

US EPA ARCHIVE DOCUMENT

Environmental Protection Agency National Dive Safety Program

2010 Annual Report



June 2011

Executive Summary

The U. S. Environmental Protection Agency (EPA) conducts a wide range of diving activities in support of regional and national programs. Diving is conducted in rivers, lakes, harbors, and the open ocean in support of 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 the requirements of EPA's Diving Safety Policy.

The EPA's National Diving Safety Program conducted 1279 dives in 2010, involving nine EPA dive units and totaling 75 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:

Kennard Potts, Chairman
EPA Diving Safety Program

Phone: (202) 566-1267
E-mail: potts.kennard@epa.gov

Environmental Protection Agency National Dive Safety Program

2010 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, 2009 through September 30, 2010. The annual reports from EPA Unit Dive Officer's (UDO) are the basis for the information contained in this report. Copies of each UDO's Annual Report are available upon request.

The EPA's NDSP conducted 1279 dives in FY 2010 (Figure 1), involving nine EPA dive units, totaling 75 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 2010 operational year.

Overview

EPA's NDSP is represented nationally by nine regional dive units, each under the supervision of a Unit Dive Officer (Figure 3). The dive units are located in: (1) Region 1 Boston Headquarters and the Narragansett Lab (R1); (2) Environmental Response Dive Team - Edison, NJ (ERT), (3) Region 3 Headquarters - Philadelphia, PA (R3); (4) Region 4 - Atlanta Headquarters, Atlanta, GA (ATL); (5) Region 4 - Athens Lab, Athens, GA (ATH); (6) Gulf Ecology Division (GED) - Gulf Breeze, FL.; (7) Region 6 - Dallas, Texas (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

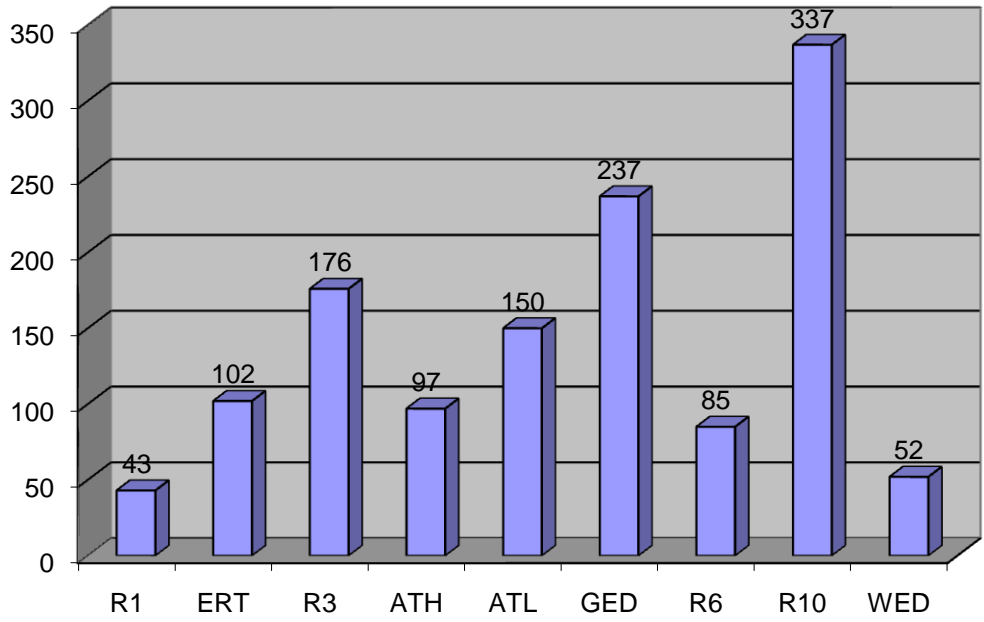


Figure 2: Number of EPA Divers by Unit

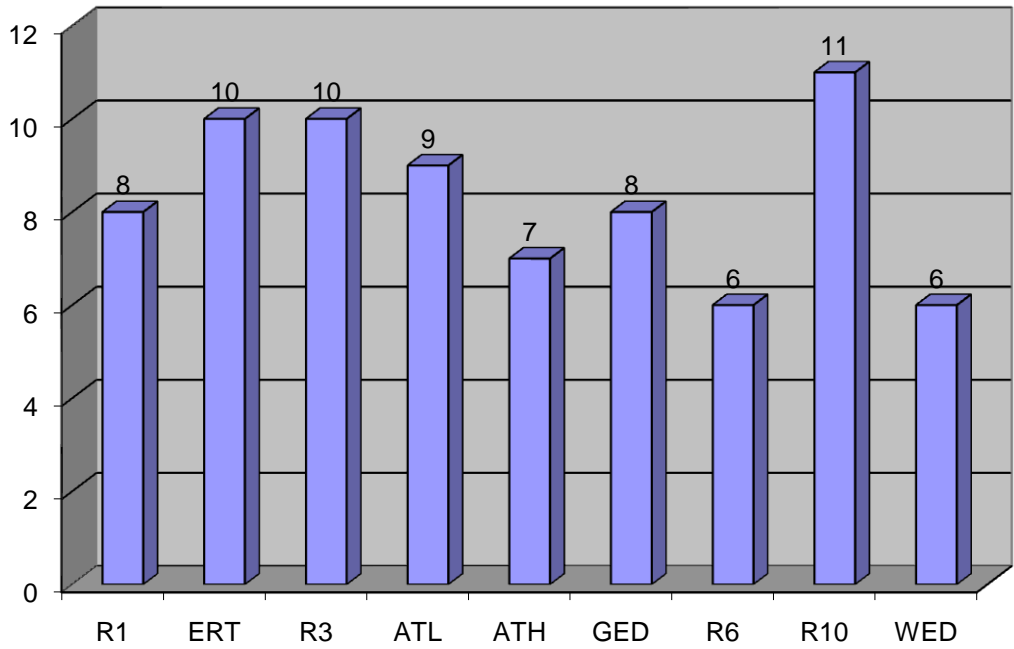
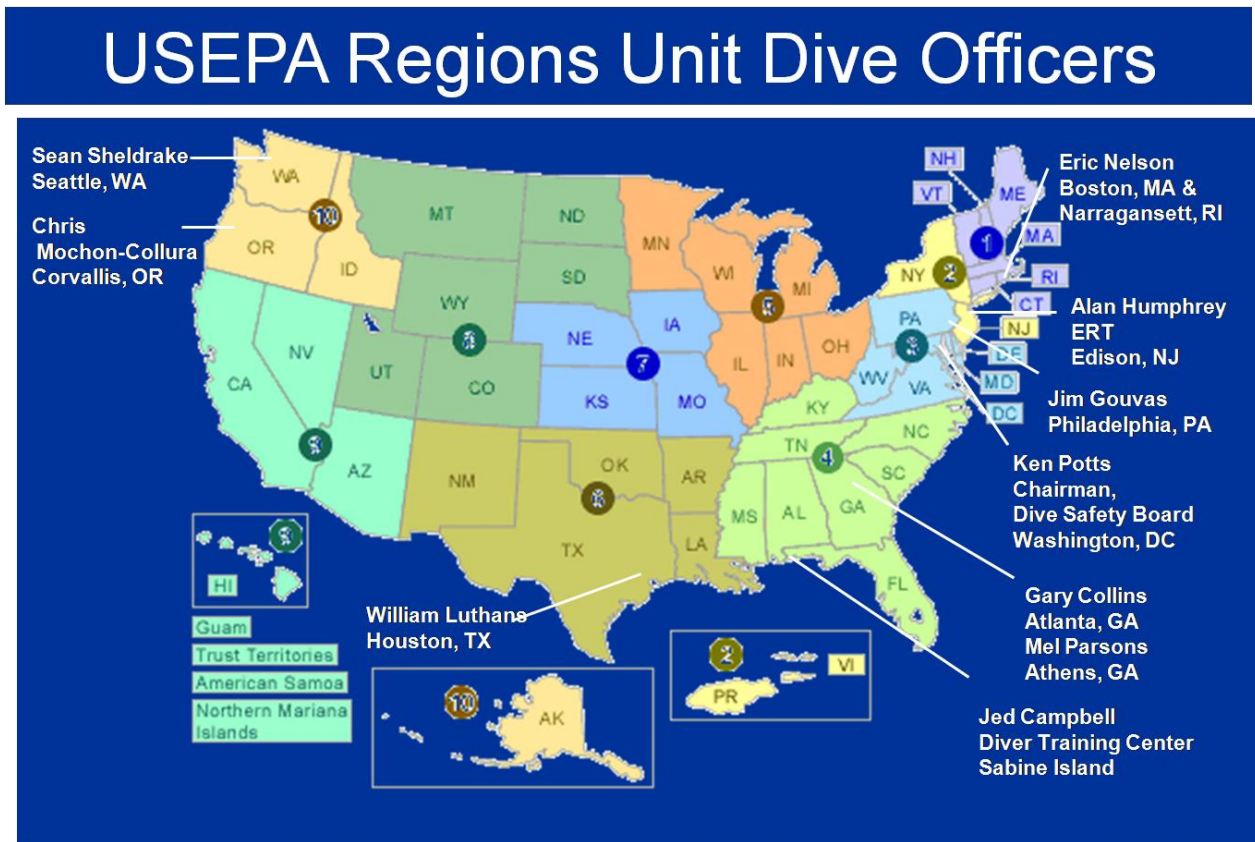


Figure 3: EPA Unit Dive Officers



2010 EPA Diving Safety Board Meeting

The 2010 EPA Diving Safety Board meeting was held at the EPA Western Ecology Division Laboratory, in Newport, Oregon, on November 2-4, 2009. Agenda items included:

- 2010 Dive Safety Manual Revisions
- Physical Fitness for Diving
- Diver Performance Agreements
- Deep Water Horizon experiences
- Discussion of First Aid and CPR
- New DAN O₂ Second Stage Regulator
- ERT/Region 2 Joint Oil Investigation
- 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 10-14, 2010. The training sessions were conducted at the EPA Diver Training Center in Gulf Breeze, Florida.



Training at EPA Gulf Ecology Division Lab Facility, Gulf Breeze, Florida

The Gulf Ecology Division hosted the EPA National Diver Training Program to train EPA personnel in Scientific Diving techniques. EPA Regions 1, 2, 3, 4, 5, 6, 8, 9, 10, the EPA Atlantic Ecology Division, the EPA Gulf Ecology Division, EPA's Safety Health and Environmental management Division and Office of Water, the University of West Florida Underwater Archaeology Team, local first responders, and other diving experts from across the country, participated in this training session. There were over 50 participants in the training. 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

Underwater to surface communications
 Compressed gas handling
 Lift bag
 Diving Physiology
 Blackout Diving
 Contaminated water diving
 Diver to diver communications
 Underwater video and photography
 Diver propulsion vehicle product test

Reciprocity:

EPA participates in joint diving activities with a variety of outside organizations. These can include other Federal and State agencies, universities, and private sector organizations. To facilitate these operations and to 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 2010, EPA established Reciprocity Agreements with:

- U. S. Department of Commerce, National Oceanic and Atmospheric Administration
- U. S. Fish and Wildlife Service
- U. S. National Park Service
- State of Alaska, Department of Fish and Game
- State of Florida, Department of Environmental Protection
- University of Georgia
- Georgia Aquarium
- Scientific Diving International
- Mote Marine Laboratory
- University of Puerto Rico – Mayaguez
- Oregon State University
- University of North Carolina – Wilmington
- The Nature Conservancy

Dive Unit Highlights

Regional Units

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

A. Diving Activities

The New England Dive Unit is comprised of divers from the Atlantic Ecology Division Laboratory in Narragansett, RI, and the Regional Office in Boston, MA.

Diving Operations:

- The presence of invasive tunicates on eelgrass, were assessed in five coastal ponds on Martha's Vineyard, MA.
- Deep water training dives were conducted on the USS Vandenberg, off Key West, FL.
- Requalifying dives and diver emergency drills were conducted in Gloucester, MA and Jamestown, RI following suspension of diving activities during winter months.
- The status of colonizing marine tunicates on riprap covering stormwater outfall pipes were inspected and videotaped in Gloucester, MA.
- One diver successfully completed EPA diver training in Gulf Breeze, FL.
- Training dive was conducted in support of SHEMD dive program audit in Jamestown, RI.
- Three technologies designed to measure eelgrass coverage, were assessed in Gloucester Harbor, MA. This was in collaborative effort with the Massachusetts Institute of Technology (MIT) Seagrant and EPA's ORD lab in Chelmsford, MA. Gear malfunctions and delays forced cancellation of study.

- Eelgrass surveys were conducted in Buzzards Bay and Plymouth Harbor, MA. This work supported the U.S. Army Corps of Engineers comparative study of aquatic vegetation mapping using airborne hyper-spectral imagery and LIDAR technology.
- Eelgrass samples were collected in Sengekontacket Pond, Martha’s Vineyard, MA. This effort supported studies to assess the possible relationship between the presence of invasive tunicates on grass and eelgrass growth rates.
- Dives to collect blue mussels was conducted in Narragansett Bay (Bristol, RI). Mussels were collected for chemical exposure experiments in New Bedford Harbor, MA. No live mussels were found.
- Eelgrass was tagged for growth measurements and invasive tunicates were collected for genetic analysis in Menemsha Pond and Lake Tashmoo, Martha’s Vineyard, MA, in collaboration with researchers from Woods Hole Oceanographic Institute and U.S. Geological Survey.

Dive Locations

- Buzzards Bay, MA
- Coastal ponds on Martha’s Vineyard (Lagoon Pond, Lake Tashmoo, Sengekontacket Pond), MA
- Gloucester Harbor, MA
- Gulf Breeze, FL (inshore and offshore)
- Gulf of Mexico, off Key West
- Narragansett Bay, RI
- Plymouth Harbor, MA

B. Dive Statistics

Number of Dives

Scientific	20
Training	22
Proficiency	1
 Total Dives	 43

C. Diving Accidents, Injuries, or Incidents

On September 14, 2010, a diver experienced ringing in one ear following multiple shallow water dives. No other symptoms of ear barotrauma were evident, or reported by the diver. The next day, the diver continued to experience ringing, as well as notable hearing loss. A medical evaluation revealed sudden sensorineural hearing loss in the left ear. The diver has been instructed not to dive until medical clearance has been provided by Dr. Holland.

D. Review of Unit Diving Personnel

Eight EPA divers are on the roster, including five divemasters.

2. Edison Environmental Response Team Dive Unit

A. Diving Activities

The Environmental Response Team (ERT) conducted a limited number of scientific dives at EPA projects around the country. Some of the ERT dives were training and proficiency dives, conducted primarily in Gulf Breeze and Panama City (Florida), Denver (Colorado), and Raritan Bay, New Jersey, on the ERT 41-foot vessel Biglane. During the 2010 Fiscal Year, ERT conducted a total of 29 scientific dives, 61 training dives, and 12 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.

Diving Operations:

- Cordova, Alaska. ERT diver assisted Region X with inspection of seafood processor outfall waste piles in Cordova, Alaska. Tethered diving techniques were utilized to safely inspect the dimensions of seafood waste piles. Each diver provided photos, video, live narration, and descriptions of the pipe outfall area. GPS coordinates and compass bearings to diver were used to calculate diver location and dimensions of the waste pile.
- Syracuse, New York. ERT conducted extent of contamination sampling at the Lower Ley Creek Superfund Site during November 2009. To access shallow areas, divers worked out of an inflatable Zodiac in this creek contaminated with metals, polychlorinated biphenyls, and semi-volatile organic compounds. Sediment core samples were manually collected by divers for later laboratory

analysis. Diver sampling provided complete sampling coverage of locations not accessible by sampling vessel or too deep for waders.

- Lake George, New York. ERT assisted the Scientific Diving International (SCIDI) with statistical sampling of an area found to contain Asian clams, an invasive species. One meter quadrats were used at specific coordinates; two divers noted percent vegetation and collected five sediment samples for lab analysis. The 1-meter area was searched and all native mussels were removed for counting and identification on the dive vessel. The findings of the survey led to a rapid remediation project to rid the 4-acre area of the clams.

B. Dive Statistics

Number of Dives

Scientific	29
Training	61
Proficiency	12

Total Dives	102
-------------	-----

C. Diving Accidents, Injuries, or Incidents

No diving accidents were reported.

D. Review of Unit Diving Personnel

The ERT Dive Team has six members, including five divemasters.

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

Alan Humphrey presented a paper, “Environmental Response Team Standard Operating Procedures for Contaminated Water Diving Operations,” at the 2010 American Association of Underwater Scientists (AAUS) Workshop held in Honolulu, Hawaii, in March 2010. The paper was authored by Humphrey, Grossman, and McBurney.

3. Region 3 Dive Unit

A. Diving Activities

- Dutch Springs Quarry: Fall Classic Proficiency and Training Dives. On December 8, 2009 four members of the Dive Team and one Trainee Diver mobilized to the Dutch Springs Quarry near Allentown, Pennsylvania. The purpose of the exercise was intended to gain proficiency and practice using wireless communication equipment in our Aga masks and dry suit kits. The dives were conducted in up to 70 feet of fresh water, visibility was approximately 50 feet, and the water temperature was approximately 40 degrees. There was no known or suspected pollutant exposure. Number of Dives – 6 training dives.
- Dutch Springs Quarry: Spring Training Proficiency and Training Dives. On April 28, 2010 seven members of the Dive Team mobilized to the Dutch Springs Quarry near Allentown, Pennsylvania. Six Divers completed a total of 8 dives in dry suits using nitrox (approximately 36% oxygen) breathing gas. The purpose of the operation was to check out newly serviced dive regulators. The dive also served as a re-qualification dive for any diver who had not completed a dive in the last three months. Dives were conducted in up to 79 feet of freshwater, visibility was approximately 50 feet, and the water temperature was in the low 50's. There was no known or suspected pollutant exposure. Divers practiced open water ascent, diver rescue, surface swimming, and compass navigation. Number of Dives – 8 training dives.
- EPA Diver Training Week at the Gulf Breeze Ecology Division in Florida. During the week of May 10, 2010, Jim Gouvas, UDO; Steve Donohue, Alternate UDO; and John Armstead, Dive Master, attended the annual diver training and participated/assisted with training of the working divers and dive masters. One diver, Matthew Colip, attended the training. There was no known or suspected pollutant exposure. Number of dives- 22 training dives total for trainees and instructors/advanced operations.
- During the week of June 28, five divers from EPA Region 3's Dive Team and three divers from the U.S. Fish and Wildlife Service (FWS) conducted 64 separate dives in a collaborative freshwater mussel survey in East Brady on the Allegheny River, approximately 80 miles NNE of Pittsburgh, PA. Divers surveyed and characterized recovery of the freshwater mussel population where a bridge had been demolished, and dropped into the river in 2008. Mussels and gravel substrate were sampled in 30 plots along 10 transects and placed in mesh bags floated to the surface and processed at a shoreline station. Individual animals were identified and measured and the substrate carefully searched for small mussels. Divers also searched for and collected endangered Rayed Bean mussels (*Villosa fabalis*) for

relocation and repopulation of this endangered species in a segment of the Cheat River in West Virginia. Over 225 small (less than 1 inch) Rayed Beans were collected for relocation. Divers contended with three-foot visibility resulting from strong thunderstorms and stormwater runoff but the relatively shallow river depth (approximately 15 feet) safely allowed divers unlimited bottom time. EPA Divers took about an hour of video of the survey operations. Following the survey, with multimedia contractor support from the Region 3 office, an edited five minute video was produced, with maps, still and voice over narrative, to describe the survey.

- During the week of August 2, three divers from EPA Region 3’s Dive Team and six divers from the FWS conducted 70 separate dives in a collaborative freshwater mussels survey in East Brady, PA. Divers characterized the freshwater mussel population in a control area upstream of where a bridge had been demolished, dropped into the river, and removed in 2008. Mussels and gravel substrate were removed from 18 plots along 6 transects and placed in mesh bags floated to the surface and processed at a shoreline station. Individual animals were identified and measured and the substrate carefully searched for small mussels. Over one hundred threatened Rayed Beans mussels were also collected for relocation. In the second part of the survey, divers assessed the condition of the river bed and the recovery of the mussel population under the new bridge. EPA Divers also took video of the condition of the eastern bridge support pier. The coffer dam sheet piling and cribbing were still present around the pier and the inside of the coffer dam had not been backfilled with gravel. Divers noted other debris including wire cable and refuse in this area. This information and video was forwarded to the Pennsylvania Department of Transportation.
- A planned August 31 through September 7 Dive Survey off the OSV Bold was cancelled due to a combination of poor underwater visibility and heavy seas. A couple of strong Northeasters, and Tropical Storm Danielle passed through the mid-Atlantic the week before the survey and reduced visibility at the Redbird Reef to 1.5 meters. Tropical storm Earl also passed through the survey area during the survey window time.

B. Dive Statistics

Number of Dives

Scientific	77
Training	36
Proficiency	63
 Total Dives	 176

C. Diving Accidents, Injuries, or Incidents

No diving accidents, injuries, or incidents were reported.

D. Review of Unit Diving Personnel

Region 3 has ten EPA Scientific Divers, including six divemasters:

4. Atlanta - Region 4 Dive Unit

A. Diving Activities

- The Atlanta unit conducted seven project dives throughout the year: one related to habitat assessment on top of the disposal berm within the Tampa Ocean Dredged Material Disposal Site (ODMDS); two were in support of invasive species monitoring for the orange cup coral (*Tubasterea spp*) within south Florida waters from Broward County to the Dry Tortugas; and four were ground-truthing of sidescan targets located during site characterization for a new ODMDS offshore of Jacksonville, Florida.
- The dive unit conducted a one dive day at Lake Hartwell to practice in-water diver rescue techniques.
- A proficiency dive event was conducted at Ginnie Springs, FL, for a couple of divers to maintain program proficiency.

B. Dive Statistics:

Number of Dives

Scientific:	132
Training:	10
Proficiency:	8

Total Dives	150
-------------	-----

C. Diving Accidents, Injuries, or Incidents

No diving accidents, injuries, or incidents were reported.

D. Review of Unit Diving Personnel

The Atlanta unit has nine members, including four Divemasters.

5. Athens – Region 4 Dive Unit

A. Diving Activities

- Sediment oxygen demand/nutrient studies: Sediment oxygen demand (SOD) rates are determined through the deployment of aluminum chambers over the bottom sediments. Four replicates and two blank chambers were deployed at each station. The replicate chambers are sealed directly to the bottom while the blank chambers are sealed as a unit and are not in contact with the bottom sediments. The blank chambers are filled with ambient water to measure the water column respiration. Nutrient exchange studies are conducted using the same chambers and require a long incubation period, generally all day or overnight. Water samples are then pulled from the chambers by divers and analyzed for nutrients. SOD and nutrient exchange studies are both conducted in aerobic conditions. The anaerobic sediment gas exchange study was performed. This study is a similar study to nutrient exchange but conducted in anaerobic conditions. Samples from this study are analyzed for methane, ammonia and sulfides.
- Ocean Dredged Material Disposal Sites: These surveys determine the sedimentological, water quality, and benthic infaunal characteristics in areas within and adjacent to the influence of dredged material disposal. Divers are responsible for collecting sediment cores for laboratory analysis and benthic macroinvertebrate analysis, as well as taking bottom photographs and recording observations.
- Deploy/retrieve instruments: Deployment and retrieval of current meters at Ocean Dredged Material Disposal Sites (ODMDS). A lift bag was utilized for the deployment and retrieval process.

Location of diving operations/water body:

Florida – Estuaries and offshore

Georgia – Lakes

B. Dive Statistics:

Number of Dives

Scientific:	45
Training:	35
Proficiency:	17
Total Dives	97

C. Diving Accidents, Injuries, or Incidents

No diving accidents, injuries, or incidents were reported.

D. Diving Personnel

There are a total of seven divers on the Athens Dive Team, including two divemasters.

6. Gulf Ecology Division, Gulf Breeze Dive Unit (GED)

A. Diving Activities

GED carried out several scientific diving operations. The multiple dive projects performed included Coral Surveys, Acoustic Doppler Current Profiler (ADCP) data download and service, and inspection and service of seawater intakes for the GED lab. The GED dive team accounted for a total of 237 individual dives.

- GED divers made inspection dives around the GED west dock to search and remove any hazards. Ladders were removed, cleaned, and reinstalled. Barnacles, oysters, and fishing gear were removed from the pilings. 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.
- EPA Divers collected coral condition data and photographed corals off the coast of Flower Gardens. 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 macro biota. 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 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:

1. Located underwater stations
 2. Enumerated the number and species of coral colonies located along a 25 meter transects
 3. Estimated class size for each coral colony along the transect
 4. Enumerated reef fish and calculated the available biomass
 5. Characterized Octocorals, gorgonia, macroinvertebrates,
 6. Photographed samples of each class size for computerized determination of surface area and living tissue
 7. Conducted disease and bleaching surveys
 8. Assessed percent of living/dead, size class, disease frequency, bleaching and numbers of coral colonies
 9. Mapped and videoed the sites
 10. 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: 237

C. Diving Accidents, Injuries, and Incidents

No diving accidents, injuries, or incidents were reported.

D. Diving personnel

There are eight GED divers, including six Divemasters

7. Region 6 – Dallas, TX

A. Diving Activities

- Diving activities this year were primarily limited to training activities for new Region 6 divers and participation in the Flower Garden Banks biological assessment.

- The Region 6 dive team added three new members this year and conducted four training exercises in local Texas lakes and quarries.
- Van Kozak and Bill Luthans were invited to assist the ORD Gulf Breeze ORD laboratory in the conduct of a biological assessment of the Flower Garden Banks and assist Region 4 in the conduct of a survey for orange cup corals on the Stetson Bank. Operations were conducted off the OSV Bold October 15 to 23, 2010. Excellent weather and sea conditions permitted a total of 22 dives for Region 6 divers. Operations were conducted from inflatable boats and the 23 foot Parker deployed from the OSV Bold.

Location of diving operations/water body:

Offshore – Flower Garden Banks and Stetson Bank, Gulf of Mexico
 North Texas Lakes for training exercises

B. Dive Statistics

Number of Dives

Scientific	22
Training	63

Total Dives	85
-------------	----

C. Diving Accidents, Injuries, and Incidents

No diving accidents, injuries, or incidents were reported.

D. Review of Unit Diving Personnel

There are six R6 divers including two Divemasters.

8. Region 10 Dive Unit-Seattle, WA

A. Diving Activities:

Region 10 (R10) dive unit had 10 scientific work diving events, some of which were multi-week operations. Additionally, there were ten training events. R10 had 135 work dives and 149 training dives. Overall, Region 10 had a total of 337 dives (including requalification and off-duty dives).

- Duwamish River Stormwater Sampling Event: Sampling devices were placed in and near a stormwater pipe discharging to the Duwamish Superfund site to determine what, if any, impact the discharge was having on sediment chemical concentrations. The scientific evaluation of inputs was shared with Superfund, RCRA, and other interested programs.
- Derelict Gear Mapping and Observations: Derelict gear was located and documented as to its size, extent, potential to entrap aquatic life, and the aquatic life trapped within it. This was done as part of the Puget Sound and Coastal Americas initiatives R10 is sponsoring in scientific reports. 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.
- McCormick and Baxter Transition Zone Water Sampling: Divers supported the Superfund program by using their scientific sample collection expertise in collecting shallow groundwater samples (piezometers) in a clean cap overtop creosote contaminated sediment. Superfund used this data to quantitatively evaluate whether the cap was performing as designed to protect aquatic life.
- ASARCO Cap Survey: Divers documented Superfund sediment cap conditions prior to Puget Sound Initiative pilings removal work. The scientific dives documented cap conditions, types of life supported by the cap, and areas where no cap seemed to be present, as a pre-project baseline to ensure the remedy remained/remains protective.
- Willapa Bay Instrument Deployment/Recovery: Scientific divers deployed and retrieved scientific instruments at several locations vital to implementation of the Clean Water Act and updating of EPA's 303(d) list of impaired water bodies. 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. Data collected will be utilized in a scientific report on the health of regional estuaries.
- NPDES Outfall Surveys: EPA divers collected scientific data in support of the Office of Water to determine, size, shape, and health of the seafloor near outfall locations in Prince William Sound. Data was collected by video surveys and other direct observations. These scientific dives also assessed potential hypoxic conditions on the seafloor in support of the evaluation of new permit writing conditions.
- Pacific Sound Resources (PSR) Solid Phase microextraction devices (SPME) Deployments/Retrieval: Superfund requested dive unit support for evaluation of the ongoing success of the clean sediment cap at the PSR Superfund Site.

Scientific divers placed and retrieved SPME's meant to mimic the uptake of aquatic life upon the cap in conjunction with University of Texas scientists. Sediment samples (co-located) were also taken at the SPME locations to look for correlation between cap contamination and levels of PAHs in porewater.

Training Dives:

- Deep checkout dives. Two separate events were conducted to perform deep checkouts for scientific divers Arrigoni and Richmond.
- Pool dive. One pool training dive was conducted to troubleshoot wireless communication devices and perform emergency drills (AGA mask doff and don).
- Training Dives. Several training dives were conducted individually with divers who planned to attend the EPA and NOAA dive training. This was intended to promote gear familiarity and troubleshoot gear issues before going to training.
- Lake Union Training Dives. These dives practiced scientific diving data collection of vessel characteristics by using video survey techniques, identification of bottom life on the vessel, and identification of any hazardous materials on the vessel. Decontamination techniques were also practiced.
- Rescue training dive event. This event provided exposure to scientific diving data collection techniques. All divers practiced rescue techniques.
- AAUS training courses, towboarding, and photography for science. These courses were offered by AAUS and taught by University of Hawaii staff. "Towboarding for science" emphasized scientific data collection techniques used while covering miles of ground. Digital photography for scientific diving was taught also by University of Hawaii staff and focused on techniques to get better photos underwater.
- Earth Day Outreach Dives. Dives were conducted via tethered SCUBA and with a drop camera to show fourth and fifth grade students what EPA divers do in performing scientific dives. Rescue drills were conducted after the students departed.
- Rescue drills/dive audit. Divers conducted practice of scientific diving data collection techniques, such as video survey tools, and practiced dive rescue skills.

Location of diving operations:

Dives conducted in:

- Washington State: Puget Sound, Willapa Bay, Lake Union, Lake Washington, and the Duwamish River.
- Alaska: Prince William Sound.
- Oregon: Willamette River.

B. Dive Statistics

Number of Dives

Scientific	135
Training	149
Proficiency	53
 Total Dives	 337

C. Diving Accidents, Injuries, and Incidents

No diving accidents, injuries, or incidents were reported.

D. Diving Personnel

There are a total of eleven divers, including five Divemasters.

- Divers Tohan and Baron were certified at the NOAA Dive Center in May 2010.
- Diver Richmond was certified by EPA in May 2010.

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

A. Diving Activities

- Dive activities during 2009-2010 consisted of proficiency and working dives to test new equipment and search for and retrieve water quality equipment. Working dives included photographs of a prototype fish trap for collecting nekton samples in eelgrass beds, inspection of a PVC pipe used to house a YSI data sonde for year round deployment in Yaquina Bay and retrieval of a YSI data sonde lost in Netarts Bay for over two months. Proficiency and re-qualification dives were performed as needed.
- Locations of work dive operations: Yaquina Bay and Netarts Bay, Oregon.

- WED divers continue to have difficulty maintaining proficiency by diving at bimonthly intervals, and overall the need to dive has lessened over the last year due to a shift in projects.
- One WED diver took extended periods off from diving due to a back injury. The diver has completed their annual physical and has since completed a re-qualifying program.

B. Dive Statistics:

Number of Dives

Scientific	7
Training	0
Proficiency	45

Total Dives 52

C. Diving Accidents, Injuries, and Incidents

No diving accidents, injuries, or incidents were reported.

E. Diving Personnel

The WED unit consists of six divers, including five Divemasters.

One WED diver is involved with the Oregon Coast Aquarium and he conducts a number of dives to help with aquarium maintenance on a monthly basis.