



EPA Science to Achieve Results (STAR) Tribal Environmental Health Research and Accomplishments

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Portfolio Details

Four Solicitations

2000

•Environmental Justice: Partnerships for Communication

2002

• Lifestyle and Cultural Practices of Tribal Populations and Risks from Toxic Substances in the Environment

2007

• Issues in Tribal Environmental Research and Health Promotion: Novel Approaches for Assessing and Managing Cumulative Risks and Impacts of Global Climate Change

2013

Science for Sustainable and Healthy Tribes

- 16 Grants - \$11M
- 10 grants closed – 6 currently active
- 33 journal articles, 4 books/book chapters, 4 educational films/videos, 1 guidance manual, 7 technical reports/risk assessments (to date)
- Chapter on Alaska and Alaska Native Village Biomonitoring data in [AMAP Assessment 2015: Human Health in the Arctic](#)
- Supported within EPA Sustainable and Healthy Community Project 2.63, Assessing Environmental Health Disparities in Vulnerable Groups



Research Areas and Portfolio Characteristics

Key research areas

- Risk communication and management
- Persistent organic pollutants and heavy metals
- Climate change
- Water Quality (pathogens, metals, algal toxins/HABS)
- Subsistence practices and natural resources
- Indoor air pollution
 - All projects involve Tribal engagement and collaboration
- Uniqueness of portfolio
 - Incorporates and values tribal perspectives and cultural norms
 - Tribal elder and ecological knowledge





Developed biomonitoring and human health data to improve understanding of Alaska Native Health and Arctic Health

- EPA STAR research from the Alaska Native Tribal Health Consortium provided critical biomonitoring data from 2009-2012 from mother-infant pairs from Alaska Native Villages (Yup'ik and Yukon and Kuskokwim River Delta in southwestern Alaska).
- These data are included in the AMAP Assessment 2015: Human Health in the Arctic report (see Section 3.4.1), and AMAP 2009
- Reported on persistent organic pollutants (POPs and metals) in umbilical cord blood in infants and maternal blood
 - High levels of PBDEs and flame retardants measured in blood/cord blood
- Collection and sampling of subsistence seafood and sea mammals for persistent organic pollutants, mycotoxins and heavy metals



Source: AMAP, 2015
<https://oaarchive.arctic-council.org/handle/11374/1703>



Enhancing Tribal community engagement and participation in research

STAR grantees working with Crow Environmental Health Steering Committee on the Crow Reservation engaged tribal elders, tribal college students and families in water quality and climate change research, outreach and publication development

Cummins C, Doyle J, Kindness L, et al. Community-Based Participatory Research in Indian Country: Improving Health through Water Quality Research and Awareness. *Family & community health*. 2010;33(3):166-174. doi:10.1097/FCH.0b013e3181e4bcd8.

STAR grantees engaged local instructors, elders, youth, and community leaders in Point Hope, Akutan, and Seldovia, Alaska in their research on how climatic stress factors impacted the health-protective properties of wild Alaskan berries and to assess local traditional ecological knowledge (TEK) and risk perceptions regarding these berries, given the seasonal shifts associated with climate change.

Kellogg, J.; Wang, J.; Flint, C.G.; Ribnicky, D.; Kuhn, P.; de Mejia, E.G.; Raskin, I.; Lila, M. Alaskan wild berry resources and human health under the cloud of climate change. *J. Agric. Food Chem.* 2010, 58, 3884–3900.

Flint, C.G.; Robinson, E.S.; Kellogg, J.; Ferguson, G.; BouFajreldin, L.; Dolan, M.; Raskin, I.; Lila, M. Promoting wellness in Alaskan villages: Integrating traditional knowledge and science of wild berries. *EcoHealth* 2011, 8, 199–209.



Leading efforts on tribal-driven and tribal-supported Climate Change Research

STAR researchers are developing local-level GIS models and apps, enhancing existing water quality indicators, mapping subsistence resources and recording cultural history passed down by elders to observe and quantify climate change impacts on tribal communities and their environments

Examples:

- Impacts on traditional and subsistence food availability
- Impacts on water quality and ecosystem services e.g. droughts, flooding, diseases affecting fish, shellfish, and sea mammals; waterborne pathogens
- Impacts on traditional ways of life

This journal article presents Crow elder observations on changing local environment and an assessment of local and state meteorological data to highlight trends that may be associated with climate change for the Crow Reservation and surrounding areas.

Doyle JT, Redsteer MH, Eggers MJ. "Exploring Effects of Climate Change on Northern Plains American Indian Health." *Climatic change*. 2013;120(3):10.1007/s10584-013-0799-z. doi:10.1007/s10584-013-0799-z.





Developing data and models to improve and protect water quality and reducing exposures from fish consumption

STAR research developed fish advisory maps identifying high risk of mercury in walleye for the Anishinaabe in the Great Lakes region. Communities decreased fishing and consumption of walleye.

Foran JA, DeWeese AD, Hudson MJ, and Kmiecik NE. 2010. Evaluation of Mercury Exposure Reduction Through a Fish Consumption Advisory Program for Anishinaabe Tribal Members in Northern Wisconsin, Michigan, and Minnesota. *Journal of Environmental and Public Health*. Article ID 802584, 7 pp. (doi:10.1155/2010/802584)



Research from STAR grantees provided data and recommendations for improving fish consumption survey methods to reflect tribal fish intake and traditional norms.

STAR research developed participation geographic information system maps for the Yurok and other Tribes residing near the Klamath River Basin (California) showing contaminant information, raising awareness of potential exposures.





Key publications

- Judd NL, Drew CH, Acharya C, Marine Resources for Future Generations, Mitchell TA, Donatuto JL, Burns GW, Burbacher TM, and Faustman EM. 2005. Framing Scientific Analyses for Risk Management of Environmental Hazards by Communities: Case Studies With Seafood Safety Issues. *Environmental Health Perspectives* 113(11):1502–1508.
- J. A. Foran, A. D. DeWeese, M. J. Hudson, and N. E. Kmiecik, “Evaluation of Mercury Exposure Reduction through a Fish Consumption Advisory Program for Anishinaabe Tribal Members in Northern Wisconsin, Michigan, and Minnesota,” *Journal of Environmental and Public Health*, vol. 2010, Article ID 802584, 7 pages, 2010. doi:10.1155/2010/802584
- Kellogg, J.; Wang, J.; Flint, C.G.; Ribnicky, D.; Kuhn, P.; de Mejia, E.G.; Raskin, I.; Lila, M. Alaskan wild berry resources and human health under the cloud of climate change. *J. Agric. Food Chem.* 2010, 58, 3884–3900.
- Flint, C.G.; Robinson, E.S.; Kellogg, J.; Ferguson, G.; BouFajreldin, L.; Dolan, M.; Raskin, I.; Lila, M. Promoting wellness in Alaskan villages: Integrating traditional knowledge and science of wild berries. *EcoHealth* 2011, 8, 199–209.
- Harper BL, Harding AK, Harris S, and Berger P. 2012. Subsistence Exposure Scenarios for Tribal Applications. *Human and Ecological Risk Assessment: An International Journal* 18(4):810–831.
- Doyle JT, Redsteer MH, Eggers MJ. “Exploring Effects of Climate Change on Northern Plains American Indian Health.” *Climatic change*. 2013;120(3):10.1007/s10584-013-0799-z. doi:10.1007/s10584-013-0799-z
- Eggers MJ, Moore-Nall AL, Doyle JT, Lefthand MJ, Young SL, Bends AL, Crow Environmental Health Steering Committee, Camper AK. Potential health risks from uranium in home well water: an investigation by the Apsaalooke (Crow) Tribal Research Group. *Geosciences* 2015;5(1):67-94.



Synthesis Report: A Decade of Tribal Environmental Health Research: Results and Impacts from EPA's Extramural Grants and Fellowship Programs

- **Report summarized tribal research across NCER's programs, including grants and fellowships.**
- **Published in January 2014**
- **Findings:**
 - better defined and reduced the health risks of tribal populations
 - protected natural resources essential to cultural and spiritual practices, and
 - encouraged the integration of ecological knowledge and tribal practices of protecting and preserving the earth for future generations.
 - Developed unique and culturally relevant translation and communication of environmental information

Electronic version of report is available from:

<https://www.epa.gov/sites/production/files/2015-08/documents/results-impacts.pdf>

A few copies on CDs are available upon request





Current tribal human health research – Climate change and indoor air pollution focus

- **SHC Project 2.63: Assessing Environmental Health Disparities in Vulnerable Groups, Task 2.63.5: Research to understand ecological and human health for Tribal sustainability and well-being (Tribal Science Program; STAR)**

“EPA is proud to have a long and rich history of supporting environmental and public health protection for all communities. These EPA supported grants will increase our knowledge of the threats posed by climate change and indoor air pollution, while incorporating traditional ecological knowledge to reach culturally appropriate and acceptable adaptation strategies to address these threats.”

EPA Administrator, Gina McCarthy highlights the award of six new STAR tribal grants

Source:

<https://blog.epa.gov/blog/2014/07/science-for-sustainable-and-healthy-tribes/>

Grantees

- Alaska Native Tribal Health Consortium, Anchorage, AK
- Little Big Horn College, Crow Agency, MT
- Swinomish Indian Tribal Community, LaConner, WA
- University of Massachusetts Amherst, Amherst, MA
- University of Tulsa, Tulsa, OK
- Yurok Tribe, Klamath, CA



Additional STAR research addressing Tribal/Indigenous concerns

- **Health Disparities research funded under the Centers of Excellence on Environmental Health Disparities Research**
 - **Center for Native American Environmental Health Equity Research, University of New Mexico**
 - **Center for Indigenous Environmental Health Research (CIEHR), University of Arizona**

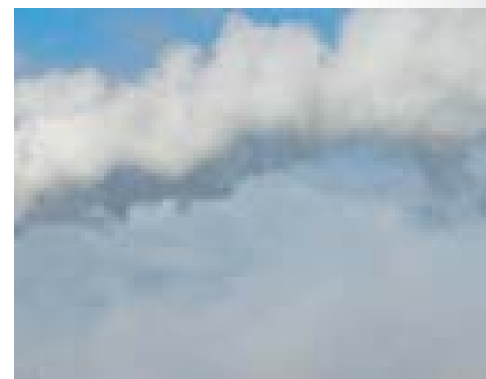
Contact: Maggie Breville, breville.maggie@epa.gov

Homepage: <https://www.epa.gov/research-grants/centers-excellence-environmental-health-disparities-research>

- **Air Pollution Monitoring for Communities**
 - **The Hawai'i Island Volcanic Smog Sensor Network (HI-Vog): Tracking air quality and community engagement near a major emissions hotspot, Massachusetts Institute of Technology**
 - **Putting Next Generation Sensors and Scientists in Practice to Reduce Wood Smoke in a Highly Impacted, Multicultural Rural Setting (NextGenSS), University of Washington**

Contact: Rich Callan, callan.rich@epa.gov

Homepage: https://cfpub.epa.gov/ncer_abstracts/index.cfm/fuseaction/recipients.display/rfa_id/587





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NCER Homepage: <https://www.epa.gov/research-grants>

NCER Tribal Grants homepage:

<https://www.epa.gov/research-grants/tribal-environmental-health-research>

- **Each project's abstract and annual progress summaries are available**