The following update provides the status of NOAA’s fleet of ships and aircraft, which play a critical role in the collection of oceanographic, atmospheric, hydrographic, and fisheries data. NOAA’s current fleet of 16 ships – the largest civilian research and survey fleet in the world – and nine aircraft, are operated, managed, and maintained by NOAA’s Office of Marine and Aviation Operations (OMAO). OMAO includes civilians, mariners, and officers of the United States NOAA Commissioned Officer Corps (NOAA Corps), one of the nation’s seven Uniformed Services.

Find us on Facebook for the latest news and activities.
http://www.facebook.com/NOAAOMAO
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Below is a sampling of clips and web links to recent news items related to OMAO and the NOAA Corps.

Ken Kaye’s Storm Center: NOAA ship capable of finding Amelia Earhart's plane, Flight 19
-Sun-Sentinel
It does not look all that impressive at first blush, but best believe NOAA Ship Okeanos Explorer is a very cool ship. Called “America’s Ship for Ocean Exploration,” it is the only federally funded U.S. vessel assigned to systematically explore the largely unknown ocean in the name of science and discovery. Equipped with a multi-beam sonar system and unmanned robots, it can examine objects almost four miles below the surface. It even has a satellite link, allowing marine aficionados to follow its adventures on the internet. Two of its main missions this year: Investigate the Caribbean Sea, focusing on deepwater habitats and trenches, and examine the Pacific around the Hawaiian Islands. “It’s always exploring,” said Fred Gorell, spokesman for NOAA’s Office of Ocean Exploration and Research. Okeanos Explorer is so technologically advanced that it could potentially find Amelia Earhart’s Lockheed 10E Electra or Flight 19 - the five Navy TBM Avengers that took off from Fort Lauderdale in 1945 and vanished - he said. Both of those are suspected to be resting on (or below) the ocean floor, the Electra in the South Pacific, Flight 19 in the Atlantic off the Central Florida coast. The Okeanos Explorer would first need a scientific purpose for undertaking such search missions – and the search area would have to be very specific, Gorell added. “It is an awfully small ship and it is an awfully big ocean,” he said.

Sky me a river: Scientists say flood threat linked to atmospheric rivers
-Washington Post
During a powerful storm, a ship bounced up and down on 20-foot waves in the black of night, “out in the middle of nowhere,” said Chris Fairall, 750 miles off the coast of San Francisco in the Pacific Ocean. “A lot of people said they didn’t sleep well at breakfast the next morning.” It was the first of several storms for the 30-member crew of the NOAA Ship Ronald H. Brown, the largest ship in the fleet of the National Oceanic and Atmospheric Administration. Why were 18 scientists and crew, including six from Howard University, braving rolling waters on a ship in the vast ocean between California and Hawaii? They were searching for rivers in the sky, trying to unlock the mystery of how they channel water from the tropics and dump it in various types of precipitation on California’s lakes and mountains, Fairall said in an interview Friday, talking on a satellite telephone. Atmospheric rivers, as they are called, carry enormous amounts of waters that have caused damaging floods, but predicting where they will strike can help officials avoid harm and possibly manipulate the water for more beneficial usage, particularly in a region suffering drought, such as California today. NOAA scientists have studied atmospheric rivers for more than a decade, but they had never succeeded in convincing the agency to include the Cadillac of its ship fleet to participate, said Fairall, a NOAA physicist….“These rivers are an important global phenomenon,” said Allen B. White, a NOAA meteorologist who waits for a chance every day at an airport in Sacramento
to hop in an agency jet and fly in and above the sky rivers at 45,000 feet to drop various electronic devices and other gadgets to study them. "It's scary," he said. "All you see out the window is fog, rain pelting the windows and it's very bumpy..."

Molly McCrea, KPIX, SF CBS affiliate, Team of scientists sailing into massive Pacific storm to study 'atmospheric river' effects on California drought

Darrell Smith, Sacramento Bee, Atmospheric Rivers poised to soak Sacramento

Amy Quinton, Capital Public Radio, Research of atmospheric rivers key to understanding California's water supply

David Bienick, KCRA, Scientists dissect approaching atmospheric river

Lonnie Wong and Darren Peck, Fox 40, NOAA goes airborne to study storm

Deborah Sullivan Brennan, San Diego Union Tribune, Scientists fly into storms in search of rain

Amy Quinton, Capital Public Radio, Research of atmospheric rivers key to understanding California's water supply

Bob Henson, Weather Underground, Atmospheric river heads to California as a massive field study gears up

Special interest: Aviation International News, Rockwell Collins, NOAA Expand Airborne Weather Observation Research
NOAA Corps - Basic Officer Training
Class (BOTC) 125

BOTC 125 is off to a roaring start despite the minus zero wind chill factors at the USCG Academy (USCGA) in New London, Connecticut, in early January. BOTC 125 reported to the USCGA on January 8, 2015, and completed their first week of the indoctrination phase; including 0500 wake ups from staff officers and a physically, emotionally, mentally challenging, and rigorous schedule. During their first week of training, they conducted their first drill competition with the 52 members of the current Coast Guard class. BOTC 125 officer candidates are learning the value of time management, situational awareness, and attention to detail with constant attention from staff officers in the barracks.

On January 16, 2015, the 14 members of BOTC 125 toured the USCGA museum as part of their NOAA history class. The NOAA history class began with Captain Albert E. Theberge (NOAA Corps, ret.) conducting a webinar on NOAA Corps’ predecessor’s involvement in the Civil War and World War II. The day ended with some hands-on history at the USCGA museum directed by museum curator, Ms. Jennifer Gaudio, and intern, Mr. Matt Sanders. Items shown were Hopley Yeaton’s musket, a narwhal tusk, a life jacket from WWII, engraved ivory pieces, and an old temperature, conductivity, and salinity wheel. The importance of the partnership between NOAA and USCG, and our shared historical legacy, were enhanced by the experience. BOTC 125 commenced their academic training under Maritime Simulation Institute (MSI) instructor, Captain Rick Comeau. MSI is a state-of-the-art marine simulation center located in Middletown, RI.

NOAA BOTC 125 holding historical maritime artifacts during a visit to the USCGA Museum (New London, CT).
[Photo: LTJG Proie, NOAA]
OMAO’s Ships and Centers

OMAO’s Ship Tracker (screen shot below) shows information about the location - present and past - of our fleet of research and survey ships. http://shiptracker.noaa.gov

OMAO’s ships and related Marine Centers are listed below based on the geographical location of the vessels’ homeports starting in the Northeast and ending in the Pacific.

**New Castle, NH**

**NOAA Ship Ferdinand R. Hassler**

Commanding Officer: CDR Marc Moser  
Primary Mission Category: Hydrographic Surveys  
DEPART: New Castle, NH  
ARRIVE: New Castle, NH

**Project:** Hydrographic Survey Operations in the Gulf of Maine

**Objectives:** To support safe navigation through the acquisition and processing of hydrographic survey data for updating nautical charts and by the identification and dissemination of dangers to navigation as identified during the course of survey operations.
The Blizzard of 2015 hit New England hard. NOAA Ship Ferdinand Hassler was safely in port in New Castle, NH, but the crew still had to break out their snow shoveling gear. It is important to remove snow and ice from the ship as soon as possible, as it can affect stability.

[Photo: LT Morgan, NOAA]

**Woods Hole, MA (currently docks in Newport, RI)**

**NOAA Ship Henry B. Bigelow**

**Commanding Officer:** CDR G. Mark Miller  
**Primary Mission Category:** Fisheries Research  
**Ship Status:** Alongside Newport, RI, for scheduled maintenance, winter repairs, scientific data processing, crew rest, and training.
Davisville, RI

**NOAA Ship Okeanos Explorer**

**Commanding Officer:** CDR Mark Wetzler  
**Primary Mission Category:** Oceanographic Exploration and Research  
**DEPART:** Davisville, RI  
**ARRIVE:** San Juan, PR

**Project:** Patch test and ship shakedown / Caribbean Exploration (Mapping)

**Objectives:** Conduct patch test to calibrate hydrographic survey equipment and sea trials to measure the vessel’s performance and general seaworthiness after repair period. After calibration, conduct Caribbean Exploration Mapping project.
1. Collect deep water multibeam bathymetry sonar data.
2. Collect sonar data acquisition with EK60 single beam sonar and Knudsen sub-bottom profiler.
3. Conduct Expendable Bathymetric Thermograph (XBT) operations.
5. Deploy Free Vehicles along Puerto Rican trench.
6. Train new personnel in all data collection and processing procedures.
7. Test new or modified mission hardware and software.
8. Maintain telepresence.

Norfolk, VA

**NOAA Ship Thomas Jefferson**

**Commanding Officer:** CAPT Shepard Smith  
**Primary Mission Category:** Hydrographic Surveys  
**Ship Status:** Alongside Marine Operations Center – Atlantic, Norfolk, VA, for scheduled maintenance, winter repairs, scientific data processing, crew rest, and training.

**OMAO’S MARINE OPERATIONS CENTER – ATLANTIC (MOC-A)**

CAPT Anne Lynch, Commanding Officer MOC-A

MOC-A serves as a homeport for one NOAA ship, and manages the day-to-day operations and provides administrative, engineering, maintenance, and logistical support for the research and survey ships in NOAA's Atlantic fleet. Each year these ships conduct dozens of missions to assess fish and marine mammal stocks, conduct coral reef research, collect seafloor data to update nautical charts, and explore the ocean.

Charleston, SC

**NOAA Ship Nancy Foster**

**Commanding Officer:** LCDR Jeffrey Shoup  
**Primary Mission Category:** Oceanographic Research, Environmental Assessment  
**Ship Status:** In drydock at GMD Shipyard in Brooklyn, NY, for installation of an EM710 multibeam sonar.
NOAA Ship *Ronald H. Brown*

**Commanding Officer:** CAPT Robert Kamphaus  
**Primary Mission Category:** Oceanographic Research, Environmental Assessment  
**DEPART:** Honolulu, HI  
**ARRIVE:** San Diego, CA  
**DEPART:** San Diego, CA  
**ARRIVE:** Papeete, Tahiti

**Project 1:** CALWATER 2 Study

**Objectives:** Characterize air-sea interaction characteristics of the marine boundary layers in both background and storm conditions. This will include: characterizing air-sea fluxes and aerosol production in atmospheric rivers (ARs), characterizing oceanic and atmospheric mixed layer response to ARs, and characterizing the size-resolved properties of boundary layer aerosols in the open ocean versus the coastal regime.

**Project 2:** Tropical Atmosphere Ocean (TAO) Buoy Array Maintenance (125W / 140W)

**Objectives:** Maintenance of the TAO moored ocean buoy array along the 125°W and 140°W meridians. The TAO buoy array is critical to providing real-time data for improved detection, understanding and prediction of El Nino and La Nina events.

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**NOAA Ship Ronald H. Brown** pulling into San Francisco, CA this month, after taking part in the CALWATER2 project alongside the NOAA Hurricane Hunters, off the Pacific coast.

[Photo: Eric Thompson, NOAA]

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**Pascagoula, MS**

**NOAA Ship *Oregon II***

**Commanding Officer:** Master Dave Nelson  
**Primary Mission Category:** Fisheries Research  
**Ship Status:** In drydock at VT Halter Marine in Pascagoula, MS, for a scheduled repair period.
**NOAA Ship *Gordon Gunter***

**Commanding Officer:** Master Donn Pratt  
**Primary Mission Category:** Fisheries Research  
**DEPART:** Pascagoula, MS  
**ARRIVE:** Pascagoula, MS

**Project:** Southeast Area Monitoring and Assessment Program (SEAMAP) Winter Ichthyoplankton

**Objectives:**
1. Assess the occurrence, abundance and geographical distribution of the early life stages of winter spawning fishes (especially groupers and tilefishes) from mid continental shelf to deep Gulf of Mexico waters by sampling at selected SEAMAP stations.
2. Describe the pelagic habitat of fish larvae through measurements of various physical and biological parameters.
3. Measure the vertical distribution of fish larvae by sampling at discrete depths in the water column at selected locations along the SEAMAP plankton survey grid.
4. Map the distribution of fish eggs and invertebrate zooplankton along the cruise track using a Continuous Underway Fish Egg Sampler (CUFES).
5. Collect detailed observations of net-caught jellyfish and ctenophores.

**NOAA Ship *Pisces***

**Commanding Officer:** CAPT Michael Hopkins  
**Primary Mission Category:** Fisheries Research  
**Ship Status:** Alongside Pascagoula, MS, for scheduled maintenance, winter repairs, scientific data processing, crew rest, and training.

**San Diego, CA**

**NOAA Ship *Reuben Lasker***

**Commanding Officer:** LCDR John Crofts  
**Primary Mission Category:** Fisheries Research  
**Ship Status:** The ship is alongside in San Diego, CA, due to voltage and harmonic issues within the propulsion motors and will remain alongside as solutions are developed.

**Newport, OR**

**NOAA Ship *Rainier***

**Commanding Officer:** CDR E.J. Van Den Ameele  
**Primary Mission Category:** Hydrographic Surveys  
**Ship Status:** The ship is alongside Marine Operations Center – Pacific, Newport, OR, for scheduled maintenance, winter repairs, scientific data processing, crew rest, and training.
**NOAA Ship Bell M. Shimada**  
**Commanding Officer:** CDR Brian Parker  
**Primary Mission Category:** Fisheries Research  
**DEPART:** Newport, OR  
**ARRIVE:** Newport, OR  
**DEPART:** Newport, OR  
**ARRIVE:** Newport, OR

**Project 1:** Northern California Current Ecosystem Survey  

**Objectives:** Make hydrographic measurements such as Conductivity, Temperature, and Depth (CTD), collect water samples for chemical analyses with a Niskin bottle rosette, and collect zooplankton samples with towed plankton nets at an array of stations along transect lines extending across the Oregon, Washington, and northern California coast.

**Project 2:** Pacific Orcinus Distribution Survey 2015  

**Objectives:** Conduct acoustic and visual surveys of marine mammals and seabirds along the Washington, Oregon, California, and Canadian coasts in order to determine Critical Habitat in the coastal portion of the range of Southern Resident killer whales. The collection of predation, fecal, and biopsy samples will be of significant additional value. Secondary objectives include locating and documenting other cetacean species, in particular the collection of photographs and audio recordings of other killer whale pods, as well as sea bird counts and oceanographic data.

**OMAO’S MARINE OPERATIONS**  
**Mr. Troy Frost, (Acting) Director of Marine Operations**  
OMAO’s Marine Operations oversees operations of the three regional Centers, including the Marine Operations Center-Pacific, Marine Operations Center-Atlantic, and Marine Operations Center-Pacific Islands.

**OMAO’S MARINE OPERATIONS CENTER – PACIFIC (MOC-P)**  
**CAPT Douglas Baird, Commanding Officer MOC-P**  
MOC-P serves as a homeport for two NOAA ships, and manages the day-to-day operations and provides administrative, engineering, maintenance, and logistical support for the research and survey ships in NOAA’s Pacific fleet. Each year these ships conduct dozens of missions to assess fish and marine mammal stocks, conduct coral reef research, collect seafloor data to update nautical charts, and explore the ocean.
Ketchikan, AK (currently docks in Newport, OR)

**NOAA Ship Fairweather**
- **Commanding Officer:** CDR David Zezula
- **Primary Mission Category:** Hydrographic Surveys
- **Ship Status:** In drydock at the Bay Ship & Yacht Shipyards in Alameda, CA, for a scheduled repair period, followed by sonar acceptance trails and transit to Seattle, WA.

Kodiak, AK

**NOAA Ship Oscar Dyson**
- **Commanding Officer:** CDR Arthur “Jesse” Stark
- **Primary Mission Category:** Fisheries Research
- **DEPART:** Kodiak, AK               **ARRIVE:** Kodiak, AK
- **DEPART:** Kodiak, AK               **ARRIVE:** Kodiak, AK

**Project 1:** CO2 Surface and Fisheries Oceanography Coordinated Investigations Subsurface Mooring Recover/Deploy

**Objectives:** In support of NOAA’s Ocean Acidification Program, NOAA will recover and deploy two surface instrumentation buoys to:

2. Conduct inter-calibration measurements near the OA observing assets in the study area, allowing inter-calibration of these autonomous assets with high quality, ship-based measurements.
3. Provide calibration data needed to develop predictive models for aragonite saturation state, pH, and other important OA indicators in the California Current System, based on widely measured parameters such as salinity, temperature, and oxygen concentration.
4. Provide quantitative assessment of phytoplankton, zooplankton, and harmful algal bloom activity in conjunction with OA measurements.
5. Provide scientific information on OA conditions and trends for resource management and decision support.

**Project 2: Acoustic Trawl Survey of the Shumagin Islands, Sanak Trough, Pavlov Bay, Morzhovoi Bay, Kenai Peninsula Bays, and Prince William Sound (PWS).**

**Objectives:**
1. Collect acoustic trawl data necessary to determine the distribution, biomass, and biological composition of walleye Pollock.
2. Collect target strength data using hull-mounted transducers for use in scaling acoustic data to estimates of absolute abundance.
3. Calibrate the EK60 acoustic and three autonomous echosounder systems using standard sphere calibration techniques.
4. Collect physical oceanographic data (temperature and salinity profiles) at selected sites, and continuously collect sea surface temperature and salinity data.
5. Conduct trawl hauls to ground truth multi-frequency echo integration data collection.
6. Deploy moored echosounders at three locations in Shelikof Strait and conduct Conductivity, Temperature, and Depth (CTD) casts and mini-acoustic surveys and trawls in vicinity of deployments. The areas where the moored echosounders are deployed will also be sampled on the transit from the Shumagin Islands survey area to Kenai/PWS survey area.

**Honolulu, HI**

**NOAA Ship Hi‘ialakai**

**Commanding Officer:** CDR Daniel Simon

**Primary Mission Category:** Oceanographic Research, Environmental Assessment

**DEPART:** Pearl Harbor, HI  
**ARRIVE:** Pago Pago, AS

**DEPART:** Pago Pago, AS  
**ARRIVE:** Pago Pago, AS

**Project:** American Samoa - Reef Assessment and Monitoring Program (RAMP)

**Objectives:**
1. Conduct ecosystem monitoring of the species composition, abundance, percent cover, size distribution, recruitment, and general health of the fishes, corals, other invertebrates, and algae of the shallow water (< 35 m) coral reef ecosystems of Johnston Atoll, the Phoenix Islands, the Territory of American Samoa, and the Line Islands.
2. Deploy, retrieve, and/or service an array of Subsurface Temperature Recorders, Sea Surface Temperature Buys, Autonomous Reef Monitoring Structures, Calcification Accretion Units, Bioerosion Monitoring Units, Ecological Acoustic Recorders, moored Acoustic Doppler Current Profilers (ADCP), as well as anchored arrays consisting of a portable underwater collector, ADCP, a Conductivity, Temperature, Depth (CTD) recorder and a thermistor string to allow remote long-term
monitoring of oceanographic and environmental conditions affecting the coral reef ecosystems of Johnston Atoll, the Phoenix Islands, the Territory of American Samoa, and the Line Islands. This effort is in support of the Coral Reef Ecosystem Integrated Observing Systems (CREIOS).

3. Monitor near-shore physical and ecological factors associated with ocean acidification and general water quality, including analysis of seawater for nutrients, chlorophyll concentration, salinity, temperature, dissolved oxygen, transmissivity, total alkalinity, and dissolved inorganic carbon. These parameters will be measured via the collection of water in Niskin bottles CTD casts. Shallow-water CTDs will be conducted from small boats to a depth of ~30 m.

4. Collect shallow water coral cores to examine calcification/growth rates in recent decades and assess potential early impacts of ocean acidification. Coring operations will be conducted opportunistically (as a scientific dive).

5. Shipboard ADCP surveys around reef ecosystems to examine physical and biological linkages supporting and maintaining the island ecosystems.

6. Collect oceanographic data utilizing ship-based measurement systems ADCP, ThermoSalinoGraph (TSG), and the Scientific Computer System (SCS) during all transits for the duration of the project.

7. Conduct investigations of marine microbial communities, including the collection of specimens via water sampling and benthic grab samples.

8. Determine the existence of threats to the health of these coral reef resources from anthropogenic sources, including marine debris.

**NOAA Ship Oscar Elton Sette**

**Commanding Officer:** CDR Stephanie Koes

**Primary Mission Category:** Fisheries Research

**Ship Status:** Alongside Marine Operations Center – Pacific Islands, Pearl Harbor, HI, for scheduled maintenance, winter repairs, scientific data processing, crew rest, and training.
OMAO’S MARINE OPERATIONS CENTER – PACIFIC ISLANDS (MOC-PI)
CAPT Douglas Baird, (Acting) Commanding Officer MOC-PI
MOC-PI serves as a homeport for two NOAA ships, and manages the day-to-day operations and provides administrative, engineering, maintenance, and logistical support for the ships in NOAA's Pacific Islands' fleet.
**OMAO’s Aircraft**

**Tampa, Florida**

**OMAO’S AIRCRAFT OPERATIONS CENTER (AOC)**

**CAPT Harris Halverson, Commanding Officer AOC**

The AOC, located at MacDill Air Force Base, serves as the main base for OMAO’s fleet of nine aircraft and provides capable, mission-ready aircraft and professional crews to the scientific community. Whether studying global climate change or acid rain, assessing marine mammal populations, surveying coastal erosion, investigating oil spills, flight checking aeronautical charts, or improving hurricane prediction models, the AOC flight crews continue to operate in some of the world's most demanding flight regimes.

**WP-3D (N42RF) – “Hurricane Hunter”**

**Aircraft Commander:** LCDR Scott Price  
**Temporary Base:** Halifax, Nova Scotia  
**Current Mission:** Ocean Winds Project

Aircraft will conduct the Ocean Winds Project for NESDIS over the North Atlantic Ocean. Microwave sensors flown aboard the P-3 aircraft in limiting environmental conditions (high winds and precipitation) will improve our understanding of measurements from existing satellite sensors such as ASCAT and the Oceansat2 scatterometers, and improve the design of future satellite sensors. This will result in better use of these data by weather and ocean models and human forecasters in their decision making process. This knowledge will also greatly aid in product improvements and planning for future satellite sensors such as DFS and ASCAT follow-on.

**Re-winging of N42RF is scheduled to commence in March 2015 and finish in May 2016.**

Re-wing Kit Consists of:  
-Outer Wing Assembly (OWA)  
-Center Wing Box (CWB)  
-Horizontal Stabilizer (Hstab)  
-Installation
Jet Prop Commander (N45RF)
Aircraft Commander: LCDR Patrick Didier and LTJG Kyle Salling
Current Mission: Various locations for Snow Survey / Soil Moisture Surveys

Aircraft will conduct Snow Survey operations for the National Operational Hydrologic Remote Sensing Center. The project utilizes an Airborne Gamma Radiation detector to make airborne Snow Water Equivalent and soil moisture measurements. Airborne Snow Water Equivalent measurements are used by NWS Weather Forecast Offices and NWS River Forecast Centers when issuing river and flood forecasts, water supply forecasts, and spring flood outlooks.

Twin Otter (N46RF)
Aircraft Commander: LT John Rossi and LTJG Kevin Doremus
Current Mission: Various Locations for Snow Survey / Soil Moisture Surveys

Aircraft will also conduct Snow Survey and Soil Moisture operations for the National Operational Hydrologic Remote Sensing Center, as described above.

NOAA's Twin Otter Aircraft N46RF on the tarmac in Duluth, Minnesota before a snow survey, January 2015.
[Photo: ENS Bonner, NOAA]

Twin Otter (N48RF)
Aircraft Commander: LCDR Jason Mansour and LCDR Nick Toth
Temporary Base: Saint Simons Islands, GA
Current Mission: Southeastern Right Whale Survey – Georgia coastal waters

Aircraft is conducting the Southeastern Right Whale survey out of Saint Simons Is., GA. NOAA Fisheries Service Southeast Regional Office conducts these multi-aircraft surveys annually, from South Carolina to Florida, in an effort to determine calf production, right whale distribution relative to habitat variables, and to reduce ship collisions with right whales. Surveys are flown under contract or grants to the Florida Fish and Wildlife Conservation Commission, Georgia Department of Natural Resources, New England Aquarium, and the Wildlife Trust.
Twin Otter (N56RF)
Aircraft Commander: LTJG Kevin Doremus
Current Mission: Various Locations for Southeast Atlantic Marine Assessment Program for Protected Species. Atlantic waters off the U.S. coast.

Aircraft is conducting the Southeast Atlantic Marine Assessment Program for Protected Species (AMAPPS). This multi-year survey will serve multiple objectives with respect to marine mammal conservation: 1) provide distribution and abundance of all species of cetaceans, seals, and sea turtles for the spring which will be used to develop spatially and temporally-specific density maps that will be available to other agencies and the public; 2) provide photo-identification records on Right whales, and 3) provide sightings of dead whales. The AMAPPS survey is a cooperative effort between NMFS's Northeast and Southeast Fisheries Science Centers.

Twin Otter (N57RF)
Temporary Base: Calgary, Alberta (Canada)
Current Mission: Aircraft is undergoing a scheduled corrosion inspection.

Gulfstream IV (N49RF)
Aircraft Commander: LT Ronald Moyers
Temporary Base: Sacramento, CA
Current Mission: CALWATER 2 Mission

Aircraft is conducting CALWATER 2 mission to measure aerosol (solid or liquid air particles suspended in air) plumes and their interaction with atmospheric rivers off, near and on coastal and inland environments. Atmospheric rivers are a direct source of precipitation to the west coast of the United States. This aircraft will be conducting the CALWATER 2 project, along with the NOAA WP-3D, N43RF. The G-IV will be obtaining high altitude data while the WP-3D will be concentrating on mid to low altitudes.

A better understanding of Atmospheric Rivers (ARs) and Aerosols is needed to reduce uncertainties in weather predictions and climate projections of extreme precipitation and its effects, including the provision of beneficial water supply. In the CALWATER 2 white paper, science gaps are identified associated with (1) the evolution and structure of ARs, (2) the prediction of aerosol burdens and properties during intercontinental transport from remote source regions to the U.S. West Coast, and (3) aerosol interactions with ARs and the impact on precipitation, including locally generated aerosol effects on orographic precipitation along the U.S. West Coast. A set of science investigations are proposed to fill these gaps with a targeted set of aircraft and ship-based measurements and associated evaluation of data over regions offshore of California and in the central and eastern Pacific for an intensive observing period.

Operational partners include NASA, National Science Foundation, Department of Energy and UC San Diego. NOAA operational research platforms working on this project include: NOAA WP-3D and NOAA G-IV aircraft, as well as NOAA Ship Ronald H. Brown.
"Atmospheric Rivers" project is currently underway off the California coast. February 3, the local news media in San Francisco shot a great story on this important project: [http://sanfrancisco.cbslocal.com/2015/02/03](http://sanfrancisco.cbslocal.com/2015/02/03)

[Photo: SANFRANCISCO.CBSLOCAL.COM]

**WP-3D (N43RF)**

- **Aircraft Commander:** CDR Mark Sweeney
- **Temporary Base:** Sacramento, CA
- **Current Mission:** Scheduled maintenance and upgrades/ CALWATER 2 Mission

Aircraft is conducting the CALWATER 2 Mission, described above, off the U.S. West Coast, collecting data on atmospheric conditions between Hawaii and California. The objectives of this project are improved understanding of atmospheric river structure, lifecycle, impact on US west coast due to precipitation and flooding, as well as improved forecast capability for Atmospheric River events. This aircraft is conducting the CALWATER 2 project, along with the NOAA G-IV, N49RF. The G-IV will be obtaining high altitude data while the WP-3D will be concentrating on mid to low altitudes.

**King Air (N68RF)**

- **Aircraft Commander:** CAPT Adam Dunbar and LT Rebecca Waddington
- **Current Mission:** Various Locations – Continuous Coastal Mapping

King Air is conducting Coastal Mapping mission flights in various locations. The Coastal Mapping work is an on-going mission, run by the Remote Sensing Division of the National Geodetic Survey (NGS), with the goal of providing a regularly-updated national shoreline for supporting marine navigation, defining territorial limits, and managing coastal resources. Stereo photogrammetry and LiDAR are used to produce a digital database for a national shoreline. The King Air will be conducting operations along the U.S. eastern seaboard and along the Gulf of Mexico.
Unmanned Systems Support

NASA Global Hawk
Location: Edwards Air Force Base (AFB), CA
One of NASA’s Global Hawks is currently being instrumented for a multinational science campaign. The Coordinated Airborne Studies in the Tropics project, or CAST, will carry eight payloads (two from NOAA) operating out of Edwards AFB to the equatorial region for atmospheric profiling. Science flights will begin in late February and conclude in March of 2015. A NOAA Corps officer, LCDR Jonathan Neuhaus, will be participating as a pilot and project manager.

APH-22 Hexacopter
Location: Antarctica – Cape Shirreff, Livingston Island and Copacabana Field Camp, King George Island
Mission: Aerial Survey of Penguin Colonies and Fur Seals

The Southwest Fisheries Science Center has successfully used the APQ-16 and APH-22 in field seasons from 2010 to 2014, and continues this effort this year from Cape Shirreff Field Station in Antarctica. SWFSC also plans to expand the aerial survey work to include routine monitoring flights conducted at a second research site in Antarctica at the U.S. Antarctic Ecosystem Research program’s seabird monitoring project at the Copacabana Field Camp in Admiralty Bay on King George Island. This season’s efforts from Copacabana Field Camp will focus on collecting replicate counts of penguin chicks for Adélie, Gentoo, and Chinstrap penguins and establishing base line photo mosaics of colony locations and sizes in a rapidly changing colony of penguins. Integrated within these missions will be a set of controlled, decreasing-altitude flights to establish the affect, if any, that these flights have on wild animal populations. This season’s efforts from Cape Shirreff will focus on collecting replicate counts of breeding pairs and chicks for Gentoo and Chinstrap penguins, Antarctic fur seal pup counts, and defining the relationship between mass of leopard seals and their size and shape as determined from vertical aerial photographs.

Puma
Location: Offshore Waters of Maui and Hawaii
Mission: Hawaiian Islands Humpback Whale National Marine Sanctuary Puma Project

This project is a demonstration and evaluation of the Puma Unmanned Aerial System (UAS) platform and payload to support Humpback Whale research and entanglement response efforts at the Hawaiian Islands Humpback Whale National Marine Sanctuary (HIHWNMS). The Office of National Marine Sanctuaries plans on utilizing the Puma UAS for a variety of Sanctuary management and research requirements. The primary mission will be Living Marine Resource surveys, specifically humpback whale research. In addition, joint operations with the Puma and a Liquid Robotics Wave Glider Unmanned Surface Vehicle (USV) are planned to evaluate future potential for joint UAS and USV operations. The Puma will be evaluated for potential large whale entanglement emergency response. The Puma will be operated in coordination with the USV in a “tip and queue” scenario where the Puma will identify areas of interest and the USV will be directed to the designated location for surface analysis.
Douglas Krause, a research biologist with NMFS and UAS pilot, seen here piloting a hexacopter in Antarctica.
[Photo: McKenzie Mudge, NOAA/NMFS]
OMAO Partnerships

United States Senate Committee on Commerce, Science, and Transportation – Office of Ranking Member, Senator John Thune (R-SD)

Location: Washington, DC
Detail: LCDR Wendy Lewis, NOAA Commissioned Officer Corps
LCDR Lewis is currently on detail to the Committee and the office of Ranking Member Thune where she will be assisting on activities pertaining to oceans, atmosphere, and fisheries policy, as well as other matters within the Committee’s jurisdiction.

National Science Foundation

Location: Antarctica
Mission: LTJG Jesse Milton, NOAA Commissioned Officer Corps
Members of the NOAA Commissioned Officer Corps carry out NOAA’s mission in remote locations across the globe. LTJG Milton is assigned to Antarctica where he serves as the Station Chief for NOAA’s Atmospheric Research Observatory (ARO) at the Amundsen-Scott South Pole Station. The ARO at the Amundsen-Scott South Pole Station is a National Science Foundation facility used in support of scientific research related to atmospheric phenomena.

Department of Defense - U.S. Pacific Command (USPACOM)

Location: Honolulu, HI
Embedded Liaison: CAPT Barry Choy, NOAA Commissioned Officer Corps
The U.S. Pacific Command (USPACOM) area of responsibility encompasses approximately half the earth's surface and more than half of its population. The 36 nations that comprise the Asia-Pacific include: two of the three largest economies and nine of the ten smallest; the most populous nation; the largest democracy; the largest Muslim-majority nation; and the smallest republic in the world. The region is a vital driver of the global economy and includes the world's busiest international sea lanes and nine of the ten largest ports. By any meaningful measure, the Asia-Pacific is also the most militarized region in the world, with seven of the world's ten largest standing militaries and five of the world's declared nuclear nations. Under these circumstances, the strategic complexity facing the region is unique. CAPT Choy is linked closely with the activities within the region allowing for identification of opportunities and cooperation between USPACOM and NOAA, and better overall government function situational awareness in the region.

Department of Defense - U.S. Northern Command (USNORTHCOM)

Location: Boulder, CO
Embedded Liaison: CAPT Mark Moran, NOAA Commissioned Officer Corps
U.S. Northern Command (USNORTHCOM) partners to conduct homeland defense, civil support, and security cooperation to defend and secure the United States and its interests. NORTHCOM’s area of responsibility includes air, land, and sea approaches and encompasses the continental United States, Alaska, Canada, Mexico, and the surrounding water out to approximately 500 nautical miles. It also includes the Gulf of Mexico, the Straits of Florida, and portions of the Caribbean region that include The Bahamas, Puerto Rico, and the U.S. Virgin Islands. CAPT Moran serves as the liaison for the NOAA Corps, helping to plan, organize, and execute homeland defense and civil support missions.
**Department of Defense - U.S. Navy**
**Location:** Washington, DC
**Embedded Liaison:** CDR Christiaan van Westendorp, NOAA Commissioned Officer Corps

CDR van Westendorp serves as NOAA liaison to the Oceanographer of the Navy and is an important interface between the U.S. Navy and other U.S. Federal Agencies, including NOAA. As NOAA Liaison, CDR van Westendorp serves as the Head of the Interagency Policy Branch of the International and Interagency Policy Division, Office of the Oceanographer of the Navy, located at the U.S. Naval Observatory. The mission of this Division is to coordinate and execute the Oceanographer of the Navy functions related to policy and programs involving international and/or interagency oceanography. Oceanography includes meteorology, oceanography, mapping, charting and geodesy, astronomy, and precise time and time interval.

**Department of Defense - U.S. Navy**
**Location:** Stennis Space Center, MS
**Embedded Liaison:** LT Jonathan French, NOAA Commissioned Officer Corps

Embedded in the Navy’s Naval Oceanography Mine Warfare Center, LT French works side by side with Navy officers operating Unmanned Underwater Vehicles worldwide and is currently deployed to the Arabian Gulf. This collaboration will provide knowledge and experience that will keep NOAA on the cutting edge of this emerging technology as well as strengthen the partnership between NOAA and the Navy.

**Department of Defense and NOAA’s Office of Coast Survey**
**Location:** Silver Spring, MD
**Embedded Liaison:** CDR Matthew Wingate, NOAA Commissioned Officer Corps

NOAA’s National Ocean Service Office of Coast Survey (OCS) is the lead federal provider of nautical charts and hydrographic survey data of the U.S. Exclusive Economic Zone. Meeting this responsibility requires active cooperation and coordination with federal partners in the Departments of Defense and Homeland Security with which NOAA shares responsibility for U.S. navigational products and services. CDR Wingate tracks, coordinates, and adds value to existing activities involving OCS subject matter experts and partners, seeks and develops additional opportunities for collaboration, and increases visibility and access to these activities and partnerships for OCS leadership.

**Department of Homeland Security - U.S. Coast Guard**
**Location:** Washington, DC
**Embedded Liaison:** CAPT Jeremy Adams, NOAA Commissioned Officer Corps

As the NOAA liaison to the United States Coast Guard (USCG), CAPT Adams maintains a current and comprehensive knowledge of interagency activities and policies related to the USCG and NOAA. He identifies potential conflicts or benefits issues for analysis and evaluation, conducts appropriate assessments and studies, and serves as the interface between NOAA and the USCG. CAPT Adams initiates, designs, and implements strategies through federal agency liaison and coordination that results in cooperative arrangements for maritime security, oceanographic research, hazardous materials spill response, and many other activities.
The mission of the Teacher at Sea (TAS) program is to give teachers a clearer insight into our ocean planet, a greater understanding of maritime work and studies, and to increase their level of environmental literacy by fostering an interdisciplinary research experience. The program provides a unique environment for learning and teaching by sending kindergarten through college-level teachers to sea aboard NOAA research and survey ships to work under the tutelage of scientists and crew. Then, armed with new understanding and experience, teachers bring this knowledge back to their classrooms. Since its inception in 1990, the program has enabled more than 600 teachers to gain first-hand experience of science and life at sea. By participating in this program, teachers enrich their classroom curricula with knowledge that can only be gained by living and working side-by-side, day and night, with those who contribute to the world's body of oceanic and atmospheric scientific knowledge. Below is a list of the NOAA Teachers at Sea activities for the current month. Once the 2015 teachers at sea sailing projects have started, you can gain access to their blogs which document their missions at sea and offer a wealth of information about the research being conducted as well as personal stories. More info:

http://teacheratsea.noaa.gov


2014 NOAA Teacher at Sea Year in Review Report - http://teacheratsea.noaa.gov/about/highlights.html

**February 6, 2015** – Two shark scientists from NOAA’s National Marine Fisheries Service, Southeast Fisheries Science Center will visit Julie Karre’s (TAS, 2013) school in Baltimore, MD.

**February 7, 2015** – NOAA Heritage Day Open House; Jenny Goldner (TAS, 2011), Dr. William Driggers and Kristin Hannan from NOAA’s National Marine Fisheries Service, Southeast Fisheries Science Center will give a presentation and have hands-on activities in Silver Spring, MD.

**February 11-12, 2015** – International Teacher Scientist Partnership Conference in San Francisco, CA; Three TAS staff will present and Stacey Klimkosky (TAS 2009) will present with Grace Simpkins, science educator from NOAA’s National Marine Fisheries Service, Northeast Fisheries Science Center.

**March 2015** – Looking to start the season and begin sailing teachers.
OMAO - NOAA Dive Program

OMAO manages and implements NOAA’s Dive Program (NDP), which trains and certifies scientists, engineers, and technicians from federal, state, tribal governments, and the private sector to perform the variety of tasks carried out underwater to support NOAA’s mission. NDP also has cooperative diving agreements with over 100 government agencies and academic institutions. NOAA has more than 400 divers who perform over 14,000 dives per year. The NDP is headquartered at the NOAA Diving Center at the NOAA Western Regional Center in Seattle, Washington. [http://www.ndc.noaa.gov/gi_program.html](http://www.ndc.noaa.gov/gi_program.html).

Most NOAA ships have NOAA Corps divers on board that provide essential services in support of research projects and to conduct ship maintenance. Ship hull inspections, hull cleanings and maintenance provided by the divers save the NOAA Office of Marine and Aviation Operations tens of thousands of dollars per ship every year.

Shown above, a ship’s diver from NOAA Ship *Oscar Elton Sette* uses a pneumatic wheel grinder to clean the ship’s propellers during a maintenance dive.

[Photo: LT Ryan Wattam, NOAA]
OMAO - NOAA Small Boat Program

OMAO sets policy and provides safety inspections for almost 400 small boats operated by the various Line and program offices throughout NOAA, which support fisheries laboratories, dive support, nautical charting, ocean and Great Lakes research, and more. More info: http://www.sbp.noaa.gov/

NOAA small boats support many diverse operations across the country.
[Photos: NOAA]
The personnel, ships, and aircraft of NOAA play a critical role in gathering environmental data vital to the nation’s economic security, the safety of its citizens, and the understanding, protection, and management of our natural resources. The NOAA fleet of ships and aircraft is managed and operated by the Office of Marine and Aviation Operations (OMAO), an office comprising civilians, mariners, and officers of the NOAA Commissioned Officer Corps, one of the seven uniformed services of the United States. NOAA’s roots trace back to 1807, when President Thomas Jefferson ordered the first comprehensive coastal surveys. Those early surveys ensured safe passage of ship-borne cargo for a young nation. As the needs of the nation have grown, so too have OMAO’s responsibilities. Today, OMAO civilians and NOAA Corps officers operate, manage, and maintain NOAA’s active fleet of 16 research and survey ships and nine specialized aircraft. Together, OMAO and the NOAA Corps support nearly all of NOAA’s missions.

After Hurricane Sandy in 2012, NOAA ships Thomas Jefferson and Ferdinand R. Hassler conducted emergency bathymetric surveys to locate possible submerged navigational hazards in the ports of New York and Virginia. These surveys enabled the ports to reopen quickly. Aerial images of storm-stricken regions, taken by NOAA aircraft, helped residents and emergency workers to quickly assess the condition of houses, bridges, and vital infrastructure. In 2010, the NOAA fleet and the NOAA Corps played a major role in the response to the BP Deepwater Horizon oil spill. NOAA’s entire Atlantic fleet and over a quarter of the total strength of the NOAA Corps were deployed to the Gulf following the spill, developing mission plans and assisting response efforts.

While manned aircraft and sea-going vessels have been, and will continue to be, a primary source of environmental data, new technology will have a significant role to play in the future NOAA fleet. OMAO, in coordination with other NOAA offices and federal agencies, is evaluating and deploying remotely piloted underwater and aircraft systems that could significantly contribute to environmental observations. OMAO’s ongoing challenge is to meet the growing demand for in situ scientific data while providing the highest level of service. To better serve the needs of the nation, NOAA is examining the composition of the fleet through an exhaustive and critical review of at-sea science and observation requirements. Our objective is to develop a clear, cost-efficient path forward to ensure that the NOAA fleet can continue to conduct at-sea surveys and research vital to fisheries management, updating nautical charts, responding to natural and manmade disasters, and understanding coastal and marine systems more fully. Meeting these requirements is essential to developing sustainable, science-based management and conservation plans that protect the health and resiliency of these resources over the long-term.

We continue our efforts to build a civilian and NOAA Corps officer workforce that is uniquely qualified to gather critical environmental intelligence and be adaptive and responsive to a changing world and work to expand our partnerships with other federal agencies. For example, NOAA Corps officers are currently assigned to work in the Department of Defense, National Science Foundation, and the U.S. Senate among others where they lend their expertise and service. We also continue to strengthen our partnership with the U.S. Coast Guard. Our basic NOAA Corps officer training class is held at the U.S. Coast Guard Academy, where newly commissioned officers train alongside Coast Guard officer candidates, developing skills and professional relationships that will benefit both services, especially during challenging times. Active collaboration among the Federal family is critical to ensuring the long-term capability and success of the federal ocean infrastructure. Our partners’ success is our success. The men and women of OMAO and the NOAA Corps provide environmental intelligence for a dynamic world as they serve our nation every day from the farthest seas to the highest skies.
The NOAA Commissioned Officer Corps (NOAA Corps) is one of the nation’s seven uniformed services and serve with the ‘special trust and confidence’ of the President. NOAA Corps officers are an integral part of the National Oceanic and Atmospheric Administration (NOAA), an agency of the U.S. Department of Commerce. With 321 officers, the NOAA Corps serves throughout the agency’s line and staff offices to support nearly all of NOAA’s programs and missions. The combination of commissioned service and scientific expertise makes these officers uniquely capable of leading some of NOAA’s most important initiatives.

The NOAA Corps is part of NOAA’s Office of Marine and Aviation Operations (OMAO) and traces its roots back to the former U.S. Coast and Geodetic Survey, which dates back to 1807 and President Thomas Jefferson. In 1970, NOAA was created to develop a coordinated approach to oceanographic and atmospheric research and subsequent legislation converted the commissioned officer corps to the NOAA Corps.

The NOAA Corps today provides a cadre of professionals trained in engineering, earth sciences, oceanography, meteorology, fisheries science, and other related disciplines. Corps officers operate NOAA’s ships, fly aircraft, manage research projects, conduct diving operations, and serve in staff positions throughout NOAA.

Benefits of the NOAA Corps to the Nation
The combination of commissioned service with scientific and operational expertise, allows the NOAA Corps to provide a unique and indispensable service to the nation. NOAA Corps officers enable NOAA to fulfill mission requirements, meet changing environmental concerns, take advantage of emerging technologies, and serve as environmental first responders. For example:

- In 2012 after Hurricane Sandy, seafloor sonar surveys completed by NOAA ships and small boats helped reopen Baltimore and Virginia ports, quickly restarting commerce and allowing Navy ships to return to port. New York and New Jersey ports were reopened, enabling emergency supplies to reach some of the hardest-hit areas. Maritime traffic resumed more quickly because NOAA embedded regional navigation managers within command centers.

- Hours after Sandy, NOAA planes and scientists conducted aerial surveys of the affected coastlines and immediately published the photos online, allowing emergency managers and residents to examine the damage even before ground inspections were permitted. These surveys are also vital to FEMA assessment teams and other on-the-ground responders and those managing oil spill clean-up and damage assessment. Over 3,000 miles of coastline have been surveyed, and over 10,000 images processed to document coastal damage and impacts to navigation.

- In 2011, OMAO’s Aero Commander and Jetprop Commander aircraft conducted snow surveys, which increased the accuracy of National Weather Service’s River Forecast Centers flood forecasting during a record year of snow and floods.

- After Hurricane Irene in 2011, the NOAA Ship Ferdinand Hassler and team completed 300 lineal nautical miles of survey work in less than 48 hours providing a Damage Assessment that enabled the
U.S. Coast Guard to re-open ports and restore more than $5M per hour in maritime commerce less than 3 days after the storm.

- More than 80 officers, or a quarter of the NOAA Corps' total strength, were re-assigned and/or deployed to support the Deepwater Horizon disaster response in the Gulf in 2010.
  - Eight NOAA-owned vessels, or the entire Atlantic fleet, were also deployed to the Gulf of Mexico for spill response, as well as several aircraft.

- NOAA Corps officers who run NOAA’s Ships support fish stock and marine mammal assessments, marine ecosystem studies, ocean exploration, coral reef preservation and protection, and mapping and charting around the United States and the Arctic, and more.

- NOAA Corps officers who run NOAA’s Aircraft collect environmental and geographic data essential to studying climate change, assess marine mammal populations, survey coastal erosion, investigate oil spills, and improve hurricane and winter storm forecasts as they pilot the WP-3D Orion hurricane hunters and other aircraft that fly through, and above the storms to obtain critical forecasting data.

Find out more about the NOAA Corps, its mission and history at [http://www.noaacorps.noaa.gov/](http://www.noaacorps.noaa.gov/).

NOAA officer candidates heaving on a line aboard the U.S. Coast Guard Cutter EAGLE during their basic officer training at the Coast Guard Academy.

[Photo: NOAA]