

NATIONAL IMAGERY AND MAPPING AGENCY

EDGE

GUARANTEERING THE INFORMATION EDGE
APRIL 2001



Introducing GI21

see page 12...

Contents

- 4 Systems Engineering Graduate Program Begins
- 5 New Office of the Americas Is NIMA's Future
- 6 NIMA and LizardTech Inc. Sign CRADA
- 7 Kathy Buono: New CRADA Program Manager
- 8 How USIGS Will Meet Challenges of 2010
- 10 Enterprise Resource Planning Comes to NIMA
- 11 Intelligence Community Lawyers Meet
- 12 Now Showing: New GI Centers of Excellence
- 19 Don't Misuse our AIS Assets
- 21 The Puck Stops in St. Louis
- 22 Navy Names Ship for Mary Sears, Oceanographer

Departments

- 9 Our Programs: Savings Bonds Drive
- 20 Accolades: Individuals Honored by DoD, NIMA

On The Cover

A new symbol designed by Jodi Stiefvater captures the focus of the Geospatial Information and Services Office's new organization -- "Geospatial Information That Makes the Difference." To keep America strong and free, NIMA customers depend on an endless variety of geospatial information and services, as the images surrounding the new symbol suggest. It could be data to guide troop movements, new products of unprecedented accuracy derived from space shuttle data, aim points for a B-2 mission, or Digital Nautical Chart (DNC®) to help an icebreaker research vessel cut through the Northwest Passage. Linda Miller designed the cover based on a concept developed by GI's Kelley Dunkelberg, Kyle Simon and Howard Cohen; these three also guided the standup presentation that begins on page 12.

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COMMAND POST

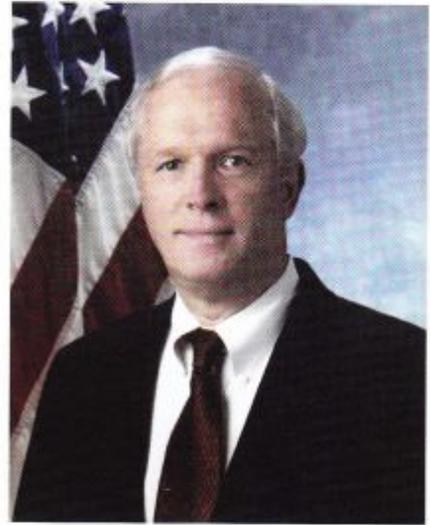
Our Director, LTG King, is traveling overseas as this issue goes to press, so I have been given a welcome opportunity to share a few words with you in this month's Command Post. This comes at the time of year when we are preparing for the annual round of budget discussions within NIMA and with our Executive Branch overseers and Congressional oversight committees. The best part of the process, for me, is that we are prompted to reflect on what NIMA has achieved in the past year. We do this so that we can best describe our accomplishments and priority needs to those who provide us our resources for future programs.

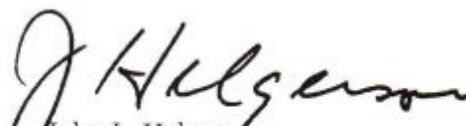
I want to share with you my feeling – and pride – that our Agency recently achieved a number of concrete and even dramatic successes as we pursue the goals of our strategic plan. We really have enhanced information available to our customers, improved USIGS capabilities for our user partners, and strengthened our workforce and infrastructure to ensure future mission success. As examples, consider this list of victories.

- Geospatial data on JWICS, intelligence reports posted on Intelink, hits on NIMA's web sites, and the amounts of data downloaded have all grown rapidly. Word is getting around – users know where the pay dirt is.
- The NIMA Office of the Americas has been established. This new organization represents the first integrated management and production site of its kind where imagery analysts and geospatial analysts are collocated in an effort to provide robust information products. On a larger scale, we have established a program office to bring about the collocation of East Coast operations elements in Bethesda, paving the way for greater long-term collaborative work.
- The National Imagery Exploitation System has been successfully deployed at Joint Forces Command, Pacific Command and European Command. We have also deployed more than 175 imagery product libraries (IPLs) in a wide variety of locations. These deployments are key milestones in our effort to guarantee America's warfighters information superiority and decision dominance.
- The USIGS Requirements Process has been overhauled. We have consolidated the efforts of offices that formerly worked independently and created a faster, more focused process that involves the customer through our newly created USIGS Requirements Council. We have just finished a major re-baselining of much of our program, to the positive reviews of almost all of our key customers.
- NIMA College has won full accreditation. Achievement of this goal is recognition that NIMA's investment in training, which increased almost fivefold since standup, has paid off. And we have brought on board a substantial number of highly qualified new imagery analysts and acquisition officers to strengthen NIMA in key mission areas. We are indeed preparing both our workforce and our customers to succeed in the 21st century.

Not long ago I had a unique opportunity to brief Vice President Cheney on NIMA's key programs and accomplishments, using some of these and other classified examples. He was clearly impressed with our enhanced capabilities to support warfighters and policymakers, and I was proud to be able to tell our story.

We should all pause occasionally to reflect on the enormity of what our Agency has accomplished. Be proud of what we have done, and build on it for the future. We really are guaranteeing the information edge.




John L. Helgerson
Deputy Director

SEGCP Provides 'Exceptional Opportunity'

by Carl Townsend

The Acquisition and Technology Directorate (AT) has joined with the Systems Engineering Occupation Council (SEOC) in sponsoring a graduate program in systems engineering.

The objective of the Systems Engineering Graduate Certification Program (SEGCP) is to provide a voluntary means for NIMA employees to improve their fundamental knowledge and skills in systems engineering through graduate-level education from an accredited institution. Dr. Howard Eisner of the Engineering Management and Systems Engineering Department in the School of Engineering and Applied Sciences at the George Washington University is conducting the program, which is being funded by AT.

The curriculum of the SEGCP consists of six systems engineering core courses across two years. One 12-week course will be taken each semester, one day a week after work. The first class, comprised of 35 students, began Feb. 6 in Reston.

The SEGCP provides benefits to employees and NIMA. The employees gain essential systems engineering skills, knowledge and the opportunity to improve their performance and contribution to the Agency. NIMA benefits from the organizational programmatic contributions of a more competent and skilled systems engineering team.

"Instituting this program responds to a NIMA Commission recommendation to improve our systems engineering and acquisition competency," said Dr.



Photos by Kerry Gilbert

Bill Allder, Deputy Director for Acquisition and Technology, welcomes the first class in the Systems Engineering Graduate Certification Program.

Thomas Holzer, deputy chair of the SEOC and deputy chief systems engineer of the U.S. Imagery and Geospatial Information Service (USIGS).

"The SEGCP will provide NIMA and its employees an exceptional opportunity to bridge the gap in qualified systems engineers," he said.

"The need to improve systems engineering competency can be a touchy subject. For this reason, it is often avoided, and for this very reason, it is worthy and worthwhile to take tangible actions to address it," said USIGS Chief Systems Engineer Barry Barlow. "The SEGCP

attacks this issue head on, and it provides the foundation for NIMA to both incrementally and radically improve our processes, our personnel and our end product."

The first cohort was selected from a pool of 50 applicants from the Washington area who responded to a course announcement last fall. The applicants and those selected are from AT, the Directorate of Operations and the Directorate of Information Systems. Senior representatives from these directorates formed the panel that developed the rating and ranking criteria, reviewed the applicants and made the final selections.

About the Author

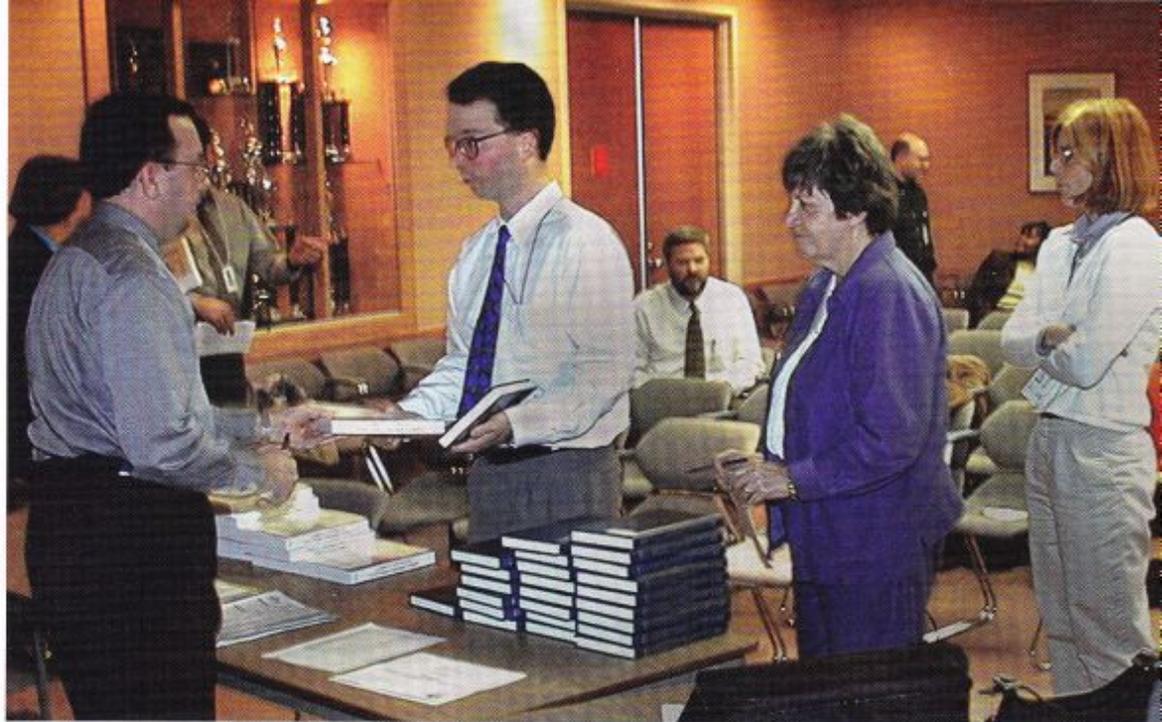
A former cartographer, Carl Townsend worked 16 years in the geospatial information offices of the Defense Mapping Agency and NIMA. In January, he earned his master's in computer science after completion of long-term, full-time training. Now the program manager of the Systems Engineering Graduate Certification Program at NIMA among other duties, he is a systems engineer in the USIGS Systems Engineering Division (ATSE).



A second cohort is planned for fall. The program will expand to include St. Louis employees. The Occupation Council is currently identifying and evaluating schools and systems engineering programs available to St. Louis personnel. St. Louis and Washington area employees should watch for a course announcement in late July.

The six SEGCP courses constitute half a master's degree program in engineering management and systems engineering. Courses cover systems engineering and analysis, program/project management, engineering economics, and analytical decision making. Students successfully completing

the two-year program will receive a graduate certificate in systems engineering. They will then have the option of applying for admission into the master's degree program. Some students who already have a master's degree may be eligible for admission into the doctoral program. *



Carl Townsend registers students for the Systems Engineering Graduate Certification Program on the first night of class. From left are Tom Skelly, Elizabeth Krebs and Michele Motsko.

Establishment of the Office of Americas - NIMA's Future

"NIMA's dominance as an imagery intelligence and geospatial information provider is critical to our Nation achieving information and decision superiority in the 21st century," the Director, LTG James C. King, said in a message to the workforce March 29.

"In order for us to continue our transformation I have decided to establish the Office of Americas under the Directorate of Operations (DO)," King said.

The Office of Americas (AM) will combine imagery, geospatial and support elements from across the Agency. Its mission is to integrate and fuse imagery and geospatial information to achieve NIMA's vision of guaranteeing the information edge.

"This Office will establish the future organization for NIMA," King said. The Director selected William Carruthers, formerly Associate Director for Strategic Initiatives in the Geospatial Information and Services Office (GI), as Director of AM and Steve Davila, formerly Chief of the Strategic Issues Division in the Imagery Analysis Office (IA), as Deputy Director of AM.

CORRECTION

The team members who provided on-the-scene support to security forces during the presidential inauguration were mostly from the Integrated Program Office (IPO). These include Al League, Chief of IPA - the Applied Technology and Process Innovation Division, and team lead Stacy Mayse of IPAE, the Exercise, Experiment and Demonstration Branch. The others are as follows: from IPAE, Elizabeth Crews, Rick Dille, Tom Hersey, Damien Kerr, Michael Lenihan, Jim Luzius and Mike Thomas; from IPAA, the Applied Technology Branch, Dave Berg; from IPAB, the Bethesda Branch, Denise Filkins and from IPAS, the St. Louis Branch, Marsha Mocaby, Jeff Reichman and Mark Tatgenhorst. Todd Cummings is NIMA's technical representative to the Secret Service, Marzio Dellagnello is assigned to the Geospatial Information and Service Office's Eurasia Center (GIE) and Chris Riopelle works in the Office of the Americas (AM).

NIMA and LizardTech Inc. Sign CRADA To Investigate Use of Image Compression

by George Tabora
Geospatial Information and Services Office

NIMA and LizardTech Inc. (LTI) have signed a Cooperative Research and Development Agreement (CRADA) to investigate use of the image-compression and server technology of LTI's Multi-resolution Seamless Image Database (MrSID). The investigation will be conducted in both the NIMA production and customer operational environments until December 2002.

NIMA's principal investigators for the CRADA are NIMA staff officer Gary Hacker of the Information Services Directorate and geospatial analyst George Tabora of the Geospatial Information and Services Office's Middle East/Africa Center (GIF). Kathy Buono, an imagery and geospatial scientist in the Directorate of Acquisition and Technology's Advanced Research and Development Division (ATTR) manages NIMA's CRADA program. (See related article.)

The CRADA between NIMA and LTI is a win/win opportunity for both. LTI will benefit by gaining access to NIMA's expertise and testing environment, with the potential to enlarge the customer base for its products. NIMA will benefit by having a collaborative environment for possibly influencing the development of LTI's technology to meet NIMA's requirements and further improve customer support.

"We are looking forward to this partnership," said John Grizz Deal, LizardTech's president and chief executive officer. "NIMA will provide additional top-level testing and development environments to apply our products to real-world situations."

Potential technology benefits for NIMA include increased storage capacity, a reduction in the size of raster data sets and reduced transmission times of raster information over NIMA's dissemination networks.

Shane Lehman, a member of the NIMA research team, commented, "Lizard Tech's MrSID image encoder offers a robust COTS (commercial off-the-shelf) solution to NIMA's enormous raster data demands as well as a format that is widely accepted by the GIS (geographic information system) and image-processing communities and vendors. By investigating this technology through a CRADA,



Photos by Rob Cox

William Alder, NIMA Deputy Director for Acquisition and Technology (left), and Robert Libutti, Chairman of the Board for LizardTech, sign a CRADA to investigate LizardTech's image-compression and server technology. Standing are George Tabora, NIMA principal investigator (left), and Walt Wiley, LizardTech government solutions manager.

issues such as accuracy and image quality can be quantified."

The CRADA is divided into three main tasks, which will be shared by GI, IS, the Integrated Program Office (IP) and AT's Analysis and Control Division (ATSA). Many NIMA imagery analysts, geospatial analysts and information services specialists will participate in the testing and evaluation.

The tasks are as follows:

Task 1. Read NIMA standard raster file formats with MrSID encoding/image-compression applications (i.e. MrSID Publisher) and investigate the potential for tailoring MrSID's compression format to present NIMA raster products. Raster file formats will be tested for the National Image Transmission Format (NITF), Controlled Image Base (CIB), 11- and 16-bit GEOTIFF, ARC Digitized Raster Graphics (ADRG) and ERDAS Imagine's ".img."

Task 2. Assess the image quality and geospatial positional accuracy of NIMA information that has been compressed by MrSID's technology. ATSAI will perform an image-quality assessment



Members of the LizardTech/NIMA team are seated, from left, Gary Hacker, Walt Wiley (LTI), George Tabora and John Rourke (LTI). Standing, from left are Mike Utterback, Shane Lehman, Brian Snyder, Leigh Harrington, Mike Noderer, John Tierney, Andrew Bower, Steve Balik, Steve Kremer, Kathy Buono, Heath Rasco, Marc Hunter, Tom Hersey and Alex Spalding. Not pictured are Mike Zimbleman, Dave Couch, John Geskermann, Jeff Reichman, Bill Burley and Craig Ackermann.

using the National Imagery Interpretability Rating Scale (NIIRS), and geospatial analysts in GI and IP will perform the positional accuracy testing.

Task 3. Assess the MrSID image Web server and Web client software for effectiveness in delivering raster information over intelligence

community and DoD networks. The Information Services Directorate will test LTI's server technology on NIMA Gateways. *

Gary Hacker and Kathy Buono contributed to this article.

Kathy Buono Named NIMA CRADA Program Manager

Kathy Buono has been appointed NIMA Cooperative Research and Development Agreement (CRADA) program manager in the Acquisition and Technology Directorate's Advanced Research and Development Division (ATTR).

CRADAs are a means to pursue joint research goals with industry and academia and encourage technology transfer between the government and the private sector. Buono works with industry partners and NIMA personnel in bringing the two together to collaborate on research projects that are mutually beneficial to both parties.

"I am really enjoying my new position," she said. "It is very exciting to be working on R&D that can potentially improve NIMA's ability to provide our customers with the information they need or that could solve NIMA problems."

Buono's most recent position was as Earth-Info project manager in the Acquisition and Technology Directorate's National Technology Alliance Division (ATTN). The results of that project can be seen on the Internet at www.earth-info.org,

where the public can access imagery and geospatial information produced by NIMA and others.

Buono began her career in 1983 as a bathymetric analyst in the Defense Mapping Agency's Scientific Data Department. She was later a requirements analyst for the Area Requirements and Product Status (ARAPS) program, contracting officer's technical representative for the modernization program's Data Integration Segment (DI/S), Outreach Office briefer, and Lab Infrastructure division chief.

Originally from Barlow, Ohio, Buono earned her master's in geography with a certificate in cartography from Rutgers University and bachelor's in geography with a minor in economics from the University of Cincinnati. *



How USIGS Will Meet Challenges of 2010

by Paul Mich

The 2010 Concept of Operations (CONOPS) for the United States Imagery and Geospatial Information Service (USIGS), released by the Director last October, implements the principal thrusts of Joint Vision 2010 and 2020, as well as the Strategic Intent of the Director of Central Intelligence.

This document provides a description of USIGS operations from the customer's perspective. It addresses concepts whose implementation will enable the USIGS to provide the full range of national, military and civil customers - at every level and echelon - with the imagery and geospatial information component of a common operating picture needed to achieve information superiority in 2010.

In the USIGS 2010 CONOPS, NIMA and the Community have an outline of how to meet the challenges of the 21st century through the collective use of intellectual and technical innovation. The document provides a conceptual template, context, and common direction with which to develop supporting operations concepts and architectures for the future.

The USIGS 2010 CONOPS should be used by USIGS members as the point of departure for the development of future imagery, imagery intelligence and geospatial information support strategies, doctrine and procedures.

Much more than a "system of systems," the USIGS is a service that includes doctrine, people, leadership, organizations,

About the Author

Paul Mich is Chief of APPP, the Planning Branch in the Analysis and Plans Office. He was a key member of the TPED analysis process, which received the National Intelligence Meritorious Unit Citation last June. (A component of the U.S Imagery and Geospatial Information Service, TPED refers to "tasking, processing, exploitation and dissemination.") In his present position, Mich is responsible for managing strategic planning and developing future concepts of operations. Born in Kenosha, Wis., Mich earned a bachelor's in geography at the University of Wisconsin-Milwaukee. He entered federal service in 1977 as cartographer at the Defense Mapping Agency in Bethesda. He is a 1991 graduate of the Army War College and holds a master's in public administration from Shippensburg University.



training and equipment. It is comprised of Department of Defense and Intelligence Community organizations and civil agencies. It also fosters partnerships with commercial organizations, academic institutions, foreign governments and coalition allies, to collaborate in sharing information. The USIGS focus is on providing the nation with the imagery, imagery intelligence, imagery-derived measurement and signature intelligence (MASINT), and geospatial information and knowledge needed to achieve information superiority.

Future Environment Will Be Demanding

The USIGS of 2010 will have an operational environment much more demanding than today. That era will be witness to powerful growth in collection; to dramatically compressed

planning, operating and decision cycle times; and to the challenges posed by the increased need for knowledge on demand. To support our country's national security objectives, national, military and civil customers will need — and demand — imagery, imagery intelligence, and geospatial information on a timely basis and in the right format.

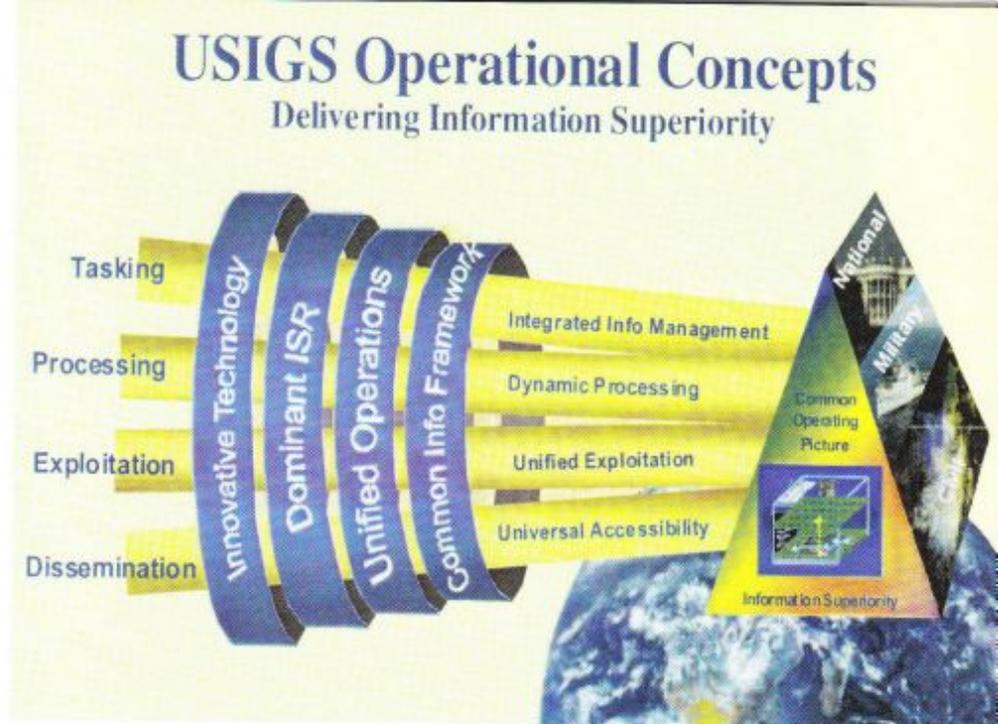
The USIGS 2010 CONOPS describes how the USIGS will operate, collectively and effectively, to meet these challenges. It calls for building on the strengths of the USIGS partners, on the quality and vision of Community leadership, and on the expertise and analytical skills of the Community workforce. The CONOPS describes how the USIGS will establish the common reference framework necessary to effectively integrate information that is timely, accurate and relevant to user-

specific planning and decision making.

The USIGS 2010 CONOPS is not a single, stand-alone document. It is accompanied by a series of operational vignettes that illustrate the CONOPS in action. It also serves as the keystone for development of more detailed concepts of operations addressing functional, Command, Service and Agency imagery and geospatial operations.

Additional Documents Will Be Developed

Additional CONOPS documents have been and will be developed as necessary to help clarify the overall objectives and doctrine of USIGS, the missions of its components, and how the components will work together. Two of these amplifying documents — the *USIGS 2010 and 2007 Information System (IS) CONOPS* — were issued with the



USIGS uses four key enablers -- innovative technology; dominant intelligence, surveillance and reconnaissance (ISR); unified operations; and a common imagery and geospatial information framework -- to achieve the kind of dramatic change imagery and geospatial operations will require in 2010.

basic CONOPS document. The 2010 IS document describes how USIGS will operate as a "system of systems," and the 2007 IS document describes how USIGS systems and capabilities will

operate by the end of the current Future Years Defense Program (FYDP). Additional functional and Command CONOPS are already in work. *



Photo by Gerald Goodin

NIMA senior leaders in St. Louis sign up for U.S. Savings Bonds, from left Joe Goines, Tom Mann and Steve Wallach. The campaign begins NIMA-wide May 1. Sue Meisner is NIMA's campaign manager. She can be reached at (301) 227-1981, DSN 287-1981, or by sending an e-mail to meisners@nima.mil.

Enterprise Resource Planning Comes to NIMA in April

Enterprise Resource Planning (ERP) has arrived at NIMA. The Acquisition and Technology Production Management Solutions Division (ATAZ), working with two offices and a directorate — the Integrated Program Office (IP), Geospatial Information and Services Office (GI) and Information Services Directorate (IS) — is implementing this new capability, used in business to better manage and leverage resources.

With its powerful and flexible software to keep track of resources, ERP has been used to save money, increase efficiency and provide substantial customer satisfaction. NIMA selected the Systems

Applications & Planning (SAP) package after reviewing several ERP vendors. ATAZ is implementing the capability in partnership with the NIMA Systems Engineering Services and Multi-Systems Maintenance Services teams.

By purchasing this off-the-shelf package, ATAZ shortened the procurement cycle while preserving the option to upgrade along with the SAP user community. The software in GI was configured to match the terminology of GI's operational needs.

A cadre of GI, IP and IS employees configured the software and conducted preliminary testing in Tysons Corner, Va. The team members included Kathie Baker, Jerry Bratz, Carl Bright, Barbara Brown, Bill Caulk, JoAnn Cecere, Joe Edelen, Kris Grabbi, Tim Hegarty, Pat Hochstetter, Karan Kiesling, Linda Kinstler, Debbie Mahoney, John Mitchell, Dan Oliver, Robbin Queen, Dick Schissler, Jim Shaughnessy, Jim Stinson, Elaine Villforth, Gerry Walter and Marjorie Zimmerman.

Known as the Production Management Alternate Architecture (PMAA), the ATAZ project replaces the management tools GI lost when the Production Management Segment was decommissioned. PMAA also will enable GI to move off existing contingency systems.

The first delivery, consisting of planning tools, is scheduled for April. A second delivery, scheduled for July, consists of contract management and production scheduling tools. Enhancements to these base functions are possible and are under consideration. These include, for example, interfacing to NIMA library and source holdings, as

well as the processing and management of customer requirements. Each enhancement will further improve NIMA's ability to efficiently support evolving customer needs, thus directly contributing to customer readiness.

Phased delivery of the SAP functions can be accomplished due to the highly integrated mod-

ules. The software maintains data consistency through the identification of a production request and the materials it requires, planning and scheduling. The labor-intensive work now done to manually check this consistency will be eliminated, making GI much more efficient.

The SAP software will operate on SCEN workstations. Currently, training is being conducted for employees who will be using the planning functionality. Following this, training will be done for the rest of the workforce that manages and supports production.

The PMAA project is unique for several reasons: the speed of its procurement, the fact that it is predominantly COTS, the "commercial" business perspective it brings, and the ability to manage in a way consistent with the NIMA strategic vision.

Congratulations are due the hardworking group of employees who have brought these capabilities to NIMA. *

*—Integrated Program Office,
Geospatial Information and Services Office,
Information Services Directorate and
the Directorate of Acquisition and Technology
Production Management Solutions Division*

Used in business to better manage and leverage resources, the new capability replaces the management tools GI lost when the Production Management Segment was decommissioned.

Intelligence Community Lawyers Meet

by Jim Harris

The NIMA and NRO General Counsels recently hosted a conference for Intelligence Community lawyers on information law. The Intelligence Community Information Conference for Legal Expertise (ICICLE), first sponsored by NSA in 1999, focuses attention on the intelligence-related challenges associated with information law.

NIMA GC led the inter-agency team that developed the educational program for the 2001 conference, held in the Westfields Conference Center Feb. 12.

The theme for this year's conference was "Who let the dogs out? Bits and Bytes in the 21st Century (Do we have them caged?)" The theme and topics reflected the growing demand for the use of intelligence information in non-traditional ways; the tension between expanding the use of intelligence and protecting sources and methods; and the challenge posed by technologically advanced commercial information sources. The conference explored several areas of legal practice where these concerns are present.

Over 150 lawyers and support personnel from almost all of the Intelligence Community agencies participated. A number of non-lawyer guests attended, including panel participants.

The conference clarified two thoughts. First, the IC legal community has made progress since the last ICICLE in its understanding of the complexities of information law issues and in the sharing of information and experiences. Second, there is still more that can and must be done. Information law issues are becoming so pervasive and so complex that more resources and creative legal thinking must be applied to adequately serve the national security interests of the United States.



Judy Miller, former DoD General Counsel, addresses the Intelligence Community lawyers' conference.

Photo courtesy of NRO

In addition to discussing law and policy, the attorneys and invited guests were provided the opportunity to learn more about the missions of NIMA and NRO. Two NRO video presentations highlighted NRO's systems capabilities and its 40th anniversary celebration, while two NIMA videos and an interactive display highlighted NIMA's imagery intelligence and geospatial information capabilities

and achievements since standup.

NIMA's interactive display, manned by Air Force Lt. Col. Dan Turgeon, Chief of NIMA Outreach, and B.J. Cavis, demonstrated the fusion of imagery and geospatial information capabilities. The videos were "NIMA Successes," sponsored by Leading The Edge class III, and "Geospatial Foundation Data." A presentation by Stacy Mayse, Elizabeth Crews and Michael Lenihan on NIMA's use of imagery and geospatial capabilities to support the presidential inauguration closed out the conference. *

About the Author

James M. Harris, NIMA Deputy General Counsel for Intelligence, coordinated the 2001 ICICLE. On detail from the CIA Office of General Counsel, he has served as DGC/Intelligence since 1997. An intelligence community lawyer since 1975, Harris has served in a number of senior legal positions in the CIA and NRO, and in various acquisitions and policy management positions in the CIA.



Now Showing

New Centers of Excellence

by Staff of the Geospatial Information and Services Office (GI)

The curtain rose Jan. 8 on eight new "Centers" in the Geospatial Information and Services Office (GI) — part of the GI21 reorganization to fulfill a new vision of providing "Geospatial Information That Makes the Difference." (See the February-March *Edge*.)

Since January, one of these Centers -- the Americas Center -- has moved out of the GI structure as a separate office that involves a direct merger of geospatial and imagery analysis capabilities. See page 5.

Designed to incorporate "end-to-end" processes, the three remaining regional Centers plus four functional Centers are working together to support military operations and readiness, as well as national policy makers. The Centers also support varied programs such as counter-narcotics, counter-terrorism and counter-proliferation.

Users with internet access may view the GI21 Homepage by clicking on the "Maps & Geodata" button, then the "Geospatial Information and Services Office" hotlink on NIMA's ois Web site or at www.nima.mil.

REGIONAL CENTERS

The Regional Centers will maintain close working relationships with numerous internal customers, such as GI's Business Integration Group and Commercial Partnerships Group, the Integrated Program Office (IP),

and the Directorates of Acquisition and Technology (AT) and Information Services (IS).

Introducing the three Regional Centers:



GIO personnel visit members of the Army 29th Engineer Battalion Terrain Team during a visit to Fort Shafter, Hawaii. From left, Dave Douglas; Joe Zwettler; Sgt. 1st Class James Shafer; Sgt. Brandy Harris; Air Force Lt. Col. Sandra Small of NIMA's Customer Operations Office; Chief Warrant Officer 2 Kevin Tice; Barb Smart, NIMA technical representative to the Pacific Command (PACOM); Pete Strzyzewski; Jim Boever, NIMA technical representative to PACOM; Marjorie Hall, NIMA InReach Program manager for St. Louis; Gary Lorenz; Kim Moore, and Sally Gilman, NIMA liaison to PACOM.

Asia/Oceania Center

The Asia/Oceania Center (GIO) area of responsibility covers over 50 percent of the world's surface, encompasses 75 languages, 20 religions and 43 nations. Over 60 percent of the world's natural disasters, such as typhoons, floods, tsunamis and earthquakes, occur within Asia/Oceania. GIO's people are dispersed, with the majority located in St. Louis, a small contingent in Bethesda, and others on rotational assignments.

Center Chief Karen Thomas and Deputy Chief Candy Frame are poised to provide optimal

customer support. And how do they do this?

"It's the structuring," says Thomas. "Our organization is structured for providing timely and relevant geospatial informa-

tion and can support a wide range of customers including DoD, federal, state, and civil organizations."

This support includes tailored and strategic geospatial analysis, forward deployment of geospatial analysts, and creation and maintenance of databases for a regional geospatial information system. Database builds are currently under way for Korea, Sri Lanka and the Philippines.

Frame says, "To avoid duplicating, we collaborate with outside organizations to ensure the most efficient use of our resources." Rotational assignments also play an integral role. Currently, six GIO personnel are

Will Fulfill Vision of GI21

at NIMA with imagery-analyst counterparts and one is in Korea.

GIO's cross-functional branches are responsible for knowledge and development of all geospatial data and support within their sub-region. This includes program development, source acquisition, data mining, geospatial analysis, contract support, international issues and direct coordination with customers.

Looking at foreign source data and understanding other languages is important. To help employees understand the languages of their area, many are involved in NIMA College's Language and Area Studies Training for Analysts (LASTRA). Says Thomas, "Many have already benefited from their study of Chinese and Korean."

NIMA College is also sponsoring a program for hands-on country studies, with initial plans for an educational trip to China in September. "This will be a great opportunity for our people to practice what they have learned through the LASTRA program," Thomas says.

Responsibility and resources are being allocated to sub-regions, with the Center's highest priority being the completion of Feature Foundation Data in the sub-regions. GIO's Integration Group is working with NIMA's Imagery Analysis Office (IA) to develop an integrated production plan.

GIO will play a large part in the Pacific Command production conference in St. Louis. Imagery, imagery intelligence and geospatial information support are discussed; issues are customer-driven at this annual conference sponsored by the Pacific Command Division of NIMA's Customer Operations Office.

In January GIO held a leadership off-site in St. Louis to discuss the Center's vision, establish short- and long-term goals, and bring cohesion to the group. Thomas stated, "The time spent strategizing and discussing issues was very productive."

Middle East/Africa Center



Photo by Alan Huguley

GIF supports the Multinational Force and Observers in the Sinai Peninsula. Here Larry Hill of GIF (left) and Damien Kerr of NIMA's Integrated Program Office (IPO) present a CD on laptop to New Zealand Army Lt. Col. Terry Kinloch, deputy chief of operations for the MFO North Camp in the Sinai.

The region covered by the Middle East/Africa Center (GIF) presents an immense but exciting challenge. Lisa Canzano, Chief, and Jack Fahey, Deputy Chief, lead GI's Middle East/Africa

Center, which is staffed in both the Washington, D.C., and St. Louis areas. Personnel include cartographers, regional analysts, geospatial analysts, administrative officers, managers and staff officers.

Canzano says, "For a variety of reasons, this region is the focus of U.S. policymakers and military commanders, who demand intense geospatial support as well as integrated imagery and geospatial information." The Center has a robust standard geospatial production program and faces an increasing demand for geospatial analysis to support an ever-increasing customer base. "Our support" she remarked, "remains keenly focused

on our military customers, but the demand for geospatial support across the Intelligence Community is steadily increasing."

GIF is divided into three sub-regions: Iran, the Middle East (North Africa, the Arabian Peninsula, Israel and its neighbors), and Sub-Saharan Africa. Each sub-region is supported by one of the three branches in the Washington area, and one branch in St. Louis supports all three sub-regions.

Canzano says, "Each team within these branches is multi-functional. Whereas prior to GI21 most processes were separated by organization, the teams are now responsible for end-to-end production and analysis within a sub-region.

Team members are already noting the benefits of working more directly with cartographers, regional analysts and geospatial analysts who are engaged in different functions within the same project."

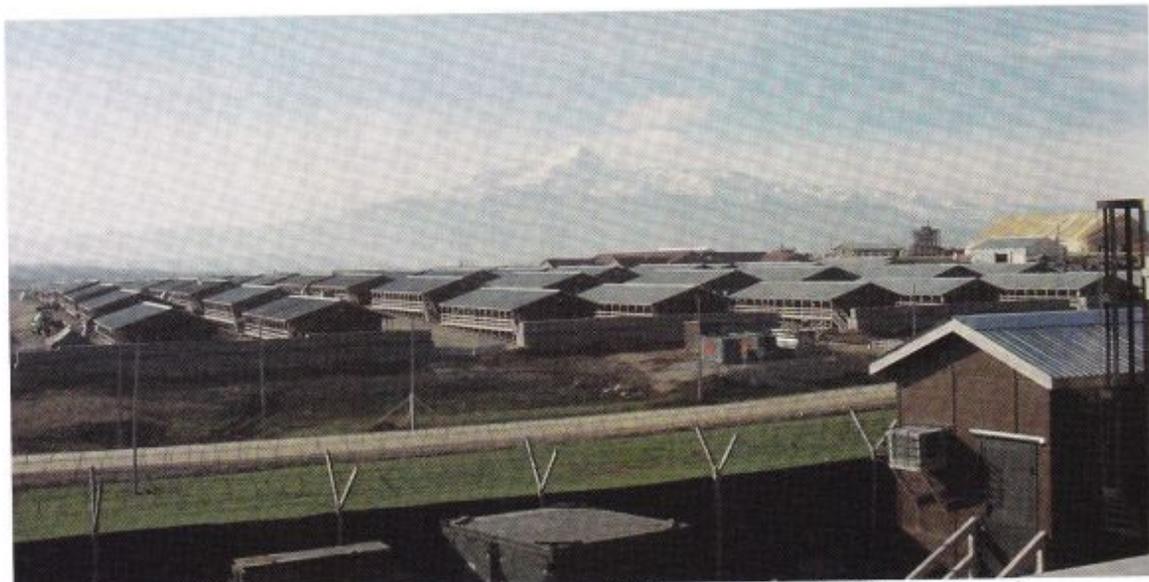
This aspect of the restructuring is reminiscent of the way people worked together during crises, she adds. The early successes of the collaborative environment among teams, the Directorate and the community are serving as guideposts to greater integration of functions in the months and years ahead.

GIF began by establishing close ties with counterparts in the Imagery Analysis Office (IA), says Fahey, as well as developing a geospatial analysis strategy.

Working with IA, the Center "developed an African Readiness Strategy that focused on preparing for crises by identifying the top-priority countries, assessing the NIMA data on hand, and creating possible solutions to better respond to customer issues," Fahey says. "This process proved highly effective as GIF had data tailored to meet customer needs in Sierra Leone, Liberia and Guinea before the crises began there."

The collaboration with IA in the Middle East, primarily in Iraq, helped clarify the parameters for an Iraqi geospatial information system or database. "The goal is to enhance customer readiness, which requires completing traditional production over key mission areas, as well as constructing a database that can deliver tailored information to help customers plan operations or increase their understanding of the region," Fahey says.

Canzano says, "We aim to provide better support in time of crisis and enhance our responsiveness by using standard products in conjunction with geospatial analysis and tailored solutions. It's a two-pronged approach to provide better support to all our customers."



Kosovo falls within the Eurasia Center's area of responsibility, as glimpsed in this snapshot of Camp Bondsteel, headquarters of Multinational Brigade East. The photo was taken by Mel Willsey, GIE's rep to the NIMA intelligence support team.

Eurasia Center

The Eurasia Center (GIE) encompasses a vast land area covering 15 time zones, stretching from Iceland to the Bering Straits and from the northernmost Arctic islands of Europe and Russia to Greece, Turkey and Central Asia. This huge land-mass covers all of eastern and western Europe, including the Balkans, Greece, Turkey and the nation-states arising from the collapse of the Soviet Union. Monitoring this vast stretch of geography are Jack Hild, Chief, and Jeff Goebel, Deputy Chief.

Hild says, "We are responsible for all geospatial information within these areas, including not only the production of timely, accurate new data and products meeting current and future program requirements, but also the development of geospatial information system capabilities that merge existing terrain and feature information. This mission will be accomplished through the efforts of in-house, contract and co-production activities."

GIE is working a number of projects that form the core of its activities. "The standard mapping and charting products familiar to most NIMA employees are still being produced to meet customer demand," Hild says. In addition, newly developed products, such as high-resolution data sets, Mission Specific Data Sets (MSDS) and European Command Data Sets (EDS), are being created to meet both global and discrete customer needs.

"New and improved processes are being developed to more efficiently meet the needs of our

customers," Goebel says. "The co-production activities with our international partners such as the United Kingdom and Germany are constantly being managed and developed." The Eurasia Center is also designing and developing a customer-accessible database of feature and elevation data, with the intention of creating a user-friendly interface to instantly access data.

Presently, requirements lean heavily toward the production and maintenance of both digital and hard copy standard NIMA products, but future efforts are aimed toward a purely digital output of MSDS solutions.

The Eurasia Center's primary external customers are the U.S. Army and two regional commands. Hild says, "We provide high-priority support to our customers in the field. The presence of U.S. troops in Bosnia and Kosovo drives a need for both tactical and planning information." A geospatial information system database is being developed over the Balkans and until very recently, Eurasia had a forward-deployed Technical Representative in the Kosovo Area of Operations. Goebel adds that continuous and extensive reach-back support is available for all deployed personnel.

Making GIE a success are the approximately 260 dedicated people who make up the NIMA Eurasia teams located in St. Louis, Bethesda and the Navy Yard in Washington, D.C.

FUNCTIONAL CENTERS

The four functional Centers each have their own unique and critical mission to provide and guarantee NIMA's customers the information edge. Introducing the Functional Centers:

Aeronautical Safety Center

The Aeronautical Safety Center (GIX) has taken off and is soaring high! In the cockpit are Carol Rauh, Chief, and Steve Prokasky, Deputy Chief, guiding the Center's experts in aeronautical data and services.

"The Aero Safety Center's mission is to serve DoD aircrews by supplying global aeronautical geospatial information and services to support and advance national security objectives," Rauh states.

Activities of the Center's highly professional cadre of aeronautical analysts, geospatial analysts and cartographers include the acqui-

sition and evaluation of aeronautical information, and maintenance of NIMA's aeronautical database and its derived products.

GIX strives to maintain good working relationships with customer-requirements representatives and groups, international source-gathering organizations, international and inter-agency standardization organizations, and other producers of products and services within the global aviation community.

"The GIX AeroVision is to provide customers an integrated on-line database of quality geo-referenced aeronautical information, with NIMA-provided access, delivery mechanisms, and tools for tailoring," Rauh says. "This virtual database will link together information provided by a number of producers, fully leveraging NIMA resources."

The Digital Aeronautical Flight Information File (DAFIF) provides worldwide digital flight information used for automated applications, such as flight planning systems, flight simulators, and flight-management computer systems. "DAFIF is the nucleus for the information needed to make the AeroVision a reality," Rauh says.

The Automated Air Facilities Information File (AAFIF) is a database that provides in-depth information on airfields worldwide. Used by DoD mission planners, AAFIF contains over 43,000 airfields with 469 data elements for each airfield.

Flight Information Publications (FLIP) are published every 28 days or multiples thereof to support the three primary phases of flight: planning, enroute and terminal. DoD flight crews use



Aeronautical analysts, from left, Terrill Allies, La'Trita Westfall and Jay Dickerson assess aeronautical source data to ensure safety of flight.

Photo by Gerald Goodlin

these products daily to prepare and execute peacetime and crisis-support missions.

Other important databases include the Digital Vertical Obstruction File (DVOF), which is a database containing information on man-made obstacles that can pose a threat to flight safety, and the Chart Updating Manual (CHUM), which provides users with monthly updated listings of known changes to vertical obstructions.

Although a number of producers provide the data, all this aeronautical information will be accessed through a single point: NIMA. Customers will be able to extract and tailor information to meet their unique mission requirements. "GIX can extract traditional hardcopy products as needed and at the same time progress towards a total softcopy environment," Rauh says. "NIMA's Aeronautical Safety Center is primed to serve its customers into the 21st century."

Geospatial Sciences Center



Randy Taylor of the Geospatial Sciences Center works at NIMA's GPS tracking station in Quito, Ecuador.

Geospatial Sciences Center (GIG) is ready to provide NIMA and other DoD customers the most

accurate and timely geodetic data, services and analysis possible. Under the leadership of Robert Edwards, Chief, and Phyllis Farris, Deputy Chief, GIG's staff of experts work in St. Louis, Bethesda and at five remote locations. Teams are co-located with customers at Edwards Air Force Base, Calif., Holloman AFB, N.M., Patrick AFB, Fla., Vandenberg AFB, Calif., and White Sands Missile Range, N.M.

"Our vision is simple," says Edwards, "To ensure scientific excellence and integrity in all Geospatial Information."

GIG provides the geospatial information and analysis that is the foundation for all NIMA products.

Edwards explains, "This highly accurate geodetic information is vital to the successful testing, evaluation, and real-world operations of DoD weapon systems. The accuracy requirements of NIMA's geospatial and intelligence information, as well as the military's defense and navigation systems, demand an ever-increasing understanding of the size and shape of the Earth."

Center personnel provide that knowledge through their maintenance and improvement of the World Geodetic System Reference Frame (WGS84) and Earth Gravity Model (EGM96).

Farris explains, "In addition to supporting NIMA products with geodetic control through a common frame of reference, we pride ourselves on direct customer support of accurate targeting, navigation and positioning information." Edwards agrees, "We pride ourselves on providing the most accurate and timely geodetic analysis possible."

GIG directly supports the Global Positioning System (GPS) Master Control Station at Shriver AFB, Colo., with GPS data and expert analysis. "This daily support is an essential quality assurance step that improves this service to all GPS users worldwide," Farris says. GIG satellite experts also compute daily GPS precise orbit information that is posted daily on the World Wide Web and serves as the DoD "truth" for all GPS-related weapons system accuracy evaluations.

Center experts also serve a critical role in directly providing DoD customers with essential gravity data. The Inertial Navigation Systems in the B-2 and F-117 aircraft are equipped with GIG-computed gravity data that allows for safe navigation of these and other DoD systems.

In addition to providing customers with geodetic data and services, GIG will be assisting the other GI Centers of Excellence in the coordination of

process improvements and technical initiatives for all GI processes. Senior subject matter experts representing all GI scientific disciplines will partner with process owners and other technical experts in the Centers to make GI process improvement and technical advancements happen.

"More stringent accuracy requirements and new and improved weapon systems are putting more and more emphasis on precise geodetic control and information," says Edwards. "GIG personnel are excited about the future and ready to meet the challenges ahead, as they continually look for ways to provide our customers the most accurate information possible."



Photo by John Beer

Cartographers Dan Thornes and Julie Michaels maintain a Digital Nautical Chart on a Data Capture and Finishing Environment (DCAFE) work station.

Maritime Safety Information Center

The Maritime Safety Information Center (GIH) is under way and making way! Steve Hall, Chief, and Roy Soluri, Deputy Chief, are at the helm, guiding the Center's experts in nautical data and services. Hall says, "With the creation of GIH, we will serve as the organization responsible for all NIMA hydrographic activities."

"Our mission," Soluri adds, "is to build the Digital Nautical Chart (DNC®) worldwide, then collect, evaluate and compile all available worldwide marine navigation data, disseminate the data

by radio and satellite broadcast, provide electronic access to the data files, and produce hardcopy publications and nautical charts."

GIH is comprised of marine analysts, cartographers, geospatial analysts and regional analysts who represent a unique gathering of navigational and cartographic expertise. GIH provides functional expertise to other regional Centers and source information for contract production.

Hall emphasizes, "We will create the nautical information data foundation needed to play a vital role in delivering maritime safety information to the U.S. Navy and civil mariner, thus guaranteeing our customers the navigation information edge. We

will also ensure that product and information quality are not compromised."

The Navigation Safety System (NSS) will process source data and focus on the database maintenance, vice products. Marine analysts will acquire and assess thousands of pieces of data yearly to populate nautical databases that directly affect NIMA's hydrographic data, products and services to ensure the safety of life at sea for military and commercial users. The Maritime Safety Information Center uses Data Capture and Finishing Environment

(DCAFE) equipment for DNC compilation. GIH also operates the Hydrographic Source Assessment System (HYSAS), used by several agencies to share, assess and store hydrographic and bathymetric data holdings, and it is forging into the object-oriented database environment with the Hydro NIMA Production Cell.

Producing hydrographic products and information such as nautical publications, charts and DNC will not change. NIMA's approximately 4,000-sheet nautical chart portfolio, when combined with the National Ocean Service's 1,000 charts, provides mariners with worldwide coverage. These 5,000 charts have been converted to DNC on 29 CD-



Photo by Gerald Goodin

GIT members in St. Louis work closely with the Imagery Office's Logistics Analysis Division (IAW) on the Joint Chiefs of Staff Single Integrated Operational Plan (SIOP). Team chief Maryann VanDermeulen is seated in left foreground. Clockwise around the table from her left are Stan Molenda, Steve Byland of Strategic Command Customer Operations, George Housley, Ron Ruffin of IAW, Derek Reinertson, David Kovar, Richard Wisely and Mike Earl. Standing, from left, are Dan Fergus, Mary Glauber, John Tuley, Terry Wilson of IAW, Pete Ofstedal of Transportation Command Customer Operations and Mike Earl.

Transnational Center

The Transnational Center (GIT) serves a broad spectrum of customers. Led by Lynne Puetz, Chief, and Jim Heskett, Deputy Chief, GIT people work in the St. Louis and Washington, D.C., areas.

"At one end, we provide a variety of imagery, positioning and support services to the other GI Centers," Puetz says. "On the other end, we provide specific global customers with detailed, tailored products needed for military planning and operations."

The Center has three categories of teams, focusing on (1) precise geospatial production requirements, (2) tailored customer production requirements and (3) services used by internal and external NIMA customers. Teams in the first category work on geopositioning, control generation, targeting support and the production of Digital Point Positioning Database (DPPDB). Teams in the second category work on Terrain Contour Matching (TERCOM), Hard Deeply Buried Targets (HDBT), the Single Integrated

Operational Plan (SIOP), Special Operations support and Special Analytical Techniques. Teams in the third category support the Integrated Source Exploitation Environment (ISEE), Modernized Integrated Database (MIDB), film writers and scanners, and the Requirements Analysis System.

The Transnational Center also provides oversight to geospatial analysts deployed to the NIMA Prototype Facilities in Bethesda and St. Louis."

In collaboration the Imagery Analysis Office (IA), GIT is merging geospatial and imagery intelligence information in several projects to provide customers a more complete information set.

In the area of geospatial production, the production process begins with geopositioned imagery that GIT provides. "The standard of quality and accuracy is set by us at that time," says Heskett. "The accuracy of any imagery-derived product will never be better than what we achieve during this process." Heskett adds, "It is important to note that no precise weapons are fired by U.S. forces without involvement of our products and services."

Puetz says, "We are leaning forward in the use of new technology, in the application of commercial imagery, and in the constant pursuit of new ways to improve our current processes." *

ROMs. Although available in digital form only to the U.S. Government and military customers at this time, most of this digital data will be released to the public in the future.

First published in 1869, *Notice to Mariners* continues to be the single most authoritative navigational tool of the U.S. government. It updates and maintains the United States' enviable suite of nautical products and is mandated by law in U.S. Title 10. Last year the "Notice," as it is called, provided over 9,000 chart corrections, 7,000 light and radio aid corrections, and 2,500 publication corrections. Hall says, "GIH will continue to satisfy safety-of-navigation legislative requirements."

GIH maintains liaison with international, federal and public maritime organizations. Says Soluri, "These contacts stimulate interest in NIMA, getting the word out of who we are and what we do and helping us recruit a skilled workforce."

"As NIMA enters the 21st century," Soluri concluded, "Mariners can be assured that the Maritime Safety Information Center will maintain the beacon of light for years to come."

Don't Misuse NIMA AIS Assets

The vast majority of NIMA employees and contractors use their NIMA provided computer systems to accomplish the agency's mission. Some employees and contractors, with their supervisor's permission, use NIMA systems for limited personal use, such as using the web to check the weather or sending a quick email to a son or daughter away at school. These uses of NIMA AIS are appropriate. What is of concern is misuse of NIMA AIS. Misuse of NIMA AIS can cause embarrassment for the agency and a loss of bandwidth, critical to NIMA's mission to support other commands, services, and agencies.

How AIS misuse is discovered and handled within NIMA.

- Internet misuse is often discovered by use of routine audits conducted by the IMT. The audit logs from NIMA's Internet server are run against a "dirty word" list of words and web sites known to contain pornography, hate information, and other sites inappropriate for visiting from a US government computer system. Email misuse is often discovered by reports from system administrators, supervisors, or co-workers.

- If misuse is found by the IMT, a misuse investigation is initiated and evidence of the misuse is collected.

- A report of findings is forwarded to the Office of General Counsel for review. If during the investigation, or upon review by GC, criminal activity is suspected (visiting web sites of child pornography, threats made in an email, etc.), GC contacts the Defense Criminal Investigative Service (DCIS) and requests a criminal investigation.

- If DCIS opens a criminal investigation and the person or persons are found to be committing

criminal acts with NIMA AIS assets, they *may be* prosecuted under federal criminal law. *Recently, as a result of an investigation initiated after pornography was discovered on an NIMA computer, a NIMA employee was charged with and convicted of two felony counts involving the possession and receipt of child pornography. The employee is currently incarcerated pending sentencing later this year.*

- If no criminal activity is found, or substantiated by DCIS, the case is sent back to NIMA GC for **administrative** action.
- GC forwards the report to the appropriate supervisor or Contracting Officer for action.

Disciplinary action will be taken against NIMA employees found to be misusing NIMA systems.

- For contractors, NIMA may request that they be removed from working on the NIMA contract.

Contractors frequently terminate the employment of personnel reported for misuse of NIMA's computers.

- For civilian government employees, disciplinary actions have included written reprimands, suspensions without pay, and termination from federal service.

- For military personnel, NIMA GC coordinates

with the appropriate service's Judge Advocate (JAG) and Commanders to take actions ranging from prosecution under the Uniform Code of Military Justice (UCMJ) or non-judicial punishment.

- NIMA is committed to ensuring NIMA AIS assets are available for the critical mission needs of the agency. All NIMA employees and contractors should mirror this commitment.

Thank you for your cooperation. Questions may be addressed to the NIMA Incident Management Team.

Misuse of NIMA AIS can cause embarrassment for the agency and a loss of bandwidth, critical to NIMA's mission to support other commands, services, and agencies.

DoD Honors Alder, Lenczowski; NIMA Cites Other Employees

The Department of Defense recently honored the deputy directors of two NIMA directorates.

William R. Alder Jr., Deputy Director for Acquisition and Technology (AT), received the Secretary of Defense Medal for Meritorious Civilian Service for demonstrating "great vision and aggressive leadership" in managing the U.S. Imagery and Geospatial Information Service (USIGS) modernization. He "was instrumental in defining the optimal organizational structure to allow NIMA to transition from analog, hardcopy products and services to digital softcopy data and information," the citation says.



Alder was liaison to the Defense Mapping Agency for the U.S. Geological Survey during the development of the digital production system. He later joined DMA, where he served as Deputy Director for Modernization, before moving to the Central Imagery Office as Deputy Director for Systems, Technology and Standards. He was NRO Deputy Director for Imagery Systems Acquisition and Operations before assuming his present position.

Roberta E. Lenczowski, Deputy Director for Operations (DO), received the Secretary of Defense Medal for Meritorious Civilian Service for "pushing the defense community toward the digital environment." The citation says "her accomplishments range from initiating many of the conceptual discussions to prototyping the inaugural data sets; from personally writing some of the draft software code to directing community efforts for standards of use and exchange; and from



advocating organizational change to managing both large and small organizations."

Lenczowski received the Presidential Rank Award of Distinguished Executive in December. She was Director of Acquisition and Technology for the Defense Mapping Agency before the standup of NIMA, when she became Associate Deputy Director of Operations.

The DoD awards were among those presented at the Director's Quarterly Awards ceremony March 15 in Bethesda.

NIMA honored four employees for Distinguished Civilian Service: David Broadhurst, Director of the National Imagery and Mapping College; Steve Earle, Bethesda Site Manager; Dr. J. Edwin Henson, Director of the Acquisition Office (ATA), and Robert Thibodeaux, Chief of the Operational Integration Division (IPI).

The Meritorious Civilian Service award was presented to Greg Barac, Chief of the Requirements Management Division, Plans and Customer Operations Directorate (PCO/RIM); James Barclay, Enhanced Imaging System project lead in the Systems Engineering Office (ATS); Julie Jones, team leader for the Legal Support Group in the Office of General Counsel (GC), and George Morgan, imagery analyst in the Imagery Analysis Office Special Operations Division (IAO). Morgan also received the Army Achievement Medal for Civilian Service.

The NIMA Medallion for Excellence was presented to Gerald Dunbar, director of the Mission Support Office (MS), for his "steadfast support" of NIMA's Combined Federal Campaign, and posthumously to Leo Pompliano, who worked for the Infrastructure Operations and Support Division (ESI) at the Washington Navy Yard. Pompliano was honored for "outstanding service and commitment," which continued until the day of his death last July of bone cancer. Tom Hennig, NIMA's director of the joint NIMA-NASA Shuttle Radar Topography Program (SRTM), received the NIMA Coin. *

The Puck Stops in St. Louis

by Paul Hurlburt

Another hockey season has come to a close for an informal group of NIMA employees, friends and family in St. Louis that has met regularly to play the game since at least 1978. The group, which has no name, rents a covered outdoor rink in Granite City, Ill. Play is biweekly on Friday nights beginning at 10:15 – in prior years at midnight, if the rink was booked. Members have played into their 50s, says unofficial spokesman Dan Fergus, who's approaching that mark. His son Andy joins him now.

Fourteen to 20 players will match up and face off in what Fergus calls a "a nice, friendly game – no checking and no slap shots." Allowed in professional ice hockey, "checking" refers to hitting another player with your body to gain an advantage. Of course, collisions do happen, says Fergus, who's taken his lumps. A "slap shot" is when you raise the hockey stick over your head, adding force to your swing, as in golf.

"We've had maybe three pushing matches in the last five years," Fergus admits. "I can't recall ever seeing a fight. It doesn't matter who wins – sometimes we lose count of how many goals we've scored."

There's no crowd to please at these games either. "Once in awhile a wife or girlfriend will show up," Fergus says. And the players have videotaped their action on occasion. "On tape, we look really slow compared to professional teams," Fergus admits, "but out on the ice, it seems fast."

Kevin Vermeulen is the group's "commissioner." "He does the heavy lifting – collecting fees, booking the rink, you name it," Fergus says. Notable players have included Kevin Howard, who



Photo by Dan Fergus

Goalie Craig Ackermann tries to control the rebound of a shot by Rick Remmler.

played for Lake Superior State, past NCAA champions, and now works for NIMA in Reston.

What's the appeal that's held this group together so long? Playing hockey forces him to shape up, Fergus says, and his son's enthusiasm helps a lot, but that doesn't explain it for the group, so he puts it this way: "I can have a tough day on Friday and go home feeling whipped. Then about 8 o'clock I'll start thinking about hockey. The adrenaline starts pumping, and by 10:15 I'm ready to go." *



The ad hoc hockey group gathers on a Friday night in St. Louis. Kneeling is Craig Ackermann. Standing, from left, are Andy Fergus, Ray Fyalka, Keith Paulson, Tom Hoake (Yes, his name IS pronounced "hockey"), Tim Bramstedt, Dan Fergus and John Riganti.

To join the action next fall, give Dan a call at (314) 263-4001 or Kevin at (314) 263-4041.

Navy Names Ship for Mary Sears, Legendary Oceanographer

by Howard Cohen
Maritime Safety Information Center

Scuttling a long-time Navy tradition, former Secretary of the Navy Richard Danzig named the Navy's newest oceanographic survey vessel for Mary Sears, honoring one of this country's earliest women pioneers in oceanography. It is the first Navy oceanographic ship named for a woman.

"Mary Sears helped expand the role of applied oceanography within the Navy," Danzig said. Christened and launched last October, the USNS Mary Sears (T-AGS 65) will employ products, services and data from NIMA's Maritime Safety Information Center to accomplish its various oceanographic survey missions. Delivery is set for later this year (see the September 2000 *Edge*). Crewed by civilian mariners, the ship will be operated by the Military Sealift Command for the Oceanographer of the Navy, Rear Adm. Richard D. West. It is the sixth ship in the Pathfinder T-AGS 60 class. Like all ships in its class, the Sears will be multi-mission, capable of surveying in coastal waters or the deep ocean.

Born July 18, 1905, Mary Sears was raised in Wayland, Mass. She graduated from Radcliffe College and received a master's degree in 1929 and a Ph.D. in zoology in 1933. While a graduate student she worked at Harvard University with Dr. Henry Bigelow, a founder and the first Director of the Woods Hole Oceanographic Institution (WHOI). She began working summers as a planktonologist and was one of the first 10 research assistants appointed to the WHOI staff.

During World War II, Sears answered her country's call to duty. As a Navy lieutenant in the WAVES, she and Navy Reserve Lt. Roger Revelle, for whom the Scripps Institution of Oceanography research vessel RV Roger Revelle is named, were appointed to head a new oceanographic unit. The



Navy Lieutenant Mary Sears organized and headed the Navy Oceanographic Unit during World War II.

Oceanographic Unit, Pilot Chart Section, Division of Maritime Security, which she and Revelle headed, was created in 1943 after the oceanographic unit of the Army Air Force was transferred to the Navy Hydrographic Office, which marked the beginning of military efforts to consolidate oceanographic programs.

Sears's contributions to the U.S. Navy and to the research community are legendary.

"Time and tide wait for no man" is a familiar adage. It was literally true in the Battle of Tarawa in the South Pacific. The Second Marine Division's invasion of Betio — the

atoll's only island of consequence because it had an airfield — was set for Nov. 20, 1943 when the tide was expected to be favorable. The bombardment would begin in the early morning at low tide. As the tide rose and water levels in the lagoon reached five feet, landing craft would head ashore, and by noon, at high tide, heavier craft could come ashore bringing tanks and supplies.

It seemed like a sound military plan; however, the British advised against the invasion timing because of an unusually low and narrow tidal range time that would prevent the invasion craft from moving close to the beach. Navy planners believed differently and their calculations proved grossly in error.

The Higgins boats needed four feet of water to cross the reef. At landing time the reef was covered by only three feet of water. As a result no landing craft was able to float over the reef. The Second Marine Division troops had to wade for 400 to 500 yards under heavy fire, in water waist-deep, which meant death by drowning from a wound or a stumble into an underwater shell hole. It was here that the phrase "bloody Tarawa" was born.

Photos courtesy of Naval Oceanographic Office (NAVOCEANO)

Three days and 3,407 casualties later the three-mile long, 800-yard wide Betio Island was secured.

Lieutenant Sears soon went to Tarawa and did an in-depth tidal analysis.

Recently the Oceanographer of the Navy's Technical Director, Dr. Richard Spinrad, reviewed Sears's tidal data studies following the historic assault on Betio Island. "Her post-analysis showed that tidal forecasts had been in error by nearly one hour in phase, and about six inches in magnitude. Therefore the expectations that a high tide would carry landing craft over the reef were misguided," Spinrad said. "Coupled with a delay from the planned invasion time this led to horrendous losses for the Marines."

Sears subsequently "applied her observational tidal data to build a much-improved model (based on harmonic analysis) for tidal forecasting," Spinrad said. "Arguably, her model helped guarantee the success of subsequent beach assaults, and save the lives of many American soldiers, sailors and Marines — and it was all done without benefit of modern computers."

Sears's research while in the WAVES was also critical to the survivability of U.S. submarines during the war. Her intelligence reports, "Submarine Supplements to the Sailing Directions," predicted the presence of *thermoclines* — areas of rapid water temperature change — under which a submarine could hide to escape enemy detection by surface sonar.

Following the war, on recommendations from the Chief of Naval Operations, the Office of Research and Inventions (now the Office of Naval Research) formally established a Division of Oceanography in the Hydrographic Office. On Jan 29, 1946, Sears was appointed the first officer-in-charge of the Division and Dr. R.H. Fleming the civilian director.

Sears returned to Woods Hole in 1947, transferring to the Navy Reserves. Since women were not permitted to go to sea until many years later, she made her mark in marine science by editing the journals and books in which oceanographers published their results and by helping to

establish the journals *Deep-Sea Research* and *Progress in Oceanography*. She was a founding editor of *Deep-Sea Research*, serving as editor from 1953 to 1974, and also edited several books considered to be milestones in documenting the history of marine science. Sears retired as a Commander in the U.S. Naval Reserve in 1963. She was named a Senior Scientist in the Biology Department, a position she held until her retirement in 1970. The honor of being named a Scientist Emeritus was bestowed to her in 1978.

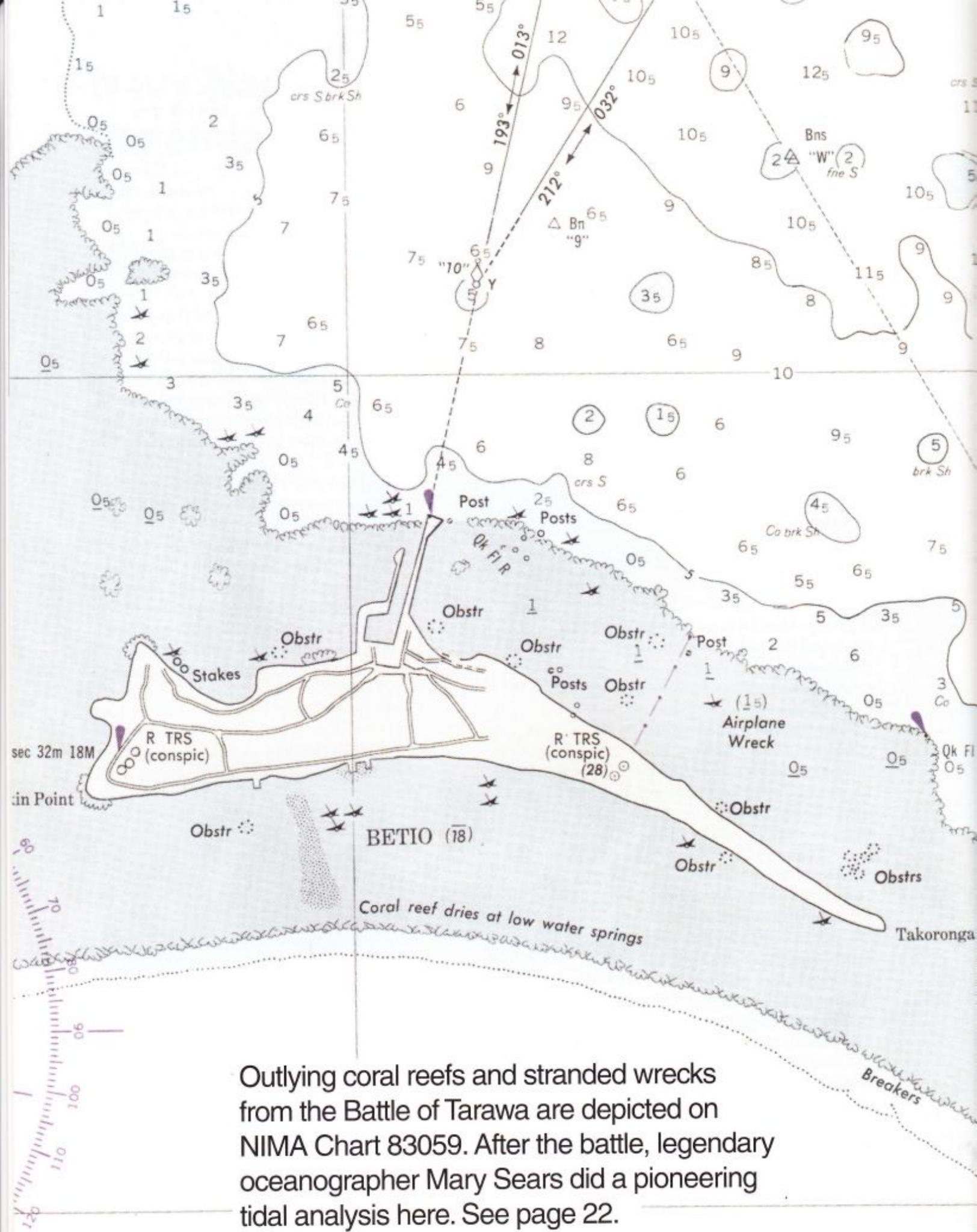
On the occasion of her 80th birthday, *Deep-Sea Research* dedicated an issue to Mary Sears, noting that she "has probably played a greater role in the advancement of oceanographic studies than any other woman." The Woods Hole Oceanographic Institution's Women's Committee honored her at its first "Woman Pioneers in Oceanography" seminar in 1994.

"Every tide has its ebb" — after a brief illness, Mary Sears passed away Sept. 2, 1997 at age 92 in her home at Woods Hole.

Robert Gagosian, Director of Woods Hole Oceanographic Institution, at the launching of the USNS Mary Sears said, "Mary Sears was a giant in the field of oceanography. Although diminutive in size and prone to be shy, she had a huge impact. I think it's wonderful and altogether fitting that — at last — Mary Sears gets to go to sea in a manner befitting her." *



The USNS Mary Sears rolls down the ways after being christened and launched on last Oct. 19 at the Halter Marine Shipyard in Pascagoula, Miss. Having the honors of christening the USNS Sears were Alice Rivlin, former Vice Chair of the Federal Reserve, and Leila Sears, sister of Mary Sears, who was also a WAVE during World War II.



Outlying coral reefs and stranded wrecks from the Battle of Tarawa are depicted on NIMA Chart 83059. After the battle, legendary oceanographer Mary Sears did a pioneering tidal analysis here. See page 22.