U. S. Environmental Protection Agency
National Dive Safety Program

2014 Annual Report

October 14, 2015

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 the EPA Diving Safety Policy.

The EPA National Diving Safety Program conducted 891 dives in 2014, involving nine EPA dive units and 69 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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EPA Diving Safety Program

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INTRODUCTION

This report is provided to the Environmental Protection Agency's (EPA's) Safety, Health and Environmental Management Division (SHEMD), in accordance with the EPA Dive Safety Policy. This policy and the EPA 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 National Diving Safety Program (NDSP) activities from October 1, 2013, through September 30, 2014. The annual reports from EPA Unit Dive Officers (UDOs) serve as the basis for the information contained in this report. Each UDO's Annual Report is available upon request.

OVERVIEW

The EPA NDSP conducted 891 dives in Fiscal Year 2014 (Figure 1), involving nine EPA dive units, and a total of 69 divers (Figure 2). These dives were conducted in a variety of water bodies that included 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 2014 operational year.

The EPA NDSP 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, Massachusetts, and the Narragansett, Rhode Island Lab (R1)
(2) Environmental Response Dive Team, Edison, New Jersey (ERT)
(3) Region 3 Headquarters, Philadelphia, Pennsylvania (R3)
(4) Region 4 Headquarters, Atlanta, Georgia (ATL)
(5) Region 4 Athens Lab, Athens, Georgia (ATH)
(6) Gulf Ecology Division, Gulf Breeze, Florida (GED)
(7) Region 6 Headquarters, Dallas, Texas (R6)
(8) Region 10 Headquarters, Seattle, Washington (R10)
(9) Western Ecology Division, Corvallis, Oregon (WED)

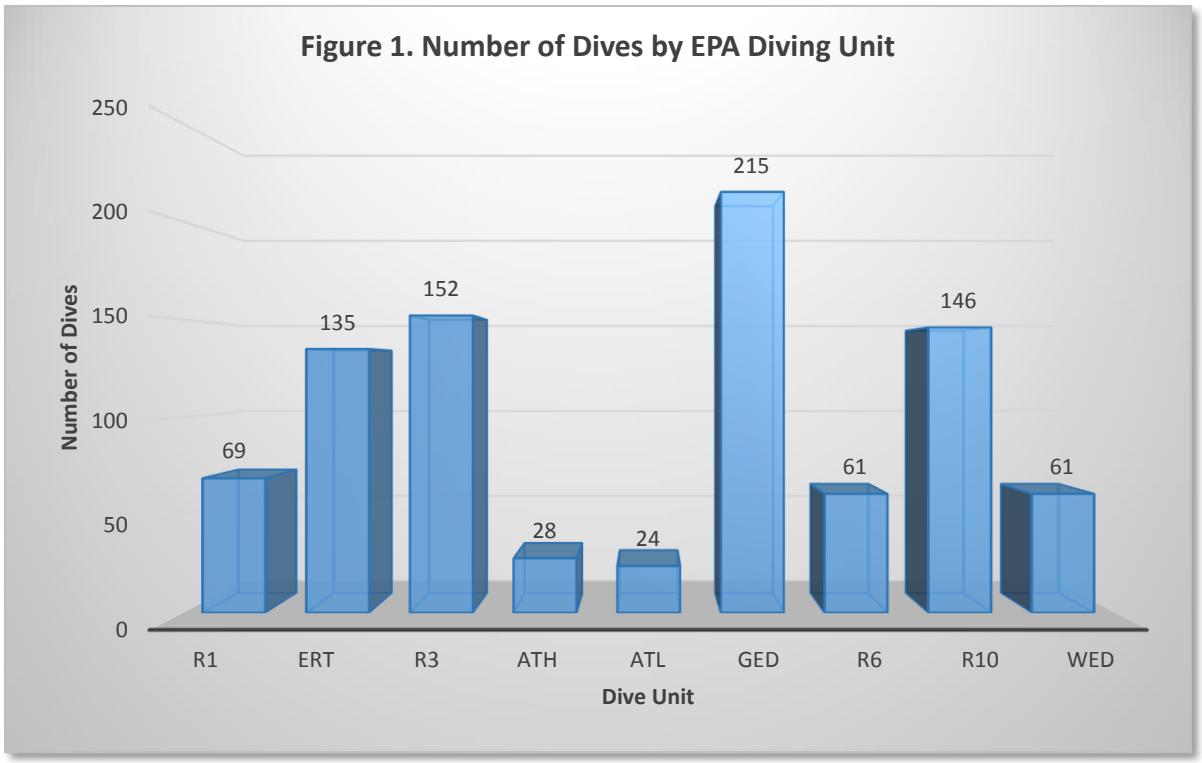


Figure 1. Number of Dives by EPA Diving Unit
Number of Dives
250
200
150
100
50
0
69
135
152
28
24
215
61
146
61
R1
ERT
R3
ATH
ATL
GED
R6
R10
WED
Dive Unit

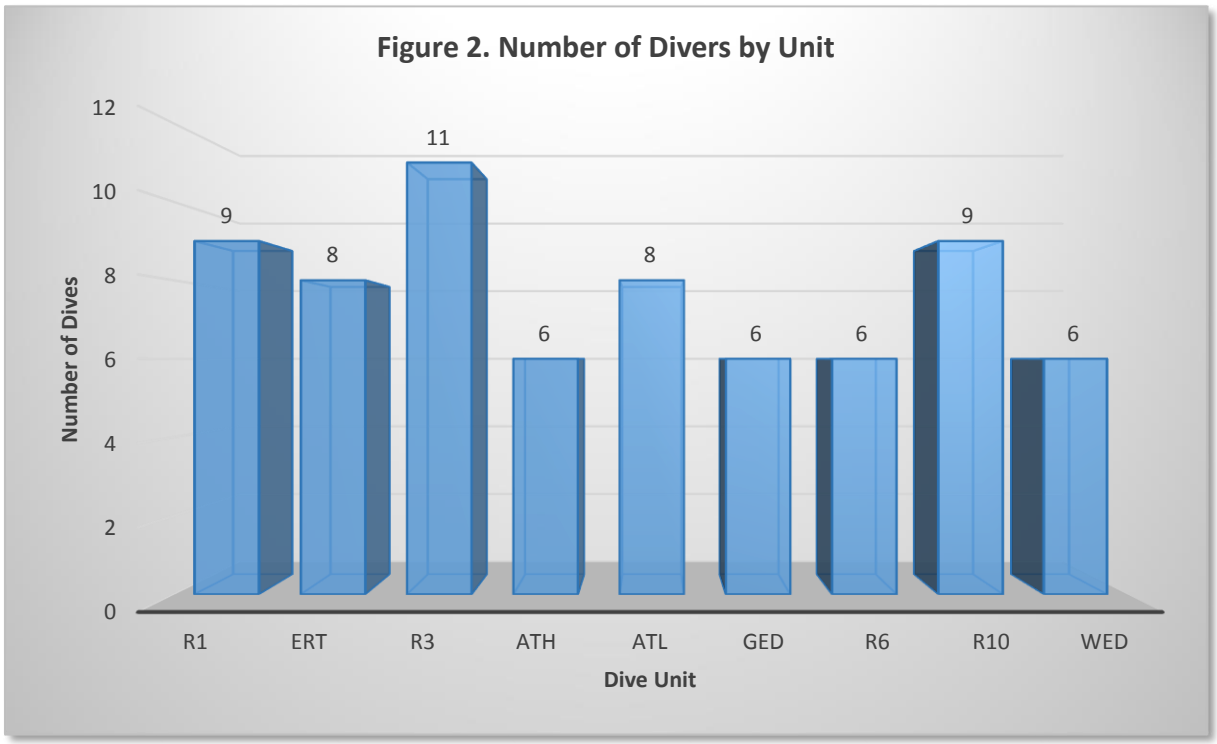
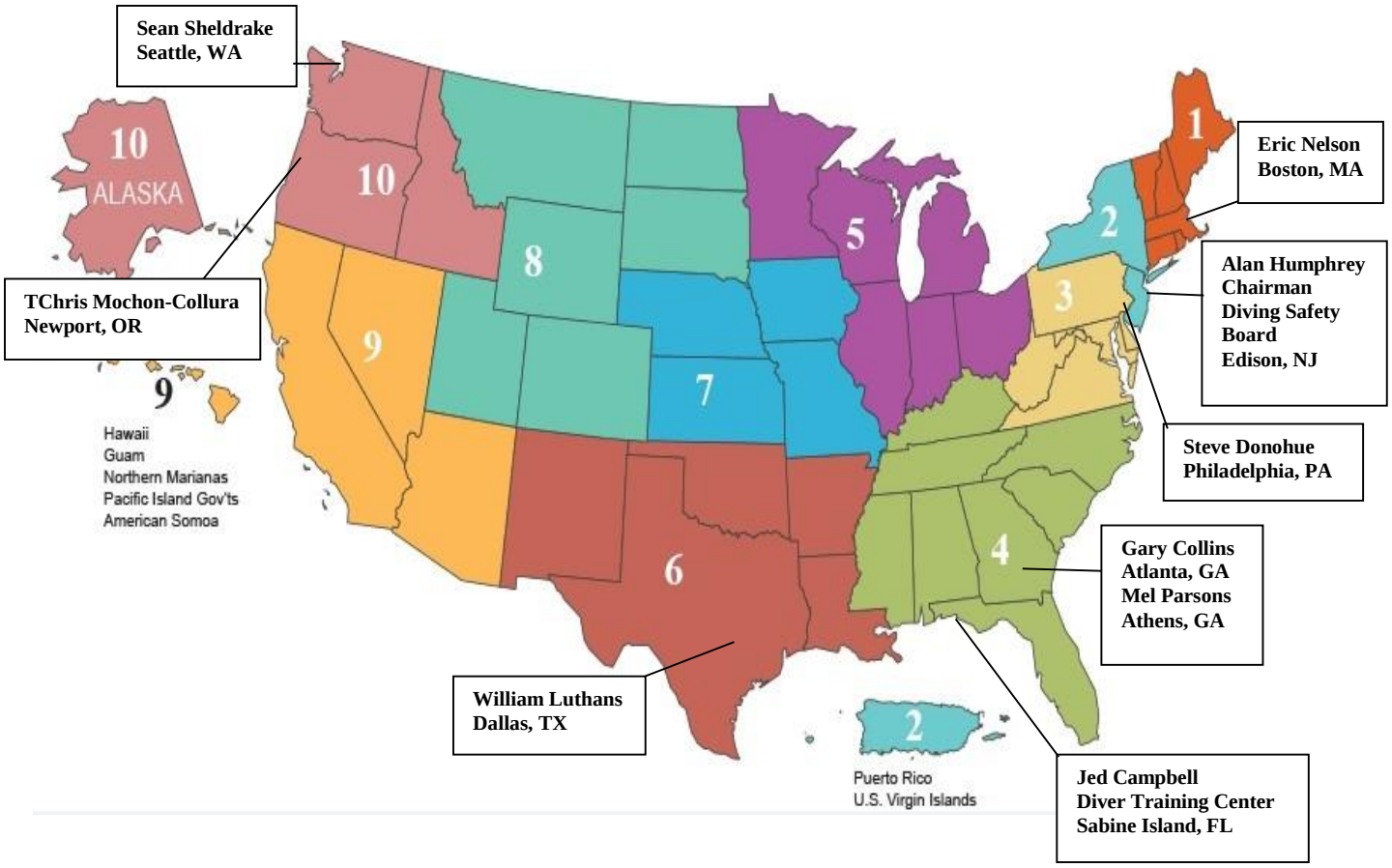


Figure 2. Number of Divers by Unit
Number of Dives
12
10
8
6
4
2
0
9
8
11
6
8
6
6
9
6
R1
ERT
R3
ATH
ATL
GED
R6
R10
WED
Dive Unit

US EPA Regions
Unit Dive Officers



2014 EPA Diving Safety Board Meeting

The 2014 EPA Diving Safety Board conducted its annual meeting at the EPA ORD Gulf Ecology Division Lab, which also serves as the EPA Diver Training Center.

Agenda items included:

- Dive Safety Manual Revisions
- Physical Fitness Standards for Diving and Medical Surveillance Testing
- SHEMD Input and Safety Audits
- Reports from Annual AAUS Workshop
- Emergency First Aid and AED Procedures
- Diver Field Emergency Forms
- Discussions/Reports from Regional Dive Units

Training

The EPA National Diver Training Program was not able to conduct training in Fiscal Year 2014 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 2014, EPA established reciprocity agreements with:

- U. S. Department of Commerce, National Oceanic and Atmospheric Administration
- U. S. Geological Survey
- Alaska Department of Fish and Game
- 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

US EPA Region I Dive Unit, Boston, MA and the Atlantic Ecology Division (AED), Narragansett, RI

- **Diving Activities**

Conducted requalifying dives and diver fitness assessments in Pirate's Cove, Nahant, Massachusetts, following the suspension of diving activities during the winter months (December–June). Pollutant exposure: none expected.

Conducted video transects for presence/abundance of invasive freshwater Asian clam (*Corbicula fluminea*) in the Merrimack River in proximity to Merrimack Station Power Plant, Bow, New Hampshire. Work was conducted in support of the NPDES permit program. Pollutant exposure: none expected.

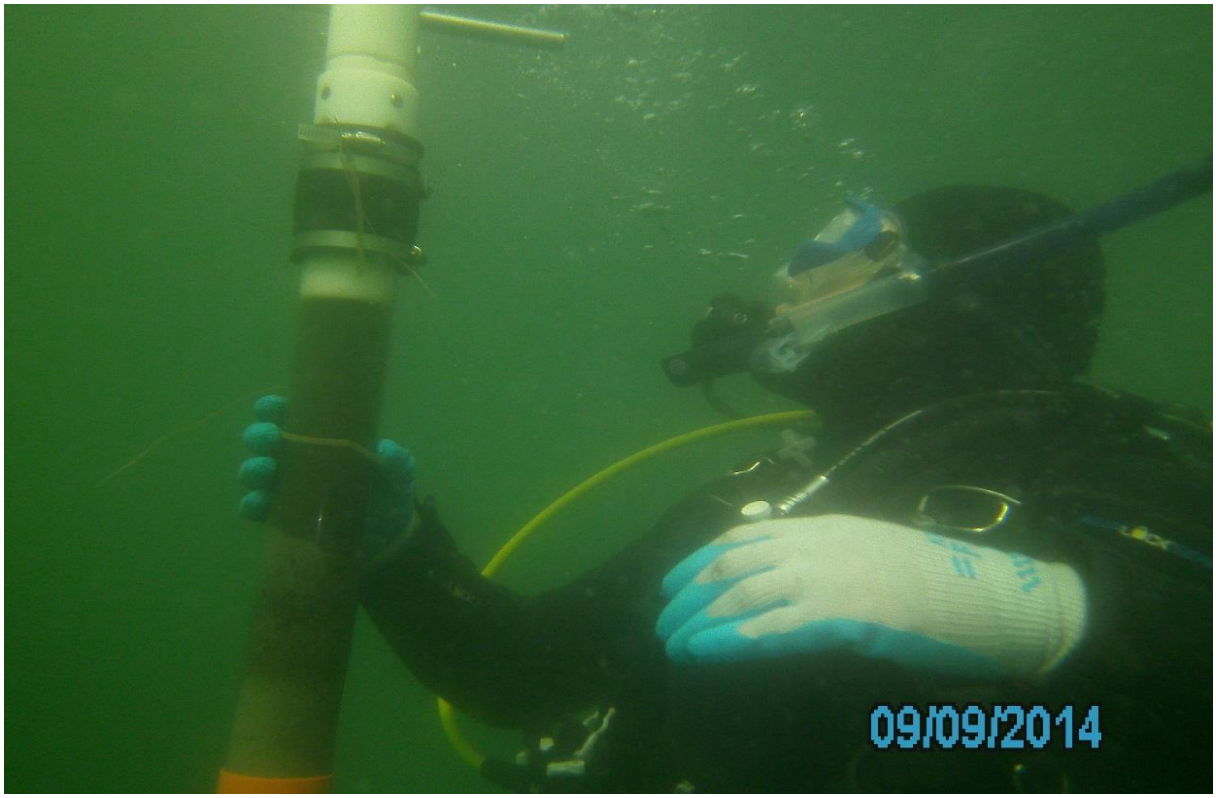
Deployed and recovered temperature and light sensors (Hobos) and collected eelgrass samples in Pirate's Cove, Nahant, Massachusetts. Data supports comprehensive latitudinal study of invasive tunicates and eelgrass in the Northwestern Atlantic Region. Pollutant exposure: none expected.

Deployed and recovered sediment traps and collected sediment core samples in Pirate's Cove, Nahant, Massachusetts, and Niles Beach, Gloucester Harbor, Massachusetts in support of Blue Carbon Initiative. Pollutant exposure: none expected.

Search and recovery of temperature data sensors, and conducted benthic survey on an artificial reef in Boston Harbor. The reef is mitigation for benthic impacts related to the Hubline natural gas pipeline project in Massachusetts Bay. The dive was conducted jointly with the Massachusetts Division of Marine Fisheries under an existing EPA reciprocity agreement. Pollutant exposure: none expected.

Searched for (but did not recover) temperature data sensors, and conducted benthic survey on an artificial (tire) reef in Nantucket Sound, off Harwich, Massachusetts. The dive was conducted jointly with the Massachusetts Division of Marine Fisheries under an existing EPA existing reciprocity agreement. Pollutant exposure: none expected.

Collected video and still images of eelgrass beds in Great Bay, New Hampshire, in support of a state eelgrass monitoring project. Pollutant exposure: none expected.



- **Dive Statistics**

Number of Dives		Number of Exposure Days	
Work:	55	Work:	26
Training:	6	Training:	4
Proficiency/off duty:	8	Proficiency/off duty:	6
Total:	69		36

- **Diving Accidents, Injuries, or Incidents**

None to report.

- **Diving Personnel**

Nine divers, including four dive masters.

Note: The AED laboratory management has decided to discontinue the lab's dive team based on a lack of dive-required work. If the situation changes, the AED dive team may be reactivated based on review by the Diving Safety Board. The Region 1 team has offered dive support to the lab, if needed.

U.S. EPA Environmental Response Team (ERT) Dive Unit, Edison, New Jersey

ERT conducts scientific diving in EPA Region II and across all EPA Regions to support other dive units, or conduct operations in areas where no EPA dive unit exists.

- **Diving Activities**

United Heckathorn Sample Recovery, Richmond, California. ERT provided scientific and polluted water diving support for recovery of passive pore water samplers at the United Heckathorn NPL site, near the EPA Region 9 lab in Richmond, California. ERT divers, in coordination with EPA Region 9, the Massachusetts Institute of Technology, and contractors, deployed polyethylene devices (PEDs) at 10 locations in the Lauritzen channel for passive absorption of pesticides over a four-week period. . All dive operations were polluted water dives, including fully enclosed diver PPE, a single-line tended diver with comms, and diver decontamination procedures. Diving operations had to avoid barge and tug operations at this active ship channel to ensure diver safety. Diving was conducted at depths of 15-42 feet with primarily zero visibility and soft sediments. Based on our log book, the diver swam to a specific piling, descended to the bottom, located the cord tied to the base, followed the cord out into the channel about 75 feet, located the 30-inch PED frame stickup, pulled in the lead weight on the tag line, swam back to the piling, and returned to the dive boat with PED and sample materials. ERT divers were deemed essential by Region 9 during the government shutdown so we were able to travel and recover the unit after four weeks... Region 9 personnel were not available but, fortunately they allowed us to use their equipment, including vehicles, boats, trailers and warehouse space.

Donna Canal NPL Site Investigation. ERT and EPA Region 6 Dive Teams, supported by a vessel provided by the U.S. Fish and Wildlife Service (USFWS), conducted sonar operations and data collection in a one-quarter mile section of canal in search of PCB transformers. ERT used Didson sonar, a type of high frequency imaging sonar providing a sonogram-like image, which is similar to shining a spotlight on the objects in the field of view. Striking video images of the resident fish population, including alligator gar, were also collected. Both digital pictures and video were taken, reviewed and prioritized for the diver survey. Up to 50 targets were identified, although most were low priority. During the week of March 31, the ERT/Region 6 Dive Team again used sonar to guide Region 6 divers to possible man-made targets previously identified by sonar. With surfaced supplied air and hard-wired communications, the sonar operator guided the diver to the selected targets, all of which were other types of man-made objects. The sonar image was so accurate that the operator could say to the diver, "reach out with your left hand," and the object would be in their grasp. Some of the items identified by the divers (feeling with their hands), included a microwave oven, a fuse box, a table saw, a small TV with built-in VCR tape player, an industrial motor, several paint cans, various pipes, blocks, tires, and a large section of concrete pipe with a flange on the end.

Tappan Zee Bridge Instrument Search/Recovery. ERT conducted search and recovery sonar and dive operations in search of scientific instruments in the Hudson River, just south of the Tappan Zee Bridge. EPA Region 2 was examining the impact of bridge construction on historical oyster beds. In March, three data sonds were deployed on a windy day and the vessel was swept downstream so coordinates were imprecise. During vessel recovery, the wireless release system did not work, so none of the sonds were located. Off the Biglane vessel, ERT used side scan, Didson and vector sonar to scan three 1,000-foot transects in the vicinity of the data sond locations. High priority targets were marked and a tethered diver was dropped in close proximity. One of the three data sonds was recovered during a July search in 15 feet of water. Sonar coverage and target delineation was difficult due to numerous oyster bed/hard targets and variable depths. Tethered diving was in wet suits with full face mask and wired comms.

Duwamish Passive Sampling, Seattle, Washington. ERT dive master Stephen Blaze supported diver installation of passive sampling devices in support of the Region 10 Dive Unit. (See Region 10 report for more details.)

Environmental Security Technology Certification Program (ESTCP), Quantico, Virginia. The dive operations were for the purpose of demonstrating and promoting the Sediment Ecotoxicity Assessment (SEA) Ring, an in-situ ecological risk assessment approach for sediment characterization and remedy effectiveness. Prior ERT dive operations and testing occurred prior to cap placement. In early 2014. a thin layer cap (6-12 inches of sand/silt) was applied over a 10-acre area to minimize benthic exposure to site contaminants (primarily DDT), and enhance the

sediment habitat. The SEA Ring has 10 separate chambers containing two species of worms and clams; the diver pushes the chamber into the sediment, releases the organisms into the sediments, and activates the air pump to enhance survival over the two-week exposure period. Deployment and recovery was challenging on the uneven sand cap, plus no anchoring was allowed to avoid damaging the sand cap. ERT used vector scanning sonar to precisely locate the Sea Rings and sediment traps. Additional work off the ERT pontoon vessel is diver collection of sediment cores for chemical/physical profiling, diver installation of passive samplers (SPMEs) to measure bioavailability of contaminants, measuring cap thickness and grain size using a friction sound probe, and using a sediment profiling camera to collect cross-sectional vertical images of cap material/sediments. Diving is conducted in less than 10 feet of water with low visibility, using contaminated water PPE and a hard-wired tether for single-diver safety and communications. ERT is working with the U.S. Navy and the Space and Warfare (SPAWAR) Systems Command at this Department of Defense site contaminated with DDT.

- **Dive Statistics**

Dive	Total No. of dives	No of exposure days
Scientific dives	**44**	**23**
Training dives	**22**	**11**
Proficiency dives	**69**	**34**
Total	**135**	**68**

- **Diving Accidents, Injuries, or Incidents**

None to report.

- **Diving Personnel**

Eight scientific divers, including six dive masters. Four other scientific divers from other EPA regions may dive for ERT, if qualified, including one Dive master

U. S. EPA Region 3 Scientific Dive Unit, Philadelphia, PA

- **Diving Activities**

The Scientific Dive Unit (SDU) is a program within the Oceans & Dredged Disposal Team in the Environmental Assessment and Innovation Division's (EAID's) Office of Monitoring and Assessment. SDU scientists and engineers include representatives from EAID, Hazardous Site Cleanup Division, Land and Chemical Division, and Office of Policy and Management.

EPA R3 SDU –FY-2013-01. The EPA Dive Safety Manual (DSM) requires periodic diving to enhance and retain diver proficiency. The UDO is required to establish re-qualification criteria for divers who has not completed a dive in the past three months.

Five members of the SDU participated in the Equipment Testing and Requalification Dive, held on May 29, 2014. All planned objectives outlined in the Dive and Safety Plan were accomplished. Each diver completed two dives for a total of 10 Unit dives. On the first dive, all recently serviced primary regulators were tested and confirmed to be operating correctly. Buddy pairs practiced use of the scrape sampling device and mesh sample bags that will be used in the survey to collect epibenthic samples from artificial reef off the coast of Delaware, scheduled for the week of June 9. For the second dive, divers switched over to, and set up their positive pressure Aga masks with, wireless communication. The Aga mask covers the eyes, nose and mouth, and allows diver-to-diver, as well as diver-to-surface, communication. Divers were in constant communication with the divemaster throughout this dive and information was exchanged to practice radio protocol.

EPA R3 SDU –FY-2014-02. The Region 3 Scientific Dive Unit (SDU) resumed the biological monitoring of EX USS Radford Artificial Reef Off DE's Coast, at the request of, and in collaboration with, the Delaware Department of Natural Resources and Environmental Control (DNREC). On June 11, 2014, the SDU conducted the second of five annual biological surveys of the EX USS Radford Artificial reef (AR) site. The Radford is a retired US Navy Destroyer over 550 feet long that was sunk 26 NM off the coast of Delaware to serve as an artificial reef. SDU divers obtained scrape samples of the epifauna on vertical and horizontal surfaces of the ship, which has broken into three pieces from storms such as Superstorm Sandy. The survey showed that the reef continues to develop with a heavy growth of mature blue mussels and with additional communities of hydroids and other invertebrates now present. DNREC provided sampling supplies and a chartered vessel for the sampling. This survey was originally scheduled for the fall of 2013 but had to be canceled due to the government shutdown.

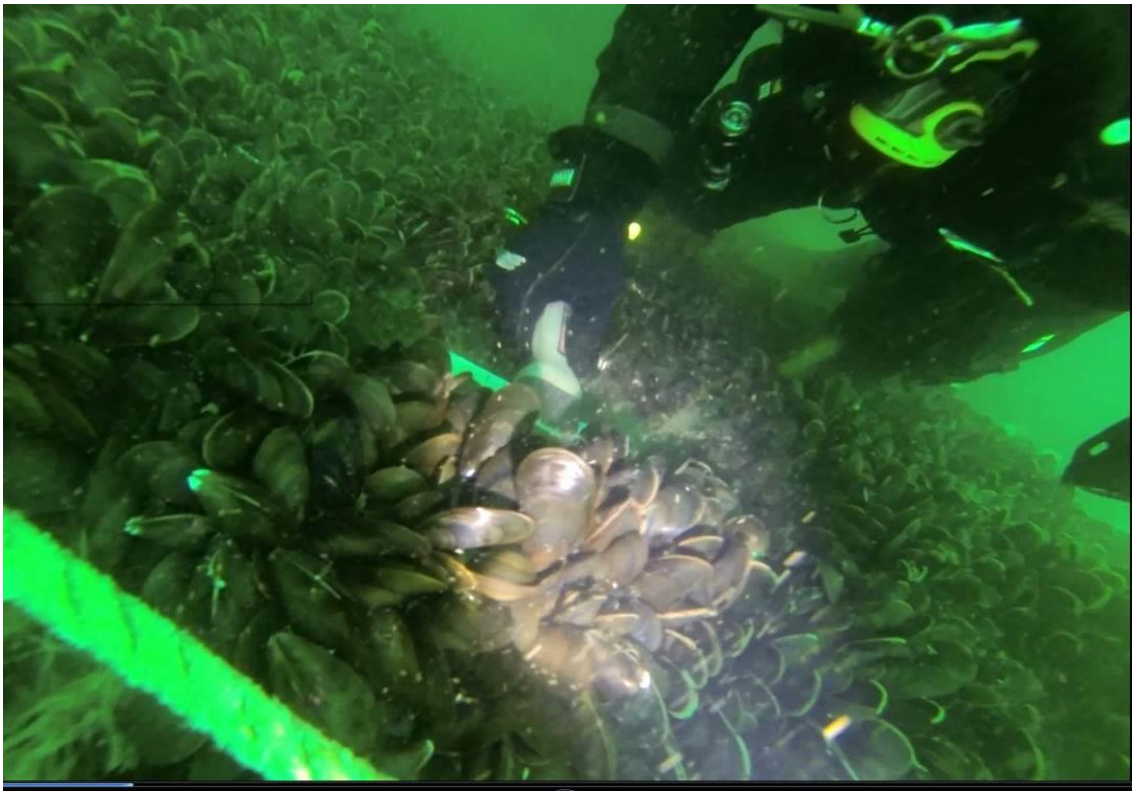
EPA R3 SDU –FY-2014-03 – The Region 3 Scientific Dive Unit Samples Freshwater Mussels in the Tidal Delaware River. Responding to a request by the Partnership for the Delaware Estuary (PDE) and Academy of Natural Sciences, The Region 3 Scientific Dive Unit sampled freshwater mussel populations along transects in the tidal Delaware River on August 26, 27, and 28, and September 10, 2014. EPA Divers collected substrate and animals from 32 separate one-fourth meter areas, while reporting observations in real time to the surface and shooting HD video of sample locations with mask-mounted cameras. Transects were completed at a site near Neshaminy State Park and a site between the Tacony and Betsy Ross Bridges in Philadelphia. In addition to the many adult mussel collected, scientists were excited to discover thumbnail-sized young mussels that are an indicator that the population is actively reproducing. Divers also completed two qualitative video transect dives to document bottom substrate and habitat in a larger spatial area at the site. The weather had to be dry and river flows low to allow diving which also had to be scheduled, planned, and executed in an approximately two-hour window before and after slack low tide. 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.

In addition to the operations described above, the SDU continued a long-term partnership and collaboration in support of our sister agency, the US Fish and Wildlife Service, and its freshwater

mussel work in Fiscal Yeqr 2014. The SDU divers stationed in our Wheeling Field Office participated in US FWS training as well as scientific dives. This has undoubtedly benefitted both organizations.

As mentioned above, the SDU again collaborated on a freshwater mussel survey with the Partnership for the Delaware Estuary in Fiscal Year 2014. The EPA participation was acknowledged in a poster summarizing the tidal Delaware River freshwater mussel data presented at a National Estuarine Conference. Freshwater mussels are long lived, often living 60 or more years, and we were encouraged to find both young and mature animals. It appears that these mussels have existed in the Philadelphia urban corridor of the Delaware River largely unnoticed for quite some time. Their presence, particularly in deeper water, greatly increases the potential ecosystem services these filter feeders could provide within the basin. Comprehensive mussel surveys in larger rivers need to include sampling at all depths to accurately characterize mussel population size and composition.

The SDU assisted the Delaware Department of Natural Resources and Environmental Control (DNREC) with scientific diving. The SDU collaboration with multiple partners has enhanced the networking and communication between UDEL and DNREC to the benefit of all parties by sharing data and resources related to the Radford, Poole and Redbird Reefs.



- **Dive Statistics**

Dive	Total No. of dives	No of exposure days
Scientific dives	**89**	**29**
Training dives	**11**	**6**
Proficiency dives	**52**	**27**
Total	**152**	**62**

- **Diving Accidents, Injuries, or Incidents**

None reported**.**

- **Diving Personnel**

Eleven scientific divers, including six dive masters, located in Philadelphia, Pennsylvania, and the Wheeling, West Virginia Field Office.

U.S. EPA Region 4 Dive Unit, Atlanta, Georgia

- **Diving Activities**

Work/scientific. Two separate projects used dive operations this year; one was managed by Mel Parsons, Athens Dive Unit Officer; the second was co-managed by our unit and Mel. 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, South Carolina, in support of the proposed Charleston Harbor Deepening Project (5 weeks). The second project was related to habitat assessment associated with channel deepening and widening at Port Everglades, Florida, conducted aboard the *NOAA Nancy Foster* (1 day).

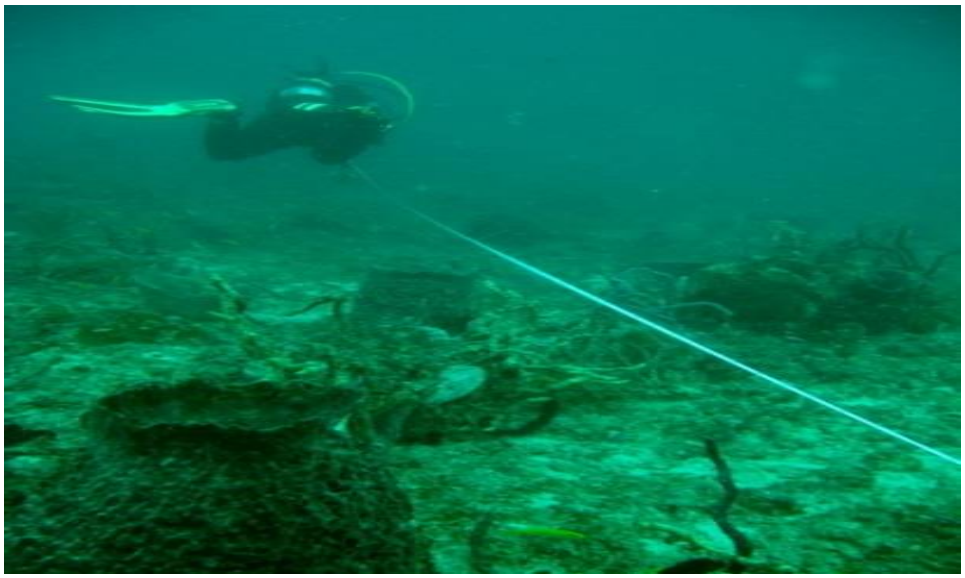
Proficiency. Two dive days were dedicated to this purpose, held at Lake Hartwell, Georgia, and Ginnie Springs, Florida. One diver is involved with the Georgia Aquarium and conducts a number of dives to help with aquarium maintenance on a monthly basis.

Training. The unit had no separate dive operations dedicated to this purpose. Six Unit members took an Oxygen Administration Training Course.

*Lake Hartwell, Georgia***.** The USACE cove facility used for proficiency dives.

*Offshore South Carolina & Florida***.** Acoustic Doppler Current Profiler (ADCP) deployments and habitat assessment.

*Ginnie Springs, Florida***.** Used for proficiency dives.



- **Dive Statistics**

Number of Dives		Number of Exposure Days	
Science:	13	Science:	5
Training:	0	Training:	0
Proficiency:	11	Proficiency:	9
Totals	24		14

Note: Unit divers did nearly all of this year's diving under management of the Athens Unit.

- **Diving Accidents, Injuries, or Incidents**

None to report

- **Diving Personnel**

Eight scientific divers, including four dive masters, located in Atlanta, Georgia.

U.S. EPA Region 4 Dive Unit, Athens, Georgia

- **Diving Activities**

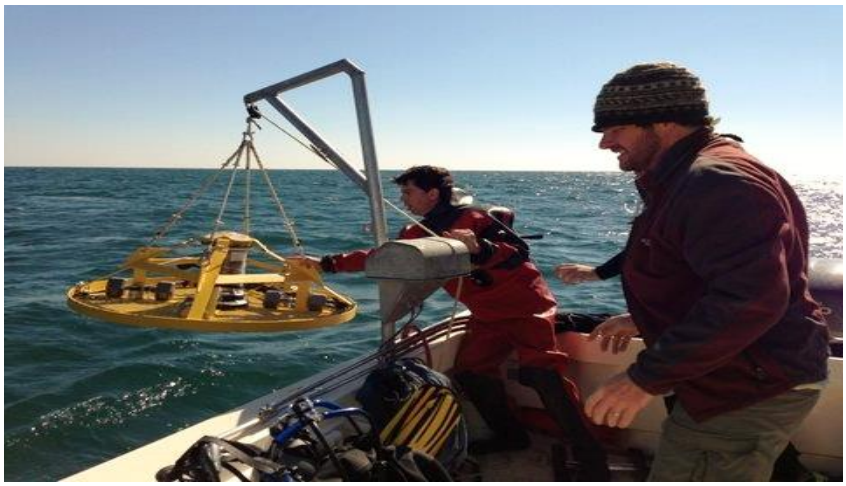
Lowest number of dives in over 30 years of Region 4 dive operations – 28 total dives

Sediment oxygen demand/nutrient studies: No SODs this year!

Sediment oxygen demand (SOD) rates are determined through the deployment of aluminum chambers over the bottom sediments.

Ocean Dredged Material Disposal Sites (ODMDS) – 7 Dives

These surveys are to characterize the sediment, water and benthic infaunal community within and adjacent to the ODMDS. Conducted habitat assessments at the Port Everglades, FL entrance channel from the NOAA vessel NANCY FOSTER.



Retrieval of current meters at Ocean Dredged Material Disposal Sites (ODMDS). Acoustic Doppler Current Profiler (ADCP) meter retrieval offshore, Charleston, South Carolina.

- **Dive Statistics**

Number of Dives		Number of Exposure Days	
Work:	16	Work:	12
Training:	12	Training:	10
Proficiency:	0	Proficiency:	0
Totals	**28**		**22**

- **Diving Accidents, Injuries, or Incidents**

None to report.

- **Diving Personnel**

Six scientific divers, including three dive masters, located in Athens, Georgia. Due to TMDL funding cuts our ESAT contract diver has gone to inactive status until further notice.

U.S. EPA Region 6 Dive Unit, Dallas, Texas

- **Diving Activities**

Fiscal Year 2014 marked a year of renewed life for the small, but dedicated Region 6 Science Diving Team. In Fiscal Year 2013, with assistance from Region 10 UDO, Sean Sheldrake, Region 6 science divers engaged in sustained outreach to Region 6 managers in all programs, Superfund staff and supervisors, and our Office of Criminal Enforcement, to market the potential of the Region's Science Divers. In Fiscal Year 2014, that effort began to pay dividends with a request from Superfund to assist in the Remedial Investigation of the Donna Canal Superfund Site near the Mexican Border.

Lacking expertise in contaminated water diving, Region 6 worked closely with Alan Humphrey, UDO of the ERT Dive Unit in New Jersey. Alan assisted in a pre-operation training dive to familiarize Region 6 divers with new equipment and procedures (Whites dry suits and Guardian full-face masks using tethered diving techniques with communications). Mr. Humphrey then assisted with development of a Dive Plan and led the operation for the Donna Canal investigation. That investigation (which is outlined in the ERT annual report) relied on directing divers in extremely low visibility to "put hands" on anomalous objects located using side-scan sonar. The goal was to identify potential sources of high PCB levels detected in fish. All dives were performed with a single diver in full-body protection (dry suit, gloves, full-face mask), surface supplied air and communications, with a standby diver. Three Region 6 divers spent four diving days logging 22 dives and over 10 hours of bottom time.

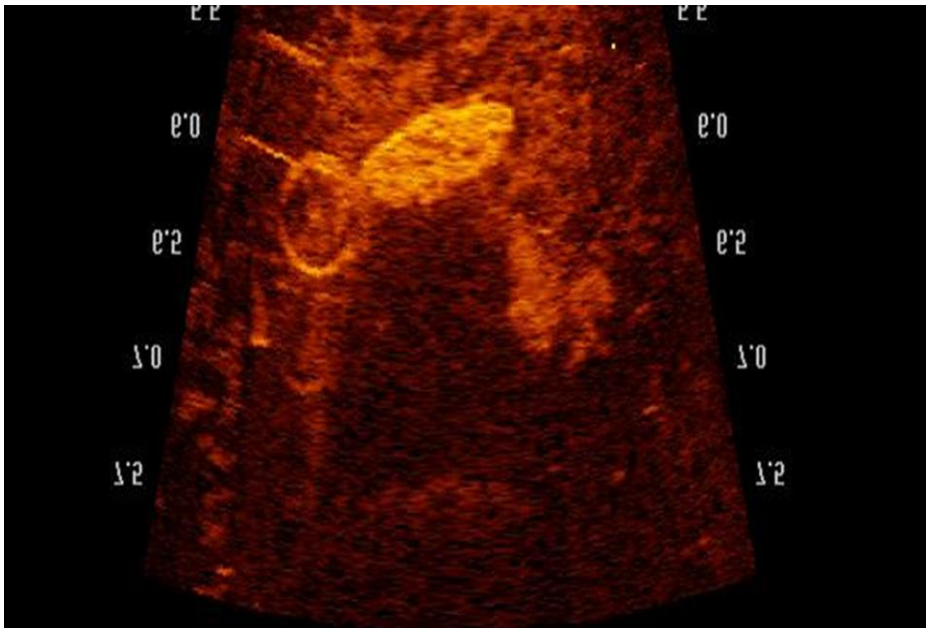
The Donna Canal Remedial Project Manager (RPM) is now requesting additional diver assistance to help with passive monitoring of the sediment. ERT UDO Humphrey is again assisting Region 6 divers to plan. Two other RPMs have also submitted requests, through Superfund Management, to assist with cap integrity surveys at two additional sites with high community interest in the effectiveness of those remedies.

With the hope and expectation of increasing work, especially in Superfund, the Region 6 Science Dive team has been able to secure some additional funding for equipment purchases. The Deputy Regional Administrator approved a decision to recruit and support some new divers to replenish recent and expected "retirements" from the dive team. The dive team hosted an open house to showcase the EPA Science Diving Program. Through that and other outreach efforts, six potential divers expressed interest, and three are being included in the national EPA Science Diver Training Program in October 2014.

Training dives included pool and quarry dives committed to practice with new dive computers, dry suits, and full-face masks including tethered dives with comms. This also included pool dives with three new candidate Science Diver trainees to instruct them on the use of dry suits and full-face masks in preparation for the national training program.

- **Dive Statistics**

Dive Type	Number of dives	No. of exposure days
Science	22	4
Training	19	3
Proficiency	22	2
Total	**61**	**9**



- **Diving Accidents, Injuries, or Incidents**

None to report.

- **Diving Personnel**

Seven scientific divers, including two dive masters, located in Dallas and Houston, Texas.

U.S. EPA Region 10, Western Ecology Division, ORD/NHEERL, Newport, Oregon

- **Diving Activities**

Dive activities during Fiscal Year 2014 consisted of working and proficiency dives. Working dives included installation and follow-up inspection of a multi-parameter water quality instrument deployment housing.

Location of work dive operations: Yaquina Bay, Newport, Oregon
Location of work-related proficiency dive: Netarts Bay, Netarts, Oregon

WED divers continue to have difficulty maintaining proficiency by diving at bimonthly intervals, and, overall, the need to dive has lessened over the past five years due to a shift in projects. Management still supports diving operations at the division.

- **Dive Statistics**

Type of dives	Number of dives	Number of exposure days
Working	10	03
Proficiency	51	27
Training	0	0
Totals	**61**	**30**

- **Diving Accidents, Injuries, or Incidents**

None to report.

- **Diving Personnel**

Six scientific divers, including five dive masters, located in Newport, Oregon.

U.S EPA Region 10, Seattle, Washington **www.epa.gov/region10/dive**

- **Diving Activities**

During Fiscal Year 2014, the Region 10 unit had four scientific work diving events, some of which were multi-week operations (a fifth one-week trip, Coquille River outflow ocean dredge material disposal survey in the Pacific Ocean, was cancelled due to weather). There were also six training events to make use of safety training funds. There were two projects in support of the Superfund Program. Two projects were related to natural resource, water, or habitat quality issues. One half of work dives this year involved use of free swimming SCUBA, one was via tethered SCUBA, and one was surface supplied. Training was conducted to maintain proficiency with all diving modes, rescue, and underwater photography. Region 10 had 52 work dives and

71 training dives. Overall, Region 10 had a total of 146 dives (including requalification and off-duty dives). During FY2014, Region 10 (R10) had the following work projects:

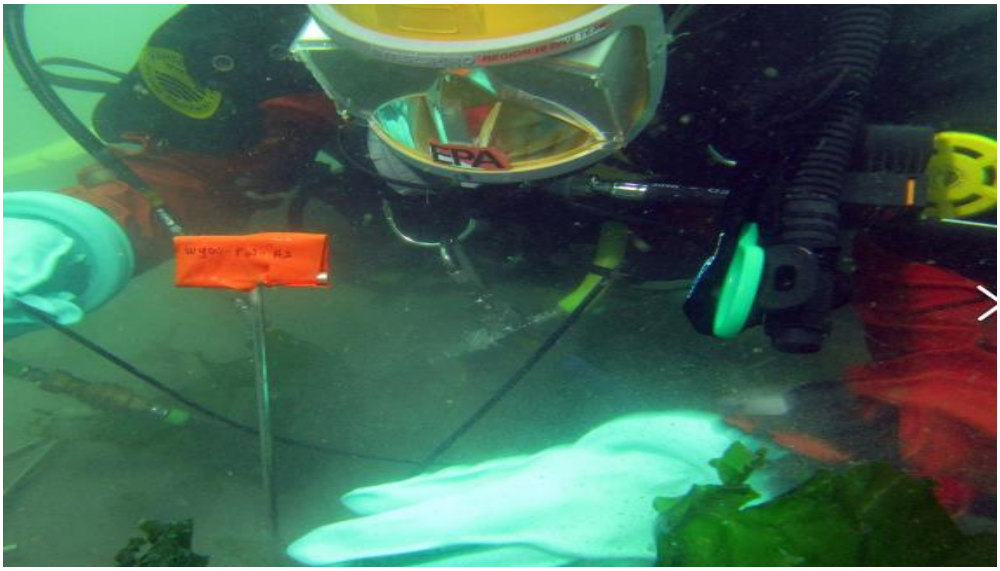
Duwamish Superfund Site Sampling. Divers supported the Superfund Program by using their scientific sample collection expertise in deploying passive samplers on the river bottom in this estuarine area to evaluate bioavailabilty of PCBs in the area in a study led by principle investigators at the Massachusetts Institute of Technology (MIT). EPA divers both provided in water sample collection support, as well as invaluable QA/QC formulation for the project QAPP to ensure that the data was of high quality in making cleanup decisions—two separate dive operations for deployment (July 2014) and retrieval (FY15, October 2014).

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 reports which evaluated 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. For more information, see: *Finding ghost nets saves money - King 5 News* (February 8, 2012).

Wyckoff Superfund site passive 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 PAHs to convey to the project manager for decision-making purposes on whether the area requires cleanup. For photos, see: https://www.facebook.com/media/set/?set=a.398696980263722.1073741838.130505740416182&type=3

Elwha River Dam Removal Benthic Survey in the Strait of Juan de Fuca. A team of diving scientists, led by USGS in collaboration with EPA and the Elwha Tribe, has conducted dive surveys to assess the effects of Elwha Dam removal on shallow, sub-tidal benthic communities. Dive surveys were initiated in 1994 by USFW and EPA to characterize near-shore biological communities prior to dam removal. Due to the length of time between authorization and funding for the dam removal, these surveys had to be re-initiated 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-meter transects (two transect lines laid out east and west from a fixed location at multiple stations). 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 three 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 near-shore 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. For more Region 10 Dive Unit project information, see: http://yosemite.epa.gov/r10/OEA.NSF/webpage/Dive+Team+Projects.



- **Dive Statistics**

Number of dives		Number of diving (exposure) days (= sum divers/days)	
Work	52	Work	33
Training	71	Training	51
Other (off-duty & proficiency)	23	Other	14
Totals	**146**		**98**

- **Diving Accidents, Injuries, or Incidents**

No injuries reported.

- **Diving Personnel**

Nine scientific divers, including five dive masters, located in Seattle and Manchester, Washington.

For more information: **www.epa.gov/region10/dive**