

January

• **Flood/Debris Flows in Southern California**, Tue, 19 Jan 2010 13:24:54 -0500 (EST)

- The first in a series of storms arrived in California Sunday and Monday, with the next round expected to bring even more strong winds and rains throughout the week. Debris flows occurred in San Gabriel foothill communities yesterday and USGS personnel are in communication with the multi-agency incident command structure in place there. There continues to exist a significant threat for flash floods, mud and debris flows in the burn areas. The expected total rainfall accumulation is 4 to 8 inches for the coast and valley areas and up to 8 to 16 inches in the foothills and mountains in southern California, - this includes the burn areas. By the end of next week northern California rainfall could reach 10 - 15 inches at high elevations with nearly 20 inches in the wettest locations.

California Water Science Center measured a significant peak yesterday was for Arroyo Seco nr Pasadena, which drains from the Station Fire burn area of the San Gabriels, with a peak flow recorded of 7,160 cfs, which ranks 3rd for the period of record. Previous peaks include 1938 was 8,620 and 1969 was 8,540 cfs. California Water Science Center continues to deploy data personnel today.

• **Re: please submit a daily update to Project Alert**, Wed, 20 Jan 2010 18:15:20 -0500 (EST)

- CA Storms during the week of Jan. 17, 2010. Tues. Jan 19 saw a general respite from the more severe storms of Mon. Jan 18, with respect to rainfall totals and runoff produced. There was however a wave of very intense rainfall that passed through the central and southern parts of the State, producing moderate peaks. So far this week, runoff events have been in the 10-25 yr. RI range, with the exception of runoff from the Burn Areas in So. Calif. As each wave of storms come through, soils are becoming saturated and unit runoff is increasing. Nearly all Data Program staff are in the field making medium and high flow measurements. All personnel are accounted for and staying in touch.

It is just now that severe weather is becoming more widespread, with higher peak flows occurring in the Central coast, from the San Francisco Bay Area, down to the LA Basin. Severe Thunderstorm and even Tornado Warnings have been issued. Tornadic activity is scattered, but one did touch down in the Huntington Harbor area on the coast late yesterday. There will be more significant peak flow info in the morning as the current front passes through.

• **California storm to hit tomorrow could set record**, Wed, 20 Jan 2010 23:47:45 -0500 (EST)

- The storm expected to hit California tomorrow could be a record storm in regards to low pressure. See the attached notes from the California Water Science Center staff.

The screenshot shows a Mozilla Firefox browser window with the address bar displaying <http://www.accuweather.com/mt-news-blogs.asp?blog=Weathermatrix>. The page content includes a weather map of California with isobars and a text block titled "The lowest pressure ever measured in the state is 28.85\" Hg according to Chris Burt, author of Extreme Weather. As of this hour, the pressure is already 28.92\" at Crescent City in the northernmost part of the state (and 28.88 on the Oregon coast). But tomorrow night is when the big storm swings in further south, and if you believe the NMM forecast model, it will be 28.80\" on the central coast, breaking the all-time record (in other words, a stronger storm has not hit the state in recorded history!)."

The right sidebar contains sections for "Entries" with a list of recent blog posts, "Categories" with a search bar, "Photo Gallery" with three image thumbnails, and "Recent News & Blogs" with buttons for "Headlines" and "Blogs". The browser's taskbar at the bottom shows the Windows Start button, the AccuWeather.com News & Blogs application, and the system clock at 3:01 PM.

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- **CA Storm Activities, CA WSC, Fri, 22 Jan 2010 16:51:02 -0500 (EST)**

- Currently, higher flows are receding, with some instability pop up rain events occurring, primarily in the southern part of the State. The strongest precipitation and resultant runoff has been in the south, with peaks being in the 2-25 year R.I. range. Following several dry years, these storms have drawn a lot of media attention, with lots of concern for the fire/flood/debris flow issues in So Cal.

The CA WSC has been deployed all week to cover our gaging station network.

On this date, the staff is partnered up in 27 crews out in the field, Statewide, from the Klamath River in the north, to the San Diego River in the south. Since Monday, 241 direct discharge measurements have been obtained, with another 45 planned to be completed today. These measurements are critical for rating definition and revision, given the prolonged dry spell, with sediment movement and plant growth in the channels causing rating shifts.

Only minor problems have been experienced, mostly in the alluvial channels along the central coast, with some orifice lines damaged, and some wet electronics needing a fix. These repairs will be completed tomorrow.

Flood Stages exceeded on San Diego River nr Fashion Valley, as is typical for a wetter year, when a dip /culvert crossing to the shopping center is submerged. Minor flooding in the San Lorenzo river basin in Santa Cruz Co., which is also typical of even moderate peaks. Sustained moderate flows are occurring in other major rivers throughout the State, but also in recession. Channels have been wetted after the prolonged dry spell, and a quicker response is anticipated to any new rain events.

A few new ratings required extension in the Ukiah area, on streams in the Russian River basin, however these were needed on new sites, not re-definition of old ratings due to flooding.

- **daily update to Project Alert, Thu, 21 Jan 2010 16:54:58 -0500 (EST)**

- Flooding has started in Arizona, mostly occurring in the central area of the state, where runoff is greatly increasing. Four crews from our Tempe office are getting in position to make measurements on tributaries to the Salt and Verde River basins. This is shaping up to be the largest flood in Arizona since 1993.

Bert Duet, Tempe Field Office Chief, as of 1330 Jan. 21, 2010, central Arizona is experiencing the third wave of pacific fronts battering the California coast. Several tributaries on the lower part of the Verde River are now producing 4000 cfs each, and much more is expected tonight as the biggest part of the storm crosses Arizona.

There are estimates that the Verde could peak at about 120,000 cfs, and releases have already begun from Bartlett Dam. We could see a release of up to 50,000 cfs into the Salt River through the Phoenix Metro area for the next several days.

Additionally, Agua Fria River, New River, and Cave Creek, each are currently flowing at about 5000 cfs.

The Bill Williams drainage has not yet experienced significant flows; however, projections indicate that there may be enough flow generated to cause a 7,000 cfs release from Alamo Lake.

Yuma has received over two inches of rain which has produced the largest flow events in the last 10 years.

- **Summary of Las Vegas events from January 19-21, Sat, 23 Jan 2010 12:12:18 -0500 (EST)**

- Sizable peaks have occurred in Southern Nevada during the period January 19-21, but other than street flooding, no significant flooding has occurred. The peak flow events resulted from urban runoff in the Las Vegas vicinity and have been flashy. A set of three runoff events occurred on Las Vegas Wash, each about 4 to 8 hours in duration during the nights of January 19-20, 20-21, and during the late afternoon/evening of January 21. The greatest discharges occurred during the evening of January 21, resulting from about 0.9 inches of rainfall recorded at McCarran International Airport on that day. Discharge peaked at 6,300 cfs at Las Vegas Wash at Pabco Road near Henderson (09419700) at about 1700 on January 21. At Las Vegas Wash above Three Kids Wash (09419753), the peak discharge was an estimated 8,900 cfs at about 1830 on January 21. These are the highest discharge peaks since December 29, 2004 when flows peaked at 9,620 cfs at the Pabco gage and 12,700 at the Three Kids gage. Preliminary exceedance probabilities from the program peakfq for the January 22 peak are between 0.10 and 0.04 (between 10 and 25 year events) at the Pabco gage and between 0.2 and 0.1 (5 and 10 year events) for the Three Kids gage, which has a spotty period of record. Note that these estimates are NOT using the software WIE to weight the variance yet, as recommended by OSW. We are reading up on this newer method and will run that software soon.

- **PROJECT ALERT NOTICE, Mon, 25 Jan 2010 13:14:40 -0500 (EST)**

- Flooding is occurring in the mountains from rainfall on snowpack. Flooding is known on the Greenbrier River including the town of Marlinton. The headwaters of the Monongahela, Gauley, and South Fork South Branch Potomac Rivers are included in the flood area. We have crews on the Greenbrier, South Branch and Shavers Fork (Monongahela Basin).

- **Project ALERT update--South Carolina, January 25, 2010, Mon, 25 Jan 2010 16:11:36 -0500 (EST)**

- Heavy rains (between 2 to 4 inches) fell over much of the western South Carolina with lesser amounts statewide Sunday night and early Monday morning. Sites on the Broad and Wateree Rivers are expected to crest tomorrow and Wednesday with minor to moderate flooding. Sites on the Lower Savannah and Edisto Rivers are currently above flood stage and expected to rise through the remainder of the week. The Pee Dee River at Pee Dee is currently above flood stage and forecast to reach moderate flood stage this weekend.

Measurements have been made at 12 sites, with 6 of those being at or near the highest measurement of record.

All gages are operational with no damage reported.

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- **PROJECT ALERT NOTICE**, Mon, 25 Jan 2010 17:25:27 -0500 (EST)

- USGS Crews from the North Carolina Water Science Center respond to minor and moderate flooding across North Carolina (Monday, January 25, 2010).

Nearly all the 174 USGS raingages across the state of North Carolina reported rainfall in excess of 1 inch in the last 24 hours with many reporting rainfall totals in excess 2 inches. Some raingages in the areas of the Yadkin, Catawba and French Broad River basins reported rain in excess of 3 inches. Eleven crews from each of the three North Carolina Water Science Center Field Offices (Asheville, Charlotte and Raleigh) were out today making streamflow measurements, collecting samples and ensuring that streamgages were functioning properly. Rivers are forecast to crest at or above flood stage at one or more points on the Roanoke, Tar, Contentnea, Neuse, Haw, Yadkin, Lumber, Rocky, South Fork Catawba, Broad and French Broad Rivers.

At least three crews will be out tomorrow to continue to measure sites where discharge ratings need verification and to communicate any needed measurement information to National Weather Service River Forecast Centers.

- **minor to moderate floods in FL panhandle**, Mon, 25 Jan 2010 19:46:13 -0500 (EST)

- Minor to moderate flooding is occurring at several streams in the FL panhandle, the result of 2-7 in. of rainfall over the basins the past week. Recurrence intervals are all 5 yr (exceedance probability = 0.2), or less, at gages on the Ochlockonee, Chipola, Choctawhatchee, Shoal, and Escambia Rivers. Much larger events have been observed at all sites within the past year, many of them most recently in March-April and/or Dec. 2009.

For the Ochlockonee River near Havana (02329000) and Chipola River near Altha (02359000), the floods should crest tomorrow. For the Choctawhatchee River near Caryville (02365500), the peak occurred this morning after midnight. For Shoal River near Crestview (02369000), the flood crested Jan. 23. For the Escambia River at Century, the flood is at peak today.

Two crews have been out repairing gage sensor malfunctions today.

This has been a wet winter in northern FL. Pensacola in the western panhandle has received over 24 inches of rainfall for Dec 2009 to Jan 2010. Tallahassee in the eastern part of the panhandle has received over 18 inches of rain for Dec-Jan. High flows are expected to continue for some time.

- **Project ALERT update--Tennessee, January 26, 2010,** Tue, 26 Jan 2010 10:37:57 -0500 (EST)

- Minor to moderate flooding has occurred at a couple of sites in Tennessee. The Pigeon River at Newport (03461500) and Sequatchie River near Whitwell both crested yesterday. Three crews have been making measurements during the past couple of days at these and several other sites which crested near flood stage.

- **PROJECT ALERT NOTICE**, Tue, 26 Jan 2010 13:13:19 -0500 (EST)

- Precipitation of one to three inches along the Blue Ridge Mountains along with saturated soils has caused flooding throughout central and western Virginia. Gages in the southwest Piedmont, Blue Ridge, and Valley and Ridge Physiographic Provinces are recording flooding at the 10 to 20-year recurrence interval (0.05 to 0.1 percent exceedance). Lesser flooding (2 to 10-year recurrence intervals) is being observed in central and western Virginia from the Coastal Plain (I-95) to the Appalachian Plateaus (I-77). Smaller rivers have already peaked, larger rivers will peak tonight or tomorrow.

March

- **PROJECT ALERT NOTICE**, Fri, 12 Mar 2010 11:39:23 -0500 (EST)

- High water is expected over the weekend in the Cheat, Tygart, Greenbrier, upper Gauley, and upper Elk River Basins of West Virginia. About 2 inches of rainfall is expected that will add to about 3 inches of water equivalent in the existing snowpack. The National Weather Service has forecast rises to the 5-year recurrence interval in these river basins.

Although a major flood is not expected, two field crews have already been dispatched to the Tygart and Cheat River Basins to obtain rising limb rating-definition measurements. Another field crew headed to the upper Potomac River Basin to collect water-quality samples of the storm runoff for the Chesapeake Bay Program. The three crews are expected to work thru the weekend.

The Ohio River is expected to rise above flood level next week. All West Virginia Data Collection Platforms along the river are currently operational.

- **Project Alert Notice**, Sat, 13 Mar 2010 05:28:42 -0500 (EST)

- Rainfall in the upper basins of the Conemaugh, Youghiogheny and Monongahela rivers is expected to contribute significantly to the existing high water-level of those river systems and produce moderate flooding in several communities downstream. Snow melt over the past week has saturated the ground and brought these rivers to near flood stage already.

4 crews will be out today and tomorrow measuring discharge along the major rivers.

The Ohio River is expected to crest at 28 ft early Monday morning. All Pennsylvania Data Collection Platforms along the river are currently operational.

- **moderate flooding in Central Florida**, Sat, 13 Mar 2010 08:52:43 -0500 (EST)

- Rainfall in central Florida ranged from 2 - 8 inches March 10-11. The Tampa office had 9 crews making discharge measurements to check ratings on Friday. Tampa and Orlando offices sent crews out on Saturday to measure flows on Shell Creek (lower Peace Basin) and the Ochlawaha River to measure releases from structures. Flooding is not considered major at this time.

- **PROJECT ALERT NOTICE**, Sun, 14 Mar 2010 08:44:39 -0400 (EDT)

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- The Southern coast of Connecticut received between 4 and 5 inches of rain over the last 24 hours causing moderate flooding. 3 crews are out making discharge measurements today and tomorrow.

- **Project Alert Notice, Sun, 14 Mar 2010 11:38:53 -0400 (EDT)**

- New Jersey has received 3 to 6 inches of rain since Friday morning. We're getting some bands of heavy showers and thunderstorms moving through the state this morning. These showers are expected through the day. The southern part of the state has received 3-4 inches, with generally 4-5 inches in central and northern New Jersey. There are isolated pockets of 5-7 inches with over 6 inches recorded at the USGS raingages at Watchung, Mountainside and Middlesex, in Union and Somerset Counties. There are numerous road closures due to flooding and downed trees causing power outages.

The majority of gages across the state are above flood stage. The highest water is in the Raritan and Passaic River basins in central and northern New Jersey. Peaks are generally in the range of 5-10 year recurrence interval events. The Raritan River at Bound Brook will peak later today at about a 25-year event. The Passaic River at Little Falls will peak on Tuesday morning at about a 25 year event.

Snowmelt in Northern New Jersey has contributed to rising flows in many streams since March 2-6, resulting in higher than normal flows before this storm even though there has been no precipitation during the period.

We had 3 crews measuring discharges yesterday. We also had 2 crews measuring discharge and collecting water quality samples for a Barnegat Bay nutrient loading project. Five crews are out measuring highwater today. The highest measurement was made at one gage this morning. Two more crews will be out later today to continue measuring discharges and collecting samples for the Barnegat Bay nutrient project. Crews will be out again tomorrow.

- **Project Alert Notice VA WSC, Sun, 14 Mar 2010 13:21:53 -0400 (EDT)**

- Virginia has received 2-4 inches of rainfall across the state as of Sunday afternoon. Rain is expected to continue sporadically distributed across the State into the evening hours. Localized flooding is occurring in many cities and towns. Streams and Rivers are rising and expected to do so throughout the night and into tomorrow.

The VA WSC is deploying one field crew today to install a localized storm surge monitoring network in the city of Alexandria, VA. This network is in support of the Chesapeake Bay Observing System (<http://www.cbos.org/>) Inundation Prediction Project. The sensors will monitor the results of tidal storm surge and overland runoff flooding along the Potomac river. Tomorrow the VA WSC will have 3 field crews working across the State monitoring high flows and making discharge measurements. Additional field crews may also be deployed to collect water-quality samples as part of the Chesapeake Bay River Input Monitoring and Quantico Marine Corps Base studies.

- **PROJECT ALERT NOTICE - SD WSC, Sun, 14 Mar 2010 16:23:09 -0400 (EDT)**

- Central and Eastern South Dakota has received 1-2 inches of rain over the past few days. The rainfall was on top of snow with water equivalents of up to 6 inches. Small tributaries to the Missouri, James, Vermillion, and Big Sioux Rivers are currently near peak or have peaked. The main stems of the James, Vermillion, and Big Sioux Rivers are rising quickly. Five crews were out on Saturday and four are out today making discharge measurements.

- **Project Alert Notice MN WSC, Sun, 14 Mar 2010 17:08:58 -0400 (EDT)**

- Minnesota is experiencing flooding in the southern and western parts of the state, as 0.5 to 1 inch of rainfall last week combined with melt of a snowpack containing 4-5 inches of snow-water equivalent. Flood warnings or watches are posted for many rivers in the Minnesota, Red River of the North, and Upper Mississippi River Basins. Smaller streams or those farthest south may have already crested. Larger streams and those further north will likely continue rising well into or past next week. Flooding is more widespread than spring snowmelt floods of 2009.

- **PROJECT ALERT NOTICE, Mon, 15 Mar 2010 11:13:27 -0400 (EDT)**

- A section of the New York State Thruway was partly flooded in Rockland County on Sunday as a result of 2-4 inches of rainfall and snowmelt in extreme southeastern New York. Recurrence intervals of peak flows at Ramapo R at Ramapo (01387400) and Ramapo R at Suffern (01387420) were about 25-35 year (4% & 2.8% exceedence). In the Croton R basin, several USGS stations recorded their second or third highest flow in the last 13 years. A total of 5 crews were dispatched Saturday afternoon and Sunday from the Troy and Potsdam offices, making about a dozen discharge measurements. Cold temperatures and snowfall totals of 6-12 inches in the Catskill Mtns limited runoff in that region.

Long Island and the Five Boroughs of New York City received from 2.5 to 5 inches of rain from the intense coastal storm over the weekend. The Coram office had three teams out over the weekend measuring high-flow conditions. No major stream flooding was reported, but high-flows were collected on a number of streams.

Of greater concern with this storm, was the widespread moderate coastal flooding and significant beach erosion caused by the strong, long-duration east to northeast winds gusting to 65 to 75 mph at times. Most of the coastal flooding with this storm occurred in western sections of Long Island Sound and in some of the western South Shore Bays. At least five of the nine USGS tide gages located in western Long Island reached moderate NWS coastal flooding thresholds during Saturday night's high-tide cycle. As of Sunday morning minor coastal flooding was still occurring in some areas. The 2.5 to 5 inches of rainfall, on top of the already high water-table conditions, has caused significant basement flooding problems in some areas of Long Island.

- **Project Alert Notice -- Iowa, Mon, 15 Mar 2010 12:01:41 -0400 (EDT)**

- Iowa is experiencing moderate flooding through the center of the state, moderate rainfall last week along with a melt off of most of the snow pack throughout the central and southern section of the state. Flood warnings or watches are posted for many rivers including the Des Moines, Raccoon, Iowa and Cedar rivers. Many smaller streams have already peaked and are receding.

USGS flood-monitoring activities early last week and continued through the weekend. Several field crews were repairing gages and making discharge measurements.

- **PROJECT ALERT NOTICE, Mon, 15 Mar 2010 12:26:42 -0400 (EDT)**

- West Virginia experienced flooding over the weekend from a combination of heavy rain and lingering snowpack on already-saturated ground.

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The Bluestone River near Pipestem in Summers County rose more than 7 ft above flood stage at 4 AM on Saturday setting a new record of 17.18 ft, topping the previous high water mark of 15.82 ft set since the gage began in 1950. Peak discharge of 22,300 cfs was a 1% probability flood for the 395 square mile drainage. The Pipestem gage is located about 10 miles upstream of Bluestone Dam which is getting an extensive retrofit to correct some structural concerns. Bluestone Dam is not currently able to operate at maximum capacity but was still able to hold back some water because it was not yet at planned summer pool. Summersville Dam was actively operated at reduced outflow for flood control for the Kanawha River in Charleston.

The Piney Creek at Raleigh in Raleigh County gage, also operated since about 1950, set a new peak of record for its 50 square mile drainage and will be flagged tomorrow for an indirect discharge measurement. Although flow at most USGS gages did not exceed expected 5-year levels, small stream flooding caused significant damage throughout the state and two persons died in the flood waters.

- **PROJECT ALERT NOTICE**, Mon, 15 Mar 2010 13:45:50 -0400 (EDT)

- Southern New Hampshire is having flooding from weekend rainfall ranging from 1" in western parts of Merrimack and Hillsborough Counties to 5+" in eastern coastal parts of Strafford and Rockingham Counties. Antecedent conditions prior to this event are above-normal due to recent heavy rainfall and continued snowmelt over the past 2 weeks.

Piscataqua Basin streams within Strafford and Rockingham Counties have or will be experiencing peaks in the 4-10% annual exceedence range and Merrimack Basin streams south of Concord, NH have or will be experiencing peaks in the 10% exceedence range. Most streams within the coastal basin are still rising at this time while those within the Merrimack Basin, especially tributaries, are falling.

Three field crews are out measuring high flows in southern NH.

- **Project Alert for Maryland**, Date: Mon, 15 Mar 2010 15:50:51 -0400 (EDT)

- Maryland experienced flooding over the weekend from a combination of heavy rain throughout the region, and lingering snow pack in the western part of the state.

USGS flood-monitoring activities began on Friday and continued through the weekend. High flow measurements have been made primarily in the western section of Maryland, in sections of the Ohio River basin and the Potomac River basin. Flood measurements have been made since Friday on the Youghiogheny River, Bear Creek, Cherry Creek, the North Branch Potomac River at Kitzmiller, Wills Creek, Georges Creek, Antietam Creek, Marsh Run, and Fishing Creek. Check measurements were also made on a couple of these stations due to measured discharges that plotted off the current stage-discharge rating.

The heavy rain and melting snow has caused flooding on the main stem of the Potomac River. The Potomac River at Point of Rocks crested early this morning at a gage height of 25.52 ft (flood stage of 16.0 ft), and a discharge of approximately 172,000 cfs (preliminary recurrence interval of between 5 and 10 years).

The Potomac River near Washington, D.C. is currently cresting at a gage height of approximately 13.0 feet (flood stage of 10.0 feet), and a discharge slightly greater than 200,000 cfs (preliminary recurrence interval between 5 and 10 years).

Storm samples were collected yesterday on the Patuxent River, and today on the Susquehanna River at Conowingo, MD as part of our Center's long term Chesapeake Bay River Input Monitoring Project. Storm samples were also collected over the weekend on the Northeast and Northwest Branches of the Anacostia River as part of another of our Center's water quality monitoring projects.

- **Project Alert Notice - South Dakota**, Mon, 15 Mar 2010 15:51:29 -0400 (EDT)

- South Dakota is experiencing minor to moderate flooding through the southern and eastern part of the state, following moderate to heavy rainfall in eastern SD last week and over the weekend. Rainfall on snow triggered melt off of most of the snow pack in all but the northern part of the state. Tributaries continue to run high with ice remaining on most of the larger rivers. Many of the larger rivers are expected to break up this week with higher temperatures. Cooler weather later in the week may slow things down some.

Ten crews are currently out making measurements where possible and documenting ice conditions.

- **Project Alert Notice MA-RI WSC**, Date: Mon, 15 Mar 2010 23:11:27 -0400 (EDT)

- Eastern and central Massachusetts and all of Rhode Island is having flooding from rain occurring from Saturday March 13 - Monday March 15. Rainfall total for this 3-day storm have ranged from about 3-8 inches.

Most current streamflows are the highest for this day - historically. Several rating have been extended until measurements can be made, and many of the measurements are the highest ever made at that streamgage.

One field crew was out measuring high flows in central MA on Sunday,

Five field crews were out measuring high flows in eastern MA and in RI today.

Five crews are planned to be out measuring high flows in eastern MA and in RI for tomorrow through the remainder of the week.

- **Project Alert - South Dakota**, Wed, 17 Mar 2010 11:13:12 -0400 (EDT)

- South Dakota is experiencing minor to moderate flooding through the southern and eastern part of the state, following moderate to heavy rainfall in eastern SD last week. Rainfall on snow triggered melt off of most of the snow pack in all but the northern part of the state. Tributaries in the southern part of Eastern SD have begun to decline although many remain above or near flood stage. Ice is remaining on many of the larger rivers. Many of the larger rivers are expected to break up this week with higher temperatures. Cooler weather later in the week may slow things down some.

Ten crews are currently out making measurements where possible and documenting ice conditions. The James River at Huron gage is currently down and being worked on. The James River nr Mitchell is near the peak of record with current stages higher than anything prior to 1997.

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Flood communications have primarily been from the field crews which were then relayed to participating agencies via NWSChat. Information relayed included information on discharge measurements, gage status, and status of ice jams. One crew was interviewed by a local television station (KLDT in Sioux Falls) this morning.

- **Project Alert Notice MN WSC**, Wed, 17 Mar 2010 11:47:05 -0400 (EDT)

- Minnesota is experiencing flooding in the southern and western parts of the state, as a result rainfall last week combining with the melt of a snowpack containing 4-5 inches of snow-water equivalent. Flood warnings continue for 35 counties in Minnesota, encompassing many streams and rivers in the Red River of the North, Minnesota, Missouri, and Mississippi River Basins. Conditions of streams vary from south to north and west to east, with those farther west or north containing more ice cover or ice jams, and those farther east and south mostly open. Smaller streams or those farthest south have crested. Streams farther north and larger rivers including the Minnesota Mississippi and Red Rivers will likely continue rising into next week. Flooding is more widespread than spring snowmelt floods of 2009.

USGS flood-monitoring activities currently consist of 6 field crews who are repairing gages, making discharge measurements, and collecting sediment samples. More crews will be dispatched Friday, with the arrival of detailees and hydroacoustic measuring instrumentation from the Massachusetts Water Science Center.

- **Project Alert Notice North Dakota WSC**, Wed, 17 Mar 2010 13:14:51 -0400 (EDT)

- Flooding has begun in the Red River Basin. Rainfall amounts over 1-inch late last week, on snow covered ground, plus above normal temperatures, began the melt process. Rivers in eastern North Dakota began to rise over the weekend. Three field crews from the North Dakota Water Science Center (WSC) were dispatched on Sunday, March 14, to start making discharge measurements in support of the National Weather Service River Forecast Center (RFC), in Chanhausen, Minnesota. Many river gaging locations were ice jammed and discharge measurements were not possible at numerous locations. (Total crews in the field – 3)

Monday, March 15, one additional field crew from the North Dakota WSC was dispatched to make discharge measurements. Field crews continued to find ice jams in the rivers, though some river gaging locations opened up enough for discharge measurements to be made. Additional field crews were mobilized from the Colorado, Kansas, Arkansas, Nebraska, and Montana WSC with arrival dates scheduled by mid-week. (Total crews in the field – 4)

Tuesday March 16, work was continued as stated above, with more discharge measurements being made since some of the rivers started to open up a bit. One field crew from Kansas WSC arrived late in the day. One field crew from the North Dakota WSC was also mobilized to begin a sediment collection project in the Fargo area (Total crews in the field – 4)

Wednesday, March 17, ice has finally started to move out of the tributaries and warmer temperatures have melted more snow resulting in a rapid increase in water levels at many locations, particularly in the southern Red River Valley. Four field crews were dispatched to make discharge measurements and one field crew was working on the Fargo area sediment collection project. Additional field crews from the Kansas and Colorado WSC's arrived at noon today. River levels are quite high in many locations, though not as high as record levels in 2009. (Total crews in the field – 7).

Western North Dakota (Missouri River Basin)

Widespread major flooding has not begun in the western part of North Dakota mainly due to cooler temperatures. Forecast warmer temperatures for this week should begin the melt process in this part of North Dakota. Five field crews over the last two weeks have continued to flood harden gages and install nine temporary river gaging stations for the Corps of Engineers – two on the Missouri River, six in the James River and one in the upper Sheyenne River basins. One field crew from the Montana WSC is scheduled to arrive on Thursday to support Corps of Engineers flood efforts in the James River basin (Total crews in the field – 5)

Flood communications have included participation NWS conference calls, phone contacts with various local agencies, and participation in NWSChat, where discharge measurements, field conditions, gage status, and logistics have been shared with participating agencies. Measurements have been made at specific gages at the request of the National Weather Service.

- **Project Alert Notice -- Iowa**, Wed, 17 Mar 2010 15:32:49 -0400 (EDT)

- Iowa is experiencing minor to moderate flooding through the Eastern section of the state, many of the rivers have crested and are now receding. The Mississippi River is slowly rising but is unknown at this time when the river will crest. Field crews will monitor the gages over the weekend and will measure and repair gages as needed.

In the central section of the state, the Des Moines River and the Raccoon river has moderate to major flooding in the northern section of the watershed. Many smaller streams have already peaked and are receding.

In the western section of the state special attention will be given to the NW section of Iowa where some snow pack still exists.

USGS flood-monitoring activities for the rest of this week and through the weekend will consist of several field crews repairing gages and making discharge measurements as the rivers crest over the weekend.

- **USGS Flood Surveillance Update--March 18, 2010**, Thu, 18 Mar 2010 15:44:56 -0400 (EDT)

- USGS currently or has had ongoing flood surveillance operations in numerous states since March 13, 2010. As part of the flood surveillance operations, USGS field crews are making field measurements of streamflow and ensuring the continued operations of critical real-time streamgages. While USGS still has a few field crews deployed in the eastern United States, at present, the major flood surveillance effort is taking place in Iowa, Minnesota, North Dakota, and South Dakota, with approximately 26 crews making crucial field measurements of discharge in support of the National Weather Service and U.S. Army Corps of Engineers. Major river basins of concern include the Red River of the North, James River in North and South Dakota, upper Missouri

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River, and Upper Mississippi River. USGS has or is in the process of installing special Rapid Deployment Gages at various sites in North Dakota and South Dakota to collect data at locations crucial to the flood fight in those states.

- **Project Alert Notice MN WSC, Thu, 18 Mar 2010 15:48:49 -0400 (EDT)**

- Minnesota is experiencing flooding in the southern and western parts of the state, as a result rainfall last week combining with the melt of a snowpack containing 4-5 inches of snow-water equivalent. Flood warnings exist for 36 counties in Minnesota, encompassing many streams and rivers in the Red River of the North, Minnesota, Missouri, and Mississippi River Basins. Conditions of streams vary from south to north and west to east, with those farther west or north containing more ice cover or ice jams, and those farther east and south mostly open. Smaller streams or those farthest south have crested. Streams farther north and larger rivers including the Minnesota Mississippi and Red Rivers will likely continue rising into next week.

Flooding is more widespread than spring snowmelt floods of 2009, but less severe so far. Provisional data indicate that for those Minnesota tributaries to the Red River of the North that have peaked, annual probabilities of exceedance have generally been in the 10-20 percent interval, with some tributaries in the 4-10 percent interval. Similar probabilities of exceedance have occurred other streams with flood warnings. The National Weather Service forecasts a peak with a 1-2 percent probability of exceedance on the Crow River at Rockford.

USGS flood-monitoring activities currently consist of 6 field crews who are repairing gages, making discharge measurements, and collecting sediment samples. More crews will be dispatched Friday, with the arrival of detailees and hydroacoustic measuring instrumentation from the Massachusetts Water Science Center.

- **Project Alert Notice North Dakota WSC, Thu, 18 Mar 2010 16:30:03 -0400 (EDT)**

- Eastern North Dakota (Red River Basin)
Ice has started to move out of the tributaries and the main stem Red River south of Fargo. A number of gages in southeast North Dakota have crested and are beginning to recede. Peaks stages and flows for this year are less than 2009, though in several locations the recorded peaks for 2010 rank in the top 5 recorded peaks of record.

USGS field crews continue to make discharge measurements in support of Local, State and Federal agencies involved in flood fighting and flood forecasting activities. Five field crews were dispatched to make discharge measurements, one field crew was working in the Fargo area on a sediment collection project, and one crew on a sediment/water quality project on the Lake Agassiz Refuge in north west Minnesota. In addition to field staff from the North Dakota WSC, field crews from the Arkansas, Colorado and Kansas WSC's are involved in the data collection activities in North Dakota. (Total crews in the field – 7).

Western North Dakota (Missouri River Basin)

Widespread major flooding has not begun in the western part of North Dakota mainly due to cooler temperatures. Five field crews continue to flood harden gages and install temporary river gaging stations for the Corps of Engineers on the upper Sheyenne River upstream of Lake Ashtabula. In all 12 rapid deployment gages have been installed through out the state on the Missouri, James, Sheyenne, Wild Rice and Red River basins. One field crew from the Montana WSC is scheduled to arrive today to support Corps of Engineers flood efforts in the James River basin (Total crews in the field – 5)

- **Project Alert - South Dakota, Thu, 18 Mar 2010 19:10:45 -0400 (EDT)**

- South Dakota is experiencing minor to moderate flooding through the southern and eastern part of the state, and major flooding on the lower Vermillion, James, and Big Sioux Basins. Tributaries in the southern part of Eastern SD have begun to decline although many remain above or near flood stage. Ice is remaining on many of the larger rivers causing ice jams, damage to orifice lines, etc. Cooler weather later in the next couple of days may slow things down some.

Ten crews are currently out making measurements where possible and documenting ice conditions. The James River nr Mitchell continues to be just below the peak of record with current stages higher than anything prior to 1997. Vermillion River nr Vermillion is also near the peak of record.

- **Project Alert Notice MN WSC, Fri, 19 Mar 2010 17:05:43 -0400 (EDT)**

- Minnesota is experiencing flooding in the southern and western parts of the state, as a result rainfall last week combining with the melt of a snowpack containing 4-5 inches of snow-water equivalent. Flood warnings exist for 37 counties in Minnesota, encompassing streams and rivers in the Red River of the North, Minnesota, Missouri, and Mississippi River Basins. Conditions of streams vary from south to north and west to east, with those farther west or north containing more ice cover or ice jams, and those farther east and south mostly open. Smaller streams or those farthest south have crested. Streams farther north and larger rivers including the Minnesota Mississippi and Red Rivers will likely continue rising into next week.

Flooding is more widespread than spring snowmelt floods of 2009, but less severe to date. Provisional data indicate that for those Minnesota tributaries to the Red River of the North that have peaked, annual probabilities of exceedance have generally been in the 10-20 percent interval, with some tributaries in the 4-10 percent interval. Similar probabilities of exceedance have occurred other streams with flood warnings. The National Weather Service forecasts a peak with a 1-2 percent probability of exceedance on the Crow River at Rockford, Saturday or Sunday.

USGS flood-monitoring activities currently consist of five field teams who are making discharge measurements, repairing gages and collecting sediment samples. As of today the teams include two hydrographers on loan from the Massachusetts Water Science Center.

- **Project Alert - South Dakota, Fri, 19 Mar 2010 17:18:40 -0400 (EDT)**

- South Dakota is experiencing minor to moderate flooding through the southern and eastern part of the state, and major flooding on the lower Vermillion, James, and Big Sioux Basins. Inflows from tributaries to the James River are causing enough backwater that reverse flows are occurring on the James River at Columbia and Ashton. The Vermillion River

Ten crews are currently out making measurements where possible and documenting ice conditions. The James River nr Mitchell continues to be just below the peak of record with current stages higher than anything prior to 1997. James River nr Mitchell is near historic levels and has leveled off but may rise again with warmer weather and upstream flows. The Vermillion River nr Vermillion's preliminary peak is 26.2 ft (3rd highest) with a discharge of 10,900 cfs (2nd highest), a recurrence between 2 and 4 percent. The Big Sioux River continues to rise with some evacuations taking place in the Waubay

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Lake area (near Watertown, SD). The Corps of Engineers has requested daily measurements on the Big Sioux River at Watertown and the inlet to Lake Kampeska as well as measurement on the outlet of Still Lake.

- **Project Alert Notice North Dakota WSC**, Fri, 19 Mar 2010 17:51:40 -0400 (EDT)

- Eastern North Dakota (Red River Basin)

Since flood peaks are forecast on the Red River over the week weekend, all crews will be actively collecting data, though no update to Project_Alert is planned for Saturday, March 20 and Sunday, March 21. A number of gages in southeast North Dakota have crested and are beginning to recede. Peaks stages and flows for this year are less than 2009, though in several locations the recorded peaks for 2010 rank in the top 5 recorded peaks of record.

USGS field crews continue to make discharge measurements in support of Local, State and Federal agencies involved in flood fighting and flood forecasting activities. Six field crews were dispatched to make discharge measurements, one field crew was working in the Fargo area on a sediment collection project, and one crew on a sediment/water quality project on the Lake Agassiz Refuge in north west Minnesota. In addition to field staff from the North Dakota WSC, field crews from the Arkansas, Colorado, Kansas and Nebraska WSC's are involved in the data collection activities in North Dakota. (Total crews in the field – 8).

- Western North Dakota (Missouri River Basin)

Because of colder temperatures flooding has not begun in earnest in this part of the state. Some crews will be active over the weekend collecting discharge measurements in support of flood fighting agencies. One field crew from the Montana WSC is actively making discharge measurements in the James River basin (Total crews in the field – 3)

- **Project Alert - South Dakota**, Mon, 22 Mar 2010 13:43:59 -0400 (EDT)

- South Dakota is experiencing moderate to major flooding on the lower Vermillion, James, and Big Sioux Basins. Inflows from tributaries to the James River are causing enough backwater that reverse flows are occurring on the James River at Columbia and Ashton. River stage on the James River continue to rise with many sites approaching 1997 levels. The majority of the tributaries to the James are declining. The Vermillion River near Vermillion has started to decline and the lower Big Sioux River has started to decline. Additional measurements are being made on the Big Sioux River, Lake Kampeska, and Still Lake in the Watertown area as requested by the Corps of Engineers.

A new gage was installed on the James River nr Yankton, SD by request of the James River Water Development District. This is anticipated to be a long-term gage but because of the flooding, a rapid deployment gage was put in place to get data to the cooperators and local citizens as soon as possible. The gage was installed on Saturday and Sunday and stage was made available to the public this morning. Discharge measurements will also be displayed until a rating can be verified/developed.

Six crews are currently out making measurements, 5 crews were out over the weekend. Over the past week, 79 discharge measurements have been made in the James, Vermillion, and Big Sioux Basins as well as numerous inspections. Flood frequency updates are being worked on as time allows.

- **Project Alert Notice North Dakota WSC**, Mon, 22 Mar 2010 16:39:38 -0400 (EDT)

- Eastern North Dakota (Red River Basin)

The Red River at Fargo crested on Sunday, March 21. The preliminary peak of 21,300 cfs for the Red River at Fargo, is the 5th largest flood (.02 exceedance probability) for the since records collection began in 1897.

http://nwis.waterdata.usgs.gov/nd/nwis/peak?site_no=05054000&agency_cd=USGS&format=html

USGS field crews have made over 100 discharge measurements in support of Local, State and Federal agencies involved in flood fighting and flood forecasting activities, since the flood began on March 13. Field crews are shifting to the northern portion of the Red River basin as the flood peak moves further north. Field crews continue to fight ice conditions on the Sheyenne River and the northern tributaries to the Red River.

Six field crews continue to make discharge measurements, and one field crew is working in the Fargo area on a sediment collection project. In addition to field staff from the North Dakota WSC, field crews from the Arkansas, Colorado, Kansas and Nebraska WSC's continue to participate in the data collection activities in North Dakota. (Total crews in the field – 7).

- Western North Dakota (Missouri River Basin)

Current flood conditions in this portion of the state are less severe than predicted due to the favorable melt conditions. Field crews from the Bismarck office as well as one field crew from the Montana WSC continue to make discharge measurements where possible. (Total crews in the field – 5) Flood communications have included participation in NWS conference calls, phone contacts with various local agencies, and participation in NWSChat, where discharge measurements, field conditions, gage status, and logistics have been shared with participating agencies.

- **Project Alert Notice MN WSC**, Mon, 22 Mar 2010 17:29:15 -0400 (EDT)

- Flooding continues in southern and western Minnesota as the winter's snowpack containing 4-5 inches of snow-water equivalent continues to melt. Flood warnings exist for 33 counties in Minnesota, encompassing streams and rivers in the Red River of the North, Minnesota, Missouri, and Mississippi River Basins. Barring substantial precipitation, many streams have crested and begun slow recessions. Only mainstems of the Red, Minnesota, and Mississippi Rivers continue to rise.

Provisional data indicate that for those Minnesota tributaries to the Red River of the North that have peaked, annual probabilities of exceedance have generally been in the 10-20 percent interval, with some tributaries in the 4-10 percent interval. Similar probabilities of exceedance have occurred other streams with flood warnings. For instance, the Crow River at Rockford peaked today at 12,000 cfs, with a provisional 4-10 percent probability of exceedance.

Four teams worked through the weekend. USGS flood-monitoring activities currently consist of five field teams who are making discharge measurements and collecting sediment samples: Two teams are deployed to the Red River Basins, while the other teams are in the Mississippi River Basin. Teams include two hydrographers on loan from the Massachusetts Water Science Center.

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- **Project Alert Notice North Dakota WSC**, Tue, 23 Mar 2010 16:41:42 -0400 (EDT)

- Eastern North Dakota (Red River Basin)
Field crews are distributed through out the Red River basin as the flood peak moves further north.

Six field crews continue to make discharge measurements, and one field crew is working in the Fargo area on a sediment collection project. In addition to field staff from the North Dakota WSC, field crews from the Arkansas, Colorado, Kansas and Nebraska WSC's continue to participate in the data collection activities in North Dakota. (Total crews in the field – 7).

Western North Dakota (Missouri River Basin)

Current flood conditions in this portion of the state are less severe than predicted due to the favorable melt conditions. Field crews from the Bismarck office are making discharge measurements on the inflows and outflow of Lake LaMoure - the spillway for Lake LaMoure was heavily eroded during the record flows of 2009. Above normal inflows to Lake LaMoure for this year have pushed water down the recently repaired spillway and there has been some erosion of the spillway as a result. Flow information collected by the USGS measurements crews are being used by State Agencies to plan and implement erosion control methods.

- **Project Alert - SD WSC**, Tue, 23 Mar 2010 18:44:49 -0400 (EDT)

- South Dakota is experiencing moderate to major flooding on the lower Vermillion, James, and Big Sioux Basins. Inflows from tributaries to the James River are causing enough backwater that reverse flows are occurring on the James River at Columbia. The James River nr Ashton has turned around and now has positive flows. River stage on the James River continue to rise with many sites approaching 1997 levels but appear to be cresting, at least temporarily for the upper James River. There is still quite a bit of ice and snow in the upper basin of the Big Sioux and James. The Vermillion River near Vermillion continues to decline and the lower Big Sioux River has started to decline. Additional measurements are being made on the Big Sioux River, Lake Kampeska, and Still Lake in the Watertown area as requested by the Corps of Engineers.

A new gage was installed on the James River nr Yankton, SD by request of the James River Water Development District. This is anticipated to be a long-term gage but because of the flooding, a rapid deployment gage was put in place to get data to the cooperators and local citizens as soon as possible. The gage was installed on Saturday and Sunday and stage was made available to the public today. Discharge measurements will also be displayed until a rating can be verified/developed.

Five crews are currently out making measurements, a few staff are in updating shifts and corrections. Flood frequency updates are being worked on as time allows with preliminary results indicating flows in the 2 to 4 percent range (25-50 year event).

- **Project Alert Notice North Dakota WSC**, Wed, 24 Mar 2010 15:45:46 -0400 (EDT)

- Update on flooding for North Dakota, for March 24, 2010
Eastern North Dakota (Red River Basin)
The Red River at Grand Forks crested on Sunday, March 21. The preliminary peak of 62,200 cfs for the Red River at Grand Forks, is the 6th largest flood (.05 exceedance probability) for this gaging location since records collection began in 1882.

http://nwis.waterdata.usgs.gov/nd/nwis/peak?site_no=05082500&agency_cd=USGS&format=html

Field crews are distributed through out the Red River basin as the flood peak moves further north. Crews continue to make discharge measurements in support of Local, State and Federal agencies involved in flood fighting and flood forecasting activities. The ice has moved out of the Sheyenne River and most locations can now be measured.

Six field crews continue to make discharge measurements, and one field crew is working in the Fargo area on a sediment collection project. In addition to field staff from the North Dakota WSC, field crews from the Arkansas, Colorado, Kansas and Nebraska WSC's continue to participate in the data collection activities in North Dakota. (Total crews in the field – 7).

Western North Dakota (Missouri River Basin)

Current flood conditions in this portion of the state are less severe than predicted due to the favorable melt conditions. Most gaging locations in this part of the state are no longer in flood - higher flows are limited to the James River basin. (Total crews in the field – 5).

- **Project Alert - SD WSC**, Wed, 24 Mar 2010 18:38:30 -0400 (EDT)

- South Dakota is experiencing moderate to major flooding on the James River and minor flooding on the Big Sioux River. Most sites are current cresting or have crested and if the dry weather pattern continues, will likely begin to decline gradually. Warmer temperatures have ice breaking up and snow melting in much of north-western SD with river stages on the Bad River remaining high and the Grand River rising.

Five crews are currently out making measurements, a few staff are in updating shifts and corrections. Initial flood frequency results have much of the James River basin in the 4 to 2 percent range with the current stage at the James River at Huron in the 2 to 1 percent range. The sites on the Vermillion River were also typically in the 4 to 2 percent range and the Big Sioux River was generally in the 10 to 4 percent range.

- **Project Alert Notice MN WSC**, Wed, 24 Mar 2010 22:09:05 -0400 (EDT)

- Flooding persists, but most rivers are receding in southern and western Minnesota. Flood warnings exist for 29 counties, encompassing streams and rivers in the Red River of the North, Minnesota, Missouri, and Mississippi River Basins. Only a few mainstem gages are still rising, such as the Minnesota River near Morton, and Mississippi River streamgages downstream of St Paul, at Hastings and Winona. Provisional data indicate that annual probabilities of exceedance have generally been in the 10-20 percent interval, with selected streams tributaries in the 4-10 percent interval. Flood crests have generally been lower and earlier than initially forecast by the NWS. This is due in part to the first 3 weeks of March being abnormally dry--with 7 days to go, this may be the first March in modern Twin Cities history with no snowfall.

USGS flood-monitoring activities currently consist of five field teams who are making discharge measurements and collecting sediment samples: 2 teams are deployed in the Mississippi River Basin, and 1 team each in the Red River Basin, Missouri River Basin, and Minnesota River Basin. Teams include two

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hydrographers on loan from the Massachusetts Water Science Center.

Flood communications have included participation NWS conference calls, phone contacts with various local agencies, and participation in NWSChat, where discharge measurements, field conditions, gage status, and logistics have been shared with participating agencies. Measurements have been made at specific streamgages at the request of the National Weather Service.

- **Project Alert Notice North Dakota WSC**, Thu, 25 Mar 2010 16:37:53 -0400 (EDT)

- Eastern North Dakota (Red River Basin)

Field crews are distributed throughout the Red River basin as the flood peak moves further north. Overnight temperatures of 10-15 degrees created ice conditions at several northern gaging station locations near the international border with Canada – these locations could not be measured. Crews continue to make discharge measurements in support of Local, State and Federal agencies involved in flood fighting and flood forecasting activities. All gaging locations on the Red River and tributaries to the Red River, south of Oslo, Minnesota have crested and are in recession.

Six field crews continue to make discharge measurements, and one field crew is working in the Fargo area on a sediment collection project. In addition to field staff from the North Dakota WSC, field crews from the Arkansas, Colorado, Kansas, Massachusetts and Nebraska WSC's continue to participate in the data collection activities in North Dakota. (Total crews in the field – 7).

- Western North Dakota (Missouri River Basin)

Most gaging locations in this part of the state are no longer in flood - higher flows are limited to the James River basin. Field crews from the Bismarck office made discharge measurements on the inflows and outflow of Lake LaMoure - the spillway for Lake LaMoure was heavily eroded during the record flows of 2009. Above normal inflows to Lake LaMoure for this year have pushed water down the recently repaired spillway and there has been some erosion of the spillway as a result. Flow information collected by the USGS discharge measurement crews is being used by State Agencies to monitor the effects of erosion control methods, that were established over the past few days. One crew from the Montana WSC continues to assist the North Dakota WSC, particularly in the James River basin. (Total crews in the field – 5)

- **Project Alert - SD WSC**, Thu, 25 Mar 2010 17:49:24 -0400 (EDT)

- South Dakota is experiencing moderate to major flooding on the James River and minor flooding on the Big Sioux River. Most sites are current cresting or have crested and if the dry weather pattern continues, will likely begin to decline gradually. Warmer temperatures have ice breaking up and snow melting in much of north-western SD with river stages on the Bad River remaining high and the Grand River rising. A considerable amount of snow is still present in much of northwestern SD in the draws and along river banks.

Five crews are currently out making measurements, a few staff are in updating shifts and corrections. Initial flood frequency results have much of the James River basin in the 4 to 2 percent range with the current stage at the James River at Huron in the 2 to 1 percent range. The sites on the Vermillion River were also typically in the 4 to 2 percent range and the Big Sioux River was generally in the 10 to 4 percent range.

Flood communications have primarily been from the field crews which were then relayed to participating agencies via NWSChat. Information relayed included information on discharge measurements, gage status, shifts or corrections, and river conditions. John Stamm, a hydrologist with the SDWSC, was interviewed Thursday morning by SD Public Radio on climate change with questions specific to SD and Joyce Williamson will be interviewed Thursday evening by SD Public Television on flooding in SD.

- **Project Alert Notice MN WSC**, Thu, 25 Mar 2010 18:37:44 -0400 (EDT)

- Floods are receding in southern and western Minnesota. Flood warnings exist for 28 counties in the Red River of the North, Minnesota, Missouri, and Mississippi River Basins. Flood crests have moved down the Mississippi River--only the Mississippi River at Winona gage has increasing flow. Flood crests have been lower and earlier than initially forecast by the NWS, likely due to an abnormally dry March.

USGS flood-monitoring activities today consist of six field teams making discharge measurements, repairing gages, and collecting sediment samples. Three teams are deployed in the Mississippi River Basin, 2 in the Minnesota River Basin, and 1 team in the Red River Basin. Teams include two hydrographers on loan from the Massachusetts Water Science Center. A measurement was made today at Bois de Sioux River near White Rock, at the request of the Corps of Engineers to check their releases from White Rock Dam.

- **PROJECT ALERT NOTICE**, Fri, 26 Mar 2010 14:01:34 -0400 (EDT)

- Description of hydrologic event: Rainfall totals of 1-3 inches combined with snowmelt resulted in flooding in eastern New York on March 22-25, 2010. Minor flooding was reported in the Schroon R, Sacandaga R, middle Hudson R, Esopus Cr, Rondout Cr, and East Br Ausable R basins. Moderate flooding was reported in the Schoharie Cr basin. Recurrence intervals of peak flows at USGS stations in these basins ranged from about 2 yrs to <10 yrs (>10% to 50% annual exceedance). A total of 6 crews made 30+ discharge measurements, 7 of which were the highest measured flows for the period of record.

- **Project Alert - SD WSC**, Fri, 26 Mar 2010 15:49:57 -0400 (EDT)

- With continued dry weather, water levels on the Vermillion River have dropped below flood stage and may sites along the Big Sioux have declined although a few still remain above flood stage. There is still ice and some snow in the northern part of South Dakota so with warmer temperatures beginning on Sunday, we may see some increases in river stage for some of the Big Sioux River Basin and are expecting higher flows in the Grand and Moreau Rivers in western SD.

The James River continues with major to moderate flooding and backwater conditions from some tributaries however most tributaries have peaked and are declining. Because of the lack of slope in both the James and the Big Sioux Rivers, recession for most streamflow gages will likely take months.

We have 4 crews out today collecting measurements in the Big Sioux, James, Moreau, Grand, and Bad River Basins.

- **Project Alert Notice North Dakota WSC**, 26 Mar 2010 16:33:48 -0400 (EDT)

- Eastern North Dakota (Red River Basin)

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Most gaging locations in the Red River Valley have crested and are in recession. A few remaining gaging locations on the main stem of the Red River are forecast to crest this weekend – the peak on the Red River is forecast to pass on into Canada on or around Wednesday, March 31.

Most North Dakota WSC field crews will be off over the weekend and out-of-state crews will begin to return home. Three field crews will remain active over the weekend measuring the Red River gaging locations that will crest this week end and making recession measurements at key locations throughout the Red River Valley. In addition to field staff from the North Dakota WSC, field crews from the Arkansas, Colorado, Kansas, Massachusetts and Nebraska WSC's continue to participate in the data collection activities in North Dakota. (Total crews in the field – 7).

Western North Dakota (Missouri River Basin)

Most gaging locations in this part of the state are no longer in flood. Warmer temperatures for today and forecast through the weekend are beginning to melt the remaining snow pack and rises are expected on the Knife River and in the James River basin. For this reason two crews will be actively making discharge measurements on Saturday. The field crew from Montana will return home on Saturday (Total crews in the field – 5)

Flood communications have included participation in NWS conference calls, phone contacts with various local agencies, and participation in NWSChat, where discharge measurements, field conditions, gage status, and logistics have been shared with participating agencies.

- **Project Alert Notice MN WSC--last one unless flows increase**, *James D Fallon*, *Date: Fri, 26 Mar 2010 16:52:53 - 0400 (EDT)*
 - This will be the last Project Alert update from Minnesota unless conditions change. Floods are receding in southern and western Minnesota with dwindling snowmelt. Flood warnings exist for 28 counties in the Red River of the North, Minnesota, Missouri, and Mississippi River Basins. Flood crests have moved down the Minnesota and Mississippi Rivers--only the Mississippi River at Winona gage has increasing flow. Flood crests have been lower and earlier than initially forecast by the NWS.

USGS flood-monitoring activities today consist of 4 field teams making discharge measurements, repairing gages, and collecting sediment samples. Teams are deployed in the Mississippi, Minnesota, and Red River Basins. Two hydrographers and an acoustic Doppler current profiler on loan from the Massachusetts Water Science Center are returning home today and tomorrow. Plans for this weekend include 1-2 measurements at streamgages on tributaries in backwater from highflows on the mainstem Minnesota River.
- **PROJECT ALERT NOTICE**, *jmorriso*, *Date: Mon, 29 Mar 2010 13:50:53 -0400 (EDT) 3*
 - Description of hydrologic event: The Ct WSC is preparing for statewide flooding. The forecast is for 5-6 inches of Rainfall statewide with up to 8 inches possible in some areas. This is in addition to the 7-8 inches already recieved within the last 2 weeks.

Moderate flooding is expected statewide. The Connecticut River at Middletown receded below flood stage this morning and has already risen back above flood stage.

One crew is being sent to fairfield county to make high flow measurements today. An additional 3 field crews are being sent out Tuesday morning to make measurements.
- **PROJECT ALERT NOTICE for MA and RI**, *Mon, 29 Mar 2010 18:36:10 -0400 (EDT)*
 - Description of hydrologic event: All of Massachusetts and Rhode Island is forecasted to have flooding from rain occurring from late evening Sunday March 28 - Wednesday March 31. Rainfall total for this 3-day storm is projected to be from about 3-8 inches. This rainfall event comes on top of areas of eastern MA and RI which have received widespread 8-10 inches of rainfall over the last two weeks. A few streamgages were still above flood stage from this previous event yesterday. Boston, MA has already set a record for rainfall for the month of March. During the previous storm of March 15-17, a few streamgages set period of record peaks. The NWS is projection a few more streamgages will reach all-time record stages this week in MA and RI.

Planned work:

 - Two crews were out installing new temporary gage above the anticipated flood levels, since the gages were inundated in the previous high-water event two weeks ago at their current elevation.
 - Two crews were out making high-flow measurements today.
 - Five to six crews are planned to be out measuring high flows for the remainder of the week.
- **Florida Flooding March 30, 2010**, *Tue, 30 Mar 2010 10:46:40 -0400 (EDT)*
 - The FLWSC has approximately 12 teams deployed in the field making flood discharge measurements. Rainfall throughout most of the State and especially in Central Florida has been approximately twice the normal amount for the past 4 months with March having the largest totals. High water and medium flow discharge measurements are being made at sites for rating verification with some sites having their highest levels and flows for the past 5 years.
- **North Carolina Flooding March 30, 2010**, *Tue, 30 Mar 2010 12:17:11 -0400 (EDT)*
 - The North Carolina Water Science Center has 2 teams deployed in the field making flood discharge measurements for rating verification. Rainfall across central and eastern North Carolina on March 28 and 29 has resulted in minor flooding occurring or forecast for sites in the Roanoke, Tar and Neuse River Basins.
- **Project Alert - SDWSC**, *Tue, 30 Mar 2010 15:20:06 -0400 (EDT)*
 - The James River continues with major to moderate flooding and backwater conditions on the main stem. Because of the lack of slope in the James River, recession for most streamflow gages will likely take months. If the weather pattern changes from our current cycle of dry, we may see some localized flooding since much of eastern SD still has standing water or saturated soil conditions.

We had 3 crews out yesterday and 2 out today collecting measurements in the Big Sioux, James, Moreau, and Grand River basins.
- **PROJECT ALERT NOTICE**, *Tue, 30 Mar 2010 19:23:59 -0400 (EDT)*

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- Description of hydrologic event: rainfall totals in south eastern region of CT about 7.0 inches. Statewide rainfall totals ranged from 3 to 7 inches.

Several rivers exceeded 0.04 annual exceedance probability

Yantic River - 5th highest flow since 1930.

Pendleton Brook (small da) highest flow on record (1959-2010)

4 crews deployed on 3/30/2010

about 12 measurements made as of 6:30 pm 3/30/2009

flagging and placing high water marks may be necessary on several rivers were direct measurements couldn't be made

- **PROJECT ALERT NOTICE for MA and RI - March 30, 2010**, Tue, 30 Mar 2010 20:18:12 -0400 (EDT)

- Description of hydrologic event: Much of Massachusetts and all of Rhode Island has received from 3-8+ inches of rain since late evening Sunday March 28 - Tuesday March 31. The continuous heavy rains have subsided to intermittent moderate showers. Rhode Island was the hardest hit, with most of the State receiving 8+ inches. As mentioned yesterday this storm follows two other storms over the last two weeks during which areas received 8-10 inches of rain. Both Boston and Providence total monthly precipitation to date is a new monthly record for March.

In Rhode Island 22 of the 27 long-term network streamgages have had period of record peaks exceeded already. The already historic flows at the majority of these 22 streamgages currently continues to rise. Most of these streamgages likely will peak overnight or tomorrow. The ratings at most of these sites was temporarily extending, and we are following them up with measurements over the next few days to adjust our extensions. Ten of these sites were measured today, and a few could not be - due to impassable roads and difficult hydrologic conditions.

In Massachusetts, the hardest hit area was southeastern part of the State. There are a few streamgages which have exceeded their previous historic peaks and a few which may come close over the next few days. Five sites were measured in this part of the State today.

Planned work:

- Five crews from the MA-RI WSC were out measuring today, and we also received assistance from the NH-VT WSC with a crew today.
- Seven to eight crews (including two crews from the NH-VT WSC) will be out tomorrow.
- Five to six crews are planned to be out measuring high flows for the remainder of the week.

- **PROJECT ALERT NOTICE for MA and RI - March 31, 2010**, Wed, 31 Mar 2010 21:51:31 -0400 (EDT)

- Description of hydrologic event: Much of Massachusetts and all of Rhode Island received from 3-8+ inches of rain from late evening Sunday March 28 - Tuesday March 31. Rhode Island was the hardest hit, with most of the State receiving 8+ inches. As mentioned yesterday both Boston and Providence total monthly precipitation to date is a new monthly record for March.

In Rhode Island 22 of the 27 long-term network streamgages have had period of record peaks exceeded already. Most of the streamgages peaked yesterday or today, only a few have yet to peak and likely will late tonight or early tomorrow. We continue to adjust and extend ratings based on new measurements. Twelve streamgages in RI were measured today, and a few could not be - due to impassable roads.

The most news worth streamgage was the Pawtuxet River at Cranston, RI (01116500) which peak at a gage height of 20.79 ft and a discharge of 14,100 cfs. This has resulted in millions of dollars of damage and has closed Interstate 95 near Providence. It was measured at a gage height of 20.64 ft and a discharge of 13,900 cfs a few hours after the peak (it took upwards of 2+ hours to drive 15 miles to the streamgage). This event exceeded the previous peak of record - gage height of 14.50 ft and discharge of 5,440 cfs. There are 70 years of record at the streamgage.

In eastern Massachusetts 10 streamgages were measured today.

Planned work:

- Six crews from the MA-RI WSC were out measuring today, and we also received assistance from the NH-VT WSC with two crews today.
- Seven to eight crews (including two crews from the NH-VT WSC) will be out tomorrow.
- Five to six crews are planned to be out measuring high flows for the remainder of the week.

April

- **Preliminary high flow information for Southern NH from the March 29- April 1 runoff event**, Thu, 1 Apr 2010 11:27:53 -0400 (EDT)

- Attached, please find provisional data for this past flood event, which again for the 3rd time in a month was mostly within the Piscataqua and lower Merrimack River Basins of New Hampshire. The NWS AHPS site generally showed 3-6" of rainfall from this past storm. Please contact me if you have any questions.

- **Texas Flood Activities**, Sun, 18 Apr 2010 09:38:48 -0400 (EDT)

- A slow moving cold front from west to east across the state triggered widespread thunderstorms Saturday. Moderate to high flows were measured in North, West, and South Central Texas.

Crews from our Wichita Falls, San Angelo, San Antonio and Austin offices were deployed yesterday making numerous high flow measurements. Crews from these offices will be making measurements again today.

A squall line associated with the cold front continues to move east across the state today and will impact watersheds in East Texas throughout the day today into tomorrow. Field crews from our Ft. Worth office will deploy to sites in the Brazos and Trinity River basins today. No plans for deployment of

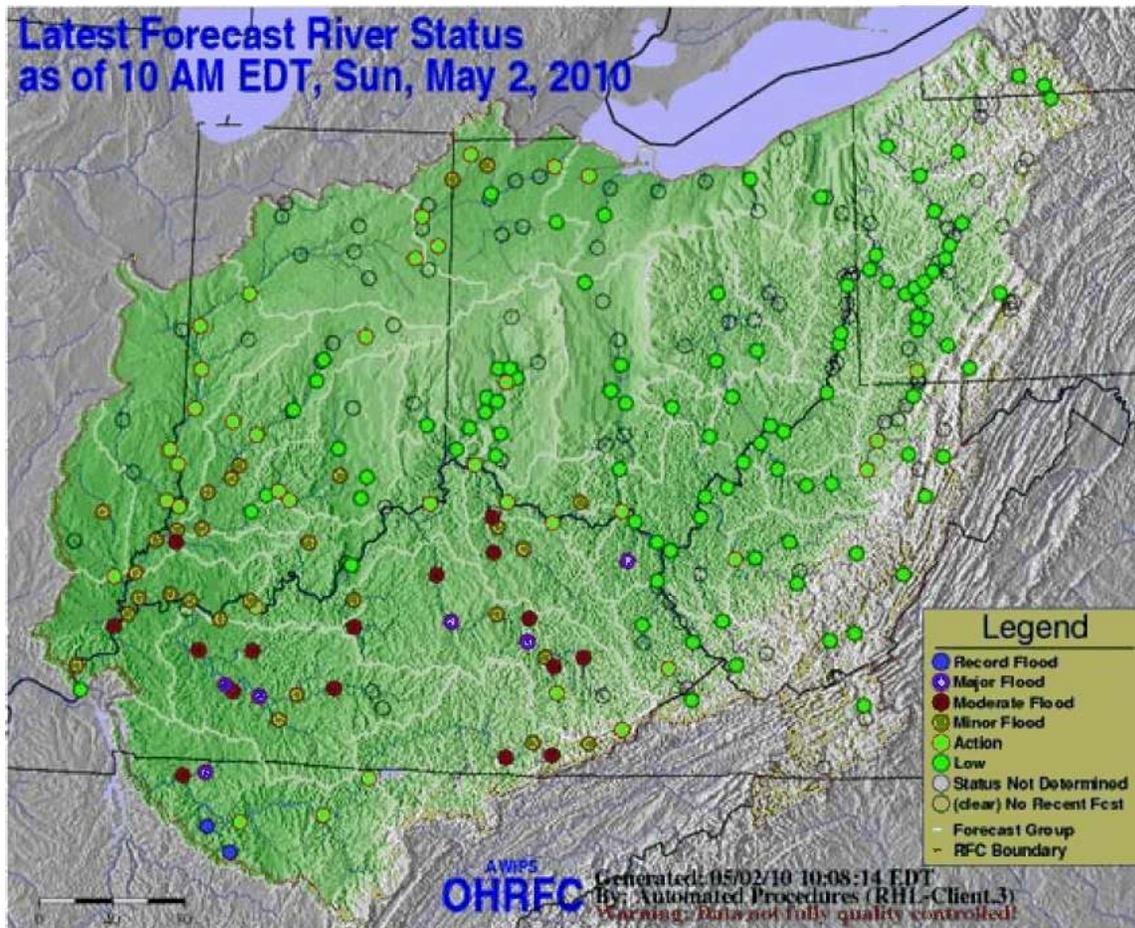
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crews from Houston planned at this time. Crews from our Houston office may deploy tomorrow as the front moves through that part of the state.

Communications with NWS via NWSChat and with cooperators via email.

May

- **PROJECT ALERT NOTICE**, Sat, 1 May 2010 13:54:14 -0400 (EDT)
 - Description of hydrologic event: The Kentucky Water Science Center has 5 crews measuring what would be considered moderate-to-high flow conditions in the Louisville, Lexington, and Hopkinsville areas of Kentucky. The State has received between 1.5 and 2.5 inches of rain. Over the next 24 hours, Kentucky is expected to receive an additional 2-3 inches of rain in selected areas. It is expected that crews will be out tomorrow and additional personnel will be used Monday when the larger basins start to rise. Each crew is making multiple measurements to better define rating gaps.
- **Tennessee Flooding**, Sun, 2 May 2010 09:25:25 -0400 (EDT)
- Description of hydrologic event: Rainfall totals during the past couple of days have exceeded 10 inches in areas just south of Nashville and north of Jackson. The National Weather Service is forecasting major to record flooding at several rivers in Middle and West Tennessee. The Tennessee Water Science Center had 3 crews in the field yesterday and has 4 crews in the field today. One team is focusing on the Harpeth River south and west of Nashville, one team is focusing on smaller streams in Nashville, one team is focusing on sites north of Jackson, and one team is focusing on sites north of Nashville.
- **PROJECT ALERT NOTICE**, Sun, 2 May 2010 12:03:48 -0400 (EDT)
 - Description of hydrologic event: The Kentucky Water Science Center has 8 crews out measuring moderate to high flows across the state. We have new PORs for smaller sites in the Louisville and Lexington areas. The State has received between 3 and 8 inches over the last 36 hours.
- **Flooding in Tennessee**, Sun, 2 May 2010 21:10:59 -0400 (EDT)
 - Description of hydrologic event: The Tennessee Water Science Center had 4 crews out measuring moderate to record flows in Middle and West Tennessee today. Areas south and west of Nashville received another 3 to 7 inches today with 2 day totals exceeding 17 inches in some areas. The most severe flooding is on the Harpeth River near Bellevue (just west of Nashville). The peak stage at our gage in Bellevue was about 9 feet higher than the historic high (data since 1920). This gage and the USACE/USGS gage downstream at Kingston Springs have been partially submerged and are not operating; however, we have been making periodic gage height and/or discharge measurements at these two gages.
- **Ohio River Basin Stations Major Flooding**, Mon, 3 May 2010 00:00:27 -0400 (EDT)
 - Below is a map of the Ohio River Forecast Center's (OHRFC) area of responsibility and the streamgages at Major or Record Flooding. OHRFC reports that one or two more streamgages are likely to go to Record flooding.



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- **Mississippi Flooding**, *Date: Mon, 3 May 2010 12:22:51 -0400 (EDT)*

- Heavy rains in the upper portion of Mississippi over the weekend caused several of our streams to reach stages that exceed the NWS flood stage. Several reached the highest stages in the last 10 years, and the Little Tallahatchie River at Etta is past the peak of record stage of over 60 years of record.

One crews was dispatched Saturday measure discharge and collect sediment samples. Four additional crews were sent out Sunday to make discharge measurements. Currently , five crews are out making discharge measurements.

Rivers in the upper Tennessee-Tombigbee Basin are expected to peak this week and one crew will remain in that area. Additionally, rivers in the Mississippi Delta are expected to go to unusually high stages as the water from the four flood control reservoirs at the edge of the bluffs is released. Crews will be deployed to that part of the state to measure stream flow and collect nutrient samples.

- **PROJECT ALERT: Georgia**, *Mon, 3 May 2010 12:42:41 -0400 (EDT)*

- The Georgia WSC has deployed 10 2-person crews to measure and sample as a result of the heavy rains that fell in the area starting early Monday morning. The middle Chattahoochee River Basin as of this morning received between 4"-6" of rainfall in less than a 12-hour period, and the rainfall is continuing.

There are 10 personnel from the Surface-Water (streamgaging) unit responding to moderate flooding in the Columbus, Georgia and NW Georgia areas. There are 10 personnel from the urban hydrology monitoring programs in the field making flood measurements and collecting water-quality samples.

- **Tennessee**, *Mon, 3 May 2010 21:16:58 -0400 (EDT)*

- Update: The TN WSC had 4 crews in the field making measurements today and one crew flagging high water marks. The majority of the measurements are the highest measurements ever made and record flows have occurred on the Harpeth, Duck, and Buffalo Rivers. Approximately 8 stream gages are not operating and are suspected to have been destroyed/damaged by the flooding. A few of these are historic gage structures not located near bridges and are not yet accessible because of high water. The USACE-Nashville District owns/services one of these gages (the TN WSC quality assures the data and collects discharge data) and TVA owns/provides the equipment for another of these gages (the TN WSC operates the gage for TVA).

Tomorrow, 2 crews will continue to make measurements in the area southwest of Nashville, one crew will make measurements to the east of Knoxville as they return to the Knoxville Field Office, 3 crews will be flagging high water marks at crest-stage gages and smaller continuous discharge stations, and two crews will be repairing/servicing water-quality and sediment monitoring gages.

- **Tennessee - Update**, *Thu, 6 May 2010 10:42:06 -0400 (EDT)*

- Update: Most of the smaller rivers in Middle Tennessee, several of which experienced historic flooding (greatest since at least 1897), are now below flood stage. These rivers are in the Cumberland and lower Tennessee basins and moderate to major flooding is still occurring on the Cumberland River, moderate flooding is occurring on the lower Tennessee River, and minor to moderate flooding is occurring on several rivers in northwest Tennessee which drain directly to the Mississippi River.

The TN WSC has 6 crews in the field today. One crew is making discharge measurements in northwest Tennessee, one crew is making discharge measurements on the Cumberland River, two crews are repairing gages and deploying a couple of the rapid deployment gages received from HIF, and two crews are flagging high water marks.

- **Northern Illinois Flooding**, *Thu, 13 May 2010 15:39:24 -0400 (EDT)*

- Significant rainfall in the past 24 hours over Northern Illinois has caused many rivers and streams to rise to or above flood stage. Areas just north and west of the Chicago metropolitan area were hardest hit with rainfall totals between 2 and 3 inches in a 12-hour period overnight. The ground in this area was already saturated from rainfall earlier in the week, further increasing the potential for flooding. The National Weather Service is forecasting water levels on the Des Plaines, Fox, Pecatonica, and Rock Rivers to approach "Moderate Flood Stage" over the next few days. The USGS, Illinois Water Science Center has deployed 4 field crews to the affected areas to maintain gaging stations, measure high flows, and collect specific high-flow data for projects on the Chicago Sanitary and Ship Canal. Additional field crews will be deployed as needed.

June

- **Project Alert Notice -- Wyoming**, *Wed, 9 Jun 2010 00:30:36 -0400 (EDT)*

- Wyoming is experiencing minor to moderate flooding in the upper North Platte and Wind River basins as well as the Blacks Fork and Henrys Fork. Beginning Friday June 4, rapidly warming temperatures resulted in accelerated mountain snowmelt-runoff. In some instances, rainfall has contributed. New peaks of record have been recorded at 2 sites. One gage has been destroyed.

Crews currently are in the field repairing gage instrumentation and making streamflow measurements. Staff also are extending ratings and planning to compute flood frequencies. Flood stages have been updated and links to Flood Tracking Charts have been added to station real-time web pages.

Flood communications primarily have been with NWS hydrologists and USACE personnel. Information related include discharge data and gage status. USACE has requested assistance installing staff gages for monitoring flood crests in the Wind River basin.

- **Project Alert Notice - Utah**, *Wed, 9 Jun 2010 13:07:21 -0400 (EDT)*

- Utah and far western Wyoming are experiencing minor to moderate flooding in the upper Provo, Weber, and Bear River basins as well as several basins draining the south slope of the Uinta Mountains. Beginning Saturday June 4, rapidly warming temperatures resulted in accelerated mountain snowmelt-runoff. In some instances, rainfall has slightly contributed. New peaks of record have been recorded at 5 sites and near record flows at several others. One gage has been damaged. Flows are expected to decrease over the next couple of days due to approaching cooler weather.

Six field crews currently are in the field making streamflow measurements and repairing gage instrumentation. Staff also are extending ratings and planning to compute flood frequencies.

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Flood communications primarily have been with the Colorado Basin River Forecast Center hydrologists. Information related include discharge data and gage status.

- **Project Alert Notice--Texas, Thu, 10 Jun 2010 10:00:37 -0400 (EDT)**

- Texas experienced significant flooding in the New Braunfels and Seguin, Texas areas Tuesday night and Wednesday. An intense thunderstorm northwest of New Braunfels, TX produced an estimated 11 inches of rain during a 6 hour period Tuesday night. This intense rainfall event resulted in flooding in the Comal and Guadalupe River basins Wednesday and continues today on the Guadalupe River downstream of Seguin. Two gages in the Guadalupe basin were inundated.

The San Antonio office deployed three flood measurement crews yesterday and one boat crew. Austin personnel were also dispatched to the area to assist with indirect measurement reconnaissance and high water mark flagging.

Post event activities today include additional flood measurements as the flood wave moves downstream, gage repairs, follow-up measurements in the New Braunfels area, and flagging high water marks for indirect measurements.

- **Flooding and record flows in Idaho, Thu, 10 Jun 2010 11:15:16 -0400 (EDT)**

- Flooding and record flows are occurring in Idaho due to rain-on-snow events that have occurred throughout the state over the last week. The areas with the most significant flooding are the Payette River, Teton River, Henrys Fork, and Salmon River basins, but record flows have been recorded throughout the state. Approximately 2-3 inches of rain fell over the past week in various parts of the state. Additional rain is expected today, and flash flood warnings have been issued for the Upper Weiser River, Big and Little Wood Rivers, and upper Snake River Basin. Numerous contacts have been made with the National Weather Service (NWS), the Corps of Engineers (USACE), and various state agencies. These contacts were primarily to give gage status updates and coordination of flow at regulated sites. Field crews have been deployed from field offices in Boise, Post Falls, Idaho Falls, and Twin Falls to make measurements, collect water-quality samples, and flag high-water marks. Crews have made approximately 65 streamflow measurements over the past week.

A USGS gage on the Lake Fork Payette River above Jumbo Creek near McCall was destroyed by the high flows, which were exacerbated by the failure of an earthen dam on Browns Reservoir upstream of the gage. High water marks indicate water levels reached approximately 15 feet above the gage.

Additional high-water marks are being flagged to estimate peak flow. Suspended and bedload sediment samples were collected near peak flows at selected sites in the Clearwater and lower Snake River basins in support of a sediment transport and sediment surrogate study for USACE in rivers draining to Lower Granite Reservoir.

- **Project Alert Notice -- Wyoming Jun 10 update, Thu, 10 Jun 2010 12:58:25 -0400 (EDT)**

- Wyoming continues to see minor to moderate flooding in the upper North Platte River basin, the Wind River basin, and the Blacks Fork basin. The flooding primarily is from rapidly warming temperatures resulting in accelerated snowmelt runoff. Rain and rain-on-snow was a factor in some areas. New maximum discharge and (or) stage peaks have been recorded at 6 USGS streamgages with periods of record ranging from 37 to 69 years.

Three crews installed staff plates and measured discharge at 3 miscellaneous sites in the Wind River basin selected by USACE. Extra measurements at USGS streamgages were made at the request of USACE and NWS. Communication primarily has been with USACE personnel from Omaha and on-site as well as NWS personnel in Riverton. Field crews communicated with local EM personnel on-site.

In the Blacks Fork basin, 09229500 Henrys Fork nr Manila UT has been destroyed. Plans are being made to flag HWMs for an indirect. Installation of a replacement streamgage is pending evaluation of the site for a suitable location. A temporary streamgage has not been installed. Elsewhere in the basin the flood peak is being monitored as it moves through the basin. USGS UT WSC has been contacted for possible coordination.

In the North Platte River basin, 2 crews have been measuring and extending ratings. Significant scour has been noted (1.1 to 1.5 ft) at 06632400 which will result in a much larger peak than recorded. A discharge measurement at the streamgage at flood stages was not possible because the cablecar was partially submerged.

While USGS streamgages show many streams to be on the recession, a few continue to rise and rain is forecast over the next 3 days potentially adding to flood concerns in the Wind and North Platte River basins. The Wyoming State Engineer's Office and USBR have been contacted for coordinating data needs in the North Platte River basin where most of the reservoirs are at or near capacity. USGS NE WSC has offered assistance in the basin. s

- **Project Alert Notice--Texas, Date: Thu, 10 Jun 2010 17:06:50 -0400 (EDT)**

- After almost 12 inches of rain in about a six-eight hour time frame in the New Braunfels area late Tuesday into early Wednesday, heavy flooding along the Guadalupe and Comal rivers caused extensive damage to several USGS gages:

08168000 – Hueco Springs nr New Braunfels, Tx; Gage shelter completely inundated and washed 150 ft downstream from pad. Concrete pad destroyed, all equipment (antenna, PT, DCP, conoflow, etc. and shelter) complete loss.

08168913 – Comal Rv (oc) nr Landa Lk, New Braunfels, Tx: Gage shelter completely inundated, turned over, and buried under debris pile. All equipment (antenna, AVM, DCP, etc. and shelter) complete loss.

08169000 – Comal Rv at New Braunfels, Tx: Gage is concrete stilling well with instrument shelf at 22.5 ft. Gage was completely inundated and all equipment (DCP, Shaft encoder, etc.) complete loss.

Flood struck at about 5-6 am Wednesday morning and by 10 am USGS crews were in the area assessing damage, obtaining levels to HWM's, and flagging peaks for indirects. Flood measurements were made Wednesday morning at Dry Comal Ck (08168797). By mid-afternoon Wednesday, crews had repaired the Comal gage (08169000) and gotten it and the Guadalupe Rv abv Comal at New Braunfels (08168500) gage back on line. Late Wednesday evening a flood measurement (highest measurement for POR) had been made at Guadalupe Rv at Hwy 1117 nr Seguin (08169792).

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Thursday morning, we have one crew continuing flagging peaks for indirects in the New Braunfels area and two crews making follow-up and flood measurements in New Braunfels, Gonzales and Luling areas.

- **Project Alert Notice - Arkansas, Date: Fri, 11 Jun 2010 12:37:02 -0400 (EDT)**

- Southwestern Arkansas received nearly 8 inches of rain since late last night and early this morning. The flooding was isolated to a 50 - 75 mile radius in SW Arkansas. 12 drowning victims have been reported by State police in the vicinity of 2 USGS gaging stations. These 2 gaging stations experienced peaks of record. One crew is currently measuring and another is headed down to flag and survey indirect(s).

Flood communications primarily have been with the National Weather Service in Little Rock. Information relayed to them was discharge data and gage status. We have been in constant communication with the National Weather Service as search and rescue efforts are being conducted.

- **Fw: USGS news release Little Missouri and Caddo River (Arkansas) flooding, Date: Fri, 11 Jun 2010 17:33:27 -0400 (EDT)**

- Copy of news release bcc'd to Arkansas media and The Weather Channel.

USGS Flood Peak Stage and Streamflow Information for Little Missouri and Caddo Rivers for June 11, 2010

Intense rainfall occurring in southwestern Arkansas on June 10 and 11 has resulted in extreme flooding on the Little Missouri and Caddo Rivers. The flood stage on the Little Missouri River near Langley was the highest peak since the U.S. Geological Survey (USGS) began recording water-level stages and flow at this site in 1988 and was approximately 10 feet higher than the previous record. The flood stage on the Caddo River near Caddo Gap was within 1 foot of the previous record. Stage and flow have been measured at this site since 1993.

Provisional data at the USGS Little Missouri River near Langley gaging station indicate that the flood on the upper Little Missouri River was greater than a 1% flood (meaning a flood of this magnitude has a 1% chance of occurring in any given year, previously referred to as a 100 year flood event). Provisional flow data at the USGS Caddo River at Caddo Gap gaging station indicate that the flood on the Caddo River was greater than a 4% flood (previously referred to as a 25-year flood event).

Near real-time stage and streamflow information (updated via satellite every one to four hours) is available on the USGS Arkansas Water Science Center's home page at <http://ar.water.usgs.gov>. Information is provided in an easily understandable graphical format (see below).

The USGS uses data from its 160 streamgaging stations in Arkansas to operate several flood warning information systems. These systems are in operation in Hot Springs, Hardy, Benton, and Batesville and are funded in cooperation with local and Federal agencies. These flood warning systems automatically call emergency management officials, including the National Weather Service, when certain rainfall amounts or water levels are reached.

"Data from USGS streamgaging stations are used for a variety of reasons," said Jaysson Funkhouser, USGS Arkansas Water Science Center surface-water specialist and Chief of the Hydrologic Surveillance and Analysis Program. "Streamflow data can be used to study how often flooding occurs in Arkansas's rivers and streams and it is also used by numerous agencies, such as the National Weather Service, to warn residents of imminent flooding".

A new service of the USGS, WaterAlert, sends e-mail or text messages when certain parameters (stage, for example) measured by a USGS streamgaging station exceed user-definable thresholds.

Real-time data from USGS gages are transmitted via satellite or other telemetry to USGS offices at various intervals; in most cases, once every one or four hours. Emergency transmissions, such as during floods, may be more frequent. Notifications will be based on the data received at these site-dependent intervals. Visit <http://water.usgs.gov/wateralert/> to sign up for this free service.

- **Project Alert Notice -- Wyoming Jun 11 update, Date: Fri, 11 Jun 2010 20:01:09 -0400 (EDT)**

- This is the last update: Wyoming continues to see minor to moderate flooding in the upper North Platte River basin and the Wind River basin. While some streams remain above flood stage, flood peaks are receding in most instances. Municipal water supplies have been impacted for 3 towns. The Governor issued a disaster declaration (Monday).

One crew extended a staff plate at 1 miscellaneous site in the Wind River basin selected by USACE. In the North Platte River basin, 1 crew has flagged HWMs for an indirect measurement. USGS will be assisting the Wyoming State Engineer's Office next week by measuring discharge at a furnished record site.

NWS has issued a winter storm warning for the Wind River Range in effect through Saturday evening. Snow accumulations from 6 in to 3 ft (locally) are forecast above 7,000 ft. Temperatures initially will be cool then warming by mid-week. Potential rain in the basins over the weekend followed by snowmelt runoff from the warmer temperatures could result in renewed flooding.

- **Project Alert Notice - Arkansas, Date: Sat, 12 Jun 2010 10:40:00 -0400 (EDT)**

- The flood waters in the Caddo River and Little Missouri River receded yesterday. The AR WSC has one crew out flagging high water marks and surveying indirects. This crew will likely be out for most of next week. Bob Holmes with OSW is planning to assist with indirects and will arrive Sunday afternoon.

Flood communications continue to be with the National Weather Service in Little Rock. Personnel with the NWS will be assisting with the indirect surveying later today.

- **Project Alert Notice - Nebraska, Date: Sun, 13 Jun 2010 19:25:11 -0400 (EDT)**

- Heavy rains have continued across the state with general storm totals from 5 to 10 inches over the last 4 days. The Loup and Elkhorn basins have been hardest hit, but high water is also reported in the Republican and Little Blue basins. This area of the state is dominated by the Nebraska Sand Hills, which has extremely porous soils, not typically subject to flooding. However, high water in the North Loup River basin of the Sand Hills caused an irrigation diversion to fail above [06786000 North Loup River at Taylor, Nebr.](#) The US183 highway bridge at the gage collapsed, but the gage has continued to operate. One crew is on the way to assess the condition of the gage and flag high-water marks. Record high discharge (not gage height) for 73 years of

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record.

30 percent (17) of the long-term gages (58) in the state are at record high conditions for this date. Anecdotal reports are 5-10 inches of precipitation across the state, but storm totals in the middle of the state have certainly exceeded that. Most of the precipitation was in the central and western part of the state and levels in the eastern downstream parts of the Elkhorn and Platte Rivers will likely continue to rise.

NEWSC has five crews out making discharge measurements and have documented most of the peaks. Two sites need repairs to lines, but were temporarily repaired in the field.

- **Project Alert--Arkansas: Little Missouri Killer Flood**, *Date: Mon, 14 Jun 2010 00:39:06 -0400 (EDT)*

- USGS personnel have been working on surveying high water marks and making forensic determinations of peak discharge on the Little Missouri River all weekend. Field crews from the USGS Arkansas Water Science Center have been concentrating their efforts this weekend on a forensic determination of the peak discharge at the USGS streamgage on the Little Missouri River near Langley, AR. The streamgage had risen over 20 feet in just over 5 hours in the early morning hours of Friday June 11, 2010. Staff from the USGS Office of Surface Water have concentrated on flagging high water marks approximately 10 miles upstream of the Langley gage in the U.S. Forest Service Albert Pike Campground. A forensic determination of peak discharge will be estimated from the surveyed high water marks. Additional high water marks will be flagged and surveyed in large tributaries upstream of the campground areas to properly document the flood. USGS efforts will continue throughout this week to document the flood.

As of 6:00 PM CDT, the death toll (as reported on major news networks) stood at 19, with almost 2 dozen people still unaccounted for. Numerous search and rescue teams are in the area.

- **Project Alert Notice - Oklahoma**, *Date: Mon, 14 Jun 2010 14:02:34 -0400 (EDT)*

- The Oklahoma City Metro area received over 10 inches of rain in 8 hrs. North Central Oklahoma and Northeast Oklahoma are also experiencing heavy rainfall amounts. Rainfall is continuing and is expected to continue through tomorrow. Seven crews have been dispatched throughout the state but road conditions have been a problem. Conditions are still developing.

- **Project Alert - Oklahoma**, *Date: Tue, 15 Jun 2010 08:59:20 -0400 (EDT)*

- Reports of 6 to 8 inches of rain received since early Monday morning are common across the Oklahoma City area with some areas reporting more than 10 inches. Large amounts of rain also fell across North Central and Northeast Oklahoma.

More than 50 people were rescued from cars and other structures in the Oklahoma City Metro area. The Emergency Medical Services Authority's medics were involved in 5 water rescues. Also people whose residences and businesses were threatened by high waters were evacuated.

Measurements on the North Canadian River at Briton Road (07241520) and near Harrah (07241550) were near peak of record. Crews are out making measurements along the North Canadian River, Chikaskia River, and Bird Creek watersheds.

Rain is continuing to come down across the state on Tuesday, with areas in the south central part of the state receiving over an inch already.

- **Re: Fw: Project Alert Notice - Nebraska**, *Date: Tue, 15 Jun 2010 18:03:16 -0400 (EDT)*

- Heavy rains (in excess of 12 inches over the last 5 days in several areas) across about 2/3 of Nebraska have caused abrupt increases in streamflow in the Loup, Elkhorn, Niobrara, Republican, Little Blue, and Platte River Basins. Several stage-discharge ratings have been extended based on recent streamflow measurements above previous peak measurements.

Damage to bridges, levees, small towns are common news as shown from this portion taken from the Lincoln Journal Star newspaper from a story posted yesterday ("Map: Flooding across Nebraska" posted on June 14, 2010):

1. Dam on farm pond fails above North Loup; most of town evacuated temporarily; homes, churches damaged.
2. In Wheeler County, earthen dam on Cedar River near Ericson fails.
3. Downstream from Ericson, water flowing over top of dam at Spalding, but dam holding most of the water. Flood warning for Boone County downstream.
4. Record flooding along Elkhorn River from Ewing to Neligh and Norfolk downstream through Waterloo. Elkhorn at Ewing sets new crest level of 13.8 feet, breaking record set in 1947. Crest of 14.5 feet expected at Norfolk by Tuesday night.
5. By midday Monday, considerable flooding of Elkhorn River on south side of Neligh. Several houses flooded; at least one water evacuation made. Water encroaching airport.
6. Elkhorn River overflows in northwestern Douglas County near Nebraska 36.
7. Estimated 8 inches of rain fell Friday night and Saturday in parts of Loup and Valley counties.
8. Stream gauges break long-standing records: North Loup at Taylor reaches highest flow in 73 years, Elkhorn at Ewing its highest peak water level and flow in 62 years.
9. Gracie Creek dam near Burwell breaks.
10. Schuyler blocking roads, sandbagging; Platte County puts stockpile of sandbags at the Twister Bar near Columbus so people could sandbag their homes.
11. Missouri River rising near Brownville; Cooper Nuclear Station prepares for flooding; water could top federal levees at Rulo.

Just after noon today, a railroad bridge collapsed in the Elkhorn River about a mile upstream of the USGS streamgage at Norfolk, NE. Railroad personnel were on the bridge at the time, and three people went into the river. One was pulled out. Two of our hydrotechnicians (one of which was recently retired, and was volunteering during the flood effort) had just finished making the peak measurement of all time at that site, and then assisted law enforcement in the efforts to rescue/recover the other two railroad personnel. As of the posting of this Project Alert Notice, I do not have a confirmed update to this incident other than the USGS crew was released from this site after about 2 hours when enough rescue personnel were available to handle the situation.

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Currently, eight crews are in the field collecting data and repairing damaged streamgages (mostly pressure line replacement). One indirect discharge measurement is being made at station 06786000 North Loup River at Taylor, NE, where the gage bridge collapsed. Levels have already been run to the high water marks at this gage. Flooding at several long-term streamgages will be within the top five rankings for those respective sites.

- **Project Alert Notice - Nebraska**, *Date: Wed, 16 Jun 2010 23:25:39 -0400 (EDT)*

- The majority of the Nebraska Water Science Center's streamgages remained in "much above normal" to "high" flow status through today (June 16). The peaks of the Elkhorn River continued to move downstream and also continues to destroy roads and bridges along its path. From the Lincoln Journal Star newspaper today, "Bridge damage, especially to those structures owned by counties, is extensive. Floodwaters have inundated low-lying areas, county roads, farms and isolated ranches. Berndt said the Elkhorn River was a mile wide in some places. In Holt County, emergency officials so far have counted 10 damaged bridges and 20 bridges with damaged approaches, said Jennifer Koenig with the local roads department. Two bridges were out in Stanton County along with 75 miles of roads, Berndt told reporters at a news conference after the flyover."

Also from the Lincoln Journal Star newspaper today, "State officials warned flood-weary residents of northeast Nebraska to brace themselves for more rain this weekend -- possibly more than 2 inches."

The NE WSC had 6 crews out today to repair gages and make high flow measurements. Based on another peak of record measurement at the Elkhorn River at Pilger gage, another rating was extended. Air temperatures have been in the upper 80's to lower 90's with high humidity throughout this flood. Due to high sediment movement in the streams and heavy streambed movement, ADCP's have been unusable. So far, two Columbus weights (100# and 150#) and Price meters have been lost due to fast moving channel debris.

A crew will be deployed tomorrow to make an indirect measurement at the streamgage at the Elkhorn River at Ewing, NE. Two other crews will be collecting high-flow water quality samples tomorrow.

- **Project Alert Notice - Nebraska**, *Date: Mon, 21 Jun 2010 18:00:27 -0400 (EDT)*

- The streamgages in southeast Nebraska remained in "much above normal" to "high" flow status through today (June 21). Lancaster County, which includes Lincoln, is currently under a flash flood watch and rain is expected again tonight. Four teams of USGS hydrologic technicians are currently out in the field taking high-water measurements and performing maintenance on gages hard hit by the flooding. The Elkhorn and Loup rivers appear to be receding and have fallen below flood stage except for the Elkhorn River at West Point. There are six alert sites around Lincoln and four of those are at two-thirds bank full and rising.

According to NEMA, 10 reservoirs across Nebraska have reportedly failed.

- **Flooding in Central Indiana**, *Date: Tue, 22 Jun 2010 08:26:10 -0400 (EDT)*

- Heavy rainfall over the last 12-24 hours has produced localized flash flooding primarily in Central Indiana. Central Indiana has received 2-3 inches of new rain overnight with some isolated areas reported to have received in excess of 5 inches. Several USGS crews will make flood measurements today in Central Indiana. Riverine flooding is expected to be limited primarily to Central and South Central Indiana over the next several days.

17 USGS gages in Central, and South Central Indiana are above flood stage at this time.

- **Flooding in Iowa**, *Date: Tue, 22 Jun 2010 10:12:20 -0400 (EDT)*

- Several periods of rain has saturated the ground and have caused the rivers to rise into flood stage mostly in the southern half of the State. Field crews have been making several measurements of flow over the last several days. The weather outlook calls for a clearing or decreased chance of rain from late Wednesday, then for the next several days.

- **Flooding in Central Indiana**, *Date: Tue, 22 Jun 2010 17:53:11 -0400 (EDT)*

- 3 USGS flood crews have made 7 high flow measurements in and around Central Indiana today after widespread rains of 3+ inches and isolated areas of 5+ inches fell predominantly over the central 1/3 of Indiana. Approximately 36 USGS streamgages are above flood stage in Indiana at this time.

- **Flooding in Indiana**, *Date: Wed, 23 Jun 2010 09:57:08 -0400 (EDT)*

- Heavy rainfall on June 21 and 22 resulted in minor to moderate flooding on streams and rivers throughout much of Central Indiana. Widespread rains of 2-3 inches with reports in some areas exceeding 5 inches resulted in flash flooding throughout much of the central 1/3 of the state.

Currently, approximately 35 USGS streamgages are above flood stage.

3 USGS crews continue to make measurements in the Lafayette, Shelbyville, and Indianapolis areas. Yesterday, crews completed 7 high flow measurements through these areas, and today 8 sites will be measured

No long term USGS sites have exceeded peak of record flows. Peak flows however were recorded for several newer sites where discharge rating are still in development.

Crews will likely continue making follow-up measurements at selected sites through tomorrow.

- **RE: Flooding in Indiana**, *Date: Wed, 23 Jun 2010 10:16:50 -0400 (EDT)*

- DNR is not planning to set any high Water mark work or flood response other than floodplain management assistance to communities as needed.

- **Project Alert Notice - Nebraska**, *Date: Thu, 24 Jun 2010 17:23:01 -0400 (EDT)*

- Lincoln is inching toward one of its wettest Junes since 1887. As of Wednesday, 10.14 inches of rain had fallen for the month. That makes it the sixth-wettest June on record. Normal precipitation for June is 3.51 inches. At the forecast is for drying conditions for the next few days.

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The South Platte at Roscoe peaked on June 22 at 9,410 cfs (The peak stage was on June 23 at 10.19 ft.), ranking 6th out of 25 years, and the North Platte at the Wyoming-Nebraska State line peaked on June 18 at 6,640 cfs, ranking 9th out of 81 years. The Platte will continue to remain high throughout the lower part of the basin for at least the next week.

9 long-term gages remain at record levels for the day.

One crew is conducting streamgage maintenance, and one crew is running indirects.

- **Major flooding in Des Moines River and Little Sioux River basins, Iowa**, Date: Tue, 29 Jun 2010 14:38:58 -0400 (EDT)

- Heavy rainfall over the past several weeks has resulted in major flooding in the Des Moines River basin and the Little Sioux River basin, and minor to moderate flooding throughout the rest of Iowa.

Multiple field crews have been deployed in Iowa to collect flood measurements and maintain streamgages, and USGS staff are coordinating with other flood-monitoring agencies.

-- The streamgage at Des Moines River near Stratford, IA crested Monday, June 28th, at a stage of 28.42 ft (flood stage is 14.0 ft), exceeding the June 2008 peak stage of 27.32 ft. The U.S. Army Corps reports that that the flow will likely overtop the emergency spillway at Saylorville Lake in Des Moines, IA, sometime on Wednesday, June 30th. Water levels in the Des Moines River basin are forecast to remain high into next week.

-- The streamgage at Little Sioux Rver at Correctionville, IA crested Monday, June 28th, at a stage of 23.78 ft (flood stage is 19.0 ft), just below the July 1993 peak stage of 23.82 ft.

July

- **Project Alert Notice--Texas**, Date: Thu, 8 Jul 2010 08:14:57 -0400 (EDT)

- The remnants of Hurricane Alex continue to produce significant rainfall totals in watersheds of the lower Rio Grande and its tributaries. The watershed of the Rio San Juan in Mexico has been hit especially hard. The Rio San Juan enters the Rio Grande below Falcon Dam and resulting flood flows in the lower Rio Grande is of particular concern to authorities because of the dense population in the lower Rio Grande Valley.

The TXWSC deployed two three-man crews to Laredo, TX. from our San Antonio and Austin offices yesterday to provide support to the International Boundary and Water Commission (IBWC) by making flood measurements and providing technical support to the agency. Flows at some IBWC gages are currently in excess of 125,000 cfs. These flows are expected to increase significantly today with additional rainfall produced by Tropical Storm #2 which is expected to make landfall near Brownsville, TX. sometime today.

- **TXWSC-Gulf Coast Program Office (GCPO) highwater activities July 8, 2010**, Date: Thu, 8 Jul 2010 14:15:11 -0400 (EDT)

- Additional information on Texas highwater activities.

Large rains caused by continued tropical flow in the Houston area has lead to continued flooding in the upper gulf coast. Field crews are measuring multiple bayous and streams in Houston today and sampling coastal and inland sites in the Houston area. I have listed below the sites expected to be visited today. I expect that we will continue this effort well into the afternoon and evening as the pattern continues to develop.

- **Project Alert Notice--Texas--UPDATE**, Michael E Dorsey, Date: Thu, 15 Jul 2010 10:35:51 -0400 (EDT)

- The TXWSC continues providing flood measurement support at the request of the US International Boundary and Water Commission (USIBWC). We have one boat crew making high flow measurements at 4 of their most critical sites downstream from International Falcon Reservoir in the Lower Rio Grande valley.

I have attached a synopsis, provided by William Finn, Chief, Water Accounting Division, USIBWC. of the cause of these extreme flows that we are currently experiencing on the Lower Rio Grande.

Mike,

Basically, tributaries of the Rio Grande received heavy rainfall from the remnants of Hurricane Alex. The runoff from this event worked its way through both Amistad and Carranza Reservoir (Mexico). Rio Grande and Rio Salado are the two main tributaries to Falcon reservoir, thus Falcon reached a new record high yesterday. We are presently releasing around 1700 cms (~60,000 cfs) from Falcon. The Falcon release coupled with flood releases from reservoir releases on the Rio San Juan (Mexican tributary below Falcon) are causing a significant flows within the lower Rio Grande requiring the use of interior floodways in each country. Because of need to equitably divide the flood water between the respective countries, it is crucial the IBWC quantify flood flow volumes.

USIBWC is not equipped at this time to conduct boat measurements during high flows and reached out to the USGS to provide this support. USGS has been very responsive in this event and we appreciate all the data your team is collecting.

- **Flooding in Chicago and northeastern IL**, Date: Sun, 25 Jul 2010 07:50:35 -0400 (EDT)

- Major flooding is occurring throughout Chicago in northeastern IL. Rainfall totals from Friday night to this morning totaled 4 to 6 inches throughout the heavily urbanized region. The resultant flooding has resulted in many inundated homes/businesses, closed roads (including an Interstate) and peak-of-record stages and discharges at many USGS stations. The IL Water Science Center dispatched 4 crews yesterday morning and they will continue to work today making discharge measurements, flagging high water marks, and fixing gages. The new national USGS WaterAlert utility has proven to be very useful in awareness of and response to this major flood event. Numerous contacts have been made with the National Weather Service, the Corps of Engineers,

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and State and local flood response managers. Rainfall totals can be seen at the IL WSC Real-Time Precipitation mapping utility:

<http://il.water.usgs.gov/gmaps/precip/>

- **Major flooding in the Maquoketa and Wapsipinicon River basins, eastern Iowa**, *Date: Mon, 26 Jul 2010 11:44:08 - 0400 (EDT)*

- The Maquoketa and Wapsipinicon River basins in eastern Iowa are currently experiencing major flooding.

Peak of record crests were observed on the Maquoketa River at Manchester (streamgage 05416900) and Maquoketa River at Maquoketa (streamgage 05418500). The Lake Delhi Dam on the Maquoketa River failed on Saturday, causing excessive damage downstream.

The Wapsipinicon River at Independence (streamgage 05421000) crested yesterday about 6.8 ft above flood stage, and the Wapsipinicon River at Anamosa (streamgage 05421710) is about 9.4 feet above flood stage as of 10:15 CDT today.

USGS crews have been deployed throughout the past few days to obtain flood measurements at gaged and ungaged locations in the basins, and are coordinating with the National Weather Service and U.S. Army Corps of Engineers.

August

- **Major Flooding in Iowa -- Peaks of Record Exceeded in South Skunk River Basin**, *Date: Wed, 11 Aug 2010 12:41:56 - 0400 (EDT)*

- Heavy rainfall is again causing major flooding throughout Iowa, particularly in the South Skunk River basin where peak discharges have already exceeded records set in 1993 and 2008. Additional peaks of record are forecast for downstream sites in the coming days. Road closures, including Interstate 35 and U.S. Hwy 30 near Ames, and evacuations of low-lying areas are on-going.

Multiple field crews have been deployed to collect flood measurements and maintain streamgages, and USGS staff are coordinating with other flood-monitoring agencies.

- **UPDATE: Major Flooding in Iowa -- Peaks of Record Exceeded in South Skunk River Basin**, *Date: Mon, 16 Aug 2010 09:45:32 -0400 (EDT)*

- Major flooding continues in Iowa, particularly in the South Skunk River basin where new peaks of record were recorded at several USGS streamgages. Several USGS crews were deployed over the weekend to obtain flood measurements. In general, the flood levels are forecast to recede throughout this week, depending on future precipitation amounts.

September

- **Flooding in Texas**, *Date: Wed, 8 Sep 2010 17:59:53 -0400 (EDT)*

- Tropical Storm Hermine came ashore south of Brownsville, Texas Monday night and has tracked northward through the center of the state. The central part of the state in the Austin area has received the highest rainfall totals with as much as 14 inches over night Tuesday in the Jollyville and Georgetown, TX areas northwest of Austin. There has been one flood-related death confirmed in the Killeen, TX area with search and rescue efforts continuing for a potential victim in the Austin area.

The TXWSC deployed crews from offices throughout the state to make direct flood measurements and flag high water marks for indirect measurements.

Flood warnings continue in north Texas as Hermine weakens and continues to track out of Texas and follow the projected path into Oklahoma.

Flood related activities are expected to continue through Thursday in Texas.

- **Project Alert Notice--flooding in southern Minnesota**, *Date: Thu, 23 Sep 2010 13:28:07 -0400 (EDT)*

- Major flooding is occurring in southern Minnesota. The areas with the most significant flooding are the tributaries to the Minnesota River basin, and to the Mississippi River basin below the Twin Cities. Radar estimated rainfall totals indicate a band of rainfall about stretching east-west across the state from of 3-4 inches, with locations southeast of Mankato Minnesota with as much as 8 inches. NWS observer gage network reports amounts of greater than 6 inches in the last 24 hours. Weather forecasts call for additional 1-4 inches of rain in and north of the currently affected area for the next 24 hours (http://www.hpc.ncep.noaa.gov/qpf/fill_94qwbq.gif).

Roads are closed due to flow over roads and culvert separation at a few locations in Goodhue county. Some homes have been evacuated in Owatonna, MN.

Streamflows are still increasing. The NWS unofficially indicates several streamgages may approach peak of record flows depending on rainfall. Rivers and tributaries affected include the Straight River, Zumbro River, and Minnesota River.

USGS flood activities include flood chasing and communicating with other agencies, especially with the NWS and other agencies through NWSChat, email, and phone. Field staff dispatched include 5 crews from the Mounds View Office and an additional crew is being re-deployed from the Grand Rapids Office. Current activities include making flood measurements and sampling suspended sediment. To date, no special measurement have been requested by the other agencies. Field plans for tomorrow include more of the same, as the flood develops.

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- **SD WSC Project Alert, Date: Fri, 24 Sep 2010 11:33:18 -0400 (EDT)**

- Localized flooding is occurring in Eastern SD as the result of heavy rain on Wednesday evening and Thursday, Sept. 22-23. Rainfall totals ranged from 3-6 inches in some areas after an already wet month. Homeowners have been evacuated in the town of Brookings where around 5 inches of rain fell during this event, 10 inches this month. Two crews are out today and tomorrow making measurements on the Big Sioux River and tributaries. The Big Sioux is above flood stage from just north of Brookings to the SD/IA state line. The James River is above flood stage for much of the middle reach through the state (Stratford to Mitchell). Measurements are being called in as they are made and passed on to the NWS and COE.

- **Project Alert Notice--flooding in southern Minnesota, Day 2, Date: Fri, 24 Sep 2010 14:25:35 -0400 (EDT)**

- Major flooding continues in southern Minnesota. The areas with the most significant flooding are the tributaries to the Minnesota River basin, and to the Mississippi River basin below the Twin Cities. Observer confirmed rainfall reports for the storm were as high as 10.53 inches at Amboy, south of Mankato, MN. Little significant rainfall is expected for the next day or two.

Roads are closed due to flow over roads and culvert separation at several locations in southeast counties. Homes have been evacuated in Owatonna, Pine Island Truman, and a few other locations.

Major tributaries to the Minnesota and Mississippi Rivers are generally increasing or shortly past peaks. To date, a few streamgages have exceeded peak of record flows, including the Straight River near Faribault, MN and the Zumbro River at Zumbro Falls, MN. One gage has been lost (submerged) at the Zumbro River at Zumbro Falls. A crew is attempting to reach the gage has not yet been successful.

USGS flood activities include flood chasing, gage repairs, sampling suspended sediment, and communicating with other agencies, especially with the NWS and other agencies through NWSSchat, email, and phone. Field staff dispatched include 5 crews from the Mounds View Office and an additional crew is being re-deployed from the Grand Rapids Office. To date, no special measurement have been requested by the other agencies. Field plans for tomorrow include more of the same, as tributaries peak and the mainstem rivers begin to rise.

- **Project Alert Notice--flooding in western and central Wisconsin, Date: Fri, 24 Sep 2010 15:41:03 -0400 (EDT)**

- 4-8 inches of rain over the last 2 days in western and central Wisconsin has triggered flooding in this area. The most significant flooding is on the Black, Trempealeau and the Chippewa Rivers and their tributaries. Little significant rainfall is expected for the next day or two.

Many roads in the area are closed. Thursday, about 1500 residents were evacuated from the town of Arcadia due to flooding on the Trempealeau R. The Governor has declared a state of emergency for Jackson, Clark and Trempealeau counties.

6 field crews have been dispatched from the Middleton and Rhinelande Offices to collect measurements and repair gages. Measurements have been communicated to the NWS. Tomorrow looks to be more of the same probably less crews will be out.

- **Project Alert Notice--flooding in northern Michigan, Date: Fri, 24 Sep 2010 15:54:20 -0400 (EDT)**

- Much of the Upper Peninsula received the continuation of the rainfall that was in yesterday's news reports for southern Minnesota. There are many rainfall reports in the 3 to 4 inch range along a line between Escanaba (in the central UP) and Newberry (northeastern UP). Weather and streamflow was discussed with the NWS in Marquette, including the reporting of discharge measurements at forecast points. The NWS will post a precipitation map later today or tomorrow. The flooding in Michigan was not as severe as noted in earlier South Dakota and Minnesota reports. Several USGS streamgages reached flood stage, however. Five USGS crews have been out today. We do not anticipate crews being in the field tomorrow. NWS, Marquette has contact information for USGS for the weekend. Many streams in this part of the State are well buffered with wetlands and swampy areas, so will continue to rise over the next few days.

One crew was interviewed by two different television crews at the Pine River near Rudyard streamgage. The TV station numbers were TV 9/10 from Traverse City and TV7/8 from Cheboygan. A summary of the interview will be included with the weekly "highlights" from the MI WSC.

- **Project Alert Notice--flooding in southern Minnesota, Day 3, Date: Sat, 25 Sep 2010 14:51:14 -0400 (EDT)**

- Major flooding continues in southern Minnesota. The areas with the most significant flooding are the tributaries to the Minnesota River basin, and to the Mississippi River basin below the Twin Cities. Observer confirmed rainfall reports for the storm were as high as 10.68 inches at Amboy, south of Mankato, MN. Little significant rainfall is expected for the next week.

Governor Pawlenty declared a state of emergency in 34 counties, and intends to call a special legislative session and is seeking a national disaster declaration to address damages.

Major tributaries to the Minnesota and Mississippi Rivers generally are peaking or beginning to recede. Streamgages that have exceeded peak of record flows include Zumbro River at Zumbro Falls, MN. (100 years or record), Straight River near Faribault, MN (43 year of record), and Little Cobb River near Beauford (NAWQA site, 13 years of record). At least 7 other gages with 70 or more years of record will have peaks among the top 5.

One gage has been lost (submerged) at the Zumbro River at Zumbro Falls, MN. High-water marks were flagged and a determination of whether an indirect measurement of discharge is possible will be assessed. USGS flood activities include flood chasing, gage repairs, sampling suspended sediment, and communicating with other agencies, especially with the NWS and other agencies through NWSSchat, email, and phone. Two crews will be out Saturday and Sunday.

- **Project Alert Notice--flooding in western and central Wisconsin, Date: Sat, 25 Sep 2010 15:18:58 -0400 (EDT)**

- Flooding continues in western and central Wisconsin. The Governor has declared a state of emergency for the counties of Portage, Wood, Buffalo, Marathon. These are in addition to Jackson, Clark and Trempealeau counties which were declared yesterday.

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3 field crews are out today, probably 2 tomorrow & more again on Monday. Measurements have been communicated to the NWS.

The Black River has been at or near record peaks - about the 100yr RI. The Wis. R at Wis. Dells is approaching the 50yr RI. The Flambeau R at Bruce is at about the 10yr RI. The Chippewa R at Durand is predicted to peak on Monday at near the 10 yr RI

- **Project Alert -- Flooding in North Carolina, Date: Thu, 30 Sep 2010 11:26:04 -0400 (EDT)**

- After severe drought had crept back in to portions of North Carolina last week, rainfall events this week brought flooding to locations in central and eastern North Carolina. Areas in southeastern North Carolina have been particularly hard hit with Wilmington reporting rainfall totals in excess of 12 inches for the rain event ending September 28, including a one-day total of 10.33 inches, second only to Hurricane Floyd's record one-day total of 13.38 inches. Additional rainfall since then bring current totals in the Wilmington area to greater than 20 inches with rain still falling in some areas. Rainfall data for USGS raingages are available at: <http://waterdata.usgs.gov/nc/nwis/current?type=precip>

Seven USGS crews have been dispatched to make discharge measurements in central and eastern North Carolina at as many as 22 streamgaging stations. The USGS streamgage on Chicod Creek near Simpson, North Carolina (USGS station number 02084160) peaked at 15.82 feet earlier this morning, the second highest peak at this site since the floodwaters associated with Hurricane Floyd in 1999, when the river crested at 21.46 feet. Real-time river stage and streamflow information is available at: <http://waterdata.usgs.gov/nc/nwis/current/?type=flow>

The Southeast River Forecast Center has projected minor and moderate flooding at 11 sites in North Carolina (http://www.srh.noaa.gov/serfc/ahps_RVFNC.php)

USGS crews will continue to measure streamflow, monitor the streamgaging network and collect high water marks to document this event.

- **Project Alert--Flooding in Maryland, Date: Thu, 30 Sep 2010 15:07:50 -0400 (EDT)**

- Beginning in the early morning, and continuing through the day today, a strong low pressure system moving up the Mid-Atlantic coast has delivered 4 to 6 inches of rainfall to central and northeastern Maryland, with higher totals reported in some locations. The duration and intensity of rainfall has caused flooding on many streams and rivers throughout the region.

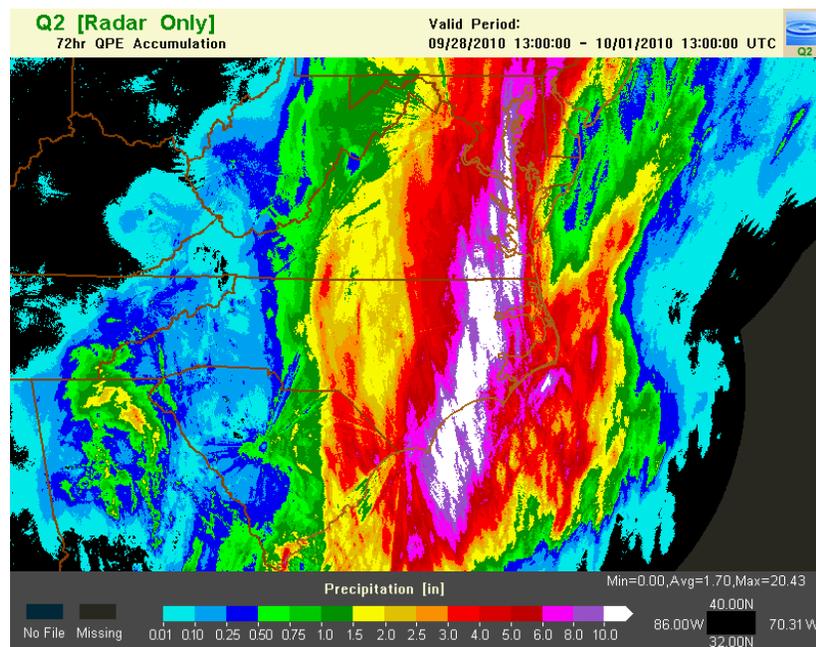
Five USGS crews have been dispatched today to make discharge measurements in central and northeastern Maryland at as many as 20 streamgaging stations. Additional discharge measurements are planned for tomorrow on four rivers in Maryland and northern Delaware that the Middle Atlantic River Forecast Center projects will experience moderate to major flooding conditions (<http://www.erh.noaa.gov/marfc/>). Real-time river stage and streamflow information is available at: <http://waterdata.usgs.gov/md/nwis/rt>

USGS crews will continue to measure streamflow, monitor the streamgaging network and collect high water marks to document this event. Water-quality sampling of storm-induced flows will also be carried out at several sites in Maryland over the next several days as major rivers crest and begin to recede.

October

- **Project Alert -- Update concerning flooding in North Carolina, Date: Fri, 1 Oct 2010 10:55:03 -0400 (EDT)**

- Tropical moisture combined with a strong upper low and stationary frontal boundary across the Coastal Plain region brought a two-day period of additional heavy rainfall across much of central and eastern North Carolina. Provisional rainfall estimates since September 28 at 13:00 are shown below in the map image made available via <http://www.nssl.noaa.gov/projects/q2/>. Note the large swath of 10+ inches from the Onslow County region north to the Northampton / Hertford Counties region.



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Maps showing rainfall totals indicate the highest amounts (10+ inches) since Sunday (Sept 26) in a swath from Brunswick County to Hertford County at the Virginia border. Rainfall totals reported for Wilmington in New Hanover County are 22.54 inches for the 5-day period ending September 30, a total of 10.33 inches occurring on Monday alone. The 3-, 4- and 5-day totals for Wilmington are new record wettest periods since records started in 1850.

Seven USGS crews dispatched across central and eastern North Carolina on Thursday made 20 measurements at 17 sites. Four of these crews are in eastern North Carolina today to obtain additional measurements at 10 sites. Road flooding in northeastern part of the state is making travel conditions difficult for crews to reach the streamgages. Pictured below are USGS crews preparing to make a discharge measurement at Chicod Creek at Secondary Road 1760 near Simpson in Pitt County (http://waterdata.usgs.gov/nc/nwis/uv/?site_no=02084160&PARAMeter_cd=00065,00060). The crews measured 4,200 cubic feet per second on Thursday at this site.



A compilation of provisional peak discharges at gages across central and eastern NC indicates that maximum flows have reached 2- to 5-year levels at many of the sites.

However, in the northeastern section of the state, maximum flows have reached 25+ years recurrence intervals, including 100-year levels at Ahoskie Creek at Ahoskie in Hertford County (http://waterdata.usgs.gov/nc/nwis/uv/?site_no=02053500&PARAMeter_cd=00065,00060) and 50-year levels at Cashie River near Windsor in Bertie County (http://waterdata.usgs.gov/nc/nwis/uv/?site_no=0208111310&PARAMeter_cd=00065,00060). Preliminary precipitation totals for the Tri-County Airport near Ahoskie report 11.88 inches for the period September 26-30 (NC CRONOS database available via <http://www.nc-climate.ncsu.edu/>). Peak discharges for these sites are occurring or are expected to occur on Friday, and USGS crews currently are obtaining discharge measurements at these locations.

- **PROJECT ALERT NOTICE: New York (September 30 - October 1, 2010),** *Date:* Fri, 1 Oct 2010 15:56:08 -0400 (EDT)
 - Rainfall totals of 4-8 inches resulted in flooding in eastern and central New York State September 30 and October 1, 2010. Major flooding was reported at Schoharie Creek at Prattsville, NY; W Br Delaware River Delhi, NY; and Esopus Creek at Coldbrook, NY. Moderate flooding was reported at Tioughnioga River nr Cortland, NY; E Br Delaware River at Fishs Eddy, West Br Delaware R at Walton, NY; and Delaware R at Callicoon, NY. A total of 11 crews have made about 30 discharge measurements.

December

- **Flooding in Western Washington,** *Date:* Mon, 13 Dec 2010 11:09:52 -0500 (EST)
 - On Saturday, December 11, 2010, an atmospheric river associated with a strong extratropical cyclone made landfall in Western Washington resulting in the largest flooding episode in Western Washington in 2 years. Flooding began on Sunday with National Weather Service (NWS) flood stages being exceeded in 12 river basins and at 16 of 42 USGS streamgages having a NWS flood stage designation. This morning, Monday, December 13, 9 streamgages remain above NWS flood stage in 6 river basins. Preliminary data indicate new record discharge peaks at 2 USGS streamgages; the N.F Stillaguamish River (82 years of record) and Huge Creek (54 years of record).

Rainfall subsided overnight and all rivers are forecasted to drop below flood stage today or early Tuesday. USGS crews were out Sunday making discharge

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measurements and will be out again all this week making post event measurements.

No deaths are being attributed to the event. Numerous landslides throughout Western Washington damaged homes, blocked secondary roads, and caused Amtrak to suspend service between Portland, OR and Vancouver, B.C.

- **Project Alert Notice - minor flooding in east Oahu, Hawaii, Date: Mon, 20 Dec 2010 17:46:37 -0500 (EST)**

- There was minor flooding yesterday in east Oahu that drew a fair amount of press coverage. Rainfall amounts in excess of 5 inches occurred over a relatively short time period. The majority of flooding was from plugged storm drains. Two field crews were dispatched yesterday to verify gage readings and collect suspended-sediment samples. Five field crews are out today servicing gages and verifying peak stages. More wet weather is forecast for the next several days.

- **Project Alert Notice - Flooding in SW Utah, Date: Tue, 21 Dec 2010 11:43:56 -0500 (EST)**

- Tropical moisture continues to feed into the Virgin and Santa Clara drainages and is expected to continue into Wednesday. Several gages are at or near flood stage and are expected to peak later today, with a smaller secondary peak occurring tomorrow. Four crews are in the field making discharge measurements, verifying gage readings, and keeping equipment operational. Additional crews are in route and plans are to continue making measurements and repairing flood damaged gages. Contact has been made and updates are being passed along to the NWS and the NV WSC.

- **PROJECT ALERT NOTICE (CA - So. Cal. Coastal and Desert) Flooding in Southern California, Date: Tue, 21 Dec 2010 13:01:17 -0500 (EST)**

- For nearly four days, a deep stationary low pressure center in the Gulf of Alaska has entrained a great amount of sub-tropical moisture from the Pacific, far west of Hawaii. Heavy rain and snow covered nearly the entire State of California over the weekend, causing localized flooding in the San Joaquin valley. Heavy snow accumulations are occurring in the Central and Southern Sierra Nevada mountains.

Over 12 in. of rain was recorded in the hills and mountains of Santa Barbara and Ventura Counties from Friday 12/17.10 through Sunday evening. The stream of sub-tropical moisture shifted further south and east on Monday 12/20, bringing continuous heavy rain to the San Gabriel and San Bernardino Mountains, with the Lytle Creek basin USGS Rain gage recording over 12 in. in 24 hrs. on Monday. All southern California USGS field staff are deployed in the field making direct measurements, and ensuring operation and calibration of the streamgages. The 11 crews in the field have made over 65 measurements so far. No reports yet of any serious damages to the gage network.

A crew is measuring the Mojave River at Victorville to better calibrate the sand channel gage, as a flood warning is issued for the Barstow area downstream, and more heavy rain is forecast through Wednesday evening.

No peaks of record have occurred yet, but the forecast is calling for up to an additional 10 in. of rain in the mountains before the storm is over.

Peak flow recurrence interval data will be forwarded later today.

- **Project Alert Notice - Flooding in Virgin River Basin, SE Nevada and SW Utah, Date: Tue, 21 Dec 2010 14:15:25 -0500 (EST)**

- Subtropical moisture has continued to drop heavy precipitation over the Virgin River Basin in Southwestern Utah and Southeastern Nevada. Over 7-inches of precipitation has fallen over the headwaters of the Virgin River Basin and more precipitation is expected over the next two days. Several gages are near or at flood stage and are expected to peak a few times between Tuesday and Thursday. Two crews have been sent to the Virgin River, Beaver Dam Wash, and locations in the Las Vegas Valley to verify gage operations, make measurements, and set high-water marks to verify peaks. The crews are working in coordination with personnel from the Utah WSC. Field work will continue through the week.

- **PROJECT ALERT NOTICE (CA -Southern California Coast and Deserts) Flash Flood and Debris Flow Watch Issued, Date: Tue, 21 Dec 2010 20:54:06 -0500 (EST)**

- Description of hydrologic event:

The USGS has been in partnership with NOAA, NWS as part of the Prototype Debris Flow Warning System program, and the Multi Hazards Demonstration Project. Dr. Sue Cannon and the Landslide Hazards group developed threshold data for Post Fire Debris Flow probabilities. These thresholds have been incorporated into the NWS forecast models so that the public can be warned of not only flash floods, but dangerous Debris Flows.

The CA Water Science Center also added numerous satellite reporting raingages, and additional streamflow gages that are also used in the NWS forecast and warning system. Based on the USGS data and real time monitoring information, the NWS LA/Oxnard has issued a Flash Flood and Debris flow Watch for Los Angeles County Mountains excluding the Santa Monica Range – Antelope Valley-Los Angeles County San Fernando Valley – Los Angeles County San Gabriel Valley. The watch includes the cities of Action, Mount Wilson, Sandberg, Lancaster, Palmdale, Woodland Hills, Northridge, Burbank, Universal City, Pasadena, San Gabriel, and Pomona.

- **PROJECT ALERT NOTICE (CA - LA Orange San Bern Riv. San Diego Co s.) So Cal Flooding - Watches and Warnings, Date: Wed, 22 Dec 2010 11:59:38 -0500 (EST)**

- Description of hydrologic event:

As the low pressure center finally moves through to the East, unstable air and heavy rain continues moving into and through Southern California.

LA, Orange, San Bernardino, Riverside, and San Diego Counties all continue to be under a flash flood watch with Flash Flood Warnings issued for San Bernardino and San Diego counties as the heavy band of rain (red on the radar) moves through.

A few indirect measurements will be needed to quantify peaks where major channel changes have occurred, on the N. and S. side of the San Gabriel mountains where gages were either inaccessible or un-measurable. Suspected peak of record (exceeding the 1938 major flood) at Big Rock Cr. nr Valermo. The headwaters of this creek on the N. side of the San Gabriel Mountains were affected by the N. flank of the Station Fire last year.

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10 field crews are still out measuring and keeping the gages operating. So far only one site, Santa Margarita River nr Ysidora, on USMC Camp Pendleton, is not operating properly due to orifice line damage. NWS has been notified to use the two upstream sites for guidance as the SMR is still above flood stage.

CA WSC flood specialists prepared a new high flow rating, using the partial flood measurement obtained by field personnel at 10261500 Mojave R nr. Victorville, where partial depth and velocities were obtained greater than 14 ft. and 15 feet per second, under very hazardous conditions. Measuring equipment was snagged by a submerged tree in the flow. Experienced crew cut loose ensuring their safety on the cable car. Even the partial data obtained will be invaluable to rating analysis.

The Mojave River is back below flood stage, but rising again with this last wave.

The Santa Margarita River remains above flood stage, with some roads on Camp Pendleton flooded.

The San Diego River is also above flood stage, with a designed road crossing still closed. Poway field staff is measuring this morning, with combination wading in the parking lot, and bridge measurements. Flooding of the Fashion Valley Mall parking lot is occurring, but currently Houswares and Ladies Shoe department are still dry.

- **SW Utah flooding, Date: Wed, 22 Dec 2010 12:28:27 -0500 (EST)**

- The same storm system that is causing flooding in CA and NV continues to bring moisture into the SW corner of Utah and cause flooding on the Santa Clara and Virgin Rivers. Yesterdays damage from the flooding included several vehicle and pedestrian bridges in the St. George, UT area and many road closures across Washington County. Damage to streamgages included: Virgin nr. St. George - It is believed the structure holding the radar stage sensor has been destroyed. A crew is on the way to install a temporary bubbler system and Santa Clara nr. St. George - Orifice line was damaged, temporary line was installed yesterday and is being lowered today.

Yesterday, crews were able to perform discharge measurements, verify stage readings and keep most gages operational. The rivers are projected to peak again this evening at levels slightly lower than yesterdays peak. Five crews are in the field today making measurements and repairing damage. Crews will also be in the field tomorrow doing the same thing. Rainfall is forecast to end later today with a return to sunny and dry weather. River flows should drop significantly by Friday. The WSC continues to be in contact with the NWS and is providing information on gage operation and rating updates.

- **Project Alert Notice - Flooding in Southern Nevada, Date: Wed, 22 Dec 2010 21:15:16 -0500 (EST)**

- The storm system causing floods in Southern Nevada is subsiding and the area is moving into a period of relatively calm weather. Rivers, washes, and urban channels in Southern Nevada are receding with secondary peaks expected at some locations tonight. Three crews from the Henderson Field Office visited gages in the Virgin River Basin and Las Vegas Valley to repair gages, verify gage heights, flag high-water marks, and obtain surface velocities. Discharge measurements on the Virgin River were still too dangerous to obtain due to heavy debris and high velocities. As a result, indirect measurements will be performed to verify or better define ratings.

The Virgin River at Littlefield gage was repaired by installing a temporary orifice line, but as the river recedes, the orifice line will need to be periodically extended until it's safe to enter the river to repair the old orifice or install a new permanent orifice. The radar unit on Beaver Dam Wash was verified to be properly operating, but the channel moved during a low point between peak flows. Other gages in the Virgin River Basin and Las Vegas Valley were verified to be properly operating with the exception of some poorly defined ratings that will require indirect measurements for verification.

Three crews will visit gages in the Virgin River Basin, Las Vegas Valley, and Amargosa River Basin. Roads were closed or too dangerous (landslides and wash crossings) to visit the two gages on the Amargosa River near Tecopa and the Virgin River above Lake Mead near Overton. Tomorrow, field crews will attempt to visit these gages to verify operations and flag high-water marks. A field crew will also visit Meadow Valley Wash near Caliente in the next couple of days

- **Project Alert - SW Utah, Date: Thu, 23 Dec 2010 11:04:12 -0500 (EST)**

- The tropical jet of moisture that has been causing rain in CA, NV, and SW UT is moving east and high pressure will return to the area later today. Light rain is still falling in the area and a smaller peak occurred last night on rivers in the area. Flows are currently slowly dropping and are expected to drop significantly by tomorrow. Local crews will be on the watch and will be lowering temporary orifices at a couple of damaged gages and obtaining measurements on the recession. This is the last project alert update for SW Utah.