

Effect of current drought to Canadian river basin

John Zhu, Yujuin Yang and Ruben Solis

Texas Water Development Board, USA

In order to provide the current and most reliable water availability information for the TWDB's water resource planning and development efforts, an extended Water Availability Model (WAM) for Canadian River Basin has been developed by regression between existing naturalized flows and observed flows. The input data (naturalized flow and net lake evaporation) are updated from 51 years (1948-1998) to 65 years (1948-2012). Hence, the most recent droughts, such as that in 2011, are included. The simulation result from WAM RUN3 model indicates that the most recent drought is the worst in term of water supply since 1948. Comparing with the result from existing 51 year simulation, the overall water right volume reliability has reduced from 71.96% to 65.46%. Among 37 water rights in the basin, the volume reliability of major municipal water right (100,000 ac-ft/y) at Lake Meredith has reduced from 73.77% to 68.56% and major industrial water right (51,200 ac-ft/y) from the same lake has reduced from 68.31% to 59.44%. The volume reliability of another major municipal water right at Palo Duro Reservoir has reduced from 80.27% to 71.04%. Firm yield from Lake Meredith has reduced from 79,970 ac-ft/y to 74,960 ac-ft/y and the critical period in determining the firm yield has changed from 1973-1981 to 1973-2012. As time development into 2013 and most areas in Texas are experiencing dramatic or recorded low in streamflow and reservoir storage, it seems urgent to extend the input data to 2012 for the existing Texas WAM models, so the new simulated results can provide better assistance for the future water resource planning and management.

Biography

John Zhu has completed his Ph.D. at the age of 27 years from Chinese Academy of Science in hydrological sciences. He had worked as Research Associate in the Manchester Metropolitan University, Lecturer in the University of Papua New Guinea and Chief Hydrologist for the government of Papua New Guinea. He is now a Senior Hydrologist in Texas Water Development Board, responsible for water availability modeling and other hydrological data analysis.

John.Zhu@twdb.texas.gov