Joint Publication 2-03

Geospatial Intelligence in Joint Operations

5 July 2017

PREFACE

1. Scope

This publication provides doctrine for conducting geospatial intelligence (GEOINT) across the range of military operations. It describes GEOINT organizations, roles, responsibilities, and operational processes that support the planning and execution of joint operations.

2. Purpose

This publication has been prepared under the direction of the Chairman of the Joint Chiefs of Staff (CJCS). It sets forth joint doctrine to govern the activities and performance of the Armed Forces of the United States in joint operations, and it provides considerations for military interaction with governmental and nongovernmental agencies, multinational forces, and other interorganizational partners. It provides military guidance for the exercise of authority by combatant commanders and other joint force commanders (JFCs) and prescribes joint doctrine for operations and training. It provides military guidance for use by the Armed Forces in preparing and executing their plans and orders. It is not the intent of this publication to restrict the authority of the JFC from organizing the force and executing the mission in a manner the JFC deems most appropriate to ensure unity of effort in the accomplishment of objectives.

3. Application

a. Joint doctrine established in this publication applies to the Joint Staff, commanders of combatant commands, subordinate unified commands, joint task forces, subordinate components of these commands, the Services, and combat support agencies.

b. The guidance in this publication is authoritative; as such, this doctrine will be followed except when, in the judgment of the commander, exceptional circumstances dictate otherwise. If conflicts arise between the contents of this publication and the contents of Service publications, this publication will take precedence unless the CJCS, normally in coordination with the other members of the Joint Chiefs of Staff, has provided more current and specific guidance. Commanders of forces operating as part of a multinational (alliance or coalition) military command should follow multinational doctrine and procedures ratified by the US. For doctrine and procedures not ratified by the US, commanders should evaluate and follow the multinational command's doctrine and procedures, where applicable and consistent with US law, regulations, and doctrine.

4. Contribution

The following staff, in conjunction with the Joint Doctrine Development Community, made a valuable contribution to the revision of this Joint Publication: Lead Agent and Joint Staff Doctrine Sponsor Mr. Sean Murphy, Joint Staff J-2; Joint Analysis Division Action Officer Mr. Mark Brown, Joint Staff J-7, Joint Doctrine Analysis Division; and Joint Doctrine Action Officer LTC Gregory Browder, Joint Staff J-7, Joint Doctrine Division.

For the Chairman of the Joint Chiefs of Staff:

KEVIN D. SCOTT
Vice Admiral, USN
Director, Joint Force Development

SUMMARY OF CHANGES
REVISION OF JOINT PUBLICATION 2-03
DATED 31 OCTOBER 2012

- **Clarifies the national security mission of National Geospatial-Intelligence Agency to include responsibility for analysis, dissemination, and incorporation of geospatial intelligence (GEOINT) produced by ground-based platforms or handheld photography into the national system for geospatial intelligence.**

- **Expands Chapter II, "Roles and Responsibilities," to include the contents of Appendix F, "Geospatial Intelligence Roles and Responsibilities and Specific Guidance."**

- **Provides guidance on the establishment and composition of a notional GEOINT cell.**

- **Updates GEOINT activities conducted by national and Department of Defense-level agencies, the Services, and partner nations.**

- **Provides a more detailed description of GEOINT operations activities and how GEOINT contributes to mission planning.**

- **Describes new processes and methods to organize and analyze GEOINT data, to include structured observation management, object based production, and activity based intelligence.**

- **Updates the various dissemination methods for data derived from national, commercial, airborne, handheld, and surface-based collection systems.**

- **Deletes Appendix C, "Sample Annex M (Geospatial Information and Services)," in accordance with CJCSM 3130.03, *Adaptive Planning and Execution (APEX)*, 31 August 2012, which eliminates Annex M, "Geospatial Information and Services," by consolidating it into Appendix C, "Sample Appendix 7 (Geospatial Intelligence) to Annex B (Intelligence)."**

- **Replaces Appendix D, "Sample Appendix 7 (Imagery Intelligence) to Annex B (Intelligence)," with "Sample Appendix 7 (Geospatial Intelligence) to Annex B (Intelligence)," and merges in unique considerations for geospatial information and services to reconcile the deletion of Annex M, "Geospatial Information and Services."**

- **Updates the list of organizations that provide meteorological and oceanographic support to GEOINT and removes links to Websites.**

- **Introduces concepts of human geography and data layer themes used within geospatial intelligence preparation of the environment.**

- **Updates the list of standard GEOINT products and services.**

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Overview of Geospatial Intelligence

Geospatial intelligence (GEOINT) operations include the tasks, activities, and events used to collect, manage, analyze, generate, visualize, and provide the imagery, imagery intelligence, and geospatial information necessary to support national and defense missions as well as international arrangements.

Geospatial intelligence (GEOINT) is defined in Title 10, United States Code, Section 467, as "the exploitation and analysis of imagery and geospatial information to describe, assess, and visually depict physical features and geographically referenced activities on the Earth. GEOINT consists of imagery, imagery intelligence (IMINT), and geospatial information." Any one or combination of these three GEOINT elements may be considered GEOINT. The full utility of GEOINT comes from the integration and use of imagery, IMINT, and geospatial information, enabling customers to gain a more comprehensive perspective, an in-depth understanding, and a cross-functional awareness of the operational environment (OE). GEOINT collection encompasses all aspects of literal, infrared (IR), and synthetic aperture radar (SAR) imagery; overhead persistent IR capabilities; and geospatial information and services. GEOINT includes the exploitation and analysis of electro-optical, IR, and radar imagery, as well as the exploitation and analysis of geospatial, spectral, laser, IR, radiometric, SAR phase history, polarimetric, spatial, and temporal data.

GEOINT Support to Joint Operations

GEOINT supports joint operations through the multidirectional flow and integration of geospatially referenced data from relevant GEOINT and other sources of intelligence and information to achieve a shared awareness of the OE, near real time tracking, and collaboration between forces. There are five

general categories of GEOINT support to joint operations:

- General Military Intelligence and Warning Intelligence.
- Safety of Navigation.
- OE Awareness.
- Mission Planning, Rehearsal, and Command and Control.
- Support to Targeting.

Roles and Responsibilities

National and Department of Defense (DOD)-Level Entities

National System for Geospatial Intelligence (NSG). As the Department of Defense (DOD) GEOINT Mission Manager and the intelligence community (IC) GEOINT Functional Manager, the Director, National Geospatial-Intelligence Agency (NGA), is responsible for the processes for tasking imagery and geospatial information collection, processing raw data, exploiting geospatial information and imagery, analyzing information and intelligence, disseminating information and GEOINT to consumers, and identifying and assessing risks and capability gaps and recommending mitigation alternatives.

NGA. NGA is a combat support agency (CSA), as well as an IC member organization, and is directly subordinate to the Secretary of Defense (SecDef), the Under Secretary of Defense for Intelligence (USD[I]), and the Director of National Intelligence (DNI). NGA produces timely, relevant, and accurate GEOINT to the joint force. NGA is the primary source for GEOINT analysis, products, data, and services at the national level and provides advisory tasking recommendations for Service-operated airborne and surface-based GEOINT collection platforms and sensors. NGA provides a National Geospatial-Intelligence Agency support team (NST) in direct support to a joint force commander's (JFC's) joint intelligence operations center (JIOC) and maintains NSTs for each of the Services, DOD agencies, and several non-DOD agencies. NGA manages satellite collection requirements and develops distribution protocols for

the NSG in accordance with the National Intelligence Priorities Framework (NIPF).

National Reconnaissance Office (NRO). The NRO is a DOD agency and a member of the IC. The NRO is responsible for research and development, acquisition, launch, deployment, and operation of overhead systems and related data processing facilities to collect intelligence and information to support national and departmental missions and other US Government needs.

Joint Collaboration Cell—East. The Joint Collaboration Cell—East provides time-sensitive GEOINT support to national, strategic, and tactical customers by exercising NGA and NRO processes, tasking capabilities, and coordinating with subject matter experts.

National Security Agency. The National Security Agency is a CSA and a national-level intelligence agency subordinate to SecDef, the USD(I), and the DNI. The National Security Agency's cybersecurity and foreign signals intelligence information missions incorporate GEOINT in the agency's day-to-day operations.

Defense Intelligence Agency (DIA). As the Defense Collection Manager, the Director, DIA, serves as the DOD conduit for collection coordination of both national and airborne GEOINT.

Defense Logistics Agency (DLA). The director of DLA serves as the DOD integrated material manager for all standard geospatial information products, including maps, controlled image base, charts, elevation data, and other aeronautical and maritime navigation aids with national stock numbers.

Joint Staff

The Joint Staff is the primary interface between the CSAs, Services, and joint force commands for federated support. To establish federated support, the joint force submits a community on-line intelligence system for end-users and managers

request to the Joint Staff or Geospatial Requirements One-Stop Visualization Environment request.

Combatant Commands

The combatant commands (CCMDs) develop GEOINT requirements to support development of warning intelligence, as well as the planning and execution of joint operations. The geographic combatant commander, in partnership with the NST, may establish a GEOINT cell to coordinate all GEOINT requirements within its area of responsibility while ensuring the supporting commands or component commands are managing theater and mission-specific GEOINT requirements.

Subordinate Joint Force Commander

Subordinate commanders develop area and point target GEOINT requirements to support the planning and execution of joint operations. The designation of the GEOINT officer and subsequent establishment of the GEOINT cell is normally accomplished under the direction of the intelligence directorate of a joint staff (J-2).

Services

The Services support departmental planning functions with GEOINT products, Service-specific content, format, and media. The Services are responsible for ensuring forces train with the appropriate range of GEOINT and for identifying specific or unique GEOINT requirements for weapons systems. Services maintain a Service GEOINT element at Headquarters NGA (consistent with Department of Defense Directive 5105.60, *National Geospatial-Intelligence Agency [NGA])*, and assign departmental requirements officers to participate in and represent their Service interests at GEOINT collection subcommittee meetings.

Non-DOD Agencies

While US DOD and IC agencies are key GEOINT producers, civil agencies also participate in supporting operations, whether they are military or humanitarian in nature. As examples, the Department of Interior's United States Geological Survey and elements of the Department of Homeland Security participate with the NSG in providing support to defense and civil operations through the acquisition and analysis of commercial

imagery and topographic products. Other non-DOD and IC agencies providing GEOINT in support of operations include the National Oceanic and Atmospheric Administration, US Department of Agriculture, and the Federal Aviation Administration.

Commonwealth Allies

As functional manager of GEOINT, the Director, NGA strives to incorporate to the maximum extent its commonwealth allies: Australia, Canada, New Zealand, and the United Kingdom. These countries work closely with the US theater CCMD's JIOC on GEOINT production as part of GEOINT mission management, also known as unified geospatial-intelligence operations (UGO). While the individual nation may have varying strategic goals, the desired end state for the group is a common analysis and production agreement and an interoperable information technology infrastructure for GEOINT.

Geospatial Intelligence in Joint Operations

Joint Intelligence Operations Center

The JIOC is the focal point for the command's intelligence planning, collection management, operations, exploitation, analysis, production, and dissemination effort. It is organized to satisfy the commander's intelligence requirements.

Joint GEOINT Cell

The GEOINT cell, led by a GEOINT officer, integrates people, processes, and tools using multiple information sources and collaborative analysis to build a shared knowledge of the environment, the adversary, and friendly forces. The recommended composition of the GEOINT cell contains both core and extended cell representatives. Optimally, the core GEOINT cell would consist of a GEOINT officer; an imagery collection and production manager; a geospatial collection and production manager; a visualization, systems, and data expert; a GEOINT plans and requirements expert; an NST; and an NST liaison officer. An extended GEOINT cell consists of the core personnel augmented with additional members from across the organization and its mission partners to coordinate information fusion,

visualization, analysis, and sharing.

National Geospatial-Intelligence Agency Intelligence Collaboration and Assistance Team

The NGA intelligence collaboration and assistance team, located within the National Geospatial-Intelligence Agency Operation Center, provides continuous global situational awareness and GEOINT assistance to joint operations, including support for declared events (e.g., personnel recovery).

Joint Intelligence Preparation of the Operational Environment

Subordinate commands should utilize compatible GEOINT products, data, and standards to facilitate joint intelligence preparation of the operational environment (JIPOE) processes and products developed by the joint force J-2 to adequately support the mission. Advanced coordination of GEOINT support is essential among the joint force, national agencies, CCMDs, and multinational and host nation forces in order to form a common point of reference and framework for JIPOE. The JFC may choose to establish a JIPOE coordination cell to assist in integrating and synchronizing the JIPOE effort with supporting organizations, related capabilities, and staff elements. The GEOINT officer is typically a member of the JIPOE coordination cell and provides advice and assistance regarding geospatial issues, including registering data to a common reference system. A multinational JIPOE effort requires interoperable GEOINT data, applications, and data exchange capabilities.

Geospatial Intelligence Activities

Introduction

GEOINT activities are the tasks, actions, and events to collect, manage, analyze, generate, visualize, and provide imagery, IMINT, and geospatial information necessary to support the NIPF, international arrangements, safety of navigation, and targeting. GEOINT activities build upon the intelligence process; tasking, processing, exploitation, and dissemination capabilities; and joint warfighter interoperable models.

Direction, Planning, and

Direction. The GEOINT cell may develop and

Requirements Management

publish the CCMD's GEOINT concept of operations identifying the required resources, delineating the management of the CCMD GEOINT cell, and specifying coordination and collaboration processes with the NST, UGO, and subordinate command GEOINT cells.

GEOINT Planning and Direction. The GEOINT cell leads the planning and direction of GEOINT information and intelligence processes for fusion, visualization, analysis, and sharing by developing appendix 7 (Geospatial Intelligence) to annex B (Intelligence) to plans and orders.

GEOINT Requirements Management. To support appendix 7 to annex B of the plan or order, the GEOINT cell coordinates across all functions of the command and subordinate commands to accomplish specified mission requirements to enable fusion, visualization, analysis, and sharing.

Discover and Obtain GEOINT

The GEOINT cell coordinates the procedures and manages the tasks to search for, find, access, and gather GEOINT information and foundational data from existing holdings, databases, and libraries. The user can discover, exploit, and manipulate data from available libraries or databases to create tailored products or data sets for specific mission purposes or military applications. Available libraries or databases provide the foundation for a DOD-wide distributed network of content that includes, but is not limited to, topographic, air, space, hydrographic, and other geospatial information, as well as imagery, geographic names, and boundary data.

Tasking and Collection

Tasking involves submitting collection requirements necessary for acquiring data or information to meet mission objectives to the collection management authority. The process involves converting intelligence or mission requirements into collection requirements, establishing priorities, tasking or coordinating with appropriate collection sources or agencies, monitoring results, and re-tasking as required. GEOINT Information Management Services is the

system used to task national collection systems. The Planning Tool for Resource, Integration, Synchronization, and Management is the system used to manage airborne asset collection requirements and for tasking airborne assets.

Collection includes those activities related to the acquisition of GEOINT data or information necessary to satisfy tasked requirements. Primary collection systems used by NGA and the DOD community are satellite and airborne platforms and their associated sensors, as well as imagery derived from surface-based platforms and open sources. The GEOINT cell coordinates the collection, acquisition, or procurement of GEOINT sources and the associated tasking and management of collection resources.

Processing and Exploitation

The GEOINT cell coordinates the assessment, correlation, and conversion of collected foundation GEOINT data into a useable form or formats suitable for analysis, production, and application by end users. The processing may include automated, semi-automated, and manual procedures to integrate data. Exploitation involves the evaluation and manipulation of processed GEOINT data to extract information related to a list of essential elements of information (EEIs). Exploitation results in the extraction of information and data that is specifically selected for use or integration in subsequent tasks in the GEOINT operations process.

Analysis, Production, and Visualization

The GEOINT cell coordinates the use, interpretation, and integration of information into standard or tailored GEOINT products and data, visual presentations of situational awareness, and trend analysis in response to expressed or anticipated information requirements. During this step of the process, information and intelligence is analyzed, produced, and visualized to satisfy the commander's critical information requirements (priority intelligence requirements and friendly force information requirements) through the evaluation of EEIs.

Dissemination, Collaboration, and Storage

Dissemination is the timely conveyance of GEOINT content or products in an appropriate form and by any suitable means, whether in hard copy or electronic form, and ensuring they are discoverable and retrievable by the user on the appropriate network. Increasingly, the GEOINT community is moving toward a common approach to capture, store, standardize, and make GEOINT observations available. Using structured observation management (SOM), imagery observations may be captured and stored as structured data, allowing analysts to quickly discover information and intelligence, allowing them to focus on qualitative and quantitative analysis. SOM and all-source structured observations of object based production create and organize information making it easier for analysts to use data from multiple sources, discover new knowledge about objects and networks, and enable models that drive automated tipping and cueing.

Evaluation and Feedback

The joint force provides feedback to the developers of national-level GEOINT through their resident GEOINT cells (or similar organization). This feedback is provided through features embedded in the various tools and systems, and is an extension of the previously mentioned collaboration process.

CONCLUSION

This publication provides doctrine for conducting GEOINT across the range of military operations. It describes GEOINT organizations, roles, responsibilities, and operational processes that support the planning and execution of joint operations.

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CHAPTER I
OVERVIEW OF GEOSPATIAL INTELLIGENCE

"The want of accurate maps of the Country which has hitherto been the Scene of War, has been a great disadvantage to me. I have in vain endeavored to procure them and have been obliged to make shift with such sketches as I could trace from my own Observations…"

General George Washington, according to John C. Fitzpatrick, *Writings of George Washington from the Original Manuscript Sources,* 1745-1799, ed. (Washington, D.C.: Government Printing Office, 1931-1944)

1. Introduction

a. Joint forces require the ability to rapidly respond to threats around the world. Geospatial intelligence (GEOINT) supports this requirement by providing imagery, imagery intelligence (IMINT), geo-referenced data, and products (e.g., maps, charts, and elevation or vector information) that serve as a foundation and common frame of reference for any joint operation.

b. GEOINT is defined in Title 10, United States Code (USC), Section 467, as "the exploitation and analysis of imagery and geospatial information to describe, assess, and visually depict physical features and geographically referenced activities on the Earth. GEOINT consists of imagery, IMINT, and geospatial information." Any one or combination of these three GEOINT elements may be considered GEOINT. While geospatial information

GEOSPATIAL INTELLIGENCE ELEMENTS

Imagery: A likeness or presentation of any natural or man-made feature or related object or activity and the positional data acquired at the same time the likeness or representation was acquired, including products produced by space-based national intelligence reconnaissance systems, and likenesses or presentations produced by satellites, airborne platforms, unmanned aerial vehicles, or other similar means (except that such term does not include handheld or clandestine photography taken by or on behalf of human intelligence collection organizations).

Imagery Intelligence: The technical, geographic, and intelligence information derived through the interpretation or analysis of imagery and collateral materials.

Geospatial Information: Information that identifies the geographic location and characteristics of natural or constructed features and boundaries on the Earth, including statistical data and information derived from, among other things, remote sensing, mapping, and surveying technologies; and mapping, charting, geodetic data, and related products.

SOURCE: Title 10, United States Code, Section 467

can be used for non-intelligence related purposes, it can be used to depict features and activities relevant to intelligence functions.

c. The National Geospatial-Intelligence Agency (NGA) mission is to manage and produce GEOINT in accordance with (IAW) Title 10, USC, Section 442, and Title 50, USC, Section 3045. Title 10, USC, directs NGA to develop a system to facilitate the analysis, dissemination, and incorporation of likenesses, videos, and presentations produced by ground-based platforms, including handheld or clandestine photography taken by or on behalf of human intelligence collection organizations or available as open-source information, into the National System for Geospatial Intelligence (NSG). Title 10, USC, Section 442, does not include the authority for NGA to manage tasking of handheld or clandestine photography taken by or on behalf of human intelligence collection organizations.

2. Geospatial Intelligence Overview

a. GEOINT is an intelligence discipline that has evolved from the integration of imagery, IMINT, and geospatial information to a broader cross-functional effort in support of national and defense missions and international arrangements. Advances in technology and the use of geospatial data throughout the joint force have created the ability to integrate more sophisticated capabilities for visualization, analysis, and dissemination of fused views of the operational environment (OE). The full utility of GEOINT comes from the integration and use of imagery, IMINT, and geospatial information, enabling customers to gain a more comprehensive perspective, an in-depth understanding, and a cross-functional awareness of the OE (see Figure I-1). GEOINT collection encompasses all aspects of literal, infrared (IR), and synthetic aperture radar (SAR) imagery; overhead persistent IR capabilities; and geospatial information and services (GI&S). GEOINT includes the exploitation and analysis of electro-optical, IR, and radar imagery, as well as the exploitation and analysis of geospatial, spectral, laser, IR, radiometric, SAR phase history, polarimetric, spatial, and temporal data. It employs all ancillary data, signature information, and fused data products, as necessary. GEOINT provides many advantages for the warfighter, national security policy makers, homeland security personnel, and intelligence community (IC) collaborators by precisely locating activities and objects; enabling safe navigation over air, land, and sea; assessing and discerning the meaning of events; and providing context for decision makers. Technical advancements in structured observation management (SOM), object-based production (OBP), and activity-based intelligence (ABI) are also promoting the integration of intelligence data; improving the ability to discover, access, and use data; and creating efficiencies in analysis and production.

b. GEOINT operations include the tasks, activities, and events used to collect, manage, analyze, generate, visualize, and provide the imagery, IMINT, and geospatial information necessary to support national and defense missions, as well as international arrangements. GEOINT operations consist of a set of interrelated and specific activities and procedures to conduct GEOINT and cross-functional operational awareness of the environment. These activities continuously support information fusion, visualization, analysis, and sharing. They may be performed independently; in conjunction with one another; or as a component of other intelligence, combat support, or information-related activities.

Geospatial Intelligence in Joint Operations

NRT Feeds

- Message (AMHS, Freetext and USMTF)
- RSS
- Weather

Intelligence Layers

- Threats
- AOB/GOB/NOB
- Collections
- Assessments
- Targeting
- Cyberspace order of battle

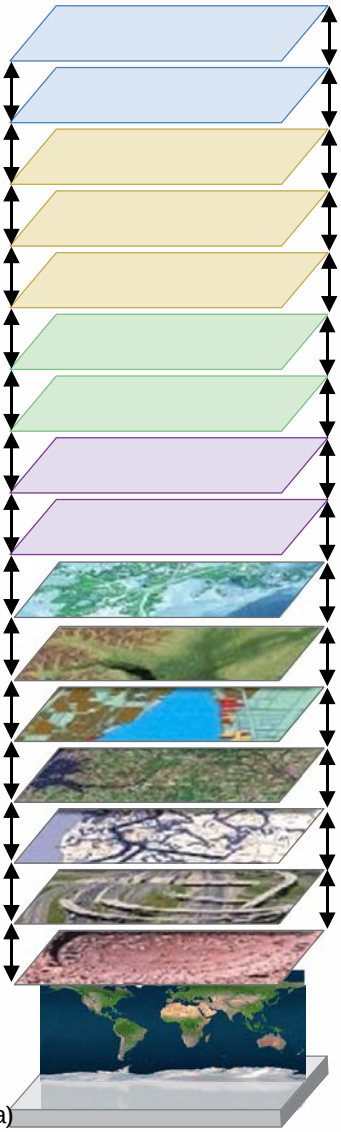
Cross-Functional Data Layers:

- UN, host nation, NGO
- Regional cooperation relationships
- Climate, ecosystem applications
- Water and land management
- Demographic, human geography
- Population, refugees, and migration
- Logistics plans and operations
- Medical
- Operation/concept plans
- Checkpoints, MSRs, LOCs

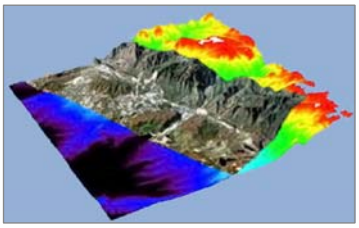
Shared Foundation Geospatial Database

- Map data
- Imagery data
- Elevation data
- Infrastructure
- Cyberspace data

(Notional Layers – Can be any geospatially enabled data)



Common, Service-Enabled Access to Authoritative Information Across all Domains Viewed Using Standards-Based Applications



Imagery, Imagery Intelligence, Geospatial Information

Geospatial capabilities enable cross-functional information fusion, visualization, analysis, production, and sharing activities.

GEOINT provides a common framework for managing information in support of situational awareness, JIPOE, COP, targeting, and decision making.

Legend

AMHS	automated message handling system	MSR	main supply route
AOB	air order of battle	NGO	non-governmental organization
COP	common operational picture	NOB	naval order of battle
GOB	ground order of battle	NRT	near real time
GEOINT	geospatial intelligence	RSS	really simple syndication
JIPOE	joint intelligence preparation of the operational environment	USMTF	United States message text format
LOC	line of communications	UN	United Nations

Figure I-1. Geospatial Intelligence in Joint Operations

3. Geospatial Intelligence Support to Joint Operations

a. GEOINT provides a common foundation for supporting joint operations to better enable mission accomplishment across the range of military operations. GEOINT supports joint operations through the multidirectional flow and integration of geospatially referenced data from relevant GEOINT and other sources of intelligence and information to achieve a shared awareness of the OE, near real time (NRT) tracking, and collaboration between forces. GEOINT provides a context of space and time regarding the OE, contributing to knowledge about capabilities, trends, and patterns for operational awareness and decision making.

b. Foundation GEOINT, in the form of features, elevation, controlled imagery base, geodetic sciences, geographic names and boundaries, aeronautical, maritime, digital point positioning database (DPPDB), and human geography, provides the basic framework for visualizing the joint common operational picture (COP). It is information produced by multiple sources and is streamed and stored using validated Department of Defense Information Technology Standards Registry (DISR) interoperable data standards. GEOINT online on-demand services include tools that enable users to access and manipulate data and provide instruction, training, laboratory support, weapon systems analysis, and guidance for the use of geospatial data.

c. GEOINT activities support joint operations through the delivery of finished analytical products. The GEOINT operations process consists of interrelated and specific GEOINT activities and procedures to conduct GEOINT in support of joint operations. These activities are continuous and may be performed independently; in conjunction with one another; or integrated as a component of other intelligence disciplines or operational procedures that require information fusion, visualization, analysis, and sharing. Optimization of GEOINT production to support operations is facilitated by unified geospatial-intelligence operations (UGO), which is the collaborative and coordinated process to assess, align, and execute GEOINT across the NSG and its partner organizations. Refer to Chapter IV, "Geospatial Intelligence Activities," for a more detailed discussion of the GEOINT operations process and the associated activities and procedures.

d. Joint force commanders (JFCs) should consider establishing a GEOINT cell to manage GEOINT activities under the joint force's command structure. The JFC can request the establishment of this cell, which typically includes both NGA civilian and military personnel, with representation from Service GEOINT organizations. NGA will frequently deploy a forward element with reachback connectivity to NGA analysts and data repositories in support of a crisis response operation. Execution of the GEOINT support mission is conducted by personnel in theater and supported with continental United States (CONUS)-based elements in a reachback capacity. Requests to establish this cell are initiated by contacting the National Geospatial-Intelligence Agency Operation Center (NOC) and the NGA Director of Operations, Office of Expeditionary Operations via the combatant command (CCMD) National Geospatial-Intelligence Agency support team (NST). Early coordination with NGA and other GEOINT producers is essential. The GEOINT cell interacts directly with customers and the NSG to obtain and provide the highest quality GEOINT support in response to validated mission requirements.

e. There are five general categories of GEOINT support to joint operations:

(1) **General Military Intelligence and Warning Intelligence.** As one component of general military intelligence and warning intelligence, GEOINT supports monitoring scientific and technological developments and capabilities of foreign military forces for long-term planning purposes and for detecting and reporting foreign developments that could involve a threat to US and partner nations' military, diplomatic, or economic interests or to US citizens abroad. Additionally, GEOINT supports situational awareness (SA) by providing warning of possible increased threats or a significant increase in the tactical positioning of adversary assets.

For more information on general military intelligence and warning intelligence, see Joint Publication (JP) 2-0, Joint Intelligence.

(2) **Safety of Navigation.** Using bathymetric, hydrographic, maritime safety, gravimetric, aeronautical, atmospheric, and topographic information for sea, air, and land navigation. The Global Positioning System (GPS) is the primary source of positioning, navigation, and timing information.

(3) **OE Awareness.** Visualizing the OE via change detection; tracking movements of interest; and monitoring land installations, support facilities, airfield site selection suitability, and port activity. GEOINT is a key component supporting joint intelligence preparation of the operational environment (JIPOE) and provides the geospatial foundation to visualize all sources of intelligence and operational data within a COP.

(4) **Mission Planning, Rehearsal, and Command and Control (C2).** Employing GEOINT content to plan, rehearse, and execute missions; evaluate mission progress; adjust schedules; and assign and apportion forces, as appropriate. GEOINT can be used to create realistic, interactive scenarios that accurately depict the operational area in three dimensions and across time. The simulated air, land, or maritime environment prepares personnel for factors they may encounter in the planning and execution of missions.

(5) **Support to Targeting.** Targeting support consists of the development of target materials through basic, intermediate, and advanced target development; IC target vetting; collateral damage estimation; and battle damage assessment. NGA provides geospatial accuracy assurance through its accreditation, certification, geopositioning tools validation, Modernized Integrated Database/National Production Workshop quality review, and testing and evaluation programs. NGA also performs numerous photogrammetric processes to generate targeting foundation products.

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CHAPTER II
ROLES AND RESPONSIBILITIES

"Nothing should be neglected to acquire a knowledge of the geography and the military statistics of other states, so as to know their material and moral capacity for attack and defense, as well as the strategic advantages of the two parties."

General Antoine Henri de Jomini
***Translated from Précis de l'Art de la Guerre*, 1838**

1. National and Department of Defense-Level Entities

a. **NSG.** The NSG is the combination of technology, policies, capabilities, doctrine, activities, people, data, and organizations necessary to produce GEOINT in an integrated, multi-intelligence environment. Operating within the laws of the US and the policies and guidelines established by the Director of National Intelligence (DNI), the NSG community consists of principal members, associate members, and partners (see Figure II-1). As the Department of Defense (DOD) GEOINT Mission Manager and the IC GEOINT Functional Manager, the Director of NGA is responsible for the processes for tasking imagery and

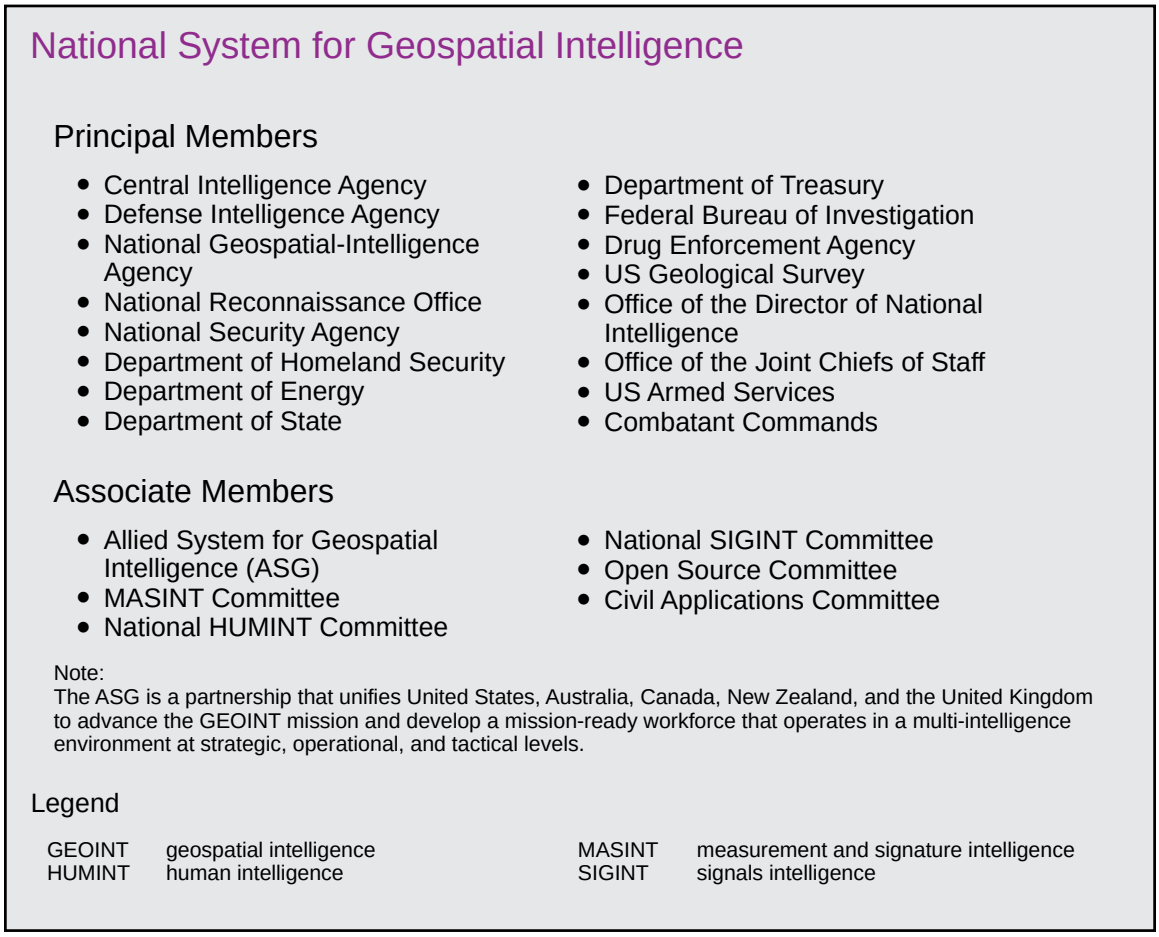

Figure II-1. National System for Geospatial Intelligence

geospatial information collection, processing raw data, exploiting geospatial information and imagery, analyzing information and intelligence, disseminating information and GEOINT to consumers, and identifying and assessing risks and capability gaps and recommending mitigation alternatives. The DOD GEOINT Manager mandates and enforces GEOINT standards and architectures for the NSG, promotes interoperability between existing and future systems, and sets guidance to the NSG.

b. **NGA** is a combat support agency (CSA), as well as an IC member organization, and is directly subordinate to the Secretary of Defense (SecDef), the Under Secretary of Defense for Intelligence (USD[I]), and the DNI. NGA produces timely, relevant, and accurate GEOINT to the joint force. NGA is the primary source for GEOINT analysis, products, data, and services at the national level and provides advisory tasking recommendations for Service-operated airborne and surface-based GEOINT collection platforms and sensors. In addition to the GEOINT support identified in JP 2-01, *Joint and National Intelligence Support to Military Operations*, NGA's mission supports national and homeland security, defense policy and force structure, advanced weapons and systems development, and natural disaster relief. Along with the United States Air Force (USAF), NGA is a co-provider of positioning and navigation services to DOD and the IC. By accessing NGA's Map of the World, intelligence analysts have access to additional data and products to aid in development of their own customized GEOINT products or can obtain standard and nonstandard GEOINT products and analysis. NGA's authorities and responsibilities are codified in Department of Defense Directive (DODD) 5105.60, *National Geospatial-Intelligence Agency (NGA).* NGA's responsibilities include:

(1) NGA serves as the DOD lead for all acquisition or exchange of commercial and foreign government-owned, imagery-related, remote sensing data for DOD components. The agency coordinates such purchases by other United States Government (USG) departments and agencies, on request. This effort facilitates NGA's support to and collaborative efforts with partner nations, other IC agencies, DOD organizations, and other civilian entities.

(2) NGA provides an NST in direct support to a JFC's joint intelligence operations center (JIOC) and maintains NSTs for each of the Services, DOD agencies, and several non-DOD agencies. NGA also maintains a Pentagon NST supporting the Joint Staff. Each NST consists of a core cadre that includes geospatial analysts, imagery analysts, and staff officers. An established NST has reachback connectivity with NGA to gather support requirements, synchronize, and coordinate NGA's support to the joint force. The NST cadre includes personnel who are trained and ready to deploy to a joint force headquarters (HQ) staff at any time. Emergency-essential designation personnel deploy at the discretion of the host commander and in coordination with the NST chief. The NST chiefs serve as the Director/NGA's personal representatives to the host organization for direct support and oversee NGA GEOINT resources and capabilities to meet the host site mission requirements. The NST chief also represents the GEOINT functional manager and contributes to UGO management at the host site. Emergency-essential designation personnel provide deployed on-site GEOINT support in the form of a GEOINT support team to work directly with and augment their military counterparts and serve as a conduit to the NGA and the remaining NST contingent. At the request of the NST, NGA can provide specific capabilities and

additional personnel to the GEOINT support team to meet CCMD mission requirements. The NST HQ element can then provide reachback to the national-level as needed, potentially augmenting any NGA presence.

(3) NGA manages satellite collection requirements and develops distribution protocols for the NSG IAW the National Intelligence Priorities Framework (NIPF). Once GEOINT data is collected and processed, NGA serves as the lead agency for the exploitation and analysis of the data and the access/distribution of the resulting products.

(4) **Additional Roles and Responsibilities of the NGA**

(a) Assist in development of GEOINT requirements to be included in appendix 7 of annex B for appropriate plans and orders. See Appendix C, "Sample Appendix 7 (Geospatial Intelligence) to Annex B (Intelligence)," for more information.

(b) Develop support plans for all designated plans.

(c) Produce and maintain timely, accurate, and relevant worldwide aeronautical and maritime safety of navigation databases and products essential for safe and effective operations in support of national interests.

(d) Coordinate planned production of DOD-standard GEOINT products with the Defense Logistics Agency (DLA) to ensure combatant commander (CCDR) and Service requirements are considered when stock levels are established.

(e) Train and maintain an internal crisis management team to respond to CCDR requirements.

(f) Provide GEOINT strategic workforce planning and specific training for general and specialized tradecraft skills through the National Geospatial-Intelligence College.

(g) Provide guidance and oversight on procedures and processes to task, collect, analyze, disseminate, share, and archive GEOINT by the most efficient and expeditious means consistent with DOD and the Office of National Intelligence security and information sharing policies and procedures.

(h) Participate in Chairman of the Joint Chiefs of Staff (CJCS) level exercises in order to assess NGA responsiveness and readiness to support operational forces.

(i) Participate in DOD requirements and acquisition forums to identify digital GEOINT dissemination requirements and ensure DOD communications networks and infrastructures meet customer needs.

(j) Develop and consolidate GEOINT collection requirements for the NSG and develop collection plans that respond to national and military priorities.

(k) Assist in development of GEOINT requirements to be included in life cycle intelligence mission data planning to support defense acquisition programs.

(l) Prescribe, mandate, and enforce GEOINT standards and architecture to promote joint interoperability.

(m) Support joint targeting during all steps of the joint targeting cycle with GEOINT production, analysis, and services. This includes plan development, target list maintenance, target analysis and material production, precise point mensuration, and certification/accreditation, vetting, and battle damage assessments.

(n) Develop imagery graphics and provide to responsible producers of the Modernized Integrated Database installations/facilities for incorporation into the National Production Workshop. Graphics clearly outline boundaries of installations/facilities and include annotated elements within each facility that are important to the overall function of the facility.

c. **National Reconnaissance Office (NRO).** The NRO is a DOD agency and a member of the IC. The NRO is responsible for research and development, acquisition, launch, deployment, and operation of overhead systems and related data processing facilities to collect intelligence and information to support national and departmental missions and other USG needs. The NRO designs, builds, and operates the nation's reconnaissance satellites, which comprise one of the primary collection sources for GEOINT data. The satellites also provide significant imagery to support DOD targeting and mapping requirements. Applications of this data include warning, monitoring of arms control agreements, and the planning and execution of military operations. NRO field representatives are located within each of the CCMDs and serve as a direct link between the NRO and CCDRs and their staffs. NRO field representatives provide support covering pre-deployment training, education, weapon system integration, and dissemination of products and services.

d. **Joint Collaboration Cell—East.** The Joint Collaboration Cell—East is co-led by the NGA Director/Source Operations Group and the NRO Commander, Aerospace Data Facility-East. The Joint Collaboration Cell—East provides time-sensitive GEOINT support to national, strategic, and tactical customers by exercising NGA and NRO processes, tasking capabilities, and coordinating with subject matter experts (SMEs).

e. **National Security Agency.** The National Security Agency is a CSA and a national-level intelligence agency subordinate to SecDef, the USD(I), and the DNI. The National Security Agency's cybersecurity and foreign signals intelligence (SIGINT) information missions incorporate GEOINT in the agency's day-to-day operations. SIGINT, while an independent source of intelligence in its own right, when utilized in conjunction with GEOINT, can complement, enhance, and maximize all-source intelligence analysis to derive actionable intelligence production. With the implementation of expanding technology and increasing IC collaboration and partnerships, SIGINT enables geospatial associations and pattern analysis.

f. **Central Intelligence Agency (CIA).** The CIA is a national-level intelligence agency reporting to the President through the DNI. The CIA provides foreign intelligence on national security topics and conducts counterintelligence activities, special activities, and other functions, as directed by the President. To ensure effective collaboration, CIA and NGA liaison officers and analysts are embedded in each other's agencies. This collaborative relationship aids in the integration of NGA's GEOINT and other specialized intelligence into the agency's respective functions, products, and missions, providing more robust intelligence capabilities.

g. **Defense Intelligence Agency (DIA).** The DIA is a CSA and a member of the national IC. The Director, DIA, reports to SecDef through the CJCS. DIA's combat support mission is to support operating forces planning for or conducting military operations, including support during conflict or in the conduct of other military activities related to countering threats to US national security. DIA's mission as a national IC organization is to satisfy the military and military-related intelligence requirements of SecDef and the Deputy SecDef, the CJCS, and the DNI, and provide the military intelligence contribution to national foreign intelligence and counterintelligence. The Director, DIA, develops and recommends, through the Joint Staff J-25 [Deputy Directorate for Intelligence, Operations, Policy and Plans], globally optimized sourcing solutions for Defense Intelligence Enterprise intelligence units and personnel capabilities to support CCDR intelligence requirements. As the Defense Collection Manager, the Director, DIA, serves as the DOD conduit for collection coordination of both national and airborne GEOINT.

h. **DLA.** The DLA is a CSA that provides worldwide logistics support for Military Departments and the CCMDs, as well as other DOD components and government agencies. The Director of DLA serves as the DOD integrated material manager for all standard geospatial information products (including maps, charts, elevation data, and other aeronautical and maritime navigation aids), and controlled image base (CIB), with national stock numbers. See Chapter IV, "Geospatial Intelligence Activities," subparagraph 6.e.(1), "GEOINT Products," for more information.

(1) DLA Mapping Customer Operations (MCO) Division is the supply chain manager for all standard maps, CIB, charts, elevation data, and other aeronautical and maritime navigation aids in federal supply classes 7641 (Aeronautical), 7642 (Hydrographic), 7643 (Topographic), and 7644 (Digital) maps, charts, and geodesic products. MCO is responsible for managing map accounts, ordering maps, and receiving status of orders.

(2) Defense Logistics Agency Distribution Mapping (DDM) operates a wholesale depot and several retail map support offices (MSOs) located around the world (see Figure II-2). DDM is responsible for the storage and distribution of standard GEOINT products. The MSOs serve as regional distribution centers for standard GEOINT products and training.

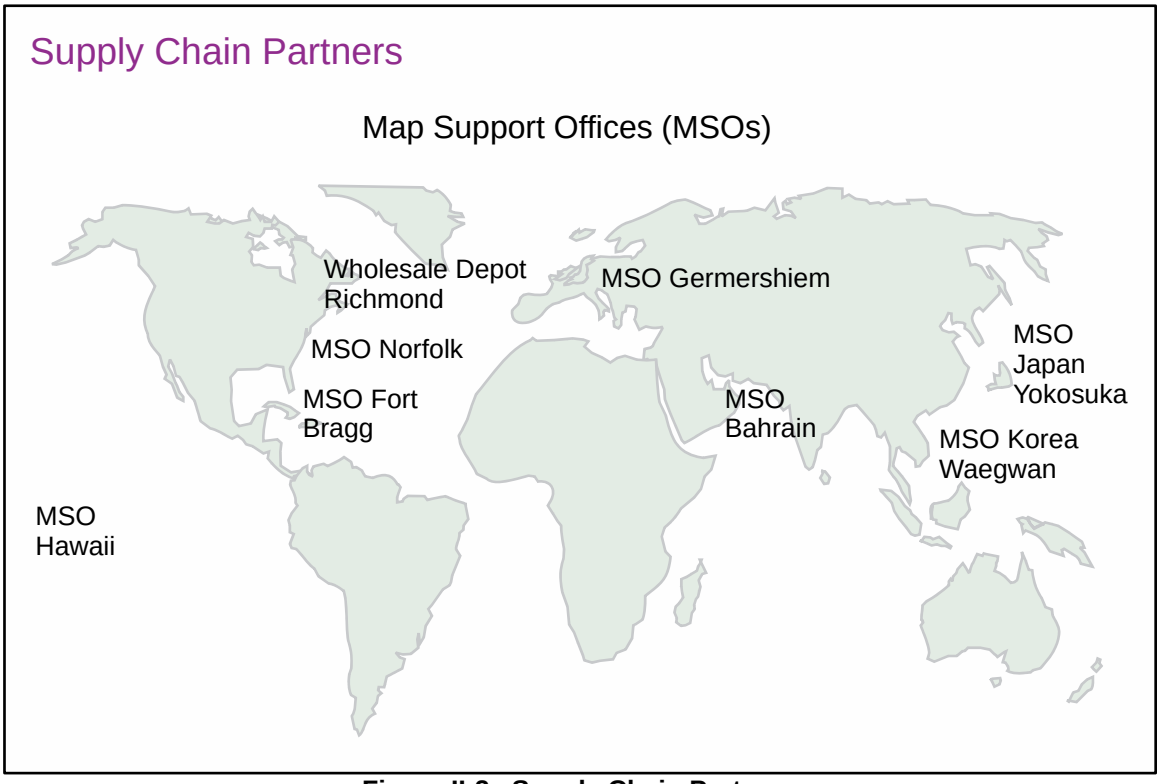

Figure II-2. Supply Chain Partners

(3) DLA's Logistics Information Service produces the DLA Map Catalog. The catalog contains standard maps, CIB, charts, elevation data, and other aeronautical and maritime navigation aids available in the DLA inventory and is available via DVD and online. The customer information Website is at http://www.dla.mil/Aviation/Offers/Products/Mapping.aspx.

(4) DLA Document Services operates in-house printing and replication service centers located around the world, as well as contract print and replication vendors located in CONUS. DLA Document Services is responsible for the printing of hard copy and the replication of portable media (CD/DVD) standard GEOINT products.

(5) Specific roles and responsibilities of DLA include:

(a) Serve as the DOD integrated material manager for standard GEOINT products.

(b) Coordinate reprint requirements of standard GEOINT products with NGA to ensure CCDR and Service requirements can be filled in a timely manner.

(c) Equip and maintain a deployable DLA support team organized to support the CCDR's staff, if requested. The team's capability should normally include the ability to support the GEOINT mission forward IAW DLA-CCDR performance-based agreements and supporting plans.

(d) Print, replicate, or acquire and maintain inventories of, and participate in, the distribution of standard maps, charts (nautical and aeronautical), air target materials, terrain analysis databases, digital products, and related materials to support military operations and safety of navigation.

(e) Maintain sufficient stocks of standard maps, CIB, charts, and other aeronautical and maritime navigation aids to support pre-positioned war reserve requirements and sustained crisis operation requirements IAW theater operation plans (OPLANs)/concept plans (CONPLANs). It is incumbent on the CCMD GEOINT officers to coordinate their standard GEOINT requirements to ensure DLA can have the product on the shelf. This is especially important when plans call for storing and distributing maps at one or more of DDM's retail MSOs, since they have limited storage capacity and personnel.

(f) Establish liaison with the supported commander's GEOINT cell and/or NST.

2. Joint Staff

The Joint Staff is the primary interface between the CSAs, Services, and joint force commands for federated support. To establish federated support, the joint force submits a community on-line intelligence system for end-users and managers (COLISEUM) request to the Joint Staff or Geospatial Requirements One-Stop Visualization Environment (GROOVE) request. The Joint Staff will validate the request and ensure proper federated support is provided.

See JP 2-01, Joint and National Intelligence Support to Military Operations, *for more information on federated intelligence support.*

3. Combatant Commands

The CCMDs develop GEOINT requirements to support development of warning intelligence, as well as the planning and execution of joint operations. The geographic combatant commander (GCC), in partnership with the NST, may establish a GEOINT cell to coordinate all GEOINT requirements within its area of responsibility (AOR) while ensuring the supporting commands or component commands are managing theater and mission-specific GEOINT requirements. The GEOINT cell is further described in Chapter III, "Geospatial Intelligence in Joint Operations."

a. Each CCMD can establish a JIOC to plan, prepare, integrate, direct, synchronize, and manage continuous, full-spectrum defense intelligence operations. The goal of a JIOC is to integrate all DOD intelligence functions and disciplines and facilitate access to all sources of intelligence in a prescribed timeline and appropriate format to positively affect CCMD missions and operations. A JIOC is designed to facilitate access to all available intelligence sources and analyze, produce, and disseminate accurate and timely all-source intelligence and GEOINT to support planning and execution of military operations. For more information on planning, see Appendix A, "Geospatial Intelligence and Joint Planning." The CCMDs primarily have imagery analysis capabilities, but may lack GI&S capabilities at the JIOC level. CCMDs may leverage their components for geospatial analytic capability, and

they can also submit requests for geospatial exploitation via the NST and NGA's online request for information (RFI) system.

b. The types of GEOINT products generated by the CCMDs include text reports, database entries, target materials and support products, Joint Desired Point of Impact point's mensuration products, visualization products, and annotated graphics. The GEOINT cell can inform and advise the CCDR on all GEOINT and geodetic sciences. While the CCMDs rely heavily on basic maps, charts, precise coordinates (DPPDB), and other standard GEOINT provided by NGA, they also research, develop, and produce mission-specific, specialized GEOINT products and services for the CCDR and components.

c. CCDRs, in conjunction with NGA and DIA, establish the appropriate architecture to support theater and mission-specific GEOINT digital logistics.

d. CCMDs have varying levels of organic GEOINT production capability using both NGA- and DIA-provided systems and applications. Production personnel provide tactical and operational data of special interest for use by the NSG and multinational partners.

e. **War Reserve Stock (WRS).** WRS is a responsibility of the CCMD and is one of the three categories of inventory authorized to support SecDef sustainability planning guidance. JP 4-09, *Distribution Operations,* contains in-depth explanations regarding the identification and stocking of war reserve to support CCDR operations. Title 10, USC, identifies Service responsibilities for identifying war-reserve requirements. The CCMD GEOINT cell should work closely with Service component GI&S personnel to review, update, and maintain war reserve requirements in peacetime to support crisis or wartime operations.

See Department of Defense Instruction (DODI) 3110.06, War Reserve Materiel (WRM) Policy, *for CCDRs' responsibilities for establishing war reserve mapping and charting requirements.*

f. Specific roles and responsibilities of the CCMDs include:

(1) Maintain, within the HQ staff, the capability to direct and manage GEOINT cell activities.

(2) If a GEOINT cell is created, appoint a lead GEOINT officer and identify GEOINT cell members from relevant directorates and mission partners.

(3) Develop appendix 7 (Geospatial Intelligence) IAW Chairman of the Joint Chiefs of Staff Manual (CJCSM) 3130.03, *Adaptive Planning and Execution (APEX) Planning Formats and Guidance.*

(4) Submit requirements for GEOINT products and services IAW guidance contained in CJCSM 3130.03, *Adaptive Planning and Execution (APEX) Planning Formats and Guidance,* and Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3901.01, *Requirements for Geospatial Information and Services.* Indicate the phase of exploitation for each GEOINT requirement (see Chapter IV, "Geospatial Intelligence Activities," subparagraph 5.e, for discussion of phases of exploitation). Supporting applications and

Web-based systems include GROOVE and the Geospatial Intelligence Enterprise tasking, Processing, Exploitation, and Dissemination Services (GETS).

(5) Task components and supporting commands with mission-specific GEOINT tasks consistent with assessed capabilities (e.g., intratheater distribution, lift planning, and requirements).

(6) Establish responsibilities, requirements, and procedures for the storage and maintenance of WRS, crisis or contingency stocks, and/or directed unit holdings and allowances of GEOINT products.

(7) Assess the need for and, as appropriate, request Service or NGA contingency response teams and/or NSTs to assist with GEOINT planning and operations.

(8) Assess the need for, and, as appropriate, request DLA contingency support teams to assist with the provision of standard GEOINT products.

(9) Assess the capabilities of NGA to support operational needs. Include NGA in exercises to assess their capability. Assess NGA responsiveness to supported CCDR's needs and respond via NSG customer support teams or customer surveys.

(10) Ensure intratheater connectivity exists to receive, store, and disseminate digital data.

(11) Assess GEOINT readiness through the Defense Readiness Reporting System.

4. Subordinate Joint Force Commander

a. Subordinate commanders develop area and point target GEOINT requirements to support the planning and execution of joint operations. Accordingly, timely GEOINT support is crucial for providing a common framework for visualizing the OE.

b. The designation of the GEOINT officer and subsequent establishment of the GEOINT cell is normally accomplished under the direction of the intelligence directorate of a joint staff (J-2). If there is insufficient expertise or personnel within the J-2 to designate a GEOINT officer or form a GEOINT cell, the J-2 should coordinate with other staff directorates, NGA, other CCMDs, the Services, or other agencies to seek additional support. NGA personnel, as part of an NST at an in-theater Service GEOINT production center, may provide reachback support to the GEOINT cell.

c. The GEOINT cell should be fully aware of the requirements management process for organic and nonorganic allocation and deconfliction of intelligence collection capabilities and assets in order to assist subordinate commands' planners in the development of mission-type orders. Effective integration of organic assets with national capabilities minimizes overlap of asset allocation while providing the best data population to local and national databases. The GEOINT cell should identify and resolve communications shortfalls to facilitate GEOINT support. The GEOINT cell should lead the development, coordination,

and execution of strategies for the timely collection, production, dissemination, and management of GEOINT data into, within, and out of theater.

For additional information on communications systems, see JP 6-0, Joint Communications System.

5. Services

The Services support departmental planning functions with GEOINT products, Service-specific content, format, and media. Capabilities exist primarily within the intelligence and geospatial engineering elements. The Services are responsible for ensuring forces train with the appropriate range of GEOINT and for identifying specific or unique GEOINT requirements for weapons systems. Services maintain a Service GEOINT element at HQ NGA (consistent with DODD 5105.60, *National Geospatial-Intelligence Agency [NGA]),* and assign departmental requirements officers (DROs) to participate in and represent their Service interests at GEOINT collection subcommittee meetings. Services also have the responsibility to keep CCMDs informed on Service GEOINT programs and capabilities. Designated Service GEOINT officers coordinate with the CCMD's JIOC and NGA to establish policy regarding roles and responsibilities for co-production, value-adding, and management of distributed geospatial libraries. Services should provide systems that adhere to DISR standards to facilitate maximum interoperability throughout the NSG.

a. Specific Roles and Responsibilities of the Service Chiefs

(1) Ensure forces train with the appropriate range of GEOINT data, information, products, and services.

(2) Ensure new systems are designed to use DOD-standard GEOINT data, information, products, and services where possible. Identify and submit requirements for new and unique GEOINT data, information, products, and services IAW guidance in CJCSI 3141.01, *Management and Review of Joint Strategic Capabilities Plan (JSCP)-Tasked Plans.*

(3) Ensure logistic and communication systems are capable of managing or requisitioning GEOINT data, information, products, and services.

(4) Assess the capability of NGA to support operational needs. Include NGA in exercises to use and assess this capability. Assess NGA responsiveness to CCMD and Service needs and respond via NSTs and customer surveys.

(5) Assess the capability of DLA to support operational needs. Include DLA in exercises to assess this capability. Assess DLA responsiveness to Service needs and respond via DLA contingency support teams and customer surveys.

(6) Provide information on availability of Service holdings of GEOINT data from NGA.

(7) Establish and maintain Service GEOINT elements at HQ, NGA consistent with DODD 5105.60, *National Geospatial-Intelligence Agency (NGA).*

(8) Assign DROs to present Service collection requirements at geospatial-intelligence collection subcommittee meetings.

b. **United States Army (USA).** GEOINT in the USA supports all aspects of military planning and ground force operations. GEOINT provides a basic framework and foundation for visualizing and understanding the OE, maintaining SA, and making decisions. Army GEOINT operations are conducted by GEOINT elements that include GEOINT imagery analysts, GEOINT imagery technicians, geospatial engineers and geospatial engineering technicians, and Department of the Army civilians. The Army uses GEOINT by analyzing intelligence reports, aeronautical, topographic, hydrographic, littoral, cultural, imagery-based, and atmospheric data that is essential for successful ground combat.

(1) Army GEOINT is enabled by all forces, intelligence, and engineering from national to tactical levels that conduct or enable GEOINT operations. Army GEOINT elements at all echelons contribute to and leverage the GEOINT enterprise—the NSG, and when appropriate, the Allied System for Geospatial Intelligence (ASG). The GEOINT enterprise consists of all GEOINT professionals, data and databases, products, sources, tools, architecture, infrastructure, processes, methodologies (including ABI), and frameworks (OBP and SOM) to enhance situational understanding and enable mission command. GEOINT functions and services are implemented to make GEOINT universally discoverable and usable, regardless of the mission profile. Much of the Army GEOINT production and dissemination is conducted on the Army's GETS Web-based system. Commands and the other Services can access GETS by establishing accounts. Army geospatial engineers and intelligence units work closely with the commands at all levels to conduct JIPOE; produce specialized, tailored views and products; and then support mission execution. The Army's geospatial engineering teams provide in-depth terrain analysis, including topographic support and terrain visualization, and use the distributed common ground system-Army (DCGS-A) to manage and provide a standard, sharable geospatial foundation for warfighters, planners, intelligence personnel, and logisticians.

(2) Army GEOINT capabilities support protection of the homeland through NRT support to multi-disciplinary intelligence, identification and high-resolution geolocation of threats, support to national special security events, and assistance in regional crises and natural disasters. GEOINT products and services may be supplied by the broader Army GEOINT enterprise or by Army National Guard forces supporting state and local officials. In particular, geospatial engineering provides accurate, precise, and timely geospatial products to support all warfighting functions.

(3) To support regional security and Army Service component command (ASCC) and ground component command requirements, regionally aligned elements partner with NSTs and allies in conducting GEOINT for combined missions, disseminating appropriately classified products in a sharable format, and developing a common running estimate. Within a given theater, Army GEOINT capabilities may be found within GEOINT cells at brigade combat team, division, and corps levels.

(a) The geospatial planning cell (GPC) provides geospatial engineering support by collecting, vetting, conflating, exploiting, analyzing, and disseminating geospatial data to

ASCC staff and subordinate units. The GPC manages the theater geospatial database, which is the authoritative data source for all land components in the CCMD AOR. This database is accessible to NGA and subordinate elements via push and pull processes.

(b) The Army's military intelligence brigade-theater, supported by the theater analysis and control element, provides GEOINT analysis and production to the ASCC commander, Army or Marine Corps component intelligence staff officer (G-2), and major subordinate command G-2/battalion or brigade intelligence staff officers. The military intelligence brigade-theater maintains the DCGS-A GEOINT architecture in order to provide theater-specific access to timely and accurate GEOINT to all ASCC major subordinate commands.

(4) Additional reachback support to the theater is provided by the CONUS-based Army Geospatial Center; Army GEOINT Battalion; and the Army Processing, Exploitation, and Dissemination (PED) Center. The Army PED Center provides analysis and production support from GEOINT collectors in the aerial and space layers, providing a unique capability in support of ground requirements. Further, Army GEOINT personnel support strengthening regional ties and future interoperability by supporting the GEOINT functional manager in training allies to conduct GEOINT production.

c. **United States Marine Corps (USMC).** The USMC uses GEOINT to analyze the topographic impact and climatic conditions on friendly and enemy force capabilities. All related USMC GEOINT supports the Marine air-ground task force (MAGTF) in performing its mission. A common geographic reference is critical in supporting any MAGTF operation. Accurate positioning information is key in supporting the following warfighting functions: C2, intelligence, fires, protection, movement and maneuver, and sustainment. During planning, GEOINT provides the initial framework to support visualizing the OE. This assists warfighters in developing their courses of action (COAs), as well as conceptualizing possible adversary COAs. The distributed common ground/surface system Marine Corps (DCGS-MC) provides core GEOINT exploitation, analysis, production, dissemination, and archival capabilities for the MAGTF. DCGS-MC also supports the Marine Corps Intelligence, Surveillance, and Reconnaissance Enterprise (MCISRE) by providing both foundational and specialized GEOINT products, services, and availability to the expertise needed to support the MAGTF intelligence centers organic to the Marine expeditionary force (MEF) HQ. From the intelligence battalion of each MEF, task-organized Marine Corps GEOINT support teams consisting of both imagery analysis specialists and geographic intelligence specialists can be provided to supplement intelligence elements of the MEF's components and to augment joint task force (JTF)/CCMD efforts as needed. The Marine Corps Intelligence Activity (MCIA) is the fixed site for the MCISRE, providing reachback support to the MAGTF intelligence centers and other MAGTF intelligence elements. MCIA is also the USMC Service Intelligence Center and the central archive for all USMC GEOINT products. MCIA is responsible for producing these products and making them available to the entire NSG community.

For more information, see Marine Corps Warfighting Publication 2-26, Geospatial Information and Intelligence.

d. **United States Navy (USN).** The Navy maximizes GEOINT by fusing aeronautical, topographic, hydrographic, littoral, cultural, and geospatially enabled atmospheric and oceanographic data for successful combat rehearsals and operations. The Naval Oceanographic Office (NAVOCEANO) is tasked to collect oceanographic, bathymetric, and hydrographic data in support of Navy and CCMD requirements. Intelligence units use imagery and feature data from multiple sources to produce imagery and intelligence, and conduct all-source intelligence analysis. Operational assets use GEOINT to maximize their maritime domain awareness, effecting tactical decision processes and responses within their immediate operating areas. The USN possesses a wide array of GEOINT collection capabilities, but dedicated naval imagery analysts are concentrated at the Office of Naval Intelligence in the fleet imagery support team. USN GEOINT collection capabilities include airborne intelligence, surveillance, and reconnaissance (ISR) capabilities, such as P-3 and MQ-4C; tactical and theater-level unmanned aerial systems and other unmanned systems; weapons systems video from air and surface units; and handheld cameras. Fleet requirements for GEOINT analytic support are met with augmentees from Office of Naval Intelligence fleet intelligence detachments or via reachback exploitation and analytic production at the fleet imagery support team. Maritime operations centers, aircraft carriers, large deck amphibious warfare ships, and command ships have significant GEOINT processing and exploitation capabilities through the distributed common ground/surface system (DCGS)-Navy.

e. **USAF.** GEOINT is a key component of the USAF's core missions: air and space superiority, ISR, rapid global mobility, global strike, and C2. The USAF provides integrated ISR, base engineering, flight safety, and flight weather capabilities across the entire range of air, space, and cyberspace operations.

(1) The USAF DCGS is a principal source for GEOINT derived from theater airborne collection systems while also utilizing national and commercial sources to answering warfighter needs. The National Air and Space Intelligence Center, as part of its mission to provide all-source intelligence on air and space systems and technologies for warfighters, acquisition managers, and policy makers, is a leader in full-spectrum GEOINT production, as well as the development of new GEOINT algorithms, tools, and products. The 363rd ISR Group (the former Air Force Targeting Center) includes in its mission GEOINT production such as CIB for domestic range missions and the operation of the Enhanced Geospatial Product Library (eGPL). Additionally, the Air Force Geospatial Production Cell satisfies USAF ISR-related priority geospatial requirements on CONUS and select worldwide data sets.

(2) In USAF operations engineering is divided into general engineering, combat engineering, and geospatial engineering. Geospatial engineering contributes to a clear understanding of the physical environment. The Air Force Materiel Command's Air Force Installation and Mission Support Center produces geospatial information for the installation management mission while major command civil engineers produce specific modeling and planning oriented GEOINT for potential forward operating locations. Both missions provide tailored GEOINT that contribute to a clear understanding of the physical environment to enabling commanders to make informed decisions during installation planning throughout all phases of operations.

(3) The Air Force Flight Standards Agency is the lead for defining requirements for safety-of-navigation products, such as flight information publications and Digital Aeronautical Flight Information File, for US military aviators.

(4) The 557th Weather Wing forecasts worldwide weather conditions and provides geospatial visualization products supporting defense and intelligence operations planning.

f. **United States Coast Guard (USCG).** GEOINT supports all USCG statutory missions including defense readiness; ports, waterways, and coastal security; drug interdiction; migrant interdiction; marine safety; search and rescue; living marine resources; marine environmental protection; aids to navigation; and ice operations. In addition to producing and leveraging GEOINT within USCG operations, the Service provides GEOINT data and products to IC partners and law enforcement agencies via its sectors, districts, maritime intelligence fusion centers, and the USCG Intelligence Coordination Center.

For more information on USCG GEOINT support, see Commandant of the Coast Guard Instruction M3800.6, Coast Guard Intelligence Manual.

g. **Specific Roles and Responsibilities of Service Component Commands**

(1) Identify requirements for GEOINT products and services to supported CCDRs IAW guidance contained in CJCSM 3130.03, *Adaptive Planning and Execution (APEX) Planning Formats and Guidance,* and CJCSI 3901.01, *Requirements for Geospatial Information and Services.*

(2) Ensure requirements for GEOINT products and services are included in the supported CCDR's appendix 7 to annex B.

(3) Develop and submit plans for intratheater distribution and stockage using the available Service logistics and communication systems.

(4) Develop and submit storage and lift requirements for GEOINT products to be incorporated in the plan's time-phased force and deployment data (TPFDD) requirements.

(5) Assess NGA responsiveness to component needs, integrate and use NGA capabilities in CCMD exercises, and respond via the operational chain-of-command.

(6) Assess DLA responsiveness to component needs and respond via the operational chain-of-command.

6. Non-Department of Defense Agencies

While US DOD and IC agencies are key GEOINT producers, civil agencies also participate in supporting operations, whether they are military or humanitarian in nature. As examples, the Department of Interior's United States Geological Survey (USGS) and elements of the Department of Homeland Security (DHS) participate with the NSG in providing support to defense and civil operations through the acquisition and analysis of commercial imagery and topographic products. Other non-DOD and IC agencies providing

GEOINT in support of operations include the National Oceanic and Atmospheric Administration (NOAA), United States Department of Agriculture (USDA), and the Federal Aviation Administration (FAA).

a. **USGS.** The USGS provides reliable scientific information to describe and understand the Earth; minimize loss of life and property from natural disasters; manage water, biological, energy, and mineral resources; and enhance and protect quality of life. The USGS collects, monitors, analyzes, and provides scientific understanding about natural resource conditions, issues, and problems. The USGS also collects imagery in the domestic environment in support of civilian disaster response and recovery missions. The USGS facilitates the sharing of information by providing a centralized, unclassified repository (http://earthexplorer.usgs.gov/) for dissemination of imagery and map products from the DOD and homeland security communities. USGS hard copy map products are also made available to the CCMDs and Services via the DLA Map Catalog. The USGS forms cooperative partnerships with organizations from all levels of government and industry. It chairs the Civil Applications Committee, which is an interagency forum that coordinates and oversees the federal civil use of classified collections.

b. **DHS.** The DHS mission depends upon accurate and timely GEOINT focused across the US. Much of the GEOINT data needed for DHS activities comes from local and state sources. Under certain conditions, however, DHS requests and receives GEOINT support from the national IC, principally NGA, and through its relationship with US Northern Command. DOD reviews intelligence collection requirements relating to homeland defense and defense support of civil authorities (DSCA) during the planning process. DOD intelligence component capabilities, resources, and personnel, as a rule, may not be used for activities other than foreign intelligence or counterintelligence, unless that use is specifically approved by SecDef. Executive Order 12333, *United States Intelligence Activities,* and DOD 5240.1-R, *Procedures Governing the Activities of DOD Intelligence Components that Affect United States Persons,* allow for the collection of "overhead reconnaissance not directed at specific US persons," which NGA interprets to be in support of homeland security/defense issues, such as disaster response and national special security events. Within DHS, the Federal Emergency Management Agency (FEMA) and the USCG represent important NSG members. FEMA leads the effort to prepare the nation for all hazards and effectively manage federal response and recovery efforts following any national incident. GEOINT is required to accomplish missions ranging from assisting law enforcement agencies with security, transporting and distributing food and water, conducting search and rescue operations, providing counseling services, hiring and assigning critical personnel, planning for continuity of DOD operations, and coordinating relief efforts.

See JP 3-27, Homeland Defense; *JP 3-28,* Defense Support of Civil Authorities; *DOD 5240.1-R,* Procedures Governing the Activities of DOD Intelligence Components that Affect United States Persons; *and DODD 3025.18,* Defense Support of Civil Authorities (DSCA), *for additional information on support to civil authorities.*

c. **NOAA.** NOAA has assets and sensors that collect imagery of US coastlines both for research purposes and in support of response and recovery missions during major domestic events. Also part of NOAA is the National Ocean Survey which surveys and charts US

territorial waters. NOAA provides hard copy survey and charting products, as well as electronic charting of most USN ports and USCG stations.

d. **USDA.** The USDA's National Agriculture Imagery Program is a collection of aerial imagery over the US. This imagery can be used by the GEOINT community and all levels of government. This imagery provides a key baseline data for change detection and other analyses during domestic disaster events and in DSCA operations.

e. **FAA.** The FAA has assets and sensors that collect imagery and geospatial information of US airfields for CONUS aeronautical safety of navigation purposes. The FAA maintains both hard copy and electronic charting products for use by the CCMDs and Services.

7. Commonwealth Allies

As functional manager of GEOINT, the Director, NGA, strives to incorporate to the maximum extent its commonwealth allies: Australia, Canada, New Zealand (NZ), and the United Kingdom (UK). These countries work closely with the US theater CCMD's JIOC on GEOINT production as part of the UGO. While the individual nation may have varying strategic goals, the desired end state for the group is a common analysis and production agreement and an interoperable information technology (IT) infrastructure for GEOINT. The objective is to work together as partners to respond quickly to the customer's GEOINT needs with the highest quality technology and information.

a. **ASG.** The ASG is a GEOINT partnership that unifies Australia, Canada, NZ, the UK, and the US. The ASG is an associate member of the NSG, upon which its organizational structure is modeled. Due to the size and scope of its GEOINT enterprise, the US provides a permanent chair for each ASG forum, while the co-chair positions rotate among the other four member nations.

b. **Australia.** Australia's lead GEOINT agency is the Australian Geospatial-Intelligence Organisation (AGO). AGO's mission is to provide GEOINT in support of defense and national security customers, enabling decision making at all levels of government. AGO leads an integrated defense GEOINT effort to include Royal Australian Navy's Hydrographic, Meteorological, and Oceanographic Branch; the Royal Australian Air Force aeronautical charting function; and creation of GEOINT support teams within Joint Operations Command and elsewhere. AGO is responsible for imagery and geospatial data, imagery collection and analysis, foundation information production, and GEOINT production on behalf of the government and Australian Defence Force. AGO has control over setting and promulgating standards and regulations and assuring compliance within the Australian Defence Organisation.

c. **Canada.** The provision of GEOINT in Canada is the responsibility of the Canadian Armed Forces Intelligence Command. There are two components under the command that provide GEOINT support. The first component is the Canadian Forces Intelligence Group, which brings together Canadian Armed Forces units for mapping and charting (Mapping and Charting Establishment), IMINT (Canadian Forces Joint Imagery Centre), and

meteorology/oceanography (METOC-Joint Meteorological Centre). Their mission is to provide GEOINT support to the Canadian Armed Forces under their area of expertise, conduct national procurement for all deployed GEOINT systems and Canadian forces-wide imaging equipment, and train geospatial/imagery analysts and meteorological technicians. The Canadian Forces Intelligence Group also serves as the Canadian Armed Forces functional authority for GEOINT, responsible for the standards for all mapping and imagery products, meteorological and oceanographic (METOC), unmanned aerial vehicles, and training. The other component is the Director of Geospatial Intelligence Policy under the Directorate General of Intelligence Policy and Partnerships. This component is responsible for the staff functions of GEOINT providing strategic governance and policy advice.

d. **NZ.** The lead agency for GEOINT in NZ is Geospatial Intelligence New Zealand (GNZ). As a part of the Defence Intelligence branch of the NZ Defence Force, GNZ provides strategic direction, policy, and guidance to other government agencies on all GEOINT matters with a focus on fused GEOINT to meet national tactical and strategic needs. The GNZ mandate includes providing GEOINT support to other NZ government agencies, particularly partners in the security and intelligence sector. Land Information NZ is the NZ Government agency responsible for foundation geodetic, topographic, hydrographic, and imagery material over the NZ territory.

e. **UK.** The UK's lead agency for foundation GEOINT, including topography and aeronautical data, is the Defence Geographic Centre, the lead agency for hydrographic data is the UK Hydrographic Office, and the center for IMINT processing and exploitation is the Defence Intelligence Fusion Centre (DIFC). All three of these GEOINT organizations fall under the Joint Forces Intelligence Group within the Ministry of Defence. The Joint Forces Intelligence Group provides geospatial and fused intelligence support to UK operations worldwide. Per UK Joint Doctrine Publication 2-00, *Understanding and Intelligence Support to Joint Operations,* the DIFC manages and produces GEOINT and fused multi-intelligence in support of strategic and operational decision makers. A GEOINT support element provides intelligence derived from the analysis and exploitation of geospatial information and imagery to describe, assess, and visually depict physical features and geographically referenced activity. Its output will usually be referenced by geospatial position and arranged in a coherent structure. A GEOINT support element can draw on imagery from specialist geospatial centres. The UK specialist centres include the DIFC, Hydrographic Office, Meteorological Office, Defense Geographic Centre, and the Joint Aeronautical and Geospatial Organisation.

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CHAPTER III
GEOSPATIAL INTELLIGENCE IN JOINT OPERATIONS

"Everything has a place. The better that you can understand the geospatial relationships of the sea, Earth, conditions of the globe and the things on it, the better you are the master of your own destiny."

Mike McConnell, Former Director for National Intelligence
Geospatial Intelligence Forum
Volume 7, Issue 6
December 2009

1. Joint Intelligence Operations Center

JIOCs are established by CCMDs, selected subunified commands, and other JTFs as determined by the JFC, as interdependent operational intelligence organizations capable of conducting intelligence operations and integrating all DOD intelligence functions and disciplines in support of the command mission. The primary responsibility of the JIOC is to satisfy the intelligence requirements of the applicable commander and subordinate joint forces. The JIOC is the focal point for the command's intelligence planning, collection management, operations, exploitation, analysis, production, and dissemination effort. It is organized to satisfy the commander's intelligence requirements. The JIOC establishes working relationships and tactics, techniques, and procedures (TTP) for exchanging intelligence with all potential intelligence contributors.

For more information on GEOINT in planning, see Appendix A, "Geospatial Intelligence and Joint Planning."

2. Joint Geospatial Intelligence Cell

a. When established, the GEOINT cell or similar organization coordinates all GEOINT requirements within the operational area while ensuring the supporting commands or component commands are managing theater and mission-specific GEOINT requirements. The GEOINT officer should utilize the UGO process to the fullest extent that is practical to identify existing community GEOINT capabilities that can support operations and avoid unnecessary duplication of effort. The GEOINT cell, led by a GEOINT officer, integrates people, processes, and tools using multiple information sources and collaborative analysis to build a shared knowledge of the environment, the adversary, and friendly forces. The GEOINT cell supports not only intelligence processes like JIPOE, but also supports development of the COP, joint force logistics, and operational processes like the joint targeting cycle. The GEOINT cell, or like designation, is a group formed by the JFC to accomplish broad GEOINT oversight functions relative to GEOINT. The cell is normally comprised of representatives from the joint force staff, all components, and if required, component subordinate units and mission partners.

b. GEOINT cell configuration and composition are dependent on CCMD and JTF missions, joint GEOINT requirements, and mission partner participation and/or responsibilities. A joint GEOINT cell should include organic and supporting assets as well

as representatives from all mission partners' functional areas. The GEOINT cell can be physically present, distributed via collaborative technologies or a combination thereof. Mission partners may include DOD, governmental and nongovernmental agencies, partner nations, academia, industry, and multinational organizations. The GEOINT cell should establish a collaborative relationship with the JIOC.

c. The GEOINT cell facilitates the use of standardized GEOINT processes, procedures, and organizations across the CCMDs, Services, and agencies to enhance organic capabilities to conduct effective joint operations. Organic and reachback capabilities at the JTF level and below must facilitate multidirectional flow of GEOINT within the NSG, to, from, and across the lowest joint level.

d. The recommended composition of the GEOINT cell contains both core and extended cell representatives. Optimally, the core GEOINT cell would consist of a GEOINT officer; an imagery collection and production manager; a geospatial collection and production manager; a visualization, systems, and data expert; a GEOINT plans and requirements expert; an NST; and an NST liaison officer. However, the composition of the cell can be tailored to meet the needs of the JFC. These members perform the day-to-day functions of the core GEOINT cell and coordinate GEOINT capabilities in support of the military mission. An extended GEOINT cell consists of the core personnel augmented with additional members from across the organization and its mission partners to coordinate information fusion, visualization, analysis, and sharing. See Figure III-1 for a notional organizational construct of a GEOINT cell.

(1) **Core GEOINT Cell**

(a) **GEOINT Officer.** Responsible for coordinating requirements and implementing the planning, collection, fusion, visualization, analysis, and sharing of GEOINT. The GEOINT officer ensures the GEOINT cell coordinates and integrates GEOINT capabilities within the command and subordinate commands, including JTFs, other CCMDs, and national-level agencies and organizations. The GEOINT officer identifies and establishes mission partner collaborative relationships and reachback support assets necessary for the GEOINT cell to coordinate and manage the broad range of joint GEOINT mission requirements. The GEOINT officer facilitates communication between the NSG at the strategic level down to the lowest joint level within the command to ensure the timely passing of relevant information.

(b) **Imagery Collection and Production Manager.** Manages, supervises, and performs imagery activities and functions in support of operations and other activities. Monitors RFIs from subordinate units and confirms that requests are assigned, produced, and disseminated. Geospatial analysis uses accurate georeferenced data and analytic methods to draw conclusions about intelligence issues and provide specialized services and geospatial products to customers.

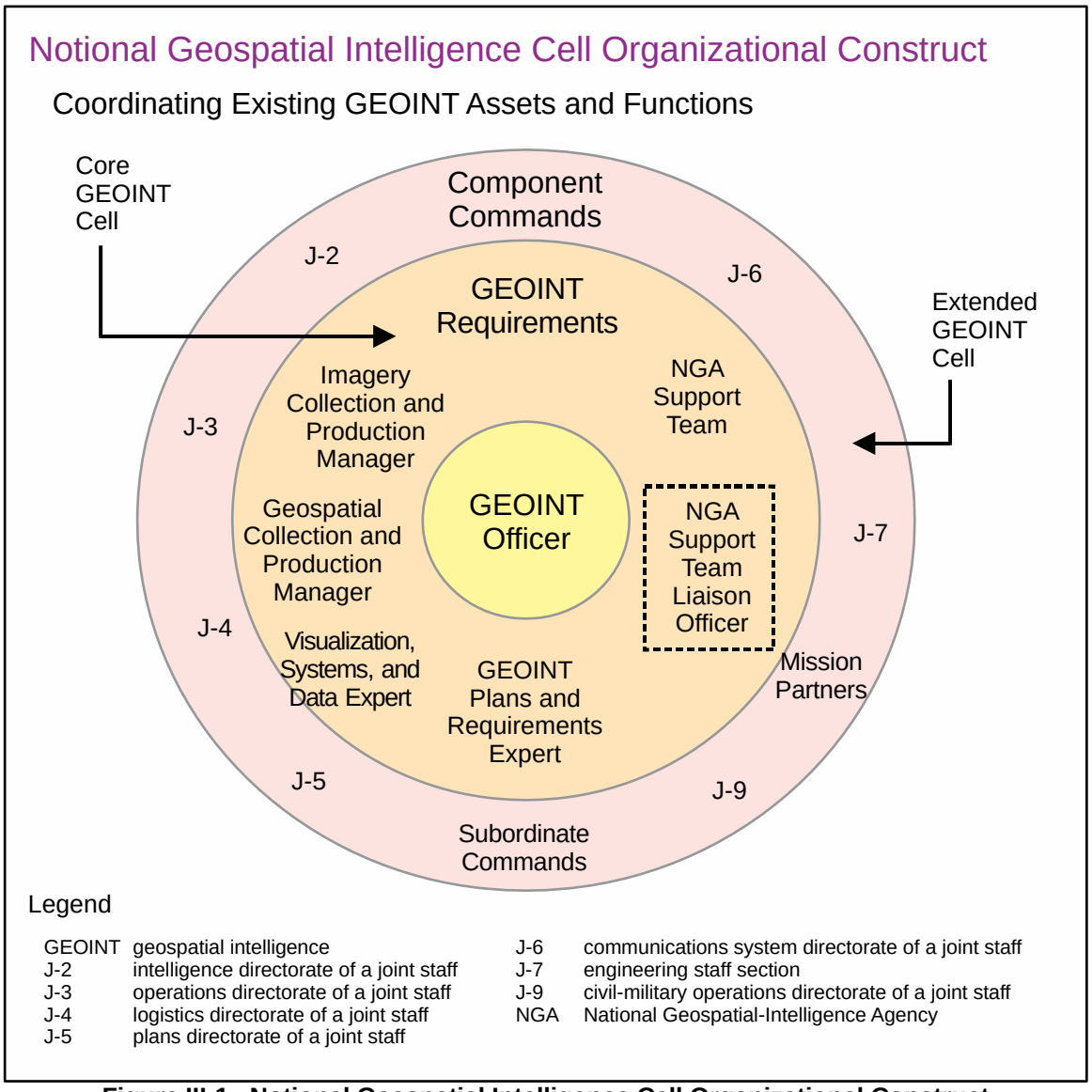

Figure III-1. Notional Geospatial Intelligence Cell Organizational Construct

(c) **Geospatial Collection and Production Manager.** Manages, supervises, and performs geospatial activities and functions in support of operations and other activities. Monitors RFIs from subordinate units and confirms requests are assigned, produced, and disseminated.

(d) **Visualization, Systems, and Data Expert.** Identifies and manages GEOINT data use, storage, and dissemination processes across intelligence and C2 systems. Performs system-level support of multi-user operating systems and hardware and software tools, including installation, configuration, maintenance, and support of these systems, to include the DOD DCGS family of systems and Global Command and Control Systems. Acts as the GEOINT cell representative to the joint data network operations cell.

(e) **GEOINT Plans and Requirements Expert.** Oversees GEOINT planning and establishment of GEOINT requirements.

(f) **NST.** Advises the JFC on GEOINT policies, capabilities, doctrine, data, and processes and serves as the primary reachback to national strategic resources of the NGA. The NST provides GEOINT capability, expertise, data, and products in support of the planning and execution of the command's requirements, provides advisory tasking recommendations for airborne intelligence collection, and can provide support in the development and assessment of GEOINT requirements for joint weapons and support systems. The NST assists in the development of requests and requirements for GEOINT collection and production via NGA Geospatial Intelligence Information Management Services (GIMS) and assists in the development of COLISEUM requests. The NST maintains the GEOINT infrastructure, including libraries, exploitation capabilities, IT systems, and data transport that support the command's mission. An NST member may serve in the GEOINT cell in any of the core positions as an imagery analyst, GEOINT analyst, or visualization, systems, and data expert.

(2) **Extended GEOINT Cell**

(a) Each organization within the joint force HQ and its mission partners should be represented in the extended GEOINT cell. All functions in a military HQ use geospatially referenced information to fuse, visualize, analyze, and share information for decision making.

(b) A command HQ has a battle rhythm for briefings, meetings, and reporting requirements. The GEOINT cell, as part of the battle rhythm, is essential to support decision making, staff actions, and higher HQ information requirements and to manage the dissemination of information in a coordinated manner. GEOINT cell meetings should be synchronized with the joint and component HQ meetings and take into account operating cycles and processes (e.g., those for intelligence, targeting, and the air tasking order).

3. National Geospatial-Intelligence Agency Intelligence Collaboration and Assistance Team

The NGA's intelligence collaboration and assistance team, located within the NOC, provides continuous global SA and GEOINT assistance to joint operations, including support for declared events (e.g., personnel recovery). Once an event is declared, NGA determines the type of imagery collection needed, identifies standard GEOINT products, and designates the personnel participating in the event. The use of national or multinational technical means of verification commercial imagery, or evasion charts (EVCs) will be made available to the event coordinator. The NGA's intelligence collaboration and assistance team's roles and responsibilities during a declared event are depicted sequentially in Figure III-2.

For more detailed information, see JP 3-50, Personnel Recovery; *DODI 3115.10E,* Intelligence Support to Personnel Recovery; *and CJCSI 3270.01,* Personnel Recovery.

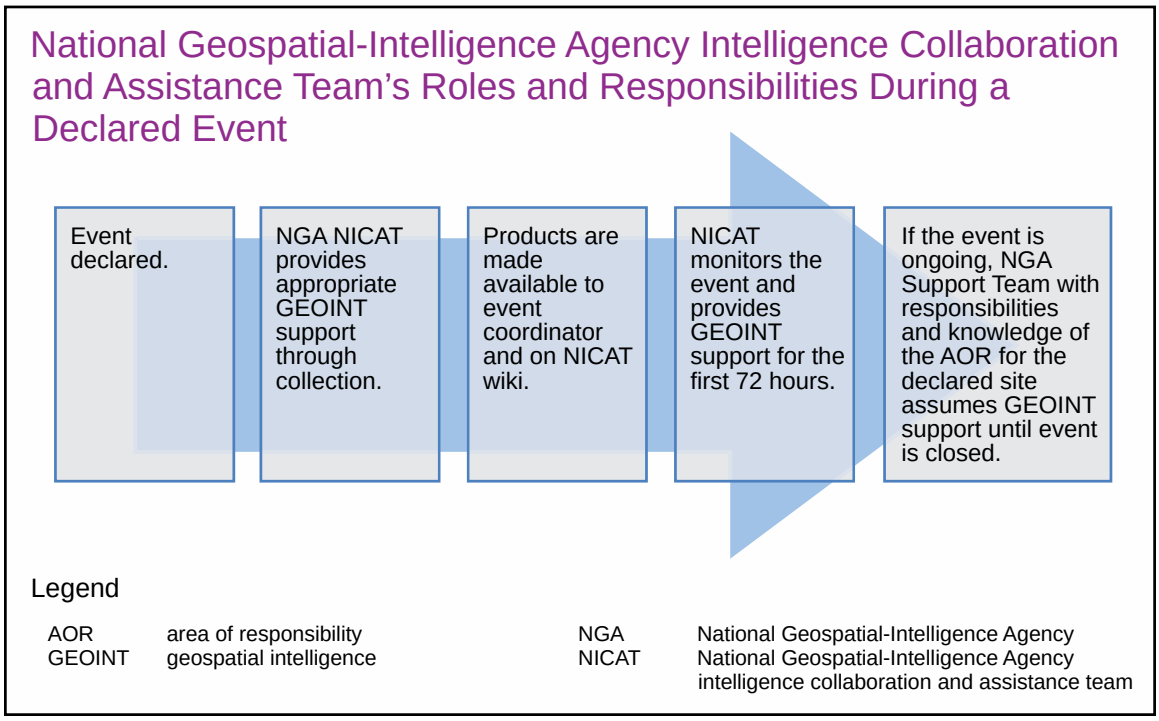

Figure III-2. National Geospatial-Intelligence Agency Intelligence Collaboration and Assistance Team's Roles and Responsibilities During a Declared Event

4. Joint Intelligence Preparation of the Operational Environment

a. **JIPOE Overview.** Subordinate commands should utilize compatible GEOINT products, data, and standards to facilitate JIPOE processes and products developed by the joint force J-2 to adequately support the mission. JIPOE is the analytical process used by joint intelligence organizations to produce intelligence assessments, estimates, and other intelligence products in support of the JFC's decision-making process (see Figure III-3).

(1) The JIPOE process is continuous and involves four major steps:

(a) Define the OE.

(b) Describe the impact of the OE.

(c) Evaluate the adversary.

(d) Determine adversary's COA.

(2) The process is used to analyze the physical domains (air, land, maritime, and space); the electromagnetic spectrum; the information environment (which includes cyberspace); political, military, economic, social, information, and infrastructure systems and subsystems; and all other relevant aspects of the OE to determine an adversary's capabilities to operate within that environment. JIPOE products are used by joint force, component, and supporting command staffs in preparing their estimates and are also applied during the analysis and selection of friendly COAs.

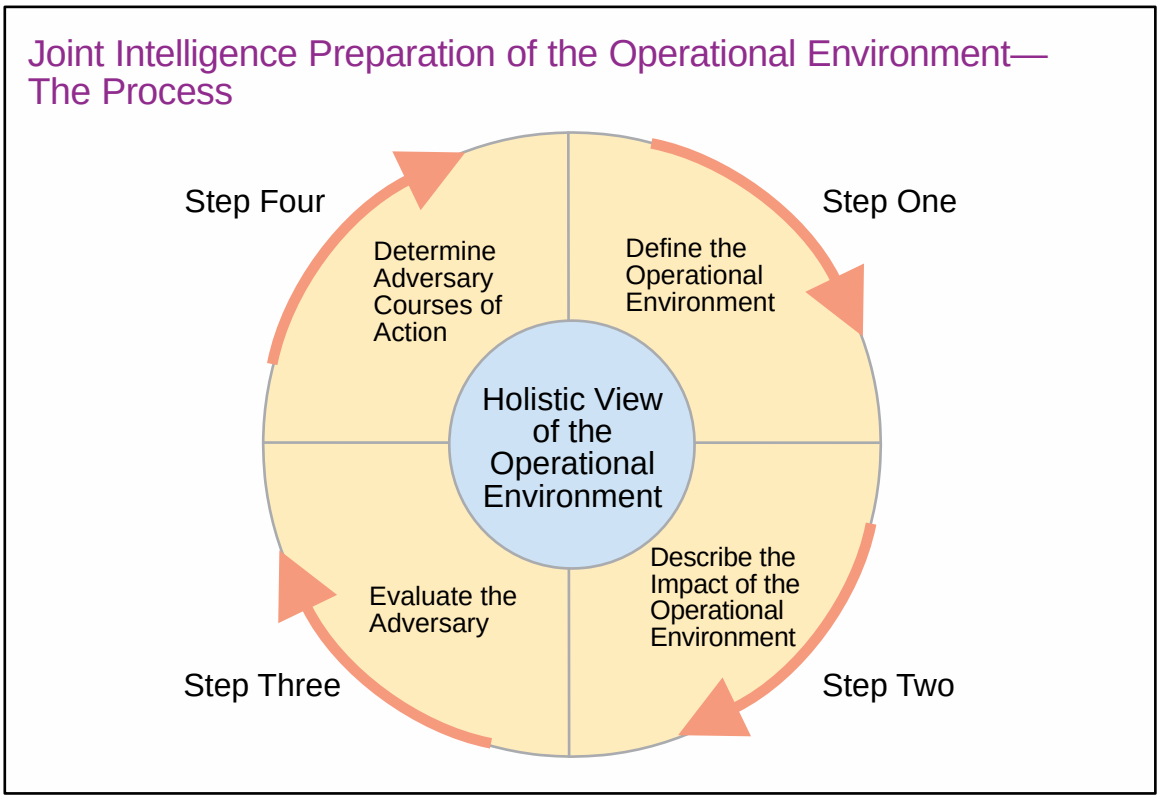

Figure III-3. Joint Intelligence Preparation of the Operational Environment—The Process

For more information, see Appendix B, "Sample Geospatial Intelligence Estimate."

(3) JIPOE is a continuous, analytical process used by joint intelligence organizations to produce intelligence assessments, estimates, and other intelligence products in support of the JFC's decision-making process. However, the main focus of JIPOE is on providing predictive all-source intelligence designed to help the JFC discern the adversary's probable intent and most likely future COA.

(4) The joint force J-2 coordinates and manages the JIPOE effort in order to support joint planning, enable commanders and other key personnel to visualize the full range of relevant aspects of the OE, identify adversary centers of gravity, conduct assessment of friendly and enemy actions, and evaluate adversary and friendly COAs. The JIPOE effort must be fully coordinated, synchronized, and integrated with the separate intelligence preparation of the battlespace efforts of the component commands and Service intelligence centers. Additionally, JIPOE relies heavily on inputs from several related, specialized efforts, such as geospatial intelligence preparation of the environment (GPE) and medical intelligence preparation of the OE. All staff elements of the joint force and component commands fully participate in the JIPOE effort by providing information and data relative to their areas of expertise. As JFCs and their subordinate commanders plan and guide the intelligence effort, JIPOE plays a critical role in this effort by ensuring the efficient conduct of intelligence operations, determining an acceptable COA, and developing a concept of operations (CONOPS).

b. **GEOINT Perspective.** Advanced coordination of GEOINT support is essential among the joint force, national agencies, CCMDs, and multinational and host nation forces in order to form a common point of reference and framework for JIPOE. GEOINT analysts generally support the entire JIPOE process, but play a specific role during Step 2 of the JIPOE process in describing the impact of the OE. During this step, GEOINT analysts evaluate the impact of the OE on adversary, friendly, and neutral military capabilities and broad COAs. All relevant physical and nonphysical aspects of the OE are analyzed to produce a geospatial perspective. A geospatial perspective supports all views of the OE by aiding analysis of its physical, nonphysical, and locational aspects. Each aspect of the OE is assessed in a two-step process that:

(1) Analyzes its relevant characteristics.

(2) Evaluates its potential impact on military operations. Additionally, since the physical aspects of the OE are not homogeneous, various land and maritime areas may require greater or lesser analysis depending on the relative geographical complexity of the region. Products developed during this step include, but are not limited to, overlays and matrices that depict the military impact of geography, METOC factors, demographics, physical landmarks with language translations, and the information environment, to include features associated with cyberspace.

For more information on METOC, see Appendix E, "Meteorological and Oceanographic Support to Geospatial Intelligence."

c. **JIPOE Coordination Cell.** The JFC may choose to establish a JIPOE coordination cell to assist in integrating and synchronizing the JIPOE effort with supporting organizations, related capabilities, and staff elements. Normally, a J-2 representative will chair the JIPOE coordination cell. Organizations participating in the cell provide advice and assistance regarding the employment of their respective capabilities and activities. The GEOINT officer is typically a member of the JIPOE coordination cell and provides advice and assistance regarding geospatial issues, including registering data to a common reference system. The GEOINT officer also assists JIPOE analysts with map backgrounds and data overlays.

For additional information, see Appendix D, "Geodetic Datums and Coordinate Reference Systems."

d. **Multinational Considerations.** A multinational JIPOE effort requires interoperable GEOINT data, applications, and data exchange capabilities. Information exchange throughout the operational area for the purpose of fostering mutual interests in resolving or deterring conflict or providing support is highly beneficial to all concerned parties; however, the disclosure and release of US GEOINT and JIPOE products and information may require foreign disclosure approval.

For more detailed guidance, see JP 2-01.3, *Joint Intelligence Preparation of the Operational Environment.*

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CHAPTER IV
GEOSPATIAL INTELLIGENCE ACTIVITIES

"The commander must thoroughly acquaint himself beforehand with the maps so that he knows dangerous places for chariots and carts, where the water is too deep for wagons; passes in famous mountains, the principal rivers, the locations of highlands and hills; where rushes, forests, and reeds are luxuriant; the road distances; the size of cities and towns; well-known cities and abandoned ones, and where there are flourishing orchards. All this must be known, as well as the way boundaries run in and out."

Chinese Poet and Administrator Tu Mu, 803-852

1. Introduction

GEOINT activities are the tasks, actions, and events to collect, manage, analyze, generate, visualize, and provide imagery, IMINT, and geospatial information necessary to support the NIPF, international arrangements, safety of navigation, and targeting. GEOINT activities build upon the intelligence process; tasking, processing, exploitation, and dissemination capabilities; and joint warfighter interoperable models (see Figure IV-1). The

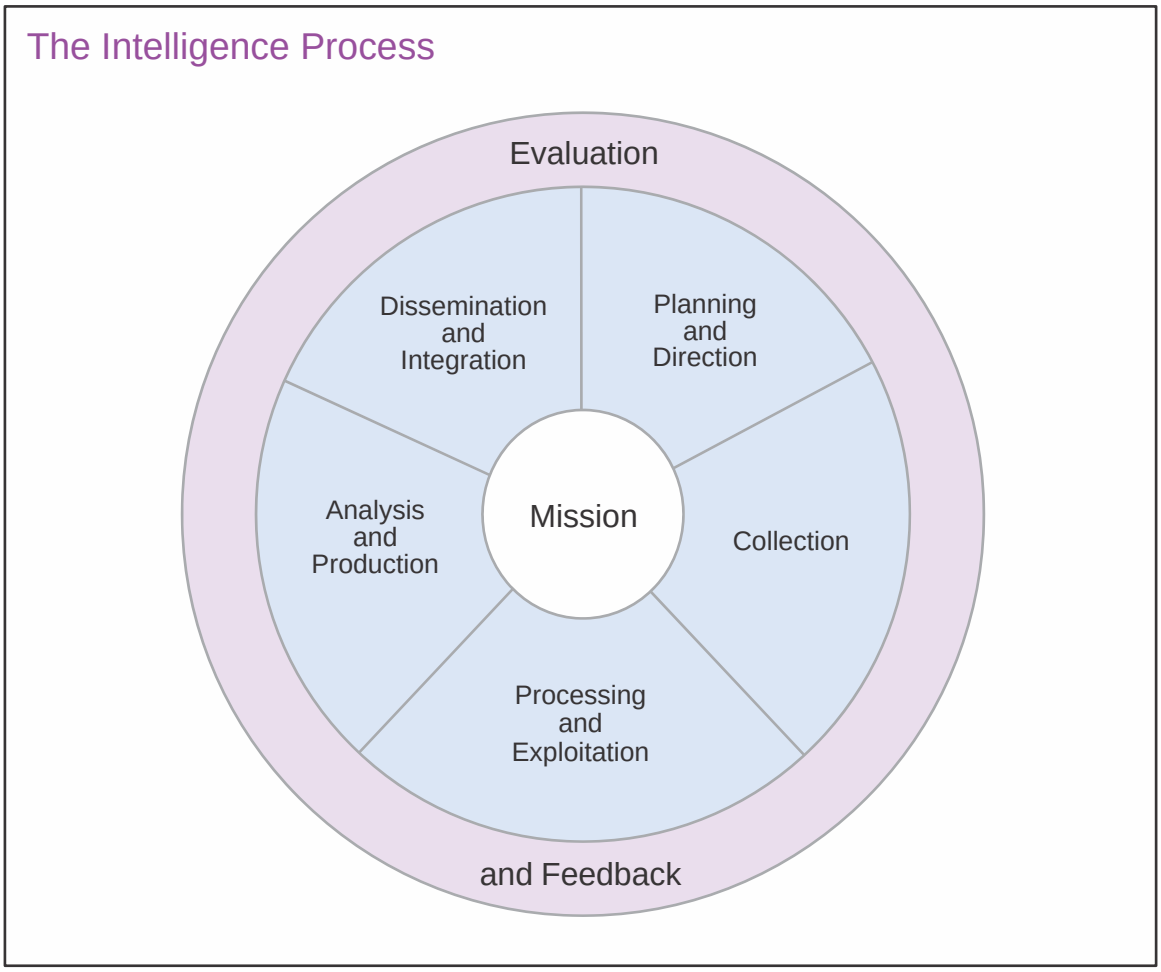

Figure IV-1. The Intelligence Process

GEOINT activities consist of a set of interrelated and specific actions and procedures that provide SA and support joint operations (see Figure IV-2). GEOINT cell analysts perform each of the activities to satisfy information and intelligence requirements. These actions and subtasks are continuous and iterative, and may be performed independently; in conjunction or concurrent with one another or bypassed; or conducted as a component of other intelligence or operational procedures that require information fusion, visualization, analysis, and sharing. It integrates key tasks into a unified cross-functional approach enabling and enhancing SA.

2. Direction, Planning, and Requirements Management

The foremost step in the process is the determination of GEOINT requirements and priorities and the associated strategies, capabilities, plans, programs, and guidance necessary to acquire, create, or maintain GEOINT knowledge, information, foundational data, products, and services. GEOINT direction, planning, and requirements are conducted continuously to support mission information needs during routine operation planning and in response to disaster or crisis situations (see Appendix F, "Geospatial Intelligence Requirements Considerations").

a. **Direction.** The GEOINT cell may develop and publish the CCMD's GEOINT CONOPS identifying the required resources, delineating the management of the CCMD GEOINT cell, and specifying coordination and collaboration processes with the NST, UGO, and subordinate command GEOINT cells. The CCMD GEOINT CONOPS should be consistent with UGO, ongoing GEOINT operations, NSG, and joint guidance.

b. **GEOINT Planning and Direction.** In coordination with joint intelligence planners who participate in CCMD battle rhythm events that support CCDR planning and operational assessment decision making, the GEOINT cell conducts planning and direction for GEOINT-related needs and operational activities of the CCMD and JTFs. UGO assesses and aligns GEOINT mission, needs, and operational capabilities used to plan and conduct

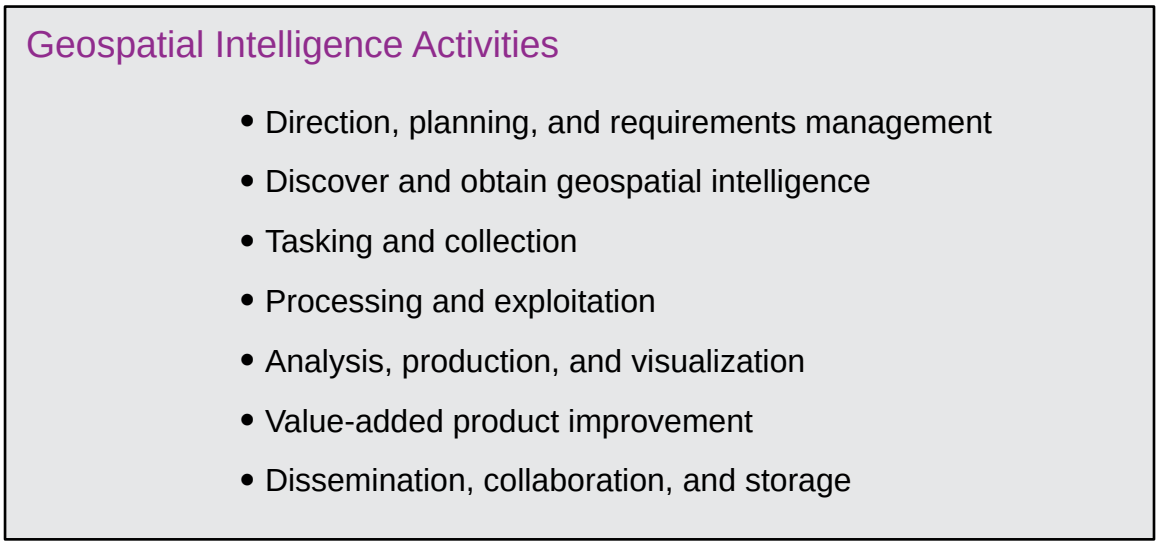

Figure IV-2. Geospatial Intelligence Activities

support for routine and crisis operations. GEOINT officers in GEOINT cells work with their organizational UGO officers and manager counterparts to identify and employ GEOINT capabilities across the NSG to support the information and intelligence needs of the command. The GEOINT cell leads the planning and direction of GEOINT information and intelligence processes for fusion, visualization, analysis, and sharing by developing appendix 7 (Geospatial Intelligence) to annex B (Intelligence) to plans and orders.

c. **GEOINT Requirements Management.** To support appendix 7 to annex B of the plan or order, the GEOINT cell coordinates across all functions of the command and subordinate commands to accomplish specified mission requirements to enable fusion, visualization, analysis, and sharing. These requirements include the data, information, and product needs for JTF operations, such as support for weapons systems, C2, and intelligence functions. For the purpose of the GEOINT cell, the process is generalized as "fusion, visualization, analysis, and sharing," although the order of these activities is not dictated. **Fusion** is the process to collate, organize, examine, and integrate, and make sense of information and intelligence from multiple sources to formulate a complete assessment of activity. **Visualization** is the representation of data in a viewable medium or format. Visualization is used to organize spatial data and related information so it can be analyzed and/or displayed as maps, three-dimensional (3-D) modeling, summary charts, tables, time-based views, and schematics. **Analysis** is the conversion of processed information into intelligence through the integration, evaluation, examination, and interpretation of all-source data and the preparation of intelligence products in support of known or anticipated user requirements. GEOINT analysis extracts meaning from imagery and geospatial data using geographic information systems and analytical tradecraft. This service uncovers and investigates relationships and patterns in all forms of geospatial data to answer intelligence requirements. **Sharing** is providing the means by which to make data available to those requiring access. Requirements management considerations necessary for mission accomplishment include:

(1) The GEOINT cell coordinates data, information, product, and service requirements to enable fusion, visualization, analysis, and sharing in support of the joint mission. Requirements for GEOINT data, information, and products include, but are not limited to, raw foundational GEOINT data and processed GEOINT information, and standard and customized products. Requirements must include information about area coverage, scale, timeliness, formats, accuracy, resolution level, updating criteria, data storage, naming conventions, and metadata. Customized GEOINT consists of fusing geospatial foundational data to meet new and emerging mission-specific data sets requirements and can contain foundational data, information, and products that include, but are not limited to, feature data, scanned maps, 3-D modeling, summary charts, tables, time-based views, and schematics.

For further information, see CJCSI 3901.01, Requirements for Geospatial Information and Services.

(2) The GEOINT cell also focuses on joint GEOINT IT requirements. It enables the joint warfighter to acquire and operationally employ GEOINT from all sources within the NSG and to provide value-added GEOINT back into the NSG to be discoverable by all. IT

requirements include, but are not limited to, systems, standards, hardware, storage, software/applications, and network connectivity of the CCMD, supporting JTFs and components, subordinates, higher HQ, and supporting/supported organizations. The GEOINT cell should coordinate IT capabilities based on available infrastructure and operation/contingency plan.

(3) The GEOINT cell should coordinate with the information systems security manager to ensure requirements are met for database protection, firewalls, public key infrastructure certificates, virtual private networks, intrusion detection, and encryption requirements for GEOINT.

(4) The GEOINT cell, in conjunction with the foreign disclosure officer, recommends releasability, transfer, or disclosure of classified or sensitive information and requires the capability to transfer data between networks.

(5) The GEOINT cell collaborates with subordinate command GEOINT cells to enable fusion, visualization, analysis, and sharing.

(6) In response to requirements, the JIOC or GEOINT cell researches available data/products and retrieves the needed information, or conveys prioritized, validated RFIs (exploitation, production, or analysis) to its designated NST office and UGO manager to deconflict with and prioritize among other command, Service, and national agency requirements.

3. Discover and Obtain Geospatial Intelligence

The GEOINT cell coordinates the procedures and manages the tasks to search for, find, access, and gather GEOINT information and foundational data from existing holdings, databases, and libraries. The user can discover, exploit, and manipulate data from available libraries or databases to create tailored products or data sets for specific mission purposes or military applications (see Appendix G, "Geospatial Intelligence Products and Services"). Available libraries or databases provide the foundation for a DOD-wide distributed network of content that includes, but is not limited to, topographic, air, space, hydrographic, and other geospatial information, as well as imagery, geographic names, and boundary data. Manual methods and automated services will be used to conduct metadata searches across all networks to discover existing data and product sources; obtain available data and products; identify coverage gaps; and access directories, catalogs, Web mapping services, and libraries across the NSG. Search parameters should be designed to enable manual and automated discovery of GEOINT based on joint requirements. Parameters include, but are not limited to, classification, content and completeness, resolution, accuracy, projection, datum, coordinate system, currency, and geographic coverage. Once the required source or information is obtained, analysts use it to develop knowledge; understand intelligence problems; provide SA; answer questions; and respond to essential elements of information (EEIs), the JFC's priority intelligence requirements (PIRs), and programs of analysis.

4. Tasking and Collection

a. **Tasking** involves submitting collection requirements necessary for acquiring data or information to meet mission objectives to the collection management authority (CMA). The process involves converting intelligence or mission requirements into collection requirements, establishing priorities, tasking or coordinating with appropriate collection sources or agencies, monitoring results, and re-tasking as required. The GEOINT cell determines if a coverage gap or shortfall exists and whether new collection is required. It clearly articulates the new collection requirement to satisfy the information need and sends the requirement to the CCMD or JTF intelligence collection manager in a format defined by the receiving command. Requirements are processed primarily through two collection management systems: one for satellite (national) and one for airborne (theater).

(1) GIMS is the system used to task national collection systems. GIMS manages intelligence requirements for national and the DOD user community in support of the NSG.

(2) The Planning Tool for Resource, Integration, Synchronization, and Management (PRISM) is the system used to manage US airborne asset collection requirements and to task airborne assets. It is a Web-based application that provides users at theater level and below with the ability to integrate all US intelligence discipline assets with all US theater airborne collection requirements. GEOINT personnel have access to PRISM but the actual tasking is a function of the collection operations management.

(3) New airborne collection requirements are approved by the CMA. The CMA constitutes the authority to establish, prioritize, and validate theater collection requirements; establish sensor tasking guidance; and develop theater collection plans. Although the CMA normally resides at the CCMD, it may be delegated to a subordinate task force as required.

(4) The GEOINT cell will coordinate with the METOC cell to acquire climatology and real-time meteorology, oceanography, and space weather information to support GEOINT collection and dissemination.

JP 3-59, Meteorological and Oceanographic Operations, *contains detailed information on joint METOC operations. Also see Appendix E, "Meteorological and Oceanographic Support to Geospatial Intelligence."*

b. **Collection** includes those activities related to the acquisition of GEOINT data or information necessary to satisfy tasked requirements. Collection activities are revised as required and monitored for the overall satisfaction of the requirements, and the effectiveness of the collection strategy to satisfy the original and evolving intelligence and information needs is continuously assessed. Collected information is distributed via appropriate classified systems to processing and exploitation elements. Primary collection systems used by NGA and the DOD community are satellite and airborne platforms and their associated sensors, as well as imagery derived from surface-based platforms and open sources. The GEOINT cell coordinates the collection, acquisition, or procurement of GEOINT sources and the associated tasking and management of collection resources. Collection assets include:

(1) **Satellite Systems.** Satellite systems are a primary source for classified government and open-source commercial imagery collection used to produce GEOINT. These systems utilize multiple sensors to satisfy customer needs. Commercial systems and commercial producers increasingly contribute GEOINT for NSG requirements. These systems can also provide releasable versions of intelligence that, under certain circumstances, may be shared with partner nations.

(2) **Airborne Systems.** Government and commercial airborne systems are also primary sources for imagery collection used to produce GEOINT. Airborne systems are managed by the Services and tasked and coordinated at the theater level and below. During domestic operations, National Guard forces can also provide imagery collection.

(a) Government airborne systems at the theater and tactical level provide intelligence collection assets operated and managed by the GCC through subordinate components. NGA does not have CMA to task or manage airborne systems, but it may submit advisory tasking recommendations to the appropriate CCMD. Airborne intelligence collection sources include all manned and unmanned platforms that collect still and full motion imagery using electro-optical, thermal, overhead non-imaging IR, ground moving target indicator, polarimetric and bathymetric, multiband imagery (including multispectral, hyperspectral, and ultraspectral), laser-based or radar-based imaging sensors (including SAR [complex and detected], and SAR phase history data), and audio.

(b) Commercial airborne systems provide yet another source of GEOINT. Due to their flexibility and resolution capabilities, commercial airborne collectors are increasingly relied upon to augment satellite collection where there is permissive airspace. With the high costs associated with commercial airborne systems, cost sharing arrangements should be considered.

(c) The National Guard regularly delivers a wide spectrum of GEOINT-capable assets that can be used during DSCA operations.

(3) **Handheld and Surface-Based Systems.** Handheld imagery includes any one or combination of digital or film-based still and video imagery taken by a sensor that is held by, or attached to, a human being, or emplaced and retrieved directly by a human, regardless of altitude. Handheld imagery is becoming increasingly more significant with the expansion of open sources, as well as from government and other commercial sources. NGA has no legal authority to manage tasking of handheld or clandestine photography taken by or on behalf of human intelligence collection organizations. However, NGA, by law, is responsible for developing a system whereby such imagery is made discoverable and accessible by, available to, and sharable with members of the joint community. These images may be collected by, and shared with, the CCMDs and components as well as members of the DOD and the IC.

5. Processing and Exploitation

a. Within the tasking, collection, PED cycle, PED is viewed as a capability as much as a process. As a capability, PED consists of manpower, architecture, and systems to process

and exploit raw data collected from ISR platforms and disseminate the results to the requesting customer.

b. The GEOINT cell coordinates the assessment, correlation, and conversion of collected foundation GEOINT data into a useable form or formats suitable for analysis, production, and application by end users. The processing may include automated, semi-automated, and manual procedures to integrate data. After being processed, GEOINT is distributed, archived, and made accessible for users.

c. Exploitation involves the evaluation and manipulation of processed GEOINT data to extract information related to a list of EEIs. Exploitation results in the extraction of information and data that is specifically selected for use or integration in subsequent tasks in the GEOINT operations process.

d. The exploitation process for GEOINT data, as accomplished across the IC, incorporates several phases of exploitation divided into two categories: time dominant (includes first-phase exploitation) and content dominant (includes second- and third-phase exploitation). The specific category and subsequent phase of exploitation is dependent on requirements. These requirements vary from NRT reporting for full motion video or moving target indicator call outs via chat to a much more in-depth GEOINT product that can be fused with other types of intelligence reports to provide a holistic view of the OE.

e. The GEOINT categories and subsequent phases of exploitation are as follows:

(1) **Time Dominant.** First-phase exploitation is the exploitation of newly acquired GEOINT in support of validated time dominant requirements. The purpose of first-phase exploitation is to answer EEIs in order to satisfy PIRs and key intelligence questions of immediate need or to identify changes or activity of immediate significance. First-phase exploitation timelines range from NRT reporting not to exceed 24 hours.

(2) **Content Dominant**

(a) Second-phase exploitation is the exploitation of GEOINT in support of validated non-time dominant requirements. The purpose of second-phase content dominant exploitation is to provide comprehensive reporting that can be derived from multiple intelligence disciplines over multiple missions to answer specific EEIs/key intelligence questions. Second-phase exploitation reporting timelines vary from one to seven days.

(b) Third-phase exploitation is the exploitation of GEOINT in support of validated non-time dominant requirements. The purpose of third-phase content dominant exploitation is to provide in-depth, long-range analysis that fuses any available intelligence discipline. It is in this phase that detailed, authoritative reports and strategic studies on specified installations, objects, and activities (typically over multi-day collection periods) are prepared by the Services and agencies participating in the exploitation effort. Third-phase content dominant exploitation reporting timelines are not bounded.

6. Analysis, Production, and Visualization

a. Once data has been processed and exploited, it can be analyzed and used to produce general intelligence and describe, assess, or visually depict information in standard, customized, or tailored GEOINT products. The GEOINT cell coordinates the use, interpretation, and integration of information into standard or tailored GEOINT products and data, visual presentations of SA, and trend analysis in response to expressed or anticipated information requirements. During this step of the process, information and intelligence is analyzed, produced, and visualized to satisfy the commander's critical information requirements (PIRs and friendly force information requirements) through the evaluation of EEIs.

b. Advanced technology and processes are assisting discovery and accessibility of data, allowing efficiencies in performing analysis and production. OBP is used to organize and share information, relating data from all sources to known objects (e.g., units, people, locations, or events). By organizing information about objects across multiple domains, OBP creates efficiencies by bringing all-source intelligence information together. NGA's framework for facilitating integration of GEOINT information into OBP is SOM. SOM normalizes how the GEOINT observations from sensors and sources is captured, organized, and shared. When observations are organized under the construct of OBP, an analytic method known as ABI may be applied to the structured data to discover objects (e.g., high-value target location), relationships (e.g., supplier/consumer), or behaviors (e.g., pattern of life) by resolving significant activity. The data-centric analytic method of ABI accelerates insight and deepens understanding of adversary behaviors and relationships.

c. Producers of the intelligence should coordinate with the users and/or requesters to ensure the products meet mission needs. The main producers include Service exploitation and production centers, NGA, DIA, and the JIOCs. At the CCMD and Service levels, specialized units or sections provide the ability to analyze integrated databases for specific applications, add valuable information or update features and attributes within the database, and strengthen the database content to meet the commander's tailored mission requirements. If operations security considerations allow, the user should then coordinate the addition of the new file back into the print-on-demand database for community-wide use.

d. Through UGO, the GEOINT cell facilitates and leverages a collaboration and federated effort in which information is rapidly and fully shared among geographically dispersed organizations. This approach involves assessing, aligning, and executing analysis and production efforts among US and multinational partners to meet the mission requirements of the joint force.

e. Categories of GEOINT products and related services and support are listed below.

(1) **GEOINT Products.** Derived from collected information and data, GEOINT products consist of reports, maps (e.g., topographic maps), charts, geodetic products, controlled imagery base, the DPPDB, as well as elevation publications.

(2) **Customized GEOINT Products.** Customized GEOINT products consist of foundation GEOINT data and reports, acquired through a variety of means. Although they may not have been produced IAW NGA standards, they are of value to the NSG community. They are maintained in the Geospatial Search Query Resource Locator, a repository within the National System for Geospatial-Intelligence Consolidated Library (NCL). NGA provides three levels of support for customized products: self-service, assisted service, and full service.

(a) **Self-Service.** NGA's foundation GEOINT data is available online through their unified presence and streaming services. The Globe is an NGA Website that integrates geospatial content, tools, and intelligence to provide context to information on global events. Map of the World is a tool available on this Website that allows the IC the opportunity to develop their own mission-specific products and data sets.

(b) **Assisted Service.** Organizations submit RFIs through their enterprise RFI manager, and NGA routes the RFIs to the appropriate SME. The GEOINT expert collaborates with the originator of the RFI on the optimal COA to satisfy the RFI.

(c) **Full Service.** When a requirement or RFI can be answered by the NGA only, NGA provides the customized GEOINT product to the originator of the request. This can be a single episode or an ongoing sustainable request that requires coordination and the building of requirements directly with the NGA. Commands should use their NST to assist in building this requirement. Products may be developed by incorporating validated data from multiple sources, multiple intelligence disciplines, and data from advanced sensors. They may also include a fourth dimension: time. Time can provide multi-date context, change detection, and tracking functionality to create dynamic, interactive products. These products can include realistic mission models that help determine the impact of currents, tides, wind, daylight, and other environmental factors on a given mission, battle damage assessment, indications of enemy activity, and improvised explosive devices. Customized products can include two-color multi-view, change detection, interactive maps to visually depict patterns and trends; dynamic images; 3-D models; and imagery graphics that provide a rapid common reference for mission partners supporting the same mission.

(3) **GEOINT Services.** GEOINT services support the generation, management, and use of GEOINT data and products. These include tools that enable both users and producers to access and manipulate data. Examples are instruction, training, laboratory support, and guidance for the use of GEOINT data. GEOINT services include on-site technical support, geodetic surveys, software development, tailored geodetic and geophysical products, and validation of software that assesses coordinate derivation for coordinate seeking munitions.

f. GPE is an analytical method that may be used by GEOINT analysts to support the JIPOE process.

(1) GPE provides a template to ensure all available data is considered during GEOINT analysis and product development. GPE is a four-step analytical method described in Figure IV-3.

Four Steps of Geospatial Intelligence Preparation of the Environment

The geospatial intelligence (GEOINT) preparation of the environment analytic method is based on, and provides GEOINT support to, the joint intelligence preparation of the operational environment process.

Step 1 **Define the environment:** Gather basic facts needed to outline the exact location of the mission or area of interest. Physical, political, and ethnic boundaries must be determined. The data might include grid coordinates, latitude and longitude, vectors, altitudes, natural boundaries (mountain ranges, rivers, shorelines), etc. This data serves as the foundation for the GEOINT product.

Step 2 **Describe influences of the environment:** Provide descriptive information about the area defined in Step 1. Identify existing natural conditions, infrastructure, and cultural factors. Consider all details that may affect a potential operation in the area: weather, vegetation, roads, facilities, population, languages, social, ethnic, religious, and political factors. Layer this information onto the foundation developed in Step 1.

Step 3 **Assess threats and hazards:** Add intelligence and threat data, drawn from multiple intelligence disciplines, onto the foundation and descriptive information layers (the environment established in the first two steps). This information includes: order of battle; size and strength of enemy or threat; enemy doctrine; the nature, strength, capabilities, and intent of area insurgent groups; and effects of possible weapons of mass destruction threats. Step 3 requires collaboration with national security community counterparts.

Step 4 **Develop analytic conclusions:** Integrate all information from Steps 1-3 to develop analytic conclusions. The emphasis is on developing predictive analysis. In Step 4, the analyst may create models to examine and assess the likely next actions of the threat, the impact of those actions, and the feasibility and impact of countermeasures to threat actions.

Figure IV-3. Four Steps of Geospatial Intelligence Preparation of the Environment

(2) A geospatial perspective of the OE supports all views of the OE by helping to analyze relevant physical, nonphysical, and locational aspects of the OE. Human geography with data layer themes, as reflected in Figure IV-4, supports GPE.

Data Layer Themes Used in Human Geography

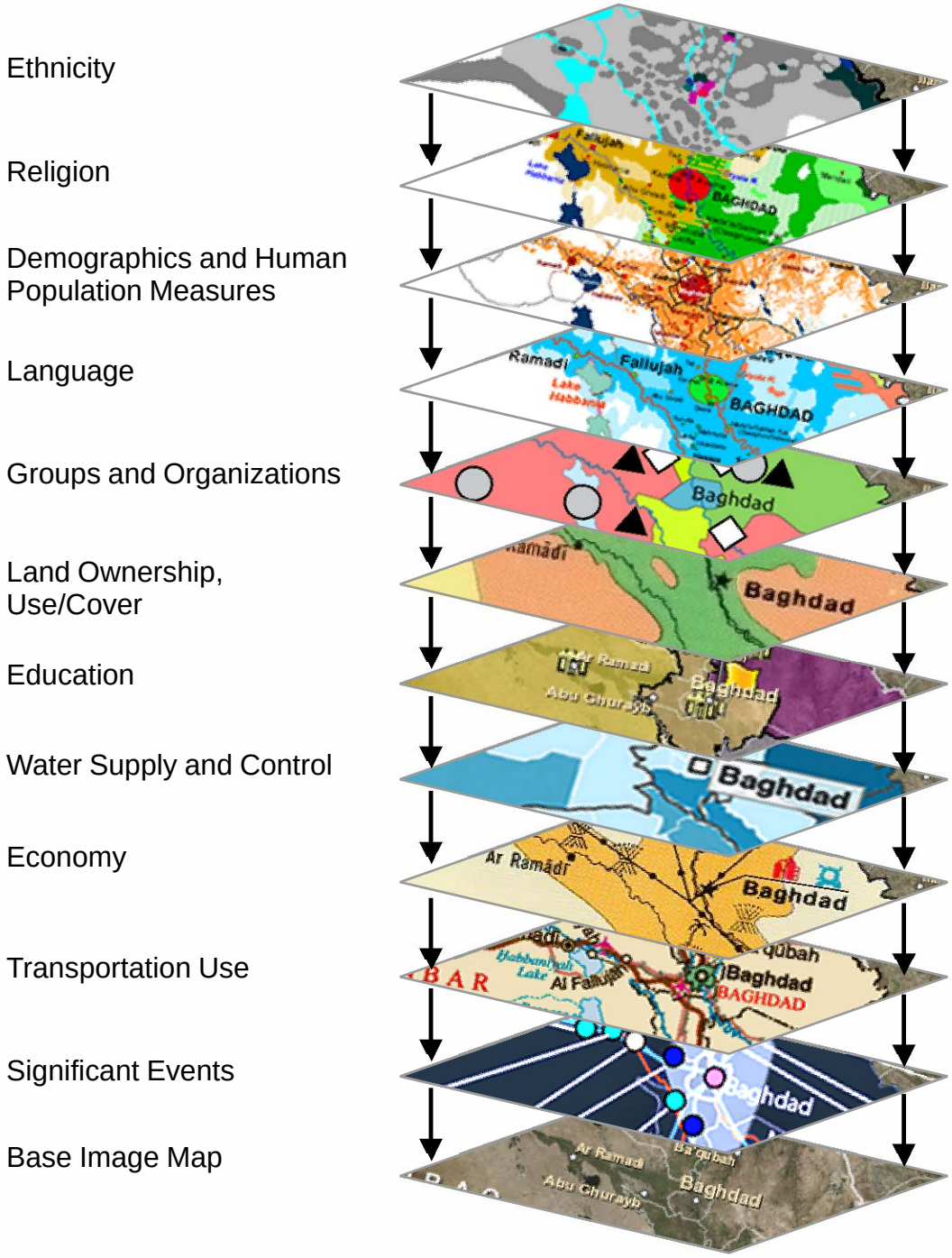

Figure IV-4. Data Layer Themes Used in Human Geography

g. **Value-Added GEOINT Products.** GEOINT products are typically developed and improved through a collaborative enhancement process based on GPE and JIPOE assessments in which both the producer and/or user of GEOINT update or refine a database

or product with current, additional, or more detailed information. Durable and high-demand GEOINT products, also known as "standard GEOINT products," are assigned an NGA reference number and a national stock number in order to be distributed via the DLA's distribution channels. Improving the quality of GEOINT products consists of activities performed on existing foundational content that increases its value for subsequent use. Quality improvements may include, but are not limited to, data verification, correction, update, densification, supplementation with additional categories of content, reformatting, fusing, or resampling. New roads, obstacles, seismic activity, orthorectification, map finishing and 3-D visualization, and intelligence reports are examples of activities that require updating for products to remain current. Organic assets (such as special forces, terrain teams, GPCs, or GEOINT cells) take GEOINT products and add tactical data of special interest for use by local commanders and operators. Updating and improving GEOINT products increases confidence levels of sources and contributes content and/or metadata to augment the completeness, accuracy, or currency of holdings. This data is stored in databases or made available in products that may be readily discovered, retrieved, and used by others. This specialized data should be centrally stored and catalogued. Intelligence personnel and consumers at all levels must provide timely feedback, throughout the intelligence process, on how well the various intelligence operations perform to meet the commander's requirements.

7. Dissemination, Collaboration, and Storage

a. The GEOINT cell coordinates the conveyance, retention, and use of GEOINT data, information, and products in suitable forms and contexts for the individual and collaborative application by end-users and partners to support their missions, operations, and tasks. Dissemination is the timely conveyance of GEOINT content or products in an appropriate form and by any suitable means, whether in hard copy or electronic form, and ensuring they are discoverable and retrievable by the user on the appropriate network. Dissemination is accomplished through both the "pull" and "push" principles. The "pull" principle provides intelligence organizations at all levels with direct reachback capability via electronic access to central databases, intelligence files, or other repositories containing GEOINT data and products, as well as to services from other entities. The "push" principle allows the producers to transmit GEOINT, along with other relevant information, to those who have registered standing interest in certain regions, products, or types of content. Typically, the intelligence staff element at each echelon manages the dissemination of GEOINT. This publication primarily addresses the more common processes used for separate dissemination of GEOINT products. For example, NGA uses the Defense Information Systems Agency's Enterprise File Share service to synchronize global holdings on all NGA domains with customers across the IC, DOD, and ASG partners. Increasingly, the GEOINT community is moving toward a common approach to capture, store, standardize, and make GEOINT observations available. Using SOM, imagery observations may be captured and stored as structured data, allowing analysts to quickly discover information and intelligence, allowing them to focus on qualitative and quantitative analysis. SOM and all-source structured observations of OBP create and organize information making it easier for analysts to use data from multiple sources, discover new knowledge about objects and networks, and enable models that drive automated tipping and cueing.

(1) **Physical Delivery.** DLA distributes geospatial products from the NGA to the CCMDs and Services utilizing DDM and MCO. MSOs are established in theater to facilitate GEOINT product distribution. The current MSOs are used first, and the determination to create an expeditionary capability is conducted during the CCDR planning processes. The NGA may establish additional in-theater facilities to support distribution of its products. Commands might also need to establish in-theater distribution points for map depots. Requirements identified in support of CJCSI 3110.01, *(U) 2015 Joint Strategic Capabilities Plan (JSCP),* or other contingency planning will be identified and coordinated ahead of time in order to ensure the mapping material in the WRS is maintained at a high level of readiness. Exercise COLD START, held two to three times a year, is an internal NGA readiness exercise to test effective physical GEOINT distribution.

(2) **Electronic Delivery**

(a) NGA provides GEOINT data and products online via the Globe (NGA's single point of entry portal), as well as Enterprise Streaming Services-enabled software, which are accessible via the Non-classified Internet Protocol Router Network (NIPRNET), SECRET Internet Protocol Router Network (SIPRNET), and Joint Worldwide Intelligence Communications System (JWICS). It is also available to Australia, Canada, NZ, and the UK via Stone Ghost and to other international partners via the International Partners Operations Center and national and CCMD electronic transmission systems.

(b) NGA supports short-notice digital and hard copy reproduction of GEOINT products through the remote replication system (RRS) team, who compiles custom GEOINT solutions for the joint force. The RRS has a worldwide presence in direct support of CCMDs and Services. NGA sites, NGA Campuses East and West, serve as reachback centers for the NSG. The RRS technical support team maintains the robust RRS equipment, including multiple large-format systems for high-volume replication. Software includes a full suite of high-end GEOINT tools and image manipulation capability. The RRS analytical team is comprised of geospatial analysts with unique skills.

(c) The Services have developed dissemination capabilities that support standard NGA digital maps and charts (eGPL), as well as attributed feature data (Ground-warfighter Geospatial Data Model). The integration of both of these complementary Service capabilities in a forward theater location provides a robust theater data center that can support the requirements generated at the tactical level.

(d) The integrated broadcast service (IBS) provides over-the-air updates of time-sensitive intelligence to commanders and enables information sharing and collaboration. IBS disseminates a combined NRT combat intelligence picture derived from intelligence sources to operational and intelligence customers at all levels. Another dissemination system is the Global Broadcast Service (GBS). GBS can disseminate large amounts of data in NRT to a group of users or each user can pull a large file from NGA's Net-Centric Geospatial-Intelligence Discovery Services (NGDS) via GBS. The joint force can pull large files from NGA via the GBS.

b. There are various dissemination methods for data derived from national, commercial, airborne, and handheld and surface-based systems. The Image Product Library and the eGPL provide standard GEOINT products that could be derived from all three sources. Separate systems exist as the primary dissemination method for each collection system.

(1) **National.** NCL is the primary online system for storage of information derived from national imagery systems. The NCL is comprised of two National Data Libraries. The NCL allows higher echelons to make their GEOINT data available to and accessible by lower echelons. With these tools, multiple sources of foundational information can be enabled and combined to produce intelligence.

(2) **Commercial.** There are several storage and dissemination systems used to distribute information derived from commercial overhead systems. Data for NSG-member use is stored in the NCL, an imagery archive, and on the Enhanced View Web Hosting Service (EV WHS), which is an NGA-contracted commercial imagery Web hosting service available on both NIPRNET and SIPRNET. NCL and EV WHS allow users to identify and download commercial imagery. NGDS electronically receives NGA-purchased imagery from commercial data providers and provides it to users via NGDS query, streaming, and download tools. NGDS can also be used to access national source material. NGDS is part of the NGA portal and has a presence on JWICS, SIPRNET, and NIPRNET. Commercial imagery is discoverable and downloadable using NGDS, Cedalion (formerly known as the National Exploitation System), and EV WHS query and download tools.

(3) **Airborne.** The DOD DCGS is a family of systems connected through designated points of interoperability designed to provide multi-disciplined intelligence collection capabilities and associated PED resources at the JTF level and below through a combination of reachback, forward support, and collaboration. Airborne imagery is discoverable using the same discovery methods as national imagery. Motion imagery, to include full motion video, is currently discoverable through NGDS, Cedalion, and the USAF's UNICORN [Unified Collections Operations Reporting Network] system.

(4) **Handheld and Surface-Based.** In addition to previously cited capabilities, NGA's GeoSQRL [Geospatial Search Query Resource Locater] is a capability to discover and access imagery derived from handheld and surface-based platforms by all members of the DOD and the IC, including those collected and stored at the CCMDs. The availability of this class of imagery will greatly enhance the level and quality of intelligence available to support joint operations.

8. Evaluation and Feedback

Intelligence, planning, and operations personnel and consumers at all levels need to provide timely feedback on how well the various GEOINT operations performed to meet the commander's requirements. The joint force provides feedback to the developers of national-level GEOINT through their resident GEOINT cells (or similar organization). This feedback is provided through features embedded in the various tools and systems, and is an extension of the previously mentioned collaboration process.

APPENDIX A
GEOSPATIAL INTELLIGENCE AND JOINT PLANNING

1. Geospatial Intelligence Planning

This appendix serves as a guide for GEOINT planning. GEOINT planning activities are aligned with the joint planning process steps described in JP 5-0, *Joint Planning* (see Figure A-1).

2. Geospatial Intelligence Planning Steps and Activities

a. **Step 1: Planning Initiation.** The detailed discussion of planning initiation is covered in JP 5-0, *Joint Planning.* The extent to which GEOINT SMEs will participate in this step of the process will be situation dependent.

b. **Step 2: Mission Analysis.** The commander's staff analyzes the mission and presents the restated mission for approval. Mission analysis is critical because it identifies all specified and implied tasks necessary to accomplish the mission. GEOINT cell responsibilities during mission analysis:

(1) In coordination with the joint intelligence planners who assist the plans directorate of a joint staff, GEOINT cell reviews the operational area of interest (AOI) (latitude/longitude coordinates). Determine if datum issues exist; determine the GEOINT data, information, products, and services required.

(2) Identify deficiencies and request NGA assessment of geospatial coverage for the area.

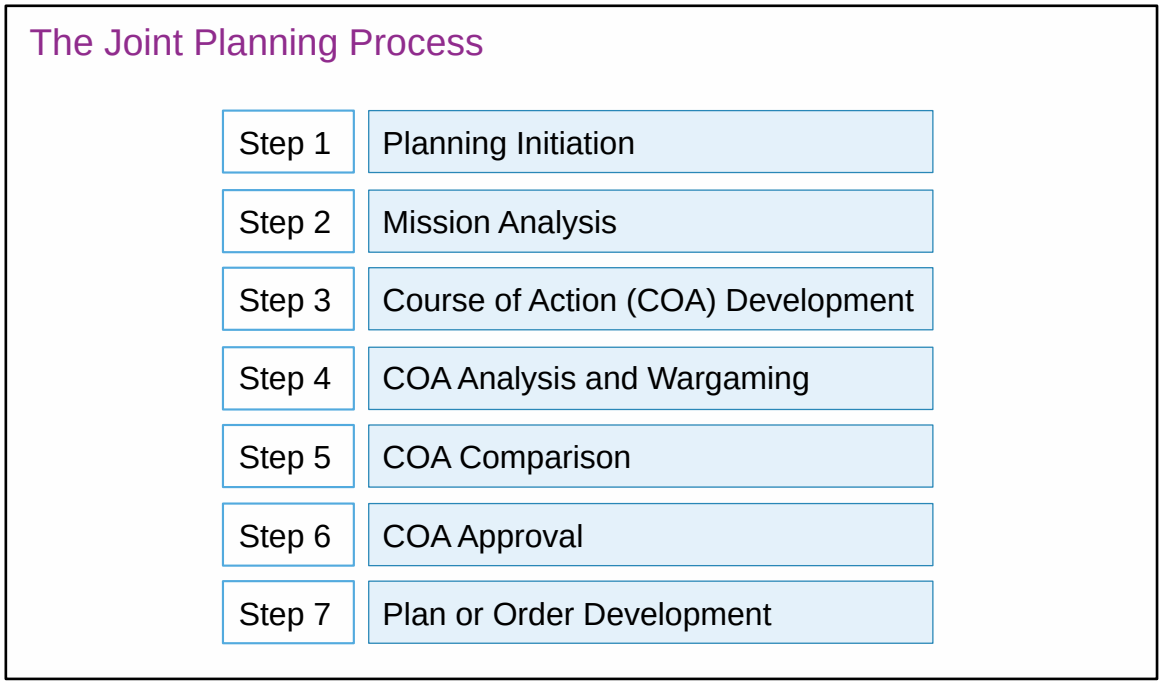

Figure A-1. The Joint Planning Process

(3) Assist the J-2 in conducting JIPOE by coordinating the interactive geospatially enabled analytical environment, with supporting digital geospatial data, imagery, and analytical TTP, which is linked to multi-source information, intelligence databases, and NRT information and intelligence feeds.

(4) In coordination with joint intelligence planners, identify the required GEOINT capabilities to support the JFC's initial mission analysis process.

(5) Determine specified, implied, and essential GEOINT tasks required to support the commander's proposed mission statement.

c. **Step 3: COA Development.** The staff develops COAs to provide unique choices to the commander, all oriented on accomplishing the military end state. It also gives components the maximum latitude for initiative. GEOINT cell responsibilities during COA development are:

(1) Act as the J-2's GEOINT SME in the COA development, outlining capabilities and issues.

(2) Provide analytical support and information (e.g., maps, charts, digital data, and IMINT) to support the COA process.

(3) Identify the required GEOINT capabilities to support the JFC's concept development and construct the priorities and assumptions on their availability and use.

d. **Step 4: COA Analysis and Wargaming.** While time-consuming, the results of the COA analysis should answer two primary questions: **Can the COA accomplish the mission,** and **Is the COA supportable? Wargaming** is the primary means to conduct this analysis. The heart of the commander's estimate process is analysis of multiple COAs. GEOINT cell responsibilities in this step are:

(1) Using the GPE, produce the GEOINT estimate to support each COA.

(2) Review assigned and/or apportioned forces and capabilities to ensure they are adequate to support the mission statement for each COA.

(3) Review and evaluate the tasks, required capabilities, and assumptions, and develop coordinating instructions.

(4) Ensure critical issues, capabilities, and limitations are identified and communicated in each estimate.

e. **Step 5: COA Comparison.** The commander and staff evaluate all friendly COAs against established evaluation criteria and select the COA that has the highest probability of success. The number of evaluation criteria will vary, but there should be enough to differentiate COAs. Consequently, COAs are not compared to each other, but rather they are individually evaluated against the criteria that are established by the staff and commander. GEOINT cell responsibilities are:

(1) Review commander's guidance for relevant criteria.

(2) Identify implicit significant factors relating to the operation.

(3) Identify GEOINT-related criteria.

(4) Recommend criteria based on the particular circumstances and relevance to the situation.

(5) Coordinate GEOINT support for the CONOPS.

f. **Step 6: COA Approval.** After the JFC selects (or selects and modifies) the COA, the GEOINT cell responsibilities are to:

(1) In coordination with the intelligence planners, review the selected COA and determine if any GEOINT tasks, required capabilities, and assumptions require modification.

(2) Ensure subordinate GEOINT assets receive notification of the approved COA and understand their responsibilities as outlined in the selected COA estimate.

(3) Identify and assemble the GEOINT products necessary to support plan development.

g. **Step 7: Plan or Order Development.** During this step, the supported commander refines the complete plan while supporting and subordinate commanders, Services, and supporting agencies complete their plans for review and approval.

(1) GEOINT Cell Responsibilities During Initial Plan Preparation.

(a) Develop appendix 7 (Geospatial Intelligence) of annex B (Intelligence).

(b) Identify required assigned and/or apportioned GEOINT forces and capabilities.

(c) Review and evaluate the GEOINT tasks, required capabilities, and assumptions and document them in the plan.

(d) Ensure all data, information, products, and services outlined in the estimate are available at the times and places required.

(e) Coordinate with all mission partners to determine the structure and composition of required GEOINT data, information products, and services. Of critical importance is to ensure product formats are compatible and usable by all force participants.

(2) GEOINT Cell Role in Preparing Final Plan.

(a) Finalize appendix 7 (Geospatial Intelligence) of annex B (Intelligence) in coordination with intelligence planners.

(b) Ensure all commands have the necessary GEOINT assets and expertise to prepare their command's GEOINT portion of their plan.

(c) Coordinate with all GEOINT assets to deconflict products within the command to ensure all plans are complementary.

(d) Identify special or unique GEOINT capabilities or products and ensure coordination is conducted, at all echelons, to facilitate their implementation.

(e) Identify GEOINT cell resources and personnel needed to accomplish tasks in all functional areas according to the CONOPS, commander's intent, and tasks to subordinate elements.

(f) Identify required GEOINT personnel and basic loads to the JFC for listing in the TPFDD.

(g) Develop GEOINT sustainment flow and related TPFDD in coordination with NGA and DLA.

(h) Task Service components and supporting CCMDs to develop automatic distribution accounts with DLA to support unit basic load and/or planning stock requirements.

(i) Develop automatic distribution listing to cover requirements of CCMD and/or JTF HQ.

(j) Assist staff target planning efforts by providing additional GPE (GEOINT-aided analysis subject matter expertise, analytical environment, and supporting GEOINT) to fulfill specific requirements (e.g., target system analysis, physical/functional target characterization, collateral effects estimation) associated with development and maintenance of targeting annexes to plans and orders, including the provision of GEOINT products and services that enable the visualization of consequences of execution, and coordination with NGA for such exceptional support as may be required.

(k) Coordinate with Service components and supporting CCDRs to ensure they have agreements in place to support en route overflight and access of GEOINT assets and support requirements.

(3) GEOINT Cell Role in Developing Estimates. Provide GEOINT estimates and capabilities to support plans and CONOPS.

(4) GEOINT Cell Role to Monitor and Assess. Assess the performance of the GEOINT process in support of the planning process and advise the J-2 on issues requiring attention.

(5) GEOINT Cell Role During In-Progress Review (IPR).

(a) Provide available geospatial and intelligence products, such as maps, charts, digital data, and IMINT, to support briefing requirements.

(b) After the IPR, evaluate the GEOINT tasks, required capabilities, assumptions, and mission statement to determine if modification is required based upon SecDef guidance.

See Figure A-2 for a depiction of the relationship between overall planning and GEOINT cell-supporting activities by step.

GEOSPATIAL INTELLIGENCE PLANNING CHECKLIST		
Steps/Actions	**CCMD and JTF Actions**	**GEOINT Cell Actions**
Step 1. Planning Initiation		
Initiation	CCDR receives strategic guidance.	Review tasking document. In coordination with the intelligence planners, J-3 and J-5, review operational area of interest.
Step 2. Mission Analysis		
Mission Analysis	Identify critical facts and assumptions on which to base the plan.	In coordination with joint intelligence planners, review operational area of interest. Determine if datum issues exist; determine the GEOINT data, information, products and services required.
	Identify enemy situation and capabilities.	Identify deficiencies and request NGA assessment of GEOINT coverage for the area. Assist the J-2 in conducting JIPOE by coordinating the available hydrography, terrain, and imagery products as required. Identify the required GEOINT capabilities to support the CCDR's initial mission analysis process.
	Develop list of specified, implied, and essential tasks to be accomplished.	Determine specified, implied, subsidiary, and essential GEOINT tasks required to support the CCDR's proposed mission statement.
	Create proposed mission statement and desired strategic-operational end state.	In coordination with joint intelligence planners, develop the draft GEOINT mission statement.
	Identify major friendly capabilities and conditions needed for mission success.	
	Develop key strategic planning factors and assumptions that may change during planning or execution.	Determine acceptable readiness level. Coordinate with NGA on production strategy to fill shortfalls.
	In coordination with joint intelligence planners, ensure associated scenarios for the plan contain contingencies or other options as required. To do so, analyze	

GEOSPATIAL INTELLIGENCE PLANNING CHECKLIST		
Steps/Actions	**CCMD and JTF Actions**	**GEOINT Cell Actions**
	scenarios initially provided in strategic guidance statements, confirming them or proposing modifications.	
IPR	Incorporate results of SecDef IPRs.	Provide available GEOINT products to support IPR briefing. In coordination with joint intelligence planners, evaluate GEOINT tasks, capabilities, assumptions, and mission statement based on revised mission statement from the IPR.
Step 3. COA Development		
COA Development	Conduct COA analysis using wargaming, operational modeling, and initial feasibility assessments.	Act as the J-2's GEOINT advisor in the assessment process, outlining capabilities and issues. Provide available GEOINT data, information, products, and services as required. Identify GEOINT capabilities required to support the CCDR's COA analysis and construct the assumptions on their availability/use.
	Evaluate COA comparisons developed during analysis.	Compare results of COA analysis to provide best COA recommendation and options.
Step 4. COA Analysis		
Staff Estimates	Develop estimate as narrative statement, with supporting graphics.	In coordination with joint intelligence planners, develop a GEOINT estimate to support each COA. Develop GEOINT tasks. Review assigned and/or apportioned GEOINT forces and capabilities to ensure they are adequate to support the mission statement for each COA. Review and evaluate GEOINT tasks, required capabilities, host nation agreements, and assumptions. Ensure critical GEOINT issues, including legal issues, capabilities, and limitations, are identified and communicated in each estimate. Keep NGA and other stake holders informed as required.
Strategic Concept	Submit strategic concept/ COA recommendation.	Prior to submission, review strategic concept (STRATCON) to ensure GEOINT capabilities and level of support are correctly defined. Coordinate available GEOINT products to support finished STRATCON.
Step 5. COA Comparison		
Evaluate COAs	Establish criteria-governing factors. Create matrix for criteria evaluation.	Select GEOINT criteria based on circumstances. Review command's guidance for relevant criteria. Identify GEOINT factors relating to the operation.

GEOSPATIAL INTELLIGENCE PLANNING CHECKLIST		
Steps/Actions	**CCMD and JTF Actions**	**GEOINT Cell Actions**
		Apply GEOINT support to the finished strategic CONOPS.
Step 6. COA Approval		
COA Selection	Communicate COA selection to lower echelons.	In coordination with joint intelligence planners, review the selected COA and determine if any GEOINT tasks, required capabilities, and assumptions require modification. Ensure that subordinate GEOINT assets receive notification of the approved COA and understand their responsibilities as outlined in the selected COA estimate.
Step 7. Plan or Order Development		
Resource Planning	Complete employment, force, support, and functional planning.	In coordination with joint intelligence planners, develop GEOINT tasks and initial input for appendix 7 to annex B. Review assigned and/or apportioned GEOINT forces and capabilities to ensure they are adequate to support the mission statement for each COA. Review and evaluate the GEOINT tasks, required capabilities, and assumptions.
Sourcing	Complete detailed sourcing.	Coordinate with all echelons of source to ensure connectivity and interoperability. Evaluate required products, identify issues, and make recommendations to the J-2 on how to resolve the issues.
Feasibility Analysis	Complete feasibility analyses.	Provide evaluation and solutions as required for GEOINT issues.
Plan Review	Submit plan summary, basic plan, and required annexes for approval.	Provide available GEOINT products to support construction of the plan.
IPR	Resolve IPR issues.	Provide available GEOINT products to support the IPR briefings to SecDef. After the IPR, in coordination with joint intelligence planners, evaluate the GEOINT tasks, required capabilities, assumptions, and mission statement to determine if modification is required based upon SecDef guidance.
Prepare Final Plan	Prepare complete plan while subordinate elements complete their plans for review and approval.	In coordination with joint intelligence planners, finalize appendix 7 to annex B. Ensure all commands have the necessary GEOINT assets and expertise to prepare their command's GEOINT portion of their plan. Coordinate with all GEOINT assets within the command to ensure all plans are complementary. Identify any special or unique GEOINT capabilities or products required in the plan and ensure that coordination is conducted, at all echelons, to facilitate their implementation. Identify all GEOINT cell resources/personnel needed to accomplish GEOINT tasks in all functional areas according to the GEOINT (CONOPS), commander's intent, and tasks to

GEOSPATIAL INTELLIGENCE PLANNING CHECKLIST		
Steps/Actions	**CCMD and JTF Actions**	**GEOINT Cell Actions**
		subordinate elements. Task Service components and supporting CCMDs to provide TPFDD for GEOINT basic loads. Task Service components and supporting CCMDs to include war reserve in the TPFDD (if not already stored in-theater). Develop GEOINT sustainment flow and related TPFDD in coordination with DLA and NGA. Task Service components and supporting CCMDs to develop AD accounts with DLA to support unit basic load and/or planning stock requirements.

Legend

AD	automatic distribution	J-5	plans directorate of a joint staff
CCDR	combatant commander	JIPOE	joint intelligence preparation of the operational environment
CCMD	combatant command		
COA	course of action	JTF	joint task force
CONOPS	concept of operations		
DLA	Defense Logistics Agency	NGA	National Geospatial-Intelligence Agency
GEOINT	geospatial intelligence		
IC	intelligence community	SecDef	Secretary of Defense
IPR	in-progress review	STRATCON	strategic concept
J-2	intelligence directorate of a joint staff	TPFDD	time-phased force and deployment data
J-3	operations directorate of a joint staff		

Figure A-2. Geospatial Intelligence Planning Checklist

3. Crisis Action Planning

Crisis action planning activities are associated with the time-sensitive development of operation orders (OPORDs) in response to a situation that may result in actual military operations. It has three broad operational activities: SA, planning, and execution.

a. **SA.** SA development is a dynamic process demanding that staffs be able to provide immediate advice to commanders, based on contingency planning. SA activities include monitoring the global situation, identifying that an event has occurred, recognizing the event is a problem or potential problem, reporting the event, and reviewing all-source intelligence and information. GEOINT cell responsibilities during SA development are:

(1) Develop a commander's situation assessment for GEOINT support. The report must provide current and accurate assessments of the preparedness of the command to execute military operations in the joint operations area (JOA) and monitor the AOI from a GEOINT perspective. The GEOINT cell should make this assessment with input from the appropriate NGA support team. The GEOINT cell's assessment must consider the following factors:

(a) The geographic "footprint" of the JOA and the AOI.

(b) The operational requirements for the command based on the mission and the force structure. The planning factors database can be used to determine what GEOINT is needed by specific weapons and C2 systems.

(c) The availability and currency of GEOINT. That is, what products and data currently reside "on the shelf" at depots and servers, to include available assets provided by the components in the AOR and AOI that can be shared easily to reduce redundant movement/updating of large repositories of GEOINT data.

(d) A preliminary recommendation for what GEOINT cell forces should be included in the JTF.

(e) In conjunction with the communications system directorate of a joint staff (J-6), provide an initial estimate of the communications requirements needed to transmit digital GEOINT data between forward-deployed units, US production centers, and digital data warehouses, and theater-level computer data servers, and to multinational forces.

(f) The use of interim products, such as satellite image maps as an initial deliverable, and meteorological data systems instead of more standard and more detailed digital data. What GEOINT can be developed or updated is a function of requirements and time available.

(2) Analysis of the situation assessment to determine whether a military option should be prepared. The CCMD GEOINT cell continues to refine the GEOINT cell assessment and now begins to consider the strategic lift requirements for transporting required geospatial data, information, products, and services of the operational area and the AOI.

(3) The crisis assessment ends with a decision by SecDef to return to the pre-crisis state or to have military options developed for consideration and possible use. SecDef decision provides strategic guidance for joint planning and may include specific guidance on the COAs to be developed. The responsibilities of the GEOINT cell if SecDef decides to have military options developed for consideration and possible use are as follows:

(a) Coordinate with mission partners to ensure they are informed of the President and SecDef decision and the CJCS planning guidance directive.

(b) Provide a recommendation and receive CCDR guidance on the datum to be used for the operation.

(c) Coordinate with DLA to place a hold on distribution of any hard copy products and digital media covering the AOI. This will allow the GEOINT cell officer to prioritize the distribution of the required data and products to the units involved in the immediate operation.

(d) Develop and provide guidance to subordinate and supporting GEOINT cell staffs, supporting organizations, and appropriate forces regarding special procedures to be

used when requisitioning products over the AOI. Information about distribution limits and unit priorities must be established early to prevent depletion of stocks.

(e) Coordinate with the logistics directorate of a joint staff (J-4) as early as possible in the planning effort to determine the impact the transportation infrastructure status has on deployment planning for GEOINT data, information, products, services, and GEOINT production-capable units.

(f) Coordinate with NGA and the Services for GEOINT cell staff augmentation, if required. NGA has crisis response teams specially trained in requirements planning, GEOINT cell production, distribution, and map depot warehousing operations that can be deployed in theater upon request by the CCDR. The command relationship of NST or national level support to a JFC will be established in a deployment order. Typically, these teams will work with the J-2 and be integrated into the intelligence staff to provide the necessary coordination and support the campaign. The US Army Geospatial Center, the Naval Meteorology and Oceanography Command, USAF expeditionary site mapping programs, the MCIA, and other Service assets may also provide assistance to joint forces as part of their Service components assigned to the operation. Information required by these DOD and Service activities includes justification for request, what expertise is needed, where support will be located, and approximately, when the support will need to be in place.

(g) Coordinate with J-6 to determine bandwidth requirements, impacts, and shortfalls to include all levels of networks. This includes determining availability and source integration of GBS or IBS to facilitate movement of large GEOINT data files.

(h) Coordinate the early geospatial information production and collection efforts of national and theater assets. The CCMD GEOINT cell officer must coordinate with all GEOINT cell producers, including subordinate GEOINT cell units, units from multinational forces, Service assets, and NGA, to eliminate duplication of effort.

(i) Identify, in coordination with the joint force staff, GEOINT cell requirements and/or requests from multinational forces. If required, begin coordinating requests for foreign disclosure and/or release with the GEOINT community.

(j) Establish points of contact (POCs) with multinational forces for supply and receipt of GEOINT cell products and data. Identify foreign disclosure and releasability process.

For further details, see DODD 5230.11, Disclosure of Classified Military Information to Foreign Governments and International Organizations.

b. **Planning**

(1) At the beginning of the planning activity, a SecDef decision or CJCS planning directive to develop military options is issued. This directive (and required actions) is described in JP 5-0, *Joint Planning.*

(2) The supported commander analyzes each COA and provides recommendations to SecDef and CJCS. This planning activity ends with submission of the commander's estimate, which includes the GEOINT cell estimate.

(a) The GEOINT cell coordinates with NSG and others as applicable, for analysis of all COAs, and determines the supportability of each.

(b) The GEOINT cell supports other staff elements with their planning effort by providing GEOINT or guidance.

(3) The CJCS reviews and evaluates the CCDR's estimate and prepares recommendations and advice for SecDef. SecDef selects a COA and directs that execution planning be accomplished.

(4) An alert order implements SecDef decision and contains sufficient detail to allow the JFC to conduct detailed planning. A CJCS planning order could be issued to initiate execution planning before SecDef selects a COA. The focus of the GEOINT cell staff element shifts to the COA selected by SecDef. In addition, the GEOINT cell officer will complete the following tasks:

(a) Review the checklists found in Figure A-2 and Figure A-3.

(b) Ensure all subordinate joint force GEOINT cell personnel understand the organizational structures, command, and multinational relationships established for the mission. Subordinate forces and supporting command GEOINT cell personnel should be briefed on key C2 relationships affecting their specific responsibilities.

(c) Coordinate with the operations directorate of a joint staff (J-3), J-4, and DLA MCO to ensure adequate lift and priority is provided for the shipment of paper maps and charts, as well as electronic media.

(d) In coordination with the J-6, finalize communications support for the subordinate force GEOINT cell element so adequate communications bandwidth exists to transmit digital geospatial information from the US to deployed units and data management centers. Develop backup procedures for maintaining support to units if primary communications are lost.

(e) Ensure requests for theater and national augmentation (both personnel and equipment) are formally submitted and responses are tracked. Coordinate with the manpower and personnel officer to ensure logistic preparations for locating and housing augmentees are underway. As directed, the NSG will provide support teams and analysts to theater joint intelligence/analysis centers to directly support the highest and most urgent intelligence needs.

(f) Coordinate final personnel, systems, supply, and equipment requirements with the subordinate GEOINT cell officer and ensure these requirements are submitted to the Joint Operation Planning and Execution System and the TPFDD.

(g) Resolve foreign disclosure and/or release policies with respect to GEOINT and inform subordinate GEOINT cell personnel of these procedures IAW US law. Requirements to share geospatial data must be finalized, and specific products or data to be shared must be identified in the OPORD. Coordinate with NGA for support being provided to multinational forces through the United Nations, North Atlantic Treaty Organization, or other international organizations.

(h) Obtain status from NGA on their crisis production plan to cover GEOINT cell shortfalls.

(i) Begin coordination with DLA and Services on in-theater regional map depot and manning requirements.

(j) Seek staff judge advocate review of the status of in-place bilateral and/or multilateral diplomatic agreements to support en route overflight and access of GEOINT assets and personnel.

(5) The approved CJCS COA is transformed into an OPORD. Detailed planning occurs throughout the joint planning community. If required, the supported commander will initiate campaign planning or refine a campaign plan already developed.

(6) The supported commander develops the OPORD and supporting TPFDD by modifying an existing OPLAN, expanding an existing CONPLAN, or developing a new plan. This phase ends with a SecDef decision to implement the OPORD. In those instances where the crisis does not progress to implementation, the CJCS provides guidance on continued planning using either deliberate planning or crisis action planning procedures.

(a) The planning emphasis shifts to transportation requirements and the building of movement schedules. The movement status of GEOINT cell forces, equipment, and GEOINT data should be included in every status report and briefing prepared during the planning of joint operations. Emphasis should be placed on ensuring required aircraft diplomatic clearance timelines outlined in the DOD *Electronic Foreign Clearance Guide* are considered. The guide can be accessed at https://www.fcg.pentagon.mil/fcg.cfm and is also available on SIPRNET at http://www.fcg.pentagon.smil.mil.

(b) GEOINT cell actions include the following:

1. Brief subordinate GEOINT cell officers, DLA, NGA, and Service GEOINT support activities on the alert or planning order.

2. Finalize any remaining planning or previous actions that were compressed due to the rapid development of the crisis.

3. Refine appendix 7 (Geospatial Intelligence) to annex B (Intelligence) to the OPORD according to CJCSM 3130.03, *Adaptive Planning and Execution (APEX) Planning Formats and Guidance.* See Appendix C, "Sample Appendix 7 (Geospatial Intelligence) to Annex B (Intelligence)."

4. Ensure all subordinate GEOINT cell personnel understand the GEOINT cell support operations concept.

5. Ensure C2 relationships have been defined for GEOINT cell support to major component forces of the subordinate joint force.

6. Apprise the commander of the current status of GEOINT cell capabilities and limitations, as well as the status of crisis production of GEOINT.

7. Brief personnel on the complete OPORD.

c. **Execution.** Execution begins when the President or SecDef decides to use a military option to resolve a crisis. Only the President or SecDef can authorize the CJCS to issue an execute order. The execute order directs the supported commander to initiate military operations, defines the time to initiate operations, and conveys guidance not provided earlier. The CJCS monitors the deployment and employment of forces and advises and makes recommendations to the President, the National Security Council, and SecDef on the operation. US Transportation Command provides common-user and commercial global air, land, and sea transportation, reporting the progress of deployments to the CJCS and the supported commander. Execution continues until the operation is terminated or the mission is accomplished or revised. The crisis action planning process may be repeated continuously as circumstances and missions change. As soon as the deployment begins, the command GEOINT cell coordinates the deployment of requested GEOINT cell augmentation of personnel and/or equipment to the theater. The command GEOINT cell continues to provide production guidance to NSG and suggests GEOINT collection requirements to theater commands until the subordinate joint force GEOINT cell staff has reached operational status at the deployed location.

See Figure A-3 for a depiction of the relationship between overall planning and GEOINT cell supporting activities by step.

GEOSPATIAL INTELLIGENCE CELL CRISIS ACTION PLANNING CHECKLIST		
Activity	**Actions of CCMD/JTF Staff**	**Actions of GEOINT Cell**
Situational Awareness	Begin monitoring and reporting on the situation. Establish a crisis action team to track the situation. Begin the mission analysis process; define the mission. Identify available forces. Identify major constraints. Inform the CJCS of any actions or plans being taken (COA development).	Provide available planning maps, nautical and aeronautical charts, imagery, and digital data to the staff. Understand enemy and friendly situations. Understand the boundaries of the AOI and provide warning order to components, DLA, and NGA. If required, request GEOINT cell staff augmentation from NGA or Service assets. Review CCDR guidance. Assist the staff in COA development. Determine what forces and weapons systems are being

GEOSPATIAL INTELLIGENCE CELL CRISIS ACTION PLANNING CHECKLIST		
Activity	**Actions of CCMD/JTF Staff**	**Actions of GEOINT Cell**
		considered for employment. Assist the J-2 with the JIPOE process. In conjunction with components, determine area requirements for GEOINT cell support. Coordinate with subordinate command and supporting CCMD GEOINT cell officers. Develop GEOINT cell facts and assumptions. Identify any datum issues in the AOI; make a preliminary recommendation to the J-2.
Situational Awareness	Continue mission analysis and situation monitoring. Review existing OPLANs and CONPLANs for applicability to the situation. Evaluate disposition of assigned and available forces. Evaluate status of assigned theater transportation assets. Brief commander as necessary on the situation and ongoing planning actions.	Direct all in-theater GEOINT cell activities (units, map depots) to provide an immediate report. Assess the possibility of multinational operations and related GEOINT cell requirements and/or production capabilities. Begin release and disclosure assessments. Prioritize GEOINT information and intelligence activities to facilitate possible CCDR reallocation to minimize emerging risk. Review appendix 7 (Imagery Intelligence), annex B, (Intelligence), of similar OPLANs and CONPLANs. Provide guidance (project codes, quantity limits, priority units, and other related areas) to DLA, subordinate and supporting GEOINT cells for product requisitioning. Evaluate most current status of GEOINT cell units and activities. Receive NGA's initial assessment of product and data availability and suitability. In close coordination with joint intelligence planners, determine geospatial and imagery data shortfalls based on PIRs. In conjunction with components and NGA, coordinate crisis collection and production.
Situational Awareness		Consider substitute products or data production such as single color overprints, image maps, native edition maps, and charts. Request DLA freeze issue of products that cover the AOI, except small quantities for planning.

GEOSPATIAL INTELLIGENCE CELL CRISIS ACTION PLANNING CHECKLIST		
Activity	**Actions of CCMD/JTF Staff**	**Actions of GEOINT Cell**
Planning	Receive and evaluate CJCS warning order. Develop and evaluate tentative COAs. Develop TPFDD. With United States Transportation Command, conduct transportation feasibility analyses. Prepare commander's estimate with analysis of all COAs. Provide a recommended COA.	Determine what organic or other available Service GEOINT cell assets can support crisis production effort. Keep GEOINT activities informed. Review the CJCS warning order; ensure GEOINT activities have a copy. In close coordination with joint intelligence planners, determine the deadline for the submission of the J-2 staff estimate and the commander's estimate. Assist the staff in COA development and recommendation. Develop a GEOINT cell concept of operations for each COA under consideration. Determine need for map depot establishment in theater. Determine GEOINT cell forces required for each COA. Prepare a GEOINT cell estimate for each COA. Provide a copy of the completed commander's estimate to GEOINT activities.
Planning	Continue monitoring the situation and evaluating the impacts on the recommended COA. Continue transportation planning. Await receipt of the planning order or alert order from the CJCS. Await SecDef decision on the selection of a COA. Make adjustments to COA based on SecDef and/or CJCS guidance. Prepare complete OPORD for SecDef's selected COA.	Coordinate with DLA and NGA to "push" essential GEOINT cell products to assigned units. In close coordination with joint intelligence planners, begin preparation of appendix 7 to annex B. When (if) JTF GEOINT cell is assigned, coordinate all actions to avoid duplication of effort. Discuss CJCS planning order or alert order with GEOINT activities. Complete draft appendix 7 of annex B; coordinate with GEOINT activities for comment. Work with DLA, J-3, and J-4 for transportation planning of GEOINT cell products to deploying units and map depot(s). Work with J-6 to determine paths for distribution of digital GEOINT information to units at both home station and forward-deployed sites. Keep subordinate and supporting command GEOINT cells informed. Monitor status of GEOINT cell products and units. In close coordination with the joint intelligence planners, finalize

GEOSPATIAL INTELLIGENCE CELL CRISIS ACTION PLANNING CHECKLIST		
Activity	**Actions of CCMD/JTF Staff**	**Actions of GEOINT Cell**
		appendix 7 to annex B and assist subordinate and supporting command GEOINT cells to meet specified appendix 7 of annex B requirements.
Planning		Maintain contact with GEOINT activities on crisis production, distribution of products, and the availability of information in GEOINT data servers. Adjust GEOINT cell support IAW changes to the published OPORD. Coordinate with GEOINT activities on the anticipated levels of GEOINT cell sustainment.
Execution	Receive CJCS execute order. Issue execute order to the designated JTF.	

Legend

AOI	area of interest	JIPOE	joint intelligence preparation of the operational environment
CCDR	combatant commander		
CCMD	combatant command	JTF	joint task force
CJCS	Chairman of the Joint Chiefs of Staff	NGA	National Geospatial-Intelligence Agency
COA	course of action	OPLAN	operation plan
CONPLAN	concept plan	OPORD	operation order
DLA	Defense Logistics Agency	PIR	priority intelligence request
GEOINT	geospatial intelligence	SecDef	Secretary of Defense
IAW	in accordance with	TPFDD	time-phased force and deployment data
J-2	intelligence directorate of a joint staff		
J-3	operations directorate of a joint staff		
J-4	logistics directorate of a joint staff		
J-6	communications system directorate of a joint staff		

Figure A-3. Geospatial Intelligence Cell Crisis Action Planning Checklist

APPENDIX B
SAMPLE GEOSPATIAL INTELLIGENCE ESTIMATE

The GEOINT estimate is an appraisal of available GEOINT for a specific situation in a certain region of the world. It is used to determine the supportability of a COA, depending upon the GEOINT requirements for planning and execution. The format for the GEOINT estimate is provided as follows:

CLASSIFICATION

Originating Section Issuing Headquarters
Classified documents mandate appropriate marking and
Sourcing—which for derivative classifiers include a
CL BY
DER FROM
DECL ON
or Original classifiers of
CL BY
CL REASON
DECL ON

(Note: When this estimate is distributed outside the issuing HQ, the first line of the heading is the official designation of the issuing command, and the ending of the estimate is modified to include authentication by the authorizing section, division, or other official according to local policy.)

Place of Issue
Day, Month, Year
GEOINT STAFF ESTIMATE NUMBER

(Note: Normally, these are numbered sequentially during a calendar year.)

( ) REFERENCES:

a. ( ) GEOINT data, information, products, and services.

b. ( ) Other relevant documents.

1. ( ) Mission. State the assigned task and its purpose. The mission of the overall command is taken from the commander's mission analysis, planning guidance, or other statement.

2. ( ) Situation

a. ( ) Definition of the AOI. Describe the limits of the AOI both in terms of natural or cultural features and latitude and longitude coordinates. If the AOI limits are difficult to describe, a map with the appropriate boundaries should be appended. Appropriate imagery should also be used whenever possible.

b. ( ) Assigned or apportioned GEOINT assets. Identify those forces that can perform one or more of the following GEOINT functions:

(1) ( ) Direct machine-to-machine access (e.g., Internet protocol addresses).

(2) ( ) Digital dissemination of data and/or information.

(3) ( ) Analysis of the OE.

(4) ( ) Digital data production.

(5) ( ) Provide value-added improvement to GEOINT data sets.

(6) ( ) Construction of modeling and/or simulation databases.

(7) ( ) GEOINT analysis.

(8) ( ) GPS SA.

(9) ( ) Imagery.

(10) ( ) Imagery analysis.

(11) ( ) Access to GEOINT libraries.

c. ( ) Facts and assumptions. Facts and assumptions are usually generated during the mission analysis process, and may include items such as release and disclosure of GEOINT products to multinational forces, transportation availability, and digital communications availability and other topics as necessary.

d. ( ) GEOINT considerations. Example items are:

(1) ( ) Availability of standard GEOINT data, information, products, and services.

(2) ( ) Currency of data, information, and products.

(3) ( ) Availability of imagery from national and commercial sources.

(4) ( ) GEOINT support to and from multinational forces.

(5) ( ) Existing GEOINT agreements with foreign countries.

(6) ( ) WRS and basic load considerations.

(7) ( ) Maintenance of GEOINT data.

(8) ( ) Sustainment of GEOINT assets and personnel.

(9) ( ) Creation and manning of forward map depots.

(10) ( ) Data, information, products, and services requirements for mission rehearsal areas.

(11) ( ) Local availability of networks and online GEOINT data, products, and services.

(12) ( ) Distribution of hard copy products.

(13) ( ) Requirement for command to provide supplemental manning to the MSO.

(14) ( ) Disclosure or release to multinational partners or other USG departments and agencies and multinational partners (military and/or civilian).

3. ( ) Analysis of COAs. The following are examples of factors the GEOINT cell can use to weigh COAs:

a. ( ) GEOINT forces and functions: The COA employs forces to cover the greatest number of GEOINT functions.

b. ( ) Datums and interoperability: Assesses each COA for datum and format transformations needed to support forces within the AOI.

c. ( ) Multinational partner operations: Assessment of how each COA facilitates operations and what support is required of other nations.

d. ( ) GEOINT coverage: Assessment of each COA for the availability of GEOINT data and information over the AOI (if COAs have somewhat different geographic boundaries).

e. ( ) NGA supportability: An assessment by COA from an NGA supportability perspective.

f. ( ) Simplicity of GEOINT distribution and digital dissemination: Assessment by COA of the probable scheme for distributing paper maps and charts and the digital dissemination of GEOINT data.

g. ( ) C2 of GEOINT assets: Assessment of the COA from a C2 perspective.

h. ( ) WRS: Assessment of the COA for requirements by operational forces for both paper and digital geospatial data.

4. ( ) Comparison of COAs. Using the factors stated above and others, the GEOINT cell compares the different COAs to determine if GEOINT supportability is a factor for execution.

5. ( ) Conclusions. Once the analysis is complete, the GEOINT cell should either make a recommendation for a single COA or state that none of the COAs are adversely affected by the current GEOINT situation.

(signed)

_____

(Note: The staff division chief [J-2] signs the GEOINT cell estimate. If the estimate is to be distributed outside the HQ, the heading and signature block must be changed to reflect that fact.)

ANNEXES: (By letter and title) Annexes should be included where the information is in graphs (such as geospatial data coverage graphics) or is of such detail and volume that inclusion makes the body of the estimate cumbersome. They should be lettered sequentially as they occur throughout the estimate.

DISTRIBUTION: (According to procedures and policies of the issuing HQ)

CLASSIFICATION

APPENDIX C
SAMPLE APPENDIX 7 (GEOSPATIAL INTELLIGENCE) TO ANNEX B (INTELLIGENCE)

1. Purpose

To provide guidance and formatting for use in the preparation of the GEOINT appendix of OPLANs and CONPLANs. Refer to CJCSM 3130.03, *Adaptive Planning and Execution (APEX) Planning Formats and Guidance*, for the current format for appendix 7 (Geospatial Intelligence) to annex B (Intelligence).

2. General

The GEOINT appendix to the intelligence annex should include sufficient information to clarify the GEOINT support provided for the specific operation.

References: List documents essential to this appendix.

1. Situation

a. Enemy. Refer to Annex B.

b. Friendly. Identify the geospatial intelligence (GEOINT) organizations and approximate strengths of units required.

c. Assumptions. State any assumptions about friendly or enemy capabilities and courses of action that significantly influence GEOINT operations.

2. Mission. See Annex B, the base plan or develop a mission statement specific to this appendix.

3. Execution

a. Concept of operations for GEOINT collection, processing, and production.

(1) Identify targets and other collection requirements to be fulfilled by GEOINT operations.

(2) Identify theater and national collection assets as well as supporting systems. Describe how and when employed.

(3) Identify allied or coalition foreign interface accesses and capabilities, as appropriate.

(4) Identify tasking procedures for GEOINT requirements. Identify procedures (as required) for development, maintenance, and execution of contingency collection problem sets or collection requirements.

b. Concept of GEOINT Operations

(1) General. Provide a broad statement of how the command will provide the GEOINT support necessary to meet the commander's overall mission requirement.

(a) Describe the forces involved; the time phasing of operations; the general nature and purpose of GEOINT operations to be conducted; the interrelated or cross-Service support; and support provided by agreements, coordination, and cooperation necessary for the successful implementation of this plan.

(b) Describe the scope and extent of host-nation support (HNS) available to enhance GEOINT operations in support of the plan.

(c) State operations security (OPSEC) planning guidance for GEOINT operations.

(d) List the types of GEOINT data, products, and services required. Show desired area coverage requirements in Tab A, Appendix 7 in the format prescribed or portray them graphically using standard index bases. GEOINT product quantity requirements also will be compiled in Tab A.

(2) Deployment. Summarize the requirements for deploying GEOINT forces, materiel, and necessary depot activities from their normal peacetime locations to the operational area. Pay particular attention to the time phasing of these deployments to effect an orderly transition from current to planned organizational configurations.

(3) Employment. Describe how deployed GEOINT forces will be employed in the conduct of GEOINT operations.

(4) Interoperability. The geographic datum used for all operations must be clearly stated, but World Geodetic System 1984 is the current standard datum to be used by all US/allied/coalition forces. Provide guidance to ensure datum, theater coordinate sources, methods, and procedures deliver the required accuracy. Provide specific technical guidance and procedures to ensure interoperability of GEOINT material, particularly the proper derivation, documentation, and use of coordinates derived from GEOINT products.

c. Tasks. For each activity or applicable GEOINT discrete function identify the staff, element, or unit responsible and the type of collection plans and approving authority required. Outline specific responsibilities of all supporting organizations and agencies. Identify GEOINT roles in an all-source fusion and production environment.

d. Coordination Instructions

(1) Identify coordination requirements unique to GEOINT operations such as requirements identification and tasking. Refer to activities listed in paragraph 3 above, if applicable.

(2) Identify coordination requirements for support.

(a) From and to other US Government and allied or coalition agencies.

(b) For technical, communications, logistic, or security support.

(c) For mutual support to satisfy collection requirements. Refer to paragraph 3 above.

(3) Identify and/or cross-reference other GEOINT collection portions of the plan. This section should identify organizations, list points of contact, and identify procedures to ensure GEOINT requirements are prioritized and tasked to support those planning and execution functions not directly related to intelligence activities.

(4) Describe processing, exploitation, production, and dissemination operations as well as backup procedures.

(5) Include pertinent comments on conducting GEOINT operations while collocated with allied or coalition forces.

4. Administration and Logistics

a. Logistics. Identify unique logistics requirements or processes.

b. Supply and Storage. Provide instructions regarding GEOINT supply and storage procedures and responsibilities.

(1) Describe procedures for acquiring both standard and nonstandard geospatial products.

(2) Specify the types and quantities of products to be held by the supporting command's units or agencies.

(3) Outline the intra-theater distribution plan to be implemented by component logistics organizations.

c. Transportation. Provide instructions regarding GEOINT material transportation requirements and assign appropriate priorities. Use a separate appendix to list detailed transportation requirements and procedures. The TPFDD may reflect movement requirements for GEOINT materials.

d. Reporting

(1) Identify reporting and dissemination needs in terms of product types, timeliness for GEOINT applications, capacities, and transmission media.

(2) Identify reporting dissemination procedures. Include pertinent comments on releasability and dissemination to allied or coalition forces.

5. Command and Control

a. Command Relationships. Provide statement of command responsibilities, applicability and scope, and chain of command for reporting.

b. Communications

(1) Summarize imagery communications requirements or reference paragraph in Annex K that states requirements.

(2) Summarize imagery systems/ADP requirements or reference paragraph in Annex K that states the requirements.

Tabs

A—GEOINT Requirements List

TAB A TO APPENDIX 7 TO ANNEX B TO USXXXXX OPLAN XXXX-XX
GEOSPATIAL INTELLIGENCE REQUIREMENTS LIST

DATA DOMAINS	**REQUIREMENTS**	**COVERAGE REQUIRED**
1. FEATURES DOMAIN	(What type of data or product is specifically required to support the mission.)	(Area to be covered described by geographic coordinates, political boundaries [identified by geopolitical codes], or recognizable geographic code.)
2. AERONAUTICAL DOMAIN		
3. MARITIME DOMAIN		
4. CONTROLLED IMAGERY DOMAIN		
5. ELEVATION DOMAIN		
6. GEOMATICS DOMAIN		
7. GEONAMES AND BOUNDARIES DOMAIN		
8. HUMAN GEOGRAPHY DOMAIN		

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APPENDIX D
GEODETIC DATUMS AND COORDINATE REFERENCE SYSTEMS

1. Position Reference System

World Geodetic System 1984 (WGS 84) is the official DOD positional reference system. IAW CJCSI 3900.01, *Position (Point and Area) Reference Procedures,* in unilateral and joint operations, the US military force of the commander involved will use the WGS 84 horizontal coordinates and height (height above ellipsoid) unless the commander determines that the use of other position reference systems (i.e., horizontal and/or vertical datum) is mission critical.

2. Global Area Reference System

a. In multinational and joint operations, CCDRs should direct the use of the Global Area Reference System (GARS) unless the commander determines that the use of another area reference system (e.g., locally developed area reference systems such as the Korean common grid reference system) is mission critical. Universal use of the GARS area reference system will eliminate confusion regarding which system is being used in reporting areas.

b. GARS is primarily an operational-level administrative measure used to coordinate geographic areas rapidly for OE deconfliction and synchronization of operations. GARS is not a replacement for position-reference procedures or systems described above such as the Universal Transverse Mercator-based Military Grid Reference System or geodetic coordinates—latitude, longitude, and ellipsoid height. GARS is a reference system, not a fire support coordination measure or airspace coordinating measure. It provides the two-dimensional construction from which control and coordination measures can be constructed. The area reference system can be a tool for rapid deconfliction within the OE.

c. The GARS system uses three numbers followed by two letters to describe a unique 30 minute by 30 minute area. A graphical depiction is in Figure D-1. The origin point for the system is 90 degrees south (the South Pole) and 180 degrees east/west. The areas described by GARS are coincident with even WGS 84 degree and minute lines. The areas are read right (west to east, 001-720) then up (south to north, AA-QZ). The 30 minute by 30 minute areas are subdivided by quadrant into 15 minute by 15 minute areas, then further subdivided by a keypad division into 5 minute by 5 minute areas (see Figure D-2).

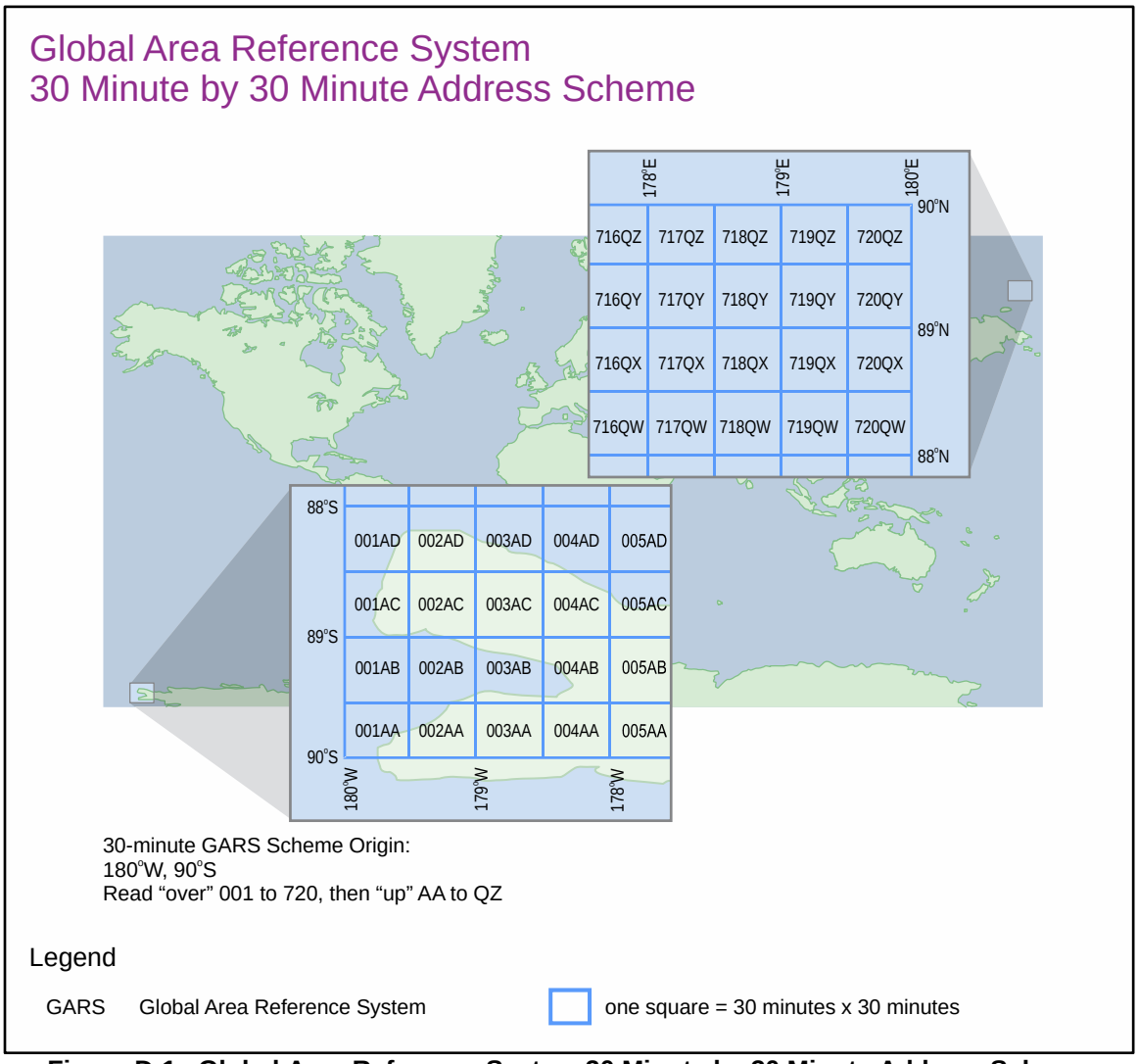

Figure D-1. Global Area Reference System 30 Minute by 30 Minute Address Scheme

3. Coordination

a. The Director, NGA, will establish specifications and procedures for applying position reference systems to GEOINT. WGS 84 is the official DOD position reference system. NGA will assist its allied co-producers in using this system. When WGS 84 cannot be used, NGA will assist the CCDRs in determining an appropriate reference system. NGA will provide standard algorithms and parameters to perform datum transformation and coordinate conversion (e.g., as implemented in Geographic Translator or Mensuration Services Program). For existing products (e.g., maps, software, aircraft systems) not in compliance with this instruction, NGA will coordinate with the affected agency, CCMD, or Service on the feasibility of converting these products with regard to time, cost, and scheduling. NGA will coordinate with the Joint Staff, DOD agencies, CCMDs, and the Services in making all future products used for position reference in compliance with this instruction.

b. CCDRs will develop procedures for coordinating the use of the WGS 84 system of coordinates in all joint operations involving US military forces. CCDRs will coordinate with

partner nation commands on position reference procedures to be followed within areas of multinational interest. In cases where conditions preclude the use of WGS 84, CCDRs will coordinate on the use of position reference procedures. Examples of the authorized reference system formats are provided in Figure D-3.

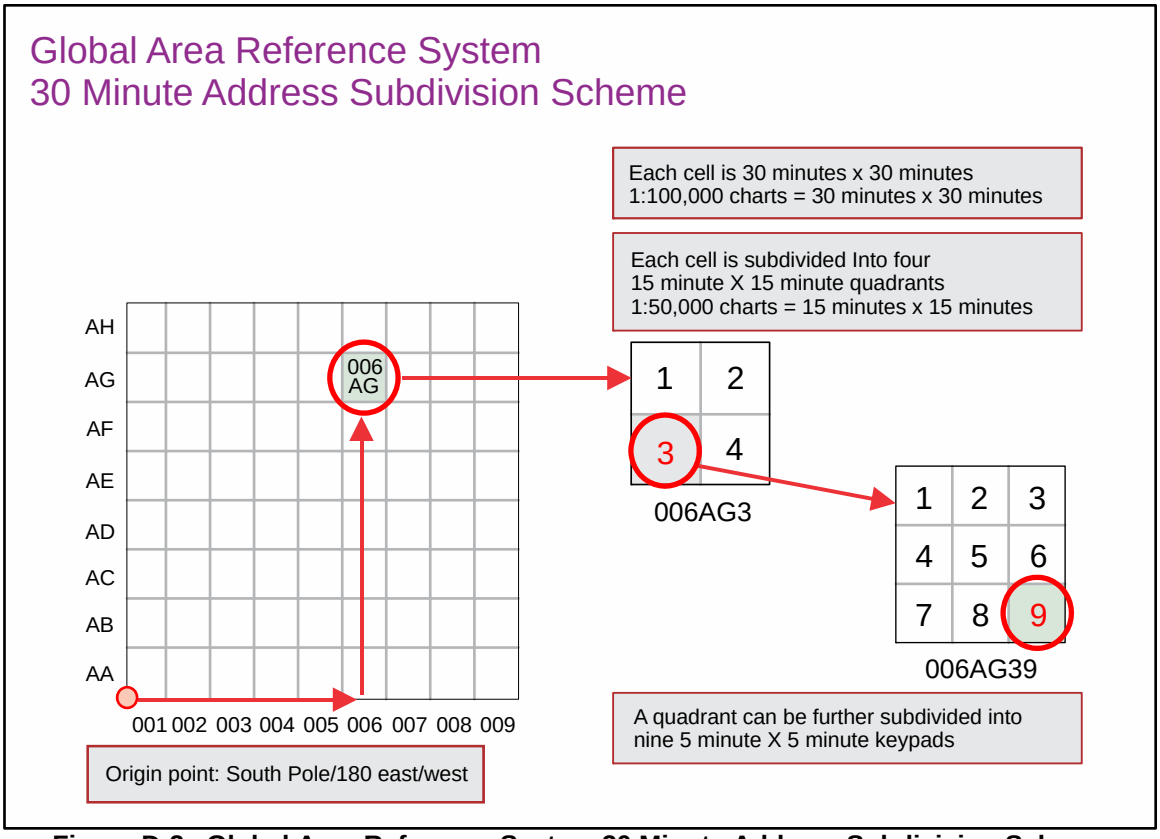

Figure D-2. Global Area Reference System 30 Minute Address Subdivision Scheme

Examples of Authorized Reference System Formats

Geographic coordinates	3659.9390N 10902.7100W
Military grid reference system	12SXF7394596545
Global Area Reference System	142LP23

Figure D-3. Examples of Authorized Reference System Formats

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APPENDIX E
METEOROLOGICAL AND OCEANOGRAPHIC SUPPORT TO GEOSPATIAL INTELLIGENCE

1. Relationship of Meteorological and Oceanographic to Geospatial Intelligence

As shown in NSG Basic Doctrine Publication 1-0, *Geospatial Intelligence (GEOINT) Basic Doctrine*, METOC data complements and enhances the GEOINT information base. METOC conditions can affect GEOINT activities, so a detailed understanding of the OE, both in the planning process and during ongoing operations, is critical to joint operations.

2. Meteorological and Oceanographic Doctrine

METOC operations are described in detail in JP 3-59, *Meteorological and Oceanographic Operations*, and CJCSI 3810.01, *Meteorological and Oceanographic Operations.* METOC responsibility is normally assigned to the J-3, but may be assigned to the J-2 if the commander desires (typical where an Army organization is assigned as the lead element). The CCMD senior meteorological and oceanographic officer (SMO) and joint meteorological and oceanographic officer (JMO) are the primary METOC POCs for obtaining METOC information within their commands. The JMO operates within theater guidance provided by the CCMD SMO.

3. National System for Geospatial Intelligence Meteorological and Oceanographic Specialty Team

The GEOINT functional manager designates an NSG SMO to provide centralized coordination for METOC activities affecting GEOINT across the NSG. The NSG SMO institutes the METOC Specialty Team program to integrate METOC personnel into the intelligence operations centers to provide dedicated and tailored support. A link to their product Website can be found on JWICS at http://www.intelink.ic.gov/wiki/ADF-E_METOC.

4. Theater Meteorological and Oceanographic Guidance

The CCMD SMO sets METOC policy in the GCC's AOR, normally through a METOC OPORD/OPLAN/CONPLAN annex H. Annex H is the SMO/JMO's primary vehicle to provide guidance on tasks and responsibilities, coordinating instructions, and the joint METOC CONOPS. SMOs are generally assigned to J-3, but support all directorates and components.

5. Climatology Support for Planning

During the planning process, climatology or historical weather data for the AOI can be obtained through the SMO, JMO, or staff weather officer. If no METOC officer is assigned, climatology data can be obtained from the 14th Weather Squadron, Fleet Numerical Meteorology and Oceanography Center, or the National Climatic Data Center. Historical and climatological oceanographic information can be obtained from the NAVOCEANO.

6. Real-Time Meteorological and Oceanographic Support and Data

Real-time METOC support and data support for the GEOINT process can be obtained through METOC applications on various systems and through classified and unclassified Websites. Soil moisture from weather satellites is relayed through these METOC systems for applications to trafficability and other intelligence preparation of the OE processes. METOC information from civilian and foreign sites is widely available, but non-DOD data can be suspect and is not consistently available. Per CJCSI 3810.01, *Meteorological and Oceanographic Operations*, joint forces should not rely on non-DOD sources of METOC information for joint operations unless determined by the METOC personnel responsible for supporting that joint force that the information is sufficiently timely, accurate, consistent, and relevant. The SMO or lead Service functional, through formal delegated authority, will determine the acceptability of specific non-DOD METOC sources. When a JMO is not assigned, Service production centers can receive and respond to requests for real-time, tailored METOC support within their respective area of forecast responsibility. Navy and Air Force METOC production centers and regional METOC agencies provide dynamic real-time support to operating forces.

a. **USAF METOC**

(1) The 557th Weather Wing is the main METOC production center for USA and USAF weather and all Service space weather information.

(2) Operational weather squadrons are regional USAF METOC centers.

b. **USN METOC**

(1) Fleet Numerical Meteorology and Oceanography Center, Monterey, CA, is the main METOC production center for USN and USMC weather information.

(2) NAVOCEANO, Stennis Space Center, MS, which hosts the Warfighting Support Center, is the main DOD production site for oceanographic and riverine METOC information.

(3) Navy METOC Enterprise. USN and USMC oriented support can be attained by contacting the USN METOC enterprise watch (Primary) or the fleet weather centers (Alternate).

APPENDIX F
GEOSPATIAL INTELLIGENCE REQUIREMENTS CONSIDERATIONS

1. Identify the CCMD's or JTF's GEOINT POCs. Notify subordinate forces of correct requisition procedures for predeployment topographic maps, hydrographic and aeronautical charts, and digital products.

2. Notify CCMD GEOINT cell of the GEOINT support POC in the subordinate joint force.

3. Identify subordinate joint staff GEOINT requirements to the CCMD GEOINT cell with respect to forces deploying and the operational area. Include GEOINT production quantities, personnel, and equipment to operate a map depot or digital dissemination capabilities and staff support personnel.

4. Request the following from the CCMD GEOINT cell: the production schedule; status of products and digital data required and date of first shipment; status of host-nation support for GEOINT products, digital data, and capabilities; and the status on disclosure and/or release of GEOINT to coalition forces.

5. Verify and/or submit appendix 7 (Geospatial Intelligence) of annex B (Intelligence) of OPORD to J-2.

6. Send a message reminding forces about accuracies, datum, and coordinates of GEOINT products and digital data. (See JP 2-01, *Joint and National Intelligence Support to Military Operations,* for a quick reaction checklist.)

7. Coordinate shipment of deployment stock to the map depot. Obtain weight, physical dimensions, including cubic measurements, number of pallets, and ready-for-shipment date from DLA. Also obtain requirements for hardware, including printers and other peripheral devices, digitized mapping and charting products, and software. Forward unit line number to the CCMD GEOINT cell.

8. Identify and describe access to digital GEOINT dissemination sources.

9. Establish map depot inventory quantities to include reorder levels. Report results to the CCMD GEOINT cell via a Defense Message System message, electronic mail, or joint deployable intelligence support system.

10. Request that the CCMD GEOINT cell have NGA publish a special catalog for the operation.

11. Establish and define procedures for destruction of GEOINT products.

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APPENDIX G
GEOSPATIAL INTELLIGENCE PRODUCTS AND SERVICES

This appendix identifies many standard products, describes the product development process, and organizes the products into categories. The outline below summarizes primary data, information, products, and services produced by NGA, which have been organized into seven categories: aeronautical, nautical/hydrographic, topographical/terrestrial, precise positioning and targeting, geodesy and geophysics, geographic names, and GEOINT analysis. While this appendix provides an overview of many of the more widely used GEOINT products and services, it is not an exhaustive list. Users may access NGA's complete line of GEOINT products via the Globe, which serves as NGA's point of entry on the primary unclassified and classified networks.

1. Aeronautical Products

a. **Aim Point Graphic.** This database contains radar, IR, and visually significant navigation and training points. It is used daily by air wings to do mission planning and operations. The 25th Air Force is a co-producer of aim point data and has the responsibility for all photographic reproductions after initial distribution.

b. **Automated Air Facilities Intelligence File.** A database on the physical characteristics of airfields, both foreign and domestic.

c. **Aeronautical Charts and Graphics.** Global and operational navigations charts, tactical pilotage charts, and joint operations graphics (JOGs).

d. **Airfield Products.** Include airfield line drawings, force protection graphics, special aeronautical information request graphics, and force protection graphic slides and airfield reports.

e. **Digital Aeronautical Flight Information File.** Consists of airports, heliports, navigation aids, waypoints, air traffic system routes, airspace boundaries, special-use airspace, military training routes, parachute jump areas, and preferred routes. Used for flight planning and the programming of automated aircraft flight management systems.

f. **Digital Vertical Obstruction File.** A file consisting of man-made point features on the Earth's surface which could pose a potential hazard to flight.

g. **Electronic Chart Updating Manual.** Used for manual amendment of selected aeronautical charts with updated or corrected information pertaining to safety of air navigation.

h. **EVC.** Is designed to assist isolated personnel to evade capture and survive in hostile territory and to provide evaders with a means of navigating to a selected area for evasion or recovery. The EVC program supports operational force requirements with a series of charts that cover geographic areas specifically identified by CCMDs. The EVC is a derivative of standard products, the JOG and topographic line map, and is scaled at approximately 1:200,000 with map detail of approximately 1:100,000.

i. **Notice to Airmen.** Contains information concerning the establishment, condition, or change in any aeronautical facility, service, procedures, or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

j. **Flight Information Publication.** DOD planning documents, en route supplements, and terminal instrument procedures (see Figure G-1).

2. Nautical/Hydrographic

a. **Digital Nautical Charts (DNCs).** DNCs provide worldwide databases of nautical information in vector product format. These databases are distributed via the NGA Gateway. Each DNC covers a specific geographic area of the world and consists of data partitioned into harbor, approach, coastal, and general libraries based upon the scale of the source chart.

Flight Information Publication Chart

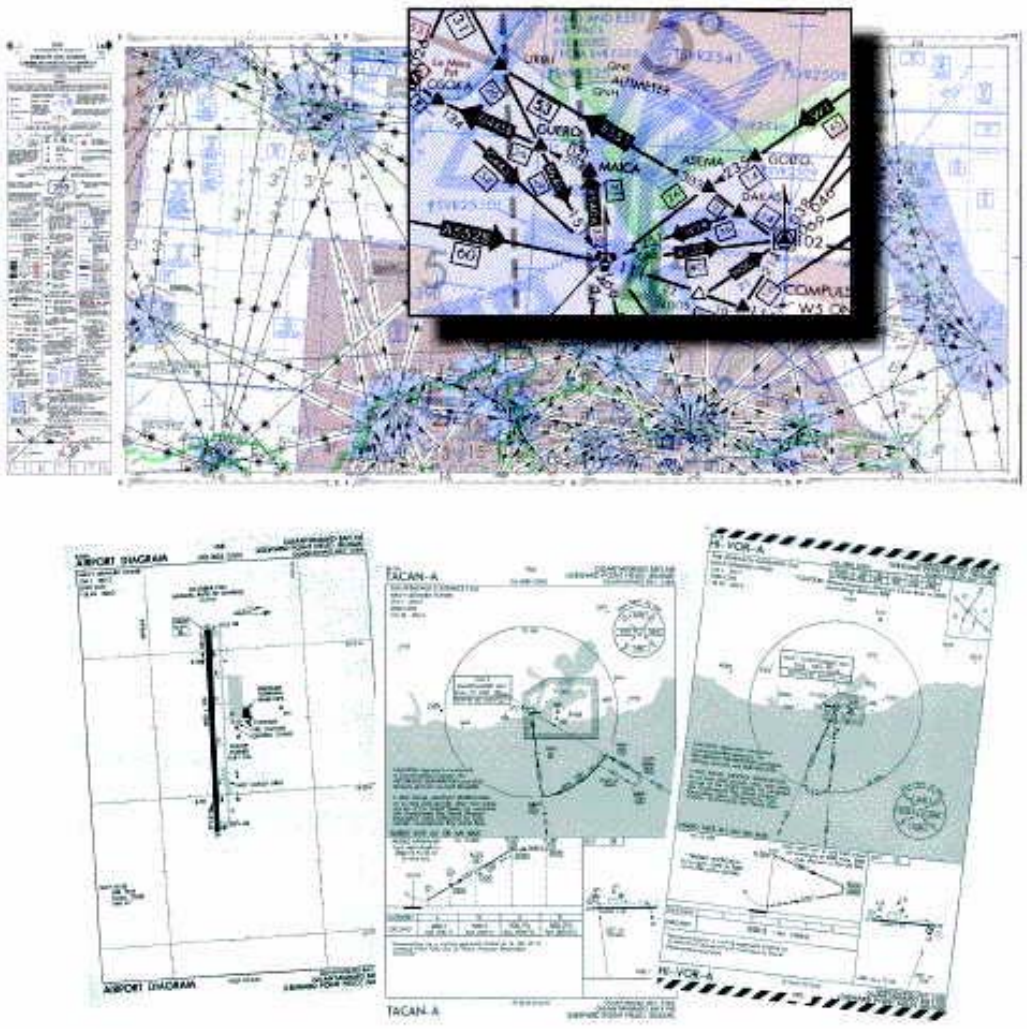

Figure G-1. Flight Information Publication Chart

The data content and coverage closely replicate NGA's portfolio of harbor, approach, coastal, and general charts. The DNC is supported by NGA's notice to mariners.

b. **Digital Bathymetric Database.** A various-resolution gridded bathymetric database developed by NAVOCEANO supports the generation of bathymetric chart products and to provide bathymetric data to be integrated with other geophysical and environmental parameters for ocean modeling.

c. **Fleet Guides.** Provide port information unique to the Navy that is not available elsewhere. Port commands contribute to the overall effectiveness by providing information related to the facilities and services available.

d. **Hydrographic Charts.** Nautical charts showing depths of water, nature of bottom, contours of bottom and coastline, and tide and currents in a given sea or sea and land area. Types of standard nautical charts include harbor, approach, coastal, and general.

e. **Tactical Ocean Data.** This product is composed of five layers that overlay DNC. These layers contain operational areas and ranges, and four submarine navigation layers.

f. **Maritime Safety Information.** Information and products required for safe navigation including charts, publications, hydrographic catalog, broadcast warning messages, mobile offshore drilling units, and anti-shipping activity messages. This data can be found on the World Wide Web at: http://www.nga.mil/maritime.

g. **Notice to Mariners.** Contains corrections to hard copy hydrographic products produced by NGA, the National Ocean Service, and the USCG.

Digital nautical charts provide global nautical information.

h. **Port Graphics.** Image-based products with a vector overlay of the following force protection information: seawalls, floodlights, spotlights, large light standards near/on docks, entry control points' guard shacks, hard-surface major roads, both single- and multi-lane, fence lines, and railroads.

i. **Sailing Directions.** Provide the "informational arm" to the DNC and/or standard nautical chart. Each publication provides the mariner a unique perspective by bringing to life the information graphically represented by the chart.

3. Topographical/Terrestrial

a. **Compressed ARC [Equal Arc Second Raster Chart/Map] Digitized Raster Graphic.** Scanned image of a map or chart used in any application requiring rapid display of map image or manipulation of the image of a map in raster form.

b. **CIB.** An unclassified seamless dataset of orthorectified imagery, usually made from grayscale images. CIB supports various weapons, theater battle management, mission planning, digital moving map displays, terrain analysis, simulation, and intelligence systems. CIB data is produced from digital source images and is compressed and reformatted to conform to the raster product format standard. CIB files are physically formatted within a National Imagery Transmission Format message. CIB may be derived from a grayscale image, from one band of a multispectral product, or from an arithmetic combination of several multispectral bands. Applications for CIB include rapid overview of areas of operations, map substitutes for emergencies and crises, metric foundation for anchoring other data in communications systems or image exploitation, positionally correct images for draping in terrain visualization, and image backgrounds for mission planning and rehearsal.

c. **Digital Terrain Elevation Data (DTED).** A uniform matrix of terrain elevation values which provides basic quantitative data for all military systems that require terrain elevation, slope, and/or surface roughness information. DTED-formatted elevation data identified as derived from the Shuttle Radar Topography Mission is a c-band radar reflective surface offset from the ground where there is vegetation or urbanization.

d. **Topographic Line Map.** Portrays the greatest detail of topographic and cultural information in a standard view (see Figure G-2). The map is a true representation of terrain detail with relief shown by contours and spot elevations. All NGA topographic line map products and USGS maps have been converted to GeoPDF format.

e. **Vector Feature Data.** Map data consisting of points, lines, and polygons which represent natural and man-made features. Can be symbolized to provide a graphic mapping display for visualization, as well as be used to provide the geospatially referenced features and attributes necessary to conduct spatial analysis. Feature data will be compliant with the National System for Geospatial Intelligence Feature Data Dictionary family of standards and made available at the global, regional, local, and specialized/urban levels. Available in various formats to include ESRI [Environmental Systems Research Institute is an international supplier of geographic information system software] Shapefile and Personal Geodatabase, geographic markup language, and keyhole markup language.

Topographic Line Map

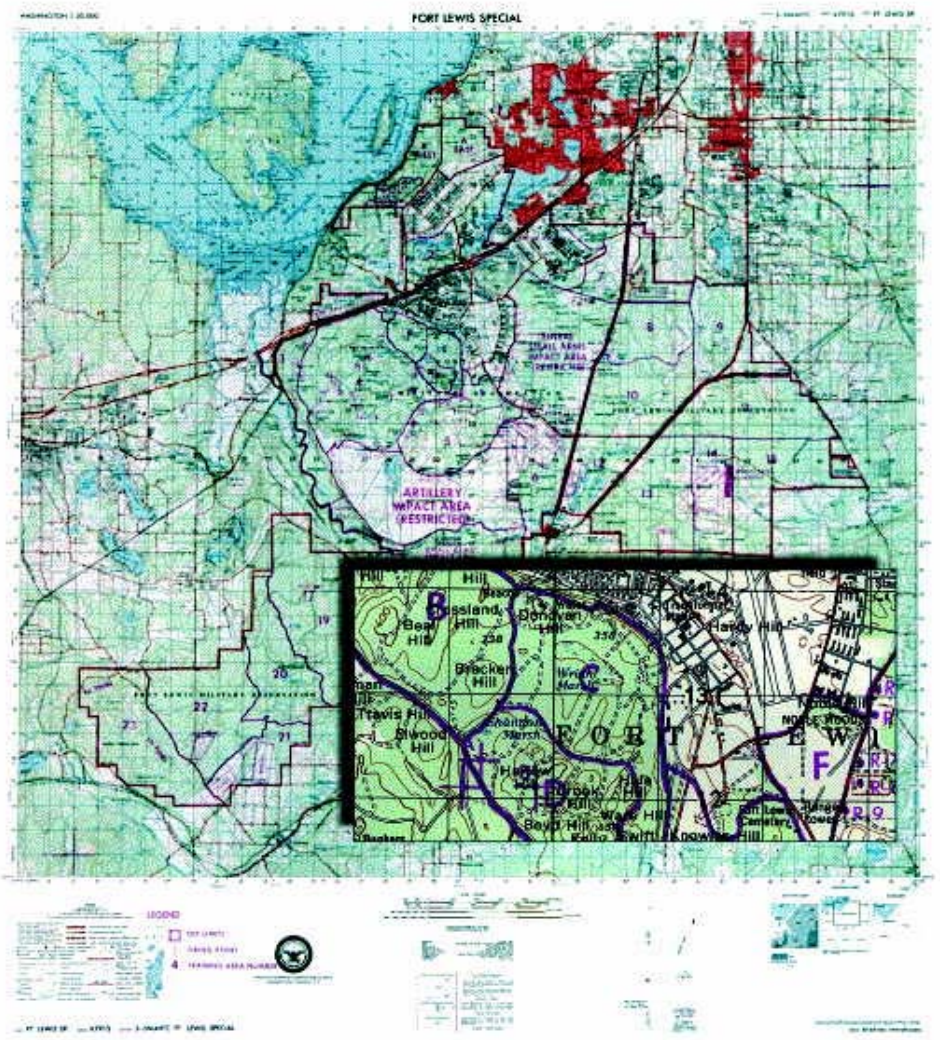

Figure G-2. Topographic Line Map

f. **World Mean Elevation Data.** A database of minimum, maximum, and mean terrain elevations. The preferred source is DTED. In areas with no DTED coverage, the best medium- or small-scale cartographic source is used. Data collected for each 12 by 18 nautical mile cell include minimum and maximum elevation value, arithmetic mean elevation, standard deviation, source, and absolute vertical accuracy.

g. **World Vector Shoreline Plus.** A digital data file containing the shorelines, international boundaries, and country names of the world. These geographic features are required for many of the digital databases being used to support geographic information systems and weapons systems.

h. **Image City Maps (ICMs).** ICMs are image-based maps of a city in either paper or digital form for close-in navigation, planning, and urban area operations.

i. **City Graphic.** A large-scale map of populated places and environs portraying streets and through-route information. It contains a numbered guide to important buildings and street names in the margin (see Figure G-3).

j. **Geospatial-Intelligence Base for Contingency Operations (GIBCO).** A collection of products providing coverage over specific areas designated as evacuation sites by both the Department of State and/or the unified commands. GIBCOs contain specific maps, charts, imagery, and other geospatial products to support evacuation planning and operations. GIBCOs are replacing the noncombatant evacuation operation package for each country, city, or region. The NGA produces GIBCOs, which give users flexibility through the use of Web browser technology for navigation and display of geospatial data. Applications of the GIBCO are broad, including the capability to become familiar with a foreign environment; develop a battle scene; plan, coordinate, and execute noncombatant evacuations, contingency operations, urban area missions, and search and rescue operations; as a desk-side reference; and as a means of access to geospatial data and navigation aids where networks or infrastructure have been damaged or do not exist. Tailored to each customer's request, each DVD can hold an entire country or an intensified coverage down to a single facility.

k. **Homeland Infrastructure Foundation-Level Data (HIFLD).** A unified compilation of USG and commercial proprietary data for homeland security uses. HIFLD

City Graphic

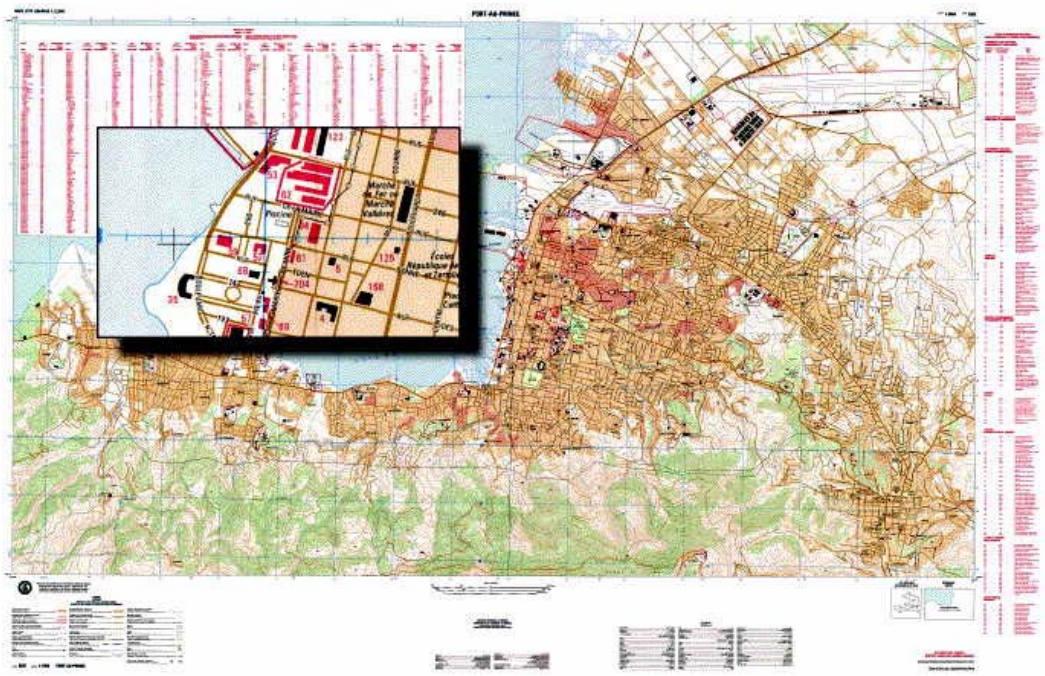

Figure G-3. City Graphic

serves federal-level decision makers, providing them with the geospatial information necessary to support readiness, response, and recovery planning for natural or man-made disasters. State and local decision makers are also able to leverage HIFLD during presidentially declared disasters.

l. **Lidar sensors** are similar to radar, transmitting laser pulses to a target and recording the time required for the pulses to return to the sensor receiver. Lidar can be used to measure shoreline and beach volume changes, shallow water depths (0-50 meters), conduct flood risk analysis, identify waterflow issues, and augment transportation mapping applications. Lidar supports large-scale production of high-resolution digital elevation products displaying accurate, highly detailed, 3-D models of structures and terrain invaluable for operational planning and mission rehearsal.

m. **Graph Plots.** A first phase line drawing of a specific target that depicts, in icon form, the order of battle found during the exploitation of that target. Generated by the Graphical Exploitation and Reporting Tool.

4. Geospatial Intelligence Targeting

a. Target materials include data supporting the COP, mission planning, precision coordinate generation, and a wide variety of analytic products and specialized data used to identify and characterize facilities at the functional level.

b. Targeting support services include validation of precision geopositioning tools and associated sensor models supporting coordinate seeking weapons, establishing minimum standards for mensuration certification and accreditation, providing a national mensuration reachback capability, and providing precision geospatial and imagery analysis and assessments in support of munitions effectiveness and target impact studies.

c. Sample targeting materials may include aim point graphic database; CIB; DPPDB; mission specific data set; terrain contour matching; terrain data (which includes DTED, high resolution terrain elevation); and target materials supporting operational needs, analysis, and target development.

5. Geodesy

a. **Coordinate System Analysis.** Provides the parameters to transition data and products from local datums to WGS 84 and supports provision of coordinates for DOD weapons/navigation systems.

b. **Datum Transformation Parameters Metadata.** A listing of transformation parameters, solved through the systematic determination of the discrepancies between a local non-Earth centered datum and the Earth-centered WGS 84 datum.

c. **Earth Orientation Prediction Parameters.** Daily predictions of the Earth's polar position using observations from the US Naval Observatory. Predictions are published daily for each of the seven days beginning with Sunday of each week.

d. **Geodetic Surveys.** NGA executes geodetic surveys worldwide in support of US national interests. State-of-the-art techniques are used to collect, process, and analyze data. Survey types include geodetic, astronomic, gravity, gradiometry, terminal aeronautical global navigation satellite system geodetic (airfield), and hand-held GEOINT (stills and immersive).

e. **GPS Precise Ephemeris.** DOD truth for GPS orbits. Computed after the fact for best accuracy, used for precise positioning and WGS 84 reference frame.

f. **GPS Monitor Station Data.** NGA provides its global GPS network data to the USAF for inclusion in their GPS mission. Used for GPS precise ephemeris.

g. **GPS SA.** Can include GPS interference information, availability, and accuracy.

h. **Deflection of the Vertical.** This gravity data is essential to the accuracy and effectiveness of high order inertial navigation systems (INSs) as it reduces position and velocity errors and improves orientation control when used as part of the INS solution. If left uncompensated, the largest errors in an INS are induced by variations in the Earth's gravity field.

i. **Geotechnical Analysis.** Developing and generating models and products to characterize the properties and composition of the surface and near-subsurface of the Earth. Applications include: hydrologic modeling for a country-wide surface drainage network, soil characterization based on physical and geochemical traits, and flood potential modeling to delineate and rank areas based on its susceptibility to flooding.

6. Geographic Names

a. **Federal Information Processing Standards Publication 10-4.** Provides a list of the basic geopolitical entities in the world, together with the principal administrative divisions to comprise each entity.

b. **Foreign Names Information Bulletin.** Provides up-to-date information regarding the place-name decisions of the Foreign Names Committee of the US Board on Geographic Names. The bulletin is issued electronically on a quarterly basis.

c. **US Board on Geographic Names.** The interagency board established by public law to standardize geographic name spellings for use in government publications.

d. **Geographic Net Names Server.** Provides access to NGA's and the US Board on Geographic Names' database of foreign geographic feature names.

7. Geospatial Intelligence Analysis

a. **Baseline Reports.** Intelligence and information products consisting of text and graphics produced by image analysts to establish a snapshot of historic events of the region/facility of interest. These reports are then compared by analysts to determine the progress of specific

events or situations such as the construction of nuclear power plants or the effects of local strikes by the work force on an industrial facility.

b. **Cables.** Highlight and intelligence problem cables. Message traffic used to disseminate any high-interest or time-sensitive events/activities observed on imagery to the rest of the IC. The information contained in these cables is generally processed by image analysts within moments of the images being downloaded.

c. **Facility Products.** Collected intelligence-related materials such as images, reference images, reports, text, maps, and sketches on a specific subject or facility.

d. **First Looks.** Annotated image graphics and text that present events/activity observed on imagery by the NGA current operations analysts. These products represent the first reporting of an observed activity and precede the NGA intelligence brief.

e. **Imagery Derived Products (IDPs).** Any representation made from US classified satellite imagery that is not a direct copy of the original image itself. IDPs can either be literal or nonliteral representations. Literal IDPs are image-like products (e.g., panchromatic images), while nonliteral IDPs are graphic products such as maps, line drawings, or graphs and statistical data derived from imagery. IDPs can be in hard copy or soft copy form. The IDP program is managed by NGA on behalf of the DNI. The program is designed to manage and support the generation of IDPs where a compelling and justifiable requirement exists to disclose or release an image or imagery-derived information to persons without security clearances (such as public briefings, field personnel, contractors, state or local agencies, as well as foreign nationals as part of a coalition) and no practical alternative exists.

f. **Intelligence and Information Reports.** These reports cover a wide range of formats including initial photo interpretation reports and supplemental photo interpretation reports, intelligence summaries, intelligence information reports, research papers, reference aids, intelligence assessments, chronologies, blind memoranda, situation reports, tactical action reports, handbooks, sanctions monitoring reports, imagery maps, tabular material, and graphics presentations.

g. **NGA Intelligence Brief.** A set of annotated graphics of a current event with some attached explanatory text. Presents NGA's GEOINT analytic findings on a single event, related events, or developments in a broad topic or issue.

h. **Geospatial Intelligence Note.** An NGA product in which analysts capture and disseminate GEOINT analytic finds, discoveries, or observations of new or updated priority intelligence topics. Geospatial intelligence notes incorporate annotated images, maps, photos, videos, shapefiles, etc. Products are tagged with metadata for easy discoverability.

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APPENDIX H
REFERENCES

The development of JP 2-03 is based upon the following primary references:

1. Department of Defense Publications

a. DODD 3025.18, *Defense Support of Civil Authorities (DSCA).*

b. DODD 5105.60, *National Geospatial-Intelligence Agency (NGA).*

c. DODD 5230.11, *Disclosure of Classified Military Information to Foreign Governments and International Organizations.*

d. DODD 5250.01, *Management of Intelligence Mission Date (IMD) in DOD Acquisition.*

e. DODI 3110.06, *War Reserve Materiel (WRM) Policy*.

f. DODI 3115.10E, *Intelligence Support to Personnel Recovery*.

g. DODI 5000.56, *Programming Geospatial Intelligence (GEOINT), Geospatial Information and Services (GI&S), and Geodesy Requirements for Developing Systems.*

h. DOD Manual 5200.01, Volume 1, *DOD Information Security Program: Overview, Classification, and Declassification.*

i. DOD Manual 5200.01, Volume 3, *DOD Information Security Program: Protection of Classified Information.*

j. DOD 5240.1-R, *Procedures Governing the Activities of DOD Intelligence Components that Affect United States Persons.*

k. DOD *Electronic Foreign Clearance Guide.*

2. Chairman of the Joint Chiefs of Staff Publications

a. CJCSI 3110.08E, *Geospatial Information and Services Supplemental Instruction to Joint Strategic Capabilities Plan (JSCP).*

b. CJCSI 3141.01E, *Management and Review of Joint Strategic Capabilities Plan (JSCP)-Tasked Plans.*

c. CJCSI 3270.01B, *Personnel Recovery*.

d. CJCSI 3810.01D, *Meteorological and Oceanographic Operations.*

e. CJCSI 3900.01D, *Position (Point and Area) Reference Procedures.*

f. CJCSI 3901.01E, *Requirements for Geospatial Information and Services.*

g. CJCSI 6130.01F, *2016 CJCS Master Positioning, Navigation and Timing Plan (MPNTP).*

h. CJCSM 3130.03, *Adaptive Planning and Execution (APEX) Planning Formats and Guidance.*

i. JP 2-0, *Joint Intelligence.*

j. JP 2-01, *Joint and National Intelligence Support to Military Operations.*

k. JP 2-01.3, *Joint Intelligence Preparation of the Operational Environment.*

l. JP 3-0, *Joint Operations.*

m. JP 3-27, *Homeland Defense.*

n. JP 3-28, *Defense Support of Civil Authorities.*

o. JP 3-34, *Joint Engineer Operations.*

p. JP 3-50, *Personnel Recovery.*

q. JP 3-59, *Meteorological and Oceanographic Operations.*

r. JP 5-0, *Joint Planning.*

s. JP 6-0, *Joint Communications System.*

3. Other Publications

a. Military Handbook 850, *Glossary of Mapping, Charting, and Geodetic Terms.*

b. Military Standard-2410, *Standards for Digital Printing of GEOINT Products.*

c. NSG: *Geospatial Intelligence (GEOINT) Basic Doctrine Publication 1-0.*

d. NGA Standardization Document 12, *The Universal Grids and the Transverse Mercator and Polar Stereographic Map Projections.*

e. NGA Standardization Document 36, *Department of Defense (DOD) World Geodetic System (WGS) 1984.*

f. NGA Standardization Document 37, *Universal Grids and Reference Systems.*

APPENDIX J
ADMINISTRATIVE INSTRUCTIONS

1. User Comments

Users in the field are highly encouraged to submit comments on this publication using the Joint Doctrine Feedback Form located at: https://jdeis.js.mil/jdeis/jel/jp_feedback_form.pdf and e-mail it to: js.pentagon.j7.mbx.jedd-support@mail.mil. These comments should address content (accuracy, usefulness, consistency, and organization), writing, and appearance.

2. Authorship

The lead agent and Joint Staff doctrine sponsor for this publication is the Director for Intelligence (J-2).

3. Supersession

This publication supersedes JP 2-03, *Geospatial Intelligence Support to Joint Operations,* 31 October 2012.

4. Change Recommendations

a. To provide recommendations for urgent and/or routine changes to this publication, please complete the Joint Doctrine Feedback Form located at: https://jdeis.js.mil/jdeis/jel/jp_feedback_form.pdf and e-mail it to: js.pentagon.j7.mbx.jedd-support@mail.mil.

b. When a Joint Staff directorate submits a proposal to the CJCS that would change source document information reflected in this publication, that directorate will include a proposed change to this publication as an enclosure to its proposal. The Services and other organizations are requested to notify the Joint Staff J-7 when changes to source documents reflected in this publication are initiated.

5. Lessons Learned

The Joint Lessons Learned Program (JLLP) primary objective is to enhance joint force readiness and effectiveness by contributing to improvements in doctrine, organization, training, materiel, leadership and education, personnel, facilities, and policy. The Joint Lessons Learned Information System (JLLIS) is the DOD system of record for lessons learned and facilitates the collection, tracking, management, sharing, collaborative resolution, and dissemination of lessons learned to improve the development and readiness of the joint force. The JLLP integrates with joint doctrine through the joint doctrine development process by providing lessons and lessons learned derived from operations, events, and exercises. As these inputs are incorporated into joint doctrine, they become institutionalized for future use, a major goal of the JLLP. Lessons and lessons learned are routinely sought and incorporated into draft JPs throughout formal staffing of the development process. The JLLIS Website can be found at https://www.jllis.mil (NIPRNET) or http://www.jllis.smil.mil (SIPRNET).

6. Distribution of Publications

Local reproduction is authorized, and access to unclassified publications is unrestricted. However, access to and reproduction authorization for classified JPs must be IAW DOD Manual 5200.01, Volume 1, *DOD Information Security Program: Overview, Classification, and Declassification,* and DOD Manual 5200.01, Volume 3, *DOD Information Security Program: Protection of Classified Information.*

7. Distribution of Electronic Publications

a. Joint Staff J-7 will not print copies of JPs for distribution. Electronic versions are available on JDEIS Joint Electronic Library Plus (JEL+) at https://jdeis.js.mil/jdeis/index.jsp (NIPRNET) and http://jdeis.js.smil.mil/jdeis/index.jsp (SIPRNET), and on the JEL at http://www.dtic.mil/doctrine.

b. Only approved JPs are releasable outside the combatant commands, Services, and Joint Staff. Defense attachés may request classified JPs by sending written requests to Defense Intelligence Agency (DIA)/IE-3, 200 MacDill Blvd., Joint Base Anacostia-Bolling, Washington, DC 20340-5100.

c. JEL CD-ROM. Upon request of a joint doctrine development community member, the Joint Staff J-7 will produce and deliver one CD-ROM with current JPs. This JEL CD-ROM will be updated not less than semi-annually and when received can be locally reproduced for use within the combatant commands, Services, and combat support agencies.

GLOSSARY

PART I—ABBREVIATIONS, ACRONYMS, AND INITIALISMS

ABI	activity-based intelligence
AGO	Australian Geospatial-Intelligence Organization
AOI	area of interest
AOR	area of responsibility
ASCC	Army Service component command
ASG	Allied System for Geospatial Intelligence
C2	command and control
CCDR	combatant commander
CCMD	combatant command
CIA	Central Intelligence Agency
CIB	controlled image base
CJCS	Chairman of the Joint Chiefs of Staff
CJCSI	Chairman of the Joint Chiefs of Staff instruction
CJCSM	Chairman of the Joint Chiefs of Staff manual
CMA	collection management authority
COA	course of action
COLISEUM	community on-line intelligence system for end-users and managers
CONOPS	concept of operations
CONPLAN	concept plan
CONUS	continental United States
COP	common operational picture
CSA	combat support agency
DCGS	distributed common ground/surface system
DCGS-A	distributed common ground system-Army
DCGS-MC	distributed common ground/surface system Marine Corps
DDM	Defense Logistics Agency Distribution Mapping
DHS	Department of Homeland Security
DIA	Defense Intelligence Agency
DIFC	Defense Intelligence Fusion Centre
DISR	Department of Defense Information Technology Standards Registry
DLA	Defense Logistics Agency
DNC	digital nautical chart
DNI	Director of National Intelligence
DOD	Department of Defense
DODD	Department of Defense directive
DODI	Department of Defense instruction
DPPDB	digital point positioning database
DRO	departmental requirements officer
DSCA	defense support of civil authorities

DTED	digital terrain elevation data
EEI	essential element of information
eGPL	Enhanced Geospatial Product Library (USAF)
EVC	evasion chart
EV WHS	Enhanced View Web Hosting Service
FAA	Federal Aviation Administration (DOT)
FEMA	Federal Emergency Management Agency (DHS)
G-2	Army or Marine Corps component intelligence staff officer (Army division or higher staff, Marine Corps brigade or higher staff)
GARS	Global Area Reference System
GBS	Global Broadcast Service
GCC	geographic combatant commander
GEOINT	geospatial intelligence
GETS	Geospatial Intelligence Enterprise Tasking, Processing, Exploitation, and Dissemination Services
GI&S	geospatial information and services
GIBCO	geospatial-intelligence base for contingency operations
GIMS	Geospatial Intelligence Information Management Services
GNZ	Geospatial Intelligence New Zealand
GPC	geospatial planning cell
GPE	geospatial intelligence preparation of the environment
GPS	Global Positioning System
GROOVE	Geospatial Requirements One-Stop Visualization Environment
HIFLD	homeland infrastructure foundation-level data
HQ	headquarters
IAW	in accordance with
IBS	integrated broadcast service
IC	intelligence community
ICM	image city map
IDP	imagery derived product
IMINT	imagery intelligence
INS	inertial navigation system
IPR	in-progress review
IR	infrared
ISR	intelligence, surveillance, and reconnaissance
IT	information technology
J-2	intelligence directorate of a joint staff
J-3	operations directorate of a joint staff
J-4	logistics directorate of a joint staff

J-6	communications system directorate of a joint staff
JFC	joint force commander
JIOC	joint intelligence operations center
JIPOE	joint intelligence preparation of the operational environment
JMO	joint meteorological and oceanographic officer
JOA	joint operations area
JOG	joint operations graphic
JP	joint publication
JTF	joint task force
JWICS	Joint Worldwide Intelligence Communications System
MAGTF	Marine air-ground task force
MCIA	Marine Corps Intelligence Activity
MCISRE	Marine Corps Intelligence, Surveillance, and Reconnaissance Enterprise
MCO	Mapping Customer Operations (Defense Logistics Agency)
MEF	Marine expeditionary force
METOC	meteorological and oceanographic
MSO	map support office
NAVOCEANO	Naval Oceanographic Office
NCL	National System for Geospatial-Intelligence Consolidated Library
NGA	National Geospatial-Intelligence Agency
NGDS	Net-Centric Geospatial-Intelligence Discovery Services
NIPF	National Intelligence Priorities Framework
NIPRNET	Non-classified Internet Protocol Router Network
NOAA	National Oceanic and Atmospheric Administration (DOC)
NOC	National Geospatial-Intelligence Agency Operation Center
NRO	National Reconnaissance Office
NRT	near real time
NSG	National System for Geospatial Intelligence
NST	National Geospatial-Intelligence Agency support team
NZ	New Zealand
OBP	object-based production
OE	operational environment
OPLAN	operation plan
OPORD	operation order
PED	processing, exploitation, and dissemination
PIR	priority intelligence requirement
POC	point of contact
PRISM	Planning Tool for Resource, Integration, Synchronization, and Management

RFI	request for information
RRS	remote replication system
SA	situational awareness
SAR	synthetic aperture radar
SecDef	Secretary of Defense
SIGINT	signals intelligence
SIPRNET	SECRET Internet Protocol Router Network
SME	subject matter expert
SMO	senior meteorological and oceanographic officer
SOM	structured observation management
3-D	three-dimensional
TPFDD	time-phased force and deployment data
TTP	tactics, techniques, and procedures
UGO	unified geospatial-intelligence operations
UK	United Kingdom
USA	United States Army
USAF	United States Air Force
USC	United States Code
USCG	United States Coast Guard
USDA	United States Department of Agriculture
USD(I)	Under Secretary of Defense for Intelligence
USG	United States Government
USGS	United States Geological Survey
USMC	United States Marine Corps
USN	United States Navy
WGS 84	World Geodetic System 1984
WRS	war reserve stock

PART II—TERMS AND DEFINITIONS

activity-based intelligence. An analytic method applied to structured data from multiple sources, to discover objects, relationships, or behaviors by resolving significant activity. Also call **ABI.** (Approved for inclusion in the DOD Dictionary).

aeronautical chart. None. (Approved for removal from the DOD Dictionary.)

Allied System for Geospatial Intelligence. A partnership between five nations (United States and allied partners Australia, Canada, New Zealand, and the United Kingdom) to advance the geospatial intelligence mission with a common analytic environment to provide a common geospatial intelligence picture. Also called **ASG.** (Approved for inclusion in the DOD Dictionary.)

change detection. An image enhancement technique that compares two images of the same area from different time periods and eliminates identical picture elements in order to leave the signatures that have undergone change. (DOD Dictionary. SOURCE: JP 2-03)

combat chart. None. (Approved for removal from the DOD Dictionary.)

control. 1. Authority that may be less than full command exercised by a commander over part of the activities of subordinate or other organizations. (JP 1) 2. In mapping, charting, and photogrammetry, a collective term for a system of marks or objects on the Earth or on a map or a photograph, whose positions or elevations (or both) have been or will be determined. (JP 2-03) 3. Physical or psychological pressures exerted with the intent to assure that an agent or group will respond as directed. (JP 3-0) 4. In intelligence usage, an indicator governing the distribution and use of documents, information, or material. (DOD Dictionary. SOURCE: JP 2-01)

datum (geodetic). 1. A reference surface consisting of five quantities: the latitude and longitude of an initial point, the azimuth of a line from that point, and the parameters of the reference ellipsoid. 2. The mathematical model of the Earth used to calculate the coordinates on any map. Different nations use different datum for printing coordinates on their maps. (DOD Dictionary. SOURCE: JP 2-03)

foundation geospatial intelligence data. The base data providing context and a framework for display and visualization of the environment, which consists of: features, elevation, controlled imagery base, geodetic sciences, geographic names and boundaries, aeronautical, maritime, digital point positioning database, and human geography. (Approved for replacement of "foundation geospatial-intelligence data" and its definition in the DOD Dictionary.)

geographic coordinates. The quantities of latitude and longitude which define the position of a point on the surface of the Earth with respect to the reference ellipsoid. (Approved for incorporation into the DOD Dictionary.)

geospatial information. Information that identifies the geographic location and characteristics of natural or constructed features and boundaries on the Earth, including: statistical data and information derived from, among other things, remote sensing, mapping, and surveying technologies; and mapping, charting, geodetic data and related products. (DOD Dictionary. SOURCE: JP 2-03)

geospatial information and services. The collection, information extraction, storage, dissemination, and exploitation of geodetic, geomagnetic, imagery, gravimetric, aeronautical, topographic, hydrographic, littoral, cultural, and toponymic data accurately referenced to a precise location on the Earth's surface. Also called **GI&S.** (DOD Dictionary. SOURCE: JP 2-03)

geospatial intelligence. The exploitation and analysis of imagery and geospatial information to describe, assess, and visually depict physical features and geographically referenced activities on the Earth. Geospatial intelligence consists of imagery, imagery intelligence, and geospatial information. Also called **GEOINT.** (DOD Dictionary. SOURCE: JP 2-03)

geospatial intelligence operations. The tasks, activities, and events to collect, manage, analyze, generate, visualize, and provide imagery, imagery intelligence, and geospatial information necessary to support national and defense missions and international arrangements. Also called **GEOINT operations.** (DOD Dictionary. SOURCE: JP 2-03)

hyperspectral imagery. Term used to describe the imagery derived from subdividing the electromagnetic spectrum into very narrow bandwidths allowing images useful in precise terrain or target analysis to be formed. Also called **HSI.** (DOD Dictionary. SOURCE: JP 2-03)

imagery. A likeness or presentation of any natural or man-made feature or related object or activity, and the positional data acquired at the same time the likeness or representation was acquired, including: products produced by space-based national intelligence reconnaissance systems; and likeness and presentations produced by satellites, airborne platforms, unmanned aerial vehicles, or other similar means (except that such term does not include handheld or clandestine photography taken by or on behalf of human intelligence collection organizations). (DOD Dictionary. SOURCE: JP 2-03)

imagery exploitation. The cycle of processing, using, interpreting, mensuration and/or manipulating imagery, and any assembly or consolidation of the results for dissemination. (DOD Dictionary. SOURCE: JP 2-03)

imagery intelligence. The technical, geographic, and intelligence information derived through the interpretation or analysis of imagery and collateral materials. Also called **IMINT.** (DOD Dictionary. SOURCE: JP 2-03)

infrared imagery. That imagery produced as a result of sensing electromagnetic radiations emitted or reflected from a given target surface in the infrared portion of the

electromagnetic spectrum (approximately 0.72 to 1,000 microns). (DOD Dictionary. SOURCE: JP 2-03)

National System for Geospatial Intelligence. The combination of technology, policies, capabilities, doctrine, activities, people, data, and organizations necessary to produce geospatial intelligence in an integrated, multi-intelligence environment. Also called **NSG.** (DOD Dictionary. SOURCE: JP 2-03)

object-based production. The intelligence communities' framework for organizing and sharing information, relating data from all sources to known objects (e.g., units, people, locations, or events). Also called **OBP.** (Approved for inclusion in the DOD Dictionary.)

overhead persistent infrared. 1. Those systems originally developed to detect and track foreign intercontinental ballistic missile systems. (JP 3-14) 2. Within geospatial intelligence, a capability that provides on-demand, persistent, global, and/or localized coverage of high- to low-intensity infrared events to detect energy radiation from various tactical to strategic objects. Also called **OPIR.** (JP 2-03) (Approved for incorporation into the DOD Dictionary.)

planning factors database. Databases created and maintained by the Services for the purpose of identifying all geospatial intelligence requirements for emerging and existing forces and systems. Also called **PFDB.** (JP 2-03) (Approved for incorporation into the DOD Dictionary.)

public key infrastructure. None. (Approved for removal from the DOD Dictionary).

structured observation management. The framework for normalizing how geospatial intelligence observations from sensors and sources is captured, organized, and shared. Also called **SOM.** (Approved for inclusion in the DOD Dictionary.)

technical analysis. In imagery interpretation, the precise description of details appearing on imagery. (DOD Dictionary. SOURCE: JP 2-03)

terrain analysis. The collection, analysis, evaluation, and interpretation of geographic information on the natural and man-made features of the terrain, combined with other relevant factors, to predict the effect of the terrain on military operations. (DOD Dictionary. SOURCE: JP 2-03)

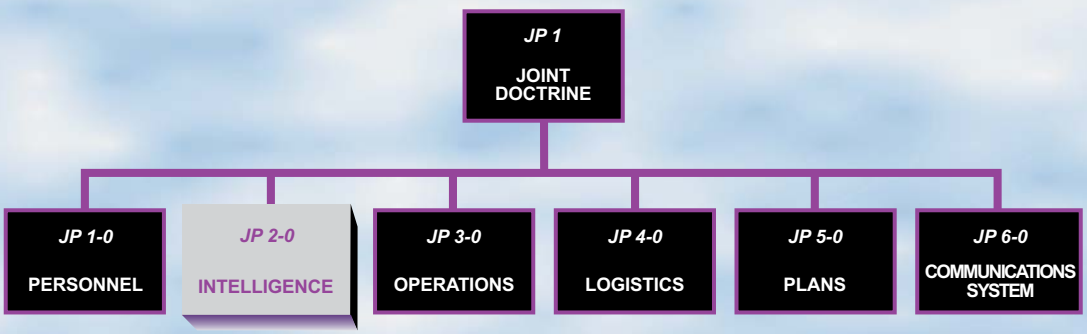
topographic map. A map that presents the vertical position of features in measurable form as well as their horizontal positions. (DOD Dictionary. SOURCE: JP 2-03)

unified geospatial-intelligence operations. The collaborative and coordinated process to assess, align, and execute geospatial intelligence across the National System for Geospatial Intelligence and its partner organizations. Also called **UGO.** (Approved for inclusion in the DOD Dictionary.)

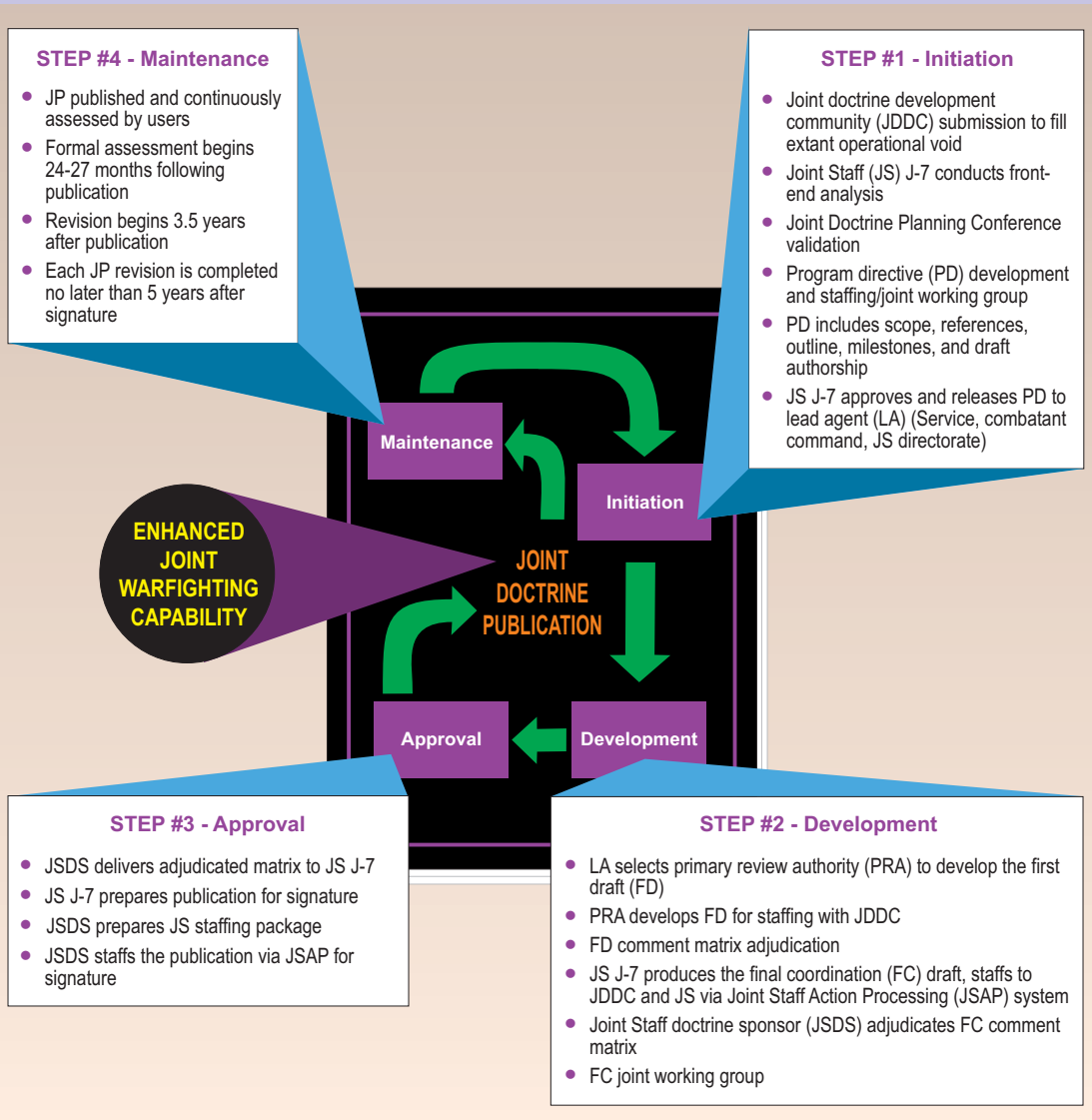
universal polar stereographic grid. None. (Approved for removal from the DOD Dictionary.)

war reserve stock. None. (Approved for removal from the DOD Dictionary.)

JOINT DOCTRINE PUBLICATIONS HIERARCHY



All joint publications are organized into a comprehensive hierarchy as shown in the chart above. **Joint Publication (JP) 2-03** is in the **Intelligence** series of joint doctrine publications. The diagram below illustrates an overview of the development process:




JOINT
CHIEFS OF STAFF