



USDA Adaptation Actions

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USDA Climate Change Program Office



Climate Change
and
Water Resources Workgroup
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USDA Adaptation Actions

- **USDA Regional Climate Hubs**
- **USDA–NOAA MOU:** focused on improving climate services and delivery response to PCAP
 - NIDIS (National Integrated Drought Information System) – addresses impacts of drought on agriculture
 - Establishment of National Soil Moisture Monitoring Network
- **USDA NRCS: SCAN and SNOTEL Networks.**



USDA Regional Climate Hubs

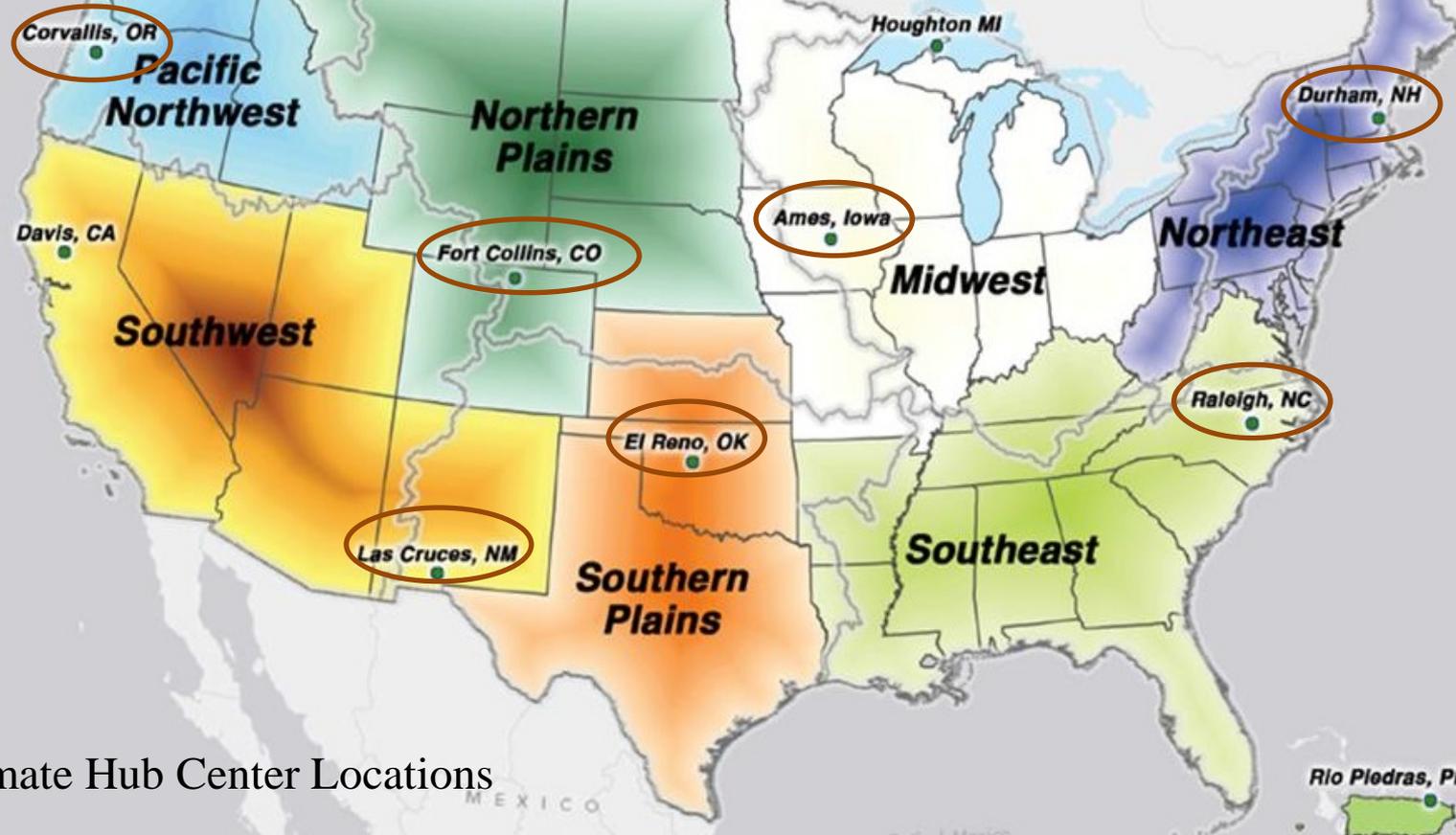
Vision: Agricultural production and natural resources maintained and strengthened under increasing climate variability and climate change

Mission: To develop and deliver science-based, region-specific information and technologies to agricultural and natural resource managers that enable climate-smart decision-making



USDA Climate Hub Regions

USDA Climate Hubs for Risk Adaptation and Mitigation to Climate Change



Regional Climate Hub Center Locations

USDA Regional Hubs will Function as a Network of USDA facilities with partners and other stakeholders

Objectives:

- Provide **Coordinated Technical Support** to USDA conservation, and natural resource programs to ensure continued delivery of USDA services in the face of climate change. *Integrate* research, development and application ...*Operationalize our science!*
- **Regional Assessments and Forecasts**: Currently most vulnerable to direct and indirect impacts; Future vulnerabilities; Through USDA-NOAA MOU – regional forecasting
- **Outreach and Education**: Use existing USDA systems to deliver tools and information to respond to risk (the Cooperative Extension Service system, online capabilities, field offices, etc.)

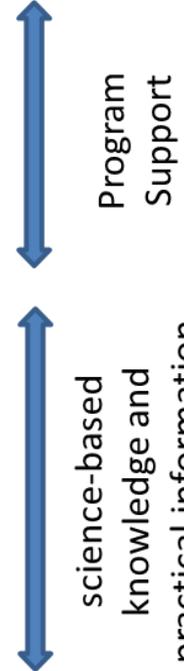




Partners

USDA Contributions to the Climate Hubs

USDA Program Agencies: FSA, AMS, RMA, RD, etc.

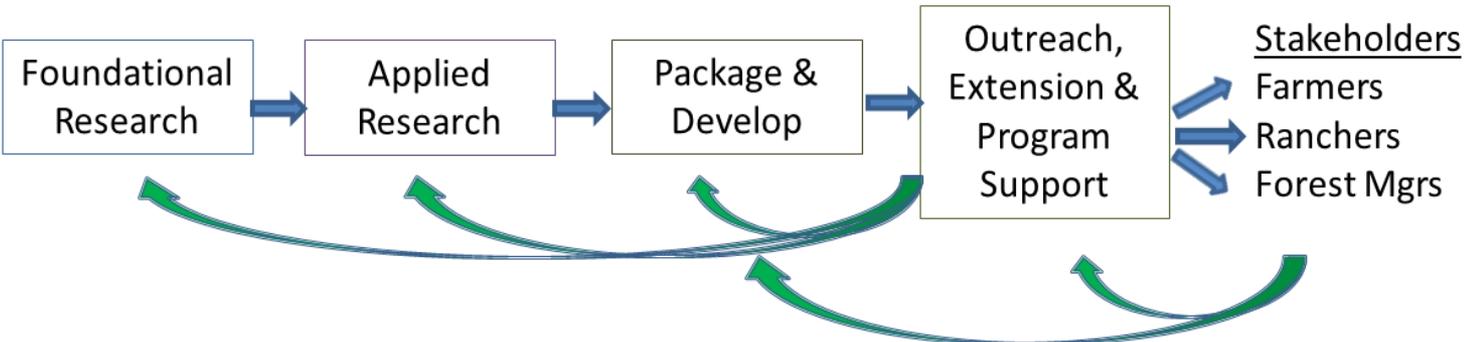


NIFA (external research and Ag Extension)

ARS (in house programs)

NRCS (Tech Centers & Service Centers)

Forest Service (R&D, S&PF, NFS)

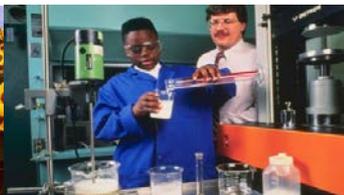


Feed back on stakeholder needs and effectiveness of products and services



USDA Regional Climate Hubs 2014 Goals

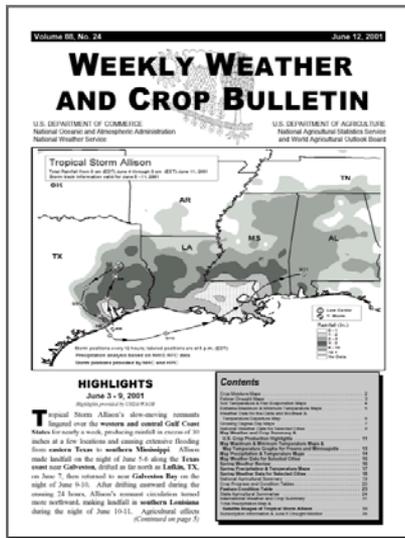
- Assess regional vulnerabilities to ID most pressing issues
- Establish work plans
- Work with partners and stakeholders to access needs and capabilities
- Establish web presence



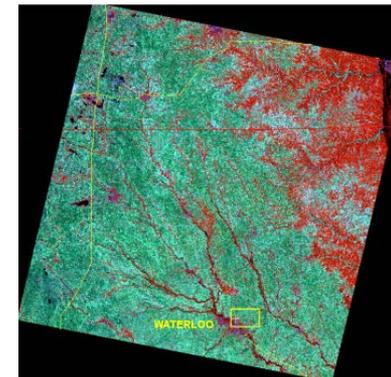
USDA Interests: Weather Monitoring and Impact Assessment



**Wild Fire and
Weather Forecasting**



**Global Monitoring
and Assessment**



**Ground Truth for
Remote Sensing**



**Western Water
Supply Forecasting**



Research



Crop Insurance Programs

USDA-NOAA Agreements



MEMORANDUM OF UNDERSTANDING
BETWEEN THE
U.S. Department of Commerce
AND THE
U.S. Department of Agriculture

I. General Information

WHEREAS, the U.S. Department of Commerce (Commerce) has responsibility for supporting and sustaining economic growth and development, and, through the National Oceanic and Atmospheric Administration (NOAA), has responsibility for understanding, monitoring, and predicting weather and climate, including variations and changes in climate extremes, oceans, and coasts, and for sharing knowledge and information of interest to agriculture, forestry, and rural and urban communities to enhance the resilience of economies and ecosystems, across the Nation;

WHEREAS, the U.S. Department of Agriculture (Agriculture) has responsibility within the Federal Government to monitor and assess national and international food supplies and natural resource conditions, and acquires, analyzes and interprets weather and climate information for the purpose of providing appropriate information related to the impacts of weather and climate on ecosystems, rural communities, forestry, and agricultural production to the people of the United States; and

WHEREAS, there is increasing risk and vulnerability to rural and urban communities, tribal lands, the agricultural and forestry sectors, transport, and utilities from extreme weather events such as drought, flood, fire, tropical cyclones, and periods of high temperature, and there is evidence that these risks are changing due to climate change;

NOW, THEREFORE, Commerce and Agriculture enter into this Memorandum of Understanding (MOU) covering cooperative efforts to advance the development, sharing and application of weather, climate, economic and demographic information for risk management with respect to agriculture, forestry, and other resource management decisions, with an emphasis on food and energy security, international trade, water availability, water management and ecosystem protection in the face of changing environmental, economic, and social conditions.

II. Reference and Authorities

Commerce enters into this MOU pursuant to the authority vested in it by 15 U.S.C 313; Agriculture enters into this MOU pursuant to the authority vested in it by 7 U.S.C. 2201. This MOU supersedes the 1995 agreement between the two Departments relating to coordination and cooperation in climate and weather matters.

SUBSIDIARY INTERAGENCY AGREEMENT
BETWEEN THE
U.S. Department of Commerce
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA)
and the
U.S. DEPARTMENT OF AGRICULTURE (USDA)

Regarding Cooperation on the Successful Application of the
NATIONAL INTEGRATED DROUGHT INFORMATION SYSTEM (NIDIS)

Agreement No. CPO13-003-0000-000

General Information

This agreement is a subsidiary to the Interagency Agreement dated December 21, 2012, between the Department of Commerce and the Department of Agriculture, which provides for cooperation in order to advance the development, sharing, and application of weather, climate, economic, and geographic information for risk management with respect to agriculture, forestry, and other resource management decisions, with an emphasis on food and energy security, international trade, water availability, water management, and ecosystem protection in the face of changing environmental, economic, and social conditions.

Reference and Authorities

This agreement is executed pursuant to the provisions of 7 U.S.C. 2201 and 15 U.S.C. 313.

Purpose

The purpose of this subsidiary agreement is to establish a framework by which agencies within the Departments of Commerce and Agriculture can work together towards improving their capabilities to monitor and plan for drought, and support risk management strategies, with particular emphasis placed on protecting the interests of the agricultural and forestry communities. This will be accomplished by fully utilizing the existing infrastructure of both Departments through cooperative processes established in the development and implementation of the National Integrated Drought Information System (NIDIS), and providing opportunities to expand collaborative research and outreach activities addressing drought risk management and resilience. Particular activities addressed by this subsidiary agreement are:

Increased collaboration on the development and implementation of tools and products to improve the reliability and accuracy of drought monitoring, predictions and projections, including those products used in the production of the U.S. Drought Monitor;

Improving accessibility, compatibility, and sharing of data, analysis, and expertise supporting the development of regional drought early warning systems;

Establishment of a National Soil Moisture Monitoring Network, with emphasis on expansion into under-served regions, including tribal lands;



JAWF (The Joint Agricultural Weather Facility)



U.S. Dept. of Commerce

NOAA
National Oceanic &
Atmospheric Administration



National Weather Service
(NWS)



Climate Prediction Center

Global Weather Data



U.S. Dept. of Agriculture

WAOB
World
Agricultural
Outlook
Board

NASS
National
Agricultural
Statistics
Service

International
Crop
Information

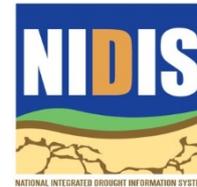
Domestic
Crop
Statistics



JOINT AGRICULTURAL WEATHER FACILITY

Developing a Coordinated National Soil Moisture Network

- NIDIS, USDA, and several partners organized meeting in Kansas City, MO, November 12-13, 2013
- Assessed status of current soil moisture data & monitoring networks
 - In situ
 - Satellite obs/Land Surface Models
 - Network integration and User Access
- Assessed ways to create national network through integration of existing networks and data sources
 - ID gaps and barriers
 - Proposed actions to close gaps and remedy barriers
- Developing a National Soil Moisture Monitoring Framework document-Summer 2014



**US Army Corps
of Engineers.**

NRCS Water Resource Networks

**** Snow Survey and Water
Supply Forecasting Program**

**** SNOTEL**



**💧 Soil Climate Analysis
Network (Soil Moisture)**

💧 SCAN



Altavista Soil

<http://www.mo15.nrcs.usda.gov/features/gallery/altavista.html>

Snow Survey and Water Supply Forecasting Program

Purpose:

** “...provides ... water supply forecasts... also provides public and scientific community with a data base...”

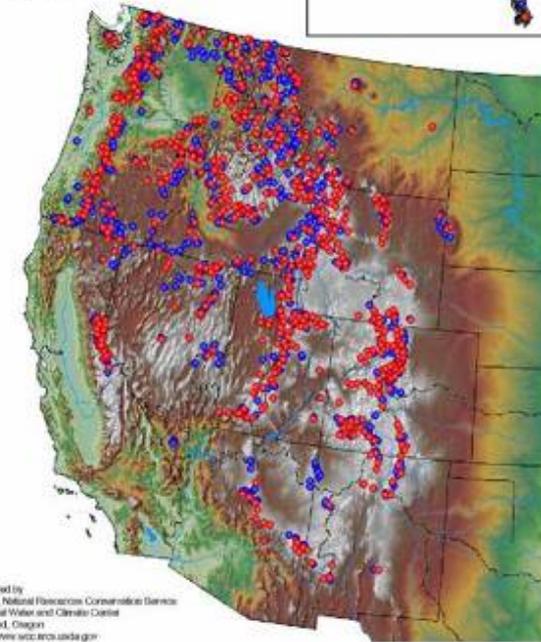
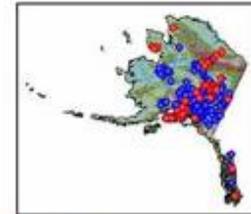
CFR Title 7, part 612

Customers

- ※ Sovereign Nations
- ※ Federal Departments & Agencies
- ※ State and Local Agencies
- ※ NGOs

SNOTEL Site and Snow Course Locations

Legend
 ● SNOTEL
 ● Snow Course

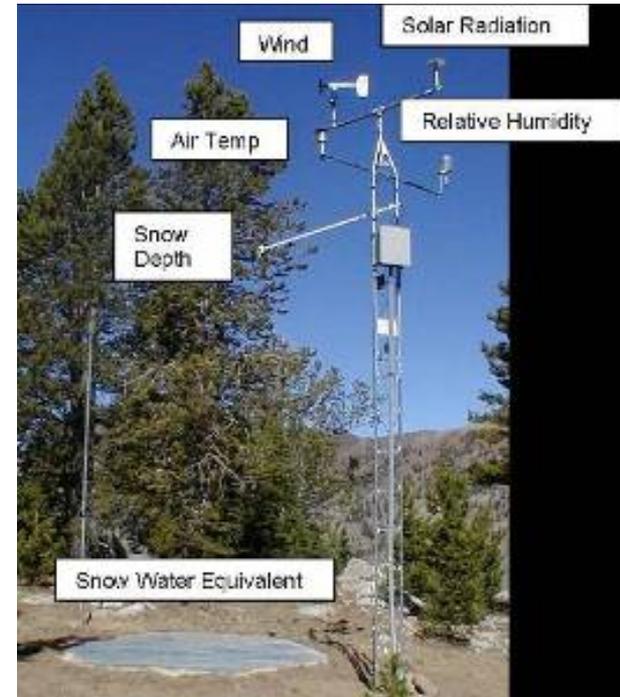


Prepared by:
 USDA, National Resources Conservation Service
 National Water and Climate Center
 Portland, Oregon
<http://www.wcc.nrcs.usda.gov>



Data collection:

- ** Manual snow courses
- ** SNOw TELeMtry (SNOTEL) sites



SNOW Survey Products and Services

** Snow Survey and Water Supply products available via the world-wide-web (www.wcc.nrcs.usda.gov)

The screenshot shows the NRCS National Water and Climate Center website. The main heading is "SNOTEL Data & Products". Below this, there is a "Search" box and a "SNOTEL Map Interface" section with a map of the United States. The map is color-coded by state, and a legend indicates that clicking on a state or selecting from a list below will filter the data. The "About SNOTEL" section provides general information, and there are links to "Snow Depth", "Precipitation", and "Temperature" data products. The "All Sensors" section lists various sensors and their data products.

This screenshot shows the SNOTEL website for the MT ROSE SKI AREA. It features a line graph titled "Water Year Graph for MT ROSE SKI AREA SNOTEL in Nevada" showing snow depth over time. Below the graph is a table of available reports for the site:

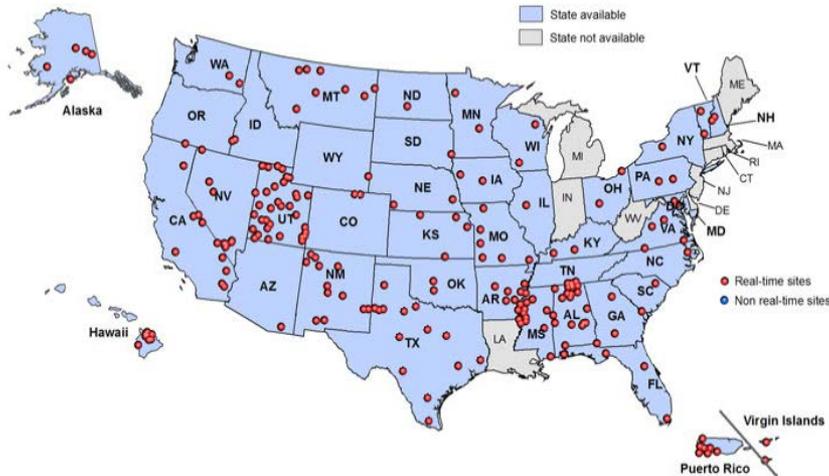
Report Type	Hourly	Daily	Current Water Year*	Historical
Standard Seasonal (last Current Data)	Link 7 Days	Link 7 Days	Daily Graphs	Daily Tab (Historical)
All Sensors (by Format)	Link 7 Days	Link 7 Days	Daily Graphs	Daily Tab
Precipitation, Accumulated	Link 7 Days	Link 7 Days	Daily Graphs	Daily Tab
Snow Depth	Link 7 Days	Link 7 Days	Daily Graphs	Daily + Monthly
Snow Water Equivalent	Link 7 Days	Link 7 Days	Tab + Map + Avg	Tab + Map + Avg
Temperature	Link 7 Days	Link 7 Days	Tab + Map + Avg	Tab + Map + Avg

This line graph shows the forecast for the Salmon Falls Ck Nr San Jacinto (NV) for the Mar-Jul volume. The y-axis represents the forecast in inches per second (in/sec), ranging from 0 to 200. The x-axis shows the forecast period from 1-Oct to 1-Sep. The graph displays several data series, including the Official forecast (yellow circles), the 7-day 10-day 15-day 20-day 30-day 45-day 60-day 75-day 90-day 105-day 120-day 135-day 150-day 165-day 180-day 200-day 210-day 225-day 240-day 255-day 270-day 285-day 300-day 315-day 330-day 345-day 360-day 375-day 390-day 405-day 420-day 435-day 450-day 465-day 480-day 495-day 510-day 525-day 540-day 555-day 570-day 585-day 600-day 615-day 630-day 645-day 660-day 675-day 690-day 705-day 720-day 735-day 750-day 765-day 780-day 795-day 810-day 825-day 840-day 855-day 870-day 885-day 900-day 915-day 930-day 945-day 960-day 975-day 990-day 1005-day 1020-day 1035-day 1050-day 1065-day 1080-day 1095-day 1110-day 1125-day 1140-day 1155-day 1170-day 1185-day 1200-day 1215-day 1230-day 1245-day 1260-day 1275-day 1290-day 1305-day 1320-day 1335-day 1350-day 1365-day 1380-day 1395-day 1410-day 1425-day 1440-day 1455-day 1470-day 1485-day 1500-day 1515-day 1530-day 1545-day 1560-day 1575-day 1590-day 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Soil Climate Analysis Network

SCAN

- 200 sites in 40 states
- Soil-climate monitoring
- Critical for drought monitoring



💧 SCAN Data and Products (www.wcc.nrcs.usda.gov)

NRCS National Water and Climate Center - Soil Climate Analysis Network - Microsoft Internet Explorer

Address: <http://www.wcc.nrcs.usda.gov/scan/>

United States Department of Agriculture
NRCS Natural Resources Conservation Service
 National Water and Climate Center

Search: Enter Keywords [GO]

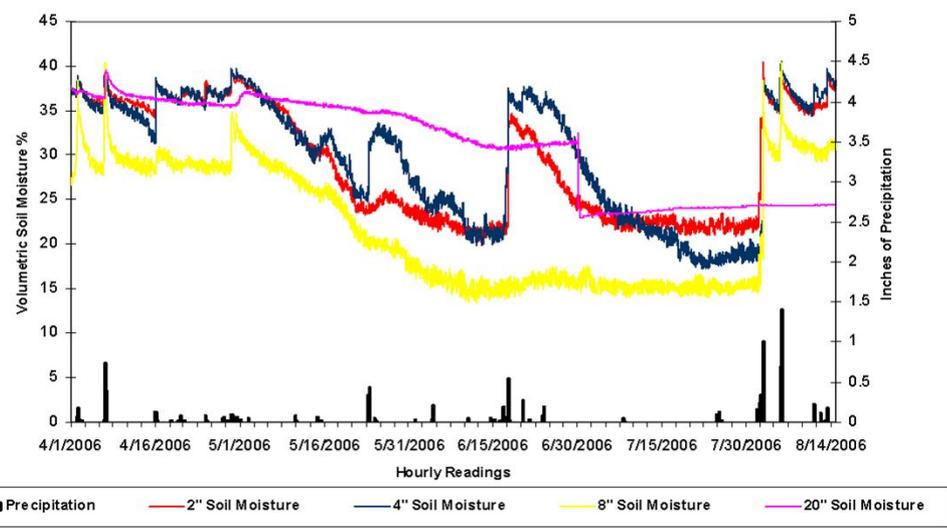
Soil Climate Analysis Network (SCAN)

Map of SCAN site locations

- Water and Climate Information
 - Water Supply
 - SNOTEL Data
 - Snow Course Data
 - SCAN Data
 - Climate
 - GIS Products **NEW**
- Conservation Planning Information
 - Animal Waste Management
 - Hydraulics & Hydrology
 - Irrigation & Water Management
 - Nutrient Management
 - Pest Management
 - Salinity Management
 - Water Quality
 - Wetlands & Drainage

Map Legend: State available (blue), State not available (grey). Real-time sites (red dot), Non real-time sites (blue dot).

ERPS Data Center, South Dakota
 Soil Moisture vs. Precipitation
 PRELIMINARY DATA SUBJECT TO CHANGE



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Potential Deliverables

- USDA Regional Climate Hubs offer an opportunity to strengthen existing partnerships and coordinate water resource and climate change information at regional scales
- Soil Moisture Networks: Assess ways to develop national network through integration of existing networks and data sources
- Encouragement of interdepartmental inter-jurisdictional projects through greater coordination of cooperative agreements