International St. Mary-Milk Rivers Study Technical Working Groups

Water Management Modeling

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Focus

The Water Management Modelling (WMM) Technical Working Group (TWG) is refining two models, WRMM and RiverWare, used for water management operations in the St. Mary and Milk River system to assess study scenarios. Each model incorporates operational rules for distributing the water in the basin using streamflow data, water rights data, water demand data, and the terms of the Boundary Waters Treaty which governs water sharing apportionment between Canada and the United States. The models will be used to evaluate how different scenarios affect water distribution in the system for present and future scenarios investigated by the study.

Background

In 1981, the Water Resource Management Model (WRMM) was created by Alberta Environment and Protected Areas for water planning purposes in Alberta and the setup for the St Mary and Milk Rivers was used for modelling during the Montana-Alberta St. Mary and Milk water rights and water use detail in the Canadian part of the basin. Rivers Water Management Joint Initiative. Numerous structural and non-structural alternatives were examined for possible changes in water management. Compared to the RiverWare model, WRMM has more alternatives were examined for possible changes in water management. Compared to the RiverWare model, WRMM has more water rights and water use detail in the Canadian part of the basin.

RiverWare is another water management model set up for use in the St Mary and Milk Rivers system about 10 years ago. RiverWare is currently being updated under an effort separate from this study. Several structural and non-structural alternatives are being examined. Compared to WRMM, RiverWare has more water rights and water distribution detail in the U.S. part of the basin.

Planned Outputs

The WMM TWG will align WRMM and RiverWare models to minimize differences and deliver more comparable outputs in guiding operational water flow management. The models will be used to determine how scenarios suggested by other TWGs in the Study will change the water distribution and availability in the St. Mary-Milk River Basin. The outputs will consist of numerical values describing streamflow, water withdrawals, and reservoir elevations. WRMM and RiverWare will have a complete set of runs twice; once using historical data and once using future hydrology and climate data.

The Technical Working Groups are formed by, and report to, the International Joint Commission's International St. Mary-Milk Rivers Study Board (ISMMRSB). The study is seeking to ensure and/or improve equitable sharing and apportionment of the St. Mary and Milk Rivers today and into the future. The ISMMRSB Work Plan is posted here: https://www.ijc.org/sites/default/files/ISMMRSB_Final_Work_Plan_20230401.pdf

*Image of the Hoodoo badlands at Writing-on-Stone Park and Aisinaipi National Historic Site in Alberta, Canada used under license from Shutterstock.com