NOAA Fleet Update

February 2017

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.
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OMAO and the NOAA Corps – In the News

New air quality study launched over Utah, Salt Lake and Cache valleys
-Daily Herald
If you see a small aircraft flying low to the ground before Feb. 14, it may be part of a new research project designed to better understand Utah’s air pollution. The first flight by a specially-equipped aircraft called a Twin Otter was conducted Monday as part of a $2 million research project intended to help better understand the chemical makeup of the upper layers of air pollution that regularly make winter appearances in the Utah, Salt Lake and Cache valleys. Cold air often traps the pollution in the three valleys in an occurrence known as inversion. Multiple organizations have partnered with the Utah Department of Environmental Quality for the research project, including the National Oceanic and Atmospheric Administration, the Environmental Protection Agency, the University of Utah and Brigham Young University...

Researchers using specialized plane to study Utah’s air pollution
-Fox 13
SALT LAKE CITY — When it comes to the air pollution problem, research teams in the state of Utah will go to great heights to try and find a solution.
“As I speak, the NOAA Twin Otter Aircraft is here and being flown around Northern Utah,” said Associate Professor of Atmospheric Sciences at the U of U, John Lin...Between January 17th and February 14th, the plane will go through the valleys, climbing and dropping in altitude and taking measurements from air samples. The Department of Air Quality plans to use those measurements to better understand the chemical reactions that take place in the upper portion of the pollution layer during inversions. It could also help determine which altitudes see the worst concentrations of particles...

US ‘hurricane hunters’ based at Shannon Airport
-The Clare Herald
A United States “hurricane hunter” aircraft is currently based in Ireland and undertaking weather reconnaissance missions in Irish airspace. The National Oceanic and Atmospheric Administration (NOAA) Lockheed WP-3D Orion, also known as “Kermit”, arrived in Ireland on January 20th where, along with its 19-person crew, is based at Shannon Airport. Best known for its role as a “hurricane hunter”, it’s also the plane’s first major deployment since undergoing an extensive overhaul and equipment upgrades which includes a prototype antenna designed by the European Space Agency for use on Europe’s next generation weather satellites...

First Footage of Stylodactylid Shrimp Filter-Feeding at Depth of 4826 m
-The Fish Site
US - The first of a kind footage of a living stylodactylid shrimp filter-feeding at depth of 4826 m has been captured on high-quality video during the US National Oceanographic and Atmospheric Administration's '2016 Exploration of the Marianas’ expedition. Depths such as those at the Marianas Trench Marine National Monument are an extreme challenge for explorers, providing scarce information about their inhabitants, let alone their behavior. While most of them are known from dead specimens gathered by trawls, a team of scientists, led by Dr Mary Wicksten, Texas A&M University, USA, have recently retrieved footage of a living shrimp from the seafloor at a striking depth of 4826 m...

NOAA Ship Changes of Command
On January 12 a change of command for the NOAA Ship Rainier occurred, at which CAPT Van Den Ameele was properly relieved by CDR Lomnicky at a ceremony at the Marine Operations Center- Pacific in Newport, Oregon.
Upgraded NOAA P-3 Deployed on First Mission Since Overhaul

NOAA Lockheed WP-3D Orion N42RF, also known as “Kermit,” departed for Ireland Jan. 18 on its first major deployment since undergoing an extensive overhaul and upgrades. Operating from Shannon, Ireland, the aircraft will be supporting a NOAA Satellite and Information Service mission called “Ocean Winds,” a multi-year project whose objective is to improve our understanding of satellite-based ocean surface wind measurements in the high wind regions of winter storms over the North Atlantic. The experiment also seeks to determine how wind speed and direction changes across sea surface temperature boundaries. This mission helps to calibrate and validate weather satellite data.

Best known for its role as a “hurricane hunter,” N42RF returned to the NOAA Aircraft Operations Center in October 2016 after a 19-month overhaul at the U.S. Navy’s Fleet Readiness Center Southeast in Jacksonville, Florida. The aircraft has been refitted with newly refurbished wings and tail, more fuel-efficient engines, and state-of-the-art avionics. Kermit also sports a new paint scheme. NOAA’s other WP-3D Orion, “Miss Piggy” (N43RF), will undergo a similar overhaul beginning mid-2017 as part of a comprehensive “nose-to-tail” NOAA project to extend the service life of the agency’s two WP-3D Orions another 15 to 20 years.
BOTC 129 is now underway! On Monday, January 9, 2017, the Oath of Office was administered to 12 new NOAA Corps Officers. These men and women come from 10 different states across the country and have diverse backgrounds including physics, ocean engineering, geology, chemistry, marine science, and public policy. Please join us in congratulating the following men and women on their selection:

Jeffrey D. Calderon  Linda J. Junge
Michael D. Card  Justin K. Miyano
Hillary K. Fort  David T. Norman
Michael P.C. Fuller  Jacquelyn M. Putnam
Anna M. Hallingstad  Sony Vang
Gabriel E. Johnson  Mary C. Youpel

BOTC 129 has successfully completed the indoctrination phase of the program and is currently studying basic seamanship and navigation while simultaneously focusing on their professional development in areas such as time management, attention to detail, and professionalism.
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. Please note: To access Ship Tracker you must create an account with a .gov or .mil email address. All other access is restricted.

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:** LCDR Matthew Jaskoski  
**Primary Mission Category:** Hydrographic Surveys  
**DEPART:** Jacksonville, Florida  
**ARRIVE:** Jacksonville, Florida

**Project:** Approaches to Jacksonville  
**Objective:** 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.

*Sunset from the NOAA Ship Ferdinand R. Hassler’s flying bridge.*  
Photo: [John Kidd/NOAA]
Newport, RI  
**NOAA Ship Henry B. Bigelow**

- **Commanding Officer:** CDR Jeff Taylor  
- **Primary Mission Category:** Fisheries Research  
- **DEPART:** Newport, Rhode Island  
- **ARRIVE:** Newport, Rhode Island

**Project:** Winter Ecosystem Monitoring Survey  
**Objective:** The principal objective is to assess the hydrographic, planktonic and pelagic components of the Northeast U.S. Continental Shelf Ecosystem. Specifically, quantify the spatial distribution of the following parameters: water currents, water properties, phytoplankton, microzooplankton, mesozooplankton, sea turtles and marine mammals.

Davisville, RI  
**NOAA Ship Okeanos Explorer**

- **Commanding Officer:** CAPT Mark Wetzler  
- **Primary Mission Category:** Oceanographic Exploration and Research  
- **DEPART:** Pago Pago, American Samoa  
- **ARRIVE:** Apia, Samoa

**Project:** CAPSTONE  
**Objectives:** CAPSTONE is a three year initiative to collect critical baseline NOAA science and management needs in largely unknown areas of U.S. waters in the Pacific. Operations conducted during this campaign support NOAA missions to understand and predict changes in climate, weather, oceans and coasts, and share that knowledge and information with others. Much of this work associated with CAPSTONE will contribute to and complement Deep Sea Coral Research and Technology Program’s three-year Pacific Islands Regional Initiative.

Norfolk, VA  
**NOAA Ship Thomas Jefferson**

- **Commanding Officer:** CDR Christiaan van Westendorp  
- **Primary Mission Category:** Hydrographic Surveys

**Ship Status:** Vessel will be in scheduled dry dock as well as alongside for scheduled maintenance, winter repairs, scientific data processing, crew rest, and training.

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

**CAPT Scott Sirois, 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:** Master Donn Pratt  
- **Primary Mission Category:** Oceanographic Research, Environmental Assessment

**Ship Status:** Vessel will be alongside for scheduled maintenance, winter repairs, scientific data processing, crew rest, and training.
**NOAA Ship Ronald H. Brown**
Commanding Officer: CAPT Robert Kamphaus  
Primary Mission Category: Oceanographic Research, Environmental Assessment  
Depart: Punta Arenas, Chile  
Arrive: Montevideo, Uruguay  
Depart: Montevideo, Uruguay  
Arrive: Charleston, South Carolina

**Project:** PIRATA Northeast Extension  
**Objectives:** Prediction Research Moored Array in the Tropical Atlantic (PIRATA) is a three-party project between Brazil, France and the United States that seeks to monitor the upper ocean and near surface atmosphere of the Tropical Atlantic via the deployment and maintenance of an array of moored buoys and automatic meteorological stations. This array is the Atlantic’s analogue of the Pacific Ocean's Tropical Atmosphere Ocean (TAO) array. The PIRATA array consists of a backbone of ten moorings that runs along the equator and extends southward along 10ºW to 10ºS, and northward along 38ºW to 15ºN.

**Pascagoula, MS**  
**NOAA Ship Pisces**  
Commanding Officer: CDR Nicholas Chrobak  
Primary Mission Category: Fisheries Research  
**Ship Status:** Vessel will be in scheduled dry dock as well as alongside for scheduled maintenance, winter repairs, scientific data processing, crew rest, and training.

**NOAA Ship Oregon II**  
Commanding Officer: Master Dave Nelson  
Primary Mission Category: Fisheries Research  
**Ship Status:** Vessel will be in scheduled dry dock as well as alongside for scheduled maintenance, winter repairs, scientific data processing, crew rest, and training.

**NOAA Ship Gordon Gunter**  
Commanding Officer: LCDR Lindsay Kurelja  
Primary Mission Category: Fisheries Research  
**Ship Status:** Vessel will be in scheduled dry dock as well as alongside for scheduled maintenance, winter repairs, scientific data processing, crew rest, and training.

**San Diego, CA**  
**NOAA Ship Reuben Lasker**  
Commanding Officer: CDR Kurt Dreflak  
Primary Mission Category: Fisheries Research  
**Ship Status:** Vessel will be in scheduled alongside repair period for scheduled maintenance, winter repairs, scientific data processing, crew rest, and training.

**Newport, OR**  
**NOAA Ship Rainier**  
Commanding Officer: CDR John Lomnicky  
Primary Mission Category: Hydrographic Surveys  
**Ship Status:** Alongside winter repair period. Vessel will be alongside in Newport, Oregon for scheduled maintenance, winter repairs, scientific data processing, crew rest, and training.
NOAA Ship *Bell M. Shimada*

**Commanding Officer:** CDR Paul Kunicki  
**Primary Mission Category:** Fisheries Research  
**DEPART:** San Francisco, California  
**ARRIVE:** Newport, Oregon  
**DEPART:** Newport, Oregon  
**ARRIVE:** Newport, Oregon

**Project 1:** Spawning Hake Stock Acoustic  
**Objectives:** 2017 Spawning Hake (*Merluccius productus*) Stock Acoustic-Trawl Survey will characterize the winter distribution of Pacific hake aggregations, and the fish within those aggregations, to support evaluation of the feasibility/design of a winter hake biomass survey and increase our understanding of the winter ecology and biology of hake in the California Current Ecosystem.

**Project 2:** Northern California Current (NCC) Ecosystem Forecasting Survey  
**Objectives:** This project continues long-term studies of the Northern California Current (NCC) pelagic ecosystem and includes study of broad-scale patterns of hydrography, phytoplankton and zooplankton and ocean acidification/hypoxia in the NCC Large Marine Ecosystem off Oregon and Washington. Ecosystem studies were initiated in 1996, and studies of ocean acidification/hypoxia were initiated in 2010.

NOAA Ship *Bell M. Shimada* alongside Marine Operations Center-Pacific in Newport, Oregon.  
[Photo: NOAA]

**OMAO’S MARINE OPERATIONS**  
**CAPT Todd Bridgeman, Director of Marine Operations**  
OMAO’s Marine Operations over-sees 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)**  
**CDR Brian Parker, 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**  
**NOAA Ship Fairweather**

**Commanding Officer:** CDR Mark Van Waes  
**Primary Mission Category:** Hydrographic Surveys  
**Ship Status:** Alongside winter repair period. Vessel will be alongside in Newport, Oregon for scheduled maintenance, winter repairs, scientific data processing, crew rest, and training.

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**Kodiak, AK**  
**NOAA Ship Oscar Dyson**

**Commanding Officer:** CDR Michael Levine  
**Primary Mission Category:** Fisheries Research  
**DEPART:** Seattle, Washington  
**ARRIVE:** Kodiak, Alaska  
**DEPART:** Kodiak, Alaska  
**ARRIVE:** Kodiak, Alaska

**Project:** Walleye Pollock Shumagin Sanak Pre Spawning Survey  
**Objectives:** Collect acoustic-trawl data necessary to determine the distribution, biomass, and biological composition of walleye pollock. The project will also collect target strength data using hull-mounted transducers for use in scaling acoustic data to estimates of absolute abundance; and conduct trawl hauls (Aluetian Wing Trawl, Poly Nor’Easter) to ground truth multi-frequency echo integration data collection.

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**Honolulu, HI**  
**NOAA Ship Hi’ialakai**

**Commanding Officer:** CAPT Elizabeth Kretovic  
**Primary Mission Category:** Oceanographic Research, Environmental Assessment  
**Ship Status:** Dry Dock & Winter Repair Period. Vessel will be in scheduled dry dock in Bellingham, Washington for scheduled maintenance, winter repairs, scientific data processing, crew rest, and training.

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**NOAA Ship Oscar Elton Sette**

**Commanding Officer:** CDR Donald Beaucage  
**Primary Mission Category:** Fisheries Research  
**Ship Status:** Vessel will be in alongside for scheduled maintenance, winter repairs, scientific data processing, crew rest, and training.

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_NOAA Ship Oscar Elton Sette as seen from the back deck of the NOAA Ship Okeanos Explorer._  
[Photo: ENS Pacheco/NOAA]
OMAO’S MARINE OPERATIONS CENTER – PACIFIC ISLANDS (MOC-PI)

CDR Matthew Wingate, 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.
**Tampa, Florida**

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

**Current Mission:** Ocean Winds January through February.

The aircraft re-wing and paint is complete! The Ocean Winds project began in mid-January. This project uses advanced microwave sensors flown aboard the NOAA P-3 aircraft to improve the use of ocean surface wind data gathered by satellites. This will allow for improvements in active and passive wind measurements and reduce the design and development risk of future observing systems. NOAA will use the information gathered to provide better surface wind data over the global oceans. This mission will also provide advanced measurements to support and calibrate satellites from multiple international organizations.

**WP-3D (N43RF) – “Hurricane Hunter”**

**Current Mission:** Scheduled Maintenance

At the conclusion of a busy hurricane season, P-3 N43RF will be in scheduled maintenance through February 20. Following that, the aircraft is scheduled to be inducted into re-winging mid-2017. No additional projects are planned on this airframe until re-wing is complete.

**Gulfstream IV (N49RF) – “Hurricane Hunter”**

**Current Mission:** Equipment Installation

The aircraft will have equipment installed in preparation for the 2017 hurricane season.

**Jet Prop Commander (N45RF)**

**Temporary Base:** Indianapolis, Indiana

**Current Mission:** Scheduled maintenance through February

This aircraft is in scheduled maintenance for engine overhauls through February 20, 2017. Following this maintenance period, the aircraft will resume its snow survey mission, using specialized detection equipment to make accurate, real-time measurements of snow water content across the country. This information is critical for managers and others to make optimal decisions supporting river, flood, and water supply forecasting, agriculture and forest management, recreation and winter tourism, and the commerce, industry, and transportation sectors of the Nation’s economy.

**Construction of new hangar to house the NOAA Aircraft Operations Center at Lakeland Linder Regional Airport.**
**Twin Otter (N46RF)**

**Temporary Base:** Various Locations  
**Current Mission:** Snow Survey

NOAA aircraft use specialized detection equipment to make accurate, real-time measurements of soil moisture content across the country. This information is critical for managers and others to make optimal decisions supporting river, flood, and water supply forecasting, agriculture and forest management, recreation and winter tourism, and the commerce, industry, and transportation sectors of the Nation’s economy. The benefits of accurate soil moisture measurements are immense and NOAA aircraft are uniquely capable to provide this information.

**King Air (N68RF)**

**Temporary Base:** Various locations  
**Current Mission:** Continuous Coastal Mapping

Coastal Mapping is an on-going mission of NOAA’s National Geodetic Survey (NGS) to survey approximately 95,000 miles of United States coastline providing the Nation with an accurate, up-to-date and seamless database of the national shoreline. This data is used as the baseline for defining America’s marine territorial limits, including its Exclusive Economic Zone, and for the geographic reference needed to manage coastal resources and support marine navigation. Stereo photogrammetry and LiDAR are used to produce a digital database. In addition, the Coastal Mapping Program supports NOAA’s homeland security and emergency response requirements by rapidly acquiring and disseminating a variety of datasets to federal, state, and local government agencies as well as the general public.

**Twin Otter (N48RF)**

**Temporary base:** Salt Lake City, Utah  
**Current Mission:** Utah Air Quality followed by Snow Survey

The Utah Air Quality survey will study particulate matter buildup in the urban air basin along Utah’s Wasatch Front. This region experiences some of the most severe particulate matter air quality issues in the Nation, particularly in December and January. Special sensors will be used to conduct vertical profiles to better understand the chemical composition of the particulate matter and the mechanisms by which the particulate matter forms.

Following the completion of the Utah Air Quality project, this aircraft will commence snow survey operations through the end of April. This mission uses specialized detection equipment to make accurate, real-time measurements of soil moisture content across the country. This information is critical for managers and others to make optimal decisions supporting river, flood, and water supply forecasting, agriculture and forest management, recreation and winter tourism, and the commerce, industry, and transportation sectors of the Nation’s economy. The benefits of accurate soil moisture measurements are immense and NOAA aircraft are uniquely capable to provide this information.

**Twin Otter (N56RF)**

**Temporary base:** St. Simons Island, Georgia  
**Current Mission:** Southeast Right Whales

North Atlantic right whales are critically endangered and listed under the Marine Mammal Protection Act. Aerial surveys serve multiple objectives with regard to conservation including providing locations and distribution of right whales to mariners to avoid collisions with ships, photo identification records on right whales, information on distribution and abundance of marine mammals and turtles, and provide sightings of dead whales for monitoring mortality.
Twin Otter (N57RF)
Temporary base: Various Location
Current Mission: Coastal Mapping LiDAR

The TopoBathy Lidar mission will collect data in the coastal zone used to produce the most up-to-date and accurate marine navigation charts, FEMA flood plain and inundation maps, and other Integrated Ocean and Coastal Mapping (IOCM) applications. Data gathered will help ensure safe and efficient marine transportation and benefit coastal communities with accurate resource management and aid emergency response efforts.

OMAO’S AIRCRAFT OPERATIONS CENTER (AOC)
CAPT Michael Silah, Commanding Officer AOC

The AOC, located at MacDill Air Force Base in Tampa, Florida, 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.
**NASA Global Hawk**

**Location:** Edwards Airforce Base  
**Mission:** Scheduled Inspection and Maintenance  

NASA’s 872 Global Hawk is just completing a Major Phase maintenance inspection and is beginning systems retests. A new INMARSAT command and control communications system is being installed in NASA 872 during February. NASA 872 is preparing to support a Department of Defense project’s systems ground and flight tests in the spring followed by mission flights in the fall.

NASA 874 is currently in refurbishment with the tail section received last week. It is expected to fly functional flight checks in the Edwards Range this spring. NASA 874 will support science missions this summer as part of a NASA project to train new engineers through preparing and executing flights against cyclonic storms in the Pacific, Gulf, Caribbean, and Atlantic regions.

Mission plans and FAA COA’s are in process to support the fall 2017 missions as well as groundwork for potential flights to the Arctic for a joint NOAA/NASA project (Arctic Domain) proposed for 2018.

**APH-22 Hexacopter**

**Location:** Livingston Island, Antarctica  
**Mission:** Antarctic Field Operations  

The NOAA National Marine Fisheries Service, Southwest Fisheries Science Center (SWFSC) in partnership with the Antarctic Ecosystem Research Division (AERD) seeks to use the APH-22 hexacopter to measure wildlife response to UAVs, continue previous year’s pinnipeds surveys, and fly colony-wide census flights to monitor penguin chick production. Information gathered from these flights will ensure that UAS best practices are developed as to not cause undue stress to wildlife during breeding and non-breeding periods. Aerial pinniped surveys will prevent the drugging and capture of animals to gather mass, size, and shape data. Colony wide penguin flights will be used to calculate abundance and trends of chick populations.

**Location:** Antarctic Peninsula, Antarctica  
**Mission:** Antarctic Peninsula Whale Survey  

The Southwest Fisheries Science Center (SWFSC) Hexacopter launch and recovery operations will be conducted from the deck of a Zodiac boat launched from the expedition ship National Geographic Explorer. Mission flights will typically last about 10 – 15 minutes and will be conducted at typical altitudes between 100 and 150’, with occasional descents below 10’ to collect blow samples. The aircraft will hover over groups of whales and take a series of still images or video before moving on to another group of whales.

This project is designed to collect aerial photogrammetry images to estimate the size and shape of whales to further evaluate the krill requirements of large whales and the predatory impact killer whales in order to assess their respective trophic interactions and requirements within the context of climate change. This mission will also couple photogrammetry with the collection of whale exhalant from blow, which will be used to study the respiratory diseases that may be associated with variance in body condition. This will allow a more complete health assessment, to compare to similar studies the SWFSC is conducting on whales in the NW Atlantic and NE Pacific oceans.
The North East Fisheries Science Center (NEFSC) seeks to use the APH-22 hexacopter to respond to entanglements and other unplanned situations involving marine mammals. Photographs will be collected for the purpose of aiding emergency stranding response, event documentation, and photo ID. UAS technologies will also be used to conduct surveys for marine turtles. The intent is to assess the feasibility of using small unmanned rotorcraft to search for turtles in their marine environment both at surface and subsurface. Turtles that are discovered either by the APH-22 or by on-vessel observers will be photographed by the APH-22 and then tagged and or sampled as part of an ongoing study. Turtles may be photographed post-release with the APH-22 to document post-release behavior. NEFSC will also use the APH-22 to conduct surveys of seal haul out sites. Photographs will be collected for the purpose of obtaining local population numbers, documenting seals with evidence of fishery interactions, and collecting photo ID data of seals with brands, wounds, and other distinguishing marks.

**Location:** Atlantic Northeast  
**Mission:** Emergency Response Turtles and Seals

The North East Fisheries Science Center (NEFSC) seeks to utilize the APH-22 airframe to obtain right whale aerial photography and collect blow samples. Vessel surveys will be conducted in the near coastal waters of Georgia and northeast Florida during the winter calving season for North Atlantic right whales. This project is in collaboration with the Southeast Fisheries Science Center (SEFSC) and Woods Hole Oceanographic Institute (WHOI). Flight crews will maintain an altitude of at least 100 vertical feet over whales for photogrammetry measurements. If an injured or entangled whale is encountered, UAS operators are permitted to descend to 50 feet for more detailed images. Permit allows for descent to 10 feet in order for collecting a blow (breath) samples.

**Location:** Florida and Georgia Coastal Waters  
**Mission:** Right Whale Photogrammetry

The Puma AE UAS will be hand-launched from Shearwater and recovered in the net, which will be installed aboard R/V Shearwater. Objectives are to characterize the precision approach sensors and software algorithms with low altitude "low-and-goes" over the launch-recovery area and with net captures. An additional objective is to assess the performance of the automated antenna switching system while the aircraft performs orbits around the ship within visual line of sight.

**Location:** Santa Barbara Channel  
**Mission:** Puma Net Capture

NOAA’s Air Resources Laboratory, Atmospheric Turbulence and Diffusion Division (NOAA/ARL/ATDD) seeks to utilize the NOAA National Marine Fisheries Center for Cooperative Unmanned Technologies (NOAA/NMFS/CCUT) MD4-1000 and DJI S-1000 airframes to perform instrument testing to verify its performance prior to the upcoming VORTEX-SE 2017 field study. Two iMet-XQ temperature/pressure/relative humidity sensors will be flown on the MD4-1000 for inter-comparison with the existing DJI S-1000 platform.

**Location:** Corryton, Tennessee  
**Mission:** Training and Operational Development

NOAA’s Atmospheric Turbulence and Diffusion Division (ATDD) will utilize a DJI-S1000 to measure the conditions that lead to Convective Initiation (CI) in the lower boundary layer in Northern Alabama. The goal is to measure the scale and extent of the temperature and moisture fields in the lower boundary layer adjacent to fixed towers on the surface. The mission will be flown over Auburn University’s Tennessee Valley Research and Extension Center (TVREC) in Belle Mina, AL using ATDD’s existing COA 2015-ESA-106 and COA 2015-ESA-200 for this area. Additionally, the mission will be flown over Auburn University’s Northern Alabama Horticultural Research Center (NAHRC) in Cullman, Alabama using the FAA-NOAA Memorandum of Agreement. ATDD’s DJI S-1000 will also be utilized to perform storm damage assessment over a large area of Northern Alabama.

**Location:** Bella Mina, Alabama  
**Mission:** Measure Convective Initiation in the Lower boundary layer.
The visible and near infrared cameras will be used to document storm damage to assist the National Weather Service with determining the category of any tornado activity in the area that occurs during the VORTEX SE intensive study periods. These flights will be performed after all severe thunderstorm and/or tornado activity has subsided.

**MD4-1000/ SenseFly eBee RTK**

**Location:** Camarillo, CA – California State University Channel Islands  
**Mission:** Training and Operational Development  
West coast training and testing field to operate the micro drones md4-1000 and senseFly eBee in order to maintain operator currency and proficiency and provide a controlled environment for refining data collection protocols and procedures. California State University Channel Islands (CSUCI) and NOAA’s Collaborative Center for Unmanned Technologies (CCUT) have signed a Memorandum of Agreement to partner on the use of UAS for research and monitoring at the Channel Islands and have agreed to provide access to training field and support facilities.

**SenseFly eBee RTK**

**Location:** Corbin, Virginia – Catlett Islands, Virginia  
**Mission:** Training and Operational Development  
The Remote Sensing Division (RSD) and the Office of National Marine Sanctuaries (ONMS) have been funded to operate the SenseFly eBee RTK to further the development of UAS operational procedures specifically related to coastal and habitat mapping, living marine resource surveys, as well as a range of emergency preparation, response and recovery requirements. The project consists of the initial acquisition, flight training and system acceptance. Upon completion of the training/system acceptance segment several operational missions will take place during the fall to begin the development of procedures and protocols for integrating eBee operations and data collection into existing RSD and ONMS programs.
OMAO Partnerships

United States Senate Committee on Commerce, Science, and Transportation
Location: Washington, DC
Detail: LCDR Wendy Lewis, NOAA Commissioned Officer Corps
LCDR Lewis is currently on detail to the Committee with the staff of the Chair, Senator John Thune (R-SD), where she is 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 Gavin Chensue, NOAA Commissioned Officer Corps
Members of the NOAA Commissioned Officer Corps carry out NOAA's mission in remote locations across the globe. LTJG Chensue 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, Hawaii
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. Navy
Location: Washington, DC
Embedded Liaison: LCDR Jason Mansour, NOAA Commissioned Officer Corps
LCDR Jason Mansour 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, LCDR Jason Mansour 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.

Location: Stennis Space Center, Mississippi
Embedded Liaison: LTJG Laura Dwyer, NOAA Commissioned Officer Corps
Embedded in the Navy’s Naval Oceanography Mine Warfare Center, LTJG Laura Dwyer works side by side with Navy officers operating Unmanned Underwater Vehicles worldwide and is currently stationed at Stennis Space Center. 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.
As the NOAA liaison to the United States Coast Guard (USCG), CDR G. Mark Miller, NOAA Commissioned Officer Corps, 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. CDR Miller 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 800 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. Please access former teacher at sea blogs which document their missions at sea and offer a wealth of information about the research being conducted as well as personal stories.

- In FY 16, NOAA’s Teacher at Sea Program sent 13 teachers to sea, and supported 36 Teacher at Sea Events.
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.

NOAA working diver students prepare to take their first breath as NOAA Divers, in the January course.

[Photo: Greg McFall/NOAA]
OMAO Small Boat Program

OMAO manages NOAA’s Small Boat Program and 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.

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.

NOAA has the largest fleet of federal research and survey ships in the nation. The fleet ranges from large oceanographic ships capable of exploring and charting the world's deepest ocean, to smaller vessels responsible for surveying the shallow bays and inlets of the United States. The fleet supports a wide range of marine activities including fisheries surveys, nautical charting, and ocean and climate studies. Based throughout the continental United States, Alaska, and Hawaii, the ships operate in all regions of the nation and around the world.

NOAA's aircraft provide a wide range of airborne capabilities. Our highly specialized Lockheed WP-3D aircraft are equipped with an unprecedented variety of scientific instrumentation, radars, and recording systems for both in situ and remote sensing measurements of the atmosphere, the Earth, and its environment. Equipped with both C-band weather radar and X-band tail Doppler radar systems, the WP-3Ds have the unique ability to conduct tropical cyclone research in addition to storm reconnaissance. Together with NOAA's Gulfstream IV-SP jet, these 'hurricane hunter' aircraft greatly improve our physical understanding of hurricanes and enhance the accuracy of tropical cyclone forecasts. NOAA's light aircraft also play a vital role in monitoring our environment. Our King Air, Turbo Prop Commander, and Twin Otter aircraft support marine mammal population studies, shoreline change assessments, oil spill investigations, and water resource/snowpack surveys for spring flood forecasts.
The NOAA fleet provides immediate response capabilities for unpredictable events. For example, in October 2016, NOAA’s WP-3D (N43RF) and G-IV (N49RF) conducted 21 operational missions in seven days into Hurricane Matthew gathering vital data used to improve hurricane track and intensity forecasts. Rapid response by NOAA Ship Ferdinand R. Hassler to survey for underwater debris and shoaling that could prove dangerous to deeper draft vessels expedited the opening of the Ports of Charleston and Savannah by the U.S. Coast Guard following the passage of Hurricane Matthew. After the storm, NOAA’s King Air (N68RF) flew 14 missions to collect post-storm damage and flooding imagery from Florida to Virginia in coordination with FEMA.

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 work force 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 United States' seven Uniformed Services and as commissioned officers 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 an authorized strength of 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. The U.S. Coast and Geodetic Survey Corps was founded in 1917 to provide officers to command U.S. coastal survey ships and field survey parties locally and abroad. 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. The NOAA Corps celebrates its Centennial year in 2017.

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. Discipline and flexibility are inherent in the NOAA Corps personnel system. Officers are trained for positions of leadership and command in the operation of ships and aircraft; in the conduct of field projects on land, at and under the sea, and in the air; in the management of NOAA observational and support facilities; as members or leaders of research efforts; and in the management of various organizational elements throughout NOAA. NOAA Corps officers must be technically competent to assume positions of leadership and command in NOAA and Department of Commerce programs and in the Armed Forces during times of war or national emergency. 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 2016, NOAA aircraft conducted research and reconnaissance missions into Hurricane Matthew, and post-storm flooding reconnaissance missions from Florida to Virginia with FEMA. NOAA Ship Ferdinand Hassler conducted post-storm surveys within of the ports of Charleston and Savannah within 48 hours to re-open the ports to maritime commerce, worth more than $5M per hour.

- In 2015, NOAA aircraft conducted research and surveillance missions into some of the planet’s most extreme weather, ranging from Hurricane Patricia, the strongest on record in the Western hemisphere, to severe storms over the U.S. Great Plains region. In addition, NOAA aircraft responded to unprecedented flooding in South Carolina using advanced sensors and imaging technology to provide emergency response managers with critical real-time information needed to respond to this disaster.

- After Hurricane Sandy in 2012, NOAA Ships Thomas Jefferson and Ferdinand R. Hassler conducted emergency bathometric 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 in the Gulf of Mexico. 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.