

**State of Maine  
River Flow Advisory Commission  
Report on Current Hydrologic Conditions  
March 1, 2007**

**Overview:**

The spring meeting of the River Flow Advisory Commission took place Thursday, March 1, 2007. The Commission meets annually in late winter to share information, examine potential for spring flooding and to renew operational protocols. Such factors as stream flow, long-term weather forecasts, snowpack, river ice conditions and reservoir levels are reviewed. This report summarizes the information presented on current hydrologic conditions.

Throughout this report, Internet addresses are listed for each category of information. The River Flow Advisory Commission web site provides a portal to all these different sites. That web site address is **[www.maine.gov/rfac](http://www.maine.gov/rfac)**. This site provides a connection to the ever-changing information critical to monitoring flood potential in the state.

At the end of the report, additional sources are provided for further information.

**Background Climatology:**

The 2006 average annual temperature for the contiguous United States was the warmest on record (the annual average temperature was 55°F, 2.2°F above the 20th Century mean).

The unusually warm start to this winter reflected the rarity of Arctic outbreaks across the country as an El Niño episode continued in the equatorial Pacific. U.S. and global annual temperatures are now approximately 1.0°F warmer than at the start of the 20th century. The past nine years have all been among the 25 warmest years on record for the contiguous United States. Other than the 3 month period of July –September 2006, average temperatures were much above normal across Maine

Precipitation in the United States during 2006 was variable throughout much of the country with periods of excessive rainfall, especially across the Northwest, Great Lakes, and the Northeast, and persistent and developing drought in other areas. The Northeast region had a record wettest summer exceeding the previous record by more than 1 inch, while the U.S. as a whole was near average. Maine ranked 8th and 3rd wettest for summer and fall respectively.

**Current Conditions and Flood Potential:**

***Stream Flow and Headwater Storage Levels:***

Stream flows earlier in the winter were above normal, but as of the end of February, had moderated and were in the normal range for all of Maine.

River basin managers report headwater storages at well above normal pre-spring drawdown levels, following the abnormally wet late summer and fall. On the West Branch of the Penobscot River, storages are at 64%, 33% above normal. In the Kennebec River basin, storages are at 54% (18% above normal). Drawdown rates have been slowed because of the lack of water content in the snow; conditions will be monitored weekly to adjust drawdown rates accordingly. In the Androscoggin River basin, storages are 25% above long-term averages, and aggressive drawdown continues. River basin managers draw down storage levels at this time of year, to make room for spring rains and snowmelt.

This allows them to “catch” excess runoff in regulated basins during flooding events, somewhat moderating river levels.

### **Ground Water**

Ground water is above normal in most parts of the state; at some sites record highs have been set during the past year, surpassing records set in 2005. Ground water recharge usually peaks later in the spring, as snow melts, before slowly falling through the summer.

For further information on stream flow and ground water:

USGS Water Resources of Maine	<a href="http://me.water.usgs.gov">me.water.usgs.gov</a> (Hydrologic Conditions Section)
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### ***Ice Conditions:***

River ice across the state, where measured by the USGS, is in the normal range for the time of year. USGS and river basin managers report 1 to 2 feet of hard, black ice in rivers across the state. At the end of a warm January, most areas had no ice at all; the ice all formed during an abnormally cold February with little snow cover. The Valentine’s Day storm provided an insulating cover of snow; ice that is in place will likely stay in place for the time being.

At the present time, there are no large ice jams reported at any location. However, ice jams can form and release rapidly during a rain or warm-up event. Emergency managers are urged to report observed ice jams or ice movement to the National Weather Service and MEMA. Ice jam formation or movement can result in rapid water rise and necessitate quick action protect life and safety.

The USGS maintains a live web camera on the Kennebec River in Augusta to provide remote “eyewitness” observation of ice and water movement. The web cam images are accessible on the Internet at <http://me.water.usgs.gov>

Ice-breaking by the US Coast Guard in the lower Kennebec is projected to begin in late March. The Coast Guard can respond earlier if needed. The USCG has conducted breaking in the Penobscot earlier in the winter.

For more information on ice conditions:

Northeast River Forecast Center	<a href="http://www.weather.gov/nerfc">www.weather.gov/nerfc</a>
USGS	<a href="http://me.water.usgs.gov">me.water.usgs.gov</a>

### ***Snowpack:***

A full statewide snow survey was conducted February 26<sup>th</sup> through 28<sup>th</sup>. Water equivalents across most of the state are in the lower 25% of historical averages. Some areas of southern and downeast Maine are in the normal range (25% to 75% of historical averages) but in the low end of that range. The approaching snow storm is expected to bring most sites into the normal range for the time of year.

The Maine Cooperative Snow Survey conducts surveys at sites across Maine from January until the snowpack is gone from the headwaters of our major rivers. Cooperators measure snow depth and water content at specific sites. The critical measurement “snow water equivalent” quantifies the amount of water that could potentially run off into the river basins. Snowmelt alone does not generally cause flooding in Maine, but can add to the runoff caused by rainfall.

Contributors to the Maine Cooperative Snow Survey include Federal and State agencies, hydroelectric power and paper companies and Canadian and New Hampshire environmental agencies.

For more information on snow survey data, updated weekly with every survey through the spring:

Maine Cooperative Snow Survey	<a href="http://www.maine.gov/mema/weather/snow.shtml">www.maine.gov/mema/weather/snow.shtml</a>
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### ***Weather Outlook:***

There will be moderate temperatures immediately in the wake of the expected March 2 storm. However, early next week and for approximately the next 14 days, temperatures will drop. For the first week, temperatures are expected to be extremely below normal, with highs only in the single numbers in northern Maine. The next week will moderate somewhat, but still remain below normal. During this period precipitation is expected to be in the normal range.

### ***Flood Potential:***

With the snow expected March 2, flood potential is estimated to be normal for the time of year. Snow pack is below normal for the time of year in most of the state, but the coming snow is expected to bring most areas into the normal range compared to historical averages. Rivers are for the most part icebound, with hard black ice. Short-term weather forecasts show below average temperatures for the next two weeks, which will “freeze” the current conditions in place, carrying existing snow pack, any additional snow and river ice later into the spring. These factors could elevate flood potential later in the month, so will be closely monitored.

The most important single factor in determining the severity of flooding is rainfall, how much and in how short a period of time. Major flooding on Maine rivers does not generally occur from snowmelt alone. However, ice jam flooding is a concern as long as large amounts of ice remain in Maine’s rivers. Ice jam flooding cannot be forecast. Local observation is critical as ice begins to break up and move. Ice jams can cause sudden flooding above the jam, as the water backs up, and below the jam if it breaks and releases a large amount of water.

The National Weather Service Forecast Offices in Caribou and Gray will issue Flood Potential Statements every two weeks throughout the spring. These reports will examine all current hydrologic factors and give an overall assessment of flood potential. Both offices are scheduled to issue Flood Potential Statements on Friday, March 2.

For more information on flood potential and for flood watches and warning should they arise:

NWS Gray	<a href="http://www.weather.gov/gray">www.weather.gov/gray</a>
NWS Caribou	<a href="http://www.weather.gov/caribou">www.weather.gov/caribou</a>
NWS Flood Forecasts/MEMA site	<a href="http://www.maine.gov/mema/weather/flood.shtml">www.maine.gov/mema/weather/flood.shtml</a>

### **Preparedness and Mitigation:**

#### ***Flood Insurance and Floodplain Management:***

The Maine Floodplain Management Program of the State Planning Office stresses that flooding is always a threat to properties located within a floodplain, but even more so during winter’s river ice and spring rains. Many people believe that their homeowner’s or business owner’s insurance policy will cover any flood related losses but unfortunately, these insurance policies DO NOT cover flood related damages. In order to receive insurance protection related to flood damage, property owners and renters need to purchase a separate flood insurance policy. For more details on the policies available, Mainers are urged to contact their insurance agents. There is a 30-day waiting period, before a new policy goes into effect.

March and April are historically when flooding occurs in Maine, but heavy rains can cause flooding any time of the year. It is estimated that up to 75% of homes and businesses in floodplains in Maine are

NOT covered by flood insurance. There are close to 8,000 flood insurance policies in effect in Maine as of the end of January 2007. That is 9.7% increase over last year at this time. This is the largest annual increase for Maine in many years. Maine's flood insurance policy base had averaged about 3-4% annual growth up until this past year. The increase is likely due to increased flood insurance awareness from major flooding event in the news around the country and increased agent and lender training. There is over \$1.4 billion in flood coverage in Maine. The average coverage per flood insurance policy in Maine is \$179,000, (up 7% from last year) and the average annual premium is \$653 a 3% increase. As long as a community participates in the National Flood Insurance Program, residents and business owners can buy flood insurance no matter where in the community their properties are located.

Additional assistance is available through the Maine Floodplain Management Program at the State Planning Office by calling 1-800-662-4545.

The State Planning Office and the Maine Emergency Management Agency, in partnership with the Federal Emergency Management Agency (FEMA) have ongoing programs stressing "mitigation", or the reduction of risk from disasters. Flood mitigation can be as simple as moving perishable items out of a basement, elevating a furnace or improving drainage for a road that always floods. It can be as far-reaching as moving entire neighborhoods out of the floodplain.

Flooding is Maine's most costly hazard, affecting some community in the state every year, sometimes with disastrous results. Mitigation measures can not only save repair dollars in the long term, but may even make a community more attractive to development and business investment.

The SPO and MEMA are also collaborating this year on a planning project that will document historical flood impact in Maine's major river basins. It is expected that the data-gathering for this project will be complete in late summer of 2007. A web-based portal is planned where users can look up the flood history in their communities.

For more information on floodplain management and mitigation:

State Planning Office, Floodplain Management Program	<a href="http://www.state.me.us/spo/flood">http://www.state.me.us/spo/flood</a>
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### ***Preparedness and Safety:***

Preparedness is key to minimizing the impact of flooding or any emergency. Individuals and families, businesses, schools and communities benefit from reviewing their vulnerability to flooding and ensuring that they have workable plans for dealing with the event. Everyone should stay aware of National Weather Service forecasts as the spring progresses, and talk to local officials and County Emergency Management Agencies if they have questions about flood preparedness in their communities, or how to build an emergency plan for family, business or school.

**It is also critical during a flood event that all citizens heed all official warnings.** The Commission again noted that its number one public safety concern is people driving through flooded roadways. During a flood no one should drive on submerged roads, as the stability of the road may have been severely damaged by flood waters. Highway crews will place signs and barricades to warn of flooded sections of road. Motorists who ignore these warnings and drive through flooded areas are gambling with their own safety and that of their passengers.

**Nationwide, most flooding deaths occur when vehicles are caught in flood water.** According to the National Weather Service, even 6 inches of fast-moving flood water can knock a person off his feet, and a depth of two feet will float a car.

The National Weather Service Forecast Offices in Caribou and Gray have designated Thursday, March 1, 2007 as Flood Awareness Day in Maine. However, because of the advent of a major winter storm, their distribution of flood preparedness and safety information will be postponed. Both offices plan to incorporate this information, along with other preparedness tips, in statements issued during the national flood awareness week, March 19-23. For more information on flood preparedness and safety:

Maine Prepares	<a href="http://www.maine.gov/mema/prepare">www.maine.gov/mema/prepare</a>
NWS Caribou	<a href="http://www.weather.gov/caribou">www.weather.gov/caribou</a>
NWS Gray	<a href="http://www.weather.gov/gray">www.weather.gov/gray</a>
County Emergency Management Agencies	<a href="http://www.maine.gov/mema/about/mema_county.shtml">www.maine.gov/mema/about/mema_county.shtml</a>

### Important Factors for Springtime Floods (in order of relative importance):

- 1) **RAINFALL:** This is the most important factor in determining the magnitude of significant floods in Maine. If precipitation during April and May are normal and evenly distributed, then streamflow will be in the normal range. However, if significant rainfall occurs over a short period of time, flooding could result.
- 2) **SNOW COVER:** This is a secondary factor and can add to rainfall events. As the snow pack becomes more “ripe” (nearly saturated), it can melt quickly and significantly add to a flood peak. The most accurate measurement of snow cover is “snow water equivalent”. Snow water equivalent is the amount of liquid water contained in the snow. Snowmelt alone should not produce major floods.
- 3) **RIVER ICE:** Ice jams can cause increased damage by temporarily blocking rivers and streams and causing higher water levels behind the jam. Peak flows downstream increase when jams break up and quickly release stored water.
- 4) **TEMPERATURE:** Warm days with freezing night temperatures allow a gradual melting and runoff of the snowpack. A sudden warm up, especially when coupled with significant rainfall, can send large amounts of runoff into rivers and streams.
- 5) **RESERVOIR STORAGE:** Maine’s headwater storage reservoirs typically reach their annual low water levels in March. These reservoirs can moderate downstream flood peaks if rainfall occurs above the storage dams while the reservoir’s water levels are down. The reservoir systems have limited ability to moderate flood peaks in the lower parts of the river basins if large amounts of rain fall or if heavy rains fall downstream of the storage dams.

### Conclusion:

The River Flow Advisory Commission found that as of March 1, taking into account thick river ice, significant snowfall expected and continued cold temperatures, flood potential should be considered normal for the time of year. Since cold temperatures will keep snow and ice in place for approximately two weeks, and snow pack may increase during that period, flood potential may be elevated later in the month.

The current conditions information in this report represents a “snapshot” of conditions throughout the state as of March 1, 2007. However, many new factors will influence the flood potential in Maine as the spring progresses.

National Weather Service and emergency management reports should be watched throughout the spring, and local officials should monitor the flood-prone areas for each community. In particular, rivers should be monitored closely as ice begins to break up and move, as ice-jam related flooding can arise quickly and have locally devastating impact. Property owners, business owners and renters in flood-prone areas should check their insurance coverage to be sure that they are protected against flooding damages.

The Maine River Flow Advisory Commission is composed of representatives from major river basin management operations, state agencies, federal agencies and the University of Maine. The Commission was originally formed after the spring floods of 1983 to improve the exchange of

hydrologic information collected by the members, to review the data, and to provide information to emergency action agencies and the public. It was created in statute by the Legislature in 1997.

No additional meetings for the Commission are planned. However, conditions will be closely monitored and the Commission will meet again later in the spring should the situation warrant.

### Information Resources:

For additional information on particular aspects of this report, please contact:

<b>Charles Jacobs/Lynette Miller</b> , Maine Emergency Management Agency	Flood preparedness and mitigation	207-624-4400
<b>Bob Lent</b> , U.S. Geological Survey	Stream flow, ice conditions, snow survey	207-622-8202
<b>Tom Hawley</b> , National Weather Service, Gray, Maine	Flood potential for central and southern Maine; flood forecasting	207-688-3216
<b>Mark Turner</b> , National Weather Service, Caribou, Maine	Flood potential for northern and eastern Maine; flood forecasting	207-492-0180
<b>Marc Loiselle</b> , Maine Department of Conservation, Maine Geological Survey	Snow survey	207-287-2801
<b>Lou Sidell</b> , State Planning Office, Floodplain Management Program	Floodplain management, flood insurance and mitigation	207-287-8063

Links to further information on all sections of the report, updated as conditions change:

<http://www.maine.gov/rfac>