

SCIENCE IN ACTION

Highlights 2003-2004

Region 10 Office of
Environmental Assessment



Science in Action

Highlights from 2003-2004 Office of Environmental Assessment

Region 10's scientific and technical leadership is housed in the Office of Environmental Assessment (OEA). Staff members are located in EPA's offices in Seattle and at the Manchester Environmental Laboratory (MEL), in Port Orchard, Washington. These staff members and their managers work collaboratively with regional and national EPA programs, various agencies within the four states in the Region (Alaska, Idaho, Oregon and Washington), other federal agencies, hundreds of tribes, industry, non-profit organizations and the public to establish the scientific principles and develop the associated technical work products that are so critical to environmental decision-making. OEA is also home to the Pollution Prevention program (P2), added in 2003, to help incorporate P2 principles and real-world applications into our technical and scientific work. Here is a brief summary of notable accomplishments:

Work Accomplished in Calendar Year 2003-2004

- Over 85 site-specific quality assurance project plans reviewed and approved
- "First in the Nation" P2 outcome measurement system developed
- 2004 Regional Innovator of Year Award presented to two IEU staff members for inventing a new sampling device.
- Over 200 inspections in support of 14 regulations and 11 media programs

- Collaborated on development/release of test method distinguishing organic/ inorganic arsenic in seafood
- BlueSkyRAINS wins the Region's Innovation Gold Medal in 2003
- Numerous publications including:
 - Modeling Fish Distributions in the Pacific Northwest Coast Range Ecoregion Using Environmental Monitoring and Assessment Program (EMAP) Data
 - A Review of Some of the Effects of Dissolved Oxygen on the Fish and Invertebrate Resources of Ward Cove, Alaska
 - 2003 Region 10 Annual Quality Assurance Report and Manchester Environmental Laboratory Annual Report
 - Water Quality Assessment of American Falls Reservoir; EPA 910-R10-04-006
 - Receptor Model Analyses of Aerosol PM_{2.5} Data from the IMPROVE Monitor at Denali National Park; EPA 910-R-04-012

Science is at the heart of EPA's work-- from evaluating the condition of the environment, to the assessment of risk, to the development of methods to prevent or remediate risk. Region 10 is committed to developing new tools and providing sound and thoughtful scientific input to our regulatory decisions. The Region seeks to advance the integration of science on a geographic and cross-media basis to address environmental concerns more holistically and to use our limited resources more efficiently. Our success depends upon the talent and hard work of staff and managers within OEA, and on the Region's commitment to proper utilization of these resources. You have our pledge to continue working cooperatively and productively, with our internal and external partners, toward the development and application of sound science in making decisions that affect the environment of the Pacific Northwest and Alaska that we all cherish.

Signed,
OEA Management

Mission Statement

Office Of Environmental Assessment

The mission of the Office of Environmental Assessment is to demonstrate scientific/technical leadership, develop partnerships for providing scientific/technical information, assess the condition of the environment, and determine the compliance status of pollution sources.

Scientific/Technical Leadership:

- Learn, use, and develop state-of-the-art assessment methods to continuously improve the depth and accuracy of the Region's knowledge and evaluation of environmental conditions.
- Promote a system of peer review and data quality management to ensure our actions are scientifically and technically defensible.
- Collaborate with other agencies and the public to identify and explore new scientific/ technical issues, methods, and solutions for enhancing our assessment and protection of the environment.
- Provide scientific/technical training and consultation within EPA, and to other agencies and the public.

Partnerships:

- Provide the best available scientific/technical support, including analysis and interpretation, to our partners and the public.
- Establish and improve scientific/technical networks, both internal and external to EPA.

Environmental Assessment:

- Assess the condition of the environment, including the compliance status of pollution sources.
- Identify information gaps to direct future data acquisition activities.
- Provide information on meaningful and measurable environmental indicators that can be used to make informed management and/or policy decisions.
- Provide comparative risk analyses and risk management options for use in setting priorities.

The Composition of OEA

In order to achieve these objectives, the Office is divided into units, each responsible for particular aspects of the mission statement.

There are 91 staff in OEA, including the Office Director, Associate Director, Laboratory Director, three Unit Managers, and a senior supervisory chemist. There are three (3) units: the Investigation and Engineering Unit (IEU), the Risk Evaluation Unit (REU), and the Technical Support Unit (TSU). OEA is home to the Manchester Laboratory as well. There are three key administrative staff who support the units in the Seattle office and two supporting the staff in Manchester. There are several staff who work directly for the Office Director including the Regional Quality Assurance Manager, the Regional Science Liaison to EPA's Office of Research and Development (ORD), and OEA's management and program analysts.

Manchester Environmental Laboratory (MEL)

Regional laboratories apply science policies, principles, and methods to support regulatory programs, monitoring programs, and special projects. Regional laboratory expertise is directed at a daunting array of environmental issues through direct implementation and leveraged through partnerships with state, local, and tribal governments, private industry, the academic community, EPA program offices, ORD, and the public. Regional laboratories are crucial to advancing the Agency's science agenda through the application of the following principles:

Integrate laboratory activities with those of field and quality assurance partners into a comprehensive, holistic, multi-media approach to solving ecosystem-based environmental problems.

Provide scientific data of known quality to support Agency decisions through partnerships with regional and national media program offices, state, local, and tribal governments, academia, the private sector, and the public.

Maintain a fully equipped laboratory to produce physical, chemical, and biological data of known quality to be used for environmental decision-making at all levels of government.

Maintain and enhance a technically and scientifically skilled, dedicated, and diverse staff through outstanding recruitment, career development, training, management, and leadership.

Advance the Agency's science agenda at the point where decisions are made.

Technical Support Unit (TSU)

The Technical Support Unit provides broad scientific and technical support to all Regional programs. The Unit includes experts in chemistry, atmospheric sciences and meteorology, health physics, engineering, and economics and finance. The Unit

staff members provide advice and technical assistance to state, local, and tribal agencies, other federal agencies, international organizations, and the general public. The staff members participate in the development of Regional and national technical guidance in their respective areas of expertise, and participate in professional organizations and conferences.

Quality Assurance Expertise: In support of the Regional Quality Assurance program, Unit staff members ensure that environmental data employed in management decisions are of acceptable and appropriate quality; review and approve quality assurance plans; and, conduct technical and performance audits of field and laboratory activities.

Air Program Support: The Unit provides analyses of ambient air quality and meteorological data; performs and reviews multi-scale, multi-pollutant air quality modeling analyses; oversees state, local, and tribal air quality monitoring and modeling programs; manages submittal of state, local, and tribal data to national data bases; performs assessments of state and local air quality monitoring networks; develops and reviews air emission inventories; and, assesses the adequacy of air pollutant control technologies.

Economics and Financial Analysis Support: The Unit has two staff with economics and financial analysis expertise that they provide to all programs, including expert advice and financial analysis on an array of enforcement-related issues; developing and implementing surveys, workshops, and training; and, performing other special studies.

Radiation Program Support: Unit staff members integrate and coordinate the Regional radiation program with other Regional programs, involving such areas of responsibility as radiological emergency response and homeland security; remediation of contaminated sites; radiological safety and training; monitoring and regulation of radionuclide emissions; and, maintaining professional health physics capability for the Region and the Agency.

Risk Evaluation Unit (REU)

The Risk Evaluation Unit is responsible for characterizing the environment as well as assessing risks to people and ecosystems. The Unit includes experts in the physical, chemical, and biological sciences. The Unit supports all EPA programs by determining what would be considered safe consumption of fish and shellfish; identifying and assessing point and non-point source stressors to aquatic ecosystems; recommending ways to reduce human health and ecological risks from exposure to persistent, bioaccumulative and/or toxic chemicals (lead, pesticides, PCBs, dioxins); characterizing ecosystems including the conditions in Indian Country; improving the public's ability to reduce exposure to human health and environmental risks; and, advancing the scientific understanding of the integrity and sustainability of ecosystems through measurement, modeling, maintenance, or restoration at multiple scales (i.e., macro-, micro-scale). The staff members provide advice and technical assistance to tribes, states, other federal agencies, and the general public on all matters related to the condition of the environment. The staffers also assist Headquarters in developing guidance on human health and ecological assessments.

Investigation and Engineering Unit (IEU)

The Investigation and Engineering Unit is a multi-disciplinary/multi-media team providing scientific, engineering and technical support to all Region 10 media programs. It is an expertise-driven, technical support unit. Field inspectors in this Unit are trained in environmental monitoring, assessment, and sampling for pesticides, toxic chemicals, water quality, air quality, asbestos and PCBs. These experienced inspectors serve as mentors, assisting new staff by providing job development and training support. They have expertise in the area of multi-media inspection coordination and execution.

This Unit has special investigations capabilities for enforcement and other programs, including Superfund. They provide support

for civil and criminal enforcement actions, as well as assist in program initiatives. Investigators provide intelligence- and information-gathering on companies and individuals who may be in non-compliance with environmental laws and regulations.

Pollution prevention (P2) experts provide support for state programs, with the intention of fostering constructive working relationships and integrating P2 work in the Region as well as providing technical assistance to businesses. This Unit also provides credentials training for prospective inspectors.

Meet the New Leader of OEA

Bill Riley recently joined OEA as its Director. Bill began his federal career in 1974 at the US Geological Survey. He has also worked for the Corps of Engineers, Seattle City Light and, in 1980, joined Region 10 to work on energy issues. During his 24 years with Region 10, he has worked on environmental impact statement (EIS) development and review, managed the Regional Wetlands Protection Program and prior to his new assignment, served for 9 years as the Region's Mining Coordinator in the Office of Water. Bill has a varied interdisciplinary educational background and enjoys working cross-program issues. He likes working with technical specialists to properly incorporate good science into complex regulatory decision-making.

Key Elements to Achieving OEA's Mission

OEA staff members are actively involved in providing direct environmental assessment, oversight, and/or advice to nearly every office in the Region. There are several key elements to OEA's work that are essential to achieving the mission of the organization. These elements include:

- the preparation of statistical or qualitative study designs for data collection and analysis,
- collection of data or other environmental information by conducting field work, inspections and interviews,
- completion of chemical, microbiological, and geochemical laboratory analyses,
- interpretation of environmental information using measurements, models, and best professional judgement, and
- completion of quality assurance reviews of data.

In addition to direct project support to the Region and its partners, OEA staff members are also involved in the development of new guidance, procedures and techniques as part of state, regional, national and international efforts. This report is intended to give the reader a better idea of the scope of OEA's work.

OEA Delivers!

In response to the age-old question "So, what have you done for me lately?", the following is a "snapshot" of the work conducted by staff in OEA over the past two years. It is not meant to account for all of the Office's work, rather it highlights several areas that are important to the Region where OEA has focused resources and staff.

- OEA hazardous waste team hydrogeologists and risk assessors work with project managers in Superfund and RCRA to identify the fate and transport of toxic chemicals as well as the likelihood of exposure to these chemicals. Over 100 site-specific projects within these programs were supported by these OEA staff over the last two years.

- OEA's hydrogeologists have been instrumental in characterizing groundwater at various facilities and hazardous waste sites as well as providing assistance for groundwater remediation. They developed a method for measuring groundwater and its influence on surface water; thereby improving the monitoring of contaminants and assessing remedy effectiveness. In addition to these types of assessments, these staff have provided on-site support and expertise to several Native American tribes in the Pacific Northwest who face challenging environmental problems.
- OEA's human health and ecological risk assessors helped advance the understanding of tribal exposure scenarios through regional and national workgroups and site-specific discussions. They have developed regional and national guidance on vapor intrusion, which was particularly important to the Georgetown community (a Seattle neighborhood) where toxic vapors were seeping from groundwater into area homes.
- OEA inspectors, working closely with the program staff and attorneys to develop inspection strategies, conducted 203 inspections for 11 media programs in 2003. The table below indicates the total number of 2004 inspections performed and under what authority.



**FY 2004
OEA INSPECTION ACTIVITIES
Completed Inspections**

		Total	Lead	Assist
AIR	CFC	15	15	0
	FCE	15	13	2
Air Totals		30	28	2
AHERA		4	4	0
EPCRA		12	1	11
FIFRA		7	7	0
TSCA		55	54	1
RCRA		0	0	0
UIC		42	14	28
UST		0	0	0
OPA		1	1	0
Other		0	0	0
	S/W	6	6	0
	CEI	31	28	3
NPDES	CSI	23	15	8
	CSO	1	1	0
	PCI	8	8	0
	SSO	0	0	0
	Other	2		2
NPDES Sub Totals	71	58	13	
Grand Totals	222	167	55	

This table makes an important distinction. Where two or more OEA personnel are involved in an inspection, each must document their role, however, only the “lead” inspector’s report is counted for reporting purposes.

During FY 2003, 88 site-specific quality assurance project plans (QAPPs) were reviewed and approved by OEA staff. Each plan took, on average, 17 days to review by various OEA staff. An additional 40 QAPPs were reviewed and approved for Superfund's Emergency Response program.

The environmental monitoring and assessment team completed total maximum daily loads (TMDLs) for sediment and temperature pollution in Idaho, Washington and Oregon. They also either prepared in-house biological assessments (BAs) or reviewed contractor-prepared BAs as required under the Endangered Species Act.

The water quality modelers developed the temperature model for the Columbia and Snake Rivers. This model was used to complete the temperature TMDL for the Snake River.

State and Local Government Entries into the Region 10 P2 Results Measurement Tool* Cumulative Reductions (starting in 1992)

- 575 million pounds of reduced hazardous waste generation
- 1.2 million pounds and 600,000 gallons of reduced toxic materials
- 646 million kWh of electricity not used
- 28,000 therms of natural gas saved
- 5,000 gallons of diesel and 15 million gallons of other fuels not used
- 2.2 billion gallons of water saved
- 242 million pounds of solid waste reduced
- 840 tons of CO₂ emissions prevented
- 18 million vehicle miles avoided
- 1.4 million kWh renewable energy generated

These results demonstrate the success of P2, energy efficiency, solid waste and natural resource reduction projects in Alaska, Idaho, Oregon and Washington, assessed between 1993 and the present. This accounting does not reflect all of the reductions and resource efficiencies in the Region.

R10 P2 Results Measurement Tool

The Region 10 Pollution Prevention program has made great strides in outcome measurement. Region 10 was the first in the Agency to develop a viable outcome measurement system for P2 (a multi-year project). The Region 10 system has now been adopted by EPA Headquarters and other regions as part of the national outcome measurement program.

R10 Field Support Activities

Technical and field support staff are responsible for purchasing, repairing, servicing, maintaining, loaning and tracking the field equipment and supplies utilized by staff in the Seattle office and MEL. These include 6 boats, 4 field vehicles, hundreds of pieces of equipment, and thousands of supply items.



OEA staff members responsible for the boats provided support for many projects in 2003-2004 including:

- Headquarters tours,
- Dive support,
- Texas A&M study of the Duwamish River,
- Eagle Harbor study,
- CID support,
- Rhone Poulenc, and
- Columbia River study.

In 2003-2004, they prepared and shipped supplies and equipment in support of numerous projects or sites, including:

- NPDES compliance inspections,
- Kivalina Village drinking water inspection,
- LUST and UIC inspections,
- CAFO overflights
- TMDL studies,
- Site assessments,
- Nez Perce Tribe,
- Shoshone-Bannock project,
- Umatilla Basin,
- Colville Tribe, and
- Coeur d'Alene Basin.

They also provided materials and supplies for staff in the Operations Offices in Idaho, Oregon, Alaska, and Washington, along with EPA contractors, EPA's Criminal Investigation Division, regional health and safety personnel, and the Oregon Department of Environmental Quality (ODEQ).

Working With Our Partners

As part of our daily work to protect the environment and public health, we support or assist our local, state, tribal, and federal partners in numerous ways. A few of the 2003 activities are described below:

In Oregon

Carpenter Lane: OEA staff assisted the Agency for Toxic Substances and Disease Registry (ATSDR) by collecting water, soil, vegetation and air samples for environmental contamination assessment, including pesticides. The samples were analyzed by MEL. This project began when ATSDR needed additional information to conduct a health consultation requested by concerned community members in Gresham, Oregon. The community members live in a rural area, surrounded by commercial tree farms, where pesticides are applied to the trees both aerially and by hand. The community was concerned



that the pesticides may be causing health problems for them and their animals. The results of this study have been provided to ATSDR for review and analysis.

Mercury TMDL: MEL is assisting ODEQ by testing the rivers for mercury. This data will be used in establishing the TMDL for mercury in the Willamette and Umpqua/Calapooya Rivers in Oregon. Monitoring began in July 2003. MEL has analyzed the samples collected for total mercury in addition to other parameters, and will be collaborating with others who can, for example, perform methyl mercury analyses.

Portland Harbor Superfund Site: Sturgeon, spring Chinook, and lamprey were collected from the Willamette River within the Portland Harbor Superfund Site in the summer of 2003 through a cooperative effort involving the Oregon Department of Human Services (ODHS), ATSDR, Oregon Department of Fish and Wildlife (ODFW), the City of Portland and EPA Region 10. The samples were analyzed for metals, semi-volatile organic compounds, PCBs and pesticides by MEL. The results of these analyses have recently been used to: (1) help ODHS determine if a change is needed in the current fish consumption health advisory for this stretch of river and (2) develop ATSDR public health consultations done as a part of ODHS' work under Superfund. The Potentially Responsible Parties (PRPs) for the Superfund site will also use these data in the baseline human health risk assessment for the Portland Harbor Remedial Investigation.



Nitrate and Perchlorate in the Lower Umatilla Basin: OEA supported a Basin-wide sampling initiative for nitrates in groundwater in the Lower Umatilla Basin Groundwater Management Area (GWMA) at the request of ODEQ. This area of approximately 550 square miles includes 180,000 acres of irrigated agriculture and was last sampled in 1992 at the time the GWMA was established. OEA provided sample analyses through MEL and, OEA personnel developed the project's quality assurance plan. Of the 164 wells sampled, 54% had detectable concentrations of perchlorate - a salt consisting of the most oxidized form of chlorine and four oxygen atoms. Perchlorate and nitrates may be toxic to people who drink the water. Due to possible adverse health effects EPA Region 10 recommends that individuals whose drinking water contains greater than 4 ppb of perchlorate should seek alternative sources of drinking water.

In addition, OEA, in a continuing cooperative effort with ODEQ, Region 10's Office of Water and Watersheds and Office of Ecosystems, Tribal and Public Affairs, has been working in the Lower Umatilla Basin of Eastern Oregon. OEA developed a model to assist Morrow and Umatilla Counties in determining appropriate zoning (i.e., residence spacing) necessary to protect groundwater quality in the Basin which records less than 7 inches of annual precipitation. OEA developed this mathematical model to assess septic tank nitrate loading, degradation processes and dilution from infiltrating rainwater.

In Washington

Temperature Impacts to the White River: At the request of the Puyallup Tribe, OEA staff used a model developed by Puget Power to analyze temperature impacts of diverting water from the White River into Lake Tapps and found substantially higher impacts than had been previously reported. This work is under consideration in a National Marine Fisheries Service (NMFS) biological opinion regarding endangered salmon stocks in the White River.

Water Quality/Quantity Peer Review for Columbia Basin:

OEA's Peer Review Coordinator for Region 10 set up a "peer review" process for a new report using two private consulting firms and the U.S. Geological Survey. The report, Hydrostratigraphic Mapping of Selected Sediment and Basalt Units in the Columbia Basin Groundwater Management Area, Adams, Grant, and Franklin Counties, Washington, will be used by state and local officials in protecting both water quality and quantity in the Columbia Basin.

Eelgrass Survey for Swinomish Tribe: Working with NASA, the Dryden Flight Research Center, and the Swinomish Tribe, EPA Region 10 is providing high resolution GIS analyses of aquatic vegetation, as well as GIS representation of adjacent uplands, in a resolution compatible with satellite images. The techniques used in this study included an airborne multi-spectral scanner and infrared photography. Four teams of OEA staff members were involved in the survey. OEA participated in this effort by providing technical assistance to the Tribe in order to assess Tribal natural resources, particularly shellfish beds. OEA staffers, in collaboration with NASA, are preparing a report on this eelgrass survey conducted for the Swinomish Tribal Community in 2000. The report, Evaluation of Mapping Several Northern Puget Sound, Washington Seagrass Beds (*Zostera* spp.) Using an Airborne Thematic Mapping Simulator, is expected to be published in 2004.

Tribal Risk Assessment for the Midnite Mine Superfund Site:

OEA risk assessment staff members are writing a tribal risk assessment for the Midnite Mine Superfund site. The Spokane Tribe owns the property upon which the mine is located. In addition to the typical human health exposures, OEA staff worked with the Spokane Tribe to develop a special tribal-exposure scenario. OEA's radiation program provided technical review of data, and developed the radiological risk assessment portion of the baseline risk assessment as part of the Remedial Investigation/Feasibility Study baseline risk assessment. The radiation program also provided technical input to support removal actions that address nonuniform contamination along the mine haul road routes.

Upper Columbia/Lake Roosevelt: OEA staffers are providing technical assistance on human and ecological risk issues to support project planning, external communication, and PRP negotiations for the Upper Columbia River (aka Lake Roosevelt) Superfund assessment/study.

Measuring Arsenic Uptake in Port Gamble S’Kallam Tribal Members: At the request of the Port Gamble S’Kallam Tribe, OEA, in cooperation with ORD, measured arsenic uptake in tribal members who consume seafood. The results of this study provided ORD with information on the likelihood of arsenic uptake by tribal people who are subsistence fishers. It also helped advance the science of measuring different forms of arsenic. Arsenic metabolism in aquatic organisms results in forms (speciation) with differing toxicities. It is, therefore, important for risk assessment to understand the critical form of arsenic which may be consumed. This study, along with advancement in laboratory analytical tools spearheaded by ORD and MEL, will result in an improved understanding of the risks of exposure to arsenic.

In Alaska

QA Plan for Toxics in Fish Tissue: The State of Alaska Department of Environmental Conservation (ADEC) requested OEA staff support on developing a quality assurance plan for collection and analysis of toxic chemicals in fish tissue from the waters of Alaska. These data were used by the State to determine whether there is a need for fish advisories. ADEC’s analysis and interpretation of the data led to a conclusion by the State that no fish advisories are warranted.

Cook Inlet Fish Contamination Assessment: At the request of the Cook Inlet Villages, OEA completed a summary report titled “Cook Inlet Fish Contamination Survey.” The report discusses the contaminants in fish, shellfish, and other aquatic biota from Cook Inlet. The villagers will use the information to determine the effect on their traditional foods and their potential exposure to contaminants released during oil and gas drilling in Cook Inlet.

Rivers and Streams Monitoring: During the summers of 2003 and 2004, as part of the National State Monitoring, Assessment, and Reporting Program Grants, 50 wadeable (shallow) streams were monitored in Alaska. Water chemistry, physical habitat, benthic macroinvertebrate and periphyton assemblage data will be collected using EMAP field protocols. ADEC has selected the Yukon River Lowlands/ Yukon Tanana Uplands as the study area. This area is located in interior Alaska, north of the Alaska Range. It extends from Denali National Park and Preserve east to the Yukon Territory border. The project will be managed by ADEC in collaboration with the University of Alaska Environmental and Natural Resources Institute, OEA staff, Alaska Cooperative Fish and Wildlife Research Unit and the US Geological Survey's Alaska office. OEA conducted the field training and audits, and will continue to provide technical support to this project.

In Idaho

Temperature Monitoring and Modeling System for the Snake River: Pursuant to the 2000 biological opinion for endangered salmon within the Columbia and Snake Rivers, OEA participated in a multi-agency effort (Corps of Engineers, National Marine Fisheries Service, and the States of Idaho, Oregon and Washington) to develop a temperature monitoring and modeling system for the Snake River. The workgroup completed a report that establishes a plan for data collection and model development. Once developed and tested, the model will be used in planning cold water release operations at Dworshak Dam to improve salmon habitat in the Lower Snake River.

Region-Wide Initiatives

Much of OEA's work crosses state borders and involves working collaboratively with other agencies and organizations. Here are a few examples of that work :

Columbia River Basin Regional Priority: In 2002, EPA Region 10 completed an assessment of chemical contaminants in resident and anadromous fish species caught and consumed by four Native American Tribes (Nez Perce, Warm Springs, Umatilla, and Yakama) in the Columbia River Basin. This Basin-wide survey found the highest level of contamination in four resident fish species collected from the mid Columbia and lower Yakima Rivers. The chemicals of concern in fish were identified as those which are the primary contributors to the risks from consumption of fish. These were dichloro diphenyl trichloroethane (DDT) and analogs, chlordane and analogs, polychlorinated biphenyls (PCBs), polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs), and eight trace metals (arsenic, cadmium, chromium, copper, mercury, nickel, selenium, and zinc).

With the completion of this study, Region 10 agreed to include toxics chemicals as one component of the multi-level Columbia River Regional priority. OEA has lead responsibility for developing the toxics component of this strategy. The objectives of the toxics strategy are to determine the source of contaminants found in fish and the likelihood that fish are at risk to toxic chemicals released in the Basin.

To date, OEA inspectors and investigators have examined information from hydroelectric facilities in the Basin and determined that all are in compliance with respect to storage and disposal of PCB-laden equipment. The Superfund program reviewed their records and identified sites which may be sources of the primary contaminants of concern (PCBs, DDT, mercury, arsenic, etc.). The GIS group developed maps of hazardous waste facilities as well as all other activities in the Basin which may contribute to toxic chemical exposures. OEA also developed a plan for sampling sediments in the Basin to determine the loading

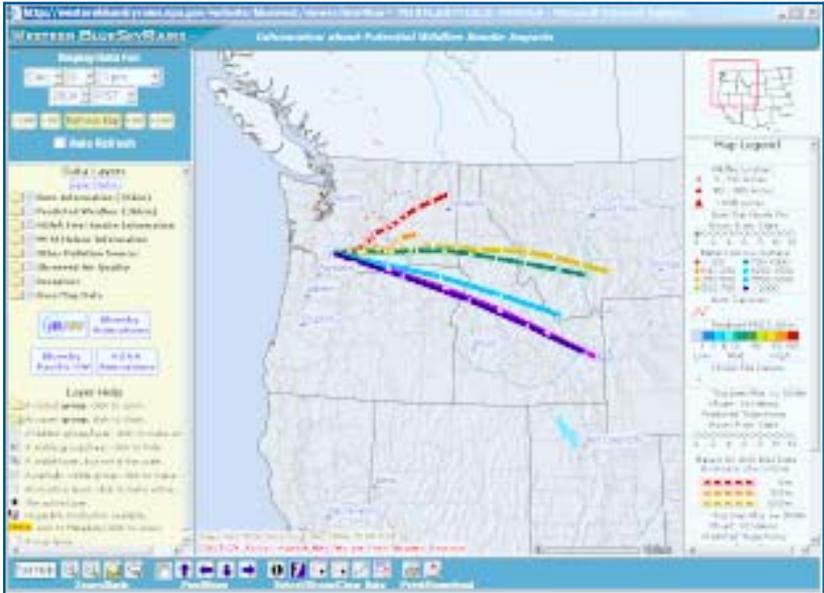
of toxic chemicals. Sample collection and analysis occurred during Fall 2004. Finally, OEA staff members are working with scientists from the Science Center of the National Oceanographic and Atmospheric Administration (NOAA-Fisheries) on a joint proposal for addressing the effect of recently-used pesticides on salmon in the Basin.

Air Quality: Over the past several years, OEA has been active in building capacity for regional air modeling in agencies and universities in Region 10. We are providing leadership to two collaborative organizations:

- The Northwest Regional Modeling Consortium (NRMC) is focused on state-of-the-science meteorological modeling, weather forecasting and air quality analysis. The products of the NRMC have been recognized as a world-class environmental prediction system (Bulletin of the American Meteorological Society, October 2003, cover story).
- The Northwest International Air Quality Environmental Science and Technology Consortium (NW-AIRQUEST) is focused on all science related to air quality, including modeling and monitoring. The NW-AIRQUEST Consortium was officially formed late in 2003, and is facilitating collaboration on a variety of air quality projects that are in support of air quality management decision-making in the Pacific Northwest.

OEA and the Region's Office of Environmental Management and Information staff are collaborating with the U.S. Forest Service Pacific Northwest Fire Sciences Lab in the development of a web-based forecast system to predict air quality impacts of prescribed forest and agricultural burning. The prototype system for the Pacific Northwest became operational in March 2003 at <http://www.blueskyrains.org>. The system is used as a tool to help prescribed-burn decision makers manage smoke, and minimize its impact on public health. In addition, the system was used during the 2003 and 2004 wildfire season to predict wildfire smoke impacts and direct aerial fire-fighting activities. Initial efforts to transfer the BlueSkyRAINS technology to other regions of the

U.S. are underway, with Region 8, 9 and part of 6 being included for wildfire prediction in 2004. The vision is eventually BlueSkyRAINS will become a national system. The BlueSkyRAINS development team was awarded the Region 10 Gold Medal Innovation Award in 2003. Currently the system is being used to monitor volcanic activity at Mount St. Helens.



Energy Efficiency: From a standing start in October 2002, OEA's P2 staffers have made considerable progress in promoting energy conservation/pollution prevention by educating school districts, universities, hospitals, home builders, supermarkets and others about the benefits of the ENERGY STAR® programs for buildings and new homes. ENERGY STAR is a government-backed program helping businesses and individuals protect the environment through superior energy efficiency.

As a result of OEA's efforts, at least five school districts, one university complex, one major hospital complex, a supermarket chain and a couple of home builders have indicated their commitment to energy reduction by signing up with the EPA as

new ENERGY STAR Partners. Several of them have already made considerable progress in reducing their energy use. For example,



two schools in the Renton School District were awarded ENERGY STAR plaques certifying their high energy efficiency. These were the first ENERGY STAR building plaques ever awarded to any of the schools in the Region. Subsequently, two schools in the East Valley School District in Spokane also received similar recognition and continue to make further progress.

In addition, OEA P2 staffers have made significant progress in coordinating with other organizations and agencies who are promoting energy efficiency in the Region (e.g., Northwest Energy Alliance, Puget Sound Energy, City of Seattle, Seattle City Light, Pollution Prevention Resource Council, Washington State University Energy Efficiency program, King/Snohomish Master Builders Association). Through closer cooperation in the future with these organizations, agencies and our partners in the various sectors, it is anticipated that we will continue to achieve ever increasing participation/partnering in the various ENERGY STAR programs throughout the Region, leading to reductions in air pollution, greenhouse gas emissions and other environmental impacts associated with energy production.

Economics: Economics and financial analysis technical support is available to all staff and management for all programs and media in Region 10. This Region is fortunate to have staff devoted solely to economic issues. Some of the activities performed by the Regional Economist are: conducting special studies; advising on environmental and natural resource economics and regional socio-economic issues; reviewing the economic component of various types of reports, studies, and applications; providing technical

Asbestos--From Dream Material to Major Environmental Problem:

Asbestos was once a “dream material” used in everything from fire proofing to brake linings. OEA staff members, along with other programs and EPA staff throughout the country, have been working on projects where asbestos has caused environmental problems.



IEU completed a study of asbestos-contaminated soil at the former Vermiculite Northwest / W.R. Grace Vermiculite Expansion Facility in Spokane, Washington. This work was requested by the Region 10

Superfund Emergency Response Unit as part of their assessment of the site. The three-phase study demonstrated that asbestos found in several soil samples collected from the site can become airborne if the soil is disturbed. This study has led to involvement in similar on-going studies of other asbestos sites; particularly the North Ridge Estates site in Klamath Falls, Oregon, a Superfund removal action.

This work also demonstrates the innovation and on-going skill development by OEA staff. Julie Wroble and Jed Januch collaborated to develop a method to help assess airborne asbestos exposure from asbestos-contaminated soil. A glove-box technique developed by



Jed Januch will be available for use by other labs around the country once the standard operating procedures have been developed. Both Jed and Julie have received national recognition for their innovative methods and interpretation of complex data.

assistance for analyzing the economic benefit component for enforcement cases; and, developing, implementing and advising on surveys.

Specific financial analysis to the programs comes in the reviewing a company or individual's financial statements, tax returns and related accounting, financial and economic information to determine a violator's ability or inability to pay their penalties or contribute to a cleanup action. Expert advice can be provided to regional staff on the structure and relationships of special financial entities such as trusts and endowments. Both the economist and financial analyst can provide expert testimony at hearings or trials on financial issues.

Radiation: The Region 10 radiation program played a key role in the planning, preparation, successful completion and follow-up of the May 2003 TOPOFF 2 (Top Official) radiological dispersal device emergency exercise in Seattle. Radiation program health physicists provided critical technical input into the exercise scenario design to ensure effective and practical testing of exercise objectives. By specifying the radiological make-up of the hypothetical terrorist incident, responders had the necessary conditions to test their capabilities in practical terms.

Protective action recommendations for this type of incident had not been developed previously, so Region 10 radiation experts worked collaboratively with technical and program staff from the Washington Department of Health (WDOH) to prepare protective action recommendations that could be used in the early phases of response to large-scale radiological dispersal devices. To be effective, protective action recommendations must be provided to the public early in such events, often before radiological data or dose estimates are available. Working with WDOH, Region 10 helped to analyze potential consequences of various possible radiological dispersal devices in urban environments, and developed prepared actions that could be taken with minimal available data. During the exercise, the use of these protective action recommendations by decision makers in the early phase of the exercise was an essential element in the response.

In preparing for the exercise, Region 10 health physicists also worked closely with local fire departments, health departments, utilities, and elected officials to provide training and technical support for the local response organizations. To support the special needs of radiological response within EPA, the Region 10 radiation program provided training for Superfund On-Scene Coordinators and technical advice on radiation instrument use and purchase, as well as participation as technical experts during the exercise.

Environmental Monitoring and Assessment Program (EMAP)

Water monitoring in Region 10 is performed by states and tribes via EPA Headquarters' Office of Research and Development's EMAP. OEA, working closely with these partners, secures funding for sampling and analyses. EMAP generates regional-scale assessments of ecological resource conditions by describing the current geographic extent of ecological resources, what resources are degrading or improving, and how the resources are responding to changing control and regulatory programs. OEA staff completed a report, Modeling Fish Distribution in the Pacific Northwest Coast Range Ecoregion Using EMAP Data, in support of EMAP.

In 2003, NOAA, EPA, along with the States of Oregon, Washington and California, combined efforts to conduct a survey of the ecological condition of aquatic resources in near-coastal waters along the U.S. western continental shelf. NOAA-Fisheries provided field support and analysis of fish pathologies through a cooperative agreement with EPA. Sampling was conducted at approximately 50 stations along the West Coast of the U.S., for a total of approximately 150 stations. This survey provided the data necessary for this "first ever" comprehensive assessment of ecological conditions of near-coastal waters (30-120 meter depth) from the Strait of Juan de Fuca in Washington State to the Mexican border. The survey included stations in all five of NOAA's National Marine Sanctuaries on the West Coast, thus providing an opportunity to assess conditions in sanctuaries as compared to non-sanctuary areas of the shelf.

During 2002 and 2003, staff working on landscape issues developed a series of databases to be used in the management of coastal and inland aquatic resources. Much of this database work is now complete and the data are used to develop associations between measures of landscape attributes and aquatic conditions. An example of these associations is an attempt to identify areas of potential rangeland grazing impacts to aquatic resources. In 2002, a full suite of data sets and preliminary landscape analyses for the Western EMAP landscape pilot area in northwest Oregon was completed. These data and analyses are available on CD and will soon be available via an interactive web browser-based tool. Much of the landscape data are also available for the entire State of Oregon. As the data sets are completed for Idaho, Oregon, and Washington, landscape metrics will be calculated for the various landscape components. A core set of metrics will eventually be developed for each state. In addition, more specific analyses will be conducted on other targeted regions within the Pacific Northwest. The goal is to have all of the data and analyses produced by these landscapes scientists available via interactive Web browser-based tools.

Emerging Environmental Problem: PBDE

In 2002, polybrominated diphenyl ethers (PBDEs) were identified as an emerging environmental problem. PBDEs are suspected of causing brain development defects in fetuses and children. These chemicals are used as a fire-retardant and are found in clothing, fabric, computers and electronic devices. PBDEs have been banned in some European countries. OEA staff began to collect and analyze samples to determine how wide-spread these chemicals may be in the environment.

Initial testing for PBDEs: In 2003, OEA investigators and field staff provided MEL chemists with water and sediment samples to be tested for PBDEs and triclosan, an anti-microbial product found in various consumer products. Residues of PBDEs and

triclosan were found in Columbia and Yakima River water and sediments, as well as sludges and effluent from waste water treatment plants that discharge into the Columbia and Yakima Rivers and Puget Sound.

Results and Further Testing for PBDEs and Other Contaminants: OEA staff sampled sediments off the McNary, Ice Harbor and Priest Rapids dams. Nine sediment samples were collected from areas near the dams and analyzed for various compounds, including PBDEs. PCBs and various other pollutants were measured in fish collected around these dams as part of the earlier Columbia River Basin fish tissue study. Additional information is needed to determine the extent of possible environmental problems. In the Fall 2004, staff from OEA collected sediment samples along the Columbia Reach to try to establish a correlation/relationship between the sediment loads and the fish tissue analytical results. The samples are being analyzed for pesticides, priority pollutants, and PBDEs.

Open Ocean Sediment Sampling for PBDEs: At the request of OEA, PBDEs were included in open ocean sediment sampling at roughly 150 stations off the coasts off Washington, Oregon and California. The sampling was conducted by OEA and NOAA and State environmental agencies as part of the National Coastal Environmental Monitoring and Assessment Program (EMAP) sampling project. Samples for PBDE analysis were taken offshore from the mouths of major tributaries entering the ocean to assess any impacts in the open ocean sediments. These were the first open ocean sediments collected for PBDE analysis in the Region. OEA staff participated in the shipboard sampling activities and MEL is responsible for analyzing approximately nineteen (19) samples obtained from the 150 stations for PBDEs. The entire group of 150 randomly-located samples were archived for PBDE analysis, however, only those collected offshore from the mouths of large rivers (“potential sources”) will be the first to be analyzed. If these results show “hits”, others can be analyzed later.

Science Leadership On the National Front

As much of OEA's work cuts across media and is transferable to other regions, OEA staff members are active in national initiatives and activities. These include involvement in about 30 state and national workgroups and guidance development teams, such as the National Ground Water and Engineering Forum, the Ecological Risk Assessment Forum, and the Risk Assessment Group for Superfund. These forums provide an opportunity for OEA and other Region 10 staff to share newly developed methods that were designed to address problems encountered on site-specific projects. Ideas are shared and new information may be incorporated into the national guidance and methods through these forums.

Do You Need to Know...?

...where one of your violators lives now, a few years after the violation? who currently owns the environmentally-damaged property and who owned it or worked on it in the past? or, who are the potentially responsible parties that caused the contamination?

These are a few of the activities OEA civil investigators are involved in every day. Investigators conduct research in support of a number of R10 programs including wetlands, air, pesticides, RCRA, NPDES, and TSCA. Investigators also provide litigation support to the Office of Regional Counsel. However, the majority of the investigators work is to identify PRPs for the Office of Environmental Cleanup sites. During FY 2003, investigators supported the Upper Columbia River Preliminary Assessment by researching over one hundred years of property ownership and operation for selected mines in this assessment. In 2004, focus shifted to the Duwamish Waterway, along with additional mines in northeastern Washington and an asbestos removal action in Oregon.

Council on Regulatory Environmental Modeling (CREM)

CREM, a council of senior managers from across EPA, was established in 2000 to promote consistency and consensus among environmental model developers and users. Region 10's Deputy Regional Administrator is Co-Chair of the Council along with the Assistant Administrator of EPA's Office of Research and Development.

CREM's purpose is to:

- help ensure that EPA documents and communicates the data, algorithms, and expert judgments used to develop models,
- document and implement best management practices to use models consistently and appropriately,
- establish and implement criteria so that model-based decisions satisfy regulatory requirements and Agency guidelines,
- facilitate information exchange among model developers and users so that models can be continuously improved and,
- proactively anticipate scientific and technological developments so that EPA is prepared for the next generation of environmental models.

OEA staff members have been active participants on the CREM. They provided substantial input on the draft modeling guidance developed by the CREM, particularly on model documentation and the wisdom of using proprietary models in regulatory actions. OEA staffers were also responsible for the concept of the interactive video seminars. They presented the development of the Columbia River temperature model for the first seminar. Additionally, they have started a water modeling workgroup that includes modelers from states, tribes, other federal agencies, and ORD.

Laboratory Guidance and Methods

In addition to conducting analytical work for the programs, MEL scientists are actively involved in reviewing national guidance and developing new test methods and guidance on their use. Here are a few examples of the work conducted in 2003:

- Guidance on Establishing A Laboratory Reporting Limit was submitted by MEL scientists to the Office of Water, interested EPA laboratories, other federal agencies and private laboratories and organizations. The guidance describes a procedure for establishing a reporting limit with a level of confidence in quantitation based on accuracy and precision rather than the Agency's minimum level of quantitation which is based solely on precision.
- MEL and National Environmental Research Laboratory/Cincinnati scientists developed a method to distinguish arsenic species in seafood, providing for improved characterization of the risks associated with seafood consumption.
- MEL staff assisted in the review and modification of Method 1623 (Detection of Giardia and Cryptosporidium in Drinking Water Using IMS/IFA).

Environmental Management Systems

OEA and Region 10's Suspension and Debarment Division, working in cooperation with Headquarters' Office of Sustainability, have taken the national and international lead in bringing together businesses with successful Environmental Management System (EMS) designs, non-governmental organizations, regulatory agencies, international governing bodies, and academics to study the EMS concept for non-traditional applications. EPA Headquarter's Suspension and Debarment Division has required an EMS in all of their agreements with environmental violators. From this experience, the Region has learned that a well designed and implemented EMS that is fully integrated into the overall business management system, and actively endorsed by the CEO, can be beneficial to the environmental, social and economic performance of the business.

Region 10 Dive Team Key In Shuttle Recovery Efforts

Seven members of EPA Region 10's Dive Team, at the request of the EPA Region 7 Dive Team, provided assistance with in-water recovery of parts of the Columbia Space Shuttle, which disintegrated upon re-entry into the Earth's atmosphere on February 1, 2003. The divers spent 10-day rotations at the site in Toledo-Bend Reservoir, near Jasper, Texas on the Texas/Louisiana State border. The U.S. Navy provided the overall direction to divers from EPA's Environmental Response Team, EPA Region 3, and Texas police search and recovery teams. EPA divers have the special expertise needed for the many hazardous materials that could be encountered and the effects of a low-visibility diving environment.

Each day, divers conducted sonar searches for possible shuttle debris. Divers entered the water in areas where suspected debris was identified. The tethered divers were in constant communication with the surface staff who directed in search patterns around a differential global positioning system (DGPS) buoy marked "target." Divers searched the bottom in low or zero visibility conditions by sweeping with their legs and arms to locate any suspicious objects. The reservoir contains a submerged forest, so divers had to beware of the constant threat of entanglement with trees, horizontal logs, and stumps.



Training and Technical Guidance

The expertise of OEA staff is recognized around the country. As a result, OEA staffers are involved in regional and national training activities. These are some of the courses OEA staff helped teach:

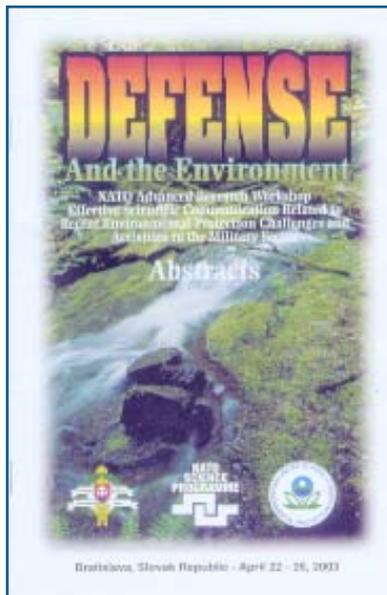
- OEA staffers are actively involved with the National Environmental Training Institute (NETI), teaching the complete Basic Inspector Training course. This course is given to federal, state, tribal and local agency inspectors to ensure consistency in the techniques used for environmental inspections. During FY 2003-2004, a number of courses were given throughout the country.
- The OEA field support staff organized and provided in-house training on the use of field equipment and shipping of hazardous materials. They also provided training at EPA's annual National Inspectors Workshop.
- MEL scientists taught the Metals and Microbiology Analytical Methods segment of a Drinking Water Laboratory Certification Officers Course for the EPA Office of Groundwater and Drinking Water.
- Region 10 also offered the first in a series of regional seminars on modeling. OEA staff presented the Columbia River Temperature Model to an Agency-wide audience using Lotus SameTime technology.

Development of Transition Zone Technical Guidance: OEA staff members have been involved in the development of RCRA Environmental Indicators Guidance for Groundwater/Surface Water, and the National Remediation Technologies Development Forum—a private/public partnership. OEA staff members work regularly with state agencies, tribes, and other federal agencies (NOAA, FWS) during routine project negotiations, to use and enhance these techniques.

Other Technical Applications: While OEA’s hazardous waste team was conducting this work, the OEA environmental monitoring and assessment team was developing a similar view of heat transfer between groundwater and surface water through the “hyporheic zone.” This heat exchange may contribute to temperature increases. These analyses have added another layer of complexity that needs to be factored into the creation of state temperature TMDLs developed in the Region’s Office of Water and Watersheds.

OEA Goes International

Two OEA staff were instrumental in coordinating an international workshop held in Bratislava, Slovak Republic in April 2003. The workshop, “Defense and the Environment, a NATO Advanced Research Workshop”, sponsored by EPA, the NATO Science Programme and the Slovak Republic, was held to foster effective scientific communication related to recent environmental protection challenges and activities in the military sector. OEA staff also presented a paper and took the responsibility for compiling the technical papers given at the conference.



OEA Vision/Work Focus for 2004-2005

P2 and Inspections: Inspectors from OEA have helped craft two projects designed to integrate P2 information into our inspection and enforcement process. In 2004, we began sending letters to facilities after inspections informing them of pollution prevention resources that can assist them in improving their environmental performance (the letter is independent of potential enforcement actions and decisions). This step will likely strengthen ties between the pollution prevention and enforcement programs.

A Legacy of OEA Involvement and Support

OEA work conducted for regional Superfund projects has led to the development of national guidance and exchange of information. One example is the work originally done at the Wyckoff Eagle Harbor and Western Processing sites in the 1980's and early 1990's. Based on the challenges faced by OEA's hydrogeologists working on problems in the upland area of the site and the ecological risk group (including the EPA divers at Wyckoff) working on the offshore problems, these two groups combined efforts to better understand the contaminant issues at the transition zone between the uplands and the intertidal beach.

Workshop on Groundwater/Surface Water Transition Zone: As a result of issues raised on this project, a national workshop on the groundwater/surface water transition zone was held in Denver in January 1999. That workshop led to a more detailed workshop on the tools and techniques available for this very specific need. Today, the techniques such as micro-wells, mini-piezometers, seepage meters, diffusion samplers, towed probes, and in-situ toxicity testing bioassays are in use at other sites throughout the country and have been used to help characterize and define plumes of contaminants flowing from upland RCRA and Superfund sites into rivers in South Carolina, Maine, Oregon, and Washington, to name a few, and in Lake Michigan.

In 2004, OEA sponsored a P2 workshop for federal, state and local inspectors to create a dialogue between the inspectors and P2 Technical Assistance Providers about basic P2 concepts and resources. The workshop was the first step toward exploring and improving the relationship between inspection and P2 technical assistance.

New Methods Development to Analyze Metals in Mammals: In a joint project with the US Fish and Wildlife Service (FWS), MEL is working on a multi-year project to analyze metals in mammals from the Bunker Hill Superfund site area to assess the extent to which contamination is impacting the food chain. As part of the project, MEL has developed new methods for sample preparation and analysis.

Development of Tribal Seafood Consumption Survey Software: Tribal members typically consume much more seafood than the general population and consequently have higher risks from seafood contaminants. Tribal seafood consumption survey results will support risk analyses and tribal water quality standards that are protective of tribes. Tribal seafood consumption survey software was developed from previous Region 10 seafood consumption surveys to facilitate cost effective adaptation of survey methodologies for tribes desiring their own surveys. This software will standardize survey methodologies and data entry, and facilitate data analysis. The first draft of the software is near completion.

Coastal EMAP

The coastal component of Western EMAP applies EMAP's monitoring and assessment tools to create an integrated and comprehensive coastal monitoring program for the West Coast. Water column measurements, sediment characteristics and chemistry, benthic organisms, and data from fish trawls are combined to describe the current estuarine condition. Sampling has focused on a different type of estuarine resource each year. In 2004, samples were collected from small estuaries along the Washington and Oregon coasts, as well as the southeast coast of Alaska. Coastal

EMAP is a cooperative project between EPA ORD, EPA Region 10, Alaska DEC, Oregon DEQ, and Washington Department of Ecology.

Surface Waters (Rivers and Streams) EMAP

The surface water component of Western EMAP evaluates the ecological condition of rivers and streams of the western United States at two scales. The broad scale assessment will allow evaluation of the overall condition of rivers and streams for each state and the entire region. The second level of evaluation is smaller and more localized. Region 10 will be intensifying the Western EMAP sampling effort in three focus areas: the John Day and Deschutes Basins of Oregon, the Wenatchee Basin of Washington, and the medium to large-sized rivers of Idaho. Water chemistry, physical habitat, benthic macroinvertebrate, fish, and periphyton assemblage data will be combined to describe the current river and stream conditions. The Western EMAP Surface Waters program is a cooperative project between EPA ORD, EPA Region 10, Oregon DEQ, Washington Department of Ecology, Idaho DEQ and the Nez Perce Tribe. 2004 was the final year of field sampling.

Lower Duwamish Groundwater Sampling Project

The risk to organisms in the Lower Duwamish River in central Puget Sound from contaminated groundwater is currently unknown. OEA has begun an effort to collect and analyze groundwater samples taken along the Lower Duwamish River shoreline. Between 10 and 20 sites were chosen, based on both the probability for encountering contamination and the likelihood that an area is clean. The locations were identified using data about potential sources of contamination obtained during the Lower Duwamish Superfund site assessment. Mini-piezometers were driven into the shoreline area and groundwater samples collected. Samples are being analyzed for PCBs, VOCs, and metals at MEL. A data report will be produced that will summarize sample results and relative risks.

Homeland Security

Under the National Strategy for Homeland Security, EPA is charged with building laboratory diagnostic surge capacity for environmental samples during crises. To this end, in FY04-05, MEL will be actively involved in reviewing and commenting on reports from the Homeland Security Laboratory and Response Workgroup. MEL will continue to encourage governmental and private laboratories in the Northwest and Alaska to document their capacities to analyze standard chemical and biological analytes and chemical warfare, bioterrorism, and radiochemical agents in EPA's Compendium of Environmental Testing Laboratories. This compendium will help personnel who respond to emergency situations in identifying qualified and appropriate laboratory capabilities, and their capacity to analyze chemical, biological and radiochemical agents. MEL will also continue to encourage other federal and state (Alaska, Idaho, Oregon, and Washington) laboratories to enter into a written agreement with EPA regarding cross-laboratory support in the event of a terrorist incident or natural disaster. Currently, the Office of Regional Counsel is investigating the concept of an Oregon DEQ/EPA Region 10/FDA-Bothell inter-laboratory emergency support agreement. Finally, MEL will continue to support the EPA/ORD's National Homeland Security Support Research Center (NHSRC) in establishing analytical methods for assessing the need for, and effectiveness of, response actions to terrorist incidents. To date, three MEL chemists have provided valuable input on the selection of methods for the analysis of arsenic compounds and other toxic metals, inorganic gases, biotoxins, halogen-, nitrogen-, phosphorous- and sulfur-containing compounds and chemical warfare agents. In addition, MEL's senior microbiologist has participated in five-month detail with the NHSRC.

Asbestos

In FY04-05, OEA will be further developing and refining its capabilities to analyze asbestos in environmental samples. Plans are underway to convert space in one of the MEL facilities into an asbestos laboratory. OEA has previously relied on the Washington

Department of Ecology for analysis of asbestos samples. Region 10 is working with Headquarters to standardize a glovebox method to determine whether asbestos in soil or other matrices can become airborne when agitated. This method is particularly valuable in assessing current and former vermiculite processing facilities, and may provide a quick yes or no answer to whether vermiculite attic insulation is contaminated with asbestos.

Regional Methods Initiative (RMI)

Benthic macroinvertebrates are frequently used in monitoring and assessment of freshwater ecosystems. Macroinvertebrate taxa can be classified in terms of their sensitivity or tolerance to anthropogenic disturbances (tolerance values). These tolerance values for different stressors provide a basis for diagnosing the causes of impairment. Although tolerance values have been successfully applied to assess the condition of streams in the Midwest and eastern United States, their use in the western United States is currently limited by two factors: different species are typically collected in the West, and different stressors are often important. Therefore, Regions 8, 9 and 10, and ORD (NCEA, NHEERL) are working on an RMI project to derive tolerance values for western taxa. In February 2004, a workshop was held with biologists from western state agencies, EPA and academia to review methods that are currently available for deriving and applying tolerance classifications. In 2005, ORD will publish a report titled *The Derivation and Application of Macroinvertebrate Tolerance Values*.

Regional Applied Research Effort (RARE) Project in the Lower Umatilla Basin

OEA initiated a study in the Lower Umatilla Basin to determine isotopic analyses of the sources contributing to Basin-wide nitrate contamination. The study is titled *Developing and Utilizing Isotopic and Tracer Tools to Evaluate the Movement of Nitrate in Contaminated Groundwater in the Lower Umatilla Basin, Oregon: A Site Specific Study With Broad-Reaching Regional*

Usefulness for Groundwater, Surface Water, and Land Use Management. The potential sources of nitrate contamination in the Basin include: irrigated agriculture, confined animal feeding operations, rural residential septic systems, land-application of food processor waste and waste from munitions originating at the Umatilla Army Depot. OEA obtained ORD funding from the RARE program to determine the most important nitrate sources in order to focus resources on the most important contributor. This work is in cooperation with the USGS who is providing expertise on the isotopic techniques.

Dive Team Activities

The nine members of Region 10's all volunteer Dive Team are actively involved in a number of ways to ensure EPA divers across the country properly trained and safe while diving. Dive Team members are completing and testing modified dive tracking software that stores dive statistics, diver training, certifications, and equipment maintenance and usage. The expected outputs could show dive profile histories and other graphics. The Region is assisting in the development of Dive Team Emergency Response Capability using some "lessons learned" from the Columbia Shuttle recovery work. For example, a system allowing better diver coordination capability has been established with records that contain information on divers' general and technical training and experience, including re-certification status (e.g., first aid, HazWoper, surface-supplied air diving, Nitrox diving). Region 10 has developed diver decontamination protocols for biological exposures and chemical hazards and testing the effectiveness of these procedures with the intent of producing a protocols document. Dive Team members are collaborating with MEL and a national committee comprised of unit diving officers and the Gulf Breeze training center to conduct tests on dive gear and suited divers during this fiscal year and the next.

Establishment of the Regional Science Council

OEA's Office of Research and Technical Development liaison spearheaded the creation of the Regional Science Council (R10-RSC), a group of EPA Region 10 scientists and their Executive Team (ET) sponsor who support regional science activities and interests by transferring and exchanging information. The RSC's vision is to be instrumental in advancing science issues and needs of all regional programs and media. Their primary purpose is to maintain and strengthen the Region's cross-program, cross-media science network and support regional and national strategic objectives by enhancing the use of sound science in environmental decision-making. Over the next year, the RSC will develop a two-year work plan which will then be reviewed annually.



Conclusion

OEA looks forward to an even better year in 2005. The Office is anxious to engage in helping the Region's media programs and others define technical assistance needs and priorities. We stand at the ready to provide the technical support in the next year and coming years that is needed to promote better decision-making on behalf of the environment we live in and that we all depend on for sustenance and quality of life.



