

Republican River Basin Impacts of Non-Federal Reservoirs and Land Terracing on Basin Water Supplies

**Final Report
from the
Republican River Compact Settlement Conservation Committee
for The Republican River Compact Administration
June 2014**

Executive Summary

Kansas filed suit in the U.S. Supreme Court in May 1998 complaining that the State of Nebraska had violated the Republican River Compact. The three original parties to the Compact, Kansas, Nebraska, and Colorado, became parties to the case and the United States entered the case as *amicus curiae*. The parties agreed to a settlement and the United States Supreme Court approved the Final Settlement Stipulation by decree on May 19, 2003.

The Stipulation required the States to form a committee to develop a study plan to determine the quantitative effects of Non-Federal Reservoirs and land terracing practices on water supplies in the Republican River Basin above Hardy, Nebraska. The Conservation Committee transmitted the study plan to members of the Republican River Compact Administration (RRCA) in April 2004. The RRCA approved the study plan during the meeting on July 27, 2004. The Conservation Committee provided an annual status report on progress of the study to the RRCA annually.

The purpose of this report is to document the study methods and procedures and report the findings of the study to determine the quantitative effects of Non-Federal Reservoirs and land terracing practices on water supplies in the Republican River Basin above Hardy, Nebraska.

The study area consists of the portion of the Republican River Basin above the measuring gage near Hardy, Nebraska (Figure 1). The study area consists of an area of 22,401 square miles (14,336,640 acres) with a drainage area of 14,901 square miles (9,536,640 acres) that contribute runoff to the Hardy gage. Non-Federal Reservoirs are reservoirs other than federal reservoirs that have a storage capacity of 15 acre-feet or greater at the principal spillway elevation. There are 716 of these reservoirs within the study area. The states identified six Non-Federal Reservoirs in Colorado, 148 in Kansas, and 562 in Nebraska. Terraces provide protection for approximately 2.13 million acres of land in the Republican River Basin, which is equivalent to 15 percent of the total area of the study area and about 22 percent of the contributing area in the study area. Colorado has about 290,000 acres of terraced land, Kansas has about 923,000 acres, and Nebraska has about 919,000 acres.

Water balance models for this study simulate the impact of terraces and Non-Federal Reservoirs on surface water supplies. The study consists of four primary components:

- Field investigations to better understand the water balance of the Non-Federal Reservoirs and land terraces,
- Development of databases for model input,
- Evaluation and modification of existing simulation models, and
- Application of the water balance and GIS models to summarize the impact from basins with Non-Federal Reservoirs and land terraces.