Toward a National Climate Service
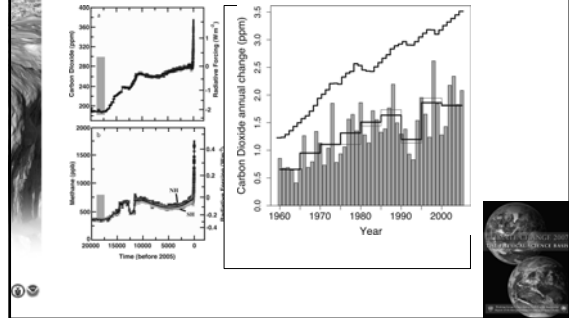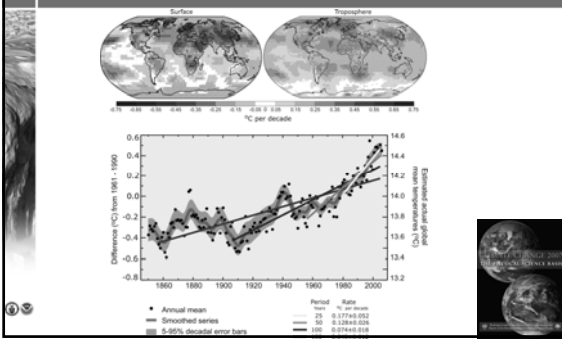
Dr. Chet Koblinsky
Director, NOAA Climate Program Office
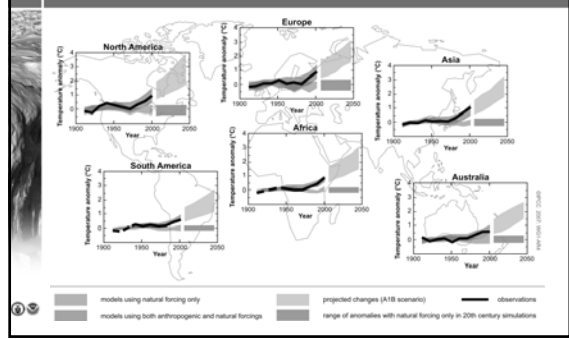
Alaska Climate Change Adaptation Advisory Group

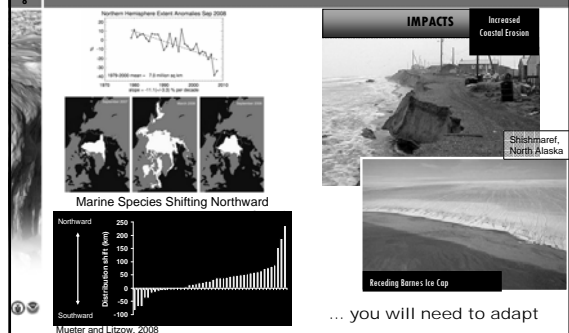# The World Has Warmed

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The World Has Warmed

... it will get warmer

... especially in the Arctic

... there will be impacts

Marine Species Shifting Northward

Mueter and Litzow, 2008
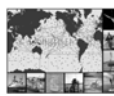
... you will need to adapt
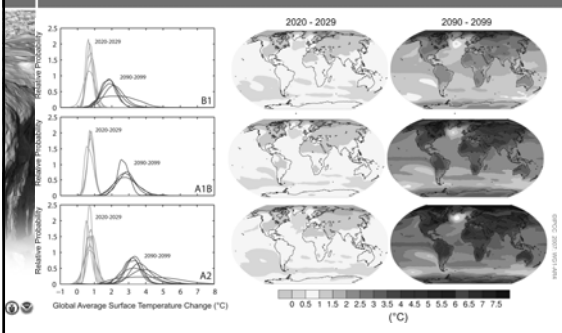
NOAA & Climate: The Present

- NOAA is a leading provider of reliable weather, water and climate information to the nation and the globe

- NOAA's products are the result of a vigorous research program and a growing operational capability

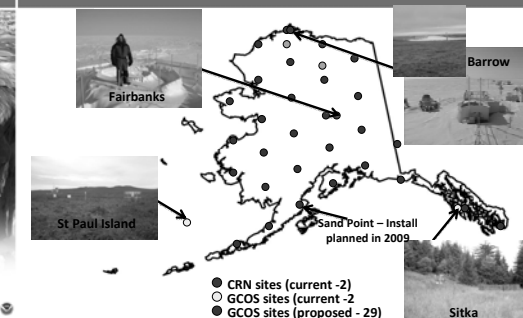- Products and services are currently provided in a distributed manner

NOAA Satellite and Information Service
National Environmental Satellite, Data, and Information Service (NESDIS)

CLIMATE PROGRAM OFFICE

NATIONAL OCEAN SERVICE

NOAA FISHERIES SERVICE

noaa research

Monitor the state of the climate

- Climate System Observations -
  - Ocean
  - Atmosphere
  - Arctic
  - Carbon

USHCN by Climate Region

CLASS

- Data Management and Information

  - NOAA's Comprehensive Large Array-data Stewardship System
  - State of the Climate Report
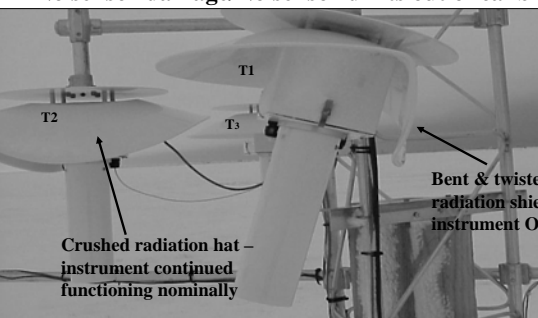 - Climatological Statistics and Summaries

Selected Global Significant Events
July 2007

STATE OF THE CLIMATE IN 2006

Observing and Monitoring the Arctic

Barrow

Fairbanks

St Paul Island

Sand Point – Install planned in 2009

Sitka

● CRN sites (current -2)
○ GCOS sites (current -2)
● GCOS sites (proposed - 29)

USCRN Web Site: http://www.ncdc.noaa.gov/crn

Polar Bear "hugs" at Pt. Barrow, Alaska
No sensor damage/No sensor drifts out of calibra

T1

T2

T3

Bent & twisted radiation shield instrument OK.

Crushed radiation hat – instrument continued functioning nominally

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NOAA Products and Services For Alaska and the Arctic

Arctic Report Card 2008
Tracking recent environmental changes

· Home · Atmosphere · Sea Ice · Ocean · Land · Greenland · Biology

Arctic Report Card

- Issued annually
- Presents clear, reliable and concise information on recent observations of environmental conditions, relative to historical time series records.
- Updates and expands the State of the Arctic Report, published in fall 2006.

www.arctic.noaa.gov/reportcard

Understand the future state of the climate

- Understanding Climate Processes –

- Earth System Modeling, Predictions, and Projections –

- Analysis and Attribution

NOAA GFDL CM2.1 Model Simulation

1885

1985

2085

Arctic Research Program

- *Maintaining and extending a network of integrated climate observing systems*
- *Systems measure temperatures of water, ice, and air, plus thickness of sea ice, species abundance, and biodiversity.*

Collaborations with NOAA Labs:
- Provide intellectual and technical expertise
- Develop a modeling framework for the Bering-Chukchi Seas marine observatory.
- Conducting analysis of climate data and model outputs.
- Provide constant improvement in global climate models.

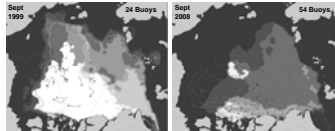Sept 1999   24 Buoys   Sept 2008   54 Buoys

Over ten years, the age and thickness of Arctic sea ice has decreased dramatically. Over the same period the International Arctic Buoy Program increased the number of active buoys from 24 to 54.

0   age of ice in years   10

## Assess evolving user needs and context

- Assessing Climate, Impacts and Adaptation –
  Global, national, regional, sectoral assessments of vulnerability, impacts and adaptation

- Climate Services Development and Delivery –
  National Integrated Drought Information System (NIDIS)
  Emerging foci on Coasts, Arctic, Fisheries,…
  Regional
  International

Alaska Center for Climate Assessment and Policy

- Interpreting Climate Projections
- Training for Decision Support Tools

1961-1990 (PRISM climatology)   2070-2090 (ECHAM5)
January   January
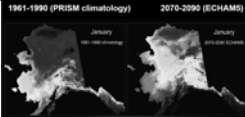
Robert, Paniq Kaleak, Lewis Nuvuk Brower, Matthew Druckenmiller, Archie Ygayaq Ahkiviana, Harry Kupaaq Brower, Jr.

- Presenting Monthly Climate Teleconferences & Web Highlights
- Informing Decision Support for At-Risk Communities
- Improving Seasonal Fire Predictions

Ken Stenek and David Atkinson. Photo by Ned Rozell

UAF
UNIVERSITY OF ALASKA FAIRBANKS   Working Together   SNAP   For Alaska   UNIVERSITY of ALASKA ANCHORAGE
www.uaf.edu/accap

Climate Service Case Study: Living Marine Resources

NOAA-centric and Problem focused:

- Attribution of Climate Signals impacting ecosystems : Long Term Change & Natural Variability
- Ocean Warming: Impacts on Distribution & Productivity (phenology, production, invasives)
- Impacts of Loss of Sea Ice on Living Marine Resources (at both poles)
- Ocean Acidification Impacts on Marine Biota
- Freshwater Supply & Resource Management
- Sea Level Rise (Natural Resource Implications)

Climate Service Case Study: Coastal Regions

Enterprise solution and problem focused:

- Sea level
- Precipitation patterns and associated effects on freshwater, nutrient, and sediment flow
- Ocean temperature
- Circulation patterns
- Frequency, track and intensity of coastal storms
- Levels of atmospheric CO2 and ocean acidification
- Sea ice formation and extent

Village of Shishmaref, on the Chukchi Sea, Alaska

Toward a National Climate Service

- Public demand for climate information exceeds current capacity
- Sources of information are distributed and usually not coordinated
- Commitment to establish a Climate Service is needed to integrate provision of NOAA's climate products and services
- NOAA needs to engage other agencies and organizations in defining their roles in a National Climate Service partnership
- Improved capabilities are needed to enable:
  ➢ User and issue focused approach
  ➢ Better monitoring
  ➢ Improve national to local predictions and projections
  ➢ Assessments of impacts and vulnerabilities in support of adaptation and mitigation

Meeting the Nation's Challenges Through Partnerships

"The community is highly dependent on its cultural and traditional heritage. Subsisting off the land and sea is a vital component to the daily consumption of natural foods … and passed on from generation to generation, which is continued today. The preservation of our unique culture is vital to the continued existence of our community as one family." -Tony Weyiouana Sr. and Luci Eningowuk, Shishmaref, AK

Sea Grant and Sea Grant Extension

•Work with coastal native villages to understand and mitigate shoreline erosion caused by the loss of shore-fast sea ice buffers and winter storms.

•Sponsor research, workshops, and publications on Alaskan coastal planning and adaptation issues.

•Outreach/Education Publication: *Alaska Seas and Coasts* – May 2008 issue "Changing Climate Changing Fisheries?"

Alaska Center for Climate-Change Solutions (Proposed)

•Provide the information, adaptation tools, technical assistance, and funding to develop the capacity to plan for and respond to climate change

•A central goal of the policy is economic, social, and ecological sustainability of Alaska

We are Looking Forward to Other Ongoing Partnerships with Alaska …

Thank You

Questions?