2020 Retrospective and Water Supply Forecast Review
Truckee, Carson, Walker and Humboldt Basins

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Nevada Division of Water Resources

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Other NRCS Programs of note…

Water Management Entities are Eligible for Water Conservation Projects through the Environmental Quality Incentives Program (EQIP). EQIP provides financial and technical assistance to agricultural producers to address natural resource concerns and deliver environmental benefits such as improved water and air quality, conserved ground and surface water, increased soil health, and reduced soil erosion and sedimentation, improved or created wildlife habitat, and mitigation against increasing weather volatility.

The 2018 Farm Bill authorizes direct program assistance to irrigation districts, including acequias and other entities, for purposes of improving water use efficiencies. Each contract is limited to $450,000, unless the Chief grants a waiver, which limits contracts to no more than $900,000. NRCS may decline to select an EQIP application from a water conservation entity and irrigation efficiency projects with water management entities who are otherwise eligible if NRCS determines that the project is better suited to be implemented under the Regional Conservation Partnership Program. The Regional Conservation Partnership Program (RCPP) promotes coordination between

Next EQIP deadline – yet to be determined

Other Deadlines…
Wetland Reserve Enhancement Partnership (WREP) easements to help protect and restore critical wetlands on agricultural lands.
Open to State/Local Govt, Tribes, NGOs, and landowners

Contact your local NRCS Field Office for more information
https://www.nrcs.usda.gov/wps/portal/nrcs/main/nv/contact/local/
April 1, 2020
Snow Water Equivalent
As Percent of Median

Snow Water Equivalent
Percent NRCS 1981-2010
Median
Beginning of April, 2020

- ≥ 150%
- 130% - 149%
- 110% - 129%
- 90% - 109%
- 70% - 89%
- 50% - 69%
- < 50%
- No basin value

Watershed Boundaries
- State Watersheds

Created 10-16-2020, 11:09 AM PDT
2020 Peak April 11
74% of median peak
~2 weeks late

March 14 (42% of median peak)  Early Melt-out

Median Peak
Mar 28

We missed a few April 1 snow course measurements due more to stormy flying weather, then because of COVID
"Corona Comeback"
Rapid Melt
~3 weeks earlier melt-out

2020 Peak Mar 31
79% of median peak

Median Peak
Mar 31
2020 Water Year Precipitation As Percent of Average

Water Year to Date Precipitation Percent NRCS 1981-2010 Average
October 1, 2019 through September 30, 2020

- Blue: ≥ 150%
- Medium Blue: 130% - 149%
- Light Blue: 110% - 129%
- Green: 90% - 109%
- Light Green: 70% - 89%
- Yellow: 50% - 69%
- Orange: < 50%
- Grey: No basin value

Watershed Boundaries
- State Watersheds

Created 10-20-2020, 08:44 AM PDT
2020 Water Year Precipitation Records

- ~4th - 10th driest yr since ~1981 <30th percentile with a few <10th percentile

- Record dry at Lobdell Lk

- 2nd Driest at Leavitt Mdw, Leavitt Lake, Poison Flat

- Record dry WY precip in Ruby Mtns
  - Lamoille #3
  - Green Mtn
  - Corral Canyon

- 2nd Driest
  - Lewis Peak (nr Battle Mtn)

- Also Record Dry from Austin to Ely
  - Big Creek Summit
  - Diamond Peak
  - Berry Creek
2020 April - July
Runoff Summary as Percent of Average

**Sierra Basins**
- Average - 46%
- Min – E Walker nr Bridgeport 25% Apr-Aug
- Max – Ash Canyon Ck nr Carson City 65%

**Humboldt Basin**
- Average - 39%
- Min – Humboldt R nr Imlay 8%
- Max – NF Humboldt R at Devils Gate 83%

**Colorado R at Glen Canyon Dam** - 53%

**Owyhee R nr Gold Ck** 106%
Forecast accuracy example
Each forecast is issued with 5 exceedance volumes.

Forecast Exceedance Probabilities

Labels on chart represent volumes of water expressed in thousand acre-feet.

<table>
<thead>
<tr>
<th>Forecast Point</th>
<th>Forecast Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carson Rnr</td>
<td>Apr-Jul</td>
</tr>
<tr>
<td>Carson City</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bin</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>&lt;90% Exceedance</td>
</tr>
<tr>
<td>2</td>
<td>90-70% Exceedance</td>
</tr>
<tr>
<td>3</td>
<td>70-50% Exceedance</td>
</tr>
<tr>
<td>4</td>
<td>50-30% Exceedance</td>
</tr>
<tr>
<td>5</td>
<td>30-10% Exceedance</td>
</tr>
<tr>
<td>6</td>
<td>&gt;10% Exceedance</td>
</tr>
</tbody>
</table>

Observed Runoff falls into 1 of 6 Bins
Generally in the Sierra Basins Apr-July 2020 runoff was near to slightly above the 50% exceedance forecast.
Summary of observed flow percent of average and April 1 forecast percent of average
Observed streamflow generally centered around 50% exceedance with skew toward wetter (30-10% exceedance).
April – July
Precipitation as % of Average
2020 Peak April 10
74% of median peak

March 14 (42% of median peak)
Humboldt Basin

Observed streamflow generally well less than 50% exceedance forecasts
<table>
<thead>
<tr>
<th>Forecast Point</th>
<th>Forecast Period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marys R nr Death</td>
<td>Apr-Jul</td>
</tr>
<tr>
<td>Lamoille Cr nr Lamolle</td>
<td>Apr-Jul</td>
</tr>
<tr>
<td>NF Humboldt R at Devils Gate</td>
<td>Apr-Jul</td>
</tr>
<tr>
<td>Humboldt R nr Elko</td>
<td>Apr-Jul</td>
</tr>
<tr>
<td>SF Humboldt R nr Dish Creek</td>
<td>Apr-Jul</td>
</tr>
<tr>
<td>Humboldt R nr Carlin</td>
<td>Apr-Jul</td>
</tr>
<tr>
<td>Humboldt R at Pahaska</td>
<td>Apr-Jul</td>
</tr>
<tr>
<td>Reck Cr nr Battle Mountain</td>
<td>Apr-Jul</td>
</tr>
<tr>
<td>Humboldt R at Comus</td>
<td>Apr-Jul</td>
</tr>
<tr>
<td>L Humboldt R nr Paradise Valley</td>
<td>Apr-Jul</td>
</tr>
<tr>
<td>Martin Cr nr Paradise Valley</td>
<td>Apr-Jul</td>
</tr>
<tr>
<td>Humboldt R nr Inlay</td>
<td>Apr-Jul</td>
</tr>
</tbody>
</table>

### April – July Precipitation as % of Average

#### Forecast Exceedance Probabilities

- **Past Events:**
  - 25%
  - 35%
  - 41%
  - 48%
  - 58%

- **Future Conditions:**
  - 27%
  - 27%
  - 32%
  - 39%

#### Labels on Chart:
- Chart values represent volumes of water expressed in thousand acre-feet.
- Observations range from 10% to 150% of average.
Summary of observed flow percent of average and April 1 forecast percent of average
Record Low Water Year
Precipitation in Ruby Mtns

Example: Green Mtn was +3.5 inches drier than previous minimum years

2020 = 17.5”
Median Peak Mar 31

2020 Peak Mar 31
79% of median peak

Rapid Melt
Early Melt-out
Most of Humboldt basin snow came by February 1.

Very little accumulation March - April.

Southern aspects (not represented by SNOTEL network) were no doubt snow-free by April-July runoff period.
Soil Moisture Deficits

**DEPTH AVERAGED SOIL SATURATION IN UPPER HUMBOLDT**

- Link to data: CSV / JSON
- Station List
  - Max
  - Average
  - Min
  - Stats
  - 2021
  - 2019
  - 2018
  - 2017
  - 2016
  - 2015
  - 2014
  - 2013
  - 2012
  - 2011
  - 2010
  - 2009
  - 2008

Current as of 10/20/2020

**DEPTH AVERAGED SOIL SATURATION AT LAMOILLE #3**

- Link to data: CSV / JSON

Current as of 10/20/2020

Statistical shading breaks at 10th, 30th, 50th, 70th, and 90th Percentiles. For more information visit: 30 year normals calculation description.
April 1 forecasts compared to observed streamflow as a percent of average
Humboldt River at Imlay

Humboldt River at Imlay April-July Forecasts

Average

Observed

1-JAN 1-FEB 1-MAR 1-APR 1-MAY 1-JUN

61 45 61 54 15 15

61 131 139 115 76 60

335 250 199 175 200 178

265 250 178 178 178 178

90% 70% 50% 30% 10% Observed Average
Forecast redevelopment for 2020-2021

2020-2021 we will be updating all forecasts in the West

Fall of 2020 East Side of Nevada redevelopment
Humboldt River (all forecasts)
Forecasts in Eastern Nevada
Forecasts in Northwest Nevada.

2021 work will include updates of all forecasts in the Sierra Nevada (NV/CA)
Sierra
• Corona comeback snow (mid-March to mid-April) saved Sierra winter by boosting peak and delaying melt 2 extra weeks.
• < 50% normal April – July runoff could have been much worse.
• April-July 2020 runoff was near to slightly above the 50% exceedance forecasts.

Humboldt
• Flattened snowpack curve leading to 3-week earlier melt out.
• Flattened precipitation curve leading to record dry water year.
• What was above normal snowpack on Feb 1 stalled, and turned into disappointing runoff with <40% of average April-July streamflow.
• April-July 2020 runoff far less than 50% exceedance forecasts.