

Spring Flood Outlooks

National Weather Service Spring Flood Outlooks show the potential for high and low flows on rivers over a 90-day period. There are qualitative and quantitative aspects to them.

Qualitative Aspects

The below factors are considered. They have the greatest impact on the spring flood risk in Iowa.

- Snowpack. High water content increases the flood risk.
- Soil moisture. High soil moisture increases the flood risk.
- Frost depth. Deep frost depth increases the flood risk.
- Streamflows. Elevated stream levels increase the flood risk.
- Rainfall. Heavy rain—especially repeated episodes—increases the flood risk.
- Speed of snowmelt. Rapid snowmelt increases the flood risk.

Quantitative Aspects

The NWS river model is used to calculate numerical probabilities for minor, moderate and major flooding at NWS river forecast points. These probabilities are for a 90-day period. An ensemble approach is used and provides probabilities of high flows and low flows using multiple spring season scenarios from 30 or more years of climatological data. These numbers take into account current conditions of the river, snow cover and soil moisture. There are two types of probabilities provided for high flows and low flows:

• **Conditional Simulation**

- For each year's worth of climatological data, the model is initialized on the present year's current conditions and is then run with the climatological data for Year #1 over the 90-day outlook period. Once the model is run with the climatological data for Year #1, the model is re-initialized to the present year's current conditions and the process is repeated for Year #2. This process continues for a total of at least 30 years. Typically data for the most recent 30 years—or very close to that—is used.

• **Historical Simulation**

- The model is initialized ONCE on the present year's current conditions and is then run with the climatological data from Year #1 through the same years used for the Conditional Simulation.

When the Conditional and Historical Simulations are complete, the model results for each simulation are analyzed for exceedance and non-exceedance probabilities for time spans ranging from 7 days to the full 90-day outlook period. The output is in both tabular and graphical formats.

The results from the Historical Simulation analysis can be considered climatology—the long-term average—for the hydrologic response during the 90-day outlook period.

The results from the Conditional Simulation analysis can be considered to reflect the potential hydrologic response based on the present year's conditions. By comparing the results from the Historical and Conditional Simulations, one can determine if the risk of high flows or low flows is near, above or below normal.

The latest probabilistic information for the NWS Des Moines service area are available on the NWS Advanced Hydrologic Prediction Services Webpage, or by [clicking here](#).

For more information visit the National Weather Service in Des Moines, Iowa at <http://www.weather.gov/desmoines>