Evolution of a Robust Tribal-University Research Partnership to Investigate Tribal Exposures and Build Scientific Capacity

Tribal-University Collaboration to Address Tribal Exposures to PAHs and Improve Community Health

6th Annual Northwest Environmental Health Conference
April 8, 2014
Portland State University, Portland, OR

Barbara Harper, CTUIR/OSU and Anna Harding, OSU

OSU: Barbara Harper, Anna Harding, Molly Kile, Kim Anderson, Staci Simonich
CTUIR: Barbara Harper, Stuart Harris
Focus of the OSU Superfund Research Program
Polycyclic Aromatic Hydrocarbons
Confederated Tribes of the Umatilla Indian Reservation

CTUIR Field Station equipment:
Two greenhouses
Botany and chemistry labs
ICP/AES; GC/MS; UV/Vis spec.
Equipment installed Jan-Feb 2012
History of Collaboration


- Air and urine samples collected
- Passive sampling devices (PSD) deployed
- PSD deployed in the Nixyáawii Governance Center

2003 - 2009

2010

2011

2012

2013

2014

2015 - 2018

High-volume ambient air sampler installed on the Umatilla Reservation

1 joint paper published

3 joint papers published

Dietary study - PAH

Personal air monitoring training video’s

PAH in traditionally smoked salmon study published

Memorandum of Understanding
OSU and the CTUIR Department of Science and Engineering (DOSE) begin collaboration

Engage Tribal Youth
The beginning of a partnership

2003 – EPA grant

2006 – Memorandum of Understanding

Template for the Data Sharing Agreement currently being used (CTUIR, Swinomish, Samish)

All data belong to the CTUIR

Specific CTUIR concerns identified
Mission of the University-Tribal Partnership

Create a collaborative project and partnership aimed at better understanding health risks associated with PAH exposure on the Reservation and assist in capacity building with tribal partners and research scientists.
CTUIR-University Partnership: Activities

Research interests identified by CTUIR

(1) PAH Exposures created during the traditional smoking of salmon
  - PAH exposure from conducting traditional smoking practices
  - PAH exposures from eating traditionally smoked foods

(2) PAH concentrations in ambient air on the Reservation

(3) Tribal member engagement in research (CBPR)
What makes a University-Tribal Partnership Sustainable?

Community-based participatory Research
- Empowering communities to make informed decisions regarding their health and their environment
- Doing collaborative research that has been identified as important by CTUIR
- Trust between CTUIR and OSU Scientists

Attention to capacity building in scientists and Tribal members
- Utilize the CTUIR Field Station
- Increase scientist cultural capacity

Respect for Tribal culture and traditions
- Develop culturally respectful ways to reduce the health effects of chemical exposures
- Recognition of a sovereign government with laws & policies
2007 - 2010

Traditional Tribal Subsistence Exposure Scenario and Risk Assessment Guidance Manual

Symposium: Conducting Research in Tribal Communities

La Sells Stewart Center
Engineering and Construction Auditorium
Oregon State University
Corvallis, Oregon

April 7, 2010

SUMMARY

This jointly sponsored symposium was on important issues related to working with tribal communities. The program covered historical legal context, Tribal perspectives, research ethics and informed consent, and a case study on Tribal risk research.

Approximately 80 participants attended the symposium. Attendees included OSU SRP researchers, a wide variety of other OSU academic departments, OSU Extension, US Forest Service, and non-profit organizations working with local tribes.
2010 - 2011

Specific Tribal Requests

• PAH concentrations in ambient air on the Reservation

• Tribal member engagement in research (CBPR)

Installed ambient PAH monitors

Produced training videos – How to use personal air samplers

Trained Tribal Air Quality Technician to collect PAH filters
Specific Tribal Requests

- Traditional Smoking Practices
  - PAH exposure from traditional smoking practices

2011 - 2012

Traditional Salmon Smoking Event

Collection and analysis of personal air and urine samples from Tribal members smoking food

*Tribal involvement:* Catching and smoking Chinook salmon, wearing air monitors, provide urine samples

*OSU involvement:* Analysis of PAH in air and fish, analysis of PAH in urine
Traditional Salmon Smoking Event
Anderson and Simonich Laboratories, CTUIR Tribal members, DOSE

- Shed
  - Apple
  - Alder
  - Chinook Salmon

- Tipi
  - Apple
  - Alder
  - Chinook Salmon

- Non-smoked salmon
  - Commercial Salmon #1
  - Commercial Salmon #2
  - Commercial Salmon #3

Analysis of 33 PAH in ambient air, personal air exposure, salmon

\[ \Sigma \text{PAH levels} \text{ between } 140 - 430 \times \text{higher in CTUIR smoked salmon} \]

\[ \Sigma \text{PAH levels} \text{ in commercial vs CTUIR non-smoked salmon similar} \]
Traditional Salmon Smoking Event

Personal air sampling
*The first of its kind conducted with tribal members.*

PAH concentration was higher in the tipi versus the shed

PAH in urine
Collected urine from 2 Tribal members to analyze PAH levels in urine

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“The initial trigger for this work occurred because regulatory agencies need to understand tribal exposures in order to evaluate risks and set risk-based remedial goals at contaminated sites if tribal lands, health or resources are affected either on- or off-reservation.”

2011 – 2012

Building a sustainable partnership – using the Material and Data Sharing Agreement as a model for other projects

Conducting Research with Tribal Communities: Sovereignty, Ethics, and Data-Sharing Issues
Anna Harding,† Barbara Harper,†,2 Dave Stone,3 Catherine O’Neill,4 Patricia Berger,5 Stuart Harris,² and Jamie Donatuto6

1School of Biological and Population Health Sciences, College of Public Health and Human Sciences, Oregon State University, Corvallis, Oregon, USA; 2Department of Science and Engineering, Confederated Tribes of the Umatilla Indian Reservation, Pendleton, Oregon, USA; 3Department of Environmental and Molecular Toxicology, Oregon State University, Corvallis, Oregon, USA; 4Seattle University School of Law, Seattle, Washington, USA; 5Department of Information Technology, Marion County, Salem, Oregon, USA; 6Swinomish Indian Tribal Community, Office of Planning and Community Development, La Conner, Washington, USA


Distributed to:
• Regional EPA Tribal Liaisons
• Regional Indian Health Service providers
• NIEHS Resource Center (Accessible to SRPs and EHSCs)
Focus Groups
Three 90-minute focus group sessions with a total of 27 participants were held to elicit opinions on meanings of health and how the environment interacts with health.

Selection of questions asked during the focus group:

1. What does being a healthy individual mean to you?
2. What does a healthy community look like?
3. In what ways is your health and the health of your family connected to the environment?
4. What sources of pollution or types of chemicals concern you the most?
5. Would you eat plants or game or fish obtained [near sources of pollution]?
### Themes describing barriers to healthy communities

<table>
<thead>
<tr>
<th>Active Lifestyle</th>
<th>Air Quality</th>
<th>Alcohol/Drug Abuse</th>
<th>Accidents of Food/Water Quality</th>
<th>Balance being Altogether-Horizontal</th>
<th>Building Chemicals</th>
<th>Cancer</th>
<th>Disease</th>
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<th>Environmental Influence</th>
<th>Family Members</th>
<th>Hanford Radiation</th>
<th>Indoor Smoke</th>
<th>Influence of Indoor Smoke</th>
<th>Air Pollution</th>
<th>Air Quality</th>
<th>Air Pollution/Gas emission</th>
<th>Chemicals</th>
<th>Clean Air Coalition</th>
<th>Healthy Lifestyle</th>
<th>Complacency</th>
<th>Concerns Not Heard</th>
<th>Culture Change</th>
<th>Diet &amp; Diabetes</th>
<th>Disappearing Wildlife/Fish</th>
<th>Disease</th>
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<td>Health Professionals</td>
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<tr>
<th>Polluted Natural Foods</th>
<th>Poor Diet</th>
<th>Poor Experiences at Local Clinic</th>
<th>Productivity Problems for Youth</th>
<th>Productive Lifestyle</th>
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<td>Q1.01 Healthy Meaning</td>
<td>Q1.02 Healthy Barriers</td>
<td>Q1.03 Health Information</td>
<td>Q2.01 Environment</td>
<td>Q2.02 Pollution</td>
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<td>Fish &amp; Game Responsibility</td>
<td>Smoking Fish</td>
<td>Social Connections</td>
<td>Social Investment</td>
<td>Social Support/Family</td>
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| Website | Wellbeing | Youth Participation | |
|---------|-----------|---------------------| |
|          |           |                     | |

| 17 |
Perceptions of Health

• Participants expressed a holistic view of health that included environmental, physical, mental, spiritual, and intergenerational social components.

• A healthy natural environment was identified as an essential component of a healthy individual and a healthy community.

• Many believe the identified environmental hazards contribute to diseases in their community.

Specific Tribal Requests

PAH exposures from traditionally smoked foods

Dietary Study

10 Tribal members

50g smoked salmon

Pre-breakfast urine sample
Urine sample – 3 hours
Urine sample – 6 hours
Urine sample – 12 hours
Urine sample – 24 hours

Survey – exposures to other sources of PAH

PAH analysis, PBPK analysis for metabolism

Restricted Foods
2014 – 2018 – Future work

Material and Data sharing agreements

- Improve understanding of PAHs among the Swinomish and Samish Indian communities

- Use PSD to measure ambient PAH exposure

- Engage Tribal Youth
  - Multi-media Environmental Health Activity

- Use air samplers indoors
  - Measure air quality in CTUIR homes using wood burning stoves
Summary: Building a robust, sustainable partnership

- Community-based participatory research
- Scientific and cultural capacity building between CTUIR and OSU researchers
  - Emphasis on trust between CTUIR and University
- Developed data sharing agreements for Tribal-University partnerships that protect Tribal rights
- Develop culturally appropriate risk reduction strategies with CTUIR
- Disseminated knowledge through journals, newsletters and community meetings to provide Tribal Perspectives on research practices
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