Alaska Native Monitoring Needs

Sustaining Arctic Observing Networks Workshop

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Alaska Native Monitoring Needs

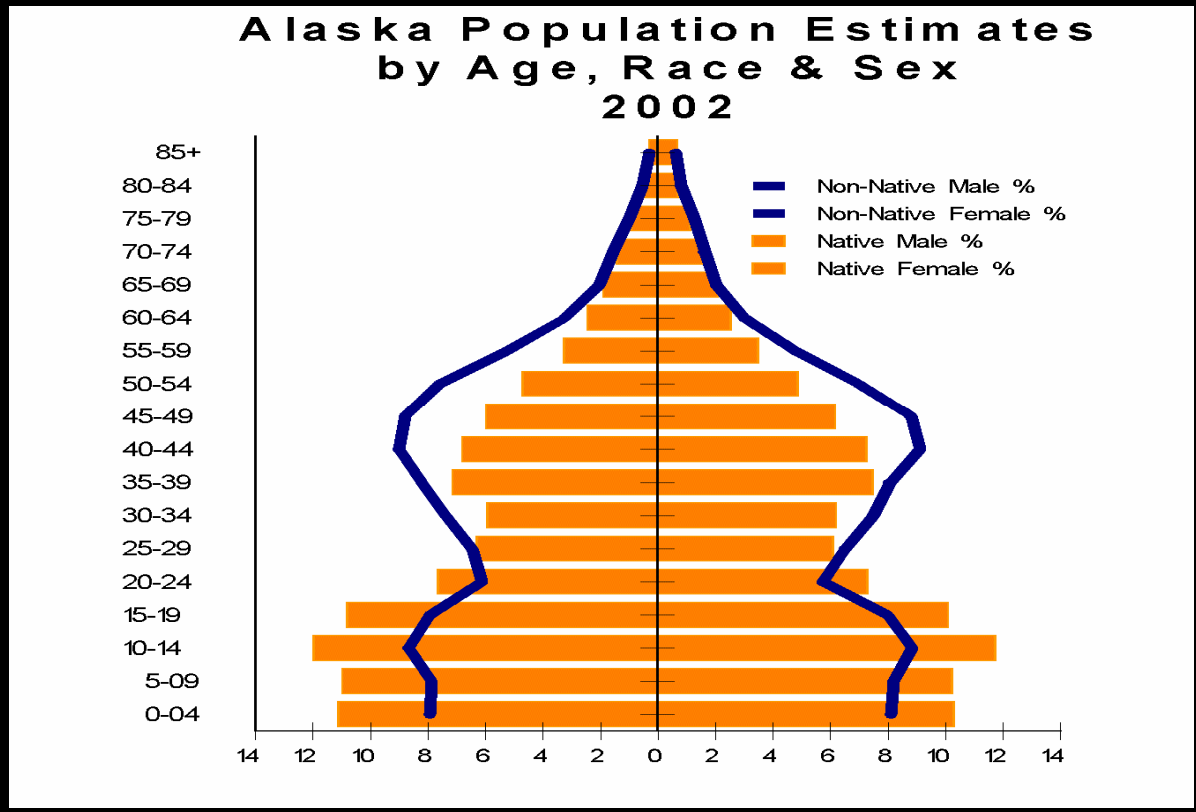
Population Demographics

Background

- Alaska Native population is 125,000, this represents 19% of Alaska's population, the highest Native American population percentage of any State
- Approximately 65% rural, 35% urban, 58% in villages of 200 or less
- Most of the rural communities have no road connection with major population centers

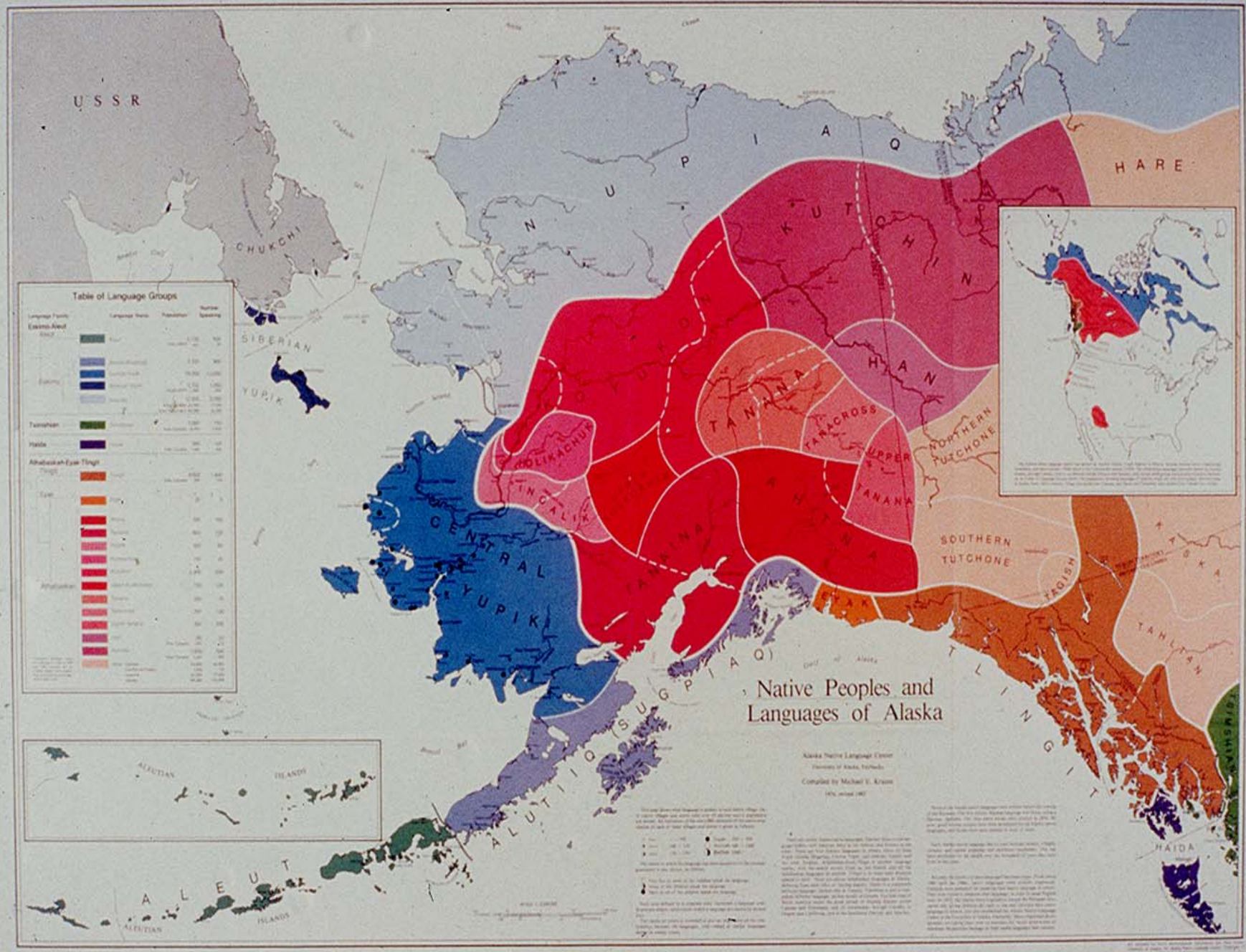
ALASKA NATIVE HEALTH STATUS

Alaska Population Estimates, 2002



NOTE: American Indian/Alaska Native alone or in combination with one or more of the other five races.

SOURCE: State of Alaska, Alaska Department of Labor & Workforce Development, Research and Analysis, Census & Geographic Information Network and U.S. Census Bureau, 2000 Census of Population & Housing Summary.


USSR
CHUKCHI
SIBERIAN YUPIK
I N U P I A Q
K U T C H I N
H A N
HARE
KOYUKON
TANANA
TANACROSS
UPPER TANANA
NORTHERN TUTCHONE
SOUTHERN TUTCHONE
HOLIKACHUK
INGALIK
TANAINA
CENTRAL YUPIK
ALUTIIQ (SUGPIAQ)
ALEUT
ALEUTIAN ISLANDS
TLINGIT
TAGISH
TAHLTAN
HAIDA
Table of Language Groups
Native Peoples and Languages of Alaska
Alaska Native Language Center
University of Alaska, Fairbanks
Compiled by Michael E. Krauss
1974, revised 1987

Northwest Coastal Alaska Village

Alaska Native Monitoring Needs

Major Health Challenges

- Health status disparities (cancer, injuries, infectious disease, suicide)
- Climate change
- Subsistence food safety/contaminants
- Cultural/economic stress

Alaska Native Monitoring Needs

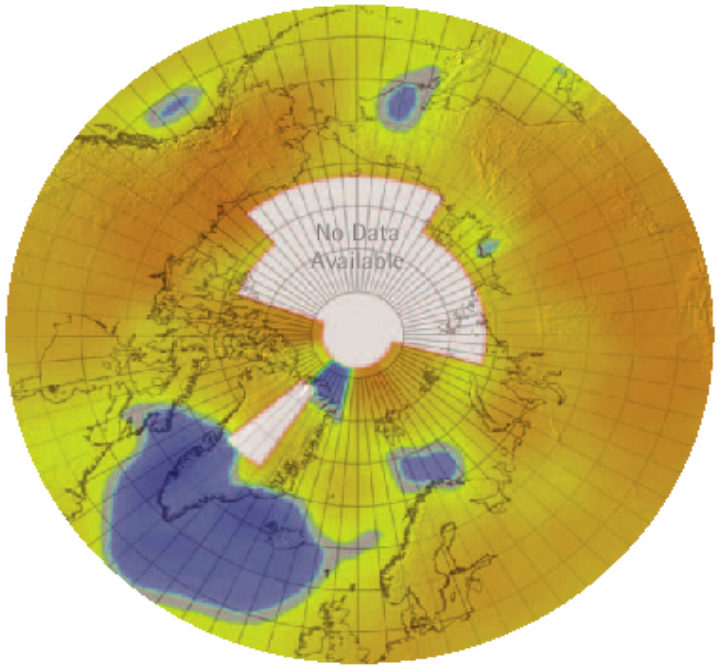
Climate Change

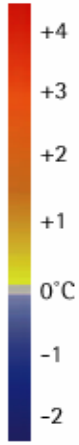
- The climate is changing rapidly in the Arctic regions of the northern hemisphere and more of the warming is in winter than summer
- Some regions are cooling

IMPACTS OF A WARMING ARCTIC

1 Arctic climate is now warming rapidly and much larger changes are projected.

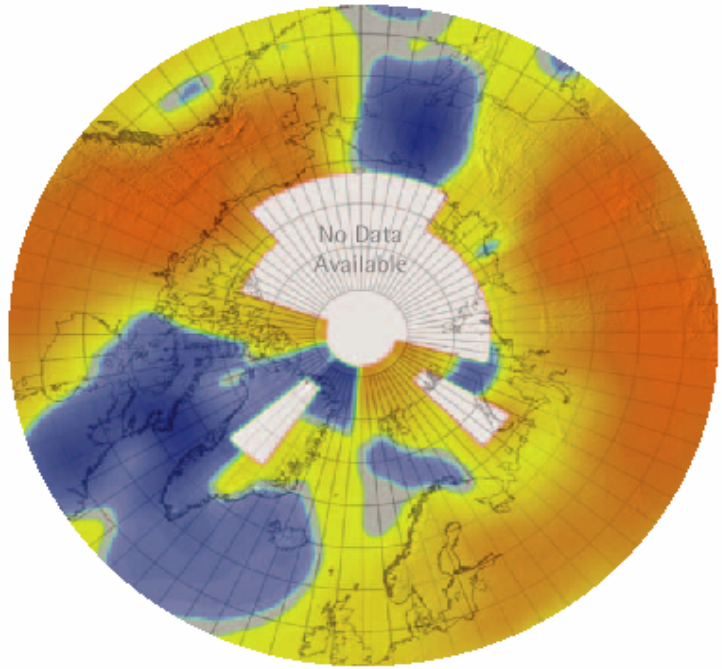
Observed Surface Air Temperature Changes: 1954–2003
(ANNUAL, ˚C)





The colors indicate the change in temperature from 1954 to 2003. The map indicates annual average temperature change, which ranges from a 2-3˚C warming in Alaska and Siberia to a cooling of up to 1˚C in southern Greenland.

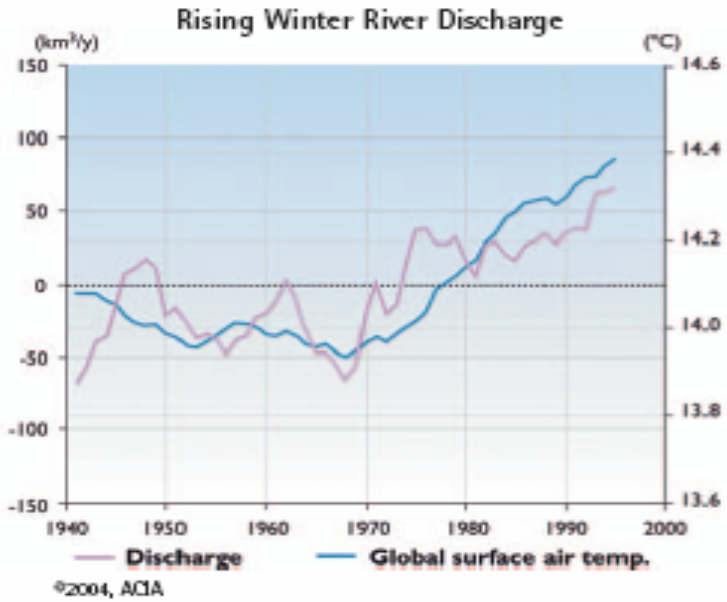
Observed Surface Air Temperature Changes: 1954–2003
(WINTER: Dec-Feb in ˚C)



This map indicates the temperature change during the winter months, ranging from a warming of up to 4˚C in Siberia and Northwest Canada to a cooling of 1˚C over southern Greenland.

IMPACTS OF A WARMING ARCTIC

2 Arctic warming and its consequences have worldwide implications.

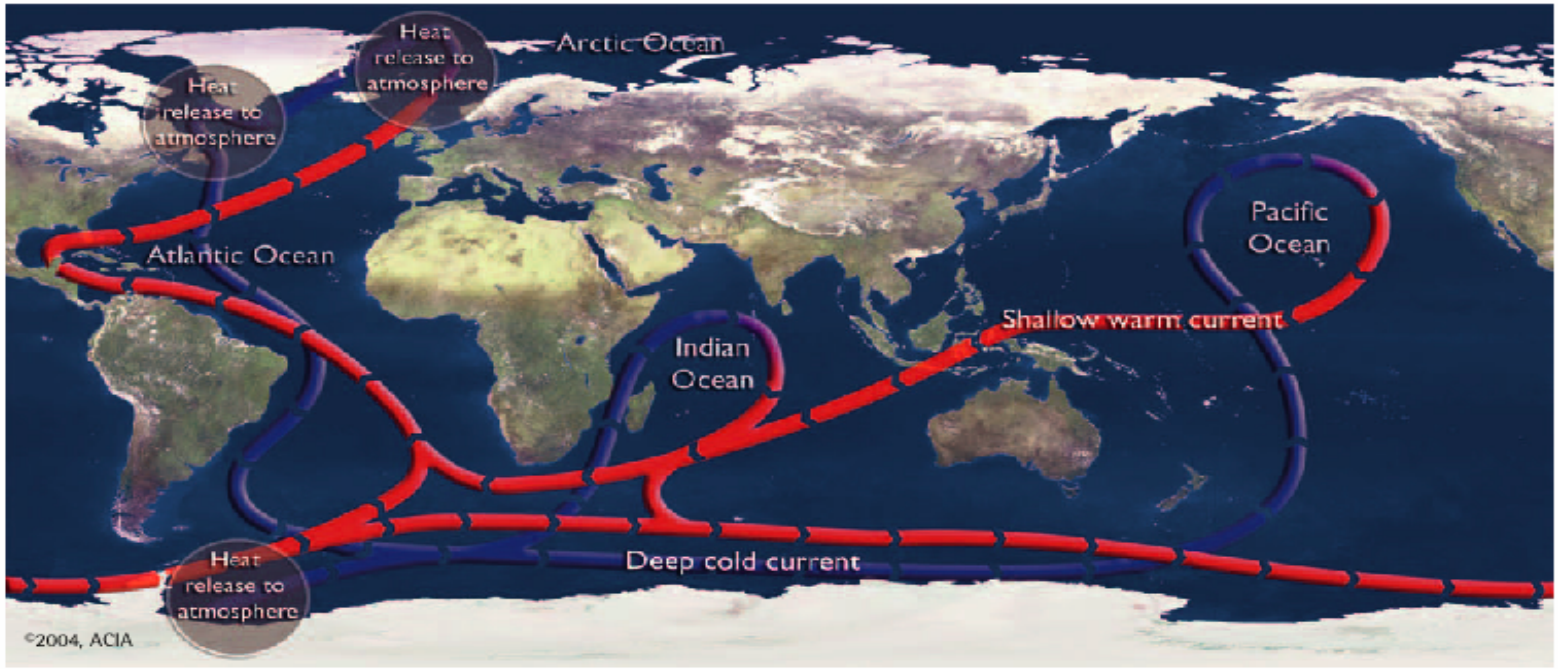


The purple line shows departures from the long-term average of annual Eurasian river discharge, and the blue line shows changes in global average surface air temperature.

IMPACTS OF A WARMING ARCTIC

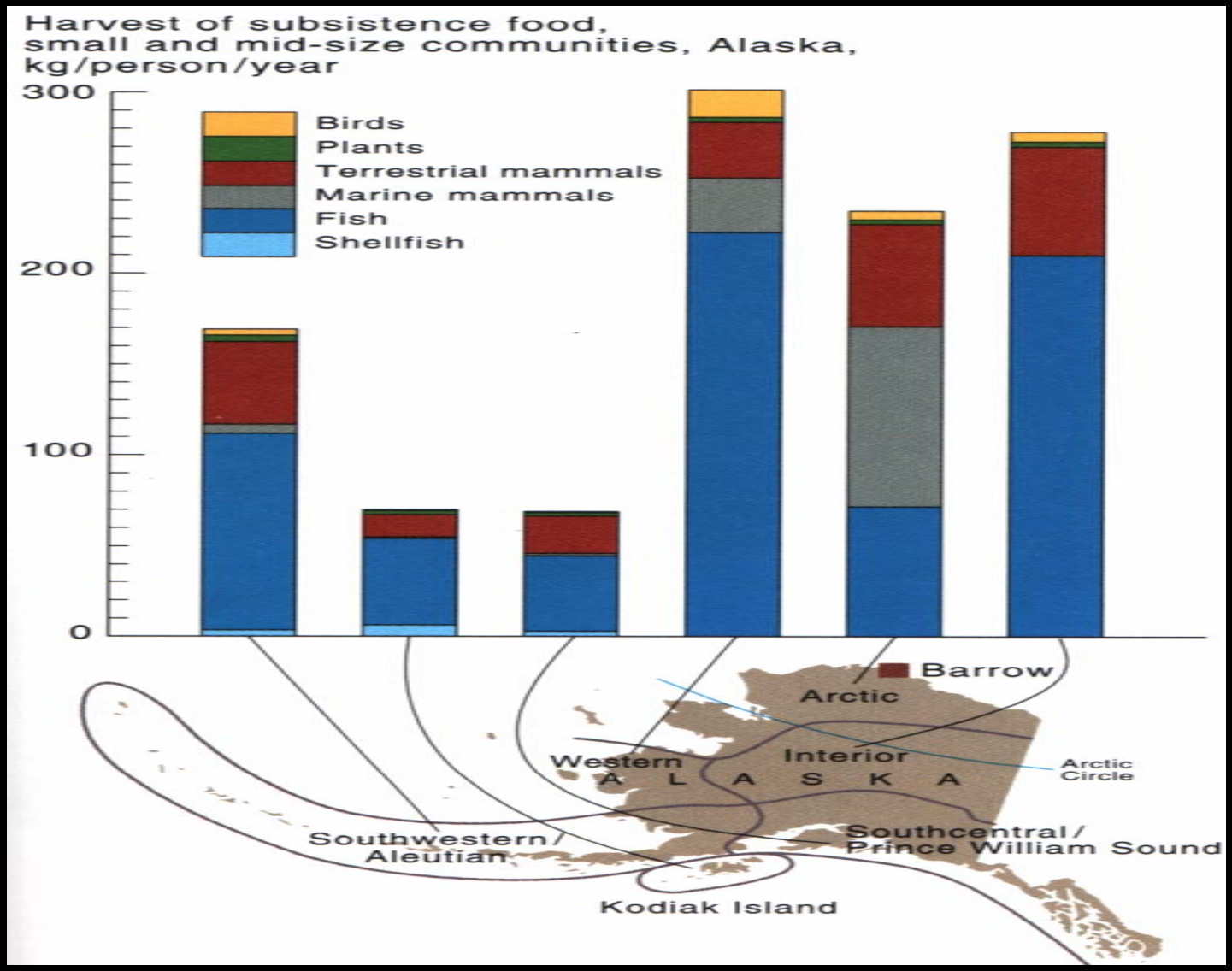
1 Arctic climate is now warming rapidly and much larger changes are projected.

Global Ocean Circulation



Changes in global ocean circulation can lead to abrupt climate change. Such change can be initiated by increases in arctic precipitation and river runoff, and the melting of arctic snow and ice, because these lead to reduced salinity of ocean waters in the North Atlantic.

Alaska Subsistence Food Harvest



Alaska Native Monitoring Needs

Subsistence Food Safety

- Rural Alaska Natives are the most subsistence dependent population in the US
- Accumulation of organic contaminants in the food web biomagnifies; the developing fetus and pregnant women are most sensitive
- Transport of contaminants by ocean, river, and atmospheric mechanisms may be increased by a warming climate

Alaska Native Monitoring Needs

Contaminant Transport

Subsistence Food Safety

- Global air currents are hemispheric
- Ocean currents are global
- All local sources are eventually distributed globally
- Warming Arctic Climate may be increasing transport from lower latitudes to the Arctic

Alaska Native Monitoring Needs

Subsistence Food Safety

Toxicological Effects

- Growth, neurologic development
- Endocrine disruption
- Immunologic effects
- Adult chronic disease

Alaska Native Monitoring Needs

Climate Change

Zoonotic Disease

"Volatility of infectious diseases may be one of the earliest biologic expressions of climate instability."

Epstein. Scientific Am. 2000; 283 (2) 50-57

Alaska Native Monitoring Needs

Climate Change

Zoonotic Disease

- Climate warming has resulted in north ward spread of zoonotic diseases

- West Nile Virus is steadily extending northward into cold regions

IMPACTS OF A WARMING ARCTIC

10 Multiple influences interact to cause impacts to people and ecosystems.

West Nile Virus Change in Canada

The West Nile encephalitis virus is a recent example of how far and fast a disease can spread once it becomes established in a new region. The West Nile virus can infect many bird and mammal species (including humans) and is transmitted by mosquitoes. It was first identified on the East Coast of North America in 1999 and spread to 43 states and six Canadian provinces by 2002. Migratory birds are responsible for its spread to other regions. Mosquitoes spread the virus to other birds (as well as to other animals and humans) within a region. Although the virus originated in tropical Africa, it has adapted to many North American mosquitoes, and so far, to over 110 species of North American bird, some of which migrate to the Arctic. Mosquito species known to transmit the virus are also found in the Arctic. Climate has historically limited the range of some insect-borne diseases, but climate change and adaptive disease agents such as the West Nile virus tend to favor continued northerly expansion. Some arctic regions, such as the State of Alaska, have initiated West Nile virus surveillance programs.

Alaska Native Monitoring Needs
Climate Change

- Damage Destruction of Structures
- Cost to Move Housing Out of Harms Way
- Increased Costs for Repairs

Alaska Native Monitoring Needs

Rural Alaska Monitoring Program (RAMP

Purpose

- To Detect emerging threats to community health and sustainability
- To empower communities to develop a useful response to Arctic warming
- To identify potential threats and develop mitigation and adaptation strategies
- To form regional and international networks to enable governments to develop and advocate for mitigation and adaptation policies

Alaska Native Monitoring Needs

Rural Alaska Monitoring Program

Components

Core indicators shared by all communities

- Human health indicators
- Ecosystem indicators, for example, zoonotic and wildlife diseases, changes in prevalence of species
- Physical environment indicators, for example permafrost temperature, shoreline changes, climate indicators

Community-specific indicators

- Contaminant levels in wildlife