

NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY

FOUNDATION GEOINT GROUP



FOUNDATION GEOINT GROUP

SF

Understanding the Earth from its core to the Space Domain

COVERAGE SUPPORTED BY NGA

- ACCURATE AND PRECISE MEASUREMENTS
- ASSURED POSITIONING, NAVIGATION, TIMING AND TARGETING
- WORLDWIDE DOD FORCES MISSION SPECTRUM
- HUMANITARIAN ASSISTANCE AND DISASTER RESPONSE
- WORLDWIDE AND MARITIME NAVIGATION
- WORLDWIDE DOD AND U.S. COAST GUARD AVIATION NAVIGATION
- WORLDWIDE NSG FOUNDATION GEOINT REQUIREMENTS

NGA FOUNDATION GEOINT GROUP

MISSION

OPERATIONS

OPERATIONS

OPERATIONS

OPERATIONS

ENGAGEMENT

SUPPORT

HISTORY

OFFICE OF GEOMATICS

SFN



OFFICE OF GEOGRAPHY

SFG



MARITIME SAFETY OFFICE

SFH



AERONAUTICAL NAVIGATION OFFICE

SFA



FOUNDATION GEOINT NSG OPERATIONS EXECUTIVE OFFICE

SFP



CORPORATE OPERATIONS AND TECHNOLOGY OFFICE

SFC



HISTORY OF THE FOUNDATION GEOINT GROUP

FOUNDATION GEOINT

supports a critical part of NGA's mission to satisfy intelligence, defense, civil and commercial needs. It's the data, products and services describing physical and cultural characteristics from the center of the Earth to the space domain. This includes content areas such as earth sciences, gravity, magnetics, geodetic surveys, elevation, precise imagery, coordinate systems, global navigation satellite systems, topography, geographic names, human geography, political boundaries, and safety of navigation for maritime and aeronautical domains.

WHO WE ARE

FOUNDATION BUILDERS of a global geospatial operational framework for military operations, intelligence analysis and humanitarian assistance

MASTERS in the art and science of depicting the Earth's surface
MODELERS of the forces of gravity and magnetics, the depths of the seas, and the physical and cultural landscape of the world

WORKFORCE

Government | Military | Contractor personnel

PRIMARY WORK ROLES

- AERONAUTICAL ANALYST
- BATHYMETRIST
- CARTOGRAPHER
 - TOPOGRAPHICAL
 - NAUTICAL
- DATA STEWARD
- DATA SCIENTIST
- FOUNDATION GEOINT OFFICER
- GEODETIC EARTH SCIENTIST
- GEODETIC ORBIT SCIENTIST
- GEODETIC SURVEYOR
- HUMAN GEOGRAPHER
- HUMAN GEOGRAPHY LINGUIST
- MARITIME ANALYST
- PHOTOGRAMMETRIST
- PROGRAM MANAGER

LOCATIONS

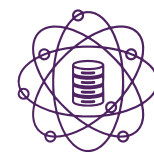
40% NGA WASHINGTON

55% NGA ST. LOUIS

5% OTHER



GEOMATICS



- World Geodetic System 1984 (WGS 84)
 - ◆ Earth Reference Frame (precise global coordinates)
 - ◆ Earth Gravitational Model (EGM) (defines mean sea level)
 - ◆ World Magnetic Model (WMM) (defines bearing and azimuth)
- 17 Global Navigation Satellite System (GNSS) collection stations
 - ◆ Supports 4 billion Global Positioning System (GPS) users worldwide
 - ◆ Quality control data collected from 200 independent GNSS ground tracking sources
- 350 million square kilometers of elevation data
 - ◆ Shuttle Radar Topography Mission (SRTM), Digital Terrain Elevation Data (DTED), Defense Gridded Elevation Data (DGED), TanDEM-X, etc.
- 200+ million gravity records
- 580 airfield surveys (TAGGS, or Terminal Aeronautical GNSS Geodetic Survey)
- 118 million square kilometers of precise imagery
 - ◆ 19,965 Digital Point Positioning Database (DPPDB) titles
 - ◆ 35,983 Controlled Imagery Regional Ortho-mosaic (CIRO) ¼ cells
 - ◆ 40,108 Controlled Image Base 1M (CIB01) ¼ cells
 - ◆ 11,126 Controlled Image Base 5M (CIB05) 1-degree cells
- 30 Holloman High Speed Test Track Surveys (10-mile track, 1,020 survey marks)
- 3,600+ geodetic and geophysical surveys

LAND



- 104 million square kilometers of mono-orthorectified imagery
- 100 percent of the Earth's surface has 12-meter high-resolution elevation data
- 5+ billion topographic features
- 118 million square kilometers of precise stereo imagery
- 90,000 topographic maps

HUMAN AND POLITICAL GEOGRAPHY



- 2+ million human geography features describing population demographics, collective identities, community system and stability
- Steward of official geographic names, political boundaries and country codes for the U.S. government
- 8.4 million features with 13.8 million geographic names in the Geographic Names Database (GNDB)
- 16 million Geographic Names Server (GNS) hits annually
- 37 foreign languages spoken by analysts
- Boundaries
 - ◆ 900+ international land and maritime boundaries
 - ◆ 74,000+ administrative (internal) boundaries
 - ◆ 2,500+ claimed maritime limits and zones
 - ◆ 2.85+ million miles of high-resolution shoreline data

SEA



- 70 million hydrographic features
- 30,000 points in bathymetric dataset
- 16,500 U.S. government and commercial vessels supported
- 4,100 nautical hard copy charts
- 11,000 electronic navigational charts (ENCs)
- 3,900 digital nautical charts (DNCs)
- 15,000 submarine electronic navigational charts (SMENCs)
- 1,400 tactical ocean data (TOD) libraries
- 580 littoral planning charts (LPCs)
- 79 nautical publications
- 24/7 World-Wide Navigational Warning Service (WWNWS)

AIR



- 13,000+ DOD and U.S. Coast Guard aircraft supported (Title 10)
- 4.5+ billion aeronautical data elements
- 24+ million vertical obstructions (VOs)
- 49,000+ airfields in the Automated Air Facilities Intelligence File (AAFIF)
- 11,600+ airfields with Airfield Foundation Data (AFD) vectors collected
- 9,800+ airfields in the Digital Aeronautical Flight Information File (DAFIF®)
- 15,000+ Instrument Flight Procedures (IFPs) in DOD Flight Information Publications (FLIPs)
- 18,000+ IFPs in Federal Aviation Administration (FAA) FLIPs
- 14,000+ IFPs in the Electronic Instrument Procedure Library (E-IPL)

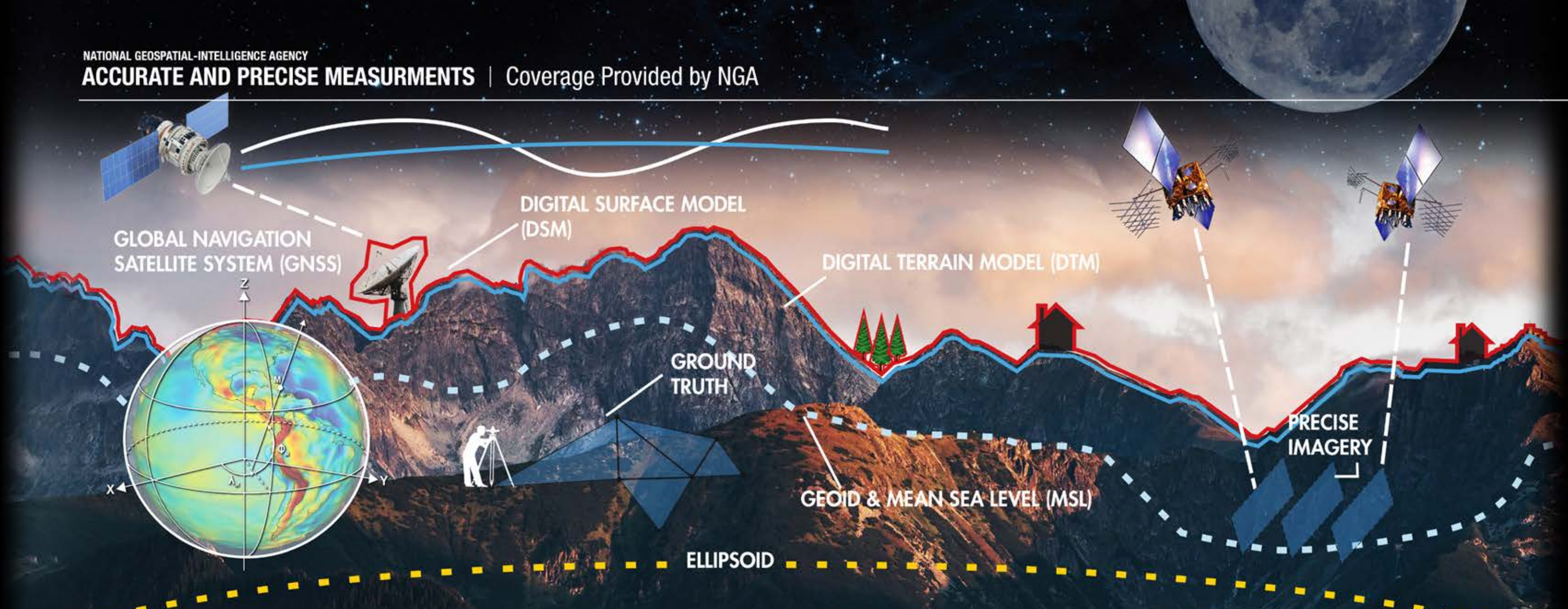
PARTNERSHIPS



- Competing strategically for allies and partners
- Building partner GEOINT capabilities to provide interoperable data
 - ◆ 240+ nations with agreements for foundation data and products
 - ◆ (Basic Exchange and Cooperation Agreements [BECAs], multilateral and bilateral)
- 32 nations sharing 1:50K scale topographic feature data via the Multinational Geospatial Co-Production Program (MGCP)
- 24 nations sharing 1:5K scale topographic feature data via the MGCP
- Urban Vector Data (MUVD) Program
- 15 nations sharing human geography data via the International Program for Human Geography (IPHG)
- 33 nations in the TanDEM-X High Resolution Elevation Data Exchange (TREX) program
- Operation DEEP FREEZE - support to DOD, FAA, the National Science Foundation and international partners

MISSION: Provide assured, timely, relevant, and accurate foundation data, products, and services in support of prioritized requirements of the warfighter, our national security objectives, and the Safety of Navigation needs of the U.S. government





GEOMATICS

- Collection of sciences, technology, and tradecraft measuring and modeling the globe to provide 3D accuracy of every point in, on or above the Earth
- Provides accurate positioning, navigation, timing, and targeting content and services in support of critical infrastructure and the national security objectives of the U.S. government

GEOSCIENCES

GEOTECHNICAL HAZARDS, INDICATIONS & POTENTIALS (GEOHIP)
 EARTH GRAVITATIONAL MODEL (EGM)
 WORLD MAGNETIC MODEL (WMM)
 COORDINATE SYSTEM ANALYSIS
 3D AND 4D MODELING

ELEVATION

LOW RES (SHUTTLE RADAR TOPOGRAPHY MISSION [SRTM]/(DIGITAL TERRAIN ELEVATION DATA [DTED])
 HIGH RESOLUTION TERRAIN ELEVATION (HRTE3/4)
 DEFENSE GRIDDED ELEVATION DATA (DGED) (GLOBAL 2M)
 TANDEM-X (GLOBAL 12M)
 BARE EARTH/REFLECTIVE

GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS)

GLOBAL POSITIONING SYSTEM (GPS) PRECISE ORBIT PRODUCTION
 MAINTAIN & ENHANCE THE WORLD GEODETIC SYSTEM 1984 (WGS84)
 EARTH ORIENTATION PARAMETER PREDICATION (EOPP)
 GNSS MONITOR STATION NETWORK

PRECISE IMAGERY

COMMERCIAL IMAGERY REGIONAL ORTHO-MOSAIC (CIRO)
 DIGITAL POINT POSITIONING DATABASE (DPPDB)
 CONTROLLED IMAGE BASE (CIB) & ENHANCED CIB
 NEAR GLOBAL STEREO IMAGERY

GEODETIC SURVEYS

GEOPHYSICAL: ASTRONOMIC POSITIONING & AZIMUTH (POS & AZ), GRAVITY, MAGNETIC
 AIRFIELD SURVEYS (TERMINAL AERONAUTICAL GNSS GEODETIC SURVEY [TAGGS])
 GEODETIC: POSITIONING & AZIMUTH, LIGHT DETECTION AND RANGING (LIDAR), DEFLECTION OF VERTICAL (DOV), AND PRECISE LEVELING

CUSTOMERS: U.S. AIR FORCE, U.S. ARMY, U.S. NAVY, U.S. MARINE CORPS, U.S. COAST GUARD, U.S. SPACE FORCE, COMBATANT COMMANDS, INTELLIGENCE COMMUNITY, ALLIES, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA), NATIONAL RECONNAISSANCE OFFICE (NRO), MISSILE DEFENSE AGENCY (MDA), NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)/NATIONAL GEODETIC SURVEY (NGS), UNIVERSITIES, RESEARCH LABORATORIES, SCIENTIFIC COMMUNITY, DOD TEST RANGES AND 4 BILLION GLOBAL POSITIONING SYSTEM (GPS) USERS



MISSIONS

MARITIME AND AERONAUTICAL SAFETY OF NAVIGATION | GROUND NAVIGATION | SPACE LAUNCH, TELEMETRY AND TRACKING | SEA, LAND AND AIR BASED WEAPON SYSTEMS SUPPORT
INFRASTRUCTURE SECTORS SUPPORT | GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS) | TERMINAL AERONAUTICAL GNSS GEODETIC SURVEY (TAGGS) | ELEVATION DATA, MODELS AND REPOSITORY

POSITIONING

PRECISE LATITUDE/LONGITUDE/ELEVATION
GROUND TRUTH GEODETIC SURVEYS
GPS CONSTELLATION POSITIONING
WORLD GEODETIC SYSTEM 1984 (WGS 84)
REFERENCE FRAME

NAVIGATION

TERRAIN CONTOUR MATCHING (TERCOM)
INERTIAL NAVIGATION SYSTEM (INS)
MAGNETIC/TRUE/GRID NAVIGATION
GPS NAVIGATION

TIMING

CRITICAL NATIONAL INFRASTRUCTURE
GPS CONSTELLATION TIMING
COMMUNICATIONS NETWORK
ATOMIC CLOCKS

TARGETING

DIGITAL POINT POSITIONING DATABASE (DPPDB)
COORDINATE GUIDED MUNITIONS
DEFLECTION OF VERTICAL (DOV)
GPS GUIDED MUNITIONS

WORLDWIDE DOD FORCES MISSION SPECTRUM | Global Coverage Supported by NGA

FOUNDATION GEOINT DATA, PRODUCTS AND SERVICES PRODUCED TO ACCOMPLISH WORLDWIDE MISSIONS

STRATEGIC

OPERATIONAL

TACTICAL



- TOPOGRAPHIC**
- POLITICAL GEOGRAPHY**
GEOGRAPHIC NAMES
DIGITAL BOUNDARIES
- HUMAN GEOGRAPHY**
POPULATED PLACES FRAMEWORK
- PARTNERSHIPS**
CO-PRODUCTION



- JET NAVIGATION CHARTS
1:2M
- JOINT OPERATIONS GRAPHICS
1:250K
- TACTICAL PILOTAGE CHARTS
1:500K

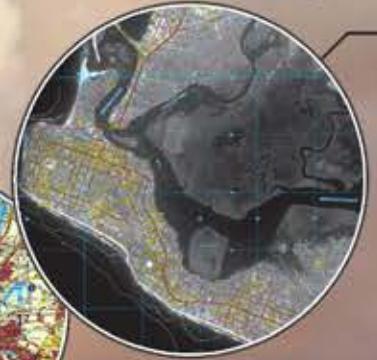


IMAGE CITY MAPS
~1:12K



GLOBAL NAVIGATION CHARTS
1:5M



LANGUAGE MAPS



TOPOGRAPHIC MAPS
1:100K
1:50K



EVASION CHARTS
1:250K

MISSION PLANNING

HOME STATION PREDEPLOYMENT ACTIVITIES

- MISSION ANALYSIS
- INTELLIGENCE PREPARATION OF THE BATTLESPACE
- COURSE OF ACTION DEVELOPMENT

DEPLOYMENT

SAFETY OF NAVIGATION

- AIRFIELD POINT OF EMBARKATION/DEBARKATION
- SEA POINT OF EMBARKATION/DEBARKATION

RECEPTION AND STAGING

INTERMEDIATE STAGING BASE

- CONTINUE MISSION PLANNING
- LINE OF COMMUNICATION
- GROUND CONVOY
- INTER-THEATER AIRLIFT

ONWARD MOVEMENT AND INTEGRATION

TACTICAL ASSEMBLY AREA

- MAIN SUPPLY ROUTES
- MISSION REHEARSAL

CONDUCT OPERATIONS

ACTIONS ON OBJECTIVE

- ACTIONS ENROUTE
- CHANGE OF MISSION





MISSION PROVIDING GEOSPATIAL DATA, PRODUCTS AND SERVICES TO INFORM AND IMPROVE DOMESTIC AND INTERNATIONAL RESPONSE

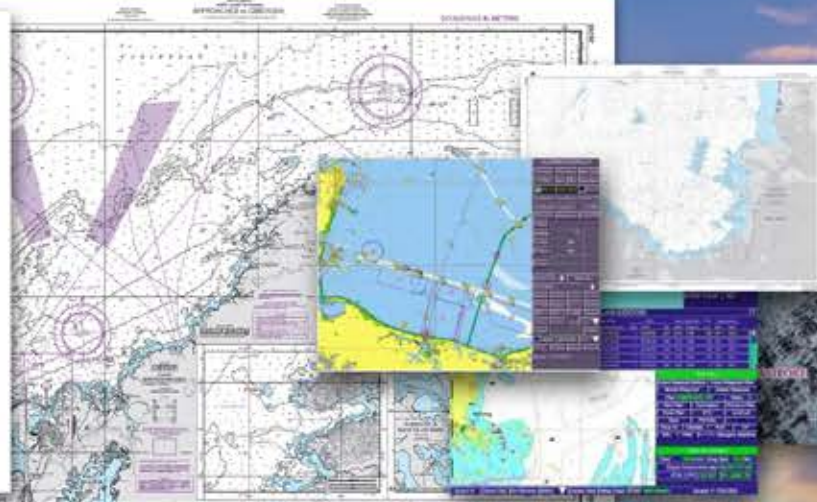
GEODETIC SURVEYS
ELEVATION MODELS
PRECISE IMAGERY
GLOBAL MODELS

POLITICAL GEOGRAPHY
HUMAN GEOGRAPHY
TOPOGRAPHIC MAPS

WORLD-WIDE NAVIGATIONAL WARNING SERVICE
NAVIGATION PUBLICATIONS
NOTICE TO MARINERS
NAUTICAL CHARTS

DIGITAL AERONAUTICAL FLIGHT INFORMATION FILE
FLIGHT INFORMATION PUBLICATIONS
VERTICAL OBSTRUCTIONS

SAFETY OF NAVIGATION PRODUCTS AND DATA PROVIDED TO ACCOMPLISH DOD WORLDWIDE MISSIONS



DAILY SUPPORT TO NAVAL VESSELS AND U.S. NAVY SAILORS AND MARINES UNDERWAY

SEND OVER 30 CRITICAL NAVIGATIONAL WARNINGS AND DISTRESS MESSAGES TO U.S. AND INTERNATIONAL MARINERS DAILY

MISSION PLANNING

PORT OF EMBARKATION

NAVIGATION/OBSTRUCTIONS

MISSION EXECUTION

- LITTORAL PLANNING CHARTS (LPCs)
- NAVIGATION PUBLICATIONS
- OPERATION AREA CHARTS
- WORLD PORT INDEX
- CLOSURE AREAS

- SUBMARINE ELECTRONIC NAVIGATIONAL CHARTS (SMENCs)
- ELECTRONIC NAVIGATIONAL CHARTS (ENCs)
- NAUTICAL HARD COPY CHART
- DIGITAL NAUTICAL CHARTS (DNCs)
- TACTICAL OCEAN DATA (TOD)

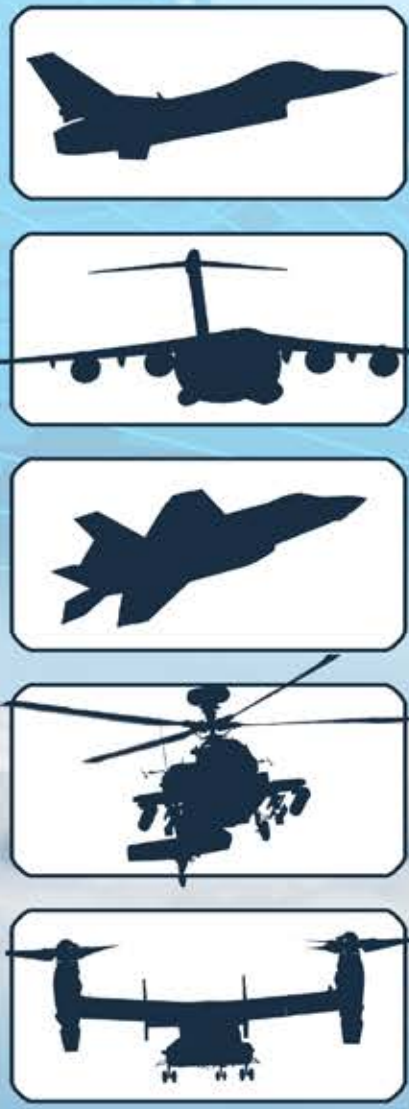
- WORLD-WIDE NAVIGATIONAL WARNING SERVICE (WWNWS)
- RECEIVES NAVIGATIONAL WARNING DAILY FROM WORLDWIDE SOURCES
- 24/7 MARITIME WATCH

- MARITIME QUALITY FEEDBACK SYSTEM (MQFS)
- MOBILE OFFSHORE DRILLING UNITS (MODUs)
- ANTI-SHIPING ACTIVITIES (PIRACY)
- MARITIME INTELLIGENCE SUPPORT
- SATELLITE-DERIVED INFORMATION
- OCEAN TIDE PREDICTION



SAFETY OF NAVIGATION PRODUCTS AND DATA PRODUCED EVERY 28 DAYS TO ACCOMPLISH DOD MISSIONS WORLDWIDE

PERFORMANCE-BASED NAVIGATION (PBN) — TRANSFORMING TO DATA-DRIVEN, SPACE-BASED NAVIGATION



FLIP
FLIGHT INFORMATION PUBLICATIONS



DAFIF
DIGITAL AERONAUTICAL FLIGHT INFORMATION FILE



MISSION PLANNING

AERO PLATFORMS SUPPORTED THROUGHOUT DOD (13,000)

DISSEMINATION VIA WEB-ENABLED AND MOBILE APPLICATIONS

TAKEOFF

AIRFIELD FOUNDATION DATA (AFD) (50,000 AIRFIELDS)

DEPARTURE

STANDARD INSTRUMENT DEPARTURES (SIDs) (12,000)

ENROUTE

AIRWAY STRUCTURE (4.5 MILLION MILES)

ARRIVAL

STANDARD TERMINAL ARRIVALS (STARs) (7,200)

APPROACH

INSTRUMENT APPROACH PROCEDURES (IAPs) (28,800)

LANDING

VERTICAL OBSTRUCTIONS (VOs) (24.8 MILLION FEATURES)

MISSION PARTNERS



FOUNDATION GEOINT PRODUCERS



EMERGENT & CRISIS REQUIREMENTS



STANDING REQUIREMENTS

	Current Fiscal Year (CFY)			CFY + 1											
	FY Q4	FY Q1	FY Q2	FY Q3	FY Q4										
	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
	Execute Production Plan														
CFY + 1	Production Plan Approval			Execute Production Plan											
CFY + 2	Data Call			Gap Analysis			Strategy Priorities			Prioritization			Plan Approval		

NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY
OFFICE OF GEOMATICS | SFN

Assured Positioning, Navigation, Timing and Targeting

GEOSCIENCES

- Earth Gravitational Model (EGM)
- World Magnetic Model (WMM)
- Coordinate Systems Analysis
- Geotechnical Hazards, Indications & Potentials (GEOHip)
- Global humanitarian assistance and disaster relief and advanced mobility analysis
- Inertial Navigation System (INS) support



ELEVATION

- Global, regional, local and specialized datasets
- Bare Earth/reflective data
- Finished/unfinished data
- In-house/contracted production
- Auto-generation capability
- Supercomputing partnerships to support 3D GEOINT
- Geospatial Repository and Data Management (GRiD) system
- 32 nations in the TanDEM-X High Resolution Elevation Data Exchange (TREX) Program
- Elevation models
 - Terrain contour-matching sciences
 - High Resolution Terrain Elevation 4 (HRTE4) products
 - Air-launched cruise missile support
- 100% of the Earth's surface has 12-meter high-resolution elevation data



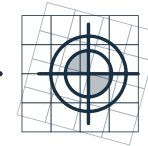
GEODETIC SURVEYS

- Space launch and weapons system support
- DOD flight safety
- Survey technical expertise
- Geophysical data collection and analysis
- Astronomic azimuth, astronomic positioning, deflection of vertical, gravity, magnetic and geodetic positioning



PRECISE IMAGERY

- Digital Point Positioning Database (DPPDB) - stereo precision targeting product
- Controlled Image Base (CIB) - global ortho-mosaic mission planning product
- Imagery accuracy improvement, exploitation and evaluation
- Commercial Imagery Regional Ortho-mosaic (CIRO) - unclassified ortho-mosaic imagery products
- Near global stereo imagery content



GLOBAL NAVIGATION SATELLITE SYSTEM (GNSS)

- Maintain and enhance the World Geodetic System 1984
- Earth Reference Frame
 - Built from 17 GNSS collection stations' data
 - Provides a single set of global coordinates for navigation and targeting
- Interoperability between U.S. and international reference frames
- Support National System for Geospatial Intelligence (NSG) GPS services
- GPS Monitor Station Network
- Real-time GNSS dataflow
- GPS precise orbit production
- Earth-orientation parameter predictions



INTEGRATION

- Technical integration
- Business operations support
- Geomatics tradecraft advancement
- Cloud migration
- Geomatics standards



MISSION: Provide accurate positioning, navigation, timing and targeting content and services in support of critical infrastructure and the national security objectives of the U.S. government

World Geodetic System 1984 (WGS 84)

Earth Reference Frame

Maintains and updates the underlying foundation x,y,z coordinate system used by the IC/DOD and all Safety of Navigation (SoN) systems

Earth Gravitational Model (EGM)

The EGM is built utilizing global correction files to support accurate strategic and tactical navigation systems using 200+ million gravity records

World Magnetic Model (WMM)

Maintain and update the WMM, the accurate description of the Earth's magnetic field supporting sea, land and air magnetic-based navigation, utilized by the U.S. Armed Forces, NATO partners and commercial platforms that serve the global population

Geodetic Surveys

Provide DOD weapons and flight-testing ranges, airfield safety of navigation and U.S. Navy strategic systems programs

Elevation

Provide global coverage of digital elevation models (DEM) at different resolutions to support a wide range of missions including targeting, mission planning, safety of navigation and 3D GEOINT

Precise Imagery

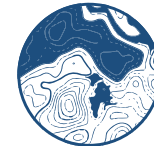
Provide global coverage of DOD's most accurate ortho-mosaic imagery to support a full range of U.S. joint force and allied operations, such as targeting, mission planning and SoN

NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY
OFFICE OF GEOGRAPHY | SFG

Showing the Way From the Ground Up

TOPOGRAPHY

- Feature data collection, quality assurance, integration, management and distribution
- Map and chart finishing, and quality assurance
- Data integration
- 5+ billion topographic features including geometry and attributes for roads, rails, hydrography, land cover, buildings, and industrial and cultural features
- 83,000+ topographic maps
 - ◆ 3,479 Joint Operations Graphic-Air charts
 - ◆ 460 Evasion Charts (EVCs)
 - ◆ 1,561 Image City Maps (ICMs)
 - ◆ 1,086 NAVPLAN charts (Tactical Pilotage Charts [TPCs], Jet Navigation Charts [JNCs], Operational Navigation Charts [ONCs] and Global Navigation and Planning Charts [GNCs])
 - ◆ 3,889 urban scale topographic maps and 68 topographic atlases
- National System for Geospatial Intelligence (NSG) Open Mapping Environment (NOME)
 - ◆ 104+ campaigns in FY23
 - ◆ 27+ million new buildings
 - ◆ 175,000+ new kilometers of roads
 - ◆ 16,000+ new meters of waterways
 - ◆ 270,000+ new Points of Interest (POI)



HUMAN GEOGRAPHY

- Describes the demographics of populations and their collective identities including ethnicity, religion, language, politics and ideology
- Identifies community systems for communications, economics, education, energy, elections, health, security, transportation, water, worship and cultural heritage
- Focuses on social stability and conflict at the regional, national and sub-national levels
- Populated Place Framework enables geolocation of population attributes to settlements, villages, cities and neighborhoods
- Over 2+ million human geography features



POLITICAL GEOGRAPHY

- Steward of official geographic names, political boundaries and country codes for the U.S. government
- 8.4 million features with 13.8 million geographic names in the Geographic Names Database (GNDB)
- 37 foreign languages spoken by analysts
- Boundaries
 - ◆ 900+ international land and maritime boundaries
 - ◆ 74,000+ administrative (internal) boundaries
 - ◆ 2,500+ claimed maritime limits and zones
 - ◆ 2.85+ million miles of high-resolution shoreline data



TECHNOLOGY AND INTEGRATION

- Foundation GEOINT Modernization (FG MOD)
- Production management of data and products
- Amazon Web Services (AWS) for storage
- Utilize Cloud migration to increase computing performance
- NSG Open Mapping Environment (NOME) for collaborative feature data
- Fully-automated and semi-automated map and chart finishing



PARTNERSHIPS

- Develops, manages and leverages NGA's bilateral and multilateral Foundation Geography international partnerships, maximizing partner contributions to meet NGA/NSG/Allied System for Geospatial Intelligence (ASG)/IC/DOD/NATO FG requirements for boundaries, geographic names, human geography and topography
- Strategic partnerships assist in meeting the growing demand for Foundation GEOINT
- Combatant command support
- Education partnership and data exchange with academia
- Environmental security
- 70+ nations have multi- or bi-lateral agreements for foundation data and products
- 32 nations sharing 1:50K scale topographic feature data via the Multinational Geospatial Co-Production Program (MGCP)
- 19 nations sharing 1:5K scale topographic feature data via the MGCP Urban Vector Data (MUVD) Program
- 14 nations sharing human geography data via the International Program for Human Geography (IPHG)
- Chairing and serving as U.S. representatives at multinational forums



MISSION: Provide geographic data, products and services in support of our military, intelligence community, and international partners, enabling them to make informed decisions and execute successful operations

TACTICAL MAPS

Maintain more than **90,000** topographic maps worldwide supporting combat operations, humanitarian assistance, disaster relief and military training

POLITICAL GEOGRAPHY

Maintain the U.S. government's official repository of **13.8** million geographic names and **900+** international land and maritime boundaries in direct support of the DOD, Intelligence Community and Department of State

HUMAN GEOGRAPHY

Examine human populations and their collective identities, community systems and stability, providing insights into the activities of human population segments within customers' operating environments

NOTICE TO MARINERS

- Weekly unclassified publication since 1869
- Provides critical Safety of Navigation (SoN) updates to all NGA, National Oceanic and Atmospheric Administration (NOAA) and U.S. Coast Guard nautical hard copy charts
- Monthly classified version

NOTICE



NAUTICAL CHARTS

- 4,100 nautical hard copy charts
- 3,900 digital nautical charts (DNCs)
- 1,400 tactical ocean data (TOD) libraries
- 15,000 submarine electronic navigational charts (SMENCs)
- 11,000 NGA and foreign-produced electronic navigational charts (ENCs)
- 73 operation area (OPAREA) charts
- 580 littoral planning charts (LPCs)



WORLD-WIDE NAVIGATIONAL WARNING SERVICE (WWNWS)

- Internationally coordinated 24/7 operation that provides immediate SoN messages to mariners at sea
- World divided into 21 NAVAREAS; U.S./NGA is the NAVAREA coordinator for NAVAREA IV and NAVAREA XII
- Receives 300,000 messages per year; 8,000 messages are promulgated as a NAVAREA IV, NAVAREA XII, HYDROLANT, HYDROPAC or HYDROARC
- Closure areas, piracy, icebergs, and U.S. maritime alerts and advisories



NAUTICAL PUBLICATIONS

- Bowditch - The American Practical Navigator Volumes I & II
- Sailing Directions (enroute and planning guides) - 42 publications
- NGA List of Lights - 7 volumes
- Fleet Guides - Atlantic and Pacific
- World Port Index
- Radio Navigation Aids
- Global Maritime Traffic Density Service



BATHYMETRY

- Provides bathymetric datasets for the SoN portfolio
- Custom bathymetric products



PARTNERSHIPS AND STANDARDS

- 40+ bi- and multi-lateral International Maritime Agreements
- Primary Charting Authority responsibilities for 12 foreign partners
- Tri-Service (NOAA, U.S. Navy and NGA) member of the U.S. Delegation to the International Hydrographic Organization (IHO)
- 75 Strategic Engagement Representatives supporting the IHO technology and standards modernization



MISSION: Provide global maritime geospatial intelligence in support of national security objectives, including commercial and defense Safety of Navigation (SoN), international obligations and joint military operations

WORLD-WIDE NAVIGATIONAL WARNING SERVICE

Provide **24/7 broadcast** of urgent maritime safety information for the Navigation Areas IV and XII, northwestern Atlantic and northeastern Pacific, respectively, to **thousands** of commercial, international and U.S. government ships **per day**, ensuring maritime Safety of Navigation

MARITIME SAFETY

Maintain 70 million hydrographic features globally, which are used to produce over **10,000 charts and publications** that are certified safe for navigation for military and civilian mariners per U.S. Code Title 10 and Title 44

AERONAUTICAL NAVIGATION OFFICE | SFA

FOUNDATION AERO DATA

- Maintain airfield data on 49,000+ airfields worldwide in the Automated Air Facilities Intelligence File (AAFIF)
- 11,600+ airfields with Airfield Foundation Data (AFD) vectors collected
- 24.8 million vertical obstructions (VOs) collected
 - ◆ ≥150 feet worldwide
 - ◆ ≥50 feet within seven miles of 9,800 priority airfields



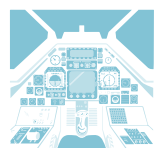
ENROUTE AERO DATA

- 9,000 navigation aids
- 54,000 waypoints
- 10,000 airways with 154,000 segments
- 16,000 boundaries with 191,000 segments
- 14,800 special use airspace with 81,000 segments



TERMINAL AERO DATA

- 18,000+ Instrument Flight Procedures (IFPs) in global FAA Flight Information Publications (FLIPs)
- 15,000+ IFPs in the DOD FLIP
- 14,000+ IFPs in the Electronic Instrument Procedure Library (E-IPL)
- 27,219+ IFPs coded in the Digital Aeronautical Flight Information File (DAFIF®)



AERO DATABASE

- 4 billion data elements
- 44 million updates on a 28-day cycle
- 10,000 lines of SQL code



WORKFORCE

- Comprised of military and civilian pilots, navigators, air traffic controllers, airfield managers and other technical specialties
- Credentialed by the Federal Aviation Administration (FAA)



DISSEMINATION

- 7.5 million hard copy FLIP products disseminated via Defense Logistics Agency accounts
- 50,000 users of the DOD's Aeronautical Mobile Application (iOS, Android, Windows)
- 9,830 active accounts for the Aeronautical Content Exploitation System (ACES)
- Web-enabled on JWICS, SIPRNet, NIPRNet and the internet



PARTNERSHIPS

- 410 national, international and industry working relationships
- 240+ nations with agreements for foundation data and products
 - ◆ 170 managed by this office
- Allied System for Geospatial Intelligence (ASG) Aeronautical Sub Group (FVEY) - aeronautical co-production, data compares and development of FVEY standards
- NGA aeronautical analysts embedded with FAA
- Operation DEEP FREEZE – support to DOD, FAA, the National Science Foundation and international partners

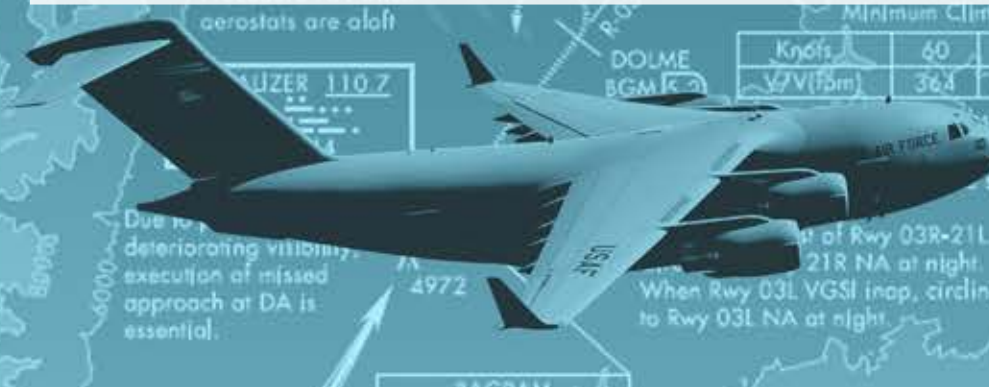


ENABLES

- 24/7 digital access to worldwide aeronautical data
- Life-saving collision and terrain avoidance systems
- Intelligence Community support for global operational planning and targeting
- Global combat, training, force protection and humanitarian assistance disaster relief (HADR) operations
- Aeronautical Safety of Navigation for DOD and allied partners



MISSION: Acquire, prepare and distribute aeronautical geospatial intelligence for U.S. government and partner organizations in support of national strategy and interests



Maintain data on **49,000** airfields in Automated Air Facilities Intelligence File (AAFIF) in support of the Intelligence Community and Combatant Commands

27,219 instrument flight procedures in the Digital Aeronautical Flight Information File (DAFIF®) to support internationally mandated performance-based navigation requirements for DOD aircraft

Support **13,000** DOD aircraft with hundreds of unique missions

3,000 DOD flights per day

FOUNDATION GEOINT NATIONAL SYSTEM FOR GEOSPATIAL INTELLIGENCE (NSG) OPERATIONS EXECUTIVE OFFICE (NOX) | SFP

REQUIREMENTS

- Collect and report Foundation GEOINT (FG) requirements across the NSG
- Assist customers with creation, refinement and submission of FG requirements
- Oversee and synchronize the prioritization process of FG requirements
- Coordinate with FG Production Offices to develop a detailed, production plan based on prioritization
- Maintain and enhance a requirements management system enabling customers to efficiently submit, validate, track and query requirements



READINESS AND ASSESSMENT

- Serve as the Source lead for both FG and the Chairman of the Joint Chiefs of Staff (CJCS) mission-readiness reviews
- Perform annual availability and adequacy assessments against stated requirements and identify shortfalls
- Coordinate with FG Production Offices to develop and leverage new FG methods and tradecraft to meet mission needs



OPERATIONS

- Facilitate cross-functional FG activities and report accomplishments to DOD, the Intelligence Community, and U.S. government decision-makers
- Serve as the FG crisis manager
- Produce and disseminate Non-Combatant Evacuation Operations (NEO) products
- Lead FG international partner engagements



PARTNERSHIPS

- Lead development and execution of international engagement strategies, aligning with NGA vision and policies
- Facilitate strategic engagements with NSG and Allied System for Geospatial Intelligence (ASG) partners
- Coordinate within NGA the development of international agreements, co-production and data exchange programs
- Assess capabilities of international partners and identify opportunities to enhance NGA/NSG global data through exchange, co-production and burden-sharing activities



MISSION: Coordinate, refine, and execute the prioritized National System for Geospatial Intelligence (NSG) Foundation GEOINT (FG) requirements to ensure optimal use of production resources in support of the DOD and the Intelligence Community, report on NGA's FG mission readiness, lead the Foundation GEOINT Group's international engagements and ensure non-combatant and other contingency operations (NCO) support to the Department of State

NEO Support

Support U.S. government contingency operations worldwide with the most current FG products for **600+** NEO sites in 189 countries; maintain and disseminate authoritative "Listing of Products" for each site

International Engagement

International bilateral sharing agreements with **70+** nations that support the DOD warfighter, national security objectives, and Safety of Navigation requirements

CORPORATE OPERATIONS AND TECHNOLOGY OFFICE | SFC

RESOURCE MANAGEMENT

- Perform strategic workforce-planning coordination
- Monitor manpower and career service requirements



FOUNDATION GEOINT TECHNOLOGY

- Coordinate new technology requirements and modernization
- Lead enterprise data management and discovery efforts for SF in support of data-centric operations and outputs
- Establish and maintain FG information technology (IT) governance across SF
- Coordinate the transition of new capabilities from Research to the SF Offices
- Document Foundation GEOINT (FG) mission planning and capabilities
- Coordinate SF's dissemination strategy
- Support the SF Technical Executive, Integrated Program Office (IPO) – Foundation (IPF) Mission Owner, and the Foundation Digital Twin (FDT) Integration Manager (IM)
- Produce NGA's FG feature-based Basemaps, as background and context for customers to display their data
- Develop the Quality Assurance Capability (QAC) software application to conduct QA of FG feature datasets
- Fulfill requests from within SF for data science/data analysis work
- Conduct outreach and partner with government, academia and industry to identify, develop, leverage, or deploy artificial intelligence (AI) / machine learning (ML) capabilities within S



STANDARDS

- Lead, influence and coordinate FG standards activities across the NGA, National System for Geospatial Intelligence (NSG) and international standards communities
- Develop and maintain standards to increase interoperability and compatibility across products and services
- Enable online access to FG standards and extraction guidance through the FGS-DPS at <https://fgs-dps.gs.mil/#/>
- Lead the SF Standards Forum to encourage collaboration and knowledge sharing across FG standards



BUSINESS OPERATIONS

- Provide communications and engagement support
- Oversee space, IT systems/devices and software
- Oversee taskers and awards
- Oversee business continuity and information assurance
- Provide senior-level staff support
- Lead Next NGA St. Louis Program Office (N2W) planning for SF and Source



MISSION: Oversee Foundation GEOINT Group's (SF) corporate business, technology and standards activities supporting aeronautical, maritime, geography and geomatics missions

Partner with the Defence Geospatial Information Working Group (DGIWG-NATO) to enhance the Defence Geospatial Information Framework (DGIF) Data Model to ensure foundation data interoperability and develop the Defence City Map Data Product Specification to provide a modern hard copy map specification to support large-scale urban map requirements within NSG and NATO

Lead **SF's corporate activities** including manpower, taskers, business continuity planning, workspace planning and IT infrastructure. Manage the SF Awards Program along with travel, training and supply budgets on behalf of the group. Also, directly support the Next NGA St. Louis Program Office (N2W), ensuring representation of Source equities

Influence **data models** with customers such as the Army Geospatial Center (AGC) to ensure foundation data interoperability with current and future geospatial-based U.S. Army systems

Partner with the **IPF** to develop, acquire, integrate, deploy and sustain IT capabilities and services

NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY
**HISTORY OF THE FOUNDATION
 GEOINT GROUP**

- 1777** Office of Geographer
Continental Army
- 1830** Depot of Charts and Instruments
U.S. Navy
- 1910** Central Map Reproduction Plant
U.S. Army
- 1928** Map Unit, Information Division
U.S. Army Air Corps
- 1942** Army Map Service
U.S. Army
- 1944** Aeronautical Chart Service
U.S. Army Air Force
- 1946** Inter-American Geodetic Survey
Caribbean Defense Command
- 1952** Aeronautical Chart and Information Center
U.S. Air Force
- 1962** U.S. Naval Oceanographic Office (NAVO)
Formed
- 1972** Defense Mapping Agency (DMA)
Formed
- 1996** National Imagery and Mapping Agency (NIMA)
Formed
- 2003** National Geospatial-Intelligence Agency (NGA)
NIMA changes its name to NGA
- 2005** Foundation Based Operations (FBO/S2)
Formed; offices included Geography and Geomatics
- 2011** Foundation GEOINT Group (S2)
Renamed after FBO combined with the Office of Global
Navigation (Aeronautical Navigation and Maritime Safety)
- 2015** Foundation GEOINT Group (SF)
Group two-letter designation changed from S2 to SF

**The Foundation
 GEOINT Group**

traces its lineage back over 247 years. In 1777, General George Washington established the Office of Geographer for the Continental Army, which consisted of cartographers and surveyors. In 1830, the U.S. Navy's Depot of Charts and Instruments was established. By 1962, this office evolved into the U.S. Naval Oceanographic Office (NAVO). In 1910, the U.S. Army's Central Map Reproduction Plant was established, evolving into the Army Map Service in 1942. In 1928, the Map Unit, part of the Information Division of the U.S. Army Air Corps, was established, evolving into the Aeronautical Chart Service in 1944 and subsequently to the U.S. Air Force Aeronautical Chart Information Center in 1952. In 1946, under presidential directive, the Inter-American Geodetic Survey formed under the Caribbean Defense Command.

These organizations, along with other entities, eventually combined to form the Defense Mapping Agency (DMA) in 1972. The Foundation GEOINT Group inherited key missions of the original DMA mission that was assimilated into the National Imagery and Mapping Agency (NIMA) and then NGA. Below is a summary of the chronicle of events that resulted in the formation of the Foundation GEOINT Group.



DMA

1971 A presidential memorandum directed the consolidation of the Department of Defense (DOD) mapping, charting and geodesy operations.

1972 The DOD established DMA to provide mapping, charting and geodesy to support the Secretary of Defense, military departments, Joint Chiefs of Staff and other DOD components.

In establishing DMA, DOD combined the selective activities of the U.S. Army Topographic Command (including the Army Map Service); the Department of Topography of the U.S. Army Engineer School; the Inter-American Geodetic Survey of the U.S. Army; and the chart production, nautical information, and distribution activities of the U.S. Navy Oceanographic Office, the Aeronautical Chart and Information Center operations, the 1st Geodetic Survey Squadron, and elements of the 15th Reconnaissance Technical Squadron of the U.S. Air Force.

Those organizations formed DMA's four operational offices: the Inter-American Geodetic Survey, the Topographic Center, the Hydrographic Center and the Aerospace Center.

Through these four organizations, DMA support spanned the next quarter century, providing for the production, worldwide distribution, and support of maps, charts and geodesy. This also included precise positioning data and digital data for strategic and tactical military operations, weapons systems and Safety of Navigation.



NIMA

1996 NIMA was formed to bring our nation's most capable imagery and geospatial assets together into a single agency. NIMA brought together DMA, Central Imagery Office, the Defense

Dissemination Program Office and the National Photographic Interpretation Center. It also incorporated parts of the Central Intelligence Agency, the Defense Airborne Reconnaissance Office, the Defense Intelligence Agency and the National Reconnaissance Office. Subsequently, DMA's offices and missions were distributed across various NIMA offices.

2003 NIMA established the Source Operations and Management Directorate (S), responsible for acquiring, managing, and delivering imagery and other source data and information to the National System for Geospatial Intelligence (NSG).



NGA

2003 The Defense Authorization Bill included a provision renaming NIMA as the National Geospatial-Intelligence Agency.

2005 The NGA Director commissioned a review of current agency missions. As a result of its findings, an entity within the Source Directorate, Foundation Based Operations (FBO/S2), with an NSG Operations Executive (NOX), was formed. Offices included in the FBO were Geography (SG) and Geomatics (SN).

The offices of Aeronautical Navigation (PVA) and Maritime Safety (PVM) were in the Analysis and Production (P) Directorate in the Office of Global Navigation (PV) with a Safety of Navigation (SON) NSG Operations Executive (NOX).

2011 The foundation mission activities

of FBO and PV were combined to form the Foundation GEOINT Group (S2).

2015 To be consistent with the rest of the agency's two-letter designations, S2 was changed to SF.

Today, the Foundation GEOINT Group is organized in a similar manner to that of DMA. The organization of DMA's former four operational offices correlates to a certain degree to that of the SF operational offices of today: the Inter-American Geodetic Survey to the Office of Geomatics (SFN), the Topography Center to the Office of Geography (SFG), the Hydrography Center to the Maritime Safety Office (SFH), and the Aerospace Center to the Aeronautical Navigation Office (SFA).

SF features two support offices. The Corporate Operations and Technology Office (SFC) manages personnel, administration, communications, information technology and logistic functions. Foundation GEOINT NOX (SFP) manages customer mission requirements.

Today, the SF workforce consists of military, government and contractor personnel. Their distribution in St. Louis, the National Capital Region and locations around the world reflects the agency's varied geographical roots and global presence to provide world-class data, products and services describing the physical and cultural characteristics of the Earth and space.

Foundation GEOINT is the data, products and services describing the physical and cultural characteristics from the center of the Earth to the space domain. Foundation GEOINT includes data content areas, earth sciences, gravity, magnetics, geodetic surveys, elevation, precise imagery, coordinate systems, global navigation satellite systems, topography, geographic names, human geography, political boundaries, and maritime and aeronautical Safety of Navigation.

Foundation GEOINT data supports intelligence, defense, civil and commercial needs.



NGA.mil

