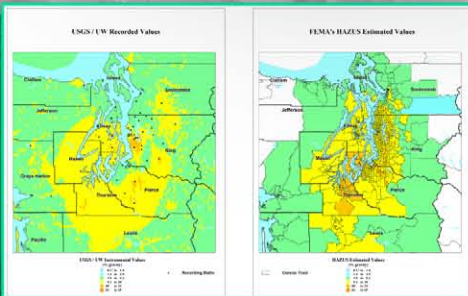
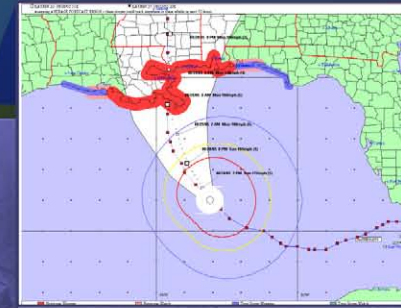
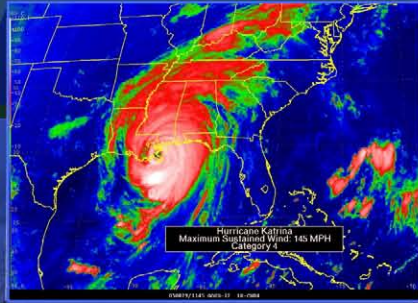




# Federal Interagency Geospatial Concept of Operations (GeoCONOPS)



## Preface

This draft Geospatial Concept of Operations (GeoCONOPS) has been developed as a starting point for understanding how the coordination of disaster response geospatial activities can be improved at the Federal level. The intended audience for this draft document are the geospatial communities that support emergency management activities of the Federal government under the NRF. This includes individual Emergency Support Functions (ESFs), the Joint Field Offices and operations centers, including the National Response Coordination Center (NRCC). Stakeholders and actors representing ESFs, operations centers and other NRF activities have been extensively engaged in providing input for this document.

When finalized, this GeoCONOPS is intended to serve as a guide to federal departments and agencies providing geospatial support under the Stafford Act. The Stafford Act describes the programs and processes by which the Federal Government provides disaster and emergency assistance to state and local governments, tribal nations, eligible private nonprofit organizations, and individuals affected by a declared major disaster or emergency.

## Revision Register

<b>Version</b>	<b>Date</b>	<b>Summary of Changes</b>	<b>Name</b>
1.0	06/30/09	Final Draft	Department of Homeland Security, Office of Chief Information Officer (DHS OCIO)
2.0	06/28/10	Final Draft	Department of Homeland Security, Office of Chief Information Officer (DHS OCIO), Office of Applied Technology, Geospatial Management Office

**Table of Contents**

<b>Team Members</b> .....	<b>5</b>	2.2.3 <i>Data Dissemination</i> .....	23
<b>1.0 Geospatial Concept of Operations</b> .....	<b>7</b>	<b>2.3 Geospatial Production and Delivery</b> .....	<b>23</b>
<b>1.1 Mission Statement</b> .....	<b>8</b>	2.3.1 <i>Production</i> .....	23
<b>1.2 Overview</b>	<b>8</b>	2.3.2 <i>Delivery</i> .....	24
<b>1.3 GeoCONOPS Community</b> .....	<b>9</b>	<b>3.0 Specific Mission Areas</b> .....	<b>25</b>
1.3.1 <i>State Authorities</i> .....	11	<b>3.1 Damage Assessments</b> .....	<b>26</b>
1.3.2 <i>Information Support Services</i> .....	11	3.1.1 <i>Imagery and Derived Products</i> .....	26
1.3.3 <i>Infrastructure</i> .....	12	3.1.2 <i>Models</i> .....	28
1.3.4 <i>Civil Support</i> .....	12	3.1.3 <i>Field Data Collection</i> .....	31
1.3.5 <i>People</i> .....	13	<b>3.2 Life-Saving Missions</b> .....	<b>33</b>
1.3.6 <i>Operations/Coordination</i> .....	13	3.2.1 <i>Search and Rescue</i> .....	33
<b>1.4 Audience and Intended Use</b> .....	<b>14</b>	3.2.2 <i>Critical Medical Support</i> .....	34
<b>1.5 Alignment with NIMS and NRF</b> .....	<b>14</b>	3.2.3 <i>Provision of Critical Food, Shelter, and Water</i> .....	37
<b>1.6 Determination of Authorities</b> .....	<b>16</b>	<b>3.3 Recovery</b> .....	<b>38</b>
<b>2.0 Geospatial Requirements and Capabilities</b> .....	<b>19</b>	3.3.1 <i>Public Assistance</i> .....	39
<b>2.1 Geospatial Mission Support</b> .....	<b>20</b>	3.3.2 <i>Individual Assistance</i> .....	40
2.1.1 <i>Coordination Requirements</i> .....	20	3.3.3 <i>Mitigation</i> .....	41
2.1.2 <i>Staffing Requirements</i> .....	21	<b>4.0 Disaster Operations</b> .....	<b>45</b>
2.1.3 <i>Technology Requirements</i> .....	21	<b>4.1 DHS National Operations Center</b> .....	<b>46</b>
2.1.4 <i>Geospatial Capabilities</i> .....	22	<b>4.2 DHS National Infrastructure Coordinating Center</b> .....	<b>48</b>
<b>2.2 Geospatial Data</b> .....	<b>22</b>	<b>4.3 FEMA National Response Coordination Center</b> .....	<b>50</b>
2.2.1 <i>Authoritative Data</i> .....	22	<b>4.4 FEMA Regional Response Coordination Centers</b> .....	<b>52</b>
2.2.2 <i>Essential Elements of Information</i> .....	23	<b>4.5 FEMA Joint Field Operations</b> .....	<b>54</b>

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices

**5.0 Catastrophic Disasters . . . . . 59**

**5.1 How to use This Section of the GeoCONOPS . . . . . 60**

**5.2 Natural Events . . . . . 60**

    5.2.1 Notice Events . . . . . 60

    5.2.2 No-Notice Events . . . . . 60

**5.3 The New Madrid Earthquake Scenario . . . . . 60**

    5.3.1 Modeled Earthquake Impacts . . . . . 60

    5.3.2 GeoCONOPS Mission Area Support . . . . . 63

**5.4 Post-Event efforts (long-term) 79**

**5.5 Actives Outside NMSZ Scenario . . . . . 80**

    5.5.1 Pre-Event Emergency Activities . . . . . 80

    5.5.2 Non Earthquake Activities . . . . . 81

**Appendix A: Mission Engineering Methodology Overview . . . . . 83**

    Community Analysis . . . . . 84

    Operations Analysis . . . . . 84

**Appendix B: Authoritative Data Matrix . . . . . 85**

**Appendix C: Civil Support . . . . . 141**

**Appendix D: Actors . . . . . 145**

**Appendix E: Referenced Documents . . . . . 147**

**Appendix F: Related CONOPS/SOPs . . . . . 149**

**Appendix G: Acronyms . . . . . 155**

**List of Figures**

**Figure 1–1: GeoCONOPS Development Phases . . . . . 8**

**Figure 1–2: GeoCONOPS Community Model . . . . . 10**

**Figure 1–3: State Authorities . . . . . 11**

**Figure 1–4: Information Support Services . . . . . 11**

**Figure 1–5: Infrastructure . . . . . 12**

**Figure 1–6: Civil Support . . . . . 12**

**Figure 1–7: People . . . . . 13**

**Figure 1–8: Operations/Coordination . . . . . 13**

**Figure 1–9: Federal Response - Stafford Act Support to States . . . . 15**

**Figure 3–1: Damage Assessment Maps - Nisqually Earthquake . . . . 26**

**Figure 3–2: TCPED Process . . . . . 27**

**Figure 3–3: Imagery Sample . . . . . 28**

**Figure 3–4: Imagery-Derived Data Sample . . . . . 28**

**Figure 4–1: Disaster Operations Reporting Structure . . . . . 45**

**Figure 4–2: Example JFO/GIU Organizational Chart . . . . . 53**

**Figure 5–1: Regional Ground Shaking Intensity from NMSZ Earthquake Scenario . . . . . 61**

**Figure 5–2: Total Casualties from Scenario Earthquake . . . . . 61**

**Figure 5–3: Estimated Damage to General Building Stock . . . . . 62**

**Figure 5–4: Major Damage to River Crossing Bridges in NMSZ . . . 62**

**Figure 5–5: Distribution of Water Outages on Day 1 in NMSZ . . . . 62**

**Figure 5–6: New Madrid Geospatial Activities . . . . . 64**

**Figure 5–7: New Madrid Geospatial Timeline . . . . . 65**

Figure 5–8: Geospatial Timeline – Life Saving ..... 66

Figure 5–9: Geospatial Timeline – Damage Assessment ..... 70

Figure 5–10: Geospatial Timeline – Recovery ..... 74

Figure A–1: Legend..... 84

Figure C–1: Request For Assistance Process Decision Matrix ..... 142

**List of Tables**

Table 2–1: Geospatial Roles and Responsibilities ..... 20

Table 2–2: Federal Geospatial Teams ..... 22

Table 3–1: Authoritative Data - Damage Assessment Mission - Imagery ..... 29

Table 3–2: Authoritative Data - Damage Assessment Mission - Modeling..... 31

Table 3–3: Authoritative Data - Damage Assessment Mission - Ground Truth ..... 33

Table 3–4: Authoritative Data - Life Saving Mission - SAR ..... 36

Table 3–5: Authoritative Data - Life Saving Mission - Critical Medical Support..... 37

Table 3–6: Authoritative Data – Critical Food Shelter and Water... 38

Table 3–7: Authoritative Data - Recovery Mission - Public Assistance ..... 40

Table 3–8: Authoritative Data - Recovery Mission - Individual Assistance ..... 41

Table 3–9: Authoritative Data - Recovery Mission - Mitigation..... 43

Table 4–1: Authoritative Data - Disaster Operations - NOC ..... 46

Table 4–2: Authoritative Data - Disaster Operations - NICC..... 49

Table 4–3: Authoritative Data - Disaster Operations - NRCC ..... 51

Table 4–4: Authoritative Data - Disaster Operations - RRCC ..... 54

Table 4–5: Authoritative Data - Disaster Operations - JFO ..... 57

Table 5–1: Estimate of “At Risk” and Shelter Seeking Populations: NMSZ Scenario Earthquake..... 61

Table 5–2: Estimated Damage to Essential Facilities in the NMSZ.. 62

Table 5–3: Sample Life Saving EEIs by ESF ..... 67

Table 5–4: Sample Damage Assessment EEIs by ESF..... 71

Table 5–5: Sample Recovery EEIs by ESF..... 76

Table 5–6: Event Specific Missions ..... 82

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices

*This page intentionally left blank.*

Team Members

GeoCONOPS

Requirements &  
Capabilities

Specific  
Mission Areas

Disaster  
Operations

Catastrophic  
Disasters

Appendices

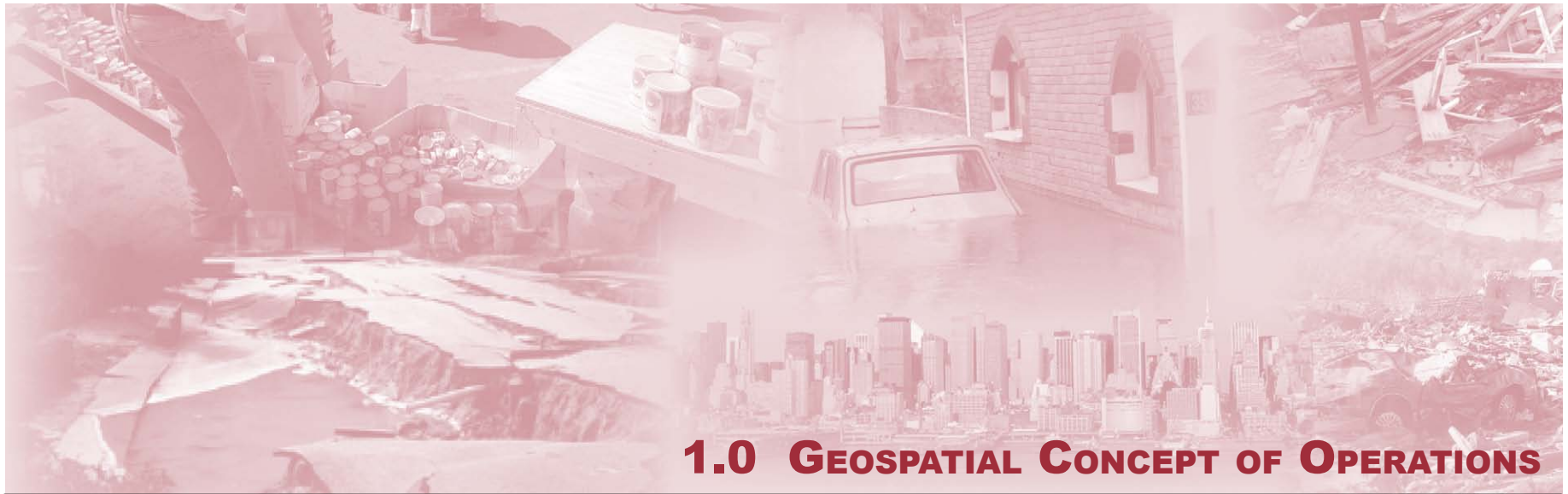


The GIOT is the Geospatial Interagency Oversight Team, a selected group of federal geospatial leads used to discuss and guide the process of the Geospatial Concept of Operations (GeoCONOPS) ensuring true federal interagency oversight. The following list includes GIOT member representatives from participating departments and agencies, supporting offices and key programs.

## *GIOT Team Member List*

1. American Red Cross (ARC)
2. DHS/Chief Technology Office/  
Geospatial Management Office (GMO)
3. DHS/Customs and Border Patrol (CBP)
4. DHS/Office of Infrastructure Protection (IP)
5. DHS/Office of Intelligence and Analysis (I&A)
6. DHS/Science and Technology (S&T)
7. DHS/US Coast Guard (USCG)
8. Federal Emergency Management Agency (FEMA)/Office of the Chief Information Officer (CIO)/Geospatial Solutions Branch
9. FEMA/Mitigation
10. FEMA/Disaster Operations Division/  
Remote Sensing
11. FEMA National Incident Management System (NIMS)
12. Environmental Protection Agency (EPA)
13. Department of Defense (DoD) National Geospatial-Intelligence Agency (NGA)
14. DoD US Army Corps of Engineers (USACE)
15. US Geological Survey (USGS)





## 1.0 GEOSPATIAL CONCEPT OF OPERATIONS

The GeoCONOPS is a multiyear effort focused on the geospatial communities supporting the Department of Homeland Security (DHS) and the emergency management activities under the NRF. This version of the GeoCONOPS is the first release of a multiyear product to document the current geospatial practices supporting the NRF and Stafford Act activities. The participants and intended audience of the GeoCONOPS include the 15 Emergency Support Functions (ESF), both primary and support, and other federal mission partners. The GeoCONOPS will be expanded in the coming years to include the homeland defense, civil support, and law enforcement missions. The GeoCONOPS is currently in review by the Federal Emergency Management Agency (FEMA) for adoption by the National Incident Management System (NIMS).

## 1.1 Mission Statement

The Federal Interagency GeoCONOPS is intended to identify and align the geospatial resources that are required to support the NRF, ESF, and supporting federal mission partners.<sup>1</sup> Through the development of the document, end users supporting homeland security and emergency management operations will be better served with authoritative and expedited coordination mechanisms that facilitate geospatial information sharing. By defining these mechanisms and authorities, this GeoCONOPS aims to reduce redundancy and confusion and ensure efficient access to geospatial information for incident management.

## 1.2 Overview

DHS is relying more often and more broadly on geospatial information technology to collect and analyze key information awareness data for its emergency response missions. According to the National Strategy for Homeland Security and DHS’s mission statement, homeland security covers prevention, protection, response, and recovery. Geospatial products and intelligence play a key role in the Department’s preparation for disasters and its response to them; they are used to help assess damage, aid in search and rescue (SAR) and debris removal, and support incident management.

The Geospatial Management Office (GMO) serving the DHS Chief Information Office, was established by the Intelligence Reform and Terrorism Prevention Act of 2004 (Title VII, Subtitle B, Section 8201, Homeland Security Geospatial Information). Through its implementation of DHS Management Directive 4030, the GMO exercises executive leadership in establishing DHS geospatial information technology programs, directives, and initiatives and provides oversight for the integration of geospatial data and technology. It serves as the principal office

to facilitate all interagency activities relating to domestic geospatial and remote sensing (RS) data to support the needs of homeland security-related intelligence, law enforcement, environmental, scientific, and emergency response requirements.

The GMO must develop requirements and processes for access to common operating data used by components and provides guidance to other federal departments and agencies that are providing support and executing homeland security and emergency management operations.

Geospatial technology provides a significant role in incident management. Its uses today include disaster early warning and mitigation, border monitoring, criminal investigations, public health protection, and critical infrastructure oversight. In recent years, federal mission partners have been operating with minimal formal guidance or direction on how to conduct

geospatial support to the emergency response and homeland security operating regimes, relying instead on ad hoc coordination.

As a result, geospatial efforts in support of incident management have frequently been slow to start or have been completely unavailable immediately following a disaster, leaving the “full power” and benefits of geospatial technology unrealized. The development of the GeoCONOPS for homeland security and emergency management operations ensures that timely and accurate geospatial data is shared across the entire geospatial community resulting in better informed decision making across all phases of an incident.

The GeoCONOPS is being developed over a 5 year period. Description of each of the five development phases is shown in *Figure 1-1*.

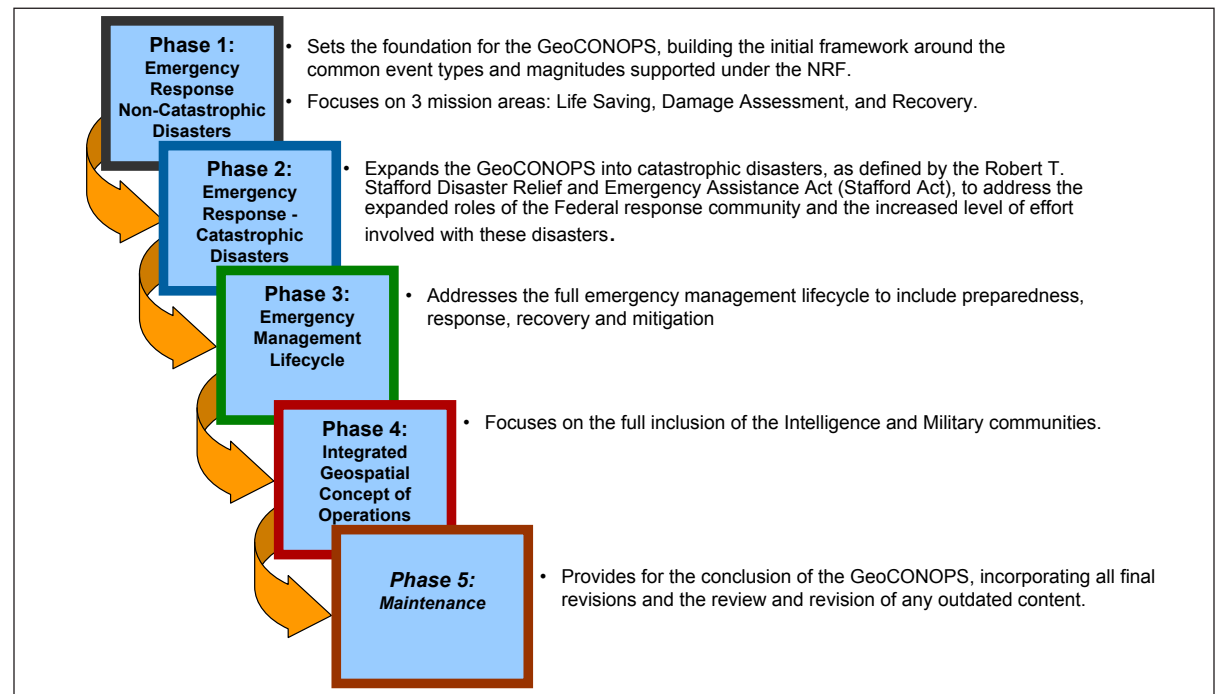


Figure 1–1: GeoCONOPS Development Phases

<sup>1</sup> See Annex C for a complete list of federal partners.

## 1.3 GeoCONOPS Community

Community analysis characterizes how the geospatial community within the GeoCONOPS operates and supports the overall DHS mission. The intent of community analysis is to describe and characterize the various actors and stakeholders and their relationships that compose the current geospatial support to emergency response operations at the national, regional, and field levels. The purpose of a Community Model (CM) is to provide an overall enterprise view that captures stakeholder interactions related to disaster operations and the mission areas of damage assessment, life saving, and recovery operations. The CM allows stakeholders to see how they fit into the overall geospatial community. The GeoCONOPS CM, shown in *Figure 1-2* provides a graphical representation of the operational framework that:

- Identifies actors and stakeholders that support the GeoCONOPS community mission
- Identifies the information environment, actor responsibilities, and transactional information exchanges
- Illustrates high-level processes across the geospatial mission operations and the correlating relationships of these processes with stakeholders.

The GeoCONOPS CM graphically represents the geospatial community in relation to non-catastrophic events. The model comprises five segments representing the following functional groups: Information Support Service, Infrastructure, People, Civil Support, and Operations/Coordination. The actors participating in the interview process for the GeoCONOPS were broken into these groupings to facilitate consistent topical areas of information collection and analysis. Each group is described in more detail below.

At the center, Life Saving, Damage Assessment, Recovery, and Mitigation themes provide the centerpiece of the model demonstrating the cyclical nature of the overall DHS mission. The ESFs provide the foundation on which all functional groups operate regarding a national-level noncatastrophic event. Guidance is provided by the NRF and NIMS, which form the core of the model and dictate the governing stakeholders, processes, and policies. As event information is collected at the federal, state, and local level, additional information is compiled and produced by the geospatial community and assimilated by the Operations/Coordination group. This information, including geospatial products and reports, is provided back to the functional groups as well as state and local authorities to assist in event management.

# Geospatial CONOPS Community Model

- Team Members
- GeoCONOPS
- Requirements & Capabilities
- Mission Specific Areas
- Disaster Operations
- Catastrophic Disasters
- Appendices

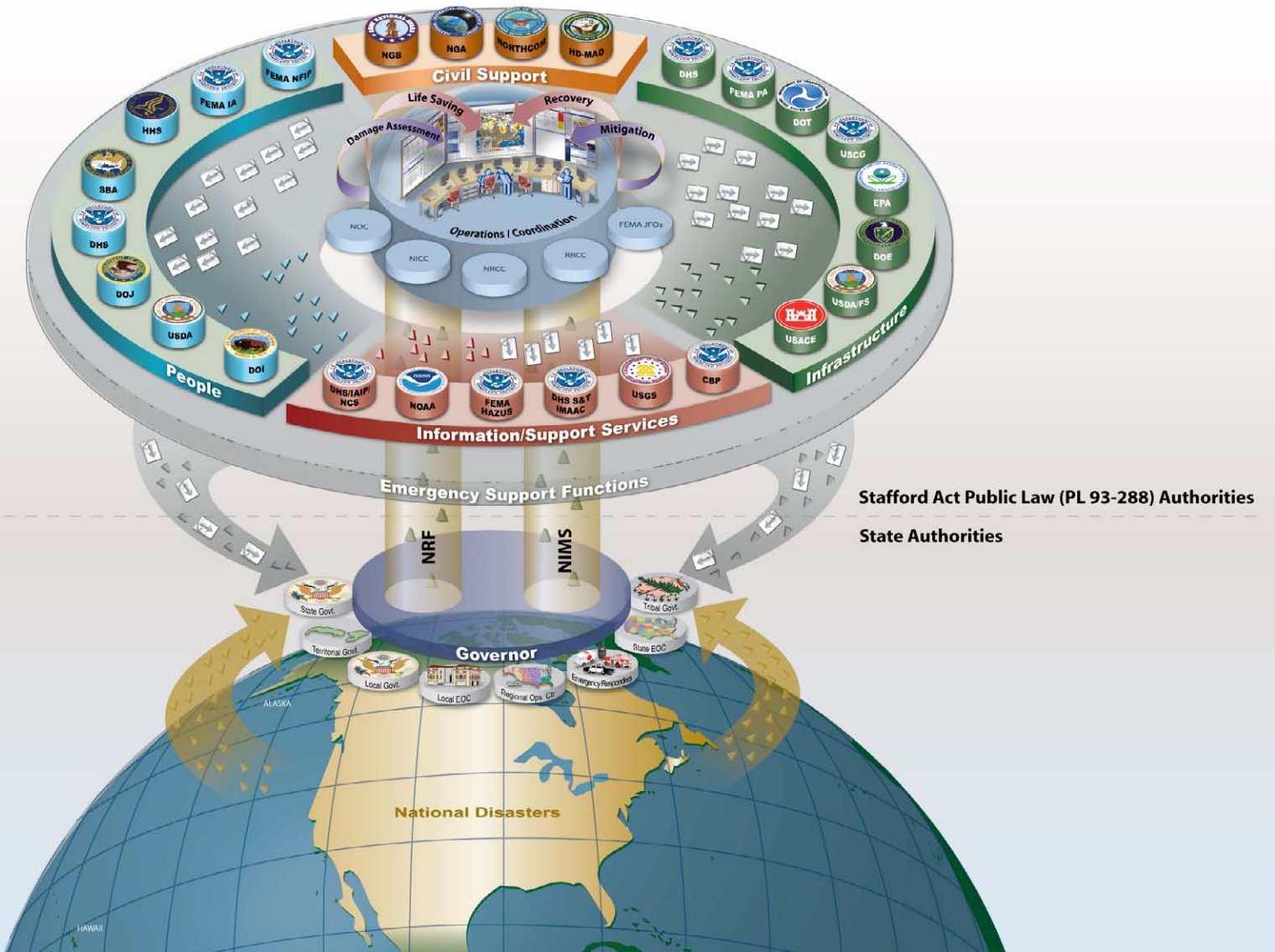


Figure 1-2: GeoCONOPS Community Model

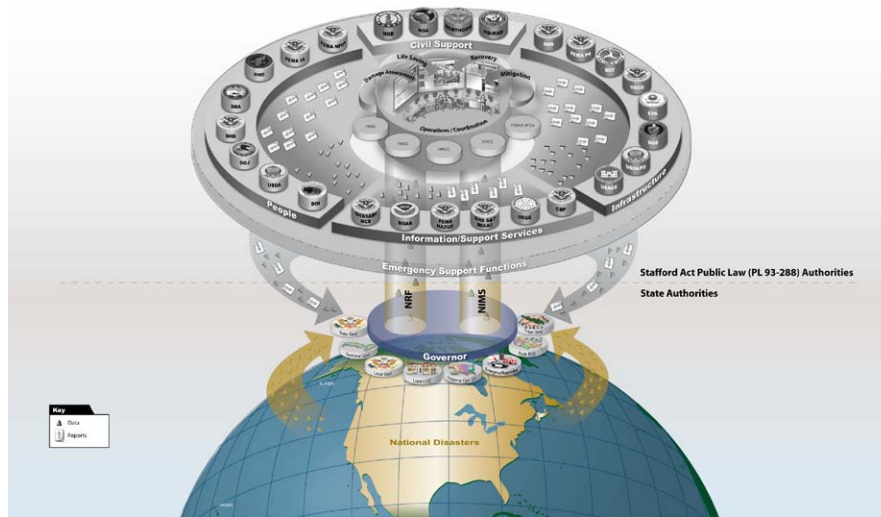


Figure 1-3: State Authorities

### 1.3.1 State Authorities

As disasters occur, state, local, territorial, and tribal governments and Emergency Operations Centers (EOC) provide coordination and support based on governing state authorities. The highlighted elements illustrate the nonfederal government organizations responsible for providing information and immediate response regarding the disaster incident. A state Governor can provide this information directly to federal Operations/Coordination actors based on the NRF and the NIMS guidelines for requesting assistance.

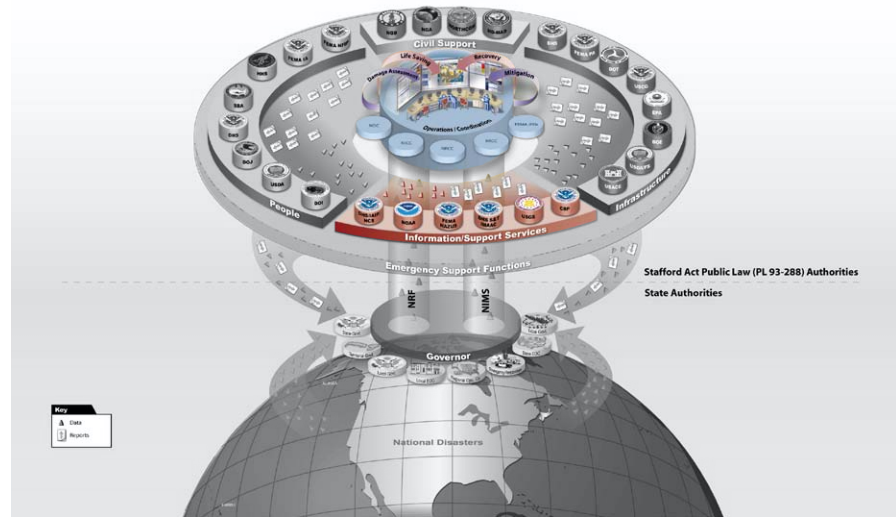


Figure 1-4: Information Support Services

### 1.3.2 Information Support Services

The Information Support Services segment provides the Operations/Coordination segment with modeling, weather, border, and geological-related information in response to a disaster incident. The key stakeholders include National Oceanic and Atmospheric Administration (NOAA), Customs and Border Protection (CBP), DHS National Communications System (NCS), and US Geological Survey (USGS) and leverage the Interagency Modeling and Atmospheric Assessment Center (IMAAC) and HAZUS programs.

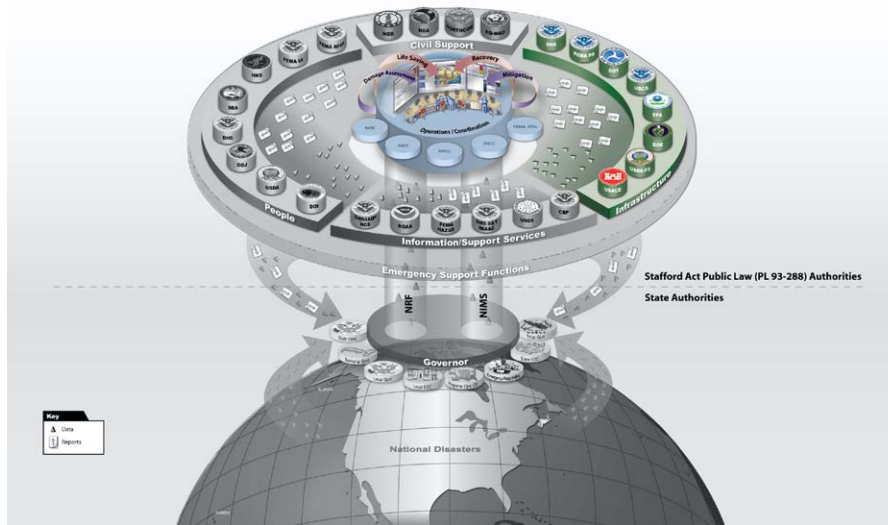


Figure 1-5: Infrastructure

### 1.3.3 Infrastructure

The Infrastructure segment provides the Operations/Coordination segment with assessment information regarding buildings, schools, dams, levies, and other man-made structures as well as the impact to the local community and environment. The key stakeholders responsible for this information are the Army Corps of Engineers (USACE), Forest Service, (USFS) Department of Energy (DOE), Environmental Protection Agency (EPA), Coast Guard, Department of Transportation (DOT), DHS, and FEMA Public Assistance (PA).

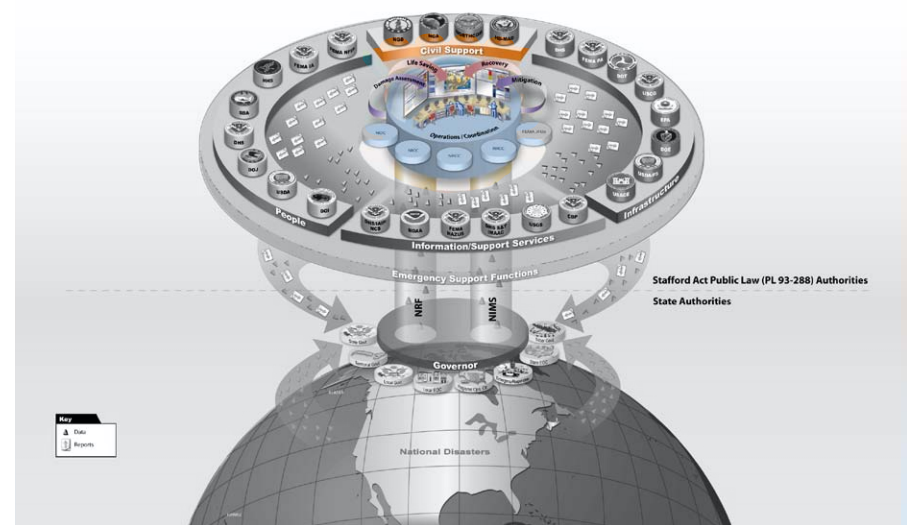


Figure 1-6: Civil Support

### 1.3.4 Civil Support

The Civil Support segment provides the Operations/Coordination segment with geospatial information in support of homeland security related disaster incidents. The key stakeholders responsible for this information are the National Guard Bureau (NGB), National Geospatial-Intelligence Agency (NGA), and US Northern Command (USNORTHCOM) Mission Assurance Division (MAD).

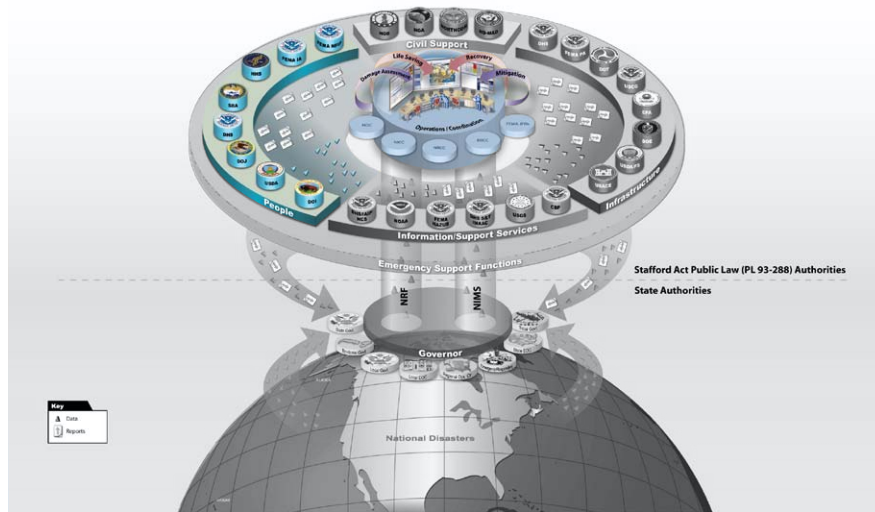


Figure 1-7: People

### 1.3.5 People

The People segment provides the Operations/Coordination segment with information regarding services provided to victims of disaster incidents including life saving, employment, shelters, legal, and health-related information. The key stakeholders include the Department of Justice (DOJ), Department of Health and Human Services (DHHS), FEMA, and US Department of Agriculture (USDA).

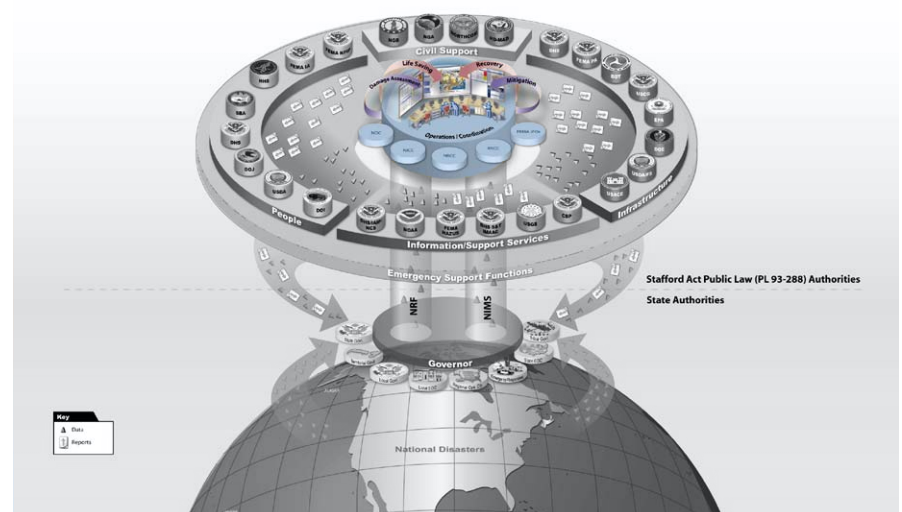


Figure 1-8: Operations/Coordination

### 1.3.6 Operations/Coordination

The Operations/Coordination segment is the central access point for the request for assistance as well as information and reports provided to other geospatial community segments and state and local entities. The key stakeholders responsible for gathering, compiling, and distributing this information are the DHS National Operations Center (NOC), National Infrastructure Coordinating Center (NIICC), National Response Coordination Center (NRCC), FEMA, Joint Field Offices (JFO), and FEMA Regional Response Coordination Center (RRCC).

## 1.4 Audience and Intended Use

The intended audience for this document is the geospatial communities supporting DHS and emergency management activities from the JFOs to the NRF headquarters entities and operation centers. The GeoCONOPS has been developed with input from the stakeholders and actors who have direct ownership in the key mission areas outlined in this document. This document outlines federal geospatial capabilities in support of state, local, and tribal authorities during homeland security and emergency management operations across the entire emergency management lifecycle.

This GeoCONOPS serves as a guide to federal departments and agencies providing geospatial support under the Stafford Act. The Stafford Act describes the programs and processes by which the Federal Government provides disaster and emergency assistance to state and local governments, tribal nations, eligible private nonprofit organizations, and individuals affected by a declared major disaster or emergency. Once the President declares a major disaster or emergency, the majority of assistance to state, local, and tribal jurisdictions is provided under the Stafford Act. However, federal assistance can also be provided in a number of ways through various mechanisms and authorities. Federal assistance does not always require coordination by DHS and may be provided without a Presidential declaration of a major disaster or emergency.

## 1.5 Alignment with NIMS and NRF

The NRF establishes a comprehensive, national, all-hazards approach to domestic incident response and defines the key principles, roles, and structures that organize the way we respond as a nation. It describes how communities, tribes, states, the Federal

Government, private sector, and nongovernmental organizations (NGO) partners apply these principles for a coordinated, effective national response. In addition, the NRF enables first responders, decision makers, and supporting entities to provide a unified national response.

The GeoCONOPS is aligned to the NRF mission partners, the ESFs, and other support elements through the depiction of geospatial information required to provide key mission support (life saving, damage assessment, and recovery). Within the event-specific sections of the GeoCONOPS, ESF-specific mission activities are identified as well as the geospatial information products produced by the ESF.

The NIMS provides a systematic, proactive approach to guide departments and agencies at all levels of government, NGOs, and the private sector to work seamlessly to prevent, protect against, respond to, recover from, and mitigate the effects of incidents, regardless of cause, size, location, or complexity, to reduce the loss of life and property and harm to the environment. NIMS works hand in hand with the NRF. NIMS provides the template for the management of incidents, while the NRF provides the structure and mechanisms for national-level policy for incident management. Component II, Section C, of NIMS (draft 2007) has a section dedicated to the critical importance of geospatial information to communication and information management during an incident.

The alignment of the GeoCONOPS to NIMS can be used to support information and communication management as well as to support the other components of NIMS:

- **Preparedness.** Pre-event planning and coordination. The GeoCONOPS reflects the “as-is” environment of the geospatial community supporting emergency management activities.

- **Resource Management.** The GeoCONOPS supports credentialing of staff and resource requirements, as discussed in Section 2.
- **Coordination and Management.** The GeoCONOPS will assist in reducing duplication of efforts in geospatial data and products by identifying authoritative sources for information and products.
- **Management and Maintenance/Standards and Technology.** Planning and training and development of best practices and standard operating procedures (SOP).

Within the NRF, the ESFs provide the structure to group the capabilities and functional expertise of Federal departments and agencies and the American Red Cross for coordinating Federal interagency support for a Federal response to an incident. The NIMS provides the flexibility to assign the ESFs in support of event operations at the Joint Field Offices (JFO), Regional Response Coordination Centers (RRCC) or the National Response Coordination Center (NRCC) in order to respond to incidents in a more collaborative manner. Each ESF assigns responsibilities to a primary agency and support agencies. The Roles and Responsibilities of the 15 ESFs are defined below:

### ESF #1 – Transportation

- Aviation/airspace management and control
- Transportation safety
- Restoration/recovery of transportation infrastructure
- Movement restrictions
- Damage and impact assessment

### ESF #2 – Communications

- Coordination with telecommunications and information technology industries



- Restoration and repair of telecommunications infrastructure
- Protection, restoration, and sustainment of national cyber and information technology resources
- Oversight of communications within the Federal incident management and response structures

ESF #3 – Public Works and Engineering

- Infrastructure protection and emergency repair
- Infrastructure restoration
- Engineering services and construction management
- Emergency contracting support for life-saving and life-sustaining services

ESF #4 – Firefighting

- Coordination of Federal firefighting activities
- Support to wildland, rural, and urban firefighting operations

ESF #5 – Emergency Management

- Coordination of incident management and response efforts
- Issuance of mission assignments
- Resource and human capital
- Incident action planning
- Financial management

ESF #6 – Mass Care, Emergency Assistance, Housing, and Human Services

- Mass care
- Emergency assistance
- Disaster housing
- Human services

ESF #7 – Logistics Management and Resource Support

- Comprehensive, national incident logistics planning, management, and sustainment capability
- Resource support (facility space, office equipment and supplies, contracting services, etc.)

ESF #8 – Public Health and Medical Services

- Public health
- Medical
- Mental health services
- Mass fatality management

ESF #9 – Search and Rescue

- Life-saving assistance
- Search and rescue operations

ESF #10 – Oil and Hazardous Materials Response

- Oil and hazardous materials (chemical, biological, radiological, etc.) response
- Environmental short- and long-term cleanup

ESF #11 – Agriculture and Natural Resources

- Nutrition assistance
- Animal and plant disease and pest response
- Food safety and security
- Natural and cultural resources and historic properties protection and restoration
- Safety and well-being of household pets

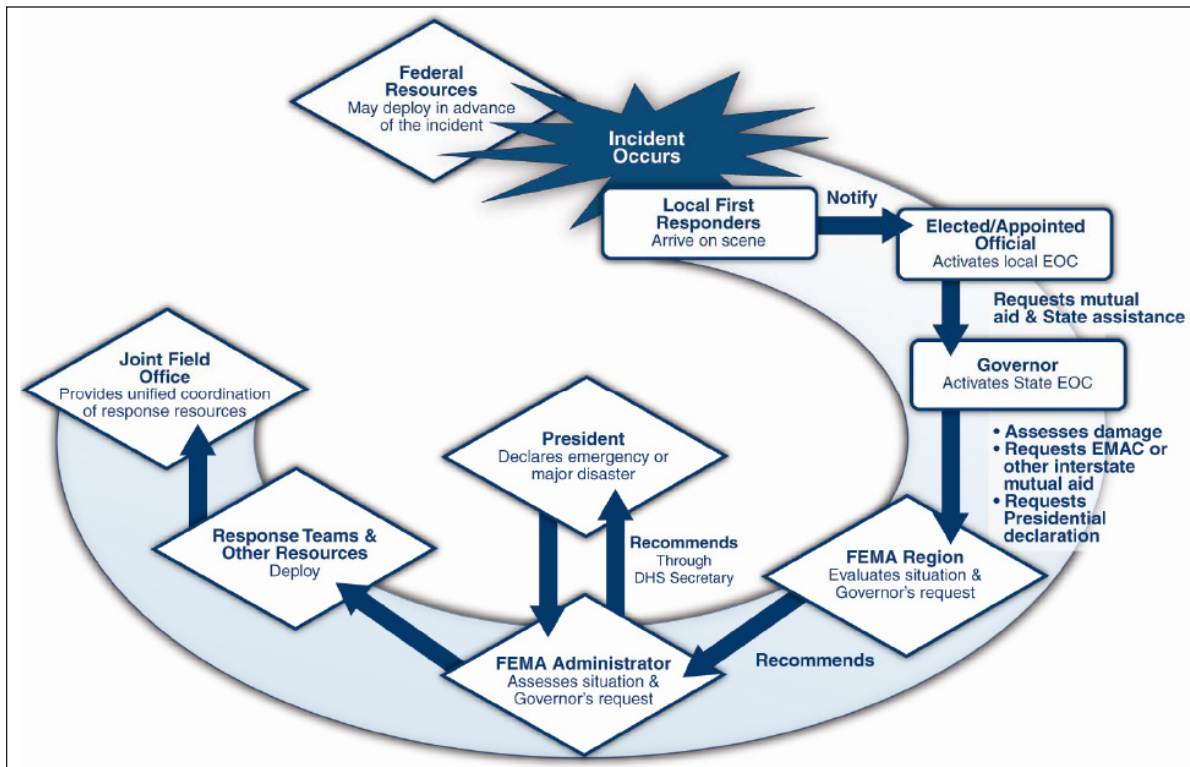


Figure 1–9: Federal Response - Stafford Act Support to States

ESF #12 – Energy

- Energy infrastructure assessment, repair, and restoration
- Energy industry utilities coordination
- Energy forecast

ESF #13 – Public Safety and Security

- Facility and resource security
- Security planning and technical resource assistance
- Public safety and security support
- Support to access, traffic, and crowd control

ESF #14 – Long-Term Community Recovery

- Social and economic community impact assessment
- Long-term community recovery assistance to States, local governments, and the private sector
- Analysis and review of mitigation program implementation

ESF #15 – External Affairs

- Emergency public information and protective action guidance
- Media and community relations
- Congressional and international affairs
- Tribal and insular affairs

Federal departments and agencies routinely manage the response to incidents under their statutory or executive authorities. When a federal entity with primary responsibility and authority for handling an incident requires federal assistance above and beyond its interagency mechanisms (e.g., Executive orders, memorandums of understanding [MOU], memorandums of agreement [MOA], etc.), that department or agency can request additional federal assistance through DHS. When this happens, this support is:

- Coordinated by DHS using the multiagency coordination structures established in the NRF and in accordance with the NIMS
- Generally funded by the federal entity with primary responsibility and statutory authority for the incident in accordance with provisions of the Economy Act, unless other statutory authorities exist
- Facilitated by the interagency MOU for Mutual Aid, and executed at the time of the incident through interagency agreements (see the Financial Management Support Annex for more information).

*Figure 1-3* illustrates actions federal departments and agencies will take to assist state and local governments under Stafford Act.

## 1.6 Determination of Authorities

The GeoCONOPS is based on appropriate roles, responsibilities and authorities and is consistent with all appropriate United States laws, policies, and other related requirements.

Specific authorities include, but are not limited to:

- **The Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act)**, as amended (42 United States Code [U.S.C.] § 5121 et seq.) describes the programs and processes by which the Federal Government provides disaster and emergency assistance to state and local governments, tribal nations, eligible private nonprofit organizations, and individuals affected by a declared major disaster or emergency. The Stafford Act covers all-hazards, including natural disasters and terrorist events.
- **National Response Framework (NRF)**, January 2008, is a guide to how the nation conducts an all-hazards response. It describes specific authorities and best practices for managing incidents that range from the serious but purely local, to large-scale terrorist attacks or catastrophic natural disasters.

- **National Incident Management System (NIMS)**, March 2004, provides the template for incident management regardless of size, scope, or cause of the event. It is a consistent doctrinal framework for incident management at all jurisdictional levels. It includes a core set of concepts, principles, terminology, and technologies covering the incident command system; multiagency coordination systems; unified command; training; identification and management of resources (including systems for classifying types of resources); qualifications and certification; and the collection, tracking, and reporting of incident information and incident resources.
- **Homeland Security Act of 2002** (P.L. 107-296, 116 Stat. 2135 (2002) (codified predominantly at 6 U.S.C. § 101-557), as amended, with respect to the organization and mission of FEMA in the DHS Appropriations Act of 2007, P.L. 109-295, 120 Stat. 1355 (2006), established DHS as an executive department of the United States. The Homeland Security Act consolidated component agencies, including FEMA, into DHS.
- **Post-Katrina Emergency Management Reform Act (PKEMRA)** of 2006 (P.L. 109-295) clarified and modified the Homeland Security Act with respect to the organizational structure, authorities, and responsibilities of FEMA and the FEMA Administrator.
- **Homeland Security Presidential Directive-5 (HSPD-5), Management of Domestic Incidents**, February 28, 2003, establishes a single, comprehensive national incident management system. It also designates the Secretary of Homeland Security as the principal federal official for domestic incident management and recognizes the statutory authorities of the Attorney General, Secretary of Defense, and Secretary of State. It directs the heads of all federal departments and agencies to provide their full and prompt cooperation, resources, and support, as appropriate and consistent with their own responsibilities for protecting national security,

to the Secretary of Homeland Security, Attorney General, Secretary of Defense, and Secretary of State in the exercise of leadership responsibilities and missions assigned.

- **HSPD-7, Critical Infrastructure Identification, Prioritization, and Protection**, December 17, 2003, establishes a national policy for federal departments and agencies to identify and prioritize US critical infrastructure and key resources (CIKR) and to protect them.
- **HSPD-8, National Preparedness**, December 17, 2003, establishes policies to strengthen the preparedness of the United States to prevent and respond to threatened or actual domestic terrorist attacks, major disasters, and other emergencies by requiring a national domestic all-hazards preparedness goal, establishing mechanisms for improved delivery of federal preparedness assistance to state, local, and tribal governments, and outlining actions to strengthen preparedness capabilities of federal, state, local, and tribal entities. Annex 1, National Planning, published on December 3, 2007, establishes a standard and comprehensive approach to national planning.

*This page intentionally left blank.*

Team Members

GeoCONOPS

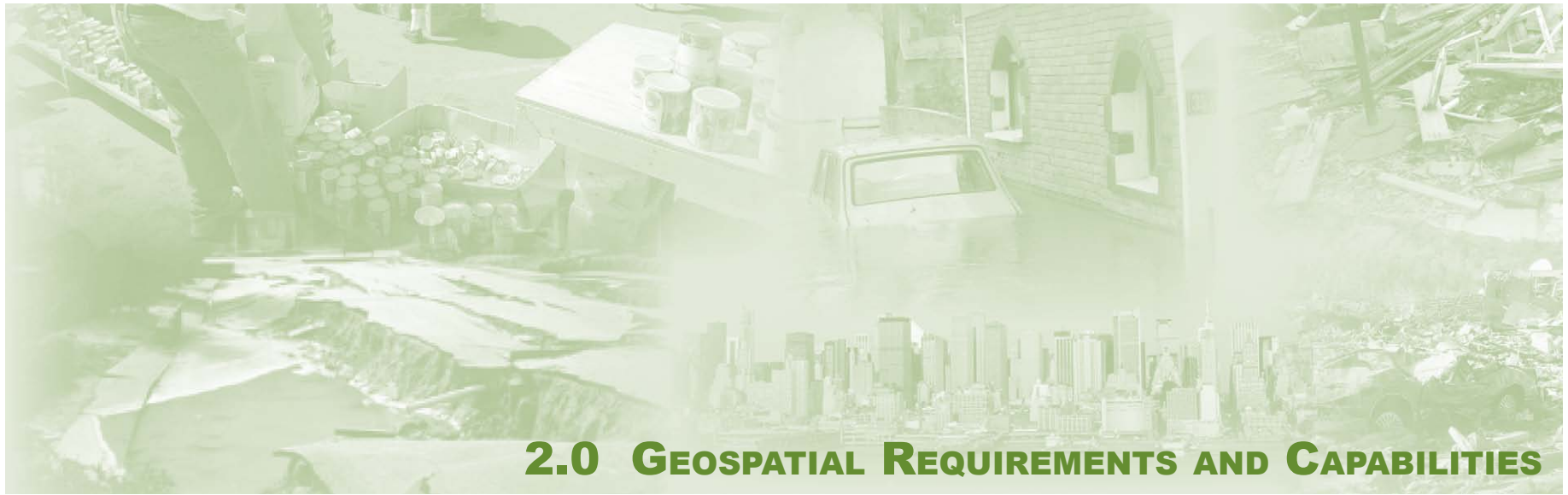
Requirements &  
Capabilities

Specific  
Mission Areas

Disaster  
Operations

Catastrophic  
Disasters

Appendices



## 2.0 GEOSPATIAL REQUIREMENTS AND CAPABILITIES

Geospatial technology provides big-picture visibility in tandem with operational support at the ground level. To accomplish this, the staffing resources and technology assets, must be available to fill the production requirement of an event. This section assists in identifying the general requirements and capabilities of a geospatial support entity. The details of the specific mission areas as well as the operational environments are further addressed in Sections 3 and 4 of the GeoCONOPS.

## 2.1 Geospatial Mission Support

Geospatial technology is used throughout the operations and entities supporting mitigation, preparedness, response, and recovery efforts. The missions reflected in these efforts include the saving of lives and property, the provision of food and shelter, financial assistance, damage assessments, and recovery. With coordination and a strategy for resource use, geospatial technology can be more effective in meeting the requirements of any incident.

### 2.1.1 Coordination Requirements

The focus of the geospatial leadership is to provide a coordinated level of support to their customers. In the context of this GeoCONOPS, the term “geospatial leadership” refers to an operational paradigm that suggests ownership at multiple levels of a community or organization, which allows for geospatial activities to operate efficiently in support of incident response. This operational paradigm will assist in minimizing the duplication of efforts and expedite the availability of critical information. Efforts to maintain connections with other entities involved with disaster operations will assist in the pursuit of mutually supportive projects at the strategic, operational, and tactical levels.

Geospatial efforts require full integration with the leadership and mission areas supporting an incident. The geospatial managers must work to build relationships with the onsite leadership team, attending key meetings and ensuring that geospatial technology is available to support the event in its entirety. Having full situational awareness, the geospatial leads will effectively build staffing and resource plans for the provision of support.

**Table 2–1: Geospatial Roles and Responsibilities**

Position Title	Responsibilities
Team Leader	<ul style="list-style-type: none"> <li>Responsible for the coordination of geospatial information system (GIS) production, RS, and geospatial database efforts.</li> <li>Conducts briefings, attends meetings, and directs overall geospatial support operations.</li> <li>Interfaces with federal, state, and local authorities establishing MOUs, partnerships, and data sharing agreements.</li> <li>Proactively seeks opportunities to integrate geospatial products into executive decision making.</li> </ul>
Deputy Team Leader	<ul style="list-style-type: none"> <li>Reports to the Geospatial Team Leader.</li> <li>Responsible for maintaining the coordinated efforts of the geospatial team.</li> <li>During times of absence of the Team Leader, becomes the representative of the Team.</li> </ul>
Administrative Assistant	<ul style="list-style-type: none"> <li>Reports to the Team Leader.</li> <li>Provides administrative support to the Team Leader and the Team in general.</li> <li>Manages reception area.</li> <li>Greets customers and assists them in filling out request forms.</li> </ul>
Geospatial Production Manager	<ul style="list-style-type: none"> <li>Reports to the Team Leader.</li> <li>Coordinates GIS requirements and supervises assigned Geospatial Analysts.</li> <li>Prioritizes GIS production and activities.</li> <li>Works with product requesters to properly define requirements and ensures the timely preparation and delivery of recurring and ad hoc GIS products.</li> </ul>
Geospatial Analyst	<ul style="list-style-type: none"> <li>Reports to the Geospatial Production Manager.</li> <li>Prepares recurring and ad hoc GIS products.</li> <li>Compiles various types of geospatial information into map and data products.</li> <li>Analyzes geospatial data from various sources to answer diverse questions and populate geospatial products.</li> </ul>
Geospatial Imagery Manager	<ul style="list-style-type: none"> <li>Reports to the Team Leader.</li> <li>Responsible for the coordination of RS requirements, resources, and requests for the team.</li> <li>Operates as task originator &amp; collection manager for assets related to the operation.</li> <li>Works with Geospatial Production Manager to ensure imagery- derived products are delivered in a timely manner.</li> <li>Supervises Imagery Analysts.</li> </ul>

**Table 2-1: Geospatial Roles and Responsibilities (cont.)**

Position Title	Responsibilities
Imagery Analyst	<ul style="list-style-type: none"> <li>• Reports to the Geospatial Imagery Manager.</li> <li>• Processes and interprets acquired imagery.</li> <li>• Processes imagery in native and/or other formats.</li> <li>• Prepares image data files for use by the Geospatial Analyst Staff.</li> <li>• Creates imagery-derived datasets and products.</li> </ul>
Geospatial Database Manager	<ul style="list-style-type: none"> <li>• Reports to Team Leader.</li> <li>• Responsible for creating and managing the file-based data storage system, updating and distributing associated documentation, answering all queries for use, and briefing teams on use of data.</li> <li>• Initiates data sharing agreements or purchases for data as required and arranges for data updates as necessary.</li> </ul>
Geospatial Database Administrator	<ul style="list-style-type: none"> <li>• Reports to the Geospatial Database Manager.</li> <li>• Develops, maintains, and coordinates the geospatial data used.</li> <li>• Sets database access rights and privileges.</li> <li>• Responsible for data backups as required.</li> </ul>
Geospatial Data Analyst	<ul style="list-style-type: none"> <li>• Reports to the Geospatial Database Manager.</li> <li>• Designs and builds custom database queries as requested by task force members.</li> <li>• Performs quality control and corrects anomalies in the data.</li> <li>• Loads data sets under direction of Database Manager.</li> </ul>

### 2.1.2 Staffing Requirements

To ensure access to critical geospatial information and products, personnel must be readily available to support the many entities engaged in incident operations. This level of specific operational support provides situational awareness and geospatial tools to the managers of Multiagency Coordination Centers (MACC) and field facilities.

Staffing requirements can be met with proper planning. While smaller events may be adequately supported with existing in-house staff, larger events will require additional staffing resources. After determining an estimated level of effort required for an operation, staff

should be ordered/requested in a phased sequence to ensure that the team grows with the progress of the operation. Staff planning should look 30+ days into the future and accommodate rotation and duration requirements of the respective parent organizations. Surge staff can be accessed within the operational organization, other federal entities, contract staff, local hires, and/or volunteer organizations.

An effective operational response will rely heavily on establishing and following a regular operational tempo in concert with interagency partners, and other stakeholders. Interagency Agreements, Mission Assignments (MA), Pre-Scripted Mission

Assignments (PSMA), MOUs, and MOAs will be leveraged during all phases to support surge requirements, in coordination with state, local, and tribal authorities.

Staffing procedures must be in accordance with existing department and agency plans, MACC (e.g., NRCC, RRCC, JFO) SOPs, policies, and procedures relating to statutory requirements as well as in support of explicit roles, responsibilities, and assignments specified under:

- NRF ESF, Support and Incident Annexes
- Existing and ad hoc MAs, authorized by FEMA and coordinated through the JFO, RRCC, or NRCC
- State, local, tribal, and regional emergency operations plans and associated procedures
- National Infrastructure Protection Plan (NIPP) Sector Specific Plans
- National Continuity Policy and national essential functions (NEFs).

Federal departments and agencies acting under their own jurisdictional authorities and funding mechanisms can deploy prior to or in support of an incident without a prior request from FEMA.

Geospatial staff and teams typically fall under the Planning Section within NIMS and Incident Command System (ICS) but may be assigned to Operations or other areas within the NIMS structure.

**Table 2-1** contains a list of key geospatial position titles and associated responsibilities.

### 2.1.3 Technology Requirements

The tools required for geospatial support can be acquired in advance or procured immediately following an event. In an effort to minimize delays in service, a basic level of hardware/software should be maintained in preparation for future operations (FEMA JFOs use this type of hardware/software solution with their Deployable Emergency GIS

Suites [DEGS] and NGA with its Mobile Integrated Geospatial Intelligence System [MIGS]). The level of effort required for hardware/software maintenance is high because hardware performance capabilities increase with time and software updates are released regularly. This effort provides large returns when responding to notice and no-notice events with the support and speed associated with current technology and properly trained staff.

### 2.1.4 Geospatial Capabilities

There are many geospatial-specific organizations and programs in existence across the emergency management and homeland security environments. Although some of these are mission-specific, others are more general and available to support many different operational requirements. A sample listing of common geospatial capabilities, both fixed and field is presented in *Table 2-2*.

## 2.2 Geospatial Data

Data is required for every geospatial product. The quality of this data dictates the overall value of these products and the level of support available. Without valid authoritative sources and core standards for data management, the investment in hardware, software, and labor can be immediately undermined. This section defines the term “Authoritative” as it relates to geospatial data and provides background on basic data standards for the GeoCONOPS.

### 2.2.1 Authoritative Data

For the purpose of the GeoCONOPS, authoritative data owned and/or produced by the federal entities supporting the NRF is defined as follows:

**Rational Authority.** Government agencies are by default the “authoritative” sources for data or services that they produce, or have a statutory responsibility for.

**Expert Authority.** Scientifically authoritative data is defined in the realm of the various professions under which the standards and methodology for data are created.

These classifications provide clarity beyond the frequent notion that an authoritative data source is simply the entity trusted because of a subjective belief that it is the “best” or “most accurate” source for a specific data theme. The owner or authoritative source of any geospatial data is responsible for defining the business rules for the access and sharing

of that information across the stakeholder community. The data provider should identify restrictions that may inhibit the mission at For Official Use Only (FOUO) level, and establish classification at lowest level possible. Data users should abide by the established rules to ensure seamless coordination.

**Table 2–2: Federal Geospatial Teams**

Team	Type	Location
FEMA Mapping and Analysis Center (MAC)	Fixed	Located at FEMA HQ supporting NRCC, RRCC and JFO operations
FEMA Geospatial Intelligence Unit (GIU)	Field	Operational within each FEMA JFO
DHS Geospatial Management Office (GMO)	Fixed	Support for all DHS-related geospatial activities
DHS Interagency Modeling and Atmospheric Assessment Center (IMAAC)	Fixed	Authoritative modeling source for air-borne hazards
DHS Infrastructure Information Collection Division (IICD)	Fixed	Support for Critical Infrastructure
DHS National Infrastructure Coordinating Center (NICC) Geospatial Information System (GIS) Desk	Fixed	Internal support to NICC
DHS National Operations Center (NOC) GIS Desk	Fixed	Internal support to NOC
NGA Mobile Integrated Geospatial-Intelligence System (MIGS)	Field	Mobile Geospatial Team supporting FBI, FEMA, and others
NGA PMH (Office of Americas/Homeland Security Division)	Field	Located at NGA Bethesda and St. Louis supporting defense, intelligence, and civil federal agencies with a homeland security/defense mission.
NGB Civil Support Team (CST)	Field	Support for NGB operations
USACE Planning & Response Team (PRT)	Field	Deployed to JFO and other disaster support facilities



## 2.2.2 Essential Elements of Information

The DHS GMO has developed the DHS geospatial data model (GDM) to support geospatial interoperability and information sharing.<sup>1</sup> Geospatial operations at the DHS are based on the model, as are data exchanges with stakeholders in the homeland security and disaster management community. The GDM is a comprehensive framework for organizing features of interest to the homeland security community.

Immediately following an event, priority is given to the collection of key information on the nature and scope of damages. This data is formally defined as Essential Elements of Information (EEI) and typically collected under the guidance of an Information Collection Plan (ICP). The EEIs contribute directly to situational awareness and revolve around a time-based reporting cycle. The overall list of EEIs may vary by a specific event or type, but generally include information such as: disaster boundaries, socio-economic impacts, and status of communications, transportation systems, and critical infrastructure.

The information collection and analysis process evolves through the life cycle of the event. Initially, predictive modeling may provide estimates for an EEI, prior to field information becoming available. As the event response progresses, the EEI will be populated with data pulled from Situation Reports, and later through ground truth sources. As priorities shift to sustained response and initial recovery, the ICP is adjusted to reflect changing requirements and the EEIs adjust as the key activities determine what information is essential.

<sup>1</sup> More information can be obtained at <http://www.fgdc.gov/participation/working-groups-subcommittees/hswg/dhs-gdm/>

## 2.2.3 Data Dissemination

Data dissemination is accomplished through many sources as opposed to a single centralized venue. While this is effective in promoting information data sharing and general wide area access, it does not provide a consolidated or managed source for either. Currently the formal location for posting and accessing geospatial data is through the Homeland Security Information Network (HSIN) and the Integrated Common Analytical Viewer (iCAV).

Vector data products are fairly compact in individual file size, facilitating data sharing through web services, e-mail, and web postings. With agile delivery options, emergency managers have access to these data products in a timely manner to assist in their decision making. Larger data files such as imagery or national datasets are more difficult to manage. Frequently these data types are shared through the physical transfer of external hard drives and other portable media.

## 2.3 Geospatial Production and Delivery

The production and delivery of geospatial products in the disaster environment is a challenge because each event brings unique circumstances and solutions. The information requirements, data availability, and customer base are driven by the event. Pre-planning allows for immediate activation and productivity as the teams adjust as required to ensure products are available when needed. The production of geospatial products can occur at either a fixed or field facility.

- **Fixed facilities** provide internal and external support focused at their areas of responsibility. Often, surge staff and resources are brought in to assist with the large workloads and long hours associated with disaster operations. For typical day-to-day operations, geospatial staffing may be 1–5 individuals. When activated, the staff count

might climb to 8–10 individuals to meet the surge requirements of an event. Entities with specific surge plans have the opportunity to pre-train staff to minimize delays in response and recovery efforts. Hardware and software is generally pre-configured and available to the workforce as they arrive.

- **Field facilities** are typically created rapidly to accommodate the requirements of the event. On smaller events, this entity may be fully operational with 1–5 individuals while large events may require a staffing level of 30+ people. As the magnitude of the event and support requirements increase so does the level of complexity of the geospatial entity supporting it.

### 2.3.1 Production

The initial point at which a geospatial product request is taken is vital to its execution and completion. The Geospatial Request for Information (RFI) must provide enough information to ensure that the product delivered to the requestor is accurate, timely, and effective. With the multitude of RFIs, a system must be defined to triage them against mission requirements and priorities, requestor responsibilities, and geospatial capabilities.

Several geospatial products are developed during every event: maps, analysis, analytical results, reports, and geospatial data. Paper maps are the predominate geospatial product for onsite RFIs. These products are used for low-tech briefings, posting on conference room walls, and literally placing critical information into the hands of key leadership. Digital graphics provide the medium for basic information sharing, reproduction, and archiving. These products are e-mailed, embedded into text-based reports, and posted to HSIN, iCAV, and other web-based locations.<sup>2</sup>

<sup>2</sup> See Section 4.2.5 for detailed overview of iCav and other dissemination tools.

## Best Practices - Requests for Information

The Request for Information (RFI) process streamlines geospatial product delivery and ensures the requests meet the needs of the requestor. To meet the growing information requirements of its internal and external customers, the DHS Office of Infrastructure Protection (IP) Infrastructure Information Collection Division (IICD) has defined a RFI process for managing requests for infrastructure related information. The RFI process is designed to fulfill requests for infrastructure data which are vital for preparing, responding to, or supporting events that require DHS resources. RFIs can include (but are not limited to) data, map products, policy, guidelines, and reports related to infrastructure data.

Incoming RFIs require the collaboration of various divisions within IP to complete the RFI process; because the National Infrastructure Coordinating Center (NICC) manages collaboration between all IP divisions, IICD mission partners are able to use a single interface to submit a RFI. The NICC is responsible for capturing and tracking all RFIs submitted to IP. When an event occurs, the Incident Management Cell (IMC) provides surge support to handle the influx of event-related RFIs. The IMC coordinates event-related RFIs with the NICC to ensure that all event-related RFIs are:

- Identified and documented
- Reviewed for sufficient information accuracy
- Routed to the appropriate party for action
- Tracked
- Provided to the requestor upon completion

While many RFIs result in ad hoc products or repetitive products for specific customers, unique situations and/or large events may require mass production of large volumes of unique paper map products. In these scenarios, efforts are immediately streamlined by consolidating multiple similar products into a single product. Process flows of large production efforts must be completely documented to ensure continued success. These operations may require a large amount of printing, packaging, and hardware resources unavailable locally; teams should plan to order them in from outside sources.

### 2.3.2 Delivery

The delivery of geospatial RFI products is normally a routine activity. For disaster support, additional thought and conversation is needed to determine the proper format for product delivery. Factoring the product destination (fixed location vs. field location), purpose (briefing, embedded report, etc.), timeliness (5 minutes, today, tomorrow, etc.) and audience (public, internal, classified, etc.) will assist in defining the final output type. Prior to releasing products, each should be checked for errors in spelling, grammar, dates, symbology, and general accuracy.

Paper products require the greatest amount of hardware and consumable resources. Teams should ensure that adequate supplies are available to support the estimated printing requirements. For events requiring information management in a secure environment, specific data and products should be stored appropriately. Printed products are immediately out of date, which will drive regular revisions to ensure product currency. When defining a geospatial RFI management system, the designer should make certain that it provides closure when a request is completed to ensure that products get to customers.

Digital graphics are essentially electronic prints of the products listed above and therefore must adhere to the same guidance. These files are easily distributed

widely and often presented to other stakeholders as needed. Teams should expect to field e-mail and phone questions on products and be prepared to defend the data, analysis, and presentation of these products.

To augment the map and graphic products, there may be additional operational requirements for the development of custom applications to support various missions. These should be reserved for situations where the level of effort is validated by the level of use. These applications have the ability to reach a large user base both internal and external to the entity supported. Some advantages to this type of support are near-real-time access to data, wide visibility of critical information, and diminishing support efforts over the duration of the project.



## 3.0 SPECIFIC MISSION AREAS

This section details three critical mission areas supporting disaster response: damage assessment, life-saving, and recovery missions, which encompass multiple federal partners to accomplish their goals. The geospatial requirements and specific products supporting each mission area are discussed.

This section contains assessment data on the current geospatial capabilities, tools, and technologies supporting the following key mission areas:

- **Damage Assessment.** Includes assessment of application of geospatial technologies, including RS and modeling, for completing accurate damage assessments
- **Life Saving.** Includes SAR, critical medical support, and critical water, food, and shelter provisioning
- **Recovery.** Includes public assistance (debris volume analysis and mission management), individual assistance (application of geospatial technologies in managing financial assistance process to victims), and an overview of geospatial technologies used in post-disaster mitigation and development of flood recovery maps.

### 3.1 Damage Assessments

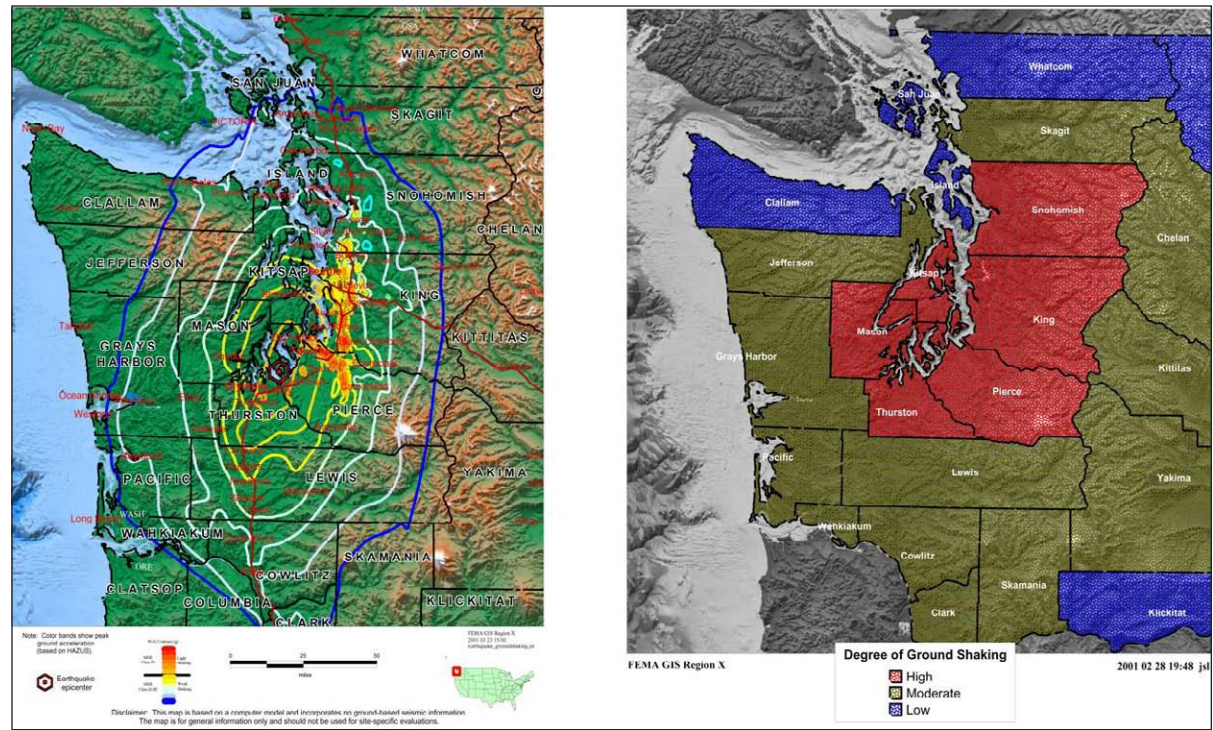
Damage assessments are conducted by multiple entities in support of their mission-specific information requirements. These efforts are time and labor intensive and often focus on long-term recovery missions as opposed to critical response operations. The immediate needs of the post-event response are assessed using reports from field observations, localized damage reports, imagery sources, models, and subject matter expertise.<sup>1</sup> Additional internal sources of information include text-based reports provided by cities, counties, state, and tribal governments as well as the Internet, television, news reports, and other media sources, which may provide photo, video, and map products with varying levels of validation and accuracy. **Figure 3-1** provides sample damage Assessment products from the Nisqually Earthquake. These maps utilized data from multiple sources (modeled and reported) to create simplified damage assessment products.

Specific geospatial information supporting the damage assessment process can assist in ensuring that the proper resources are deployed into the field. For example, the identification of boundaries for event damage (flooding, water depth, wind damage, etc.) allow managers to understand the operational magnitude of an event. In addition, information identifying specific damage locations (collapsed structures, destroyed homes, and transportation infrastructure, etc.) support decision making on the tactical aspects of the response. This section outlines key processes used to collect critical geospatial data and the supporting geospatial product development at/around the disaster area.

<sup>1</sup> In the context of this GeoCONOPS, the term “post-event” includes all near-term and long-term activities supporting response and recovery missions.

#### 3.1.1 Imagery and Derived Products

RS is a general reference to any remotely sensed information, predominately imagery-type products from satellite and aircraft sources. Imagery can be invaluable following an event, providing the ability to view impacts in the disaster area from a remote location over large expanses with minimal effort. To make the most of RS technology, it must be accessed in a timely manner, analyzed by qualified methodologies, and disseminated efficiently. Imagery and the data derived from it can identify damaged areas, specific target locations, or serve as a base-map product for use with other data sets. This section discusses the uses of imagery for damage assessments (see **Figure 3-1**).



**Figure 3-1: Damage Assessment Maps - Nisqually Earthquake**

#### Areas of Expertise

With proper coordination, RS data can be available to any user to assist with mission support requirements. For Stafford Act events, RS efforts are coordinated by FEMA through the JFO, RRCC, and NRCC RS Coordinators. Working with the US Coast Guard (USGS), NGA, DHS, and other federal departments and agencies, imagery is acquired, analyzed, and products disseminated using the Tasking, Collection, Processing, Exploitation, and Dissemination (TCPED) Process (see **Figure 3-2**).

The steps in the TCPED process (see **Figure 3-2**) are as follows:

- **Tasking.** The tasking phase begins with the identification of and prioritization of key target

areas. While it is safe to assume that the adjacent areas will be included, requests for imagery should be very specific in coverage area and identify any specific targets.

- **Collection.** Immediately following the tasking phase, the collection phase is focused on the acquisition of “raw” imagery. Because the post-event environment is dynamic, tasking and collection are closely linked. The combined tasks are reliant on continuous feedback. While this phase is often transparent, details such as triaged

areas of interest (AOI) and air-space access must be factored into the entire mission.

- **Processing.** During this phase, acquired imagery is processed. The processing requirements can include image registration, rectification, color balancing, and others. Once complete, the imagery is available for exploitation and dissemination.
- **Exploitation.** This phase provides the interpretation required to generate usable end products. Analysis may be automated or interpreted visually by imagery analysts to derive

vector data from the imagery source data. This derived data can then be attributed with key pieces of information to add value.

- **Dissemination.** The final phase of the process ensures that the imagery and derived products are effectively delivered and available to the end users and products. This may be accomplished through a person-to-person exchange of physical media, embedded into a COP-type viewer, or passed through email or web-based tools.

### Support

Pre- and post-event imagery requests are processed through the RS Coordinator at the FEMA JFO, RRCC, or NRCC. Requests are compiled, validated, and cross-checked against others for mutually supportive requirements and missions.

Vector-derived products are produced by the exploitation phase of the TCPED process. In addition to the FEMA NRCC, RRCC, and JFOs, other groups may develop derived products in support of their specific missions. For example, DHS Directorates, FEMA organizational elements, federal ESF leads, and/or state/local/tribal entities have derived vector products from federal-funded imagery products. These activities may be performed at on- or off-site facilities and accessed through the requesting source.

### Authoritative Data

Imagery provides a static picture of an area and must be updated regularly to support monitoring efforts. When imagery is initially purchased, licensing agreements are made defining use requirements and restrictions, potentially limiting distribution for the response and recovery efforts. Imagery data products are available in many graphic formats enabling them to be used with imagery-specific software and GIS applications.

The data products derived from imagery are highly valuable and easy to share. These are typically vector

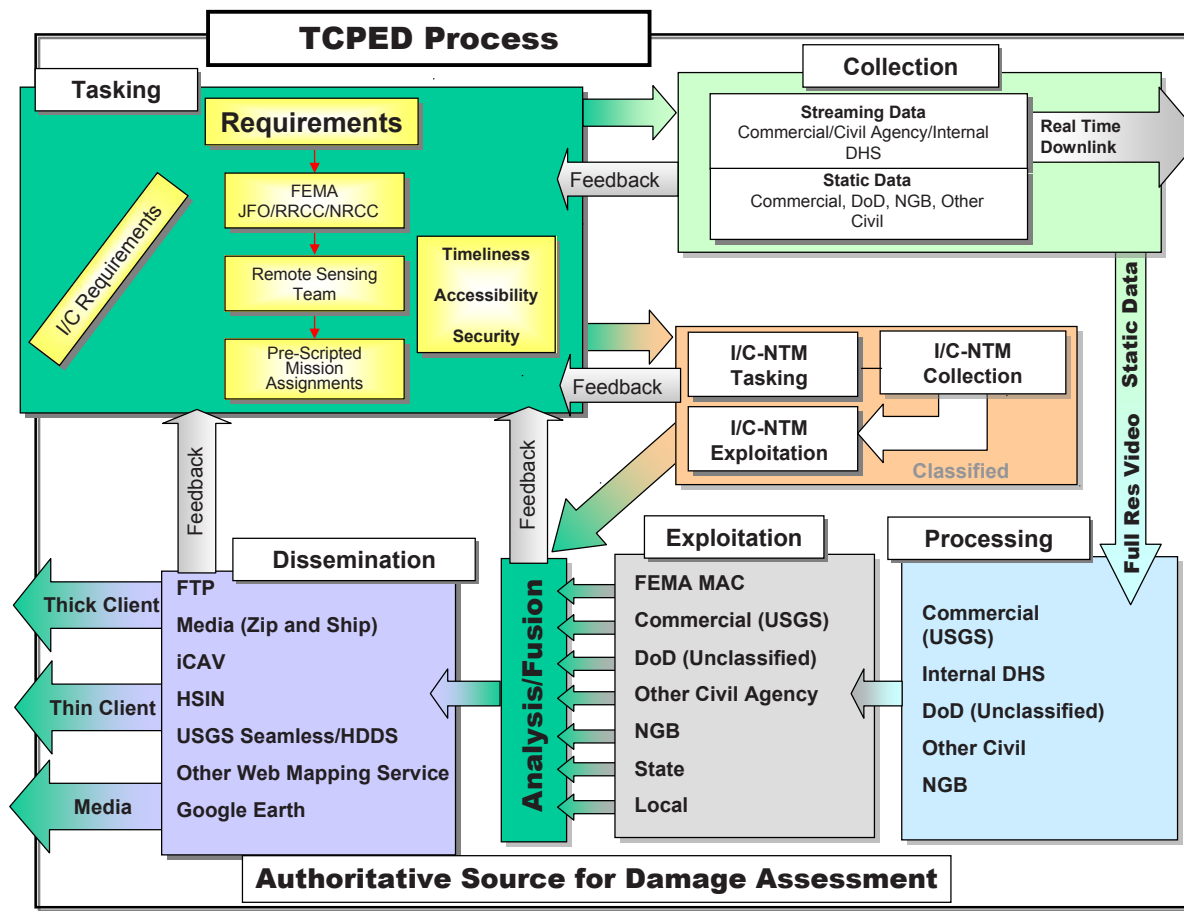


Figure 3-2: TCPED Process



**Figure 3–3: Imagery Sample**

(point, line, or polygon) or grid products that can quickly provide information on specific structures, impacted areas, or flooded regions. In addition, they represent an excellent information source for determining the area of disaster impact (see Table 3-1).

### Specific Products

Because of the large file size of imagery data, the derived products are shared quickly through email and other forms while the source imagery will be delivered at a later date or posted to a web environment.

### Raster Products

Post-event imagery is used by a multitude of secondary users as it is made available. This data is disseminated through multiple entities including the USGS (on behalf of FEMA), FEMA, NOAA, and others. Following a disaster event, USGS manages daily RS coordination conference calls and an email distribution list. These forums allow the geospatial community to discuss all aspects of RS in support of an incident. Those interested in participating must contact the FEMA RS Coordinator at the FEMA NRCC (see Figure 3-3).

### Vector Products

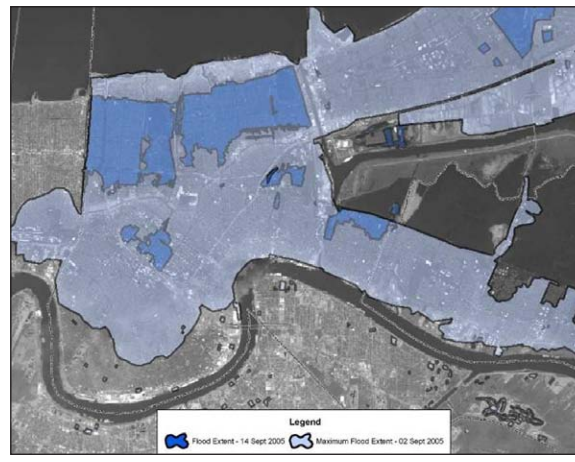
Imagery-derived data consists of any theme imaginable from SAR targets, to road damages, flooded areas. These vector products can be available immediately following the analysis and are sent directly to the requestor and then delivered to the larger stakeholder community as required (see Figure 3-4).

### 3.1.2 Models

Models provide critical predicted information for scenario events prior to an event actually occurring. This information allows for response plans to be developed in preparation for a coming event. This section covers the majority of modeling efforts related to damage assessments.

### Areas of Expertise

There are several unique programs and software applications that provide the modeled information that is required to support early exposure, damage, and loss estimates. This section defines several of the significant models and coordinating entities providing modeled information to the disaster response



**Figure 3–4: Imagery-Derived Data Sample**

community. Each focuses at a specific area of interest providing authoritative information to assist in federal disaster operations.

**Hazards US-MultiHazard (HAZUS-MH).** FEMA’s HAZUS model provides loss estimates for flood, hurricane (wind), and earthquake events. HAZUS development has been supported by domain experts from academia, nonprofit organizations, and the private sector. The model provides estimates on impact relating to physical damage to residential and commercial buildings, schools, critical facilities, and infrastructure; economic loss, including business interruption, repair and reconstruction costs; and social impacts, including estimates of shelter requirements, displaced households, and population exposed to scenario floods, earthquakes, and hurricanes.

### HURricane EVACuation (HURREVAC).

HURREVAC provides estimates on evacuation decisions using modeled hurricane track information from the National Hurricane Center (NWS, NOAA) and data from the federal hurricane evacuation study for the area. In addition, storm surge inundation graphics, where available, are also displayed, using data from the NWS Sea, Lake, and Overland Surges From Hurricanes (SLOSH) model.

**Interagency Modeling and Atmospheric Assessment Center (IMAAC).** The IMAAC provides interagency coordination to use the most appropriate atmospheric dispersion model for a particular incident and for delivery of a single federal prediction to all responders. The current IMAAC agency federal partners are DHS, Department of Defense (DoD), DOE, EPA, NOAA, Nuclear Regulatory Commission (NRC), and National Aeronautics and Space Administration (NASA).

**LandScan USA.** Oakridge National Laboratory (ORNL) has developed a population distribution model that produces the finest resolution population distribution data available for the continental United States. LandScan USA includes nighttime (residential)

as well as daytime population distributions. LandScan USA is more spatially refined than the resolution of block-level census data and includes demographic attributes such as age, sex, or race. LandScan USA also identifies daytime populations and other socio-economic data including places of work, journey to work, and other mobility factors.

**National Infrastructure Simulation and Analysis Center (NISAC).** The NISAC provides advanced modeling and simulation capabilities for the analysis of critical infrastructures, their interdependencies, vulnerabilities, and complexities. NISAC is a program under the DHS Preparedness Directorate, building a partnership between Sandia National Laboratories (SNL) and Los Alamos National Laboratory (LANL).

**Sea, Land, Overland, Surge from Hurricanes (SLOSH).** The SLOSH model estimates storm surge depths resulting from historical, hypothetical, or predicted hurricanes by taking into account a storm’s pressure, size, forward speed, forecast track, wind speeds, and topographical data. SLOSH was developed by FEMA, USACE, and the NOAA NWS.

**USACE Debris Model.** The debris model estimates amounts of debris from hurricanes making landfall along the Gulf and East Coasts of the continental United States. The model has been developed by USACE subject matter experts (SME) and is based heavily on experience from Hurricanes Andrew, Fredrick, and Hugo. This work has been further extended for the estimation of debris across the United States.

**Support**

In most cases, modeling support will be provided by fixed facilities with stable operating environments to support the hardware and software requirements of the computer models. This provides continuity of information released through authoritative

**Table 3–1: Authoritative Data - Damage Assessment Mission - Imagery**

Sub Category	Theme	Type	Delay	POC
<b>Emergency Services</b>				
Emergency Management	Image Library Footprints	Polygon	4 day	FEMA
	Imagery Collection Paths (Aircraft)	Polyline	24 hour	NOAA
	Imagery Collection Paths (Aircraft)	Polyline	48 hour	FEMA
	Imagery Collection Paths (Motion Video)	Polyline	24 hour	FEMA
	Imagery Collection Paths (Satellite)	Polyline	24 hour	FEMA
<b>Event Impact</b>				
Event Location	Burn Extents-Imagery Derived	Polygon	24 hour	USGS
	Flood Extents-Imagery Derived	Polygon	48 hour	FEMA
	HMS Thermal Imagery	Raster	24 hour	USGS GeoMAC
	Imagery Derived Products (Targets)	Point	24 hour	FEMA
	Imagery Post-Event (Aircraft)	Raster	3 day	FEMA
	Imagery Post-Event (Motion Video)	Video	24 hour	FEMA
	Imagery Post-Event (Satellite)	Raster	3 day	FEMA
	Residential Damage-Imagery Derived	Polygon	48 hour	FEMA
	Roof Damage - Imagery Derived	Polygon	24 hour	DOD/USACE, FEMA
Wildfire Perimeters (GeoMAC)	Polygon	24 hour	USGS	
<b>Imagery</b>				
High Resolution	EPA ASPECT	Raster	4 day	EPA
	FEMA LIDAR	Raster	7 day	FEMA
	FEMA Radar	Raster	4 day	FEMA
	NOAA Coastal Shoreline Aerial Photography	Raster	4 day	NOAA/NOS
	NOAA Thermal	Raster	3 day	NOAA
	Post-Event Video	Video	24 hour	DHS, NASA, DoD, NGB, DOI
	USACE Blue-Roof Aerial Photography	Raster	3 day	DOD/USACE

sources, versioning of updated results, and effective distribution mechanisms. Within these fixed operations, SMEs have a preidentified work area to report to and access to the preconfigured hardware and software required to produce the modeled results.

The authoritative sources of modeled information generally comprise specific SMEs working together with specific software applications to provide the best-available results for any given subject area.

These activities may operate with a single model (FEMA and HAZUS) or through a federal sponsor to access specific areas of several national labs (DHS IMAAC and DOE VMWG).

It is also possible for individuals to acquire modeling software for use within their professional disciplines. These applications are designed to run on desktop hardware and are in use by thousands of individuals

## Best Practices - FEMA Damage Polygons

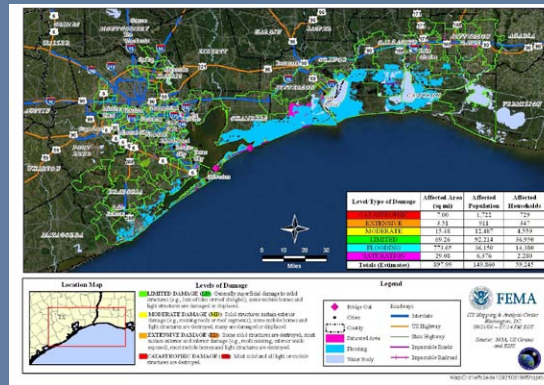
Imagery derived data products support the immediate information requirements for Response and Recovery operations by allowing fixed facilities to analyze imagery data and quickly share the results with field teams, state/local entities, and the DHS COP with minimal effort. In support of FEMA, NGA provides damage analysis in the form of Imagery Derived Polygons (IDPs) for specific targeted areas. These IDPs provide situational awareness, visualization, and key common operating data for emergency responders and decision-makers following hurricane, earthquake, fire, and flood events. The IDPs are identified and annotated based on the Damage Classification System guidelines developed by FEMA and provided to NGA. These guidelines are used by geospatial analysts to determine the magnitude of damage. The NGA analysts delineate the damaged areas according to the FEMA's criteria and provide this information to FEMA in both map and data product formats.

The FEMA NRCC develops analytical products with the IDPs estimating impacted areas, populations and

### FEMA Damage Classification

Damage Level		Observed Damages
<b>General Damage Classifications</b>		
LD	Limited Damage	Generally superficial damage to solid structures (e.g., loss of tiles or roof shingles); some mobile homes and light structures are damaged or displaced.
MD	Moderate Damage	Solid structures sustain exterior damage (e.g., missing roofs or roof segments); some mobile homes and light structures are destroyed, many are damaged or displaced.
ED	Extensive Damage	Some solid structures are destroyed; most sustain exterior and interior damage (roofs missing, interior walls exposed); most mobile homes and light structures are destroyed.
CD	Catastrophic Damage	Most solid and all light or mobile home structures destroyed.
<b>Wildfire Damage Classifications</b>		
B	Burned	Areas observed that have already burned.
LD	Limited Damage	Few structures are burned/destroyed.
ED	Extensive Damage	Some structures are completely burned/destroyed and sustained observable exterior damage.
CD	Catastrophic Damage	Most structures are completely burned/destroyed.

*Note: The above classifications represent generalized expectations only; they do not exclude the possibility of variation within any classified area. Areas that are not observed nor have no discernable damage are left uncolored.*



FEMA Damage Map

residential infrastructure. These map and data products are shared with all FEMA operations as well as being distributed to external customers involved in the incident and are posted at [www.fema.gov](http://www.fema.gov).

The following table represents the classification system and color scheme used to characterize damage in FEMA's Damage Polygons.

across the country. For federal operations, these sources may not be the authority for the event and must be used with caution because the event input parameters, supporting data, and other factors can yield drastically conflicting results.

### Authoritative Data

Modeled output is typically map- or report-based, providing products intended to effectively answer specific scenario-based questions. In addition, the majority of the supporting modeled data can be extracted for other purposes. One example of this is the SLOSH model, the derived data produced by SLOSH is used by HAZUS and HURREVAC to support their modeling efforts. In addition, SLOSH outputs are used by others for map products and analysis relating to an event scenario (see Table 3-2).

### Specific Products

As identified above, most models produce combinations of map and report products identifying estimates of damage and associated losses for their areas of expertise and authority. These products are made available to the user community through email and other media where they support decision making across the event. It is important to keep track of versioned results as the event operations progress. Many of the models will be run frequently to support the evolution of the event, and each run will produce updated versions of the modeled results. Products created by several models include:

#### HAZUS-MH

- Spatial boundaries of hazard/event
- Damage to essential facilities
- Casualties
- Shelter requirements
- Economic loss.
- HURREVAC



**Table 3–2: Authoritative Data - Damage Assessment Mission - Modeling**

Sub Category	Theme	Type	Delay	POC
<b>Event Impact</b>				
Modeling	CBRN Model Predictions: DOE Temporary Emergency Exposure Limits (TEEL)	Polygon	24 hour	IMAAC
	CBRN Model Predictions: Emergency Response Planning Guidelines (ERPG)	Polygon	24 hour	IMAAC
	CBRN Model Predictions: EPA Protective Action Guidelines (PAG)	Polygon	24 hour	IMAAC
	CBRN Model Predictions: SEPA Acute Emergency Guideline Levels (AEGL)	Polygon	24 hour	IMAAC
	CBRN Model Predictions: Time Integrated Air Concentrations	Polygon	24 hour	IMAAC
	CBRN Model Predictions: USDA/FDA Derived Intervention Levels (DIL)	Polygon	24 hour	IMAAC
	Earthquake Damage-Modeled	Polygon	24 hour	USGS
	Earthquake Impact-Modeled Liquefaction	Polygon	24 hour	USGS
	Model Input - CATS	Text	24 hour	DTRA
	Model Input - HAZUS	Text	24 hour	FEMA
	Model Input - HPAC	Text	24 hour	DTRA
	Model Input - HURREVAC	Text	24 hour	FEMA
	Model Input - IMAAC	Text	24 hour	IMAAC
	Model Input - NISAC	Text	24 hour	DHS
	Modeled Impacts - CATS	Polygon	24 hour	DTRA
	Modeled Impacts - HAZUS	Polygon	24 hour	FEMA
	Modeled Impacts - HPAC	Polygon	24 hour	DTRA
	Modeled Impacts - HURREVAC	Polygon	24 hour	National Hurricane Center
	Modeled Impacts - IMAAC	Polygon	24 hour	IMAAC
	Modeled Impacts - NISAC	Polygon	24 hour	DHS
	Modeled Impacts - SLOSH	Polygon	24 hour	FEMA, USACE, NWS
	Modeled Impacts - Surge (SLOSH)	Polygon	24 hour	FEMA, USACE, NWS
	Modeled Impacts - USACE Debris	Polygon	24 hour	DOD/USACE
	Modeled Losses - CATS	Polygon	24 hour	DHS
	Modeled Losses - HAZUS	Polygon	24 hour	FEMA
	Modeled Losses - NISAC	Polygon	24 hour	DHS
	Plume Analysis	Point	24 hour	IMAAC
	ShakeMap Pager	Point	Immediate	USGS
	Volcano Damage-Modeled	Polygon	24 hour	USGS
	Wildfire Damage-Modeled	Polygon	24 hour	USGS

- Evacuation recommendations
- Estimated wind speeds.

**IMAAC**

- Plume projections
- Lethality/dosage predictions.

**USACE Debris**

- Debris volume estimates
- Debris removal requirements.

**3.1.3 Field Data Collection**

The final damage assessment element is the collection of information from the field. There are many types of field collection efforts: windshield surveys, preliminary damage assessments (PDA), searches, detailed post-event surveys, program-specific inspections, etc. These efforts are labor intensive and require individuals to be placed into the damage area to meet the surge staffing requirements. Although these transient staff add to the burden of the impacted communities to provide food and lodging, they also provide additional income to the impacted area, aiding in the economic recovery of the geography.

In many cases, field data collection efforts provide the most detailed information on the impact of an event. While this is a great source for general impact information, it may be limited by the scope of the mission that created it (i.e., the FEMA Individual Assistance [IA] program does not look at military or university housing). In addition, field data assists in validating modeled information, identifies affected areas missed by other information collection means, and provides a ground presence, validating the event while supporting community relations by being in the field. The information collected ensures that the necessary services and commodities are provided to affected citizens as quickly as possible.

## Areas of Expertise

Each field data collection effort is intended to meet the specific missions of the hosting entity. This data also supports seemingly unrelated efforts in the greater emergency response environment by providing field-level information to the broader community. Field information is collected in a spatial context using GPS-based tools by the majority of entities conducting the work. Some data collection efforts are still focused on the collection of data manually out of mission necessity or lack of pre-planning. This information must be compiled and processed to generate a geographic coordinate required for spatial reference.

Below are several field data collection efforts deployed on most federally declared disasters:

**American Red Cross (ARC).** The ARC Disaster Assessment workers gather, analyze, interpret, and distribute accurate and timely information on the extent of the damage, overall impact, weather conditions, and demographics of a disaster-affected community. ARC teams focus on 15 “high-level” essential elements of information, which represent the broad categories of information to be collected about what has happened (typically excluding damage figures) as a result of any disaster.

**FEMA PDA Teams.** Immediately following an event, FEMA sends out PDA teams to conduct windshield surveys of the impacted areas to assist in determining the level of assistance required from FEMA by county. The PDA teams are composed of FEMA and state staff representing the IA, PA, and Mitigation program areas. The information collected supports the state request for federal assistance and assists FEMA in determining the level and extent of federal assistance required.

**FEMA IA Inspections.** Immediately following a disaster declaration, FEMA IA inspectors are deployed to inspect the households of individuals

applying for federal assistance. These inspections are intended to verify levels of damage and focus on the habitability of private properties to ensure that basic levels of living requirements are met.

**FEMA Mitigation High Water Marks.** For flood-related events, FEMA collects high water marks to determine the overall level of flooding within the inspected area. This information is used to support the NFIP in proper flood zoning and assists in making determinations of level of damage to impacted properties.

**FEMA Mitigation Assessment Team (MAT).** FEMA’s Risk Reduction Branch will deploy a Mitigation Assessment Team (MAT) to conduct field inspections and technical evaluations of the performance of buildings subjected to damaging forces generated by an event. The primary purpose of the MAT’s technical evaluations is to identify design practices, construction methods, and building materials that either failed, or were successful in resisting such forces.

**FEMA Public Assistance (PA) Inspections.** Once applicants to the FEMA PA program supply information on damage locations, PA inspectors team up with state PA inspectors to create inspection teams. These PA teams visit individual sites to determine eligibility, validate levels of damage, and assist in the approval of inspected PA projects.

**Small Business Administration (SBA) Inspections.** Similar to the FEMA IA inspections, the SBA conducts inspections of properties seeking assistance under the SBA disaster assistance program. Inspections are conducted to verify level of damages and estimate costs for repairs to private properties.

**Local Red-Tag/Yellow-Tag Reports.** At the city and county level, inspections are conducted immediately following an event to determine the structural safety of individual properties. This is commonly known as Red/Yellow tagging of structures. This data is frequently collected by local governments as they

## Best Practices - Disaster Clearinghouses

The concept of Disaster Clearinghouses originated with the earthquake community in an effort to coordinate post disaster field data collection and research activities. The Disaster Clearinghouses provide an ideal opportunity to access information on observed damages missed in formal program-based data collection efforts. Clearinghouses were used extensively in the aftermath of the Northridge, California earthquake in 1994, and then more formally developed in response to the Nisqually, Washington earthquake of 2001.

Following Hurricane Katrina in 2005, FEMA and Louisiana State University (LSU) established the LSU GIS Clearinghouse Cooperative (LGCC) to coordinate and centralize the collection and dissemination of geospatial information. The LGCC marked an important transition in the clearinghouse concept from a coordination of post disaster field data collection and research activities to a centralizing post disaster geospatial information and making the information available through innovative technologies. Innovative features of the LGCC include:

- Installing a 20 Terabyte, restricted access data server that provided a common storage area for geospatial data for use by federal, state, local, research and private sector users.
- Allowing users without GIS software to access and view high resolution imagery.
- Utilizing readily accessible Web-based technology such as Google Earth to share field data and other geospatial files, making them accessible to local officials and the disaster response community.

Disaster clearinghouses are scalable, unifying, and transferable, and will continue to serve a valuable role in post-event collection, coordination and dissemination of geospatial information.

conduct inspections and share with state and federal entities supporting the response efforts.

## Support

Field data collection operations are typically self-sufficient in their information compilation and processing activities. Many feed automatically into larger database environments where they are combined with additional information collected through other means to support a specific program. In more dynamic environments, the information collected may be passed to geospatial staff in fixed or field facilities for additional processing and/or analysis. In the worst-case scenario, hand-written paper reports may require manual entry into computer-based systems to generate useful information for geospatial efforts.

### Authoritative Data

Each entity conducting field data collection efforts is by default the authoritative source for the specific information acquired. Each data set is unique to the program it supports and may have use restrictions attached to it. These data are key in analysis requiring specific attributes; examples would include structures by type, owner/renter, water depth at a specific location, etc. As a secondary use, these data sets are used to support the overall damage assessment by providing field-level damage data, which provides additional visibility into the impacted areas (*see Table 3-3*).

### Specific Products

The products resulting from the field collection efforts focus on the missions of the specific entities conducting the work. Output products are used in map and text-based reports and are often shared across the event. Field data products include:

- Reported damage comparisons (FEMA IA, FEMA PA, SBA, etc.)
- Actual damage locations
- Distribution of Red/Yellow tagged homes
- High water marks.

**Table 3–3: Authoritative Data - Damage Assessment Mission - Ground Truth**

Sub Category	Theme	Type	Delay	POC
<b>Event Impact</b>				
Damage - Infrastructure	Commercial Building Damage	Polyline	5 day	FEMA (State/Local EOC)
	Government Building Damage	Polyline	5 day	FEMA (State/Local EOC)
	Residential Building Damage	Polyline	5 day	FEMA (State/Local EOC)
	Road Damage	Polyline	24 hour	FEMA (State/Local EOC)
Event Location	Damaged Areas (Report Derived)	Polygon	3 day	FEMA, JOC, State
	Earthquake Damage-Field Reported Liquefaction	Polygon	48 hour	USGS
	Earthquake Damage-Field Reports	Polygon	48 hour	USGS
	Earthquake Damage-Reported (Did you feel it)	Polygon	24 hour	USGS
	Earthquake Impact-Measured (MMI)	Polygon	24 hour	USGS
	FEMA IMAT Reports	Polygon	48 hour	FEMA
	High Water Depth	Polygon	4 day	FEMA Mitigation
	Red Cross Inspections	Point	3 day	ARC
	Red/Yellow Tag Reports	Point	3 day	FEMA/State
	SBA Applicants	Point	5 day	SBA
	Volcano Damage-Field Reports	Point	24 hour	USGS
Wildfire Damage-Field Reports	Polygon	24 hour	USGS	
<b>Specialized Response Teams</b>				
DHS	FEMA Damage Assessment Teams	Point	48 hour	FEMA

## 3.2 Life-Saving Missions

Life-saving missions are intended to save lives and reduce casualties and can be initiated before, during, or immediately following an event. The efforts referenced here cover all aspects of life-saving including SAR, evacuation, feeding, and critical medical support. Many of these activities are high-profile in the eyes of the government officials and emergency managers as well as the media and public.

It is imperative that the geospatial support entities stay agile, dynamic, self-contained, and fully prepared for the unknown. In most cases, there will

be requirements for both on- and off-site support. The initial operations may be deployed prior to FEMA standing up a JFO and therefore the on-site staff may need to locate a suitable area to begin work.

### 3.2.1 Search and Rescue

SAR activities operate under the authority of FEMA and ESF #9 - Search and Rescue, in support of state and local authorities. SAR teams are organized within federal, state, and local government entities and spread across the country. The operational management is undertaken by Incident Management

teams or similar functional group and the tactical management is handled within the specific teams.

SAR services include the performance of distress monitoring, communications, location of distressed personnel, coordination, and execution of rescue operations. This includes extrication or evacuation along with the provisioning of medical assistance and civilian services through the use of public and private resources to assist persons and property in potential or actual distress.

### Areas of Expertise

Under ESF #9, SAR is broken into four distinct disciplines. These are intended to meet the requirements of various post-event circumstances.

#### Structural Collapse (Urban) Search and Rescue (US&R)

*Primary Agency: FEMA*

US&R operations include building/structural collapse from natural disasters as well as other building collapse operations that primarily require DHS/FEMA US&R task force operations. The National US&R Response System integrates DHS/FEMA US&R task forces, Incident Support Teams (IST), and technical specialists.

#### Waterborne Search and Rescue

*Primary Agency: DHS/USCG*

Waterborne SAR operations cover situations related to hurricane, dam/levee failure, and other disasters that primarily require DHS/USCG air, ship, and boat force operations. The federal waterborne SAR response integrates DHS/USCG assets in support of overall SAR operations conducted in accordance with the U.S. National Search and Rescue Plan (NSP).

#### Inland/Wilderness Search and Rescue

*Primary Agency: Department of the Interior (DOI)/ National Park Service (NPS)*

Inland/wilderness search and rescue efforts include SAR operations conducted in backcountry, remote, or undeveloped or rural areas that primarily require operations necessitating the use of specialized equipment to access these areas and may require responders traveling over land by alternate methods or by aircraft.

#### Aeronautical Search and Rescue

*Primary Agency: DoD/US Air Force (USAF)/Air Force Rescue Coordination Center (AFRCC)*

Aeronautical search and rescue activities include SAR operations conducted in aviation-related incidents and aeronautical search and rescue corresponding to the continental United States, the Virgin Islands and Puerto Rico, and other US territories and possessions other than Alaska and US territories in the Pacific Ocean. This may require specialized SAR operations in both open and wilderness areas and in the vicinity of airports requiring the coordinated deployment of personnel and equipment.

### Support

Geospatial support is provided through FEMA and can consist of individuals from FEMA, NGA, USFS, contractors, and others. The overall environment is very dynamic with large quantities of ad hoc requests initially followed by frequent updates of event-specific standard products. The staffing positions are highly technical and fast-moving.

SAR activities require on-site geospatial support to meet the aggressive missions they are given. In past events (i.e., 9/11 in New York City and Hurricane Katrina), the dedicated staff totaled over 20 individuals. In addition, field support can supplement the operations with appropriate duties. On-site (field) support includes map production, data collection, and mission-specific analysis. Fixed support can include imagery analysis and data processing.

### Authoritative Data

SAR operations produce minimal authoritative data sets. Base data comes primarily from Homeland Security Infrastructure Program (HSIP) Gold and local sources collected on site (*see Table 3-4*).

### Specific Products

There are several standard products used for all SAR operations. In addition, each SAR area may have its own mission-specific products. These standards are always augmented by a multitude of ad hoc products focused at answering specific nonstandard questions. Some are “one-off” products and others evolve into standard products that are unique to the specific event.

SAR products include, but are not limited to:

#### Operational Management

- Mission Tracking
- Base of Operations
- Area Management
- Safety
- Resource Tracking
- Search Planning
- Flight Planning.

#### Tactical Missions

- Search Tasking
- Search Status
- Transportation Plans.

### 3.2.2 Critical Medical Support

Emergency Support Function #8 (ESF #8) - Public Health and Medical Services leads efforts to provide critical medical support during disaster response activities. These services must be available immediately after an incident, when permanent resources and facilities are damaged or overwhelmed

## Best Practices - Search and Rescue Management

By the very nature of the SAR mission, geospatial tools support critical information requirements in the management of their operations. SAR activities are conducted at the ground-level (i.e. street, buildings) and are managed across the extent of the impacted area (i.e. multi-county, multi-state). Information identifying specific locations (points and areas) is tasked, collected, and acted upon with distinct references to the geography of the search area. The geospatial products supporting this mission are critical to the operational and tactical SAR operations. All products must maintain a simplicity allowing them to be replicated in color, black and white, and at worst drawn by hand.

In effort to accommodate conflicting requirements for coordinate systems in printed map products, FEMA is working to develop a standard for FEMA operational maps using the US National Grid (USNG) System (Memo dated May 28, 2009 from William L. Carwile, Assistant Administrator for Disaster Operations). This effort is intended to improve the overall effectiveness within FEMA by standardizing and streamlining operations.

### Local Integration

Federal SAR resources are deployed in support of State and local operations. They provide a multitude of specialized plans, tools, techniques, and institutional knowledge adapted from other areas of expertise to assist in the SAR mission. These resources arrive on-site, integrate with local emergency operations, and engage in the roles assigned to them. In doing this, event-specific strategies and standards are developed in effort to provide the most effective support to the operation.

by the impact of the event. The efforts required cover all aspects of medical needs from child birth to basic first aid.

### Information tracking

The SAR mission is spatially defined and directed. Operational directives task resources to the field-level entities to undertake specific missions in specific areas. Tactical assignments are given in the field, referencing points and/or areas for action. Field-level activities are tasked and completed with their progress tracked and reported with spatial references to areas and locations. Reported information is then compiled into map-based products for presentation to the command staff for planning the next operational period.

### Referencing points and areas

There are several predominate systems in place that support interoperability across SAR operations, most notably latitude and longitude and the USNG. SAR support entities are deployed from across the country and come together from many different disciplines. These groups and individuals may by default favor one system over another as their day-to-day non-disaster operations are often using one legacy system for their activities. The basic requirements for SAR related geospatial products are as follows:

- **Point Reference** - Provide options for USNG and latitude and longitude on all map products. This is accomplished through the inclusion of grids for both systems overlaid on all products (can be generated within most software platforms).
- **Area Reference** - Each SAR operation must define a system for managing search areas. This will be used for reporting, general area reference, and the generation of map-books and other geospatial products.

### Areas of Expertise

Critical medical services must be available to the incident victims as well as the response workers. Services also cover the medical needs of members of the “at risk” or “special needs” population as

defined under the NRF. This section will not address veterinary medicine.

**Patient Evacuations.** ESF #8 is responsible for transporting seriously ill or injured patients and medical needs populations from casualty collection points in the impacted area to designated reception facilities. ESF #8 may request DoD, VA, and FEMA, via the national ambulance contract, to provide support for evacuating seriously ill or injured patients. Support may include providing transportation assets, operating and staffing National Disaster Medical System (NDMS) Federal Coordination Centers, and processing and tracking patient movements from collection points to their final destination reception facilities.

**Emergency Equipment/Supplies.** In addition to deploying assets from the Strategic National Stockpile (SNS), ESF #8 may request DoD or the VA to provide medical equipment, durable medical equipment, and supplies, including medical, diagnostic, and radiation-detecting devices, pharmaceuticals, and biologic products in support of immediate medical response operations and for restocking health care facilities in an area affected by a major disaster or emergency.

**Patient Care/Staffing Medical Facilities.** ESF #8 may task DHHS components to engage civil service personnel, the officers from the U.S. Public Health Service Commissioned Corps, the regional offices, and states to engage civilian volunteers and request the VA and DoD to provide available personnel to support prehospital triage and treatment, inpatient hospital care, outpatient services, pharmacy services, and dental care to victims who are seriously ill, injured, or suffer from chronic illnesses who need evacuation assistance, regardless of location.

**Medical Needs Assessments.** DHHS, in collaboration with DHS, mobilizes and deploys ESF #8 personnel to support national or regional teams to assess public health and medical needs, including the needs of

**Table 3–4: Authoritative Data - Life Saving Mission - SAR**

Sub Category	Theme	Type	Delay	POC
<b>Agriculture/Food</b>				
Mobile Food	Mobile Commissary - Mobilized Locations	Point	48 hour	DOI/NIFC
	Mobile Food Unit - Mobilized Locations	Point	24 hour	DOI/NIFC
<b>Emergency Services</b>				
Emergency Management	FEMA SAR Metrics	Polygon	3 day	FEMA
	FEMA SAR Recovery	Point	24 hour	FEMA
	FEMA SAR Rescues	Point	48 hour	FEMA
	FEMA SAR Temporary Landing Zones	Point	48 hour	FEMA
	FEMA Search Grid (2 minute x 2 minute)	Polygon	24 hour	FEMA
	FEMA Search Grid (30 second x 30 second)	Polygon	24 hour	FEMA
	FEMA Search Management Sectors	Polygon	24 hour	FEMA
	FEMA US&R Search Status	Polygon	24 hour	FEMA
	FEMA US&R Search Targets	Point	24 hour	FEMA
Emergency Resources	FEMA US&R Unsafe Areas	Polygon	48 hour	FEMA
	FEMA US&R Equipment Cache Locations	Point	immediate	FEMA
Emergency Resources	Mobile Shower Facilities	Point	24 hour	DOI/NIFC
	<b>Field Operating Locations</b>			
FEMA	Area Command/Unified Area Command Post	Point	24 hour	FEMA
	Incident Command Post (ICP)	Point	24 hour	FEMA
<b>Specialized Response Teams</b>				
DHS	Disaster Medical Assistance Team (DMAT) Locations	Point	48 hour	FEMA
	FEMA Incident Management Assistance Team (IMAT)	Point	24 hour	FEMA
	FEMA US&R Canine Teams	Point	3 day	FEMA
	FEMA US&R Incident Support Teams	Point	24 hour	FEMA
	FEMA US&R Teams (Deployed)	Point	24 hour	FEMA
	Incident Management Teams (IMTs) Federal Type 1 and Type 2	Point	48 hour	FEMA
	USCG Strike Teams	Point	24 hour	DHS/USCG
DoD	NGB WMD-Civil Support Team Deployed Locations	Point	48 hour	NGB (JFHQ-STATE)
	USACE Planning & Response Teams (PRTS)	Point	48 hour	DoD/USACE
Other Federal Agency	EPA Environmental Response Team (ERT)	Point	24 hour	EPA
	Mine Rescue Teams	Point	3 day	MSHA/MEO
State/Local	CBRNE Enhanced Response Force Package (CERF-P)	Point	24 hour	NGB
	Hazmat Emergency Response Units - Local	Point	48 hour	FEMA (State/Local)
	Search and Rescue Units - Local	Point	24 hour	FEMA (State/Local)

at-risk population groups, such as language assistance services for limited English-proficient individuals and accommodations and services for individuals with disabilities. This function includes the assessment of the health care system/facility infrastructure.

**Health Monitoring.** DHHS, in coordination with supporting departments and agencies, enhances existing surveillance systems to monitor the health of the general and medical needs population; carries out field studies and investigations; monitors injury and disease patterns and potential disease outbreaks, blood and blood product biovigilance, and blood supply levels; and provides technical assistance and consultations on disease and injury prevention and precautions.

**Support**

The Emergency Management Group (EMG), operating from the DHHS Secretary’s Operations Center (SOC), coordinates the overall national ESF #8 response and maintains constant communications with the NOC. All headquarters and regional organizations participating in response operations report public health and medical requirements to the appropriate ESF #8 representative operating in the NRCC, RRCC and JFO, when activated.

Geospatial staff supporting the DHHS SOC and ESF roles with the NRCC, RRCC, and JFO provide products assisting in risk analysis, needs evaluations, and analysis to determine the capability required to meet the mission objective and provide required public health and medical support medical assistance to state, tribal, and local medical and public health officials.

**Authoritative Data**

The Critical Medical Support Mission produces minimal authoritative data during response activities. With efforts focused primarily on analysis and deployment of resources, many of the data compiled are simple resource tracking files consisting of basic

point references for various transient field operations (see Table 3-5).

### Specific Products

Products supporting the Critical Medical Support Mission include, but are not limited to:

- Life Saving Activities
  - Evacuation areas and routes
  - Special needs populations
  - Urgent transport.
- Resource Deployments
  - Medical teams deployments
  - Commodity caches.
- Impact Assessments
  - Damaged facilities
  - Resource requirements.

### 3.2.3 Provision of Critical Food, Shelter, and Water

Following an event, many communities are left without the basic needs they require for survival: food, shelter, and water. These critical resources must be available to assist the victims of an event in a very short timeframe. ESF #6 - Mass Care, Emergency Assistance, Housing, and Human Services is led by DHS/FEMA and coordinates many federal entities in the provision of critical food, shelter, and water.

#### Areas of Expertise

This section focuses on topics within the two primary functions supporting disaster response efforts under ESF #6.

**Feeding Operations.** Feeding includes a combination of fixed sites, mobile feeding units, and bulk distribution sites. These operations are often co-

**Table 3-5: Authoritative Data - Life Saving Mission - Critical Medical Support**

Sub Category	Theme	Type	Delay	POC
<b>Emergency Services</b>				
Rescue and Emergency Medical Services	Armed Forces Reserve Medical Units	Point	3 day	DoD (NGB)
<b>Event Impact</b>				
Damage - Infrastructure	Hospitals/Medical Damage	Point	24 hour	ESF
Evacuation	Evacuation Targets/Status	Point	24 hour	FEMA (State)
	Evacuation Tracking - Special Needs	Point	24 hour	FEMA (State)
	Quarantine Areas	Polygon	48 hour	DHHS
<b>Healthcare and Public Health</b>				
Direct Patient Healthcare	Health Monitoring Results	Polygon	3 day	DHHS
	Medical Requirement Assessments	Polygon	3 day	DHHS
Health Supporting Facilities	Pharmaceutical Storage and Stockpile	Point	immediate	FDA
	Strategic National Stockpile (SNS) Sites	Point	24 hour	DHHS/CDC
<b>Specialized Response Teams</b>				
DHHS	DHHS Incident Response Coordination Team (IRCT)	Point	3 day	DHHS
DHS	Disaster Mortuary Operational Response Team (DMORT) Locations	Point	3 day	FEMA
	Medical Emergency Radiological Response Team (MERRT)	Point	24 hour	FEMA
	National Nurse Response Teams (NNRT)	Point	24 hour	FEMA
	National Pharmacy Response Teams (NPRT)	Point	48 hour	FEMA
	National Veterinary Response Team (NVRT) Locations	Point	3 day	FEMA
Other Federal Agency	DOI Interagency Hotshot Crews	Point	3 day	DOI/NIFC

located with shelter sites and can be placed in support of other facilities including disaster response entities.

**Sheltering.** Emergency sheltering uses predesignated shelter sites in existing structures within the affected area(s), as well as additional sites designated by local government. In addition, nonconventional sheltering

may include hotels, motels, and other single-room facilities. Temporary facilities can include tents, prefabricated modular facilities, trains, and ships.

In addition to supporting the actual shelter facilities, information management systems such as the National Shelter System (NSS) are maintained

constantly and used during a crisis. The NSS is a web-based comprehensive database that provides information for shelters during response to disasters and emergencies. Reports from the NSS detail the location and capacities of shelters (evacuation, general, ADA compliant, pet friendly, medical, etc.) open, on stand-by, or closed. The information is submitted by the local, tribal, state, and voluntary agencies (VOLAG) operating these shelters and provides information on victims to family members and support to evacuations (including registration and tracking of evacuees) and assists in the reunification of families.

**Bulk Distribution of Emergency Commodities.** Bulk distribution of emergency commodities includes the distribution of emergency relief items to meet urgent needs through sites established within the affected area(s). These sites are used to distribute food, water, or other commodities in coordination with federal, state, local, tribal, and territorial governmental entities and voluntary agencies and other private sector organizations.

**Support**

FEMA, the lead agency for ESF #6, coordinates federal response and recovery operations with state, local, and tribal governments, VOLAGs, and the private sector. ESF #6 assistance is managed and coordinated at the lowest possible organizational level (i.e., JFO and RRCC). Only requests that cannot be filled or issues that cannot be resolved at the RRCC/JFO levels are elevated to the NRCC, ESF #6 Branch for resolution. Initial response activities focus on immediate needs of victims. Recovery efforts are initiated concurrently with response activities.

While many of the larger initiatives are managed and monitored by headquarters-level offices within FEMA and the ARC, the majority of the initial analysis and deployment orders are directed at the RRCC/JFO level. Geospatial support is typically

accessed through the GIU of the Planning Section at the JFO.

**Authoritative Data**

The authoritative data associated with this mission is sensitive by nature and in many cases will be protected by the Privacy Act. Data will identify the locations of individuals and a mobile critical infrastructure (see Table 3-6).

**Specific Products**

Products developed to support the Critical Food, Shelter, and Water mission area come from many different sources (federal, state, local, nonprofits, and contractors). Products are developed for specific internal requirements, and many are shared with the greater response community in reports and emails. Examples of products include, but are not limited to:

- Shelter
  - Locations with sponsor information, populations, etc.

- Population analysis: home location, income, relations to others.
- Feeding
  - Operation locations with capacities
  - Commodity storage
  - Requirement analysis.
- Distribution
  - Points of distribution (PODs) locations
  - Staging areas
  - Requirement analysis
  - Tracking of commodities distributed
  - Delivery locations.

**3.3 Recovery**

Recovery efforts begin immediately following an event. This section focuses on three urgent recovery activities: debris volume analysis and management (FEMA PA), efforts to expedite the delivery of financial assistance to impacted individuals (FEMA

**Table 3-6: Authoritative Data – Critical Food Shelter and Water**

Sub Category	Theme	Type	Delay	POC
<b>Emergency Services</b>				
American Red Cross	ARC Deployments	Point	24 hour	ARC
Emergency Management	Ice/Water Distribution Metrics	Point	3 day	DOD/USACE
	Ice/Water Model Estimates	Polygon	24 hour	DOD/USACE
	National Shelter System	Point	24 hour	FEMA
<b>Event Impact</b>				
Evacuation	NRC Evacuation Shelters/ Reception Centers	Point	48 hour	NRC
<b>Field Operating Locations</b>				
FEMA	Federal Operational Staging Areas (FOSAS)	Point	24 hour	FEMA
	FEMA Mobilization Centers and Staging Areas	Point	24 hour	FEMA
	Points of Distribution (POD) Sites	Point	3 day	FEMA (USACE, State EOC)
	State Staging Areas	Point	24 hour	FEMA



IA), and post-disaster efforts including flood recovery maps and advisory base flood elevations (FEMA Mitigation). These activities provide much-needed assistance to communities affected by disaster events, allowing the citizens to recover as quickly as possible.

### 3.3.1 Public Assistance

FEMA's PA program has many responsibilities, one of which is the clearing and removal of debris. These operations require valid estimates of debris volume and transparent strategies for managing the

#### Best Practices - USACE Commodities Model

When required, USACE leads missions for providing water and ice to citizens immediately following disaster event. The USACE has developed a Commodities Model to assist in estimating their mission requirements. Model estimates are developed and posted on ENLink public website <http://www.englink.usace.army.mil>. For hurricane events, timing of the release of model results is dependent on critical information provided by the National Hurricane Center (NHC) or Central Pacific Hurricane Center (CPHC), depending on storm event.

The model is based on population and an estimated 'percent of population' likely to be without power and require commodities. This 'percent of population' is based on estimated power outages. The factor changes with forecasted storm intensity. The USACE supports the commodity teams as much as ten days post landfall to provide projections of commodity needs and help them with 'burn rates' and commodity ordering.

The model outputs provided include maps depicting amount of commodities required for the event and tables that detail the amount of water and ice needed per day. This information provides emergency managers with an estimate of how many commodities to order and is used to help communities determine the number of Points of Distribution (PODs) sites for water and ice as well as their optimal distribution locations.

removal efforts. In addition, debris such as hazardous containers, vehicles, and deceased livestock must be removed quickly to minimize their negative impact on the environment and communities.

Geospatial technologies assist in recovery efforts by providing spatial estimates of debris volumes before an event to support preplanning efforts and again immediately following the event to continue assisting the management of the debris removal efforts. Debris removal can account for 25 to 50 percent of the overall recovery costs and must be effectively managed to keep the expense to a minimum.

#### Areas of Expertise

There are two major areas where geospatial technologies provide immediate support for the debris missions under FEMA's PA program: volume estimation and mission management. While there are additional missions and geospatial activities within PA, this section is focused specifically on the debris mission.

Debris modeling is accomplished through several modeling applications. The use of these models vary with the event, locations, and magnitude of damages. These models are used to predict debris volumes resulting from wind events and factor in variables such as area demographics (housing, population, etc), estimated storm intensity, and predicted areas of impact. These pre-event debris models provide a basis for planning response and recovery activities but may vary in accuracy when compared to the measured amount of debris actually generated from an event. Efforts to collect debris information in the field provide validation of initial estimations and bring clarity to the debris management requirements as a result of the event. Using field teams and sampling methodologies, improved estimations can be derived to support the continued removal efforts.

The management of the debris mission is driven by geography. Management efforts include tracking the debris locations on streets, recording the measured amounts of

debris delivered to staging areas, and reporting the overall status of the debris mission to leadership.

#### Support

Geospatial support for debris removal efforts is typically performed at the FEMA JFO. Staff deploy from locations around the country to produce map products, collect field data, and perform geospatial analysis, as needed. Off-site support can be added as required and may consist of geospatial modeling activities and imagery interpretation.

FEMA supports the geospatial requirements for the debris mission with FEMA staff, Technical Assistance Contractors (TAC), and mission assignments to the USACE. During the debris removal operations, the debris haulers may use geospatial programs to track the progress of debris removal along streets and may have their own programs or private contractors to assist them with this effort.

#### Authoritative Data

The authoritative datasets generated by the debris mission are focused in scope and quickly outdated. The debris removal mission is constantly evolving as roads are cleared, additional debris is identified, and materials are removed. In addition, specific data is maintained supporting the management and status reporting of the overall operations (*See Table 3-7*).

#### Specific Products

With the mixture of products supporting the debris mission generated by FEMA and USACE as well as products originating from several loss models, there is no single standard for layout or symbology within the debris mission. Below are several examples of the products supporting the PA debris mission:

- Loss Modeling
  - USACE: debris volume

**Table 3–7: Authoritative Data - Recovery Mission - Public Assistance**

Sub Category	Theme	Type	Delay	POC
<b>Emergency Services</b>				
Emergency Management	FEMA Debris Removal Metrics	Polygon	10 day	FEMA PA/USACE
	FEMA Debris Volume Estimates	Polygon	4 day	FEMA PA/USACE
	FEMA PA Applicant Locations	Point	6 day	FEMA PA
	FEMA PA Deployed Assets	Point	4 day	FEMA PA
	FEMA PA Project Locations	Point	12 day	FEMA PA

- HAZUS: debris volume, debris type, impacted population, estimates of FEMA applicants.
- Field Data Collection
  - County maps depicting the PDA debris estimates
  - Debris site locations visited during field data collection
  - Maps depicting the location of samples and county maps depicting the estimated amount of debris.
- Management and Removal
  - Area maps displaying statistics on debris removal efforts (volume removed vs. estimate). Amounts are either obtained from the debris teams or from the Debris Removal Tracking System (DRTS) located within the Resource Information Management System (RIMS).
  - Products tracking debris removal efforts on roads.
  - Private property debris removal (PPDR) progress.
  - Stump tracking.
  - Debris tracking in waterways (barges, trees, boats, cars, etc).

### 3.3.2 Individual Assistance

The FEMA IA program provides financial and emergency housing assistance to individuals, families, and businesses that have been impacted by a federally declared disaster. In support of the IA program, geospatial technologies assist in determining the spatial boundaries of damaged areas, assess the nature and scope of damages to housing units and occupants, and estimate the quantities of individuals requiring assistance. Several IA GIS initiatives are underway to integrate and optimize geospatial data and analyses to improve efficiencies and accuracy in estimating IA requirements, particularly for large-scale disasters where reliance on field housing inspections is logistically impractical, or costly.

#### Areas of Expertise

FEMA’s IA program uses imagery and modeling in conjunction with other geospatial technologies to assess the nature and scope of residential damage from major disasters. FEMA IA protocols have been established for gathering and analyzing imagery to support IA missions, including post-disaster housing inspections. Damage polygons are derived from aerial photography and used to delineate structures that are destroyed or substantially damaged, based on specified criteria for residential damage states. This process supports a mechanism for processing payments in an expedited manner for applicants

in geographic areas that have sustained major or catastrophic damage. A Rapid Damage Assessment (RDA) database of historical awards based on foundations types and high watermarks is used in conjunction with imagery analysis in the National Emergency Management Information System (NEMIS) GIS processing.

HAZUS-MH modeling is used to delineate the spatial boundaries of floods, hurricanes (wind), and earthquakes (liquefaction, ground shaking, ground deformation), which can be used to identify potential areas of operations, population at risk, characteristics of housing stock within the impacted area, and estimates of residential losses. As a regional loss estimation tool, HAZUS-MH outputs are most reliable at the county or multicounty scale.

In assessing housing damage, Light Detection and Ranging (LIDAR) imagery and river gauge data (flood stage levels) are used to determine base elevations (bare earth) to estimate flood depth and the extent of the flooded area. Flood depth grids are used by the IA program to assess and delineate residential damage.

#### Support

The following FEMA entities have a role in the production and application of geospatial data and technologies to support the IA mission:

- FEMA MAC provides geospatial support.
- Disaster Assistance Support Center (DASC) provides policy and program guidance and establishes priorities for data collection and analysis.
- GIU provides geospatial technical support at the JFO, including GIS products and analysis that supports the IA mission.
- Virginia National Processing Support Center (VA-NPSC) manages the geospatial processing of IA applicants in NEMIS and the Contract Management and Housing Inspection Services

(CMHIS). The FEMA NEMIS system stores IA applicant information and determines eligibility for IA payment awards following a declared disaster.

Multiple FEMA contracts have been used to support geospatial analysis of housing damage, response, and recovery. In addition to support for acquisition and analysis of imagery, contract support has been provided through the FEMA Mitigation Directorate for hazard impact analysis and a range of technical studies that contributed to the IA knowledge base of housing vulnerability and the performance of structures in scenario events. Technical support from the Mitigation Directorate is often channeled through technical clearinghouses, which are established following major disasters and provide researchers, contractors, and government agency personnel with a “laboratory” or clearinghouse for event-specific research, including the production and application of geospatial data and technologies.

### Authoritative Data

Authoritative datasets for IA efforts to expedite services are illustrated below (see *Table 3-8*).

### Specific Products

Below are several examples of the products supporting the IA mission:

- NRCC
- Demographic profiles
  - Population and population density
  - Housing units
  - Median household income
  - Median housing value
  - Shelters and shelter status.

NRCC (MAC and RS Coordinator)

- HAZUS runs that provide estimates of spatial boundaries of hazards (wind, flood, surge)
- Damage area polygons
- Photographic records of dwellings
- ZIP code analysis.

JFO GIU Maps and Reports

- GIS products, updated daily, that display IA data and analysis
- Specialized studies.

VA-NPSC

- GIS processed IA applications
- Housing inspection reports.

Mitigation Directorate

- Damage functions (flooding, wind, ground shaking, etc.) for residential structures
- High watermarks and other damage data.

### 3.3.3 Mitigation

Early recovery efforts provide support to many urgent missions, including mitigation. Although mitigation efforts relate primarily to long-term projects, several activities are pursued as quickly as possible to expedite the recovery of hard-hit communities. These projects incorporate the collection of time-sensitive post-event geospatial data and close interaction with local governments to provide critical guidance for

## Best Practices - FEMA Region VI Field Data Collection Tool

FEMA’s process for data collection and reporting associated with debris assessment consisted primarily of handwritten documentation with little standardization of data captured. Historically this has resulted in information processing delays, transcription errors, duplication of collected data records and ultimately the inability to provide accurate and expedited reimbursements to FEMA applicants.

In response to these issues, FEMA Region VI initiated a pilot effort to develop a Field Data Collection Tool to assist in managing the debris mission. The tool consists of GPS enabled ruggedized tablet computer, the custom application, and a data management system. This facilitates the collection and distribution of information related to disaster response and recovery efforts. The tool is used as a method for capturing disaster specific information in the field in a digital environment. There are several modules within the application, but the primary use is to collect and display debris assessments. Users can automatically add GPS coordinates to features such as a debris pile type and volume, establish GPS-tracked linear debris estimates, and use GPS to monitor the geographic footprint of their activities. Users can roll up totals of debris estimates to various levels of aggregation, such as county or state level. This tool enables accurate data collection, while providing near real-time situational awareness, and “on demand” report generation.

**Table 3-8: Authoritative Data - Recovery Mission - Individual Assistance**

Sub Category	Requirement	Type	Delay	POC
<b>Emergency Services</b>				
Emergency Management	FEMA IA Applicants	Point	48 hour	FEMA IA
	FEMA IA Expedited Assistance Areas	Polygon	3 day	FEMA IA

## Best Practices - FEMA Post Katrina Damage Assessment for Individual Assistance

In the aftermath of Hurricane Katrina, FEMA faced a significant challenge in identifying and quantifying the nature and scope of damage to residential structures. In response to this issue, FEMA developed a strategy to utilize post-event imagery and other geospatial analysis to assess residential losses.

To assess the feasibility of the strategy, FEMA conducted a study of four Louisiana parishes that used remote sensing, topography (Digital Elevation Model), ZIP Code, and parcel data to perform GIS analysis to estimate numbers of households by ZIP Code area that had experienced severe flooding. The geospatial process for catastrophic damage assessment was extended to coastal counties in Mississippi and Alabama and Florida counties that sustained damage from Hurricane Wilma.

The findings from the study included:

- In large-scale events, geospatial analysis is a cost-effective approach to housing damage assessment.
- Geospatial readiness is a direct function of the availability of data acquisition and analysis contracts, and data “pre-staging”, which includes pre-event identification of necessary base and analysis data (ZIP Code areas, LIDAR, tax parcel records, NGA HSIP Gold data).
- Models are valuable in delineating spatial boundaries of damage and housing loss and in establishing priorities for more detailed housing inspections.
- Technical clearinghouses are very useful “integrators” of geospatial technologies and expertise.

Following Katrina, approximately 150,000 homes were analyzed and classified using geospatial tools. Post-Katrina analysis indicated that less than 10 percent of homes surveyed using geospatial technology were incorrectly classified, due largely to issues associated with the use of ZIP Code areas for reporting purposes. The analysis proved to be statistically valid, cost effective and timely, as compared to physical inspections.

rebuilding. This section focuses on the mitigation efforts for flood-related events.

### Areas of Expertise

FEMA’s Mitigation Directorate mobilizes resources immediately following an event to begin work in the reduction of future losses. For flood events, this is a large and labor intensive effort. Initially these projects are managed at the RRCC, but this authority transfers to the JFO as soon as it becomes operational.

**High Watermark Collection.** Field observers and survey crews are deployed by FEMA to interview residents, find confirmation of high water levels, and capture supporting evidence of high water. These field crews collect detailed information about each high watermark, including physical basis of the mark, such as a mud line inside the building, a mud line on the outside of the building, or debris. Wherever possible, crews also note the coastal flooding characteristics captured by coastal high watermarks, including storm surge, wave run-up, and wave height. The survey crews use GPS methods to determine an accurate elevation for each high watermark. These locations have been surveyed to within accuracies of 0.25 foot vertically and 10 feet horizontally, with a 95 percent confidence level.

**Storm Surge Inundation Mapping.** Flood inundation levels are created for the coastal communities by mapping the coastal high watermark elevations onto digital, pre-storm, topographic contour data developed from LIDAR surveys. These inundation levels represent an estimate of the inland extent of flooding caused by storm surge. The inundation limit is then refined to remove small-scale, isolated areas of inundated and noninundated terrain based on knowledge of overland surge propagation and engineering judgment.

**Advisory Base Flood Elevations (ABFE).** In larger flood events, ABFEs are developed to provide communities with initial recommended building

## Best Practices - Advisory Base Flood Elevations

Following Hurricanes Katrina and Rita in 2005, FEMA conducted a new flood frequency analysis and determined that current base elevations for many communities impacted by the storms were too low. To help communities reduce their vulnerability to damage from future flooding, FEMA issued Advisory Base Flood Elevations (ABFEs) that incorporated data from Hurricane Katrina, as well as tide and storm data from other events during the preceding 25 years. The ABFEs were significantly higher than Base Flood Elevations (BFEs) shown on pre-Katrina flood maps, and more accurately reflected post-storm conditions.

FEMA issued ABFEs in areas where the effects of the 2005 storms significantly altered the floodplain, or demonstrated that the current BFEs were outdated. Since 2005, ABFEs have become an important tool in early disaster recovery to assess updated community vulnerabilities to flooding. Increasingly, key mitigation programs have tied eligibility for funding to adherence to elevations reflected in ABFEs.

elevations for use in the reconstruction process until more detailed data become available. ABFEs are based on a new flood frequency analysis that takes into account the immediate event as well as additional tide and storm data from other events that have occurred since the existing Flood Insurance Rate Maps (FIRM) were developed.

### Support

The FEMA Region and Disaster Support Branch at headquarters serve as a central point of contact for coordinating disaster operations, cadre management (including GIS support), regional support, and program coordination. Geospatial support activities for mitigation include:

- Staffing a Mitigation GIS Coordinator to be the liaison with the FEMA JFO GIU, FEMA headquarters, and local operations.
- Supporting the acquisition of pre- and post-disaster data collection and coordinating with appropriate mitigation programs.

The Mitigation Directorate’s Program Coordination Group brings together representatives of key branches with geospatial expertise that can be applied in the recovery phase, including:

- Building Sciences Coordinator serves as the point of contact for the risk reduction and provides building science tools and guidance to support recovery.
- Floodplain Management Coordinator provides geospatial data and relevant analysis to the NRCC Hazard and Mitigation (HM) Branch to support the mission.
- Mapping Coordinator represents the Data and Dissemination Branch and Risk Analysis Division and provides geospatial data and analysis to support the mission.

### Authoritative Data

See Table 3-9.

### Specific Products

These high resolution maps are designed to assist property owners in the repair or rebuilding of structures to newly determined advisory coastal flood elevations. Specific mitigation-based products include, but are not limited to:

- Recovery Maps
- High watermarks
- Inundation levels
- FEMA’s ABFEs
- Repetitive loss.

**Table 3–9: Authoritative Data - Recovery Mission - Mitigation**

Sub Category	Theme	Type	Delay	POC
<b>Event Impact</b>				
Event Location	High Water Depth	Polygon	4 day	FEMA Mitigation
	High Water Grid	Grid	4 day	FEMA Mitigation
	High Water Marks	Point	4 day	FEMA Mitigation/USGS

- Team Members
- GeoCONOPS
- Requirements & Capabilities
- Specific Mission Areas
- Disaster Operations
- Catastrophic Disasters
- Appendices

*This page intentionally left blank.*

Team Members

GeoCONOPS

Requirements &  
Capabilities

Specific  
Mission Areas

Disaster  
Operations

Catastrophic  
Disasters

Appendices

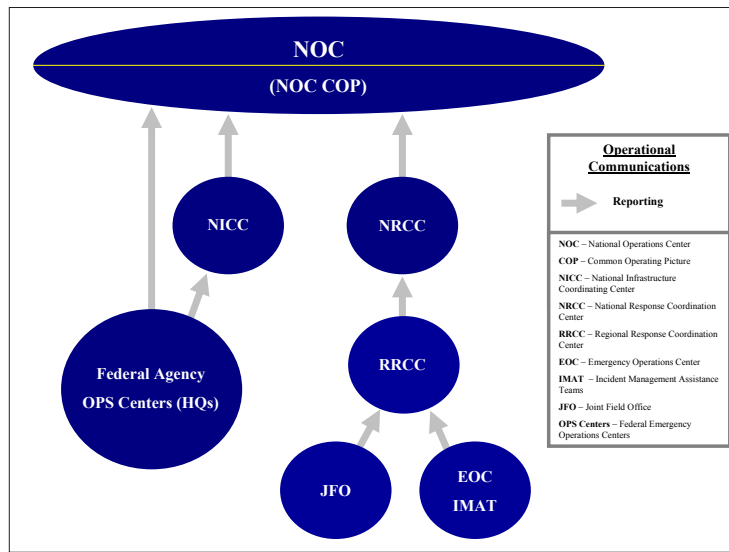


Figure 4-1: Disaster Operations Reporting Structure

This section discusses the primary operation centers supporting DHS-related activities before, during, and after a disaster. These entities provide the oversight, direction, and coordination required at the federal level to support disaster operations. The following graphic identifies the information reporting streams from field operations to the executive-level briefings (see Figure 4-1).

In addition to formal reports, DHS provides a suite of web-based visualization tools to federal, state, and local partners via iCAV and DHS Earth for situational awareness, visualization, and lightweight analytics.

- iCAV is a web-based 2D viewer, used by customers that require the ability to analyze geospatial data.
- DHS Earth is a 3D web viewer and is primarily used by customers that require rapid visualization of dynamic data in relation to CIKR with limited need to analyze that data.

The intent of this section is to discuss the geospatial requirements and specific products supporting the following federal operation centers.

## 4.1 DHS National Operations Center

### Overview

The Office of Operations Coordination and Planning’s (OPS) mission is to integrate DHS and interagency planning and operations coordination in order to prevent, protect, respond to, and recover from terrorist threats/attacks and other man-made or natural disasters. Through the National Operations Center (NOC), the DHS OPS interacts with DHS Components, State Governors, Homeland Security Advisors (HSAs), law enforcement partners, and critical infrastructure operators in all 50 states and more than 50 major urban areas nationwide.

The NOC provides real-time situational awareness and monitoring of the homeland, coordinates incident response activities, issues advisories and bulletins concerning threats to homeland security and provides specific protective measures. The NOC operates 24 hours a day, 365 days a year to coordinate information sharing to help deter, detect, and prevent terrorist acts and to manage domestic incidents. Information on domestic incident management is shared with EOCs through the Homeland Security Information Network (HSIN)

### Roles and Responsibilities

The NOC is the principal operations center for DHS and provides situational awareness and a COP for the entire federal government, as well as for State, local and tribal governments as appropriate. The NOC ensures that critical terrorism and disaster-related information reaches government decision-makers. In the performance of its mission, the NOC enables the Secretary and other leaders to make informed

decisions and identify courses of action during an event or threat.

In addition to NOC staff, more than 30 entities from the federal, state and local level have a presence within the NOC. These agencies work in tandem with the NOC to collect, fuse, and share information. RFIs are coordinated by the NOC’s on-duty Senior Watch Officer (SWO) with the Desk Officers representing specific DHS components, other federal agencies, state and local law enforcement agencies, as well as non-governmental organizations. The NOC establishes information sharing partnerships with specific customer groups through Communities of Interest (COI) within HSIN. Additional methods for information sharing include phone calls, emails, and reports from and to specific agencies.

Specific geospatial roles and responsibilities include:

- **Spatial Tagging.** In support of creating National Situation Summaries, the NOC Knowledge Management Officer (KMO) establishes an area of interest and creates a summary product for the incident. This geospatial picture is viewable from the HSIN COP COI within a stored map view within iCAV. In addition, the KMOs use DHS Earth for situational awareness. When immediate products are required, NGA supports the NOC leadership for enhanced decision making and executive presentations. These products are often made available to KMOs for distribution to the greater HSIN community.

- **GIS Support.** Within the NOC, the GIS Watch Desk provides geospatial production and geospatial data visualization support to the NOC Senior Watch Officers and the NOC Director as its primary mission. The NOC GA also provides GIS subject matter expertise, imagery and data requirements support, and production capabilities to DHS component operations centers, as well as the DHS Office of Intelligence & Analysis. The NOC GIS Watch Desk also serves as a liaison and coordination point with the NGA Support Team (NST).
- **Remote Sensing.** The NOC relies primarily upon the Interagency Remote Sensing Coordination Cell (IRSCC) during incidents to ensure that federal airborne assets and sensors are tasked efficiently. Additionally, the NOC relies upon the NST to assist with tasking for Commercial Remote Sensing (CRS), as well as classified national imagery. The NOC also coordinates with the US CBP via the Air and Marine Operations Center to task CBP unmanned aerial vehicles to fly particular missions. Real-time video feeds from these tactical resources are streamed to the NOC for Senior Watch Officer Situational Awareness via the “Big Pipe” system.
- **Modeling.** CBRN releases, explosions, fires, and other events can create smoke, gas, or particulate plumes. During planning for special events, response to real world incidents, or in line with training and exercises, the SWO will often want to have situational awareness of downwind

Table 4–1: Authoritative Data - Disaster Operations - NOC

Sub Category	Theme	Type	Delay	POC
<b>Emergency Services</b>				
Emergency Management	Blue Force Tracking	Point	12 hour	DHS/NOC
Emergency Management	NOC Message Alert Location	Point	24 hour	DHS/NOC
<b>Event Impact</b>				
Damage - Infrastructure	NOC Sweat Model	Polygon	24 hour	DHS/NOC



consequences (real or simulated) of such plumes. The NOC GIS Watch Desk coordinates that awareness as a spatial requirement, for which Lawrence Livermore National Lab (LLNL) provides modeling expertise. The IMAAC serves as the single point of coordination for modeling, production, and dissemination of Federal government dispersion modeling and predictive products. The SWO is the Authorized IMAAC Requestor (AIR) within the NOC. The SWO relies upon the GIS Desk Officer's subject matter expertise to assist with coordination and integration with NOC operations.

### Operational Support

Among its various duties, the NOC is responsible for tracking and reporting the National Situation Summaries, the International Situation Summary (ISS) as well as RFIs from the executive branch, DHS components, DoD, and ESFs. Operational support provided by the NOC is primarily centered on gathering event data, coordinating the enhancement of this data with other homeland security partners, and disseminating this information to customers to provide situational awareness. The role of the NOC is to provide information to DHS executive stakeholders for reporting, decision making, and response coordination.

### Production Methods

The NOC GIS Watch Desk Officer, or Geospatial Analyst (GA), is responsible for managing the NOC's Geospatial Production Request (GPR) process, in coordination with the SWO. The GA produces products both for the SWO, for other NOC desk officers, OPS leadership, and other DHS customers. These products can be requested on both a normal priority for day-to-day planning and support operations, as well as for incident management situational awareness and assessment. The type of product created will always depend on the time

allotted by the requestor, as well as the level of effort deemed necessary by the SWO.

The GPR Process begins when a requestor submits an RFI to the NOC GIS Watch Desk. The on-shift GA ensures that a NOC number is assigned to the project by notifying the SWO on-duty, as well as the Tracker, who assigns the number in their Tracker Database.

The GA then begins project planning in close coordination with the requestor, searching foundation-level datasets, official data sources, as well as historic products. If additional data is needed, the GA has three avenues to satisfy data needs: (1) Open source collection; (2) Geospatial data fusion and conversion (of textual reporting); or (3) the NOC RFI process. For the NOC RFI process, the GA works with the SWO and Tracker to task other DHS component desks or interagency operations centers to provide data within a specific timeframe.

As the product is created, and analysis conducted, the GA works iteratively with the requestor to ensure that the product continues to meet the requirements. Upon completion, the SWO has final approval over all product dissemination. Methods for dissemination include a variety of tools, to include: HSIN COIs (FedOps, COP, LE, EM, GIS, etc.), GEOINT Online, Intelink, as well as direct dissemination via email to the requestor.

### Authoritative Data

The NOC uses authoritative data as provided by each of its component and mission partner Watch Desk Officers. The NOC RFI system, as managed by the Tracker Watch Desk, pushes RFIs from the SWO, CAT Director or other DHS leadership personnel to the appropriate data providers.

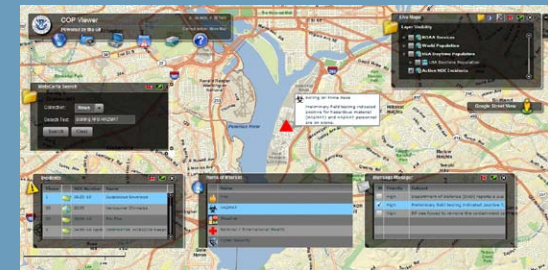
The NOC GIS Watch Desk also uses a National Information Exchange Model (NIEM)-compliant suite of data standards. These standards help to structure and facilitate the sharing of datasets

## Best Practices - iCAV COP

The DHS Integrated Common Analytical Viewer (iCAV) is a secure, Web-based, geospatial visualization tool that integrates commercial and government-owned data and imagery from multiple sources into a single COP. Using iCAV, homeland security partners can establish a comprehensive situational and strategic awareness across the nation to better prepare, prevent, respond and recover from disasters, such as hurricanes or real-time events.

Geospatial information links systems and homeland security-specific missions, and iCAV delivers a geospatial context to engage partners.

iCAV access is granted at no cost to authorized state and local emergency responders, emergency managers, homeland security officials and other personnel with official infrastructure protection responsibilities, through the Homeland Security Information Network (HSIN). iCAV can be accessed from any Web-browser system, so it can be used in an office via a desktop computer or in a mobile-command unit on a laptop or hand-held device.



within the NOC's Geodata Catalog. These datasets are identified as authoritative within the National framework of the Federal Geospatial Data Committee (FGDC) and by their respective data stewards (see Table 4-1).

## Product Specifications

The NOC fuses, collects, disseminates, and produces volumes of geospatial and spatially-referenced data each day. These include both “official” reporting, web-based geospatial data visualization, as well as finished geospatial products.

Official NOC reporting products include, but are not limited to:

- **NOC Message Alerts.** Disseminated as required via email to a set distribution list. Message alerts typically contain a level of awareness, a location of the alert event, and a description of the issue.
- **NOC COP.** Updated as significant situations develop and available via HSIN. The components composing the NOC COP include National Situation Summaries, ISS, RFI Tracking Management, Situation and Spot Report Tracking Management, NOC Event Chronology, Blue Force Tracking, Critical Infrastructure Monitor, GIS, and Media Analysis.
- **Spot Reports.** Spot Reports provide warning reports for incidents meriting immediate notification to the NOC. They are submitted to inform selected individuals or entities of critical information as it becomes available.
- **Security, Water, Electricity, Accessibility, Telecom Charts.** These charts provide a county by county view color coded (red: 0%–39%, yellow: 40%–79%, green: 80%–100%) as to the percent of availability of these elements

## 4.2 DHS National Infrastructure Coordinating Center

### Overview

The DHS Office of Infrastructure Protection (IP) within the National Protection and Programs Directorate

(NPPD) leads the coordinated national program to reduce risks to the nation’s critical infrastructure key resources (CIKR) posed by acts of terrorism, and to strengthen national preparedness, timely response, and rapid recovery in the event of an attack, natural disaster, or other emergency. The Contingency Planning and Incident Management Division (CPIMD) of IP coordinates and implements preparedness activities such as exercises, contingency planning, and incident management in events that impact the nation’s CIKR. CPIMD operates the NICC. The NICC is part of NOC and is the 24 x 7 coordination and watch center that serves as the primary focal point for CIKR-related situational awareness.

The NICC is divided into two elements; the NICC Watch and the Incident Management Cell (IMC). The primary role of the NICC Watch is to operate as a watch center that continuously assesses the operational status of the nation’s CIKR and provides situational awareness to DHS leadership. The NICC serves as a two-way conduit for information sharing between the federal government and the private sector partners on the status of CIKR during and after a natural or manmade event.

The IMC serves as IP’s central mechanism for coordinating IP incident management activities and provides incident-specific situational awareness through the integration of information regarding CIKR, risk, response, and recovery operations. The IMC is staffed by all divisions within IP; however, CPIMD and the NICC are the lead IP Division responsible for RFI receipt, tasking, tracking, and fulfillment. These RFIs consist of requests for geospatial products, post-event imagery, CIKR status, and management-level situation reports.

### Roles and Responsibilities

The NICC provides the Assistant Secretary for IP, the NOC, and senior DHS/IP decision makers with a central location for CIKR-related event situational

awareness and response coordination. In addition, the NICC provides a centralized hub through which CIKR public and private sector owners and operators are able to request status information, analysis, geospatial products, and imagery of their facilities, pre-event, during, and after impact of the event. The NICC collects these RFIs and tracks their fulfillment via its internal RFI management tool. RFIs for analysis, geospatial products, and event imagery are then tasked out to NICC support elements, most notably the NISAC, IMAAC, NRCC, and IICD Infrastructure Visualization Branch (IVB) for fulfillment.

Specific geospatial roles and responsibilities include:

- **GIS Support.** The IICD IVB provides geospatial production and geospatial data visualization support to the NICC and IP IMC. The IVB maintains a minimum of one geospatial analyst on-site at the NICC and IMC during normal daily operations and surge capacity during an event. Standard IVB products include base map imagery, event boundaries such as hurricane cones, wildfire perimeters, contamination areas, and significant CIKR, which are defined as Infrastructure of Concern (IOC) within the area of interest. The NICC uses iCAV and DHS Earth for visualization of events impacting CIKR in the area of interest to maintain situational awareness on the NICC watch floor and within the IMC.
- **RS.** The IVB also provides post-event imagery collection coordination with the NRCC on behalf of the NICC and the IMC. Post-event imagery collection is typically focused on IOC within the impacted area. Requests for post-event imagery originate from a combination of customers including private sector partners, federal partners, and DHS management. The imagery is made available to the customer via a variety of mechanisms including the KML file format used to display geographic data, soft copy presentations uploaded to the HSIN GIS COI, or email. Release of the imagery may be limited to federal and specific customers only

depending on the sensitivity of the product or the request of the customer.

- **Modeling.** The NISAC uses a number of tools to perform event-driven, rapid analysis. From a geospatial perspective, one of the primary tools used is FASTMap. FASTMap is a suite of mapping and analysis tools custom built for rapid infrastructure analysis. Results from FASTMap are disseminated in a number of different formats including KML, ESRI Shape file, and in hardcopy as well as softcopy geospatial products. The IVB collects FASTMap outputs within the iCAV suite of tools to provide enhanced situational awareness both on the NICC watch floor and within the IMC.

### Operational Support

The IMC is the central information collection, triage, and processing element for all IP incident management activities and private sector partner suspicious activity reporting. When an incident occurs, the IMC, in coordination with the NICC watch, becomes the primary node for CIKR incident-specific RFIs. Within the IMC, the Incident Manager is responsible for prioritizing all incoming RFIs. When a request is received, the RFI is verified and accepted by the IMC’s Information Fusion Cell.

Specific IVB GIS capabilities delivered on behalf of the NICC include:

- **Daily Support.** Geospatial product development is executed at the request of the customer. An example of these types of requests would be maps showing the location of specific dams in a certain region. Daily support maps typically contain base map imagery and infrastructure point data. The geospatial production support is typically provided on the NICC watch floor, with additional resources available as required.
- **National Security Specific Events (NSSE) Support.** Prior to an NSSE, map books are created depicting various areas of interest and sector-

specific infrastructure data. Examples of NSSE geospatial products include a map book for the Super Bowl or the recent Presidential Inauguration.

- **Incident/Event State Support.** Examples of event state geospatial products include post-hurricane landfall imagery of chemical facilities in the impacted area. Incident/event state support is provided by contractor support as well as the IMC.

The **Quick Look** product provides the NICC partners with a brief, visual depiction of any CIKR in a given geographical area. The development is initiated in response to an incident or for an upcoming event and is not intended to be an in-depth analysis of area infrastructure. This product is delivered as a PowerPoint presentation.

**Spot Reports** are unclassified - FOUO documents used to notify the NOC, sector specialists, and IP leadership of emerging incidents/events impacting the nation’s CIKR. A Spot Report provides as much information as the watch stander can gather on the incident in a short period of time. Depending on the amount of information available, a geospatial product may be requested to insert into the report to provide location information.

**Current Situation Reports** provide a more in-depth analysis of an incident impacting CIKR. Situation Reports are initiated as follow-on reporting to an

initial Spot Report or to inform of a slowly developing situation that has risen to a level where reporting would be prudent. The watch stander may request a map product to insert into the report displaying the location and any CIKR affected in the area.

### Production Methods

RFIs from customers to the NICC are requested via phone and email. NICC watch standers track official RFIs within the Master Watch Control Log (MWCL). Open RFI items are closed out after distribution to NICC customers. Primary customers of the NICC include the Public Security Advisors (PSA) deployed in the field, sector-specific agencies, DHS NOC, the IP IMC, and Infrastructure Liaison Officer, when a JFO is created in response to an incident/event. The NICC leverages its relationship with IICD for support with requests for more complex geospatial product development when necessary. The RFI requests that generate geospatial products from the IICD team are initially entered in a spreadsheet and then tasked to the Geospatial Production Team (GPT) within the IVB.

The tools used to create and disseminate these products consist primarily of web-based geospatial data viewers, thick client analytic tools, data storage, manipulation and management capabilities, and data/product dissemination mechanisms.

**Table 4–2: Authoritative Data - Disaster Operations - NICC**

Sub Category	Theme	Type	Delay	POC
<b>Emergency Services</b>				
Emergency Management	NICC Infrastructure of Concern (IOC)	Point	24 hour	DHS/NICC
	Patriot Report Area of Concern	Polygon	24 hour	DHS/NICC
	Quick Look Area of Concern	Polygon	24 hour	DHS/NICC
<b>Event Impact</b>				
Damage - Infrastructure	Communications Damage	Point	24 hour	ESF
	Power Supply Damage	Point	24 hour	ESF

Products requested may range from simple geospatial map products showing the IOC in a given area to more complex geospatial products depicting event locations (e.g., hurricane path, fire perimeter, radiation plume) in relation to CIKR. In addition, the RS Team within the IVB receives requests for post-event imagery and works through the Interagency Remote Sensing Coordination Cell (IRSCC) to fulfill these requests.

### Authoritative Data

The NICC uses data sets from the IP Tier 1 and Tier 2 Program, which identifies nationally significant, high-consequence assets and systems to prioritize the nation's CIKR. High-level criteria for inclusion on this list include assets that if destroyed or disrupted could cause some combination of significant casualties, major economic losses, or widespread and long-term disruptions to national well-being and governance capability. Identification of these nationally significant assets is conducted annually and relies on the combined insights of Infrastructure Analysis and Strategy Division (IASD), the NISAC, the state/territorial Homeland Security Advisors and the federal sector-specific agencies. The resulting list provides DHS and its security partners with the ability to efficiently and effectively implement protection programs and initiatives such as grant programs, buffer zone protection efforts, facility assessments training, and related activities.

The Tier 1 and Tier 2 data set is classified when provided in its entirety for a given state or within one of the 18 sectors. To provide customers with an unclassified version of these critical assets, IVB will create geospatial products that narrow the AOI around an event to a level where the data presented does not conflict with the classification guidelines. The resulting unclassified data set is then referenced as IOC. Additional IP/NICC authoritative data sets consist of the following (*see Table 4-2*):

### Product Specifications

Geospatial data is maintained in shape file and Relational Database Management System formats and is served out via iCAV viewer or DHS Earth via KML. Within the IMC, geospatial products generated on behalf of the NICC by the IVB are typically 11"x 17" in size and wall size maps are 30" x 60" and displayed prominently within the IMC.

Symbology used by the IVB typically consists of the Federal Geospatial Data Commission (FGDC) compliant symbology available within the HSIP dataset. The IVB provides map and post-event imagery products in paper, pdf, jpg, and KML formats. Each product adheres to a consistent and standardized format as determined by the IMC. Once completed, and if appropriate, each product is given a standard naming convention (yyyy/mm/dd/RFI/size) and uploaded to the HSIN GIS COI for customer retrieval.

## 4.3 FEMA National Response Coordination Center

### Overview

FEMA's Disaster Operations Directorate coordinates and provides the core federal disaster response capability needed to save lives, reduce suffering, and protect property in communities throughout the nation that have been overwhelmed by the impact of a major disaster or emergency, regardless of cause. The Disaster Operations Directorate must ensure that federal emergency response systems and capabilities are properly poised to support states and communities overwhelmed by disasters and emergencies.

The FEMA NRCC is a multiagency entity operating from FEMA headquarters that functions as the operational component of the DHS NOC. The NRCC coordinates personnel and resource deployments to

support disaster operations and prioritizes interagency allocation of resources. It maintains situational awareness linkages with regional, state, and local partners and 24 x 7 watch team. The NRCC is staffed to support daily monitoring activities with the ability to surge in support of catastrophic events.

### Roles and Responsibilities

The NRCC integrates the nation's emergency response teams, systems, and capabilities into a comprehensive, coordinated operational capability to provide an effective and efficient response to major disasters or emergencies. The NRCC coordinates all federal emergency management disaster operational planning and programs to ensure the delivery of immediate emergency assistance to support individuals and communities.

FEMA, through the NRCC, provides coordination and support for geospatial activities responding to federally declared disaster response and recovery activities. This support reaches to the 15 ESF desks, FEMA mission areas, and the DHS NOC and NICC. In addition to federal headquarters operations, the NRCC provides geospatial services to the FEMA regional offices and field operations.

Specific geospatial roles and responsibilities include:

- **GIS Support (FEMA MAC).** The MAC supports the NRCC through the GIS Coordinator desk. The MAC is fully staffed and able to provide surge capabilities for disaster production. Standard MAC products include flooded areas, hurricane impact (modeled), HAZUS products, disaster declarations, damage locations, and FEMA applicant locations. In addition to these products, the MAC accepts ad hoc requests for all types of information products related to an event. Products requiring specific field information may be forwarded to individuals supporting field activities.
- **RS.** RS requirements are coordinated by FEMA's RS coordinator, also located in the NRCC.

Imagery collection and processing is tasked through existing relationships with NGA, USGS, and other federal and commercial sources. The RS Coordinator works closely with customers in the NRCC, FEMA headquarters, DHS, FEMA regions, and FEMA/state field offices to ensure that all requirements are met and duplication of efforts is prevented. Once acquired and processed, imagery is made available to all entities supporting the event through various media sources. In some situations, licensing restrictions may limit use to federal or other users.

- **Modeling.** In support of the NRCC, the MAC is the designated entity for producing HAZUS-MH runs of record for FEMA. The MAC produces standardized Level 1 HAZUS-MH analyses using the hurricane, flood, and earthquake models and has developed a dissemination method and protocol for sharing the standardized products. The model developers provide technical support to the MAC.

### Operational Support

The NRCC provides support to all presidentially declared disasters, special security events, and other significant events as required. The MAC is the primary geospatial production entity for all federal operations and is augmented by NGA, USGS, USACE, and other federal geospatial offices.

### Production Methods

GIS requests are taken by the NRCC GIS Coordinator who validates requirements and forwards them to the MAC lead. Requests are then triaged and assigned to individuals. The analyst staff work with the customer to deconflict any concerns and the product is generated and delivered to the customer. In situations where data must be collected or created, the analyst works to acquire the best available data and validates with the customer as needed.

RS requests are given to the NRCC RS Coordinator for execution. Requests include details of the area to be acquired, level of detail necessary, and any time constraints. Acquisitions are combined with others when possible and are discussed in a conference call forum when possible to ensure that others are aware of activities and able to assist or be included. Once complete, imagery and derived products are made available to all responding entities as allowed by licensing and other restrictions.

The MAC used the ESRI Suite of software for data collection/creation, data maintenance, analysis and map production. Additional software tools include Oracle, geocoder, Adobe Acrobat, Adobe Connect, and others. Geospatial products developed for formal delivery follow basic standards for layout and content and are reviewed for content accuracy and spelling prior to delivery.

**Table 4-3: Authoritative Data - Disaster Operations - NRCC**

Sub Category	Theme	Type	Delay	POC
<b>Emergency Services</b>				
Emergency Management	FEMA IA Applicants	Point	48 hour	FEMA IA
	FEMA NFIP Claims	Polygon	5 day	FEMA Mitigation
	FEMA PA Applicant Locations	Point	6 day	FEMA PA
	FEMA PA Project Locations	Point	12 day	FEMA PA
	Presidential Disaster Declaration Areas	Polygon	immediate	FEMA
	Presidential Emergency Declaration Areas	Polygon	24 hour	FEMA
<b>Event Impact</b>				
Event Location	Imagery Derived Products (Targets)	Point	24 hour	FEMA
	Imagery Post-Event (Aircraft)	Raster	3 day	FEMA
	Imagery Post-Event (Motion Video)	Video	24 hour	FEMA
	Imagery Post-Event (Satellite)	Raster	3 day	FEMA
Modeling	Radiological Hazard Warning (RHW)	Point	24 hour	NRC (FCC)
	Radiological Hazard Warning (RHW)	Point	24 hour	NRC (FCC)
<b>Field Operating Locations</b>				
DoD	JTF Joint Operations Center	Point	24 hour	NORTHCOM/PACOM
<b>Specialized Response Teams</b>				
DHS	FEMA Incident Management Assistance Team (IMAT)	Point	24 hour	FEMA
	FEMA MERS/MATTS Locations (Deployed)	Point	24 hour	FEMA
	Scientific and Technical Advisory and Response Teams (STARTS)	Point	48 hour	FEMA

## Best Practices - HAZUS Concept of Operations

Prior to 2008, FEMA did not have a standardized process for using HAZUS-MH for disaster response or a system to disseminate the output products for recovery operations. Recognizing the need to have an authoritative source for HAZUS modeling in support of the NRCC, GIS Solutions Branch (GSB), under the Office of Chief Information Officer (OCIO), developed the HAZUS Concept of Operations (CONOPS). This CONOPS is intended to define the official HAZUS-MH run of record for FEMA, minimizing opportunities for conflicting HAZUS model from entering the disaster response community.

With the development of the HAZUS CONOPS, FEMA has taken an important step in the integration of the HAZUS model into the suite of geospatial tools that are used by the NRCC to assess disaster impacts. While HAZUS has been used by FEMA for a decade or more to estimate losses from earthquakes, floods and hurricanes, the CONOPS provides clear, official guidance on the use of HAZUS by the GSB to support the NRCC in gaining situational awareness.

The HAZUS CONOPS outlines procedures for producing standardized Level 1 HAZUS-MH runs of record for FEMA and the emergency management community. The CONOPS identifies the GSB Mapping Analysis Center (MAC) as the designated geospatial entity for producing HAZUS runs of record for FEMA. The HAZUS CONOPS defines operational deliverables, workflow, tools, and data sources for providing standardized Level 1 HAZUS-MH hurricane, earthquake, and flooding products. The standardized products are intended to be disseminated through internal FEMA networks as well as HSIN.

The HAZUS CONOPS is an important contribution in the application of modeling to support disaster impact assessments. It is important that the SMEs running HAZUS are experienced in its use for disaster operations (rather than for planning purposes) and prepared to quickly and effectively interpret and share the modeled results. The HAZUS CONOPS fuses procedures required to guide the use of HAZUS together into a single authoritative document to support situational awareness and disaster operations.

### Authoritative Data

The NRCC maintains a minimal amount of unique data. Base data is provided by HSIP Gold and other government and commercial sources. The NRCC is a major data user and produces many products designed to answer specific questions. Products and data are provided through iCAV, email, and other means to the NOC, NICC, and FEMA regional offices on an as-needed or as-available basis (*see Table 4-3*).

### Product Specifications

Geospatial data is maintained in ESRI Oracle/SDE format for internal use and output into geodatabase, shape files, and xml formats, depending on customer requirements. Data collected for input can be accessed from almost any source type and may be labor/time intensive. Collections of event data are specific to the FEMA entity directly supporting the response and recovery efforts and are generally not accessible across the network and must be requested at the point of origin.

The MAC uses a standard symbology based on ICS and FGDC Homeland Security formats with additions for FEMA-specific data and products. Data pushed into iCAV will follow iCAV symbology standards.

The NRCC provides map products in pdf, jpg, and other formats. Using standardized layouts, the MAC produced products with a consistent feel and makes the template available to all FEMA facilities. In addition to internal production, several standard products are made available on FEMA's public Internet site. These include map graphics, specific authoritative data themes, and xml exports.

## 4.4 FEMA Regional Response Coordination Centers

### Overview

FEMA's RRCCs operate within each of the 10 FEMA regional offices around the nation. These facilities provide support to each of the states within the regional boundaries as well as support disaster operations within other regions during major multistate events.

The FEMA RRCC is a multiagency entity operating from FEMA regional offices in two capacities: watch mode, operating during normal business hours and activation mode, when supporting relevant events. The RRCC is staffed to support daily monitoring activities with the ability to surge in support of catastrophic events.

The RRCC functions as the regional interface between the states and the FEMA NRCC, maintaining situational awareness with all partners until a JFO opens. The RRCC coordinates personnel and resource deployments to support disaster operations and prioritizes interagency allocation of resources.

### Roles and Responsibilities

The RRCC integrates the regional and nation's emergency response teams, systems, and capabilities into a comprehensive, coordinated operational capability to provide an effective and efficient response to major disasters or emergencies. The RRCC coordinates all federal emergency management disaster operational planning and programs to ensure the delivery of immediate emergency assistance to support individuals and communities.

FEMA, through the RRCC, provides key coordination and support for geospatial activities

responding to federally declared disaster response and recovery activities. This support reaches the regional and national response teams, the 15 ESF desks, FEMA mission areas, and the NRCC. In addition to regional operations, the RRCC provides the initial geospatial support required to provide situational awareness to regional field operations.

Specific geospatial roles and responsibilities include:

- **GIS Support.** The GIU, under the Planning Section, provides all regional GIS and RS support in response to an event. FEMA is responsible for the management and coordination of all geospatial activities and provides services ranging from basic map production to field data collection to overhead coordination with other federal entities.
- **Remote Sensing.** RS requirements and requests are coordinated by the RS Coordinator within the GIU.
- **Modeling.** In some situations, FEMA headquarters will provide the RRCC with HAZUS-MH expertise. Through technical support from the Risk Analysis Branch, the RRCC has been able to identify and prioritize HAZUS-MH outputs for use in disaster operations, based on the reliability of the analysis and value to the emergency management community.

### Operational Support

The RRCC provides support to all events of regional interest, this includes local events with the potential to expand, significant civil and weather events, national special security events (NSSE), declared disasters, and other events as required. The GIU is the primary geospatial production entity for RRCC operations and is augmented by NGA, USGS, USACE, and other federal geospatial offices.

### Production Methods

GIS requests are taken by the RRCC GIU where they are validated against mission requirements and

acted upon. Requests are triaged and assigned to individuals. The analyst staff work with the customer to deconflict any concerns and the product is generated and delivered to the customer. In situations where data must be collected or created, the analyst works to acquire the best available data and validates with the customer as needed.

RS requests are given to the RRCC GIU lead and passed to the RS Coordinator for execution. Requests include details of the area to be acquired, level of detail necessary, and any time constraints. Acquisitions are combined with others when possible and are discussed in a conference call forum when possible to ensure that others are aware of activities and able to assist or be included. Once complete, imagery and derived products are made available to all responding entities as allowed by licensing and other restrictions.

Geospatial products developed for formal delivery follow basic standards for layout and content and are reviewed for content accuracy and spelling prior to delivery.

### Authoritative Data

The RRCC maintains data unique to the Federal Government. Some of this critical information is collected from state and local governments to support FEMA’s operations. Although FEMA is not the originating entity of this information, it is compiled from multiple entities and consolidated into theme-specific federated datasets. This information is then available as common operating data in support of various regional missions.

Base data is provided by HSIP Gold and other government and commercial sources. The RRCC is a major data user and produces many products designed to answer specific questions. Products and data are provided through iCAV, email, and other

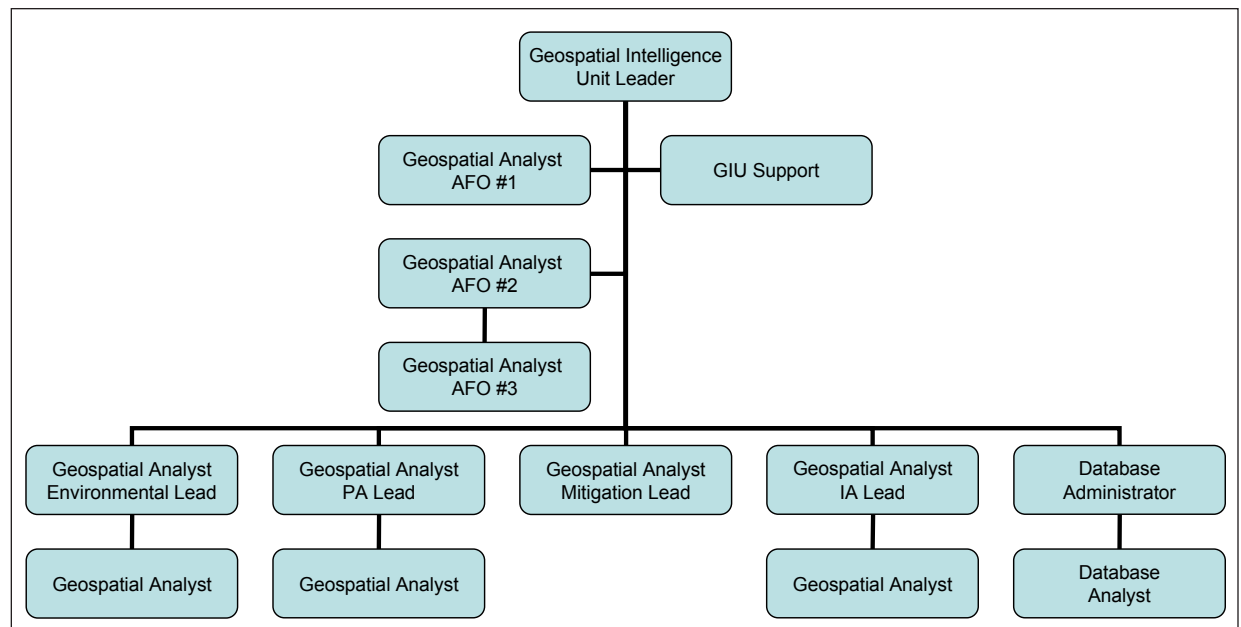


Figure 4-2: Example JFO/GIU Organizational Chart

means to the state/local EOCs, the FEMA NRCC, and other entities on an as-needed or as-available basis (see Table 4-4).

### Product Specifications

Geospatial data is maintained in ESRI shape file and ESRI Oracle/SDE formats for internal use and output into geodatabase, shape files, and xml formats, depending on customer requirements. Data collected for input can be accessed from almost any source type and may be labor/time intensive. Collections of event data are specific to the FEMA entity directly supporting the response and recovery efforts and are generally not accessible across the network and must be requested at the point of origin.

RRCC symbology varies by regional office and is often based on ICS and FGDC Homeland Security formats with additions for FEMA specific data and products.

The RRCC provides map products in pdf, jpg, and other formats. Product layouts adhere to common basic standards but do vary by facility maintaining a common local feel.

## 4.5 FEMA Joint Field Operations

### Overview

A FEMA JFO is established within an affected state following the presidential declaration of a disaster. The JFO is a temporary federal/state multiagency coordination center (as defined by the NIMS) established locally to facilitate field-level domestic incident management activities related to prevention, preparedness, response, and recovery. The JFO provides a central location for coordination of federal, state, local, tribal, nongovernmental, and private sector organizations. The JFO works to establish joint priorities and allocate resources, resolve agency policy issues, and provide strategic guidance to support

Table 4-4: Authoritative Data - Disaster Operations - RRCC

Sub Category	Theme	Type	Delay	POC
<b>Event Impact</b>				
Damage - Infrastructure	Road Damage	Polyline	24 hour	FEMA (State/Local EOC)
Evacuation	Evacuee Reception	Point	24 hour	FEMA
	Federal Medical Shelters	Point	24 hour	VA
	Hurricane Evacuation Routes	Polyline	24 hour	FEMA
	Mandatory Evacuation - State/Local	Polygon	24 hour	FEMA (State/Local EOC)
	Patient Reception	Point	24 hour	VA
	Veteran Locations	Point	48 hour	VA
	Veteran Patient Tracking	Point	48 hour	VA
Event Location	Tornado Touchdown - Current	Point	24 hour	NOAA
<b>Field Operating Locations</b>				
FEMA	Incident Command Post (ICP)	Point	24 hour	FEMA
	Joint Field Office (JFO)	Point	24 hour	FEMA
<b>Man-Made Hazards</b>				
Emergency Warning	Civil Danger Warning (CDW)	Point	24 hour	FCC (State/Local)
	Civil Emergency Message (CEM)	Polygon	24 hour	DHS (FCC)
	Evacuation Immediate (EVI)	Polygon	24 hour	FCC (State/Local)
	Hazardous Materials Warning (HMW)	Polygon	24 hour	FCC (State/Local)
	Law Enforcement Warning (LEW)	Polygon	24 hour	FCC (State/Local)
	Local Area Emergency (LAE)	Point	24 hour	FCC (State/Local)
	Nuclear Power Plant Warning (NUW)	Point	24 hour	NRC (FCC)
<b>Natural Hazards</b>				
Emergency Warning	Avalanche Warning (AVW)	Polygon	24 hour	USGS (State/Local)
	Avalanche Watch (AVA)	Point	24 hour	USGS (State/Local)
	Blizzard Warning (BZW) Area	Polygon	24 hour	NOAA/NWS
	Coastal Flood Warning (CFW) Area	Polygon	24 hour	NOAA/NWS
	Coastal Flood Watch (CFA) Area	Polygon	24 hour	NOAA/NWS
	Dust Storm Warning (DSW) Area	Polygon	24 hour	NOAA/NWS
	Earthquake Warning (EQW)	Polygon	24 hour	USGS (FCC)
	Fire Warning (FRW)	Polygon	24 hour	FCC (State/Local)
	Flash Flood Warning (FFW) Area	Polygon	24 hour	NOAA/NWS



Table 4-4: Authoritative Data - Disaster Operations - RRCC (cont.)

Sub Category	Theme	Type	Delay	POC
Emergency Warning	Flash Flood Watch (FFA) Area	Polygon	24 hour	NOAA/NWS
	Flood Warning (FLW)	Polygon	24 hour	NOAA/NWS
	Flood Watch (FLA) Area	Polygon	24 hour	NOAA/NWS
	High Wind Warning (HWW) Area	Polygon	24 hour	NOAA/NWS
	High Wind Watch (HWA) Area	Polygon	24 hour	NOAA/NWS
	Hurricane Warning (HUW) Area	Polygon	24 hour	NOAA/NWS
	Hurricane Watch (HUA) Area	Polygon	24 hour	NOAA/NWS
	Severe Thunderstorm Warning (SVR) Area	Polygon	24 hour	NOAA/NWS
	Severe Thunderstorm Watch (SVA) Area	Polygon	24 hour	NOAA/NWS
	Special Marine Warning (SMW) Area	Polygon	24 hour	NOAA/NWS
	Tornado Warning (TOR) Area	Polygon	24 hour	NOAA/NWS
	Tornado Watch (TOA) Area	Polygon	24 hour	NOAA/NWS
	Tropical Storm Warning (TRW) Area	Polygon	24 hour	NOAA/NWS
	Tropical Storm Watch (TRA) Area	Polygon	24 hour	NOAA/NWS
	Tsunami Warning (TSW) Area	Polygon	24 hour	NOAA/NWS
	Tsunami Watch (TSA) Area	Polygon	24 hour	NOAA/NWS
Volcano Warning (VOW) Area	Polygon	24 hour	USGS (FCC)	
Winter Storm Warning (WSW) Area	Polygon	24 hour	NOAA/NWS	
Winter Storm Watch (WSA) Area	Polygon	24 hour	NOAA/NWS	
<b>Specialized Response Teams</b>				
DHS	FEMA Damage Assessment Teams	Point	48 hour	FEMA
	FEMA Emergency Response Team-Regional (ERT-A)	Point	24 hour	FEMA

federal incident management activities. The exact composition of the JFO is dependent on the nature and magnitude of the incident.

The JFO uses the scalable, modular organizational structure of the NIMS in the context of both pre-incident and post-incident management activities (see Figure 4-3). The JFO may begin as a small staff

supporting the Principal Federal Official (PFO) or Federal Coordination Official (FCO) upon arrival in the affected jurisdiction and will expand or move as required to accommodate additional JFO subcomponents. While every JFO will generally consist of a JFO Coordination Group, a JFO Coordination Staff, and JFO Sections (JFO Operations, JFO Planning, JFO Logistics, and JFO Finance/

Administration), the size and number of unit/branches in each section will vary according to the nature of the situation. The JFO structure should be seen as a scalable “menu” from which applicable component elements can be added as the incident requires.

The JFO may include a limited number of principal state (represented by an appropriate state official or State Coordinating Officer [SCO]), local, and tribal officials, as well as NGO and private sector representatives. The JFO staff focus on providing support to on-scene efforts and incident management and/or disaster response and recovery program implementation and coordinating broader support operations that may extend beyond the immediate incident site. The JFO does not manage on-scene operations.

### Roles and Responsibilities

Geospatial activities at the JFO reside predominately within the GIU under the Planning Section. The GIU operates as the coordination lead for GIS, RS, and modeling activities for the JFO. In support of the Planning Section, the GIU is involved with overall situational awareness and reporting activities for the event. The JFO GIU maintains contact with the RRCC and NRCC as required for mutual support. While there are many “standard” products available across an event, there are a multitude of ad hoc requests for products and services unique to the specific event. The GIU assists in the coordination and implementation of geospatial activities outside the JFO. These efforts include internal field-data collection, imagery collaboration, field team support (Area Field Offices [AFO]), and state, local, and other external customers.

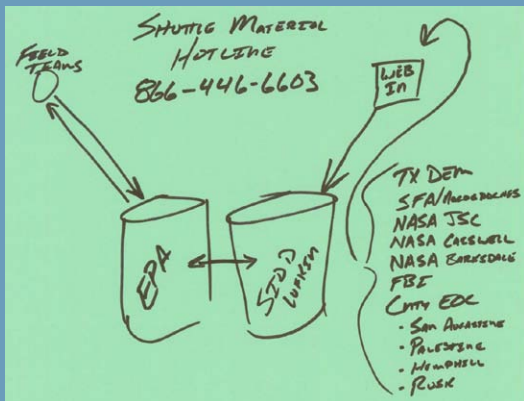
In addition to the GIU, geospatial entities may be operating under the authorities of PA, operations, mitigation, DHS, USACE, EPA, and other federal agencies in support of their specific missions. These

## Best Practices - Disaster Data and Production

On February 1st 2003, the Space Shuttle Columbia broke apart during re-entry into the earth's atmosphere killing the crew and spreading debris over 300 miles across East Texas and into Louisiana. As the lead agency for the immediate recovery efforts, FEMA established a GIS team at the JFO and began to assist the efforts with products and data management for the field operations.

The need for a centralized debris database was identified almost immediately and hasty plans were made to design and develop it. The Shuttle Interagency Debris Database (SIDD) was constructed and the entire event revolved around it. As the event progressed, the SIDD housed records of all debris collected, supported daily mission taskings, and collected citizen reports of debris found as well as the action taken by the field teams. This single dataset was incorporated into the majority of map products produced for the event and provided the key piece of COD for everyone involved.

The production requirements for the 90-day search and recovery effort exceeded that of any other event from a single field operation. To maximize effectiveness, the primary production focused on three products; search management, air search, and ground search. To support this, a second key component of the database was developed, the Shuttle Search Grid. This simple dataset was utilized to manage the areas searched, create map products, collect post-search field reports, and manage the product requests and tasking.



entities must coordinate with the JFO GIU to ensure operational awareness and minimize duplication of effort.

Specific geospatial roles and responsibilities include:

- **GIS Support.** The GIU, under the Planning Section, is the federal coordinator of all geospatial activities supporting the event and provides support to all federal and state entities in response to an event. FEMA is responsible for the management and coordination of all geospatial activities and provides services ranging from basic map production to field data collection to overhead coordination with other federal entities. The GIU continues to provide large quantities of printed products and augments these with various digital tools to meet their requirements.
- **RS.** RS requirements and requests are coordinated by the RS Coordinator within the GIU. The JFO RS Coordinator in turn works with colleagues at the RRCC and/or NRCC to provide customers with the products they require.
- **Modeling.** At the JFO, technical support from the Risk Analysis Branch can be leveraged to assist in the running of the HAZUS-MH model and the prioritization of modeled outputs for use in disaster operations. In addition, derived data is accessed to produce nonstandard products for the JFO customers.

### Operational Support

The JFO provides geospatial support to all entities involved in the response and recovery efforts related to the event supported. Geospatial requests at the JFO are submitted through the JFO GIU where they are triaged and acted upon. Each event drives the creation of several standard products that are updated and improved regularly to meet customer demands. In addition, ad hoc requests may consume well over half of the GIU resources.

The GIU can fluctuate in size from 1 to 50 members to accommodate the event requirements. As the primary geospatial production entity for JFO operations, the GIU and its staff must remain agile. FEMA has the ability to pull federal staff from across the government in support of disaster operations. Typically federal staff will be requested from NGA, USGS, USACE, and USFS to support the operations at the JFO.

RS activities are assigned to on-site and off-site entities as appropriate. The GIU RS Coordinator works closely with state/federal partners and the NRCC RS Coordinator to provide the required levels of support. Often, coordination efforts allow missions to be combined across multiple requests and/or fill requests with data products already acquired by other entities.

### Production Methods

GIS requests are taken by the JFO GIU where they are validated against mission requirements and acted upon. Requests are triaged and assigned to individual analysts. The analyst staff work with the customer to deconflict any concerns, and the product is generated and delivered to the customer. In situations where data must be collected or created, the analyst works to acquire the best available data and validates with the customer as needed.

RS requests are given to the JFO GIU lead and passed to the RS Coordinator for execution. Requests include details of the area to be acquired, level of detail necessary, and any time constraints. Acquisitions are combined with others when possible and are discussed in a conference call forum when possible to ensure that others are aware of activities and able to assist or be included. Once complete, imagery and derived products are made available to all responding entities as allowed by licensing and other restrictions.

Geospatial products developed for formal delivery follow basic standards for layout and content and are reviewed for content accuracy and spelling prior to delivery.

### Authoritative Data

The JFO maintains data unique to the Federal Government but is a significant user of data acquired from other entities. Some of this critical information is collected from state and local governments to support FEMA’s operations. Although FEMA is not the originating entity of this information, it is compiled from multiple entities and consolidated into theme-specific federated datasets. This information is then available as common operating data in support of various regional missions.

The JFO GIU invests a considerable amount of labor to locate, collect, and process data required by its customers. While many federal-level data-sets provide the thematic overages required, the detail and currency of local data make on-site data acquisition a major requirement. This data, collected early in the event operations, provides critical support to response, recovery, and mitigation efforts across the lifespan of the recovery efforts. When the JFO closes, this data is archived at the appropriate FEMA regional office for continued and future use.

Base data is provided by HSIP Gold and other government and commercial sources. The JFO is a major data user and produces many products designed to answer specific questions. Products and data are provided through iCAV, email, and other means to the state/local EOCs, the FEMA RRCCs, FEMA NRCC, and other entities on an as-needed or as-available basis (*see Table 4-5*).

### Product Specifications

Geospatial data is maintained in many formats for internal use and output into geodatabase, shape

**Table 4-5: Authoritative Data - Disaster Operations - JFO**

Sub Category	Theme	Type	Delay	POC
<b>Emergency Services</b>				
American Red Cross	ARC Deployments	Point	24 hour	ARC
Emergency Management	FEMA IA Applicants	Point	48 hour	FEMA IA
	FEMA PA Applicant Locations	Point	6 day	FEMA PA
	FEMA PA Project Locations	Point	12 day	FEMA PA
	State Guard Joint Receiving Points	Point	48 hour	NGB/State Guard
	State Guard Logistic Supply Points	Point	48 hour	NGB/State Guard
	State Guard Staging Areas	Point	48 hour	NGB/State Guard
	State Guard Unit Locations	Point	48 hour	NGB/State Guard
Emergency Resources	Generator Placement	Point	48 hour	DOD/USACE, FEMA
<b>Event Impact</b>				
Damage - Infrastructure	Bridge/Tunnel Damage	Point	48 hour	ESF
	Commercial Building Damage	Polyline	5 day	FEMA (State/Local EOC)
	Gas Distribution Damage	Point	24 hour	ESF
	Government Building Damage	Polyline	5 day	FEMA (State/Local EOC)
	Residential Building Damage	Polyline	5 day	FEMA (State/Local EOC)
Event Location	Burned Areas	Polygon	48 hour	USGS
	Coastal Flooding	Polygon	48 hour	USGS
	Debris Flows	Polygon	48 hour	USGS
	Debris Locations	Polygon	3 day	USGS
	Disease Impacts	Polygon	48 hour	CDC
	Flood-Fight Measures	Polygon	24 hour	FEMA
	Marine Hazards	Polygon	48 hour	NOAA
	Oil Spill Locations	Polygon	48 hour	NOAA
	Storm Tracks	Polygon	24 hour	NOAA/NWS
	Tsunami Damage	Polygon	24 hour	NOAA
Wildfire Induced Hazards	Polygon	48 hour	USGS	

**Table 4–5: Authoritative Data - Disaster Operations - JFO (cont.)**

Sub Category	Theme	Type	Delay	POC
<b>Field Operating Locations</b>				
DoD	JTF Joint Operations Center (State)	Point	24 hour	NGB
FEMA	Disaster Recovery Center (DRC)	Point	24 hour	FEMA
	Satellite JFO Facilities	Point	48 hour	FEMA
	State Staging Areas	Point	24 hour	FEMA
<b>Government Facilities</b>				
DHS	FEMA Logistics Centers	Point	immediate	FEMA
<b>Man-Made Hazards</b>				
Emergency Warning	Shelter in Place Warning (SPW)	Polygon	24 hour	FCC (State/Local)
<b>Specialized Response Teams</b>				
DHS	Incident Management Teams (IMTs) Federal Type 1 and Type 2	Point	48 hour	FEMA
Other Federal Agency	Infrastructure Assessment Response Team	Point	48 hour	DOD/USACE
	Navigation Response Team	Point	48 hour	NOAA
	NOAA Incident Meteorologists (IMET)	Point	48 hour	NOAA
	Oil Spill/HAZMAT Response Team	Point	48 hour	NOAA
	Vaccination Teams	Point	48 hour	VA

files, and xml formats, depending on customer requirements. Data collected for input can be accessed from almost any source type and may be labor/time intensive. Collections of event data are specific to the FEMA entity directly supporting the response and recovery efforts and are generally not accessible across the network and must be requested at the point of origin.

JFO symbology varies by facility and is typically based on ICS and FGDC Homeland Security formats with additions for FEMA-specific data and products. Because of the dynamic nature of disaster response and the wide array of JFO customers, symbol standards are often created or modified to meet the unique situations of the event-driven environment.

The JFO provides map products in paper, pdf, jpg, and other formats. Product layouts adhere to common standards but do vary by facility to create a common local feel. Paper is the predominate medium for field-level map products and the GIU must be postured to meet these requirements.

Digital products do however provide the predominate means for sharing geospatial information with off-site entities. Geospatial data is shared actively between FEMA and other facilities in several formats. Geospatial products are produced in various graphic formats and posted to operation center sites, attached as emails, and included with digital-versions of JFO reports.

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices



## 5.0 CATASTROPHIC DISASTERS

Catastrophic events result in an immediate surge of requirements exceeding available resources. The majority of guidance documents related to disaster operations are focused on frequently occurring events and provide a core framework that supports all levels of Federal, state, and local response and recovery operations. This section of the GeoCONOPS provides detailed guidance on the provision of geospatial support activities for catastrophic natural events.

## 5.1 How to use This Section of the GeoCONOPS

This section of the GeoCONOPS explores the details of applying geospatial technologies for catastrophic natural event response and recovery focused on large-scale planning efforts for a New Madrid Seismic Zone (NMSZ) earthquake scenario. The NMSZ has a 10 percent probability of a catastrophic NMSZ earthquake in the next fifty years. This scenario is described in section 5.3.

In this section, the GeoCONOPS will use a detailed scenario to outline the expected geospatial activities that will occur as a result of a catastrophic NMSZ earthquake. Documenting the timing for application of geospatial tools as a result of a NMSZ scenario provides an understanding of activities resulting from an earthquake no-notice event. The geospatial activities can be applied to response efforts of an actual catastrophic event or support disaster exercises.

## 5.2 Natural Events

Natural events are inherently dynamic. While they are predictable to a point, events initially believed to be minor threats can quickly become catastrophic. Natural events with catastrophic potential range from hurricanes (with counts and severity predicted yearly) to earthquakes (predicted by magnitude and large reoccurrence intervals). Natural disaster threats are variable with both predicted (notice) and surprise (no-notice) events happening regularly across the country.

### 5.2.1 Notice Events

Weather produced events generally provide opportunities to observe their formation and development, greatly aiding predictions related to magnitude and impact potentials. The science behind these prediction efforts continues to improve as do

the response plans that build from the detail they provide.

This advanced notice allows commodities and other resources to be pre-deployed in preparation for the predicted impacts. The response activities with these events benefit greatly from the pre-event attention they are given. In some situations, Federal Emergency Declarations are granted to provide immediate funding for pre-event activities.

Natural notice events include; hurricanes, wildfire, riverine flooding, and wind storms.

### 5.2.2 No-Notice Events

No-notice events, including earthquakes, tornadoes and volcanoes, initially create a multitude of unknowns. The impacted areas, level of damages and immediate threats must be defined to support initial impact assessments and planning for disaster response. Depending on the situation, this and other information may be delayed or otherwise unavailable. Estimates from modeling and other geospatial tools may serve as the basis for the immediate response activities.

In addition to local knowledge and assumptions, computer-based models are utilized to assist in defining potential impacts immediately following an event. These tools may be designed specifically for response efforts while others are adapted from their role in planning and preparedness estimations.

## 5.3 The New Madrid Earthquake Scenario

The NMSZ earthquake scenario was developed by FEMA and the Mid America Earthquake (MAE) Center for contingency planning efforts to assist in defining the Federal government's response to an earthquake in the NMSZ. The NMSZ earthquake scenario is a magnitude 7.7 (Richter scale)

earthquake caused by a simultaneous rupture over the entire length of three separate segments in the NMSZ impacting an eight state region.

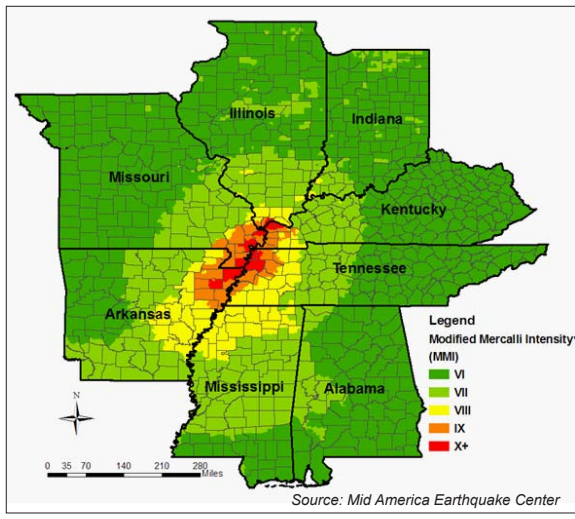
HAZUS-MH was used to estimate losses in the eight impacted states, in support of the multi-year New Madrid Catastrophic Planning Initiative. The earthquake model estimates the impacts of scenario earthquakes on buildings, transportation and utility lifelines and the population at risk. Model outputs include maps and tables of estimated losses.

*Figure 5-1* shows the ground shaking intensity from the scenario event. As a result of this intensity, high level impacts include:

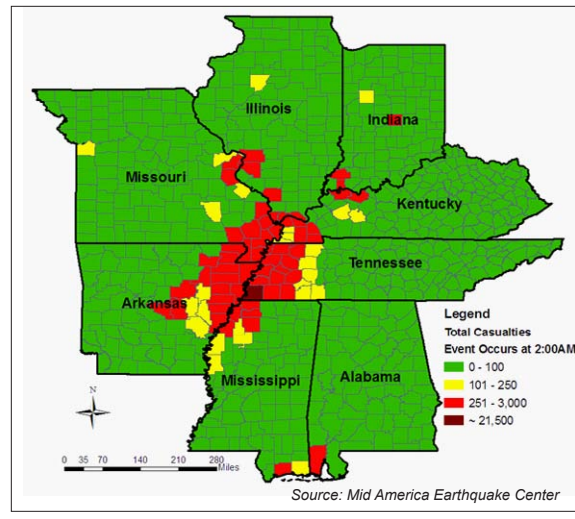
- Severe ground shaking occurs in western Kentucky, Tennessee, southeast Missouri, and northeast Arkansas.
- An estimated 141 counties are impacted in the eight state region.
- By day 3, approximately 3 million people will seek shelter
- There are approximately 82,000 injuries and 3,500 deaths
- Approximately 715,000 buildings will be damaged, with 230,000 damaged beyond repair.
- Aftershocks of magnitude 6 are likely to occur in the days and weeks following the initial event.

### 5.3.1 Modeled Earthquake Impacts

The following section highlights the nature and scope of damage in the NMSZ of a magnitude 7.7 earthquake, including social impacts (casualties, shelter requirements, displaced households, etc.), damage to buildings and essential facilities, and damage and loss of functionality to transportation and utility lifelines.



**Figure 5-1: Regional Ground Shaking Intensity from NMSZ Earthquake Scenario**



**Figure 5-2: Total Casualties from Scenario Earthquake**

**Casualties**

The Central U.S. has high concentrations of unreinforced masonry structures and other buildings that are vulnerable to even moderate levels of ground shaking from earthquakes. Damage to vulnerable structures contributes to the estimated 85,000 casualties that occur in the scenario earthquake, including an estimated 3,500 fatalities.

The largest number of total casualties occurs in Western Tennessee, with 25% of all casualties occurring in the Memphis area. Northeast Arkansas and southeast Missouri also incur substantial casualties, as shown in *Figure 5-2*.

**Displaced Population and Shelter Requirements**

A magnitude 7.7 earthquake will cause a massive displacement of households in the NMSZ. The HAZUS-MH methodology calculates displaced and shelter-seeking populations based on damage to residential structures, and severe and long-term

Estimates for the number of people seeking shelter are calculated as a percentage of the displaced population, taking into consideration demographic composition factors including ethnicity, age, and income level. These demographic factors influence the number of families seeking shelter in a region. For example, those families with limited financial means are more likely to seek public shelter and require short-term housing.

A preliminary analysis of shelter availability and the shelter requirements defined in *Table 5-1*, conducted as part of the NMSZ catastrophic planning initiative, reveals significant shelter gaps in the NMSZ, with the exception of northern parts of Illinois and Indiana.

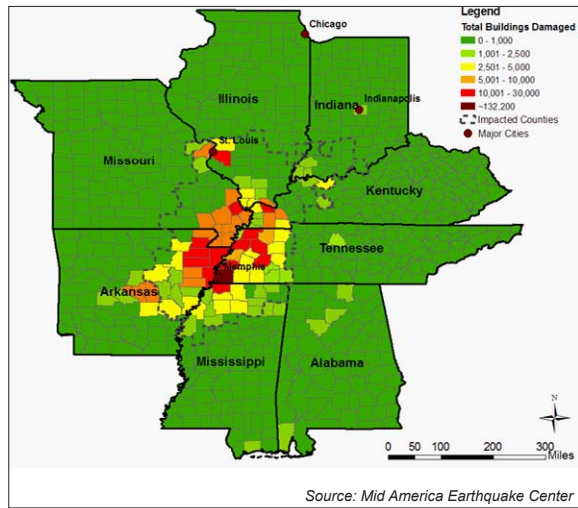
**Building Damage**

Overall, there are more than 700,000 buildings moderately or severely damaged in the eight states that are in the NMSZ. As reflected in *Figure 5-3*, Arkansas and Tennessee experience the most significant building damage. The scenario earthquake would cause at least moderate or severe damage to over 265,000 buildings in Tennessee alone, including nearly 50,000 unreinforced masonry structures.

**Table 5-1: Estimate of “At Risk” and Shelter Seeking Populations: NMSZ Scenario Earthquake**

State & FEMA Region Total	Total Population	At Risk (Day 1)	Seeking Shelter (Day 1)	At Risk (Day 3)	Seeking Shelter (Day 3)
Alabama	4,447,100	9,645	3,081	601,561	173,412
Kentucky	4,041,769	53,860	14,952	850,615	233,909
Mississippi	2,844,658	61,997	18,345	705,032	205,507
Tennessee	5,689,283	316,681	91,103	2,072,942	562,468
Illinois	12,419,293	50,285	15,588	650,247	185,139
Indiana	6,080,485	9,932	2,701	579,627	153,570
Arkansas	2,673,400	124,730	38,827	937,518	285,865
Missouri	5,595,211	103,655	30,074	842,002	237,991
Total	43,791,199	730,795	214,671	7,239,544	2,037,861

Source: Mid America Earthquake Center



Source: Mid America Earthquake Center

Figure 5-3: Estimated Damage to General Building Stock

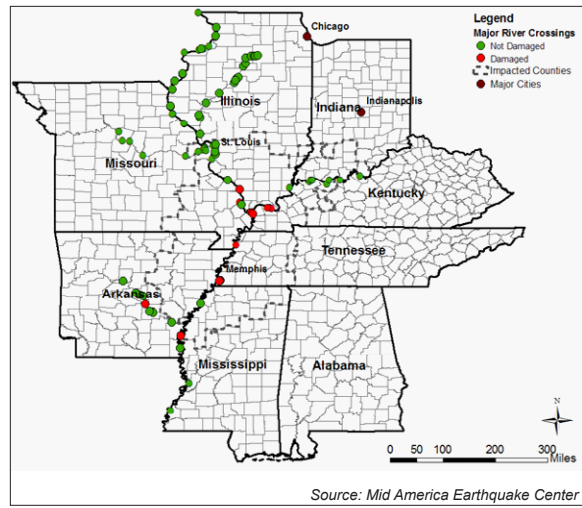
Essential Facilities

In the aftermath of this event, there will be limited medical, firefighting and law enforcement services in the most impacted states in the NMSZ. Table 5-2 shows the total number of essential facilities in the

Table 5-2: Estimated Damage to Essential Facilities in the NMSZ

Essential Facility	Total Facilities	At Least Moderate Damage	Complete Damage
Schools	44,288	1,322	277
Fire Stations	8,958	729	177
Police Stations	3,984	379	136
Hospitals	2,615	129	32
Emergency Operations Centers (EOC)	869	116	44

Source: Mid America Earthquake Center



Source: Mid America Earthquake Center

Figure 5-4: Major Damage to River Crossing Bridges in NMSZ

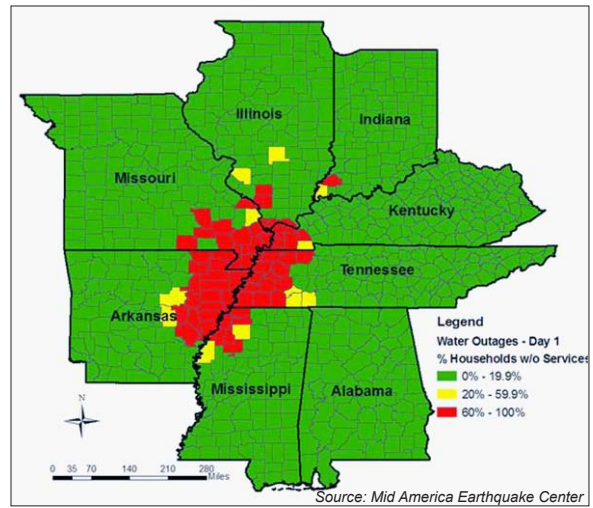
seven states most at risk from a catastrophic earthquake in the NMSZ, estimates of “at least moderate damage” and estimates of “complete damage.”

Data Analysis:

- Approximately 80 percent of essential facilities that sustain complete damage are located in the three regions: western Tennessee, southeast Missouri, and eastern Arkansas.
- Many schools in the study area are unreinforced masonry structures, which account for a high percentage of moderately damaged and completely damaged school buildings.
- Over 40 EOCs will be completely damaged, which will significantly impact the ability of local emergency response to respond to needs.

Transportation System Damage

The scenario earthquake damages over 3,500 highway bridges in the 140 counties in the NMSZ. Approximately 1,255 highway bridges will sustain



Source: Mid America Earthquake Center

Figure 5-5: Distribution of Water Outages on Day 1 in NMSZ

complete damage. Many of these bridges cross the Illinois, Mississippi, Missouri, Ohio, and Arkansas Rivers, which carry high volumes of traffic as well as major pipelines and communications lines. Figure 5-4 shows major damaged bridges that cross these rivers, which will impede emergency response and evacuation operations.

Water and Power Outages

Over a million households will be without water following a magnitude 7.7 earthquake in the NMSZ, with over 500,000 in Tennessee alone. Similarly, power outages are widespread, occurring in over 100 counties, and affecting approximately 2.5 million households.

The severity of utility damage and duration of disruption has a major impact on the number of households that will seek shelter following the scenario earthquake. In addition, water outages in population centers impede fire suppression.



## Scenario Summary

The comprehensive earthquake impact assessment that was undertaken by the MAE Center in support of the New Madrid catastrophic planning initiative utilizes HAZUS-MH and other advanced models to quantify economic loss, building and infrastructure damage, and social impacts. The results of the analysis characterize the catastrophic nature of a magnitude 7.7 earthquake in the NMSZ, and implications for response and recovery.

- Economic losses approach \$300 billion.
- There is substantial damage to utility infrastructure, particularly in the impacted counties, leaving 2.6 million households without electricity and 1.1 million households without water after the event
- Major transportation corridors are interrupted by damage to key infrastructure. Extensive bridge and road damage limits the viable routes for transporting commodities and response and recovery assets.
- Damage to essential facilities will limit the response capabilities of fire, medical, law enforcement and emergency management in the 140 counties that are most impacted.
- Direct damage to over 700,000 buildings will generate significant urban search and rescue team requirements.
- Inland road, rail, air and river travel in the Central U.S. will be severely impacted in the aftermath of the scenario event.
- Over two million people will require temporary shelters after the event due to extended lack of utility services.
- Waterways may become blocked with debris, reducing the viability of major shipping channels in the U.S., namely along the Mississippi, Ohio, Missouri and Arkansas Rivers.

The results of the loss estimation studies provide FEMA and the states at risk with information that can be used to identify resource gaps and both strategic and tactical challenges to response and recovery from a catastrophic earthquake in the NMSZ.

### 5.3.2 GeoCONOPS Mission Area Support

The New Madrid Geospatial Timeline identifies high-level Federal activities designed to support response and recovery to a catastrophic earthquake in the NMSZ. The geospatial activities are organized into three categories (Operations, Models, Remote Sensing), and further grouped into the three overlapping Mission Areas (Life Saving, Damage Assessment, Recovery), described in Section 3. The graphics included in this section provide an overview of activities based on the following assumptions.

- Each push pin represents a key support activity (coded 1-40) with an approximate beginning and end time.
- Each Mission Area is represented by a horizontal platter extending to the right as defined by its operational duration
- Activities support multiple Mission Areas and are connected by a dashed line dropping to the next platter.
- A significant number of Federal activities are initiated concurrently within the first hours of the No-Notice event.
- This graphic represents the “as-is” nature of these activities during this type of event.

The graphics are intended to align the key mission areas in the GeoCONOPS with core geospatial activities. This alignment illustrates the complexities and overlap of geospatial products and information during the initial 90 days following the NMSZ event.

The following sub-sections define many of the activities undertaken within the Mission Areas.

Within each Mission Area, sample Essential Elements of Information (EEIs) are provided for individual activities (see section 2.1.5 for background on EEIs). While EEI lists may be slightly unique to a specific functional area, facility, and/or event type, they generally share common themes and use similar titles regardless of their source. In all instances, EEIs are Activity generated information therefore an activity could begin on day 1 while the information may not be available for another 36 hours.

Under the NRF, Federal activities are undertaken by each of the 15 Emergency Support Functions (see section 1.5 for background on the ESFs). With representation at the NRCC, RRCCs and each JFO, key ESF information is reported and shared across the community. The ESFs are responsible for the following functional areas:

- ESF #1 – Transportation
- ESF #2 – Communications
- ESF #3 – Public Works and Engineering
- ESF #4 – Firefighting
- ESF #5 – Emergency Management
- ESF #6 – Mass Care, Emergency Assistance, Housing, and Human Services
- ESF #7 – Logistics Management and Resource Support
- ESF #8 – Public Health and Medical Services
- ESF #9 – Search and Rescue
- ESF #10 – Oil and Hazardous Materials Response
- ESF #11 – Agriculture and Natural Resources
- ESF #12 – Energy
- ESF #13 – Public Safety and Security
- ESF #14 – Long-Term Community Recovery
- ESF #15 – External Affairs

For reference, ESF definitions and descriptions are outlined in Section 1.5 of this document.

As-is Federal Activities					
Operations	Code	Start	End	Mission Area	
NOC Spot Reporting & HSIN/COP	1	1hr	90	LS, DA, Rec	
Sheltering	2	6hr	90	LS, DA, Rec	
State/Local Situation Reports	3	6hr	90	LS, DA, Rec	
RNA Teams	4	1	15	LS, DA	
FEMA IMAT	5	1	30	LS, DA	
Fire Fighting	6	1	30	LS	
FEMA US&R Teams	7	1	30	LS	
Transportation Inspections (Airport, Rail, & Bridge)	8	1	60	LS, DA, Rec	
FEMA IA Inspections (Housing)	9	1	75	DA, Rec	
Commodity Distribution	10	1	90	LS, DA, Rec	
National Guard Security Teams	11	1	90	LS, Rec	
Disaster Medical Assistance Teams	12	3	25	LS, Rec	
Veterinary Medical Assistance Teams	13	3	60	LS	
FEMA JFO/GIU	14	3	90	LS, DA, Rec	
FEMA DRCs	15	3	90	Rec	
ARC Damage Assessment Teams	16	4	10	DA, Rec	
FEMA PDA Teams	17	4	15	DA, Rec	
SBA Inspection Teams	18	4	75	Rec	
FEMA PA Inspectors (Infrastructure)	19	5	90	DA, Rec	
Debris Removal	20	5	90	Rec	
Temporary Hospitals	21	6	90	LS, Rec	
Environmental Assessments	22	6	90	Rec	
Temporary Housing	23	6	60	Rec	
USCG Riverine Task Force	24	8	90	LS, DA, Rec	
FEMA Mitigation Assessment Teams	25	15	30	DA, Rec	
Models					
USGS Earthquake Notification Service	26	1hr	2	LS, DA, Rec	
USGS ShakeMap/PAGER	27	1hr	15	LS, DA, Rec	
NOAA/National Weather Service	28	1hr	90	LS	
HAZUS-MH	29	4hr	15	LS, DA, Rec	
HAZMAT	30	1	8	LS, DA, Rec	
USACE Commodities	31	1	45	LS	
NISAC (Infrastructure)	32	2	10	DA, Rec	
USACE Post-Earthquake Flood	33	2	15	LS, DA, Rec	
DHS IMAAC	34	2	15	LS, DA	
Debris (USACE)	35	2	90	LS, DA, Rec	
FEMA Post-Event Flood Impacts	36	15	90	Rec	
Economic Impact	37	25	60	Rec	
Remote Sensing					
Life Saving	38	1	30	LS, DA, Rec	
Damage Assessment	39	1	60	DA, Rec	
Recovery	40	1	90	Rec	

Figure 5-6: New Madrid Geospatial Activities

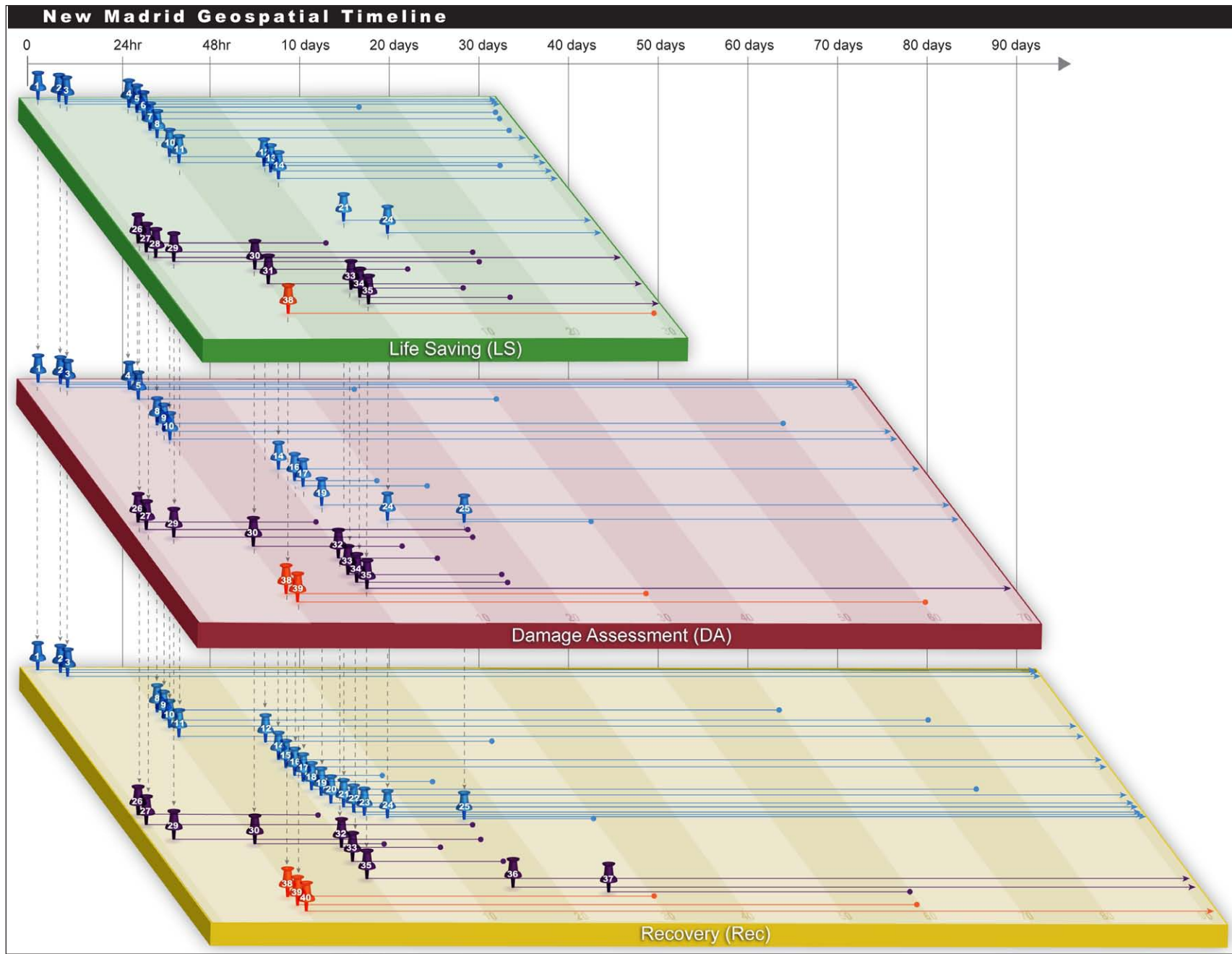


Figure 5-7: New Madrid Geospatial Timeline

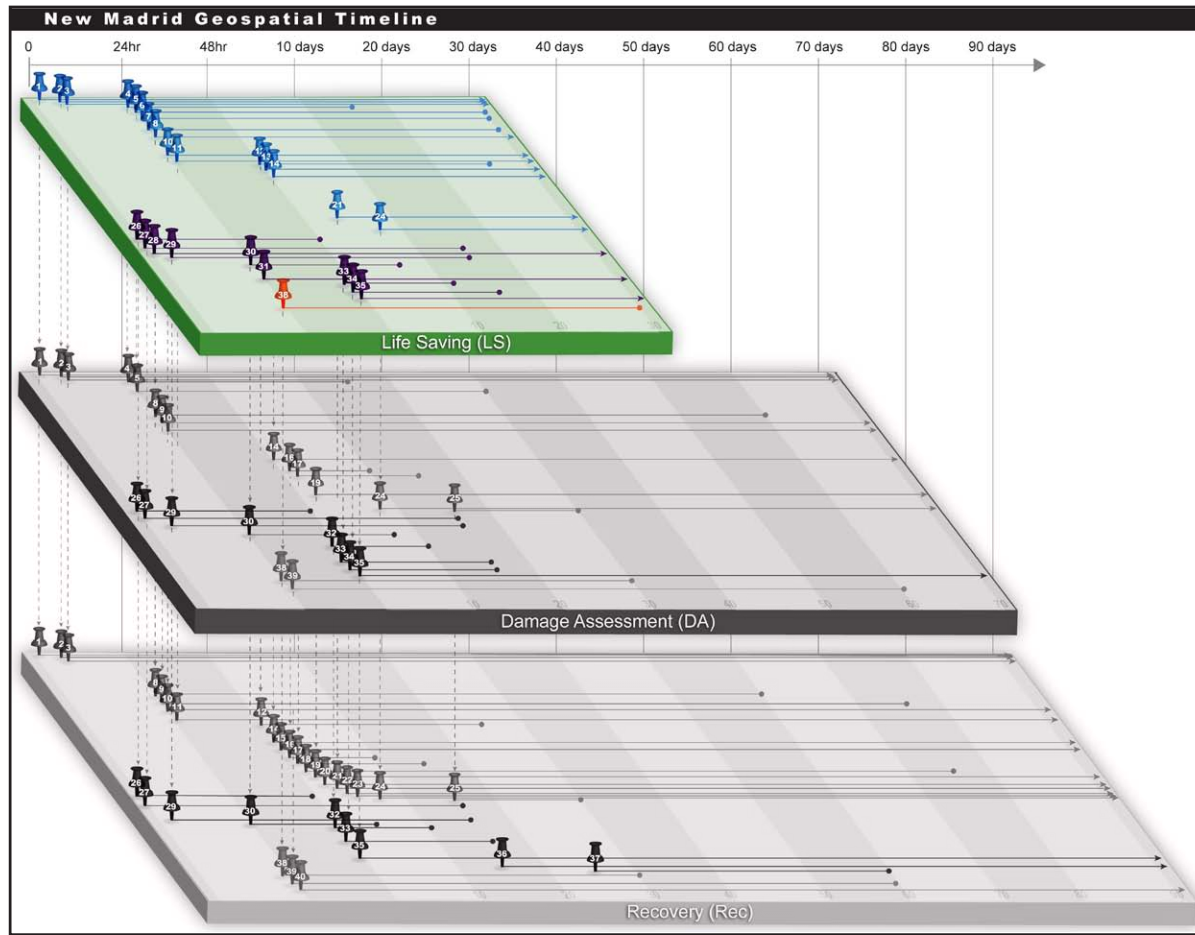


Figure 5-8: Geospatial Timeline – Life Saving

### 5.3.2.1 Life Saving Mission

The Life Saving mission is time-critical and locally-driven, with assets deployed and managed through NIMS and/or ICS. At the Federal level, life saving resources are mobilized and deployed from across the country (as with any catastrophic event). Several factors in the New Madrid scenario directly impact the execution of Life Saving missions: no warning, multi-state area of operations, continued aftershocks, and the potential damage and loss of

functionality to communications systems. Combined, these factors generate and maintain high-levels of uncertainty across the life saving community, placing significant information requirement on the geospatial professionals supporting their efforts.

ESF involvement during the Life Saving phase of the event are limited to those activities supporting the initial response efforts. As displayed in the Time Line graphic (Figure 5-7), many of the activities overlap between mission areas as the information they

provide is useful for many areas of the event. It is important to understand that the information acquired for a specific mission can and will be repurposed to support activities across the event.

The ESFs, through their operations or the compilation of information reported by entities within their specific domain, are expected to provide much of the detailed information on the disaster event, fulfilling the requirements of the EEIs. Information supporting the Life Saving Mission is categorized by EEI in Table 5-3 below.

### Search and Rescue

The multi-state area of operations in a NMSZ scenario and the time-critical nature of SAR missions combine to heighten the importance of effectively utilizing geospatial tools to identify and prioritize the deployment of Federal SAR assets. At the NRCC level, geospatial products will initially be focused at the impacted region, and designed to develop strategic plans for the distribution of SAR resources.

Search and Rescue operations at the Federal level are initiated immediately following the New Madrid event. Initial activation identifies teams for alert status and their availability for deployment to the area of operations. Single or multiple IMT provide direct geospatial support, with additional products coming from the NRCC, RRCCs, and other federal entities. Geospatial products utilized within the IMT support the development of strategic, operational and tactical plans for the deployment of SAR teams.

US&R activities focus on the rescue of persons trapped in confined structures. Geospatial analysts assist in determining areas with high probabilities of structural collapse and spatially locating communities reporting structural failures and/or trapped individuals. The Inland Search teams would assist communities with their efforts clearing rural communities and searching for unaccounted people outside collapsed structures. Water rescue teams are

Table 5-3: Sample Life Saving EEIs by ESF

Essential Elements of Information	Geospatial Product/Analysis	Authoritative Source	Estimated Availability	Activity Code
Boundaries of Disaster Area	USGS Earthquake Notification System	ESF #5	1 hour	26
	USGS ShakeMap (intensity)	ESF #5	1 hour	27
	Major Oil/HAZMAT Release	ESF #10	12 hours	30
	Summary of Impacts	ESF #5	24 hours	1
	Imagery Derived Boundaries	ESF #5	24 hours	38
	USACE Dam Failure Inundation (Modeled)	ESF #3	5 days	33
Access to Disaster Area	High Impact Urban Areas	ESF #3	12 hours	11
	Road Closure Estimates	ESF #5	12 hours	29
	Bridge & Tunnel Damage Estimates	ESF #5	12 hours	29
	Debris Estimates	ESF #5	12 hours	29
	Road Closures	ESF #1	24 hours	8
	Isolated Communities	ESF #5	24 hours	3
	Bridge & Tunnel Damage - Reported	ESF #1	48 hours	1
	River Transportation Status	ESF #1	10 days	24
	Airport Status Reports	ESF #1	24 hours	8
Jurisdictional Boundaries	Communities Impacted (USGS ShakeMap)	ESF #5	1 hour	27
	Impacted Communities (Reported)	ESF #5	24 hours	29
Hazard-Specific Information	Vulnerable Structure Reports	ESF #5	12 hours	29
	Active Fires	ESF #4	24 hours	6
	Unsafe Areas	ESF #5	24 hours	3
	Secondary Structural Hazards	ESF#5	48 hours	5
	Vulnerable Structures (modeled)	ESF #3	3 days	14
Weather	NOAA/NWS Forecasted Weather	ESF #5	12 hours	28
	NOAA/NWS Forecasted Weather	ESF #9	24 hours	7
Demographics	Estimated Exposed Populations (USGS ShakeMap/PAGER)	ESF #5	1 hour	27
	Impact Upon Income, Ethnicity, & Age (USGS PAGER)	ESF #5	1 hour	27
	Impacted Population Estimates	ESF #5	1 hour	29

## Best Practices - Estimating Search and Rescue Requirements

Following an earthquake, there is a strong correlation between building collapse and urban search and rescue requirements. HAZUS-MH provides a useful tool to assist in scaling mission requirements for ESF #9 (Search and Rescue) in response to a catastrophic event. FEMA has developed a methodology to calculate the collapse rates of completely damaged structures, based on their building types (e.g., concrete, wood, unreinforced masonry). Through these estimations, the required number of urban search and rescue teams can be identified across impacted areas to assist in triaged deployments. Requirements are identified for the following types of urban search and rescue (US&R) task forces:

- US&R Type I (trained and equipped for heavy reinforced concrete operations)
- US&R Type II (heavy wall, heavy floor, concrete-steel construction)
- US&R Type III (unreinforced masonry construction)
- US&R Type IV (light frame construction)

The product of this analysis for the New Madrid catastrophic planning initiative is a summary of requirements for each type of US&R task force. The requirements analysis is aggregated by state, number of structures assessed per day per team, and other variables that can be used to quantify mission requirements. Demand is most acute for Type I and Type III task forces, with anticipated demand dominated by Memphis and western Tennessee.

mobilized to assist in river rescue and within areas flooded by levee collapse or diversion of normal river courses.

**Critical Medical Support**

Like SAR teams, medical teams with varying capacities are mobilized to treat potentially thousands of injured disaster survivors. Medical support includes standing-up temporary hospitals to support staff and patients displaced by damaged hospital facilities and to provide hospital services to address incident-related injuries. As potential sites need to be identified prior to the team and other resource deployments, geospatial analysts analyze all available information to identify suitable locations for these facilities.

Emergency evacuations from the field transport victims to sites appropriate for rotor wing Landing Zones (LZ), vehicular, and foot traffic. These sites are needed throughout the region as victims are rescued, triaged, and transported to locations inside and outside the impacted area. Sites need to accommodate both aircraft and over-road mechanisms of transportation, frequent updates of access (ingress/egress) routes, airspace closures, and other information will be required to sustain transportation activities.

The Critical Medical Support mission requires large volumes of equipment and supplies for delivery to locations across the region. The nature of these shipments requires pre-planned transportation routes and an adequate level of security to ensure the commodities arrive at the locations where they are required.

The geospatial products available to support medical response planning in a catastrophic earthquake include HAZUS estimates of casualties from structural and bridge damage, and loss of functionality due to damaged medical facilities. Analyses are used to scale mission requirements,

**Table 5–3: Sample Life Saving EEIs by ESF (Continued)**

Essential Elements of Information	Geospatial Product/Analysis	Authoritative Source	Estimated Availability	Activity Code
Predictive Modeling	USGS Ground Shaking (ShakeMap)	ESF #5	1 hour	27
	HAZUS-MH Outputs (General)	ESF #5	6 hours	29
	USACE Ice/Water Requirements	ESF #6	24 hours	31
	HAZMAT Locations	ESF #10	24 hours	30
Damage Assessments	USACE Post Earthquake Flood Modeling	ESF #3	48 hours	33
	USACE Debris	ESF #3	48 hours	35
	IMAAC	ESF #5	48 hours	34
	USACE Dam Failure Impacts	ESF #3	5 days	33
	FEMA RNA Team Reports	ESF #5	24 hours	4
	River Transportation Status	ESF #1	48 hours	24
	General Imagery Analysis	ESF #5	4 days	38
	FEMA MAT Reports	ESF #5	15 days	25
Airport	Modeled Airport Impact	ESF #1	12 hours	29
	Airport Status	ESF #1	24 hours	8
Status of Communities	State/Local Situation Reports	ESF #5	6 hours	3
	Current Shelter Requirements	ESF #6	6 hours	2
	Distribution Site Location/Status	ESF #6	4 days	10
Status of Transportation	Evacuation Routes	ESF #1	12 hours	3
	Road, Rail, Pipeline, Port, & Airport Status	ESF #1	24 hours	8
Status of Communications	Land-Line, Cellular, and Internet access status	ESF #2	12 hours	1
Status of Emergency Operations Centers	Federal EOC Status	ESF #5	1 hour	1
	JFO/GIU Locations	ESF #5	24 hours	14
Status of Critical Infrastructure	Federal Critical infrastructure Status	ESF #5	1 hour	1
	State/local Critical infrastructure Status	ESF #5	12 hours	3
Status of State/local EOCs	State/Local EOC Status	ESF #5	12 hours	3

**Table 5–3: Sample Life Saving EEIs by ESF (Continued)**

Essential Elements of Information	Geospatial Product/Analysis	Authoritative Source	Estimated Availability	Activity Code
Status of Medical Services	Estimated Hospital Functionality	ESF #5	4 hours	29
	Disaster Medical Team Deployment Status	ESF #8	24 hours	12
	Veterinary Team Deployment Status	ESF #8	3 days	13
	Hospital Status	ESF #8	6 days	21
Status of Energy Systems	Damage to Power Infrastructure	ESF #12	24 hours	1
Status of Personnel	FEMA IMAT Deployment	ESF #5	1 hour	5
Status of Remote Sensing Operations	Remote Sensing Status	ESF #5	12 hours	38
Donations/Voluntary Agency Activities	Shelter Status	ESF #6	48 hours	2
Public Safety	Alert Notifications (reported)	ESF #5	12 hours	1
	National Guard Security Team Status	ESF #5	24 hours	11
	High Hazard/Unsafe Areas	ESF #5	36 hours	38
Hazardous, Toxic, and Radiological Issues	Public Safety Notices	ESF #8	12 hours	1
	Public Safety Notices	ESF #12	12 hours	1

and to identify areas with critical medical services requirements.

Finally, Disaster Mortuary Operational Response Teams (DMORT) operations begin in 24-36 hours to assist with the remains of non survivors. While not specifically a Life Saving activity, it is a byproduct of the situation and must be deployed early into the event. This mission requires the creation and maintenance of a business process and supporting database to collect, maintain and retrieve information on the names of the deceased and the location of the recovery. This data is highly sensitive and is

vital to meeting the aggressive requirements of the communities impacted.

**Provision of Critical Food, Shelter, and Water**

The provision of critical food, shelter and water is key in supporting the impacted communities across the NMSZ. Initial feeding options focus on low maintenance foods such as military-style Meals Ready to Eat (MREs) and bottled water. As these commodities require delivery to shelters, households, and PODs across the region, geospatial tools can be used in conjunction with American Red Cross and

USACE methodologies to identify and prioritize feeding and bottled water requirements across a multi-state area of impact.

As the NMSZ scenario results in an immense number of displaced households across a multi-state region, options and strategies for shelter provision are unique. Significant impediments to response to a New Madrid catastrophic earthquake include; accessibility to shelters, weather conditions, and major damage to water and power infrastructure. HAZUS, ShakeCast, and PAGER are among the geospatial tools available to support initial Shelter decision-making. These spatial models provide estimates on populations requiring shelter, residential structure damage, and areas impacted all key elements in determining regional shelter requirements.

In this event, the demand for bottled water will be difficult to fill beyond the immediate deployment of available resources. Other solutions such as water trailers, tanker ships, and river-water processing options may provide the impacted communities with clean potable water. Geospatial methodologies are utilized to identify request locations and ingress/egress options based upon analysis of demographics and other dynamic critical factors.

**5.3.2.2 Damage Assessment Mission**

Damage assessments provide a vital flow of information to the response community. In an event of this magnitude, communications technologies would be greatly impacted, limiting the ability of communities and citizens to request assistance or report on their status. Through the use of imagery, models, and ground truth data, the scale of the event and overall impact will be initially estimated and later validated.

The data collected and compiled through Damage Assessment activities defines the locations and levels of magnitude of event related impacts. The

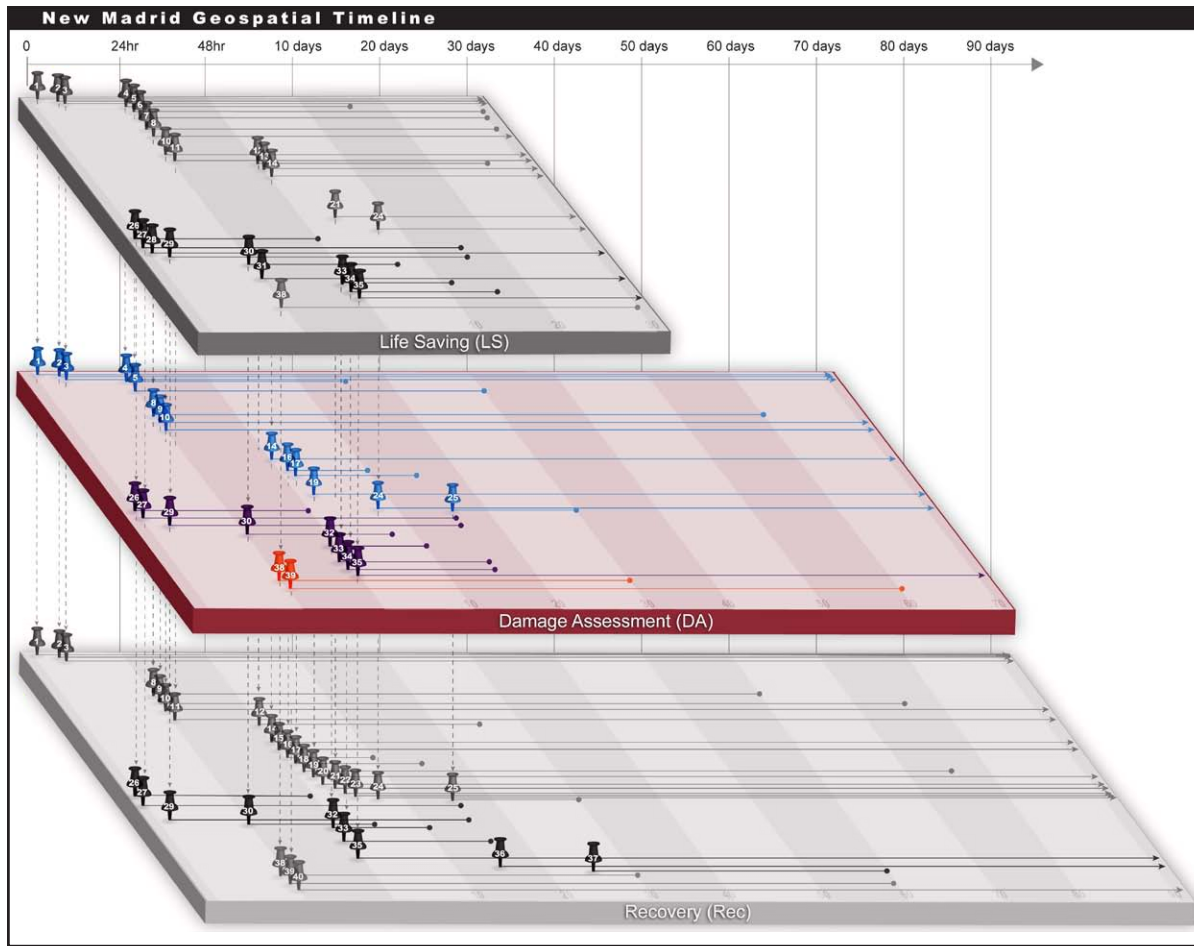


Figure 5–9: Geospatial Timeline – Damage Assessment

combination of imagery resources, models, and ground truth data provide rapid estimates and quantitative field observations to assist in making critical decisions in the early phases of the disaster response operation. In the New Madrid scenario, the multi-state area of impact will require a large volume of staff and an unusually long duration of inspections. In addition, the potential for aftershocks could complicate damage assessment missions as re-inspections will be required in response to aftershock events.

### Imagery & Derived Products

Many challenges exist when supporting the imagery requirements for an event of this magnitude. Satellite-based imagery resources will be unaffected by the event however their ability to download data within the United States will be limited within the impacted area. This data will suffer minor delays in reaching the stakeholders at the field level due to basic connectivity issues such as; locally damaged

infrastructure, operating in temporary facilities, and intermittent power outages.

Airborne resources will initially be delayed as the majority of aircraft required for these missions will be sent from outside the impacted area. Complications with aircraft-based sensors will include access to fuel, smoke and other airborne hazards, and ultimately in the enormous area requiring data collection.

While this section is focused on imagery, specific sensor and vendor information has not been included as similar sensors are available through multiple sources and technology is quickly evolving.

### Satellite Imagery

Under the International Charter, all participating satellite platforms will be available to the United States government through FEMA as the coordinator. These resources satisfy high-level requirements for general damage assessment, including ground deformation, power outages, fires, and other key themes of information through provision of base imagery in several formats.

As impacted areas are defined in a general classification, higher resolution data is collected to further assess earthquake damage. The FEMA NRCC Remote Sensing Coordinator collects place-names for communities that require/request assessments and assist in the triage to determine mission tasking and the balancing of available resources. This effort will require the tasking of satellite resources to move from large, course coverage areas to tighter and higher resolution imagery collections thus removing these assets from the broader collection mission.

The Life Saving Missions will require high resolution and spatially accurate data products to support their emergency activities. In the absence of field reports, ingress routes to target locations can be determined with proper imagery data and analysis. In addition, the areas around these targets will be visible and



support mission planning for landing zones, base camp selections, and other geographies required Search and Rescue teams.

At 3-5 days into the response operations, imagery dissemination will be problematic. The broad area of impact will generate proportional data volumes of available imagery to supply the multitude of waiting customers. With network communications hindered across the region, other options will be pursued for sharing both imagery and derived products across the response community.

### Airborne Imagery

Aircraft will serve as the second wave of imagery sources and provide the high-resolution products required for assessments of individual structures and systems. The airborne mission will have a slow start-up, as resources are deployed from outside the impacted area. With FEMA coordinating Remote Sensing activities it is imperative that ESF-based functions are engaged with the NRCC to identify their requirements and report their geospatial activities. For entities operating under their own authorities, airborne missions will be directed and funded by the responsible parties.

Life saving missions will benefit greatly from the increased resolution and coverage these platforms provide. In addition to color imagery, aircraft can also provide the following:

- **LIDAR** - to assist in determining elevation changes that impact ingress and structures
- **IR (thermal)** - sensors identify fires and ground-based hazardous releases.
- **Oblique** – providing a side view allowing for determinations of structure damage and habitability
- **Full Motion Video** – feed EOCs with real-time video of impacted areas

**Table 5–4: Sample Damage Assessment EEIs by ESF**

Essential Elements of Information	Geospatial Product/Analysis	Authoritative Source	Estimated Availability	Activity Code
Boundaries of Disaster Area	USGS Earthquake Notification System	ESF #5	1 hour	26
	USGS ShakeMap (intensity)	ESF #5	1 hour	27
	Major Oil/HAZMAT Release	ESF #10	12 hours	30
	Summary of Impacts	ESF #5	24 hours	1
	Imagery Derived Boundaries	ESF #5	24 hours	38
	Energy Infrastructure Failures	ESF #12	24 hours	32
	USACE Dam Failure Inundation (Modeled)	ESF #3	5 days	33
Access to Disaster Area	Road Closure Estimates	ESF #5	12 hours	29
	Bridge & Tunnel Damage Estimates	ESF #5	12 hours	29
	Debris Estimates	ESF #5	12 hours	29
	Road Closures	ESF #1	24 hours	8
	Isolated Communities	ESF #5	24 hours	3
	Bridge & Tunnel Damage - Reported	ESF #1	48 hours	1
	River Transportation Status	ESF #1	10 days	24
	Airport Status Reports	ESF #1	24 hours	8
Jurisdictional Boundaries	Communities Impacted (USGS ShakeMap)	ESF #5	1 hour	27
	Impacted Communities (Reported)	ESF #5	24 hours	29
Hazard-Specific Information	Vulnerable Structure Reports	ESF #5	12 hours	29
	Active Fires	ESF #4	24 hours	6
	Unsafe Areas	ESF #5	24 hours	3
	Secondary Structural Hazards	ESF#5	48 hours	5
	Vulnerable Structures (modeled)	ESF #3	3 days	14
Weather	NOAA/NWS Forecasted Weather	ESF #5	12 hours	28
	NOAA/NWS Forecasted Weather	ESF #9	24 hours	7
Demographics	Estimated Exposed Populations (USGS ShakeMap/PAGER)	ESF #5	1 hour	27
	Impact Upon Income, Ethnicity, & Age (USGS PAGER)	ESF #5	1 hour	27
	Impacted Population Estimates	ESF #5	1 hour	29

Team Members  
 GeoCONOPS  
 Requirements & Capabilities  
 Specific Mission Areas  
 Disaster Operations  
 Catastrophic Disasters  
 Appendices

**Table 5–4: Sample Damage Assessment EEIs by ESF (Continued)**

Essential Elements of Information	Geospatial Product/Analysis	Authoritative Source	Estimated Availability	Activity Code
Predictive Modeling	USGS Ground Shaking (ShakeMap)	ESF #5	1 hour	27
	HAZUS-MH Outputs (General)	ESF #5	6 hours	29
	HAZMAT Locations	ESF #10	24 hours	30
	USACE Post Earthquake Flood Modeling	ESF #3	48 hours	33
	USACE Debris	ESF #3	48 hours	35
	IMAAC	ESF #5	48 hours	34
	USACE Dam Failure Impacts	ESF #3	5 days	33
Damage Assessments	FEMA RNA Team Reports	ESF #5	24 hours	4
	IA Applicant Locations	ESF #6	24 hours	9
	SBA Applicant Locations	ESF #6	24 hours	18
	River Transportation Status	ESF #1	48 hours	24
	General Imagery Analysis	ESF #5	4 days	38
	IDP - Structure Damages	ESF #5	5 days	39
	IDP - Transportation Damages	ESF #5	5 days	39
	FEMA PDA Team Reports	ESF #5	6 days	17
	ARC Damage Assessment Team Reports	ESF #6	6 days	15
Airport	Modeled Airport Impact	ESF #1	12 hours	29
	Airport Status	ESF #1	24 hours	8
	FEMA PDA Team Reports	ESF #5	6 days	17
Status of Communities	State/Local Situation Reports	ESF #5	6 hours	3
	Current Shelter Requirements	ESF #6	6 hours	2
	Distribution Site Location/Status	ESF #6	4 days	10
	FEMA PDA Team Reports	ESF #5	6 days	17
Status of Transportation	Evacuation Routes	ESF #1	12 hours	3
	Road, Rail, Pipeline, Port, & Airport Status	ESF #1	24 hours	8
Status of Communications	Land-Line, Cellular, and Internet access status	ESF #2	12 hours	1
Status of Emergency Operations Centers	Federal EOC Status	ESF #5	1 hour	1
	JFO/GIU Locations	ESF #5	24 hours	14

In addition to the urgent need to assist in recovery, public safety and force protection will require high levels of data collection in strategic areas to maintain law and order in the region. Oblique imagery further supports these efforts as it provides the ability to view the sides of buildings to further assess individual structures, and determine locations suitable for rebuilding the law enforcement communities across the region.

Unmanned Aerial Vehicles also have a significant role in the NMSZ event as imaging resources will be required in many areas across the geography. UAVs are provided by both government and private companies to assist in the damage assessment imagery mission. To mitigate legal concerns with the use of these aircraft, event-specific policies and guidance must be required before these resources can be fully utilized.

**Mission Overlap**

In some situations, satellite imagery and aircraft imagery are competing resources in the form of multiple platforms with similar instrumentation. With an event of this magnitude, a strategy will be developed to make best use of the available assets and ensure that efforts are not duplicated. Satellite solutions will provide the early sources of imagery followed by airborne systems as the requirements transition from regional to local views.

Close coordination will be required between FEMA and the multitude of Federal, State, and local partners. Efforts will be made to ensure that there are multiple uses for all imagery collected and that these data will be available to everyone with requirements to access it.

**Exploitation**

Imagery alone cannot be the single data source for situational awareness, as in most cases it only provides background information. The greatest

**Table 5–4: Sample Damage Assessment EEIs by ESF (Continued)**

Essential Elements of Information	Geospatial Product/Analysis	Authoritative Source	Estimated Availability	Activity Code
Status of Critical Infrastructure	Federal Critical infrastructure Status	ESF #5z	1 hour	1
	State/local Critical infrastructure Status	ESF #5	12 hours	3
Status of State/local EOCs	State/Local EOC Status	ESF #5	12 hours	3
Status of Medical Services	Estimated Hospital Functionality	ESF #5	4 hours	29
Status of Energy Systems	Power Outages	ESF #12	12 hours	32
	Damage to Power Infrastructure	ESF #12	24 hours	1
Status of Personnel	FEMA IMAT Deployment	ESF #5	1 hour	5
Status of Remote Sensing Operations	Remote Sensing Status	ESF #5	12 hours	38
Donations/Voluntary Agency Activities	Shelter Status	ESF #6	48 hours	2
Public Safety	Alert Notifications (reported)	ESF #5	12 hours	1
	High Hazard/Unsafe Areas	ESF #5	36 hours	38
Hazardous, Toxic, and Radiological Issues	Public Safety Notices	ESF #8	12 hours	1
	Public Safety Notices	ESF #12	12 hours	1

return on imagery investment is on derived imagery. IDPs expand on basic imagery by including simple attributes (i.e. destroyed, flooded, fire) as well as more detailed information (i.e. degree of damage, damage type, estimated water depth). These IDPs are developed based on customer requirements and vary greatly across the stakeholder community. In many cases, IDP requirements can be combined into a single analytical request and provided to several customers.

As the executive agent for RS Coordination, FEMA has a role in coordinating the IDPs as well. With every specific data collection requirement, IDP development must be part of the deliverable regardless of the source. As IDP data will be utilized

in briefings, map products, and web viewers across the country, it is imperative that information does not conflict and that sources are properly and easily defined.

### Dissemination

The dissemination of imagery for the New Madrid event will be difficult as the data volumes generated over the impacted area will quickly exceed the capabilities of existing systems to provide storage and delivery. As the authoritative agent for data compilation and dissemination of imagery-based data, the USGS EROS Data Center will be the Federal hub of post-event data. In addition, the providers (government or commercial) can be

expected to serve data to the stakeholders as allowed by data licenses. Third-party distribution options will be provided through various public and private internet-based spatial environments.

The sharing of vector datasets will be closely coordinated as IDPs are easily transmitted across the community and must have adequate metadata to insure they are used correctly and kept current. As multiple sources compile similar data for different geographies these localized data will be rolled-up by theme to support big-picture views and seamless coverage for coordination efforts at all levels.

### Models

The modeling communities begin work immediately following the New Madrid event and provide updates as improved information is available and/or following aftershocks in the region. These applications play an important role in the first 12 to 24 hours following a major or catastrophic earthquake, when detailed and accurate damage assessments are unavailable. Subject Matter Experts (SMEs) in the model methodologies and outputs play a critical role in interpreting the data and identifying proper use of the analyses to support Damage Assessment and Life Saving missions

HAZUS, PAGER, ShakeCast, ShakeMap and other impact assessment applications will provide analyses immediately following the event. The outputs of these geospatial models provide initial parameters of the areas of impact and estimated damage. These are used in conjunction with field assessments to delineate the area of operations, and the nature and scope of damage. Other modeling activities will include:

- The USACE will begin to assess the region for debris-related requirements as well as water and ice missions.
- The Earth Science communities will arrive to assess geologic phenomenon to ground-truth their models.

- IMAAC will perform assessments on airborne hazards following the event and provide authoritative information on them

Each of these models provides an output product consisting of combinations of reports, maps, and geospatial data. These geospatial based products are vital in sharing the results with the stakeholder community. Users require complete metadata to ensure proper use of the data and to ensure that updates are acquired and presented to their customers.

The modeling communities produce many similar products, which may be applicable to more than one mission. The geospatial products will have subtle differences, and interpretations of results should be supported by subject matter experts, including authoritative sources for the subject domain.

### Field Data Collection

Imagery and models provide key data for early operations, and can be used in conjunction with field information to provide improved situational awareness, complementing on-ground damage assessments and field data collection. Data from the field is critical to supporting multiple Federal and State Life Saving, Damage Assessment and Recovery Missions. The inclusion of field data also lends credibility to imagery derived and modeled data feeds. Field data collection activities will include:

- **Incident Management Assistance Teams (IMAT)** – Federal interagency team
- **Rapid Needs Assessment (RNA)** – Federal and state interagency team
- **PA Inspection Teams** – Federal and state interagency team
- **American Red Cross Inspection Teams** – Paid and volunteer staff
- **IA PDA Teams** – Federal and state interagency team

These and other field data sources provide additional perspectives into the reality of the field. While most of the data collected is done to support specific operational authorities, the data can be easily repurposed in support of the Damage Assessment mission.

Frequently, inspection teams for different programs travel independently creating a level of duplication in data collected and creating low-level confusion amongst the home and property owners who must

provide access to multiple groups at different dates/times. These data can be quickly linked and compiled to determine key trends in impact and/or losses.

### 5.3.2.3 Recovery Mission (short-term)

In the New Madrid scenario, Life Saving operations may last for 30 days and beyond, and will overlap greatly with Recovery activities. After 15-20 days, rescue efforts wind-down as the focus transitions

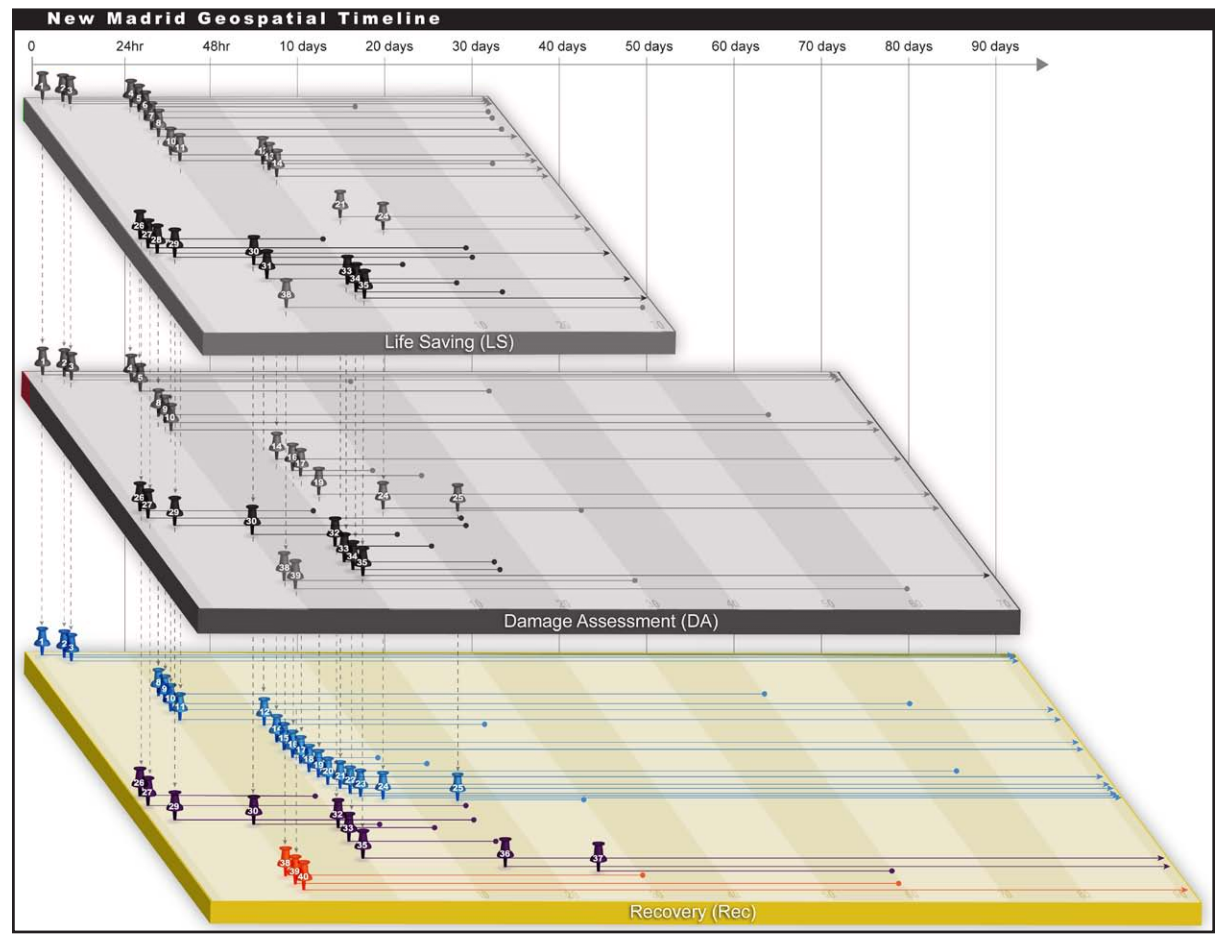


Figure 5-10: Geospatial Timeline – Recovery

## Best Practices - USGS Earthquake Products & Situational Awareness

Situational awareness is the continual process of collecting, analyzing, and disseminating information and knowledge on hazards and their impacts. Following a disaster event, authoritative geospatial information and products will flow from multiple sources as they become available. Authoritative modeled data for earthquakes is available almost immediately from the USGS and assists with key decision making immediately following a catastrophic event, before field data can be collected.

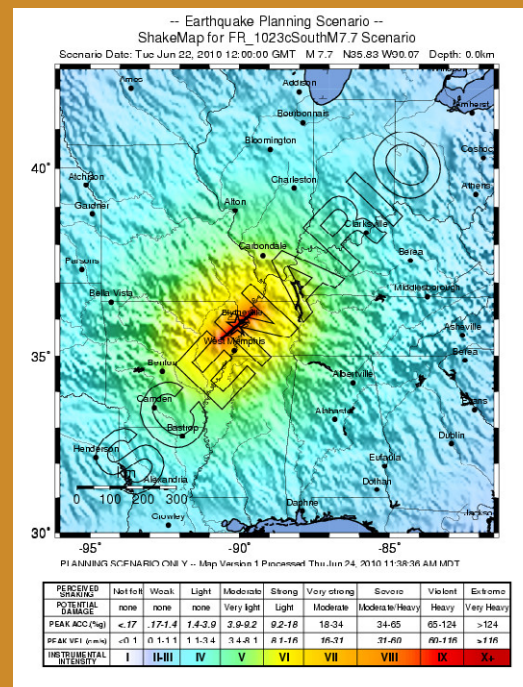
The USGS National Earthquake information Center (NEIC) located in Boulder, Colorado maintains a suite of tools that contribute significantly to earthquake situational awareness. These products provide near real-time information on the location, magnitude, and intensity of earthquakes around the globe. Within the US, USGS earthquake notification and impact assessment tools and products include:

- **USGS Earthquake Notification Service (ENS)** – ENS provides real time text information to any email address providing the location and magnitude of an earthquake. The messages contain the basic information to plot the epicenter location and initiate model runs within HAZUS-MH and other applications.
- **USGS ShakeMap** – ShakeMap portrays earthquake extent and distribution of intensity across the earth’s surface within an hour of the earthquake event. ShakeMap generates color-coded maps of the spatial variations of shaking intensity, indicating areas with areas with the strongest shaking in simple visual patterns. When used as the scenario input with HAZUS-MH, the model performs analysis against inventory data on population, essential facilities, transportation and utility lifelines, and general building stock to rapidly assess impacts on the population and built inventory exposed to earthquake shaking intensity.
- **USGS Prompt Assessment of Global Earthquakes for Response (PAGER)** - PAGER

uses ShakeMap results as the primary shaking input and incorporates these analyses with comprehensive population data to compute the population exposed to each shaking intensity. The next version of PAGER uses simplified loss modeling approaches to quantify estimated casualties and economic losses.

- **USGS Shake Map Broadcast (ShakeCAST)** – ShakeCAST is an automated system for retrieving specific ShakeMap products and analyzing the shake intensity against a user’s inventory of structures to assess potential impacts. This information can be used for setting inspection priorities for post-event activities and reporting on potential losses.

These products provide valuable information in the critical hours immediately following the earthquake. As a suite of data solutions, these applications support the core information requirements for situational awareness following an earthquake event.



to Medical support, Feeding and Shelter support activities. The short-term recovery focuses aggressively on providing a core level of government services, sheltering of displaced households, and measures to stabilize the situation. The New Madrid Geospatial Timeline highlights the recovery activities for the first 90 days.

### Public Assistance

FEMA’s PA program is activated following the event. FEMA Headquarters plan for PA missions in support of the multiple JFOs within each of the impacted states. As part of the PDA Teams, PA staff are deployed to the field to assess overall impacts, returning with reported data and maps. While these reports may not be geospatial in nature, their location information is analyzed for spatial content to derive their specific location incorporated into the event data holdings.

Communities in areas of highest earthquake intensity are expected to suffer significant losses to their infrastructure. Due to limitations in staff and resources immediately available for inspections, partial repairs will be required for critical public assets. These activities will include; repairing road damages for single lane travel, removing debris to clear single lanes of traffic, repairing levees and other water control structures, and constructing temporary routes around damaged transportation structures such as bridges and overpasses.

Under PA, the Debris mission will be challenging given the broad area of impact, anticipated damages, and loss of functionality to bridges and transportation systems. As sites need to be identified for interim storage and long-term disposal, geospatial analyses provide key information for selecting sites that are suitable for the PA activities. To assist in reducing to volume of debris material requiring removal, incinerators may be permanently sited and constructed.

**Table 5–5: Sample Recovery EEIs by ESF**

Essential Elements of Information	Geospatial Product/Analysis	Authoritative Source	Estimated Availability	Activity Code
Boundaries of Disaster Area	USGS Earthquake Notification System	ESF #5	1 hour	26
	USGS ShakeMap (intensity)	ESF #5	1 hour	27
	Major Oil/HAZMAT Release	ESF #10	12 hours	30
	Summary of Impacts	ESF #5	24 hours	1
	Imagery Derived Boundaries	ESF #5	24 hours	38
	Energy Infrastructure Failures	ESF #12	24 hours	32
	USACE Dam Failure Inundation (Modeled)	ESF #3	5 days	33
Access to Disaster Area	High Impact Urban Areas	ESF #3	12 hours	11
	Road Closure Estimates	ESF #5	12 hours	29
	Bridge & Tunnel Damage Estimates	ESF #5	12 hours	29
	Debris Estimates	ESF #5	12 hours	29
	Road Closures	ESF #1	24 hours	8
	Isolated Communities	ESF #5	24 hours	3
	Bridge & Tunnel Damage - Reported	ESF #1	48 hours	1
	Debris Removal Status	ESF #3	7 days	20
	River Transportation Status	ESF #1	10 days	24
	Airport Status Reports	ESF #1	24 hours	8
Jurisdictional Boundaries	Communities Impacted (USGS ShakeMap)	ESF #5	1 hour	27
	Impacted Communities (Reported)	ESF #5	24 hours	29
Socio-Economic Impacts	Estimated Monetary Losses	ESF #5	12 hours	29
	Estimated Residential Damage	ESF #5	12 hours	29
	IA Applicant Estimates	ESF #6	48 hours	9
	SBA Applicant Estimates	ESF #6	48 hours	18
	FEMA PA Inspection Locations	ESF #3	7 days	19
Hazard-Specific Information	Vulnerable Structure Reports	ESF #5	12 hours	29
	Unsafe Areas	ESF #5	24 hours	3
	Secondary Structural Hazards	ESF#5	48 hours	5
Weather	NOAA/NWS Forecasted Weather	ESF #5	12 hours	28
	NOAA/NWS Forecasted Weather	ESF #9	24 hours	7

The PA inspection teams visit project locations and collect detailed attribute information as well as photos of the damages and temporary work to assist in the distribution of program funds. The data collected during the inspection process will feed into their databases to support the determination of eligibility and expense breakdowns. In addition, this information provides a source of ground-truth information useful in identifying the impacted areas, making general assessments by community, and satisfying the overwhelming requirements for information. As the PA program supports publicly owned facilities, the inspection data is not bound by the Privacy act and is useful to the public for many secondary purposes such as status monitoring and community recovery applications

**Individual Assistance**

The Individual Assistance Program is the government’s connection to the citizens impacted by disaster events. This program provides financial assistance for food, clothing, housing and other personal needs through government funds, voluntary agencies, and low interest loans.

Applicants for the FEMA IA program are required to call FEMA’s toll-free number from any location and provide their personal information in order to receive assistance for their personal losses. This process collects key information including damage address, mailing address, and physical address. This location information enables ESF #6 to identify where the damage occurred and where applicants are currently located. In the days and weeks following the event, many individuals move to formal shelters, move in with family and friends outside of the damaged areas, or move to regions beyond the impacted area. These simple address fields support analyses to determine shelter needs, victim re-population, and return options for the foreseeable future.

Table 5–5: Sample Recovery EEIs by ESF (Continued)

Essential Elements of Information	Geospatial Product/Analysis	Authoritative Source	Estimated Availability	Activity Code
Demographics	Estimated Exposed Populations (USGS ShakeMap/PAGER)	ESF #5	1 hour	27
	Impact Upon Income, Ethnicity, & Age (USGS PAGER)	ESF #5	1 hour	27
	Impacted Population Estimates	ESF #5	1 hour	29
Predictive Modeling	USGS Ground Shaking (ShakeMap)	ESF #5	1 hour	27
	HAZUS-MH Outputs (General)	ESF #5	6 hours	29
	Economic Impact Modeling (HAZUS-MH)	ESF #5	24 hours	37
	HAZMAT Locations	ESF #10	24 hours	30
	USACE Post Earthquake Flood Modeling	ESF #3	48 hours	33
	USACE Debris	ESF #3	48 hours	35
	FEMA Post-Event Flood Modeling	ESF #5	4 days	36
	USACE Dam Failure Impacts	ESF #3	5 days	33
Damage Assessments	IA Applicant Locations	ESF #6	24 hours	9
	SBA Applicant Locations	ESF #6	24 hours	18
	River Transportation Status	ESF #1	48 hours	24
	General Imagery Analysis	ESF #5	4 days	38
	IDP - Structure Damages	ESF #5	5 days	39
	IDP - Transportation Damages	ESF #5	5 days	39
	FEMA PDA Team Reports	ESF #5	6 days	17
	ARC Damage Assessment Team Reports	ESF #6	6 days	15
	Debris Removal Status	ESF #3	7 days	20
	FEMA PA Inspection Locations	ESF #3	7 days	19
	FEMA MAT Reports	ESF #5	15 days	25
	Imagery Analysis (pre vs. post event imagery)	ESF #5	30 days	40
Airport	Airport Status	ESF #1	24 hours	8
	FEMA PDA Team Reports	ESF #5	6 days	17

Housing inspections assess structures for habitability and estimate repair/replacement costs. Following a New Madrid scenario event, residential damages are expected to exceed the ability of inspectors to conduct visits to personal properties in a timely manner. Geospatial technology will be used to provide expedited financial assistance based on damage assessment data derived from imagery, models, and ground truth sources. This effort will focus on communities with the greatest impacts to assist in making immediate approval for applicants to receive financial assistance as quickly as possible.

The Emergency Housing programs are vital to the impacted communities. Options are available for long-term housing (1-2 years) in the form of rental assistance, hotel vouchers, shelter environments, and other alternatives. Unlike notice events, many individuals with the financial means to leave will be stranded in the area. Temporary shelters will meet the immediate requirements but cannot support housing beyond 30-60 days.

### Mitigation

The aftermath of a damaging or catastrophic earthquake provides a window of opportunity for the implementation of mitigation measures that target essential facilities (police, fire, hospitals, shelters), businesses, residences, and lifelines (transportation and utilities). Mitigation measures – including the adoption of seismic provisions in building codes, seismic retrofits of buildings, and non-structural mitigation measures (e.g., fastening water heaters) – can improve the performance of buildings and contents in the next major event.

Post-earthquake investigations are coordinated through the National Earthquake Hazards Reduction Program (NEHRP), under the direction of the National Institute of Science and Technology (NIST) and FEMA. These programs focus on building and lifeline performance in damaging earthquakes,

Table 5–5: Sample Recovery EEIs by ESF (Continued)

Essential Elements of Information	Geospatial Product/Analysis	Authoritative Source	Estimated Availability	Activity Code	
Status of Communities	Regional Environmental Assessments	ESF #10	9 days	22	
	State/Local Situation Reports	ESF #5	6 hours	3	
	Current Shelter Requirements	ESF #6	6 hours	2	
	Distribution Site Location/Status	ESF #6	4 days	10	
	FEMA PDA Team Reports	ESF #5	6 days	17	
	Temporary Housing Status	ESF #6	8 days	23	
	IDP - Post-Event Construction Monitoring	ESF #5	30 days	40	
Status of Transportation	Evacuation Routes	ESF #1	12 hours	3	
	Road, Rail, Pipeline, Port, & Airport Status	ESF #1	24 hours	8	
Status of Communications	Land-Line, Cellular, and Internet access status	ESF #2	12 hours	1	
Status of Emergency Operations Centers	Federal EOC Status	ESF #5	1 hour	1	
	JFO/GIU Locations	ESF #5	24 hours	14	
	DRC Locations/Status	ESF #5	2 days	15	
Status of Critical Infrastructure	Federal Critical infrastructure Status	ESF #5	1 hour	1	
	State/local Critical infrastructure Status	ESF #5	12 hours	3	
Status of State/local EOCs	State/Local EOC Status	ESF #5	12 hours	3	
	Status of Medical Services	Estimated Hospital Functionality	ESF #5	4 hours	29
		Disaster Medical Team Deployment Status	ESF #8	24 hours	12
Status of Energy Systems	Hospital Status	ESF #8	6 days	21	
	Power Outages	ESF #12	12 hours	32	
	Damage to Power Infrastructure	ESF #12	24 hours	1	
Status of Declarations	Declaration Status	ESF #5	1 hour	1	
Status of Remote Sensing Operations	Remote Sensing Status	ESF #5	12 hours	38	
Donations/Voluntary Agency Activities	Shelter Status	ESF #6	48 hours	2	
Public Safety	Alert Notifications (reported)	ESF #5	12 hours	1	
	National Guard Security Team Status	ESF #5	24 hours	11	
	High Hazard/Unsafe Areas	ESF #5	36 hours	38	
Hazardous, Toxic, and Radiological Issues	Public Safety Notices	ESF #8	12 hours	1	
	Public Safety Notices	ESF #12	12 hours	1	

## Best Practices - Modeling Socio-Economic Vulnerability

The demographic characteristics of certain populations make them more vulnerable to the impacts of disasters than others. It is widely recognized that jurisdictions with high concentrations of households in poverty face significant challenges in short term response and long term recovery. In a study of the social impacts of a catastrophic earthquake in the New Madrid Seismic Zone (Mid America Earthquake Center, August, 2009), several indicators of socio-economic vulnerability are identified:

- Income level (including percentage of population in poverty)
- Command of the English language
- Age (percentage of population over 65 and under 5 years of age)
- Disabilities (and other special needs)
- Prisoners
- Medical needs

A series of maps have been produced by FEMA visualizing the distribution of vulnerable populations in the “high impact” counties of the New Madrid Seismic Zone. These maps can be overlaid with data outputs from ShakeMaps to quickly identify counties with high shaking intensity and high concentrations of vulnerable populations resulting from a major NMSZ earthquake. This information can be used to more effectively deploy assets immediately following the event.

Exposure analysis is a series of informed assumptions on the location, nature and scope of damages and social losses and serves as initial input for the development of the Common Operating Picture. Exposure analysis for a New Madrid earthquake combines: 1) data and knowledge of building practices and building inventory in areas with the highest intensity of earthquake shaking; 2) knowledge of how buildings and lifelines perform at various levels of ground shaking; and 3) knowledge of population at risk, including their vulnerabilities and “coping capabilities”.



and utilize the findings to improve risk reduction practices. This analysis is also incorporated into Long-Term Community Recovery initiatives.

Residential building safety inspections are a critical post-earthquake function. Tens of thousands of residential structures will need to be evaluated to determine structural safety for re-habitation. Efficient building safety assessments will increase the supply of safe structures and reduce demand for housing assistance under the IA Program. FEMA's Rapid Observation of Vulnerability and Estimation of Risk (ROVER), developed for the Earthquake Program, is an open source software applications that provides FEMA and other users with a database of structures that are vulnerable to earthquakes. ROVER can be used to prioritize and carry out post-event building safety evaluations, and facilitate the sharing of data in the field. This tool supplements and complements other building safety initiatives.

## 5.4 Post-Event efforts (long-term)

Recovery planning begins within weeks of the event, accelerating after approximately 90 days from the disaster occurrence. The specific geospatial efforts vary by event impact and the abilities of the individual communities to participate in the recovery activities. This section focuses on long term recovery planning, monitoring recovery project activities to include debris removal and environmental impact, and event closeout. These activities assist the recovery efforts of the communities impacted by the event.

In addition to the geospatial support available in the GIU, there may be requirements for geospatial analysts co-located with the long term recovery group. This individual assists the long term recovery staff in the development of specific products addressing post event analytical requirements. Because this is a localized activity, there is a significant amount of coordination between the

Federal geospatial support staff and the State and local geospatial staff. This coordination consists of data and product sharing, prioritizing field data collection efforts, and documenting procedures to assist in future response efforts.

Since a catastrophic NMSZ event will impact several states, geospatial activities need to be coordinated among the JFOs established as a result of the event. This will foster collaboration, standardization of products, data sharing, and facilitate better use of geospatial products for post-event efforts.

The datasets generated for the post-event efforts are valuable pieces of information to assist in the long term recovery efforts. Often, this information builds upon data generated during the response phase and is integrated into a geospatial clearinghouse developed to store event related information. After a NMSZ catastrophic event, the geospatial clearinghouse facilitates broader information dissemination and will centralize event-specific data.

### *Community-Based Products*

The long-term recovery is a community-driven effort. Impacts at this level require coordination with one or more local governments and require new data to properly reflect the current conditions. With the assistance of ESF #14, local community-specific data is collected, analyzed, and presented to better understand the community impacts. Products build upon the housing, infrastructure, and environment impact data to include economic impact and an analysis of the resources and local capacity of the community to address their issues.

### *Project Monitoring*

The PA Debris mission will be a long-term effort in the NMSZ event. Initial recovery measures deal with the clearing of key transportation routes and temporary storage of the removed debris materials. As the complete clean-up of debris will take many

months, geospatial products will be generated to track on-going debris removal efforts to include activities on private property. The demolition of structures impacted by the event are subject to a special considerations review and are often tracked geospatially to provide a better understanding of removal efforts.

Large public projects are also subject to a special considerations review to include environmental impact assessment and condition of cultural resources assessment. These reviews consist of analyzing environmental data to understand proximity of the project to environmental considerations. Efforts are made to understand the locations of historical structures to minimize the impact of recovery efforts on these structures. Activities include mapping the location of historical structures and districts and provision of historical map documents through a geospatial-based website.

In addition, FEMA provides grant funding to communities through the State for PA and mitigation. In the post-event phase, the locations of these grants are monitored to track status and made available to the public through internet-based mapping applications.

### *Transition to State and Local Governments*

For the NMSZ event, the transition of recovery activities to the States will not happen for many months. As specific missions are demobilized the geospatial products and data are provided to the state, tribal, and local incident stakeholders by FEMA or the authoritative entity to support their continued work and archives. These materials will include post-event imagery, event related vector data, and digital copies of geospatial products

Activities related to final close-out will include the tracking of project completion and financial close-out. These products will address total numbers of

recovery projects and the financial metrics associated with them.

## 5.5 Actives Outside NMSZ Scenario

The NMSZ Earthquake Scenario serves as the primary scenario for the Catastrophic Natural Event section of the GeoCONOPS. The discussion on the NMSZ Earthquake Scenario excludes certain activities, including Pre-Event Emergency Activities and Non-Earthquake Activities. Section 5.5 discusses the non-scenario activities to minimize key areas excluded by the scenario discussions.

### 5.5.1 Pre-Event Emergency Activities

In discussion of the NMSZ Scenario, pre-event emergency activities have been excluded from the earlier sections of the GeoCONOPS. Earthquakes are typically “No-Notice Events” and therefore have minimal pre-event Emergency Activities associated with them. This sub-section is intended to capture the majority of activities that would be undertaken in catastrophic natural events – including hurricanes, tsunamis, flooding, and tornados - that have some notice. The pre-event emergency activities covered in this section include personnel activation, evacuation and sheltering, resource deployment, and remote sensing mission planning.

#### *Personnel Activation*

One of the initial pre-event activities is the activation and deployment of staff to EOC facilities or into the field with various types of forward teams. These individuals are expected to be available around-the-clock to serve in their disaster roles. Geospatial staff are embedded across these teams to assist with mission execution and overall coordination of their activities. In the pre-event phase, personnel are responsible for making key decisions on where

to send resources, what commodities to stage, and strategies to be used for the upcoming event.

The point at which the RRCC and NRCCs are activated is critical in leading an effective federal response effort. The FEMA Remote Sensing Coordinator serves as the federal lead for disaster-related activities before and after a disaster declaration. The activities managed by the RS Coordinator in the pre-event phase include:

- Collection of RS requirements
- Submission of RS Mission Assignments
- Tracking of FEMA led RS missions
- Situational awareness of other RS missions
- Coordination with the IRSCC, USACE, NOAA, and others

In preparation for an expected Catastrophic Natural event, the NRCC Geospatial Intelligence Unit actively supports internal and external customers. Staff activated for NRCC operations provide 24 hour coverage driven by requests for information and perceived future requirements such as:

- Producing map-based products
- Running HAZUS-MH models based on current predictions
- Coordinating with RRCCs and Federal partners
- Acquiring local-level data
- Briefing leadership in geospatial capabilities

Across the Federal response community, teams are activated and deployed as a preparedness measure for the upcoming event. Activations may mobilize resources to a central location in preparation of deployment of teams into the field. Many of these teams are comprised of staff and hardware resources pulled from locations around the country; others are co-located and therefore ready to move at a moment’s notice.

## *Evacuation & Sheltering*

Pre-Event evacuation notifications are made at the local level and typically follow plans developed in coordination with federal, state, and neighboring jurisdictions. In most cases geospatial data is available for evacuation routes and planned shelter locations. Following an actual event, additional logistics may be required to execute these plans. These activities require significant levels of geospatial support to provide dynamic situational awareness and monitoring. Evacuations are not limited to humans, plans often include pets and livestock as well. In the worst situations, over-the road support will be required to assist citizens with fuel, food, and water.

When announcing evacuation orders, government entities are responsible for more than just managing the transportation corridors. Special needs populations require proper assistance in the form of medical support, transportation mechanisms, and evacuation destinations. These activities are tracked through map products and analysis may be requested in evacuation support. Shelters are typically operated by the American Red Cross, however in catastrophic circumstances, shelters are also “stood-up” by organizations witnessing requirements as well as unorganized options occurring as people congregate after reaching a perceived safe zone. These ad-hoc shelters are intended to provide adequate support to the populations located within them.

Many factors will determine the overall requirements for shelter facilities, including hazard intensity, weather conditions, and the socio-economic profile of the impacted population. However, income is the overriding determinant of shelter requirements. Additionally, emergency managers must factor the requirements of special needs populations in developing and executing shelter plans.

## Resource Deployment

In support of notice-events, decisions are often made to deploy resources and commodities to strategic locations based on estimates of event impact. For some items, federal staging areas are utilized as a secure storage and distribution points in preparation for more localized use. Staff resources may be pre-deployed as well with special precautions being taken to keep them out of harm's way. Specific resources tracked will include; food, water, specific hardware, teams and individuals.

Models, response plans, and local knowledge drive these decisions. Geospatial based models can identify areas of hurricane-force winds, heavy rains, and storm surge. The data produced by these models is used by analysts for many requirements including decisions on the pre-deployment of resources. Mobilization Sites can be analyzed against potential event impacts to assist in making decisions on strategic locations. All these items, teams, and people must be accounted for, this is best done with the assistance of geospatial technologies. Maps and data depicting these locations will be used in status reports and situational awareness tools.

## Remote Sensing Mission Planning

The tasking of Remote Sensing technologies for large events requires significant coordination and levels of effort. In the pre-event environment time is a key factor. Working with the Federal partners, the FEMA RS Coordinator can query the stakeholder community for specific data collection targets. This information assists in the development of post-event Areas of Interest (AOIs) to be triaged following the event impact and expedites the acquisition of critical imagery resources.

In addition to the tasking efforts, detailed plans can be made for imagery processing and dissemination. Through the many resources and processing operations available, the RS Coordinators at both

the headquarters and regional levels can be better prepared for the activities that will follow.

## 5.5.2 Non Earthquake Activities

In addition to the pre-event activities discussed above, the NMSZ scenario discussion excludes activities that do not pertain to an earthquake response effort and that extend beyond the 90 day timeframe covered in the NMSZ scenario section (post event operations). Examples of these activities include personnel activation, evacuation and sheltering, and mission planning and are discussed in this section to assist the GeoCONOPS in supporting all catastrophic natural events.

### Personnel Activation

In addition to the personnel activation activities outlined in the pre-event section, every event type will have unique nuances related to staff and team deployments. Specialized personnel resources are typically associated with the ESF responsible for their activities. For natural events, teams deploy to assist with wildfire, weather, hurricane, flood, and other specialized activities. Geospatial staff assist these groups in varying levels depending on their specific requirements.

The scientific community works diligently to study and model natural events. Following large-scale and catastrophic events, researchers from around the country and world make efforts to access the impacted areas to collect volatile ground-truth information. Supporting geospatial activities include detailed data collection, and database development initially followed by advanced analysis and modeling as the datasets are completed. This data can assist with all areas of the response and recovery activities. Much of this information, while not pertinent during the response efforts can only be collected in an urgent timeframe as disaster work, weather, and time will obscure the opportunities to observe and document the natural impacts.

## Evacuation & Sheltering

Evacuation efforts vary by event type as well. Key facilities identified as Hurricane Shelters may be unavailable following an earthquake or wildfire event. Shelters should be classified based on their ability to support the event threats they are exposed to. These attributes would be expected to be available within the NSS database to assist leadership in understanding the physical capabilities of the shelter network and the relationship to the impacted communities.

The sheltering missions, while similar across events have different implications. With wind, fire, and rain events, the majority of citizens will return to their homes, make necessary repairs and continue with their lives. Analyzing the areas impacted against residential properties will assist in opening access to communities as roads are opened and essential public services. Another aspect of sheltering is to shelter-in-place. These orders are given when conditions outside are dangerous based on many situations. For example, with chemical or other airborne hazards (possibly following an earthquake) citizens may be safer inside their structures as the hazard passes.

Shelter-in-place orders come from the local entities and follow with details on when to stop sheltering and/or evacuate the area. Spatial technologies assist in identifying communities with limited or no communications and assist in determining options for message delivery. With an earthquake event, the communications systems required to support public notices may be damaged and prevent citizen from receiving the messages.

## Mission Planning

All aspects of mission planning are driven by the specific event. Each event type has predictable unique activities however, as seen in this section, many activities overlap as event consequences and activities compile over the response and recovery

timelines. Samples of specific geospatial activities are listed below by event type in **Table 5-6: Event-Specific Missions**.

**Table 5-6: Event Specific Missions**

Wildfire	<ul style="list-style-type: none"> <li>• Fire progression modeling</li> <li>• Fuels analysis</li> <li>• Resource tracking through internal systems</li> <li>• Post-event landslide analysis</li> </ul>
Hurricane	<ul style="list-style-type: none"> <li>• Target identification for the temporary roofing mission (Blue Roof)</li> <li>• GPS data collection of inundation levels and coverage</li> <li>• Building performance evaluations (wind) by location</li> <li>• SLOSH modeling</li> </ul>
Flood	<ul style="list-style-type: none"> <li>• Collection of high water marks</li> <li>• Inundation analysis and boundary creation</li> <li>• Local collection flood extents</li> <li>• Compilation of rainfall data over time</li> <li>• Snowpack analysis against weather trends (temperature)</li> </ul>
Windstorm	<ul style="list-style-type: none"> <li>• Peak gust analysis over time</li> <li>• Delineation of wind damage to residential structures by damage type</li> </ul>
Landslide/Debris Flow	<ul style="list-style-type: none"> <li>• Analysis of slope, soils, ground cover, and rainfall</li> <li>• GPS collection of current slides</li> <li>• Assessments of vulnerable communities</li> <li>• Estimations of debris locations and volumes</li> </ul>



## APPENDIX A: MISSION ENGINEERING METHODOLOGY OVERVIEW

The collection of geospatial-specific requirements across the federal entities supporting the NRF required execution of proven methodology to ensure that information is efficiently collected, analyzed, and consolidated into one uniform document. The Mission Engineering® (ME) methodology provides this approach as an assessment of holistic operations supporting the Geospatial Management Office's (GMO) GeoCONOPS. The premise of ME is to start from the strategic vision of the organization and then build downward, using a graphically rich framework to characterize and understand how the individual processes, activities, and interactions of the organization fit within the intended realms of missions, customers, suppliers, and responsibilities. The ME approach results in a definition of current operating practices and ties these to the strategic operations such that it is possible to simultaneously identify desirable "to be" processes that are logical supplements to the current "as is" practices.

This methodology was used to assess the geospatial community and baseline interactions between and among various federal entities, information sharing

needs, technologies, products, and processes. The ME approach consists of progressive phases (Community Analysis and Operations Analysis) that increase in substantive detail such that the end product not only reflects the four key mission objectives but the detailed information needed to execute these missions from the federal partners. All the ME phases are highly iterative and can be tailored to capture, analyze, visualize, and communicate organizational needs.

In development of this GeoCONOPS, these assessments focused upon the Geospatial community’s operational environment and processes to enable Department of Homeland Security (DHS) and the federal mission partners to make more knowledgeable, timely, and defined use of geospatial information and products.

### Community Analysis

The Community Analysis phase characterizes how the Geospatial community operates within and supports the overall DHS community. The intent of this phase is to describe and characterize the various actors and stakeholders, their relationships, as well as tools that compose the current geospatial support to emergency response operations at the national, regional, and field levels. ME products in this phase illustrate mission-critical, business, and operations support services as well as the information flows between and among actors and stakeholders.

The GeoCONOPS **Community Model** provides a graphical representation of the operational framework that:

- Identifies actors and stakeholders that support the Geospatial community mission
- Identifies the information environment, actor responsibilities, and transactional information exchanges
- Documents methods for sharing data within and outside the Geospatial community

- Illustrates high-level processes across the geospatial mission operations and the correlating relationships of these processes with stakeholders.

### Operations Analysis

The Operational Analysis phase decomposes the Geospatial community further to visualize the processes that the actors and stakeholders follow to achieve their mission needs and responsibilities.

**Information Transaction Inventory (ITI)** captures specific details regarding the movement of geospatial information into, across, and out of the Geospatial community. The ITI defines the fundamental processes involved in information assimilation and analytical

effort, clarifies current information transactions, demonstrates what data interfaces exist, which systems currently integrate information transactions, and the frequency of the information transactions.

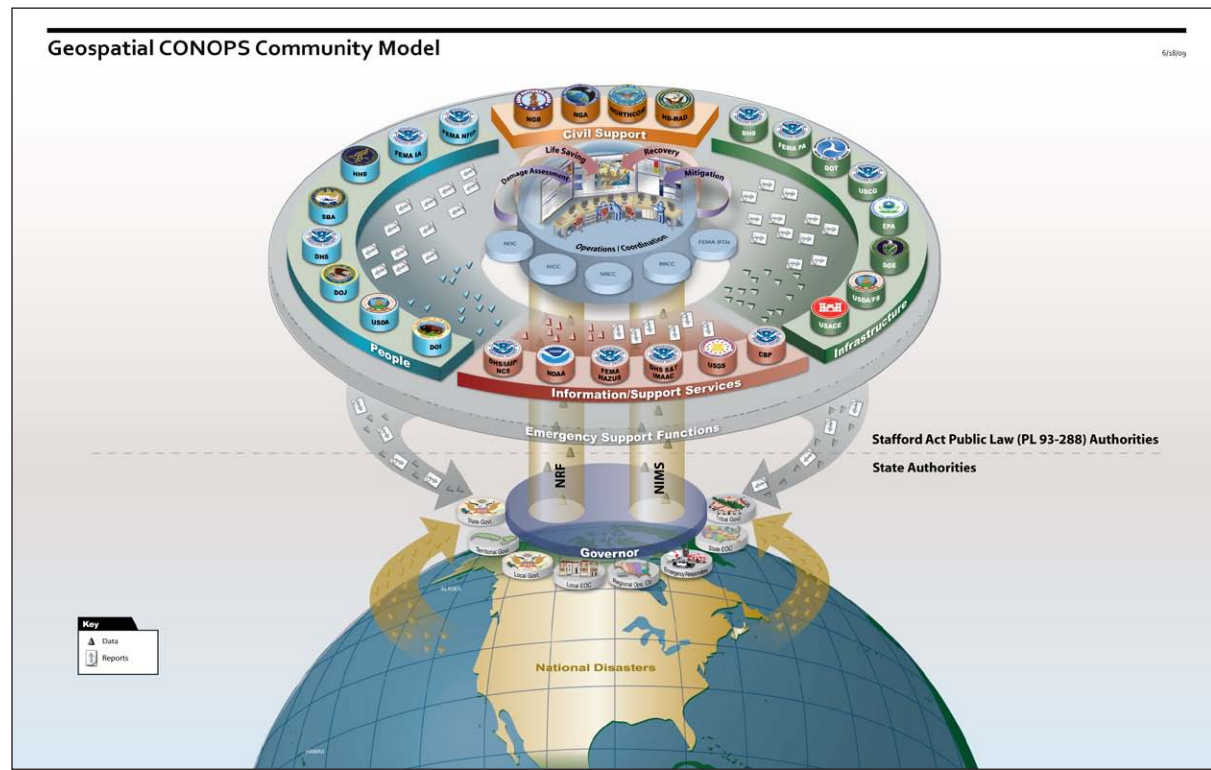


Figure A-1: Legend



**APPENDIX B: AUTHORITATIVE DATA MATRIX**

Sub Category	Theme	Type	POC	Restrictions	URL
<b>Agriculture/ Food</b>					
Animal Health Surveillance	Animal Health Surveillance	Point	USDA	n/a	<a href="http://www.aphis.usda.gov/vs/nahss/index.htm">http://www.aphis.usda.gov/vs/nahss/index.htm</a>
Mobile Food	Mobile Commissary - Base	Point	DOI/NIFC	n/a	unavailable
	Mobile Commissary - Mobilized Locations	Point	DOI/NIFC	n/a	unavailable
	Mobile Food Unit - Base	Point	DOI/NIFC	n/a	unavailable
	Mobile Food Unit - Mobilized Locations	Point	DOI/NIFC	n/a	unavailable

Sub Category	Theme	Type	POC	Restrictions	URL
Processing/ Packaging/ Production	Animal Food Manufacturing	Point	FDA	n/a	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Animal Slaughter and Processing Facilities	Point	USDA	n/a	unavailable
	Breweries/Distilleries	Point	FDA	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Canneries	Point	FDA	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Dairy Product Manufacturing	Point	FDA	n/a	unavailable
	Fruit/Vegetable Preserving, Specialty Food Manufacturing	Point	FDA	n/a	unavailable
	Grain Mills	Point	Dun & Bradstreet (FDA)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Ice Production	Point	FEMA	n/a	unavailable
	Meals Ready to Eat (MRE) Production	Point	DoD/DCMA	n/a	unavailable
	Meat Packing And Processing Plants	Point	Dun & Bradstreet (FDA)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Other Food Manufacturing	Point	FDA	n/a	unavailable
	Seafood Product Processing	Point	FDA	n/a	unavailable
	Soft Drink Bottling Plants	Point	Dun & Bradstreet (FDA)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Sugar and Confectionary Product Manufacturing	Point	FDA	n/a	unavailable
Tobacco Product Manufacturing	Point	USDA	n/a	unavailable	
Water Bottling	Point	Dun & Bradstreet (FDA)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>	
Product Distribution	Food Importation/Distribution Centers	Point	FDA	n/a	unavailable
	Water Distribution Centers	Point	FEMA	n/a	unavailable
Product Storage	Bulk Food Storage	Point	FEMA	n/a	unavailable
	Ice Storage	Point	FEMA	n/a	unavailable
	Meals Ready to Eat (MRE) Storage	Point	DoD/DCMA	n/a	unavailable
Product Transportation	Food Importation Ports	Point	FDA	n/a	unavailable



Sub Category	Theme	Type	POC	Restrictions	URL
Supply	Cattle Ranch/Farms	Polygon	USDA	n/a	<a href="http://www.ers.usda.gov/data/baseline/default.asp?ERSTab=3&amp;VIEW=Dairy">http://www.ers.usda.gov/data/baseline/default.asp?ERSTab=3&amp;VIEW=Dairy</a>
	Crop Businesses	Point	USDA	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Crop Production Farms and Facilities	Polygon	USDA	n/a	unavailable
	Cropland (National Agricultural Statics Service)	Polygon	USDA	n/a	<a href="http://www.nass.usda.gov/research/Cropland/SARS1a.htm">http://www.nass.usda.gov/research/Cropland/SARS1a.htm</a>
	Dairy Businesses	Point	USDA	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Dairy Cattle Farms	Polygon	USDA	n/a	<a href="http://www.ers.usda.gov/data/baseline/default.asp?ERSTab=3&amp;VIEW=Dairy">http://www.ers.usda.gov/data/baseline/default.asp?ERSTab=3&amp;VIEW=Dairy</a>
	Egg Production Farms	Polygon	USDA	n/a	<a href="http://www.ers.usda.gov/data/baseline/default.asp?ERSTab=3&amp;VIEW=Dairy">http://www.ers.usda.gov/data/baseline/default.asp?ERSTab=3&amp;VIEW=Dairy</a>
	Sheep/Goat Farms	Polygon	USDA	n/a	<a href="http://www.ers.usda.gov/data/RegionMapper/Documentation.htm">http://www.ers.usda.gov/data/RegionMapper/Documentation.htm</a>
Support Facilities	Agriculture Chemical Manufacture	Point	USDA	n/a	unavailable
	State Fairgrounds	Point	NGA-PMHP	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	US Agriculture Census	Point	USDA	n/a	unavailable
	Veterinary Pharmaceutical Manufacture	Point	USDA	n/a	unavailable
	Veterinary Services	Point	USDA	n/a	unavailable

Sub Category	Theme	Type	POC	Restrictions	URL
<b>Banking/Finance</b>					
Banking and Credit	Automated Check Clearing Houses	Point	Federal Reserve	n/a	unavailable
	Banking Institutions-National Credit Union Administration (NCUA)	Point	NCUA	n/a	<a href="http://www.ncua.gov/DataServices/Directory/cudir.aspx">http://www.ncua.gov/DataServices/Directory/cudir.aspx</a>
	Branches/Agencies of Foreign Banks	Point	FDIC	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Credit Unions HQ	Point	National Credit Union Administration	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Farm Credit Administration (FCA) Financial Institutions	Point	FCA	n/a	unavailable
	FDIC Insured Banking Administration Offices	Point	FDIC	n/a	<a href="http://www.fdic.gov/consumers/community/offices.html">http://www.fdic.gov/consumers/community/offices.html</a>
	FDIC Insured Banks	Point	FDIC	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Federal Check Processing Units	Point	Federal Reserve	n/a	unavailable
	Federal Reserve Banks	Point	TGI (FDIC)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Federal Reserve Banks District Branches	Point	Federal Reserve	n/a	<a href="http://www.ustreas.gov/offices/index.shtml">http://www.ustreas.gov/offices/index.shtml</a>
	Federal Reserve Banks Districts	Polygon	Federal Reserve	n/a	<a href="http://www.federalreserve.gov/Pubs/frseries/frseri3.htm">http://www.federalreserve.gov/Pubs/frseries/frseri3.htm</a>
	Federal Reserve Headquarters	Point	Federal Reserve	n/a	unavailable
	Financial Processing Centers	Point	TGI (FDIC)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Foreign Trade/International Banking	Point	Dun & Bradstreet (FDIC)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Insurance	Point	TGI (DOC)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Money Service Business (MSB) Financial Institutions	Point	Dept of Treasury	n/a	unavailable
	OCC Regulated Banks	Point	Dept of Treasury	n/a	unavailable
	Printing Facilities	Point	Dept of Treasury	n/a	unavailable
	Stock Exchanges	Point	FDIC	n/a	unavailable
	Securities/ Commodities/ Financial Investments	US Mint Engraving	Point	TGI (Dept of Treasury)	Yes
US Mint Facilities		Point	Dept of Treasury	n/a	<a href="http://www.usmint.gov/about_the_mint/index.cfm?action=mint_facilities">http://www.usmint.gov/about_the_mint/index.cfm?action=mint_facilities</a>
Brokerages		Point	US SEC	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
Bullion Repositories		Point	US SEC	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
Commodity Exchanges		Point	US SEC	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
Investment Brokerage Headquarters		Point	US SEC	n/a	unavailable
Mutual Fund Headquarters		Point	US SEC	n/a	unavailable
Securities and Commodity Exchanges		Point	US SEC	n/a	unavailable
Stock Regulatory Agencies	Point	US SEC	n/a	unavailable	

Sub Category	Theme	Type	POC	Restrictions	URL
<b>Base Map</b>					
Bodies of Water	Great Lakes	Polygon	Navteq (USGS NHD)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Lakes	Polygon	Navteq (USGS NHD)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Oceans	Polygon	Navteq (USGS NHD)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Rivers	Polygon	USGS NHD	n/a	<a href="http://nhd.usgs.gov/data.html">http://nhd.usgs.gov/data.html</a>
	Streams	Polyline	USGS NHD	n/a	<a href="http://nhd.usgs.gov/data.html">http://nhd.usgs.gov/data.html</a>
	Water	Polygon	Navteq (USGS NHD)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
Border Crossings	Border Crossings - Canada Mexico	Point	DHS/CBP	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Economic Exclusion Zones (EEZS)	Polygon	DHS/USCG	n/a	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Lines of Demarcation	Point	DHS/USCG	n/a	unavailable
	Non Crossings Port of Entries	Point	NGA-PMHP	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Ports of Entry (POE)	Point	DHS/CBP	n/a	<a href="http://www.cbp.gov/xp/cgov/toolbox/contacts/ports/">http://www.cbp.gov/xp/cgov/toolbox/contacts/ports/</a>
	Territorial Waters Boundary	Polygon	DHS/USCG	n/a	<a href="http://www.cbp.gov/xp/cgov/toolbox/contacts/ports/">http://www.cbp.gov/xp/cgov/toolbox/contacts/ports/</a>
Boundaries	Water Ports of Entry (POE)	Point	DHS/CBP	n/a	<a href="http://www.cbp.gov/xp/cgov/toolbox/contacts/ports/">http://www.cbp.gov/xp/cgov/toolbox/contacts/ports/</a>
	Bathymetry Boundaries	Polygon	USGS	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	City AOI 133	Polygon	NGA-PMH	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Common Land Unit (CLU)	Polygon	USDA/FSA	n/a	<a href="http://datagateway.nrcs.usda.gov/GatewayHome.html">http://datagateway.nrcs.usda.gov/GatewayHome.html</a>
	Counties	Polygon	USGS, US Census	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	EPA Regions	Polygon	EPA	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=epa&amp;regions&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=epa&amp;regions&amp;tab=lyr&amp;type=lyr</a>
	Federal Lands	Polygon	USGS National Atlas	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	National Forest (lower 48)	Polygon	USDA/USFS	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	National Forest Grasslands	Polygon	USDA/USFS	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Political Boundaries	Polygon	USGS	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Postal Inspection Service Boundaries	Polygon	USPS	n/a	unavailable
	Radiological Administrative Districts	Polygon	DOE	n/a	unavailable
	Urban Clusters	Polygon	US Census	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
Urbanized Area	Polygon	US Census	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>	
US Fish and Wildlife Service Lands	Polygon	DOI/USFWS	n/a	unavailable	

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices

Sub Category	Theme	Type	POC	Restrictions	URL
Conservation Areas	Endangered/Protected Species Habitat Areas	Polygon	DOI/USFWS (States, Natureserve)	n/a	<a href="http://criticalhabitat.fws.gov/">http://criticalhabitat.fws.gov/</a>
	Endangered/Protected Species Habitats	Point	DOI/USFWS (States, Natureserve)	n/a	<a href="http://criticalhabitat.fws.gov/">http://criticalhabitat.fws.gov/</a>
	Migratory Bird Paths	Polygon	DOI/USFWS	n/a	<a href="http://mbdcapps.fws.gov/">http://mbdcapps.fws.gov/</a>
	National Fire Plan – Hazardous Fuels Reduction Program	Polygon	DOI (USDA)	n/a	<a href="http://www.nationalatlas.gov/atlasftp.html#firplnp">http://www.nationalatlas.gov/atlasftp.html#firplnp</a>
	Wildlife Refuges	Polygon	DOI/USFWS (State/Local)	n/a	<a href="http://www.fws.gov/data/Cadastral.htm">http://www.fws.gov/data/Cadastral.htm</a>
Elevation	Digital Terrain Elevation Data (DTED) Level 2 (30M POST)	Grid	NGA	n/a	unavailable
	Gulf Depth Contours	Polygon	NOAA	n/a	<a href="http://geo-nsdi.er.usgs.gov/metadata/open-file/00-19/bathy-contour.faq.html#getacopy">http://geo-nsdi.er.usgs.gov/metadata/open-file/00-19/bathy-contour.faq.html#getacopy</a>
	LIDAR - Building Feature Extraction Data	Grid	NGA	n/a	unavailable
	LIDAR - Data (1M POST)	Grid	NGA (DoD/USACE, USGS)	n/a	unavailable
	National Elevation Dataset (NED) (10-30M POST)	Grid	USGS	n/a	<a href="http://ned.usgs.gov/">http://ned.usgs.gov/</a>
	North American Bathymetry	Grid	NOAA	n/a	unavailable
	USA 10 Meter Elevation	Grid	USGS	n/a	<a href="http://seamless.usgs.gov/index.php">http://seamless.usgs.gov/index.php</a>
Geonames	Concise Features	Point	USGS/GNIS	No	<a href="http://geonames.usgs.gov/domestic/download_data.htm">http://geonames.usgs.gov/domestic/download_data.htm</a>
	Government Units	Point	USGS/GNIS	No	<a href="http://geonames.usgs.gov/domestic/download_data.htm">http://geonames.usgs.gov/domestic/download_data.htm</a>
	Historical Features	Point	USGS/GNIS	No	<a href="http://geonames.usgs.gov/domestic/download_data.htm">http://geonames.usgs.gov/domestic/download_data.htm</a>
	Place Names (GNIS)	Point	USGS/GNIS	No	<a href="http://geonames.usgs.gov/domestic/download_data.htm">http://geonames.usgs.gov/domestic/download_data.htm</a>
	Populated Places	Point	USGS/GNIS	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
Land	Land Cover (200M RES)	Polygon	USGS	n/a	<a href="http://www.nationalatlas.gov/atlasftp.html#lancovi">http://www.nationalatlas.gov/atlasftp.html#lancovi</a>
	Native Lands	Polygon	DOI/BIA	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Soil	Polygon	USGS (NRCS, States)	n/a	<a href="http://soildatamart.nrcs.usda.gov/">http://soildatamart.nrcs.usda.gov/</a>
	Wetlands	Polygon	DOI/USFWS	n/a	<a href="http://www.fws.gov/wetlands/Data/Mapper.html">http://www.fws.gov/wetlands/Data/Mapper.html</a>

Sub Category	Theme	Type	POC	Restrictions	URL
Non-Political Boundaries	Time Zones (GMT)	Polygon	USGS	n/a	<a href="http://www-atlas.usgs.gov/atlasftp.html#timeznp">http://www-atlas.usgs.gov/atlasftp.html#timeznp</a>
	Watershed	Polyline	USGS National Atlas	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Watershed Areas	Polygon	USGS National Atlas	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
Political Boundaries	Cities	Polygon	USGS	n/a	unavailable
	City Civil Divisions	Polygon	USGS	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	HSIP Urbanized Areas	Polygon	NGA	n/a	<a href="http://www-atlas.usgs.gov/atlasftp.html#urbanap">http://www-atlas.usgs.gov/atlasftp.html#urbanap</a>
	Populated Place Boundaries	Polygon	USGS	n/a	<a href="http://www-atlas.usgs.gov/atlasftp-na.html#pop000x">http://www-atlas.usgs.gov/atlasftp-na.html#pop000x</a>
	Urban Area Security Initiative 2005 Cities	Polygon	DHS	n/a	<a href="http://www.dhs.gov/xlibrary/assets/UASI_FY04_Allocations.doc">http://www.dhs.gov/xlibrary/assets/UASI_FY04_Allocations.doc</a>
	US Congressional Districts (110th)	Polygon	US Census	n/a	unavailable
	US Counties	Polygon	USGS	n/a	<a href="http://www.nationalatlas.gov/natlas/Natlasstart.asp">http://www.nationalatlas.gov/natlas/Natlasstart.asp</a>
	US States	Polygon	USGS/NTAD	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
US Territories and Possessions	Polygon	USGS	n/a	unavailable	
Raster Maps	Compressed ARC Digitized Raster Graphics (CADRG)	Raster	NGA	n/a	unavailable
	FAA Digital Aeronautical Chart	Raster	FAA	n/a	unavailable
	NOAA Raster Navigational Charts	Raster	NOAA	n/a	<a href="http://www.nauticalcharts.noaa.gov/mcd/Raster/index.htm">http://www.nauticalcharts.noaa.gov/mcd/Raster/index.htm</a>
	USGS 1:100,000 DRG	Raster	USGS	n/a	<a href="http://topomaps.usgs.gov/drg/drg_name.html">http://topomaps.usgs.gov/drg/drg_name.html</a>
	USGS 1:20,000 DRG	Raster	USGS	n/a	<a href="http://topomaps.usgs.gov/drg/drg_name.html">http://topomaps.usgs.gov/drg/drg_name.html</a>
	USGS 1:24,000 DRG	Raster	USGS	n/a	<a href="http://edc2.usgs.gov/geodata/samples.php">http://edc2.usgs.gov/geodata/samples.php</a>
	USGS 1:25,000 DRG	Raster	USGS	n/a	<a href="http://topomaps.usgs.gov/drg/drg_name.html">http://topomaps.usgs.gov/drg/drg_name.html</a>
	USGS 1:250,000 DRG	Raster	USGS	n/a	<a href="http://topomaps.usgs.gov/drg/drg_name.html">http://topomaps.usgs.gov/drg/drg_name.html</a>
	USGS 1:30,000 DRG	Raster	USGS	n/a	<a href="http://topomaps.usgs.gov/drg/drg_name.html">http://topomaps.usgs.gov/drg/drg_name.html</a>
USGS 1:63,360 DRG	Raster	USGS	n/a	<a href="http://topomaps.usgs.gov/drg/drg_name.html">http://topomaps.usgs.gov/drg/drg_name.html</a>	

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices

Sub Category	Theme	Type	POC	Restrictions	URL
Residential	Apartments	Point	FEMA	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=apartments&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=apartments&amp;tab=lyr&amp;type=lyr</a>
	Mobile Home Park Points	Point	FEMA	n/a	unavailable
	Mobile Home Parks	Polygon	FEMA	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=mobile%20home%20parks&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=mobile home parks&amp;tab=lyr&amp;type=lyr</a>
	Multi Family Residences	Point	FEMA	n/a	unavailable
Video	Exit Video	Video	DHS	n/a	unavailable
	Video Logs	Video	DHS	n/a	unavailable
<b>Cadastre</b>					
Property Ownership	Property Boundaries	Polygon	USGS (Local Assessor, FEMA (MapMod), AGI)	n/a	<a href="http://www-atlas.usgs.gov/boundaries.html">http://www-atlas.usgs.gov/boundaries.html</a>
	Structure Points	Point	USGS (Local Assessor, FEMA (MapMod), AGI)	n/a	unavailable
<b>Chemical and Hazardous Materials</b>					
Manufacturing Facilities	Canada/Mexico Chemical Plants	Point	Dept of State (EPA)	n/a	unavailable
	Chemical Plants - Canadian	Point	Dept of State	n/a	unavailable
	Chemicals Industries	Point	EPA	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Facilities with Response Plans	Point	EPA	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Facilities with Risk Management Programs	Point	EPA	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
Release	Toxics Release Inventory	Point	EPA	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
Storage	Chemical Munitions Storage Sites	Point	DoD/FEMA	n/a	unavailable
	Hazardous Waste Handlers	Point	EPA	n/a	<a href="http://www.lib.ncsu.edu/gis/search/datainfo.php?datasetid=2528_hazusmhl">http://www.lib.ncsu.edu/gis/search/datainfo.php?datasetid=2528_hazusmhl</a>
	RCRA Hazardous Waste	Point	EPA	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
Superfund Sites	Superfund Sites (NPL)	Point	EPA	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
Transportation	Hazmat Routes	Polyline	DOT/NTAD	No	<a href="http://www.bts.gov/publications/north_american_transportation_atlas_data/">http://www.bts.gov/publications/north_american_transportation_atlas_data/</a>

Sub Category	Theme	Type	POC	Restrictions	URL
<b>Commercial Assets</b>					
Industry	Coal Fields	Polygon	USGS (DOE)	n/a	<a href="http://pubs.usgs.gov/of/1997/ofr-97-0461/">http://pubs.usgs.gov/of/1997/ofr-97-0461/</a>
	Coal Marine Terminals	Point	DOE	n/a	unavailable
	Commercial Building Construction Companies	Point	DoD/USACE	n/a	unavailable
	Commercial Road Construction Companies	Point	DOT	n/a	unavailable
	Debris Removal and Disposal Companies	Point	DoD/USACE	n/a	unavailable
	Metal Manufacturing	Point	DOC	n/a	unavailable
	Nonferrous Metal Processing Plants	Point	USGS	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Refractive Abrasive and Other Industrial Mineral Operations	Point	USGS	n/a	<a href="http://tin.er.usgs.gov/mrds/">http://tin.er.usgs.gov/mrds/</a>
	Salvage Companies	Point	DHS/USCG	n/a	unavailable
	Sand and Gravel Operations	Point	USGS	n/a	<a href="http://www.nationalatlas.gov/mld/sndgrvx.html">http://www.nationalatlas.gov/mld/sndgrvx.html</a>
	Tall Commercial Buildings	Point	DHS (FEMA HAZUS, EMPORIS)	n/a	unavailable
	Textile Manufacturing	Point	DOC	n/a	unavailable
	Trailer Production and Storage	Point	FEMA	n/a	unavailable
	Lodging	Campgrounds and RV Parks	Point	FEMA (BLM, USFS, USFWS, DoD/USACE)	n/a
Hotels and Motels		Point	FEMA	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
Manufacturing	Armament Manufacturing	Point	DoD	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	General Manufacturing	Point	TGI (Dept of Commerce)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Steel Plants	Point	TGI (Dept of Commerce)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Textile Plants	Point	TGI (Dept of Commerce)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>

Sub Category	Theme	Type	POC	Restrictions	URL
Mining	Agricultural Minerals Operations	Point	USGS	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Coal Fields US	Point	USGS (DOE)	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Construction Minerals Operations	Point	USGS	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Crushed Stone Operations - US	Point	USGS	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Ferrous Metal Mines	Point	USGS (DOL/MSHA)	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Ferrous Metal Processing Plants	Point	USGS	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Mines Manufacturing	Point	TGI (DOC)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Mining Industrial Manufacturing	Point	TGI (DOC)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Miscellaneous Industrial Mineral Operations	Point	USGS	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Nonferrous Metal Mines	Point	USGS (DOL/MSHA)	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Refract Abrasive Other Ind Mineral Operations	Point	USGS	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Sand Gravel Operations - US	Point	USGS	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
Uranium, Radium, and Vanadium Operations	Point	Dun & Bradstreet (DOE)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>	



Sub Category	Theme	Type	POC	Restrictions	URL
Public Venues	Amphitheaters	Point	USGS/GNIS	n/a	unavailable
	Amusement, Theme, and Water Parks	Point	DHS	n/a	unavailable
	Bowl Game Locations	Point	NGA-PMHP	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Community Parks	Point	USGS/GNIS	n/a	<a href="http://www.nps.gov/findapark/index.htm#">http://www.nps.gov/findapark/index.htm#</a>
	Convention Centers	Point	USGS/GNIS	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Cruise Line Terminals	Point	DHS	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Gambling Facilities/Resorts	Point	DOC	n/a	unavailable
	Golf Courses	Polygon	Navteq (USGS/GNIS)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a> <a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Houses Of Worship	Point	USGS/GNIS	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Mosques	Point	TGI (IONIC/MCH)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Movie Theaters	Point	DOC	n/a	unavailable
	Museums	Point	Navteq (USGS/GNIS)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Parks	Point	Navteq (USGS)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Performing Arts Centers and Auditoriums	Point	DHS	n/a	unavailable
	Racetracks Motor	Point	USGS/GNIS	n/a	unavailable
	Raceways - Busch Series	Point	NGA-PMHP	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Raceways - Craftsman Truck Series	Point	NGA-PMHP	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Raceways - NASCAR	Point	NGA-PMHP	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Religious Organization Facilities	Point	IRS	n/a	unavailable
	Sports Arenas	Point	NGA-PHMP	n/a	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Sports Complex Park	Point	Navteq (USGS/GNIS)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Stadiums	Point	NGA-PMHP	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
State Parks	Point	USGS	n/a	<a href="http://recreation.usgs.gov/state_parks.html">http://recreation.usgs.gov/state_parks.html</a>	
Tracks Horses	Point	NGA-PMHP	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>	
Tracks IRL	Point	NGA-PMHP	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>	
Zoos, Aquariums and Botanical Gardens	Point	USGS/GNIS	n/a	<a href="http://www.americanzoos.info/">http://www.americanzoos.info/</a>	
Retail Facilities	Corporate Headquarters	Point	DOC	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Firearms Retailers and Wholesalers	Point	ATF	n/a	unavailable
	Mall Centers	Point	DOC	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Shopping Centers and Malls	Point	DOC	n/a	unavailable

Sub Category	Theme	Type	POC	Restrictions	URL
<b>Dams</b>					
Dams	Dam Hazard Areas	Polygon	DoD/USACE	n/a	unavailable
	Dams	Point	DoD/USACE (FEMA National Dam Safety Program)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Levees	Polyline	DoD/USACE	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=levees&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=levees&amp;tab=lyr&amp;type=lyr</a>
<b>Defense Industrial Base</b>					
Defense Industrial Base	Defense Industrial Base (DIB) Facilities	Polygon	Defense Contract Management Agency	n/a	unavailable
<b>Emergency Services</b>					
American Red Cross	ARC Deployments	Point	ARC	n/a	unavailable
	Bio-Med Division and Region Boundaries	Polygon	ARC	n/a	unavailable
	Bio-Med Facilities	Point	ARC	n/a	unavailable
	Fixed Communication Facilities	Point	ARC	n/a	unavailable
	National Vehicle Fleet "Home" Locations	Point	ARC	n/a	unavailable
	Red Cross	Point	TGI (IONIC/MCH)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Red Cross Chapter HQs	Point	ARC	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Red Cross Chapters	Polygon	ARC	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Service Area Boundaries	Polygon	ARC	n/a	unavailable
	State Service Delivery Area Boundaries	Polygon	ARC	n/a	unavailable

Sub Category	Theme	Type	POC	Restrictions	URL
Emergency Management	Evacuation Areas	Polygon	DOT	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=evacuation%20areas&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=evacuation%20areas&amp;tab=lyr&amp;type=lyr</a>
	Evacuation Routes	Point	FEMA (State/Local)	n/a	<a href="http://www.ibiblio.org/rcip/evacuationroutes.html#sbs">http://www.ibiblio.org/rcip/evacuationroutes.html#sbs</a>
	Federal Emergency Operations Centers	Point	FEMA	n/a	unavailable
	FEMA Debris Removal Metrics	Polygon	FEMA PA/USACE	n/a	unavailable
	FEMA Debris Volume Estimates	Polygon	FEMA PA/USACE	n/a	unavailable
	FEMA IA Applicants	Point	FEMA IA	n/a	unavailable
	FEMA IA Expedited Assistance Areas	Polygon	FEMA IA	n/a	unavailable
	FEMA NFIP Claims	Polygon	FEMA Mitigation	n/a	unavailable
	FEMA PA Applicant Locations	Point	FEMA PA	n/a	unavailable
	FEMA PA Deployed Assets	Point	FEMA PA	n/a	unavailable
	FEMA PA Project Locations	Point	FEMA PA	n/a	unavailable
	FEMA Region Boundaries	Polygon	FEMA	Yes	unavailable
	FEMA Regional Hqs	Point	FEMA	Yes	<a href="http://www.fema.gov/about/contact/index.shtm">http://www.fema.gov/about/contact/index.shtm</a>
	FEMA SAR Metrics	Polygon	FEMA	n/a	unavailable
	FEMA SAR Recovery	Point	FEMA	n/a	unavailable
	FEMA SAR Rescues	Point	FEMA	n/a	unavailable
FEMA SAR Temporary Landing Zones	Point	FEMA	n/a	unavailable	

Sub Category	Theme	Type	POC	Restrictions	URL
Emergency Management	FEMA Search Grid (2 minute x 2 minute)	Polygon	FEMA	n/a	unavailable
	FEMA Search Grid (30 second x 30 second)	Polygon	FEMA	n/a	unavailable
	FEMA Search Management Sectors	Polygon	FEMA	n/a	unavailable
	FEMA US&R Search Status	Polygon	FEMA	n/a	unavailable
	FEMA US&R Search Targets	Point	FEMA	n/a	unavailable
	FEMA US&R Unsafe Areas	Polygon	FEMA	n/a	unavailable
	Ice/Water Distribution Metrics	Point	DOD/USACE	n/a	unavailable
	Ice/Water Model Estimates	Polygon	DOD/USACE	n/a	unavailable
	Image Library Footprints	Polygon	FEMA	n/a	<a href="http://www.fema.gov/about/photolibrary.shtm">http://www.fema.gov/about/photolibrary.shtm</a>
	Imagery Collection Paths (Aircraft)	Polyline	NOAA	n/a	unavailable
	Imagery Collection Paths (Aircraft)	Polyline	FEMA	n/a	unavailable
	Imagery Collection Paths (Motion Video)	Polyline	FEMA	n/a	unavailable
	Imagery Collection Paths (Satellite)	Polyline	FEMA	n/a	unavailable
	Incident Declarations by Census Tract - Local	Polygon	FEMA (State/Local)	n/a	unavailable
	Incident Declarations by County - Local	Polygon	FEMA (State/Local)	n/a	<a href="http://www.fema.gov/news/disasters.fema">http://www.fema.gov/news/disasters.fema</a>
	Incident Declarations by State - Local	Polygon	FEMA (State/Local)	n/a	<a href="http://www.fema.gov/news/disasters.fema">http://www.fema.gov/news/disasters.fema</a>
	Local Emergency Management Hqs	Point	FEMA (State/Local)	n/a	unavailable
	Local EOCs	Point	FEMA (State/Local)	n/a	unavailable
	National Shelter System	Point	FEMA	n/a	unavailable
	NDMS Federal Coordinating Centers	Point	FEMA	n/a	unavailable
	NICC Infrastructure of Concern (IOC)	Point	DHS/NICC	n/a	unavailable
	NOC Message Alert Location	Point	DHS/NOC	n/a	unavailable
	Patriot Report Area of Concern	Polygon	DHS/NICC	n/a	unavailable
	Presidential Disaster Declaration Areas	Polygon	FEMA	n/a	<a href="http://www.peripresdecusa.org/mainframe.htm">http://www.peripresdecusa.org/mainframe.htm</a>
Presidential Emergency Declaration Areas	Polygon	FEMA	n/a	unavailable	
Public Safety Answering Points (PSAPs) - 911	Point	FCC	n/a	unavailable	
Quick Look Area of Concern	Polygon	DHS/NICC	n/a	unavailable	
State Emergency Management Hqs	Point	FEMA (State/Local)	n/a	<a href="http://www.fema.gov/about/contact/statedr.shtm">http://www.fema.gov/about/contact/statedr.shtm</a>	
State EMS Directors	Point	FEMA (State/Local)	n/a	<a href="http://www.jems.com/resources/directory/State_EMS_Directors.html">http://www.jems.com/resources/directory/State_EMS_Directors.html</a>	

Sub Category	Theme	Type	POC	Restrictions	URL
Emergency Management	State EOCs	Point	FEMA (State/Local)	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	State Guard Joint Receiving Points	Point	NGB/State Guard	n/a	<a href="http://www.sgaus.org/">http://www.sgaus.org/</a>
	State Guard Logistic Supply Points	Point	NGB/State Guard	n/a	<a href="http://www.sgaus.org/">http://www.sgaus.org/</a>
	State Guard Staging Areas	Point	NGB/State Guard	n/a	<a href="http://www.sgaus.org/">http://www.sgaus.org/</a>
	State Guard Unit Locations	Point	NGB/State Guard	n/a	<a href="http://www.sgaus.org/">http://www.sgaus.org/</a>
	State Homeland Security Contact	Point	DHS (State/Local)	n/a	<a href="http://www.dhs.gov/xgovt/editorial_0291.shtm">http://www.dhs.gov/xgovt/editorial_0291.shtm</a>
	US DOT Emergency Regional Transportation Center	Point	DOT	n/a	<a href="http://www.dot.gov/ost/oet/retco.html">http://www.dot.gov/ost/oet/retco.html</a>
	US National Grid (10,000 km)	Polygon	DHS (NGA)	n/a	<a href="http://www.fgdc.gov/usng">http://www.fgdc.gov/usng</a>
	USACE Division EOCs	Point	DoD/USACE	n/a	unavailable
Emergency Resources	Cot/Sleeping Bag/Blanket Storage	Point	FEMA	n/a	unavailable
	Emergency Food Supplies	Point	USDA	n/a	unavailable
	FEMA US&R Equipment Cache Locations	Point	FEMA	n/a	unavailable
	Generator Placement	Point	DOD/USACE, FEMA	n/a	unavailable
	Mine Equipment and Services	Point	MSHA/MEO	n/a	unavailable
	Mobile Generator Storage	Point	FEMA (DoD/USACE, DoD/DLA)	n/a	unavailable
	Mobile Shower Facilities	Point	DOI/NIFC	n/a	unavailable
	National Interagency Cache System Locations	Point	DOI/USFS	n/a	unavailable
	Tarp/Plastic Sheeting Storage	Point	FEMA	n/a	unavailable
Fire	Community Fire Support Infrastructure	Point	USGS GeoMAC	n/a	unavailable
	Fire Department Hqs	Point	FEMA (DHS/USFA, State/Local)	n/a	<a href="https://www.usfa.dhs.gov/applications/feedback/index.jsp">https://www.usfa.dhs.gov/applications/feedback/index.jsp</a>
	Fire Locations - Historic	Point	DOI/NIFC	n/a	<a href="http://www.geomac.gov/">http://www.geomac.gov/</a>
	Fire Retardant Storage	Point	DOI/NIFC	n/a	unavailable
	Fire Service Boundary Areas	Polygon	DOI/NIFC	n/a	unavailable
	Fire Stations	Point	TGI (DHS/USFA)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Firefighting Aviation Assets	Point	USGS GeoMAC	n/a	unavailable
	HMS Thermal Imagery - Historic	Raster	USGS GeoMAC	n/a	<a href="http://www.geomac.gov/">http://www.geomac.gov/</a>
	MODIS Thermal Imagery - Historic	Raster	USGS GeoMAC	n/a	<a href="http://www.geomac.gov/">http://www.geomac.gov/</a>
	Primary Fire Response Zone	Polygon	DOI/NIFC	n/a	unavailable
	Smoke Jumper Bases	Point	DOI/NIFC	n/a	unavailable
State Fire Marshals	Point	DHS/USFA (DOI/NIFC, State/Local)	n/a	<a href="http://www.ehso.com/firemarshalstate.php">http://www.ehso.com/firemarshalstate.php</a>	

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices

Sub Category	Theme	Type	POC	Restrictions	URL
Law Enforcement	ATF Hqs/Offices	Point	ATF	n/a	<a href="http://www.atf.gov/field/index.htm">http://www.atf.gov/field/index.htm</a>
	Correctional Facilities	Point	ATF	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	DEA	Point	ATF	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	DHS/ICE	Point	DHS	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	DOI/BIA	Point	DOI	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	DOI/BLM	Point	DOI	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	DOI/BOR	Point	DOI	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	DOI/FWS	Point	DOI	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	DOI/NPS	Point	DOI	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Explosive Ordnance Disposal (EOD) Units	Point	DoD (Stare/Local)	n/a	<a href="http://www.eod.navy.mil/Locations.htm">http://www.eod.navy.mil/Locations.htm</a>
	FBI	Point	TGI (FBI)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	FBI Field Office District Boundaries	Polygon	NGA-PMH (FBI)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	FBI Field Office Locations (SAC)	Point	FBI	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	FBI Resident Agency (RA) District Boundaries	Polygon	FBI	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	FBI Resident Agency (RA) Office Locations	Point	FBI	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Federal Bureau of Prison Offices and Training Centers	Point	DOJ	n/a	unavailable
	Federal Bureau of Prisons Institutions	Point	DOJ	n/a	<a href="http://www.bop.gov/">http://www.bop.gov/</a>
	Law Enforcement	Point	ATF	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Local Police	Point	TGI (ATF)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Marine Emergency Units	Point	ATF (USCG, State/Local)	n/a	unavailable
	OBP Sectors Detailed	Polygon	DHS/CBP	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	OBP Sectors HQ	Polygon	DHS/CBP	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	OBP Stations	Point	DHS/CBP	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Probation and Parole Offices	Point	DOJ	n/a	unavailable
	State Drug Offices	Point	DHHS	n/a	unavailable
	State Police	Point	TGI (ATF)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	University Police	Point	TGI (ATF)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	US Customs	Point	TGI (DHS/CBP)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	US Fish and Wildlife	Point	TGI (DOI/USFWS)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	US Marshals Districts	Polygon	US Marshals	n/a	<a href="http://www.usmarshals.gov/district/index.html">http://www.usmarshals.gov/district/index.html</a>
US Marshals Offices	Point	TGI (US MARSHALS)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>	
US Park Police	Point	TGI (US Park Police)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>	
US Secret Service	Point	TGI (US Seceret Service)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>	

Sub Category	Theme	Type	POC	Restrictions	URL
Rescue and Emergency Medical Services	Ambulance Providers	Point	DHHS	n/a	<a href="http://www.cms.hhs.gov/RegionalOffices/99_RegionalMap.asp#TopOfPage">http://www.cms.hhs.gov/RegionalOffices/99_RegionalMap.asp#TopOfPage</a>
	Armed Forces Reserve Medical Units	Point	DoD (NGB)	n/a	unavailable
	DOD Air/Medivac Assets	Point	DoD (AAMS ADAMS)	n/a	unavailable
	Emergency Shelters	Point	ARC	n/a	unavailable
	EMS Facilities	Point	TGI, IONIC/MCH (DHHS, DHS, Navteq)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	EMS Operation Stations	Point	DHHS	n/a	unavailable
<b>Energy</b>					
Electricity	Electric Control Center	Point	Global Energy Decisions (DOE)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Electric Distribution Lines	Polyline	DOE (State/Local, Global Energy Decisions)	n/a	unavailable
	Electric Generating Units	Point	Global Energy Decisions (DOE)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Electric Holding Area	Point	DOE	n/a	unavailable
	Electric Power Plants	Point	Global Energy Decisions (DOE)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Electric Service Territories	Polygon	Global Energy Decisions (DOE)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Electric Sub Stations	Point	Global Energy Decisions (DOE)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Electric Transmission Lines	Polyline	Global Energy Decisions (DOE)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Energy Control Areas	Polygon	DOE	n/a	unavailable
	Est Planning Areas	Polygon	DOE	n/a	unavailable
	Flowgates Lines	Polyline	Global Energy Decisions (DOE)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Flowgates Points	Point	Global Energy Decisions (DOE)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Power Plants	Point	DOE	n/a	<a href="http://www.nucleartourist.com/us/us-plant.htm#USMap">http://www.nucleartourist.com/us/us-plant.htm#USMap</a>
	Substations	Point	DOE	n/a	unavailable
Transmission Lines	Polyline	DOE	n/a	unavailable	
Wind Fields	Polygon	DOE	n/a	unavailable	

Team Members  
 GeoCONOPS  
 Requirements & Capabilities  
 Specific Mission Areas  
 Disaster Operations  
 Catastrophic Disasters  
 Appendices

Sub Category	Theme	Type	POC	Restrictions	URL
Natural Gas	LNG Exporting Terminals	Point	DOE	n/a	unavailable
	LNG Facilities	Point	DOE	n/a	unavailable
	LNG Import Terminals	Point	DOE	n/a	<a href="http://www.ferc.gov/industries/lng/indus-act/terminals/exist-term.asp">http://www.ferc.gov/industries/lng/indus-act/terminals/exist-term.asp</a>
	LNG Pipeline Interconnections	Point	DOT/NPMS	n/a	<a href="http://www.npms.phmsa.dot.gov/application.asp?tact=pimma&amp;page=pimma/about_pimma.htm">http://www.npms.phmsa.dot.gov/application.asp?tact=pimma&amp;page=pimma/about_pimma.htm</a>
	LNG Pipelines	Polyline	DOT/NPMS	n/a	<a href="http://www.npms.phmsa.dot.gov/application.asp?tact=pimma&amp;page=pimma/about_pimma.htm">http://www.npms.phmsa.dot.gov/application.asp?tact=pimma&amp;page=pimma/about_pimma.htm</a>
	LNG Processing Plant	Point	DOE	n/a	unavailable
	Natural Distribution Lines	Polyline	DOE	n/a	unavailable
	Natural Gas City Gates	Point	DOE	n/a	unavailable
	Natural Gas Markets	Polygon	DOE	n/a	<a href="http://www.ferc.gov/market-oversight/mkt-gas/overview.asp">http://www.ferc.gov/market-oversight/mkt-gas/overview.asp</a>
	Natural Gas Pipeline Interconnections	Point	DOT/NPMS	n/a	<a href="http://www.npms.phmsa.dot.gov/application.asp?tact=pimma&amp;page=pimma/about_pimma.htm">http://www.npms.phmsa.dot.gov/application.asp?tact=pimma&amp;page=pimma/about_pimma.htm</a>
	Natural Gas Pipelines	Polyline	DOT/NPMS	n/a	<a href="http://www.npms.phmsa.dot.gov/application.asp?tact=pimma&amp;page=pimma/about_pimma.htm">http://www.npms.phmsa.dot.gov/application.asp?tact=pimma&amp;page=pimma/about_pimma.htm</a>
	Natural Gas Processing Plant	Point	DOE	n/a	unavailable
	Natural Gas Storage	Point	Global Energy Decisions (DOE)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
Natural Gas Underground Storage	Point	DOE	n/a	<a href="http://www.ferc.gov/industries/gas/indus-act/storage.asp">http://www.ferc.gov/industries/gas/indus-act/storage.asp</a>	



Sub Category	Theme	Type	POC	Restrictions	URL
Petroleum	Biodiesel Production	Point	DOE (DHS)	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Bulk Fuel Terminals/Tank Farms	Point	DOE (IRS)	n/a	unavailable
	Compressor/Pump Stations	Point	EPA	n/a	unavailable
	Ethanol Plants	Point	DOE	n/a	unavailable
	Gas Stations	Point	Navteq (DOE)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Gulf Platforms	Point	DOE	n/a	<a href="http://www.gomr.mms.gov/homepg/pubinfo/repcat/arcinfo/index.html">http://www.gomr.mms.gov/homepg/pubinfo/repcat/arcinfo/index.html</a>
	Gulf Shipping Fairways	Polygon	DHS/USCG	n/a	<a href="http://www.gomr.mms.gov/homepg/pubinfo/repcat/arcinfo/index.html">http://www.gomr.mms.gov/homepg/pubinfo/repcat/arcinfo/index.html</a>
	Independent System Operators	Point	Global Energy Decisions (DOE)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Lube/Oil/Grease Plants	Point	Dun & Bradstreet (DOE)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Motor Vehicle Fuel Terminals	Point	DOE	n/a	unavailable
	Offshore Interconnect Points	Point	DOT/NPMS	n/a	<a href="http://www.gomr.mms.gov/homepg/pubinfo/repcat/arcinfo/index.html">http://www.gomr.mms.gov/homepg/pubinfo/repcat/arcinfo/index.html</a>
	Offshore Pipelines	Polyline	DOT/NPMS	n/a	<a href="http://www.gomr.mms.gov/homepg/pubinfo/repcat/arcinfo/index.html">http://www.gomr.mms.gov/homepg/pubinfo/repcat/arcinfo/index.html</a>
	Oil Pipelines	Polyline	DOT/NPMS	n/a	<a href="http://www.npms.phmsa.dot.gov/application.asp?tact=pimma&amp;page=pimma/about_pimma.htm">http://www.npms.phmsa.dot.gov/application.asp?tact=pimma&amp;page=pimma/about_pimma.htm</a>
	Oil Refineries	Point	DOE	n/a	<a href="http://www.eia.doe.gov/emeu/security/Oil/refineries.html">http://www.eia.doe.gov/emeu/security/Oil/refineries.html</a>
	Oil Terminals	Point	TGI (DOE)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Oil/Gas Facilities	Point	PennWell MAPSearch (DOE)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Oil/Gas Pipelines	Polyline	PennWell MAPSearch (DOE, DOT/NPMS)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Oil/Gas Platforms	Point	DOE	n/a	unavailable
	Pacific Platforms	Point	DOE (MMS)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Petroleum Storage - Tank Farms	Point	DOE	n/a	unavailable
	Petroleum Storage - Underground	Point	DOE	n/a	unavailable
	Pipeline Interconnects	Point	PennWell MAPSearch (DOE)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Propane Locations	Point	DHS	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
Refineries	Point	NGA-PMHP (DOE)	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>	
Strategic Petroleum Reserves	Point	TGI (DOE)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>	
US Oil/Gas Wells	Point	TGI (DOE, USGS, State/Local)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>	

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices

Sub Category	Theme	Type	POC	Restrictions	URL
Regulatory, Oversight and Industry	Energy Control Area	Polygon	Global Energy Decisions (DOE)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	FERC Region	Polygon	Global Energy Decisions (DOE)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	NERC Region	Polygon	Global Energy Decisions (DOE)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	NERC Reliability Coordinators	Point	NERC (DOE)	n/a	<a href="http://www.nerc.com/page.php?cid=1 7 128">http://www.nerc.com/page.php?cid=1 7 128</a>
	NERC Subregion	Polygon	Global Energy Decisions (DOE)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	State Utility Commissions - Energy	Point	DOE (State/Local)	n/a	<a href="http://www.naruc.org/commissions.cfm">http://www.naruc.org/commissions.cfm</a>
<b>Event Impact</b>					
Animal Impact	Causalities-Animal	Polygon	CDC	n/a	unavailable
Damage - Infrastructure	Bridge/Tunnel Damage	Point	ESF	n/a	unavailable
	Commercial Building Damage	Polyline	FEMA (State/Local EOC)	n/a	unavailable
	Communications Damage	Point	ESF	n/a	unavailable
	Gas Distribution Damage	Point	ESF	n/a	unavailable
	Government Building Damage	Polyline	FEMA (State/Local EOC)	n/a	unavailable
	Hospitals/Medical Damage	Point	ESF	n/a	unavailable
	NOC Sweat Model	Polygon	DHS/NOC	n/a	unavailable
	Power Supply Damage	Point	ESF	n/a	unavailable
	Residential Building Damage	Polyline	FEMA (State/Local EOC)	n/a	unavailable
	Road Damage	Polyline	FEMA (State/Local EOC)	n/a	unavailable

Sub Category	Theme	Type	POC	Restrictions	URL
Evacuation	Evacuation Targets/Status	Point	FEMA (State)	n/a	unavailable
	Evacuation Tracking - Special Needs	Point	FEMA (State)	n/a	unavailable
	Evacuee Reception	Point	FEMA	n/a	unavailable
	Federal Medical Shelters	Point	VA	n/a	unavailable
	Hurricane Evacuation Routes	Polyline	FEMA	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=hurricane%20evacuation%20routes&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=hurricane evacuation routes&amp;tab=lyr&amp;type=lyr</a>
	Mandatory Evacuation - State/Local	Polygon	FEMA (State/Local EOC)	n/a	unavailable
	NRC Evacuation Shelters/Reception Centers	Point	NRC	n/a	unavailable
	Patient Reception	Point	VA	n/a	unavailable
	Quarantine Areas	Polygon	DHHS	n/a	<a href="http://www.cdc.gov/ncidod/dq/quarantine_stations.htm">http://www.cdc.gov/ncidod/dq/quarantine_stations.htm</a>
	Veteran Locations	Point	VA	n/a	unavailable
	Veteran Patient Tracking	Point	VA	n/a	unavailable
Event Location	Arms, Ammunition, and Explosive Event	Point	DoD/TRANSCOM	n/a	unavailable
	Burn Extents-Imagery Derived	Polygon	USGS	n/a	unavailable
	Burned Areas	Polygon	USGS	n/a	<a href="http://burnseverity.cr.usgs.gov/download_data.php">http://burnseverity.cr.usgs.gov/download_data.php</a>
	Chemical Release	Point	EPA	n/a	unavailable
	Coastal Flooding	Polygon	USGS	n/a	<a href="http://www.weather.gov/oh/hic/flooding.shtml">http://www.weather.gov/oh/hic/flooding.shtml</a>
	Contamination Attack	Polygon	DHS/NOC	n/a	unavailable
	Cyber Attack	Point	DHS/NOC	n/a	unavailable
	Damaged Areas (Report Derived)	Polygon	FEMA, JOC, State	n/a	unavailable
	Debris Flows	Polygon	USGS	n/a	unavailable
	Debris Locations	Polygon	USGS	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=debris%20locations&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=debris locations&amp;tab=lyr&amp;type=lyr</a>
	Disease Impacts	Polygon	CDC	n/a	unavailable
	Earthquake Damage-Field Reported Liquefaction	Polygon	USGS	n/a	<a href="http://earthquake.usgs.gov/research/">http://earthquake.usgs.gov/research/</a>
	Earthquake Damage-Field Reports	Polygon	USGS	n/a	<a href="http://earthquake.usgs.gov/research/">http://earthquake.usgs.gov/research/</a>
	Earthquake Damage-Reported (Did you feel it)	Polygon	USGS	n/a	unavailable
	Earthquake Epicenter	Point	USGS	n/a	<a href="http://earthquake.usgs.gov/research/topics.php?areaID=13">http://earthquake.usgs.gov/research/topics.php?areaID=13</a>
	Earthquake Impact-Measured (MMI)	Polygon	USGS	n/a	unavailable
Explosive Detonation	Point	FEMA (State/Local EOC)	n/a	unavailable	

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices

Sub Category	Theme	Type	POC	Restrictions	URL
Event Location	FEMA IMAT Reports	Polygon	FEMA	n/a	<a href="http://www.fema.gov/rebuild/mat/mat_reprts.shtm">http://www.fema.gov/rebuild/mat/mat_reprts.shtm</a>
	FEMA Windfields	Polygon	FEMA, NOAA, DOE	n/a	unavailable
	Fire Locations	Point	DOI/NIFC	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=firelocations&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=firelocations&amp;tab=lyr&amp;type=lyr</a>
	Fire Origins - Active	Point	DOI/NIFC	n/a	<a href="http://activefiremaps.fs.fed.us/lg_fire2.php">http://activefiremaps.fs.fed.us/lg_fire2.php</a>
	Fire Perimeters	Polygon	DOI/NIFC	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=fireperimeters&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=fireperimeters&amp;tab=lyr&amp;type=lyr</a>
	Flood Extents-Imagery Derived	Polygon	FEMA	n/a	unavailable
	Flood-Fight Measures	Polygon	FEMA	n/a	unavailable
	High Water Depth	Polygon	FEMA Mitigation	n/a	<a href="http://water.usgs.gov/waterwatch/">http://water.usgs.gov/waterwatch/</a>
	High Water Grid	Grid	FEMA Mitigation	n/a	unavailable
	High Water Marks	Point	FEMA Mitigation/USGS	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=highwatermarks&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=highwatermarks&amp;tab=lyr&amp;type=lyr</a>
	HMS Thermal Imagery	Raster	USGS GeoMAC	n/a	<a href="http://www.geomac.gov/">http://www.geomac.gov/</a>
	Imagery Derived Products (Areas)	Polygon	FEMA (NGA)	n/a	unavailable
	Imagery Derived Products (Targets)	Point	FEMA	n/a	unavailable
	Imagery Post-Event (Aircraft)	Raster	FEMA	n/a	unavailable
	Imagery Post-Event (Motion Video)	Video	FEMA	n/a	unavailable
	Imagery Post-Event (Satellite)	Raster	FEMA	n/a	unavailable
	Marine Hazards	Polygon	NOAA	n/a	unavailable
	MODIS Thermal Imagery	Raster	USGS GeoMAC	n/a	<a href="http://www.geomac.gov/">http://www.geomac.gov/</a>
	Oil Spill Locations	Polygon	NOAA	n/a	<a href="http://library.thinkquest.org/C004218/OilLoc.htm">http://library.thinkquest.org/C004218/OilLoc.htm</a>
	Physical Attack	Point	DHS/NOC	n/a	unavailable
	Red Cross Inspections	Point	ARC	n/a	unavailable
	Red/Yellow Tag Reports	Point	FEMA/State	n/a	unavailable
	Residential Damage-Imagery Derived	Polygon	FEMA	n/a	unavailable
	Roof Damage - Imagery Derived	Polygon	DOD/USACE, FEMA	n/a	unavailable
	SBA Applicants	Point	SBA	n/a	unavailable
Storm Tracks	Polygon	NOAA/NWS	n/a	<a href="http://www.stormtracker.noaa.gov/">http://www.stormtracker.noaa.gov/</a>	
Tornado Touchdown - Current	Point	NOAA	n/a	unavailable	
Tsunami Damage	Polygon	NOAA	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=tsunamidamage&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=tsunamidamage&amp;tab=lyr&amp;type=lyr</a>	

Sub Category	Theme	Type	POC	Restrictions	URL
Event Location	Volcano Damage-Field Reports	Point	USGS	n/a	unavailable
	Wildfire Damage-Field Reports	Polygon	USGS	n/a	unavailable
	Wildfire Induced Hazards	Polygon	USGS	n/a	unavailable
	Wildfire Perimeters (GeoMAC)	Polygon	USGS	n/a	<a href="http://www.geomac.gov/viewer/viewer.htm">http://www.geomac.gov/viewer/viewer.htm</a>
Impacted Area	911 Telephone Outage Emergency (TOE)	Polygon	FCC (State/Local)	n/a	unavailable
	Earthquake Modified Mercalli Intensity (MMI)	Polygon	USGS	n/a	unavailable
	Earthquake Shake Intensity	Polygon	USGS	n/a	<a href="http://earthquake.usgs.gov/eqcenter/eqarchives/">http://earthquake.usgs.gov/eqcenter/eqarchives/</a> or <a href="http://earthquake.usgs.gov/eqcenter/shakemap/">http://earthquake.usgs.gov/eqcenter/shakemap/</a>
Impact-Human	Causalities-Human	Point	FEMA (CDC, State/Local)	n/a	unavailable

Sub Category	Theme	Type	POC	Restrictions	URL
Modeling	CBRN Model Predictions: DOE Temporary Emergency Exposure Limits (TEEL)	Polygon	IMAAC	n/a	unavailable
	CBRN Model Predictions: Emergency Response Planning Guidelines (ERPG)	Polygon	IMAAC	n/a	unavailable
	CBRN Model Predictions: EPA Protective Action Guidelines (PAG)	Polygon	IMAAC	n/a	<a href="http://www.epa.gov/rpdweb00/rert/pags.html">http://www.epa.gov/rpdweb00/rert/pags.html</a>
	CBRN Model Predictions: SEPA Acute Emergency Guideline Levels (AEGl)	Polygon	IMAAC	n/a	unavailable
	CBRN Model Predictions: Time Integrated Air Concentrations	Polygon	IMAAC	n/a	unavailable
	CBRN Model Predictions: USDA/FDA Derived Intervention Levels (DIL)	Polygon	IMAAC	n/a	unavailable
	Earthquake Damage-Modeled	Polygon	USGS	n/a	<a href="http://earthquake.usgs.gov/">http://earthquake.usgs.gov/</a>
	Earthquake Impact-Modeled Liquefaction	Polygon	USGS	n/a	unavailable
	Model Input - CATS	Text	DTRA	n/a	unavailable
	Model Input - HAZUS	Text	FEMA	n/a	unavailable
	Model Input - HPAC	Text	DTRA	n/a	unavailable
	Model Input - HURREVAC	Text	FEMA	n/a	unavailable
	Model Input - IMAAC	Text	IMAAC	n/a	unavailable
	Model Input - NISAC	Text	DHS	n/a	unavailable
	Modeled Impacts - CATS	Polygon	DTRA	n/a	unavailable
	Modeled Impacts - HAZUS	Polygon	FEMA	n/a	unavailable
	Modeled Impacts - HPAC	Polygon	DTRA	n/a	unavailable
	Modeled Impacts - HURREVAC	Polygon	National Hurricane Center	n/a	<a href="http://www.fema.gov/plan/prevent/nhp/hurrevac.shtm">http://www.fema.gov/plan/prevent/nhp/hurrevac.shtm</a>
	Modeled Impacts - IMAAC	Polygon	IMAAC	n/a	unavailable
	Modeled Impacts - NISAC	Polygon	DHS	n/a	unavailable
	Modeled Impacts - SLOSH	Polygon	FEMA, USACE, NWS	n/a	unavailable
	Modeled Impacts - Surge (SLOSH)	Polygon	FEMA, USACE, NWS	n/a	unavailable
	Modeled Impacts - USACE Debris	Polygon	DOD/USACE	n/a	unavailable
	Modeled Impacts - VMWG	Polygon	DOE	n/a	unavailable
	Modeled Losses - CATS	Polygon	DHS	n/a	unavailable
	Modeled Losses - HAZUS	Polygon	FEMA	n/a	unavailable
	Modeled Losses - NISAC	Polygon	DHS	n/a	unavailable
	Plume Analysis	Point	IMAAC	n/a	unavailable
	Radiological Hazard Warning (RHW)	Point	NRC (FCC)	n/a	unavailable
	Radiological Hazard Warning (RHW)	Point	NRC (FCC)	n/a	unavailable

Sub Category	Theme	Type	POC	Restrictions	URL
Modeling	ShakeMap Pager	Point	USGS	n/a	<a href="http://earthquake.usgs.gov/eqcenter/shakemap/">http://earthquake.usgs.gov/eqcenter/shakemap/</a>
	Volcano Damage-Modeled	Polygon	USGS	n/a	<a href="http://volcanoes.usgs.gov/">http://volcanoes.usgs.gov/</a>
	Wildfire Damage-Modeled	Polygon	USGS	n/a	unavailable
<b>Field Operating Locations</b>					
DoD	JTF Joint Operations Center	Point	NORTHCOM/PACOM	n/a	unavailable
	JTF Joint Operations Center (State)	Point	NGB	n/a	unavailable
FEMA	Area Command/Unified Area Command Post	Point	FEMA	n/a	unavailable
	Disaster Recovery Center (DRC)	Point	FEMA	n/a	unavailable
	Federal Operational Staging Areas (FOSAS)	Point	FEMA	n/a	unavailable
	FEMA Mobilization Centers and Staging Areas	Point	FEMA	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Incident Command Post (ICP)	Point	FEMA	n/a	unavailable
	Joint Field Office (JFO)	Point	FEMA	n/a	unavailable
	Joint Information Center (JIC)	Point	FEMA	n/a	unavailable
	Points of Distribution (POD) Sites	Point	FEMA (USACE, State EOC)	n/a	unavailable
	Regional Response Coordination Center (RRCC)	Point	FEMA	n/a	unavailable
	Satellite JFO Facilities	Point	FEMA	n/a	unavailable
	State Staging Areas	Point	FEMA	n/a	unavailable
NOAA	Incident Meteorologist (IMETs)	Point	NOAA/NWS	n/a	unavailable
<b>Government Facilities</b>					
Defense Industrial Base	DOD Joint Task Force (JTF) HQ	Point	USNORTHCOM	n/a	<a href="http://www.northcom.mil/About/index.html">http://www.northcom.mil/About/index.html</a>
DHHS	DHHS Facilities	Point	DHHS (VA)	n/a	unavailable
	DHHS Regional Offices	Point	DHHS (VA)	n/a	<a href="http://www.hhs.gov/about/regions/">http://www.hhs.gov/about/regions/</a>

Team Members  
GeoCONOPS  
Requirements & Capabilities  
Specific Mission Areas  
Disaster Operations  
Catastrophic Disasters  
Appendices

Sub Category	Theme	Type	POC	Restrictions	URL
DHS	CBP AMOC Bases	Point	DHS/CBP	n/a	unavailable
	CBP Border Patrol Offices	Point	DHS/CBP	n/a	unavailable
	CBP Border Patrol Sectors	Polygon	DHS/CBP	n/a	<a href="http://www.cbp.gov/xp/cgov/border_security/border_patrol/border_patrol_sectors/">http://www.cbp.gov/xp/cgov/border_security/border_patrol/border_patrol_sectors/</a>
	CBP Customs Management Centers	Point	DHS/CBP	n/a	unavailable
	CBP Ports of Entry	Point	DHS/CBP	n/a	<a href="http://www.cbp.gov/xp/cgov/toolbox/contacts/ports/">http://www.cbp.gov/xp/cgov/toolbox/contacts/ports/</a>
	CBP Press Offices	Point	DHS/CBP	n/a	<a href="http://www.cbp.gov/xp/cgov/newsroom/press_officers/">http://www.cbp.gov/xp/cgov/newsroom/press_officers/</a>
	FEMA Commercial Storage Sites	Point	FEMA	n/a	unavailable
	FEMA Logistics Centers	Point	FEMA	n/a	unavailable
	FPS Deployment Cities	Point	DHS/ICE/FPS	n/a	unavailable
	FPS Deployments	Point	DHS/ICE	n/a	unavailable
	FPS Offices	Point	DHS/ICE/FPS	n/a	<a href="http://www.ice.gov/about/news/contact.htm">http://www.ice.gov/about/news/contact.htm</a>
	FPS Protected Buildings/Facilities	Point	DHS/ICE/FPS	n/a	unavailable
	FPS Service Regions	Point	DHS/ICE/FPS	n/a	<a href="http://www.ice.gov/about/fps/contact.htm">http://www.ice.gov/about/fps/contact.htm</a>
	ICE Air & Maritime Interdiction	Point	DHS/ICE	n/a	unavailable
	ICE Detention Facilities	Point	DHS/ICE	n/a	<a href="http://www.ice.gov/pi/dro/facilities.htm">http://www.ice.gov/pi/dro/facilities.htm</a>
	ICE District Council	Point	DHS/ICE	n/a	unavailable
	ICE Field Intelligence	Point	DHS/ICE	n/a	<a href="http://www.ice.gov/about/intel/contact.htm">http://www.ice.gov/about/intel/contact.htm</a>
	ICE Immigration Courts	Point	DHS/ICE	n/a	<a href="http://www.justice.gov/eoir/sibpages/ICadr.htm#Immigration">http://www.justice.gov/eoir/sibpages/ICadr.htm#Immigration</a>
	ICE Internal Affairs Field Offices	Point	DHS/ICE	n/a	unavailable
	ICE Office of Investigations SAC Offices	Point	DHS/ICE	n/a	<a href="http://www.ice.gov/about/investigations/contact.htm">http://www.ice.gov/about/investigations/contact.htm</a>
	ICE Public Affairs	Point	DHS/ICE	n/a	<a href="http://www.ice.gov/about/news/contact.htm">http://www.ice.gov/about/news/contact.htm</a>
ICE SPEC Facilities	Point	DHS/ICE	n/a	unavailable	
PSA Cities	Point	DHS	n/a	unavailable	
PSA District Boundaries	Polygon	DHS	n/a	unavailable	



Sub Category	Theme	Type	POC	Restrictions	URL
DHS	PSA District Counties	Polygon	DHS	n/a	unavailable
	TSA OCONUS Deployments	Point	DHS/TSA	n/a	unavailable
	TSA Offices/Assets	Point	DHS/TSA	n/a	unavailable
	TSA Organic Airport Assets	Point	DHS/TSA	n/a	unavailable
	USCG Air Station	Point	DHS/USCG	n/a	<a href="http://www.globalsecurity.org/military/facility/useg-air.htm">http://www.globalsecurity.org/military/facility/useg-air.htm</a>
	USCG Area Command Hqs	Point	DHS/USCG	n/a	unavailable
	USCG Canine Asset Home Bases	Point	DHS/USCG	n/a	unavailable
	USCG Captain of the Port Jurisdictions	Polygon	DHS/USCG	n/a	unavailable
	USCG District Command Hqs	Point	DHS/USCG	n/a	unavailable
	USCG Districts	Polygon	DHS/USCG	n/a	<a href="http://www.uscg.mil/top/units/">http://www.uscg.mil/top/units/</a>
	USCG Homeport/Base Assets	Point	DHS/USCG	n/a	unavailable
	USCG Sectors	Polygon	DHS/USCG	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	USCG Stations	Point	DHS/USCG	n/a	<a href="http://www.uscg.mil/history/Station_Index.asp">http://www.uscg.mil/history/Station_Index.asp</a>
	USCG Units	Polygon	DHS/USCG	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	USCIS Districts	Polygon	DHS/USCIS	n/a	unavailable
USCIS Field Offices	Point	DHS/USCIS	n/a	<a href="https://egov.uscis.gov/crisgwi/go?action=offices.type&amp;OfficeLocator.office_type=LO">https://egov.uscis.gov/crisgwi/go?action=offices.type&amp;OfficeLocator.office_type=LO</a>	
USCIS Regions	Polygon	DHS/USCIS	n/a	<a href="https://egov.uscis.gov/crisgwi/go?action=offices.type&amp;OfficeLocator.office_type=SC">https://egov.uscis.gov/crisgwi/go?action=offices.type&amp;OfficeLocator.office_type=SC</a>	
USCIS Sub-Field Offices	Point	DHS/USCIS	n/a	<a href="https://egov.uscis.gov/crisgwi/go?action=offices.type&amp;OfficeLocator.office_type=SC">https://egov.uscis.gov/crisgwi/go?action=offices.type&amp;OfficeLocator.office_type=SC</a>	
USSS Field Offices	Point	USSS	n/a	<a href="http://www.secretservice.gov/field_offices.shtml">http://www.secretservice.gov/field_offices.shtml</a>	
DOE	DOE Facilities	Point	DOE	n/a	<a href="http://www.energy.gov/contact/index.htm">http://www.energy.gov/contact/index.htm</a>
	DOE Regions	Polygon	DOE	n/a	<a href="http://www.eia.doe.gov/emeu/reps/maps/us_census.html">http://www.eia.doe.gov/emeu/reps/maps/us_census.html</a>
Educational Facilities	Colleges and Universities	Point	Dept of Education	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Flight Schools	Point	Dun & Bradstreet (FAA)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Schools (K-12)	Point	Dept of Education	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Trade, Vocational and other Post-Secondary Schools (Public & Private)	Point	Dept of Education	n/a	unavailable

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices

Sub Category	Theme	Type	POC	Restrictions	URL
Foreign	Chanceries	Point	Dept of State	n/a	<a href="http://www.state.gov/s/cpr/rls/fco/fallwinter2/71015.htm">http://www.state.gov/s/cpr/rls/fco/fallwinter2/71015.htm</a>
	Consulates	Point	Dept of State	n/a	<a href="http://www.usembassy.gov/">http://www.usembassy.gov/</a>
	DC Chanceries/Embassies	Point	NGA-PMHP	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Diplomatic Missions Offices	Point	NGA-PMHP	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Embassies	Point	Dept of State	n/a	<a href="http://www.usembassy.gov/">http://www.usembassy.gov/</a>
GSA	Available Federal Office Space	Point	GSA	n/a	<a href="http://www.gsa.gov/Portal/gsa/ep/contentView.do?contentType=GSA_BASIC&amp;contentId=12458">http://www.gsa.gov/Portal/gsa/ep/contentView.do?contentType=GSA_BASIC&amp;contentId=12458</a>
	Federal Government Contracting Entities	Point	GSA (DoD)	n/a	unavailable
	GSA Facilities	Point	GSA	n/a	unavailable
	GSA Owned and Leased Buildings (PBS)	Point	GSA	n/a	unavailable
	Surplus Office Equipment/Office Supplies	Point	GSA	n/a	<a href="http://www.surplussales.gsa.gov/howto.cfm">http://www.surplussales.gsa.gov/howto.cfm</a>
Judicial	Federal Judicial Districts	Polygon	DOJ	n/a	<a href="http://www.uscourts.gov/courtlinks/">http://www.uscourts.gov/courtlinks/</a>
	State Appellate Courts	Point	DOJ	n/a	unavailable
	US Court of Appeals	Point	DOJ	n/a	<a href="http://www.uscourts.gov/courtlinks/">http://www.uscourts.gov/courtlinks/</a>
	US District Court	Point	DOJ	n/a	<a href="http://www.uscourts.gov/courtlinks/">http://www.uscourts.gov/courtlinks/</a>

Sub Category	Theme	Type	POC	Restrictions	URL
Military Installations	Air National Guard Bases	Polygon	ARNG	n/a	unavailable
	ANG Installation Areas	Polygon	USAF/GeoBase	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	ANG Sites	Point	ANG	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Army Aviation Support Facilities (AASF) - USAR	Polygon	USAR	n/a	unavailable
	Army Reserve Centers (AFRCs)	Point	DoD/USA GIS-R	n/a	unavailable
	ARNG Combined Sup Maintenance Shop	Point	ARNG	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	ARNG Field Maintenance Shop	Point	ARNG	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	ARNG Man Area Train Equip Site	Point	ARNG	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	ARNG Readiness and Res Center	Point	ARNG	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	ARNG Training Centers	Polygon	ARNG	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	ARNG Unit Training Equip Sites	Point	ARNG	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Aviation Facilities - ARNG	Polygon	ARNG	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Civil Air Patrol (CAP) Facilities	Point	USAF	n/a	unavailable
	Defense Fuel Supply Points (DFSP)	Point	DoD/DLA (DESC)	n/a	unavailable
	Defense Logistics Agency (DLA) Facilities	Polygon	DoD/DLA	n/a	unavailable
	Joint Forces Headquarters	Point	NGB	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	JTF and Subordinate Task Force Hqs	Point	USNORTHCOM	n/a	<a href="http://www.northcom.mil/About/index.html">http://www.northcom.mil/About/index.html</a>
	Military Base Structure Report (BSR)	Point	DoD/DISDI	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Military Bases	Polygon	Navteq (DoD/DISDI)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Military Installation Boundary	Point	DoD/DISDI	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
Military Ranges	Polygon	DoD/DISDI	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>	
US Air Force Installations	Polygon	USAF/GeoBase	n/a	<a href="http://www.airforce.com/contact-us/base-locator/">http://www.airforce.com/contact-us/base-locator/</a>	
US Army Installations	Polygon	USA GIS-R	n/a	<a href="http://www.army.mil/info/organization/">http://www.army.mil/info/organization/</a>	
US Marine Corps Installations	Polygon	USMC/GeoFidelis	n/a	<a href="http://www.mcieast.usmc.mil">http://www.mcieast.usmc.mil</a>	
US Navy Installations	Polygon	USN/GeoReadiness	n/a	<a href="http://www.army.com/resources/item/928">http://www.army.com/resources/item/928</a>	
US Navy Supervisor Salvage (NAVSUPSALV) Assets	Point	US NAVY	n/a	unavailable	
Other	Formerly Used Defense Sites	Polygon	DoD/USACE	n/a	<a href="https://environment.usace.army.mil/what_we_do/fuds/inventory/">https://environment.usace.army.mil/what_we_do/fuds/inventory/</a>
Other Federal Agency	DOT Regions	Polygon	DOT	n/a	unavailable
	FDA Facilities	Point	FDA	n/a	unavailable
	US Public Health Service (USPHS) Offices	Point	DHHS/USPHS	n/a	<a href="http://www.hhs.gov/about/">http://www.hhs.gov/about/</a>
	USDA Facilities	Point	USDA	n/a	<a href="http://offices.sc.egov.usda.gov/locator/app">http://offices.sc.egov.usda.gov/locator/app</a>

Sub Category	Theme	Type	POC	Restrictions	URL
State/Local	County Seats	Point	USGS/GNIS	n/a	unavailable
	Fusion Centers	Point	DHS	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Governors Mansions	Point	TGI (DHS, State)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Landfills	Point	EPA (State/Local)	n/a	unavailable
	Libraries	Point	Dun & Bradstreet (Dept of Ed)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Local City Council Districts	Polygon	DHS (State/Local)	n/a	unavailable
	Local City Mayors	Point	DHS (State/Local)	n/a	unavailable
	Local County Council Districts	Polygon	DHS (State/Local)	n/a	unavailable
	Local Sanitation Department Facilities	Point	DHS (State/Local)	n/a	unavailable
	Local Voting Districts (CENSUS)	Polygon	DHS (State/Local)	n/a	<a href="http://www.census.gov/geo/www/cob/vt2000.html">http://www.census.gov/geo/www/cob/vt2000.html</a>
	Regional Councils of Governments	Point	DHS (State/Local)	n/a	unavailable
	State Capitols	Point	NGA-PMHP	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	State Governor	Point	DHS (State/Local)	n/a	<a href="http://www.globalcomputing.com/GovernorsContent.htm">http://www.globalcomputing.com/GovernorsContent.htm</a>
	State House	Point	DHS (State/Local)	n/a	unavailable
State Senate	Point	DHS (State/Local)	n/a	<a href="http://www.senate.gov/pagelayout/senators/f_two_sections_with_teasers/states.htm">http://www.senate.gov/pagelayout/senators/f_two_sections_with_teasers/states.htm</a>	
USACE	USACE Districts	Point	DoD/USACE	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	USACE Divisions	Polygon	DoD/USACE	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	USACE Projects	Point	DoD/USACE	n/a	unavailable

Sub Category	Theme	Type	POC	Restrictions	URL
<b>Healthcare and Public Health</b>					
Direct Patient Healthcare	Ambulatory Healthcare Facilities	Point	DHHS	n/a	unavailable
	Bone Marrow Centers	Point	National Cancer Institute	n/a	<a href="http://cancercenters.cancer.gov/cancer_centers/cancer-centers-names.html">http://cancercenters.cancer.gov/cancer_centers/cancer-centers-names.html</a>
	Burn Beds	Point	American Burned Association	n/a	unavailable
	Clinics	Point	HRSA	n/a	unavailable
	DOD Military Healthcare Facilities	Point	DoD/OASD	n/a	unavailable
	Extended Care Facilities	Point	DHHS	n/a	unavailable
	Health Monitoring Results	Polygon	DHHS	n/a	unavailable
	Health Practitioner Offices and Clinics	Point	DHHS	n/a	unavailable
	Hospitals	Point	AHA, VA	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Hospitals - Psychiatric and Substance Abuse	Point	AHA	n/a	unavailable
	Medical Requirement Assessments	Polygon	DHHS	n/a	unavailable
	Urgent Care	Point	TGI, IONIC/MCH (AHA)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	VA Healthcare Facilities	Point	VA	n/a	<a href="http://www2.va.gov/directory/guide/home.asp?isFlash=1">http://www2.va.gov/directory/guide/home.asp?isFlash=1</a>
End-of-Life Facilities	Cemeteries and Crematories	Point	USGS GNIS, Veterans Administration	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Coroners and Medical Examiners Offices	Point	DHHS (State/Local)	n/a	unavailable
	Funeral Home Services	Point	Dun & Bradstreet (DHHS, State/Local)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Mortuaries	Point	DHHS (State/Local)	n/a	unavailable

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices

Sub Category	Theme	Type	POC	Restrictions	URL
Health Supporting Facilities	Adult Day Care Facilities	Point	DHHS (State/Local)	n/a	unavailable
	Alcohol and Drug Facilities	Point	DHHS (State/Local)	n/a	unavailable
	Blood and Organ Banks	Point	DHHS	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Cancer Centers/Services	Point	DHHS	n/a	<a href="http://cancercenters.cancer.gov/cancer_centers/cancer-centers-names.html">http://cancercenters.cancer.gov/cancer_centers/cancer-centers-names.html</a>
	Daycare Facilities	Point	DHHS	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Diagnostic Imaging Centers	Point	DHHS	n/a	unavailable
	Diagnostic Laboratories	Point	DHHS	n/a	unavailable
	Home Health/Hospice	Point	DHHS	n/a	unavailable
	Homeless Shelters	Point	DHHS	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Master Caches	Point	VA	n/a	unavailable
	Medical Caches	Point	VA	n/a	unavailable
	Medical Supplies, Devices, and Equipment Distribution Facilities	Point	DHHS	n/a	unavailable
	National Laboratory Response Network (NLRN) Facilities	Point	DHHS/CDC	n/a	unavailable
	Nursing Homes	Point	DHHS	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Pharmaceutical Caches - VA	Point	VA	n/a	unavailable
	Pharmaceutical Distributors	Point	FDA	n/a	unavailable
	Pharmaceutical Manufacturing Facilities	Point	FDA	n/a	unavailable
	Pharmaceutical Storage and Stockpile	Point	FDA	n/a	unavailable
	Pharmacies	Point	FDA	n/a	unavailable
	Pre-Planned Inoculation Sites	Point	DHHS (State/Local)	n/a	unavailable
Renal Dialysis/Transplant Services	Point	DHHS	n/a	unavailable	
Retail Pharmacies	Point	DHHS	n/a	unavailable	
Senior Centers	Point	DHHS	n/a	unavailable	
SNS Reception and Storage Sites	Point	DHHS/CDC	n/a	unavailable	
Strategic National Stockpile (SNS) Sites	Point	DHHS/CDC	n/a	unavailable	
Tissue Banks	Point	DHHS	n/a	<a href="http://www.aatb.org/content.asp?contentid=458">http://www.aatb.org/content.asp?contentid=458</a>	

Sub Category	Theme	Type	POC	Restrictions	URL
Public Health Agencies	Centers for Disease Control	Point	DHHS/CDC	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Healthcare and Public Health Treatment Facilities, Agencies and Departments	Point	DHHS	n/a	unavailable
	Metropolitan Medical Response System (MMRS) Jurisdictions	Polygon	FEMA	n/a	<a href="http://www.fema.gov/mmrs/jurisdictions.html">http://www.fema.gov/mmrs/jurisdictions.html</a>
	Public Health State/Local	Point	TGI, IONIC/MCH (DHHS)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
<b>Imagery</b>					
High Resolution	Border Crossings	Raster	DHS/CBP	n/a	unavailable
	EPA ASPECT	Raster	EPA	n/a	unavailable
	FEMA LIDAR	Raster	FEMA	n/a	unavailable
	FEMA Radar	Raster	FEMA	n/a	unavailable
	HSIP Urbanized Areas (Imagery 1-2-FT RES)	Raster	NGA (USGS)	n/a	<a href="http://www.fsa.usda.gov/FSA/apfoapp?area=home&amp;subject=prog&amp;topic=nai">http://www.fsa.usda.gov/FSA/apfoapp?area=home&amp;subject=prog&amp;topic=nai</a>
	IKONOS/Quickbird/commercial airborne	Raster	USGS	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=ikonos&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=ikonos&amp;tab=lyr&amp;type=lyr</a>
	NOAA Coastal Shoreline Aerial Photography	Raster	NOAA/NOS	n/a	<a href="http://shoreline.noaa.gov/">http://shoreline.noaa.gov/</a>
	NOAA Thermal	Raster	NOAA	n/a	unavailable
	Post-Event Video	Video	DHS, NASA, DoD, NGB, DOI	n/a	unavailable
	Rail Photos	Raster	DOT/FRA (AAR)	n/a	unavailable
TSA - Imagery Request Areas	Raster	DHS/TSA	n/a	unavailable	
US Airport Imagery	Raster	FAA (DOT)	n/a	<a href="http://www.faa.gov/airports_airtraffic/airports/airport_safety/airportdata_5010/">http://www.faa.gov/airports_airtraffic/airports/airport_safety/airportdata_5010/</a>	
USACE Blue-Roof Aerial Photography	Raster	DOD/USACE	n/a	unavailable	
High Resolution Oblique	Urban Areas	Raster	USGS (Pictometry Inc., Grenman-Pederson Inc., Multivision USA)	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=urban areas&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=urban areas&amp;tab=lyr&amp;type=lyr</a>
International Charter	Landsat/SPOT/IRS/Radarsat/Envisat/ALOS/SAC-C/CBERS2/DMC	Raster	USGS	n/a	<a href="http://eros.usgs.gov/products/satellite/">http://eros.usgs.gov/products/satellite/</a>

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices

Sub Category	Theme	Type	POC	Restrictions	URL
Low Resolution	CONUS Imagery - Aerial/Satellite	Raster	USGS (NGA)	n/a	unavailable
	National Agricultural Imagery Program (NAIP) (1-2m res)	Raster	USDA	n/a	<a href="http://datagateway.nrcs.usda.gov/">http://datagateway.nrcs.usda.gov/</a> (
	National Orthoimagery Dataset (1m res)	Raster	USGS	n/a	<a href="http://seamless.usgs.gov/index.php">http://seamless.usgs.gov/index.php</a>
	POES/GOES/MODIS/AQUA	Raster	NOAA, NASA	n/a	unavailable
	USGS DOQQ 1m	Raster	USGS	n/a	<a href="http://seamless.usgs.gov/index.php">http://seamless.usgs.gov/index.php</a>
Mid Resolution	Landsat/ASTER/Hyperion/ALI/AWIFS/LISS	Raster	USGS/NASA/USDA	n/a	<a href="http://eros.usgs.gov/products/satellite/">http://eros.usgs.gov/products/satellite/</a>
<b>Man-Made Hazards</b>					
Biological	S&T Biowatch	Point	DHS	n/a	unavailable
Chemical	EPA Air Sampling Stations	Point	EPA	n/a	unavailable
Emergency Warning	Civil Danger Warning (CDW)	Point	FCC (State/Local)	n/a	unavailable
	Civil Emergency Message (CEM)	Polygon	DHS (FCC)	n/a	unavailable
	Evacuation Immediate (EVI)	Polygon	FCC (State/Local)	n/a	unavailable
	Hazardous Materials Warning (HMW)	Polygon	FCC (State/Local)	n/a	unavailable
	Law Enforcement Warning (LEW)	Polygon	FCC (State/Local)	n/a	unavailable
	Local Area Emergency (LAE)	Point	FCC (State/Local)	n/a	unavailable
	Nuclear Power Plant Warning (NUW)	Point	NRC (FCC)	n/a	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Shelter in Place Warning (SPW)	Polygon	FCC (State/Local)	n/a	unavailable

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices



Sub Category	Theme	Type	POC	Restrictions	URL
Radiological	Radiation Detection Identifier Devices (RIID)	Point	DHS	n/a	unavailable
	Radiation Detection Monitors (RPM)	Point	DHS	n/a	unavailable
	Radiation Detectors (PRD)	Point	DHS	n/a	unavailable
	Radiation Detectors~BTS PRD (PERS RAD DETECTOR)	Point	DHS	n/a	unavailable
	Radiation Detectors~CBP Commercial (PORTAL)	Point	DHS/CBP	n/a	unavailable
	Radiation Detectors~CBP MAIL & ECCF (PORTAL)	Point	DHS/CBP	n/a	unavailable
	Radiation Detectors~CBP Pagers	Point	DHS/CBP	n/a	unavailable
	Radiation Detectors~CBP Personal Vehicles (PORTAL)	Point	DHS/CBP	n/a	unavailable
	Radiation Detectors~DOE Pager-s (ORAU)	Point	DOE	n/a	unavailable
	Radiation Detectors~EPA ERAMS - Air Particulate	Point	EPA (DHS)	n/a	unavailable
	Radiation Detectors~EPA ERAMS - Drinking Water	Point	EPA (DHS)	n/a	unavailable
	Radiation Detectors~EPA ERAMS - Milk	Point	EPA (DHS)	n/a	unavailable
	Radiation Detectors~EPA ERAMS - Precipitation	Point	EPA (DHS)	n/a	unavailable
	Radiation Detectors~FBI HRMS (Handheld RAD Monitor)	Point	FBI (DHS)	n/a	unavailable
	Radiation Detectors~FBI HRMS At Bomb Squads	Point	FBI (DHS)	n/a	unavailable
	Radiation Detectors~FBI Pager-s	Point	FBI (DHS)	n/a	unavailable
	Radiation Detectors~FBI RADPACK	Point	FBI (DHS)	n/a	unavailable
	Radiation Detectors~NNSA Backpack - G	Point	DOE/NNSA (DHS)	n/a	unavailable
	Radiation Detectors~NNSA Backpack - G/N	Point	DOE/NNSA (DHS)	n/a	unavailable
	Radiation Detectors~NNSA Backpack - N	Point	DOE/NNSA (DHS)	n/a	unavailable
	Radiation Detectors~NNSA Briefcase - G	Point	DOE/NNSA (DHS)	n/a	unavailable
	Radiation Detectors~NNSA Briefcase - N	Point	DOE/NNSA (DHS)	n/a	unavailable
	Radiation Detectors~NNSA Mobile System - G	Point	DOE/NNSA (DHS)	n/a	unavailable
	Radiation Detectors~NNSA Mobile System - G/N	Point	DOE/NNSA (DHS)	n/a	unavailable
	Radiation Detectors~NNSA Mobile System - N	Point	DOE/NNSA (DHS)	n/a	unavailable
	Radiation Detectors~NNSA Pagers	Point	DOE/NNSA (DHS)	n/a	unavailable
	Radiation Identifiers~All Identifiers	Point	DHS	n/a	unavailable
	Radiation Identifiers~CBP RIID (LOW RES)	Point	DHS/CBP	n/a	unavailable
	Radiation Identifiers~FBI Civil Defense (LOW RES)	Point	FBI (DHS)	n/a	unavailable
	Radiation Identifiers~FBI GR-130 (LOW RES)	Point	FBI (DHS)	n/a	unavailable
	Radiation Identifiers~FBI GR-135 (LOW RES)	Point	FBI (DHS)	n/a	unavailable
	Radiation Identifiers~NNSA Handheld ID (LOW RES)	Point	DOE/NNSA (DHS)	n/a	unavailable
	Radiation Identifiers~NNSA HPGE (HI RES)	Point	DOE/NNSA (DHS)	n/a	unavailable
Radiation Identifiers~NNSA NAI (LOW RES)	Point	DOE/NNSA (DHS)	n/a	unavailable	
Radiological Hazard Measurements (ACTUAL, NON-PREDICTIVE)	Point	DOE/FRMAC	n/a	unavailable	

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices

Sub Category	Theme	Type	POC	Restrictions	URL
X-Ray Capabilities	All X-Ray	Point	DHS	n/a	unavailable
<b>National Monuments &amp; Icons</b>					
Archeological Sites	Archeological Sites	Point	DOI	n/a	<a href="http://www.uark.edu/misc/aras/map.html">http://www.uark.edu/misc/aras/map.html</a>
Business	Fortune 1000 Company Headquarters	Point	DOC	n/a	unavailable
Industry	Major Media Corporation Headquarters	Point	DHS	n/a	unavailable
	Oil Company Corporate Headquarters	Point	DOE	n/a	unavailable
National Monuments & Icons	National Monuments and Icons	Point	DOI	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	National Symbols	Point	Navteq (DOI)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Tourist Attractions	Point	DOI	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>

Sub Category	Theme	Type	POC	Restrictions	URL
<b>Natural Hazards</b>					
Emergency Warning	Avalanche Warning (AVW)	Polygon	USGS (State/Local)	n/a	unavailable
	Avalanche Watch (AVA)	Point	USGS (State/Local)	n/a	unavailable
	Blizzard Warning (BZW) Area	Polygon	NOAA/NWS	n/a	<a href="http://www.spc.noaa.gov/products/wwa/">http://www.spc.noaa.gov/products/wwa/</a>
	Coastal Flood Warning (CFW) Area	Polygon	NOAA/NWS	n/a	<a href="http://www.spc.noaa.gov/products/wwa/">http://www.spc.noaa.gov/products/wwa/</a>
	Coastal Flood Watch (CFA) Area	Polygon	NOAA/NWS	n/a	<a href="http://www.spc.noaa.gov/products/wwa/">http://www.spc.noaa.gov/products/wwa/</a>
	Dust Storm Warning (DSW) Area	Polygon	NOAA/NWS	n/a	unavailable
	Earthquake Warning (EQW)	Polygon	USGS (FCC)	n/a	unavailable
	Fire Warning (FRW)	Polygon	FCC (State/Local)	n/a	unavailable
	Flash Flood Warning (FFW) Area	Polygon	NOAA/NWS	n/a	<a href="http://www.spc.noaa.gov/products/wwa/">http://www.spc.noaa.gov/products/wwa/</a>
	Flash Flood Watch (FFA) Area	Polygon	NOAA/NWS	n/a	<a href="http://www.spc.noaa.gov/products/wwa/">http://www.spc.noaa.gov/products/wwa/</a>
	Flood Warning (FLW)	Polygon	NOAA/NWS	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=floodwarning&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=floodwarning&amp;tab=lyr&amp;type=lyr</a>
	Flood Watch (FLA) Area	Polygon	NOAA/NWS	n/a	<a href="http://www.spc.noaa.gov/products/wwa/">http://www.spc.noaa.gov/products/wwa/</a>
	High Wind Warning (HWW) Area	Polygon	NOAA/NWS	n/a	<a href="http://www.spc.noaa.gov/products/wwa/">http://www.spc.noaa.gov/products/wwa/</a>
	High Wind Watch (HWA) Area	Polygon	NOAA/NWS	n/a	<a href="http://www.spc.noaa.gov/products/wwa/">http://www.spc.noaa.gov/products/wwa/</a>
	Hurricane Warning (HUW) Area	Polygon	NOAA/NWS	n/a	<a href="http://www.nhc.noaa.gov/">http://www.nhc.noaa.gov/</a>
	Hurricane Watch (HUA) Area	Polygon	NOAA/NWS	n/a	<a href="http://www.nhc.noaa.gov/">http://www.nhc.noaa.gov/</a>
	Severe Thunderstorm Warning (SVR) Area	Polygon	NOAA/NWS	n/a	<a href="http://www.spc.noaa.gov/products/wwa/">http://www.spc.noaa.gov/products/wwa/</a>
	Severe Thunderstorm Watch (SVA) Area	Polygon	NOAA/NWS	n/a	<a href="http://www.spc.noaa.gov/products/wwa/">http://www.spc.noaa.gov/products/wwa/</a>
	Special Marine Warning (SMW) Area	Polygon	NOAA/NWS	n/a	unavailable
	Tornado Warning (TOR) Area	Polygon	NOAA/NWS	n/a	<a href="http://www.spc.noaa.gov/products/wwa/">http://www.spc.noaa.gov/products/wwa/</a>
	Tornado Watch (TOA) Area	Polygon	NOAA/NWS	n/a	<a href="http://www.spc.noaa.gov/products/wwa/">http://www.spc.noaa.gov/products/wwa/</a>
	Tropical Storm Warning (TRW) Area	Polygon	NOAA/NWS	n/a	<a href="http://www.spc.noaa.gov/products/wwa/">http://www.spc.noaa.gov/products/wwa/</a>
	Tropical Storm Watch (TRA) Area	Polygon	NOAA/NWS	n/a	<a href="http://www.spc.noaa.gov/products/wwa/">http://www.spc.noaa.gov/products/wwa/</a>
Tsunami Warning (TSW) Area	Polygon	NOAA/NWS	n/a	<a href="http://www.prh.noaa.gov/ptwc/">http://www.prh.noaa.gov/ptwc/</a>	
Tsunami Watch (TSA) Area	Polygon	NOAA/NWS	n/a	<a href="http://www.prh.noaa.gov/ptwc/">http://www.prh.noaa.gov/ptwc/</a>	
Volcano Warning (VOW) Area	Polygon	USGS (FCC)	n/a	<a href="http://volcanoes.usgs.gov/">http://volcanoes.usgs.gov/</a>	
Winter Storm Warning (WSW) Area	Polygon	NOAA/NWS	n/a	<a href="http://www.prh.noaa.gov/ptwc/">http://www.prh.noaa.gov/ptwc/</a>	
Winter Storm Watch (WSA) Area	Polygon	NOAA/NWS	n/a	<a href="http://www.prh.noaa.gov/ptwc/">http://www.prh.noaa.gov/ptwc/</a>	

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices

Sub Category	Theme	Type	POC	Restrictions	URL
Geologic	Earthquake Epicenters - Historic	Point	USGS/NEIC (USGS National Atlas)	n/a	<a href="http://earthquake.usgs.gov/research/topics.php?areaID=13">http://earthquake.usgs.gov/research/topics.php?areaID=13</a>
	Fault	Point	USGS National Atlas	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Fault Lines	Polyline	USGS National Atlas	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Lahars - Historic	Polygon	USGS	n/a	unavailable
	Lahars - Prediction/Probability	Polygon	USGS	n/a	unavailable
	Landslide Susceptibility	Polygon	USGS	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=landslide%20susceptibility&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=landslide susceptibility&amp;tab=lyr&amp;type=lyr</a>
	Landslides - Historic	Polygon	USGS	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Seismic Hazards	Polygon	USGS National Atlas	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Surficial Sediment Sinkhole Susceptibility	Polygon	USGS	n/a	unavailable
	Tsunami Hazard Area	Polygon	NOAA	n/a	unavailable
	Tsunami Worldwide	Point	NOAA	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
Volcanoes	Point	USGS National Atlas	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>	

Sub Category	Theme	Type	POC	Restrictions	URL
Weather	Drought Monitoring	Polygon	USDA	n/a	<a href="http://www.drought.unl.edu/dm/monitor.html">http://www.drought.unl.edu/dm/monitor.html</a>
	Floodplain - DFIRM	Polygon	FEMA	n/a	<a href="https://hazards.fema.gov/wps/portal/mapviewer">https://hazards.fema.gov/wps/portal/mapviewer</a>
	Floodplain - Q3	Polygon	FEMA	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=floodplainQ3&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=floodplainQ3&amp;tab=lyr&amp;type=lyr</a>
	Hurricane Error	Polygon	NOAA	n/a	unavailable
	Hurricane Forecasted Locations - Historic	Polyline	NOAA	n/a	<a href="http://nhc.boulder.noaa.gov/index.shtml">http://nhc.boulder.noaa.gov/index.shtml</a>
	Hurricane Forecasted Path - Historic	Polyline	NOAA	n/a	<a href="http://nhc.boulder.noaa.gov/index.shtml">http://nhc.boulder.noaa.gov/index.shtml</a>
	Hurricane Track - Current	Polyline	NOAA/NHC	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=hurricane%20tracks&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=hurricane tracks&amp;tab=lyr&amp;type=lyr</a>
	Hurricane Tracks - Historic	Polyline	NOAA/NHC	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=historic%20hurricane%20tracks&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=historic hurricane tracks&amp;tab=lyr&amp;type=lyr</a>
	Hurricane Wind Speeds - Historic	Point	NOAA/NHC	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=historic%20hurricane%20tracks&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=historic hurricane tracks&amp;tab=lyr&amp;type=lyr</a>
	Hurricane Windswath - Current	Polygon	NOAA	n/a	<a href="http://www.aoml.noaa.gov/hrd/data_sub/wind.html">http://www.aoml.noaa.gov/hrd/data_sub/wind.html</a>
	National Digital Forecast Database (NDFD)	Grid	NOAA/NWS	n/a	<a href="http://www.nws.noaa.gov/ndfd/technical.htm">http://www.nws.noaa.gov/ndfd/technical.htm</a>
	National Weather Service (NWS) Observation Stations	Point	NOAA/NWS	n/a	unavailable
	NEXRAD Radar Imagery (WSR-88D)	Raster	NOAA/NWS	n/a	<a href="http://radar.weather.gov/">http://radar.weather.gov/</a>
	Nexrad Radar Locations	Point	NOAA/NWS	n/a	<a href="http://www.unidata.ucar.edu/maps/nexrad.html">http://www.unidata.ucar.edu/maps/nexrad.html</a>
	NOAA Weather Radio All Hazards (NWR) Transmitters	Point	NOAA/NWS	n/a	<a href="http://www.nws.noaa.gov/nwr/nwrbro.htm">http://www.nws.noaa.gov/nwr/nwrbro.htm</a>
	NWS Upper Air Stations	Point	NOAA/NWS	n/a	<a href="http://www.ua.nws.noaa.gov/dataqc.htm">http://www.ua.nws.noaa.gov/dataqc.htm</a>
	Rainfall - Daily	Point	NOAA	n/a	<a href="http://precip.fsl.noaa.gov/beta/precip7.html">http://precip.fsl.noaa.gov/beta/precip7.html</a>
	Red Flag Warning (Wildfire)	Polygon	NOAA/NWS	n/a	<a href="http://fire.boi.noaa.gov/">http://fire.boi.noaa.gov/</a>
Remote Automated Weather Stations (RAWS)	Point	BLM	n/a	<a href="http://www.raws.dri.edu/">http://www.raws.dri.edu/</a>	
River Gage Levels	Point	USGS	n/a	<a href="http://waterdata.usgs.gov/nwis/rt">http://waterdata.usgs.gov/nwis/rt</a>	
Storm Cells	Polygon	NOAA/NWS	n/a	<a href="http://www.nws.noaa.gov/">http://www.nws.noaa.gov/</a>	

Team Members

GeoCONOPS

Requirements & Capabilities

Mission Specific Areas

Disaster Operations

Catastrophic Disasters

Appendices

Sub Category	Theme	Type	POC	Restrictions	URL
Weather	Storm Corridor	Polyline	NOAA/NWS	n/a	<a href="http://www.nws.noaa.gov/">http://www.nws.noaa.gov/</a>
	Storm Surge	Polygon	NOAA/NHC	n/a	<a href="http://www.nhc.noaa.gov/HAW2/english/surge/slosh.shtml">http://www.nhc.noaa.gov/HAW2/english/surge/slosh.shtml</a>
	Storm Surge Prediction (SLOSH)	Polygon	NOAA/NHC	n/a	<a href="http://www.weather.gov/mdl/psurge/download.php">http://www.weather.gov/mdl/psurge/download.php</a>
	Tornado Touchdown - Historic	Point	NOAA/NWS	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Tropical Cyclone Wind Speed Probabilities	Polygon	NOAA/NHC	n/a	<a href="http://www.spc.noaa.gov/products/wwa/">http://www.spc.noaa.gov/products/wwa/</a>
	Tropical Storms - Historic	Polygon	NOAA	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	World Wide Weather Conditions	Polygon	NOAA	n/a	<a href="http://www.worldweather.org/">http://www.worldweather.org/</a>
Wildfire	Active Fire Origins	Point	DOI/NIFC	n/a	unavailable
	Fire Detection	Point	USGS GeoMAC (MODIS or AVHRR)	n/a	unavailable
	Fire Perimeters - Historic	Polygon	DOI/NIFC (USGS GeoMAC)	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=fire%20perimeters%20historic&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=fire perimeters historic&amp;tab=lyr&amp;type=lyr</a>
	Fire Watch/Lookout	Point	NOAA/NWS	n/a	unavailable
	Fire Weather Watch	Polygon	NOAA/NWS	n/a	<a href="http://forecast.weather.gov/wwamap/wwatxtget.php?cwa=mqt&amp;wwa=fire%20weather%20watch">http://forecast.weather.gov/wwamap/wwatxtget.php?cwa=mqt&amp;wwa=fire%20weather%20watch</a>
	Red Flag Warnings	Polygon	NOAA/NWS	n/a	unavailable
<b>Nuclear Facilities</b>					
Deactivated Nuclear Facilities	Deactivated Nuclear Facilities	Point	NRC	n/a	unavailable
Nuclear Fuel	Nuclear Fuel	Point	TGI (NRC)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
Nuclear Fuel Cycle Facilities	Fuel Fabrication Facilities	Point	NRC	n/a	<a href="http://www.nrc.gov/info-finder/materials/">http://www.nrc.gov/info-finder/materials/</a>
	Uranium Mill Sites	Point	NRC	n/a	<a href="http://www.nrc.gov/info-finder/materials/uranium/">http://www.nrc.gov/info-finder/materials/uranium/</a>
	Uranium Milling Facilities	Point	NRC	n/a	<a href="http://www.nrc.gov/info-finder/materials/">http://www.nrc.gov/info-finder/materials/</a>
	Uranium Radium and Vanadium Ores	Point	USGS	n/a	unavailable

Sub Category	Theme	Type	POC	Restrictions	URL
Nuclear Materials Transport	Proposed Nuclear Waste Highway Routes	Polyline	NRC	n/a	<a href="http://www.state.nv.us/nucwaste/states/states.htm">http://www.state.nv.us/nucwaste/states/states.htm</a>
	Proposed Nuclear Waste Railroad Routes	Polyline	NRC	n/a	<a href="http://www.state.nv.us/nucwaste/states/states.htm">http://www.state.nv.us/nucwaste/states/states.htm</a>
	WIPP Transuranic Waste Routes	Polyline	DOE	n/a	<a href="http://www.wipp.energy.gov/routes.htm">http://www.wipp.energy.gov/routes.htm</a>
Nuclear Power Plants	Nuclear Plants	Point	NGA-PMHP (NRC)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Nuclear Power Facilities - Commercial	Polygon	NRC	n/a	<a href="http://www.nrc.gov/info-finder/materials/">http://www.nrc.gov/info-finder/materials/</a>
	Nuclear Power Reactors - Commercial	Point	NRC	n/a	<a href="http://www.eia.doe.gov/cneaf/nuclear/page/nuc_reactors/reactsum.html">http://www.eia.doe.gov/cneaf/nuclear/page/nuc_reactors/reactsum.html</a>
Radioactive Waste Management	Nuclear Waste Sites	Point	NRC (DOE)	n/a	<a href="http://www.nrc.gov/waste.html">http://www.nrc.gov/waste.html</a>
	Spent Fuel Storage Facilities	Point	NRC (DOE)	n/a	<a href="http://www.nrc.gov/waste/spent-fuel-storage/locations.html">http://www.nrc.gov/waste/spent-fuel-storage/locations.html</a>
	TRU Waste Sites	Point	DOE	n/a	unavailable
Regulatory, Oversight and Industry	Emergency Operations Facilities (EOF)	Point	NRC	n/a	unavailable
	Emergency Planning Zone (EPZ) Grids (2-, 5-, 10-, 50-Mile)	Polygon	NRC	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=epz&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=epz&amp;tab=lyr&amp;type=lyr</a>
	Fuel Cycle Licensees	Point	NRC	n/a	<a href="http://www.nrc.gov/materials/fuel-cycle-fac/licensing.html">http://www.nrc.gov/materials/fuel-cycle-fac/licensing.html</a>
	NRC Nuclear Material Licensees Locations (W/I Non-Agreement States)	Point	NRC	n/a	unavailable
	NRC Offices	Point	NRC	n/a	<a href="http://www.nrc.gov/about-nrc/locations.html#usmap">http://www.nrc.gov/about-nrc/locations.html#usmap</a>
	NRC Regions	Polygon	NRC	n/a	<a href="http://www.nrc.gov/info-finder/region-state/">http://www.nrc.gov/info-finder/region-state/</a>
	Nuclear Emergency Evacuation Routes	Polyline	NRC	n/a	unavailable
	Nuclear Material License Agreement States (34)	Polygon	NRC	n/a	<a href="http://www.nrc.gov/info-finder/materials/#state-list">http://www.nrc.gov/info-finder/materials/#state-list</a>
	Nuclear Material Licensees	Point	NRC	n/a	<a href="http://www.nrc.gov/info-finder/materials/#state-list">http://www.nrc.gov/info-finder/materials/#state-list</a>
Protective Action Sectors (PAS)	Polygon	NRC	n/a	unavailable	
Research, Training, and Test Reactors	Nuclear Research Facilities	Point	TGI (NRC)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Nuclear Research, Training and Test Reactors	Point	NRC	n/a	<a href="http://www.nrc.gov/reactors/operating/project-managers.html#non-pwr">http://www.nrc.gov/reactors/operating/project-managers.html#non-pwr</a>

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices

Sub Category	Theme	Type	POC	Restrictions	URL
<b>Population/ Demographics</b>					
Census	CENSUS 2000	Polygon	US Census	n/a	<a href="http://www.census.gov/main/www/cen2000.html">http://www.census.gov/main/www/cen2000.html</a>
	CENSUS 2010 (Forecast)	Polygon	US Census	n/a	unavailable
	Metropolitan Statistical Areas	Polygon	US Census	n/a	<a href="http://www.census.gov/population/www/metroareas/metrodef.html">http://www.census.gov/population/www/metroareas/metrodef.html</a>
	Population by Census Tracts	Polygon	US Census	n/a	<a href="http://www.census.gov/geo/www/relate/rel_tract.html">http://www.census.gov/geo/www/relate/rel_tract.html</a>
	Population by City	Polygon	US Census	n/a	<a href="http://www.census.gov/popest/cities/">http://www.census.gov/popest/cities/</a>
	Population by County	Polygon	US Census	n/a	<a href="http://www.census.gov/popest/counties/">http://www.census.gov/popest/counties/</a>
Crime	Arson Report	Point	DOJ	n/a	<a href="http://www.fbi.gov/ucr/cius2007/index.html">http://www.fbi.gov/ucr/cius2007/index.html</a>
	Assault Report	Point	DOJ	n/a	<a href="http://www.fbi.gov/ucr/cius2007/index.html">http://www.fbi.gov/ucr/cius2007/index.html</a>
	Burglary Report	Point	DOJ	n/a	<a href="http://www.fbi.gov/ucr/cius2007/index.html">http://www.fbi.gov/ucr/cius2007/index.html</a>
	Larceny Report	Point	DOJ	n/a	<a href="http://www.fbi.gov/ucr/cius2007/index.html">http://www.fbi.gov/ucr/cius2007/index.html</a>
	Motor Vehicle Theft Report	Point	DOJ	n/a	<a href="http://www.fbi.gov/ucr/cius2007/index.html">http://www.fbi.gov/ucr/cius2007/index.html</a>
	Murder Report	Point	DOJ	n/a	<a href="http://www.fbi.gov/ucr/cius2007/index.html">http://www.fbi.gov/ucr/cius2007/index.html</a>
	Rape Report	Point	DOJ	n/a	<a href="http://www.fbi.gov/ucr/cius2007/index.html">http://www.fbi.gov/ucr/cius2007/index.html</a>
	Robbery Report	Point	DOJ	n/a	<a href="http://www.fbi.gov/ucr/cius2007/index.html">http://www.fbi.gov/ucr/cius2007/index.html</a>
Labor, Income and Employment	Income and Employment	Polygon	DOC/BEA	n/a	<a href="http://www.bea.gov/regional/remdmap/">http://www.bea.gov/regional/remdmap/</a>
	Labor Statistics	Polygon	DOL/BLS	n/a	<a href="http://www.bls.gov/">http://www.bls.gov/</a>
	Poverty and Median Income	Polygon	DOC	n/a	<a href="http://www.census.gov/hhes/www/income/income.html">http://www.census.gov/hhes/www/income/income.html</a>
	Social Security Allocation	Point	SSA	n/a	<a href="http://www.usatrace.com/ssnchart.html">http://www.usatrace.com/ssnchart.html</a>
LandScan USA	LandScan USA - Raster Population	Raster	Oak Ridge National Laboratory (DHS)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>



Sub Category	Theme	Type	POC	Restrictions	URL
<b>Postal/Shipping</b>					
Courier	DHL Locations	Point	DHS	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	FedEx Locations	Point	DHS	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Private Non-Retail Shipping	Point	TGI (USPS, DHS)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	UPS Locations	Point	DHS	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	ZIP Code	Polygon	US Census (USPS)	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
Mailing/shipping	Bulk Mail Centers	Point	USPS	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
Routing	Arms, Ammunition and Explosive Shipping Routes	Polyline	DoD/TRANSCOM	n/a	unavailable
USPS	USPS Inspection Service Offices	Point	USPS	n/a	<a href="https://postalinspectors.uspis.gov/#">https://postalinspectors.uspis.gov/#</a> or <a href="http://www.usps.com/nsc/locators/find-is.html">http://www.usps.com/nsc/locators/find-is.html</a>
	USPS Post Offices - Contract	Point	USPS	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	USPS Post Offices - Owned	Point	USPS	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	USPS Processing Facilities	Point	USPS	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
<b>Specialized Response Teams</b>					
DHHS	DHHS Incident Response Coordination Team (IRCT)	Point	DHHS	n/a	unavailable
	DHHS Teams	Point	NDMS	n/a	unavailable
	Key Personnel Deployment	Point	DHHS/SOC	n/a	unavailable

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices

Sub Category	Theme	Type	POC	Restrictions	URL
DHS	CBP Search, Trauma, and Rescue (BORSTAR) Team Locations	Point	DHS/CBP	n/a	unavailable
	Disaster Medical Assistance Team (DMAT) Locations	Point	FEMA	n/a	unavailable
	Disaster Mortuary Operational Response Team (DMORT) Locations	Point	FEMA	n/a	unavailable
	FEMA Damage Assessment Teams	Point	FEMA	n/a	unavailable
	FEMA Emergency Response Team-Regional (ERT-A)	Point	FEMA	n/a	unavailable
	FEMA Federal Incident Response Support Team (FIRST)	Point	FEMA	n/a	unavailable
	FEMA Incident Management Assistance Team (IMAT)	Point	FEMA	n/a	unavailable
	FEMA MERS/MATTS Home Bases	Point	FEMA	n/a	unavailable
	FEMA MERS/MATTS Locations (Deployed)	Point	FEMA	n/a	unavailable
	FEMA NDMS Team Home Locations	Point	FEMA	n/a	unavailable
	FEMA US&R	Point	FEMA	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	FEMA US&R Canine Teams	Point	FEMA	n/a	unavailable
	FEMA US&R Incident Support Teams	Point	FEMA	n/a	unavailable
	FEMA US&R Team Home Bases	Point	FEMA	n/a	unavailable
	FEMA US&R Teams (Deployed)	Point	FEMA	n/a	unavailable
	Incident Management Teams (IMTs) Federal Type 1 and Type 2	Point	FEMA	n/a	unavailable
	Maritime Safety and Security Team (MSST) Bases	Point	DHS/USCG	n/a	unavailable
	Maritime Safety and Security Team (MSST) Deployed Locations	Point	DHS/USCG	n/a	unavailable
	Medical Emergency Radiological Response Team (MERRT)	Point	FEMA	n/a	unavailable
	National Medical Response Teams (NMRTS)	Point	FEMA	n/a	<a href="http://nmrt-ncr.com/">http://nmrt-ncr.com/</a>
	National Nurse Response Teams (NNRT)	Point	FEMA	n/a	unavailable
	National Pharmacy Response Teams (NPRT)	Point	FEMA	n/a	unavailable
	National Veterinary Response Team (NVRT) Locations	Point	FEMA	n/a	unavailable
Scientific and Technical Advisory and Response Teams (STARTS)	Point	FEMA	n/a	unavailable	
USCG National Strike Force Bases	Point	DHS/USCG	n/a	unavailable	
USCG National Strike Force Deployed Locations	Point	DHS/USCG	n/a	unavailable	
USCG Strike Teams	Point	DHS/USCG	n/a	unavailable	

Sub Category	Theme	Type	POC	Restrictions	URL
DoD	NGB WMD Civil Support Teams	Point	NGB	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	NGB WMD-Civil Support Team Deployed Locations	Point	NGB (JFHQ-STATE)	n/a	<a href="http://www.au.af.mil/au/c21/wmd-cst.htm">http://www.au.af.mil/au/c21/wmd-cst.htm</a>
	USACE Planning & Response Teams (PRTS)	Point	DoD/USACE	n/a	unavailable
Other Federal Agency	Aviation Safety Teams	Point	DOT (DOI)	n/a	unavailable
	DOE Nuclear Incident Response Team (NIRT)	Point	DOE	n/a	<a href="http://www.nrc.gov/about-nrc/organization/nsirfuncdesc.html">http://www.nrc.gov/about-nrc/organization/nsirfuncdesc.html</a>
	DOI Interagency Hotshot Crews	Point	DOI/NIFC	n/a	unavailable
	DOL/OSHA Specialized Response Teams	Point	DOL/OSHA	n/a	unavailable
	EPA Counter Terrorism Response Teams (CTRT)	Point	EPA	n/a	unavailable
	EPA Environmental Response Team (ERT)	Point	EPA	n/a	unavailable
	EPA National Counter Terrorism Evidence Response Team (NCERT)	Point	EPA	n/a	unavailable
	FBI Domestic Emergency Support Team (DEST)	Point	DOJ/FBI	n/a	unavailable
	Infrastructure Assessment Response Team	Point	DOD/USACE	n/a	unavailable
	Mine Rescue Teams	Point	MSHA/MEO	n/a	unavailable
	Navigation Response Team	Point	NOAA	n/a	unavailable
	NOAA Incident Meteorologists (IMET)	Point	NOAA	n/a	unavailable
	Oil Spill/HAZMAT Response Team	Point	NOAA	n/a	unavailable
	Vaccination Teams	Point	VA	n/a	unavailable
State/Local	CBRNE Enhanced Response Force Package (CERF-P)	Point	NGB	n/a	unavailable
	Donations Coordination Teams	Point	FEMA (State/Local)	n/a	unavailable
	Hazmat Emergency Response Units - Local	Point	FEMA (State/Local)	n/a	unavailable
	NGB WMD-Civil Support Team Bases	Point	NGB (JFHQ-STATE)	n/a	<a href="http://www.globalsecurity.org/military/agency/army/wmd-cst.htm">http://www.globalsecurity.org/military/agency/army/wmd-cst.htm</a>
	Search and Rescue Units - Local	Point	FEMA (State/Local)	n/a	unavailable

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices

Sub Category	Theme	Type	POC	Restrictions	URL
<b>Telecommunications</b>					
Broadcasting	AM Antennas	Point	FCC	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Antenna Structure Registrars	Point	FCC	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Broadband - Co-Location Facilities	Point	FCC	n/a	unavailable
	Cable Franchise Boundaries	Polygon	FCC	n/a	unavailable
	FCC AM	Point	FCC	n/a	<a href="http://finder.geocommons.com/overlays/1482">http://finder.geocommons.com/overlays/1482</a>
	FCC FM	Point	FCC	n/a	<a href="http://www.fcc.gov/mb/audio/fmq.html">http://www.fcc.gov/mb/audio/fmq.html</a>
	FCC TV	Point	FCC	n/a	<a href="http://www.fcc.gov/mb/video/tvq.html">http://www.fcc.gov/mb/video/tvq.html</a>
	FM Antennas	Point	FCC	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	FM Radio Contours	Polygon	FCC	n/a	<a href="http://www.fcc.gov/mb/audio/fmclasses.html">http://www.fcc.gov/mb/audio/fmclasses.html</a>
	FM Radio Towers	Point	FCC	n/a	unavailable
	Microwave Towers	Point	FCC (DHS/NCS)	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Television Contours	Polygon	FCC	n/a	unavailable
	Television Towers	Point	FCC	n/a	unavailable
	TV DIGITAL	Point	FCC	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
TV NTSC	Point	FCC	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>	
Communications	Fiber Lit Buildings Locations	Point	Navteq (DHS/NCS, FCC)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Fiber Optic Lines	Polyline	NGA (FCC, NCS)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	IT Locations/Portals	Point	DHS	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Land Mobile Broadcast	Point	FCC	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Land Mobile Communications	Point	FCC	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Land Mobile Private	Point	FCC	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	LATA Boundary	Polygon	Navteq (DHS/NCS, FCC)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Metro Fiber USA	Polyline	Navteq (FCC, NANPA, DHS/NCS)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Rate Center Boundaries	Polygon	Navteq (FCC, NANPA, DHS/NCS)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
Wire Center Boundaries	Polygon	Navteq (FCC, NANPA, DHS/NCS)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>	
DoD	Armed Forces Reserve Communications Units	Point	DoD (NGB)	n/a	<a href="http://www.fcc.gov/Bureaus/MB/Databases/tv_service_contour_data/readme.html">http://www.fcc.gov/Bureaus/MB/Databases/tv_service_contour_data/readme.html</a>

Sub Category	Theme	Type	POC	Restrictions	URL
Internet	Cable Landings	Point	FCC	n/a	unavailable
	Cable Modem Coverage	Polygon	FCC	n/a	unavailable
	CLEC Fiber Lines	Polyline	FCC	n/a	unavailable
	CLEC Hqs	Point	FCC	n/a	unavailable
	DSL - Enabled Wire Centers	Point	FCC	n/a	unavailable
	High Speed Service Providers	Point	FCC	n/a	unavailable
	Internet Access Points	Point	DHS	n/a	unavailable
	Internet Exchange Points	Point	DHS	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Internet Hubs	Point	FCC	n/a	unavailable
	Internet Service Provider Areas	Polygon	DHS	n/a	unavailable
	Internet Service Providers	Point	DHS	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
Priority/ Emergency Assets	FEMA National Emergency Coordination NET Assets	Point	FEMA	n/a	unavailable
	Government Emergency Telecommunications Service (GETS) Assets	Point	DHS/NCS	n/a	<a href="http://gets.ncs.gov/contact.html">http://gets.ncs.gov/contact.html</a>
	NCS Shared Resources (SHARES) High-Frequency Radio Program Assets	Point	DHS/NCS	n/a	unavailable
	Telecommunications Service Priority (TSP) Program Assets	Point	DHS/NCS	n/a	unavailable
	Wireless Priority Service (WPS)	Point	DHS/NCS	n/a	unavailable
Satellite	Continuously Operating Reference Stations (CORS)	Point	National Geodetic Survey	n/a	<a href="http://geodesy.noaa.gov/CORS/cors-data.html">http://geodesy.noaa.gov/CORS/cors-data.html</a>
	Satellite Control Stations	Point	FCC	n/a	unavailable
Transport Facilities	Microwave Facilities (Commercial)	Point	FCC	n/a	unavailable
	Telecom Hotels	Point	FCC	n/a	unavailable
Wired	Area Code	Polygon	FCC	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Border Gateways	Point	FCC (DHS/NCS)	n/a	unavailable
	Central Offices/Switching Stations	Point	FCC (DHS/NCS)	n/a	unavailable
	International Gateways	Point	FCC (DHS/NCS)	n/a	unavailable
	Tandem Offices	Point	FCC (DHS/NCS)	n/a	unavailable
	Underwater Cable Facilities	Point	FCC (DHS/NCS)	n/a	unavailable
	Wire Centers	Point	FCC (DHS/NCS)	n/a	unavailable

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices

Sub Category	Theme	Type	POC	Restrictions	URL
Wireless	Cellular Market Area	Polygon	FCC	n/a	unavailable
	Cellular Towers	Point	FCC (DHS/NCS)	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Mobile Communications Equipment Production	Point	FEMA (DoD/DLA)	n/a	unavailable
	Mobile Communications Equipment Storage	Point	FEMA (DoD/DLA)	n/a	unavailable
	Paging Towers	Point	FCC (DHS/NCS)	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Regional Fiber Optics	Polyline	FCC (DHS/NCS)	n/a	unavailable
<b>Threat/ Suspicious Activity</b>					
Reports	Events of Interest	Point	DHHS/SOC (FEMA)	n/a	unavailable
	Location Based Threat Reporting	Point	DHS/NOC	n/a	unavailable
Surveillance	Surveillance or Suspicious Activity	Point	DHS/NOC	n/a	unavailable

Sub Category	Theme	Type	POC	Restrictions	URL
<b>Transportation</b>					
Aviation	Aero Navaids	Point	FAA	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Aero Obstructions	Point	FAA	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Air Route Traffic Control Center (ARTCC)	Point	FAA (DOT)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Air Route Traffic Control Centers - Regions	Polygon	FAA (DOT)	n/a	<a href="http://www.faa.gov/about/office_org/headquarters_offices/ato/artcc/">http://www.faa.gov/about/office_org/headquarters_offices/ato/artcc/</a>
	Air Traffic - Flight Path Points	Point	FAA (DOT)	n/a	unavailable
	Airport Districts	Polygon	FAA (DOT)	n/a	unavailable
	Airport/Airfield Boundaries	Polygon	FAA (DOT)	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=airportboundaries&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=airportboundaries&amp;tab=lyr&amp;type=lyr</a>
	Airports - Private	Polygon	FAA (DOT)	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=heliports&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=heliports&amp;tab=lyr&amp;type=lyr</a>
	Airports - Public Use	Polygon	FAA (DOT)	n/a	unavailable
	Airports Heliports	Point	DOT/NTAD	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Commercial Airport Facilities (Building Polygons)	Polygon	FAA (DOT)	n/a	unavailable
	FAA Flight Feed	Point	FAA (DOT)	n/a	unavailable
	FAA Flight Snapshot	Point	FAA (DOT)	n/a	unavailable
	FAA Flight Standard District Office (FSDO)	Point	FAA (DOT)	n/a	<a href="http://www.faa.gov/about/office_org/field_offices/fsdo/">http://www.faa.gov/about/office_org/field_offices/fsdo/</a>
	FAA Regions	Polygon	NGA (FAA, DOT)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	FAA Schools	Point	FAA (DOT)	n/a	unavailable
	FAA Terminal Radar Approach Control (TRACON) Facilities	Point	FAA (DOT)	n/a	<a href="http://www.faa.gov/about/office_org/headquarters_offices/ato/tracon/">http://www.faa.gov/about/office_org/headquarters_offices/ato/tracon/</a>
	Flight Paths	Polygon	FAA (DOT)	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=flightpaths&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=flightpaths&amp;tab=lyr&amp;type=lyr</a>
	Flight Restriction Zones	Polygon	FAA (DOT)	n/a	unavailable
	FRMAC Aviation Assets	Point	DOE/FRMAC	n/a	unavailable
Government Aviation Asset/Bases	Polygon	FAA (DOT)	n/a	unavailable	
Heliports - Private	Point	FAA (DOT)	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=heliports&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=heliports&amp;tab=lyr&amp;type=lyr</a>	
Heliports - Public	Point	FAA (DOT)	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=heliports&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=heliports&amp;tab=lyr&amp;type=lyr</a>	
Metropolitan Washington Airports Authority Lands	Polygon	MWAA	n/a	unavailable	

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices

Sub Category	Theme	Type	POC	Restrictions	URL
Aviation	Military Airfields and Air Bases	Polygon	DoD/DISDI GEOBASE	n/a	unavailable
	Runways	Polygon	DOT/NTAD (FAA)	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Sea Plane Bases	Point	FAA (DOT)	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=seaplanebases&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=seaplanebases&amp;tab=lyr&amp;type=lyr</a>
	Short Take-off/Landing Ports	Point	FAA (DOT)	n/a	unavailable
	Ultralight Ports	Point	FAA (DOT)	n/a	unavailable
Intermodal	Intermodal Facilities	Point	DOT/NTAD	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Intermodal Terminals	Point	DOT/BTS	n/a	<a href="http://www.loadmatch.com/directory/city.cfm?category=terminals">http://www.loadmatch.com/directory/city.cfm?category=terminals</a>



Sub Category	Theme	Type	POC	Restrictions	URL
Maritime	Anchorage Areas	Polygon	DoD/USACE	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=anchorageareas&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=anchorageareas&amp;tab=lyr&amp;type=lyr</a>
	Anchorage	Point	DOD/USACE	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Boating Facilities	Point	DHS/USCG (DoD/USACE)	n/a	unavailable
	Breakwater Lines	Polyline	NOAA, DoD/USACE	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Breakwater Points	Point	NOAA, DoD/USACE	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Canals	Polyline	DOT/BTS, DoD/USACE	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Channels	Polygon	DOT/BTS, DoD/USACE	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Commercial Ports	Point	DHS/USCG	n/a	unavailable
	Danger Zones	Polygon	DoD/USACE	n/a	unavailable
	Digital Nautical Charts	Raster	NGA	n/a	<a href="http://www.nga.mil/portal/site/dnc/index.jsp?front_door=true">http://www.nga.mil/portal/site/dnc/index.jsp?front_door=true</a>
	Electronic Navigational Charts (ENC)	Point	NOAA/OCS	n/a	<a href="http://ocsddata.ned.noaa.gov/ChartServerV2.0/jsp/index.jsp">http://ocsddata.ned.noaa.gov/ChartServerV2.0/jsp/index.jsp</a>
	Fairways	Polygon	DHS/USCG	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=fairways&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=fairways&amp;tab=lyr&amp;type=lyr</a>
	Ferry Terminals	Point	DOT/BTS	n/a	<a href="http://marinas.com/browse/ferry/US/">http://marinas.com/browse/ferry/US/</a>
	Home Ports	Point	NDMS	n/a	unavailable
	Inland Electronic Navigation Charts (IENC)	Point	DoD/USACE	n/a	<a href="http://www.agc.army.mil/echarts/inlandnav/">http://www.agc.army.mil/echarts/inlandnav/</a>
	Locks	Point	TGI (DoD/USACE)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Nautical NAVAIDS	Point	TGI (NOAA)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Navigable Waterways	Polygon	TGI (DOT/BTS, USACE)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Navigation Locks	Point	DoD/USACE	n/a	unavailable
	Piers/Wharves/Quays	Point	TGI (DoD/USACE)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
Port Cameras	Point	DHS/TSA	n/a	unavailable	
Port Facilities	Polygon	DHS/USCG	n/a	<a href="http://www.iwr.usace.army.mil/ndc/data/datapwd.htm">http://www.iwr.usace.army.mil/ndc/data/datapwd.htm</a>	
Port Water Boundaries	Polygon	DHS/USCG	n/a	unavailable	
Ports	Polygon	DoD/USACE (DOT/NTAD)	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>	

Sub Category	Theme	Type	POC	Restrictions	URL
Maritime	Principal Ports	Point	DHS/USCG	n/a	<a href="http://www.iwr.usace.army.mil/NDC/data/datappor.htm">http://www.iwr.usace.army.mil/NDC/data/datappor.htm</a>
	Restricted Zones	Polygon	DoD/USACE	n/a	unavailable
	River Mile Markers	Point	DoD/USACE	n/a	<a href="http://www.iwr.usace.army.mil/NDC/data/datamile.htm">http://www.iwr.usace.army.mil/NDC/data/datamile.htm</a>
	Safety & Security Zones	Polygon	DHS/USCG	n/a	unavailable
	Shipping Fairways	Polygon	TGI (NOAA, DHS/USCG)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
Mass Transit	Amtrak Railroad Lines	Polyline	DOT/FRA	n/a	unavailable
	Amtrak Stations	Point	DOT/NTAD (DOT/FRA)	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Amtrak Stations (BUS)	Point	DOT/NTAD (DOT/FRA)	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=amtrakstations&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=amtrakstations&amp;tab=lyr&amp;type=lyr</a>
	Bus Stations	Point	DOT (State/Local)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Bus Stops	Point	DOT (State/Local)	n/a	unavailable
	Bus Terminals	Point	DOT (State/Local)	n/a	unavailable
	Commuter Rail Transit Passenger Stations	Point	DOT/BTS	n/a	<a href="http://www.transtats.bts.gov/tables.asp?table_id=1180">http://www.transtats.bts.gov/tables.asp?table_id=1180</a>
	Commuter Rails	Polyline	DOT/BTS	n/a	<a href="http://www.transtats.bts.gov/Search.asp">http://www.transtats.bts.gov/Search.asp</a>
	Ferries	Point	TGI (DOT/BTS)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Ferry Routes	Polyline	TGI (DOT/BTS)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	HOV Lanes	Polyline	DOT/BTS	n/a	<a href="http://www.bts.gov/publications/north_american_transportation_atlas_data/">http://www.bts.gov/publications/north_american_transportation_atlas_data/</a>
	Light Rail	Polyline	DOT/BTS	n/a	unavailable
	Railroad Stations	Point	TGI (DOT/BTS, Navteq)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
Transit Line	Polyline	DOT/NTAD	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>	
Transit Station	Point	DOT/NTAD	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>	

Sub Category	Theme	Type	POC	Restrictions	URL
Railroad	Interchanges	Point	DOT/NTAD	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=interchanges&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=interchanges&amp;tab=lyr&amp;type=lyr</a>
	Rail Mile Markers	Point	DOT/FRA	n/a	<a href="http://www.iwr.usace.army.mil/NDC/data/datamile.htm">http://www.iwr.usace.army.mil/NDC/data/datamile.htm</a>
	Rail Nodes	Point	Oak Ridge National Laboratory (DOT/FRA, DOT/NTAD)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Rail Ramps	Point	DOT/FRA (DOT/NTAD)	n/a	<a href="http://www.bts.gov/publications/north_american_transportation_atlas_data/">http://www.bts.gov/publications/north_american_transportation_atlas_data/</a>
	Railroad	Polyline	TGI (DOT/BTS, DOT/NTAD, US Census)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Railroad - 1:100K	Polyline	DOT/FRA	n/a	<a href="http://www.bts.gov/publications/north_american_transportation_atlas_data/">http://www.bts.gov/publications/north_american_transportation_atlas_data/</a>
	Railroad - 1:2M	Polyline	DOT/FRA	n/a	unavailable
	Railroad Bridges	Point	DOT/FRA (DOT/NTAD, AAR)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Railroad Dispatch/Control Centers	Point	DOT/FRA (AAR)	n/a	<a href="http://www.bts.gov/publications/north_american_transportation_atlas_data/">http://www.bts.gov/publications/north_american_transportation_atlas_data/</a>
	Railroad Interlockings/Interfaces	Polyline	DOT/FRA (AAR)	n/a	unavailable
	Railroad Operation Centers	Point	DOT/FRA (DOT/NTAD)	n/a	<a href="http://www.bts.gov/publications/north_american_transportation_atlas_data/">http://www.bts.gov/publications/north_american_transportation_atlas_data/</a>
	Railroad Repair Shops	Point	DOT/FRA (AAR)	n/a	unavailable
	Railroad Tunnels	Point	DOT/FRA (DOT/NTAD, AAR)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Railroad Yards	Polygon	DOT/FRA (DOT/NTAD, AAR)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
Strategic Rail Corridor Network (STRACNET)	Polyline	DoD/TRANSCOM	n/a	unavailable	
Regulatory, Oversight and Industry	State DOT Facilities	Point	DOT (State DOT)	n/a	unavailable
	State DOT Hqs	Point	DOT (State DOT)	n/a	unavailable
	TSA - Machinery	Point	DHS/TSA	n/a	unavailable
	TSA - Screeners	Point	DHS/TSA	n/a	unavailable

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices

Sub Category	Theme	Type	POC	Restrictions	URL
Road	Automatic Traffic Counters	Point	DOT/NTAD	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Bridges	Point	DOT/NTAD	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Critical Transportation Infrastructure	Point	DOT	n/a	unavailable
	Exits	Polyline	DOT/NTAD, US Census	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Highways	Polyline	DOT/NTAD, US Census	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Interstates	Polyline	DOT/NTAD, US Census	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Major Highways	Polyline	DOT/NTAD, US Census	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Major Roads	Polyline	DOT/NTAD, US Census	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Secondary Hwys	Polyline	DOT/NTAD, US Census	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Strategic Highway Network (STRAHNET)	Polyline	DoD (DOT)	n/a	<a href="http://www.fhwa.dot.gov/planning/nhs/">http://www.fhwa.dot.gov/planning/nhs/</a>
	Streets	Polyline	DOT/NTAD, US Census	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Traffic Cameras - Video Feed	Video	DoD/TRANSCOM	n/a	unavailable
	Traffic Events	Point	DoD/TRANSCOM	n/a	unavailable
	Traffic Flow Monitors	Point	DoD/TRANSCOM	n/a	unavailable
Tunnels	Polyline	DOT/NTAD	n/a	<a href="http://www.bts.gov/publications/north_american_transportation_atlas_data/">http://www.bts.gov/publications/north_american_transportation_atlas_data/</a>	
Routing	Army National Guard Convoy Routes	Polyline	ARNG	n/a	unavailable
	Chlorine Shipment Routes	Polyline	DOT (AAR)	n/a	unavailable
	Movement Restriction Areas/Closures	Polygon	DoD/TRANSCOM	n/a	unavailable
	Route Cameras	Point	DoD/TRANSCOM	n/a	unavailable
	Toxic Inhalation Hazard (TIH) Railroad Routes	Polyline	DOT (AAR)	n/a	unavailable
	Transportation Choke Points	Point	DOT (AAR)	n/a	unavailable
<b>Water</b>					
Raw Water Storage	Raw Water Storage	Point	EPA (USGS NHD)	n/a	unavailable

Sub Category	Theme	Type	POC	Restrictions	URL
Raw Water Supply	Aqueducts	Polyline	USGS NHD (EPA)	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=aqueducts&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=aqueducts&amp;tab=lyr&amp;type=lyr</a>
	Aquifers	Point	USGS National Atlas	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Covered Reservoirs	Point	EPA (USGS NHD)	n/a	<a href="http://nhdgeo.usgs.gov/viewer.htm">http://nhdgeo.usgs.gov/viewer.htm</a>
	Drinking Water Intake	Point	EPA (USGS NHD)	n/a	unavailable
	Ground Water	Point	USGS NHD	n/a	<a href="http://nhdgeo.usgs.gov/viewer.htm">http://nhdgeo.usgs.gov/viewer.htm</a>
	Reservoirs	Polygon	USGS/GNIS (USGS NHD)	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Spring	Point	USGS/GNIS (USGS NHD)	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Surface Water	Point	USGS NHD	n/a	<a href="http://nhdgeo.usgs.gov/viewer.htm">http://nhdgeo.usgs.gov/viewer.htm</a>
	Uncovered Reservoirs	Polygon	EPA (USGS NHD)	n/a	<a href="http://nhdgeo.usgs.gov/viewer.htm">http://nhdgeo.usgs.gov/viewer.htm</a> or
	Water Sources (intake)	Point	EPA	n/a	unavailable
Regulatory, Oversight and Industry	Federal Water Agencies	Point	EPA	n/a	unavailable
	State Utility Commissions - Water	Point	EPA (AWWA, ASDWA)	n/a	unavailable
Treated Water Distribution Systems	Community Water System	Polygon	EPA	n/a	unavailable
	Fire Hydrants	Point	EPA	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=firehydrants&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=firehydrants&amp;tab=lyr&amp;type=lyr</a>
	Pumping Stations	Point	EPA	n/a	unavailable
	Treated Water Monitoring Systems	Point	EPA	n/a	unavailable
	Water Distribution Lines	Polyline	EPA	n/a	unavailable
	Water Transmission/Distribution Mains	Polyline	EPA	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=watermains&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=watermains&amp;tab=lyr&amp;type=lyr</a>
Treated Water Storage	Water Towers	Point	EPA	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=water%20towers&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=water%20towers&amp;tab=lyr&amp;type=lyr</a>

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices

Sub Category	Theme	Type	POC	Restrictions	URL
Wastewater Facilities	Drainage	Polyline	DoD/USACE	No	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Manholes	Point	EPA	n/a	<a href="http://www.mapdex.org/search/search.cfm?layerkeyword=manholes&amp;tab=lyr&amp;type=lyr">http://www.mapdex.org/search/search.cfm?layerkeyword=manholes&amp;tab=lyr&amp;type=lyr</a>
	Sewage Lift Stations	Point	EPA	n/a	unavailable
	Sewage Mains	Polyline	EPA	n/a	unavailable
	Sewage Treatment Facilities	Point	Dun & Bradstreet (EPA)	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Treated Wastewater Monitoring Systems	Point	EPA	n/a	unavailable
	Wastewater Control Centers	Point	EPA	n/a	unavailable
	Wastewater Discharge Systems	Point	EPA	n/a	unavailable
	Wastewater Facilities	Point	EPA	Yes	<a href="https://www.hifldwg.org/hsip.asp">https://www.hifldwg.org/hsip.asp</a>
	Wastewater Raw Influent Storage	Point	EPA	n/a	unavailable
Water Treatment Facilities	Point	EPA	n/a	unavailable	



## APPENDIX C: CIVIL SUPPORT

The Department of Defense (DoD) protects the Continental United States (CONUS) through two distinct but interrelated missions: Homeland Defense (HD) and Civil Support (CS) missions. DoD serves as the federal department with lead responsibility for HD, which may be executed by DoD alone or include support provided to DoD by other agencies. While these missions are distinct, some department roles and responsibilities overlap, and operations require extensive coordination between lead and supporting agencies.

The actors interviewed for HD/CS support include US Northern Command (USNORTHCOM)/US Pacific Command (USPACOM), National Geospatial Intelligence Agency (NGA), and National Guard Bureau (Title 10 Status). The Civil Support Appendix will evolve in future phases of the GeoCONOPS project when the focus moves to catastrophic, intelligence, and law enforcement missions.

CS is defined as the application of DoD's rapid response and other technical capabilities to domestic emergencies or disasters in support of civil authorities. CS includes, but is not limited

to, support to US civil authorities for natural and manmade domestic emergencies, civil disturbances, and authorized law enforcement activities. When this type of support is requested through a formal request process, approved by the President or Secretary of Defense (SecDef), and executed under the guidance of the National Response Framework (NRF), the support is characterized as Defense Support of Civil Authorities (DSCA). For the purposes of this GeoCONOPS, the umbrella term “Civil Support” is assumed to include the activities, roles, and responsibilities described by the following legacy terms: CS, DSCA, and Military Assistance for Civil Disturbance (MACD).

DoD is a full partner in the federal response to domestic incidents, and the DoD response is fully coordinated through the mechanisms outlined in the NRF. In providing CS, the SecDef will always retain command of DoD personnel, with the exception of National Guard forces under the command and control of the Governors (State Guard in Title 32 status: State Mission, Federally Funded). Nothing in the NRF impedes the SecDef’s statutory authority pertaining to DoD personnel and resources.

Per Joint Publication 3-28 Civil Support, the authority over and control of DoD capabilities is maintained by the President, as Commander in Chief, through the SecDef and the chain of command as established by law. When emergency conditions dictate, and when time does not permit approval from higher headquarters, local military commanders and responsible DoD component officials are authorized to respond to requests from local authorities and to initiate immediate response actions to save lives, prevent human suffering, or mitigate great property damage under imminently serious conditions.

Requests for DoD assistance may occur under Stafford Act or non-Stafford Act conditions. The Robert T. Stafford Disaster Relief and Emergency Assistance Act (Public Law 93-288) (Title 42 US

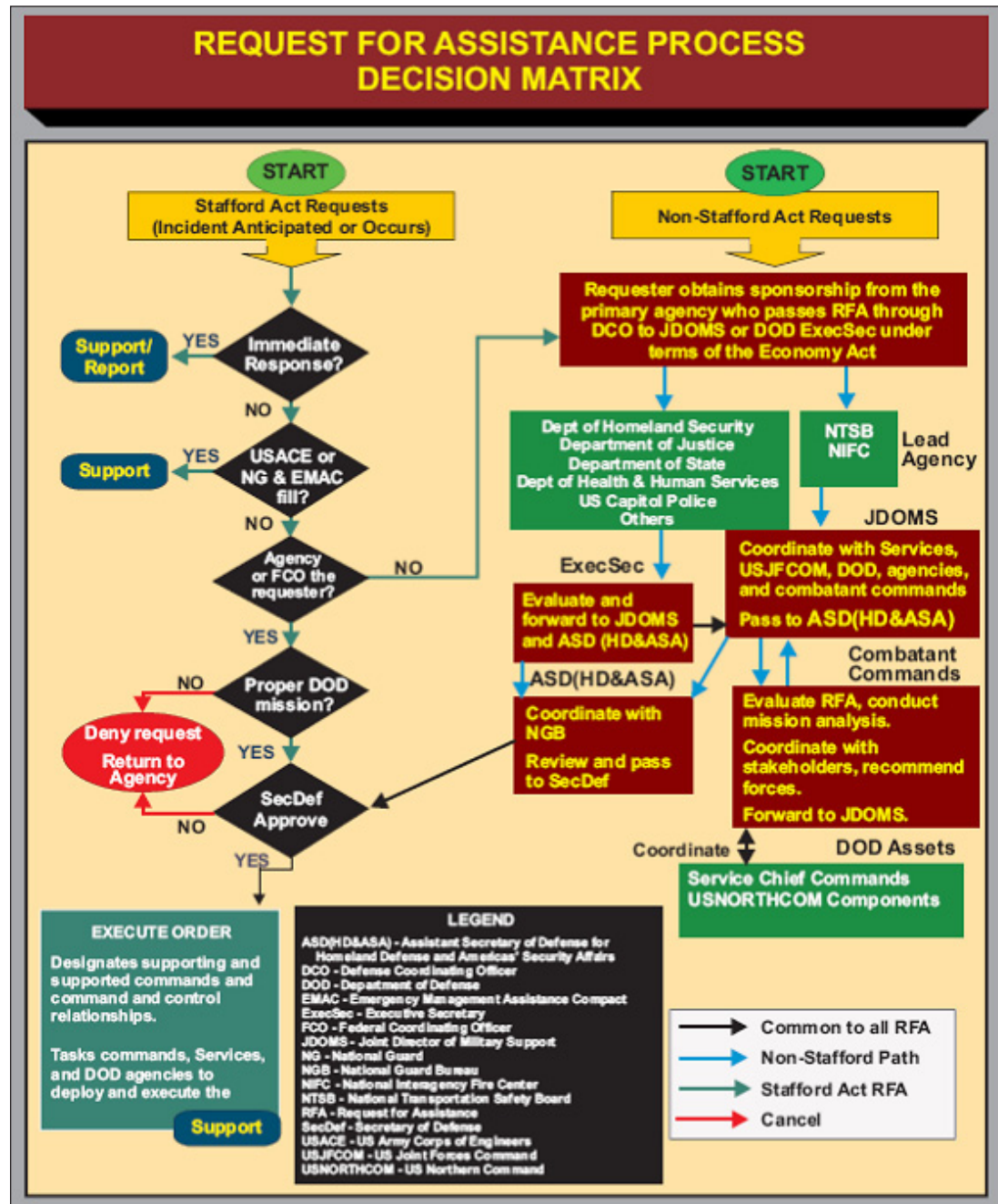


Figure C-1: Request For Assistance Process Decision Matrix



Code, Section 5121), authorizes the Federal Government to help state and local governments alleviate the suffering and damage caused by disasters. DoD support in a domestic disaster or a presidential declaration of emergency is in support of the primary or coordinating agency(ies). Military commanders and responsible DoD civilians may, under certain conditions, respond under immediate response authority to save lives, prevent suffering, and mitigate great property damage under imminently serious conditions. Without a disaster declaration, the President may also direct DoD to support the response to a disaster or emergency for a period not to exceed 10 days.<sup>1</sup>

DoD has assigned 10 Defense Coordinating Officers (DCO), one to each FEMA region. If requested and approved, the DCO serves as DoD's single point of contact at the JFO for requesting assistance from DoD. With few exceptions, requests for CS originating at the JFO are coordinated with and processed through the DCO. The DCO may have a Defense Coordinating Element (DCE) consisting of a staff and military liaison officers to facilitate coordination and support to activated Emergency Support Functions (ESF). Specific responsibilities of the DCO (subject to modification based on the situation) include processing requirements for military support, forwarding mission assignments to the appropriate military organizations through DoD-designated channels, and assigning military liaisons, as appropriate, to activated ESFs.<sup>2</sup>

As noncatastrophic events emerge, the DoD will initiate various tasking chains and mechanisms

- 1 *Joint Publication 3-28, Civil Support, September 14, 2007.*
- 2 *DOD Support to Domestic Incidents, January 2008. Prepared by The Office of the Assistant Secretary of Defense/Homeland Defense and America's Security Affairs.*

to support information requests, analysis, and coordination efforts for CS. Formal tasking requests for support and information will be processed by USNORTHCOM/USPACOM, National-Geospatial Intelligence Agency (NGA), Defense Program Office for Mission Assurance (DPO-MA), and other DoD agencies. As one of foundational organizations supporting CS, USNORTHCOM's command structure of governance and reporting is typical of many DoD organizations. Reporting to USNORTHCOM are component commands for each of the services, US Army North (USARNORTH), US Air Force North (USAFNORTH), US Fleet Forces Command, etc. The USARNORTH commander has additional duties in charge of the Joint Land Forces Component Command (JFLCC). There are also specialized Joint Task Forces (JTF) with specific missions. Of the various JTFs, the main one charged with executing tasks related to CS is Joint Task Force-Civil Support, headquartered in Norfolk, VA. During crisis events the JTF-CS commander reports directly to the ARNORTH commander, while DCOs at FEMA act in liaison roles directly with the ARNORTH commander as well.

All of these DoD organizations have unique mission requirements to support CS with unique and tailored geospatial products and analysis. In addition, each of these organizations approaches the geospatial non-critical event by leveraging infrastructure, imagery, critical infrastructure assessments, time-sensitive event data, and complex geospatial analysis for data and product dissemination to state and local agencies. The USNORTHCOM Interagency Coordination Group (ICG), coordinates information sharing and deconfliction between the DoD agencies and provides clear and authoritative information for CS. These CS processes often consist of a complex network of geospatial information and analysis to provide comprehensive data products and services for federal, state and local emergency responders. Through the years since the stand up DHS, USNORTHCOM, NGA, DPO-MA, and USPACOM have supported

hundreds of analysis and geospatial products, for hurricane support, critical infrastructure assessments, major wildfires, national significant security events and have provided intelligence and operational support resulting in a prevention of terrorists' attacks. The relationship and communication between the DoD and civil organizations need to continue to mature for support of emergency operations, catastrophic, and noncritical catastrophic events.

Another element of CS is the use of the National Guard, both state (Title 32) and federal (Title 10). The National Guard is a constitutionally unique element of the DoD, serving first as a state militia under direction of the State Governor and State Adjutant General, but ultimately under the direction of the President of the United States. The Adjutant General serves as the State Director of Homeland Security in six states and the State Director of Emergency Management in three states. The State National Guard serves as a joint reserve entity, comprising two reserve services: Army and Air Force. The National Guard serves in three distinct operational status: Title 10 (federal active duty), Title 32 (federally funded state duty) and state active duty. The majority of CS operations performed by the National Guard are in Title 32 status. The National Guard Bureau (NGB), a joint entity, administers the federal functions of the Army National Guard and Air National Guard.

The National Guard is typically the first military element to respond to an emergency within a state or local jurisdiction under the direction of the Governor and State Adjutant General. The National Guard assists state and local emergency management and response personnel with a vast number of services, primarily as a force multiplier. Through this support, the National Guard has many unique geospatial information elements from fixed joint force headquarters to staging areas and logistics support. The following geospatial information categories define the National Guard's support to state and local emergency management:

- Joint Task Force Joint Operations Center (JTF JOC)
- State National Guard receiving locations
- State National Guard logistics supply points
- State National Guard staging areas
- State National Guard unit locations

Federal agencies or state governors request DoD capabilities to support their emergency response efforts by using a formal Request for Assistance (RFA) process. The decision process for approving Stafford RFAs is illustrated above<sup>3</sup> (see *Figure C-1*).

---

<sup>3</sup> *Joint Publication 3-28, Civil Support , September 14, 2007, pg II-5.*



## APPENDIX D: ACTORS

Federal Emergency Management Agency (FEMA)/Office of the Chief Information Officer (CIO) / Geospatial Solutions Branch  
 FEMA / National Integration Center (NIC)  
 FEMA / Disaster Operations / National Response Coordination Center (NRCC)  
 FEMA / Disaster Operations / Remote Sensing (RS)  
 FEMA / Disaster Assistance / Individual Assistance (IA)  
 FEMA / Disaster Assistance / Debris  
 FEMA / Mitigation / Hazard US (HAZUS) Program  
 FEMA / Mitigation / National Flood Insurance Program (NFIP)  
 FEMA / Mitigation / Hazard and Mitigation (HMTAP)  
 FEMA Regions I-X and Joint Field Operations (JFOs) (selected)  
 Department of Homeland Security (DHS) Office of Infrastructure Protection (IP)  
 DHS / Science and Technology / Interagency Modeling and Atmospheric Assessment Center (IMAAC)  
 DHS Office of Intelligence and Analysis (I&A)  
 United States Coast Guard (USCG)  
 Transportation Security Administration (TSA)  
 DHS National Operations Center (NOC)

DHS National Infrastructure Coordination Center (NICC)  
 Department of Defense (DoD) National Geospatial-Intelligence Agency (NGA)  
 DoD Northern Command/Pacific Command (USNORTHCOM/USPACOM)  
 DoD US Army Corps of Engineers (USACE)  
 National Guard Bureau (NGB)  
 Small Business Administration (SBA)  
 Health and Human Services (HHS)  
 Department of Commerce (DOC) / National Oceanic and Atmospheric Administration (NOAA)  
 DOC / NOAA / National Weather Service (NWS)  
 Department of Agriculture (DOA)  
 Department of Energy (DOE)  
 Environmental Protection Agency (EPA)  
 American Red Cross (ARC)  
 Emergency Support Functions (ESFs) #1 – #15  
 Logistics

*This page intentionally left blank.*

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices



## APPENDIX E: REFERENCED DOCUMENTS

**National Incident Management System (NIMS)**, December 2008, provides a systematic, proactive approach to guide departments and agencies at all levels of government, nongovernmental organizations (NGO), and the private sector to work seamlessly to prevent, protect against, respond to, recover from, and mitigate the effects of incidents, regardless of cause, size, location, or complexity, to reduce the loss of life and property and harm to the environment.

**National Infrastructure Protection Plan (NIPP)**, January 2009, establishes a risk management framework for the nation's unified national approach to critical infrastructure and key resources (CIKR) protection.

**National Response Framework (NRF)**, January 2008, is a guide to how the nation conducts all-hazards response. It describes specific authorities and best practices for managing incidents that range from the serious but purely local, to large-scale terrorist attacks or catastrophic natural disasters.

**Defense Production Act (P.L. 81-774)** is the primary authority to ensure the timely availability of

resources for national defense and civil emergency preparedness and response.

**Homeland Security Act of 2002** (P.L. 107-296, 116 Stat. 2135 (2002) (codified predominantly at 6 United States Code [U.S.C.] § 101-557), as amended, with respect to the organization and mission of the Federal Emergency Management Agency (FEMA) in the Department of Homeland Security (DHS) Appropriations Act of 2007, P.L. 109-295, 120 Stat. 1355 (2006), established DHS as an executive department of the United States. The Homeland Security Act consolidated component agencies, including FEMA, into DHS.

**The Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), as amended** (42 U.S.C. § 5121 et seq.) describes the programs and processes by which the Federal Government provides disaster and emergency assistance to state and local governments, tribal nations, eligible private nonprofit organizations, and individuals affected by a declared major disaster or emergency. The Stafford Act covers all-hazards, including natural disasters and terrorist events.

**HSPD-5, Management of Domestic Incidents**, February 28, 2003, establishes a single, comprehensive national incident management system. It also designates the Secretary of Homeland Security as the principal federal official for domestic incident management and recognizes the statutory authorities of the Attorney General, Secretary of Defense, and Secretary of State. It directs the heads of all federal departments and agencies to provide their full and prompt cooperation, resources, and support, as appropriate and consistent with their own responsibilities for protecting national security, to the Secretary of Homeland Security, Attorney General, Secretary of Defense, and Secretary of State in the exercise of leadership responsibilities and missions assigned.

**HSPD-7, Critical Infrastructure Identification, Prioritization, and Protection**, December 17, 2003, establishes a national policy for federal departments

and agencies to identify and prioritize United States CIKR and to protect them.

**HSPD-8, National Preparedness**, December 17, 2003, establishes policies to strengthen the preparedness of the United States to prevent and respond to threatened or actual domestic terrorist attacks, major disasters, and other emergencies by requiring a **national domestic all-hazards preparedness goal**, establishing mechanisms for improved delivery of federal preparedness assistance to state, local, and tribal governments, and outlining actions to strengthen preparedness capabilities of federal, state, local, and tribal entities. Annex 1, National Planning, published on December 3, 2007, establishes a standard and comprehensive approach to national planning.

**HSPD-20/National Security Presidential Directive-51 National Continuity Policy**, May 9, 2007, establishes a comprehensive national policy on the continuity of Federal Government structures and operations and a single National Continuity Coordinator responsible for coordinating the development and implementation of federal continuity policies.

**Civil Support, Joint Publication 3-28**, September 14, 2007, sets forth joint doctrine to govern the activities and performance of the Armed Forces of the United States in civil support operations and provides the doctrinal basis for interagency coordination during domestic civil support operations. It also provides overarching guidelines and principles to assist commanders and their staffs in planning and conducting joint civil support operations.

**Homeland Defense, Joint Publication 3-27**, July 12, 2007, provides doctrine for the defense of the US homeland across the range of military operations. It provides information on command and control, interagency and multinational coordination, and operations required to defeat external threats to, and aggression against, the homeland.

**Department of Defense (DoD) Support to Domestic Incidents**, January 2008, was developed by The Office of the Assistant Secretary of Defense/Homeland Defense and America's Security Affairs. It outlines the Defense Support of Civil Authorities (DSCA) support provided by U.S. military forces (federal military, Reserve, and National Guard), DoD civilians, DoD contract personnel, DoD agency, and DoD component assets in the federal response to domestic incidents, coordinated through the mechanisms outlined in the NRF.



**APPENDIX F: RELATED CONOPS/SOPs**

		National Response Framework											
		ESF 1	ESF 2	ESF 3	ESF 4	ESF 5	ESF 6	ESF 7	ESF 8	ESF 9	ESF 10	ESF 11	ESF 12
AFNORTH	Air Force Northern Air Support Handbook												
ARC	Disaster Assessment Toolkit						x						
	Information Management Services Disaster Assessment Program Guide						x						
DHS	IRSCC GEOINT CONOPS												
	IRSCC Natural Event Playbook					x							
	RFI Process					x							
	NICC CONOPS					x							
	IICD GA SOP					x							
	NICC RFI Process					x							
	NOC GA SOP					x							
	OIP IMC SOP					x							
DOE	VMWG Virtual Team Playbook												x
DOI	Directive: Designation Management and Enforcement of Authoritative Data Sources				x								

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices

		National Response Framework												
		ESF 1	ESF 2	ESF 3	ESF 4	ESF 5	ESF 6	ESF 7	ESF 8	ESF 9	ESF 10	ESF 11	ESF 12	
EPA	EM GIS Plan											X		
	EM GIS Data Plan											X		
	EPA Central Data Exchange Short Term Emergency Response Geospatial Operations											X		
	EPA Central Data Exchange Emergency Response Geospatial Operations											X		
	EPA Headquarters Incident Management Plan											X		



		National Response Framework											
		ESF 1	ESF 2	ESF 3	ESF 4	ESF 5	ESF 6	ESF 7	ESF 8	ESF 9	ESF 10	ESF 11	ESF 12
FEMA	Emergency Response Program CONOPS												
	Essential Elements of Information Standard List					x							
	ESF 5 SOP					x							
	ESF-14 Field Response Guide												
	FEMA Geospatial Process for Damage Assessment Housing Recovery					x							
	FEMA Geospatial Solutions Branch On Call GIS Support SOP					x							
	FEMA Hurricane CONPLAN Annex B Situational Awareness					x							
	FEMA IMAT Geospatial Intelligence Unit Operations					x							
	FEMA IMAT GIS Request Form					x							
	FEMA MAC GIU Operations Support					x							
	FEMA Mapping and Analysis Center Map Request Form					x							
	Geospatial Process for Damage Assessment					x							
	FEMA Mapping and Analysis Center SOP for Obtaining GIS Support					x							
	FEMA N-IMAT Planning Org Chart					x							
	Geospatial HAZUS Modeling for Disaster Response and Preparedness CONOPS					x							
	Global Earth Observation Integrated Data Environment CONOPS												
	ICP-Chemical Hazardous Materials Information Collection Plan					x							
ICP-Earthquake Information Collection Plan					x								
ICP-Epidemic/Pandemic Information Collection Plan					x								

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices

		National Response Framework											
		ESF 1	ESF 2	ESF 3	ESF 4	ESF 5	ESF 6	ESF 7	ESF 8	ESF 9	ESF 10	ESF 11	ESF 12
FEMA	ICP-Flood Information Collection Plan					x							
	ICP-Generic Information Collection Plan					x							
	ICP-Hazardous Material Information Collection Plan					x							
	ICP-Hurricane Information Collection Plan					x							
	ICP-Major Oil Spill Information Collection Plan					x							
	ICP-Nuclear Power Plan Information Collection Plan					x							
	ICP-Nuclear Weapons Incident Information Collection Plan					x							
	ICP-Olympics Information Collection Plan					x							
	ICP-Power Failure Information Collection Plan					x							
	ICP-Space Entry or Re-entry Information Collection Plan					x							
	ICP-Terrorist Information Collection Plan					x							
	ICP-Tornado Information Collection Plan					x							
	ICP-Tsunami Information Collection Plan					x							
	ICP-Volcano Information Collection Plan					x							
	ICP-Winter Storm Information Collection Plan					x							
	Joint Field Office Activation and Operations Interagency Integrated SOP					x							
	Mapping and Analysis Center SOP for NRCC Support					x							
MT Directorate Disaster Ops SOP					x								

		National Response Framework											
		ESF 1	ESF 2	ESF 3	ESF 4	ESF 5	ESF 6	ESF 7	ESF 8	ESF 9	ESF 10	ESF 11	ESF 12
FEMA	National IMAT West Minimum Suggested Staffing Needs for Disaster Deployments					x							
	NRCC EGS Emergency Response and After Hours Support					x							
	NRCC SOP					x							
	Remote Sensing SOP					x							
	Situation Status Branch Drought Information Collection Plan					x							
HHS	ESF-8 Hurricane Response Playbook								x				
NGA	Damage Classification System and Color Scheme					x							
	Damage Classification System and Color Scheme for Fires					x							
NGB	Standard Operational Information Sharing Plan of Action												
NOAA	Storm Mapping Tutorial v2												
NORTHCOM	Joint Warfighter Interoperable Geospatial Intelligence CONOPS												
USACE	SOP/Field Guide			x									
	EM GIS SOP			x									
USFS	National Wildfire Coordinating Group GIS SOP on Incidents				x	x							
	Wildfire Information Collection Plan				x								

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices

*This page intentionally left blank.*

Team Members

GeoCONOPS

Requirements &  
Capabilities

Specific  
Mission Areas

Disaster  
Operations

Catastrophic  
Disasters

Appendices



## APPENDIX G: ACRONYMS

<b>ABFE</b>	Advisory Base Flood Elevations
<b>AFO</b>	Area Field Office
<b>AFRCC</b>	Air Force Rescue Coordination Center
<b>ARC</b>	American Red Cross
<b>CA</b>	Congressional Affairs
<b>CAT</b>	Crisis Action Team
<b>CBP</b>	Customs and Border Protection
<b>CBRN</b>	Chemical Biological, Radiological, and Nuclear
<b>CDC</b>	Centers for Disease Control and Prevention
<b>CFDA</b>	Catalog of Federal Domestic Assistance
<b>CI/KR</b>	Critical Infrastructure/Key Resources

Team Members

GeoCONOPS

Requirements & Capabilities

Specific Mission Areas

Disaster Operations

Catastrophic Disasters

Appendices

<b>CIMS</b>	Crisis Information Management Software
<b>CIO</b>	Chief Information Officer
<b>CIR</b>	Critical Information Requirement
<b>CM</b>	Community Model
<b>CMHIS</b>	Contract Management and Housing Inspection Services
<b>COI</b>	Communities of Interest
<b>CONPLAN</b>	Concept Plan
<b>CONUS</b>	Continental United States
<b>COP</b>	Common Operating Picture
<b>COOP</b>	Continuity of Operations
<b>CPIMD</b>	Contingency Planning and Incident Management Division
<b>CRS</b>	Commercial Remote Sensing
<b>CSEPP</b>	Chemical Stockpile Emergency Preparedness Program
<b>CS</b>	Civil Support
<b>CST</b>	National Guard Civil Support Team
<b>CWIN</b>	Critical Infrastructure Warning Information Network
<b>DASC</b>	Disaster Assistance Support Center
<b>DCE</b>	Defense Coordinating Element
<b>DCO</b>	Defense Coordinating Officers
<b>DEGS</b>	Deployable Emergency Geospatial Information System (GIS) Suite
<b>DHHS</b>	Department of Health and Human Services
<b>DHS</b>	Department of Homeland Security

<b>DMAT</b>	Disaster Medical Assistance Team
<b>DMORT</b>	Disaster Mortuary Team
<b>DoD</b>	Department of Defense
<b>DOE</b>	Department of Energy
<b>DOI</b>	Department of Interior
<b>DOJ</b>	Department of Justice
<b>DOL</b>	Department of Labor
<b>DOS</b>	Department of State
<b>DOT</b>	Department of Transportation
<b>DPO-MA</b>	Defense Program Office for Mission Assurance
<b>DRG</b>	Domestic Readiness Group
<b>DRTS</b>	Debris Removal Tracking System
<b>DSCA</b>	Defense Support of Civil Authority
<b>EA</b>	External Affairs
<b>EAS</b>	Emergency Alert System
<b>EEI</b>	Essential Elements of information
<b>EMG</b>	Emergency Management Group
<b>EMIMS</b>	Emergency Management Information Management System
<b>EMS</b>	Emergency Medical Services
<b>ENS</b>	Emergency Notification System
<b>EOC</b>	Emergency Operations Center
<b>EPA</b>	Environmental Protection Agency
<b>ESF</b>	Emergency Support Function
<b>ESFLG</b>	Emergency Support Function Leaders Group

<b>FAA</b>	Federal Aviation Administration
<b>FBI</b>	Federal Bureau of Investigation
<b>FCO</b>	Federal Coordinating Officer
<b>FEMA</b>	Federal Emergency Management Agency
<b>FGDC</b>	Federal Geospatial data Commission
<b>FIRM</b>	Flood Insurance Rate Maps
<b>FOC</b>	FEMA Operations Center
<b>FOUO</b>	For Official Use Only
<b>GA</b>	Geospatial Analyst
<b>GeoCONOPS</b>	Geospatial Concept of Operations
<b>GDM</b>	Geospatial Data Model
<b>GIS</b>	Geospatial Information System
<b>GISC</b>	Geographic Information System Coordinator
<b>GIU</b>	Geospatial Intelligence Unit
<b>GMO</b>	Geospatial Management Office
<b>GPR</b>	Geospatial Production Request
<b>GPT</b>	Geospatial Production Team
<b>GSA</b>	General Services Administration
<b>HAS</b>	Homeland Security Advisor
<b>HazMat</b>	Hazardous Material
<b>HAZUS-MH</b>	Hazards U.S. Multi-hazards
<b>HD</b>	Homeland Defense
<b>HLT</b>	Hurricane Liaison Team
<b>HM</b>	Hazard and Mitigation

<b>HQ</b>	Headquarters	<b>IGA</b>	Intergovernmental Affairs		
<b>HSDN</b>	Homeland Secure Data Network	<b>IICD</b>	Infrastructure Information Collection Division	<b>KMO</b>	Knowledge Management Officer
<b>HSIN</b>	Homeland Security Information Network	<b>IIPG</b>	Initial Incident Planning Group		
<b>HSIN-I</b>	Homeland Security Information Network- Intelligence	<b>IMAAC</b>	Interagency Modeling and Atmospheric Assessment Center	<b>LANL</b>	Los Alamos National Laboratories
<b>HSIP</b>	Homeland Security Infrastructure Program	<b>IMAT</b>	Incident Management Assistance Teams	<b>LIDAR</b>	Light Detection and Ranging
<b>HSPD</b>	Homeland Security Presidential Directive	<b>IMC</b>	Incident Management Cell	<b>LSA</b>	Logistical Staging Areas
<b>HUD</b>	United States Department of Housing and Urban Development	<b>IMPT</b>	Incident Management Planning Team	<b>MAA</b>	Mutual Aid Agreement
		<b>IOC</b>	Infrastructure of Concern	<b>MA</b>	Mission Assignment
<b>HURREVAC</b>	Hurricane Evacuation	<b>IOF</b>	Interim Operating Facility	<b>MAC</b>	Mapping and Analysis Center
		<b>IP</b>	Infrastructure Protection	<b>MACC</b>	Multiagency Coordination Center
<b>I&amp;A</b>	Intelligence & Analysis	<b>IRSCC</b>	Interagency Remote Sensing Coordination Cell	<b>MACD</b>	Military Assistance for Civil Disturbance
<b>IA</b>	Individual Assistance			<b>MAT</b>	Mitigation Assessment Team
<b>IASD</b>	Infrastructure Analysis and Strategy Division	<b>ISS</b>	International Situation Summary	<b>ME</b>	Mission Engineering
<b>IAP</b>	Incident Action Plan	<b>IST</b>	Incident Support Team	<b>MERS</b>	Mobile Emergency Response Support
<b>IAS</b>	International Assistance System	<b>ITT</b>	Information Transaction Inventory	<b>MIGS</b>	Mobile Integrated Geospatial Intelligence System
<b>iCAV</b>	Integrated Common Analytical Viewer	<b>IVB</b>	Infrastructure Visualization Branch	<b>MIL</b>	Military
<b>ICEPP</b>	Incident Communications Emergency Policy and Procedures			<b>MOA</b>	Memorandum of Agreement
<b>ICG</b>	Interagency Coordination Group	<b>JFO</b>	Joint Field Office	<b>MOU</b>	Memorandum of Understanding
<b>ICP</b>	Information Collection Plan	<b>JFLCC</b>	Joint Land Forces Component Command	<b>MWCL</b>	Master Watch Control Log
<b>ICPACC</b>	Incident Communications Public Affairs Coordination Committee	<b>JIC</b>	Joint Information Center		
		<b>JOC</b>	Joint Operations Center	<b>NASA</b>	National Aeronautics and Space Administration
<b>ICS</b>	Incident Command System	<b>JRIES</b>	Joint Regional Information Exchange System	<b>NCC</b>	National Coordination Center for Telecommunications
<b>IDP</b>	Imagery Derived Products	<b>JTF</b>	Joint Task Forces	<b>NCS</b>	National Communications System
		<b>JWICS</b>	Joint Worldwide Intelligence Communications System		

Team Members

GeoCONOPS

Requirements & Capabilities

Mission Specific Areas

Disaster Operations

Catastrophic Disasters

Appendices

<b>NDMS</b>	National Disaster Medical System
<b>NEF</b>	National Essential Function
<b>NEFRLS</b>	National Emergency Family Registry and Locator System
<b>NFIP</b>	National Flood Insurance Program
<b>NGA</b>	National Geospatial-Intelligence Agency NGO
<b>NGB</b>	National Guard Bureau
<b>NGO</b>	Nongovernmental Organizations
<b>NHC</b>	National Hurricane Center
<b>NICC</b>	National Infrastructure Coordinating Center
<b>NICCL</b>	National Incident Communications Conference Line
<b>NIMS</b>	National Incident Management System
<b>NIPP</b>	National Infrastructure Protection Plan
<b>NISAC</b>	National Infrastructure Simulation and Analysis Center
<b>NJIC</b>	National Joint Information Center
<b>NMSZ</b>	New Madrid Seismic Zone
<b>NOAA</b>	National Oceanic and Atmospheric Administration
<b>NOC</b>	National Operations Center
<b>NPPD</b>	National Protection and Programs Directorate
<b>NPS</b>	National Park Service
<b>NRC</b>	Nuclear Regulatory Commission

<b>NRCC</b>	National Response Coordination Center
<b>NRF</b>	National Response Framework
<b>NSS</b>	National Shelter System
<b>NSSE</b>	National Special Security Events
<b>NST</b>	NGA Support Team
<b>NVOAD</b>	National Volunteers Active in Disasters
<b>NWS</b>	National Weather Service
<b>OCONUS</b>	Outside the Continental United States
<b>OD</b>	Operations Director
<b>ODP</b>	Office for Domestic Preparedness
<b>OLA</b>	Office of Legislative Affairs
<b>OPA</b>	Office of Public Affairs
<b>OPM</b>	Office of Personnel Management
<b>OPLAN</b>	Operational Plan
<b>OPORDER</b>	Operational Order
<b>ORNL</b>	Oakridge National Laboratory
<b>OSHA</b>	Occupational Safety and Health Administration
<b>OSHE</b>	Occupational Safety, Health, and Environment
<b>PA</b>	Public Assistance
<b>PDA</b>	Preliminary Damage Assessment
<b>PFO</b>	Principal Federal Official
<b>PHT</b>	Planning and Response Team

<b>PICCL</b>	Private Sector Incident Communications Conference Line
<b>PIO</b>	Public Information Officer
<b>PKEMRA</b>	Post Katrina Emergency Management Reform Act
<b>PODs</b>	Points of Distribution
<b>POS</b>	Office of Operations Coordination and Planning
<b>PPDR</b>	Private Property Debris Removal
<b>PSA</b>	Public Service Announcement
<b>PSMA</b>	Pre-Scripted Missions Assignment
<b>RDA</b>	Rapid Damage Assessment
<b>REPP</b>	Radiological Emergency Preparedness Program
<b>RFA</b>	Request for Assistance
<b>RFI</b>	Request for Information
<b>RMIS</b>	Resource Information Management System
<b>RRCC</b>	Regional Response Coordination Center
<b>RS</b>	Remote Sensing
<b>SAR</b>	Search and Rescue
<b>SBA</b>	Small Business Administration
<b>SCO</b>	State Coordinating Officer
<b>SFO</b>	Senior Federal Official
<b>SHIRA</b>	Strategic Homeland Infrastructure Risk Assessment
<b>SICCL</b>	State Incident Communications Conference Line



<b>SLFC</b>	State and Local Fusion Center	<b>USNORTHCOM</b>	United States Northern Command/Pacific Command
<b>SLOSH</b>	Sea, Land, Overland, Surge From Hurricanes	<b>USPACOM</b>	United States Pacific Command
<b>SME</b>	Subject Matter Expert	<b>US&amp;R</b>	Urban Search and Rescue
<b>SNL</b>	Sandia National Laboratories	<b>VAL</b>	Voluntary Agency Liaison
<b>SNS</b>	Strategic National Stockpile	<b>VA-NPSC</b>	Virginia National Processing Support Center
<b>SOP</b>	Standard Operating Procedures	<b>VMWG</b>	Visualization and Modeling Working Group
<b>SOC</b>	Secretary's Operations Center	<b>VOAD</b>	Voluntary Organizations Active in Disasters
<b>SWAT</b>	Special Weapons And Tactics	<b>VOLAG</b>	Voluntary Agency
<b>SWO</b>	Senior Watch Officer	<b>VTC</b>	Video Teleconference
<b>TAC</b>	Technical Assistance Contractors	<b>WFO</b>	Weather Forecast Office
<b>TEMP</b>	Temporary	<b>WMD</b>	Weapons of Mass Destruction
<b>TCPED</b>	Tasking, Collection, Processing, Exploitation, & Dissemination		
<b>TSA</b>	Transportation Security Administration		
<b>UCS</b>	Unified Command System		
<b>USACE</b>	United States Army Corps of Engineers		
<b>USAF</b>	United States Air Force		
<b>USAID</b>	United States Agency for International Development		
<b>U.S.C.</b>	United States Code		
<b>USCG</b>	United States Coast Guard		
<b>USDA</b>	United States Department of Agriculture		
<b>USFS</b>	United States Forest Service		
<b>USGS</b>	United States Geological Survey		