*Climate Change in Delaware Region*

Climate change has the potential to impact water availability and the ability to meet water management goals in the Basin. Predicted increases in precipitation and temperature, as well as shifts in seasonality, may affect the water cycle and thus the amount of groundwater, streamflow, and snowpack. Warmer temperatures in the winter will mean less water stored as snow and greater evaporation rates. Although more precipitation is predicted for the region, increases in temperature may offset that due to the increase in evaporation rates. Sea level rise (SLR) is also a result of climate change that may change the salinity in the estuary and impact habitat, water availability and flow management goals.

Studies of the anticipated changes to temperature and precipitation indicate that the trend is for the Basin to be warmer and wetter in the future[[1]](#footnote-1). In addition, weather events are predicted to be more extreme with more active Atlantic hurricane seasons, higher intensity storm events and short, but severe, dry periods. Due to changes in flow resulting from the increased precipitation and evaporation, combined with the impact of sea level rise to salinity, new drought and flow management programs may be needed. Concerns about how increases in precipitation and temperature may affect flows and flow management have led the DRBC to employ the USGS Water Availability Tool for Environmental Resources (WATER) and the DRB Planning Support Tool (PST) to determine how water availability may change in the future3. WATER is a hydrologic model of the Delaware River Basin which can be used to simulate the inflows with changes in temperature and precipitation predicted by different climate models and emission scenarios. Those inflows are then used in PST to simulate different flow management plans for the Basin. According to the model in almost all months, the precipitation increases, with the larger increases occurring in the winter and early spring. Temperature and evapotranspiration (evaporation plus the removal of water by vegetation) also increases in all months.

The overall result to the water cycle is mixed. In addition, winter inflows are higher, spring inflows are lower, and summer inflows increase in the lower basin and decrease in upper basin. With higher temperatures, the increased precipitation in the winter occurs more often as rain rather than snow, reducing the snowpack. In the spring, because there is less snowpack and higher evaporation rates, less water is available to become streamflow. Because the evaporation is changing at different rates compared with the increase in precipitation, the changes in flow differ by location based on land use. Predicted sea level rise in the Delaware Bay by 2100 ranges from approximately 0.5 m (1.6 ft) to 1.5 m (5 ft)3. Previous modeling of salinity under different sea level rise scenarios indicated that a sea level rise of 3 feet would likely result in salinity concentrations that create corrosive conditions in surface water intakes and adversely affect drinking water treatment facilities in the Upper Estuary.

1. Delaware River Basin Commission. *State Of The Basin 2019*. Delaware River Basin Commission; 2019. https://www.state.nj.us/drbc/library/documents/SOTBreport\_july2019.pdf. [↑](#footnote-ref-1)