National Hydrologic Assessment

March 15, 2018

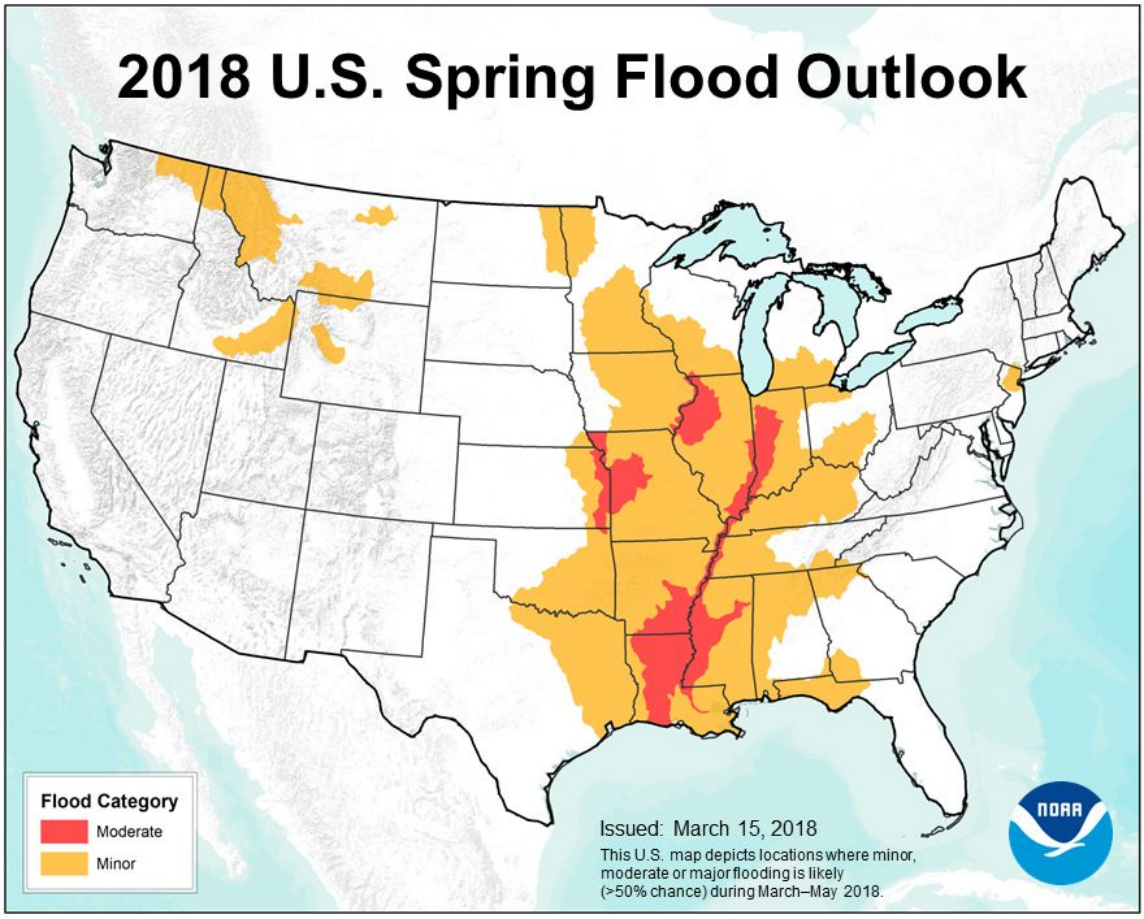

Figure 1: National Spring Flood Risk defined by risk of exceeding Minor, Moderate, and Major Flood Levels.

Executive Summary

This analysis of flood risk and water supply for Spring 2018 integrates late summer and fall precipitation, frost depth, soil saturation levels, streamflow, snowpack, temperatures and rate of snowmelt. A network of 122 weather forecast offices and 13 river forecast centers nationwide assess this risk, summarized here at the national scale. Areas across the country that are at risk of exceeding major, moderate, or minor flood this spring are shown in Figure 1.

Heavy rainfall mid-February through early March brought moderate to major flooding across much of the Middle to Lower Mississippi and Ohio River Basins, with record flooding observed in the Great Lakes drainages in northeast Illinois, northern Indiana, and southwest Michigan. Significant flooding continues through mid-March in the Middle to Lower Mississippi Valley. Even in those locations where rivers have crested and flooding has receded,

streamflows and soil moisture are well above normal, increasing the risk of flooding from heavy rainfall typical of the spring season. As a result, it is expected that rivers in the Lower Mississippi Basin, parts of the Ohio River Basin, in the Illinois River Basin, and in parts of the Lower Missouri River Basin are likely to exceed moderate flood levels.

Runoff from a much above normal snowpack in the Northern Rockies is likely to lead to rivers exceeding minor flooding on tributaries of the Columbia River, including in the Snake and Pend Oreille Basins, as well as drainages in the Upper Missouri River Basin. Though snowpack is generally shallow, there is an increased possibility of minor flooding across much of the Upper Mississippi River Valley where frozen ground could cause increased runoff rates from heavy rains typical of the spring. Minor flooding is also anticipated along and in the drainages of the Red River of the North. Possible heavy rainfall also would be expected to cause rivers to exceed minor flooding in parts of the Florida Panhandle, northern Alabama and Georgia, and in isolated basins across the Mid-Atlantic and Northeast.

The Spring Breakup flood potential in the Tanana River Valley is currently rated as above average. The Central Yukon River, Koyukuk River, Copper River, and North Slope are rated as slightly above average flood potential. In the rest of the state, flood potential is rated as average or below average. This forecast is based on observed snowpack, ice thickness reports, and long-range temperature forecasts.

Heavy rainfall at any time can lead to flooding, even in areas where overall risk is considered low. The latest information for your specific area, including official watches and warnings should be obtained at: http://water.weather.gov

Current water supply forecasts and outlooks in the western United States range from above average in the Upper Missouri Basin to near to much below normal in the Pacific Northwest, throughout the Sierra Nevada, the Great Basin and in the upper Colorado River Basin.

Heavy Rainfall and Flooding

The information presented in this report focuses on spring flood potential, using evaluation methods analyzed on the timescale of weeks to months, not days. Heavy rainfall at any time can lead to flooding, even in areas where overall risk is considered low. Rainfall intensity and location can only be accurately forecast days in the future, therefore flood risk can change rapidly.

Stay current with flood risk in your area with **the latest official watches and warnings at** weather.gov. For detailed hydrologic conditions and forecasts, go to water.weather.gov.

NOAA's Experimental Long Range River Flood Risk Assessment

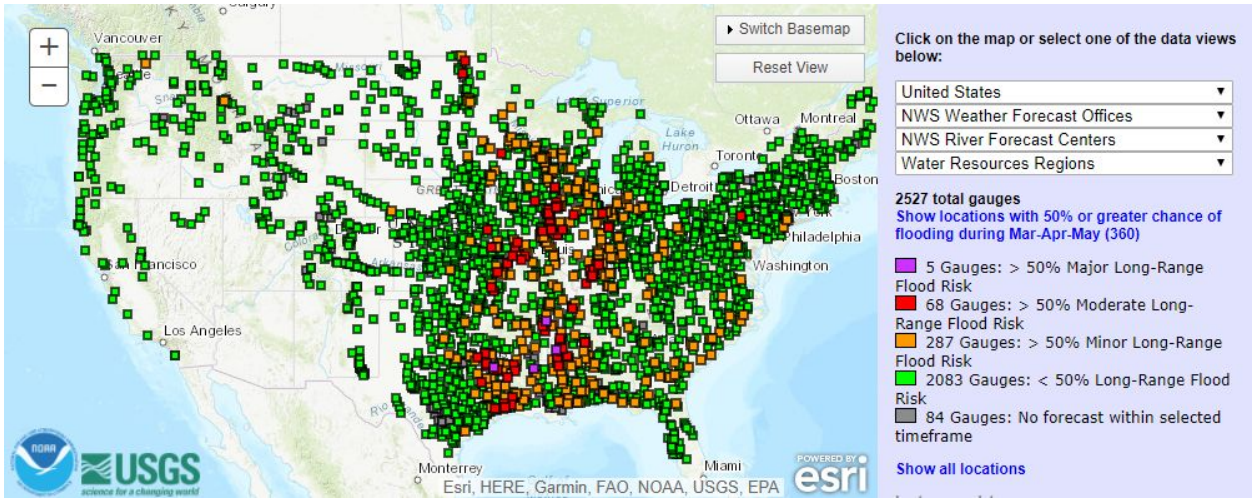

Figure 2: Greater than 50% chance of exceeding minor, moderate, and major river flood levels during March - April - May

At the request of national partners including the Federal Emergency Management Agency (FEMA) and the US Army Corps of Engineers, the National Oceanic and Atmospheric Administration (NOAA) continues its improved decision support services with the "Experimental National Long Range River Flood Risk" web page available at: http://water.weather.gov/ahps/long_range.php. Here, stakeholders can access a single, nationally consistent map depicting the 3-month risk of minor, moderate, and major river flooding as shown in Figure 2. This risk information is based on NOAA Ensemble Streamflow Prediction (ESP) forecasts which are generated for thousands of river and stream forecast locations across the nation. With this capability, stakeholders can quickly view flood risk for levels known to affect their specific area of concern. These enhancements improve the value of the National Hydrologic Assessment, by clearly and objectively communicating flood risk at the local level.

The sections below quantify river flood risk based on the river location having a 50% or more likelihood of exceeding minor, moderate or major flood levels. The National Weather Service (NWS), in coordination with local officials, defines flood levels for each of its river forecast locations, based on the impact over a given area. The flood categories are defined as follows:

- **Minor Flooding -** minimal or no property damage, but possibly some public threat (e.g., inundation of roads).
- **Moderate Flooding -** some inundation of structures and roads near stream. Some evacuations of people and/or transfer of property to higher elevations.
- **Major Flooding -** extensive inundation of structures and roads. Significant evacuations of people and/or transfer of property to higher elevations.

For example, on the Red River of the North at Fargo, ND, Moderate Flood Stage is 25 feet. At that height, city parks and recreation areas near the river are impacted. The impacts of all floods are local and, as such, this information is unique for each forecast location. To access local flood impact information, visit water.weather.gov and click on any river service location.

Risk of Exceeding Moderate Flooding

Lower Mississippi River Valley

Moderate flooding is anticipated this spring for rivers across the Lower Mississippi River Valley, including the Ouachita, lower Saline, and lower White Rivers in Arkansas and Louisiana, the Red and Calcasieu Rivers in Louisiana, and the Yazoo and Big Black Rivers in Mississippi. Much of this region experienced moderate to major flooding in association with heavy rainfall across the central part of the country during February and March. As of the writing of this assessment, major flooding is ongoing on lower portions of the mainstem Mississippi River and its tributaries, like the White River in Arkansas and the Ouachita in Arkansas and Louisiana. Even in areas where rivers have crested and flooding has receded, streamflows and soil moisture are well above normal, driving an increased risk for spring flooding where heavy rainfall typical of the spring occurs.

Ohio, Cumberland, and Tennessee River Valleys

Minor to moderate flooding is expected to redevelop in the Ohio River Valley and on the Cumberland and Tennessee Rivers this spring. Minor to moderate and even some major flooding was experienced across the region in February and March when Cincinnati reached flood levels comparable to 1997 and the lower Ohio River experienced water levels not seen since 2011. Much of the susceptibility to flooding in this region is driven by individual convective rain storms typical in the spring causing heavy rain on areas of elevated streamflows and soil moisture, conditions currently found in all but the northeast portion of the Ohio River Basin. Minor to moderate flooding is expected on the lower half of the mainstem Ohio River, and in the Wabash, Little Wabash, White, and Maumee Basins through Illinois and Indiana. Minor flooding is expected in lower half of the Tennessee River Valley, and in the Kentucky, Green, Licking, and Cumberland River Basins in Kentucky. In Ohio, minor flooding is likely on the Maumee, Muskingum and Scioto River Basins, and in the Lake Erie watersheds.

Illinois River Basin

There is a risk of exceeding moderate flooding in the Illinois River Basin. The Illinois River and its tributaries crested above moderate flooding in February with record flooding observed in parts of northwest Indiana and southwest Michigan due to a combination of heavy rainfall and snowmelt during the next few months. Warm temperatures and rain generally eliminated the snowpack for areas south of Minnesota, reducing the risk of significant spring

flooding for much of the Upper Mississippi, but wet antecedent conditions along the middle Mississippi River, and the Illinois River and its tributaries in northwest Indiana contribute to the likelihood of minor to moderate flooding during the next several months.

Lower Missouri River Basin

There is a risk of exceeding moderate flooding in parts of the Lower Missouri River Basin, an area that already experienced minor to moderate flooding resulting from thunderstorms and heavy rainfall that occurred during late February. Flooding in this area is driven by individual convective rain storms typical during the springtime. Specifically, moderate flooding is likely along Stranger Creek and in the Osage River Basin in Kansas and in Missouri in the Grand and Osage River Basins, along the Tarkio River, and in some of the smaller tributaries to the Missouri River. Minor flooding is likely in Kansas within the Marais de Cygnes and in the lower Big Blue River Basins and in Missouri along the Platte and Chariton Rivers, as well as on the Missouri River below Nebraska City.

Risk of Exceeding Minor Flooding

Columbia River Basin

Much of the Northern Rockies has recorded above normal precipitation since the beginning of the water year, especially across parts of Washington, Idaho, and Montana. This will contribute to a risk of minor flooding for a number of tributaries of the Columbia River in this area, including in the Snake and Pend Oreille Basins. Minor flooding is likely in the Snake River Basin as a snowpack averaging 110 percent of normal may cause above average reservoir releases through the upper Snake River system; reservoirs in this area already contain much above average hold-over water from last year.

Upper Missouri River Basin

A number of rivers located in the northern plains of the Missouri River Basin are expected to exceed minor flooding due to an above average snowpack in the mountains and across the plains of Montana. Rivers expected to experience minor flooding in this area include the Sun River, Boulder River, Little Bighorn River, Milk River, Clear Creek, and the Clarks Fork Yellowstone River in Montana, as well as the Wind River Basin in Wyoming. The extent and severity of flooding will depend on how quickly temperatures warm, the number of rain on snow events, and how drastically temperatures swing between daytime highs and nighttime lows. There is also a high potential for river ice contributing to flooding across this region. Elsewhere, shallow snowpack and abnormally dry soils will limit springtime flooding from snowmelt alone across much of the plains.

Upper Mississippi River Basin and Red River of the North

Precipitation this winter has been near to below normal across much of the upper reaches of the Mississippi drainage. A cold winter with near normal snowpack has decreased the risk of flooding due to snowmelt alone. However, the region is still vulnerable to heavy spring rain events, especially where frozen ground could cause increased runoff rates. Overall, these factors contribute to the likelihood for minor flooding for tributaries of the Upper Mississippi across southern Minnesota and Wisconsin, extending down the Mississippi River, as well as across Michigan, Illinois, Indiana, and parts of Iowa. Spring tributary flooding in these areas and along the mainstem Mississippi River will be driven by spring convective storms. Minor to moderate spring flooding is common at many locations in this area.

There is a risk of exceeding minor flooding in parts of the Red River of the North in Minnesota. Snowpack across the area generally contains 2 to 4 inches of water equivalent, and is greatest in parts of eastern North Dakota and into northwest parts of Minnesota. Frost is very deep, with several reports of 3-4 feet. With deep frost and normal to above normal snowpack, soils may have delayed capacity to absorb much of the spring melt, contributing to the likelihood of minor flooding. Flood risk is reduced in the rest of the Hudson Bay Basin, including the Souris and Devils Lake Basins, where significant spring flooding due to snowmelt alone is not expected.

Southeastern United States: Florida Panhandle, Northern Alabama and Georgia

Minor flooding is possible for river systems along the Florida Panhandle, in northern portions of Georgia, and western and northern basins in Alabama. This flood potential is driven by individual convective rain storms typical in the spring falling in basins where near to above average soil moisture conditions exist.

Northeast

Warm temperatures dominated February in New England and the Mid-Atlantic, with above normal precipitation generally in the form of rainfall recorded from Pennsylvania into the coastal Northeast. With river flows and soil moisture generally near to above normal, combined with a near to below normal snowpack across much of this region, some minor flooding is likely in parts of the Northeast - where snow water equivalents are highest - and for parts of northern New Jersey.

Other Regions/Low Flood Risk Areas

Mid-Atlantic

While current conditions of a much below normal snowpack and average to below streamflow conditions lead to a reduced risk of flooding across the Mid-Atlantic states from

Virginia to Pennsylvania, heavy rainfall typical of the spring season can lead to flooding, even where overall risk is considered low.

Southeast

Record warm temperatures during February combined with drier than average conditions have limited the risk of flooding this spring across the Southeast. Areas of moderate drought are expected to persist across central and southern parts of Alabama and Georgia, with abnormally dry conditions continuing elsewhere from Alabama into North Carolina. While current conditions lead to a reduced risk of flooding across the Southeast states from Alabama to North Carolina, heavy rainfall typical of the spring season can lead to flooding, even where overall risk is considered low.

Central Plains

There is very low chance of flooding over the Central and Southern Plains, as drought conditions persist from Colorado through Missouri and down into southern Texas. While recent precipitation has offered some relief across parts of Missouri and Arkansas, drought has intensified across the Texas and Oklahoma panhandles due to dry conditions during the winter and early spring. The primary factor in development of significant river flooding over most of the region is the occurrence of excessive rainfall in relatively short periods of time, even for areas where drought conditions persist or have developed. Please visit drought.gov for detailed outlooks, impacts and information related to your area.

Western U.S. - Regarding Spring Flood Prediction

Mid-March is still too early to determine final spring flooding potential across the western United States due to snowmelt since heavy snowpacks at higher elevations are expected to persist and even build over the next month. However, due to the substantial snowpack in the Northern Rockies, it is very likely that parts of Washington, Idaho, Montana, and Wyoming and Utah will experience snowmelt flooding in the spring. The duration and intensity of flooding will depend on future precipitation and temperatures.

Snowpack in the Pacific Northwest is generally near to above average except for the Rocky Mountains where it is above average. This is especially true for the upper headwaters of the Snake River where snow water equivalent is 135% at some locations. Current snowpack is less than normal across much of Oregon and southern Idaho.

Snowpack in the Upper Missouri and Yellowstone Basins at high elevations is above average. As of March 9, the snowpack above Fort Peck, Montana was 145 percent of average and 135 percent of average in the St Mary-Milk Basin. The snowpack in the Upper Yellowstone Basin was 137 percent of average. The snow packs in the Wind, Bighorn, and Shoshone Basins were 120, 130, and 155 percent of average, respectively. The snow packs in the Tongue and Powder Basins were 102 and 121 percent of average, respectively. Areas of above normal

snowpack contribute to the risk for likely minor flooding along the Sun River, Boulder River, Little Bighorn River, Clear Creek, and the Clarks Fork Yellowstone in Montana. Minor flooding is also possible in the Wind River Basin of Wyoming.

Snowpack in the Great Basin of Utah, Idaho, and Wyoming is below average for this time of year. Snowpack is highly variable throughout the upper Colorado River Basin but in general near or below average except for part of the Upper Green River Basin in Wyoming. Spring flooding due to snowmelt is not anticipated at this time in these areas.

Snowpack in the Great Basin of Nevada is below average and snowpack is much below average in Sierras, resulting in a low chance of snowmelt flooding this spring in the Sierras and within the Humboldt River Basin. Statewide the snow water content in California is 37% of normal as of March 9.

There is still ample time left in the accumulation period for the spring flood potential to change across the West. Even in areas where the spring flood risk might be lower, some smaller streams and flood prone rivers may experience minor flooding with a sudden large warm-up or the occurrence of heavy rain or thunderstorms over those watersheds. Weather conditions preceding and during the melt period determine the threat of flooding. Rapid warming can lead to elevated melt rates. During the melt, when rivers and streams are flowing at or near capacity, any precipitation can increase the risk of flooding. As always, citizens are encouraged to monitor the forecasts from their local Weather Forecast Offices.

Western Water Supply

Water supply forecasts are produced for mountainous basins in the western United States that supply water for agriculture, municipalities, and industrial uses. Forecasts reflect current hydrologic conditions including snow pack and soil moisture, weather forecasts, and climate information. As these conditions change, especially over the next couple months, forecasts will be updated to reflect these changes. Water supply forecasts are generated by NOAA/NWS River Forecast Centers and the Natural Resources Conservation Service (NRCS) National Water and Climate Center.

Current water supply forecasts and outlooks in the western United States range from below average in the Sierra Nevada, the Great Basin and into the upper Colorado River Basin to near to much above normal in the northern parts of the Pacific Northwest, Northern Rockies and Upper Missouri Basin:

- Snake and Columbia Rivers - Median forecast is 105% of average for the Snake River at Lower Granite Dam and 110% of average for The Columbia River at The Dalles.
- Missouri River - Median forecast at Toston is 127% of average.
- Colorado River - Median forecast inflow for April through July for Lake Powell is 47% of average. The forecasts for basins across the Upper Colorado range from 40% of average in the Dolores River Basin to 95% of average in the Upper Green River Basin.
- Eastern Great Basin (Utah) – Median forecasts range from 40% in the Sevier River Basin in southern Utah to more than 75% of average in the Bear River Basin in northern Utah and southern Idaho.

- Western Great Basin (Nevada) - Median forecasts range from 22% to 95% of average.
- California - Median forecasts range from 22% of average to 100% of average, with most less than 70% average.

The geographic variability in these water supply forecasts reflect above average precipitation experienced this year across the northern part of the region, with below normal precipitation recorded to the south.

The combination of above average precipitation and colder temperatures has boosted the water supply forecasts throughout the upper Columbia and Snake River Basin. The April through September runoff forecast for the upper Columbia River at Grand Coulee Dam is 115%. Washington snowpack in the Cascades is generally well above normal leading to water supply forecast ranging from 90% to 110% of average. Based on the above average snowpack and observed precipitation in the Snake River Basin, the water supply forecast ranges from 120% to 135% in the Upper Snake, Salmon, and Clearwater Rivers. Lower Snake River tributaries are experiencing low snow conditions and have forecasts that are well below normal in many places. Similarly, Oregon snowpack is very low and water supply forecasts are between 40% to 85% for most of the state.

Streamflow in the Upper Missouri Basin is forecast to be near to above average during the upcoming spring and summer due to an above average snowpack as of March 1. However, near to below normal high elevation snowpack in southern Wyoming and Colorado leads to streamflows forecasts to be below average during the upcoming spring and summer. Runoff for streams above Seminoe Reservoir is expected to be about 85 percent of average. Streams in the southern portion of the upper South Platte Basin in Colorado can expect about 65 percent of average flow with flows near average for the northern portions of the upper South Platte Basin.

Across the Upper Colorado Basin, near or above average snow conditions continue to be limited to the Green River Basin of Wyoming. Snow conditions in most areas remain below 70 percent of median with below 50 percent of median extending from southwest Colorado into central and northeastern Utah. Water supply forecasts for April through July are well below average over most of the area, except in the Upper Green River Basin where near average conditions exist. Inflow into Lake Powell is expected to be near 47% of average.

In the Lower Colorado Basin of Arizona and western New Mexico, streamflow volumes are forecast to range from near 5 to 40 percent of the historical median as dry conditions have dominated the past several months. Streamflow volume forecasts in the Lower Colorado River Basin for the March-May period call for well below median runoff in the Gila, Salt, and Verde and Little Colorado River Basins. Reservoir storage in the Salt River Basin is near 60 percent of capacity, Gila River Basin is at 10 percent of capacity, and Little Colorado River Basin 40 percent of capacity.

Water year precipitation in the eastern Great Basin is below average and snowpack conditions are at record or near record lows. Water supply forecasts range from 45 to 75 percent of average. Conditions are similarly dry in the western Great Basin, where water year precipitation and snowpack conditions are much below average. Water supply forecasts are below average in the Nevada portion of the Great Basin, ranging from 22% to 95% of average.

Precipitation is below normal for the water year across California and throughout the Sierra. Statewide snow water content is approximately 35% percent of the April 1st average.

The April through July streamflow volume is forecast to be below normal for the majority of streams across the state. As a result of last winter's record precipitation, the water supply situation in California is still improved as compared to past years. Storage for the major reservoirs in northern California range from 59-100% of average (42-76% of capacity) with continued improvement expected. Storage in the San Joaquin and Tulare Basin reservoirs range from 69-129% of average (54-82% of capacity).

Water Resources East of the Rockies

Projections of surface water availability provided by the National Weather Service play a crucial role in water resource decision making in other regions of the country. Warm, dry conditions in February during across much of the Southern U.S. may expand drought conditions through the spring and summer across much of Nevada, parts of South Texas, and in coastal areas in parts of South Carolina, Georgia, and northeast Florida. The last month has brought above normal precipitation to parts of eastern Oklahoma, central Arkansas, eastern Texas, and northern Louisiana, but recent lack of precipitation has led to dry soils and development of moderate to exceptional drought towards the west, across the Texas and Oklahoma panhandles.

Alaska Spring Ice Breakup Outlook

The Spring Breakup flood potential in the Tanana River Valley is currently rated as above average. The Central Yukon River, Koyukuk River, Copper River, and North Slope are rated as slightly above average flood potential. In the rest of the state, flood potential is rated as average or below average. This forecast is based on observed snowpack, ice thickness reports, and long-range temperature forecasts.

River Ice

March ice thickness data are available for a limited number of observing sites in Alaska. Late February/Early March measurements indicate that ice thickness is variable across the state with locations generally between 75-100 percent of normal. Many locations in the Tanana Basin are slightly below normal, with the exception of the Chena River showing only 65 percent of normal ice thickness. The Yukon River at Eagle has ice slightly thicker than normal, and the Colville River, up on the Arctic Coastal Plain, has ice slightly thinner than normal. Accumulated Freezing Degree Days are much lower than normal on the Arctic Coast, West Coast, and Western Interior indicative of a warmer than normal winter. Bethel stands out in particular as having only 46% of the normal Freezing Degree days. Freezing Degree Days in southcentral were close to normal and the central and eastern Interior Alaska was just below normal.

Snowpack

Analysis of the March 1st snowpack by the Natural Resources Conservation Service

(NRCS) indicates much higher than normal snowpack in the Tanana Basin (175-200%) and higher than normal in the Central Yukon and Koyukon Basins (150%). The Copper River Basin is slightly higher than normal (125%). Other basins have near normal snowpacks or below, or too few observations exist to determine basin-wide conditions.

Climate Outlook

The most important factor determining the severity of ice breakup remains the weather during April and May. Dynamic breakups with a high potential for ice jam flooding typically require cooler than average temperatures for most of April followed by an abrupt transition to warm summer-like temperatures in late April to early May. The temperature outlook for late March and early April suggest an increased chance of below normal temperatures for most of Alaska. The longer 3-month outlook which includes March, April and May indicates increased chances of above average temperatures in Northern and Western Alaska, trending towards equal chances of above, near, or below normal temperatures in areas south and east of the Alaska Range. For more information on the climate forecasts please refer to the Climate Prediction Center.

Spring Flood Outlook and Implications for Gulf of Mexico and Chesapeake Bay Hypoxia

The predicted spring flood risk across the Mississippi River watershed is anticipated to create conditions favorable to hypoxia and lead to an above average hypoxic zone in the northern Gulf of Mexico this summer. There is an elevated flood risk over large portions of the upper and central Mississippi and Ohio River Basins with several portions predicted to be at moderate risk. These basins contribute the majority of nutrients flowing down the Mississippi River. Flood conditions, should they occur, may lead to higher than normal springtime discharges of nutrients and freshwater from the Mississippi River into the Gulf of Mexico, conditions that promote hypoxia formation and spread. This cause and effect relationship, however, can be confounded by weather events such as tropical storms and hurricanes, which can locally disrupt hypoxia formation and maintenance. There are also areas of moderate flood risk identified lower down the Mississippi River, near the main-stem, but these areas contribute a relatively small percentage of the overall discharge from the watershed.

In the northern Gulf of Mexico each year a large area of low-oxygen forms in the bottom waters during the summer months, often times reaching in excess of 5,000 square miles with last year being the largest measured so far at 8,776 square miles, an area about the size of New Jersey. This area of low-oxygen, otherwise known as the “dead zone”, is strongly influenced by precipitation patterns in the Mississippi-Atchafalaya River Basin (MARB) which drains over 41% of the contiguous United States. Changes in precipitation will influence river discharges into the Gulf, which carry the majority of nutrients helping to fuel the annual dead zone, so examining spring flood risk in the MARB can provide a useful indicator of the possible size of the dead zone during the summer months.

In the Chesapeake Bay, recurring summer hypoxia has also been linked to nutrient loadings and river discharge, especially from the Susquehanna and Potomac Rivers. The spring flood risk map for these basins does not indicate any large areas of minor or major flood risks so we anticipate an average hypoxia zone for the Chesapeake Bay. This assumes typical summer conditions in the Bay region and the absence of major disruptive events such as tropical storms and hurricanes or drought conditions.

The spring flood outlook provides an important first look at some of the major drivers influencing summer hypoxia in the Gulf of Mexico and Chesapeake Bay. In early June, the measured river discharge amounts and corresponding nutrient concentrations will be available from the U.S. Geological Survey. This information is used by NOAA to release its annual dead zone forecast for the Gulf of Mexico and Chesapeake Bay. In the summer, the dead zone sizes will be measured and compared against the predictions. Hypoxia forecast models that evaluate the size of the dead zone based on causative factors such as watershed nutrient loading deliver critical information to the Gulf of Mexico/Mississippi River Watershed Nutrient Task Force and Chesapeake Bay Program to assess the effectiveness of watershed nutrient reduction targets and measure progress toward efforts to reduce the size of their respective dead zones. The National Weather Service and Ocean Service are working with States to develop new tools to forecast runoff risk which should help limit nutrient runoff to the Gulf, Chesapeake Bay and other regions by identifying the optimal times for fertilizer application within these watersheds.

NOAA's Role in Flood Awareness and Public Safety

Floods kill an average of 89 people each year in the US. The majority of these cases could have been easily prevented by staying informed of flood threat and following the direction of local emergency management officials.

To help people and communities prepare, NOAA offers the following flood safety tips:

- Determine whether your community is in a flood-risk area and continue monitoring local flood conditions at http://water.weather.gov.
- Learn what actions to take to stay safe before, during and after a flood at www.floodsafety.noaa.gov and ready.gov/floods.
- Visit http://www.floodsmart.gov to learn about FEMA's National Flood Insurance Program and for flood preparedness advice to safeguard your family, home and possessions.
- Purchase a NOAA Weather Radio All- Hazards receiver with battery power option to stay apprised of quickly changing weather information.
- Study evacuation routes in advance and heed evacuation orders.
- Turn Around, Don't Drown – never cross flooded roads, no matter how well you know the area or how shallow you believe the water to be.

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NOAA’s mission is to understand and predict changes in the Earth's environment, from the depths of the ocean to the surface of the sun, and to conserve and manage our coastal and marine resources. Visit us online or on Facebook and Twitter.

About this Product

The National Hydrologic Assessment is a report issued each spring by the NWS that provides an outlook on U.S. spring flood potential, river ice jam flood potential, and water supply. Analysis of flood risk integrates late summer and fall precipitation, frost depth, soil saturation levels, streamflow, snowpack, temperatures and rate of snowmelt. A network of 122 weather forecast offices and 13 river forecast centers nationwide assess this risk, summarized here at the national scale. The National Hydrologic Assessment depicts flood risk over large areas, and is not intended to be used for any specific location. Moreover, this assessment displays river and overland flood threat on the scale of weeks or months. Flash flooding, which accounts for the majority of flood deaths, is a different phenomenon associated with weather patterns that are only predictable days in advance. To stay current on flood risk in your area, go to http://water.weather.gov/ahps for the latest local forecasts, warnings, and weather information 24 hours a day.