

US EPA ARCHIVE DOCUMENT

**Environmental Protection Agency
National Dive Safety Program**

2011 Annual Report



March 2012

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 1,596 dives in 2011, involving nine EPA dive units and 82 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

2011 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, 2010, through September 30, 2011. The annual reports from EPA Unit Dive Officer's (UDO) are the basis for the information contained in this report. Each UDO's Annual Report is available upon request.

Overview

The EPA's NDSP conducted 1,596 dives in FY 2011 (Figure 1), involving nine EPA dive units, and a total of 82 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 EPA divers fluctuates annually, based on the number of divers that are currently qualified in the program. 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 2011 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 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 (GED) - Gulf Breeze, FL.; (7) Region 6 – Headquarters Dallas, TX (R6); (8) Region 10 Headquarters - Seattle, WA. (R10) and (9) the Western Ecology Division Lab, Corvallis, OR (WED).

Figure 1: Number of Dives by EPA Diving Unit

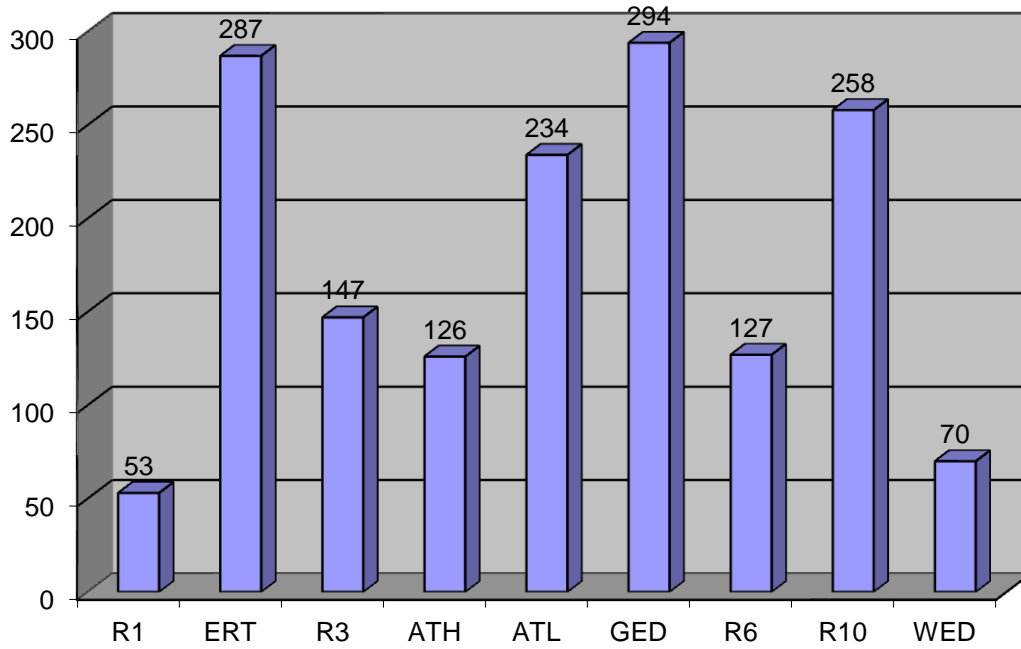


Figure 2: Number of EPA Divers by Unit

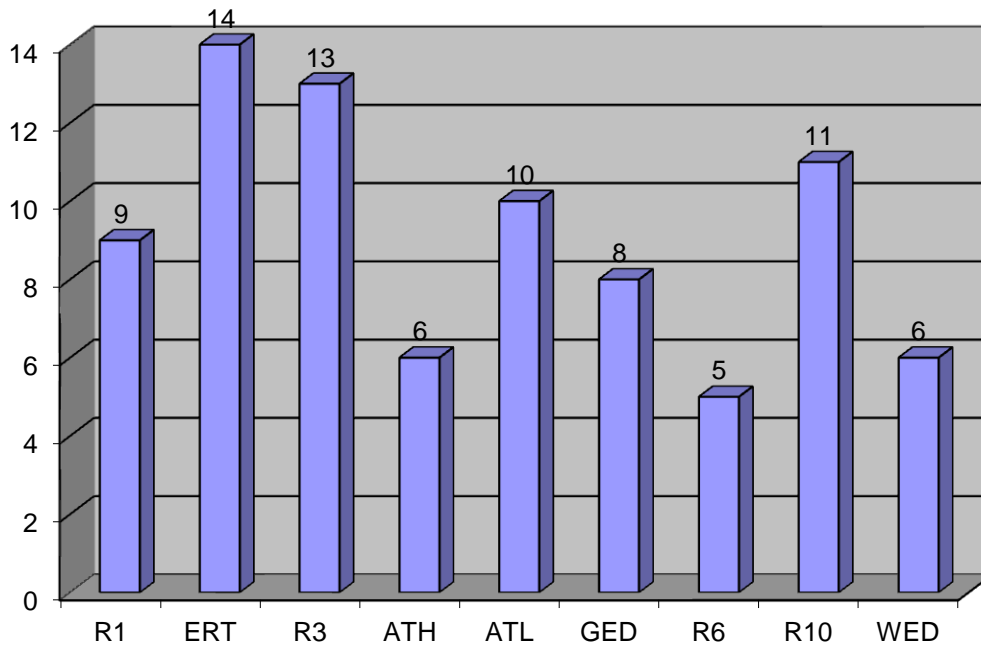
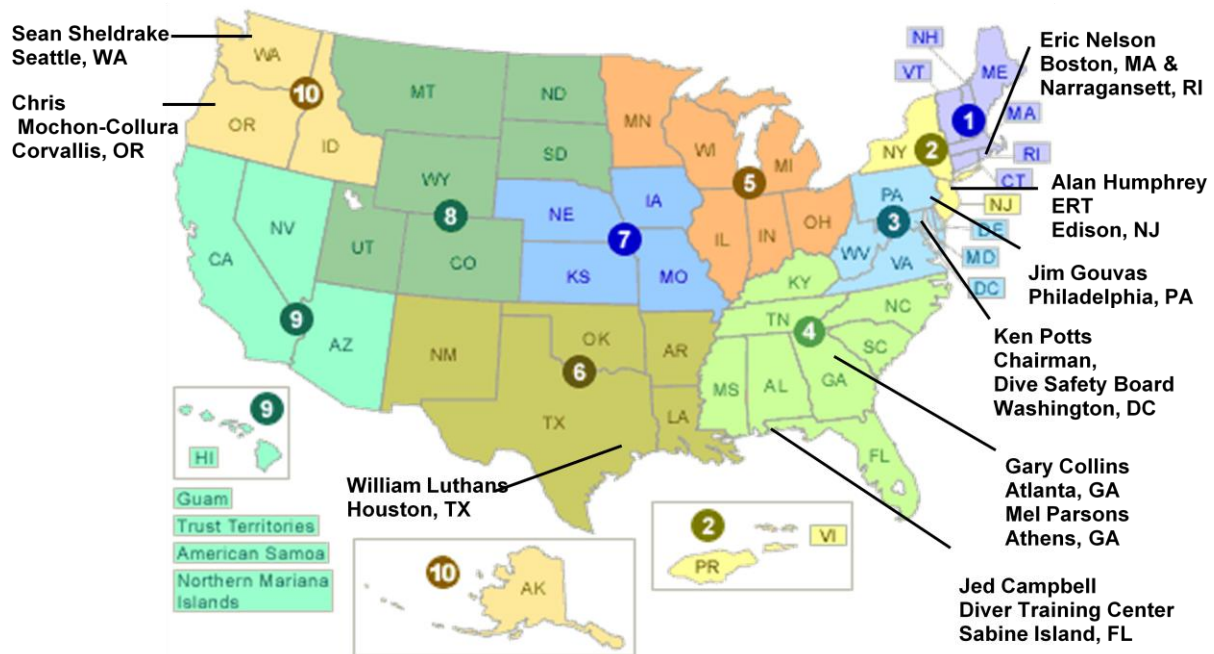


Figure 3: EPA Unit Dive Officers

USEPA Regions Unit Dive Officers



2011 EPA Diving Safety Board Meeting

The 2011 EPA Diving Safety Board met in Portland, Maine, on November 12-13, 2011.

Agenda items included:

- Dive Safety Manual Revisions
- Physical Fitness for Diving
- The investigation of the sunken tug *William H. McAllister* in Lake Champlain, NY
- Discussion on diving on closed bombing ranges
- Reports from Regional Dive Units

Training

The Gulf Ecology Division, in collaboration with the EPA's Safety Health and Environmental Management Division, sponsored the EPA National Diver Training Program on May 16-20, 2011. The training sessions were conducted at the EPA Diver Training Center in Gulf Breeze, Florida.



Figure 4: Training at EPA Gulf Ecology Division Lab Facility, Gulf Breeze, Florida

The GED hosted the training program to train EPA scientists in scientific diving techniques. The training included scientific diver candidates, divemaster candidates, and advanced ops participants from EPA's SHEMD, Office of Water, EPA Regions 1, 2, 3, 4, 5, 6, 8, 9, 10; AED; GED; and WED. Also in attendance were participants from the University of West Florida, local first responders, the State of Tennessee, and other diving experts from across the country. There were 43 participants involved in 226 training dives. Listed below are a few of the aspects of the training that were covered and practiced during the training.

- Diving accident management
- Oxygen administration
- Principles of scientific diving
- EPA diving safety policy
- Oxygen enriched air diving "Nitrox"
- Surface supply diving
- Drysuit diving
- Full face positive pressure mask
- Decontamination procedures
- Diver -to- surface communications
- Compressed gas handling
- Lift bag methods
- Diving physiology
- Black- out diving
- Contaminated water diving
- Diver-to-diver communications
- Underwater video and photography
- Underwater geiger counter testing

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 2011, EPA established reciprocity agreements with:

- U. S. Department of Commerce, National Oceanic and Atmospheric Administration
- U. S. Fish and Wildlife Service
- U. S. Geological Survey
- Oregon Coast Aquarium
- North Carolina State University
- State of Alaska, Department of Fish and Game
- Scientific Diving International

Dive Unit Highlights

Regional Units

1. **Region 1 Dive Unit Boston Headquarters and the Atlantic Ecology Division (AED-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.
- Inspected and videotaped newly-installed “low impact” moorings in Manchester Harbor, MA, and off Misery Island, Beverly, MA.
 - Completed training dives in two exhibit tanks at the Oregon Coast Aquarium in Newport, OR.
 - Conducted requalifying dives in Gloucester, MA, and Dutch Island, RI, following suspension of diving activities during winter months.
 - Inspected and videotaped status of colonizing marine tunicates on riprap covering a stormwater outfall pipe in Gloucester, MA.
 - Two divers successfully completed EPA diver training in Gulf Breeze, FL, and one diver assisted with project set-up and training.
 - Harvested eelgrass at construction site at the end of a runway at Logan International Airport to be transplanted in other parts of Boston Harbor.
 - Collected freshwater mussels in Sudbury Reservoir (Southboro, MA) in support of a Superfund toxicity study.
 - Attempted to collect blue mussels in Narragansett Bay (Bristol, RI) for chemical exposure experiments in New Bedford Harbor, MA. No live mussels were found.
 - Collected eelgrass samples at three locations north of Boston, in support of a larger EPA nutrient study being conducted in nearshore marine waters of New England.
 - Took video and still images of “healthy” eelgrass beds in Great Bay, NH, in support of nutrient study.

B. Dive Statistics:

<u>Number of Dives</u>	
Scientific	39
Training	14
<u>Proficiency</u>	<u>0</u>
Total Dives	53

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

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

2. Edison Environmental Response Team Dive Unit

A. Diving Activities: The ERT conducted a limited number of scientific dives at EPA projects around the country this year. Some of the ERT dives were training and proficiency dives, conducted primarily in Gulf Breeze and Panama City, FL, Denver, CO, and Raritan Bay, NJ, on the ERT 41-foot vessel *Biglane*. During the 2010 Fiscal Year, ERT conducted a total of 169 scientific dives, 62 training dives, and 56 proficiency dives, for a total of 102 dives. This total includes statistics from EPA divers in Regions II, VIII, and IX, who may conduct work or training dives with ERT, but do not yet have a dive team in their respective region.

- Oyster Project, Staten Island, Raritan Bay, NJ. ERT/EPA R2 are 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 to 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.
- EPA Diver Training, Gulf Breeze, FL: ERT assisted with annual diver training, including a complete diver decontamination demonstration manned by EPA divers.
- *OSV BOLD* Coral Survey, PR: ERT divers continue to support the Coral Reef Survey Project recently conducted during Nov/Dec 2010 off the southern coastline of Puerto Rico. Led by EPA R2 and GED, ERT divers provide data collection, dive master support, video transects, and still photo documentation.

- *OSV BOLD/Redbird* Artificial Reef Survey, DE: ERT divers supported R3 dive investigation to assess the current condition and integrity, as well as ecological function, of about 25 subways cars used as artificial reef in the “Red Bird Reef”, approximately 16 nm east of Lewes, Delaware. A Nitrox mix was used to optimize safe bottom times (35 min at 90 feet). This project was an excellent example of EPA divers from several dive units collaborating.
- *William H. McAllister* Oil Project, Port Kent, NY: ERT monitored commercial divers hired by McAllister to assess and recover any remaining diesel/oil products on the tug boat wreck, which rests at a depth of 150 feet. Weather (Hurricane Irene) and recent storms delayed mobilization of the dive barge and positioning over the wreck. A 120-foot steel barge was set up with two dive shacks, two decompression chambers, a crane, push boat, 10,000 gal storage tank, surface supply diving equipment, generators, compressors, welding equipment, and several pumps for product recovery. Four large anchor balls, attached to one ton anchors, were set in a box configuration about 1,000 feet from the wreck. Using large winches and cables attached to the barge and the anchor buoys, the barge was maneuvered directly over the wreck. The anchoring system had to be secure to maintain position while divers on umbilicals were conducting deep air dives on the wreck. ERT provided project oversight for the EPA On Scene Coordinator (OSC) and worked with commercial divers (from BIDCO), the U.S. Coast Guard, the Lake Champlain Maritime Museum, and consultants for McAllister on this project. The ERT vessel *RV Biglane* was used to confirm the location of the wreck and was used as a safety vessel.



Figure 5: A support tug alongside a diving barge on Lake Champlain, Sept. 21, 2011. Divers explored the wreck of the tugboat, *William H. McAllister*, that sank decades ago in Lake Champlain to determine if any fuel remains in its tanks. Photo: AP/ AP



Figure 6: A commercial diver prepares to search the sunken tug, the *William H. McAllister*, on Lake Champlain, Sept. 21, 2011.

B. Dive Statistics

<u>Number of Dives</u>	
Scientific	169
Training	62
<u>Proficiency</u>	<u>56</u>
Total Dives	287

C. Diving Accidents, Injuries, or Incidents: During two separate training sessions, two trainee divers, Jeffery McPherson and Dave Adams, suffered barotrauma to the ear. Both divers were wearing full face AGA mask and dry suits with hoods for the first time. Both divers had used the equipment during a prior pool session. The divers admitted having some sinus congestion, but were unaware of the ear problem when they surfaced. The dives were cold water, shore dives with gradual horizontal descents. Both divers saw a doctor and were cleared to dive within several weeks, once the ear drum healed. Even with the proper equipment and safety briefing, divers should always be cautious about diving with congestion.

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. Two Region 8 trainee divers, Jeff McPherson and Gregory Oberley, participated in a training dive with ERT at the Aurora Reservoir, Denver, CO.

Scott Grossman presented a paper, “Use of Surface-Supplied Gas for Scientific Diving Operations”, at the 2011 American Association of Underwater Scientists (AAUS) Workshop in Portland, ME on October 14, 2011. The paper was authored by A. Humphrey, S. Grossman, J. McBurney, and S. Sheldrake.

3. Region 3 Dive Unit

A. Diving Activities

- Dutch Springs Quarry – Fall Proficiency and Training Dive: On November 22, 2010, nine members of the EPA Region 3 Dive Team participated in a proficiency/training dive at the Dutch Springs Quarry in Bethlehem, PA. Eight divers logged a total of 16 dives. The purpose of the operation was to practice emergency rescue procedures. Team members took turns bringing their dive buddy up from a thirty foot deep platform to the surface in a safe, controlled, free ascent without any assistance from the diver being “rescued”. This was an exercise in trust for the diver being brought up, and competency for the rescuer of the “non-responsive” diver. The drill was continued on the surface with emergency 911 being activated, surface tow of diver, placement on a backboard, and the diver being carried up on the dock where they were administered oxygen, and given a field neurological exam. Other skills practiced included divers using video and still cameras while wearing heavy gloves and dry suits.
- Dutch Springs Quarry – Spring Proficiency and Training Dive: On May 4, 2011, eight members of the EPA Region 3 Dive Team participated in a proficiency/training dive at the Dutch Springs Quarry, in Bethlehem, PA. Seven divers logged one dive each. The purpose of the operation was to deep dive certify (approximately 90 feet) some of the junior members of the team and to practice set up and use of the “pony bottle” redundant air supply system. Divers will be utilizing this redundant air supply system during a planned survey, in June 2012, off the coast of Delaware. In addition, a trainee diver accompanied an EPA dive master on a shallow dive to demonstrate proficiency in navigation and buoyancy control. The diver master also practiced using still cameras while wearing heavy gloves and his dry suit. Max depth for five dives was 92 feet, while the dive master and trainee diver had a max depth of 45 feet. Divers used dry suits and air breathing gas. The dive also served as a re-qualification dive for any diver who had not completed a dive in the last three months.
- EPA Diver Training – National EPA Diver Training, GED Gulf Breeze, FL: During the week of May 16, 2010, Jim Gouvas, UDO, attended the annual training, and participated in 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, BCDs, and regulators with bailout bottle for the students at the training. The

region had two divers, William Early and Jennifer Fulton, attending the training. Both successfully completed the Scientific Diver Training.

- **Mid-Atlantic Artificial Reef Investigation:** From June 2 through 9, 2011, fifteen EPA divers conducted a survey from the OSV Bold to assess the condition, integrity, and ecological function of the subway car artificial reef 16 nm off the coast of Delaware. The team collected detailed data on the structural condition, percent coverage, and height of growth on a total of twenty five cars at six locations. The EPA Dive Team examined many additional cars and obtained substantial HD video and numerous still photo images. Conditions were challenging: 15-foot visibility, depths in excess of 80 feet for all dives, and in excess of 90 feet on 47 dives. Weather and sea conditions were mostly favorable, with only a few days with 2-3 foot seas, 15-20 knot winds, and surface currents. Divers had to contend with surface air temperatures of approximately 80°F, surface water temperatures about 60°F and bottom water temperatures as low as 48°F. The team was led by, and had members from, the Region 3 Dive Team. Other representatives included the EPA ERT, US Fish and Wildlife Service, and EPA Region 10.



Figure 7: Redbird Reef, Artificial Reef Survey June 2011

- **US Fish and Wildlife Service (FWS) Freshwater Mussel Repopulation:** On August 5, 2011, and September 22, 2011, divers from EPA Region 3's Dive Team assisted the FWS and West Virginia Department of Natural Resources in a study to examine freshwater mussel re-population in the Ohio River at Neal Island, WV, approximately 120 miles southwest of Pittsburgh, PA. Approximately 2000 freshwater mussels were planted in the Ohio River Restoration Area at Neal Island. This effort reintroduced the animals, whose population was devastated by

an industrial spill several years ago. 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.

B. Dive Statistics

<u>Number of Dives</u>	
Scientific	62
Training	47
<u>Proficiency</u>	<u>38</u>
Total Dives	147

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

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

4. Atlanta - Region 4 Dive Unit

A. Diving Activities: Three separate project dives were conducted this year: One project was related to habitat assessment on top of a disposal berm at the Tampa Ocean Dredged Material Disposal Site (ODMDS). Two projects were in support of invasive species monitoring for the orange cup coral (*Tubasterea spp*); one monitoring site was in Florida waters from Dade County to Conch Reef in the Florida Keys, and a second was in the Flower Gardens Banks National Marine Sanctuary. A proficiency dive day was conducted at Lake Hartwell, GA, to maintain proficiency and to augment diver training. A training dive day was held at an indoor pool in Marietta, GA, to evaluate a new diver candidate.

B Dive Statistics:

<u>Number of Dives</u>	
Scientific:	219
Training:	2
<u>Proficiency:</u>	<u>13</u>
Total Dives	234

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

D. Diving Personnel: Ten 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 bottom sediments. Water samples are pulled from the chambers by divers for analysis. SOD and nutrient exchange studies are both conducted from diver deployed chambers.
- Ocean Dredged Material Disposal Sites: These surveys were conducted to determine the sediment, water quality, and benthic infaunal characteristics within, and adjacent to, dredged material disposal sites. Divers collected sediment cores for laboratory analysis and benthic macroinvertebrate analysis, and obtained bottom photographs.
- Deployment and retrieval of instruments: Divers deployed and retrieved current meters at Ocean Dredged Material Disposal Sites (ODMDS).

B. Dive Statistics:

<u>Number of Dives</u>	
Scientific:	103
Training:	23
<u>Proficiency:</u>	<u>0</u>
Total Dives	126

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

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

6. Gulf Ecology Division (GED) Dive Unit

A. Diving Activities: GED conducted several scientific diving operations during CY 2011. The multiple dive projects included coral surveys, Acoustic Doppler Current Profiler (ADCP) data download and service, and inspection and service of seawater intakes for the GED lab.

- GED divers made inspection dives around the GED west dock to remove hazards. Ladders were removed, cleaned, and reinstalled. Barnacles, oysters, and fishing gear were removed from the pilings. Dives were made to test equipment (Superlite-27, wireless, hard wire, EXO-26, a number of Aga mask and regulators).

- EPA Divers collected coral condition data and photographed corals at the Flower Gardens National Marine Sanctuary. These dives were directed toward estimating biological conditions of coral populations and to help understand associations between coral reefs, reef fish, soft corals, and other macrobiota. Estimates of conditions can be used to compare species and populations of coral across reef types, study areas and 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 were recorded. These observations resulted in both 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
- Acoustic Doppler Current Profiler Deployment (ADCP) 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: 294

- C. Diving Accidents, Injuries, and Incidents: No serious injuries to report. One diver had to miss two days of diving due to sinus infection.

Per the the Diving Safety Board, GED removed from service several Luxfer aluminum cylinders that had reports of failure. Twenty two tanks were taken out of GED inventory and condemned. Tanks were replaced with Catalina cylinders.

GED had a steel 100cf tank blow a burst disc while sitting in the tank storage locker. The storage locker is an air conditioned area and the cylinder had been filled several weeks before. It was determined, through visual inspections, that the dive shop switched the valve from a steel 172 cf tank to a valve from a steel 100 cf tank. The burst disc on the 172 cf tank was not rated for 3400 psi. The other dangerous situation is that a burst disc with a 5000 psi rating was on a cylinder only rated to 2270 psi. Dive units should check dive shop work after inspection.

- D. Diving personnel: There are six GED divers, including five divemasters. Additionally, two divers, Ross Lunetta and Dorsey Worthy, are remote divers without an active unit, and are managed through the GED dive unit.

7. Region 6 – Dallas, TX

A. Diving Activities

- Diving operations during the EPA Safety Health and Environmental Management Division (SHEMD) audit were conducted at a quarry in Terrell, TX, and simulated placement of scientific equipment using lift bags, assembly, buoy marking, photo documentation; and subsequent retrieval. The entire team participated: William Luthans as dive master/tender and two 2-member dive teams. The audit was complementary about the automation and electronic access of dive records, including system prompts and reminders for equipment and recertification requirements.
- In October 2010, Van Kozak and Bill Luthans participated as divers on a mission aboard the OSV Bold at the Flower Gardens National Marine Sanctuary, off the TX/LA coast. The mission was sponsored by Region 4, with participation by EPA's ORD, BOEMRE (formally MMS), NOAA, and Georgia Tech.
- In November/December 2010, one diver participated on the OSV Bold. This was a 17 day mission along the southern coast of Puerto Rico to assess the biodiversity of reefs and perform human disturbance surveys.
- The Region 6 Dive team conducted four team training/proficiency exercises; two as lake diving in a local spring-fed quarry in North Central Texas, and two as drift dives in a Central Texas river, the Comal. The quarry dives were performed in either dry suits or standard scuba, depending on the season, at less than 60-foot depths, and in visibility ranging from 2 to 10 feet, and included a variety of communication, diver recall and navigation drills. The river dives were performed in currents of about 1 knot or less, with five-to-ten-foot visibility. In addition, the team conducted one training exercise in rescue procedures in a

swimming pool to drill on backboard use and emergency oxygen administration and first aid. That pool exercise also included equipment checks, drills on the use of lift bags and air supply for the lift bag and other skills.

B. Dive Statistics

<u>Number of Dives</u>	
Scientific	44
Training	1
<u>Proficiency</u>	<u>82</u>
Total Dives	127

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

D. Diving Personnel: Five divers, including one Divemaster

8. Region 10 (R10) Dive Unit-Seattle, WA

A. Diving Activities: During FY11, the Region 10 unit had seven scientific work diving events and eight training events. There were two projects in support of Superfund cleanup sites. Five projects were related to natural resource, water, or habitat quality issues. During FY2011, Region 10 had the following work projects:

- McCormick and Baxter Superfund Site Sampling: Divers supported the Superfund program by deploying solid phase microextraction devices (SPME/SPMD) in a clean cap overtop creosote-contaminated sediment. The Superfund program used this 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, potential to entrap aquatic life, or aquatic life trapped within, as part of the Puget Sound and Coastal Americas initiative.
- Willapa Bay Instrument Deployment/Recovery: Scientific divers deployed and retrieved scientific instruments vital to implementation of the Clean Water Act; divers also updated EPA’s 303(d) list of impaired water bodies.
- Onondaga Vessel Survey: At the request of the Puget Sound Partnership, EPA R10 asked the dive unit to survey this sunken vessel for signs of leaking hazmat materials. R10 divers scientifically documented the orientation, depth, and size of the wreck, and video documented the outside of the vessel.
- Artificial Reef Survey off the Delaware coast aboard the EPA Ocean Survey Vessel Bold

- 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. EPA and USGS divers collaborated in 2011 to characterize the seafloor community before dam removal. The dive team’s efforts measured community responses to short and long-term changes in deposited and suspended sediments both before and after dam removal. This study offers an unprecedented opportunity to gain insight relevant to managing these marine resources, for the largest dam removal effort to date.
- Wyckoff Superfund Site Flux Chamber Sampling: Divers located and marked flux chambers for sampling in 2011. The purpose of these scientific dives was to evaluate the sediment cap at the site, contained creosote contamination from the plant located near Eagle Harbor, WA.
- Training dives: Two training dives were undertaken for proficiency by several divers at Manchester Environmental Laboratory, to focus on communication and videography skills. Pool dives were conducted at a dive shop to requalify one diver, and to practice AGA full face mask doff and don (emergency drill).
- Lake Union Training Dives: These dives practiced scientific diving data collection by using video survey techniques, identification of bottom life on vessels, and identification of any hazardous materials. Decontamination techniques were also practiced.
- Surface supplied diver training was conducted by an outside contractor for all EPA R10 divers. All divers were checked out on the surface supplied diving system, and they conducted proficiency and rescue drills in Lake Washington at the NOAA Dive Center. This training was approximately 50 hours per diver.
- Earth Day Outreach. Dives were conducted via surface supplied diving equipment, and with a drop camera to show 4th and 5th grade students what EPA divers do in scientific dives. Rescue drills were conducted after the students departed.

B. Dive Statistics

<u>Number of Dives</u>	
Scientific	140
Training	83
<u>Proficiency</u>	<u>35</u>
Total Dives	258

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

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

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

A. Diving Activities: Dive activities during 2010-2011 consisted of working, proficiency, and training dives. Working dives included inspection and cleaning of a PVC pipe used to house a YSI data sonde for year-round deployment in Yaquina Bay, WA. Divers were re-qualified after extended breaks from diving.

B. Dive Statistics:

<u>Number of Dives</u>	
Scientific	4
Training	9
<u>Proficiency</u>	<u>57</u>
Total Dives	70

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

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