

US EPA ARCHIVE DOCUMENT

**Environmental Protection Agency  
National Dive Safety Program**

**2012 Annual Report**



**April 2013**

## 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 1,540 dives in 2012, involving nine EPA dive units and 72 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

## 2012 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 on line at the SHEMD site: URL: <http://intranet.epa.gov/oaintran/shemd/divmanuals/index.htm>.

This report is a summary of the EPA's National Diving Safety Program (NDSP) activities from October 1, 2011, through September 30, 2012. 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 1,540 dives in FY 2012 (Figure 1), involving nine EPA dive units, and a total of 72 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 2012 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

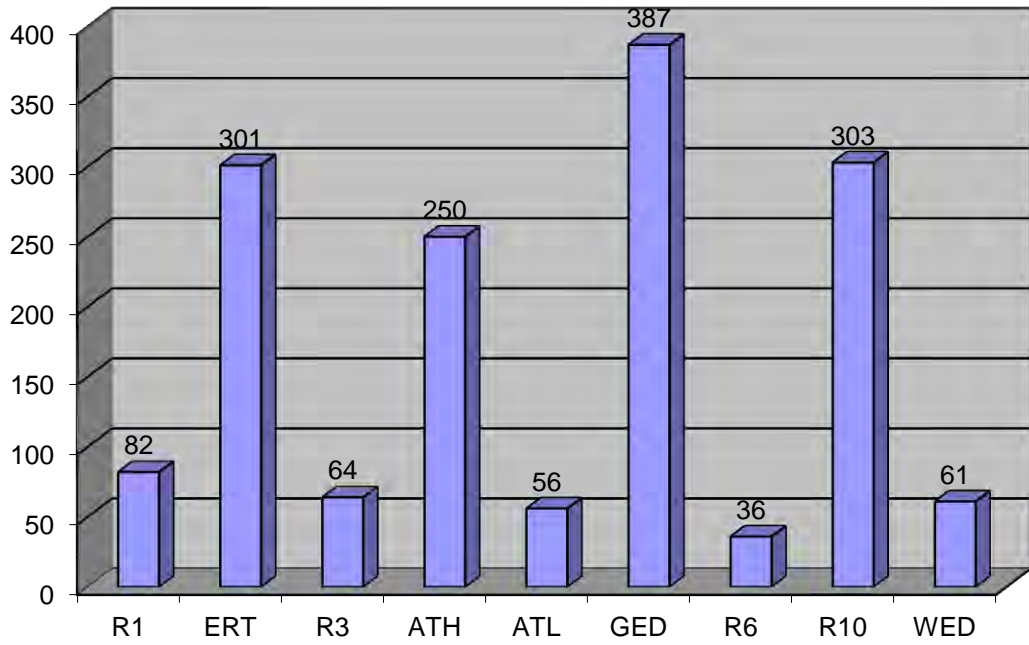


Figure 2: Number of EPA Divers by Unit

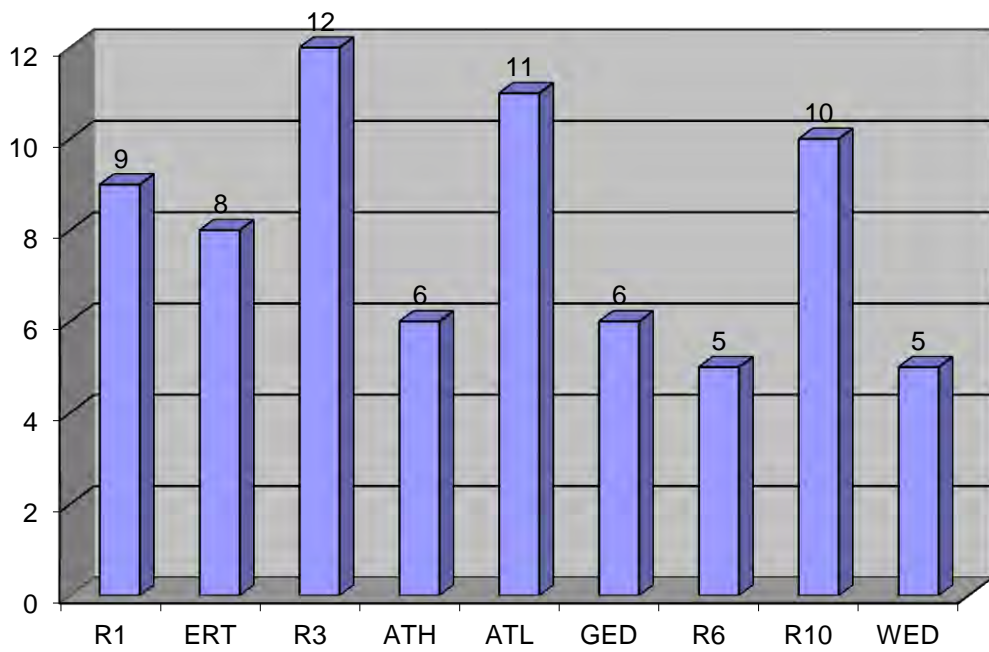


Figure 3: EPA Unit Dive Officers

## USEPA Regions Unit Dive Officers



### 2012 EPA Diving Safety Board Meeting

The 2012 EPA Diving Safety Board met at the EPA Gulf Breeze lab in Gulf Breeze, Florida, on May 17-18, 2012.

Agenda items included:

- Dive Safety Manual Revisions
- Physical Fitness Standards for Diving
- Use of Automated External Defibrillator (AED)
- Use of Dive Computers
- Safety Audits
- Discussions/Reports from Regional Dive Units

## Training

The EPA National Diver Training Program was hosted by the Gulf Ecology Division on May 21-25, 2012. The sessions were conducted at the EPA Diver Training Center in Gulf Breeze, Florida and funded through the support of offices listed below.

Office of Water  
ERT  
SHEMD  
Region 1  
Region 2  
Region 3  
Region 4 Athens  
Region 6  
Region 10



Scientific Diver gaining surface supply experience.



Advanced Operations, undisclosed location, Gulf of Mexico

Diver training provides instruction to EPA researchers in scientific diving techniques. The levels of training included: scientific diver candidates, divemaster candidates, and advanced operations divers. Participants from throughout EPA were in attendance to instruct, participate, and observe during the training program. EPA participants were from the Office of Water, SHEMD, EPA Regions 1, 2, 3, 4, 6, 8, 10; ERT, and GED. Non EPA participants were individuals from the U.S. Army, State of Florida, State of Tennessee, Public Safety Divers, and the University of West Florida. Also in attendance were several diving experts from across the country. There were 36 active participants involved in the training. Guest and observers were not included in this count, notably Craig Hooks, the Assistant Administrator for the Office of Administration and Resources Management (OARM) at EPA, and SHEMD senior management, Wesley Carpenter, Director, Safety, Health and Environmental Management Division. Over the course of the training, including the advanced operations dives, there were 207 training dives logged. Listed below are a few of the aspects that were covered during the training event.

- EPA diving safety policy
- Principles of scientific diving



- Diving accident management
- Oxygen administration
- Contaminated water diving
- Decontamination procedures
- Drysuit diving
- Oxygen enriched air diving “Nitrox”
- Surface supply diving
- Full face positive pressure mask
- Diver –to- surface communications
- Compressed gas handling
- Lift bag methods
- Diving physiology
- Black- out diving
- Diver-to-diver communications
- Rebreather demonstrations
- Underwater video and photography

### **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 2012, EPA established reciprocity agreements with:

- U. S. Department of Commerce, National Oceanic and Atmospheric Administration
- U. S. Geological Survey
- Scientific Diving International
- The Nature Conservancy
- Massachusetts Division of Marine Fisheries
- University of Washington
- Lower Elwha Klallam Tribe
- University of Georgia

# 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.

- Provincetown Harbor, MA. Inspected and videotaped newly installed “low impact” moorings.
- Narragansett Bay, RI. Collected blue mussels for bio-accumulation studies.
- Boston MA. Harbor. Collected video of benthic conditions for in-house documentary on the history of Boston Harbor’s water quality.
- Rockport, MA and Jamestown, RI. Conducted requalifying dives and diver fitness assessments.
- Gulf Breeze, FL. One diver assisted with project set-up and training at EPA diver training.
- Quonset Point, RI. Assessed feasibility of conducting dissolved oxygen experiments using diver collected core samples in Narragansett Bay.
- Great Bay and Little Bay, NH. Collected video and still images of eelgrass beds in support of nutrient study.
- Duxbury Bay, MA. Collected video footage of a juvenile sand tiger shark for an in-house documentary on the history of Boston Harbor’s water quality.
- Salem Harbor, MA. Attempted to locate anchor lost from EPA lab vessel.
- Martha’s Vineyard, MA. Conducted sampling of invasive tunicates in support of a Regional Applied Research Effort (RARE) grant study.
- Boston MA, Boston Harbor. Inspected and video-documented impacts on eelgrass bed habitat.

B. Dive Statistics:

<u>Number of Dives</u>	
Scientific	73
Training	9
<u>Proficiency</u>	<u>0</u>
Total Dives	82

- C. Diving Accidents, Injuries, and Incidents: On September 12, 2012, a diver suffered multiple stings to the neck from one or more jellyfish suspected to be clinging jellyfish (*Gonionemus vertens*). Because these jellyfish had been previously observed at this dive site (Stonewall Pond, Martha's Vineyard), all divers were instructed to wear full wetsuits, hoods, and gloves. However, the stung divers' hood was not tucked in at the time the stings occurred. The diver experienced some immediate discomfort in the area of the stings and localized redness. He discontinued diving for the day, and divers tenders thoroughly rinsed the affected area of his neck with vinegar. Afterwards, calamine lotion was applied to his neck, followed by an ice pack. The diver also took an oral antihistamine (Benadral). The diver was observed for several hours during which time his condition appeared to gradually, but steadily improve. The diver indicated that he had no neck discomfort that evening, and all symptoms were gone by the next morning.
- 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 and proficiency dives, conducted primarily at the EPA Dive Training Center, Gulf Breeze, FL, Denver, CO, and Raritan Bay, New Jersey on the ERT 41 foot vessel Biglane. For the year, the ERDT conducted 186 scientific dives, 67 training dives, and 48 proficiency dives, for a total of 301 dives, 141 exposure days, and 11,113 minutes of bottom time. This total includes statistics from EPA divers in Regions II and VIII, who may conduct scientific or training dives with the ERDT.

There were no significant national events (disasters, spills, etc.) which required ERDT or other EPA dive units to coordinate operations on a national scale.

- Oyster Restoration, Staten Island, Raritan Bay, NJ: ERT/EPA R2 continue assisting the NY/NJ Riverkeeper and the New York Harbor High School with diving operations for assessment of oyster growth on gravel substrates constructed for the project. Several times each season ERT divers deploy or collect shell material from random locations in the study plot to identify inhabitants and determine if transplanted oyster spat are able to grow in this location. Factors such as water quality, sediment loading, and natural predation are factors related to survival and growth. Although depths are less than 10 feet, tide changes produce strong currents and make this an excellent local scientific dive. ERT also collects still and video images for the Riverkeeper.

- Elwha Dam Removal Benthic Survey, WA: ERT divers Humphrey and Grossman assisted with R10 diving operations to characterize the benthic community to better determine the potential impact of dam removal. The primary task was identification of algae types along a transect and photo documentation. Tasks were safely completed in current and cold water (46 deg F). See R10 report (S. Sheldrake) for details.
- Gulf Breeze, FL: ERT assisted with EPA annual diver training, including a complete vessel-based diver decontamination demonstration manned by EPA divers and Advanced Dive Operations. One ERT diver attended the training and graduated as a Scientific Diver. A second diver rejoined the Dive Team after a multi- year absence and was recertified as Divemaster. An EPA R8 diver also attended and graduated as a Scientific Diver.
- OSV BOLD/Puerto Rico Coral Survey, PR: ERT divers continue to support the Coral Reef Survey Project conducted during Nov/Dec 2011 off the southern coastline of Puerto Rico. Led by EPA R2 and Gulf Ecology Division (GED), ERT divers provide data collection, dive master support, video transects, and still photo documentation. See GED report (J. Campbell) for more details.
- Former Synergy Site, NH: The ERDT, assisted by R1 divers, conducted diving operations at this former manufactured gas plant (MGP) to determine the extent of sediment contamination in the nearby Sugar River. Single divers were line tended with a Com rope during this polluted water dive. During diver sediment sampling concentrations of coal tar produced oil sheening at the surface. Contaminant migration (oil/PAHs) may be occurring via both surface runoff and ground water recharge to the river. Due to upriver dams and significant changes in flow on a daily basis, Sugar River flow rates were closely monitored via USGS stream gauge.

B. Dive Statistics

<u>Number of Dives</u>	
Scientific	186
Training	67
<u>Proficiency</u>	<u>48</u>
Total Dives	301

C. Diving Accidents, Injuries, or Incidents:

There was an incident during a training dive on the wreck Rum Runner, off Sandy Hook, NJ. After an uneventful first dive, max depth 78 feet, the diver surfaced after 38 min, removed his dry suit, and stated he felt a tingling in his left leg below the buttocks. The Dive Safety Plan was reviewed and the Diver Alert Network (DAN) was contacted. The diver acted normal, was walking around the boat, and exhibited no other symptoms. Based on the assessment, the diver was laid down and put him on oxygen. A field Neuro exam was conducted and concluded that tingling in the left leg was the only issue. After about 15 minutes the tingling went away and the diver was continued on 100 percent oxygen for about 30 min using an oral/nasal mask in demand mode with the MTV-100 regulator. There were no further symptoms shown by the diver with no other ill effects.

There were no elevated risk factors present, such as rapid ascent, no safety stop, exceeding no-deco limits (dive profile on computer was reviewed), no equipment issues, was not a repetitive dive, was a non-strenuous dive. The diver is a non-smoker with no known medical issues, but there was some physical activity the night before. There were follow-up conversations with Dr. Holland and DAN. DAN recommended a two week break from diving for the diver. The DAN physician also said that 99% of divers who experience these Decompression sickness (DCS) type symptoms, such as tingling, seem to just occur without any causative factors identified. As a dive unit we are taking several actions to increase our awareness and communication of potential risk factors for DCS to try to minimize the chance of a reoccurrence.

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

Several EPA divers, including Scott Faller (Scientific Diver), Pete Stevenson (Divemaster, Region 8), Daniel Rodriguez (Scientific Diver, Region 2), and Michelle Rogow (Scientific Diver, Region 9) have conducted work and/or training dives with ERT, but do not currently have a dive team in their respective regions or local area.

### 3. Region 3 Dive Unit

A. Diving Activities

- OSV BOLD Puerto Rico. Coral Reef Study from December 7 through 13, 2011. One diver from the Region 3 Scientific Diving Unit (SDU) participated in a Coral Reef Survey conducted in Puerto Rico aboard the OSV Bold.

- Allegheny River, Freshwater Mussel Repopulation. On May 30, 2012 two divers from the Region 3 SDU assisted the US Fish and Wildlife Service (FWS) in a qualitative freshwater mussel re-survey on the Allegheny River at Tailwaters of Allegheny Lock and Dam #5 (Pool 4). The process involved scuba diving between 7 and 19 feet in depth, excavating a small hole on the bottom of the river and ‘planting’ an adult freshwater mussel in the hole within the designated area.
- S Dutch Springs Quarry in Bethlehem, PA., Spring Training Proficiency Dive. On June 20, 2012, eight members of the EPA Region 3SDU, and one dive tender, participated in an equipment testing and requalification dive at the Dutch Springs Quarry in Bethlehem, PA. Seven divers logged two dives each in the spring fed, mid-50°F, freshwater quarry. The purpose of the operation was to test Scuba regulators and equipment that had been serviced over the winter and to re-qualify divers prior to mobilizing for mission related activities this field season. The EPA Dive Safety Manual requires a re-certifying program for resuming scientific diving after a lapse of three months or more of diving. Divers practiced compass navigation skills, buoyancy control, and use of dive computers in planning for a second dive. During the exercise, divers also responded to an emergency scenario where a diver had to be rescued from the water and administered first aid.
- Gulf Breeze, FL., National EPA Scientific Diver Training. During the week of May 21, 2012, One diver attended the annual training and participated and assisted with training of the working divers and dive masters. The Region again supported the National Training Program by providing Hard Line Communication, AGA masks and specialized harnesses, Buoyancy Control Devices, and regulators with bailout bottle for the students at the training. The region had one diver and one divemaster candidate attend the training.
- Wilkes-Barre, PA., Freshwater Mussel Survey. On August 28, 2012, four members of the SDU completed biological monitoring of the Susquehanna River. The PA Department of Environmental Protection (PADEP) requested SDU assistance for the freshwater mussel portion of their Large Rivers Survey of the Commonwealth. Using the PADEP protocol, three EPA divers conducted 12 dives and reported real time to the surface via wireless communication on habitat conditions at the river bottom. Divers collected and brought to the surface live and dead mussel shell for species identification by the PADEP Chief Scientist. Data from the successful field sampling will become part of the Commonwealth's important large rivers assessment.

B. Dive Statistics

<u>Number of Dives</u>	
Scientific	33
Training	16
<u>Proficiency</u>	<u>15</u>
Total Dives	64

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

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

**4. Atlanta - Region 4 Dive Unit**

A. Diving Activities:

- Tampa, FL. Two separate project dives throughout the year. One was related to habitat assessment on top of the disposal berm within the Tampa Ocean Dredged Material Disposal Site (ODMDS). Another was in support of ongoing and upcoming Interagency Agreements with various Districts within the U.S. Army Corps of Engineers to obtain real time, *in situ* current and wave measurements at selected ODMDSs throughout Region 4. The unit performed one training dive day at indoor pool (UGA, Athens), to check out new diver candidate and to allow four divers to complete fitness demonstration skills.
- Fort Pierce and Fernandina Beach, FL. The dive unit participated in two joint offshore projects aboard OSV Bold with Athens Unit - Ft. Pierce ODMDS Status & Trends Study, Oct 2011 (4 ATL divers) and Fernandina ODMDS Habitat Assessment Study (1 ATL diver), Apr 2012.

B. Dive Statistics:

<u>Number of Dives</u>	
Scientific:	51
Training:	5
<u>Proficiency:</u>	<u>        </u>
Total Dives	56

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

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

**5. Athens – Region 4 Dive Unit**

A. Diving Activities

- Sediment oxygen demand/nutrient studies were performed at various locations.
- Dives at Ocean Dredged Material Disposal Sites (ODMDS) were performed at various locations to characterize the sediment, water and benthic infaunal community within and adjacent to the ODMDS. Divers are responsible for collecting sediment cores for laboratory analysis and benthic macroinvertebrate analysis, as well as taking bottom photographs and recording observations and conducting habitat assessments
- Charleston, NC, deploy/retrieval of instruments. Divers performed deployment and retrieval of current meters at Ocean Dredged Material Disposal Sites (ODMDS). Five Acoustic Doppler Current Profiler (ADCP) meters were deployed offshore of Charleston, SC in November. One meter is 30 miles offshore.
- Training Dives. Training dives included approximately 20 dives offshore of Pensacola during diver training with depths ranging from 90 -130 feet as well as 6 dives as an introduction to re-breathers.

B. Dive Statistics:

<u>Number of Dives</u>	
Scientific:	202
Training:	48
Proficiency:	0
Total Dives	250

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: GED carried out several scientific diving operations. The multiple dive projects performed included Coral Surveys, acoustic doppler current profiler (ACDP) data download and service, and inspection and service of



seawater intakes for the GED lab. Divers deployed real time data loggers with satellite uplink. Divers also deployed electronics packages for long term monitoring. The GED dive team accounted for a total of 387 individual dives since our last reporting date. Dives made by other EPA employees, during joint operations, were not included in the total count.

- Gulf Breeze, FL. 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. 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 hydrostatic test were serviced. All regulators were annually serviced.
- Puerto Rico. EPA Divers collected coral reef condition data and photographed corals off the coast of Puerto Rico. These operations in Puerto Rico were in collaboration with other units within EPA's Diving Program. Completion of the Program's overall goal brought into play an ability to estimate biological conditions of coral populations and to help understand associations between coral reefs, reef fish, soft corals, and other macro biota. Estimates of conditions can be used to compare species and populations of coral across reef types, study areas, geographic regions, and can be related to water quality, human influences and bleaching/disease status. Species identification, colony size and the proportion of live tissue on each colony will be recorded in this and future coral surveys. These observations lead to a variety of conventional and unique assessment endpoints which will assist resource managers in tracking changes in coral condition.

Divers completed the following:

- Located underwater stations
  - Enumerated the number and species of coral colonies located along 25 meter transects
  - Estimated class size for each coral colony along the transect
  - Enumerated reef fish and calculated the available biomass
  - Characterized octocorals, gorgonia, macroinvertebrates
  - Photographed samples of each class size for computerized determination of surface area and living tissue
  - Conducted disease and bleaching surveys
  - Assessed percent of living/dead, size class, disease frequency, bleaching and numbers of coral colonies
  - Mapped and video recorded the sites
  - Conducted fish surveys
- Escambia Bay, FL. ADCP deployment and Service. GED divers assisted in the deployment of an environmental monitoring buoy, water quality sondes, and

ADCP in Escambia Bay, under zero visibility conditions. The ADCP was retrieved, downloaded, cleaned, and returned to the mount on a bimonthly basis.

B. Dive Statistics

Total number of dives reported: 387

C. Diving Accidents, Injuries, and Incidents: No serious injuries to report.

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 4<sup>th</sup> 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

<u>Number of Dives</u>	
Scientific	0
Training	3
<u>Proficiency</u>	<u>33</u>
Total Dives	36

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 FY12 the Region 10 unit had six scientific diving events, some of which were multi-week operations. There were also five training events. There were two projects in support of the Superfund program, including the Wyckoff Superfund cleanup site that lasted two full weeks. Five projects were related to natural resource, water, or habitat quality issues. Most dives involved use of free swimming SCUBA. Training was conducted to maintain proficiency with surface supplied diving operations. Region 10 had 188 scientific dives and 65 training dives. Overall, Region 10 had a total of 303 dives (including requalification and off-duty dives). During FY2012, Region 10 had the following work projects:

- Wyckoff Superfund Site Sampling. Divers supported the Superfund program by using their scientific sample collection expertise in deploying solid phase microextraction devices in a clean cap overtop creosote contaminated sediment. Superfund used these data to quantitatively evaluate whether the cap was performing as designed to protect aquatic life.
- Derelict Gear Mapping and Observations. Derelict gear was located and documented as to its size, extent, and 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
- 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. EPA and state staff worked jointly to obtain data for this estuary. 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.

- Duwamish East Waterway Spill Evaluation. A light hydraulic fluid was spilled off of a Port of Seattle dock area into the waterway. The Superfund project manager asked that we evaluate cap impacts, if any. Video documentation was provided showing no visible impacts.
- Quartermaster Harbor/Dockton Habitat assessment. In support of the Puget Sound Initiative, habitat was evaluated to determine if moorage areas were negatively impacting area eelgrass beds, vital to the health of Puget Sound.
- Elwha River Dam Removal Benthic Survey in the Strait of Juan de Fuca. USGS, in collaboration with EPA and the Elwha Tribe, 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. One diver focused on algae characterization and one on invertebrates, along 30 meters of two transect lines laid out east and west from a fixed location. Divers counted well over a hundred different species during the 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 team'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 resources. USGS has funding for one more year of survey work. This year was the first for the survey in evaluating sediment deposition in the Strait, which resulted in a drastic die off of algal species.
- Two training dive operations were conducted at the NOAA dive center to practice rescue techniques, and camera/wireless communication skills, as well as surface supplied diving.
- Pool dives. Most Region 10 divers completed their fitness required tests (every two year requirement) and performed an AGA doff/clear/don with Viking drysuits and dryhoods to ensure proficiency in case this is needed in open water.

- NOAA working diver training. One diver attended working diver training. Their completion certificates will be en route to the Training Director for review and possible issuance of an EPA scientific diver certification.

B. Dive Statistics

<u>Number of Dives</u>	
Scientific	188
Training	65
<u>Proficiency</u>	<u>50</u>
Total Dives	303

- C. Diving Accidents, Injuries, and Incidents: One diver had a reverse ear squeeze during September, 2012 NOAA dive training. The diver is expected to return to diving within a week. The chairman was notified the day of the diving issue.
- D. Diving Personnel: Ten divers, including five Divemasters.

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

- A. Diving Activities: Dive activities during 2011-2012 consisted of working, proficiency and training dives. Working dives included recovery of a sediment grab, recovery of a data sonde, partial removal of seagrass root window equipment and deployment of an acoustic doppler current profiler.

Following skills training, divers were re-qualified for diving. One of our divers is involved with the Oregon Coast Aquarium and conducts a number of dives to help with aquarium maintenance on a monthly basis.

B. Dive Statistics:

<u>Number of Dives</u>	
Scientific	20
Training	6
<u>Proficiency</u>	<u>35</u>
Total Dives	61

- C. Diving Accidents, Injuries, and Incidents: None reported
- D. Diving Personnel: Five divers, including four Divemasters.