

Forests

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Key Message 7.1

Forests Are Increasingly Affected by Climate Change and Disturbances

Climate change is increasing the frequency, scale, and severity of some disturbances that drive forest change and affect ecosystem services (*high confidence*). Continued warming and regional changes in precipitation are expected to amplify interactions among disturbance agents (*likely, high confidence*) and further alter forest ecosystem structure and function (*likely, high confidence*).

Key Message 7.2

Climate Change Affects Ecosystem Services Provided by Forests

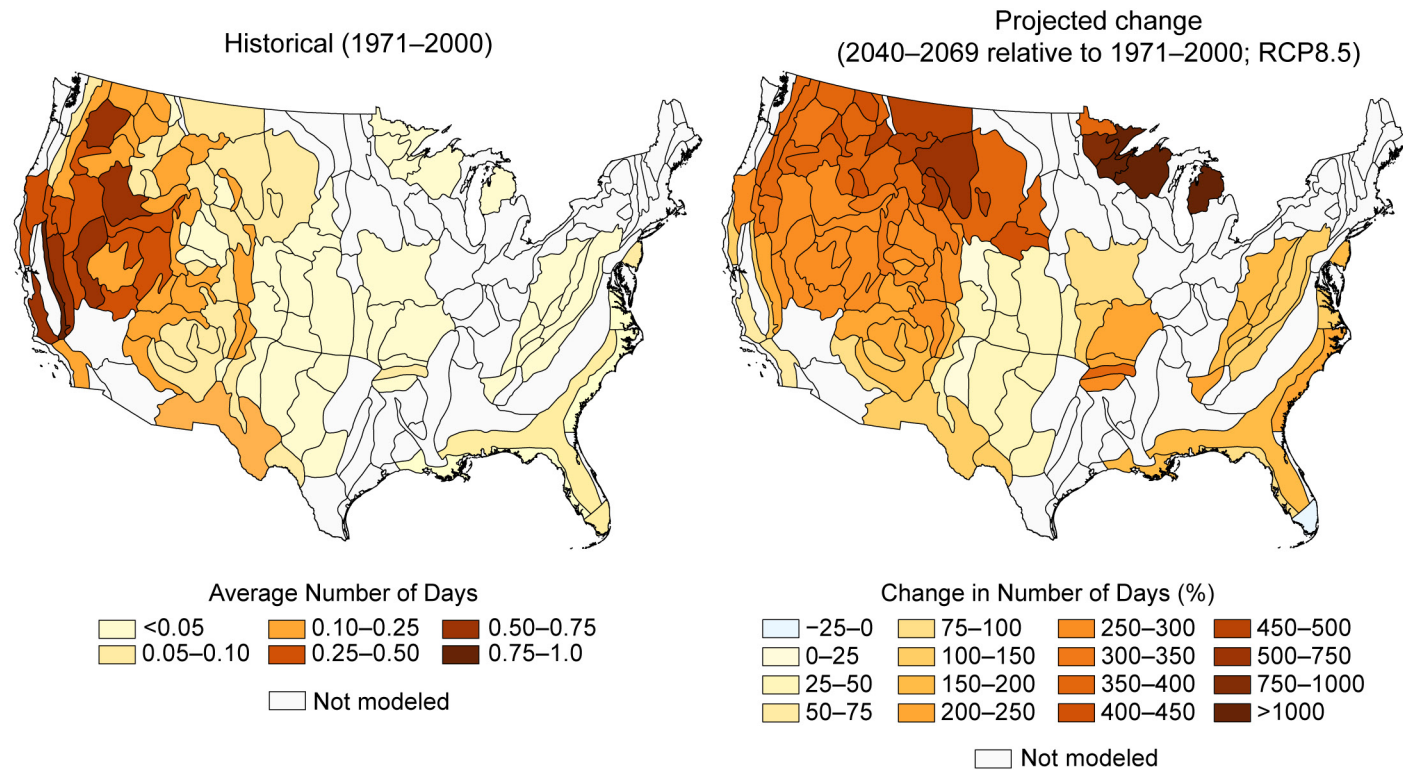
Climate change threatens the ecosystem services forests provide that enrich human lives and sustain life more broadly. Increasing temperatures, changing precipitation patterns, and altered disturbances are affecting the capacity of forest ecosystems to sequester and store carbon (*high confidence*), provide clean water and clean air (*high confidence*), produce timber and non-timber products (*high confidence*), and provide recreation (*medium confidence*), among other benefits. Future climate effects will interact with societal changes to determine the capacity of forests to provide ecosystem services (*likely, high confidence*).

Key Message 7.3

Adaptation Actions Are Necessary for Maintaining Resilient Forest Ecosystems

Climate change creates challenges for natural resource managers charged with preserving the function, health, and productivity of forest ecosystems (*high confidence*). Forest landowners, managers, and policymakers working at local, state, Tribal, and federal levels are preparing for climate change through the development and implementation of vulnerability assessments and adaptation plans (*medium confidence*). Proactive adaptation of management strategies that create, maintain, and restore resilient forest ecosystems are critical to maintaining equitable provisioning of ecosystem services (*medium confidence*).

Very Large Fires



Conditions conducive to very large fires are projected to increase.

Figure 7.4. The left panel shows historical (1971–2000) values for the annual number of days in May through October with extreme weather conditions conducive to very large fires (VLFs; more than 12,000 acres). The right panel shows the percent change in the number of days for a projected future (2040–2069) climate under a very high scenario (RCP8.5). Changes are summarized by Bailey ecoregions, which are areas of similar vegetation and climate defined by Bailey (2016). The number of days with conditions associated with VLFs more than doubles in many ecoregions, with more than a fourfold increase for parts of the Northwest, fivefold for the northern Rockies, and over sevenfold for the Upper Midwest. Projected conditions are an average of a 17-GCM (global climate model) ensemble selected for data availability. Areas with no color indicate lack of data (sufficient data are unavailable or where wildfires were historically rare). Data were unavailable for Alaska, Hawai'i and the Affiliated US Pacific Islands, and the US Caribbean. Figure credit: USGS. See full chapter for detailed citation.

Recommended Citation

Domke, G.M., C.J. Fettig, A.S. Marsh, M. Baumflek, W.A. Gould, J.E. Halofsky, L.A. Joyce, S.D. LeDuc, D.H. Levinson, J.S. Littell, C.F. Miniati, M.H. Mockrin, D.L. Peterson, J. Prestemon, B.M. Sleeter, and C. Swanston, 2023: Ch. 7. Forests. In: *Fifth National Climate Assessment*. Crimmins, A.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, B.C. Stewart, and T.K. Maycock, Eds. U.S. Global Change Research Program, Washington, DC, USA. <https://doi.org/10.7930/NCA5.2023.CH7>