Agricultural Impacts and Adaptation to Drought and Climate Variability

Reagan Waskom
Colorado Water Institute

Jeff Tranel
CSU Extension

Governor's Drought Conference, October 9, 2008

Veva's Questions

1. *What is the current status and trends?*
2. *How does drought planning & management take place each season/year and over the long-term?*
3. *What are the information and partnerships needs?*
4. *What drought triggers do you use?*
5. *How do you plan for drought and climate change?*

1. What is the current status and trends?

Denver Post
Sept. 17, 2008

Voice of the Rocky Mountain Empire

THE DENVER POST

WEDNESDAY, SEPTEMBER 17, 2008 CHANCE OF RAIN ▲84° ▼51° »14B • DENVERPOST.COM • © THE DENVER POST • 50 CENTS PRICE MAY VARY

Years of record drought
plus cattle-killing blizzards
have left farmers in 22 counties

HIGH, DRY AND DEVASTATED

By Howard Pankratz *The Denver Post*

It's hard to imagine from the look of the lush lawns of metro Denver, but from the plains to the Front Range, much of eastern Colorado is a disaster area.

On Monday, the U.S. Agriculture Department designated 22 Colorado counties as "primary natural disaster areas" because of what the agency described as drought conditions since Jan. 1.

The declaration is the latest in a string of hard times for ranchers and farmers in an area stretching roughly from Interstate 25 east to the Kansas border and from the New Mexico border north to Lincoln County.

"Southeast Colorado had unprecedented drought in 2002, 2003, 2004, 2005. We just had continual drought," said Chuck Hanagan, the executive director for the Otero-Crowley Farm Service Agency, a branch of the U.S. Department of Agriculture.

DROUGHT » 10A

CROPS

August rain has helped, but crop yields have been lower and some ranchers worry they will not be able to grow enough feed.

CATTLE

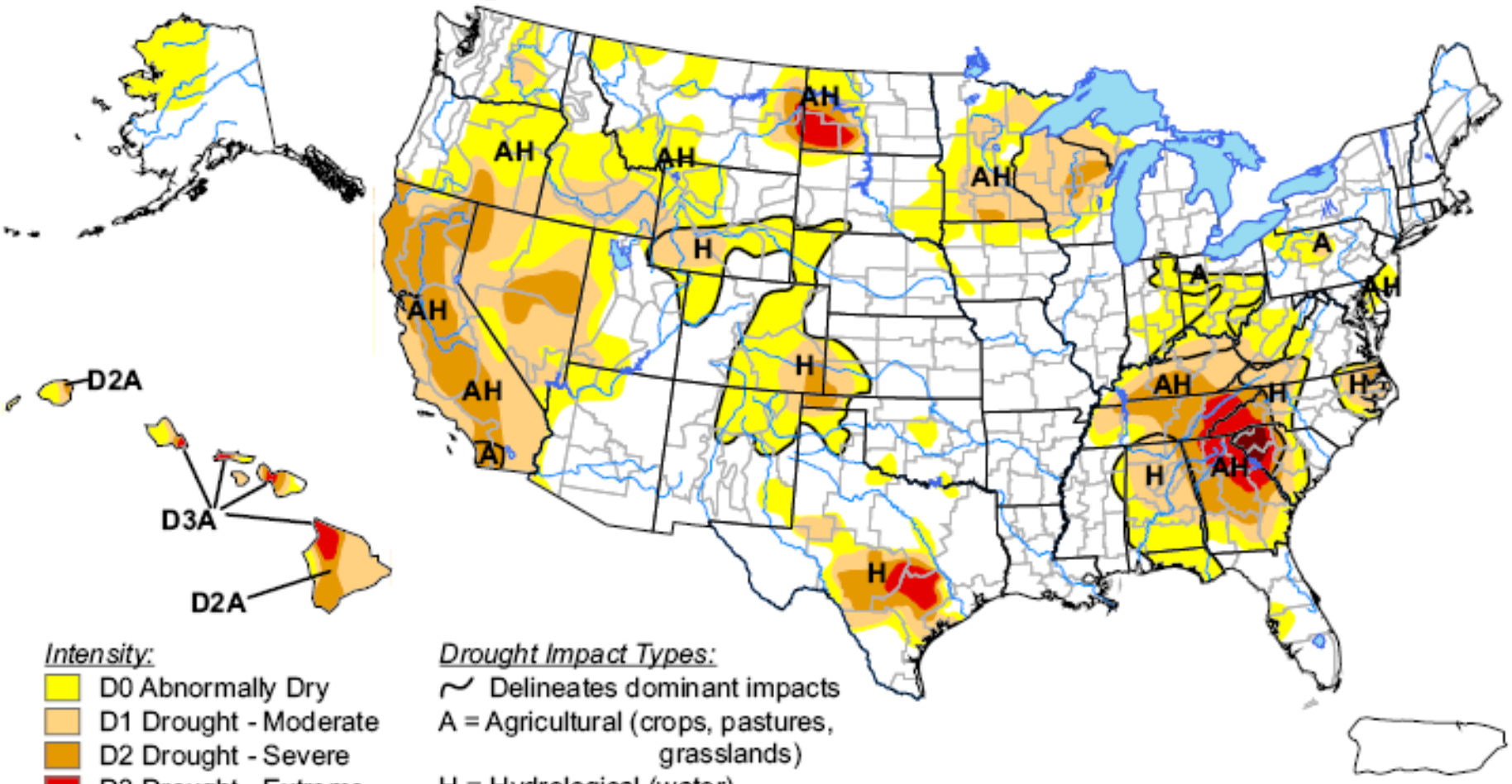
The blizzards of late 2006 killed more than 10,000 cattle. Ranchers have not been able to rebuild herds.

CLIMATE

Southeast Colorado experienced unprecedented drought in 2002, 2003, 2004 and 2005. Then the drought returned in 2007 and 2008. *The Denver Post file photos*

U.S. Drought Monitor

October 7, 2008
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

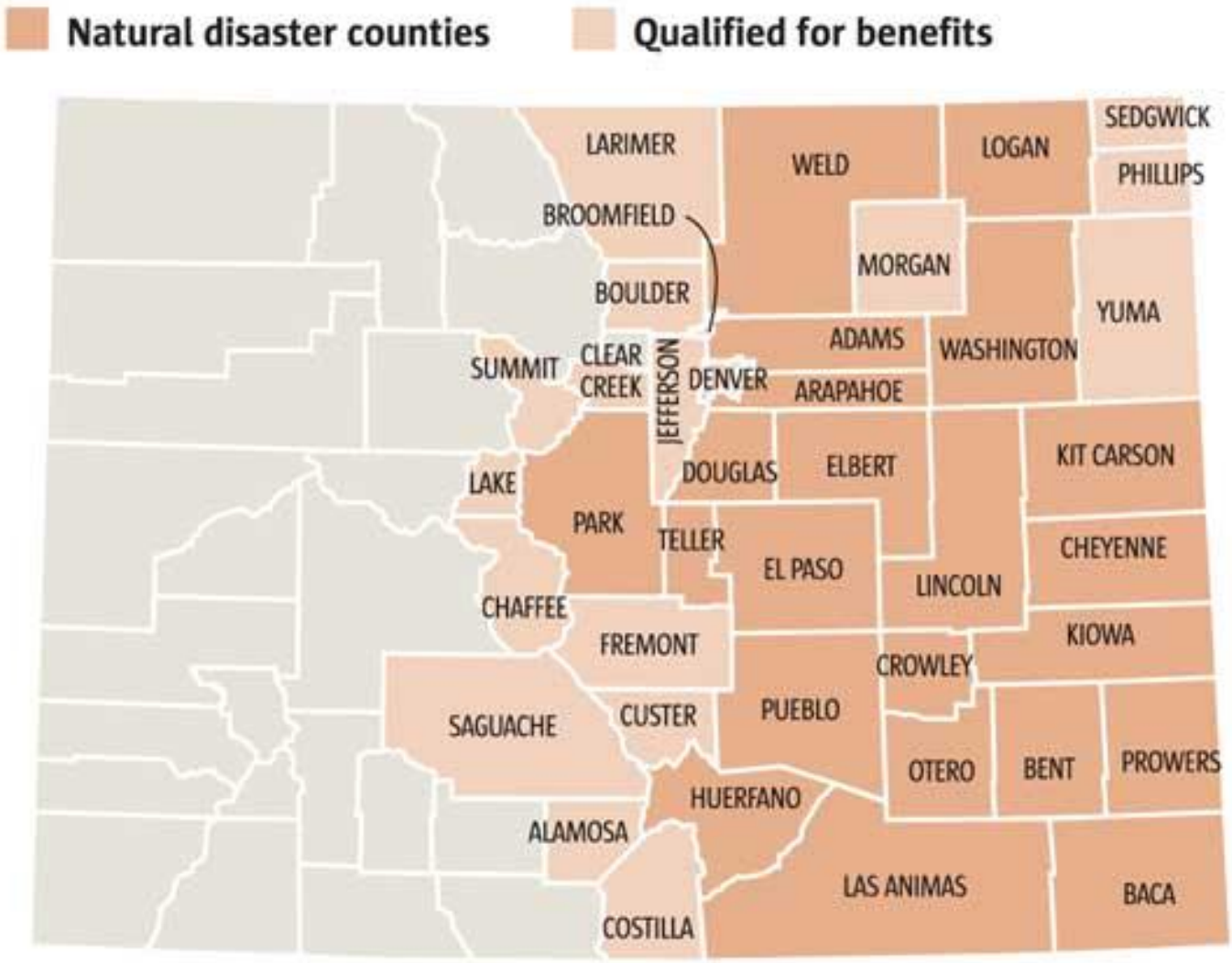
USDA National Drought Mitigation Center

Released Thursday, October 9, 2008

Author: Laura Edwards, Western Regional Climate Center

Colorado disaster counties

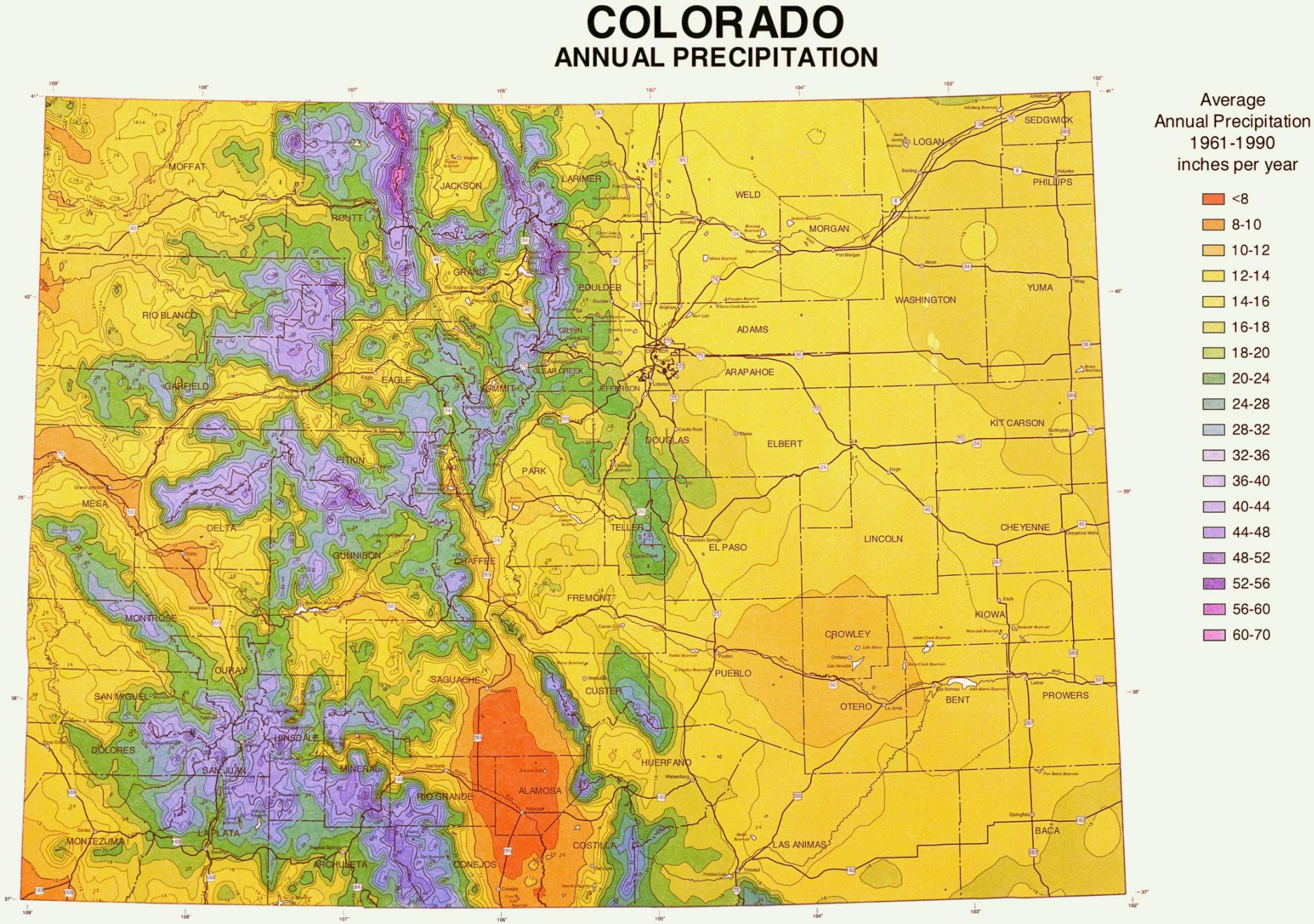
The U.S. Department of Agriculture has designated 22 Colorado counties as primary natural-disaster areas because of drought and qualified an additional 18 counties for natural-disaster benefits because their counties are contiguous.



Source: Farm Service Agency

The Denver Post

2. How does drought planning take place?



2. How does drought planning take place?

- **Agricultural drought occurs when there is not enough soil moisture to meet the needs of a particular crop at a particular time.**
  - **Snowpack and runoff**
  - **Subsoil and surface soil moisture**
  - **Seasonal precipitation, temperature and wind**
  - **Crop and livestock condition**

- **Agricultural drought happens after meteorological drought but before hydrologic drought.**

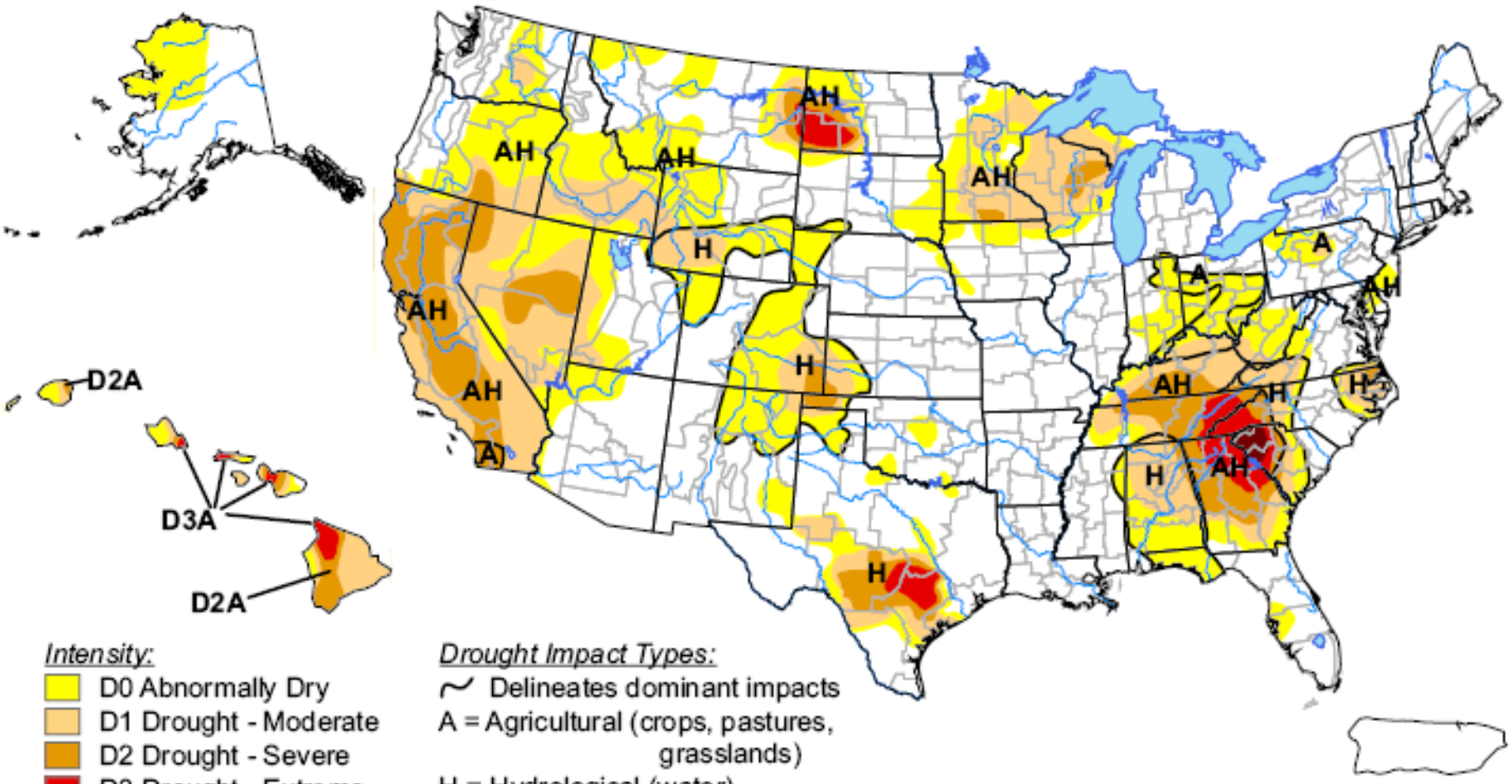
- **Agriculture is usually the first economic sector to be affected by drought.**

3. *What are the information and partnerships needs?*

- **Colorado Dept of Agriculture publishes weekly crop reports – need county and local level impact data**
- **Colorado Climate Center and CoCoRaHS publishes daily precipitation data – need better soil & subsoil moisture data**
- **USDA-NRCS publishes snowpack data and runoff forecasts – need better and more timely forecasts of irrigation water supply**

U.S. Drought Monitor

October 7, 2008
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)

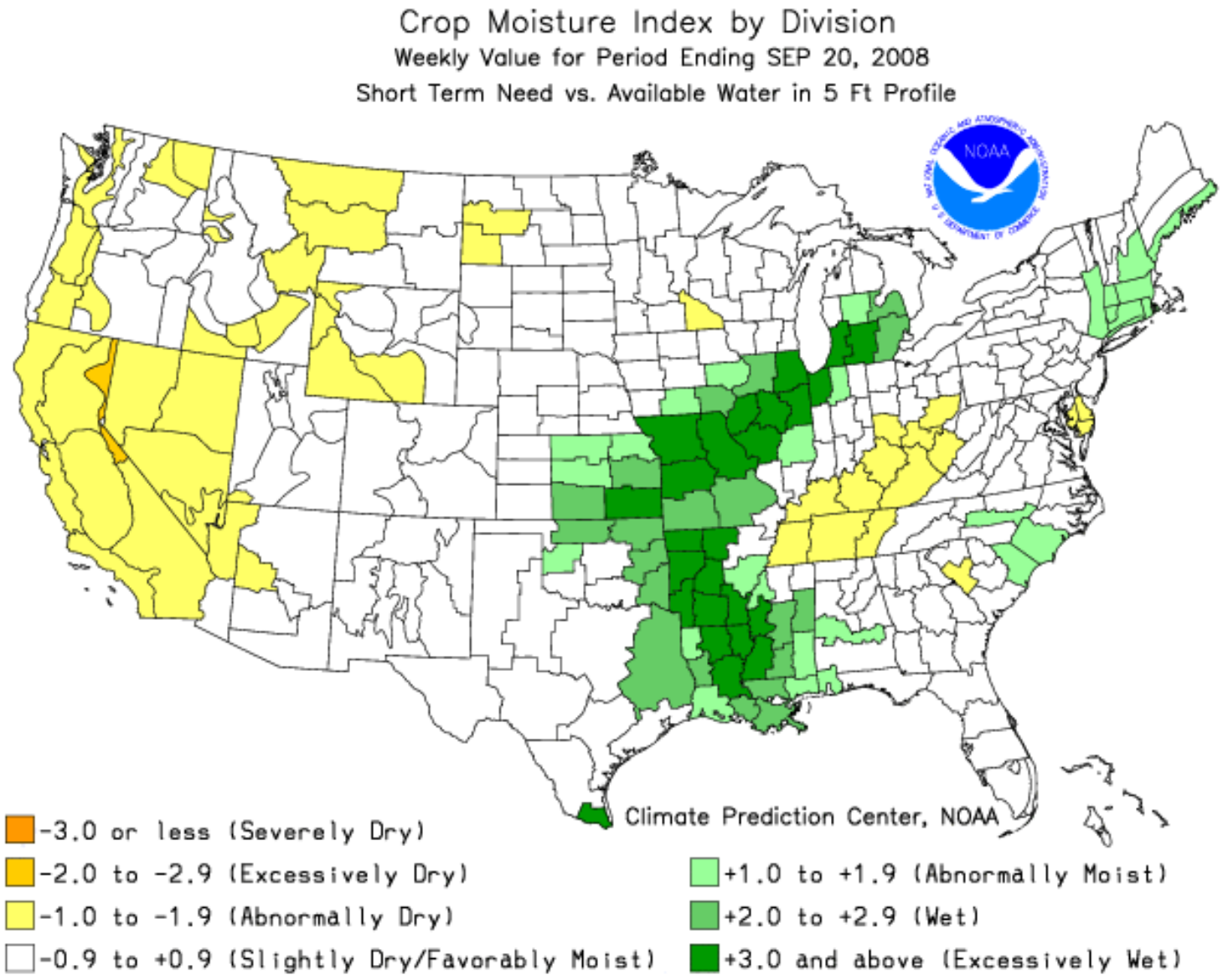
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

http://drought.unl.edu/dm

USDA National Drought Mitigation Center

Released Thursday, October 9, 2008

Author: Laura Edwards, Western Regional Climate Center

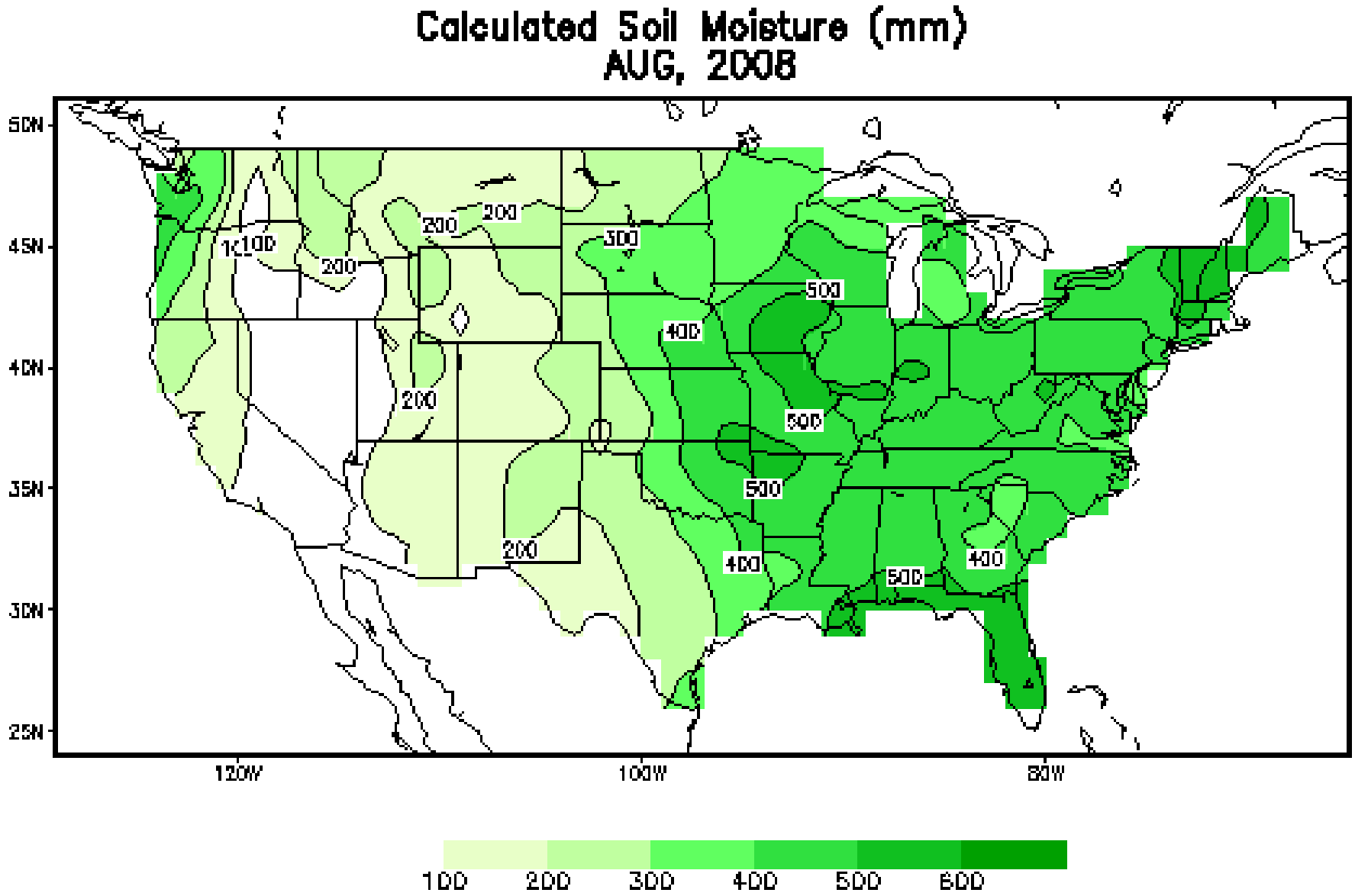


NOAA Crop Moisture Index

http://www.cpc.ncep.noaa.gov/products/analysis_monitoring/regional_monitoring/cmi.gif

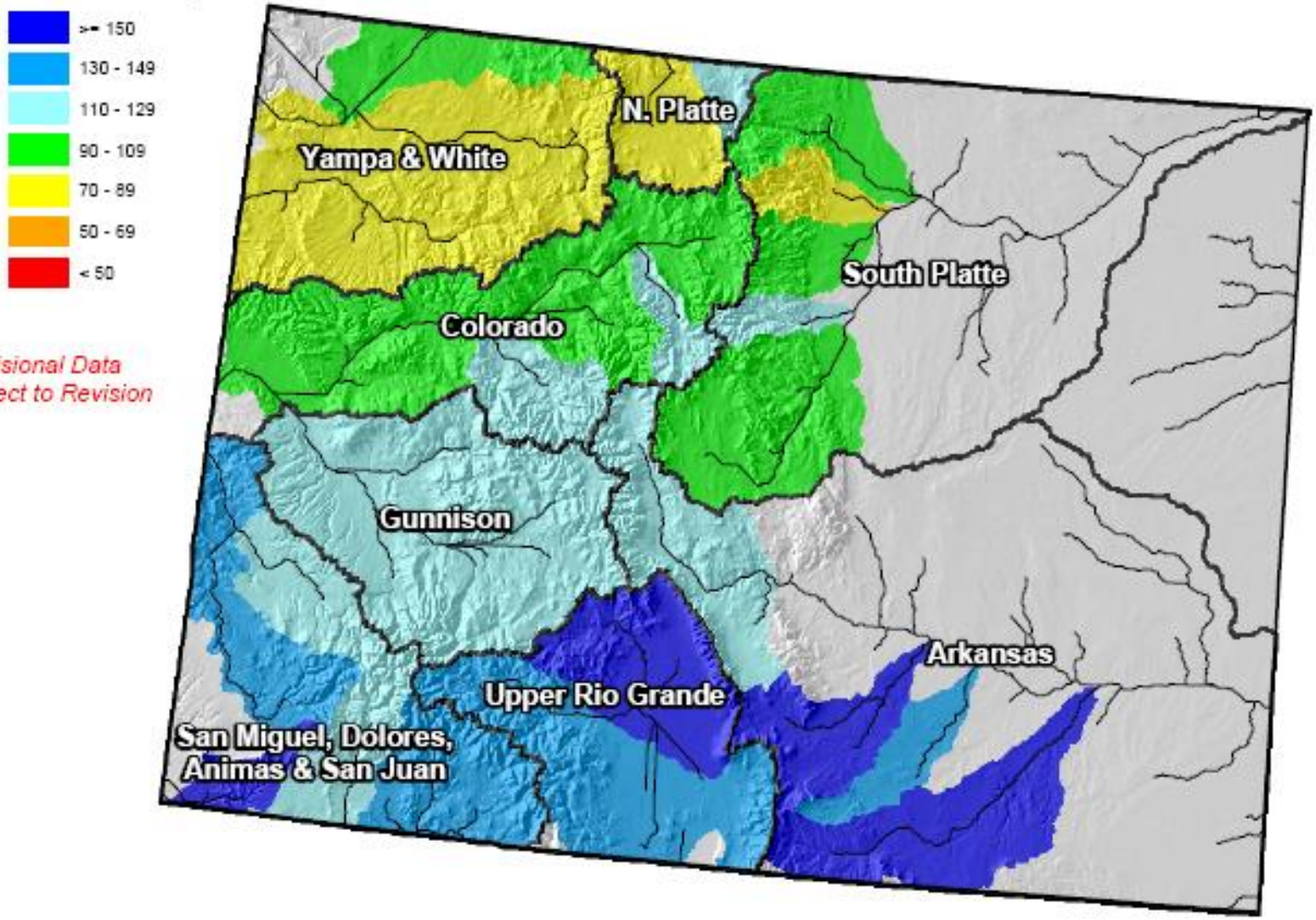
NOAA Soil Moisture Outlook

http://www.cpc.ncep.noaa.gov/soilmst/w.shtml



Colorado Snowpack Map

Percent of Average



Provisional Data
Subject to Revision

Current as of January 1, 2008

Colorado Crop Progress

NATIONAL AGRICULTURAL STATISTICS SERVICE

USDA NASS Colorado Field Office
P.O. Box 150969, Lakewood, CO 80215
Phone 1-800-392-3202 · 1-800-643-6885
e-mail: nass-co@nass.usda.gov
To access USDA-NASS reports http://www.nass.usda.gov/

Released: October 6, 2008 Vol. 45 No. 31

Agricultural Summary: Colorado was exceptionally dry and warm again last week. Most areas did not receive any measurable amounts of rainfall. Temperatures were well-above normal for this time of year. These conditions allowed producers 6.4 days suitable for field operations.

TOP SOIL MOISTURE BY PERCENT

	Very Short	Short	Adequate	Surplus
This Week	8	31	56	5
Last Week	7	30	59	4
Last Year	19	37	43	1

SUBSOIL MOISTURE BY PERCENT

	Very Short	Short	Adequate	Surplus
This Week	14	39	44	3
Last Week	14	38	45	3
Last Year	13	41	43	3

ROW CROP CONDITION BY PERCENT
Week ending October 5, 2008

	Very Poor	Poor	Fair	Good	Excellent
Corn					
This Week	4	11	32	28	25
Last Year	2	4	17	55	22
Sorghum					
This Week	4	13	40	38	5
Last Year	0	0	21	66	13

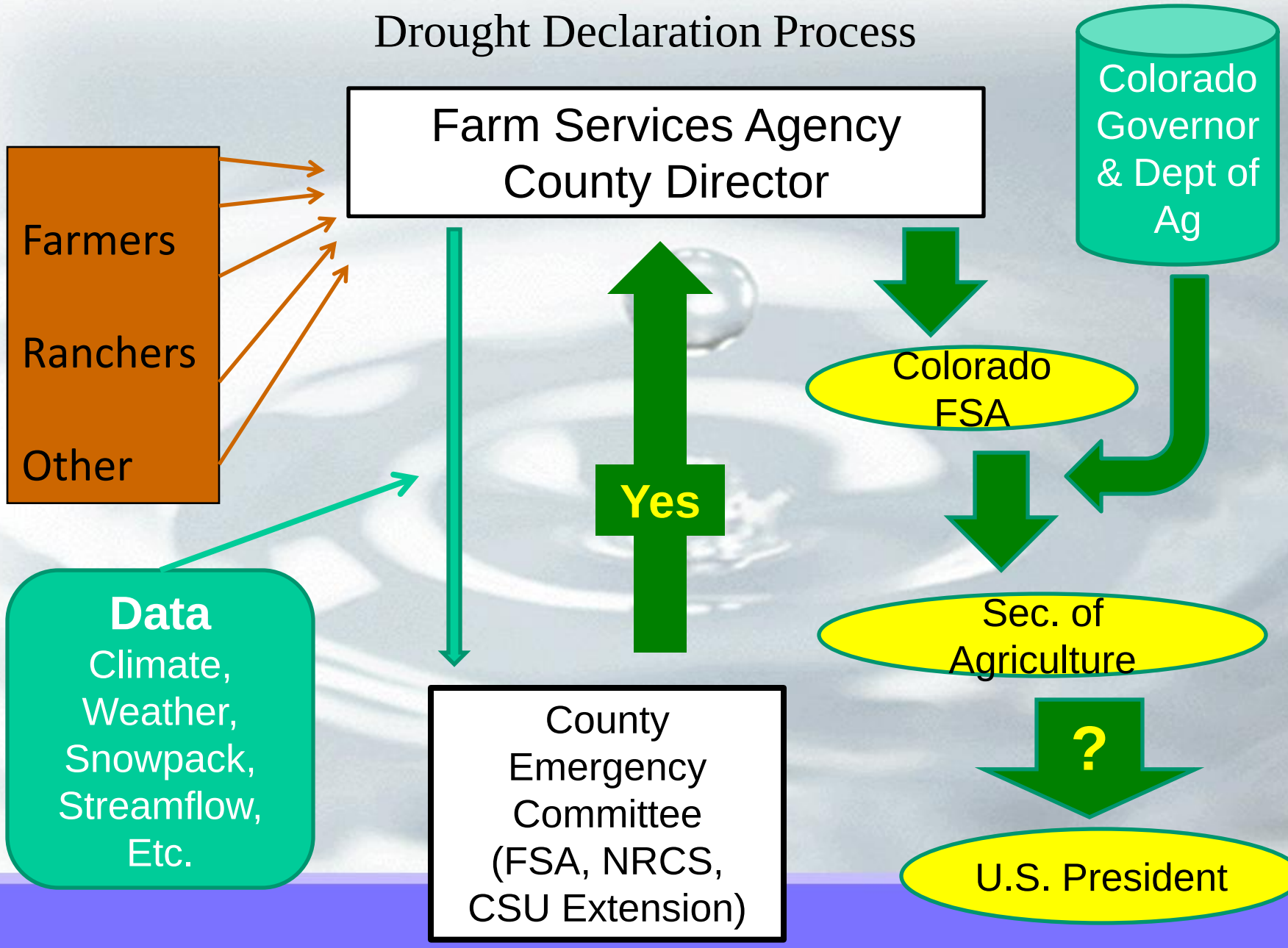
Pasture, Range, and Hay: Pasture and range conditions rated in mostly fair to good condition. Third cutting alfalfa was 95 percent complete while fourth cutting was 27 percent harvested. The crop was rated in mostly fair to good condition.

Livestock: Death losses for cattle were rated just below average while sheep and lambs were rated average. Stored feed supplies were rated just above average for this time of year.

Partnerships?

Water Availability Task Force
State Engineer
CDA
USDA
Colorado State University
Municipalities
Ag Water Users

4. What drought triggers do you use?



Drought Disaster Designations

Designation means that all qualified farm operators in the designated areas are eligible for low interest emergency (EM) loans from USDA's Farm Service Agency (FSA), provided eligibility requirements are met.

Farmers in eligible counties have eight months from the date of the declaration to apply for loans to help cover part of their actual losses. FSA has a variety of programs, in addition to the EM loan program, to help eligible farmers recover from adversity.

Drought Disaster Designations

State and Federal tax code provides producers drought relief by allowing extraordinary income to be declared in future years.

CRP haying and grazing may be temporarily released to provide additional emergency forage for livestock.

USDA has also made other programs available to assist farmers and ranchers, including the Emergency Conservation Program, Federal Crop Insurance and the Noninsured Crop Disaster Assistance Program.

5. How do we plan for Drought & Climate Variability?

- Drought is a given recurrence in Colorado – it is just a matter of when, where and how severe
- Agriculture in the West is highly vulnerable to water shortage
- IPCC projects increase avg. temp., more frequent/severe droughts & floods
- Decreasing snow “storage”
- Increased crop and non-crop evapotranspiration

Increasing Drought Resiliency of Colorado Agriculture

Producers in all agricultural sectors and lenders need timely and reliable long-term forecasts

Producers need risk management decision tools and new technologies – e.g. new crop genetics

Institutional mechanisms are needed to better document and communicate impacts

Mechanisms to firm and secure Ag water supplies are needed to secure food production capability

Agricultural Impacts and Adaptation to Drought and Climate Variability in Colorado

Reagan Waskom and Jeff Tranel, Colorado State University

Colorado agriculture is a diverse industry that is well adapted to the State's arid conditions, however, adequate water supply is almost always a yield limiting input variable. Currently, parts of eastern and northwest Colorado are abnormally dry and 22 counties in the State have disaster designations from USDA. Current dry conditions are exacerbated by institutional and administrative water scarcity in important agricultural production areas such as the Republican River, S. Platte Basin and the San Luis Valley. Even though agricultural producers always plan for water scarcity, the realization of water availability occurs late in spring when many production decisions have already been locked in. Institutional drought planning also tends to occur on a reactive basis as dry conditions develop. If drought develops to the point that economic impacts occur, official drought declaration flows through the County Director of the Farm Services Agency. When there are sufficient drought concerns, the FSA Director calls the County Emergency Committee together to review relevant data on climate and weather, snowpack, hail damage, range conditions, streamflows, etcetera. If the County Emergency Committee believes there is enough evidence of drought damage, the FSA Director will draft a drought declaration to be forwarded to the State Farm Services Agency Committee. Colorado's Governor and Department of Agriculture will aid in the declaration process. If there is sufficient evidence of drought, it puts forward a request of declaration and assistance to the Secretary of the United States Department of Agriculture. The USDA Secretary will then declare (or not declare) a drought for the county. The Secretary forwards the declaration to the U.S. President, who may also give the county Presidential Disaster Status. The Colorado Department of Agriculture plays a key role in drought planning by providing information, accumulating impact data and coordinating communications. Participation of CSU Extension and Colorado Department of Agriculture in the Colorado Water Availability Task Force ensure agricultural concerns are shared with other State and Federal agencies.

REAGAN M. WASKOM
Director, Colorado Water Institute
CSU Water Center
E102 Engineering Building
Colorado State University
Fort Collins, CO 80523-2033
(970) 491-6308
Reagan.Waskom@colostate.edu

Reagan Waskom currently serves as the Director of the Colorado Water Institute and as Director of the Colorado State University Water Center. Dr. Waskom is a member of the Department of Soil & Crop Sciences faculty with a joint appointment to the Department of Civil and Environmental Engineering at CSU. In addition, Reagan currently serves as the National Chair and Regional Director of the USDA-CSREES Integrated Water Program. Dr. Waskom has worked on various water related research, education and outreach programs in Colorado for the past 22 years.