

Basin Report: Missouri River

The Missouri is the longest river in the United States and has a watershed of more than 500,000 square miles. It includes portions of 10 states and one Canadian province and encompasses approximately one-sixth of the United States. The Missouri drains the largest watershed within the United States and produces annual yields of 40,000,000 acre-feet. Reclamation has constructed more than 40 dams on Missouri River tributaries that have helped with agriculture development in the basin. The



facilities in the basin also provide significant benefits including flood control, navigation, irrigation, power, water supply, recreation, fish and wildlife and water quality. Navigation is important in the lower basin states. Water-based recreation is another important activity and includes boating, boating related activities and swimming. To protect these critical resources, Reclamation must continually evaluate and report on the risks and impacts from a changing climate and to identify appropriate adaptation and mitigation strategies utilizing the best available science in conjunction with stakeholders.

Future Changes in Climate and Hydrology

Reclamation's 2011 SECURE Water Act Report identifies climate challenges the Missouri River Basin could likely face:

- Temperature is projected to increase by roughly 5°F - 6°F during the 21st century with precipitation projected to increase from 0.6 to 7.3% over the basin by 2050.
- Mean annual basin runoff is projected to increase as much as 9.7%, with higher variability in sub-basin runoff.
- Moisture falling as rain instead of snow at lower elevations may increase the wintertime runoff with decreased runoff during the summer.

Future Impacts for Water and Environmental Resources

Historical and projected climate changes have potential impacts for the basin:

- Runoff decreases during the spring and early summer likely translate into water supply reductions for meeting irrigation demands, adversely impacting hydropower operations and increasing wintertime flood control challenges.
- Warmer conditions might increase fishery stress, increase electricity demand, increase water demands for instream ecosystems and thermoelectric cooling, increase invasive species infestations and further shrink the prairie pothole region.
- Climate changes in the Missouri Basin could lead to declines in basin hydropower generation and moderate decreases in local water supplies.

Adequate and safe water supplies are fundamental to the health, economy and ecology of the United States and global climate change poses a significant challenge to the protection of these resources. Reclamation is taking a leading role in assessing risks to Western U.S. water resources and is dedicated to mitigate risks to ensure long-term water resource sustainability. To this end, Reclamation is refining these preliminary results through detailed basin studies on the St. Mary, Milk and Niobrara Rivers, tributaries to the Missouri, under its WaterSMART program.

Where opportunities exist, Reclamation has begun adaptation actions in response to climate stresses as well as land use, population growth, invasive species and others. These activities include extending water supplies, water conservation, hydropower production, planning for future operations and supporting rural water development. Further, the Department of the Interior High Priority Goal for Climate includes activities of the Landscape Conservation Cooperatives and Climate Science Centers, assessing vulnerabilities to the natural and cultural resources management by the Department and activities to adapt to the stresses of climate change.

This fact sheet contains information from the SECURE Water Act Section 9503(c) - Reclamation Climate Change and Water 2011, Section 5 - Basin Report: Missouri. The full report may be read online at www.usbr.gov/climate.