



# NOAA Fleet Update

## JULY 2015

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.



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# Office of Marine and Aviation Operations (OMAO) and the NOAA Commissioned Officer Corps – In the News –



Below is a sampling of clips and web links to recent news items related to OMAO and the NOAA Corps.

## [NOAA scientists tackle mystery of nighttime thunderstorms](#)

-USA Today

Violent nighttime thunderstorms have sent generations of terrified children scurrying into their parents' beds over the booming sounds of thunder and brilliant flashes of lightning. Now, for the first time, dozens of scientists are fanning out across the central USA this summer to unlock the mysteries of how these nocturnal storms form and improve forecasts for when they might strike. The massive field campaign "PECAN" (Plains Elevated Convection at Night) has been underway since June 1 and will continue until mid-July...The storms — which typically form in huge clusters — can also be rather challenging to predict. Unlike their daytime counterparts that rely on the sun's heat to form, the development of thunderstorms at night is not well understood. The field research is allowing scientists to get an up-close look at weather phenomena such as the low-level jet stream (a speedy flow of air about a mile up) and little-understood bores (atmospheric ripples or waves), both of which help stir up the atmosphere to create nighttime storms. PECAN uses eight mobile radars, three research aircraft, dozens of mobile weather balloon launching systems and more than 100 weather instruments to "chase" severe nighttime storms...

## [Researchers study plumes of algae in Sequim, Discovery bays; biotoxins stand below hazard levels](#)

-Peninsula Daily News

An algae strain capable of producing a potentially deadly biotoxin rarely found on the North Olympic Peninsula has been found in large quantities in both Sequim and Discovery bays. The marine algae has produced biotoxins in Sequim Bay, but not to the level that represents a public health risk, researchers said. Tests are being done for the biotoxin in Discovery Bay. The algae does not always secrete the biotoxin, and scientists do not know what triggers the process in the wild...For the past 12 years, Odell has been a research analyst for the UW-led Olympic Region Harmful Algal Bloom Partnership. The organization provides critical monitoring data and other information about toxic algae blooms to coastal communities on Washington's Olympic Peninsula. Odell left June 15 from Newport, Ore., aboard *the Bell M. Shimada*, a National Oceanic and Atmospheric Administration (NOAA) research vessel...

## [Airborne lab seeks fracking leaks](#)

-Philadelphia Inquirer

The inside of the Twin Otter airplane was turned into a flying laboratory, crammed with racks of computer equipment and an array of suitcase-sized plastic containers. Its mission: to fly over the busy natural-gas drilling operations of northeastern Pennsylvania so a pair of scientists could measure how much of the stuff was leaking into the atmosphere. In particular, the researchers were interested in the prime

component of natural gas, an odorless substance called methane that gets much of the blame for global warming. "This is what we're going to fly today," said atmospheric scientist Anna Karion, indicating a zigzag pattern on her iPad map, covering an area that measured 50 miles by 80 miles...

### **[Newest NOAA Fisheries Survey Vessel Begins U.S. West Coast/Alaska Whale Survey](#)**

-[NOAA Fisheries](#) (via Alaska Native News)

NOAA's newest research ship, the *Reuben Lasker*, departs San Diego this week on its first scientific mission that includes surveying gray whales along the West Coast. The survey will also search the Gulf of Alaska for right whales, among the most rare and endangered whales on Earth. The expedition is collaboration between the Southwest Fisheries Science Center in La Jolla, California, and Alaska Fisheries Science Center in Seattle to take advantage of the *Reuben Lasker's* advanced design and technology. The *Reuben Lasker* is engineered to operate more quietly than other similar ships, minimizing disturbance to the fish or marine mammals it is studying, and carries the latest navigation and acoustic technology for tracking and assessing fish and marine mammal populations. "This is a great opportunity for both science centers to make use of this new ship to answer some important questions about different species of whales," said Dave Weller, a marine biologist at the Southwest Fisheries Science Center and chief scientist for the voyage. "We see this as a model for how we may work together in the future..."

### **[Arctic Drilling Support Vessel Heading to Oregon for Repair](#)**

-Associated Press (via ABC News)

Shell Oil Company will send a damaged ship carrying equipment required for Arctic offshore oil drilling from Alaska back to the West Coast for repairs. Royal Dutch Shell PLC 's drilling schedule for two exploratory wells this summer in the Chukchi Sea off Alaska's northwest coast, however, shouldn't be delayed by maintenance work on the 380-foot icebreaker *Fennica*, spokesman Curtis Smith said Monday. "We do not anticipate any impact to the (drilling) season as we do not require the vessel until August," Smith said. The *Fennica's* primary job for Shell is carrying equipment for stopping an underwater well blowout...The National Oceanic and Atmospheric Administration announced Monday its mapping ship *Fairweather* had found shallow, rocky areas near where the hull was damaged. The agency submitted a "Dangers to Navigation Report" to the Coast Guard listing the shoal depths, which are less than 30-feet deep in sections...

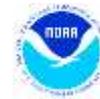
### **[Hurricane Hunters in Wisconsin](#)**

-WFRV (Green Bay, WI) (Video)

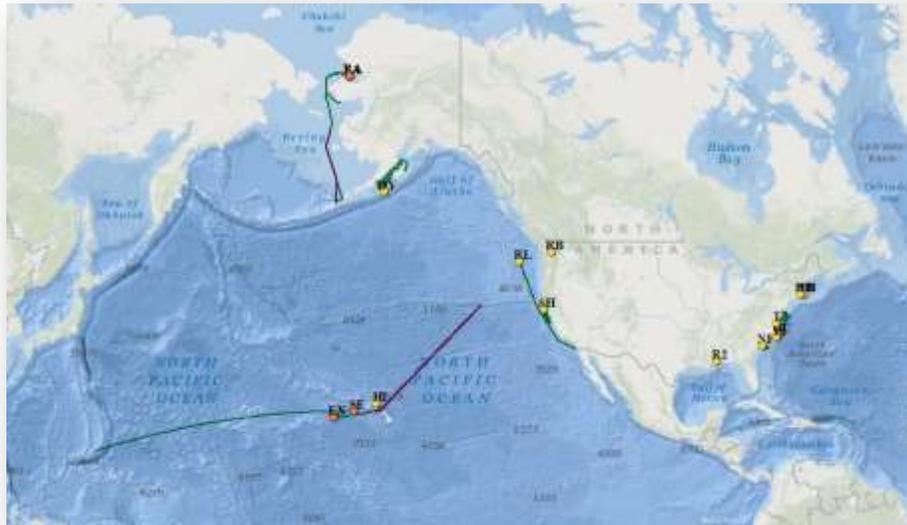
A group of meteorologists known as the "PECAN" team is studying storms that happen at night to better understand the prediction of severe weather. "We're putting our airplane where most wise airplanes don't go," says Jack Parrish. A large plane loaded with weather instruments was sent to our area early this morning to study the tornado-warned storm from the sky. But this wasn't just any average aircraft. "The NOAA Hurricane Hunter, the P-3 that is participating in this project, we're based at MacDill Air Force Base in Tampa, Florida," added Parrish. And this very aircraft was studying the skies over Wisconsin...



# OMAO's Ships and Centers



OMAO's Ship Tracker - <http://shiptracker.noaa.gov> - (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:** CDR Marc Moser

**Primary Mission Category:** Hydrographic Surveys

**DEPART:** New Castle, NH

**ARRIVE:** Woods Hole, MA

**DEPART:** Woods Hole, MA

**ARRIVE:** Norfolk, VA

**Project 1:** Mapping Rhode Island Sound and Approaches

**Project 2:** Mapping Chesapeake Bay

### **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.

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

**NOAA Ship *Henry B. Bigelow***

**Commanding Officer:** CDR G. Mark Miller

**Primary Mission Category:** Fisheries Research

**DEPART:** Newport, RI

**ARRIVE:** Newport, RI

**DEPART:** Newport, RI

**ARRIVE:** Newport, RI

## **Project 1: Cetacean and Turtle Biology**

### **Objectives:**

- Deploy the small boat to collect identification photographs and biopsy samples of as many cetacean individuals as possible, and possibly deploy tags
- Collect passive acoustic data on cetaceans via sonobuoys, dipping hydrophones and towed array;
- Develop a better understanding of habitat use and site fidelity for abundance and monitoring of critical areas
- Determine the distribution and relative abundance of plankton and prey species
- Use big-eye binoculars, binoculars and Puma fixed wing unmanned aerial systems to locate sea turtles
- Capture, bring on board, sample, and satellite tag hard-shelled sea turtles (primarily loggerheads)
- Suction cup leatherback sea turtles
- Use shipboard equipment and deploy instruments overboard to assess gelatinous zooplankton
- Use remaining resources to advance other protected species research, including acoustics, photo ID, fecal sample collection and biopsy.

## **Project 2: Deep Sea Corals**

### **Objectives:**

- Survey and ground-truth known or suspected deep-sea coral habitats associated with deepwater canyons off the coast of the northeastern U.S.
- Survey canyon area and intercanyon slope habitats using *TowCam*; with concurrent sampling of environmental factors (i.e. depth, hydrography) to characterize benthic habitats and identify areas of coral presence.
- Ground-truth areas predicted to be coral hotspots based on data provided from a habitat suitability model.
- Ground-truth historical coral records.
- Conduct multibeam mapping in areas where data are missing or incomplete.
- Assemble a database of photographs, species identification, species abundances/distributions.
- Provide research opportunities for teachers and professional researchers.



Sunset aboard the NOAA Ship *Henry B. Bigelow* during the Cetacean and Turtle Biology Survey.  
[Photo: NOAA]

## Davisville, RI

### **NOAA Ship *Okeanos Explorer***

**Commanding Officer:** CDR Mark Wetzler

**Primary Mission Category:** Oceanographic Exploration and Research

**DEPART:** Pearl Harbor, HI

**ARRIVE:** Pearl Harbor, HI

**Project:** CAPSTONE - Northwest Hawaiian Islands & Johnston Exploration (Mapping)

### **Objectives:**

This is an exploratory mapping expedition that seeks to:

- Acquire data to support priority Monument and Sanctuaries science and management needs, including habitat surveys in recently expanded boundary areas.
- Identification and characterization of vulnerable marine habitats - particularly high density deep sea coral and sponge communities.
- Characterization of seamounts within the Prime Crust Zone (PCZ). The PCZ is the area of the Pacific with the highest expected concentration of deep sea minerals, including rare metals and rare earth elements.
- Collect information on the geologic history of Central Pacific Seamounts, including those that are or may be relevant to our understanding of plate tectonics and subduction zone biology and geology.
- Provide a foundation of publicly accessible data and information products to spur further exploration, research, and management activities.

## Norfolk, VA

### **NOAA Ship *Thomas Jefferson***

**Commanding Officer:** CAPT Shepard Smith

**Primary Mission Category:** Hydrographic Surveys

**DEPART:** Norfolk, VA

**ARRIVE:** Boston, MA

**Project 1:** Mapping Buzzards Bay

#### **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.

### **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

**DEPART:** Charleston, SC

**ARRIVE:** Savannah, GA

**DEPART:** Savannah, GA

**ARRIVE:** Charleston, SC

**Project 1:** Mapping Essential Fish Habitat in the Southeast

#### **Objectives:**

- Scientists will conduct broad-scale geophysical surveys of the Coastal and Outer Continental Shelf of Long Bay (South Carolina) using side-scan and multibeam sonars as well as sub-bottom profilers.
- Scientists will use fishery echosounders to map the water column biomass of fishes and other organisms to relate to the seafloor habitat features.
- Scientists will conduct drop camera surveys to ground truth/validate seafloor habitat types derived from multibeam and sidescan sonar surveys as well as statistical predictions of the locations of hardbottom habitats important to reef fish and other living marine resources.
- Scientists will replace a CCU met/ocean instrumentation buoy located off North Myrtle Beach to maintain continuity in near real time wave, current and 3m met data. They will also recover a AWAC instrument frame that was previously deployed near the Frying Pan Shoals Light Tower
- Scientists will collect periodic water samples using ship's seawater system in support of a NOAA funded study of distribution of microplastics to Clemson University.

## Project 2: Gray's Reef National Marine Sanctuary Southeast (GRNMS) Regional Ecosystem Assessment

### Objectives:

- Ship based mapping and characterization of benthic habitats in the waters around Gray's Reef National Marine Sanctuary. Collected data will need to include backscatter.
- Assess spatial variation in distribution of prey and associated predators both on and off reefs (i.e., along a gradient of distance from edges of undercut ledges), using acoustic and direct visual survey methods, over diel periods.
- Service acoustic telemetry array. This involves divers deploying instruments on established arrays, and retrieving instruments deployed previously.
- Continue investigation of abundance and distribution of invasive lionfish within the sanctuary. This involves divers conducting visual fish censuses at numerous sites around the sanctuary.
- Continue long term monitoring of marine debris distribution, accumulation and characterization at established sites within the sanctuary. This involves divers conducting survey transects at nine locations within GRNMS.
- Collect opportunistic photo and video imagery of the living marine resources and habitats within Gray's Reef. These images will be used for education and outreach purposes.
- Collect photo and video of sea turtles, as encountered, for the purpose of photo-identification of individual turtles.



Side-scan sonar sits waiting to be towed behind NOAA Ship *Nancy Foster*

[Photo: ENS Conor Maginn, NOAA]

### **NOAA Ship *Ronald H. Brown***

**Commanding Officer:** CAPT Robert Kamphaus

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

**DEPART:** Seattle, WA

**ARRIVE:** Kodiak, AK

**Project:** Ocean Acidification

#### **Objectives:**

Conduct 15 sampling transects, with 100 stations, throughout the coastal region of the Gulf of Alaska. Each station will include conductivity, temperature and depth casts with water samples at various depths and bongo net tows. Water samples will be analyzed with analytical instrumentation at sea (testing for carbon, oxygen and chlorophyll measurements) or they will be frozen to be analyzed after the cruise (testing for nutrients).

## **Pascagoula, MS**

### **NOAA Ship *Oregon II***

**Commanding Officer:** Master Dave Nelson

**Primary Mission Category:** Fisheries Research

**DEPART:** Pascagoula, MS

**ARRIVE:** Pascagoula, MS

**DEPART:** Pascagoula, MS

**ARRIVE:** Pascagoula, MS

**Project 1:** Summer Southeast Area Monitoring and Assessment Program (SEAMAP) Groundfish Survey

#### **Objectives:**

- Sample the northern Gulf of Mexico with SEAMAP standard trawl sampling gear to determine the abundance and distribution of benthic fauna.
- Collect size measurements to determine population size structures.
- Transmit real-time shrimp biological data weekly to Gulf States Marine Fisheries Commission.
- Profile the water column - temperature, salinity, fluorescence, dissolved oxygen, and turbidity.
- Collect at-depth water samples daily and perform benchtop dissolved oxygen tests using the benchtop Winkler Titration method on triplicate samples and handheld Orion 3 Star Portable Dissolved Oxygen Meter. Transmit the processed CTD profiles to a previously setup FTP site as often as time permits to NOAA National Coastal Data Development Center at Stennis Space Center, MS and other researchers to map the hypoxic zone.
- Assess the occurrence, abundance and geographical distribution of the early life stages of ichthyoplankton using a bongo frame fitted with a 0.335 mm net and neuston frame fitted with a 0.950 mm net at selected SEAMAP stations.
- Assess the functionality of an autonomous hydro-acoustic altimeter on the trawl foot-rope.

**Project 2:** Shark Red Snapper Longline

#### **Objective:**

- Sample the U.S. Atlantic and northern Gulf of Mexico for data concerning the distribution and abundance of shark and red snapper populations to aid in stock assessments.
- Collect morphological measurements and biological samples to facilitate life history studies.
- Conduct conductivity, temperature and depth casts to profile water column temperature, salinity, transmissivity, dissolved oxygen concentrations and fluorometry.



**NOAA Ship *Oregon II* celebrates her 300<sup>th</sup> cruise.**

[Photo: Kirk Pellegrin]

**NOAA Ship *Gordon Gunter***

**Commanding Officer:** Master Donn Pratt

**Primary Mission Category:** Fisheries Research

**DEPART:** Newport, RI

**ARRIVE:** Miami, FL

**Project:** East Coast Ocean Acidification

**Objectives:**

This is the comprehensive survey of inorganic carbon, nutrients and other biogeochemical parameters along the East coast of the USA. The effort is in support of the NOAA/OAR Ocean Acidification Program that has as a major objective to monitor changes in inorganic carbon dynamics, due to anthropogenic carbon input and natural changes in the coastal regions. These processes are often referred to as ocean acidification. The project will increase our understanding of the controls of ocean acidification and its impacts on ocean ecosystems. Additionally, the project seeks to better understand a unique set of processes such as freshwater discharge and intense net production known to affect the coastal carbonate cycle.

**NOAA Ship *Pisces***

**Commanding Officer:** CAPT Michael Hopkins

**Primary Mission Category:** Fisheries Research

**DEPART:** Morehead City, NC

**ARRIVE:** Morehead City, NC

**Project:** Southeast Fishery-Independent Survey

**Objectives:**

- Assessment of spatial variability in distribution and abundance of species within the snapper-grouper complex.
- Comparative analysis of fish traps, video cameras, and acoustics.
- Bathymetric data collection (for subsequent habitat mapping) over hard bottom habitats.
- Collect environmental and water quality information using Conductivity-Temperature-Depth sensor (CTD) casts and expendable bathythermographs (XBTs).
- Periodic hook-and-line sampling for additional life history and diet samples.

## San Diego, CA

**NOAA Ship *Reuben Lasker***

**Commanding Officer:** LCDR John Crofts

**Primary Mission Category:** Fisheries Research

**DEPART:** San Diego, CA

**ARRIVE:** Kodiak, AK

**Project:** Collaborative Large Whale Survey

**Objectives:**

- Mark-recapture estimate (from photo-id) of abundance over the entire southern summer feeding area(s).
- Examine population structure, including maturity (from hormones) and sex (from genetics) composition and assessment of internal and external recruitment.

## Newport, OR

**NOAA Ship *Rainier***

**Commanding Officer:** CDR E.J. Van Den Ameele

**Primary Mission Category:** Hydrographic Surveys

**DEPART:** Juneau, AK

**ARRIVE:** Dutch Harbor, AK

**Project:** Arctic Alaska- Kotzebue Sound

**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.

**NOAA Ship *Bell M. Shimada***

**Commanding Officer:** CDR Brian Parker

**Primary Mission Category:** Fisheries Research

**DEPART:** Newport, OR

**ARRIVE:** Newport, OR

**Project:** Joint Sardine and Hake Integrated Acoustic-Trawl Survey (SaKe)

**Objectives:** The primary goal of the survey is to estimate the biomasses, distributions, and biological compositions of populations of Pacific hake and Coastal Pelagic Species (CPS) using data from an

integrated acoustic and trawl survey off the west coasts of the U.S. and Canada from approximately San Diego, California (lat 32°48.02'N) to the north end of Vancouver Island, Canada (lat 50°45.65'N).

- Besides Pacific sardine, the other CPS of interest for the SWFSC are those comprised in the Pacific Fisheries Management Council Fisheries Management Plan (PFMC, 2011) including: Northern anchovy (*Engraulis mordax*), Pacific Mackerel (*Scomber japonicus*), Jack Mackerel
- (*Trachurus symmetricus*). The Northwest Fisheries Science Center and Southwest Fisheries Science Center are interested in all species of euphausiids found within the U.S.' West Coast Exclusive Economic Zone. The current sampling resolution will probably not allow for a comprehensive assessment of all anchovy sub-populations. In particular, those residing in the Southern California Bight and off the Columbia River plume might require additional effort given their patchy distribution.
- SaKe 2015 will continue to monitor the populations of Ecosystem Component Species, in particular Pacific Herring (*Clupea pallasii*).
- Continuously sample multi-frequency acoustic backscatter data using the ship's Simrad EK60 scientific echo-sounder system. These data will be used to estimate the distributions and abundances of hake and the CPS assemblage.
- Conduct daytime trawling to classify observed backscatter layers to species and size composition and to collect specimens of hake and other organisms.
- Conduct nighttime (i.e., between sunset and sunrise) surface trawling to collect specimens of CPS and other organisms.

## **OMAO'S MARINE OPERATIONS**

### **CAPT Todd Bridgeman, 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.



**Bird's eye view of NOAA's Marine Operation Center – Pacific.**

[Photo: NOAA]

## **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**

### **NOAA Ship *Fairweather***

**Commanding Officer:** CDR David Zezula

**Primary Mission Category:** Hydrographic Surveys

**DEPART:** Juneau, AK

**ARRIVE:** Nome, AK

**Project:** Arctic Alaska- Kotzebue Sound

**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.

## **Kodiak, AK**

### **NOAA Ship *Oscar Dyson***

**Commanding Officer:** CDR Arthur "Jesse" Stark

**Primary Mission Category:** Fisheries Research

**DEPART:** Dutch Harbor, AK

**ARRIVE:** Kodiak, AK

**Project:** Summer Pollock-Gulf of Alaska

#### **Objectives:**

- Collect acoustic-trawl data necessary to determine the distribution, biomass, and biological composition of walleye Pollock and other mid-water fishes
- Calibrate the acoustic systems using standard sphere calibration techniques
- Collect target strength data using centerboard-mounted or lowered transducers for use in scaling acoustic data to estimates of absolute abundance
- Collect physical oceanographic data (temperature and salinity profiles) at selected, and continuously collect sea surface temperature and salinity data using the ships flow thru water monitoring system
- Conduct trawl hauls to ground truth multi-frequency acoustic data collection

# Honolulu, HI

## NOAA Ship *Hi'ialakai*

**Commanding Officer:** CDR Daniel Simon

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

**DEPART:** Honolulu, HI

**ARRIVE:** Honolulu, HI

**DEPART:** Honolulu, HI

**ARRIVE:** Honolulu, HI

### **Project 1:** Woods Hole Oceanographic Institute's Hawaii Ocean Time Series Station

#### **Objectives:**

- To deploy the Woods Hole Ocean Time Series (WHOTS) -12 mooring.
- To simultaneously log data from the WHOTS-12 buoy, the WHOTS-11 buoy, Project-supplied meteorological sensors, and *Hi'ialakai* shipboard instruments during a ~48 hr inter-comparison period during which a sequence of conductivity, temperature and depth (CTD) casts will also be made.
- To recover the WHOTS-11 mooring.
- To obtain hydrographic data (CTD casts and acoustic Doppler current profiler (ADCP) profiles) at or near the center of Station ALOHA.
- Deploy an acoustic monitoring mooring.

### **Project 2:** Northwestern Hawaiian Islands Reef Assessment and Monitoring Program (RAMP)

#### **Objectives:**

- Reef Assessment and Monitoring Program: Divers will conduct rapid ecological assessments (REAs) using stratified sampling of reef fish, corals, other invertebrates, and algae. The RAMP is for the purpose of conducting ecological assessments employing standardized methods to improve understanding of the spatial and temporal processes influencing the health of coral reef ecosystems throughout the archipelago.
- Coral Disease and Prevalence Study: a dive team will conduct coral disease surveys to determine disease presence within the NWHI. This effort will be done in conjunction with the REA benthic surveys.
- Maritime Heritage: Conduct non-invasive wreck assessment surveys of selected maritime heritage sites and continued monitoring of known shipwreck and sunken aircraft sites for the purposes of understanding impacts and changes to maritime heritage resources. The maritime heritage efforts will be conducted with the use of SCUBA and snorkel using tow boards or DPVs and have proposed terrestrial surveys for historic camps utilized by shipwrecked whaling ships at Lisianski Island, Laysan Island and Kure Atoll.
- Outreach: Activities associated with outreach will be conducted by a Papahānaumokuākea Marine National Monument (PMNM) staff member. These activities will consist of at-sea outreach through the PMNM Facebook page and webpage, two evening radio show call-ins using an Iridium satellite phone belonging to the PMNM. A Google chat event with local schools on Oahu will be attempted during course of HA1505, dates to be determined.
- Sea Turtle Surveys: A sea turtle biologist will conduct shoreline surveys for sea turtles at Pearl and Hermes Atoll, Kure Atoll, Midway Atoll, Lisianski Island and Laysan Island. These will be done when dive operations are being conducted in close proximity to emergent islands.

### **NOAA Ship *Oscar Elton Sette***

**Commanding Officer:** LCDR Keith Golden

**Primary Mission Category:** Fisheries Research

**DEPART:** Saipan, Northern Mariana Islands

**DEPART:** Honolulu, HI

**ARRIVE:** Honolulu, HI

**ARRIVE:** Honolulu, HI

**Project 1:** Fisheries Oceanography- Commonwealth of the Northern Mariana Islands and Mariana Trench Marine National Monument

**Objectives:** The ship will conduct scientific operations in the waters surrounding the Commonwealth of the Northern Mariana Islands (CNMI) and the Mariana Trench Marine National Monument.

- Traps will be deployed from the ship and a small boat deployed from the ship. These traps will target both fish and invertebrates over sandy bottoms in coastal areas throughout the archipelago. Samples collections will support CNMI Division of Fish and Wildlife research to characterize biodiversity over sandy bottom habitats within the Mariana Archipelago and the Barcode of Life project.
- Mid water trawl operations will be conducted in the nighttime and early morning to collect mid water larval and juvenile stages of pelagic and reef fish species as well as pelagic midwater fauna. Samples collections will support CNMI Division of Fish and Wildlife research to evaluate latitudinal shifts in trophic relations via stable isotope analysis of tissue samples and to characterize mid water biodiversity within the Mariana Archipelago. Samples collections will also support a University of Guam research proposal to evaluate genetic connectivity within the Mariana Archipelago and the Barcode of Life project. These trawling operations will take place in offshore waters.
- Plankton sampling operations will be conducted during the daytime using 2 types of nets ring nets deployed as vertical casts in the upper 100m.
- Collect oceanographic data from routine conductivity-temperature-depth casts, continuous acoustic Doppler current profiler and thermosalinograph measurements throughout the project.
- Drifting night-light dip-netting operations off the port side long line pit will be conducted in the late evening to collect surface occurring larval and juvenile stages of pelagic and reef fish species. Samples collections may provide support for a University of Guam research proposal to evaluate genetic connectivity within the Mariana Archipelago.
- Shallow-water and shore-based collections and surveys of organisms will be conducted at selected islands. Sette small boat will be used to put a small team of 3-4 scientists ashore for day excursions inland for collections and surveys.

**Project 2:** Hawaii Island and Line Islands Insular Bottomfish & Reef Fish Bio-Sampling

#### **OBJECTIVE:**

To support deep-slope bottomfish bio-sampling of early pelagic and adult demersal stages, documentation of shark interactions and range wide analysis of select coral reef fishes.

### **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.



# OMAO's Aircraft



## Tampa, Florida

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

**Aircraft Commander:** N/A  
**Temporary Base:** Naval Air Station Jacksonville, FL  
**Current Mission:** Scheduled Maintenance - Until April 2016

The aircraft is at the Naval Air Station Jacksonville, Florida undergoing an extensive refurbishment period which will include replacing the wings and upgrading various components. This effort will extend the useful life of the aircraft for another 15-20 years.



One of NOAA's two Lockheed WP-3D Orion aircraft recently entered a long-term maintenance period at Naval Air Station, Jacksonville. The aircraft will receive new wings and significant additional upgrades as part of a service life extension program that will allow our WP-3D Orion aircraft to continue supporting all of NOAA's critical missions for years to come. These photos show the removal of the wings from the airframe.

[Photo: Victor Pitts, FRCSE Jacksonville]

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

**Aircraft Commander:** TBD  
**Temporary Base:** MacDill Air Force Base, FL  
**Current Mission:** Awaiting Hurricane Tasking

The 2015 Hurricane Season has begun and the NOAA Hurricane Hunter aircraft are ready to respond. Radar reconnaissance missions on NOAA WP-3D aircraft will be conducted to support tropical cyclone forecasting and the Hurricane Forecast Improvement Project. These flights will use the WP-3D's tail Doppler radar system to obtain high-density, three-dimensional measurements of the inner core wind structure of each tropical cyclone, potentially throughout its full life cycle. The hurricane research missions will also use the WP-3D to support the calibration/validation of satellite measurements and instrumentation development for the tropical cyclone environment and sampling of other aspects of the tropical cyclone inner core. These measurements will be used to enhance the accuracy of track and intensity guidance generated by NOAA's numerical weather prediction models. They will also be used directly by NWS hurricane specialists with the ultimate outcome being improved accuracy of intensity and track forecasts, extended forecast/warning lead-times and improved confidence levels by decision makers.

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

**Aircraft Commander:** TBD  
**Current Mission:** Awaiting Hurricane Tasking

NOAA's Gulfstream IV aircraft will support operational tropical cyclone forecasting and the Hurricane Forecast Improvement Project. The G-IV will be the primary aircraft for surveillance missions. The radar reconnaissance missions will use the G-IV's Tail Doppler Radar (TDR) system to obtain high-density, three-dimensional measurements of the inner core wind structure of tropical cyclones, potentially throughout its full life cycle. The National Weather Service is seeking to gather data on the performance of the TDR observation system and will work with the Hurricane Research Division to develop observing strategies for maximizing the utility of the TDR with the goal of improving hurricane track and intensity forecasts.

**Jet Prop Commander (N45RF)**

**Aircraft Commander:** LTJG Kyle Salling/LTJG Kevin Doremus  
**Current Mission:** GRAV-D

Aircraft is supporting NOAA's National Geodetic Survey (NGS) on a project to re-define the vertical datum of the US by 2022. Beginning in 2007, GRAV-D is one of the most ambitious projects undertaken by the NGS with the goal of modeling and monitoring Earth's gravity field to serve as a zero reference point for all heights in the nation. Accurate heights are critical to many scientific endeavors, but particularly to understanding and protecting low-lying coastal ecosystems. At the completion of this project, NGS will be able to execute its mission with substantial improvements to both accuracy and efficiency. The benefits to the nation will be immense in avoidance cost from improved floodplain management alone.

### **Twin Otter (N46RF)**

**Aircraft Commander:** LCDR Doug MacIntyre/LT David Cowan  
**Current Mission:** Soil moisture

The aircraft is conducting soil moisture work for the National Operational Hydrologic Remote Sensing Center (NOHRSC) using an airborne gamma radiation detector to make soil moisture measurements in TX and OK. These measurements are used by NWS Weather Forecast Offices (WFO) and NWS River Forecast Centers (RFC) when issuing river and flood forecasts, water supply forecasts, and spring flood outlooks.

### **Twin Otter (N48RF)**

**Aircraft Commander:** LT Francisco Fuenmayor  
**Current Mission:** Plankton Layers

This project studies the distribution of subsurface plankton layers using airborne Light Detecting and Ranging System (LiDAR). These observations are compared with data from surface vessels in the Gulf of Mexico to better understand how oceanic removal of CO<sub>2</sub> from the atmosphere may change with increased layering of plankton.

### **Twin Otter (N56RF)**

**Aircraft Commander:** LT Tanner Simms  
**Current Mission:** LOSI Project

This project will address the critical need for assessment data on ribbon, spotted, bearded, and ringed seals. The abundance of these species, protected under the Marine Mammal Protection Act, is not well documented. The best way to estimate the abundance of ice-associated seals is through aerial photographic surveys during the period when the greatest proportions of the populations are hauled out on the ice and available to be seen. This project is part of a multi-year plan to conduct surveys in the Chukchi and Beaufort Seas.

### **Twin Otter (N57RF)**

**Aircraft Commander:** ENS Kerryn Schneider  
**Temporary Base:** US Coast Guard Air Station Cape Cod, MA  
**Current Mission:** Northeast Right Whale Survey - New England waters

This survey will: 1) provide locations of North Atlantic Right whales to mariners, 2) provide description of Right whale distribution to support the implementation of seasonal and dynamic area management, 3) provide annual photo-identification records on Right whales, as well as detailed vertical photogrammetry in selected periods, 4) provide information on the distribution and abundance of marine mammals and marine turtles in the winter, spring, summer and fall seasons, 5) provide sightings of dead whales, 6) provide information on the distribution of shipping and fishing gear, and 7) census seal populations along the New England coast.

**King Air (N68RF)**

**Aircraft Commander:**

LCDR 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.

**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.



**NOAA's Aircraft Operations Center at MacDill Air Force Base, Tampa FL**

[Photo: NOAA]



# Unmanned Systems Support



## MOA Regarding NOAA Operations from USCG Assets

Building upon the United States Coast Guard (USCG) and NOAA Fleet Plan, a new Memorandum of Agreement (MOA) was recently signed which enables NOAA and USCG to collaborate in the testing and operation of unmanned and autonomous systems, advanced platforms, payloads and applications in the polar and marine environments aboard CG Cutters. This ground breaking agreement was conceived based on the success of NOAA's small Unmanned Aircraft System engagement with the USCG Research and Development Center during Arctic Shield exercises aboard the USCG ship HEALY.

## NASA Global Hawk

**Location:** Edwards Air Force Base (AFB), CA

**Mission:** Multiple Flight Test Activities

NASA's Global Hawk unmanned aircraft system (UAS) has now been geared for multiple flight test activities in May and June. This test period will be followed by hurricane surveillance instrumentation in July for the Sensing Hazards with Operational Unmanned Technology (SHOUT) project. The SHOUT project is a NOAA funded hurricane surveillance and research activity that is scheduled to operate from the NASA Wallops Flight Facility in August and September. NOAA Corps officer, LCDR Neuhaus, is supporting Global Hawk as a project manager and instructor pilot.

## APH-22 Hexacopter: Fur Seals

**Location:** San Diego, CA

**Mission:** Pribilof Island Fur Seals / Stellar Sea Lion

NOAA's National Marine Mammal Laboratory's primary objective is to use the APH-22 hexacopter unmanned aircraft system (UAS) equipped with a high resolution camera to photograph northern fur seal (NFS) rookeries on the four islands in the Pribilof Islands: St. Paul, St. George, Otter, and Walrus Islands. Images will be captured to update historical photographs of rookery space-use of NFS as well as testing this platform for the possible future use to supplement abundance studies. Additionally, opportunistic surveys of Steller sea lions hauled out will be photographed to collect counts and sight for permanent marks.

## APH-22 Hexacopter: Stellar Sea Lions

**Location:** Coastal OR / CA

**Mission:** Coastal Oregon / California Stellar Sea Lions

NOAA's National Marine Mammal Laboratory would like to use the APH-22 hexacopter unmanned aircraft system (UAS) equipped with a high resolution camera at three sites off the coast of California and Oregon. The three sites are the St. George Reef, CA; Rogue Reef, OR; and Orford Reef, OR sea lion rookeries. The primary objective is to capture images to obtain counts of sea lions (pup and non-pups) to be used in modeling abundance trends. The second objective is to sight for permanently marked animals from images for the long-term life-history study. The third objective is capture aerial images of the sea lion rookeries to create site maps. NMFS is mandated under the Endangered Species Act and Marine Mammal Protection Act to monitor and study this recently delisted population of Steller sea lions. Using this same small UAS and designated PICs, the National Marine Mammal Laboratory has successfully

conducted 2 surveys with several flight missions completed in 2014 and is anticipating 2 more in Alaska in June/July of 2015. The same safety measures, mission protocols, and restrictions will be adhered to as were implemented in previous successful surveys.

### **Puma UAS**

**Location:** US Northeast Offshore Waters

**Mission:** Sea Turtle Surveys

The objective of this project will be to locate, capture, sample, and satellite tag loggerhead sea turtles in the poorly understood area from the southern flank of Georges Bank through the Scotian Shelf. Operations will be conducted from the NOAA Ship *Henry B. Bigelow*. Puma operations will be conducted as part of the 8-day cruise operating along the southern flank of Georges Bank, across the northeast channel, and onto Browns Bank and the Scotian Shelf. The Puma UAS will be used to locate sea turtles and relay the location information to the ship and scientific crew. The locations of the turtles will be used to vector the ship's launches to the turtles. The crew aboard the launches will capture, tag and release the turtles.

### **PUMA UAS: USCG**

**Location:** Polar Sea Arctic

**Mission:** Arctic Shield aboard the U.S. Coast Guard ship HEALY

Arctic Shield 2015 will be the third trip with NOAA and the Puma AE onboard the U.S. Coast Guard (USCG) ship HEALY. Last year, Puma AE flew as part of a joint technology demonstration in the Beaufort and Chukchi Sea. The Puma AE was used to search, detect, and map the ice flow from the air. Utilizing its standard payload configuration, the Puma AE provided real-time imagery back to the ship improving situational awareness of the exercise. The imagery depicted actual on-scene ice conditions, ice movements and simulated oil spill locations, dimension, and size which were vital to the success of the Oil Spill Response Demonstration. Due to its success last year, the Puma AE will be utilized again this year for another ISR Arctic and Ice Exercise. Due to a lack of permissions and policy last year, landing the Puma AE on HEALY's using the autonomous net-capture system was not permitted. As a result, autonomous landing procedures for the Puma AE have been under development in order to continue to reduce personnel and equipment safety risks. This operation was recently successfully tested onboard NOAA's R/V SHEARWATER and a U.S. Navy Patrol Boat. The system was successful throughout 20 autonomous captures during developmental testing.

### **DJI S-1000**

**Location:** Oak Ridge, TN

**Mission:** Convective Initiation

This project is an initiative from NOAA's Office of Oceanic and Atmospheric Research's, Atmospheric Turbulence and Diffusion Division (ATDD) to measure the conditions that lead to Convective Initiation in the lower boundary layer. A DJI S-1000 rotor-based UAS system will be operated by NOAA/ATDD and will be used to measure the dynamics of land-atmosphere interactions in the lower boundary layer. 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. A field experiment is planned for the summer of 2015 using this UAS in Northern Alabama to help accomplish this mission.



# OMAO Partnerships



## United States Senate Committee on Commerce, Science, and Transportation – Chair, 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 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 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 Homeland Security - U.S. Coast Guard**

**Location:** Washington, DC

**Embedded Liaison:** CDR Scott Sirois NOAA Commissioned Officer Corps  
As the NOAA liaison to the United States Coast Guard (USCG), CDR Sirois 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 Sirois 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.



# Teacher At Sea Program



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 for the current monthly update for the 2015 Field Season. Once they have embarked on their cruise, 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>

2015 Season Stats: 22 teachers will be sailing on different projects

## **NOAA Ship *Pisces***

**Name:** Ms. Leah Johnson

**School:** Sir Francis Drake HS, San Anselmo, CA

**Cruise:** Southeast Fisheries- Independent Survey, July 17, 2015 – August 8, 2015

**Blog:** [http://teacheratsea.noaa.gov/#/2015/Leah\\*Johnson/blogs](http://teacheratsea.noaa.gov/#/2015/Leah*Johnson/blogs)

## **NOAA Ship *Oscar Dyson***

**Name:** Ms. Andrea Schmuttermair

**School:** Colorado STEM Academy, Westminter, CO

**Cruise:** Summer Pollock-Gulf of Alaska, July 05, 2015 – July 24, 2015

**Blog:** [http://teacheratsea.noaa.gov/#/2015/Andrea\\*Schmuttermair-2015/blogs](http://teacheratsea.noaa.gov/#/2015/Andrea*Schmuttermair-2015/blogs)

## **NOAA Ship *Oregon II***

**Name:** Ms. Kathleen Gibson

**School:** Trumbull High School, Trumbull, CT

**Cruise:** Shark/Red Snapper Longline Survey, July 25, 2015 – August 8, 2015

**Blog:** [http://teacheratsea.noaa.gov/#/2015/Kathleen\\*Gibson/blogs](http://teacheratsea.noaa.gov/#/2015/Kathleen*Gibson/blogs)



**Teacher-At-Sea Andrea Schmuttermair, aboard NOAA Ship *Oscar Dyson* preparing to sort a catch. [Photo: NOAA]**



## 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).



**NOAA Diver Kosta Stamoulis encounters a manta ray (*Manta birostris*) during a visual fish survey conducted from the NOAA Ship *Hi'ialakai*.**

[Photo: Ray Boland/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]



# Office of Marine and Aviation Operations



Providing environmental intelligence for a dynamic world

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 "Hurricane Hunter" 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 hurricane surveillance jet, these 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, 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 November 2014, our aircraft flew missions over upstate New York after the record snow falls of up to seven feet and conducted airborne Snow Water Equivalent (SWE) and soil moisture measurements. Airborne SWE measurements are used by NOAA's National Weather Service when issuing river and flood forecasts, water supply forecasts, and spring flood outlooks.

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 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.



# NOAA Commissioned Officer Corps



– Honor, Respect, Commitment –

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 November 2014, our aircraft flew missions over upstate New York after the record snow falls of up to seven feet and conducted airborne Snow Water Equivalent (SWE) and soil moisture measurements. Airborne SWE measurements are used by NOAA's National Weather Service when issuing river and flood forecasts, water supply forecasts, and spring flood outlooks.
- 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.
- 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 three days after the storm.
- 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.

Find out more about the NOAA Corps, its mission and history at <http://www.noaacorps.noaa.gov/>.