

## NOAA's Newest Satellite Launched

—By Patricia Viets

The nation's most advanced environmental satellite, GOES-M, was launched into space aboard an Atlas 2A rocket at 3:23 a.m. EDT July 23 from Cape Canaveral Air Force Station in Florida.

*continued on page 2*



NASA

GOES-M lifts off from a Cape Canaveral launch pad aboard an Atlas rocket.

## Navy and NOAA Recover *Monitor* Engine

—By Dane Konop

A team of 150 Navy divers under the direction of NOAA marine archaeologists John Broadwater and Jeff Johnston has recovered the steam engine from the wreck of the historic Civil War ironclad warship *U.S.S. Monitor*.

The *Monitor* wreck lies in 240 feet of water 16 miles off Cape Hatteras, N.C.

Based on a barge moored above *Monitor*, the Navy-NOAA team worked in two shifts, 24 hours a day for 45 days. Divers spent 650 hours on the bottom to free the engine from the wreck.

Using a giant winch, the 30-ton engine was brought to the surface and placed aboard a transport barge July 16.

"The engine was lifted intact and has been transported back to the Newport News (Va.) Drydock and Shipbuilding Company, where it will be sent to the Mariners' Museum for preservation treatment," according to Broadwater, the manager of the *Monitor* National Marine Sanctuary.

The site of the wreck was named the nation's first national marine sanctuary on Jan. 30, 1975.

The Mariners' Museum in Newport News, the designated repository for *Monitor* artifacts, already has the *Monitor* anchor, screw and other parts of the wreck recovered from earlier expeditions. The *Monitor* wreck, discovered by Duke University researchers in 1973, has been steadily deteriorating since the ship sank under tow during a severe storm Dec. 31,

1862, landing upside down on top of its revolutionary revolving gun turret.

In recent years, gaping holes have formed in the hull, exposing the interior spaces and machinery. The ship's armor belt, which protected it from enemy shells, is also disintegrating under the constant onslaught of currents, sand and salt water.

*Monitor*, which battled the armored Confederate ship *Virginia* to a draw in the famous battle of Hampton Roads March 9, 1862, is considered to be the first modern warship.

Designed by engineering genius John Ericsson, the ship contained a

*continued on page 8*



Carol Meyers/NOAA

Marine archaeologist John Broadwater examines recovered *Monitor* artifacts.

## GOES

*continued from page 1*

The geostationary operational environmental satellite will gather data on daily weather and severe storms and detect solar flares.

The launch was delayed one day, after lightning struck an adjacent launch pad. Managers delayed the launch to allow time to inspect the rocket to make sure the sensitive electronic systems were not damaged.

The satellite separated from the launch vehicle about 27 minutes after launch.

"The partial solar array deployment took place successfully," said Tim Walsh, manager of NOAA's Satellite Operations Center in Suitland, Md.

The GOES-M satellite is the fifth of five advanced environmental satellites operated by NOAA's National Environmental Satellite, Data and Information Service. It is designed to help improve forecasting of space weather, in addition to Earth's weather.

GOES-M is the first to have an operational solar X-ray imager, the most advanced instrument of its kind, which will allow space weather forecasters to better detect the sun's solar storms.

"We're all extremely excited about this new satellite," Walsh said. "We're looking forward to turning on the instruments and receiving the data, especially from the solar X-ray imager."

The X-ray imager will take a full and detailed snapshot of the sun's atmosphere each minute. The images will be used by NOAA and the U.S. Air Force to forecast the intensity and speed of solar disturbances that could destroy satellite electronics, disrupt long-distance radio communication and cause surges in power grids.

"Space weather affects really  
*continued on page 6*

## Oklahoma Experiment Improves Modeling Tools for Forecasting Severe Weather

—By Keli Tarp

For eight weeks this spring and summer, NOAA researchers and forecasters in Norman, Okla., worked side-by-side in an experiment designed to improve the tools used to predict severe thunderstorms.

Their aim is to provide the public more time to prepare for thunderstorms that can bring lightning, hail, strong winds and tornadoes. These storms can be devastating, resulting in hundreds of deaths and millions of dollars in damage each year.

Participants evaluated several operational and experimental computer models and algorithms used by forecasters to determine which ones provide the best guidance.

"Just as a golfer uses a different club for various situations on the course, we want to help forecasters apply different models to various

atmospheric conditions to produce the most accurate forecast," said Paul R. Janish, science infusion meteorologist with NOAA's Storm Prediction Center in Norman.

"We need to identify more clearly under what circumstances and with which models we can predict severe thunderstorm development with significant lead time and confidence," said John S. Kain, a research meteorologist at NOAA's National Severe Storms Laboratory in Norman and co-leader of the project with Janish.

The computer models include operational versions developed at the Environmental Modeling Center at NOAA's National Centers for Environmental Prediction in Camp Springs, Md., and at NOAA's Forecast Systems Laboratory in Boulder, Colo., as well as research versions developed at the Severe Storms Laboratory.

*continued on page 7*



*Keli Tarp/NOAA*

*Research meteorologist Jack Kain (left) and science infusion meteorologist Paul Janish, the experiment co-leaders, examine weather model output.*



Erica Van Coverden/NOAA

Nina Liebig.

## Nina Liebig Is the Employee of the Month for August

—By Jana Goldman

The first time Nina Liebig saw the Atlantic Oceanographic and Meteorological Laboratory in Miami, Fla., was her first day at work.

"I applied for the job over the Internet and was interviewed over the phone," she said.

Using technology to find a job was a logical step for the former computer programmer, who is a budget analyst at the NOAA laboratory and the August NOAA Employee of the Month.

After spending 10 years at Fort Drum, an Army installation in upstate New York, Nina came to Florida to care for an ill relative.

Fort Lauderdale is now her home and she's been at the lab for more than two years, first as an administrative assistant and then in her current position working with the lab's budget.

"The creative part of this job is fun," she said. "Every end of the year is challenging."

Liebig is one of the many

behind-the-scenes NOAA employees whose work is critical to support the agency's mission.

She prepares formulas for projections, works with the science divisions to prepare spending plans, reviews reports and does the myriad other tasks associated with budgeting.

While she knows the intimate financial details of the lab's four divisions—hurricane research, ocean chemistry, ocean acoustics and physical oceanography—she's learning about the science conducted there by attending as many of the lectures and other scientific talks that are frequently given at the laboratory as she can.

"I'd love to learn more about what goes on here. I don't know as much as I think I need to know to help them," she said. "The work that they do here is very exciting."

According to her award nomination, for all her varied duties, Liebig has an uncanny ability to detect errors, tease out the exact nature of the problem and determine the easiest and most direct solution.

Along with her technical and professional skills, Nina was also nominated for her personality. Part of the nomination reads, "Nina is a pleasure to work with.

"She always greets people with a smile, even though most people who stop at her office are doing so because they are having a problem or need something.

"Her friendly response and ready willingness to listen and assist anyone with a problem complement her insightful solutions."

The Florida climate can be quite a change for one who is used to the moderate temperatures of upstate New York. But Nina says she has adapted quite nicely, thank you.

"I've been very happy at AOML," she said. "It's a nice bunch of people and we are one big happy group." ☺



Stephen Frangos/USMMA

Capt. Chris McMahon.

## Team Member of the Month Is Capt. Chris McMahon

—By Jeanne Kouhestani

NOAA's Team Member of the Month for August, Capt. Christopher McMahon of the U.S. Maritime Service, has been described as a renaissance man.

He has traveled the globe aboard commercial vessels engaged in worldwide trade and served as an associate professor and sailing master at the U.S. Merchant Marine Academy.

McMahon holds graduate degrees in business, counseling and theology, is an ordained Unitarian Universalist minister, currently heads up the academy's Global Maritime and Transportation School and can speak on just about any topic.

Most importantly for NOAA, he works closely in partnership with the Office of Marine and Aviation Operations and NOAA Corps on training and marine transportation system issues, activities that fall under NOAA's strategic initiative to promote safe navigation.

*continued on page 6*



# Focus On...

## The Great American Fish Count

—By Laura Francis, Julie Dutcher and Christy Semmens

This year, the Great American Fish Count took place in eight national marine sanctuaries: Channel Islands, Monterey Bay, Olympic Coast, Stellwagen Bank, Gray's Reef, Florida Keys, Flower Garden Banks and the Hawaiian Islands Humpback Whale Sanctuaries.

This annual event, held each July, is coordinated by the Reef Environmental Education Foundation and NOAA's National Marine Sanctuary System.

The fish count encourages volunteer divers to become active stewards of the marine environment

by training them to conduct underwater fish surveys.

Data from the fish count are accessible on the REEF Web site and are used by the national marine sanctuaries to assess trends and changes in local fish populations.

The fish count has grown in scope in 2001 to include over 85 seminars and 100 survey dives.

In California, the Channel Islands education staff hosted five seminars and fish surveying trips, including a snorkeling fish count with the Santa Barbara junior lifeguards.

REEF staff taught an additional fish identification seminar that was followed by a two-day fish surveying trip to the Channel Islands, where divers surveyed new areas within the sanctuary.

The Monterey Bay sanctuary provided a seminar taught by local volunteer Leon Garden and sanctuary staff member Karen Grimmer. Garden and the Monterey Bay Sea Otter Dive Club also hosted an informational booth on San Carlos beach for three weekends in July.

The Florida Keys fish count coincided with the establishment of the Tortugas Reserve on July 1. As part of the event, renowned marine explorer Sylvia Earle and NOAA Fisheries biologist James Bohnsack, along with many other volunteers, conducted the first REEF surveys in the new reserve to document fish abundance and diversity so that any changes through time can be tracked. Several seminars were also held in the Keys. REEF partner Florida Keys Community College coordinated survey dives in the sanctuary every weekend in July.

Along with seminars, the Flower Garden Banks sanctuary taught fish identification and surveying to 60 teachers during two annual teachers' cruises in July. During the first cruise, 96 species were recorded and over 85 surveys were completed.

In Gray's Reef, local dive operators, Island Dive Center and Atlantic Reef Dwellers, offered fish seminars and survey trips to the sanctuary.

*continued on page 5*



*Shauna Bingham/NOAA*

*A junior lifeguard volunteer returns to the boat to show off his sightings after snorkeling to survey fish in the Channel Islands National Marine Sanctuary.*

*continued from page 4*

In the Pacific Northwest, REEF staff and local volunteers conducted a two-day survey trip to the Olympic Coast sanctuary the last weekend in July. Several groups in Washington state organized seminars and dives throughout the Puget Sound area.

REEF and the Great American Fish Count were introduced to two new sanctuary sites this year: Stellwagen Bank and the Hawaiian Islands Humpback Whale Sanctuaries.

A kick-off dive at Brant Rock Beach, Maine, hosted by Stellwagen Bank staff and volunteers was the first of many to be held in the area. "A total of 46 divers and snorkelers has been trained in this new program since early June, and I expect more than

100 REEF surveys to be completed by the end of August," said Robert Michelson, volunteer dive team leader for the Stellwagen Bank National Marine Sanctuary.

Seminars on the fishes of the Gulf of Maine were also offered throughout July.

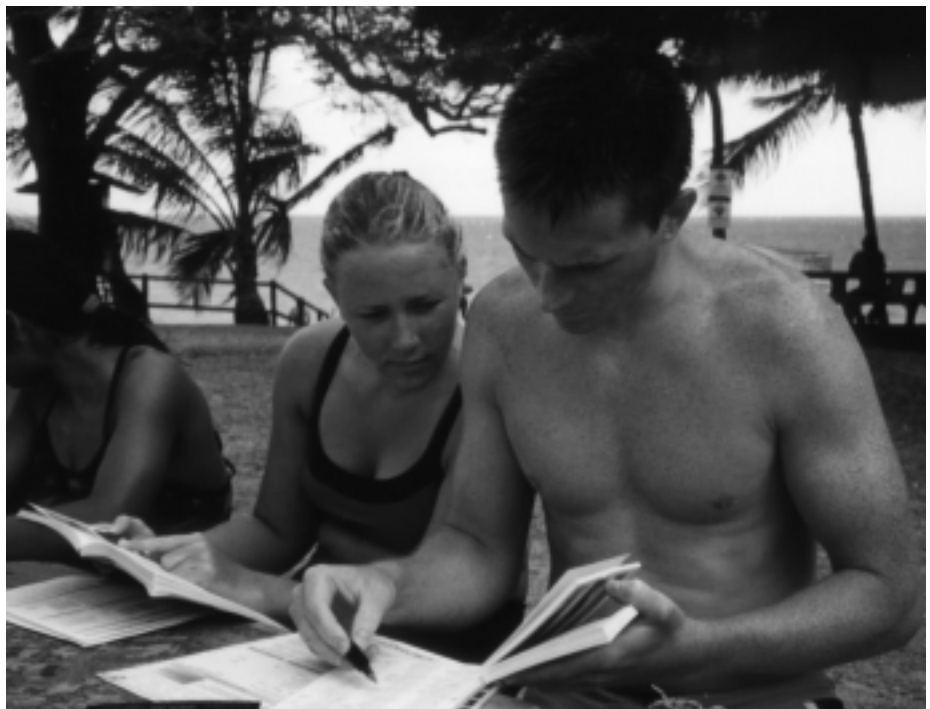
In the Hawaiian Islands humpback whale sanctuary, a fish count seminar was held at the sanctuary's classroom in Kihei. Several survey dives were coordinated by local partners Project SEA-Link, Coral Reef Network and the Maui Community College's marine option program and hosted by local dive operators. About 100 species were documented during this first year of the fish count in the Hawaii sanctuary. ☺



*Dawn Hayes/MBNMS*  
 Volunteer Joanne Garden prepares to enter the Monterey Bay National Marine Sanctuary for her first fish count dive.



*Joyce Burek*  
 REEF volunteers survey fish in the Flower Garden Banks National Marine Sanctuary.



*Liz Foote/Project SEA-Link*  
 Volunteers for the Hawaiian Islands Humpback Whale National Marine Sanctuary study fish identification guides in preparation for the Great American Fish Count.

## GOES

*continued from page 2*

billions of dollars of assets and the services provided by them, from communication satellites and navigation satellites to electrical power grids, and even impacts the International Space Station," said Steven Hill, solar X-ray image program manager at NOAA's Space Environment Center in Boulder, Colo. "The solar X-ray imager will provide the kind of improvements in space weather forecasting that satellite imagery did for tracking hurricanes," he said.

The solar X-ray imager will also be flown on future GOES satellites.

In addition to solar flare warnings, GOES-M will become a workhorse satellite for NOAA. The real-time weather data gathered by NOAA's GOES satellites, combined with data from the agency's Doppler radars on the ground and automated surface observing systems, greatly aid weather forecasters in providing better warnings of thunderstorms, winter storms, flash floods, hurricanes and other severe weather. These warnings help save lives and preserve property, and benefit commercial interests.

GOES satellites are a critical component of the ongoing National Weather Service modernization program within NOAA.

Weather data collected by this GOES-M satellite will provide forecasters with more precise and timely forecast products," said Greg Withee, assistant administrator for satellite and information

services. "Having the GOES-M in orbit and ready to go into operation ensures the continuity of weather data and uninterrupted storm warnings for the Western Hemisphere. I'm extremely proud of all the NESDIS employees who worked so hard to ensure a successful launch. It takes a tremendous amount of teamwork by NESDIS and our colleagues in the government and the private sector to design, procure and launch a

satellite. We can all celebrate the success of this mission," he said.

GOES-M is expected to reach geostationary orbit about

seventeen days after launch. At that time it will be named GOES-12.

It will then undergo a series of tests before completing its check-out phase in about three months.

The GOES satellites also provide instantaneous relays of distress signals from people, aircraft or marine vessels to ground stations of the Search and Rescue Satellite Aided Tracking System.

These unique identification distress signals are combined with signals received by NOAA's Polar-orbiting Operational Environmental Satellite system and relayed to a search and rescue ground terminal.

GOES satellites orbit the equatorial plane of the Earth at a speed matching the Earth's rotation. This allows them to hover continuously over one position on the surface.

The geostationary orbit is usually reached at about 22,300 miles above the Earth, high enough to allow the satellites a full-disc view of the Earth. ☺

## McMahon

*continued from page 3*

When the NOAA Corps training facility in Ft. Eustis, Va., closed in 1995 and officer recruitment was frozen during NOAA's push to downsize, McMahon and the Global Maritime and Transportation School at Kings Point, N.Y., stepped in to fill the training void.

Senior NOAA officers about to go to sea were sent to Kings Point for refresher training.

In 1999 the recruiting freeze was lifted. Rather than re-open the NOAA training facility at great expense, the first new recruits in four years were sent to Kings Point for their basic officer training class.

The courses there had to be adapted to fit NOAA's special needs as a research, rather than transportation, agency.

"Capt. Roger Parsons, who used to head up NOAA's training center, worked closely with Chris McMahon to set up a training program that was similar to NOAA's but also included training in new industry safety standards," said Cdr. Todd Stiles, NOAA Corps assignment coordinator and former training officer.

"Although there was a learning curve for the Global Maritime and Transportation School to learn the NOAA Corps' needs, Chris really bent over backwards to satisfy our requirements and provide the service we requested for our seagoing officers," Stiles said.

"I am very passionate about the job NOAA does," McMahon said. "We share a common problem. Most Americans have no idea what we do and how important it is to have the resources we need to devote to this, that it's absolutely central to the health of the economy and planet. I am extremely proud we can play a small part in training the next generation of NOAA Corps officers." ☺

---

*"The solar X-ray imager will provide the kind of improvements in space weather forecasting that satellite imagery did for tracking hurricanes." — Steven Hill, solar X-ray image program manager at NOAA's Space Environment Center in Boulder, Colo.*

---



## Severe Weather

*continued from page 2*

"This is a great opportunity for us to stretch our forecasts toward the limits of current science," explained Russell Schneider, chief of the Storm Prediction Center's science support branch. "During the experiment, forecasters were forced to decide whether to issue watches sooner, sometimes before they saw evidence in the satellite and radar data that storms had begun to form. It required detailed analysis of multiple computer model forecasts."

The next day, participants evaluated the output from the different models, rating them on their usefulness, and compared their forecasts with what actually happened.

"This process helps the forecasters develop a better understanding of the numerical models that provide their primary source of forecast guidance," Kain said, "and it helps researchers design more useful model guidance products for forecasters' specific needs."

"Our researchers benefit from the opportunity to sit shoulder to shoulder with operational meteorologists and look at problems together," said laboratory director James Kimpel. "From this comes new ideas and directions for research."

Adds Storm Prediction Center director Joseph Schaefer, "It was the potential for great collaboration like this that brought us to Norman and we are excited to see it come to fruition."

Visiting scientists from the Forecast Systems Laboratory, National Centers for Environmental Prediction Environmental Modeling Center, National Weather Service Norman Forecast Office, Iowa State University and the University of Oklahoma also participated in the experiment. ☺

## Aquarium, NOAA Fisheries Join Forces to Halt Dolphin Feeding and Harassment

—By Chris Smith

The boom in businesses catering to people who want to interact with wild dolphins in the Gulf of Mexico and South Atlantic has led the Florida Aquarium in Tampa to seek NOAA's help to educate the public about the possible dangers and legal constraints.

The aquarium's newly acquired 64-foot, 49-passenger catamaran, *The Bay Spirit*, will be as a tool to educate the public about the diversity and stewardship of Tampa Bay's living marine resources.

Aquarium officials asked NOAA Fisheries southeast regional staff to work with their operations and educational personnel to ensure everyone affiliated with *The Bay Spirit's* activities fully understands the marine mammal regulations, enforcement policies and viewing guidelines.

"It is our goal to be exemplary in our dolphin-related activities and to communicate appropriate messages to the thousands of

people who patronize this very popular attraction monthly," said Beck Clayton, the aquarium's education director.

"We feel a special responsibility to use all the resources at our disposal to help our visitors and students cultivate a stewardship ethic for all the creatures with which we share Tampa Bay. That's why we called upon the experts at NOAA Fisheries for help," Clayton said.

Clayton explained that since *The Bay Spirit* became operational in April, each of its three scheduled daily eco-excursions has been sold out.

The vessel has also supported special outings for students enrolled in the aquarium's summer and weekend workshops, the science staff's expanding research activities and several VIP engagements hosted by Tampa's mayor and port authority.

*continued on page 8*



*Chris Smith/NOAA*  
Diane Borggaard of NOAA Fisheries southeast protected resources staff explains marine mammal viewing guidelines to members of the Florida Aquarium's operations and education staff aboard *Bay Spirit*.

## Dolphins

*continued from page 6*

According to Diane Borggaard, a marine mammal specialist with the NOAA Fisheries' southeast regional protected resources staff, many agencies in the southeast region have teamed up to increase public awareness of the federal laws, regulations and guidelines regarding viewing or interacting with dolphins.

These teams have consisted of personnel from NOAA's Office for Law Enforcement and from Fisheries public affairs and protected resources staffs, plus experts from the Clearwater Marine Aquarium, Mote Marine Laboratory and Eckerd College.

"As more people become aware of the viewing guidelines, the laws intended to protect wild dolphins and the negative impacts associated with feeding and harassing them, there's sure to be a domino effect," Borggaard said. "We're optimistic that we can change peoples' behavior through education. The Florida Aquarium provides a valuable link to reaching people with the 'Protect Dolphins' message," she said.

Borggaard's audience included *The Bay Spirit's* skippers, crew, all eight of the Aquarium's full time education staff and several docents and volunteers.

Borggaard made it clear that vessels should never approach dolphins any closer than fifty yards. She said people should never attempt to feed them and that violators should be reported to NOAA's Office of Law Enforcement.

"We're delighted that NOAA Fisheries found the time to help us," Clayton said. "We all learned a lot from Diane. This is the kind of partnership that we intend to sustain, especially since the big winners will be the magnificent creatures of the sea." ☺

## Monitor

*continued from page 1*

number of engineering innovations, including its unique "cheesebox on a raft" hull, its rotating gun turret, screw propeller and engine.

Recovering the engine was like finding an engineering treasure chest.

"The *Monitor's* engine is fairly unique," Broadwater said in an interview from the site. "There are very few if any marine steam engines from this period."

Ericsson reduced the height of this "vibrating side lever" engine to reduce the profile of the warship above the waterline, making it less vulnerable to enemy shells.

Following its recovery, the historic engine was transported to the Newport News Drydock and Shipbuilding Company, which constructed a special holding tank to keep the engine saturated under a constant spray of water. The engine would deteriorate rapidly if it were allowed to dry out in the open air.

The recovered engine, about the size of a couple of sport utility vehicles, is barely recognizable.

"If you saw it right now, you probably wouldn't recognize it as anything at all," Broadwater said. "It doesn't look metallic. It's completely grown over. It's got a thick coating of iron oxide and marine growth. In some places the marine growth was soft corals and sponges as big as a foot or more in diameter."

Broadwater expects to move the engine to the Mariners' Museum by mid-August for preservation and eventual display.

According to Curtiss Peterson, chief conservator for the museum and the *Monitor* project, it could take ten years to preserve the engine for display.

"We have constructed, with the assistance of Newport News

Shipbuilding, a 35- by 35- by ten-foot, 91,000-gallon tank to receive the engine," Peterson said. "We put in chemical solutions that will arrest its corrosion."

The museum will then begin examining the engine in detail to produce "as built" computer-assisted design drawings," Peterson said. "We're making measurements. We're taking photographs. We're establishing data bases."

Peterson said there were some surprises. "The iron is probably in worse condition than we thought. And the copper is in better shape. There's more machinery than we had thought there would be," he said.

The team also recovered a number of pumps, blowers and small auxiliary steam engines. All will be preserved and documented, "well enough to allow someone to build another one from the records we generate," Peterson said.

During the process, "major portions of the conservation will always be on display," Peterson said. The public "will be able to see the material being conserved in tanks."

A team of NOAA-sponsored divers arrived on the site of the wreck in mid-July to prepare for next year's planned recovery of the ship's turret. ☺

The NOAA Report is a monthly publication for NOAA employees from the Office of Public and Constituent Affairs, Washington, D.C.

Address comments to:

**Editor, The NOAA Report**  
**1315 East-West Highway**  
**SSMC3, room 10853**  
**Silver Spring, MD 20910**

301-713-9042 (voice)

301-713-9049 (fax)

Email: dane.konop@noaa.gov

**NOAA Report Online:** <http://www.publicaffairs.noaa.gov/nr>  
 Jordan St. John, director, OPCA  
 Dane Konop, editor