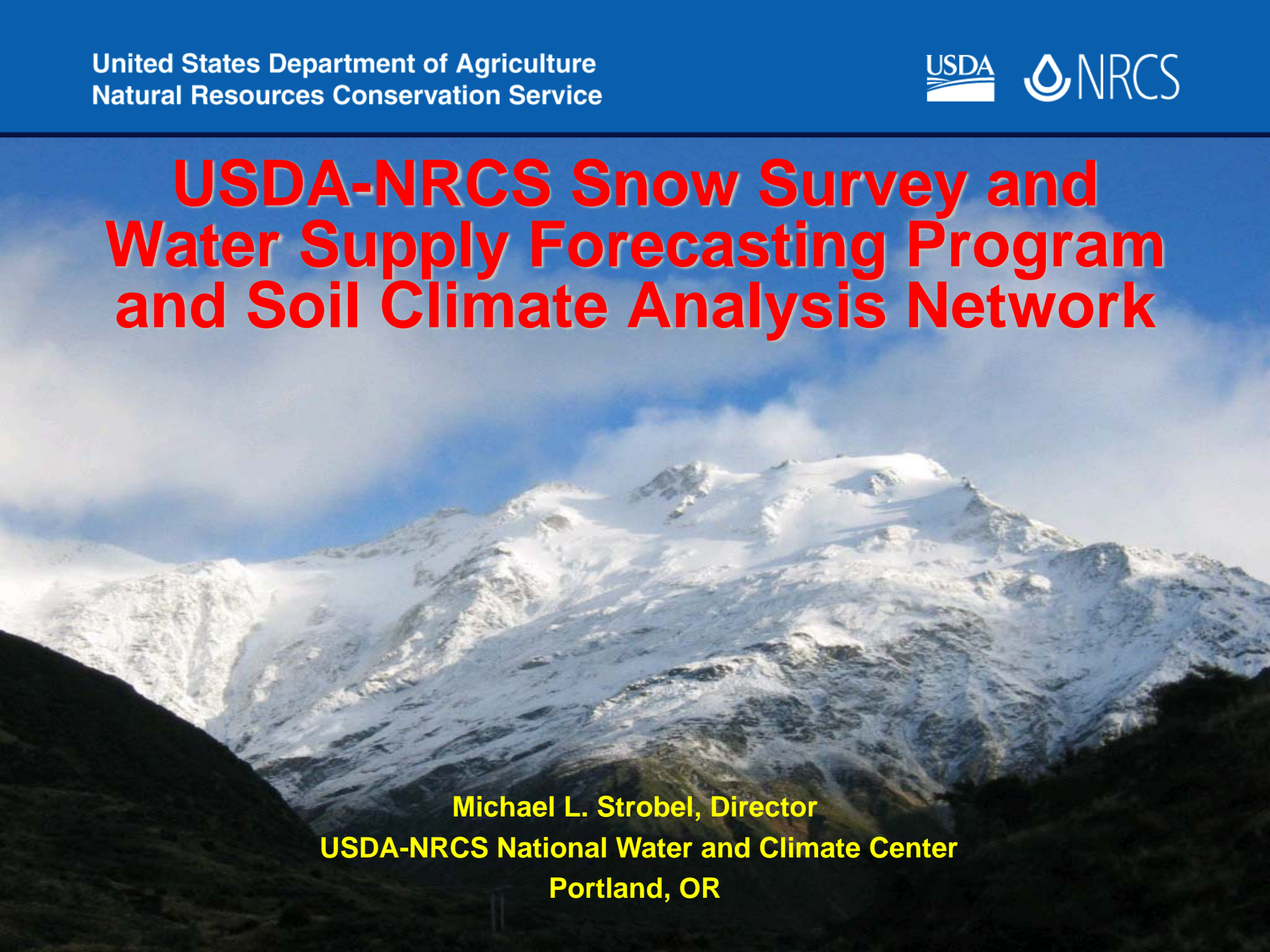
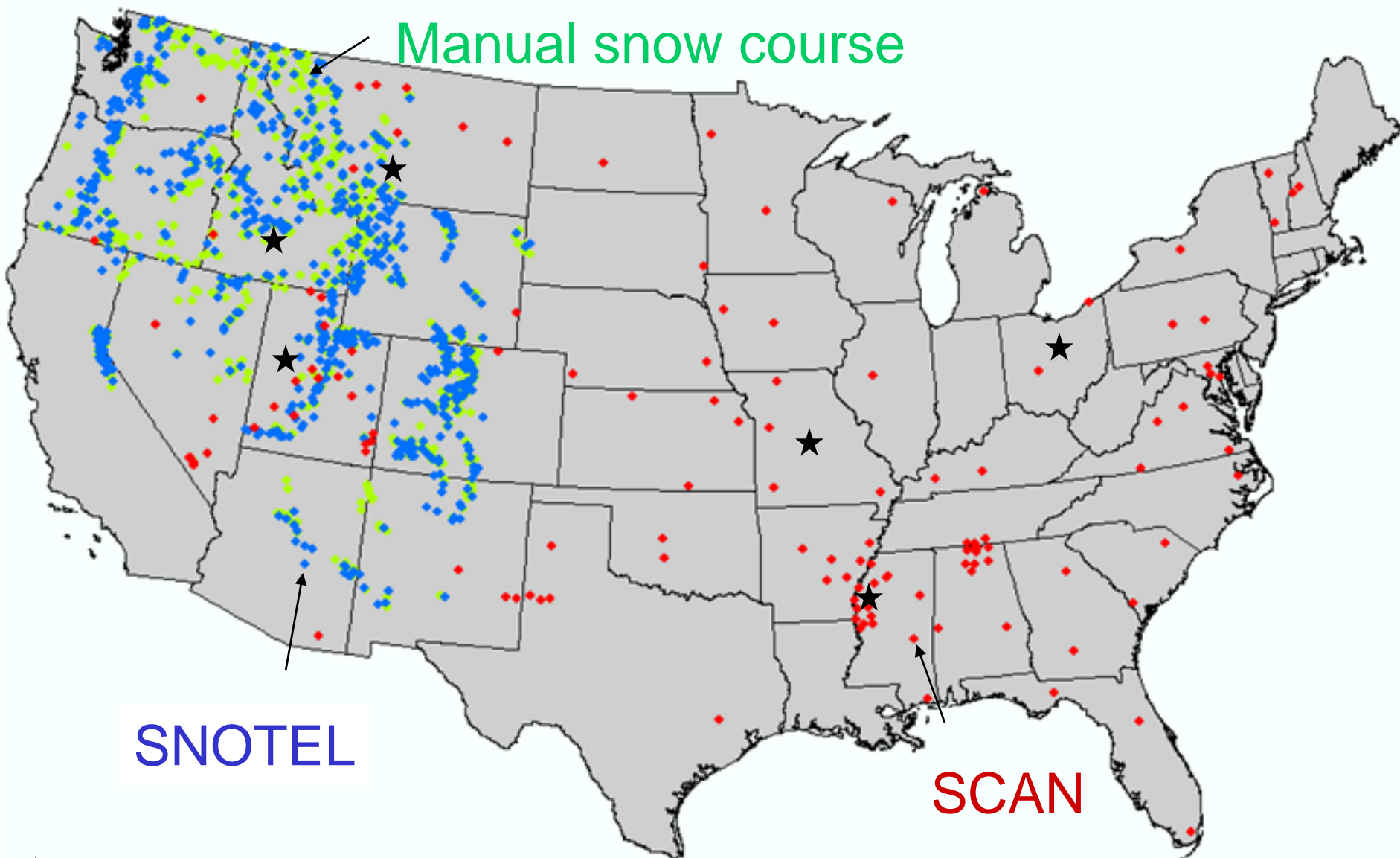


USDA-NRCS Snow Survey and Water Supply Forecasting Program and Soil Climate Analysis Network



Michael L. Strobel, Director
USDA-NRCS National Water and Climate Center
Portland, OR



★ Master stations in Utah, Idaho, Alaska, Ohio, Missouri, Mississippi, and Montana.

A Century Of Progress

- 1906 - Initial snow studies by Dr. Church at Lake Tahoe
- 1906-1909 - Snow survey sampler perfected
- 1909-1910 - First water supply forecast issued
- Soil Conservation Service Program since 1939



SSWSF Program Users and Cooperators



Agriculture



Drought and Flood
Risk Reduction



Wildlife management



Municipal Water Management,
Reservoir Management,
Power Generation



Recreation



Snow Survey and Water Supply Forecasting Program

Customers utilizing program data and forecasts:

- *Sovereign Nations*
 - Canada, Mexico, Native American Nations
 - Technology exchange with China, Mongolia, Antarctica, Europe
- *Federal Departments & Agencies*
 - Agriculture, Interior, Commerce, Defense, Energy, Bureau of Indian Affairs, Environmental Protection Agency, Bonneville Power Administration, Federal Water Masters
- *State and Local Agencies*
 - State and Interstate Organizations involved in: Drought Planning, Water Resources, Emergency Preparedness, Planning & Zoning, Forestry, Lands, Recreation and Tourism

Snow Survey and Water Supply Forecasting Program

Customers (continued):

- *Non-Governmental Entities*
 - Soil and Water Conservation Districts, University Researchers, Natural Resource Management Businesses, Private Citizens, Agricultural and Forestry Industry Cooperators
 - Water Utilities, Irrigation Districts, Limited Resource Farmers, Construction Contractors, Consulting Meteorologists, Hydrologists and Engineers
 - Educators and Schools, Energy and Power Generation Companies, Landscape Architects, Media, Recreational Interests and Transportation Companies.



1906

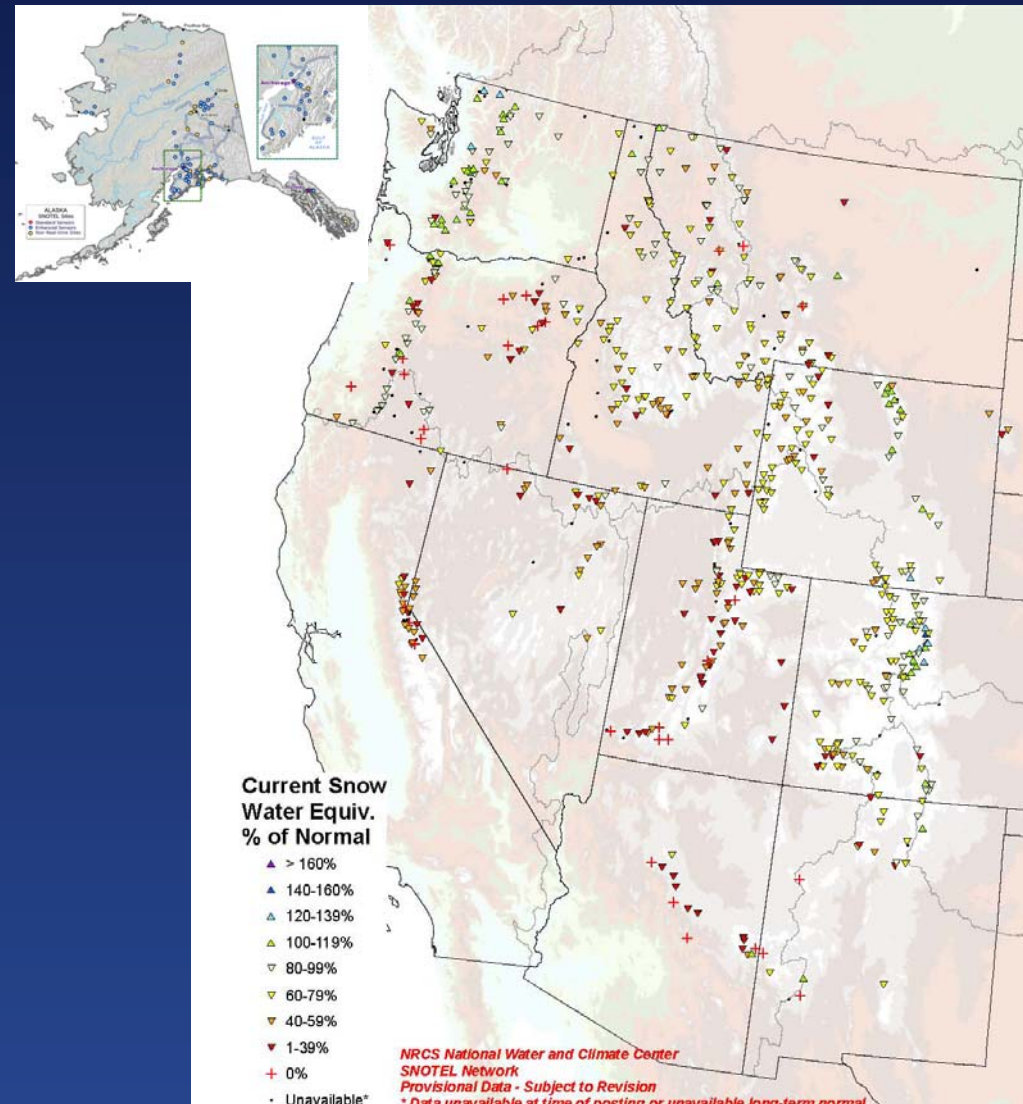
Today

Manual Snow Surveys

Metal tube inserted into snow and weighed to measure water content.
+300,000 snow course measurements to date

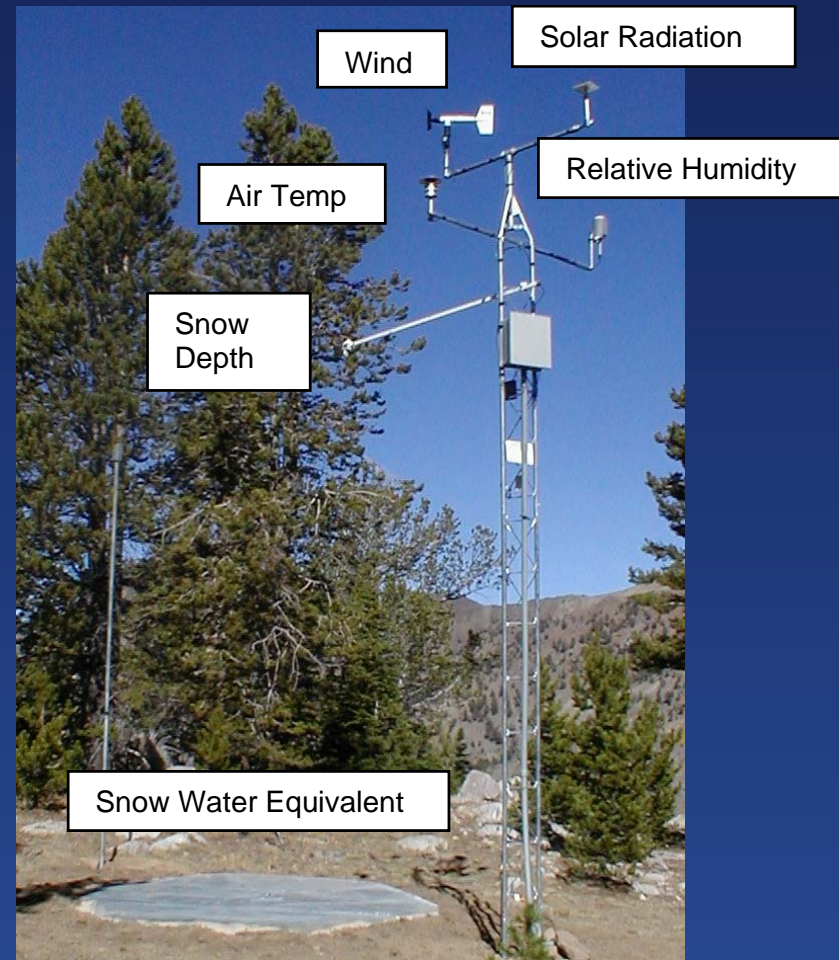
NRCS SNOTEL Network

- SNOTEL network
 - 13 Western States
 - 790 sites
 - 16 million observations/year
 - Data transmitted in near real time every hour for most stations
- 950 manual snow courses



SNOTEL Site - Augmented Data Array

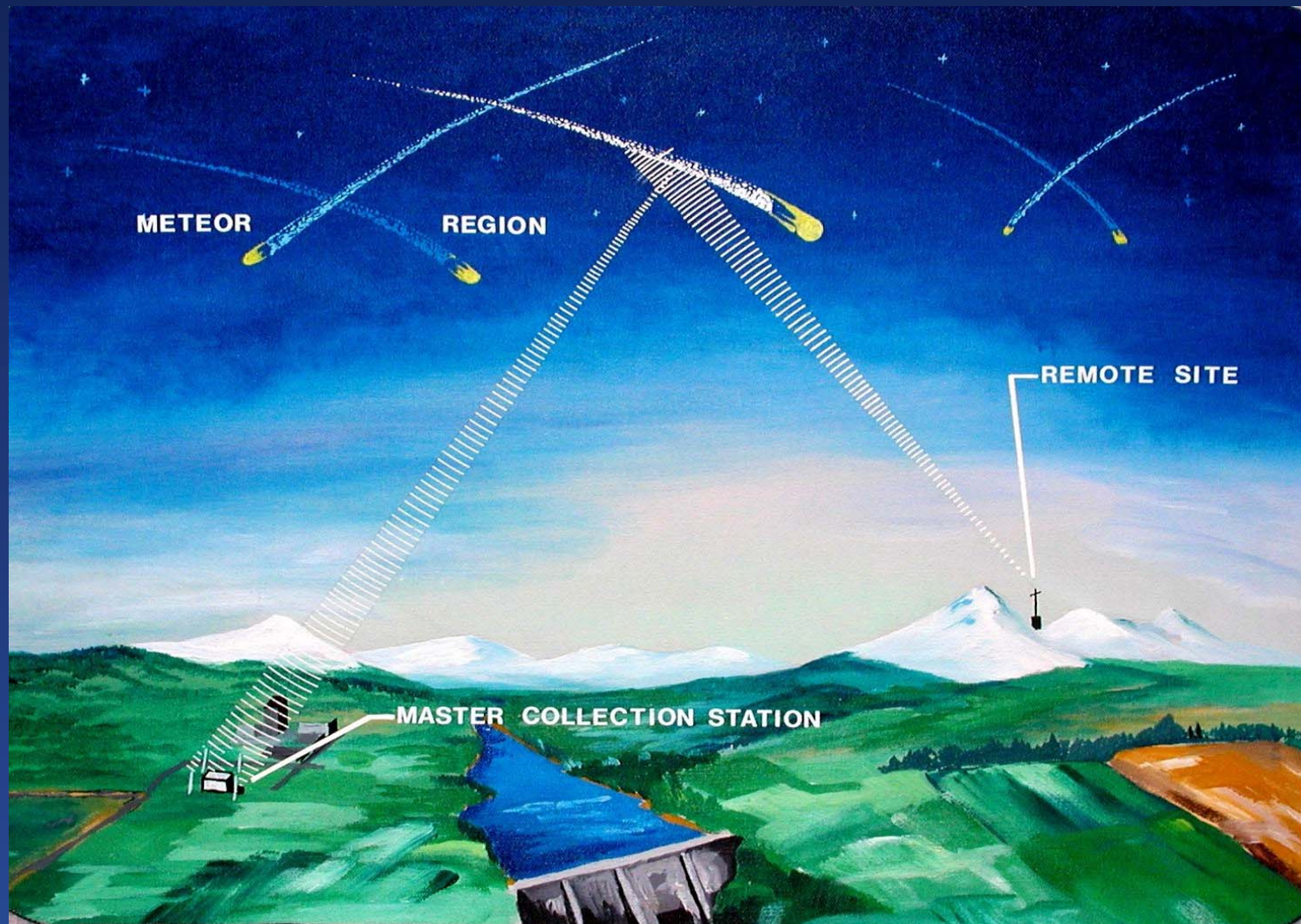
- **Snow water content**
- **Precipitation**
- **Temperature**
- **Snow depth**
- **Relative humidity**
- **Wind speed/direction**
- **Solar radiation**
- **Soil moisture / temperature**



Winter SNOTEL Site



Meteor Burst Technology



NWCC Webpage

The screenshot shows the NWCC website in a Microsoft Internet Explorer browser window. The address bar displays <http://www.nwcc.nrcs.usda.gov/>. The page header includes the USDA and NRCS logos and the text "National Water and Climate Center". A navigation menu contains links for "NWCC Home", "About Us", "Products", "Publications", "News", "Partnerships", and "Contact Us".

Search
Enter Keywords

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

[Snow Survey Programs by State](#)

[Find a Service Center](#)

[States and Regions](#)

[National Centers](#)

[Back to Top](#)

Welcome to the NRCS
National Water & Climate Center

New State GIS Maps
The National Water and Climate Center is pleased to introduce a new suite of state-level maps displaying SNOTEL snow water equivalent, snow depth, month-to-date precipitation and water-year-to-date precipitation. [...More Info](#)

SCAN Technology Used to Address Biomass Collection and Impacts
SCAN technology is helping to address new questions relative to large scale biomass collection efforts and the impact on soil and water resources. On July 16th, 2004, the U.S. Department of Energy and the U.S. Department of Agriculture Announce the FY2004 Joint Solicitation Awards for \$25 million in research funding to 22 biomass projects. [...More Info](#)

The Natural Resources Conservation Service provides leadership in a partnership effort to help people conserve, maintain, and improve our natural resources and environment.

Highlights:

- What's New
- SNOTEL Map Interface
- GIS Products
- Snow Survey Centennial Celebration
- Snow Survey Training School 2007

Special Reports:

- Drought Reports and Information
- Klamath Basin Special Reports
- Mount St. Helens Current Snowpack Conditions

Site Map | Contact | Webmaster | NRCS | USDA | FirstGov
Accessibility | FOIA | Privacy Policy | Nondiscrimination Statement | Disclaimer

NWCC Webpage - SNOTEL

SNOTEL Data & Products



SNOTEL Map Interface

Map-based access to data from individual SNOTEL sites. Includes all available sensors.

Click on a state from the map or select from the list below:

- New!** [Google Earth SNOTEL Data Layers](#)
- New!** [Snow and Precipitation Update Reports](#)



About SNOTEL

General SNOTEL information, site lists, fact sheets, and more...



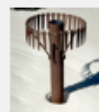
Snow Depth*

[Products](#)



All Sensors

[Data](#) | [Products](#)
Includes SWE, precipitation, temperature, snow depth* and soil moisture/temperature data*.



Precipitation

[Data](#) | [Products](#)



Snow Water Equivalent

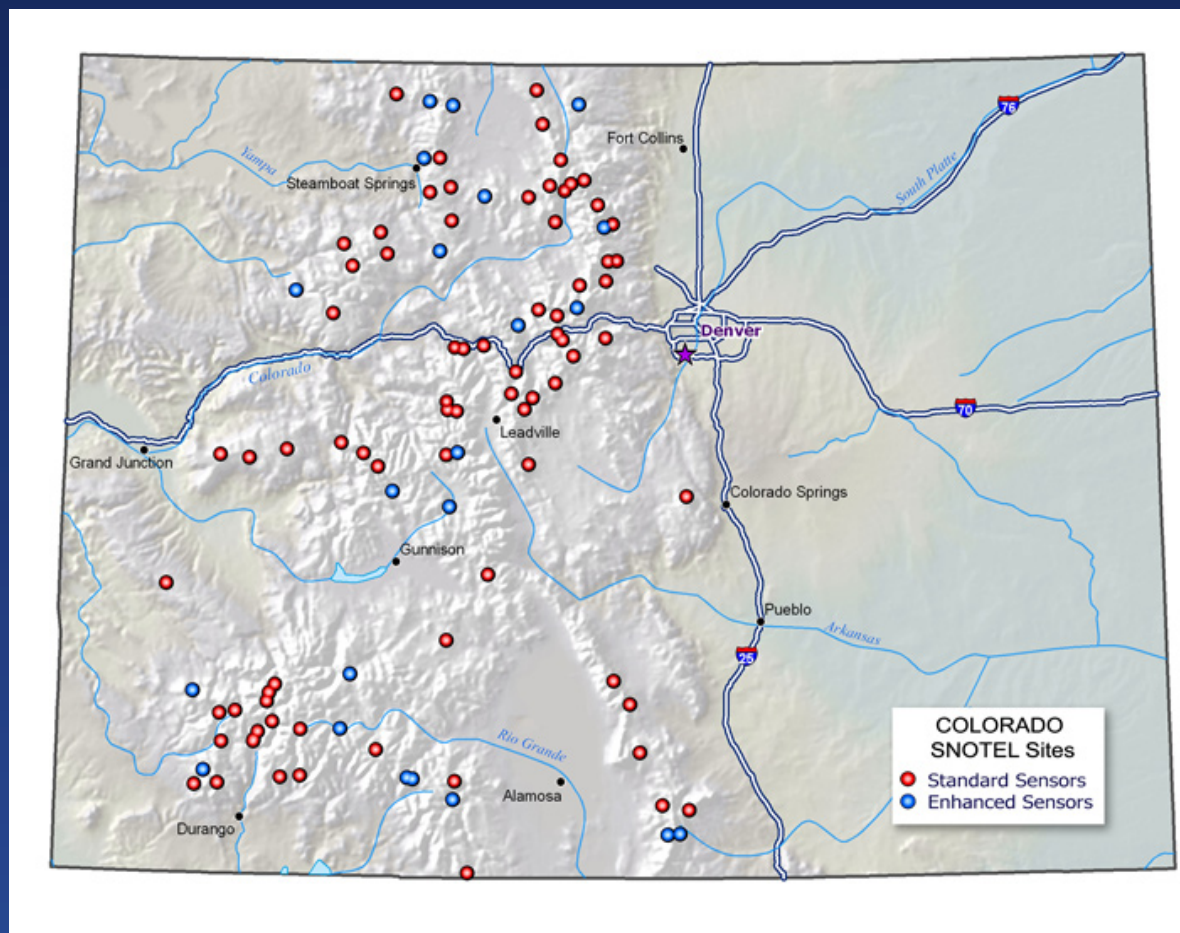
[Data](#) | [Products](#)



Temperature

[Data](#) | [Products](#)

Colorado SNOTEL Sites



NWCC Webpage Interface

Site Information and Reports for MT ROSE SKI AREA

MT ROSE SKI AREA

Site Number: 652
Station ID: 19k07s

State: Nevada
Latitude: 39.315733
Longitude: -119.894733
Elevation: 8801 feet

[Sensor Label Descriptions](#)
[Sensor History for this Site](#)



[\(Winter Photo Also Available, Select Here\)](#)

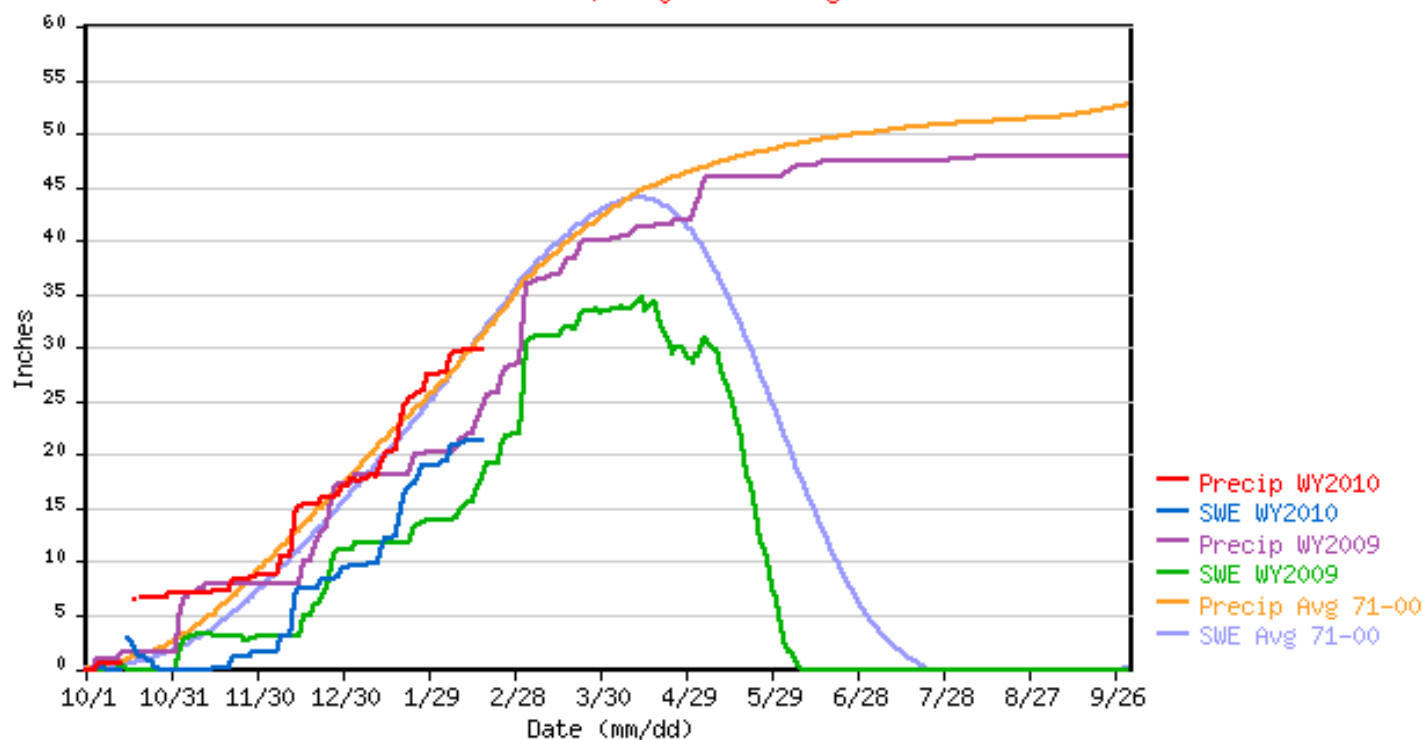
The following reports are available for this site:

Report Type	Hourly	Daily	Current Water Year*	Historical
Standard Sensors† (<i>Most Current Data</i>)	Last 7 Days	Last 7 Days	Daily Readings	Daily (Tab Formatted)
All Sensors (<i>TK Format‡</i>)	Today's Data			
Precipitation, Accumulated	Last 7 Days	Last 7 Days	Daily Table	Daily Table
Snow Depth	Last 7 Days	Last 7 Days	Daily Readings	
Snow Water Equivalent	Last 7 Days	Last 7 Days	Daily Table • Daily Graph	Daily • Monthly
Temperature	Last 7 Days	Last 7 Days	Max • Min • Avg	Max • Min • Avg

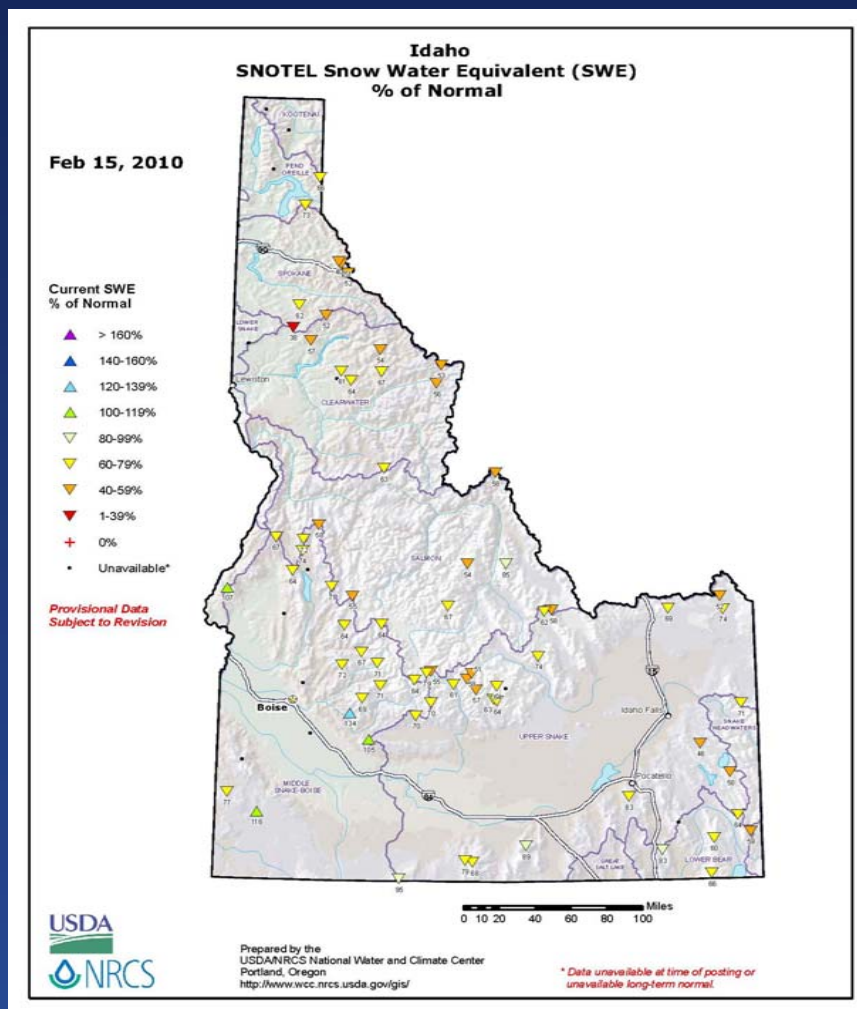
Mt. Rose SNOTEL Data

MT ROSE SKI AREA SNOTEL as of 02/16/2010

*** Provisional Data, Subject to Change ***

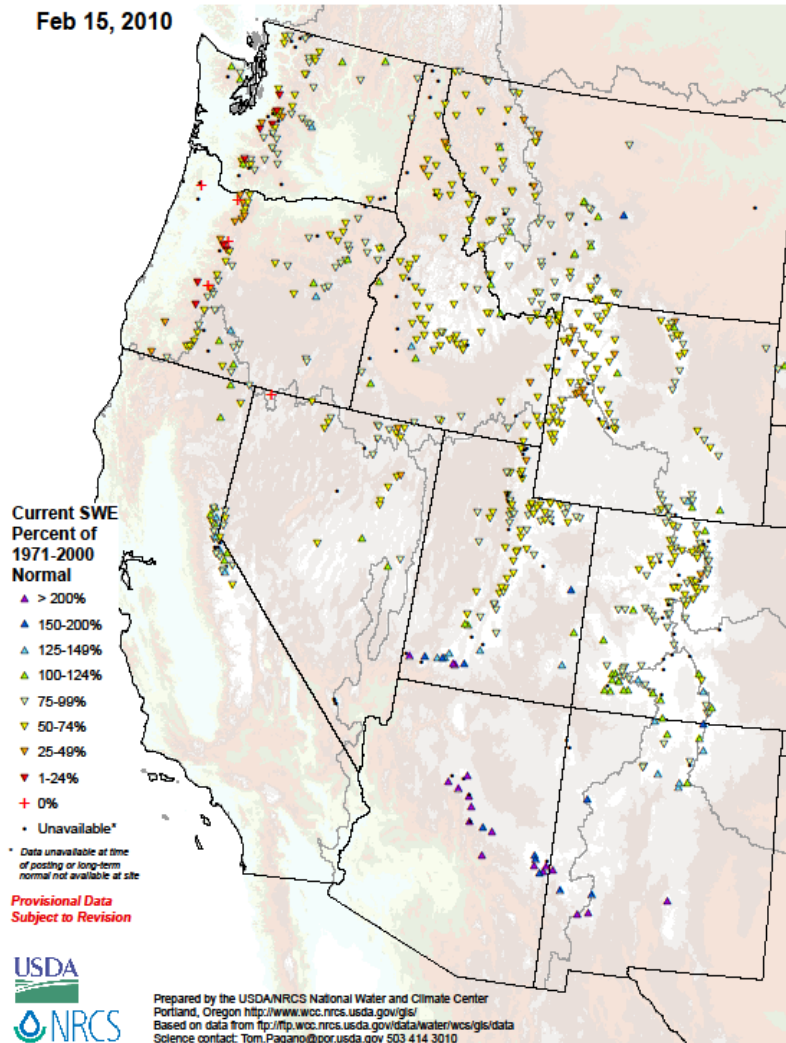


Daily State Map - Idaho



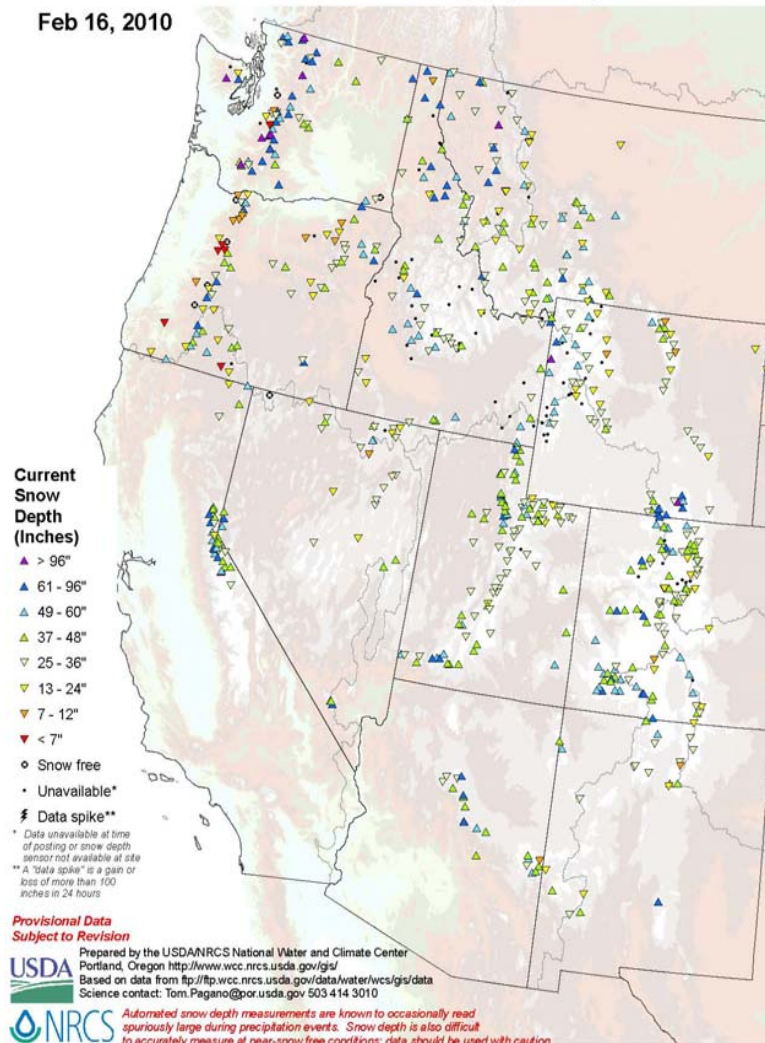
SNOTEL Current Snow Water Equivalent (SWE) Percent of Normal

Feb 15, 2010



SNOTEL Current Snow Depth (Inches)

Feb 16, 2010



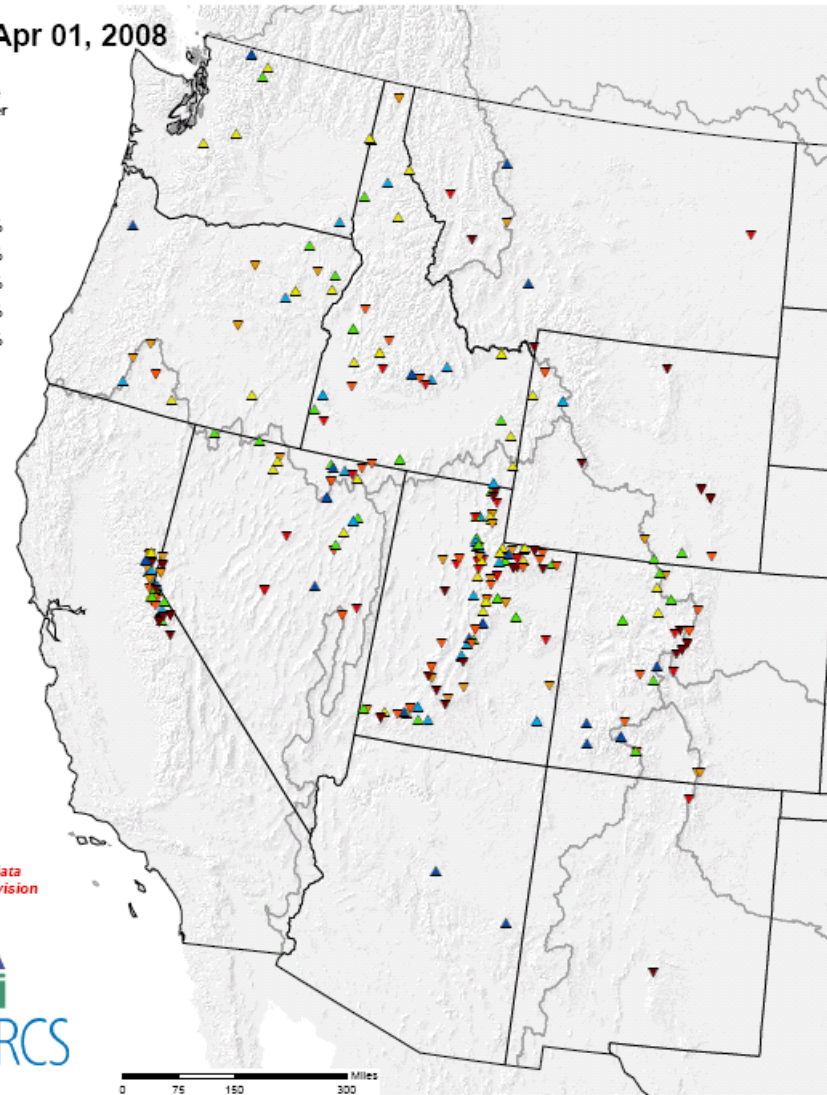
Expansion of soil moisture to SNOTEL network (data starts 2003)

Westwide SNOTEL Current 20" Depth Soil Moisture % Water by Volume

Apr 01, 2008

20" Depth
Soil Moisture
Percent Water
by Volume

- ▼ <5%
- ▼ 5-10%
- ▼ 10-15%
- ▼ 15-20%
- ▼ 20-25%
- ▼ 25-30%
- ▼ 30-35%
- ▼ >35%



Provisional data
subject to revision

Water Supply Forecasts

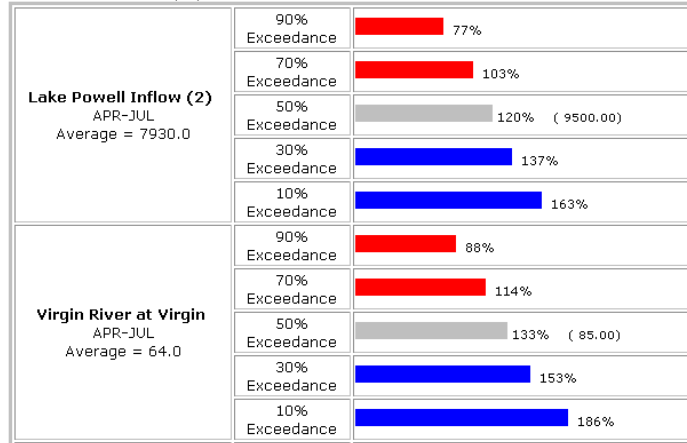
- Water Year 2009
 - 740 locations forecast Jan-Jun with NWS
 - Over 12,000 forecasts issued by States to users
 - Over 2M visits to WSF pages
- www.wcc.nrcs.usda.gov/wsf



February, 2008 Streamflow Forecast Probability Chart for Utah

E. GARFIELD, KANE, WASHINGTON, & IRON Co. Percent Exceedance Forecasting Charts

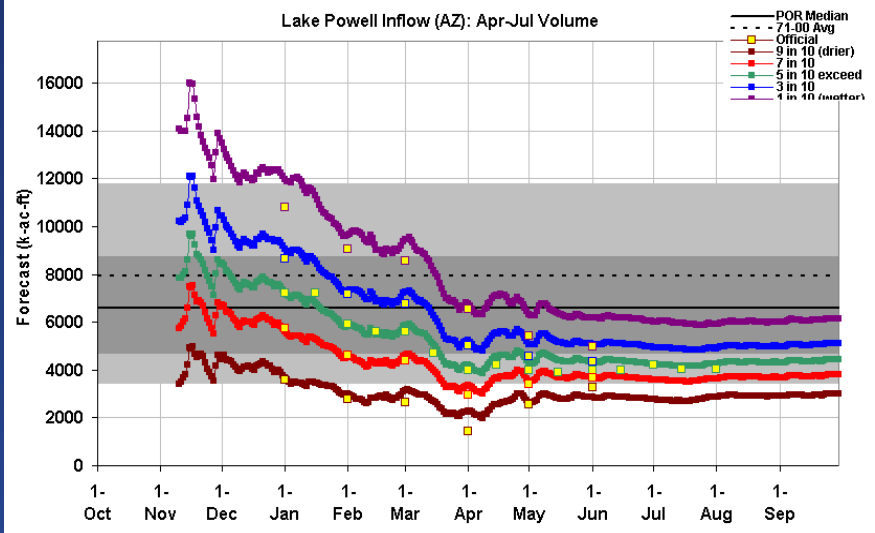
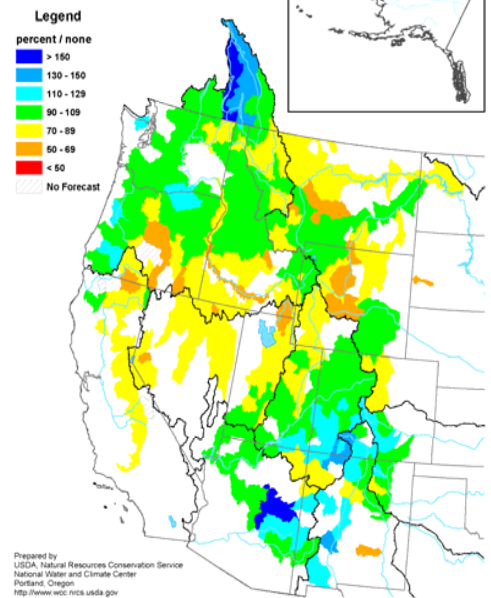
DATA CURRENT AS OF: 2/05/08 08:02:13



RIO GRANDE BASIN Streamflow Forecasts - April 1, 2002

Forecast Pt	Chance of Exceeding * (1000AF)						30 Yr Avg
Forecast Period	90%	70%	50% (Most Prob)	30%	10%	(1000AF)	(1000AF)
Rio Grande nr Del Norte	129	157	177	33	242	339	531
Platoro Reservoir Inflow	12.0	19.7	25	39	30	38	64
Conejos River nr Mogote	57	68	75	38	95	125	200

Spring and Summer Streamflow Forecasts as of January 1, 2008



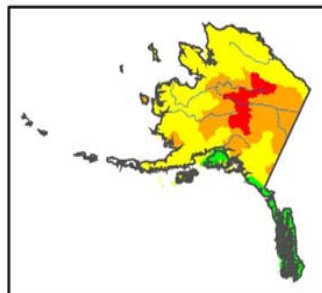
Seasonal water supply volume forecasts (available in a variety of formats) NRCS formats:

Created 12:17 Nov 6 2007



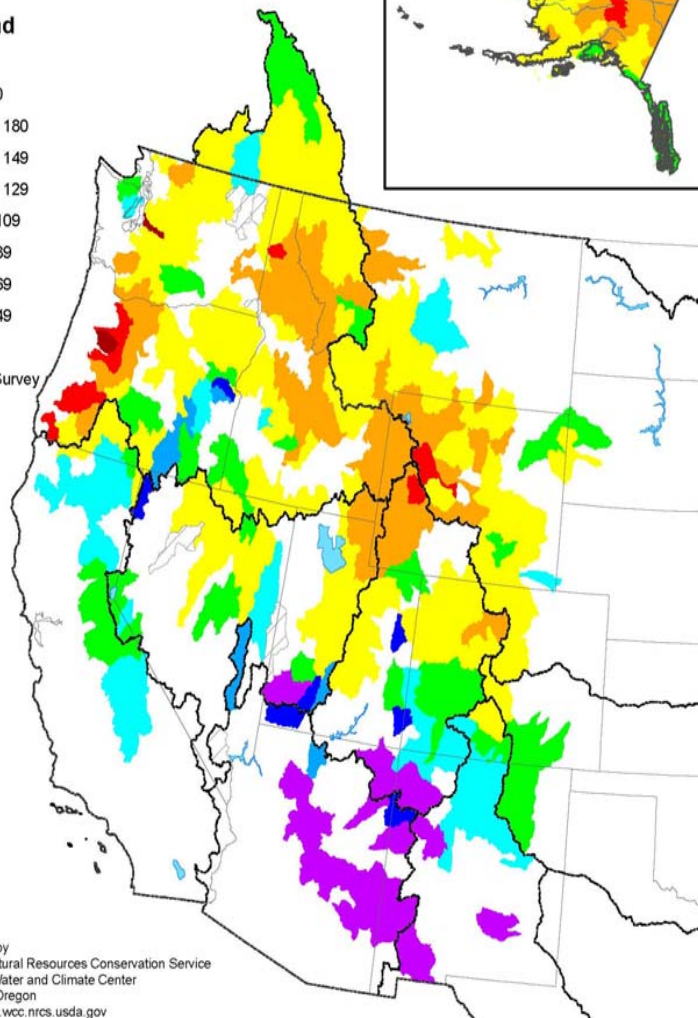
This is an automated product based solely on SNOTEL data, provisional data are subject to change. This product is a statistically based guidance forecast combining indices of snowpack and precipitation. Yellow squares are the official outlooks. Gray background is the historical period of record variability. This product does not consider climate information such as El Nino or short range weather forecasts, or a variety of other factors considered in the official forecasts. This product is not meant to replace or supersede the official forecasts produced in coordination with the National Weather Service. Science Contact: Tom.Pagano@por.usda.gov 503 414 3010 www.wcc.nrcs.usda.gov/wst/daily_forecasts.html

Mountain Snowpack as of February 1, 2010



Legend

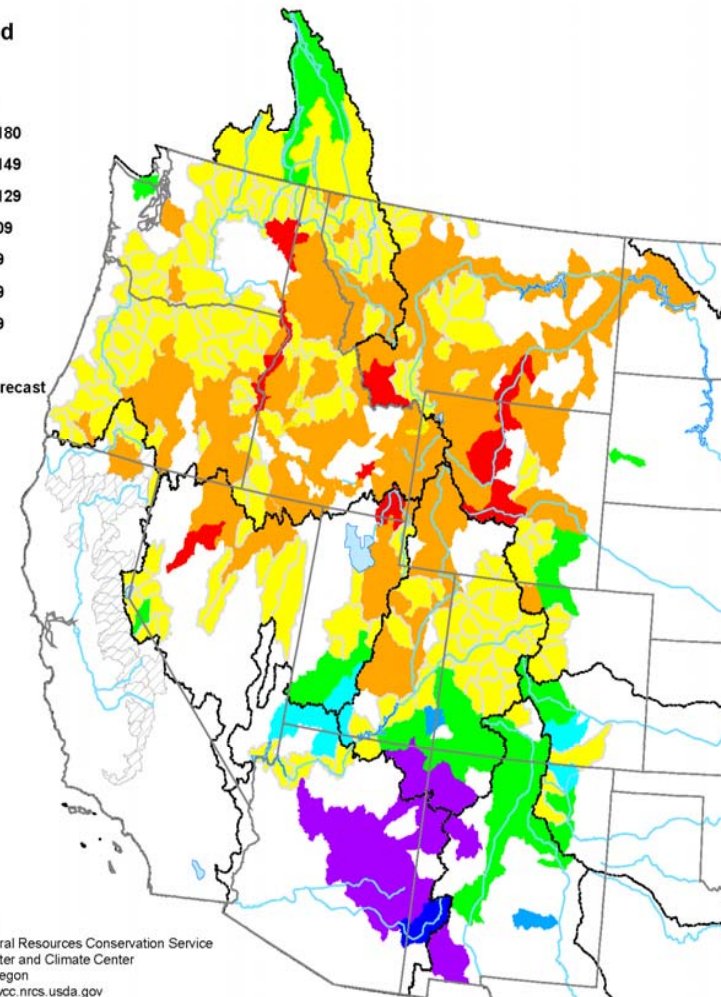
percent



Spring and Summer Streamflow Forecasts as of February 1, 2010

Legend

percent



New WSF Process - VIPER

Type	Target	Start	End
Forecast Point	06191500, MT, Yellowstone R At Corwin Spring	Apr	Jul
Type	Predictors	Start	End
1 SnotelSwe	878, WY, Younts Peak	Apr F	Apr F
2 SnotelSwe	837, WY, Two Ocean Plateau	Apr F	Apr F
3 SnotelSwe	816, WY, Thumb Divide	Apr F	Apr F
4 SnotelSwe	384, WY, Canyon	Apr F	Apr F
5 SnotelSwe	806, WY, Sylvan Lake	Apr F	Apr F
6 USGSStrm	06191500, MT, Yellowstone River At Corwin Sp	Oct-1 F	Mar
7 SnotelPrpc	878, WY, Younts Peak	Oct-1 F	Mar L
8 SnotelPrpc	837, WY, Two Ocean Plateau	Oct-1 F	Mar L
9 SnotelPrpc	816, WY, Thumb Divide	Oct-1 F	Mar L
10 SnotelPrpc	384, WY, Canyon	Oct-1 F	Mar L
11 SnotelPrpc	806, WY, Sylvan Lake	Oct-1 F	Mar L
12 SnotelSwe	683, WY, Parker Peak	Apr F	Apr F
13 SnotelSwe	670, MT, Northeast Entrance	Apr F	Apr F
14 SnotelSwe	480, MT, Fisher Creek	Apr F	Apr F
15 SnotelPrpc	683, WY, Parker Peak	Oct-1 F	Mar L
16 SnotelPrpc	670, MT, Northeast Entrance	Oct-1 F	Mar L
17 SnotelPrpc	480, MT, Fisher Creek	Oct-1 F	Mar L
18 SnotelSwe	862, MT, White Mill	Apr F	Apr F

Global month changes:	Instantaneous	Accumulated
Station 1	0.798	0.820
Station 2	0.849	0.867
Station 3	0.820	0.814
Station 4	0.867	0.814
Station 5	0.814	0.820
Correl	0.798	0.820
Years	37/37	37/37
CurZ	0.289	1.192
PctNorm	112%	136%
Pred	1687.49	2033.26
Station 7	0.817	0.824
Station 8	0.824	0.837
Station 9	0.824	0.865
Station 10	0.837	0.820
Station 11	0.865	0.820
Correl	0.817	0.824
Years	27/27	27/27
CurZ	0.636	1.483
PctNorm	119%	141%
Pred	1776.19	2122.39
Station 13	0.761	0.857
Station 14	0.857	0.786
Station 15	0.786	0.808
Station 16	0.808	0.845
Station 17	0.845	0.876
Station 18	0.876	0.820
Correl	0.761	0.857
Years	37/37	37/37
CurZ	0.166	2.299
PctNorm	106%	150%
Pred	1642.60	2322.85
Group SnotelSwe	0.895	0.907
Group SnowSwe	0.907	0.907
Group SnotelPrpc	0.907	0.907
Group CoopPrpc	0.907	0.907
Group USGSStrm	0.907	0.907
Group NRCSStrm	0.907	0.907
Correl	0.895	0.907
Years	37	37
CurZ	0.785	0.780
PctNorm	1898.67	1890.40
Pred	1898.67	1890.40
Group SOI	0.898	0.898
Group Reservoir	0.898	0.898
Group Routed	0.898	0.898
Group BEARStrm	0.898	0.898
Group BCMTMprc	0.898	0.898
Group All	0.898	0.898
Correl	0.898	0.898
Years	26	26
CurZ	0.783	0.783
PctNorm	1937.45	1937.45
Pred	1937.45	1937.45
Statistics Average	1588.1	1520.85
Statistics Median	1654.7	1647.65
Statistics Min	909.43	909.43
Statistics MinYear	1977	1977
Statistics Max	2777.79	2777.79
Statistics MaxYear	1997	1997

Analysis Type	Principal Components	Transformation
Forecast Volume	Pct	None
10	2213.45	134%
30	2048.75	124%
50	1937.45	117%
70	1826.15	111%
90	1661.45	101%
standard jackknife	0.807	0.775
r2	193.74	209.44
StdErr	0.552	0.515
StdErrSS		
Off Norm	1650	

First Year Used	Last Year Used	Target Data Src	Publication Date	Published?
1971	9999	USGS	April	<input checked="" type="checkbox"/>

# comp	% var	PCA
1	0.882	

“Visual Interactive Prediction and Estimation Routines”

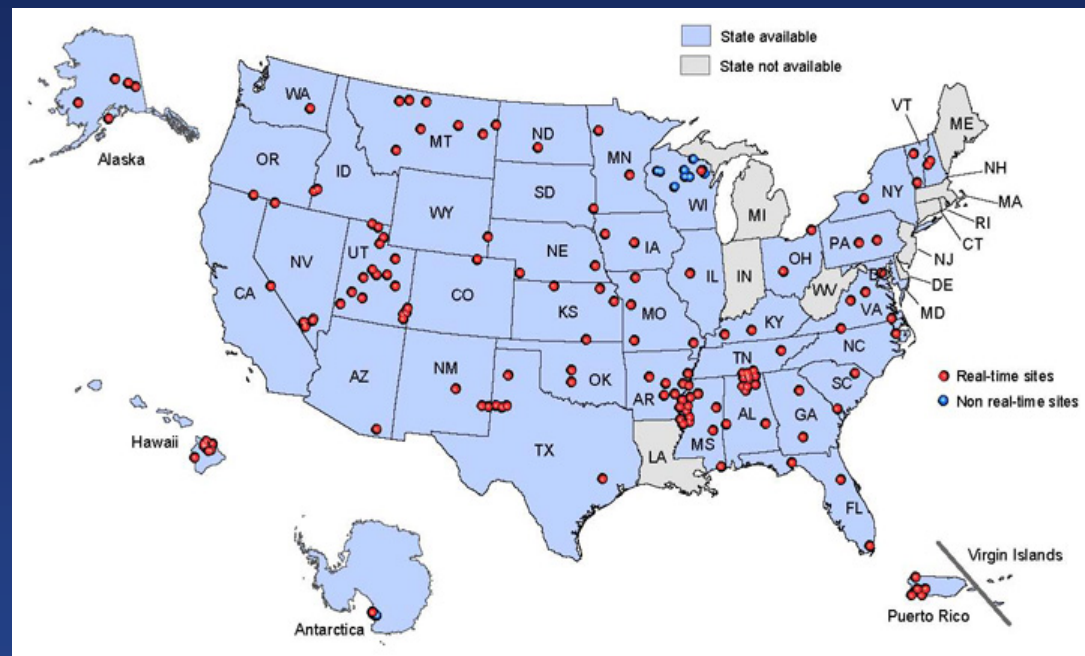
VIPER features

- Predictor search routines
- Predictor time optimization
- Report generation
- Exporting to GIS
- Saving and managing forecast equations/models
- Automated data acquisition from web
- Data management and editing
- Forecast coordination and management
- Downstream relational forecasts
- Configuration management

Soil Climate Analysis Network

- **SCAN** (Soil Climate Analysis Network)
 - 151 sites in 40 States
 - Soil-climate monitoring
 - Uses meteor burst telemetry
 - Critical for drought monitoring
- www.wcc.nrcs.usda.gov/scan/

SOIL CLIMATE ANALYSIS NETWORK



Johnson Farm, Nebraska SCAN Site



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

Address: <http://www.nrcs.usda.gov/scan/Arkansas/arkansas.html>

United States Department of Agriculture
NRCS Natural Resources Conservation Service

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Search
Enter Keywords

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

Snow Survey Programs by State

Find a Service Center

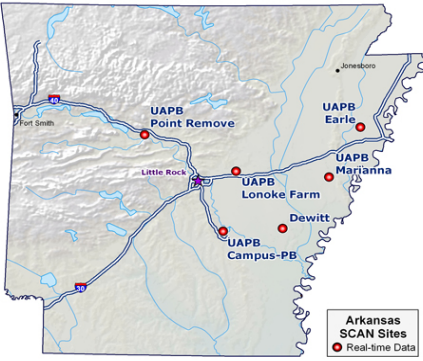
States and Regions

National Centers

Arkansas SCAN Sites

Select a SCAN site from the map or from the list below.

Select a SCAN Site



Arkansas SCAN Sites
● Real-time Data

[Back to Main SCAN Map](#)

Back to Top | Site Map | Contact | Webmaster | NRCS | USDA | FirstGov

Trusted sites

NWCC - SCAN Site Information - Microsoft Internet Explorer

Address: <http://www.nwcc.nrcs.usda.gov/scan/site.pl?siteum=2085&state=ar>

United States Department of Agriculture
NRCS Natural Resources Conservation Service

National Water and Climate Center

NWCC Home | About Us | Products | Publications | News | Partnerships | Contact Us

SCAN Site Information for UAPB Earle in Arkansas

UAPB Earle

Site Number: 2085
Crittenden County

Latitude: 35° 17' N
Longitude: 90° 27' W
Elevation: 213 feet
Period of Record: 2/7/2004 to Present

- Soils Pedon Information
(Information unavailable, soil currently being analyzed)
- [Sensor History](#)
- [Sensor Label Descriptions](#)

Data Reports: - Provisional Data - Subject to Revision

- Soil Moisture/Temperature reports for this site in table format:
Last 1 Day
- TK Formatted - Select [HERE](#) to get Todays Data - or choose from a range of days below

Daily Reports for the **Current Month of June**
Select the Day or Day(s) by Selecting Below:
(use Shift-Click or CTRL-Click to select a range of days)

1	2	3	4	5
---	---	---	---	---

Daily Reports for the **Previous Month of May**
Select the Day or Day(s) by Selecting Below:
(use Shift-Click or CTRL-Click to select a range of days)

1	2	3	4	5
---	---	---	---	---

- TK Formatted Historical Files for this Site (FTP Server)

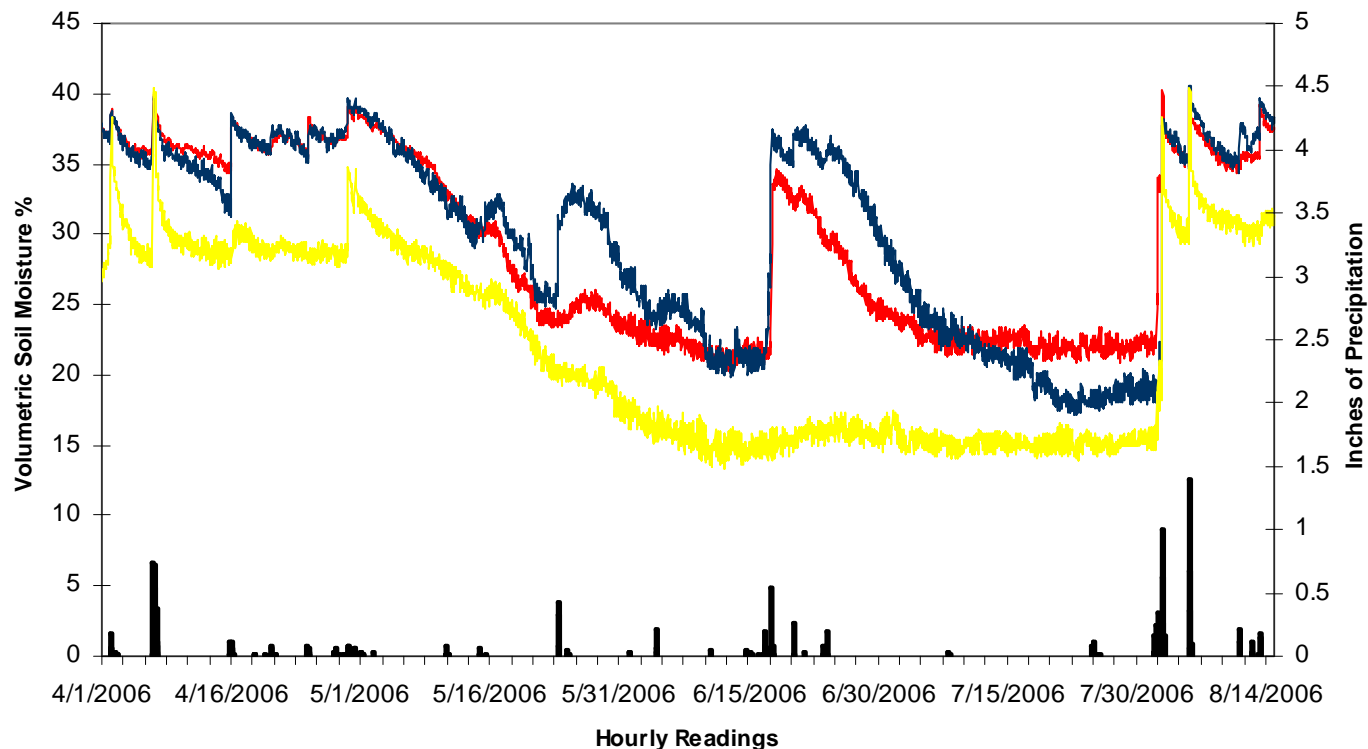
< Back to: [[Arkansas Page](#)] - [[SCAN Main Page](#)]

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Done Trusted sites

SCAN Data Plot

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



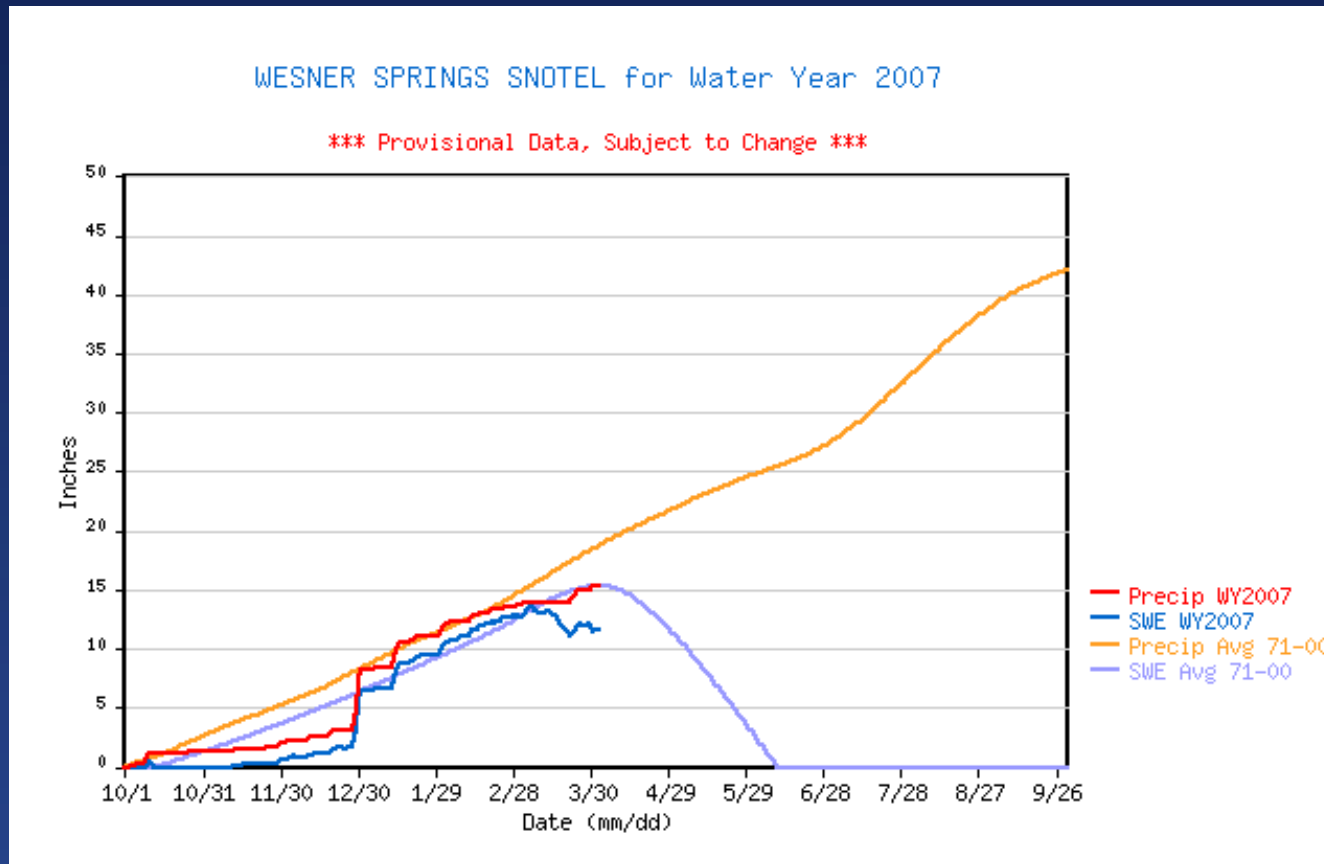
■ Precipitation

— 2" Soil Moisture

— 4" Soil Moisture

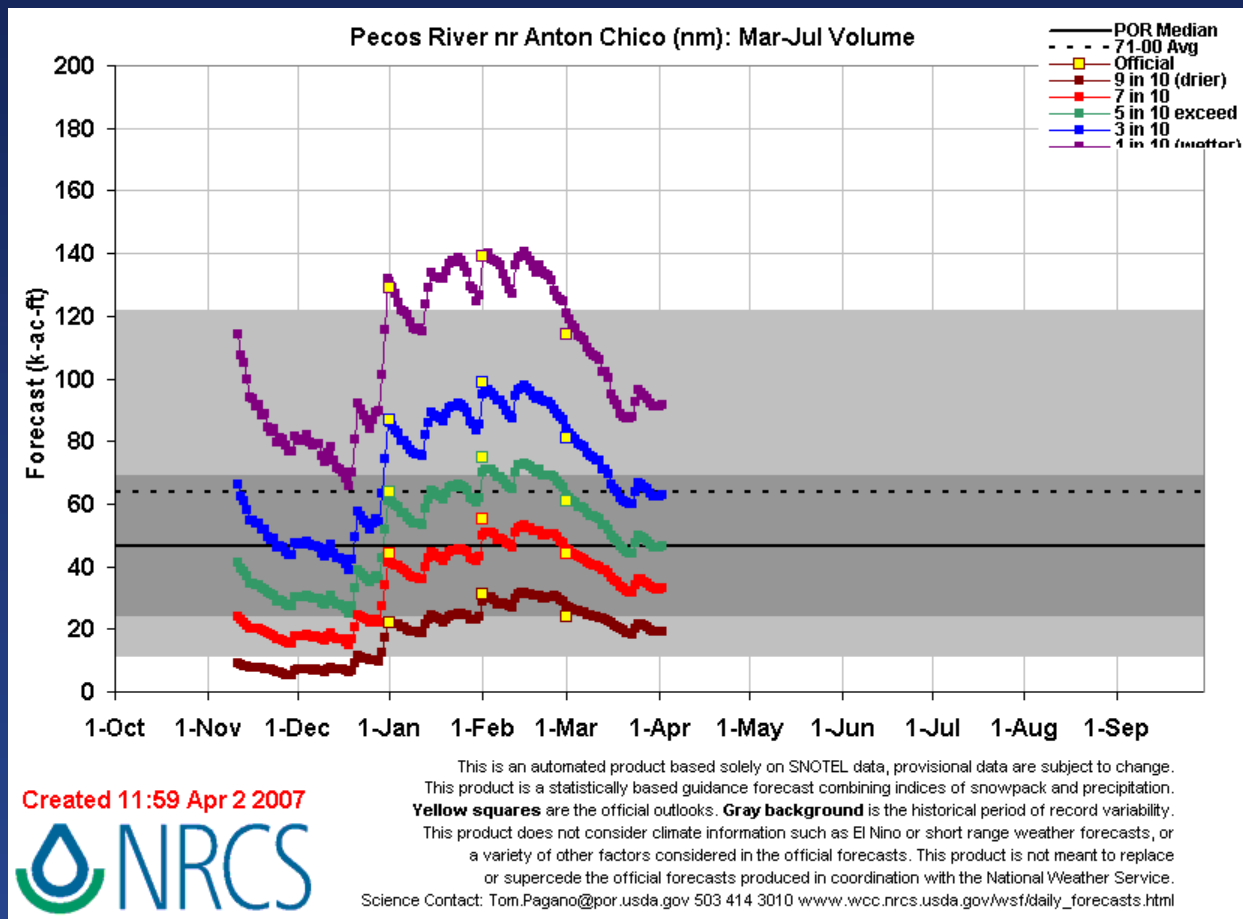
— 8" Soil Moisture

Other Tools – Water Supply Forecasting



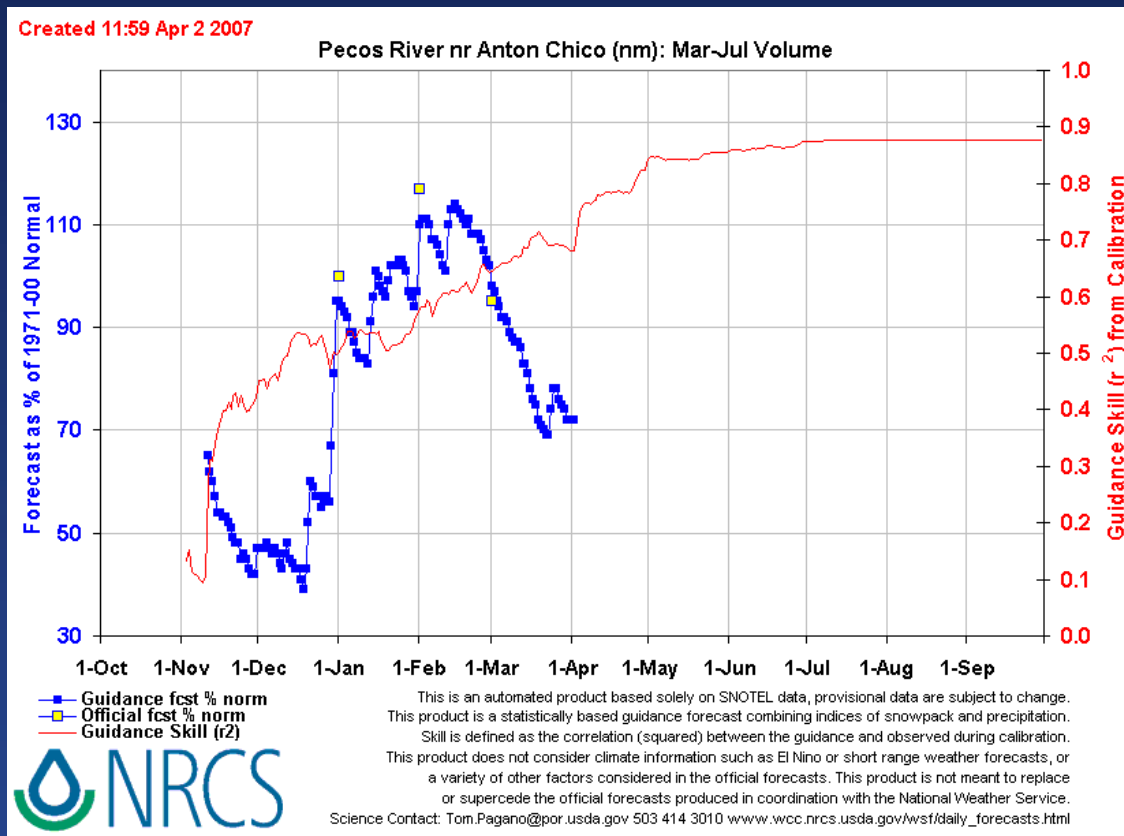
Rapid changes in snowpack affect water supply forecasts

Daily WSF Guidance



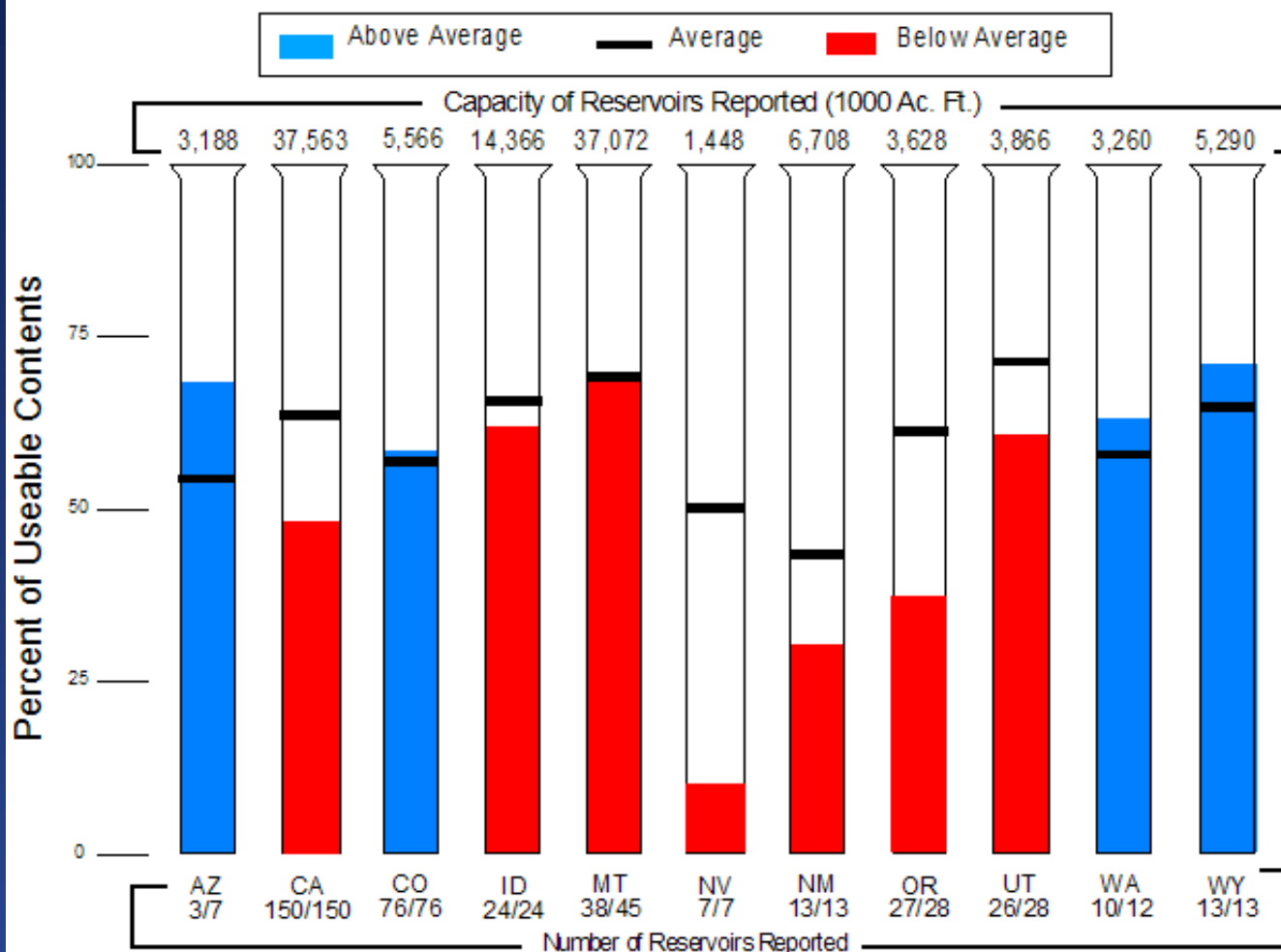
Daily Water Supply Guidance Forecasts use daily SNOTEL data

Daily WSF – Volume & Skill



Daily Water Supply Guidance Forecasts use daily SNOTEL data

Reservoir Storage as of February 1, 2010



Westwide SNOTEL Current Snow Water Equivalent (SWE) % of Normal

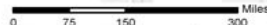
Feb 17, 2010

Current Snow Water Equivalent (SWE) Basin-wide Percent of 1971-2000 Normal

- unavailable *
- <50%
- 50 - 69%
- 70 - 89%
- 90 - 109%
- 110 - 129%
- 130 - 149%
- >= 150%

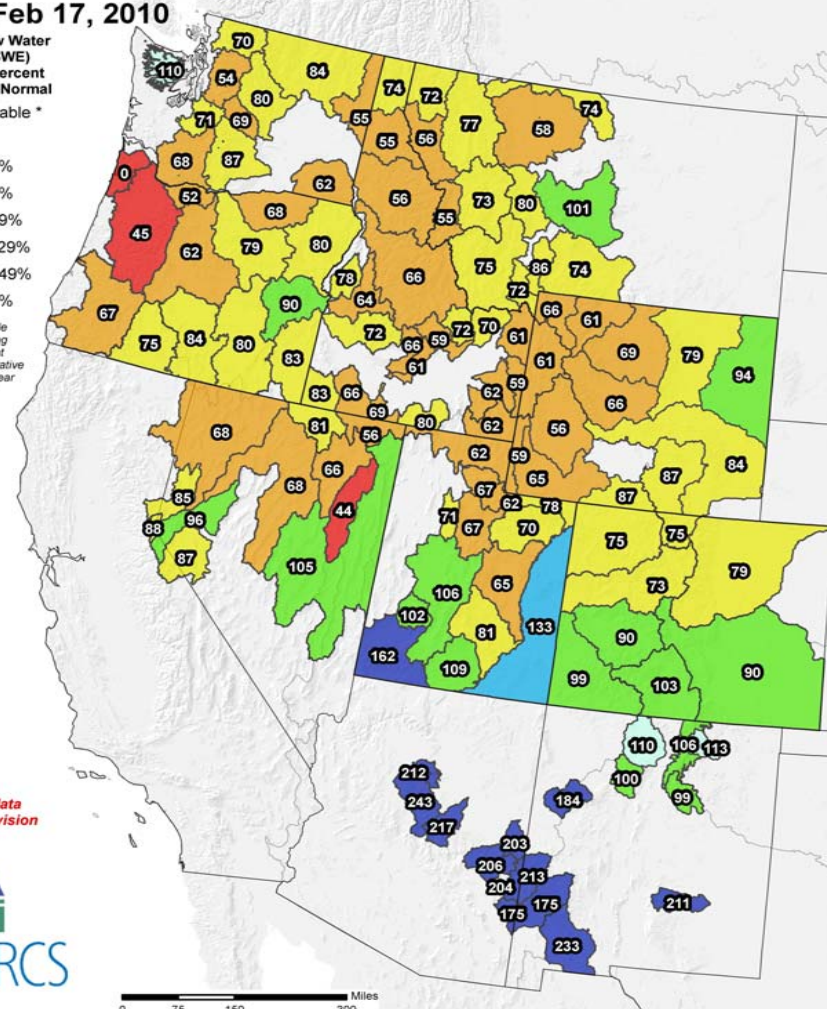
* Data unavailable at time of posting or measurement is not representative at this time of year

Provisional data subject to revision

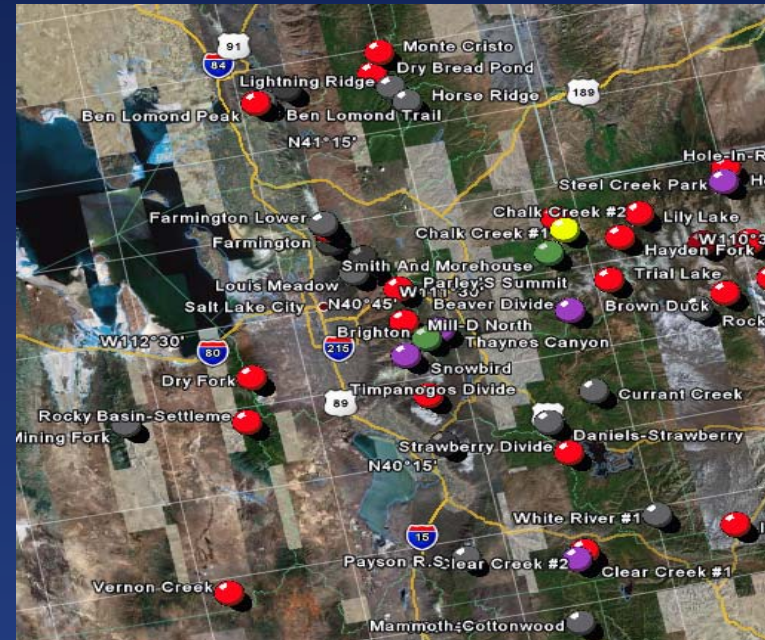


The snow water equivalent percent of normal represents the current snow water equivalent found at selected SNOTEL sites in or near the basin compared to the average value for those sites on this day. Data based on the first reading of the day (typically 00:00).

Prepared by the USDA/NRCS National Water and Climate Center Portland, Oregon <http://www.wcc.nrcs.usda.gov/gis/>
Based on data from <http://www.wcc.nrcs.usda.gov/reports/>
Science contact: Tom.Pagano@por.usda.gov 503 414 3010



Google Earth Viewers



- Google Earth
 - SNOTEL

<http://www.wcc.nrcs.usda.gov/snotel/earth/index.html>

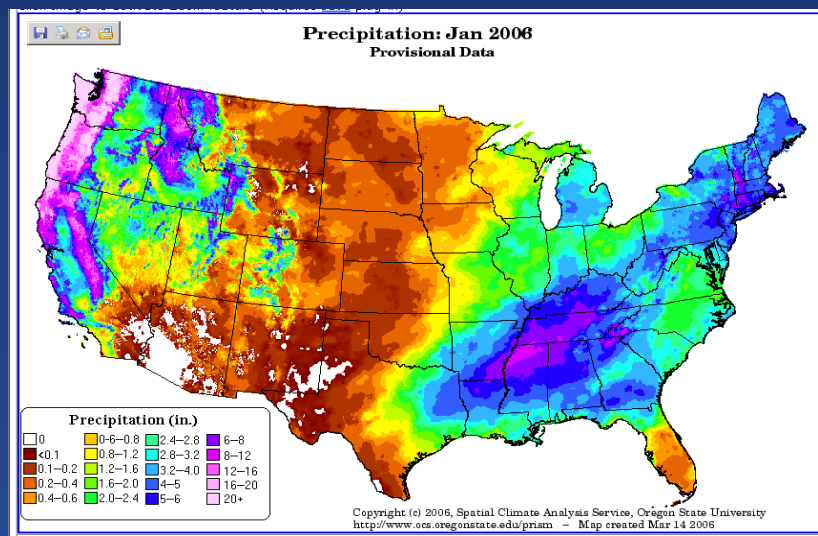
- Water Supply Forecasts

<http://www.wcc.nrcs.usda.gov/wsf/earth/index.html>

Climate Maps

- Maps of snowpack, precipitation, temperature
- NRCS Geospatial Warehouse
- Oregon State University

<http://www.ocs.orst.edu/prism/>



AgACIS - Agricultural Applied Climate Information System

United States Department of Agriculture
NRCS Natural Resources Conservation Service

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eFOTG Search/Index About

PENOBSCOT COUNTY, ME
electronic Field Office

Information Thunderbook

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eFOTG FYI

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 - Field Office Guide to Climatic Data
 - Plant Hardiness Zones of Maine
 - C. Cultural Resources Information
 - D. Threatened and Endangered Species
 - Section III
 - Section IV
 - Section V

Climate Data for Penobscot County, Maine

1. Product	2. Location	3. Variable	4. Year	5. View
<input type="radio"/> Daily data for a month	BANGOR CORINNA MILLINOCKET	<input checked="" type="radio"/> Max Temperature	<input checked="" type="radio"/> Current year	<input type="button" value="Go"/>
<input type="radio"/> Daily almanac		<input type="radio"/> Min Temperature	<input type="radio"/> Last year	
<input checked="" type="radio"/> Monthly avgs/totals		<input type="radio"/> Avg Temperature	<input type="radio"/> 1971-2000	
<input type="radio"/> Monthly occurrences		<input type="radio"/> Precipitation	<input type="radio"/> Select year:	
<input type="radio"/> Monthly extremes		<input type="radio"/> Snowfall	<input type="text" value="2007"/>	
<input type="radio"/> Daily extremes		<input type="radio"/> Snow Depth		
<input type="radio"/> Daily/monthly normals		<input type="radio"/> GDD (Base 50)		
<input type="radio"/> Record extremes				
<input type="radio"/> Frost/freeze dates				
<input type="radio"/> TAPS				
<input type="radio"/> FROST				
<input type="radio"/> GROWTH				
<input type="radio"/> WETS				

A Partnership with the Regional Climate Centers

[Questions, comments](#)

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, an average of the years 1971 through 2000, or any other year in the period of record.

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AgACIS Products

BANGOR INTL AP (170355)
Observed Daily Data
Month: Mar 2007

Day	Max Temp	Min Temp	Avg Temp	GDD B50	GDD B40	Total Prcpn	New Snow	Snow Depth
1	34	9	21.5	0	0	0.00	0.0	7
2	34	18	26.0	0	0	0.74	6.6	8
3	44	13	28.5	0	0	T	T	13
4	39	26	32.5	0	0	T	T	11
5	32	18	25.0	0	0	0.03	0.5	10
6	18	-6	6.0	0	0	0.00	0.0	10
7	14	-6	4.0	0	0	0.00	0.0	10
8	8	-11	-1.5	0	0	T	T	10
9	29	-11	9.0	0	0	0.00	0.0	10
10	40	19	29.5	0	0	0.11	0.0	9
11	47	30	38.5	0	0	0.31	0.0	6
12	46	29	37.5	0	0	0.00	0.0	2
13	49	25	37.0	0	0	0.00	0.0	2
14	48	38	43.0	0	3	0.13	0.0	0
15	46	27	36.5	0	0	0.24	0.0	0
16	27	16	21.5	0	0	0.34	2.8	3
17	47	19	33.0	0	0	2.52	1.0	4
18	29	24	26.5	0	0	T	T	3
19	33	20	26.5	0	0	T	T	2
20	38	19	28.5	0	0	0.10	0.7	3
21	34	10	22.0	0	0	0.00	0.0	2
22	48	28	38.0	0	0	T	0.0	0
23	53	27	40.0	0	0	0.00	0.0	0
24	45	26	35.5	0	0	T	T	T
25	49	25	37.0	0	0	0.00	0.0	0
26	44	24	34.0	0	0	0.01	0.0	0
27	M	M	M	M	M	M	M	M
28	M	M	M	M	M	M	M	M
29	M	M	M	M	M	M	M	M
30	M	M	M	M	M	M	M	M
31	M	M	M	M	M	M	M	M
Smry	37.5	17.5	27.5	0	3	4.53	11.6	4.8

Product generated by ACIS - NOAA Regional Climate Centers.

BANGOR INTL AP (170355)
Monthly Totals/Averages
Precipitation (inches)
Years: 1971-2000

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average	3.17	2.51	3.45	3.37	3.47	3.44	3.24	3.15	3.59	3.32	3.71	3.46	39.40

Product generated by ACIS - NOAA Regional Climate Centers.

CORINNA (171628)
Daily Climate Normals
Maximum Temperature (degrees F)
1971-2000

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	27	26	33	45	59	71	77	80	74	63	50	37
2	27	27	34	45	60	71	78	80	73	63	50	36
3	26	27	34	46	60	72	78	80	73	62	49	36
4	26	27	35	46	61	72	78	80	73	62	49	35
5	26	27	35	47	61	72	78	79	72	62	48	35
6	26	27	35	47	62	72	78	79	72	61	48	34
7	26	27	36	48	62	72	78	79	72	61	48	34
8	26	28	36	48	63	73	79	79	71	60	47	34
9	26	28	36	48	63	73	79	79	71	60	47	33
10	26	28	37	49	64	73	79	79	71	60	46	33
11	26	28	37	49	64	73	79	79	70	59	46	32
12	26	28	37	50	65	73	79	79	70	59	45	32
13	25	29	38	50	65	74	79	79	70	58	45	32
14	25	29	38	51	65	74	79	78	69	58	44	31
15	25	29	39	51	66	74	79	78	69	58	44	31
16	25	29	39	52	66	74	79	78	69	57	44	31
17	25	30	39	52	67	75	79	78	68	57	43	30
18	25	30	40	53	67	75	80	78	68	56	43	30
19	25	30	40	53	67	75	80	77	68	56	42	30
20	25	31	40	54	68	75	80	77	67	56	42	30
21	25	31	41	54	68	75	80	77	67	55	41	29
22	25	31	41	54	68	76	80	77	66	55	41	29
23	25	31	42	55	69	76	80	76	66	54	40	29
24	26	32	42	56	69	76	80	76	66	54	40	28
25	26	32	42	56	69	76	80	76	65	53	39	28
26	26	32	43	57	70	76	80	76	65	53	39	28
27	26	33	43	57	70	77	80	75	65	52	38	28
28	26	33	44	58	70	77	80	75	64	52	38	28
29	26	33	44	58	70	77	80	75	64	52	38	27
30	26	-	44	59	71	77	80	74	63	51	37	27
31	26	-	45	-	71	-	80	74	-	51	-	27
Month	25.7	29.3	39.0	51.6	65.8	74.2	79.2	77.6	68.7	57.1	43.7	31.1

Sum/average of daily normals might not match monthly normal due to rounding.

Product generated by ACIS - NOAA Regional Climate Centers.

AgACIS Features

- Fully integrated with NRCS e-Field Office Technical Guide
- Historical and real-time data
- Updated in real-time
- Seamless Internet interface to model development
- Opportunity to leverage climate expertise
- Basis for integrating many other climate networks

Future Directions

- ✓ Further automating of manual snow courses to SNOTEL sites where real-time information is needed to provide water supply forecasts.
- ✓ Expansion of SCAN to provide governments, water managers, agricultural producers, businesses and researchers improved information about soil moisture conditions and potential droughts.
- ✓ Improving models and computational capacity to provide more frequent and accurate water supply forecasts and assessments of soil moisture.
- ✓ Development of simulation modeling capabilities to compliment statistical modeling efforts

Energy and Water Programs within the United States Department of Agriculture

Ron Abramovich¹ and Michael Strobel²

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The United States Department of Agriculture (USDA) is one of the nation's oldest Federal departments. It employs more than 100,000 people whose work touches the lives of every American in various ways every day. It is one of the most complex departments in the Federal Government, with more than 300 programs that spend more than \$75 billion each year to help lead and manage a variety of food, agriculture, natural resources, and related programs. The USDA goals and objectives, and the implementation of its programs, are sound public policy based on the best available science. USDA works with individuals, agricultural and natural resources organizations, and units of government throughout the U.S., and in many other countries throughout the world, to enhance economic opportunities for agricultural producers and rural communities, to protect the nation's food supply, to improve nutrition and health, and to protect the nation's natural resources and environment.

Energy and water programs are critical components of the USDA. Agriculture in the U.S. is both a major consumer and producer of energy, with crops, forests and livestock requiring energy use for all aspects of production in the field, transport and processing, and conversely, the use of biofuels as a growing source of energy throughout the country. Irrigation is the largest user of freshwater in the U.S. and accounts for about 65 percent of total water withdrawals, excluding water used for thermoelectric power (Schaible 2004). Irrigation is critical in the U.S. as nearly half the value of all crops sold comes from the 16 percent of harvested cropland that is irrigated (Schaible 2004). Because energy and water are so critical

for agriculture, the USDA strives to meet emerging issues by supporting the development and use of new technology for increased energy production and energy conservation, and by providing water supply information along with technical and financial assistance to improve the management decisions affecting both water quantity and quality. This paper provides a brief overview of the many energy and water programs managed in the USDA.

Historic Overview

The USDA was established on May 15, 1862 when President Abraham Lincoln signed the Department of Agriculture Organic Act into law. In addition to establishing this department, 1862 also saw the Homestead Act approved; the Act opened new lands for settlement and provided 160 acres of public lands to heads of families and adults. Also important was the Morrill Land Grant College Act, which donated public lands for colleges focused on agriculture and mechanical arts. The fact that this legislation passed highlights the importance which President Lincoln and Congress placed on agriculture and its place in the American society, the economy, and the future.

Authorities and Funding

The USDA was elevated to cabinet status in 1889. USDA develops and executes policy dealing with various aspects of farming, agricultural programs and activities, and food production, distribution, and safety. In addition, the department oversees research, assistance to rural communities, conservation and protection of natural resources, and global trade.

Most funding in USDA is authorized through

Thank you

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