



NOAA's National Weather Service Alaska Region Weather and Climate Services

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- Alaska Climate Trends
- NOAA Products and Services
- Partnerships
- Overview
- CRN Lessons Learned

Alaska's Changing Climate

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Alaska's Changing Climate Cont'd



Increase in Average Annual Temperature, Selected Alaska Places, 1949 - 2005 (In Fahrenheit Degrees) Barrow 3.6 Kotzebue 3.3 Bettles* 4.1 Nome 3.2 **Big Delta** Fairbanks 3.9 3.9 McGrath Talkeena 4.] Gulkana 5.4 32 **Bethel** 3.8 Anchorage* 3.6 Yakutat Juneau **King Salmon** 29 3.8 Homer 4.5 St. Paul • 2.4 Kodiak Annette 2.5 Cold Bay* Average of all reported places: 3.5°F *For Bettles average temperatures 1951–2005; for Anchorage 1952–2005; and for Cold Bay 1950–2005. Source: University of Alaska Fairbanks, Geophysical Institute

Source: UAF, Geophysical Institute (2006)





- Earlier Spring and Later Fall
- Thawing Permafrost
- Changes in Sea-level

 inundation & subsidence
- Accelerated Coastal Erosion
- Increased Likelihood of "Extreme Events"
- Greater Incident of Aviation Icing Conditions





- Serve as customer interface
 - Provide customer service
 - Conduct climate outreach and education
 - Develop partnerships
 - Utilize available tools for customer interface



Planned Arctic Activities



- Alaska
 - 29 Climate Reference Network (CRN)
 - 40 Historical Climate Network (HCN)
 - COOP 21st Century 200 stations
- 330 Canadian CRNs
 - in coordination with NOAA







USCRN - Alaskan Phase



Deploy Climate Reference Network (CRN) Stations in Alaska

Approach: Deploy and operate 29 CRN stations across Alaska, leveraging the lessons learned and proven processes from the U. S. Climate Reference Network (USCRN) project in the lower 48 states and the four operational prototype CRN stations in Alaska since 2001 (Point Barrow, St. Paul, Sitka, and Fairbanks)

Partners:

- NOAA Line Offices (OAR, NESDIS, NWS, NOS)
- University of Alaska (Fairbanks) IARC
- NSF Arctic Program, NPS, USGS, Alaska, Canadians
- U.S. GCOS
- Individual Local Site Hosts for stations



Climate Reference Network (CRN) Station, Pt. Barrow, AK 9





NOAA's NWS Climate Services Climate Record Stewardship through COOP



- COOP Paperless Initiative
 - Electronic Ingest of Manual Observations Upfront QC
- COOP 21st Century Transition Plan
 - Remedial actions to ensure maximum quality data
- HCN Modernization
 - Automating our longest-record stations
- Fisher/Porter Automated Rain Gauge Upgrade
 - Comprehensive hourly precipitation network







NOAA's NWS Climate Services COOP Paperless Initiative



- Electronic Ingest uses PC/web & phone
- Virtual elimination of formatting and transcription errors as well as out-of-range or inconsistent entries
- More than triple (thousands more) the number of surface observations available daily
- Greatly reduced data collection and processing costs

• At obs	ervation must be greater than Min temperature.
	Date and time of observation
Feb 💌	/ 6 💌 / 2007 💌 at Midnight (11:59PM) 💌 : ?
Type of	observation daily (24 hr values/totals) 🗾 ?
	Air Temperature
Max temperature	5 × °F ?
Min temperature	15 × °F ?
At observation	8 × °F ?
	Precipitation
	* Enter a valid value for Precipitation
Precipitation	.04 x.xx in ?
Accumulation	?
Duration to the state of the st	



NOAA's NWS Climate Services COOP 21st Century Transition Plan



- Plan in coordination with NWS field and NCDC
 - leverages
 - NWS field offices and RCC and SC partner expertise
 - non-NOAA mesonets
 - improves data quality
 - addresses exposure issues
 - fixes or closes degraded stations (rooftops, missing data etc.)
 - honors century old tradition and pride of volunteers





Improving the Quality of the Nation's Climate Record:

> Toward a 21st Century Cooperative Network



Transition Plan

National Oceanic and Atmospheric Administration National Weather Service/Office of Climate Water, and Weather Services Climate Services Division National Environmental Systems and Data Information Services National Climatic Data Center/Office of the Director



NOAA's NWS Climate Services



COOP HCN Modernization

- Currently ~ 1,200 HCN stations
 - all but 50 non-airport COOPs with 80 + years and good continuity and quality
- 1,000 to be modernized with AR, PR, and Caribbean future goal
- Automated temp. & precip. snowfall & snow depth future goal
- Expandable platform

Fisher/Porter Automated Rain Gauge Upgrade

- ~ 2,500 gauges nationwide
 - Replaces unreliable mechanical punch tape with electronics
 - Supports future communications
 - Reduces missing data as well as reduced maintenance costs
 - Good RFP response; 3-4 years to complete





Partnerships (to name a few)



- Alaska State Climatologist

 University of Alaska Anchorage
- Alaska Climate Research Center
 - University of Alaska Fairbanks
 - Potential site for Alaska Region Climate Center
- Alaska Center for Climate and Policy Assessment
 - NOAA's Regional Integrated Services Assessment











NOAA Climate Services (Overview)







AK CRN Lessons Learned



- Sturdiest possible equipment to withstand wildlife curiosity
- Plan for deep snow, & raise station vertically
- Record data locally in case communications go out
- Build stations in places where there is power

Polar Bear "hugs" at Pt. Barrow, Alaska

T1

Crushed radiation hat instrument continued functioning nominally

T2

Bent & twisted radiation shield – instrument OK.

Barrow Alaska – Lesson Learned: Build the wind shield above the record snowfall ... (March 2004)