Part 2: Why Conduct a Climate Change Vulnerability Assessment?
ITEP’s Climate Change Webinar Series
2.0 Advanced Topics in Adaptation

Three Webinars-

July 26 Part 1: Why Conduct a Climate Change Vulnerability Assessment?
archived link- http://www7.nau.edu/itep/main/tcc/Training/Webinars_2018

November 1 Part 2: Why Conduct a Climate Change Vulnerability Assessment?

January Tribal Climate Adaptation Planning

Participants will gain-

❖ Better understanding of why and how to act now to adapt to climate change
❖ An appreciation for the role of vulnerability assessments in the adaptation process
❖ Increased knowledge of how to enhance local resilience and overcome modern challenges related to climate change
**Today’s Panelists**

**Gerald Wagner**, Director of the Blackfeet Environmental Office. Led Blackfeet Nation’s first ever climate adaptation planning initiative and recently received the Association of Fish and Wildlife Agencies Climate Leadership Award for Natural Resources.

**Anna Palmer**, MSES, Research Faculty, Earth & Ecosystem Science- Desert Research Institute. Conducted the first large scale Vulnerability Assessment to support Native American communities influenced by drought and climate change in Western North America for the Native Waters on Arid Lands project.

**Derek Kauneckis**, PhD., Associate Professor, Voinovich School of Leadership and Public Affairs- Ohio University. Research in institutional analysis, public policy, resilience theory and collaborative governance. Principal Investigator for the Native Waters on Arid Lands Project.

Today’s information and training session will provide an in-depth look into vulnerability concepts.
Hands On Vulnerability Assessment Training Workshop
Native Waters on Arid Lands Tribal Summit 2018

- Took place at the Tribal Summit- Reno NV
  October 17-18, 2018
- Facilitators worked with participants to identify key factors contributing to vulnerability and organized them into a VA framework.

- Could bring a focused training session like this to you!

Sponsoring Agencies

Partnering Institutions
Part 1 Webinar Reflection and Next Steps

Comments from Part 1
1. Tribal representation was missing.
3. Technical training and tutorials for using climate data would be helpful.

Today’s Webinar Will
- Highlight two examples of effective vulnerability assessments.
- Walk through climate adaptation and planning resources.
- Discuss successes, challenges and barriers to implementation of the Blackfeet Climate Adaptation Plan.
Vulnerability Review from Part 1

- A tool for synthesizing information on biophysical conditions, community assets, social characteristics and other locally important factors
- A framework and iterative process for examining vulnerabilities and evaluating potential interventions
- Fundamental support for other planning efforts.

Diagram:
- Exposure
- Sensitivity
- Potential Impact
- Adaptive Capacity
- Vulnerability
Examples of Plans Effectively Implemented by Tribes

Upper Snake River Tribes Vulnerability Assessment

Blackfeet Climate Adaptation Plan

Upper Snake River Tribes Foundation
Climate Change
Vulnerability Assessment
February 2017

Blackfeet Climate Change Adaptation Plan
BLACKFEET NATION
April 2018
blackfeetclimatechange.com
Vulnerability Assessment Stages

Stage 1. Define the Purpose
Stage 2. Define Boundaries
Stage 3. Indicator Selection
Stage 4. Assessment
Stage 5. Communicate Results
Stage 6. Prioritize Adaptation Efforts

Understanding Phase
Assessment Phase
Response Phase
<table>
<thead>
<tr>
<th>Stage 1. Define the Purpose</th>
<th>Steps – Formulate <strong>questions</strong> to be answered by the assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Upper Snake River Tribes" /></td>
<td><strong>What do we want to know and why?</strong></td>
</tr>
<tr>
<td><strong>Upper Snake River Tribes</strong></td>
<td>• How will climate change affect species, habitats, and resources that are important and valuable to USRT member tribes?</td>
</tr>
</tbody>
</table>
| ![Blackfeet Nation](image2.png) | • What are the impacts of climate change on human health and natural resources?  
• How can we integrate climate change into current and future government planning efforts? |
<table>
<thead>
<tr>
<th>Boundary</th>
<th>General Approach</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Snake River Tribes</td>
<td>Bottom-Up</td>
</tr>
<tr>
<td>Blackfeet Nation</td>
<td>Sector Specific</td>
</tr>
</tbody>
</table>
## Assessment Phase

### Stage 3&4. Indicator Selection

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Data sources</th>
</tr>
</thead>
</table>
| **Upper Snake River Tribes**
- Climate change factors
  - Temperature,
  - Precipitation,
  - Changes to hydrology,
  - Declining Snowpack,
  - Changes in Streamflow,
  - Wildfire risk | Oregon Climate Change Research Institute |

| **Blackfeet Nation**
- Social Demographic Sector Specific
  - Agriculture
  - Cultural Resources
  - Fish
  - Forestry | IPCC, National Climatic Assessment, Montana Climate Assessment |
- Human Health
- Land and Range
- Water
- Wildlife |
## Response Phase

### Stage 5&6. Communicate and Adapt

#### Communicate Results

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Taxon</th>
<th>2050s RCP4.5</th>
<th>2050s RCP8.5</th>
<th>2080s RCP4.5</th>
<th>2080s RCP 8.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Columbia Spotted Frog</td>
<td>Amphibian</td>
<td>H</td>
<td>E</td>
<td>E</td>
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<tr>
<td>Bull Trout</td>
<td>Fish</td>
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<td>E</td>
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<tr>
<td>Chinook Salmon</td>
<td>Fish</td>
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<td>E</td>
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<tr>
<td>Redband Trout</td>
<td>Fish</td>
<td>E</td>
<td>E</td>
<td>E</td>
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</tr>
<tr>
<td>Steelhead</td>
<td>Fish</td>
<td>E</td>
<td>E</td>
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<td>E</td>
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<tr>
<td>Golden Eagle</td>
<td>Bird</td>
<td>L</td>
<td>V</td>
<td>L</td>
<td>V</td>
</tr>
<tr>
<td>American Beaver</td>
<td>Mammal</td>
<td>L</td>
<td>V</td>
<td>L</td>
<td>V</td>
</tr>
<tr>
<td>Black-tailed Jackrabbit</td>
<td>Mammal</td>
<td>M</td>
<td>V</td>
<td>H</td>
<td>V</td>
</tr>
<tr>
<td>Elk</td>
<td>Mammal</td>
<td>M</td>
<td>V</td>
<td>H</td>
<td>V</td>
</tr>
<tr>
<td>Mule Deer</td>
<td>Mammal</td>
<td>M</td>
<td>V</td>
<td>H</td>
<td>V</td>
</tr>
<tr>
<td>Big Sagebrush</td>
<td>Plant</td>
<td>M</td>
<td>V</td>
<td>H</td>
<td>V</td>
</tr>
<tr>
<td>Black Cottonwood</td>
<td>Plant</td>
<td>L</td>
<td>V</td>
<td>M</td>
<td>V</td>
</tr>
<tr>
<td>Chokecherry</td>
<td>Plant</td>
<td>L</td>
<td>V</td>
<td>L</td>
<td>V</td>
</tr>
<tr>
<td>Geyer’s Willow</td>
<td>Plant</td>
<td>L</td>
<td>V</td>
<td>L</td>
<td>V</td>
</tr>
<tr>
<td>Quaking Aspen</td>
<td>Plant</td>
<td>L</td>
<td>V</td>
<td>M</td>
<td>V</td>
</tr>
<tr>
<td>Redolier Dogwood</td>
<td>Plant</td>
<td>L</td>
<td>V</td>
<td>L</td>
<td>V</td>
</tr>
</tbody>
</table>

#### Prioritize Adaptation

- Provides information for a natural resources managers.
- First step to a climate adaptation plan.
- For each sector the plan describes adaptations.
- First step to an integrated resources management plan.
Climate Change Vulnerability Index

Overview

The NatureServe Climate Change Vulnerability Index identifies plant and animal species that are particularly vulnerable to the effects of climate change. Using the Index, you apply readily available information about a species’ natural history, distribution and landscape circumstances to predict whether it will likely suffer a range contraction and/or population reductions due to climate change. You can use the Index as part of a variety of analyses, including assessing the relative risk of species listed in State Wildlife Action Plans or part of any

http://www.natureserve.org/conservation-tools/climate-change-vulnerability-index
ITEP’s Adaptation Planning Toolkit

Climate Change Resources

Adaptation Planning Tool Kit
This "toolkit" is a collection of templates and other resources developed by the Institute for Tribal Environmental Professionals (ITEP) to assist tribes in their climate change adaptation planning process. The materials provided are not "one-size-fits-all" solutions, and users are encouraged to modify the materials to better represent the needs and priorities of their own tribe. The primary users of these materials will be the tribe's climate change working group.

1. Adaptation Planning Background Material [docx]
2. Checklist [doc]
3. Template: Tribal Climate Change Adaptation Planning Guide [docx]
4. Template: Tribal Resolution for a Climate Change Adaptation Initiative [doc]
5. Worksheet: Adaptation Planning [doc]
7. Template: Tribal Climate Change Adaptation Plan [doc]
8. Guides and Tools for Climate Change Adaptation Planning [xlsx]
9. Example Tribal Climate Change Assessments and Plans [xlsx]

Download Toolkit [zip]

http://www7.nau.edu/itep/main/tcc/Resources/adaptation
Important Take Away’s

<table>
<thead>
<tr>
<th>Focus</th>
<th>Blackfeet Nation</th>
<th>Upper Snake River Tribes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Focus</td>
<td>8 Sectors, Human Health</td>
<td>Natural Resources</td>
</tr>
<tr>
<td>Funding</td>
<td>Bureau of Indian Affairs, Great Northern Landscape Conservation Cooperative, National Indian Health Grant</td>
<td>Bureau of Indian Affairs, Environmental Protection Agency tribal adaptation grant</td>
</tr>
<tr>
<td>Tools Used</td>
<td>ITEP’s Adaptation Toolkit</td>
<td>NatureServes CCVI</td>
</tr>
<tr>
<td>Primary Author</td>
<td>Blackfeet Employees in each sector</td>
<td>Adaptation International</td>
</tr>
<tr>
<td>Climate Data</td>
<td>Montana Climate Assessment</td>
<td>Localized climate projections</td>
</tr>
<tr>
<td>First Step to</td>
<td>Integrated Resources Management Plan</td>
<td>Climate Adaptation Plan</td>
</tr>
</tbody>
</table>
Practical Application

- Offer a theoretical foundation (literature review).
- Highlight that VA’s are a practical first step to climate adaptation planning.
- Formal tool for monitoring and informing adaptation strategies.
- Provide resources to assist in brainstorming.

Thesis Research - Climate Change Vulnerability Assessment

Practical Application

- Offer a theoretical foundation (literature review).
- Highlight that VA’s are a practical first step to climate adaptation planning.
- Formal tool for monitoring and informing adaptation strategies.
- Provide resources to assist in brainstorming.

Thesis Document
http://www7.nau.edu/itep/main/tcc/docs/Training/Palmer,%20Anna%20Accepted%20Thesis.pdf

Thesis Data
https://docs.google.com/spreadsheets/d/1YB8Y4i6E0xTgc_ZYKc08kEUFCGsAEKvFzckdKLoEL0w/edit?usp=sharing

Thesis Defense
https://www.dropbox.com/sh/k7958rc7ybbrtw2l/AABZim4woxuiDSngumEBO59Ua?dl=0

Useful Link
http://www.iav-mapping.net/CARAVAN/CARAVAN.html
Resources - Info Tribal Climate Adaptation Plans

- https://tribalclimateguide.uoregon.edu/adaptation-plans
- https://www.dropbox.com/sh/luf0z796jxyxwhc/AACl-dfJK0V7H4EeayUDKXi?dl=0
Resources - Climate Adaptation and Planning

• [https://www.globalchange.gov/browse/federal-adaptation-resources/natural-resources](https://www.globalchange.gov/browse/federal-adaptation-resources/natural-resources)

• [https://nativewaters-aridlands.com/resources/adaptation/](https://nativewaters-aridlands.com/resources/adaptation/)

- **BIA Tribal Climate Resilience Program**
  The Bureau of Indian Affairs (BIA) is the lead agency in charge of supporting tribes as they address challenges related to climate change. The Tribal Climate Resilience Program (TCRP) provides tribes with funding for trainings and adaptation projects, technical support, and youth engagement programs.

- **BIA Tribal Climate Resilience Resource Guide**
  A fantastic online hub of climate resilience information and resources that are available for tribes. Topics include: Training, planning, TEK/TKS, youth, tribes, regions, agencies and funding. Produced by the Bureau of Indian Affairs.

- **ITEP Climate Change Program**
  The Institute for Tribal Environmental Professionals (ITEP) Climate Change Program provides support for tribes that are preparing for or currently contending with climate change impacts, including trainings, reports, fact sheets and information on funding for climate adaptation projects.

- **SKOPF (Synthesizing Knowledge of Past Environments)**
  An online resource for paleoenvironmental data and models. This decision-support tool enables scholars to easily discover, explore, visualize, and synthesize knowledge of environments in the recent or remote past.

- **Tribal Adaptation Plans: Examples**
  Learn how other tribal nations in the United States are preparing for climate change by exploring this list of existing adaptation plans. Produced by the Native Nations Climate Adaptation Program (NNCAP) at the University of Arizona.

- **Tribal Climate Change Guide**
  From University of Oregon's Tribal Climate Change Project, this guide contains up-to-date information on funding opportunities, sample climate change adaptation plans, listings of disaster resources and more.
Resources- Climate Resilience Toolkit

- https://toolkit.climate.gov/#climate-explorer

- https://toolkit.climate.gov/topics/water/water-resources-dashboard

- https://climate-explorer.nemac.org/?tp=g_b&center=-10297495.2,3114624.1&zoom=4&p=L&bl=b_a&scales=time:20090108233342.0:20140106214356.0,ytd-prcp:0.0:33.2
Weblinks- Climate Data

- http://climatewizard.org/
- http://www.cpc.ncep.noaa.gov/
- https://climate.northwestknowledge.net/NWTOOLBOX/tribalProjections.php
Climate Data – Where to Get it

I. The North American Drought Atlas (NADA)- The North American Drought Atlas is the best source for understanding moisture variability over the last 2,000 years. It allows you to compare and contextualize various drought events in terms of the 1000-year drought variability in any area across the continent.
   **Pros**- Can view the drought conditions for any given year, as well as seasonal drought for the summer months of June July and August.
   **Cons**- Difficult to manipulate and downscale to create local averages. Data comes as a netCDF (Network Common Data Format) .nc file. Data is not yet available after 2006.
   **Link**- http://drought.memphis.edu/NADA/Default.aspx

II. PRISM Climate Group-This data platform from the Oregon State University PRISM Climate Group gives monthly temperature and precipitations values going between 1895-2016.
   **Pros**- Allows you to download raw data and manipulate how you wish for monthly precipitation and temperature trends. Can be manipulated in Excel.
   **Cons**-Does not provide projections, historical data only.
   **Link**- http://www.prism.oregonstate.edu/

III. USGS Regional Climate Change Viewer-This tool from the USGS allows you to view historical and projected changes in temperature, soil moisture, growing days, and evapotranspiration, downscaled to the intra-state regional level. Allows you to view projected changes through 2100 in an interactive map interface. Can view and download associated data as well as daily and monthly time series graphs for your own use.
   **Pros**- Interactive interface, allows you to view projections and difference with historical data “at a glance”. Allows you to download raw data and manipulate how you wish in Excel. Gives projected changes based on a variety of climate modeling methodologies.
   **Cons**- Cannot get downscaled projections or historical data beyond the intra-state region scale (e.g. Diamond-Monitor Valley).
   **Link**- http://regclim.coas.oregonstate.edu/visualization/rccv/hydrology/index.html

IV NEMAC Climate Explorer-This tool from the National Environmental Modeling and Analysis Center allows you to view historical climate data for a given region or locality. Additionally, it allows you to generate maps and visualizations for a wide variety of climate stressors (e.g. drought, flooding, etc.) to generate information that is of use to you for your specific areas of concern.
   **Pros**- Allows you to create tailored visualizations of your specific climate stressors.
   **Cons**- Does not allow you to download the data you are using. Does not give projections.
   **Link**- https://climate-explorer.nemac.org/

V. LOCA Downscaled Climate Projections-This tool from the Scripps Institute of Oceanography allows you to view downscaled climate projections up to the year 2100 for the CAL-ADAPT area, which includes California and Nevada.
   **Pros**- Allows you to get local downscaled precipitation and temperature projections for your specific area of interest. Allow you to download data as a CSV for Excel, or a JSON for ArcGIS.
   **Cons**- Applicable for California and Nevada-based tribes only.
   **Link**- http://cal-adapt.org/data/local/

Prepared by: Climate Policy Research Group, Voinovich School of Leadership and Public Affairs, Ohio University, by Miles Gordon, Anna Palmer, and Derek Kauneckis
1. What was your motivation?
2. Why did you focus on human health?
3. How long did it take to complete?
4. How did you overcome time/capacity gaps?
5. What approach did you take for integrating Blackfeet’s traditional cultural knowledge into an assessment process that is dominantly used in western based science?

https://blackfeetclimatechange.com/
Contact Information

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Derek Kauneckis, PhD., Associate Professor, Voinovich School of Leadership and Public Affairs- Ohio University.  
E: kaunecki@ohio.edu  
T: 775-313-1416
Thank you for joining us!

Have a nice day!

Webinar will be available: http://www7.nau.edu/itep/main/tcc/Training/Webinars_2018