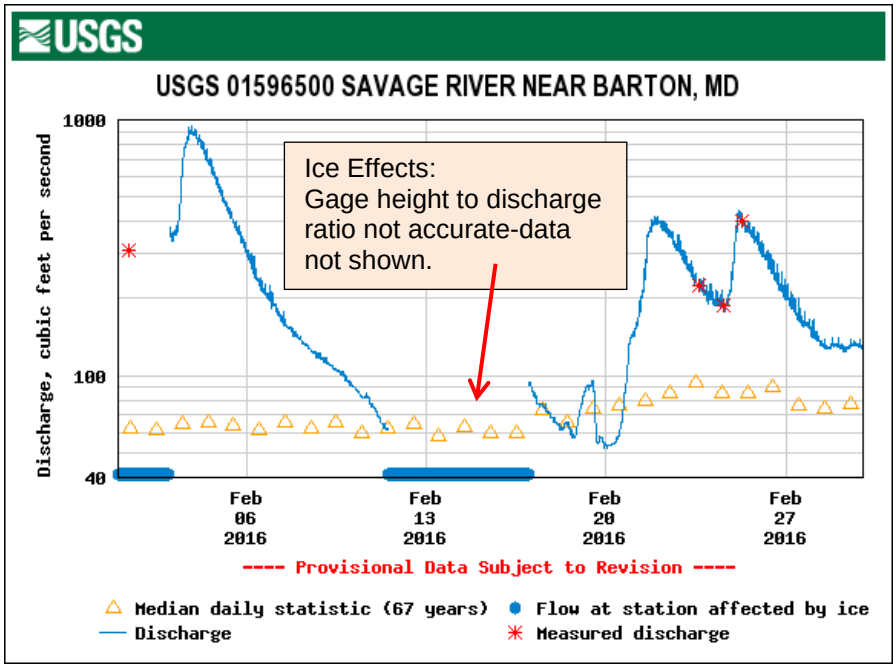
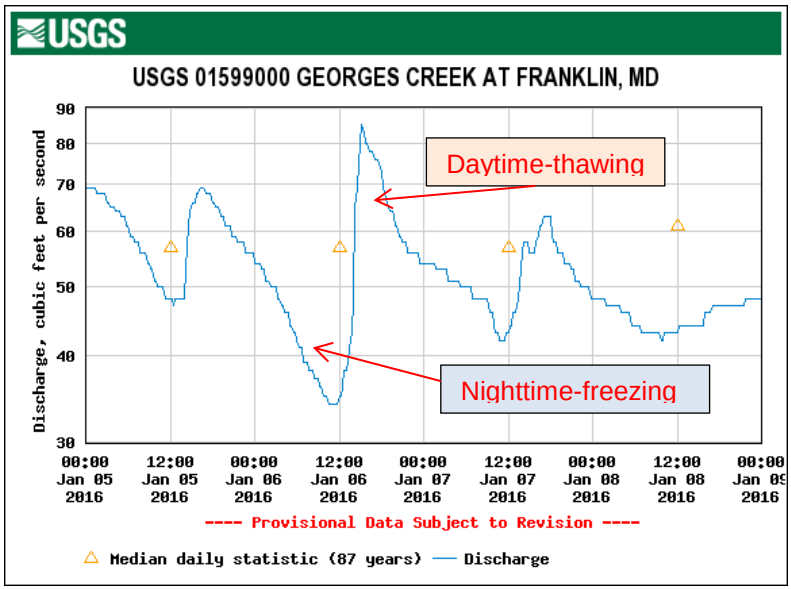
U.S. Geological Survey (USGS) Maryland-Delaware-District of Columbia

In the Mid-Atlantic region, ice effects on streams can typically occur between December and March. Below freezing air temperatures can lead to the formation of ice in many channels and may result in erratic water level readings. Ice in the stream may result in a biased gage height record, invalidating the known stage–discharge relationship.

When erroneous gage height values appear, they are flagged or removed from the web display. However if the gage heights are considered to be accurate but the ice in the channel is causing a bias to the stage–discharge relationship then a heavy blue line will mask discharge values, as shown in this example at the Savage River. Hydrographers will later analyze the data available and estimate daily discharge values affected by ice. Weather records, discharge data obtained through direct measurements (made during the ice-affected period) and/or hydrographic comparison with non-ice affected streamgages in the surrounding area all play an important role in making these estimations.



Below-freezing temperatures may also affect the amount of water in a stream channel. In wintertime, a natural freeze/thaw cycle can occur, as shown in the hydrograph below from Georges Creek. When the water in smaller tributary streams upstream of a gaging location freezes, typically after dark, then less water is able to pass by the gage; causing the sudden dropoff in flow as seen here. When the sun comes out the next day and if the air temperature rises, upstream channels will thaw and release the water, resulting in increased streamflow at the gage.



Frozen ground leads to less infiltration and groundwater movement (baseflow) to streams, which could result in lower streamflow, but as temperatures get warmer, the water is released. Fluctuations related to the freeze/thaw cycle may represent actual flow conditions which would not need corrections to the data.