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The United States Government works to provide for the general welfare of its citizens and to protect them from natural and human-caused disasters. Additionally it actively participates with the global community to help protect against poverty, famine, disease, and natural and human induced disasters as well as to help to improve good governance. This report summarizes the critical roles that various U.S. Government agencies perform in geospatial programs and projects in these endeavors, both domestically and throughout the Americas.

U.S. GEOLOGICAL SURVEY

Background

The U.S. Geological Survey (USGS) www.usgs.gov is a world leader in the natural sciences through its scientific excellence and responsiveness to society's needs. The mission of the USGS is to provide 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 our quality of life.

USGS Geospatial Program

In 2000 the U.S. Geologial Survey (USGS) took the bold step of combining the functions of the Geographic Information Office (GIO) and the Chief Information Officer (CIO), and Ms Karen Siderelis was invited from the State of North Carolina to oversee and manage the combined activities as the Associate Director for Geospatial Information. Under her leadership the USGS initiated plans to consolidate national geospatial programs, in 2004. The National Geospatial Programs Office (NGPO) was created and organizationally housed in the GIO. With the creation of the NGPO, the essential components to implement the National Spatial Data Infrastructure (NSDI) will be managed as a unified portfolio that benefits the entire geospatial community. The NGPO will engage partners in planning to ensure that their needs are met. The basis for this action is borne out in the purpose of the NGPO: *Providing leadership to place geographic knowledge at the fingertips of the Nation.*

The mission of the NGPO is twofold: one mission component focuses on leadership and the prominent role of partners and stakeholders, and the other focuses on the operational aspects and technical services needed to implement the NSDI. These two mission

components form the structure of the NGPO. In concert with its mission, the NGPO and its leaders are committed to core values of national leadership, partnership, service, value and impact, and professionalism, which will guide the NGPO into the future.

The NGPO envisions three transformations that will be necessary to fulfill the vision of the NSDI:

- Lead the development of a national geographic information system (GIS) that will provide access to quality, timely, digital geospatial data and resources.
- Focus on that untapped potential of issues, places, and users not necessarily familiar with GIS and its applications.
- Implement new business procedures for the President's Management Agenda to make access to government information transparent to citizens.

The NGPO is where the secretariat of the U.S. Board on Geographic Names (USBGN) is located. The USBGN standardizes domestic and foreign place names for U.S. Government use, and Executive Secretary Roger Payne represents the USGS and the U.S. in international toponymic fora and conducts geographic names workshops under the auspices of the Pan-American Institute for Geography and History (PAIGH.) The USGS is also proud to be one of the official representatives to the Cartographic Commission and to participate in the building of various products for the Americas such as the *Hemispheric Geographic Information Initiative for Integral Development in the Americas* -- an independent effort aimed at the solution of specific SDI and GI information needs and thematic applications for decision making in the continent. The Federal geographic Data Committee has, until recently been the principal support for the Global Spatial Data Infrastructure (GSDI) as it gains a foot hold in promoting the building of local to global Spatial Data Infrastructures (SDI) throughout the Americas as well as the rest of the world.

Global Earth Observations

In close collaboration with the Executive Branch, the National Oceanic and Atmospheric Administration (NOAA), National Aernautics and Space Administration (NASA), and many other U.S. agencies and roughly 60 other nations, the USGS also co-chairs the U.S. contributions to the Global Earth Observations (GEO) Program facilitating applications of global, regional, and local data from satellites, ocean bouys, weather stations, and other surface and airborne earth observing instruments. The GEO also promotes the GSDI principals. The anticipated end result will be ready access to an unprecidented amount of environmental information, integrated into new data products benefitting society. http://earthobservations.org/

Geographic Research and Cartographic Information Science

The USGS still considers that applied research is an integral component of geography and cartography and essential to achieve the NGPO vision, including development of methods necessary to derive and display seamless, generalized, consistent data and

topographic maps using best available data from a variety of distributed federal, state, county, and local government and private sector data sources.

Continuity of Landsat Program Operation -- As a critical element of the USGS, the Geography Program's EROS Data Center has had the responsibility for ground data collection, processsing, distribution, and applications research for satellite data and specifically for the Landsat activities. This includes the Landsat 5 and 7 with anticipated operations into 2009 and 2010 respectively. The agency also continues to collaborate with NASA and NOAA to ensure contributions to instrument design and operations for follow-on US satellite programs.

Of critical interest is the continuity of operations, should either Landsat 5 or 7 fail before follow-on instruments be launched. Funding has been secured to allow the USGS, NASA, and NOAA to design and to continue to operate the ground system and distribute data for two Operational Land Imager Instruments (OLI) -- the next generation thematic mappers. These instruments will become part of the payload for the National Polar-Orbiting Operational Environmental Satellite System scheduled for operation from 2010 to 2020. Should either one of the existing systems fail before anticipation, the three agencies are jointly investigating mitigation operations for implementation in 2007.

Geographic Analysis and Monitoring Program -- Furthering the USGS geographic research mission is the Geographic Analysis and Information Monitoring (GAM) Program also supporting the NGPO. Using geographic and monitoring tools the GAM provides the national and global perspectives for land surface changes. In so doing, it yields the comprehensive data and information needed to understand the rates, causes, and consequences of land surface change due to both both natural and human induced processes. It has direct impact on decision making in land use planning, management, and resource conservation as well as disaster preveniton and revetment.

NATIONAL OCEANIC and ATMOSPHERIC ADMINISTRATION

Background

The National Oceanic and Atmospheric Administration (NOAA) www.noaa.gov conducts research and gathers data about the global oceans, atmosphere, space, and sun, and applies this knowledge to science and service that touch the lives of all Americans. NOAA warns of dangerous weather, charts our seas and skies, guides our use and protection of ocean and coastal resources, and conducts research to improve our understanding and stewardship of the environment that sustains us all. A Commerce Department agency, NOAA provides these services through five major organizations: the National Weather Service, the National Ocean Service, the National Marine Fisheries Service, the National Environmental Satellite, Data and Information Service, and NOAA Research; and numerous special program units.

NOAA's Office of Coast Survey

The Office of Coast Survey is a component of the NOAA, and manages the official U.S. nautical charting and nautical data collection and information programs. (http://Nauticalcharts.noaa.gov)

Hydrographic Surveys - - In 2004 NOAA began using digital models (BASE - Bathymetry Associated with Statistical Error-surfaces) to better evaluate the volumes of digital bathymetric data inherent to full-bottom coverage survey work. Additionally, NOAA is testing the CUBE (Combined Uncertainty and Bathymetric Estimator) algorithm, which provides an intelligent method for automating the data cleaning process. BASE surfaces and CUBE will work in tandem to aid NOAA's hydrographers in efficiently and accurately evaluating large amounts of high-density digital bathymetric data.

Nautical Charts - - The nautical chart program produces a suite of paper, Raster Nautical Charts (RNC), "print-on-demand" (POD) charts, and Electronic Navigational Charts (ENC) as its core products. The paper products are created from the RNC suite of 1019 charts. In 2004 a certification program was initiated for any applicants who want to redistribute NOAA ENCs® as official data which would comply with Federal chart carriage regulations.

Additionally NOAA has begun to draft requirements for a Single Line Chart Production System to create multiple products from one system. As part of worldwide effort to develop a set of charts produced to a single set of agreed upon specifications, NOAA has produced a series of International (INT) Charts along the Gulf of Mexico coast, which conform approximately to the small-scale charts in the U.S. domestic series. In addition, the U.S. and Cuba are co-producing several INT Charts in the Straits of Florida.

NOAA ENCs® are distributed unencrypted via the Internet at no charge. At the close of fiscal year 2004, 420 ENCs had been created covering all of the major commercial ports in the U.S. and NOAA is currently working on completing seamless ENC coverage between the major ports. It is estimated that full coverage, a suite of approximately 700 ENCs, will be completed by the 2007/2008 timeframe.

Coast Survey Developments -- A new service, NOAA ENC Direct to GIS, provides ENC data in a seamless, Web-based map service for Web GIS applications via an OpenGIS compliant Web Map Service as well as in a downloadable form in a variety of GIS formats. VDatum is a software tool developed to properly reference bathymetric and topographic data among 29 tidal, orthometric and ellipsoidal vertical datums.

Real-time oceanographic model systems for bays, harbors, estuaries and large coastal areas are being developed to provide the mariner with now-casts and 24-hour forecasts of water levels, currents, water temperature, and salinity at hundreds of locations. An experimental circulation model of the Gulf of Mexico is being linked to a West Florida shelf model to initially study the causes and pathways of harmful algal blooms (HABs).

To support the development of ENCs and various GIS systems needed by coastal management communities, a unified comprehensive "digital coast" bathymetric database is being developed that will include the most recent depths available in U.S. waters, a national shoreline database, and a digital maritime boundary database.

International Activities -- The MesoAmerican-Caribbean Sea Regional Hydrographic Commission (MACHC), a regional hydrographic commission of the International Hydrographic Organization, encompasses the Caribbean Sea, Central America, and the north coast of South America. MACHC has a number of activities in the region, including a capacity-building project in the Gulf of Honduras and development of a series of 1:1,000,000-scale International Charts covering the Caribbean Region which will be made available for free through the MACHC website. - www.iho-machc.org

The United States and Mexico Charting Advisors Committee (CAC) was formed in 2002 under the auspices of the MACHC to address common regional issues on charting, research and data collection and to cooperate in areas of common interest in the border waters in both the Gulf of Mexico and the Pacific Ocean. Over the past two years, the CAC has made some significant accomplishments including personnel exchanges; the first joint NOAA and Mexican Navy hydrographic survey; the first International Chart jointly compiled by U.S. and Mexico; and the transfer of a decommissioned NOAA ship to Mexico to serve as their first dedicated hydrographic vessel.

NOAA's National Geodetic Survey

The National Geodetic Survey (NGS) continues to strengthen and enhance the National Spatial Reference System by providing the public with data from more than 700 continuously operating reference stations (CORS). NGS CORS installation and reference system specialist have been working closely with survey offices in the British Virgin Islands, Cayman Islands, Suriname and Trinidad and Tobago to modernize their surveying and mapping programs with the installation of several CORS sites. In addition, NGS continues various activities related to the Mainstreaming Adaptation to Climate Change program to add to the density of CORS in the Caribbean and Central America. Access to data from these sites will be made publicly available through the NGS web site and the Online Positioning User Service which provides more than 9,000 high accuracy GPS position solutions for a wide range of surveying, mapping and GIS applications each month. Additional NGS activities include the development of technology transfer seminars and workshops and developing cooperative data collection and analysis systems with the countries noted above to improve the accuracy of local geoid models. www.nos.noaa.gov

FEDERAL AVAIATION ADMINISTRATION

Background

The Federal Aviation Administration (FAA), National Aeronautical Charting Office (NACO) carries out the civil aeronautical charting functions of the United States government. Formerly called the Office of Aeronautical Charting and Cartography and located in the United States Department of Commerce, National Oceanic and Atmospheric Administration, NACO was transferred by the United States Congress to the FAA in October 2000. The organizational transfer with all personnel did not affect NACO's long-standing mission and associated functions of aeronautical information management, chart compilation, printing, and distribution.

The NACO is now modernizing its charting system. As a first step in this modernization, NACO is building a geo-referenced production database from which all chart production will be automated. Considerable efficiency gains will result from a data-centered, rather than a product-centered, approach to charting. In addition, chart automation will allow the production of a greater variety of digital chart products that will be geo-referenced and made available in vector format. The digital products will be in addition to NACO's full suite of paper chart products and related publications.

Products and Services

Currently NACO offers several digital products. These include raster airport diagrams, instrument approach procedures, and visual charts. NACO also offers the Digital Aeronautical Information CD containing the Digital Aeronautical Chart Supplement, the Digital Obstacle File, and the Navigational Aid Digital Data File. Additionally, NACO offers the National Geospatial-Intelligence Agency's (NGA)'s Digital Aeronautical Flight Information File along with the Department of Defense's full suite of flight information products. However, please note that NGA has requested public comment about their recent proposal to withdraw NGA flight products from public access commencing October 2005. A description of all digital and paper products can be found on the NACO's website: www.naco.faa.gov.

Of special note, NACO is producing the National Flight Database (NFD), which is an FAA-certified AIRINC 424 database to support flight management systems. Currently, the NFD contains United States RNAV (Area Navigation) terminal procedures, terminal arrivals and departures, en route data, and special-use airspace. Future additions to the NFD will include ground-based procedures, class airspace, and frequencies. As part of the NFD's quality control, NACO has developed strict AIRINC coding rules within the parameters of the more loosely defined AIRINC coding standards. These coding rules, which currently are limited to RNAV instrument procedure coding, are available upon request by contacting Terry Laydon, Manager, NACO, at 301-713-2619 or terry.m.laydon@faa.gov. Coding rules for vertically guided instrument approach procedures are under development.

In addition to managing a worldwide system of chart agents to provide ready access to its products, NACO also accepts orders directly. Later this year, chart customers will be able to purchase charts through NACO's new e-commerce system. Access to the e-commerce system will be through NACO's website. Currently available at this website are several free "downloadable" chart products. These include instrument approach procedures, airport diagrams, the Aeronautical Chart Bulletin, the Chart Users Guide, and NACO's chart catalogs. NACO's products are not protected by copyright.

Internationally

Of international interest, NACO is working with other FAA components, NGA, a variety of international partners, and the International Civil Aviation Organization on development of the Aeronautical Information Exchange Model (AIXM). Once developed, AIXM will be a standardized XML-based system for exchanging aeronautical data worldwide. Eurocontrol (European Airspace Management Organization), FAA, and NGA are cooperating on the development and conduct of AIXM training for interested AIXM partners. For more information on AIXM, please consult the FAA AIXM website at: www.faa.gov/aixm

NATIONAL GEOSPATIAL-INTELLIGENCE AGENCY

Background

The National Geospatial-Intelligence Agency (NGA) provides timely, relevant, and accurate geospatial intelligence in support of national security objectives. Geospatial intelligence is the exploitation and analysis of imagery and geospatial information to describe, assess, and visually depict physical features and geographically referenced activities on the Earth. Information collected and processed by NGA is tailored for customer-specific solutions. By giving customers ready access to geospatial intelligence, NGA provides support to civilian and military leaders and contributes to the state of readiness of U.S. military forces. NGA also contributes to humanitarian efforts such as tracking floods and fires, and in peacekeeping. NGA is a member of the U.S. Intelligence Community and a Department of Defense (DoD) Combat Support Agency. Headquartered in Bethesda, Maryland, NGA operates major facilities in the St. Louis, Missouri and Washington, D.C. areas. The Agency also fields support teams worldwide.

National System for Geospatial Intelligence

NGA is the functional manager for the National System for Geospatial Intelligence (NSGI). NSGI integrates technology, policies, capabilities and doctrine necessary to conduct geospatial intelligence in a multi-intelligence environment. NGA provides accurate, up-to-date geospatial intelligence to support our senior national decision makers as well as to help plan and prosecute military objectives. NGA's strategy supports operational readiness through a set of geospatial foundation data. These may include controlled imagery, digital elevation data and selected feature information-which can be

rapidly augmented and fused with other spatially referenced information such as intelligence, weather and logistics data. The result is an integrated, digital view of the mission space implemented utilizing standards that promote interoperability and operating efficiency across the NSGI community. The NSGI community includes the Department of Defense, the Intelligence Community, and when and where appropriate, federal civil agencies, and international co-producers. Geospatial intelligence standards support elements of the infrastructure such as data and data services.

International Partnerships in the Americas

NGA and its predecessor organizations, the National Imagery and Mapping Agency (NIMA) and the Defense Mapping Agency (DMA), have maintained important ties to the international mapping community in the Americas. In Latin America and the Caribbean, the Inter-American Geodetic Survey (IAGS) established collaborative projects shortly after World War II to help partner nations build geodetic networks, acquire aerial photography, and conduct mapping projects. Although IAGS was disestablished in the early 1990s, the traditions and spirit of the collaboration live on. Working under the auspices of agency-to-agency agreements, NGA currently has more than 25 active projects with national mapping agencies in Guatemala, Honduras, El Salvador, Nicaragua, Dominican Republic, Colombia, Ecuador, Peru, Bolivia, Paraguay, Chile, Argentina, and Uruguay. These projects include acquisition of aerial photography, building orthorectified image products, cartographic compilation of City Graphics and Topographic Line Maps, collection and processing of geographic names, and building digital feature foundation data. The assistance that NGA provides to the national mapping agencies includes releasable satellite imagery, airborne radar imagery, digital elevation matrices and technical support. To provide timely and effective technical support, the projects are managed by a small staff located in NGA facilities in Washington, DC, and St. Louis, Missouri; and from two Regional Offices in Guatemala and Peru. These projects assist the national mapping agencies in the production of standardized geospatial data and products as baseline information for national security, development, resource management, emergency response, safety of navigation, etc.

Additionally, NGA is an active participant along with other federal agencies and private-sector institutions in the Pan American Institute of Geography and History, a special activity of the Organization of American States dedicated to collaborative technical and scientific projects in the Americas in the areas of geography, geophysics, history and cartography.

U.S. CENSUS BUREAU

Background

The U.S. Census Bureau, a Commerce Department agency, www.census.gov serves as the leading source of quality data about the nation's people and economy. The Census Bureau honors privacy, protects confidentiality, shares its expertise globally, and conducts its work openly. The Bureau is guided on this mission by its strong and capable

workforce, its readiness to innovate, and its abiding commitment to its customers. The goal of the Census Bureau is to provide the best mix of timeliness, relevancy, quality, and cost for the data we collect and services we provide. To support this goal, the Census Bureau has recognized the need to modernize its geospatial environment.

MAF/TIGER Modernization

During the past four years the U.S. Census Bureau has contributed significant advancements to the geospatial world. Following Census 2000, the U.S. Census Bureau committed to changing its business model for geographic support from one which was based primarily on an in-house developed system to one that principally relies on Commercial off the Shelf (COTS) database and software solutions. To accomplish the Census Bureau's vision for a complete and comprehensive geographic support system for the 21st Century, the Census Bureau is developing its MAF/TIGER Enhancement Program (MTEP). http://www.census.gov/geo/www/tiger/index.html This program, comprising five objectives, allows the Census Bureau to support new technologies such as hand held computers with cartographic views for field operations for the 2010 Decennial Census Program as well as the annual American Community Survey, which is a nationwide statistical survey that will give communities the information they need to track annually how they are changing on a range of social, economic, housing and demographic issues. In 2002, in order to assure a minimum level of accuracy for street centerlines, the Census Bureau issued a contract with the Harris Corporation to improve and update the coordinates of roads in TIGER as part of its first objective. Partnerships with state, local and tribal governments serve as a source for accurate spatial data for many areas while other field data collection methodologies are used to complete geographic coverage for the nation. Data improvements continue on schedule while concurrent work is accomplished on the spatial database. A modernized TIGER database redesign, complete with a new data model as well as new COTS-based applications software to manage, maintain, update and use TIGER data comprise the second objective. Improved partnerships for acquiring and maintaining spatial data as well as administering the Census Bureau's geographic programs with state, local, and tribal governments form the basis of the third objective. Maintaining an accurate address list within the Master Address File (MAF) for mailing questionnaires to households is a fourth objective of MTEP. The last objective centers on quality measures and metrics to ensure that spatial data and geographic processes meet the agency's requirements. While the Census Bureau is moving aggressively on its MAF/TIGER modernization efforts, much is yet to be done including creation of databases supporting products and spatial data applications. Many commercial software application components to manage and use TIGER data are just beginning. The arduous task of migrating TIGER to a "redesigned TIGER" is on the horizon, followed by the development and testing of software applications within the new environment. This effort will not only enhance the geographic support capabilities for meeting the mission of the U.S. Census Bureau, but it also contributes to a national framework of geospatial data that will have immeasurable benefits to a nation of users.

As an active member of the Federal Geographic Data Committee (FGDC), the U.S. Census Bureau is conforming to the goals of the President's Management Agenda under the auspices of the Geospatial One-Stop E-Gov initiative where the U.S. Census Bureau serves as the data steward for boundaries and demographic data. At the same time, those data items as well as street centerlines and attributes contribute to the National Spatial Data Infrastructure and are served up to the U.S. Geological Survey's The National Map for on-line access of the data.

U.S. DEPARTMENT OF STATE

Humanitarian Information Unit (HIU)

In May 2002, the Secretary of State approved the creation of the HIU, with the mission to serve as a U.S. Government interagency center to identify, collect, analyze and disseminate unclassified information critical to USG decision makers and partners in preparation for and response to humanitarian emergencies worldwide, and to promote best practices for humanitarian information management.

As an interagency center, the HIU serves many parts of the U.S. Government, as well as international organizations and private voluntary organizations. The HIU taps into multiple streams and sources of information to create multi-sectoral common operating pictures that can be used for strategic decision-making. For example, the HIU created a series of maps showing the destruction of villages in Darfur, Sudan. These maps and other products, such as a Darfur Atlas, were key resources in the US government's response to this crisis.

The HIU is currently heading up an effort by 20 U.S. Goverment agencies to improve the collection, estimation, and dissemination of sub-national population data in countries at risk of humanitarian crisis. This *Populations at Risk Information Project* also incorporates a study that will be conducted by the U.S. National Academy of Sciences.

For further information on the Humanitarian Information Unit, please visit our website at http://hiu.state.gov. Username is "User12". Password is Password".