US EPA's Tribal Science Program and Activities

Cynthia McOliver & Fred Hauchman
EPA Office of Research and Development

National Tribal Public Health Summit
May 24, 2018

Outline

- Overview of the EPA Office of Research and Development (ORD)
- Tribal Partner Groups
- Science Tools and Resources for Tribal Partners
- Selected EPA-Tribal Collaborations
- Selected Tribal Grants
- Contact Information

ORD Research and Technical Support

ORD provides the scientific foundation for EPA to fulfill its mandate to protect human health and the environment.

- **Long-Term Research**
  Scientists conduct ***innovative and anticipatory*** research to solve long-term environmental challenges and provide the basis for future environmental protection.

- **Research on Specific Environmental Challenges**
  Experts conduct research to help EPA program and regional offices, as well as states, tribes and communities, respond to contemporary environmental challenges.

- **Technical and Emergency Support**
  Because of our expertise, local, state and national officials come to us for technical support to respond to environmental crises and needs, large and small.

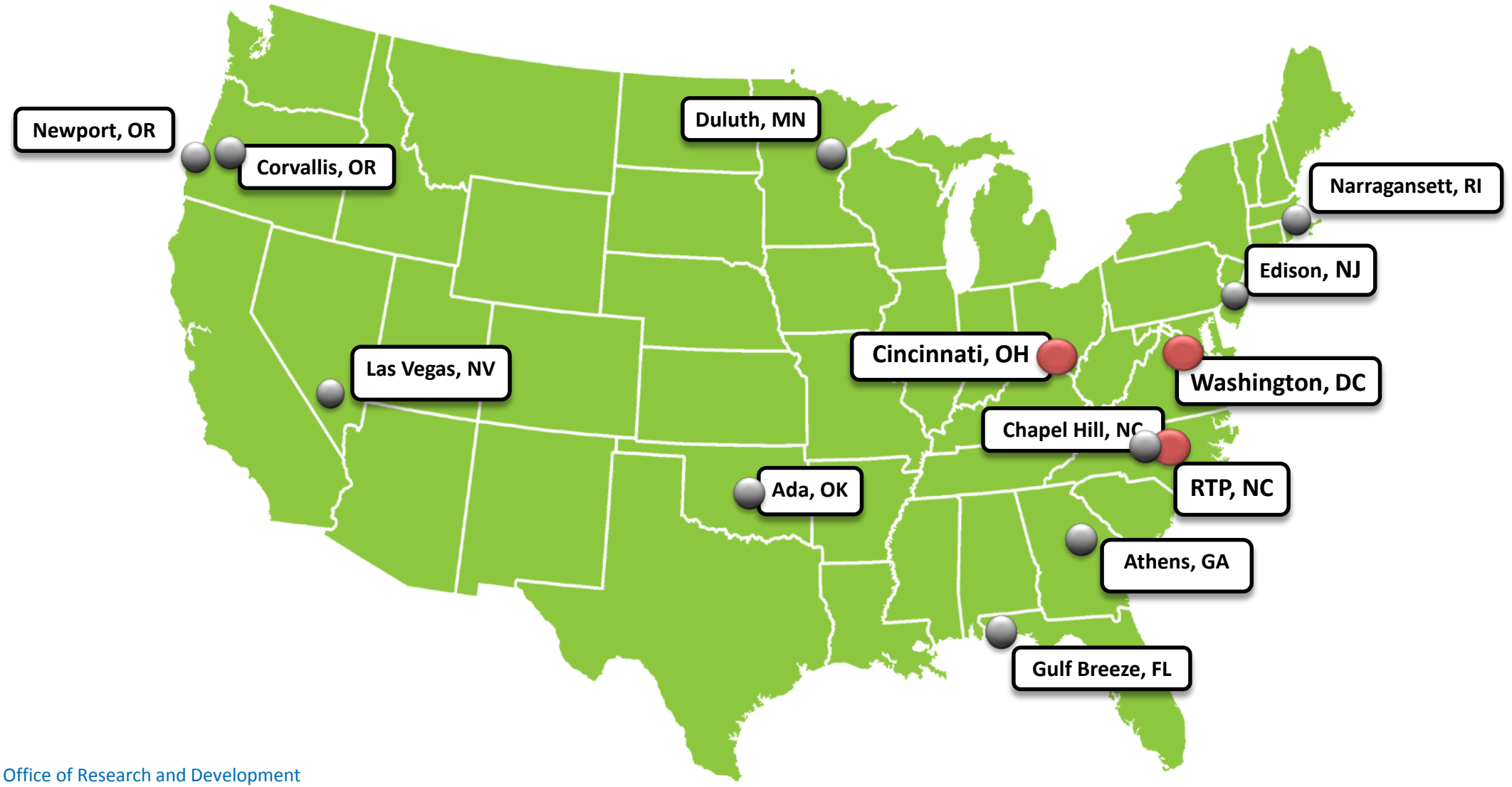
EPA-ORD Research Triangle Park

EPA-ORD Cincinnati

ORD's National Research Programs

Strategic Research Action Plans (StRAPs) for ORD's six National Research Programs describe ORD's research in each area over the coming years.

ORD HQ and Research Laboratories



Tribal Science Council

- Established in 2001 at National Tribal Caucus (NTC) request to provide scientific support in Indian country
- Forum for sharing information and collaborating on environmental issues
- Members include representatives from:
  - A federally recognized tribe in each EPA region plus a representative from the Alaska Native communities
  - Each EPA Program and Regional Office
- Coordinates with NTC and Tribal Partnership Groups on research planning and product delivery
- Current Co-Chairs
  - Carol Kriebs, Sac and Fox Nation of Missouri
  - Jose Zambrana, ORD

http://www.epa.gov/osp/tribes/tribes.htm

ORD Research Programs – Tribal Partnerships

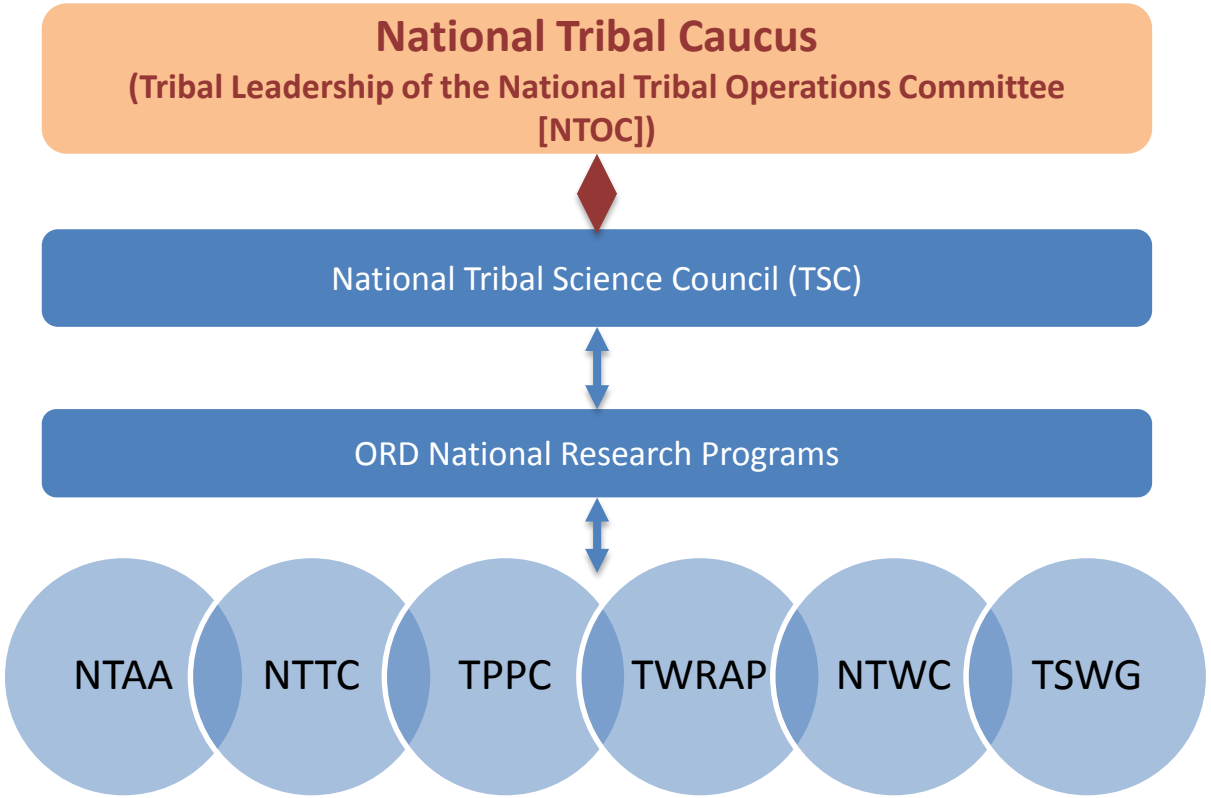
Research Program	Partnership Group
Air and Energy	National Tribal Air Association (NTAA)
Chemical Safety for Sustainability Human Health Risk Assessment	National Tribal Toxics Council (NTTC) Tribal Pesticides Program Council (TPPC)
Sustainable and Healthy Communities	Tribal Waste and Response Assistance Program (TWRAP) Tribal Superfund Working Group (TSWG)
Safe and Sustainable Water Resources	National Tribal Water Council (NTWC)
Office of Research and Development	National Tribal Science Council (TSC)

http://www.epa.gov/osp/tribes/tribes.htm





ORD Relationship with Tribal Partners



http://www.epa.gov/osp/tribes/tribes.htm

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EPA Science Tools and Resources for Tribal Partners

EPA Science Resources

Information on EPA's research databases and tools, factsheets, brochures and research reports is available at the following sites:

https://www.epa.gov/research/strategic-research-action-plans-annual-reports-updates-and-fact-sheets

https://www.epa.gov/research/methods-models-tools-and-databases

ORD research products can be found in the Science Inventory:
https://cfpub.epa.gov/si/

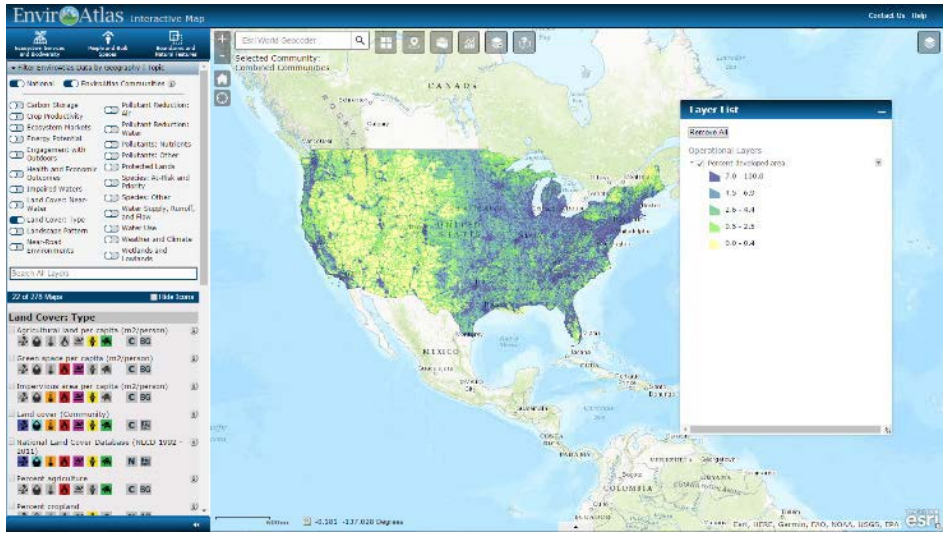
EnviroAtlas

EnviroAtlas is a web-based decision support tool that combines maps, analysis tools, downloadable data and informational resources that states, tribes, communities and individuals can use to help inform policy and planning decisions that impact the places where people live, learn, work and play.

- Two primary tools: An *Interactive Map*, which provides access to 300+ ecosystem-related maps developed by EPA researchers and an *Eco-Health Relationship Browser,* which displays evidence from scientific publications on the linkages between ecosystems, the services they provide, and human health.
  - **Youtube Video**: https://www.youtube.com/watch?v=ZMU8ZLsCmUM
  - **Case studies**: https://www.epa.gov/enviroatlas/enviroatlas-use-cases

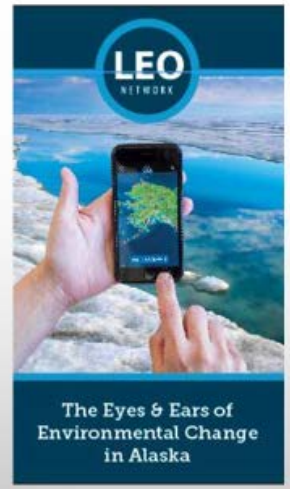
Websites:

- https://www.epa.gov/enviroatlas
- https://www.epa.gov/research/methods-models-tools-and-databases



Local Environmental Observer (LEO) Network

- Network of local environmental observers and topic experts, located in both Arctic and sub-Arctic areas
- Uses traditional and local knowledge, science and technology to document and understand significant, unusual events in Alaska and beyond
- LEO Hubs have now extended to Yurok Tribe, Northwest Indian College, and Canada (Northwest Territories and British Columbia)
- LEO Network members report and share **unusual environmental events** that help understand a changing world
- LEO Network observations contribute to One Health, which recognizes the relationships between the health of humans, animals, plants and the environment.
- Uses web-based public Google Maps to post observations™
  - Web app: www.leonetwork.org
  - Mobile app/Leo Reporter (iPhone, iPad and Android): https://www.leonetwork.org/en/mobile
  - Youtube: https://www.youtube.com/watch?v=oPGuwZPIsis
  - Learn about LEO: https://www.leonetwork.org/en/learn



www.leonetwork.org

Native Environmental Science
Northwest Indian College

http://www.nwic.edu/life-on-campus/degrees-and-certificates/b-s-in-native-environmental-science/

EPA Contacts: Santina Gay (gay.santina@epa.gov; Patrick Huber huber.patrick@epa.gov)

Smoke Ready Toolbox for Wildfires

Available at:
https://www.epa.gov/air-research/smoke-ready-toolbox-wildfires

Contacts:
Monica Linnenbrink, linnenbrink.monica@epa.gov;
Ann Brown, brown.ann@epa.gov

Airnow.gov: Current Fire Conditions

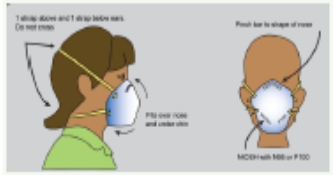
Get current air quality conditions and learn what to do to protect your health from air pollution, including smoke from wildland fires. Airnow.gov provides local air quality forecasts using EPA's science-based air quality index. https://airnow.gov/index.cfm?action=topics.smoke_wildfires

How Smoke From Fires Can Affect Your Health

Learn who is more at risk from smoke, how to tell if it is affecting you, and steps you can take to protect your health. Learn what to do before, during and after a wildfire. https://airnow.gov/index.cfm?action=smoke.index

Wildfire Smoke: A Guide for Public Health Officials

The guide is an easy-to-use resource that outlines whose health is most affected by wildfire smoke, how to reduce exposure to smoke, what public health actions are recommended, and how to communicate air quality to the public. The recommendations are based on science conducted by EPA and others. https://www3.epa.gov/airnow/wildfire_may2016.pdf



Wildfire Smoke Exposure Infographics

Two infographics provide information on actions to take to reduce health risks from smoke exposure in areas with wildfire smoke and what respirator (mask) to wear if you have to go outside and how to wear it properly. https://www3.epa.gov/airnow/smoke_fires/reduce-health-risks-with-wildfire-smoke.pdf and https://airnow.gov/static/topics/images/epa-infographic-respirator.jpg

Smoke Sense App

The Smoke Sense mobile app, developed by EPA researchers, enables you to get information on air quality and learn how to protect your health from wildland fire smoke. The app is being used in a citizen science study to determine how smoke from fires impacts public health. The app is available for anyone to use and can be downloaded on Android or iOS. www.epa.gov/air-research/smoke-sense

Particle Pollution and Your Patients' Health Course

Particle pollution, also known as particulate matter or PM, is the main component of haze, smoke, and dust. This course provides health professionals with knowledge they can share with patients to help reduce overall risk of PM-related health effects, particularly in individuals with heart and lung disease. www.epa.gov/pmcourse

Online Healthy Heart Toolkit

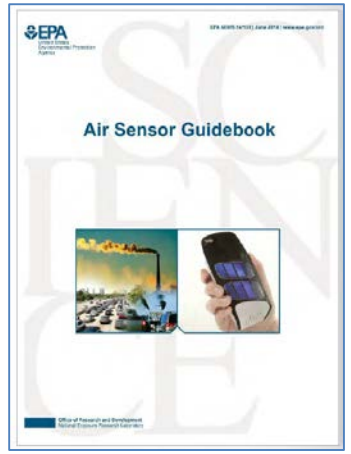
Breathing in fine particulate matter ($PM_{2.5}$) can trigger heart attacks, ischemic stroke, abnormal heart rhythms and worsen heart failure in people with cardiovascular disease or older adults with medical conditions that put them at risk. Particle pollution is a main component of smoke. Use the toolkit to protect your heart. https://www.epa.gov/air-research/healthy-heart-toolkit-and-research

Air Sensor Toolbox

for Citizen Scientists, Researchers, and Developers

Information on how to select and use low-cost, portable air sensor technology and understand results from monitoring activities

- Air Sensor Guidebook
- Technical evaluation reports
- EPA's Sensor Performance Evaluation and Application Research (SPEAR)
- Additional resources:
  - Community Air Monitoring Training videos
  - Instruction Guide and Macro Analysis Tool
  - Village Green Manual and Training Video
  - Standard Operating Procedures for Air Sensors
  - Links to resources from Air Quality Sensor Performance Evaluation Center (AQ-SPEC) and European Joint Commission Center
  - Possible funding opportunities
  - …and more…



AIR SENSOR TOOLBOX

Available at: https://www.epa.gov/air-sensor-toolbox

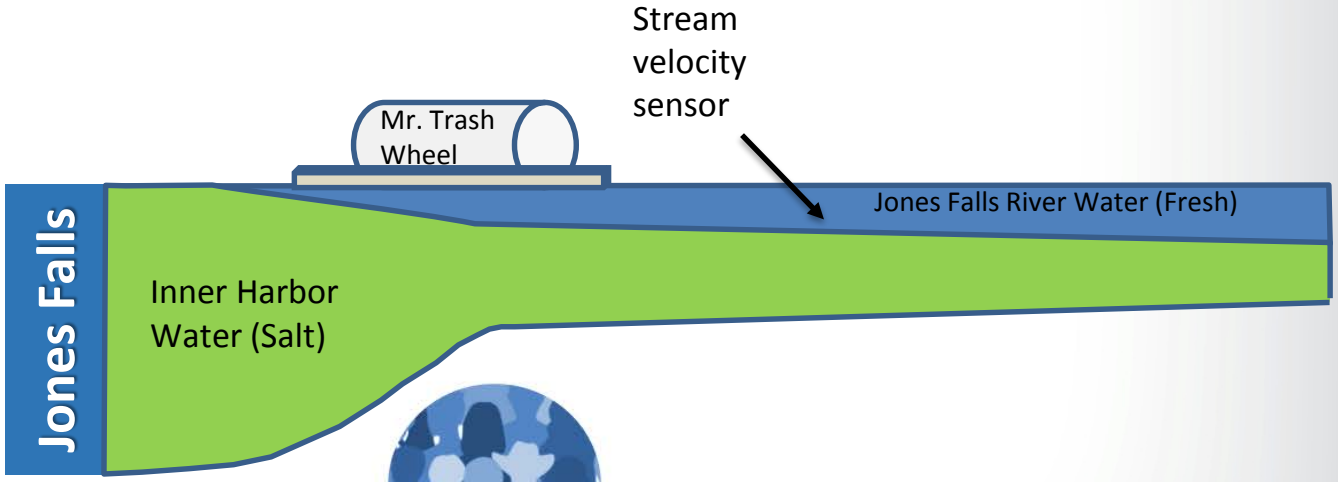
Contacts: Monica Linnenbrink, linnenbrink.monica@epa.gov;
Ann Brown, brown.ann@epa.gov

Village Blue Data and Website

- "Village Blue" research project aims to provide real-time water quality monitoring data to the Baltimore community and increase public awareness about local water quality in Baltimore Harbor and the Chesapeake Bay.
- Project will help test, evaluate and develop water sensors that collect real-time water quality data
- Collaboration between EPA and USGS, with state and local partners in Maryland

Project contact: Kevin Oshima, oshima.kevin@epa.gov
Media Contact: Emily Smith, smith.emily@epa.gov

Fact sheet: https://www.epa.gov/sites/production/files/2016-09/documents/villagebluefactsheet.pdf



Learn

Learn more about Village Blue Baltimore's water sensors and what they measure.

Explore

Explore water quality data collected by the Village Blue Baltimore water sensors.

Community

Learn more about Village Blue Baltimore's federal, state, and community partnerships.

Tools and Resources for Educators

- How Does EPA Protect the Environment? Activity Book for Children
- https://www.epa.gov/students/how-does-epa-protect-environment-activity-book-children

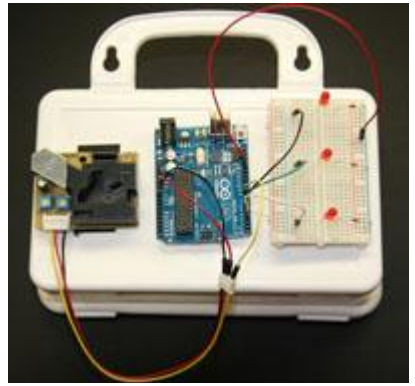
- Hands-on Activities and Other Resources on Air Quality and Climate Change for Teachers https://www.epa.gov/air-research/air-quality-and-energy-choice-stem-activities-educators

- Village Green Lesson Plans for Educators https://nepis.epa.gov/Exe/ZyPDF.cgi/P100UA3G.PDF?Dockey=P100UA3G.PDF

- Games and Quizzes https://www.epa.gov/students/games-and-quizzes-about-environment

- Prizes and Challenges https://www.epa.gov/innovation/challenges-prizes

- EPA's Office of Environmental Education https://www.epa.gov/education



Tools and Resources for Youth and Students

- Get involved in Citizen Science https://www.epa.gov/citizen-science
- EPA Internships page https://www.epa.gov/careers/student-internships
- Other Internships and Fellowships: https://www.epa.gov/careers/fellowships-scholarships-and-post-doctoral-opportunities
- USAJOBS for Students and Recent Grads https://www.usajobs.gov/Help/working-in-government/unique-hiring-paths/students/

Tribal Participation in the Exchange Network (EN)

EPA's Office of Environmental Information

- EN Grants Program supports tribes in developing IT solutions to electronically manage and share environmental and health information.
- Cooperative agreement with Institute for Tribal Environmental Professionals supports tribal participation in the Exchange Network
  - **EN Tribal Governance Group** advocates for tribal interests in the Exchange Network partnership and *facilitates access to resources and tools for improving data management and exchange solutions*.
  - **Mentorship opportunities** with more EN-experienced tribes.
  - **Annual Tribal EN Conference** provides a dynamic environment for knowledge and technology transfer among tribes and EPA.
    - http://www.tribalexchangenetwork.org/
    - http://www.exchangenetwork.net/

Contact: Edward Mixon, mixon.edward@epa.gov

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Selected EPA-Tribal Collaborations

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Lead Awareness in Indian Country: Keeping our Children Healthy!

- The National Tribal Toxics Council identified the need to create a tribal lead outreach education curriculum that includes relevant tribal scenarios.
- The purpose is to increase understanding and awareness of childhood lead exposures, health effects, and preventative actions.
- The target audience for instructors includes community/youth leaders and environmental health providers. Participants are expected to include tribal leaders, parents, grandparents, students, teachers, adults and community leaders.
- Oneida Nation will host a pilot project in Summer 2018

Contact: Amanda Hauff, hauff.amanda@epa.gov

Air Sensors and Indoor Air Quality

Using Sensors to Document Improvements in Indoor Air Pollution after Stove Replacement and Home Weatherization. [Navajo Nation]

- Goal was to design a stove that could heat with both wood and coal, meet EPA's wood stove emission standards, and reduce emissions while burning coal.
- Through this project, several companies worked with EPA to design and install cleaner-burning and more efficient wood and coal stoves
- The project led to the development of an instruction guide and tool that can be used by citizen scientists to evaluate the performance of low-cost sensors and interpret the data
- Collaborators: EPA, the Navajo Nation, Dine College, University of Colorado, and the stove industry, especially Woodstock Soapstone.

https://www.epa.gov/air-research/community-led-air-sensor-evaluation-new-tools-citizen-scientists-fact-sheet

Cookstove assessments and replacements.
Photo credit: Woodstock Soapstone

Contact: Matt Small, EPA Region 9, Regional Science Liaison
small.matthew@epa.gov;
Katie Stewart (Primary Investigator), stewart.Kathleen@epa.gov

Fishery Restoration Following Dam Removal

Investigation to Determine Efficacy of Utilizing Restored Anadromous Fisheries Resulting from Dam Removal in Support of Tribal Sustenance and Sustainability. [**Penobscot Indian Nation**, 2016]

- Researchers collected and analyzed samples of several anadromous fish species as they return to Penobscot Reservation waters
- Tissues samples, from the portions used by tribal members, were analyzed for toxics including dioxin, furans, PCBs, and mercury.
- Using the contaminants results, EPA worked with the tribe to develop a culturally appropriate risk assessment for Penobscot Tribal members when engaging in their legally protected right of sustenance fishing and their traditional cultural practices.

Penobscot River, Photo credit: EPA

Contact: John Lin, lin.john@epa.gov

Floating Vegetative Islands and Water Quality

Floating Vegetation Islands: Using TEK for Development of Leading Indicators of Ecosystem Function for BMP Effectiveness, Water Quality Standards, Biological Criteria, and Control of Harmful Algal Blooms (HABs). [**Chemehuevi and Colorado River Indian Tribes,** 2015]

- The objective of this study is to evaluate the effectiveness of floating vegetated islands (Figure 1) to remove nutrients from the water column within the Chemehuevi and CRIT reservation areas along Lake Havasu and the Lower Colorado River.

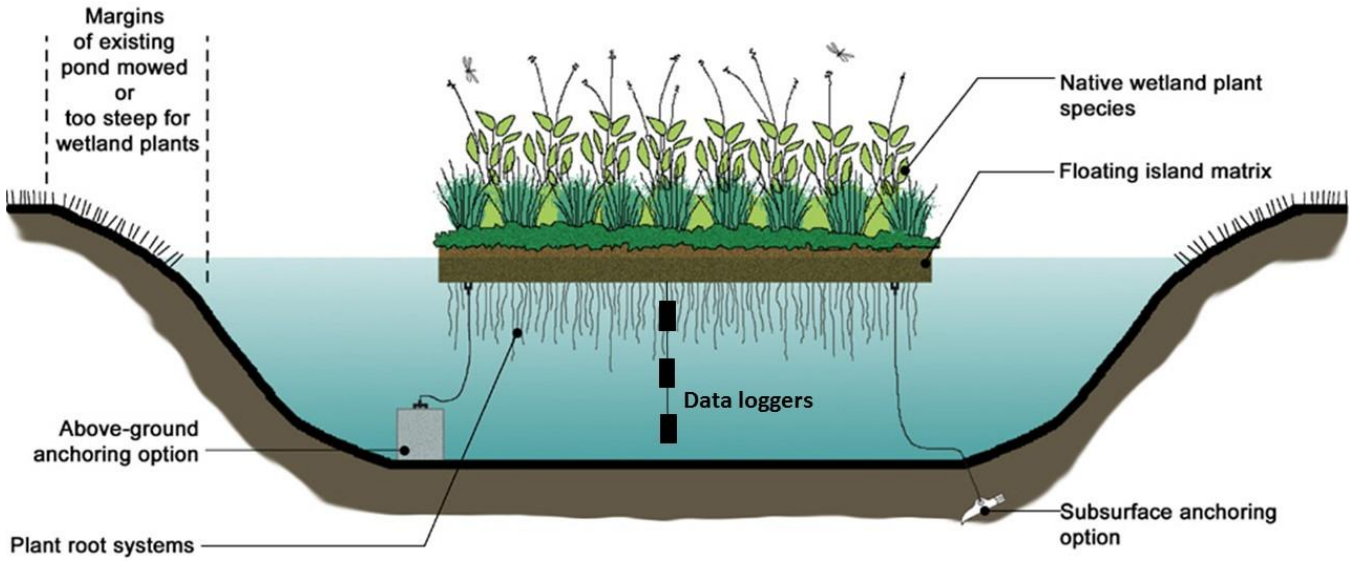

Figure 1. Stylized diagram of a floating vegetation island. Diagram is from the Texas Coastal Watershed Program where they used a dense mesh of polyethylene terephthalate (PET) fibers which have been recycled from plastic waste such as soda bottles (http://tcwp.tamu.edu/floating-wetland-islands/). Data loggers will be placed down column, and up and down flow of the island.

EPA Contact: Bob Hall, hall.robert@epa.gov

Waterborne Disease

The Waterborne Infection Risk Evaluation (WIRE) study. [**Choctaw Nation of Oklahoma**, 2017; **Cherokee Nation**, 2018-2019]

- EPA researchers are working with colleagues in EPA Region 6 and local tribes to conduct studies on the occurrence of waterborne disease and other infections in tribal populations.

EPA Contact: Tim Wade, wade.tim@epa.gov

Air Sensor and Outdoor Air Quality

Community-led air sensor evaluation: New tools for citizen scientists . [**Eastern Band of Cherokee Indians (ECBI),** 2016]

- The tools were developed as part of a community-led air sensor evaluation project initiated during fall 2016
- EPA partnered with a community group (Clean Air Carolina) and the Eastern Band of Cherokee Indians to conduct a sensor performance evaluation using their choice of low-cost sensors.
- Both project partner groups used the tools and gave feedback on how to better tailor them to a citizen scientist audience.
- The project led to the
  - development of an instruction guide and tool that can be used by citizen scientists to evaluate the performance of low-cost sensors and interpret the data.
  - Link to information on the tool: https://www.epa.gov/air-research/instruction-guide-and-macro-analysis-tool-community-led-air-monitoring
-

EPA and partners from the Eastern Band of Cherokee Indians review the assembly of a weather shelter for low-cost sensors.

EPA Technical Contact Teri Conner, conner.teri@epa.gov

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Selected Tribal Grants

Science to Achieve Results (STAR) Grants

Alaska Native Tribal Health Consortium (Anchorage, AK)
Assessing, monitoring, and adapting to the threats of a changing environment to the sustainability of food and water in remote Alaska Native villages.

Swinomish Indian Tribal Community (La Conner, WA), Skagit System Cooperative, USGS Western Fisheries Research Center
Examining coastal environmental impacts to traditional foods, cultural sites, and tribal community health and well-being.

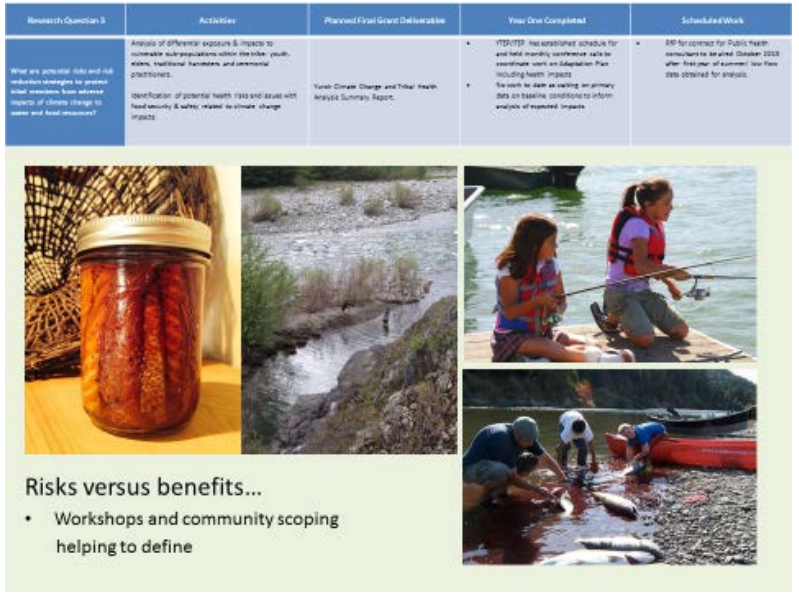
Yurok Tribe (Klamath, CA), Northern Arizona University
Identifying, assessing, and adapting to environmental change impacts to Yurok water and aquatic resources, food security and tribal health.

Little Big Horn College (Crow Agency, MT) and Montana State University
Studying environmental change adaptation and waterborne disease prevention on the Crow Reservation.

University of Tulsa (Tulsa, OK), Cherokee Nation Environmental Program, Institute for Tribal Environmental Professionals, Navajo Nation - EPA and Dept. of Diné Education, Nimiipuu Health, University of Oklahoma
Examining ways to improve indoor air quality and reduce environmental asthma triggers in tribal homes/ schools.

University of Massachusetts-Amherst (Amherst, MA)
Measuring indoor air quality in tents as related to wood smoke exposures and identify potential health risks in remote subsistence hunting communities in North America.

https://www.epa.gov/research-grants/tribal-environmental-health-grants-recipient-lists



EPA project officer: Cynthia Nolt-Helms, nolt-helms.cynthia@epa.gov

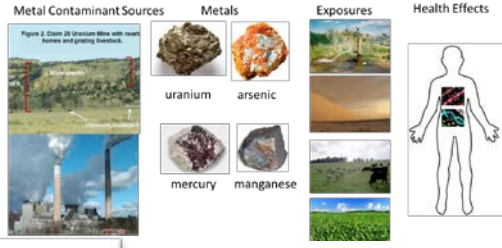
STAR Grants *(continued)*

University of Washington, Heritage University
Reducing Wood Smoke and improving air quality in Yakima Valley using sensor technology
EPA Project Officer: Rich Callan, callan.richard@epa.gov

University of New Mexico Center for Native Environmental Health Equity Research, Cheyenne River Sioux Tribe, Crow Environmental Health Steering Committee, Navajo Nation chapters, Montana State University, University of Washington, Southwest Research & Information Center, Missouri Breaks, Inc. *Exposures and Health disparities associated with metal mixtures from mine-related wastes*
EPA Project Officer: Maggie Breville, breville.maggie@epa.gov

University of Arizona, Northern Arizona University, Center for Indigenous Environmental Health Research *Investigate how chemical and other environmental exposures, including social determinants, lead to health inequities for AI/AN communities*
EPA Project Officer: Maggie Breville, breville.maggie@epa.gov

University of Illinois, Urbana-Champaign, Tlingit-Haida Regional Housing Authority (THRHA)
Measuring wood stove emissions and indoor air quality before and after replacement with new EPA-certified stoves and training THRHA technicians to conduct testings
EPA Project Officer: Dr. Terry Keating, keating.terry@epa.gov



Navajo: Traditional Foods and Water Contamination

Navajo R21: Gold King Mine Spill Dine Exposure Project

Hopi Environmental Health Project

Contacts

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mcoliver.cynthia@epa.gov

Monica Rodia and **Jose Zambrana** can provide assistance in communication and engaging with the Tribal Partnership Groups and the Tribal Science Council.

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rodia.monica@epa.gov

Jose Zambrana: (213) 244-1819
zambrana.jose@epa.gov

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Disclaimer

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