

# NOAA's National Climatic Data Center and Regional Climate Centers: Quality Feedback, Assurance, and Dissemination

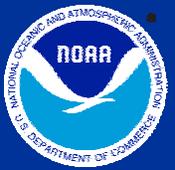
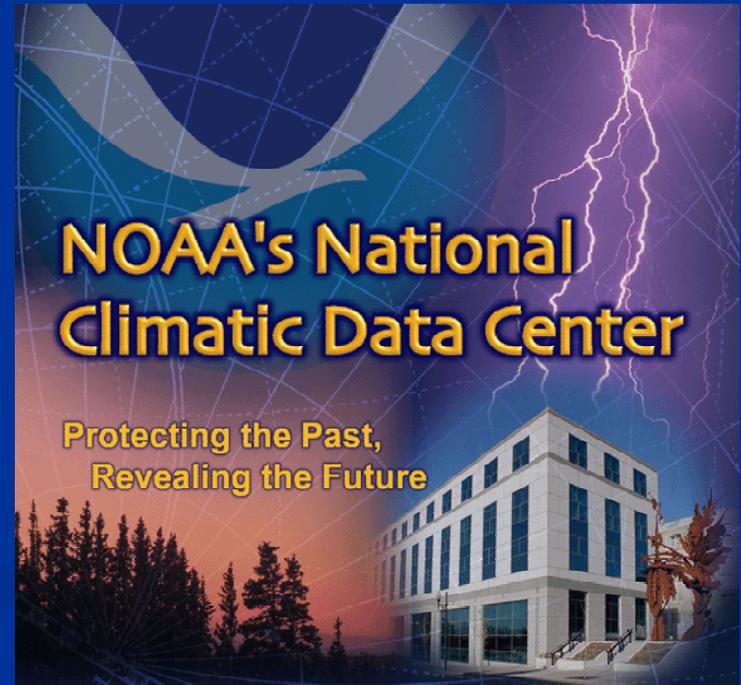
Tim Owen

Third Climate Prediction Applications Science Workshop

Palisades, New York

15 March 2005

Tim.Owen@noaa.gov



NOAA's National Climatic Data Center

# NCDC's Mission:

**Data Management** of global climatological in-situ and remotely sensed data and information to promote environmental stewardship.

**Assessment** through climate monitoring and product development.

**Partnership** to support prediction of environmental variability and change.



Protecting the Past,  
Revealing the Future



NOAA Satellites and Information

*National Environmental Satellite, Data, and Information Service*



# What are Climate Services?

**Climate Services:** “The timely production and delivery of useful climate data, information, and knowledge to decision makers.”

- Board of Atmospheric Sciences and Climate, 1999

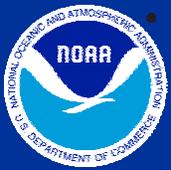
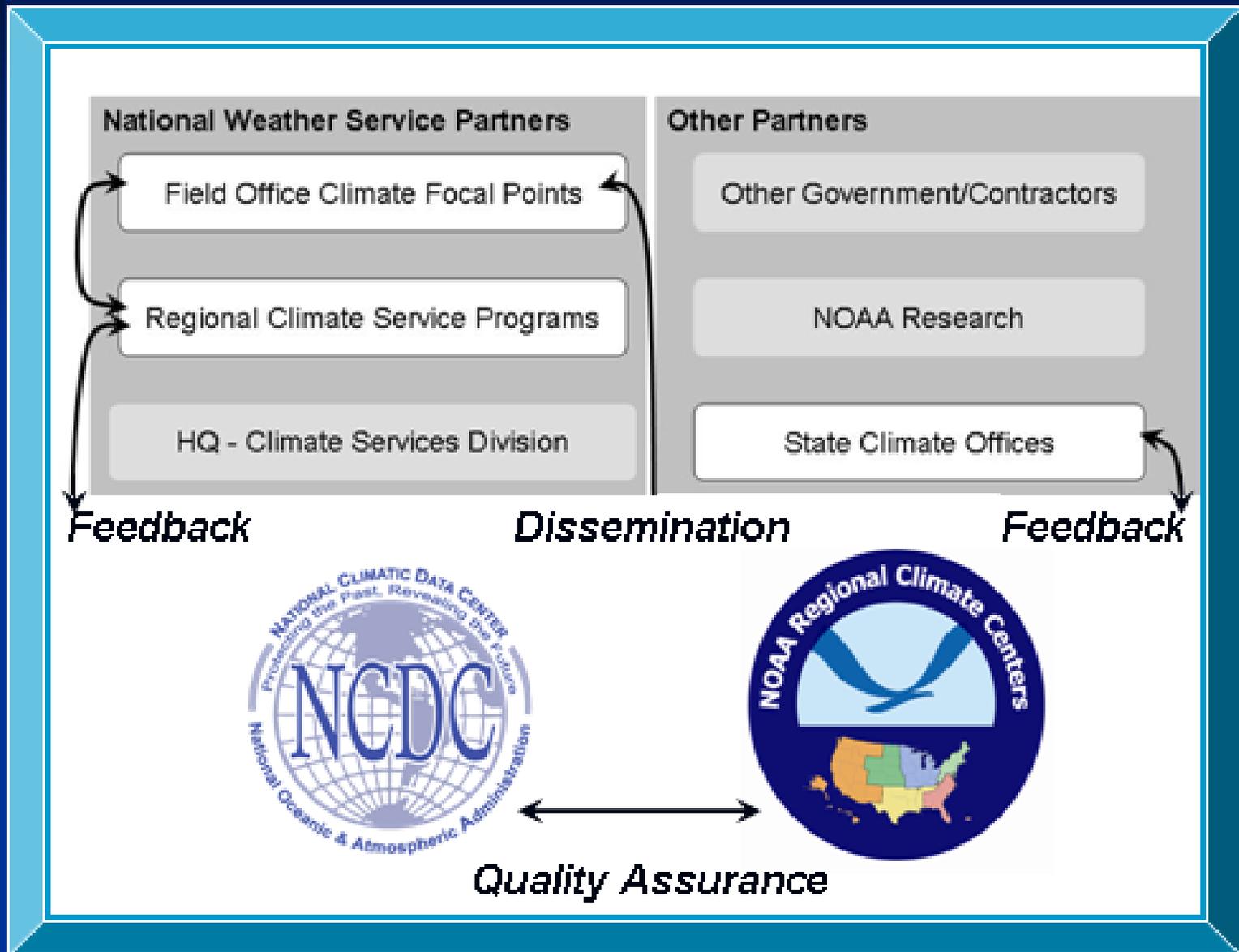
Scientific Data Stewardship

Diligence Today  
Understanding Tomorrow

**Goal: Provide end-to-end climate services**



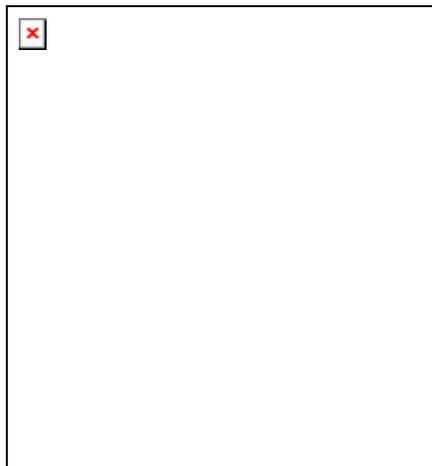
# Who Are Our Partners in Climate Services?



# ACIS: Applied Climate Information System

## NOAA's Regional Climate Centers

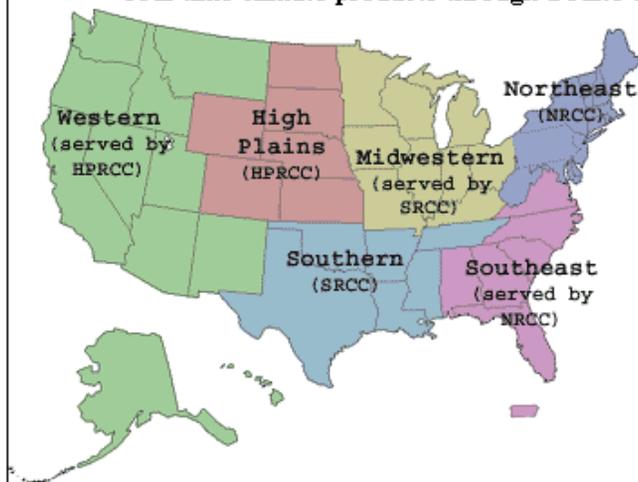
<http://www.rcc-acis.org/>



## ACIS Applied Climate Information System

## Regional Climate Centers

The links for the map below provide subscribers with access to historical and near real-time climate products through a suite of standard climate analyses



Climate products for the US are provided by three servers:

- ◆ <http://climod.nrcc.cornell.edu>
- ◆ <http://climod.srcc.lsu.edu>
- ◆ <http://hprcc2.unl.edu/Climod/>

Powered by   
NOAA Regional Climate Centers

### ACIS Highlights

- ◆ BAMS Announcement
- ◆ ACIS Current Climate Summary Maps
- ◆ ACIS Power Point Presentation

### Climate Centers

- ◆ High Plains (HPRCC)
- ◆ Midwest (MRCC)
- ◆ Northeast (NRCC)
- ◆ Southeast (SERCC)
- ◆ Southern (SRCC)
- ◆ Western (WRCC)



# ACIS: From Ingest to Dissemination

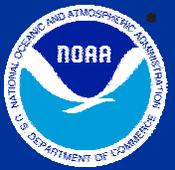


## System Architecture:

- **Distributed/Synchronized Data Bases**  
**SHEF → NCDC prelim → NCDC final**
- Redundancy
- Flexible interface
- Object-oriented programming

## System Tools:

- netCDF Data Structures
- PostgreSQL RDBMS (for metadata)
- Python and JAVA programming languages
- Quixote (web application server)
- CORBA compliant network software

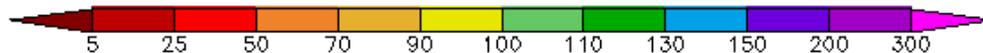
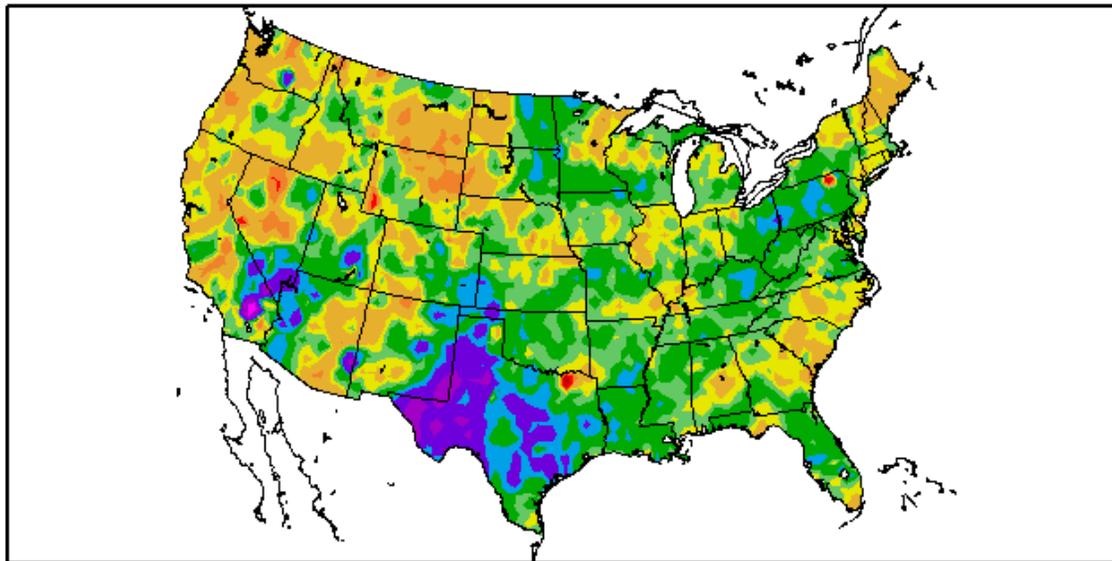


# ACIS: From Ingest to Dissemination

## Mapping:



Percent of Normal Precipitation (%)  
1/1/2004 - 12/31/2004



Generated 1/4/2005 at HPRCC using provisional data.

NOAA Regional Climate Centers



# Data Dissemination: xmACIS

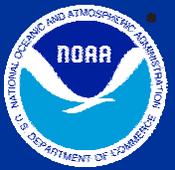


## System Architecture:

- Routines for quick access to climatological summary products
- Web-based frames interface
- Cookies are not used and JavaScript is minimal
- Designed for main-stream web browsers

## System Deployment:

- National Weather Service Regional Offices
- National Weather Service Field Offices
- External Version for Public Use in Development



# Data Dissemination: xmACIS

## What were the coldest Inauguration Days in Washington, DC?



WASHINGTON REAGAN NATIONAL AP (KDCA)  
Extremes  
Lowest Average Average Temperature (degrees F)  
Days: 1/20 - 1/20  
Length of period: 1 days  
Years: 1948-2004

Rank	Value	Ending Date
1	13.0	1/20/1994
2	17.0	1/20/1984
3	21.5	1/20/1970
6	25.0	1/20/1996
7	25.5	1/20/1971, 1/20/1983, 1/20/2004



Reagan



Kennedy



Carter



# Data Dissemination: External xmACIS

www.nws.noaa.gov

National Weather Service  
Climate Services



News

Organization

Search

## NOAA Regional Climate Centers - Applied Climate Information System

<b>1. Product »</b>	<b>2. Location »</b>	<b>3. Variable »</b>	<b>4. Timeframe »</b>	<b>5. View »</b>
<input type="radio"/> Daily data for a month	<input type="text" value="Athens, TX"/>	<input checked="" type="radio"/> Max Temperature	<input checked="" type="radio"/> Current year	<input type="button" value="Go"/>
<input type="radio"/> Daily almanac	Bardwell Dam, TX	<input type="radio"/> Min Temperature	<input type="radio"/> Last year	
<input checked="" type="radio"/> Monthly avgs./totals	Bowie, TX	<input type="radio"/> Avg Temperature	<input type="radio"/> 1971-2000	
<input type="radio"/> Monthly occurrences	Brazos, TX	<input type="radio"/> Precipitation		
<input type="radio"/> Monthly extremes	Breckenridge, TX	<input type="radio"/> Snowfall		
<input type="radio"/> Daily extremes	Bremond, TX	<input type="radio"/> Snow Depth		
<input type="radio"/> Daily/monthly normals	Bridgeport, TX	<input type="radio"/> Heating Degree Days		
<input type="radio"/> Record extremes	Burleson, TX	<input type="radio"/> Cooling Degree Days		
<input type="radio"/> First/last dates	Center City, TX	<input type="radio"/> Growing Degree Days		
	Centerville, TX			

### Product Description:

MONTHLY AVERAGES/TOTALS - calculates averages or totals, as appropriate, for the selected variable for each month of the year. This product is available for the current year, the previous year, or an average of the years 1971 through 2000. Additional stations and years of data are available from the Regional Climate Centers.

[Feedback](#)

Powered by  
**ACIS**  
NOAA Regional Climate Centers



# Data Feedback: Tracking Errors

## NOAA Data Error Tracking System

### Description: [\[reply\]](#)

Rainfall data for Nov 7, 1989 and May 8, 1995 for the New Orleans Airport (COOP ID 16-6660-09) are missing in a query of the extremes product performed by Robert Ricks of the New Orleans WFO.

However, the LCD from NCDC shows RECORD values for these days. This is odd, because the xmACIS data are derive from NCDC TD3200 data.

Why do the LCD and TD3200 data disagree?

Robert Ricks has confirmed that the rainfall values that appear in the LCD are, indeed, correct.

Nov 7, 1989 - 10.92" (appear as missing in TD3200)

May 8, 1995 - 12.24" (appear as missing in TD3200)

----- *Additional Comment #1* From [Kevin Robbins](#) 2004-12-08 10:55 Central Time [\[reply\]](#) -----

Forcing a mail message



# Data Quality Assurance: Integrated Vision

## The VISION

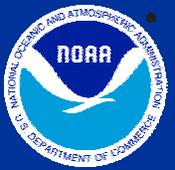
Perhaps the greatest challenge is to develop one **integrated** observation plan for the atmosphere, ocean, and land which everyone can support.

Vice Admiral Conrad C. Lautenbacher, Jr.  
NOAA Administrator, June 2002

## The SOLUTION

Develop an Integrated Surface Observing System (ISOS)

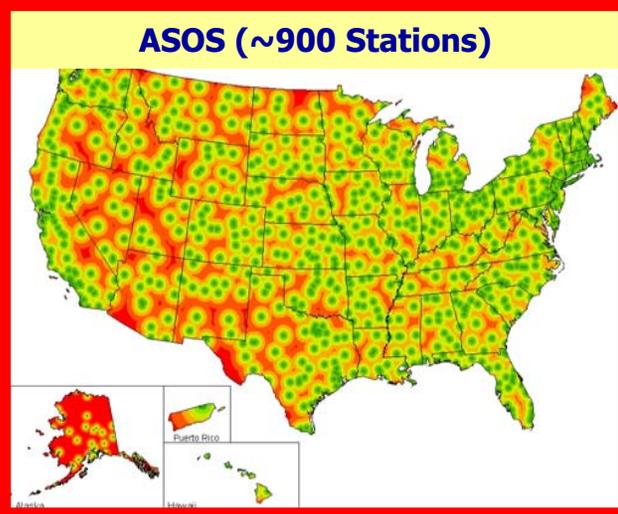
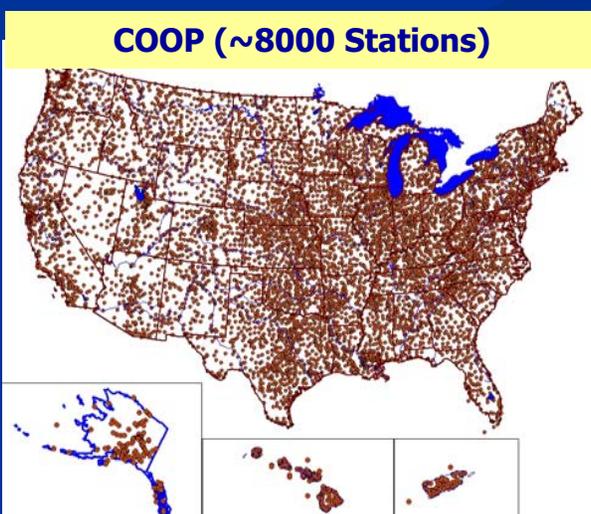
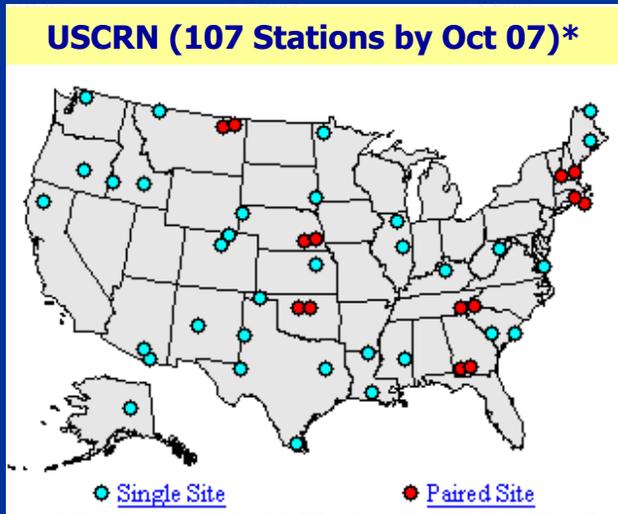
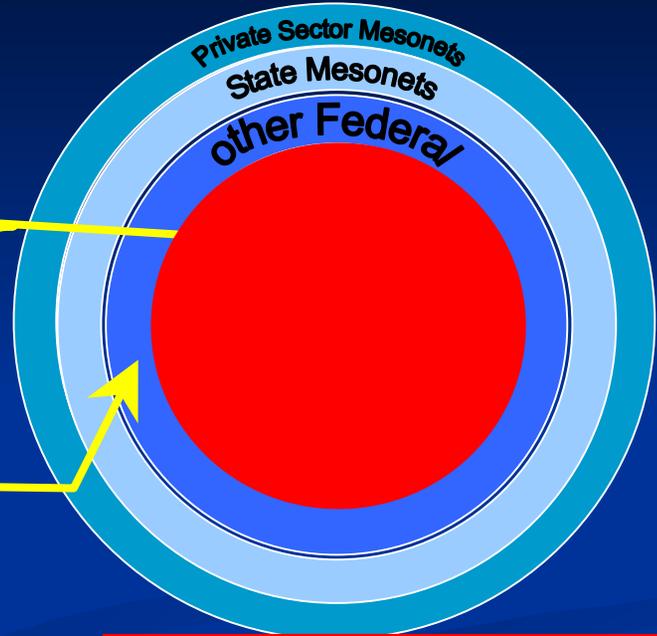
9,000 weather/climate observing stations needed to meet NOAA's data coverage requirements



# Data Quality Assurance: ISOS Model

**“Integrate from the Inside Out”**

- USCRN (NOAA)
- COOP (NOAA)
- ASOS (NOAA)
- Other (PORTS, SURFRAD, ARIMON, BSRN) (NOAA)
- SCAN (USDA)
- RAWs (BLM)
- SNOTEL (USDA)



\*47 now commissioned, others planned

# Quality Assurance: Improved ASOS Availability

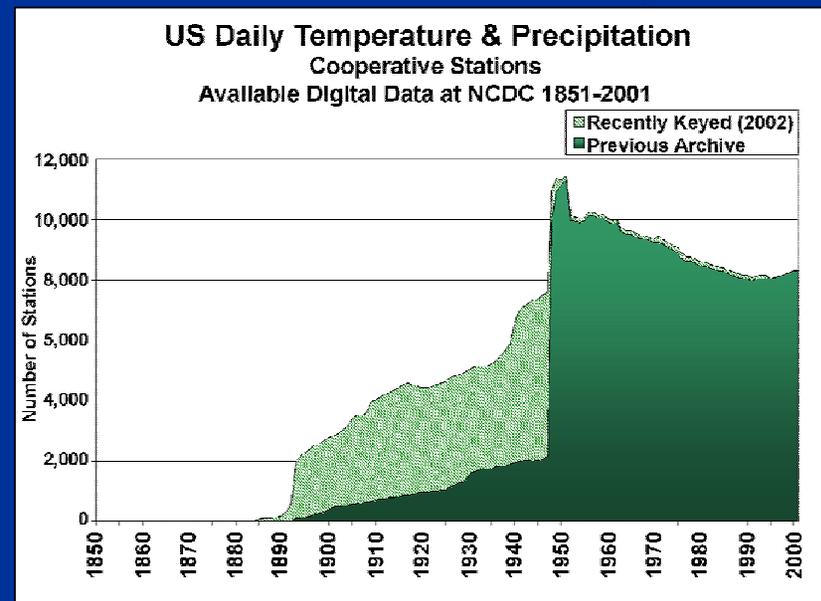
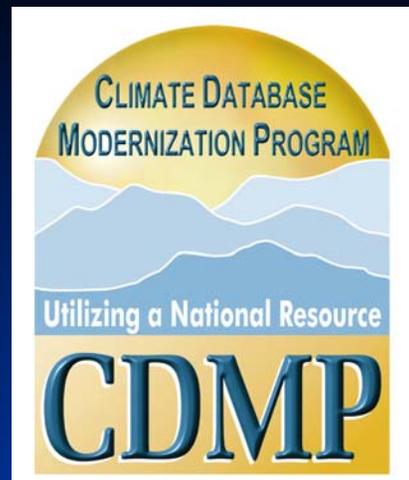
Level	NCDC QA Level	Previous	Implemented	Implement Date
<b>1</b>	<b>None</b> (Real-time ingest)	Daily	Hourly	<b>September 2004</b>
<b>2</b>	<b>Automated</b> (Internal consistency, limits checks)	~5 Days after EOM	~1 Day after Receipt	<b>September 2004</b>
<b>3</b>	<b>Integrated</b> (Spatial, multiple sensor and model checks)	~20-45 Days after EOM	~10-15 Days after EOM	<b>September 2005</b>
<b>4</b>	<b>Climate Research</b> (Data homogeneity)	as required by USGCRP and CCSP	No change	-



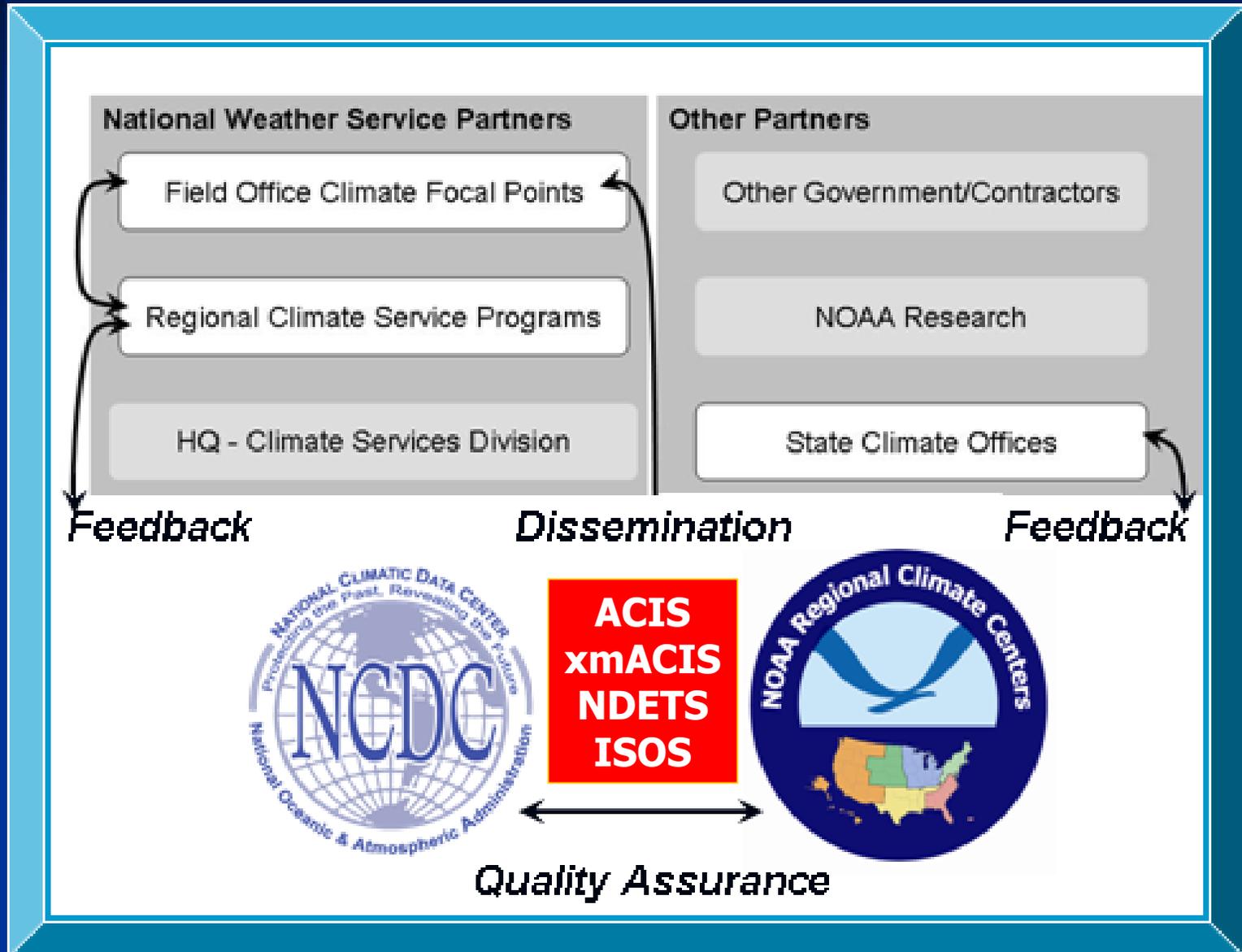
# Historical Data Access

## Climate Database Modernization Program

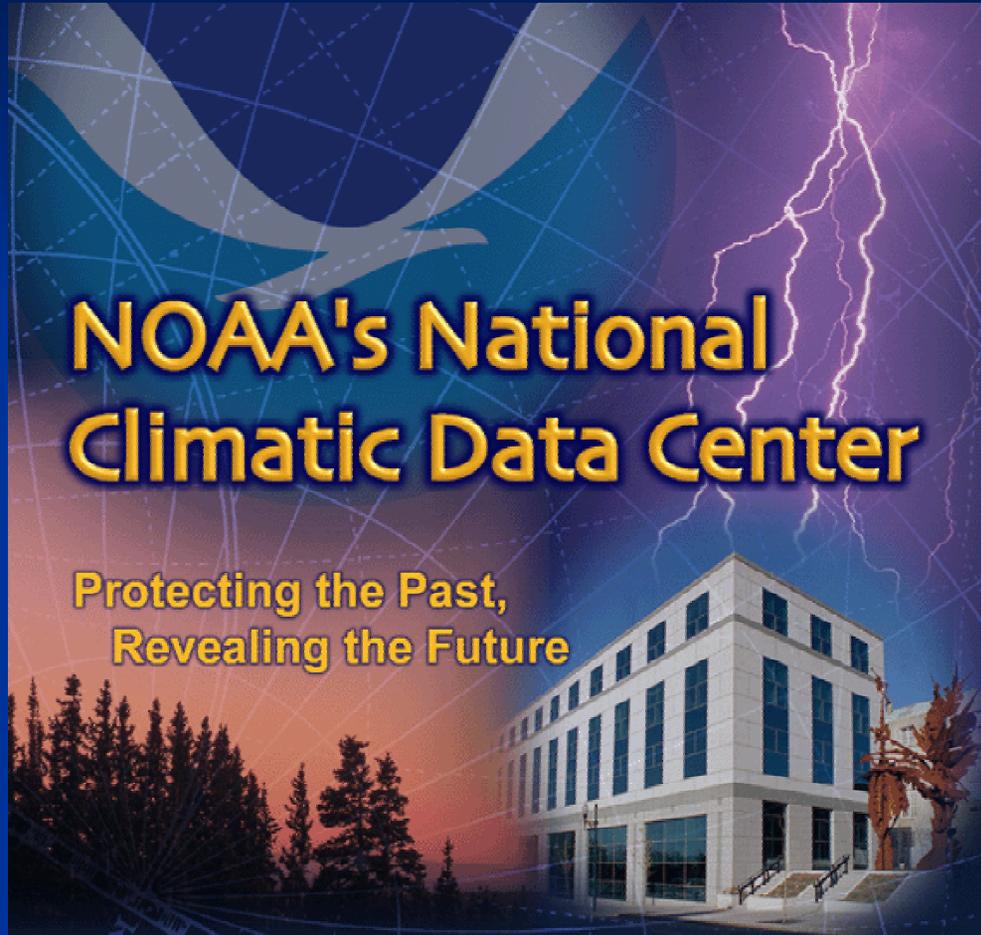
Imaged and Digitized daily and hourly data, extending access to periods before 1948.



# Cyberinfrastructure for Partner Success



**"The farther backward you can look,  
the farther forward you are likely to see."**



**- Winston Churchill**

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