Environmental Protection Agency
National Dive Safety Program

2013 Annual Report

October 7, 2014

Executive Summary

The U. S. Environmental Protection Agency (EPA) conducts a wide range of diving activities for regional and national programs. Diving is conducted in rivers, lakes, harbors, and the open ocean to support monitoring, research, and emergency response efforts. The EPA administers diving activities under guidelines established through the EPA Diving Safety Management Program, and in compliance with the Occupational Safety and Health Administration (OSHA) regulations. This report has been developed in response to the requirements of EPA's Diving Safety Policy.

The EPA's National Diving Safety Program conducted 1,246 dives in 2013, involving nine EPA dive units and 71 divers. This report describes how the program is administered nationally, and what activities each EPA dive unit undertakes.

Questions regarding this report or about the EPA Diving Safety Program should be directed to:

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Environmental Protection Agency
National Dive Safety Program

2013 Annual Report

Introduction

This report is provided to the Environmental Protection Agency's (EPA) Safety, Health and Environmental Management Division (SHEMD), in accordance with EPA's Dive Safety Policy. This policy and EPA's Diving Safety Manual can be viewed online at the SHEMD site: URL: http://intranet.epa.gov/shemd/content/dive/divingmanual_508.pdf

This report is a summary of the EPA's National Diving Safety Program (NDSP) activities from October 1, 2012, through September 30, 2013. The annual reports from EPA Unit Dive Officer's (UDO) serve as the basis for the information contained in this report. Each UDO's Annual Report is available upon request.

Overview

The EPA's NDSP conducted 1,246 dives in FY 2013 (Figure 1), involving nine EPA dive units, and a total of 71 divers (Figure 2). These dives were conducted in a variety of water bodies that include lakes, rivers, harbors, and the open ocean. The population of qualified EPA divers fluctuates annually. Qualification is based on medical compliance, diving proficiency, and other regulatory requirements. No serious injuries or accidents were reported by the dive units for the 2013 operational year.

EPA's NDSP is represents nine regional dive units, each under the supervision of a UDO (Figure 3). The dive units are located in:

(1) Region 1- Headquarters Boston, MA, and the Narragansett, RI Lab (R1)
(2) Environmental Response Dive Team - Edison, NJ (ERT)
(3) Region 3 Headquarters - Philadelphia, PA (R3)
(4) Region 4 - Headquarters, Atlanta, GA (ATL)
(5) Region 4 - Athens Lab, Athens, GA (ATH)
(6) Gulf Ecology Division - Gulf Breeze, FL. (GED)
(7) Region 6 – Headquarters Dallas, TX (R6)
(8) Region 10 Headquarters - Seattle, WA. (R10)
(9) Western Ecology Division, Corvallis, OR (WED)

Figure 1: Number of Dives by EPA Diving Unit

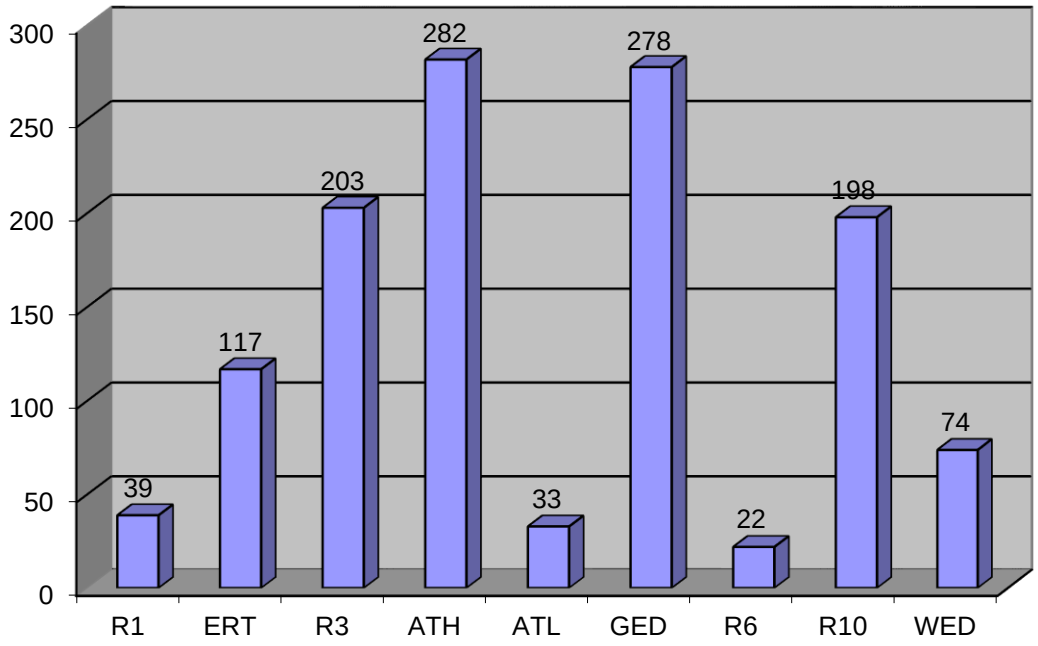

Figure 2: Number of EPA Divers by Unit

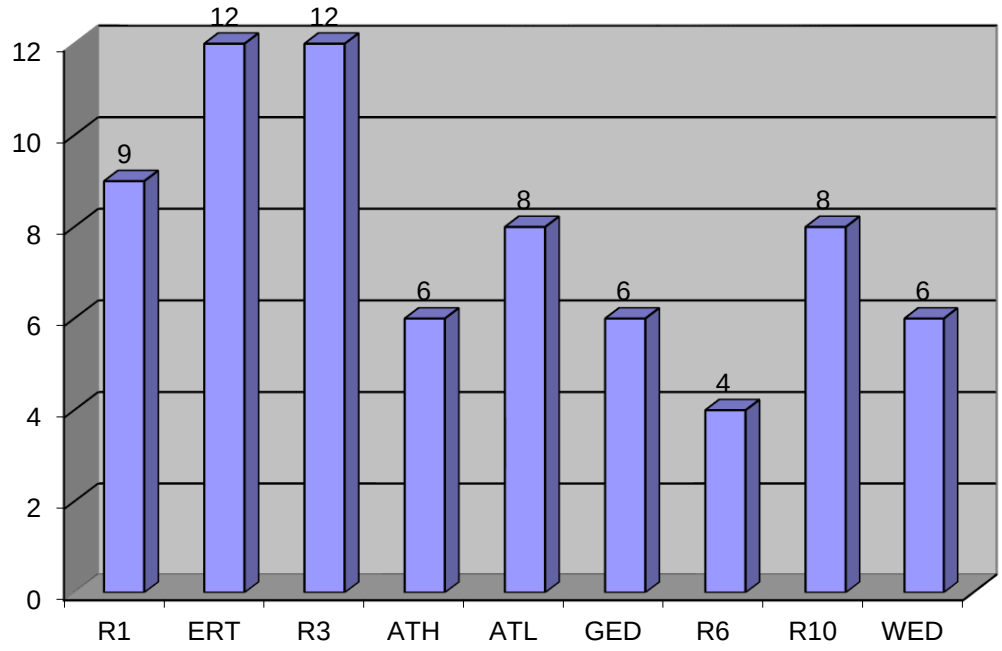

Figure 3: EPA Unit Dive Officers

2013 EPA Diving Safety Board Meeting

The 2013 EPA Diving Safety Board conducted the annual meeting at the EPA Region 1 Headquarters, in Boston MA, on Nov 19-21, 2013.

Agenda items included:

- Dive Safety Manual Revisions
- Physical Fitness Standards for Diving
- Frequency of medical surveillance testing
- Safety Audits
- Discussions/Reports from Regional Dive Units

Training

The EPA National Diver Training Program was not able to conduct training in 2013 due to lack of funding.

Reciprocity:

EPA participates in joint diving activities with a variety of organizations, including other federal and state agencies, universities, and private sector groups. To facilitate these operations and ensure safety, formal reciprocity agreements are established with these entities, based upon approved standards. These agreements are maintained for the calendar year and can be renewed annually, as needed. In 2013, EPA established reciprocity agreements with:

- U. S. Department of Commerce, National Oceanic and Atmospheric Administration
- U. S. Geological Survey
- U.S. National Park Service
- U.S. Fish and Wildlife Service
- Scientific Diving International
- Oregon State University
- Massachusetts Division of Marine Fisheries
- Oregon Coast Aquarium
- University of Washington
- Lower Elwha Klallam Tribe

Dive Unit Highlights

Regional Units

1. Region 1 Dive Unit Boston Headquarters and the Atlantic Ecology Division (AED) and the Narragansett Lab

A. Diving Activities: The Region 1 Dive Unit is comprised of divers from the AED Laboratory in Narragansett, RI, and the Headquarters Office in Boston, MA. The following missions were supported:

- Conducted requalifying dives and diver fitness assessments in Gloucester, MA and Jamestown, RI following the suspension of diving activities during the winter months (December – March).
- Conducted a post-construction inspection of a runway extension at Logan Airport, Boston Harbor, assessing project impacts on eelgrass and shellfish beds.
- Collected video footage of benthic conditions in Boston Harbor for in-house documentary on the history of Boston Harbor's water quality.
- Collected eelgrass samples for assessment of invasive tunicate presence in Gloucester Harbor, MA.
- Collected video and still images of eelgrass beds in Great Bay, Little Bay, Little Harbor and Portsmouth harbor, NH in support of state eelgrass monitoring project.
- Conducted sampling of invasive tunicates in Martha's Vineyard, MA in support of a Regional Applied Research Effort (RARE) grant study.
- Assisted Environmental Response Team (ERT) divers with in-water sampling operations at the Henry's Dry Cleaners site on the Winnepesaukee River, in Laconia, NH.

B. Dive Statistics:

Number of Dives	
Scientific	24
Training	2
Proficiency	13
Total Dives	39

C. Diving Accidents, Injuries, and Incidents: None

D. Diving Personnel: Nine Divers, including four Divemasters

2. Edison Environmental Response Team Dive Unit

A. Diving Activities: The Environmental Response Dive Team (ERDT) conducted a limited number of scientific dives at EPA projects around the country. Some of the ERDT dives were training dives, conducted primarily in Denver, Colorado, and Raritan Bay, New Jersey on the Environmental Response Team (ERT) 41 foot vessel Biglane. The following missions were supported:

- Hurricane Sandy struck New York and New Jersey in October 2012, causing extensive damage to shore communities with 80 mph winds and high tides 12 feet above normal. The ERT assisted EPA Region 2 with hurricane response activities, including oversight of commercial diving operations at the Sayreville, NJ POTW pump station, on the shore of the Raritan River. Numerous high volume pumps could not drop water levels, in the flooded plant, sufficiently enough to resume operations. The only rapid solution was in use divers to install a new 3 ton sluice gate. The gate was at basement level, under 25 feet of river and sewage water. Work was conducted in zero visibility. Divers guided the gate onto 32 bolts, with only one quarter inch tolerance. The bolts were tightened down by hand over two days. The ERDT supported the operation with vector scanning sonar (to identify debris in chamber before the diver entered), design of the diver decontamination station, provisioning with chemical resistant dry gloves, evaluation of dive team personnel, and continuous technical support throughout the operation.

- Henry's Dry Cleaner site, Laconia, New Hampshire: ERT divers installed passive pore water samplers (peepers) and collected sediment and water quality samples at six locations in the Winnepesaukee River, adjacent to this Superfund site. Diving was tethered diving, with communications in scuba mode with dry suit and full face mask. There was good visibility in shallow water while using Zodiac vessel. Dive operation was supported by the EPA Region 1 dive team.

- Environmental Security Technology Certification Program (ESTCP), Quantico, Virginia: ERT divers collaborated with ESTCP on the installation and recovery of equipment to assess bioavailability and toxicity to benthic organisms in contact with the sediment. Divers deployed in the Potomac River to assess residual DDT contamination coming off the Quantico Base in an effort to determine the extent of remediation required. Operations were conducted for 14 days. Dives were conducted in shallow water using visual observations to ensure the equipment was sent up properly. Some sediment cores were collected. Diver was on a tether.

- Barnegat Bay, New Jersey: Diver support was provided with the U. S. Geological Survey (USGS) to install and recover 18 inch PVC probes. The probes contained passive sampling vials for phosphates and nitrogen. This study was designed to evaluate the distribution and level of nutrients at variable depths in the bay. Diving was conducted in shallow water with the diver in a wet suit and on tether.

- Lake George, NY: Diver support was provided to Scientific Diving International (SDI) for an ongoing study of native freshwater mussels. Diving involved the collection of samples from a study population of mussels. Diving was in good visibility using scuba.

- United Heckathorn, Richmond, California: The ERT provided scientific and polluted water diver support for deployment of passive pore water samplers at the United Heckathorn NPL site. ERT divers, in coordination with, EPA Region 8, the Massachusetts Institute of Technology, and contractors, deployed Polyethlene devices (PEDs) at ten locations for passive adsorption of pesticides. All dive operations were polluted water dives. All divers were fully enclosed, tethered with communications, and followed diver decontamination procedures upon exit.

B. Dive Statistics

Number of Dives	
Scientific	73
Training	13
Proficiency	31
Total Dives	117

C. Diving Accidents, Injuries, or Incidents:

None reported

D. Diving Personnel: Eight Divers, including six Divemasters.

Four EPA divers are managed by ERDT: These include two Scientific Divers in Region 9, one Divemaster in Region 8, and one Scientific Diver in Puerto Rico (R2). These individuals have conducted work and/or training dives with ERT, but do not currently have an EPA dive team in their respective regions or local area.

ERT continues to work with EPA R10, Commercial Divers, NOAA, Navy, Public Safe
divers, and others regarding polluted water diving equipment and procedures.

ERT diver enters the water to recover PED samplers at the United Heckathorn Sit

3. Region 3 Dive Unit

A. Diving Activities

- Artificial Reef Study of the sunken vessels Radford and Poole, in Delaware coastal waters: At the request of the Delaware Department of Natural Resources and Environmental Control, Division of Fish and Wildlife (DNREC), the Region 3 Scientific Diving Unit (SDU) obtained biological samples from the Ex USS Arthur W. Radford (Radford) and the Ex FW Gregory Poole (Poole).The Radford is a 563 foot long by 55 foot wide retired US Navy Destroyer that was sunk as an artificial reef on August 10, 2011 approximately 26 nautical miles (NM) east southeast of Indian River Inlet in Delaware. The Poole is a retired 175-foot Navy minesweeper which later became a menhaden harvesting ship, before it was sunk as an artificial reef around December 2, 2007. The ship lies very near the Radford at a similar depth. The epibentic scrap samples along with diver observations and video will be used to study the succession of organisms colonizing the reefs.

EX USS Radford Year – A carpet of young, thumbnail sized Blue Mussels provide food for the resident Black Sea Bass while Pelegic Bluefish Circle the Reef

EX FV Gregory Poole Year 5 – Diverse benthic community of mature, large Blue Mussels, and Anemones, Hydroids and Sponges

- Epibenthic study of artificial reef off Lewes, Delaware: At the request of the University of Delaware (UDEL), five EPA scientist/divers embarked on the Research Vessel Hugh R. Sharp to obtain epibenthic samples of organisms growing on artificial reef structures 16 NM off the coast of Lewes, Delaware. The primary objective of this survey was to collect tissue of organisms for stable isotope analysis that will help define the food web interaction of the flora and fauna of the "Redbird Reef". The challenging conditions in the North Atlantic in December were exacerbated by mixing of the water column following Hurricane Sandy and reduced the efficiency of the collection. Enough biomass was obtained to develop protocols for the analysis. In addition, small cameras attached to the head of each diver recorded essentially everything the diver observed during each dive. This eliminated the need for a diver dedicated to filming and resulted in more footage for analysis following the dives. The RV Sharp's multibeam was used to map the bottom and structures and obtain the coordinates for targets selected for study. UDEL also mapped the EX USS Radford and EX FV Gregory Poole during the survey.

- Training Dives: On May 29, 2013 the Scientific Diving Unit (SDU) conducted re-qualification and training dives. Objectives included: testing recently serviced SCUBA regulators; conducting rescue diver scenarios; and practice in the use of Aga masks and communication equipment. Eight members of the SDU and one Trainee diver participated in the operation. Buddy pairs practiced buoyancy control and compass navigation. Divers practiced retrieval of a "non-responsive" diver in a controlled ascent from depth without assistance, followed by a 50 yard surface rescue tow.

- Freshwater Mussel study in tidal Delaware River: Responding to a request by the Partnership for the Delaware Estuary (PDE) and the Academy of Natural Sciences, Region 3's Scientific Dive Unit (SDU) sampled freshwater mussel populations along transects at two locations in the tidal Delaware River. SDU Divers collected mussel samples from the river bottom near the Betsy Ross Bridge. Scientists from the PDE, the Academy, and the Oceans & Dredged Disposal Team in EAID's Office of Monitoring & Assessment (OMA) were topside collecting water quality data and identifying and measuring collected specimens. The PDE had conducted a snorkeling survey of mussels in the river in 2012 and requested EPA assistance in sampling deeper water to determine the effect of depth and bottom type on the freshwater mussel populations. PDE is a National Estuary Program partner that launched the Freshwater Mussel Recovery Program (FMRP) in 2007 to conserve and restore native freshwater mussels in the Delaware Estuary.

Freshwater Mussel Survey at Foot of Betsy Ross Bridge

- Pennsylvania Department of Environmental Protection (PADEP) Large Rivers Assessment Survey, Delaware River: The Region 3 Scientific Diving Unit (SDU) responded to a request by the Pennsylvania Department of Environmental Protection. The SDU provided assistance for the freshwater mussel portion of the Large Rivers Assessment Survey of the Commonwealth. The assessment is part of the Environmental Monitoring and Assessment Program (EMAP). Sampling was conducted at three locations on the Delaware River in Yardley, Byram and Belvidere, on August 20, 21 and 22, 2013, respectively. EPA Diver/ scientists characterized the river bottom habitat and reported conditions via wireless communication to the surface, shot HD video to photo document conditions, collected mussels and assisted PADEP scientists topside in identifying, weighing and measuring collected species.

- Dive Site Assessment Tool (DSAT): The SDU began using DSAT for dive site planning in FY 2013. This is an Intranet based GIS tool developed by EPA Region 3 to provide a spatial presentation of data, information and resources in the vicinity of proposed diving and aquatic operations sites. This tool provides capabilities to help the users assess the past and current aquatic and terrestrial conditions to better understand the site and surrounding area. Data layers in DSAT also identify possible risks, support services, as well as access and navigation to site. It is located at: http://r3arcgis1.r03.epa.gov/dsat/ and will open with any web browser (behind EPA firewall).

B. Dive Statistics

Number of Dives	
Scientific	90
Training	18
Proficiency	95
Total Dives	203

C. Diving Accidents, Injuries, or Incidents: None reported.

D. Diving Personnel: Twelve divers, including six Divemasters.

4. Atlanta - Region 4 Dive Unit

A. Diving Activities:

- NOTE – Unit divers did nearly all of this year's diving under management of the Athens Unit.

- Two separate projects used dive operations this year; both were managed by Mel Parsons, Athens Dive Unit Officer. The first one was in support of an Interagency Agreement with the Charleston District, U.S. Army Corps of Engineers to obtain real time, *in situ* current and wave measurements at multiple sites offshore Charleston, SC in support of the proposed Charleston Harbor Deepening Project (5 weeks). The second project was related to habitat assessment within the Fernandina ODMDS area; conducted aboard the *NOAA Nancy Foster* (1 week).

- Proficiency – One dive day was dedicated to this purpose held at Lake Hartwell. One diver is involved with the Georgia Aquarium and conducts a number of dives to help with aquarium maintenance on a monthly basis.

- Training – The unit had no separate dive operations dedicated to this purpose. Unit members took the PADI Equipment Specialist Course.

B Dive Statistics:

Number of Dives	
Scientific:	5
Training:	0
Proficiency:	28
Total Dives	33

C. Diving Accidents, Injuries, or Incidents: None reported.

D. Diving Personnel: Eight divers, including four Divemasters.

5. Athens – Region 4 Dive Unit

A. Diving Activities

- Sediment oxygen demand/nutrient studies: Sediment oxygen demand (SOD) rates are determined through the deployment of aluminum chambers over the sediments. Four replicates and two blank chambers are deployed at each station. The replicate chambers are sealed directly to the bottom while the blank chambers are sealed as a unit and are not in contact with the bottom sediments. The blank chambers are filled with ambient water to measure the water column respiration. Nutrient exchange studies are conducted with the same chambers and requires a long incubation period, generally all day or overnight. Water samples are then pulled from the chambers by divers and analyzed for nutrients.

- Ocean Dredged Material Disposal Sites (ODMDS): These surveys are to characterize the sediment, water and benthic infaunal community within and adjacent to the ODMDS. Conducted habitat assessments at the Fernandina ODMDS from the NOAA vessel NANCY FOSTER.

- Deploy/retrieve instruments: Deployment and retrieval of current meters Ocean Dredged Material Disposal Sites (ODMDS). Five Acoustic Doppler Current Profiler (ADCP) meters were deployed offshore of Charleston, SC in November, 2012. Meters are serviced quarterly and will be retrieved in February, 2014.

- Training Dives: Training dives consisted of dry suit and AGA training for new divers as well as bailout training for everyone.

B. Dive Statistics:

Number of Dives	
Scientific:	266
Training:	6
Proficiency:	10
Total Dives	282

C. Diving Accidents, Injuries, or Incidents: None reported.

D. Diving Personnel: Six divers, including three Divemasters.

6. Gulf Ecology Division (GED) Dive Unit

A. Diving Activities:

- The Gulf Ecology Division performed multiple diving operations during the 2013 fiscal year. Diving operations were conducted in the Gulf of Mexico, nearshore, inshore, and offshore waters of Pensacola, and the Florida Keys. The dive projects performed included NASA/ EPA Turbidity study in Florida Keys, Gulf Ecology Lab support, instrument deployment, instrument retrieval download and service, and inspection and service of seawater intakes for the GED lab. Diving Assistance was provided to Region 4 during Ocean Dumping Survey off Fernandina. The team also assisted The Nature Conservancy in their coral recruitment program in the Florida Keys. Along with a couple of training days. The GED dive team accounted for a total of 242 individual working dives since our last reporting date. The team also recorded 36 training dives during the course of the year. Dives made by other EPA employees during joint operations were not included in the total count.

- NASA Turbidity Study Florida Keys**:** The U.S. Environmental Protection Agency (EPA) is collaborating with the National Aeronautics and Space Administration (NASA) to explore the potential of using satellite imagery in support of water quality standards in Florida. The research has two components: 1) use existing satellite imagery to assess short-term and long-term averages and trends in water quality constituents (1980s to present), and (2) analyze the satellite data products in comparison to changes in the extent and condition of SAV and coral reef habitat. The work supports the objectives of the Clean Water Act, which is to "restore and maintain the physical, chemical, and biological integrity of the Nation's waters". Specifically, the work supports the development of tools to monitor water clarity in relation to water quality standards. Nutrient and sediment effluent from Florida watersheds are expected to be at levels sufficiently low to protect healthy well-balanced natural populations of flora and fauna. The project uses two survey procedures in a tiered approach to characterize benthic habitat and biota at high and low water clarity regions in Florida Keys as identified through satellite color products. The satellite color products for the Florida Keys were examined using Geographic Information Systems (GIS) for the intersection of coral reef habitat, high or low water clarity, and a narrow depth range to avoid habitat variation. The benthic habitat was determined by three criteria: 1) a *coral reef and hardbottom substrate* layer from NOAA benthic substrate maps; 2) the high and low water clarity layer was from composited satellite imagery of Kd488 for years 2004-2012 (using MODIS images); and 3) the depth range 10-18 ft was from bathymetry layers.

  Divers completed the following:

  - ❖ Located underwater stations

- ❖ Enumerated the number and species of coral colonies located along a 25 meter transect
- ❖ Estimate class size and for each colony along the transect
- ❖ Enumerated reef fish and calculated the biomass available
- ❖ Octocorals, gorgonia, macroinvertebrates, and substrate characterizion
- ❖ Photograph representative samples of each class size for computerized determination of surface area and living tissue
- ❖ Conduct disease and bleaching surveys
- ❖ Assessed % living/dead, size class, imaging, disease frequency, bleaching and numbers of coral colonies v transect surveys.
- ❖ Mapped and videoed the sites and diseased corals.
- ❖ Conducted fish surveys

- Ocean Dumping Survey with Region 4**:** Mel Parsons served as Divemaster and Jed Campbell worked for Mel for the week. This effort was aboard the NOAA ship *Nancy Foster* and will be reported by Region 4 Athens.
- Training Dives: GED divers made inspection dives around the GED west dock to search and remove any hazards. Ladders were removed, cleaned, and reinstalled. Barnacles, oysters, and fishing gear were removed from the pilings. We made two offshore training days with dives to depths of 90 ft. Dives were made in order to test equipment (Superlite- 27, wireless, hard wire, EXO-26, a multitude of Aga mask and regulators) during the year. All diving cylinders (40), were visually inspected and those needing hydostatic test were serviced. All regulators were annually serviced and BCD's were inspected. All oxygen systems were inspected and tested. All harnesses ropes and other life support systems were inspected and tested.

B. Dive Statistic

Number of Dives	
Scientific	242
Training	36
Proficiency	0
Total Dives	278

C. Diving Accidents or Incidents**:** None reported**.**

D**.** Diving personnel: There are six GED divers, including five divemasters. Additionally, two divers, without an active unit, are managed through the GED dive unit.

7. Region 6 – Dallas, TX

A. Diving Activities

- The Region 6 Science Diving Team experienced limited activity in FY12. Almost all dives were training and proficiency dives, in inland water bodies, under simple diving conditions. The exceptions were the dives by the UDO as part of the special operations training dives in conjunction with annual Scientific Diver Training at the GED facility in Gulf Breeze. The team of 5 divers (now 4) logged a total of 34 EPA dives; although all but one team member also logged personal recreational dives outside of work. Four of the five divers conducted at least one dive in a dry suit, and all other dives were in wetsuits with standard scuba.

- From August 2012 through the remainder of the fiscal year; dive readiness for all divers lapsed due to inactivity for greater than 90 days. At present, 3 of the 4 divers in the Region 6 dive team have been recertified and are qualified to dive. The 4th diver is current on medical and other training requirements but needs to be recertified by the UDO.

- The fate of the Region 6 dive team is currently being deliberated due to the lack of mission related work. The Region 6 management team decided to continue the science dive team for at least one more year coupled with a renewed effort at outreach and education of Region 6 managers, scientists, and other staff about the capabilities of science diving and potential benefits.

B. Dive Statistic

Number of Dives	
Scientific	0
Training	12
Proficiency	10
Total Dives	22

C. Diving Accidents, Injuries, and Incidents: None reported.

D. Diving Personnel: Four divers, including one Divemaster

8. Region 10 Dive Unit-Seattle, WA

A. Diving Activities

- During FY13 the Region 10 unit had ten scientific diving events, some of which were multi-week operations. There were also 4 training events. There were 4 projects in support of EPA's Superfund program. Six projects were related to natural resource, water, or habitat quality issues. Most scientific dives this year involved use of free swimming SCUBA. Training was conducted to maintain proficiency with surface supplied diving operations. During FY2013, Region 10 (R10) had the following work projects:

- Duwamish Superfund Site Sampling: Divers supported the Superfund program by using their scientific sample collection expertise in deploying passive samplers on the river bottom in this estuarine area to evaluate bioavailabilty of PCBs in the area in a study led by principle investigators at MIT. EPA divers both provided in water sample collect support, as well as invaluable QA/QC formulation for the project QAPP to ensure the data was of high quality in making cleanup decisions—two separate dive operations for deployment (November 2012) and retrieval (January 2013).

- Derelict Gear Mapping and Observations: Derelict gear was located and documented as to its size, extent, potential to entrap aquatic life, or aquatic life trapped within it as part of the Puget Sound and Coastal Americas initiatives (Region 10 is a sponsor). Scientific divers documented their findings in two different reports to evaluate the type of bottom habitat impacted and preponderance of aquatic life entrapped for use by the Coastal Americas team, and eventual removal of the gear by commercial divers. There were deployments in February, March, April, and May in support of the project.

- Wyckoff Superfund Site outfall survey: Region 10 divers surveyed the condition and discharge of the Superfund site groundwater treatment plant outfall in support of Superfund in May of 2013.

- Willapa Bay Instrument Deployment/Recovery: Scientific divers deployed and retrieved scientific instruments vital to implementation of the Clean Water Act and updating of EPA's 303d list of impaired water bodies in June of 2013. EPA and State staff worked jointly to obtain data for this estuary—a key area in supporting a variety of aquatic life. Scientific divers ensured that the instrument deployment took place per established procedures such that the data would be not only usable, but of high quality. A variety of government entities have recognized the critical importance estuaries play in the overall ocean ecosystem, which EPA Region 10 has chosen to support via direct scientific data collection. Data collected will be utilized in a scientific report on the health of regional estuaries.

- Wyckoff Superfund site outfall and cap survey: Region 10 divers surveyed about 500 feet of the outfall and noted significant damage in two sections of pipe. Region 10 divers also surveyed an area of the Superfund site cap suspected of requiring cap repair and provided detailed observations to the project manager for decision making purposes.

- Chetco River Ocean Material Dredge Disposal Site Evaluation: R10 divers surveyed a number of areas noted on 2008 Bold and 2012 USACE sidescans that could be rocky reef areas of high habitat value. Gopro still photos and video were provided to program staff.

- Elwha River Dam Removal Benthic Survey in the Strait of Juan de Fuca: USGS, in collaboration with EPA and the Elwha Tribe, has conducted dive surveys to assess the effects of Elwha Dam removal on shallow, subtidal benthic communities. Dive surveys were initiated in 1994 by USFW and EPA to characterize nearshore biological communities prior to dam removal. Due to the length of time between authorization and funding for the dams' removal, these surveys had to be reinitiated in 2008 by USGS. EPA and USGS divers collaborated in 2011 to characterize the seafloor community before dam removal. Using two vessels, well over a hundred dives were performed, with one diver focusing on algae characterization and one on invertebrates along 30 meters of two transect lines laid out east and west from a fixed location. Later, uniform point counts were conducted to gather statistically significant habitat information that can be used to evaluate changes as sediment is released. All information was recorded on one of 3 separate data sheets for each transect. Divers counted well over a hundred different species during their surveys. The study found that community structure in the Elwha nearshore was partly controlled by substrate composition and seafloor relief. These results highlight the importance of seafloor characteristics and suggest that different habitats and associated communities may respond differently to sedimentation. The dive unit's efforts in measuring community responses to short and long term changes in deposited and suspended sediments before and after dam removal offers an unprecedented opportunity to gain insight relevant to managing these important marine resources, for the largest dam removal effort to date. This year was the second for the survey in evaluating sediment deposition in the Strait, which resulted in a drastic die off of algal species in 2012. In 2013, alga began a comeback.

B. Dive Statistics

Number of Dives	
Scientific	112
Training	24
Proficiency	62
Total Dives	198

C. Diving Accidents, Injuries, and Incidents: One diver filed an injury report for barotrauma to the eardrum. This was unavoidable as ear clearing had been discussed with the diver, but nevertheless round window trauma occurred necessitating several weeks of recovery time.

D. Diving Personnel: Eight divers, including five Divemasters.

9. Western Ecology Division (WED): Corvallis, OR

A. Diving Activities

- Dive activities during FY 2013 consisted of working, proficiency and training dives. Working dives included partial removal of seagrass root window equipment and recovery of an acoustic Doppler current profiler.

- One diver attended the Pacific Northwest Diving Safety Officer meeting in Newport, OR in Jan. 13 and participated in four training dives. One diver is involved with the Oregon Coast Aquarium and conducts a number of dives to help with aquarium maintenance on a monthly basis.

- Due to delayed annual physicals and the partial government shutdown, several divers were re-qualified in early Dec. 2013.

- WED divers continue to have difficulty maintaining proficiency by diving at bimonthly intervals, and overall the need to dive has lessened over the last four years due to a shift in projects.

B. Dive Statistics:

Number of Dives	
Scientific	9
Training	15
Proficiency	50
Total Dives	74

C. Diving accidents, injuries, or incidents: None reported

D. Diving Personnel: Six divers, including five Divemasters