

Drought Update

January 18, 2005 WATF Meeting

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Colorado Climate Center



*presented at the Water Availability Task Force meeting,
NWS, Boulder, January 18, 2005*



Prepared by Odie Bliss

<http://ccc.atmos.colostate.edu>

Significant Climate Anomalies and Events in 2004

Average global temperature 4th warmest on record
Rise in global temperature greater than 0.6°C since 1900

Antarctic Ozone hole less extensive than the 10-year mean. Less than 20 million km² in size.

Alaska

Record warm May, June, July, August and summer

Alaska/ Yukon Wildfires

Record area burned (2.6 million hectares) in Alaska

Strong winter storms in January for Pacific Northwest

Mexico/US

Severe flooding in April along the Escondido River

East Pacific Hurricane Season

Below average activity. 12 named storms. 6 hurricanes.

Neutral ENSO transitions into weak El Niño in late boreal summer and Autumn

Peru, Chile, Argentina

Severe cold and snow during June and July

North America

8th largest snow cover extent in 38 years for October

Canada record cold summer in eastern Prairies, record summer heat on west coast

Central and Northeast U.S.

Much colder than average summer

Western U.S. Continuation of multi-year drought conditions, some relief in autumn

Tornadoes

Record year for tornadoes. Mostly a result of tropical systems

Hurricane Jeanne

Category 3 at landfall. Over 3,000 lives lost in Haiti

Hurricane Charley

strongest hurricane to impact the US since Hurricane Andrew in 1992

Hurricane Ivan

Reached category 5 in the Caribbean. 210km/hr at landfall. Massive destruction in Grenada as it passed over the island.

Atlantic Hurricane Season

Above average activity. 15 Named storms. 9 Hurricanes. 6 major. 8 tropical storms in August - most named storms for any August on record

Brazil

Wet Dec-Feb. Major flooding in January in Brazil's northeastern states

South Atlantic Hurricane

Rare hurricane in the South Atlantic in March. Made landfall in the state of Santa Catarina. Maximum sustained winds of 120-130km/hr

Sea Ice

Below long-term average. September extent 13% below 10-year mean

Europe

Widespread above average annual temperatures. (+1°C)

Spain, Portugal

Heatwave in June and July with maximum temperatures reaching 40°C

Jordan, Syria, Greece, Turkey

widespread winter storm in February. Approximately 60 cm of snow in Jordan

Africa ITCZ

Average annual ITCZ close to long-term mean position

Angola, Zambia

Severe flooding in April and also May in Zambia

Tropical Cyclone Gafik

Strongest cyclone to hit Madagascar in 10 years. Winds at 260km/hr at 1

Russia, Belarus

flooding from Mar-May. Over 1,000 people displaced.

Afghanistan

Long-term drought continued. Dry March-April season

Indian Monsoon

87% of normal. Worst regional deficit in northwest India. 22% less than average

Somalia, Kenya

Despite good 'long rains' drought remains. Only 50% of normal rainfall in southeastern Kenya over

Tropical Cyclone Etila

affected Madagascar. 29 people killed

Western Asia

Annual warm

India

Severe heatwave in March. More than 100 deaths.

India

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Somalia, Kenya

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Northern largest snow cover extent in 38 years

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India

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Indian Monsoon

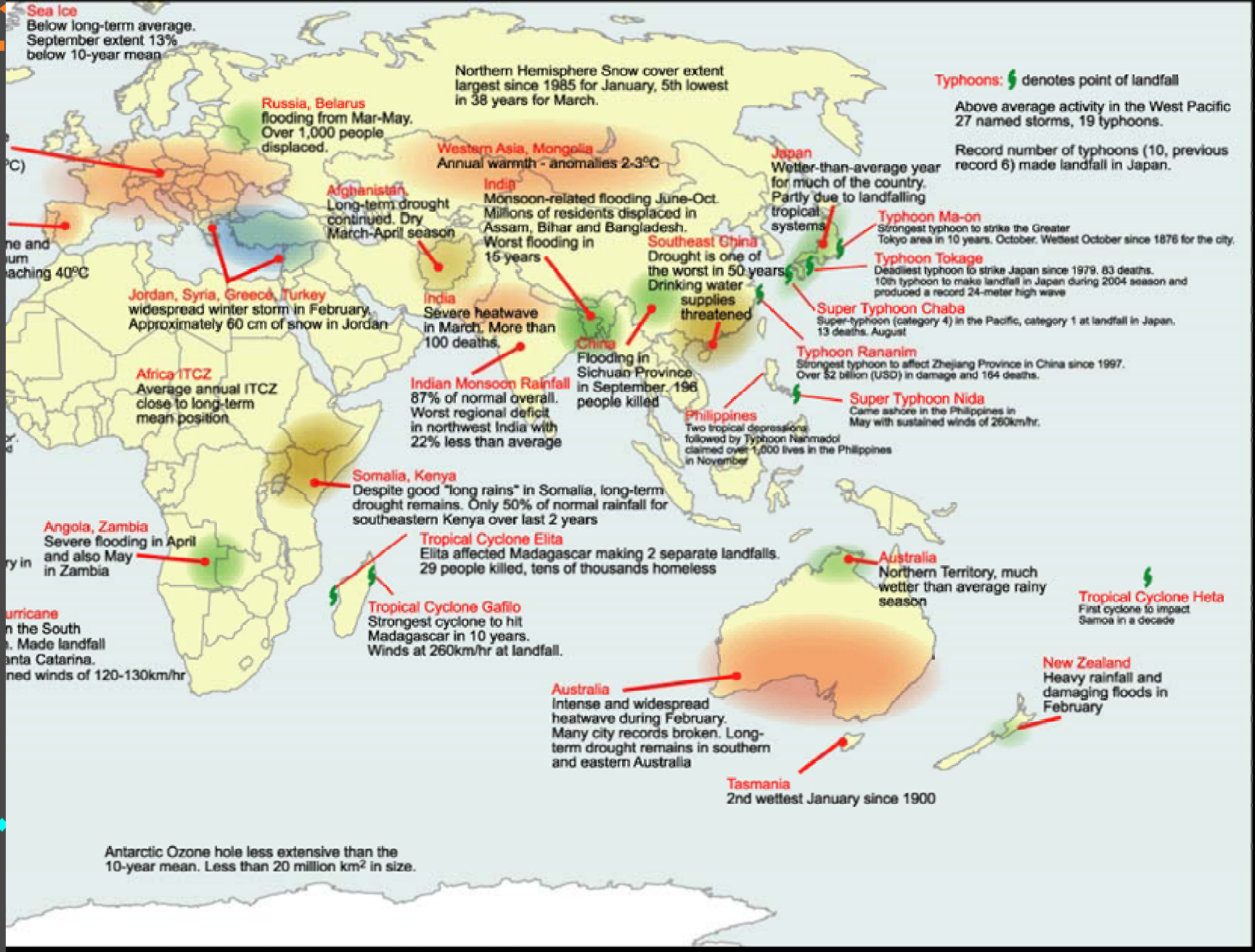
87% of normal. Worst regional deficit in northwest India. 22% less than average

Somalia, Kenya

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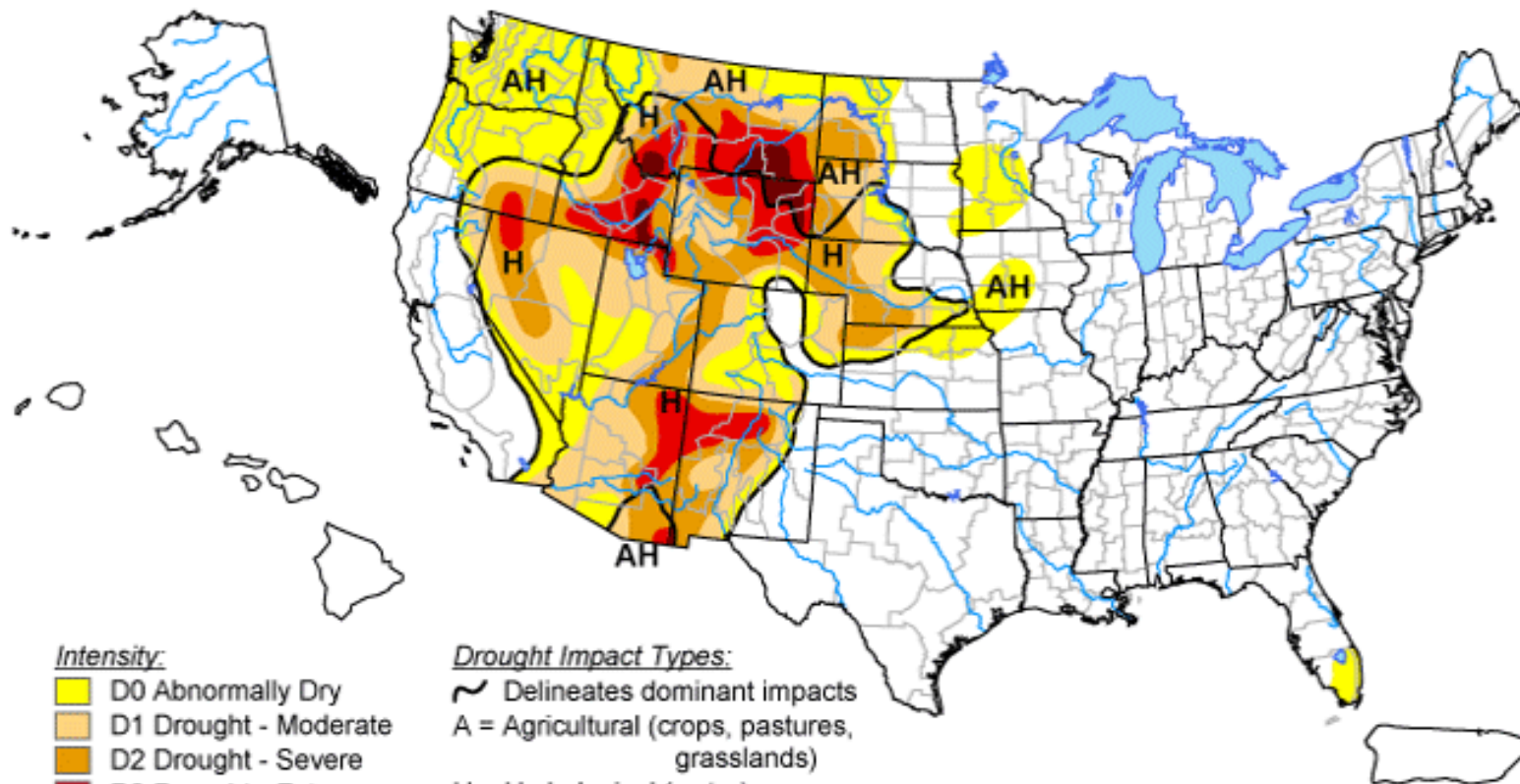
Tropical Cyclone Etila

affected Madagascar. 29 people killed








U.S. Drought Monitor


January 11, 2005
Valid 7 a.m. EST



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)
- (No type = Both impacts)

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



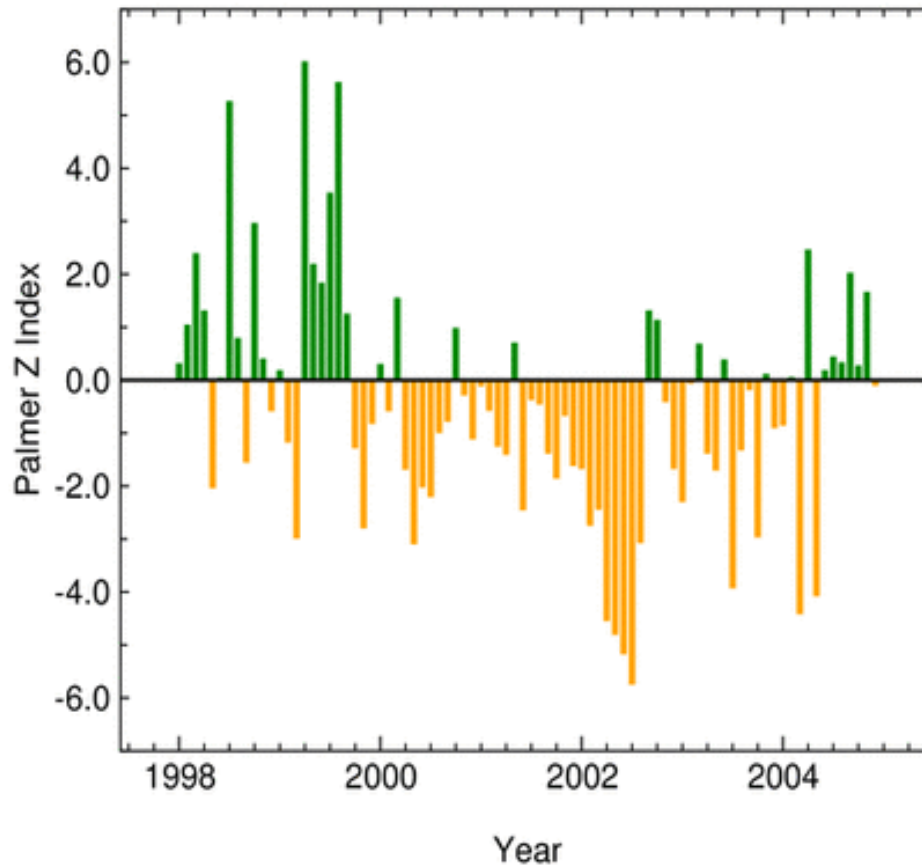
Released Thursday, January 13, 2005

Author: Mark Svoboda, NDMC

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

Colorado Statewide Z Index*

January 1998 - December 2004



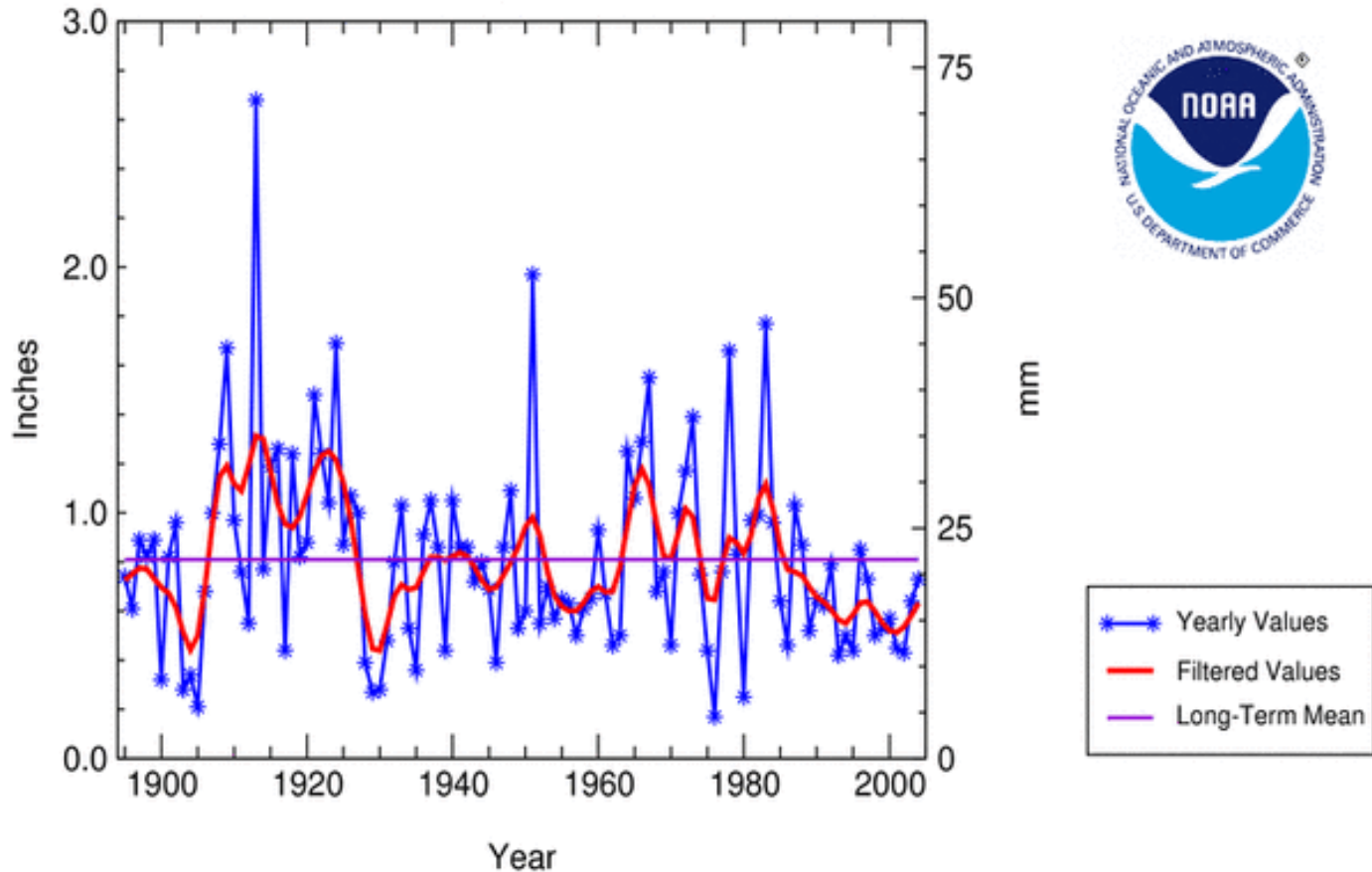
*Palmer Z Index
Short-Term Drought



National Climatic Data Center / NESDIS / NOAA

Colorado Statewide Precipitation

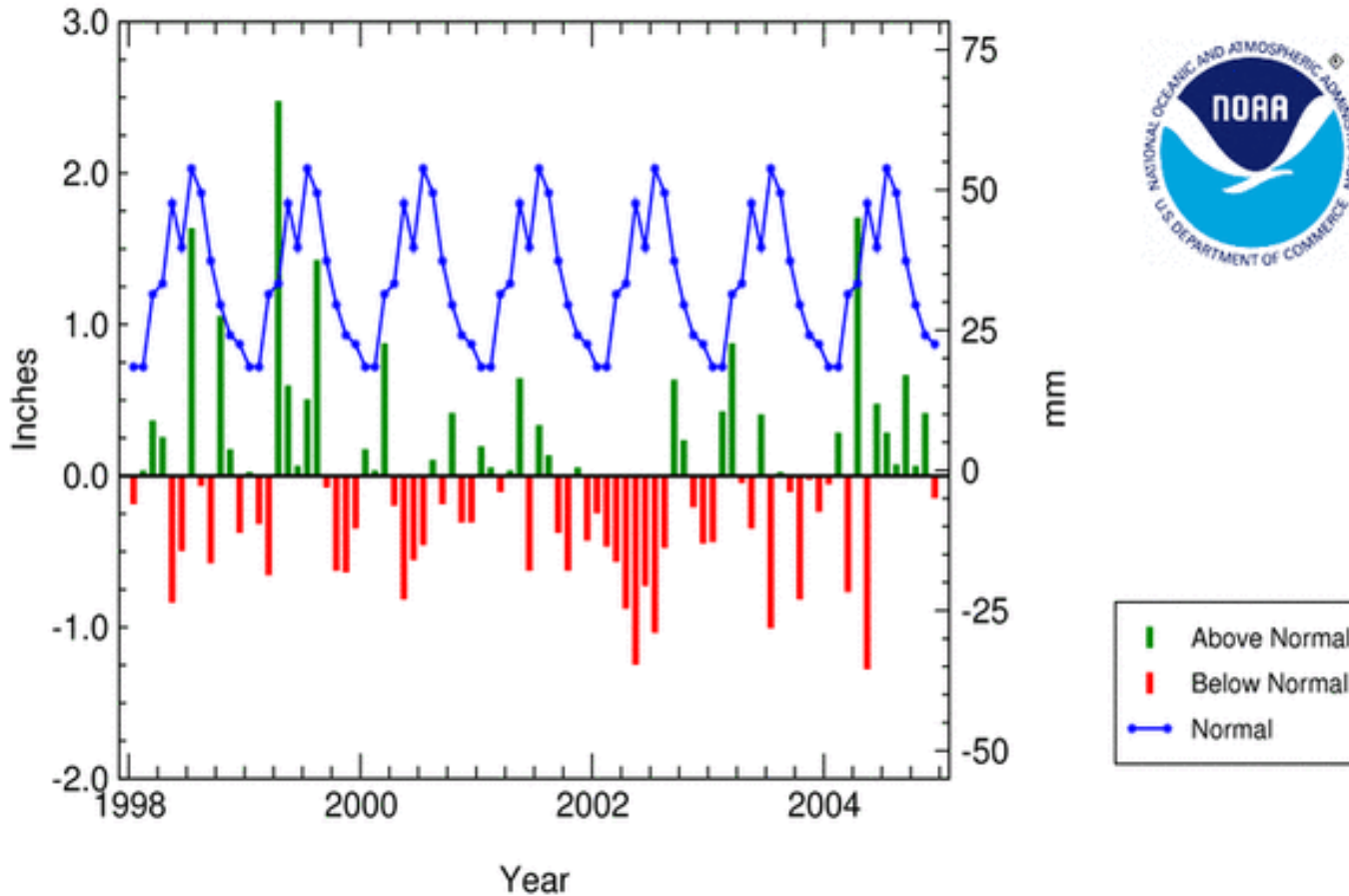
December, 1895 - 2004



National Climatic Data Center / NESDIS / NOAA

Colorado Statewide Precipitation

Normal & Departure, Jan 1998 - Dec 2004

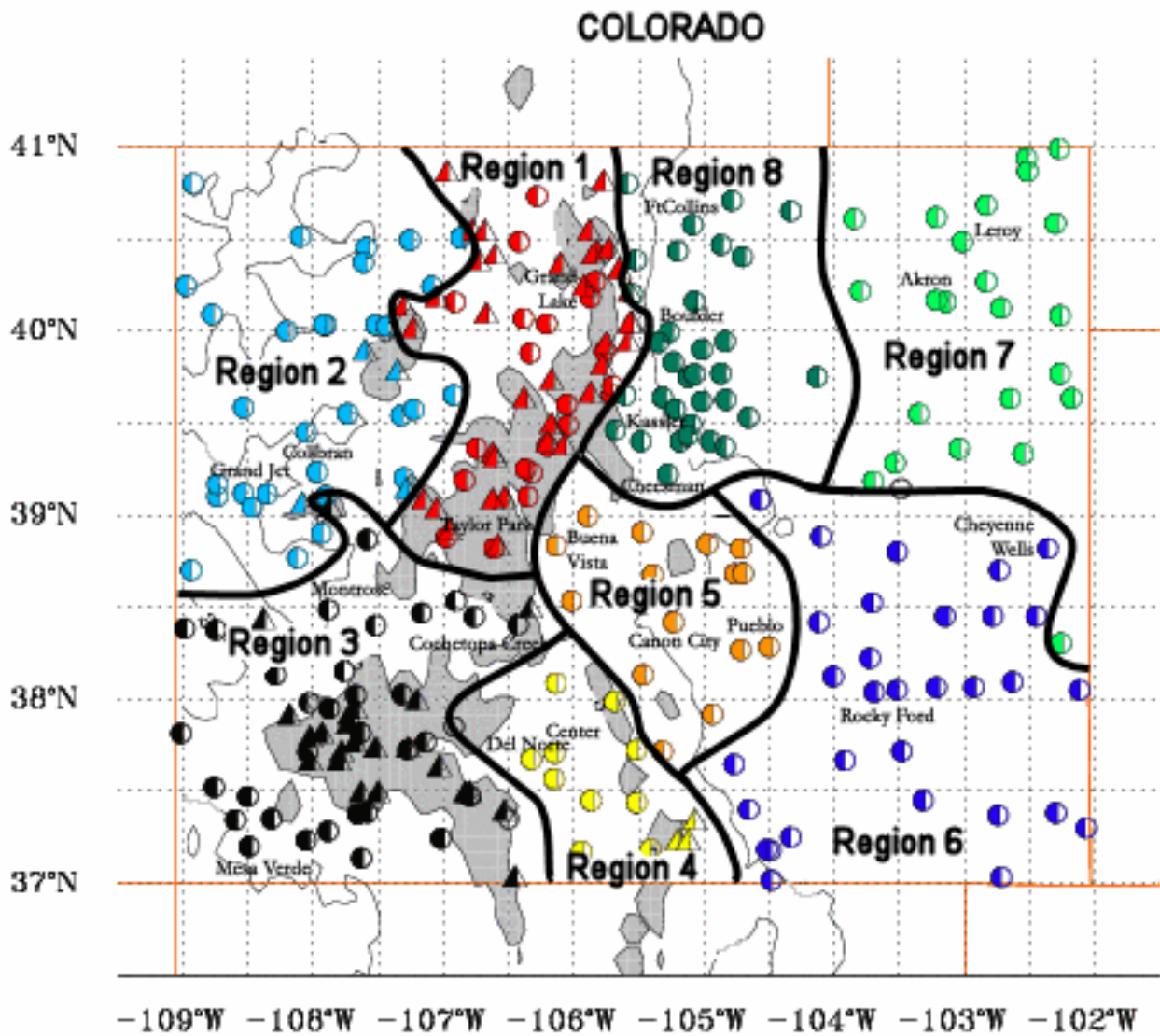


National Climatic Data Center / NESDIS / NOAA

Statewide Precipitation Ranks
for Colorado , 2004

Period	Rank
Dec	<u>51st driest</u>
Nov-Dec	<u>25th wettest</u> (<u>86th driest</u>)
Oct-Dec	<u>35th wettest</u> (<u>76th driest</u>)
Sep-Dec	<u>22nd wettest</u> (<u>89th driest</u>)
Aug-Dec	<u>23rd wettest</u> (<u>88th driest</u>)
Jul-Dec	<u>27th wettest</u> (<u>84th driest</u>)
Jun-Dec	<u>16th wettest</u> (<u>95th driest</u>)
May-Dec	<u>49th wettest</u> (<u>62nd driest</u>)
Apr-Dec	<u>19th wettest</u> (<u>92nd driest</u>)
Mar-Dec	<u>37th wettest</u> (<u>74th driest</u>)
Feb-Dec	<u>31st wettest</u> (<u>80th driest</u>)
Jan-Dec	<u>32nd wettest</u> (<u>78th driest</u>)

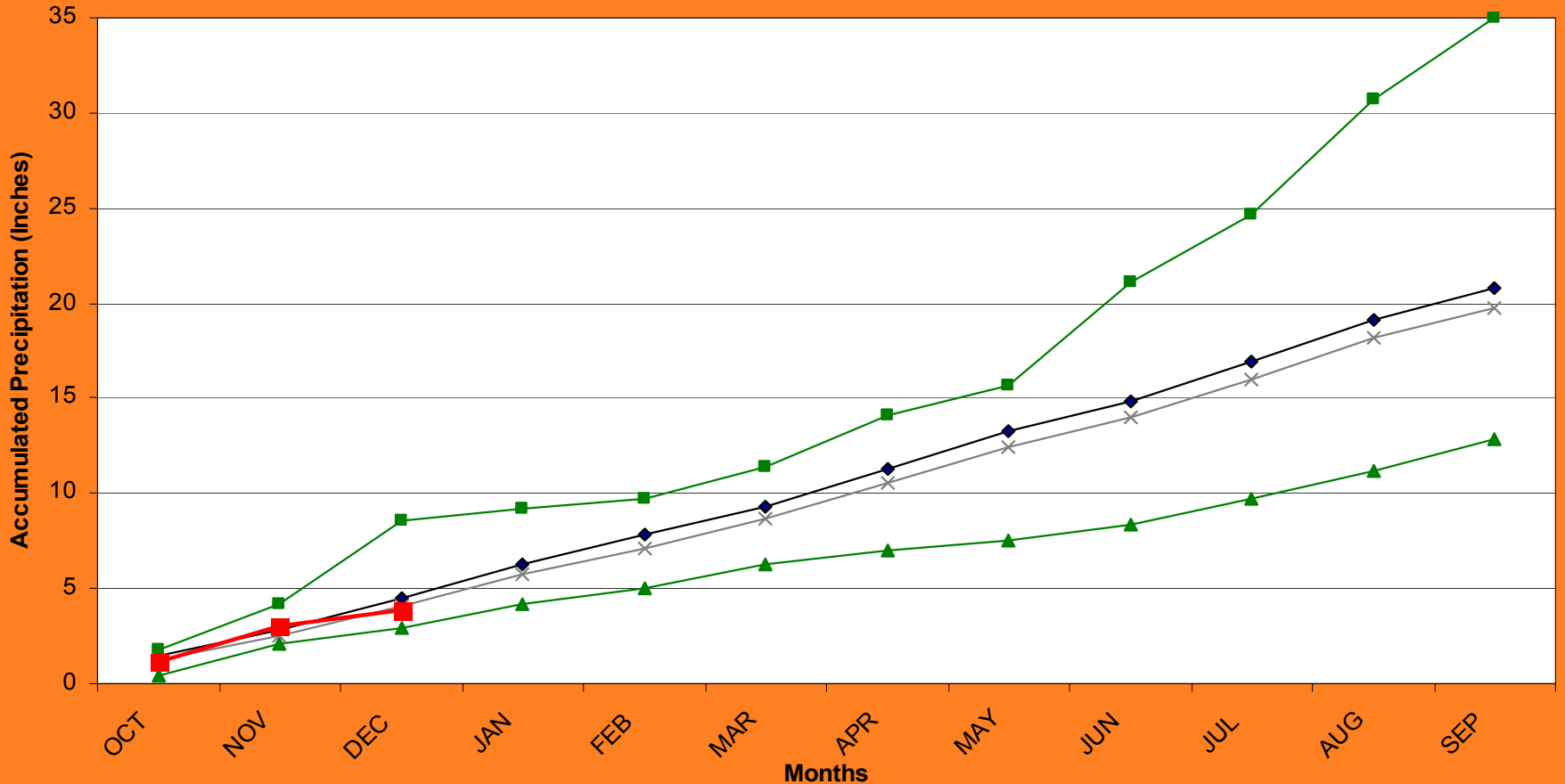
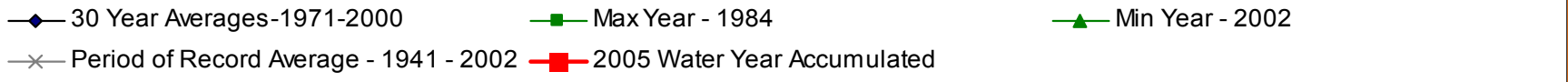
Colorado
Precipitation
Ranking
1895-2004



Climate divisions defined by Dr. Klaus Wolter of NOAA's Climate Diagnostic Center in Boulder, CO

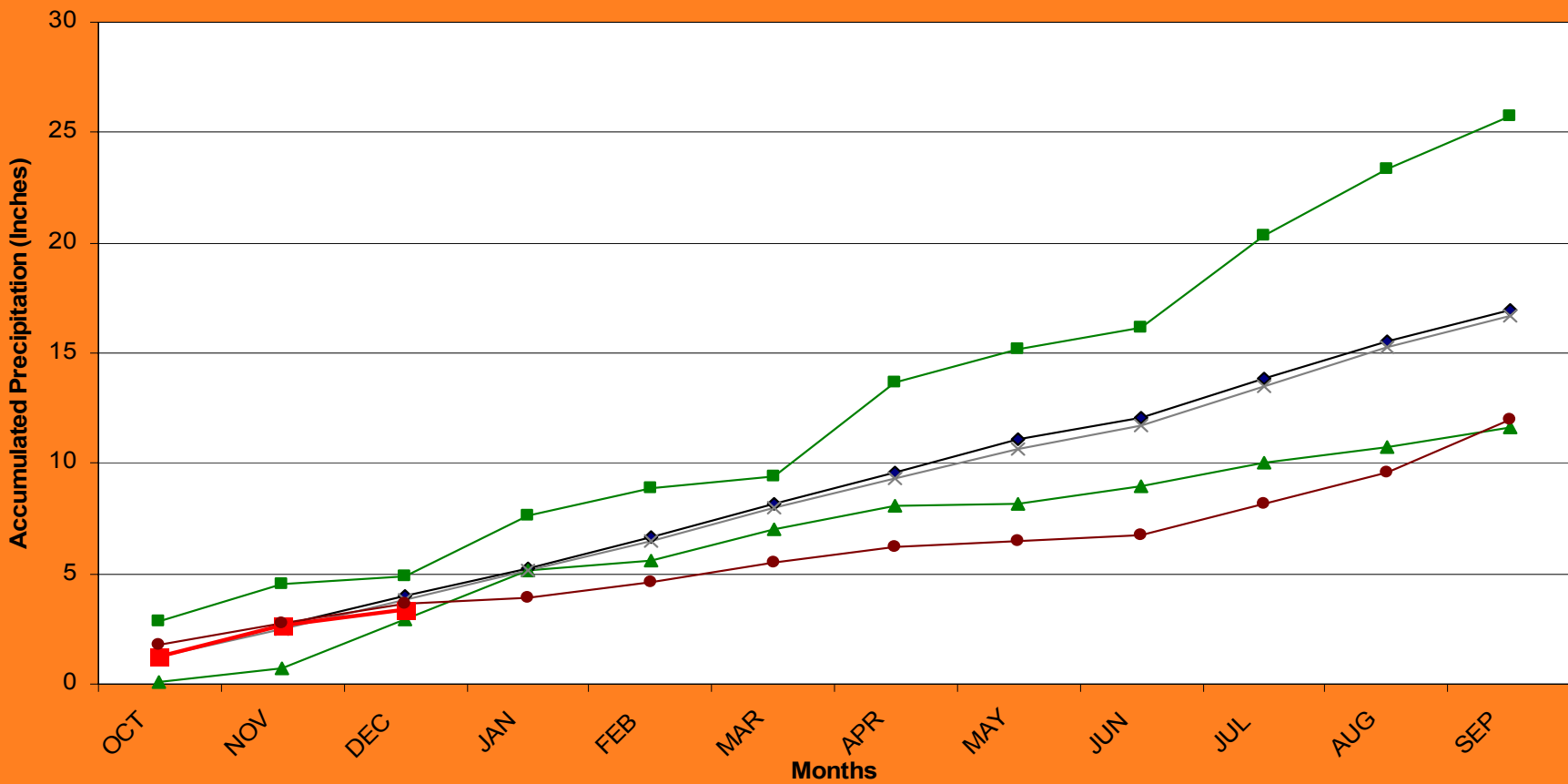
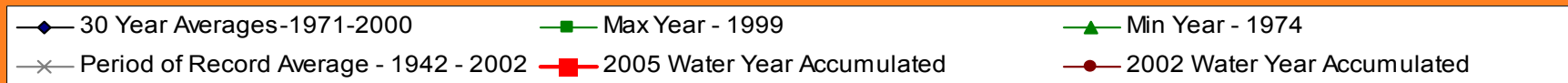
Division 1- Grand Lake 1NW

Grand Lake 1 NW 2005 Water Year (Oct '04 - Dec '04)



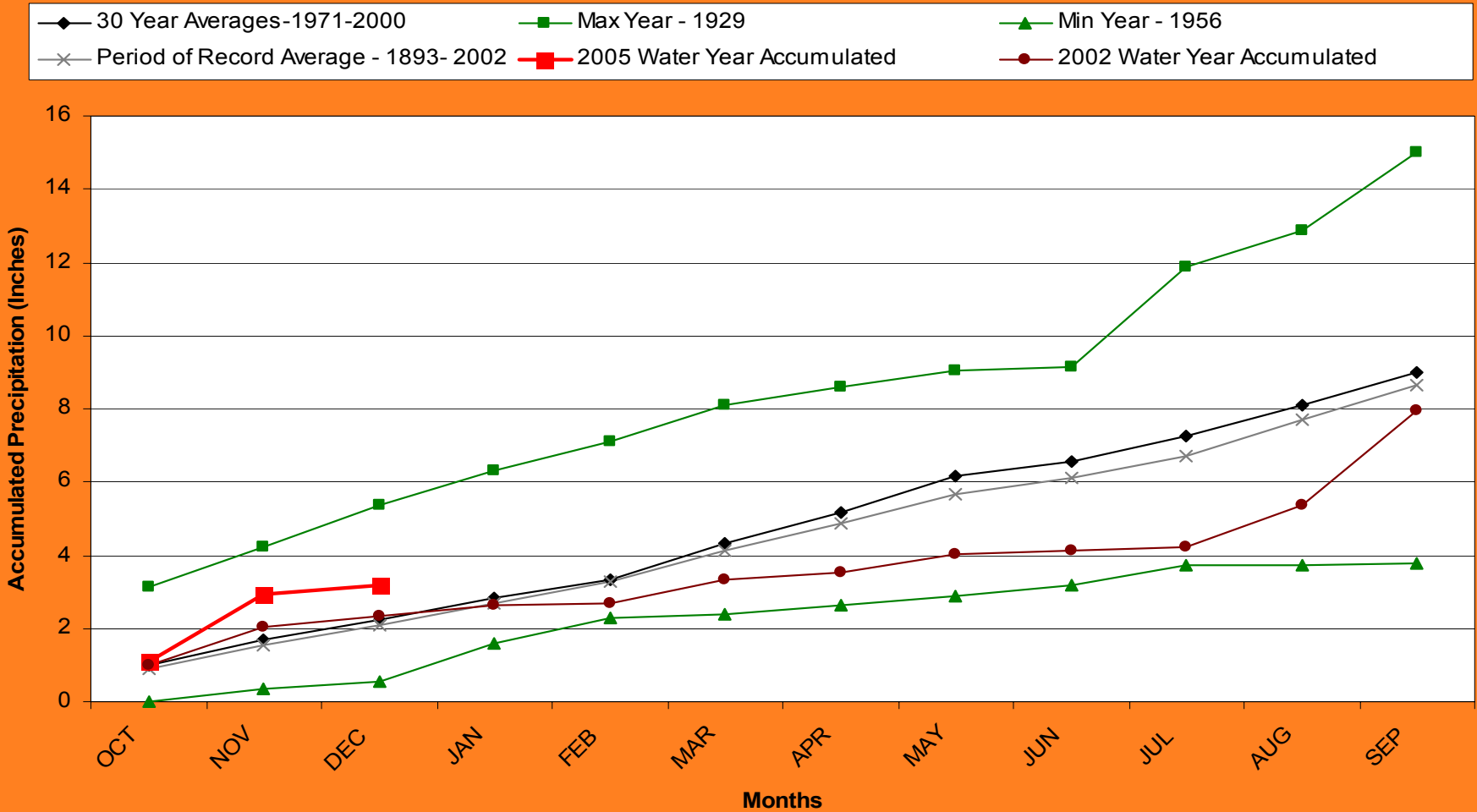
Division 1- Taylor Park

Taylor Park 2005 Water Year (Oct '04 - Dec '04)



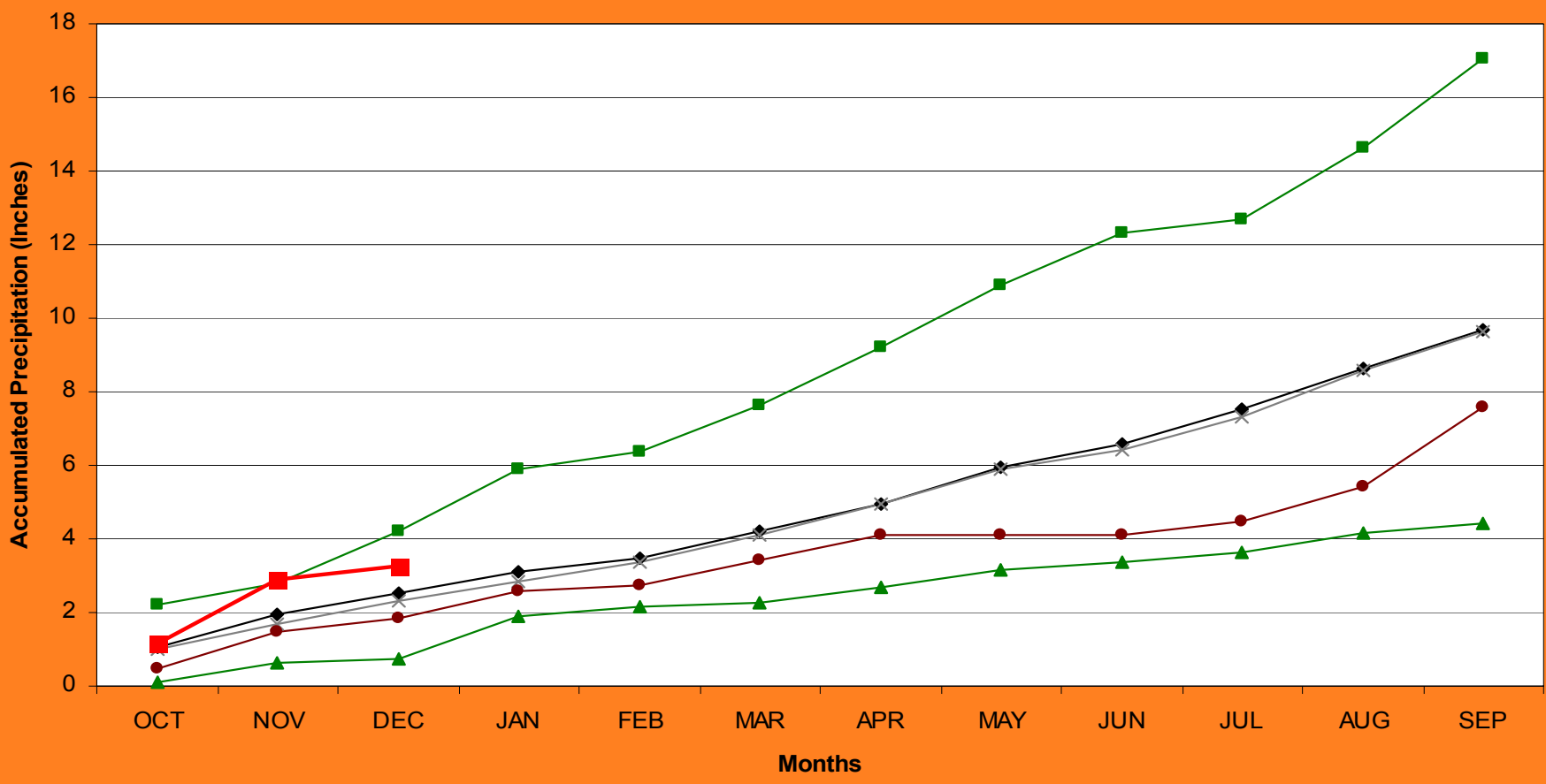
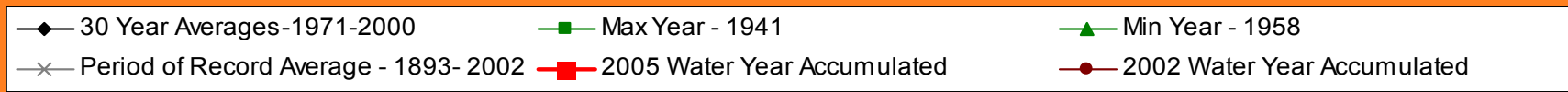
Division 2 – Grand Junction

Grand Junction WSFO 2005 Water Year (Oct '04 - Dec '04)



Division 3 - Montrose

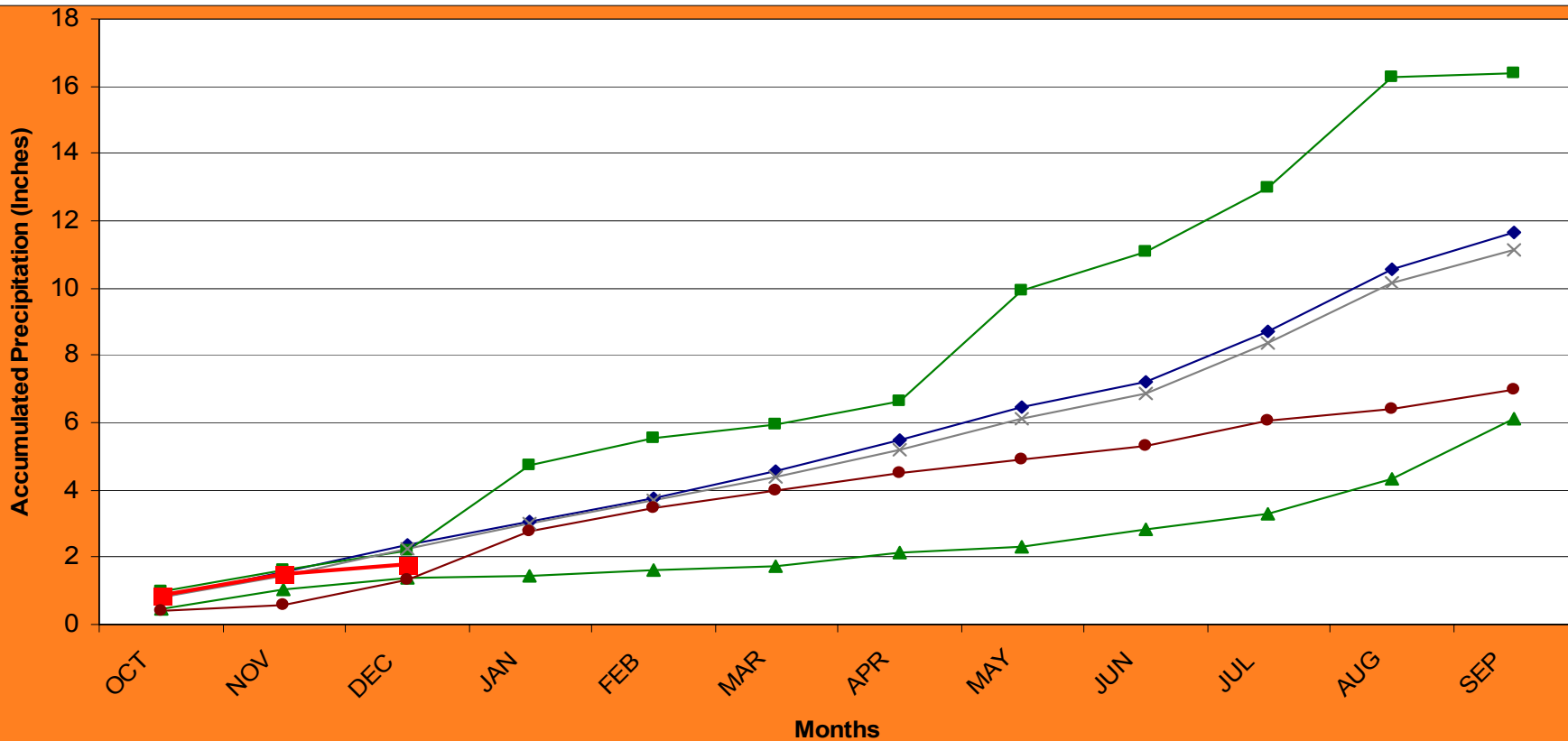
Montrose #2 2005 Water Year (Oct '04 - Dec '04)



Division 3 – Cochetopa Creek

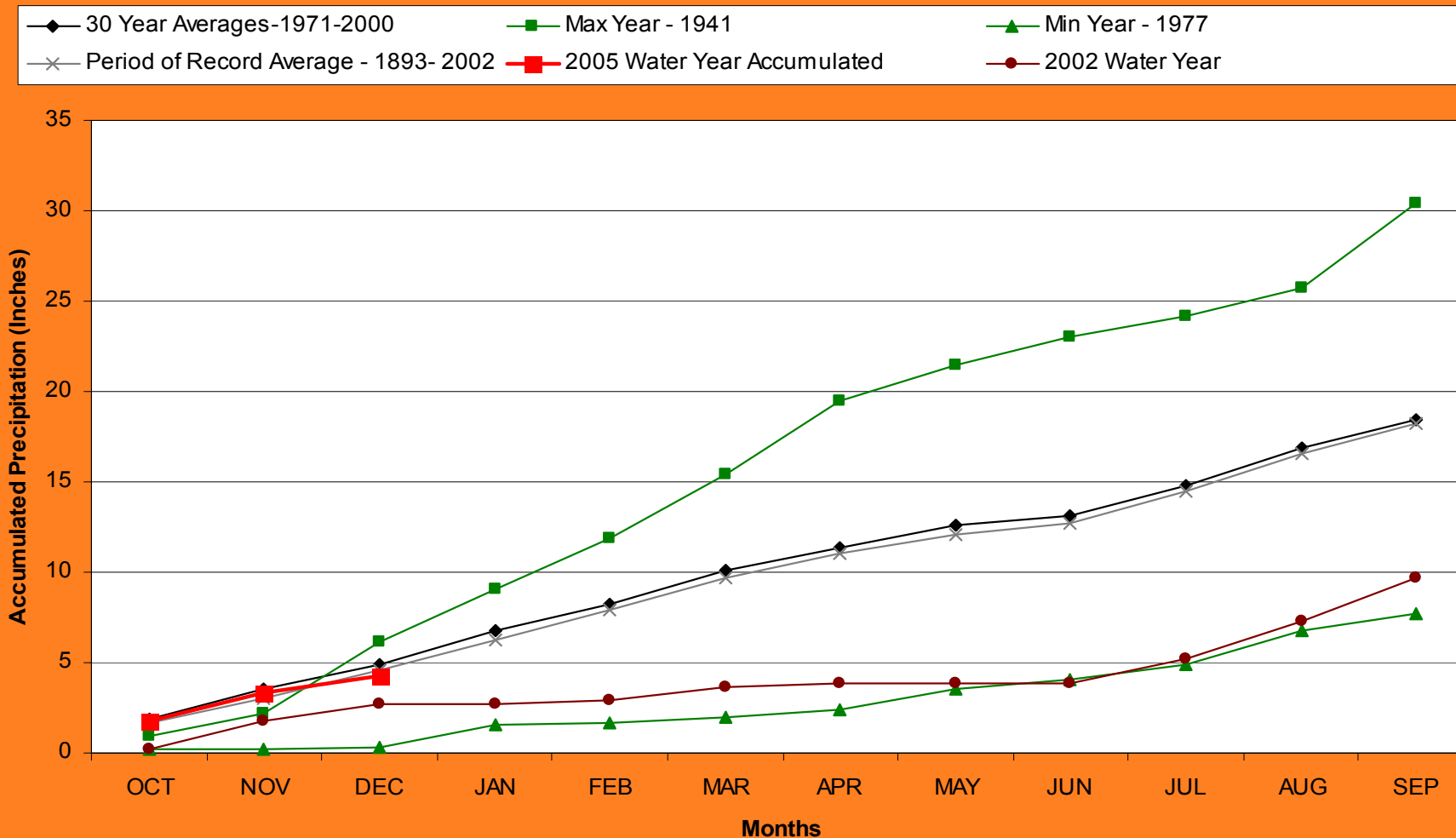
Cochetopa Creek 2005 Water Year (Oct '04 - Dec '04)

- ◆ 30 Year Averages-1971-2000
- Max Year - 1957
- ▲ Min Year - 2002
- × Period of Record Average - 1949 - 2002
- 2005 Water Year
- 2nd Min Year - 1950



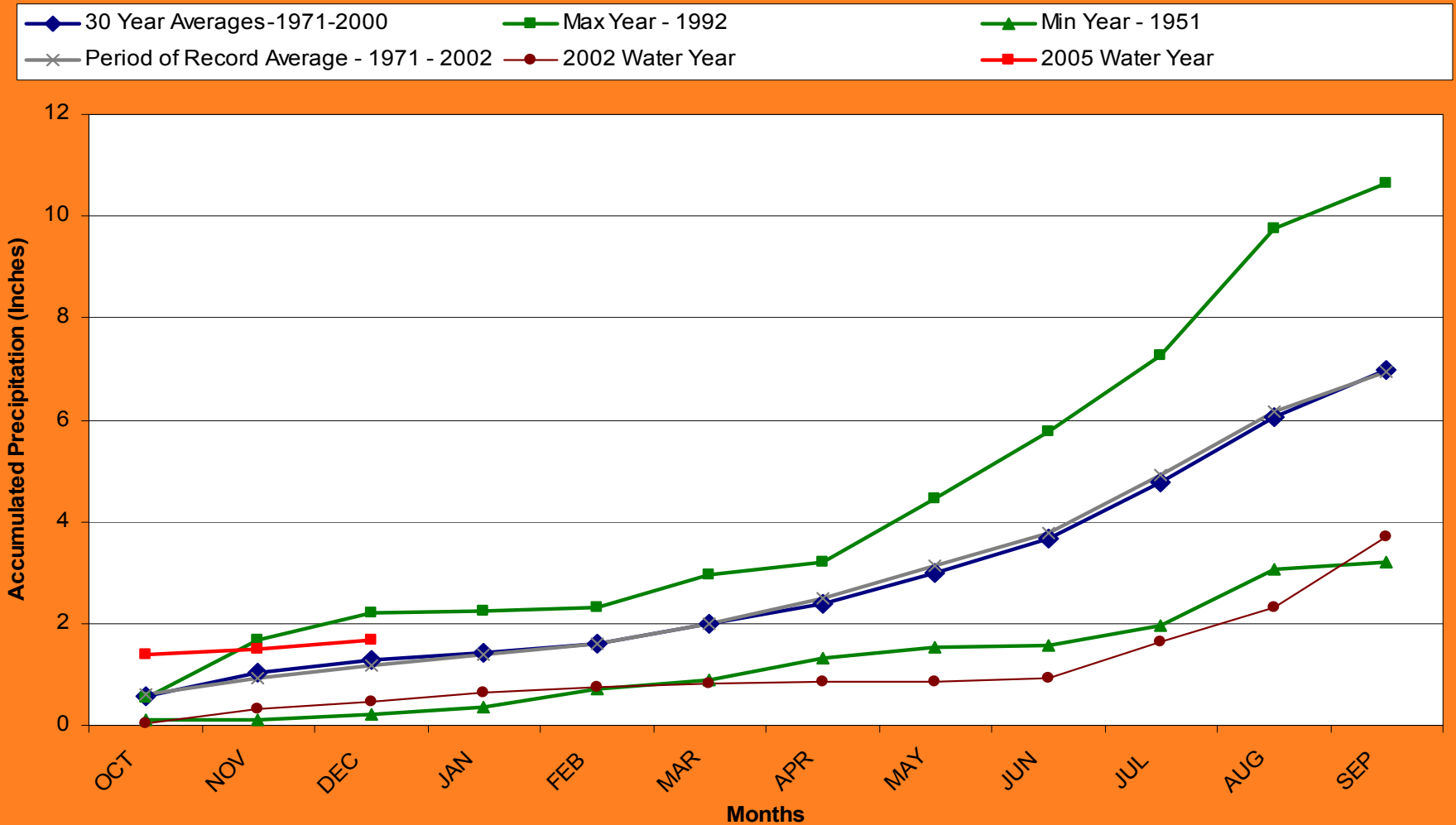
Division 3 -- Mesa Verde

Mesa Verde NP 2005 Water Year (Oct '04 - Dec '04)



Division 4 - Center

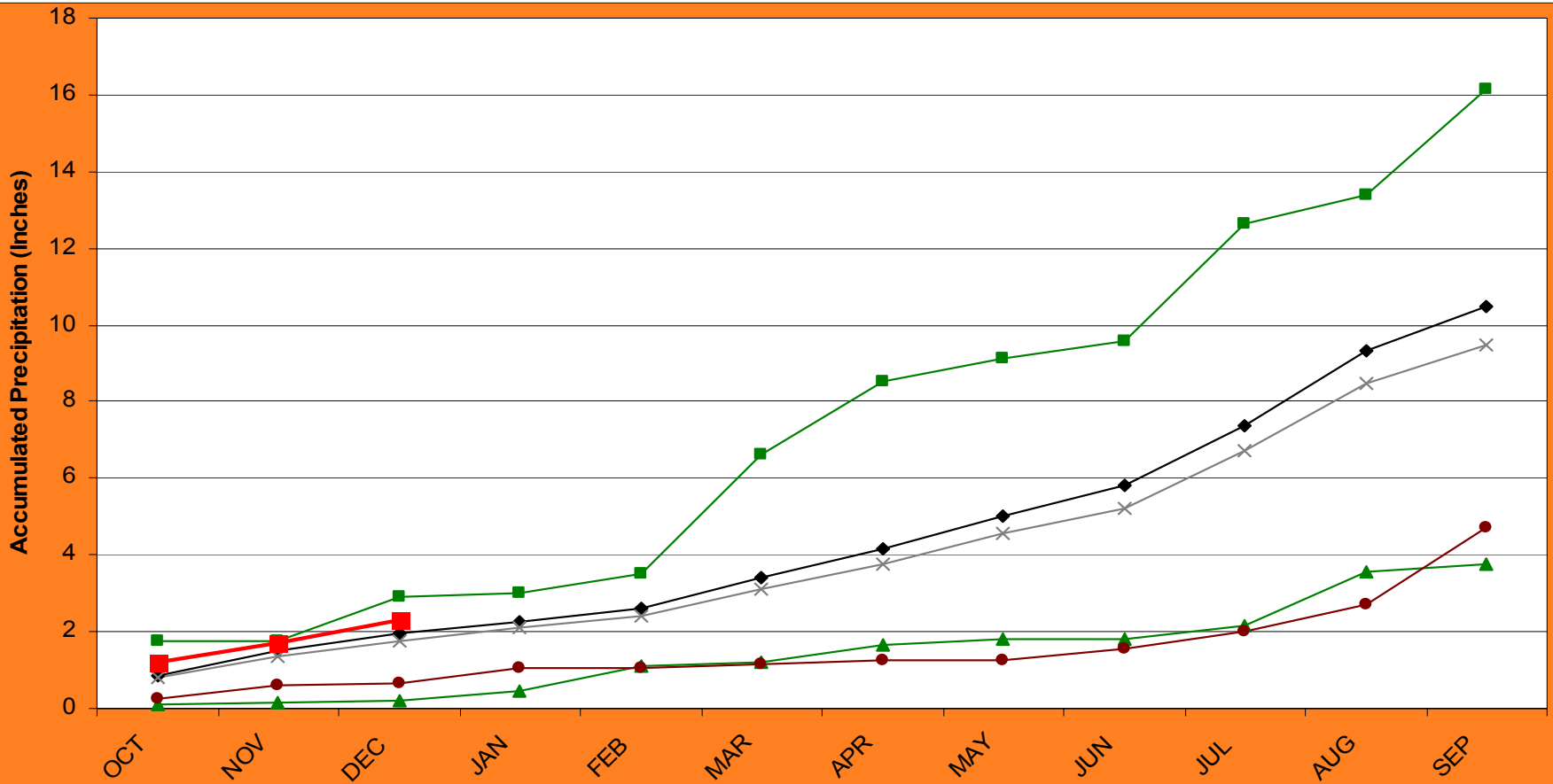
Center 4SSW 2005 Water Year (Oct '04 - Dec '04)



Division 4 – Del Norte

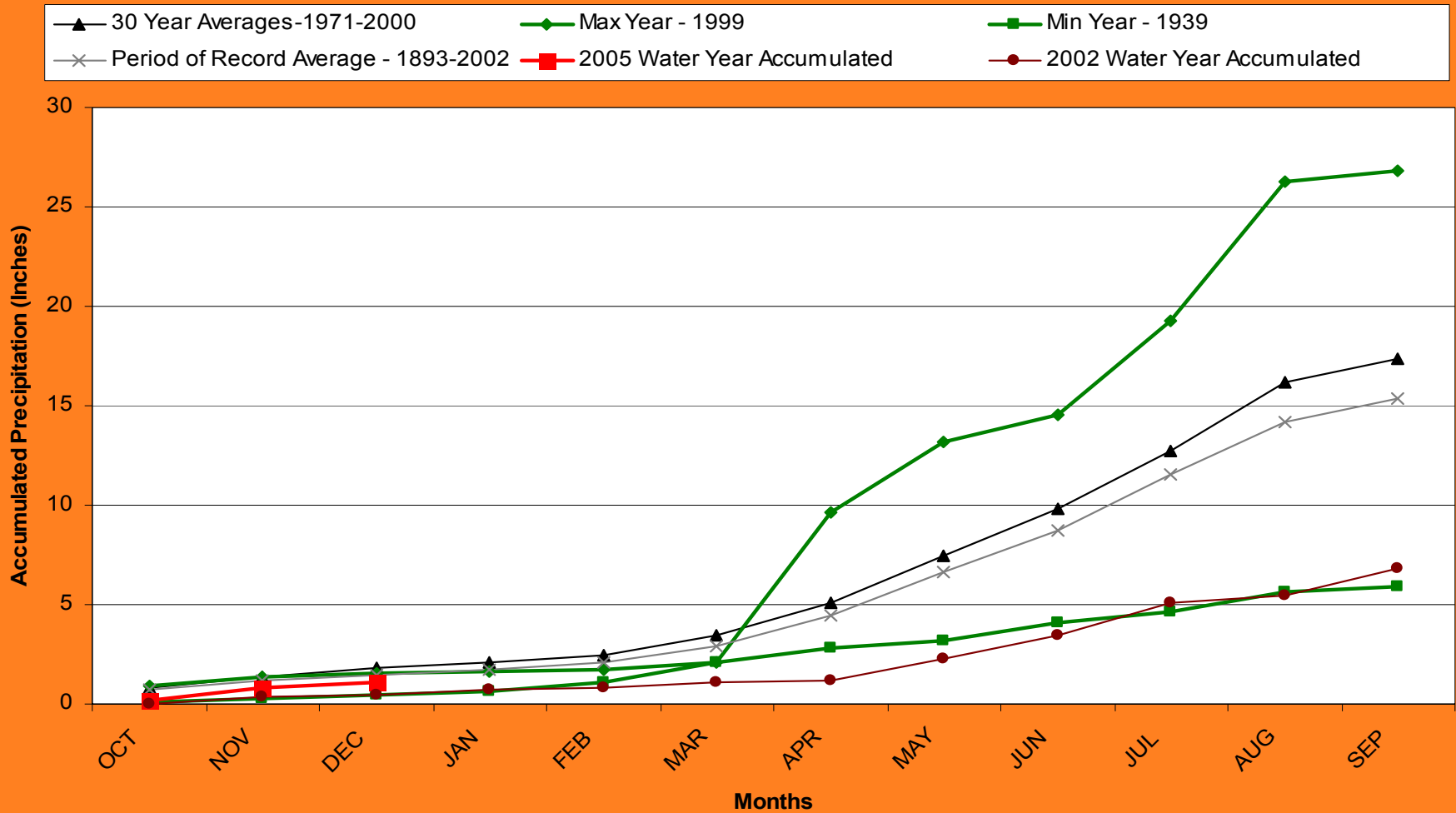
Del Norte 2005 Water Year (Oct '04 - Dec '04)

◆ 30 Year Averages-1971-2000 ■ Max Year - 1985 ▲ Min Year - 1951
× Period of Record Average - 1921-2002 ■ 2005 Accumulated ● 2002 Accumulated Water Year



Division 5 – Colorado Springs

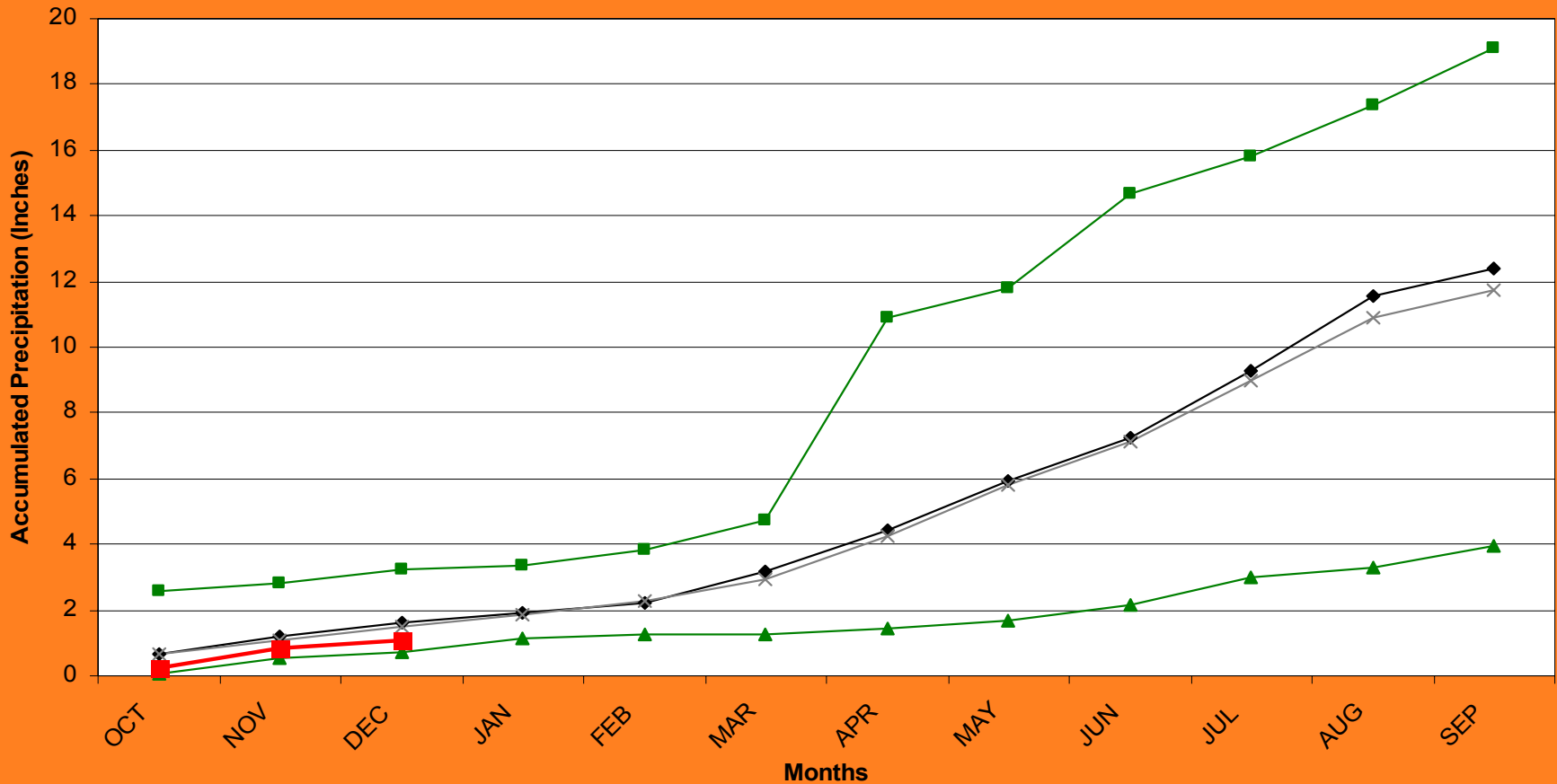
Colorado Springs 2005 Water Year (Oct '04 - Dec '04)



Division 5 - Pueblo

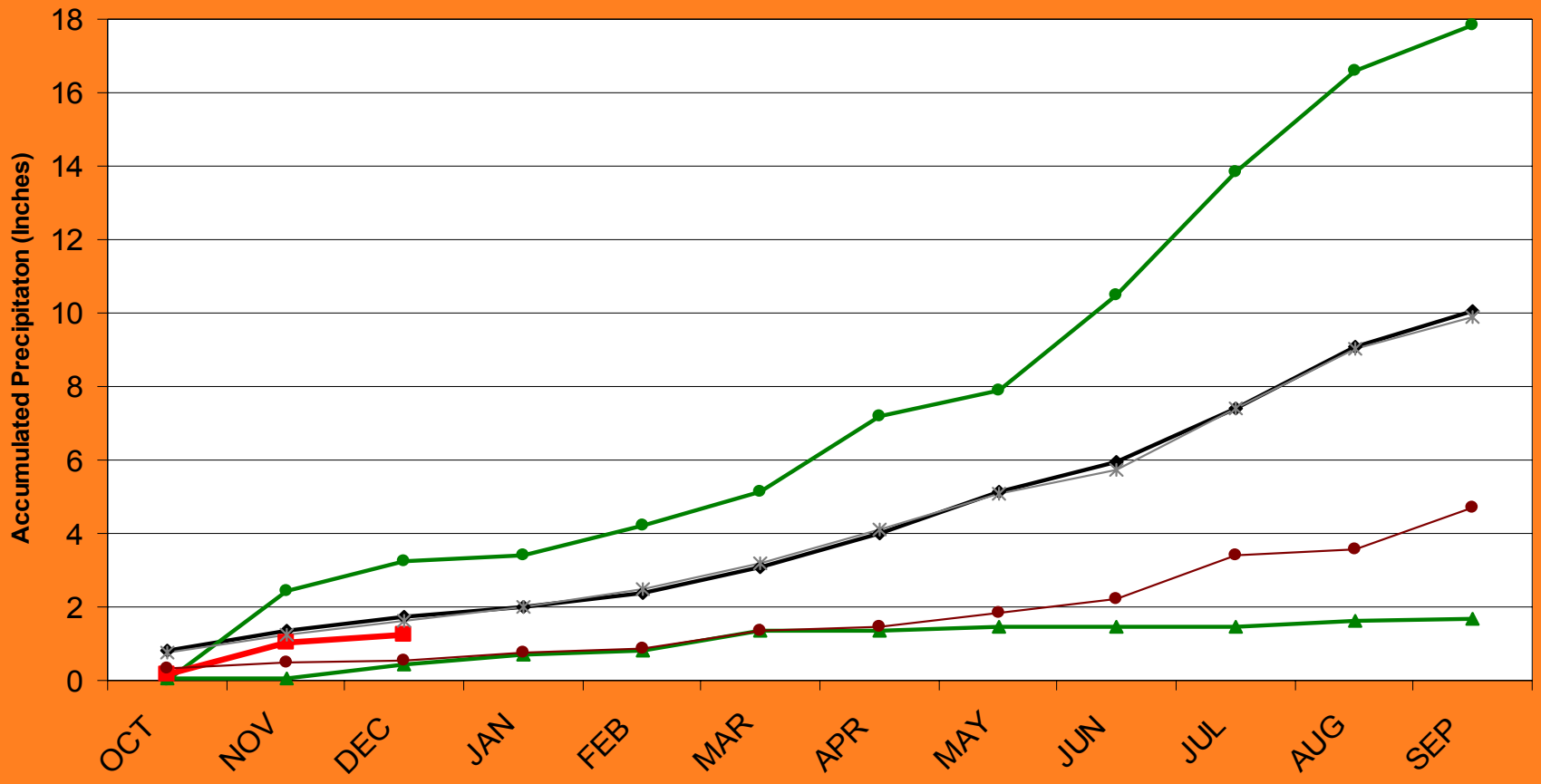
Pueblo WSO 2005 Water Year (Oct '04 - Dec '04)

◆ 30 Year Averages-1971-2000 ■ Max Year - 1942 ▲ Min Year - 2002
× Period of Record Average - 1874-2000 ■ 2005 Water Year Accumulated



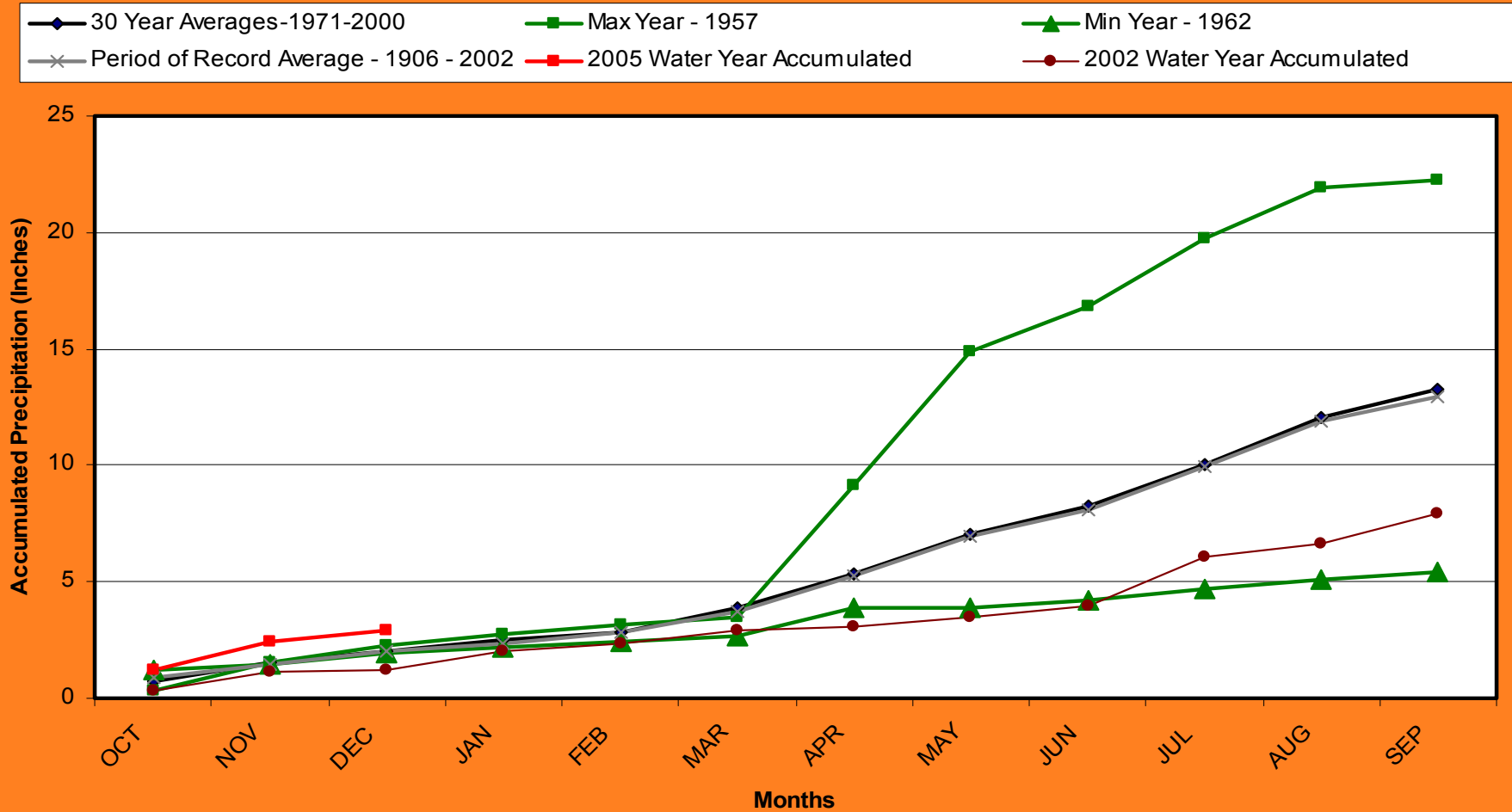
Division 5 – Buena Vista

Buena Vista 2005 Water Year (Oct '04 - Dec '04)



Division 5 – Canon City

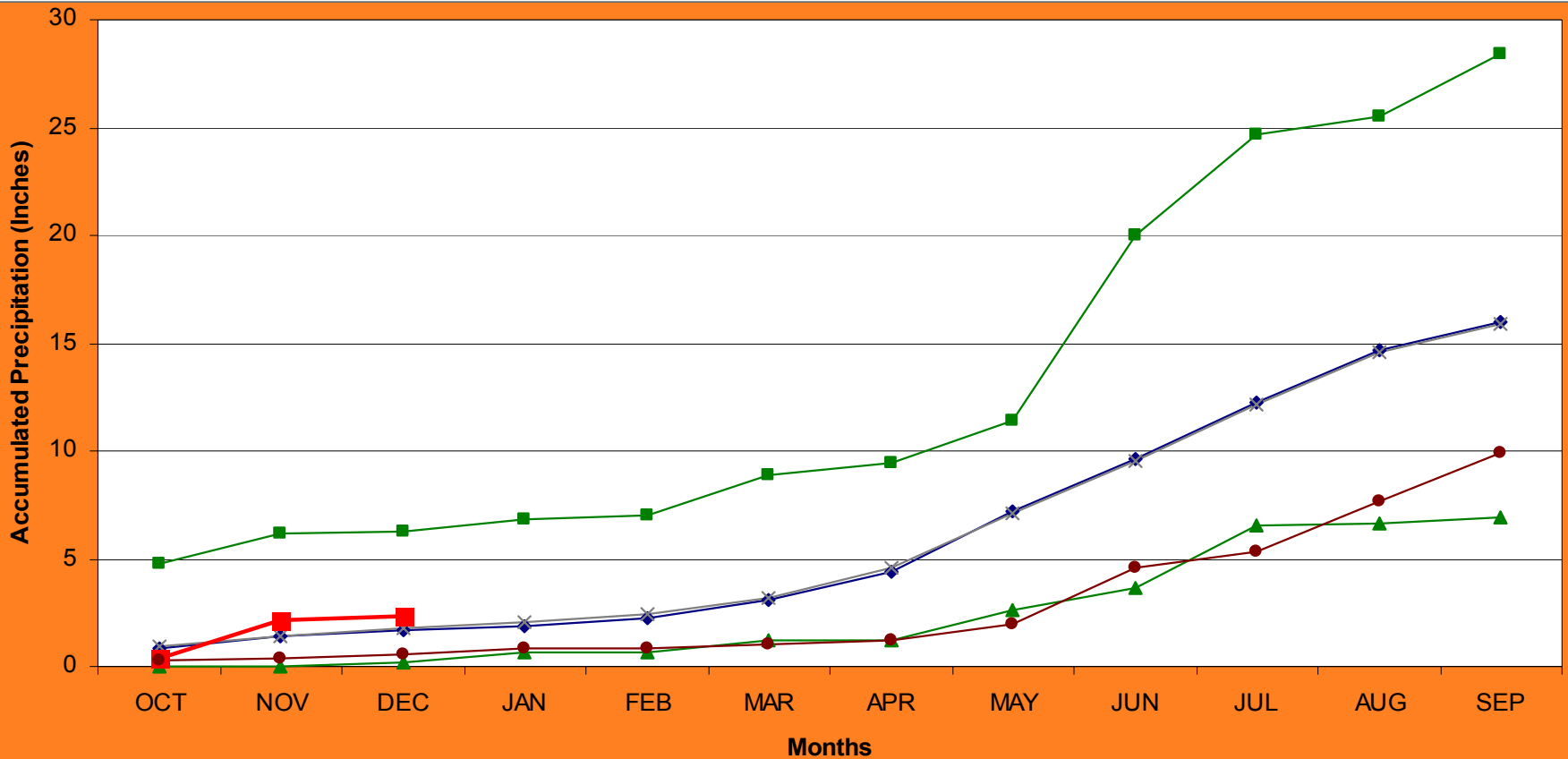
Canon City 2005 Water Year (Oct '04 - Dec '04)



Division 6 – Cheyenne Wells

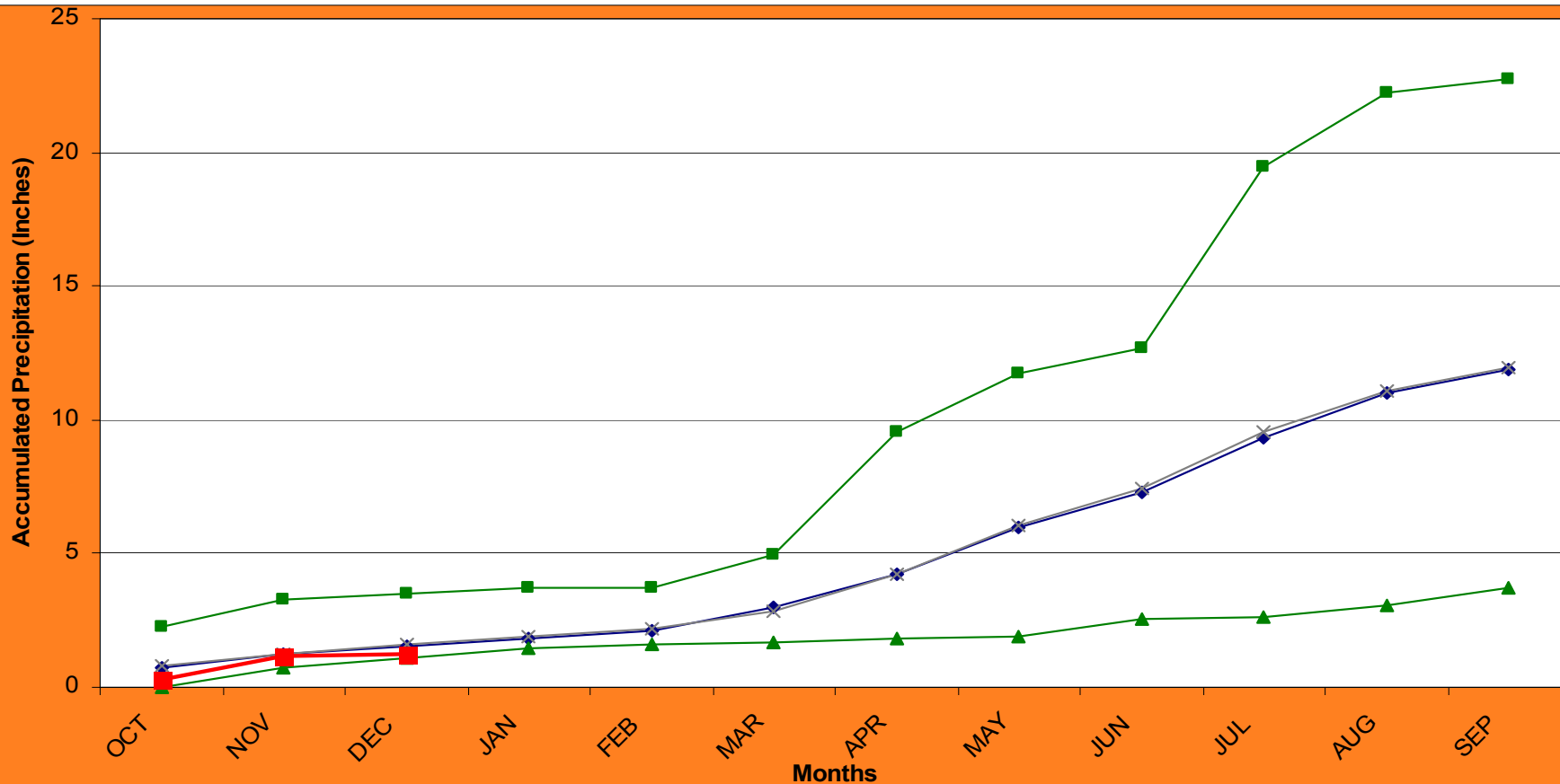
Cheyenne Wells 2005 Water Year (Oct '04 - Dec '04)

◆ 30 Year Averages-1971-2000 ■ Max Year - 1909 ▲ Min Year - 1956
× Period of Record Average - 1971 - 2002 ■ 2005 Water Year ● 2002 Water Year Accumulated



Division 6 – Rocky Ford

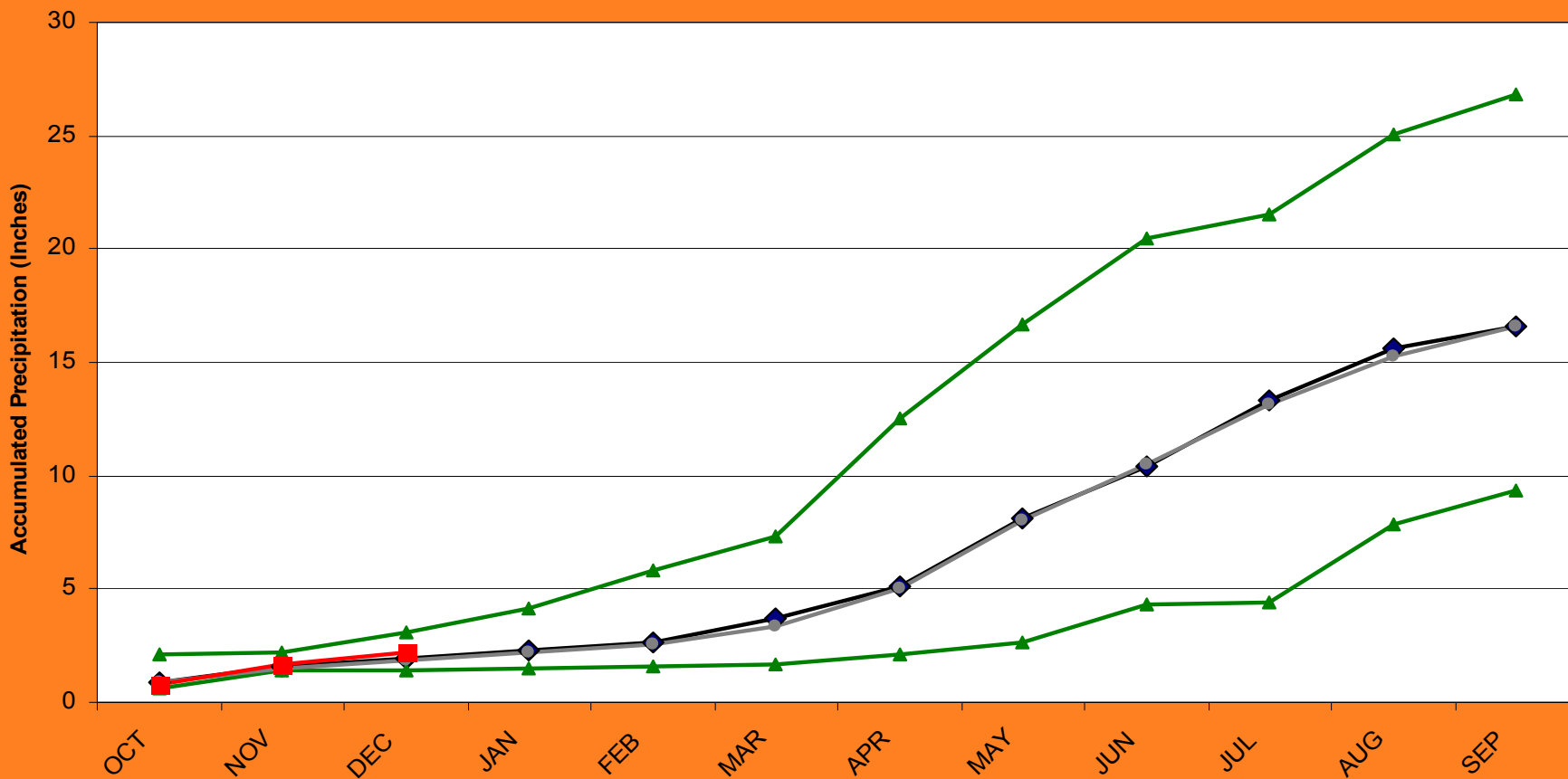
Rocky Ford 2005 Water Year (Oct '04 - Dec '04)



Division 7 – Akron

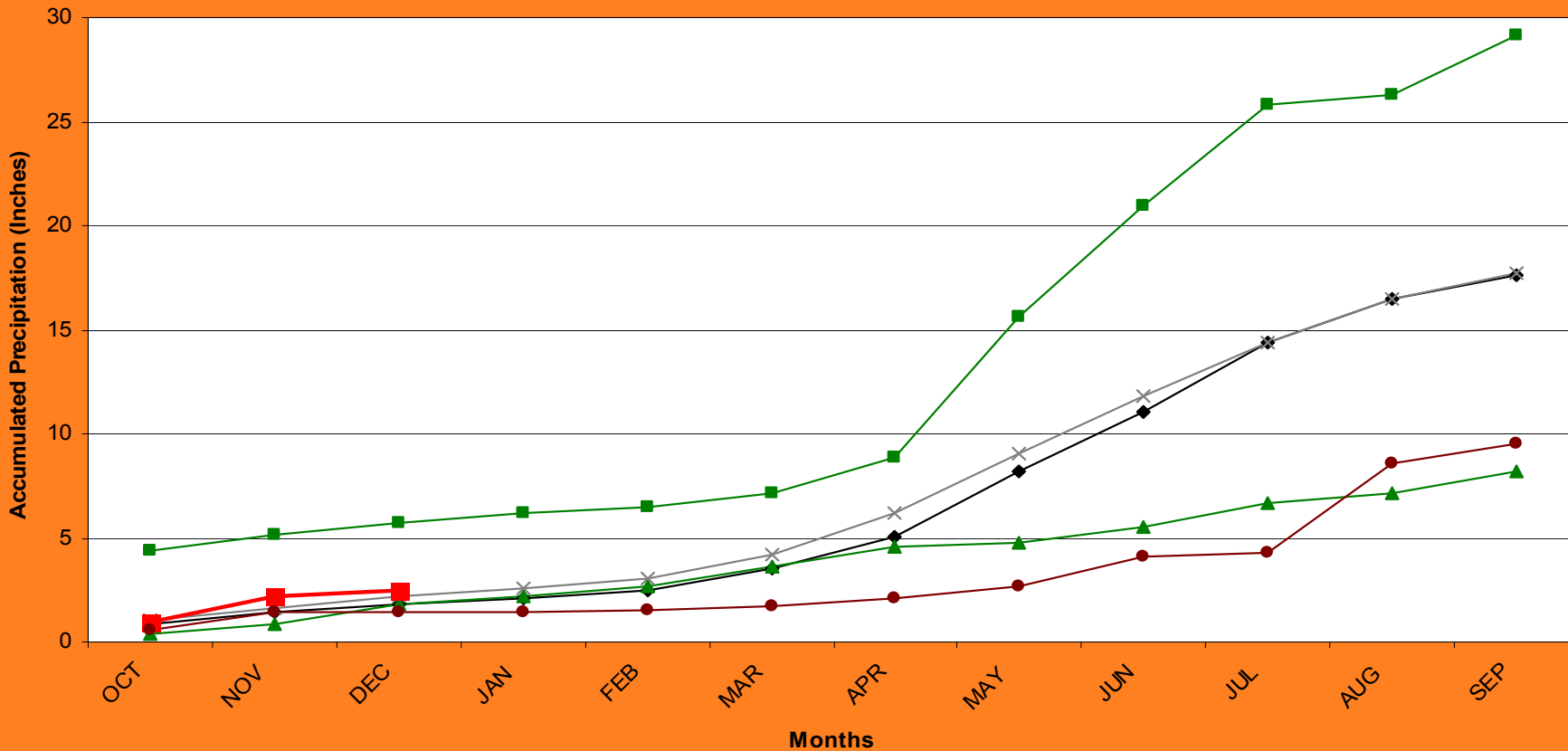
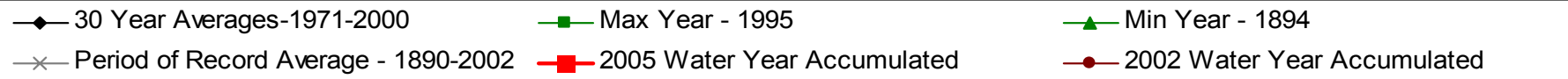
Akron 4E 2005 Water Year (Oct '04 - Dec '04)

- ◆ 30 Year Averages-1971-2000
- ▲ Max Year - 1915
- ▲ Min Year - 2002
- Period of Record Average - 1906 - 2002
- 2005 Water Year Accumulated



Division 7 - Leroy

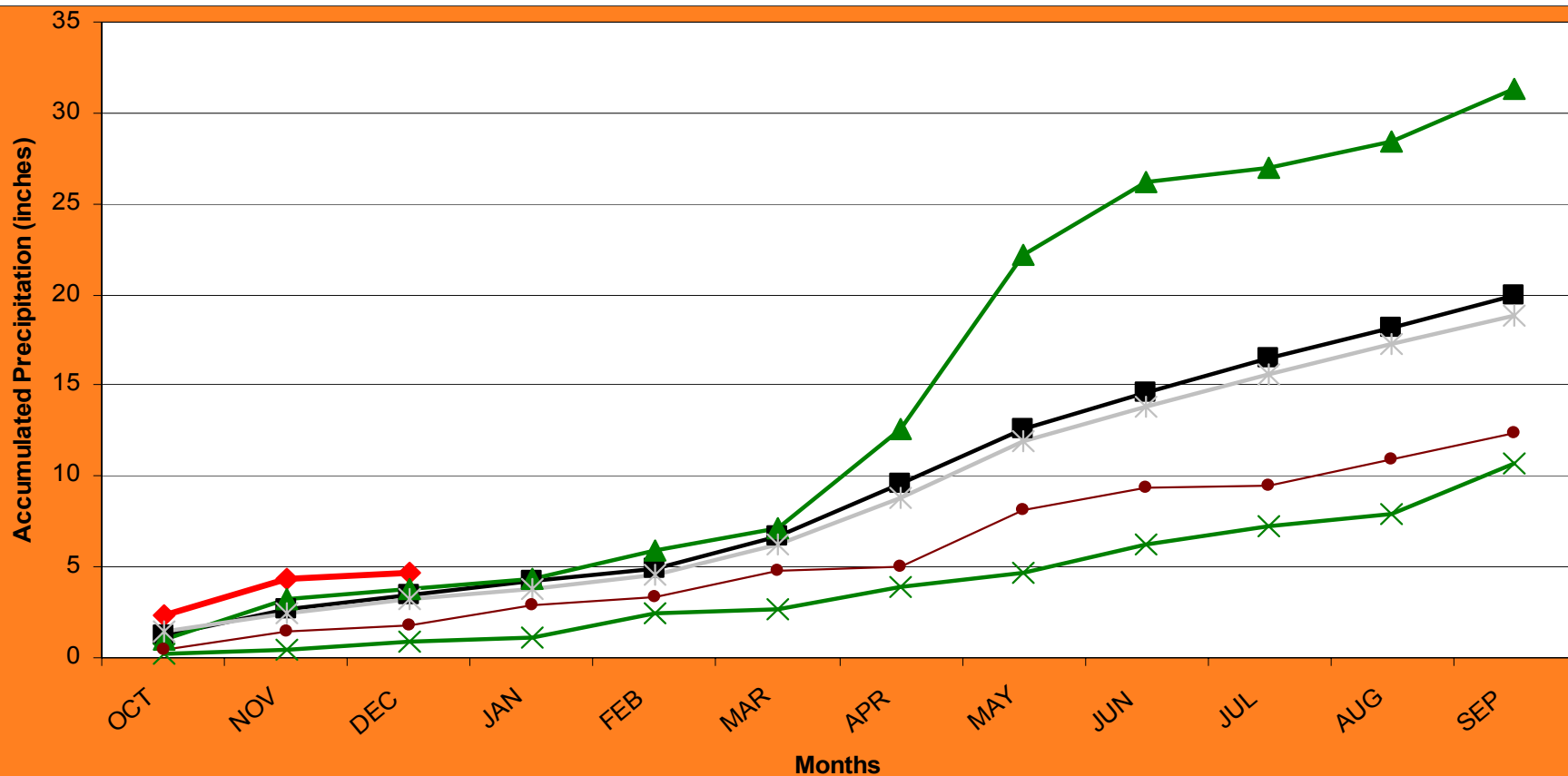
Leroy 5SW 2005 Water Year (Oct '04 - Dec '04)



Division 8 – Boulder

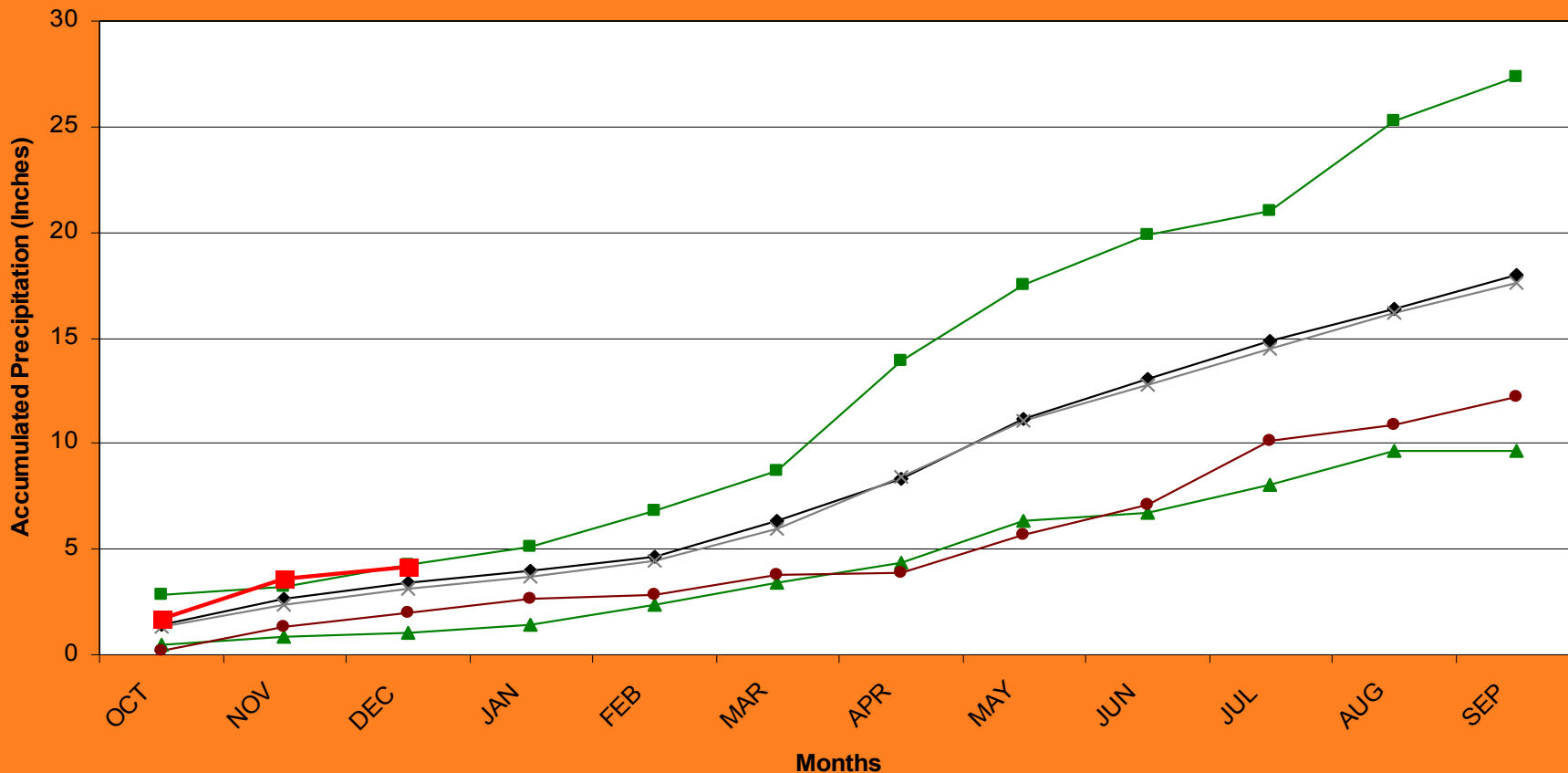
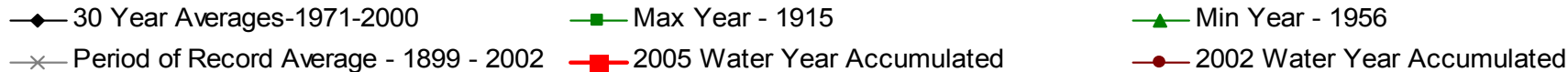
Boulder 2005 Water Year (Oct '04 - Dec '04)

◆ 2005 Water Year ■ 30 Year Averages-1971-2000 ▲ Max Year - 1995
× Min Year - 1966 * Period of Record Average - 1894-2002 ● 2002 Water Year



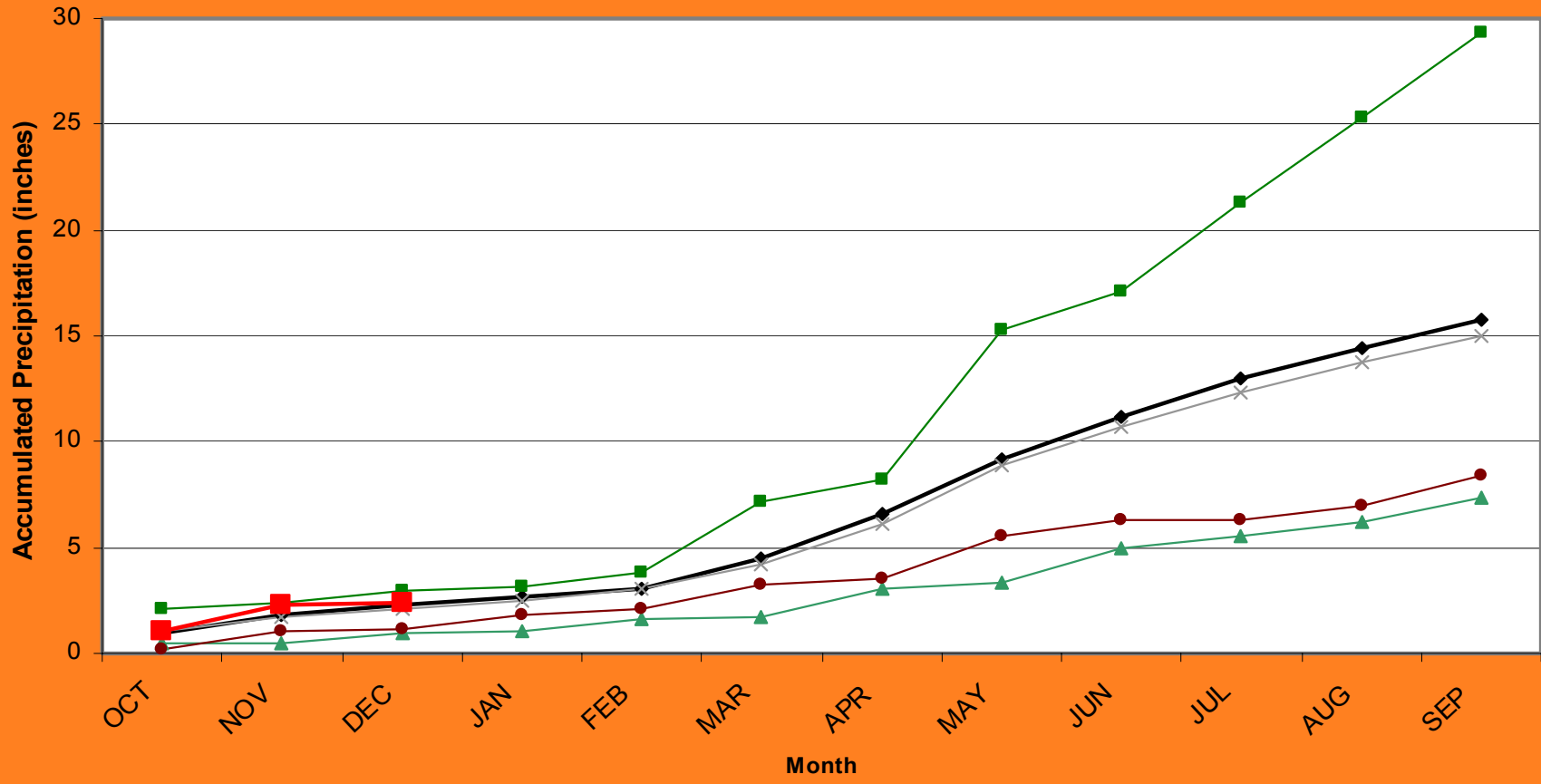
Division 8 – Kassler

Kassler 2005 Water Year (Oct '04 - Dec '04)

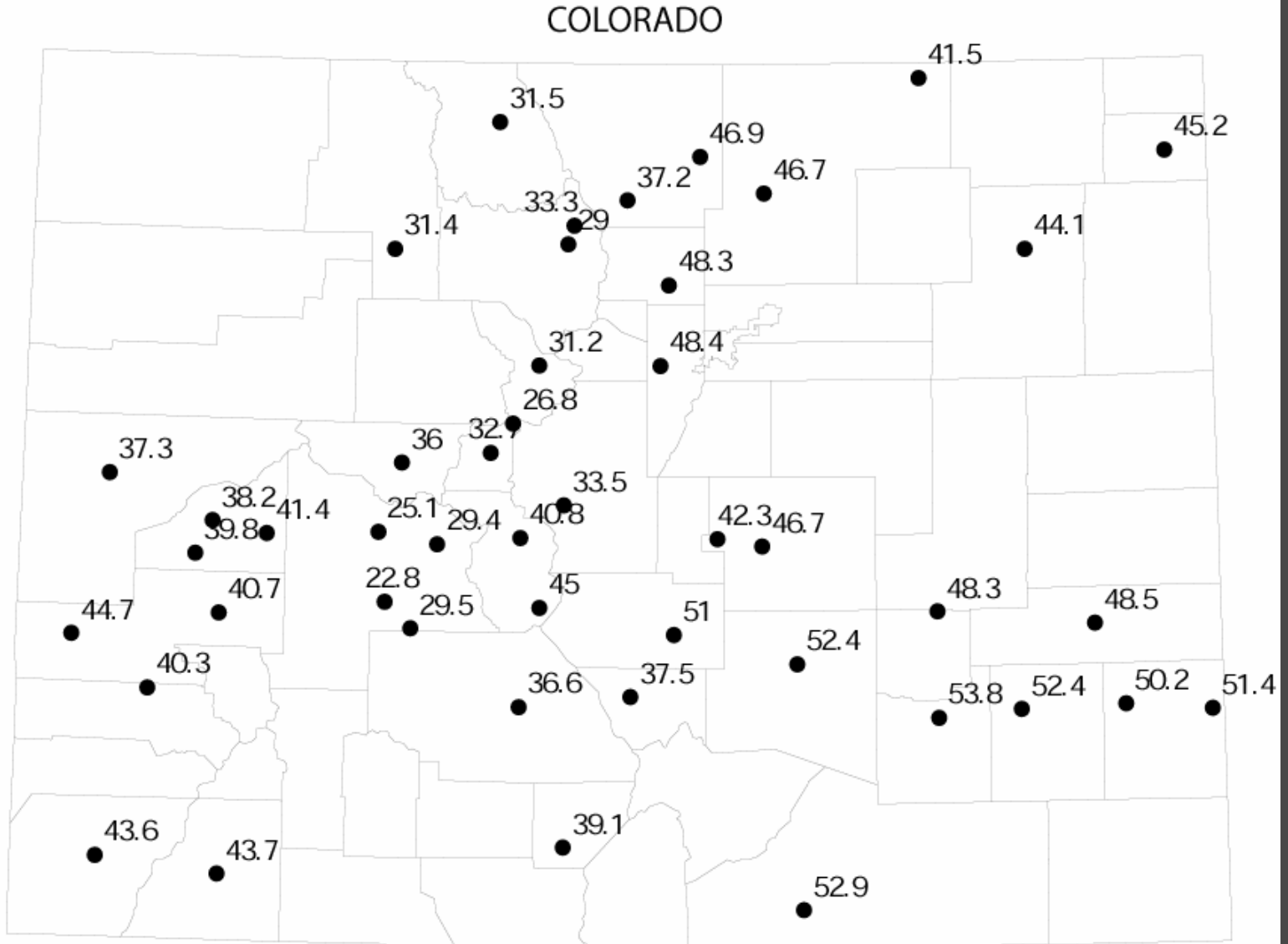


Division 8 – Fort Collins

Fort Collins 2005 Water Year (Oct '04 - Dec '04)

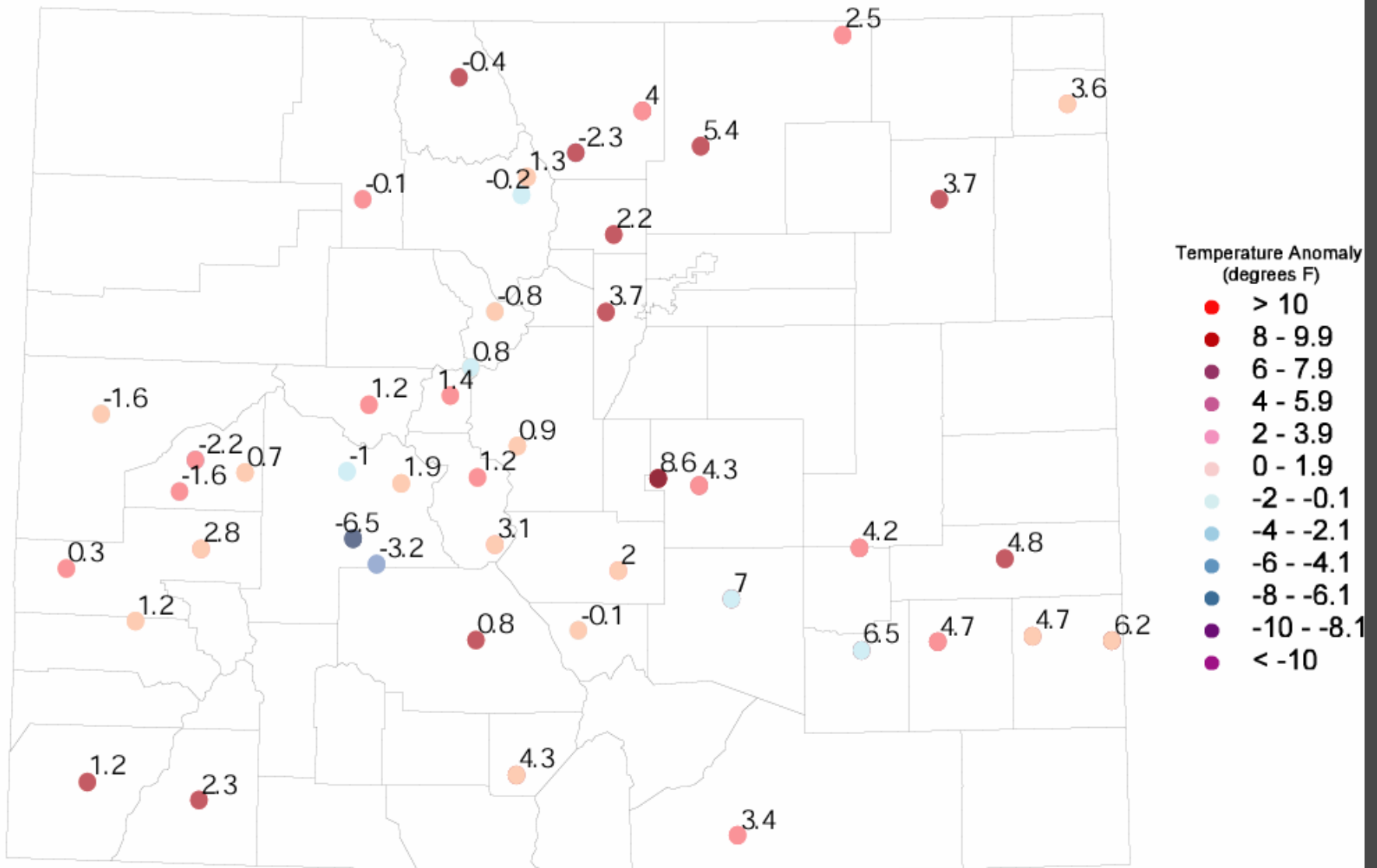


30-Year Average December Maximum Temperatures



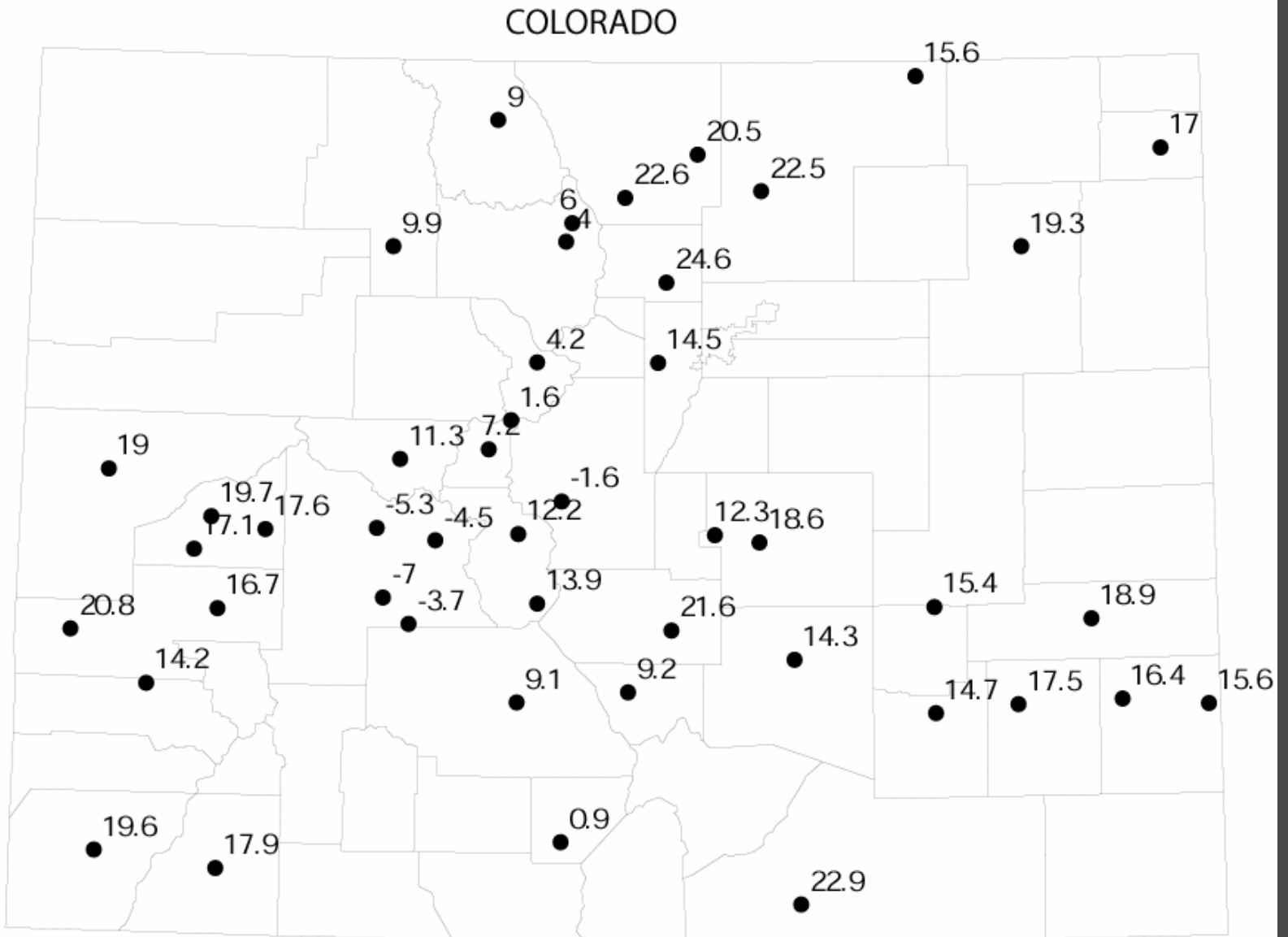
December average maximum temperatures for 1971-2000 averages.

COLORADO



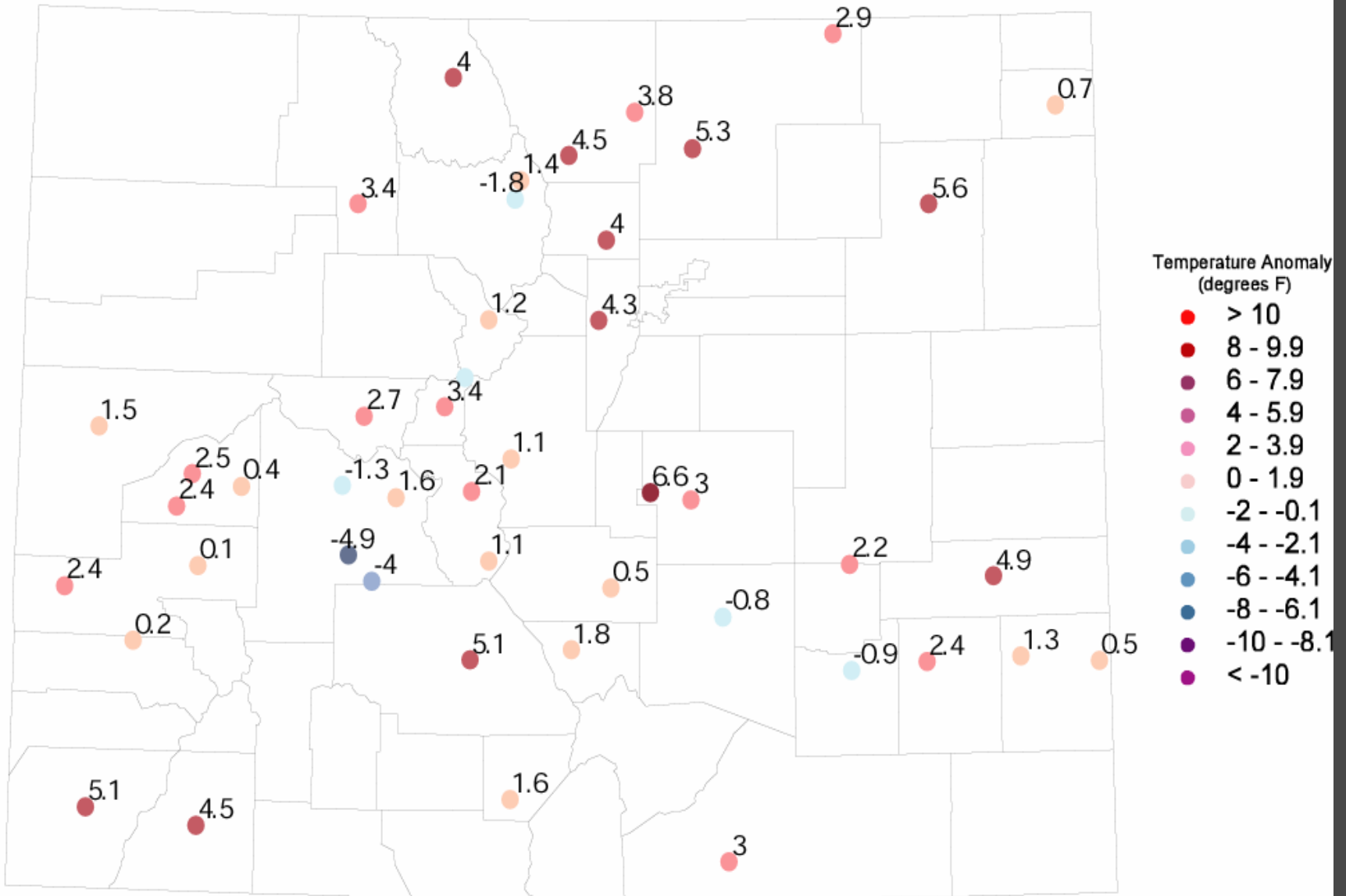
December 2004 average maximum temperature departures from the 1971-2000 averages.

30-Year Average December Minimum Temperatures



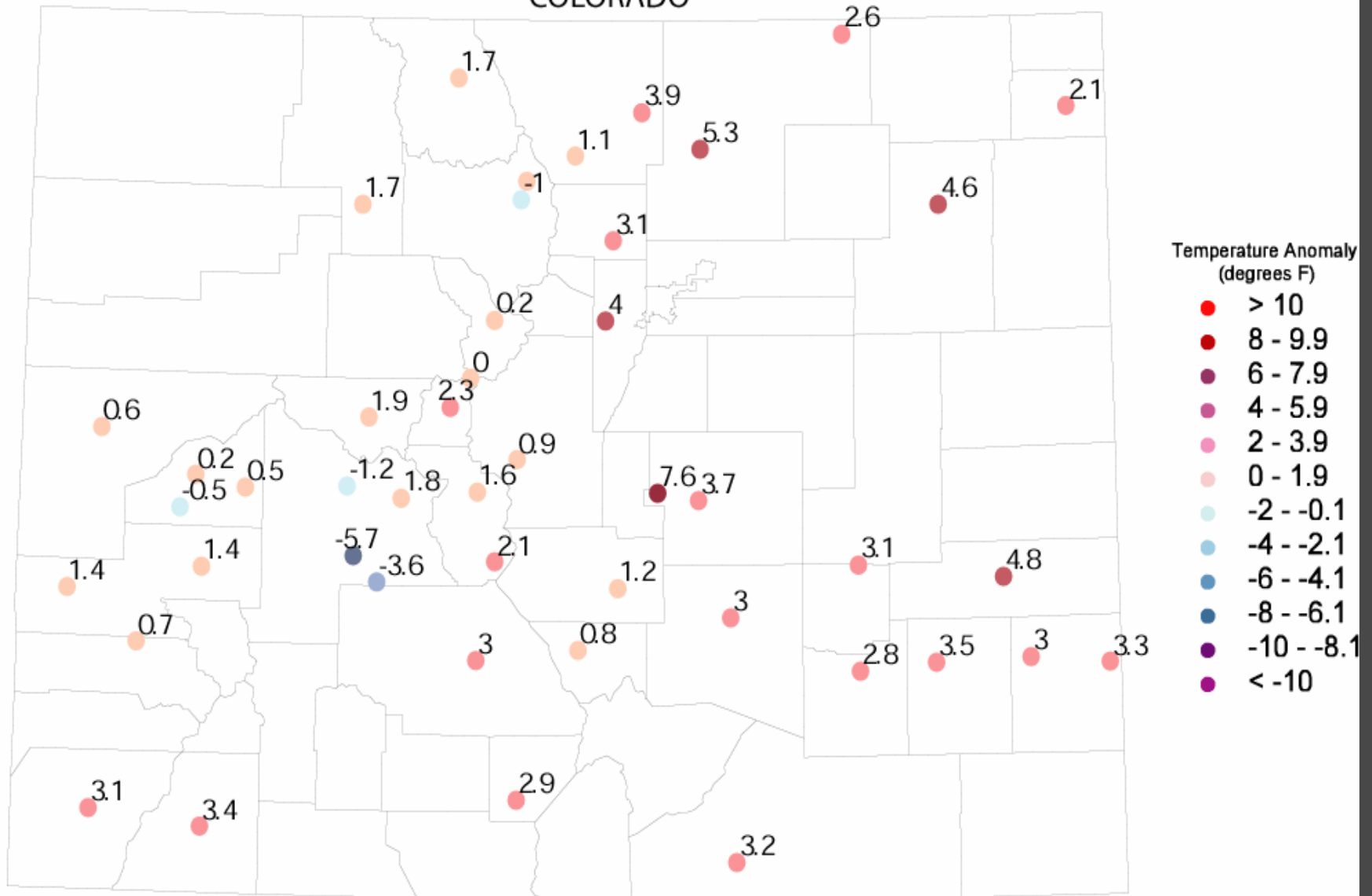
December average minimum temperatures for 1971-2000 averages.

COLORADO



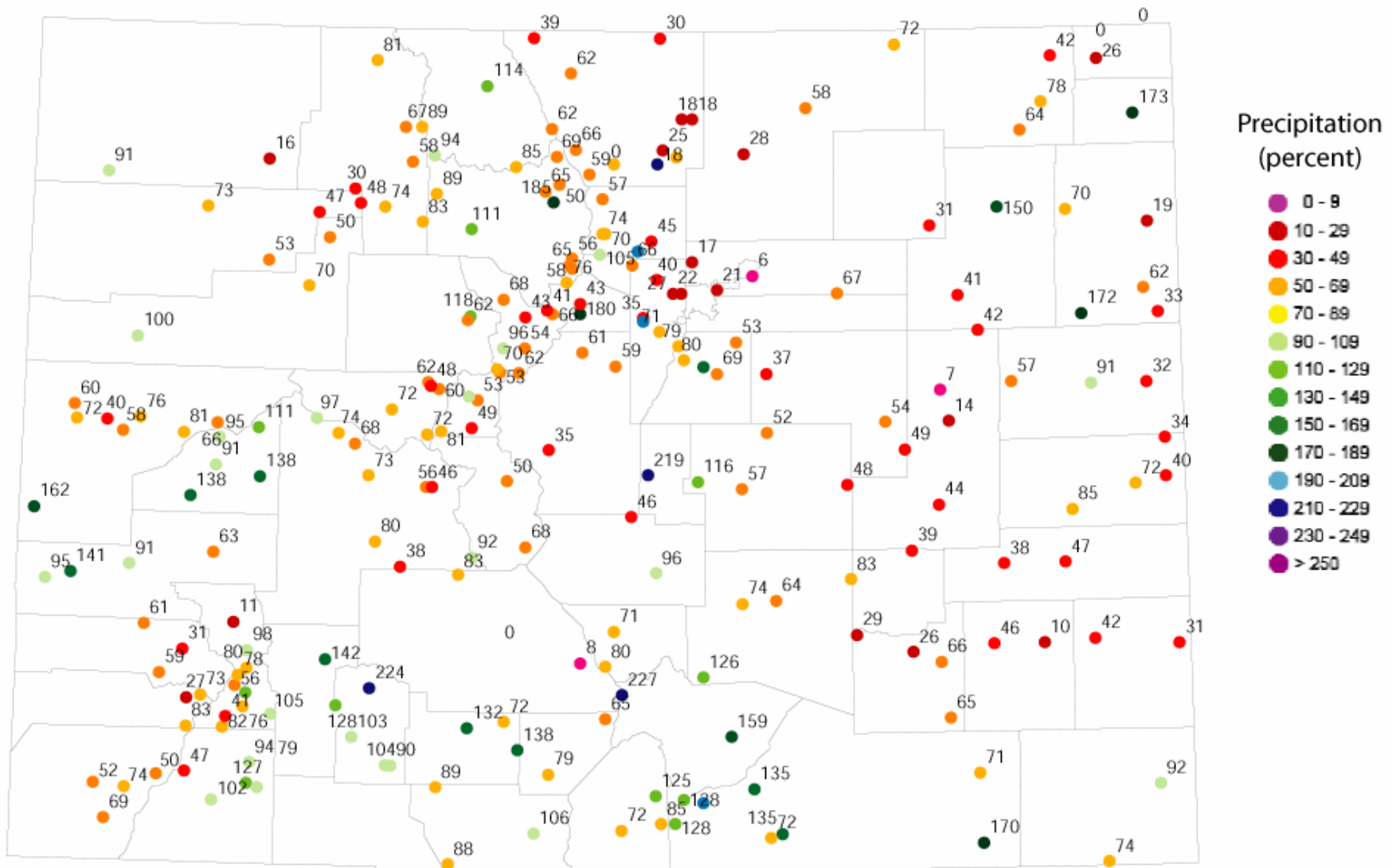
December 2004 average minimum temperature departures from the 1971-2000 averages.

COLORADO



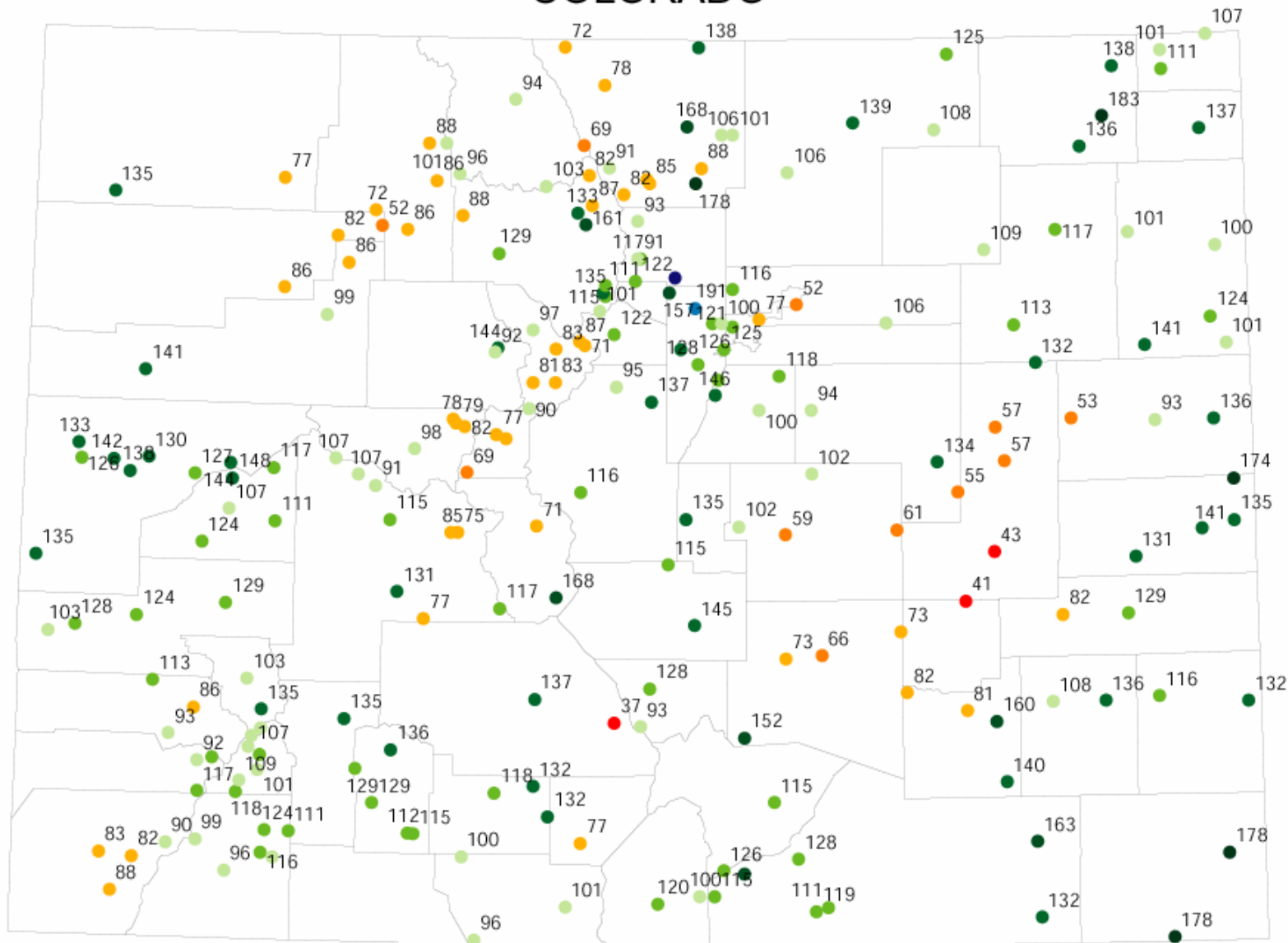
December 2004 average mean temperature departures from the 1971-2000 averages.

COLORADO



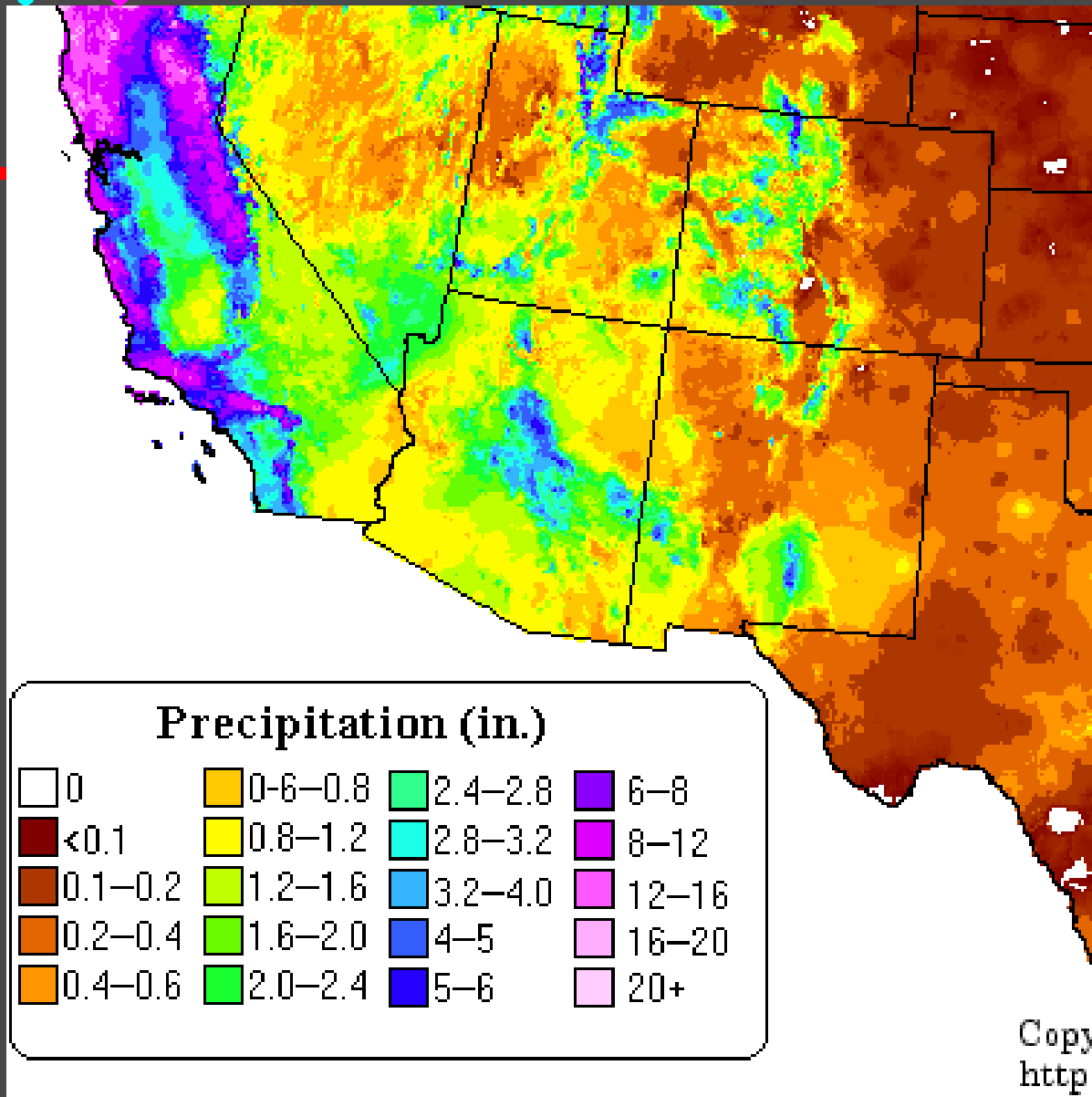
December 2004 precipitation as a percent of the 1971-2000 average.

COLORADO



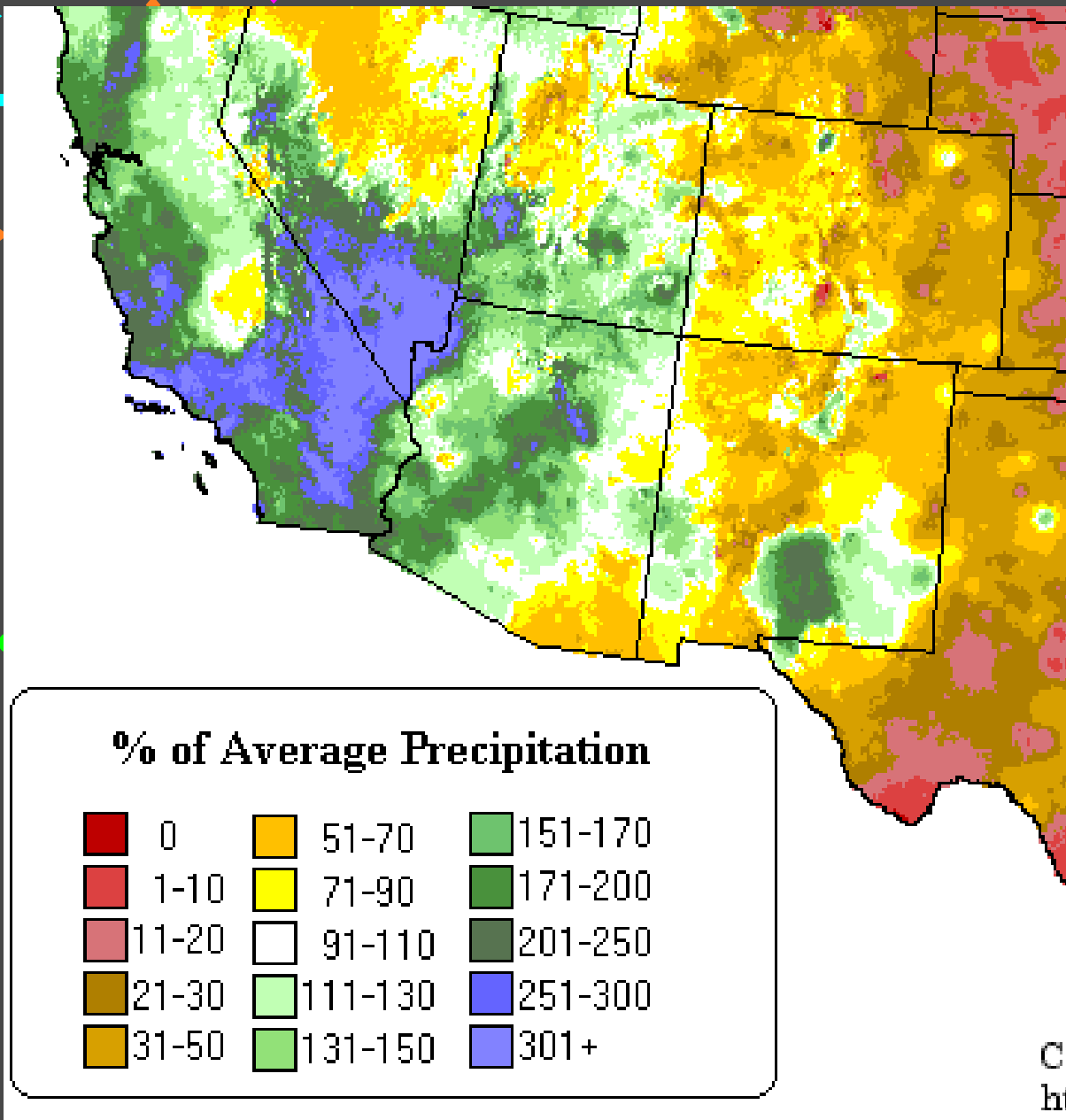
Water Year 2005 (October 2004 through December 2004) precipitation as a percent of the 1971-2000 average.

Precipitation: December 2004



Courtesy of Oregon Climate Service, <http://www.ocs.orst.edu/prism>

**1-month
Percent of
Average
Precipitation –
December
2004**



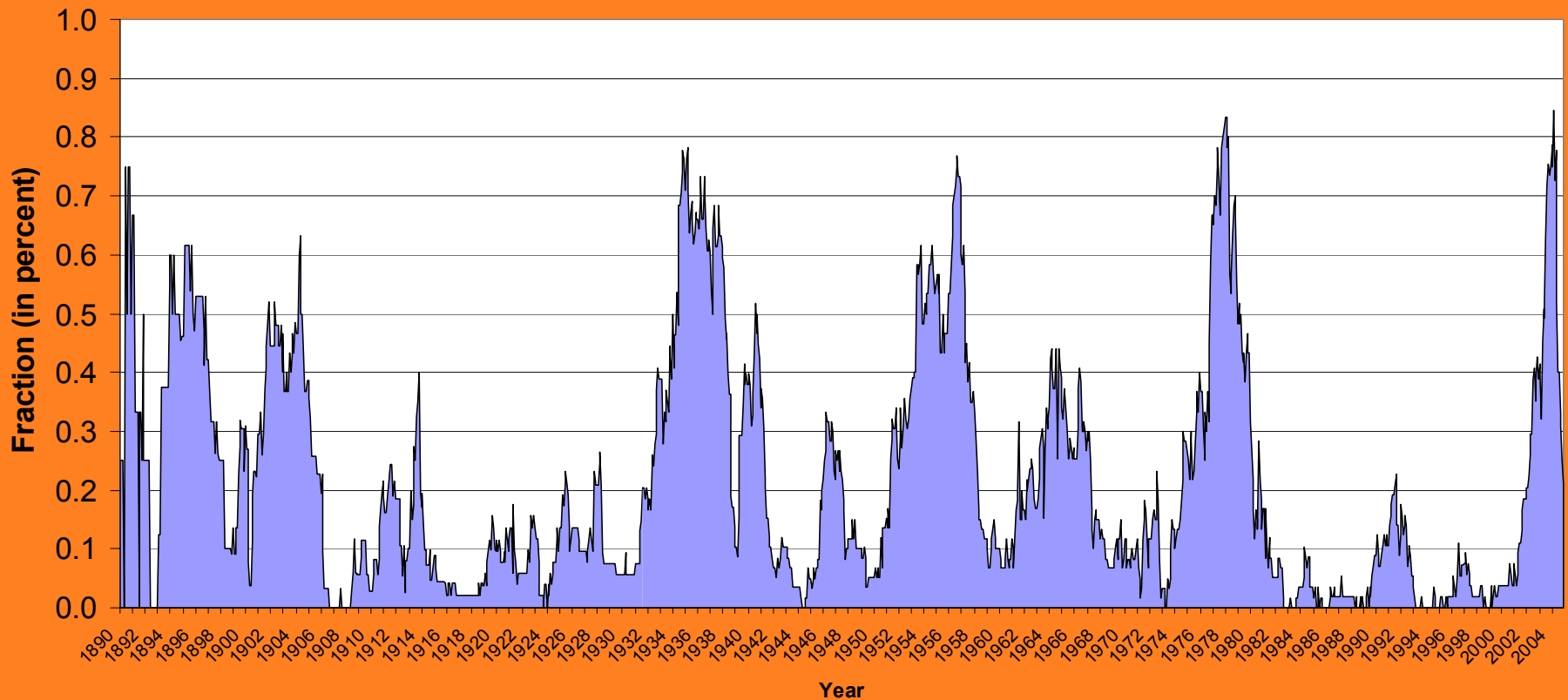
Courtesy of Oregon Climate Service, <http://www.ocs.orst.edu/prism>

Fraction of Colorado in Drought

Fraction of Colorado in Drought

Based on 48 month SPI

(1890 - Dec 2004)

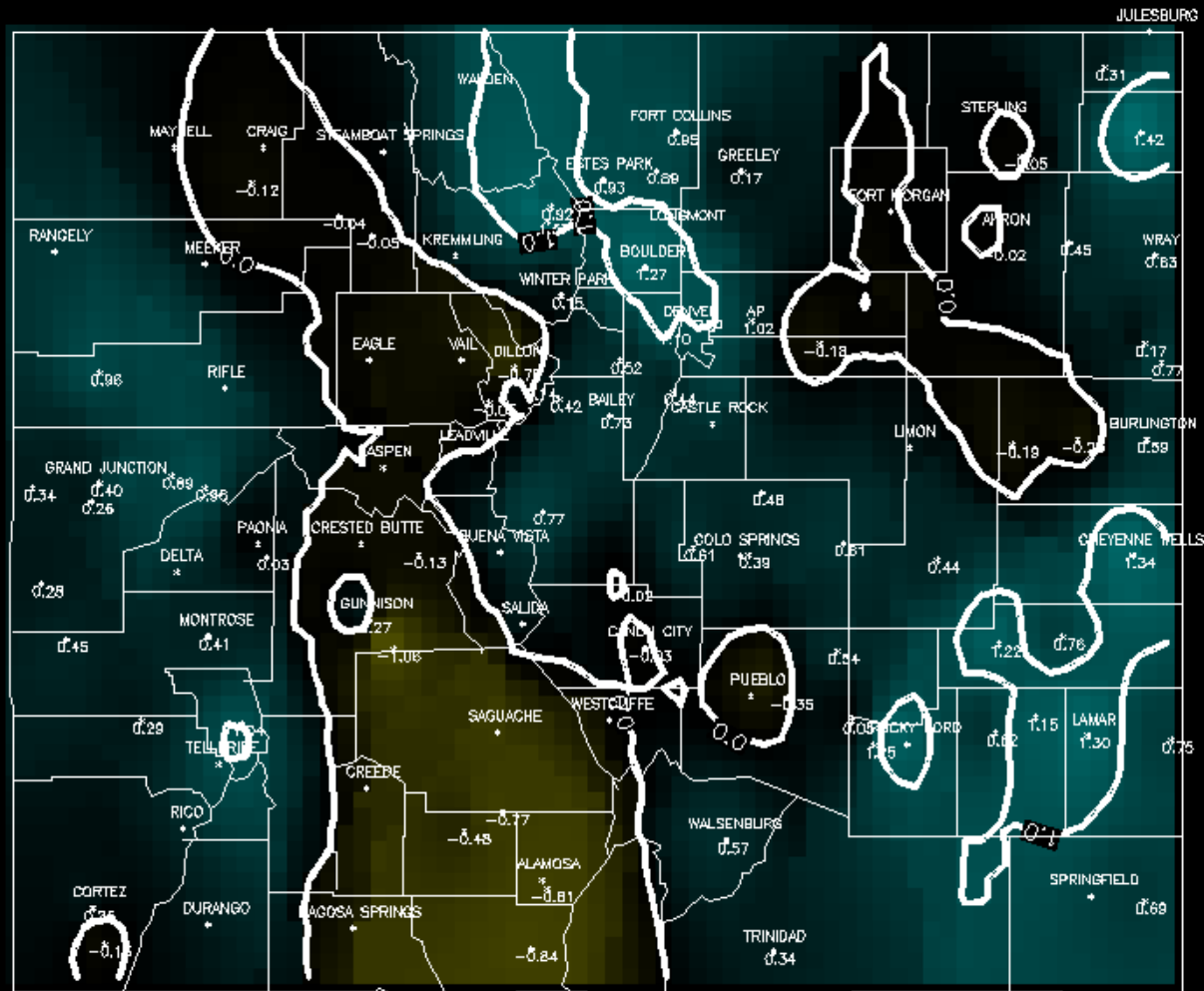


Calibration period is 1961-2000. Data values produced by John Kleist.

Projected Conditions at 0.5 Probability Level 12 Month SPI at 6 months

Colorado

12/2004 12 mon. SPI – Projected 6 mon. at P=0.50



Projected Conditions at 0.8 Probability Level 12 Month SPI at 6 months

Colorado

12/2004 12 mon. SPI - Projected 6 mon. at P=0.80



100 % << 2.0	0 % << -1.0
57 % << 1.0	0 % << -2.0
5 % << 0.0	0 % << -3.0

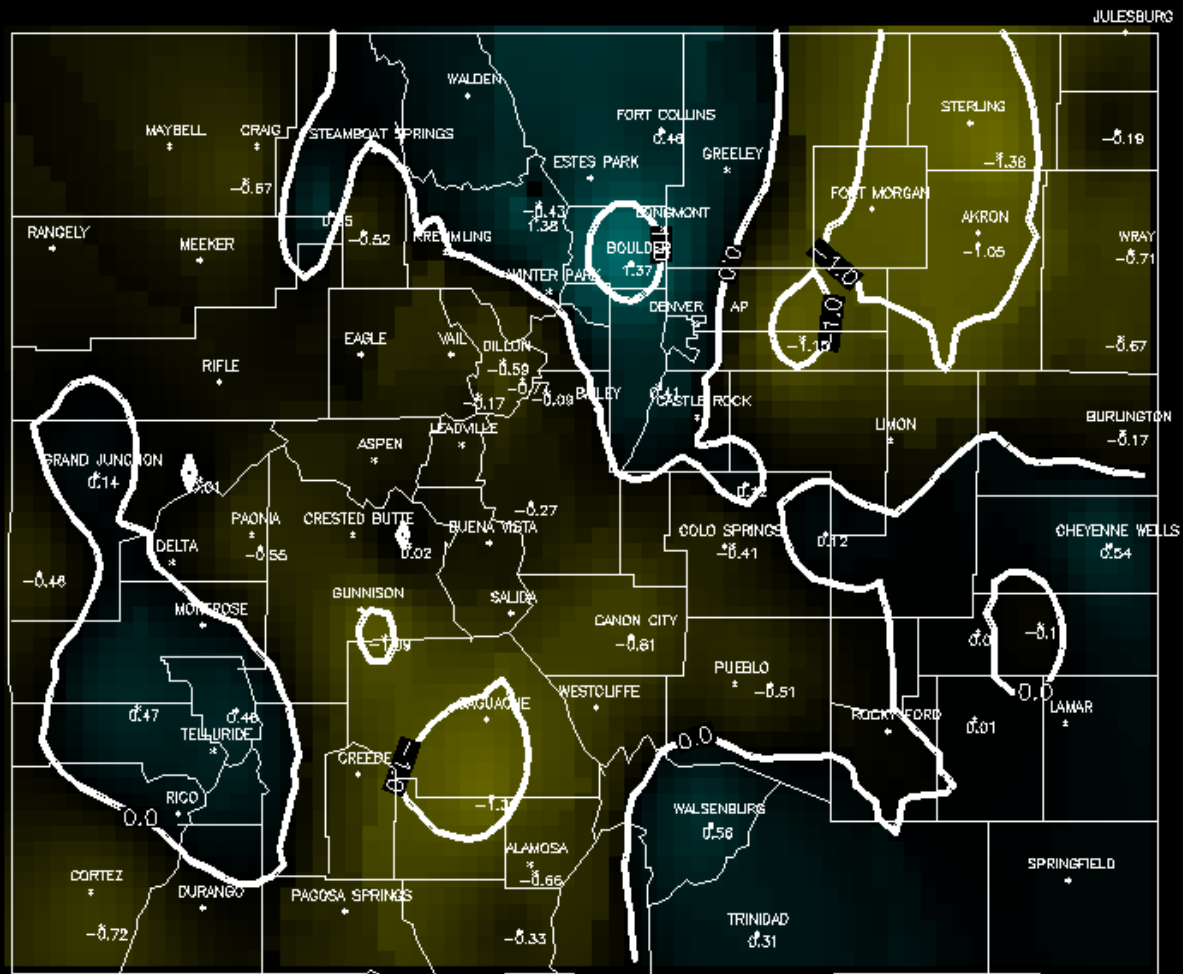
Produced by:
Colorado Climate Center
Fort Collins, CO

Projected Conditions at 0.8 Probability Level

48 Month SPI at 12 months

Colorado

12/2004 48 mon. SPI - Projected 12 mon. at P=0.80

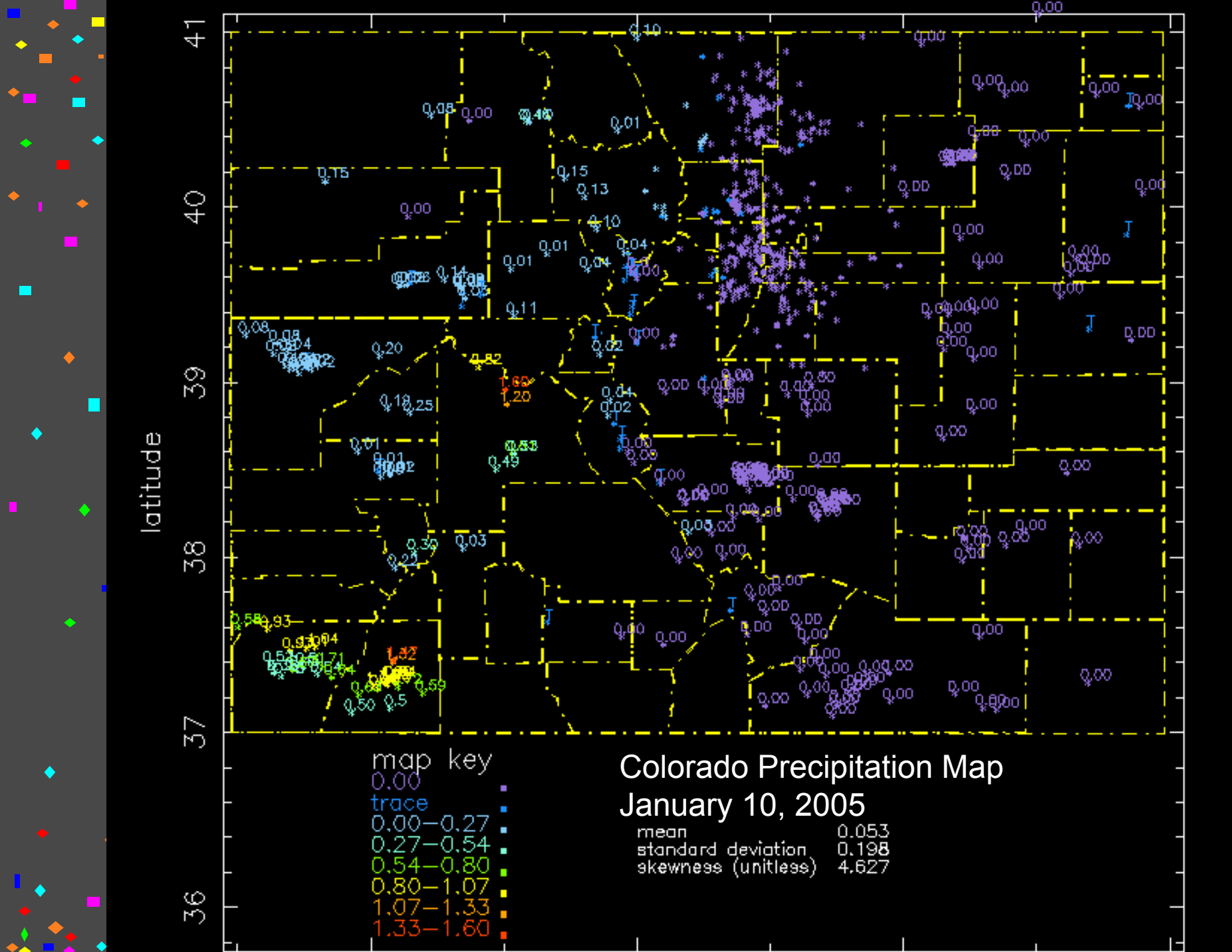


100 % <<< 2.0	6 % <<< -1.0
99 % <<< 1.0	0 % <<< -2.0
64 % <<< 0.0	0 % <<< -3.0

Produced by:
Colorado Climate Center
Fort Collins, CO

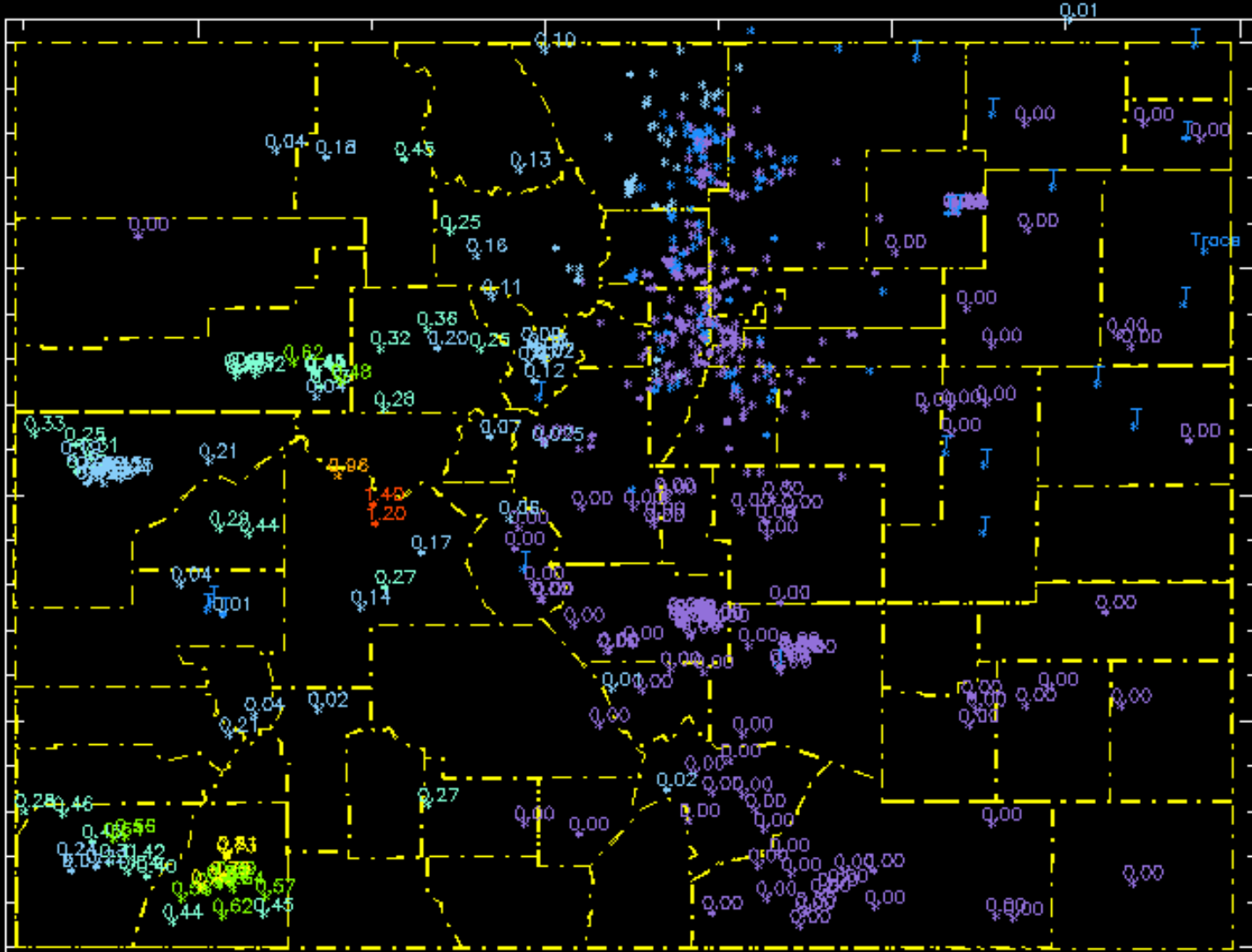
How About CoCoRaHS?





latitude

41
40
39
38
37
36



map key

- 0.00
- trace
- 0.00-0.24
- 0.24-0.47
- 0.47-0.70
- 0.70-0.94
- 0.94-1.17
- 1.17-1.40

Colorado Precipitation Map January 11, 2005

mean 0.057
standard deviation 0.162
skewness (unitless) 3.925

***For more information visit the
CoCo RaHS Web site***

www.cocorahs.org



***Support for this project provided by
Informal Science Education Program,
National Science Foundation
and
many local charter sponsors.***

Colorado Climate Center

Colorado State University

*Data and Power Point Presentations available
for downloading*

[*http://ccc.atmos.colostate.edu*](http://ccc.atmos.colostate.edu)

- *click on “Drought”*
- *then click on “Presentations”*

