

Upper Colorado River Basin 2009 Water Year Review and Glimpse into 2010. Will there be drought?

Colorado Climate Center
Nolan Doesken
Wendy Ryan
Rebecca Smith

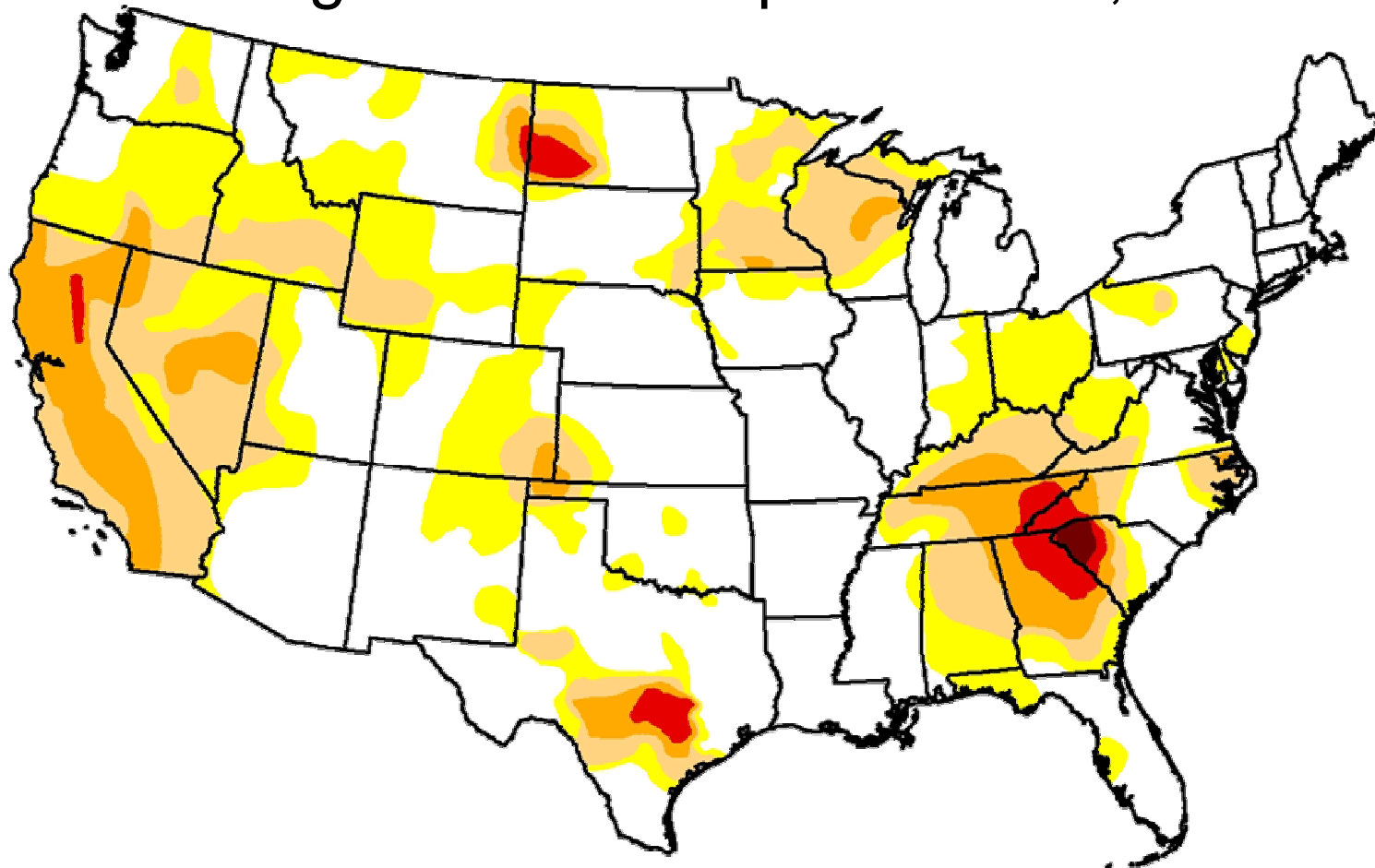
**Presented as part of 2009 Fall Webinar
hosted by the Colorado Basin River Forecast Center
November 10, 2009 10 AM MST**

Outline


- Drought Conditions Update
- Water Year 2009 Snowpack Accumulation and Melt
- Water Year 2009 Temperature Departures
- Water Year 2009 Precipitation Analysis
- Water Year 2010 Precipitation Tracking
- Water Year 2009 Streamflow Example
- Water Year 2009 Evaporation Comparison
- Water Year 2009 Reservoir Levels and October Conditions
- Hand off to Klaus for predictive information

Status at beginning of 2009 Water Year

Drought Monitor September 30, 2008




 D0
Abnormally Dry

 D1 Drought -
Moderate

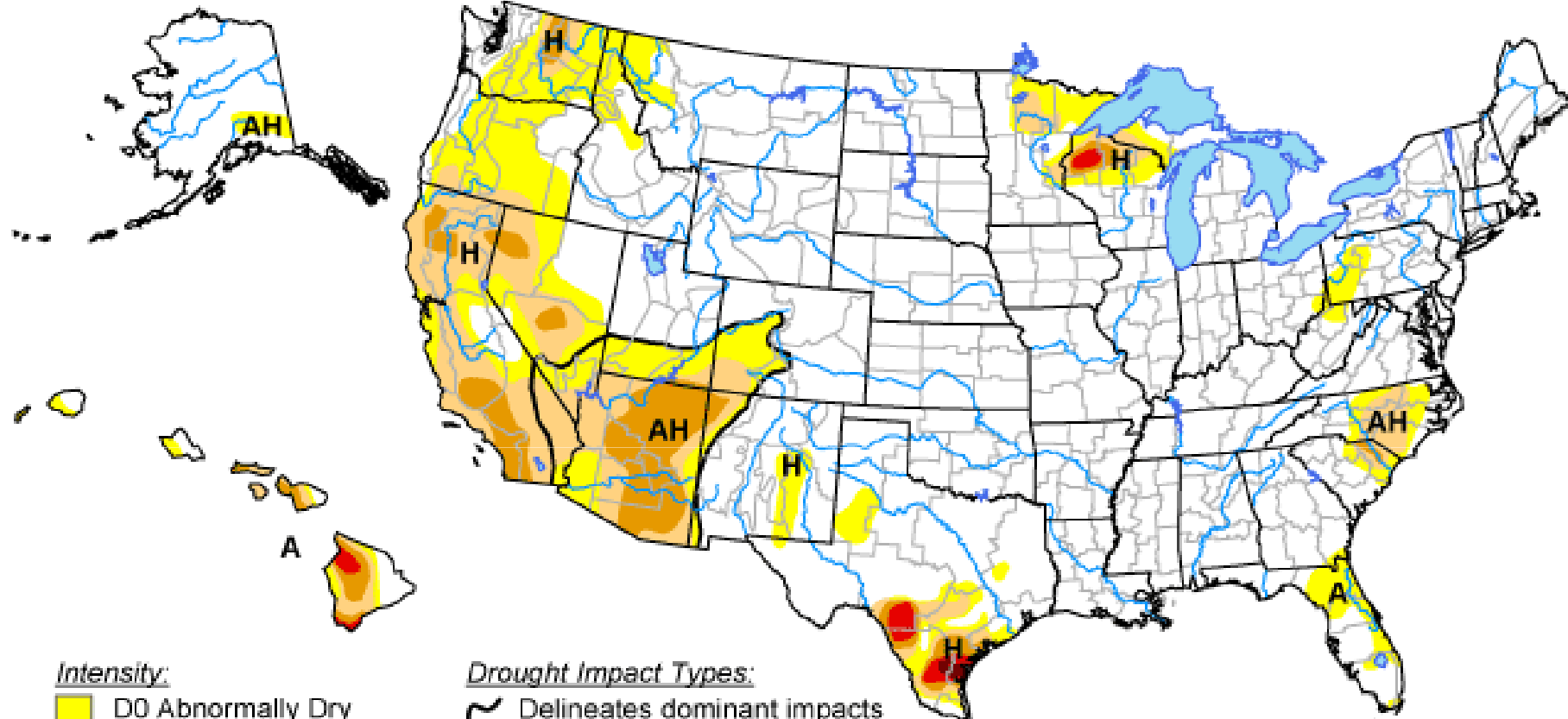
 D2 Drought -
Severe

 D3 Drought -
Extreme






 D4 Drought -
Exceptional

U.S. Drought Monitor


November 3, 2009
Valid 8 a.m. EDT



Intensity:

-  D0 Abnormally Dry
-  D1 Drought - Moderate
-  D2 Drought - Severe
-  D3 Drought - Extreme
-  D4 Drought - Exceptional

Drought Impact Types:

-  Delineates dominant impacts
- A = Agricultural (crops, pastures, grasslands)
- H = Hydrological (water)

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

<http://drought.unl.edu/dm>



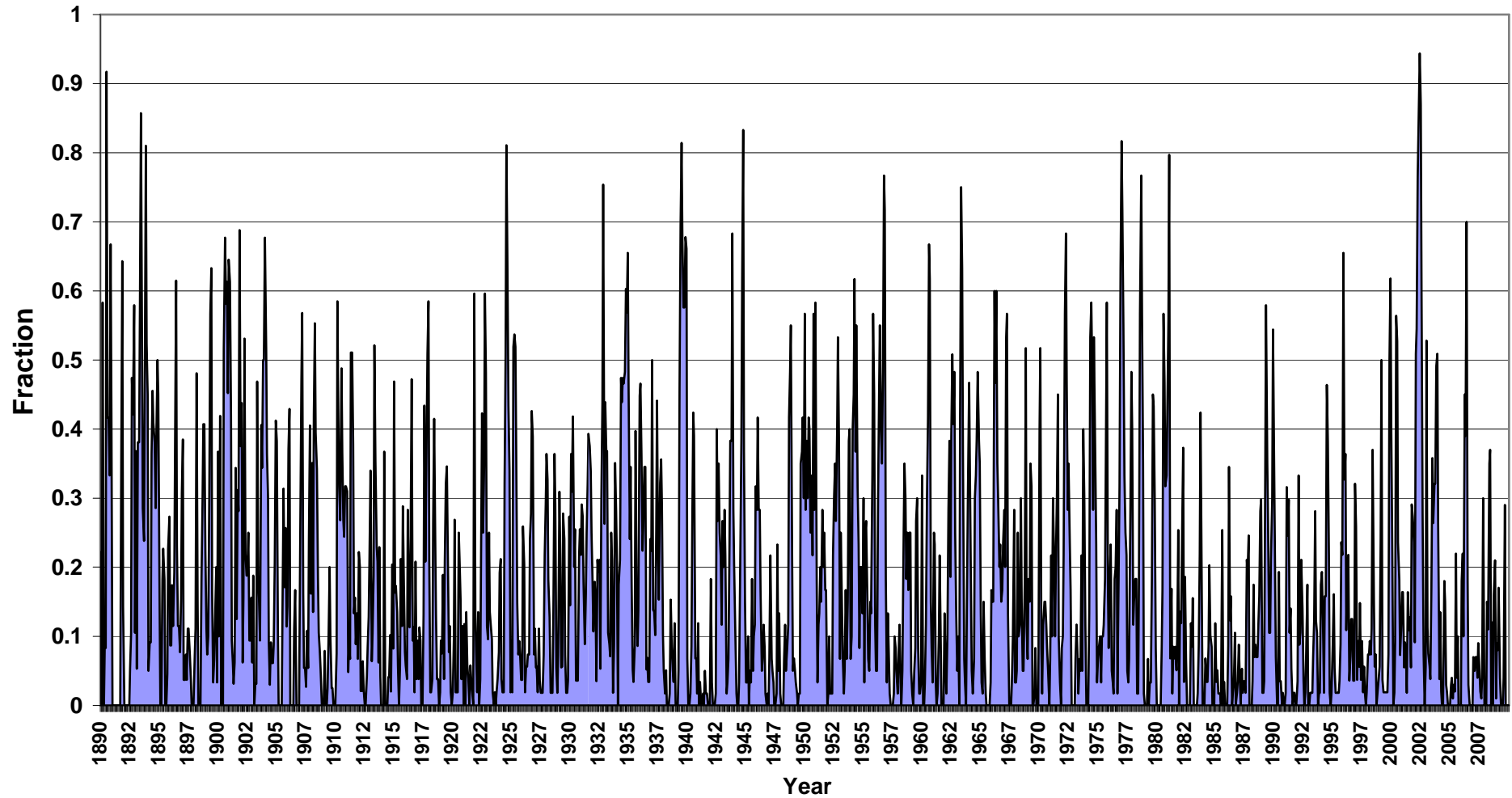
Released Thursday, November 5, 2009

Author: Brian Fuchs, National Drought Mitigation Center

Fraction of Colorado in Drought

Based on 3 month SPI

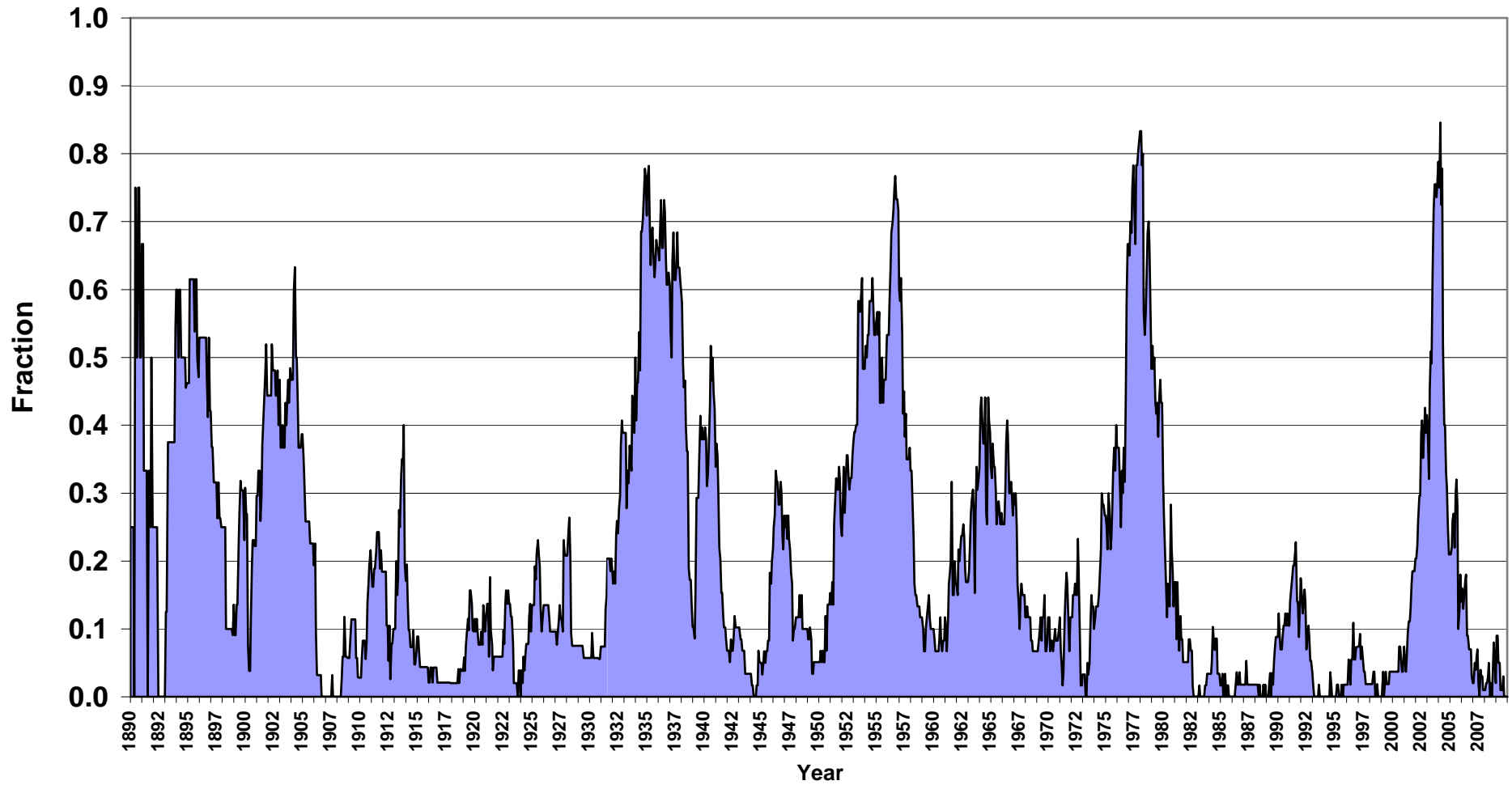
(1890 - September 2009)



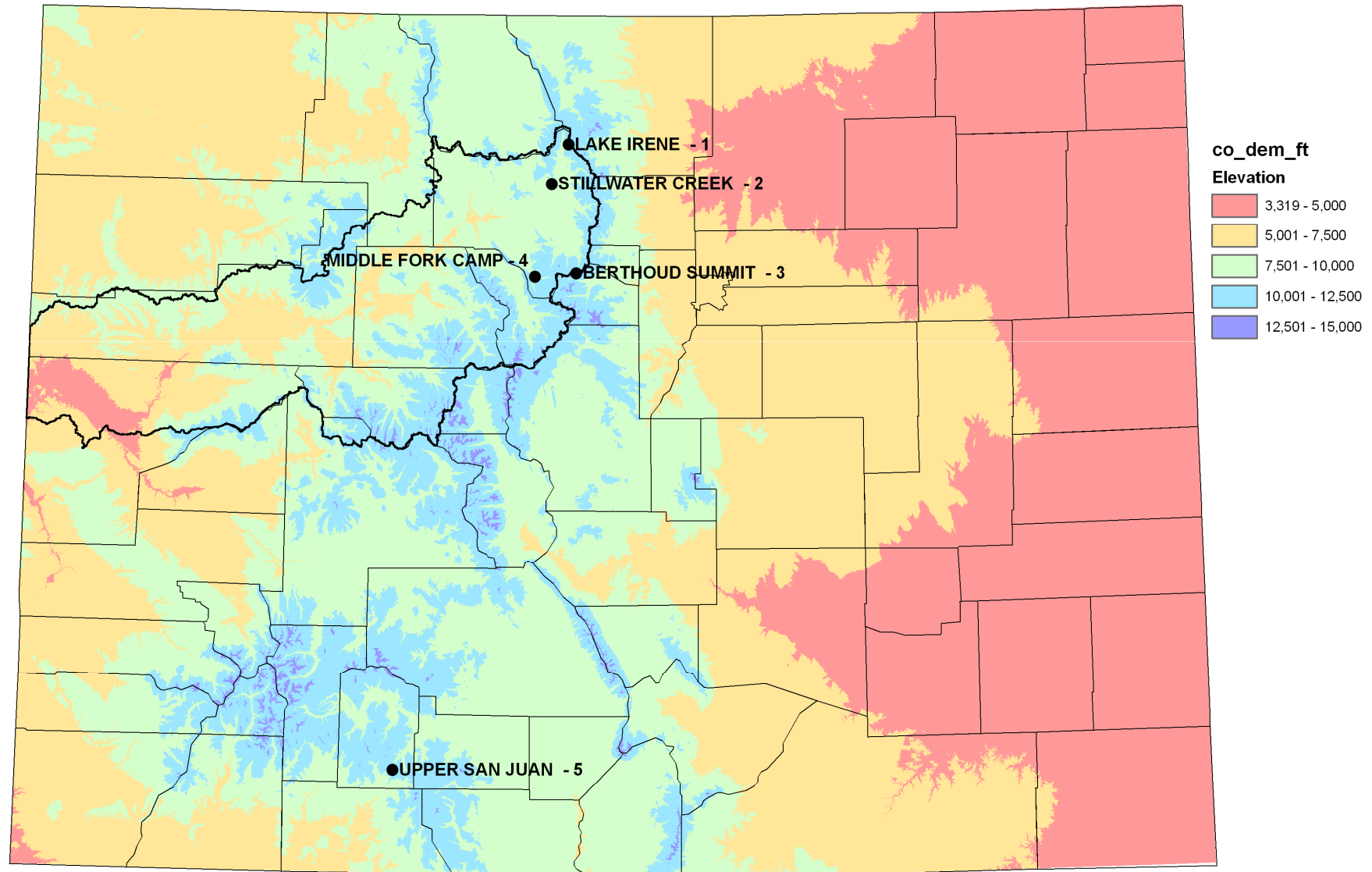
Fraction of Colorado in Drought

Based on 48 month SPI

(1890 - September 2009)



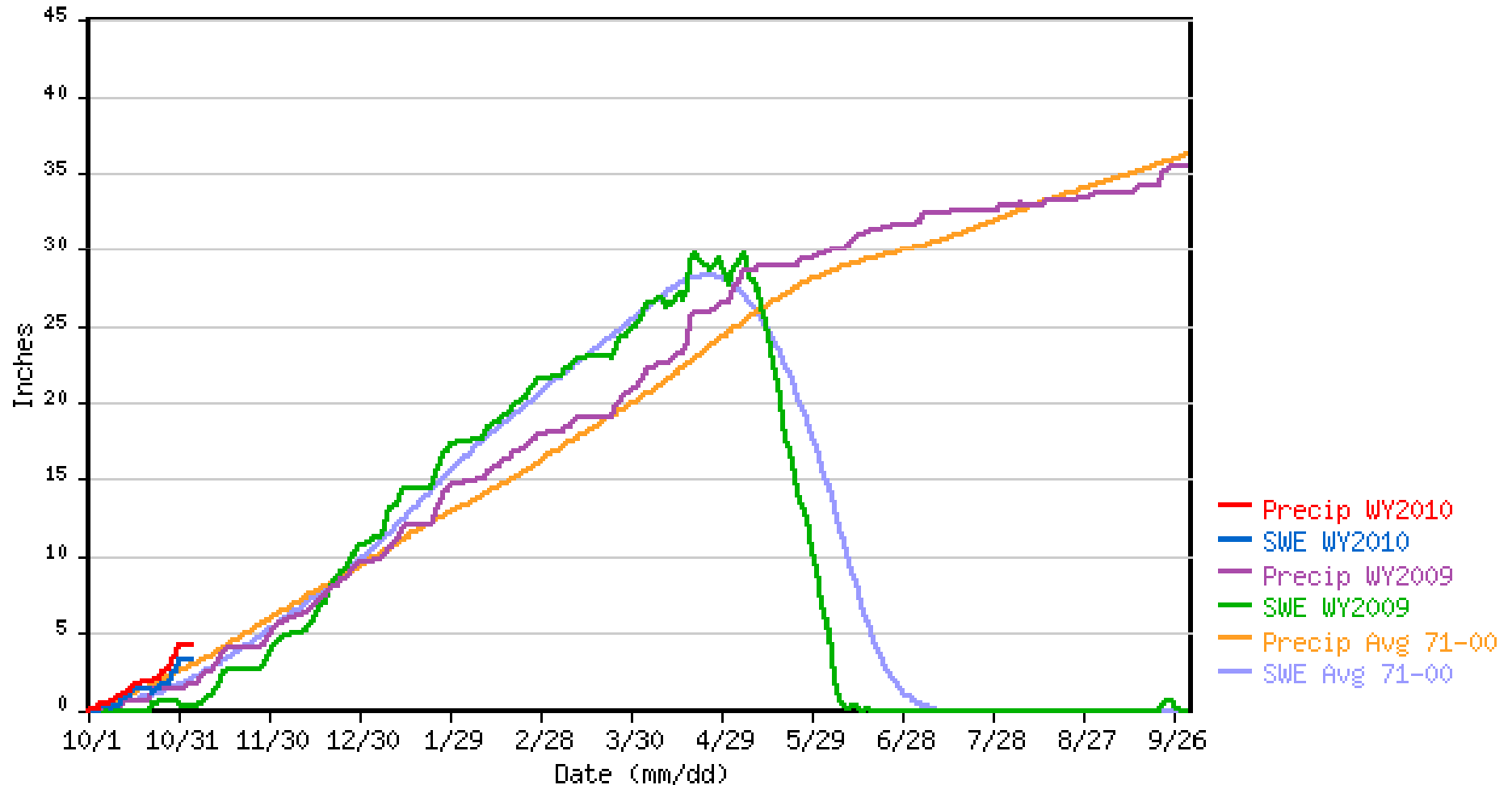
Location of Selected SNOTEL Stations Showing 2009 Accumulation and Melt



Lake Irene – Elevation 10,700'

LAKE IRENE SNOTEL as of 11/04/2009

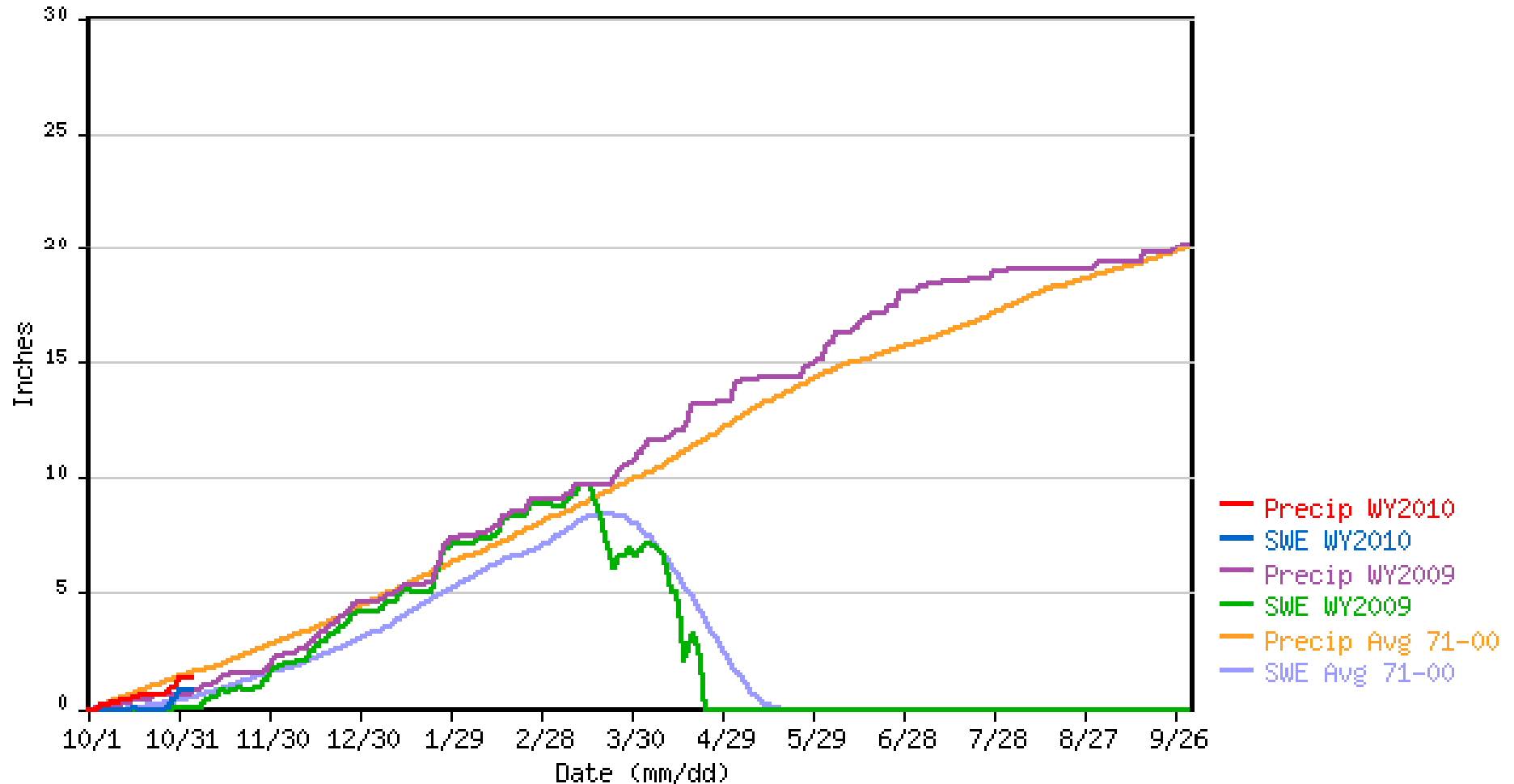
*** Provisional Data, Subject to Change ***



Stillwater Creek – Elevation 8,720'

STILLWATER CREEK SNOTEL as of 11/04/2009

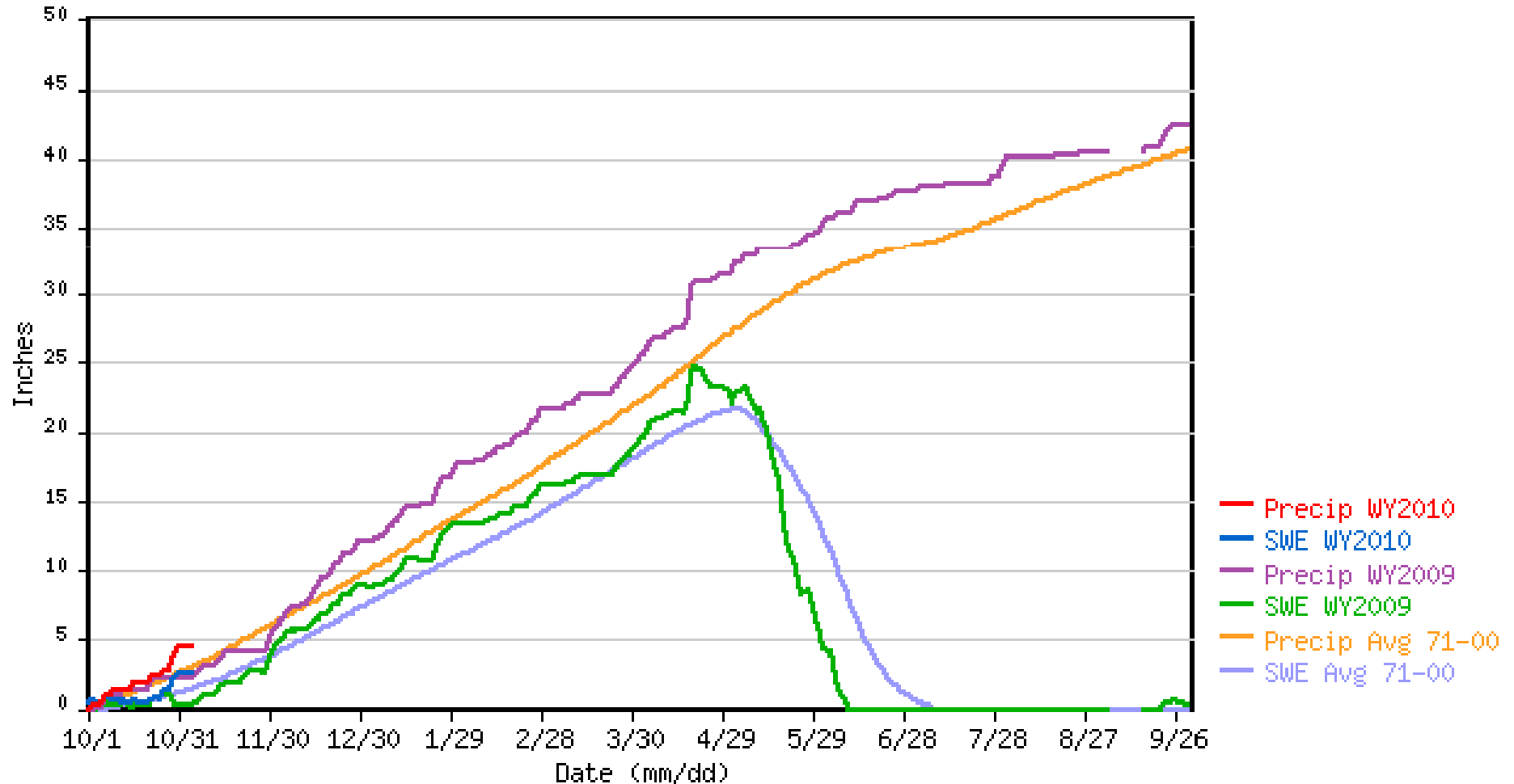
*** Provisional Data, Subject to Change ***



Berthoud Summit – Elevation 11,300'

BERTHOUD SUMMIT SNOTEL as of 11/04/2009

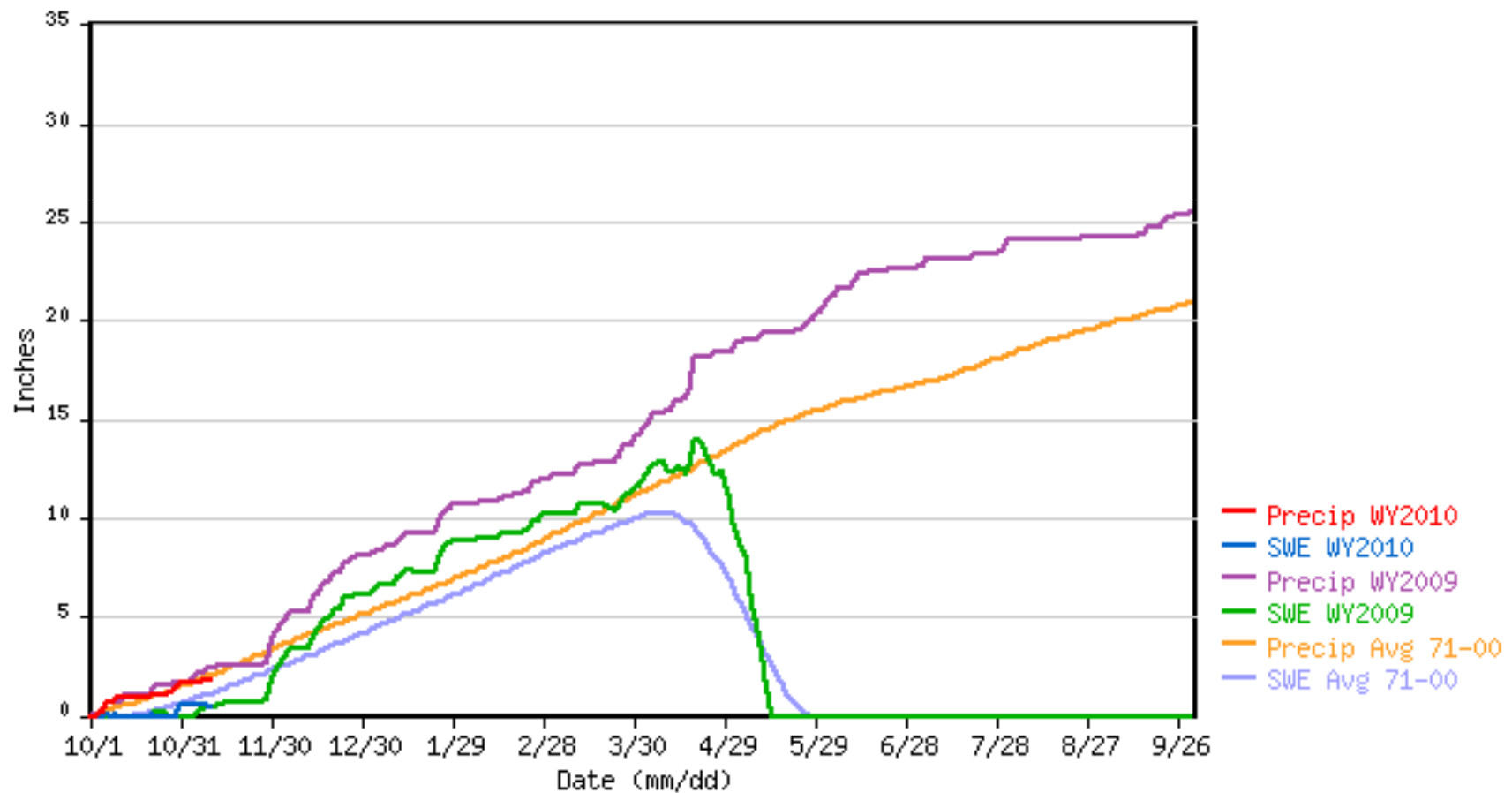
*** Provisional Data, Subject to Change ***



Middle Fork Camp – Elevation 8,940'

MIDDLE FORK CAMP SNOTEL as of 11/09/2009

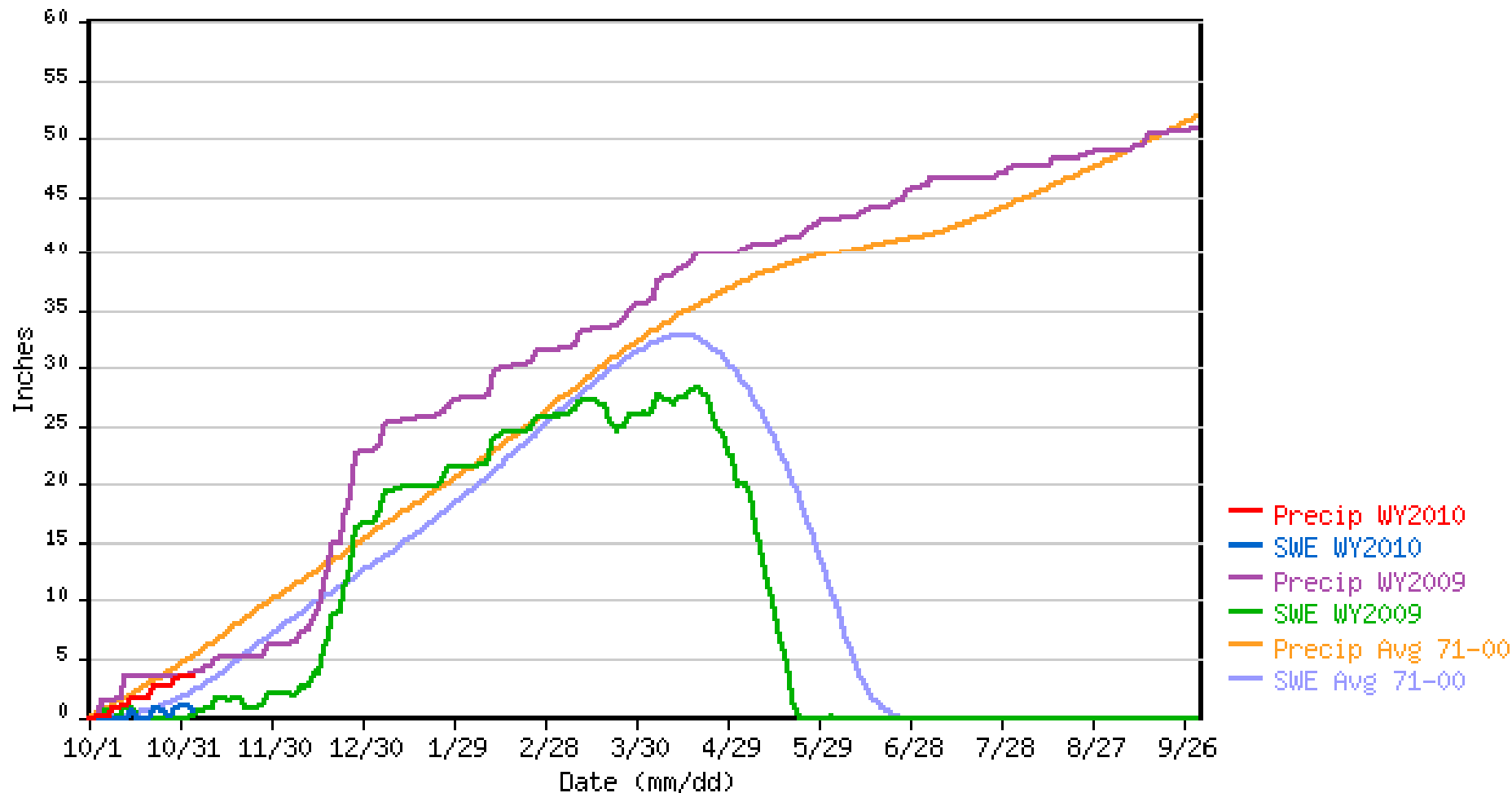
*** Provisional Data, Subject to Change ***



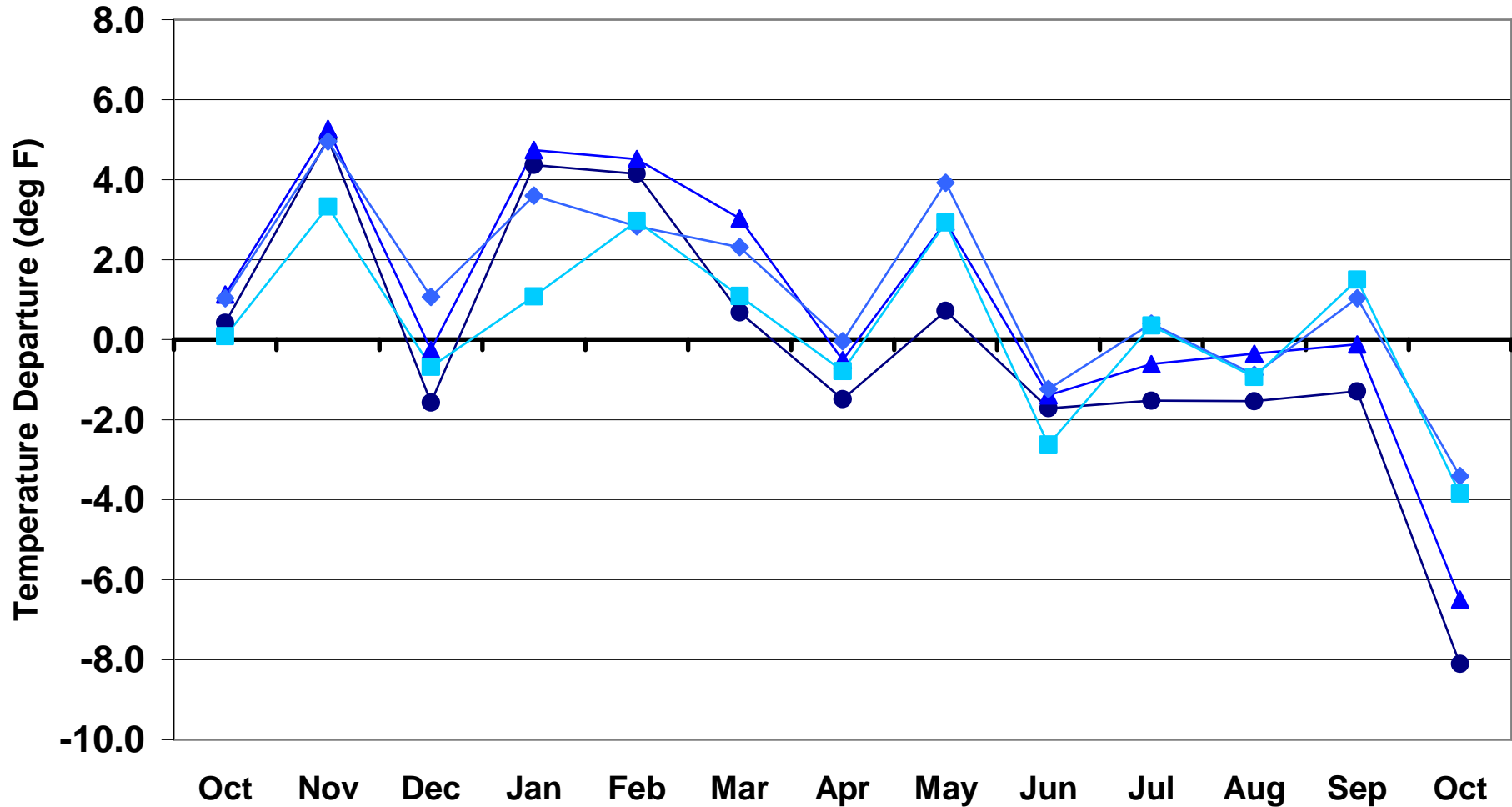
Upper San Juan – Elevation 10,200'

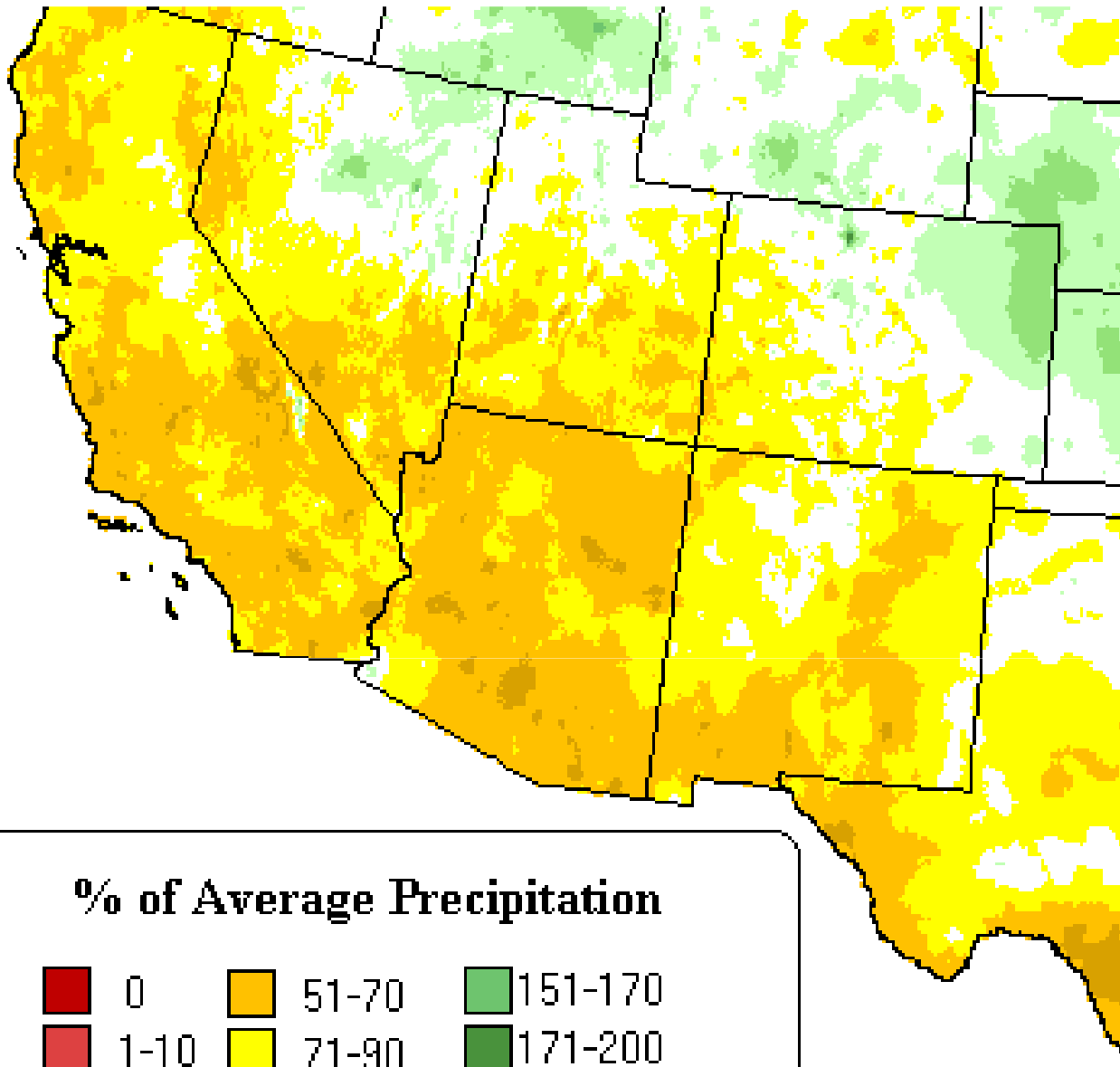
UPPER SAN JUAN SNOTEL as of 11/04/2009

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



Water Year 2009 - Current





PRISM 12-month
precipitation as
percent of
average:

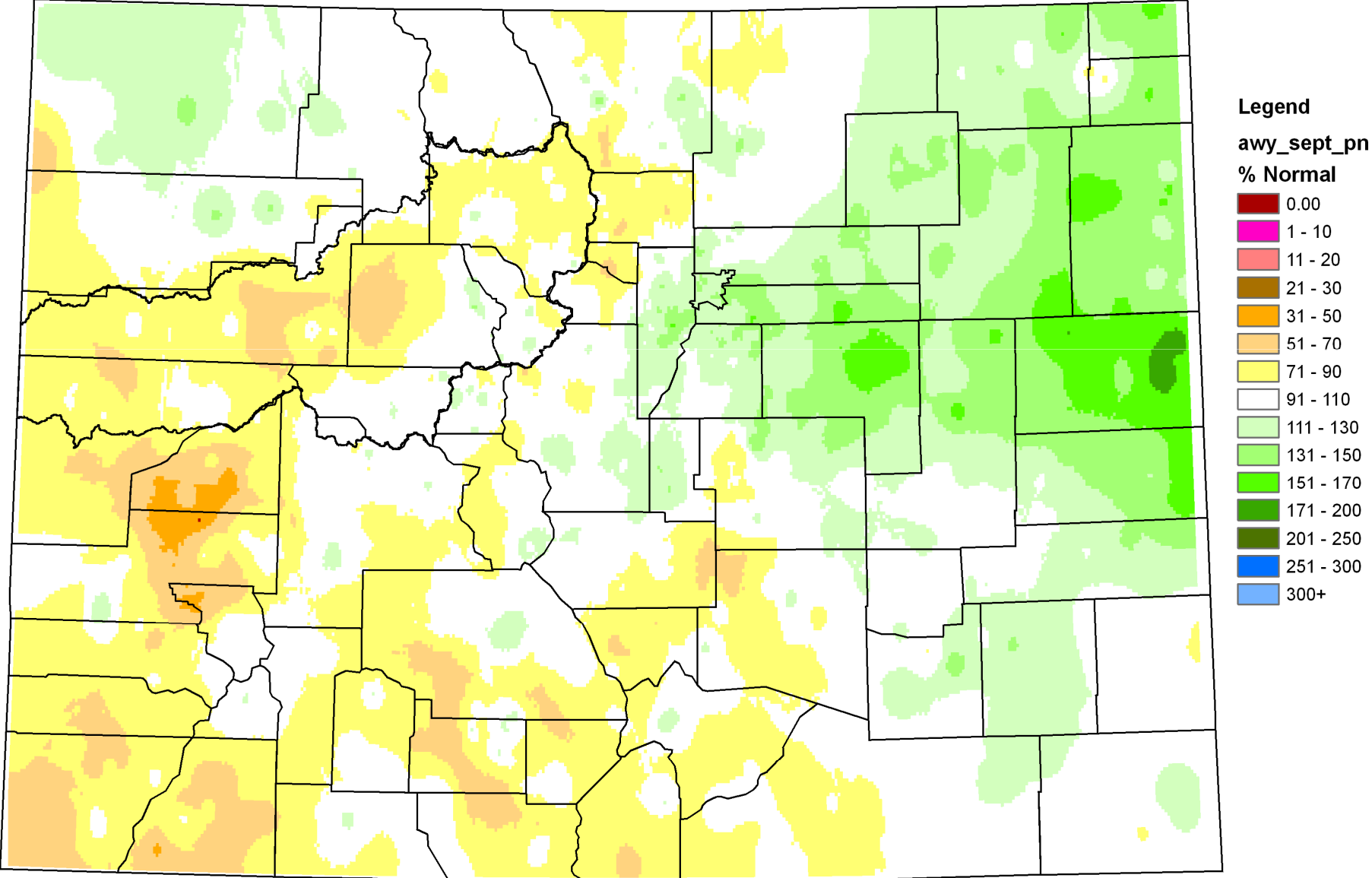
September 2009

% of Average Precipitation

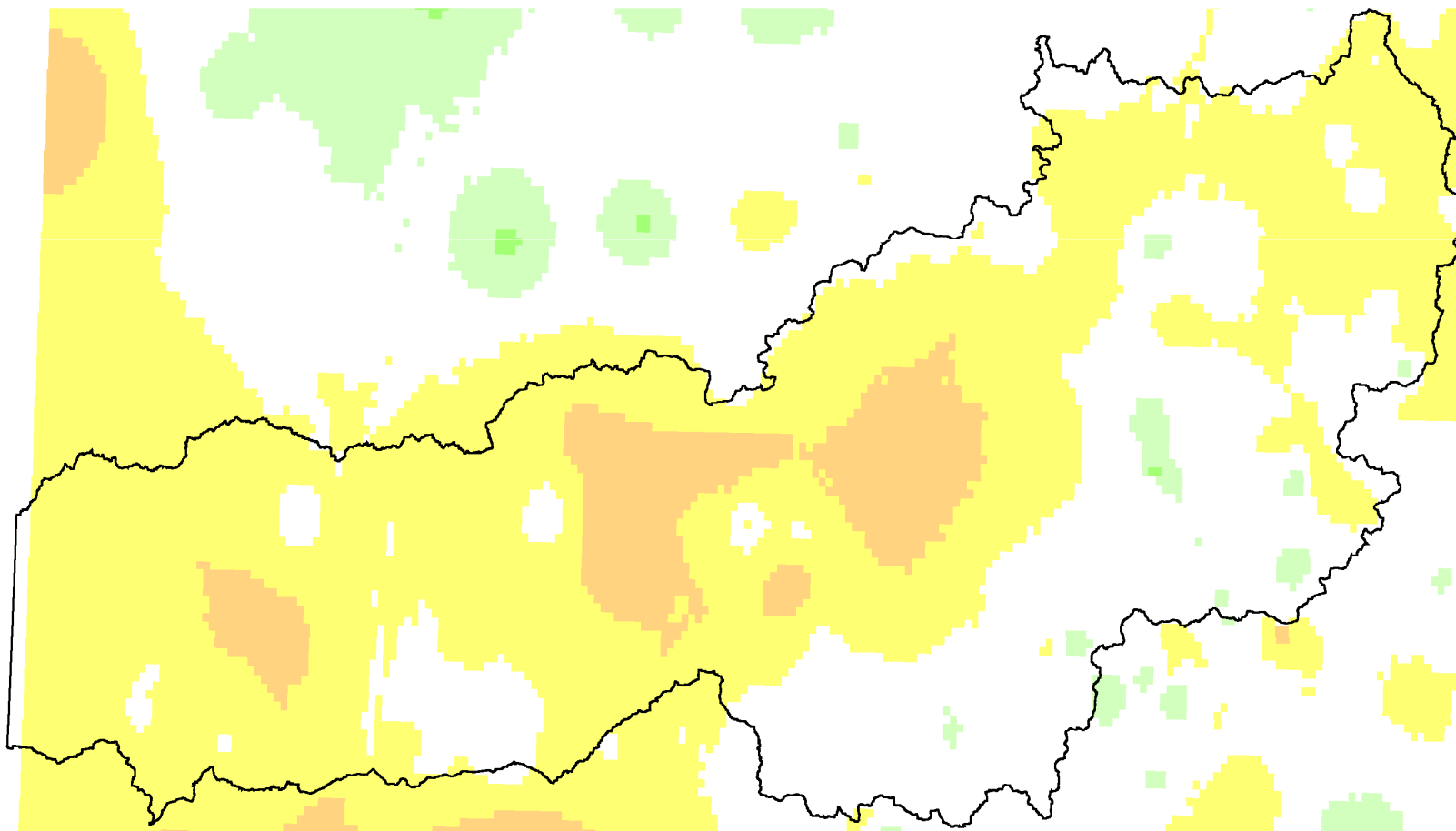
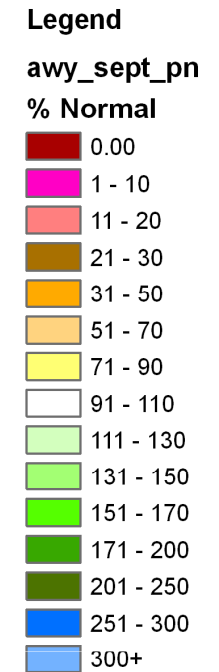
0	51-70	151-170
1-10	71-90	171-200
11-20	91-110	201-250
21-30	111-130	251-300
31-50	131-150	301+

Cc
ht

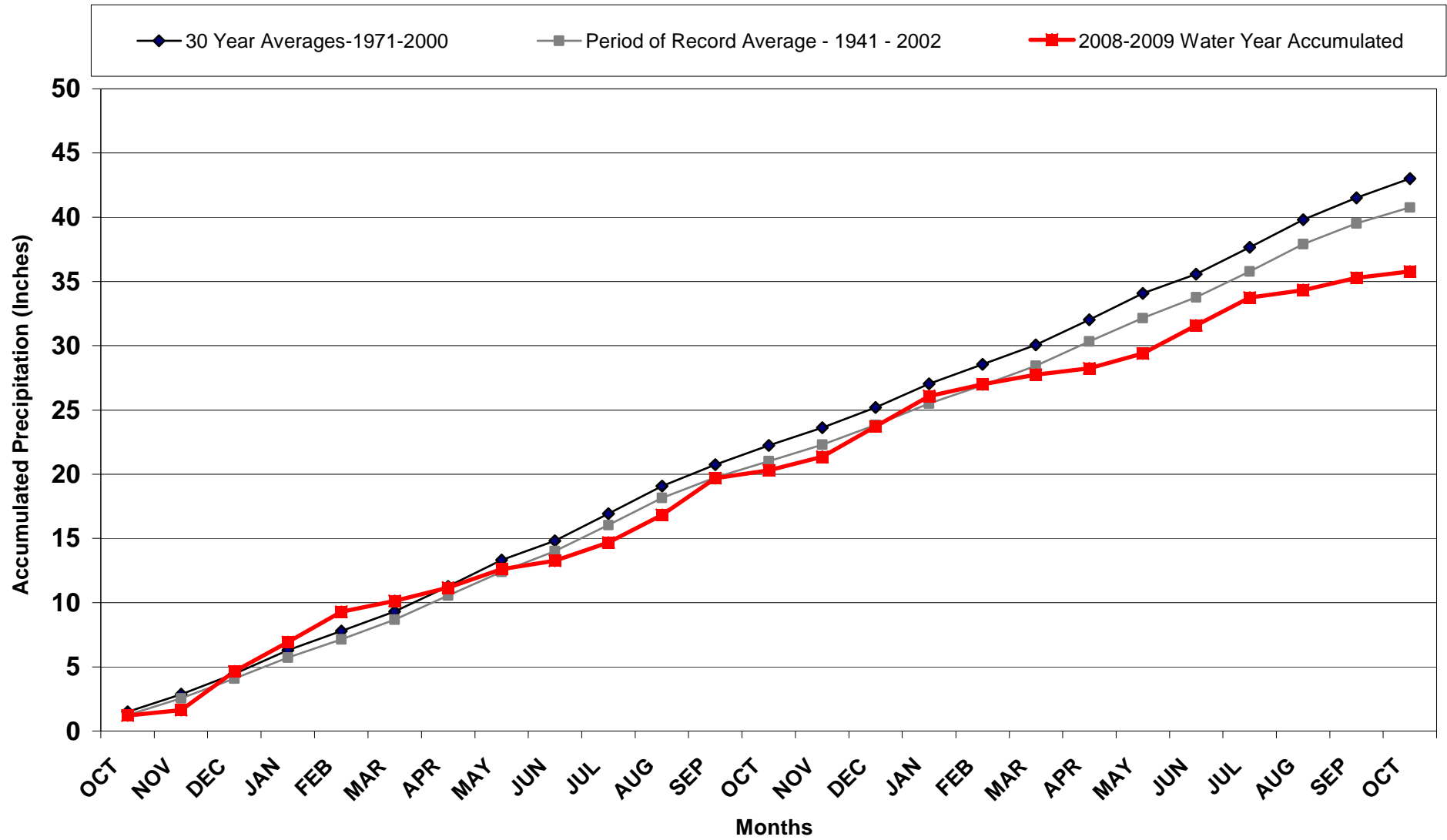
Water Year 2009 Precipitation as Percent of Normal (October 2008 - September 2009)



Water Year 2009 Precipitation as Percent of Normal Upper Colorado River Basin (October 2008 - September 2009)

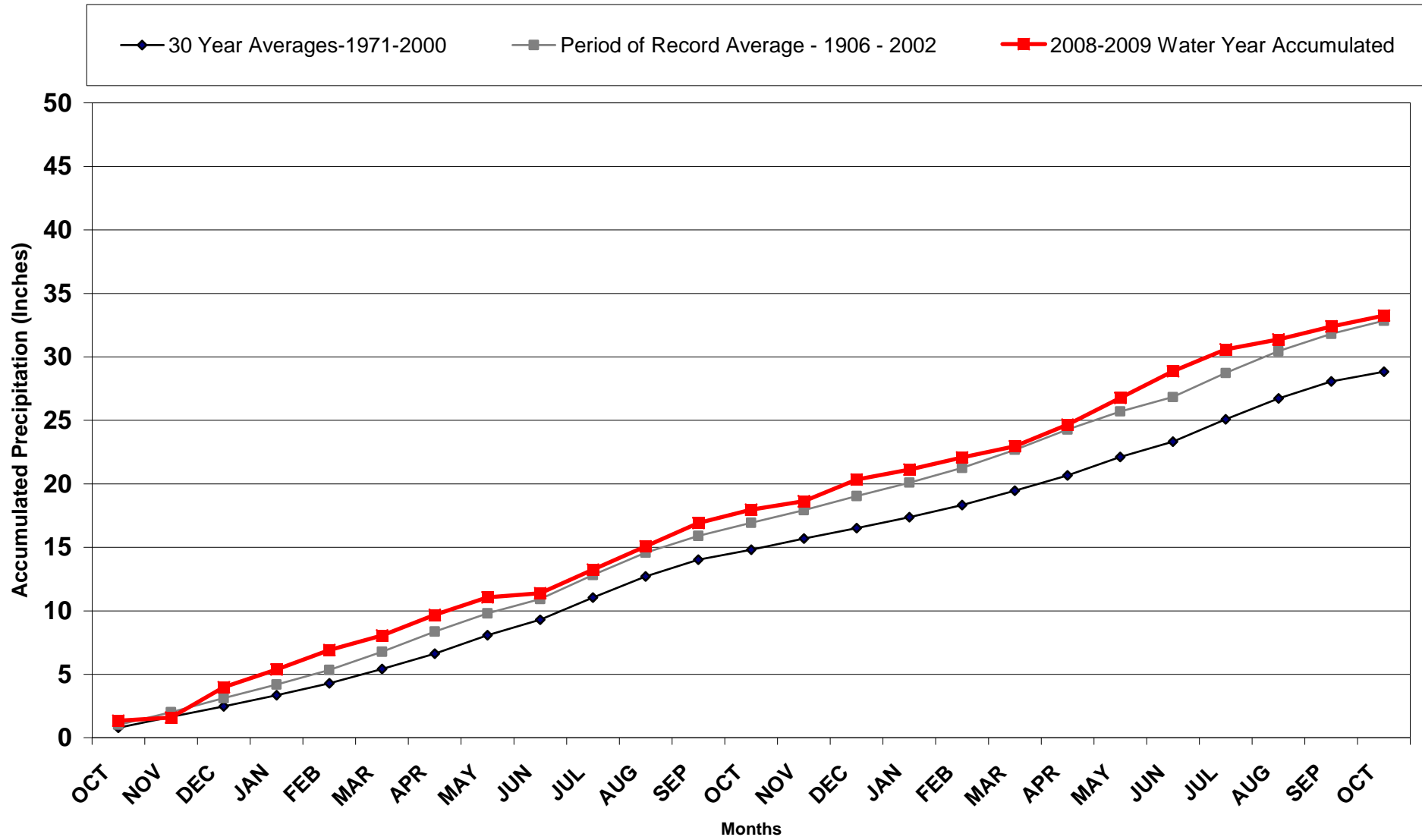


Grand Lake 1 NW 2008-2009 Water Year



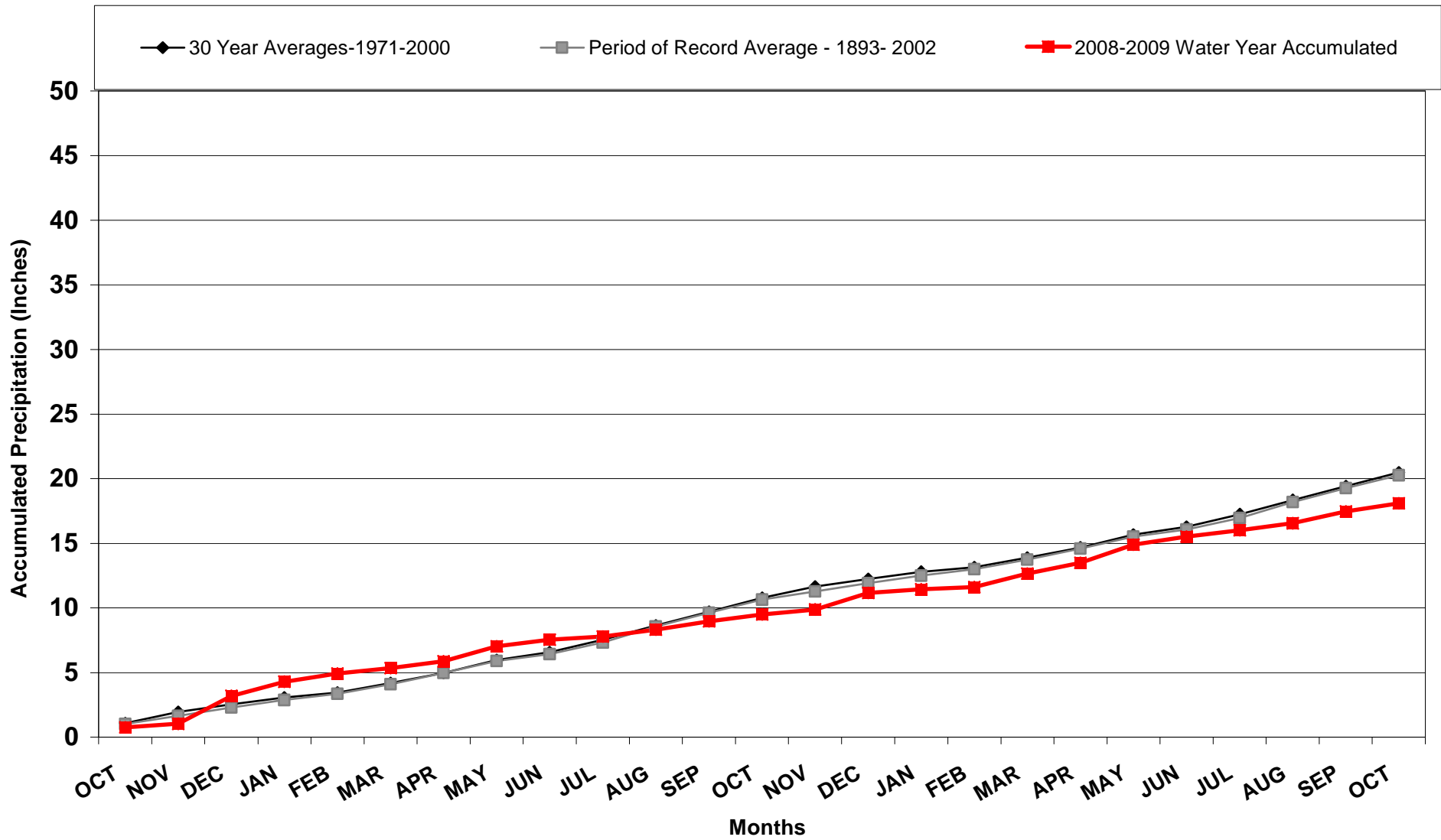
Dillon 1E

2008-2009 Water Year



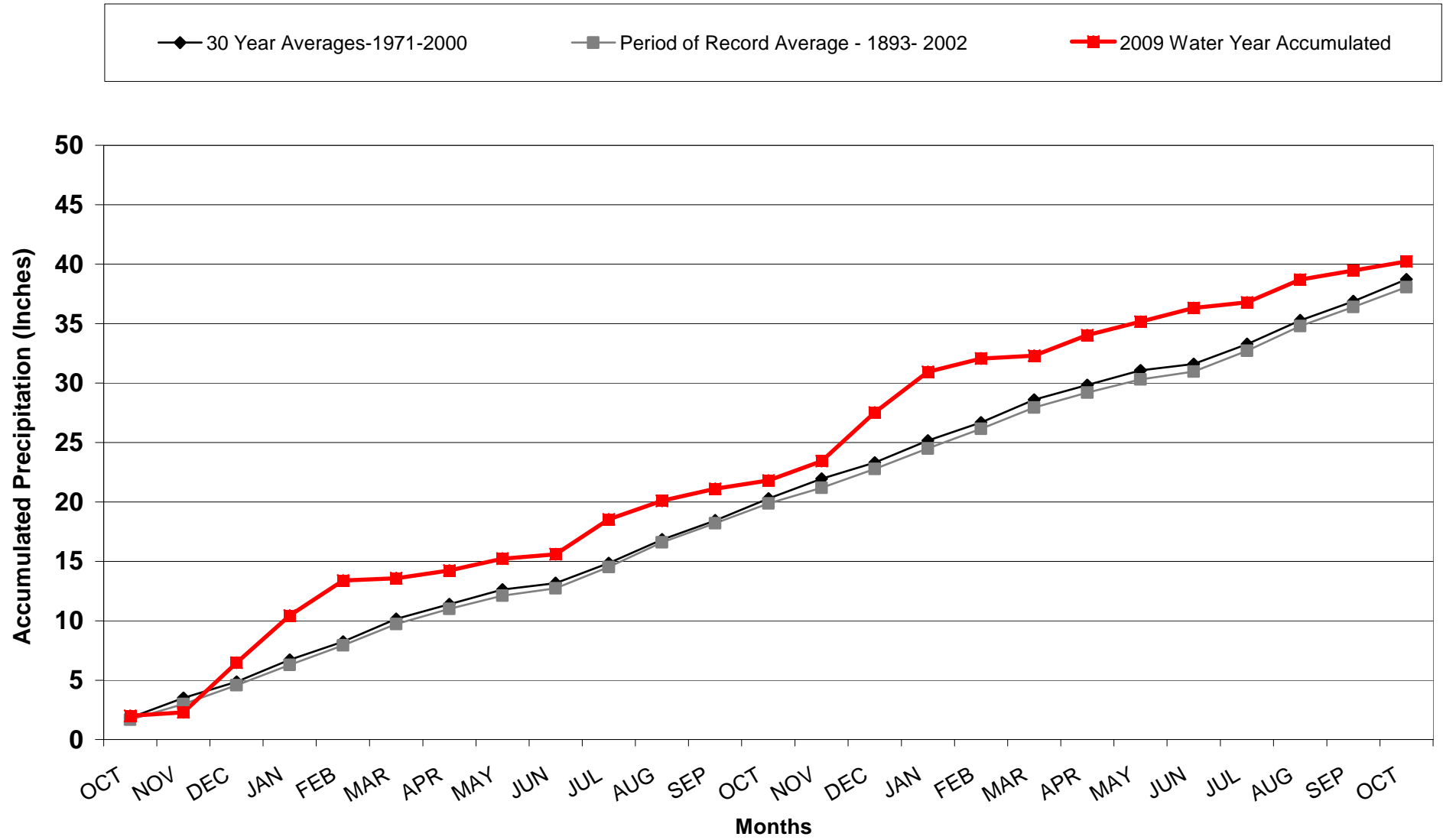
Montrose #2

2008-2009 Water Year

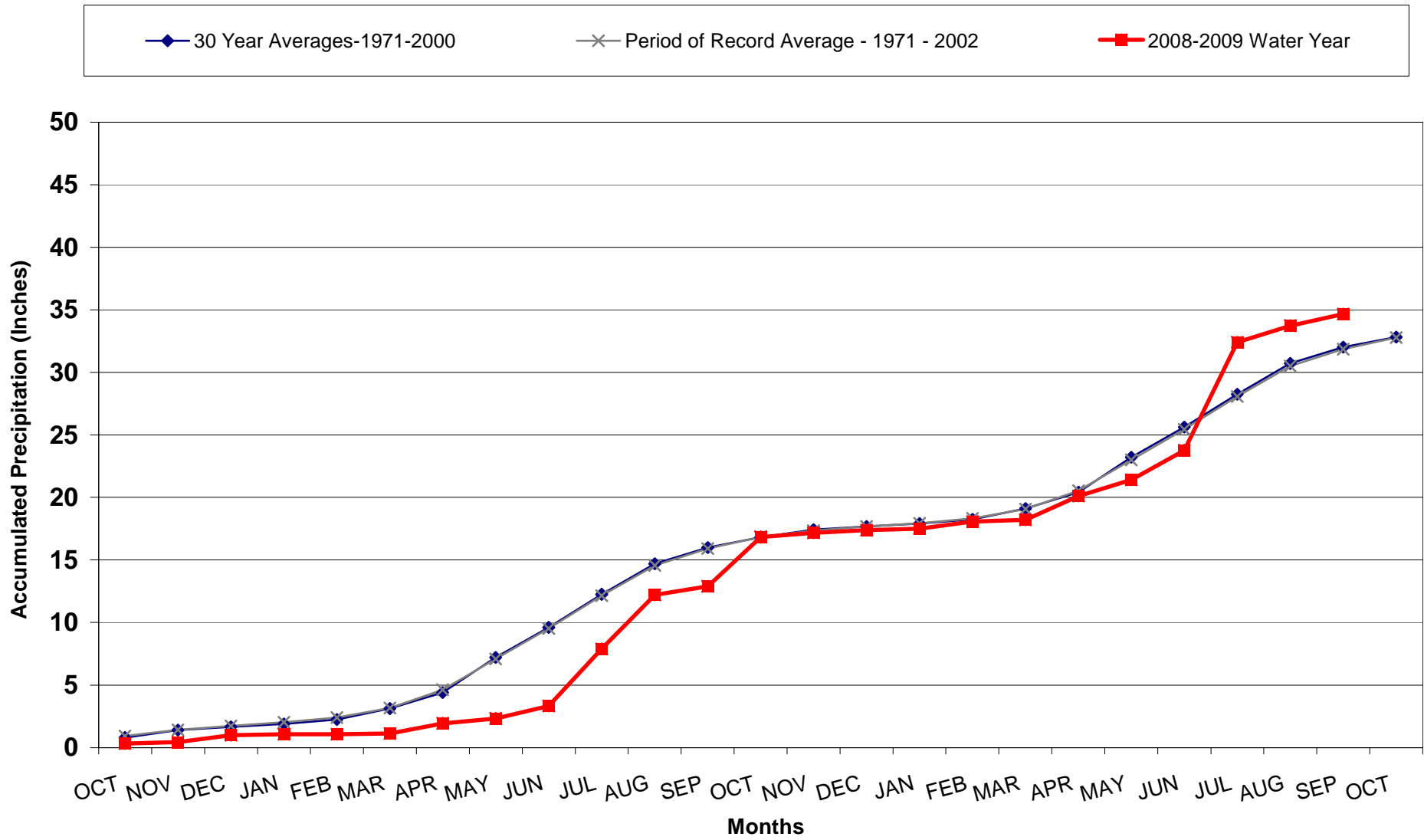


Mesa Verde NP

2008-2009 Water Year

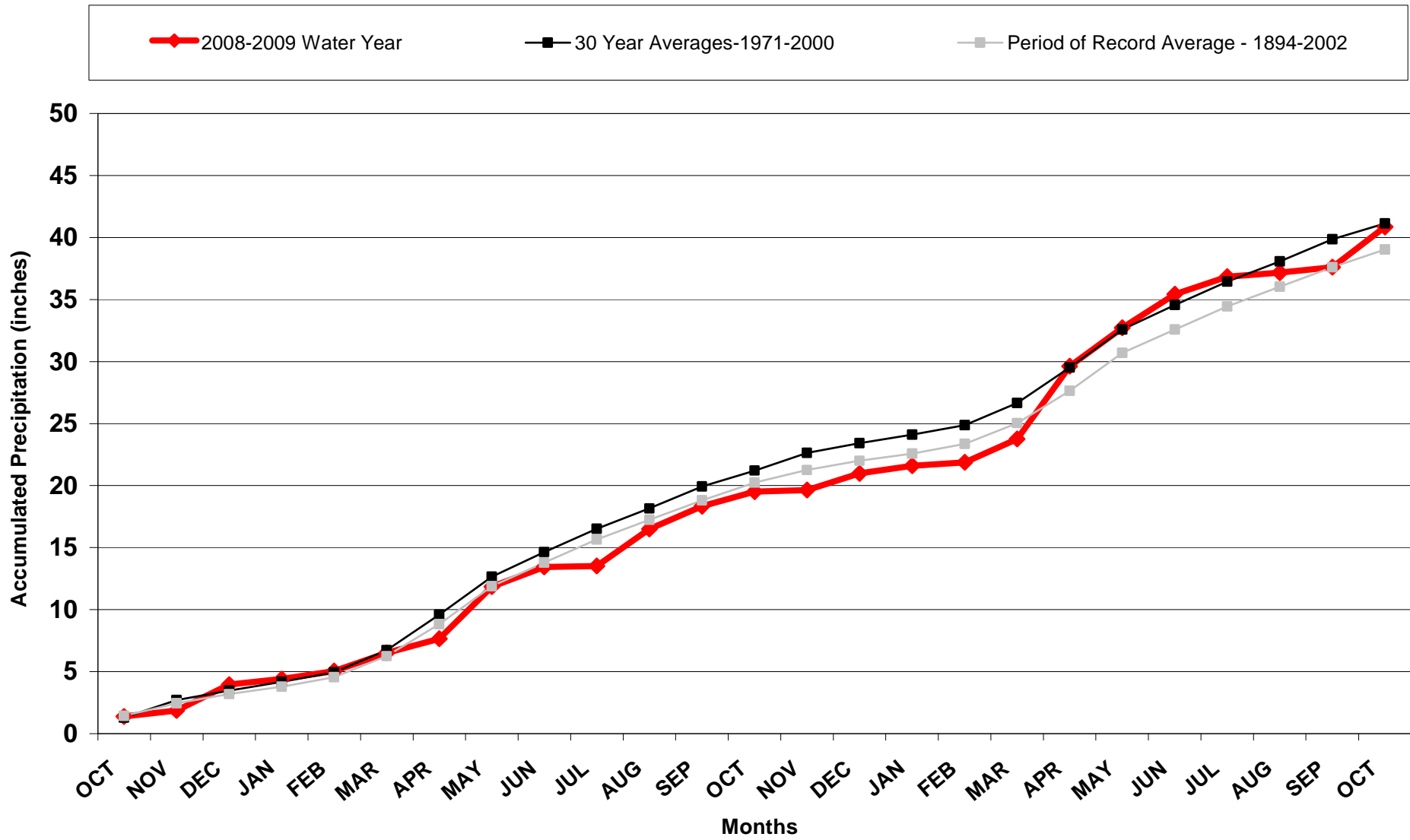


Cheyenne Wells 2008-2009 Water Year

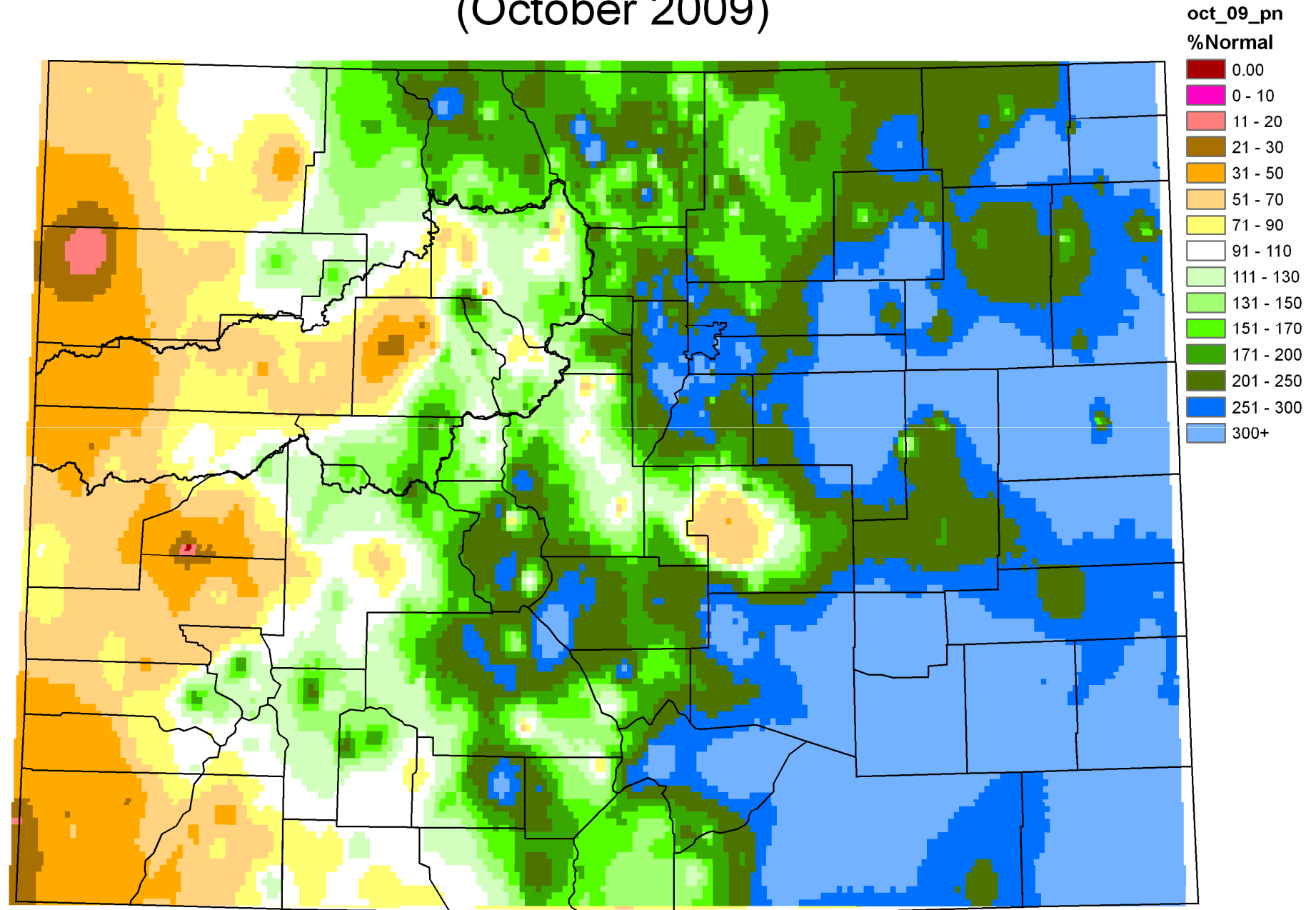


Boulder

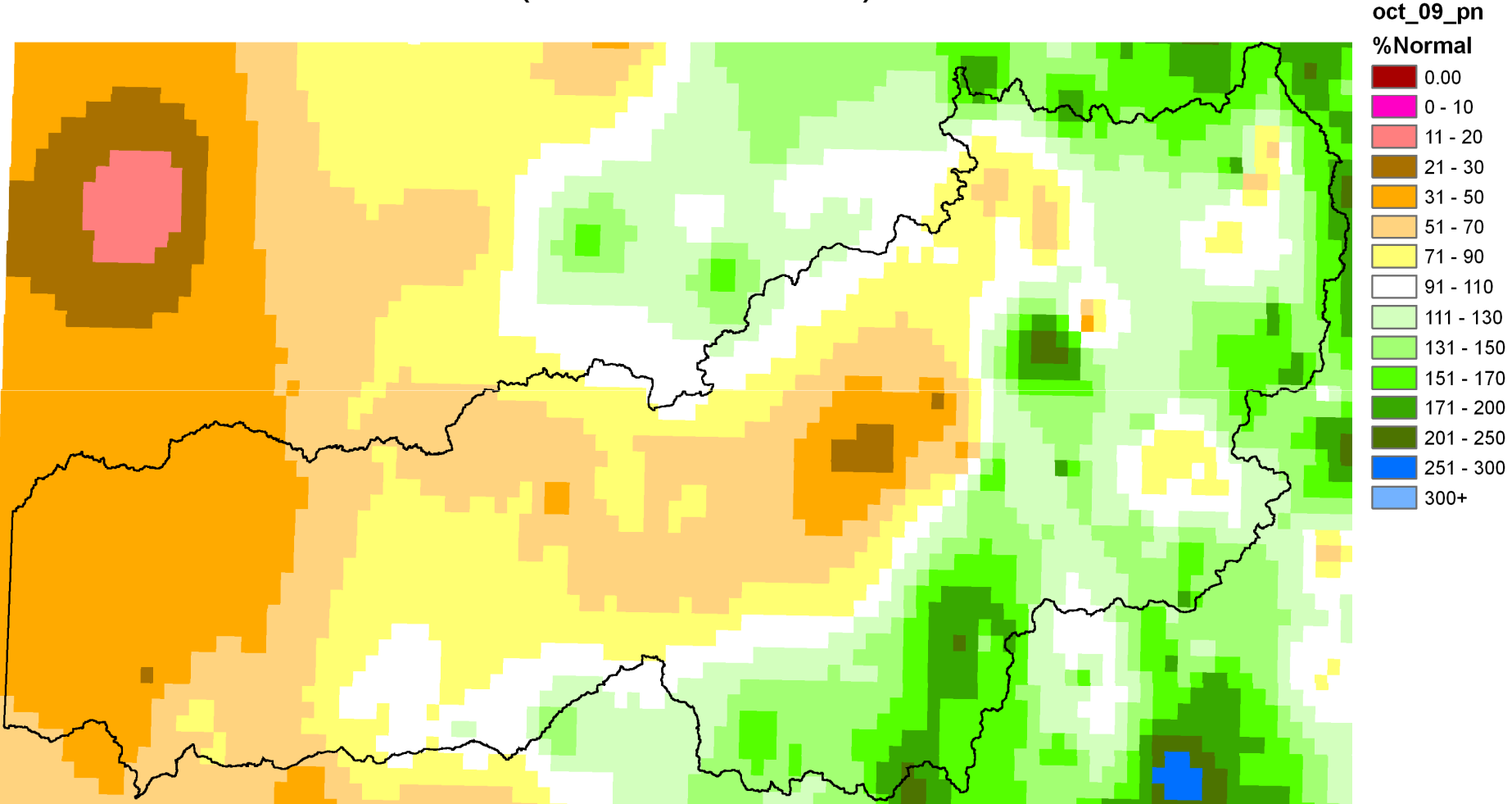
2008 - 2009 Water Year



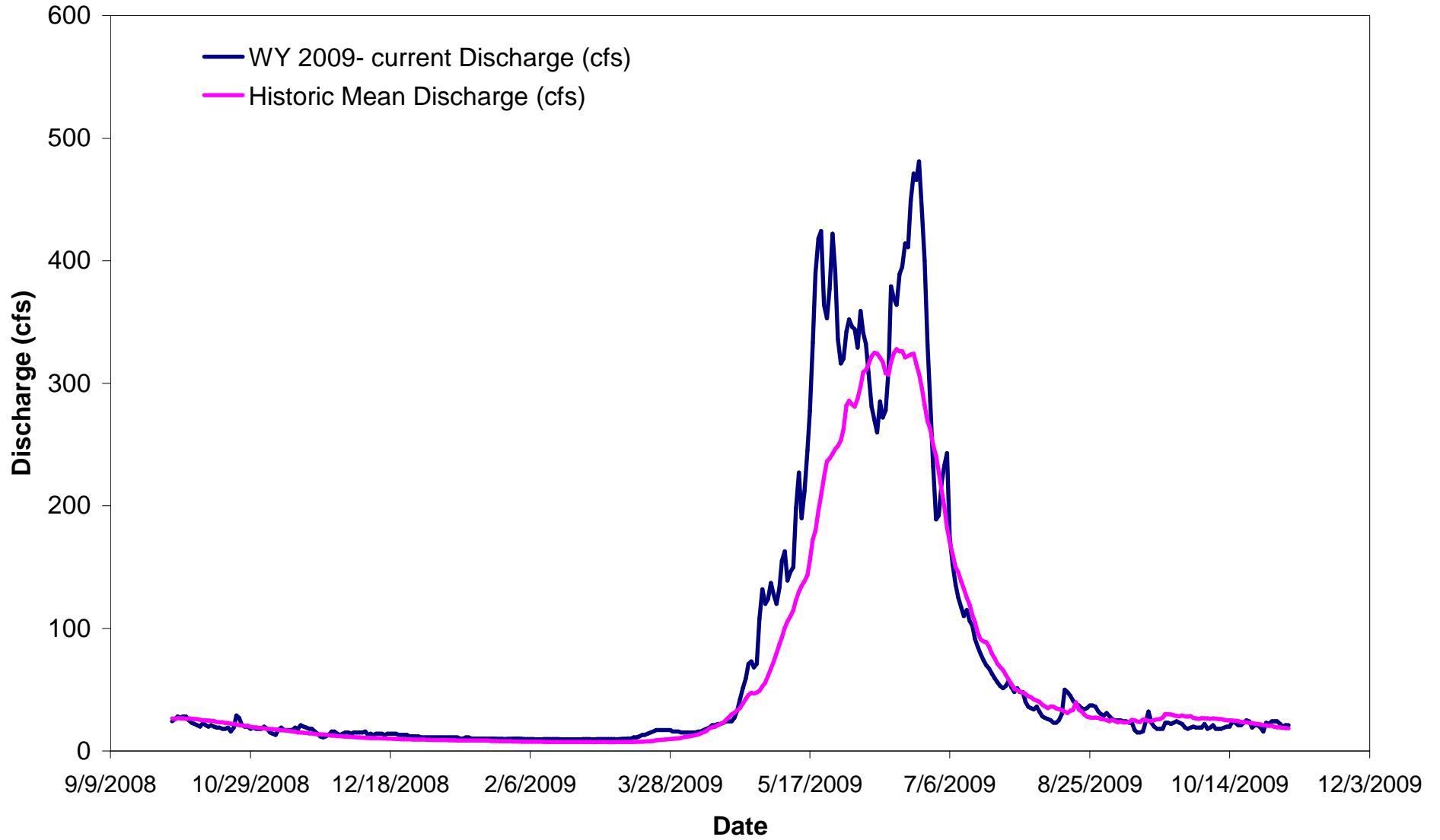
Water Year 2010 Precipitation as Percent of Normal (October 2009)



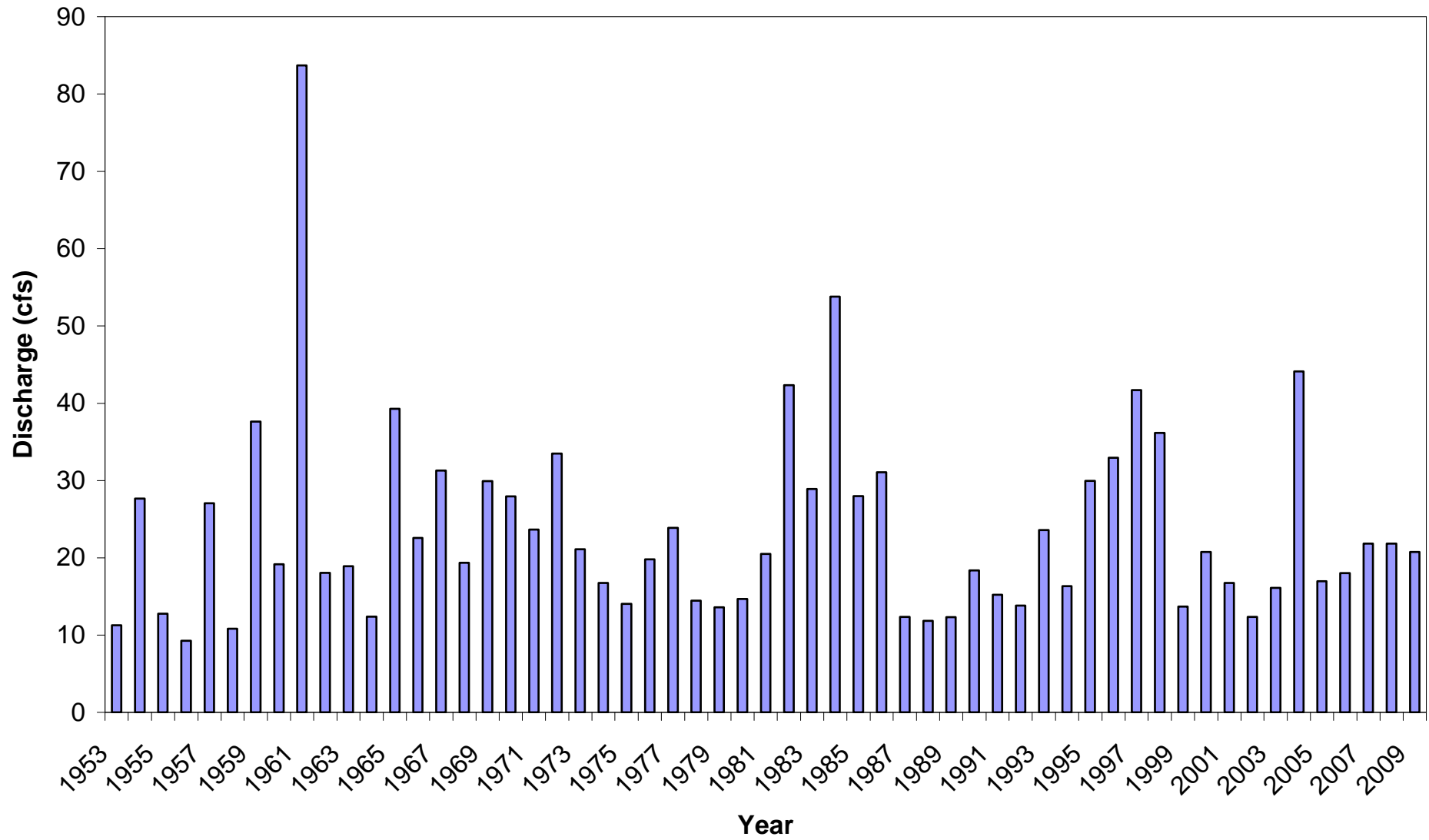
Water Year 2010 Precipitation as Percent of Normal Upper Colorado River Basin (October 2009)



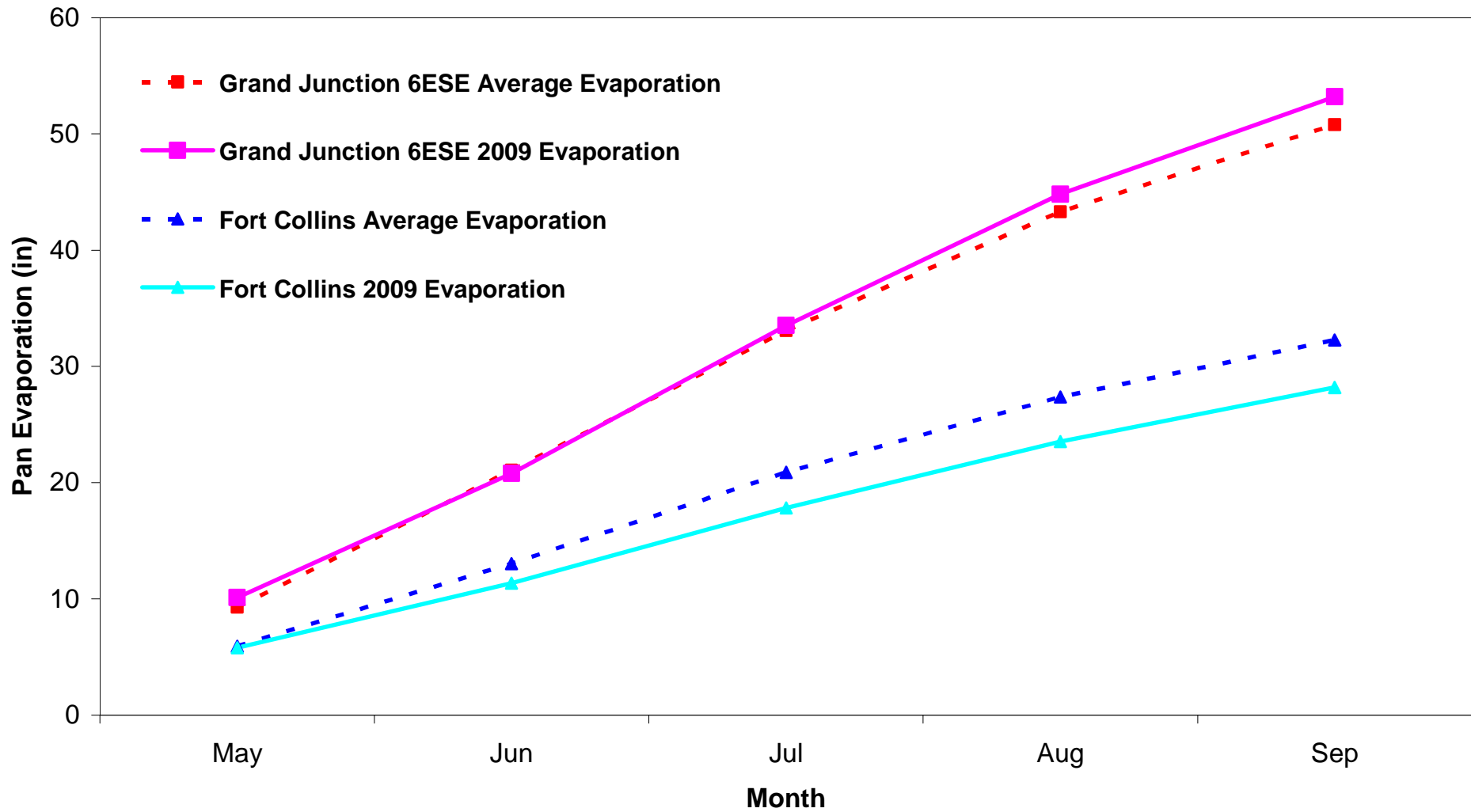
Colorado River below Baker Gulch Near Grand Lake



October Total Flow Colorado River Below Baker Gulch (cfs)



Accumulated Pan Evaporation 2009 Growing Season Compared to Normal: Grand Junction 6ESE and Fort Collins

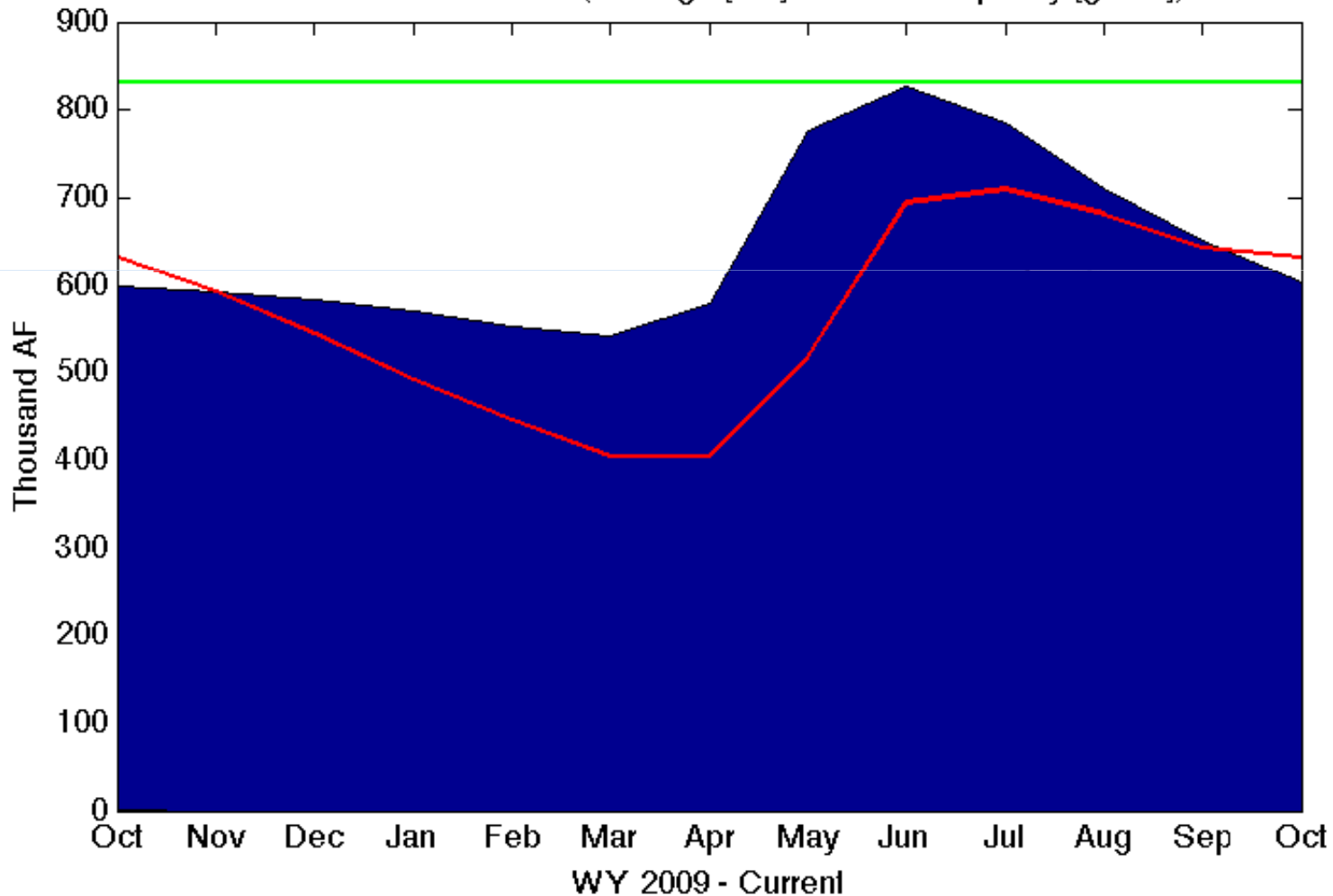


Blue Mesa October Reservoir Storage

max capacity

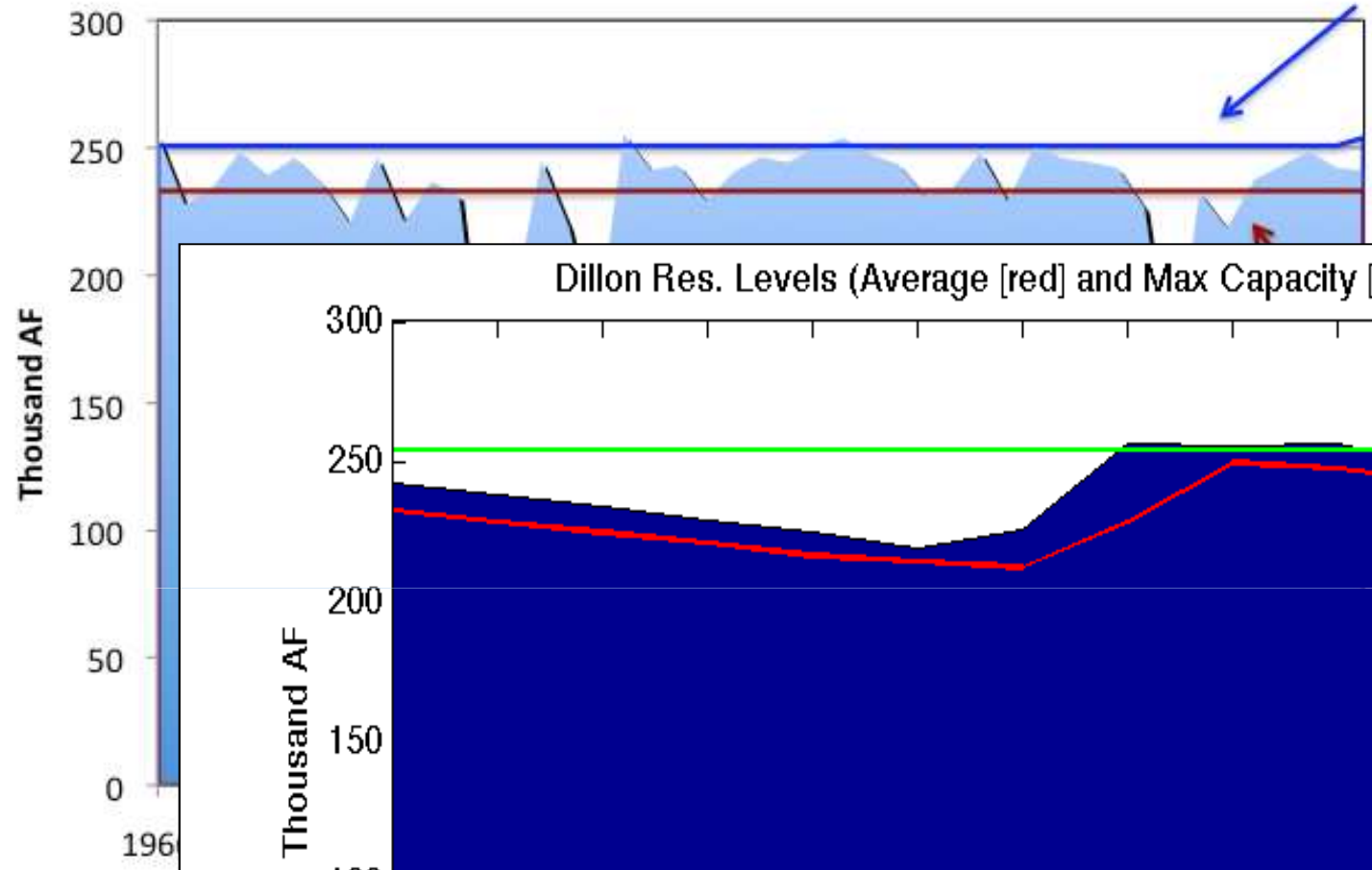
Thousand AF
900
800
700
600
500
400
300
200
100
0
199

Blue Mesa Res. Levels (Average [red] and Max Capacity [green])

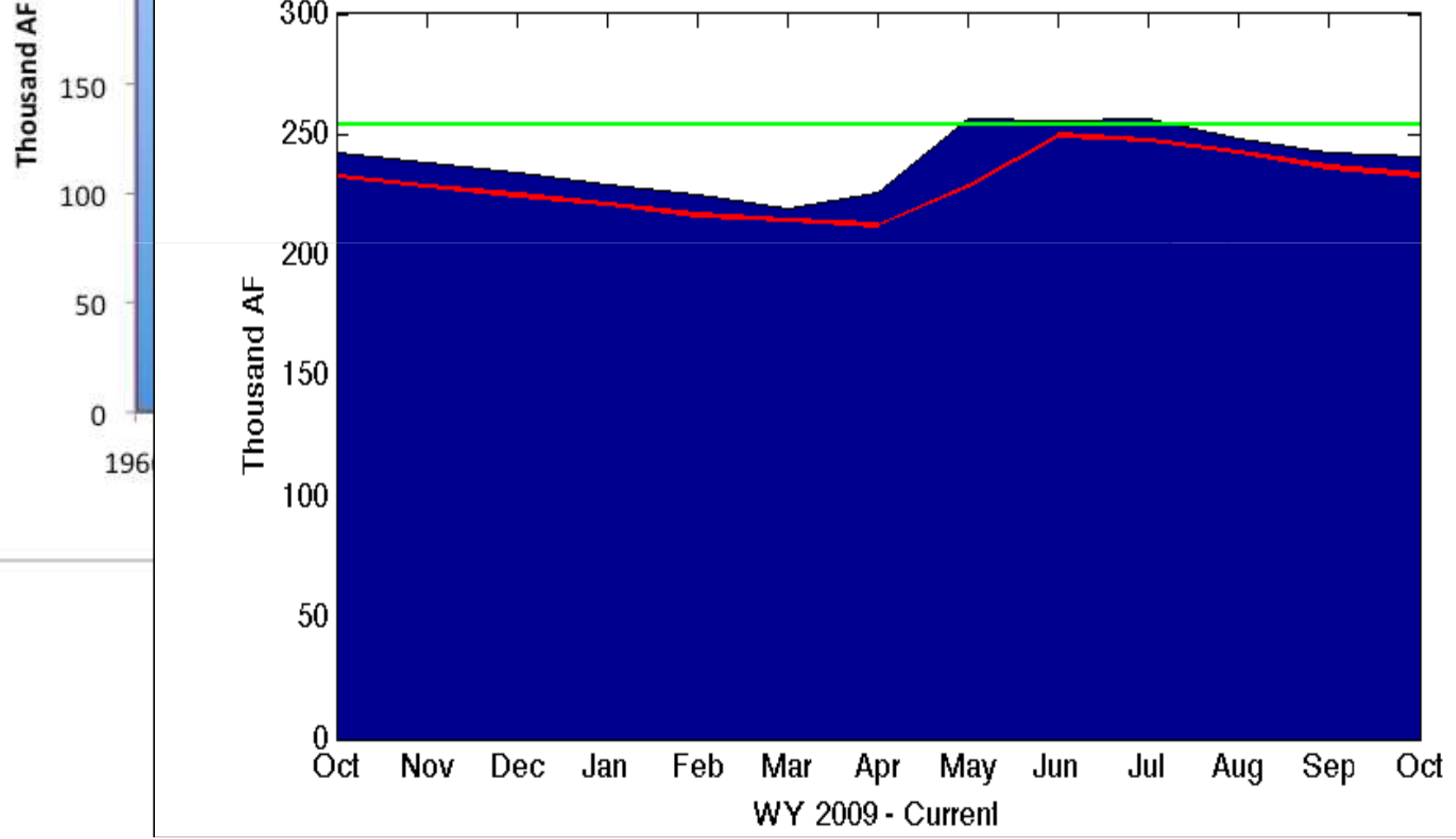


Lake Dillon October Reservoir Storage

max capacity



Dillon Res. Levels (Average [red] and Max Capacity [green])



Green Mountain October Reservoir Storage

max capacity

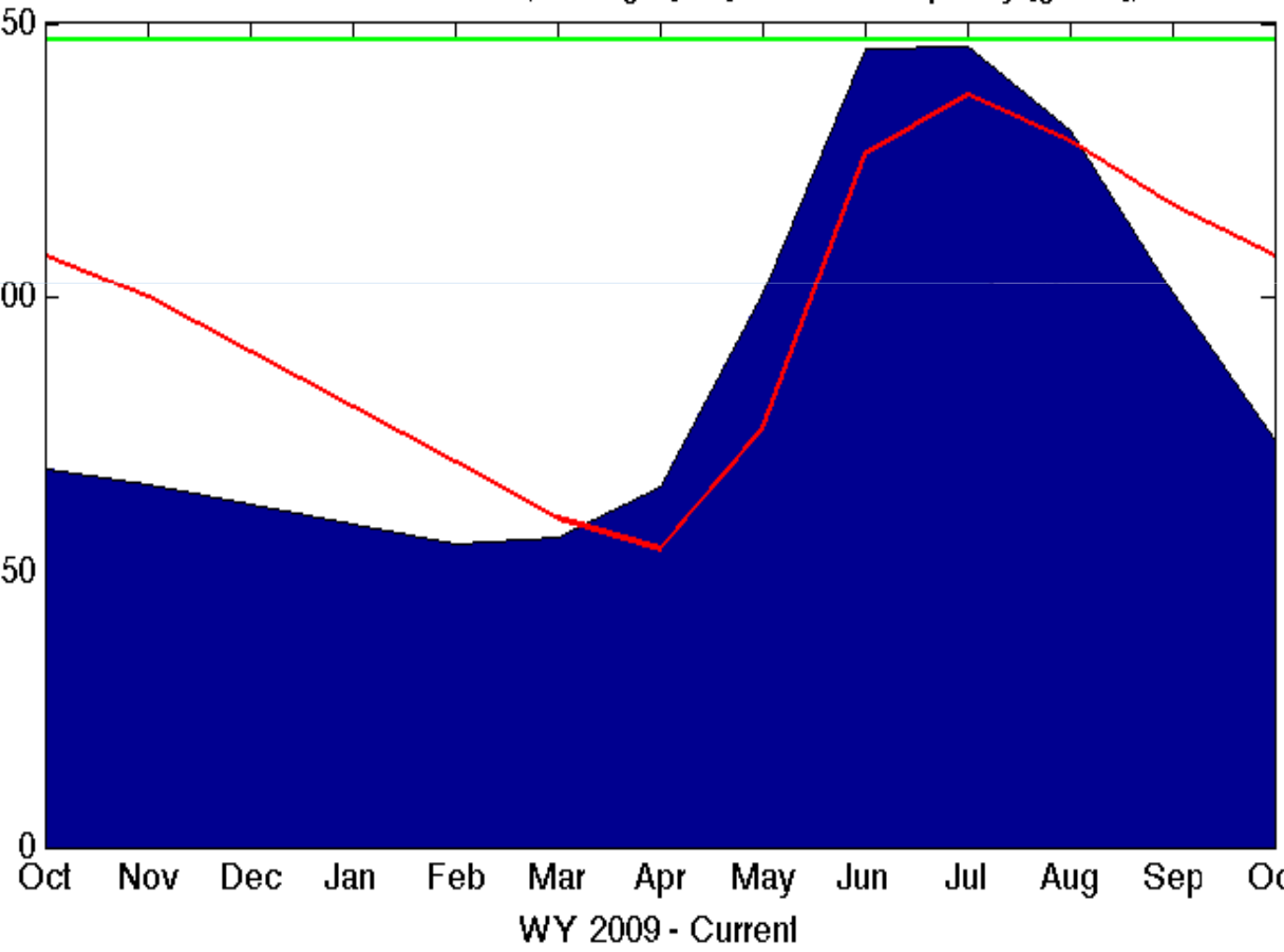
160
140
120
100
80
60
40
20
0
195
Thousand AF



Green Mt. Res. Levels (Average [red] and Max Capacity [green])

Thousand AF

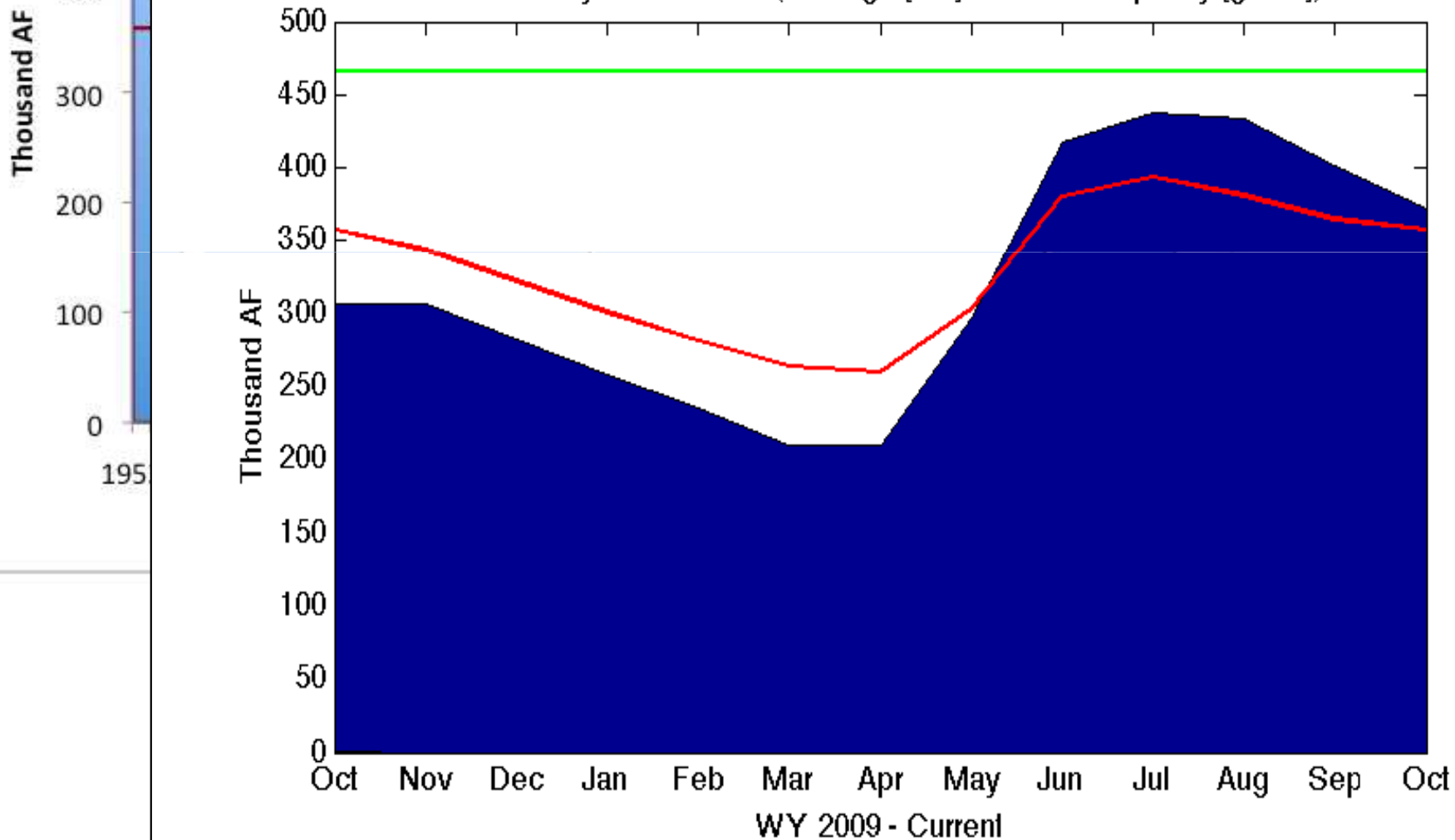
150
100
50
0
Thousand AF



Lake Granby October Reservoir Storage



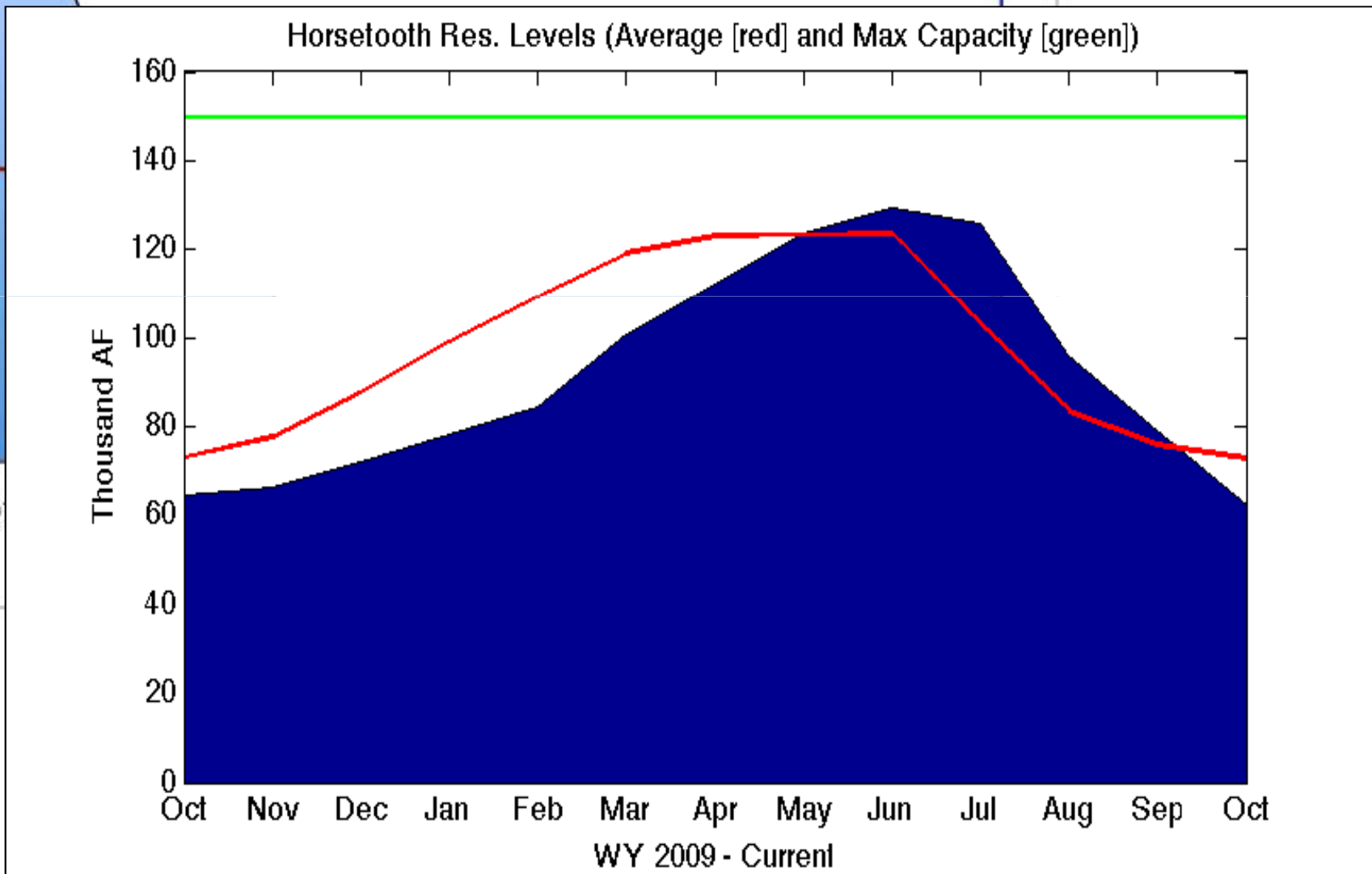
Lake Granby Res. Levels (Average [red] and Max Capacity [green])



Horsetooth Reservoir October Reservoir Storage

max capacity

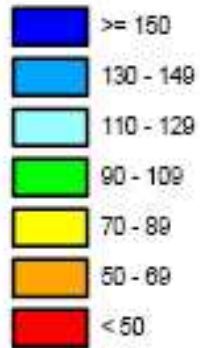
160
140
120
100
80
60
40
20
0
199



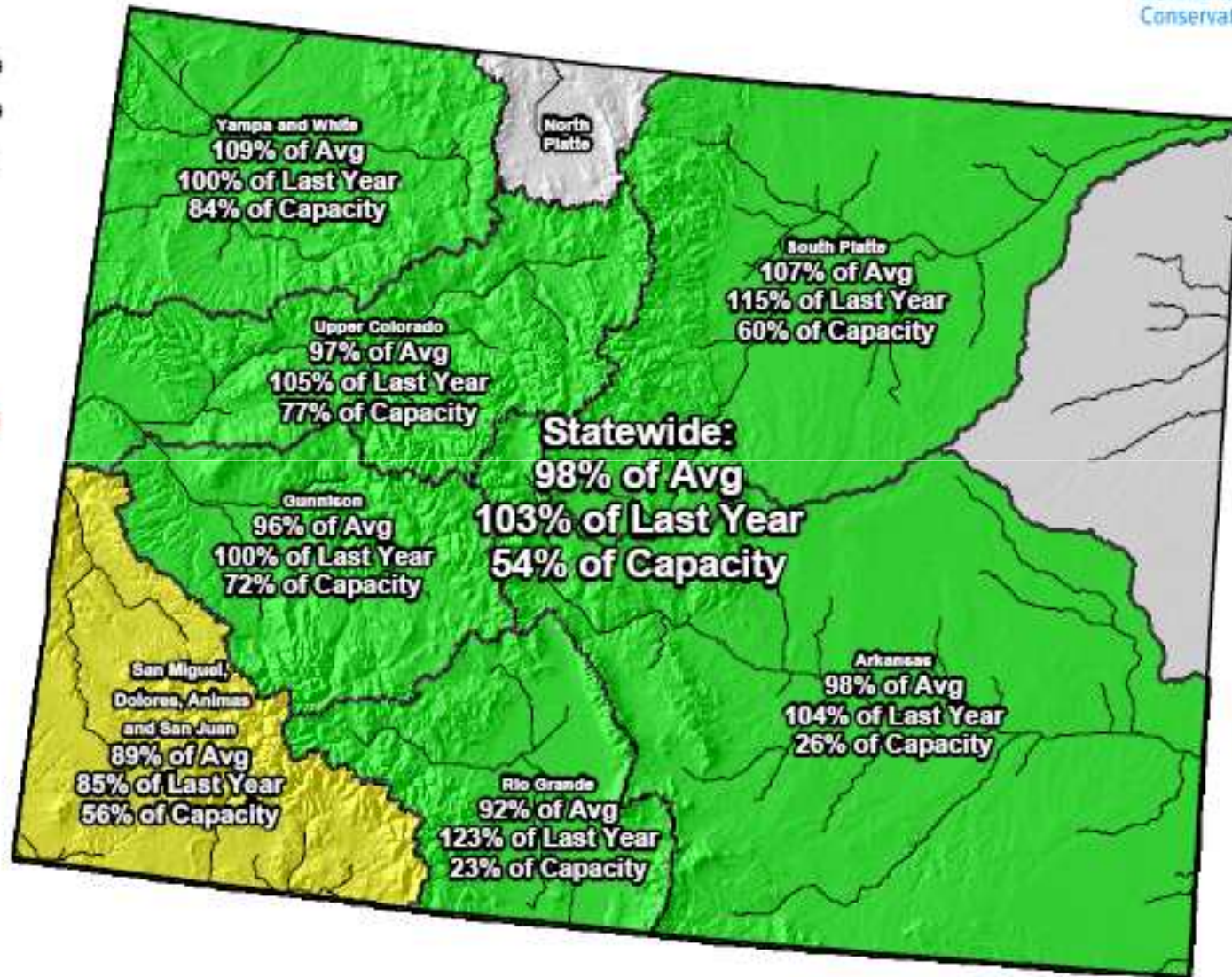
Colorado Reservoir Storage Map



Percent of Average



*Provisional Data
Subject to Revision*



End of October 2009

Summary

- 2009 good year for water in most areas of Colorado -- Excellent growing season precipitation east of the mountains.
- Large early snowmelt (May), secondary late June peak flows especially northern basins
- Reservoirs filled early -- ended the Water Year near average in most areas
- W. Colorado tending drier than average with noticeably below average summer and early autumn 2009 precipitation, especially lower elevations. **Need to keep a close eye on SW Colorado for developing drought conditions.**