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Tsunami Ready California City Responds Quickly to Earthquake

—By Greg Romano

Windows and china rattle and clink. The earth rumbles as it shakes. The sounds of an earthquake are unmistakable to most Californians. For the residents of Crescent City, Calif., many of them enjoying dinner, those sounds at 7:51 p.m. PDT on June 14 were followed closely by another sound—the wail of tsunami warning sirens.

Emergency management officials in Crescent City sounded the alarm in response to a tsunami warning issued by NOAA's West Coast/Alaska Tsunami Warning Center in Palmer, Alaska, five minutes after the 7.2-magnitude earthquake, which was centered 80 miles southwest of Crescent City.

Approximately 4,000 people were evacuated from the low-lying coastal community.

Fortunately, no significant waves were generated by the quake. U.S. Geological Survey officials confirmed the temblor as a "strike-slip" event, one that is not conducive to the uplifting of water necessary to generate a tsunami. Nevertheless, the city took no chances in responding to the warning, and for good reason. In 1964, 11 people were killed by a tsunami that hit the town following the great Alaskan earthquake.

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NOAA Scientists Monitor Gray Whale Recovery

—By Jim Milbury

Researchers from NOAA's Southwest Fisheries Science Center in La Jolla, Calif., have again observed above average numbers of gray whale calves migrating northward this year through California waters to feeding grounds in the Bering and Chuckchi Seas.

While the number of calves is less than observed last year, the continuing trend in above average numbers suggests the gray whale species along the Pacific coast is making a remarkable recovery after being taken off the Endangered

Species List in 1994.

NOAA scientists closely monitoring the whales' yearly migration to ensure their populations remain healthy or to act in the event they begin to decline.

Every spring for the past 11 years, researchers from the Southwest Fisheries Science Center have towed a trailer loaded with cameras and telescopic equipment to a location along California's rugged coastline to count the gray whale calves as they migrate towards their feeding grounds in the far north. The site, known as Point Piedras *continued on page 6*



Wayne Perryman/NOAA

Contract observer Holly Fearnbach and NOAA fisheries biologist James Carretta count gray whale calves as they migrate with other whales along the California coast.

NOAA Mini-Grant Awards Help Save Historical Assets

—By Ben Sherman

The second step in NOAA's efforts to both preserve as well as use its institutional heritage is underway.

Dan Basta, chair of the NOAA Preserve America Initiative and head of the NOAA Office of Marine Sanctuaries, has announced the winners in the first-ever competition in the NOAA Preserve America Initiative Grant Program. The "mini-grant" program is designed to stimulate the preservation of NOAA's historical assets.

The total available for grants this year was approximately \$100K. Six out of the 24 proposals submitted will be supported this year.

"We're delighted in the tremendous interest we received in response to the call for proposals," Basta said. "While we felt each proposal merited support, the selection committee chose these projects based on the special qualities each brings to laying a strong foundation for the future of this important NOAA effort."

The mini-grant program is the second part of a NOAA heritage effort that was launched this spring with the highly-successful "Treasures of NOAA's Ark" week-long display in NOAA's Silver Spring (Md.) Metro Center of assorted artifacts stretching back through one of NOAA's predecessor agencies, the Coast and Geodetic Survey. Some 3,000 NOAA employees and local community members viewed the exhibit.

Cheryl Oliver, senior program advisor for the NOAA Preserve America Initiative, coordinated the effort. John Collins of NOAA Fisheries served as chair of the

selection committee for the mini-grant program. A total of \$98,920 was awarded.

The committee selected the following to receive first-year grants.

NOAA's Lesser Known Heritage: Vindicating Seward's Folly. \$11,400. Recognizes NOAA's diverse heritage in the Pribilof Islands and the contributions of the Pribilovians through preservation of the sealing plant on St. George Island and development of interpretive displays and videos to be housed there. Submitted by John Lindsay, Pribilof Islands project manager, NOAA Ocean Service, Office of Response and Restoration.

Preserving Local Fisheries Heritage. \$15,920. In conjunction with the NOAA Fisheries Local Fisheries Knowledge Pilot Project, develops a local heritage center in the Peabody Memorial Library, Jonesport, Maine. Funding will provide equipment to record oral history interviews, preserve photographs and documents, make cultural heritage presentations and provide computer support for the Peabody Library heritage center. Submitted by Susan Abbott-Jamieson, social scientist, NOAA Fisheries.

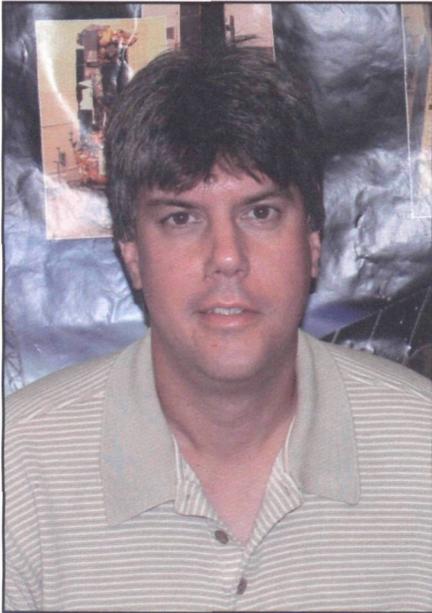
Preserving Stellwagen Bank National Marine Sanctuary Maritime Heritage. \$17,000. Will provide hardware and software to enable a live broadcast of an ROV survey of the recently discovered wreck of the steamship *Portland* to be viewed by the public at the New England Aquarium and sent out over the World Wide Web. Submitted by Deborah Marx, maritime

archaeologist, Stellwagen Bank National Marine Sanctuary.

The Lure of History: 75 Years of Fisheries Research. \$17,000. Creates a partnership between NOAA's Northwest Science Fisheries Center at Montlake, Wash., with the Seattle Museum of History and Industry to prioritize and preserve NOAA heritage resources, including books, photos, instruments, oral histories and documents, and create a permanent exhibit at the museum. Additionally, the funds will support a 75th anniversary display, create a 75th anniversary website designed for middle school students and host a lecture at the museum by a local historian and author. Submitted by Ali Senauer, research scientist, NOAA Northwest Fisheries Science Center.

Treasures of NOAA's Ark at Nauticus. \$22,600. The National Maritime Center at Nauticus at Norfolk, Va., will design, construct and install a display based on "Treasures of NOAA's Ark" to include local NOAA heritage resources housed at Nauticus. Funding will help develop a template that can be used at similar locations to highlight local NOAA heritage resources through the popular Treasures of NOAA's Ark theme. Submitted by Andrew Larkin, project coordinator, NOAA at Nauticus.

Using Oral Histories to Preserve the Heritage of NOAA's Arctic Research Programs. \$15,000. Funding will support oral history interviews and the production of transcripts and digital copies of the interviews, identify photos and documents referenced in the interviews, create a digital archive, produce a time line of NOAA arctic activities and link the time line to available bibliographies. Submitted by Tiffany Vance, technology specialist, Alaska Fisheries Science Center. ☺



Gregg Parent/NOAA

Robert Taddei.

Robert Taddei Is the Team Member of the Month

—By John Leslie

Keeping a careful watch on the satellites in the Defense Meteorological Satellite Program is high on the priority list for NOAA Team Member of the Month Robert Taddei, a contractor and senior systems engineer with Lockheed Martin Technical Operations.

NOAA manages the program's constellation of polar-orbiting weather satellites, which provide global weather data to the Air Force Weather Agency in support of military operations around the world.

Taddei's job involves detecting changes in the status of the program's individual satellites. To help monitor these changes, Taddei receives telemetry data from each satellite's inertial measurement unit, or gyroscope. Like a spinning top, this instrument is sensitive enough to spot any unfavorable changes in the attitude or position of the satellite, notifying Taddei

and his colleagues at NOAA's Satellite Operations Control Center in Suitland, Md.

If a satellite is off the mark, the program's engineering team can correct the problem by commanding the satellite to provide the best possible data to weather forecasters on the ground.

"This job never gets old. There's always something new to handle every day, and I look forward to any challenges that develop," Taddei said.

"Bob has been associated with the Defense Meteorological Satellite Program for about 21 years, and still has the enthusiasm of a new hire," said engineering team leader Doug Whiteley. "He always brings high energy to his work."

Taddei, a native of White Plains, N.Y., came to NOAA in 1998, the same year the agency took over defense meteorological satellite operations after a presidential directive to converge civilian and military polar satellites. The next year, the DMSP F-15 satellite was launched. Almost immediately after the launch, program officials learned of problems with the gyroscope that could potentially shorten the life of the F-15 mission.

During the span of the F-15 mission, two out of the three gyroscopes have failed. As a result, the attitude pointing of the spacecraft is not as precise as it could have been. But special software that Taddei helped develop and test provided critical support to continue the mission after the failures and since then.

Taddei led the effort to provide on-orbit analysis to the factory team, helping to design the new flight code, and was instrumental in testing the code, first on the flight simulator then on orbit.

"Those tests provided quite a bit of valuable analysis back to the

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Tom Taylor/NOAA

Natalie Smith.

Natalie Smith Is the Employee of the Month

—By Dane Konop

Employee of the Month Natalie Smith is the epitome of a successful career civil servant, having started in the Office of the Secretary of Commerce as a GS-1 clerk-typist in 1971.

For the past ten years, she has overseen NOAA's information technology capital investment plans for such major systems as the Weather Service's telecommunications gateway, the Advanced Weather Interactive Processing System and weather and climate supercomputing, which total \$491 million for fiscal year 2006.

"This is all IT equipment, software and services and telecommunications," said Robert Swisher, acting chief of the Office of Planning, Policy and Analysis for NOAA's Chief Information Officer in Silver Spring, Md.

Working with representatives of the line offices, Smith makes sure that technical requirements for

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Focus On...

Looking Out for the Sea Lions of St. George Light

—By Jim Milbury

This is no ordinary job. That's what one researcher thought as a decidedly small helicopter delivered her to a one of the most picturesque and remote lighthouses on the west coast of the United States.

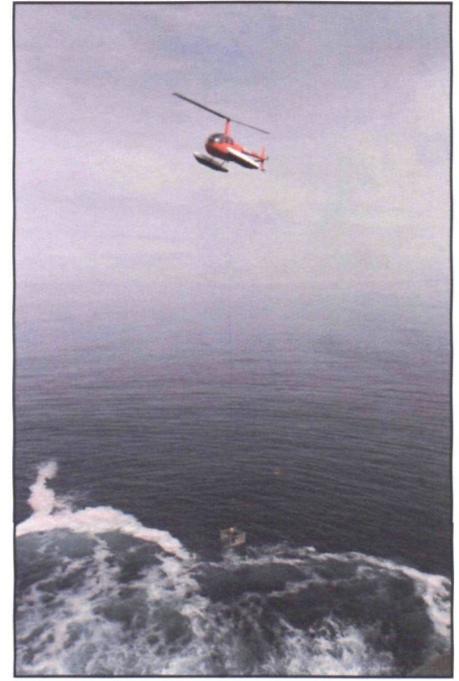
Monica DeAngelis, a biologist for NOAA Fisheries' Southwest Regional Office, landed next to St. George Reef Lighthouse, located about six miles off the rugged northern California coast. Her assignment was to evaluate a permit request and determine if activities related to the restoration of the lighthouse and associated tourism could negatively affect or harass marine mammals like seals

and sea lions.

"The St. George Reef Lighthouse Preservation Society contacted me for a permit, but their information was pretty scant," DeAngelis said. "They aren't biologists, so I went out to document the kind of marine mammals that are out there and could be impacted by their activities."

Like most lighthouses, St. George Reef Light has a rich and colorful history. The lighthouse was built to mark a dangerous reef named Dragon Rocks by English explorer George Vancouver in 1792. In 1865 the vessel *Brother Jonathan* ran aground on the reef with a loss of 212 lives.

Construction of St. George Reef



Monica DeAngelis/NOAA

A helicopter with a team that is restoring the St. George lighthouse approaches the lighthouse to land.

Lighthouse began in 1882 on a small outcropping known as Seal Rock. Due to the remoteness and hazards of construction, it wasn't completed until 1892. At a cost of over \$700,000, it was the most expensive lighthouse ever built in the United States.

"I was surprised at the inside structure of it, the granite, the workmanship that the guys had done when they built it," DeAngelis said. "Some of the little details in the granite and the wooden doors was amazing. It was definitely built to last."

The lighthouse boasted a "first order" Fresnel lens made up of over 1,000 prisms that stood about 10 feet tall and weighed about three tons. The prisms in the lens could focus the light beam of a 1,000-watt bulb up to 21 miles.

The lighthouse operated for the next 83 years in a very harsh environment. The lighthouse keepers weren't allowed to bring their families because the conditions were so hazardous.

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Monica DeAngelis/NOAA

St. George Reef Lighthouse, which rises 140 feet above the ocean about six miles off the coast of northern California, is a resting spot for sea lions.

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The navigational safety the lighthouse once provided to ships was eventually replaced by an ocean buoy in 1975. The lighthouse fell into disrepair and is now being restored as a privately maintained aid to navigation with funds from donations and tourist visits.

DeAngelis' job was to determine if these human actions related to the restoration of the lighthouse affected marine mammals protected under the Marine Mammal Protection Act. She was especially interested in Steller sea lions, whose numbers dwindled during the 1970s, as they have been listed for protection under the Endangered Species Act since 1990.

"Steller sea lions used to have a very wide range, including California," DeAngelis said. "In general, Steller sea lions ranged along the northern Pacific rim from Japan to California with the center of abundance in the Gulf of Alaska and the Aleutian Islands."

DeAngelis did determine that

the sea lions at Seal Rock do react to helicopter operations. They have since been discontinued.

"The population around the eastern Aleutian Islands was the first part of the population we noticed was going down in the mid to late 1970s," said Lowell Fritz, a fishery biologist for NOAA's National Marine Mammal Laboratory. "By 2000 or so, from the beginning of the decline to the end, the drop in the western population was about 80 percent."

The eastern population of Steller sea lions, located along southeast Alaska, British Columbia and the United States, was also at dangerously low levels in the 1970s. But instead of declining, this population of Steller sea lions began to recover, possibly due to protections afforded under the Marine Mammal Protection Act and the Endangered Species Act.

There appears to be hope for the western population of Steller sea lions as well. Researchers have recently noticed positive indica-



William Jewel for NOAA
After completing her observations of the sea lions, NOAA marine mammal biologist Monica DeAngelis prepares to leave St. George Reef Lighthouse.

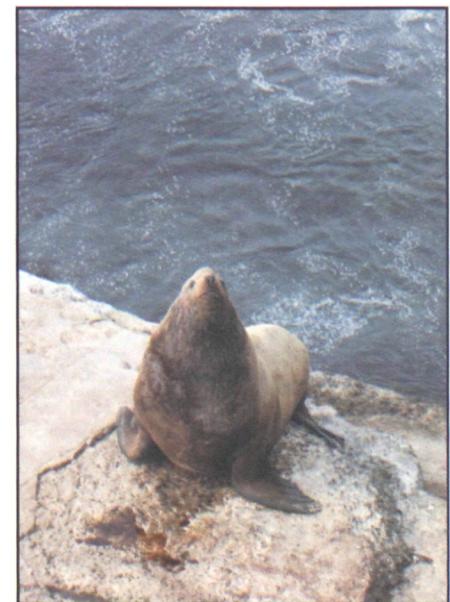
tions in their population numbers.

"Since 2000 we've noticed a small increase in adults and juveniles in our surveys, so we're seeing some hint, at least a slowing of the decline for sure, and some sense of stability in the populations from 2000 to 2004," Fritz said. ☺



Monica DeAngelis/NOAA

California sea lions and the larger Steller sea lions share the rocky outcropping that is the lighthouse's base.



Monica DeAngelis/NOAA

A male Steller sea lion checks out the humans who have come to his rock.

Gray Whales

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Blancas, is located approximately 250 miles north of Los Angeles near the historic landmark of Hearst Castle. The point juts out into the Pacific Ocean making it an ideal location to view and count gray whales swimming by.

"This site is unique in that the whales pass exceptionally close to the beach," said Wayne Perryman, lead scientist for the survey team. "The point of land also provides protection from the winds, which creates a lee allowing us to count the whales as they pass through very calm waters."

Scientists try to gage the status of the gray whale population that migrates along the California coast by using the number of newly born calves as an indicator of the health of the overall population.

"The birth rates are a lot more sensitive to changes that affect the dynamics of the population," Perryman said. "So these data provide a window into what's happening with these animals."

It is currently estimated that the gray whale population along the Pacific coast of the United States is somewhere between 19,000 and 23,000.

But not all gray whale populations around the world have fared so well. One population in the north Atlantic is now extinct, and another off Sakhalin Island between Russia and Japan is extremely

depleted with probably less than 100 animals in total.

But gray whales weren't always so plentiful along the U.S. Pacific coast.

In the 1850s and again in the early 1900s, whalers nearly drove the animals to extinction. Then in 1947 the International Whaling Commission gave the species full protection.

In the 1970s the United States listed the animals as endangered under the Endangered Species Act. Once the gray whales were taken off the endangered list, Perryman established his research team to monitor the animals migrating off California and to learn more about what factors may influence their population size.

Fortunately for researchers, gray whale migration patterns are easy to predict because they run like clockwork.

1,500 pounds and be 15 feet long. Other females pick a mate from a number of hefty suitors that can be 46 feet long and weigh up to 40 tons.

The nursing cows remain in the lagoons for several months so the calves can produce a thick coat of blubber before heading back to the feeding grounds in the Bering and Chuckchi Seas. They typically begin leaving in March, with the last stragglers passing Point Piedras Blancas in late May to early June.

Once they decide to leave the safety of the lagoons, the cows and calves hug the coastline as they swim northward, hoping to avoid orcas, or killer whales, that might be lurking in the offshore waters. It is this tendency to stay near shore and to be with the cows that Perryman and his crew rely on to count the calves as they swim by.

"We use the cows as an indicator for the presence of a calf," said Perryman. "You can see the blow [spout] of a cow three miles away while the blow of a calf you really can't see until they're right on top of you."

The regimen for searching and counting the whales is quite detailed. A team of two people works 12-hour shifts, alternating with a relief crew every three hours.

One of the two-person team focuses on near-shore waters, while the other scrutinizes the waters further offshore. During the peak of the migration in late April and early May, a third person conducts a



Richard Rowlett/NOAA

A gray whale calf breaches near Point Piedras Blancas, Calif., on its migration with its mother from their breeding grounds in Baja California to their summer feeding grounds in Alaska.

In the wintertime the animals head south from frigid Arctic waters to the warm lagoons of Baja California, Mexico, a round trip that can exceed 10,000 miles.

Pregnant females, or cows, give birth to calves that can weigh up to

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Gray Whales

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duplicate watch to ensure calves are not double-counted or missed entirely.

A nighttime watch isn't necessary because researchers have determined that the rate of whales passing by the point is the same at night as during the day. They discovered this by using heat sensitive thermal sensors to view whale spouts at night. The scientists noted the presence of whales swimming past the point because their expulsion of air through their blowhole is warmer than the surrounding water, making them visible to equipment sensitive to the temperature differences.

"Collecting the data does take intense concentration," said Paula Olson, a field biologist on the research team for her eighth consecutive season. "But I love working in the field and I love working outdoors and I never get tired of counting whales and dolphins."

Olson said she enjoys a switch in perspective from her usual research activities. "Most of the time I'm on a ship passing through a study area," Olson said. "So what's unique to me is that I'm sitting in one place and I get to see what passes by me as opposed to passing through the study area."

Miles from any town, the scientists stay in small houses built adjacent to Point Piedras Blancas Lighthouse and now maintained by the U.S. Bureau of Land Management, an agency partner supporting this research. The small ranch houses were once used to house personnel that manned the lighthouse before it became fully automated in 1975. Ironically, the lighthouse was built in the early 1870s, in part to support a whaling station in the small, nearby port of San Simeon. ☺

Tsunami Alert

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Crescent City's effective and efficient evacuation was attributable in part to its participation in the Tsunami Ready program of NOAA's National Weather Service. Crescent City is one of only two Tsunami Ready communities in California and one of 21 Tsunami Ready communities nationwide.

Tsunami Ready is a National Weather Service initiative that promotes tsunami hazard preparedness as an active collaboration among federal, state and local emergency management agencies and the public.

An effective tsunami warning system includes four key components: detecting the hazard, assessing the risk, disseminating the warning and providing for appropriate public response.

Tsunami Ready recognizes that the last component is absolutely critical. To become Tsunami Ready, a community must establish an emergency operations center, have the ability to disseminate a tsunami warning publicly, such as through sirens or local media, establish a tsunami hazard plan indicating areas of potential risk and create a community awareness program. The community must also have multiple ways to receive NOAA tsunami warnings, such as through an Emergency Management Weather Information Network receiver, a NOAA Weather Wire drop or NOAA Weather Radio All Hazards.

"A timely warning doesn't mean much if our citizens don't know how to respond to it," said retired Air Force Brig. Gen. David L. Johnson, director of the National Weather Service. "The Tsunami Ready program is designed to help ensure that. It doesn't mean a community is tsunami proof, but it does mean that the community is

better prepared to save lives when a tsunami threatens."

"Tsunami Ready really paid off for Crescent City," said Del Norte County Sheriff Dean Wilson, who was the senior emergency management official on call that evening. "All the education associated with it accomplished what we had hoped. People knew what to do and they did it."

According to Troy Nicolini, warning coordination meteorologist for the National Weather Service Forecast Office in Eureka, Calif., Crescent City's success with Tsunami Ready could be a harbinger of things to come. "Everything went right in Crescent City, so we are getting lots of calls from community leaders interested in the program," Nicolini said. "People might have been inconvenienced by the evacuation, but it is important to remember that when an earthquake occurs so close to our shore, minutes count. People need to get to high ground fast. Tsunami Ready helps communities and its residents prepare to do just that."

Tsunamis are very rare events in the Atlantic and Caribbean. Historical data suggest approximately 15 percent of the Earth's total tsunami events occur in the Atlantic basin. But given the region's population density along the coast, any major Atlantic tsunami could be catastrophic.

Indian Harbour Beach, Fla., was set to become the first east coast Tsunami Ready community in July. Located in Brevard County, one of 59 Storm Ready counties in Florida, Indian Harbour Beach is situated between the Atlantic Ocean and Indian River Lagoon.

The Tsunami Ready program is an offshoot of the National Weather Service Storm Ready program, which began in 1999 with four Oklahoma communities. Today, more than 910 communities have been recognized as Storm Ready. ☺

Natalie Smith

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information technology are in synch with federal guidelines and standards, Swisher said. If not, the plans will not be approved by the department and OMB.

"She has the institutional memory, the historical background, the knowledge and the skills needed to do the job, including trying to distinguish truth from fiction," Swisher said.

Smith brings an extraordinary breadth and depth of experience to the job, having been involved with NOAA's information technology since the earliest years of the agency.

In fact, Smith began her federal career in 1967 while still in college. She worked during the summers and during breaks in accounting and personnel jobs at various Commerce agencies, including the Office of the Secretary, the Maritime Administration and the Economic Development Administration.

A Washington, D.C., native, Smith had intended to become a teacher, receiving her bachelor's degree in history and elementary education from Lake Forest (Illinois) College. Instead, she took a job at Commerce as a clerk-typist in the Office of the Secretary, then moved over to the Office of Minority Business Enterprise. But her job wasn't just typing and filing. Having taken a course in management analysis, one of her early assignments was to update the office's directives. It gave her an inside out view of how the organization was supposed to work.

In 1972, after becoming a junior management analyst, she took a lateral transfer to a job at a new Commerce agency, the National Oceanic and Atmospheric Administration. She was working on directives with NOAA's Manage-

ment Studies Branch when she began to hear a lot about computers and decided to go back to school at George Washington University to learn about them.

"I was looking at the office documentation for why they needed computers and the technical requirements to make sure the statements of work they were writing followed what was necessary to meet federal information processing standards," Smith said.

By 1975, she landed a job as a computer specialist and auditor with NOAA's ADP Management and Planning Division in Rockville, Md.

"Everybody was going from manual to automated," she said. "I would go to agency facilities to see exactly what they had and if they were using it in the way they said they would."

The work took her to a variety of NOAA offices across the country, where she gained an appreciation for the wide range of NOAA's responsibilities and for the problems IT people in the field were facing.

About fifteen years ago, Smith began working with NOAA's IT capital planning and investment control system and has been its mainstay ever since.

"We can be perceived as being in the way," Swisher said. "So one of her strengths is that she has become perceived over time as a facilitator. She attempts wherever she can to make it easy for the line offices, or as un-bureaucratic as possible."

Her skills and expertise acquired over her long career have payed off for NOAA. All 17 of NOAA's current information technology capital investment plans have been given the go-ahead from the department. "Without Natalie Smith," Swisher said, "NOAA would be low in the water and leaning hard to port." ☺

Robert Taddei

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folks who manufactured the gyroscope, based on his experience with the on-orbit spacecraft," Whiteley said.

Recently, Taddei has devised a flight mission software patch for F-15 that is enabling the satellite to provide better pointing information. Taddei's solutions for F-15 are now being applied to the next satellite, F-16, launched in October 2003. The trials of F-15 are leading to better results with F-16 and bode well for future defense meteorological satellite missions, according to Whiteley.

"With the problems we've encountered with the gyroscope, Bob has taken a pro-active approach in dealing with those issues—above and beyond his normal duties," Whiteley said. "Without Bob's efforts, [the program] risked the loss of an on-orbit asset and potentially a gap in critical mission data coverage, affecting military operations and ultimately the war fighter."

Taddei credited the work of his colleagues at NOAA, Lockheed Martin, the Aerospace Corporation and Integral Systems, Inc. "The resolution to this problem was truly a team effort," he said. ☺

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uane konop, editor

National Oceanic and Atmospheric Administration

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