



NOAA Fleet Update

AUGUST 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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<http://www.facebook.com/NOAAOMAO>



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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.

[Hurricane Katrina spurred major forecast improvements](#)

-Sun-Sentinel (Ft. Lauderdale)

Hurricane Katrina, the most destructive and third deadliest storm in U.S. history, also was a force for change, spurring major advancements in forecasting and communication. Since its rampage in late August 2005, scientists have developed several new high-tech tools to better predict the strength and track of storms, in hopes of preventing a similar catastrophe. "We know we still have work to do but we're in a much better place because of the investments made over the past decade," said Kathryn Sullivan, administrator of the National Oceanic and Atmospheric Administration, on Tuesday...In addition to hurricane hunters, large and small drones provide a better top to bottom view of a storm's structure. Those include the Coyote, a 13-pound aircraft designed to penetrate the most violent quadrant of a hurricane at low altitude, and NASA's Global Hawk, a large jet-powered drone...

[Coast Guard investigation into damaged Shell icebreaker moves forward](#)

-Alaska Dispatch News

A Shell-contracted icebreaker damaged earlier this month in Unalaska Bay had up-to-date navigational charts on board, but the ship's draft went deeper than a previously unidentified shoal rising up from the bay's floor, according to initial findings of an investigation into the accident, the U.S. Coast Guard said Tuesday. The [M/V] Fennica, a 381-foot Finnish ship hired by Shell to support the company's planned Chukchi Sea oil drilling program, sustained a 3-foot-long gash in its hull while heading out of the Aleutian bay to start its journey north to the Arctic. The July 3 incident resulted in a ballast tank leak and put the ship temporarily out of service...The Coast Guard said it has alerted mariners to the shoal, newly charted by the National Oceanic and Atmospheric Administration's Office of Coast Survey...

[Tropical storm watch issued for Big Island, Maui County as Guillermo nears](#)

-Honolulu Star-Advertiser

Hawaii Island and Maui County are under a tropical storm watch, and other islands may be included by Tuesday morning as Tropical Storm Guillermo continues on course to pass just north of the state, forecasters said. A watch means that tropical storm conditions are likely within 48 hours. Although projected to continue weakening, Guillermo is still capable of bringing heavy rain, and the potential for flooding and strong winds to the islands starting late Tuesday night through Thursday...Crews from the Air Force Reserve's 53rd Weather Reconnaissance Squadron -- known as the Hurricane Hunters -- have been flying through the storm and data from the flights "has been critical in locating the center, determining the current intensity and adjusting the wind radii (of Hurricane Guillermo)," forecasters said. A NOAA Gulfstream IV plane is also taking measurements in the storm...

[Pacific Algae Bloom: It's The Biggest One They've Ever Seen](#)

-The Weather Channel

A giant bloom of algae, commonly known as a red tide, floating off the Pacific coast may be larger and more widespread than scientists first believed. This coastal ribbon of microscopic organisms, which stretches up to 40 miles wide and drops 650 feet below the surface in places, is flourishing amid unusually warm Pacific Ocean temperatures, reports the Associated Press. The current bloom, which stretches from California to Alaska, may be the biggest one ever recorded in the Pacific, University of Washington research analyst Anthony Odell said in a press release. "It has also lasted for an incredibly long time — months, instead of the usual week or two." Researchers aboard the NOAA Ship *Bell M. Shimada* have been sampling the algae bloom in the last several months...



NOAA Corps - Basic Officer Training Class (BOTC) 126



BOTC 126 - NOAA Corps BOTC 126 reported to the United States Coast Guard (USCG) Academy in New London, Connecticut, on July 29, 2015. The 10 new officers have been through a whirlwind of classes and military training during their first week with their 81 USCG classmates.



NOAA BOTC 126 awaits check in at Chase Hall with their USCG classmates (New London, CT).

[Photo: PA2 Cory Mendenhall, USCG]



NOAA Corps and USCG classmates participate in their first drill competition. During indoctrination week over 16 hours are spent on drill practice, honing in on discipline, teamwork, leadership, followership, and attention to detail.

[Photo: LTJG Kathleen Priesing, USCG]



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: Norfolk, VA

ARRIVE: Norfolk, VA

Project: 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.



Sunset aboard the NOAA Ship *Ferdinand R. Hassler* during a recent project.

[Photo: NOAA]

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

NOAA Ship *Henry B. Bigelow*

Commanding Officer: CDR G. Mark Miller

Primary Mission Category: Fisheries Research

DEPART: Newport, RI

ARRIVE: Newport, RI

DEPART: Newport, RI

ARRIVE: Newport, RI

Project 1: Deep-Sea Corals

Objectives:

- Survey canyon area and inter canyon slope habitat 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 records.
- Conduct multi-beam mapping in areas where data is missing or incomplete.
- Assemble a database of photographs, species identification, species abundance/distributions.
- Assemble maps of geo-referenced coral locations and associated data.
- Provide research opportunities for teachers and professional researchers.

Project 2: Benthic Habitat of the Northeast Outer Continental Shelf Ecosystems

Objectives:

- Perform sampling for benthic infauna and epifauna.
- Capture water column hydrographic profiles with vertical conductivity, temperature and depth casts.
- Perform multi-beam high-resolution mapping of an area of interest in the middle of the Delaware Wind Energy Area.
- Capture multi-frequency split beam acoustic data in all operating areas for use in water column analysis for fish.

Davisville, RI

NOAA Ship *Okeanos Explorer*

Commanding Officer: CDR Mark Wetzler

Primary Mission Category: Oceanographic Exploration and Research

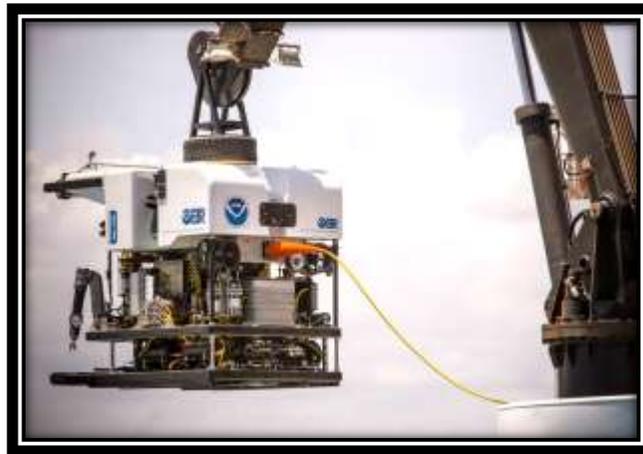
DEPART: Pearl Harbor, HI

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.



NOAA Ship *Okeanos Explorer* launches Deep Discoverer.

[Photo: NOAA]

Norfolk, VA

NOAA Ship *Thomas Jefferson*

Commanding Officer: CAPT Shepard Smith

Primary Mission Category: Hydrographic Surveys

DEPART: Norfolk, VA

ARRIVE: Norfolk, VA

Project: 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: Savannah, GA

ARRIVE: Charleston, SC

DEPART: Charleston, SC

ARRIVE: Charleston, SC

DEPART: Norfolk, VA

ARRIVE: Norfolk, VA

Project 1: Gray's Reef National Marine Sanctuary (GRNMS) - Southeast Regional Ecosystem Assessment

Objectives:

- Ship based mapping and characterization of benthic habitats in the waters around GRNMS.
- Assess spatial variation in distribution of prey and associated predators both on and off reefs.
- Service acoustic telemetry array.
- 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.
- Collect opportunistic photo and video imagery of the living marine resources and habitats within GRNMS. 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.

Project 2: Brunswick/Fernandina Beach Offshore Dredged Material Disposal Site (ODMDS) Trend Assessment Survey Project

Objectives:

- Conduct routine trend assessments at the Brunswick and Fernandina Beach ODMDS by collecting and analyzing water, sediment and biota from each ODMDS.
- Test Multi-beam/Split- beam technology for conducting fish biomass surveys in conjunction with ODMDS habitat assessment.

Project 3: EPA Region III Norfolk Ocean Disposal Site, Coastal Eutrophication, and Ocean Acidification Study

Objectives:

- Norfolk Ocean Disposal Site (water and sediment samples): Collect sediment samples for total organic carbon, metals, grain size and benthic organisms. Water quality parameters are also recorded at the site. This data will be compared to prior years to determine if conditions are degrading as a result of dredge material being placed on site.
- Coastal Eutrophication (water samples): Water samples will be collected at the surface and middle of the thermocline along the Mid-Atlantic Bight. These samples provide the EPA with information regarding total and dissolved nutrient concentrations.
- Ocean Acidification (water samples): Water quality samples will be collected and preserved for future analysis. The objective is to create a baseline data of the pH of the Mid-Atlantic Bight waters for future comparison.

NOAA Ship *Ronald H. Brown*

Commanding Officer: CAPT Robert Kamphaus

Primary Mission Category: Oceanographic Research, Environmental Assessment

DEPART: Kodiak, AK

ARRIVE: Dutch Harbor, AK

DEPART: Dutch Harbor, AK

ARRIVE: Dutch Harbor, AK

Project 1: Eco-FOCI Arctic

Objectives: This is a joint project between Office of Atmospheric Research, Pacific Marine Environmental Laboratory /Eco-FOCI and National Ocean Service to survey the Chukchi and Beaufort Seas. The Eco-FOCI project goal is to sample the series of transects using Conductivity, Temperature, and Depth casts, Tucker sled trawls and Bongo tows. This is part of the multi-institutional effort to obtain a baseline characterization of the biological, chemical and physical oceanography of ice-free portions of the U.S. Chukchi and Beaufort Seas and to understand the changing ecosystems.

Project 2: Bioeffects of Chukchi Sea

Objectives: Assess habitat conditions that influence biodiversity and distribution of benthic infaunal communities, contaminants, and chemical body burdens of resident organisms as measures of environmental health in the bays and lagoons in the Chukchi and Beaufort Seas in the vicinity of proposed oil transport pipelines. Baseline data will be essential for monitoring pollution control effectiveness and National Resource Damage Assessment activities in the event of a spill.

Pascagoula, MS

NOAA Ship *Oregon II*

Commanding Officer: Master Dave Nelson

Primary Mission Category: Fisheries Research

DEPART: Pascagoula, MS

ARRIVE: Pascagoula, MS

Project: Shark Red Snapper Longline

Objectives:

- 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 *Gordon Gunter*

Commanding Officer: Master Donn Pratt

Primary Mission Category: Fisheries Research

DEPART: Miami, FL

ARRIVE: Pascagoula, MS

Project: West Florida Shelf Bottlenose Dolphin Survey

Objectives:

- Collect tissue biopsy samples and detailed photographs of bottlenose dolphin on West Florida shelf
- Collect visual and passive acoustic data to characterize Bryde whale abundance and spatial distribution on the eastern Gulf of Mexico.
- Satellite tag Bryde whales if the opportunity allows.
- Collect acoustic recordings of marine mammal vocalizations for use in species identification.
- Collect oceanographic and environmental data including hydrographic profiles, continuous surface water characteristics, and scientific echo sounders data to quantify acoustic backscatter due to small fish and zooplankton.
- Recover and deploy two HARP recording packages.



NOAA Ship *Gordon Gunter* at Marine Operations Center Atlantic

[Photo: ENS M. Head, NOAA]

NOAA Ship *Pisces*

Commanding Officer: CAPT Michael Hopkins

Primary Mission Category: Fisheries Research

DEPART: Morehead City, NC

ARRIVE: Morehead City, NC

DEPART: Pascagoula, MS

ARRIVE: Pascagoula, MS

Project 1: 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 casts and expendable bathythermographs.
- Periodic hook-and-line sampling for additional life history and diet samples.

Project 2: SEAMAP Fall Ichthyoplankton

Objectives:

- Assess the occurrence, abundance and geographical distribution of the early life stages of fall spawning fishes, especially King and Spanish Mackerel, Red Drum and Snappers on U.S. continental shelf waters in the GOM at selected Southeast Area Monitoring and Assessment Program (SEAMAP) stations in support of annual stock assessments.
- Describe the pelagic habitat of fish larvae through the measurements of various physical and biological parameters.
- Map the Distribution of fish eggs and invertebrate zooplankton along the cruise track using a Continuous Underway Fish Egg Sampler.
- Measure the vertical distribution of fish larvae by sampling at discrete depths in the water column at selected locations along the SEAMAP plankton survey grid.
- Collect detailed observations of net-caught jellyfish and ctenophores.
- Examine the spatial resolution of Red and Vermillion snapper distribution.

San Diego, CA

NOAA Ship *Reuben Lasker*

Commanding Officer: LCDR John Crofts

Primary Mission Category: Fisheries Research

DEPART: Kodiak, AK

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) of large Whales.
- Examine population structure, including maturity and sex composition and assessment of internal and external recruitment.



A gray whale dives with NOAA Ship *Reuben Lasker* in the background. Photos taken under NMFS Permit No. 14097.

[Photo: NOAA]

Newport, OR

NOAA Ship *Rainier*

Commanding Officer: CDR E.J. Van Den Ameele

Primary Mission Category: Hydrographic Surveys

DEPART: Dutch Harbor, AK

DEPART: Nome, AK

ARRIVE: Nome, AK

ARRIVE: Kodiak, AK

Project 1: 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.

Project 2: Approaches to Shumagin Island

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: 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 to the north end of Vancouver Island, Canada.

- Besides Pacific sardine, the other CPS of interest for the SWFSC are those comprised in the Pacific Fisheries Management Council Fisheries Management Plan) including: Northern anchovy (*Engraulis mordax*), Pacific Mackerel (*Scomber japonicus*), Jack Mackerel (*Trachurus symmetricus*).
- 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 scientific echosounder system. These data will be used to estimate the distributions and abundances of hake and the CPS assemblage.

OMAO'S MARINE OPERATIONS

CAPT Todd Bridgeman, Director of Marine Operations

OMAO's Marine Operations over-see 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)

CDR Keith Roberts/CDR Joseph Bishop, Acting 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: Nome, AK

ARRIVE: Nome, AK

DEPART: Nome, AK

ARRIVE: Kodiak, AK

Project 1: 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.

Project 2: Arctic Aerial Calibration Experiments

Objectives: Conduct a 3-way comparison of data and derived statistics from the following:

- Observers in the manned aircraft;
- Digital photographs from cameras mounted to the manned aircraft;
- Digital photographs from cameras mounted to the Unmanned Aerial Vehicle

Kodiak, AK

NOAA Ship *Oscar Dyson*

Commanding Officer: CDR Arthur "Jesse" Stark

Primary Mission Category: Fisheries Research

DEPART: Dutch Harbor, AK

ARRIVE: Kodiak, AK

DEPART: Kodiak, AK

ARRIVE: Dutch Harbor, AK

Project 1: 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

Project 2: EMA-FOCI Age-0 Groundfish and Salmon Recruitment Processes: Gulf of Alaska

Objectives: Fisheries (midwater trawl) and oceanographic survey to:

- Extend time series of age-0 Walleye Pollock abundance in the western Gulf of Alaska;
- Describe the community structure, biomass, energetic status of pelagic nekton (Capelin, Eulachon, Pacific Cod, Walleye Pollock, Arrowtooth Flounder, Sablefish, and rockfishes);
- Collect age-0 Walleye Pollock associated prey and measure environmental variables that potentially affect Walleye Pollock ecology; and
- Occupy a series of cross-shelf transects of conductivity, temperature and depth stations to examine cross-shelf physical and chemical oceanography.

Honolulu, HI

NOAA Ship *Hi'ialakai*

Commanding Officer: CDR Daniel Simon

Primary Mission Category: Oceanographic Research, Environmental Assessment

DEPART: Honolulu, HI

ARRIVE: Honolulu, HI

Project: Northwestern Hawaiian Islands (NWHI) Reef Assessment and Monitoring Program (RAMP)

Objectives:

- Reef Assessment and Monitoring Program: Divers will conduct rapid ecological assessments 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.
- 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 Diver Propulsion Vehicles and have proposed terrestrial surveys for historic camps utilized by shipwrecked whaling ships at Lisianski Island, Laysan Island and Kure Atoll.
- 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: Honolulu, HI

ARRIVE: Honolulu, HI

Project: 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

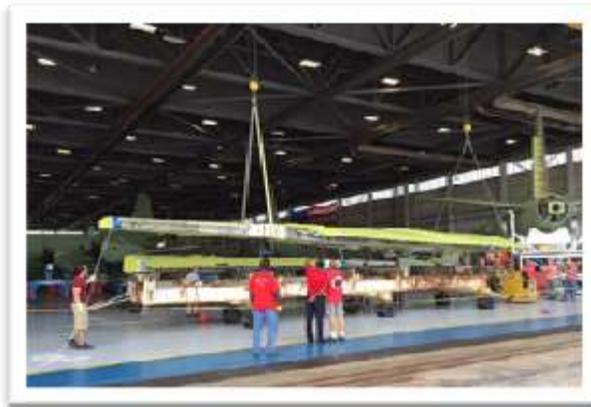


Tampa, Florida

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: LT Michael Marino
Current Mission: Harbor Seal Surveys

Supporting the National Marine Fisheries Service, the aircraft is working with a second NOAA Twin Otter aircraft conducting photographic surveys of harbor seals. Imagery collected is used to determine distribution and abundance of seals as required by the Marine Mammal Protection Act.

Twin Otter (N48RF)

Aircraft Commander: LT Mathew Nardi
Current Mission: Central U.S. Soil Moisture Surveys

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

Twin Otter (N56RF)

Aircraft Commander: LT Tanner Simms
Current Mission: Harbor Seal Surveys

Supporting the National Marine Fisheries Service, the aircraft is working in conjunction with a second NOAA Twin Otter aircraft conducting photographic surveys of harbor seals. Imagery collected is used to determine distribution and abundance of seals as required by the Marine Mammal Protection Act.

Twin Otter (N57RF)

Aircraft Commander: ENS Kerryn Schneider
Temporary Base: U.S. 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, 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, Florida.

[Photo: NOAA]



Unmanned Systems Support



NASA Global Hawk

Location: Edwards Air Force Base (AFB), CA/ NASA Wallops Flight facility

Mission: Sensing Hazards with Operational Unmanned Technology (SHOUT) project

NASA's Global Hawk Unmanned Aircraft System is completing instrumentation for hurricane surveillance and research to support 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 both Edwards Air Force Base and the NASA Wallops Flight Facility beginning in August and running through mid-October. NOAA Corps officer, LCDR Neuhaus, is supporting Global Hawk as a project manager and instructor pilot.

APH-22 Hexacopter

Location: San Diego, CA

Mission: Pribilof Island Fur Seals / Stellar Sea Lion

NMML'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

Location: Coastal OR/CA

Mission: Coastal Oregon / California Stellar Sea Lions

National Marine Mammal Laboratory (NMML) will 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.

Puma UAS

Location: U.S. 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

Location: Polar Sea Arctic

Mission: Arctic Shield aboard USCGC Healy

Arctic Shield 2015 will be the third trip with NOAA and the Puma AE onboard USCGC 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 OAR's Atmospheric Turbulence and Diffusion Division (ATDD) to measure the conditions that lead to Convective Initiation (CI) 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: 20 teachers sailed on different projects; 2 teachers scheduled

NOAA Ship *Thomas Jefferson*

Name: Ms. Jeanne Muzi

School: Lawrence Township Public Schools, Lawrenceville NJ

Cruise: Mapping Buzzards Bay, August 2, 2015 – August 13, 2015

Blog: http://teacheratsea.noaa.gov/#/2015/Jeanne*Muzi/blogs

NOAA Ship *Oscar Dyson*

Name: Ms. Christina A Veresan

School: Star of the Sea School, Honolulu HI

Cruise: Midwater Assessment Conservation Engineering, July 28, 2015 – August 16, 2015

Blog: http://teacheratsea.noaa.gov/#/2015/Cristina*Veresan/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



Teacher-At-Sea Andrea Schmittermair, 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.



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/>.