

PEAK FLOW FORECASTS

FLOW EXTREMES, NOT SUPPLY

Peak flow forecasts are fundamentally different than water supply volume forecasts. Although the watershed snowpack is a principal component in both analyses, peak flows are not a supply question at all. Rather, peak flows characterize runoff extremes by predicting maximum mean daily flow at a single point during the spring snowmelt season. This extreme is related to the water supply volume, but the relationship is not direct or constant from year to year. As such, peak flow forecasts contain much more uncertainty than water supply volume forecasts.

REGULATED VS. NATURAL FLOWS

An even more fundamental limitation is that peak forecasts describe regulated (actual or observed) in-stream flow well into the future, something difficult to do considering the quantity and changing nature of diversions in the Colorado River and Great Basin watersheds. (Note: supply forecasts deal with hypothetical "natural" flow - that which would have resulted in the absence of regulation). The Colorado Basin River Forecast Center routinely forecasts regulated streamflow, but only for several days into the future. Further into the future the ability to forecast reservoir regulation becomes more limited.

DIFFERENT USES AND USERS

Peak flow forecasts are used for different purposes than water supply volume forecasts. Users of these forecasts would include river recreationists, flood control agencies, emergency service directors, wildlife managers and anyone interested in the combined effect of watershed yield and human regulation on the actual (observed) in-stream maximum mean daily flows at a site.

FLOOD FLOWS

The National Weather Service defines flood flow as the flow at which damage to structures begins to occur. Over-bank flow may occur but still be below the defined flood flow. Flood flows contained in this document change from year to year due to such channel processes as deposition and scouring. Therefore, the flood flows that follow should only be applied to the current runoff season. It should also be noted that they are instantaneous flows and not maximum mean daily flows. **Forecast mean daily flows above the instantaneous flood flow will be highlighted in red.**

IMPORTANT NOTE:

Please note that the following peak flow forecasts will be updated during the first week in May. The updated forecasts can be accessed through the CBRFC homepage (<http://www.cbrfc.gov>) or by calling the appropriate Service Hydrologist (see page 8 and 9).

INTERPRETIVE NOTES

PEAK FLOW DEFINED

The peak flow forecast represents the maximum mean daily flow (the highest average flow for an entire day during the runoff season) at a point during the April through July period, unless otherwise noted. It does not represent the instantaneous peak (the maximum flow at a single moment). In the case of smooth snowmelt regimes (hydrographs), it may be acceptable to approximate one with the other. In Arizona, the normal snowmelt period is from February to May. Occasionally, heavy rainfall events can produce higher peak flows than the snowmelt peak flows. For verification and calibration purposes, the maximum mean daily flow during the February through May period was used regardless of the runoff source. The Average Peak and Normal Time of Peak (defined as the average date of peak plus/minus one standard deviation which should include approximately 70% of the peaks) for a given gage are all derived from 1971 through 2000 data whereas the Historic Peak is derived from the period of record, including the most recent years, after reservoir regulation began.

FORECAST PROBABILITIES

Peak flow forecasts are presented in terms of probabilities or, more specifically, exceedance probabilities. The forecast labeled “most probable” is actually the 50% exceedance level meaning there are equal chances of being below the value or above the value (i.e., 50 chances out of 100 of being exceeded). The other exceedance probabilities associate the likelihood of exceeding other levels. In general, a close bunching of the exceedance forecasts indicates low variability and that the user can have a high degree of confidence in the forecast information. Conversely, a large spread in the exceedance forecasts indicates high variability.

MODELLING TECHNIQUES

The peak flow forecasts that follow have been derived using a combination of (1) physically-based conceptual models and (2) statistical regression models. The conceptual model is the National Weather Service River Forecasting System in the Ensemble Stream flow Prediction (ESP) mode. Since the conceptual model requires reservoir operation plans for up to five months into the future, ESP application is limited to basins where regulation is minimal (mostly in the headwater areas). The farther downstream a forecast point is, the more likely it is that a statistical regression was used between natural snowmelt runoff volume and the observed maximum mean daily flow to generate the forecast. Such an approach performs better when the correlation between regulated and unregulated flow is strong and is constant from year to year.

UPPER COLORADO PEAK FLOW FORECASTS

Mean daily flows in cubic feet per second (cfs)

STATION NAME	Historic Peak	Average Peak	Flood* Flow	2006 Peak	2006 Date	2007 Forecast Exceedance Probability					Normal time of peak
						90%	75%	50%	25%	10%	
COLORADO - KREMMLING, NR	12,700	3,900	10,100	2,690	5/22	N/A	N/A	N/A	N/A	N/A	5/15 - 6/27
EAGLE - GYPSUM, BLO	6,580	3,600	6,600	3,920	5/23	2,000	2,500	3,000	3,700	4,500	6/1 - 6/21
COLORADO - DOTSERO, NR	20,800	9,425	17,150	8,830	5/23	4,500	5,500	6,800	8,000	10,000	5/25 - 6/20
ROARING FORK - GLENWOOD SPRINGS	11,200	6,150	11,800	5,640	5/23	2,800	3,500	4,100	5,000	6,000	6/3 - 6/18
COLORADO - CAMEO, NR	38,000	17,500	23,500	16,400	5/23	8,000	10,000	12,500	15,000	20,000	5/29 - 6/18
PLATEAU CK - CAMEO, NR	4,100	1,460	3,450	1,190	5/23	350	450	550	900	1,400	5/9 - 6/11
EAST - ALMONT, NR	5,000	2,080	3,100	1,830	5/24	1,000	1,100	1,300	1,500	1,900	5/28 - 6/17
NF GUNNISON - SOMERSET, NR	7,080	3,310	11,600	2,380	5/24	1,200	1,500	1,800	2,400	2,800	5/11 - 6/2
SURFACE CK - CEDAREDDGE	640	210	1,320	150	4/24	50	70	100	150	200	5/3 - 6/8
UNCOMPAHGRE - COLONA	1,900	1,070	3,000	740	6/10	N/A	N/A	N/A	N/A	N/A	5/9 - 6/22
GUNNISON - GRAND JUNCTION, NR	23,200	9,660	20,800	5,070	4/25	3,000	4,000	5,200	6,000	7,500	5/3 - 6/12
COLORADO - CO-UT STATELINE, NR	68,300	26,150	47,550	20,900	5/24	11,000	13,000	16,000	21,000	28,000	5/22 - 6/16
DOLORES - DOLORES	6,950	2,980	8,700	1,490	5/23	1,200	1,500	1,800	2,300	2,700	5/9 - 6/4
SAN MIGUEL - PLACERVILLE, NR	2,740	1,310	2,700	815	5/26	500	700	850	1,000	1,300	5/26 - 6/23
DOLORES - CISCO, NR (see note1 below)	12,900	6,050	N/A	1,115	4/17	N/A	N/A	N/A	N/A	N/A	4/26 - 6/5
COLORADO - CISCO, NR	69,500	28,800	60,500	21,400	5/24	11,500	14,000	17,500	23,000	30,000	5/20 - 6/15
GREEN - DANIEL, NR, WARREN BRIDGE, AT	5,620	2,975	N/A	2,610	6/11	1,600	1,800	2,100	2,300	3,000	5/30 - 6/30
NEW FORK - BIG PINEY, NR	9,110	5,285	N/A	4,710	5/24	2,800	3,100	3,600	4,150	5,100	5/31 - 6/24
GREEN - LABARGE, NR	18,800	9,270	14,600	7,280	5/24	N/A	N/A	N/A	N/A	N/A	5/30 - 6/24
BIG SANDY - FARSON, NR	1,690	820	1,300	690	5/22	N/A	N/A	N/A	N/A	N/A	5/28 - 6/23
GREEN - GREEN RVR WY, NR	15,400	7,110	15,500	4,100	6/11	N/A	N/A	N/A	N/A	N/A	5/23 - 7/11
HAMS FORK - FRONTIER, NR, POLE CK, BLO	2,000	825	1,600	850	5/21	230	300	400	570	650	5/10 - 6/9
BLACKS FORK - LITTLE AMERICA, NR	6,970	2,440	5,500	610	5/26	-	-	1,100	2,100	3,050	5/2 - 6/27

N/A - NOT AVAILABLE (NOT A FLOOD FORECAST POINT OR NO FORECAST PROCEDURE EXISTS)

note1 - for releases below McPhee Reservoir call 970-565-7562

* Flood flow is for current year only and is an instantaneous value

* - indicates exceedance value has already occurred during the current runoff season

UPPER COLORADO PEAK FLOW FORECASTS (continued)

Mean daily flows in cubic feet per second(cfs)

STATION NAME	Historic	Average	Flood*	2006	2006	2007 Forecast Exceedance Probability					Normal time of peak
	Peak	Peak	Flow	Peak	Date	90%	75%	50%	25%	10%	
YAMPA - STEAMBOAT SPRINGS	5,870	3,240	4,500	3,830	5/24	1,600	1,900	2,400	2,700	3,000	5/19 - 6/12
YAMPA - MAYBELL, NR	24,400	10,475	26,900	11,340	5/25	4,300	5,400	6,450	7,500	8,900	5/13 - 6/10
LITTLE SNAKE - LILY, NR	13,400	4,745	19,400	3,520	5/26	1,500	1,700	2,100	2,400	3,000	5/5 - 6/12
YAMPA - DEERLODGE PARK	32,300	13,955	17,500	13,050	5/26	4,500	6,800	8,000	9,500	11,600	5/11 - 6/6
GREEN - JENSEN, NR (see note1 below)	38,500	17,600	23,600	18,520	5/26	8,900	11,200	12,400	14,900	16,000	5/14 - 6/11
ROCK CK - UPR STILLWATER RES	2,080	1,350	N/A	960	6/11	700	880	950	1,030	1,140	5/25 - 6/20
UINTA - NEOLA, NR	4,640	1,640	5,665	950	5/23	4,400	530	610	730	1,020	5/25 - 6/15
WHITE ROCKS - WHITEROCKS, NR	4,640	1,230	5,340	480	5/21	400	480	540	630	850	5/10 - 6/10
DUCHESNE - TABIONA, NR	2,320	765	4,040	1,410	5/23	220	310	490	620	805	5/15 - 6/15
DUCHESNE - RANDLETT, NR	11,500	2,755	7,400	1,680	5/23	700	750	900	1,100	1,800	4/27 - 7/5
WHITE - MEEKER, NR	6,320	3,200	6,500	3,220	5/28	1,450	1,800	2,100	3,000	3,500	5/21 - 6/14
GREEN - GREEN RIVER, UT (see note1 below)	47,200	22,560	48,500	22,570	5/28	10,500	13,000	15,000	17,400	19,500	5/18 - 6/16
SAN RAFAEL - GREEN RIVER, NR	3,600	910	N/A	1,840	6/10	110	220	300	500	700	5/17 - 7/16
MUDDY CK - EMERY, NR	515	205	N/A	340	5/23	65	75	90	100	140	5/19 - 6/18
DIRTY DEVIL - HANKSVILLE, NR, POISON SPGS **	1,310	445	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	3/12 - 5/31
ESCALANTE - ESCALANTE, NR ***	227	72	N/A	N/A	N/A	45	50	60	65	90	3/24 - 6/2
CATARACT CANYON (estimated)	116,700	51,350	N/A	43,700	5/25	22,000	27,000	32,000	40,400	49,500	5/20 - 6/16
SAN JUAN - PAGOSA SPRINGS	4,640	2,485	6,760	1,420	5/21	1,050	1,350	1,650	1,900	2,100	5/15 - 6/12
ANIMAS - DURANGO	10,700	4,675	10,430	3,140	5/25	2,100	2,500	3,100	3,650	4,200	5/28 - 6/14
ANIMAS - FARMINGTON	11,000	4,900	8,990	3,130	5/25	1,950	2,400	3,200	3,850	4,400	5/31 - 6/15
SAN JUAN - BLUFF, NR (see note2 below)	15,600	7,340	40,700	7,070	6/09	6,400	6,800	7,100	8,100	8,700	5/21 - 7/4

N/A - NOT AVAILABLE (NOT A FLOOD FORECAST POINT OR NO FORECAST PROCEDURE EXISTS)

NOTE1 - Peak flow forecasts on the Green River below Flaming Gorge Reservoir are based on USBR planned regulation.

NOTE2 - Peak flow forecasts on the San Juan below Navajo Reservoir are based on USBR planned regulation.

* Flood flow is for current year only and is an instantaneous value ** Runoff period March - June

*** Runoff Period March - June does not include contribution from Boulder Creek

- indicates exceedance value has already occurred during the current runoff season

LOWER COLORADO PEAK FLOW FORECASTS

Mean daily flows in cubic feet per second (cfs)

STATION NAME	Historic Peak	Average Peak	Flood* Flow	2006 Peak	2006 Date	2007 Forecast Exceedance Probability					Normal time of peak
						90%	75%	50%	25%	10%	
VIRGIN - BLOOMINGTON, NR	15,500	1,020	11,530	2,600	3/29	200	230	400	575	850	3/17 - 5/25
VIRGIN - LITTLEFIELD, NR	17,000	1,915	27,780	1,610	3/29	235	285	430	600	940	3/15 - 5/6
VIRGIN - HURRICANE, NR	9,620	1,520	7,160	1,390	3/29	200	260	370	560	780	3/14 - 5/9
VIRGIN - VIRGIN	10,600	780	5,130	1,110	3/29	225	260	345	465	685	3/13 - 5/4
NORTH FORK VIRGIN - SPRINGDALE, NR	2,820	570	5,570	671	3/29	155	180	255	350	440	4/10 - 5/15
SANTA CLARA - GUNLOCK	3,300	100	N/A	475	3/29	-	-	-	-	30	3/7 - 5/25
SANTA CLARA - ST.GEORGE	2,960	60	25,660	295	3/29	9.9cfs, 2/28/2007					2/10 - 5/23
SANTA CLARA - PINE VALLEY, NR	393	65	N/A	54	3/29	-	-	-	-	17	4/25 - 5/25
STATION NAME	Historic Peak	Average Peak	Flood* Flow	2006 Peak	2006 Date						Normal time of peak
SALT - ROOSEVELT, NR	77,200	9,610	136,700	447	4/09	1690cfs, 3/26/2007					3/6 - 4/9
SALT - CHRYSOTILE, NR	41,200	8,540	73,400	388	4/08	1640cfs, 3/25/2007					3/5 - 4/8
TONTO CK - ROOSEVELT, NR, GUN CK, ABV	32,200	4,090	53,150	31	3/17	110cfs, 3/24/2007					3/3 - 4/4
OAK CREEK - SEDONA, NR	8,600	1,550	14,130	39	3/30	54cfs, 2/23/2007					3/6 - 4/9
VERDE - HORSESHOE DAM, ABV, TANGLE CK	65,100	8,530	129,200	194	3/22	226cfs, 3/23/2007					3/6 - 4/9
AGUA FRIA - ROCK SPRINGS, NR	23,600	2,565	10,970	18	3/12	2.7cfs, 2/19/2007					2/28 - 4/3

N/A - NOT AVAILABLE (NOT A FLOOD FORECAST POINT OR NO FORECAST PROCEDURE EXISTS)

* Flood flow is for current year only and is an instantaneous value

* - indicates exceedance value has already occurred during the current runoff season

GREAT BASIN PEAK FLOW FORECASTS

Mean daily flows in cubic feet per second (cfs)

STATION NAME	Historic	Average	Flood*	2006	2006	2007 Forecast Exceedance Probability					Normal time of peak
	Peak	Peak	Flow	Peak	Date	90%	75%	50%	25%	10%	
BEAR - UTAH-WYOMING STATELINE, NR	2,680	1,610	4,330	1,480	5/22	860	980	1,125	1,295	1,475	5/22 - 6/14
LOGAN - LOGAN, NR, STATE DAM, ABV	1,870	985	1,360	1,530	5/21	410	470	545	625	715	5/18 - 6/10
BLACKSMITH FORK - HYRUM, NR, UP&L DAM	1,530	490	865	672	4/17	150	190	230	285	400	4/24 - 5/20
WEBER - OAKLEY, NR	4,170	1,625	2,400	1,520	5/21	810	875	990	1,150	1,350	5/24 - 6/16
CHALK CK - COALVILLE	1,420	600	1,900	368	5/21	-	205	285	415	590	5/5 - 5/31
PROVO - WOODLAND, NR	2,530	1,685	3,150	1,920	5/27	580	620	715	850	980	5/11 - 6/6
LITTLE COTTONWOOD CK - SALT LAKE CITY, NR	762	470	800	578	6/09	235	255	270	275	305	5/23 - 6/20
BIG COTTONWOOD CK - SALT LAKE CITY, NR	980	430	800	449	5/20	180	215	235	250	285	5/18 - 6/9
MILL CK - SALT LAKE CITY, NR	153	65	180	70	5/21	15	20	25	30	45	5/18 - 6/10
PARLEYS CK - SALT LAKE CITY, NR	605	180	350	271	4/15	55	65	80	110	145	4/23 - 5/22
EMIGRATION CK - SALT LAKE CITY, NR	164	55	130	86	4/15	10	15	20	30	40	4/11 - 5/19
CITY CK - SALT LAKE CITY, NR	322	90	210	124	5/15	40	45	55	70	80	5/12 - 6/1
SEVIER - HATCH	1,740	495	1,200	502	5/20	145	165	200	245	300	5/6 - 6/2

N/A - NOT AVAILABLE (NOT A FLOOD FORECAST POINT OR NO FORECAST PROCEDURE EXISTS)

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* - indicates exceedance value has already occurred during the current runoff season



FLOOD POTENTIAL INFORMATION

SERVICE HYDROLOGISTS

The graphic on the following page depicts the areas of responsibility of the various Service Hydrologists or Hydro Focal Points. The following list links these individuals and their corresponding areas of responsibility. **A Service Hydrologist/Hydro Focal Point is the National Weather Service hydrologic coordinator and spokesperson for a given hydrologic service area and is the person to contact for current flood potential, streamflows, snowpack information and updates to peak flow forecasts.** Following their phone number is a URL to their homepage.

1) Albuquerque, NM	Ed Polasko	505-244-9147x228	http://www.srh.noaa.gov/abq/
2) Cheyenne, WY	Melissa Goering	307-772-2468x493	http://www.crh.noaa.gov/cys/
3) Boulder, CO	Treste Huse	303-494-3210x493	http://www.crh.noaa.gov/den/
4) El Paso, TX	Tim Brice	505-589-4088x308	http://www.srh.noaa.gov/elp/
5) Flagstaff, AZ	Tom Clemmons	928-556-9161x229	http://www.wrh.noaa.gov/fgz/
6) Grand Junction, CO	Brian Avery	970-243-7007x493	http://www.crh.noaa.gov/gjt/
7) Las Vegas, NV	Barry Pierce	702-263-9750	http://www.wrh.noaa.gov/vef/
8) Phoenix, AZ	Valerie Meyers	602-275-7002x237	http://www.wrh.noaa.gov/psr/
9) Pocatello, ID	Sherrie Hebert	208-233-0834	http://www.wrh.noaa.gov/pih/
10) Pueblo, CO	Larry Walrod	719-948-3838	http://www.crh.noaa.gov/pub/
11) Riverton, WY	Jim Fahey	307-857-3898x493	http://www.crh.noaa.gov/riw/
12) Salt Lake City, UT	Brian McInerney	801-524-5142x228	http://www.wrh.noaa.gov/slc/
13) Tucson, AZ	Glenn Lader	520-670-5156x228	http://www.wrh.noaa.gov/twc/

NATIONAL WEATHER SERVICE HYDROLOGIC SERVICE AREAS
IN THE CBRFC AREA OF RESPONSIBILITY

