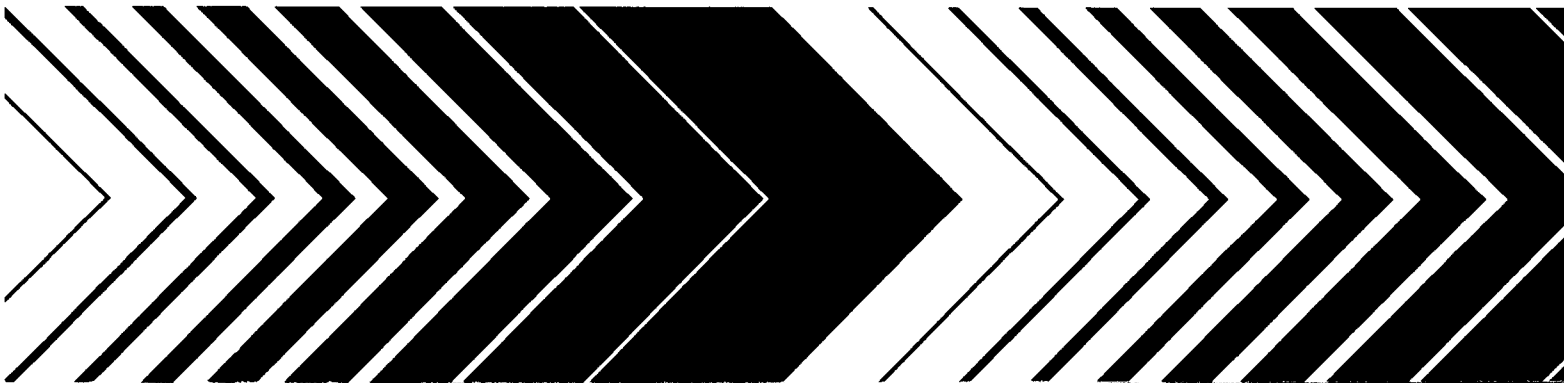




Technical Assistance Directory (Revised)



Technical Assistance Directory (Revised)

Center for Environmental Research Information
Office of Research and Development
U.S. Environmental Protection Agency
Cincinnati, Ohio 45268

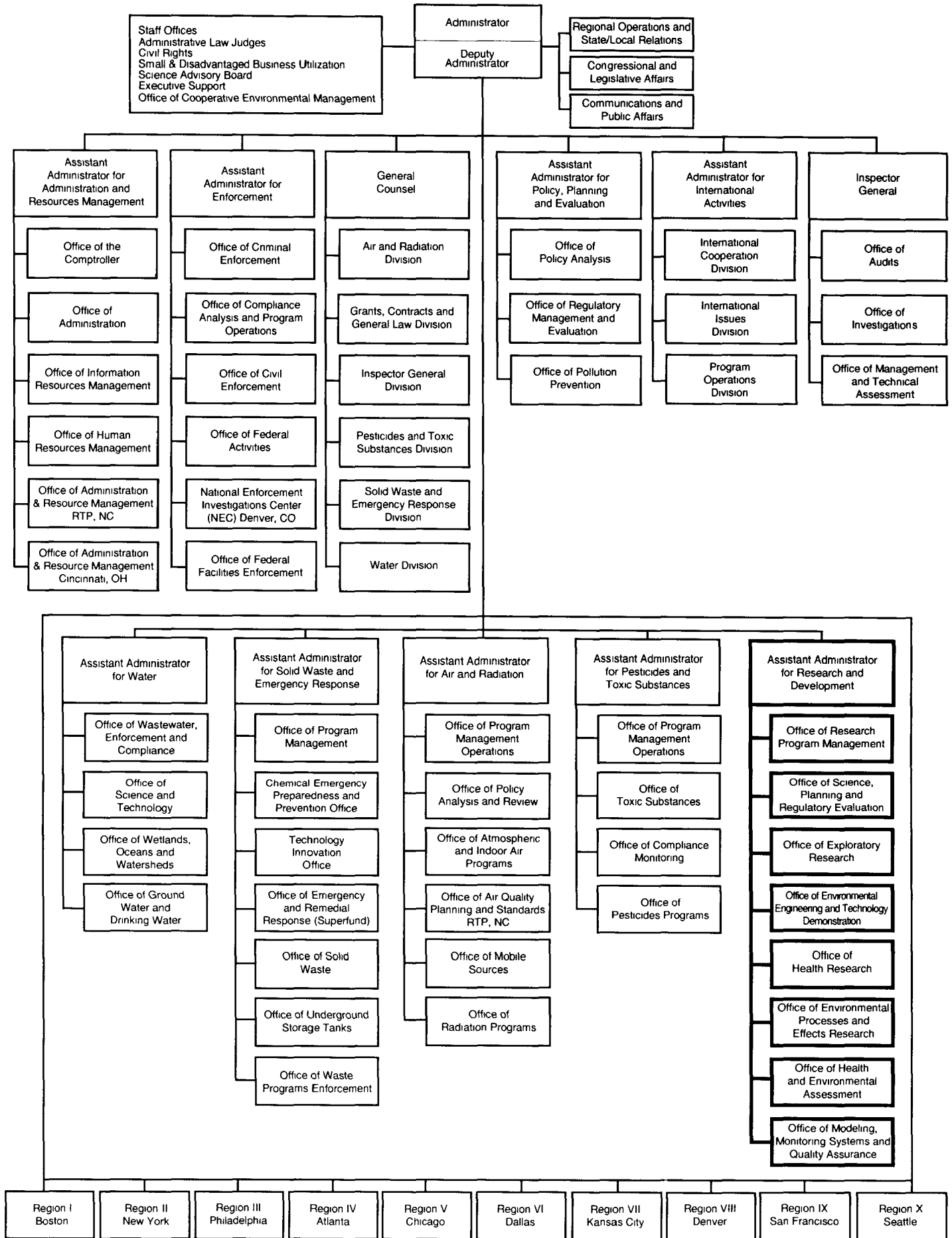


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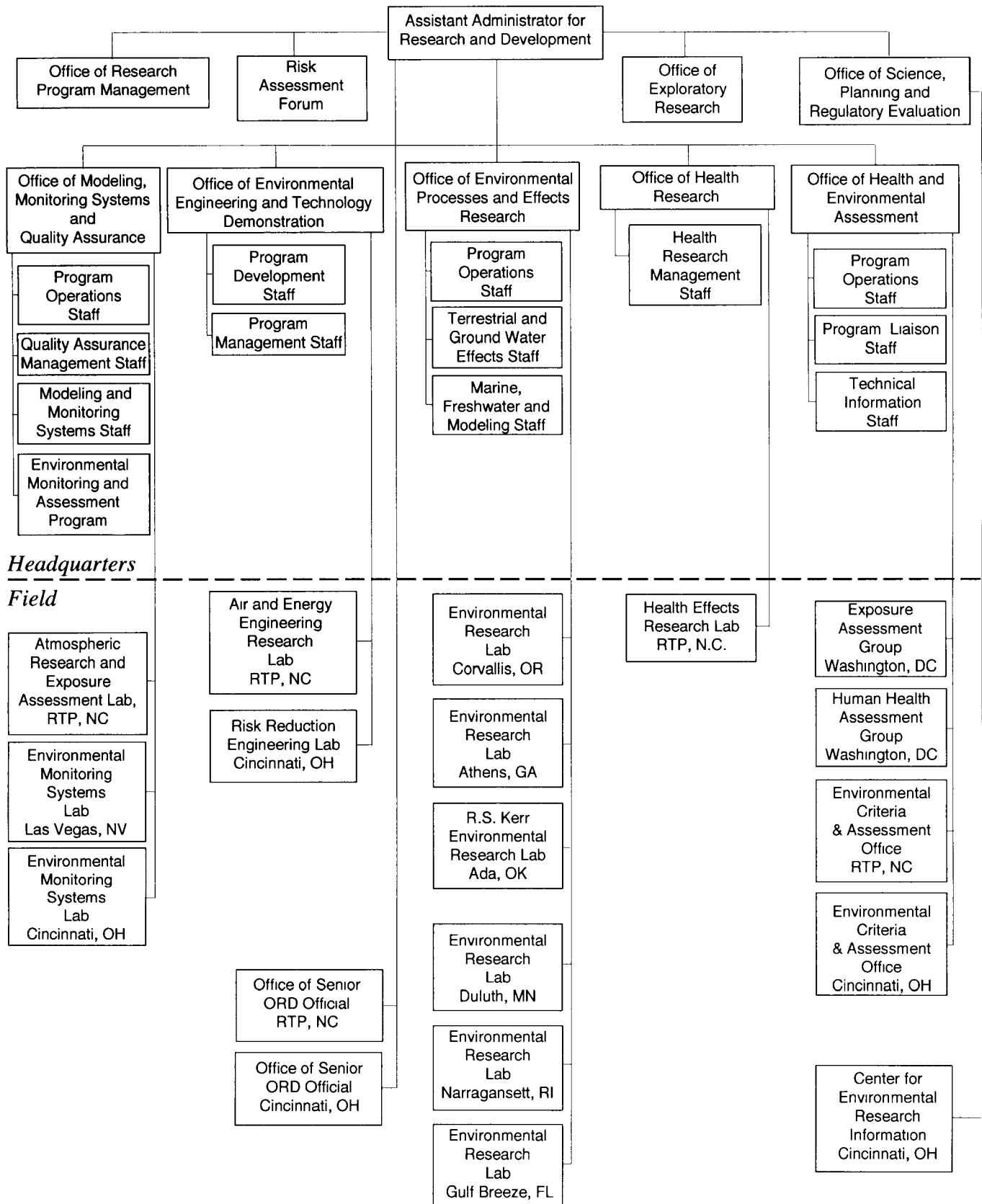
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U. S. Environmental Protection Agency Organization Chart



Office of Research and Development Organization Chart



Office of Research and Development

The Acting Assistant Administrator



Gary J. Foley is the acting assistant administrator of the Office of Research and Development. He is also the director of the Atmospheric Research and Exposure Assessment Laboratory at Research Triangle Park, North Carolina. He has served as staff director for ORD's Acid Deposition Program and acting division director, Energy and Air, for ORD's Office of Environmental Processes and Effects Research. Dr. Foley began his career with EPA in 1973 as a senior chemical engineer. Before joining the Agency, Dr. Foley served as a project manager for the American Oil Company. He received his Ph.D. in chemical engineering from the University of Wisconsin, Madison. Dr. Foley has been awarded 4 Bronze Medals by EPA.

The Deputy Assistant Administrator

Vacant

**Directory Description
Environmental Protection Agency
Office of Research and Development**

**Gary J. Foley, Acting Assistant Administrator
Mailcode: RD-672
401 M St., S.W. Washington, D.C. 20460
202-260-7676, FAX: 202-260-9761
E-Mail FOLEY.GARY**

The Office of Research and Development conducts an Agency-wide integrated program of research and development relevant to pollution sources and control, transport and fate processes, health and ecological effects, measurement and monitoring, and risk assessment. The office rigorously disseminates its scientific and technical knowledge and upon request provides technical reviews, expert consultations, technical assistance, and advice to environmental decision makers in federal, state, local, and foreign governments.

The ORD implements its activities through its Washington, D.C., headquarter's offices and associated laboratories and field locations (see organizational chart). The programs, areas of expertise, and primary contacts in each of the major

ORD operations are conveyed in the following directory. This information is made available in an effort to improve communication and technology transfer with our clients.

In addition, information may be obtained from the offices in Washington, D.C., that are listed below. ORD publications may be requested from the Center for Environmental Research Information in Cincinnati, Ohio.

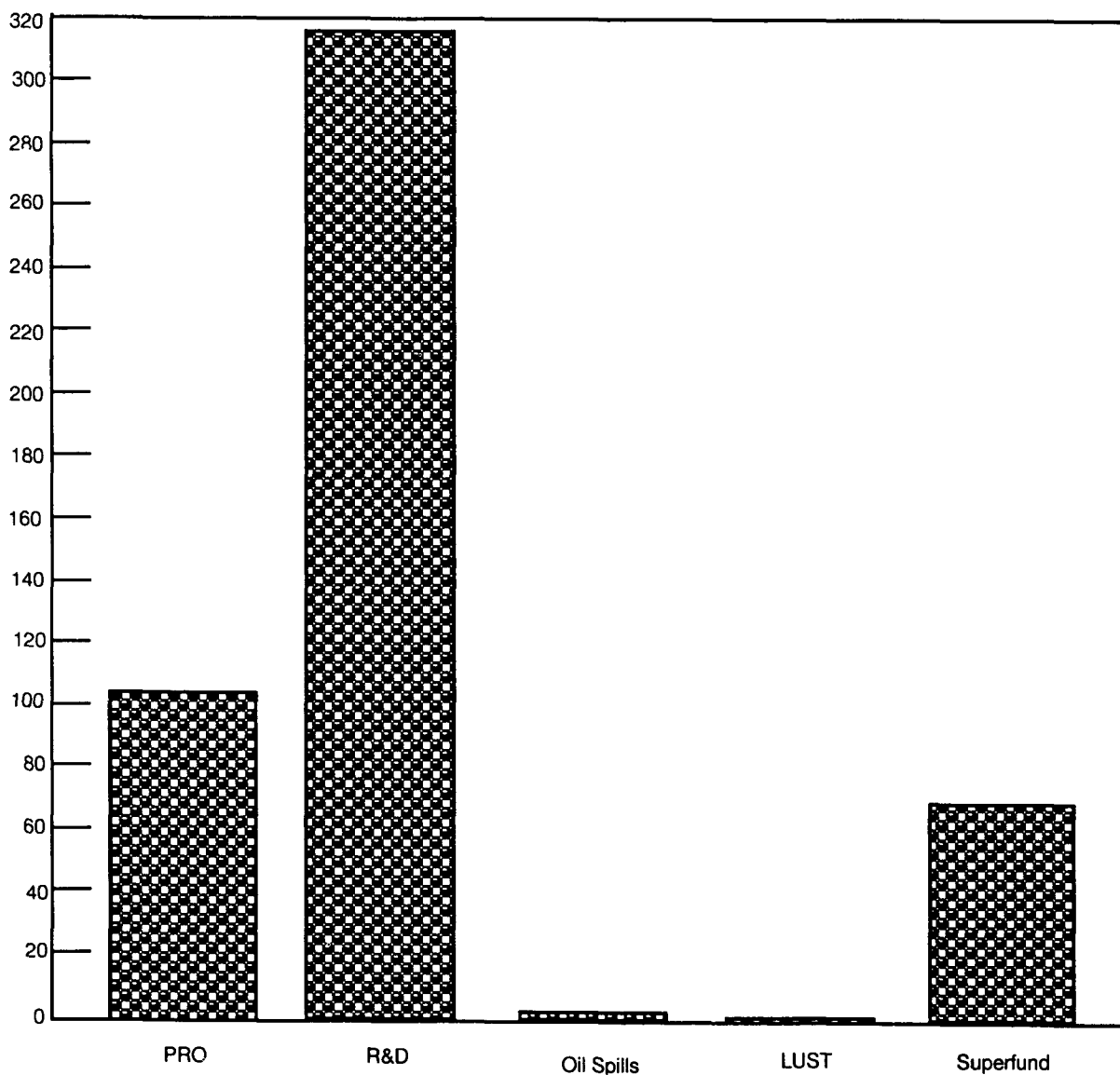
Clients are urged to make direct contacts. If help or coordination is needed to properly access the listed operations, directory assistance can be easily obtained by contacting the Office of Science, Planning and Regulatory Evaluation in Washington, D.C., 202-260-7669.

Office	Telephone
Office of Health Research	202-260-5900
Office of Environmental Processes and Effects Research	202-260-5950
Office of Modeling, Monitoring Systems and Quality Assurance	202-260-5767
Office of Health and Environmental Assessment	202-260-7315
Office of Research Program Management	202-260-7500
Office of Environmental Engineering and Technology Demonstration	202-260-2600
Office of Exploratory Research	202-260-5750
Office of Science, Planning and Regulatory Evaluation	202-260-7669

For additional help in contacting ORD headquarters' offices,
call the EPA HEADQUARTERS LOCATOR at 202-260-2090

Budget for Fiscal Year 1993
Office of Research and Development

FY 92 Resources
(In Millions)



Program and Research Operations (PRO)	\$112,622.0
Research and Development (R&D)	318,890.0
Oil Spills	2,089.8
Leaking Underground Storage Tanks (LUST)	748.9
Superfund	<u>70,097.1</u>
Total	\$504,447.8

All dollar amounts are as of 11/1/92.

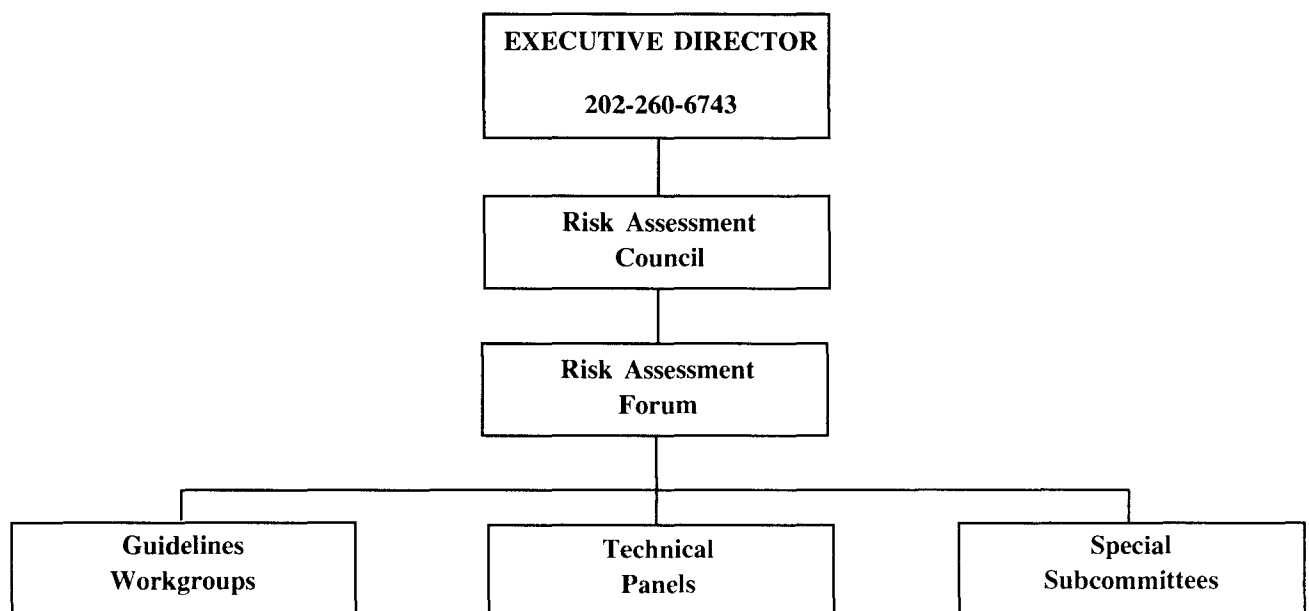
Full-Time Employees

PRO	1,721.4
Superfund	136.9
LUST	1.9
Reimbursables	<u>61.0</u>
Total	1,921.2

Risk Assessment Forum



Dorothy E. Patton has been the executive director of the Risk Assessment Forum since 1985. Currently, she also chairs that group. From 1976 to 1985, she was an attorney in EPA's Office of General Counsel, where she worked with the pesticides, toxics, and air programs. She has received three EPA Bronze Medals. Before coming to EPA, Dr. Patton was an assistant professor of biology in the City University of New York (York College), and did post-doctoral work at Albert Einstein College of Medicine in New York. Dr. Patton received her J.D. degree from Columbia University School of Law, a Ph.D. in developmental biology from the University of Chicago, and a bachelor's degree in chemistry from the University of Wisconsin.



Risk Assessment Forum
Dorothy E. Patton, Director
Mailcode: RD-689
401 M St., S.W. Washington, D.C. 20460
202-260-6743, FAX: 202-260-3955
E-Mail RISK.FORUM

Functions

EPA's Risk Assessment Forum is responsible for scientific and science policy analysis of selected precedent-setting or controversial risk assessment issues of Agency-wide interest. The primary objective is to promote Agency consensus on risk assessment and to ensure that this consensus is incorporated into appropriate guidance for Agency scientists and managers. The forum does not conduct chemical-specific risk assessments.

Program Activities

Forum activities include developing scientific analyses, risk assessment guidance, and risk assessment methodology for use in ongoing and prospective Agency actions; using scientific and technical analysis to propose risk assessment positions for Agency programs; and fostering consensus on these issues. Generally, the forum focuses on generic issues fundamental to the risk assessment process, analysis of data used in risk assessment, and on developing consensus approaches. Risk Assessment Forum reports and actions are referred to the Risk Assessment Council for consideration of policy and procedural issues, and forum scientific analyses become Agency policy upon recommendation by the Risk Assessment Council.

ORD's forum staff coordinates and implements the work of the forum. Accordingly, the staff assists and contributes to scientific analyses, coordinates all activities involving the forum and its technical panels, and manages all interaction between the forum and senior EPA management, peer reviewers, and the public. At any one time, the forum staff is working with a total of 100-150 participants on technical panels, colloquia, and workshops from all parts of the Agency.

The leadership for forum projects comes from all Agency offices, laboratories, and regions. Agency scientists contribute scientific expertise and Agency risk assessment experience to help develop consensus Agencywide.

Issues

The issues before the Risk Assessment Forum vary as risk assessment issues become prominent or controversial within the Agency or in the larger scientific community. Issues currently before the forum fall into four general categories:

- ***Carcinogen Risk Assessment:*** Recently concluded or ongoing forum analyses on carcinogen risk assessment include
 - the relevance of data on rat kidney tumors to human cancer risk assessment;
 - guidance on the use of non-tumor end points for assessing cancer risk in follicular cells of the thyroid gland;
 - toxicity equivalency factors for dioxins other than 2,3,7,8-TCDD, and the possible use of such factors for PCBs and PAHs;
 - general topics under study for revisions of EPA's carcinogen risk assessment guidelines (classification system weight-of-evidence scheme, policy on use of benign and malignant tumors, etc.).
- ***Health Effects Other Than Cancer:*** Recent projects include
 - risk assessment guidelines for male and female reproductive effects;
 - a report on cholinesterase inhibition;
 - risk assessment guidelines for neurotoxic effects;
 - amendments of EPA's 1986 guidelines for developmental toxicity (additional guidance on use of the data on maternal toxicity and on quantification for developmental effects);
 - issues on PCB and developmental neurotoxicity;
 - use of benchmark dose methodology.
- ***Exposure Guidance:*** Ongoing projects include
 - exposure measurement guidelines to supplement EPA's exposure guidelines issued in 1986;
 - exposure validation models;
 - guidance on standard factors for use in exposure assessment;
 - exposure scenarios.

- **Ecological Risk Assessment/Ongoing Risk Assessment:** Projects include
 - a *Framework Report* that outlines a flexible system for use in developing ecological risk guidance;
 - peer-reviewed case studies on ecological risk problems;
 - peer panel workshops on issues under study for use in developing risk assessment guidelines.



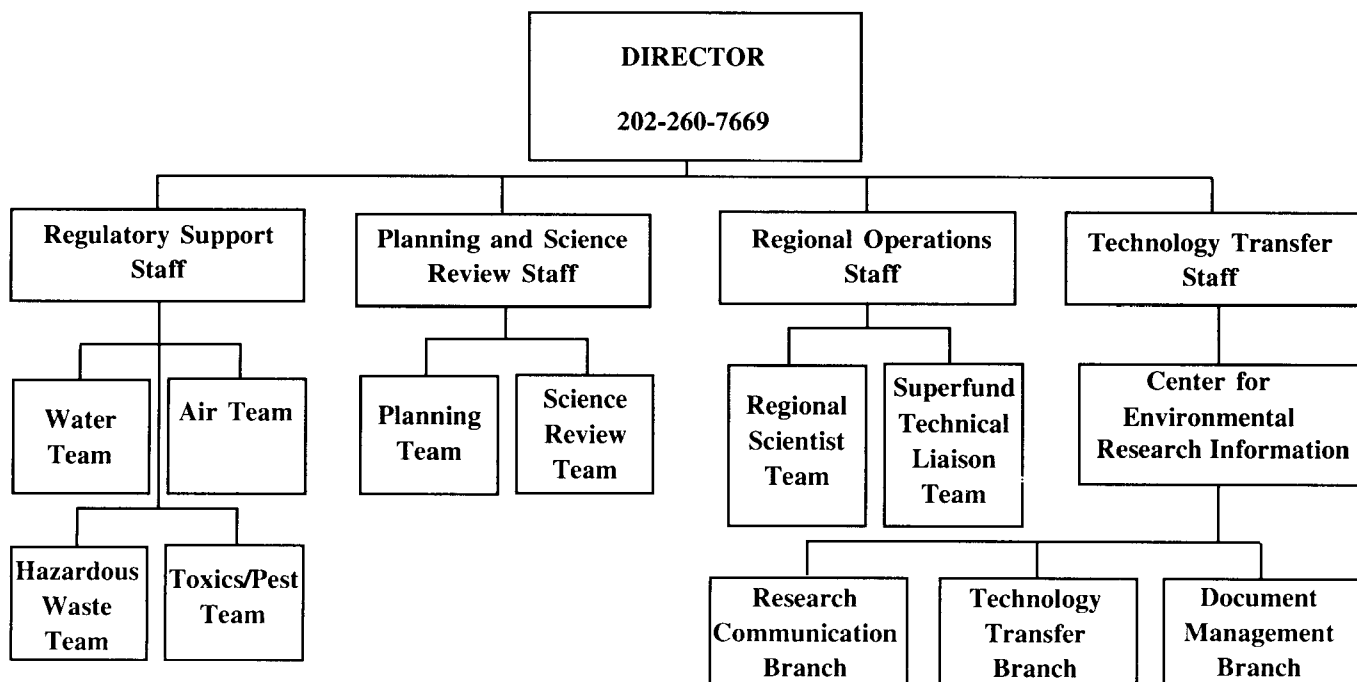
Areas of Expertise

Office of the Director	Telephone	Area of Expertise
Dorothy E. Patton	202-260-6743	Health risk assessment
William P. Wood	202-260-1095	Exposure assessment
William van der Schalie	202-260-4191	Ecological risk assessment
Harry Teitelbaum	202-260-2787	Health risk assessment

Office of Science, Planning and Regulatory Evaluation



Peter W. Preuss has been the director of the Office of Science, Planning and Regulatory Evaluation since 1988. From 1985 to 1988, he was the director of the Office of Health and Environmental Assessment. Prior to joining EPA, Dr. Preuss was associate executive director for Health Sciences for the U.S. Consumer Product Safety Commission. Dr. Preuss began his career with the Boyce-Thompson Institute for Plant Research. He received Ph.D. and master's degrees in plant physiology and biochemistry from Columbia University and a bachelor's degree in chemistry and mathematics from Brooklyn College.



Office of Science, Planning and Regulatory Evaluation

Peter W. Preuss, Director

Mailcode: H-8105

401 M St., S.W. Washington, D.C. 20460

202-260-7669, FAX: 202-260-0106

Functions

The Office of Science, Planning and Regulatory Evaluation (OSPRE) performs several functions that link ORD science programs and the environmental policy and regulatory activities of EPA's program and regional offices:

- provide advice and analysis of the scientific and technological basis for Agency policies, both regulatory and non-regulatory;
- manage ORD's issue-based process for planning the research program;
- lead Agency implementations of *Safeguarding the Future: Credible Science, Credible Decisions*, 11 major recommendations of the expert panel on the role of science at EPA for improving EPA's science knowledge base;
- manage the delivery of products and services from ORD laboratories through technology transfer and technical information exchanges;
- promote the interests of EPA regional offices in Agency research activities.

The responsibilities for these functions are divided among four Headquarters staffs and the Center for Environmental Research Information.

Staff Responsibilities

Regulatory Support Staff

The OSPRE regulatory support staff, working with laboratory experts, ensures that all relevant scientific and technology information is considered in the development of Agency regulations, decisions, and policies. To strengthen the role of science at EPA, the staff also evaluates legislation, such as the Clean Air Act Amendments, to align ORD's research program with legislative requirements. The staff represents ORD in Agency initiatives that require creative scientific approaches, as in the case of EPA's Corrective Action Risk Impact Analysis. Often the staff works with other federal agencies, like the Department of Agriculture, to design joint research programs.

Planning and Science Review Staff

The planning and science review staff implements ORD's new issue-based research planning process and the recommendations of the Expert Panel on the Role of Science at EPA. For research planning purposes, ORD's research program is divided into about 40 issues, or areas of research,

that correspond to high-risk, multimedia, regulatory, or strategic environmental problems. For each issue, a comprehensive three-to-five-year plan has been developed that includes detailed descriptions of scientific questions needing research, the specific areas in which EPA will conduct research, products, and technology transfer activities. The planning team facilitates the many steps of the process among the ORD Headquarters offices and laboratories.

The science review team is responsible for implementing the recommendations of the Expert Panel on the Role of Science, outlined in its March 1992 report, *Safeguarding the Future: Credible Science, Credible Decisions*. The report made significant recommendations for improving the science knowledge base of the Agency. Key recommendations being implemented by the team include improving the science for decision making; establishing and coordinating the efforts of the Council of Science Advisors, an intra-Agency group of scientists that advises the Administrator on science policy issues that have impacts across Agency programs; and implementing a World Class Scientist Program for recruiting outstanding scientists in environmental disciplines to work with EPA scientists.

Technology Transfer Staff

As the regulatory support and planning staffs work within the Agency to bring ORD into activities, the technology transfer staff (and the Center for Environmental Research Information, *see separate section*) promotes ORD science and technical information to the broadest possible audience outside the Agency. The staff works to forge partnerships between EPA laboratories and the private sector. In addition, the staff implements the Agency's Federal Technology Transfer Act program for establishing cooperative research and development agreements with businesses and academic institutions to do joint research and commercialize the results. The OSPRE technology transfer staff has taken the lead in developing and advocating biotechnology initiatives, environmental education resources for all levels of students, small community outreach, and electronic information services such as the ORD bulletin board system.

Regional Operations Staff

The regional operations staff (ROS) is ORD's primary liaison to EPA's regional offices and the environmental decision makers in state and local government. ROS advocates regional needs in ORD's research program and promotes the flow of information and technology to state and local government clients through three programs: 1) the Regional Scientist Program, 2) the Superfund Technical Liaison Program, and 3) the State and Local Program.

The regional scientist program places an ORD scientist in each region who aids the communication between ORD and the regions and promotes the development of applied research and technical assistance support for the regional offices' programs. The Superfund technical liaison program places an ORD point of contact in each regional office who facilitates access to ORD laboratories and oversees ORD's Superfund technical support programs. The state and local program, through cooperative agreements, provides techni-

cal assistance to state and local government environmental management professionals. The cooperatives also provide a conduit for state and local governments to communicate their research needs to ORD. Three cooperative agreements are in effect with (1) the National Governors' Association, (2) Public Technologies, Inc., (representing the League of Cities, National Associations of Counties, and International City Managers Association), and (3) the National Association of Counties and Conference of Mayors.



Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
Peter W. Preuss, Ph.D., Director	202-260-7669	
Jay Benforado, Deputy Director	202-260-7669	
Shirley Hamilton	202-260-7891	Program operations
Regulatory Support Staff		
Jay Benforado, Director	202-260-7669	
<i>Air Team</i>		
Kevin Teichman, Chief	202-260-7669	Indoor air
Stan Durkee	202-260-7891	Mobile sources; municipal waste
Stacey Katz	202-260-7669	NAAQS
Bob Fegley	202-260-7891	Air toxics
<i>Hazardous Waste Team</i>		
<i>Toxic/Pesticide Team</i>		
Elaine Francis, Chief	202-260-7891	Pesticide risk assessment; food safety; non-cancer health effects
David Cleverly	202-260-7891	Exposure assessment; toxic air pollutants; dioxin
Michael Troyer	513-569-7399	Ecological risk assessment; endangered species; wetlands; migratory birds
Vivian Williams	202-260-7891	Human health effects; toxicology
<i>Water Team</i>		
Ronnie Levin, Chief	202-260-7891	Lead; drinking water
Burnell Vincent	202-260-7891	Sewage sludge; nonpoint sources; waste water

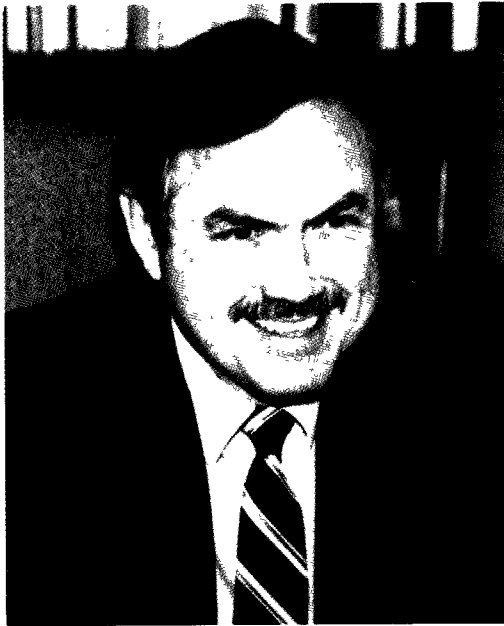
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Areas of Expertise

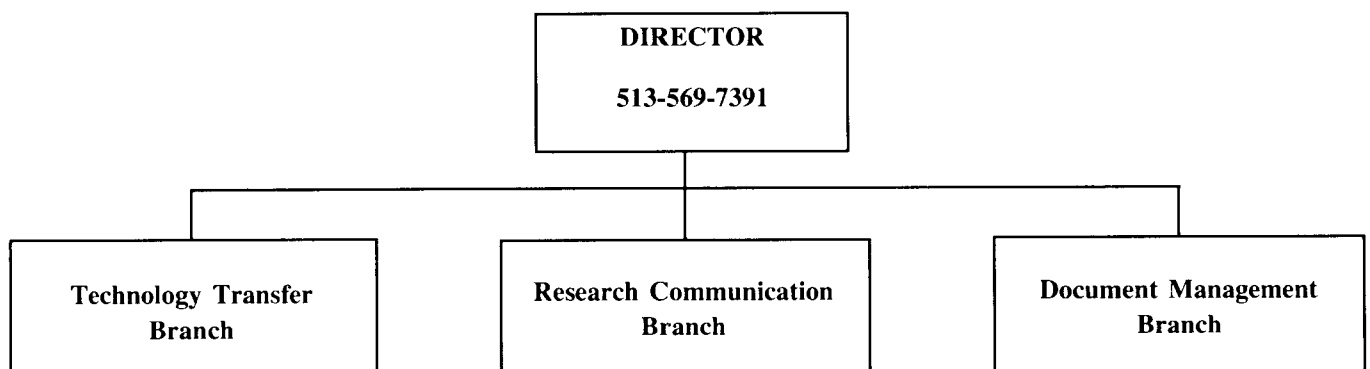
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	Telephone	Area of Expertise
Planning and Science Review Staff		
Joe DeSantis, Director	202-260-7891	
<i>Planning Team</i>		
Jerry Garman	202-260-7891	Research plans development
Gail Robarge	202-260-7669	Research committees; strategic planning
Mary Wigginton	202-260-7891	Research planning support
<i>Science Review</i>		
Brian Lane	202-260-7891	Council of Science Advisors
Technology Transfer Staff		
Michael Moore, Director	202-260-7671	Environmental Technology Utilization
Ronald Slotkin	202-260-7671	Environmental Science and Technology Education
Larry Fradkin	513-569-7960	Federal Technology Transfer Act
Regional Operations Staff		
David Klauder, Director	202-260-7667	
Lawrence Martin	202-260-7667	State and local coordinator
<i>Regional Scientist Team</i>		
Ron Landy, Chief	202-260-7667	
Thomas Waddell	617-565-3397	Region I
Patricia Laformara	908-906-6988	Region II
David Smith	303-293-1475	Region VIII
Randall J.F. Bruins	206-553-2146	Region X
<i>Superfund Technical Liaison Team</i>		
Amy Mills, Acting Chief	202-260-7891	
Magalie Breville	212-264-6788	Region II
Norm Kulujian	215-597-1113	Region III
Deborah Stockdale	404-347-1586	Region IV
Steve Mangion,	312-886-3011	Region V
Robert E. Mournighan	913-551-7913	Region VII
Robert L. Stone	303-294-7597	Region VIII
Joe Greenblott	415-744-2307	Region IX
John Barich	206-553-8562	Region X

Center for Environmental Research Information



Calvin O. Lawrence has served as the director of the Center for Environmental Research Information since 1980. He was the deputy director of CERI for three years. He became the Senior Official for Research and Development-Cincinnati in 1990. Mr. Lawrence worked for ORD in Washington, D.C., from 1972 to 1977, ending his tenure there as technical assistant to the Assistant Administrator for ORD. He began his federal career in 1963 as mathematician and electrical engineer at the Naval Ordnance Laboratory, White Oak, Maryland. Mr. Lawrence was awarded an EPA Bronze Medal in 1973. He has a bachelor's degree in mathematics from Lamar University and a master's degree in numerical science from John Hopkins University.



Center for Environmental Research Information

Calvin O. Lawrence, Director

Mailcode: G-75

26 W. ML King Dr., Cincinnati, OH 45268

513-569-7391, FAX: 513-569-7566

E-Mail LAWRENCE.CALVIN

The Center for Environmental Research Information (CERI) is a focal point for the exchange of scientific and technical information both within the federal government and to the public. CERI's Technology Transfer, Research Communication, and Document Management Branches coordinate a comprehensive program in support of the activities of EPA's Office of Research and Development (ORD), its laboratories, and associated programs nationwide.

The Technology Transfer Branch works with the ORD laboratories, program offices, regions, academia, and the private sector to produce technology transfer products (i.e., reports, summaries, journal articles, design manuals, handbooks, capsule reports, seminars, workshops, and training courses) that aid states, local governments, and the regulated community in complying with EPA regulations. This information is based upon the latest technology and is in a form that is easily understood as well as comprehensive in coverage. Topics include groundwater remediation, pollution prevention, solid and hazardous wastes, sludge, small community water treatment, municipal wastewater treatment, air pollution, and EMAP.

The Research Communication Branch is responsible for working with the ORD laboratories, program offices, and regions to produce information products that summarize

research, technical, regulatory, and enforcement information that will assist non-technical audiences in understanding environmental issues. Additionally, research communication products will allow a non-technical audience to make informed decisions necessary to respond to EPA's regulatory requirements and enforcement actions.

The Document Management Branch is responsible for the production and distribution of scientific and technical reports, responding to requests for publications, and quality control of information products through the application of standardized procedures for the production of documents. Our personnel employ state-of-the-art electronic publishing systems to efficiently produce, edit, publish, and distribute documents in the most appropriate format.

Electronic links with the offices, regions, laboratories, researchers, and the private sector afford CERI the immediate ability to serve the needs of our clients. A noteworthy component of this service is the ORD Electronic Bulletin Board System (BBS). It facilitates the exchange of technical information and ORD products among our clients in the form of electronic messages, brief bulletins about ORD products and activities, files for downloading, participation in conferences, and on-line databases for identifying ORD publications.

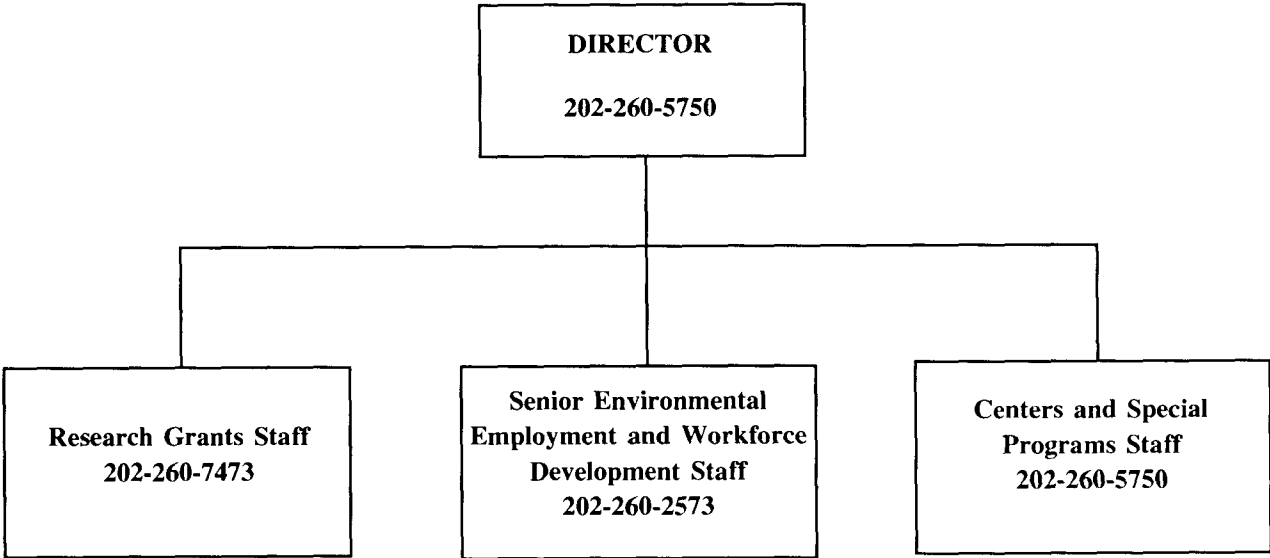
Areas of Expertise

	Telephone	Area of Expertise
Ed Barth	513-569-7669	Treatment of hazardous wastes (solidification; stabilization; vitrification)
Sue Schock	513-569-7362	Ground water
James F. Kreissl	513-569-7394	Small community wastewater, drinking water, and solid waste management
Fran Kremer	513-569-7346	Treatment of hazardous wastes (bioremediation; oil spills)
Denis Lussier	513-569-7354	Municipal wastewater treatment; ORD Electronic Bulletin Board System
Justice Manning	513-569-7349	Air pollution
Daniel J. Murray	513-569-7522	Nonpoint source water pollution; industrial wastewater pretreatment; wastewater and water quality monitoring
Jose D. Perez	513-569-7502	Expert systems
Randy Revetta	513-569-7394	Municipal wastewater treatment
J. E. Smith	513-569-7355	Drinking water and wastewater treatment; residuals management; hazardous waste management; working with international organizations to solve developing country industrial and hazardous waste problems
Jack Teuschler	513-569-7314	Expert systems; computer systems development; software development
H. Douglas Williams	513-569-7361	Hazardous materials risk reduction for waste minimization; pollution prevention

Office of Exploratory Research



Robert E. Menzer was appointed acting director of the Office of Exploratory Research in 1991. Concurrently, he serves as director of the Gulf Breeze Environmental Research Laboratory. Before joining ORD in 1989 Dr. Menzer was a professor at the University of Maryland, where he also served in several research administration posts, including associate dean and acting dean for Graduate Studies and Research. He received a Ph.D. in entomology from the University of Wisconsin, Madison, and a bachelor's degree in chemistry from the University of Pennsylvania.



Office of Exploratory Research
Robert Menzer, Acting Director
Mailcode: RD-675
401 M St., S.W. Washington, D.C. 20460
202-260-5750, FAX: 202-260-0450
E-Mail MENZER.ROBERT

The Office of Exploratory Research (OER) plans, administers, manages, and evaluates EPA's extramural grant research. It supports research in developing a better understanding of the environment and its problems. OER's main goals are

- to support the academic community in environmental research;
- to maintain scientific and technical personnel in environmental science and technology;
- to support research for the identification and solution of emerging environmental problems.

OER's goals are accomplished primarily through four core programs:

The Research Grants Program: Supports research initiated by individual investigators in areas of interest to the Agency. Research proposals are solicited by (1) the general "Solicitation for Research Proposals," which is published each year and invites proposals in six areas of environmental science and engineering; and (2) the Request for Applications (RFA), which is a more targeted solicitation mechanism that requests proposals in well-defined areas of particular interest to the Agency such as global climate change and hazardous substances. All proposals are subjected to external peer review. In an effort to provide more support to minority institutions for the conduct of basic environmental research, the Research Grants Program makes available pre-application assistance for minority faculty of Historically Black Colleges and Universities (HBCUs) and members of the Hispanic Association of Colleges and Universities (HACU) through its Minority Institutions Assistance Program.

The Environmental Research Centers Program: This program has two components: the Academic Research Centers Program (ARC) and the Hazardous Substance Research Centers Program (HSRC). Within ARC, a competition was held to select four new academic research center consortia, which began operations in 1992. The lead institutions are Massachusetts Institute of Technology, University of Maryland, Michigan Technological University, and University of California, Davis.

The HSRC program started with the establishment of five university-based consortia to conduct Superfund research, training, and technology transfer. The lead institution for each consortium is as follows: the New Jersey Institute of Technology for Region Pair 1/2, the University of Michigan for Region Pair 3/5, Louisiana State University for Region Pair 4/6, Kansas State University for Region Pair 7/8, and Stanford University for Region Pair 9/10.

The Small Business Innovation Research (SBIR) Program: Mandated by Public Law 97-219, which requires EPA to devote 1.5 percent of its extramural research and development budget to small business innovation research, the SBIR Program supports, via contracts, small businesses for the development of ideas relevant to EPA's mission. The program focuses on projects in pollution control development. It also receives 1.5 percent of the Agency's resources devoted to extramural Superfund research.

The Visiting Scientists Program: Components are (1) an Environmental Science and Engineering Fellows Program and (2) a Resident Research Associateship Program. Each year, under summer fellowships, the Fellows Program supports ten mid-career post-doctoral scientists and engineers at EPA headquarters and regional offices. The Research Associateship Program attracts national and international scientists and engineers to EPA research laboratories for up to three years to collaborate with Agency researchers on important environmental issues.

In addition to the above core programs, OER administers other programs which are also important to the accomplishment of its goals. They include:

A Minority Fellowship Program: Awards fellowships to college seniors and graduate students enrolled on a full-time basis at Historically Black Colleges and Universities and member institutions of the Hispanic Association of Colleges and Universities who are majoring in curricula that could be applied to the solution of environmental problems.

A Minority Summer Intern Program: Gives recipients of fellowships under the Minority Fellowship Program hands-on experience in the area of their academic training through a summer internship at EPA or some other environmental organization.

The Agency's Senior Environmental Employment Program (SEE): Uses the skills and talents of older Americans to provide technical assistance in environmental programs throughout EPA.

The Federal Workforce Training Program: Coordinates ORD's participation in workforce training programs used by state and local governments.

An Experimental Program to Stimulate Competitive Research (EPSCoR): Dedicated to stimulating better research and developing better researchers in those states which have traditionally been relatively unsuccessful in garnering federal research support.

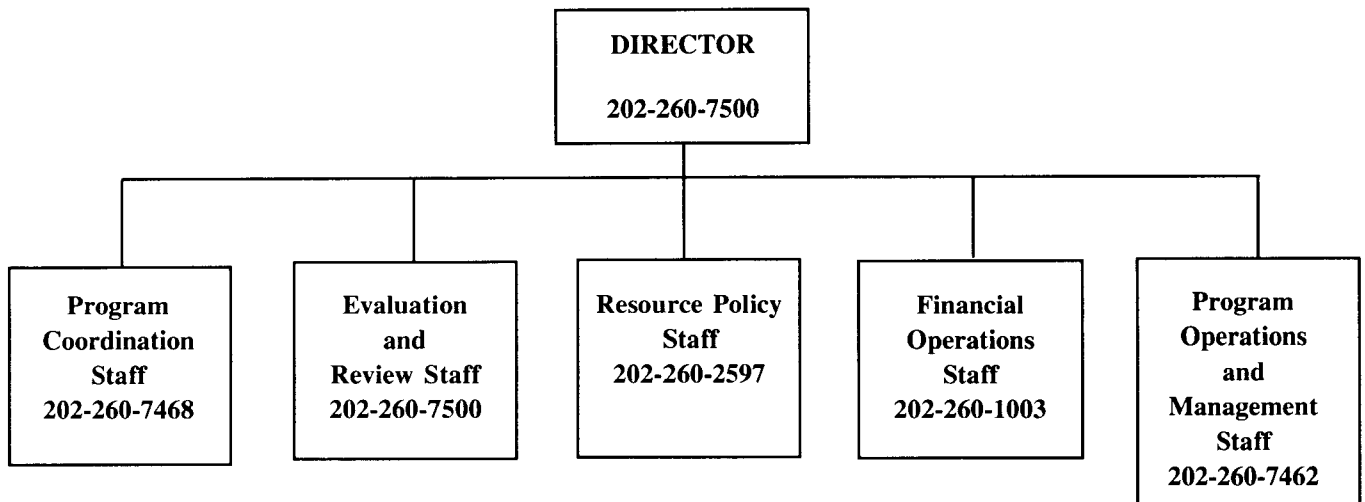
Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
Robert E. Menzer, Acting Director	202-260-5750	
Science Review Administration		
Clyde Bishop	202-260-5727	Environmental biology research grants; environmental health research grants
Deran Pashayan	202-260-2606	Air chemistry and physics research grants; EPSCoR
Louis Swaby	202-260-7445	Water chemistry and physics research grants; engineering research grants
Program Analysis		
Virginia Broadway	202-260-7664	Minority institution assistance; minority student fellowships
Alvin Edwards	202-260-7663	Program operations; minority summer internships; research associateships
Ted Just	202-260-2618	Workforce development
Susan Street	202-260-4331	Workforce development
Robert Papetti, Director	202-260-7473	Exploratory research grants; socioeconomic research grants
Karen Morehouse, Director	202-260-5750	Academic Research Centers; centers and special programs
Dale Manty, Program Manager	202-260-7454	Superfund research centers; Hazardous Substance Research Center Program
Patricia Powers, Director	202-260-2573	Senior Environmental Employment Program; workforce development
Donald Carey, Program Manager	202-260-7899	Small Business Innovation Research

Office of Research Program Management



Clarence E. Mahan has been the director of the Office of Research Program Management since April 1986. From 1983 to 1986, he was associate comptroller for EPA. Before that, he spent a year as the director, Office of Fiscal and Contracts Management. He held several positions with the Army, the Air Force, and the Department of Energy. Mr. Mahan received an MBA degree from Syracuse University, a master's in history from American University, and a bachelor's from the University of Maryland. He has received the Presidential Rank of Meritorious Executive Award.



Office of Research Program Management

Clarence E. Mahan, Director

Mailcode: RD-674

401 M St., S.W. Washington, D.C. 20460

202-260-7500, FAX: 202-260-0552

E-Mail MAHAN.CLARENCE

Functions

The Office of Research Program Management (ORPM) is the principal staff office to the Assistant Administrator on matters of budgeting, accountability, program planning, analysis, review, integration and coordination, resource management, organizational and manpower management, environmental compliance, policy development and analysis, and administrative management services.

ORPM develops and implements the planning process in ORD and assures that the budget requests to the Agency, OMB, and Congress respond to the regulatory and program needs of EPA and anticipate future environmental research necessary to address emerging issues.

ORPM manages the overall budget execution of all ORD resources, including directing plan development for headquarters and field facilities; tracking, monitoring, and analyzing changes, and expenditures; and similar budget management and analysis functions. These activities operate simultaneously and concurrently to cover three budget cycles, i.e., current year, planning year, and budget year during any given fiscal year.

ORPM is responsible for implementation and oversight for ORD of the Agency's Integrated Financial Management Systems (IFMS). These functions include ensuring proper maintenance, accuracy, and adequacy of the system to meet the various and complex requirements of ORD entities in fulfilling their budget, operating, financial, and management needs.

ORPM conducts policy/program reviews at the request of the Assistant Administrator. It develops and implements strategies to promote integrity, effectiveness, and efficiency in ORD's business management practices.

ORD-wide accountability framework is maintained through developing, monitoring, and analyzing internal and external management reviews.

Policy/program reviews requested by the laboratory directors and office directors are conducted to enhance their operations.

ORPM has national responsibility for human resource management (HRM) programs within ORD. The continuing need and validity of these programs is tested against an ongoing strategic planning process. The ORD Comprehensive Human Resource Plan provides the basis for this process. The plan is to address long-term scientific and engineering objectives in an expanding environmental agenda. The stra-

tegic HRM plan, as defined by the Assistant Administrator for ORD, is to develop options on how ORD can better meet its objectives to attract and retain highly qualified scientists and engineers.

Infrastructure Management

Responsibility for keeping ORD's infrastructure strong to ensure that ORD's science can be performed also rests with ORPM. In this area, ORPM provides administrative direction for all functions related to facilities planning and engineering needs at ORD laboratories. This includes the collection of needs and the management of the analyses required to determine priorities of new construction projects, maintenance projects for facilities, compliance of ORD facilities with environmental regulations, and ensuring that ORD facilities have health/safety programs to ensure that employees are not exposed to harmful working conditions.

ORPM also oversees the scientific equipment program. This ensures that the need for new and replacement equipment is addressed during the budget process and the existing inventory of scientific equipment is managed in a defensible fashion so that ORD's budget requests are supportable.

Information Management

ORPM is responsible for ensuring that activities carried out by ORD comply with federal and EPA policies and regulations concerning the maintenance, acquisition, and management of all hardware and software required for data processing. This responsibility includes directing and managing the planning and budgeting for all ORD information systems and the technology needed to support these systems. Information needs are coordinated across ORD and data is integrated where feasible to eliminate unnecessary duplication.

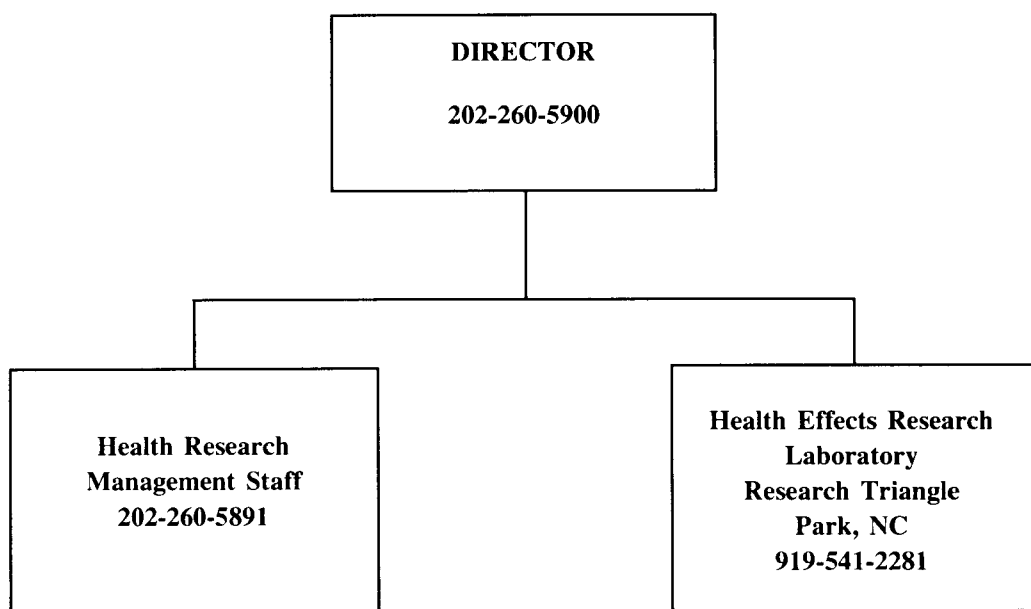
Administrative Management and Analysis

ORPM also provides an ORD-wide oversight function in the following areas: developing policy for contracts, grants, and cooperative agreements; developing and executing the budget for the Office of the Assistant Administrator and associated staff offices; managing the ORD policy and procedures program; managing, coordinating, and staffing the ORD Awards Committee activities; coordinating the review of GAO and Inspector General audits, Agency's reorganization and delegation proposals, Freedom of Information Act requests, and overseeing the Federal Manager's Financial Integrity Act responsibilities. In addition, ORPM coordinates all international travel requests and manages the system which provides reports on all activities.

Office of Health Research



Ken Sexton received his doctorate in environmental health sciences from Harvard University, where he was the recipient of both the Du Pont fellowship and a clinical epidemiology training grant. Before coming to EPA, Dr. Sexton was director for scientific review at the Health Effects Institute in Cambridge, Massachusetts, and prior to that he was director of California's Indoor Air Program. Dr. Sexton is currently co-chairman of the U.S./Canadian Binational Human Health Issues Committee, chairman of the Federal Interagency Task Force on Air Pollution Research, chairman of the Federal Interagency Working Group on Environmental Cancer and Heart and Lung Disease, and chairman of the Federal Interagency Task Force on Human Exposure Assessment. He has published extensively in the scientific literature on human exposures to environmental agents, research to improve health risk assessment, and the role of science in environmental policy and regulatory decisions.



Office of Health Research

Ken Sexton, Director

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Program Activities

The goals of the Office of Health Research (OHR) are

- (1) Hazard identification,
- (2) Dose response assessment,
- (3) Development of chemical-specific information.

These three goals serve as the core around which each of the media-specific programs are planned and implemented. Below is a brief description of the health issues which are being addressed in OHR's research program.

Air: In the air health research program major efforts are being directed at providing dose-response data for use in quantifying the health risk resulting from exposure to the criteria pollutants. This research is being conducted using animal toxicology studies and both human clinical and epidemiological studies and develops data describing the effects of exposure to these pollutants on pulmonary function, changes in host defense functions (immunotoxicity), cardiovascular disease, and neurological function. Research is also developing better methods to determine the deposition of pollutants in the lung in order to improve our risk assessment capabilities. Research on hazardous air pollutants is focused on determining the potential mutagenic and carcinogenic hazard of VOCs and mixtures of air pollutants. The indoor air health

effects research program is focusing on developing methodology and data to evaluate the effects, both cancer and non-cancer, from exposure to combustion emissions from kerosene heaters, wood stoves, environmental tobacco smoke, and other sources of indoor air pollution.

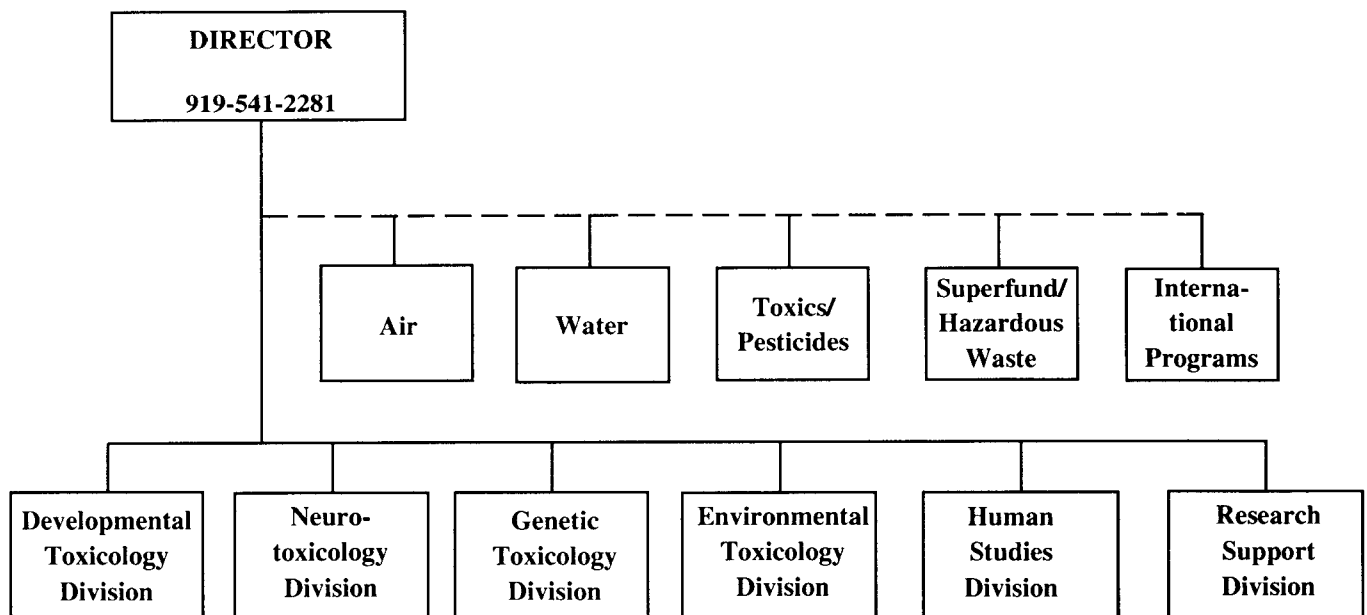
Water: The primary focus of the drinking water health effects research program is to determine the health effects from the use of various drinking water disinfectants (chlorine, chloramine, ozone). Epidemiology studies are being planned and conducted to determine the relationship between water disinfection and both cancer and reproductive effects. These methods are used to identify and isolate the biologically active components or chemicals from drinking water concentrates for further in-depth health characterization. Dose-response studies are also being conducted on drinking water disinfection byproducts to support the development of drinking water standards.

Pesticides and Toxics: The pesticides and toxic substances research program develops test methods for determining the health effects from pesticides and commercial chemicals, developing both animal and human biomarkers to improve our understanding of exposure-dose relationships and to apply these methods in biochemical epidemiology studies, research to determine the potential health effects from microbial pesticides and genetically engineered organisms and research to develop structure activity relationship models to support TSCA section 5.

Health Effects Research Laboratory



Lawrence W. Reiter has been the director of the Health Effects Research Laboratory since April 1988. Prior to being named director of the laboratory, Dr. Reiter was director of HERL's Neurotoxicology Division. Earlier in his career, he was responsible for centralizing the neurotoxicology research program for the Agency and received an EPA Bronze Medal in 1979 for his role in this effort. Dr. Reiter also has received two Special Achievement Awards and the Agency's Scientific and Technological Achievement Award. Dr. Reiter serves on the editorial board of three professional journals and is an internationally recognized neurotoxicologist who has been involved in a variety of activities to define and implement national priorities for environmental health research in this area. He earned his Ph.D. in neuropharmacology from the University of Kansas Medical Center in Kansas City. Before joining EPA in 1973 as a research pharmacologist, he was a post-doctoral fellow and lecturer in environmental toxicology at the University of California-Davis.



Health Effects Research Laboratory

Lawrence W. Reiter, Director

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The Health Effects Research Laboratory formulates and implements a comprehensive research program to investigate the human health effects resulting from exposure to environmental pollutants. Staffed by health scientists with recognized expertise in a variety of disciplines—environmental medicine, physiology, epidemiology, statistics, biochemistry, neurotoxicology, toxicology, teratology, perinatal toxicology, geriatric toxicology, pulmonary toxicology, immunotoxicology, cardiovascular toxicology, genotoxicology, hepatotoxicology, and microbiology—HERL is the focal point for toxicological, clinical, and epidemiological research within the Agency. HERL also establishes cooperative research projects with academic and other scientific institutions which facilitate the Agency efforts in understanding the health effects of environmental pollutants. This research program develops and applies state-of-the-science biological assays, predictive models, and extrapolation methods which serve as the basis for the Agency's health risk assessments.

HERL consists of six divisions. Most of the research facilities are located in the Research Triangle Park, North Carolina. HERL has one of the nation's few sophisticated human inhalation exposure facilities, located on the campus of the University of North Carolina at Chapel Hill.

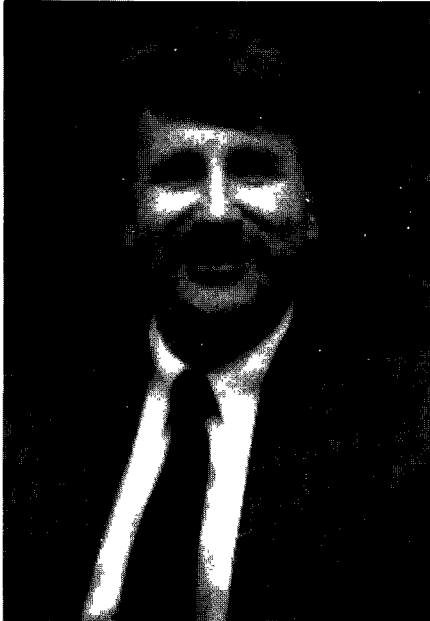
Research at HERL is being conducted in the following areas:

- **Oxidants:** Develop a database for use in regulatory decision making on the health effects of O_3 and NO_2 exposure by conducting human clinical, epidemiologic, and animal studies. Models are also being developed to quantitatively extrapolate animal data to humans.
- **Hazardous Air Pollutants (HAP):** Develop and validate techniques to evaluate the toxic effects of HAPs, produce dose-response data on the toxic effects of HAPs and develop models which improve our ability to use toxicological data in risk assessments.
- **Mobile Sources:** Provide quality health data on the effects of vehicle fuels and additives, including methanol and exposure to CO and develop methods for obtaining dose-response data for use in risk assessments for regulatory purposes.
- **Superfund:** Develop and evaluate dose-response data, extrapolation models, and test methods on complex mixtures to reduce uncertainties in risk assessment.
- **Gases and Particles:** Develop a database for use in regulatory decision making on the health effects of SO_2 , particles and lead by conducting human clinical, epidemiologic, and animal studies. Models are also being developed to extrapolate animal data to humans and to provide information on the relationship between particle size and lung deposition in man.
- **Water Quality:** Evaluate methods to assess health hazards associated with complex mixtures arising as discharges from publicly owned treatment works.
- **Municipal Wastewater:** Provide data and appraisal documents on health aspects of land application of municipal sludge and use of renovated wastewater for a source of drinking water.
- **Drinking Water:** Provide health effects information for drinking water standards and health advisories with special emphasis on hazards posed by drinking water disinfectants (chlorine, chloramine, chlorine dioxide, and ozone) utilizing state-of-the-art toxicologic and epidemiologic methodologies.
- **Hazardous Waste:** Evaluate the health effects of emissions and residues from hazardous waste incineration (HWI) and municipal waste combustion (MWC).
- **Pesticides:** Develop methodologies and generate data for the assessment of health risks from pesticides; define environmental and health endpoints for future test methods. Studies are also being carried out on health effects of biological and bioengineered pesticides.
- **Indoor Air Research (with an emphasis on combustion products, multiple chemical sensitivity, VOCs, and environmental tobacco smoke):** Apply results of the research to the development of health risk assessments.
- **Improved Health Risk Assessments:** Develop a systematic and integrated approach to improve the health risk assessment process.
- **Toxic Chemical Testing and Assessment:** Develop and validate test methods for identifying health hazards under the Toxic Substances Control Act (TSCA). Study relationship between chemical structure and toxicologic activity. Carry out human epidemiological studies on hazardous chemicals. Also, evaluate human health hazards of bioengineered materials.

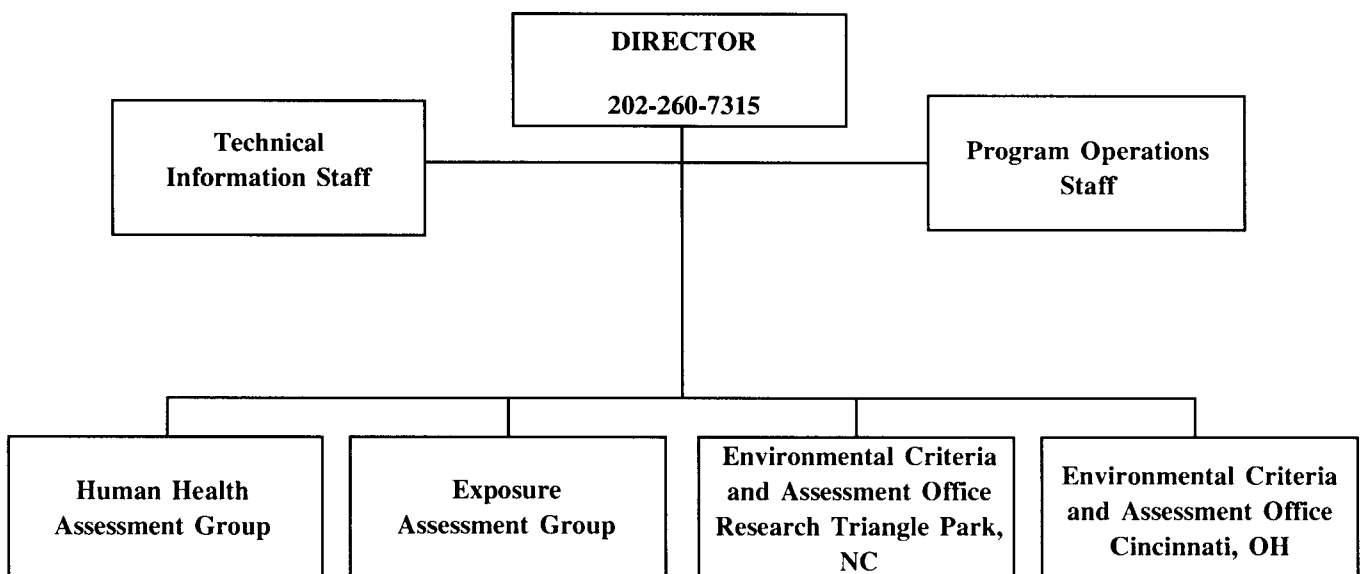
Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
Lawrence W. Reiter, Director	919-541-2281	Health effects of environmental pollutants
Harold Zenick, Deputy Director	919-541-2283	Health effects of environmental pollutants
Michael D. Waters, Assoc. Lab Director	919-541-2537	International programs
Elaine C. Grose, Assoc. Lab Director	919-541-3844	Health effects of pesticides/toxic substances
Fred Hauchman, Assoc. Lab Director	919-541-3893	Health effects of water pollutants
Ila L. Cote, Assoc. Lab Director	919-541-3644	Health effects of air pollutants
Robert S. Dyer, Assoc. Lab Director	919-541-2760	Health effects of hazardous waste and Superfund chemicals
John J. Vandenberg, RIHRA Director	919-541-4527	Coordinator for RIHRA program
Developmental Toxicology Division		
Robert J. Kavlock	919-541-2771	Reproductive toxicology
Sally P. Darney	919-541-3826	Reproductive physiology
John M. Rogers	919-541-5177	Perinatal toxicology
Environmental Toxicology Division		
Linda S. Birnbaum	919-541-2655	Pharmacokinetics and toxicology
Daniel L. Costa	919-541-2531	Pulmonary toxicology
James D. McKinney	919-541-3585	Chemistry and metabolism
Mary Jane Selgrade	919-541-2657	Immunotoxicology
Genetic Toxicology Division		
Larry D. Claxton, Acting Director	919-541-2329	Genetic toxicology
Stephen Nesnow	919-541-3847	Chemical carcinogenesis
Joellen Lewtas	919-541-3849	Genetic toxicology of complex mixtures
Martha M. Moore	919-541-3933	Mammalian mutagenesis
Human Studies Division		
Hillel Koren	919-966-6200	Human inhalation toxicology
Tim Gerrity	919-966-6206	Inhalation dosimetry
Jack Griffith, Acting Chief	919-966-7549	Epidemiology
Neurotoxicology Division		
Hugh A. Tilson	919-541-2671	Neurotoxicology
Robert C. MacPhail	919-541-7833	Behavioral toxicology & pharmacology
William K. Boyes	919-541-7538	Neurophysiological toxicology
Joseph S. Ali	919-541-2240	Electrical engineering
Research Support Division		
Ann Akland	919-541-2883	Program operations and administration
John Creason	919-541-2598	Multivariate analysis
Barry Howard	919-541-2729	Special Studies/Technical Support
Kenneth P. Laws	919-541-5744	Management Information System
Kathy Driver	919-541-7932	Program operations

Office of Health and Environmental Assessment



William H. Farland is the director of the Office of Health and Environmental Assessment. He has been with EPA since 1979 and served as deputy director, Health and Environmental Review Division, Office of Toxic Substances, before joining ORD in 1986 as director of the Carcinogen Assessment Group. He received a Ph.D. and master's degree from the University of California, Los Angeles, and a bachelor's degree in biology from Loyola University. He was a National Cancer Institute Postdoctoral Fellow (National Research Service Awardee), at the University of California, Irvine, California, and Brookhaven National Laboratory, Upton, New York.



Office of Health and Environmental Assessment

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The Office of Health and Environmental Assessment (OHEA) is EPA's focal point for the scientific assessment of the degree of risks imposed by environmental pollutants on human health and ecological systems. OHEA occupies a critical position in the Office of Research and Development (ORD) between (1) the researchers in other ORD components who are generating new findings and data, and (2) the regulators in the EPA program offices and regions who must make regulatory, enforcement, and remedial action decisions. In support of its mission to provide the Agency with assessments of risk to human health and the environment, OHEA carries out three functions:

- Prepare human health risk assessments that serve as the scientific bases for regulatory and enforcement decisions within the Agency.
- Promote Agencywide coordination and consistency of risk assessments by preparing guidelines, providing expert advice, reviews, and data analyses, and participating in regulatory decision processes; be a spokesperson to the public, other federal agencies, and internationally for environmental risk assessment.
- Advance the science of risk assessment through research planning with the scientific community. OHEA plans research projects that are carried out by its own programs and other ORD organizations.

OHEA's four laboratory-level field components implement the health science program; three support units provide administrative, planning, and information management support.

Program Activities

Air

- Develop air quality criteria documents that provide the scientific bases for setting and revising National Ambient Air Quality Standards (NAAQS).
- Develop health risk assessments for hazardous air pollutants from stationary and mobile sources to provide the scientific foundations of rulemakings under the 1990 Clean Air Act Amendments (CAAA), Titles II and III.
- Provide expert scientific consultation to (a) the Office of Air and Radiation for CAA imple-

mentation, and (b) federal interagency groups and international organizations on health and ecological effects of air pollutants and global climate change.

- Develop research for criteria air pollutants and mobile sources.
- Assess risks from indoor air pollutants.

Water

- Assess the health effects of exposure to drinking water contaminants.
- Assess the risk of human exposure to toxic chemicals, and evaluate site-specific health hazards for ambient waters.
- Provide risk assessment methodologies for chemicals and pathogens in the use and disposal of municipal sludge.

Hazardous Waste

- Provide documents to support RCRA 3001 listing decisions and the land disposal restriction program in the form of reference dose documentation.
- Develop methods for assessing risks from hazardous and municipal waste treatment and disposal techniques and waste minimization options.
- Develop PC-based systems that will permit risk assessors to conduct risk assessments.

Pesticides and Toxic Chemicals

- Assist the Office of Pesticide Programs in health risk assessments for cancer, mutagenicity, reproductive and developmental effects, and exposure assessment.
- Assist the Office of Pollution Prevention and Toxics in health risk assessments and exposure assessment.
- Develop risk assessment methods for effects in humans caused by exposure to environmental chemicals.

Multimedia

- Support exposure and risk assessment regulatory decisionmaking by EPA.

- Plan and fund research to reduce uncertainty in risk assessments.
- Provide consensus information on reference doses (RfDs), inhalation reference concentrations (RfCs), or Agency agreed-upon quantitative risk estimates of carcinogenicity for IRIS.
- Provide leadership in reassessing dioxin.

Superfund

- Assist EPA offices and regions in evaluating Superfund alternative courses of action.
- Operate a Technical Support Center for health risk assessments.
- Provide health assessments to support needs for the remedial planning and cost recovery efforts.
- Provide data on carcinogenicity and chronic effects to support activities necessary to adjust the reportable quantities for hazardous substances.
- Conduct research to fill information and assessment gaps in the Superfund public health evaluation process.

Issues

OHEA assures consistency and high scientific quality in the risk and exposure assessments conducted in other parts of the Agency.

Issues Related to Conducting Risk Assessments

OHEA's work on the lead criteria document brought about its involvement in several other areas such as:

- the development of the Maximum Contaminant Level in drinking water,
- the development of comparative risk assessment methods and techniques for assessing potential impacts to human and ecological health,
- the development of the lead biokinetic model,
- involvement in the Congressionally mandated study of effects of lead in children and in its removal from soils in urban areas,
- participation in the Interagency Lead Task Force activities,
- the lead role in developing the ORD research plan and budget for lead and other heavy metals, and
- a role in evaluating whether the critical health effect of lead is its carcinogenic potential or its neurological effects.

As a result of the CAAA of 1990, OHEA assesses risks from acid aerosols. OHEA's assessment of health hazards associated with exposure to environmental tobacco smoke is an example of the indoor air issue.

Issues Related to Risk Assessment Research

OHEA provides direction to research efforts in risk assessment. ORD is pursuing research efforts in understanding ecological risk and in improving exposure assessment. Pharmacokinetics, model validation, and reducing the uncertainty in exposure assessment are areas of future research.

OHEA assesses environmental risk and develops techniques for comparing risks of different remedial strategies and risk reduction techniques.

OHEA is an important client for research conducted by the other ORD offices and helps plan research to be conducted by ORD. The result of such enhanced planning will be research findings that are better targeted to the needs of the risk assessors.

Issues Related to Providing Guidance and Consistency to Agency Risk Assessment Activities

OHEA develops risk assessment guidelines under the Risk Assessment Forum. Five guidelines were published in 1986. During the past year, the guidelines for exposure assessment and developmental toxicity risk assessment were revised and reissued. Revised guidelines are under development for carcinogen risk assessment, reproductive toxicity, and quantitative approaches for chronic toxicity. OHEA is involved in preparing the first-ever ecological risk assessment guidelines.

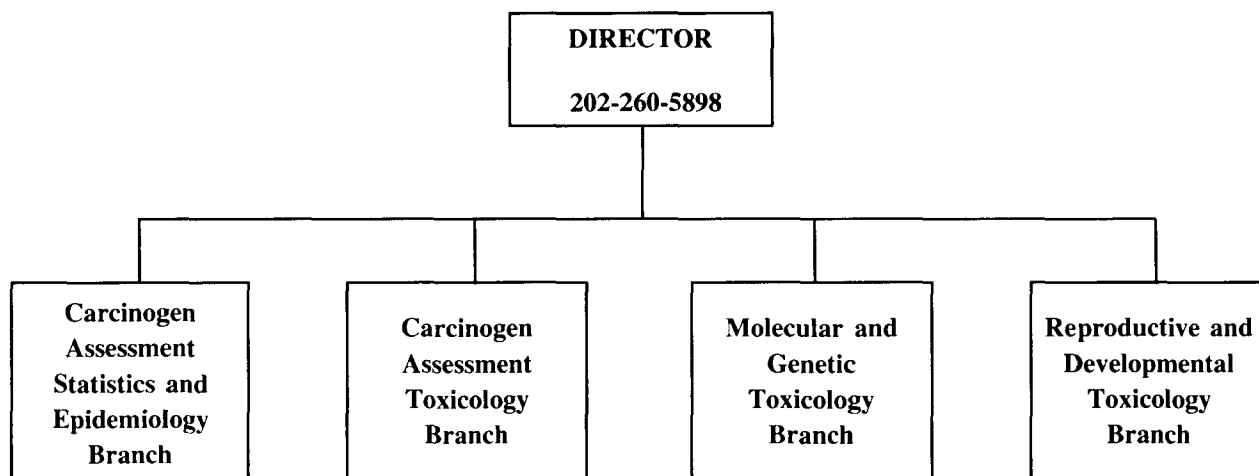
In managing the flow of risk assessment information, OHEA

- Leads discussions of how to coordinate risk analysis activities.
- Demonstrates new approaches for characterizing health risk through its guidelines development, IRIS activities, and risk assessment work.
- Develops non-cancer health effects risk assessments.
- Manages the Integrated Risk Information System.
- Works with OAQPS in managing the Air Risk Information Support Center.
- Has provided the lead support for the Developmental and Reproductive Toxicology Database.
- Has established a Technical Support Center for Health and Risk Assessment for Superfund to provide a contact point for dissemination of health risk assessment information to regional and state officials and private organizations involved in Superfund.

Human Health Assessment Group



Since February 1990, **Hugh W. McKinnon** has been the director of the Human Health Assessment Group. He received his medical degree from the University of Virginia in 1977. He completed the General Preventive Medicine Residency in the School of Hygiene and Public Health at the Johns Hopkins University in Baltimore in June 1989 and received a master of public health degree from that university in 1988. He was appointed as medical officer in the Office of Health Research in 1978 and served as the acting director of that office from November 1985 to May 1987. He has professional memberships in the American Public Health Association and the Federal Physicians Association.



Human Health Assessment Group

Hugh McKinnon, Director

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The Human Health Assessment Group develops human health risk assessments and reviews assessments developed elsewhere in EPA; participates in the development and implementation of EPA's risk assessment guidelines, including guidelines training courses; and performs research to improve health risk assessments. The group also provides advice on the health risks associated with suspected cancer-causing agents and the risks associated with chemicals suspected of causing mutagenic and adverse developmental and reproductive effects. The group plans and implements its own program and provides extensive consultation and technical assistance to others.

The group is composed of four branches:

- **The Carcinogen Assessment Toxicology Branch** advises the Agency on the health-hazard potential from suspected cancer-causing agents as interpreted from animal toxicology and pathology data.
- **The Carcinogen Assessment Statistics and Epidemiology Branch** advises the Agency on the health-hazard potential from suspected cancer-causing agents as interpreted from epidemiology data and defines and interprets dose-response relationships from both epidemiologic and animal data.
- **The Reproductive and Developmental Toxicology Branch** is responsible for advising the Agency on the health risks associated with suspected reproductive and developmental toxicants as interpreted from *in vitro*, experimental animal, and human data.
- **The Molecular and Genetic Toxicology Branch** advises the Agency on the health risks associated with suspected genotoxins and provides assessments of the mechanism of action for other branches.

Expertise is provided in the following areas:

- **Carcinogen Assessment Statistics and Epidemiology:** Health risks associated with suspected cancer-causing agents as interpreted from epidemiology data and the statistical analysis of both human and animal data.
- **Carcinogen Assessment Toxicology:** Health risks associated with suspected cancer-causing agents as interpreted from animal toxicology and pathology data.
- **Molecular and Genetic Toxicology:** Health risks associated with suspected genotoxins as interpreted from *in vitro*, experimental animal, and human data; provides a focus on health risk issues related to the molecular and cellular determinants of environmentally induced diseases.
- **Reproductive and Developmental Toxicology:** Health risks associated with suspected reproductive and developmental toxicants as interpreted from *in vitro*, experimental animal, and human data.
- **Technical Assistance:** Technical assistance to state and local health and pollution control agencies, regional offices, other U.S. Governmental agencies, and the international community on matters pertaining to health and risk assessments, including assistance to the Agency's Air RISC Support Center and Superfund Technical Support Center; revisions to proposed and final regulations and guidance documents for various agency and regional offices; and risk assessments for EPA program and regional offices and state agencies.

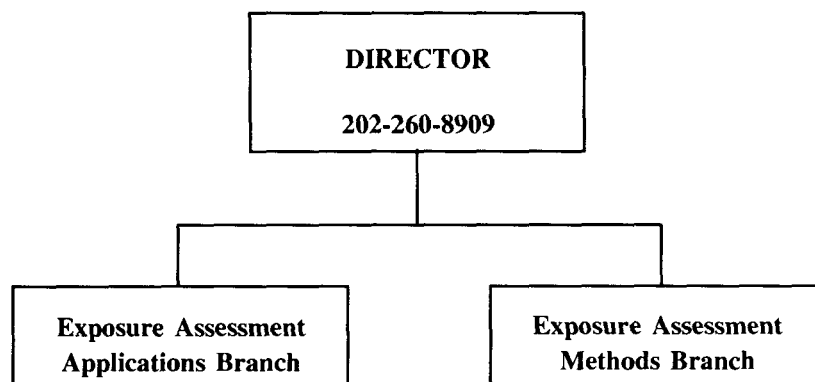
Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
Hugh McKinnon, Director	202-260-5898	Preventive medicine, including environmental and occupational medicine; public health practice; environmental health policy and management
Charles Ris, Deputy Director	202-260-7338	Risk assessment methods; cancer risk assessment; risk assessment/management policy
Robert McGaughy, Senior Scientist	202-260-5889	Risk assessment (all phases) for chemical carcinogens; toxicology; basic physics; spectroscopy; modelling epidemiology; radiation; electromagnetic fields; risk assessment policy
Carole Kimmel, Senior Scientist	202-260-7331	Reproductive and developmental toxicology, neurotoxicity and other noncancer health effects, risk assessment, and modeling; science policy of risk assessment; biomarkers; mechanisms; hyperthermia
Carcinogen Assessment Statistics and Epidemiology Branch		
V. James Cogliano, Chief Steven Bayard David Bayliss Chao Chen Jennifer Jinot Aparna Koppikar Lorenz Rhomberg Cheryl Siegel Scott	202-260-3814	Cancer risk estimation; biostatistics; epidemiology; pharmacokinetics; mathematical modelling; computer simulation; PCBs
Carcinogen Assessment Toxicology Branch		
Jean Parker, Chief Robert Beliles Arthur Chiu Charalingayya Hiremath William Pepelko Dharm Singh	703-308-8597	Toxicologic and carcinogenic effects of agents; risk assessment methodology; pharmacology; metabolism pathology; biochemistry; human physiology
Molecular and Genetic Toxicology Assessment Branch		
Vicki Dellarco, Chief Margaret Chu James Holder David Reese Sheila Rosenthal Larry Valcovic	202-260-7336	Mechanisms of mutagenesis and carcinogenesis; genetic risk assessment; genetics; biochemistry; molecular and cellular biology; biotechnology
Reproductive and Developmental Toxicology Branch		
Babasaheb Sonawane, Chief Eric Clegg Tom Crisp Carole Kimmel Gary Kimmel Sherry Selevan	202-260-1495	Reproductive and developmental toxicology; neurodevelopmental toxicology; experimental design and test methodology issues; qualitative and quantitative approaches to risk assessment

Exposure Assessment Group



Michael A. Callahan has been the director of the Exposure Assessment Group since 1986. His prior experience at EPA includes positions in the Office of Toxic Substances and the Office of Water. He began his career as a chemist with the U.S. Army Research and Development Center. He has been awarded the EPA Gold Medal for Exceptional Service and three EPA Bronze Medals for Commendable Service. He received a master's degree in organic chemistry from George Washington University and a bachelor's degree in chemistry from Northwestern University. He was a primary author of EPA's "Guidelines for Exposure Assessment" in 1992 and has professional membership in both the International Society for Exposure Analysis and the Society for Risk Analysis.



Exposure Assessment Group

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The major responsibilities of the Exposure Assessment Group (EAG) are:

- to provide state-of-the-art methodology, guidance, and procedures for assessing human and ecological exposure to environmental contaminants;
- to ensure quality and consistency in the Agency's scientific exposure/risk assessments;
- to provide independent assessments of exposure and recommendations to the appropriate regulatory offices concerning the exposure potential of specific agents.

Included in the first responsibility are both a research component and a strong tech transfer component. The second responsibility has resulted not only in EAG's development of exposure assessment guidelines, but also in the establishment of a risk assessment review capability that has been used by program offices, regions, and states. The third responsibility requires EAG to put the methods developed into use by actually performing exposure and risk assessments.

The mandate to develop and apply methods to see if they work in "real life" situations has led to a broad diversity

of the work in EAG. EAG is divided into two branches, the Exposure Assessment Methods Branch (EAMB) and the Exposure Assessment Applications Branch (EAAB). Although the focus of EAMB is on methods development, and the focus of EAAB is on applications, personnel from both branches routinely work together in groups to take advantage of the wide expertise and backgrounds of the personnel in both branches.

All of the research EAG does is directed toward advancing the state of the art in exposure assessment and translating these advances into useable tools for exposure/risk assessors. The research is categorized into three general areas: research into "exposure factors," that is, the values for parameters which characterize human or ecological behavior and are needed as input into exposure assessments; research into methods for estimating and evaluating exposure, and the research related to tools, such as software systems, that will allow assessors to use the research in their work.

Just as it is important to do the research into developing methods and tools for doing exposure assessment, it is important to make these results available to end users, in a form they can easily apply to their own work. In this area, EAG has established a wide-ranging program including conducting exposure assessments, providing consultation, reviewing risks assessments for other organizations, and conducting training workshops.

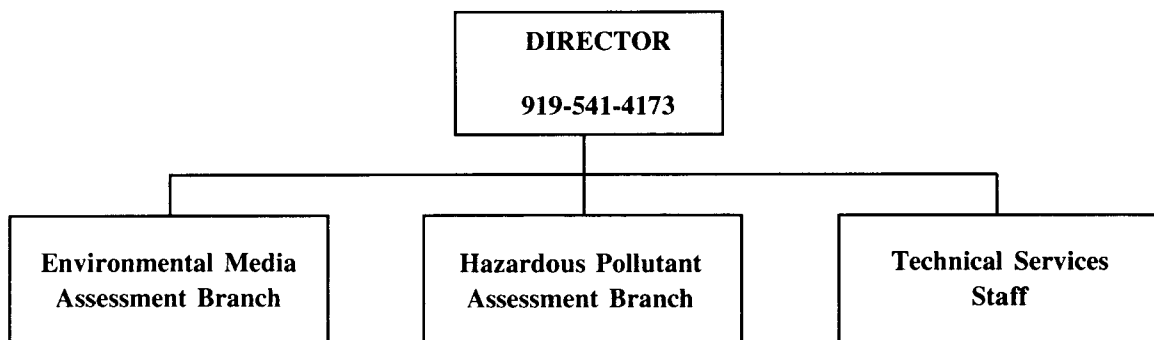
Areas of Expertise

Office of the Director	Telephone	Area of Expertise
Michael A. Callahan, Director	202-260-8909	Chemistry; exposure assessment
Exposure Assessment Applications Branch		
Kevin Garrahan	202-260-2588	Environmental engineering; civil engineering; landfill design; water treatment; hydrology
Jacqueline Moya	202-260-2385	Chemical engineering; fish ingestion; exposure scenarios; reviewing risk assessments; showering exposures
Karen Hammerstrom	202-260-8919	Chemical engineering; dermal exposure; chemical fate and transport
Malcolm Field	202-260-8921	Hydrogeology; karst geology; groundwater investigation and remediation
Sue Norton	202-260-6955	Environmental science; ecological risk assessment; wildlife factors
Anne Sergeant	202-260-9376	Environmental science; soil science; ecological assessments; wetlands; ecological indicators of risk
Amy Long	202-260-8918	Environmental science; dermal absorption
Exposure Assessment Methods Branch		
John Schaum	202-260-5988	Environmental engineering; exposure assessment; dermal exposure; dioxin
Matthew Lorber	202-260-8924	Agricultural engineering; pesticide exposure; fate modeling; PCB; dioxin
Paul White	202-260-2589	Statistics; food ingestion; soil ingestion; uncertainty analysis
Rich Walentowicz	202-260-8922	Biomedical engineering; exposure software; model selection; model validation; pharmacokinetics
Kim Chi Hoang	202-260-2059	Chemical engineering; pharmacokinetics; dermal exposure

Environmental Criteria and Assessment Office—Research Triangle Park



Lester D. Grant has been director of the Environmental Criteria and Assessment Office in Research Triangle Park, North Carolina (ECAO-RTP), since 1978. While with EPA, he has received two EPA Gold Medals, one Silver and one Bronze Medal. Dr. Grant is on the governing board of the Society of Occupational and Environmental Health, and the Scientific Advisory Committee of the Pan American Health Organization's Center for Human Ecology and Environmental Health. He often serves as an invited expert consultant on health effects of air pollution, global climate change, lead, and other heavy metals to various U.S. federal, state, and local agencies and, internationally, to numerous multinational organizations and national governments. From 1970 to 1980, Dr. Grant rose from instructor to associate professor at the University of North Carolina School of Medicine, where he also served as associate director of the Neurobiology Program and as co-director of a major environmental toxicology research program. He received a bachelor's degree from the University of Pittsburgh and masters and Ph.D. degrees from Carnegie-Mellon University. As a postdoctoral fellow (Public Health Service Awardee) at the University of Chicago, Dr. Grant also received specialty training in neurobiology before joining the University of North Carolina faculty.



Environmental Criteria and Assessment Office—Research Triangle Park

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Functions

The mission of the Environmental Criteria and Assessment Office in Research Triangle Park, North Carolina (ECAO-RTP), is the scientific assessment of health and ecological effects of air pollutants, conducted in support of EPA implementation of the Clean Air Act (CAA) and its 1990 Amendments (CAAA). ECAO-RTP also coordinates risk assessments aimed at preventing environmental contamination. ECAO-RTP coordinates preparation of special assessments mandated by Congress or requested by other federal, state, and local agencies, or in support of international cooperative activities. ECAO-RTP: (a) is an Agency focal point for technical information on air pollution sources and exposures and non-cancer health risk assessment methods and results; (b) provides technical transfer assistance to a variety of clients; and (c) identifies knowledge gaps in assessed databases and coordinates development and implementation of research strategies to address such data gaps.

ECAO-RTP is organized into the Environmental Media Assessment Branch (EMAB), the Hazardous Pollutant Assessment Branch (HPAB), and the Technical Services Staff (TSS). ECAO-RTP staff efforts are concentrated in the following areas:

NAAQS Criteria Review: Includes development of air quality criteria documents (AQCDs) that provide the scientific bases for decisions by the EPA Administrator on setting or revising the National Ambient Air Quality Standards (NAAQS) for criteria air pollutants. Preparation of AQCDs, coordinated by EMAB, includes evaluations of health, ecological, and other welfare effects of such pollutants and extensive peer-review.

Air Toxics Assessments/Support: Includes (a) development of health risk assessments to provide scientific foundation for Agency rulemaking under CAAA Titles II and III; (b) development of non-cancer health assessment methodologies for acute and chronic air toxics exposures; (c) consultation to OAR for implementation of CAAA Titles II and III provisions; and (d) operation of the Air RISC Center, which provides hotline response and assistance to EPA regions, states, and local agencies regarding air toxics problems.

Mobile Sources/Alternative Fuels: Includes (a) preparing diesel and other mobile source-related health risk assess-

ments; (b) coordinating development of ORD research strategy and planning documents; and (c) consulting with OMS on rulemaking issues for conventional and alternative fuels.

Indoor Air: Coordinates OHEA inputs to research planning and budgeting activities, prepares Agency risk assessments for indoor air pollutants, maintains the Indoor Air Reference Database and disseminates information to client users, and participates in research on population exposures to indoor air pollutants.

Lead Assessment/Research: Assesses sources and pathways of lead exposure, models lead uptake and biokinetics, evaluates lead health effects and risks, and develops technologies for abatement of lead in paint, soil, water, etc. ECAO-RTP provides consultation on lead issues to all EPA program offices, other federal agencies, states, and local governments, and multinational organizations and national governments.

Research Planning/Coordination: Coordinates (1) development, revision, and Agency representation of long-range plans and budgeting for criteria air pollutants, mobile sources/alternative fuels, lead and other heavy metals and (2) ECAO-RTP representation of OHEA in research planning for air toxics, indoor air, and other issues. Coordinates development of ORD research strategies for national and international research programs for alternative fuels and for tropospheric ozone NAAQS revision and attainment.

International Activities: Serves as the ORD focal point for cooperative interactions with the Pan American Health Organization. ECAO-RTP contributes to cooperative activities with several international organizations regarding development and revision of international air quality criteria and guidelines. ECAO-RTP provides technical transfer and other types of assistance as part of bilateral interactions with several countries.

Educational Outreach: Participates in (a) developing agreements for cooperative activities with EPA programs and ORD laboratories; (b) recruiting qualified graduates for EPA staff, and (c) identifying research opportunities for University faculty members. ECAO-RTP staff helps develop and teach courses on environmentally-related topics at UNC and other local universities.

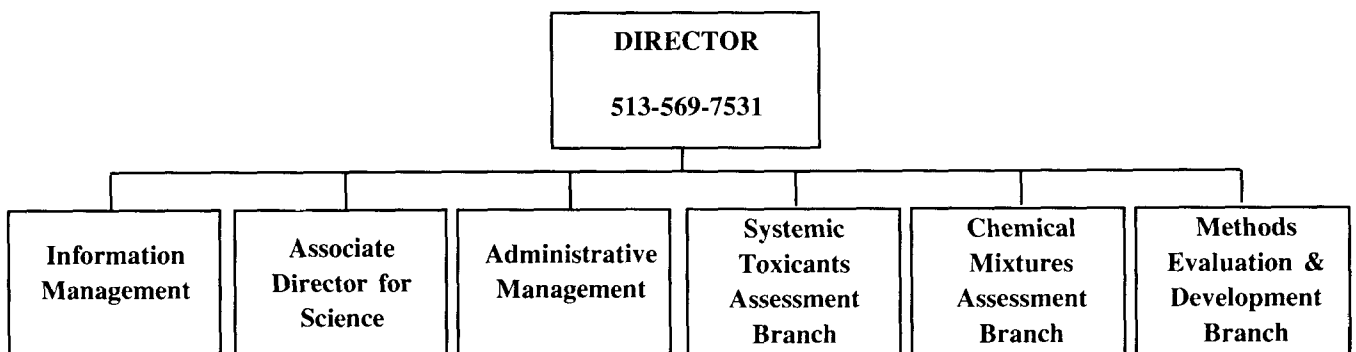
Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
Lester D. Grant, Director	919-541-4173	Health effects of criteria air pollutants, heavy metals, climate change
Michael A. Berry, Deputy Dir.	919-541-4172	Environmental legislation; indoor air pollution
Judith A. Graham, Assoc. Dir.	919-541-0349	Health assessment of toxic air pollutants; criteria air pollutants; mobile sources/alternative fuels
Si Duk Lee	919-541-4477	International collaboration; health risk assessment
Environmental Media Assessment Branch		
Norman E. Childs, Chief	919-541-2229	Criteria air pollutants, indoor air pollution
Beverly M. Comfort	919-541-4165	Pesticides; indoor air pollution
Robert W. Elias	919-541-4167	Heavy metals; exposure modeling
William G. Ewald	919-541-4164	Toxicology; radiation biology
Jasper H.B. Garner	919-541-4153	Ecosystem and vegetation effects
Dennis J. Kotchmar	919-541-4158	Epidemiology and respiratory effects; No _x , PM health effects
James A. Raub	919-541-4157	Respiratory physiology/toxicology; Health effects of carbon monoxide, ozone
Beverly E. Tilton	919-541-4161	Air chemistry; effects of VOCs, No _x , ozone
Hazardous Pollutant Assessment Branch		
Chon R. Shoaf, Chief	919-541-4155	Inhalation toxicology; risk assessment
J. Michael Davis	919-541-4162	Developmental neurotoxicology; lead; alternative fuels & fuel additives, (methanol, etc.)
Gary J. Foureman	919-541-1183	General metabolism; biological chemistry; general toxicology
Jeff S. Gift	919-541-4828	Biologic markers for non-cancer and cancer end-points; health risk assessment
Mark M. Greenberg	919-541-4156	Organic chemicals; toxicology
Dan J. Guth	919-541-4930	Pulmonary toxicology; inhalation risk assessment
John Hinz	919-541-4154	Inhalation toxicology; health risk assessment
Annie M. Jarabek	919-541-4847	Inhalation toxicology and risk assessment; physiologically based pharmacokinetic modeling
Marsha Marsh	919-541-1314	Environmental health risk assessment, communication

Environmental Criteria and Assessment Office—Cincinnati



Terry Harvey received his doctorate in veterinary medicine at the University of Illinois and subsequently obtained professional, academy recognition in both pharmacology and toxicology. He is licensed to practice in Illinois, Missouri, and Ohio and spent 15 years at the U.S. Food and Drug Administration in Washington where his highest position was deputy director of the Bureau of Veterinary Medicine. Dr. Harvey spent 7 years in the private sector at the Monsanto Company, St. Louis, as an executive in charge of global, biotechnology development of commercial products for health and agricultural applications. In May 1991 he joined the U.S. EPA as the director of the Environmental Criteria and Assessment Office in Cincinnati, Ohio, where one of his responsibilities is the Agency's research planner for federal drinking water research and assessments.



Environmental Criteria and Assessment Office—Cincinnati

Terry Harvey, Director

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E-Mail HARVEY.TERENCE

The Environmental Criteria and Assessment Office in Cincinnati, OH (ECAO-CIN), in partnership with the Office of Health and Environmental Assessment, provides scientific leadership for risk assessment research and methods development. Specific risk assessments are developed to validate these methods and test hypotheses in new areas. The office performs key risk assessments for chemicals or exposures that further scientific credibility and foster a creative atmosphere for additional research and methods development. Technical assistance and support is provided to enhance the use and effectiveness of the methods and assessments generated within ECAO-CIN. Areas of concentration for the nearterm include: 1) develop risk assessment methods, which provide guidance for evaluating potential risks to human health from exposure to environmental pollutants; 2) evaluate research data which may lead to reducing uncertainties in risk assessment, aid in predicting risk, and enhance our capabilities for comparing one risk with another; 3) prepare scientific assessment documents/health risk assessment reports which provide a defensible basis for setting environmental standards; 4) actively participate in Agencywide workgroups in the planning, development, and implementation of future research strategies for the Agency; and 5) conduct outreach technical initiatives with other federal agencies and the World Health Organization.

These theme areas are addressed by three branches:

- **Chemical Mixtures Assessment Branch:** Provides scientific support for the development of background documentation and technical support necessary to formulate human health risk assessment activities for Agency program offices as mandated by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, the Superfund Amendment and Reauthorization Act (SARA), the Resource Conservation and Recovery Act (RCRA), and the Hazardous and Solid Waste Amendment (HSWA). These assessments establish the basis for regulatory

activities in the Office of Solid Waste and Emergency Response (OSWER) associated with the potential human exposure to environmental pollutants, particularly chemical mixtures. Operates the Superfund Technical Support Center.

- **Systemic Toxicants Assessment Branch:** Provides scientific support for the development of background documentation and technical support necessary to formulate human health risk assessment activities for Agency Program Offices as mandated by the Clean Water Act (CWA), the Safe Drinking Water Act (SDWA), and the Clean Air Act (CAA). These assessments establish the basis for regulatory activities and advisories associated with potential human exposure to environmental pollutants, particularly systemic toxicants. Additionally, the evaluation of risks associated with municipal solid wastes is undertaken. Specific areas of research include risks associated with municipal solid waste recycling, municipal waste combustion (including the assessment of indirect exposures), and comparative risk assessment of municipal waste disposal alternatives and water disinfection.
- **Methods Evaluation and Development Branch:** Initiates and coordinates the development of risk assessment methods and Agency guidelines for chemical mixtures and noncancer health effects, and reviews new methods in response to identified Agency needs. The staff also coordinates input to the Agency's Reference Dose (RfD) and Carcinogen Risk Assessment Verification Endeavor (CRAVE) workgroups, and manages the Integrated Risk Information System (IRIS). These activities help ensure that the Agency's risk assessments remain credible and that state-of-the-art methods are continually evaluated, developed, and implemented.

Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
Terry Harvey, Director	513-569-7531	Risk assessment; veterinary medicine; pharmacodynamics
Steve Lutkenhoff, Deputy Director	513-569-7615	Resource management; information management; environmental education
Rita Schoeny, Associate Dir. for Science	513-569-7544	Carcinogen Risk Assessment Endeavor (CRAVE); polycyclic aromatic hydrocarbons (PAHs)
Debdas Mukerjee,	513-569-7572	Cancer assessments; dioxin; dibenzofurans; PCBs
Kate Mahaffey	513-569-7957	Lead toxicity; toxicity of heavy metals and essential elements; characterization of populations highly susceptible to metal toxicity; food as a source of toxic chemical exposure
Chemical Mixtures Assessment Branch		
Cynthia Sonich-Mullin, Chief	513-569-7523	Superfund/Hazardous Waste Program; applied epidemiology; carbon tetrachloride; asbestos
Bob Bruce	513-569-7569	PAHs; nickel chromium; HEEDs; RQs
Harlal Choudhury	513-569-7536	Reproductive/developmental toxicity; lead; heavy metals
Chris Cubbison	513-569-7599	Less-than-lifetime risk assessments; risk assessment ecology; biostatistics; RQTOX
Joan Dollarhide	513-569-7539	RfD; incineration; Superfund risk assessment; Superfund Technical Support Center
Linda Knauf	513-569-7573	HEAST; statistics; mathematical modeling; hypothesis testing
Becky Madison	513-569-7257	Hazardous waste regulations; risk characterization; regulatory policy
Bruce Peirano	513-569-7540	Mercury; asphalt; pharmacokinetics; quantitative risk assessment
Kenneth Poirier	513-569-7462	Metals; trace elements; manganese; glycol ethers; selenium; RfD/RfC methodology; ammonia; DIMP; essentiality/toxicity; Superfund Technical Support Center
Adib Tabri	513-569-7505	Organic chemistry; pesticides; chlorinated hydrocarbons; carbamates; organophosphates; quality assurance
<i>Superfund Technical Support Hotline 513-569-7300</i>		

(continued)

Areas of Expertise

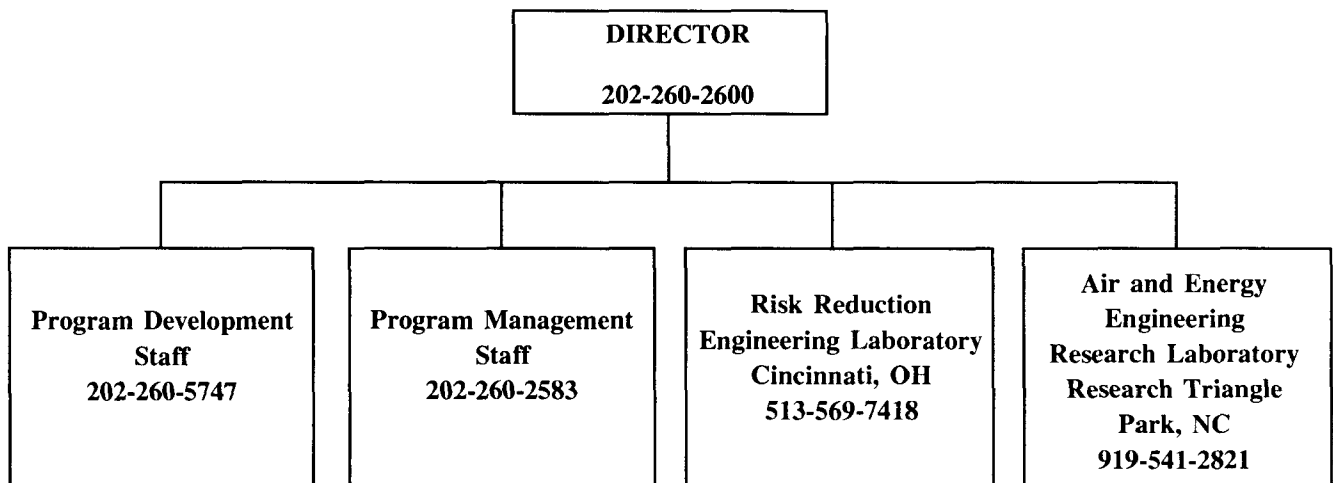
(continued)

	Telephone	Area of Expertise
Systemic Toxicants Assessment Branch		
Michael Dourson, Chief	513-569-7533	General toxicology; human health risk assessment; noncancer methods (RfD)
Eletha Brady-Roberts	513-569-7662	Municipal solid waste recycling; stable strontium
John Cicmanec	513-569-7481	Veterinary medicine; dichloro-, hexachloro-, and trichlorobenzenes; ethylene thiourea; PCBs; arsenic; methyl mercury
Charlotte Cottrill	513-569-7221	Risk communication; technology transfer; incineration
Michael Dubowe	513-569-7579	Industrial hygiene; AirRISC; solid waste recycling; incineration; MDA; PERC; methylene chloride
Norman Kowal	513-569-7584	Sludge/pathogens risk assessment; ecologic risk assessment
Carolyn Smallwood	513-569-7425	Endrin; chloramines
Sue Velazquez	513-569-7571	Nickel; silver; manganese; aluminum; boron; inorganics
Methods Evaluation and Development Branch		
Lynn Papa, Chief	513-569-7587	Drinking water disinfectants; beryllium; cyanides; site-specific risk assessments; cardiovascular physiology; RfD methodology
Pat Daunt	513-569-7596	IRIS database
Richard Hertzberg	513-569-7582	Mathematical modeling; biostatistics; chemical mixtures guidelines; dosimetry; noncancer risk assessment; computer programming
Patricia Murphy	513-569-7226	Epidemiology; biostatistical techniques; design analysis; interpretation; fluoride; ionizing/non-ionizing radiation; indoor air; drinking water disinfectants; waterborne disease microbes
Jacqueline Patterson	513-569-7574	IRIS database
David Reisman	513-569-7588	Hexachlorocyclopentadiene; copper; acetone; database development
Glenn Rice	513-569-7813	Incineration; CRAVE; fish consumption
Jeff Swartout	513-569-7811	RfD methodology; database development; IRIS; computer science; LAN technology; toxicology
<i>IRIS User Support: 513-569-7254</i>		

Office of Environmental Engineering and Technology Demonstration



Alfred W. Lindsey is the director of the Office of Environmental Engineering and Technology Demonstration. He has been the deputy director of the Office of Environmental Engineering and Technology Demonstration and the Hazardous and Industrial Waste Division, Office of Solid Waste. He has held various hazardous waste management positions in EPA. Before coming to EPA, he held positions dealing with pollution control, quality control, process engineering, and product development. He received a bachelor's degree in pulp and paper technology from North Carolina State University and did graduate work at Drexel University in environmental engineering and at George Washington University in environmental management.



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Alfred W. Lindsey, Director

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The Office of Environmental Engineering and Technology Demonstration (OEETD) is responsible for planning, managing, and evaluating a comprehensive program of research, development, and demonstration of cost-effective methods and technologies to:

- Control and manage hazardous waste generation, storage, treatment, and disposal;
- Provide innovative technologies for response actions under Superfund and technologies for control of hazardous waste spills;
- Control environmental impacts of public sector activities including publicly-owned wastewater and solid waste facilities;
- Improve drinking water supply and system operations, including improved understanding of water supply technology and water supply criteria;
- Characterize, reduce, and mitigate indoor air pollutants, including asbestos and radon; and
- Characterize, reduce, and mitigate acid rain precursors and other air pollutants from stationary sources.

OEETD is also responsible for the development of engineering data needed by the Agency in reviewing pre-manufacturing notices relative to assessing potential release and exposure to chemicals, treatability by waste treatment systems, containment and control of genetically engineered organisms, and the development of alternatives to mitigate the likelihood of release and exposure to existing chemicals.

In carrying out these responsibilities, the office:

- Develops program plans and manages the resources assigned to it;
- Implements the approved programs and activities;
- Assigns objectives and resources to the OEETD laboratories;
- Conducts appropriate reviews to ensure the quality, timeliness, and responsiveness of outputs; and
- Conducts analyses of the relative environmental impacts of engineering methods and control technologies and strategies.

The Office of Environmental Engineering and Technology Demonstration is the focal point within the Office of Research and Development for providing liaison with the Department of Energy on issues associated with clean coal

and energy development. It is also the focal point within the Office of Research and Development for liaison with the rest of the Agency on issues relating to engineering research and development, and control of pollution discharges.

Program Activities

Air

- SO_x and NO_x control technologies (LIMB, ADVACATE, REBURNING).
- Hazardous air pollutant control technologies.
- Indoor air source characterization and control technologies
- Ozone attainment—control of VOC emissions from products.
- Global Climate—Stratospheric Modification.

Water Quality

- Municipal sewage innovative and alternative wastewater and sludge technologies.
- Toxicity treatability protocols for wastewater treatment processes.
- Storm and combined sewer overflow control technologies.

Drinking Water

- Disinfection technologies, including evaluation of byproducts.
- Water quality problems in distribution systems, e.g., lead solder.
- VOCs, pesticides, and radionuclides treatment technologies.

Hazardous Wastes/Superfund

- Pretreatment technologies for land disposal.
- Waste minimization technologies and clearinghouse.
- Land disposal technology, including air emissions.
- Incineration of hazardous wastes and municipal solid wastes.
- Cleanup technologies for leaking underground storage tanks.
- Superfund Innovative Technology Evaluation program (SITE).

- Evaluate cleanup technologies for Superfund sites.
- Municipal solid waste and sludge innovative technology evaluations (MITE).
- Evaluate technologies for sludge and municipal solid waste disposal.

Pesticides

- Personal protection technology for applicators.

Radiation

- Radon mitigation technologies for schools and homes.

Toxic Substances

- Toxicity assessment methodology for pre-manufacturing notices.
- Asbestos abatement technologies for schools and tall buildings.
- Risk management for genetically engineered microorganism manufacturers.



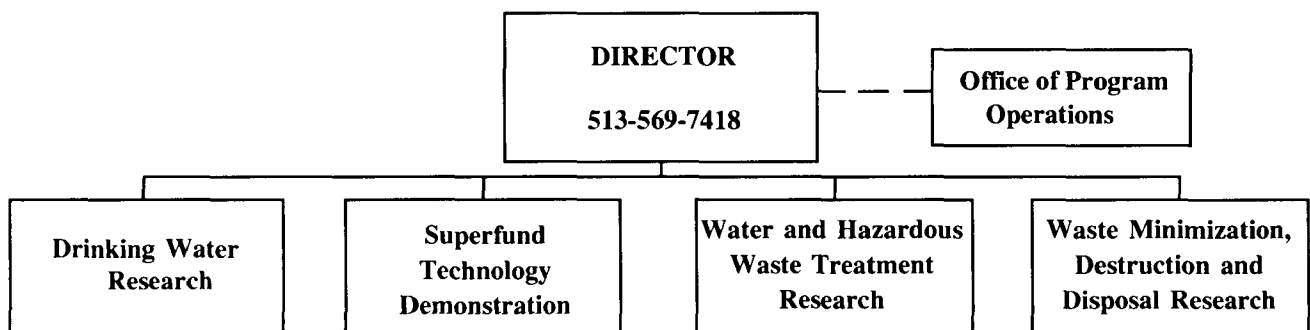
Areas of Expertise

	Telephone	Area of Expertise
Marshall Dick	202-260-2583	Radon; indoor air; global climate; stratospheric ozone; air toxics; air pollution; energy; toxics; asbestos; pesticides; municipal solid waste
Bala Krishnan	202-260-2583	Hazardous waste
Richard Nalesnik	202-260-2583	Superfund alternative treatment technologies; innovative technology evaluation; technical assistance response team; underground storage tanks; medical waste
Don Tang	202-260-2583	Municipal wastewater; industrial wastewater; storm-water and combined sewer overflow; constructed wetlands; drinking water
Michael L. Mastracci	202-260-5748	Commercialization of environmental technologies: - National Environmental Technology Applications Corporation - Alternative procurement and investment incentive mechanism - Interagency coordination
Kurt Jakobson	202-260-5748	Oil spills; bioremediation
Paul Shapiro	202-260-5748	Pollution prevention
Myles Morse	202-260-5748	Pollution prevention; international cleaner production; alternative treatment technologies; technical information transfer; data networking
Curtis Harlin	202-260-5748	Alternative treatment technology information center; Superfund; drinking water treatment; municipal wastewater treatment

Risk Reduction Engineering Laboratory



E. Timothy Oppelt is the director of the Risk Reduction Engineering Laboratory. Mr. Oppelt has held managerial positions in EPA in such diverse components as the Municipal Environmental Research Laboratory, Hazardous Waste Engineering Research Laboratory, and the Waste Management Division of Region V, EPA. Mr. Oppelt's academic degrees are: bachelor's in civil engineering and master's in sanitary engineering from Cornell University; and an MBA from Xavier University, Cincinnati, Ohio. He holds EPA's Bronze and Silver Medals.



Risk Reduction Engineering Laboratory

E. Timothy Oppelt, Director

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The mission of the Risk Reduction Engineering Laboratory (RREL) is to advance the understanding, development, and application of engineering solutions for the prevention or reduction of risks from environmental contamination. This mission is accomplished through basic and applied research studies, engineering technology evaluations, new process development, and demonstration studies designed to:

- Enhance our understanding of environmental engineering technology design, performance, and operation.
- Anticipate engineering control and prevention measures for environmental problems not of immediate regulatory or enforcement concern.
- Provide a sound scientific basis for development and enforcement of environmental regulations, standards, guidelines, and policy decisions in areas for which EPA is responsible.
- Foster the development, evaluation, and commercialization of improved and innovative environmental engineering technology in collaboration with industry.
- Provide a basis for technical assistance and engineering support to EPA, other government organizations, and private industry regarding the implementation of environmental regulations, standards, and guidelines.

Research development and technical support are provided in the following specific areas of concern:

- Treatment, distribution, and preservation of safe public drinking water supplies.
- Treatment, disposal, recycling, and minimization alternatives for hazardous wastes, municipal solid wastes, and medical wastes.
- Technologies for remedial action at uncontrolled hazardous waste sites and for corrective action at existing hazardous waste facilities.
- Detection and remedial action for leaking underground storage tank facilities.
- Alternatives for controlling the release of asbestos, existing and new chemicals in manufacturing, and emissions from biotechnology operations.
- Alternatives for remediation of oil spills.
- Engineering alternatives for disposal of canceled and suspended pesticides and for minimizing worker exposure to pesticides.
- Prevention, treatment, and control of municipal and industrial wastewater discharges, sludges, and urban runoff pollution.
- Pollution prevention through industrial process change, product substitution, development of clean products, and clean technology.



Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
E. Timothy Oppelt, Director	513-569-7418	Hazardous waste management
John J. Convery, Deputy Director	513-569-7896	Municipal wastewater treatment
Alden G. Christianson, Special Assistant to the Director	513-569-7997	Pollution control research administration
Drinking Water Research Division		
Robert M. Clark, Director	513-569-7201	Drinking water treatment
Walter Feige	513-569-7496	Drinking water management
Thomas J. Sorg	513-569-7370	Drinking water inorganics control; radionuclides
Donald Reasoner	513-569-7234	Drinking water microbiological treatment
H. Paul Ringhand	513-569-7450	Organics control; disinfection byproducts
Benjamin W. Lykins	513-569-7460	Drinking water field evaluations; costs

(continued)

Areas of Expertise

	Telephone	Area of Expertise
Richard J. Miltner	513-569-7403	Disinfection byproducts; disinfectant applications; GHC adsorption
Michael R. Schock	513-569-7412	Corrosion; lead/copper
Kim R. Fox	513-569-7820	Inorganics control; small systems
Lewis Rossman	513-569-7603	Distribution systems and modeling
Jeffrey Adams	513-569-7835	Membrane technology
James Goodrich	513-569-7605	Small systems; field applications
Superfund Technology Demonstration Division		
Robert A. Olexsey, Director	513-569-7861	Superfund engineering technology, division activities
John S. Farlow*	908-321-6635	Superfund releases control
Benjamin L. Blaney	513-569-7406	Superfund technical assistance
Donald E. Sanning	513-569-7875	International remedial technology
Frank Freestone*	908-321-6632	Technical support program management for vacuum extraction; soil vapor extraction; national/interna- tional land reclamation
John F. Martin	513-569-7758	SITE demonstration and evaluation activities
Laurel J. Staley	513-569-7863	Innovative thermal treatment
Paul dePercin	513-569-7797	Vacuum extraction, soil vapor extraction
Gordon M. Evans	513-569-7684	Superfund cost estimation
Jackson S. Hubbard	513-569-7507	Mining sites
Norma M. Lewis	513-569-7665	Chemical oxidation; UV/ozone
Naomi P. Barkley	513-569-7854	Redevelopment of land; debris washing
Ronald F. Lewis	513-569-7856	Bioremediation
Randy A. Parker	513-569-7271	Electrokinetics
Water and Hazardous Waste Treatment Research Division		
Subhas K. Sikdar, Director	513-569-7528	Water and hazardous waste research
Jonathan G. Herrmann, Assistant Director	513-569-7839	Mining waste management; large volume waste treatment; inorganic wastes
Carl A. Brunner	513-569-7655	Urban runoff; wastewater sludge
Roger C. Wilmoth	513-569-7509	Asbestos; industrial wastewater treatment
Dolloff F. Bishop	513-569-7629	Air biofilter treatment
Richard A. Dobbs	513-569-7649	Fate and treatability of toxics
Richard C. Brenner	513-569-7657	Engineered biosystems
Teresa M. Harten	513-569-7565	Metal finishing; pollution prevention; separations technology
James A. Heidman	513-569-7632	Biological wastewater treatment
Glenn M. Shaul	513-569-7408	TRI improvement estimations; industrial wastewater
Bruce A. Hollett	513-569-7654	Asbestos
Albert D. Venosa	513-569-7668	Oil spills
John O. Burckle	513-569-7506	Biotechnology
Richard Field*	908-321-6674	Urban runoff

(continued)

*Edison, NJ, location

Areas of Expertise

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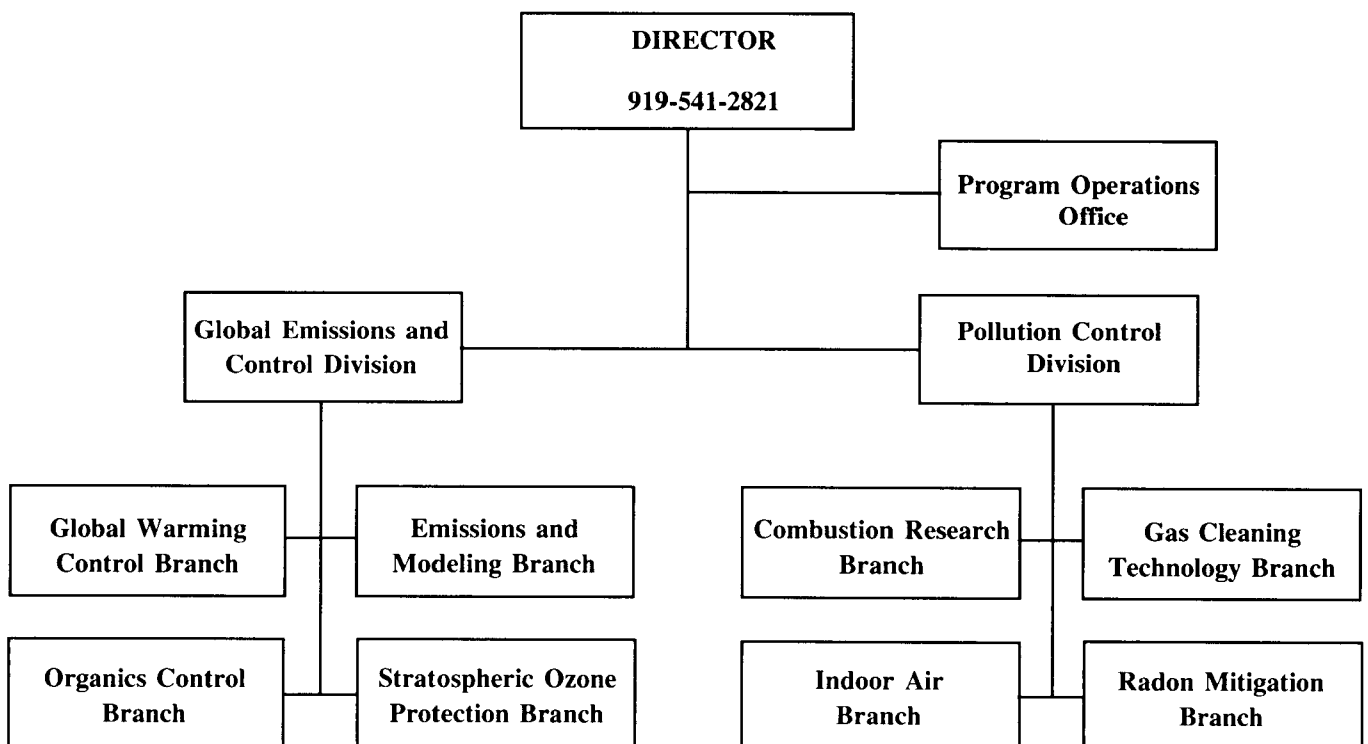
	Telephone	Area of Expertise
Waste Minimization, Destruction and Disposal Research Division		
Clyde R. Dempsey, Acting Director	513-569-7504	Thermal treatment/destruction
Albert J. Klee	513-569-7493	Decision scientist; statistics; operations research
Harry M. Freeman	513-569-7529	Pollution prevention; waste minimization
Robert C. Thurnau	513-569-7692	Thermal destruction; treatability studies
James S. Bridges	513-569-7683	Waste minimization in federal facilities
Robert E. Landreth	513-569-7881	Landfill design and operation
Carlton C. Wiles	513-569-7795	Stabilization; municipal solid waste
George L. Huffman	513-569-7431	Thermal destruction; combustion
Michael H. Roulier	513-569-7796	In-situ treatment of soils
Donald A. Oberacker	513-569-7510	Thermal destruction of hazardous materials
Ivars J. Licis	513-569-7718	Industrial pollution prevention
Federal Technology Transfer Act Cooperative Research Agreement		
Michael Borst*	908-321-6631	Chapman, Inc.—Use of EPA's mobile in-situ soil containment technology for treating hazardous wastes
Bruce A. Hollett	513-569-7654	Chemical Specialties Manufacturers Association—Study of asbestos fiber release while performing various normal wet floor maintenance procedures
John O. Burckle	513-569-7506	Cold Jet, Inc.—Evaluate dry ice particle blasting and other abatement processes to remove lead paint
James Goodrich	513-569-7605	Drysdale and Associates, Inc.—Develop and evaluate automatic sensors and data acquisition equipment for drinking water treatment plants
Richard C. Brenner	513-569-7657	James Graham Brown Foundation, Inc., and Remediation Technologies, Inc., and U.S. Forest Service—Use of fungal technology to biotreat soil contaminated with PCP and PAHs
Dolloff F. Bishop	513-569-7629	Levine-Fricke, Inc.—Lab and pilot scale study of biodegradation waste treatment technology for degraded solid, liquid, or gaseous RCRA and CERCLA waste
Robert M. Clark	513-569-7201	Lewis Publishers, Inc./CRC Press, Inc.—Develop cost and performance model for safe drinking water clean-up technologies
Daniel Sullivan*	908-321-6677	Vulcan Iron Works, Inc.—Use of EPA's mobile incinerator for destruction of hazardous wastes
Thomas J. Sorg	513-569-7370	Water Quality Association—Evaluate effect of ion exchange softening on corrosion products in household plumbing system
Chi-Yuan Fan*	908-906-6924	Shell Oil Company—Evaluation of vacuum extraction technology for USTs
John F. Martin	513-569-7758	Clean Sites, Inc., and USAF—Commercializing innovative treatment technologies for contaminated soils and ground water at McClellan AFB, Sacramento, CA

*Edison, NJ, location

Air and Energy Engineering Research Laboratory



Frank T. Princiotta is the director of the Air and Energy Engineering Research Laboratory (AEERL), Research Triangle Park, North Carolina. He has served as a division director of ORD's Office of Environmental Engineering and Technology Demonstration. Prior to going to EPA headquarters in 1975, he was chief of AEERL's Engineering Test Section. Mr. Princiotta's career includes engineering positions with Hittman Associates and the U.S. Atomic Energy Commission's New York Operations. EPA has awarded him a Gold Medal, three Bronze Medals, and the President's Rank of Meritorious Executive. Mr. Princiotta has a bachelor's degree in chemical engineering from City College of New York.



Air and Energy Engineering Research Laboratory

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The mission of the Air and Energy Engineering Research Laboratory (AEERL) is to research, develop, and demonstrate pollution prevention approaches and control technologies for air pollutants emitted from stationary sources and to provide methods to estimate emissions from these sources. Among these stationary sources are electric power plants, manufacturing and processing industries, and incinerators. The laboratory does not deal with pollution from nuclear power plants or controls for mobile sources.

Staffed primarily by engineers, the laboratory creates and improves air pollution control equipment, seeks means of preventing or reducing pollution through product substitution or changes in industrial processes, develops predictive models and emissions estimation methodologies, identifies and assesses the importance of air pollution sources, and conducts fundamental research to define the mechanisms by which processes, equipment, and fuel combustion produce air pollution.

Currently, AEERL is concentrating its efforts in eight main program areas:

Acid Rain: This program focuses on developing innovative controls for acid rain precursors, SO_2 and NO_x , including innovative sorbent injection approaches such as the Limestone Injection Multistage Burner (LIMB) and ADVACATE (advanced silicate); developing models that will identify the best possible control alternatives for various scenarios; and emissions projection modeling.

Air Toxics: Emphasis is placed on developing technologies and pollution prevention approaches to reduce emissions of air toxics regulated under Title III of the 1990 Clean Air Act Amendments; identifying sources and developing urban inventories of air toxics; developing improved designs that will achieve better control of toxic woodstove emissions; and providing direct technical assistance to state and local agencies through the Control Technology Center (CTC), which has extensive information on existing technologies applicable to a variety of air pollution sources.

Hazardous Wastes: The primary goal of this program is to study the fundamental combustion mechanisms that influence thermal destruction of hazardous wastes. Included are studies of metal aerosols from waste incineration, failure

modes in a small pilot-scale rotary kiln, and small pilot-scale studies of fluidized-bed incineration.

Indoor Air Quality/Radon: Research is currently concentrating on (1) developing and demonstrating technologies for reducing the entry of naturally-occurring radon into houses, schools, and other public buildings; (2) fundamental studies of processes that influence radon entry; (3) studying building materials and consumer products as sources of indoor air pollution; and (4) evaluating approaches to prevent or control indoor air pollutants including biocontaminants.

Municipal Waste Combustion: Work focuses on evaluating techniques to minimize pollutant formation during combustion and determining the effectiveness of various devices in controlling air pollution from municipal waste incinerators.

Ozone Non-Attainment: This program supports ORD's overall ozone nonattainment strategy by developing innovative NO_x and Volatile Organic Compounds (VOC) control technologies, improving existing technologies, enhancing and developing emissions estimation methodologies, and developing pollution prevention approaches for VOC's and other ozone precursors.

Stratospheric Ozone: In cooperation with industry, AEERL evaluates, identifies, and demonstrates the viability of substitute compounds and technologies which will replace ozone depleting substances that are now in use. The current emphasis of the program is to evaluate alternatives for existing refrigeration (commercial and residential) and space cooling systems (heat pumps, chillers); to identify replacements for halons used in fire suppression systems and evaluate replacements for insulation systems. In addition, research is underway to evaluate destruction approaches for CFC's and other ozone depletion substances.

Global Climate Change: This program is evaluating mitigation and prevention options for greenhouse gases (carbon dioxide, methane, nitrous oxide). Emphasis is on reducing methane emissions by using them as a feedgas to power fuel cell and innovative biomass utilization approaches. In addition, emission factors for key greenhouse gas sources are being enhanced and software (GloED) is under development to serve as the international repository for greenhouse gas emissions data.

Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
Frank T. Princiotta, Director	919-541-2821	Air and energy environmental assessment and control technology development
G. Blair Martin, Deputy Director	919-541-7504	Combustion; incineration; furnace injection for SO _x control
Pollution Control Division		
Everett L. Pyler, Director	919-541-2918	Combustion modification control technology; fundamental hazardous waste incineration research; municipal waste combustion; radon control; indoor air quality
W. Gene Tucker, Deputy Director	919-541-2746	Fundamental hazardous waste incineration research; municipal waste combustion; radon control; indoor air quality
Combustion Research Branch		
Robert E. Hall, Chief	919-541-2477	Combustion modification control technology including reburning; fundamental hazardous waste incineration research; municipal waste combustion; combustion toxics control
Indoor Air Branch		
Michael C. Osborne, Chief	919-541-4113	Indoor air pollutant source/emissions characterization; air cleaners and other indoor air quality (IAQ) mitigation approaches; IAQ modeling
Radon Mitigation Branch		
Timothy M. Dyess, Chief	919-541-2802	Radon mitigation techniques for new and existing houses, schools and other structures; fundamental studies of radon source potentials, entry, accumulation and removal mechanisms
Gas Cleaning Technology Branch		
Charles B. Sedman	919-541-7700	LIMB development; low NO _x burners; fundamental sorbent reactivity/kinetics studies; flue gas cleaning technologies; NO _x selective catalytic reduction; LIMB demonstrations (wall-fired and tangentially-fired); toxic particulate
Global Emissions and Control Division		
Dennis C. Drehmal, Director	919-541-7505	Control technologies/pollution prevention approaches for volatile organic compounds (VOCs), greenhouse gases, and ozone depleting compounds; emissions models and estimation methodologies
Robert P. Hangebrauck	919-541-4184	
Global Warming Control Branch		
Michael A. Maxwell	919-541-3091	Emissions characterization and mitigation for greenhouse gases (methane, CO ₂ , etc.)
Emissions and Modeling Branch		
Larry G. Jones, Chief	919-541-7716	Emission estimation methodologies and projection models; field validation of improved methods

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Areas of Expertise

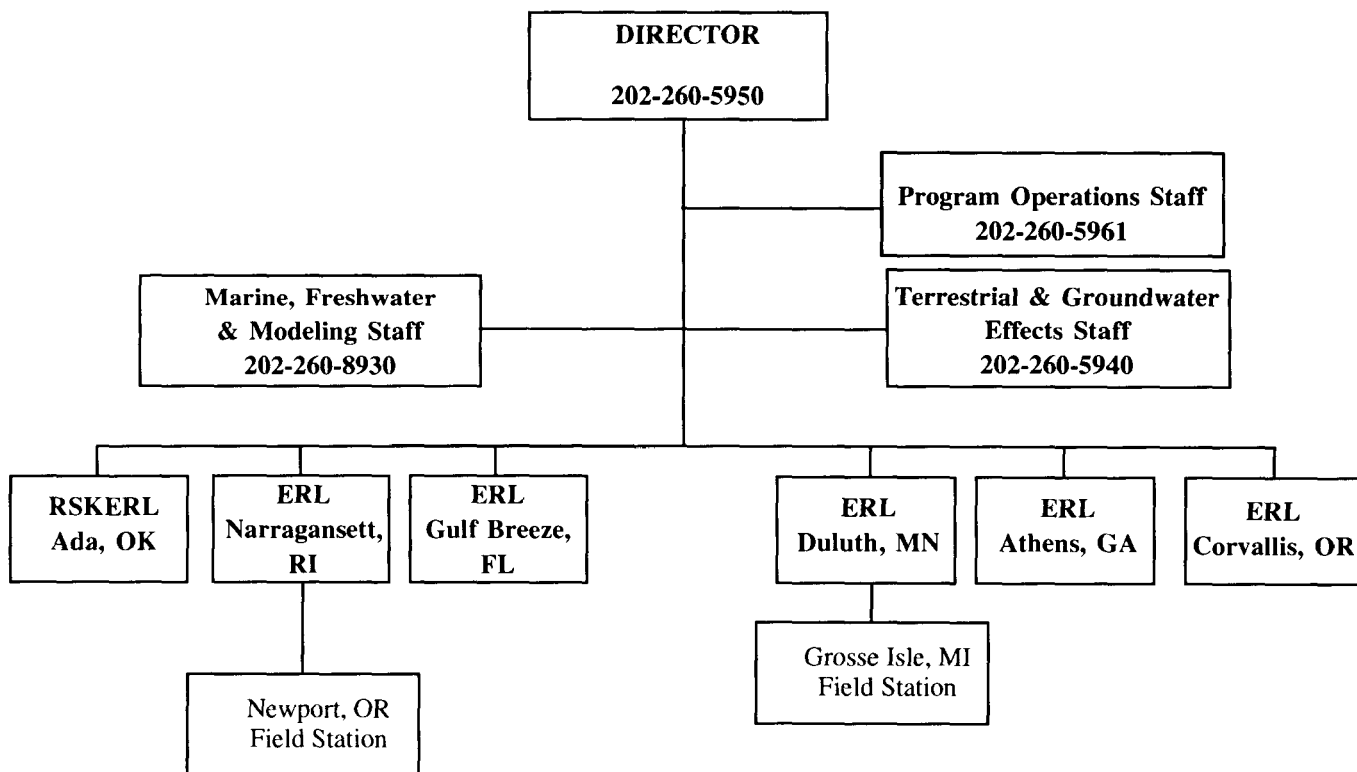
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	Telephone	Area of Expertise
<i>Organics Control Branch</i> Wade H. Ponder	919-541-2818	VOC controls; organic toxics control; Control Technology Center (CTC Hotline: 919-541-0800); pollution prevention approaches for VOC area sources; woodstoves; coke oven controls
<i>Stratospheric Ozone Protection Branch</i> William J. Rhodes	919-541-2853	Substitutes for CFCs, HCFCs and other ozone-depleting compounds; CFC/Halon recycling and destruction approaches; alternative refrigerants and modified refrigerator designs
Federal Technology Transfer Act Cooperative Research Agreement Charles B. Sedman	919-541-7700	Flakt, Inc.—Development of absorbents for air pollution control technology
Brian K. Gullett	919-541-1534	Nalco Fuel Tech—Selective catalytic reduction of nitrogen oxide emissions in combustion exhaust streams
Control Technology Center Hotline	919-541-0800	Extensive information on existing control technologies applicable to a variety of air pollution sources

Office of Environmental Processes and Effects Research



Courtney Riordan is the director of the Office of Environmental Processes and Effects Research. His prior experience with EPA includes director, Office of Acid Deposition, Environmental Monitoring and Quality Assurance; Acting Assistant Administrator, Office of Research and Development; director, Office of Monitoring Systems and Quality Assurance; associate director, Office of Air, Land, and Water Use. Dr. Riordan received a bachelor's degree in civil engineering from Northeastern University in Boston, a Ph.D. in regional planning and systems analysis from Cornell University, in Ithaca, New York, and a J.D. from George Washington University.



ERL = Environmental Research Laboratory

Office of Environmental Processes and Effects Research

Courtney Riordan, Director

Mailcode: RD-682

401 M St., S.W. Washington, D.C. 20460

202-260-5950, FAX: 202-260-6370

E-Mail RIORDAN.COURTNEY

The Office of Environmental Processes and Effects Research (OEPER) is responsible for administering a broad range of ecological research programs. These programs are structured to provide the scientific data and technological methods necessary to understand, predict, and control the entry and movement of pollutants into the environment and to determine the effects of such substances on organisms and ecosystems. The information and research products resulting from these programs are directly applicable to fulfilling the Agency's regulatory responsibilities.

Research is conducted within the full realm of environmental media—atmosphere, soil, ground water, surface water, and coastal and marine waters. The development and implementation of our research programs are coordinated and managed by the Headquarters staff with contributions and guidance provided by our six field laboratories and the Agency's program offices. These offices have the responsibility

to comply and implement legislative mandates; and much of their effort to establish rules, regulations, criteria, and standards relies on the research findings we provide. Our research focuses on meeting their needs.

Our major research activities will focus on global climate change, estuaries and near coastal systems, environmental sustainability (biodiversity, habitat, etc.), freshwater systems, wetlands, Great Lakes, biotechnology (recombinant DNA), ground water, Arctic systems, oil spills, contaminated land sites, contaminated sediments, new chemicals, and existing chemicals.

The office also actively provides technical support in environmental science and technology to regions and states in order to assist in problem solving and to transfer information and technology to local users.

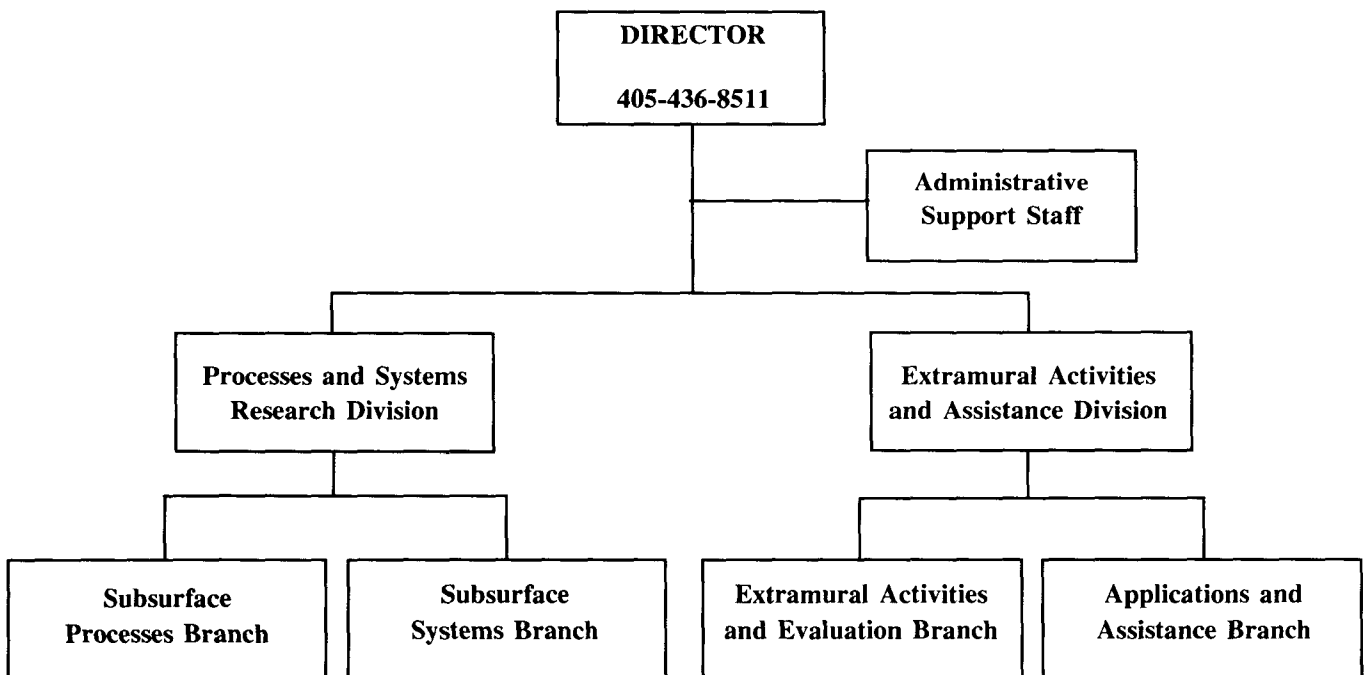
Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
Courtney Riordan, Director	202-260-5950	Global climate change
Michael W. Slimak, Deputy Director	202-260-5950	Wildlife ecology; ecological risk assessment; ecotoxicology; biodiversity
Program Operations Staff		
Patricia Neuschatz, Director	202-260-5961	Administrative and budget processes
Marine, Freshwater and Modeling Staff		
Jack Durham, Director	202-260-8930	Atmospheric chemistry; aerosols; global climate change
Robert Frederick	202-260-5967	Biotechnology; pesticides and toxics
Paul Ringold	202-260-5609	Global climate change; aquatic and terrestrial effects; marine ecology; arctic ecology; stratospheric ozone depletion
Lowell Smith	202-260-5717	Global climate biogeochemical cycles; emissions inventory and modeling
Dennis Trout	202-260-5991	Atmospheric transport and dispersion; global climate change
Barbara Levinson	202-260-5983	Agricultural; nonpoint source; biodiversity; habitat
Terrestrial and Groundwater Effects Staff		
Steve Cordle, Director	202-260-5940	Ground water; wetlands; water quality; hazardous waste; bioremediation; habitat
Ken Hood	202-260-5976	Ocean pollution; agricultural ecology; plant physiology; estuaries
Will LaVeille	202-260-5990	Hazardous waste and Superfund; ecorisk; bioremediation; ground water
Chieh Wu	202-260-5977	Water quality management; water quality criteria; wetlands; water treatment; environmental engineering; sediment quality
Peter Jutro	202-260-5600	Environmental sustainability; biodiversity; ecology; conservation biology

Robert S. Kerr Environmental Research Laboratory



Clinton W. Hall is the director of the Environmental Research Laboratory, Ada, Oklahoma, in which capacity he has served since 1980. From 1971 to 1979, Mr. Hall served in many Agency programs. Before joining EPA, he was a hydrologist for the Defense Intelligence Agency. He received a bachelor's degree from the University of Delaware and a master's degree in groundwater geology from the University of Connecticut. He participated in advanced graduate study in geophysics/geochemistry at Florida State University. He was awarded the EPA Bronze Medal in 1978.



Robert S. Kerr Environmental Research Laboratory

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The Robert S. Kerr Environmental Research Laboratory (RSKERL) serves as U.S. EPA's center for ground-water research, focusing its efforts on studies of the transport and fate of contaminants in the subsurface, development of methodologies for protection and restoration of ground-water quality, and evaluation of the applicability and limitations of using natural soil and subsurface processes for the treatment of hazardous wastes. The laboratory has a long history of research responsibilities related to the use of soils and subsurface for waste treatment and to the protection of the soil, ground water, and surface water. These responsibilities have included the development and demonstration of cost-effective methods for land treatment of municipal wastewaters, animal production wastes, and petroleum refining and petrochemical wastes, as well as the development of technologies for the protection of ground-water quality.

RSKERL carries out research through in-house projects and cooperative and interagency agreements with universities, national laboratories, and other research centers:

- **Drinking Water:** Determines contaminant transport and transformation mechanisms and rates in the subsurface as they relate to assimilative capacities and drinking water protection strategies of the Wellhead Protection Program and Underground Injection Control Program.
- **Hazardous Wastes:** Develops and tests mathematical models that describe and predict the hydrologic, biotic, and abiotic processes that define site-characterization parameters for RCRA facility closure and corrective action decisions.
- **Superfund:** Develops and demonstrates subsurface remediation technologies, especially *in situ* bioremediation, vacuum extraction and pump-and-treat. Maintains the RSKERL Superfund Technology Support Center which provides state-of-the-science assistance to EPA/state decision-makers responsible for implementation of the Superfund Amendments and Reauthorization Act of 1986.

Associated activities operated and/or supported by RSKERL to provide research and technology transfer:

- **Injection Well Research and Training Facility:** Field site consisting of three research injection wells and four monitoring wells used to develop, test, and demonstrate emerging technologies for determining the environmental integrity of injection wells and to train state and federal regulatory personnel.
- **RSKERL Technology Support Center:** Consists of 13 EPA scientists and engineers supported by RSKERL in-house and extramural researchers, and a technology support contractor with subcontractors and consultants.
- **Center for Subsurface Modeling Support (CSMoS):** Comprised of RSKERL scientists, the International Ground Water Modeling Center at Colorado School of Mines, and a number of ground-water modeling consultants.
- **Ground-Water Remediation Technologies Research and Analysis Center:** Operated in cooperation with OSWER's Technology Innovation Office to track ongoing research and development of ground-water remediation technologies.
- **Subsurface Remediation Information Center:** Develops, collects, evaluates, coordinates and disseminates information related to remediation of contaminated soils and ground water.

Areas of Expertise

	Telephone	Area of Expertise
Processes and Systems Research Division		
Stephen G. Schmelling, Acting Chief	405-436-8540	Contaminant transport modeling; fractured media
John Wilson	405-436-8532	Bioremediation
Carl G. Enfield	405-436-8530	Contaminant transport modeling
 <i>Subsurface Processes Branch</i>		
Michael D. Jawson, Chief	405-436-8560	Soil microbiology; agricultural chemicals
Don Clark	405-436-8562	Inorganic analytical chemistry
Roger Cosby	405-436-8533	Organic analytical chemistry
Steve Hutchins	405-436-8563	Subsurface biotransformations
Don Kampbell	405-436-8564	Soil chemistry; vapor transport
Dennis Miller	405-436-8567	Immiscible flow; vapor transport
Guy Sewell	405-436-8566	Subsurface biotransformations
Garmon Smith	405-436-8565	Organic analytical chemistry
 <i>Subsurface Systems Branch</i>		
Stephen G. Schmelling, Chief	405-436-8540	Contaminant transport modeling; fractured media
Frank Beck	405-436-8546	Soil science
Jong Cho	405-436-8547	Contaminant transport modeling; vapor transport
Eva Davis	405-436-8548	Nonaqueous phase liquid transport (NAPLs)
Steve Kraemer	405-436-8549	Contaminant transport modeling; fractured media
Bob Lien	405-436-8555	Soil science
Fred Pfeffer	405-436-8542	Analytical chemistry
Susan Mravik	405-436-8577	Soil science
Robert Puls	405-436-8543	Geochemistry; metals transport
Thomas Short	405-436-8544	Contaminant transport modeling; unsaturated
Dave Walters	405-436-8550	Soils; modeling
James Weaver	405-436-8545	Contaminant transport modeling; NAPLs
Candida West	405-436-8551	Subsurface abiotic processes; NAPLs
Lynn Wood	405-436-8552	Subsurface abiotic processes; mixed solvents
 Extramural Activities and Assistance Division		
M. Richard Scalf, Director	405-436-8580	Ground-water monitoring
 <i>Extramural Activities and Evaluation Branch</i>		
James F. McNabb, Chief	405-436-8590	Microbiology; wellhead protection
Jerry N. Jones	405-436-8593	Analytical chemistry; aquifer restoration
R. Douglas Kreis	405-436-8594	Ecological effects

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Areas of Expertise

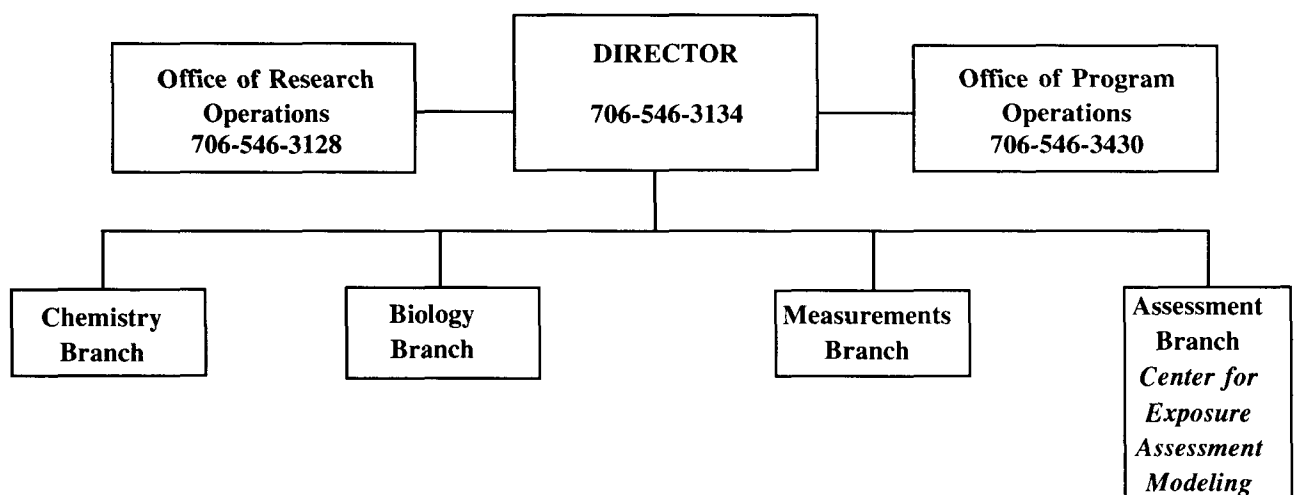
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	Telephone	Area of Expertise
<i>Applications and Assistance Branch</i>		
John Matthews, Chief	405-436-8600	Hazardous wastes biological processes
Don Draper (TSC Director)	405-436-8603	Hydrogeology; underground injection (UIC)
Steve Acree	405-436-8609	Hydrogeology; geophysics
Bert Bledsoe	405-436-8605	Analytical chemistry; metals transport
Dave Burden	405-436-8606	Hydrology; wellhead protection
Dom DiGiulio	405-436-8607	Hydrology; modeling; soil venting
Scott Huling	405-436-8610	Land treatment; RCRA; modeling; NAPLs
Mary Randolph	405-436-8616	Microbiology; bioremediation
Randall Ross	405-436-8611	Hydrogeology; modeling; NAPLs
Hugh Russell	405-436-8612	Bioremediation
Jerry Thornhill	405-436-8604	Hydrogeology; underground injection (UIC)
Joe Williams	405-436-8608	Soil science; modeling

Environmental Research Laboratory—Athens



Rosemarie C. Russo is the director of the Environmental Research Laboratory at Athens, Georgia. She started with the Agency in 1983 as associate director for Research Operations at Duluth. Her career includes: Adjunct professor of chemistry and associate director of Fisheries Bioassay Laboratory at Montana State University; senior research chemist, Colorado State University; assistant professor, Gettysburg College; and instructor, University of Minnesota-Duluth. She received her bachelor's degree in chemistry from the University of Minnesota-Duluth and her Ph.D. in inorganic chemistry from the University of New Hampshire.



Environmental Research Laboratory

Rosemarie C. Russo, Director

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ERL-Athens conducts and manages basic and applied research to predict, assess, and reduce the human and environmental exposures and risks associated with release of organics and heavy metals into freshwater marine, and terrestrial ecosystems, and of greenhouse gases to the atmosphere. This research identifies and characterizes the natural biological and chemical processes that affect the environmental fate and effects of toxic substances, such as solvents, pesticides, or metals, and the net exchange of greenhouse gases between the troposphere and terrestrial biosphere taking into account cycling and sequestration. Results are applied in mathematical models developed to assess and manage multimedia pollution problems at the watershed and larger geographical scales.

Strategic Research Issues emphasized include Global Climate Change, Ecological Risk Assessment, Nonpoint Sources, Bioremediation, Human Exposure, and Environmental Review of New Chemicals. Unique laboratory capabilities include computational chemistry, chemical remediation processes, watershed response, multimedia pollutant exposure assessment and multispectral identification of unusual organic pollutants. Research themes are

- **Environmental Chemistry:** Characterize the mechanisms by which chemicals are transformed in the environment and develop mathematical expressions that describe these mechanisms for prediction of environmental concentrations; develop and apply computational chemistry methods (including fundamental perturbation theory and molecular spectroscopic relationships) to predict equilibrium constants, reaction rates, and reaction products; apply theoretical considerations and laboratory experimentation to determine the efficacy of chemical processes (alone and in concert with biological techniques) for remediation of soils and sediments; and develop and apply multispectral identification

techniques to identify organic-source chemicals and transformation products in soils, wastes, leachates, and the ambient environment.

- **Predictive Exposure Assessment:** Establish the kinetics of abiotic and microbial degradation of hazardous chemicals in the environment; develop computerized mathematical models, with appropriate expert systems, to predict environmental fate and effects of chemicals; describe and predict the multimedia transport and fate of pollutants incorporating state of the science chemical and biological fate and bioaccumulation processes; and develop and apply methodologies for estimating uncertainty in model predictions.
- **Predictive Ecological Risk Assessment and Eco-Resource Management:** Develop multi-level (from species-population through landscape-regional) risk assessment frameworks, methodologies, and decision support systems for aquatic and terrestrial environments; develop quantitative uncertainty analysis methods for assessment and reduction of ecological risk factors; develop frameworks for interpreting watershed, regional and landscape ecosystem monitoring data; develop biospheric feedback models for greenhouse gases emitted from the terrestrial biosphere and couple to earth systems models for global damage assessment.

EPA's Center for Exposure Assessment Modeling, located at ERL-Athens, distributes developed and supported models to environmental managers throughout the world. The center assists the Agency and states in environmental risk-based decision-making concerning remediation and pollution prevention strategies for the protection of water, soil, groundwater, and air.

Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
Rosemarie C. Russo, Director	706-546-3134	Ammonia/nitrite toxicity to aquatic organisms
Robert R. Swank, Jr.	706-546-3128	Multimedia models; industrial sources; control technology
Lee A. Mulkey	706-546-3358	Landfill permitting/site selection; hazardous waste management; climate change
<i>Chemistry Branch</i>		
Arthur W. Garrison	706-546-3145	Organic chemical analysis
Leo V. Azarraga	706-546-3453	Molecular spectroscopy; metal-humic interactions
George W. Bailey	706-546-3307	Metal sorption; soil chemistry
Roger A. Burke	706-546-3503	Global climate change; biogeochemistry
Samuel W. Karickhoff	706-546-3149	Structure-activity relationships (chemical)
Eric J. Weber	706-546-3198	Fate of organic pollutants
N. Lee Wolfe	706-546-3429	Hydrolysis/redox reactions in water
Richard G. Zepp	706-546-3428	Environmental photochemistry; global climate change
<i>Biology Branch</i>		
William C. Steen	706-546-3103	Microbial kinetic constant measurement
Rochelle Araujo	706-546-3468	Microbial ecology; bioremediation
M. Craig Barber	706-546-3147	Chemical bioaccumulation modeling; Environmental Monitoring & Assessment Program
George L. Baughman	706-546-3103	Dye chemistry
Donald L. Brockway	706-546-3422	Aquatic biology; fish toxicology
Lawrence A. Burns	706-546-3511	Exposure-effects modeling; ecology
W. Jack Jones	706-546-3228	Anaerobic microbiology
Ray R. Lassiter	706-546-3208	Exposure-effects modeling; ecology
David L. Lewis	706-546-3358	Microbial biotransformation processes
John E. Rogers	706-546-3128	Microbial kinetics; biochemistry; ecology; bioremediation
Luis A. Suarez	706-546-2301	Pharmacokinetics of biological systems
<i>Measurements Branch</i>		
William T. Donaldson	706-546-3183	Multispectral analysis; transformation rate constants
Timothy W. Collette	706-546-3525	Molecular spectroscopy; organic ID
J. Jackson Ellington	706-546-3197	Chemical kinetic constant measurement
Heinz P. Kollig	706-546-3770	Fate constant database; reliability evaluation
J. MacArthur Long	706-546-3184	Molecular spectroscopy
John M. McGuire	706-546-3185	Mass spectrometry; organic ID
Susan D. Richardson	706-546-3199	Mass spectrometry; organic ID

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Areas of Expertise

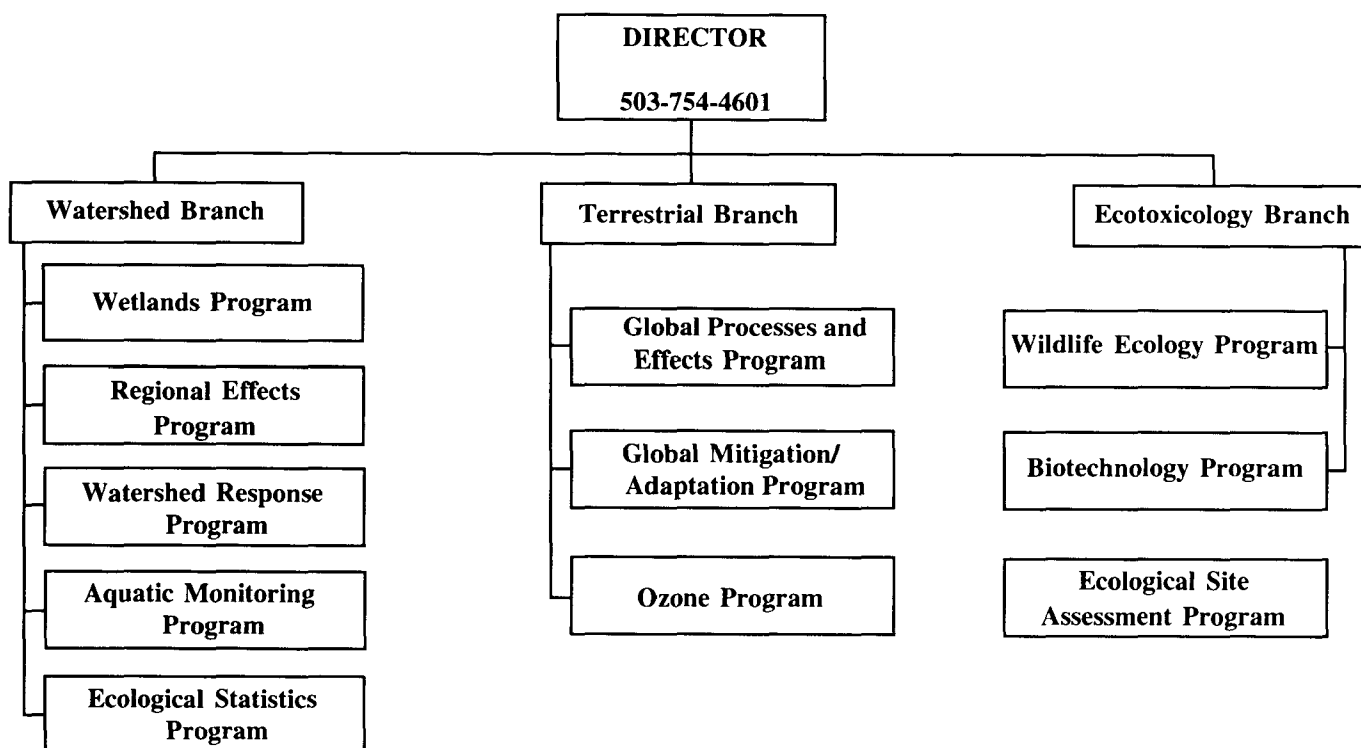
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	Telephone	Area of Expertise
<i>Assessment Branch</i>		
David S. Brown	706-546-3546	Metals speciation; terrestrial exposure
Robert B. Ambrose, Jr.	706-546-3130	Exposure and risk assessment modeling
Thomas O. Barnwell, Jr.	706-546-3210	Water quality modeling; decision support/expert systems
Sandra L. Bird	706-546-3372	Pesticide spray drift; terrestrial exposure modeling
Robert F. Carsel	706-546-3476	Pesticide and groundwater leachate modeling
Nicholas T. Loux	706-546-3174	Inorganic analysis; metal adsorption/speciation
Steve C. McCutcheon	706-546-3301	Sediment transport; hydrodynamics; sorption modeling
Charles N. Smith	706-546-3175	Pesticide dynamics; field sampling methods
William W. Sutton	706-546-3370	Environmental monitoring; exposure assessment; physiology
<i>Regional/State Contact</i>		
Robert C. Ryans	706-546-3306	
<i>Center for Exposure Assessment Modeling</i>		
Dermont Bouchard	706-546-3130	

Environmental Research Laboratory—Corvallis



Thomas A. Murphy is the director of the Environmental Research Laboratory at Corvallis, Oregon. He has been in Agency programs since 1970, including Nonpoint Source Division and Air, Land, Water Use. From 1967-1970 he was with the Federal Water Quality Administration. He received a master's degree in zoology and a Ph.D. degree in biology from Yale. He received a bachelor's degree in biology and chemistry from Knox College, and a certificate in animal physiology from Glasgow University.



Environmental Research Laboratory

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The Environmental Research Laboratory-Corvallis (ERL-C) is the U.S. Environmental Protection Agency's national center for research on plant and wildlife ecology and on the regional and landscape scale functions and response of inland ecosystems. Current research includes ecological processes and effects of climate change, stratospheric ozone depletion, atmospheric pollution (such as tropospheric ozone and acidic deposition), habitat loss and alteration, and terrestrial release of toxic chemicals and biological agents including genetically engineered plants and microbes); methods for assessing the condition and response of wetland, surface water and forest ecosystems; loss of biodiversity; sustainability of terrestrial ecosystems; and restoration of damaged or degraded ecosystems.

The laboratory conducts research and assessments on the effects of pollutants and other human stresses on land-dominated ecological systems that include forests, wetlands, wild animal and plant populations, agricultural systems, soils and microbial communities, watersheds and regional landscapes. It also develops and evaluates methods for mitigating effects on and restoring ecological systems. The laboratory provides the Agency's primary scientific expertise in terrestrial, watershed and landscape ecology, and terrestrial ecotoxicology. Research is conducted in six major areas:

- **Air Pollution Effects:** Assess the effects of atmospheric pollutants including acidic deposition on forests, crops, watersheds, and surface waters.
- **Climate Change:** Assess the effects of changing climate, including temperature, precipitation, and solar radiation, on ecological systems. Determine

the role of ecological systems, such as forests, in controlling climate or moderating climate change. Develop and evaluate methods for managing the terrestrial biosphere to mitigate or reduce the effects of climate change.

- **Environmentally Applied Chemicals and Biologicals:** Develop and test methods to assess the effects on terrestrial ecological systems of chemicals, such as pesticides, and biological agents, such as genetically engineering microorganisms, that are intentionally introduced into the environment.
- **Landscape Modification:** Assess the regional scale effects of physical changes to the landscape, such as habitat loss or hydrologic modification, on the ability of ecological systems to maintain desired levels of biodiversity and sustainable ecological functioning.
- **Wetlands:** Develop the scientific basis for assessing and managing risks for the nation's freshwater wetlands, including criteria for preventing wetland loss or degradation and guidelines for wetland restoration and creation. Develop guidelines for using created or natural wetlands for water quality improvement in a manner that is compatible with other ecological functions of wetlands.
- **Regional Ecological Assessment:** Develop and test methods for assessing the regional scale "health" of ecological systems, through the use of ecological indicators and environmental statistics.



Areas of Expertise

	Telephone	Area of Expertise
Watershed Branch		
Roger Blair	503-754-4662	Forest ecology
Joan Baker	503-754-4517	Fisheries biology; ecological processes; acidic deposition
Mary E. Kentula	503-754-4478	Wetlands ecology
Dixon H. Landers	503-754-4427	Limnology

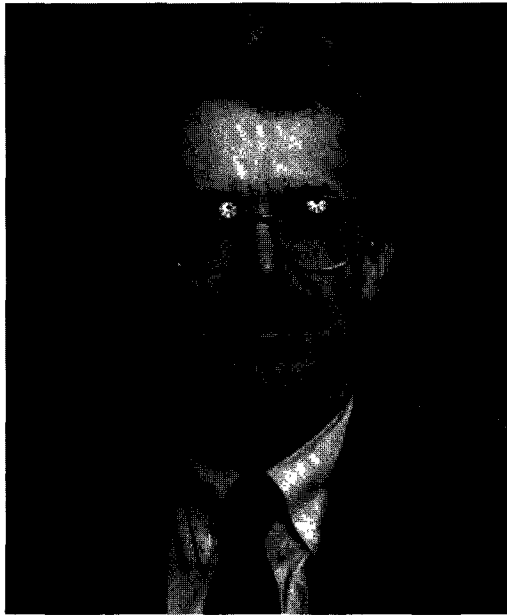
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Areas of Expertise

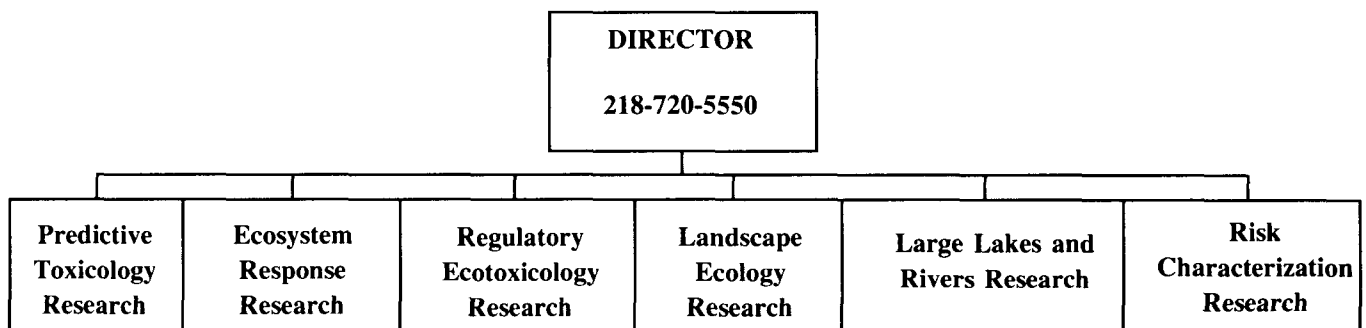
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	Telephone	Area of Expertise
Watershed Branch (continued)		
D. Phillip Larsen	503-754-4362	Lake/stream ecology
Scott Leibowitz	503-754-4508	Landscape ecology
Anthony R. Olsen	503-754-4790	Environmental statistics; Environmental Monitoring & Assessment Program
James M. Omernik	503-754-4458	Geography/cartography
Spencer A. Peterson	503-754-4457	Limnology/lake restoration; Environmental Monitoring & Assessment Program
Eric Preston	503-754-4459	Wetlands ecology
Richard R. Sumner	503-754-4444	Wetlands ecology
Parker J. Wigington	503-754-4341	Hydrology/stream chemical dynamics
Terrestrial Branch		
Peter A. Beedlow	503-754-4634	Global climate change; landscape ecology
Christian P. Andersen	503-754-4791	Air pollution effects on vegetation
M. Robbins Church	503-754-4424	Limnology; watershed ecology
Robert K. Dixon	503-754-4777	Plant physiology; climate change
William E. Hogsett III	503-754-4632	Air pollution effects on vegetation
Jeffrey Lee	503-754-4578	Ecology; soils
J. Craig McFarlane	503-754-4670	Plant physiology; UVB effects
David M. Olszyk	503-754-4397	Plant physiology
Donald L. Phillips	503-754-4485	Ecology; spatial statistics
Allen Solomon	503-754-4772	Global climate change; forest ecology
David T. Tingey	503-754-4621	Plant physiology; climate change
James A. Weber	503-754-4503	Air pollution effects on vegetation
Carlos Wickliff	503-575-4841	Botany; pesticide effects
Ecotoxicology Branch		
Richard S. Bennett, Jr.	503-754-4638	Wildlife ecology/toxicology
Clarence A. Callahan	503-754-4764	Soil invertebrate ecology
Anne Fairbrother	503-754-4606	Wildlife ecology/toxicology
Charles W. Hendricks	503-754-4718	Microbiology
Bruce Lighthart	503-754-4879	Microbiology
Alan V. Nebeker	503-754-4350	Aquatic and wildlife toxicology
Christine A. Ribic	503-754-4717	Wildlife ecology
Paul T. Rygielwicz	503-754-4702	Plant and soil ecology
Gerald S. Schuytema	503-754-4833	Invertebrate taxonomy/toxicology
Ramon J. Seidler	503-754-4708	Microbial ecology/biotechnology
Mostafa A. Shirazi	503-754-4656	Systems ecology
Lidia Watrud	503-754-4874	Plant and microbial biotechnology; soil microbiology; fungal genetics
Environmental Monitoring and Assessment Program		
Harold V. Kibby	503-754-4679	Ecology
Daniel H. McKenzie	503-754-4625	Ecological modeling
Steve Paulsen	503-754-4428	Aquatic ecology

Environmental Research Laboratory—Duluth



Steven F. Hedtke is currently serving as acting director of the Environmental Research Laboratory at Duluth (ERL-D). He has been associate director for research operations since 1990; chief, Monticello Ecological Research Station, 1987-90; and research aquatic biologist at Monticello, 1982-1987, at Newtown Fish Toxicology Station, 1977-82, and at Duluth, 1972-75. He began his career in ORD headquarters in 1971. He received his bachelor's degree in zoology from the University of Kansas, and his doctorate degree in environmental science and engineering from the University of North Carolina at Chapel Hill. He has published numerous scientific articles and served on a variety of EPA committees.



Environmental Research Laboratory

Steven F. Hedtkke, Acting Director
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The Environmental Research Laboratory at Duluth (ERL-D) conducts research to advance our fundamental understanding of aquatic toxicology and freshwater ecology. Its mission is to develop a scientific basis for EPA to create environmental policies concerning the use of freshwater resources. To accomplish this, ERL-D conducts the research development, and technical assistance programs described below.

The Regulatory Ecotoxicology Branch develops and evaluates methods for identifying hazardous xenobiotics in freshwater effluents, surface waters, and sediments, defining toxicity and other adverse effects, and developing protocols that can be used as regulatory tools to help identify environmental hazards from separate industrial chemicals and their mixtures to specific freshwater aquatic life and ecosystems. Our regulatory ecotoxicologists are active in the design of sediment quality criteria

The Ecosystem Response Branch seeks to quantify dose response relationships and indirect effects of stresses on freshwaters. Specialized methods involving microcosms, mesocosms, streams, ponds, wetlands, and small lakes are used to provide the basis for models and extrapolation techniques. The knowledge has been incorporated into testing protocols for pesticides registration. Members of this branch are active in the research and implementation of EMAP in the Great Lakes.

The Landscape Ecology Branch specializes in the diagnosis of ecosystem dysfunction and developing indicators of ecosystem health. As EPA moves closer to programs for better management practices from a watershed perspective, we expect to provide much of the guidance to protect and improve water quality. This branch also leads the ORD effort to understand the impact of nonindigenous species on freshwater systems.

The Large Lakes and Rivers Branch is focused primarily on the Great Lakes and the science necessary for lake-wide management planning. This research uses the mass balance framework to integrate large-system impacts and responses to changes in pollutant loadings. The development of mass balance models for Green Bay, Michigan, the integration with air modeling efforts, the impact of exotic species, and the process studies to reduce the uncertainties of model predictions are important ongoing studies.

The ability to understand and predict the effect of chemicals on aquatic life remains the focus of the **Predictive Toxicology Branch**. A complete array of computerized models for structure-toxicity relationships, toxicokinetic extrapolations, and dynamic toxic effects are being developed based on fundamental research. Studies to determine the ecological significance and adequacy of existing laboratory-derived hazard assessments for protecting aquatic life are being conducted. A new thrust seeks to validate low-cost fish models in the classification of chemical carcinogens.

The Risk Characterization Branch develops and applies procedures for integrating information on toxicology, ecology, and environmental chemistry into statements of risk concerning anthropogenic stresses on aquatic ecosystems. Specific research is directed at identifying and reducing important uncertainties, especially regarding linkages among the various components of a risk characterization. Efforts include risk characterizations for specific chemicals, such as 2,3,7,8-TCDD, and development of guidelines for water quality criteria.

ERL-Duluth research is concentrated in the following areas:

- Develop a sound understanding of the effects of chemical, physical, and biological insults to aquatic ecosystems; determine levels that will not harm aquatic life and consumers of aquatic organisms; share the expertise and data resource with EPA regional and program offices, other agencies and scientists, and the public.
- Develop common denominators, quantitative structure-activity relationships, and models that can be used to predict or assess the impact of chemical and physical pollutants on aquatic and aquatic-related organisms.
- Evaluate the ability of laboratory test methods and models to predict the fate and effects of contaminants under field conditions through use of ecological studies.
- Identify biological indicators of ecological conditions of the Great Lakes and determine the role of nonindigenous species on the sustainability of these ecosystems.

Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
Steven F. Hedtke, Acting Director	218-720-5550	
Robert A. Drummond	218-720-5733	Scientific outreach; behavioral toxicology
Nelson A. Thomas	218-720-5702	National programs; complex effluents; technology transfer
Predictive Toxicology Research Branch		
Steven P. Bradbury	218-720-5527	Mechanisms of toxic actions; metabolism; QSAR
Douglas W. Kuehl	218-720-5511	Molecular dosimetry; biomarkers; ultra-trace analysis
James M. McKim	218-720-5567	Toxicokinetics; comparative toxicology
Christine L. Russom	218-720-5709	QSAR; toxic effect models and databases
Patricia K. Schmieder	218-720-5537	Mechanisms of toxic action; toxicokinetics
Ecosystem Response Research Branch		
Richard E. Siefert	218-720-5552	Pesticide bioassays; fish and fish food taxonomy
Richard L. Anderson	218-720-5616	Invertebrates; toxicity testing chemical/microbial pesticides
Frank S. Stay	218-720-5542	Experimental ecosystems
Steven Lozano	218-720-5610	Environmental Monitoring & Assessment Program; freshwater ecology
Regulatory Ecotoxicology Research Branch		
Steven J. Broderius	218-720-5574	Toxic mechanisms; mixture toxicity
Gerald T. Ankley	218-720-5603	Toxicology; sediment toxicity; bioassays
Lawrence P. Burkhard	218-720-5554	Effluent assessment; chemistry
Rodney D. Johnson	218-720-5731	Cell biology; pathology; carcinogen assay; Medaka
Teresa J. Norberg-King	218-720-5529	Toxicity identification evaluation

(continued)

Areas of Expertise

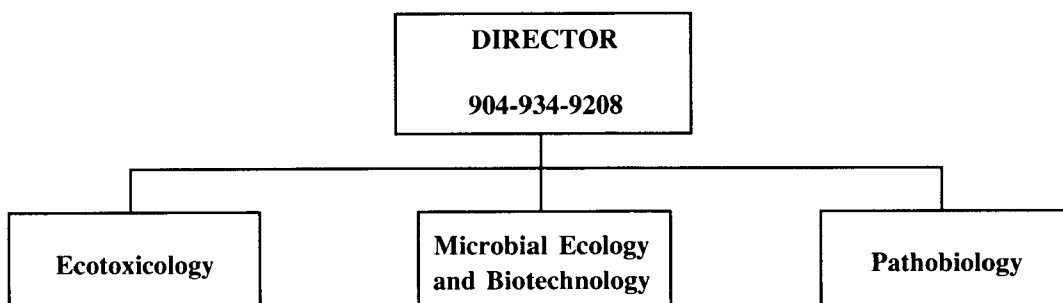
(continued)

	Telephone	Area of Expertise
Landscape Ecology Research Branch		
John G. Eaton	218-720-5557	Global climate change; lake ecology
John W. Arthur	218-720-5565	Watersheds; ecological effects
Anthony R(on) Carlson	218-720-5523	Site-specific water quality; toxicity testing field response
William D. Sanville	218-720-5723	Wetlands; ecological effects
J. David Yount	218-720-5752	Exotic species; stream classification
Large Lakes and Rivers Research Branch, Grosse Isle, MI		
William L. Richardson	313-378-7611	Great Lakes; ecosystem modeling waste load allocation; eutrophication
Douglas D. Endicott	313-378-7613	Modeling theory; ecosystem modeling
Russell G. Kreis	313-378-7615	Ecosystem-chemical effects; effects assessment
Ronald Rossman	313-692-7612	Inorganic chemical analysis and transport
Risk Characterization Research Branch		
Nelson A. Thomas, Acting	218-720-5702	
Philip M. Cook	218-720-5553	Ecological risk of dioxin
Russell J. Erickson	218-720-5534	Relationship of toxicity to exposure conditions
Robert L. Spehar	218-720-5564	Water quality criteria development
Charles E. Stephan	218-720-5510	Water quality criteria guidelines

Environmental Research Laboratory—Gulf Breeze



Robert Everett Menzer was named director of the Environmental Research Laboratory at Gulf Breeze in November 1989. Before this appointment he had served as professor and director of the graduate program in Marine-Estuarine-Environmental Sciences and director of the Water Resources Research Center at the University of Maryland, College Park. Dr. Menzer's research has focused on the metabolism and environmental fate of pesticides, particularly organophosphorus compounds. He received his bachelor's degree in chemistry from the University of Pennsylvania, master's degree in entomology from the University of Maryland, and Ph.D. in entomology and biochemistry from the University of Wisconsin.



Environmental Research Laboratory

Robert E. Menzer, Director

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The Environmental Research Laboratory at Gulf Breeze develops and analyzes scientific data on the impact of hazardous materials released in marine and estuarine environments. Scientific investigations primarily involve chemical compounds and biological products regulated by EPA's Office of Prevention, Pesticides and Toxic Substances, the Office of Water Programs, and the Office of Solid Waste and Emergency Response.

Laboratory scientists develop scientific methods and data to (1) evaluate and define mechanisms that affect biodegradation and accumulation of toxicants in aquatic food webs; (2) develop and evaluate protocols for biological treatment of hazardous wastes; (3) determine effects of carcinogens, mutagens, and teratogens in aquatic species; (4) develop principles and applications of ecotoxicology, including measurement and prediction of fate and effect of chemicals and synthetics on estuarine species and environments, monitor and assess the biological health and chemistry of near-coastal systems. Methods also are under development to apply laboratory observations to field situations and to evaluate potential risks from the release of biotechnological products in the marine environment.

Information from laboratory research is used to establish guidelines, standards, and strategies for managing hazardous materials in the near-coastal marine environment, to define and predict its ecological health, and describe causes of aberrant conditions or changes in its ecological status.

The Environmental Monitoring and Assessment Program, Estuaries Resource Group, is based at the laboratory. The Estuaries Resource Group (EMAP-E) is responsible for development of a national estuarine monitoring program to assess ecological conditions of the estuarine resources of the U.S. Scientists monitor health of bays and estuaries through measurements of biological communities, chemistry of sediments, toxicity, water quality, and the bioaccumulation of contaminants.

Research at Gulf Breeze is organized into these branches:

- **Ecotoxicology Branch:** (1) Develop and test methods to determine acute and chronic effects (including bioaccumulation) of contaminants on estuarine and marine plants and animals; (2) develop culture techniques for test organisms; (3) develop and verify biological indicators for laboratory and field investigations to detect

contaminant exposure and effects at the population, community, and ecosystem levels; (4) develop and validate model systems to predict resiliency (impact and recovery) of populations, communities, and ecosystems exposed to contaminants; (5) determine effects of contaminants on ecological structure and function and delineate endpoints that describe structure and function; (6) conduct field studies (i.e., verification of laboratory methodologies and results) to predict environmental response to pesticide use in potential impact areas; (7) develop and improve methods to analyze seawater and marine matrices (plants, animals, sediments) for contaminants prior to laboratory and field studies; (8) assess risks of chemicals and other contaminants by integration and interpretation of biological, chemical, and physical data in aquatic environments, (9) monitor and assess the biological health and chemistry of bays and estuaries of the Gulf of Mexico to classify health statuses over time and determine causes of deterioration.

- **Microbial Ecology and Biotechnology Branch:** (1) Monitor biodegradation processes carried out by microbial communities and assess their ability to transform organic chemicals and heavy metals into nontoxic products; (2) evaluate potential risks associated with release of genetically engineered microorganisms (biotechnology) in the environment; (3) quantitatively define environmental factors that control biodegradation and describe the potential manipulation of ecosystems and microbial communities to enhance extent and rate of biodegradation of specified single compounds and complex mixtures; (4) develop methods for bioremediation using microbial systems.
- **Pathobiology Branch:** (1) Develop scientific methods and data to evaluate risks of biological pesticidal agents to nontarget, aquatic species and systems, including natural and genetically altered microbial pest control agents and biochemical control agents; (2) develop aquatic species as indicators and models to assess hazards of genotoxic agents to aquatic animals and humans; and (3) elucidate mechanisms in toxicants that impair development or cause disease in aquatic species.

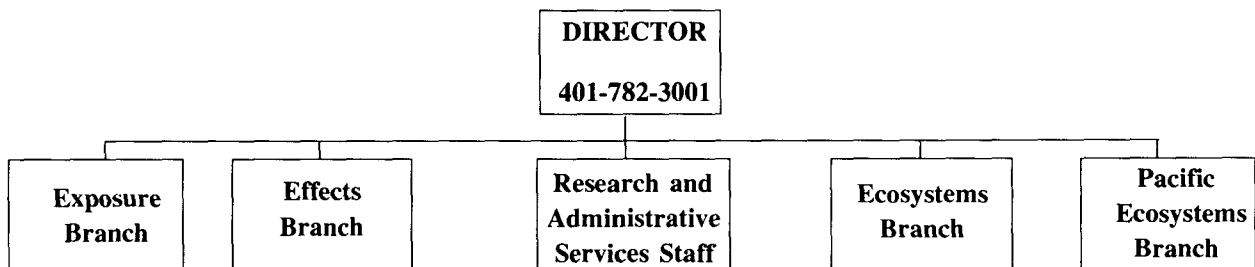
Areas of Expertise

	Telephone	Areas of Expertise
Office of the Director		
Robert E. Menzer	904-934-9208	Pesticide toxicology
Raymond G. Wilhour, Deputy Director	904-934-9213	Plant pathology; terrestrial ecology
John A. Couch	904-934-9271	Pathology; toxic mechanisms
Andrew J. McErlean	904-934-9231	Pollution ecology
Frank G. Wilkes	904-934-9223	Aquatic ecology
Ecotoxicology Branch		
Michael A. Lewis	904-934-9382	Phytotoxicity/aquatic ecology
Geraldine Cripe	904-934-9233	Crustacean culture/toxicology
Carol Daniels	904-934-9329	Genetic toxicology
William P. Davis	904-934-9312	Ichthyology; marine ecology
David Flemer	904-934-9253	Aquatic ecology
Leroy Folmar	904-934-9207	Physiology; toxicology
Larry Goodman	904-934-9205	Aquatic toxicology
John Macauley	904-934-9353	Environmental Monitoring and Assessment Program
David Weber	904-934-9245	Plant pathology
Foster L. Mayer	904-934-9380	Toxicology; aquatic ecology
James C. Moore	904-934-9236	Analytical chemistry
Kevin Summers	904-934-9244	Systems ecology; Environmental Monitoring & Assessment Program
Microbial Ecology and Biotechnology Branch		
Parmely H. Pritchard	904-934-9260	Microbial ecology; biodegradation
Tamar Barkay	904-934-9295	Microbial ecology
Peter Chapman	904-934-9261	Biochemistry; biodegradation
Richard Coffin	904-934-9255	Marine microbial ecology
Richard Devereux	904-934-9346	Microbial ecology
Richard Eaton	904-934-9268	Microbial genetics; biodegradation
Fred Genthner	904-934-9342	Microorganism; invertebrates interactions
Jan Kurtz	904-934-9286	Microbial ecology
Len Mueller	904-934-9211	Analytical chemistry
Pathobiology Branch		
William Fisher	904-934-9394	Invertebrate pathology
Lee Courtney	904-934-9313	Electron microscopy
John Fournie	904-934-9272	Fish Pathology
Doretha Foushee	904-934-9384	Molecular biology
Charles L. McKenney	904-934-9311	Physiology
Douglas P. Middaugh	904-934-9310	Fish culture; toxicology
Wilhelm Peter Schoor	904-934-9276	Biochemistry
Federal Technology Transfer Act Cooperative Research Agreements		
Parmely H. Pritchard	904-934-9260	Southern Bioproducts, Inc.—Bioremediation of wood treatment waste sites. Electric Power Research Institute—Development of remedial treatments for the removal of mercury from contaminated waters.

Environmental Research Laboratory—Narragansett



Norbert A. Jaworski has been the director of the Environmental Research Laboratory in Narragansett, Rhode Island, since 1986. From 1970 to 1985, he was the director of several Agency research laboratories, including Corvallis, Oregon, and Duluth, Minnesota; director of the Larger Lakes Research Laboratory at Grosse Isle, Michigan; and deputy director of the Industrial Environmental Research Laboratory, Research Triangle Park, North Carolina. Before joining the Agency, he was a sanitary engineer in the Department of Interior and the U.S. Public Health Service. He received a Ph.D. degree in water resources management from the University of Michigan and bachelor's and master's degrees in civil engineering from the University of Wisconsin (Madison). He has written over 50 publications and technical reports. He has received an EPA Gold Medal and the Presidential Rank of Meritorious Executive.



Environmental Research Laboratory

Norbert A. Jaworski, Director

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Pacific Ecosystems Branch-Newport

Hatfield Marine Science Center

Newport, OR 97365-5296

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E-Mail EPA8428

The mission of the Environmental Research Laboratory-Narragansett and Newport (ERL-N) is to develop and evaluate theory, methods, and data needed to quantify risks to marine and estuarine ecosystems posed by the disposal of complex wastes, estuarine municipal and industrial wastewater effluents, dredge materials, ocean discharges, and other anthropogenic stresses. This research emphasizes the development, evaluation, and application of techniques and test systems for measuring, monitoring, and predicting the transport, fate and effects of complex wastes in marine and estuarine systems with special focus on nutrients and organic over-enrichment. ERL-N also serves as lead laboratory for the Coastal and Marine Issue and for the Contaminated Sediment Issue.

Research Areas

- Develop indicators of nutrient pollution, organic matter over-enrichment, and toxic contamination for coastal and marine ecosystems.
- Understand fundamental marine ecological processes that mitigate or exacerbate the effects of nutrient/organic matter pollution in coastal marine environments.
- Develop population, community, and ecosystem dose-response relationships for nutrients, organic matter, and toxic loading rates.
- Develop toxicity testing methodologies and guidelines for deriving site-specific and national water and sediment quality criteria.
- Develop biomonitoring methods for on-site laboratory and *in situ* field assessments of biological effects of single or combined point source discharges.
- Quantify and mathematically model the transport, transformation, trophic transfer, and fate of pollutants in hydrodynamically complex marine and estuarine environments.
- Quantify the effectiveness of Agency pollution control and prevention programs by monitoring the status and trends of our nation's near-coastal environment through EMAP for the Virginian and Acadian Provinces.
- Evaluate the effects of stratospheric ozone loss and subsequent increase in ultraviolet-B radiation on marine life cycles and chemistry.
- Determine the importance of oceanic carbon cycling in global climate change and the environmental consequences of efforts to mitigate global warming by enhancing oceanic sinks of atmospheric CO₂.
- Develop microcosm-based approaches for determining the fate and effects of pollutants from multiple sources in complex coastal ecosystems and the time-to-recovery of these systems after the removal of pollutant stress.
- Develop and evaluate biomarkers and chemical markers to identify, diagnose, and predict ecological risks in marine and estuarine environments posed by disposal of complex wastes.
- Develop and evaluate theory, protocols, methods, and data needed to quantify and monitor ecological risks in marine and estuarine environments as the result of the disposal of complex wastes from multiple discharges and sources.

Areas of Expertise

	Telephone	Area of Expertise
B. Brown	401-782-3188	Sediment Transport
S.M. Baksi	401-782-3162	Biomarkers; physiological response
W. Boothman	401-782-3161	Inorganic chemistry
G.A. Chapman*	503-867-4027	Water quality criteria/toxicity methods
E.H. Dettmann	401-782-3039	Exposure assessment; water quality modeling
J.H. Garber	401-782-3154	Eutrophication; nutrient biogeochemistry
G.R. Gardner	401-782-3036	Marine pathology; histological responses
J.H. Gentile	401-782-3015	Risk characterization; ecological toxicity
R.J. Haebler	401-782-3095	Marine mammalian pathology; histological responses
D.J. Hansen	401-782-3027	Marine water and sediment quality criteria
K. Ho	401-782-3196	Sediment toxicity
E.H. Jackim	401-782-3042	Biomarkers; DNA adducts
N.A. Jaworski	401-782-3001	Water quality modeling
D.J. Keith	401-782-3135	Dredged material disposal
J.L. Lake	401-782-3173	Environmental chemistry; bioaccumulation
R.W. Latimer	401-782-3077	Environmental engineering; Environmental Monitoring & Assessment Program
H. Lee*	503-867-4042	Bioaccumulation processes; stratospheric ozone
A.R. Malcolm	401-782-3055	Biomarkers; physiological responses
D.C. Miller	401-782-3090	Dissolved oxygen; environmental criteria
G.E. Morrison	401-782-3016	Complex effluent; toxicity testing
W.G. Nelson	401-782-3053	Biomonitoring; NPDES and near coastal; Superfund
J.F. Paul	401-782-3037	Environmental Monitoring & Assessment Program
K.T. Perez	401-782-3052	Ecological risk assessment; ecosystem analysis
G.G. Pesch	401-782-3007	Genetic toxicology; biological oceanography
D.K. Phelps	401-782-3004	Biomonitoring
R.J. Pruell	401-782-3091	Environmental and analytical chemistry
N.I. Rubinstein	401-782-3002	Dredging; bioaccumulation
A. Sigleo*	503-867-5022	UVB effects
S.C. Schimmel	401-782-3078	EMAP near coastal, Virginian Province
R.L. Steele*	503-867-5023	Biological effects; algae
R.C. Swartz*	503-867-4031	Benthic toxicity testing; sediment criteria
H.A. Walker	401-782-3134	Global climate change; ocean disposal
D.R. Young*	503-867-4038	Trophic transfer; ocean outfalls
G.E. Zarogian	401-782-3079	Biochemistry

* Pacific Ecosystems Branch-Newport

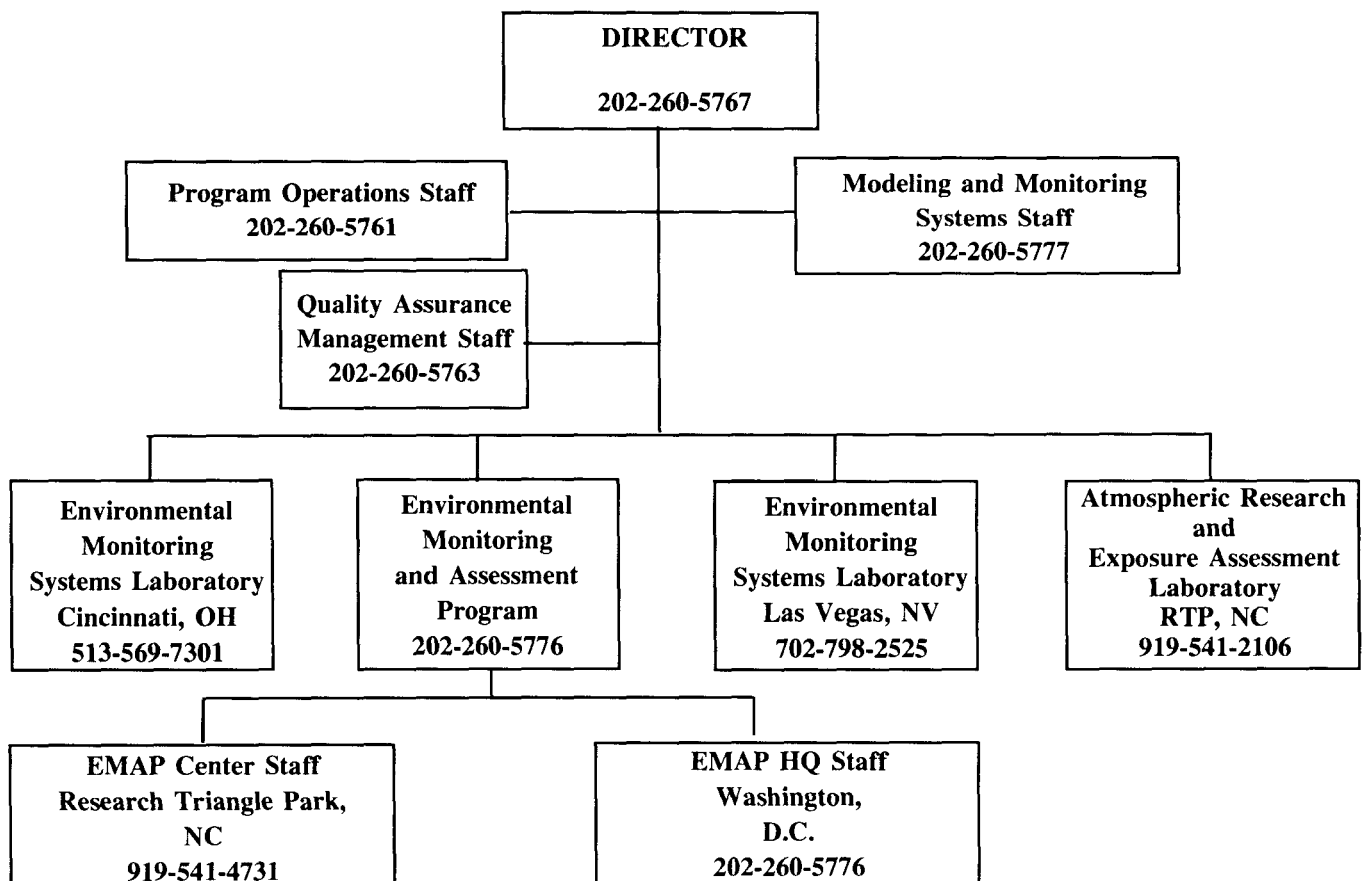
Membership on National Estuaries and Near Coastal Program Projects of OMEP and Regions

<i>Buzzards Bay</i>	Management Committee TAC Co-chair TAC	Don Phelps Don Phelps William Nelson
<i>Casco Bay (Maine)</i>	TAC Member	James Lake
<i>Chesapeake Bay</i>	STAC Staff Support Toxics Subcommittee	Suzanne Lussier Suzanne Lussier
<i>Delaware Bay</i>	STAC Member	Suzanne Lussier
<i>Delaware Inland Bays</i>	STAC Member	Suzanne Lussier
<i>Long Island Sound</i>	Management Committee TAC D.O. Study Subcommittee TAC Modeling Subcommittee	Jonathan Garber Don Miller Ed Dettmann
<i>Lower Columbia River</i>	TAC Member	Rick Swartz
<i>Massachusetts Bay</i>	TAC Member	Jack Gentile
<i>Narragansett Bay</i>	Management Committee TAC Chairman TAC Water Quality Subcommittee TAC Monitoring Subcommittee	Norbert Jaworski Norbert Jaworski Ed Dettmann Don Phelps
<i>NY/NJ Harbor Estuary</i>	Management Member TAC Member	Norbert Jaworski Norm Rubinstein Wayne Davis
<i>Puget Sound</i>	TAC Member	Rick Swartz
<i>San Francisco Bay</i>	TAC Member	Dave Young
<i>Santa Monica Bay</i>	TAC Member	Dave Young

Office of Modeling, Monitoring Systems and Quality Assurance



H. Matthew Bills is the director of the Office of Modeling, Monitoring Systems and Quality Assurance. Mr. Bills joined the Agency in 1971 as the director of Data and Information Research. Prior to joining the Agency, he was manager of Systems and Project Support for AIL Information Systems, a division of Cutler-Hamer, Inc. Mr. Bills did his undergraduate work at William Jewell College and the University of Kansas. He holds a J.D. degree from the University of Missouri at Kansas City. He is a member of the Missouri Bar Association.



Office of Modeling, Monitoring Systems and Quality Assurance

H. Matthew Bills, Director

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Program Activities

Research of monitoring systems are ongoing in the following areas:

Air

- Clean Air Act Initiatives
- National Ambient Air Quality Standards
- New Source Performance Standards (NSPS) and State Implementation Plans (SIPs)
- Hazardous Air Pollutant Regulation
- Mobile Source Pollutant Regulation
- Indoor Air Quality
- Stratospheric Ozone
- Global Warming
- Acid Deposition

Water Quality

- **Water Quality-Based Approach—Permitting:** Provide assurance that ambient water quality monitoring data for regulation setting, enforcement, or compliance purposes are scientifically valid and legally defensible.
- **Waste Water Treatment Technology:** Provide quality control materials and calibration standards for regulated CWA analytes.

Drinking Water

- **Drinking Water Technology:** Provide contaminant monitoring procedures to assure compliance with the Safe Drinking Water Act and provide quality assurance/quality control programs for on-site evaluation and certification of drinking water monitoring laboratories. Develop methods, analytical procedures, and training courses to produce measurement systems for chemical, radiochemical, and microbiological analysis. Develop and distribute QC and PE samples for drinking water laboratory certification program.
- **Groundwater:** Develop measurement systems, methods for locating abandoned wells, geophysical methods to detect and evaluate underground movement of fluids from injection wells, quality control procedures and guidelines to support Agency-wide QA program, and methods for well head protection.

Hazardous Waste

- **Waste Identification:** Develop and evaluate analytical techniques for hazardous waste characterization. Develop and evaluate subsurface monitoring methods for use at RCRA waste sites.
- **Quality Assurance:** Support quality assurance of the RCRA data generated by the EPA regional offices, contractors, and state and local agencies.
- **Releases:** Provide aerial photography, satellite imagery, and multispectral scanner support to assist regional offices. Develop and evaluate procedures for external monitoring and corrective action around underground storage tanks.

Pesticides

- **Health Markers, Dosimetry, and Extrapolation:** Evaluate the use of biomarkers in monitoring of pesticide exposure and support the operation of the pesticides and industrial chemical repository.
- **Exposure Monitoring:** Monitor dietary, non-dietary, and residential exposure scenarios to investigate human exposure to pesticides.

Radiation

- Measure ionizing radiation contaminants in air, water, milk and food.

Quality Assurance Management Program

- Develop and provide Agency guidance on management of quality assurance systems. Conduct management systems reviews.

Toxic Substances

- **Analytical Methods Development for Toxic Substances:** Develop immunoassays for measurement of organic compounds. Investigate new separation procedures for analysis.
- **Health Markers, Dosimetry, and Extrapolation:** Evaluate DNA and protein adducts for use in human exposure monitoring studies.
- **Exposure Monitoring Systems Development:** Develop predictive models for human exposure and characterize human activity patterns.

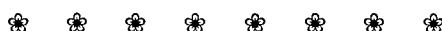
- **Biotechnology/Microbial and Biochemical Pesticides Control Agents:** Develop guidelines and processes for monitoring the release of genetically engineered microorganisms in the environment.

Superfund

- Provide technical support of historical and current data for site-specific investigations.
- Provide monitoring techniques and procedures for site assessment, geophysical methods, remote sensing, soil sampling methods, and survey designs.
- Technical support to regions, program offices, and enforcement in monitoring (air, water, ground-water, soils).
- Field screening technology.
- Improve/develop analytical methods.
- Provide quality assurance/quality control support for the Superfund Contract Laboratory Program; provide assessment and improvement of methods to evaluate Superfund sites.

Environmental Monitoring and Assessment Program (EMAP)

- EMAP is designed to determine the status, trends, and changes in the condition of the nation's ecological resources, on regional scales, with known levels of statistical confidence. It represents the first national program to adopt a holistic perspective of ecological condition, and to develop and implement consistent methodologies across regions and ecological resources
- EMAP monitors selected indicators of ecological condition in near-coastal waters, the Great Lakes, inland surface waters, wetlands, forests, arid ecosystems, agricultural ecosystems, and integrated landscapes. Program objectives include associating observed condition with selected indicators of natural and human-caused stresses. EMAP results will help identify environmental risks from widespread phenomena such as habitat modification, atmospheric deposition, and global climate change.



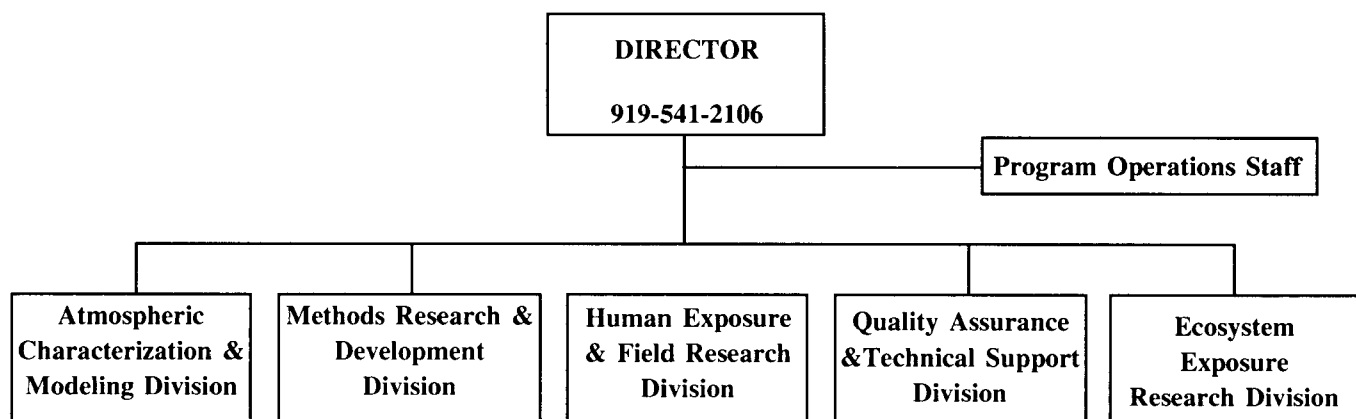
Areas of Expertise

	Telephone	Area of Expertise
William Keith	202-260-5716	Modeling and monitoring systems
Michael Dellarco	202-260-5789	Air; radiation; atmospheric ozone; global warming; acid deposition
Carol Finch	202-260-5798	Water; drinking water
William Stelz	202-260-8934	Superfund
Ken Sala	202-260-4346	Hazardous waste
Chris Saint	202-260-5772	Exposure research
David Friedman	202-260-3535	Monitoring methods
Edward Martinko	202-260-5776	Environmental Monitoring & Assessment Program
Thomas Baugh	202-260-5776	Environmental Monitoring & Assessment Program
Nancy Wentworth	202-260-5763	Quality assurance program
Tom Dixon	202-260-5780	Quality assurance training
John Warren	202-260-9464	Data quality objectives
Fred Haeberer	202-260-5785	Quality control—technical systems
Gary Johnson	919-541-7612	Quality assurance management systems reviews
Jim Stemmler	202-260-7353	Quality assurance program plans

Atmospheric Research and Exposure Assessment Laboratory



Gary J. Foley is the director of the Atmospheric Research and Exposure Assessment Laboratory at Research Triangle Park, North Carolina. He is also the acting assistant administrator of the Office of Research and Development. He has served as staff director for ORD's Acid Deposition Program and acting division director, Energy and Air, for ORD's Office of Environmental Processes and Effects Research. Dr. Foley began his career with EPA in 1973 as a senior chemical engineer. Before joining the Agency, Dr. Foley served as a project manager for the American Oil Company. He received his Ph.D. in chemical engineering from the University of Wisconsin, Madison. Dr. Foley has been awarded 4 Bronze Medals by EPA.



Atmospheric Research and Exposure Assessment Laboratory

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The Atmospheric Research and Exposure Assessment Laboratory (AREAL), Research Triangle Park, North Carolina, conducts intramural and extramural research programs, through laboratory and field research, in the chemical, physical, and biological sciences.

The laboratory is composed of the following major components: Office of the Director, Program Operations Staff, Atmospheric Characterization and Modeling Division, Methods Research and Development Division, Human Exposure and Field Research Division, Quality Assurance and Technical Support Division, and the Ecosystem Exposure Research Division.

AREAL Major Research Areas

- **Air Toxics:**
Develop methods to measure toxic air pollutants in ambient air and use them to monitor emissions at toxic waste sites. Conduct monitoring studies to assess emission sources, ambient pollutant concentrations, transport, transformation of pollutants, and removal of pollutants from the atmosphere.
- **Acid Deposition:**
Model atmospheric processes to evaluate acid rain, acid deposition, and transport and transformation of acid pollutants over urban and regional scales. Develop methods and quality assurance materials to measure dry and wet deposition. Operate acid deposition monitoring networks, and maintain a repository of data on acid deposition.
- **Visibility Degradation:**
Devise approaches to measure visibility changes, and conduct studies to determine how the composition and morphology affects light scattering.
- **Mobile Sources:**
Identify and measure pollutants emitted from mobile sources. Develop methods to assess population exposures to pollutants from mobile sources.
- **Global Climate Change:**
Determine how increases in atmospheric concentrations of trace gases affect earth's climate. Investigate the sources, transport and transformation of greenhouse gases and their precursors.
- **Human Exposure Assessment:**
Develop methods to measure and estimate the frequency of human exposure to pollutants. Methods include use of personal exposure monitors, questionnaires, and protocols that relate exposure to sources.
- **Indoor Air:**
Develop and test indoor air monitoring devices. Design and implement field studies to identify and quantify indoor air pollutants. Use the results to produce information regarding proper use and performance limitations of these devices.
- **Ozone Non-attainment:**
Develop models to predict ozone concentrations, which can be verified with ambient data to indicate pollution controls needed to attain the Clean Air Act's ozone standard.
- **Air Pollution Model Application Studies:**
Develop mathematical models to describe and predict relationships between emitted air pollutants and resulting air quality.
- **Methods Development:**
Develop methods and monitoring systems to measure air pollutants in ambient air and those emitted by stationary or mobile sources. Implement ambient air monitoring equivalency regulations.
- **Quality Assurance:**
Develop methods to assure the quality of air pollution measurements, particularly measurements made in compliance with regulatory standards. Develop procedures and reference materials to audit air pollution measurements—both data collection and data analysis.
- **Stratospheric Ozone Research:**
Determine the lifetime and fate of HCFCs and other chemicals that may deplete the protective stratospheric ozone layer; operate a network to monitor fluxes of ultraviolet (UV-B) radiation penetrating to the earth's surface, and publish a public information index of potential exposure to UV-B.

Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
Gary J. Foley, Director	919-541-2106	
Jay J. Messer, Deputy Director	919-541-2107	Ecological studies
John B. Clements,	919-541-2188	Quality assurance
Gerald G. Akland	919-541-4885	Human exposure
Rick A. Linthurst	919-541-4909	Ecological studies
Jack H. Shreffler	919-541-2194	Atmospheric processes
William E. Wilson	919-541-2551	Visibility; aerosol chemistry
Lawrence Cox	919-541-2648	Statistics
Atmospheric Characterization and Modeling Division		
Frank A. Schiermeier	919-541-4542	Meteorological monitoring
H. Michael Barnes	919-541-3086	Heterogeneous chemistry
Joseph J. Bufalini	919-541-2422	Gas kinetics
Jason K.S. Ching	919-541-4801	Dispersion model development
Robin L. Dennis	919-541-2870	Regional model evaluation
Basil Dimitriadis	919-541-2706	Photochemistry; ozone
Bruce W. Gay, Jr.*	919-541-2830	FTIR analysis
Joan Novak	919-541-4545	Model evaluation/applications
William B. Petersen	919-541-1376	Toxics air quality modeling
William H. Snyder	919-541-1198	Fluid modeling
Methods Research and Development Division		
Larry T. Cupitt	919-541-2454	Air toxics
Jerry L. Varns	919-541-5797	Analytical chemistry
Kenneth T. Knapp	919-541-1352	Mobile sources
Joseph E. Knoll	919-541-2952	Source methods
Thomas J. Logan	919-541-2580	Continuous emission monitoring
William A. McClenny*	919-541-3158	Monitoring methods development
M. Rodney Midgett	919-541-2196	Source methods
Russell W. Wiener	919-541-1910	Aerosol methods
Human Exposure and Field Research Division		
Dale Pahl	919-541-1851	Exposure assessment
V. Ross Highsmith	919-541-7828	Indoor air
David O. Hinton	919-541-3075	Exposure assessment
Alan H. Huber	919-541-1338	Wake effects studies

(continued)

*Acting

Areas of Expertise

(continued)

	Telephone	Area of Expertise
Jimmy C. Pau*	919-541-5579	Dioxins, stack measurement for organics
Robert K. Stevens	919-541-3156	Source apportionment
Nancy K. Wilson	919-541-4723	Semivolatile organics; analytical chemistry
Andrew E. Bond	919-541-4329	Pesticides monitoring
 Quality Assurance and Technical Support Division		
Ronald C. Evans	919-541-5488	Quality assurance
Ronald K. Patterson	919-541-3779	Quality assurance management
Joseph E. Bumgarner	919-541-2430	Organic analysis
Thomas C. Lawless	919-541-2291	Computer systems
Warren A. Loseke	919-541-2173	Inorganic analysis
William J. Mitchell	919-541-2769	QA material development and application
Joseph J. Walling	919-541-2430	Chemical analysis
 Ecosystem Exposure Research Division		
James S. Vickery	919-541-2184	Acid deposition
Peter L. Finkelstein	919-541-4553	Global climate change
Sharon K. LeDuc	919-541-1335	Statistical meteorology
Joseph E. Sickles	919-541-2446	Tropospheric chemistry and global change
Johnnie L. Pearson	919-541-0572	CASNET; acid deposition monitoring
Daniel A. Vallero	919-541-0150	Physical geography and epidemiology

*Acting

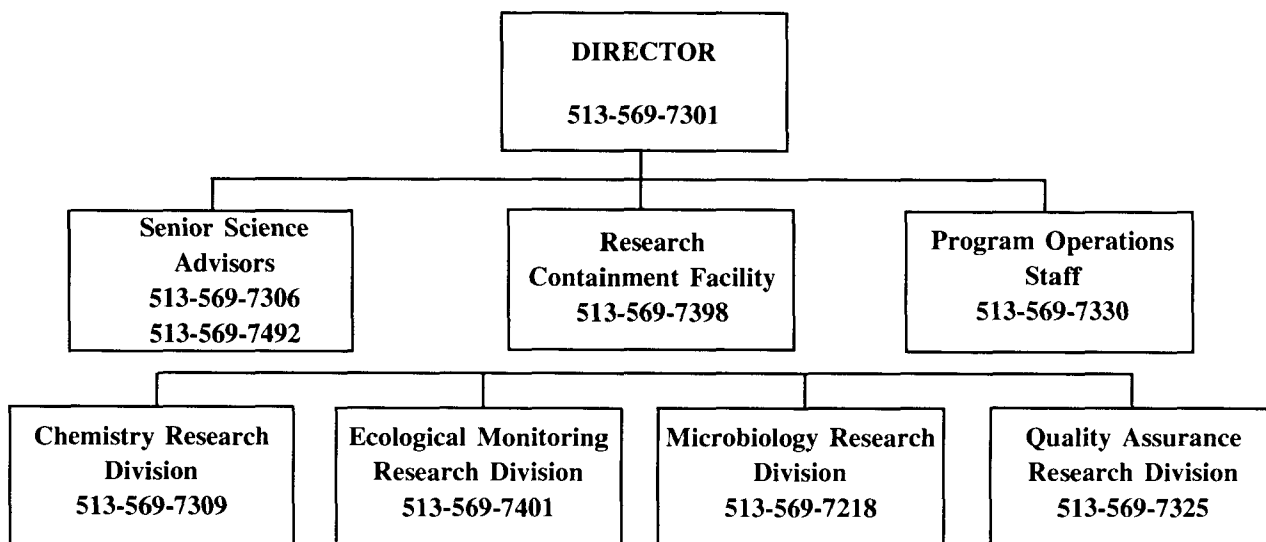
Federal Technology Transfer Act Cooperative R&D Agreements

	Telephone	Project
Ronald K. Patterson	919-541-3779	FTTA Coordinator, AREAL
William H. Snyder	919-541-1198	Georgia Institute of Technology—Perform hydraulic model study for improved ocean outfall design at Boston harbor
Edward O. Edney	919-541-3905	Ford Motor Company—Use of EPA's Environmental Chamber Facility to evaluate effects of environmental fallout on automotive products
William A. McClenny	919-541-3158	Perkin-Elmer—Develop and improve physical and chemical methods for trace contaminant analysis, automated canister sampling technologies for gaseous air contaminants and diffusion monitoring technologies
John W. Spence	919-541-3905	Rohm & Haas—Paint substrate exposure study using covering-spray devices
Edward O. Edney	919-541-3905	Dow Corning Corporation—Investigate the effects of the environment on damage to Dow Corning coatings and sealants
Sharon L. Harper	919-541-2443	Frandon Enterprises, Inc.—Develop a trace metal screening technique
Joseph E. Bumgarner	919-541-2430	CDS Analytical, Inc.—Design a system that utilizes an integrated combination of commercially available instruments
Joachim D. Pleil	919-541-4680	Graseby/Nutech—Produce a valveless injection system for the gas chromatographic analysis of VOCs

Environmental Monitoring Systems Laboratory—Cincinnati



Thomas A. Clark is the director of the Environmental Monitoring Systems Laboratory. He previously served as its deputy director from 1985 to 1988. From 1973 to 1981, Mr. Clark worked in the Quality Assurance Division of EMSL-RTP in various supervisory positions and also served as deputy director of that laboratory from 1981 to 1985 before moving to Cincinnati. He was awarded a Bronze Medal in 1982 and 1986. Mr. Clark began his career as an analytical chemist at the Matheson Company in Norwood, Ohio. He has a bachelor's degree in chemistry from Xavier University.



Environmental Monitoring Systems Laboratory

Thomas A. Clark, Director

Mailcode: 591

26 W. ML King Dr., Cincinnati, OH 45268

513-569-7301, FAX: 513-569-7424

E-Mail CLARK.THOMASA

The Environmental Monitoring Systems Laboratory in Cincinnati, Ohio (EMSL-Cincinnati), develops tools to evaluate the health of the environment. The laboratory has expertise in chemistry, molecular biology, microbiology, biochemistry, cellular biology, ecology, and statistics.

EMSL-Cincinnati scientists develop methods to determine physical parameters and to identify and measure organic and inorganic chemical pollutants in water and wastes. To minimize laboratory waste and prevent pollution, emphasis is placed on analytical methods that minimize the use of organic solvents and hazardous reagents.

Research is conducted to enhance microbiological techniques to detect, identify, enumerate, and evaluate effects of bacteria, fungi, viruses, protozoa, and parasites. Biotechnology is used to develop methods for determining the occurrence, distribution, transport, and fate of human pathogenic parasites in the environment. Methods are applicable to drinking water, ambient water, raw and treated wastewater, sediment, sludge, and biological samples.

Biochemical, cellular biological, and ecological methods are developed to detect and quantify responses of aquatic and terrestrial organisms and communities to environmental stressors. The diagnostic capabilities of these bioindicators are correlated with community impacts and xenobiotic stressors, including individual chemicals, mixtures of chemicals, and environmental samples. Biochemical and molecular markers

are being developed in ecologically relevant species that can be used to document exposures, elucidate stressor-induced effects, and establish causality in ecosystems. The sensitivity and reliability of potential bioindicators of exposures are evaluated both in a controlled laboratory environment and in various ecosystems. Methods are evaluated to demonstrate their usefulness for improving ecological risk assessment including: monitoring toxicant exposure levels, identifying dose to aquatic and terrestrial species, and quantifying the general ecosystem health using ecological monitoring techniques.

To ensure that data of known and adequate quality are obtained through the Agency's monitoring programs, a quality assurance (QA) program is maintained for both biology and chemistry. The QA program involves method evaluation studies to establish the precision and bias of the Agency's selected analytical methods. QA manuals and guidelines, quality control samples, and calibration standards are made available to support water and waste regulations. To ensure that laboratories using Agency methods are providing data of acceptable quality, performance evaluation studies are designed and conducted.

The laboratory has chemical and biological laboratories, including a self-contained, freestanding building especially designed for research involving hazardous materials, a suite of laboratories designed for safe handling of pathogens, and numerous laboratories especially equipped to conduct research with aquatic and terrestrial organisms.



Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
Thomas A. Clark, Director	513-569-7301	Methods and quality assurance
Gerald McKee, Deputy Director	513-569-7303	Methods and quality assurance
Ann Alford-Stevens	513-569-7492	Methods and quality assurance
James Lichtenberg	513-569-7306	Standardization, certification, and compliance monitoring
Microbiology Research Division		
Alfred Dufour, Director	513-569-7218	Microbiology

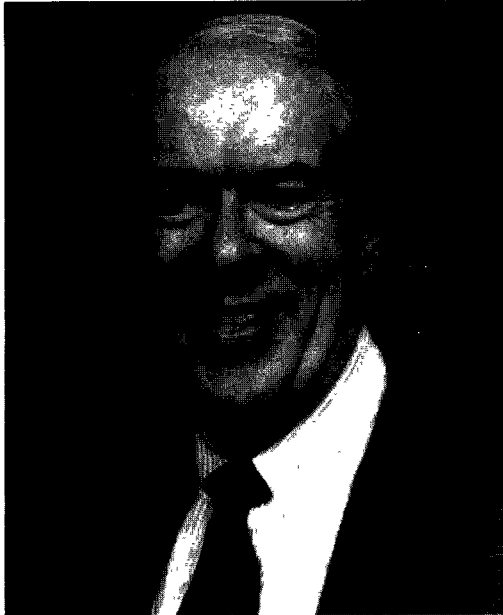
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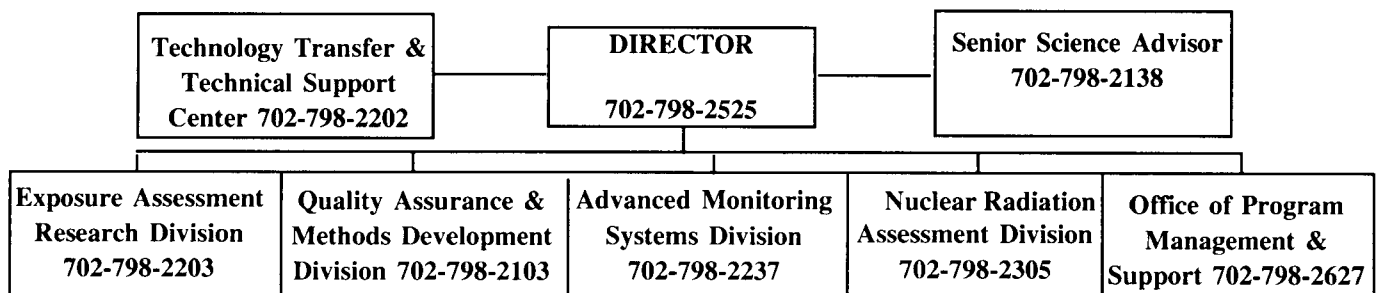
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	Telephone	Area of Expertise
<i>Virology Branch</i>		
Robert Safferman	513-569-7334	Virology
<i>Bacteriology Branch</i>		
Gerard Stelma	513-569-7384	Bacteriology
<i>Parasitology and Immunology Branch</i>		
Walter Jakubowski	513-569-7385	Parasitology
Chemistry Research Division		
William Budde, Director	513-569-7309	Chemical methods
<i>Organic Chemistry Branch</i>		
James Eichelberger	513-569-7278	Organic methods
<i>Inorganic Chemistry Branch</i>		
Vacant		Chemical methods
Quality Assurance Research Division		
John Winter, Director	513-569-7325	Quality assurance issues
<i>Development and Evaluation Branch</i>		
Robert Graves	513-569-7197	Quality control/performance evaluation samples
<i>Project Management Branch</i>		
Raymond Wesselman	513-569-7325	Methods standardization
Ecological Monitoring Research Division		
F. Bernard Daniel, Director	513-569-7401	Ecological monitoring
<i>Cellular and Biochemical Markers Branch</i>		
Maryrose Kate Smith	513-569-7577	Ecological biomarkers
<i>Physiological and Clinical Indicators Branch</i>		
Susan Cormier	513-569-7995	Ecological biomarkers
<i>Bioassessment and Ecotoxicology Branch</i>		
James Lazorchak*	513-533-8114	Ecological biomarkers
Federal Technology Transfer Act Cooperative Research and Development Agreements		
Raymond Wesselman	513-569-7325	Development, preparation, verification, and distribution of quality control and reference materials (five existing agreements)
* Newtown facility		

Environmental Monitoring Systems Laboratory—Las Vegas



Wayne N. Marchant was named director of the Environmental Monitoring Systems Laboratory in Las Vegas, Nevada, in July 1992. Dr. Marchant was formerly the chief of Research and Laboratory Services in the Bureau of Reclamation, U.S. Department of the Interior, a position he had held since 1988. He holds a Ph.D. degree in chemistry from the University of California at Santa Barbara, and a bachelor of science degree from the University of Nevada at Reno. He has won numerous awards for service and technical achievements, including three patents. Before his assignment with the Bureau of Reclamation, he served as the deputy assistant secretary for water and science in the Department of the Interior and as program manager and scientist for the U.S. Bureau of Mines in both Salt Lake City, Utah, and in Washington, D.C.



Environmental Monitoring Systems Laboratory

Wayne N. Marchant, Director
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The Environmental Monitoring Systems Laboratory-Las Vegas develops methods, systems, and strategies for monitoring the environment with the primary purposes of assessing the exposure of man and other receptors in the environment to polluting substances, characterizing the status of environmental quality, and identifying the trends in environmental quality.

The laboratory develops and applies field monitoring techniques, analytical methods, and remote sensing systems for monitoring environmental pollutants. It field tests, demonstrates and applies these systems, and initiates transfers of operational systems to Agency user organizations. It provides technical support to Agency, regional, and program offices in response to their requests for pollutant monitoring, testing and surveillance assistance.

The laboratory develops and operates quality assurance programs for radiation, hazardous wastes, and toxic/pesticide monitoring. This includes the development and maintenance of reference standards, preparation of performance evaluation materials, and the conduct of performance audits for EPA laboratories as well as other federal, state, and local laboratories.

Under a Memorandum of Understanding with the U.S. Department of Energy (DOE), the laboratory conducts a comprehensive off-site radiological safety program for the U.S. Nuclear Weapons Testing Program, which includes pathways research to determine actual and potential radiation exposure to humans and the environment from past and present nuclear testing. The laboratory also provides quality assurance oversight for DOE's mixed waste management activities.

The laboratory's major programs are

- **Advanced Analytical Methods:** Development and evaluation of innovative techniques for sample extraction and analysis of organic and inorganic contaminants in complex environmental matrices. Advanced methods using liquid chromatography, mass spectrometry, Fourier transform infra-red spectroscopy, gas chromatography, inductively coupled plasma spectroscopy, and immunoassay are developed and evaluated.
- **Advanced Monitoring Methods:** Research directed at providing monitoring methods that are simpler, more reliable, or more rapid to use than existing methods. Overhead remote sensing, aerial photography, multispectral scanner, and laser fluorosensing technologies, airborne laser

systems, and geophysical techniques are tools used to detect waste discharge, locate waste disposal sites, identify erosion, assess air particulate problems, and monitor pollutants in soils and in ground water.

- **Monitoring Network Design:** The laboratory has long been in the forefront of monitoring design—using a concept that advocates a multimedia approach to environmental monitoring emphasizing proper selection of critical receptors, optimum siting, and number of samples, through planning and an understanding of how pollutants are transported from the source to the receptor. Geostatistics play a major role by using data from a preliminary study to establish the optimum distance between sampling points.
- **Quality Assurance:** In an effort to support the Agency's commitment to the quality assurance aspects of environmental sampling and analysis, test methods are validated and performance criteria are established. The precision, accuracy, and ruggedness of the analytical protocols are then evaluated for use in Agency monitoring programs. Quality assurance support, as well as laboratory and data audits, are provided for the Superfund Contract Laboratory Program.
- **Exposure Assessment:** Human exposure assessment provides critical information required to make risk estimates for environmental pollutants. A comprehensive approach is required to develop simultaneous information on sources, exposure, dose, effect, and control. Projects related to this topic include examination of consumer products as sources of pollutants, evaluation/validation of indoor air models, evaluation of indoor air sinks, development of a benzene exposure model, human activity patterns, development/evaluation of immunoassays for environmental pollutants, monitoring of microorganisms in residential settings, and the examination of biomarkers as indicators of exposure.
- **Radiological Monitoring and Analysis:** The laboratory maintains extensive radioanalytical, field radiological monitoring and health physics capability to conduct an integrated program of environmental monitoring, sampling, analysis, exposure assessment and quality assurance in support of the United States Nuclear Weapons

Testing Program. The group responds to radiation accidents and potential emergencies such as the Three Mile Island incident and the launches of Galileo and Ulysses deep space probes carrying radioisotope thermoelectric generators. They play a major role in the Federal Radiological Monitoring and Assessment Center. A whole body-counting facility is operated at the laboratory for determining radionuclide identification and distribution in people. Also, the laboratory conducts an EPA-wide occupational radiation monitoring exposure program. This group supports the National Interim Primary Drinking Water Regulations by conducting the Drinking Water Laboratory Certification Program, which includes providing radioactive reference standards, conducting intercomparison studies and performing audits of state drinking water laboratories.

- **Ecological Monitoring:** The laboratory participates in the Agency's Environmental Monitoring and Assessment Program (EMAP), a national research program to determine the condition of the nation's ecological resources. Research classifies, characterizes, and monitors status and trends of major ecosystems and their subclasses. The monitoring efforts specifically focus on conditions over periods of years to decades. Advanced monitoring methods are being used to determine status and trends in forest, agricultural and arid lands. The laboratory is responsible for conducting initial ecosystem characterization, providing remote sensing support, providing guidance and support for field logistics and quality assurance, and for developing and implementing a distributed database management system.

- **Monitoring and Measurement Technologies:** Under the aegis of the Superfund Innovative Technology Evaluation (SITE) Program, the laboratory is responsible for identifying, evaluating, demonstrating, and transferring alternative or innovative technologies used for site characterization and for monitoring the progress of remedial activities. Technologies that have participated in the program include portable gas chromatographs, ion mobility spectrometers, long-path-length infrared spectrometers, immunochemical test kits, fiber optic and other chemical sensors, x-ray fluorescence spectrometers, and mass spectrometers, among others. The Monitoring and Measurement Technologies Program also focuses on technologies used to characterize the physical characteristics of sites. The Monitoring and Measurement Technologies Program is matrix managed, involving the expertise residing in EMSL-LV's sister laboratories—EMSL-CI and AREAL-RTP.
- **Technical Assistance:** The laboratory's Technical Support Center provides regional personnel with monitoring and site assessment expertise. Areas of assistance include sampling and monitoring design assistance; remote sensing, mapping and geostatistics; analytical methods and quality assurance; bore-hole and surface geophysics; field portable x-ray fluorescence field methods; mixed waste and radiological analysis. Technical assistance is provided in a variety of ways, including reviews, information research and retrieval, technology transfer, teleconferencing, on-site measurements, training programs, seminars and workshops.



Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
Wayne N. Marchant	702-798-2525	Director
J. Gareth Pearson	702-798-2522	Environmental monitoring; quality assurance
Llewellyn R. Williams	702-798-2138	Chemical/biological testing; water quality; quality assurance
Office of Program Management and Support		
Walter B. Galloway	702-798-2568	Marine environmental chemistry; program management; total quality management
Douglas C. Sharp	702-798-2627	Safety, health, and environmental management
Quality Assurance and Methods Development Division		
Richard L. Garnas	702-798-2101	Agricultural chemistry
Stephen N. Billets	702-798-2232	Organic analytical chemistry; mass spectroscopy

(continued)

Areas of Expertise

(continued)

	Telephone	Area of Expertise
<i>Methods Research Branch</i>		
Christian G. Daughton	702-798-2207	Analytical chemistry; microbial degradation; bioremediation; environmental toxicology
<i>Quality Assurance Research Branch</i>		
Michael H. Hiatt	702-798-2383	Organic analytical chemistry; trace level environmental contaminant analysis; vacuum distillation; mass spectrometry; contract laboratory program (CLP); quality assurance
Exposure Assessment Research Division		
Robert D. Schonbrod	702-798-2229	Chemistry; field monitoring; quality assurance
Charles H. Nauhan	702-798-2258	Environmental toxicology
<i>Ecosystems Monitoring Program</i>		
Ann M. Pitchford	702-798-2217	Ecosystems monitoring; environmental monitoring; quality assurance
<i>Exposure Monitoring Program</i>		
Stephen C. Hern	702-798-2594	Microbiology; exposure monitoring
Advanced Monitoring Systems Division		
Eugene P. Meier	702-798-2237	Ground-water monitoring; analytical environmental chemistry
John M. Moore	702-798-2237	Systems engineering; systems analysis
<i>Aquatic and Subsurface Monitoring Branch</i>		
Jane E. Denne	702-798-2368	Ground-water monitoring
<i>Remote and Air Monitoring Branch</i>		
Bill J. Forté	702-798-2260	Remote sensing; Geographic Information Systems
<i>Environmental Photographic Interpretation Center (Warrenton, Va)</i>		
Donald Garofalo	703-341-7503	Remote sensing
Nuclear Radiation Assessment Division		
Paul J. Weeden	702-798-2311	Radiation safety; environmental monitoring; radiochemistry
George G. (Jerry) Martin	702-798-2374	Environmental monitoring; health physics
<i>Monitoring and Assessment Branch</i>		
Anita A. Mullen	702-798-2597	Health physics; dose assessment
<i>Radioanalysis Branch</i>		
Terence M. Grady	702-798-2136	Radiochemistry
Environmental Monitoring Assessment Program		
K. Bruce Jones	702-798-2671	EMAP (landscape ecology)
William Kepner	702-798-2193	EMAP (arid ecosystems)
Denice Shaw	919-541-2698	EMAP (landscape characterization)
Lee Campbell	919-515-3311	EMAP (agro-ecosystems)
Sam Alexander	919-549-4020	EMAP (forests)

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Technical Assistance Directory



Technical Assistance Directory

Center for Environmental Research Information
Office of Research and Development
U.S. Environmental Protection Agency

U.S. Environmental Protection Agency
Region 5, Library
77 West Jackson Blvd, 12th Floor
Chicago, IL 60604-3590

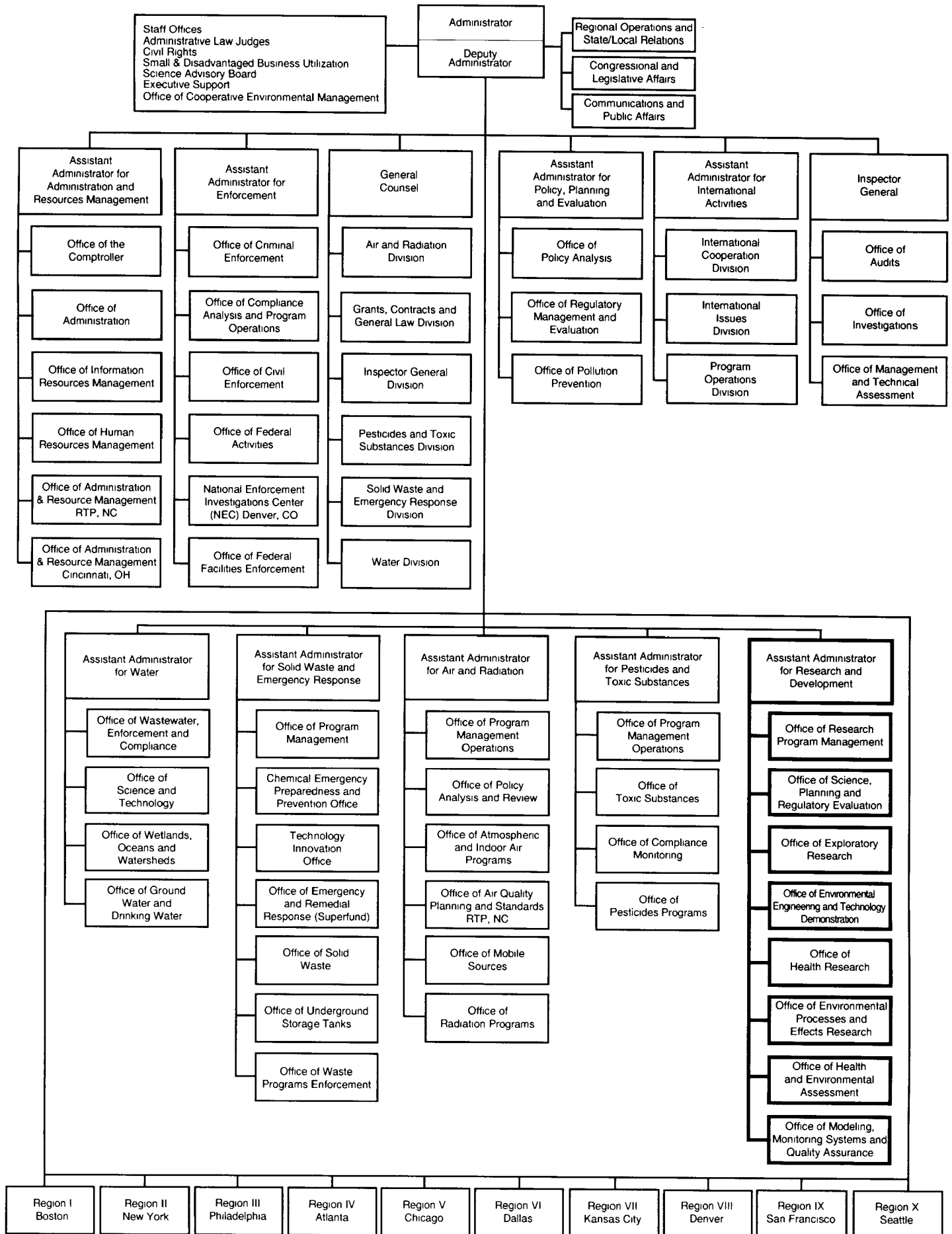


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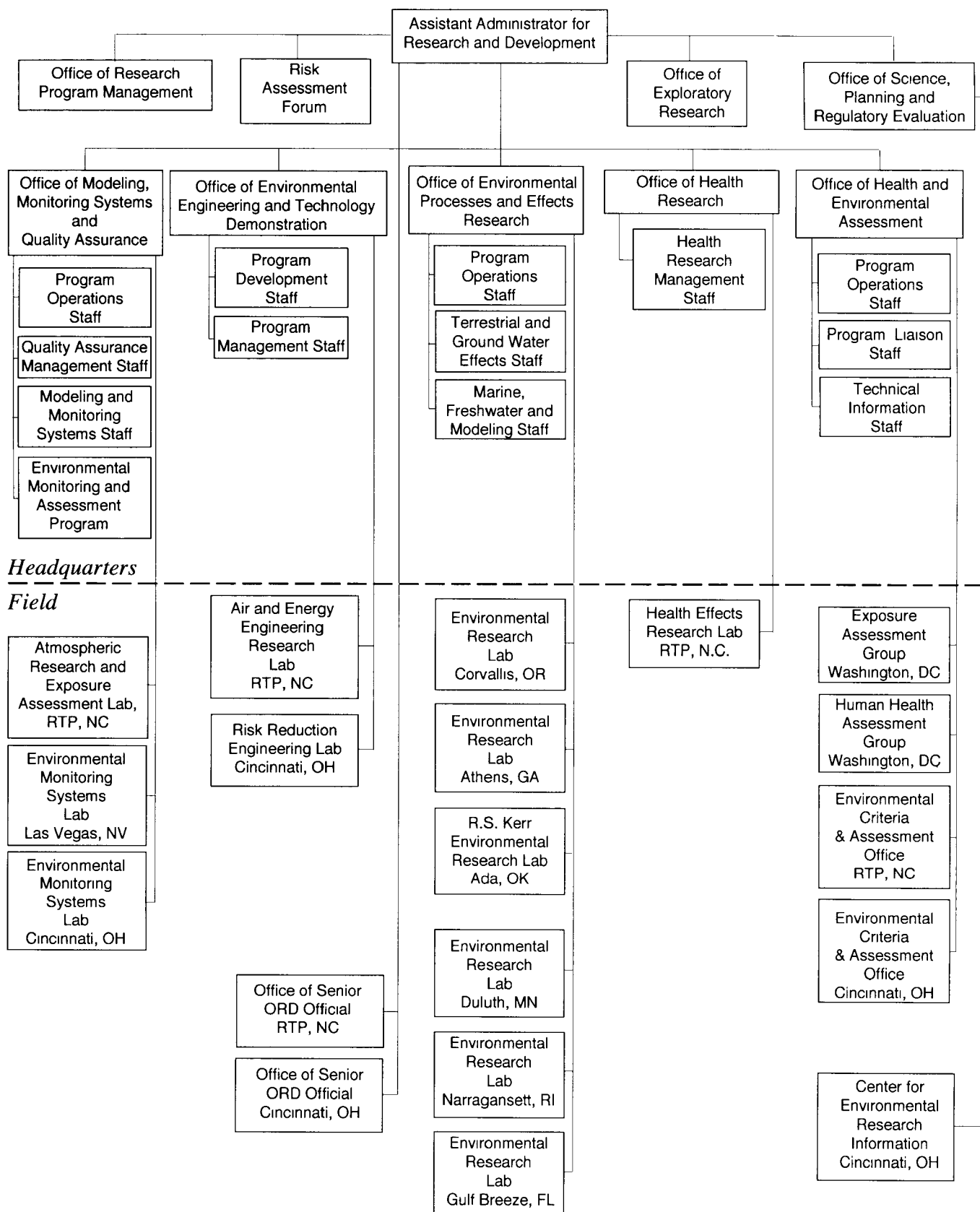
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U. S. Environmental Protection Agency Organization Chart



Office of Research and Development Organization Chart



Office of Research and Development

The Acting Assistant Administrator



Gary J. Foley is the acting assistant administrator of the Office of Research and Development. He is also the director of the Atmospheric Research and Exposure Assessment Laboratory at Research Triangle Park, North Carolina. He has served as staff director for ORD's Acid Deposition Program and acting division director, Energy and Air, for ORD's Office of Environmental Processes and Effects Research. Dr. Foley began his career with EPA in 1973 as a senior chemical engineer. Before joining the Agency, Dr. Foley served as a project manager for the American Oil Company. He received his Ph.D. in chemical engineering from the University of Wisconsin, Madison. Dr. Foley has been awarded 4 Bronze Medals by EPA.

The Deputy Assistant Administrator

Vacant

**Directory Description
Environmental Protection Agency
Office of Research and Development**

**Gary J. Foley, Acting Assistant Administrator
Mailcode: RD-672
401 M St., S.W. Washington, D.C. 20460
202-260-7676, FAX: 202-260-9761
E-Mail FOLEY.GARY**

The Office of Research and Development conducts an Agency-wide integrated program of research and development relevant to pollution sources and control, transport and fate processes, health and ecological effects, measurement and monitoring, and risk assessment. The office rigorously disseminates its scientific and technical knowledge and upon request provides technical reviews, expert consultations, technical assistance, and advice to environmental decision makers in federal, state, local, and foreign governments.

The ORD implements its activities through its Washington, D.C., headquarter's offices and associated laboratories and field locations (see organizational chart). The programs, areas of expertise, and primary contacts in each of the major

ORD operations are conveyed in the following directory. This information is made available in an effort to improve communication and technology transfer with our clients.

In addition, information may be obtained from the offices in Washington, D.C., that are listed below. ORD publications may be requested from the Center for Environmental Research Information in Cincinnati, Ohio.

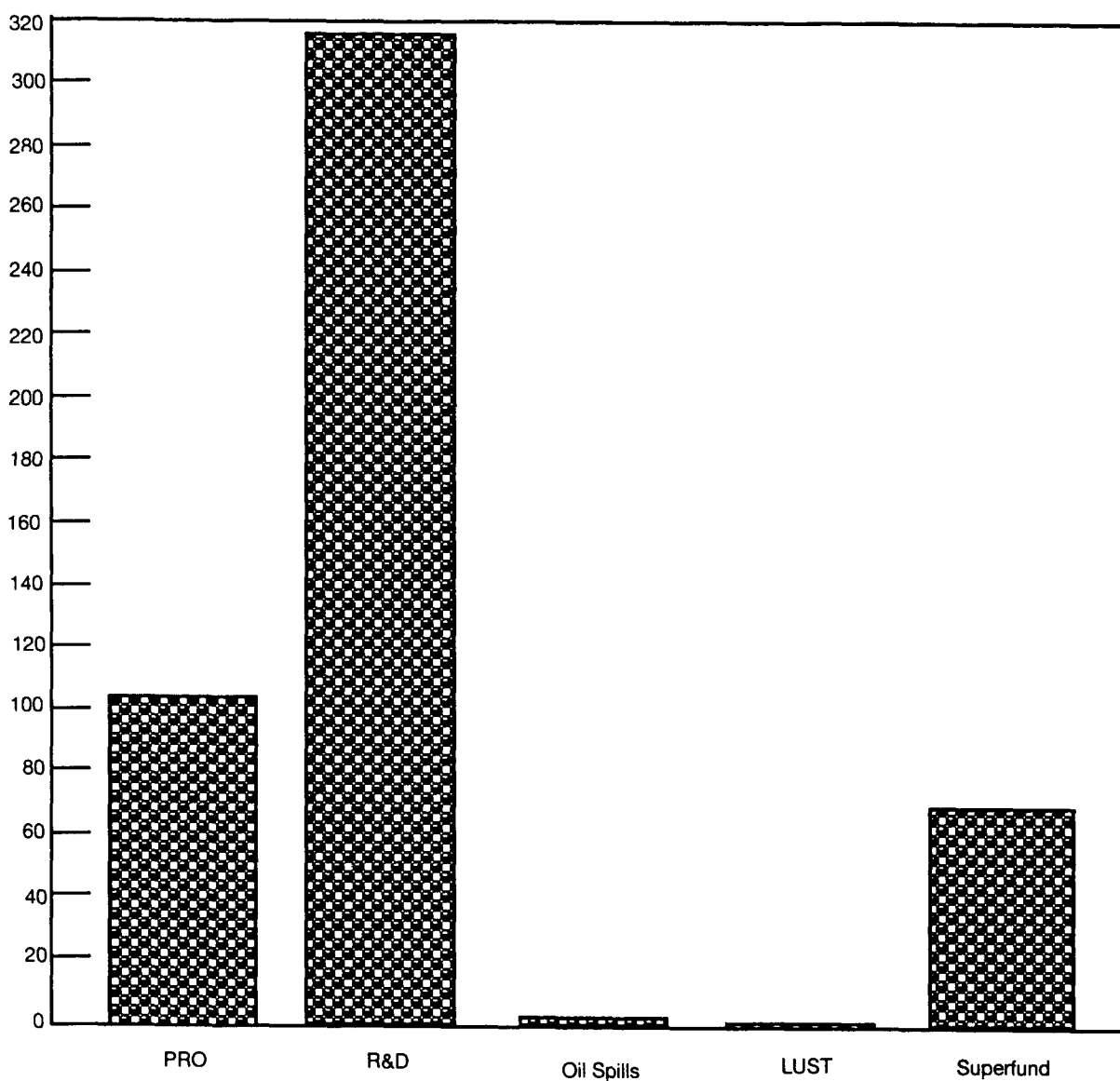
Clients are urged to make direct contacts. If help or coordination is needed to properly access the listed operations, directory assistance can be easily obtained by contacting the Office of Science, Planning and Regulatory Evaluation in Washington, D.C., 202-260-7669.

Office	Telephone
Office of Health Research	202-260-5900
Office of Environmental Processes and Effects Research	202-260-5950
Office of Modeling, Monitoring Systems and Quality Assurance	202-260-5767
Office of Health and Environmental Assessment	202-260-7315
Office of Research Program Management	202-260-7500
Office of Environmental Engineering and Technology Demonstration	202-260-2600
Office of Exploratory Research	202-260-5750
Office of Science, Planning and Regulatory Evaluation	202-260-7669

For additional help in contacting ORD headquarters' offices,
call the EPA HEADQUARTERS LOCATOR at 202-260-2090

Budget for Fiscal Year 1993
Office of Research and Development

FY 92 Resources
(In Millions)



Program and Research Operations (PRO)	\$112,622.0
Research and Development (R&D)	318,890.0
Oil Spills	2,089.8
Leaking Underground Storage Tanks (LUST)	748.9
Superfund	70,097.1
Total	\$504,447.8

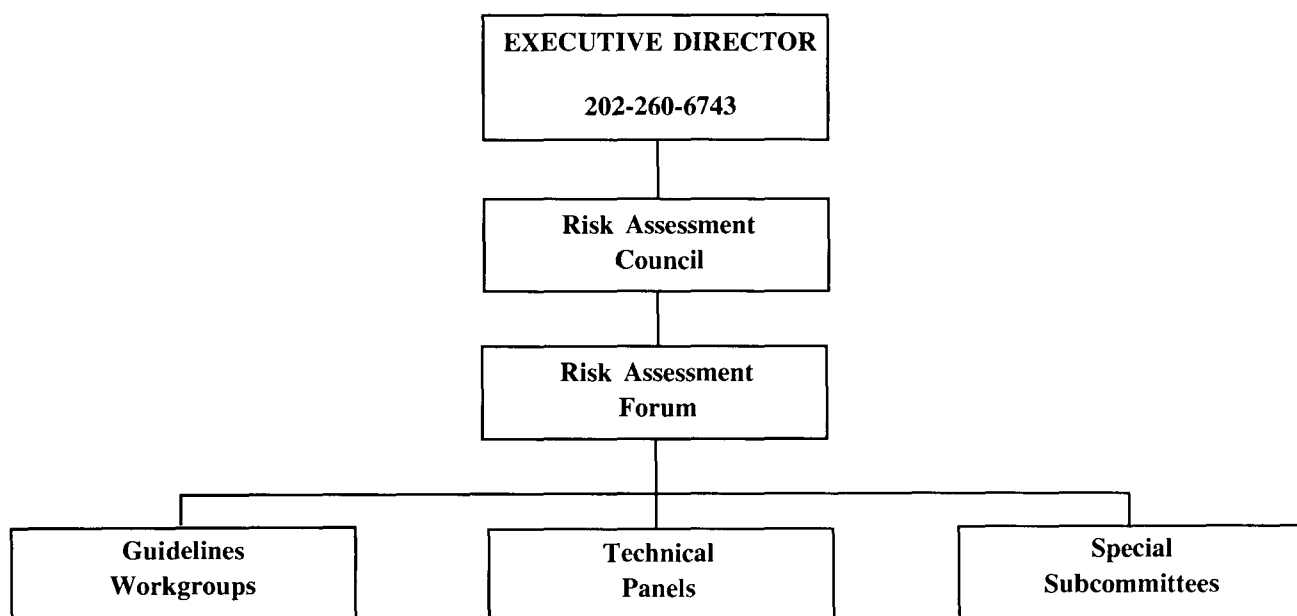
All dollar amounts are as of 11/1/92.

Full-Time Employees	
PRO	1,721.4
Superfund	136.9
LUST	1.9
Reimbursables	61.0
Total	1,921.2

Risk Assessment Forum



Dorothy E. Patton has been the executive director of the Risk Assessment Forum since 1985. Currently, she also chairs that group. From 1976 to 1985, she was an attorney in EPA's Office of General Counsel, where she worked with the pesticides, toxics, and air programs. She has received three EPA Bronze Medals. Before coming to EPA, Dr. Patton was an assistant professor of biology in the City University of New York (York College), and did post-doctoral work at Albert Einstein College of Medicine in New York. Dr. Patton received her J.D. degree from Columbia University School of Law, a Ph.D. in developmental biology from the University of Chicago, and a bachelor's degree in chemistry from the University of Wisconsin.



Risk Assessment Forum
Dorothy E. Patton, Director
Mailcode: RD-689
401 M St., S.W. Washington, D.C. 20460
202-260-6743, FAX: 202-260-3955
E-Mail RISK.FORUM

Functions

EPA's Risk Assessment Forum is responsible for scientific and science policy analysis of selected precedent-setting or controversial risk assessment issues of Agency-wide interest. The primary objective is to promote Agency consensus on risk assessment and to ensure that this consensus is incorporated into appropriate guidance for Agency scientists and managers. The forum does not conduct chemical-specific risk assessments.

Program Activities

Forum activities include developing scientific analyses, risk assessment guidance, and risk assessment methodology for use in ongoing and prospective Agency actions; using scientific and technical analysis to propose risk assessment positions for Agency programs; and fostering consensus on these issues. Generally, the forum focuses on generic issues fundamental to the risk assessment process, analysis of data used in risk assessment, and on developing consensus approaches. Risk Assessment Forum reports and actions are referred to the Risk Assessment Council for consideration of policy and procedural issues, and forum scientific analyses become Agency policy upon recommendation by the Risk Assessment Council.

ORD's forum staff coordinates and implements the work of the forum. Accordingly, the staff assists and contributes to scientific analyses, coordinates all activities involving the forum and its technical panels, and manages all interaction between the forum and senior EPA management, peer reviewers, and the public. At any one time, the forum staff is working with a total of 100-150 participants on technical panels, colloquia, and workshops from all parts of the Agency.

The leadership for forum projects comes from all Agency offices, laboratories, and regions. Agency scientists contribute scientific expertise and Agency risk assessment experience to help develop consensus Agencywide.

Issues

The issues before the Risk Assessment Forum vary as risk assessment issues become prominent or controversial within the Agency or in the larger scientific community. Issues currently before the forum fall into four general categories:

- ***Carcinogen Risk Assessment:*** Recently concluded or ongoing forum analyses on carcinogen risk assessment include
 - the relevance of data on rat kidney tumors to human cancer risk assessment;
 - guidance on the use of non-tumor end points for assessing cancer risk in follicular cells of the thyroid gland;
 - toxicity equivalency factors for dioxins other than 2,3,7,8-TCDD, and the possible use of such factors for PCBs and PAHs;
 - general topics under study for revisions of EPA's carcinogen risk assessment guidelines (classification system weight-of-evidence scheme, policy on use of benign and malignant tumors, etc.).
- ***Health Effects Other Than Cancer:*** Recent projects include
 - risk assessment guidelines for male and female reproductive effects;
 - a report on cholinesterase inhibition;
 - risk assessment guidelines for neurotoxic effects;
 - amendments of EPA's 1986 guidelines for developmental toxicity (additional guidance on use of the data on maternal toxicity and on quantification for developmental effects);
 - issues on PCB and developmental neurotoxicity;
 - use of benchmark dose methodology.
- ***Exposure Guidance:*** Ongoing projects include
 - exposure measurement guidelines to supplement EPA's exposure guidelines issued in 1986;
 - exposure validation models;
 - guidance on standard factors for use in exposure assessment;
 - exposure scenarios.

- **Ecological Risk Assessment/Ongoing Risk Assessment:** Projects include
 - a *Framework Report* that outlines a flexible system for use in developing ecological risk guidance;
 - peer-reviewed case studies on ecological risk problems;
 - peer panel workshops on issues under study for use in developing risk assessment guidelines.



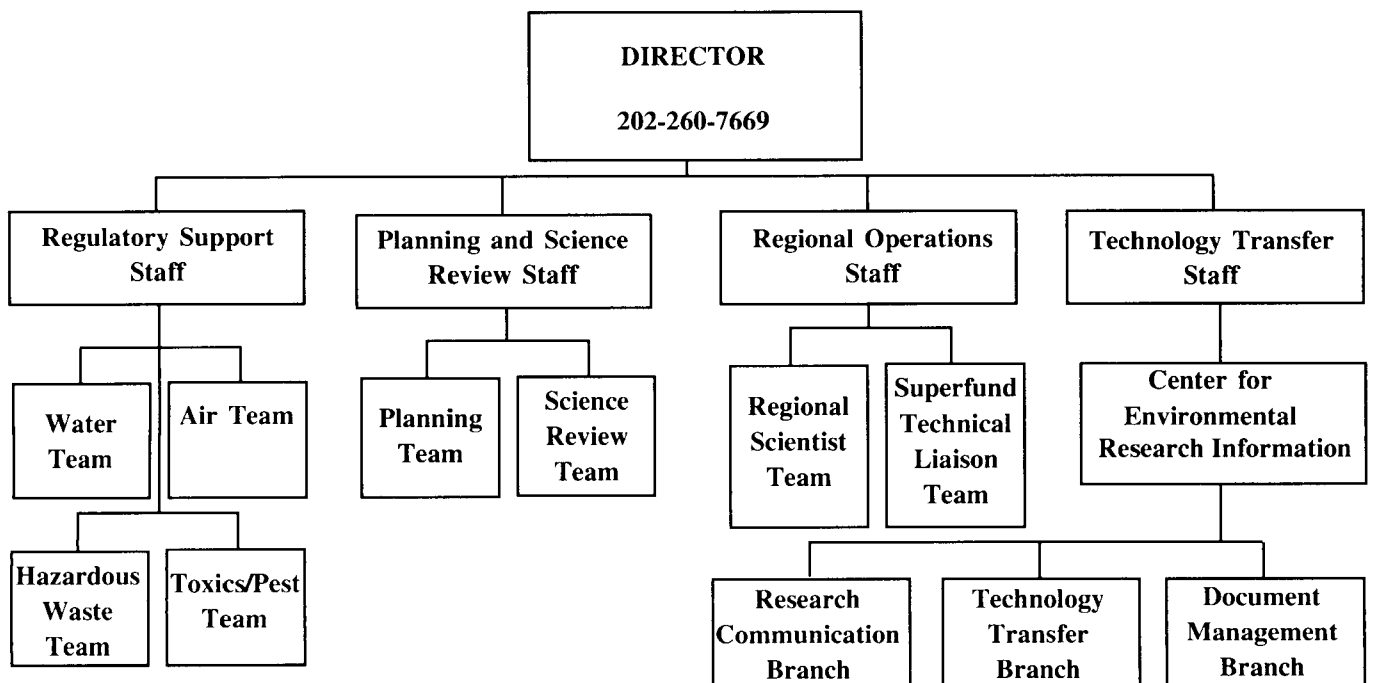
Areas of Expertise

Office of the Director	Telephone	Area of Expertise
Dorothy E. Patton	202-260-6743	Health risk assessment
William P. Wood	202-260-1095	Exposure assessment
William van der Schalie	202-260-4191	Ecological risk assessment
Harry Teitelbaum	202-260-2787	Health risk assessment

Office of Science, Planning and Regulatory Evaluation



Peter W. Preuss has been the director of the Office of Science, Planning and Regulatory Evaluation since 1988. From 1985 to 1988, he was the director of the Office of Health and Environmental Assessment. Prior to joining EPA, Dr. Preuss was associate executive director for Health Sciences for the U.S. Consumer Product Safety Commission. Dr. Preuss began his career with the Boyce-Thompson Institute for Plant Research. He received Ph.D. and master's degrees in plant physiology and biochemistry from Columbia University and a bachelor's degree in chemistry and mathematics from Brooklyn College.



Office of Science, Planning and Regulatory Evaluation

Peter W. Preuss, Director

Mailcode: H-8105

401 M St., S.W. Washington, D.C. 20460

202-260-7669, FAX: 202-260-0106

Functions

The Office of Science, Planning and Regulatory Evaluation (OSPRE) performs several functions that link ORD science programs and the environmental policy and regulatory activities of EPA's program and regional offices:

- provide advice and analysis of the scientific and technological basis for Agency policies, both regulatory and non-regulatory;
- manage ORD's issue-based process for planning the research program;
- lead Agency implementations of *Safeguarding the Future: Credible Science, Credible Decisions*, 11 major recommendations of the expert panel on the role of science at EPA for improving EPA's science knowledge base;
- manage the delivery of products and services from ORD laboratories through technology transfer and technical information exchanges;
- promote the interests of EPA regional offices in Agency research activities.

The responsibilities for these functions are divided among four Headquarters staffs and the Center for Environmental Research Information.

Staff Responsibilities

Regulatory Support Staff

The OSPRE regulatory support staff, working with laboratory experts, ensures that all relevant scientific and technology information is considered in the development of Agency regulations, decisions, and policies. To strengthen the role of science at EPA, the staff also evaluates legislation, such as the Clean Air Act Amendments, to align ORD's research program with legislative requirements. The staff represents ORD in Agency initiatives that require creative scientific approaches, as in the case of EPA's Corrective Action Risk Impact Analysis. Often the staff works with other federal agencies, like the Department of Agriculture, to design joint research programs.

Planning and Science Review Staff

The planning and science review staff implements ORD's new issue-based research planning process and the recommendations of the Expert Panel on the Role of Science at EPA. For research planning purposes, ORD's research program is divided into about 40 issues, or areas of research,

that correspond to high-risk, multimedia, regulatory, or strategic environmental problems. For each issue, a comprehensive three-to-five-year plan has been developed that includes detailed descriptions of scientific questions needing research, the specific areas in which EPA will conduct research, products, and technology transfer activities. The planning team facilitates the many steps of the process among the ORD Headquarters offices and laboratories.

The science review team is responsible for implementing the recommendations of the Expert Panel on the Role of Science, outlined in its March 1992 report, *Safeguarding the Future: Credible Science, Credible Decisions*. The report made significant recommendations for improving the science knowledge base of the Agency. Key recommendations being implemented by the team include improving the science for decision making; establishing and coordinating the efforts of the Council of Science Advisors, an intra-Agency group of scientists that advises the Administrator on science policy issues that have impacts across Agency programs; and implementing a World Class Scientist Program for recruiting outstanding scientists in environmental disciplines to work with EPA scientists.

Technology Transfer Staff

As the regulatory support and planning staffs work within the Agency to bring ORD into activities, the technology transfer staff (and the Center for Environmental Research Information, *see separate section*) promotes ORD science and technical information to the broadest possible audience outside the Agency. The staff works to forge partnerships between EPA laboratories and the private sector. In addition, the staff implements the Agency's Federal Technology Transfer Act program for establishing cooperative research and development agreements with businesses and academic institutions to do joint research and commercialize the results. The OSPRE technology transfer staff has taken the lead in developing and advocating biotechnology initiatives, environmental education resources for all levels of students, small community outreach, and electronic information services such as the ORD bulletin board system.

Regional Operations Staff

The regional operations staff (ROS) is ORD's primary liaison to EPA's regional offices and the environmental decision makers in state and local government. ROS advocates regional needs in ORD's research program and promotes the flow of information and technology to state and local government clients through three programs: 1) the Regional Scientist Program, 2) the Superfund Technical Liaison Program, and 3) the State and Local Program.

The regional scientist program places an ORD scientist in each region who aids the communication between ORD and the regions and promotes the development of applied research and technical assistance support for the regional offices' programs. The Superfund technical liaison program places an ORD point of contact in each regional office who facilitates access to ORD laboratories and oversees ORD's Superfund technical support programs. The state and local program, through cooperative agreements, provides techni-

cal assistance to state and local government environmental management professionals. The cooperatives also provide a conduit for state and local governments to communicate their research needs to ORD. Three cooperative agreements are in effect with (1) the National Governors' Association, (2) Public Technologies, Inc., (representing the League of Cities, National Associations of Counties, and International City Managers Association), and (3) the National Association of Counties and Conference of Mayors.



Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
Peter W. Preuss, Ph.D., Director	202-260-7669	Program operations
Jay Benforado, Deputy Director	202-260-7669	
Shirley Hamilton	202-260-7891	
Regulatory Support Staff		
Jay Benforado, Director	202-260-7669	
<i>Air Team</i>		
Kevin Teichman, Chief	202-260-7669	Indoor air
Stan Durkee	202-260-7891	Mobile sources; municipal waste
Stacey Katz	202-260-7669	NAAQS
Bob Fegley	202-260-7891	Air toxics
<i>Hazardous Waste Team</i>		
<i>Toxic/Pesticide Team</i>		
Elaine Francis, Chief	202-260-7891	Pesticide risk assessment; food safety; non-cancer health effects
David Cleverly	202-260-7891	Exposure assessment; toxic air pollutants; dioxin
Michael Troyer	513-569-7399	Ecological risk assessment; endangered species; wetlands; migratory birds
Vivian Williams	202-260-7891	Human health effects; toxicology
<i>Water Team</i>		
Ronnie Levin, Chief	202-260-7891	Lead; drinking water
Burnell Vincent	202-260-7891	Sewage sludge; nonpoint sources; waste water

(continued)

Areas of Expertise

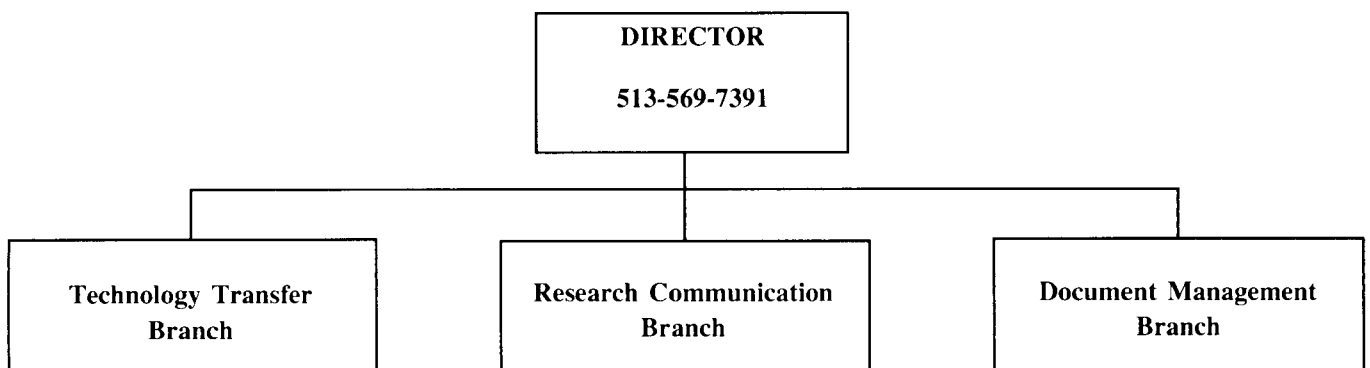
(continued)

	Telephone	Area of Expertise
Planning and Science Review Staff		
Joe DeSantis, Director	202-260-7891	
<i>Planning Team</i>		
Jerry Garman	202-260-7891	Research plans development
Gail Robarge	202-260-7669	Research committees; strategic planning
Mary Wigginton	202-260-7891	Research planning support
<i>Science Review</i>		
Brian Lane	202-260-7891	Council of Science Advisors
Technology Transfer Staff		
Michael Moore, Director	202-260-7671	Environmental Technology Utilization
Ronald Slotkin	202-260-7671	Environmental Science and Technology Education
Larry Fradkin	513-569-7960	Federal Technology Transfer Act
Regional Operations Staff		
David Klauder, Director	202-260-7667	
Lawrence Martin	202-260-7667	State and local coordinator
<i>Regional Scientist Team</i>		
Ron Landy, Chief	202-260-7667	
Thomas Waddell	617-565-3397	Region I
Patricia Lafornera	908-906-6988	Region II
David Smith	303-293-1475	Region VIII
Randall J.F. Bruins	206-553-2146	Region X
<i>Superfund Technical Liaison Team</i>		
Amy Mills, Acting Chief	202-260-7891	
Magalie Breville	212-264-6788	Region II
Norm Kulujian	215-597-1113	Region III
Deborah Stockdale	404-347-1586	Region IV
Steve Mangion,	312-886-3011	Region V
Robert E. Mournighan	913-551-7913	Region VII
Robert L. Stone	303-294-7597	Region VIII
Joe Greenblott	415-744-2307	Region IX
John Barich	206-553-8562	Region X

Center for Environmental Research Information



Calvin O. Lawrence has served as the director of the Center for Environmental Research Information since 1980. He was the deputy director of CERI for three years. He became the Senior Official for Research and Development-Cincinnati in 1990. Mr. Lawrence worked for ORD in Washington, D.C., from 1972 to 1977, ending his tenure there as technical assistant to the Assistant Administrator for ORD. He began his federal career in 1963 as mathematician and electrical engineer at the Naval Ordnance Laboratory, White Oak, Maryland. Mr. Lawrence was awarded an EPA Bronze Medal in 1973. He has a bachelor's degree in mathematics from Lamar University and a master's degree in numerical science from John Hopkins University.



Center for Environmental Research Information

Calvin O. Lawrence, Director

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The Center for Environmental Research Information (CERI) is a focal point for the exchange of scientific and technical information both within the federal government and to the public. CERI's Technology Transfer, Research Communication, and Document Management Branches coordinate a comprehensive program in support of the activities of EPA's Office of Research and Development (ORD), its laboratories, and associated programs nationwide.

The Technology Transfer Branch works with the ORD laboratories, program offices, regions, academia, and the private sector to produce technology transfer products (i.e., reports, summaries, journal articles, design manuals, handbooks, capsule reports, seminars, workshops, and training courses) that aid states, local governments, and the regulated community in complying with EPA regulations. This information is based upon the latest technology and is in a form that is easily understood as well as comprehensive in coverage. Topics include groundwater remediation, pollution prevention, solid and hazardous wastes, sludge, small community water treatment, municipal wastewater treatment, air pollution, and EMAP.

The Research Communication Branch is responsible for working with the ORD laboratories, program offices, and regions to produce information products that summarize

research, technical, regulatory, and enforcement information that will assist non-technical audiences in understanding environmental issues. Additionally, research communication products will allow a non-technical audience to make informed decisions necessary to respond to EPA's regulatory requirements and enforcement actions.

The Document Management Branch is responsible for the production and distribution of scientific and technical reports, responding to requests for publications, and quality control of information products through the application of standardized procedures for the production of documents. Our personnel employ state-of-the-art electronic publishing systems to efficiently produce, edit, publish, and distribute documents in the most appropriate format.

Electronic links with the offices, regions, laboratories, researchers, and the private sector afford CERI the immediate ability to serve the needs of our clients. A noteworthy component of this service is the ORD Electronic Bulletin Board System (BBS). It facilitates the exchange of technical information and ORD products among our clients in the form of electronic messages, brief bulletins about ORD products and activities, files for downloading, participation in conferences, and on-line databases for identifying ORD publications.

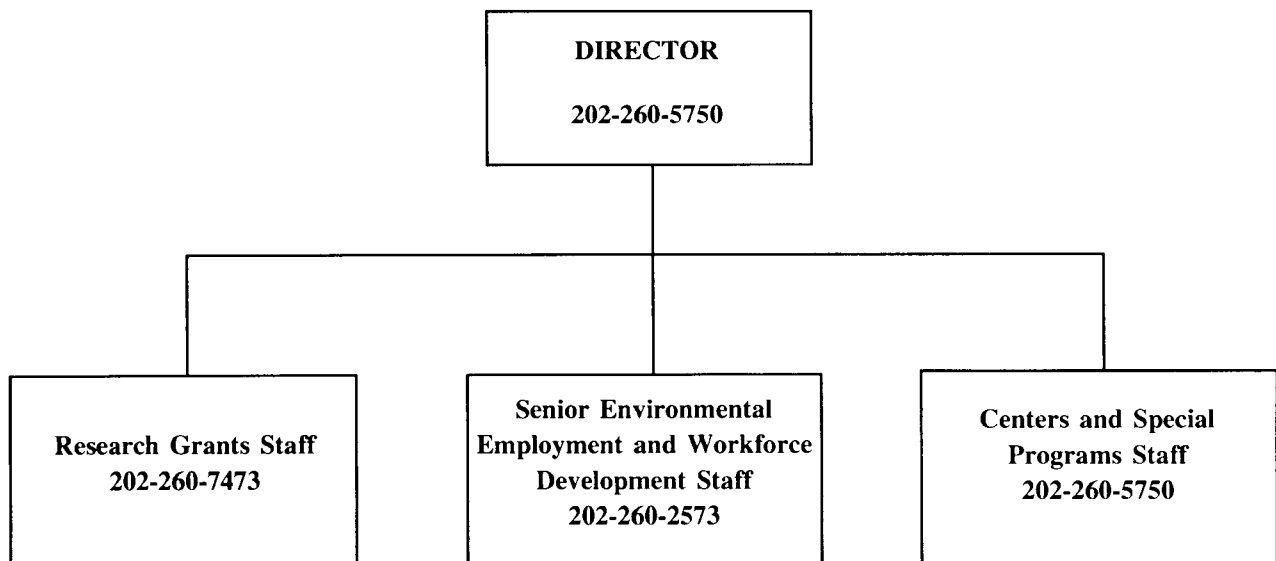
Areas of Expertise

	Telephone	Area of Expertise
Ed Barth	513-569-7669	Treatment of hazardous wastes (solidification; stabilization; vitrification)
Sue Schock	513-569-7362	Ground water
James F. Kreissl	513-569-7394	Small community wastewater, drinking water, and solid waste management
Fran Kremer	513-569-7346	Treatment of hazardous wastes (bioremediation; oil spills)
Denis Lussier	513-569-7354	Municipal wastewater treatment; ORD Electronic Bulletin Board System
Justice Manning	513-569-7349	Air pollution
Daniel J. Murray	513-569-7522	Nonpoint source water pollution; industrial wastewater pretreatment; wastewater and water quality monitoring
Jose D. Perez	513-569-7502	Expert systems
Randy Revetta	513-569-7394	Municipal wastewater treatment
J. E. Smith	513-569-7355	Drinking water and wastewater treatment; residuals management; hazardous waste management; working with international organizations to solve developing country industrial and hazardous waste problems
Jack Teuschler	513-569-7314	Expert systems; computer systems development; software development
H. Douglas Williams	513-569-7361	Hazardous materials risk reduction for waste minimization; pollution prevention

Office of Exploratory Research



Robert E. Menzer was appointed acting director of the Office of Exploratory Research in 1991. Concurrently, he serves as director of the Gulf Breeze Environmental Research Laboratory. Before joining ORD in 1989 Dr. Menzer was a professor at the University of Maryland, where he also served in several research administration posts, including associate dean and acting dean for Graduate Studies and Research. He received a Ph.D. in entomology from the University of Wisconsin, Madison, and a bachelor's degree in chemistry from the University of Pennsylvania.



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The Office of Exploratory Research (OER) plans, administers, manages, and evaluates EPA's extramural grant research. It supports research in developing a better understanding of the environment and its problems. OER's main goals are

- to support the academic community in environmental research;
- to maintain scientific and technical personnel in environmental science and technology;
- to support research for the identification and solution of emerging environmental problems.

OER's goals are accomplished primarily through four core programs:

The Research Grants Program: Supports research initiated by individual investigators in areas of interest to the Agency. Research proposals are solicited by (1) the general "Solicitation for Research Proposals," which is published each year and invites proposals in six areas of environmental science and engineering; and (2) the Request for Applications (RFA), which is a more targeted solicitation mechanism that requests proposals in well-defined areas of particular interest to the Agency such as global climate change and hazardous substances. All proposals are subjected to external peer review. In an effort to provide more support to minority institutions for the conduct of basic environmental research, the Research Grants Program makes available pre-application assistance for minority faculty of Historically Black Colleges and Universities (HBCUs) and members of the Hispanic Association of Colleges and Universities (HACU) through its Minority Institutions Assistance Program.

The Environmental Research Centers Program: This program has two components: the Academic Research Centers Program (ARC) and the Hazardous Substance Research Centers Program (HSRC). Within ARC, a competition was held to select four new academic research center consortia, which began operations in 1992. The lead institutions are Massachusetts Institute of Technology, University of Maryland, Michigan Technological University, and University of California, Davis.

The HSRC program started with the establishment of five university-based consortia to conduct Superfund research, training, and technology transfer. The lead institution for each consortium is as follows: the New Jersey Institute of Technology for Region Pair 1/2, the University of Michigan for Region Pair 3/5, Louisiana State University for Region Pair 4/6, Kansas State University for Region Pair 7/8, and Stanford University for Region Pair 9/10.

The Small Business Innovation Research (SBIR) Program: Mandated by Public Law 97-219, which requires EPA to devote 1.5 percent of its extramural research and development budget to small business innovation research, the SBIR Program supports, via contracts, small businesses for the development of ideas relevant to EPA's mission. The program focuses on projects in pollution control development. It also receives 1.5 percent of the Agency's resources devoted to extramural Superfund research.

The Visiting Scientists Program: Components are (1) an Environmental Science and Engineering Fellows Program and (2) a Resident Research Associateship Program. Each year, under summer fellowships, the Fellows Program supports ten mid-career post-doctoral scientists and engineers at EPA headquarters and regional offices. The Research Associateship Program attracts national and international scientists and engineers to EPA research laboratories for up to three years to collaborate with Agency researchers on important environmental issues.

In addition to the above core programs, OER administers other programs which are also important to the accomplishment of its goals. They include:

A Minority Fellowship Program: Awards fellowships to college seniors and graduate students enrolled on a full-time basis at Historically Black Colleges and Universities and member institutions of the Hispanic Association of Colleges and Universities who are majoring in curricula that could be applied to the solution of environmental problems.

A Minority Summer Intern Program: Gives recipients of fellowships under the Minority Fellowship Program hands-on experience in the area of their academic training through a summer internship at EPA or some other environmental organization.

The Agency's Senior Environmental Employment Program (SEE): Uses the skills and talents of older Americans to provide technical assistance in environmental programs throughout EPA.

The Federal Workforce Training Program: Coordinates ORD's participation in workforce training programs used by state and local governments.

An Experimental Program to Stimulate Competitive Research (EPSCoR): Dedicated to stimulating better research and developing better researchers in those states which have traditionally been relatively unsuccessful in garnering federal research support.

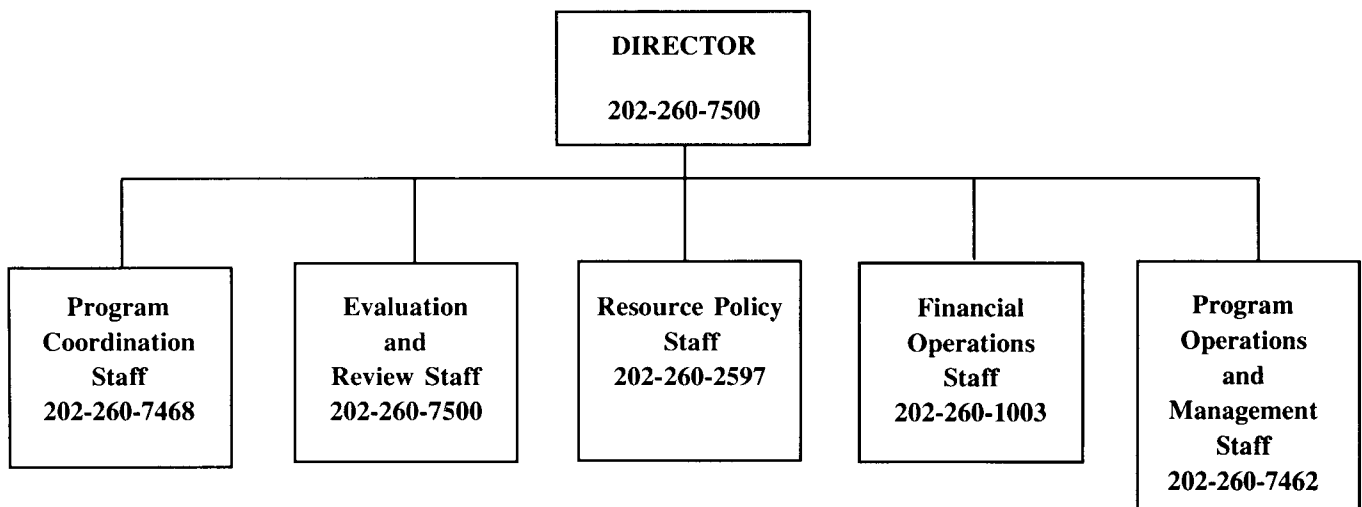
Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
Robert E. Menzer, Acting Director	202-260-5750	
Science Review Administration		
Clyde Bishop	202-260-5727	Environmental biology research grants; environmental health research grants
Deran Pashayan	202-260-2606	Air chemistry and physics research grants; EPSCoR
Louis Swaby	202-260-7445	Water chemistry and physics research grants; engineering research grants
Program Analysis		
Virginia Broadway	202-260-7664	Minority institution assistance; minority student fellowships
Alvin Edwards	202-260-7663	Program operations; minority summer internships; research associateships
Ted Just	202-260-2618	Workforce development
Susan Street	202-260-4331	Workforce development
Robert Papetti, Director	202-260-7473	Exploratory research grants; socioeconomic research grants
Karen Morehouse, Director	202-260-5750	Academic Research Centers; centers and special programs
Dale Manty, Program Manager	202-260-7454	Superfund research centers; Hazardous Substance Research Center Program
Patricia Powers, Director	202-260-2573	Senior Environmental Employment Program; workforce development
Donald Carey, Program Manager	202-260-7899	Small Business Innovation Research

Office of Research Program Management



Clarence E. Mahan has been the director of the Office of Research Program Management since April 1986. From 1983 to 1986, he was associate comptroller for EPA. Before that, he spent a year as the director, Office of Fiscal and Contracts Management. He held several positions with the Army, the Air Force, and the Department of Energy. Mr. Mahan received an MBA degree from Syracuse University, a master's in history from American University, and a bachelor's from the University of Maryland. He has received the Presidential Rank of Meritorious Executive Award.



Office of Research Program Management

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Functions

The Office of Research Program Management (ORPM) is the principal staff office to the Assistant Administrator on matters of budgeting, accountability, program planning, analysis, review, integration and coordination, resource management, organizational and manpower management, environmental compliance, policy development and analysis, and administrative management services.

ORPM develops and implements the planning process in ORD and assures that the budget requests to the Agency, OMB, and Congress respond to the regulatory and program needs of EPA and anticipate future environmental research necessary to address emerging issues.

ORPM manages the overall budget execution of all ORD resources, including directing plan development for headquarters and field facilities; tracking, monitoring, and analyzing changes, and expenditures; and similar budget management and analysis functions. These activities operate simultaneously and concurrently to cover three budget cycles, i.e., current year, planning year, and budget year during any given fiscal year.

ORPM is responsible for implementation and oversight for ORD of the Agency's Integrated Financial Management Systems (IFMS). These functions include ensuring proper maintenance, accuracy, and adequacy of the system to meet the various and complex requirements of ORD entities in fulfilling their budget, operating, financial, and management needs.

ORPM conducts policy/program reviews at the request of the Assistant Administrator. It develops and implements strategies to promote integrity, effectiveness, and efficiency in ORD's business management practices.

ORD-wide accountability framework is maintained through developing, monitoring, and analyzing internal and external management reviews.

Policy/program reviews requested by the laboratory directors and office directors are conducted to enhance their operations.

ORPM has national responsibility for human resource management (HRM) programs within ORD. The continuing need and validity of these programs is tested against an ongoing strategic planning process. The ORD Comprehensive Human Resource Plan provides the basis for this process. The plan is to address long-term scientific and engineering objectives in an expanding environmental agenda. The stra-

tegic HRM plan, as defined by the Assistant Administrator for ORD, is to develop options on how ORD can better meet its objectives to attract and retain highly qualified scientists and engineers.

Infrastructure Management

Responsibility for keeping ORD's infrastructure strong to ensure that ORD's science can be performed also rests with ORPM. In this area, ORPM provides administrative direction for all functions related to facilities planning and engineering needs at ORD laboratories. This includes the collection of needs and the management of the analyses required to determine priorities of new construction projects, maintenance projects for facilities, compliance of ORD facilities with environmental regulations, and ensuring that ORD facilities have health/safety programs to ensure that employees are not exposed to harmful working conditions.

ORPM also oversees the scientific equipment program. This ensures that the need for new and replacement equipment is addressed during the budget process and the existing inventory of scientific equipment is managed in a defensible fashion so that ORD's budget requests are supportable.

Information Management

ORPM is responsible for ensuring that activities carried out by ORD comply with federal and EPA policies and regulations concerning the maintenance, acquisition, and management of all hardware and software required for data processing. This responsibility includes directing and managing the planning and budgeting for all ORD information systems and the technology needed to support these systems. Information needs are coordinated across ORD and data is integrated where feasible to eliminate unnecessary duplication.

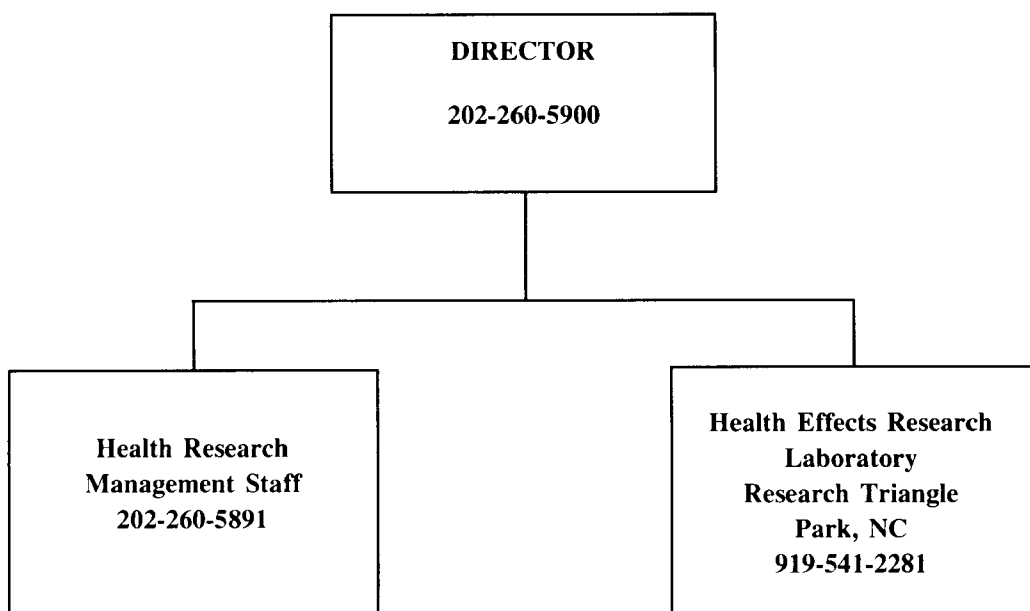
Administrative Management and Analysis

ORPM also provides an ORD-wide oversight function in the following areas: developing policy for contracts, grants, and cooperative agreements; developing and executing the budget for the Office of the Assistant Administrator and associated staff offices; managing the ORD policy and procedures program; managing, coordinating, and staffing the ORD Awards Committee activities; coordinating the review of GAO and Inspector General audits, Agency's reorganization and delegation proposals, Freedom of Information Act requests, and overseeing the Federal Manager's Financial Integrity Act responsibilities. In addition, ORPM coordinates all international travel requests and manages the system which provides reports on all activities.

Office of Health Research



Ken Sexton received his doctorate in environmental health sciences from Harvard University, where he was the recipient of both the Du Pont fellowship and a clinical epidemiology training grant. Before coming to EPA, Dr. Sexton was director for scientific review at the Health Effects Institute in Cambridge, Massachusetts, and prior to that he was director of California's Indoor Air Program. Dr. Sexton is currently co-chairman of the U.S./Canadian Binational Human Health Issues Committee, chairman of the Federal Interagency Task Force on Air Pollution Research, chairman of the Federal Interagency Working Group on Environmental Cancer and Heart and Lung Disease, and chairman of the Federal Interagency Task Force on Human Exposure Assessment. He has published extensively in the scientific literature on human exposures to environmental agents, research to improve health risk assessment, and the role of science in environmental policy and regulatory decisions.



Office of Health Research

Ken Sexton, Director

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Program Activities

The goals of the Office of Health Research (OHR) are

- (1) Hazard identification,
- (2) Dose response assessment,
- (3) Development of chemical-specific information.

These three goals serve as the core around which each of the media-specific programs are planned and implemented. Below is a brief description of the health issues which are being addressed in OHR's research program.

Air: In the air health research program major efforts are being directed at providing dose-response data for use in quantifying the health risk resulting from exposure to the criteria pollutants. This research is being conducted using animal toxicology studies and both human clinical and epidemiological studies and develops data describing the effects of exposure to these pollutants on pulmonary function, changes in host defense functions (immunotoxicity), cardiovascular disease, and neurological function. Research is also developing better methods to determine the deposition of pollutants in the lung in order to improve our risk assessment capabilities. Research on hazardous air pollutants is focused on determining the potential mutagenic and carcinogenic hazard of VOCs and mixtures of air pollutants. The indoor air health

effects research program is focusing on developing methodology and data to evaluate the effects, both cancer and non-cancer, from exposure to combustion emissions from kerosene heaters, wood stoves, environmental tobacco smoke, and other sources of indoor air pollution.

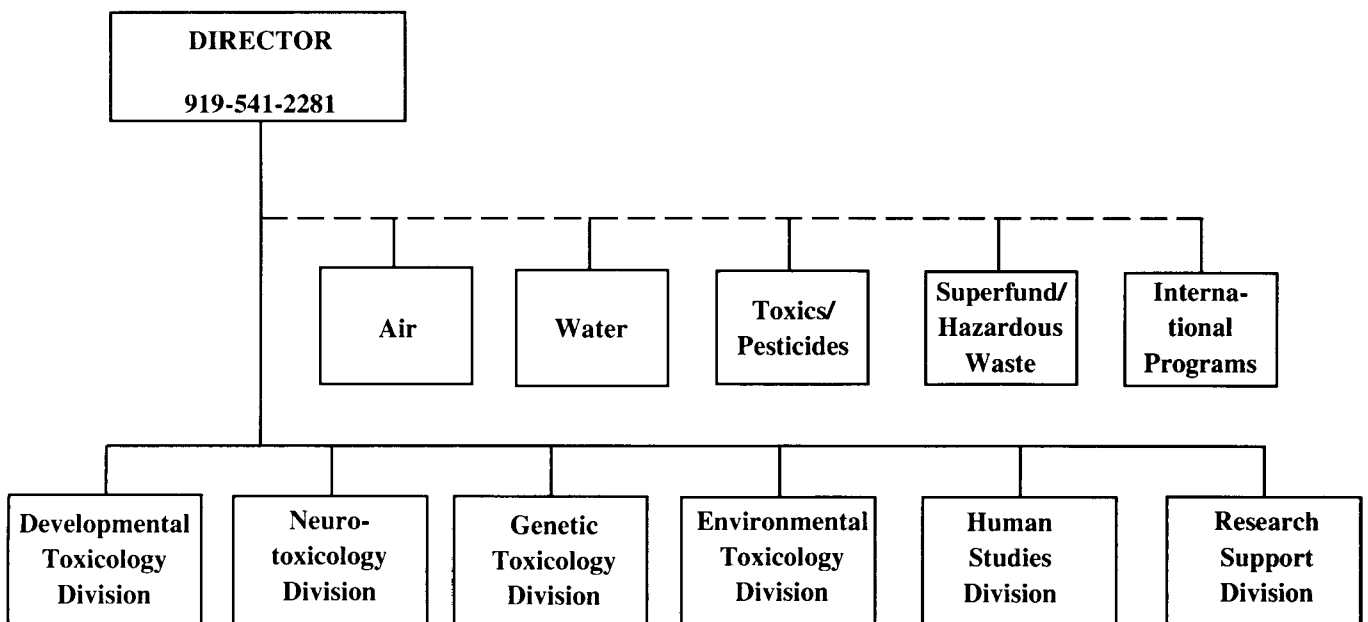
Water: The primary focus of the drinking water health effects research program is to determine the health effects from the use of various drinking water disinfectants (chlorine, chloramine, ozone). Epidemiology studies are being planned and conducted to determine the relationship between water disinfection and both cancer and reproductive effects. These methods are used to identify and isolate the biologically active components or chemicals from drinking water concentrates for further in-depth health characterization. Dose-response studies are also being conducted on drinking water disinfection byproducts to support the development of drinking water standards.

Pesticides and Toxics: The pesticides and toxic substances research program develops test methods for determining the health effects from pesticides and commercial chemicals, developing both animal and human biomarkers to improve our understanding of exposure-dose relationships and to apply these methods in biochemical epidemiology studies, research to determine the potential health effects from microbial pesticides and genetically engineered organisms and research to develop structure activity relationship models to support TSCA section 5.

Health Effects Research Laboratory



Lawrence W. Reiter has been the director of the Health Effects Research Laboratory since April 1988. Prior to being named director of the laboratory, Dr. Reiter was director of HERL's Neurotoxicology Division. Earlier in his career, he was responsible for centralizing the neurotoxicology research program for the Agency and received an EPA Bronze Medal in 1979 for his role in this effort. Dr. Reiter also has received two Special Achievement Awards and the Agency's Scientific and Technological Achievement Award. Dr. Reiter serves on the editorial board of three professional journals and is an internationally recognized neurotoxicologist who has been involved in a variety of activities to define and implement national priorities for environmental health research in this area. He earned his Ph.D. in neuropharmacology from the University of Kansas Medical Center in Kansas City. Before joining EPA in 1973 as a research pharmacologist, he was a post-doctoral fellow and lecturer in environmental toxicology at the University of California-Davis.



Health Effects Research Laboratory

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The Health Effects Research Laboratory formulates and implements a comprehensive research program to investigate the human health effects resulting from exposure to environmental pollutants. Staffed by health scientists with recognized expertise in a variety of disciplines—environmental medicine, physiology, epidemiology, statistics, biochemistry, neurotoxicology, toxicology, teratology, perinatal toxicology, geriatric toxicology, pulmonary toxicology, immunotoxicology, cardiovascular toxicology, genotoxicology, hepatotoxicology, and microbiology—HERL is the focal point for toxicological, clinical, and epidemiological research within the Agency. HERL also establishes cooperative research projects with academic and other scientific institutions which facilitate the Agency efforts in understanding the health effects of environmental pollutants. This research program develops and applies state-of-the-science biological assays, predictive models, and extrapolation methods which serve as the basis for the Agency's health risk assessments.

HERL consists of six divisions. Most of the research facilities are located in the Research Triangle Park, North Carolina. HERL has one of the nation's few sophisticated human inhalation exposure facilities, located on the campus of the University of North Carolina at Chapel Hill.

Research at HERL is being conducted in the following areas:

- **Oxidants:** Develop a database for use in regulatory decision making on the health effects of O₃ and NO₂ exposure by conducting human clinical, epidemiologic, and animal studies. Models are also being developed to quantitatively extrapolate animal data to humans.
- **Hazardous Air Pollutants (HAP):** Develop and validate techniques to evaluate the toxic effects of HAPs, produce dose-response data on the toxic effects of HAPs and develop models which improve our ability to use toxicological data in risk assessments.
- **Mobile Sources:** Provide quality health data on the effects of vehicle fuels and additives, including methanol and exposure to CO and develop methods for obtaining dose-response data for use in risk assessments for regulatory purposes.
- **Superfund:** Develop and evaluate dose-response data, extrapolation models, and test methods on complex mixtures to reduce uncertainties in risk assessment.
- **Gases and Particles:** Develop a database for use in regulatory decision making on the health

effects of SO₂, particles and lead by conducting human clinical, epidemiologic, and animal studies. Models are also being developed to extrapolate animal data to humans and to provide information on the relationship between particle size and lung deposition in man.

- **Water Quality:** Evaluate methods to assess health hazards associated with complex mixtures arising as discharges from publicly owned treatment works.
- **Municipal Wastewater:** Provide data and appraisal documents on health aspects of land application of municipal sludge and use of renovated wastewater for a source of drinking water.
- **Drinking Water:** Provide health effects information for drinking water standards and health advisories with special emphasis on hazards posed by drinking water disinfectants (chlorine, chloramine, chlorine dioxide, and ozone) utilizing state-of-the-art toxicologic and epidemiologic methodologies.
- **Hazardous Waste:** Evaluate the health effects of emissions and residues from hazardous waste incineration (HWI) and municipal waste combustion (MWC).
- **Pesticides:** Develop methodologies and generate data for the assessment of health risks from pesticides; define environmental and health endpoints for future test methods. Studies are also being carried out on health effects of biological and bioengineered pesticides.
- **Indoor Air Research** (with an emphasis on combustion products, multiple chemical sensitivity, VOCs, and environmental tobacco smoke): Apply results of the research to the development of health risk assessments.
- **Improved Health Risk Assessments:** Develop a systematic and integrated approach to improve the health risk assessment process.
- **Toxic Chemical Testing and Assessment:** Develop and validate test methods for identifying health hazards under the Toxic Substances Control Act (TSCA). Study relationship between chemical structure and toxicologic activity. Carry out human epidemiological studies on hazardous chemicals. Also, evaluate human health hazards of bioengineered materials.

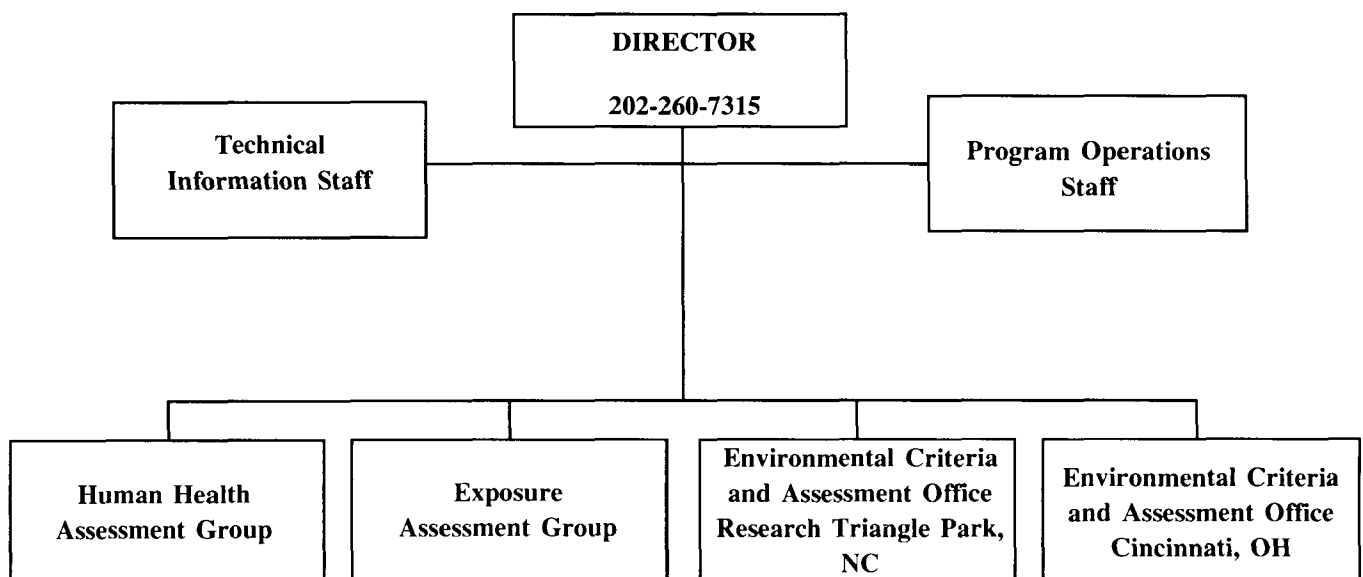
Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
Lawrence W. Reiter, Director	919-541-2281	Health effects of environmental pollutants
Harold Zenick, Deputy Director	919-541-2283	Health effects of environmental pollutants
Michael D. Waters, Assoc. Lab Director	919-541-2537	International programs
Elaine C. Grose, Assoc. Lab Director	919-541-3844	Health effects of pesticides/toxic substances
Fred Hauchman, Assoc. Lab Director	919-541-3893	Health effects of water pollutants
Ila L. Cote, Assoc. Lab Director	919-541-3644	Health effects of air pollutants
Robert S. Dyer, Assoc. Lab Director	919-541-2760	Health effects of hazardous waste and Superfund chemicals
John J. Vandenberg, RIHRA Director	919-541-4527	Coordinator for RIHRA program
Developmental Toxicology Division		
Robert J. Kavlock	919-541-2771	Reproductive toxicology
Sally P. Darney	919-541-3826	Reproductive physiology
John M. Rogers	919-541-5177	Perinatal toxicology
Environmental Toxicology Division		
Linda S. Birnbaum	919-541-2655	Pharmacokinetics and toxicology
Daniel L. Costa	919-541-2531	Pulmonary toxicology
James D. McKinney	919-541-3585	Chemistry and metabolism
Mary Jane Selgrade	919-541-2657	Immunotoxicology
Genetic Toxicology Division		
Larry D. Claxton, Acting Director	919-541-2329	Genetic toxicology
Stephen Nesnow	919-541-3847	Chemical carcinogenesis
Joellen Lewtas	919-541-3849	Genetic toxicology of complex mixtures
Martha M. Moore	919-541-3933	Mammalian mutagenesis
Human Studies Division		
Hillel Koren	919-966-6200	Human inhalation toxicology
Tim Gerrity	919-966-6206	Inhalation dosimetry
Jack Griffith, Acting Chief	919-966-7549	Epidemiology
Neurotoxicology Division		
Hugh A. Tilson	919-541-2671	Neurotoxicology
Robert C. MacPhail	919-541-7833	Behavioral toxicology & pharmacology
William K. Boyes	919-541-7538	Neurophysiological toxicology
Joseph S. Ali	919-541-2240	Electrical engineering
Research Support Division		
Ann Akland	919-541-2883	Program operations and administration
John Creason	919-541-2598	Multivariate analysis
Barry Howard	919-541-2729	Special Studies/Technical Support
Kenneth P. Laws	919-541-5744	Management Information System
Kathy Driver	919-541-7932	Program operations

Office of Health and Environmental Assessment



William H. Farland is the director of the Office of Health and Environmental Assessment. He has been with EPA since 1979 and served as deputy director, Health and Environmental Review Division, Office of Toxic Substances, before joining ORD in 1986 as director of the Carcinogen Assessment Group. He received a Ph.D. and master's degree from the University of California, Los Angeles, and a bachelor's degree in biology from Loyola University. He was a National Cancer Institute Postdoctoral Fellow (National Research Service Awardee), at the University of California, Irvine, California, and Brookhaven National Laboratory, Upton, New York.



Office of Health and Environmental Assessment

William H. Farland, Director

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The Office of Health and Environmental Assessment (OHEA) is EPA's focal point for the scientific assessment of the degree of risks imposed by environmental pollutants on human health and ecological systems. OHEA occupies a critical position in the Office of Research and Development (ORD) between (1) the researchers in other ORD components who are generating new findings and data, and (2) the regulators in the EPA program offices and regions who must make regulatory, enforcement, and remedial action decisions. In support of its mission to provide the Agency with assessments of risk to human health and the environment, OHEA carries out three functions:

- Prepare human health risk assessments that serve as the scientific bases for regulatory and enforcement decisions within the Agency.
- Promote Agencywide coordination and consistency of risk assessments by preparing guidelines, providing expert advice, reviews, and data analyses, and participating in regulatory decision processes; be a spokesperson to the public, other federal agencies, and internationally for environmental risk assessment.
- Advance the science of risk assessment through research planning with the scientific community. OHEA plans research projects that are carried out by its own programs and other ORD organizations.

OHEA's four laboratory-level field components implement the health science program; three support units provide administrative, planning, and information management support.

Program Activities

Air

- Develop air quality criteria documents that provide the scientific bases for setting and revising National Ambient Air Quality Standards (NAAQS).
- Develop health risk assessments for hazardous air pollutants from stationary and mobile sources to provide the scientific foundations of rulemakings under the 1990 Clean Air Act Amendments (CAAA), Titles II and III.
- Provide expert scientific consultation to (a) the Office of Air and Radiation for CAA imple-

mentation, and (b) federal interagency groups and international organizations on health and ecological effects of air pollutants and global climate change.

- Develop research for criteria air pollutants and mobile sources.
- Assess risks from indoor air pollutants.

Water

- Assess the health effects of exposure to drinking water contaminants.
- Assess the risk of human exposure to toxic chemicals, and evaluate site-specific health hazards for ambient waters.
- Provide risk assessment methodologies for chemicals and pathogens in the use and disposal of municipal sludge.

Hazardous Waste

- Provide documents to support RCRA 3001 listing decisions and the land disposal restriction program in the form of reference dose documentation.
- Develop methods for assessing risks from hazardous and municipal waste treatment and disposal techniques and waste minimization options.
- Develop PC-based systems that will permit risk assessors to conduct risk assessments.

Pesticides and Toxic Chemicals

- Assist the Office of Pesticide Programs in health risk assessments for cancer, mutagenicity, reproductive and developmental effects, and exposure assessment.
- Assist the Office of Pollution Prevention and Toxics in health risk assessments and exposure assessment.
- Develop risk assessment methods for effects in humans caused by exposure to environmental chemicals.

Multimedia

- Support exposure and risk assessment regulatory decisionmaking by EPA.

- Plan and fund research to reduce uncertainty in risk assessments.
- Provide consensus information on reference doses (RfDs), inhalation reference concentrations (RfCs), or Agency agreed-upon quantitative risk estimates of carcinogenicity for IRIS.
- Provide leadership in reassessing dioxin.

Superfund

- Assist EPA offices and regions in evaluating Superfund alternative courses of action.
- Operate a Technical Support Center for health risk assessments.
- Provide health assessments to support needs for the remedial planning and cost recovery efforts.
- Provide data on carcinogenicity and chronic effects to support activities necessary to adjust the reportable quantities for hazardous substances.
- Conduct research to fill information and assessment gaps in the Superfund public health evaluation process.

Issues

OHEA assures consistency and high scientific quality in the risk and exposure assessments conducted in other parts of the Agency.

Issues Related to Conducting Risk Assessments

OHEA's work on the lead criteria document brought about its involvement in several other areas such as:

- the development of the Maximum Contaminant Level in drinking water,
- the development of comparative risk assessment methods and techniques for assessing potential impacts to human and ecological health,
- the development of the lead biokinetic model,
- involvement in the Congressionally mandated study of effects of lead in children and in its removal from soils in urban areas,
- participation in the Interagency Lead Task Force activities,
- the lead role in developing the ORD research plan and budget for lead and other heavy metals, and
- a role in evaluating whether the critical health effect of lead is its carcinogenic potential or its neurological effects.

As a result of the CAAA of 1990, OHEA assesses risks from acid aerosols. OHEA's assessment of health hazards associated with exposure to environmental tobacco smoke is an example of the indoor air issue.

Issues Related to Risk Assessment Research

OHEA provides direction to research efforts in risk assessment. ORD is pursuing research efforts in understanding ecological risk and in improving exposure assessment. Pharmacokinetics, model validation, and reducing the uncertainty in exposure assessment are areas of future research.

OHEA assesses environmental risk and develops techniques for comparing risks of different remedial strategies and risk reduction techniques.

OHEA is an important client for research conducted by the other ORD offices and helps plan research to be conducted by ORD. The result of such enhanced planning will be research findings that are better targeted to the needs of the risk assessors.

Issues Related to Providing Guidance and Consistency to Agency Risk Assessment Activities

OHEA develops risk assessment guidelines under the Risk Assessment Forum. Five guidelines were published in 1986. During the past year, the guidelines for exposure assessment and developmental toxicity risk assessment were revised and reissued. Revised guidelines are under development for carcinogen risk assessment, reproductive toxicity, and quantitative approaches for chronic toxicity. OHEA is involved in preparing the first-ever ecological risk assessment guidelines.

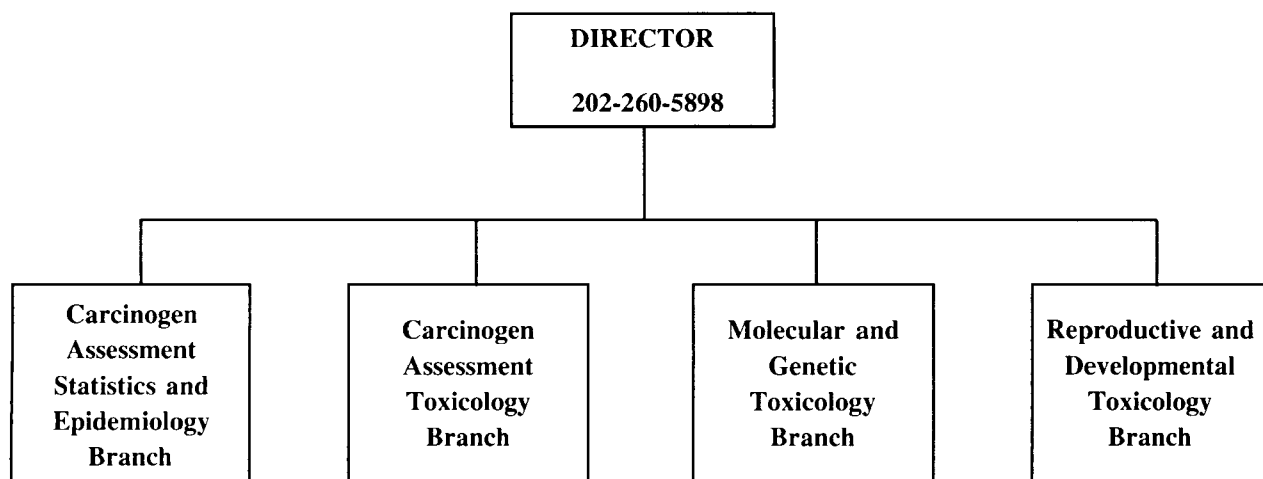
In managing the flow of risk assessment information, OHEA

- Leads discussions of how to coordinate risk analysis activities.
- Demonstrates new approaches for characterizing health risk through its guidelines development, IRIS activities, and risk assessment work.
- Develops non-cancer health effects risk assessments.
- Manages the Integrated Risk Information System.
- Works with OAQPS in managing the Air Risk Information Support Center.
- Has provided the lead support for the Developmental and Reproductive Toxicology Database.
- Has established a Technical Support Center for Health and Risk Assessment for Superfund to provide a contact point for dissemination of health risk assessment information to regional and state officials and private organizations involved in Superfund.

Human Health Assessment Group



Since February 1990, **Hugh W. McKinnon** has been the director of the Human Health Assessment Group. He received his medical degree from the University of Virginia in 1977. He completed the General Preventive Medicine Residency in the School of Hygiene and Public Health at the Johns Hopkins University in Baltimore in June 1989 and received a master of public health degree from that university in 1988. He was appointed as medical officer in the Office of Health Research in 1978 and served as the acting director of that office from November 1985 to May 1987. He has professional memberships in the American Public Health Association and the Federal Physicians Association.



Human Health Assessment Group

Hugh McKinnon, Director

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The Human Health Assessment Group develops human health risk assessments and reviews assessments developed elsewhere in EPA; participates in the development and implementation of EPA's risk assessment guidelines, including guidelines training courses; and performs research to improve health risk assessments. The group also provides advice on the health risks associated with suspected cancer-causing agents and the risks associated with chemicals suspected of causing mutagenic and adverse developmental and reproductive effects. The group plans and implements its own program and provides extensive consultation and technical assistance to others.

The group is composed of four branches:

- ***The Carcinogen Assessment Toxicology Branch*** advises the Agency on the health-hazard potential from suspected cancer-causing agents as interpreted from animal toxicology and pathology data.
- ***The Carcinogen Assessment Statistics and Epidemiology Branch*** advises the Agency on the health-hazard potential from suspected cancer-causing agents as interpreted from epidemiology data and defines and interprets dose-response relationships from both epidemiologic and animal data.
- ***The Reproductive and Developmental Toxicology Branch*** is responsible for advising the Agency on the health risks associated with suspected reproductive and developmental toxicants as interpreted from *in vitro*, experimental animal, and human data.
- ***The Molecular and Genetic Toxicology Branch*** advises the Agency on the health risks associated with suspected genotoxins and provides assessments of the mechanism of action for other branches.

Expertise is provided in the following areas:

- ***Carcinogen Assessment Statistics and Epidemiology***: Health risks associated with suspected cancer-causing agents as interpreted from epidemiology data and the statistical analysis of both human and animal data.
- ***Carcinogen Assessment Toxicology***: Health risks associated with suspected cancer-causing agents as interpreted from animal toxicology and pathology data.
- ***Molecular and Genetic Toxicology***: Health risks associated with suspected genotoxins as interpreted from *in vitro*, experimental animal, and human data; provides a focus on health risk issues related to the molecular and cellular determinants of environmentally induced diseases.
- ***Reproductive and Developmental Toxicology***: Health risks associated with suspected reproductive and developmental toxicants as interpreted from *in vitro*, experimental animal, and human data.
- ***Technical Assistance***: Technical assistance to state and local health and pollution control agencies, regional offices, other U.S. Governmental agencies, and the international community on matters pertaining to health and risk assessments, including assistance to the Agency's Air RISC Support Center and Superfund Technical Support Center; revisions to proposed and final regulations and guidance documents for various agency and regional offices; and risk assessments for EPA program and regional offices and state agencies.

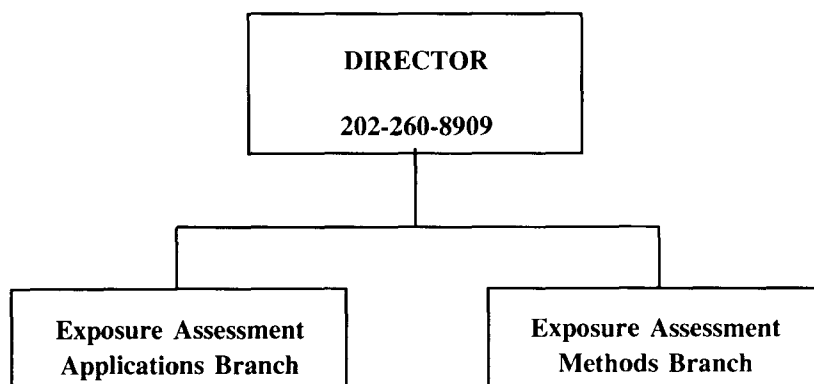
Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
Hugh McKinnon, Director	202-260-5898	Preventive medicine, including environmental and occupational medicine; public health practice; environmental health policy and management
Charles Ris, Deputy Director	202-260-7338	Risk assessment methods; cancer risk assessment; risk assessment/management policy
Robert McGaughy, Senior Scientist	202-260-5889	Risk assessment (all phases) for chemical carcinogens; toxicology; basic physics; spectroscopy; modelling epidemiology; radiation; electromagnetic fields; risk assessment policy
Carole Kimmel, Senior Scientist	202-260-7331	Reproductive and developmental toxicology, neurotoxicity and other noncancer health effects, risk assessment, and modeling; science policy of risk assessment; biomarkers; mechanisms; hyperthermia
Carcinogen Assessment Statistics and Epidemiology Branch		
V. James Coglianò, Chief Steven Bayard David Bayliss Chao Chen Jennifer Jinot Aparna Koppikar Lorenz Rhomberg Cheryl Siegel Scott	202-260-3814	Cancer risk estimation; biostatistics; epidemiology; pharmacokinetics; mathematical modelling; computer simulation; PCBs
Carcinogen Assessment Toxicology Branch		
Jean Parker, Chief Robert Beliles Arthur Chiu Charalingayya Hiremath William Pepelko Dharm Singh	703-308-8597	Toxicologic and carcinogenic effects of agents; risk assessment methodology; pharmacology; metabolism pathology; biochemistry; human physiology
Molecular and Genetic Toxicology Assessment Branch		
Vicki Dellarco, Chief Margaret Chu James Holder David Reese Sheila Rosenthal Larry Valcovic	202-260-7336	Mechanisms of mutagenesis and carcinogenesis; genetic risk assessment; genetics; biochemistry; molecular and cellular biology; biotechnology
Reproductive and Developmental Toxicology Branch		
Babasaheb Sonawane, Chief Eric Clegg Tom Crisp Carole Kimmel Gary Kimmel Sherry Selevan	202-260-1495	Reproductive and developmental toxicology; neurodevelopmental toxicology; experimental design and test methodology issues; qualitative and quantitative approaches to risk assessment

Exposure Assessment Group



Michael A. Callahan has been the director of the Exposure Assessment Group since 1986. His prior experience at EPA includes positions in the Office of Toxic Substances and the Office of Water. He began his career as a chemist with the U.S. Army Research and Development Center. He has been awarded the EPA Gold Medal for Exceptional Service and three EPA Bronze Medals for Commendable Service. He received a master's degree in organic chemistry from George Washington University and a bachelor's degree in chemistry from Northwestern University. He was a primary author of EPA's "Guidelines for Exposure Assessment" in 1992 and has professional membership in both the International Society for Exposure Analysis and the Society for Risk Analysis.



Exposure Assessment Group
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The major responsibilities of the Exposure Assessment Group (EAG) are:

- to provide state-of-the-art methodology, guidance, and procedures for assessing human and ecological exposure to environmental contaminants;
- to ensure quality and consistency in the Agency's scientific exposure/risk assessments;
- to provide independent assessments of exposure and recommendations to the appropriate regulatory offices concerning the exposure potential of specific agents.

Included in the first responsibility are both a research component and a strong tech transfer component. The second responsibility has resulted not only in EAG's development of exposure assessment guidelines, but also in the establishment of a risk assessment review capability that has been used by program offices, regions, and states. The third responsibility requires EAG to put the methods developed into use by actually performing exposure and risk assessments.

The mandate to develop and apply methods to see if they work in "real life" situations has led to a broad diversity

of the work in EAG. EAG is divided into two branches, the Exposure Assessment Methods Branch (EAMB) and the Exposure Assessment Applications Branch (EAAB). Although the focus of EAMB is on methods development, and the focus of EAAB is on applications, personnel from both branches routinely work together in groups to take advantage of the wide expertise and backgrounds of the personnel in both branches.

All of the research EAG does is directed toward advancing the state of the art in exposure assessment and translating these advances into useable tools for exposure/risk assessors. The research is categorized into three general areas: research into "exposure factors," that is, the values for parameters which characterize human or ecological behavior and are needed as input into exposure assessments; research into methods for estimating and evaluating exposure, and the research related to tools, such as software systems, that will allow assessors to use the research in their work.

Just as it is important to do the research into developing methods and tools for doing exposure assessment, it is important to make these results available to end users, in a form they can easily apply to their own work. In this area, EAG has established a wide-ranging program including conducting exposure assessments, providing consultation, reviewing risks assessments for other organizations, and conducting training workshops.

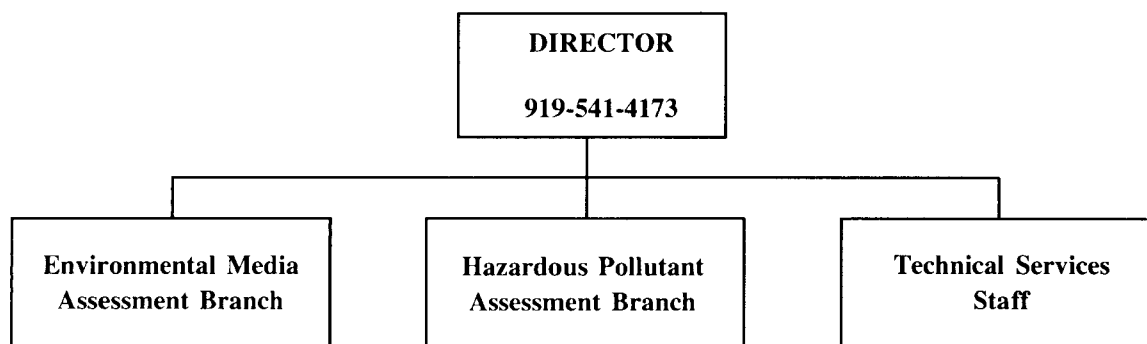
Areas of Expertise

Office of the Director	Telephone	Area of Expertise
Michael A. Callahan, Director	202-260-8909	Chemistry; exposure assessment
Exposure Assessment Applications Branch		
Kevin Garrahan	202-260-2588	Environmental engineering; civil engineering; landfill design; water treatment; hydrology
Jacqueline Moya	202-260-2385	Chemical engineering; fish ingestion; exposure scenarios; reviewing risk assessments; showering exposures
Karen Hammerstrom	202-260-8919	Chemical engineering; dermal exposure; chemical fate and transport
Malcolm Field	202-260-8921	Hydrogeology; karst geology; groundwater investigation and remediation
Sue Norton	202-260-6955	Environmental science; ecological risk assessment; wildlife factors
Anne Sergeant	202-260-9376	Environmental science; soil science; ecological assessments; wetlands; ecological indicators of risk
Amy Long	202-260-8918	Environmental science; dermal absorption
Exposure Assessment Methods Branch		
John Schaum	202-260-5988	Environmental engineering; exposure assessment; dermal exposure; dioxin
Matthew Lorber	202-260-8924	Agricultural engineering; pesticide exposure; fate modeling; PCB; dioxin
Paul White	202-260-2589	Statistics; food ingestion; soil ingestion; uncertainty analysis
Rich Walentowicz	202-260-8922	Biomedical engineering; exposure software; model selection; model validation; pharmacokinetics
Kim Chi Hoang	202-260-2059	Chemical engineering; pharmacokinetics; dermal exposure

Environmental Criteria and Assessment Office—Research Triangle Park



Lester D. Grant has been director of the Environmental Criteria and Assessment Office in Research Triangle Park, North Carolina (ECAO-RTP), since 1978. While with EPA, he has received two EPA Gold Medals, one Silver and one Bronze Medal. Dr. Grant is on the governing board of the Society of Occupational and Environmental Health, and the Scientific Advisory Committee of the Pan American Health Organization's Center for Human Ecology and Environmental Health. He often serves as an invited expert consultant on health effects of air pollution, global climate change, lead, and other heavy metals to various U.S. federal, state, and local agencies and, internationally, to numerous multinational organizations and national governments. From 1970 to 1980, Dr. Grant rose from instructor to associate professor at the University of North Carolina School of Medicine, where he also served as associate director of the Neurobiology Program and as co-director of a major environmental toxicology research program. He received a bachelor's degree from the University of Pittsburgh and masters and Ph.D. degrees from Carnegie-Mellon University. As a postdoctoral fellow (Public Health Service Awardee) at the University of Chicago, Dr. Grant also received specialty training in neurobiology before joining the University of North Carolina faculty.



Environmental Criteria and Assessment Office—Research Triangle Park

Lester D. Grant, Director

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Functions

The mission of the Environmental Criteria and Assessment Office in Research Triangle Park, North Carolina (ECAO-RTP), is the scientific assessment of health and ecological effects of air pollutants, conducted in support of EPA implementation of the Clean Air Act (CAA) and its 1990 Amendments (CAAA). ECAO-RTP also coordinates risk assessments aimed at preventing environmental contamination. ECAO-RTP coordinates preparation of special assessments mandated by Congress or requested by other federal, state, and local agencies, or in support of international cooperative activities. ECAO-RTP: (a) is an Agency focal point for technical information on air pollution sources and exposures and non-cancer health risk assessment methods and results; (b) provides technical transfer assistance to a variety of clients; and (c) identifies knowledge gaps in assessed databases and coordinates development and implementation of research strategies to address such data gaps.

ECAO-RTP is organized into the Environmental Media Assessment Branch (EMAB), the Hazardous Pollutant Assessment Branch (HPAB), and the Technical Services Staff (TSS). ECAO-RTP staff efforts are concentrated in the following areas:

NAAQS Criteria Review: Includes development of air quality criteria documents (AQCDs) that provide the scientific bases for decisions by the EPA Administrator on setting or revising the National Ambient Air Quality Standards (NAAQS) for criteria air pollutants. Preparation of AQCDs, coordinated by EMAB, includes evaluations of health, ecological, and other welfare effects of such pollutants and extensive peer-review.

Air Toxics Assessments/Support: Includes (a) development of health risk assessments to provide scientific foundation for Agency rulemaking under CAAA Titles II and III; (b) development of non-cancer health assessment methodologies for acute and chronic air toxics exposures; (c) consultation to OAR for implementation of CAAA Titles II and III provisions; and (d) operation of the Air RISC Center, which provides hotline response and assistance to EPA regions, states, and local agencies regarding air toxics problems.

Mobile Sources/Alternative Fuels: Includes (a) preparing diesel and other mobile source-related health risk assess-

ments; (b) coordinating development of ORD research strategy and planning documents; and (c) consulting with OMS on rulemaking issues for conventional and alternative fuels.

Indoor Air: Coordinates OHEA inputs to research planning and budgeting activities, prepares Agency risk assessments for indoor air pollutants, maintains the Indoor Air Reference Database and disseminates information to client users, and participates in research on population exposures to indoor air pollutants.

Lead Assessment/Research: Assesses sources and pathways of lead exposure, models lead uptake and biokinetics, evaluates lead health effects and risks, and develops technologies for abatement of lead in paint, soil, water, etc. ECAO-RTP provides consultation on lead issues to all EPA program offices, other federal agencies, states, and local governments, and multinational organizations and national governments.

Research Planning/Coordination: Coordinates (1) development, revision, and Agency representation of long-range plans and budgeting for criteria air pollutants, mobile sources/alternative fuels, lead and other heavy metals and (2) ECAO-RTP representation of OHEA in research planning for air toxics, indoor air, and other issues. Coordinates development of ORD research strategies for national and international research programs for alternative fuels and for tropospheric ozone NAAQS revision and attainment.

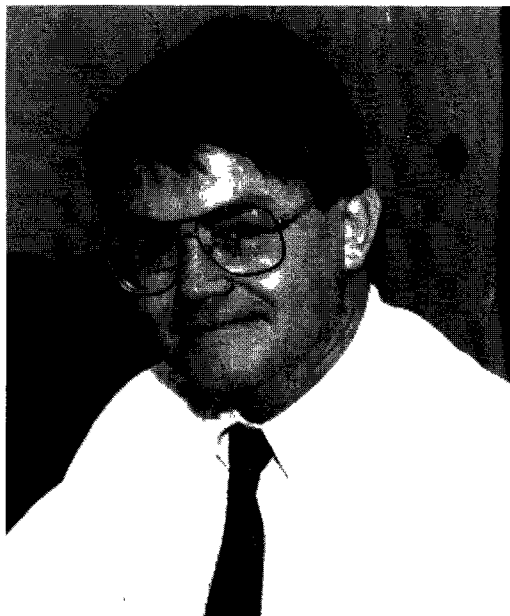
International Activities: Serves as the ORD focal point for cooperative interactions with the Pan American Health Organization. ECAO-RTP contributes to cooperative activities with several international organizations regarding development and revision of international air quality criteria and guidelines. ECAO-RTP provides technical transfer and other types of assistance as part of bilateral interactions with several countries.

Educational Outreach: Participates in (a) developing agreements for cooperative activities with EPA programs and ORD laboratories; (b) recruiting qualified graduates for EPA staff, and (c) identifying research opportunities for University faculty members. ECAO-RTP staff helps develop and teach courses on environmentally-related topics at UNC and other local universities.

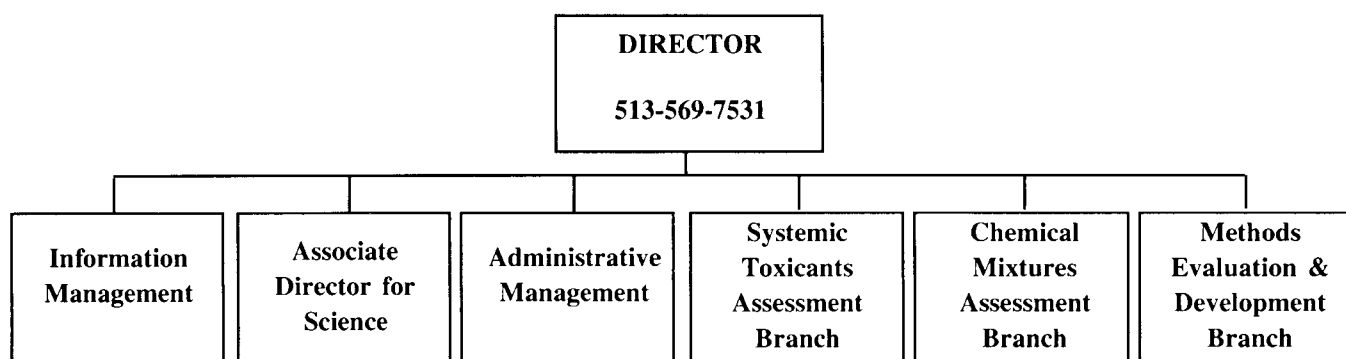
Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
Lester D. Grant, Director	919-541-4173	Health effects of criteria air pollutants, heavy metals, climate change
Michael A. Berry, Deputy Dir.	919-541-4172	Environmental legislation; indoor air pollution
Judith A. Graham, Assoc. Dir.	919-541-0349	Health assessment of toxic air pollutants; criteria air pollutants; mobile sources/alternative fuels
Si Duk Lee	919-541-4477	International collaboration; health risk assessment
Environmental Media Assessment Branch		
Norman E. Childs, Chief	919-541-2229	Criteria air pollutants, indoor air pollution
Beverly M. Comfort	919-541-4165	Pesticides; indoor air pollution
Robert W. Elias	919-541-4167	Heavy metals; exposure modeling
William G. Ewald	919-541-4164	Toxicology; radiation biology
Jasper H.B. Garner	919-541-4153	Ecosystem and vegetation effects
Dennis J. Kotchmar	919-541-4158	Epidemiology and respiratory effects; No _x , PM health effects
James A. Raub	919-541-4157	Respiratory physiology/toxicology; Health effects of carbon monoxide, ozone
Beverly E. Tilton	919-541-4161	Air chemistry; effects of VOCs, No _x , ozone
Hazardous Pollutant Assessment Branch		
Chon R. Shoaf, Chief	919-541-4155	Inhalation toxicology; risk assessment
J. Michael Davis	919-541-4162	Developmental neurotoxicology; lead; alternative fuels & fuel additives, (methanol, etc.)
Gary J. Foureman	919-541-1183	General metabolism; biological chemistry; general toxicology
Jeff S. Gift	919-541-4828	Biologic markers for non-cancer and cancer endpoints; health risk assessment
Mark M. Greenberg	919-541-4156	Organic chemicals; toxicology
Dan J. Guth	919-541-4930	Pulmonary toxicology; inhalation risk assessment
John Hinz	919-541-4154	Inhalation toxicology; health risk assessment
Annie M. Jarabek	919-541-4847	Inhalation toxicology and risk assessment; physiologically based pharmacokinetic modeling
Marsha Marsh	919-541-1314	Environmental health risk assessment, communication

Environmental Criteria and Assessment Office—Cincinnati



Terry Harvey received his doctorate in veterinary medicine at the University of Illinois and subsequently obtained professional, academy recognition in both pharmacology and toxicology. He is licensed to practice in Illinois, Missouri, and Ohio and spent 15 years at the U.S. Food and Drug Administration in Washington where his highest position was deputy director of the Bureau of Veterinary Medicine. Dr. Harvey spent 7 years in the private sector at the Monsanto Company, St. Louis, as an executive in charge of global, biotechnology development of commercial products for health and agricultural applications. In May 1991 he joined the U.S. EPA as the director of the Environmental Criteria and Assessment Office in Cincinnati, Ohio, where one of his responsibilities is the Agency's research planner for federal drinking water research and assessments.



Environmental Criteria and Assessment Office—Cincinnati

Terry Harvey, Director

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The Environmental Criteria and Assessment Office in Cincinnati, OH (ECAO-CIN), in partnership with the Office of Health and Environmental Assessment, provides scientific leadership for risk assessment research and methods development. Specific risk assessments are developed to validate these methods and test hypotheses in new areas. The office performs key risk assessments for chemicals or exposures that further scientific credibility and foster a creative atmosphere for additional research and methods development. Technical assistance and support is provided to enhance the use and effectiveness of the methods and assessments generated within ECAO-CIN. Areas of concentration for the nearterm include: 1) develop risk assessment methods, which provide guidance for evaluating potential risks to human health from exposure to environmental pollutants; 2) evaluate research data which may lead to reducing uncertainties in risk assessment, aid in predicting risk, and enhance our capabilities for comparing one risk with another; 3) prepare scientific assessment documents/health risk assessment reports which provide a defensible basis for setting environmental standards; 4) actively participate in Agencywide workgroups in the planning, development, and implementation of future research strategies for the Agency; and 5) conduct outreach technical initiatives with other federal agencies and the World Health Organization.

These theme areas are addressed by three branches:

- **Chemical Mixtures Assessment Branch:** Provides scientific support for the development of background documentation and technical support necessary to formulate human health risk assessment activities for Agency program offices as mandated by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, the Superfund Amendment and Reauthorization Act (SARA), the Resource Conservation and Recovery Act (RCRA), and the Hazardous and Solid Waste Amendment (HSWA). These assessments establish the basis for regulatory

activities in the Office of Solid Waste and Emergency Response (OSWER) associated with the potential human exposure to environmental pollutants, particularly chemical mixtures. Operates the Superfund Technical Support Center.

- **Systemic Toxicants Assessment Branch:** Provides scientific support for the development of background documentation and technical support necessary to formulate human health risk assessment activities for Agency Program Offices as mandated by the Clean Water Act (CWA), the Safe Drinking Water Act (SDWA), and the Clean Air Act (CAA). These assessments establish the basis for regulatory activities and advisories associated with potential human exposure to environmental pollutants, particularly systemic toxicants. Additionally, the evaluation of risks associated with municipal solid wastes is undertaken. Specific areas of research include risks associated with municipal solid waste recycling, municipal waste combustion (including the assessment of indirect exposures), and comparative risk assessment of municipal waste disposal alternatives and water disinfection.
- **Methods Evaluation and Development Branch:** Initiates and coordinates the development of risk assessment methods and Agency guidelines for chemical mixtures and noncancer health effects, and reviews new methods in response to identified Agency needs. The staff also coordinates input to the Agency's Reference Dose (RfD) and Carcinogen Risk Assessment Verification Endeavor (CRAVE) workgroups, and manages the Integrated Risk Information System (IRIS). These activities help ensure that the Agency's risk assessments remain credible and that state-of-the-art methods are continually evaluated, developed, and implemented.

Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
Terry Harvey, Director	513-569-7531	Risk assessment; veterinary medicine; pharmacodynamics
Steve Lutkenhoff, Deputy Director	513-569-7615	Resource management; information management; environmental education
Rita Schoeny, Associate Dir. for Science	513-569-7544	Carcinogen Risk Assessment Endeavor (CRAVE); polycyclic aromatic hydrocarbons (PAHs)
Debdas Mukerjee,	513-569-7572	Cancer assessments; dioxin; dibenzofurans; PCBs
Kate Mahaffey	513-569-7957	Lead toxicity; toxicity of heavy metals and essential elements; characterization of populations highly susceptible to metal toxicity; food as a source of toxic chemical exposure
Chemical Mixtures Assessment Branch		
Cynthia Sonich-Mullin, Chief	513-569-7523	Superfund/Hazardous Waste Program; applied epidemiology; carbon tetrachloride; asbestos
Bob Bruce	513-569-7569	PAHs; nickel chromium; HEEDs; RQs
Harlal Choudhury	513-569-7536	Reproductive/developmental toxicity; lead; heavy metals
Chris Cubbison	513-569-7599	Less-than-lifetime risk assessments; risk assessment ecology; biostatistics; RQTOX
Joan Dollarhide	513-569-7539	RfD; incineration; Superfund risk assessment; Superfund Technical Support Center
Linda Knauf	513-569-7573	HEAST; statistics; mathematical modeling; hypothesis testing
Becky Madison	513-569-7257	Hazardous waste regulations; risk characterization; regulatory policy
Bruce Peirano	513-569-7540	Mercury; asphalt; pharmacokinetics; quantitative risk assessment
Kenneth Poirier	513-569-7462	Metals; trace elements; manganese; glycol ethers; selenium; RfD/RfC methodology; ammonia; DIMP; essentiality/toxicity; Superfund Technical Support Center
Adib Tabri	513-569-7505	Organic chemistry; pesticides; chlorinated hydrocarbons; carbamates; organophosphates; quality assurance

Superfund Technical Support Hotline 513-569-7300

(continued)

Areas of Expertise

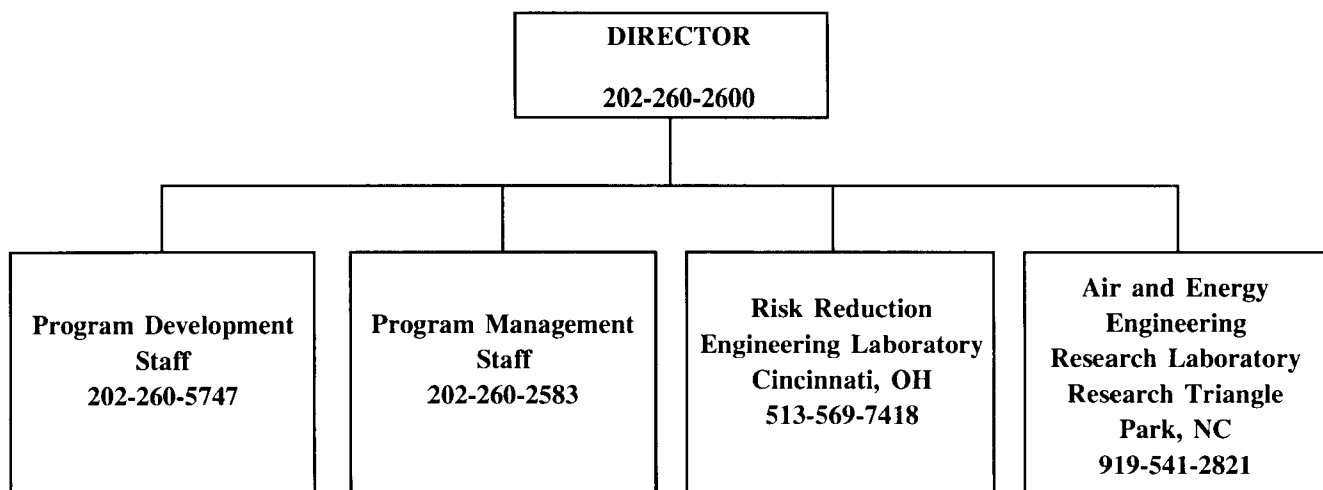
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	Telephone	Area of Expertise
Systemic Toxicants Assessment Branch		
Michael Dourson, Chief	513-569-7533	General toxicology; human health risk assessment; noncancer methods (RfD)
Eletha Brady-Roberts	513-569-7662	Municipal solid waste recycling; stable strontium
John Cicmanec	513-569-7481	Veterinary medicine; dichloro-, hexachloro-, and trichlorobenzenes; ethylene thiourea; PCBs; arsenic; methyl mercury
Charlotte Cottrill	513-569-7221	Risk communication; technology transfer; incineration
Michael Dubowe	513-569-7579	Industrial hygiene; AirRISC; solid waste recycling; incineration; MDA; PERC; methylene chloride
Norman Kowal	513-569-7584	Sludge/pathogens risk assessment; ecologic risk assessment
Carolyn Smallwood	513-569-7425	Endrin; chloramines
Sue Velazquez	513-569-7571	Nickel; silver; manganese; aluminum; boron; inorganics
Methods Evaluation and Development Branch		
Lynn Papa, Chief	513-569-7587	Drinking water disinfectants; beryllium; cyanides; site-specific risk assessments; cardiovascular physiology; RfD methodology
Pat Daunt	513-569-7596	IRIS database
Richard Hertzberg	513-569-7582	Mathematical modeling; biostatistics; chemical mixtures guidelines; dosimetry; noncancer risk assessment; computer programming
Patricia Murphy	513-569-7226	Epidemiology; biostatistical techniques; design analysis; interpretation; fluoride; ionizing/non-ionizing radiation; indoor air; drinking water disinfectants; waterborne disease microbes
Jacqueline Patterson	513-569-7574	IRIS database
David Reisman	513-569-7588	Hexachlorocyclopentadiene; copper; acetone; database development
Glenn Rice	513-569-7813	Incineration; CRAVE; fish consumption
Jeff Swartout	513-569-7811	RfD methodology; database development; IRIS; computer science; LAN technology; toxicology
<i>IRIS User Support: 513-569-7254</i>		

Office of Environmental Engineering and Technology Demonstration



Alfred W. Lindsey is the director of the Office of Environmental Engineering and Technology Demonstration. He has been the deputy director of the Office of Environmental Engineering and Technology Demonstration and the Hazardous and Industrial Waste Division, Office of Solid Waste. He has held various hazardous waste management positions in EPA. Before coming to EPA, he held positions dealing with pollution control, quality control, process engineering, and product development. He received a bachelor's degree in pulp and paper technology from North Carolina State University and did graduate work at Drexel University in environmental engineering and at George Washington University in environmental management.



Office of Environmental Engineering and Technology Demonstration

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The Office of Environmental Engineering and Technology Demonstration (OEETD) is responsible for planning, managing, and evaluating a comprehensive program of research, development, and demonstration of cost-effective methods and technologies to:

- Control and manage hazardous waste generation, storage, treatment, and disposal;
- Provide innovative technologies for response actions under Superfund and technologies for control of hazardous waste spills;
- Control environmental impacts of public sector activities including publicly-owned wastewater and solid waste facilities;
- Improve drinking water supply and system operations, including improved understanding of water supply technology and water supply criteria;
- Characterize, reduce, and mitigate indoor air pollutants, including asbestos and radon; and
- Characterize, reduce, and mitigate acid rain precursors and other air pollutants from stationary sources.

OEETD is also responsible for the development of engineering data needed by the Agency in reviewing pre-manufacturing notices relative to assessing potential release and exposure to chemicals, treatability by waste treatment systems, containment and control of genetically engineered organisms, and the development of alternatives to mitigate the likelihood of release and exposure to existing chemicals.

In carrying out these responsibilities, the office:

- Develops program plans and manages the resources assigned to it;
- Implements the approved programs and activities;
- Assigns objectives and resources to the OEETD laboratories;
- Conducts appropriate reviews to ensure the quality, timeliness, and responsiveness of outputs; and
- Conducts analyses of the relative environmental impacts of engineering methods and control technologies and strategies.

The Office of Environmental Engineering and Technology Demonstration is the focal point within the Office of Research and Development for providing liaison with the Department of Energy on issues associated with clean coal

and energy development. It is also the focal point within the Office of Research and Development for liaison with the rest of the Agency on issues relating to engineering research and development, and control of pollution discharges.

Program Activities

Air

- SO_x and NO_x control technologies (LIMB, ADVACATE, REBURNING).
- Hazardous air pollutant control technologies.
- Indoor air source characterization and control technologies
- Ozone attainment—control of VOC emissions from products.
- Global Climate—Stratospheric Modification.

Water Quality

- Municipal sewage innovative and alternative wastewater and sludge technologies.
- Toxicity treatability protocols for wastewater treatment processes.
- Storm and combined sewer overflow control technologies.

Drinking Water

- Disinfection technologies, including evaluation of byproducts.
- Water quality problems in distribution systems, e.g., lead solder.
- VOCs, pesticides, and radionuclides treatment technologies.

Hazardous Wastes/Superfund

- Pretreatment technologies for land disposal.
- Waste minimization technologies and clearinghouse.
- Land disposal technology, including air emissions.
- Incineration of hazardous wastes and municipal solid wastes.
- Cleanup technologies for leaking underground storage tanks.
- Superfund Innovative Technology Evaluation program (SITE).

- Evaluate cleanup technologies for Superfund sites.
- Municipal solid waste and sludge innovative technology evaluations (MITE).
- Evaluate technologies for sludge and municipal solid waste disposal.

Pesticides

- Personal protection technology for applicators.

Radiation

- Radon mitigation technologies for schools and homes.

Toxic Substances

- Toxicity assessment methodology for pre-manufacturing notices.
- Asbestos abatement technologies for schools and tall buildings.
- Risk management for genetically engineered microorganism manufacturers.



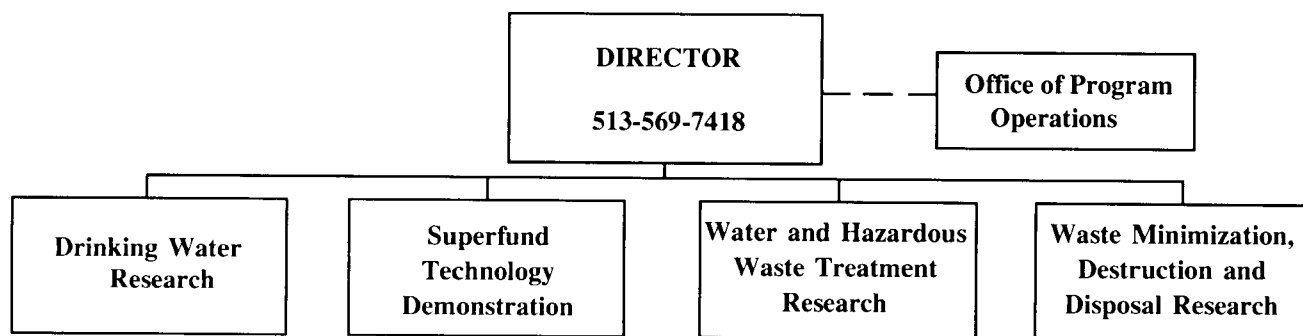
Areas of Expertise

	Telephone	Area of Expertise
Marshall Dick	202-260-2583	Radon; indoor air; global climate; stratospheric ozone; air toxics; air pollution; energy; toxics; asbestos; pesticides; municipal solid waste
Bala Krishnan	202-260-2583	Hazardous waste
Richard Nalesnik	202-260-2583	Superfund alternative treatment technologies; innovative technology evaluation; technical assistance response team; underground storage tanks; medical waste
Don Tang	202-260-2583	Municipal wastewater; industrial wastewater; stormwater and combined sewer overflow; constructed wetlands; drinking water
Michael L. Mastracci	202-260-5748	Commercialization of environmental technologies: - National Environmental Technology Applications Corporation - Alternative procurement and investment incentive mechanism - Interagency coordination
Kurt Jakobson	202-260-5748	Oil spills; bioremediation
Paul Shapiro	202-260-5748	Pollution prevention
Myles Morse	202-260-5748	Pollution prevention; international cleaner production; alternative treatment technologies; technical information transfer; data networking
Curtis Harlin	202-260-5748	Alternative treatment technology information center; Superfund; drinking water treatment; municipal wastewater treatment

Risk Reduction Engineering Laboratory



E. Timothy Oppelt is the director of the Risk Reduction Engineering Laboratory. Mr. Oppelt has held managerial positions in EPA in such diverse components as the Municipal Environmental Research Laboratory, Hazardous Waste Engineering Research Laboratory, and the Waste Management Division of Region V, EPA. Mr. Oppelt's academic degrees are: bachelor's in civil engineering and master's in sanitary engineering from Cornell University; and an MBA from Xavier University, Cincinnati, Ohio. He holds EPA's Bronze and Silver Medals.



Risk Reduction Engineering Laboratory

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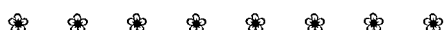
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The mission of the Risk Reduction Engineering Laboratory (RREL) is to advance the understanding, development, and application of engineering solutions for the prevention or reduction of risks from environmental contamination. This mission is accomplished through basic and applied research studies, engineering technology evaluations, new process development, and demonstration studies designed to:

- Enhance our understanding of environmental engineering technology design, performance, and operation.
- Anticipate engineering control and prevention measures for environmental problems not of immediate regulatory or enforcement concern.
- Provide a sound scientific basis for development and enforcement of environmental regulations, standards, guidelines, and policy decisions in areas for which EPA is responsible.
- Foster the development, evaluation, and commercialization of improved and innovative environmental engineering technology in collaboration with industry.
- Provide a basis for technical assistance and engineering support to EPA, other government organizations, and private industry regarding the implementation of environmental regulations, standards, and guidelines.

Research development and technical support are provided in the following specific areas of concern:

- Treatment, distribution, and preservation of safe public drinking water supplies.
- Treatment, disposal, recycling, and minimization alternatives for hazardous wastes, municipal solid wastes, and medical wastes.
- Technologies for remedial action at uncontrolled hazardous waste sites and for corrective action at existing hazardous waste facilities.
- Detection and remedial action for leaking underground storage tank facilities.
- Alternatives for controlling the release of asbestos, existing and new chemicals in manufacturing, and emissions from biotechnology operations.
- Alternatives for remediation of oil spills.
- Engineering alternatives for disposal of canceled and suspended pesticides and for minimizing worker exposure to pesticides.
- Prevention, treatment, and control of municipal and industrial wastewater discharges, sludges, and urban runoff pollution.
- Pollution prevention through industrial process change, product substitution, development of clean products, and clean technology.



Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
E. Timothy Oppelt, Director	513-569-7418	Hazardous waste management
John J. Convery, Deputy Director	513-569-7896	Municipal wastewater treatment
Alden G. Christianson, Special Assistant to the Director	513-569-7997	Pollution control research administration
Drinking Water Research Division		
Robert M. Clark, Director	513-569-7201	Drinking water treatment
Walter Feige	513-569-7496	Drinking water management
Thomas J. Sorg	513-569-7370	Drinking water inorganics control; radionuclides
Donald Reasoner	513-569-7234	Drinking water microbiological treatment
H. Paul Ringhand	513-569-7450	Organics control; disinfection byproducts
Benjamin W. Lykins	513-569-7460	Drinking water field evaluations; costs

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Areas of Expertise

	Telephone	Area of Expertise
Richard J. Miltner	513-569-7403	Disinfection byproducts; disinfectant applications; GHC adsorption
Michael R. Schock	513-569-7412	Corrosion; lead/copper
Kim R. Fox	513-569-7820	Inorganics control; small systems
Lewis Rossman	513-569-7603	Distribution systems and modeling
Jeffrey Adams	513-569-7835	Membrane technology
James Goodrich	513-569-7605	Small systems; field applications
Superfund Technology Demonstration Division		
Robert A. Olexsey, Director	513-569-7861	Superfund engineering technology, division activities
John S. Farlow*	908-321-6635	Superfund releases control
Benjamin L. Blaney	513-569-7406	Superfund technical assistance
Donald E. Sanning	513-569-7875	International remedial technology
Frank Freestone*	908-321-6632	Technical support program management for vacuum extraction; soil vapor extraction; national/international land reclamation
John F. Martin	513-569-7758	SITE demonstration and evaluation activities
Laurel J. Staley	513-569-7863	Innovative thermal treatment
Paul dePercin	513-569-7797	Vacuum extraction, soil vapor extraction
Gordon M. Evans	513-569-7684	Superfund cost estimation
Jackson S. Hubbard	513-569-7507	Mining sites
Norma M. Lewis	513-569-7665	Chemical oxidation; UV/ozone
Naomi P. Barkley	513-569-7854	Redevelopment of land; debris washing
Ronald F. Lewis	513-569-7856	Bioremediation
Randy A. Parker	513-569-7271	Electrokinetics
Water and Hazardous Waste Treatment Research Division		
Subhas K. Sikdar, Director	513-569-7528	Water and hazardous waste research
Jonathan G. Herrmann, Assistant Director	513-569-7839	Mining waste management; large volume waste treatment; inorganic wastes
Carl A. Brunner	513-569-7655	Urban runoff; wastewater sludge
Roger C. Wilmoth	513-569-7509	Asbestos; industrial wastewater treatment
Dolloff F. Bishop	513-569-7629	Air biofilter treatment
Richard A. Dobbs	513-569-7649	Fate and treatability of toxics
Richard C. Brenner	513-569-7657	Engineered biosystems
Teresa M. Harten	513-569-7565	Metal finishing; pollution prevention; separations technology
James A. Heidman	513-569-7632	Biological wastewater treatment
Glenn M. Shaul	513-569-7408	TRI improvement estimations; industrial wastewater
Bruce A. Hollett	513-569-7654	Asbestos
Albert D. Venosa	513-569-7668	Oil spills
John O. Burckle	513-569-7506	Biotechnology
Richard Field*	908-321-6674	Urban runoff

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*Edison, NJ, location

Areas of Expertise

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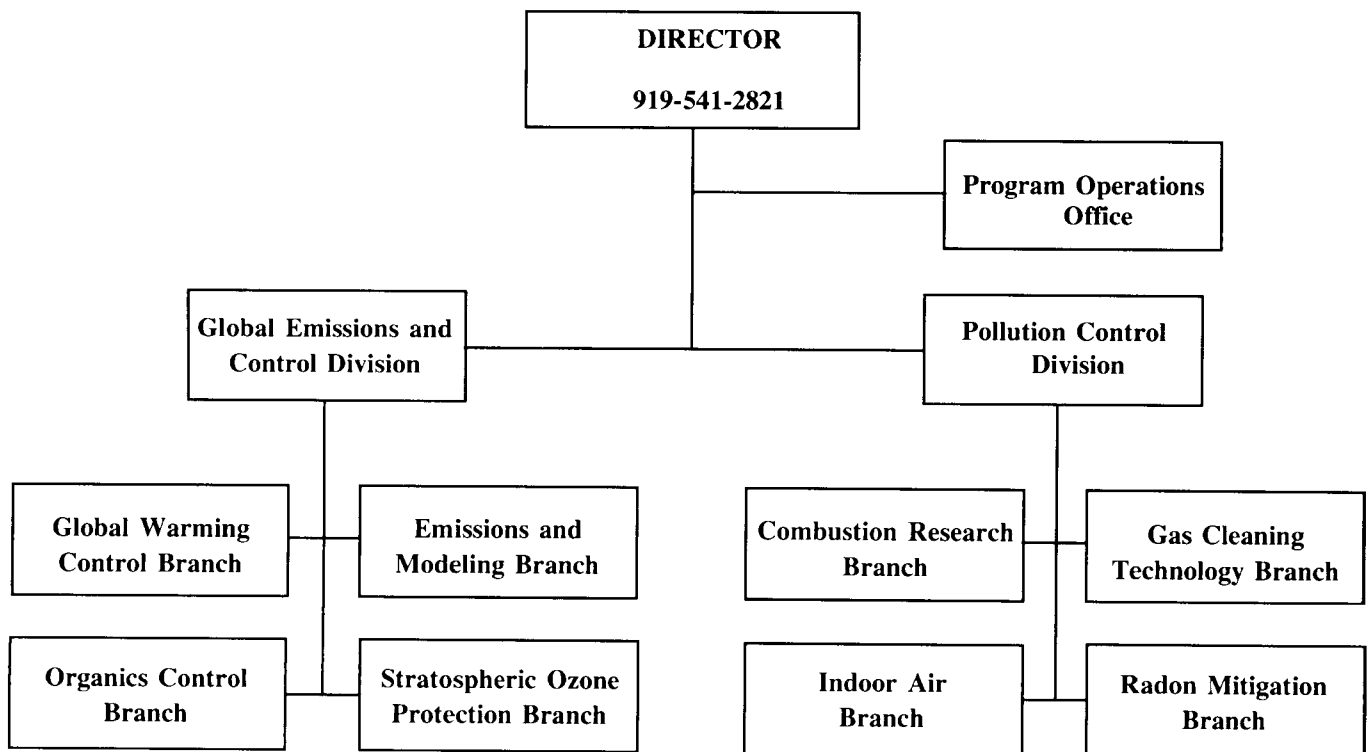
	Telephone	Area of Expertise
Waste Minimization, Destruction and Disposal Research Division		
Clyde R. Dempsey, Acting Director	513-569-7504	Thermal treatment/destruction
Albert J. Klee	513-569-7493	Decision scientist; statistics; operations research
Harry M. Freeman	513-569-7529	Pollution prevention; waste minimization
Robert C. Thurnau	513-569-7692	Thermal destruction; treatability studies
James S. Bridges	513-569-7683	Waste minimization in federal facilities
Robert E. Landreth	513-569-7881	Landfill design and operation
Carlton C. Wiles	513-569-7795	Stabilization; municipal solid waste
George L. Huffman	513-569-7431	Thermal destruction; combustion
Michael H. Roulier	513-569-7796	In-situ treatment of soils
Donald A. Oberacker	513-569-7510	Thermal destruction of hazardous materials
Ivars J. Licis	513-569-7718	Industrial pollution prevention
Federal Technology Transfer Act Cooperative Research Agreement		
Michael Borst*	908-321-6631	Chapman, Inc.—Use of EPA's mobile in-situ soil containment technology for treating hazardous wastes
Bruce A. Hollett	513-569-7654	Chemical Specialties Manufacturers Association—Study of asbestos fiber release while performing various normal wet floor maintenance procedures
John O. Burckle	513-569-7506	Cold Jet, Inc.—Evaluate dry ice particle blasting and other abatement processes to remove lead paint
James Goodrich	513-569-7605	Drysdale and Associates, Inc.—Develop and evaluate automatic sensors and data acquisition equipment for drinking water treatment plants
Richard C. Brenner	513-569-7657	James Graham Brown Foundation, Inc., and Remediation Technologies, Inc., and U.S. Forest Service—Use of fungal technology to biotreat soil contaminated with PCP and PAHs
Dolloff F. Bishop	513-569-7629	Levine-Fricke, Inc.—Lab and pilot scale study of biodegradation waste treatment technology for degraded solid, liquid, or gaseous RCRA and CERCLA waste
Robert M. Clark	513-569-7201	Lewis Publishers, Inc./CRC Press, Inc.—Develop cost and performance model for safe drinking water clean-up technologies
Daniel Sullivan*	908-321-6677	Vulcan Iron Works, Inc.—Use of EPA's mobile incinerator for destruction of hazardous wastes
Thomas J. Sorg	513-569-7370	Water Quality Association—Evaluate effect of ion exchange softening on corrosion products in household plumbing system
Chi-Yuan Fan*	908-906-6924	Shell Oil Company—Evaluation of vacuum extraction technology for USTs
John F. Martin	513-569-7758	Clean Sites, Inc., and USAF—Commercializing innovative treatment technologies for contaminated soils and ground water at McClellan AFB, Sacramento, CA

*Edison, NJ, location

Air and Energy Engineering Research Laboratory



Frank T. Princiotta is the director of the Air and Energy Engineering Research Laboratory (AEERL), Research Triangle Park, North Carolina. He has served as a division director of ORD's Office of Environmental Engineering and Technology Demonstration. Prior to going to EPA headquarters in 1975, he was chief of AEERL's Engineering Test Section. Mr. Princiotta's career includes engineering positions with Hittman Associates and the U.S. Atomic Energy Commission's New York Operations. EPA has awarded him a Gold Medal, three Bronze Medals, and the President's Rank of Meritorious Executive. Mr. Princiotta has a bachelor's degree in chemical engineering from City College of New York.



Air and Energy Engineering Research Laboratory

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The mission of the Air and Energy Engineering Research Laboratory (AEERL) is to research, develop, and demonstrate pollution prevention approaches and control technologies for air pollutants emitted from stationary sources and to provide methods to estimate emissions from these sources. Among these stationary sources are electric power plants, manufacturing and processing industries, and incinerators. The laboratory does not deal with pollution from nuclear power plants or controls for mobile sources.

Staffed primarily by engineers, the laboratory creates and improves air pollution control equipment, seeks means of preventing or reducing pollution through product substitution or changes in industrial processes, develops predictive models and emissions estimation methodologies, identifies and assesses the importance of air pollution sources, and conducts fundamental research to define the mechanisms by which processes, equipment, and fuel combustion produce air pollution.

Currently, AEERL is concentrating its efforts in eight main program areas:

Acid Rain: This program focuses on developing innovative controls for acid rain precursors, SO_2 and NO_x , including innovative sorbent injection approaches such as the Limestone Injection Multistage Burner (LIMB) and ADVACATE (advanced silicate); developing models that will identify the best possible control alternatives for various scenarios; and emissions projection modeling.

Air Toxics: Emphasis is placed on developing technologies and pollution prevention approaches to reduce emissions of air toxics regulated under Title III of the 1990 Clean Air Act Amendments; identifying sources and developing urban inventories of air toxics; developing improved designs that will achieve better control of toxic woodstove emissions; and providing direct technical assistance to state and local agencies through the Control Technology Center (CTC), which has extensive information on existing technologies applicable to a variety of air pollution sources.

Hazardous Wastes: The primary goal of this program is to study the fundamental combustion mechanisms that influence thermal destruction of hazardous wastes. Included are studies of metal aerosols from waste incineration, failure

modes in a small pilot-scale rotary kiln, and small pilot-scale studies of fluidized-bed incineration.

Indoor Air Quality/Radon: Research is currently concentrating on (1) developing and demonstrating technologies for reducing the entry of naturally-occurring radon into houses, schools, and other public buildings; (2) fundamental studies of processes that influence radon entry; (3) studying building materials and consumer products as sources of indoor air pollution; and (4) evaluating approaches to prevent or control indoor air pollutants including biocontaminants.

Municipal Waste Combustion: Work focuses on evaluating techniques to minimize pollutant formation during combustion and determining the effectiveness of various devices in controlling air pollution from municipal waste incinerators.

Ozone Non-Attainment: This program supports ORD's overall ozone nonattainment strategy by developing innovative NO_x and Volatile Organic Compounds (VOC) control technologies, improving existing technologies, enhancing and developing emissions estimation methodologies, and developing pollution prevention approaches for VOC's and other ozone precursors.

Stratospheric Ozone: In cooperation with industry, AEERL evaluates, identifies, and demonstrates the viability of substitute compounds and technologies which will replace ozone depleting substances that are now in use. The current emphasis of the program is to evaluate alternatives for existing refrigeration (commercial and residential) and space cooling systems (heat pumps, chillers); to identify replacements for halons used in fire suppression systems and evaluate replacements for insulation systems. In addition, research is underway to evaluate destruction approaches for CFC's and other ozone depletion substances.

Global Climate Change: This program is evaluating mitigation and prevention options for greenhouse gases (carbon dioxide, methane, nitrous oxide). Emphasis is on reducing methane emissions by using them as a feedgas to power fuel cell and innovative biomass utilization approaches. In addition, emission factors for key greenhouse gas sources are being enhanced and software (GloED) is under development to serve as the international repository for greenhouse gas emissions data.

Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
Frank T. Princiotta, Director	919-541-2821	Air and energy environmental assessment and control technology development
G. Blair Martin, Deputy Director	919-541-7504	Combustion; incineration; furnace injection for SO _x control
Pollution Control Division		
Everett L. Pyler, Director	919-541-2918	Combustion modification control technology; fundamental hazardous waste incineration re-search; municipal waste combustion; radon control; indoor air quality
W. Gene Tucker, Deputy Director	919-541-2746	Fundamental hazardous waste incineration research; municipal waste combustion; radon control; indoor air quality
Combustion Research Branch		
Robert E. Hall, Chief	919-541-2477	Combustion modification control technology including reburning; fundamental hazardous waste incineration research; municipal waste combustion; combustion toxics control
Indoor Air Branch		
Michael C. Osborne, Chief	919-541-4113	Indoor air pollutant source/emissions characteriza-tion; air cleaners and other indoor air quality (IAQ) mitigation approaches; IAQ modeling
Radon Mitigation Branch		
Timothy M. Dyess, Chief	919-541-2802	Radon mitigation techniques for new and existing houses, schools and other structures; fundamental studies of radon source potentials, entry, accumula-tion and removal mechanisms
Gas Cleaning Technology Branch		
Charles B. Sedman	919-541-7700	LIMB development; low NO _x burners; fundamental sorbent reactivity/kinetics studies; flue gas cleaning technologies; NO _x selective catalytic reduction; LIMB demonstrations (wall-fired and tangentially-fired); toxic particulate
Global Emissions and Control Division		
Dennis C. Drehmal, Director	919-541-7505	Control technologies/pollution prevention approaches for volatile organic compounds (VOCs), green-house gases, and ozone depleting compounds; emissions models and estimation methodologies
Robert P. Hangebrauck	919-541-4184	
Global Warming Control Branch		
Michael A. Maxwell	919-541-3091	Emissions characterization and mitigation for greenhouse gases (methane, CO ₂ , etc.)
Emissions and Modeling Branch		
Larry G. Jones, Chief	919-541-7716	Emission estimation methodologies and projection models; field validation of improved methods

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Areas of Expertise

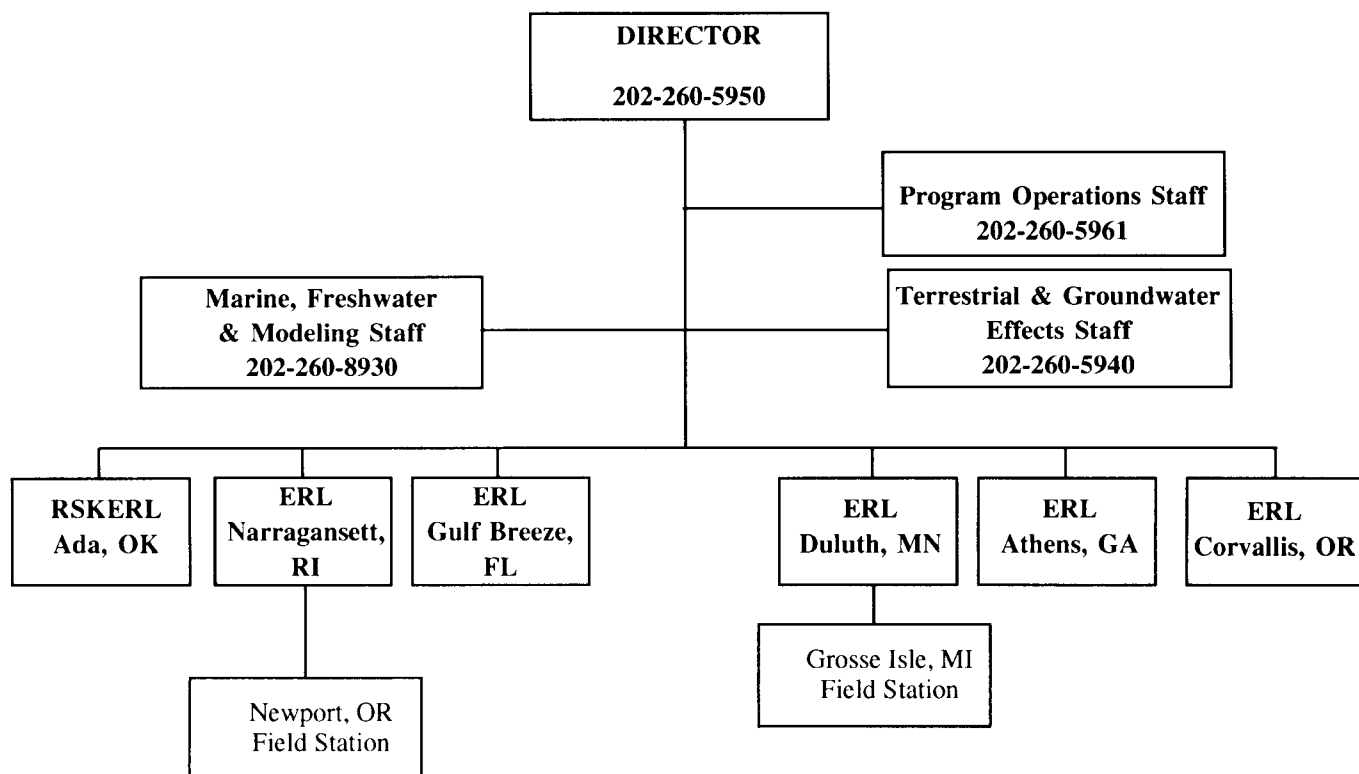
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	Telephone	Area of Expertise
<i>Organics Control Branch</i> Wade H. Ponder	919-541-2818	VOC controls; organic toxics control; Control Technology Center (CTC Hotline: 919-541-0800); pollution prevention approaches for VOC area sources; woodstoves; coke oven controls
<i>Stratospheric Ozone Protection Branch</i> William J. Rhodes	919-541-2853	Substitutes for CFCs, HCFCs and other ozone-depleting compounds; CFC/Halon recycling and destruction approaches; alternative refrigerants and modified refrigerator designs
Federal Technology Transfer Act Cooperative Research Agreement Charles B. Sedman	919-541-7700	Flakt, Inc.—Development of absorbents for air pollution control technology
 Brian K. Gullett	919-541-1534	Nalco Fuel Tech—Selective catalytic reduction of nitrogen oxide emissions in combustion exhaust streams
Control Technology Center Hotline	919-541-0800	Extensive information on existing control technologies applicable to a variety of air pollution sources

Office of Environmental Processes and Effects Research



Courtney Riordan is the director of the Office of Environmental Processes and Effects Research. His prior experience with EPA includes director, Office of Acid Deposition, Environmental Monitoring and Quality Assurance; Acting Assistant Administrator, Office of Research and Development; director, Office of Monitoring Systems and Quality Assurance; associate director, Office of Air, Land, and Water Use. Dr. Riordan received a bachelor's degree in civil engineering from Northeastern University in Boston, a Ph.D. in regional planning and systems analysis from Cornell University, in Ithaca, New York, and a J.D. from George Washington University.



ERL = Environmental Research Laboratory

Office of Environmental Processes and Effects Research

Courtney Riordan, Director

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The Office of Environmental Processes and Effects Research (OEPER) is responsible for administering a broad range of ecological research programs. These programs are structured to provide the scientific data and technological methods necessary to understand, predict, and control the entry and movement of pollutants into the environment and to determine the effects of such substances on organisms and ecosystems. The information and research products resulting from these programs are directly applicable to fulfilling the Agency's regulatory responsibilities.

Research is conducted within the full realm of environmental media—atmosphere, soil, ground water, surface water, and coastal and marine waters. The development and implementation of our research programs are coordinated and managed by the Headquarters staff with contributions and guidance provided by our six field laboratories and the Agency's program offices. These offices have the responsibility

to comply and implement legislative mandates; and much of their effort to establish rules, regulations, criteria, and standards relies on the research findings we provide. Our research focuses on meeting their needs.

Our major research activities will focus on global climate change, estuaries and near coastal systems, environmental sustainability (biodiversity, habitat, etc.), freshwater systems, wetlands, Great Lakes, biotechnology (recombinant DNA), ground water, Arctic systems, oil spills, contaminated land sites, contaminated sediments, new chemicals, and existing chemicals.

The office also actively provides technical support in environmental science and technology to regions and states in order to assist in problem solving and to transfer information and technology to local users.

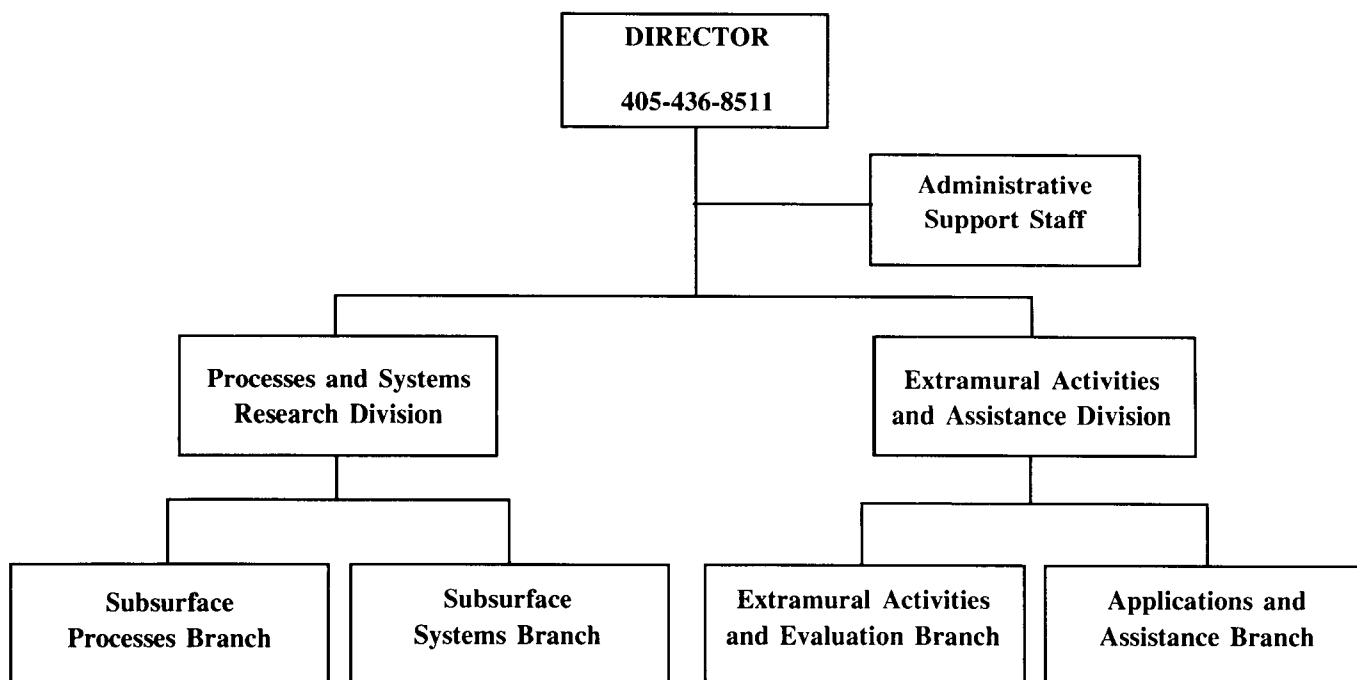
Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
Courtney Riordan, Director	202-260-5950	Global climate change
Michael W. Slimak, Deputy Director	202-260-5950	Wildlife ecology; ecological risk assessment; ecotoxicology; biodiversity
Program Operations Staff		
Patricia Neuschatz, Director	202-260-5961	Administrative and budget processes
Marine, Freshwater and Modeling Staff		
Jack Durham, Director	202-260-8930	Atmospheric chemistry; aerosols; global climate change
Robert Frederick	202-260-5967	Biotechnology; pesticides and toxics
Paul Ringold	202-260-5609	Global climate change; aquatic and terrestrial effects; marine ecology; arctic ecology; stratospheric ozone depletion
Lowell Smith	202-260-5717	Global climate biogeochemical cycles; emissions inventory and modeling
Dennis Trout	202-260-5991	Atmospheric transport and dispersion; global climate change
Barbara Levinson	202-260-5983	Agricultural; nonpoint source; biodiversity; habitat
Terrestrial and Groundwater Effects Staff		
Steve Cordle, Director	202-260-5940	Ground water; wetlands; water quality; hazardous waste; bioremediation; habitat
Ken Hood	202-260-5976	Ocean pollution; agricultural ecology; plant physiology; estuaries
Will LaVeille	202-260-5990	Hazardous waste and Superfund; ecorisk; bioremediation; ground water
Chieh Wu	202-260-5977	Water quality management; water quality criteria; wetlands; water treatment; environmental engineering; sediment quality
Peter Jutro	202-260-5600	Environmental sustainability; biodiversity; ecology; conservation biology

Robert S. Kerr Environmental Research Laboratory



Clinton W. Hall is the director of the Environmental Research Laboratory, Ada, Oklahoma, in which capacity he has served since 1980. From 1971 to 1979, Mr. Hall served in many Agency programs. Before joining EPA, he was a hydrologist for the Defense Intelligence Agency. He received a bachelor's degree from the University of Delaware and a master's degree in groundwater geology from the University of Connecticut. He participated in advanced graduate study in geophysics/geochemistry at Florida State University. He was awarded the EPA Bronze Medal in 1978.



Robert S. Kerr Environmental Research Laboratory

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The Robert S. Kerr Environmental Research Laboratory (RSKERL) serves as U.S. EPA's center for ground-water research, focusing its efforts on studies of the transport and fate of contaminants in the subsurface, development of methodologies for protection and restoration of ground-water quality, and evaluation of the applicability and limitations of using natural soil and subsurface processes for the treatment of hazardous wastes. The laboratory has a long history of research responsibilities related to the use of soils and subsurface for waste treatment and to the protection of the soil, ground water, and surface water. These responsibilities have included the development and demonstration of cost-effective methods for land treatment of municipal wastewaters, animal production wastes, and petroleum refining and petrochemical wastes, as well as the development of technologies for the protection of ground-water quality.

RSKERL carries out research through in-house projects and cooperative and interagency agreements with universities, national laboratories, and other research centers:

- **Drinking Water:** Determines contaminant transport and transformation mechanisms and rates in the subsurface as they relate to assimilative capacities and drinking water protection strategies of the Wellhead Protection Program and Underground Injection Control Program.
- **Hazardous Wastes:** Develops and tests mathematical models that describe and predict the hydrologic, biotic, and abiotic processes that define site-characterization parameters for RCRA facility closure and corrective action decisions.
- **Superfund:** Develops and demonstrates subsurface remediation technologies, especially *in situ* bioremediation, vacuum extraction and

pump-and-treat. Maintains the RSKERL Superfund Technology Support Center which provides state-of-the-science assistance to EPA/state decision-makers responsible for implementation of the Superfund Amendments and Reauthorization Act of 1986.

Associated activities operated and/or supported by RSKERL to provide research and technology transfer:

- **Injection Well Research and Training Facility:** Field site consisting of three research injection wells and four monitoring wells used to develop, test, and demonstrate emerging technologies for determining the environmental integrity of injection wells and to train state and federal regulatory personnel.
- **RSKERL Technology Support Center:** Consists of 13 EPA scientists and engineers supported by RSKERL in-house and extramural researchers, and a technology support contractor with subcontractors and consultants.
- **Center for Subsurface Modeling Support (CSMoS):** Comprised of RSKERL scientists, the International Ground Water Modeling Center at Colorado School of Mines, and a number of ground-water modeling consultants.
- **Ground-Water Remediation Technologies Research and Analysis Center:** Operated in cooperation with OSWER's Technology Innovation Office to track ongoing research and development of ground-water remediation technologies.
- **Subsurface Remediation Information Center:** Develops, collects, evaluates, coordinates and disseminates information related to remediation of contaminated soils and ground water.

Areas of Expertise

	Telephone	Area of Expertise
Processes and Systems Research Division		
Stephen G. Schmelling, Acting Chief	405-436-8540	Contaminant transport modeling; fractured media
John Wilson	405-436-8532	Bioremediation
Carl G. Enfield	405-436-8530	Contaminant transport modeling
 <i>Subsurface Processes Branch</i>		
Michael D. Jawson, Chief	405-436-8560	Soil microbiology; agricultural chemicals
Don Clark	405-436-8562	Inorganic analytical chemistry
Roger Cosby	405-436-8533	Organic analytical chemistry
Steve Hutchins	405-436-8563	Subsurface biotransformations
Don Kampbell	405-436-8564	Soil chemistry; vapor transport
Dennis Miller	405-436-8567	Immiscible flow; vapor transport
Guy Sewell	405-436-8566	Subsurface biotransformations
Garmon Smith	405-436-8565	Organic analytical chemistry
 <i>Subsurface Systems Branch</i>		
Stephen G. Schmelling, Chief	405-436-8540	Contaminant transport modeling; fractured media
Frank Beck	405-436-8546	Soil science
Jong Cho	405-436-8547	Contaminant transport modeling; vapor transport
Eva Davis	405-436-8548	Nonaqueous phase liquid transport (NAPLs)
Steve Kraemer	405-436-8549	Contaminant transport modeling; fractured media
Bob Lien	405-436-8555	Soil science
Fred Pfeffer	405-436-8542	Analytical chemistry
Susan Mravik	405-436-8577	Soil science
Robert Puls	405-436-8543	Geochemistry; metals transport
Thomas Short	405-436-8544	Contaminant transport modeling; unsaturated
Dave Walters	405-436-8550	Soils; modeling
James Weaver	405-436-8545	Contaminant transport modeling; NAPLs
Candida West	405-436-8551	Subsurface abiotic processes; NAPLs
Lynn Wood	405-436-8552	Subsurface abiotic processes; mixed solvents
 Extramural Activities and Assistance Division		
M. Richard Scalf, Director	405-436-8580	Ground-water monitoring
 <i>Extramural Activities and Evaluation Branch</i>		
James F. McNabb, Chief	405-436-8590	Microbiology; wellhead protection
Jerry N. Jones	405-436-8593	Analytical chemistry; aquifer restoration
R. Douglas Kreis	405-436-8594	Ecological effects

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Areas of Expertise

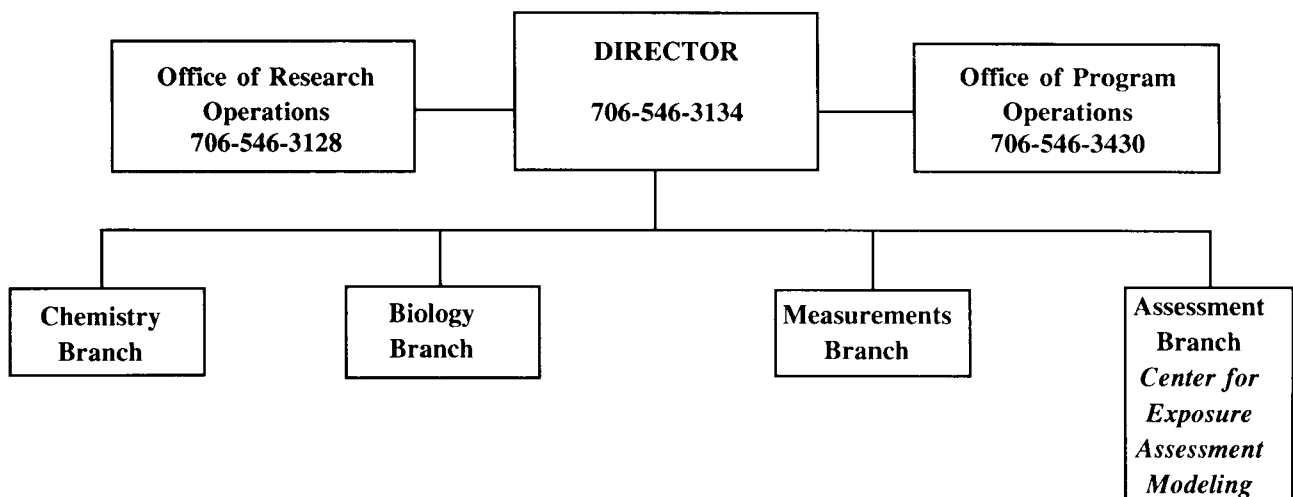
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	Telephone	Area of Expertise
<i>Applications and Assistance Branch</i>		
John Matthews, Chief	405-436-8600	Hazardous wastes biological processes
Don Draper (TSC Director)	405-436-8603	Hydrogeology; underground injection (UIC)
Steve Acree	405-436-8609	Hydrogeology; geophysics
Bert Bledsoe	405-436-8605	Analytical chemistry; metals transport
Dave Burden	405-436-8606	Hydrology; wellhead protection
Dom DiGiulio	405-436-8607	Hydrology; modeling; soil venting
Scott Huling	405-436-8610	Land treatment; RCRA; modeling; NAPLs
Mary Randolph	405-436-8616	Microbiology; bioremediation
Randall Ross	405-436-8611	Hydrogeology; modeling; NAPLs
Hugh Russell	405-436-8612	Bioremediation
Jerry Thornhill	405-436-8604	Hydrogeology; underground injection (UIC)
Joe Williams	405-436-8608	Soil science; modeling

Environmental Research Laboratory—Athens



Rosemarie C. Russo is the director of the Environmental Research Laboratory at Athens, Georgia. She started with the Agency in 1983 as associate director for Research Operations at Duluth. Her career includes: Adjunct professor of chemistry and associate director of Fisheries Bioassay Laboratory at Montana State University; senior research chemist, Colorado State University; assistant professor, Gettysburg College; and instructor, University of Minnesota-Duluth. She received her bachelor's degree in chemistry from the University of Minnesota-Duluth and her Ph.D. in inorganic chemistry from the University of New Hampshire.



Environmental Research Laboratory

Rosemarie C. Russo, Director

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ERL-Athens conducts and manages basic and applied research to predict, assess, and reduce the human and environmental exposures and risks associated with release of organics and heavy metals into freshwater marine, and terrestrial ecosystems, and of greenhouse gases to the atmosphere. This research identifies and characterizes the natural biological and chemical processes that affect the environmental fate and effects of toxic substances, such as solvents, pesticides, or metals, and the net exchange of greenhouse gases between the troposphere and terrestrial biosphere taking into account cycling and sequestration. Results are applied in mathematical models developed to assess and manage multimedia pollution problems at the watershed and larger geographical scales.

Strategic Research Issues emphasized include Global Climate Change, Ecological Risk Assessment, Nonpoint Sources, Bioremediation, Human Exposure, and Environmental Review of New Chemicals. Unique laboratory capabilities include computational chemistry, chemical remediation processes, watershed response, multimedia pollutant exposure assessment and multispectral identification of unusual organic pollutants. Research themes are

- **Environmental Chemistry:** Characterize the mechanisms by which chemicals are transformed in the environment and develop mathematical expressions that describe these mechanisms for prediction of environmental concentrations; develop and apply computational chemistry methods (including fundamental perturbation theory and molecular spectroscopic relationships) to predict equilibrium constants, reaction rates, and reaction products; apply theoretical considerations and laboratory experimentation to determine the efficacy of chemical processes (alone and in concert with biological techniques) for remediation of soils and sediments; and develop and apply multispectral identification

techniques to identify organic-source chemicals and transformation products in soils, wastes, leachates, and the ambient environment.

- **Predictive Exposure Assessment:** Establish the kinetics of abiotic and microbial degradation of hazardous chemicals in the environment; develop computerized mathematical models, with appropriate expert systems, to predict environmental fate and effects of chemicals; describe and predict the multimedia transport and fate of pollutants incorporating state of the science chemical and biological fate and bioaccumulation processes; and develop and apply methodologies for estimating uncertainty in model predictions.
- **Predictive Ecological Risk Assessment and Eco-Resource Management:** Develop multi-level (from species-population through landscape-regional) risk assessment frameworks, methodologies, and decision support systems for aquatic and terrestrial environments; develop quantitative uncertainty analysis methods for assessment and reduction of ecological risk factors; develop frameworks for interpreting watershed, regional and landscape ecosystem monitoring data; develop biospheric feedback models for greenhouse gases emitted from the terrestrial biosphere and couple to earth systems models for global damage assessment.

EPA's Center for Exposure Assessment Modeling, located at ERL-Athens, distributes developed and supported models to environmental managers throughout the world. The center assists the Agency and states in environmental risk-based decision-making concerning remediation and pollution prevention strategies for the protection of water, soil, groundwater, and air.

Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
Rosemarie C. Russo, Director	706-546-3134	Ammonia/nitrite toxicity to aquatic organisms
Robert R. Swank, Jr.	706-546-3128	Multimedia models; industrial sources; control technology
Lee A. Mulkey	706-546-3358	Landfill permitting/site selection; hazardous waste management; climate change
<i>Chemistry Branch</i>		
Arthur W. Garrison	706-546-3145	Organic chemical analysis
Leo V. Azarraga	706-546-3453	Molecular spectroscopy; metal-humic interactions
George W. Bailey	706-546-3307	Metal sorption; soil chemistry
Roger A. Burke	706-546-3503	Global climate change; biogeochemistry
Samuel W. Karickhoff	706-546-3149	Structure-activity relationships (chemical)
Eric J. Weber	706-546-3198	Fate of organic pollutants
N. Lee Wolfe	706-546-3429	Hydrolysis/redox reactions in water
Richard G. Zepp	706-546-3428	Environmental photochemistry; global climate change
<i>Biology Branch</i>		
William C. Steen	706-546-3103	Microbial kinetic constant measurement
Rochelle Araujo	706-546-3468	Microbial ecology; bioremediation
M. Craig Barber	706-546-3147	Chemical bioaccumulation modeling; Environmental Monitoring & Assessment Program
George L. Baughman	706-546-3103	Dye chemistry
Donald L. Brockway	706-546-3422	Aquatic biology; fish toxicology
Lawrence A. Burns	706-546-3511	Exposure-effects modeling; ecology
W. Jack Jones	706-546-3228	Anaerobic microbiology
Ray R. Lassiter	706-546-3208	Exposure-effects modeling; ecology
David L. Lewis	706-546-3358	Microbial biotransformation processes
John E. Rogers	706-546-3128	Microbial kinetics; biochemistry; ecology; bioremediation
Luis A. Suarez	706-546-2301	Pharmacokinetics of biological systems
<i>Measurements Branch</i>		
William T. Donaldson	706-546-3183	Multispectral analysis; transformation rate constants
Timothy W. Collette	706-546-3525	Molecular spectroscopy; organic ID
J. Jackson Ellington	706-546-3197	Chemical kinetic constant measurement
Heinz P. Kollig	706-546-3770	Fate constant database; reliability evaluation
J. MacArthur Long	706-546-3184	Molecular spectroscopy
John M. McGuire	706-546-3185	Mass spectrometry; organic ID
Susan D. Richardson	706-546-3199	Mass spectrometry; organic ID

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Areas of Expertise

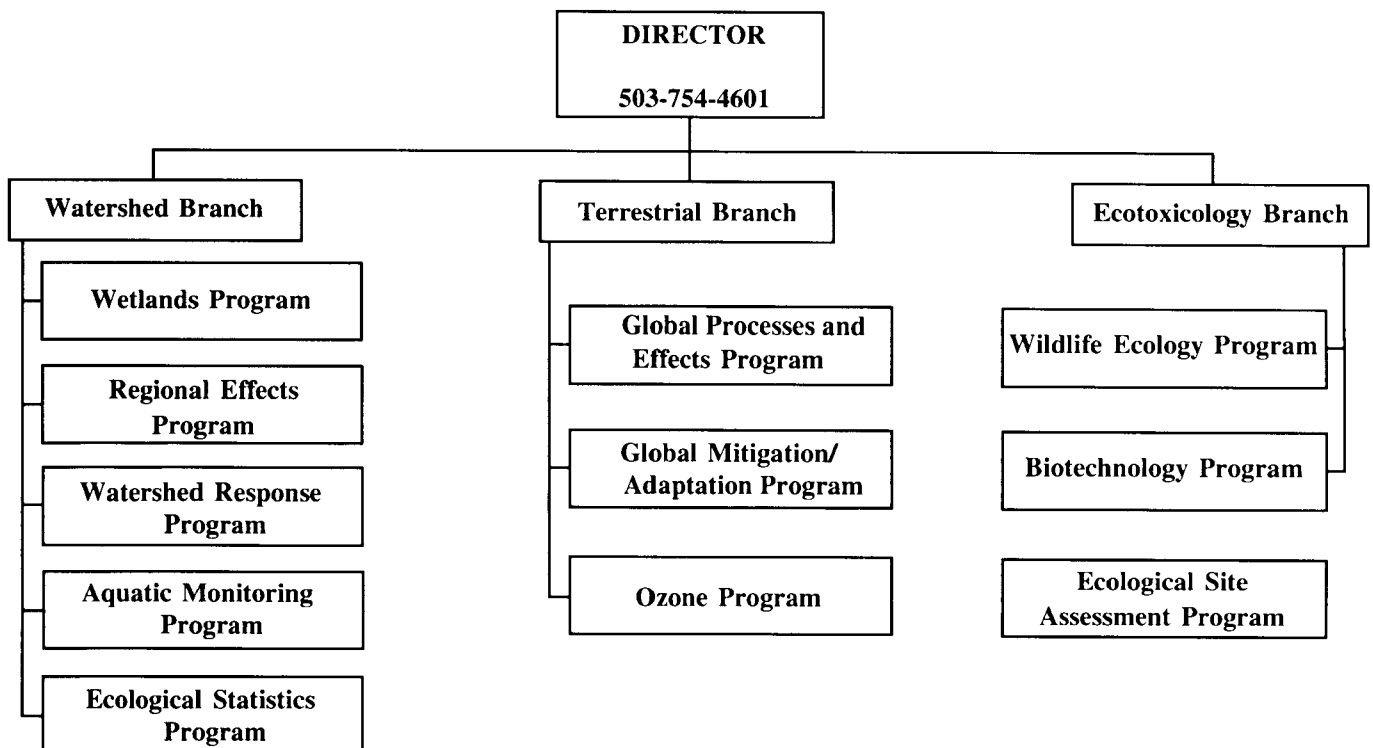
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	Telephone	Area of Expertise
<i>Assessment Branch</i>		
David S. Brown	706-546-3546	Metals speciation; terrestrial exposure
Robert B. Ambrose, Jr.	706-546-3130	Exposure and risk assessment modeling
Thomas O. Barnwell, Jr.	706-546-3210	Water quality modeling; decision support/expert systems
Sandra L. Bird	706-546-3372	Pesticide spray drift; terrestrial exposure modeling
Robert F. Carsel	706-546-3476	Pesticide and groundwater leachate modeling
Nicholas T. Loux	706-546-3174	Inorganic analysis; metal adsorption/speciation
Steve C. McCutcheon	706-546-3301	Sediment transport; hydrodynamics; sorption modeling
Charles N. Smith	706-546-3175	Pesticide dynamics; field sampling methods
William W. Sutton	706-546-3370	Environmental monitoring; exposure assessment; physiology
<i>Regional/State Contact</i>		
Robert C. Ryans	706-546-3306	
<i>Center for Exposure Assessment Modeling</i>		
Dermont Bouchard	706-546-3130	

Environmental Research Laboratory—Corvallis



Thomas A. Murphy is the director of the Environmental Research Laboratory at Corvallis, Oregon. He has been in Agency programs since 1970, including Nonpoint Source Division and Air, Land, Water Use. From 1967-1970 he was with the Federal Water Quality Administration. He received a master's degree in zoology and a Ph.D. degree in biology from Yale. He received a bachelor's degree in biology and chemistry from Knox College, and a certificate in animal physiology from Glasgow University.



Environmental Research Laboratory

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The Environmental Research Laboratory-Corvallis (ERL-C) is the U.S. Environmental Protection Agency's national center for research on plant and wildlife ecology and on the regional and landscape scale functions and response of inland ecosystems. Current research includes ecological processes and effects of climate change, stratospheric ozone depletion, atmospheric pollution (such as tropospheric ozone and acidic deposition), habitat loss and alteration, and terrestrial release of toxic chemicals and biological agents including genetically engineered plants and microbes); methods for assessing the condition and response of wetland, surface water and forest ecosystems; loss of biodiversity; sustainability of terrestrial ecosystems; and restoration of damaged or degraded ecosystems.

The laboratory conducts research and assessments on the effects of pollutants and other human stresses on land-dominated ecological systems that include forests, wetlands, wild animal and plant populations, agricultural systems, soils and microbial communities, watersheds and regional landscapes. It also develops and evaluates methods for mitigating effects on and restoring ecological systems. The laboratory provides the Agency's primary scientific expertise in terrestrial, watershed and landscape ecology, and terrestrial ecotoxicology. Research is conducted in six major areas:

- **Air Pollution Effects:** Assess the effects of atmospheric pollutants including acidic deposition on forests, crops, watersheds, and surface waters.
- **Climate Change:** Assess the effects of changing climate, including temperature, precipitation, and solar radiation, on ecological systems. Determine

the role of ecological systems, such as forests, in controlling climate or moderating climate change. Develop and evaluate methods for managing the terrestrial biosphere to mitigate or reduce the effects of climate change.

- **Environmentally Applied Chemicals and Biologicals:** Develop and test methods to assess the effects on terrestrial ecological systems of chemicals, such as pesticides, and biological agents, such as genetically engineering microorganisms, that are intentionally introduced into the environment.
- **Landscape Modification:** Assess the regional scale effects of physical changes to the landscape, such as habitat loss or hydrologic modification, on the ability of ecological systems to maintain desired levels of biodiversity and sustainable ecological functioning.
- **Wetlands:** Develop the scientific basis for assessing and managing risks for the nation's freshwater wetlands, including criteria for preventing wetland loss or degradation and guidelines for wetland restoration and creation. Develop guidelines for using created or natural wetlands for water quality improvement in a manner that is compatible with other ecological functions of wetlands.
- **Regional Ecological Assessment:** Develop and test methods for assessing the regional scale "health" of ecological systems, through the use of ecological indicators and environmental statistics.



Areas of Expertise

	Telephone	Area of Expertise
Watershed Branch		
Roger Blair	503-754-4662	Forest ecology
Joan Baker	503-754-4517	Fisheries biology; ecological processes; acidic deposition
Mary E. Kentula	503-754-4478	Wetlands ecology
Dixon H. Landers	503-754-4427	Limnology

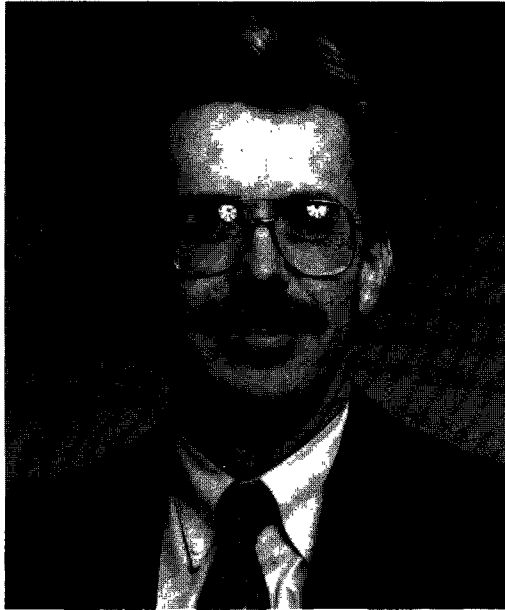
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Areas of Expertise

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	Telephone	Area of Expertise
Watershed Branch (continued)		
D. Phillip Larsen	503-754-4362	Lake/stream ecology
Scott Leibowitz	503-754-4508	Landscape ecology
Anthony R. Olsen	503-754-4790	Environmental statistics; Environmental Monitoring & Assessment Program
James M. Omernik	503-754-4458	Geography/cartography
Spencer A. Peterson	503-754-4457	Limnology/lake restoration; Environmental Monitoring & Assessment Program
Eric Preston	503-754-4459	Wetlands ecology
Richard R. Sumner	503-754-4444	Wetlands ecology
Parker J. Wington	503-754-4341	Hydrology/stream chemical dynamics
Terrestrial Branch		
Peter A. Beedlow	503-754-4634	Global climate change; landscape ecology
Christian P. Andersen	503-754-4791	Air pollution effects on vegetation
M. Robbins Church	503-754-4424	Limnology; watershed ecology
Robert K. Dixon	503-754-4777	Plant physiology; climate change
William E. Hogsett III	503-754-4632	Air pollution effects on vegetation
Jeffrey Lee	503-754-4578	Ecology; soils
J. Craig McFarlane	503-754-4670	Plant physiology; UVB effects
David M. Olszyk	503-754-4397	Plant physiology
Donald L. Phillips	503-754-4485	Ecology; spatial statistics
Allen Solomon	503-754-4772	Global climate change; forest ecology
David T. Tingey	503-754-4621	Plant physiology; climate change
James A. Weber	503-754-4503	Air pollution effects on vegetation
Carlos Wickliff	503-575-4841	Botany; pesticide effects
Ecotoxicology Branch		
Richard S. Bennett, Jr.	503-754-4638	Wildlife ecology/toxicology
Clarence A. Callahan	503-754-4764	Soil invertebrate ecology
Anne Fairbrother	503-754-4606	Wildlife ecology/toxicology
Charles W. Hendricks	503-754-4718	Microbiology
Bruce Lighthart	503-754-4879	Microbiology
Alan V. Nebeker	503-754-4350	Aquatic and wildlife toxicology
Christine A. Ribic	503-754-4717	Wildlife ecology
Paul T. Rygiewicz	503-754-4702	Plant and soil ecology
Gerald S. Schuytema	503-754-4833	Invertebrate taxonomy/toxicology
Ramon J. Seidler	503-754-4708	Microbial ecology/biotechnology
Mostafa A. Shirazi	503-754-4656	Systems ecology
Lidia Watrud	503-754-4874	Plant and microbial biotechnology; soil microbiology; fungal genetics
Environmental Monitoring and Assessment Program		
Harold V. Kibby	503-754-4679	Ecology
Daniel H. McKenzie	503-754-4625	Ecological modeling
Steve Paulsen	503-754-4428	Aquatic ecology

Environmental Research Laboratory—Duluth



Steven F. Hedtke is currently serving as acting director of the Environmental Research Laboratory at Duluth (ERL-D). He has been associate director for research operations since 1990; chief, Monticello Ecological Research Station, 1987-90; and research aquatic biologist at Monticello, 1982-1987, at Newtown Fish Toxicology Station, 1977-82, and at Duluth, 1972-75. He began his career in ORD headquarters in 1971. He received his bachelor's degree in zoology from the University of Kansas, and his doctorate degree in environmental science and engineering from the University of North Carolina at Chapel Hill. He has published numerous scientific articles and served on a variety of EPA committees.



Environmental Research Laboratory

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E-Mail HEDTKE.STEVEN

The Environmental Research Laboratory at Duluth (ERL-D) conducts research to advance our fundamental understanding of aquatic toxicology and freshwater ecology. Its mission is to develop a scientific basis for EPA to create environmental policies concerning the use of freshwater resources. To accomplish this, ERL-D conducts the research development, and technical assistance programs described below.

The Regulatory Ecotoxicology Branch develops and evaluates methods for identifying hazardous xenobiotics in freshwater effluents, surface waters, and sediments, defining toxicity and other adverse effects, and developing protocols that can be used as regulatory tools to help identify environmental hazards from separate industrial chemicals and their mixtures to specific freshwater aquatic life and ecosystems. Our regulatory ecotoxicologists are active in the design of sediment quality criteria

The Ecosystem Response Branch seeks to quantify dose response relationships and indirect effects of stresses on freshwaters. Specialized methods involving microcosms, mesocosms, streams, ponds, wetlands, and small lakes are used to provide the basis for models and extrapolation techniques. The knowledge has been incorporated into testing protocols for pesticides registration. Members of this branch are active in the research and implementation of EMAP in the Great Lakes.

The Landscape Ecology Branch specializes in the diagnosis of ecosystem dysfunction and developing indicators of ecosystem health. As EPA moves closer to programs for better management practices from a watershed perspective, we expect to provide much of the guidance to protect and improve water quality. This branch also leads the ORD effort to understand the impact of nonindigenous species on freshwater systems.

The Large Lakes and Rivers Branch is focused primarily on the Great Lakes and the science necessary for lake-wide management planning. This research uses the mass balance framework to integrate large-system impacts and responses to changes in pollutant loadings. The development of mass balance models for Green Bay, Michigan, the integration with air modeling efforts, the impact of exotic species, and the process studies to reduce the uncertainties of model predictions are important ongoing studies.

The ability to understand and predict the effect of chemicals on aquatic life remains the focus of the **Predictive Toxicology Branch**. A complete array of computerized models for structure-toxicity relationships, toxicokinetic extrapolations, and dynamic toxic effects are being developed based on fundamental research. Studies to determine the ecological significance and adequacy of existing laboratory-derived hazard assessments for protecting aquatic life are being conducted. A new thrust seeks to validate low-cost fish models in the classification of chemical carcinogens.

The Risk Characterization Branch develops and applies procedures for integrating information on toxicology, ecology, and environmental chemistry into statements of risk concerning anthropogenic stresses on aquatic ecosystems. Specific research is directed at identifying and reducing important uncertainties, especially regarding linkages among the various components of a risk characterization. Efforts include risk characterizations for specific chemicals, such as 2,3,7,8-TCDD, and development of guidelines for water quality criteria.

ERL-Duluth research is concentrated in the following areas:

- Develop a sound understanding of the effects of chemical, physical, and biological insults to aquatic ecosystems; determine levels that will not harm aquatic life and consumers of aquatic organisms; share the expertise and data resource with EPA regional and program offices, other agencies and scientists, and the public.
- Develop common denominators, quantitative structure-activity relationships, and models that can be used to predict or assess the impact of chemical and physical pollutants on aquatic and aquatic-related organisms.
- Evaluate the ability of laboratory test methods and models to predict the fate and effects of contaminants under field conditions through use of ecological studies.
- Identify biological indicators of ecological conditions of the Great Lakes and determine the role of nonindigenous species on the sustainability of these ecosystems.

Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
Steven F. Hedtke, Acting Director	218-720-5550	
Robert A. Drummond	218-720-5733	Scientific outreach; behavioral toxicology
Nelson A. Thomas	218-720-5702	National programs; complex effluents; technology transfer
Predictive Toxicology Research Branch		
Steven P. Bradbury	218-720-5527	Mechanisms of toxic actions; metabolism; QSAR
Douglas W. Kuehl	218-720-5511	Molecular dosimetry; biomarkers; ultra-trace analysis
James M. McKim	218-720-5567	Toxicokinetics; comparative toxicology
Christine L. Russom	218-720-5709	QSAR; toxic effect models and databases
Patricia K. Schmieder	218-720-5537	Mechanisms of toxic action; toxicokinetics
Ecosystem Response Research Branch		
Richard E. Siefert	218-720-5552	Pesticide bioassays; fish and fish food taxonomy
Richard L. Anderson	218-720-5616	Invertebrates; toxicity testing chemical/microbial pesticides
Frank S. Stay	218-720-5542	Experimental ecosystems
Steven Lozano	218-720-5610	Environmental Monitoring & Assessment Program; freshwater ecology
Regulatory Ecotoxicology Research Branch		
Steven J. Broderius	218-720-5574	Toxic mechanisms; mixture toxicity
Gerald T. Ankley	218-720-5603	Toxicology; sediment toxicity; bioassays
Lawrence P. Burkhard	218-720-5554	Effluent assessment; chemistry
Rodney D. Johnson	218-720-5731	Cell biology; pathology; carcinogen assay; Medaka
Teresa J. Norberg-King	218-720-5529	Toxicity identification evaluation

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Areas of Expertise

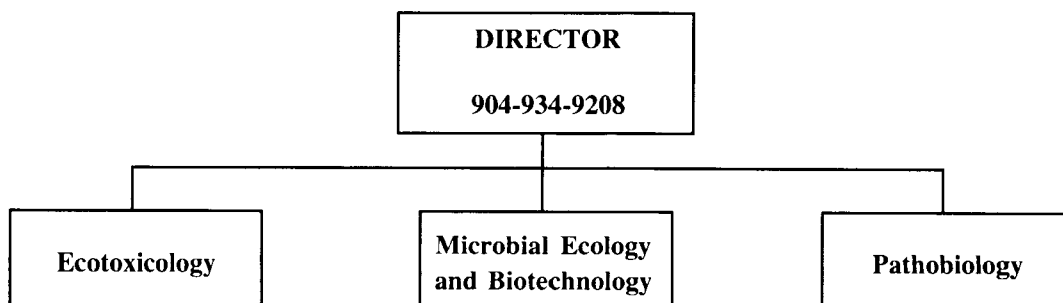
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	Telephone	Area of Expertise
Landscape Ecology Research Branch		
John G. Eaton	218-720-5557	Global climate change; lake ecology
John W. Arthur	218-720-5565	Watersheds; ecological effects
Anthony R(on) Carlson	218-720-5523	Site-specific water quality; toxicity testing field response
William D. Sanville	218-720-5723	Wetlands; ecological effects
J. David Yount	218-720-5752	Exotic species; stream classification
Large Lakes and Rivers Research Branch, Grosse Isle, MI		
William L. Richardson	313-378-7611	Great Lakes; ecosystem modeling waste load allocation; eutrophication
Douglas D. Endicott	313-378-7613	Modeling theory; ecosystem modeling
Russell G. Kreis	313-378-7615	Ecosystem-chemical effects; effects assessment
Ronald Rossman	313-692-7612	Inorganic chemical analysis and transport
Risk Characterization Research Branch		
Nelson A. Thomas, Acting	218-720-5702	
Philip M. Cook	218-720-5553	Ecological risk of dioxin
Russell J. Erickson	218-720-5534	Relationship of toxicity to exposure conditions
Robert L. Spehar	218-720-5564	Water quality criteria development
Charles E. Stephan	218-720-5510	Water quality criteria guidelines

Environmental Research Laboratory—Gulf Breeze



Robert Everett Menzer was named director of the Environmental Research Laboratory at Gulf Breeze in November 1989. Before this appointment he had served as professor and director of the graduate program in Marine-Estuarine-Environmental Sciences and director of the Water Resources Research Center at the University of Maryland, College Park. Dr. Menzer's research has focused on the metabolism and environmental fate of pesticides, particularly organophosphorus compounds. He received his bachelor's degree in chemistry from the University of Pennsylvania, master's degree in entomology from the University of Maryland, and Ph.D. in entomology and biochemistry from the University of Wisconsin.



Environmental Research Laboratory

Robert E. Menzer, Director

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E-Mail MENZER.ROBERT

The Environmental Research Laboratory at Gulf Breeze develops and analyzes scientific data on the impact of hazardous materials released in marine and estuarine environments. Scientific investigations primarily involve chemical compounds and biological products regulated by EPA's Office of Prevention, Pesticides and Toxic Substances, the Office of Water Programs, and the Office of Solid Waste and Emergency Response.

Laboratory scientists develop scientific methods and data to (1) evaluate and define mechanisms that affect biodegradation and accumulation of toxicants in aquatic food webs; (2) develop and evaluate protocols for biological treatment of hazardous wastes; (3) determine effects of carcinogens, mutagens, and teratogens in aquatic species; (4) develop principles and applications of ecotoxicology, including measurement and prediction of fate and effect of chemicals and synthetics on estuarine species and environments, monitor and assess the biological health and chemistry of near-coastal systems. Methods also are under development to apply laboratory observations to field situations and to evaluate potential risks from the release of biotechnological products in the marine environment.

Information from laboratory research is used to establish guidelines, standards, and strategies for managing hazardous materials in the near-coastal marine environment, to define and predict its ecological health, and describe causes of aberrant conditions or changes in its ecological status.

The Environmental Monitoring and Assessment Program, Estuaries Resource Group, is based at the laboratory. The Estuaries Resource Group (EMAP-E) is responsible for development of a national estuarine monitoring program to assess ecological conditions of the estuarine resources of the U.S. Scientists monitor health of bays and estuaries through measurements of biological communities, chemistry of sediments, toxicity, water quality, and the bioaccumulation of contaminants.

Research at Gulf Breeze is organized into these branches:

- **Ecotoxicology Branch:** (1) Develop and test methods to determine acute and chronic effects (including bioaccumulation) of contaminants on estuarine and marine plants and animals; (2) develop culture techniques for test organisms; (3) develop and verify biological indicators for laboratory and field investigations to detect contaminant exposure and effects at the population, community, and ecosystem levels; (4) develop and validate model systems to predict resiliency (impact and recovery) of populations, communities, and ecosystems exposed to contaminants; (5) determine effects of contaminants on ecological structure and function and delineate endpoints that describe structure and function; (6) conduct field studies (i.e., verification of laboratory methodologies and results) to predict environmental response to pesticide use in potential impact areas; (7) develop and improve methods to analyze seawater and marine matrices (plants, animals, sediments) for contaminants prior to laboratory and field studies; (8) assess risks of chemicals and other contaminants by integration and interpretation of biological, chemical, and physical data in aquatic environments, (9) monitor and assess the biological health and chemistry of bays and estuaries of the Gulf of Mexico to classify health statuses over time and determine causes of deterioration.
- **Microbial Ecology and Biotechnology Branch:** (1) Monitor biodegradation processes carried out by microbial communities and assess their ability to transform organic chemicals and heavy metals into nontoxic products; (2) evaluate potential risks associated with release of genetically engineered microorganisms (biotechnology) in the environment; (3) quantitatively define environmental factors that control biodegradation and describe the potential manipulation of ecosystems and microbial communities to enhance extent and rate of biodegradation of specified single compounds and complex mixtures; (4) develop methods for bioremediation using microbial systems.
- **Pathobiology Branch:** (1) Develop scientific methods and data to evaluate risks of biological pesticidal agents to nontarget, aquatic species and systems, including natural and genetically altered microbial pest control agents and biochemical control agents; (2) develop aquatic species as indicators and models to assess hazards of genotoxic agents to aquatic animals and humans; and (3) elucidate mechanisms in toxicants that impair development or cause disease in aquatic species.

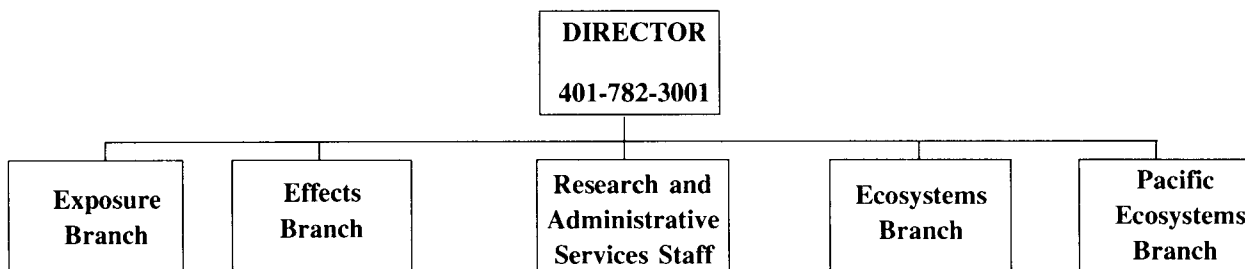
Areas of Expertise

	Telephone	Areas of Expertise
Office of the Director		
Robert E. Menzer	904-934-9208	Pesticide toxicology
Raymond G. Wilhour, Deputy Director	904-934-9213	Plant pathology; terrestrial ecology
John A. Couch	904-934-9271	Pathology; toxic mechanisms
Andrew J. McErlean	904-934-9231	Pollution ecology
Frank G. Wilkes	904-934-9223	Aquatic ecology
Ecotoxicology Branch		
Michael A. Lewis	904-934-9382	Phytotoxicity/aquatic ecology
Geraldine Cripe	904-934-9233	Crustacean culture/toxicology
Carol Daniels	904-934-9329	Genetic toxicology
William P. Davis	904-934-9312	Ichthyology; marine ecology
David Flemer	904-934-9253	Aquatic ecology
Leroy Folmar	904-934-9207	Physiology; toxicology
Larry Goodman	904-934-9205	Aquatic toxicology
John Macauley	904-934-9353	Environmental Monitoring and Assessment Program
David Weber	904-934-9245	Plant pathology
Foster L. Mayer	904-934-9380	Toxicology; aquatic ecology
James C. Moore	904-934-9236	Analytical chemistry
Kevin Summers	904-934-9244	Systems ecology; Environmental Monitoring & Assessment Program
Microbial Ecology and Biotechnology Branch		
Parmely H. Pritchard	904-934-9260	Microbial ecology; biodegradation
Tamar Barkay	904-934-9295	Microbial ecology
Peter Chapman	904-934-9261	Biochemistry; biodegradation
Richard Coffin	904-934-9255	Marine microbial ecology
Richard Devereux	904-934-9346	Microbial ecology
Richard Eaton	904-934-9268	Microbial genetics; biodegradation
Fred Genthner	904-934-9342	Microorganism; invertebrates interactions
Jan Kurtz	904-934-9286	Microbial ecology
Len Mueller	904-934-9211	Analytical chemistry
Pathobiology Branch		
William Fisher	904-934-9394	Invertebrate pathology
Lee Courtney	904-934-9313	Electron microscopy
John Fournie	904-934-9272	Fish Pathology
Doretha Foushee	904-934-9384	Molecular biology
Charles L. McKenney	904-934-9311	Physiology
Douglas P. Middaugh	904-934-9310	Fish culture; toxicology
Wilhelm Peter Schoor	904-934-9276	Biochemistry
Federal Technology Transfer Act Cooperative Research Agreements		
Parmely H. Pritchard	904-934-9260	Southern Bioproducts, Inc.—Bioremediation of wood treatment waste sites. Electric Power Research Institute—Development of remedial treatments for the removal of mercury from contaminated waters.

Environmental Research Laboratory—Narragansett



Norbert A. Jaworski has been the director of the Environmental Research Laboratory in Narragansett, Rhode Island, since 1986. From 1970 to 1985, he was the director of several Agency research laboratories, including Corvallis, Oregon, and Duluth, Minnesota; director of the Larger Lakes Research Laboratory at Grosse Isle, Michigan; and deputy director of the Industrial Environmental Research Laboratory, Research Triangle Park, North Carolina. Before joining the Agency, he was a sanitary engineer in the Department of Interior and the U.S. Public Health Service. He received a Ph.D. degree in water resources management from the University of Michigan and bachelor's and master's degrees in civil engineering from the University of Wisconsin (Madison). He has written over 50 publications and technical reports. He has received an EPA Gold Medal and the Presidential Rank of Meritorious Executive.



Environmental Research Laboratory

Norbert A. Jaworski, Director
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Pacific Ecosystems Branch-Newport

Hatfield Marine Science Center
Newport, OR 97365-5296
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E-Mail EPA8428

The mission of the Environmental Research Laboratory-Narragansett and Newport (ERL-N) is to develop and evaluate theory, methods, and data needed to quantify risks to marine and estuarine ecosystems posed by the disposal of complex wastes, estuarine municipal and industrial wastewater effluents, dredge materials, ocean discharges, and other anthropogenic stresses. This research emphasizes the development, evaluation, and application of techniques and test systems for measuring, monitoring, and predicting the transport, fate and effects of complex wastes in marine and estuarine systems with special focus on nutrients and organic over-enrichment. ERL-N also serves as lead laboratory for the Coastal and Marine Issue and for the Contaminated Sediment Issue.

Research Areas

- Develop indicators of nutrient pollution, organic matter over-enrichment, and toxic contamination for coastal and marine ecosystems.
- Understand fundamental marine ecological processes that mitigate or exacerbate the effects of nutrient/organic matter pollution in coastal marine environments.
- Develop population, community, and ecosystem dose-response relationships for nutrients, organic matter, and toxic loading rates.
- Develop toxicity testing methodologies and guidelines for deriving site-specific and national water and sediment quality criteria.
- Develop biomonitoring methods for on-site laboratory and *in situ* field assessments of biological effects of single or combined point source discharges.
- Quantify and mathematically model the transport, transformation, trophic transfer, and fate of pollutants in hydrodynamically complex marine and estuarine environments.
- Quantify the effectiveness of Agency pollution control and prevention programs by monitoring the status and trends of our nation's near-coastal environment through EMAP for the Virginian and Acadian Provinces.
- Evaluate the effects of stratospheric ozone loss and subsequent increase in ultraviolet-B radiation on marine life cycles and chemistry.
- Determine the importance of oceanic carbon cycling in global climate change and the environmental consequences of efforts to mitigate global warming by enhancing oceanic sinks of atmospheric CO₂.
- Develop microcosm-based approaches for determining the fate and effects of pollutants from multiple sources in complex coastal ecosystems and the time-to-recovery of these systems after the removal of pollutant stress.
- Develop and evaluate biomarkers and chemical markers to identify, diagnose, and predict ecological risks in marine and estuarine environments posed by disposal of complex wastes.
- Develop and evaluate theory, protocols, methods, and data needed to quantify and monitor ecological risks in marine and estuarine environments as the result of the disposal of complex wastes from multiple discharges and sources.

Areas of Expertise

	Telephone	Area of Expertise
B. Brown	401-782-3188	Sediment Transport
S.M. Baksi	401-782-3162	Biomarkers; physiological response
W. Boothman	401-782-3161	Inorganic chemistry
G.A. Chapman*	503-867-4027	Water quality criteria/toxicity methods
E.H. Dettmann	401-782-3039	Exposure assessment; water quality modeling
J.H. Garber	401-782-3154	Eutrophication; nutrient biogeochemistry
G.R. Gardner	401-782-3036	Marine pathology; histological responses
J.H. Gentile	401-782-3015	Risk characterization; ecological toxicity
R.J. Haebler	401-782-3095	Marine mammalian pathology; histological responses
D.J. Hansen	401-782-3027	Marine water and sediment quality criteria
K. Ho	401-782-3196	Sediment toxicity
E.H. Jackim	401-782-3042	Biomarkers; DNA adducts
N.A. Jaworski	401-782-3001	Water quality modeling
D.J. Keith	401-782-3135	Dredged material disposal
J.L. Lake	401-782-3173	Environmental chemistry; bioaccumulation
R.W. Latimer	401-782-3077	Environmental engineering; Environmental Monitoring & Assessment Program
H. Lee*	503-867-4042	Bioaccumulation processes; stratospheric ozone
A.R. Malcolm	401-782-3055	Biomarkers; physiological responses
D.C. Miller	401-782-3090	Dissolved oxygen; environmental criteria
G.E. Morrison	401-782-3016	Complex effluent; toxicity testing
W.G. Nelson	401-782-3053	Biomonitoring; NPDES and near coastal; Superfund
J.F. Paul	401-782-3037	Environmental Monitoring & Assessment Program
K.T. Perez	401-782-3052	Ecological risk assessment; ecosystem analysis
G.G. Pesch	401-782-3007	Genetic toxicology; biological oceanography
D.K. Phelps	401-782-3004	Biomonitoring
R.J. Pruell	401-782-3091	Environmental and analytical chemistry
N.I. Rubinstein	401-782-3002	Dredging; bioaccumulation
A. Sigleo*	503-867-5022	UVB effects
S.C. Schimmel	401-782-3078	EMAP near coastal, Virginian Province
R.L. Steele*	503-867-5023	Biological effects; algae
R.C. Swartz*	503-867-4031	Benthic toxicity testing; sediment criteria
H.A. Walker	401-782-3134	Global climate change; ocean disposal
D.R. Young*	503-867-4038	Trophic transfer; ocean outfalls
G.E. Zarogian	401-782-3079	Biochemistry

* Pacific Ecosystems Branch-Newport

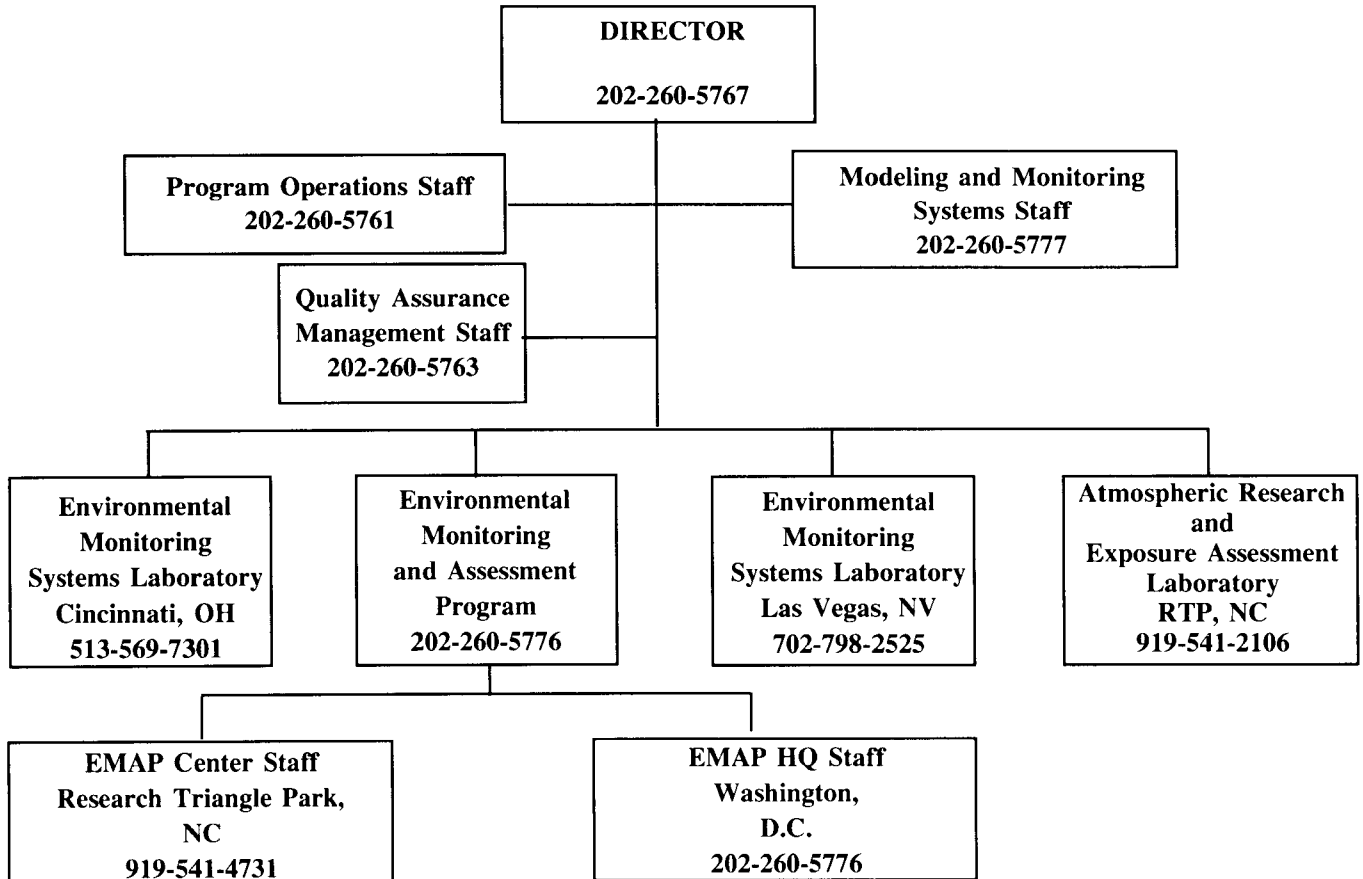
Membership on National Estuaries and Near Coastal Program Projects of OMEP and Regions

<i>Buzzards Bay</i>	Management Committee TAC Co-chair TAC	Don Phelps Don Phelps William Nelson
<i>Casco Bay (Maine)</i>	TAC Member	James Lake
<i>Chesapeake Bay</i>	STAC Staff Support Toxics Subcommittee	Suzanne Lussier Suzanne Lussier
<i>Delaware Bay</i>	STAC Member	Suzanne Lussier
<i>Delaware Inland Bays</i>	STAC Member	Suzanne Lussier
<i>Long Island Sound</i>	Management Committee TAC D.O. Study Subcommittee TAC Modeling Subcommittee	Jonathan Garber Don Miller Ed Dettmann
<i>Lower Columbia River</i>	TAC Member	Rick Swartz
<i>Massachusetts Bay</i>	TAC Member	Jack Gentile
<i>Narragansett Bay</i>	Management Committee TAC Chairman TAC Water Quality Subcommittee TAC Monitoring Subcommittee	Norbert Jaworski Norbert Jaworski Ed Dettmann Don Phelps
<i>NY/NJ Harbor Estuary</i>	Management Member TAC Member	Norbert Jaworski Norm Rubinstein Wayne Davis
<i>Puget Sound</i>	TAC Member	Rick Swartz
<i>San Francisco Bay</i>	TAC Member	Dave Young
<i>Santa Monica Bay</i>	TAC Member	Dave Young

Office of Modeling, Monitoring Systems and Quality Assurance



H. Matthew Bills is the director of the Office of Modeling, Monitoring Systems and Quality Assurance. Mr. Bills joined the Agency in 1971 as the director of Data and Information Research. Prior to joining the Agency, he was manager of Systems and Project Support for AIL Information Systems, a division of Cutler-Hamner, Inc. Mr. Bills did his undergraduate work at William Jewell College and the University of Kansas. He holds a J.D. degree from the University of Missouri at Kansas City. He is a member of the Missouri Bar Association.



Office of Modeling, Monitoring Systems and Quality Assurance

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Program Activities

Research of monitoring systems are ongoing in the following areas:

Air

- Clean Air Act Initiatives
- National Ambient Air Quality Standards
- New Source Performance Standards (NSPS) and State Implementation Plans (SIPs)
- Hazardous Air Pollutant Regulation
- Mobile Source Pollutant Regulation
- Indoor Air Quality
- Stratospheric Ozone
- Global Warming
- Acid Deposition

Water Quality

- **Water Quality-Based Approach—Permitting:** Provide assurance that ambient water quality monitoring data for regulation setting, enforcement, or compliance purposes are scientifically valid and legally defensible.
- **Waste Water Treatment Technology:** Provide quality control materials and calibration standards for regulated CWA analytes.

Drinking Water

- **Drinking Water Technology:** Provide contaminant monitoring procedures to assure compliance with the Safe Drinking Water Act and provide quality assurance/quality control programs for on-site evaluation and certification of drinking water monitoring laboratories. Develop methods, analytical procedures, and training courses to produce measurement systems for chemical, radiochemical, and microbiological analysis. Develop and distribute QC and PE samples for drinking water laboratory certification program.
- **Groundwater:** Develop measurement systems, methods for locating abandoned wells, geophysical methods to detect and evaluate underground movement of fluids from injection wells, quality control procedures and guidelines to support Agency-wide QA program, and methods for well head protection.

Hazardous Waste

- **Waste Identification:** Develop and evaluate analytical techniques for hazardous waste characterization. Develop and evaluate subsurface monitoring methods for use at RCRA waste sites.
- **Quality Assurance:** Support quality assurance of the RCRA data generated by the EPA regional offices, contractors, and state and local agencies.
- **Releases:** Provide aerial photography, satellite imagery, and multispectral scanner support to assist regional offices. Develop and evaluate procedures for external monitoring and corrective action around underground storage tanks.

Pesticides

- **Health Markers, Dosimetry, and Extrapolation:** Evaluate the use of biomarkers in monitoring of pesticide exposure and support the operation of the pesticides and industrial chemical repository.
- **Exposure Monitoring:** Monitor dietary, non-dietary, and residential exposure scenarios to investigate human exposure to pesticides.

Radiation

- Measure ionizing radiation contaminants in air, water, milk and food.

Quality Assurance Management Program

- Develop and provide Agency guidance on management of quality assurance systems. Conduct management systems reviews.

Toxic Substances

- **Analytical Methods Development for Toxic Substances:** Develop immunoassays for measurement of organic compounds. Investigate new separation procedures for analysis.
- **Health Markers, Dosimetry, and Extrapolation:** Evaluate DNA and protein adducts for use in human exposure monitoring studies.
- **Exposure Monitoring Systems Development:** Develop predictive models for human exposure and characterize human activity patterns.

- **Biotechnology/Microbial and Biochemical Pesticides Control Agents:** Develop guidelines and processes for monitoring the release of genetically engineered microorganisms in the environment.

Superfund

- Provide technical support of historical and current data for site-specific investigations.
- Provide monitoring techniques and procedures for site assessment, geophysical methods, remote sensing, soil sampling methods, and survey designs.
- Technical support to regions, program offices, and enforcement in monitoring (air, water, ground-water, soils).
- Field screening technology.
- Improve/develop analytical methods.
- Provide quality assurance/quality control support for the Superfund Contract Laboratory Program; provide assessment and improvement of methods to evaluate Superfund sites.

Environmental Monitoring and Assessment Program (EMAP)

- EMAP is designed to determine the status, trends, and changes in the condition of the nation's ecological resources, on regional scales, with known levels of statistical confidence. It represents the first national program to adopt a holistic perspective of ecological condition, and to develop and implement consistent methodologies across regions and ecological resources
- EMAP monitors selected indicators of ecological condition in near-coastal waters, the Great Lakes, inland surface waters, wetlands, forests, arid ecosystems, agricultural ecosystems, and integrated landscapes. Program objectives include associating observed condition with selected indicators of natural and human-caused stresses. EMAP results will help identify environmental risks from widespread phenomena such as habitat modification, atmospheric deposition, and global climate change.



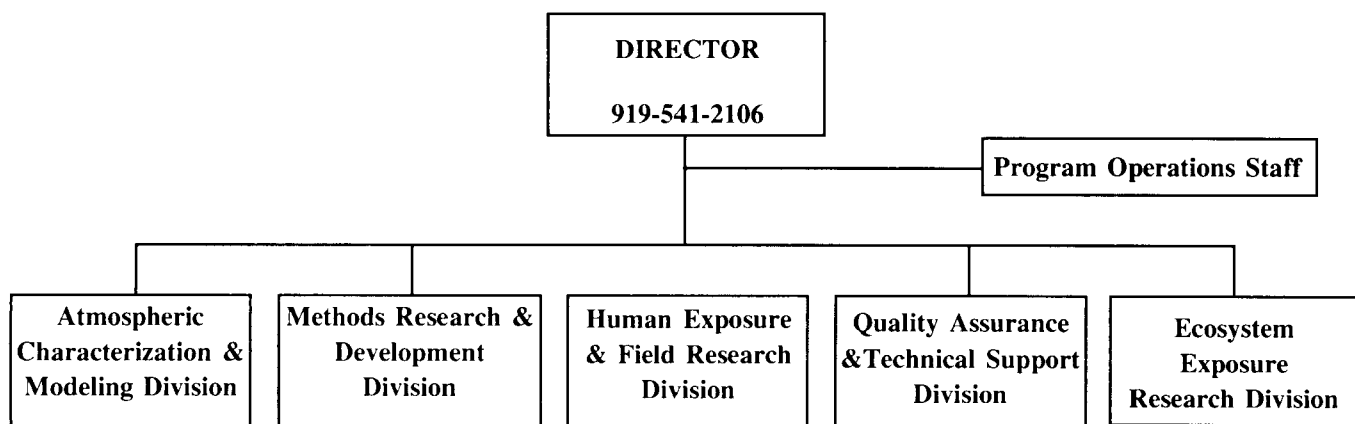
Areas of Expertise

	Telephone	Area of Expertise
William Keith	202-260-5716	Modeling and monitoring systems
Michael Dellarco	202-260-5789	Air; radiation; atmospheric ozone; global warming; acid deposition
Carol Finch	202-260-5798	Water; drinking water
William Stelz	202-260-8934	Superfund
Ken Sala	202-260-4346	Hazardous waste
Chris Saint	202-260-5772	Exposure research
David Friedman	202-260-3535	Monitoring methods
Edward Martinko	202-260-5776	Environmental Monitoring & Assessment Program
Thomas Baugh	202-260-5776	Environmental Monitoring & Assessment Program
Nancy Wentworth	202-260-5763	Quality assurance program
Tom Dixon	202-260-5780	Quality assurance training
John Warren	202-260-9464	Data quality objectives
Fred Haeberer	202-260-5785	Quality control—technical systems
Gary Johnson	919-541-7612	Quality assurance management systems reviews
Jim Stemmler	202-260-7353	Quality assurance program plans

Atmospheric Research and Exposure Assessment Laboratory



Gary J. Foley is the director of the Atmospheric Research and Exposure Assessment Laboratory at Research Triangle Park, North Carolina. He is also the acting assistant administrator of the Office of Research and Development. He has served as staff director for ORD's Acid Deposition Program and acting division director, Energy and Air, for ORD's Office of Environmental Processes and Effects Research. Dr. Foley began his career with EPA in 1973 as a senior chemical engineer. Before joining the Agency, Dr. Foley served as a project manager for the American Oil Company. He received his Ph.D. in chemical engineering from the University of Wisconsin, Madison. Dr. Foley has been awarded 4 Bronze Medals by EPA.



Atmospheric Research and Exposure Assessment Laboratory

Gary J. Foley, Director

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E-Mail FOLEY.GARY

The Atmospheric Research and Exposure Assessment Laboratory (AREAL), Research Triangle Park, North Carolina, conducts intramural and extramural research programs, through laboratory and field research, in the chemical, physical, and biological sciences.

The laboratory is composed of the following major components: Office of the Director, Program Operations Staff, Atmospheric Characterization and Modeling Division, Methods Research and Development Division, Human Exposure and Field Research Division, Quality Assurance and Technical Support Division, and the Ecosystem Exposure Research Division.

AREAL Major Research Areas

- **Air Toxics:**
Develop methods to measure toxic air pollutants in ambient air and use them to monitor emissions at toxic waste sites. Conduct monitoring studies to assess emission sources, ambient pollutant concentrations, transport, transformation of pollutants, and removal of pollutants from the atmosphere.
- **Acid Deposition:**
Model atmospheric processes to evaluate acid rain, acid deposition, and transport and transformation of acid pollutants over urban and regional scales. Develop methods and quality assurance materials to measure dry and wet deposition. Operate acid deposition monitoring networks, and maintain a repository of data on acid deposition.
- **Visibility Degradation:**
Devise approaches to measure visibility changes, and conduct studies to determine how the composition and morphology affects light scattering.
- **Mobile Sources:**
Identify and measure pollutants emitted from mobile sources. Develop methods to assess population exposures to pollutants from mobile sources.
- **Global Climate Change:**
Determine how increases in atmospheric concentrations of trace gases affect earth's climate. Investigate the sources, transport and transformation of greenhouse gases and their precursors.
- **Human Exposure Assessment:**
Develop methods to measure and estimate the frequency of human exposure to pollutants. Methods include use of personal exposure monitors, questionnaires, and protocols that relate exposure to sources.
- **Indoor Air:**
Develop and test indoor air monitoring devices. Design and implement field studies to identify and quantify indoor air pollutants. Use the results to produce information regarding proper use and performance limitations of these devices.
- **Ozone Non-attainment:**
Develop models to predict ozone concentrations, which can be verified with ambient data to indicate pollution controls needed to attain the Clean Air Act's ozone standard.
- **Air Pollution Model Application Studies:**
Develop mathematical models to describe and predict relationships between emitted air pollutants and resulting air quality.
- **Methods Development:**
Develop methods and monitoring systems to measure air pollutants in ambient air and those emitted by stationary or mobile sources. Implement ambient air monitoring equivalency regulations.
- **Quality Assurance:**
Develop methods to assure the quality of air pollution measurements, particularly measurements made in compliance with regulatory standards. Develop procedures and reference materials to audit air pollution measurements—both data collection and data analysis.
- **Stratospheric Ozone Research:**
Determine the lifetime and fate of HCFCs and other chemicals that may deplete the protective stratospheric ozone layer; operate a network to monitor fluxes of ultraviolet (UV-B) radiation penetrating to the earth's surface, and publish a public information index of potential exposure to UV-B.

Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
Gary J. Foley, Director	919-541-2106	
Jay J. Messer, Deputy Director	919-541-2107	Ecological studies
John B. Clements,	919-541-2188	Quality assurance
Gerald G. Akland	919-541-4885	Human exposure
Rick A. Linthurst	919-541-4909	Ecological studies
Jack H. Shreffler	919-541-2194	Atmospheric processes
William E. Wilson	919-541-2551	Visibility; aerosol chemistry
Lawrence Cox	919-541-2648	Statistics
Atmospheric Characterization and Modeling Division		
Frank A. Schiermeier	919-541-4542	Meteorological monitoring
H. Michael Barnes	919-541-3086	Heterogeneous chemistry
Joseph J. Bufalini	919-541-2422	Gas kinetics
Jason K.S. Ching	919-541-4801	Dispersion model development
Robin L. Dennis	919-541-2870	Regional model evaluation
Basil Dimitriadis	919-541-2706	Photochemistry; ozone
Bruce W. Gay, Jr.*	919-541-2830	FTIR analysis
Joan Novak	919-541-4545	Model evaluation/applications
William B. Petersen	919-541-1376	Toxics air quality modeling
William H. Snyder	919-541-1198	Fluid modeling
Methods Research and Development Division		
Larry T. Cupitt	919-541-2454	Air toxics
Jerry L. Varns	919-541-5797	Analytical chemistry
Kenneth T. Knapp	919-541-1352	Mobile sources
Joseph E. Knoll	919-541-2952	Source methods
Thomas J. Logan	919-541-2580	Continuous emission monitoring
William A. McClenny*	919-541-3158	Monitoring methods development
M. Rodney Midgett	919-541-2196	Source methods
Russell W. Wiener	919-541-1910	Aerosol methods
Human Exposure and Field Research Division		
Dale Pahl	919-541-1851	Exposure assessment
V. Ross Highsmith	919-541-7828	Indoor air
David O. Hinton	919-541-3075	Exposure assessment
Alan H. Huber	919-541-1338	Wake effects studies

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*Acting

Areas of Expertise

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	Telephone	Area of Expertise
Jimmy C. Pau*	919-541-5579	Dioxins, stack measurement for organics
Robert K. Stevens	919-541-3156	Source apportionment
Nancy K. Wilson	919-541-4723	Semivolatile organics; analytical chemistry
Andrew E. Bond	919-541-4329	Pesticides monitoring
Quality Assurance and Technical Support Division		
Ronald C. Evans	919-541-5488	Quality assurance
Ronald K. Patterson	919-541-3779	Quality assurance management
Joseph E. Bumgarner	919-541-2430	Organic analysis
Thomas C. Lawless	919-541-2291	Computer systems
Warren A. Loseke	919-541-2173	Inorganic analysis
William J. Mitchell	919-541-2769	QA material development and application
Joseph J. Walling	919-541-2430	Chemical analysis
Ecosystem Exposure Research Division		
James S. Vickery	919-541-2184	Acid deposition
Peter L. Finkelstein	919-541-4553	Global climate change
Sharon K. LeDuc	919-541-1335	Statistical meteorology
Joseph E. Sickles	919-541-2446	Tropospheric chemistry and global change
Johnnie L. Pearson	919-541-0572	CASNET; acid deposition monitoring
Daniel A. Vallero	919-541-0150	Physical geography and epidemiology

*Acting

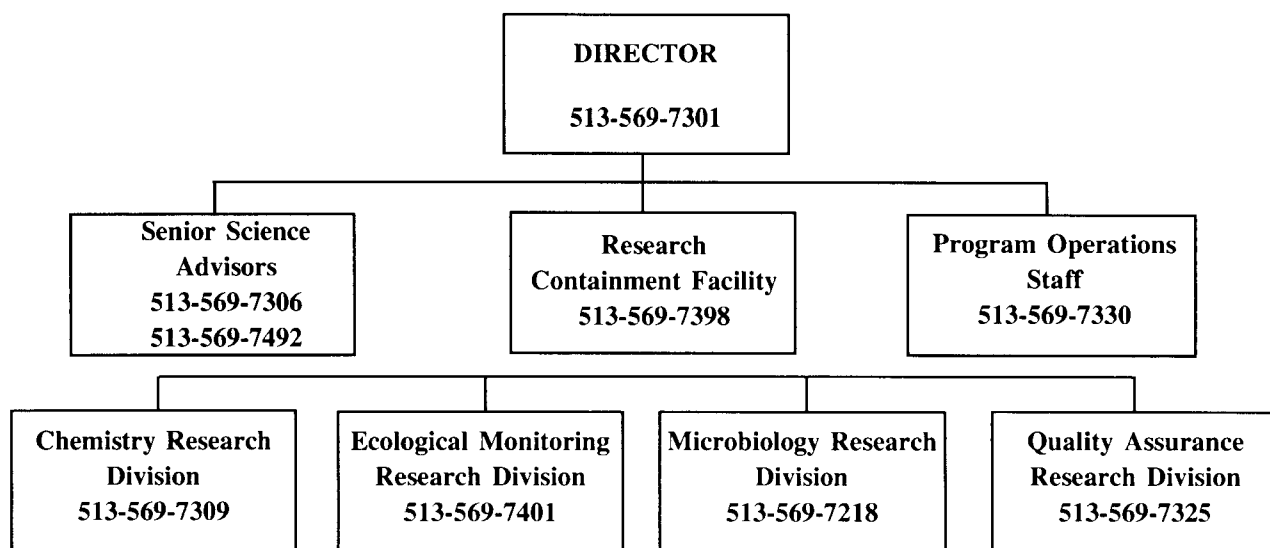
Federal Technology Transfer Act Cooperative R&D Agreements

	Telephone	Project
Ronald K. Patterson	919-541-3779	FTTA Coordinator, AREAL
William H. Snyder	919-541-1198	Georgia Institute of Technology—Perform hydraulic model study for improved ocean outfall design at Boston harbor
Edward O. Edney	919-541-3905	Ford Motor Company—Use of EPA's Environmental Chamber Facility to evaluate effects of environmental fallout on automotive products
William A. McClenny	919-541-3158	Perkin-Elmer—Develop and improve physical and chemical methods for trace contaminant analysis, automated canister sampling technologies for gaseous air contaminants and diffusion monitoring technologies
John W. Spence	919-541-3905	Rohm & Haas—Paint substrate exposure study using covering-spray devices
Edward O. Edney	919-541-3905	Dow Corning Corporation—Investigate the effects of the environment on damage to Dow Corning coatings and sealants
Sharon L. Harper	919-541-2443	Frandon Enterprises, Inc.—Develop a trace metal screening technique
Joseph E. Bumgarner	919-541-2430	CDS Analytical, Inc.—Design a system that utilizes an integrated combination of commercially available instruments
Joachim D. Pleil	919-541-4680	Graseby/Nutech—Produce a valveless injection system for the gas chromatographic analysis of VOCs

Environmental Monitoring Systems Laboratory—Cincinnati



Thomas A. Clark is the director of the Environmental Monitoring Systems Laboratory. He previously served as its deputy director from 1985 to 1988. From 1973 to 1981, Mr. Clark worked in the Quality Assurance Division of EMSL-RTP in various supervisory positions and also served as deputy director of that laboratory from 1981 to 1985 before moving to Cincinnati. He was awarded a Bronze Medal in 1982 and 1986. Mr. Clark began his career as an analytical chemist at the Matheson Company in Norwood, Ohio. He has a bachelor's degree in chemistry from Xavier University.



Environmental Monitoring Systems Laboratory

Thomas A. Clark, Director

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26 W. ML King Dr., Cincinnati, OH 45268

513-569-7301, FAX: 513-569-7424

E-Mail CLARK.THOMASA

The Environmental Monitoring Systems Laboratory in Cincinnati, Ohio (EMSL-Cincinnati), develops tools to evaluate the health of the environment. The laboratory has expertise in chemistry, molecular biology, microbiology, biochemistry, cellular biology, ecology, and statistics.

EMSL-Cincinnati scientists develop methods to determine physical parameters and to identify and measure organic and inorganic chemical pollutants in water and wastes. To minimize laboratory waste and prevent pollution, emphasis is placed on analytical methods that minimize the use of organic solvents and hazardous reagents.

Research is conducted to enhance microbiological techniques to detect, identify, enumerate, and evaluate effects of bacteria, fungi, viruses, protozoa, and parasites. Biotechnology is used to develop methods for determining the occurrence, distribution, transport, and fate of human pathogenic parasites in the environment. Methods are applicable to drinking water, ambient water, raw and treated wastewater, sediment, sludge, and biological samples.

Biochemical, cellular biological, and ecological methods are developed to detect and quantify responses of aquatic and terrestrial organisms and communities to environmental stressors. The diagnostic capabilities of these bioindicators are correlated with community impacts and xenobiotic stressors, including individual chemicals, mixtures of chemicals, and environmental samples. Biochemical and molecular markers

are being developed in ecologically relevant species that can be used to document exposures, elucidate stressor-induced effects, and establish causality in ecosystems. The sensitivity and reliability of potential bioindicators of exposures are evaluated both in a controlled laboratory environment and in various ecosystems. Methods are evaluated to demonstrate their usefulness for improving ecological risk assessment including: monitoring toxicant exposure levels, identifying dose to aquatic and terrestrial species, and quantifying the general ecosystem health using ecological monitoring techniques.

To ensure that data of known and adequate quality are obtained through the Agency's monitoring programs, a quality assurance (QA) program is maintained for both biology and chemistry. The QA program involves method evaluation studies to establish the precision and bias of the Agency's selected analytical methods. QA manuals and guidelines, quality control samples, and calibration standards are made available to support water and waste regulations. To ensure that laboratories using Agency methods are providing data of acceptable quality, performance evaluation studies are designed and conducted.

The laboratory has chemical and biological laboratories, including a self-contained, freestanding building especially designed for research involving hazardous materials, a suite of laboratories designed for safe handling of pathogens, and numerous laboratories especially equipped to conduct research with aquatic and terrestrial organisms.



Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
Thomas A. Clark, Director	513-569-7301	Methods and quality assurance
Gerald McKee, Deputy Director	513-569-7303	Methods and quality assurance
Ann Alford-Stevens	513-569-7492	Methods and quality assurance
James Lichtenberg	513-569-7306	Standardization, certification, and compliance monitoring
Microbiology Research Division		
Alfred Dufour, Director	513-569-7218	Microbiology (continued)

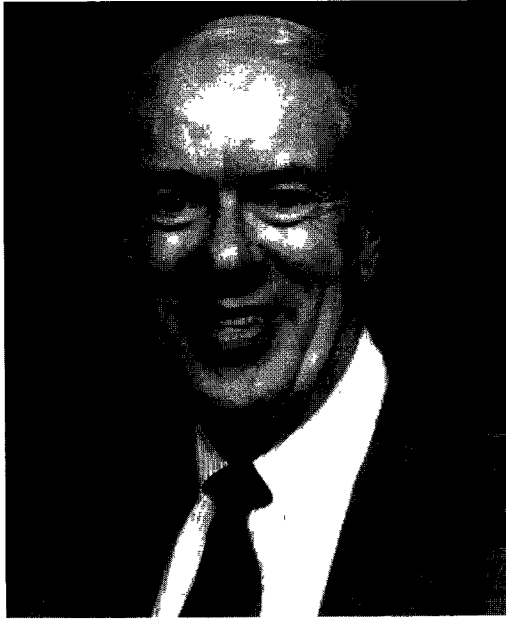
Areas of Expertise

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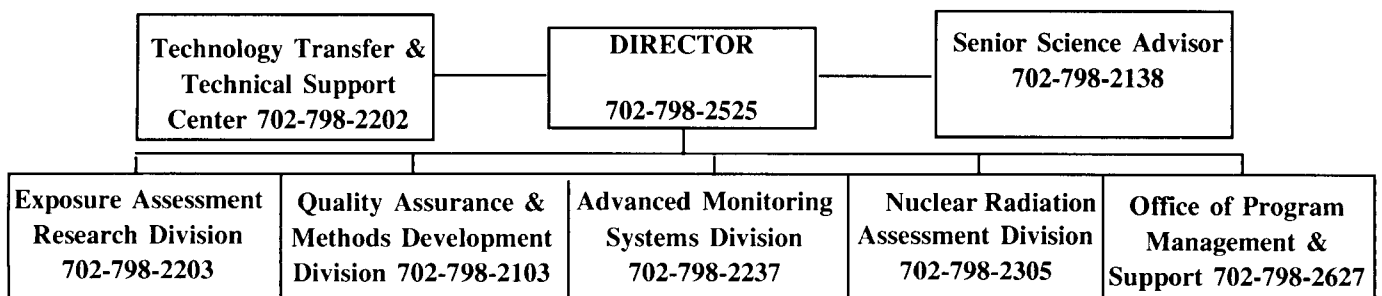
	Telephone	Area of Expertise
<i>Virology Branch</i>		
Robert Safferman	513-569-7334	Virology
<i>Bacteriology Branch</i>		
Gerard Stelma	513-569-7384	Bacteriology
<i>Parasitology and Immunology Branch</i>		
Walter Jakubowski	513-569-7385	Parasitology
Chemistry Research Division		
William Budde, Director	513-569-7309	Chemical methods
<i>Organic Chemistry Branch</i>		
James Eichelberger	513-569-7278	Organic methods
<i>Inorganic Chemistry Branch</i>		
Vacant		Chemical methods
Quality Assurance Research Division		
John Winter, Director	513-569-7325	Quality assurance issues
<i>Development and Evaluation Branch</i>		
Robert Graves	513-569-7197	Quality control/performance evaluation samples
<i>Project Management Branch</i>		
Raymond Wesselman	513-569-7325	Methods standardization
Ecological Monitoring Research Division		
F. Bernard Daniel, Director	513-569-7401	Ecological monitoring
<i>Cellular and Biochemical Markers Branch</i>		
Maryrose Kate Smith	513-569-7577	Ecological biomarkers
<i>Physiological and Clinical Indicators Branch</i>		
Susan Cormier	513-569-7995	Ecological biomarkers
<i>Bioassessment and Ecotoxicology Branch</i>		
James Lazorchak*	513-533-8114	Ecological biomarkers
Federal Technology Transfer Act Cooperative Research and Development Agreements		
Raymond Wesselman	513-569-7325	Development, preparation, verification, and distribution of quality control and reference materials (five existing agreements)

* Newtown facility

Environmental Monitoring Systems Laboratory—Las Vegas



Wayne N. Marchant was named director of the Environmental Monitoring Systems Laboratory in Las Vegas, Nevada, in July 1992. Dr. Marchant was formerly the chief of Research and Laboratory Services in the Bureau of Reclamation, U.S. Department of the Interior, a position he had held since 1988. He holds a Ph.D. degree in chemistry from the University of California at Santa Barbara, and a bachelor of science degree from the University of Nevada at Reno. He has won numerous awards for service and technical achievements, including three patents. Before his assignment with the Bureau of Reclamation, he served as the deputy assistant secretary for water and science in the Department of the Interior and as program manager and scientist for the U.S. Bureau of Mines in both Salt Lake City, Utah, and in Washington, D.C.



Environmental Monitoring Systems Laboratory

Wayne N. Marchant, Director
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E-Mail MARCHANT.WAYNE

The Environmental Monitoring Systems Laboratory-Las Vegas develops methods, systems, and strategies for monitoring the environment with the primary purposes of assessing the exposure of man and other receptors in the environment to polluting substances, characterizing the status of environmental quality, and identifying the trends in environmental quality.

The laboratory develops and applies field monitoring techniques, analytical methods, and remote sensing systems for monitoring environmental pollutants. It field tests, demonstrates and applies these systems, and initiates transfers of operational systems to Agency user organizations. It provides technical support to Agency, regional, and program offices in response to their requests for pollutant monitoring, testing and surveillance assistance.

The laboratory develops and operates quality assurance programs for radiation, hazardous wastes, and toxic/pesticide monitoring. This includes the development and maintenance of reference standards, preparation of performance evaluation materials, and the conduct of performance audits for EPA laboratories as well as other federal, state, and local laboratories.

Under a Memorandum of Understanding with the U.S. Department of Energy (DOE), the laboratory conducts a comprehensive off-site radiological safety program for the U.S. Nuclear Weapons Testing Program, which includes pathways research to determine actual and potential radiation exposure to humans and the environment from past and present nuclear testing. The laboratory also provides quality assurance oversight for DOE's mixed waste management activities.

The laboratory's major programs are

- **Advanced Analytical Methods:** Development and evaluation of innovative techniques for sample extraction and analysis of organic and inorganic contaminants in complex environmental matrices. Advanced methods using liquid chromatography, mass spectrometry, Fourier transform infra-red spectroscopy, gas chromatography, inductively coupled plasma spectroscopy, and immunoassay are developed and evaluated.
- **Advanced Monitoring Methods:** Research directed at providing monitoring methods that are simpler, more reliable, or more rapid to use than existing methods. Overhead remote sensing, aerial photography, multispectral scanner, and laser fluorosensing technologies, airborne laser

systems, and geophysical techniques are tools used to detect waste discharge, locate waste disposal sites, identify erosion, assess air particulate problems, and monitor pollutants in soils and in ground water.

- **Monitoring Network Design:** The laboratory has long been in the forefront of monitoring design—using a concept that advocates a multimedia approach to environmental monitoring emphasizing proper selection of critical receptors, optimum siting, and number of samples, through planning and an understanding of how pollutants are transported from the source to the receptor. Geostatistics play a major role by using data from a preliminary study to establish the optimum distance between sampling points.
- **Quality Assurance:** In an effort to support the Agency's commitment to the quality assurance aspects of environmental sampling and analysis, test methods are validated and performance criteria are established. The precision, accuracy, and ruggedness of the analytical protocols are then evaluated for use in Agency monitoring programs. Quality assurance support, as well as laboratory and data audits, are provided for the Superfund Contract Laboratory Program.
- **Exposure Assessment:** Human exposure assessment provides critical information required to make risk estimates for environmental pollutants. A comprehensive approach is required to develop simultaneous information on sources, exposure, dose, effect, and control. Projects related to this topic include examination of consumer products as sources of pollutants, evaluation/validation of indoor air models, evaluation of indoor air sinks, development of a benzene exposure model, human activity patterns, development/evaluation of immunoassays for environmental pollutants, monitoring of microorganisms in residential settings, and the examination of biomarkers as indicators of exposure.
- **Radiological Monitoring and Analysis:** The laboratory maintains extensive radioanalytical, field radiological monitoring and health physics capability to conduct an integrated program of environmental monitoring, sampling, analysis, exposure assessment and quality assurance in support of the United States Nuclear Weapons

Testing Program. The group responds to radiation accidents and potential emergencies such as the Three Mile Island incident and the launches of Galileo and Ulysses deep space probes carrying radioisotope thermoelectric generators. They play a major role in the Federal Radiological Monitoring and Assessment Center. A whole body-counting facility is operated at the laboratory for determining radionuclide identification and distribution in people. Also, the laboratory conducts an EPA-wide occupational radiation monitoring exposure program. This group supports the National Interim Primary Drinking Water Regulations by conducting the Drinking Water Laboratory Certification Program, which includes providing radioactive reference standards, conducting intercomparison studies and performing audits of state drinking water laboratories.

- **Ecological Monitoring:** The laboratory participates in the Agency's Environmental Monitoring and Assessment Program (EMAP), a national research program to determine the condition of the nation's ecological resources. Research classifies, characterizes, and monitors status and trends of major ecosystems and their subclasses. The monitoring efforts specifically focus on conditions over periods of years to decades. Advanced monitoring methods are being used to determine status and trends in forest, agricultural and arid lands. The laboratory is responsible for conducting initial ecosystem characterization, providing remote sensing support, providing guidance and support for field logistics and quality assurance, and for developing and implementing a distributed database management system.

- **Monitoring and Measurement Technologies:** Under the aegis of the Superfund Innovative Technology Evaluation (SITE) Program, the laboratory is responsible for identifying, evaluating, demonstrating, and transferring alternative or innovative technologies used for site characterization and for monitoring the progress of remedial activities. Technologies that have participated in the program include portable gas chromatographs, ion mobility spectrometers, long-path-length infrared spectrometers, immunochemical test kits, fiber optic and other chemical sensors, x-ray fluorescence spectrometers, and mass spectrometers, among others. The Monitoring and Measurement Technologies Program also focuses on technologies used to characterize the physical characteristics of sites. The Monitoring and Measurement Technologies Program is matrix managed, involving the expertise residing in EMSL-LV's sister laboratories—EMSL-CI and AREAL-RTP.
- **Technical Assistance:** The laboratory's Technical Support Center provides regional personnel with monitoring and site assessment expertise. Areas of assistance include sampling and monitoring design assistance; remote sensing, mapping and geostatistics; analytical methods and quality assurance; bore-hole and surface geophysics; field portable x-ray fluorescence field methods; mixed waste and radiological analysis. Technical assistance is provided in a variety of ways, including reviews, information research and retrieval, technology transfer, teleconferencing, on-site measurements, training programs, seminars and workshops.



Areas of Expertise

	Telephone	Area of Expertise
Office of the Director		
Wayne N. Marchant	702-798-2525	Director
J. Gareth Pearson	702-798-2522	Environmental monitoring; quality assurance
Llewellyn R. Williams	702-798-2138	Chemical/biological testing; water quality; quality assurance
Office of Program Management and Support		
Walter B. Galloway	702-798-2568	Marine environmental chemistry; program management; total quality management
Douglas C. Sharp	702-798-2627	Safety, health, and environmental management
Quality Assurance and Methods Development Division		
Richard L. Garnas	702-798-2101	Agricultural chemistry
Stephen N. Billets	702-798-2232	Organic analytical chemistry; mass spectroscopy

(continued)

Areas of Expertise

(continued)

	Telephone	Area of Expertise
<i>Methods Research Branch</i>		
Christian G. Daughton	702-798-2207	Analytical chemistry; microbial degradation; bioremediation; environmental toxicology
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