"Like the miner's canary, the Indian marks the shifts from fresh air to gas in our political atmosphere." --Felix Cohen

"Indigenous Peoples are like the miner's canary. When their cultures and languages disappear this reflects the profound sickness in the ecology."

--Paul Havemann & Helen Whall

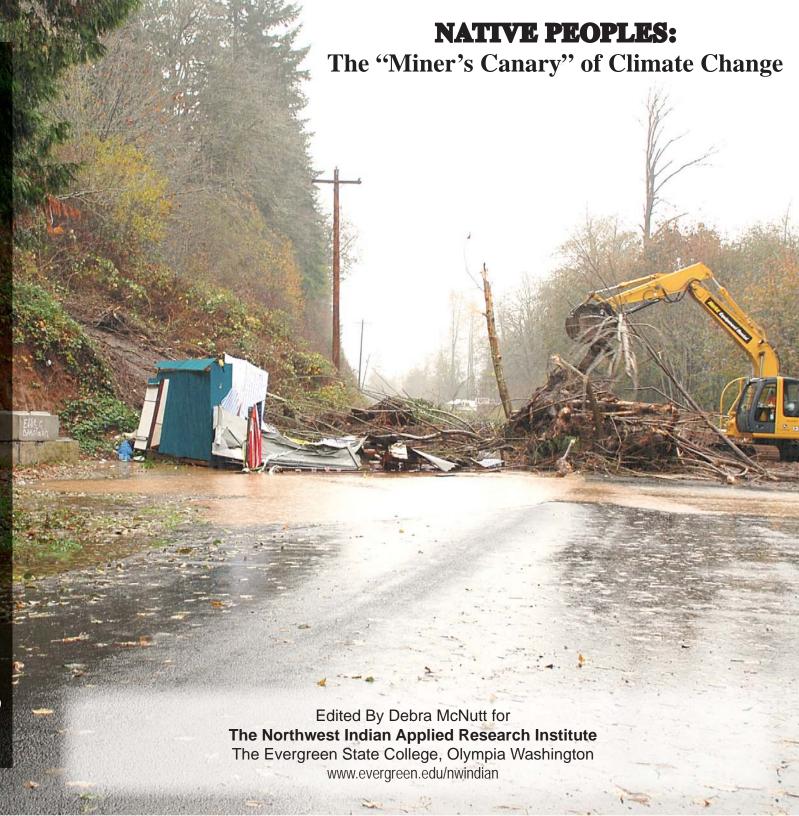
"I say canary in the coal mine because the Arctic is one part of the world that is experiencing faster impact from global warming."

--Al Gore

#### **COVER PHOTO:**

A landslide on the Skokomish Reservation closes a major highway for more than four days

(Photo by Mark Warren, The Sounder)



# CLIMATE CHANGE: IT'S NOT JUST HYPE...IT'S NOW A REALITY

1

Indigenous people are the "miner's canary" of global climate change for the rest of humanity. Just as coal miners used to take caged birds into the mines to warn miners of poison gases, the world watches as Native peoples are the first affected by climate instability. As *Indian Country Today* states "indigenous people are quietly reminding the rest of the world that they are the ones living with the consequences, in the here and now." But Native people can also help lead the way in showing how to take a stand and respond to climate change.

The latest global scientific evidence summarized in Al Gore's movie *An Inconvenient Truth*, as well as documentaries on Discovery, CNN and other media, shows us that global warming is speeding up at a much faster rate than scientists originally thought. Like the Katrina disaster (itself worsened by warmer Gulf of Mexico temperatures) we can see climate change coming. It is no longer a question whether global warming is coming. It is already here, and we have to go out and meet it by preparing today.

Global warming is caused by the emission (release) of carbon gases into our atmosphere that trap the sun's heat from rising back into space, so the Earth is becoming a hotter "greenhouse" (see diagram). The Earth has gone through natural warming cycles in its long history, but nothing like today. Our use of fossil fuels (mainly oil and coal) has released so many "greenhouse gases" that the Earth's climate is becoming unstable and extreme weather more common. Our summers in the past few years have been the hottest on record. As carbon dioxide increases in the atmosphere, global temperatures also increase (see graph on page 7).

The United Nations Intergovernmental Panel on Climate Change released a definitive report by the world's leading climate scientists in February 2007, which laid to rest any remaining doubts about the human and industrial origins of global warming. The report stated that "Global atmospheric concentrations of carbon dioxide, methane and nitrous oxide have increased markedly as a result of human activities since 1750 and now far exceed pre-industrial values determined from ice cores spanning many thousands of years. The global increases in carbon dioxide concentration are due primarily to fossil fuel use and land-use change...".

We are now experiencing climate instability caused by greenhouse gases released decades ago, so the crisis will only grow worse in coming years. Scientists now have strong evidence of abrupt climate change, with sudden and dangerous shifts that can cause catastrophic loss of lives and property. Communities that begin to prepare will suffer fewer consequences than those that ignore or trivialize this "greatest challenge"

in human history." While some climate change is now inevitable, we can do something to help our communities survive it.

Scientists expect temperature changes in this century at 2-5° C (some models estimate as high as 10° C). While these average changes may not seem like much, in the delicately balanced global climate system, they can cause massive instability. Sudden temperature shifts can cause heat waves and drought in some regions, and

We are now experiencing climate instability caused by greenhouse gases released decades ago, so the crisis will only grow worse in coming years.

blizzards or floods in other regions. The most likely effects include ocean level rises (submerging coastal areas), melting of glaciers, extinction of species, and climate-related crop and human health issues.

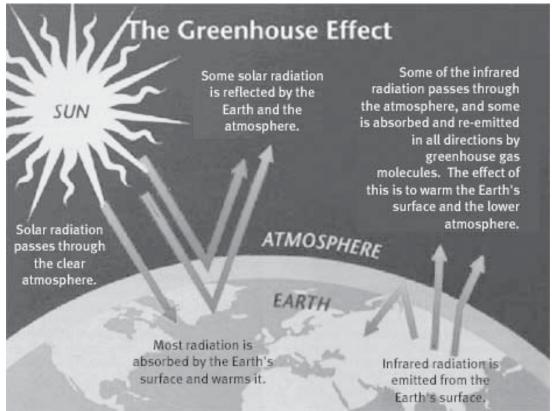
Ocean level rises. As the ice sheets melt near the North Pole (Arctic) and South Pole (Antarctic), massive amounts of freshwater are being added to the oceans. At the same time, warmer ocean temperatures cause seawater to expand in volume. Both changes contribute to rises in ocean levels which (even if they only rise 1-2 feet) will make storm waves and coastal flooding far more damaging.

- South Pacific indigenous peoples are already finding their low islands inundated by rising seas, erosion from intense storms, and saltwater in freshwater supplies.
- A sudden melting of the Greenland ice sheet could cause the evacuation of coastal cities, and possibly shift warm North Atlantic ocean currents away from Europe, causing a "little ice age."

**Melting glaciers.** Even at current warming levels, half of the glaciers in the Pacific Northwest are already gone, and the rest would disappear in this century. Glaciers in Alaska are melting twice as fast as previously predicted. This means less water in streams and rivers, drastically affecting fish and other aquatic life.

- The drying up of streams can affect vegetation, water temperatures, and freshwater supplies, further damaging the resources and communities that depend on them.
- The melting of permafrost (frozen ground) in the Far North can release huge amounts of methane, adding more of this harmful greenhouse gas to the atmosphere.

**Shifts in species, pests and disease.** As warmer temperatures creep northward (or up mountain slopes) every year, they drive some species out, and create habitat for new species to come into our area. These



species include trees, plants, fish, wildlife, insects, and microbes. Some species can move with the temperature shifts, but others cannot move fast enough, and may face extinction. Climate shifts allow invasive species to displace traditional species, insects and pests to run rampant in new areas, and disease to flourish in warmer temperatures.

- Many species have their reproductive cycles tied to the seasons, or are more vulnerable to pests or predators at particular times in a season. Climate instability can create havoc with these balanced natural systems.
- "Emerging diseases" can become threats to the health of people, livestock, wildlife, and crops, and cause epidemics in water and soil where they have not existed before.

# CLIMATE CHANGE: IT'S NOT JUST IN THE FUTURE...IT'S HAPPENING NOW

2

In North America, climate changes have already drastically affected indigenous peoples' hunting and fishing, economic infrastructure, water and housing availability, forest and agricultural resources, and even their health. Using traditional ecological knowledge, they are describing today the same drastic shifts in the environment that Western scientists had predicted would occur in the future. For the past decade, Native peoples have been meeting to document these changes. This scale of change will present severe challenges to all tribal cultures, resources and well-being.



A glacier in Alaska in 1941 (left) and 2004 (right)

**Far North.** Native nations of the Arctic and Subarctic are already feeling catastrophic effects of warmer temperatures, in the melting of the sea ice, glaciers, and permafrost (frozen ground), and increase in fires, insects, flooding and drought patterns.

- The polar bear is becoming an endangered species. Ice floes are the polar bears' home, where they mate, give birth, and raise their cubs. Now many polar bears are leaving their young to search for food, and the cubs are drowning because the ice floes are too thin. If the polar bears become extinct, a key part of the Inuit (Eskimo) culture will be lost. Northern peoples also hunt seals (who can only give birth on the ice) and caribou (which are getting harder to find). Hunters crossing ice are more often falling into open water and drowning.
- The Alaskan village of Shishmaref (inhabited for 4,000 years) is facing evacuation. Due to a reduction of sea ice and permafrost, the village is no longer protected from erosion by violent storms. Homes in many other northern villages are sinking into the melting permafrost.
- Many new species are migrating northward in the Arctic, such as the robin (for which the Inuit language has no word.) These invasive bird species can carry diseases such as the West Nile Virus. Other species such as orcas are eating new species that they had never before been seen eating.

**Southwest.** Drought has affected the water table levels and limited water sources that depend on the little rain the region gets to replenish them, killing plants and livestock.

- Droughts have caused beetles to suck all the sap of trees (such as the piñon) for water, and caused the death of medicinal plants.
- The 1993 Hanta Virus outbreak was a mystery to scientists until Navajo elders noticed that increased rainfall had caused an explosion in the population of mice (which fed on piñon nuts). The rainfall had been caused by intensified "El Niño" fluctuation in ocean temperatures,

**Great Plains.** Increased extreme weather such as flooding, blizzards and drought are threatening tribal economies where livestock and grain are the primary sources of income.

- Summer heat and severe weather has increased health risks of children and elders.
- Water resources on the surface and in underground aquifers are becoming depleted before they can be recharged by rain.

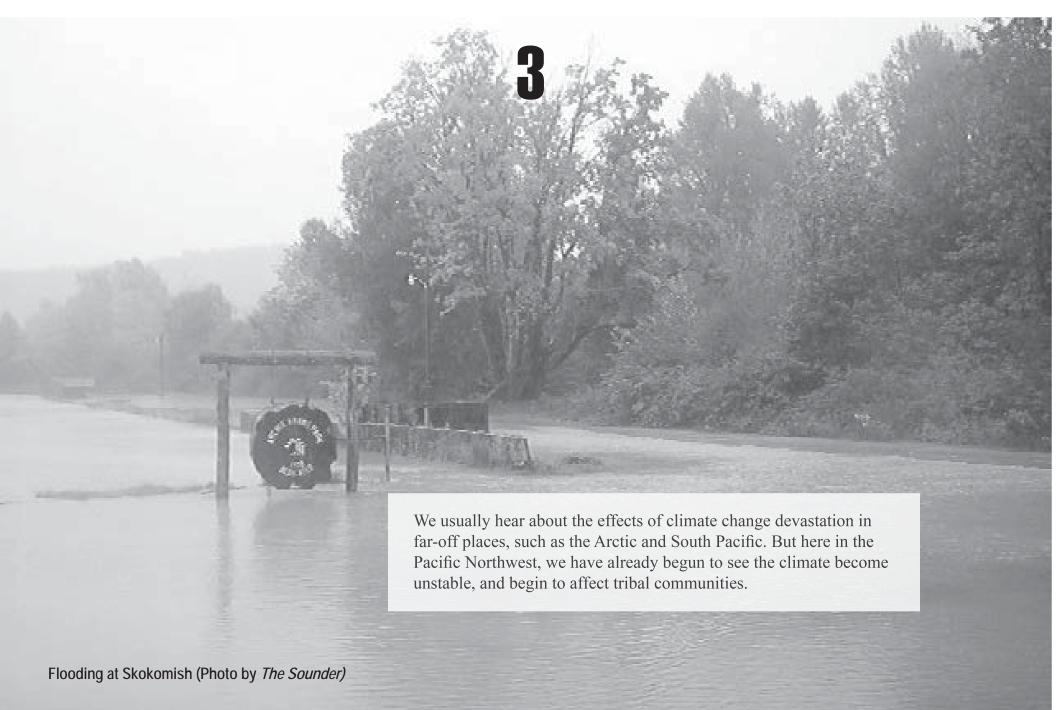
**Eastern Woodlands.** Climate Change proves an ecological global risk that disputes traditional food gathering and forestry. Severe weather events include ice storms and flowing from rapid snow melt.

- Culturally significant trees such as sugar maples and birch are shifting northward out of the Eastern and Great Lakes regions.
- Greater numbers
   have been seen of
   stinging black flies,
   disease-spreading
   mosquitoes, and
   predatory fish.
   Fewer numbers
   have been seen of
   hummingbirds and
   frogs.



Photo by Northwest Indian Fisheries Commission

IT'S NOT JUST HAPPENING ELSEWHERE..... BUT IN OUR OWN REGION



Shifts in weather patterns. An unstable climate affects different regions in different ways. Our region, where the ocean meets the coast and the mountains, is especially vulnerable to extreme variations in weather. The concern is not that there is more wind and rain, but that it comes with increased intensity in shorter bursts.

- Scientists debate whether specific recent windstorms, rainfall and mudslides can be tied to climate change. But it is not debatable that weather pattern shifts are occurring.
- Normally, weather systems come in from the west, bringing in
  ocean moisture. When the moisture hits the mountains, it rises and
  condenses into rain or snow. But increasingly, the winds are coming
  instead from the north or south, and are following the ridgelines,
  resulting in less rain and snow in the mountains.

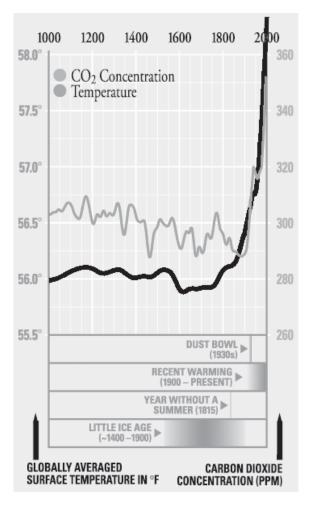
**Changes in fishing.** Northwest tribes have spent decades fighting for the right to fish in "usual and accustomed places." But these places are already being affected by the reduction of rainfall and snowmelt in the mountains, the melting glaciers, and warmer temperatures and shifts in ocean currents.

- With shorter winters, there is less time for snow to pile up in the
  mountains. The snow melts more quickly in the Spring, not only
  causing floods, but damaging salmon habitat—scouring and stirring
  up sediments, when the salmon are still smolts. Less of the runoff
  has time to seep into the groundwater.
- Smaller glaciers mean less freshwater in the streams. In the summer, there is less runoff and it flows more slowly. The blueback salmon are threatened in the Quinault River because of reduced runoff from the Olympics. Other fishers report seeing salmon with lesions associated with warm-water disease.
- Warmer ocean temperature have caused marine species to shift northward. Quinault fishers report seeing anchovies for the first time off their coast.

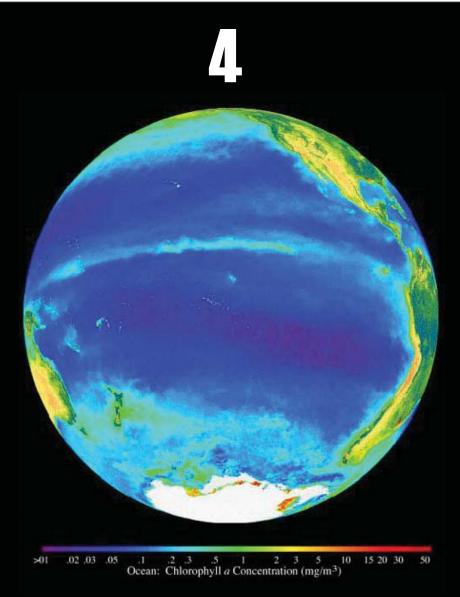
• A "dead zone" has been growing off the Washington and Oregon coasts, where fish and crab are being starved of oxygen by wild "upwellings" of micro-organisms that feed on oxygen. This crisis was caused by ocean current shifts tied to climate change.

**Changes in forestry.** Northwest forests are already being affected by inland drought conditions, and the northward shifts of diseases and pests. It is not known whether specific fires have been caused by climate change, but certain patterns of fires have been caused by climate instability.

- Warmer winters
   mean greater survival
   for many pests
   and diseases. Pest
   infestations make
   the trees useless for
   harvest, and dry logs
   are vulnerable to very
   hot fires.
- The spruce bark beetle has infested more than 10 million acres in southern Alaska and B.C. Huge swaths of forest have been killed by the infestations and the resulting catastrophic wildfires.



IT DOESN'T AFFECT EVERYONE THE SAME.....NATIVE PEOPLE HAVE MORE AT STAKE



When people talk these days about climate change, they usually bring up Al Gore or George W. Bush. But the crisis goes far beyond either individuals or politics. The media treats climate change as a large-scale global or national problem, with all communities evenly affected in the same ways. But Native peoples have more at stake than other North Americans.



The Nisqually Glacier on Mount Rainier, with the Nisqually River gushing out the bottom.

Climate change is a potential Cultural Killer. Native rights are primarily placed-based rights, dependent on a longtime attachment to local tribal territories. Climate change shifts and disrupts plant and animal habitats, and in doing so forces tribal cultures to move, adapt to new conditions, or die.

Species and treaty boundaries. According to the Tulalip Natural Resources Department, "For the tribes, range shifts in native species will threaten their cultural existence. The treaty-protected rights of tribes to hunt, fish, and gather traditional resources are based on reservation locations and usual and accustomed areas on public lands. These locations are chosen to ensure access to culturally significant resources, whose locations were thought to be fixed. If the traditionally significant plants, animals, and aquatic species shift out of these areas, tribes will no longer have the same legal rights to them."

 The Tulalip add, "Even if rights to these species could be secured, without access, to use of these species will be virtually impossible...
 Few tribes can afford to purchase large territories of new land, and federal laws prohibit the transfer or expansion of tribal jurisdiction." Loss of traditional knowledge. The loss or mitigation of culturally important species on which traditional knowledge depends will make it more difficult for elders to practice and pass their "Native Science" to the next generation. Some climate stresses will fall to the elders who are more vulnerable to heat waves, and food and water stress. It is the elders who possess the greatest knowledge of how to survive with the local natural resources, and who can recognize subtle shifts in nature.

• Tribal youth are also in danger of losing touch with traditional hunting, fishing, and gathering, as warmer weather keeps them indoors. The Tulalip cite one study that our region's average temperature will rise up to 4 degrees by 2040.

Coastal sea level rises. In the Pacific Northwest, many reservations are located on the coast or near the fishing grounds at the mouths of rivers. This makes them vulnerable to rises in sea level. Higher seas will intensify storm damage, coastal flooding, and the risk of saltwater contaminating freshwater.

- The Quileute Reservation at LaPush, Washington, has asked to be relocated to higher ground because of the risk of tsunamis, which will only be made worse by rising seas.
- A moderate 14-inch rise in ocean levels would inundate 40 percent of Puget Sound mudflats, wiping out a significant habitat for shellfish and waterfowl.

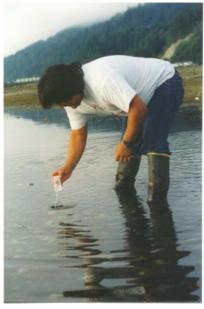


Photo by Northwest Indian Fisheries Commission

#### IT'S NOT JUST DEPRESSING..... NATIVE COMMUNITIES ARE ALREADY RESPONDING.

5

Native communities have a number of unique advantages in dealing with climate change that non-Native communities do not possess.

- Traditional Ecological
   Knowledge: Indigenous cultures have centuries of experience with local natural resources, so can recognize environmental changes before Western scientists detect
  - them, and can develop ways to respond to these changes.
- A Sense of Community: In contrast to the non-Native population, we still have community. We still have extended families that care for each other, assume responsibility for each other, and extend hospitality in times of need.
- **Sovereignty**: Because tribes have a unique status as nations, we can develop our own models of dealing with climate change, and managing nature in a sustainable way.

Gather and share information. As tribal people who have survived against all odds in the past, we will survive the changes associated with global warming--if we prepare now. Climate change is too large a concern to leave to the sole concern of a tribal department. Tribal government and members together need to gather and share the information.



- In Alaska, Inuit and Aleut villages have held community workshops of elders, other hunters, harvesters, and youth to document changes in the resources, to collect samples, and identify ways to educate their communities.
- Native Peoples/Native Homelands conferences have brought together tribes from around the country to document changes in their regions.

**Involve the youth.** The young people of today are going to be the ones most affected by climate change. If youth become aware of these issues and get active, they can educate their whole community. Encourage middle school and high school students (and other youth) to form their own groups to combat climate change.

- Alaska Youth Environment Action collected thousands of signatures on their climate change petition, which was presented by the youth to Congress in Washington DC.
- First Nations youth in British Columbia have gathered data and mapped their traditional resources to protect them from timber companies and non-Native claims. Similar youth teams could also look at how to "harden" their communities against climate change.

Use treaties to protect habitat. Because dumping carbon into the atmosphere destroys habitat for tribal resources, climate change can be seen as a violation of treaty rights. By using the treaties to protect the habitat of fish, shellfish, wild game and plants, tribes can strengthen their case against these violations.

- Tribes can pressure the federal government to fulfill its trust duty to protect tribal homelands, by reducing U.S. carbon emissions.
- Intertribal fish commissions are already protecting or co-managing fish habitats, but their work also protects the resources from climate change, for future generations.

Develop renewable energies. Tribes are in a unique position to develop renewable energies, to convert from fossil fuels to cleaner and more locally controlled power sources. They can select the most appropriate energy sources for their natural region: wind, solar, biomass, wave, tidal, and others. These energy sources can provide a source of tribal income, through selling the power to non-Native communities, and also provide an example to their neighbors.

- At the 2005 Native Renewable
   Energy Summit, city governments committed to reducing their carbon emissions began to discuss purchasing renewable energy (such as wind) from tribes.
- The Tulalip Tribes in Washington state have developed a biomass energy project with local dairy farms, to generate electricity by burning methane (thereby keeping cattle waste out of the river).

The Makah Tribe is a partner in a wave energy project that uses special buoys to generate electricity for the local utility.

**Get involved in the global process.** For the past decade, indigenous organizations from around the world have attended the annual conferences of the United Nations Framework Convention on Climate Change (UNFCCC).

These non-governmental organizations have asked for special status for indigenous nations as the people most directly affected by climate change. Their case can be strengthened by the direct

> participation of tribal governments, who have greater powers to pressure federal government than Native organizations.

• An Inuit lawsuit in an interamerican human rights court charges the U.S. with violating their human rights to their culture and hunting. This is the first example of an indigenous people using international law to protect their homeland from climate change.



#### IT'S NOT JUST HOPELESS.....THERE'S A LOT THAT TRIBES CAN DO!

6

We can see that climate change is going to be devastate us if we are not prepared, so we have to go out and meet it. The people of the world and especially our Native communities, no longer have 5 to 10 years to begin planning. We must begin today!

Tribes can respond to climate change by securing freshwater supplies and food supplies,

protecting our region's fish, wildlife and plant life, planning with local governments, and building intertribal relationships. There are many responses that tribes can take, but it is urgent that we begin now.

**Secure freshwater supplies.** Tribes need to secure access to fresh water supplies. Tribes need to assert their water rights not just for present development needs, but can start thinking ahead to future shortages.

- Some mountain streams can be redirected so the water runoff from glaciers recharges the aquifers (underground water) so the area does not dry up.
- Tribes can work with local governments to plan water conservation measures, water treatment, and protection of local supplies.

**Secure food supplies.** Native communities need to be thinking ahead to a situation of food shortages, and not be completely dependent on



supermarkets for basic needs. Tribes can plan both perishable and non-perishable food storage facilities. They can become part of the growing trend toward emphasizing Native traditional foods, to protect the health of tribal members and to keep local control.

- Tribes that have agricultural crops should research and adopt droughtresistant varieties.
- Tribes that do not have an agricultural

base can create agreements with tribes that have food crops and animal herds, so they have greater food security in times of need.

**Prepare for impacts on species.** We need to prepare for some culturally important plant and animals species to move out of our region, and determine whether adaptation will provide alternative sources of plant and animal species. As climate change changes our landscape, inevitably we will see the disappearances of fish runs, and entire fisheries may be replaced by other runs of species that are shifting north.

Drought conditions will also influence plant and animal species that
have sustained Indigenous peoples as subsistence food sources or as
essential to their ceremonial life. To the extent they can, tribes should
be studying these phenomena in order to adapt as the plants and
animals shift. This northward shift of species is not limited to fish and
other marine life, but also land based animals, plants, and trees.

• Tribal communities can begin to teach each other how to develop and harvest the new resources coming into their area. They can begin to draw on their relationship with other tribal communities to their south to anticipate the species that are moving into their area. Likewise, tribes can also draw on their relations to their north to teach them about the species that will be migrating in that direction.

Plan locally with neighbors. Tribes and local communities have the ability to work together as neighbors around common interests, such as land-use planning to prevent climate change problems, and emergency planning for the more disastrous impacts of climate change. Tribes can search for common ground with local, municipal and county governments, and provide models for them to learn from. In unstable climate conditions, local relationships are the most important. We cannot rely on state or federal assistance: look what happened after Hurricane Katrina. The smaller size of tribal and local governments can make them more flexible.

Tribal and local governments can cooperate in joint land-use planning to prevent climate change problems, such as moving or building homes above floodplains, conserving and treating water, protecting shorelines and beaches from erosion, building and retaining floodplain walls, and controlling pests and diseases through local education.

There is also a need for cooperation with local governments in emergency planning, such as identifying community shelters, identifying evacuation procedures and routes, sharing emergency food, water, and heat, and cooperating on medical and fire services.

Cooperate with other tribes. In order to survive, tribes have to work with other Indigenous nations across imposed colonial boundaries, on the basis of being part of the same natural region. First Nations in the U.S. and Canada need to cooperate to decolonize ancestral territories and protect our common property (the air and water) for future generations.

- First Nations can share skills and knowledge about shifting animal and plant species, and exchange ideas and training about community adaptation, climate change mitigation, and renewable energies.
- Indigenous nations around the Pacific Rim region can use the Treaty of Indigenous Nations process as a way to build political alliances and practical cooperation to jointly respond to climate change.



Tribal Agricultural Program uses high-tech equipment to gather crops, while others are picked by hand.

#### SOURCES AND LINKS

Climate Change & Pacific Rim Indigenous Nations project Report: www.evergreen.edu/nwindian/pdf/papers/IndigClimate.pdf

**Powerpoint:** http://academic.evergreen.edu/g/grossmaz/IndigClimate.ppt

Northwest Indian Applied Research Institute (NIARI) www.evergreen.edu/nwindian

United Nations Framework Convention on Climate Change (UNFCCC) http://unfccc.int/2860.php

Intergovernmental Panel on Climate Change (United Nations) http://www.ipcc.ch

Native Climate Commons (United Nations & Tulalip Tribes) http://climate.nativecommons.net

Be Worried, Very Worried (Time special report, 4/3/06) www.time.com/time/archive/preview/0%2C10987%2C1176980%2C00.html

Indigenous peoples voice urgency on global warming (Indian Country Today, 1/5/06) www.indiancountry.com/content.cfm?id=1096412233

Climate Alliance of European cities and indigenous peoples www.climatealliance.org/english/indigenous/frameset.htm

It's Getting Hot in Here: Dispatches from the Global Youth Climate Movement www.itsgettinghotinhere.org

The Canary Project (photos of changing landscapes) www.canary-project.org

Climate Change in a Nutshell www.henryconsulting.biz/Doc/CCNut-26Apr06b-R.pdf

State of the Salmon (maps) www.stateofthesalmon.org/page.php?pqID=17

National Tribal Environmental Council (NTEC) www.ntec.org Tribal Lands Climate Conference www.tribalclimate.org

Indigenous Environmental Network (IEN) Climate Justice Campaign www.ienearth.org/climate\_campaign.html

Circles of Wisdom: Native Peoples - Native Homelands Climate Change Workshop (U.S. Global Change Program, 1998) www.usgcrp.gov/usgcrp/Library/nationalassessment/native.pdf

Inuit Circumpolar Conference (ICC) climate change petition to Inter-American Commission on Human Rights (12/7/05) www.inuitcircumpolar.com/index.php?ID=318&Lang=En

Native Energy www.nativenergy.org www.nativewind.org

Environmental Justice and Climate Change (EJCC) Initiative www.ejcc.org

Native Americas - Special Issue on Global Warming, Climate Change & Native Lands www.news.cornell.edu/Chronicle/00/1.20.00/Native\_Americas.html

Energy Justice Network www.energyjustice.net

Climate Impacts Group (Pacific Northwest) www.cses.washington.edu/cig

Alaska Youth for Environmental Action www.ayea.org

Climate Impacts Group (Washington state) www.cses.washington.edu/cig/pnwc/cc.shtml http://www.alaskaconservationsolutions.com/acs/index.php

Northwest Indian Fisheries Commission (Washington state) http://www.nwifc.wa.gov/

Skokomish Indian Tribe (The Sounder) Skokomish Tribal News http://www.skokomish.org

Puget Sound threatened by climate change: http://www.nwf.org/sealevelrise

Rising sea, rising threat: What Puget Sound risks By Craig Welch Seattle Times Wednesday, July 25, 2007 http://seattletimes.nwsource.com/html/localnews/2003804642\_sealevelrise25m.html

"Our elders used to tell us that they knew it was coming. They would tell us: 'One day this water, these mountains, you will see a time of change where it is going to hurt our people.' That almighty dollar...is what is hurting our climate today, and hurting our people, our animal life, and our water supply, and all our mountains where our berries are. We never used to get the kind of heat we see today in Washington and Oregon. We never did see our waters, our rivers, or our lakes get so warm. Who is creating it? Not the Indian people."

> --Chief Johnny Jackson, Klickitat Band of Yakama 1998

"The message that I would send to young people in terms of the impacts of future problems associated with global warming would be to keep passing on your knowledge, our values associated with nature, the love for Mother Earth, and protection of the environment. The other day I talked to kids about some of the things I feel were occurring and it seems to go in one ear and out the other. But then I think back about my youth, and my father talked to me and taught me. I think my father felt the same way, that it all went in one ear and out the other and that I didn't learn anything. But when I think back, I value those things that I was told. Whether we think they are listening or not, we need to protect the environment. They'll pick it up. There is no doubt in my mind that the younger generation will continue with the things that we believe in . . ."

"We will be the last ones to have the last green areas remaining on the Earth in the future because of all the development in other areas. And we should continue to hold our values. We treasure nature and it shows in our Native lands."

--Caleb Pungowiyi, Alaskan Yupi'k leader

