

RECLAMATION

Managing Water in the West

Governor's Drought and Water Supply Advisory Meeting

**RESERVOIR AND RIVER OPERATIONS
Montana Area Office
Billings**

October 16, 2014



U.S. Department of the Interior
Bureau of Reclamation

SHERBURNE

204%



TIBER



106%

FRESNO



170%

NELSON



130%

GIBSON



74%

PISHKUN



125%

WILLOW CREEK



125%

CANYON FERRY



108%

CLARK CANYON



78%

BIGHORN



114%

Key

Reservoir Name



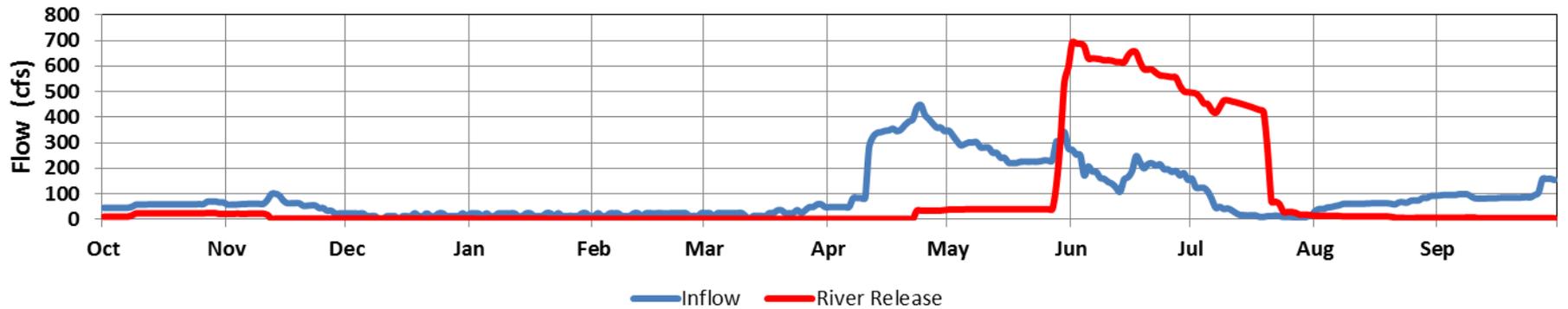
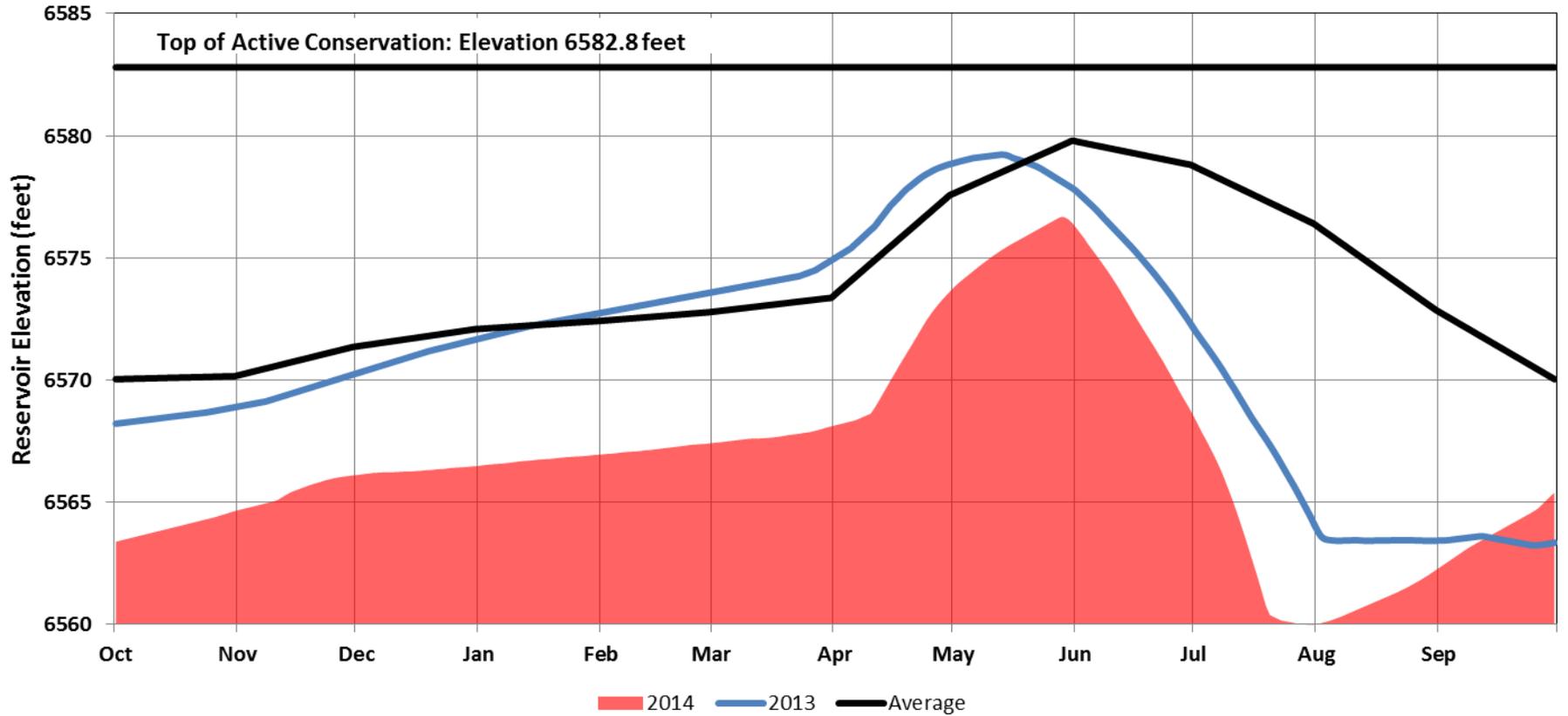
100%

Reservoir Storage
Percent of Average (%)

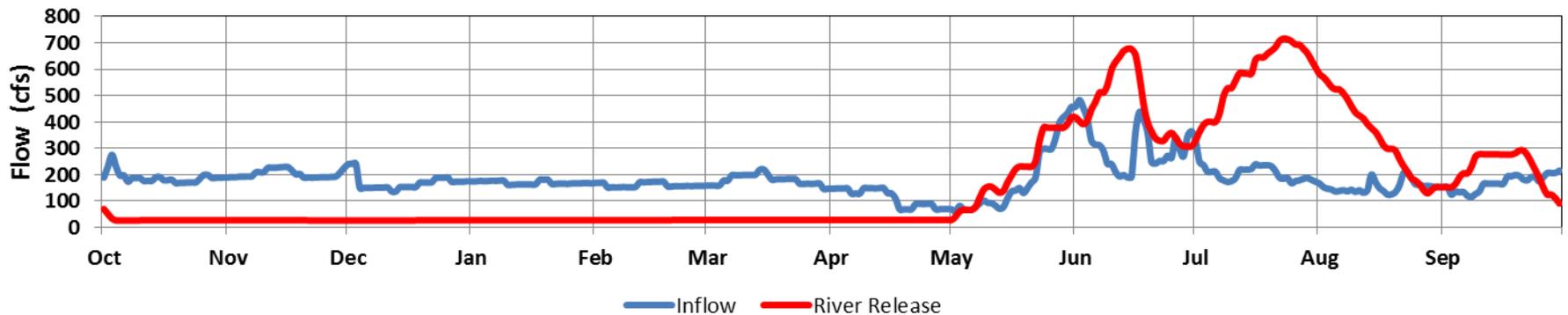
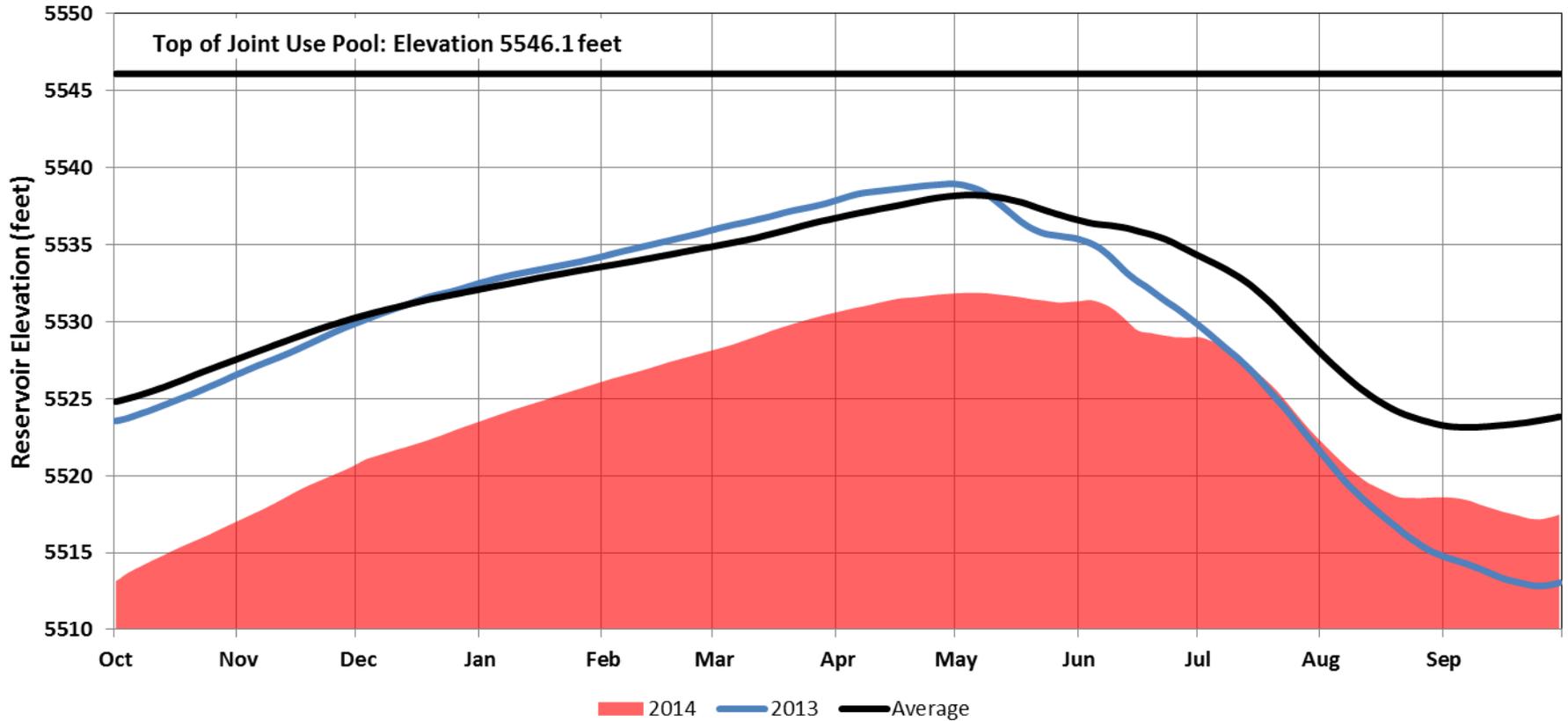
Reclamation: Montana Area Office

Reservoir Storage Status : October 14, 2014

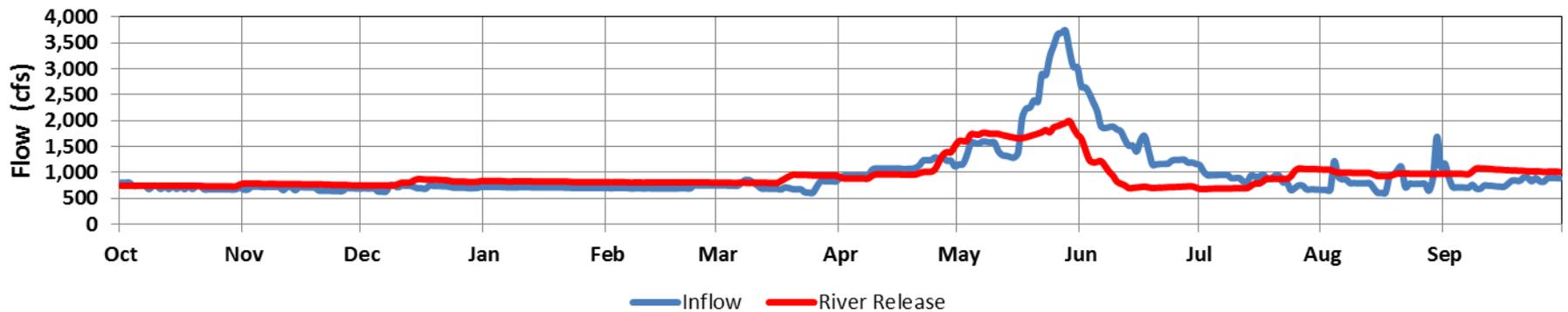
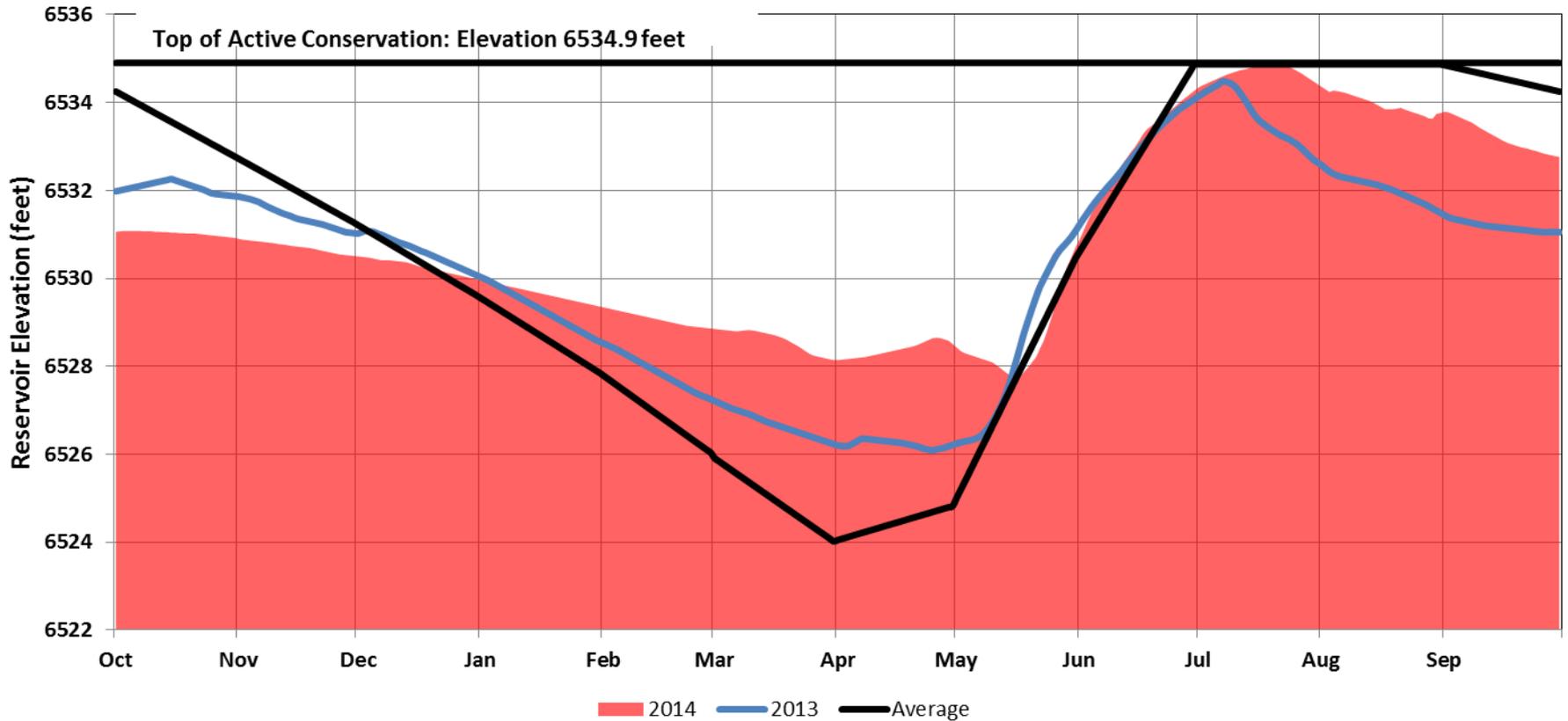
Lima Reservoir Operations



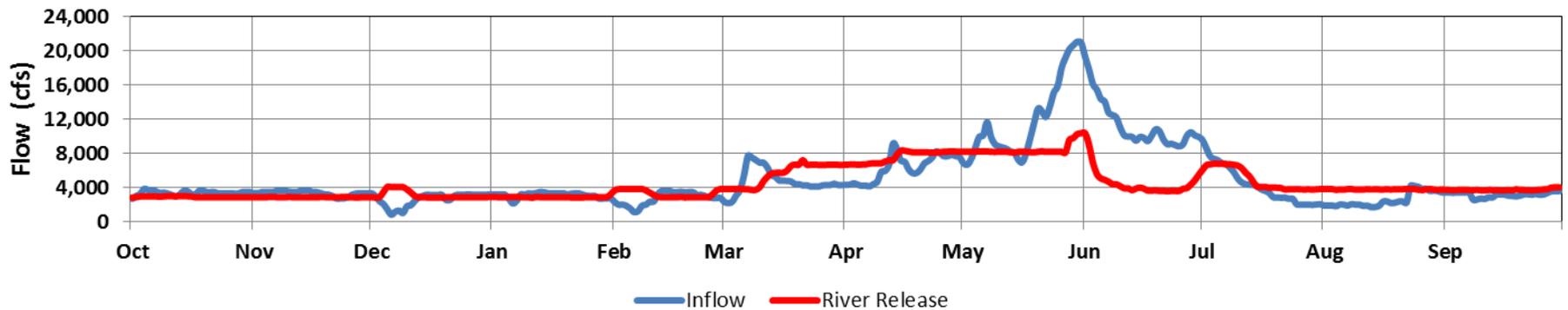
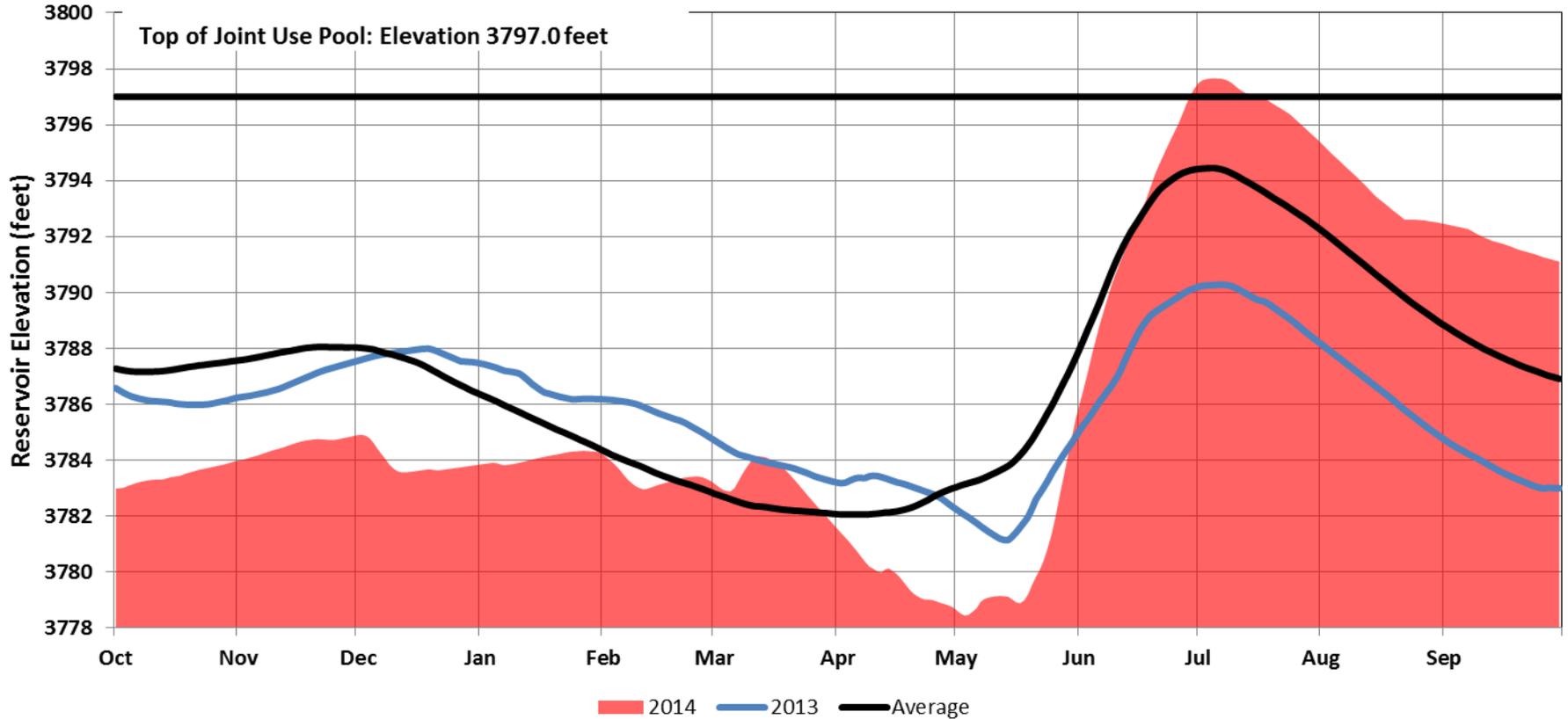
Clark Canyon Reservoir Operations



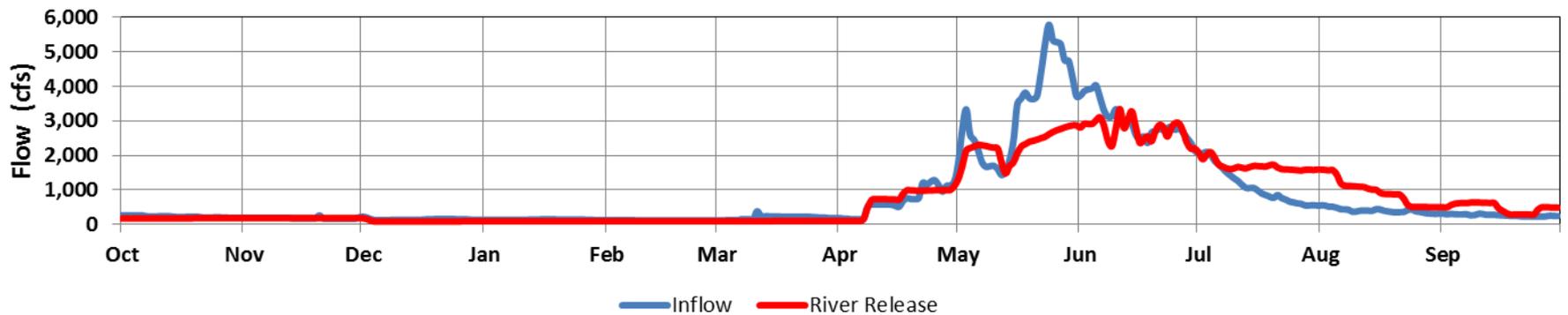
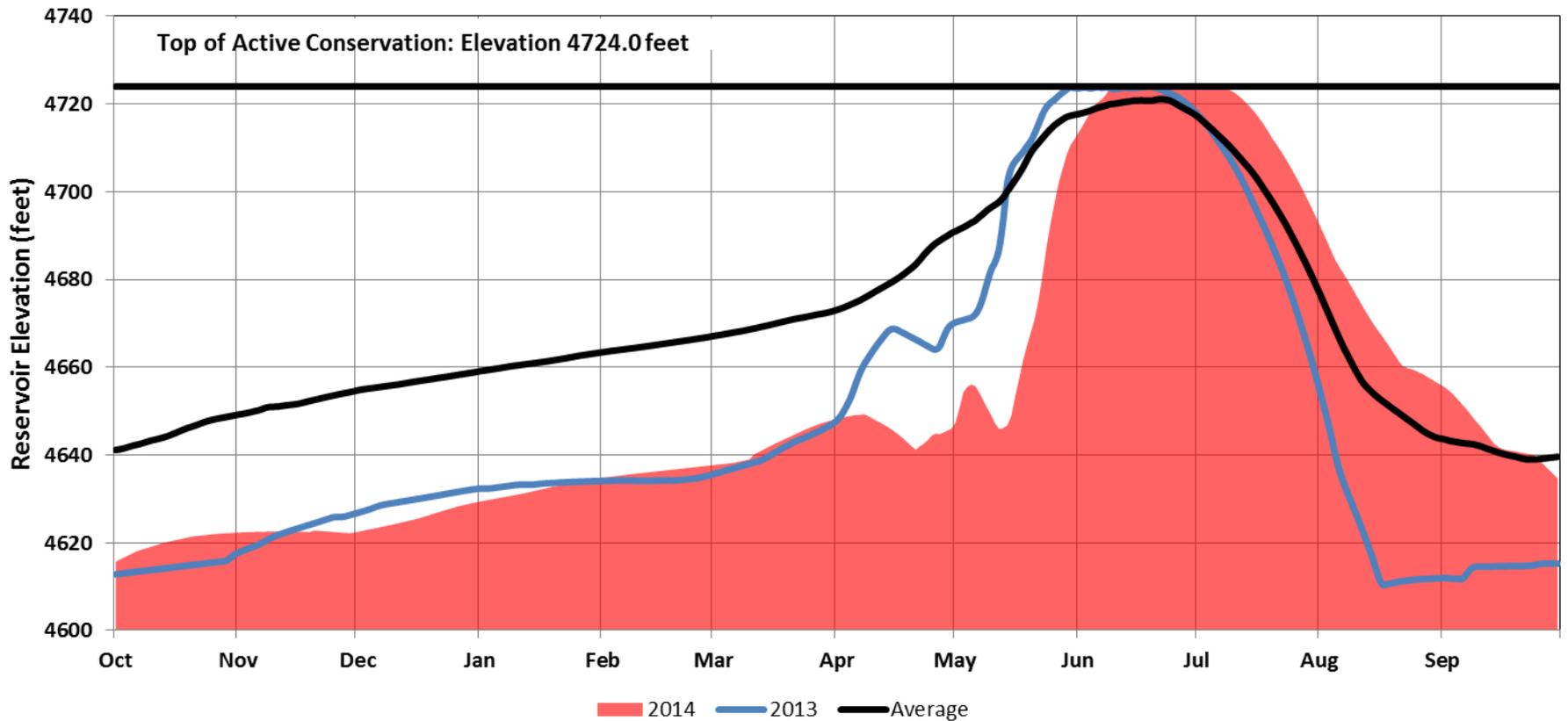
Hebgen Reservoir Operations



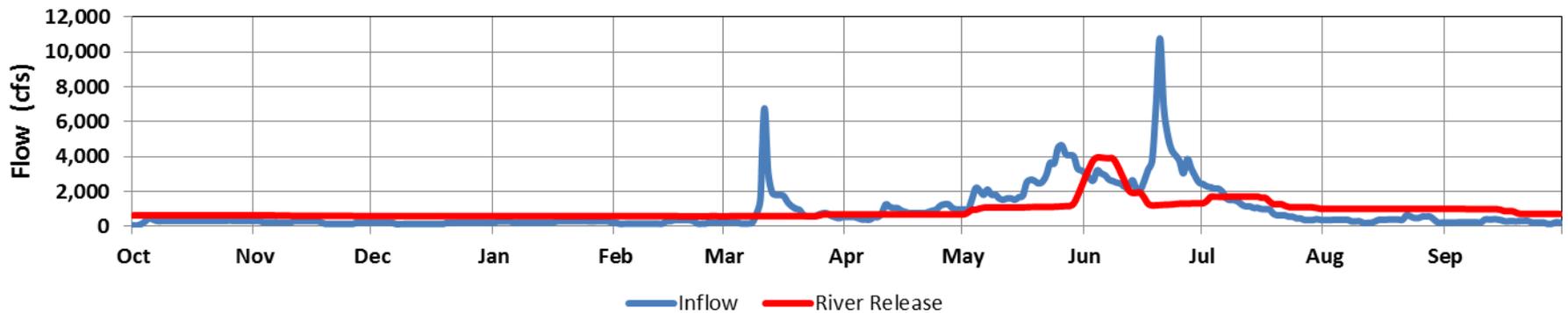
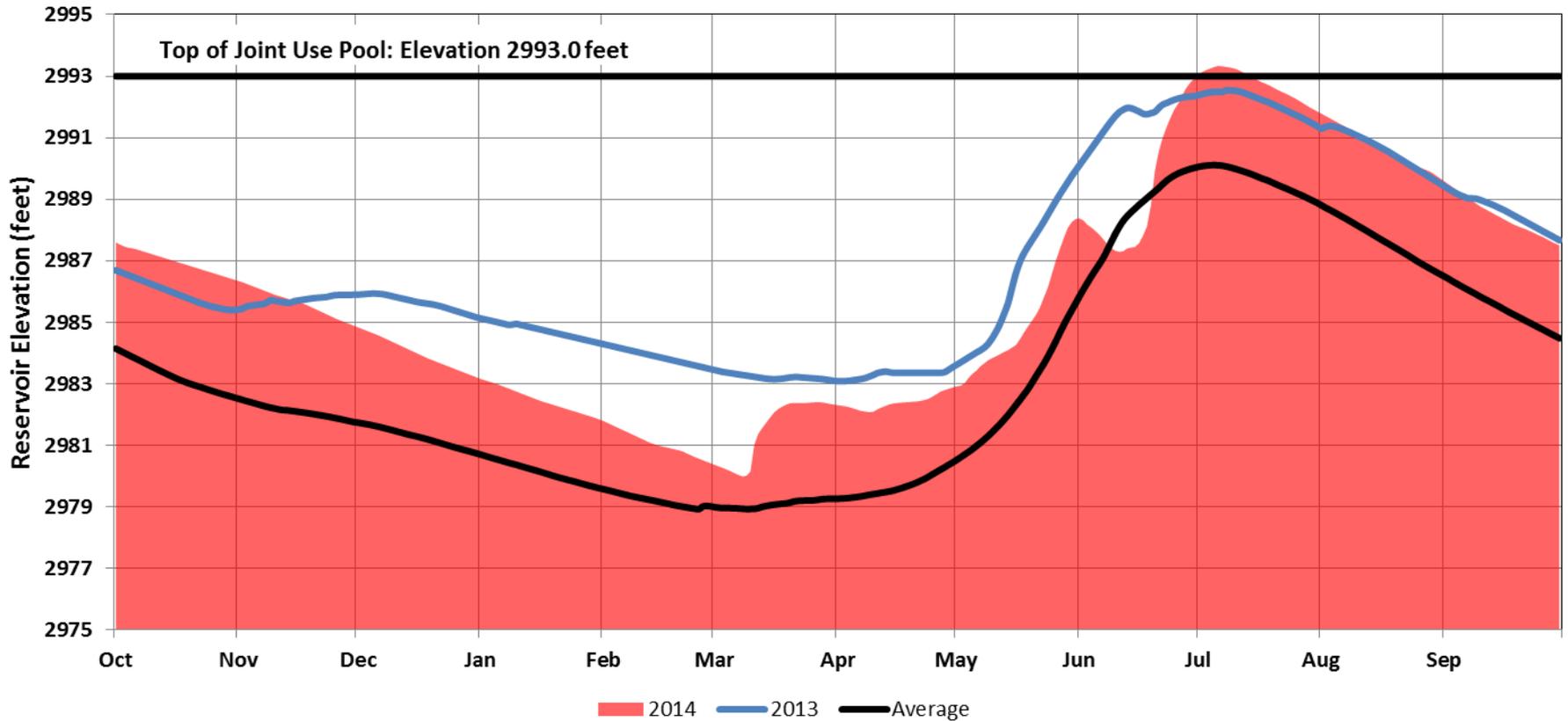
Canyon Ferry Reservoir Operations



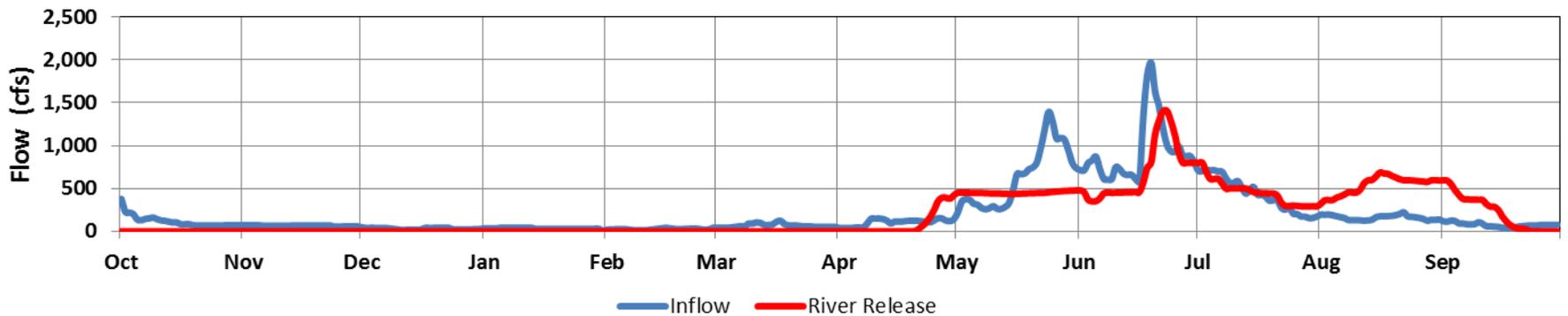
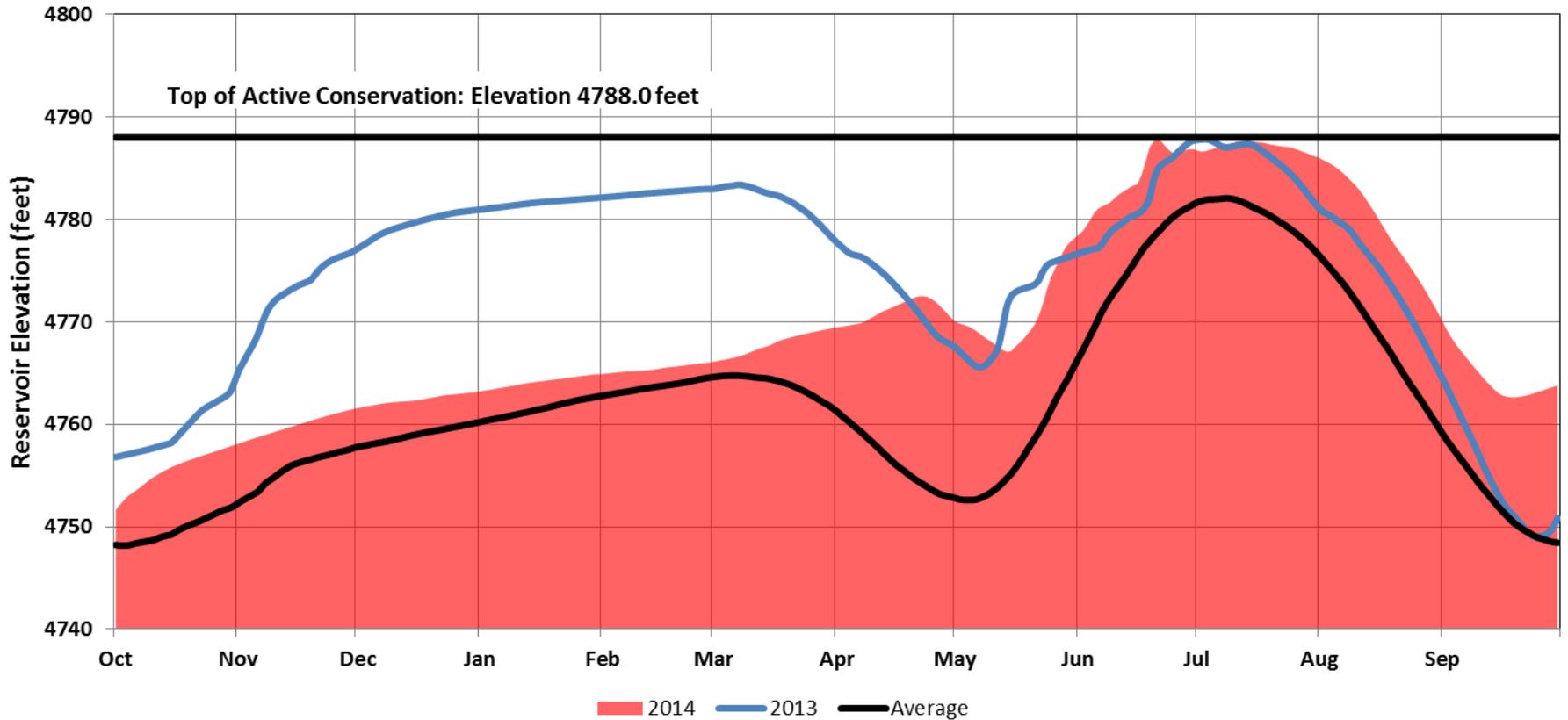
Gibson Reservoir Operations



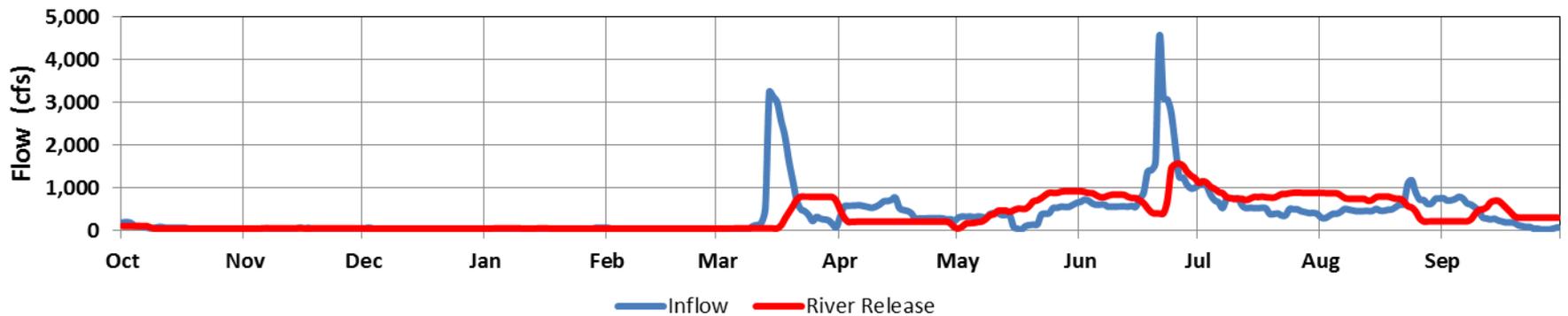
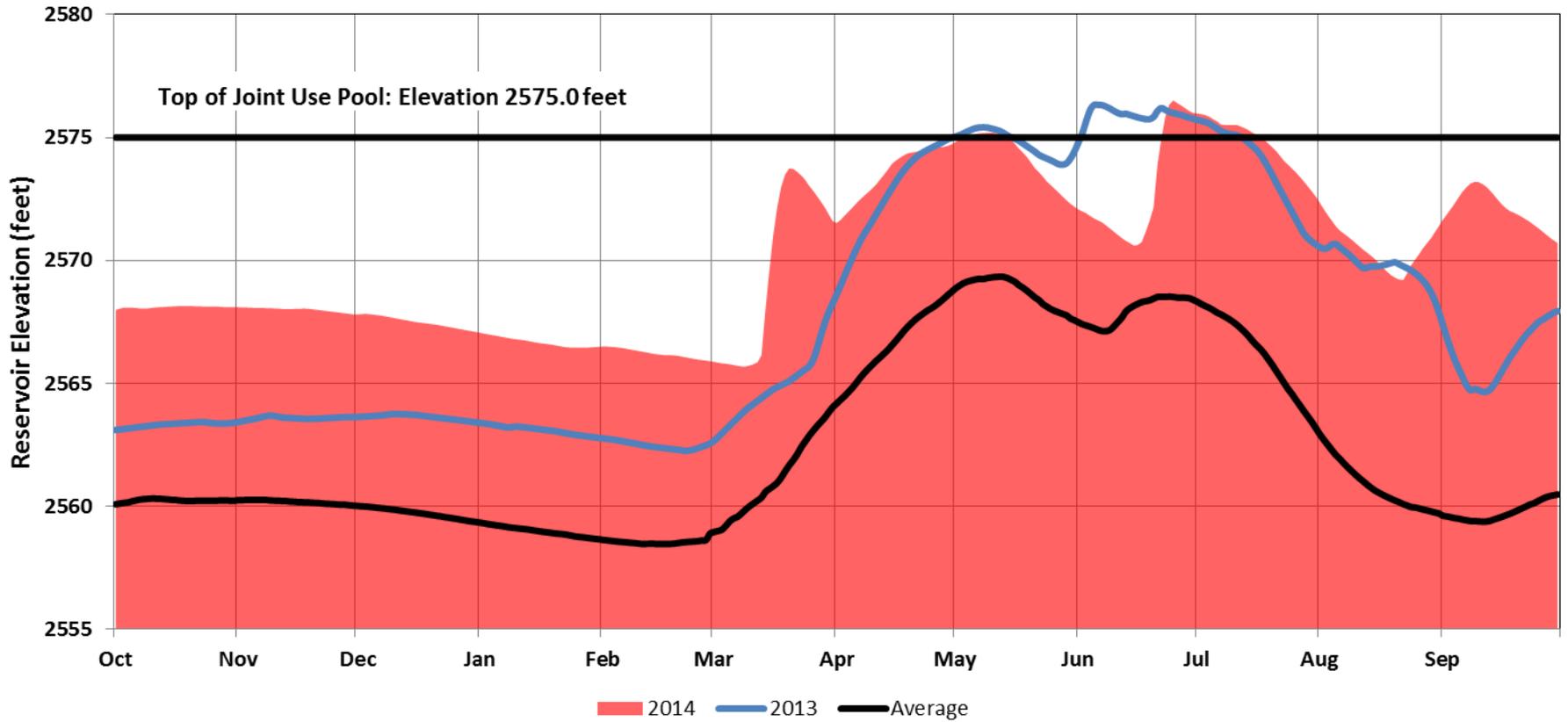
Lake Elwell (Tiber Dam) Operations



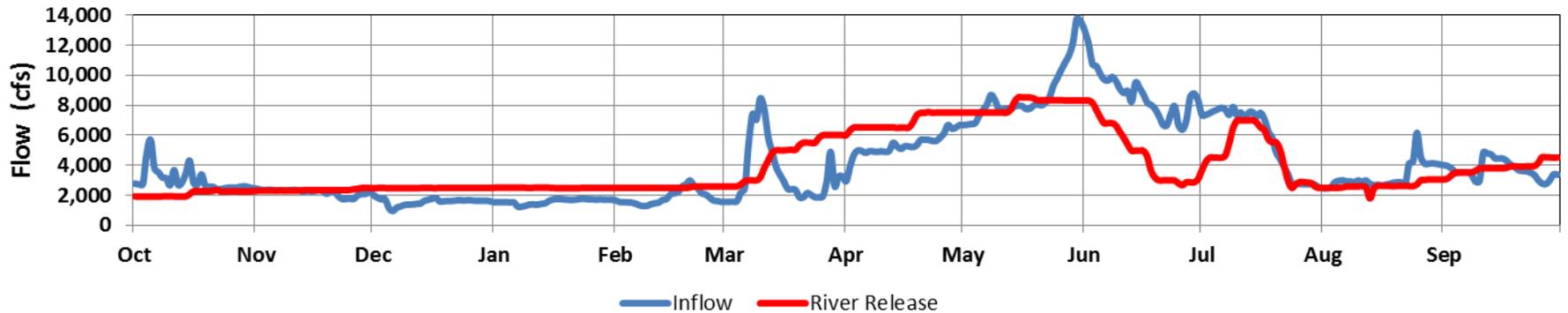
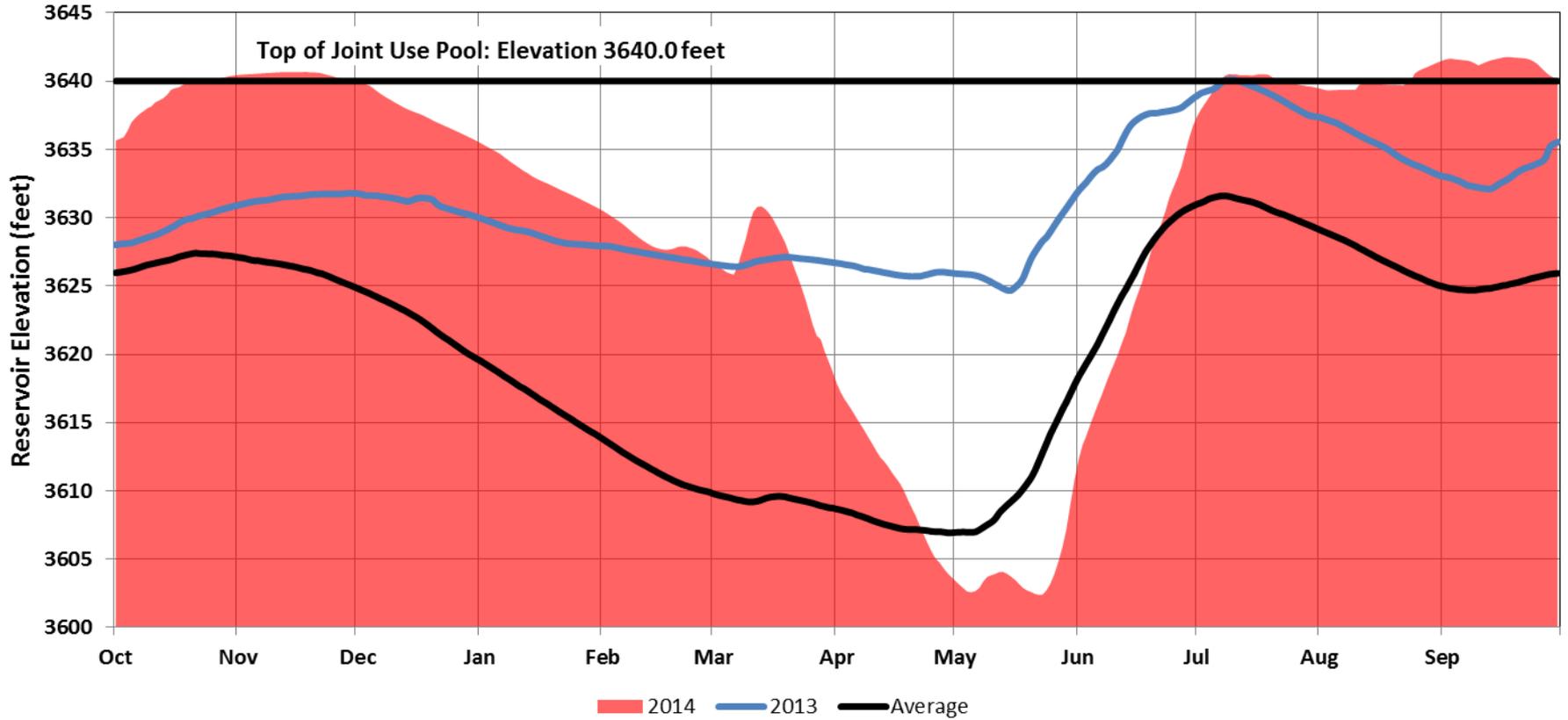
Lake Sherburne Operations



Fresno Reservoir Operations



Bighorn Lake (Yellowtail Dam) Operations



Summary of Water Year 2014

- Peak snowpack ranged between 6th - 13th highest on record
- Total inflows were 100% – 140% of 30 year average, except for Clark Canyon (60%)
- Canyon Ferry reservoir was drawn down to elevation 3778.45 feet in preparation for spring runoff
- Yellowtail Dam was drawn down to elevation 3602.38 feet in preparation for spring runoff
- All irrigation districts received a full water supply, except for East Bench Unit
- Current storage in all Reclamation reservoirs are above the 30 year average, except for Clark Canyon & Gibson
- Operational outlooks are favorable to maintain desired winter river fishery flows and good power generation

Reclamation's Internet Website

<http://www.usbr.gov/gp/hydromet/>

- near real-time data available through the HYDROMET data system
- summaries and plots of historical data
- annual reservoir operating plan publication
- monthly water supply reports
- project data
- snow plots
- links to related internet sites

RECLAMATION



Steve Bullock, Governor
Tracy Stone-Manning, Director

P. O. Box 200901 • Helena, MT 59620-0901 • (406) 444-2544 • Website: www.deq.mt.gov

2014 Climate Change Activity at the Montana Department of Environmental Quality

The Montana Department of Environmental Quality (DEQ) deals with a variety of environmental media that have a nexus with climate variability. The activities vary by media.

Public Water and Subdivision Bureau (PWSB)

The drinking water systems we regulate are affected by changes in climate that may result in significant changes to quantity and quality of the water. Changes in quality due to climate change can impact a water system's ability to adequately treat the water and assure its safety. Changes in water quantity can affect a system's ability to meet customer water demands.

During periods of flooding or extreme drought PWSB staff kept in regular contact with operators of public water systems in affected areas to assess their current status and to provide technical assistance as needed. The flooding of 2014 was no exception. Staff worked with water systems in Park, Lewis & Clark, Gallatin, Golden Valley, Lincoln, Teton, Missoula, and Yellowstone Counties. Three health advisories, four boil water orders, and one closure were issued.

The PWSB has been active in providing emergency response training including flooding and water loss (drought) situations to water system operators and program staff. In addition we have a webpage dedicated to emergency preparedness, security, and safety for public water supplies.

The PWSB has implemented a process where design reviews for systems impacted by drought or other climate change impacts are given priority over more routine files so the public water system can be brought back on-line as quickly as possible.

Also as a result of the recent drought, a policy has been implemented to require all new multi-user drinking water wells proposed for a subdivision to be pump tested prior to final approval. This ensures that the proposed water supply is adequate in terms of water quality, quantity and dependability.

Waste and Underground Tank Management Bureau (WUTMB)

WUTMB has addressed effects of climate variability on Montanans through our ongoing partnership with landfill gas capture and conversion to energy projects. Less methane to atmosphere means less greenhouse gas.

The Billings landfill methane gas capture and subsequent conversion to pipeline quality gas for use in area homes was undertaken by Montana Dakota Utilities (MDU) in 2010 and is ongoing in partnership with MDEQ. Approximately 10, 000 homes in the Billings are served by this project.

Also, methane gas from the Flathead County Regional Landfill is captured and used to power a 2 Megawatt generator which supplements electricity used in area homes and businesses. The generator came online in 2008 or 2009 and is still functioning.

Air Resources Management Bureau (ARMB)

In response to the nexus between climate variability and increased incidence, length, and severity of wildfire seasons in Montana, in 2014 the ARMB dedicated additional resources to implementation of the overall smoke management program along two primary fronts:

- First, the ARMB increased resources dedicated to implementation of the prescribed open burning program in an effort to facilitate more regulated burning and thereby limit wildfire events and associated human health and welfare impacts.
- Also, the ARMB increased resources dedicated to a wildfire smoke communication strategy to ensure that the public understands and has access to near real-time data associated with wildfire smoke impacts. This was accomplished through the Today's Air website, various stakeholder outreach media, and the development of a proposal for a Mobile App (in production) to serve a similar purpose as Today's Air but with the advantage of having the info at your fingertips at all times.

Contact information:

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Reservoir Storage Outlook

October 16, 2014

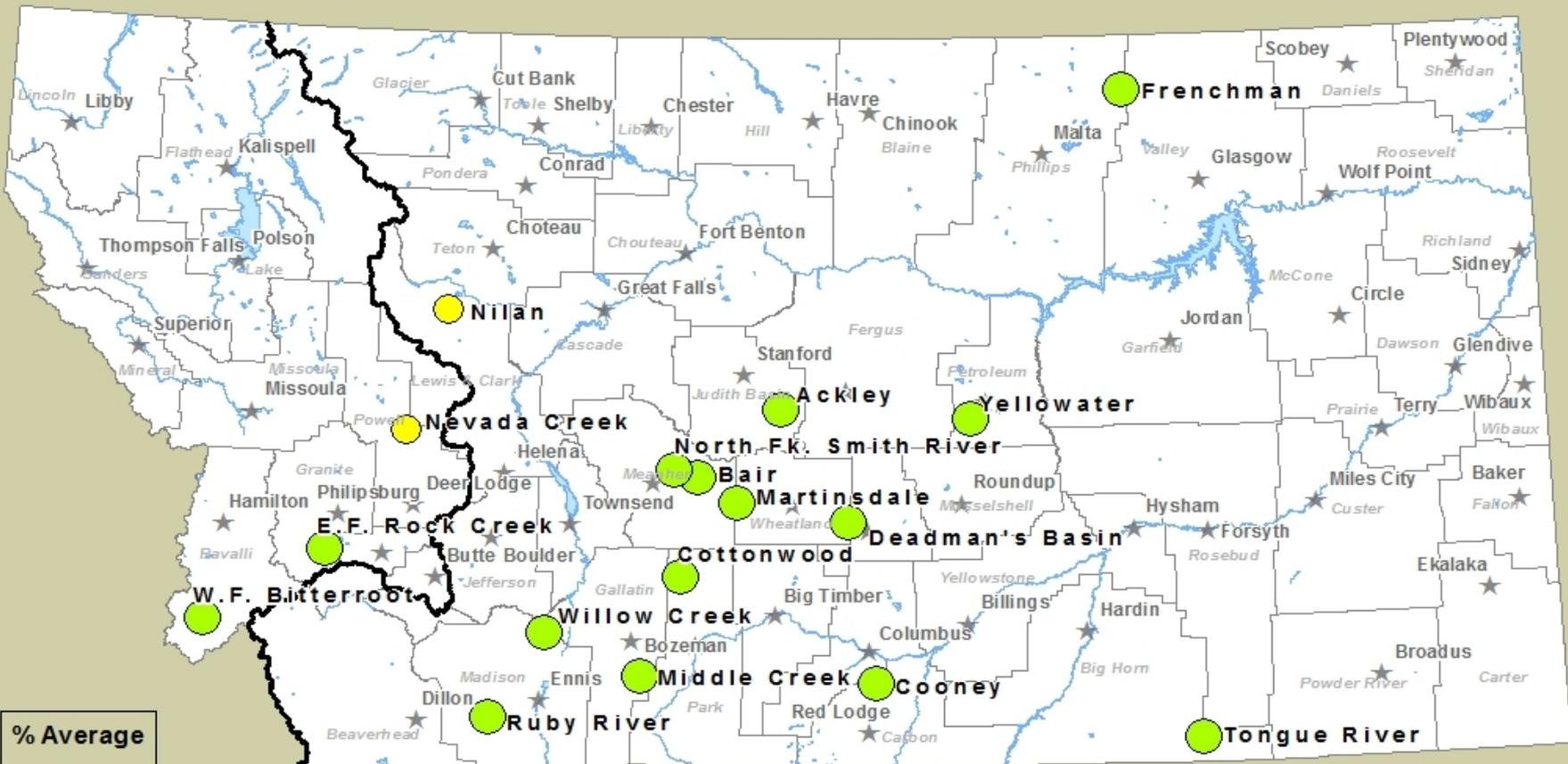


DNRC Water Resources Division
State Water Projects Bureau

Montana DNRC State Water Projects Bureau Reservoirs

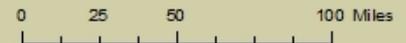


Reservoir Contents Report September 18, 2014

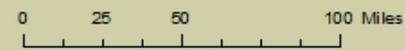
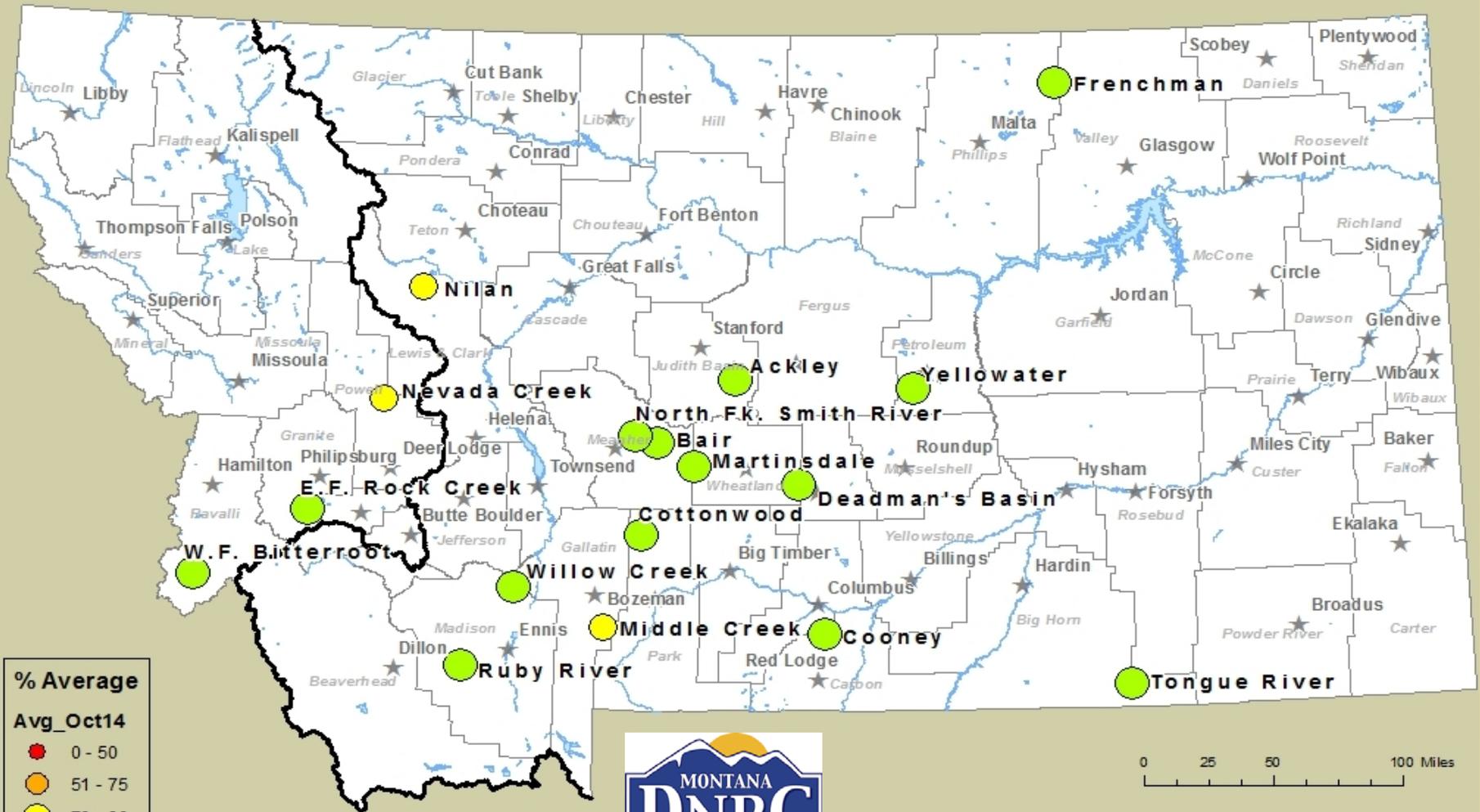


**% Average
avg_Sep14**

●	0 - 50
●	51 - 75
●	76 - 96
●	97+



Reservoir Contents Report October 16, 2014

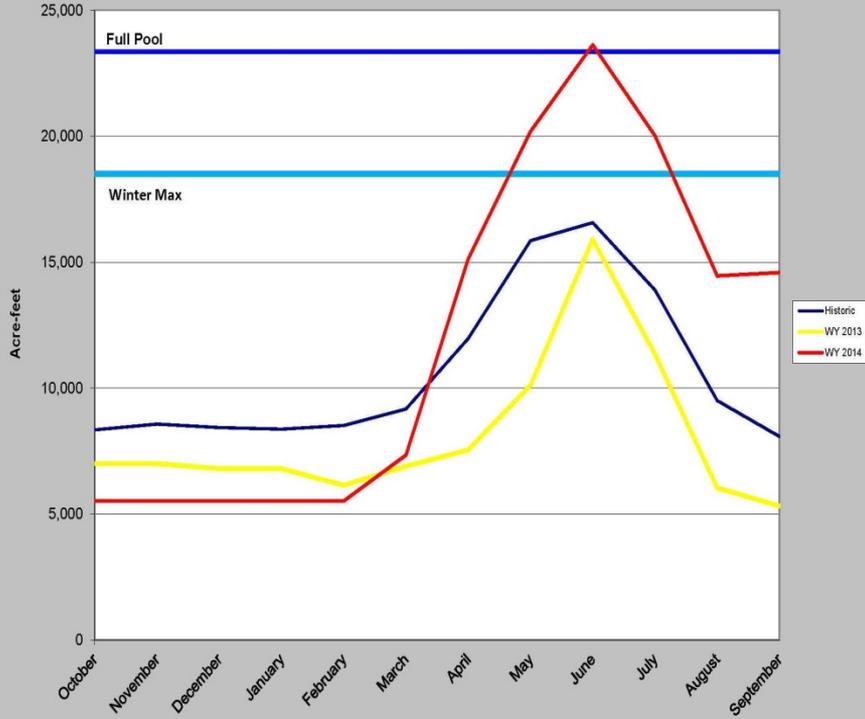


Montana DNRC State Water Projects Bureau Reservoirs

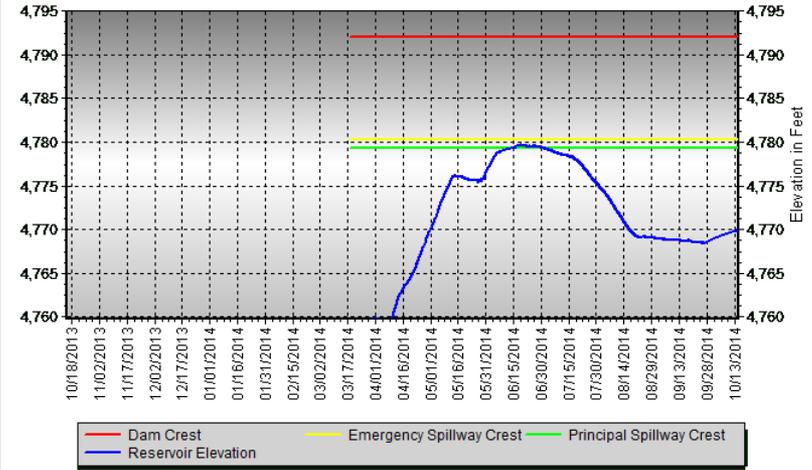


Martinsdale Reservoir

(Historic, WY 2013, and WY 2014)



MARTINSDALE DAM RESERVOIR ELEVATION — 365 DAYS



TIME OF LAST READING	10/15/2014 7:00:00 AM	REFERENCE INFORMATION	FT (MSL)	AC-FT
RESERVOIR ELEVATION	4,769.9 FT	DAM CREST	4792.0	38,958
RESERVOIR VOLUME	15,135 AF	EMERGENCY SPILLWAY CREST	4780.25	24,350
*NOTE: RESERVOIR ELEVATIONS BELOW 4759.78 FT ARE NOT VALID DUE TO INSTRUMENTATION LIMITATIONS.				
		PRINCIPAL SPILLWAY CREST	4779.25	23,348
		TRANSDUCER CASE DEPTH	4759.78	8,444

*** PROVISIONAL DATA SUBJECT TO REVISION ***



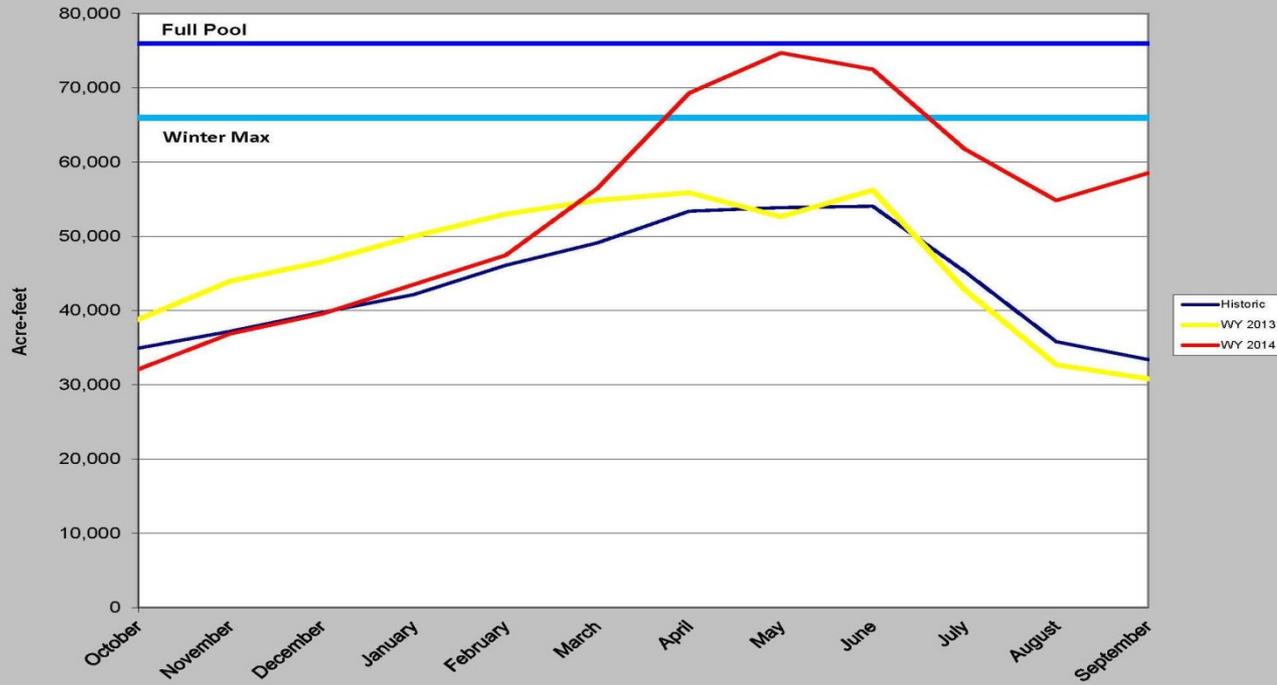
- 64% Capacity
- 15,135 Acre-Feet
- Elev. =4,769.9
- Water Supply is favorable

Montana DNRC State Water Projects Bureau Reservoirs



Deadman's Basin

(Historic, WY 2013, and WY 2014)



- 77% Capacity
- 58,521 Acre-Feet
- Elev. = 3912.19
- Water Supply is favorable

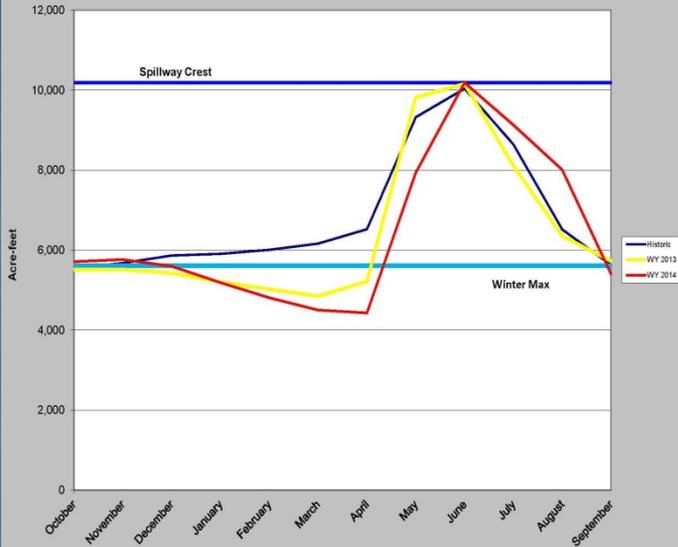


Montana DNRC State Water Projects Bureau Reservoirs

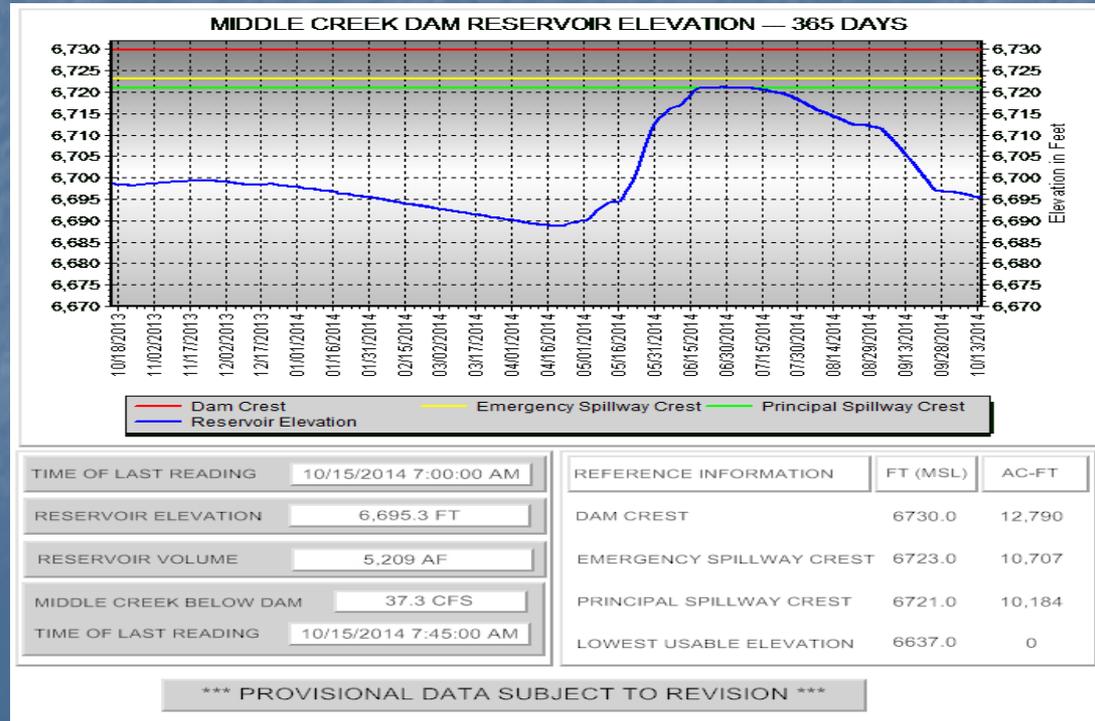


Middle Creek Reservoir

(Historic, WY 2013, and WY 2014)



- 51% Capacity
- Outflows=37 cfs
- 5,209 Acre-Feet
- Elev. =6695.3
- Water Supply is favorable

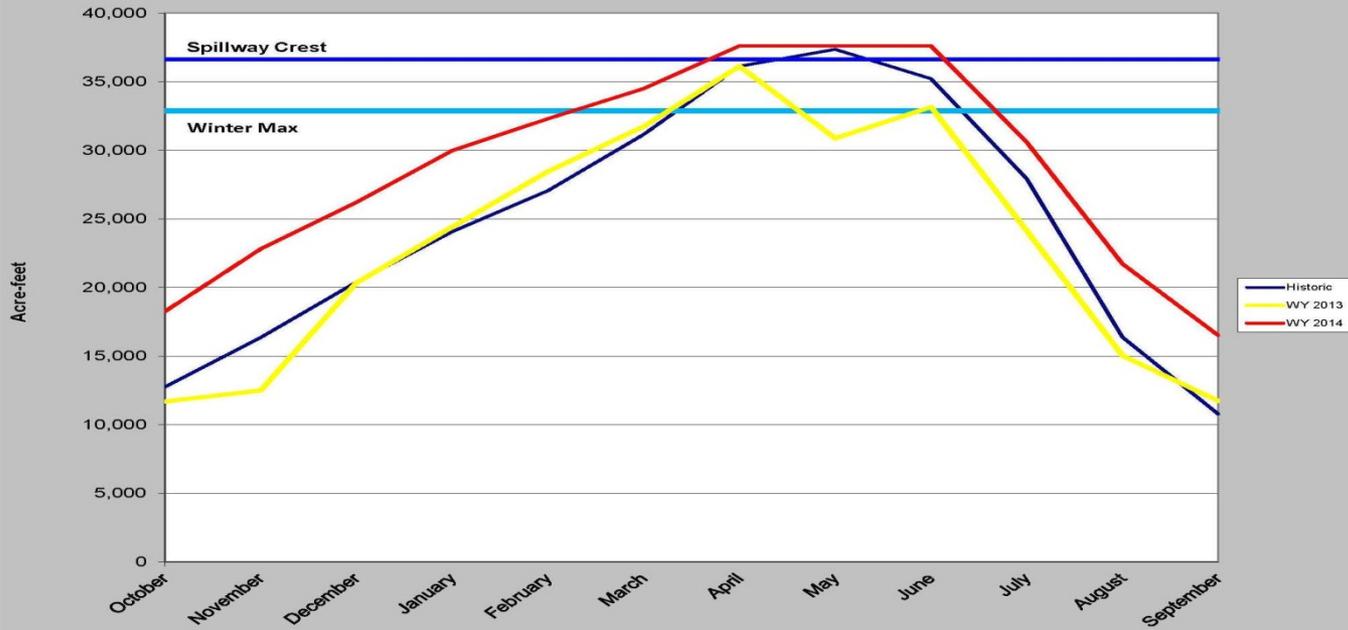


Montana DNRC State Water Projects Bureau Reservoirs



Ruby Reservoir

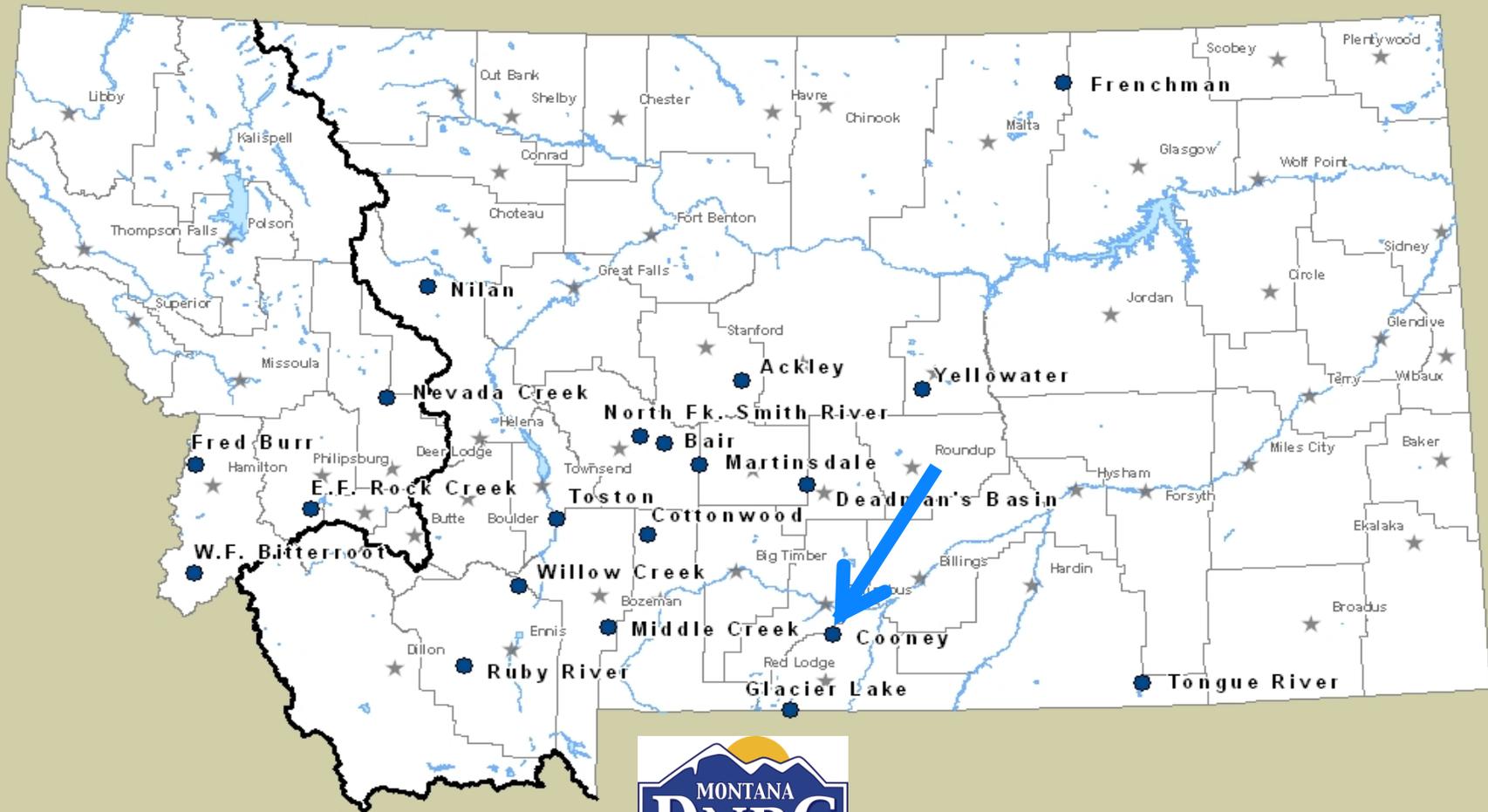
(Historic, WY 2013, and WY 2014)



- 44% Capacity
- Inflows= 136 cfs
- Outflows=60 cfs
- 16,509 Acre-Feet
- Elev.=5366.4
- Water Supply is favorable

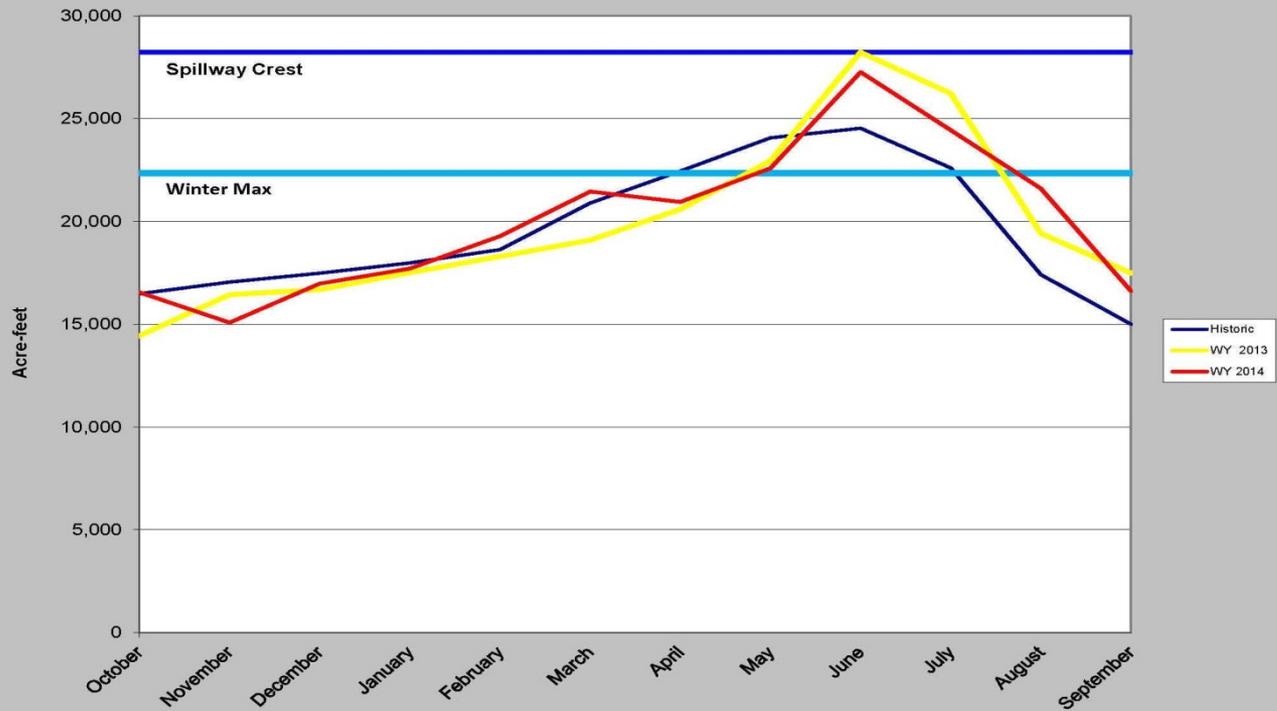


Montana DNRC State Water Projects Bureau Reservoirs



Cooney Reservoir

(Historic, WY 2013, and WY 2014)



- 59% Capacity
- 16,613 Acre-Feet
- Elev.=4235.48
- Inflows= 69 cfs
- Outflows= 177 cfs
- Water Supply is favorable

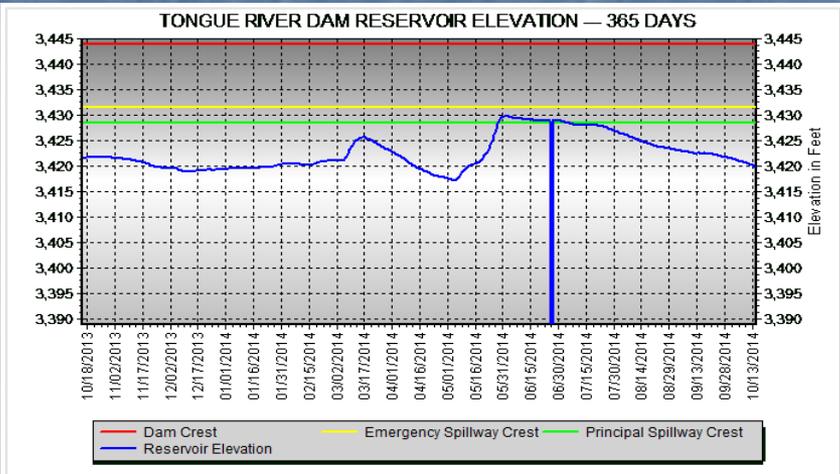


Montana DNRC State Water Projects Bureau Reservoirs



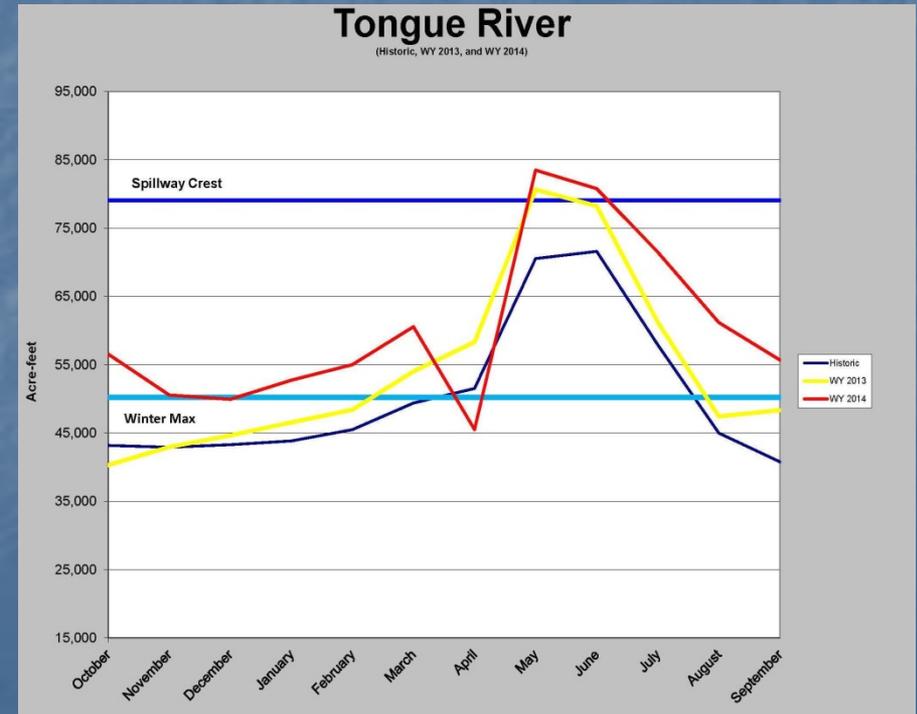
64% Capacity

- 51,236 Acre-Feet
- Elev. = 3419.9
- Inflows = 274 cfs
- Outflows = 412 cfs
- Water Supply is favorable



TIME OF LAST READING	10/15/2014 5:00:00 AM	REFERENCE INFORMATION	FT (MSL)	AC-FT
RESERVOIR ELEVATION	3,419.9 FT	DAM CREST	3444.0	150,000
RESERVOIR VOLUME	51,236 AF	EMERGENCY SPILLWAY CREST	3431.5	91,107
PRIMARY GATE	30.0%	PRINCIPAL SPILLWAY CREST	3428.4	79,071
SECONDARY GATE	1.0%	TOP OF LOW LEVEL INTAKE	3390.0	6,656

*** PROVISIONAL DATA SUBJECT TO REVISION ***



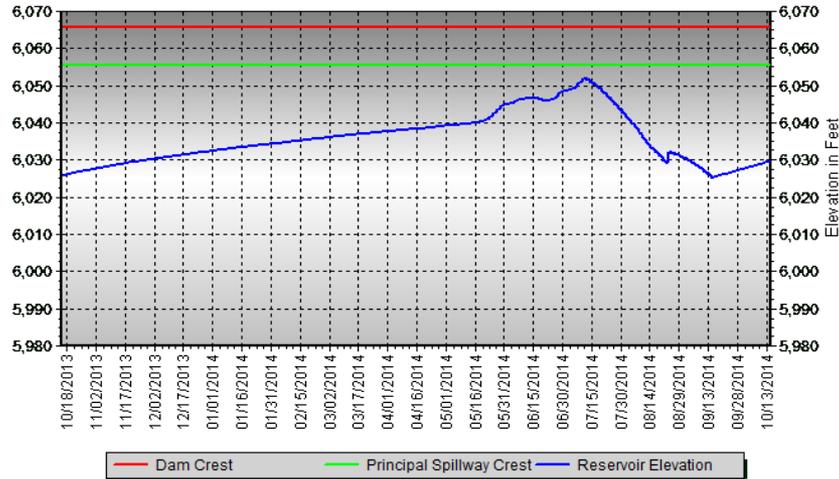
Montana DNRC State Water Projects Bureau Reservoirs





- 45% Capacity
- 7,331 Acre-Feet
- Elev. = 6029.7
- Water Supply is favorable

EAST FORK OF ROCK CREEK DAM RESERVOIR ELEVATION — 365 DAYS



TIME OF LAST READING 10/15/2014 5:00:00 AM

RESERVOIR ELEVATION 6,029.7 FT

RESERVOIR VOLUME 7,331 AF

REFERENCE INFORMATION FT (MSL) AC-FT

DAM CREST 6065.6 19,850

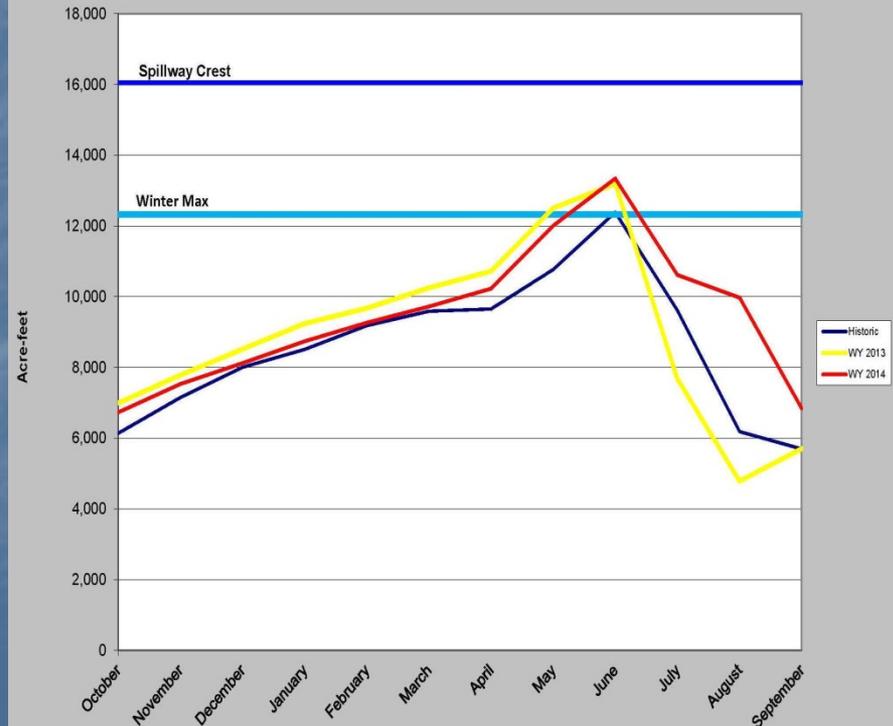
PRINCIPAL SPILLWAY CREST 6055.5 16,040

LOWEST USABLE ELEVATION 5989.7 0

*** PROVISIONAL DATA SUBJECT TO REVISION ***

East Fork Rock Creek Reservoir

(Historic, WY 2013, and WY 2014)

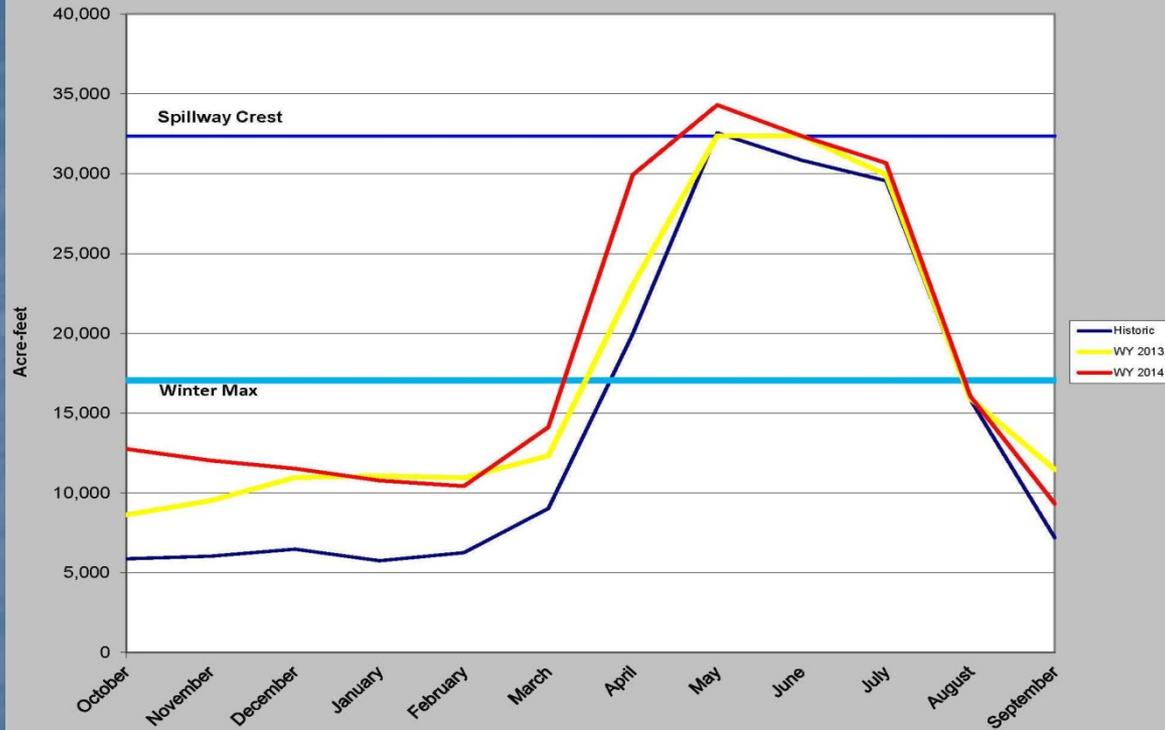


Montana DNRC State Water Projects Bureau Reservoirs



Painted Rocks Reservoir

(Historic, WY 2013, and WY 2014)



- 29% Capacity
- 9,326 Acre-Feet
- Elev. =4674.8
- Outflows=88 cfs
- Water Supply is favorable



MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

WATER RESOURCES DIVISION - STATE WATER PROJECTS BUREAU

September 30, 2014

All Contents in Acre-Feet

RESERVOIR	TOTAL CAPACITY (includes dead storage)*	CONTENTS						READING DATE	COMMENTS
		AVERAGE	Last Year	Last Month	PRESENT	% CAPACITY	%AVERAGE		
		1960 - 2013	9/30/2013	8/31/2014	9/30/2014	9/30/2014	9/30/2014		
	Full Pool								
	Contents								
ACKLEY	6,722	3,307	3,586	4,777	4,496	67	136	10/1/2014	elev.=4308.61
BAIR	7,300	2,764	2,506	5,200	5,306	73	192	10/1/2014	elev.=5316.9
COONEY	28,230	15,001	17,484	21,607	16,613	59	111	9/29/2014	elev.=4235.48 (16,523 AF)
COTTONWOOD	1,900	638	200	1,140	1,151	61	180	9/24/2014	elev.=5098.75
DEADMAN'S BASIN	75,968	33,391	30,813	54,837	58,521	77	175	10/1/2014	elev.=3912.19 (54,771 AF)
E.F. ROCK CREEK	16,040	5,694	5,702	9,971	6,842	43	120	10/3/2014	elev.=6028.0
FRENCHMAN	2,777	1,173	1,480	2,717	2,657	96	227	10/7/2014	elev.=2264.4
MARTINSDALE	23,348	8,106	5,322	14,458	14,590	62	180	10/3/2014	elev.=4769.1
MIDDLE CREEK	10,184	5,626	5,728	8,006	5,404	53	96	10/3/2014	elev.=6696.6
NEVADA CREEK	11,207	4,201	2,546	5,953	3,835	34	91	9/30/2014	elev.=4591.35
NILAN	10,992	5,462	4,461	5,841	5,257	48	96	9/30/2014	elev.=4428.85 (4,357 AF)
N.F.K. SMITH RIVER	11,406	4,874	5,474	8,241	7,486	66	154	10/1/2014	elev.=5475.03
RUBY RIVER	37,612	10,781	11,735	21,722	16,509	44	153	10/3/2014	elev.=5366.4
TONGUE RIVER	79,071	40,774	48,356	61,178	55,689	70	137	10/3/2014	elev.=3421.4
W.F. BITTERROOT	32,362	7,196	11,465	16,059	9,326	29	130	9/29/2014	elev.=4674.8
WILLOW CREEK	18,000	7,450	3,844	11,929	8,054	45	108	9/30/2014	elev.=4720.69
YELLOWWATER	3,842	1,291	3,463	4,039	3,800	99	294	10/2/2014	volume estimated

* Note: Reservoir contents include dead storage at the following:

Ackley	1001 AF	**	** O&M slope storage table does not include dead storage (so dead storage has to be added into the storage from the table)
Cooney	90 AF	**	Tongue River 711 AF (O&M storage table includes dead storage)
Deadman's	3750 AF	**	W. F. Bitterroot 656 AF (O&M storage table includes dead storage)
Nilan	900 AF	**	Willow Creek 269 AF (O&M storage table includes dead storage)

* Note: Cooney capacity reflects capacity after 1982 dam rehabilitation; prior capacity was 24,195 A.F.. Average storage shown is for post rehabilitation data.

* Note: Middle Creek capacity reflects capacity after 1993 dam rehabilitation; prior capacity was 8,027 A.F.. Average storage shown is for post rehabilitation data.

* Note: Nevada Creek Reservoir Capacity reflects live storage capacity survey conducted in year 2000. Prior live storage capacity documented as 12,723 AF.

* Note: Tongue River capacity reflects capacity after 1999 dam rehabilitation; prior capacity was 68,040 A.F.. Average storage is post rehabilitation data.

* Note: Frenchman Reservoir capacity tables updated based on aerial survey; prior capacity was 3752 A.F. Average shown is pre aerial survey

MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

WATER RESOURCES DIVISION - STATE WATER PROJECTS BUREAU

WY 2014

All Contents in Acre-Feet

RESERVOIR	CAPACITY* (includes Dead Storage)	END OF MONTH CONTENTS											
	Full Pool Contents	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep
ACKLEY	6,722	3,586	3,586	3,586	3,586	3,586	4,153	4,112	4,552	6,213	5,399	4,777	4,496
BAIR	7,300	2,761	3,000	3200	3,500	3,230	3,773	5,114	7,261	7,512	6,416	5,200	5,306
COONEY	28,230	16,550	15,076	16972	17,710	19,286	21,461	20,950	22,584	27,263	24,440	21,607	16,613
COTTONWOOD	1,900	200	225	225	300	500	1596	1981	1987	1900	1745	1,140	1,151
DEADMAN'S BASIN	75,968	32083	36880	39530	43507	47439	56444	69290	74686	72480	61770	54,837	58,521
E.F. ROCK CREEK	16,040	6727	7529	8120	8739	9261	9720	10224	12005	13340	10615	9,971	6,842
FRENCHMAN	2,777	1707	1707	1960	2777	2777	2777	2777	2777	2777	2340	2,717	2,657
MARTINSDALE	23,348	5521	5521	5521	5521	5521	7344	15138	20186	23622	20016	14,458	14,590
MIDDLE CREEK	10,184	5711	5763	5596	5186	4808	4499	4430	7935	10184	9130	8,006	5,404
NEVADA CREEK	11,207	2897	3360	3499	3784	4119	6521	10402	11522	10200	9243	5,953	3,835
NILAN	10,992	4817	5093	5272	5512	5759	6391	7920	10662	9854	7833	5,841	5,257
N.F.K. SMITH RIVER	11,406	5950	6200	6500	6700	6700	8148	10732	11553	11553	10732	8,241	7,486
RUBY RIVER	36,633	18264	22820	26211	29987	32300	34501	37612	37612	37612	30594	21,722	16,509
TONGUE RIVER	79,071	56552	50569	49942	52733	55004	60558	45515	83489	80784	71482	61,178	55,689
W.F. BITTERROOT	32,362	12,759	12032	11527	10781	10424	14125	29937	34305	32362	30664	16,059	9,326
WILLOW CREEK	18,000	8,063	8,500	8,500	9500	18000	16183	14033	16725	18000	16310	11,929	8,054
YELLOWATER	3,842	3431	3106	3106	2940	2940	3496	3431	3366	3236	2880	4,039	3,800

March 2014-Flood Damage

- Musselshell
- Flint Creek
- Missouri Broadwater
- Middle Creek (Hyalite)

TWO DOT CANAL-Upper Musselshell WUA AND DEADMAN'S SUPPLY CANAL-DMB WUA



- Two Dot Canal
Capacity=122 cfs
Length=32 miles

- Deadman's Supply Canal
Capacity=600 cfs
Length=11.5 miles

- Rapid snow melt/ice buildup overtopped canals

- Canals breached to prevent additional downstream flooding

- Total Damage
>\$100,000



Allendale Canal-Flint Creek WUA



- Allendale Canal
Capacity=125 cfs
Length=13 miles
- Rapid snow melt/ice buildup overtopped canals resulting in scarps
- Total Damage >\$30,000

Broadwater Missouri-East Canal-BWMWUA



- BW Missouri East Canal
Capacity=262 cfs
Length=34 miles
- Rapid snow melt/ice buildup overtopped canals resulting in failure
- Total Damage >\$10,000

Cottonwood Flume-Middle Creek WUA



- Cottonwood Flume
Capacity=77 cfs
Length=4 miles
- Rapid snow melt/ice buildup overtopped flume resulting in failure
- Total Damage **Undetermined**
>\$100,000

REHAB PROJECTS

- Broadwater Spillway Rubber Gate Replacement (Toston Dam)
- EF Rock Creek Main Canal Siphon
- EF Rock Creek Main Canal Fish Screen
- Ruby Reservoir

Broadwater Spillway Rubber Gate Replacement Toston Dam



- Bay 6 Gate Failure-
September 2012
- 2012-2013 Engineering
Design
- 2013-2014
Procurement of
Gates/Bulkheads
- 2014
Construction/Installation
Bulkheads/Needle
beams and Rubber
Gates
- Project Cost ~ \$2.5 M

EF Rock Creek-Rehab and Construction Projects



- Fall 2013-48" PVC siphon-"floated" out of ground
Repair Cost=\$100,000
- July 5th, 2014- 24" manhole cover ruptured
Repair Cost~\$25,000
- 2014-Fixed Vertical Panel Fish Screen
Project Cost=\$700,000

Ruby Reservoir



- New Spillway
- Lined Outlet Works
- Jet Flow Valve at Toe of Dam
- Total Project Cost=\$17,000,000

Summary

- March 2014 Flooding impacted DNRC SWP canals
- Majority of DNRC SWP Reservoirs filled to capacity during spring runoff.
- Majority of Reservoirs at or above historical average
- Winter Carryover providing good start to WY 2015
- Rehab projects wrapping up



*Montana Fish,
Wildlife & Parks*

Summary of Agency Actions

Governor's Drought and Water Supply Advisory Committee

Stephen Begley
Water Conservation Specialist

October 16, 2014

Recreational Closures

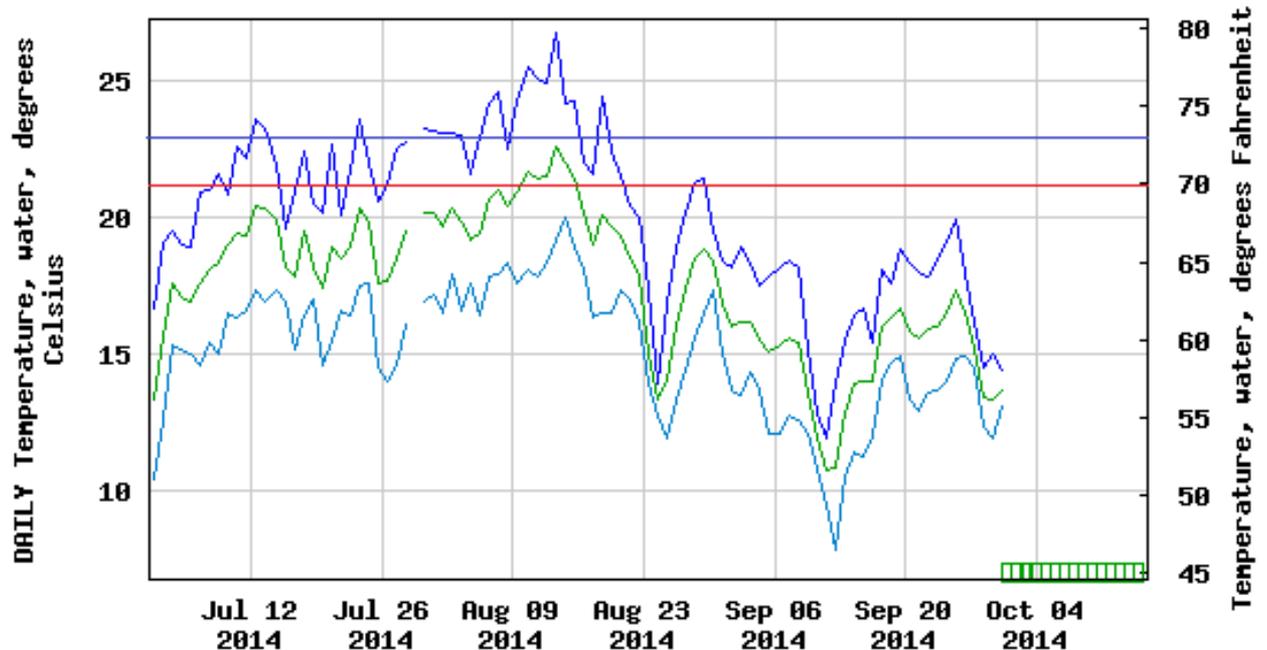


- On April 11, FWP issued an emergency closure on the Bitterroot River due to high flow conditions.

Fishing Restrictions



USGS 06077200 Smith River bl Eagle Cr nr Fort Logan MT



----- Provisional Data Subject to Revision -----

- Daily maximum temperature
- Daily minimum temperature
- Daily mean temperature
- Station operated seasonally



Montana Fish,
Wildlife & Parks

Fishing Restrictions

- On August 8, FWP issued hoot-owl (12pm-2am) fishing restrictions for the Sun, Dearborn, and Smith Rivers.
- The reopening criteria for most streams is three consecutive days when maximum water temperature does not exceed 70°F
- Hoot-owl restrictions were lifted on August 23.
- No active fishing restrictions or closures

Stream Flows

- FWP did not implement calls to junior water users during the 2014 irrigation season.
- In mid-July, FWP was closely monitoring flows at the Toston gage on the Missouri River, and the Gallatin River gage at Logan.
- Water users were notified by FWP when flows on the Jefferson River dropped below 600 cfs in late July.
- FWP was monitoring temperatures on the Jefferson and Madison Rivers, but no closures or restrictions were warranted.

Fire Restrictions on FWP Lands

- FWP did issue a number of Stage I and II Fire Restrictions on FWP Lands in Regions 1, 2, 5, 6, and 7.
- Most restrictions were rescinded by the end of August.
- Currently, FWP has one active Stage I Fire Restriction active in Powder River County in Region 7. The restriction includes the Broadus Bridge FAS.

Fire and Block Management



Hunting Fishing Recreation Fish & Wildlife Education Enforcement Doing Business News MyFWP



Home » Hunting » Hunter Access » Block Management » Region 1

Hunting Home

- Seasons
- Licenses & Permits
- Regulations
- Hunt Planner
- ALS Searches
- Hunter Access
 - Private Land Hunting
 - Block Management
 - How to Gain Access
 - Important Dates
 - Region 1

Region 1 Block Management

NOTICE: Due to current dry conditions and HIGH FIRE DANGER throughout much of Montana, hunters may encounter BMA closures or restrictions. Some BMA cooperators may be reluctant to make access commitments until weather conditions improve. Hunters should contact regional FWP staff and/or BMA landowners prior to making final hunting trip plans to identify any possible land closures, BMA use restrictions, or other actions which might affect their hunting activities.

BMA Fire Restrictions and Closures (PDFs)

Region [1](#) [2](#) [3](#) [4](#) [5](#) [6](#) [7](#)

<http://fwp.mt.gov/hunting/hunterAccess/blockman/>



Questions?



*Montana Fish,
Wildlife & Parks*



**Governor's Drought and Water Supply
Advisory Committee
2014 Summary**

Harold Gemmell
DNRC Logistics Coordinator, NRCC
hgemmell@mt.gov (406) 329-4996

2014 DNRC Fire Season Statistics

	<u>Number of Fires</u>	<u>Acres</u>
County Assist	13	15442
Direct Protection	265	544
Total Fires	278	15986

52% Human Caused

45% Lightning

3% Unknown

60 Mutual Aid Fires

58 False Alarms

396 Total Fires

% of Direct Protection Fires <10 acres – 98%

Homes Lost – 0

Estimated 2014 Fire Cost - \$2.7 Million

2014 DNRC Fire Season Statistics

Northern Rockies Interagency Incident Management Teams

12 Assignments

3 Montana

3 Washington

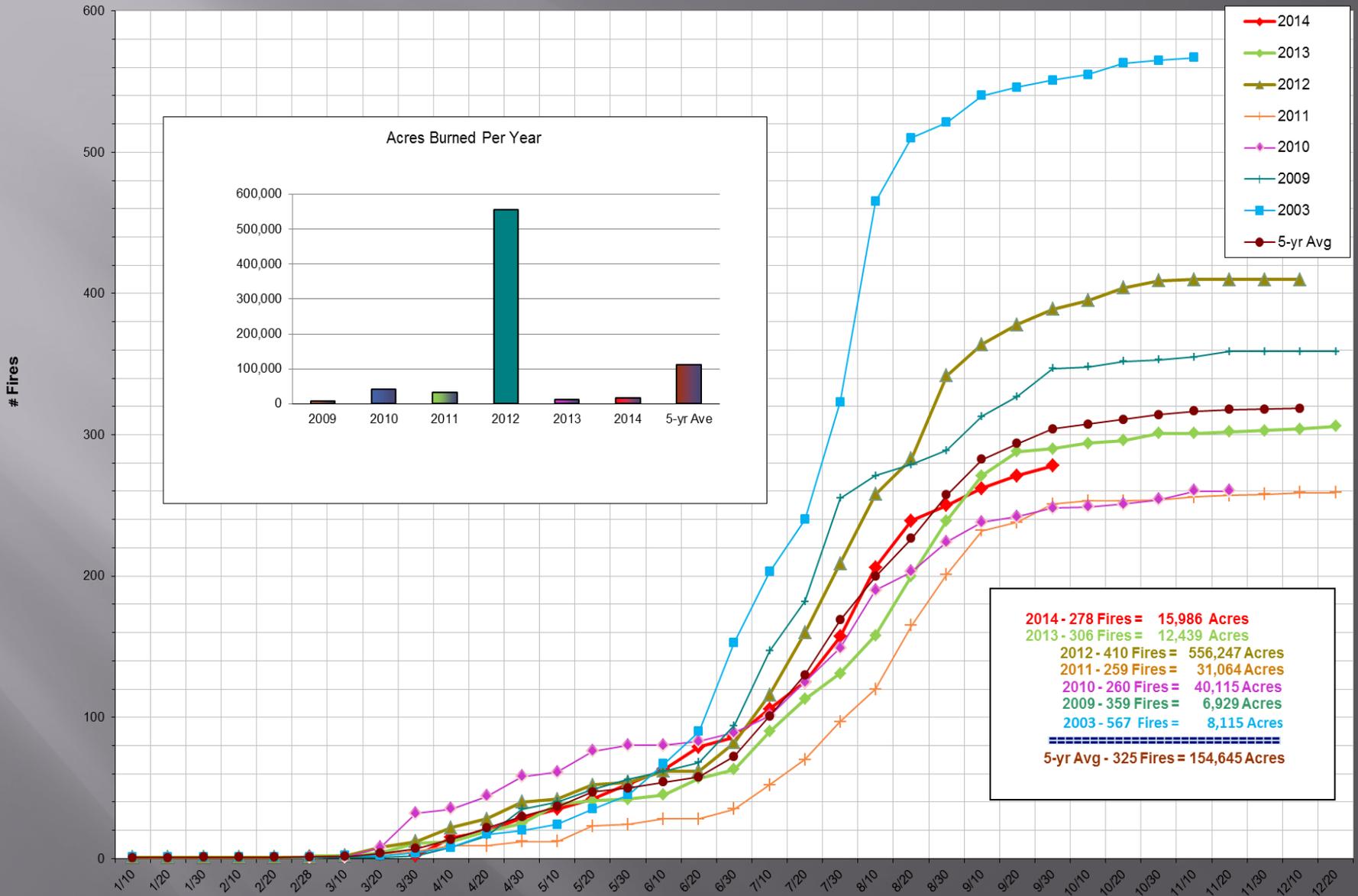
4 Idaho

2 Oregon

Eastside County Assist Team (CAT)

1 Assignment – Log Gulch, Helena

Fire Burned Summary - 2014



Happy Camp Complex
Klamath National Forest





Johnson Bar Fire
Clearwater/Nez Perce National Forest





South Fork Complex
Malheur National Forest



Seepay Creek Complex
Flathead Agency



Selway Complex
Bitterroot National Forest



Snag Canyon Fire
SE Washington DNR



Chiwaukum Complex
Okanogon - Wenatchee National Forest



Carlton Complex
Okanogon - Wenatchee National Forest



Deception Creek Complex
Willamette National Forest









Warning!

angry Squirrel
throwing
Pine Cones
at People!

WARNING

Until Next Year - **GO GRIZ!!**



OK OK - GO CATS!!



Montana Drought and Water Supply Status by County

Change from September to October 2014 – Assessed 10/7/2014

Drier – 1 Cat

Ravalli

Beaverhead

Big Horn

Blaine

Broadwater

Carbon

Carter

Cascade

Chouteau

Custer

Daniels

Dawson

Deer Lodge

Fallon

Fergus

Flathead

Gallatin

Garfield

Glacier

Golden Valley

Granite

Hill

Jefferson

Judith Basin

Lake

Lewis and

Clark

Liberty

Lincoln

Madison

McCone

No Change

Meagher

Mineral

Missoula

Musselshell

Park

Petroleum

Phillips

Pondera

Powder River

Powell

Prairie

Richland

Roosevelt

Rosebud

Sanders

Sheridan

Stillwater

Teton

Silver Bow

Sweetgrass

Toole

Treasure

Valley

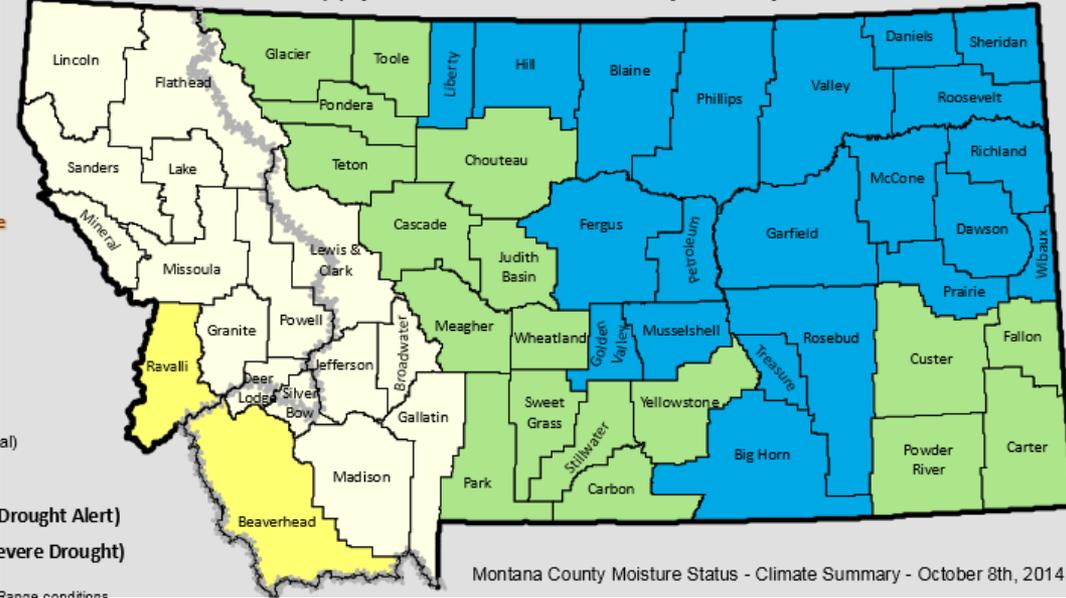
Wheatland

Wibaux

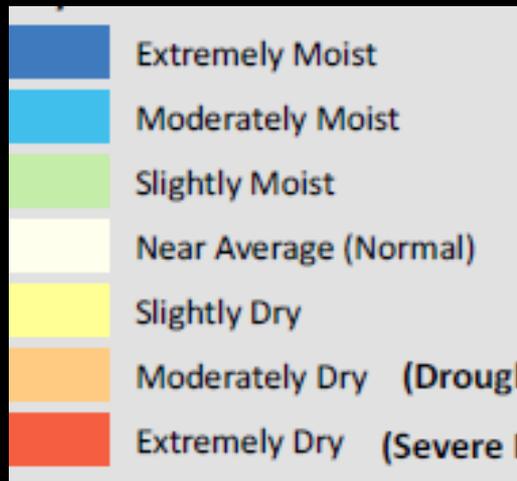
Yellowstone



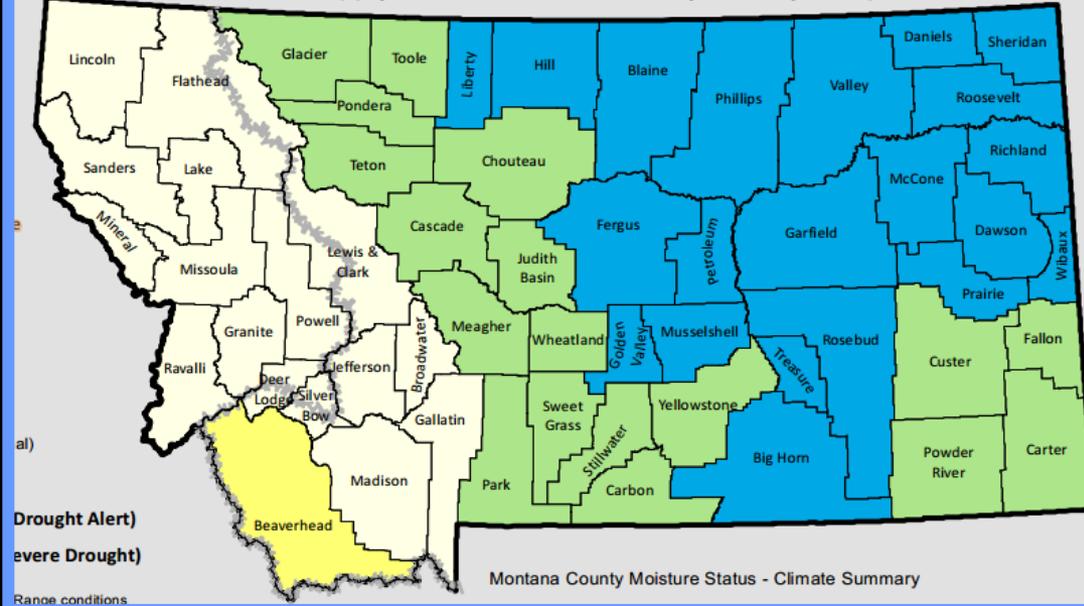
Montana Water Supply and Moisture Status by County - October 2014

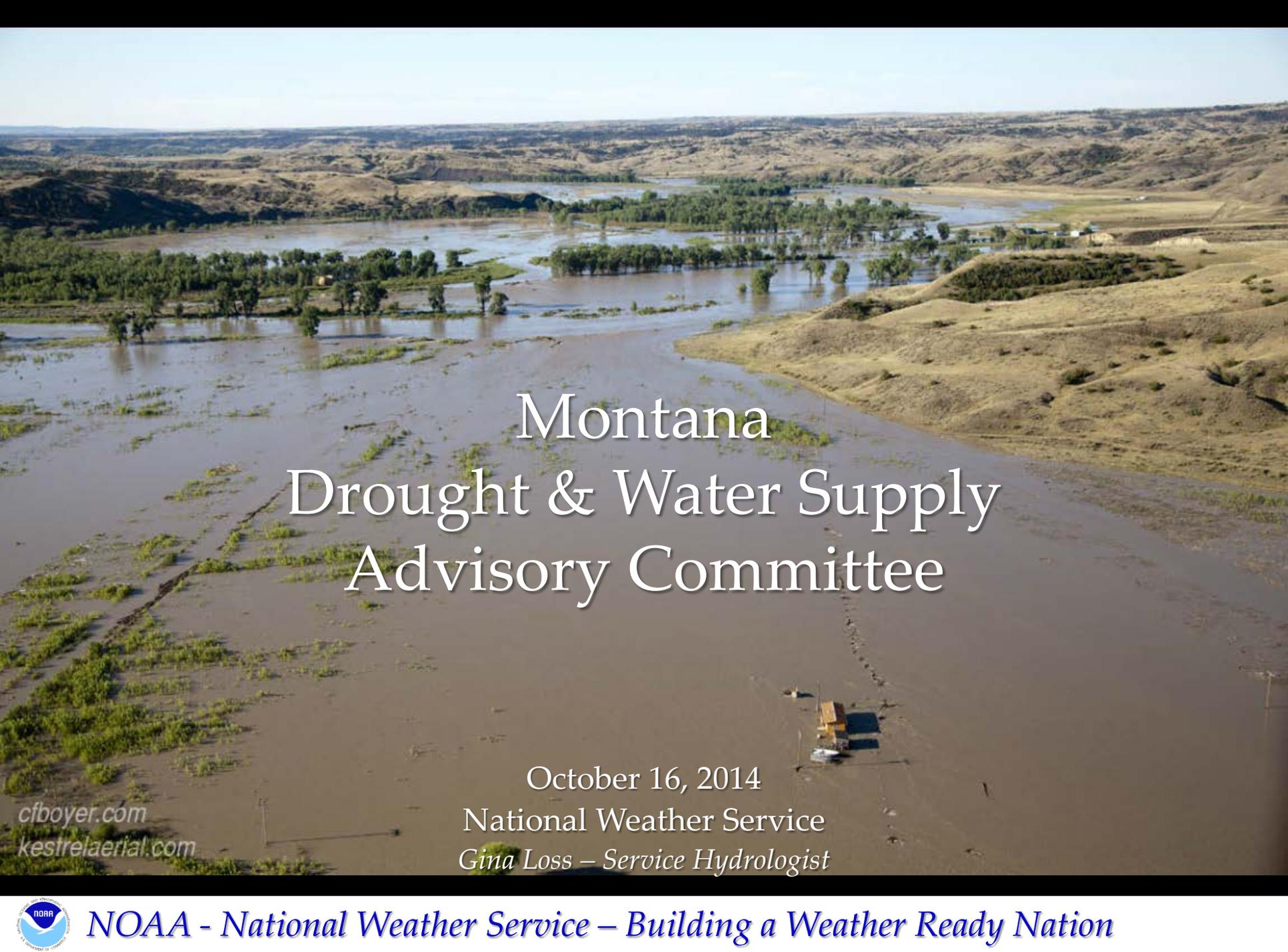


Montana Drought Status October 2014 vs. September 2014



Montana Water Supply and Moisture Status by County - September 2014





Montana Drought & Water Supply Advisory Committee

October 16, 2014

National Weather Service

Gina Loss – Service Hydrologist

cfboyer.com
kestrelaerial.com



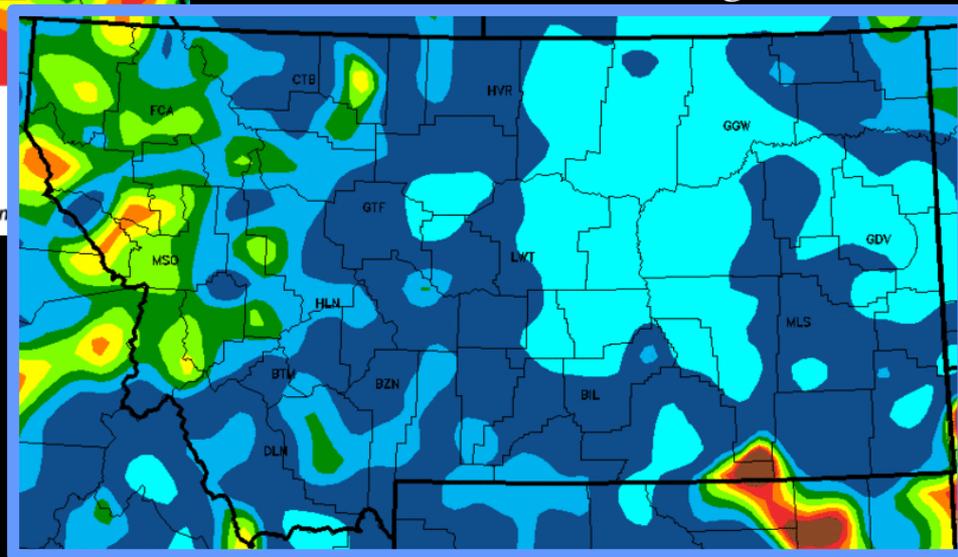
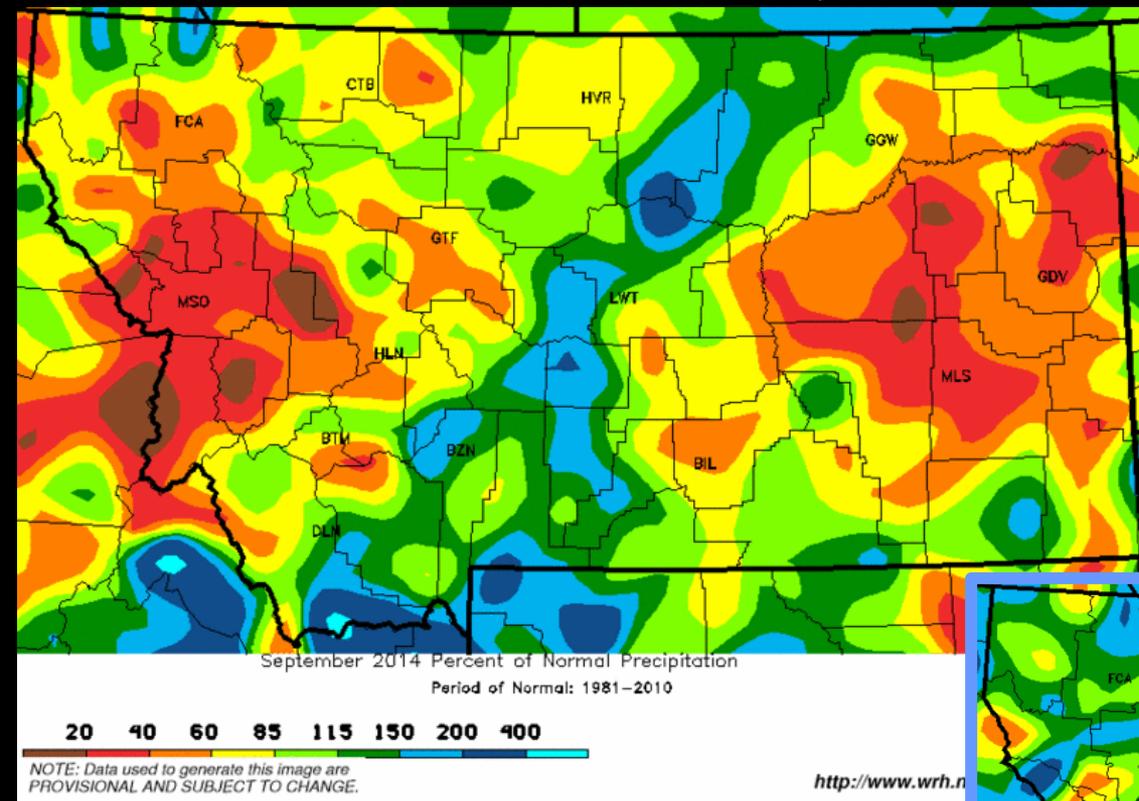
NOAA - National Weather Service – Building a Weather Ready Nation

Percent of Normal Precipitation

September 2014

- ◆ Southwest to north-central Montana above to well above normal
- ◆ Areas west and east below to well below normal

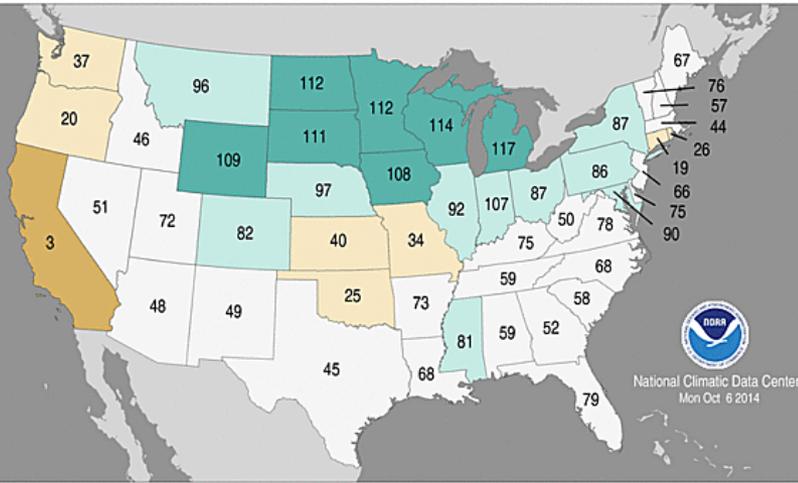
August 2014



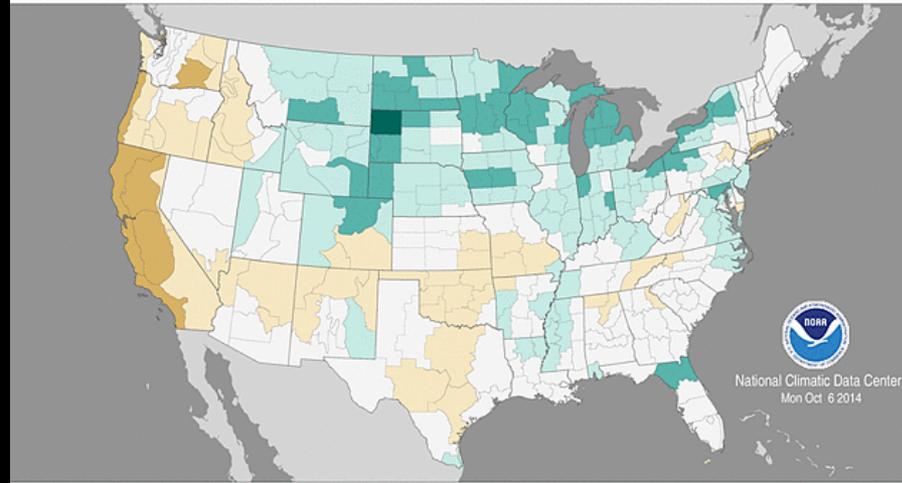
Water Year 2014 Precipitation Ranking

Statewide and Divisional

Statewide Precipitation Ranks
 October 2013–September 2014
 Period: 1895–2014



Divisional Precipitation Ranks
 October 2013–September 2014
 Period: 1895–2014



Above average for the state – 24th of 119 years
Much above average for south-central climate division.

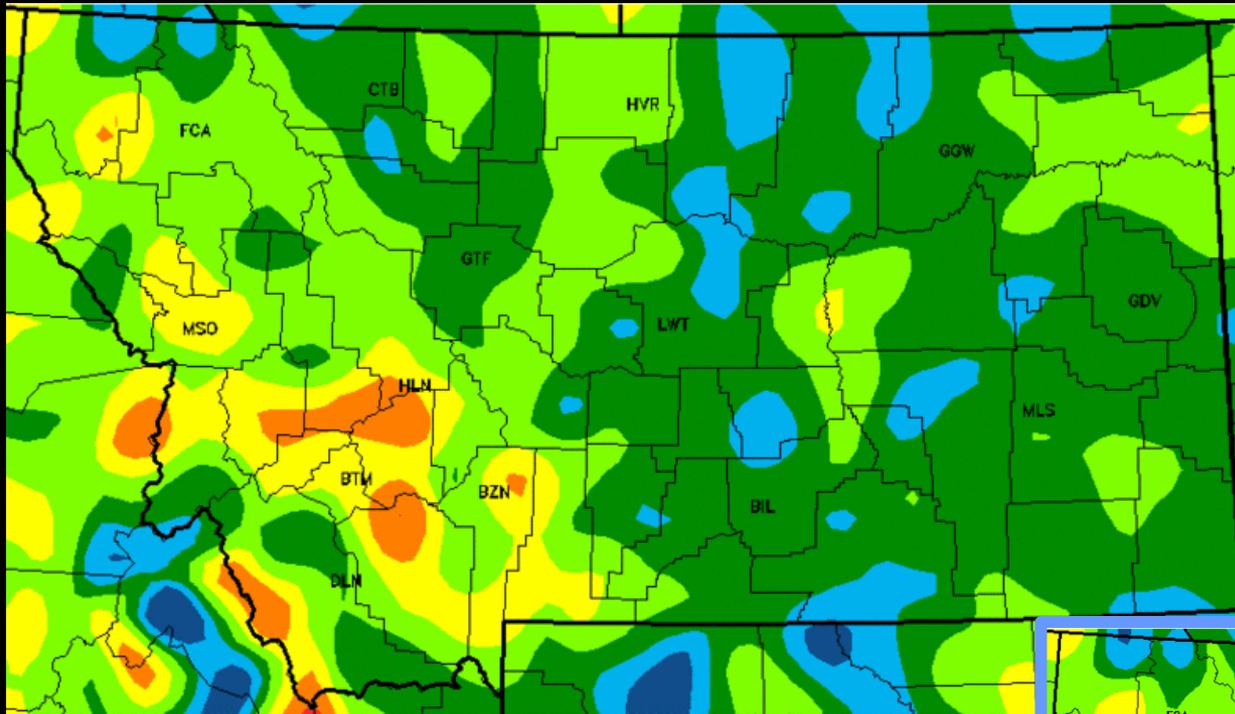


Percent of Normal Precipitation

Water Year 2014

- October – September
- Below to well below normal portions of west and southwest
- Above to well above normal over the central and eastern plains

October – August 2014



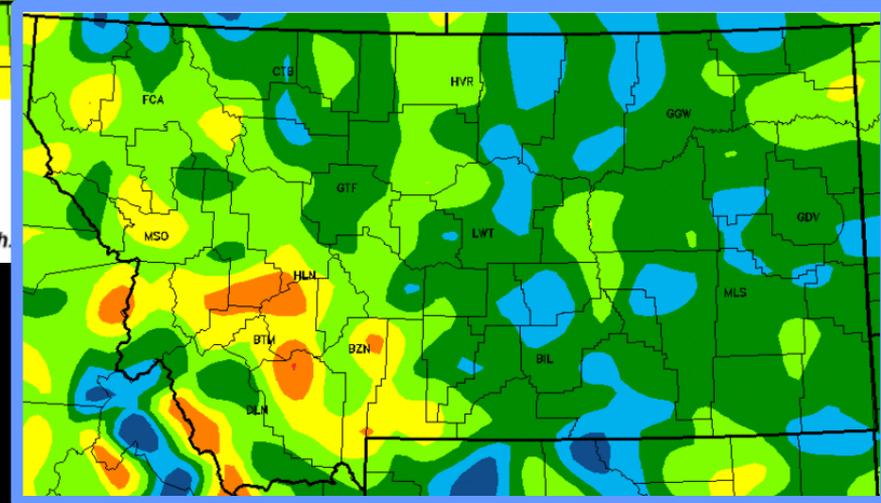
Oct 2013–Sep 2014 Percent of Normal Precipitation

Period of Normal: 1981–2010

20 40 60 85 115 150 200 400

NOTE: Data used to generate this image are PROVISIONAL AND SUBJECT TO CHANGE.

<http://www.wrh>

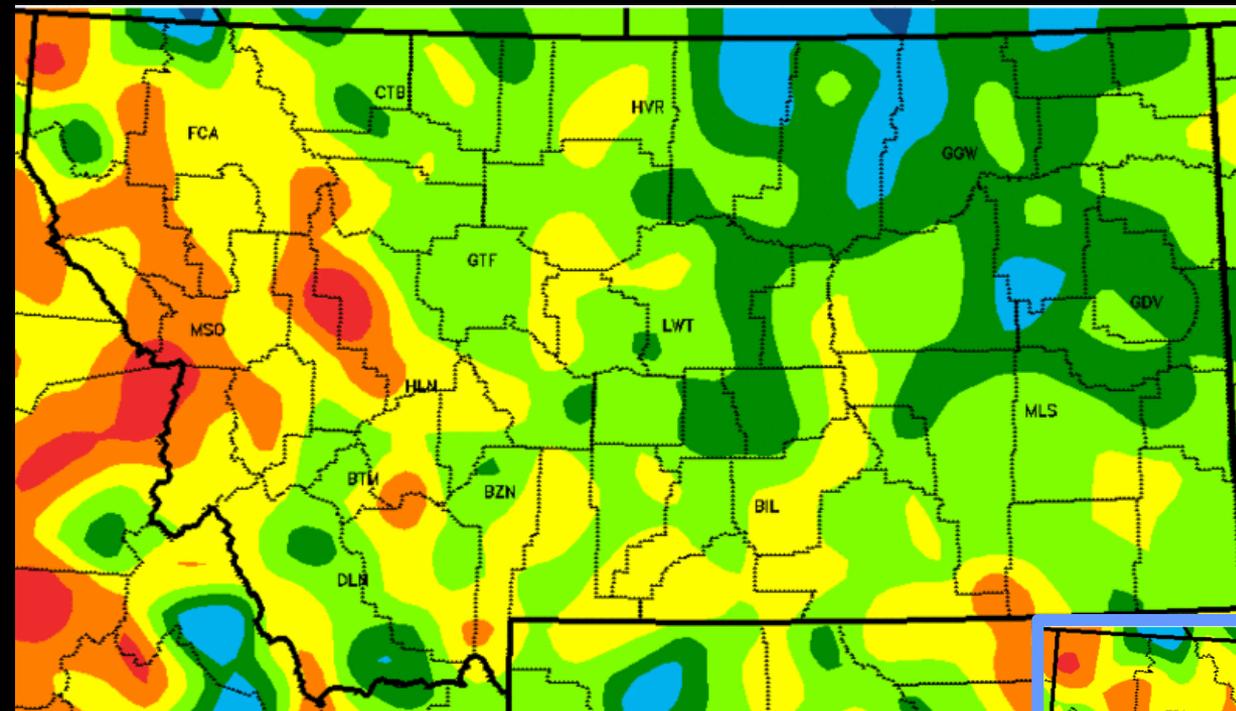


Percent of Normal Precipitation

Crop Year

- ◆ April - September
- ◆ Below to well below normal west, southwest, south central
- ◆ Near to well above normal north, northeast, central, southeast

April - August 2014

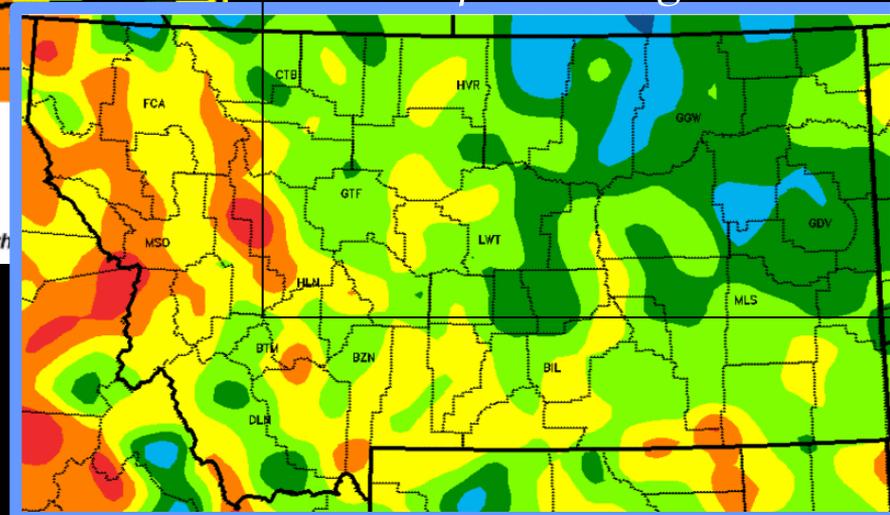


Apr-Sep 2014 Percent of Normal Precipitation
Period of Normal: 1981-2010

20 40 60 85 115 150 200

NOTE: Data used to generate this image are
PROVISIONAL AND SUBJECT TO CHANGE.

<http://www.wrh>



Temperature Anomalies

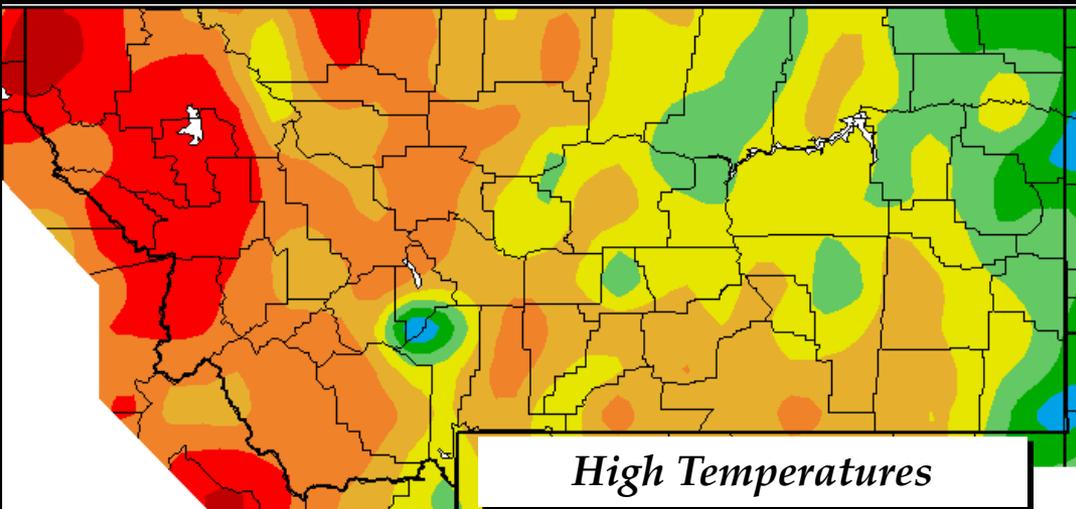
October 1 - 14

Highs

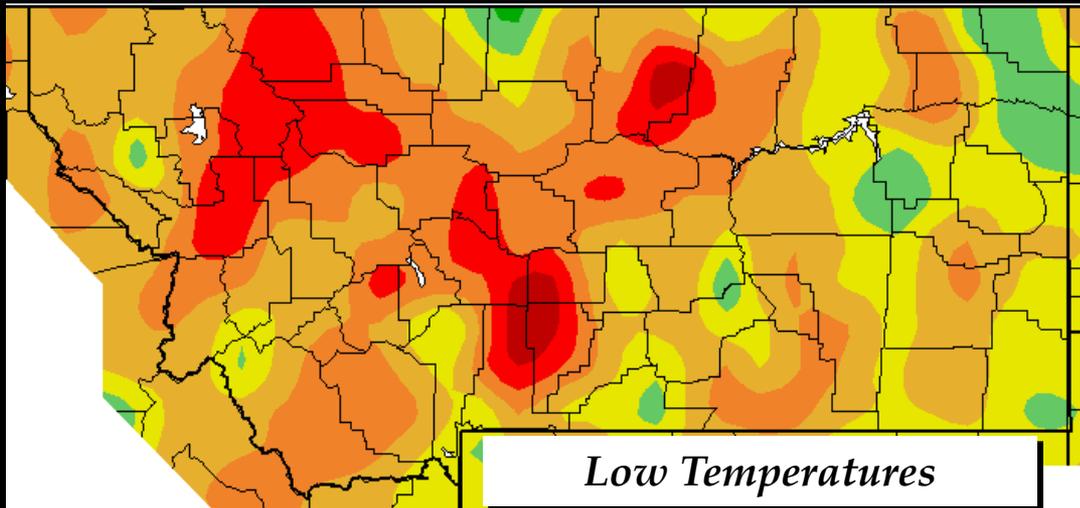
- 4 to 10 degrees above normal west and southwest, RMF and adjacent plains
- Near normal central and south-central
- 2 to 4 degrees below normal eastern border

Lows

- 2 to 8 degrees above normal west and central thirds
- Near normal east



High Temperatures

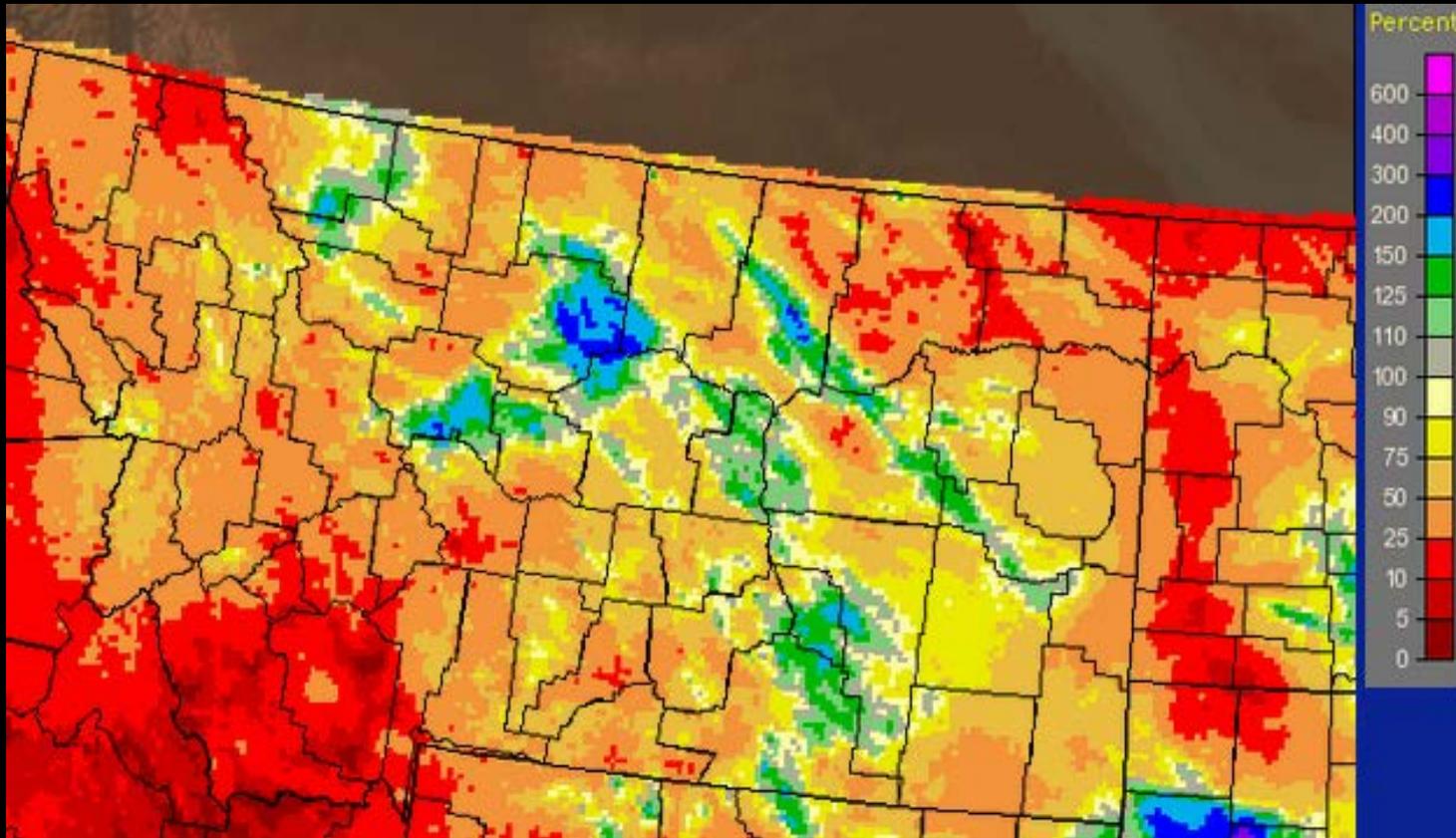


Low Temperatures



Percent of Average Precipitation

October 1 - 14

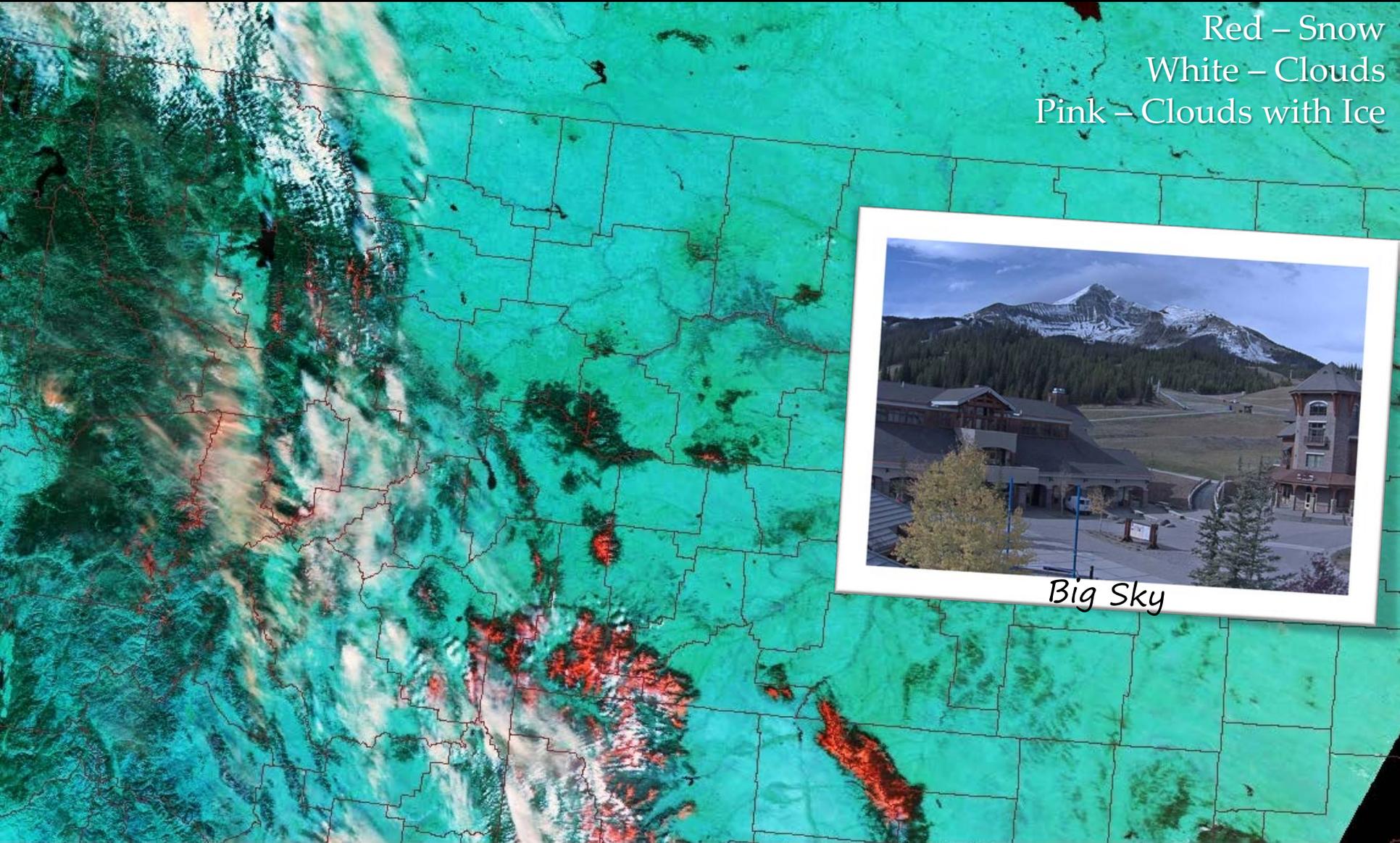


- Below to well below normal west, southwest, and northeast
- Near to above normal north central, central and, south central



Snow Starting to Accumulate - October 13, 2014

Red – Snow
White – Clouds
Pink – Clouds with Ice



NASA SPoRT - TERRA MODIS Snow/Cloud - 20141013 18:50 UTC



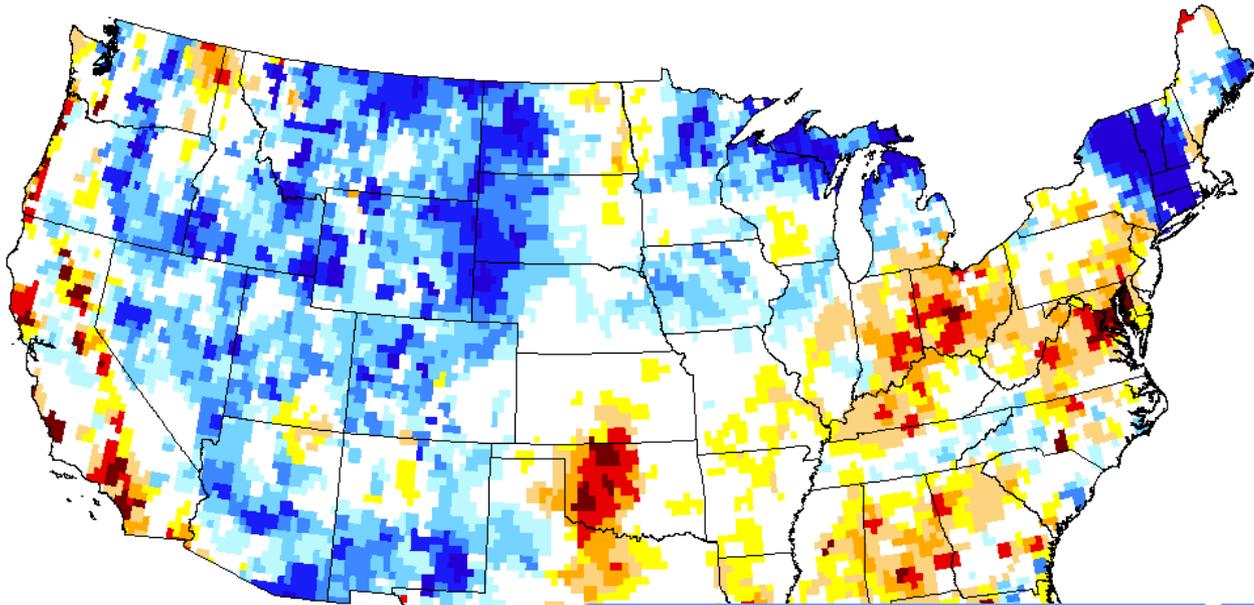
NOAA - National Weather Service – Building a Weather Ready Nation

Soil Moisture – Upper 1 Meter



GRACE-Based Surface Soil Moisture Drought Indicator

October 13, 2014

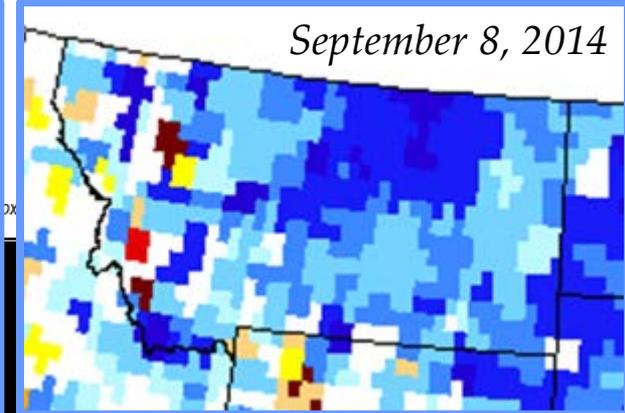
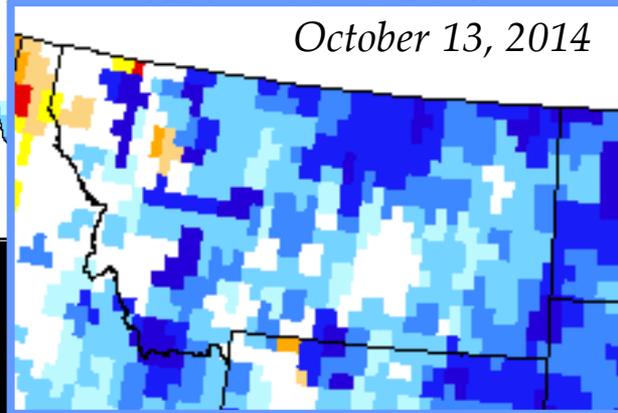


Wetness percentiles are relative to the period 1948-2009

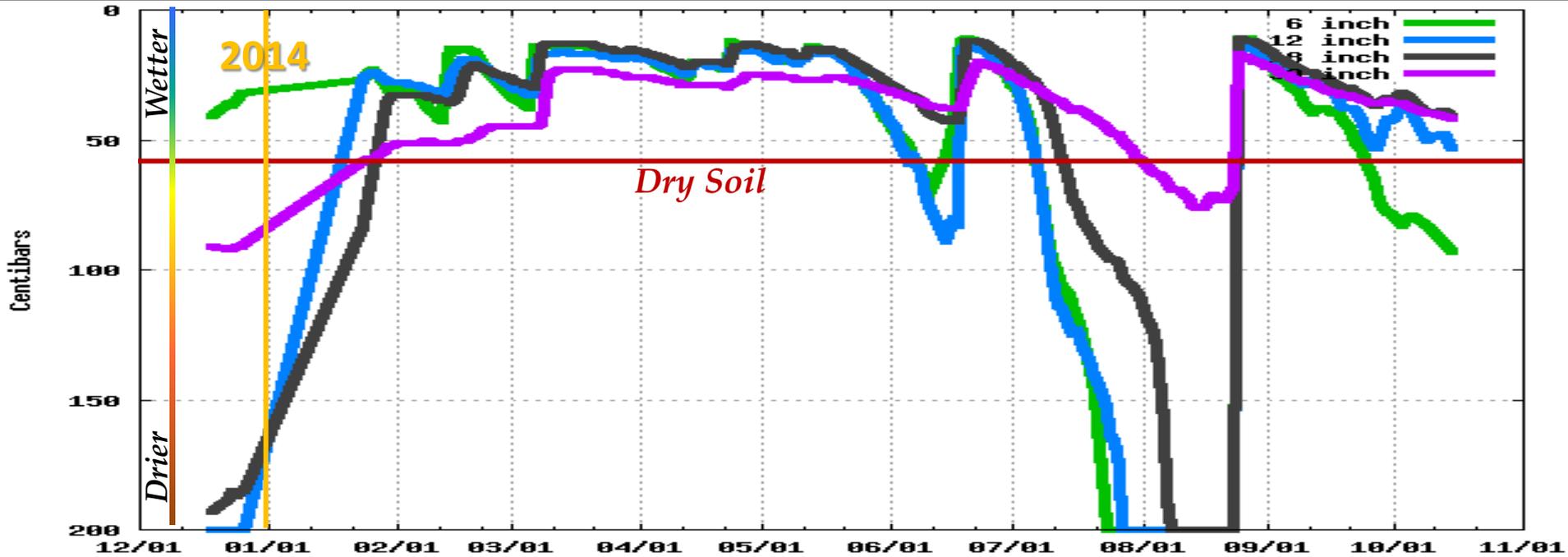
The surface layer is defined as the top 2 centimeters of soil

Cell Resolution 0.25 degrees

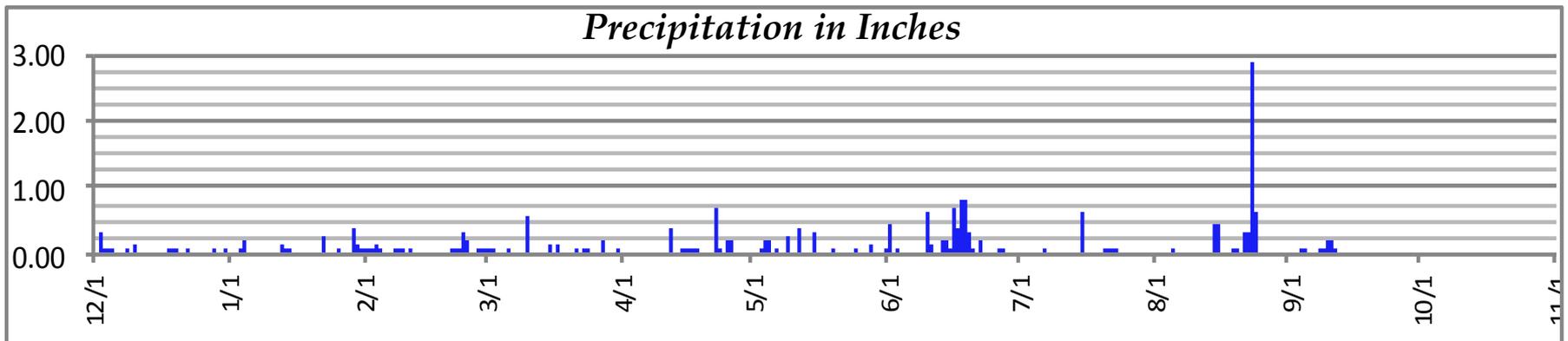
Projection of this document is Lambert Azimuthal Equal Area



Great Falls Soil Moisture



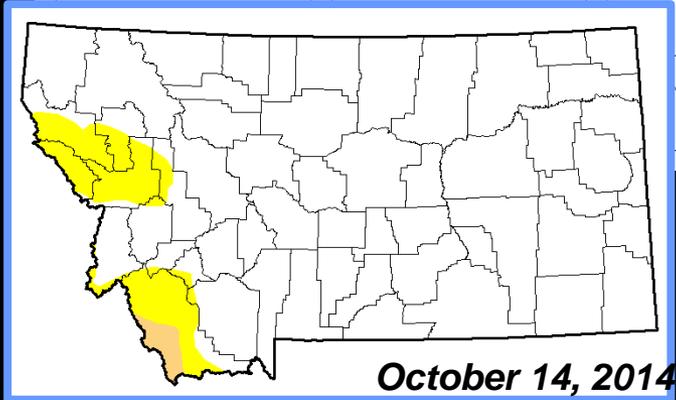
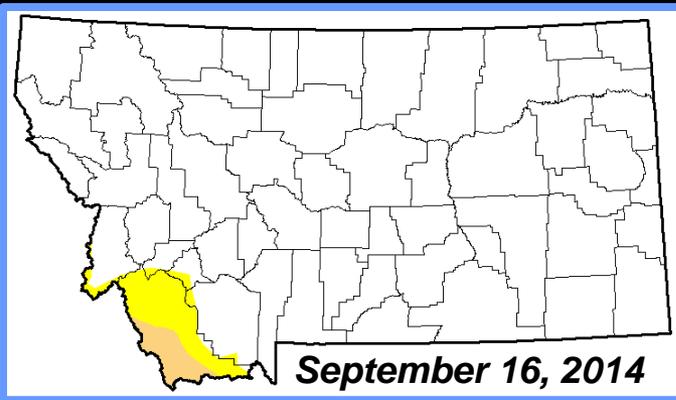
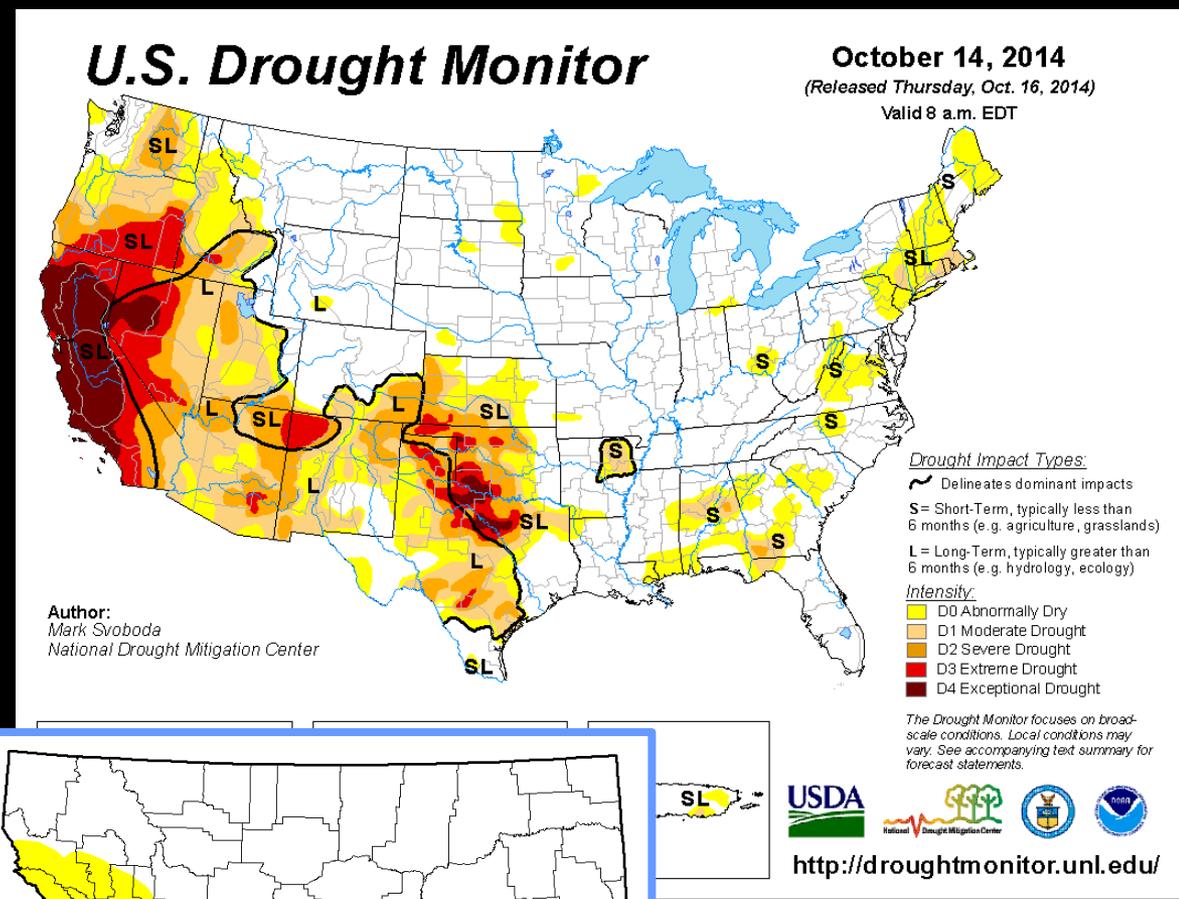
Precipitation in Inches



National Drought Monitor

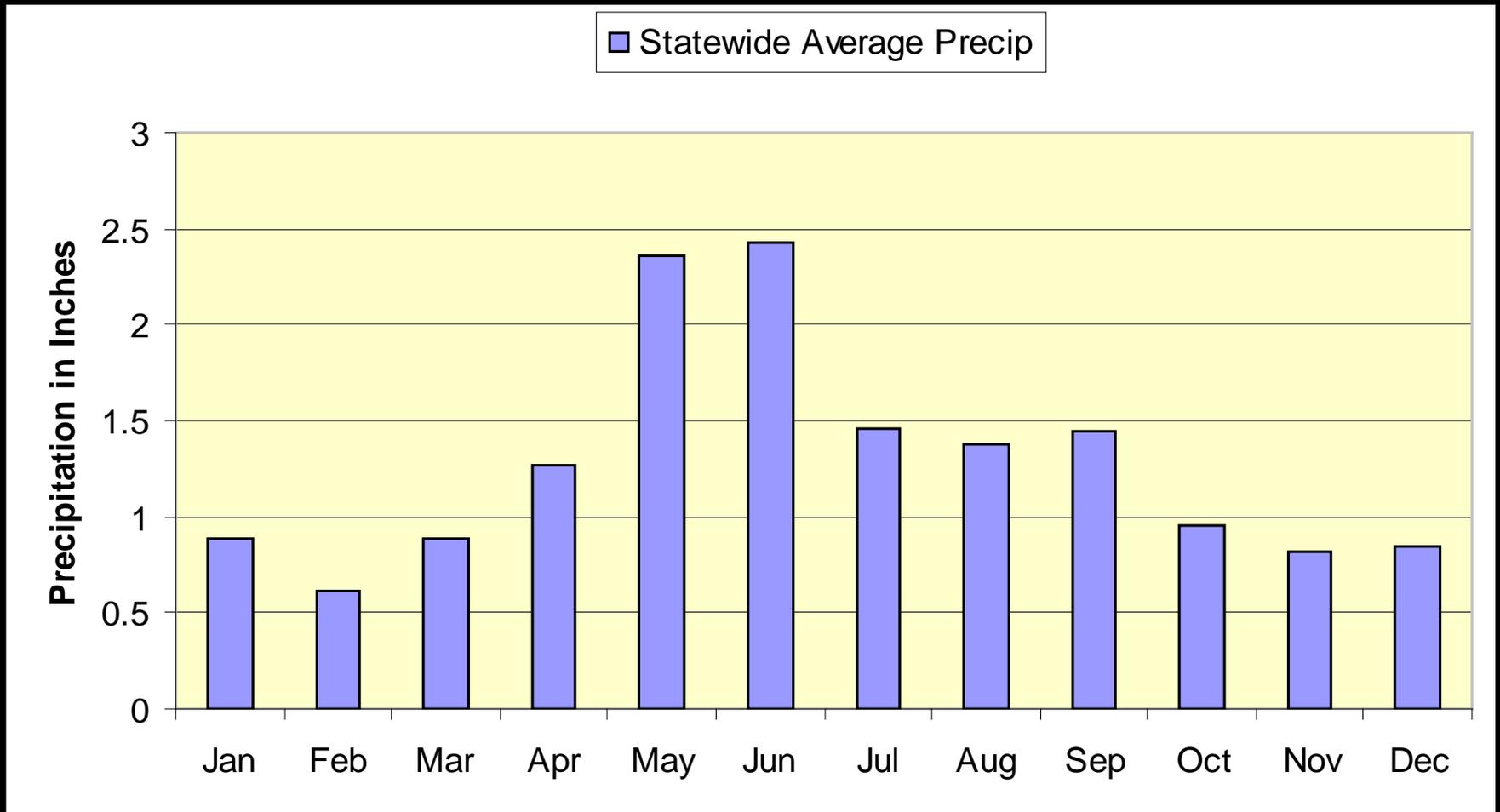
Conditions as of October 14, 2014

- Introduction of some D0-Abnormally Dry into areas west of the Divide.
- Even with recent rain, Beaverhead County seeing D0/Abnormally Dry to D1/Moderate Drought conditions



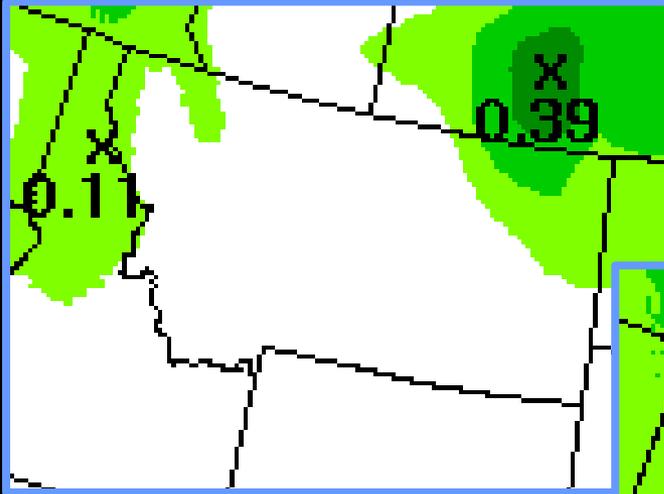
Statewide Average Precipitation

October beginning of drier autumn/winter months

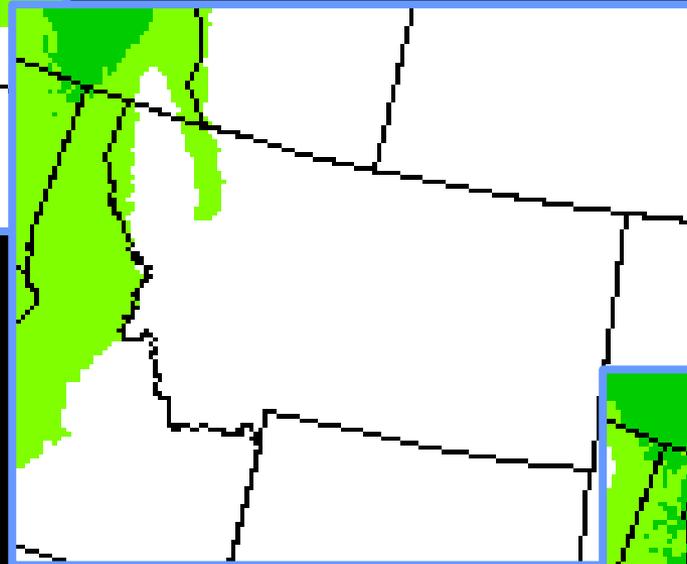


Precipitation Forecast

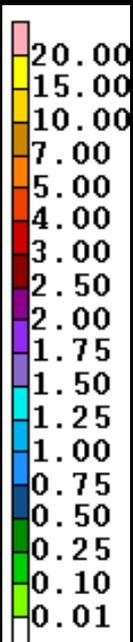
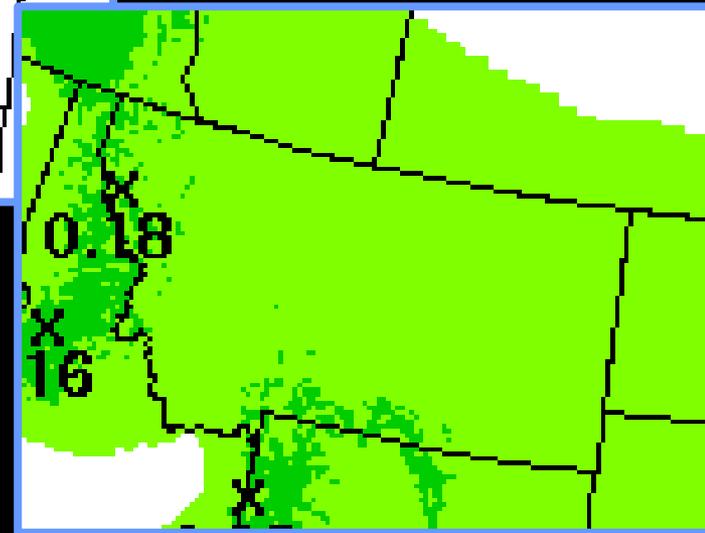
Thursday - Saturday



Sunday - Monday



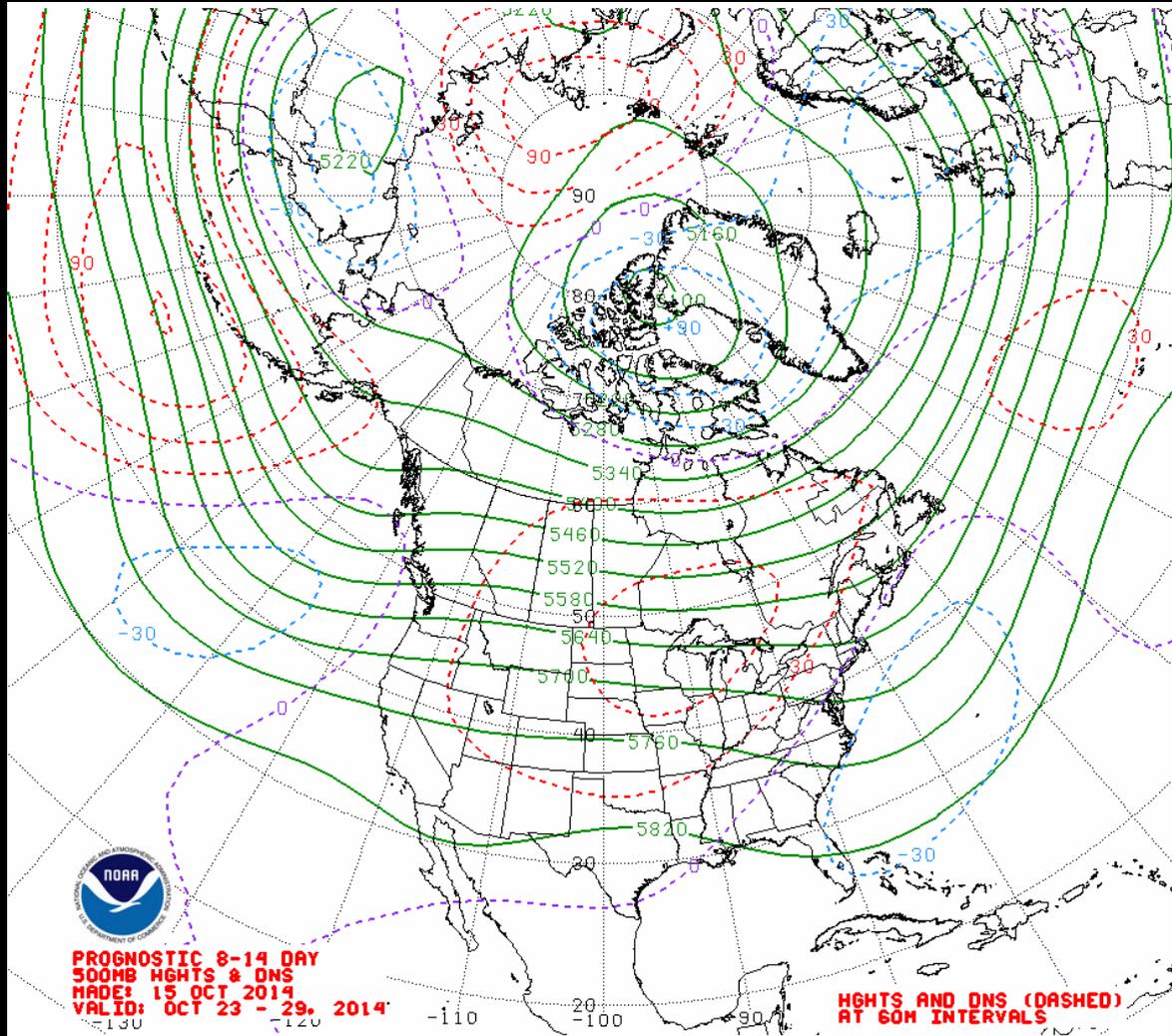
Tuesday - Wednesday



8 to 14 Day Outlook

500mb Heights and Anomalies

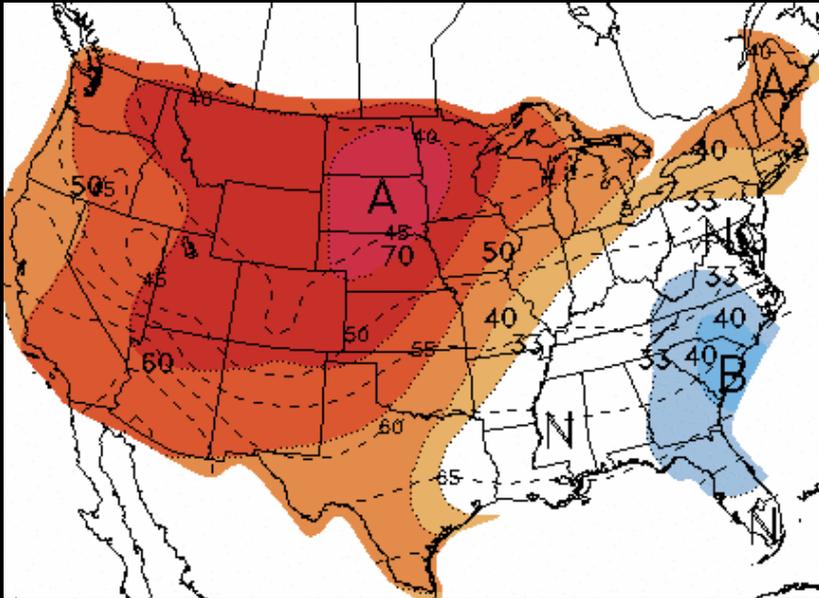
- October 23 - 29
- Westerly flow into western U.S.



8 to 14 Day Outlook

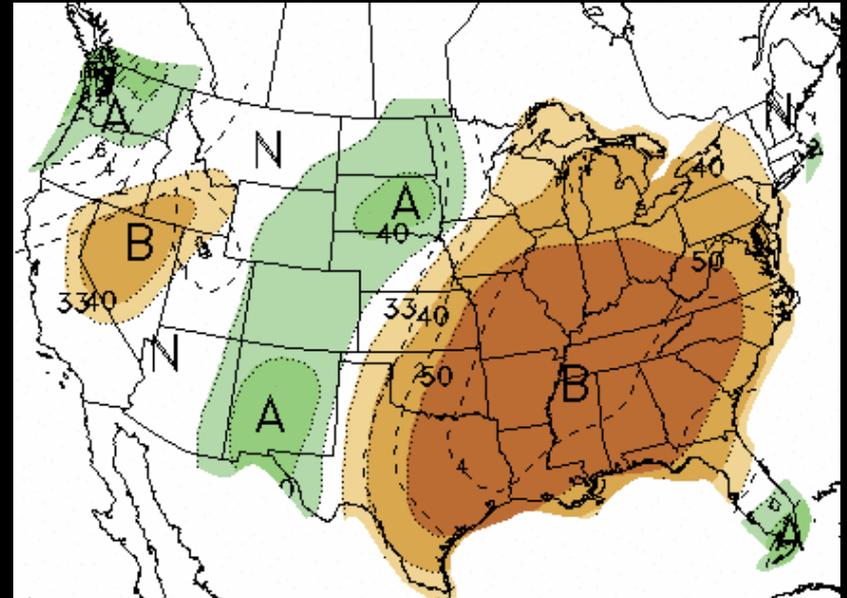
October 23 - 29

Temperature



- ◆ 60% to 70% chance temperatures will be above normal across Montana

Precipitation

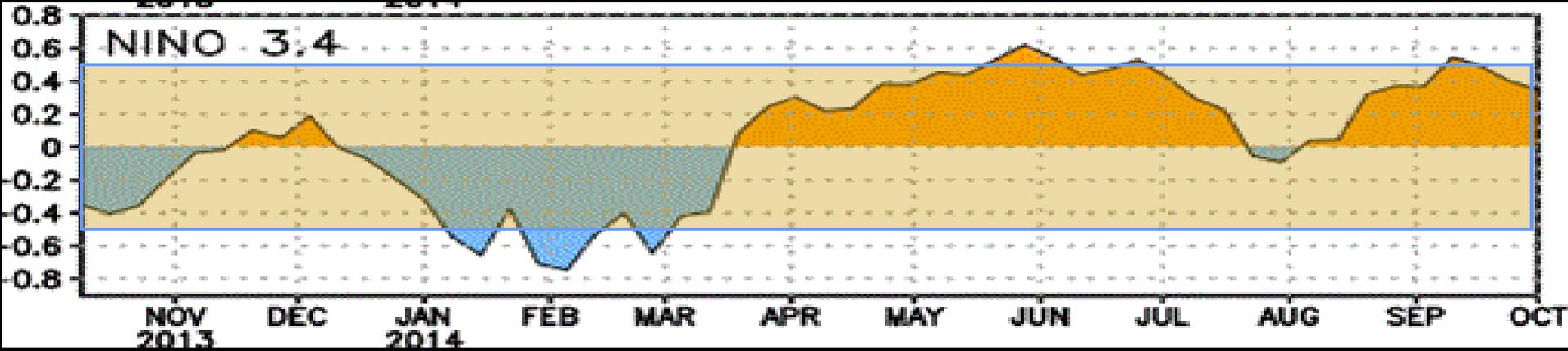


- ◆ 33% to 40% chance precipitation will be above normal southeast
- ◆ 33% to 40% chance precipitation will be below normal far southwest
- ◆ Equal chances precipitation will be above, below or near normal remainder of the state

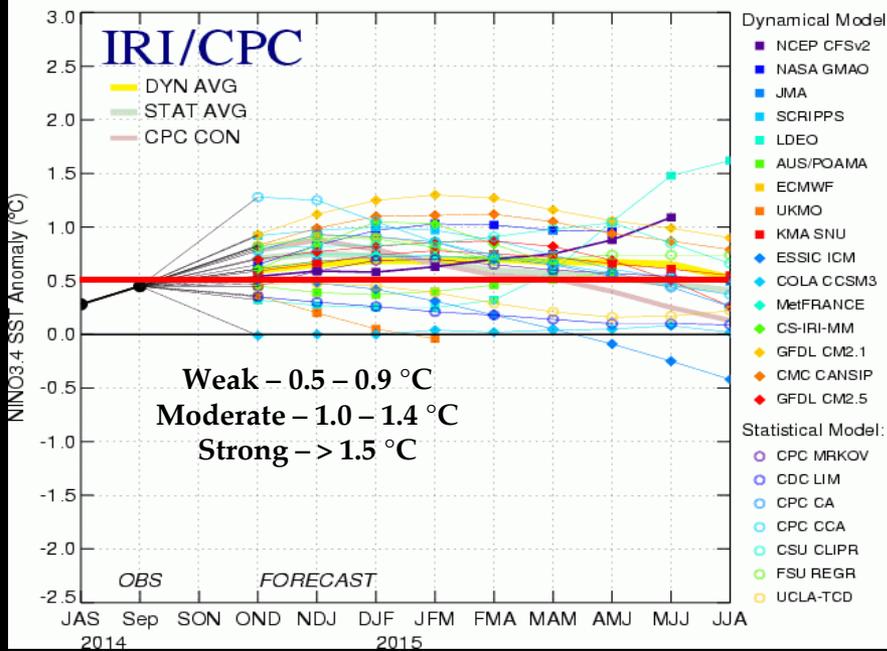


El Niño / La Niña

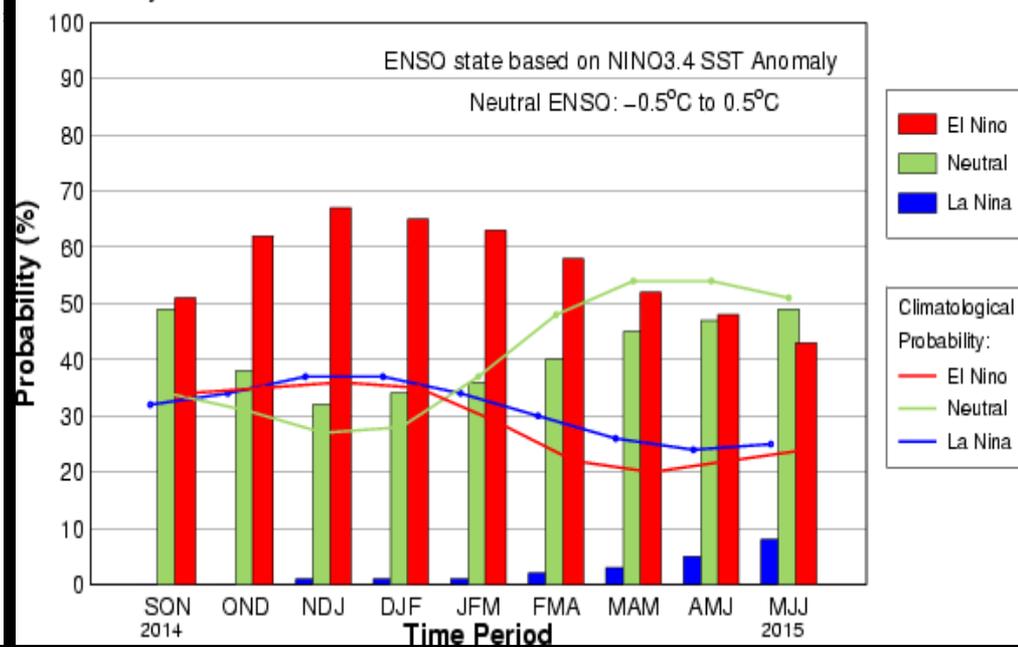
El Niño Watch – El Niño favored to begin next 1-2 months, last into spring



Mid-Oct 2014 Plume of Model ENSO Predictions



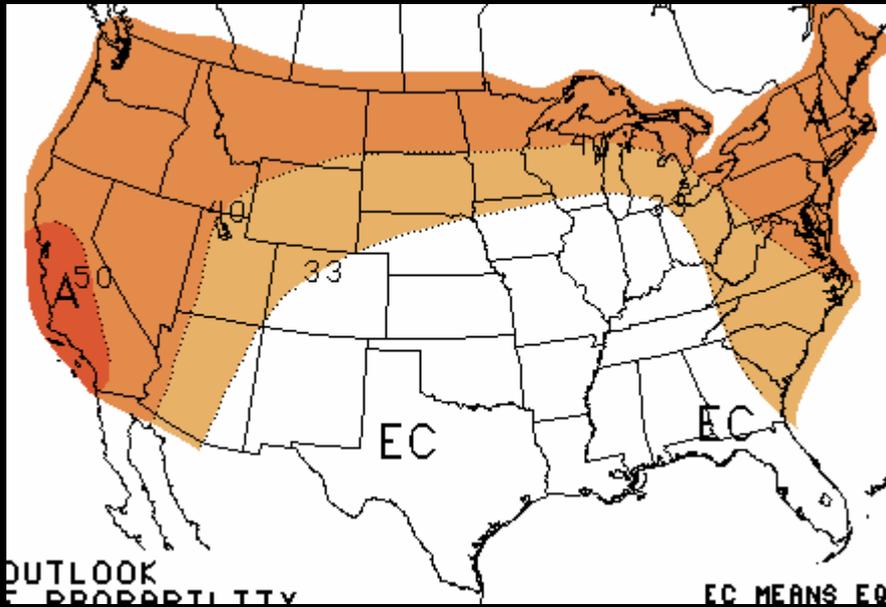
Early-Oct CPC/IRI Consensus Probabilistic ENSO Forecast



November Outlook

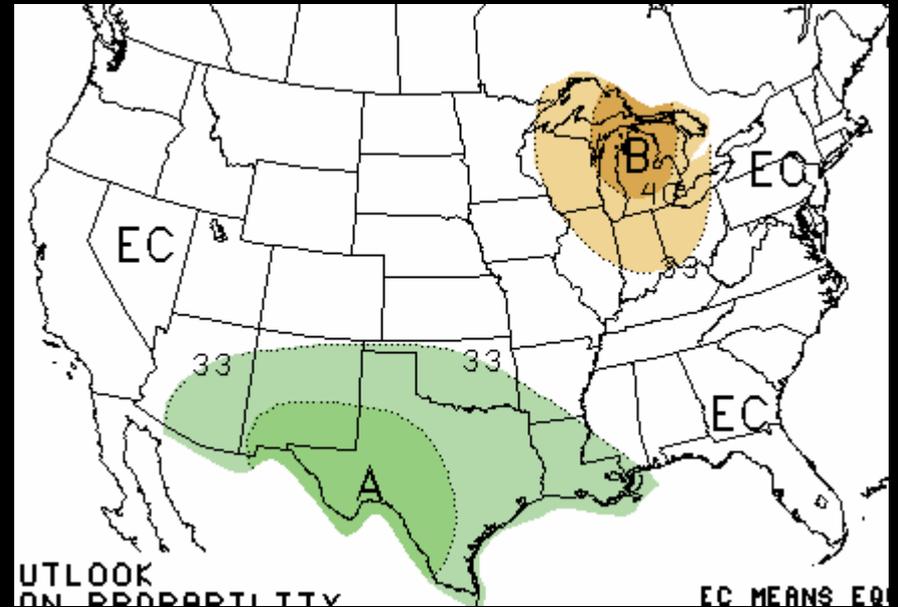
Updated October 16, 2014

Temperature



- 40% to 50% chance temperatures will be above normal across Montana

Precipitation



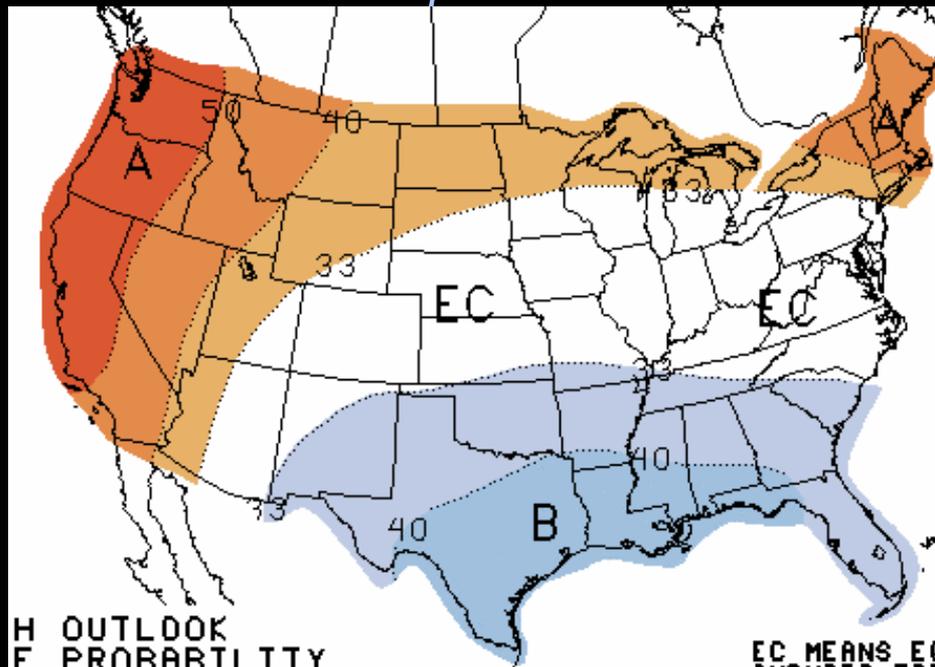
- Equal chances precipitation will be above, below or near normal across Montana



December – February Outlook

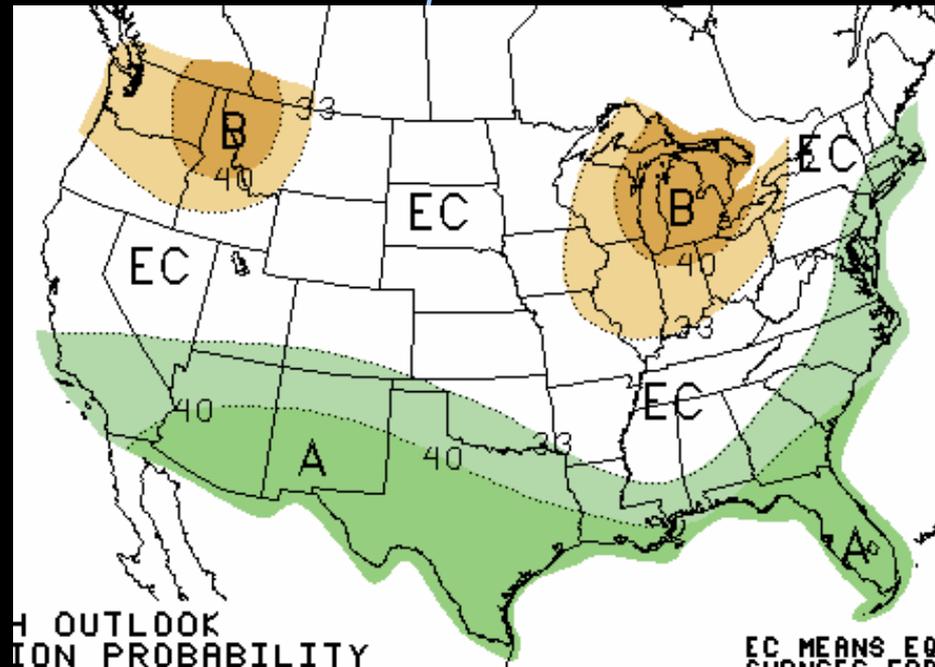
Updated October 16

Temperature



- 40% to 50% chance temperatures will be above normal across western half of Montana
- 33% to 40% chance temperatures will be above normal across eastern half

Precipitation

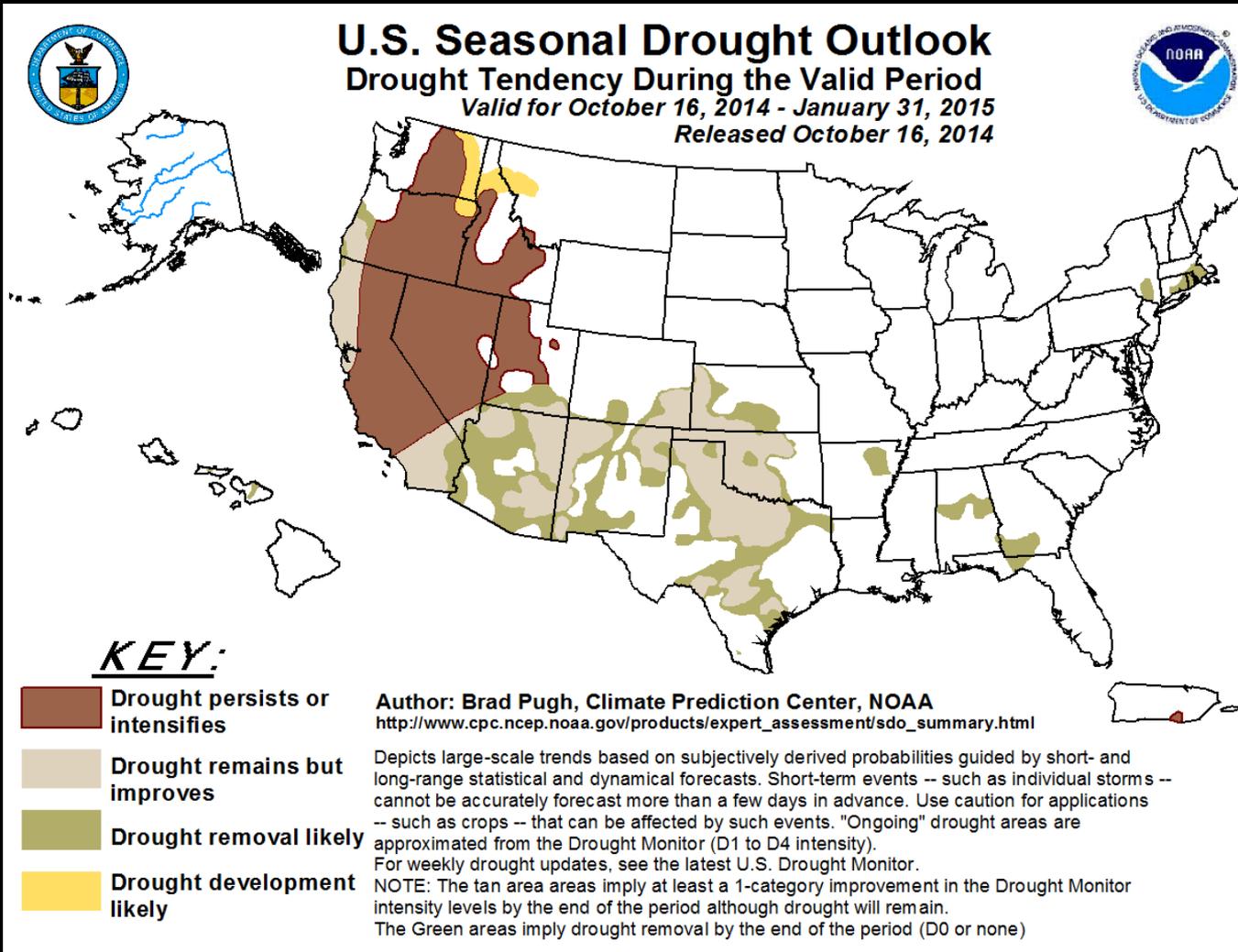


- 33% to 50% chance precipitation will be below normal western half of Montana
- Equal chances precipitation will be above, below or near normal eastern half



Drought Outlook through January

Issued October 16



- Some drought development expected west of the divide
- Drought area in far southwest Montana expected to persist/intensify



In Summary...

- ◆ September notably drier than August
 - *Below to well below normal large areas west and east*
- ◆ Water Year ended with most of Montana near to above normal
 - *Exception is southwest which ended below to well below normal*
- ◆ October mostly below normal for month to date
 - *Small areas southwest to north-central near to above normal*
- ◆ Still in El Niño Watch
 - *Expect to develop next 1-2 months, persist into spring*
 - *May be a weak rather than moderate or strong event*
- ◆ Climate Outlook for November shows better chances for above normal temperatures with equal chances for above, below, or near normal precipitation across most of Montana.
- ◆ December through February Outlook shows better chances for above normal temperatures across Montana with better chances for below normal precipitation western half of state



weather.gov

weather.gov/billings
weather.gov/glasgow
weather.gov/missoula
weather.gov/greatfalls

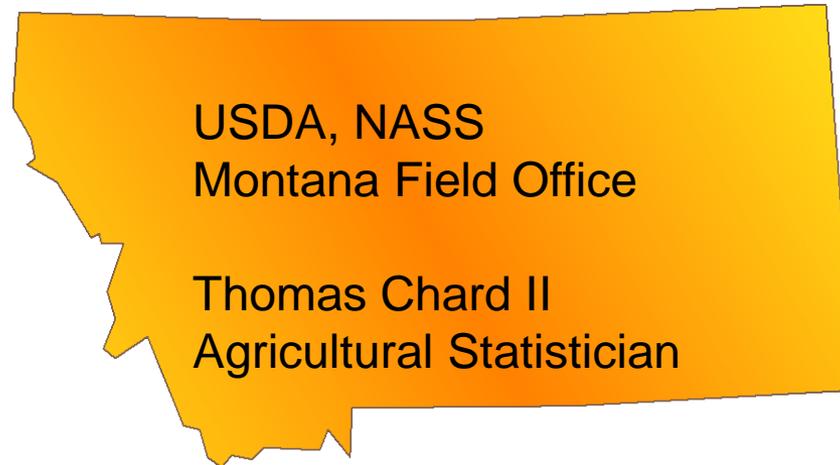


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Montana Drought & Water Supply Advisory Committee

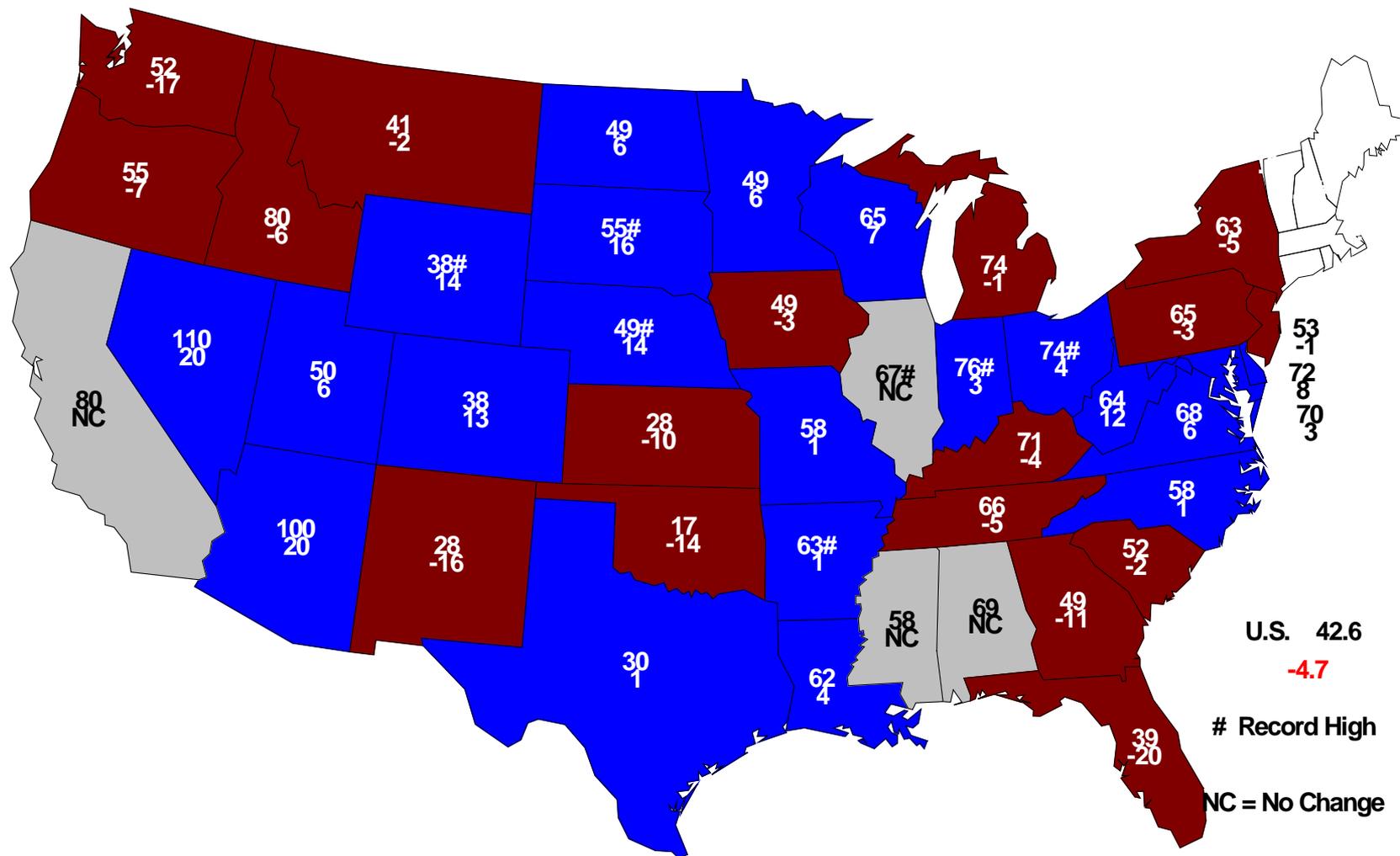


MT Small Grains Annual Summary

Crop	Unit	September 2014	% Change from Previous Season
Winter Wheat			
Harvested	Mil Ac	2.24	+17.9
Yield	Bu/Ac	41.0	-4.7
Production	Mil Bu	91.8	+12.4
Other Spring			
Harvested	Mil Ac	2.99	+5.7
Yield	Bu/Ac	36.0	-2.7
Production	Mil Bu	107.6	+2.8
Durum			
Harvested	Thou Ac	430	-1.1
Yield	Bu/Ac	32.0	-8.6
Production	Mil Bu	13.8	-9.6
All Wheat			
Production	Mil Bu	213.2	+5.8

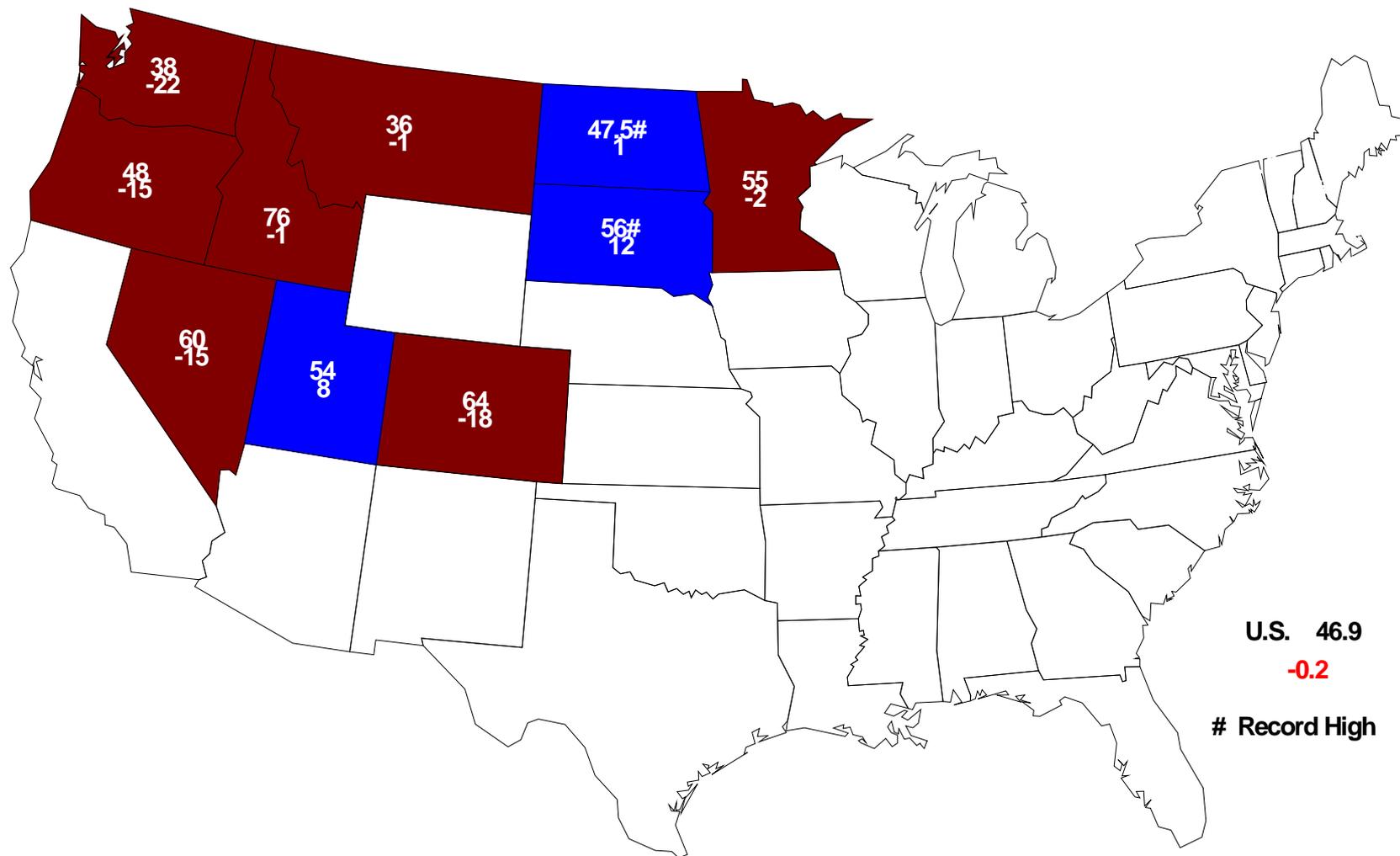
2014 Winter Wheat Yield

Bushels and Change From Previous Year



2014 Other Spring Wheat Yield

Bushels and Change From Previous Year



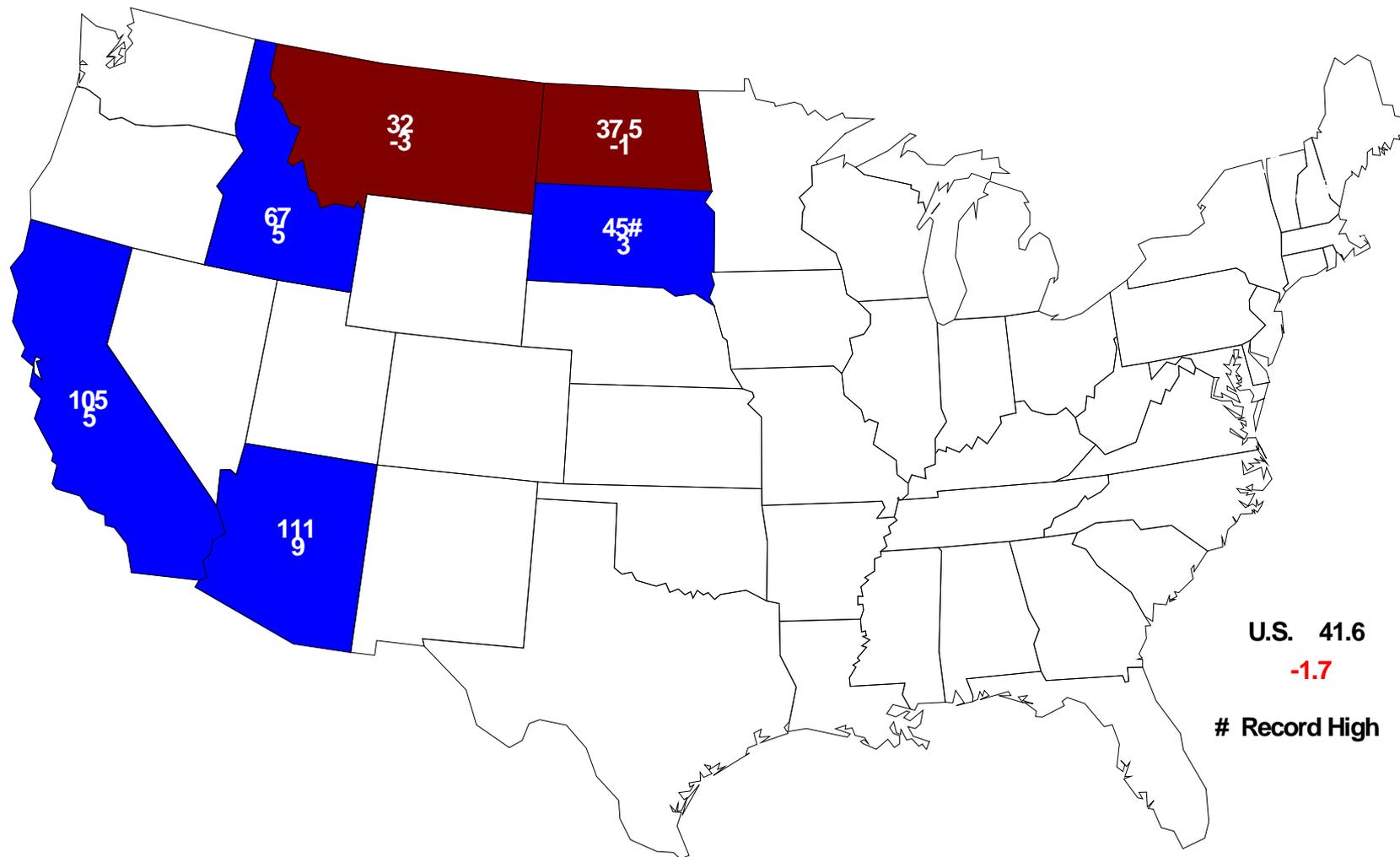
U.S. 46.9

-0.2

Record High

2014 Durum Wheat Yield

Bushels and Change From Previous Year



U.S. 41.6

-1.7

Record High

September Crops Survey

Re-interview

- Due to the late small grain harvest, NASS is recontacting small grain producers who were not done harvesting to collect updated harvest acres and production information.
- Changes in harvested acres, production, and stocks for spring wheat, durum wheat, barley, and oats will be published in the November 10th Crop Production Report.

Crop Weather Report

Week Ending October 12, 2014

- Last year numbers for this week were not collected due to Federal government shutdown
- Fall weather during the week
 - Mild days and cold nights
 - Scattered rain showers
- Harvest is wrapping up for small grains and hay.
- Cattle and sheep are being moved from summer pastures

Topsoil Moisture

Week Ending October 12, 2014

	This week	Last week	Last year	5-yr Avg.
Very short	2%	2%	NA	13%
Short	13%	13%	NA	29%
Adequate	78%	77%	NA	54%
Surplus	7%	8%	NA	4%

Adequate and surplus condition is 85 percent. Conditions are above the 5 year average of 59 percent.

Subsoil Moisture

Week Ending October 12, 2014

	This week	Last week	Last year	5-yr Avg.
Very short	2%	2%	NA	17%
Short	13%	13%	NA	34%
Adequate	77%	78%	NA	47%
Surplus	8%	7%	NA	2%

Adequate and surplus condition is 85 percent. Conditions are above the 5 year average of 49 percent.

Crop Progress Percent

Week Ending October 12, 2014

	This week	Last week	Last year	5-yr Avg.
Durum Wheat harvested	98%	78%	NA	93%
Potatoes harvested	54%	40%	NA	63%
Sugar Beets harvested	16%	11%	NA	33%

Crop Progress Percent

Week Ending October 12, 2014

	This week	Last week	Last year	5-yr Avg.
Corn for Grain harvested	32%	19%	NA	10%
Corn for Silage harvested	95%	89%	NA	88%

Hay – Second Cutting

Week Ending October 12, 2014

	This week	Last week	Last year	5-yr Avg.
Other Hay 2 nd Cutting	97%	92%	NA	95%

Crop Progress Percent

Week Ending October 12, 2014

	This week	Last week	Last year	5-yr Avg.
Winter Wheat planted	92%	79%	NA	81%
Winter Wheat emerged	52%	26%	NA	41%

Potatoes Crop Condition

Week Ending October 12, 2014

	Very poor	Poor	Fair	Good	Excellent
This week	0%	0%	5%	73%	22%
Last week	0%	0%	5%	73%	22%
Last year	NA	NA	NA	NA	NA
5-yr Avg.	NA	NA	NA	NA	NA

Corn Crop Condition

Week Ending October 12, 2014

	Very poor	Poor	Fair	Good	Excellent
This week	0%	2%	30%	53%	15%
Last week	1%	2%	31%	52%	14%
Last year	NA	NA	NA	NA	NA
5-yr Avg.	1%	5%	28%	47%	19%

Good and excellent condition is 68 percent. Conditions are above the 5 year average of 66 percent.

Sugar Beets Crop Condition

Week Ending October 12, 2014

	Very poor	Poor	Fair	Good	Excellent
This week	1%	1%	15%	41%	42%
Last week	1%	1%	14%	42%	42%
Last year	NA	NA	NA	NA	NA
5-yr Avg.	1%	6%	28%	47%	18%

Good and excellent condition is 83 percent. Conditions are above the 5 year average of 65 percent.

Movement from Summer Ranges

Week Ending October 12, 2014

	This week	Last week	Last year	5-yr Avg.
Cattle & Calves				
Moved	54%	40%	NA	55%
Sheep & Lambs				
Moved	74%	52%	NA	62%

Range & Pasture Feed Condition

Week Ending October 12, 2014

	Very poor- poor	Fair	Good	Excellent
This week	15%	32%	41%	12%
Last week	15%	32%	41%	12%
Last year	NA	NA	NA	NA
5-yr Avg.	34%	34%	26%	6%

Good and excellent condition is 53 percent. Conditions are significant better than the 5 year average of 32 percent.

Summary

Week Ending October 12, 2014

- Harvest of most spring small grains nearing completion
- Winter wheat seeding for 2014 crop
 - Ahead of the five-year average
- Cattle and sheep are being moved from summer pastures.

USDA, NASS, Mountain Region: Montana Field Office

Thomas Chard II, Agricultural Statistician

1-800-835-2612 or 406-441-1240

Email: nass-mt@nass.usda.gov

Montana Data available at following address:

http://www.nass.usda.gov/Statistics_by_State/Montana/index.asp

Governor's Drought & Water Supply Advisory Committee

Mountain Precipitation and Water Supply Report October 16th, 2014

Lucas Zukiewicz

Water Supply Specialist

USDA NRCS Montana Snow Surveys

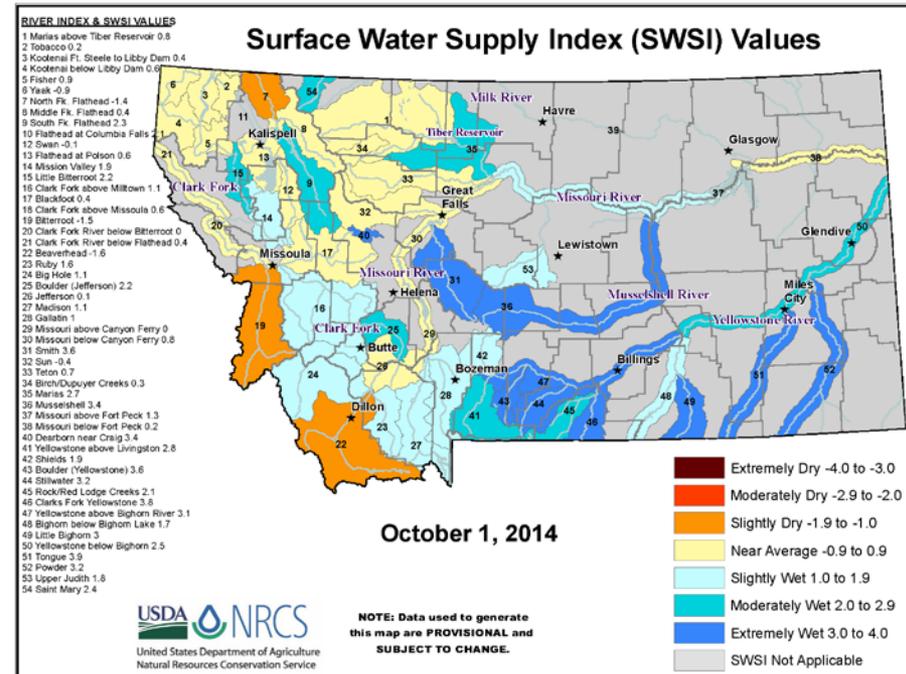
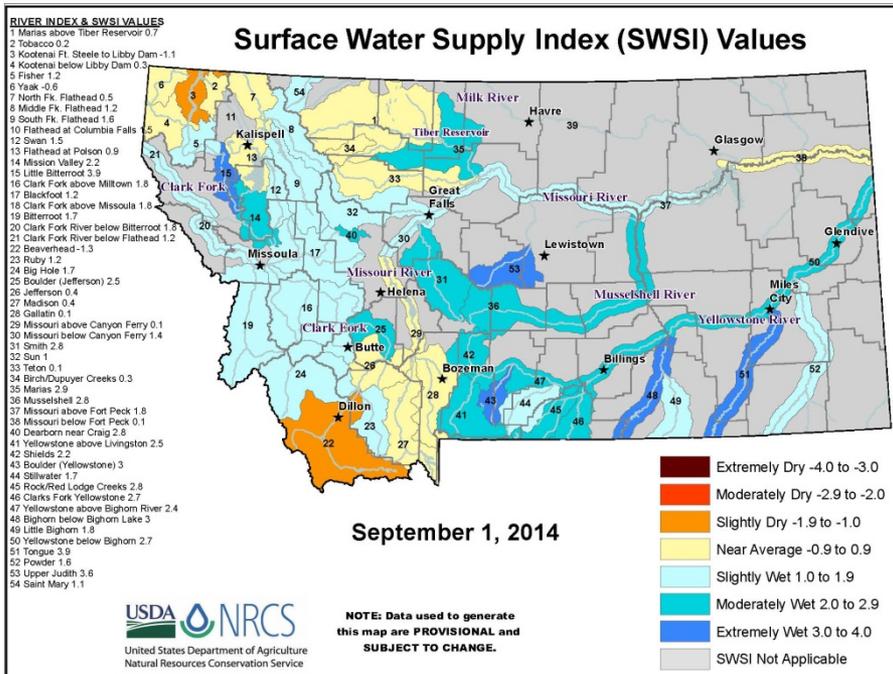
Lucas.Zukiewicz@mt.usda.gov

(406) 587-6843

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/mt/snow/>

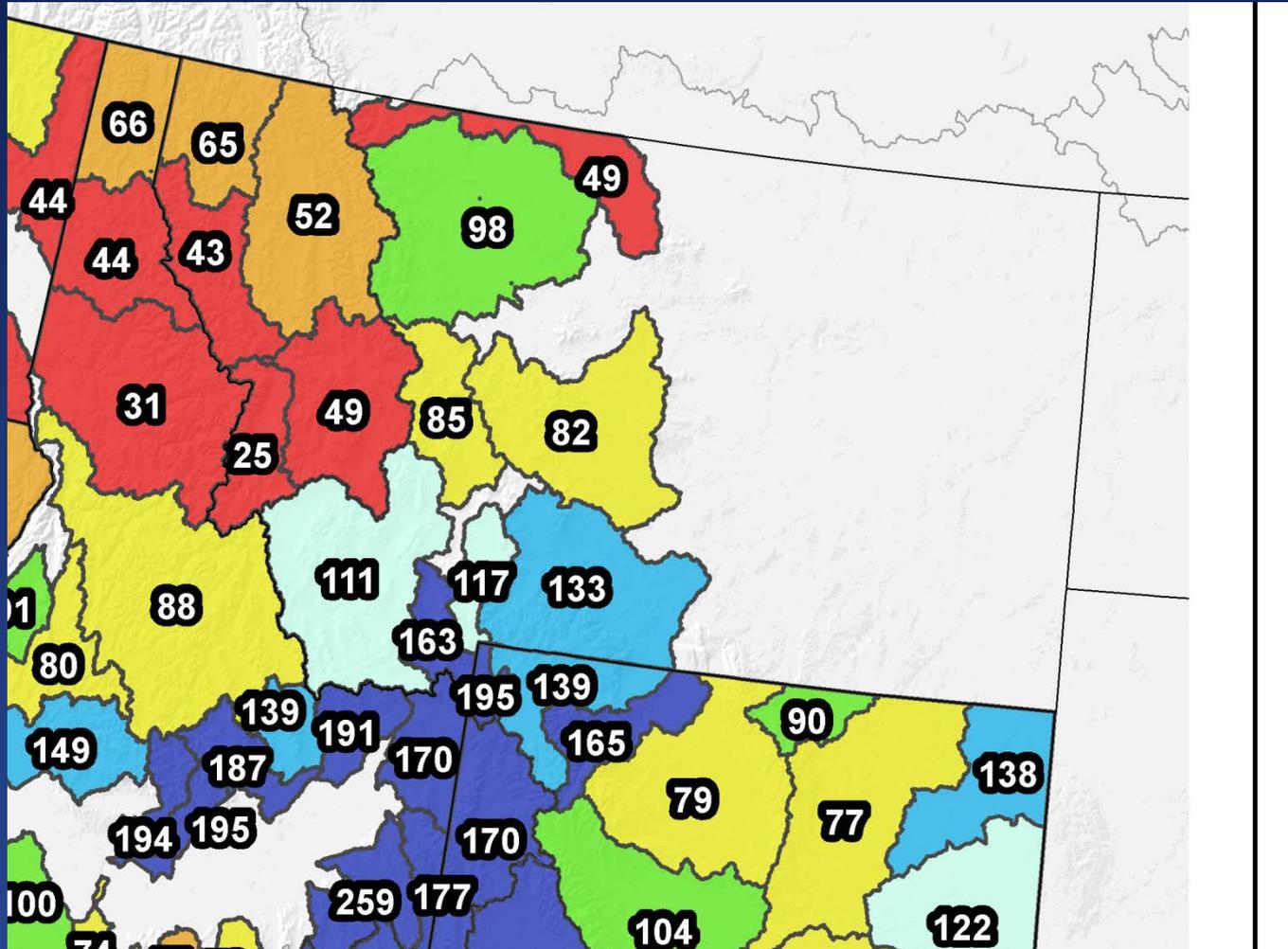
*Photo: Barker Lakes HeliSpot
Pintler Range, MT
September 21st, 2014*

Montana Snow Survey

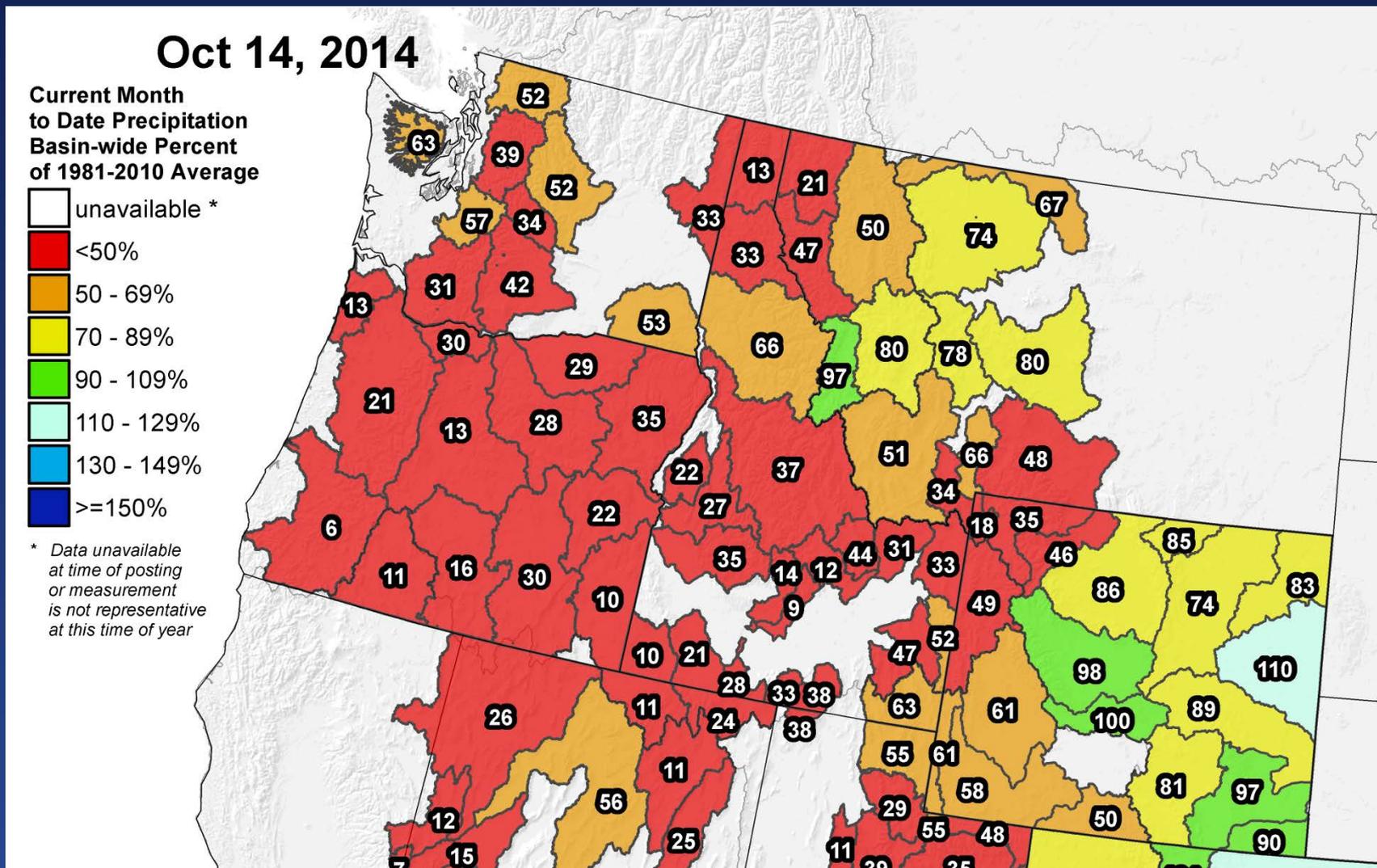


- Some SWSI values are dry due to decreased releases from reservoirs that have been feeding flow to irrigation districts/ditches
- Three basin SWSIs slightly dry conditions (negative on SWSI scale)
 - North Fork of the Flathead: -1.4
 - Bitterroot: -1.5
 - Beaverhead: -1.6

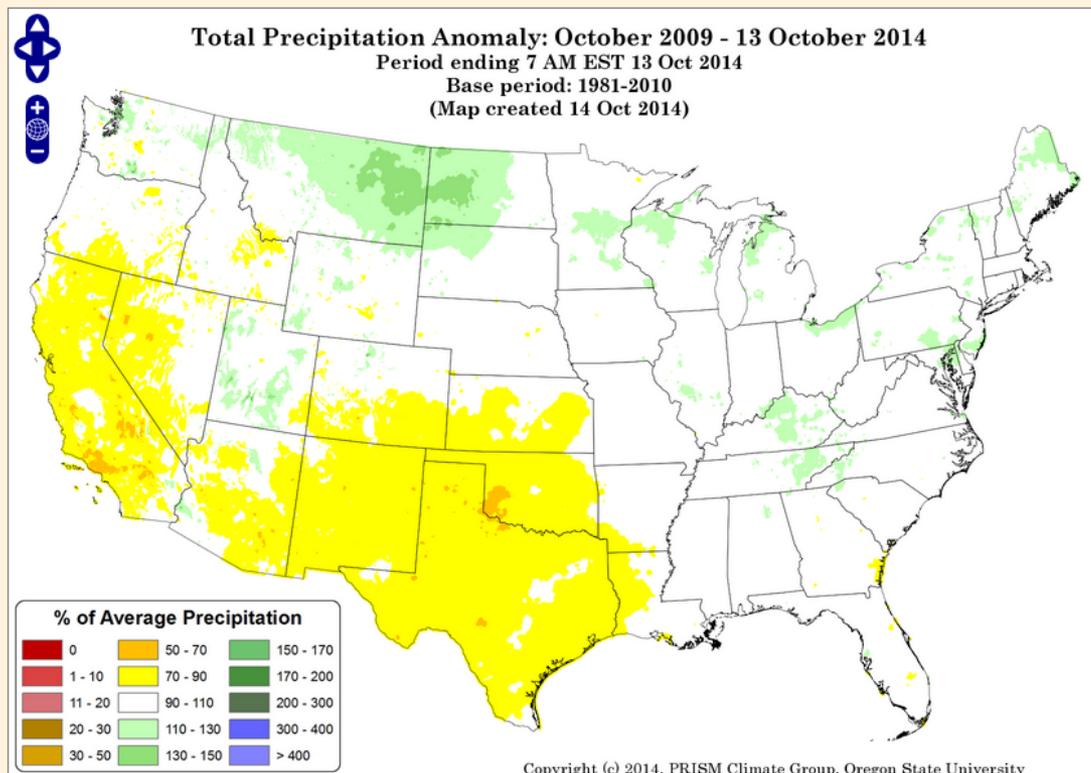
September Monthly Mountain Precipitation



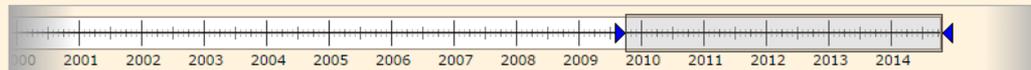
October Month-To-Date Mountain Precipitation



New Precipitation Comparison Tool Available



To change the window on the slider, use the dropdown lists or drag the scale handles.

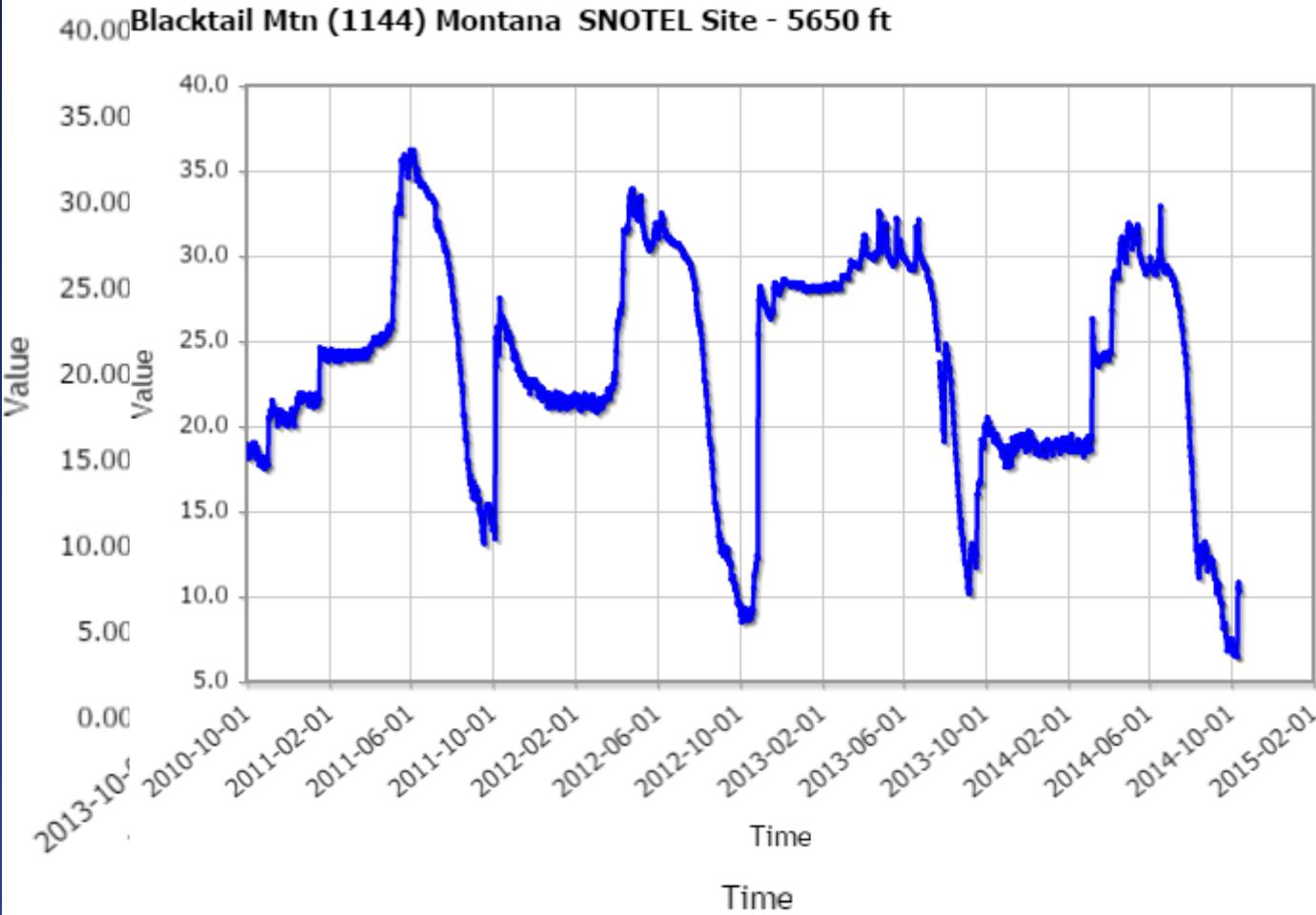


Duration (months): Start month: End month:

Choosing the current month as end date extends the time window to include whatever days have elapsed so far this month (e.g., a duration of "2" months is actually "2 plus the fractional month").

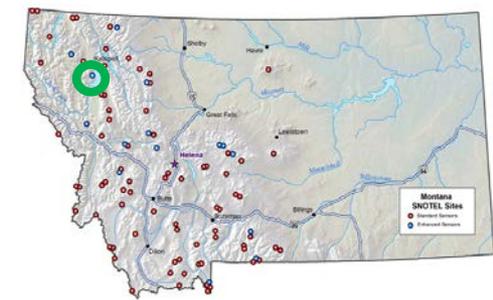
Soil Moisture Data

Blacktail Mtn (1144) Montana SNOTEL Site - 5650 ft



Soil Moisture Percent
-20in(pct)

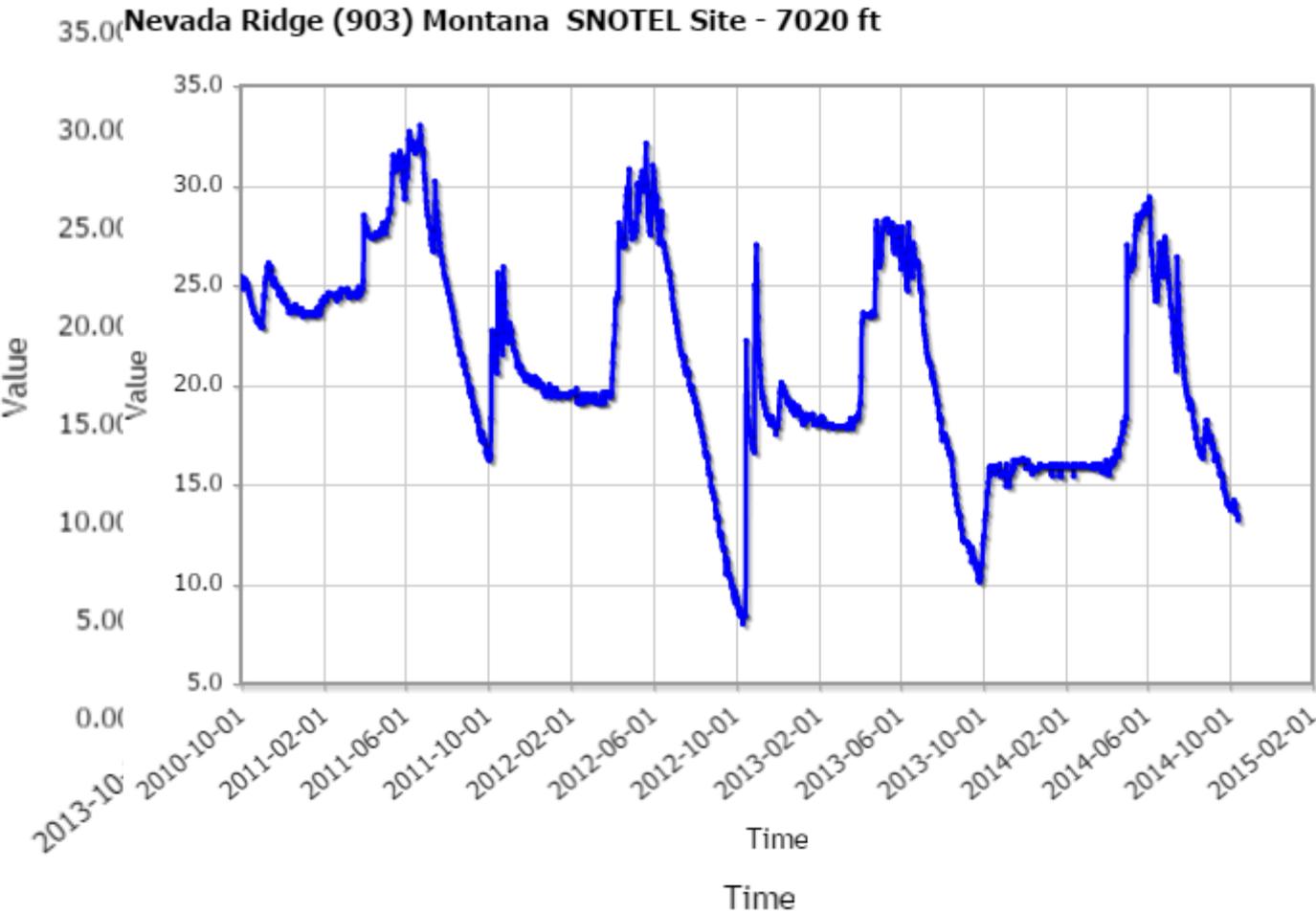
(in)



Montana Snow Survey



Nevada Ridge (903) Montana SNOTEL Site - 7020 ft



Soil Moisture Percent
-20in(pct)

t (in)

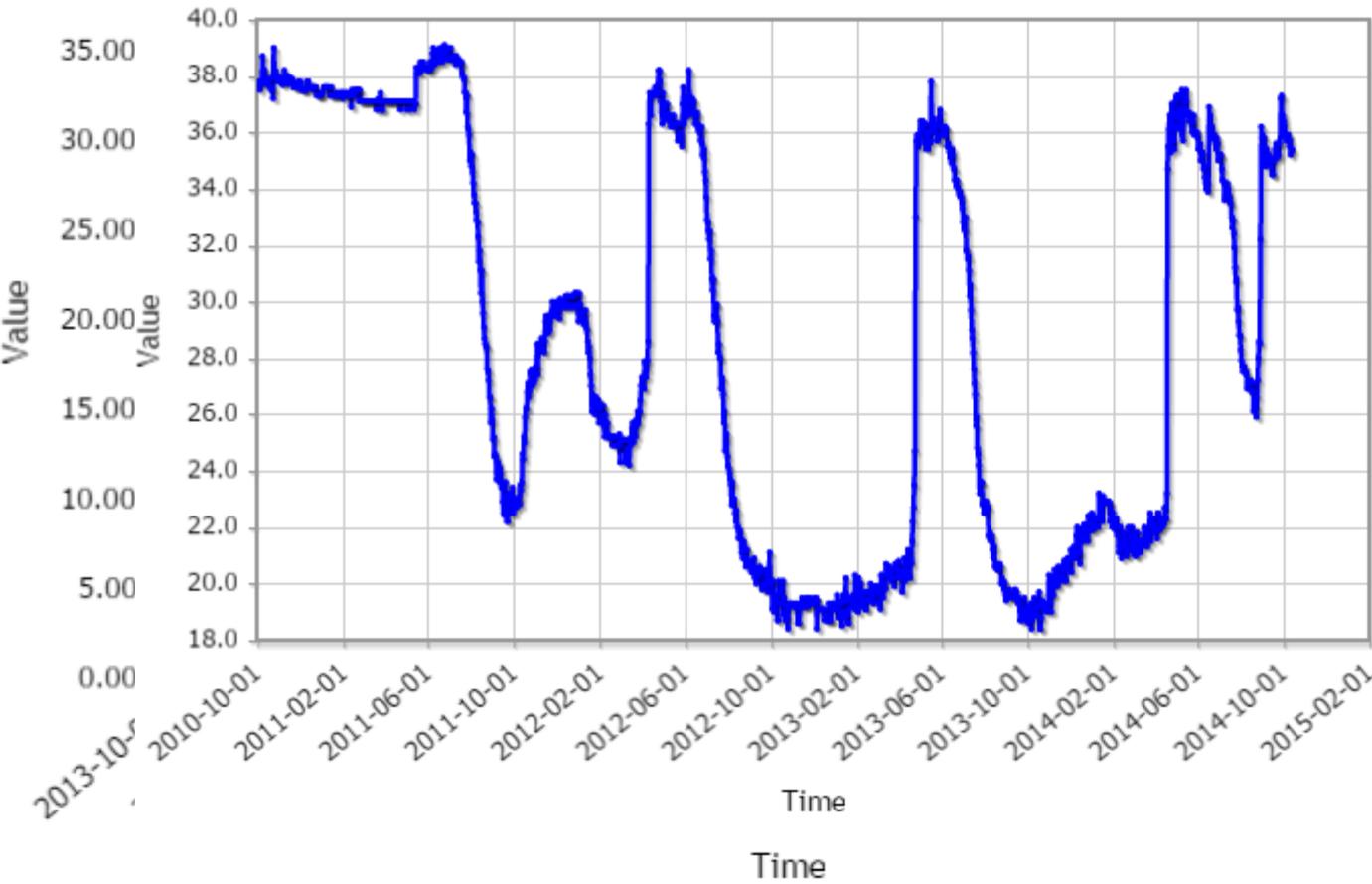


Montana Snow Survey



Lakeview Ridge (568) Montana SNOTEL Site - 7400 ft

40.00 Lakeview Ridge (568) Montana SNOTEL Site - 7400 ft

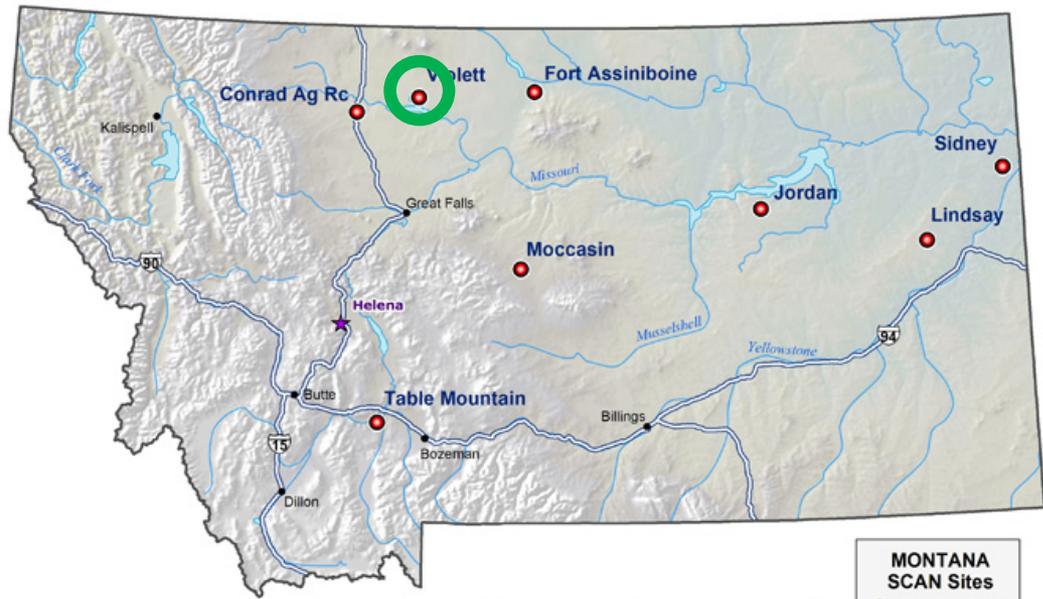


Soil Moisture Percent -20in(pct)

(in)



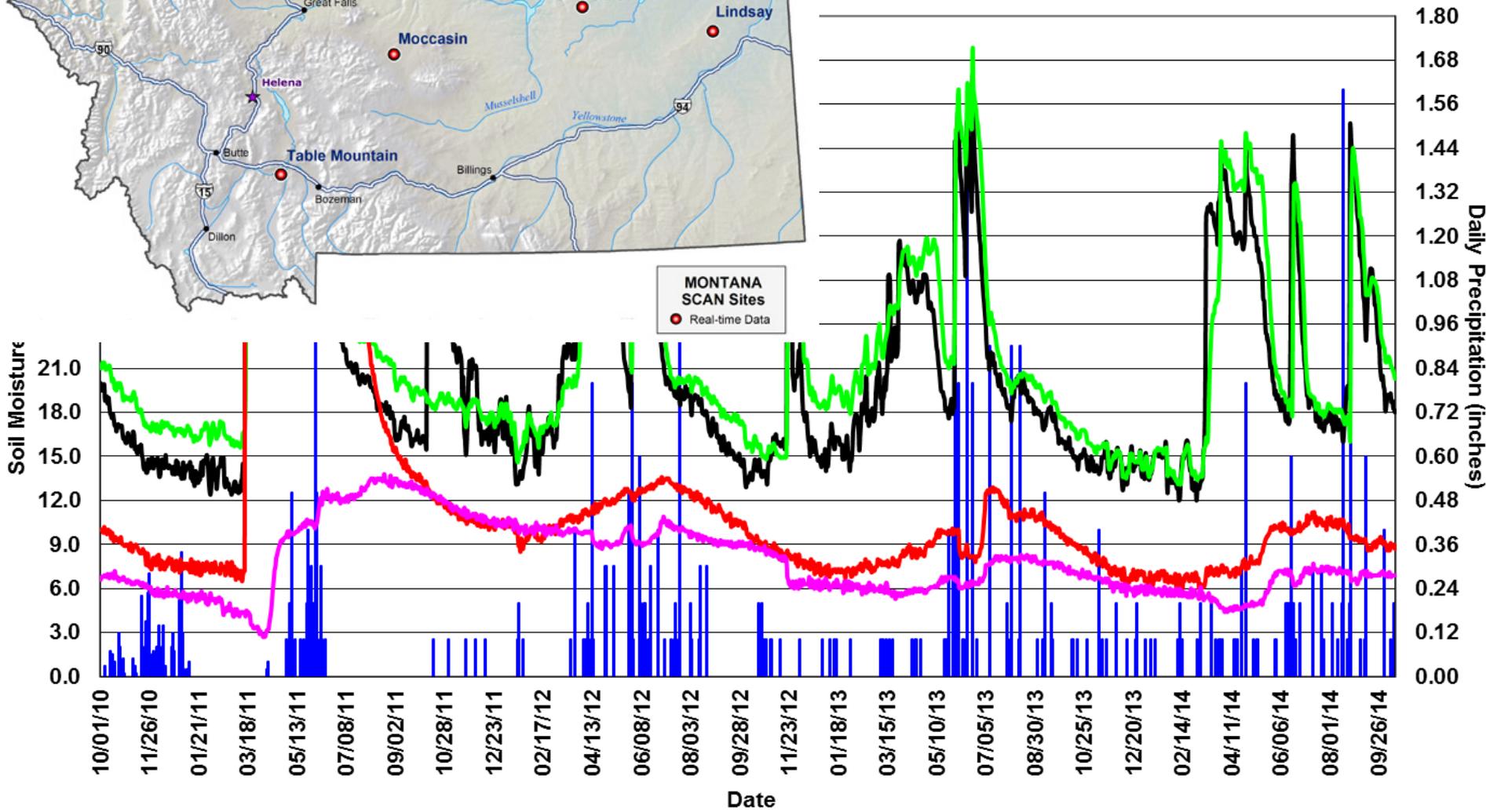
Montana Snow Survey



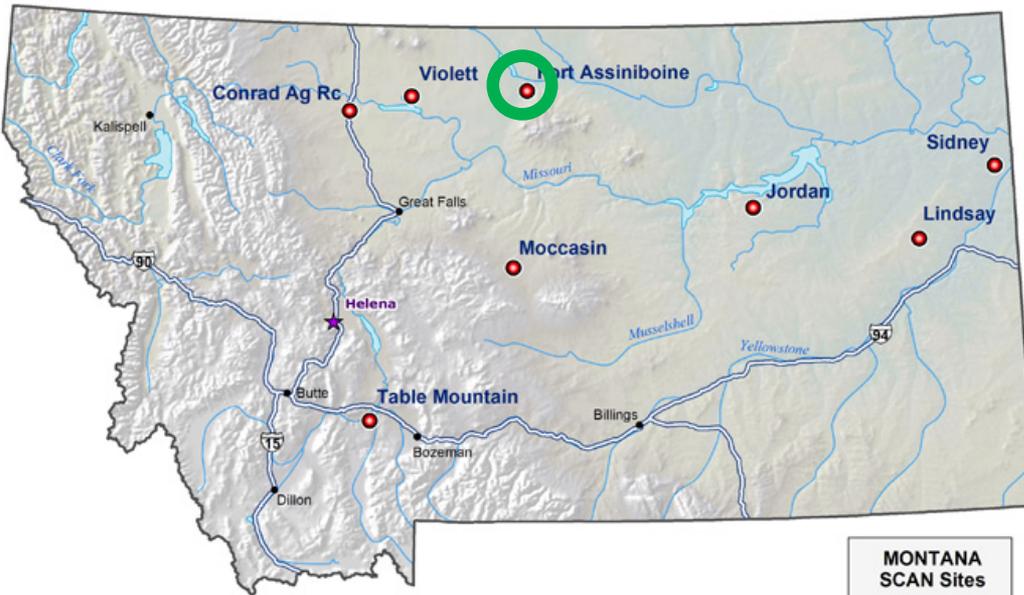
Year 2011-14
 Base Data

— Avg 20" SMR — Avg 40" SMR

MONTANA
 SCAN Sites
 ● Real-time Data

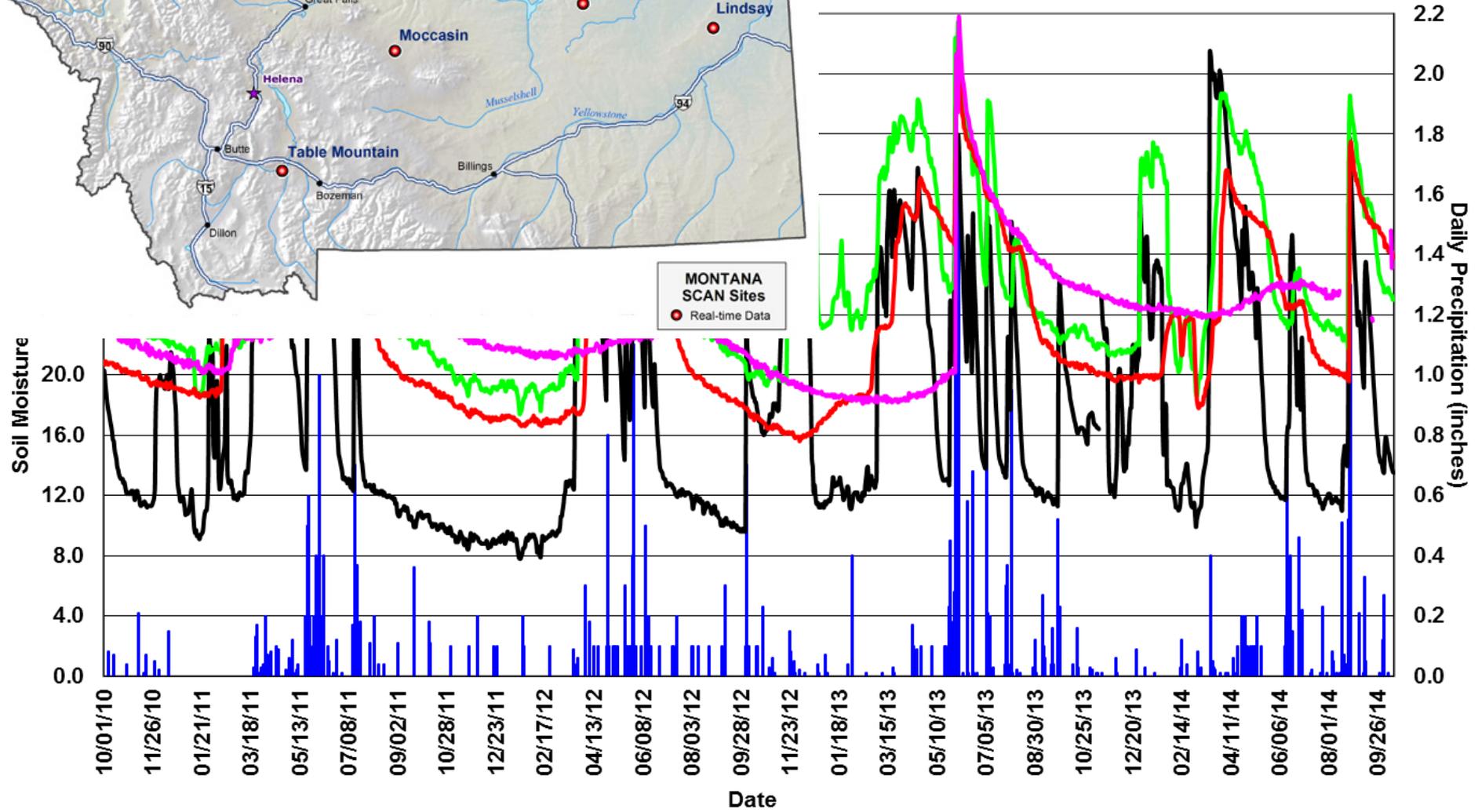


Montana Snow Survey



er Year 2011-14
nse Data

— Avg 20" SMR — Avg 40" SMR

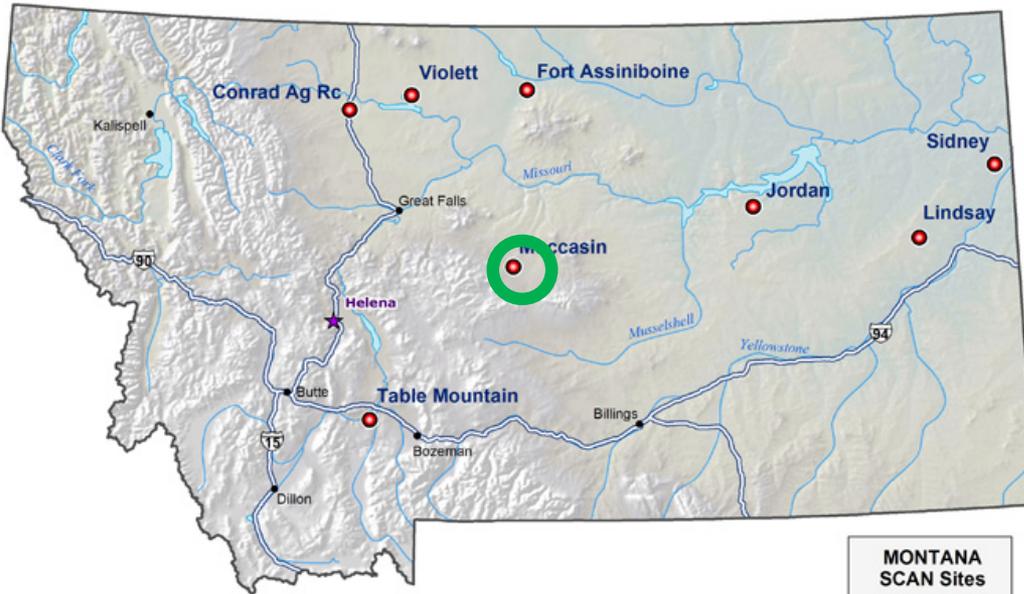


Montana Snow Survey

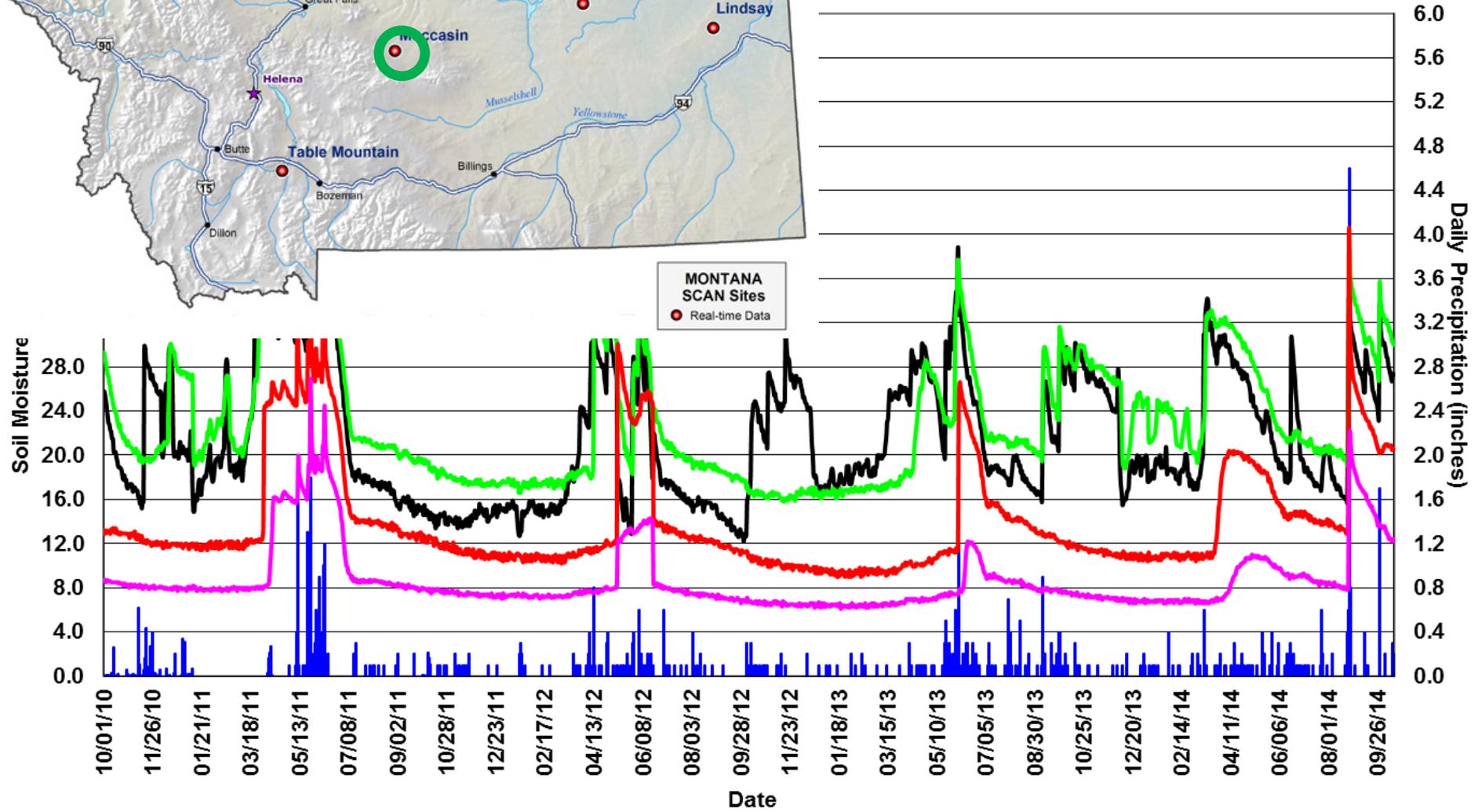


Year 2011-14
Response Data

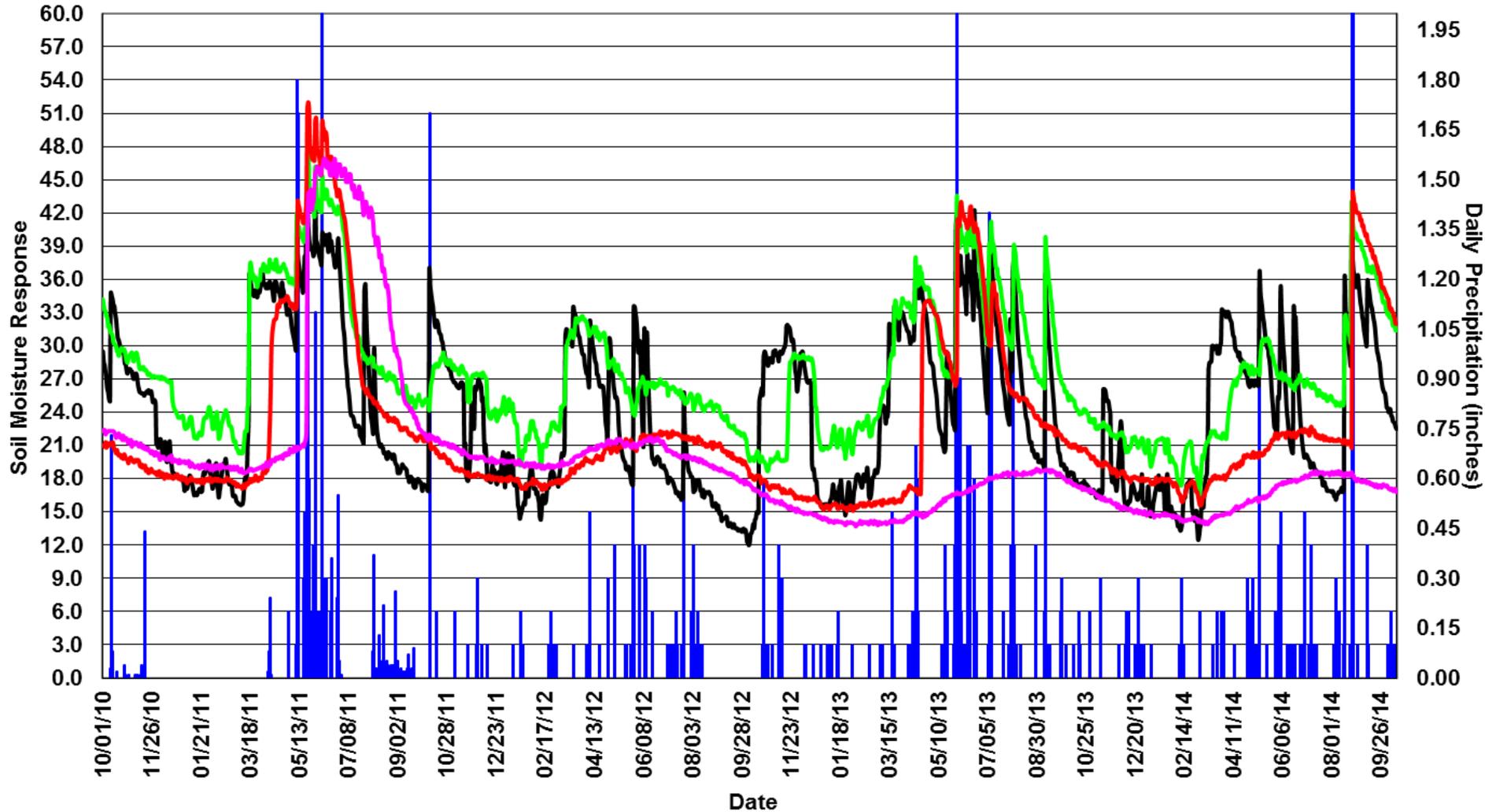
— Avg 20" SMR — Avg 40" SMR



MONTANA
SCAN Sites
● Real-time Data



Jordan SCAN Water Year 2011-14 Soil Moisture Response Data

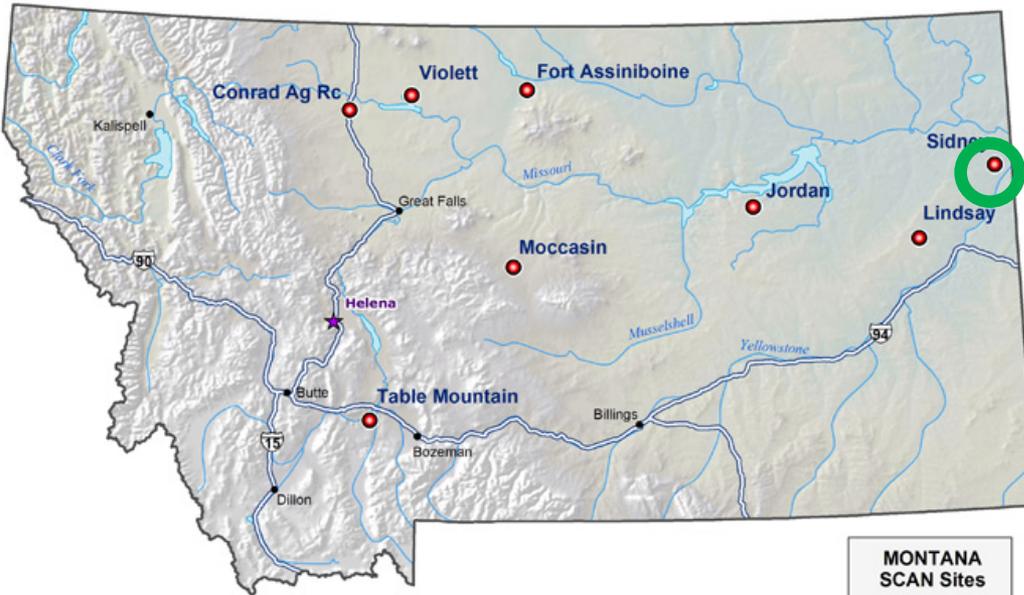


Montana Snow Survey

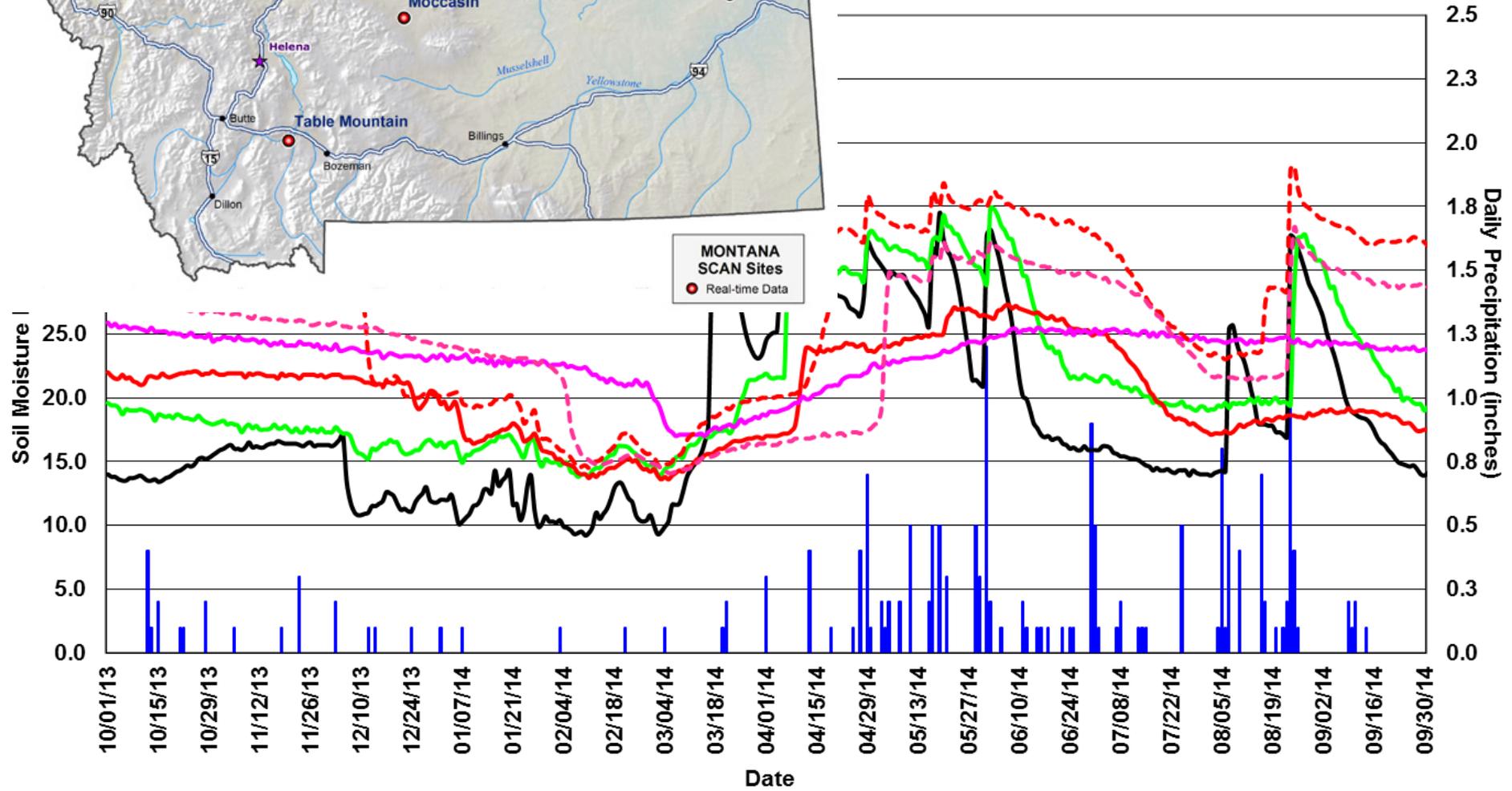


Year 2014
Use Data

SMR
1" SMR Grass Avg 8" SMR
 Field Avg 20" SMR

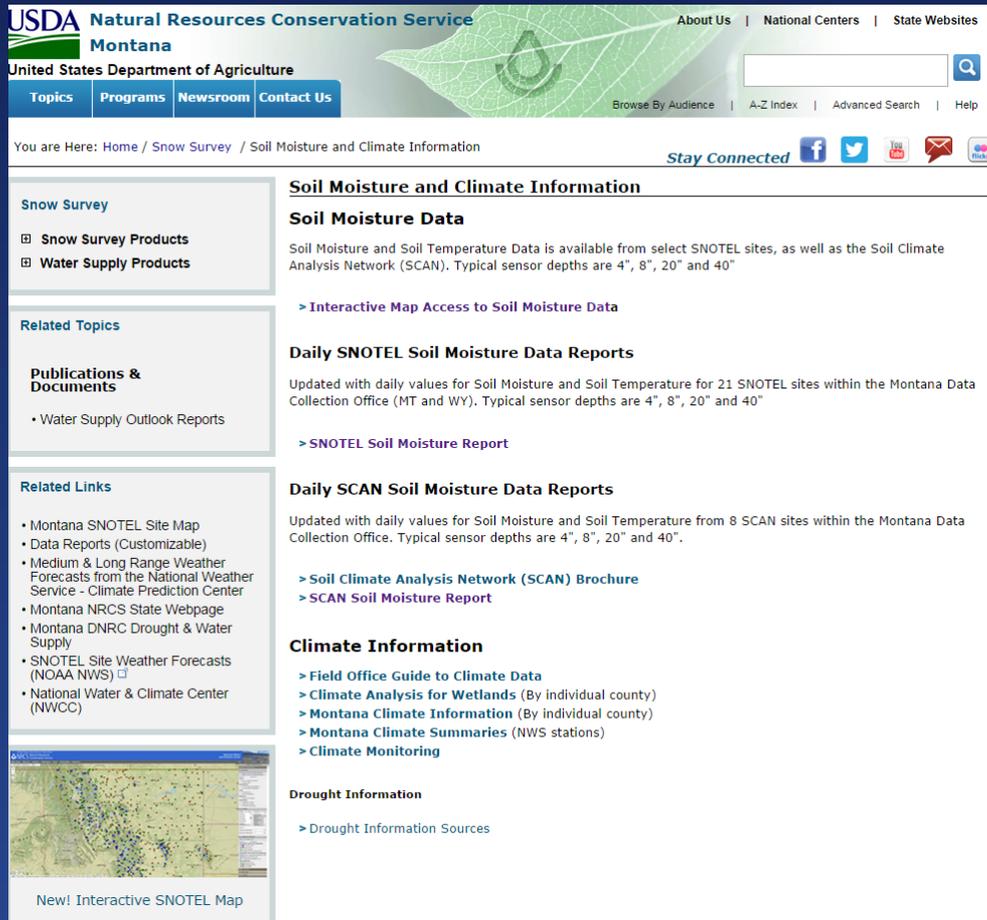


MONTANA
SCAN Sites
● Real-time Data



NEW!!

Daily Soil Moisture Reports: SNOTEL and SCAN



Soil Moisture and Climate Information

Soil Moisture Data

Soil Moisture and Soil Temperature Data is available from select SNOTEL sites, as well as the Soil Climate Analysis Network (SCAN). Typical sensor depths are 4", 8", 20" and 40"

[> Interactive Map Access to Soil Moisture Data](#)

Daily SNOTEL Soil Moisture Data Reports

Updated with daily values for Soil Moisture and Soil Temperature for 21 SNOTEL sites within the Montana Data Collection Office (MT and WY). Typical sensor depths are 4", 8", 20" and 40"

[> SNOTEL Soil Moisture Report](#)

Daily SCAN Soil Moisture Data Reports

Updated with daily values for Soil Moisture and Soil Temperature from 8 SCAN sites within the Montana Data Collection Office. Typical sensor depths are 4", 8", 20" and 40".

[> Soil Climate Analysis Network \(SCAN\) Brochure](#)
[> SCAN Soil Moisture Report](#)

Climate Information

[> Field Office Guide to Climate Data](#)
[> Climate Analysis for Wetlands](#) (By individual county)
[> Montana Climate Information](#) (By individual county)
[> Montana Climate Summaries](#) (NWS stations)
[> Climate Monitoring](#)

Drought Information

[> Drought Information Sources](#)

New! Interactive SNOTEL Map

Data is available through the Montana Snow Survey Webpage and is available daily

- SNOTEL- Available from 21 sites across Montana and Wyoming. (Soil Moisture Reponse, Soil Temperature)
- SCAN - Available from 8 sites across Montana and Wyoming. (Soil Moisture Reponse, Soil Temperature)

NEW!!

Interactive Map Based Access to SNOTEL (AWBD) Database

www.wcc.nrcs.usda.gov/webmap/index.html#elements=&networks=1&states=MT,SD,WY&counties=1&hucs=&minElevation=&maxElevation=&elementSelectType=all&activeOnly=true&overlays=&hucOverlays=&openSections=elements,location

United States Department of Agriculture
NRCS Natural Resources Conservation Service

National Water and Climate Center

Selected Stations: 982

MAP CONTROLS

Station Selection

- Stations with all checked elements
- Stations with any checked elements

Check All Uncheck All

Snow

- Snow Water Equivalent
- Snow Depth

Precipitation

- Accumulated Precipitation
- Incremental Precipitation

Soils

- Soil Moisture
- Soil Temperature

Reservoir

- Reservoir Storage

Streamflow

- Adjusted Volume
- Observed Volume
- Diversion Discharge

Location

States: All None Counties: All None

- Kansas
- Kentucky
- Maryland
- Michigan
- Minnesota
- Mississippi
- Missouri
- Montana

HUCs:

Minimum Elevation: ft.

Maximum Elevation: ft.

Collection Networks

Check All Uncheck All

USDA-NRCS Real-Time Networks

- SNOTEL (181)
- SCAN (10)
- SNOTLE (0)
- Other NRCS Hydromet (5)

USDA-NRCS Non-Real-Time Networks

- Snow Course/Aerial Marker (170)
- Manual SNOTEL (0)
- Manual Precipitation (11)

Other Networks

- Reservoir (75)
- Streamflow (231)
- ACIS (299)

Map Layers

- Base Map
- Overlays

What Data is Available?

The new map based tool allows users to access all stored values within the SNOTEL AWDB database. These parameters include:

- SNOTEL Data from all locations
- SCAN Data from all locations
- Snowcourse Data from Current and Discontinued Snowcourses
- Automated Precipitation Gauge Data (NRCS Hydromet)
- Manual Precipitation Gauge Readings
- End of Month Reservoir Storages
- Streamflow (Monthly Adjusted Streamflow Volume, Daily Observed Discharge)
- ACIS Data – Cooperative Precipitation Monthly Increments

The map can be found online at:

<http://www.nrcs.usda.gov/wps/portal/nrcs/main/mt/snow/>

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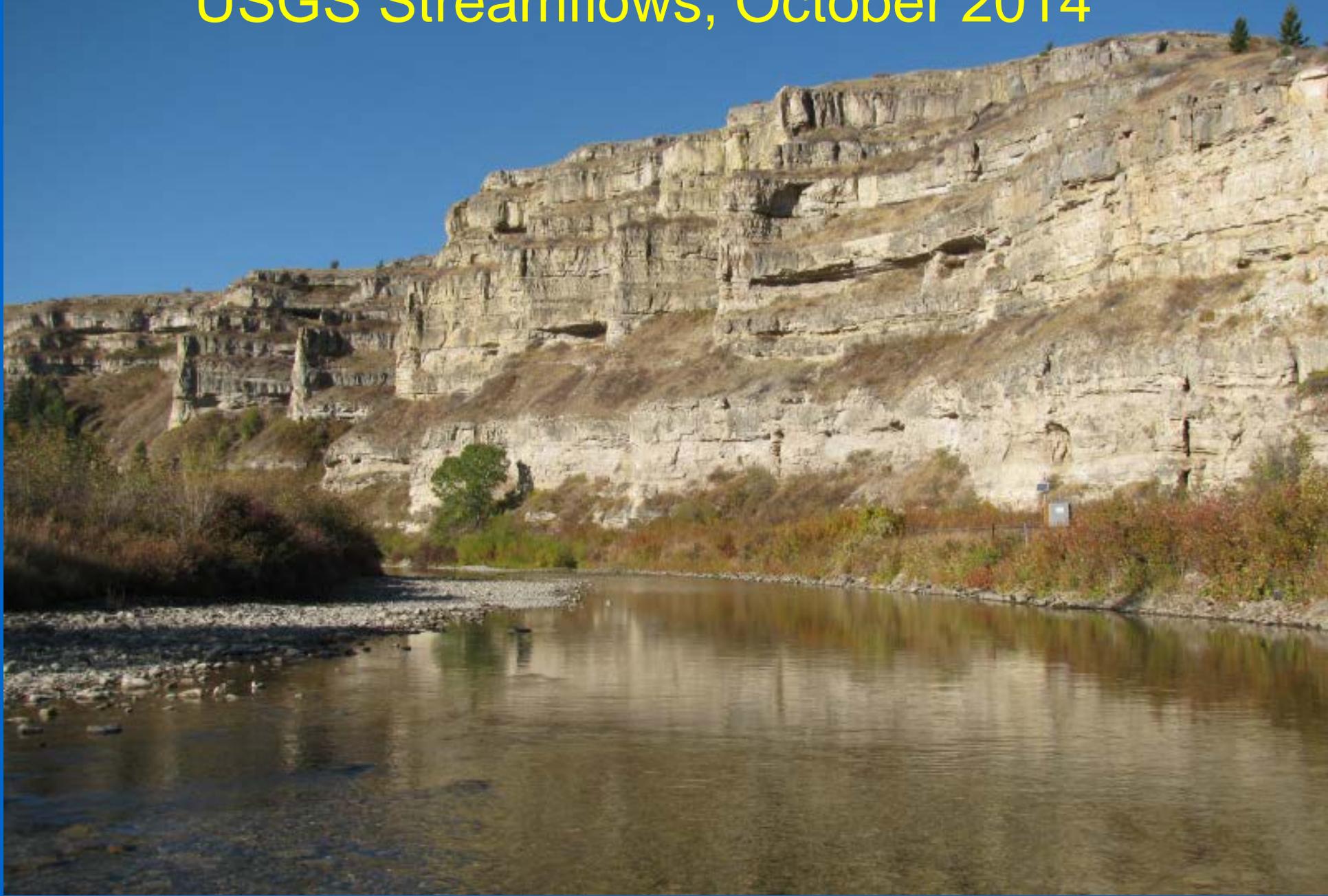
Governor's Drought & Water Supply Advisory Committee

Snow Survey and Water Supply Report
September 18th, 2014

Lucas Zukiewicz
Water Supply Specialist
USDA NRCS Montana Snow Surveys
Lucas.Zukiewicz@mt.usda.gov
(406) 587-6843
<http://www.nrcs.usda.gov/wps/portal/nrcs/main/mt/snow/>



USGS Streamflows, October 2014

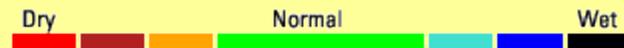
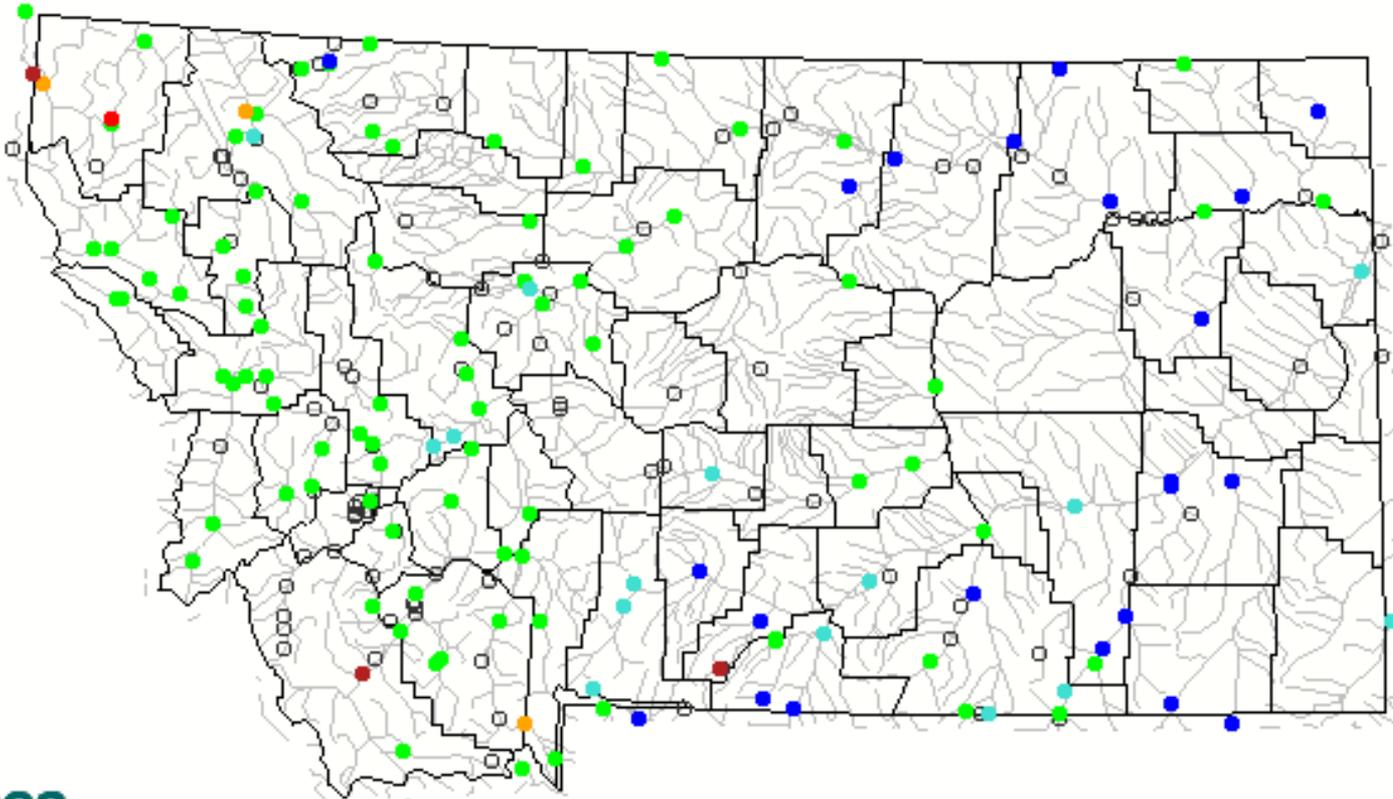


New Streamgages

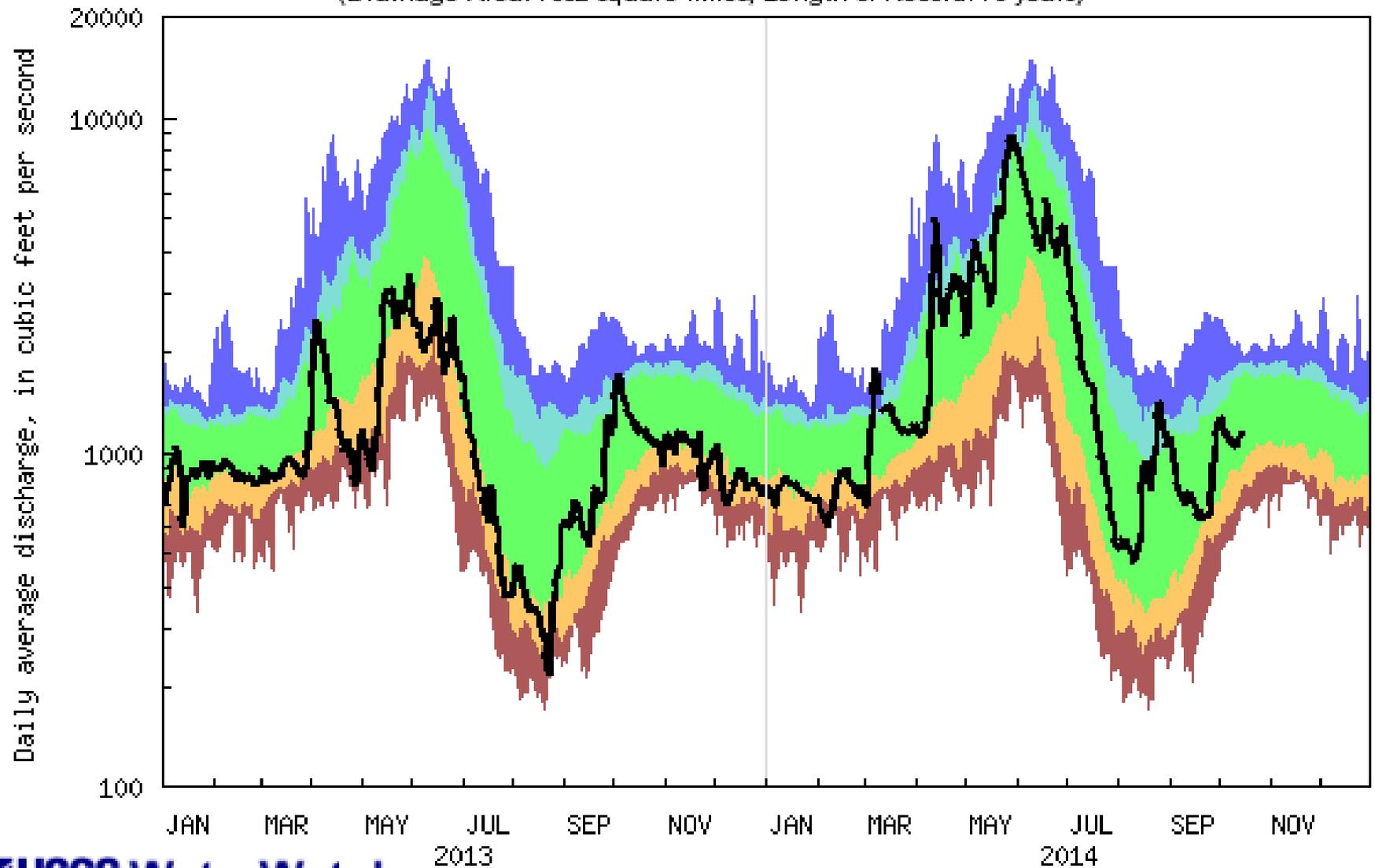
- 06048700 – East Gallatin River ab Water Reclamation Plant, near Bozeman
- 06074000 – Missouri River at Cascade
- 06076690 – Smith River at Fort Logan
- 06078500 – North Fork Sun River near Augusta
- 06078900 – South Fork Sun River near Augusta
- 06090000 – Missouri River at Great Falls
- 06099000 – Cut Bank Creek at Cut Bank
- 06110020 – Judith River above Carr Creek, near Utica
- 06111800 – Big Springs Creek at R&B Trading Post, near Lewistown
- 06118500 – South Fork Musselshell River near Martinsdale
- 06217000 – Pryor Creek near Huntley
- 06295133 – Rosebud Creek at Reservation Boundary, near Kirby
- 06307830 – Tongue River below Brandenburg Bridge, near Ashland

DAILY STREAMFLOW CONDITIONS

Wednesday, October 15, 2014 11:00ET

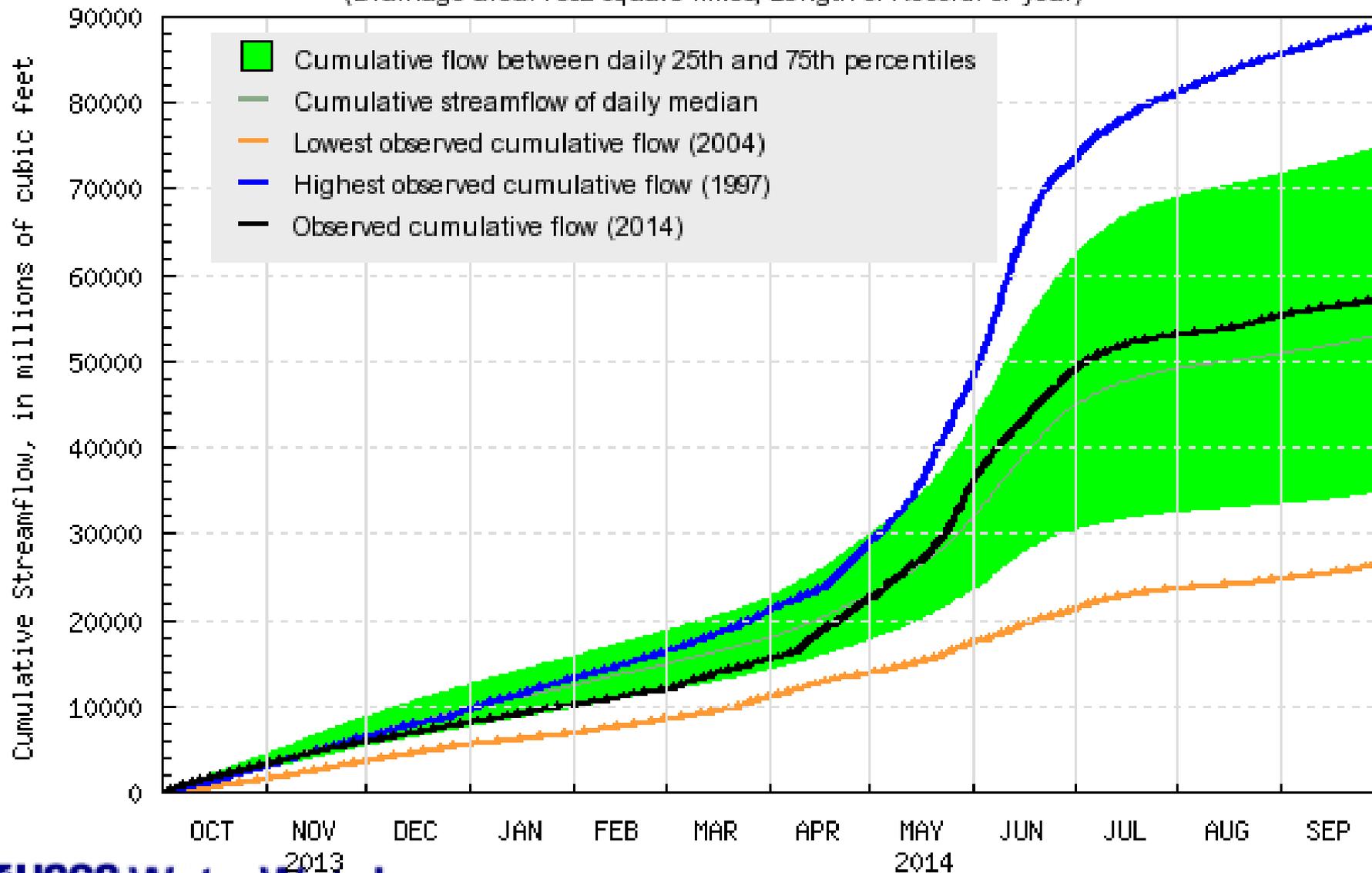


USGS 06026500 Jefferson River near Twin Bridges MT
 (Drainage Area: 7632 square miles, Length of Record: 73 years)

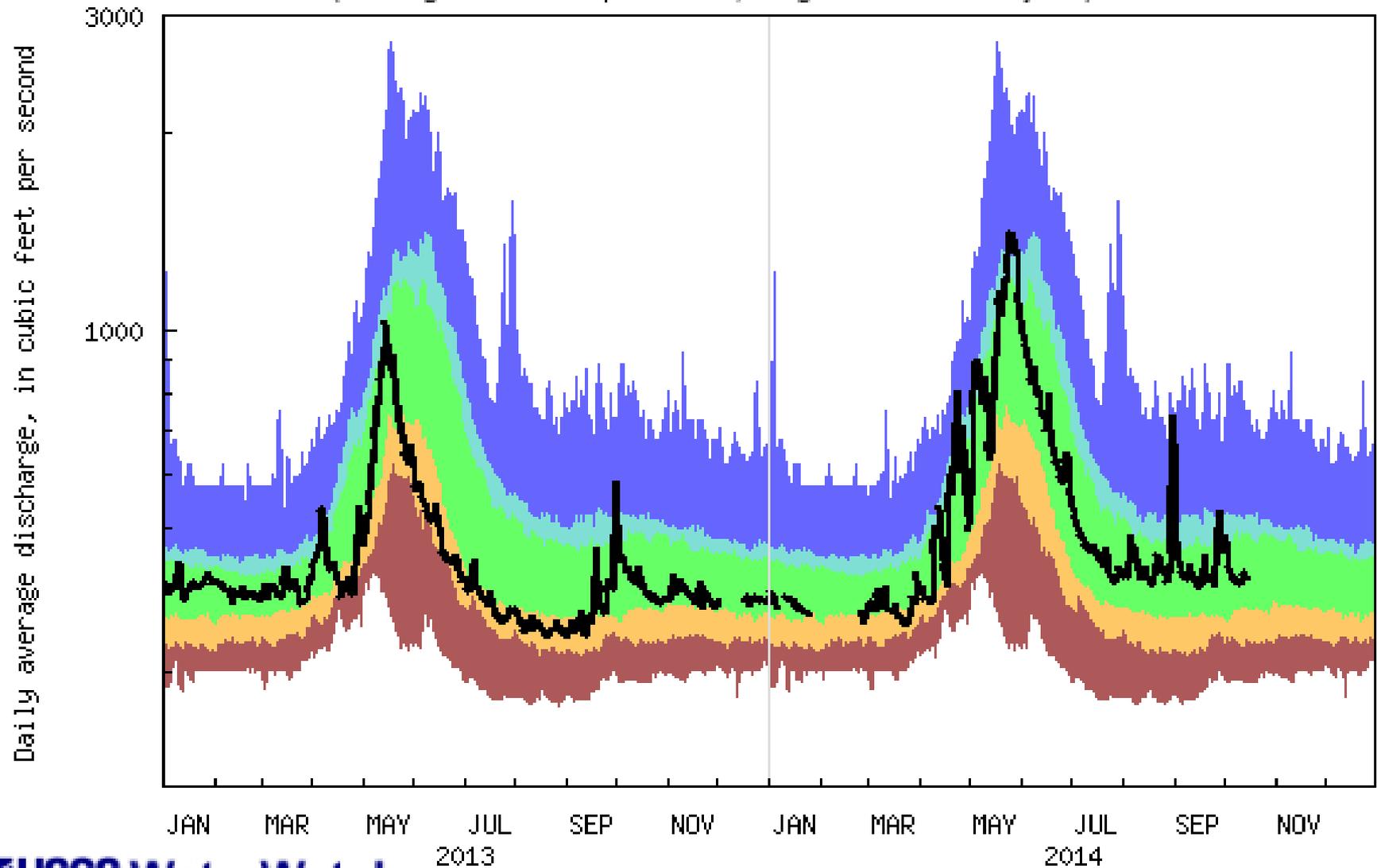


Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 06026500 Jefferson River near Twin Bridges MT
(Drainage area: 7632 square miles, Length of Record: 37 year)



USGS 06037500 Madison River near West Yellowstone MT
 (Drainage Area: 420 square miles, Length of Record: 100 years)



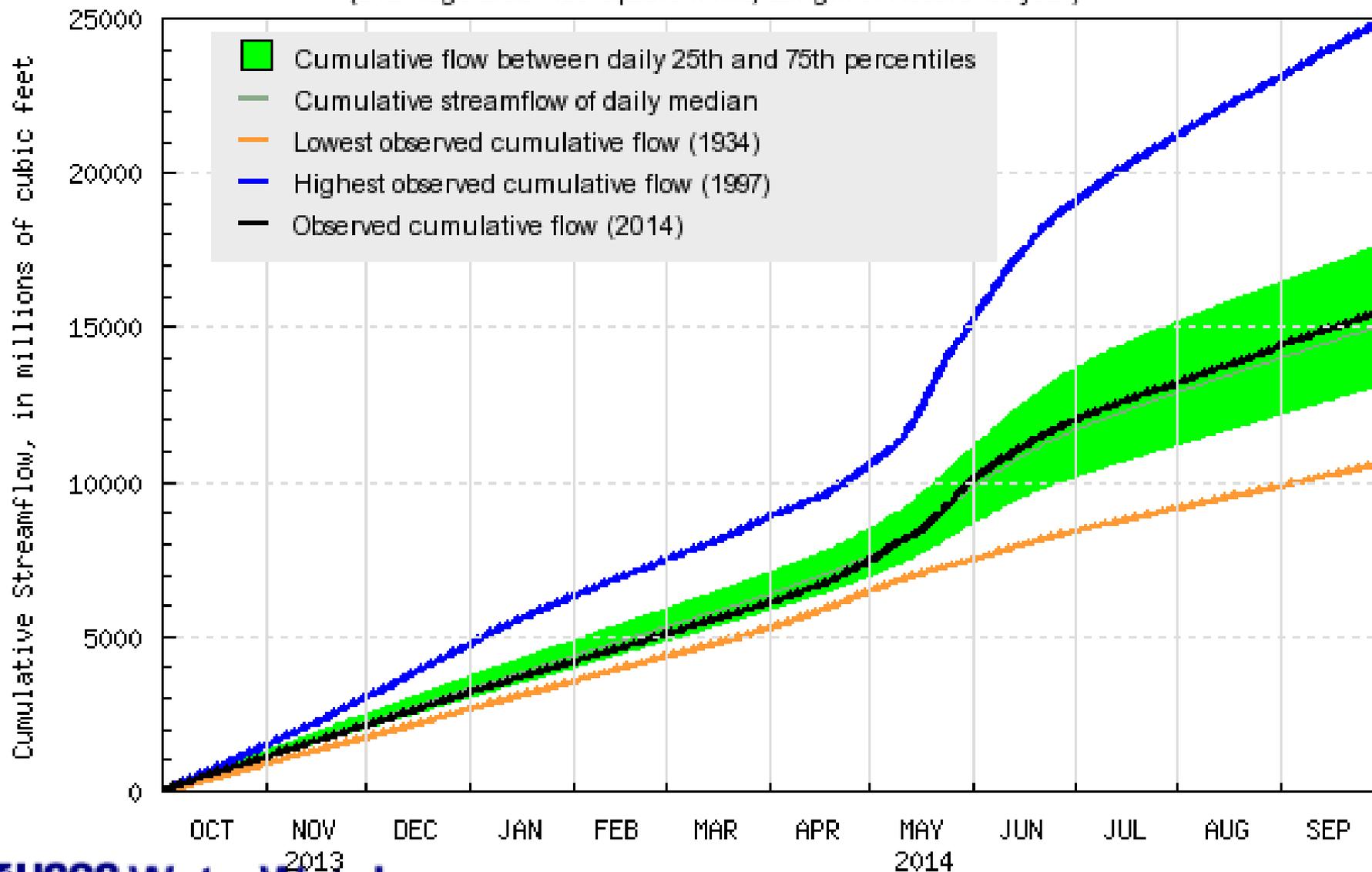
USGS WaterWatch

Last updated: 2014-10-15

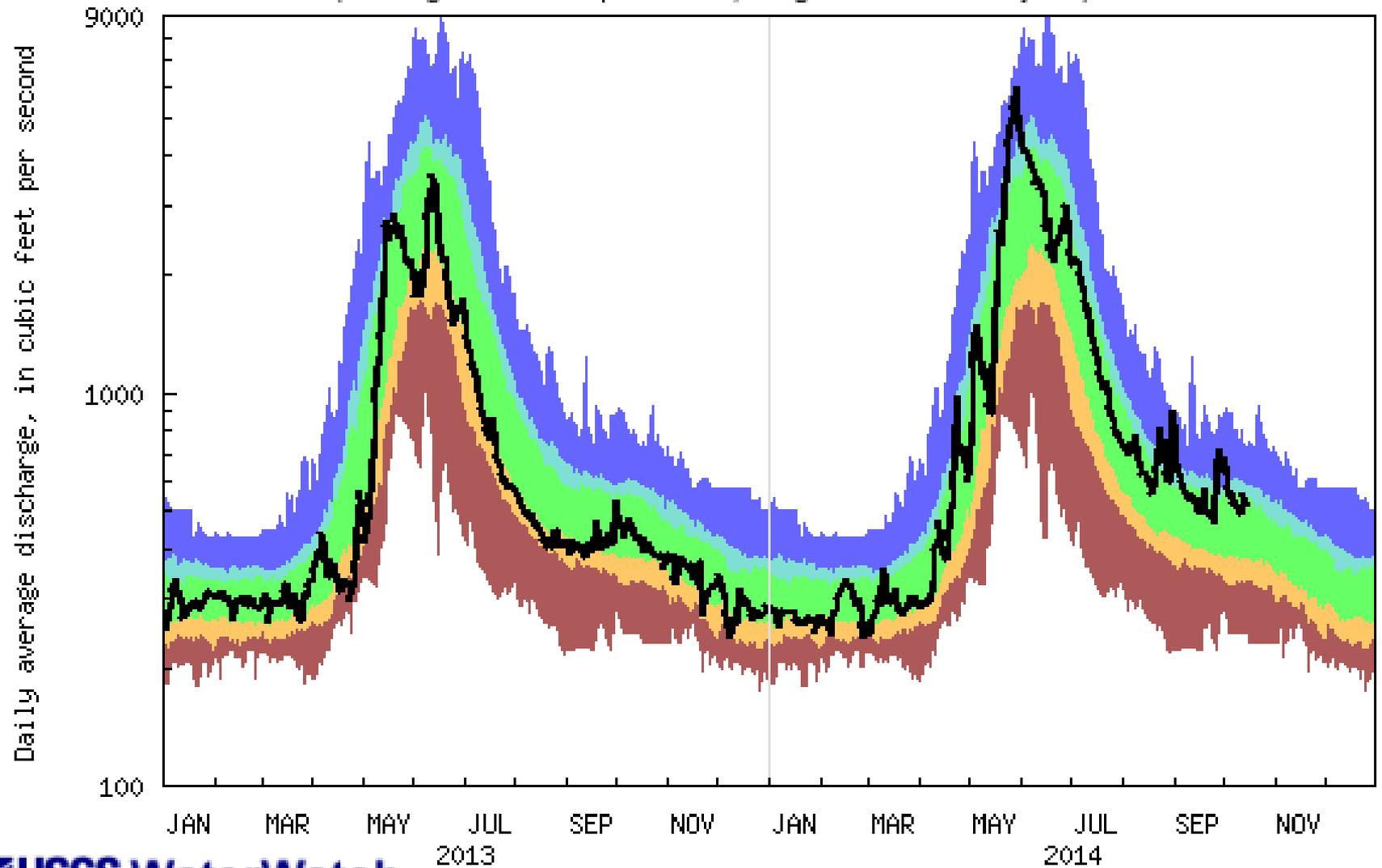
Explanation - Percentile classes				
lowest-10th percentile	10-24	25-75	76-90	90th percentile -highest
Much below normal	Below normal	Normal	Above normal	Much above normal

Flow

USGS 06037500 Madison River near West Yellowstone MT
(Drainage area: 420 square miles, Length of Record: 86 year)



USGS 06043500 Gallatin River near Gallatin Gateway MT
 (Drainage Area: 825 square miles, Length of Record: 124 years)

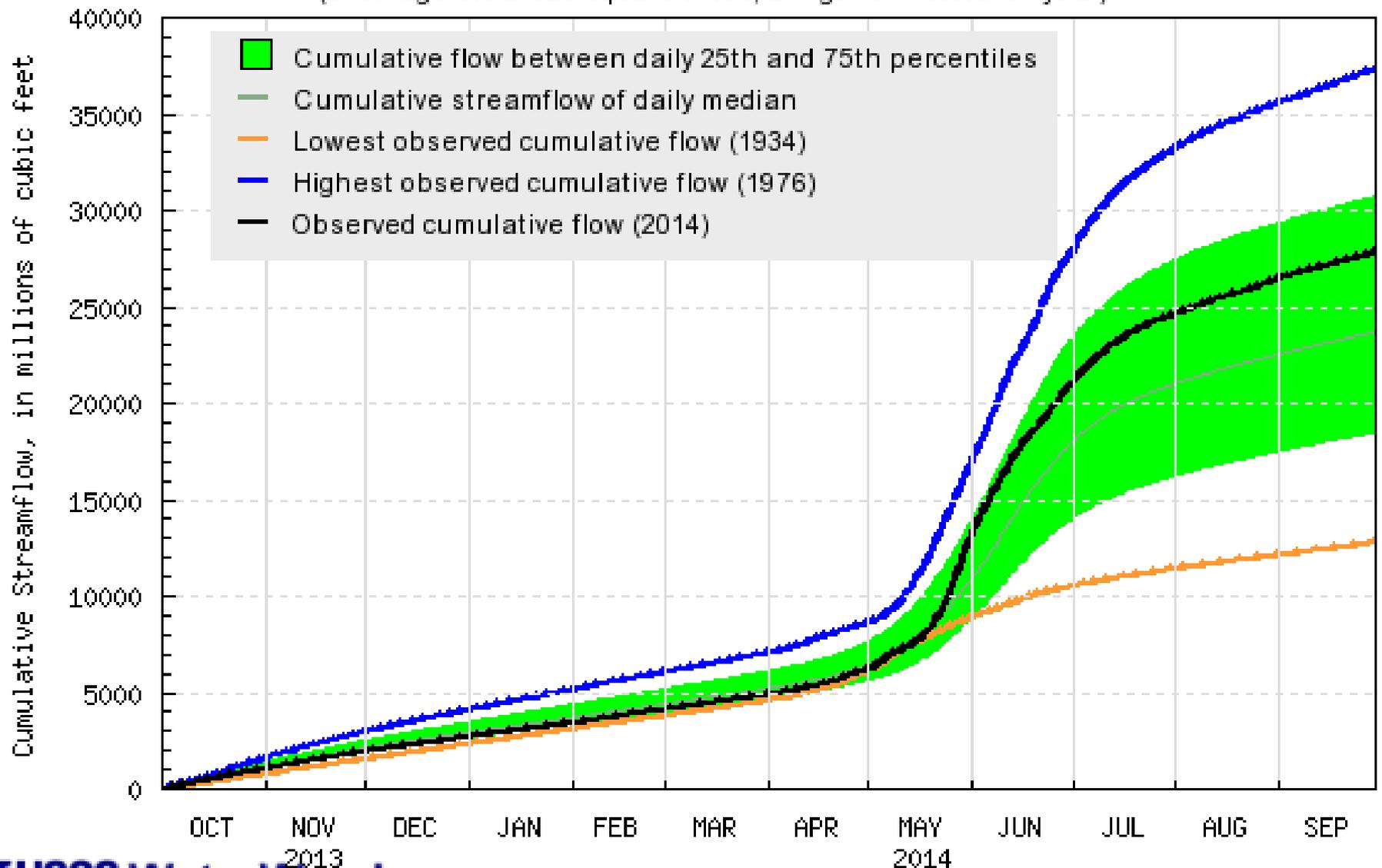


USGS WaterWatch

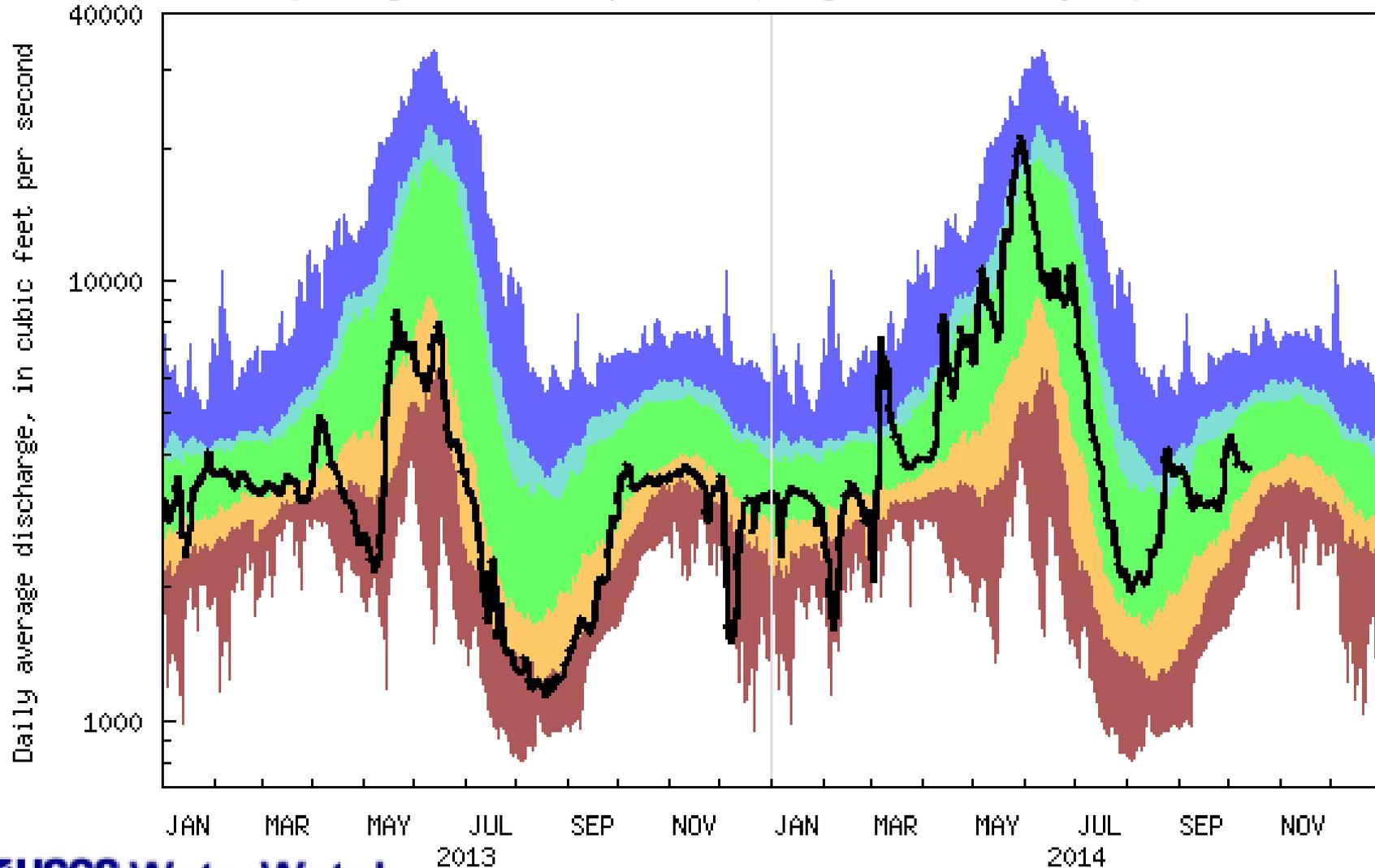
Last updated: 2014-10-15

Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 06043500 Gallatin River near Gallatin Gateway MT
(Drainage area: 825 square miles, Length of Record: 83 year)



USGS 06054500 Missouri River at Toston MT
 (Drainage Area: 14669 square miles, Length of Record: 123 years)

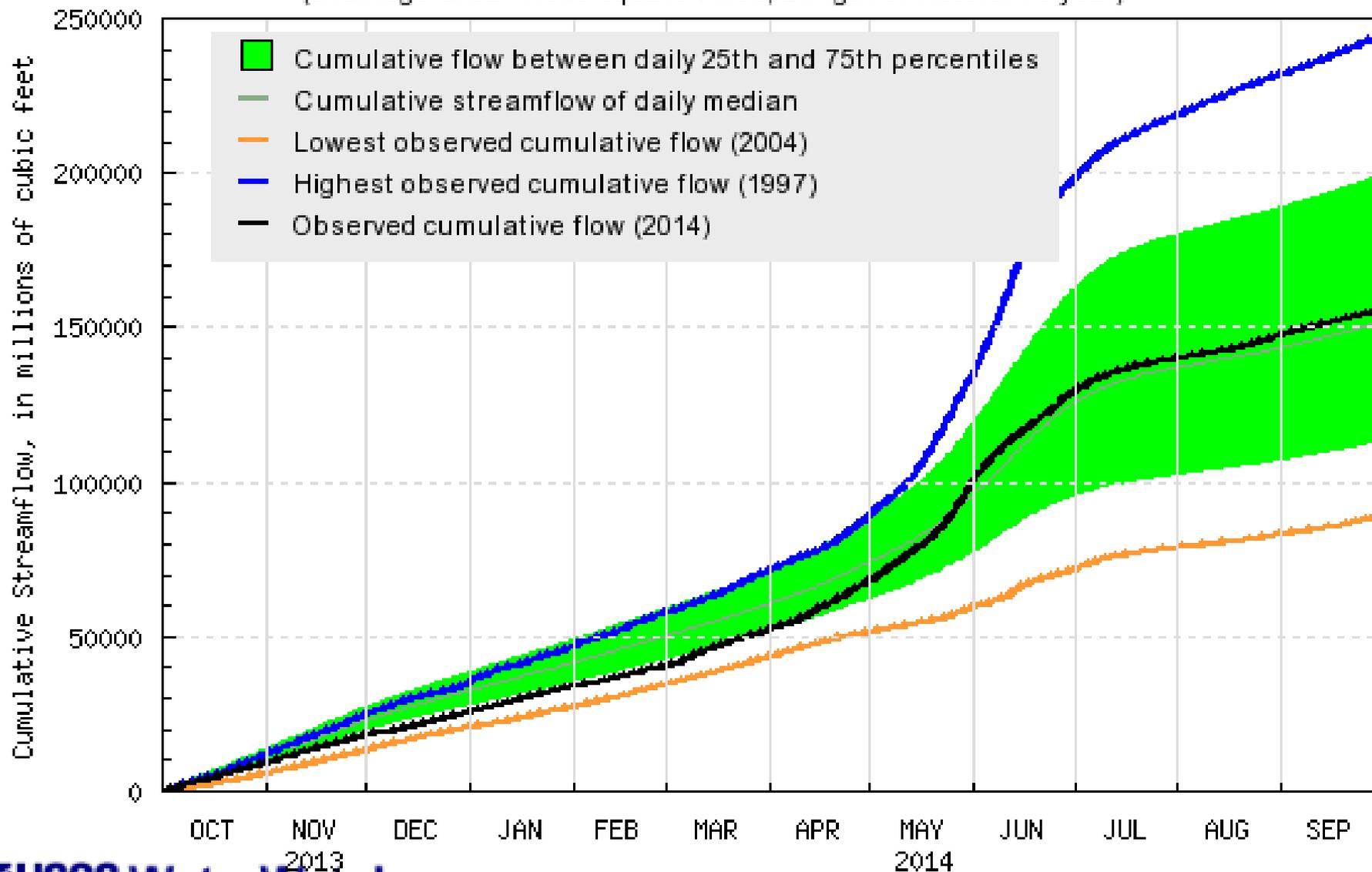


USGS WaterWatch

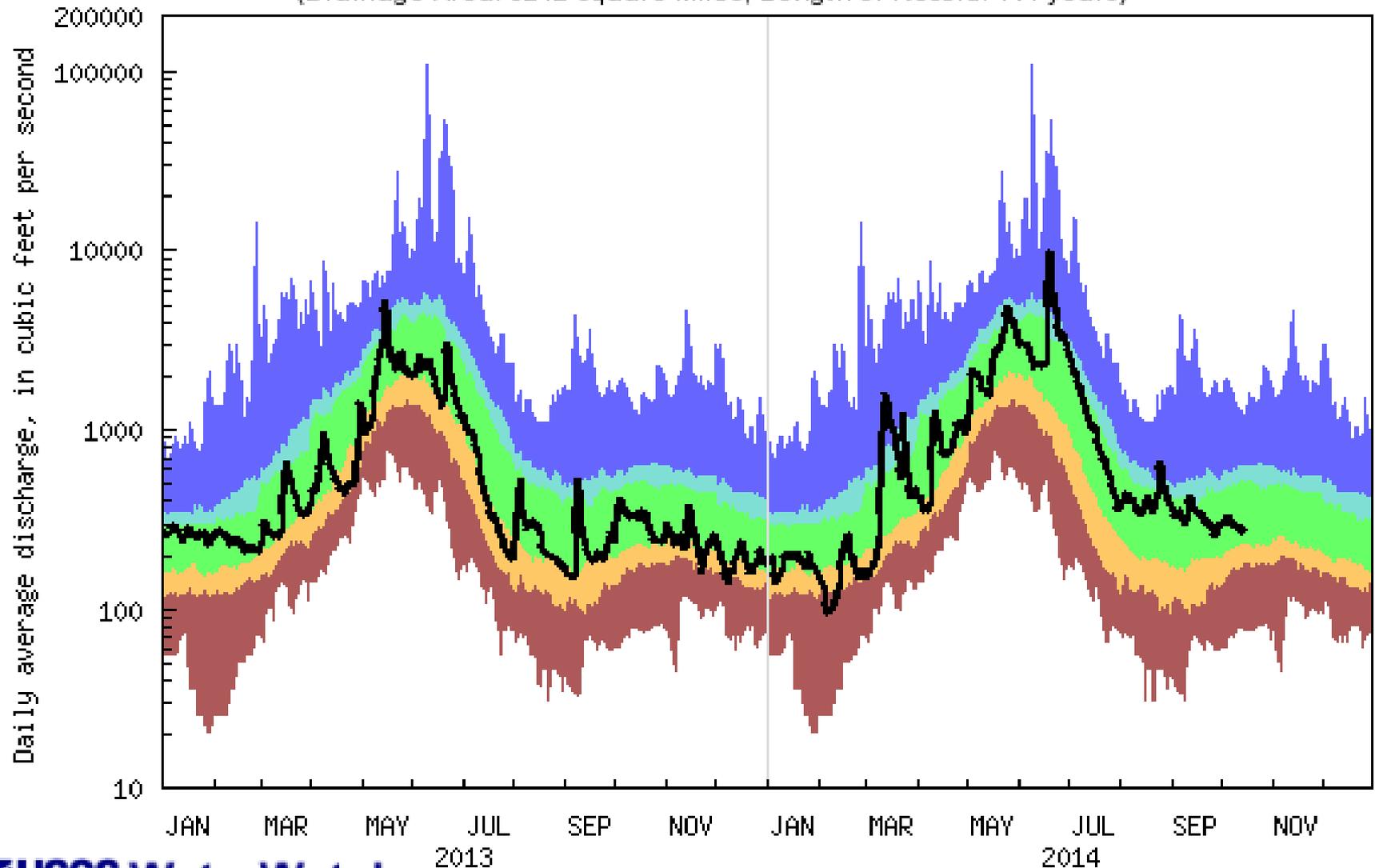
Last updated: 2014-10-15

Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 06054500 Missouri River at Toston MT
(Drainage area: 14669 square miles, Length of Record: 79 year)

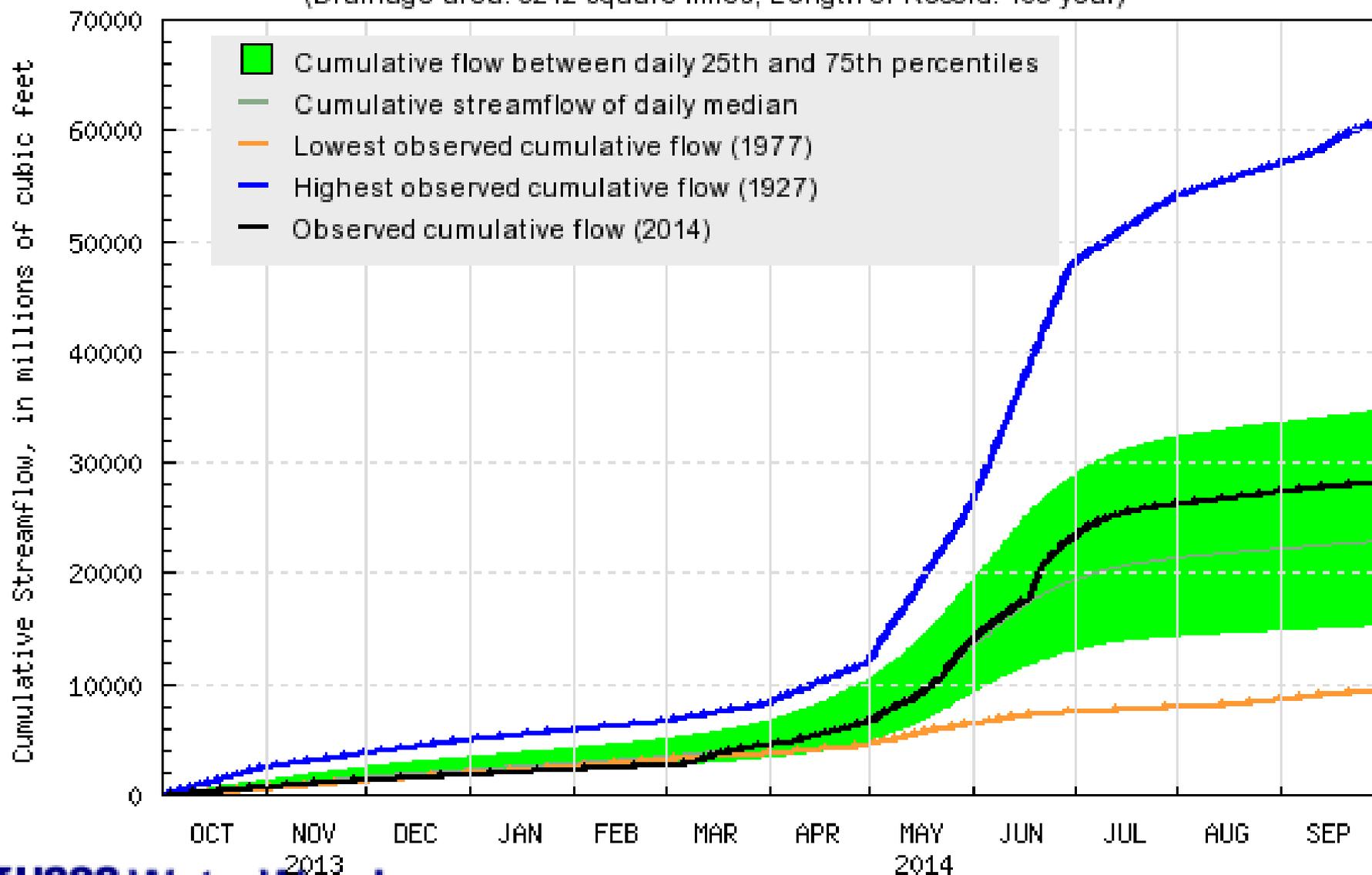


USGS 06099500 Marias River near Shelby MT
 (Drainage Area: 3242 square miles, Length of Record: 111 years)

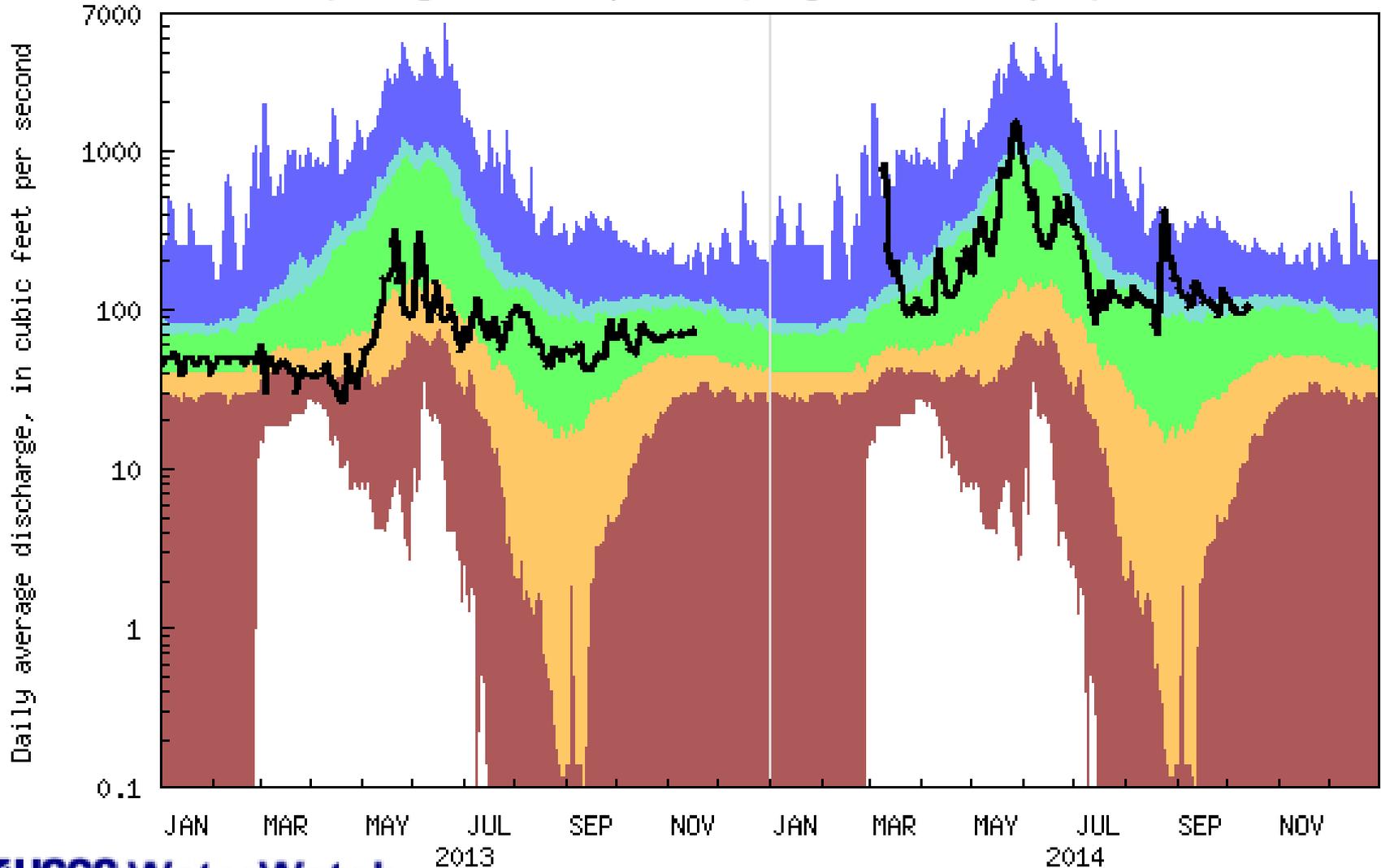


Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 06099500 Marias River near Shelby MT
(Drainage area: 3242 square miles, Length of Record: 105 year)

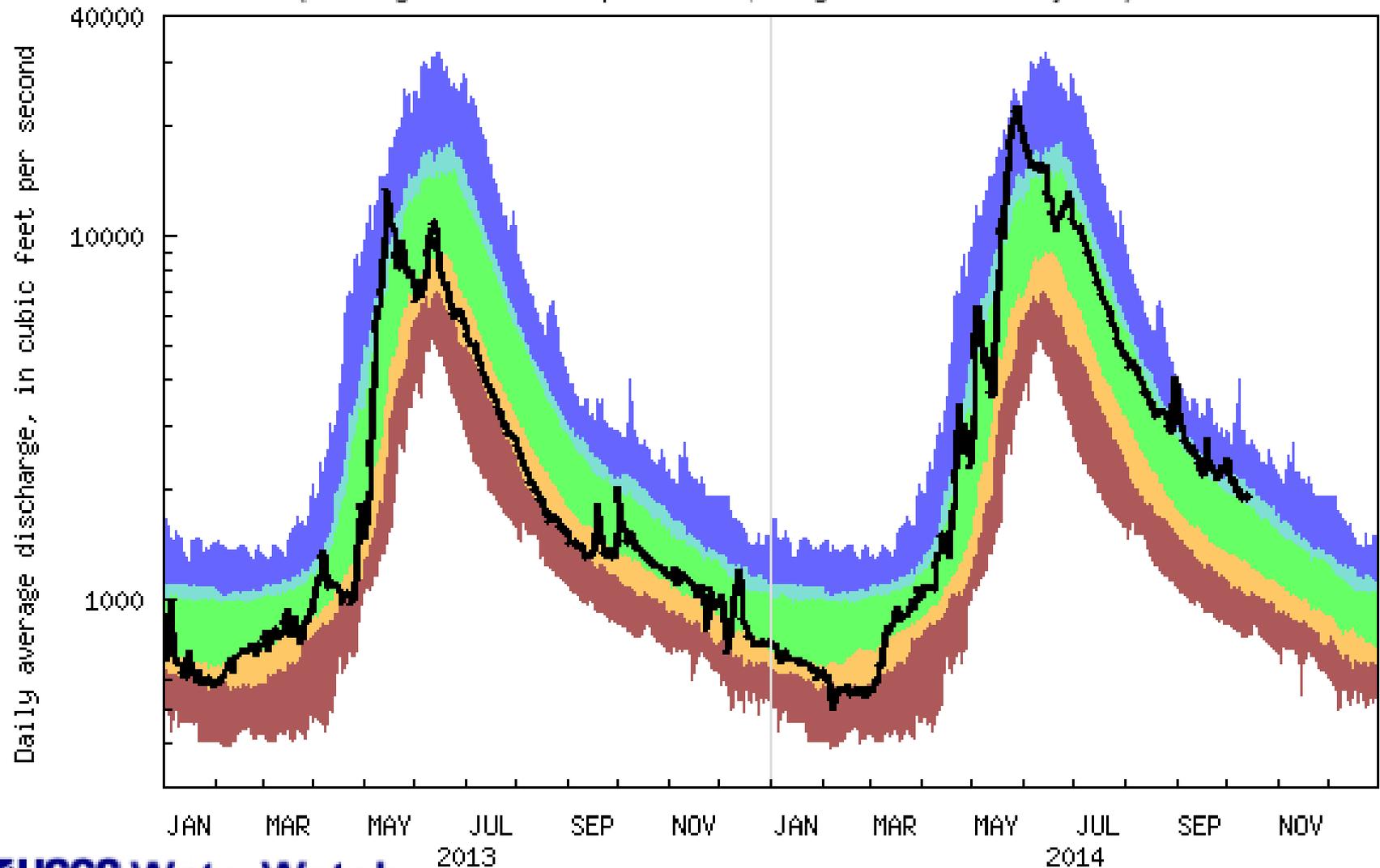


USGS 06120500 Musselshell River at Harlowton MT
 (Drainage Area: 1125 square miles, Length of Record: 106 years)



Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	—
Much below normal	Below normal	Normal	Above normal	Much above normal	Flow

USGS 06191500 Yellowstone River at Corwin Springs MT
 (Drainage Area: 2619 square miles, Length of Record: 124 years)

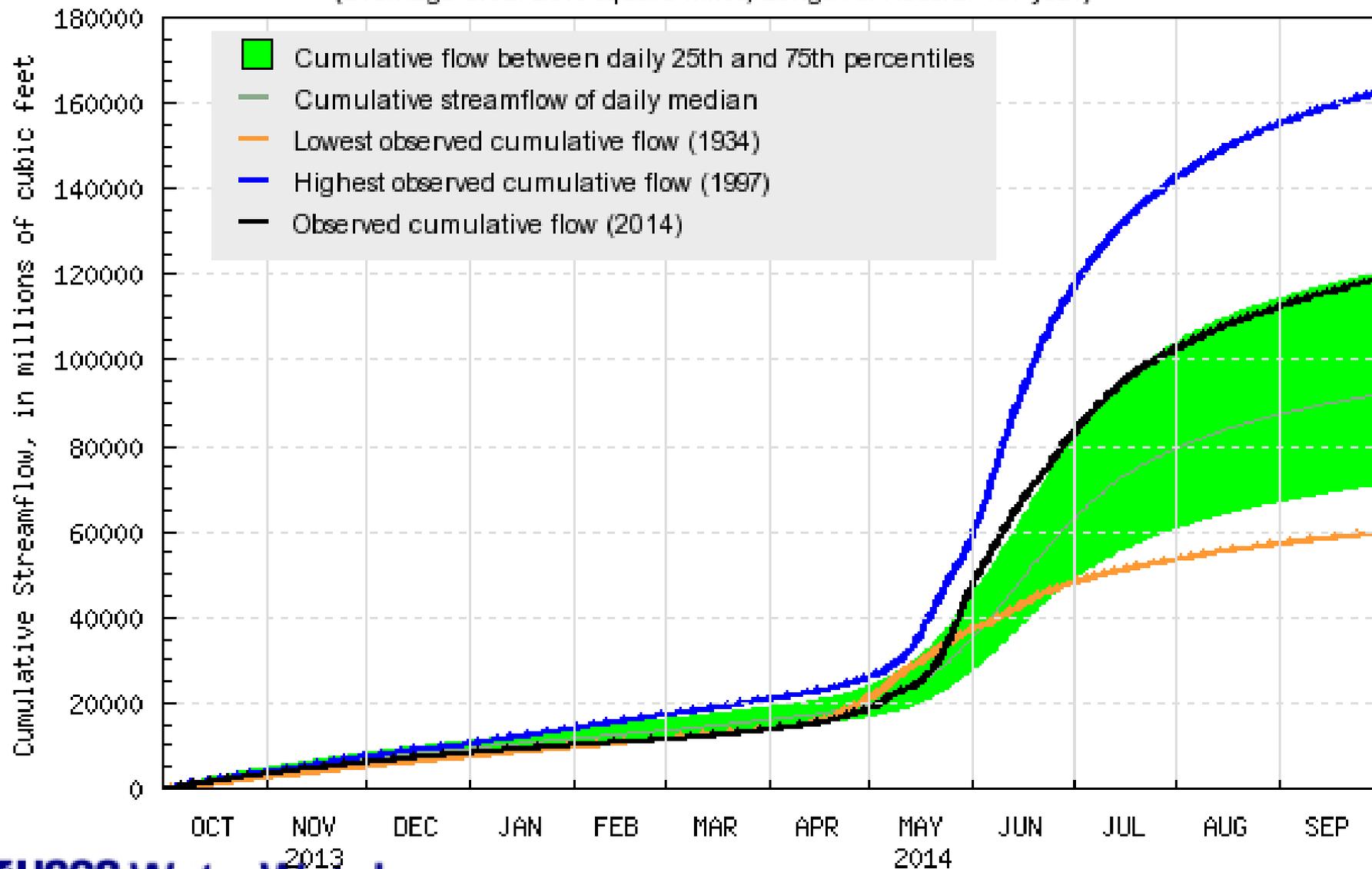


USGS WaterWatch

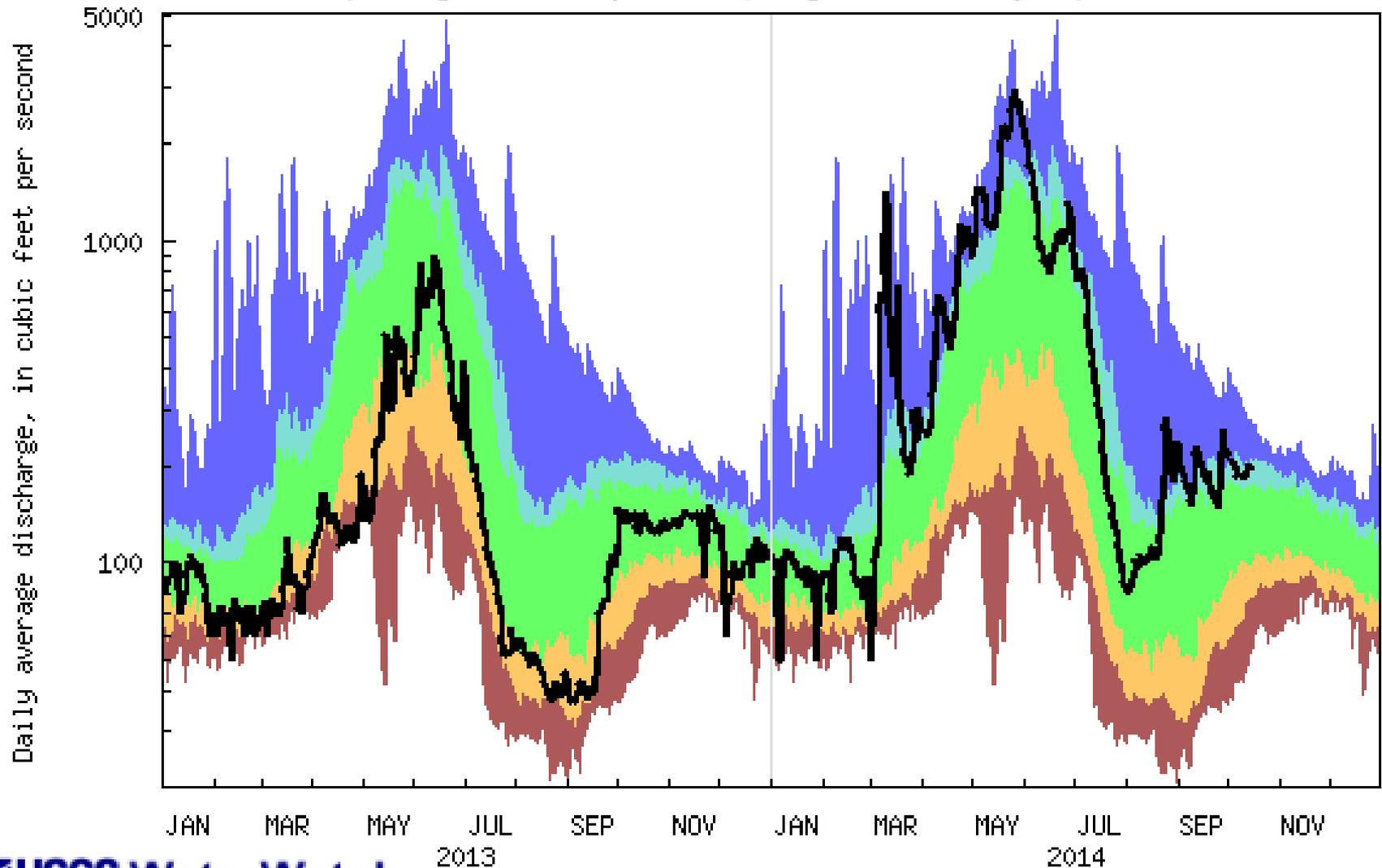
Last updated: 2014-10-15

Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 06191500 Yellowstone River at Corwin Springs MT
(Drainage area: 2619 square miles, Length of Record: 107 year)

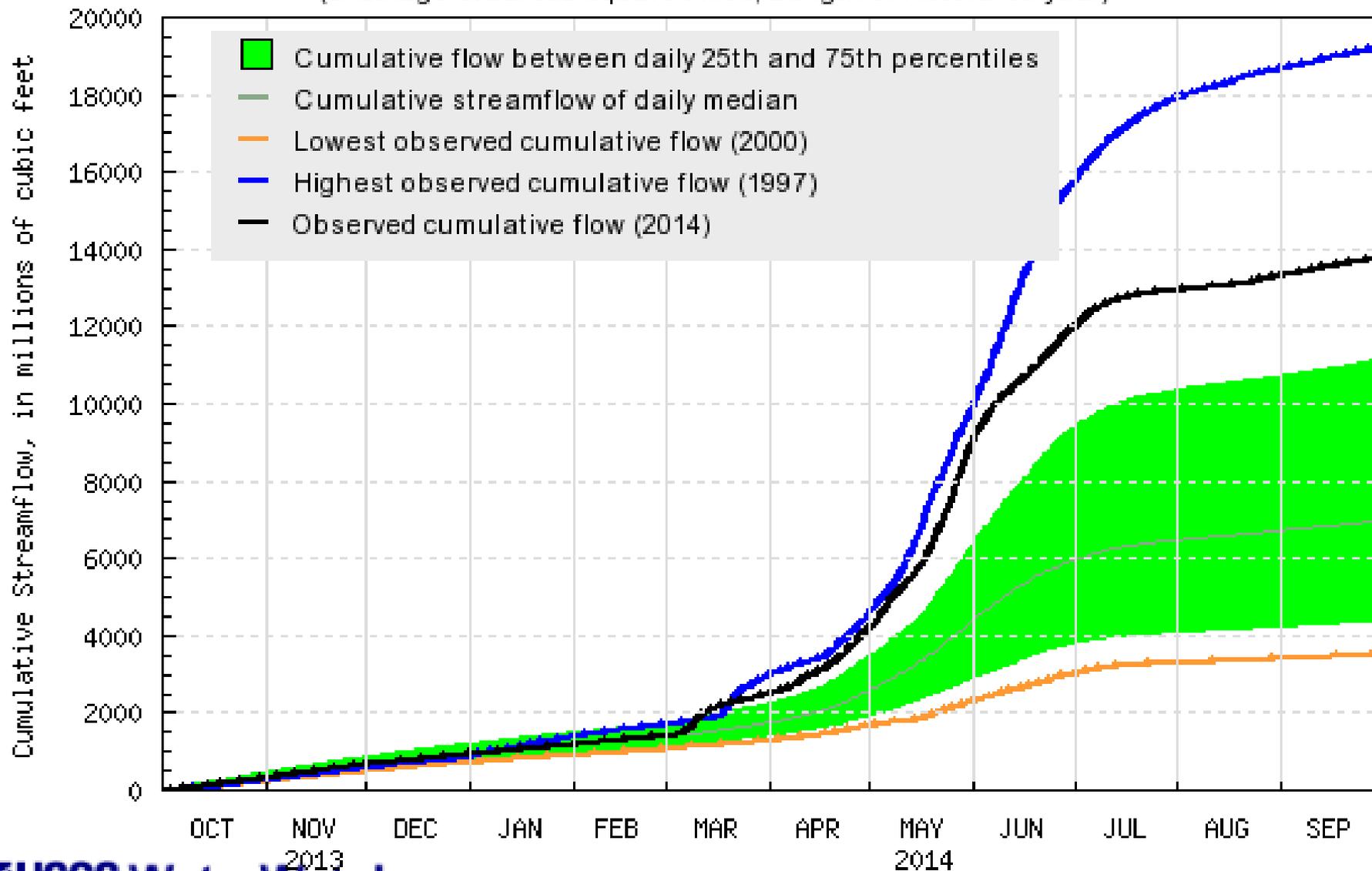


USGS 06195600 Shields River nr Livingston MT
 (Drainage Area: 852 square miles, Length of Record: 35 years)

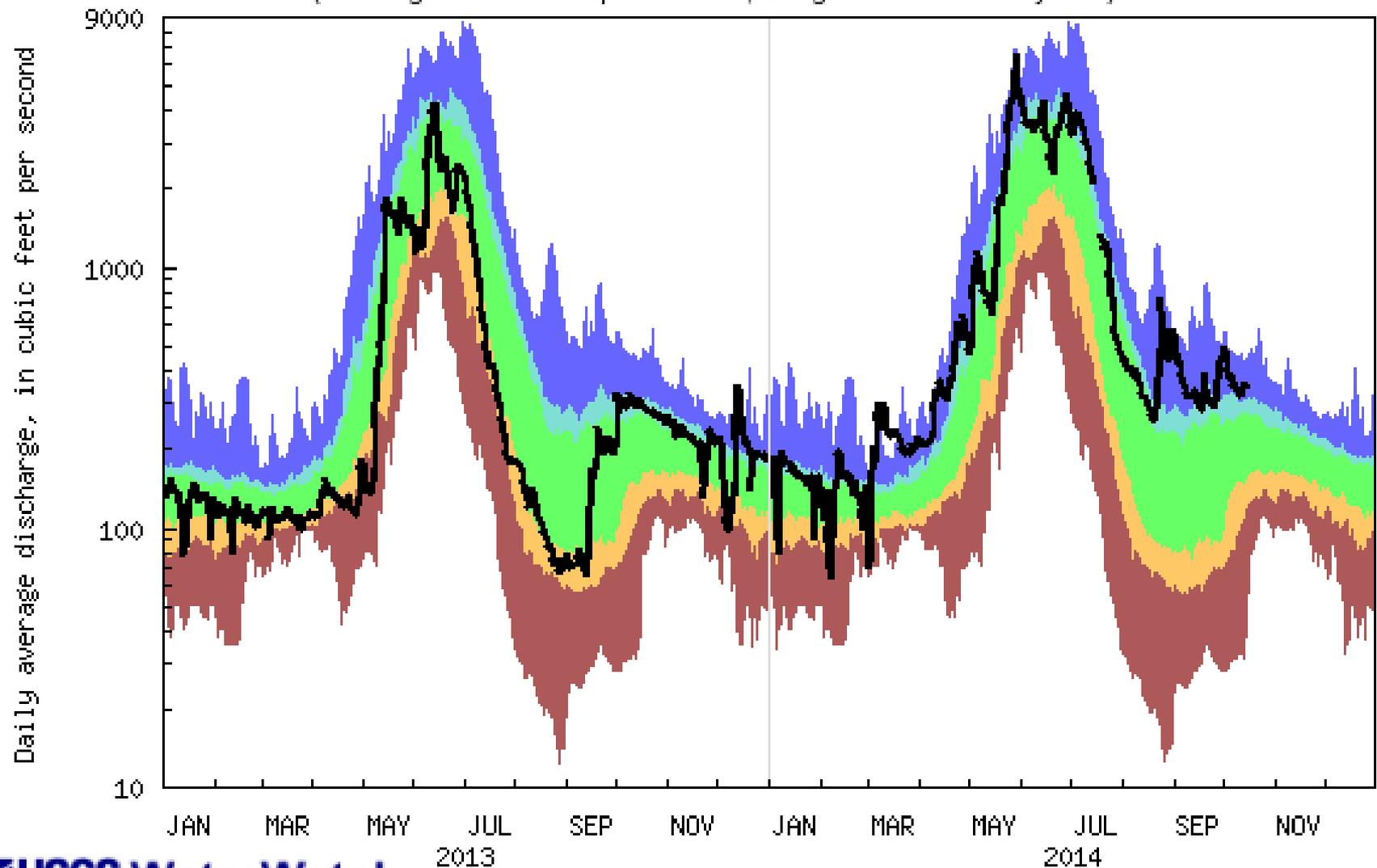


Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 06195600 Shields River nr Livingston MT
(Drainage area: 852 square miles, Length of Record: 35 year)



USGS 06200000 Boulder River at Big Timber MT
 (Drainage Area: 523 square miles, Length of Record: 66 years)

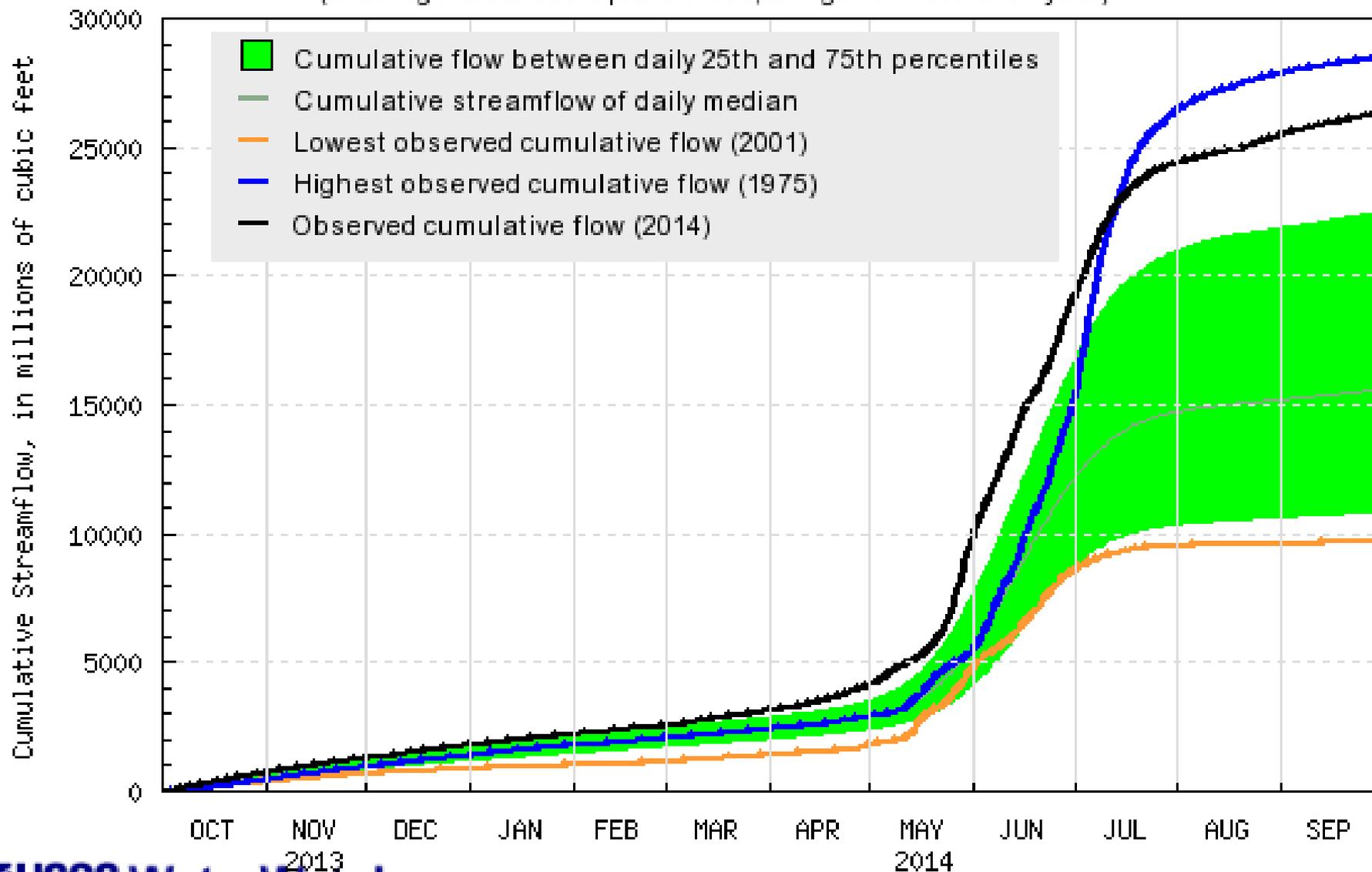


USGS WaterWatch

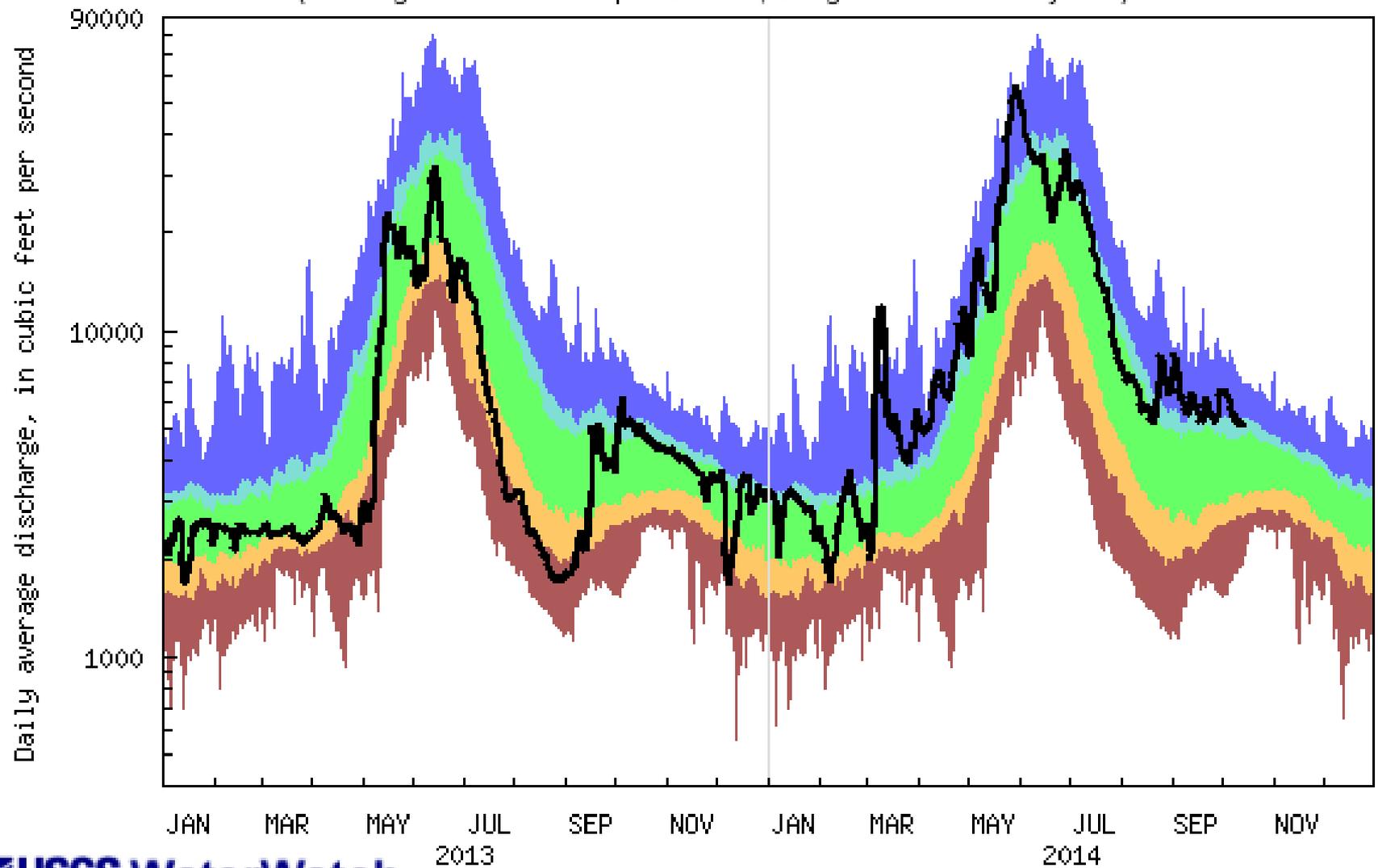
Last updated: 2014-10-15

Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 06200000 Boulder River at Big Timber MT
(Drainage area: 523 square miles, Length of Record: 64 year)



USGS 06214500 Yellowstone River at Billings MT
 (Drainage Area: 11805 square miles, Length of Record: 85 years)

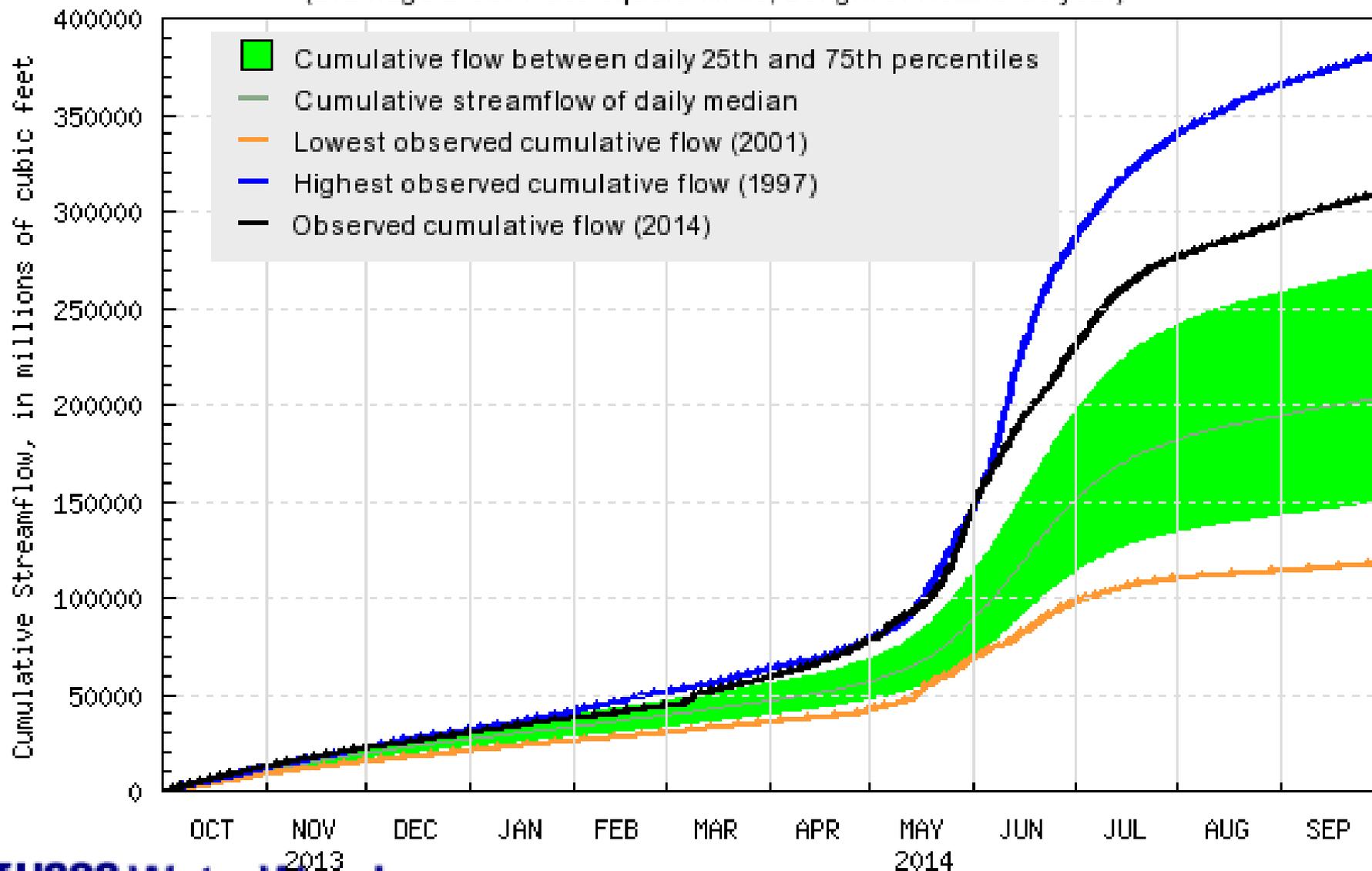


USGS WaterWatch

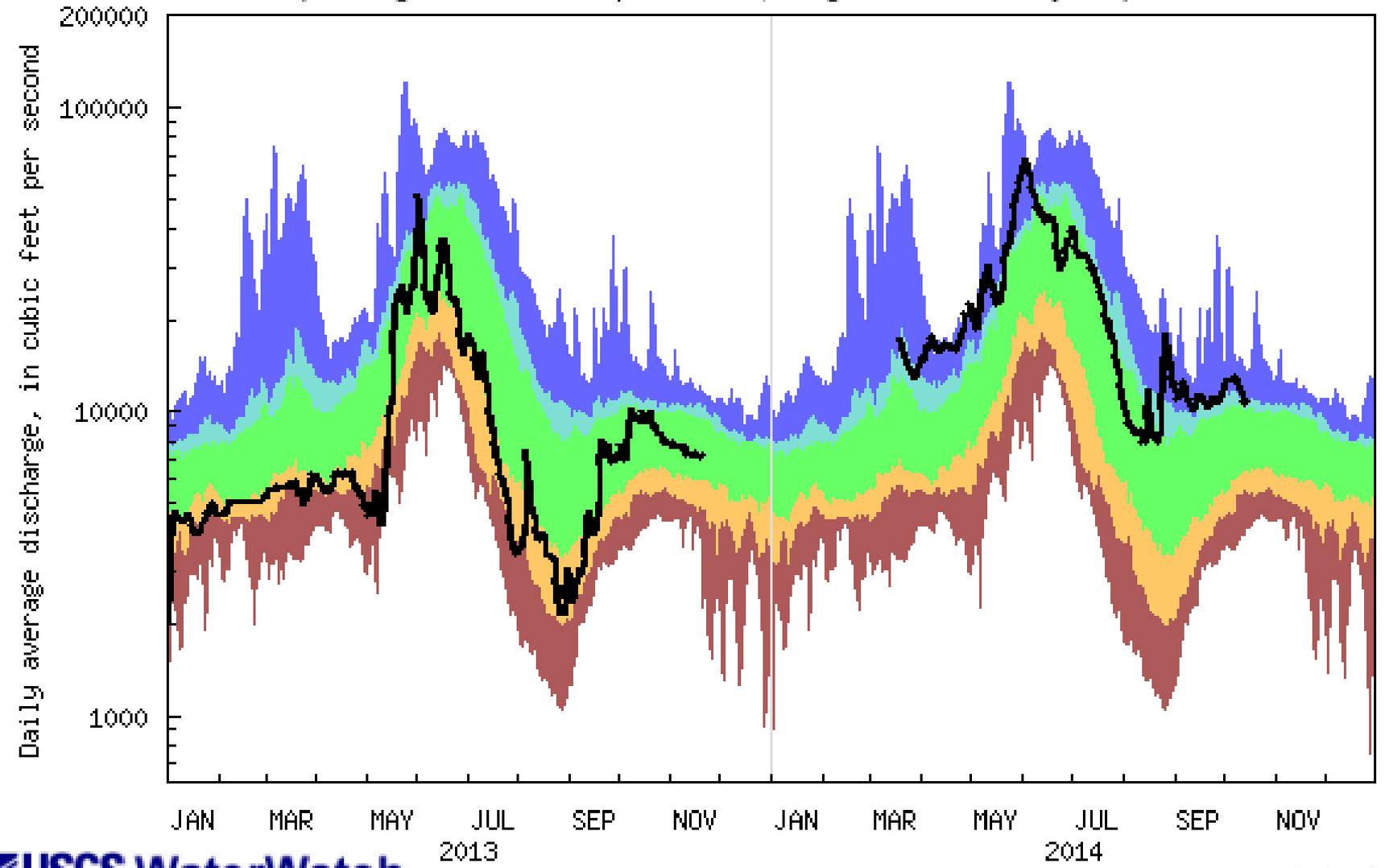
Last updated: 2014-10-15

Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 06214500 Yellowstone River at Billings MT
(Drainage area: 11805 square miles, Length of Record: 85 year)



USGS 06329500 Yellowstone River near Sidney MT
 (Drainage Area: 69083 square miles, Length of Record: 47 years)

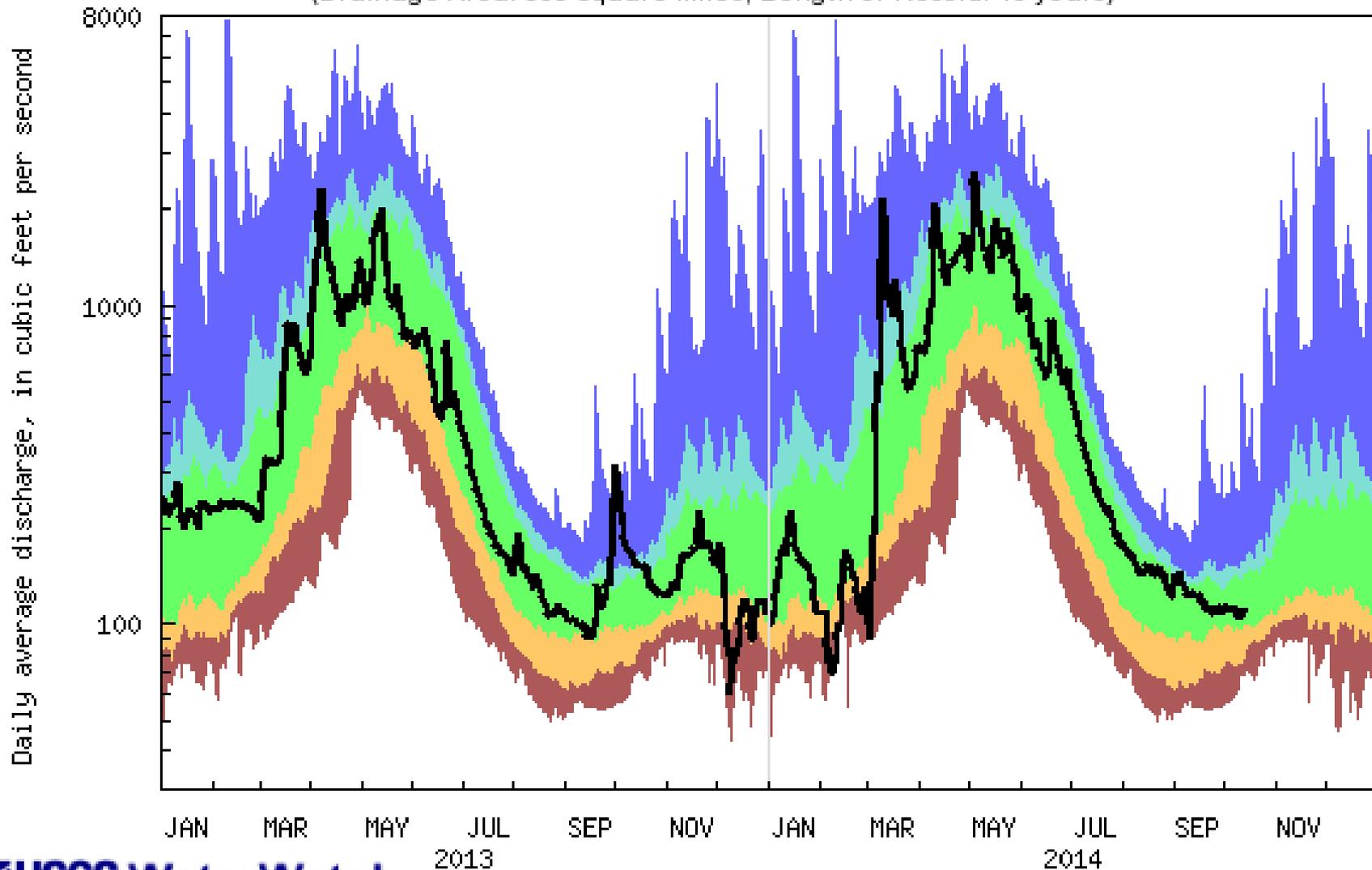


USGS WaterWatch

Last updated: 2014-10-15

Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 12302055 Fisher River near Libby MT
 (Drainage Area: 838 square miles, Length of Record: 46 years)

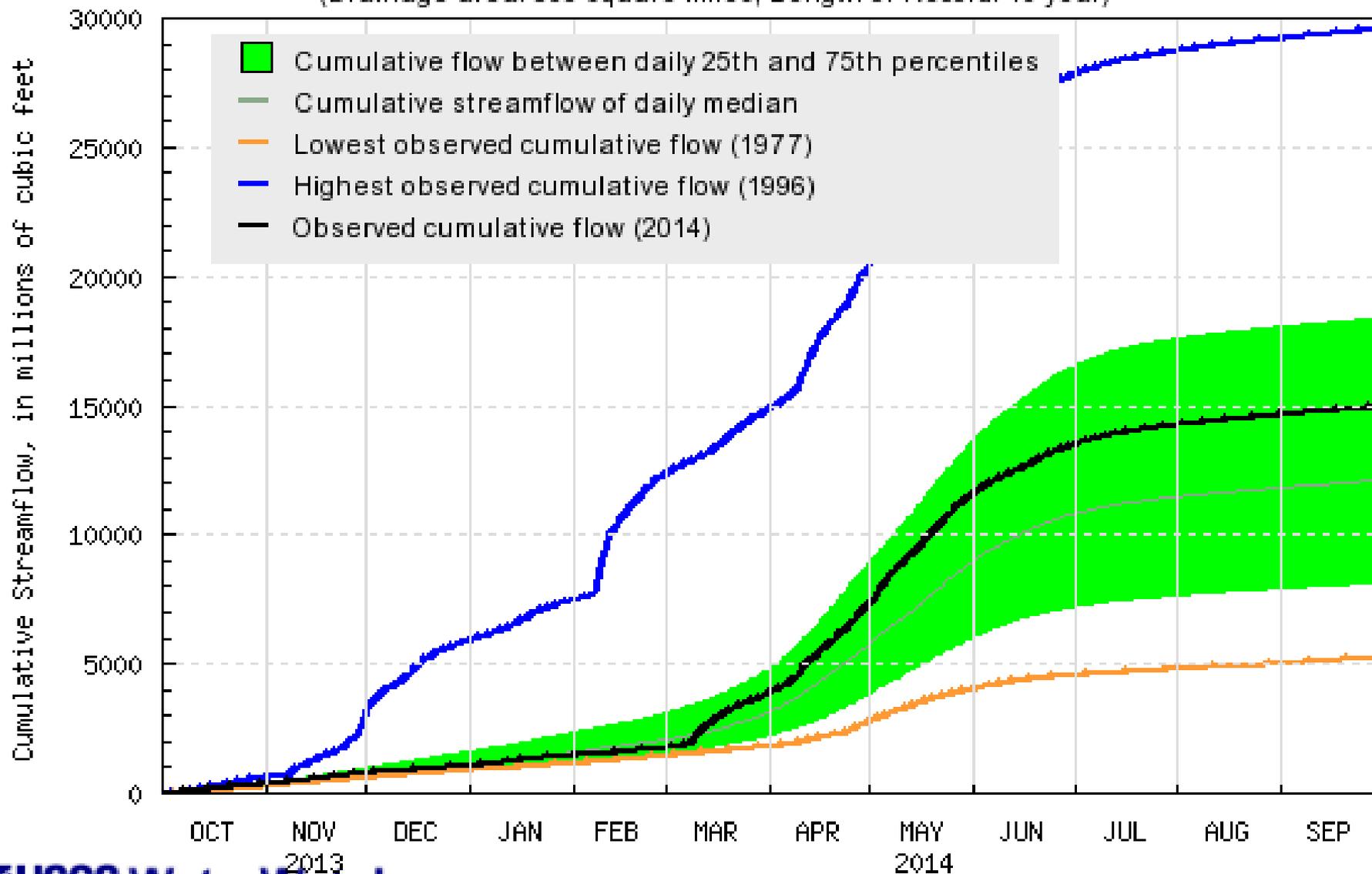


USGS WaterWatch

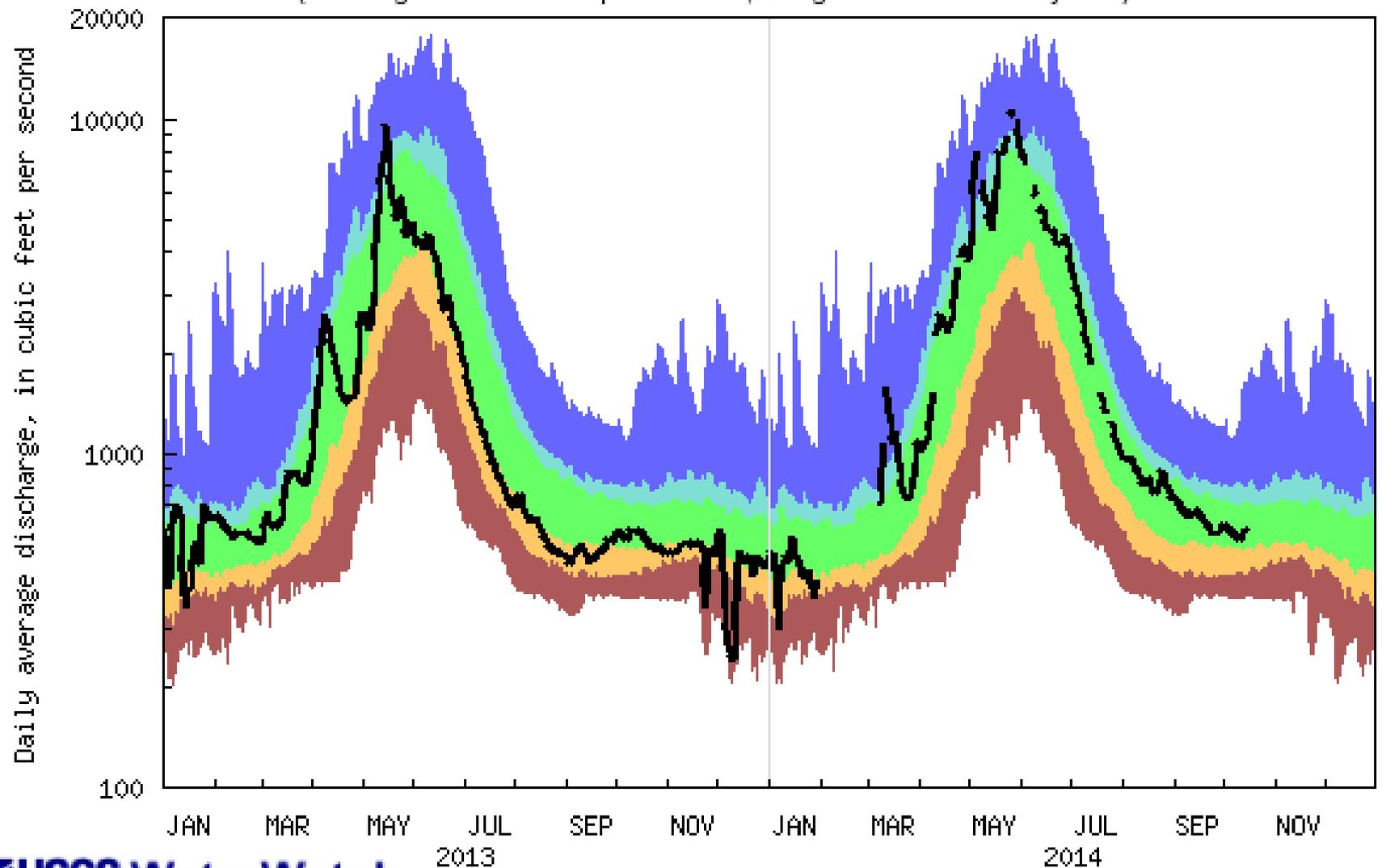
Last updated: 2014-10-15

Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 12302055 Fisher River near Libby MT
(Drainage area: 838 square miles, Length of Record: 46 year)

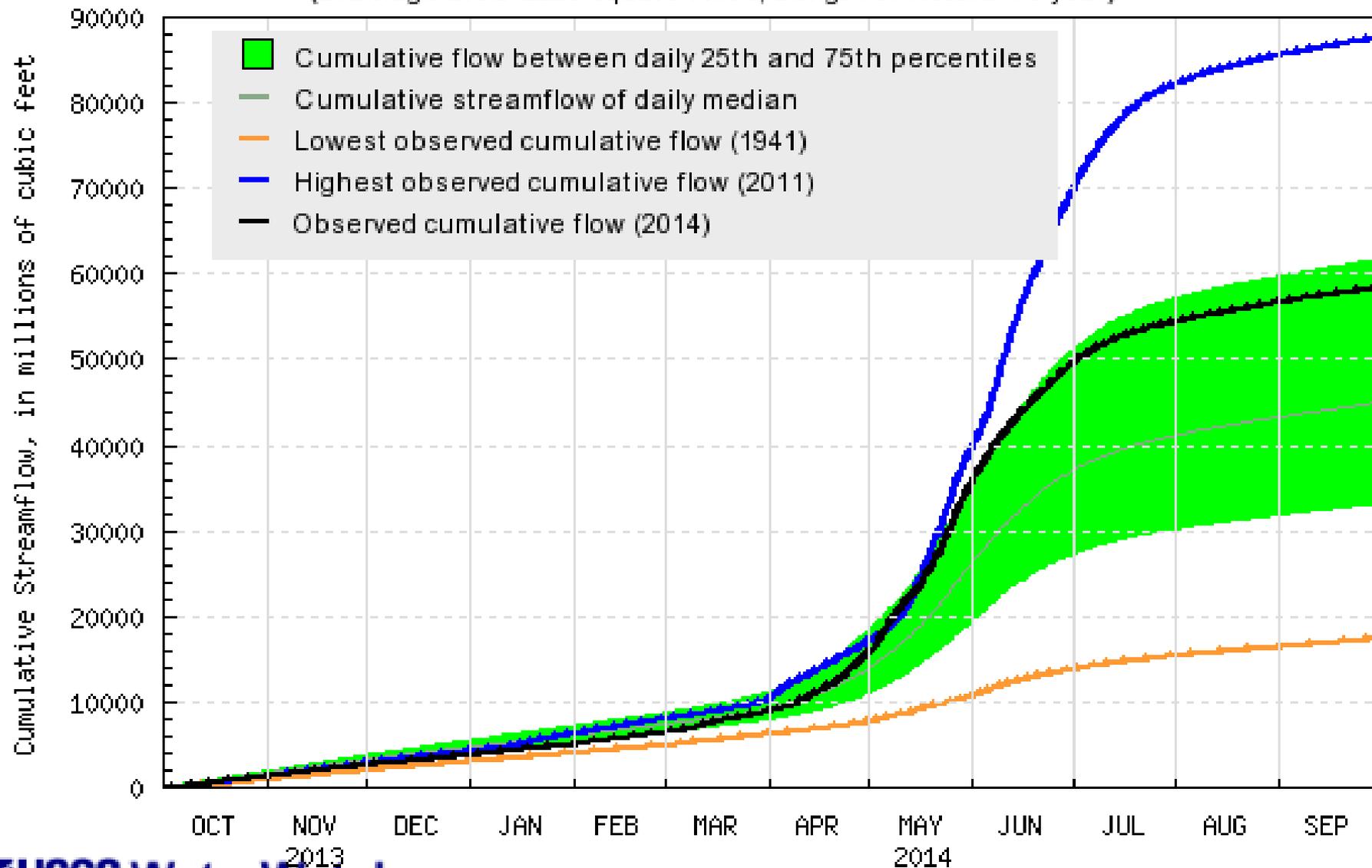


USGS 12340000 Blackfoot River near Bonner MT
 (Drainage Area: 2290 square miles, Length of Record: 115 years)

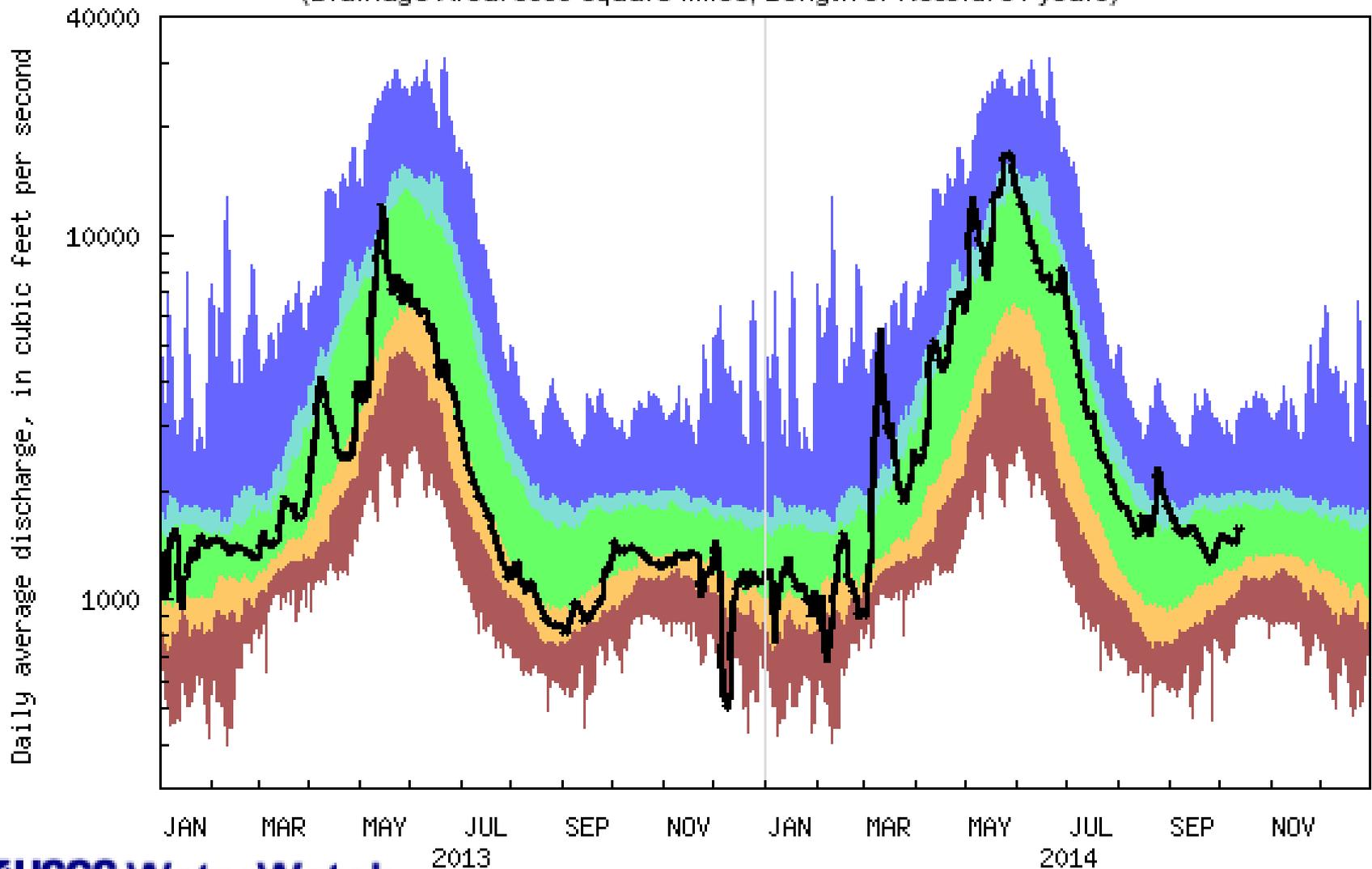


Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 12340000 Blackfoot River near Bonner MT
(Drainage area: 2290 square miles, Length of Record: 78 year)

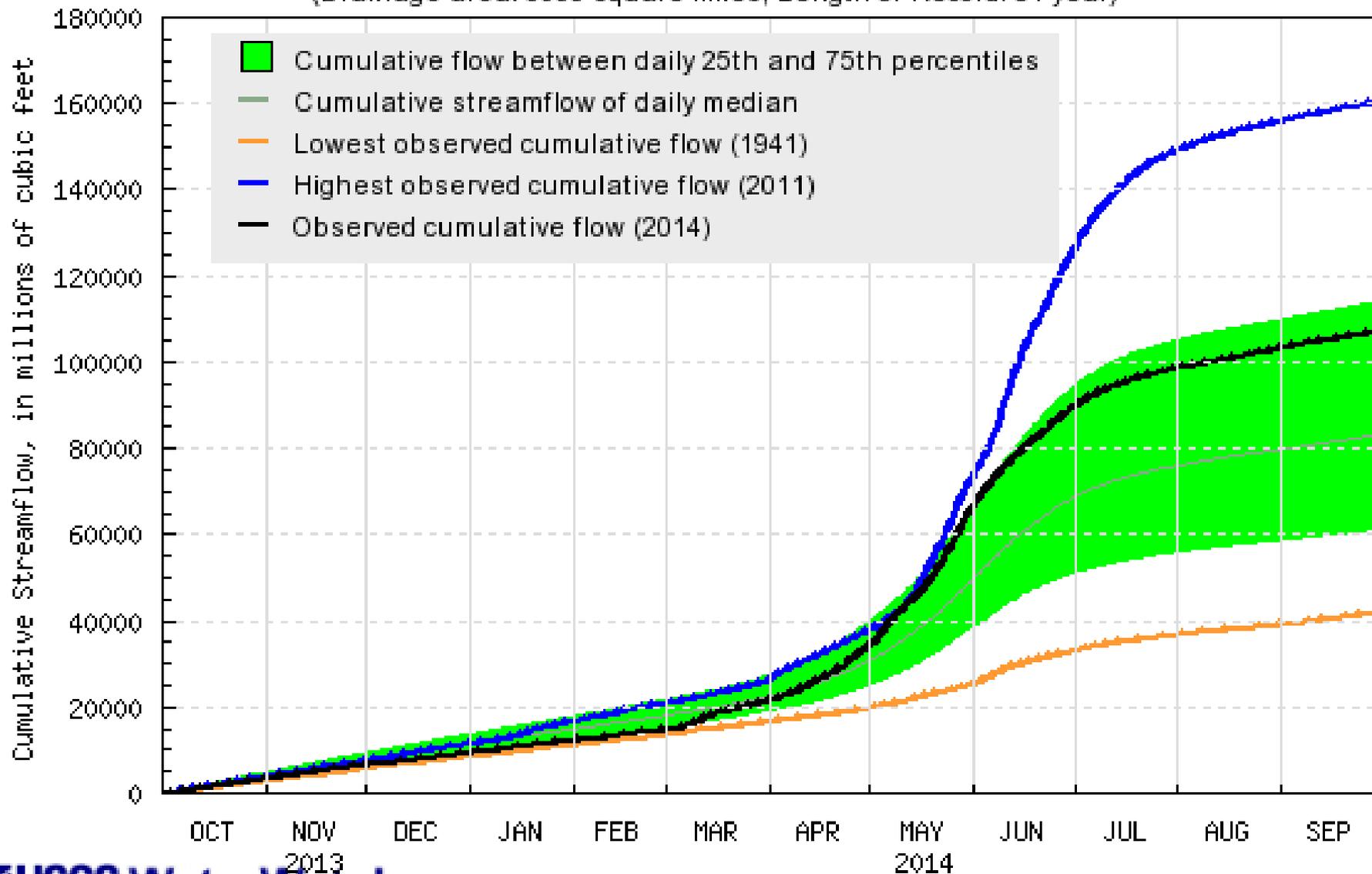


USGS 12340500 Clark Fork above Missoula MT
 (Drainage Area: 5999 square miles, Length of Record: 84 years)

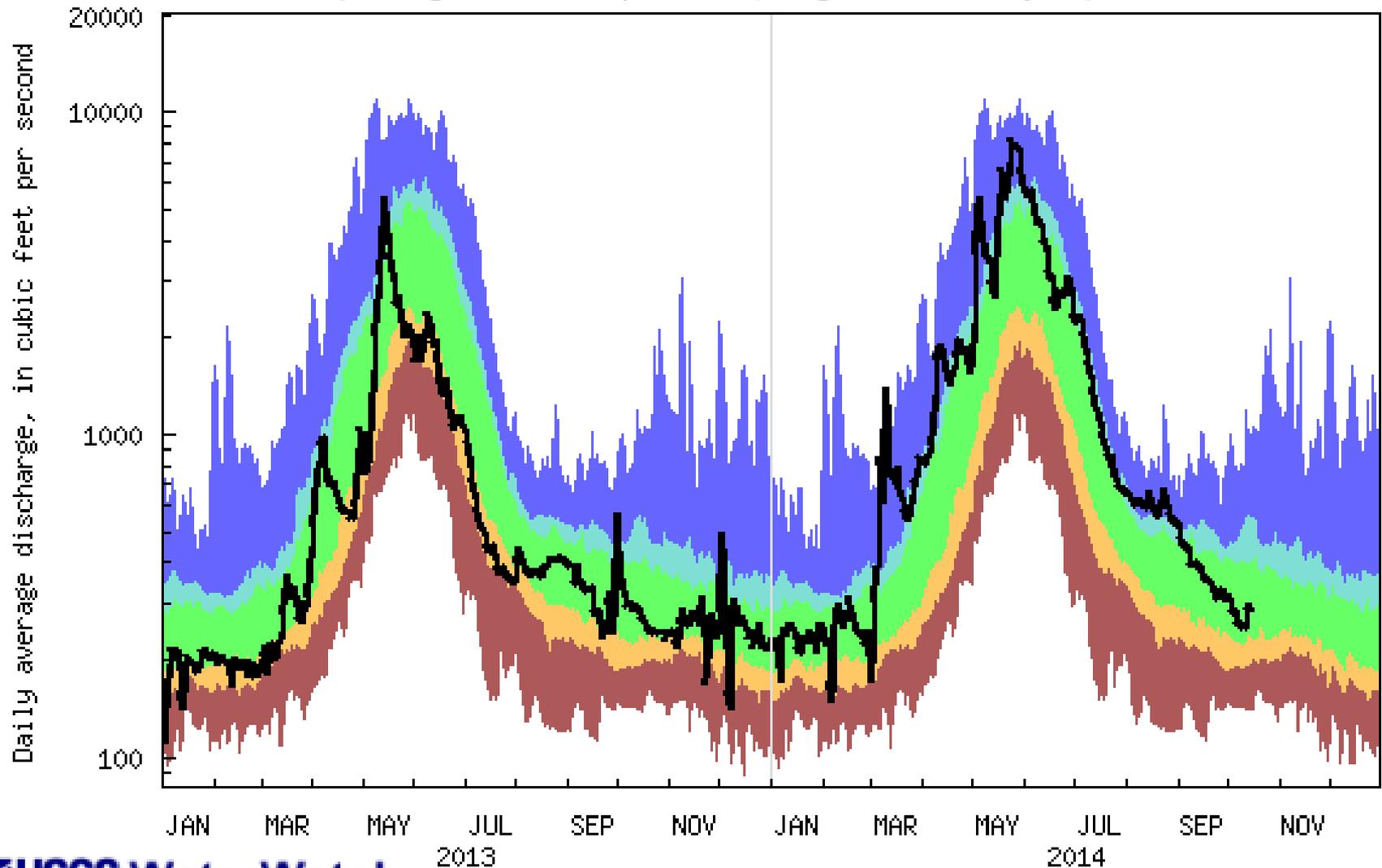


Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 12340500 Clark Fork above Missoula MT
(Drainage area: 5999 square miles, Length of Record: 84 year)



USGS 12344000 Bitterroot River near Darby MT
 (Drainage Area: 1049 square miles, Length of Record: 76 years)

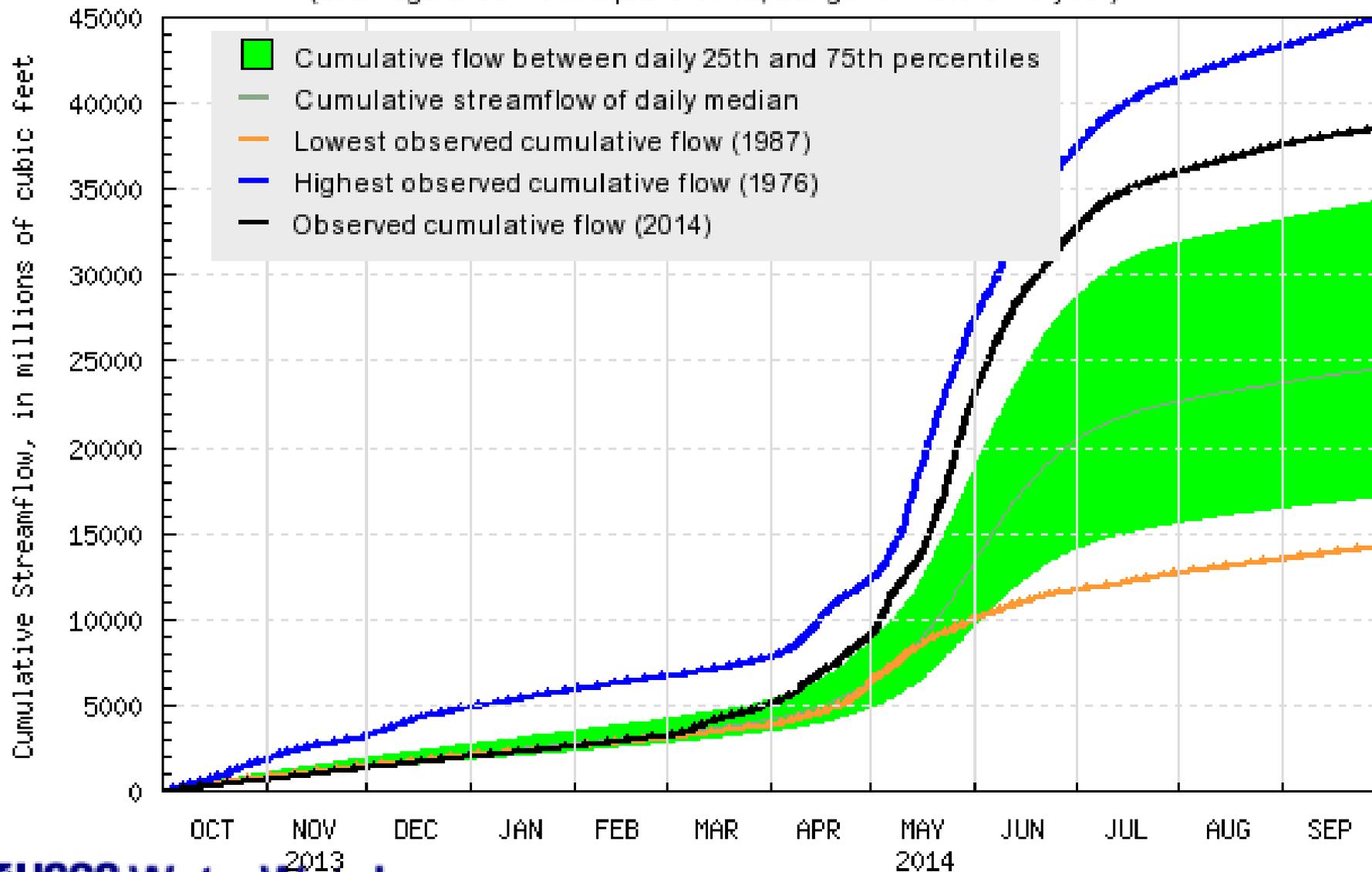


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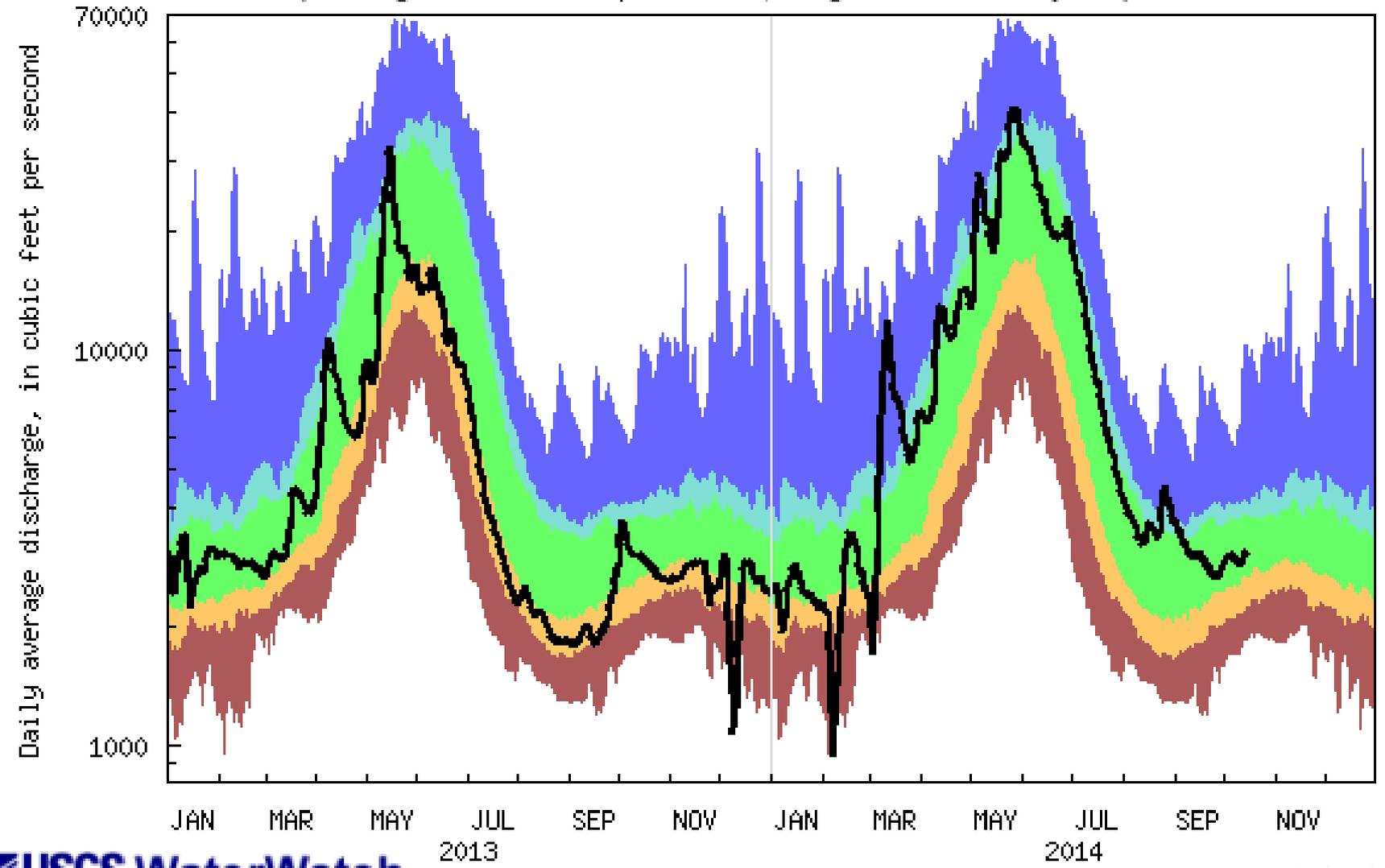
Last updated: 2014-10-15

Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 12344000 Bitterroot River near Darby MT
(Drainage area: 1049 square miles, Length of Record: 76 year)



USGS 12354500 Clark Fork at St. Regis MT
 (Drainage Area: 10709 square miles, Length of Record: 84 years)

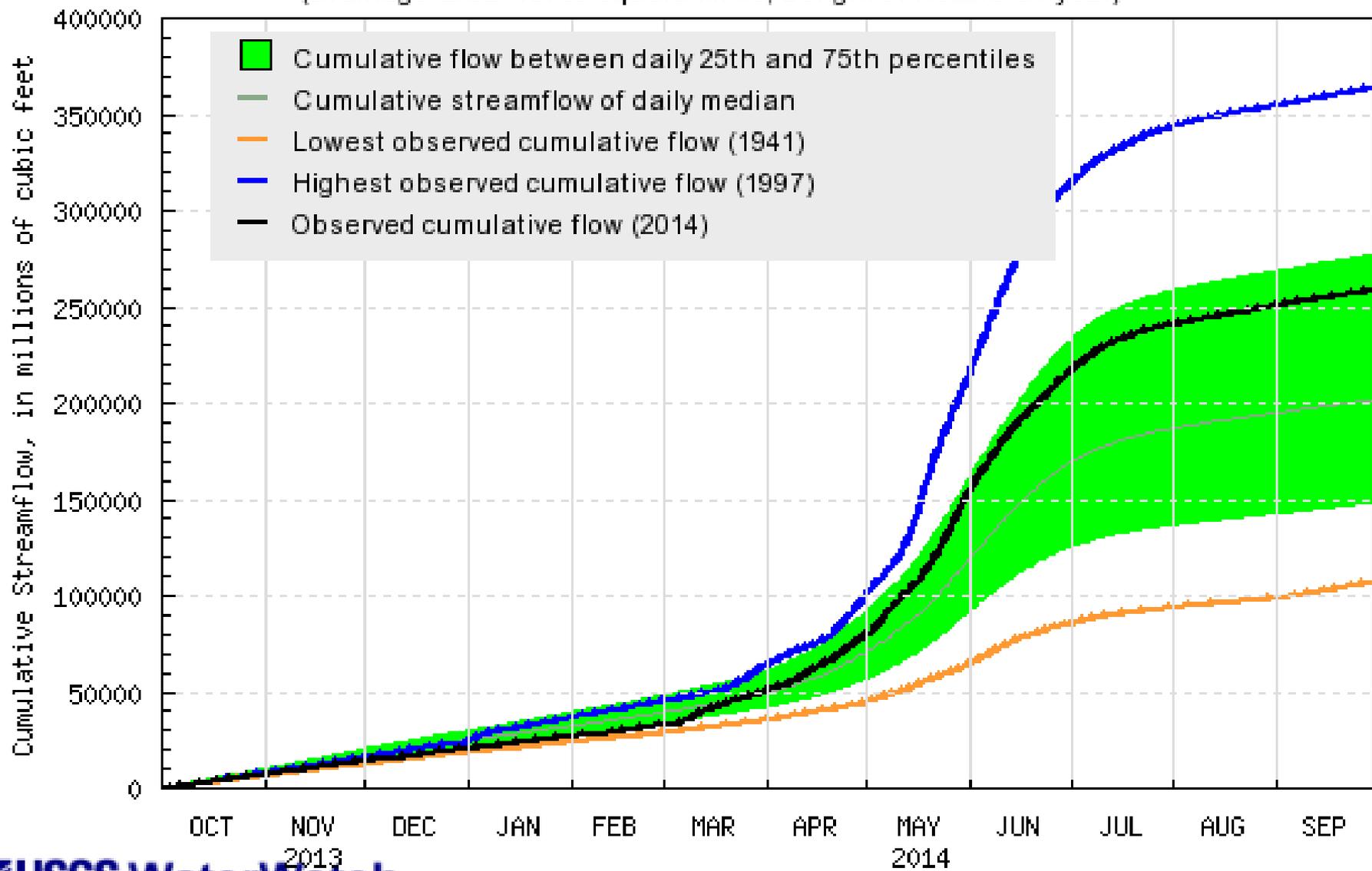


USGS WaterWatch

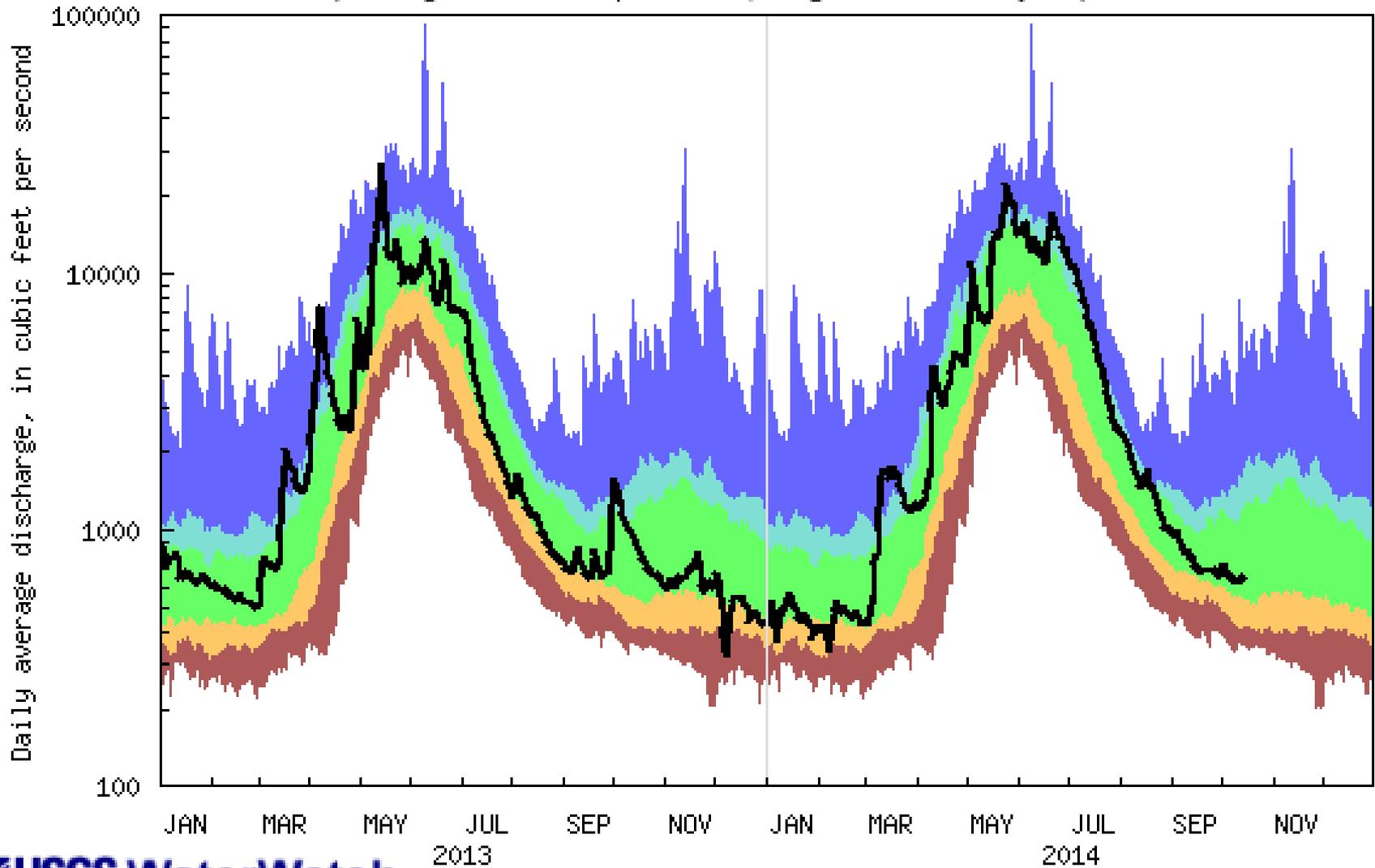
Last updated: 2014-10-15

Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 12354500 Clark Fork at St. Regis MT
(Drainage area: 10709 square miles, Length of Record: 84 year)



USGS 12368500 M F Flathead River near West Glacier MT
 (Drainage Area: 1128 square miles, Length of Record: 74 years)

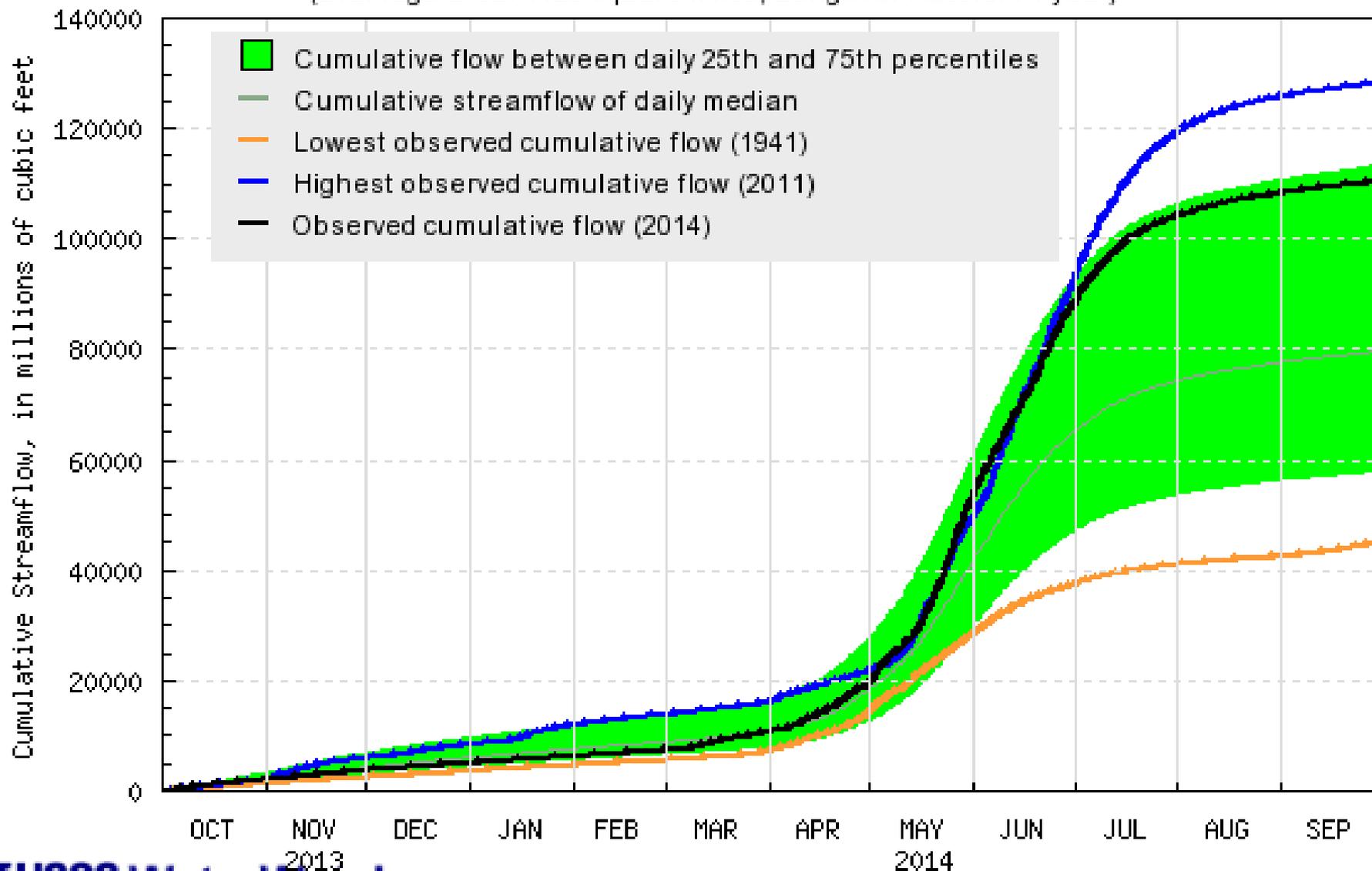


USGS WaterWatch

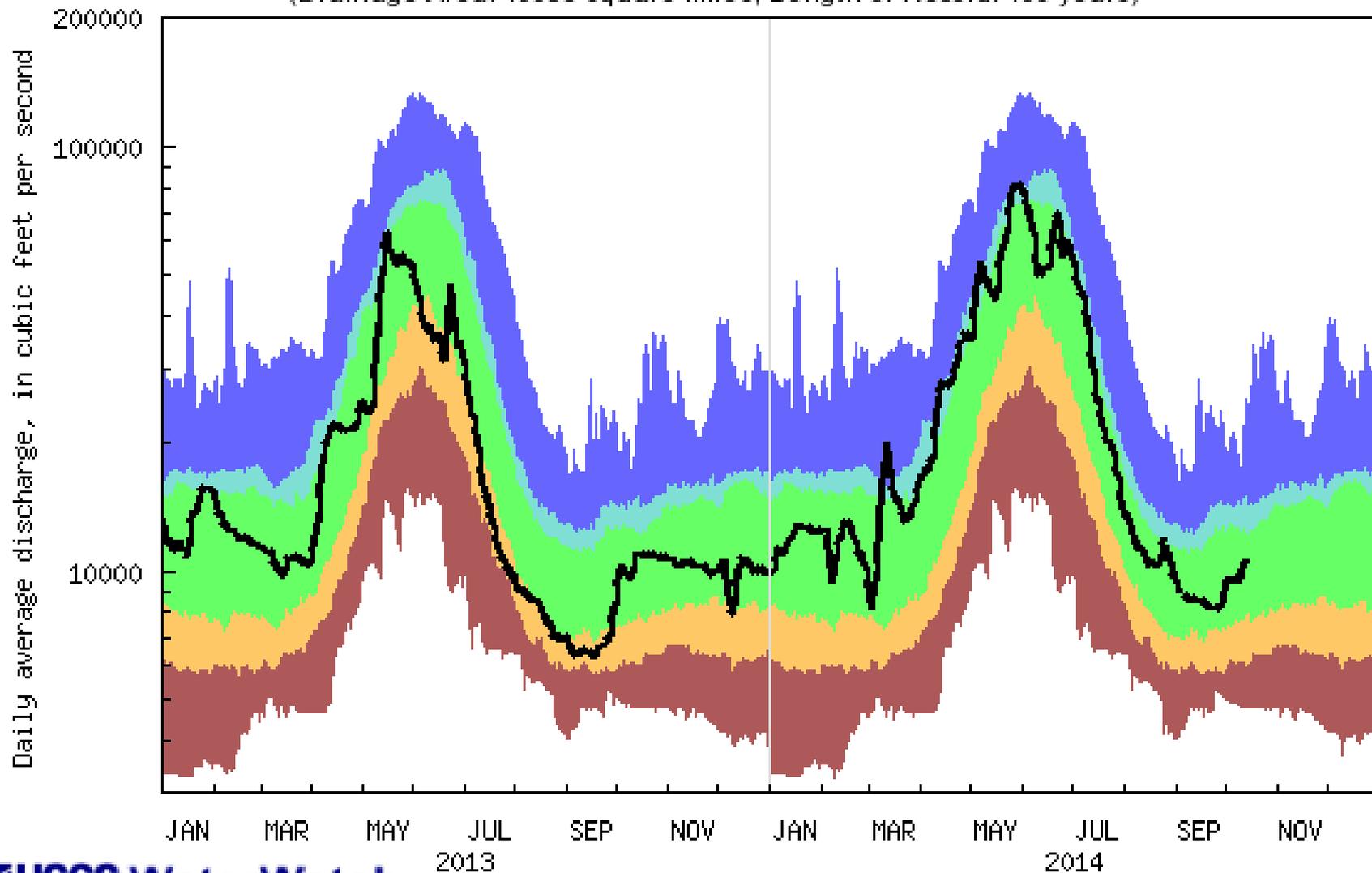
Last updated: 2014-10-15

Explanation - Percentile classes					
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest	Flow
Much below normal	Below normal	Normal	Above normal	Much above normal	

USGS 12358500 M F Flathead River near West Glacier MT
(Drainage area: 1128 square miles, Length of Record: 74 year)



USGS 12389000 Clark Fork near Plains MT
 (Drainage Area: 19958 square miles, Length of Record: 103 years)

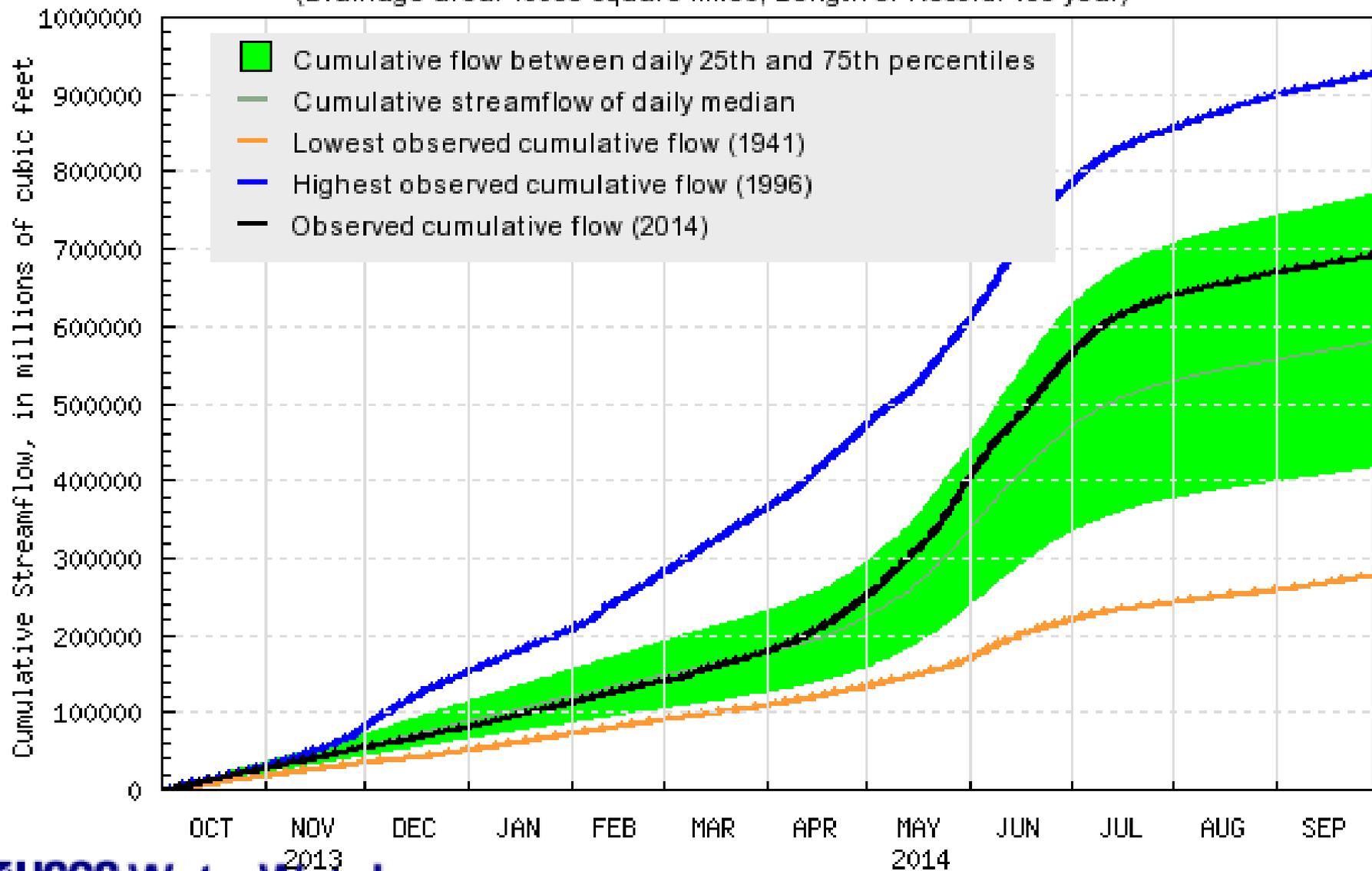


USGS WaterWatch

Last updated: 2014-10-15

Explanation - Percentile classes				
lowest-10th percentile	10-24	25-75	76-90	90th percentile-highest
Much below normal	Below normal	Normal	Above normal	Much above normal
<div style="display: flex; justify-content: space-around; align-items: center;"> Flow </div>				

USGS 12389000 Clark Fork near Plains MT
(Drainage area: 19958 square miles, Length of Record: 103 year)





USGS Home Page: <http://usgs.gov>

NwisWeb: <http://water.usgs.gov/mt/nwis>

Access to streamflow (realtime and historical), water quality, and ground water information.

Montana District Home Page: <http://mt.usgs.gov>

Montana Current Streamflow Conditions