Colorado Division of Water Resources

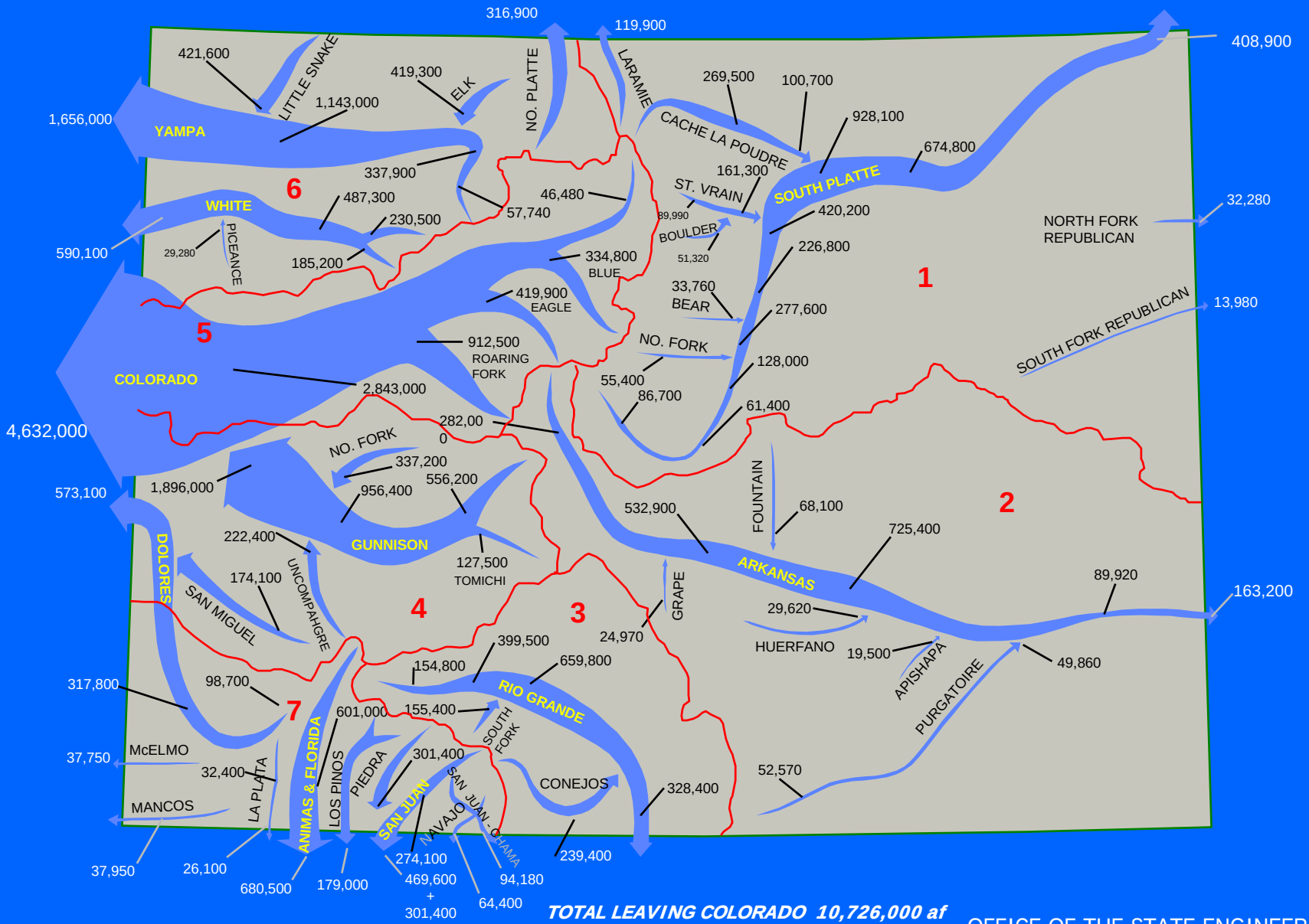
Responsibilities and Roles in Water Matters

Hal Simpson

State Engineer

COLORADO HISTORIC AVERAGE ANNUAL STREAM FLOWS

(acre feet)



Prepared by the Hydrographic Branch (2000 Revision)
Historic averages obtained from USGS Water-Data Report CO-99

OFFICE OF THE STATE ENGINEER
COLORADO DIVISION OF WATER RESOURCES

18 States Rely On Colorado's Water

The State Engineer and Colorado Water History

- Early water use in Colorado
- Constitution
  - Article XVI Section 5 & 6
  - Prior Appropriation Doctrine, Western Water Law
  - First in time -First in Right
  - Water Court

Office of the State Engineer

- The office of State Hydraulic Engineer was created by the Legislature of 1881.
- C. R. S. 37-80
- Primary Duties
  - Water Right Administration
  - Streamflow and Diversion Measurements
  - Dam Safety
  - Public Information
  - Interstate Compact Administration

Division of Water Resources

General FTE Allocation FY 02-03

- Water Administration 149
  - 177 full and part time staff
- Water Well Permitting 30
- Dam Safety 12
- Hydrographic Information 20
- Engineering and Geology 7
- Information Technology 10
- Water Information 6
- Administration 12

- Total FTE 246
- 30 positions are currently held vacant due to budget reductions

Water Administration

- Water Allocation – Typical year
  - 173,151 Water Rights
  - 104,953 Structures
  - 389,200 observations
  - 30,600 water diversions and storage records
  - 1600 court consultations

Interstate Compacts

- Ensure compact deliveries and protect entitlements
- Administration of 9 Compacts
- Commissioner 5 Compacts

Interstate Compacts

Colorado River Compact - 1922
La Plata River Compact - 1922
South Platte River Compact - 1923
Rio Grande River Compact - 1938
Republican River Compact - 1942
Costilla Creek Compact - 1944 (Rev. 1963)
Upper Colorado River Compact - 1948
Arkansas River Compact - 1948
Animas-La Plata Project Compact - 1969

U.S. Supreme Court Cases

Nebraska v. Wyoming - 325 U.S. 589 (1945)
Wyoming v. Colorado - 353 U.S. 953 (1957)

Public Safety

- Dam Safety
  - One of the best programs
  - Prevent loss of life
  - Prevent/reduce property damage
  - 3600 Dams 1800 Jurisdictional
  - Safe storage level
    - » 1000 inspections/yr.
    - » 198 restrictions 142,850 ac-ft
  - Plan approval

Reservoir Storage

	Current Storage capacity ac-ft	Restricted Storage* Total a-f (#dams)
Division 1	1,787,810 a-f	33,900 (99)
Division 2	893,544 a-f	89,200 (31)
Division 3	297,261 a-f	9,700 (3)
Division 4	1,447,948 a-f	4,200 (28)
Division 5	1,166,040 a-f	2,990 (19)
Division 6	165,387 a-f	1,400 (11)
Division 7	665,356 a-f	1,460 (7)
Total	6,423,345 a-f	142,850 (198)

- August 20, 2002
- **1990-2001 - 49 New dams with a combined storage of 120,000 a-f**
- Div 2 Two Buttes 31,500 a-f and Cucharas 33,000 a-f - very expensive reconstruction necessary.

Reservoir Storage

October 1, 2002 statewide Reservoir storage is 48% of average, 56% of 2001. The Colorado River Basin at 42% of average.

- **January 1, 2003 content;**

Blue Mesa Reservoir (940,000 a-f)	**280,000 a-f;**
Taylor Park (106,000 a-f)	**41,000 a-f;**
Ridgway (84,000 a-f)	**59,600 a-f.**
Granby Reservoir (544,000 a-f)	**129,470 a-f**
Dillon Reservoir (252,000 a-f)	**139,000 a-f.**
Green Mountain Reservoir (154,00 a-f)	**41,400 a-f.**
South Platte System* (224,520 a-f)	**113,780 a-f**

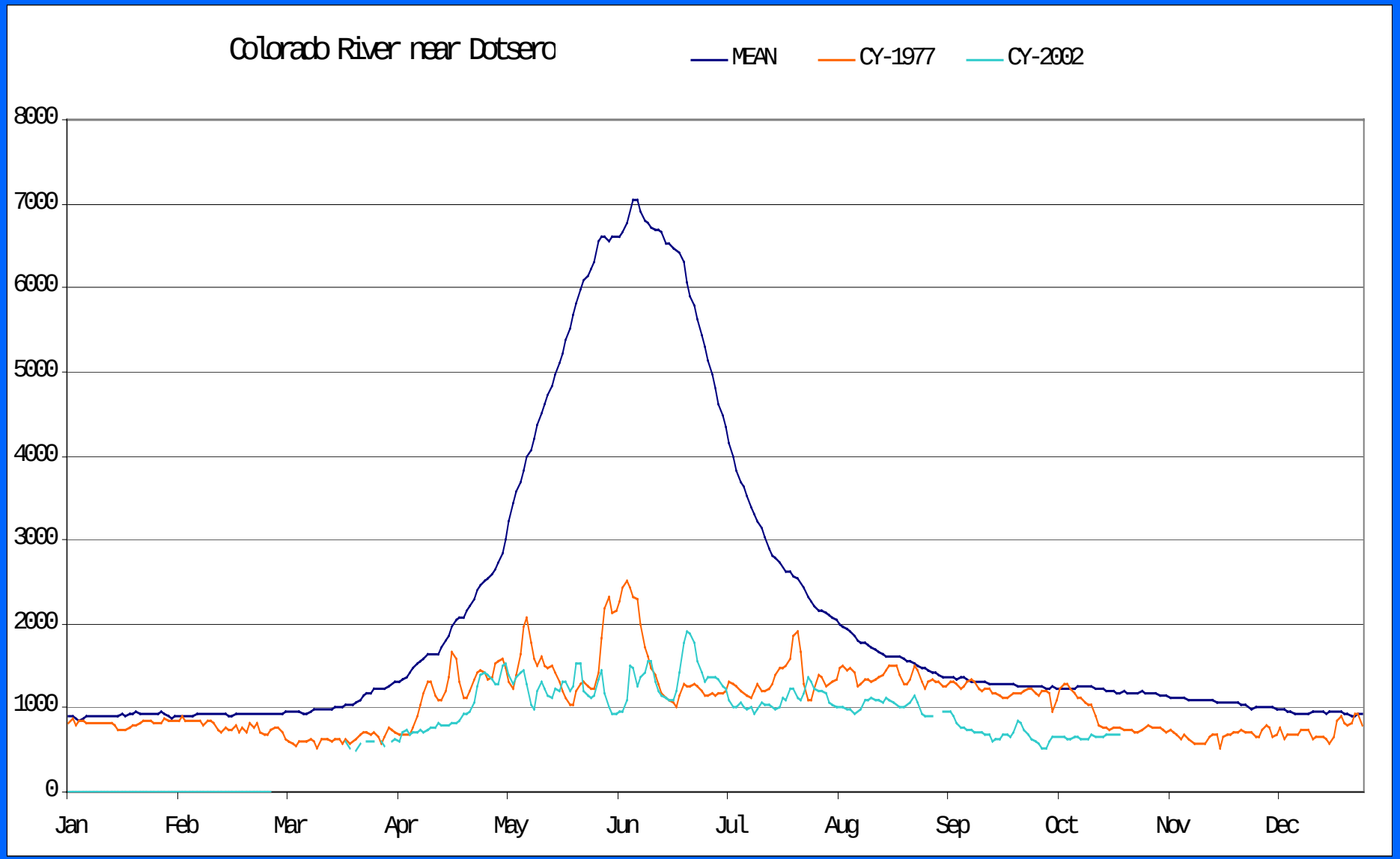
***Denver Water: Antero, 11-Mile, Cheesman, Strontia, Marston Reservoir**

Public Safety

- Water Well Construction
  - Groundwater protection and public safety
  - Rules for Well Construction revised in 2000
  - 336 Licensed contractors
  - 120 Enforcement actions
  - Outreach and education
  - Well construction observation
  - Court action against unlicensed
  - Well Inspection Program

Hydrographic Program

- Streamflow measurements
  - 260 Stream gages
  - 600 Ditch and canal gages
  - 2700 measurements annually
- Publication of streamflow records -215
- Satellite Monitoring System - 316
- 1881 to 2001 120 Years
    - » 1 station in 1881
    - » 316 in 2001


Colorado River near Dotsero
MEAN
CY-1977
CY-2002
8000
7000
6000
5000
4000
3000
2000
1000
0
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec

Uses of Stream Flow Information

- Water Administration and Distribution
- Compact Administration
- Flood
- Water Storage and Release
- Recreation
- Wildlife
- Water Quality

Groundwater

- Integral part of Colorado's water supply
- Investigations and studies
- Well permitting and enforcement
- Residential and municipal supplies
- Irrigation > 2 million acres
- Well permits 70% residential

GROUND WATER USE

Aquifer	Average Annual Supply (Acre-Feet)
Denver Basin	70,000
South Platte Alluvium	300,000
Arkansas River Alluvium	200,000
San Luis Valley Aquifers	380,000
High Plains - Ogallala	1,000,000
Bedrock Aquifers - Mountains	50,000
Total	**2,000,000**

Groundwater use increased, year to date we have processed twice the average annual permit applications for replacement wells.

Groundwater

- Tributary
- Non-tributary
- Not non-tributary
- Designated Groundwater

Designated Ground Water Basins

Crow Creek & Camp Creek Basins

Irrigation and Domestic water is from both **Alluvial and Bedrock Aquifers. No surface water supply.**

Lack of precipitation may result in increased pumping and lowing of the water table. This would lead to higher energy and production costs.

Kiowa-Bijou

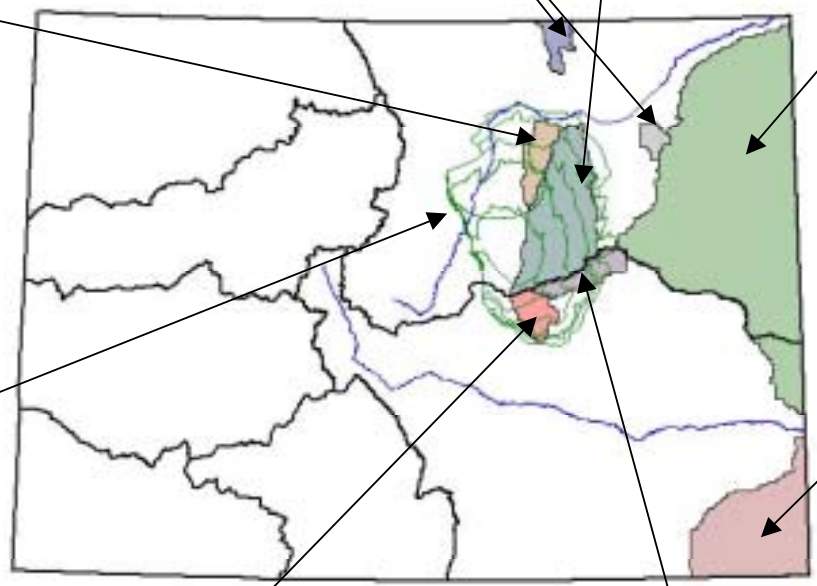
Irrigation water supply is from the **Alluvial Aquifer, No surface water supply.** Domestic supply from both **Alluvial and Bedrock Aquifers.**

Lack of precipitation may result in increased pumping and lowing of the water table. This would lead to higher energy and production costs.

Lost Creek

Irrigation and Domestic water is from both **Alluvial and Bedrock Aquifers. No surface water supply.**

Lack of precipitation may result in increased pumping and lowing of the water table. This would lead to higher energy and production costs.



Northern High Plains

Irrigation and domestic water supply is from the **Ogallala Aquifer**. **No surface water supply.**

Lack of precipitation may result in increased pumping and lowering water levels. This would lead to higher energy and production costs.

Southern High Plains

Irrigation and domestic water supply is from the **Ogallala, Dakota, Cheyenne and Docum Aquifers**. **No surface water supply**

Lack of precipitation may result in increased pumping and lowering water levels. This would lead to higher energy and production costs.

Denver Basin

Ground water supply is from the four major Denver Basin Bedrock Aquifers, **Dawson, Denver, Arapahoe and Laramie-Fox Hills.** The aquifers are not part of the surface system and are not affected by drought conditions. However, in times of shortages in the surface water supply, increased use of ground water from the basin can result in accelerated water level declines

Upper Black Squirrel

Irrigation water supply is from the **Alluvial Aquifer, No surface water supply.** Domestic water supply from **Denver Basin Aquifers**

Lack of precipitation may result in increased pumping and lowing of the water table. This would lead to higher energy and production costs.

Upper Big Sandy

Irrigation water supply is from the **Alluvial Aquifer, No surface water supply.** Domestic supply from **Alluvial and Bedrock Aquifers.**

Lack of precipitation may result in increased pumping and lowing of the water table. This would lead to higher energy and production costs.

Well Permits

- FY 1992 - 7,500
- FY1996 - 13,500
- FY2000 - 11,746
- FY2001 – 11,484
  - » New Applications 7526
  - » Replacement 857
- Residential well permits about 70%

Additional Program Activities

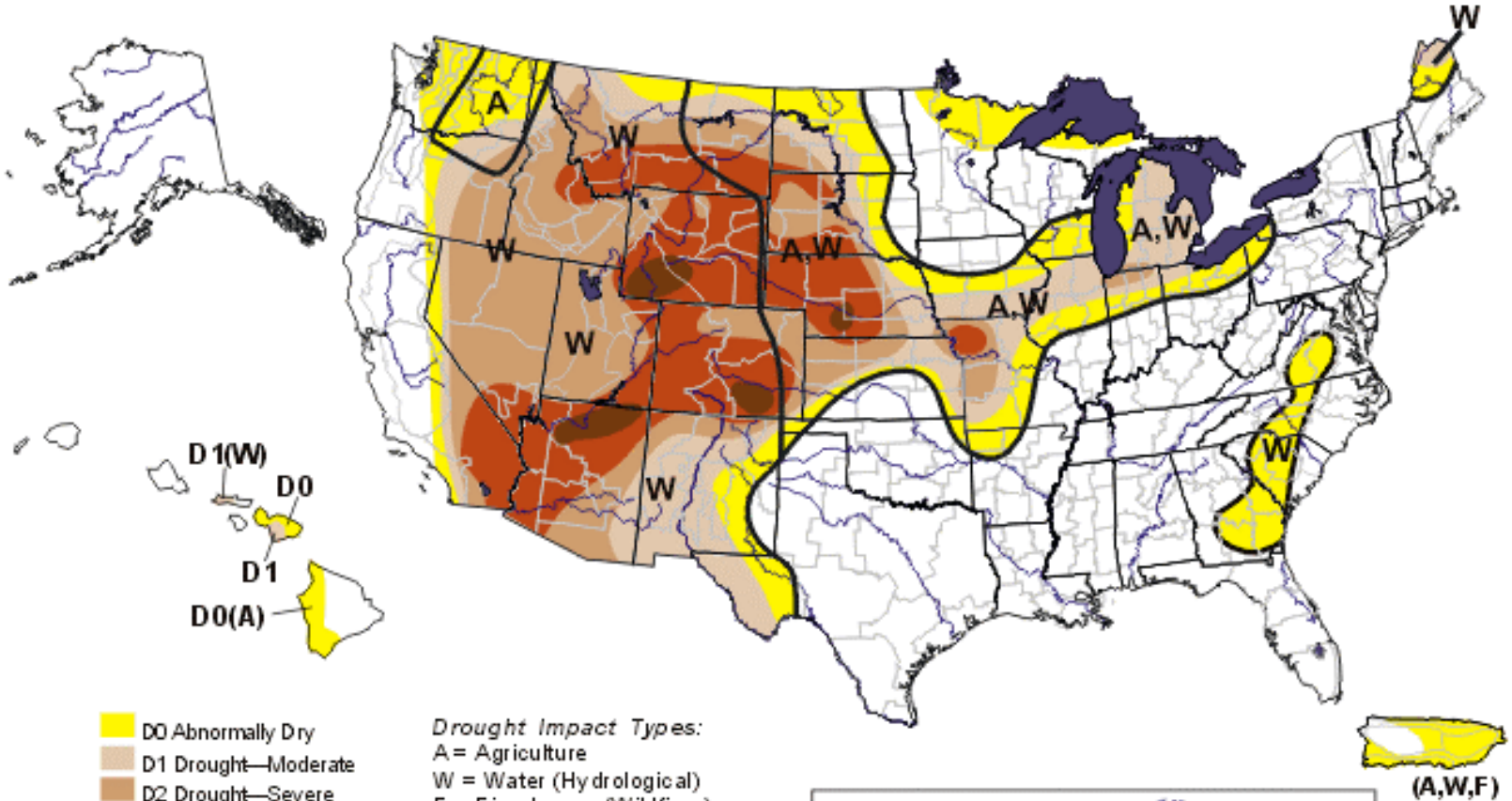
- Groundwater and Surface Water Modeling
- Colorado Decision Support System
- Engineering and Geotechnical Support
- Information Technology
  - » Internet, GIS, Imaging, Data Management
- Administration
  - » Records, Files, Support Services

Public Information Services

- Water records
  - Decrees
  - Diversions
  - Aquifer water level data
  - Well permits
  - Tabulations
  - Streamflow
  - Dam plans, specifications and inspection reports

U.S. Drought Monitor

December 31, 2002
Valid 7 a.m. EST



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

Drought Impact Types:
A = Agriculture
W = Water (Hydrological)
F = Fire danger (Wildfires)
Delineates dominant impacts
(No type = All 3 impacts)

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 | NOAA

Released Thursday, January 2, 2003

Author: *David Miskus, JAWF/CPC/NOAA*

Drought Impacts

- Calls were placed early in April and continue with the calls being more senior as the summer progresses. The Farmers Independent 11-22-1865 call in District 2 is the most senior call in 35 years in this reach of the South Platte.

- The plains irrigation reservoirs east of Denver were empty by the end of August.

- Well augmentation entities have had to continuously acquire additional augmentation water to deal with the extended call period resulting in a reduction of allowable pumping by 25%, some well pumping was curtailed to prevent violation of compact delivery requirements.

- A call this senior has not been seen before and it called out the City of Pueblo's 1874 direct flow right for 45 cfs which was the cities drought reserve water supply.

- Over 20 communities had shortages or have experienced water supply emergencies requiring special actions and include Rocky Ford, Beulah, Victor, Cripple Creek and Penrose. Many municipalities implemented restrictions on outside water use. Nearly all communities implemented some water use restrictions.

Future Issues and Activities

- Drought
- Budget, Staffing and Retirements
- Dam Safety and Security
- Aging Dam Infrastructure
- Streamgaging and Snow Survey
- Technology

- **Long-Term Possibilities:**
  - Water Project Development,
  - Maximize Existing Water Resources,
  - Forest Management,
  - Non-native vegetation Management
- **Legislation**
  - Potential for over 40 water bills to be introduced this session; water conservation, storage, representation, well inspection, and..??

Questions?

Related Web Sites

www.water.state.co.us

www.cwcb.state.co.us

www.nrcs.usda.gov/technical/water.html

www.drought.unl.edu

www.water.denver.co.gov

www.water.usgs.gov

www.weather.com

The End