

Rocky Mountain National Park

Climate Change

How is affecting us?

Global climate change in the Park

Global climate change has many implications across the globe. In Rocky Mountain National Park (RMNP) the effects of changing climate have been noted in a few key ways. Rising temperatures will affect the park through the interaction of water availability, precipitation and runoff patterns, and fires. Furthermore, it has the potential to raise the tree line ecosystem higher into the mountains and drastically affect plant and animal habitats.

Water Resources

As temperatures have increased, the Rocky Mountain region has seen an increase in below average precipitation years. This trend is alarming because water is already in short supply throughout the Rockies and the Great Basin. Water is a limiting resource both in terms of controlling the ability of plants to grow in this region, and limiting the rate and extent of growth for plants already living here. In effect, precipitation patterns will also have a considerable effect on animal populations in the park as well. Decreased precipitation breeds dangerously dry conditions in an already dry ecosystem.

• *Runoff patterns and precipitation*

Additionally, warmer temperatures, coupled with less precipitation have worked to change water patterns in the mountains. With warmer temperatures rain extends further into the fall before turning into snow, and begins again earlier in the spring.



Loch Vale in winter, Rocky Mountain National Park.
Photo by Jesse Spears.

This trend has begun to change melting and runoff patterns, altering when peak flow occurs in many mountain streams. This has ramifications for water availability and resource planning in other parts of the state. The decrease in water availability can hurt local economies like the Grand Lake community, which depend on water availability to support summer recreation on Grand Lake.

• *Glaciers*

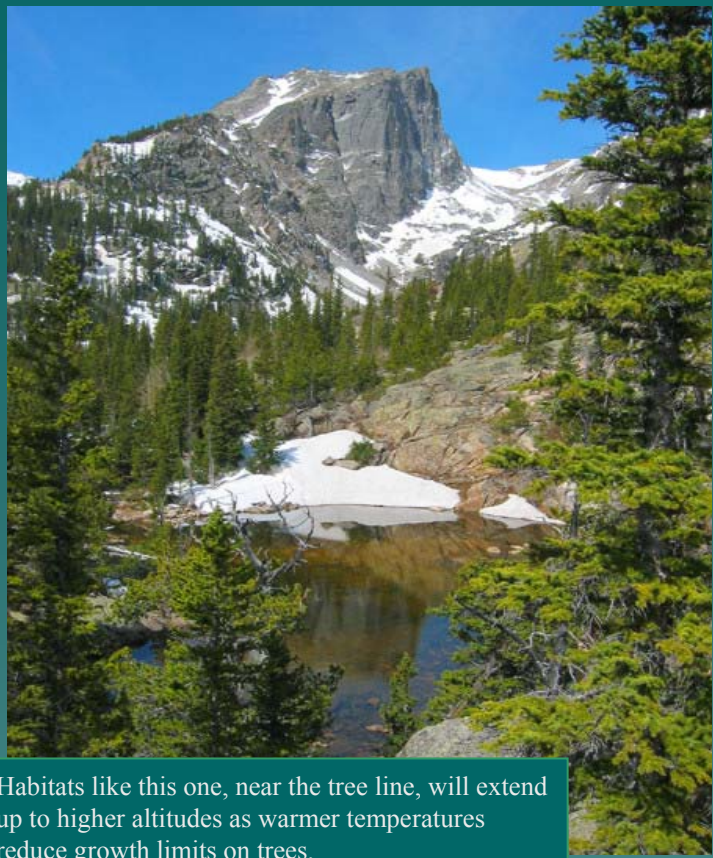
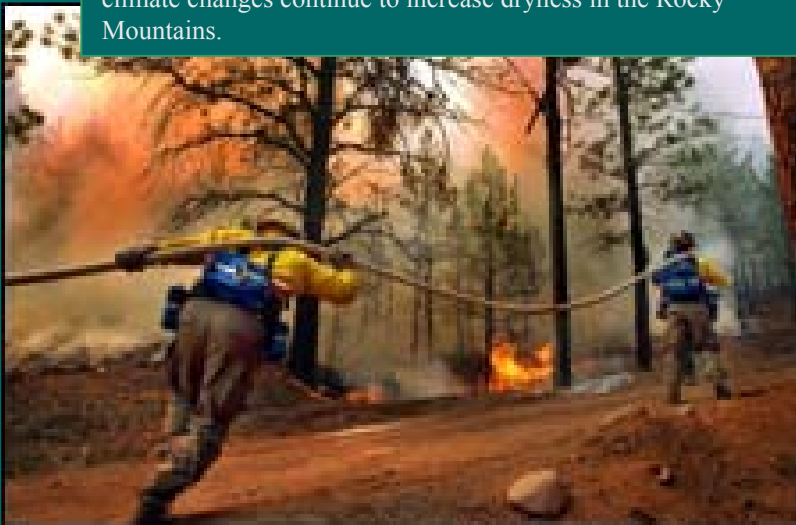
Coupled with the problems of temperature and water resources, is the problem of glacial shrinkage. Glaciers in the nearby area have shrunken significantly in recent decades. The Arapahoe glacier, in Rainbow Peaks Wilderness Area, has shown surface drops of nearly 130 feet. Such trends can have significant consequences in RMNP, where many fish in alpine lakes, depend on late season glacial runoff for survival.

Fires

The danger of increased temperature and dryness in this region, spawns from its affect on various fire regimes within the park. A fire regime is a zone with conditions that cause fires to act according to certain patterns. For the most part RMNP is a subalpine ecosystem. This means that the danger of fires resulting from dry conditions increases because we have large trees that rely on water to keep them healthy enough to avoid serious burning in forest fires. RMNP suffers because dry conditions serve to decimate our large trees by drying them to the point where they will burn completely. Thus, when fire conditions are right, Rocky Mountain National Park's forests have the potential to burn to the ground rather than to lose just understory brush, like many areas do.

In the last ten years three large fires have burned through parts of the Rocky Mountains. These fires may be indicative of a larger trend if dry conditions in the west continue.

Forest fires may be a more frequent and dangerous occurrence if climate changes continue to increase dryness in the Rocky Mountains.



Habitats like this one, near the tree line, will extend up to higher altitudes as warmer temperatures reduce growth limits on trees.

Ecosystem Effects

Temperature changes and dryness are already being blamed for unprecedented upward growth of trees along the tree line. Such changes will affect the forest-tundra ecosystem by pushing plants and animals up the alpine gradient and encroaching on those plants and animals that already live above the tree line. Additionally, warmer temperatures in lakes and streams in the park may make them unable to house certain trout species. Mountain ecosystems often house many endemic species, so physical changes to local ecosystems in RMNP may also have profound effects on their populations.

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