

Study compares growth around Yellowstone, Glacier and other national parks

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The land around Yellowstone and Glacier national parks might look like it's filling up with people and houses, but it's nothing compared to the rate of development around some other U.S. national parks, according to a new Montana State University study.

While [population densities](#) rose 246 percent around Yellowstone/Grand Teton and 210 percent around Glacier between 1940 and 2000, they surged 3,092 percent around the Mojave National Preserve in California, 2,962 percent around the Colorado River parks and almost 2,473 percent around the [Everglades National Park/Big Cypress National Park](#) in Florida.

While housing densities grew 13.2 percent around Yellowstone and 11.4 percent around Glacier, they increased 75.6 percent around the Santa Monica Mountains National Recreation Area in California.

"We are quite impressed locally with the increase in density of rural homes around both parks and with the density of people that live around the ecosystem, but when compared to 57 parks, we are quite on the lower end of that development," MSU ecologist Andrew Hansen said of Yellowstone and Glacier.

After conducting the country's first study into population density and land use changes in the ecosystems around U.S. [national parks](#), Hansen and lead author Cory Davis published their findings in "[Ecological Applications](#)," a journal published by the [Ecological Society of America](#).

Davis, a former biologist at Glacier National Park, is an MSU graduate student in ecology and works as a research associate in the College of Forestry and Conservation at the University of Montana. Hansen is a professor in MSU's Department of Ecology.

The MSU study -- which complemented a UM study on [climate change](#) -- focused on 57 national parks in the lower 48 states and found that population densities around the parks rose an average of 224 percent between 1940 and 2000, while housing densities grew 329 percent. Those surprising increases are considerably higher than the national increases in population and housing densities in the United States during the same time.

At the same time, the researchers noted that the increases were averages. Changes differed widely among the 57 parks in their study.

"Parks largely in the East like Great Smoky Mountain changed dramatically from being surrounded mostly by forests and farms to cities, suburbs and ranchettes," Hansen said. "This was also true at a moderate level for some western parks such as Olympic and Rocky Mountain. Others, such as Yellowstone and Bighorn Canyon, that we locally think are changing rapidly, had very slow rates of growth relative to the national rates."

In the course of their work, the researchers divided the 57 national parks into five categories according to types and rates of land use change around the parks. Twenty-five parks were classified as wildland-protected. Sixteen were "wildland developable." Five were agricultural. Eight were exurban. Three were urban.

Yellowstone, Glacier, the Grand Canyon and Yosemite National Park were among the wildland-protected parks. As such, they share some common issues, Hansen said. The parks may experience increasing

conflicts between humans and wildlife as private land is developed outside their boundaries, for example. Administrators may have to work to maintain or, potentially, restore top predators to their ecosystems. They may be concerned about resource extraction disrupting migration corridors, wintering grounds or key ecological processes if federal or state mandates allow mining, logging and livestock grazing near the parks. Many of the private lands around wildland parks are protected by conservation easements and support wildlife, such as bison on Ted Turner's Flying D Ranch near Yellowstone.

Approximately 35 percent of the land around Yellowstone and 45 percent of the land around Glacier is private, Hansen said. Of that private land, 75 percent remains undeveloped. Tribal land is included in private land.

Each category in the study faces unique challenges, so the researchers hope that park administrators in the same category will band together to find solutions, Hansen said.

For their study, Hansen and Davis selected large national parks that were located in the lower 48 states and had significant natural resources. They excluded parks that were primarily surrounded by water and parks that were managed for their cultural resources. Their final selections represent a wide distribution of climate and land uses. Those parks are managed primarily for natural values, biodiversity or recreation.

Davis and Hansen then looked at development on the land outside the parks. The size of those "protected-area centered ecosystems," or PACES, was determined by what was needed to sustain the species and ecological processes present within the parks.

Davis and Hansen conducted their study with statistics from the U.S. Census between 1940 through 2000, the latest year that Census figures

were available while the study was being conducted. They updated their findings with 2007 estimates of population and housing densities.

The researchers also visited several national parks and worked with park administrators and staff for their study. Among them was John Gross, climate change [ecologist](#) in the National Park Service's Inventory and Monitoring Program.

"I was impressed with the thoughtfulness of their analyses and with the clarity of the presentation of results," Gross wrote by email.

"This study greatly expanded the estimation of the PACEs, and parks have found these useful to help identify scientifically credible and defensible areas for monitoring, identifying conservation issues, and for other planning purposes," Gross continued. "We are using the PACEs as the basis for defining study areas as we further examine threats to park resources and try to anticipate actions that might prevent degradation or loss of park resources due to activities outside parks."

Provided by Montana State University

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