Clark Fork Task Force Meeting
Natural Resources Conservation Service
Snow Survey and Water Supply Report

April 26th, 2011

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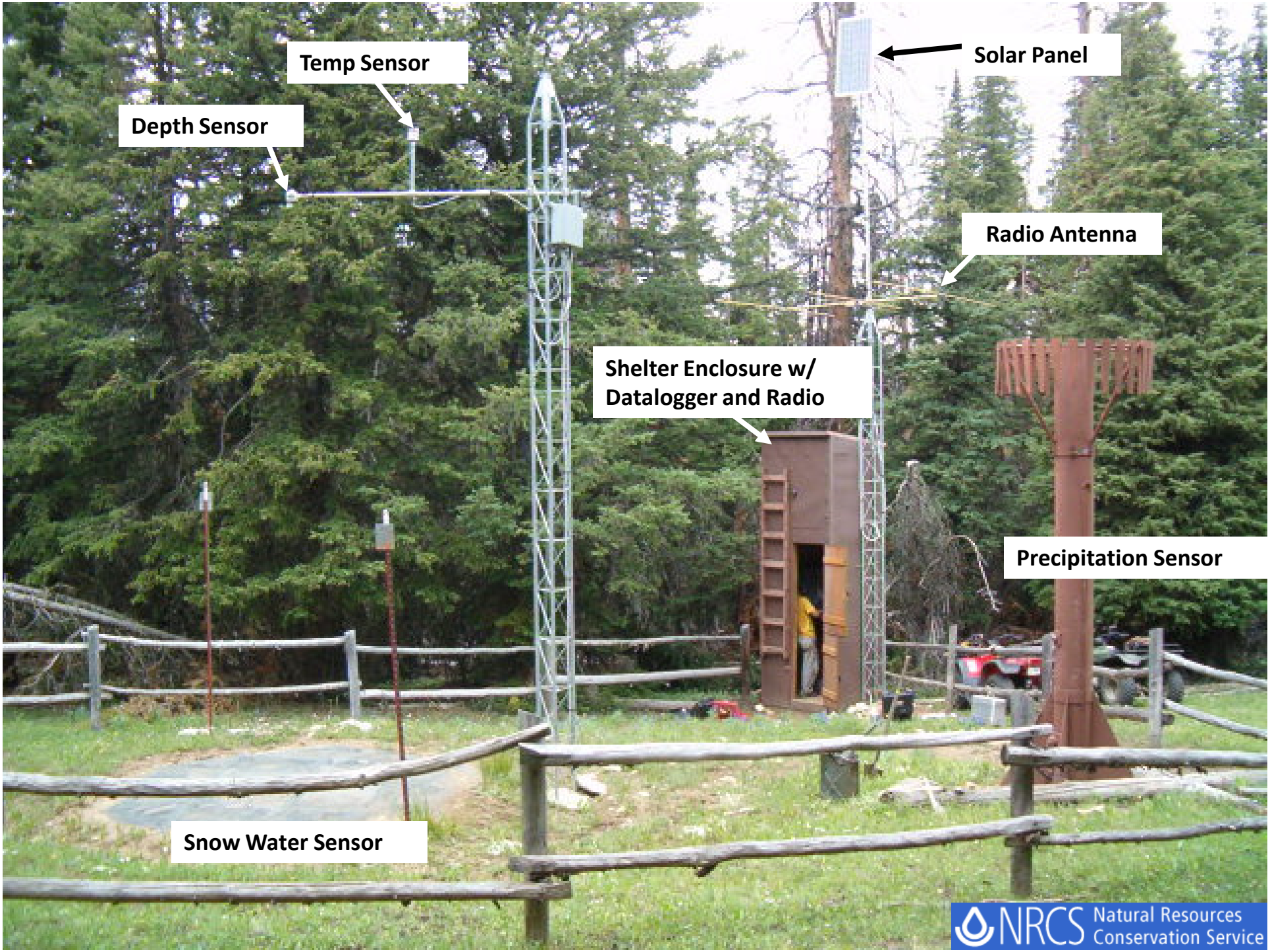
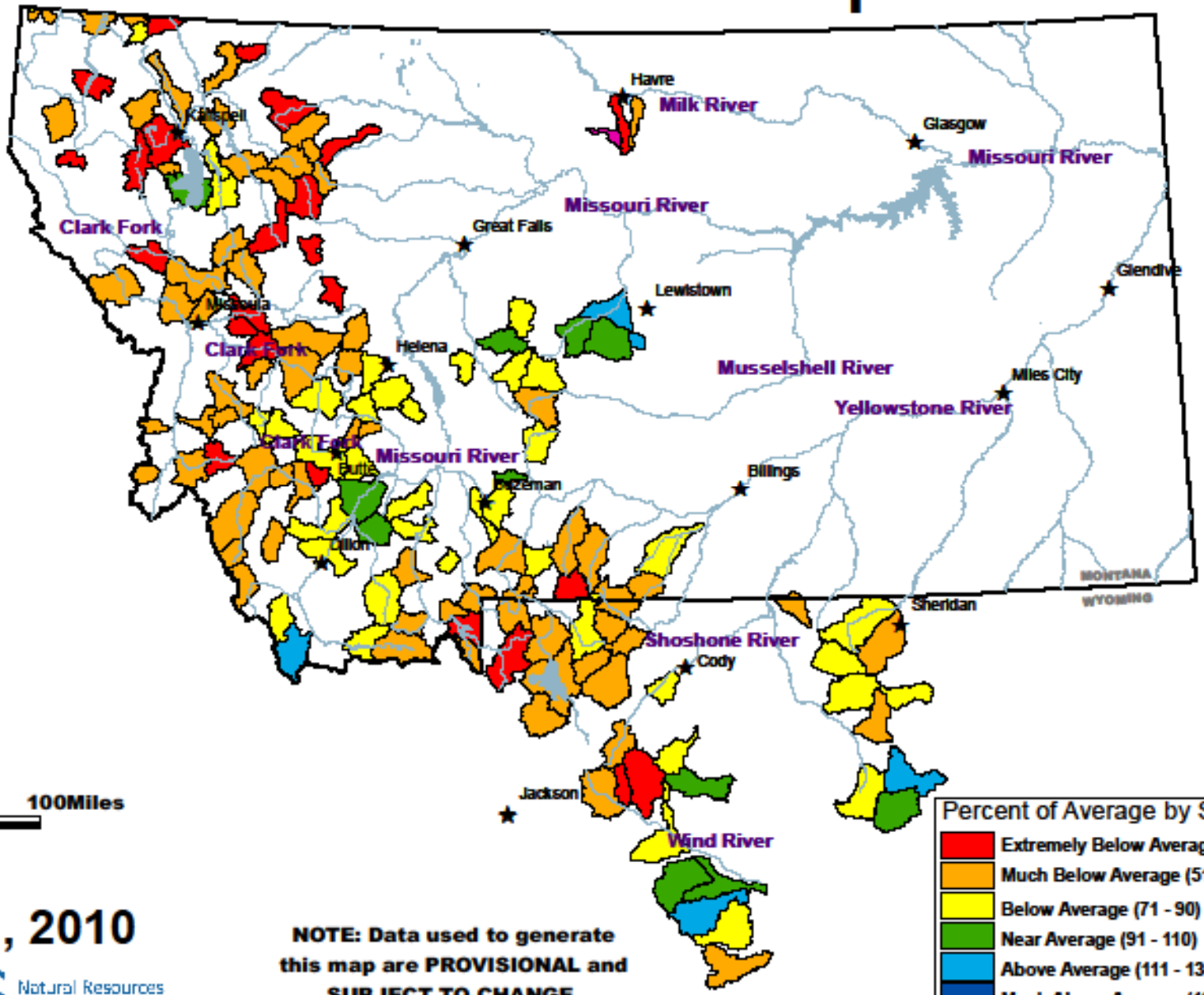

Temp Sensor
Solar Panel
Depth Sensor
Radio Antenna
Shelter Enclosure w/
Datalogger and Radio
Precipitation Sensor
Snow Water Sensor
NRCS Natural Resources
Conservation Service

UNITED STATES DEPARTMENT OF AGRICULTURE

NATURAL RESOURCES CONSERVATION SERVICE

Mountain Snow Water Equivalent



0 50 100Miles

Percent of Average by Sub-Basin

- Extremely Below Average (Below 51)
- Much Below Average (51 - 70)
- Below Average (71 - 90)
- Near Average (91 - 110)
- Above Average (111 - 130)
- Much Above Average (131 - 150)
- Extremely Above Average (Over150)

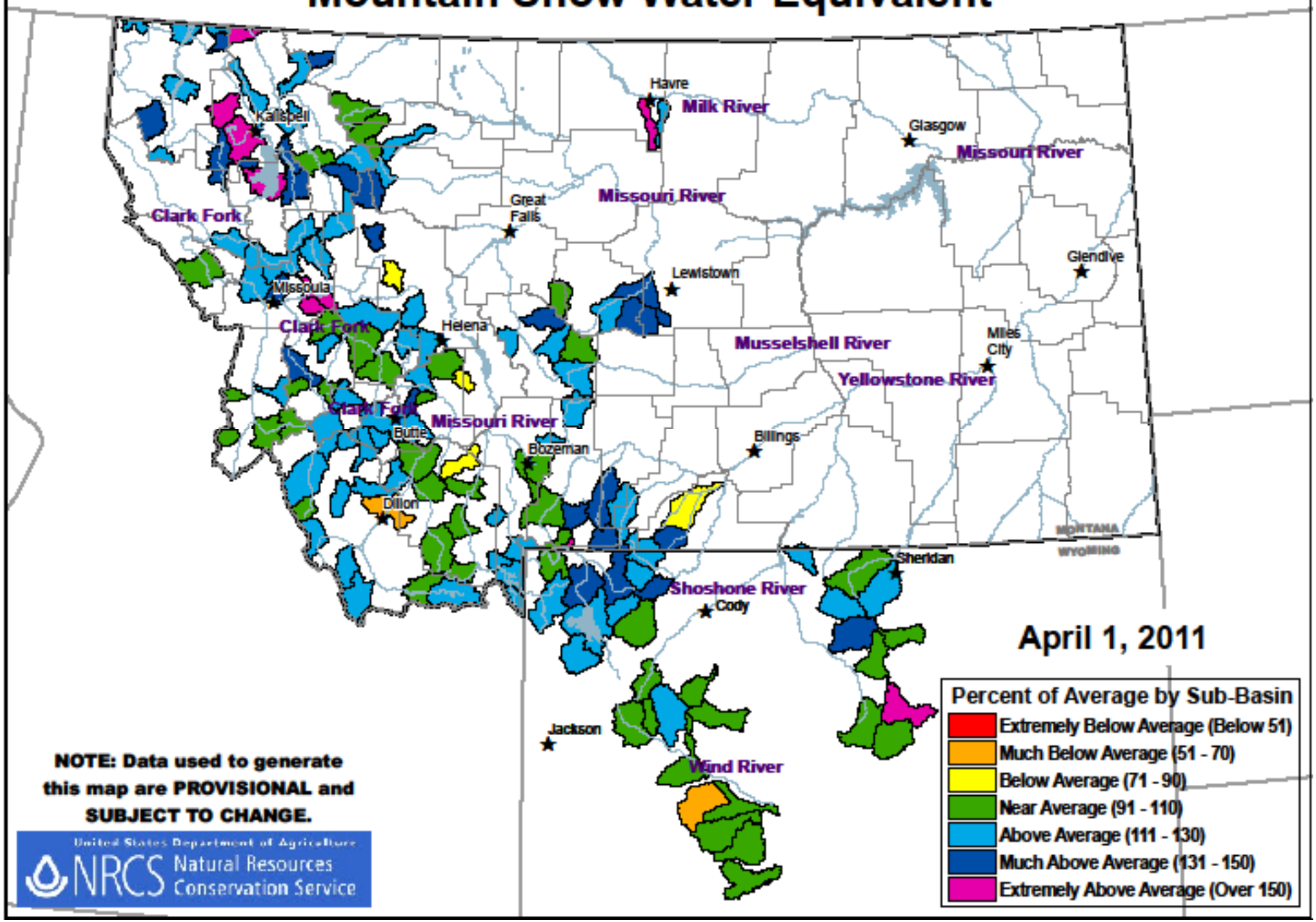
April 1, 2010

NRCS Natural Resources Conservation Service

http://www.mt.nrcs.usda.gov

NOTE: Data used to generate this map are PROVISIONAL and SUBJECT TO CHANGE.

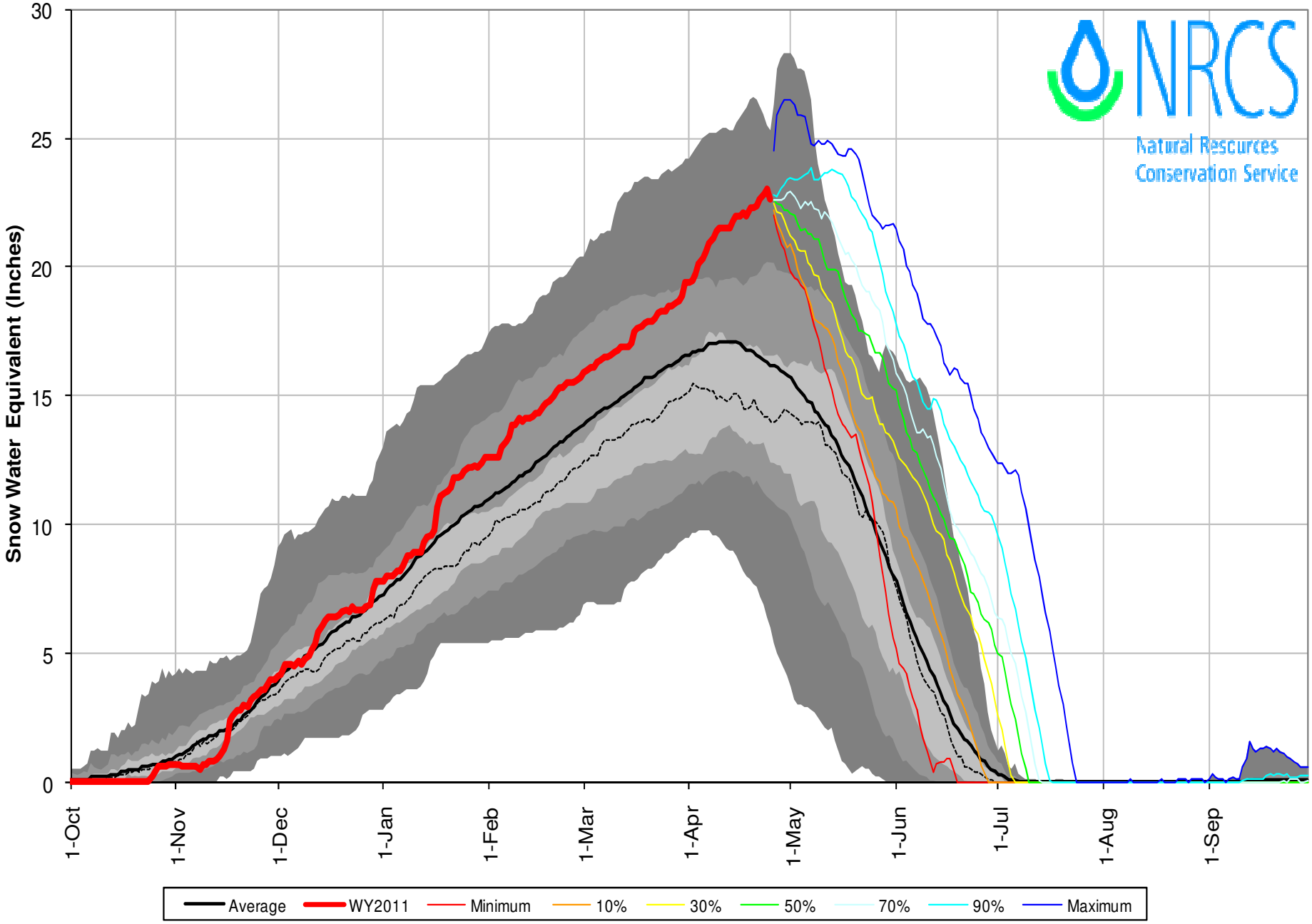
Mountain Snow Water Equivalent

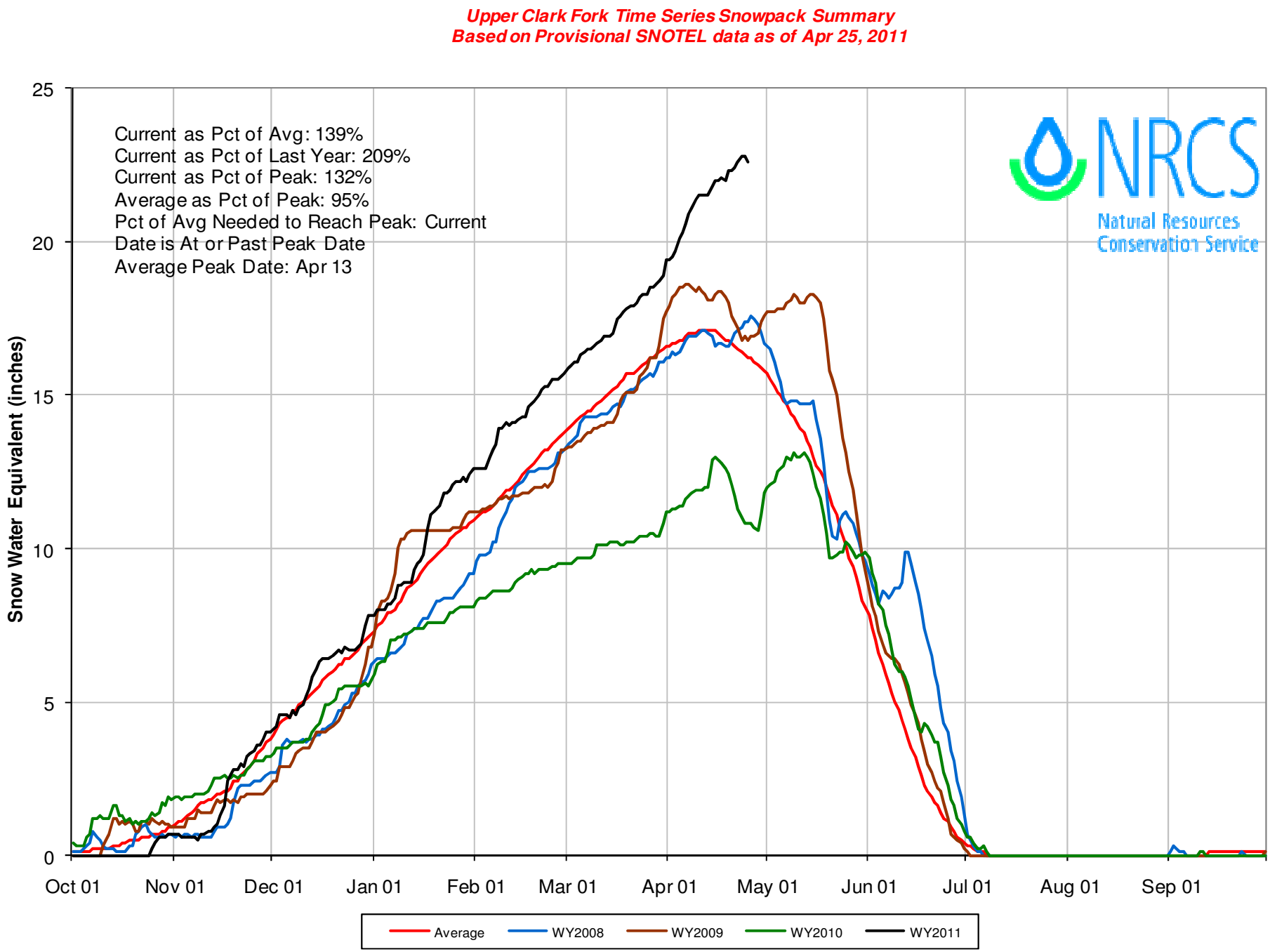


Basin Site Name	Elev (ft)	Snow Water Equivalent				Percent of	
		Current (in)	Today's Average (in)	Avg Peak (in)	Avg Peak Date	Today's Average	Avg Peak
UPPER CLARK FORK RIVER BASIN							
BARKER LAKES	8250	20.2	16.3	16.4	26-Apr	124	123
BASIN CREEK	7180	11.5	9.9	10.1	29-Apr	116	114
BLACK PINE	7210	17.6	11.8	12.9	11-Apr	149	136
COMBINATION	5600	5.2	1.7	5	26-Mar	306	104
COPPER BOTTOM	5200	6.2	6.2	11	28-Mar	100	56
COPPER CAMP	6950	60.4	N/A	N/A	N/A	*	*
LUBRECHT FLUME	4680	1.4	0.8	5.3	3-Mar	175	26
NEVADA RIDGE	7020	23.6	15.5	16	19-Apr	152	148
N FK ELK CREEK	6250	18	9.6	12.5	4-Apr	188	144
NORTH FORK JOCKO	6330	64.7	44.8	46.6	14-Apr	144	139
PETERSON MEADOWS	7200	14.3	11.5	11.5	26-Apr	124	124
ROCKER PEAK	8000	21.2	16.3	16.6	30-Apr	130	128
SKALKAHO SUMMIT	7250	31.7	25.7	25.8	14-Apr	123	123
STUART MOUNTAIN	7400	50.1	33.7	35.1	12-Apr	149	143
WARM SPRINGS	7800	31.4	23.6	23.8	28-Apr	133	132
Basin-wide percent of average						139	128
BITTERROOT							
DALY CREEK	5780	12.5	6.5	11.2	30-Mar	192	112
LOLO PASS	5240	36.8	27.5	30.5	8-Apr	134	121
MOOSE CREEK	6200	22.2	16	18.3	9-Apr	139	121
NEZ PERCE CAMP	5650	16.4	12.6	14.7	3-Apr	130	112
SADDLE MTN.	7940	34.7	26.8	26.9	19-Apr	129	129
SKALKAHO SUMMIT	7250	31.7	25.7	25.8	14-Apr	123	123
TWELVEMILE CREEK	5600	17.6	11.5	17.6	29-Mar	153	100
TWIN LAKES	6400	49.8	39.4	40.6	13-Apr	126	123
Basin-wide percent of average						134	119

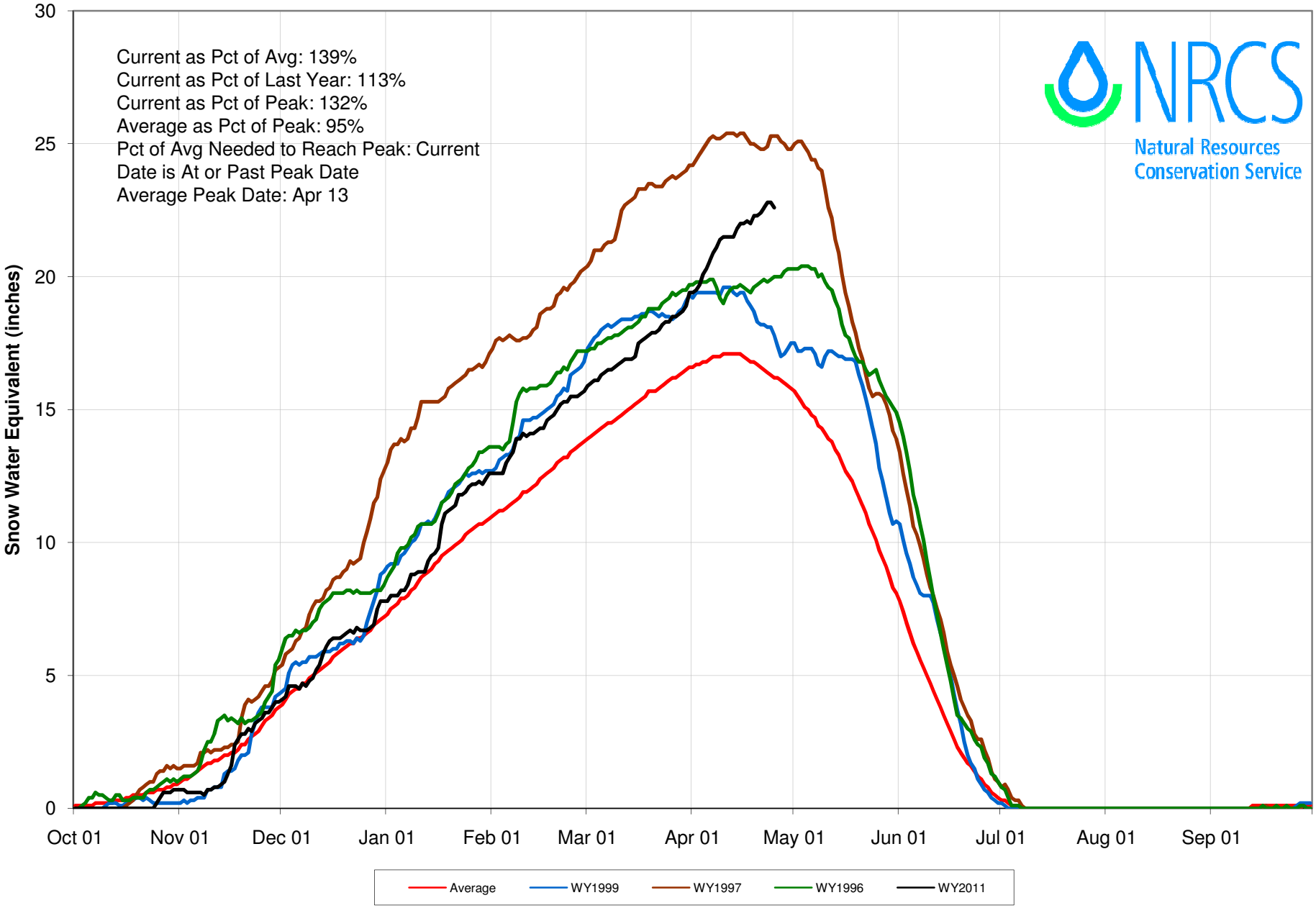
Upper Clark Fork River Basin with Non-Exceedence Projections

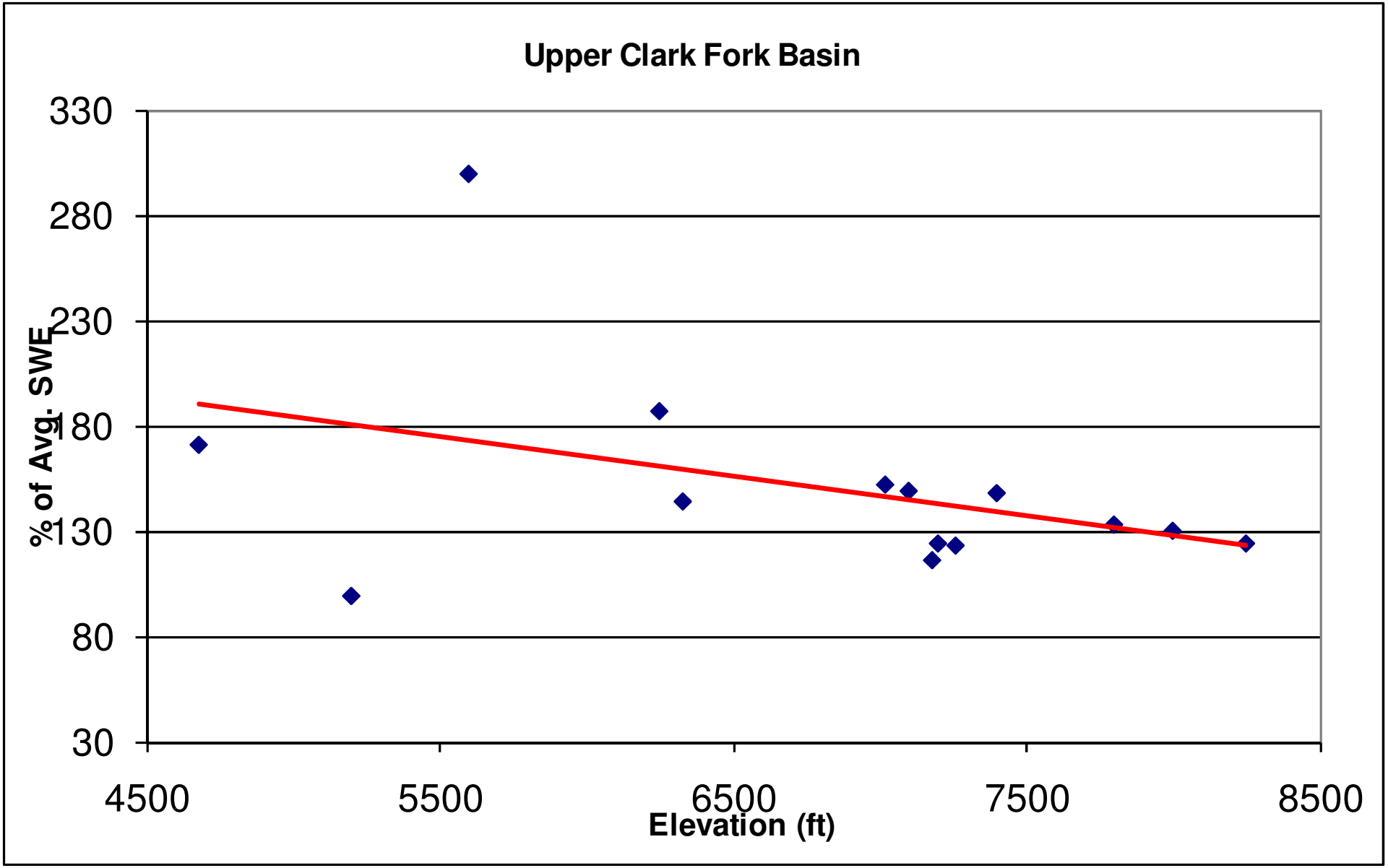
Based on Provisional SNOTEL Data as of Apr 25, 2011




Upper Clark Fork Time Series Snowpack Summary
Based on Provisional SNOTEL data as of Apr 25, 2011
Current as Pct of Avg: 139%
Current as Pct of Last Year: 209%
Current as Pct of Peak: 132%
Average as Pct of Peak: 95%
Pct of Avg Needed to Reach Peak: Current
Date is At or Past Peak Date
Average Peak Date: Apr 13
NRCS
Natural Resources
Conservation Service
Snow Water Equivalent (inches)
25
20
15
10
5
0
Oct 01
Nov 01
Dec 01
Jan 01
Feb 01
Mar 01
Apr 01
May 01
Jun 01
Jul 01
Aug 01
Sep 01
Average
WY2008
WY2009
WY2010
WY2011

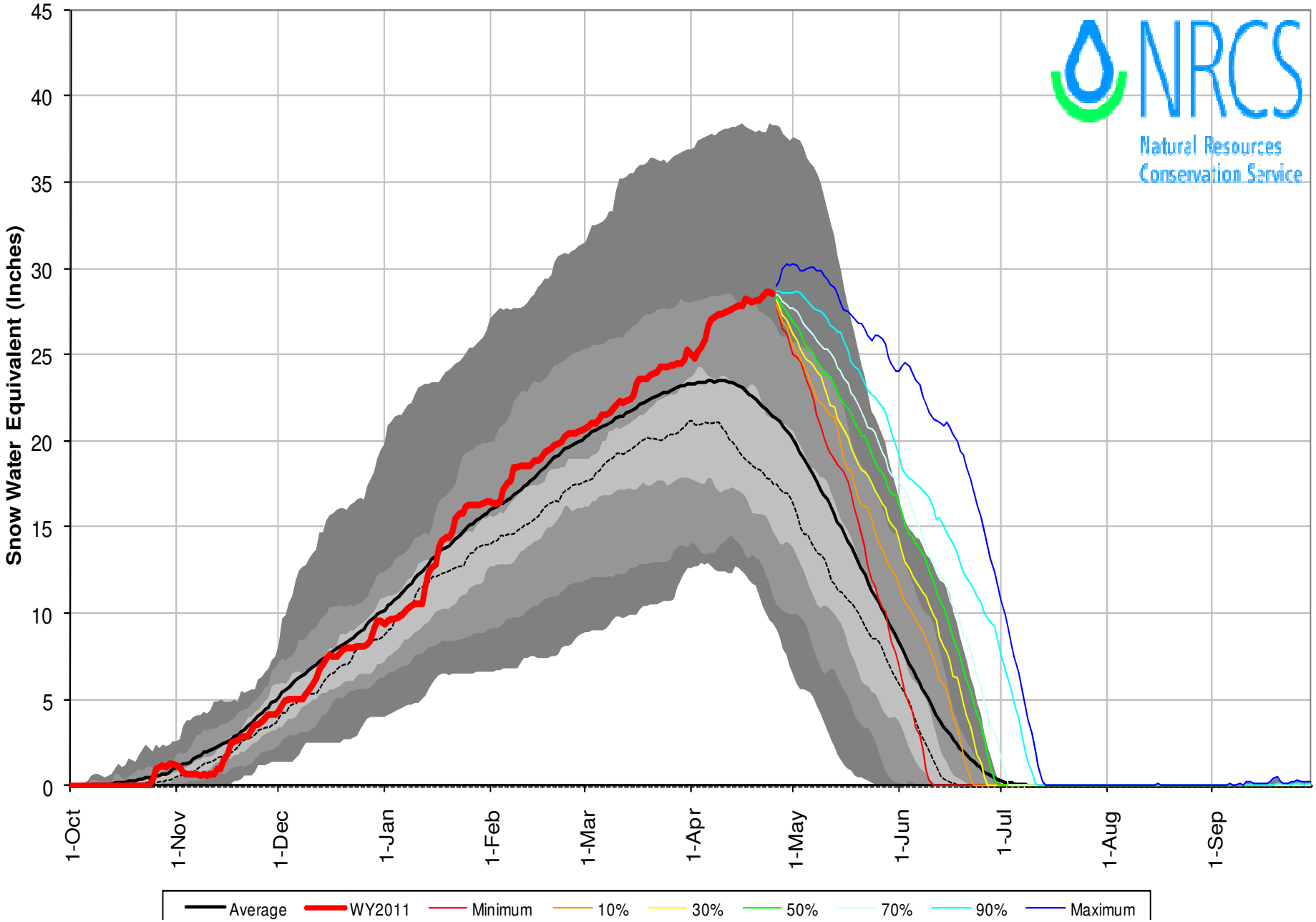
Upper Clark Fork Time Series Snowpack Summary
Based on Provisional SNOTEL data as of Apr 25, 2011

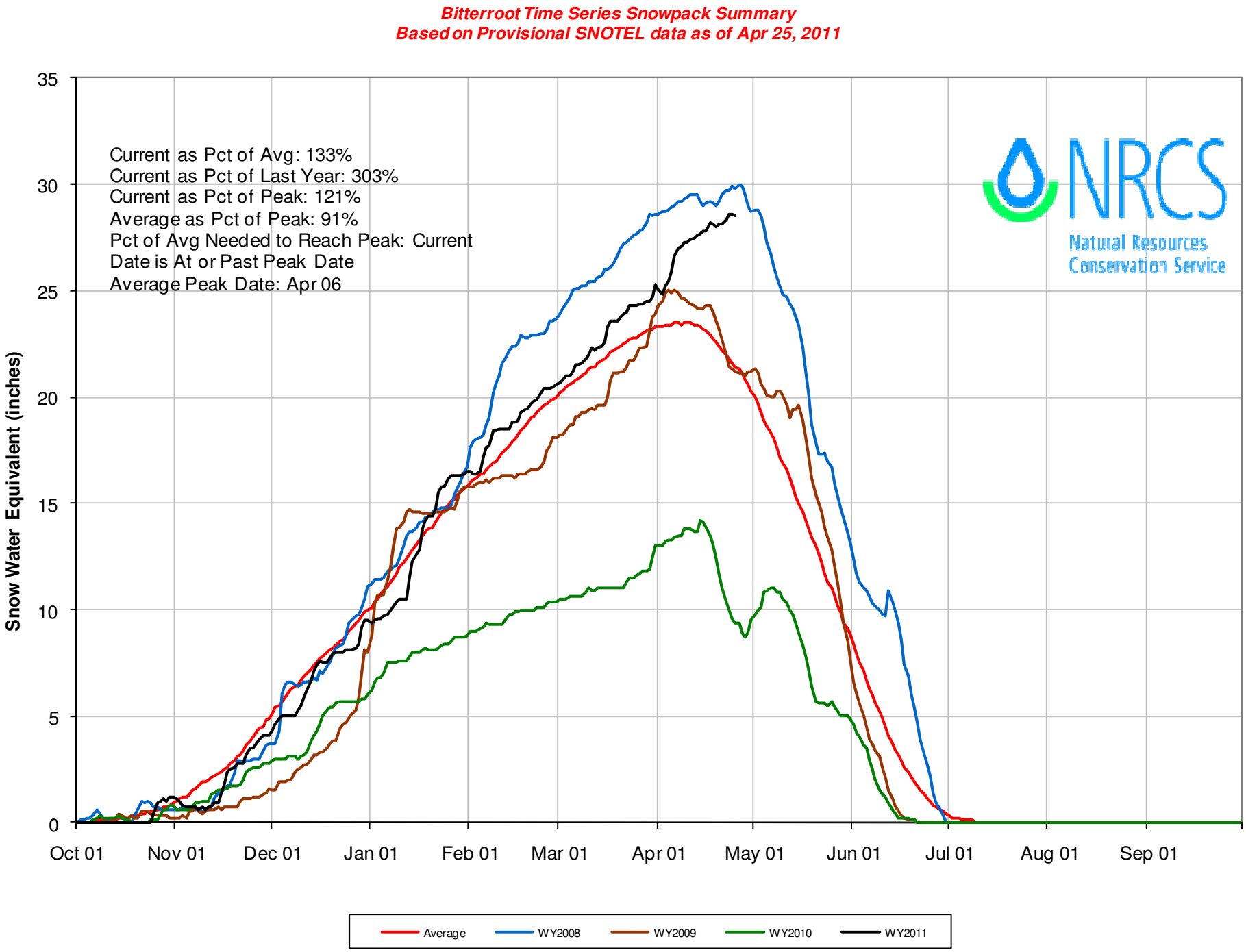



Upper Clark Fork Basin
330
280
230
180
130
80
30
% of Avg. SWE
4500
5500
6500
7500
8500
Elevation (ft)

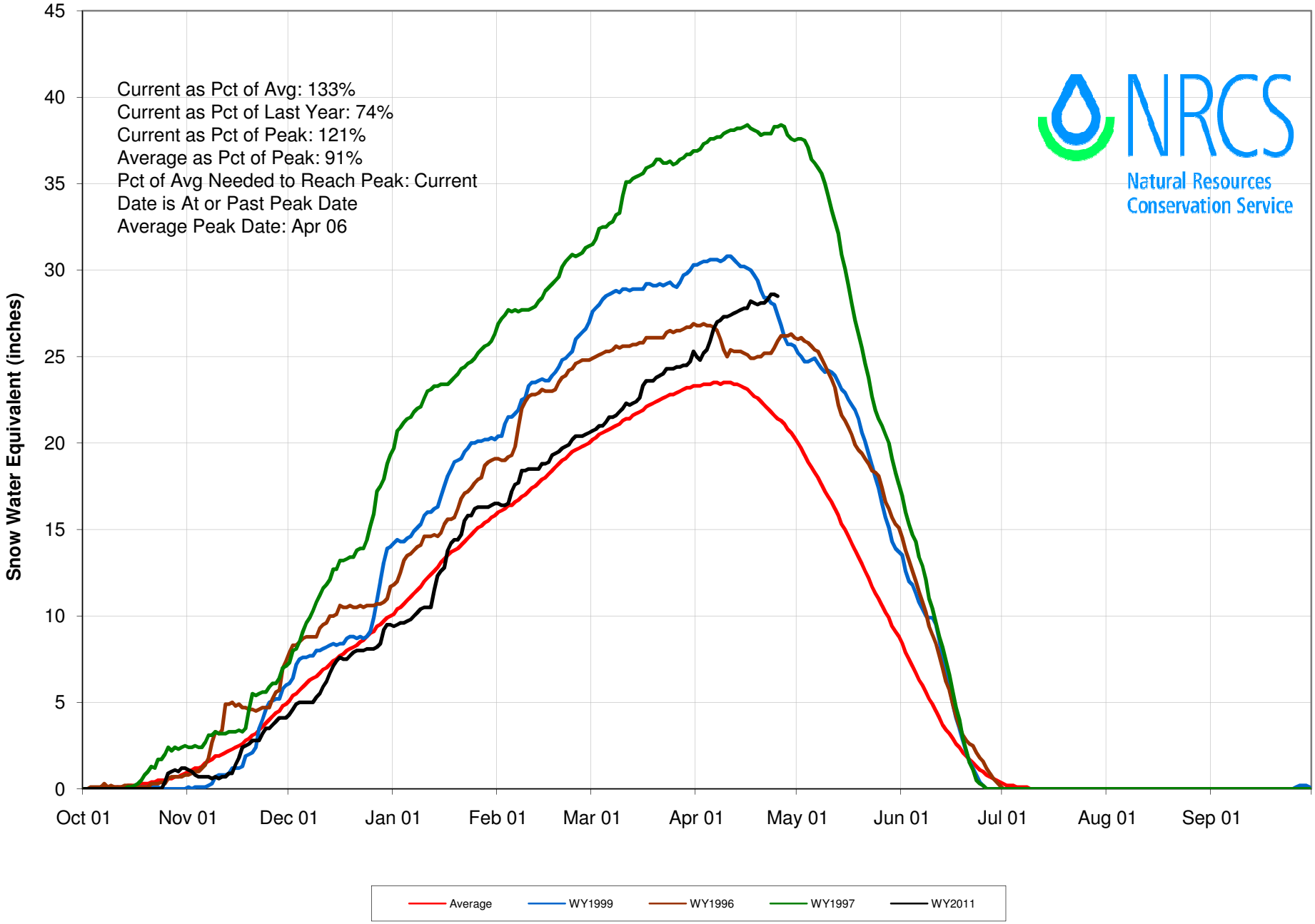
Bitterroot River Basin with Non-Exceedence Projections

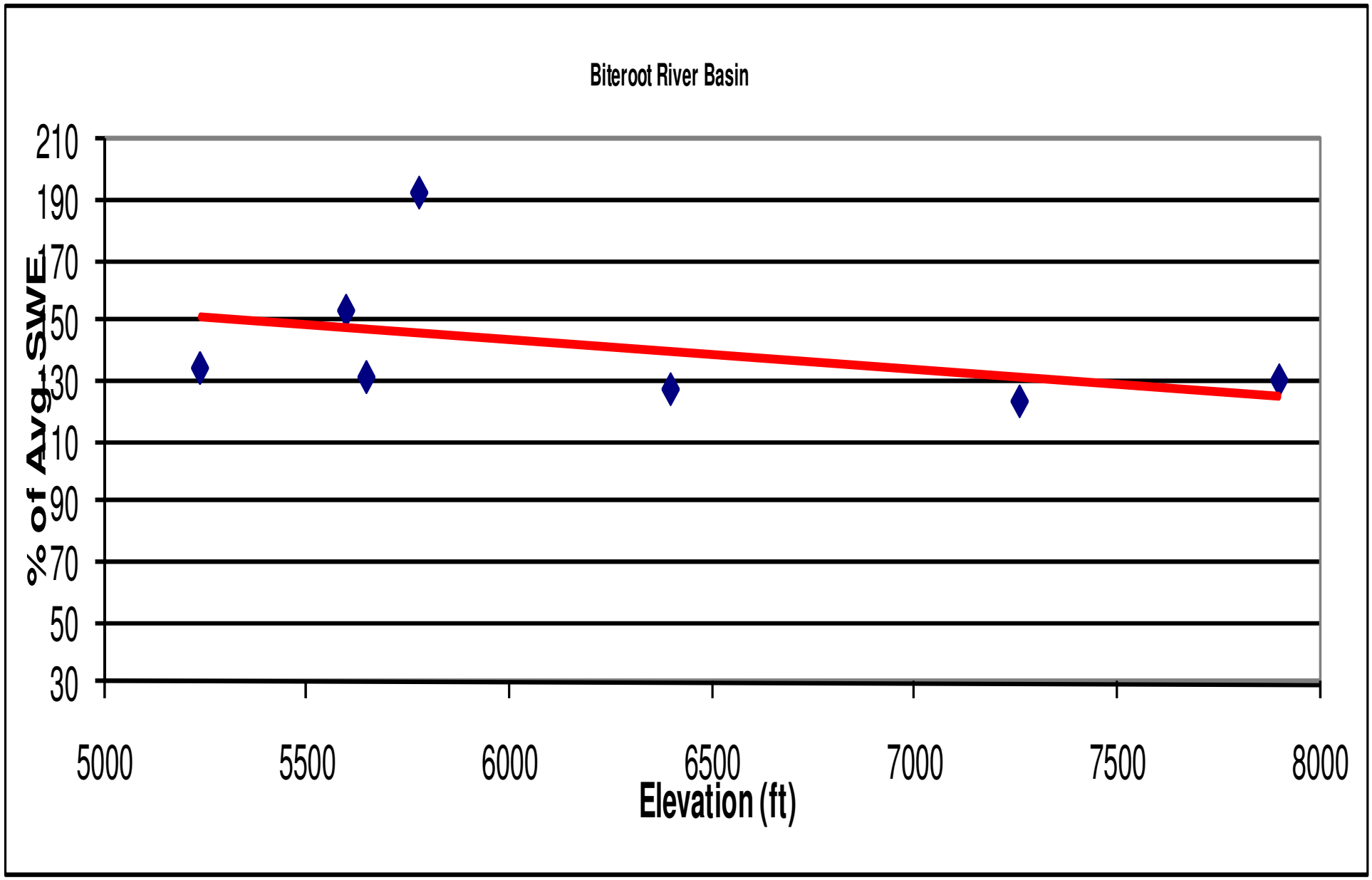
Based on Provisional SNOTEL Data as of Apr 25, 2011




Bitterroot Time Series Snowpack Summary
Based on Provisional SNOTEL data as of Apr 25, 2011
Current as Pct of Avg: 133%
Current as Pct of Last Year: 303%
Current as Pct of Peak: 121%
Average as Pct of Peak: 91%
Pct of Avg Needed to Reach Peak: Current
Date is At or Past Peak Date
Average Peak Date: Apr 06
NRCS
Natural Resources
Conservation Service
Snow Water Equivalent (inches)
35
30
25
20
15
10
5
0
Oct 01
Nov 01
Dec 01
Jan 01
Feb 01
Mar 01
Apr 01
May 01
Jun 01
Jul 01
Aug 01
Sep 01
Average
WY2008
WY2009
WY2010
WY2011

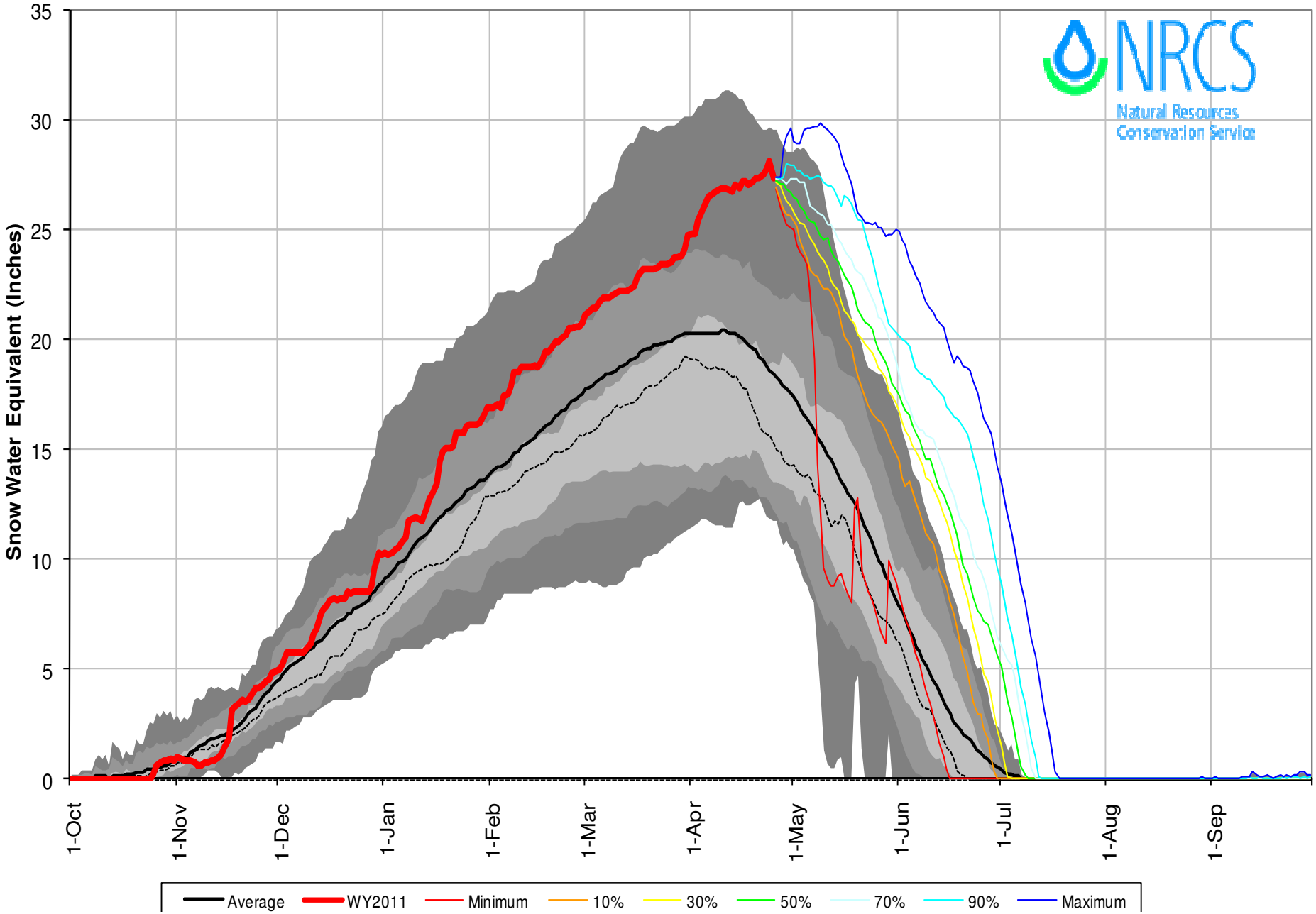
Bitterroot Time Series Snowpack Summary
Based on Provisional SNOTEL data as of Apr 25, 2011

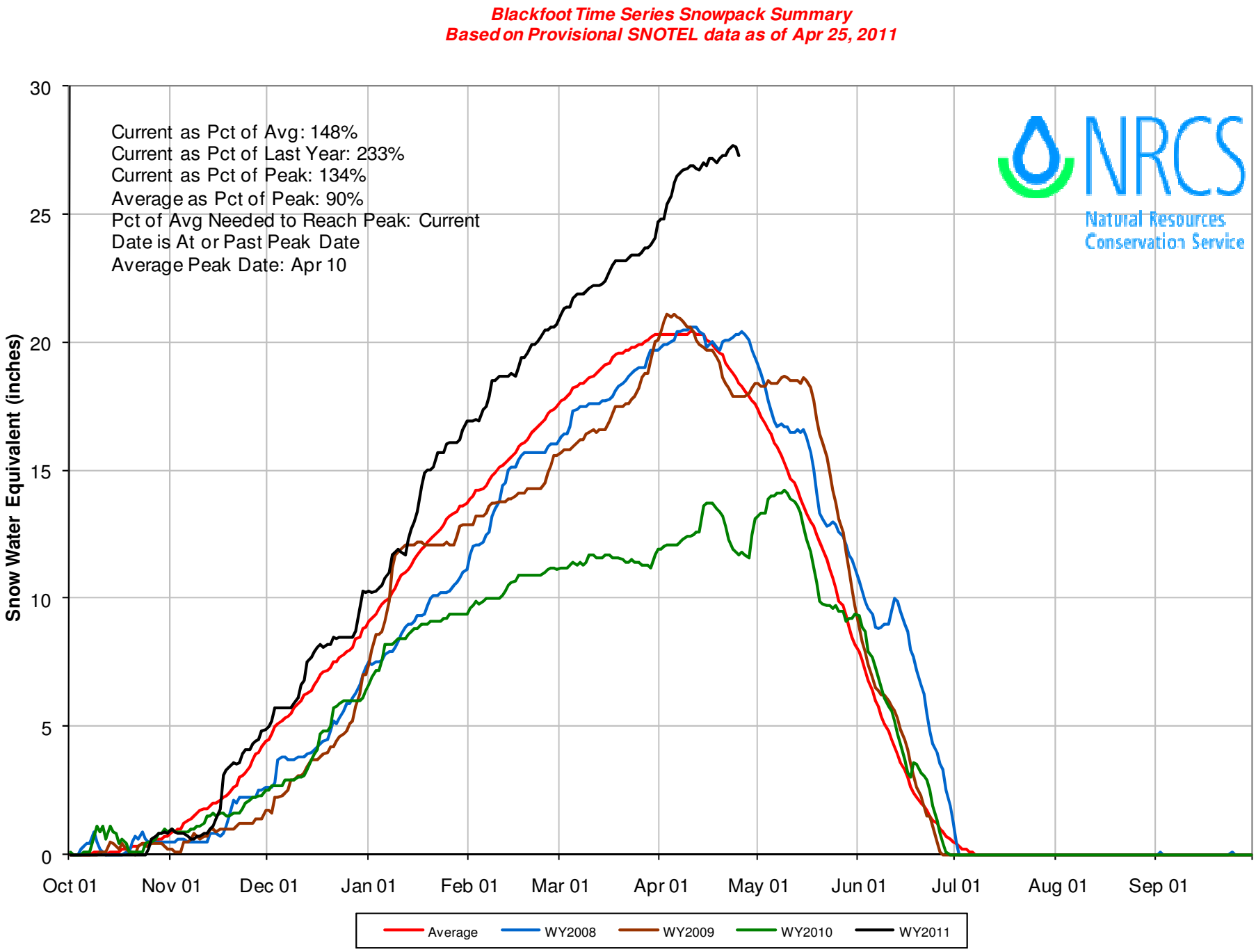



Biteroot River Basin
% of Avg. SWE
210
190
170
150
130
110
90
70
50
30
5000
5500
6000
6500
7000
7500
8000
Elevation (ft)

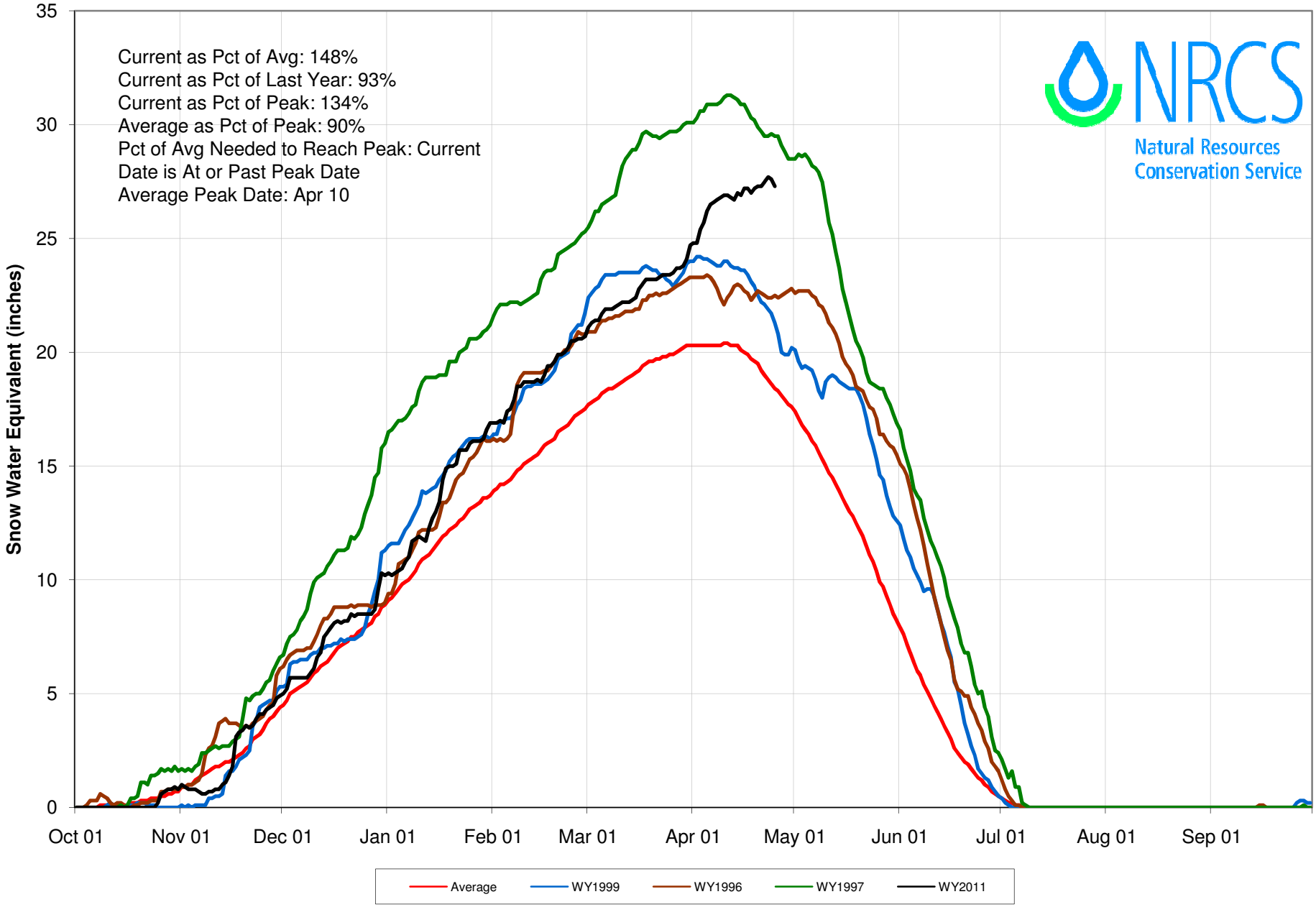
Blackfoot River Basin with Non-Exceedence Projections

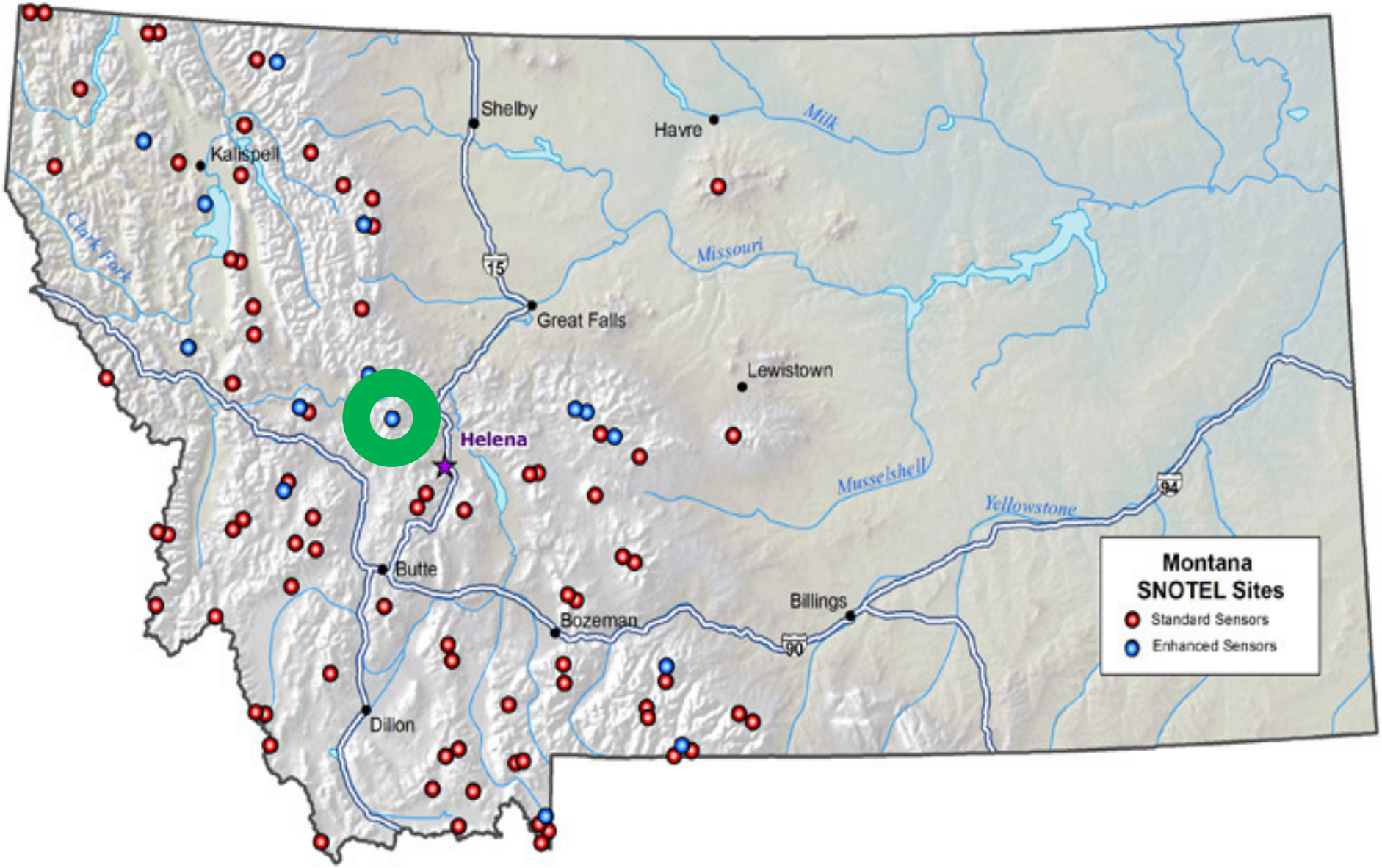
Based on Provisional SNOTEL Data as of Apr 25, 2011

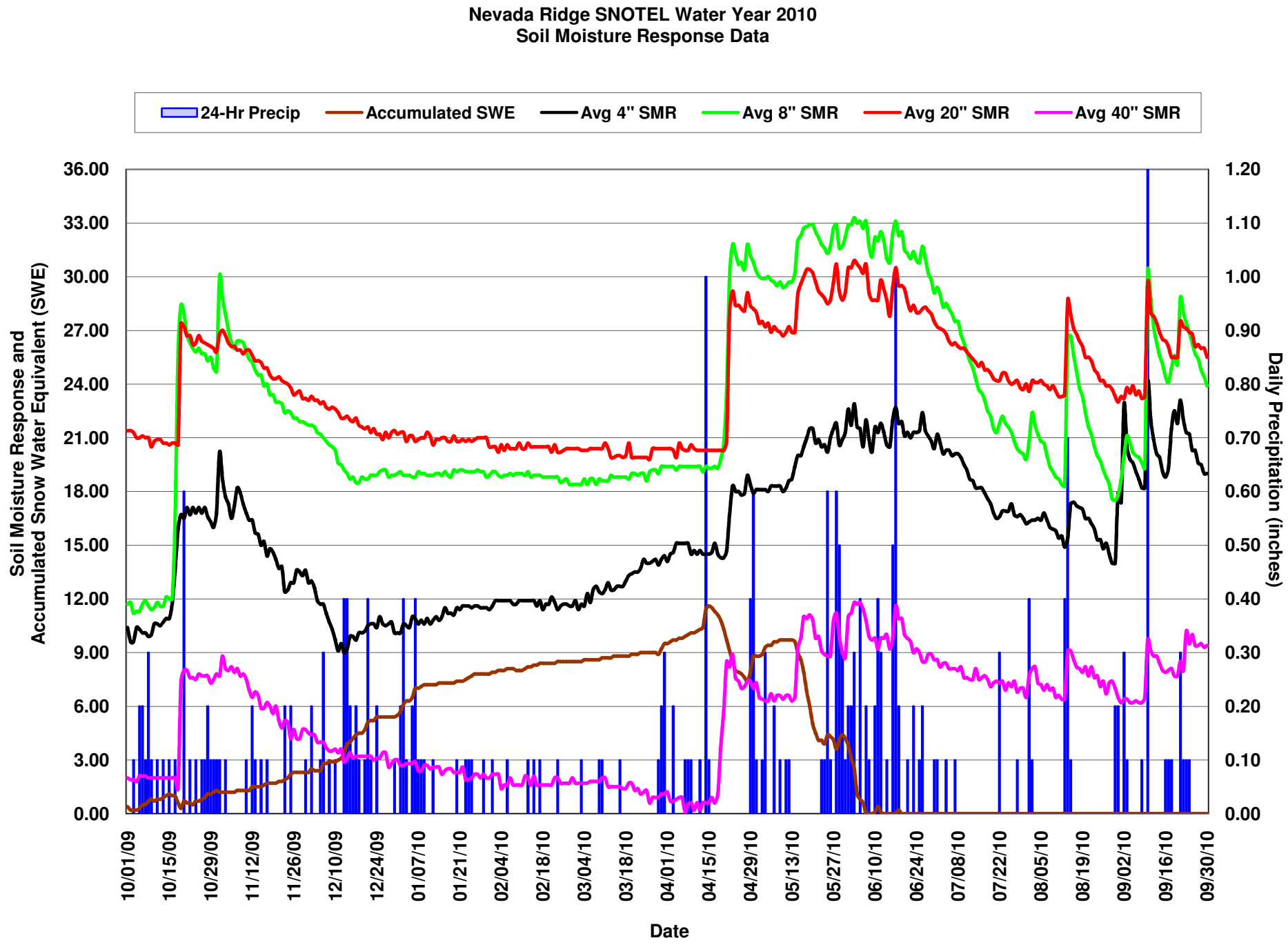


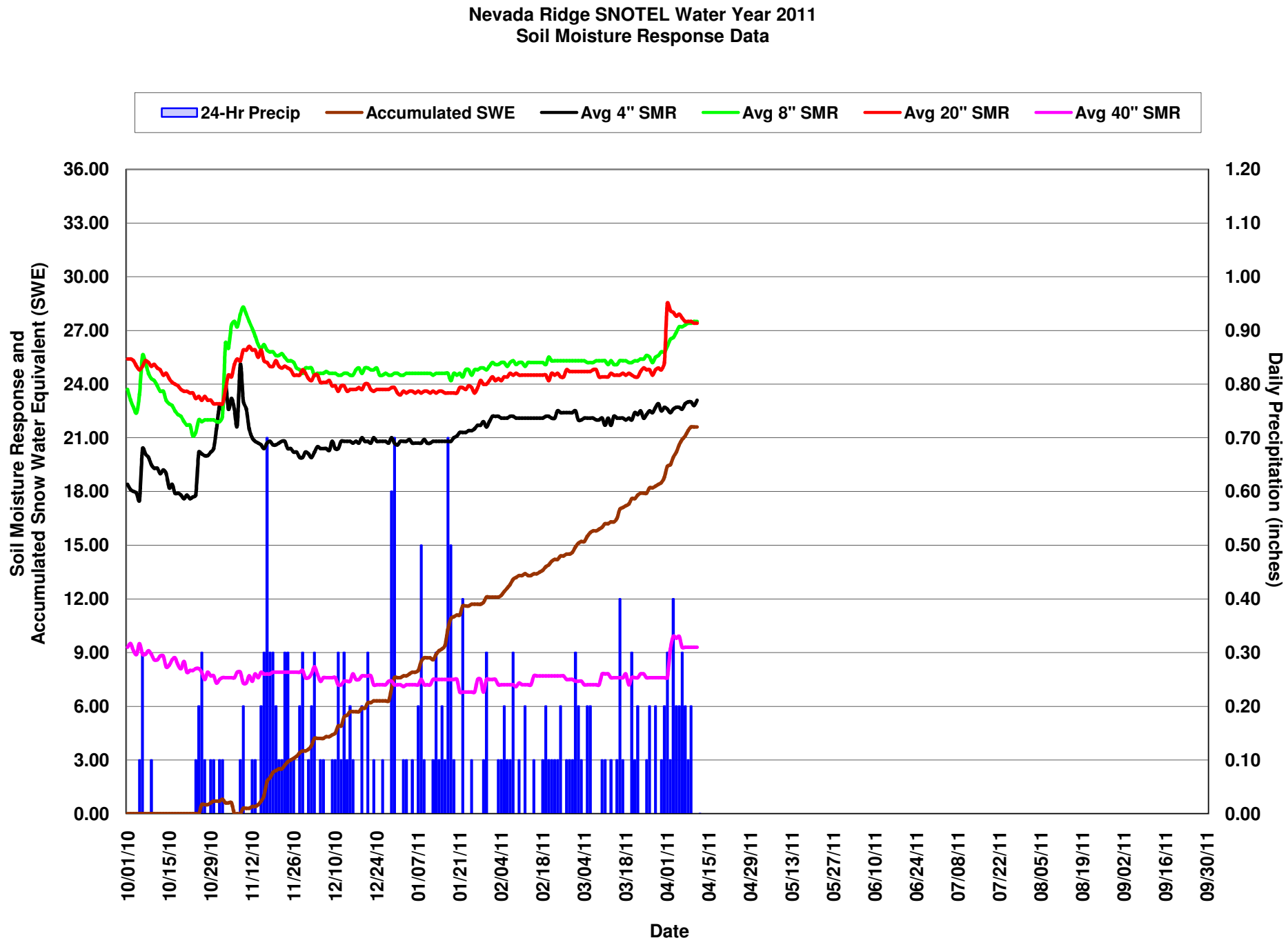

Blackfoot Time Series Snowpack Summary
Based on Provisional SNOTEL data as of Apr 25, 2011
Current as Pct of Avg: 148%
Current as Pct of Last Year: 233%
Current as Pct of Peak: 134%
Average as Pct of Peak: 90%
Pct of Avg Needed to Reach Peak: Current
Date is At or Past Peak Date
Average Peak Date: Apr 10
NRCS
Natural Resources
Conservation Service
Snow Water Equivalent (inches)
30
25
20
15
10
5
0
Oct 01
Nov 01
Dec 01
Jan 01
Feb 01
Mar 01
Apr 01
May 01
Jun 01
Jul 01
Aug 01
Sep 01
Average
WY2008
WY2009
WY2010
WY2011

Blackfoot Time Series Snowpack Summary
Based on Provisional SNOTEL data as of Apr 25, 2011




Shelby
Havre
Milk
Kalispell
Clark Fork
15
Missouri
Great Falls
Lewistown
Helena
Musselshell
Yellowstone
94
Butte
Billings
Bozeman
90
Dillon
Montana
SNOTEL Sites
Standard Sensors
Enhanced Sensors


Nevada Ridge SNOTEL Water Year 2010
Soil Moisture Response Data
24-Hr Precip
Accumulated SWE
Avg 4" SMR
Avg 8" SMR
Avg 20" SMR
Avg 40" SMR
Soil Moisture Response and Accumulated Snow Water Equivalent (SWE)
Daily Precipitation (inches)
36.00
33.00
30.00
27.00
24.00
21.00
18.00
15.00
12.00
9.00
6.00
3.00
0.00
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
10/01/09
10/15/09
10/29/09
11/12/09
11/26/09
12/10/09
12/24/09
01/07/10
01/21/10
02/04/10
02/18/10
03/04/10
03/18/10
04/01/10
04/15/10
04/29/10
05/13/10
05/27/10
06/10/10
06/24/10
07/08/10
07/22/10
08/05/10
08/19/10
09/02/10
09/16/10
09/30/10
Date


Nevada Ridge SNOTEL Water Year 2011
Soil Moisture Response Data
24-Hr Precip
Accumulated SWE
Avg 4" SMR
Avg 8" SMR
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Avg 40" SMR
Soil Moisture Response and Accumulated Snow Water Equivalent (SWE)
Daily Precipitation (inches)
36.00
33.00
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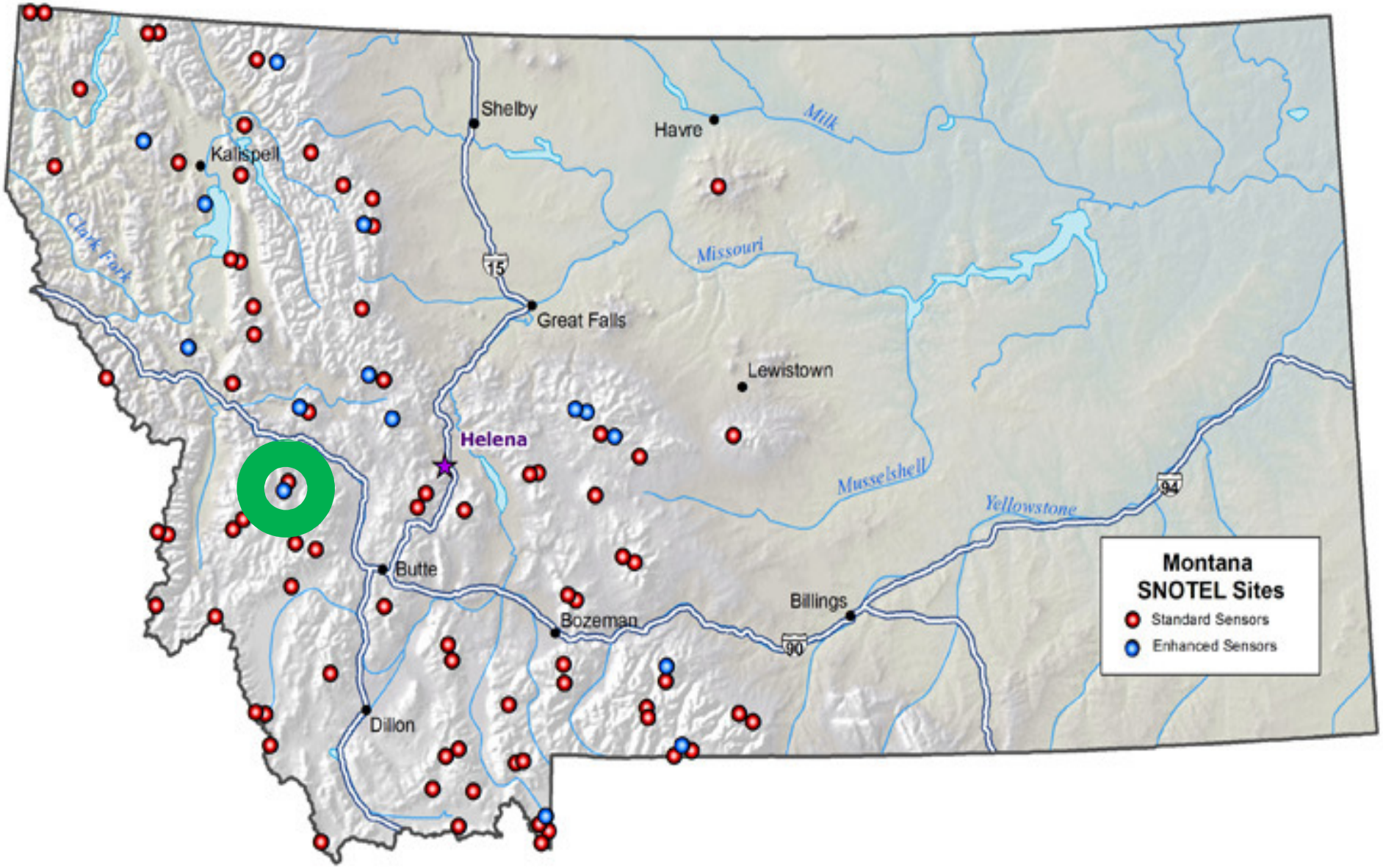
27.00
24.00
21.00
18.00
15.00
12.00
9.00
6.00
3.00
0.00
1.20
1.10
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
10/01/10
10/15/10
10/29/10
11/12/10
11/26/10
12/10/10
12/24/10
01/07/11
01/21/11
02/04/11
02/18/11
03/04/11
03/18/11
04/01/11
04/15/11
04/29/11
05/13/11
05/27/11
06/10/11
06/24/11
07/08/11
07/22/11
08/05/11
08/19/11
09/02/11
09/16/11
09/30/11
Date


Shelby
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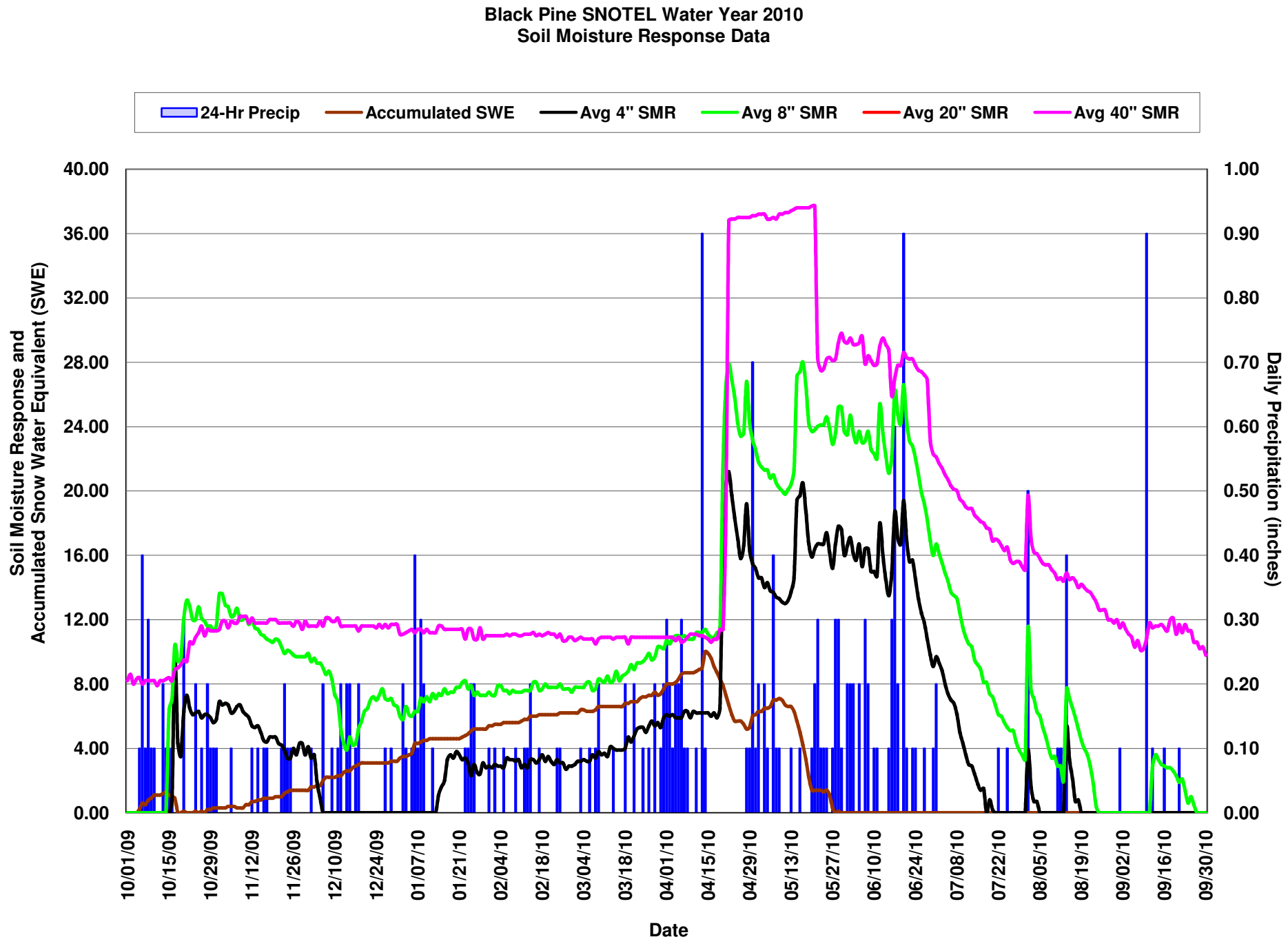
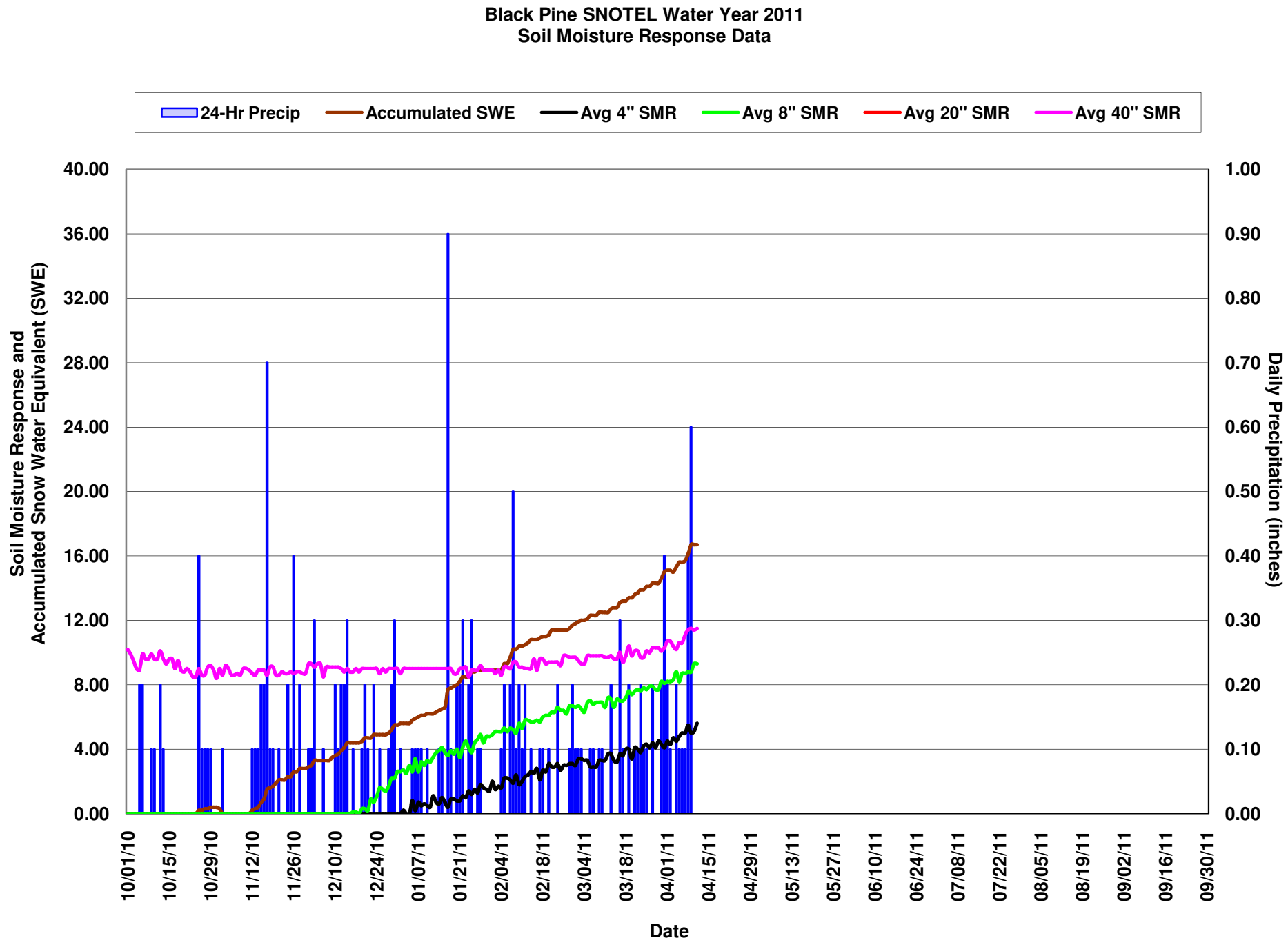

Black Pine SNOTEL Water Year 2010
Soil Moisture Response Data
24-Hr Precip
Accumulated SWE
Avg 4" SMR
Avg 8" SMR
Avg 20" SMR
Avg 40" SMR
Soil Moisture Response and Accumulated Snow Water Equivalent (SWE)
Daily Precipitation (inches)
40.00
36.00
32.00
28.00
24.00
20.00
16.00
12.00
8.00
4.00
0.00
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
10/01/09
10/15/09
10/29/09
11/12/09
11/26/09
12/10/09
12/24/09
01/07/10
01/21/10
02/04/10
02/18/10
03/04/10
03/18/10
04/01/10
04/15/10
04/29/10
05/13/10
05/27/10
06/10/10
06/24/10
07/08/10
07/22/10
08/05/10
08/19/10
09/02/10
09/16/10
09/30/10
Date

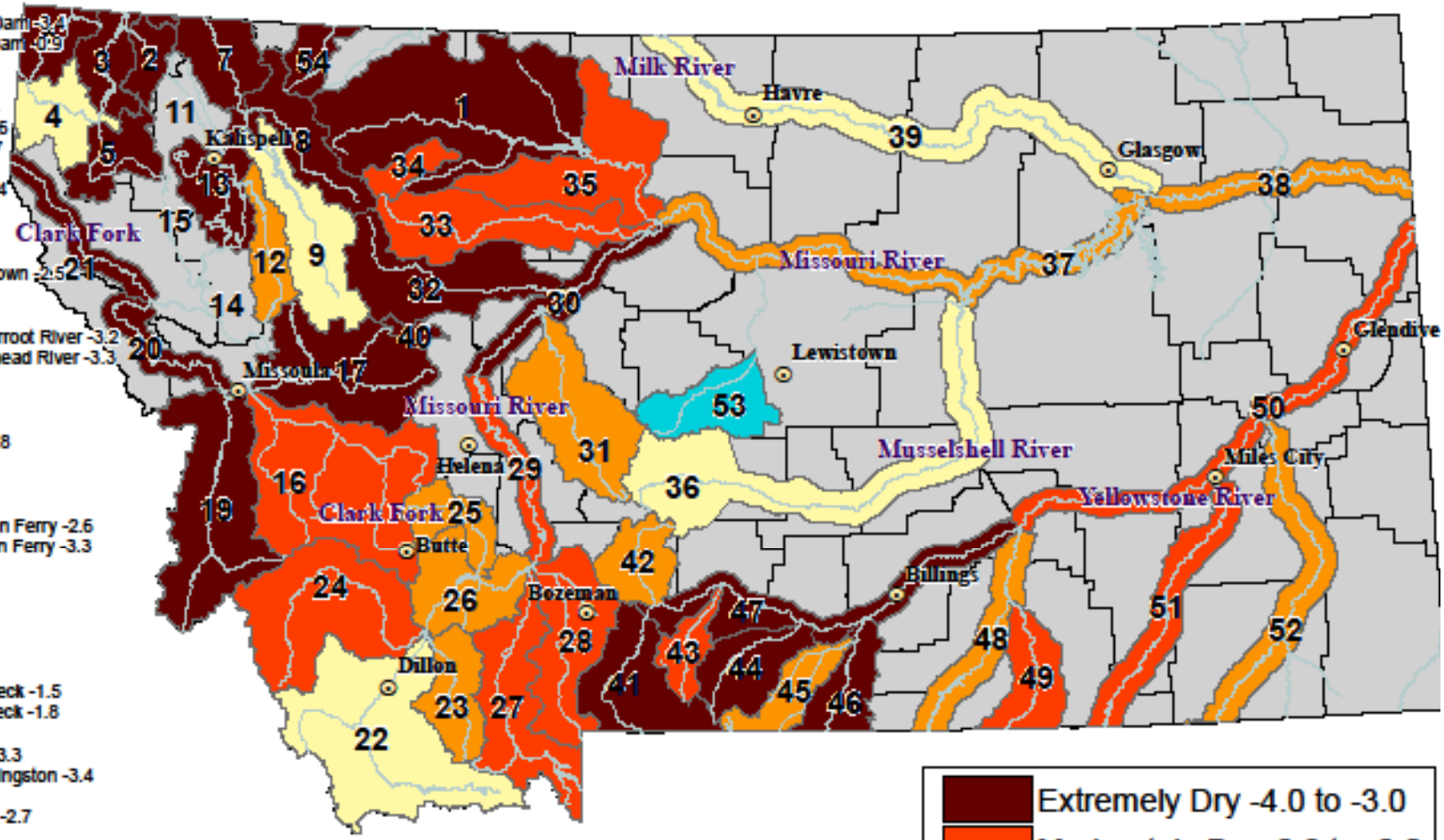

Black Pine SNOTEL Water Year 2011
Soil Moisture Response Data
24-Hr Precip
Accumulated SWE
Avg 4" SMR
Avg 8" SMR
Avg 20" SMR
Avg 40" SMR
Soil Moisture Response and Accumulated Snow Water Equivalent (SWE)
Daily Precipitation (inches)
40.00
36.00
32.00
28.00
24.00
20.00
16.00
12.00
8.00
4.00
0.00
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
10/01/10
10/15/10
10/29/10
11/12/10
11/26/10
12/10/10
12/24/10
01/07/11
01/21/11
02/04/11
02/18/11
03/04/11
03/18/11
04/01/11
04/15/11
04/29/11
05/13/11
05/27/11
06/10/11
06/24/11
07/08/11
07/22/11
08/05/11
08/19/11
09/02/11
09/16/11
09/30/11
Date

Surface Water Supply Index (SWSI) Values

UNITED STATES DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

RIVER INDEX & SWSI VALUES

1 Marias River above Tiber Reservoir -3.3
2 Tobacco River -3.2
3 Kootenai Ft. Steele to Libby Dam -3.4
4 Kootenai River below Libby Dam -0.9
5 Fisher River -3.1
6 Yaak River -3.4
7 North FK. Flathead River -3.4
8 Middle FK. Flathead River -3.6
9 South FK. Flathead River -0.7
12 Swan River -1.4
13 Flathead River at Polson -3.4
14 Mission Valley
15 Little Bitterroot River
16 Clark Fork River above Milltown -2.5
17 Blackfoot River -3
19 Bitterroot River -3.6
20 Clark Fork River below Bitterroot River -3.2
21 Clark Fork River below Flathead River -3.3
22 Beaverhead River -0.9
23 Ruby River -1.9
24 Big Hole River -2.6
25 Boulder River (Jefferson) -1.8
26 Jefferson River -1.3
27 Madison River -2.8
28 Gallatin River -2.5
29 Missouri River above Canyon Ferry -2.6
30 Missouri River below Canyon Ferry -3.3
31 Smith River -1
32 Sun River -3.9
33 Teton River -2.2
34 Birch/Dupuyer Creeks -2.6
35 Marias River -2.7
36 Musselshell River 0.1
37 Missouri River above Fort Peck -1.5
38 Missouri River below Fort Peck -1.8
39 Milk River -0.9
40 Dearborn River near Craig -3.3
41 Yellowstone River above Livingston -3.4
42 Shields River -1
43 Boulder River (Yellowstone) -2.7
44 Stillwater River -3.3
45 Rock/Red Lodge Creeks -1.1
46 Clarks Fork River -3.2
47 Yellowstone River above Bighorn River -3.3
48 Bighorn River below Bighorn Lake -1.1
49 Little Bighorn River -2.4
50 Yellowstone River below Bighorn River -2.3
51 Tongue River -2.7
52 Powder River -1.8
53 Upper Judith River 2.2
54 St. Mary River -3.4



0 45 90 Miles

Current as of April 1, 2010

	Extremely Dry -4.0 to -3.0
	Moderately Dry -2.9 to -2.0
	Slightly Dry -1.9 to -1.0
	Near Average -0.9 to 0.9
	Sightly Wet 1.0 to 1.9
	Moderately Wet 2.0 to 2.9
	Extremely Wet 3.0 to 4.0
	SWSI Not Applicable

NOTE: Data used to generate this map are PROVISIONAL and SUBJECT TO CHANGE.

NRCS Natural Resources Conservation Service

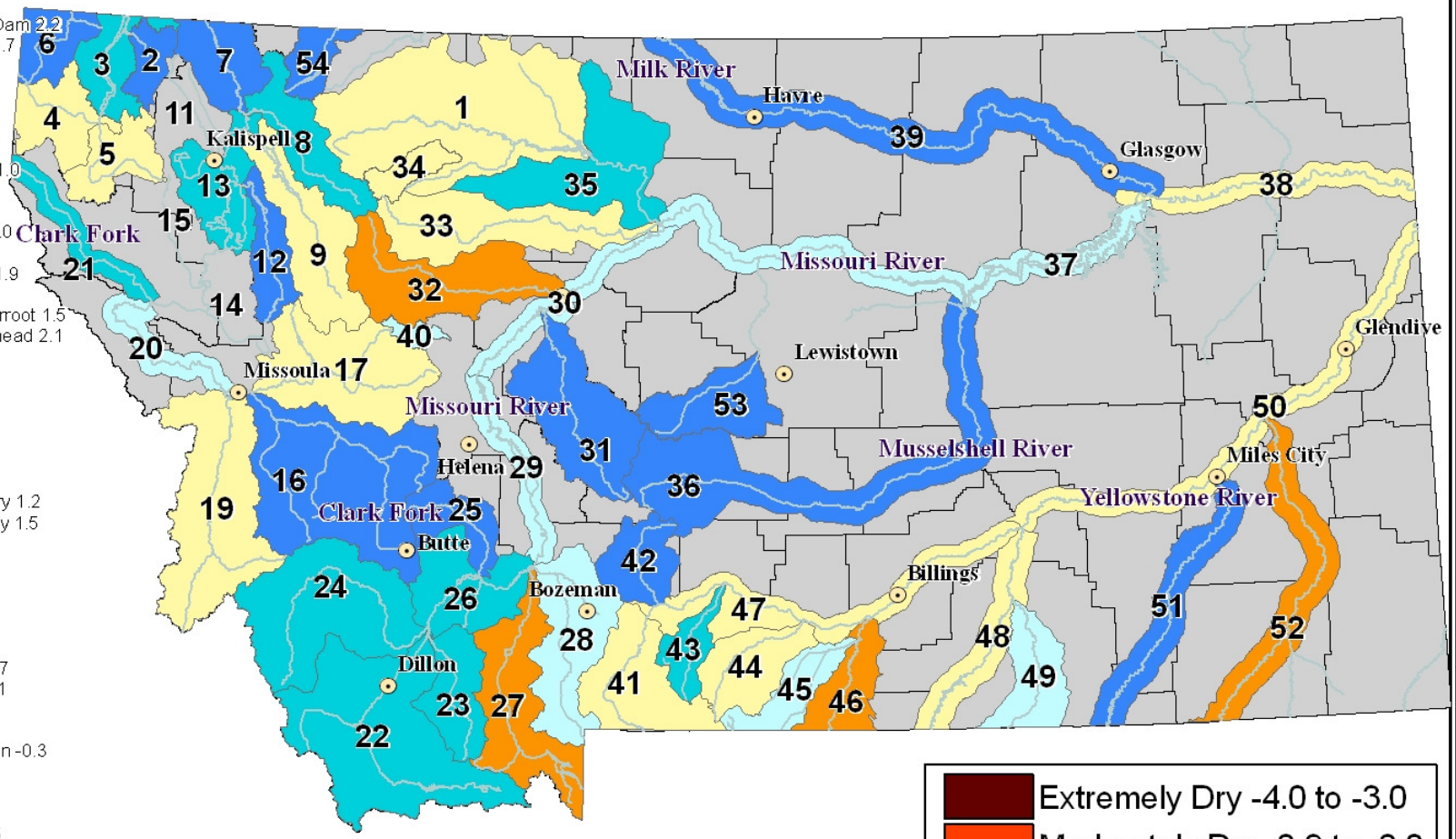
http://www.mt.nrcs.usda.gov

Surface Water Supply Index (SWSI) Values

UNITED STATES DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE

RIVER INDEX & SWSI VALUES

1 Marias above Tiber Reservoir 0.6
2 Tobacco 3.5
3 Kootenai Ft. Steele to Libby Dam 2.2
4 Kootenai below Libby Dam -0.7
5 Fisher 0.1
6 Yaak 3.2
7 North FK. Flathead 3.2
8 Middle FK. Flathead 2.1
9 South FK. Flathead 0.8
10 Flathead at Columbia Falls 1.0
12 Swan 3.1
13 Flathead at Polson 2.5
16 Clark Fork above Milltown 3.0
17 Blackfoot -0.2
18 Clark Fork above Missoula 1.9
19 Bitterroot 0.6
20 Clark Fork River below Bitterroot 1.5
21 Clark Fork River below Flathead 2.1
22 Beaverhead 2.9
23 Ruby 2.0
24 Big Hole 2.5
25 Boulder (Jefferson) 3.2
26 Jefferson 2.4
27 Madison -1.6
28 Gallatin 1.5
29 Missouri above Canyon Ferry 1.2
30 Missouri below Canyon Ferry 1.5
31 Smith 3.5
32 Sun -1.6
33 Teton 0.2
34 Birch/Dupuyer Creeks 0.2
35 Marias 2.4
36 Musselshell 3.7
37 Missouri above Fort Peck 1.7
38 Missouri below Fort Peck 0.1
39 Milk 3.3
40 Dearborn near Craig 1.9
41 Yellowstone above Livingston -0.3
42 Shields 3.7
43 Boulder (Yellowstone) 2.7
44 Stillwater 0.0
45 Rock/Red Lodge Creeks 1.5
46 Clarks Fork Yellowstone -1.2
47 Yellowstone above Bighorn River -0.1
48 Bighorn below Bighorn Lake -0.2
49 Little Bighorn 1.3
50 Yellowstone below Bighorn -0.1
51 Tongue 3.7
52 Powder -1.0
53 Upper Judith 3.9
54 Saint Mary 4.0



0 45 90 Miles

Current as of October 1, 2010

- Extremely Dry -4.0 to -3.0
- Moderately Dry -2.9 to -2.0
- Slightly Dry -1.9 to -1.0
- Near Average -0.9 to 0.9
- Sightly Wet 1.0 to 1.9
- Moderately Wet 2.0 to 2.9
- Extremely Wet 3.0 to 4.0
- SWSI Not Applicable

NOTE: Data used to generate this map are PROVISIONAL and SUBJECT TO CHANGE.

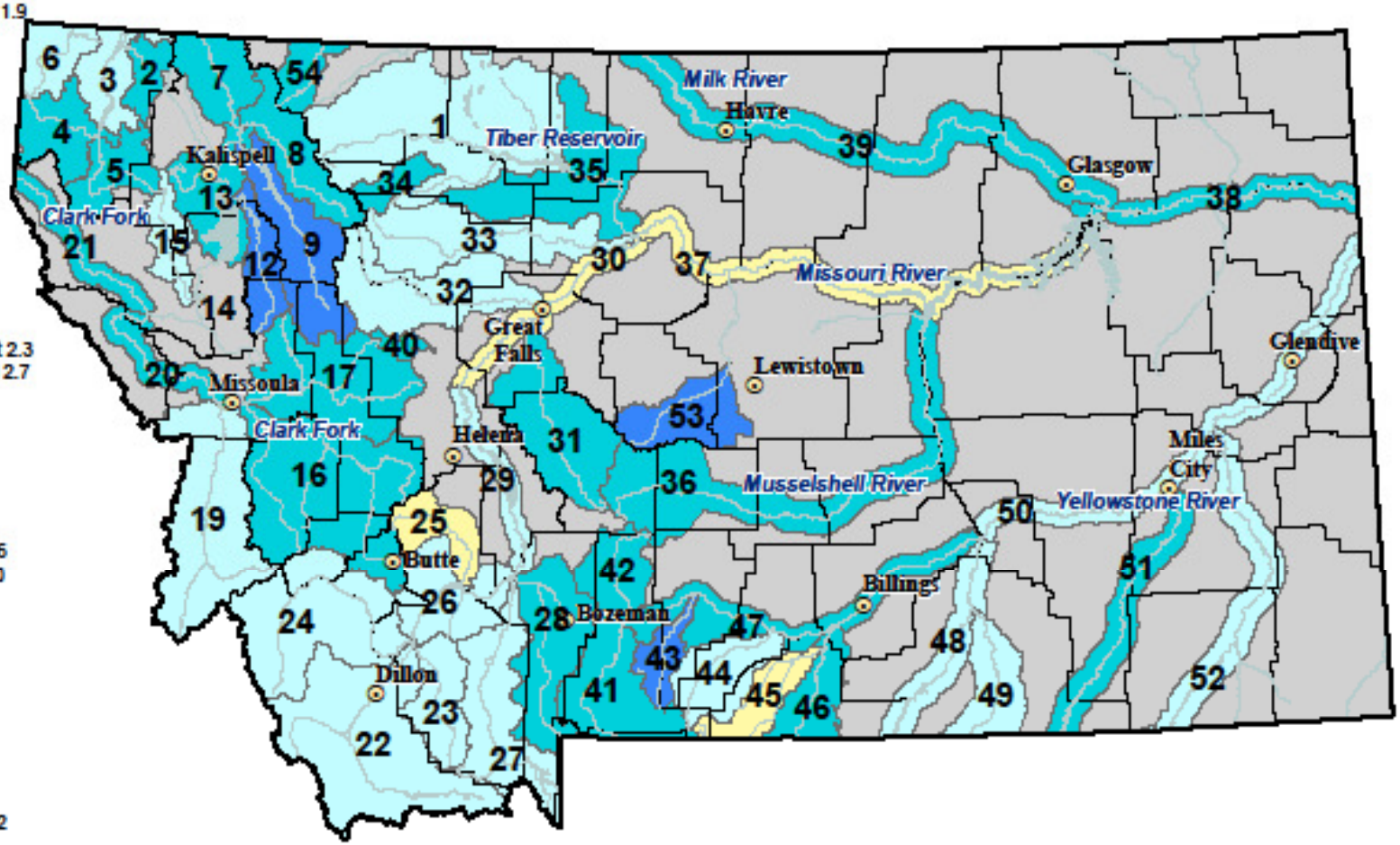
NRCS Natural Resources Conservation Service

http://www.mt.nrcs.usda.gov

Surface Water Supply Index (SWSI) Values

RIVER INDEX & SWSI VALUES

1 Marias above Tiber Reservoir 1.2
2 Tobacco 2.4
3 Kootenai Ft. Steele to Libby Dam 1.9
4 Kootenai below Libby Dam 2.6
5 Fisher 2.1
6 Yaak 1.3
7 North FK. Flathead 2.5
8 Middle FK. Flathead 2.8
9 South FK. Flathead 3.9
10 Flathead at Columbia Falls 3.5
12 Swan 3.8
13 Flathead at Polson 2.9
15 Little Bitterroot 1.7
16 Clark Fork above Milltown 2.1
17 Blackfoot 2.5
18 Clark Fork above Missoula 2.5
19 Bitterroot 1.9
20 Clark Fork River below Bitterroot 2.3
21 Clark Fork River below Flathead 2.7
22 Beaverhead 1.0
23 Ruby 1.3
24 Big Hole 1.5
25 Boulder (Jefferson) 0.8
26 Jefferson 1.9
27 Madison 1.0
28 Gallatin 2.1
29 Missouri above Canyon Ferry 1.6
30 Missouri below Canyon Ferry 0.0
31 Smith 2.2
32 Sun 1.4
33 Teton 1.8
34 Birch/Dupuyer Creeks 2.1
35 Marias 2.6
36 Musselshell 2.8
37 Missouri above Fort Peck 0.7
38 Missouri below Fort Peck 2.4
39 Milk 2.9
40 Dearborn near Craig 2.1
41 Yellowstone above Livingston 2.2
42 Shields 2.6
43 Boulder (Yellowstone) 3.1
44 Stillwater 1.7
45 Rock/Red Lodge Creeks 0.0
46 Clarks Fork Yellowstone 2.6
47 Yellowstone above Bighorn River 2.3
48 Bighorn below Bighorn Lake 1.4
49 Little Bighorn 1.2
50 Yellowstone below Bighorn 1.9
51 Tongue 2.4
52 Powder 1.7
53 Upper Judith 3.6
54 Saint Mary 2.8



April 1, 2011

NOTE: Data used to generate this map are PROVISIONAL and SUBJECT TO CHANGE.

- Extremely Dry -4.0 to -3.0
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United States Department of Agriculture
NRCS Natural Resources Conservation Service

Forecast Point	Model A	Model B	# Days After Avg Peak	Adjusted Model A	Adjusted Model B
Little Blackfoot River near Garrison, MT	14-May	19-May	11	25-May	30-May
Clark Fork River near Drummond, MT	19-May	1-Jun	11	30-May	12-Jun
Lower Willow Creek Res. Inflow	13-May	16-May	11	24-May	27-May
Middle F. Rock Creek near Phillipsburg, MT	20-May	28-May	11	31-May	8-Jun
Nevada Creek near Helmville, MT	14-May	21-May	11	25-May	1-Jun
Blackfoot River near Bonner, MT	18-May	22-May	14	1-Jun	5-Jun
Clark Fork River above Missoula, MT	18-May	26-May	13	31-May	8-Jun
Como Reservoir inflow	22-May	25-May	18	9-Jun	12-Jun
Bitterroot River near Darby, MT	20-May	23-May	18	7-Jun	10-Jun
Clark Fork River below Missoula, MT	19-May	28-May	14	2-Jun	11-Jun

BASIN STREAMFLOW FORECASTS	90%	70%	50%	30%	10%
UPPER CLARK FORK RIVER BASIN	95	118	133	149	172
Little Blackfoot R nr Garrison	86	110	125	141	165
Flint Ck nr Southern Cross	84	111	130	149	179
Flint Ck bl Boulder Ck	85	110	127	144	169
Lower Willow Ck Reservoir Inflow (2	99	125	141	158	183
MF Rock Ck nr Philipsburg	95	114	125	137	156
Rock Ck nr Clinton	98	119	133	148	169
Clark Fork R ab Milltown	83	110	128	147	174
Nevada Ck nr Helmville	92	123	144	165	194
Blackfoot R nr Bonner	122	135	143	151	163
Clark Fork R ab Missoula	108	125	137	149	166
BITTERROOT RIVER BASIN	99	113	122	131	145
WF Bitterroot R nr Conner (2)	98	115	126	138	154
Bitterroot R nr Darby	98	112	122	132	147
Como Reservoir Inflow (2)	98	109	117	124	135
Bitterroot R nr Missoula	102	114	122	130	142

Forecast Point	Period	50% (KAF)	% of avg	max (KAF)	30% (KAF)	70% (KAF)	min (KAF)	30-yr avg
UPPER CLARK FORK RIVER BASIN								
Little Blackfoot R nr Garrison	MAY-JUL	79	125	104	89	69	54	63
	MAY-SEP	87	124	115	98	76	59	70
Flint Ck nr Southern Cross	MAY-JUL	15.2	130	21	17.4	13	9.8	11.7
	MAY-SEP	18.4	130	25	21	15.7	11.7	14.2
Flint Ck bl Boulder Ck	MAY-JUL	61	127	81	69	53	41	48
	MAY-SEP	80	127	104	90	70	56	63
Lower Willow Ck Reservoir Inflow	MAY-JUL	14.4	141	18.7	16.1	12.7	10.1	10.2
	MAY	8.3	141	11.2	9.5	7.1	5.4	5.9
MF Rock Ck nr Philipsburg	MAY-JUL	74	125	92	81	67	56	59
	MAY-SEP	84	125	104	92	76	64	67
Rock Ck nr Clinton	MAY-JUL	320	133	405	355	285	235	240
	MAY-SEP	365	133	455	400	330	275	275
Clark Fork R ab Milltown	MAY-JUL	655	128	885	750	560	425	510
	MAY-SEP	780	128	1030	880	680	530	610
Nevada Ck nr Helmville	MAY-JUL	20	144	27	23	17.1	12.8	13.9
	MAY	9.9	143	13.7	11.4	8.4	6.1	6.9
Blackfoot R nr Bonner	MAY-JUL	965	143	1100	1020	910	825	675
	MAY-SEP	1090	142	1240	1150	1030	940	765
Clark Fork R ab Missoula	MAY-JUL	1630	137	1980	1770	1490	1280	1190
	MAY-SEP	1890	138	2270	2040	1740	1510	1370
BITTERROOT RIVER BASIN								
WF Bitterroot R nr Conner (2)	MAY-JUL	158	126	193	172	144	123	125
	MAY-SEP	173	125	215	190	156	131	138
Bitterroot R nr Darby	MAY-JUL	495	122	595	535	455	395	405
	MAY-SEP	560	122	665	605	515	455	460
Como Reservoir Inflow (2)	MAY-JUL	77	117	89	82	72	65	66
	MAY-SEP	82	117	95	87	77	69	70
Bitterroot R nr Missoula	MAY-JUL	1340	122	1560	1430	1250	1120	1100
	MAY-SEP	1480	122	1720	1580	1380	1240	1210

MONTANA NRCS SNOW SURVEY AND
WATER SUPPLY WEB PAGE

http://www.mt.nrcs.usda.gov/snow/

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