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Kansas, the Flint Hills, and Water

Susan Stover

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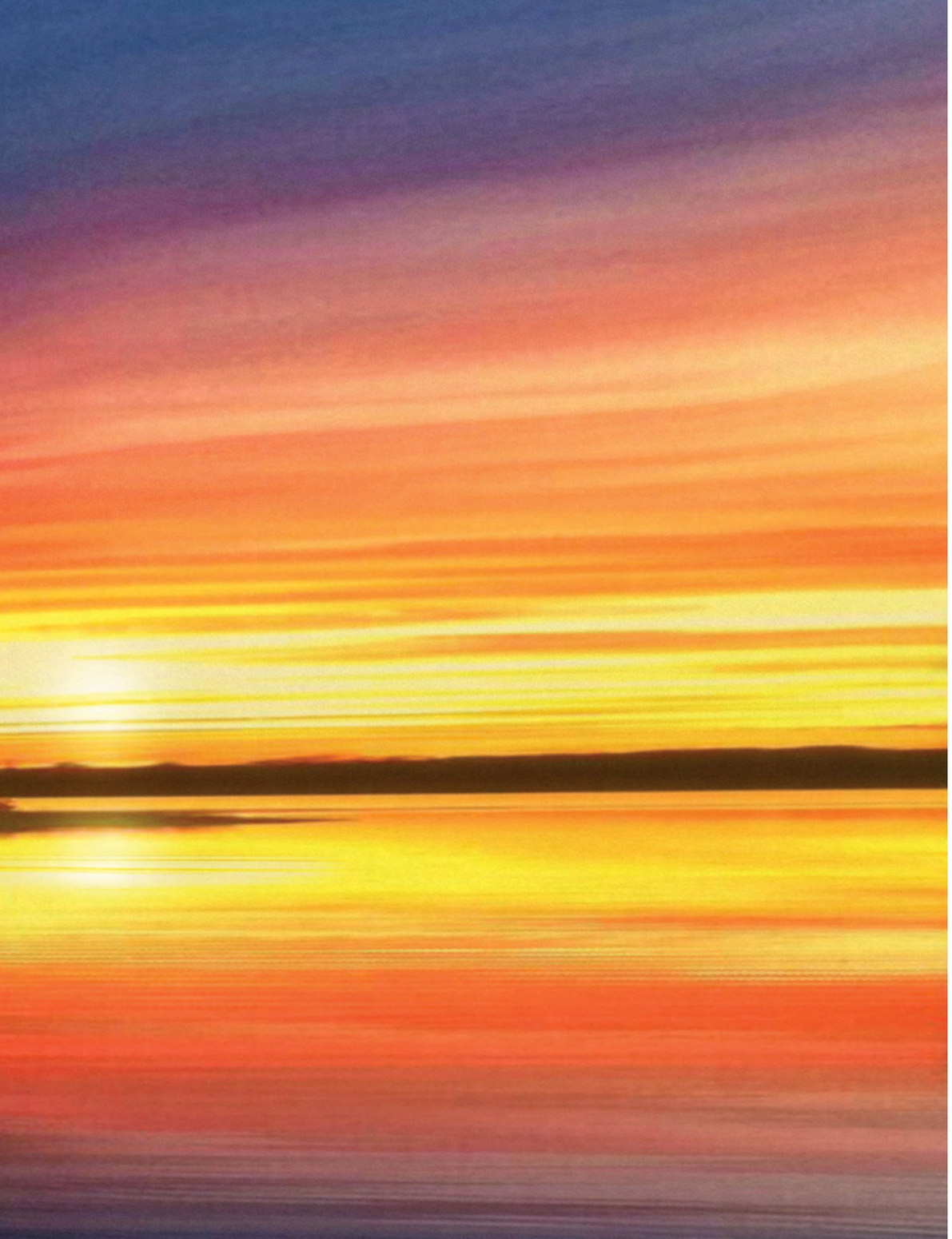

Kansas, the Flint Hills, and Water

Water has carved the distinctive rolling landscape of the Flint Hills, with its limestone ledges and hilltops thick with chert gravel. Water has also shaped how people have settled across Kansas and made use of the land. Early travelers followed the rivers. Prior to the railroad the Arkansas and Kansas Rivers served to transport people and goods.

In June 1855, the steamboat *Hartford* ran aground on its way to Fort Riley; the immigrants aboard considered their options and stayed to establish the town of Manhattan. Water was proposed as the northern boundary when statehood was discussed: the Platte River formed a natural boundary between the Kansas and Nebraska territories, being too wide to bridge and too shallow to ferry across. Reportedly, politics played a large role in the decision not to annex southern Nebraska into the new state of Kansas, as Republicans at the Wyandotte Constitutional Convention in 1859 thought it would add too many Democrats. That decision has left Kansas and Nebraska in protracted disagreements in regard to

OPPOSITE PAGE: SUNSET STRATAS, EL DORADO LAKE
Rod Seel

TOP: PEOPLE IN CANOE
ABOVE: TWO FISHERMEN
Courtesy Butler County History Center and Kansas Oil Musuem

equitably sharing the Republican River, which weaves between our states.

The quantity and availability of water vary markedly across Kansas. The change in precipitation from western Kansas to its eastern border differs as much as eastern Kansas to the east coast of the United States. Western Kansas has low rainfall and limited surface water. The impressive agricultural production in western Kansas relies on groundwater from one of the world's great aquifers, the Ogallala High Plains. The eastern half of Kansas has higher rainfall and more reliable streams. Surface water provides the dominant source for most uses in eastern Kansas.

Water in the Flint Hills comes primarily from the rivers that cross this region, including portions of the Smoky Hill, Republican, Kansas, Neosho, Cottonwood, and Walnut Rivers. There is groundwater use from alluvial aquifers adjacent to rivers where fluvial deposits hold usable amounts of water, such as along the Smoky Hill and Kansas Rivers, and the Cottonwood and Whitewater Rivers. The Flint Hills aquifer has limited water in the Permian-aged limestone beds, with yields sufficient for domestic and stockwater wells. In total, though, most use in the Flint Hills comes from surface water.

Water belongs to the people of Kansas. Since 1945, ground and surface water rights are based on prior appropriation:

first in time, first in right. When there isn't enough to meet all water needs, it is the senior right that gets the water. Once approved by the Chief Engineer-Division of Water Resources, Kansas Department of Agriculture, a water right allows the owner to use water for a specified, beneficial purpose. As long as the water right stays in good standing, the water right is permanent and can be passed to the next landowner. A water right can be sold, and its priority date stays with it, even if the type of use changes. Riparian landowners along Kansas streams do not have a right to the water without a water right; however, on most streams their property includes the river bank and bed. The implication for fishermen, canoeists, and other users is that access or travel on most streams requires permission from the adjacent landowners. The exceptions are the Missouri, Kansas, and Arkansas Rivers, which are state-owned to the high water mark and open to the public.

There isn't a water right for stream flow; however, Minimum Desirable Streamflow (MDS) functions much the same way. An MDS protects water quality, fish and wildlife needs, and existing water uses. There are specific flow targets established at thirty-three U.S. Geological Survey stream gauges on twenty-three rivers. When an MDS isn't met for seven consecutive days, water rights that are MDS-junior may be required to reduce or stop pumping. During the recent droughts, many streams did not meet MDS and

BEAUMONT
WATER TOWER
Stephen Perry

hundreds of junior water rights were administered, including along Chapman Creek in Dickinson County, Walnut River at Winfield, and Whitewater River near Towanda.

Kansas has few natural lakes but is fortunate to have twenty-three federal reservoirs, more than forty state fishing lakes, seventy-five municipal lakes, and an estimated quarter million farm ponds and small impoundments. Federal reservoirs in the Flint Hills are Tuttle Creek, Milford, Council Grove, Marion, and El Dorado. John Redmond Reservoir is fed by a watershed that partly lies in the Flint Hills. The State owns storage in thirteen of the federal reservoirs for municipal and industrial use, including all but El Dorado Reservoir in the Flint Hills. A few cities also own storage in federal reservoirs, including the city of El Dorado in El Dorado Reservoir. Roughly two-thirds of Kansans depend on reservoirs for at least a portion of their water supply. Additionally, nearly 60 percent of Kansas power plant energy production relies on water from Kansas reservoirs.

The droughts of 2011, 2012, and 2013 remind us of the value of reservoirs; it was the releases from reservoirs that helped keep streams flowing and communities supplied with water. Water for livestock was made available during the drought emergency from several federal and state lakes. Reservoirs have a design life when built, and many are not so young anymore. Our reliance on reservoirs requires they be maintained and part of the permanent infrastructure. Besides age, the main risks to our reservoirs are sedimentation, water quality, and invasive species. Marion Reservoir has repeatedly experienced toxic algal blooms. Zebra mussels are small, razor-sharp, and they cover most hard surfaces, often clogging water intake pipes. They have spread to all of the federal reservoirs in the Flint Hills, except for Tuttle Creek, and have also invaded Winfield City Lake, Chase County State Fishing Lake, and Council Grove City Lake. Sedimentation is a major concern as storage capacity is lost; over 30 percent of Council Grove and roughly 40 percent of Tuttle Creek and John Redmond state-owned storage is gone. Efforts to slow sedimentation occur through stream-bank stabilization and best management practices. Restoring lost reservoir capacity is also needed, with John Redmond Reservoir the priority for dredging. Reservoirs are essential to meet current demands in the event of an extended drought similar to the 1950s. Kansas is experiencing a warming climate and is projected to get more extreme weather. Total annual precipitation may be similar but may occur in less frequent, more intense storms. Well-maintained reservoirs will help us manage the floods and provide water during the extended dry spells.

Population and economic growth depend on reliable, clean water. Our rivers require the same to maintain aquatic life, ecological function, and aesthetic value. Water will shape our future, just as it has our past.

TOP: SHADOW ON EL DORADO LAKE
ABOVE: GROUND FOG
Neil Marcus

Susan Stover, a professional geologist and environmental scientist, is manager of High Plains Issues at the Kansas Water Office. She also serves on the Kansas Water Research Institute Committee, the Kansas Geologic Mapping Advisory Committee, and chairs the Geological Society of America's Geology and Public Policy Committee. She holds an M.S. in geology from the University of Kansas.