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Greater Yellowstone: An Ecosystem In Peril

BOZEMAN, Mont. — Summers in Yellowstone National Park could average 9.7 degrees hotter in the next 60-90 years, making them as hot as the Los Angeles suburb of Culver City and precipitating dramatic changes for the Yellowstone region's fish, wildlife and recreation, according to a report issued jointly Tuesday by the Rocky Mountain Climate Organization (RMCO) and Greater Yellowstone Coalition (GYC).

The first-ever comprehensive report on climate-change effects in the Greater Yellowstone Ecosystem also documents widespread changes already under way that are consistent with expected climate changes:

- The last decade, the hottest on record, was 1.4 degrees above the region's 20th century average, and above the global average of 1.0 degree. Summers in the past decade averaged 2.3 degrees hotter.
- Whitebark pine, the dominant and ecologically key tree species of the region's highest forests, is already in steep decline, largely because a hotter climate has allowed an epidemic of tree-killing mountain pine beetles in high-elevation forests that were once too cold for widespread beetle outbreaks.
- Spring snowpacks and glaciers have diminished and snowmelt is occurring earlier. Regional snowpacks in recent decades have been the lowest since the middle of the 13th century.
- Since 1972, the largest acreage burned by wildfire in the region occurred in 1988, a year of famously large fires. But the next six highest years for area burned since 1972 have all occurred from 2000-2008.
- Two studies separately have concluded that recent years in the region have been the driest since 1895, when weather measurements began.

People protecting the lands, waters, and wildlife of the Greater Yellowstone Ecosystem, now and for future generations.

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The report documents that Greater Yellowstone's forests are already being disrupted in ways that will render them fundamentally different. Nearly half of whitebark pine stands have suffered substantial mortality from the combined effects of mountain pine beetles and an introduced disease, white pine blister rust, prompting the U.S. Fish & Wildlife Service to determine that whitebarks qualify for protections under the Endangered Species Act. Two of three climate models project that with medium-high emissions of heat-trapping gases, aspens would virtually disappear from Greater Yellowstone by late century; a third model still suggests some decline, but far less drastic. A new study projects that huge fires on the scale of those of 1988 could occur five times in the next four decades.

The region can expect a major reduction of its world-renowned native cutthroat trout as well as substantial impacts on grizzly bears, wolverines, lynx and other wildlife for which Greater Yellowstone is famous.

According to new climate projections conducted for the report, the average of many models is for Yellowstone National Park summers to get 9.7 degrees hotter by 2070-2099 with medium-high future emissions. With a scenario of lower emissions, the average projection is for summers to get 5.6 degrees hotter. This illustrates that the most extreme effects of climate change can be avoided by taking action to reduce emissions. In fact, even the lower-emissions scenario does not assume new policies to reduce heat-trapping pollutants, and with new policies it would be possible to hold future climate change to an even smaller degree.

The effects of a disrupted climate threaten not only Greater Yellowstone's ecology but also a \$700 million annual tourism economy dependent on the region's unique resources, says the report, which also notes that surveys indicate visitation could be substantially impacted by warming temperatures.

"What we humans are doing to the climate isn't just melting polar ice caps, it's disrupting the places that are nearest and dearest to us," said Stephen Saunders, RMCO president and lead author of the report. "Already, threads are being pulled out of the tapestries of Yellowstone and other special places, and they are losing some of their luster."

"The good news is that we still have time to make important choices that will influence how climate change affects Greater Yellowstone's iconic fish and wildlife," said Scott Christensen, the Bozeman-based conservation group's climate change program director. "Protecting the ability of wildlife to move and migrate and restoring degraded habitats to increase resilience to change are two things we can do today that will give species a better chance to adapt and survive as temperatures warm."

The RMCO-GYC report, "Greater Yellowstone in Peril: The Threats of Climate Disruption," includes new temperature projections and analyses. Otherwise, the report summarizes numerous peer-reviewed scientific and government climate studies as well as consultations with scientists working in Yellowstone and Grand Teton national parks.

To view the report online, go to www.greateryellowstone.org/climatechange or http://www.rockymountainclimate.org/programs_14.htm.