

## Historic and Pre-historic Drought in the Delaware River Basin

The Delaware River Basin (DRB) supplies water to approximately 15 million people and is essential to agriculture and industry. In this study, a monthly water balance model is used to compute monthly water balance components (i.e., potential evapotranspiration, actual evapotranspiration, and runoff) for the DRB for the 1901 through 2015 period. Water-year runoff is used to identify drought periods in the basin and seven drought periods were identified. All but one of the drought periods occurred before about 1970; after this date, precipitation increased in the DRB and droughts were infrequent. The seven droughts were largely driven by precipitation deficits, rather than by unusually warm temperatures. For six of the seven droughts, the precipitation deficits were associated with atmospheric pressure patterns that resulted in northerly wind anomalies over the DRB which were associated with an anomalous flow of dry air from the North American continent into the DRB. An examination of drought events estimated from a tree ring-based reconstruction of the Palmer Drought Severity Index for the 490 through 2005 time period indicates that there were some DRB droughts in previous centuries that were longer and more severe than those that occurred during the instrumental period.

Bio: Dr. Greg McCabe is a research scientist within the Water Mission Area of the U.S. Geological Survey. He received bachelor and masters degrees from the University of Delaware and a Ph.D. from Louisiana State University. Dr. McCabe has been a research scientist with the U.S. Geological Survey since 1988. His research interests include hydroclimatology, climate variability and change, synoptic climatology, climate teleconnections, and hydrologic modeling.