



Geospatial Concept of Operations (GeoCONOPS)

Quick Start Guide

June 2011



Homeland
Security

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1.0 Introduction

The DHS Geospatial Concept of Operations (GeoCONOPS) provides an understanding of the current landscape for the coordination of disaster response geospatial activities at the Federal level. The document serves the geospatial communities that support emergency management activities of the Federal government under the National Response Framework (NRF). This includes individual Emergency Support Functions (ESFs), the Joint Field Offices, FEMA Regional Coordination Centers (RRCC), and the National Response Coordination Center (NRCC).

Stakeholders and actors representing the federal geospatial community have been extensively engaged in providing input for the development of the GeoCONOPS document. The GeoCONOPS serves as a guide to the Federal departments and agencies providing geospatial support under the Stafford Act which defines 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.

2.0 Overview of GeoCONOPS

DHS relies on geospatial technologies to collect and analyze key information for its emergency response missions. Geospatial products and intelligence play a major role in the Department's preparation for disasters and its response to them. The Geospatial Management Office (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 interagency activities relating to domestic geospatial and remote sensing (RS) data to support the needs of homeland security-based intelligence, law enforcement, environmental, scientific, and emergency response requirements.

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 environment, 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 event, 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.

3.0 Project Info

The GeoCONOPS defines the federal geospatial capabilities in support of state, local, and tribal authorities during homeland security and emergency management operations across the entire emergency management lifecycle. DHS worked with numerous departments, agencies, supporting offices, and key programs to collect information on current practices and to guide the development of the GeoCONOPS. The Geospatial Interagency Oversight Team (GIOT) was established to guide this effort and includes member representatives from the following organizations:

- **American Red Cross (ARC)**
- **Department of Agriculture (USDA)**
- **Department of Commerce (DOC)**
- **Department of Defense (DoD)**
- **National Geospatial-Intelligence Agency (NGA)**
 - National Guard Bureau
 - NORTHCOM
 - US Army Corps of Engineers (USACE)
- **Department of Homeland Security (DHS)**
 - Chief Technology Office/ Geospatial Management Office (GMO)
 - Customs and Border Patrol (CBP)
 - Federal Emergency Management Agency (FEMA)
 - » Disaster Operations Division/ Remote Sensing
 - » Mitigation
 - » National Exercise Division/National Exercise (NED) & Simulation Center
 - » National Incident Management System (NIMS)
 - » Office of the Chief Information Officer (CIO)/Geospatial Management Office
 - » Office of the Chief Information Officer (CIO)/Geospatial Solutions Branch
- National Protection & Programs Directorate (NPPD)
- Office of Infrastructure Protection (IP)
- Office of Intelligence and Analysis (I&A)
- Office of Operations Coordination
- Science and Technology (S&T)
- US Coast Guard (USCG)
- **Environmental Protection Agency (EPA)**
- **National Oceanic & Atmospheric Administration (NOAA)**
- **Small Business Administration (SBA)**
- **US Geological Survey (USGS)**
- **Veterans Administration (VA)**

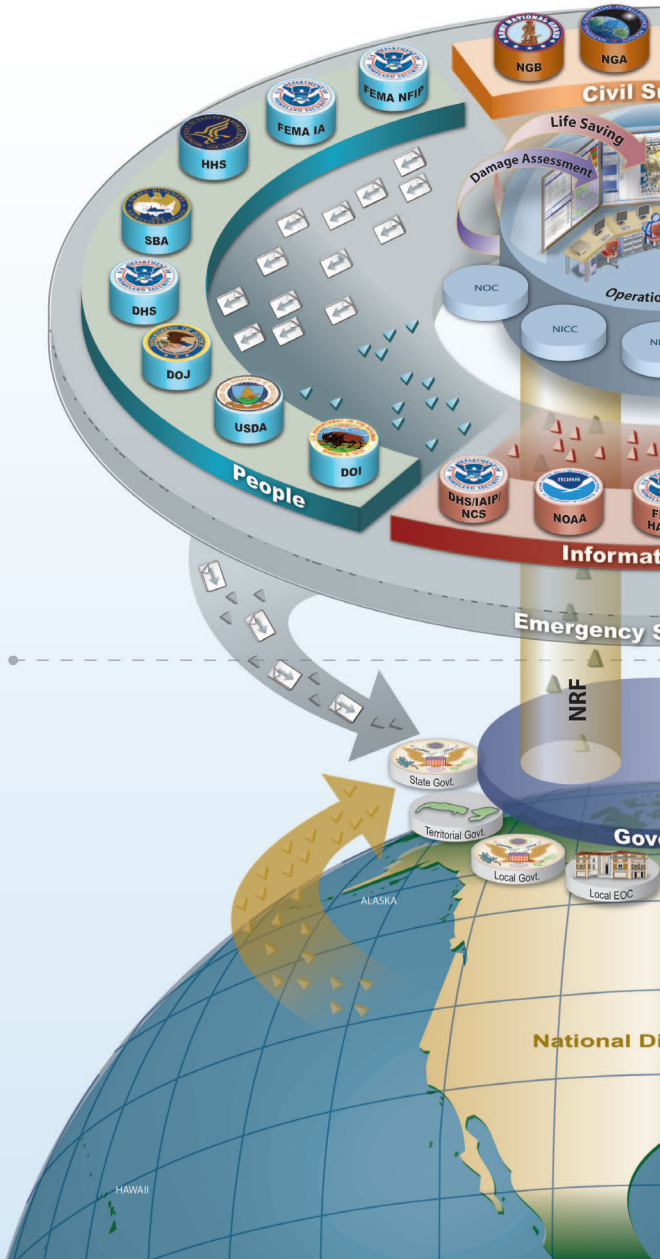
4.0 Community Analysis

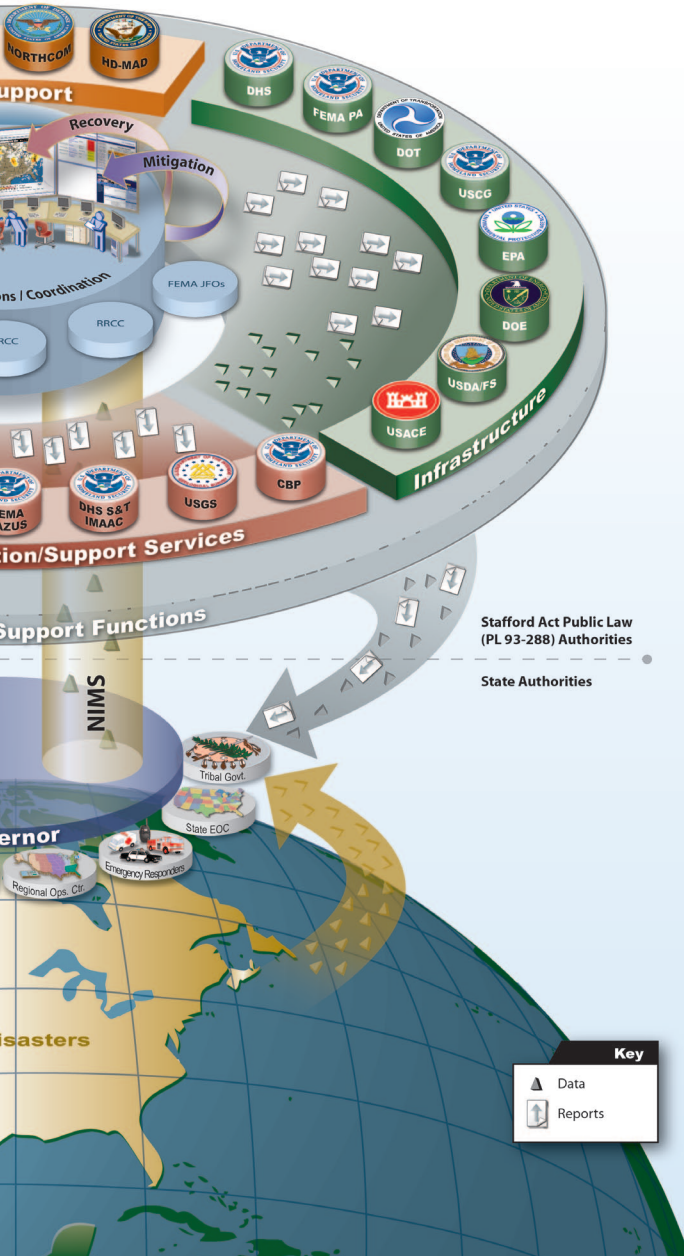
In order to gain an understanding of geospatial stakeholders and processes at the Federal level, the community has been interviewed and assessed to explore and document the current state of geospatial activities at the Federal level. The analysis characterizes how the Geospatial community operates within and supports the overall DHS mission. The intent of this effort is to describe and characterize the various stakeholders and their relationships.

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 and actor responsibilities
- Documents information sharing within and outside the Geospatial community
- Illustrates high-level processes across the geospatial mission operations and the correlating relationships of these processes with stakeholders

4.0 Community Analysis (Continued)





4.0 Community Analysis (Continued)

4.1 State Authorities

As disasters occur, non-Federal governments are responsible for providing immediate response and support regarding the disaster incident based on governing state authorities. A state Governor, working with the state Emergency Operations Centers (EOC), can interact directly with Federal Operations/Coordination actors based on the NRF and the National Incident Management System (NIMS) guidelines for requesting assistance, providing information, and facilitating effective coordination.

4.2 Public Law Authorities

Numerous Federal departments and agencies and the American Red Cross provide disaster and emergency response assistance to the state authorities based on the NRF. For the Community Model these have been organized into five functional groups: Operations / Coordination, Civil Support, Infrastructure, Information Support Service, and People. The actors, their services, and their information responsibilities are described throughout the GeoCONOPS.

4.2.1 Operations/Coordination

Serves as the central access point for the request for resources and assistance as well as information and reports provided to other geospatial community segments and state and local entities. *Described in Chapter Four, Disaster Operations.*

4.2.2 Civil Support

Provides support in response to homeland security related disaster incidents. The key participants are the National Guard Bureau (NGB), National Geospatial-Intelligence Agency (NGA), and US Northern Command (USNORTHCOM) Mission Assurance Division (MAD). *Data products identified in Appendix B, Authoritative Data Matrix.*

4.2.3 Infrastructure

Provides assessment information regarding buildings, schools, dams, levies, and other man-made structures as well as the impact to the local community and environment. *Described in Section Three, Specific Mission Areas; data products identified in Appendix B, Authoritative Data Matrix.*

4.2.4 Information Support Services

Provides modeling, weather, border, and geological-related information in response to a disaster incident. Described in Section Three, Specific Mission Areas; data products identified in Appendix B, Authoritative Data Matrix.

4.2.5 People

Provides information regarding services to victims of disaster incidents including Life Saving, employment, shelters, legal, and health-related information. Described in Section Three, Specific Mission Areas; data products identified in Appendix B, Authoritative Data Matrix.

4.8 Mission Areas

The GeoCONOPS classifies the response mission into four high-level areas - Damage Assessment, Life Saving, Recovery, and Mitigation – to capture the current geospatial capabilities deployed across the 15 Emergency Support Functions. The key geospatial requirements, expertise, operations, and products are described in Section Three, Specific Mission Areas and are incorporated into the New Madrid Scenario in Section Five, Catastrophic Disaster.

5.0 Best Practices and Authoritative Data

5.1 Best Practices

The GeoCONOPS Best Practices highlight more than a dozen mature methods and innovative practices for geospatial management processes, analyses, data products, technology, and models that are addressing key emergency response needs at the national, regional, and field levels.

Examples include:

- Requests for Information
- Damage Assessment
- Advisory Base Flood Elevations
- Field Data Collection Tools
- Commodities Model

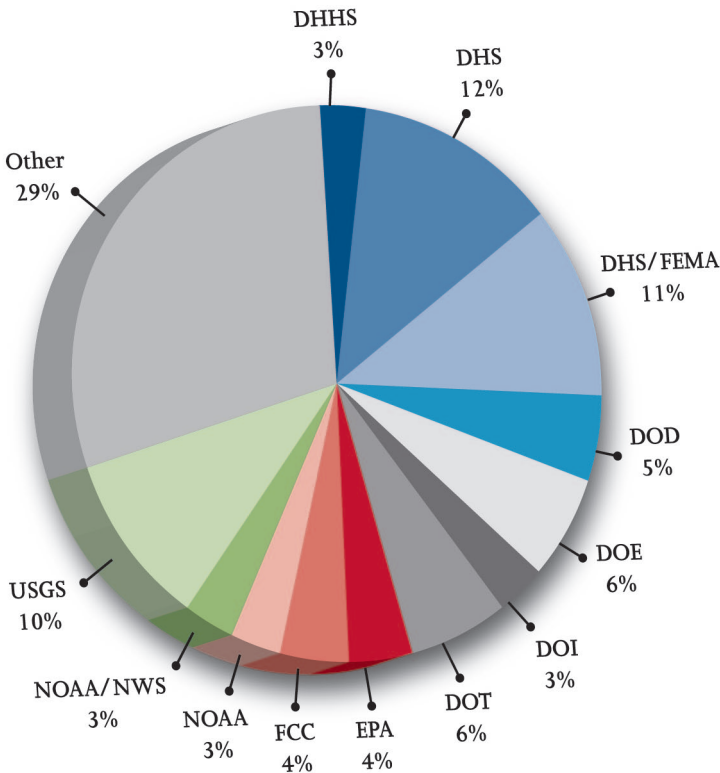
Best Practices are embedded throughout the GeoCONOPS as short summary examples of geospatial activities related to each section's explanatory content. A list of and links to the Best Practices appears in the table of contents.

5.2 Authoritative Data

Data quality drives the overall value and relevance of any geospatial product. Without valid authoritative sources and core standards for data management, the investment in hardware, software, and labor can be immediately undermined. Section 2.2.1 defines the term “Authoritative” as it relates to the GeoCONOPS.

Over 1,000 unique, authoritative data themes are catalogued in the GeoCONOPS. These are data themes, discovered through the development of the GeoCONOPS, that provide

either rational or expert authorities on topics key in supporting emergency management missions, operational elements, and functions. The themes are characterized by agency point of contact, representation type, availability, use restrictions, emergency support function alignment, and internet accessibility. Subsets of authoritative data are incorporated throughout the GeoCONOPS, to relate known critical information to the document contents; a list of these appears in the table of contents. A complete listing of all identified authoritative data themes is contained in Appendix B, Authoritative Data Matrix.



6.0 Requirements & 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.*

6.1 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 proves an effective tool in meeting the information requirements of any incident. *See section 3 for details on the GeoCONOPS Mission Areas.*

6.2 Geospatial Production and Delivery

The production and delivery of geospatial products in the disaster environment is challenging due to the unique event circumstances and dynamic solutions applied. The information requirements, data availability, and customer base are driven by the event. Pre-planning allows for immediate activation and productivity as the

geospatial teams adjust to the changing environment. 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.
- **Field facilities** are typically created rapidly to accommodate the requirements of the event. As the magnitude of the event and support requirements increase so does the level of complexity of the geospatial entity supporting it.

Section 2.1 provides additional information on production and delivery.

7.0 Specific Mission Areas

This section details three critical mission areas supporting disaster response: Damage Assessment, Life-Saving, and Recovery missions. This includes the assessment data on the current geospatial capabilities, tools, and technologies supporting the following key mission areas:

7.1 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. Additional internal sources of information include text-based community reports as well as the Internet, television, news reports, and other media sources, which may provide photo, video, and map products with varying levels of validity and accuracy. *Section 3.1 details the Damage Assessment Mission.*

7.2 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. These efforts address all aspects of life-saving including SAR, evacuation, feeding, and critical medical support. Many of these activities include

sensitive information and products requiring appropriate protection and handling. *Section 3.2 details the Life-Saving Missions.*

7.3 Recovery

Recovery efforts begin immediately following an event. This section focuses on three urgent recovery activities: debris volume analysis and management, efforts to expedite the delivery of financial assistance to impacted individuals, and post-disaster efforts including flood recovery maps and advisory base flood elevations. These activities provide much-needed assistance to communities affected by disaster events, allowing citizens to recover as quickly as possible. *Section 3.3 details the Recovery Mission.*

8.0 Disaster Operations

The Disaster Operations section discusses the primary operation centers supporting DHS-related activities before. These entities provide the oversight, direction, and coordination required at the federal level.

8.1 DHS National Operations Center

The National Operations Center (NOC) 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. Key information is

shared through the Homeland Security Information Network (HSIN). See section 4.1 for additional details.

8.2 DHS National Infrastructure Coordinating Center

The NICC operates under the DHS Office of Infrastructure Protection (IP) and provides coordination and situational awareness in effort to reduce risks to the nation's Critical Infrastructure (CI), strengthen national preparedness, ensure timely response, and aid rapid recovery in the event of an attack, natural disaster, or other emergency. 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 CI. The IMC serves as IP's central mechanism



for coordinating incident management activities and provides incident-specific situational awareness through the integration of information regarding CI, risk, response, and recovery operations. See section 4.2 for additional details.

8.3 FEMA National Response Coordination Center

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 the 24 x 7 watch team. The NRCC is staffed to support daily monitoring activities with the ability to surge in support of catastrophic events. See section 4.3 for additional details.

8.4 FEMA Regional Response Coordination Center

The FEMA Regional Response Coordination Center (RRCC) is a multiagency entity operating from each of the FEMA regional offices in two capacities: “watch mode”, operating during normal business hours, and “activation mode”, when supporting relevant events. These facilities provide support to each of the states within the regional boundaries as well as disaster operations within other regions during major multistate events. The RRCC functions as the regional interface between the states and the FEMA NRCC, maintaining situational awareness with all partners until a Joint Field Office

(JFO) opens. The RRCC coordinates personnel and resource deployments to support disaster operations and prioritizes interagency allocation of resources. See section 4.4 for additional details.

8.5 FEMA Joint Field Operations

The FEMA JFO is a temporary federal/state multiagency coordination center established within an affected state following the presidential declaration of a disaster. 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, allocates resources, resolves agency policy issues, and provide strategic guidance to support event operations. See section 4.5 for additional details.

8.6 FEMA Interim Operating Facility

The FEMA Interim Operating Facility (IOF) is intended to function as a light-weight version of a JFO with core staffing and the ability to quickly setup operations with minimal dedicated infrastructure. The IOF provides the initial location for federal coordination efforts in support of State-guided local missions. The IOF may be co-located with the State Emergency Operation Center, or function from a convention-center or other suitable facility proximal to the state offices of an impacted community. The IOF is expected to transition support to a JFO as it comes on-line, typically several days to two weeks. In support of National Special Security Events (NSSE), Federal resources are deployed to maintain a level of security for the specific event. See section 4.6 for additional details.

9.0 Catastrophic Disasters

The Catastrophic Disaster section of the GeoCONOPS explores the details of applying geospatial technologies to catastrophic natural events. Natural events are inherently dynamic. While they are predictable to a point, 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).

This section of the GeoCONOPS is structured to address the large-scale planning efforts for a New Madrid Seismic Zone (NMSZ) earthquake scenario. The NMSZ earthquake scenario (described in section 5.3 of the GeoCONOPS) 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) event, impacting an eight state region. The likelihood of this scenario has a 10 percent probability of producing a catastrophic earthquake in the next fifty years. *The catastrophic NMSZ scenario is explored in detail in section 5.1.*

10.0 Mitigation & Preparedness

Mitigation and Preparedness activities are vital to the prevention of reoccurring and foreseen losses in natural and man-made events. In the earlier chapters of the GeoCONOPS, we have discussed response and recovery efforts in detail. This chapter introduces additional activities in Mitigation and Preparedness, completing the emergency management lifecycle and providing insight on the geospatial activities and data surrounding it. *See section 6.0 for details on Mitigation and Preparedness activities.*

Mitigation efforts aim to minimize hazard impacts following disaster events. Through structural efforts (i.e. earthquake retrofitting and levee construction) or nonstructural efforts (i.e. building codes and land-use planning) loss of life and property are minimized for anticipated disaster events.

Preparedness implies a state of readiness or the taking of preventative measures to minimize the impacts of a disastrous event on life and property. Preparedness efforts are undertaken in advance of an event and build upon the experiences of past and predictions of future events.

11.0 Conclusion

As the need for accurate and authoritative data continues, the GeoCONOPS will enable more efficient sharing of geospatial data and awareness of capabilities and processes across the Federal government. The analysis and documentation created in support of the GeoCONOPS gives the Federal geospatial community a place of reference when addressing emergency management and incident response efforts.

The GeoCONOPS is working to improve the effectiveness and efficiency of geospatial technology support for the homeland security mission and the emergency management lifecycles by:

- Raising awareness of the roles, responsibilities, capabilities and activities across mission functions, operations, event types, and agencies and departments
- Establishing authoritative data sources to streamline acquisition, eliminate dissemination and use of inaccurate data, and reduce redundancy
- Improving the sharing of authoritative data
- Enabling an interagency strategy for geospatial technology resource optimization in any incident

Get Connected

The GeoCONOPS is managed by the DHS Geospatial Management Office in coordination with the project's Geospatial Interagency Oversight Team.

The project shares all documents, its operating calendar, and participant contact information via the Geospatial Information Community on the Homeland Security Information Network (HSIN) at: <https://government.hsin.gov/sites/GIS>.

Contact the project team by email at GeoCONOPS@dhs.gov for any questions about the GeoCONOPS or to join the Community on HSIN.