Colorado Climate Center – WATF Climate Update

Peter Goble, Service Climatologist
Water Availability Task Force
November 20th, 2020
2020 Water Year To Date

temperature, precipitation, standardized precipitation index
WY 2020 was the 12th warmest on record

Warm temperature anomalies took place during the summer more so than winter

The water year started cold, but ended with near record warmth
WY 2020 was the third driest on record

The last year this dry or drier was 2018

2002 was the driest year on record

Conditions late in the water year cemented widespread agricultural and ecological drought
October temperatures were above normal for most of the month, but a strong cold snap hit just before Halloween.

This is similar to what happened last year.
Colorado - Mean Temperature
August-October 2020 Percentile

WestWide Drought Tracker, U Idaho/WRCC Data Source: PRISM (Prelim), created 16 NOV 2020

COLORADO CLIMATE CENTER
November is off to a warm start in eastern Colorado

This is likely to continue
Rough start to the water year from a moisture standpoint
Colorado has leaned dry to start the water year, though anomalies are not as extreme as August.

Very few areas starting above average.
November has given the mountains several decent storms, leading to an average start to the snow year.
30-day SPI: 2020/10/18 - 2020/11/16

Data from High Plains Regional Climate Center and ACIS

http://climate.colostate.edu/~drought/spi.html
6-month SPI: 2020/05/17 - 2020/11/16

Data from High Plains Regional Climate Center and ACIS

http://climate.colostate.edu/~drought/spi.html
Our state hasn’t caught a big break since spring 2019.
Drought

National Drought
Colorado Drought
Flash Drought?
Map released: Thurs. November 19, 2020
Data valid: November 17, 2020 at 7 a.m. EST

Intensity:
- None
- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)
- No Data

Author(s):
Richard Tinker, NOAA/NWS/NCEP/CPC

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

Degredations in W CO

Steadily bad most places
Highest fall evaporative demand across much of the west

These numbers are August-heavy

Wind has been a factor

This played a role in the fire situation
Map for Jul. 19, 2020

Vegetation Condition
- Extreme Drought
- Severe Drought
- Moderate Drought
- Pre-drought stress
- Near Normal
- Unusually Moist
- Very Moist
- Extremely Moist
- Out of Season
- Water
- Other Landcover

Zoom to a region

Return to the U.S. map  State Statistics

COLORADO CLIMATE CENTER
http://climate.colostate.edu/~drought/et.php
Olathe Growing Season Evaporative Demand
July 17, 2020

Olathe Growing Season Water Balance
July 17, 2020

http://climate.colostate.edu/~drought/et.php
Water balance (P/PET) from CoAgMET stations shows substantial recovery in the Arkansas River Valley, particularly at Rocky Ford.
Soil moisture has actually improved recently save for the Arkansas basin.
But it’s still awfully low. This will have consequences on the runoff season come springtime.

Dark red = drier than 2002, 2012, 2018
Fires

- Cameron Peak (209ka), East Troublesome (194ka), and Pine Gulch (139ka) Fires are now the three largest wildfires in state history (in that order)
- 2020 is now Colorado’s largest fire season on record
- Such rapid and intense expansion of fires in October is completely unprecedented. The East Troublesome fire’s 193,812 acre footprint was burned completely in October
- Is this the new normal? Not every year will suck like 2020, but in a warmer climate dry years hurt more
18% of Larimer County’s Landmass Has Burned Since 2012
Topsoil Moisture
Percent Short to Very Short
Week Ending - July 19, 2020

48 States
Short to Very Short 40
Change from Last Week +4

Data obtained from USDA National Agricultural Statistics Service weekly Crop Progress reports.
Another sparse QPF. We would like to see our high terrain averaging 0.75-1.00”/week.

http://schumacher.atmos.colostate.edu/weather/real_time/hpc_qpf_168h_imw/hpc_qpf_168h_imw.gif
Monsoon

Clearly some monsoonal precipitation patterns beginning to take shape

Clear monsoonal pattern this week
8-14 day outlook
La Niña conditions are likely to last through the winter. It may well fall apart in the spring. That is actually a good combination for Colorado.
Seasonal outlook
Seasonal outlook

Moderate La Niña in play. May strengthen further

Temperature trends heavily factor into all seasonal guidance
Seasonal outlook

La Niña generally means more moisture to the north, less to the south

La Niña actually leads to snowier winters in the northern Rockies. Tilt towards below normal precip oversimplifies topographic impacts

Expect snow in the northern Rockies and wind in the Ark Valley
Seasonal outlook

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Lukas et al. 2014
Precipitation Projections by Climate Region (credit: Klaus Wolter NOAA)
FORT COLLINS WY2021 Precipitation Projections

- 2020-11-15: 1.41" (Average: 1.58", 89% Ave)
- Long-Term Average (16.1")
- Average Projection (99% Ave)
- Above Average Projection (100% Ave)
- Below Average Projection (83% Ave)
- 111-Year Historical Accumulations
STEAMBOAT SPRINGS WY2021 Precipitation Projections

- 2020-11-14: 1.89" (Average: 3.19", 59% Ave)
- Long-Term Average (24.63")
- Average Projection (95% Ave)
- Above Average Projection (100% Ave)
- Below Average Projection (86% Ave)
- 95-Year Historical Accumulations

Accumulated Precip (in.)
Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct
MESA VERDE NP WY2021 Precipitation Projections

- 2020-11-16: 0.61" (Average: 2.55", 24% Ave)
- Long-Term Average (18.5"
- Average Projection (90% Ave)
- Above Average Projection (94% Ave)
- Below Average Projection (76% Ave)
- 80-Year Historical Accumulations
ALAMOSA-BERGMAN FIELD WY2021 Precipitation Projections

- 2020-11-15: 1.12" (Average: 0.92", 122% Ave)
- Long-Term Average (7.31")
- Average Projection (103% Ave)
- Above Average Projection (113% Ave)
- Below Average Projection (88% Ave)
- 60-Year Historical Accumulations
PUEBLO MEMORIAL AIRPORT WY2021 Precipitation Projections

- 2020-11-15: 0.67" (Average: 0.97", 69% Ave)
- Long-Term Average (12.57")
- Average Projection (98% Ave)
- Above Average Projection (103% Ave)
- Below Average Projection (81% Ave)
- 65-Year Historical Accumulations
BOULDER WY2021 Precipitation Projections

- 2020-11-15: 1.09" (Average: 2.22", 49% Ave)
- Long-Term Average (20.68")
- Average Projection (95% Ave)
- Above Average Projection (94% Ave)
- Below Average Projection (79% Ave)
- 83-Year Historical Accumulations

Accumulated Precip (in.)

Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct
Summary points

- WY 2020 is one we would like to forget (12th warmest and 3rd driest)
- The start of WY 2021 has been unsettling. We had a huge fire month in October, not typically part of high fire season for Colorado.
- The cool down at the end of October has brought back blue skies along the Front Range as fire growth have been brought back under control
- November to date hasn’t been especially atypical. It has leaned a bit dry and warm with a few decent snows to start the mountain snowpack season
- The next several weeks are likely to lean warm and dry. No major breaks in the forecast. Expect snowpack numbers to fall a bit behind
- Weak La Niña is likely this winter. Expect warmer and dry conditions to be more likely to the south and more normal conditions to the north. Don’t expect any widespread bailouts. Winners: NW CO. Losers: SE CO
- Above normal moisture is needed to put us on track next spring
Thank you!

To view this and other presentations: http://climate.colostate.edu/ccc_archive.html

Peter.Goble@colostate.edu