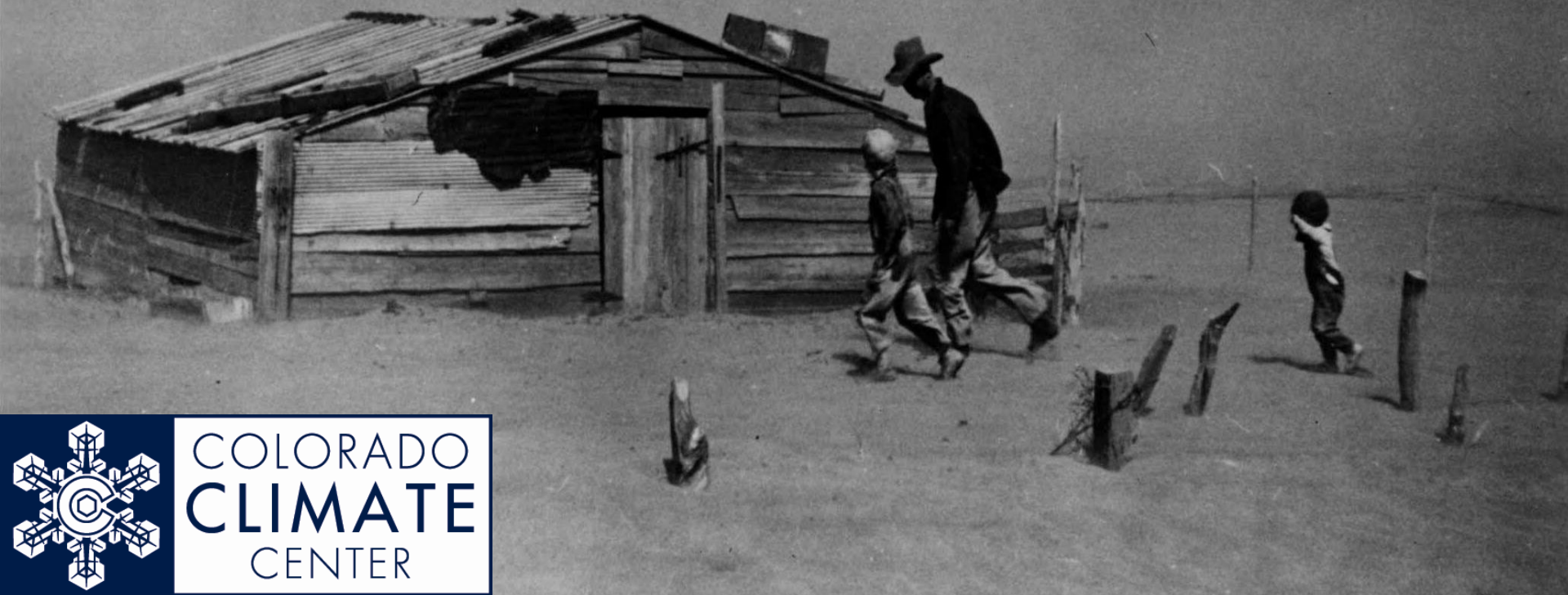


Drought: Colorado's Silent Natural Hazard



COLORADO
CLIMATE
CENTER



First off, just what is drought?

- Precipitation deficits?
- Soil moisture?
- Streamflow?
- Plants wilting?
- Wildfire?
- Famine?
- Other?

Drought seems so **obvious**...

There's *not enough water*

- Yet it remains difficult to define, especially for areas that are climatically dry
- One economic sector's drought may be another's "wonderful weather"
- But in long-term drought, almost everyone suffers



Drought defined by its impacts

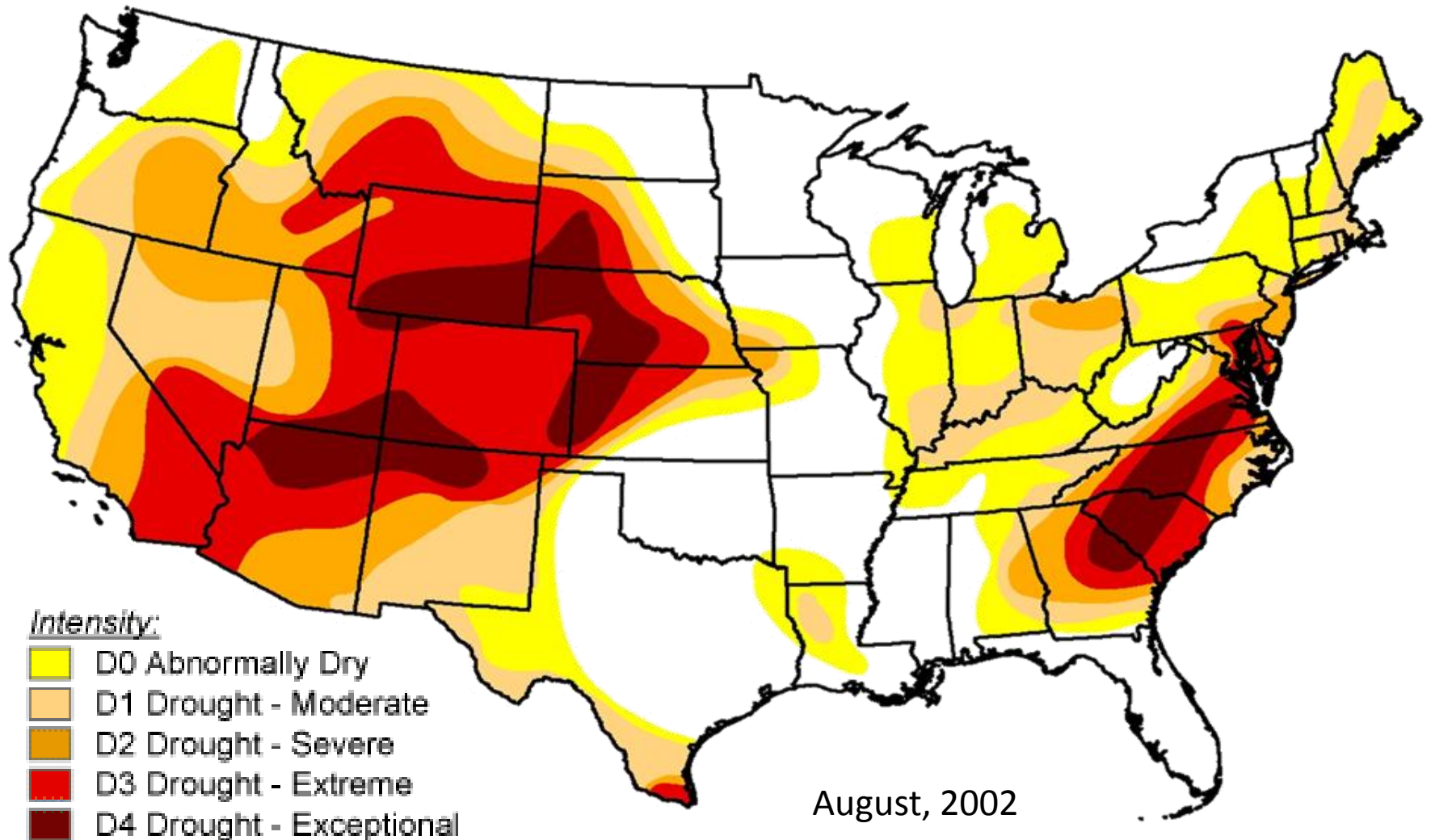
- **Meteorological Drought** – departures from “normal” precipitation
- **Agricultural Drought** – soil / groundwater deficits that affect vegetation
- **Hydrologic Drought** – deficiency of water in watersheds, rivers; often lags agriculture impacts
- **Socio-Economic Drought** – shortage of some item (water, food, fish, natural values) that affects the balance of supply and demand



What is drought?

- Drought is the condition that occurs when ***water resources are insufficient to meet water needs.***
- ... *in other words* ...
- ***Drought is a social phenomenon.***
 - It's what it does to people that counts!

Approximate Peak of 2002 Drought -- Colorado's worst recent Drought

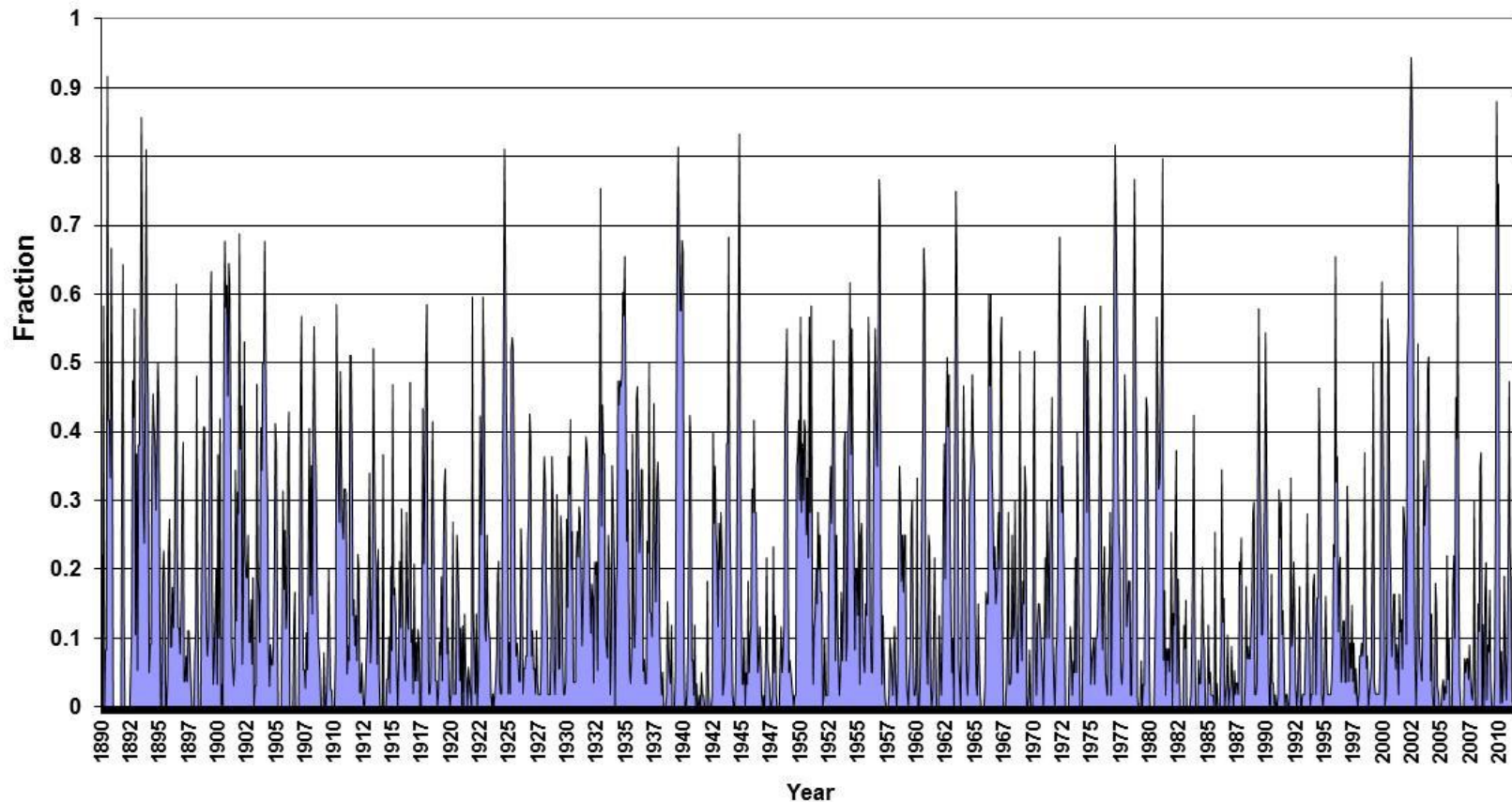


How Often Do We Experience Drought?



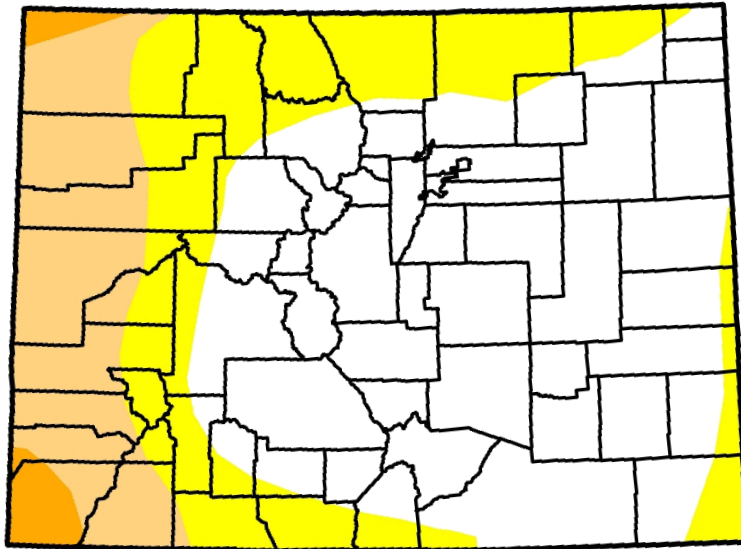
Some part of the state is experiencing at least moderate drought a surprisingly high percentage of the time

Fraction of Colorado in Drought
Based on 3 month SPI
(1890 - April 2011)

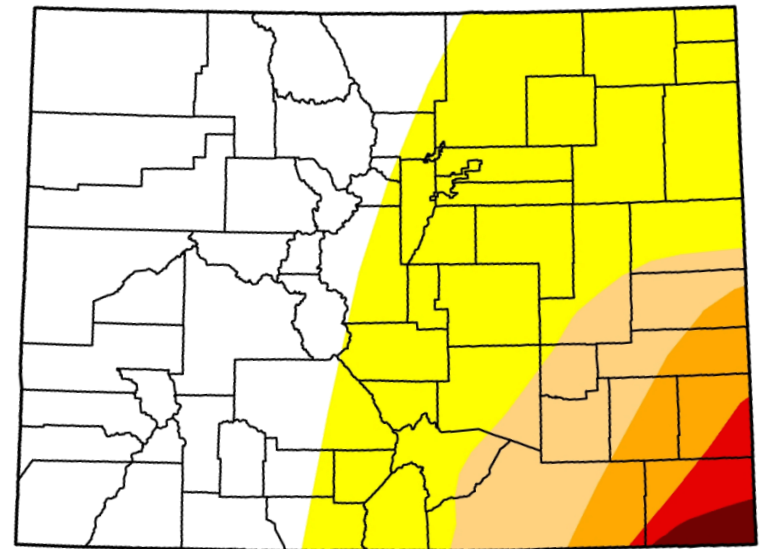


Short-term dryness occurs often in parts of Colorado...at any given time we are either in , recovering from, or headed towards drought

July 10, 2007



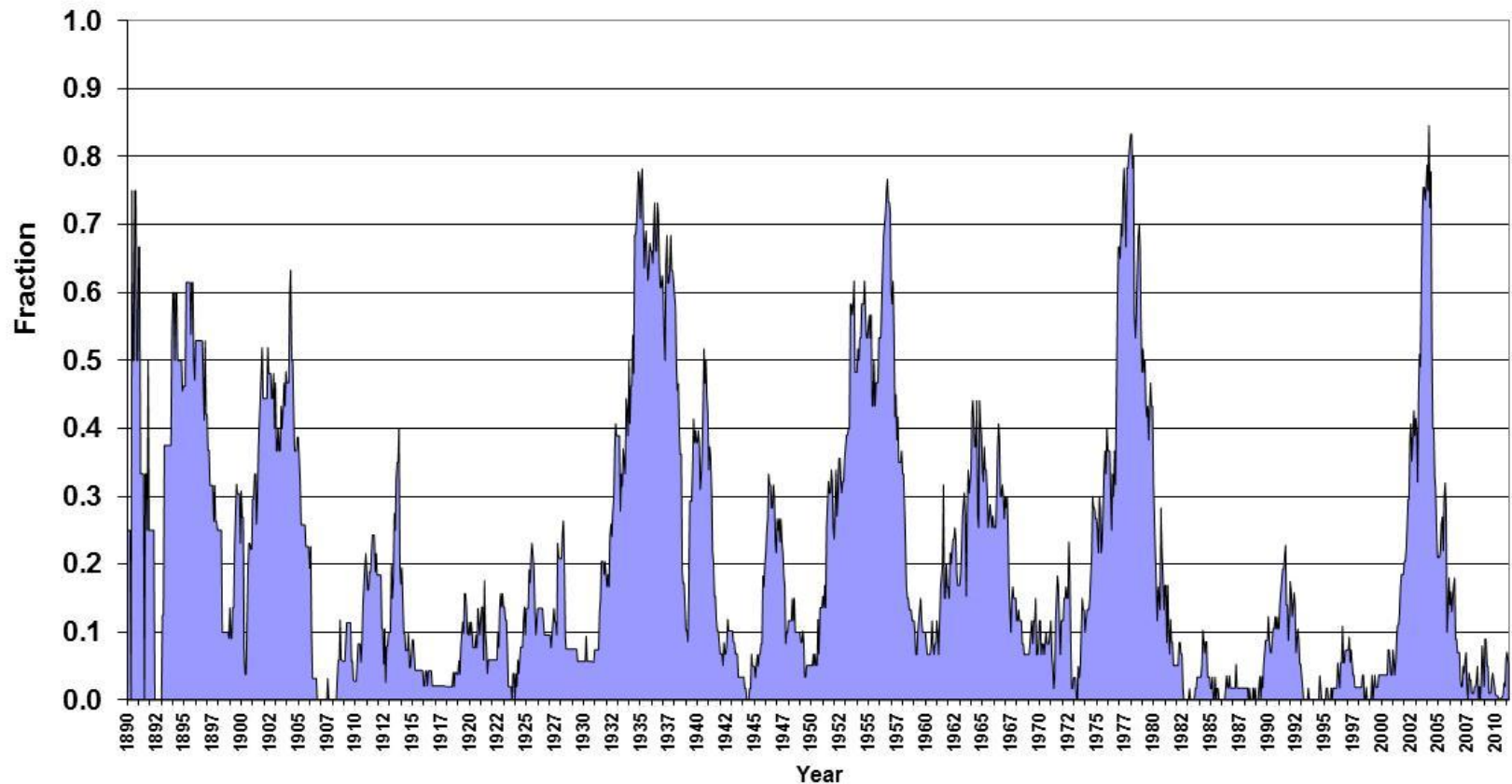
July 8, 2008



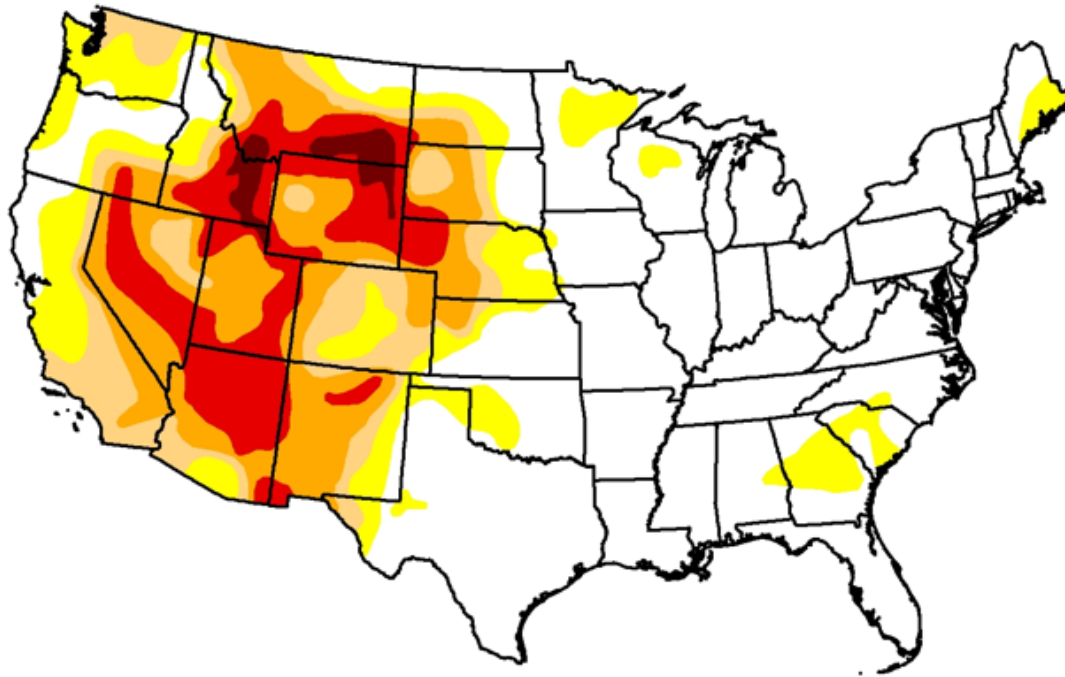
- D0: Abnormally Dry
- D1: Drought-Moderate
- D2: Drought-Severe
- D3: Drought-Extreme
- D4: Drought-Exceptional

Multi-year droughts are infrequent (every 10-30 yrs)
but have broader and deeper impacts

Fraction of Colorado in Drought
Based on 48 month SPI
(1890 - April 2011)



The drought history of each part of the state is different, but we share the misery of the large droughts.



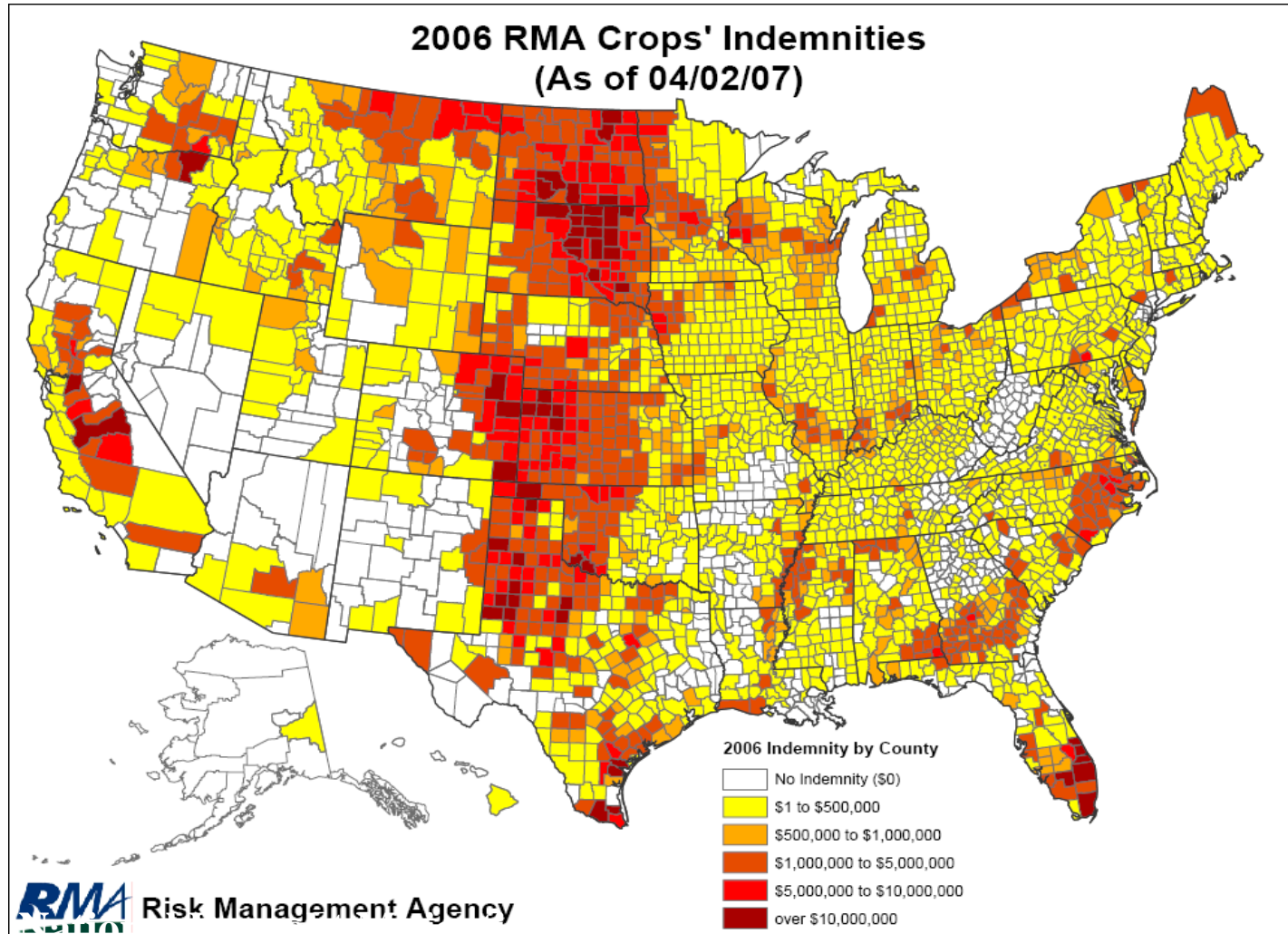
Drought Monitor for August 3, 2004 -
the 5th year of dry conditions in
Colorado and the West




What are the Potential Impacts of Drought?

- Economic
 - Crop loss, livestock loss, timber reduction, increased energy demand and reduction of supply, decreased food production, etc.
- Social
 - Heat related deaths, low flow contamination, population migration, etc.
- Environment
 - Reduced water supply , damage to plant and animal species, loss of wetlands, water quality, etc.

Economic Impacts of Drought Are A Bit Easier to Identify and Quantify than Social or Environmental





What are the Potential Impacts of Drought?

- Knowing the dominant impacts in your area aids in planning for future drought, but impact data is hard to come by.
- Report your impacts to the Drought Impact Reporter to help us understand HOW drought affects YOU!

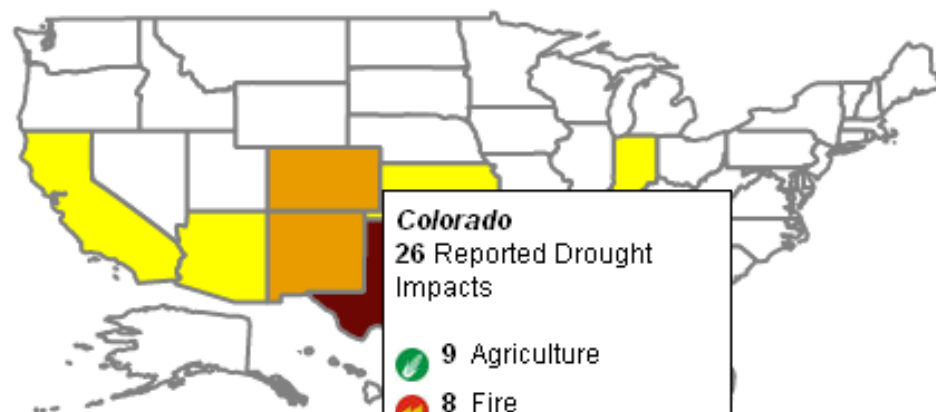
<http://droughtreporter.unl.edu/>

Drought Impact Reporter

National Drought Mitigation Center



[View Drought Impacts](#) | [Add A Drought Impact](#) | [Time-Lapse Animation](#) | [About](#) | [Help](#) | [User Login](#)



Colorado
26 Reported Drought
Impacts

-  9 Agriculture
-  8 Fire
-  3 Water/Energy
-  3 Environment
-  2 Social
-  1 Other

Map Options

Impact Categories:







- | | |
|--|--|
| <input checked="" type="checkbox"/>  Agriculture | <input checked="" type="checkbox"/>  Fire |
| <input checked="" type="checkbox"/>  Water/Energy | <input checked="" type="checkbox"/>  Social |
| <input checked="" type="checkbox"/>  Environment | <input checked="" type="checkbox"/>  Other |

Source:

Time Period:

[Show Drought Monitor Layers](#)

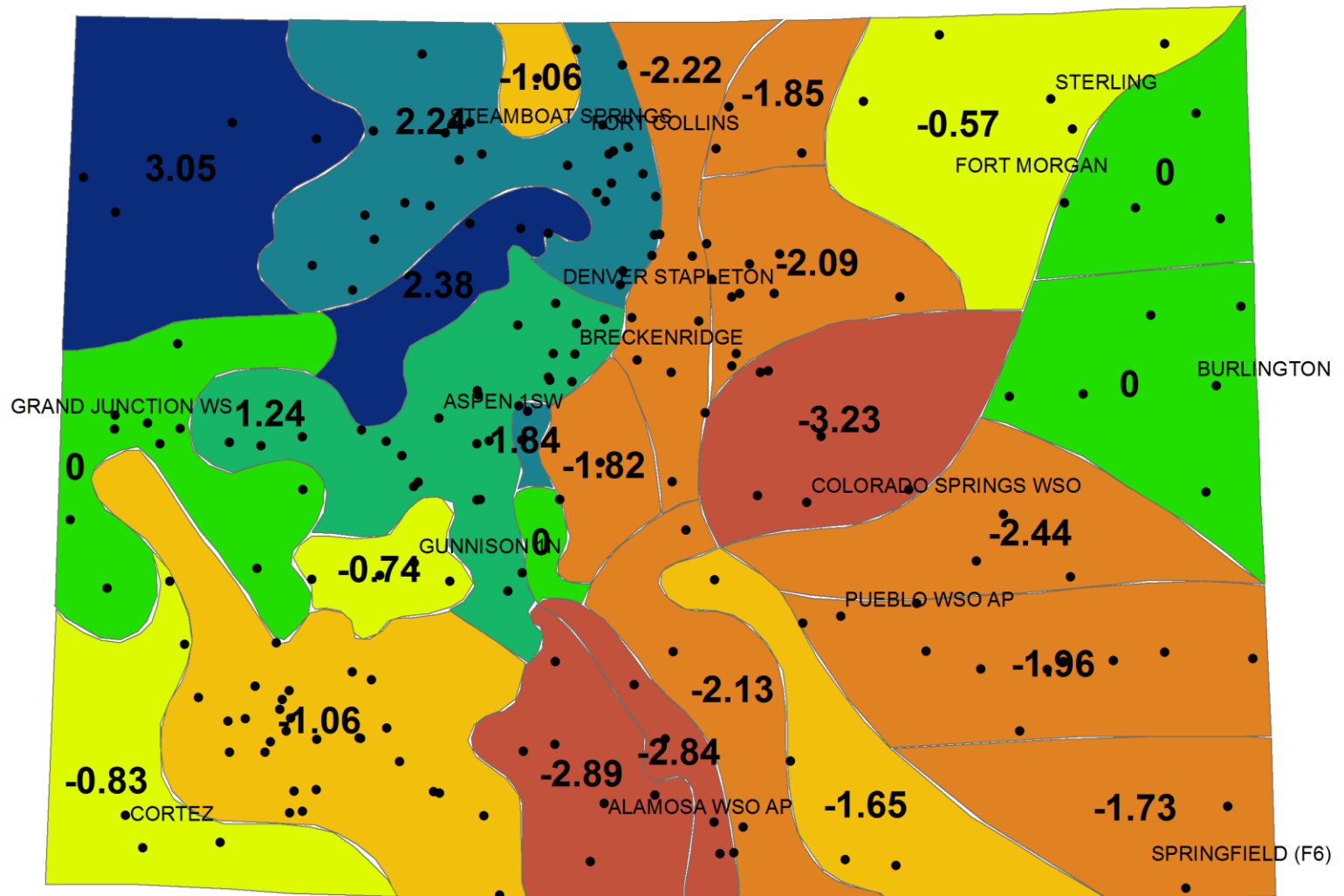
Legend

- | | |
|---|--------------------------|
|  | No reported impacts |
|  | 1 - 13 reported impacts |
|  | 14 - 25 reported impacts |
|  | 26 - 37 reported impacts |
|  | 38 - 49 reported impacts |
|  | 50 - 62 reported impacts |

So, what does our current drought depiction look like?

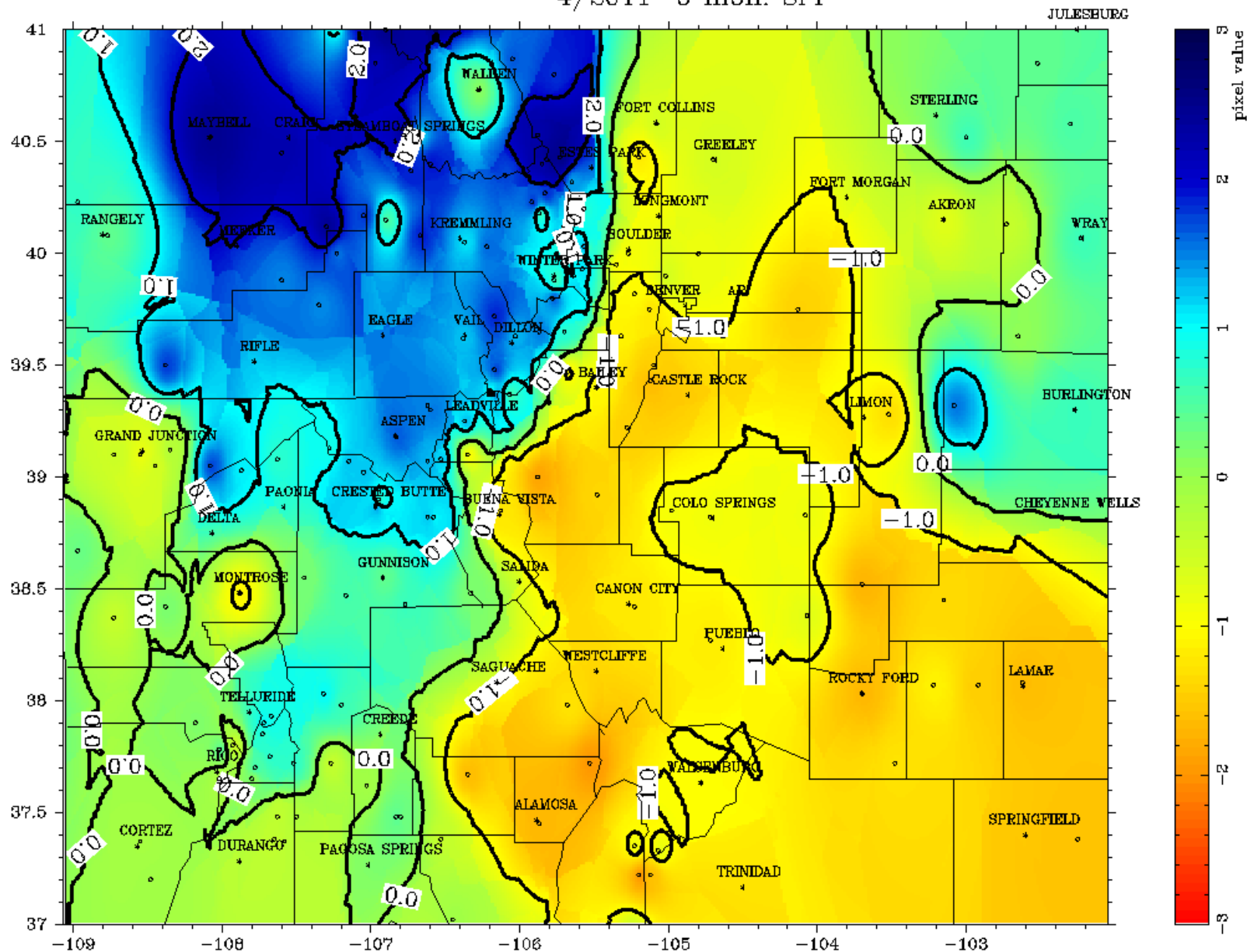
- A little complicated!
 - Depends on index used
 - Depends on time scale used
 - And it can change very quickly
 - Decisions are made by looking at different indices on different time scales
 - The CO State Drought Plan is activated/deactivated based off the following kinds of information:

Preliminary Modified Palmer Drought Severity Index for Colorado April 2011



Colorado

4/2011 6 mon. SPI



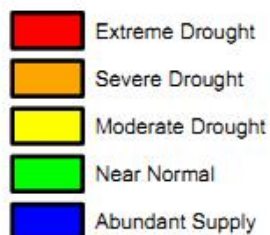
96 % < 2.0 31 % < -1.0
80 % < 1.0 0 % < -2.0
57 % < 0.0 0 % < -3.0

Produced by:
Colorado Climate Center
Fort Collins, CO

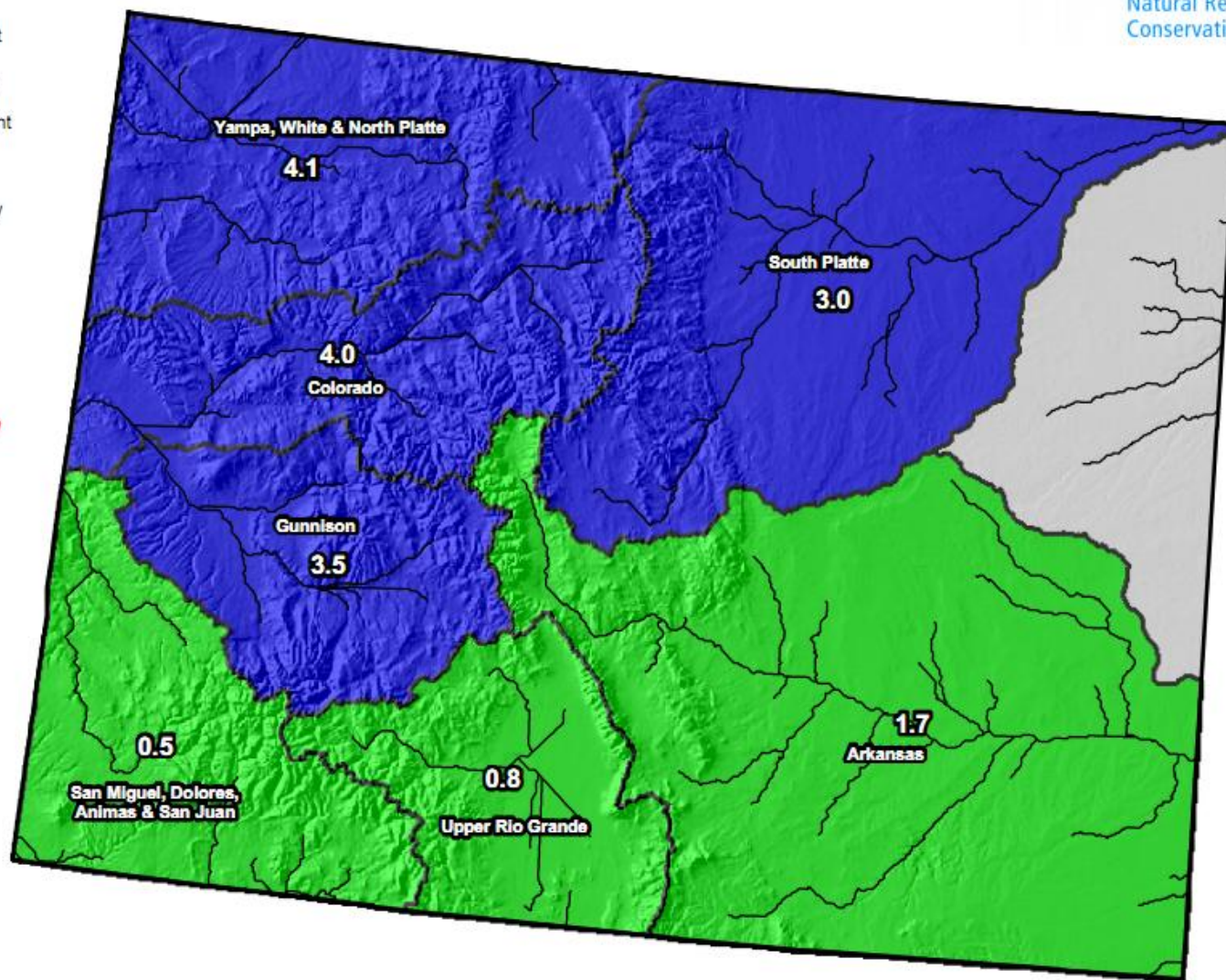
Colorado Surface Water Supply Index (SWSI) Map



Legend



*Provisional Data
Subject to Revision*

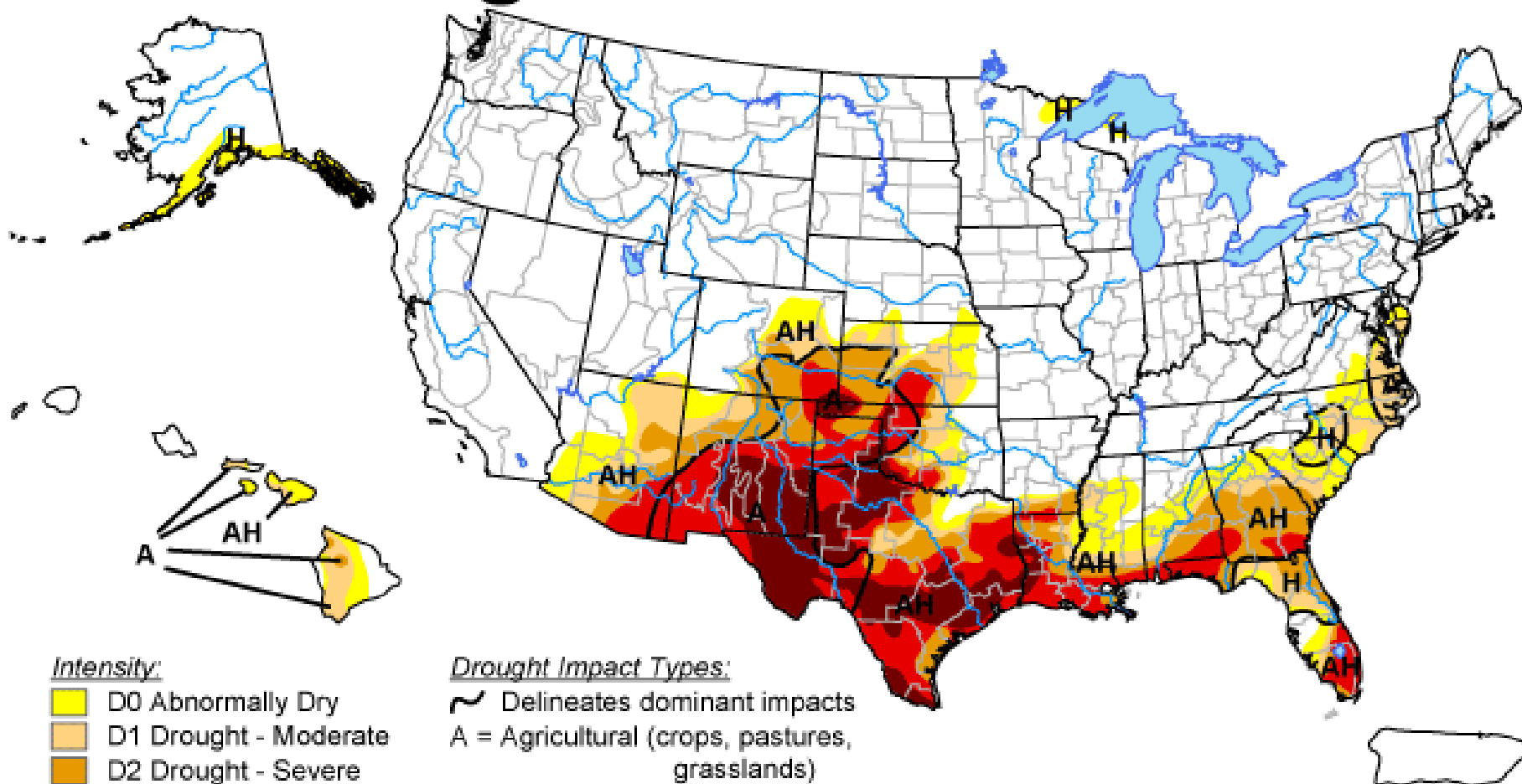


Current as of May 1, 2011

U.S. Drought Monitor

May 24, 2011

Valid 8 a.m. EDT



Intensity:

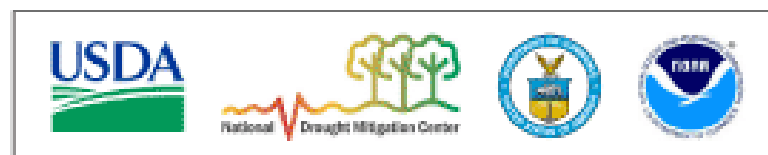
- D0 Abnormally Dry
- D1 Drought - Moderate
- D2 Drought - Severe
- D3 Drought - Extreme
- D4 Drought - Exceptional

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, May 26, 2011
Author: David Miskus, NOAA/NWS/NCEP/CPC

U.S. Drought Monitor

Colorado

May 24, 2011

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	52.49	47.51	36.32	26.22	7.55	0.88
Last Week (05/17/2011 map)	42.60	57.40	45.12	31.10	7.53	0.34
3 Months Ago (02/22/2011 map)	41.65	58.35	50.64	8.93	0.00	0.00
Start of Calendar Year (12/28/2010 map)	40.40	59.60	49.57	10.13	0.00	0.00
Start of Water Year (09/28/2010 map)	28.86	71.14	10.70	0.00	0.00	0.00
One Year Ago (05/18/2010 map)	82.75	17.25	1.93	0.00	0.00	0.00

Intensity:

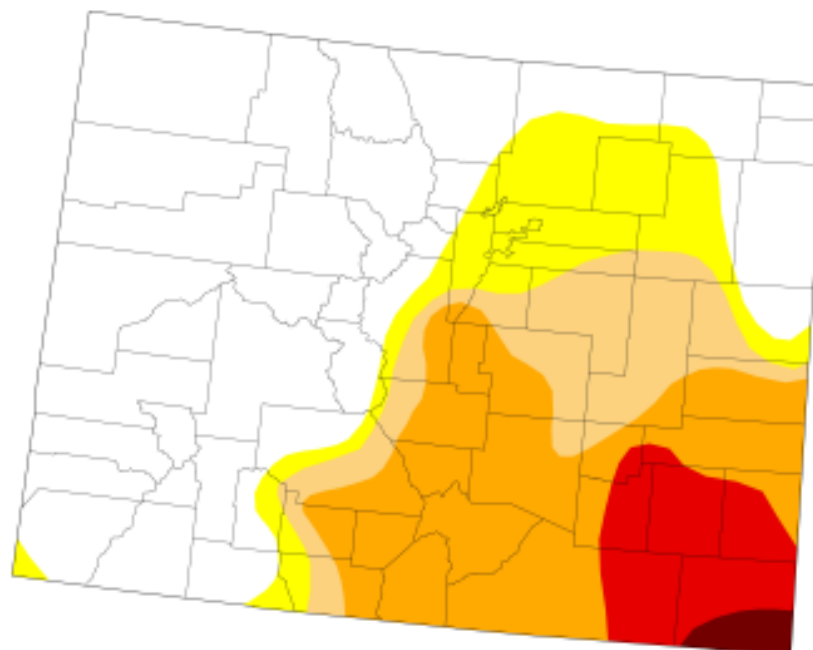
 D0 Abnormally Dry

 D1 Drought - Moderate

 D2 Drought - Severe

 D3 Drought - Extreme

 D4 Drought - Exceptional



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

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

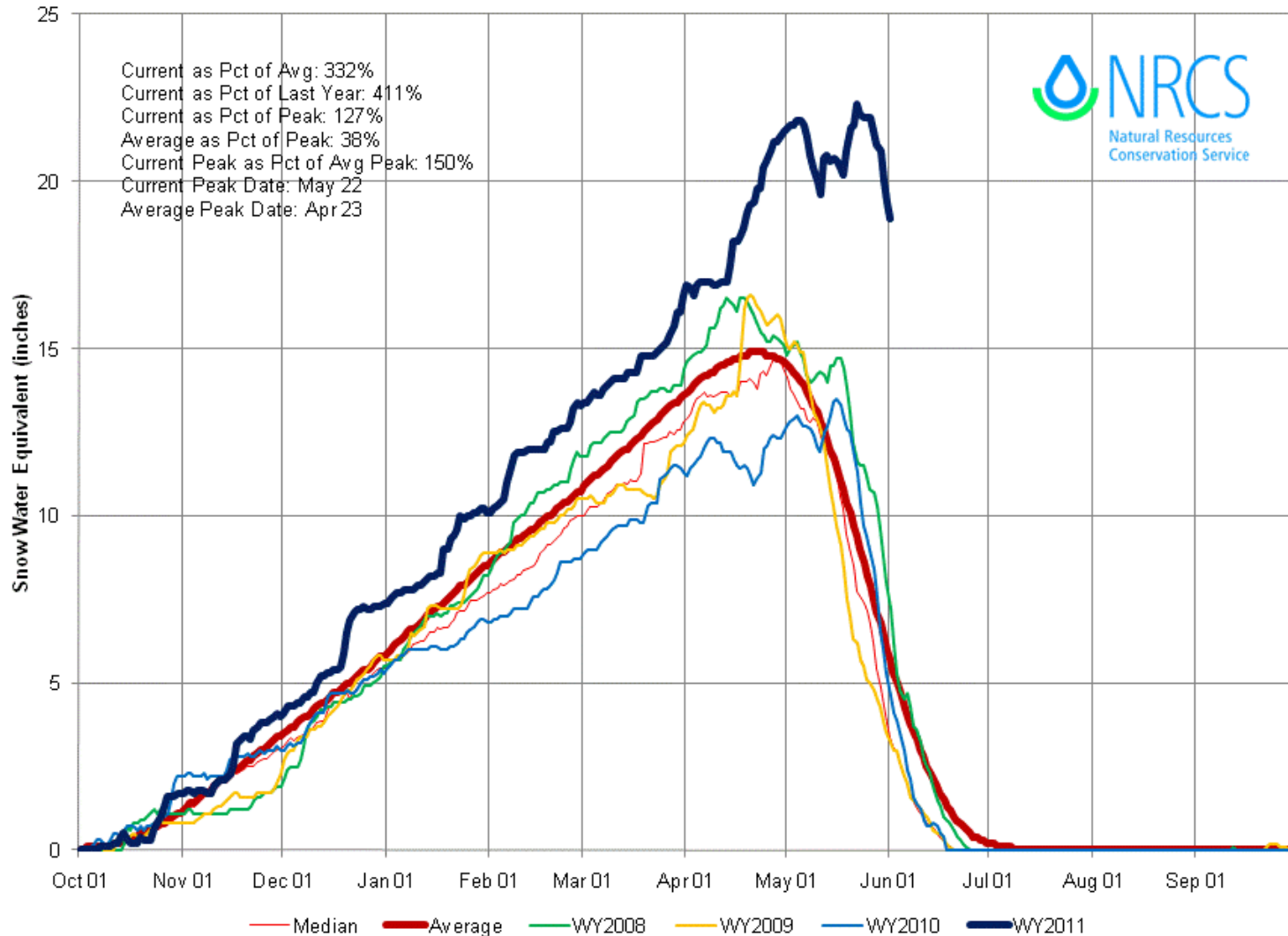


Released Thursday, May 26, 2011
David Miskus, NOAA/NWS/NCEP/CPC

Snowpack Conditions

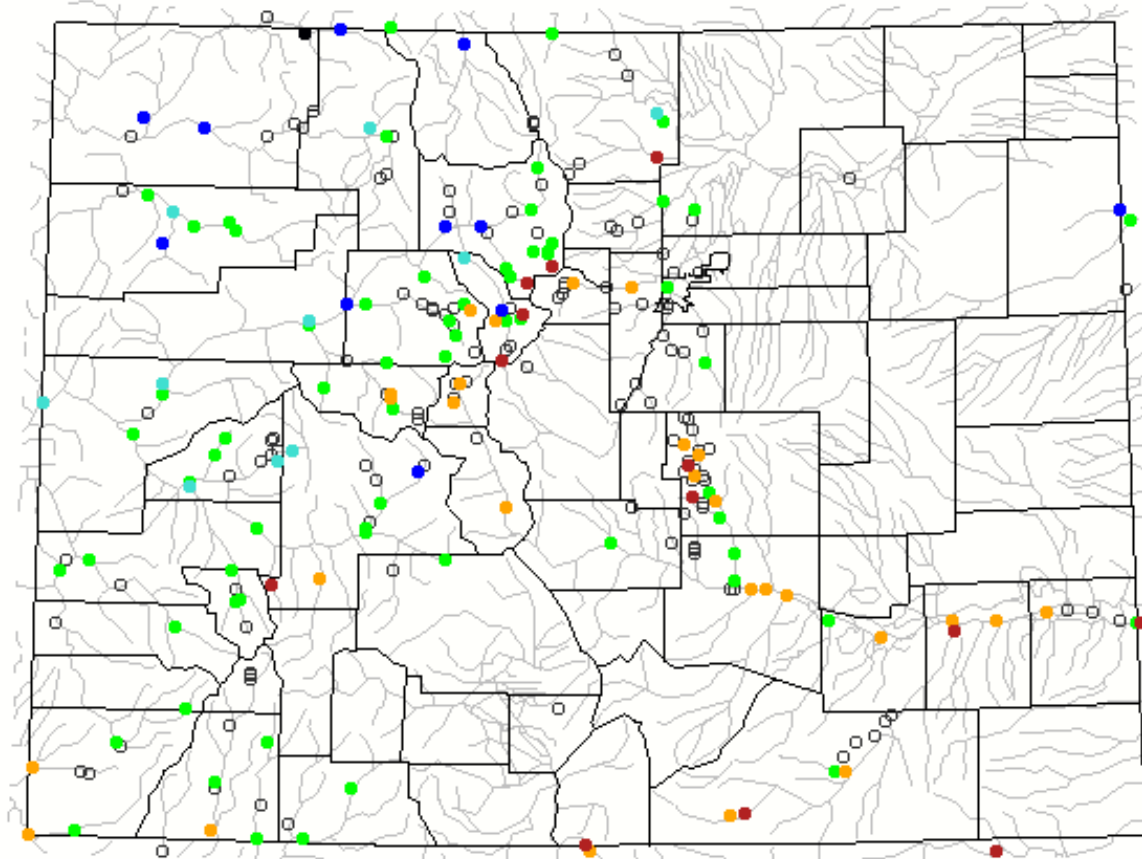
South Platte River Basin Time Series Snowpack Summary

Based on Provisional SNOTEL data as of Jun 01, 2011



USGS Streamflow Conditions

Tuesday, May 31, 2011



Explanation - Percentile classes							
Low	<10 Much below normal	10-24 Below normal	25-75 Normal	76-90 Above normal	>90 Much above normal	High	Not-ranked



Conclusions

- Drought happens often in Colorado, so be ready for it!
 - Onset can be very slow or in a “flash”
 - Ongoing monitoring is KEY to preparedness and activation of State Drought Plan.