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# **Civil Applications Committee**

## **2004**

### **Activity Report**


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## Civil Applications Committee Background

### Overview

The Civil Applications Committee (CAC) is an interagency committee that coordinates and oversees the Federal civil use of classified collections. The CAC was officially chartered in 1975 by the Office of the President to provide Federal civil agencies access to National Systems data in support of mission responsibilities. In recent years, CAC activities have expanded beyond traditional mapping applications to a broad range of environmental and remote sensing applications central to Federal agency missions. Examples include monitoring volcanoes; [REDACTED]; coordinating emergency response to natural disasters, such as hurricanes, earthquakes, and floods; monitoring ecosystems; and mapping wetlands.

### Membership

The CAC is made up of voting representatives from the Department of Commerce (DOC), Department of the Interior (DOI), Department of Transportation (DOT), Environmental Protection Agency (EPA), Federal Emergency Management Agency (FEMA), Department of Health and Human Services (HHS), National Aeronautics and Space Administration (NASA), National Science Foundation (NSF), U.S. Coast Guard (USCG), U.S. Army Corps of Engineers (USACE), and the U.S. Department of Agriculture (USDA). Additional non-voting associate members of the CAC include representatives of the Central Intelligence Agency (CIA) Community Management Staff, Defense Intelligence Agency (DIA), Department of Energy (DOE), Department of State (DOS), National Geospatial-Intelligence Agency (NGA), and National Reconnaissance Office (NRO).

### Functions and Responsibilities

Functionally the CAC is composed of a technical and coordinating committee – chaired by the Director of the USGS – that meets monthly; an Executive Steering Group – chaired by the Deputy Secretary of the Interior – that meets as necessary, and the CAC Secretariat, which is hosted by the USGS. The CAC sponsors the Global Fiducials Working Group (GFWG) as a standing interagency working group that meets monthly. In addition, the CAC sponsors the Emergency Response Working Group (ERWG), Imagery Derived Products Working Group (IDPWG), Requirements Working Group (RWG), Security Working Group (SWG), and Thermal Event Sensing Working Group (TESWG) on an ad-hoc basis.

Primary CAC responsibilities are: facilitating the relationship between the Civil Community, the Department of Defense (DOD), and the Intelligence Community (IC); providing oversight of all Civil Community source collection and management; supporting National disaster response; representing and advocating civil requirements and interests in various DOD and IC forums; providing an inter-community forum for technology and information exchange; coordinating training for CAC member agency personnel; providing oversight for the Global Fiducials Library program; promoting civil use of Imagery Derived Products (IDPs); and ensuring Civil Community needs are considered and addressed in the design of future space architectures.

The CAC provides a forum through which Federal civil agencies coordinate data requirements, develop tasking strategies, certify proper use of data, and track and plan for the progress and evolution of National Systems. The CAC coordinates the use of imagery exploitation and



application resources and supports remote sensing research and development activities at special facilities, such as the USGS Advanced Systems Center (ASC). At these facilities, appropriate capabilities and exploitation tools are available for CAC members to use for end-to-end data processing and developing custom products. Through the CAC, arrangements can also be made for technical support from military and IC agencies.

#### **Data Acquisition and Management**

Through the National Civil Applications Program (NCAP), the USGS Eastern Region Geography (ERG) staff in the ASC assists the CAC by processing requests from member agencies for the acquisition of National Systems data. The team provides expertise for acquiring, receiving, archiving, and disseminating data in support of a wide variety of scientific investigations and mapping projects with unique requirements. Government and contractor personnel work together with customers to analyze these requirements, plan and coordinate support for submitting data requests, and acquire approval from appropriate authorities. Archive searches are also performed to locate existing data sources to meet project needs in addition to initiating new data collections. Upon receipt of data, USGS specialists perform a quality assessment to ensure that requirements are met, archive the data, and deliver a copy of the data to the requestor. The GFL is also managed and operated by staff at the ASC. As with other operations, this includes defining the sites and determining collection requirements in coordination with the CAC sponsoring agency, Domestic Imagery Request (DIR) generation, tasking and acquisition of data, archiving of data, and dissemination to library users.

[REDACTED]

[REDACTED] Regular participation in the Domestic Requirements Working Group is particularly important because most CAC requirements fall within the U.S. and its territories. Daily interaction with other Departmental Requirements Officers and specialized teams facilitates solving problems with imagery collections, production, and distribution while increasing awareness and knowledge of USGS staff. This improved coordination with other members of the imagery community results in higher success rates for competing and obtaining source on a non-interference basis with other agency requirements.

### **CAC Highlights**

**Department of Homeland Security Geospatial Enterprise Architecture (GEA) Task Force**  
From November 2003 through January 2004, Mr. Keith Elliott, the CAC Executive Director, was detailed to the GEA Task Force, participating in development of the Conceptual Business Model, Conceptual Data Model, Data Dictionary, Concept of Operations, and Conceptual Applications Model for the GEA.

**American Society of Photogrammetry and Remote Sensing (ASPRS) Classified Session**  
The CAC Executive Director served as the co-chair of a classified session held May 28, 2004, as part of the ASPRS annual conference in Denver, Colorado. The session included presenters from the Department of Defense, Intelligence, and civil communities, as well as from the private sector, and focused on applications of National Systems data and technology. The Civil



Community provided three presentations: (1) *Two Case Studies of the Use of NTM in Response* by Dr. Rosalind Helz and Mr. Ron Keeler of the USGS; (2) *United States Antarctic Topographic and Satellite Image Mapping, Airborne Direct Sensor System and Geodesy Program in Antarctica* by Mr. Jerry Mullins, Mr. Larry Hothem, and Mr. Richard Sanchez of the USGS; and (3) *Monitoring Hubbard Glacier Following the 2002 Closure of Russell Fiord, Alaska* by Dr. Bruce Molnia of the USGS. An estimated 75 people attended the session. Mr. Ben Ramey of the CAC Secretariat was named to co-chair the classified session of the 2005 ASPRS annual conference.

#### **Advisory Assistance to the Law Enforcement Working Group (LEWG)**

On August 19, 2004, Mr. Keith Elliott met with Mr. Tony Saputo of the LEWG Secretariat to discuss how the model for CAC operations might be applied to the LEWG. Mr. Elliott presented a draft working paper that outlined a potential approach for applying the CAC model to the LEWG. Copies of the working paper were also provided to the LEWG Chairman and the NRO Technical Advisor to the LEWG for review and comment. During 2004, the LEWG developed a proposal for the Law Enforcement National Systems Capabilities Application Program (LENSCAP). The CAC Secretariat reviewed and commented on the proposal, and will continue to work with the LEWG in 2005 to further develop the concept, including exploring how to integrate LENSAP activities with the CAC Blue Ribbon Study.

On December 10, 2004, the Civil Applications Committee hosted a meeting of the LEWG. Dr. Chip Groat, the CAC Chairman and Director of the USGS, provided the opening remarks. The LEWG is chaired by Mr. Dan Butler. The meeting included one Civil Community briefing by Mr. Dave Saghy of the USGS entitled *U.S. Geological Survey, Geography Discipline, Special Operations Support to Federal Law Enforcement*.

#### **CAC Membership**

In September 2004, the CAC Chairman sent a letter to Secretary Ridge formally inviting the Department of Homeland Security to become a member of the CAC and CAC ESG. This action was a follow-up to prior discussions with the office of the DHS Geospatial Information Officer regarding the possibility of DHS petitioning the CAC for membership. Though DHS was established in 2002, the U.S. Coast Guard and the Federal Emergency Management Agency have continued to maintain membership in the CAC as individual agencies pending a decision at the departmental level regarding broader DHS membership. As of December 31, 2004, a DHS response was pending.

In 2002, CAC representatives assigned from the DOT and HHS were absorbed into the new Department of Homeland Security. In October of 2004, the CAC Chairman sent letters to the Secretaries of Transportation and Health and Human Services requesting identification of new primary and alternate representatives to the CAC and ESG. HHS responded by designating a new representative to the CAC; however, attendance by the HHS representative is pending his receipt of an SCI clearance. As of December 31, 2004, a response from DOT was still pending.

#### **Blue Ribbon Independent CAC Review**

On September 15, 2004, Mr. Charlie Allen, the Assistant DCI for Collection, proposed to the CAC Chairman that a Blue Ribbon Independent CAC Review be conducted to evaluate the



future role of the CAC. The proposed review will re-evaluate the role of the CAC for continuing support to civil agencies and determine whether there is an appropriate role for the CAC for providing support to the law enforcement or homeland security communities. The Blue Ribbon Review panel will be co-chaired by Mr. Charlie Allen and Dr. Chip Groat, and be comprised of a Senior Steering Committee (SSC) and an Independent Study Group (ISG). The review is expected to be initiated in early 2005 pending the selection of the SSC and the ISG.

#### **CAC Executive Steering Group (ESG)**

On December 3, 2004, the CAC ESG was convened to discuss a Memorandum of Agreement (MOA) between NASA and the IC and to receive a briefing on the future role of the CAC in light of the proposed CAC Blue Ribbon Study. Mr. Frederick Gregory, the Deputy Administrator of NASA, argued that the Columbia Accident Investigation Board findings included a recommendation that NASA establish a direct relationship with the IC to ensure future manned space flight mission support. Mr. J. Steven Griles, the ESG Chairman, recommended that the MOA be considered an exception to the CAC charter and that a memorandum formally acknowledging the MOA as such be drafted and distributed to the ESG membership. There were no objections to Mr. Griles' recommendation.

As a follow-on to the NASA/IC MOA discussion, the CAC Chairman presented a briefing detailing the evolution and details of the proposed Blue Ribbon Independent CAC Review. He concluded his presentation by asking the ESG members for concurrence with the proposed approach. None present opposed the review. In fact, many of the members representing the civil, law enforcement, and Intelligence communities expressed an interest in participating in the review.

#### **Archive Document Review**

In July 2004, the Information Security Oversight Office (ISSO) reviewed the USGS Declassification Plan and noted that the historical value of Civil Community documents more than 25 years old must be assessed. During a subsequent review in September 2004, 400-500 documents related to the history of the CAC were evaluated by Dr. Joseph Baclawski and Mr. Richard McArdle because of their long association with the CAC. They determined that the documents in question deemed to have permanent historical value must be declassified by the original classification authority, which in this case is a member of the IC. As of December 31, 2004, those declassification efforts were still pending.

#### **Disaster Response**

During 2004, CAC members requested imagery in support of the following events:

Gurnee/Des Plaines, Illinois, Flooding	April 2004
Typhoon Sudal	April 2004
East Central Alaska Wildland Fire	June 2004
Hurricane Charley	August 2004
Hurricane Frances	August 2004
Florida National Wildlife Refuge Flooding	September 2004
Hurricane Ivan	September 2004
Hurricane Jeanne	September 2004



Peeks Creek, North Carolina, Flooding  
Pennsylvania Flooding  
Louisiana Coastal National Wildlife Refuge Flooding  
Typhoon Nanmadol

September 2004  
September 2004  
October 2004  
November 2004

#### **Participation in External Forums**

During 2004, the CAC participated in the following external forums to represent civil interests and advocate for civil requirements:

Domestic Requirements Working Group (DRWG)  
Future Needs Working Group (FNWG)  
Geospatial Intelligence Board (GIB)  
Geospatial Intelligence Council (GIC)  
Global Fiducials Working Group (GFWG)  
Imagery Policy and Security Committee (IPSCOM)  
Law Enforcement Working Group (LEWG)  
Mission Requirements Board (MRB)  
National Civil Applications Program (NCAP) Steering Committee  
National Security Space Office (NSSO) Environmental Working Group  
Operations Committee (OPSCOM)  
Overhead National Users Exchange Group (ONUEG)

#### **Document Reviews**

The CAC Secretariat is routinely called upon to facilitate Civil Community review of various policy and technical requirements, and advanced systems concept documents generated by Department of Defense (DOD) and Intelligence Community (IC) organizations. The nature of the reviews is to ensure inclusion of Civil Community requirements, identify opportunities for technology and information exchange, and ensure new or revised policies do not compromise civil use of National Systems data. When possible, the CAC Secretariat solicits review and comment by the CAC membership; occasionally however, due to prohibitively short deadlines for review and comment, the CAC Secretariat is unable to solicit member inputs. During 2004, the following documents were reviewed:

- Intelligence Community's Multi-Agency Acquisition Program (ICMAP) Capabilities Development Document (CDD) June 4, 2004
- NASA-Intelligence Community Memorandum of Agreement (NASA/IC MOA)
- National Civil Applications Program Strategic Plan and Vision 2010
- National System for Geospatial Intelligence – Geospatial Intelligence (GEOINT) Basic Doctrine, GEOINT Publication 1.1, June 2004
- Proposal for Tandem Mission with RADARSAT2, August 2004
- Unified Geospatial-Intelligence Operations (UGO) Framework
- UGO Concept of Operations for Unified Exploitation and Production

#### **Outreach**

Under the direction of the CAC Chairman, in 2004 the CAC Secretariat continued a robust outreach program to senior officials in the civil, DOD, intelligence, and Law Enforcement (LE)



communities. The objectives of the outreach effort were to enhance the visibility of CAC activities at senior levels across government; facilitate civil agency participation in development of a new commercial remote sensing policy; provide advisory assistance to the LEWG; and develop new relationships across government to begin the process of clarifying the role of CAC in support of homeland security activities. Significant CAC or CAC/NCAP sponsored meetings and briefings included:

- **February 23-27** – Members of the CAC secretariat participated in the National Space Game, Thor's Hammer, sponsored by the NRO
- **March 9** – Mr. Josh Dozor, Congressional staff of Hon. Kurt Weldon (D-PA)
- **March 12** – Mr. Chuck Lapinski, National Security Space Office (CAC support to Environmental Working Group)
- **March 12** – Mr. R.J. Thompson, Chief, EROS Data Center (Space Based Radar)
- **March 13** – Mr. Steve Wallach, Director, Analysis and Production, NGA
- **March 25** – Mr. Keith Masback, Director, Frontiers Office, NGA (CAC coordination of Civil Community future needs)
- **May 21** – Mr. Dan Butler, Executive Director, Air Force Office of Special Investigations and Chairman, Law Enforcement Working Group (CAC advisory assistance to LEWG)
- **June 16** – Mr. Frank Reeder, Intelligence Coordinator, and Mr. Mark Wallace, Watch Office, Department of Interior Office of Law Enforcement and Security (CAC support to DOI LE&S)
- **June 22** – Independent Strategic Advisory Group, Institute for Defense Analysis (CAC support to USNORTHCOM)
- **July 2** – Dr. Carter Morris, Deputy Assistant Director of Central Intelligence for Collection, and Mr. Randy Soderholm Community Management Staff Policy (NASA/IC MOA)
- **July 19** – Ms. Mary Sturtevant, Deputy Director for National Support, National Reconnaissance Office (CAC Briefing)
- **August 11** – Dr. Charles McQueary, Under Secretary, Science and Technology, Department of Homeland Security (DHS); Mr. Victor Tambone, Chief of Staff for Dr. McQueary; Dr. Joseph Kielman, Science Advisor, Science and Technology, DHS; and Mr. Steve Dennis, Deputy Director for Research and Development, Information Sharing and Collaboration Program, DHS
- **August 19** – Mr. Tony Saputo, Law Enforcement Working Group Secretariat, Office of the Assistant Deputy Director of Central Intelligence for Collection (CAC model for LEWG)
- **September 6** – The CAC Chairman conducted a courtesy call on the new NRO deputy Director for National Support (DDNS), Ms. Mary Sturtevant
- **September 15** – The CAC Chairman (Dr. Groat), the Deputy Assistant Secretary for Water and Science, Department of Interior (Mr. Tom Weimer, representing the CAC ESG) and the CAC Executive Director met with the Assistant Director of Central Intelligence for Collection (Mr. Charlie Allen), and his deputy Dr. Carter Morris to discuss the NASA/IC MOA
- **October 5** – The CAC Executive Director met with the Deputy Assistant Director of Central Intelligence for Collections (Dr. Carter Morris) to kick-off development of the



structure for the CAC Blue Ribbon Study

- **October 27** – The CAC Executive Director presented a CAC Overview briefing to the Staff Director, sub-committee staff directors, and other key staff members of the House Transportation and Infrastructure Committee

**Imagery Derived Products**

The CAC Secretariat was successful working with NGA and IPSCOM to secure a broad authorization for the USGS to create unclassified Non-Literal IDPs (line drawings) of earthquake related features of concern to the USGS Earthquake Hazards Program.

[REDACTED]

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

[REDACTED]

## CAC 2004 Monthly Meetings and Briefing Topics

<b>Jan</b>	Phased Array Weather Radar	Jack Hayes
	GeoSAR	Dave Howell
	CRSSP Civil Implementation Status	Greg Snyder
	NASA Earth Observing-One Project (B-Level)	

<b>Feb</b>	Palanterra	Mark Riccio
	NGA Requirements Process	Tom Apollonio
	SRT2 Analysis	Lou Fatale, Randy Swanson

<b>Mar</b>	Automatic Geo-Coregistration and Precision Change Detection	Nevin Bryant
	Computerized Operational MASINT Weather Advanced Concept Technology Demonstration (COMWX ACTD): An Update	Sandra Weaver
	NASIC Collaborative Analysis and Reporting System (NCARS)	Sandra Weaver

<b>Apr</b>	[REDACTED]	
	[REDACTED] Overview	Barbara Eckstein
	Utility of [REDACTED]	Caitlin Mullen
	[REDACTED] Study	Jack Foidl
	[REDACTED]	Jim Hickman
	[REDACTED]	Sam Barr
	Future System [REDACTED]	Jim Godfrey
	National Security Space Architect FY05 Program Assessment [REDACTED]	Jay Moody, Chuck Lapinski

<b>May</b>	<b>Special Session – Measurement and Signatures Intelligence (MASINT)</b>	
	Overview	Christy Stephens, Bruce Leiman, Jim Pugel
	NRO Systems	Scott Levinson
	Requirements System	Jim Walsh, Pam Serafino
	National Signatures Program	Ron Fleming
	Light Detection and Ranging	Bill Neuman
	[REDACTED]	Pam Serafino
	Geophysical	George Rothe
	Spectral, Electro-Optical	Frank Avila
	Materials	Bill Metzler
	[REDACTED]	Pam Serafino

<b>Jun</b>	<b>Special Session – Unmanned Aerial Vehicle (UAV) Technology and Applications</b>	
	Commercial Remote Sensing Space Policy Update	Greg Snyder
	Antiterrorism/Personal Protection – Foreign/Domestic	Mark Smith



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<b>Jun</b>	General Atomics – Predator and Altus Characteristics and Operations	Bart Roper
	Altus Cumulus Electrification Study (ACES) UAV Science Demonstration Program	Tony Kim
	Civil Applications for Global Hawk	Bill Walker
	UAV Payloads and Data Communications	Doug Burke
	[REDACTED]	Gina Otto
	Sandia UAV Experience	Tim Tooman
	Joint Precision Strike Program's UAV Efforts	Mike Hardaway
	NASA Future Plans	Tom Mace

<b>Jul</b>	No Meeting
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<b>Aug</b>	<b>Special Session – Coastal Applications</b>	
	Coastal Ocean and Hydrologic Applications of SAR	Bill Pichel
	Data Fusion in NOAA Coastal Mapping Programs	Chris Parrish
	Navy Applications of Remote Sensing	Robert Winokur
	Louisiana Wetlands Part 1	Jim Thomas
	Louisiana Wetlands Part 2	Kurt Roettiger
	National Ice Center Products	Kelly Taylor
	IDPs at the Coastal Services Center	Erik Hund
	USCG Port GIS Program	Ned Mamula
	Use of NTM Imagery for Assessment of Coastal Issues	Larry Handley
	Global Fiducials Program Status	Lawrence Friedl

<b>Sep</b>	<b>Special Offsite Session at the National Air and Space Intelligence Center (NASIC), Wright-Patterson Air Force Base, Dayton, Ohio</b>	
	Thermal Event Sensing Working Group Status Report	Paul Greenfield
	NASIC Overview	Gary Landers
	Sudden Spirit	Michael Coyle
	Terrorist Use of Space	Aaron Bonn
	RF Threat	Joseph Butler
	Laser Threat	Wendy Kunkle
	DE Overview	Col. Downs
	[REDACTED] Utility Assessment	Dr. Baker
	[REDACTED]	Greg Koesters, Jeff Treadway
	[REDACTED]	Bill Czyzewski
	[REDACTED]	Maj. Lee
	Tours: Advanced Processing Center (APC)/ Common MASINT Exploitation Tool (COMET)	

<b>Oct</b>	<b>Special Offsite Session – Advanced Systems and Technology Update</b>	
	Way Ahead	Scott Large
	JMO System Update	John McMahon, Dave Hampel

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<b>Oct</b>	DS	Jeff Detroye
	New Sys	Dan Long
	SB	Kurt Roettiger
	LAB	Vic Gonzales
	Emerging Systems	Kevin Brown
	Site Briefing and Tour	

<b>Nov</b>	<b>Special Session - Secure Communications Networks</b>	
	Proper Use Memorandum	Gregg Badger
	Global Fiducials Program Status	Lawrence Friedl
	Homeland Secure Data Network (HSDN)	Andy Newton
	Joint Worldwide Intelligence Communications System (JWICS) and Intelink	Nancy Starecky
	Government/Contractor Wide Area Network (GWAN/CWAN)	Alfred Smith, Matt Johnson
	Unified Geospatial-Intelligence Operations (UGO)	Mike Thomas
	Mitigation [REDACTED]	Barry Tilton
	Future ONIR Architecture Update	Scott Levinson

<b>Dec</b>	<b>Special Session - Light Detection and Ranging (LIDAR)</b>	
	Commercial Remote Sensing Space Policy (CRSSP) Implementation Update	Greg Snyder
	National Security Space Office (NSSO) Protection for Space Mission Assurance Architecture	Nicholas Eftimiades
	Special Bureau of Land Management (BLM) Project: Strategy for Detecting Unexploded Ordinance	Noah Yates, Dwight Hempel
	LIDAR - A Technology Ready for Intelligence/Military Operational Application	Rich Stammler, Larry Milton
	User Segmentation Methodology	Glen Schumacher, Timothy Heaps
	Thermal Event Sensing Working Group (TESWG) Status Update	Ed Harne



## Working Group Activities

### Global Fiducials Working Group

The Global Fiducials program collects and archives classified satellite images for globally-distributed, environmentally-representative sites. The images are preserved in the Global Fiducials Library. Current and future scientists and policy makers can use the imagery to identify decadal-scale changes and trends in environmental processes.

The Global Fiducials Working Group (GFWG) made progress in developing the Library in 2004 and identifying candidate sites that would improve the global-representation of the imagery in the Library. Primary activities in 2004 focused on validation of the proposed sites that agencies selected as priorities (a.k.a., Phase 1) and identification of additional sites to boost the Library's global and ecosystem representation (a.k.a., Phase 2).

A significant activity the GFWG pursued in 2004 was the coordination of a workshop to identify cryospheric sites (e.g., glaciers, ice sheets, ice shelves, sea ice) as part of Phase 2. The NSF sponsored the workshop and the USGS organized the three-day event. In June 2004, 12 cryospheric scientists from academia and government met to discuss and identify globally-important sites. While the Library glacier sites focused on North America, the workshop identified important glacier sites on all continents, except Australia and the Arctic. GFWG members participated in the workshop and identified improvements for future workshops.

Significant progress in 2004 focused on the establishment of collection parameters for Phase 1 sites. Specific achievements include:

- Completed regular collection on all 26 sites associated with NSF priorities
- Began collection of 16 sites associated with EPA priorities (remaining 15 are in validation process)
- Completed data collection parameters for 8 US USACE sites (validation in 2005)
- Continued work on establishing data collection parameters for 46 NOAA sites
- Continued collection on 56 sites associated with the National Park Service
- Increased the number of USGS sites in regular collection from 32 to 39

The GFWG met numerous times in 2004 and made one formal presentation to the Civil Applications Committee in November 2004. The GFWG reported on Phase I progress, presented results from the cryosphere workshop, and received guidance to continue with future workshops to improve the global distribution of sites.

In 2004, the GFWG Fiducials Classification Guide was approved. The Classification Guide provides guidance on the classification of terms, figures, activities, etc. related to the program, including derivative references. The GFWG uses the Classification Guide to refer to the Global Fiducials Program appropriately and prepare workshops, Library description materials, and site selection materials.

### Emergency Response Working Group

No meetings were held.



**Imagery Derived Products Working Group**

No meetings were held.

**Requirements Working Group**

No meetings were held.

**Security Working Group**

No meetings were held.

**Thermal Event Sensing Working Group**

In 2004, a new CAC working group was established to address civil thermal event sensing requirements. The Thermal Event Sensing Working Group (TESWG) has the charter to gather civil thermal event sensing requirements and work in concert with the DOD. Civil thermal event sensing requirements would include detection and measurement capabilities such as the ability to detect and monitor wildland fires.

**Member Agency Activities**

**U.S. Department of Agriculture**

USDA agency missions continue to benefit from the use of National Systems data for emergency response, natural resource inventory and monitoring, mapping, development of conservation measures, and land management support. Applications during 2004 include:

**Forest Service**

The Forest Service is responsible for mapping all National Forest lands. One of the critical steps in the mapping process is to obtain ground control point coordinates in order to accurately reference the map to a world coordinate system. The Forest Service typically uses Global Positioning System (GPS) technology to collect control by physically visiting field sites. In remote locations, such as wilderness areas, GPS field crews are prohibited from using motorized vehicles and can spend weeks hiking to the required locations to take the needed measurements. The Forest Service has tested and obtained approval for a technique to collect control that eliminates the need to visit these remote field sites. In 2004, this technique was used on five projects. In each case, surveyors obtained control for the accessible portions of the project, and the new technique was used where control was needed in remote wilderness areas and in glacier-covered mountains.

In addition to collecting control as described above, the process of control extension can be used to generate control locations based on a minimal number of field-surveyed control points. As part of the National Digital Orthophoto Program, the Forest Service is responsible for creating and maintaining digital orthophoto quadrangles over National Forest lands. In support of this activity, three control extension projects were completed in FY04, covering approximately 9,000 square miles and saving field personnel over \$120,000 in surveying costs during the year.

[REDACTED]



[REDACTED]

During the 2004 fire season, 65,878 fires burned 8,094,531 acres. Of these totals, 707 fires, covering 6,645,978 acres were in Alaska (figures are from the National Interagency Coordination Center's 2004 wildland fire statistics, 30 December 2004).

**Other Activities** – The Forest Service is directed by Congress to perform a National Forest Inventory and Analysis (FIA) for all lands within U. S. borders, and to develop a strategy to incorporate remote sensing and other advanced technologies into this analysis. The benefits of National Systems data to support inventory and monitoring applications have been studied by the agency in previous years, with satisfactory results. In 2004, selected sites in Interior Alaska were imaged and statistical information such as forest/non-forest, tree type, health, etc. was derived for 200 new permanent measure plots from those images, and approval was obtained for non-literal IDPs. The products will be used to supplement other plot data collected by field personnel in more accessible locations. With an average cost of \$4,000 per plot in Alaska, this activity saved field personnel over \$800,000 in data collection costs. In addition, all of these plots were in areas that were difficult and/or dangerous to access.

Imagery was collected of the continuing Spruce Bark Beetle outbreak in the South-Central Alaska area (Kenai Peninsula). The combination of warm winters and extent of the host tree species has lead to mortality in the white spruce forest type on a landscape level. Initial analysis of the imagery has yielded some promising results for land managers.

### **Department of Commerce**

#### **National Geodetic Survey**

The National Geodetic Survey's Remote Sensing Division increased demand for National Systems data during 2004 due to recently initiated outsourcing activities. Eight coastal mapping projects were initiated in 2004 primarily to meet the needs of outsourced Alaska projects. Two exceptions were the Bellingham Harbor (Washington) project and the Swains Island (America Samoa) project. Acquiring National Systems data for Swains Island resulted in the ability to upgrade the 1939 Astronomical horizontal datum to the more accurate 1984 World Geodetic System datum (WGS 84). The difference between the two datums resulted in a significant horizontal shift, creating new international boundaries.

#### **National Marine Fisheries Service**

The National Marine Fisheries Service (NMFS) is making use of overhead imagery to study Chinook salmon habitat along the Sacramento River between the Delta and Shasta Dam to identify diversions and other factors in the river and examine change in the riparian zone along the river. Overhead imagery was collected June 22, 1999, exploited by the Naval Oceanographic Office, and declassified in 2002. Since 2002, the NMFS office in Santa Rosa, California has used this imagery. Overhead imagery of the Sacramento River between Sacramento and Keswick Dam also was collected in 1999. Additionally, overhead imagery from the early 1990s was acquired from the archive. However, this imagery has been exploited.



In September 1998, a massive dredging project was completed in the Atchafalaya River Delta creating new wetlands habitat in coastal Louisiana. Imagery has been acquired for September 1995, 1998, 1999, 2000, 2001, 2002, 2003, and 2004. The imagery has been exploited by the USGS to determine shorelines and areas of accretion and erosion from year to year. IDP approval has been obtained and products have been produced. The project was presented at the Federal Reconnaissance Users Conference at the NRO in 2002, the GeoTools Conference in South Carolina in 2003 and to the CAC membership in 2004. Effort is continuing on this project with Coastal Wetlands, Planning, Protection, and Restoration Act (Breaux Bill) funding and is directed at improving shoreline delineation and land cover classification. Similar studies also under the Breaux Bill are continuing on East Timbalier Island, an island along the Louisiana coast that is badly eroding in spite of efforts to protect it.

#### **National Ocean Service**

The NOAA Coastal Services Center (CSC) used National Systems data in 2003 to support National Marine Sanctuary (NMS) visitor use. Data were acquired for the Gray's Reef NMS, located 20 miles east of the Georgia coast, and the Flower Garden Banks NMS, located off the coasts of Texas and Louisiana. Fifty four Imagery Derived Products (IDPs) were produced from the imagery. The sanctuaries management and research studies plans focus on the long-term status of fish populations, benthic invertebrates, oceanographic conditions, sediment transport, benthic habitat, and visitor use. A boat census was performed for each sanctuary using National Systems data and Coast Guard Auxiliary flight observations to detect seasonal variations in visitor use.

#### **Federal Emergency Management Agency**

The FEMA mission, as part of the Department of Homeland Security, is to reduce the loss of life and property while protecting our nation's institutions from all types of hazards, caused either by natural disasters or from terrorist assaults. FEMA accomplishes this task through a comprehensive, risk-based emergency management program of preparedness, prevention, response, and recovery.

Since its creation, FEMA has responded to hundreds of disasters in all 50 states, Puerto Rico, Guam, the Pacific Island Trust Territories, and the U.S. Virgin Islands. FEMA reacts quickly when it becomes clear that a hurricane or other potentially catastrophic disaster is about to occur and equipment, supplies, and people are pre-positioned in areas likely to be affected. In other situations, when disasters such as tornadoes or earthquakes occur without warning, FEMA must respond immediately with staff and supplies, and determine if other federal agencies are required. FEMA will also lead the national response to any sort of biological or radiological attack. FEMA will facilitate and coordinate the involvement of other federal response teams in the event of a major incident or incident of national significance. FEMA also manages the federal government's national response and recovery strategy. While the disaster response phase is quick and dramatic, the recovery phase is often long and painful. Communities and individuals must cope with great loss. In some disasters, entire towns have been virtually destroyed. In others, the community survives but residents lose everything they own. FEMA will lead the nation's recovery from catastrophes and help minimize the suffering and disruption caused by disasters.



During 2004, eight requests for the use of National Systems data were submitted by FEMA to aid in responding to emergencies. All events were natural in cause that included extensive wind and water damage resulting from tropical cyclones (hurricanes and typhoons) and severe storms.

### **U.S. Coast Guard**

The United States Coast Guard is a military, multi-mission, maritime service and one of the nation's five Armed Services. Its mission is to protect the public, the environment, and U.S. economic interests in the nation's ports and waterways, along the coast, on international waters, or in any maritime region as required to support national security. The Coast Guard's five operating goals – Maritime Safety, Protection of Natural Resources, Maritime Mobility, Maritime Security, and National Defense – define the focus of the service's missions and enable it to touch everyone in the United States.

The Coast Guard's military structure, law enforcement authority, and humanitarian function make it unique within the government and enable it to support broad national goals. It is well positioned to be the first on scene bringing the right people, the right equipment, and the right partnerships to respond to any emergency. The Coast Guard continues to benefit from the use of National Systems data in support of Coast Guard missions. The Coast Guard continues to benefit from the use of national systems for all of our service missions to include emergency response and maritime security. Some of these benefits are described below:

**Search and Rescue** – The U.S. Coast Guard is best known worldwide for its search and rescue (SAR) expertise, which dates back more than 200 years to the earliest days of the Revenue Cutter Service and Life-Saving Service. Despite the nation's best efforts to prevent maritime accidents, the Coast Guard responds to about 60,000 emergency calls and saves nearly 5,000 lives annually. Historically, the Coast Guard's SAR response involves multi-mission stations, cutters (ships), aircraft, and boats linked by communications networks. The National SAR Plan divides the U.S. into regions, with the Coast Guard acting as the maritime SAR coordinator. To meet this responsibility, the Coast Guard maintains facilities on the East, West and Gulf coasts; in Alaska, Hawaii, Guam, and Puerto Rico; and on the Great Lakes and inland U.S. waterways. Today, the Coast Guard Intelligence Coordination Center (ICC) often augments SAR response efforts with National Systems, as appropriate, to refine large search areas for quicker response times to help prevent loss of life at sea.

**Maritime Port Security** – Worldwide, maritime cargoes and vessels are increasingly targeted by organized criminal conspiracies or individuals involved in alien smuggling, cargo theft, drug smuggling and terrorism. Exploiting weaknesses in port security is central to these crimes. The associated costs reduce the competitiveness of those affected, including the ports. So long as threats to trade exist, port security will remain as essential to port operations as cargo and good labor relations. Traditional views of port security responsibilities must be expanded. A complex transnational set of security issues threaten the maritime industry and the movement of cargo in international trade. Those threats include terrorism, piracy, smuggling of stowaways and drugs, cargo theft and fraud, bribery, and extortion. Sea robbery provides an excellent example of the complexity of port security issues. The nature of sea robbery necessitates that port security controls include both the waterside and the land side access of ports. The use of National imagery plays a vital role in ICC support to this mission. Although commercial imagery can be

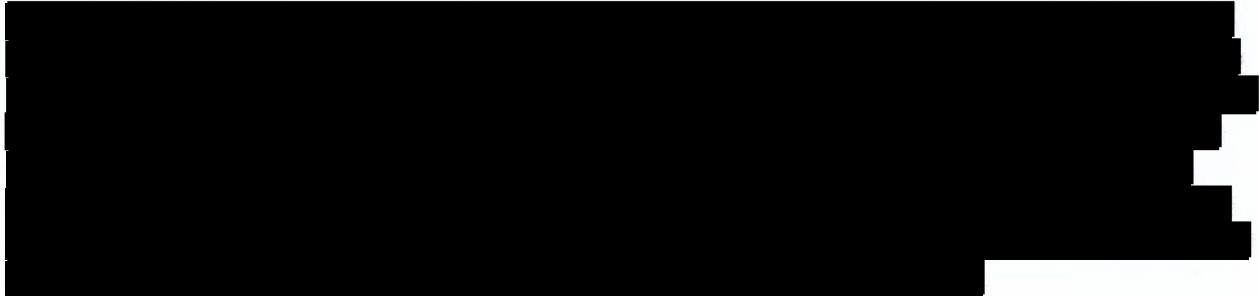


an effective force multiplier, in most cases it is not timely enough to satisfy urgent requirements for force protection and situational awareness. When organic assets are unavailable or not adequate to satisfy security requirements, exploiting National assets can mean the difference between operational success and failure in locating and identifying potentially dangerous cargoes/vessels.

## **Department of the Interior**

### **Bureau of Land Management**

BLM is responsible for managing 164 million acres of public land, primarily in the West and Alaska. BLM has used National Systems data as one of its natural resource mapping and assessment tools since 1994. Starting with mapping wetlands, BLM use of National Systems data expanded to support other activities. However, in recent years some traditional uses of this data, such as hydrographic meander line mapping, has diminished as commercial high-resolution satellite imagery has become available. Unfortunately, commercial high-resolution satellites cannot fully match all the capabilities of National Systems data, and the Bureau continues to exploit the unique capabilities provided by these high tech tools. Below is a summary of major BLM activities involving the use of National Systems data in 2004.



**Bering Glacier** – BLM has used National Systems data to monitor the environment around the Bering Glacier for over seven years. The objectives of these activities include; a) delineate and monitor glacier forelands and ice margins, b) monitor beach side and ice erosion, c) identify and assess existing and potential anadromous fish habitat, d) identify Dusky Canada Geese habitat, e) monitor and assess seal populations, and f) assess hazards for recreation and transportation. As a result of these activities, BLM, along with the USGS, and with input from the Intelligence Community, has developed procedures and techniques to accurately map and measure subtle changes and movement of earth and ice masses. National Systems data have played an important role in enabling BLM to understand and monitor this unique environment.

**National Petroleum Reserve-Alaska** – The National Petroleum Reserve-Alaska (NPR-A) is an Indiana-sized area on the North Slope of Alaska that is the center of increasing interest for the production of oil and natural gas. Numerous leases have been issued for exploratory drilling and more are slated for sale. Although new drilling technology minimizes the impact on the environment, this delicate ecosystem requires continued monitoring to evaluate the effectiveness of our environmental policies. National Systems data provide unique capabilities for year-round environmental monitoring and are important tools that allow BLM to validate the guidance it provides to oil and gas companies.



**Trans Alaska Pipeline** – One new activity in 2004 included BLM support for a vulnerability assessment of the Trans Alaska Pipeline (TAP). As the Lead Federal Agency in charge of TAP oversight, BLM conducted an environmental assessment of the area surrounding the detonation of a section of pipe similar to that used to construct the TAP. The detonation was conducted to simulate an attack on the TAP.

#### **U.S. Geological Survey**

The USGS Volcano Hazards Program, in collaboration with the Advanced Systems Center, made significant use of National Systems data in support of program activities at domestic volcanoes, and continued surveillance of foreign volcanoes of particular interest to the Volcano Disaster Assistance Program (VDAP). Principal activities in 2004 included:

(1) Provision of information [REDACTED] in support of the Volcano Hazards Program response to the eruption of Mt. St. Helens volcano (Washington), which began erupting on October 1, 2004, after being dormant since October 1986. Similar support was provided for the second eruption of Anatahan Volcano in the Commonwealth of the Northern Marianas. This volcano, after being dormant for over 400 years, began its present period of heightened activity in May 2003. Both volcanoes pose health and safety hazards to the surrounding areas.

(2) Generation of literal imagery derived products for a number of volcanoes in the Aleutians (Alaska) and in the Cascade Range (Oregon and Washington) in support of mapping for volcanic hazard assessments at those volcanoes.

In addition, the following restless U.S. volcanoes were monitored intermittently with National Systems data in 2004: Veniaminof (minor ash plumes), Shishaldin (steaming, earthquake swarms), Okmok, Mt. Spurr (melting of ice in summit crater), Iliamna (large avalanche), all in Alaska, plus Three Sisters (OR) and Mauna Loa (HI).

The Volcano Hazards Program continued to monitor eruptive activity or unrest at the following volcanoes, on behalf of the VDAP: Nyiragongo (Democratic Republic of the Congo – active summit lava lake); Tungurahua (erupting), and Cotopaxi (unrest) in Ecuador; Colima (Mexico – phreatic explosions), Galeras (Colombia – minor Strombolian activity), Awu (Indonesia – dome extrusion).

#### **U.S. Army Corps of Engineers**

The Topographic Engineering Center (TEC) represents USACE on the CAC. TEC also participates in the activities of the Global Fiducial Working Group. A DIR for natural disaster damage assessment was submitted and approved in Sept 2004. Numerous IDP's were produced during CY2004 using Approved Technique ID 97-16. Efforts to collect, validate, and update the USACE Global Fiducials Site List continue. A non-literal Image Derived Product (NLIDP) was approved during CY2004 for the production of high-resolution digital elevation models (DEM), and another NLIDP was submitted seeking approval for GIS digital data extraction from an additional source.

#### **U.S. Environmental Protection Agency**

The EPA continued to use National Systems data to support environmental research applications. The EPA's Environmental Photographic Interpretation Center (EPIC) is the Agency's lead for

exploitation and analysis of National Systems data and continued to provide scientific expertise to EPA customers and assistance to other civil and IC agencies. EPA, through the leadership of the CAC, utilized National Systems for the following projects:

- Accuracy Assessment – An Accuracy Assessment of land use and land cover change, derived from 1990 and 2000 National Land Cover Data (NLCD), was performed by USGS personnel at the ASC under an Interagency Agreement with EPA. Three hundred points, including several no-change points for quality control, were evaluated using National Systems data. The results are used to fulfill formal quality control requirements for the NLCD program and provide input into future land use and land cover change research.
- Global Fiducials Program – EPA continued to be an active participant in the GFP, providing over 30 sponsored sites to the program. EPA assisted in the planning of scientific workshops for the peer-review of current and future sites in the program.
- Other IC Community Involvement – EPA has taken advantage of several educational opportunities within the IC by attending classes in data processing and information technologies.

#### **National Science Foundation**

NSF continues to participate in the GFP and the GFWG. Over one hundred sites are under active consideration by NSF for sponsorship. The 26 LTER program field sites, which include two in the Antarctic and one in the Arctic, are of principal interest and are active. In June 2004, a workshop was jointly conducted with the USGS to develop the scientific rationale to define collection parameters for Phase 2 sites related to glaciers and periglacial environments. The three-day event, which included 12 cryospheric scientists from academia, government, and the private sector, was held at the USGS National Center in Reston, Virginia.



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