



# California

***NOAA is an agency that enriches life through science. Our reach goes from the surface of the sun to the depths of the ocean floor as we work to keep citizens informed of the changing environment around them. From daily weather forecasts, severe storm warnings, and climate monitoring to fisheries management, coastal restoration and supporting marine commerce, NOAA's products and services support economic vitality and affect more than one-third of America's gross domestic product. NOAA's dedicated scientists use cutting-edge research and high-tech instrumentation to provide citizens, planners, emergency managers and other decision makers with reliable information they need when they need it.***

***The following is a summary of NOAA facilities, staff, programs, or activities based in, or focused on, your state or territory: Starting with highlights, then by congressional districts and cities or towns, and then [statewide programs](#).***

## ***Highlights of NOAA in California***

<a href="#">Cordell Bank National Marine Sanctuary</a>	Point Reyes Station	CA-2
<a href="#">San Francisco Bay National Estuarine Research Reserve</a>	San Francisco, San Rafael, Suisun	CA-2, 3
<a href="#">Russian River Watershed Habitat Focus Area</a>	Santa Rosa	CA-5
<a href="#">Monterey Bay National Marine Sanctuary</a>	Monterey	CA-20
<a href="#">La Jolla Shores Drive Laboratory</a>	La Jolla	CA-52

The state of California also has one Cooperative Institute, six Weather Forecasting Offices, one Regional Office, three Labs and Field Offices, seven Science on a Sphere® exhibitions, three National Estuarine Research Reserves, and one Habitat Focus Area.

**Weather Forecast Offices**

Eureka	CA-2
Sacramento	CA-7
Carmel	CA-20
San Joaquin Valley/Hanford	CA-21
Los Angeles Basin	CA-26
La Jolla	CA-52

**NWS Weather Forecast Offices (WFO)** are staffed around-the-clock every day and provide the best possible weather, water, and climate forecasts and warnings to residents of California. Highly trained forecasters issue warnings and forecasts for events, including severe thunderstorms, tornadoes, winter storms, floods, and heat waves. This essential information is provided to the general public, media, emergency management and law enforcement officials, the aviation and marine communities, agricultural interests, businesses, and others. Information is disseminated in many ways, including through dedicated government channels, satellite, the Internet, and NOAA Weather Radio All Hazards. Forecasters also provide Impact-based Decision-Support Services (IDSS), both remotely and on-site, during critical emergencies, such as wildfires, floods, chemical spills, and for major recovery efforts. The WFO collects and disseminates precipitation, river, and rainfall data, and prepares local climatological data. Each WFO has a Warning Coordination Meteorologist who actively conducts outreach and educational programs, which helps build strong working relationships with local partners in emergency management, government, the media and academic communities. The WFO operates Automated Surface Observing Stations (ASOS), as well as the local Doppler Weather Radar, which provides critical information about current weather conditions. The radar data enables forecasters to issue warnings for tornadoes, severe thunderstorms, and flash floods.

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**Science On a Sphere®**

Point Reyes Station	CA-2
Modesto	CA-10
San Francisco	CA-12
San Jose	CA-13
Berkeley	CA-13
Sylmar	CA-29
Lake Forest	CA-45
Santa Ana	CA-46
Long Beach	CA-47

**Science On a Sphere (SOS)** is a room-sized global display system that uses computers and video projectors to display planetary data onto a six-foot diameter sphere, analogous to a giant animated globe. Researchers at NOAA developed Science On a Sphere® as an educational tool to help illustrate Earth System science to people of all ages. Animated images of atmospheric storms, climate change, and ocean temperature can be shown on the sphere, which is used to

explain in a way that is simultaneously intuitive and captivating what are sometimes complex environmental processes. They are located at the Point Reyes National Seashore, Great Valley Museum and Modesto Junior College, The Climate Corporation in San Francisco, Tech Museum of Innovation in San Jose, Lawrence Hall of Science in Berkeley, Discovery Cube Los Angeles in Sylmar, Panasonic Avionics Corporation in Lake Forest, Discovery Science Center in Santa Ana, and Aquarium of the Pacific in Long Beach.

### CA-1

#### *Arcata*

#### **National Ocean Service (NOS) - [Humboldt Bay PORTS®](#)**

A Physical Oceanographic Real-Time System (PORTS®) in Humboldt Bay, California operates through a partnership with the Humboldt Bay Harbor, Recreation and Conservation District and the Center for Operational Oceanographic Products (CO-OPS). The coastal ocean observing system in Humboldt Bay collects oceanographic data from four current meters, an existing long-term tide station belonging to CO-OPS' National Water Level Observation Network, and a wave buoy operated by the Coastal Data Information Program. The Humboldt Bay PORTS® monitors currents, waves, water levels, and meteorological factors in real-time in order to improve navigation safety and aid in the protection of public health from any potential hazardous material spills.

#### *Redding*

#### **National Environmental Satellite, Data, and Information Service (NESDIS) and Office of Oceanic and Atmospheric Research (OAR) - [U.S. Climate Reference Network](#)**

The U.S. Climate Reference Network (USCRN) is an operationally viable research network of 135 climate stations that are deployed nationwide. Data from the USCRN are used in various climate monitoring activities and for placing current climate anomalies into an historical perspective. The USCRN provides the United States with a reference network that contributes to an International network under the auspices of the Global Climate Observing System (GCOS).

### CA-1, 2

#### *Bodega Bay, Cazadero, Chico*

#### **Office of Oceanic and Atmospheric Research (OAR) - [Weather-Climate Connection Measurements](#)**

The Earth System Research Laboratory's Physical Sciences Division supports long term measurements of coastal weather phenomena at three sites: Bodega Bay, Cazadero, and Chico. These sites measure key phenomena associated with winter weather, fog, fire weather, air quality, and a host of other applications at the interface of weather and climate. Observations from these sites are made available to the public on the internet and they have led to dozens of research publications in the peer-reviewed literature.

### CA-1, 3

#### *Thermalito, Twitchell Island*

#### **Office of Oceanic and Atmospheric Research (OAR) - [MOA CA Department of Water Resources](#)**

The NOAA Earth System Research Laboratory's Physical Sciences Division will install two atmospheric river observatories upwind of the Oroville Dam in California to provide observations of moisture transport through the San Francisco Bay area up into the north central valley where it rises over the Sierra Nevada and causes heavy precipitation. The data will be used in research to advance NOAA predictive capabilities through the evaluation of key processes in forecast system models as well as to support nowcasting and real-time applications. The California Department of Water Resources requested that these observatories be installed in response to the Oroville Dam flood mitigation crisis in 2017.

### CA-2

#### *Arcata*

**National Marine Fisheries Service (NMFS) - [Northern California Pacific Coast Ocean Observing System Coordination Office](#)**

Located at the Humboldt State University Marine Laboratory, the Northern California Pacific Coast Ocean Observing System Coordination Office, part of the Southwest Fisheries Science Center's Fishery Ecology Division, is charged with leading and facilitating ocean observing activities and research on fisheries and oceanography off the North Coast of California, a historically understudied region of the California Current System. This collaborative effort between the Southwest Fisheries Science Center and Humboldt State University also provides opportunities for graduate student training and enhances educational programs directly linked to the NMFS mission.

**Office of Oceanic and Atmospheric Research (OAR) - Air Quality Program**

The current NOAA operational forecast challenges for fine particulate matter (PM<sub>2.5</sub>) and ozone predictions include improving emissions from sources such as wildfire smoke and dust, chemical mechanisms (e.g., representation of secondary organic aerosols) that accounts for reactions from wildfire-associated species, accuracy of meteorological predictions for fields such as planetary boundary layer height and flows in complex terrain and near coasts, chemical boundary conditions, and tempo-spatially resolved trans-boundary influences. These are among the challenges producing seasonal biases in air quality forecast guidance. Bias correction post-processing algorithms have been implemented operationally to reduce these biases. This program will answer those challenges by funding projects that focus on solutions that can be implemented in the NAQFC.

**National Marine Fisheries Service (NMFS) - [California Coastal Area Office](#)**

The California Coastal Area Office is part of the NMFS West Coast Region and includes three offices located in Arcata, Santa Rosa, and Long Beach. Our responsibilities focus on protecting species and their habitats along the California coastline and its associated watersheds, including the entire Klamath River Basin. We work to protect species listed under Endangered Species Act by evaluating the impacts of proposed federal actions, developing and implementing recovery plans, ensuring safe fish passage through federal and some private dams and seeking conservation partnerships with local governments and landowners. Using local, on-the-ground knowledge, our priorities focus on land use practices and other threats that limit particular recovery and restoration activities. We work with local communities and a diverse group of stakeholders to ensure that mutually beneficial conservation strategies are realized.

**[Bodega Bay](#)**

**National Environmental Satellite, Data, and Information Service (NESDIS) and Office of Oceanic and Atmospheric Research (OAR) - [U.S. Climate Reference Network](#)**

The U.S. Climate Reference Network (USCRN) is an operationally viable research network of 135 climate stations that are deployed nationwide. Data from the USCRN are used in various climate monitoring activities and for placing current climate anomalies into an historical perspective. The USCRN provides the United States with a reference network that contributes to an International network under the auspices of the Global Climate Observing System (GCOS).

**[Eureka](#)**

**National Weather Service (NWS) - [Weather Forecast Office](#)**- See [Page 2](#) for details.

**[Point Reyes Station](#)**

**National Ocean Service (NOS) - [Cordell Bank National Marine Sanctuary](#)**

Cordell Bank National Marine Sanctuary established in 1989 and expanded to 1,286 square miles in 2015, protects and conserves an area of extraordinary ocean productivity and coastal upwelling off northern California. Cordell Bank National Marine Sanctuary works with the West Coast region and the national program, implementing ecosystem based management that considers coastal communities, maritime commerce, ocean habitat, water quality and a thriving

community of resident and migratory fishes, invertebrates, marine mammals, seabirds and turtles. Sanctuary programs include a decades-long monitoring effort to track climate change and ecosystem health, cooperative research with local universities to understand critical ocean issues, education and outreach programs for teachers, schools and local communities to increase ocean awareness and stewardship, and resource protection efforts to educate and enforce sanctuary regulations. Field studies in 2018 revealed productive benthic habitats, covered with corals and sponges. Open water habitats were also healthy and productive in 2018. Cordell Bank National Marine Sanctuary relies on input from a citizen advisory council representing sanctuary constituent groups who provide advice on sanctuary activities and management actions. By addressing current management issues and anticipating future challenges, we strive to maintain a healthy marine environment for this and future generations. The sanctuary office is co-located with the offices for Point Reyes National Seashore in Olema, CA.

#### **NOAA Office of Education — [Environmental Literacy Program](#)**

NOAA's Environmental Literacy Program (ELP), administered by the Office of Education, provides grants and in-kind support to build the capacity of institutions and networks to advance NOAA's mission through formal (K-12) and informal education at national, regional, and local levels. In California, ELP supports the **Point Reyes National Seashore Visitor**, which has a permanent exhibit featuring NOAA's Science On a Sphere and is a member of NOAA's SOS Users Collaborative Network. The SOS Network has more than 100 institutions worldwide, reaching over 60 million people, and shares best practices in using the sphere to bring the latest global forecasts and models to the public.

**Office of Oceanic and Atmospheric Research (OAR) - [Science On a Sphere®](#)**- See [Page 2](#) for details.

#### **[Trinidad](#)**

#### **Office of Oceanic and Atmospheric Research (OAR) - [Carbon Cycle Gases and Halocarbons](#)**

NOAA's Earth System Research Laboratory Global Monitoring Division (ESRL/GMD) operates a small aircraft-based North American network of sampling sites to measure vertical profiles of important greenhouse gas concentrations. Air is sampled above the surface up to approximately 25,000 feet above sea level using a relatively small, light, and economical automated system developed by ESRL/GMD researchers. These air samples are delivered to ESRL/GMD in Boulder, Colorado for measurements of CO<sub>2</sub>, CH<sub>4</sub>, and other greenhouse gases. This data will improve understanding and models of the global carbon cycle. Sampling is conducted bi-weekly. Some air samples from the small aircraft program are also analyzed for halocarbon gases that can destroy the stratospheric ozone layer. Halocarbon measurements help determine the effectiveness of efforts to protect and restore the ozone layer so it can protect us from the sun's ultraviolet radiation.

#### **Office of Oceanic and Atmospheric Research (OAR) - [Halocarbon Measurements](#)**

NOAA's Earth System Research Laboratory Global Monitoring Division (ESRL/GMD) operates a sampling network to measure the distribution and trends of the gases most responsible for human-caused depletion of the stratospheric ozone layer. Weekly samples are collected in high-pressure flasks at fixed locations. The air sample flasks are delivered to ESRL/GMD, located in Boulder, CO for analysis. Some locations conduct continuous surface measurements on site. Halocarbon measurements help determine the effectiveness of efforts to protect and restore the ozone layer - so it can protect us from the sun's ultraviolet radiation.

#### **Office of Oceanic and Atmospheric Research (OAR) - [Ozone Measurements](#)**

NOAA's Earth System Research Laboratory Global Monitoring Division (ESRL/GMD), in collaboration with the California Air Resources Board (CARB), conducts long-term monitoring of stratospheric ozone with balloons. Stratospheric ozone measurements provide data relevant to: surface pollution events, lower and upper atmosphere mixing dynamics, boundary layer stability, ozone trend studies (vertical distribution), and temperature and pressure profiles. ESRL/GMD

also conducts long-term monitoring of ozone at the surface, with aircraft, and with balloons, through cooperative relationships with local partners. Near ground level ozone is currently monitored using ultraviolet absorption photometers at eight sites that are generally representative of background conditions. These sites, four of which have records exceeding 25 years in length, provide information on possible long-term changes in tropospheric ozone near the surface and support air quality research.

### ***Willits, Redwood Valley, Potter Valley***

#### **Office of Oceanic and Atmospheric Research (OAR) – [Forecast Informed Reservoir Operations \(FIRO\)](#)**

The NOAA Earth System Research Laboratory's Physical Sciences Division installed seven soil moisture sites (sponsored by the Sonoma County Water Agency) in California's upper Russian River watershed in support of the Forecast Informed Reservoir Operations (FIRO) project. FIRO is a management strategy that uses data from watershed monitoring and modern weather and water forecasting to help water managers selectively retain or release water from reservoirs in a manner that reflects current and forecasted conditions.

### **CA-2, 3**

#### ***San Francisco, San Rafael, Suisun***

#### **National Ocean Service (NOS) -**

The National Estuarine Research Reserve System is a network of protected areas focused on long-term research, monitoring, stewardship, education, and training. NOAA's Office for Coastal Management provides funding and national guidance, and each site is managed on a daily basis by a lead state agency or university with input from local partners. . Designated in 2003, the San Francisco Bay research reserve is managed by a partnership between San Francisco State University, California State Parks, and the Solano Land Trust. The reserve's 3,710 acres are comprised of two of the most pristine wetlands in the San Francisco Bay estuary, spread across two sites: China Camp State Park and Suisun Marsh. .

### **CA-3**

#### ***Walnut Grove***

#### **Office of Oceanic and Atmospheric Research (OAR) - [Tall Tower Carbon Measurements](#)**

NOAA's Earth System Research Laboratory Global Monitoring Division (ESRL/GMD) operates trace gas monitoring sites at tall television transmitter towers in eight states, including California. The sites were established to extend ESRL/GMD's monitoring network into the interior of North America in order to provide data to aid estimation of the net carbon balance of the continent. Variations of trace gases, especially carbon dioxide, are largest near the ground, so we utilize existing tall (> 400 meter) transmitter towers as platforms for in situ and flask sampling for atmospheric trace gases.

#### **Office of Oceanic and Atmospheric Research (OAR) - [Cooperative Global Air Sampling Network](#)**

NOAA's Earth System Research Laboratory Global Monitoring Division (ESRL/GMD) a Cooperative Global Air Sampling Network to measure the distribution and trends of carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>), the two gases most responsible for human-caused climate change, as well as other greenhouse gases and volatile organic compounds. Samples are collected weekly at fixed locations and on several commercial ships. The air samples are delivered to ESRL/GMD, located in Boulder, CO. The samples collected at Walnut Grove represent air that has been over the Pacific Ocean, upwind of North America, for days or weeks. These measurements help determine the magnitude of carbon sources and sinks in North America.

#### **Office of Oceanic and Atmospheric Research (OAR) - [Halocarbon Measurements](#)**

NOAA's Earth System Research Laboratory Global Monitoring Division (ESRL/GMD) operates a sampling network to measure the distribution and trends of the gases most responsible for human-caused depletion of the stratospheric ozone layer. Weekly samples are collected in high-pressure flasks at fixed locations. The air sample flasks are delivered to

ESRL/GMD, located in Boulder, CO for analysis. Some locations conduct continuous surface measurements on site. Halocarbon measurements help determine the effectiveness of efforts to protect and restore the ozone layer - so it can protect us from the sun's ultraviolet radiation.

#### CA-4

##### **Yosemite Village**

#### **National Environmental Satellite, Data, and Information Service (NESDIS) and Office of Oceanic and Atmospheric Research (OAR) - [U.S. Climate Reference Network](#)**

The U.S. Climate Reference Network (USCRN) is an operationally viable research network of 135 climate stations that are deployed nationwide. Data from the USCRN are used in various climate monitoring activities and for placing current climate anomalies into an historical perspective. The USCRN provides the United States with a reference network that contributes to an International network under the auspices of the Global Climate Observing System (GCOS).

#### CA-5

##### **Santa Rosa**

#### **National Ocean Service (NOS), National Marine Fisheries Service (NMFS), Oceanographic and Atmospheric Research (OAR), and National Weather Service (NWS) - [Russian River Watershed Habitat Focus Area](#)**

The Russian River watershed was the first Habitat Focus Area selected under NOAA's Habitat Blueprint. As part of the Habitat Blueprint administered by the NOAA Fisheries Office of Habitat Conservation, NOAA has selected ten Habitat Focus Areas (HFAs), place-based locations across the country to maximize the effectiveness of habitat conservation. While each HFA focuses on individual habitat conservation goals outlined in their Implementation Plan, the overarching goal is to demonstrate results in a focused area in a short time period. In the Russian River Habitat Focus Area, multiple offices within NOAA are joining an already active community of partners to make significant progress on three major objectives - rebuilding endangered coho and threatened steelhead stocks to sustainable levels through habitat protection and restoration; improving frost, rainfall, and river forecasts in the Russian River watershed through improved data collection and modeling; and increasing community resiliency to flooding damage through improved planning and water management strategies.

#### **National Marine Fisheries Service (NMFS) - West Coast Region's [California Coastal Area Office](#)**

The California Coastal Area Office is part of the NMFS West Coast Region and includes three offices located in Arcata, Santa Rosa, and Long Beach. Our responsibilities focus on protecting species and their habitats along the California coastline and its associated watersheds, including the entire Klamath River Basin. We work to protect species listed under Endangered Species Act by evaluating the impacts of proposed federal actions, developing and implementing recovery plans, ensuring safe fish passage through federal and some private dams and seeking conservation partnerships with local governments and landowners. Using local, on-the-ground knowledge, our priorities focus on land use practices and other threats that limit particular recovery and restoration activities.

##### **Sacramento**

#### **National Marine Fisheries Service (NMFS) - West Coast Region's [California Central Valley Area Office](#)**

The California Central Valley Area Office is part of the NMFS West Coast Region and is located in the heart of California's Central Valley, only a few blocks from the State Capitol. Our responsibilities focus on the Sacramento and San Joaquin River Basins and Sacramento-San Joaquin Delta. We work in these river basins to protect species listed under the Endangered Species Act by evaluating the impact of proposed federal actions, developing recovery plans, seeking conservation partnerships with local governments and landowners, and ensuring safe fish passage past federal and some private dams.

**CA-2, 5**

***Santa Rosa, Hopland, Middletown, Cazadero***

**Office of Oceanic and Atmospheric Research (OAR) - [NOAA Hydrometeorology Testbed](#)**

NOAA's Earth System Research Laboratory (ESRL) Physical Sciences Division operates and maintains five precipitation profiling radars to evaluate precipitation processes over complex terrain.

**CA-2,12, 13,14**

***Bodega Bay, Pt. Reyes, San Francisco***

**National Ocean Service (NOS) - [Greater Farallones National Marine Sanctuary](#)**

NOAA's Greater Farallones National Marine Sanctuary protects 3,295 square miles off the North-central California coast, from Point Arena in Mendocino County, south to off Half Moon Bay in San Mateo County.. It also has administrative jurisdiction over the northern sector of Monterey Bay National Marine Sanctuary. Greater Farallones manages one of the most biologically productive and diverse regions in the world, consisting of open ocean, tidal flat, rocky intertidal, estuarine wetland, subtidal reef, and sandy beach habitats. It supports 25 threatened and endangered species, 36 marine mammals, white sharks, and the largest seabird rookery in the lower 48 states. Greater Farallones carries out conservation, research, education, and stewardship programs to protect and manage these waters for resiliency, informed by long-term scientific investigations such as the Applied California Current Ecosystem Studies and Deep Sea Corals research (in conjunction with Cordell Bank National Marine Sanctuary); and its Beach Watch coastal monitoring program. Through formal and informal education and outreach programs it reaches over 30,000 people each year, and through partner exhibits including the California Academy of Sciences and Pt. Reyes National Seashore it reaches 4.3 million annually. A council representing commerce, conservation, fisheries, science, recreation, tourism, and other sectors advises sanctuary management. Established in 1981, Greater Farallones National Marine Sanctuary maintains an office, classroom and visitor center in the Golden Gate National Recreation Area's Presidio of San Francisco.

**National Ocean Service (NOS) - [Greater Farallones National Marine Sanctuary Ocean Climate Center](#)**

NOAA's Greater Farallones National Marine Sanctuary Ocean Climate Center addresses the effects of climate change on the sanctuary and surrounding marine region through partnerships, research collaborations, outreach and education, and policy actions; and acts as an ocean and climate change communication center for the Bay Area. It has implemented several climate adaptation plans with community partners, and assists other national marine sanctuaries across the program in planning for climate change.

**CA-7**

***Sacramento***

**National Weather Service (NWS) - [California-Nevada River Forecast Center](#)**

Co-located with the NWS Weather Forecast Office in Sacramento, the NWS California-Nevada River Forecast Center (CNRFC) performs continuous river basin modeling and provides hydrologic forecast and guidance products for rivers and streams and has responsibility for all river basins in California (except for the Colorado River drainage in the south), the Klamath River in southern Oregon, the Quinn River in southeast Oregon, and all river basins in Nevada (except for tributaries to the Snake River in the north, tributaries to the Colorado River in the southeast, and tributaries to the Great Salt Lake and Sevier Lake in the far east portion). These products include forecasts of river stage and flow, probabilistic river forecasts, reservoir inflow forecasts, gridded precipitation estimates and forecasts, spring flood outlooks, and flash flood and headwater guidance. Some of the RFCs in the western and central U.S. also provide water supply forecasts. RFCs work closely with local, state and federal water management agencies, including the U.S. Army Corps of Engineers, U.S. Bureau of Reclamation, and U.S. Geological Survey, to provide water and flood information for critical decisions (aka Impact-based Decision-Support Services or IDSS).

**National Weather Service (NWS) - [Weather Forecast Office](#)**- See [Page 2](#) for details.

**CA-7-13**

**[San Francisco Bay Area](#)**

**National Ocean Service (NOS) - [San Francisco Bay PORTS®](#)**

A Physical Oceanographic Real-Time System (PORTS®) is operated cooperatively with the local maritime community in greater San Francisco Bay at which real-time data are quality-controlled and disseminated to local users for safe and efficient navigation. Real-time data are available for water levels from six stations, meteorological data from fourteen stations, current data from five stations, surface wave data from one station and visibility sensors at three locations that will help mariners determine fog conditions in the region and support safe navigation in the challenging San Francisco Bay marine environment.

**National Ocean Service (NOS) – [Navigation Response Team](#)**

NOAA's Navigation Response Team 6 (currently inactive) operates out of Richmond, CA supporting navigation in the ports off the entire coast of California. These three-person teams measure depths of a changing seafloor and search for underwater dangers to navigation that can slow down commercial shipping immediately after storm events and other emergencies. The teams provide time-sensitive information to the U.S. Coast Guard or port officials and transmit data to NOAA cartographers for updating navigational charting products.

**CA-8**

**[Stovepipe Wells](#)**

**National Environmental Satellite, Data, and Information Service (NESDIS) and Office of Oceanic and Atmospheric Research (OAR) - [U.S. Climate Reference Network](#)**

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**CA-10**

**[Modesto](#)**

**Office of Oceanic and Atmospheric Research (OAR) - [Science On a Sphere®](#)** - See [Page 2](#) for details.

**NOAA Office of Education — [Environmental Literacy Program](#)**

NOAA's Environmental Literacy Program (ELP), administered by the Office of Education, provides grants and in-kind support to build the capacity of institutions and networks to advance NOAA's mission through formal (K-12) and informal education at national, regional, and local levels. In California, ELP supports the **Great Valley Museum** (Modesto), which has a permanent exhibit featuring NOAA's Science On a Sphere and is a member of NOAA's SOS Users Collaborative Network. The SOS Network has more than 100 institutions worldwide, reaching over 60 million people, and shares best practices in using the sphere to bring the latest global forecasts and models to the public.

**CA-12**

**[San Francisco](#)**

**Office of Oceanic and Atmospheric Research (OAR) - [Cooperative Global Air Sampling Network](#)**

NOAA's Earth System Research Laboratory Global Monitoring Division (ESRL/GMD) operates a Cooperative Global Air Sampling Network to measure the distribution and trends of carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>), the two gases

most responsible for human-caused climate change, as well as other greenhouse gases and volatile organic compounds. Samples are collected weekly at fixed locations and on several commercial ships. The air samples are delivered to ESRL/GMD, located in Boulder, CO. The observed geographical patterns and small but persistent spatial gradients are used to better understand the processes, both natural and human induced, that underlie the trends. These measurements help determine the magnitude of carbon sources and sinks in North America. Site operated by Lawrence Berkeley National Laboratory at the Sutro Tower.

**Office of Oceanic and Atmospheric Research (OAR) - [Science On a Sphere®](#)** - See [Page 2](#) for details.

**NOAA Office of Education - [Environmental Literacy Program](#)**

NOAA's Environmental Literacy Program (ELP), administered by the Office of Education, provides grants and in-kind support to build the capacity of institutions and networks to advance NOAA's mission through formal (K-12) and informal education at national, regional, and local levels. In California, a long-term partnership is sustained with the **Exploratorium** (San Francisco). The Exploratorium uses its unique waterfront location to engage its visitors about NOAA's work. NOAA scientists work with museum staff to understand and interpret environmental data and keep them up-to-date on instruments used for environmental data collection. NOAA's research ships regularly dock at the Exploratorium allowing NOAA Corps to conduct tours of ships and the on-board scientists to explain the ship's scientific mission. Ocean Discovery Institute engages youth from underserved urban communities through programs that consistently provide hands-on learning and mentoring as students progress from elementary school to college. These programs teach students about NOAA-related sciences and expose them to potential career paths relevant to NOAA's mission. ELP also supports the **Exploratorium** through an Environmental Literacy Grant. The Exploratorium's project uses ocean and atmospheric data to create meaningful place-based education activities for informal and formal educators to learn about the impacts of excess carbon in the ocean and atmosphere.

**CA-12, 17**

**[San Francisco, Santa Clara, Sonoma County](#)**

**Office of Oceanic and Atmospheric Research (OAR) - [Advanced Quantitative Precipitation Information System](#)**

NOAA and the Sonoma County Water Agency have signed a MOU in support of the Advanced Quantitative Precipitation Information (AQPI) System project — a four-year, regional multi-agency collaboration to improve monitoring and prediction of precipitation, hydrology, and coastal storm flooding in the San Francisco Bay region. The NOAA ESRL Physical Sciences Division and Global Systems Division officially began participation in AQPI in the late summer of 2017 along with partners from Colorado State University, USGS, and Scripps Institution of Oceanography. The project, funded by the California Department of Water Resources, includes installation of five radar systems, and high resolution modeling using a research version of NOAA's operational High Resolution Rapid Refresh (HRRR) to better predict storms and their impacts for a variety of water management practices. The first radar was installed in September 2017 in Santa Clara, CA. The project concludes in 2021 with the delivery of an operational precipitation–hydrologic information system informed by regional stakeholders.

**CA-13**

**[Fremont](#)**

**National Weather Service (NWS) - [Center Weather Service Unit](#)**

Housed in the Federal Aviation Administration's Oakland Air Traffic Control Center (ARTCC) in Fremont, the NWS Center Weather Service Unit (CWSU) staff provides aviation forecasts and other weather information to ARTCC personnel for their use in directing the safe, smooth flow of aviation traffic for most of northern California and western Nevada.

**San Jose, Berkeley**

**Office of Oceanic and Atmospheric Research (OAR) - [Science On a Sphere®](#) - See [Page 2](#) for details.**

**Oakland**

**National Ocean Service (NOS) - [Office for Coastal Management](#)**

The NOAA Office for Coastal Management practices a partner-based, boots on the ground approach to coastal management. The organization currently has staff in the eight regions to provide assistance to local, state, and regional coastal resource management efforts and facilitate customer feedback and assessments. Assistance is provided to local, state, and regional coastal resource management efforts. The central West Coast staff office is located in Oakland, California, with additional staff based in Portland, Oregon and Seattle, Washington.

**NOAA Office of Education - [Environmental Literacy Program](#)**

NOAA's Environmental Literacy Program (ELP), administered by the Office of Education, provides grants and in-kind support to build the capacity of institutions and networks to advance NOAA's mission through formal (K-12) and informal education at national, regional, and local levels. In California, ELP supports the **Lawrence Hall of Science** (Berkeley) through an Environmental Literacy Grant. Lawrence Hall of Science, in partnership with four education colleges around the U.S., prepares pre-service K-12 teachers to teach climate change topics using NOAA data and a NOAA-funded curriculum. Additionally, multiple institutions, including — but not limited to — **Chabot Space and Science Center** (Oakland) provide support to and receive support from a grant recipient to advance NOAA's mission.

**CA-15**

**Livermore**

**Office of Oceanic and Atmospheric Research (OAR) - [Program for Climate Model Diagnosis and Intercomparison](#)**

The Geophysical Fluid Dynamics Laboratory (GFDL) is involved in the archiving of its climate model data at the Lawrence Livermore National Laboratory, located in Livermore, CA. Model data is archived for the purpose of intercomparison of climate model data obtained from other national and international climate modeling institutions around the world.

**CA-16**

**Merced**

**National Environmental Satellite, Data, and Information Service (NESDIS) and Office of Oceanic and Atmospheric Research (OAR) - [U.S. Climate Reference Network](#)**

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**CA-20**

**Monterey**

**National Ocean Service (NOS) - [Monterey Bay National Marine Sanctuary](#)**

Monterey Bay National Marine Sanctuary, at 6,094 square miles, is the largest national marine sanctuary on the U.S. mainland, extending along the coastline from north of San Francisco to the south through five coastal counties to the town of Cambria. A remarkable diversity of marine habitats found nowhere else in North America is within the boundaries of the sanctuary and includes rugged rocky shores, sandy beaches, lush kelp forests, and most significantly, some of the deepest submarine canyons and the only protected seamount found on the Pacific continental shelf. The nutrient-rich currents traveling through the sanctuary allow for a diverse assemblage of marine life, including marine mammals, seabirds, shorebirds, turtles, numerous commercially-fished species and thousands of invertebrate species, some of

which are listed as threatened or endangered status. Monterey Bay National Marine Sanctuary staff coordinate multiple programs that engage with coastal residents, marine science partners, and businesses as diverse as agriculture,, commercial fishing and recreation and tourism. While the sanctuary's main office is located in Monterey, it operates additional offices and visitor centers in Santa Cruz and in San Simeon.

## CA-20

### **Monterey**

#### **National Ocean Service (NOS) - [National Marine Protected Areas Center](#)**

The mission of the National Marine Protected Areas Center is to facilitate the effective use of science, technology, training and information in the planning, management and evaluation of the nation's system of marine protected areas. The National Marine Protected Areas Center supports the nation's federal, state and territorial marine protected area (MPA) programs through capacity building, science, information, tools and outreach. MPAs include National Marine Sanctuaries, National Estuarine Research Reserves, National Parks, National Wildlife Refuges, and the state counterparts to these programs. The Center is co-located with the Office of National Marine Sanctuaries West Coast Regional Office in Monterey.

#### **National Ocean Service (NOS) - [Monterey County Hazard Mitigation Plan Update](#)**

Monterey County, in coordination with all of its incorporated municipalities, is preparing a comprehensive update to its multi-jurisdictional hazard mitigation plan. Updating the 2013-2014 plan is being led by Monterey County's Office of Emergency Services, with collaborative assistance from others, including NOAA, FEMA, and the National Association of Counties (NACo). The process includes an update to all elements in the existing plan to better reflect current conditions, along with the incorporation of new information to help address the potential long-term effects of climate change and sea level rise. In support of this effort, Monterey County has been designated a national pilot community for incorporating resources from NOAA's Digital Coast into local hazard mitigation planning. As part of this project Monterey County will leverage the data, tools, and training made available through Digital Coast in their hazard mitigation plan update.

### **Santa Cruz**

#### **National Ocean Service (NOS) - [Monterey Bay National Marine Sanctuary - Sanctuary Exploration Center](#)**

The Sanctuary Exploration Center, the main visitor center for Monterey Bay National Marine Sanctuary and the largest NOAA-dedicated education facility on the west coast, is located just steps from the Santa Cruz beach boardwalk and provides state-of-the-art, interactive, interpretive exhibits regarding the sanctuary and its adjoining watersheds to approximately 75,000 visitors annually. The Sanctuary Exploration Center is a model for sustainable, environmentally sensitive design, construction and operation, meeting the U.S. Green Building Council's GOLD standards for Leadership in Energy and Environmental Design (LEED).

#### **National Ocean Service (NOS) - [Monterey Bay National Marine Sanctuary](#)**

The National Marine Fisheries Service Lab in Santa Cruz houses two Monterey Bay National Marine Sanctuary staff, an education specialist and a senior research scientist. This co-location facilitates collaboration between sanctuary and NMFS scientists.

## CA-19

### **San Jose**

#### **NOAA Office of Education - [Environmental Literacy Program](#)**

NOAA's Environmental Literacy Program (ELP), administered by the Office of Education, provides grants and in-kind support to build the capacity of institutions and networks to advance NOAA's mission through formal (K-12) and informal education at national, regional, and local levels. In California, ELP supports the **Tech Museum of Innovation** (San Jose),

which has a permanent exhibit featuring NOAA's Science On a Sphere and is a member of NOAA's SOS Users Collaborative Network. The SOS Network has more than 100 institutions worldwide, reaching over 60 million people, and shares best practices in using the sphere to bring the latest global forecasts and models to the public.

## **CA-20**

### **Santa Cruz**

#### **National Marine Fisheries Service (NMFS) - [Fisheries Ecology Division](#)**

Located adjacent to the University of California - Santa Cruz, Long Marine Laboratory, the Fisheries Ecology Division of the Southwest Fisheries Science Center (SWFSC) conducts research on Pacific coast groundfish and Pacific Salmon. Results of this research are used by the Pacific Fishery Management Council to manage fisheries and by NMFS to develop recovery plans for threatened and endangered species. Fisheries Ecology Division scientists study causes of variability in abundance and health of fish populations, analyze ecological relations in marine communities, and study the economics of exploiting and protecting natural resources. They also assess the status of stocks targeted by various fisheries and evaluate impacts of human activities on threatened or endangered species. The Santa Cruz laboratory also houses the Data Integration and Analysis Program of the SWFSC's Environmental Research Division. Program scientists maintain environmental and fisheries relevant databases and distribute environmental index products and time series databases to cooperating researchers world-wide. The Data Integration and Analysis program also hosts the west coast regional node for the NOAA CoastWatch program, which provides rapid dissemination of satellite observation data to governmental, academic, commercial and public users. The Santa Cruz laboratory engages in educational and public engagement partnerships with the Seymour Science Center at UC Santa Cruz and the Monterey Bay National Marine Sanctuary Exploration Center.

### **Monterey**

#### **National Marine Fisheries Service (NMFS) - [Environmental Research Division](#)**

The Climate and Ecosystem Program of the Southwest Fisheries Science Center's Environmental Research Division is located in Monterey, CA, to take advantage of its long association with the United States Navy's Fleet Numerical Meteorology and Oceanography Center. The research group was formed in 1969 to develop databases and to conduct research on fishery-related effects of environmental variability and climate change over a broad range of scientific, management, and operational concerns of the government and the fishing industry of the United States.

#### **NOAA Office of Education — [Environmental Literacy Program](#)**

NOAA's Environmental Literacy Program (ELP), administered by the Office of Education, provides grants and in-kind support to build the capacity of institutions and networks to advance NOAA's mission through formal (K-12) and informal education at national, regional, and local levels. In California, ELP supports the **Monterey Bay Aquarium** (Monterey), a member of the Coastal Ecosystem Learning Center (CELC) Network, a consortium of 25 aquariums and marine science education centers with a reach of over 20 million people. The CELC Network works with NOAA and each member institution to engage the public in protecting coastal and marine ecosystems.

### **Carmel**

#### **National Marine Fisheries Service (NMFS) - [Granite Canyon Marine Laboratory](#)**

Located at Granite Canyon, eight miles south of Carmel, California, along the Big Sur coast, the Granite Canyon Marine Laboratory has been the site of NMFS' shore-based counts of southbound migrating gray whales since 1967. The University of California-Davis's Marine Pollution Studies Laboratory is also located at the site.

**National Weather Service (NWS) - [Weather Forecast Office](#)**-See [Page 2](#) for details.

### **Watsonville**

#### **National Ocean Service (NOS) - [Elkhorn Slough National Estuarine Research Reserve](#)**

The National Estuarine Research Reserve System is a network of protected areas focused on long-term research, monitoring, stewardship, education, and training. NOAA's Office for Coastal Management provides funding and national guidance, and each site is managed on a daily basis by a lead state agency or university with input from local partners. Elkhorn Slough National Estuarine Research Reserve was designated in 1979 and is located on the Central California coast halfway between Monterey and Santa Cruz. The reserve, managed on a daily basis by the California Department of Fish and Game, contains 1,439 acres of wetland and upland habitat, rare and threatened marsh, mudflat, and estuarine habitats, all of which are important for several endangered species.

### **CA-21**

#### **San Joaquin Valley/Hanford**

**National Weather Service (NWS) - [Weather Forecast Office](#)**- See [Page 2](#) for details.

### **Hanford**

#### **Office of Oceanic and Atmospheric Research (OAR) - [Surface Radiation Measurement Network](#)**

NOAA's Earth System Research Laboratory Global Monitoring Division (ESRL/GMD) operates surface-based radiation monitoring sites in seven states. ESRL/GMD's Integrated Surface Irradiance Study (ISIS) monitoring network is based in the continental United States and is collaboration with NOAA's SURFRAD Network.

#### **Office of Oceanic and Atmospheric Research (OAR) - [Total Column Ozone Measurements](#)**

NOAA's Earth System Research Laboratory Global Monitoring Division (ESRL/GMD) makes measurements of the column amounts of ozone between the earth's surface and the top of the atmosphere at a number of locations around the United States, including Hanford, CA. The observations are obtained with ground-based spectrometers that measure the attenuation by ozone of ultraviolet light.

### **CA-24**

#### **San Simeon**

#### **National Ocean Service (NOS) - [Monterey Bay National Marine Sanctuary - Coastal Discovery Center](#)**

Monterey Bay National Marine Sanctuary's southernmost office is in San Simeon, California. The office is also home to the Coastal Discovery Center, a visitor center jointly operated with California State Parks, located at William Randolph Hearst Memorial Beach. The Coastal Discovery Center's primary function is to provide education and outreach to the general public and school groups about the natural and cultural resources of the sanctuary and coastal California, reaching approximately 20,000 visitors annually. One of the educational foci for the Coastal Discovery Center is the elephant seals which aggregate on nearby beaches offering probably the easiest viewing of these huge pinnipeds in the world.

### **CA-24 (and 26)**

#### **Santa Barbara and Ventura**

#### **National Ocean Service (NOS) - [Channel Islands National Marine Sanctuary](#)**

Often referred to as the "American Galapagos," the 1,470 square-mile Channel Islands National Marine Sanctuary, surrounding San Miguel, Santa Rosa, Santa Cruz, Anacapa and Santa Barbara islands, hosts 27 species of whales and dolphins, five species of seals and sea lions, and more than 60 species of seabirds. Rich cultural resources exist as well, such as prehistoric artifacts from early island residents, the remains of more than 100 historic shipwrecks, and living maritime heritage values of contemporary indigenous Chumash people. Experience the sanctuary first-hand through commercial vessel excursions leaving from Santa Barbara, Ventura or Channel Islands harbors.

In Santa Barbara, visitors learn more about the sanctuary through exhibits at the Santa Barbara Maritime Museum, Santa Barbara Sea Center, and Outdoors Santa Barbara Visitor Center. In Ventura County, visitors can learn about the sanctuary, ocean safety and boating options at the Channel Islands Boating Center. The main office for Channel Islands sanctuary staff is located at the University of California, Santa Barbara, and the university plans to outfit the Center for Ocean Advancement of Science and Technology (COAST), co-located with the sanctuary office on campus. Two NOAA research vessels are homeported at Santa Barbara Harbor. Sanctuary programs address protecting sensitive resources, conducting marine science, community involvement and outreach, and numerous education programs. A 21-seat Sanctuary Advisory Council brings together a variety marine stakeholders and agency partners, meeting publicly every two months to discuss current sanctuary issues and develop management advice that informs agency decision-making.

**Office Oceanic and Atmospheric Research (OAR) - Joint Technology Transfer Initiative**

Through the Joint Technology Transfer Initiative (JTTI) program, OWAQ funds proposals to support further development, testing and evaluation of mature weather research that has potential for improving NOAA's NWS operational capabilities, particularly in the areas of advancing numerical weather prediction capabilities that seamlessly integrate in the NOAA Unified Forecast System (UFS), water prediction capabilities, and forecasting extreme precipitation and flooding events.

**CA-26**

**Oxnard**

**National Ocean Service (NOS) - [Channel Islands Boating Center](#)**

A consortium of agencies and boaters pursued and eventually developed the Channel Islands Boating Center at Channel Islands Harbor in Oxnard. This facility, funded by grants from the California Department of Boating and Waterways (now part of State Parks), and the NOAA Office of National Marine Sanctuaries, on land provided by the Harbor, educates visitors about boating safety and boating options at the Channel Islands and nearby mainland coastal waters. It is operated today by California State University, Channel Islands. Channel Islands National Marine Sanctuary maintains an education staff member in an office at the boating center to interact with the boating community, Ventura County residents, student groups, other agencies, and the university.

**CA-24**

**San Luis Obispo, Santa Barbara Counties**

**National Ocean Service (NOS) – [Proposed Chumash Heritage National Marine Sanctuary](#)**

The Northern Chumash Tribal Council and a large group of citizens have nominated Chumash Heritage National Marine Sanctuary. NOAA accepted that nomination into the inventory in October 2015. The proposal covers the coastline from Cambria south through San Luis Obispo County and northern Santa Barbara County to Gaviota Creek, and offshore a considerable distance. The proposal is designed to protect diverse ecological communities and habitats, numerous protected species, an upwelling center, an important ecological transition zone, and hundreds of shipwrecks, and to promote awareness of the Chumash culture. Thousands of supporters extend from tribal leaders, congressional members, elected officials at all levels of government in both counties, numerous state agencies, diverse users including recreational fishermen, scientists and recreational purveyors. Some opposition has been expressed by a much smaller group of other ocean users and several elected officials. Prevalent ocean users in this area include offshore oil and gas development, commercial and recreational fishing, marine science, wildlife watching, harbor activities, as well as proposals for offshore wind development.

**CA-24**

**San Simeon**

**National Marine Fisheries Service (NMFS) - [Piedras Blancas Field Station](#)**

Since 1994, scientists from the Southwest Fisheries Science Center's Protected Resources Division have been monitoring the northbound migration of gray whale cows and calves from Piedras Blancas, a point of land just north of San Simeon, and just south of the Big Sur coast. The field site, once used as a lookout point to spot animals during the whaling era, is also home to the Piedras Blancas Light Station and is situated on Bureau of Land Management property. The site is ideal because the whales generally pass within 200 m of the point and often stop to nurse their young in the lee of the rocky point. The survey data has been used to assess variability in annual calf production and to investigate the relationship of this variability to environmental conditions in the Arctic where these whales feed.

### ***Santa Barbara***

#### **National Environmental Satellite, Data, and Information Service (NESDIS) and Office of Oceanic and Atmospheric Research (OAR) - [U.S. Climate Reference Network](#)**

The U.S. Climate Reference Network (USCRN) is an operationally viable research network of 135 climate stations that are deployed nationwide. Data from the USCRN are used in various climate monitoring activities and for placing current climate anomalies into an historical perspective. The USCRN provides the United States with a reference network that contributes to an International network under the auspices of the Global Climate Observing System (GCOS).

### ***Vandenberg AFB***

#### **National Environmental Satellite, Data, and Information Service (NESDIS) - [Office of Satellite Data Processing and Distribution](#)**

Vandenberg Air Force Base is the site of many satellite launches for military and commercial organizations. Along with launches, it also has housed two NOAA Search and Rescue Satellite Aided Tracking (SARSAT) antenna and associated ground equipment. These ground systems, referred to as Local User Terminals (LUTs) can receive signals, relayed through polar orbiting satellites, from ships, aircraft or individuals in distress. These antennas were recently decommissioned in response to added SARSAT ground station presence in Florida and Hawaii, and other SARSAT related equipment is being installed at this CA location to aid in the SARSAT system.

#### **National Environmental Satellite, Data, and Information Service (NESDIS) - [Jet Propulsion Laboratory \(JPL\)](#)**

JPL is a Federally Funded Research and Development Corporations (FFRDC) who provides technical advancements in support of core NOAA sounder and imagery missions. They are working on the next generation advances for use in the NOAA Satellite Observing System Architecture (NSOSA) to ensure data continuity and reduction in risk and cost.

#### **National Environmental Satellite, Data, and Information Service (NESDIS) - [Aerospace Corporation](#)**

Aerospace Corporation is a Federally Funded Research and Development Corporations (FFRDC) who have been technical leaders in the advancement of cubeSat and smallsat missions. Aerospace is supporting NOAA in the area of low light nighttime imagery missions. This mission is a Key Performance Parameter for NOAA.

### ***CA-25***

### ***Palmdale***

#### **National Weather Service (NWS) - [Center Weather Service Unit](#)**

Housed in the Federal Aviation Administration's Los Angeles Air Traffic Control Center (ARTCC) in Palmdale, the NWS Center Weather Service (CWSU) staff provides aviation forecasts and other weather information to ARTCC personnel for their use in directing the safe, smooth flow of aviation traffic in Southern California and parts of Arizona, Nevada and Utah.

#### **Office of Oceanic and Atmospheric Research (OAR) - [Halocarbon Measurements](#)**

NOAA's Earth System Research Laboratory Global Monitoring Division is participating in the Atmospheric Tomography (ATOM) project. This project studies the impact of human-produced air pollution on certain greenhouse gases. Airborne instruments will look at how atmospheric chemistry is transformed by various air pollutants and at the impact on methane and ozone which affect climate. Flights aboard NASA's DC-8 will originate from the Armstrong Flight Research Center in Palmdale, California, fly north to the western Arctic, south to the South Pacific, east to the Atlantic, north to Greenland, and return to California across central North America. Project is led by Harvard University and funded by NASA.

#### **CA-26**

##### **Los Angeles Basin**

**National Weather Service (NWS) - [Weather Forecast Office](#)**- See [Page 2](#) for details.

##### **Office of Oceanic and Atmospheric Research (OAR) - [Cooperative Global Air Sampling Network](#)**

NOAA's Earth System Research Laboratory Global Monitoring Division (ESRL/GMD) operates a Cooperative Global Air Sampling Network to measure the distribution and trends of carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>), the two gases most responsible for human-caused climate change, as well as other greenhouse gases and volatile organic compounds. Samples are collected weekly at fixed locations and on several commercial ships. The air samples are delivered to ESRL/GMD, located in Boulder, CO. The observed geographical patterns and small but persistent spatial gradients are used to better understand the processes, both natural and human induced, that underlie the trends. These measurements help determine the magnitude of carbon sources and sinks in North America. Sites co-operated by NASA/Jet Propulsion Laboratory as part of the CA MegaCities Carbon Project in the LA-basin at the three different towers (USC, Cal State Fullerton, Granada Hills).

**CA-27**

**Mt. Wilson**

**Office of Oceanic and Atmospheric Research (OAR) - [Cooperative Global Air Sampling Network](#)**

NOAA's Earth System Research Laboratory Global Monitoring Division (ESRL/GMD) operates a Cooperative Global Air Sampling Network to measure the distribution and trends of carbon dioxide (CO<sub>2</sub>) and methane (CH<sub>4</sub>), the two gases most responsible for human-caused climate change, as well as other greenhouse gases and volatile organic compounds. Samples are collected weekly at fixed locations and on several commercial ships. The air samples are delivered to ESRL/GMD, located in Boulder, CO. The observed geographical patterns and small but persistent spatial gradients are used to better understand the processes, both natural and human induced, that underlie the trends. These measurements help determine the magnitude of carbon sources and sinks in North America. Site operated by University of California - Los Angeles and is near Pasadena.

**CA-29**

**Sylmar**

**Office of Oceanic and Atmospheric Research (OAR) - [Science on a Sphere](#)**- See [Page 2](#) for details.

**CA-36, 37, 46**

**Los Angeles and Long Beach**

**National Ocean Service (NOS) - [PORTS®](#)**

A Physical Oceanographic Real-Time System (PORTS®) is operated cooperatively with the Los Angeles/Long Beach Pilots Association and the local maritime community in the metropolitan Los Angeles/Long Beach area at which real-time data are quality-controlled and disseminated to local users for safe and efficient navigation. Real-time data are available for water levels from one station, meteorological data from ten stations, surface wave data from three stations, and bridge air gap data from two stations.

**Office of Oceanic and Atmospheric Research (OAR) - Snowpack and Soil Moisture**

Both snow depth (snow water equivalent) and soil moisture are important in the hydrologic cycle and as inputs to the NWM, but current measurements of both are spatially and temporally sparse and not well assimilated and parameterized into the physics of the NWM. Improving the efficiency, effectiveness, and accuracy of obtaining, and applying these measurements will improve the outputs of the NWM and the benefits to society. For example, the importance of snowpack to the nation's water budget cannot be overstated. In the Western U.S., 85% of freshwater runoff originates as snowmelt. In the Eastern U.S., nine of the most significant floods of the 20th century were directly related to snowmelt. Through this program, OWAQ is funding proposals to support research and development that has a strong potential to improve the observations of snow depth (snow water equivalent) and soil moisture data that can be used and assimilated to expand and improve the NWM and contribute directly to the mission of NOAA's National Water Center.

**CA-45**

**Lake Forest**

**Office of Oceanic and Atmospheric Research (OAR) - [Science on a Sphere](#)**- See [Page 2](#) for details.

**CA-46**

**Santa Ana**

**Office of Oceanic and Atmospheric Research (OAR) - [Science on a Sphere](#)**- See [Page 2](#) for details.

**NOAA Office of Education - [Environmental Literacy Program](#)**

NOAA's Environmental Literacy Program (ELP), administered by the Office of Education, provides grants and in-kind support to build the capacity of institutions and networks to advance NOAA's mission through formal (K-12) and informal education at national, regional, and local levels. In California, ELP supports the **DiscoveryCube** (Santa Ana), which has permanent exhibits featuring NOAA's Science On a Sphere and is a member of NOAA's SOS Users Collaborative Network. The SOS Network has more than 100 institutions worldwide, reaching over 60 million people, and shares best practices in using the sphere to bring the latest global forecasts and models to the public.

**CA-47**

**[Long Beach](#)**

**Office of Oceanic and Atmospheric Research (OAR) - [Science on a Sphere](#)**- See [Page 2](#) for details.

**National Marine Fisheries Service (NMFS) - [Southwest Inspection Branch](#)**

NOAA's Seafood Inspection Program conducts a voluntary inspection program for fishery products on a fee-for-service basis. The office offers a wide range of services to the seafood industry (fishermen, wholesalers, processors, retailers, importers and exporters) including process and product inspection, product grading, lot inspection, laboratory analysis, and training. Export health certificates as required by most countries are issued for U.S. exporters. All edible foodstuffs, ranging from whole fish to formulated products, as well as fishmeal and animal feeds, are eligible for inspection and certification.

**National Marine Fisheries Service (NMFS) - West Coast Region's [Long Beach Office](#)**

NMFS is dedicated to protecting and preserving our nation's living marine resources through scientific research, fisheries management, enforcement, and habitat conservation. The West Coast Region manages marine and anadromous fish, sea turtles, and marine mammals and their habitats administers fisheries programs along off the coasts of Washington, Oregon, and California; and in the vast inland habitats of Washington, Oregon, California, and Idaho. We carry out our work to conserve, protect, and manage these species salmon and marine mammals under the Endangered Species Act, and Marine Mammal Protection Act, and, to sustainably manage West Coast fisheries as guided by the Magnuson-Stevens Fisheries Conservation and Management Act. We work closely with tribes, local, state, and federal agencies, the Pacific Fishery Management Council, and our stakeholders and partners to find science-based solutions to complex ecological issues.

**NOAA Office of Education - [Environmental Literacy Program](#)**

NOAA's Environmental Literacy Program (ELP), administered by the Office of Education, provides grants and in-kind support to build the capacity of institutions and networks to advance NOAA's mission through formal (K-12) and informal education at national, regional, and local levels. In California, ELP supports the **Aquarium of the Pacific** (Long Beach), which has permanent exhibits featuring NOAA's Science On a Sphere and is a member of NOAA's SOS Users Collaborative Network. The SOS Network has more than 100 institutions worldwide, reaching over 60 million people, and shares best practices in using the sphere to bring the latest global forecasts and models to the public. ELP provides additional support to the **Aquarium of the Pacific**, a member of the Coastal Ecosystem Learning Center (CELC) Network, a consortium of 25 aquariums and marine science education centers with a reach of over 20 million people. The CELC Network works with NOAA and each member institution to engage the public in protecting coastal and marine ecosystems.

**CA-49, 52**

**[La Jolla](#)**

**National Ocean Service (NOS) - [California Spatial Reference Center](#)**

In a model partnership with NOAA, the California Spatial Reference Center (CSRC) serves as a way of providing a spatial referencing liaison between Federal and local authorities. The Center is a non-profit organization affiliated with the Scripps Institution of Oceanography of the University of California-San Diego. The mission of the Center is to provide the necessary geodetic services to ensure the availability of accurate, consistent, and timely spatial referencing data for California. In partnership with several other organizations, CSRC has developed a plan to establish and maintain a state-of-the-art network of GPS control stations necessary for a reliable spatial reference system in California.

**CA-50**

***Fallbrook***

**National Environmental Satellite, Data, and Information Service (NESDIS) and Office of Oceanic and Atmospheric Research (OAR) - [U.S. Climate Reference Network](#)**

The U.S. Climate Reference Network (USCRN) is an operationally viable research network of 135 climate stations that are deployed nationwide. Data from the USCRN are used in various climate monitoring activities and for placing current climate anomalies into an historical perspective. The USCRN provides the United States with a reference network that contributes to an International network under the auspices of the Global Climate Observing System (GCOS).

**CA-51**

***Imperial Beach***

**National Ocean Service (NOS) - [Tijuana River National Estuarine Research Reserve](#)**

The National Estuarine Research Reserve System is a network of protected areas focused on long-term research, monitoring, stewardship, education, and training. NOAA's Office for Coastal Management provides funding and national guidance, and each site is managed on a daily basis by a lead state agency or university with input from local partners. The Tijuana River research reserve was designated in 1982 and is jointly managed by the California Department of Parks and Recreation, U.S. Fish and Wildlife Service and the Southwest Wetlands Interpretive Association. The 2,293-acre site is located in Imperial Beach, Calif., 15 miles south of San Diego and immediately adjacent to Tijuana, Mexico. . The reserve is a home to eight threatened and endangered species of plants and birds and is recognized as a 'wetland of international importance' by the Ramsar Convention.

***San Diego***

**National Marine Fisheries Service (NMFS) - [San Diego Port Facility](#)**

The NOAA San Diego Port Facility provides storage for sea-going sampling equipment, berthing for the Southwest Fisheries Science Center's (SWFSC) small boat fleet and provides office space and parking for sea-going personnel and activities. The facility is located within the Port of San Diego's 10th Avenue Marine Terminal.

**Office of Oceanic and Atmospheric Research (OAR) - [California-Nevada Climate Applications Program](#)**

The California-Nevada Climate Applications Program (CNAP) is a cooperative agreement between NOAA's Climate Program Office, Scripps Institution of Oceanography, and the Desert Research Institute. CNAP has a long history of providing cutting edge climate science to stakeholders in the region. The program began with an emphasis on California issues in 1999 as the California Applications Program (CAP). In 2011 the team expanded its geographic scope to include Nevada and became CNAP. CNAP's core priority sectors include understanding effects of climate variation on water resources, natural resources and coastal resources, along with other linked systems including societal components. Since 2005, CNAP has worked closely with the California Energy Commission (CEC) and other State Agencies in taking a leading role in the first three California Climate Change Vulnerability and Adaptation Assessments, and is currently completing the Fourth California Climate Change Assessment. CNAP has also collaborated with California Department of Water Resources (DWR) in providing data, observations and interpretation to better anticipate how climate and

associated weather events affect water resources and water hazards in the State. CNAP, working with California agencies including DWR, CEC and the California Ocean Protection Council, has contributed to a better understanding of climate impacts on the California coast, including the occurrence of coastal storms and two iterations of Sea Level Rise Guidance to State Agencies. Another focus of CNAP is working with fire agencies in California, Nevada and across the western U.S. to investigate effects of climate and weather on wildfire. With increased emphasis on Nevada climate issues, CNAP has worked with Great Basin tribes to understand barriers to climate data and helped develop a resilience plan with Washoe County. More recently CNAP is working with Southern Nevada Water Authority to better understand how climate variation drives changes in water demand in their Clark County service territory. CNAP is also working with the Bureau of Land Management (BLM), and local National Weather Service offices on climate related projects, and CNAP researchers recently teamed with the Science Climate Alliance – South Coast to develop a comprehensive study of the vulnerability of San Diego County ecosystems to climate influences.

**Office of Oceanic and Atmospheric Research (OAR) - Infrasound Program**

The Office of Weather and Air Quality plans to support up to several studies under this program to improve our understanding of infrasound as it relates to the detection of tornadoes in the U. S., particularly the Southeast U.S., the potential operational forecasting and warning benefits, and the limits of temporal and spatial detectability with various infrasound observing network configurations (e. g., how precise can source locations be determined, measures of detectability and warning such as false alarm rate and probability of detection, etc.).

**NOAA Office of Education — [Environmental Literacy Program](#)**

NOAA's Environmental Literacy Program (ELP), administered by the Office of Education, provides grants and in-kind support to build the capacity of institutions and networks to advance NOAA's mission through formal (K-12) and informal education at national, regional, and local levels. In California, a long-term partnership is sustained with the **Ocean Discovery Institute** (San Diego). Ocean Discovery Institute engages youth from underserved urban communities through programs that consistently provide hands-on learning and mentoring as students progress from elementary school to college. These programs teach students about NOAA-related sciences and expose them to potential career paths relevant to NOAA's mission. ELP also supports the **Ocean Discovery Institute** through a Environmental Literacy Grant focused on helping people and their communities build the environmental literacy necessary to become more resilient to local weather and climate hazards. Ocean Discovery Institute's project uses NOAA science to build understanding of climate change and impacts on local hazards, human-nature interactions, and individual and community capacity for resilience through place-based education in the underserved community of City Heights, San Diego.

**Office of Marine and Aviation Operations (OMAO) - [NOAA Ship Reuben Lasker](#)**

NOAA's newest Fishery Survey Vessel , NOAA Ship *Reuben Lasker*, is homeported in San Diego within the Port of San Diego's 10th Avenue Marine Terminal, and is managed by the OMAO Marine Operations Center-Pacific in Newport, Oregon. The fifth of the Oscar Dyson class vessels, the *Lasker* primarily supports fish, marine mammals and turtle surveys off the U.S. West Coast and in the eastern tropical Pacific Ocean. The vessel supports NOAA's mission to protect, restore, and manage the use of coastal and ocean resources through an ecosystem approach to management. NOAA Ship *Reuben Lasker* is operated under the direction of officers from the NOAA Commissioned Officer Corps. The NOAA Corps today provides a cadre of professionals trained in engineering, earth sciences, oceanography, meteorology, fisheries science, and other related disciplines. Officers operate ships, fly aircraft, manage research projects, conduct diving operations, and serve in staff positions throughout NOAA.

**[CA-52](#)**

**[La Jolla](#)**

**National Marine Fisheries Service (NMFS) - [La Jolla Shores Drive Laboratory](#)**

La Jolla is the headquarters for the Southwest Fisheries Science Center (SWFSC) and the location of the Director's Office, Information Technology Services, the Marine Mammal and Turtle Division, Antarctic Ecosystem Research Division and Fisheries Research Division, as well as the Operations and Management Division. Center scientists conduct marine biological, economic and oceanographic research, observations and monitoring of living marine resources and their environment throughout the Pacific Ocean and in the Southern Ocean around Antarctica. The La Jolla Laboratory Replacement Project (completed in 2013) is an award-winning, LEED Gold-certified facility located on the campus of Scripps Institution of Oceanography, University of California - San Diego. The facility is a focal point for ecosystem-based fisheries research, surveys and monitoring programs. In addition to 35 state-of-the-art laboratories, the new facility houses a unique, multi-story Ocean Technology Development Test Tank. The La Jolla Laboratory engages in educational partnerships and public engagement partnerships throughout the city, including the Ocean Discovery Institute.

**National Weather Service (NWS) - [Weather Forecast Office](#)**- See [Page 2](#) for details.

**Office of Oceanic and Atmospheric Research (OAR) - [Cooperative Institute for Marine Ecosystems and Climate](#)**

The Cooperative Institute for Marine Ecosystems and Climate (CIMEC) conducts collaborative research through a seven-team consortium of academic institutions in the Southern California region. CIMEC fosters collaborative research between NOAA scientists, academic scientists and students at the various member institutions. CIMEC is administratively housed at the Scripps Institution of Oceanography at the University of California, San Diego (SIO/UCSD), and is comprised of California State University, Los Angeles (CSU LA), Humboldt State, University of California, Davis (UC Davis), University of California, Los Angeles (UCLA), University of California, Santa Barbara (UCSB), and University of California, Santa Cruz (UCSC).

## CA

### [Statewide](#)

**National Marine Fisheries Service (NMFS) - [West Coast Region](#)**

NMFS is dedicated to protecting and preserving our nation's living marine resources through scientific research, fisheries management, enforcement, and habitat conservation. The West Coast Region manages marine and anadromous fish, sea turtles, and marine mammals and their habitats off the coasts of Washington, Oregon, and California; and in the inland habitats of Washington, Oregon, California, and Idaho. We carry out our work under the Endangered Species Act, Marine Mammal Protection Act, and Magnuson-Stevens Fishery Conservation and Management Act. We work closely with tribes, local, state, and federal agencies, the Pacific Fishery Management Council, and our stakeholders and partners to find science-based solutions to complex ecological issues.

**National Marine Fisheries Service (NMFS) – [Aquaculture Coordinators](#)**

The aquaculture coordinators lead regional efforts to foster sustainable aquaculture across the region. The West Coast has a vibrant commercial marine aquaculture industry supported by a world class research and technology sector. These positions support permit streamlining, aquaculture outreach and education, and serve as liaisons with state and local agencies, tribes, non-government organizations, academia, and industry.

**National Marine Fisheries Service (NMFS) - [Office of Law Enforcement](#)**

NOAA's Office of Law Enforcement is the only conservation enforcement program (Federal or State) that is exclusively dedicated to Federal fisheries and marine resource enforcement. Its mission is to protect global marine resources by enforcing domestic laws and international treaties and obligations dedicated to protecting wildlife and their natural habitat. Our special agents and enforcement officers ensure compliance with these laws and take enforcement action if there are violations. Additionally, the Cooperative Enforcement Program allows NOAA the ability to leverage the resources and

assistance of 28 coast states and U.S. territorial marine conservation law enforcement agencies in direct support of the Federal enforcement mission.

Effective fisheries law enforcement is critical to creating a level playing field for U.S. fishermen and enabling sustainable fisheries to support vibrant coastal communities. The Office of Law Enforcement's West Coast Division is headquartered in Seattle, Wash., with field offices in Alameda, Long Beach., San Diego, Monterey, Sacramento, Santa Rosa and Arcata.

#### **National Marine Fisheries Service (NMFS) - [Restoration Center](#)**

The NOAA Restoration Center is devoted to restoring the nation's coastal ecosystems and preserving diverse and abundant marine life. Our projects help recover threatened and endangered species, support sustainably managed species, and reverse the damage done by oil spills and toxic releases. In addition, the Restoration Center, along with NMFS Habitat Protection and the West Coast Regional Office, are working on implementing the Russian River Watershed Habitat Focus Area. Working with four other NOAA Line offices (National Weather Service, National Ocean Service, Office of Research and Program Planning and Integration) we are conserving habitat in the Russian River at a watershed scale.

#### **National Marine Fisheries Service (NMFS) - [Southwest Fisheries Science Center](#)**

The Southwest Fisheries Science Center (SWFSC) is the research arm of NOAA's National Marine Fisheries Service (NOAA Fisheries) in the Southwest Region. Center scientists conduct marine biological, economic and oceanographic research, observations on living marine resources and their environment throughout the Pacific Ocean and the Southern Ocean off Antarctica. This scientific information supports the sustainability of the region's fisheries and fishing communities and the recovery and conservation of protected species. Guided by the Magnuson-Stevens Fisheries Conservation Act, Endangered Species Act and Marine Mammal Protection Act, research is conducted in support of several regional and international fisheries councils, commissions, conventions and agreements. The Science Center is based in La Jolla with laboratories located in Santa Cruz and Monterey, a field office in Arcata and field stations in Granite Canyon and Piedras Blancas. The SWFSC engages in educational and public engagement partnerships, including with the Exploratorium (San Francisco), Seymour Science Center (UC Santa Cruz), Monterey Bay National Marine Sanctuary Exploration Center (Santa Cruz) and Ocean Discovery Institute (San Diego).

#### **National Marine Fisheries Service (NMFS) and National Ocean Service (NOS) - [Damage Assessment, Remediation, and Restoration Program](#)**

NOAA's Damage Assessment, Remediation, and Restoration Program (DARRP) assesses and restores habitat, fisheries, protected species and recreational uses that have been harmed by oil spills, chemical releases, and ship groundings. Working with federal, state, and tribal entities, and responsible parties, we have recovered funding from responsible parties for restoration of critical habitats, fisheries, protected species and recreational uses nationwide. These projects promote recovery of the ecosystem and provide economic benefits from tourism, recreation, green jobs, coastal resiliency, property values and quality of life. In California, the Program is currently working to restore natural resources in cases including the M/V *Cosco Busan*, Luckenbach, and Refugio oil spills, and the Castro Cove, San Diego Bay, and Montrose hazardous waste sites.

#### **National Ocean Service (NOS) – [Regional Geodetic Advisor](#)**

The Regional Geodetic Advisor is a National Ocean Service (NOS) employee that resides in a region and serves as a liaison between the National Geodetic Survey (NGS) and its public, academic and private sector constituents within their assigned region. NGS has a Regional Geodetic Advisor stationed in La Jolla, CA serving the Pacific Southwest region – California and Nevada. The Geodetic Advisor provides training, guidance and assistance to constituents managing geospatial activities that are tied to the National Spatial Reference System (NSRS), the framework and coordinate system

for all positioning activities in the Nation. The Geodetic Advisor serves as a subject matter expert in geodesy and regional geodetic issues, collaborating internally across NOS and NOAA to ensure that all regional geospatial activities are properly referenced to the NSRS.

#### **National Weather Service (NWS) - [Automated Surface Observing Systems Stations](#)**

The Automated Surface Observing Systems (ASOS) program is a joint effort of the National Weather Service (NWS), the Federal Aviation Administration (FAA), and the Department of Defense (DOD). ASOS serves as the Nation's primary surface weather observing network. ASOS is designed to support weather forecast activities and aviation operations while supporting the needs of the meteorological, hydrological, and climatological research communities. ASOS works non-stop, updating observations 24/7/365 observing basic weather elements, such as cloud cover, precipitation, wind, sea level pressure, and conditions, such as rain, snow, thunderstorms, and fog. There are 86 ASOS stations in California.

#### **National Weather Service (NWS) - [Cooperative Observer Program Sites](#)**

The National Weather Service (NWS) Cooperative Observer Program (COOP) is truly the Nation's weather and climate observing network of, by and for the people. More than 10,000 volunteers take observations on farms, in urban and suburban areas, National Parks, seashores, and mountaintops. The data are representative of where people live, work and play. The COOP was formally created in 1890 under the NWS Organic Act to provide observational meteorological data, usually consisting of daily maximum and minimum temperatures, snowfall, and 24-hour precipitation totals, required to define the climate of the United States and to help measure long-term climate changes, and to provide observational meteorological data in near real-time to support forecast, warning and other public service programs of the NWS.

The data are also used by other federal (including the Department of Homeland Security), state and local entities, as well as private companies (such as the energy and insurance industries). In some cases, the data are used to make billions of dollars' worth of decisions. For example, the energy sector uses COOP data to calculate the Heating and Cooling Degree Days which are used to determine individuals' energy bills monthly. There are 493 COOP sites in California.

#### **National Weather Service (NWS) - [Incident Meteorologists](#)**

The NWS, as mandated by Congress, provides fire weather forecast products and services to the fire and land management community for the protection of life and property, promotion of firefighter safety, and stewardship of America's public wildlands. Since 1928, this effort has included providing critical on-scene support to wildfire managers via specially-trained NWS forecasters called Incident Meteorologists (IMETs). When a fire reaches a large enough size, IMETs are rapidly deployed to the incident and set-up a mobile weather center to provide constant weather updates and forecast briefings to the fire incident commanders. IMETs are very important members of the firefighting team, as changes in the fires are largely due to changes in the weather.

#### **National Weather Service (NWS) - [NOAA Weather Radio All Hazards Transmitters](#)**

NOAA Weather Radio All Hazards (NWR) is a nationwide network of radio stations broadcasting continuous weather information directly from the nearest National Weather Service (NWS) forecast office. NWR broadcasts official NWS warnings, watches, forecasts and other hazard information 24 hours a day, 7 days a week. Working with the Federal Communication Commission's (FCC) Emergency Alert System, NWR is an "All Hazards" radio network, making it the single source for comprehensive weather and emergency information. In conjunction with federal, state, and local emergency managers and other public officials, NWR also broadcasts warning and post-event information for all types of hazards – including natural, environmental and public safety. Known as the "Voice of NOAA's National Weather Service," NWR is provided as a public service by the NWS. NWR includes 1,100 transmitters covering all 50 states, adjacent coastal waters, Puerto Rico, the U.S. Virgin Islands, and the U.S. Pacific Territories. There are 32 NWR transmitters in California.

**Office of Oceanic and Atmospheric Research (OAR) - [MOA California Department of Water Resources](#)**

NOAA is in the midst of a new 5-year Memorandum of Agreement (MOA) with the California Department of Water Resources that provides state-of-the-art observations display systems, and decision support tools to address water resource and flood protection issues. The project utilizes an existing network of GPS receivers to retrieve water vapor measurements at 37 sites across the state. Because the amount of rainfall absorbed by the ground can be the deciding factor for flooding, soil measurement systems are being deployed at 43 sites across the state. Low-powered S-Band radars (designed by Earth System Research Laboratory for this project) deployed at key reservoirs around the state will help detect snow level. Coastal atmospheric observatories will measure the conditions associated with land-falling atmospheric rivers; a key component of winter storms that are responsible for flooding and can sometimes lead to dangerous debris flows.

**Office of Oceanic and Atmospheric Research (OAR) - [California Sea Grant College Program](#)**

NOAA's National Sea Grant College Program is a federal-university partnership that integrates research, education and outreach. Sea Grant forms a network of 33 programs in all U.S. coastal and Great Lakes states, Puerto Rico, and Guam. The California Sea Grant College Program, based at the University of California's Scripps Institution of Oceanography in La Jolla, annually funds over 50 concurrent research projects, which are peer-reviewed and competitively selected to address a wide range of problems and opportunities. The program supports several dozen outreach and applied research projects through its Extension Specialists. Current projects focus on healthy marine ecosystems, sustainable use of coastal and marine resources, sustainable coastal community development, fisheries and fisheries habitat, seafood safety and quality, coastal water quality, aquatic nuisance species, wetland and salmonid habitat restoration, aquaculture, new technologies, marine reserves, and education, training and public information.

**Office of Oceanic and Atmospheric Research (OAR) - [University of Southern California Sea Grant Program](#)**

NOAA's National Sea Grant College Program is a federal-university partnership that integrates research, education and outreach. Sea Grant forms a network of 33 programs in all U.S. coastal and Great Lakes states, Puerto Rico, and Guam. The Southern California Sea Grant Program, based at the University of Southern California in Los Angeles, concentrates on "The Urban Ocean" -- issues arising out of the necessity of managing people and natural resources in an intensely urban and developed coastline. USC Sea Grant focuses its research, outreach and education programs on the most pressing issues along the urban coastline, including: water quality impacts from land-based inputs into the coastal ocean, harmful algal blooms, invasive species, marine protected areas, seafood safety, ports and harbors, and climate change planning and adaptation. In addition, K-12 education programs increase science literacy among urban students and encourage teachers to adopt science education curricula. Many California institutions receive research funding through the Sea Grant College Program, including the University of Southern California and other private institutions, and University of California and California State University campuses. Any academic institution may apply for funding for projects addressing issues pertaining to the "urban ocean."

**[Coastal](#)**

**National Marine Fisheries Service (NMFS) - [Deep-Sea Coral Research and Technology Program](#)**

NOAA's Deep Sea Coral Research and Technology Program is the only federal program dedicated to mapping, characterizing, and understanding deep-sea coral ecosystems, and sharing the information needed to conserve these habitats. The Program -- called for in the reauthorization of the Magnuson-Stevens Fishery Conservation and Management Act and administered by the Office of Habitat Conservation -- is working with other NOAA offices and external partners to conduct fieldwork to study the distribution, abundance, and diversity of deep sea corals and sponges. Since 2009, more than 42,500 square miles of seafloor have been mapped and surveyed for deep-sea coral habitats from Florida to Maine, in Alaska and the West Coast, and in Hawaii and the Marianas Trench. In FY 2019, research is being

prioritized in two regions -- the southeast (states include VA, NC, SC, GA, FL, AL, MS, LA, TX, and the Caribbean islands) and the west coast (WA, OR, CA).

**National Marine Fisheries Service (NMFS) - [Cooperation with States Program](#) and [Species Recovery Grants](#)**

Under the authority of section 6 of the Endangered Species Act, the Cooperation with States Program brings states, NMFS, and other partners together to recover threatened and endangered species. A total of 25 U.S. territories and coastal states, including California, currently participate in this program. Competitive grants are awarded to states through the Species Recovery Grants to States Program to support management, monitoring, research and outreach efforts for species that spend all or a portion of their life cycle in state waters. The funded work is designed to prevent extinctions or reverse the decline of species, and restore ecosystems and their related socioeconomic benefits. The California Department of Fish and Wildlife has received multiple awards through this program, including grants to support projects focused on white abalone and the southern distinct population segment of green sturgeon.

**National Marine Fisheries Service (NMFS) - [National Marine Mammal Stranding Network](#) and [John H. Prescott Marine Mammal Rescue Assistance Grant Program](#)**

The National Marine Mammal Stranding Network and its trained professionals and volunteers respond to dead or live marine mammals in distress that are stranded, entangled, out of habitat or otherwise in peril. Our long-standing partnership with the Network provides valuable environmental intelligence, helping NOAA establish links among the health of marine mammals, coastal ecosystems, and coastal communities as well as develop effective conservation programs for marine mammal populations in the wild. There are 15 stranding network members in the state. NOAA Fisheries funds eligible members of the Stranding Network through the competitive John H. Prescott Marine Mammal Rescue Assistance Grant Program. In FY18, 36 grantees received \$2.8Mil nationwide, with four awards going to four recipients in California: California Academy of Sciences; Channel Islands Marine and Wildlife Institute; and the Regents of the University of California, Santa Cruz.

**National Marine Fisheries Service (NMFS) - [Pacific Coastal Salmon Recovery Fund](#)**

The Pacific Coastal Salmon Recovery Fund (PCSRF) was established by Congress in 2000 to reverse the declines of Pacific salmon and steelhead by advancing the protection, restoration, and conservation of Pacific salmon and their habitats. The Fund is essential to prevent the extinction of 28 salmon species protected under the Endangered Species Act and also plays a vital role in supporting the economies of local communities from California to Alaska, upholding Tribal Treaty fishing rights and subsistence fishing traditions, and restoring all salmon populations to productive and viable levels along the entire West Coast. Since 2000, approximately 13,200 projects have restored nearly 1.1 million acres of salmon habitat, opening over 10,550 miles of streams to spawning fish, with \$1.35 billion in grants leveraging over \$1.69 billion in contributions. Several studies suggest that a \$1 million investment in watershed restoration creates between 13 and 32 jobs and between \$2.2 and \$3.4 million in economic activity. In California, there are 183 active projects.

**National Marine Fisheries Service (NMFS) - [Wetlands Recovery Project](#)**

NMFS West Coast Region has been an active participant in the Southern California Wetlands Recovery Project. The Wetlands Recovery Project is a broadly based partnership with 18 state and federal agencies working in concert with scientists, local governments, and environmental organizations, as well business leaders and educators to increase the pace and effectiveness of wetlands recovery efforts in southern California. To date, the Wetlands Recovery Project has spent more than \$528 million dollars, enhanced over 3,400 acres of wetland habitat, and protected over 7,900 acres of coastal wetlands and watersheds. Major projects include coastal bay and lagoon habitat restoration, increasing fish passage opportunities, stream restoration, and invasive species eradication and control.

**National Ocean Service (NOS) - [Coastal Management Fellowship](#)**

This program matches postgraduate students with state and territory coastal zone programs to work on two-year projects proposed by the state or territory. The California Coastal Commission is hosting a fellow from 2018-2020, who is completing several key sea level rise-related projects that include data analysis, vulnerability assessment, and stakeholder engagement to advance the coastal commission's overall planning and regulatory work on sea level rise.

**National Ocean Service (NOS) - [National Coastal Zone Management Program](#)**

Through a unique federal-state partnership, NOAA's Office for Coastal Management works with the California Coastal Commission, the San Francisco Bay Conservation and Development Commission, and the California Coastal Conservancy to implement the National Coastal Management Program in California. NOAA provides these three state agencies with financial and technical assistance to further the goals of the Coastal Zone Management Act to protect, restore, and responsibly develop our nation's coastal communities and ensure coastal waters and lands are used in a balanced way to support jobs, reduce use conflicts, and sustain natural resources.

**National Ocean Service (NOS) and National Marine Fisheries Service (NMFS) – [Coastal Resilience Grant Award](#)**

These grants help coastal communities prepare for and recover from extreme weather events, climate hazards, and changing ocean conditions. The focus is on comprehensive regional approaches that use science-based solutions and rely on collaborative partnerships. In California, the NOAA Office for Coastal Management awarded three grant projects that are ongoing in 2018, including a grant to the University of San Diego to develop vulnerability assessments and improved resilience strategies in five San Diego coastal cities; a grant to Ducks Unlimited to restore 280 acres of estuarine habitat, which will provide shoreline and community flood protection and contribute to the recovery of the Central California Coast population of steelhead and forage fish populations; and a grant to the San Mateo County Resource Conservation District to re-establish access to 10 miles of the historic Butano Creek for salmon, which will also reduce flooding and improve public safety.

**National Ocean Service (NOS) - [Coastal and Estuarine Land Conservation Program](#)**

The Coastal and Estuarine Land Conservation Program brings conservation partners together to protect coastal and estuarine lands considered important for their ecological, conservation, recreational, historical, or aesthetic values. To date the program has protected more than 100,000 acres of land nationally with program funds and over 16,000 acres with an in-kind match. The program provides state and local governments with matching funds to purchase coastal and estuarine lands or obtain conservation easements for important lands threatened by development. Fourteen projects have been successfully completed in California, and these lands are protected in perpetuity.

**National Marine Fisheries Service (NMFS) and National Ocean Service (NOS) - [Montrose Settlements Restoration Program](#)**

From the late 1940s to the early 1970s, the Montrose Chemical Corporation discharged millions of pounds of DDT and PCBs onto the Palos Verdes Shelf off the Southern California coast. These hazardous chemicals persist in the environment and continue to affect marine life and birds in Southern California. NOAA and other natural resource trustees formed the Montrose Settlements Restoration Program (MSRP) to oversee restoration of bald eagles, peregrine falcons, seabirds, fishing, and fish habitat. Restoration of these resources has been ongoing since the release of the MSRP Phase 1 Restoration Plan in 2005.

**National Ocean Service (NOS) - [National Water Level Observation Network](#)**

NOAA's Center for Operational Oceanographic Products and Services (CO-OPS) operates 14 long-term, continuously operating tide stations in the state of California, which provide data and information on tidal datums, relative sea level

trends, and are capable of producing real-time data for tsunami and storm surge warning. These stations are located at San Diego, La Jolla, Los Angeles, Santa Monica, Santa Barbara, Port San Luis, Monterey, San Francisco, Alameda, Point Reyes, Port Chicago, Arena Cove, North Spit, and Crescent City. Each station is associated with a set of tidal benchmarks installed in the ground that is used to reference the height of the water levels and helps connect the water level to land. NOS also operates a long-term station at the offshore Oil Platform Harvest in support of the TOPEX project, which serves as a validation point for satellite altimeters measuring sea level. NOS has also operated a station at Bolinas Lagoon for three years in support of local monitoring and restoration efforts.

#### **National Ocean Service (NOS) - [IOOS Regional Association - Central and Northern California](#)**

The U.S. Integrated Ocean Observing System, or IOOS®, is a federally and regionally coordinated observing system with 17 interagency and 11 regional partners. The System addresses regional and national needs for coastal, ocean, and Great Lakes data and information. This includes gathering and disseminating regional observations; data management; modeling and analysis; education and outreach; and research and development. The Central and Northern California Ocean Observing System (CeNCOOS) is part of an evolving national framework of integrated coastal observing systems called the Integrated Ocean Observing System (IOOS).

Ocean observing uses various physical, biological and chemical sensing technologies to add to our knowledge of changing ocean conditions and to enhance coastal management, allowing for more informed decision-making. The geographic extent of CeNCOOS includes from Point Conception north to the California-Oregon border and from the coastline out to 200 nautical miles (the seaward extent of the Exclusive Economic Zone). CeNCOOS includes bays and estuaries in this region. Within the state, CeNCOOS collaborates closely with its neighboring Regional Association, the Southern California Coastal Ocean Observing System (SCCOOS), and the state agencies supporting coastal management activities.

#### **National Ocean Service (NOS) - [IOOS Regional Association – Southern California](#)**

The U.S. Integrated Ocean Observing System, or IOOS®, is a federally and regionally coordinated observing system with 17 interagency and 11 regional partners. The System addresses regional and national needs for coastal, ocean, and Great Lakes data and information. This includes gathering and disseminating regional observations; data management; modeling and analysis; education and outreach; and research and development. As the regional observing system serving Southern California, Southern California Coastal Ocean Observing System (SCCOOS) has developed the capabilities to support short-term decision-making and long-term assessment by implementing and leveraging biological, chemical and physical observations and models, many of them in the near real-time. The principle goal of the SCCOOS is to provide observations and products to a diverse stakeholder community of managers and planners, operational decision makers, scientists and the general public. Our information is readily available in a variety of formats to ensure that products are useful and easy to access while preserving the necessary detail to support the scientific and educational communities. SCCOOS works interactively with its neighboring IOOS Regional Association to the north, the Central and Northern California Ocean Observing System (CeNCOOS), and our activities are integral to California's economy, health and safety. Marine transportation, aquaculture, commercial fishing, recreational boating and many other industries rely on the data we provide to operate successfully.

**National Ocean Service (NOS) - [California Bay-Watershed Education and Training Program](#)**

NOAA Bay-Watershed Education and Training (B-WET) Program, administered in this region by the Office of National Marine Sanctuaries, is an environmental education program that promotes locally relevant, experiential learning in the K-12 environment. The primary delivery of B-WET is through competitive funding that promotes Meaningful Watershed Educational Experiences (MWEEs). B-WET currently serves seven areas of the country: California, Chesapeake Bay, Great Lakes, Gulf of Mexico, Hawai'i, New England, and the Pacific Northwest. The California B-WET program recognizes that knowledge and commitment built from firsthand experience, especially in the context of one's community and culture, is essential for achieving environmental stewardship. California B-WET responds to regional education and environmental priorities through local implementation of competitive grant funds.

**National Ocean Service (NOS) - [West Coast Regional Office](#)**

The Office of National Marine Sanctuaries, West Coast Regional Office oversees management of and fosters coordination among the five national marine sanctuaries of the west coast, which together protect 15,455 square miles of ocean and coastal waters from Washington to southern California. The regional office also closely collaborates with federal, state, local and tribal entities in shared management responsibilities. The West Coast Regional Office is located in Monterey, CA; each sanctuary office and visitor center is noted geographically below for individual congressional districts. NOAA Sanctuaries West Coast Regional Office also manages B-WET Pacific Northwest; see Oregon and Washington "NOAA in your State" for a description of that program. The regional office also maintains and operates two science vessels to support the three north-central California national marine sanctuaries; these vessels are homeported at Monterey Harbor.

**National Ocean Service (NOS) - [Ocean Guardian School Program](#)**

An Ocean Guardian School makes a commitment to the protection and conservation of its local watersheds, the world's ocean, and special ocean areas, like national marine sanctuaries. Funds are provided to schools at \$4,000 per year if the school makes this commitment by proposing and then implementing a school- or community-based conservation project. Once the school has completed their project, the school receives official recognition as a NOAA Ocean Guardian School. To date, the Ocean Guardian School Program has funded more than 100 schools in California and reached more than 50,000 students.

**National Ocean Service (NOS) - [Zero Waste Week](#)**

Students are inviting their local communities to "Go Green and Think Blue" by joining them in the annual *Students for Zero Waste Week campaign*. During this campaign led by the Office of National Marine Sanctuaries, students focus on reducing land-based waste in order to protect the health of local marine environments. These young leaders are raising awareness of how single-use plastic and other types of litter affect the health of local watersheds, national marine sanctuaries, and the ocean. In addition, some schools are looking at ways to reduce their energy use on campus with hopes of raising awareness of how the burning of fossil fuels also impacts the health of the ocean.

**National Ocean Service (NOS) – OR&R [Scientific Support Coordinator and Regional Resource Coordinator](#)**

NOAA's Office of Response and Restoration (OR&R) brings decades of experience, technical expertise and scientific analysis in response to oil and hazardous chemical spills. Nine regionally based Scientific Support Coordinators (SSCs) harness the input of a multi-disciplinary team to address issues such as oil slick trajectory forecasting, environmental tradeoffs, best practices, resources at risk, and chemical hazard assessment to reduce risks to coastal habitats and resources. OR&R also helps develop preparedness plans that identify spill response actions with the greatest environmental benefit and trains hundreds of members of the response community each year on the scientific and technical aspects of spills.

OR&R identifies and quantifies environmental injury caused by releases of oil and hazardous materials. Our network of Regional Resource Coordinators (RRC's) work on multi-disciplinary scientific, economic, and legal teams with the goal of securing the appropriate amount and type of restoration required to restore injured NOAA trust resources and compensate the public for their lost use. We collaborate with NMFS Restoration Center and NOAA General Council through the Damage Assessment, Remediation, and Restoration Program to ensure the process is efficient, legally defensible and restoration focused. In CA, the OR&R SSC is collocated with the USCG in Alameda and our RRC is based in Santa Rosa with support staff in Long Beach.

**National Ocean Service (NOS) - OR&R [Southwest Environmental Response Management Application](#)**

Assessing important spatial information and designing successful restoration projects rely upon interpreting and mapping geographic information, including the location, duration, and impacts from oil spills, other hazardous materials, or debris released into the environment. Southwest Environmental Response Management Application (ERMA<sup>®</sup>) is an online mapping tool that integrates both static and real-time data, such as Environmental Sensitivity Index maps, ship locations, weather, and ocean currents, in a centralized, easy-to-use format for environmental responders and decision makers. In the spring of 2013, Southwest ERMA was used in a large-scale, oil spill training drill in El Segundo, just outside of Los Angeles.

**National Ocean Service (NOS) - [Marine Debris Projects and Partnerships](#)**

The NOAA Marine Debris Program (MDP) leads national and international efforts to research, prevent, and reduce the impacts of marine debris. The program supports marine debris removal, prevention, and research projects in partnership with state and local agencies, tribes, non-governmental organizations, academia, and industry. The MDP California Regional Coordinator is based in Oakland and supports coordination efforts with regional stakeholders, provides support to grant-funded projects, tracks progress of projects, and conducts regional marine debris outreach to local audiences. In partnership with the California Ocean Protection Council, the MDP recently published the California Ocean Litter Prevention Strategy: Addressing Marine Debris from Source to Sea. The Strategy was developed through a collaborative process with various stakeholders and serves as a guiding document with priority actions to address over the next six years.

In California the MDP has initiated a targeted behavior change project with Surfrider San Francisco to prevent cigarette butt litter in the City of San Francisco and the Golden Gate National Recreation Area. The MDP is also working with California State University Channel Islands on the assessment and removal of nearly 10 tons of marine debris on remote and hard-to-access Channel Islands shorelines. The MDP is also partnering with the Channel Islands National Marine Sanctuary and local lobster fishermen to prevent and remove lost fishing gear. Lastly, the MDP is continuing a partnership with the Tijuana National Estuarine Research Reserve to reduce debris sources in Mexico and enhance trash capture in the estuary before it reaches the Pacific Ocean.

**National Ocean Service (NOS) - [Analytical Response Team](#)**

NOAA's Analytical Response Team (ART) works with Federal, academic, and state partners to respond to HAB and associated mortality events. They can provide rapid and accurate identification of harmful algae and their associated toxins to the management agencies responsible for, e.g. opening and closing fisheries, targeting monitoring, and responding to marine mammal mortality events. ART works nationally, processing samples and providing expertise upon request. This year ART has responded to events related to harmful algal blooms on the West Coast.

### **National Ocean Service (NOS) - [Phytoplankton Monitoring Network](#)**

The Phytoplankton Monitoring Network (PMN) engages volunteers in monitoring for marine phytoplankton and HABs. Data collected by PMN volunteers is used to better understand species composition and distribution in coastal and Great Lakes waters, and to identify areas for further research and monitoring. Through this program, we have alerted managers to previously undetected toxins in commercial shellfish beds, and the potential for human Amnesic Shellfish Poisoning and domoic acid toxicity in marine animals. This year PMN is active along the West Coast from CA to AK, in Lake Erie, in the Gulf of Maine, and the Gulf of Mexico.

### **National Ocean Service (NOS) - [Office of Coast Survey Navigation Manager](#)**

NOAA's navigation managers work directly with pilots, port authorities, and recreational boating organizations in California. They help identify the navigational challenges facing marine transportation in California and provide NOAA's resources and services that promote safe and efficient navigation. Navigation managers are on call to provide expertise and NOAA navigation response coordination in case of severe coastal weather events or other marine emergencies. The Office of Coast Survey has a navigation manager in Santa Barbara to support mariners and stakeholders on the West Coast.

### **National Weather Service (NWS) - [California Buoys](#)**

The National Weather Service (NWS), through its National Data Buoy Center (NDBC), develops, deploys, operates, and maintains the current national data buoy network of moored and drifting weather buoys and land stations that serve all of the Nation's coastal states and territories. Within this network, 110 of the buoys and 51 of the land stations are maintained directly by NDBC. Located at NASA's Stennis Space Center in Mississippi, supports weather and marine warning and forecast services in real time by providing deep ocean and coastal meteorological and oceanographic observations. These data provide valuable information used by NWS supercomputers to produce computer-generated model forecasts of the atmosphere and climate. NDBC manages the Volunteer Observing Ship program to acquire additional meteorological and oceanographic observations supporting NWS mission requirements. NDBC also supports operational and research programs of NOAA and other national and international organizations. NDBC also operates NOAA's network of Deep-ocean Assessment and Reporting of Tsunami (DART®) stations, for the early detection and real-time reporting of tsunamis in the open ocean. Data from the DART@s are used by the National Weather Service Tsunami Warning Centers in Alaska and Hawaii to provide tsunami forecasts, warnings, and information. NDBC also operates the Tropical Atmosphere Ocean Array of buoys in the tropical Pacific. The TAO/TRITON array consists of approximately 70 moorings in the Tropical Pacific Ocean, telemetering oceanographic and meteorological data to shore in real-time via the Argos satellite system. The array is a major component of the El Niño/Southern Oscillation (ENSO) Observing System, the Global Climate Observing System (GCOS) and the Global Ocean Observing System (GOOS). These data provide valuable information used by NWS supercomputers to produce computer generated model forecasts of the atmosphere, and climate.

### **NOAA Office of Education — [Environmental Literacy Program](#)**

NOAA's Environmental Literacy Program (ELP), administered by the Office of Education, provides grants and in-kind support to build the capacity of institutions and networks to advance NOAA's mission through formal (K-12) and informal education at national, regional, and local levels. In California, ELP supports the Sea Lion Bowl, Los Angeles Surf Bowl and Garibaldi Bowl in California, three of 25 regional competitions of the National Ocean Sciences Bowl (NOSB). The NOSB is an academic competition that engages high school students in learning about ocean sciences and related STEM careers while helping them become knowledgeable citizens and environmental stewards. ELP also supports the American Meteorological Society's DataStreme courses for K-12 educators through a grant and in-kind support. Local implementation teams in the state offer DataStreme courses that use weather, climate, and the ocean as contexts for teaching science and improving understanding about the Earth system.

Office of Oceanic and Atmospheric Research (OAR) - [Science on a Sphere](#)- See [Page 2](#) for details.

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## *NOAA In Your State*

# California

**NOAA** NATIONAL OCEANIC AND  
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