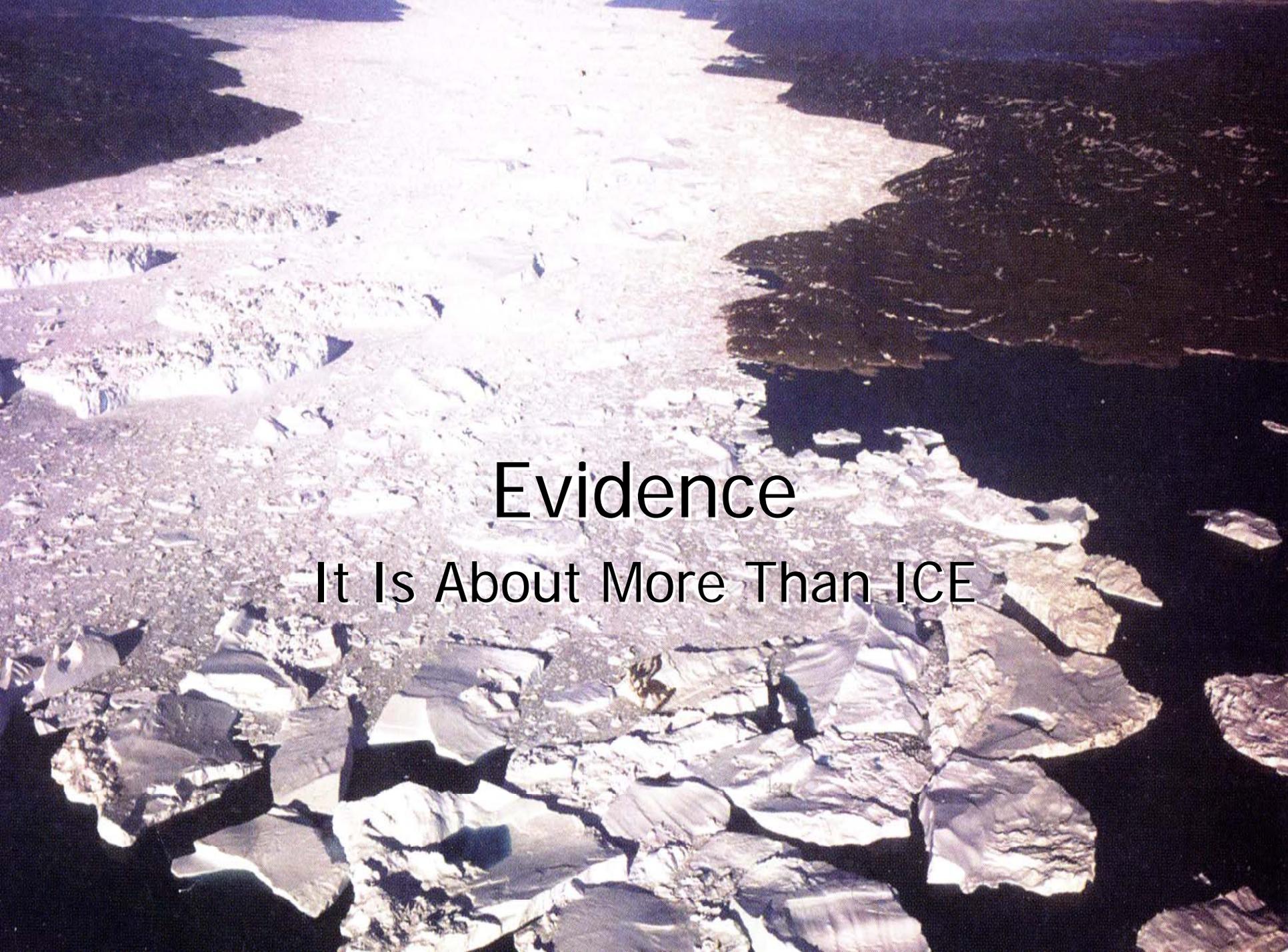


Global Climate Change: An Inconvenient - NO – Deadly TRUTH.

Distance Education Presentation National Library of Medicine
Bethesda, MD
January 29, 2009
Daniel R. Wildcat, Ph.D.
Haskell Indian Nations University



Evidence

It Is About More Than ICE

Climate heating impacts will require indigenous ingenuity or *Indigenuity.*

- Empowering Native “natural intelligence”
- Richard Williams, AICF
- Imagination
- Inventiveness
- “Agile Leadership” – Merv Tano, IIIRM
- Honesty

Indigenuity: playing to our strength- Indigenous Life-ways

- Emergent from the nature-culture nexus;
- Experience-centered;
- Experiment-rich; and
- Informed by an attentiveness to the Earth, not as nature (the abstraction) but attentiveness to the unique biomes and environments – the diverse landscapes from which our Peoples emerged.

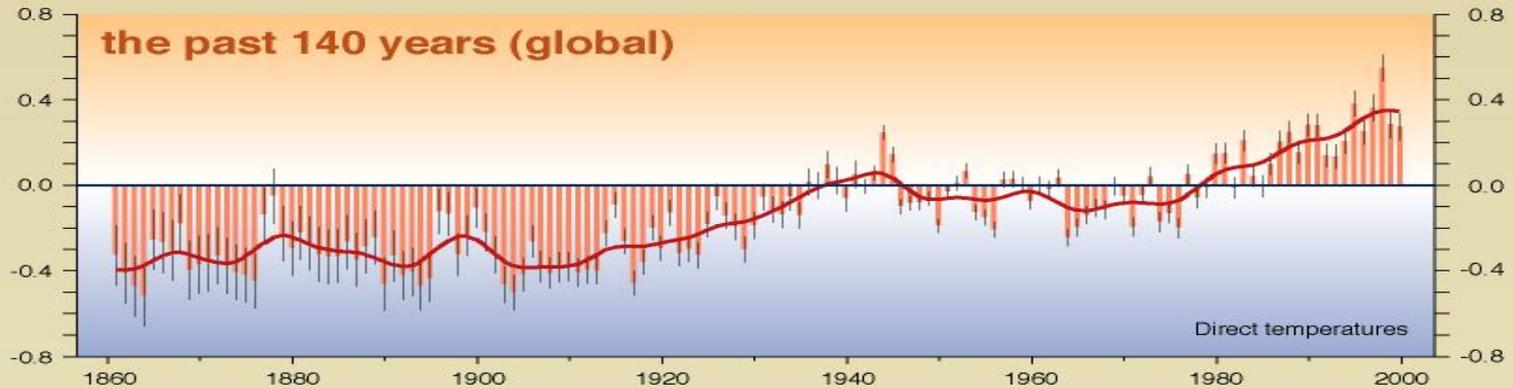
What the humankind needs is a good dose of Indigenous Realism.

- We cannot accept stereotypical “close to nature” assessments of our traditional environmental knowledge - TEK.
- We will not accept views that continually think serious examination of our TEK is romantic, unrealistic, and/or means we want to go “back to the past.”
- We will challenge the premise that “the old ways” have no relevance to the world we currently live in.

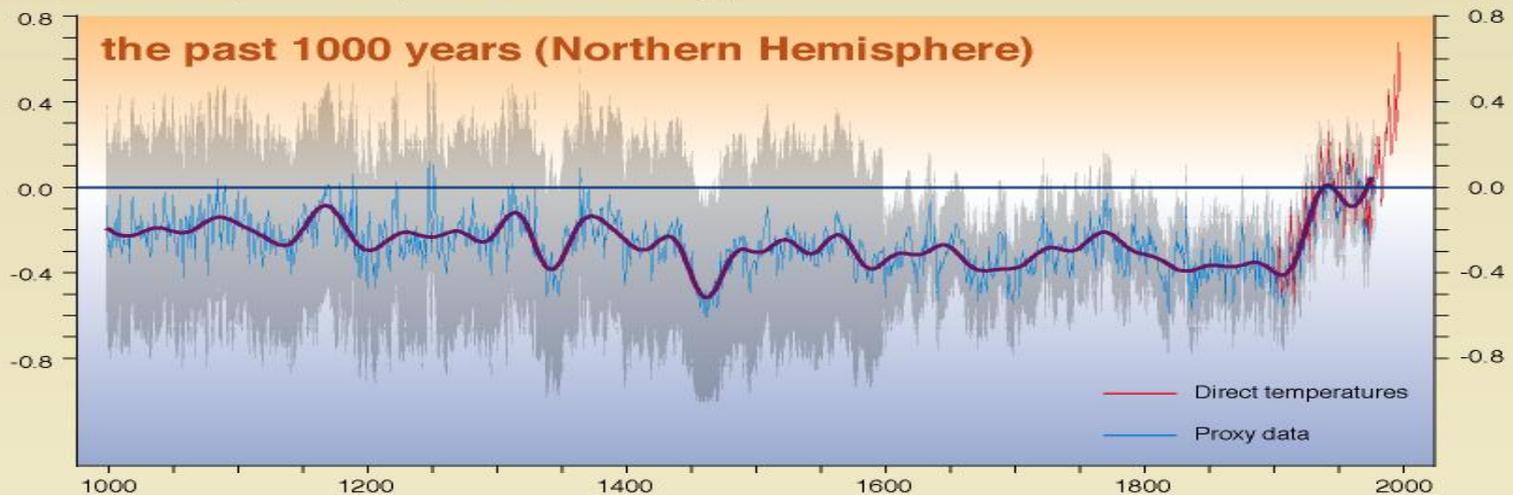
"Modern" Temperature Records

Variations of the Earth's surface temperature for...

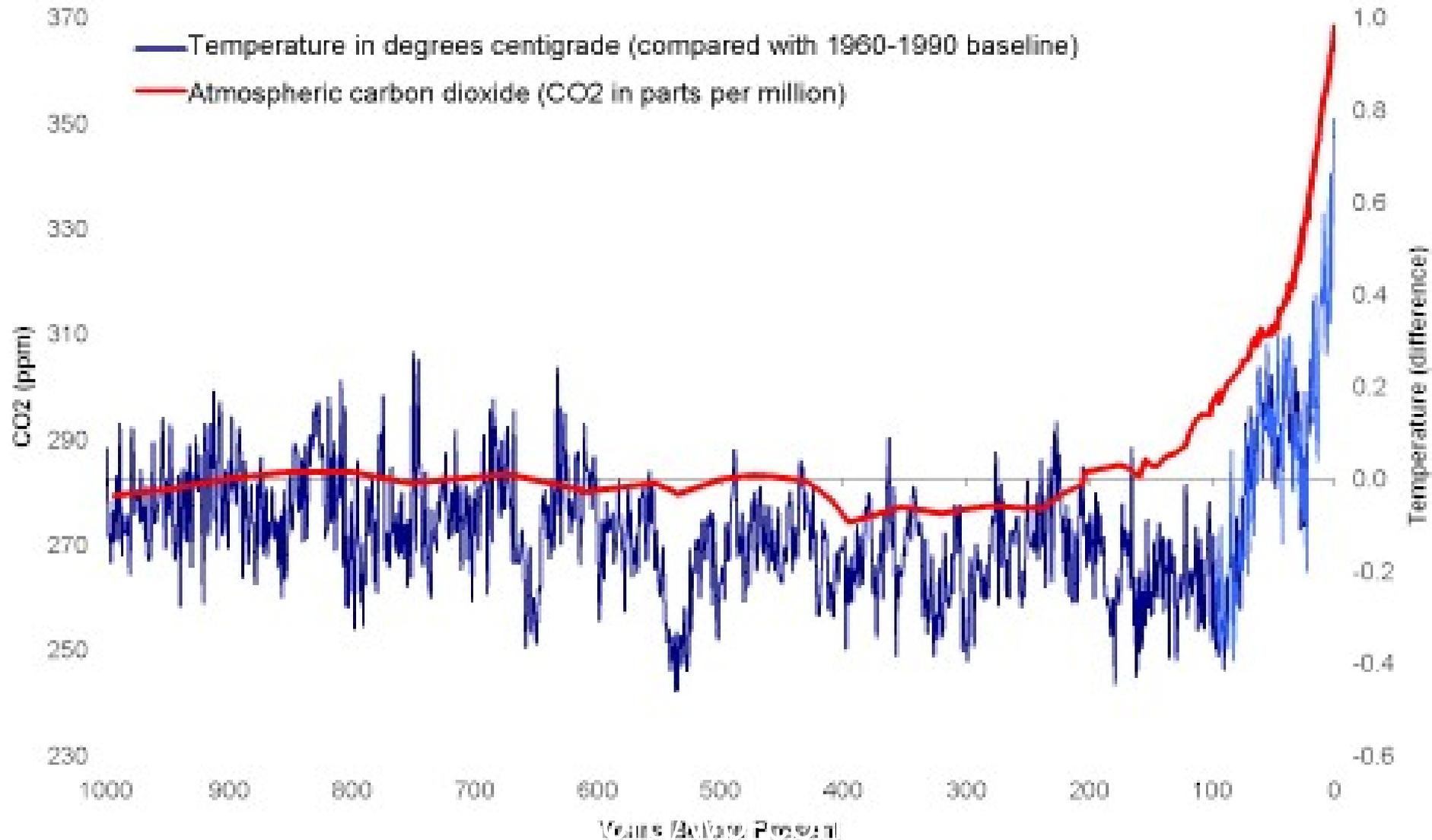
Departures in temperature in °C (from the 1961-1990 average)



Departures in temperature in °C (from the 1961-1990 average)

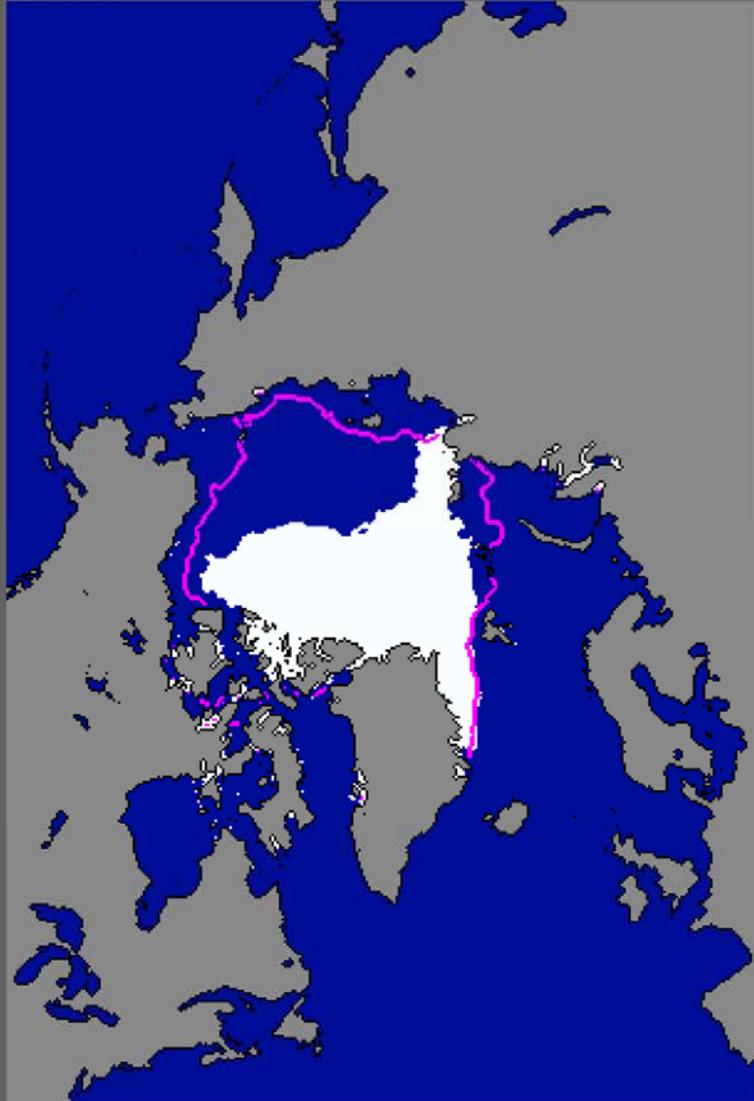


Human induced Climate Change



Shrinking Arctic Ice

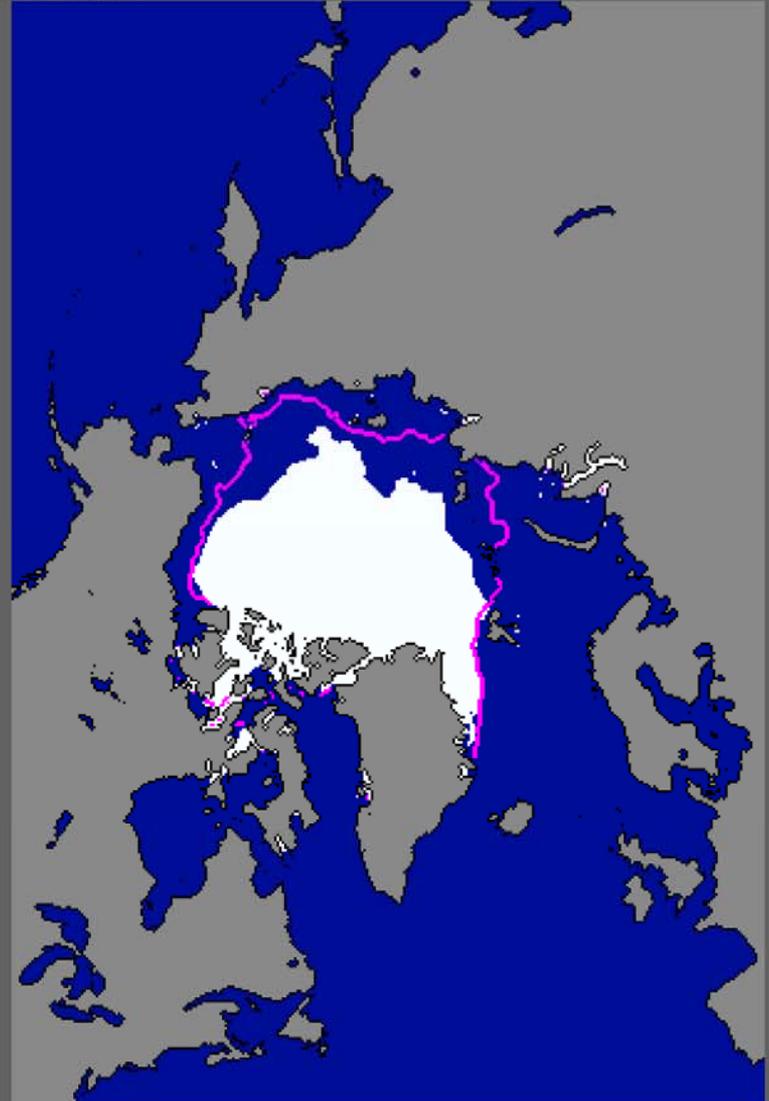
Current Ice Extent
09/16/2007



National Snow and Ice Data Center, Boulder, CO

■ median
ice edge

Current Ice Extent
09/21/2005



National Snow and Ice Data Center, Boulder, CO

■ i

Let's explore some of the impacts and consequences for the Arctic Region.



The Arctic is the Climate Change Bellwether for all of all of us.

A satellite-style view of Earth showing the Arctic region with a grid overlay. The text is centered in a white box with a black border.

The Arctic is now experiencing some of the most rapid and severe climate change on Earth. Over the next 100 years, climate change is expected to accelerate, contributing to major physical, ecological, social, and economic changes. Changes in the Arctic climate will also affect the rest of the world.

Rising Sea Level in Alaska



Coastal Erosion



Shismaref: Rising sea levels and fierce storms have eroded the shoreline near this coastal Inupiat village, breaking down sea walls and washing away homes. Residents have decided to relocate further inland for safety, giving up their traditional fishing, sealing and home-building sites.

-From NRDC

Vanishing Ice Disrupting Polar Bear Habitat

“It is scary,” he said. “Cold is what makes my language, my culture, my identity. What am I going to do without cold?”

Oscar Kawagley, Yupiak





Oscar Kawagley - YUPIAK

- “So the cold and the culture that it made: it gave us the characteristics of our identity. It gave us the characteristics of ingenuity, adaptability, belief, and persistence. These are characteristics that were given to us by the cold. My clothing, my shelter, my food and my technology were all engendered by the cold—and it is a very simple technology, and the technology that is best kept in the mind.”

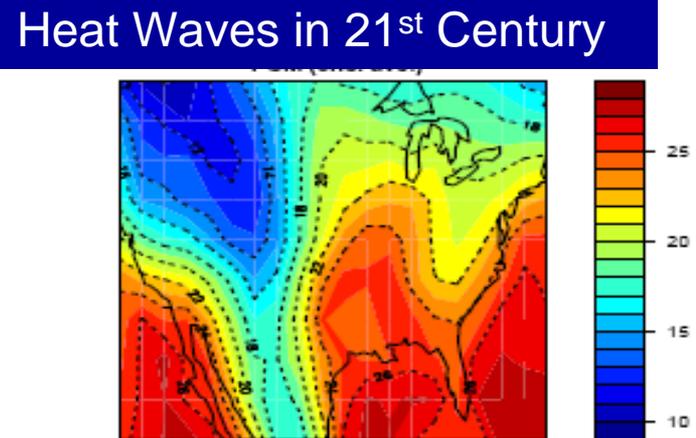
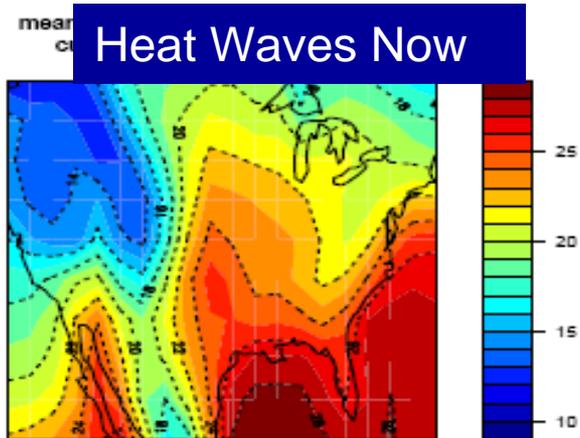


Photo by Fagre, 1997

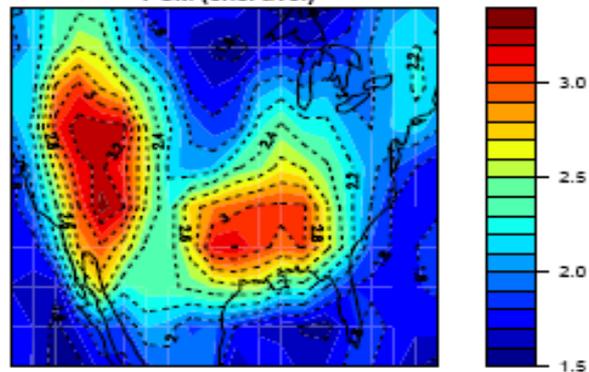


Photo by Kiser, GNP Archives, 1910

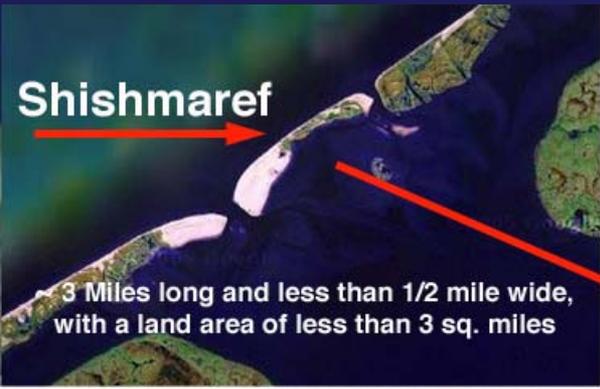
More Frequent Heat Waves



Average change in Heat Waves



Loss Sea Ice in Spring & Fall Increases Coastal Erosion



Increased Drought and Wildfires



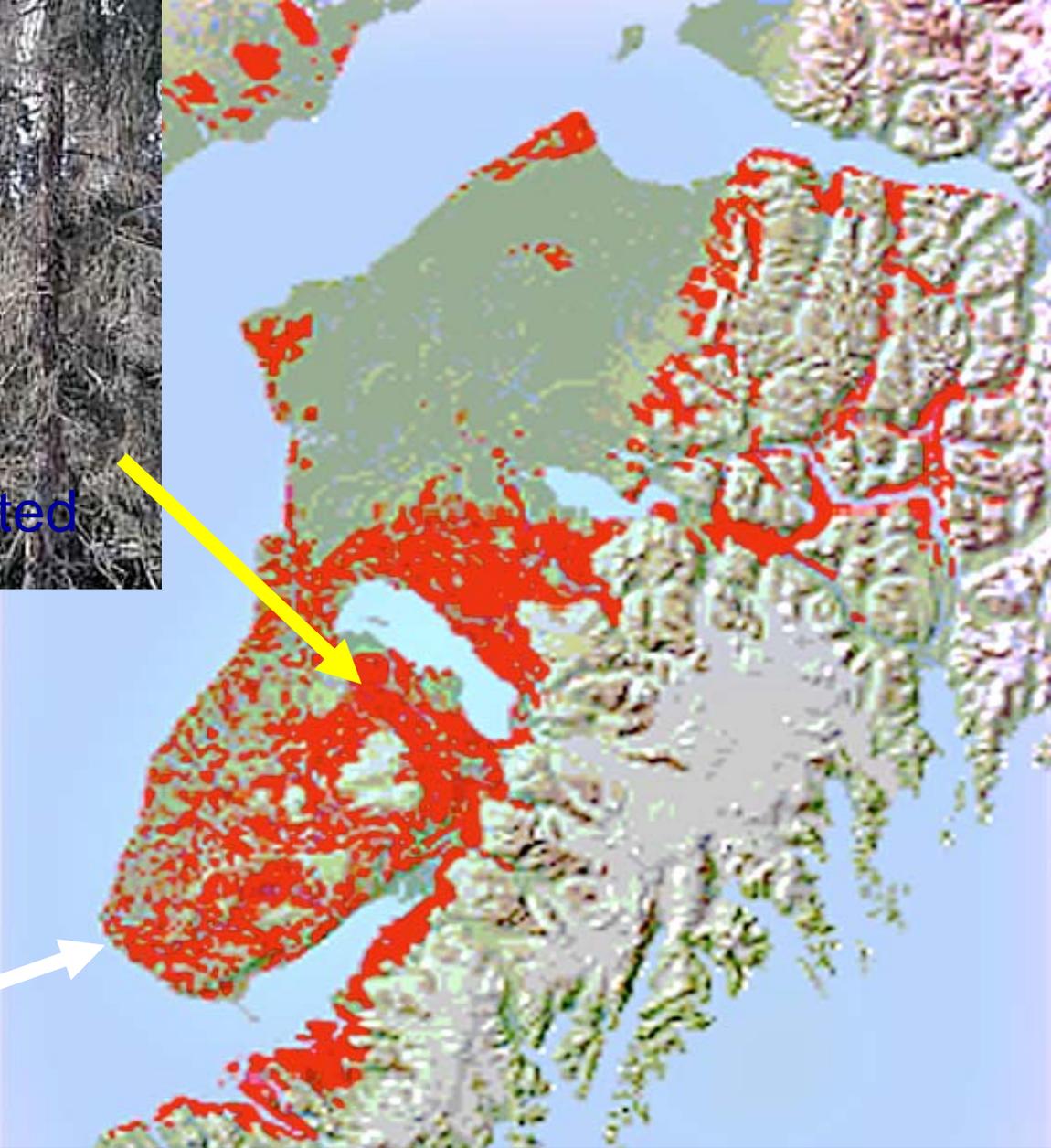


Shishmaref, Alaska 2005



125 Ft. in
One Storm

Many coastal communities and facilities face increasing exposure to storms.

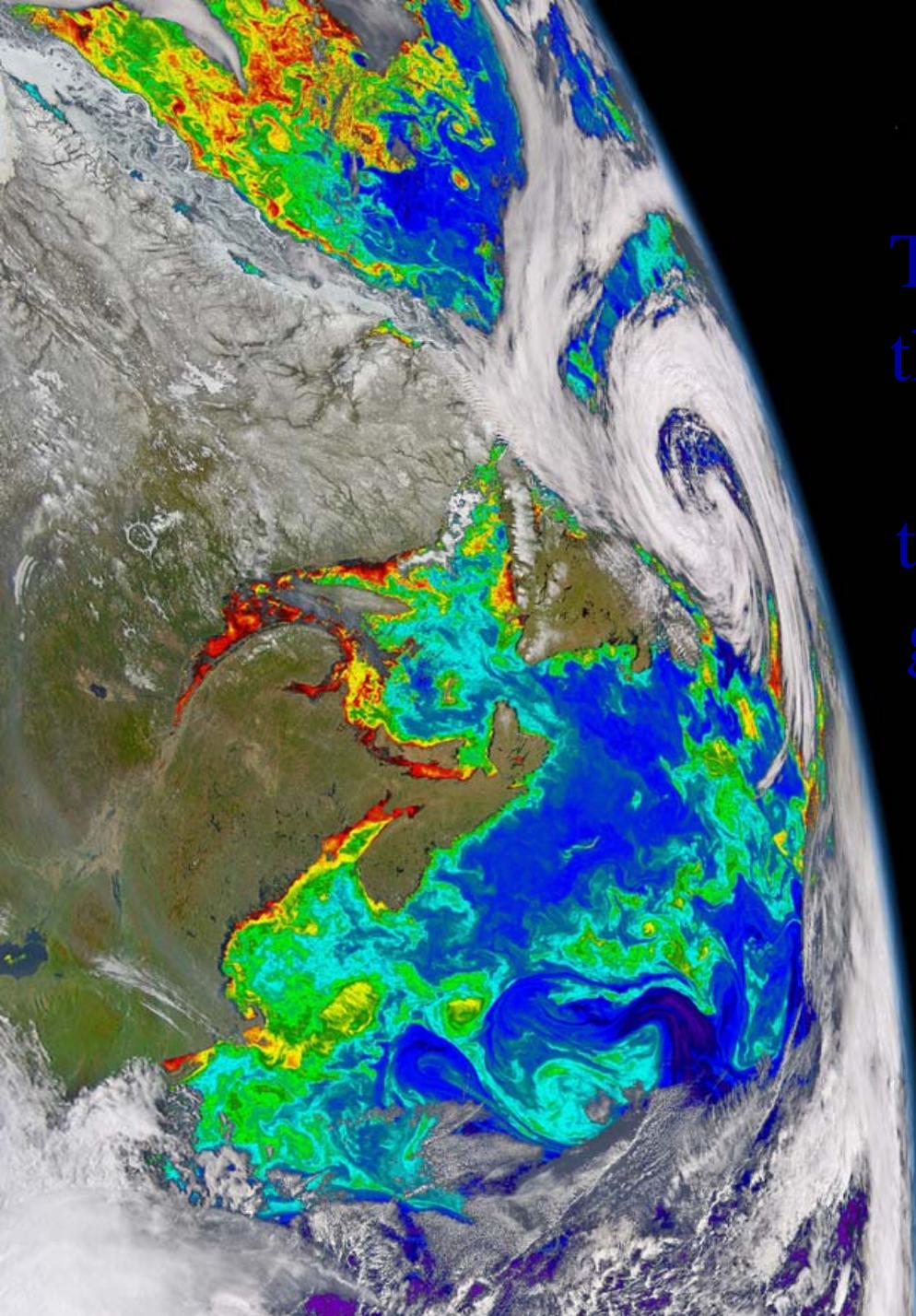


Spruce bark beetle dramatically changes the forest, the landscape, and ecological systems.

Ocean Health

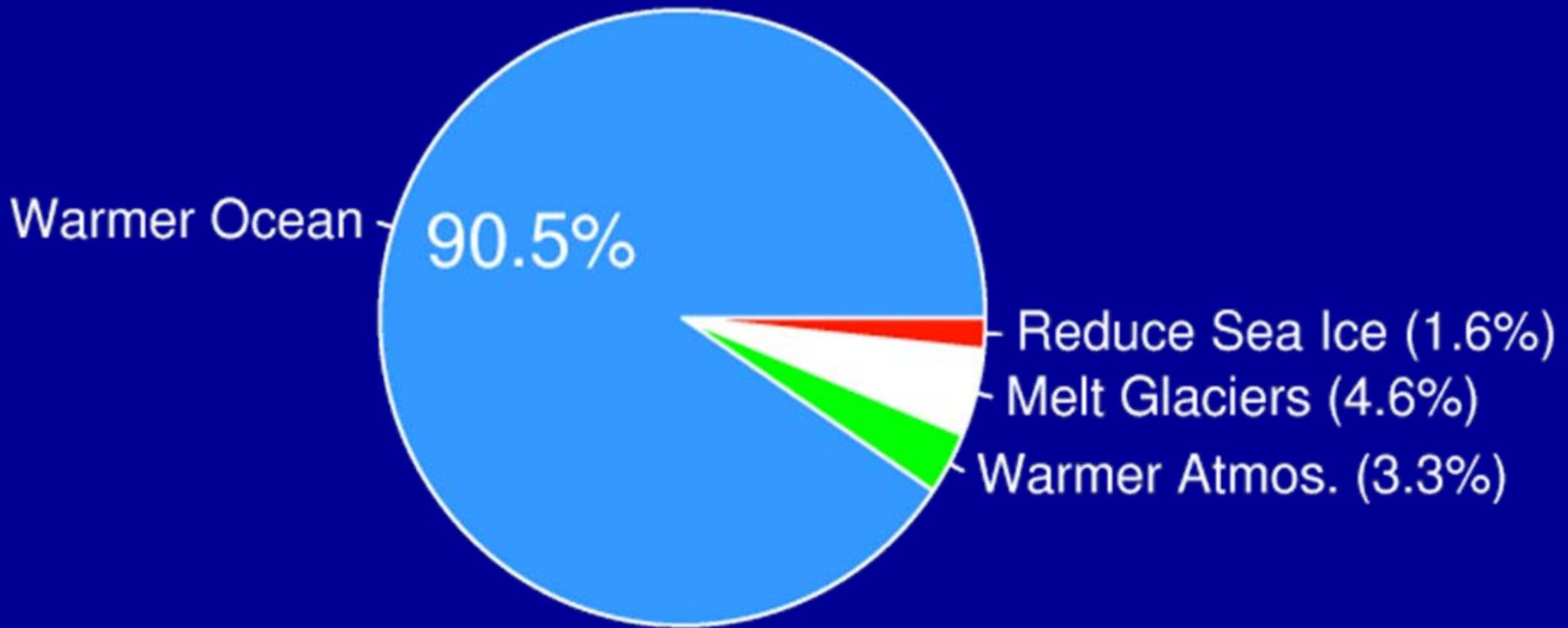


Florida Keys Marine Sanctuary



The oceans are central to the climate change issue, they govern both the timing and magnitude of global-scale changes in the climate system.

Why are the oceans Important?



Data from Levitus et al, *Science*, 2001

The Carbon Dioxide Threat



www.chbr.noaa.gov



awwwwww.org

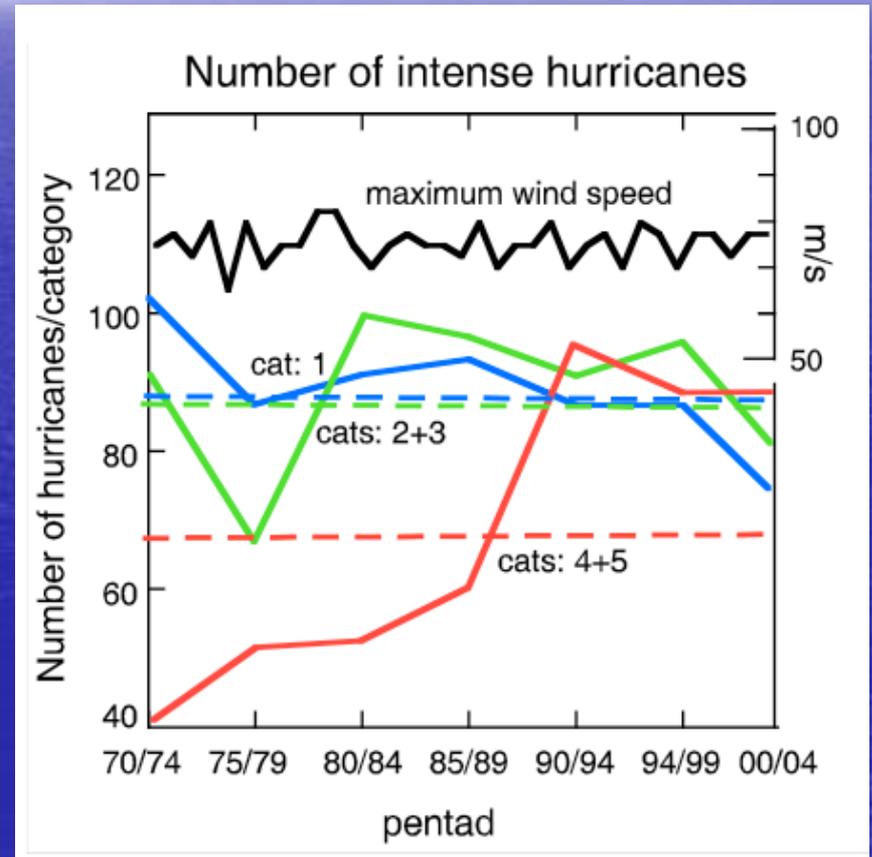


www.chbr.noaa.gov

- Carbon Dioxide dissolved in the ocean leads to increased acidity, destroying Coral Reef.
- A survey of 704 species of coral has found that nearly 33 percent of them face a greater threat of becoming extinct as the globe warms.
- The National Oceanic and Atmospheric Administration (NOAA) concluded in a recent study of U.S. waters that roughly half of the coral species are struggling and continue to decline.
- "Predictions are that within 50 to 100 years not only will we see decline in growth rates for corals and other shell-dependent species—they may actually begin to dissolve," says marine biologist Jenny Waddell of the NOAA.
- In 2006 the U.S. government listed two species of coral—Elkhorn (*Acropora palmata*) and Staghorn (*Acropora cervicornis*)—as threatened under the Endangered Species Act.

Increase in Hurricane Intensity

- Number of Cat. 4-5 systems globally has nearly doubled in last 30 years



Webster et al.

Summary of the Most Recent Findings of the Intergovernmental Panel on Climate Change

IPCC

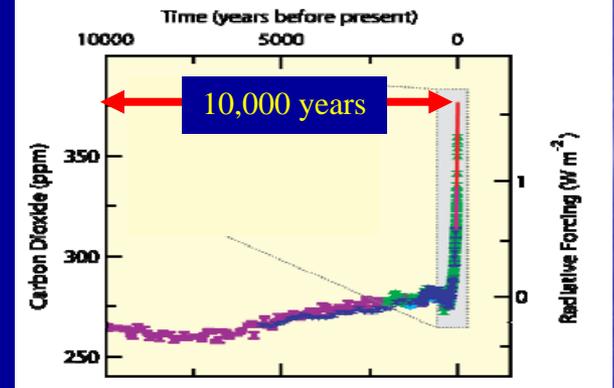
- *Warming of the climate system is unequivocal*, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice, and rising global average sea level.
- *There is now higher confidence in projected patterns of warming and other regional-scale features, including changes in wind patterns, precipitation and some aspects of extremes and of ice.*
- *Anthropogenic warming and sea level rise will continue for centuries due to the time scales associated with climate processes and feedbacks, even if greenhouse gas concentrations were to be stabilized.*

Primary Sources of Greenhouse Gases

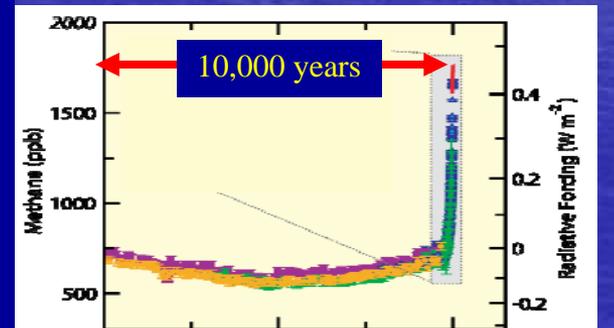
IPCC WG I (2007):

- “The global increases in carbon dioxide concentration are due primarily to fossil fuel use and land-use change, while those of methane and nitrous oxide are primarily due to agriculture.”

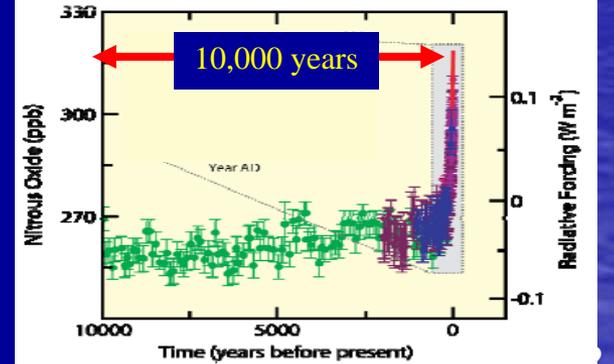
Carbon
Dioxide



Methane



Nitrous
Oxide



Summary of the Global Carbon Project October 2008 Report

- **Growth Now x4 Faster:** Since 2000, anthropogenic CO₂ emissions have been growing x4 faster than in the 1990s and above the worst case emission scenario of the Intergovernmental Panel on Climate Change.
- **Complete Shift to Developing Countries:** There has been a complete shift in the share of regional emissions, now more than half of Fossil Fuel emissions are coming from developing countries.
- **Natural Sinks Decreasing:** The efficiency of natural sinks has decreased by 5% over the last 50 years (and will continue to do so in the future), implying that the longer it takes to begin reducing emissions significantly, the larger the cuts needed to stabilize atmospheric CO₂.
- **Atmospheric CO₂ Has Been Growing 33% Faster:** Despite of 15 years of intense international climate negotiations, atmospheric CO₂ has been growing 33% faster during the last 8 years than in the 1990s.

Examples where projected climate-induced changes will have consequences vital to human well-being and the socio-economic security around the World.

Disasters: For example, the proportion of category 4 and 5 hurricanes (including cyclones and typhoons of the far east) to the total number of hurricanes has thus increased from about 20% to about 35% in the past 35 years.

Human Health and Well-being: WHO notes that these climate induced hazards are diverse, global and probably irreversible over human time scales. Next WHO states that the health impacts of climate change are potentially huge --- malaria, diarrhea and protein-energy malnutrition together cause more than three million deaths each year.

Energy: The World Energy Council recently reported that “Climate change, and more specifically the carbon emissions from energy production and use, is one of the more vexing problems facing society today.”

Climate Variability: Understanding, assessing, predicting, mitigating, and adapting to climate variability, such as El Niño/La Niña which typically brings flooding to some parts of the world and drought to others. During the 1982-83 El Niño, the most intense El Niño on record, there were torrential rains in normally arid regions and floods in many other regions.

Examples where projected climate-induced changes will have consequences vital to human well-being and the socio-economic security around the World (Con't).

Water Issues: The U.S. AID recently stated that the “world faces an unprecedented crisis in water resources management, with profound implications for global food security, protection of human health, and maintenance of aquatic ecosystems, much of which is climate driven.”

Weather and Climate Interactions: It is becoming increasingly clear that extreme events, such as droughts, floods, wildfires, heat waves and severe freezes and hurricanes are related to climate variability and change are some of the key weather-climate variables.

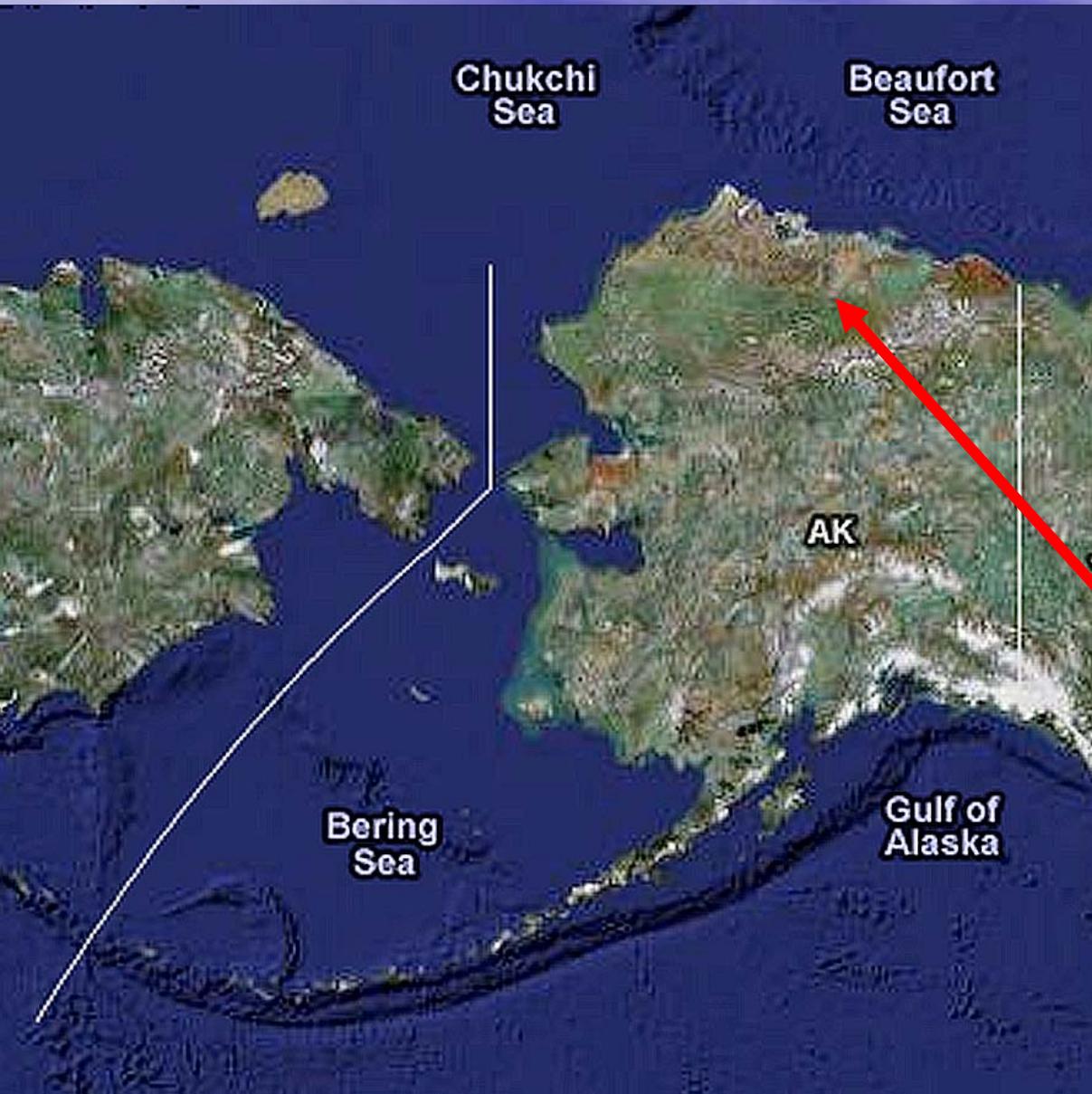
Ecological Services: The 4th IPCC Assessment concluded that “During the course of this century the resilience of many ecosystems is likely to be exceeded by an unprecedented combination of change in climate associated disturbances (e.g., flooding, drought, and ocean acidification) and in other global change drivers (especially land-use change, pollution and over-exploitation of resources).

Food and Agriculture: The 4th IPCC Assessment also concluded that there will be crop yield losses in the tropics, whereas in the mid-to-high latitude there may be crops yield benefits.

Biodiversity: The Millennium Ecosystem Assessment (2005), concluded that climate change now poses one of the principal threats to the biological diversity.

Climate Changes Shifting Weather Patterns

Thunderstorms in the Arctic



Shifting patterns in weather types and locations.

Thunderstorms have migrated northward, along with lightning, which apparently caused the first known wildfire north of the Brooks Range occurred last summer.

What Has Changed for Native America and Indigenous Peoples re Climate Change?

Native/Indigenous Peoples Are Now Increasingly Part of Climate Change Assessments, Planning & Decision-Making

Especially, in the Arctic

[Research Planning now] includes the human dimension, indigenous insights..."

Many Native CC Actions Planned!

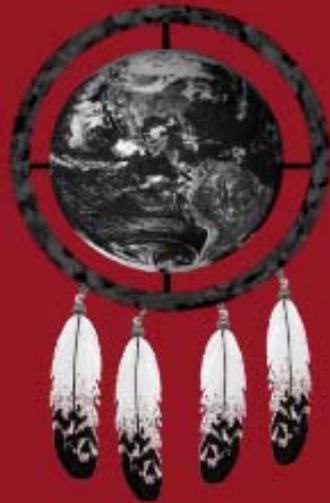
- Native Peoples are Gathering (NCAI) and Elsewhere to Plan for Adaptation to Climate Change
- American Indian/Alaska Native Climate Change Working Group and others Planning Activities

One Idea: To Create 10-year Update of NPNH Climate Change Workshop

Native Peoples-Native Homelands
Climate Change Workshop

- Final Report -
Nancy G. Maynard, Editor

CIRCLES OF WISDOM



U.S. Global Change Research Program

October 28 - November 1, 1998
Albuquerque Convention Center
Albuquerque, New Mexico

Sponsors:
The National Aeronautics and Space Administration
American Indian Chamber of Commerce of New Mexico
City of Albuquerque

• A Proposal: To Carry Out
a 2nd Native Peoples/Native
Homelands Climate Change
Impacts/Solutions
Assessment

• *Emphasis on Adaptation
& Action!*

• *Original was done in 1998*

• *Join us!*

For copies contact:

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OnLnDoc/ondocform.pl](http://www.gcrio.org/cgi-bin/OnLnDoc/ondocform.pl)

GCRIO User Services:

help@gcrio.org - email

AI/AN CCWG *Propose A New Initiative* with Specific Climate Change Action Steps - *Starting Today!*

- *A Proposal:* To Carry Out a 2nd Native Peoples/Native Homelands Climate Change Impacts/Solutions Assessment – *Emphasis on Adaptation & Action!*
 - To Assess Current Native Impacts/Vulnerabilities to Climate Change, and....
 - To Develop Adaptation Options
 - To Develop Local/Tribal Plans for Adaptation to Climate Change
 - To Ensure Documentation and Communication of Indigenous/Traditional Knowledge from Elders
 - To Train/Prepare Future Native Leaders
 - To Create Partnerships for Action
 - To Start Adaptation Solutions/Actions *now!*
- *Start with 2nd NP/NH Climate Change Workshop on Climate Change Assessment for Adaptation (10 years later)*
 - *Leadership* = Tribal Colleges, Native Peoples
 - *Partnerships* = Feds, Private Sector, Universities, etc

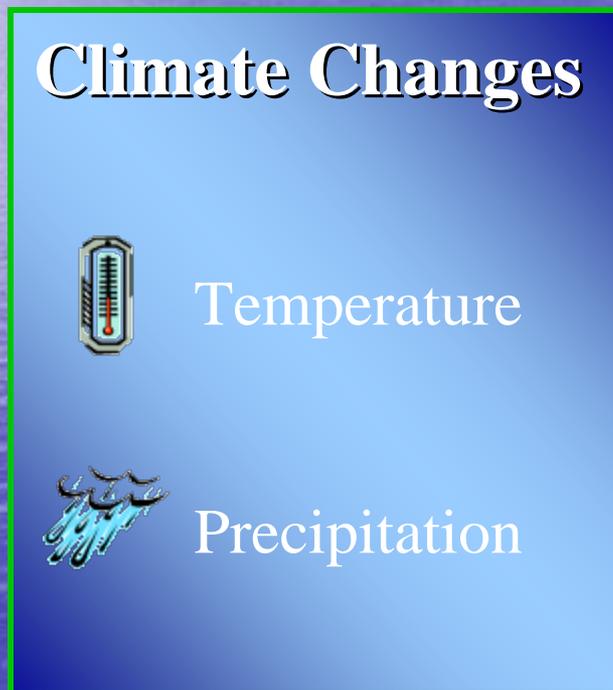
The Four Workshop Questions

1. What are current concerns and stresses on tribal lands?
2. How might climate variability and change impact these stresses?
3. What types of mitigating/coping strategies are available?
4. What information and data are needed to address these climate-related issues?

Key Issues – 1998 NPNH

Workshop

Potential Climate Change Impacts



Tourism and Community
Development

Human Health and Extreme
Events

Rights to Water and Other
Natural Resources

Subsistence Economics and
Cultural Resources

Cultural Sites, Wildlife and
Natural Resources

How Will Climate Changes Affect Native Economies: Tourism & Community Development?

- Many Tribal Development Initiatives depend upon favorable weather & climate conditions
 - Tourism & recreation-based activities – e.g.:
 - Rivers, lakes, mountains, forests, & aesthetic beauty of tribal lands
 - Reduced water runoff likely to reduce flow in streams
 - Cultural & historical sites & ceremonies –
- Drier Summers likely to increase fire risk
- Forestry & agriculture economies impacted

Adaptation Strategy = Diversify Tribal Activities

Urgent Priority = Economic Development & Jobs!

How Will Climate Change Affect Human Health and Extreme

Events? Event temperatures – Health impacts

- *Traditional structures designed to take advantage of natural warmth and coolness of landscape;*
- *many homes lack effective heating or cooling systems.*
- Increased heat stress (e.g., SW)
- Increase in air-conditioned facilities requires behavioral change toward indoor lifestyle
- Increased forest fire incidences.

Adaptation Potential - needed:

- Education and health care
- Data for monitoring and studying fires and Other extreme events (floods, etc)



How will Climate Changes Affect Rights to Water and Other Natural Resources?

- *Snowmelt and seasonal runoff patterns to change water availability & allocations*
 - Less water available
 - Significant consequences for resource-based sectors
 - Water allocation is problematic in Western US & climate change will increase issues

Adaptation Potential:

- Improve efficiency of water capture.
- Increased use of cisterns; increasing in-ground storage of water
- Application of ancient water management techniques
 - SW Ancient Native Subsistence Strategy

How Will Climate Change Affect Subsistence Economies and Cultural Resources?

Many tribal communities support themselves through subsistence & other means

Traditions closely tied to subsistence foods, seasons, natural events and resources.

Example: Subsistence lifestyle in the Arctic and sub-Arctic already threatened by changes in global climate.

- Arctic: loss of subsistence food (seals, fish, bear)
- Arctic: loss of subsistence-based culture

- ***Adaptation Potential:***

- Incorporate new technologies, new materials, new way of doing things (But – loss of culture, traditions?)

*****Adaptation by migration restricted by land ownership*****

How Will Climate Change Affect *Cultural Sites, Wildlife and Natural Resources*

Climate Change: disrupting long history of intimate association with environment.

- Many tribes have ongoing traditions and ceremonies directly tied to the land, water, plants, animals and sacred sites of their homelands
- How to protect & preserve these resources?

Adaptation Potential:

- Improve or alter land management practices to sustain useful plants and animals.
- Acquiring or development of new nearby non-Native lands to access traditional food sources.