CBRFC
May 2012
Water Supply Webinar

1pm, May 4, 2012

Kevin Werner

These slides: www.cbrfc.noaa.gov/present/present.php
Outline

• Recent Weather
• Snow States
• Future Weather/Climate
• Water Supply Forecasts
• Peak Flow Forecasts

Snow Point Classification: □ Percentiles ○ Percent Average

Created: April 5, 2012, 14:15

Web Reference:
Snow

Snow

Snow
CBRFC Snow Model States
Storms

SNOTEL percentile rankings for 2012 for all

Top 10%

Bottom 10%

Web Reference: http://www.cbrfc.noaa.gov/snow/raster/
Snow: Upper Green Basin (Fontelle)
SNOTEL percentile rankings for 2012 for UpGreen

Web Reference: http://www.cbrfc.noaa.gov/snow/raster/
Snow: Duchesne Basin

Snow: Yampa Basin

Web Reference: http://www.cbrfc.noaa.gov/station/sweplot/sweplot.cgi???open
Snow: Colorado Mainstem (above Cameo)

Colorado Basin River Forecast Center
Upper Colorado Mainstem Group

To Date: 20% (2.8 / 14.5)  
Seasonal: 17% (2.8 / 16.9)  
Melt rate -0.3 in/day averaged over last 3 days.  

Average 1981-2010  
2012  
2011  
2002

Web Reference: http://www.cbrfc.noaa.gov/station/sweplot/sweplot.cgi???open
Snow: Gunnison Basin

Web Reference: http://www.cbrfc.noaa.gov/station/sweplot/sweplot.cgi
SCHOFIELD PASS (sosc2)

Inches of Snow Water Equivalent (SWE)

Plot Created May 4, 07:59 MDT by the Colorado Basin River Forecast Center (NWS/NOAA)
Snow:
San Juan Basin
Snow:
Six Creeks in Salt Lake County

Colorado Basin River Forecast Center
Six Creeks Headwaters Group

To Date: 57% (14.3 / 24.9)
Seasonal: 57% (14.3 / 25.1)
Melt rate -0.2 in/day averaged over last 3 days.

Average 1981-2010  2012  2011

Web Reference: http://www.cbrfc.noaa.gov/station/sweplot/sweplot.cgi??open
Snow: Weber Basin

Colorado Basin River Forecast Center
Weber Basin Headwaters Group

To Date: 33% (5.1 / 15.4)
Seasonal: 26% (5.1 / 19.6)
Melt rate -0.5 in/day averaged over last 3 days.

Created: 05/03/18 20:25 UTC
NOAA/CBRFC, 2012

Snow: Bear River Basin

Colorado Basin River Forecast Center
Bear River Drainage Group

To Date: 35% (5.1 / 14.6)
Seasonal: 27% (5.1 / 19.1)
Melt rate -0.5 in/day averaged over last 3 days.


Web Reference: http://www.cbrfc.noaa.gov/station/sweplot/sweplot.cgi??open
Forecast Precipitation

Web Reference: www.hpc.noaa.gov
Weather Forecast

• Weak storm track persists mostly north of Colorado River Basin
• Generally dry pattern
• Below average temperatures for the weekend before warming up again next week.

• Chance for precipitation up to 1” in western CO and NM Sunday through mid week next week.

Web Reference: www.hpc.noaa.gov
P360H Vld Ven-Fri 00Z 18 Mai-May 2012 NAEFS-raw-brute
Probability of precipitation > 25 mm
Probabilité de précipitations > 25 mm
312 hours/heures from/de 00Z 05 Mai-May 2012
to/à 00Z 18 Mai-May 2012
Issued/Émise 2012050300Z
Counting members/Comptage de membres

Web Reference: www.weatheroffice.gc.ca
Above Average March Runoff
Below Average April Runoff

BLACKSMITH FORK - HYRUM, NR, UPNL DAM, ABV (hrmu1)
Flow (cfs) for past 30 Days, Forecast run 2012-04-05 14:00 GMT
Plot Created April 5, 15:34 MDT by the Colorado Basin River Forecast Center (NWS/NOAA)

Created: April 5, 2012, 15:30
Above Average March Runoff
La Nina Update

Web Reference: [http://www.cpc.noaa.gov](http://www.cpc.noaa.gov) and [iri.columbia.edu/climate/ENSO](http://iri.columbia.edu/climate/ENSO)
Solar Cycle Variations

IES Solar Cycle Sunspot Number Progression
Observed data through Mar 2012

Updated 2012 Apr 0
May 2012
Water Supply
Forecasts

Highlights:
• Big reductions at most forecast points in upper Colorado Basin.
• Reductions generally not as major as March to April forecast reductions.
• Less significant changes in Great Basin
Seasonal Water Supply Forecast

**1030 kaf**
50% Exceedence (Official Forecast)

**770 kaf**
90% Exceedence

**1340 kaf**
10% Exceedence

76th of 79
Official Historical Flows

Forecast Issued: May 1, 2012

**COLORADO - CAMEO, NR (CAMC2)**

Water Year 2012, Forecast Period Apr-Jul (highlighted)

Have we seen major drops in the forecast from March to April before?

Yes: 2004 (forecast dropped 6.5 MAF to 4.0 MAF) and 2007 (forecast dropped 5.6 MAF to 4.0 MAF)

2012 forecast went 5.3 MAF to 3.5 MAF
What about changes from April to May?

2002 forecast went from 3.0 to 2.0 MAF
2006 forecast went from 7.7 to 6.8 MAF

2012 forecast went 3.5 MAF to 2.4 MAF (1.1 MAF reduction)
Seasonal Water Supply Forecast

66 kaf
50% Exceedence (Official Forecast)

57% of Historical Median
56% of Historical Mean

50 kaf
90% Exceedence

80 kaf
10% Exceedence

102nd of 108
Official Historical Flows

Forecast Issued: May 1 2012

WEBSR - OAKLEY, NR (OAWU1)
Water Year 2012, Forecast Period Apr-Jul (highlighted)

Upper Colorado Mainstem Specific Site Forecasts (kaf)

Click site name for graph.

<table>
<thead>
<tr>
<th>Site Name</th>
<th>Forecast Period</th>
<th>90% Exceedance Volume</th>
<th>50% Exceedance Volume</th>
<th>Percent Average</th>
<th>10% Exceedance Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Colorado</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lake Granby, Granby, Nr</td>
<td>April-July</td>
<td>200</td>
<td>280</td>
<td>124</td>
<td>370</td>
</tr>
<tr>
<td>Willow Ck</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Willow Ck Res, Granby, Nr</td>
<td>April-July</td>
<td>44</td>
<td>70</td>
<td>137</td>
<td>102</td>
</tr>
<tr>
<td>Fraser</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Winter Park</td>
<td>April-July</td>
<td>15</td>
<td>23</td>
<td>115</td>
<td>29</td>
</tr>
<tr>
<td><strong>Williams Fork</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Williams Fork Res, Parshall, Nr</td>
<td>April-July</td>
<td>76</td>
<td>110</td>
<td>116</td>
<td>150</td>
</tr>
<tr>
<td>Muddy Ck</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wolford Mtn Res, Blo</td>
<td>April-July</td>
<td>40</td>
<td>76</td>
<td>127</td>
<td>114</td>
</tr>
<tr>
<td><strong>Blue</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dillon Res</td>
<td>April-July</td>
<td>134</td>
<td>200</td>
<td>120</td>
<td>260</td>
</tr>
<tr>
<td>Green Mtn Res</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Colorado</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kremmling, Nr</td>
<td>April-July</td>
<td>725</td>
<td>1070</td>
<td>123</td>
<td>1450</td>
</tr>
<tr>
<td>Eagle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gypsum, Blq</td>
<td>April-July</td>
<td>250</td>
<td>380</td>
<td>113</td>
<td>535</td>
</tr>
<tr>
<td><strong>Colorado</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dotsero, Nr</td>
<td>April-July</td>
<td>1140</td>
<td>1720</td>
<td>119</td>
<td>2410</td>
</tr>
<tr>
<td><strong>Frying Pan</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ruedi Res, Basalt, Nr</td>
<td>April-July</td>
<td>112</td>
<td>160</td>
<td>113</td>
<td>215</td>
</tr>
<tr>
<td>Roaring Fork</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glenwood Springs</td>
<td>April-July</td>
<td>570</td>
<td>840</td>
<td>118</td>
<td>1160</td>
</tr>
<tr>
<td>Colorado</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glenwood Springs, Blo</td>
<td>April-July</td>
<td>1700</td>
<td>2560</td>
<td>119</td>
<td>3600</td>
</tr>
<tr>
<td>Cameo, Nr</td>
<td>April-July</td>
<td>1980</td>
<td>2910</td>
<td>120</td>
<td>4020</td>
</tr>
<tr>
<td><strong>Plateau Ck</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cameo, Nr</td>
<td>April-July</td>
<td>100</td>
<td>160</td>
<td>139</td>
<td>250</td>
</tr>
<tr>
<td><strong>Colorado</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cisco, Nr</td>
<td>April-July</td>
<td>3640</td>
<td>5620</td>
<td>121</td>
<td>8020</td>
</tr>
<tr>
<td><strong>Mill Ck</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moab, Nr, Sheley Tun, At</td>
<td>April-July</td>
<td>2.9</td>
<td>6</td>
<td>120</td>
<td>10.8</td>
</tr>
<tr>
<td><strong>Colorado</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lake Powell, Glen Cyn Dam, At</td>
<td>April-July</td>
<td>5860</td>
<td>9500</td>
<td>120</td>
<td>14000</td>
</tr>
</tbody>
</table>

*Median of forecasts within each basin.
Peak Flow Forecasts

Long Lead Peak Flow Forecasts
- Snowmelt maximum mean daily flow (April‐July)
- Issued (at least) monthly from March‐June (this year semi‐monthly starting in April)
- ~60 forecast points – some unregulated, some regulated

Daily Forecasts
- Full Hydrograph out 14 days
- Includes temperature (10 days) and precipitation (5 days) forecast
- Includes any knowledge of future regulation (e.g. reservoir release)
- Single value forecast
- Issued daily by 10am MDT and updated throughout day
- ~450 forecast points
Spring Weather Really Matters

• Runoff characteristics are largely determined by the day-to-day spring weather.
  – While large snow pack years increase chances for flooding, it is not an inevitability
  – Small snow pack years (like 2010) can flood with the right sequence of spring temperatures
Peak Flow Forecast Synopsis

- All 50% forecasts (much) below flood stages
- All 10% forecasts below flood stage
- Upper Green has somewhat higher chances of river flows near bankfull reflecting near average snow pack in that drainage
CBRFC News

• Basin Focal Points (Available to discuss forecasts: 801.524.5130)
  – Upper Colorado: Brenda Alcorn / John Lhotak
  – Green: Ashley Nielson
  – San Juan / Gunnison: Greg Smith
  – Great Basin: Brent Bernard
  – Sevier / Virgin: Stacie Bender
  – Lower Colorado (below Lake Powell): Tracy Cox

• Future Webinars:
  – May 17 at 1pm MDT focus on peaks
  – June 6 at 1pm MDT focus on water supply
2012 CBRFC Stakeholder Forum

• July 31, 2012
• SLC, UT
• Theme: Observing System
• More details: www.cbrfc.noaa.gov/present/2012/2012forum.htm
• Contact: kevin.werner@noaa.gov
More Resources

• www.cbrfc.noaa.gov
• Wateroutlook.nwrfc.noaa.gov

• Next Webinar: 1pm Apr 18

Pagano et al 2004 paper on 2004 runoff:
Feedback, Questions, Concerns always welcome....

Kevin Werner
CBRFC Service Coordination Hydrologist
Phone: 801.524.5130
Email: kevin.werner@noaa.gov