EPA/600/R-24/001 | March 2024 | www.epa.gov/research

United States
Environmental Protection
Agency

Office of Research and Development

Strategic Plan

Front and back cover photo: sunset from an ORD mobile lab sampling station at a Superfund site in Idaho (credit: Anna Wade)

A Message from the Assistant Administrator

Science is about discovery. In the Office of Research and Development (ORD) of the U.S. Environmental Protection Agency (EPA), we discover and create new scientific knowledge needed to inform Agency decisions. The innovative science that ORD provides is critically important to both EPA and our external partners, including states, Tribes, and communities. ORD's science is important to underpinning EPA's actions to protect human health and the environment.

Advances in science have improved environmental protection since EPA's founding in 1970. Yet, our work is far from over. Legacy challenges remain and new challenges arise. Disparities in exposures and impacts have led to environmental injustice for many overburdened communities. Humans continue to modify our environment at many scales, from local to global. The environment responds to this human interaction, and we must adapt.

As we learn more, we better understand the complex challenges to human health and the environment, and their interactions. We also better understand how to strategically frame our research. We are now adopting a systems-based, One Environment-One Health approach to conceptualize this work.

A systems-based approach guides our research and informs decisions. For example, we design research to better characterize combinations of chemical and other stressors that cumulatively impact health, well-being, and quality of life, and we evaluate interventions to reduce these cumulative impacts.

Such a systems-based approach requires broader perspectives. Therefore, in addition to traditional ORD strengths, including the natural sciences, computational science, and engineering, we are embracing social and behavioral sciences to deliver sustainable solutions that can be effectively implemented and evaluated.

In October 2022, we released six Strategic Research Action Plans (StRAPs) to guide ORD research through fiscal years 2023 to 2026. These plans map research across our six highly integrated and transdisciplinary national research programs that is closely aligned with the Agency's strategies and goals. For ORD, high quality, decision-relevant science is a key element for our success. Our success also critically depends on managerial, administrative, and operations support within our organization. Additionally, to be the best organization that we can be, we must be a place where people can be their best and can give their best.

ORD will measure success based on our ability to:

1. Advance Science and Technology
2. Support Decision Making
3. Build a Healthy Workforce and Organization
4. Be a Trusted Scientific Source

Meeting these priorities requires effective operations, transparent and timely communication, and inclusive leadership and teamwork. Implementation of this Strategic Plan enables ORD to carry out its mission to ensure that EPA and our partners have the scientific knowledge, data, and tools needed to protect people and the planet from the most complex and challenging environmental issues of our time.

This is the DNA of who we are. We are ORD.

H. Christopher Frey, Ph.D.

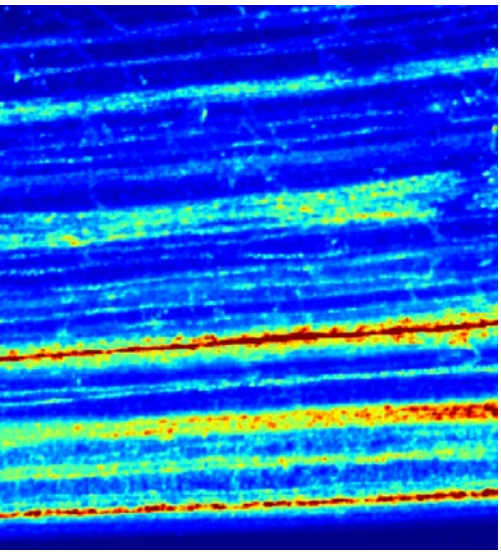


Image descriptions on inside back cover.

Table of Contents

Mission, Vision, and Principles

EPA Mission

To protect human health and the environment.

ORD Mission

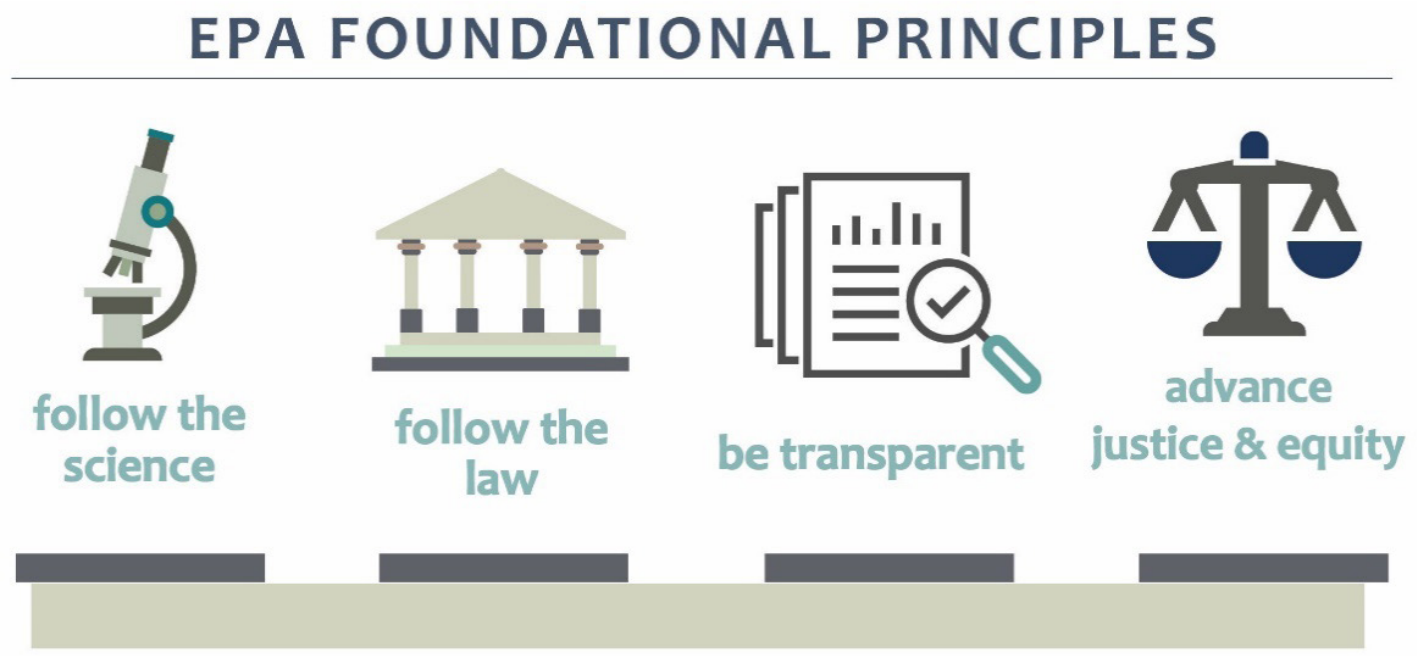
Providing the best available environmental science and technology to inform and support human health and environmental decision making for federal, state, Tribal, local, and community partners, addressing critical environmental challenges and anticipating future needs through leading-edge research.

ORD Vision

Leading the world in environmental science, technology, and research, developing breakthrough solutions that enable EPA, federal agencies, states, Tribes, and communities to protect human health and the environment.

EPA Principles

EPA's foundational principles form the basis of the Agency's culture and guide its operations and decision making now and into the future.



ORD Principles

In conducting the critical research that informs and enables the safeguarding of our nation's health and environment, ORD staff are guided by the following principles:

1. **We are environmental stewards.** *I take action to care for and ensure a healthy and thriving environment now and in the future.*

2. **We are an organization of scientific excellence that informs environmental decisions.** *I diligently use all my talents to contribute significantly to our goals and to fulfilling our mission.*

3. **We actively seek out partnerships that advance the quality, relevance, and impact of ORD's solutions-driven research.** *I actively look beyond my own areas of expertise to see how my contributions combine with those of others to fulfill ORD's mission.*

4. **We exhibit leadership and ownership.** *I am responsible for developing and exhibiting my leadership.*

5. **We trust each other and are worthy of each other's trust.** *I am mindful of others' trust in me, and I always behave with integrity.*

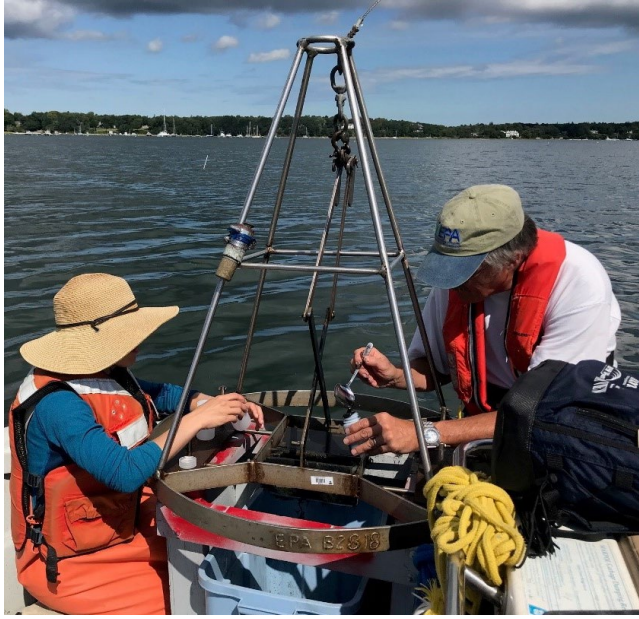
6. **We communicate honestly, openly, and clearly.** *I seek the information I need and provide the information that others need in support of a culture of open communication.*

7. **We enable decisions at the most local level possible.** *I am responsible for actively seeking opportunities to engage others in decision making.*

8. **We value the talents, skills, and experiences of our diverse workforce.** *I seek to understand, appreciate, and engage others' unique talents, perspectives, and contributions.*

9. **We are accountable to others for our actions.** *Forever mindful that our work serves a public trust, I am dedicated to fulfilling our commitments and making the most of our resources.*

10. **We recognize and celebrate our accomplishments.** *I always recognize and celebrate others for a job well done.*



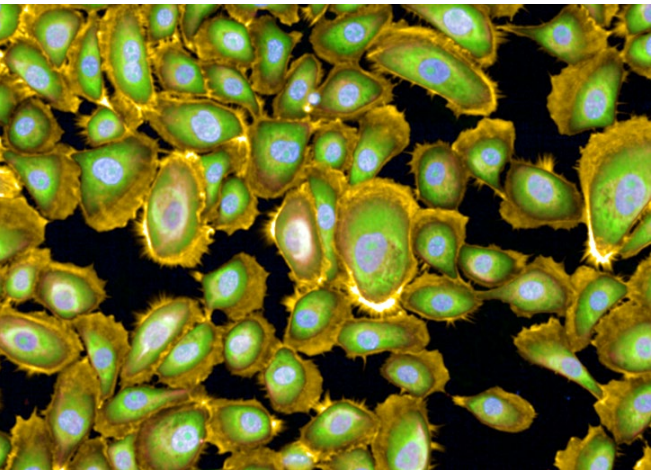


Image descriptions on inside back cover.

About the Office of Research & Development

Who We Are

EPA's Office of Research and Development (ORD) comprises a team of world-class scientists, engineers, and support staff. Our collective scientific and technical expertise covers the full spectrum of life, physical, computational, and social sciences, and engineering. We continue to build our diverse workforce, which is essential to respond to the complex environmental challenges of today and to anticipate those of the future. We are committed to our Mission, Vision, and Principles.

Together, ORD's scientists, engineers, and support staff provide the scientific foundation to carry out EPA's mission.

Our collective scientific and technical expertise covers the full spectrum of life, physical, computational, and social sciences, and engineering.

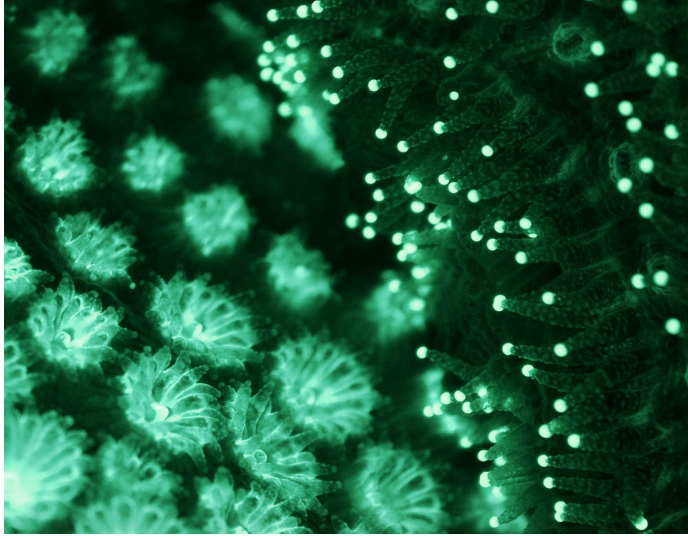


Image descriptions on inside back cover.

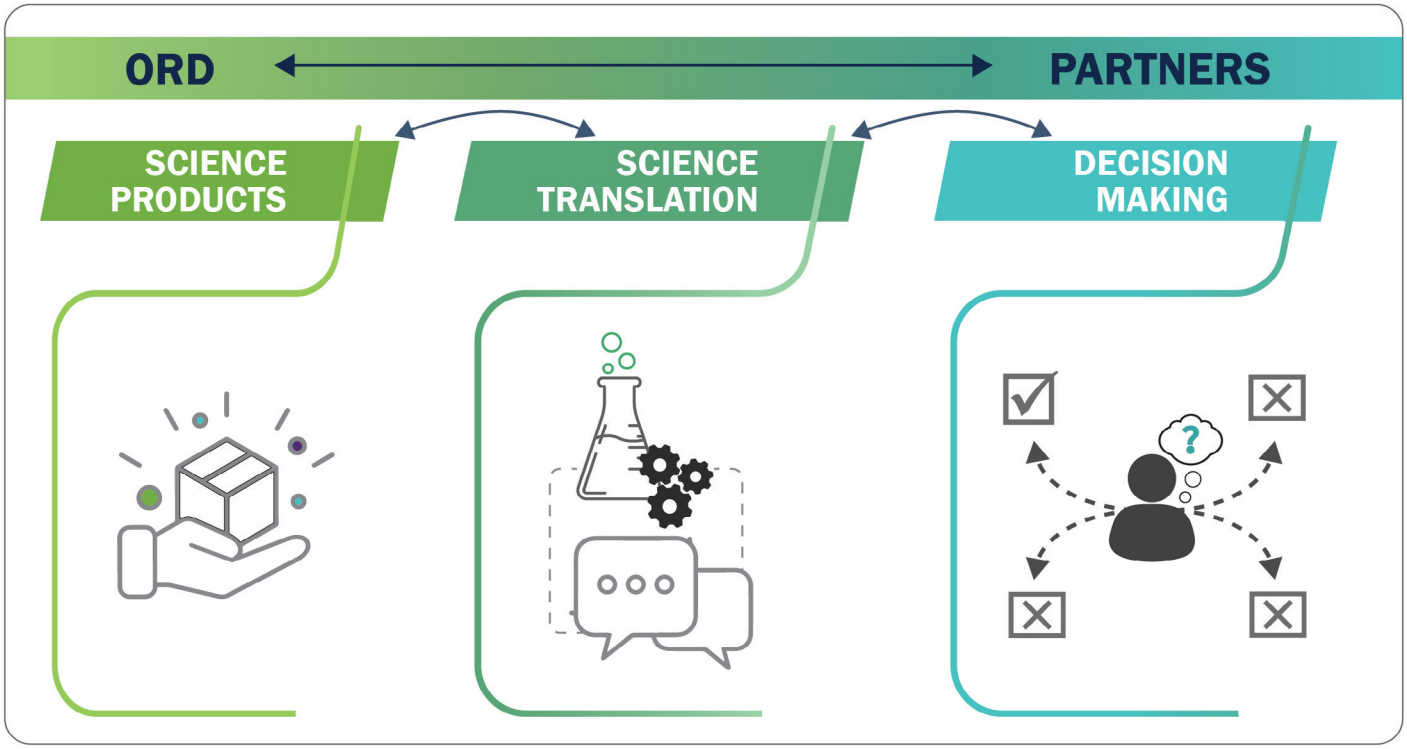
What We Do

ORD develops, translates, and delivers the science and technology solutions necessary to support EPA's mission. Through a robust research planning process, we engage with our partners—including EPA programs and regions, states, Tribes, and communities—to identify the most pressing research needs to protect human health and the environment and develop a comprehensive research portfolio to address them. ORD's strategic research action plans—one for each of our six national research programs—outline our current ambitious intramural research portfolio (epa.gov/research/strategic-research-planning), and our extramural grant programs (epa.gov/research-grants) support research by external organizations, scientists, and students.

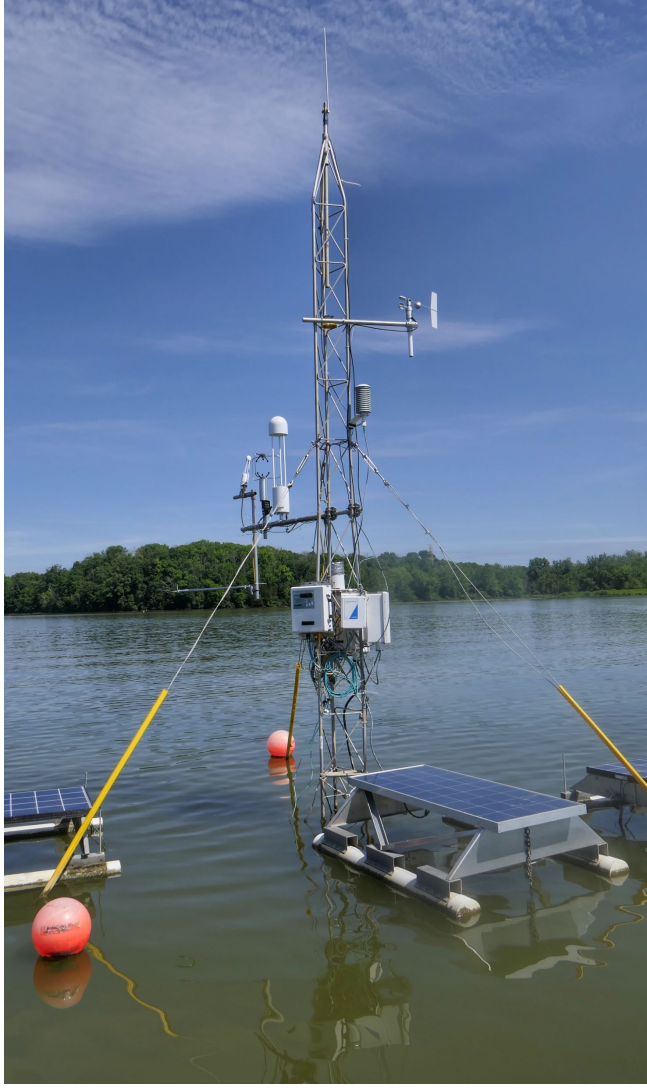
ORD's research portfolio is organized into six national research programs

- Air, Climate, and Energy
- Chemical Safety for Sustainability
- Health and Environmental Risk Assessment
- Homeland Security
- Safe and Sustainable Water Resources
- Sustainable and Healthy Communities

ORD develops, translates, and delivers the science and technology solutions necessary to support EPA's mission.



We work with our partners—including EPA programs and regions, states, Tribes, and communities—to support their decision making to protect human health and the environment.



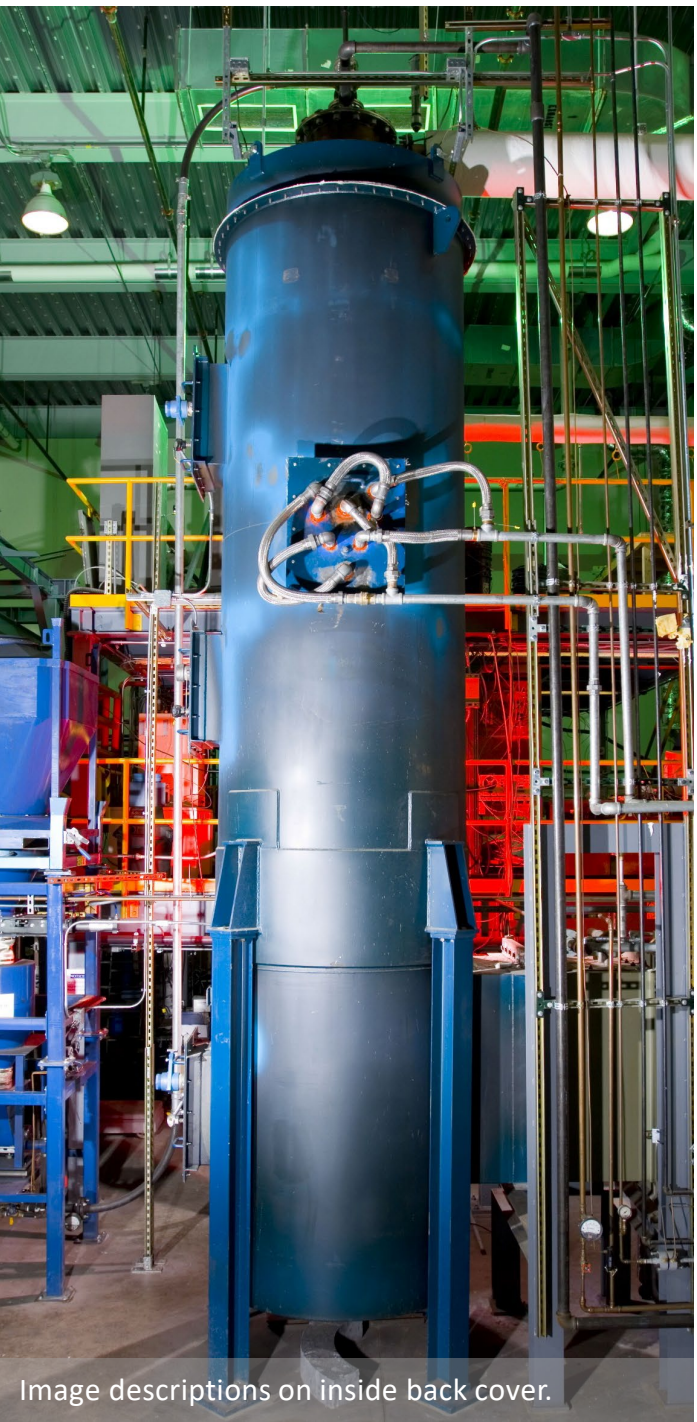


Image descriptions on inside back cover.

Image descriptions on inside back cover.

Where We Work

ORD's research activities are carried out by four research centers in twelve locations across the country. The centers include eleven cutting-edge laboratory facilities. Several offices within ORD provide additional policy, coordination, administrative, and operational functions that support both ORD's and the Agency's scientific enterprises.

ORD additionally serves as the national manager of the laboratories associated with each of EPA's ten regions.

ORD's research activities are carried out through four research centers

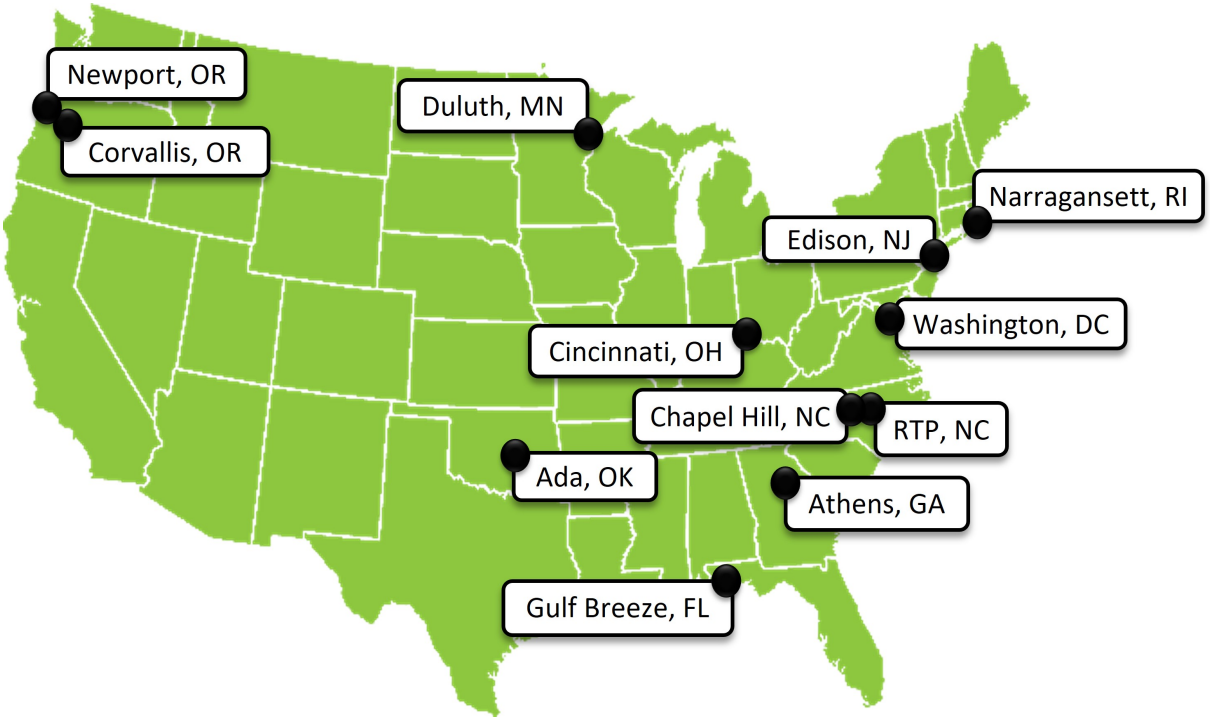
- Center for Computational Toxicology and Exposure
- Center for Environmental Measurement and Modeling
- Center for Environmental Solutions and Emergency Response
- Center for Public Health and Environmental Assessment

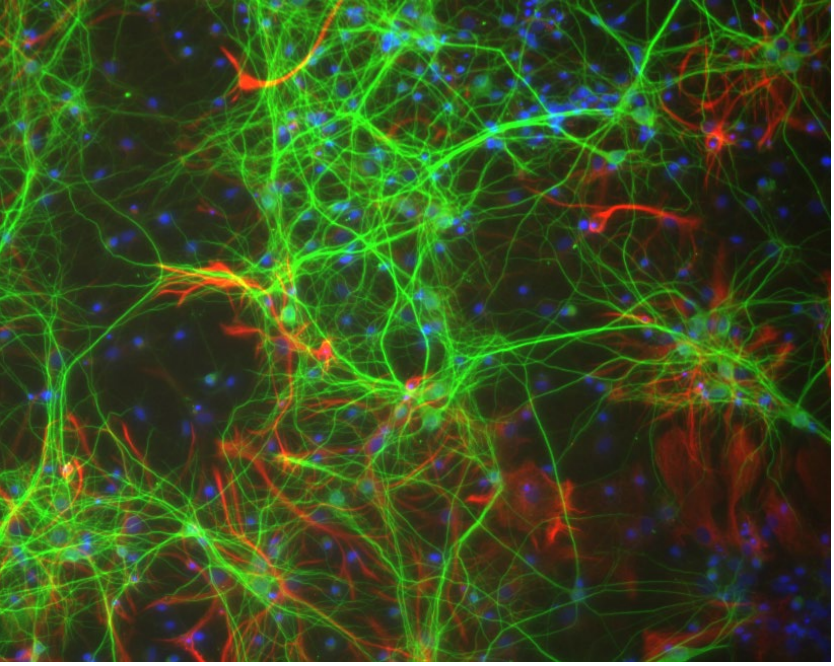
Several ORD offices support ORD's and the Agency's scientific enterprises

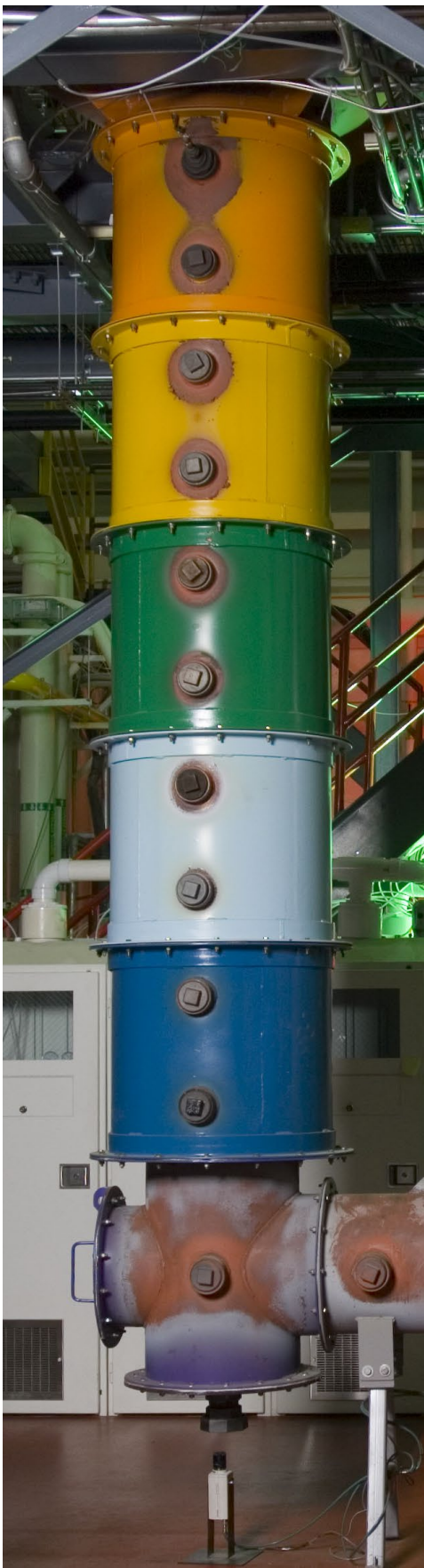
- Immediate Office of the Assistant Administrator
- Office of Resource Management
- Office of Science and Information Management
- Office of Science Advisor, Policy, and Engagement

Learn more about ORD at: epa.gov/research.

ORD's research is carried out in twelve locations across the country.







ORD Strategic Goals and Objectives

Goal 1: Advance Science and Technology

Improve protection of human health and the environment through scientific advancements, innovative research, and technology development using systems-level approaches.

Objective 1.1 Develop holistic scientific understanding using systems approaches

Today's environmental challenges are increasingly complex, far reaching, and interconnected. As recommended by the National Academies of Sciences, Engineering, and Medicine,[1] ORD's research will embrace a One Environment-One Health approach that emphasizes the dynamic connectivity between people; animals, plants, and other life; and our environment. In this overarching systems framework, our intramural and extramural research will encompass social, economic, and environmental systems; integrate across multiple levels from molecules to communities and ecosystems; address different geographic areas and timelines; and break down traditional boundaries between scientific disciplines. Applying systems approaches will enable more complete understanding of environmental challenges, such as climate change and the cumulative impacts of multiple stressors, increase our ability to identify connections between systems, and improve our understanding of the impact of potential solutions.

Objective 1.2 Innovate at the leading edge of environmental research

Innovation includes conceptualizing, developing, and implementing novel research, technology, or scientific research processes that add value for meeting the mission of ORD. ORD must have an innovative, creative, and nimble culture that pioneers better approaches to address existing challenges while also enabling us to anticipate and effectively respond to new and emerging challenges. As a leader in research that informs decisions to protect human health and the environment, we will embrace and support cross-disciplinary and diverse ideas at all levels of the organization, explore high-risk/high-reward research opportunities, and advance near-term and next generation scientific, technological, and process solutions. We will expand and strengthen our internal culture of innovation and seek new ideas and solutions from a diversity of external sources.

Objective 1.3 Expand and strengthen partnerships and collaboration

Tackling increasingly complex health and environmental challenges requires integration of knowledge and resources across organizations with complementary expertise, experience, perspectives, facilities, technologies, and reach. We will strategically enhance and expand external research collaborations to leverage the diverse talents and resources of existing and new partners, including federal agencies, states, Tribes, local governments, communities, academic institutions, non-governmental organizations, industry, international organizations, and others. We will work with our partners to integrate diverse bodies of knowledge and information, including Indigenous Knowledge, into our research efforts. Collaborative efforts will enable EPA to address complex challenges more effectively.

---

[1]National Academies of Sciences, Engineering, and Medicine. (2023). Transforming EPA Science to Meet Today's and Tomorrow's Challenges. The National Academies Press. https://doi.org/10.17226/26602.

Goal 2: Support Decision Making

Deliver the scientific and technical information our partners need to inform their decisions to protect human health and the environment.

Objective 2.1 Deliver science to inform EPA's actions

ORD's science, technology, and research inform EPA's actions to protect human health and the environment. We will engage extensively with EPA program and regional offices to identify and address current, emerging, and longer-term research needs and integrate research efforts across EPA programs. We will provide timely, relevant, and high-quality scientific information and technology, and reliable and accessible data, to our EPA partners to help support the Agency's actions, develop solutions, and inform decisions.

Objective 2.2 Translate science into solutions with our external partners

We are committed to developing and translating research, consistent with EPA's mission, that meets the needs of our external partners, including states, Tribes, local governments, and communities. We will emphasize stakeholder engagement throughout the research process, including problem formulation, research planning, implementation, dissemination, and evaluation. We will integrate and enhance community-engaged, solutions-driven research and participatory science in our research portfolio, including research aimed at helping those communities facing health inequities or environmental justice concerns.

Objective 2.3 Provide technical assistance and support

Internal and external partners rely on ORD's expertise for making scientifically defensible decisions. Our technical support activities include direct assistance, training, outreach activities, and site-specific support to internal and external partners. We will continue to provide technical assistance and support to help our partners tackle existing, emerging, and future environmental challenges, including at Superfund and other contaminated sites, in response to and in preparation for emergencies and disasters, and in other situations as needed. We will also continue integrating technical support into our research programs to assist our partners with both proactive and reactive needs.

Goal 3: Build a Healthy Workforce and Organization

Strengthen and sustain a workforce and organization that have the skills and expertise necessary to anticipate and respond to current and future challenges to human health and the enironment and that value inclusivity.

Objective 3.1 Recruit, develop, and retain a resilient workforce

ORD is committed to harnessing the power of a resilient workforce to drive innovation and creativity and to anticipate and respond to emerging human health and environmental challenges. Our workforce needs breadth, depth, and diversity of expertise, experience, and perspectives to enable us to be effective and innovative in conducting our work. We will continue to build an inclusive, multi-talented, highly capable, and highly effective workforce that embraces ORD's Principles,[2] shares a common sense of purpose, and is empowered to contribute to the impactful environmental research needs of the Agency and the nation.

Objective 3.2 Strengthen our organization through inclusivity and equity

ORD must have an inclusive and equitable work environment where every employee feels valued, respected, and empowered to contribute their unique perspectives and talents. We are committed to strengthening our programs and activities to be inclusive, to provide opportunities for all our workforce, and to result in equitable impacts to our workforce. We strive to build a culture of physical, mental, and social well-being; collegiality; mutual respect; mutual support and mentoring; psychological safety; opportunity; recognition; and development. By creating an environment where every employee is valued and empowered, we enhance our ability to address complex environmental, administrative, managerial, and operational challenges and deliver impactful and beneficial outcomes for ORD, EPA, and our partners.

Objective 3.3 Use resources strategically

ORD's efficient management of limited resources is critical to achieve our mission. We will comprehensively assess resource needs and allocation, explore innovative operations and continuous improvement opportunities, and leverage resource-sharing collaborations to meet modern scientific expectations. To maintain the scope, rigor, and quality of our scientific enterprise, we need state-of-the-art research equipment, specialized research assets, and resources for the administrative, managerial, and operational functions that support our scientific enterprise. We will be a leader in adoption of sustainable practices and promote a culture of resource stewardship amongst our workforce and at our facilities.

[2]ORD's Principles are presented on page 7 of this document.

Goal 4: Be a Trusted Scientific Source

Serve as a trusted source of scientific information for the Agency, the nation, and the world.

Objective 4.1 Ensure science of the highest quality

It is essential that research organizations uphold the highest standards of scientific quality and credibility. ORD will ensure that our research and development activities continually meet the most rigorous scientific standards by following robust processes and procedures for data gathering, generation, management, and verification; quality control; and independent peer review. We will lead efforts with EPA programs and regions to develop and coordinate consistent and quality science practices and standards across the Agency. By upholding scientific rigor, we maintain our long-standing reputation as a leading trusted source of environmental expertise nationally and globally.

Objective 4.2 Be leaders for EPA's scientific integrity

Scientific integrity is essential to ensure the public can trust the quality and validity of EPA's work. We will continue to uphold scientific and ethical standards, communicate effectively with the public, enhance transparency within scientific processes, and safeguard EPA's scientists and science from political interference or personal motivations. By upholding these principles and practices, we reinforce the integrity, quality, rigor, and objectivity of the scientific information and processes relied upon in policymaking, further strengthening public confidence in EPA's work. We will maintain our leadership role in EPA's commitment to sustain and grow a culture of scientific integrity.

Objective 4.3 Communicate science effectively

ORD is committed to transparency and open communication. We will continue to implement communications and outreach activities at all levels of ORD that engage the American people, the scientific community, elected officials, and other stakeholders in our research. Our effective communication practices will help translate ORD research to be understandable and useful. We will continue to make our data, results, and tools publicly available and explore ways to improve accessibility. We will seek opportunities to enhance our communications through new technologies and platforms, collaborations, and educational partners.

Appendix 1:
ORD Strategic Plan Measures of Success

The information below conveys the Key Performance Indicators (KPIs) that have been developed to ensure that ORD meets its strategic goals and objectives. KPIs provide a measurable way to assess the effectiveness of the strategies outlined in the strategic plan and determine whether it is producing the desired results. ORD will regularly monitor each of its KPIs to identify areas of success and those that require additional attention, allowing for adjustments to be made to the implementation of the strategy as needed. These actions will not only assist to ensure ORD stays on track to achieve its goals, but also provide valuable insights into the effectiveness of operations, allowing for continuous improvement. ORD additionally contributes to broader Agency-wide metrics under the EPA FY 2022-2026 Long-Term Performance Goals, which can be found in EPA's FY 2022-2026 Strategic Plan, available at: https://www.epa.gov/planandbudget/strategicplan.

No.	Performance Measure	Performance Measure Description	Supported Strategic Objectives
1	By September 30, 2026, increase the percentage of research products meeting partner's needs to 95% from a baseline of 93% in FY 2021.	Partner satisfaction is evaluated through a robust survey process. The annual survey engages key users of ORD products. Survey respondents evaluate the scientific rigor of research products (quality), product relevance (usability), and timeliness of product delivery.	Objective 1.1 Objective 1.2 Objective 1.3 Objective 2.1 Objective 2.2 Objective 4.1
2	By September 30, 2026, increase by 40% the number of ORD activities related to environmental justice that involve or are designed to be applicable to Tribes, states, territories, local governments, and communities.	This measure tracks the number of ORD activities that involved communities or are designed to be applicable to Tribes, states, territories, local governments, and communities with environmental justice concerns. ORD activities are funded or conducted by ORD. An activity is considered to involve a Tribe, state, territory, local government, or community if ORD engages with or consults the affected entity (or entities) on the specific activity. An activity is considered to be applicable to a Tribe, state, territory, local government, or community if the activity may be used by the entity (or entities) for the benefit of a community (or communities) with environmental justice concerns.	Objective 2.1 Objective 2.2 Objective 2.3 Objective 4.3

No.	Performance Measure	Performance Measure Description	Supported Strategic Objectives
3	By September 30, 2026, implement 126 actions for scientific integrity objectives that are certified by Deputy Scientific Integrity Officials in each EPA program and region.	This measure tracks the number of actions completed by EPA Deputy Scientific Integrity Officials (DSIOs) to implement the scientific integrity objectives that implement the EPA Scientific Integrity Policy (https://www.epa.gov/scientific-integrity/epas-scientific-integrity-policy). Each DSIO will certify completion of two actions for each of the three scientific integrity objectives: scientific integrity is highly visible at EPA (Objective 1); all of EPA embraces and models scientific integrity (Objective 2); and robust mechanisms protect and maintain EPA's culture of scientific integrity (Objective 3). DSIOs are members of the Scientific Integrity Committee representing each EPA program office and region.	Objective 4.2
4	By September 30, 2026, increase the percentage of environmental justice-focused products meeting partner's needs.	Partner satisfaction is evaluated through a robust survey process. The annual survey engages key users of ORD products. Survey respondents evaluate the scientific rigor of research products (quality), product relevance (usability), and timeliness of product delivery. This measure will evaluate a subset of ORD's research products specifically focused on environmental justice.	Objective 1.1 Objective 1.2 Objective 1.3 Objective 2.1 Objective 2.2 Objective 4.1
5	By September 30, 2026, increase the percentage of ORD climate-related research products meeting partner's needs.	Partner satisfaction is evaluated through a robust survey process. The annual survey engages key users of ORD products. Survey respondents evaluate the scientific rigor of research products (quality), product relevance (usability), and timeliness of product delivery. This measure will evaluate a subset of ORD's research products specifically related to climate.	Objective 1.1 Objective 1.2 Objective 1.3 Objective 2.1 Objective 2.2 Objective 4.1
6	Increase the use of targeted hiring authorities.	Measures the number of ORD employees that were brought onboard using the Schedule A (Disability), Peace Corps, and Veterans special hiring authorities.	Objective 3.1 Objective 3.2 Objective 3.3

Appendix 2:
Mapping to EPA's Strategic Plan

The following figure shows EPA's Cross-Agency Strategies and Strategic Goals for the Agency. It can be found in EPA's Strategic Plan Overview document, available at https://www.epa.gov/system/files/documents/2022-03/fy-2022-2026-epa-strategic-plan-overview.pdf. More information and EPA's full FY 2022-2026 Strategic Plan can be found at: https://www.epa.gov/planandbudget/strategicplan.

EPA's FY22-FY26 Strategic Plan Framework

The following table shows ORD's Strategic Goals and Objectives mapped to the EPA Cross-Agency Strategies and Strategic Goals outlined above and in EPA's FY 2022-2026 Strategic Plan.

ORD Strategic Plan Elements		Cross-Agency Strategy Alignment	Agency Strategic Goal Alignment
Goal 1: Advance Science and Technology	Objective 1.1: Develop holistic scientific understanding using systems approaches	1, 2	All
	Objective 1.2: Innovate at the leading edge of environmental research	1	All
	Objective 1.3: Expand and strengthen partnerships and collaboration	4	1, 2, 4, 5, 6, 7
Goal 2: Support Decision Making	Objective 2.1: Deliver science to inform EPA's actions	1	All
	Objective 2.2: Translate science into solutions with our external partners	1, 4	1, 2, 4, 5, 6, 7
	Objective 2.3: Provide technical assistance and support	4	All
Goal 3: Build a Healthy Workforce and Organization	Objective 3.1: Recruit, develop, and retain a resilient workforce	3	1, 2, 4, 5, 6, 7
	Objective 3.2: Strengthen our organization through inclusivity and equity	3	1, 2, 4, 5, 6, 7
	Objective 3.3: Use resources strategically	3	All
Goal 4: Be a Trusted Scientific Source	Objective 4.1: Ensure science of the highest quality	1	All
	Objective 4.2: Be leaders for EPA's scientific integrity	1	All
	Objective 4.3: Communicate science effectively	1, 3, 4	All

Image descriptions. All images are credited to EPA or to ORD staff.

Page 4 (top to bottom, left to right):

- Controlled outdoor testing environments simulate ecosystems at ORD's Corvallis, OR facility.
- Microscopic image of a blade of grass for testing lead remediation (credit: Tyler Sowers).
- Air sensor deployed in the field for monitoring air quality.
- Water distribution system simulator at ORD's Cincinnati, OH Lab.

Page 8 (top to bottom, left to right):

- Part of the full-scale Water Security Test Bed in Idaho Falls, ID, a collaboration between ORD and Idaho National Labs for testing decontamination, treatment, and other water security technologies.
- ORD staff collecting benthic sediment samples from an estuary.
- Lake Explorer II, ORD's Great Lakes research vessel stationed out of ORD's Duluth, MN lab.
- Human cells labeled with fluorescent probes for use in high-throughput chemical testing (credit: Clinton Willis and Joshua Harrill).

Page 10 (top to bottom):

- Close-up of coral studied in ORD's Gulf Breeze, FL lab.
- ORD staff installing a groundwater monitoring well at a field site.
- Part of the particulate matter test chamber at ORD's indoor air research facility at the Research Triangle Park (RTP), NC lab.

Page 12 (top to bottom):

- An eddy covariance tower monitoring carbon dioxide and methane emissions from a lake.
- Multipollutant control research facility at ORD's RTP, NC lab for testing combustion of different fuels.
- ORD staff testing water quality samplers for detecting harmful algal blooms.

Page 14 (top to bottom):

- Rat brain cells for use in chemical testing for developmental neurotoxicity (credit: Josh Harrill and Kathleen Wallace).
- Pilot-scale tunnel furnace for testing PFAS destruction at ORD's RTP, NC lab.
- Controlled freshwater stream testing environments at ORD's Cincinnati, OH lab.