Climate Change and Indoor Air Quality

HOST
NATIONAL INDIAN HEALTH BOARD (NIHB)
BREANNON BABBEL, PHD, MPP, MPH
SENIOR PUBLIC HEALTH PROGRAM MANAGER
Mission Statement

Established by the Tribes to advocate as the united voice of federally recognized American Indian and Alaska Native Tribes, NIHB seeks to reinforce Tribal sovereignty, strengthen Tribal health systems, secure resources, and build capacity to achieve the highest level of health and well-being for our People.
• Recorded and posted online
• Please keep phone lines muted
• Questions
  ◦ End of all presentations
  ◦ Use the chat box (not Q&A box)
• Survey
Climate Ready Tribes Initiative

- Provide funding and support for Tribes to conduct local climate and health work

**Awardees Include**

**First cohort**
- Blackfeet Nation
- Swinomish Indian Tribal Community
- Village of Wainwright

**New cohort**
- Kaw Nation (mini-award)
- Lummi Nation
- Pala Band of Mission Indians
- Sitka Tribe of Alaska
Climate Ready Tribes Initiative

- Share information and resources nationally

National Indian Health Board

Climate Change & Tribes: Exploring Current Impacts and Future Predictions for America’s First People

January 14, 2019

Imagine a world where one Arctic summer per decade is too warm to support the sea ice that helps maintain our global ecosystem and environment, directly impacting the people and animals of these far north communities. A world where coral reefs, once bustling with the rich diversity of sea life, have all but completely disappeared from the oceans. A world where mass global migration from tropical zones leads to a drastic change in our climate.

NIHB Resources

Articles
- Climate Change & Tribes: Exploring Current Impacts and Future Predictions for America’s First People, 1/14/19

Tribal Climate Champions Spotlights
- Spotlight on Gila River Indian Community, 1/9/19
- Spotlight on Blackfeet Nation, 5/28/18
- Spotlight on Village of Wainwright, 1/10/18
- Spotlight on Swinomish Indian Tribal Community, 12/1/17

Webinars
- 6/12/18: Including Indigenous Health in Climate Change Assessments: Overview of Methods and Results from Swinomish
  | Read Description | Watch Recording | View Slides |
- 1/30/18: Climate Change and Health in the Arctic: Impacts on Alaska Native Communities and a Spotlight on Efforts to Improve Climate Health
  | Read Description | Watch Recording | View Slides |
- 7/17/17: Climate and Health in Indian Country
  | View Slides |
- 4/20/17: CDC Climate and Health 101
  | View Slides |

Climate and Health in Indian Country Fact Sheet | View Fact Sheet Here |
Climate Ready Tribes Initiative

- Share information and resources nationally

**Climate & Health Learning Community**
  - Over 800 members
  - Opportunities to share and learn
    - Webinars (like this one!)
    - In-person event at Tribal Public Health Summit
  - Professional development certificate
Gillian Gawne-Mittelstaedt, MPA

DIRECTOR, TRIBAL HEALTHY HOMES NETWORK
PROGRAM COORDINATOR, TULALIP AIR AND
INDOOR ENVIRONMENTS PROGRAM
DRPH STUDENT, UNIVERSITY OF ILLINOIS AT
CHICAGO
WILDFIRE SMOKE: MITIGATING EXPOSURE THROUGH OUTREACH AND AN EVIDENCE-BASED PUBLIC HEALTH RESPONSE

Gillian Mittelstaedt, MPA, DrPH Student, University of Illinois at Chicago
Executive Director, Tribal Healthy Homes Network

www.thhnw.org
The new norm:

Acute exposure to fine particle air pollution, PAHs and combustion gases.

*Chronic exposure is no longer our only public health challenge.*

Morbidity and mortality is impacted by the shift from chronic to acute.
A PUBLIC-HEALTH “QUICK-START” GUIDE TO WILDFIRE SMOKE OUTREACH
One-page fact sheet with links to key to wildfire smoke outreach resources, principally by EPA, but also from CDC and other partners.

- Tribal Web Page
- Tribal Social Media Sites
- Tribal Newspaper (digital version)
A “QUICK-START” COMMUNITY PRESENTATION ON WILDFIRE SMOKE ACTION STEPS

- Intended for use in conjunction with specific EPA and Federal Fact Sheets (all linked)
- Doesn’t require a script, training or subject-matter knowledge by the presenter
- Can be used as two-sided handouts or as slide presentation
- Audiences: elders, lung/COPD patients, asthma patients/caregivers, early childhood education staff, boards/councils, parent groups, etc.
What Path to Safety?
Five Steps to Smoke Safety for You and Your Family During Wildfire Season...

Wildfire smoke is toxic...and sometimes troublesome. It finds its way inside our homes, our heart and lungs, bloodstream, even our brains. At high levels, it can even put us in the hospital. But it doesn’t have to...

Take a few minutes to empower and protect yourself through these five, scientifically based steps.
2. Slow down.

Reduce your exposure by reducing your overall activity.

- The more active you are, the higher your respiration rate. In turn, the more you breathe, the more smoke you inhale.
- Errands, heavy labor, strenuous exercise...even light housework... consider doing less until the air quality improves.
- If you, your family or your children need to be active (as we all do at times), look for alternatives, like YMCAs, gyms, or community centers that have an air filtration system.
- If you have COPD, keep it low key until the air quality improves...avoid heavy labor, avoid frying foods, ask friends for help with errands.

To learn more about the health impacts on children, see the EPA and American Academy of Pediatrics guidance on protecting children from wildfire smoke and ash.
3. Know Your Numbers.

Use a website, app or the news to track air quality levels.

- The Air Quality Index (AQI) is a scale between 0 and 500 and represents current air quality conditions.
- Tribal, state and federal air quality agencies use the AQI to communicate with us about air quality and its relative safety – or risk.
- The higher the number, the more important it is to modify your day...to reconsider what you do, where you go, where you stay.
- To know the numbers (and colors) in your area, make a daily habit of checking your preferred websites, apps or local news.
- Sign up for a program that emails you daily, local, real-time air quality info, such as AirVisual

To get started, check out EPA's AirNow website
4. Use a Mask.

Protect yourself, when outside, with a mask.

- If you must go outside (or if you work outside) when air quality is poor, a mask can reduce your exposure.
- The key to protection is wearing the right mask (an N-95 or N-100), the right way. Proper fit is essential.
- Have heart or lung disease? Talk to your doctor before wearing a mask.
- Know that masks are not designed to fit young children or adults with facial hair, which may prevent a proper fit.

To get started on learning about proper mask type and fit, check out EPA’s respirator guidance.
5. Filter Your Air.

Create your own “clean room” with filters and fans.

- During wildfires, very small particles and odorless gases from the smoke, such as Carbon Monoxide, can enter our homes. (Every home and apartment is different, but up to 70% of pollutants in the outdoor air are also found inside our homes.)
- In addition to keeping windows and doors closed, filtration of the air in your home will keep you safer and more comfortable on smoky days.
- High heat is also a risk factor, so creating your “clean room” may also involve an air conditioner or swamp cooler.

To get started, look at EPA’s guidance on filtration options for your home, or this guidance on building your own (very effective) air cleaner, using just a box fan and a furnace filter, for around $40.
Air Quality Level

Air & Indoor Environments

Community Health
- Vulnerable Populations via Clinicians, Liaison, CHWs
- Schools & TELA via Nurses, Coordinators
- Community–at-large via Media Channels
- Flag Notification System
- Office & Work Sites, via Building Maintenance Staff

Health & Safety
Air Monitoring

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TRIBAL HEALTHY HOMES NETWORK

ENVIRONMENTAL & OCCUPATIONAL HEALTH SCIENCES
UNIVERSITY of WASHINGTON | SCHOOL OF PUBLIC HEALTH

This project was supported by a DEOHS Boeing Focal Award.
Climate change and wildfires

Section of infographic from the Union of Concerned Scientists

Why do we care about indoor air monitoring during periods of wildfire smoke?

*Keep indoor air as clean as possible* if you are advised to stay indoors. Keep windows and doors closed. Run an air conditioner, but keep the fresh-air intake closed and the filter clean to prevent outdoor smoke from getting inside. If you do not have an air conditioner and it is too warm to stay inside with the windows closed, seek shelter in a designated evacuation center or away from the affected area. [Learn more about reducing your smoke exposure indoors.](#) (CDC, 2018)
'Stay Indoors': Unhealthy Air In Puget Sound Will Stay For Days

Stay indoors if you can. That's what the Puget Sound Clean Air Agency recommends due to wildfire smoke swamping the region.

By Neal McNamara, Patch Staff | Aug 20, 2018 10:30 am ET | Updated Aug 20, 2018 11:02 am ET
Levels of particles sized >100 nm (0.1 um) were very similar between indoor and outdoor locations during and after periods of wildfire smoke (Phuleria et al, 2005)

Community clean air shelters

• Maintain better indoor air quality
• Convenient location
• Lack of evidence on effectiveness

Purple Air monitor set up in the Teen Center gym. Photo by Gillian Mittelstaedt.
Placement of monitors

Inform children’s exposure
Potential clean air shelter
Compare different areas
Purple Air monitor overview

- Fan draws air past laser-based particle counter (Plantower sensor)
- Estimates PM1, PM2.5, and PM10
- Time resolution ~80 seconds
- Two sensors in each monitor
- Map and sensor list online
- SD card vs. wifi only
- $229 to $259
Data calibration equations are necessary

- Partner with a local air agency
- Co-locate with a more accurate instrument
- Use one of the correction factors on the Purple Air map
How this information will be helpful during periods of wildfire smoke:

1. Early Learning Academy
   - Children’s exposure
   - Indoor vs. outdoor ➔ inform outdoor activity

2. Teen Center gym
   - Youth exposure
   - Indoor vs. outdoor ➔ inform outdoor activity
   ➔ inform potential clean air shelter

3. Tulalip Data Services
   - Representation of airshed on east side
Community data sharing

• Currently unable to show calibrated data on the map
• Indoor/outdoor comparisons still useful
• Could include calibration equations on website
Resources

- Purple Air
  - Puget Sound Clean Air Agency info on low-cost sensors: https://www.pscleanair.org/539/Air-Quality-Sensors
  - Clean Air Carolina Purple Air info: https://cleanaircarolina.org/purpleair/

- Community use of low-cost sensors
  - Community Air Monitoring Network guidebook: http://www.phi.org/resources/?resource=guidebook-for-developing-a-community-air-monitoring-network
  - EPA Air Sensor Toolbox: https://www.epa.gov/air-sensor-toolbox
Aileen Gagney, MA.rch, GA-C, HHS, DST, CLR

TECHNICAL ADVISOR AND TRAINER, TRIBAL HEALTHY HOMES NETWORK
HEPA, MERV AND DO-IT-YOURSELF AIR CLEANERS

Aileen Gagney MArch, MFA, GA-C, HHS, DST, CLR
Technical Advisor and Trainer

TRIBAL HEALTHY HOMES NETWORK
Do we need air cleaners?

• The safest, economical and most effective way to address indoor air pollution is usually to reduce or eliminate avoidable sources of pollutants and then to exhaust to the outdoors the unavoidable particles, gases, fumes and excessive water vapor...
And what can be the problem with the outside air?
And what can be problems with the inside air?
What is outside, comes inside! (And we know what we can have inside.....)
Air Cleaners

• Intervention studies of air cleaners operating in homes have consistently found statistically significant reductions of indoor exposures to indoor PM$_{2.5}$, PM$_{10}$, and/or particle number counts with the use of portable air cleaners.....
Portable Air Cleaners

- The basic components of a portable air cleaner include a filter or other air cleaning technology and a fan that propels air through that filter/air cleaner.

- Portable air cleaners may also have a panel filter with bonded fine granules of activated carbon, an activated carbon filter encased in a frame, or other sorbent mixtures to remove gases and odorous compounds.
There are many types of air cleaners and the only two that are both safe and effective are:

• HEPA
• MERV

ESP (Electrostatic Precipitator’s)
Ozone Generators
Ion Generators
UVGI – Ultra Violet Germicidal Irradiation
HEPA – High Efficiency Portable Air Cleaner

• In residential air cleaners, filters described as being HEPA filters are generally equivalent to MERV 16 and offer the highest available particle removal efficiency of fibrous media air filters for a wide range of particle sizes.
MERV - Minimum Efficiency Reporting Value

(MERV) ranging from MERV 1 to MERV 16 based on the average removal efficiency across three particle size ranges: 0.3–1 μ, 1–3 μ, and 3–10 μ

EPA recommends that consumers who are concerned about small particles choose furnace filters with at least a MERV 13 rating or as high a MERV rating as the system fan and filter track can accommodate.
Options:

20” x 20” box fan
20” x 20” furnace filter

Do not leave unattended!
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TULALIP INTERN
LEAD INSTRUCTOR, INSTITUTE FOR TRIBAL ENVIRONMENTAL PROFESSIONALS, ENVIRONMENTAL EDUCATION OUTREACH PROGRAM
COMMUNITY YOUTH LEADER, NATIVE AMERICANS FOR COMMUNITY ACTION
Tulalip Tribes & Tribal Healthy Homes Network: Community Feedback Survey

Darrien Benally
Northern Arizona University
2017 ITEP Student Summer Intern Participant
Principle Aim

OVERVIEW

To prevent adverse health outcomes during episodes of compromised air quality by strengthening risk communication practices. Specifically, to develop a coherent strategy that reaches further in scope, can be readily activated during an episode, can be replicated by other communities.
Three Survey Types

**Tulalip Health Messaging Survey**
- 10 Respondents
- Gained feedback from various department and program managers within the Tulalip administration.

**Tulalip Community Members Survey**
- 7 Respondents
- Community members provided feedback on their air quality topic knowledge and various ways they would be willing to receive emergency communication.

**General Tribal Health Messaging Survey**
- 9 Respondents
- Various Tribal air quality department managers surveyed to provide feedback on their communication strategies with their communities.
BUILD AND ESTABLISH RELATIONSHIP WITH TULALIP DEPARTMENT MANAGERS

• Set up in person meetings at the Tulalip Cafe
• Go directly to departments ask to set up a meeting
• Ask other department managers for connections

CONNECTIONS TO COMMUNITY

Creating and establishing community buy in. Would community members be willing to join in to a text message system or other alert systems?
Tulalip Health Messaging Surveys

10 participants indicated willingness to participate in the emergency response network.
10 participants indicated they would like trainings provided by the air quality department.

Tribal Health Messaging Survey

9 Total Respondents
7 responses indicated that in person communication is the most successful way of communicating.
7 respondents do not use the Flag kit program used by the US EPA.

Tulalip Community

Recognized need for messaging system and mitigation strategies, community was willing to participate
Air quality matters for personal health. The air we breathe can impact our health. It is important to watch out for youth, elders, and those with lung diseases when there is poor air quality.

http://thhnw.org/
THANK YOU

Tulalip Tribes
Tribal Healthy Homes Network
ITEP Student Summer Internship Program

DEPARTMENT OF
APPLIED INDIGENOUS
STUDIES NORTHERN
ARIZONA UNIVERSITY
Questions and Discussion

TO ENTER A QUESTION, PLEASE USE THE CHAT BOX, NOT THE Q&A BOX

PLEASE SEND TO ALL PANELISTS
Thank you!

PLEASE BE SURE TO COMPLETE SURVEY
(TO BE SENT VIA EMAIL)