

Southwest Drylands: What's Happening and What's Ahead?

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Many of Southwest's ecosystems are drylands—arid or semiarid—and include deserts, shrublands and woodlands. Several major changes are already occurring within these ecosystems and even greater changes are projected to occur. Some of the most recent assessments for this region are included within a recent report by the US Climate Change Science Program (Synthesis and Assessment Product 4.3). These findings highlight important interrelationships among climate, water availability, vegetation change, fire, and erosion. The most relevant findings for the Southwest US include the following:

- Climate change has very likely increased the size and number of forest fires, insect outbreaks, and tree mortality in the interior West, the Southwest, and Alaska, and will continue to do so.
- Higher temperatures, increased drought, and more intense thunderstorms will very likely increase erosion and promote invasion of exotic grass species in arid lands.

Climate change in arid lands will create physical conditions conducive to wildfire, and the proliferation of exotic grasses will provide fuel, thus causing fire frequencies to increase in a self-reinforcing fashion.

- In arid regions where ecosystems have not coevolved with a fire cycle, the probability of loss of iconic, charismatic megafauna such as saguaro cacti and Joshua trees is very likely.
- Arid lands very likely do not have a large capacity to absorb CO₂ from the atmosphere and will likely lose carbon as climate-induced disturbance increases.
- River and riparian ecosystems in arid lands will very likely be negatively impacted by decreased streamflow, increased water removal, and greater competition from nonnative species.
- Changes in temperature and precipitation will very likely decrease the cover of vegetation that protects the ground surface from wind and water erosion.

Although some changes may be somewhat slow and gradual, many changes may be rapid and dramatic. A case study of drought-induced die-off across Southwestern woodlands is highlighted as an example of such a change.

Related references:

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