

NCDC Experience with CRN

Russell S. Vose
Michael Palecki



NOAA's National Climatic Data Center

GRUAN ICM-2
Payerne, Switzerland, March 2-4, 2010

An observing system that can, with the highest degree of confidence, answer the question...

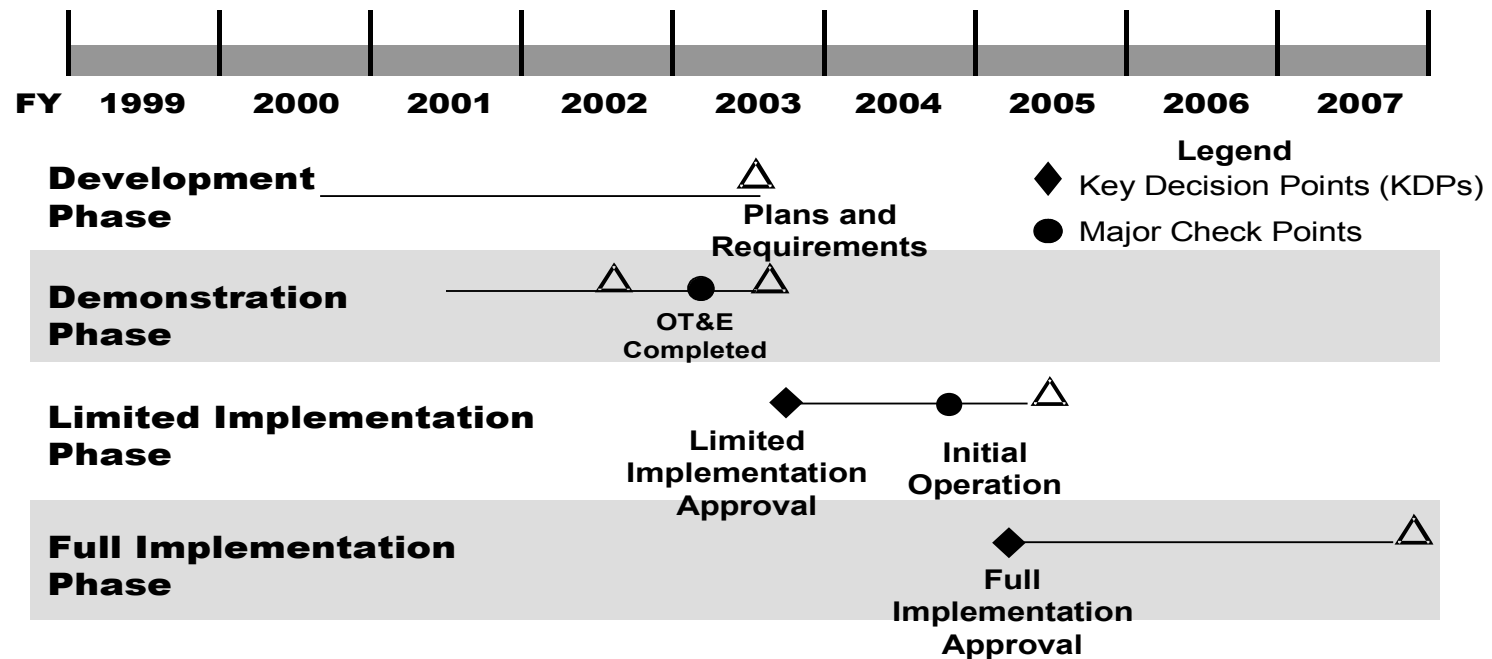
How has the climate of the United States changed over the past 50 years at the national level?

Some Background

- **How it came about**
 - Most networks were established for operational purposes, not climate monitoring
 - Concerns about land use, changes in observing practice, etc.
 - Budget proposal from Tom Karl, multiyear persistence
- **How much funding**
 - Roughly \$3 million per year to install
 - About the same for maintenance
- **How it was deployed**
 - 8 year installation period
 - Scatter stations around rather than filling in one area at a time



Program Phases

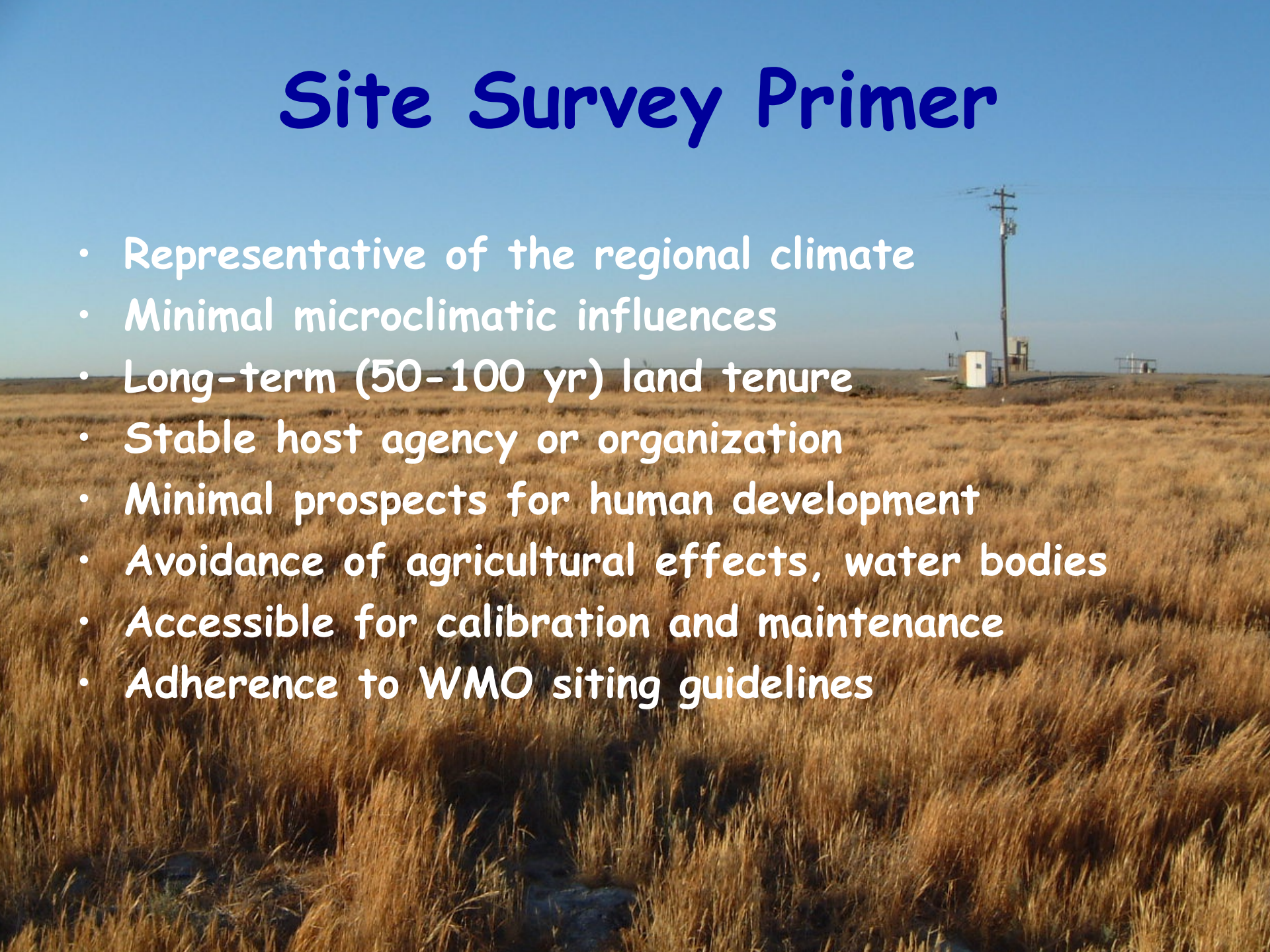


Locate Stations Rationally



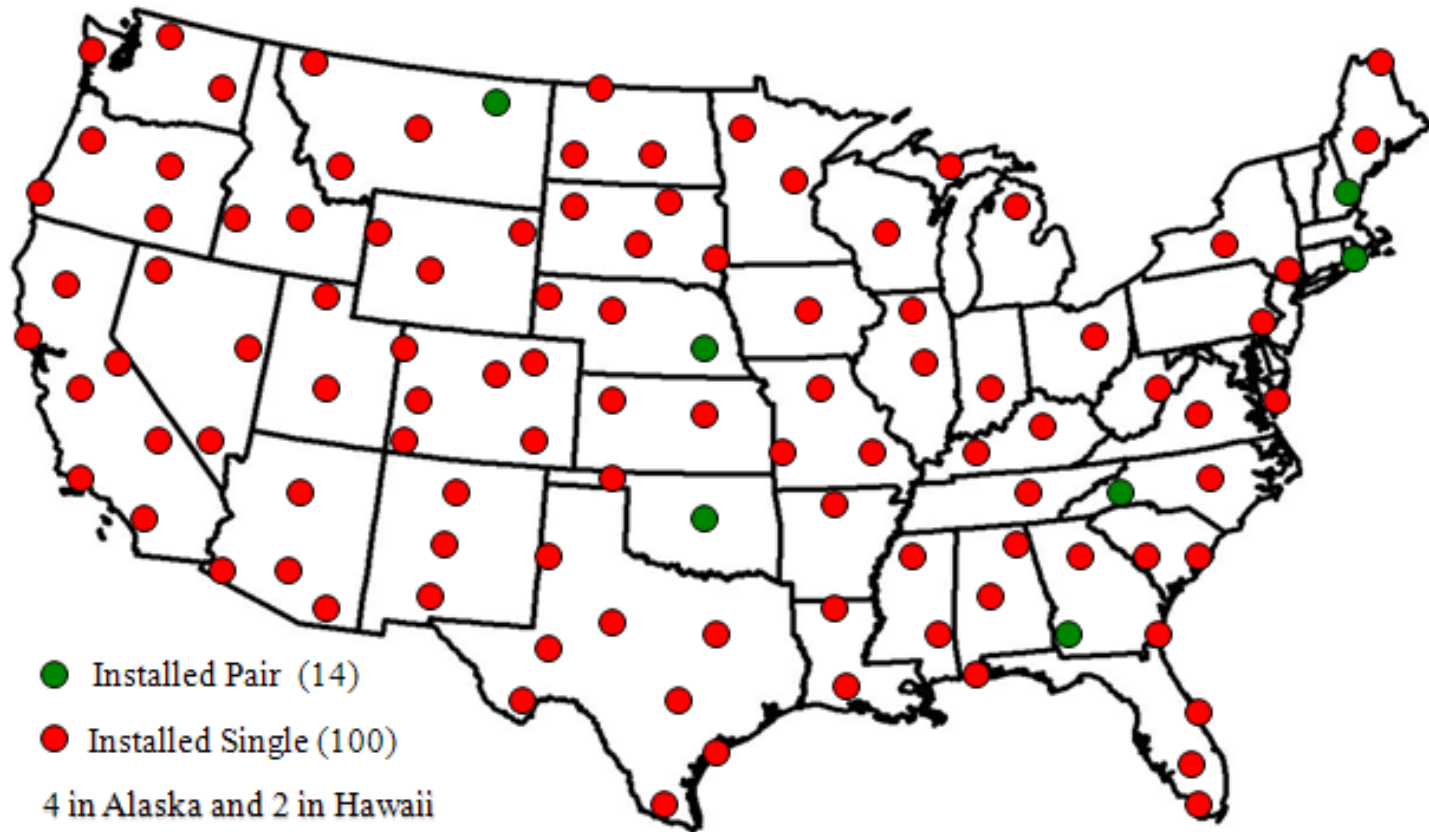
Site Survey Primer

- Representative of the regional climate
- Minimal microclimatic influences
- Long-term (50-100 yr) land tenure
- Stable host agency or organization
- Minimal prospects for human development
- Avoidance of agricultural effects, water bodies
- Accessible for calibration and maintenance
- Adherence to WMO siting guidelines

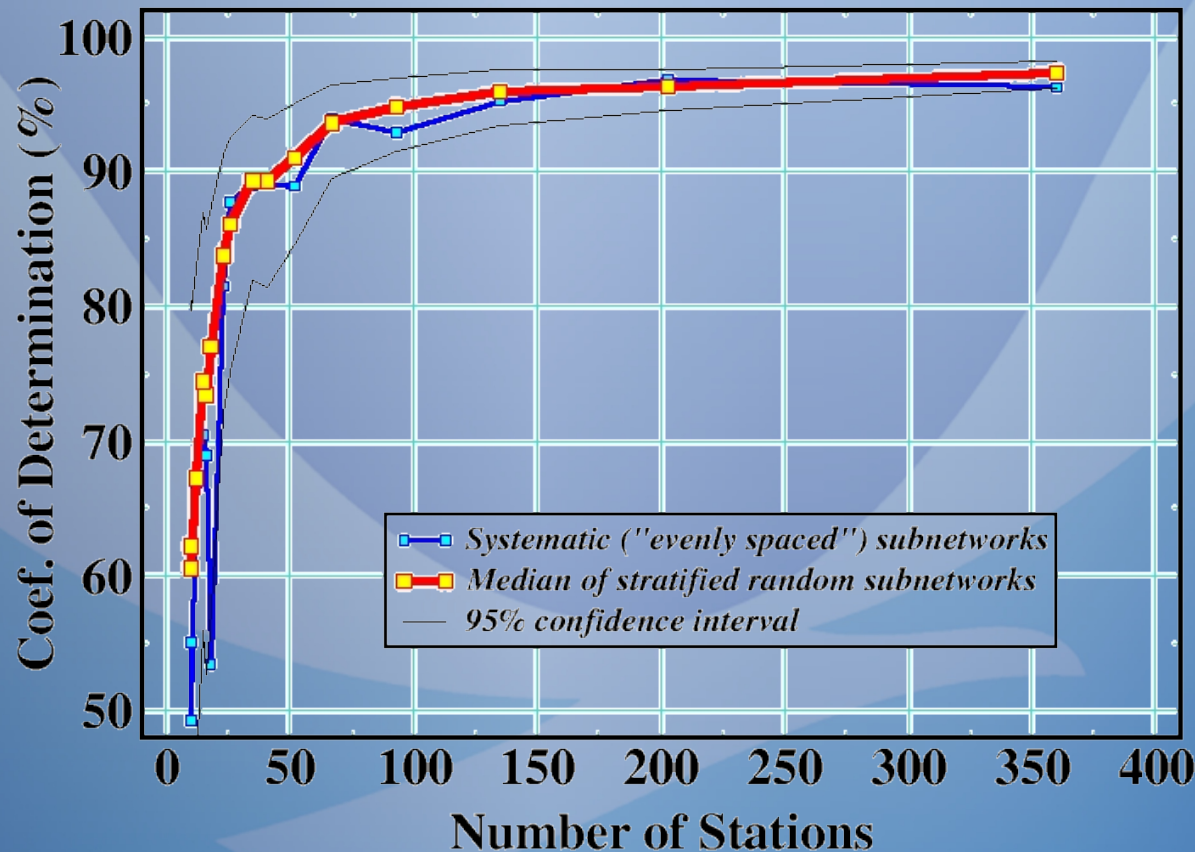


Ensure Complete Coverage

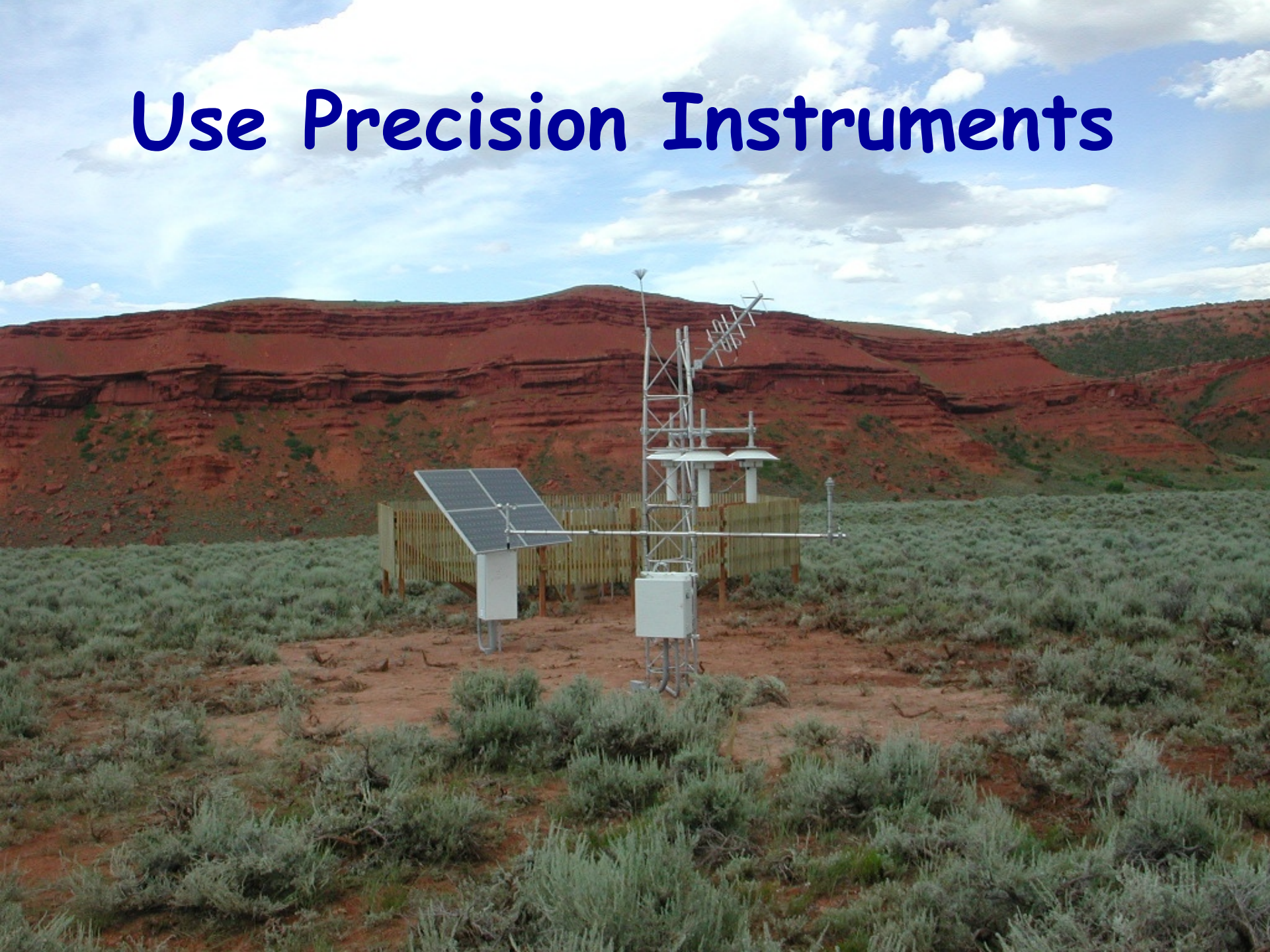
USCRN September 2008



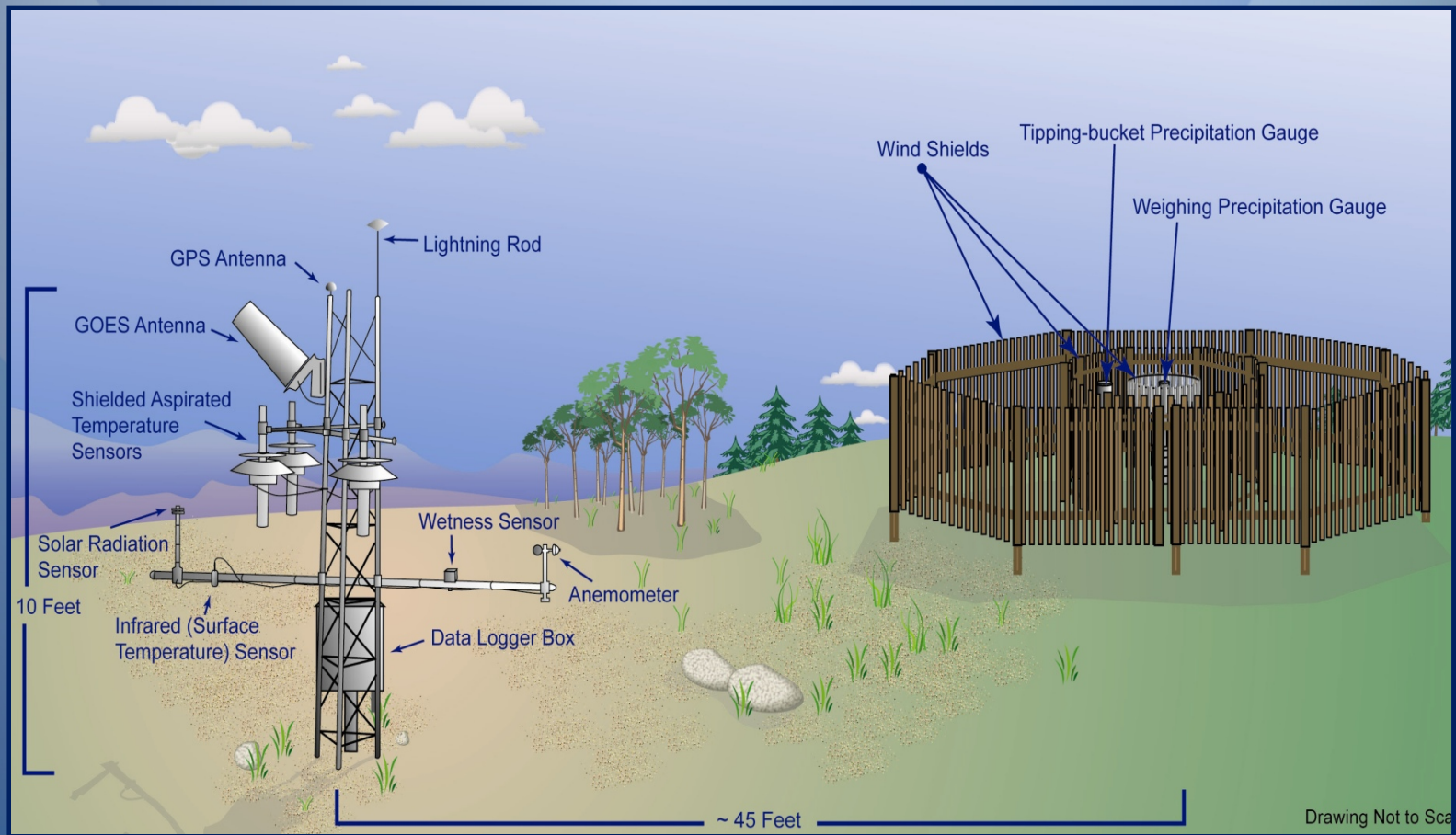
Station Density Study



Use Precision Instruments



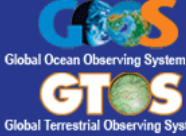

CRN Station Model



Adhere to GCOS Principles

GOSIC

Global Observing Systems Information Center



Global Ocean Observing System

Global Terrestrial Observing System


[Home](#) [About GOSIC](#) [GCOS](#) [GOOS](#) [GTOS](#) [Data Registry](#) [Search](#) [Publications](#) [Acronyms](#) [Contact Info](#)

Facilitating Access to Global Observing Systems Data and Information


GCOS Climate Monitoring Principles

Effective monitoring systems for climate should adhere to the following principles:

1. The impact of new systems or changes to existing systems should be assessed prior to implementation.
2. A suitable period of overlap for new and old observing systems is required.
3. The details and history of local conditions, instruments, operating procedures, data processing algorithms and other factors pertinent to interpreting data (i.e., metadata) should be documented and treated with the same care as the data themselves.
4. The quality and homogeneity of data should be regularly assessed as a part of routine operations.
5. Consideration of the needs for environmental and climate-monitoring products and assessments, such as IPCC assessments, should be integrated into national, regional and global observing priorities.
6. Operation of historically-uninterrupted stations and observing systems should be maintained.
7. High priority for additional observations should be focused on data-poor regions, poorly-observed parameters, regions sensitive to change, and key measurements with inadequate temporal resolution.
8. Long-term requirements should be specified to network designers, operators and instrument engineers at the outset of system design and implementation.
9. The conversion of research observing systems to long-term operations in a carefully-planned manner should be promoted.
10. Data management systems that facilitate access, use and interpretation of data and products should be included as essential elements of climate monitoring systems.



GOSIC is supported and hosted by the National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center (NCDC), and the U.S. GCOS Program on behalf of the global observing community.



Annual Maintenance Visit

- **Exchange:**
 - Datalogger
 - One platinum resistance thermometer
 - One aspirated shield fan
 - Anemometer
 - Pyranometer
- Calibrate precipitation gauges
- Complete maintenance checklist
- Take compass-platte photographs
- Bring station up to current configuration
- Document everything (ISIS metadata system)

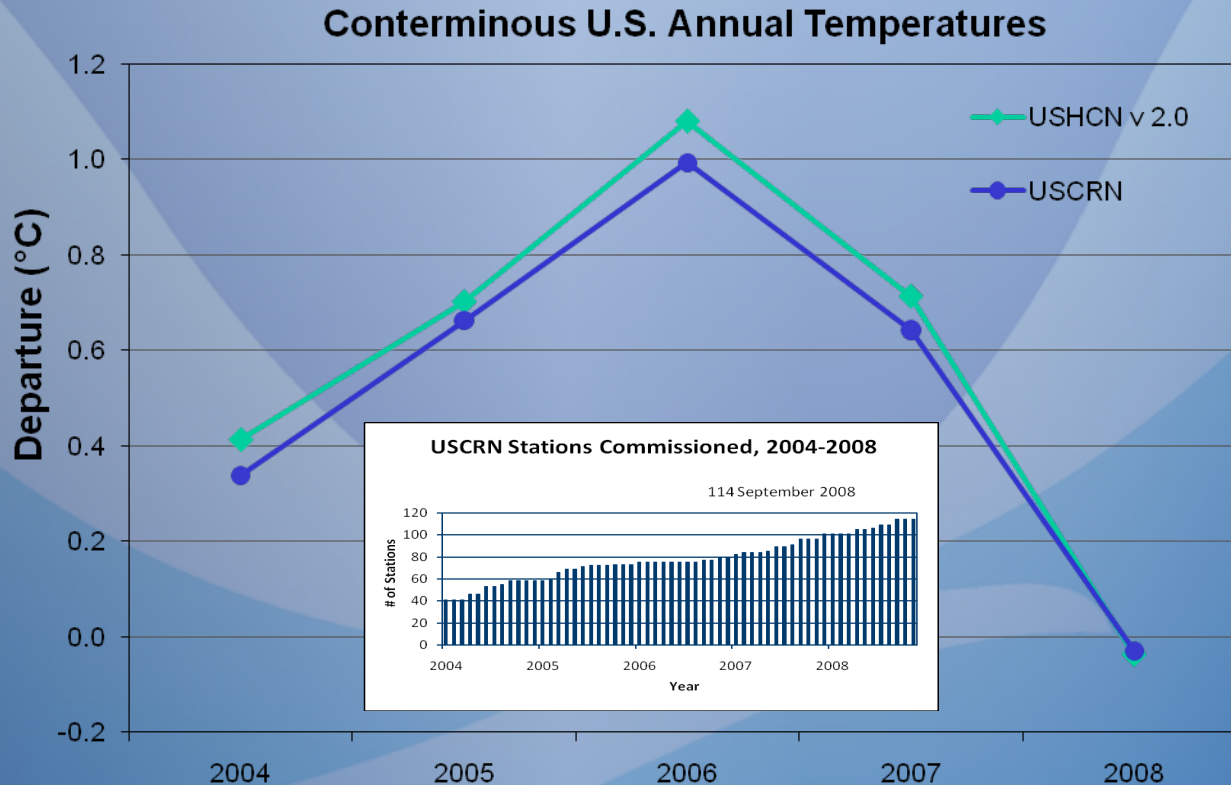


NOAA's National Climatic Data Center

GRUAN ICM-2

Payerne, Switzerland, March 2-4, 2010

CRN Temperature Record



New Directions

- Deployment of soil moisture / temperature probes and relative humidity instruments in cooperation with the National Integrated Drought Information System (NIDIS) program
 - Probes will be installed at 5 cm, 10 cm, 20 cm, 50 cm, and 100 cm depths in three separate locations around the station tower
- Deploy in Alaska over the next 5 years and collaborate with GCOS in placing instruments in underrepresented areas
- Assist the U.S. Historical Climatology Network
 - Modernization Program by leveraging the CRN experience and infrastructure



How to Get the Data

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

National Climatic Data Center
U.S. Department of Commerce


DOC > NOAA > NESDIS > NCDC













Search NCDC

US Climate Reference Network

Current Observations

Hourly Observations for Feb 23 2010 2:00 PM EST [Feb 23 2010 19:00 UTC]

[Select Station from Map](#)  [Change Date/Time](#)

Station	Temp	Precip	Plot	Sensors	Soil Data
AK Barrow 4 ENE Feb 23 2010 2:00 PM EST Barrow Obsv., NOAA Earth Systems Res. Lab., Global Mon. Div.	-18.6 °F -28.1 °C	0.00 in 0.0 mm		sensors	
AK Fairbanks 11 NE Feb 23 2010 2:00 PM EST NOAA / NESDIS (FCDAS)	17.1 °F -8.3 °C	0.00 in 0.0 mm		sensors	
AK Port Alsworth 1 SW Feb 23 2010 1:00 PM EST Lake Clark National Park	12.7 °F -10.7 °C	0.00 in 0.0 mm		sensors	
AK Sand Point 1 ENE Feb 23 2010 1:00 PM EST USGS Shumagin Magnetic Observatory	35.6 °F 2.0 °C	0.00 in 0.0 mm		sensors	
AK Sitka 1 NE Feb 23 2010 1:00 PM EST USGS Sitka Magnetic Observatory	41.9 °F 5.5 °C	0.00 in 0.0 mm		sensors	
AK St. Paul 4 NE Feb 23 2010 1:00 PM EST NOAA National Weather Service St. Paul	23.4 °F -4.8 °C	0.00 in 0.0 mm		sensors	
AL Brewton 3 NNE Feb 23 2010 1:00 PM EST Brewton	47.3 °F 8.5 °C	0.00 in 0.0 mm		sensors	
AL Clanton 2 NE Feb 23 2010 1:00 PM EST Chilton County Airport	47.8 °F 8.8 °C	0.00 in 0.0 mm		sensors	
AL Courtland 2 WSW Feb 23 2010 1:00 PM EST Lawrence County Airport	38.5 °F 3.6 °C	0.00 in 0.0 mm		sensors	
AL Cullman 3 ENE Feb 23 2010 1:00 PM EST North Alabama Horticultural Research Center	39.2 °F 4.0 °C	0.00 in 0.0 mm		sensors	
AL Fairhope 3 NE Feb 23 2010 1:00 PM EST Auburn University, Gulf Coast Research and Extension Center	48.4 °F 9.1 °C	0.00 in 0.0 mm		sensors	
AL Gadsden 19 N Feb 23 2010 1:00 PM EST Sand Mountain Research / Extension (Northwest Pasture)	38.1 °F 3.4 °C	0.00 in 0.0 mm		sensors	soil data
AL Gainesville 2 NE Feb 23 2010 1:00 PM EST	49.3 °F	0.00 in		sensors	