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perspective

Less water, more people

Two factors loom in our region's future

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The Denver Post

Article Last Updated:04/13/2007 10:45:12 PM MDT

Prolonged drought, perilous forest conditions and rapid population growth are combining to create serious challenges for the eight-state Rocky Mountain region.

With increased population growth and continued drought-like conditions becoming a regional norm, how will the Rockies manage competing needs, particularly allocation of the region's already scarce water? That was the key question that the 2007 Colorado College State of the Rockies Project examined.

The issue of sustainability increasingly permeates discussion of water distribution in the Rockies. Limited in supply and often separated from "higher-value users," water has and will continue to be a fundamental challenge for Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah and Wyoming. The sustainability and livability of the Rockies, so valued by millions of residents and visitors, depends largely on how this limited, variable and potentially shrinking supply is managed in the face of myriad challenges, ranging from climate change to rapid urban growth. Water supplies must sustain both human and environmental needs if the region is to retain vitality and viability.

Predictions of climate change in the Rockies have three major implications. The average temperature in the Rockies is expected to warm by 3 to 7 degrees Celsius during the next 100 years, and snowpack scenarios show losses of up to 50 percent in much of the region. Precipitation predictions vary. Some show marginal increases in rainfall, which could make up for some loss of snowpack; others argue that any additional winter moisture will not increase spring stream flows. Most experts agree that regional precipitation patterns will become more variable and less predictable.

Information from a 2007 National Academy of Sciences study indicates that severe droughts experienced in portions of the Rockies, including the Colorado River Basin, in the 1990s and 2000s now appear to be the expected norm for the future, rather than isolated exceptions. Further, residents are warned the region must prepare for more frequent and severe dry spells. The National Wildlife Federation reports that winter snowpack, the source of nearly 75 percent of the region's water supply, has declined by 33 percent in the northern Rocky Mountain region since 1950. This and other studies argue that global warming trends will make water availability in the Rockies even more limited, with less precipitation as snow at high elevations, thus compromising the region's extensive water collection and storage systems.

Healthy forests embody the scenic beauty and environmental quality of the Rockies and cover much of the eight-state region - 68 percent by one estimate. These forests provide critical wildlife habitat, protect watersheds and sequester carbon dioxide. Forests also supply economic resources to the region, including recreational opportunities and timber. Protecting forests for future generations requires an integrated assessment of their health, ecosystem cycles, future climate change, urban growth patterns and public policies. However, managing vast forested areas is costly and complex. Environmental regulations restrict development within forests, but increasing numbers of people live near national forests, and public opposition has challenged some forest management techniques such as prescribed burns and salvage logging.

Given decades of fire suppression, how can forests return to a more natural state, and would that replicate conditions prior to human intervention? To address this question, one must first determine which areas have been significantly altered in terms of vegetation, fuel composition and fire frequency and severity. Colorado's Front Range alone contains approximately 800,000 forested acres that have been significantly altered.

In addition to large forest fires, insect and disease infestations affect forest health. These infestations also exacerbate fire risk by killing mature trees, providing readily burnable fuel. Mountain pine beetle, piñon ips beetle, white pine blister rust, and heart-rot fungi are some infestations damaging forests in the Rockies.

Data presented in the 2007 State of the Rockies Report Card show more than 21 million acres of diseased forest in the West. Counties in the region with the largest number of diseased forest acres include Idaho County, Idaho, 1.5 million acres; Coconino, Ariz., 1 million acres; Nye, Nev., 614,000 acres; and Flathead, Mont., and Teton, Wyo., 500,000 acres each.

Recent human development is a third factor affecting forest health in the Rockies, particularly in urban areas near national forests where housing and forested areas are interspersed. Soaring population growth in the Rockies reflects the abundant natural and recreational amenities of this region, but new residents may not be aware of either the threats they pose to nearby forests or the danger diseased forests present to their new lifestyles.

One useful measure of human-forest interaction is the growing wild land-urban interface, defined as a wild land area within a half-mile of housing with a density greater than one house per 40 acres. This interface is expected to double in the next 20 years. Colorado's Front Range alone has 1.1 million such acres. A recent New York Times article estimates that since 1990, more than 8 million homes have been built in the burgeoning wild land-urban interface in the Western.

The Rockies Project identified a county-by-county measure of fire risk and calculated the top 10 counties most at risk. Of them, seven are in Arizona: Maricopa, Pima, Pinal, Navajo, Coconino, Mohave and Yavapai. Other high-risk fire counties are Clark, Nev.; Santa Fe, N.M.;

and El Paso County in Colorado.

Rapid population growth, perhaps above all else, fuels change in the Rockies. The explosion of people, when mixed with other regional trends, threatens the Rockies profoundly. The steady influx of people contributes to the strength of the economy and social fabric of the region. But with them comes added pressure on the infrastructure and natural amenities. Included in the changes sparked by the current population explosion are major modifications to the size and character of the metropolitan centers.

Between 2000 and 2005, the population of the Rocky Mountain region grew 9 percent, 4.5 times the national rate. Contrary to the perception of being mostly rural, the population of the Rockies actually is more urbanized than the U.S. as a whole. In 2005, 83 percent of Rockies residents lived in an urban area, compared to 79 percent nationally. In 1950, 55 percent of Rockies residents lived in an urban area, and in 1900, only 32 percent did.

Rapid population growth coincides with an increase in urban construction. A Brookings Institution report finds that six of the top states in the U.S. for predicted growth in residential housing units over the next 25 years are in the Rocky Mountain West, with Nevada, Arizona and Utah being the top three. A closer look at metropolitan statistical areas in the Rockies yields similar growth trends. Predicted growth of housing units places Las Vegas first, followed by Phoenix, Salt Lake City, Tucson and Denver. One important component of growth in the Rockies is the increase in those aged 65 and older, a boom within a boom. Between 2000 and 2005, the elderly population in the West grew by 45 percent, a higher rate than in any other region. Many cities in the region have experienced double-digit growth of their elderly population, including St. George, Utah, 27 percent; Las Vegas-Paradise, Nev., 22 percent; Santa Fe, N.M., 17 percent; and Colorado Springs and Fort Collins, both 11 percent.

As more people move into urban and suburban areas, opportunities and challenges arise. Urban growth manifests itself not just in the familiar sprawl pattern, but also in planned and thematic developments. Trends toward new urbanism result in different approaches toward combining housing, recreation, basic health care and employment in one location. Such trends will help define - and perhaps maintain the region's quality of life - in the 21st century.

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