NONSTATIONARITY DETECTION TOOL

The USACE Responses to Climate Change (RCC) Program has developed an analytical tool to enable users to detect abrupt and slowly varying changes (nonstationarities) in observed annual maximum discharge at United States Geological Survey (USGS) daily streamflow gages. The tool also allows users to conduct monotonic trend analysis on the resulting subsets of stationary flow records identified.

WE'VE MADE GREAT PROGRESS

RESEARCHED and identified statistical methods for the detection of nonstationarities in hydrologic time series data and consulted with academic partners to identify emerging detection methods.

INTEGRATED open-source statistical software with cutting-edge visualization technology to calculate statistically significant changes in time series of annual maximum flow.

DEVELOPED a web-based tool that detects nonstationarities in annual maximum streamflow data from the United States Geological Survey (USGS) National Water Information System.

PRODUCED user's manual for the tool. Both the tool and user's manual underwent quality control checks by USACE staff, and received an independent external peer review.

DRAFTED guidance for users on how to detect nonstationarities in their data and use the results in subsequent hydrologic analysis. This guidance is currently undergoing USACE review process.

RELEASED the user's manual and tool such that they are easily accessible to both USACE and external users by making these resources available on a public web site.

MOVING FORWARD
NEAR-TERM

REFINE the tool to incorporate feedback from an extensive peer review.

TRAIN engineers to use this tool to detect nonstationarities in annual maximum discharge.

PRESENT this tool to the larger hydrologic engineering community.

INCORPORATE the analysis done within the web application into USACE hydrologic analysis best practices.

MOVING FORWARD
LONG-TERM

EXPAND the applicability of the tool to other time series of interest in water resources management, including observed annual minimum flows, observed precipitation, tide gauges, time series input by users, and eventually datasets generated based on climate projections.

DEVELOP methods to better characterize the drivers of detected nonstationarities in flow records to support attribution of the changes to a driver that may continue or change in the future.