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A publically-available, web-based software tool to estimate daily streamflow at ungaged locations in the northeast United States

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Streamflow information is critical for solving any number of hydrologic problems. Because most stream reaches are ungauged, this data is commonly needed for rivers that have no readily available measurements of streamflow. In the Connecticut River Basin, located in the northeast United States, dam operation and its effects on the aquatic habitat are of particular interest. Here, daily streamflow is needed for use as input to reservoir simulation and optimization models of the Connecticut River Basin as well as to develop ecological-flow prescriptions for rivers and streams in the Connecticut River Basin. To provide a common scientific foundation for water allocation decisions, the U.S. Geological Survey (USGS) has developed a freely available and easy-to-use software tool termed the Connecticut River UnImpacted Streamflow Estimation (CRUISE) tool to estimate a daily streamflow time series at ungauged locations in the basin. CRUISE is used in sequence with the USGS StreamStats Web application (http://streamstats.usgs.gov), where users are able to point and click on a stream location of interest and obtain a delineated watershed and watershed characteristics for the location. Users then enter the watershed characteristics into the CRUISE tool to estimate a daily time series of streamflow. Daily streamflow was shown to be reliably estimated by the CRUISE tool, with efficiency values between the observed and estimated streamflows ranging from 0.69 to 0.92 and ecologically-relevant streamflow statistics derived from the estimated daily streamflow to be generally within +/- 10 percent of the streamflow statistics computed from the observed daily streamflow values.