San Juan River Basin
Water Supply Outlook
April 20th, 2021

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Outline

- Colorado Basin River Forecast Center (CBRFC) Background
- Precipitation and Temperature Summary
- Snow Conditions
- Antecedent Soil Moisture Conditions
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Colorado Basin River Forecast Center (CBRFC) Background

The Hierarchy and Mission – Colorado Basin River Forecast Center

Emphasis on understanding and predicting the Earth’s environment.

Emphasis on protection of lives & property, decision support services associated with weather, water, and climate.

Emphasis on river basin hydrology

- Water supply forecasting
- River stage & stream flow forecasts
- Long range probabilistic forecasts
- Flood forecasting

13 National Weather Service River Forecast Centers
Colorado Basin River Forecast Center (CBRFC) Background

- Forecast Areas:
  - Colorado River Basin
  - Eastern Great Basin

- Major Programs Include
  - Flood and daily river forecasts
  - Water Supply Forecasts

- Staff includes meteorologists and hydrologists
### Water Year (October-March) and Monthly Precipitation

#### Basin Mean Precipitation as a % of Average

<table>
<thead>
<tr>
<th></th>
<th>San Juan River above Navajo Reservoir</th>
<th>Animas River</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water Year</strong></td>
<td>85</td>
<td>70</td>
</tr>
<tr>
<td>October</td>
<td>50</td>
<td>15</td>
</tr>
<tr>
<td>November</td>
<td>120</td>
<td>85</td>
</tr>
<tr>
<td>December</td>
<td>90</td>
<td>75</td>
</tr>
<tr>
<td>January</td>
<td>90</td>
<td>85</td>
</tr>
<tr>
<td>February</td>
<td>60</td>
<td>65</td>
</tr>
<tr>
<td>March</td>
<td>80</td>
<td>85</td>
</tr>
</tbody>
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Water Year Precipitation, October 2020 - March 2021

Averaged by Basin, Major Contributing Areas

- **San Juan River**
  - October: 50%
  - November: 120%
  - December: 90%
  - January: 90%
  - February: 60%
  - March: 80%

- **Animas River**
  - October: 15%
  - November: 85%
  - December: 75%
  - January: 85%
  - February: 65%
  - March: 85%

Prepared by NWS, Colorado Basin River Forecast Center
Salt Lake City, Utah, www.dbf.nws.gov
Average monthly maximum temperatures were generally above normal for November through January.

February and March temperatures were below to near normal.
April Precipitation and Temperature to Date

Precipitation:
- Much below normal precipitation for the month through April 19.
- Very dry conditions

Temperatures:
- 6-10 degrees above normal in the San Juan River Basin for April.
Snow conditions for the entire San Juan River basin are below normal. The eastern headwaters above Navajo Reservoir have slightly better snow conditions than the Animas River basin.

Snowmelt has started which is 1-2 weeks earlier than normal.
Soil moisture conditions entering the winter were below normal and generally in the bottom 3 of the 1981-2020 40-year period.

Conditions are similar to last year in the eastern headwaters but worse over the rest of the basin.

A portion of the snowmelt will be absorbed into the dry soils.

- Near to record low historical precipitation from April-October of last year.
- SNOTELs have a 35-40 year period of record.
- Lack of monsoon and a below average 2020 spring runoff exacerbated dry conditions.

- Soil moisture conditions entering the winter were below normal and generally in the bottom 3 of the 1981-2020 40-year period.
- Conditions are similar to last year in the eastern headwaters but worse over the rest of the basin.
- A portion of the snowmelt will be absorbed into the dry soils.
April 1st Water Supply Forecasts: San Juan River Basin

April-July Forecasts
Volume in 1000’s acre-feet / Percent of 1981-2010 average

- **San Juan-Bluff**: 505 / 46%
- **Vallecito**: 103 / 53%
- **Animas-Durango**: 210 / 51%
- **Navajo Reservoir**: 395 / 54%
- **San Juan- Farmington**: 520 / 47%
- **San Juan- Pagosa**: 135 / 63%
- **Peidra-Arboles**: 105 / 50%
- **Rio Blanco-Pagosa**: 41 / 76%

Main forecast drivers:
- Dry antecedent soil moisture conditions
- Below normal snow conditions

- April 1st forecasts range from 35-75% normal with a median forecast of 50%.
- Forecast guidance has decreased by ~5-10% of average since April 1st forecasts.
Forecast Progression: Animas River - Durango

10% chance volume will be greater than 275 KAF / 66% of average

April 16 50% Forecast: 185 KAF / 45%

90% chance volume will be greater than 125 KAF / 30% of average

2021/04/15:
Min 2002: 83.32
Average: 415
Median: 385
Observed
Accumulation: 8.24
Observed Total: 10.2
Normal
Accumulation: 26.3
ESP: 178
Official 50: 185

Animas-Durango Forecast Plot Link
San Juan River Forecast Plots Link
Peak Flow Forecasts

Peaks are highly dependent on Spring weather. Many possible hydrographs.

Latest Model Guidance Peak Percentile Ranking: April 18 2021

San Juan River basin peak flows are expected to be below the 10th percentile or in the 10th-25th percentile of the historical record.
Periods of unsettled weather are expected throughout the week. Precipitation is not expected to be significant.

Temperatures are expected to be near to slightly below normal before warming to above normal for the weekend.
Model uncertainty is higher in the 8-14 day period, which is typical of spring. There are elevated odds for below normal precipitation and above normal temperatures.
Seasonal Outlook for Spring (May-July)

Elevated odds of below normal precipitation and above normal temperatures.
Summary

• Below normal water year precipitation in the San Juan River Basin

• Below normal snow conditions

• Near/record low antecedent soil moisture conditions entering water year 2021 snow accumulation & runoff season
  • Two consecutive years of poor Monsoon
  • Limited groundwater recharge since 2019 runoff

• April water supply forecasts (% of normal):
  • April 1st forecasts range between 35-75% of average
  • Forecast guidance has decreased by ~5-10% since the April 1st
  • Best conditions are located in the eastern headwaters and deteriorate moving west towards the Animas River Basin.

• Dry soils will most likely impact runoff with a portion of the snowmelt being absorbed into the ground.

• The weather pattern will remain unsettled for most of the week with no significant precipitation expected.
Contact Info

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CBRFC Webpage
https://www.cbrfc.noaa.gov/

CBRFC Water Supply Presentations
https://www.cbrfc.noaa.gov/present/present.php