

Climate Change Vulnerability Assessments

What is a CCVA?

A climate change vulnerability assessment, or CCVA, is a report that synthesizes and evaluates a wide range of scientific information, including model projections and scientific papers, on the effects climate change might have on a specific area. Generally, they are focused on ecological and social resource impacts ranging from a national scale to a local or forest level.

How WWETAC makes CCVAs

Scientists and managers collaborate to develop CCVAs, sometimes with the addition of other entities or community members. This process often includes in-person workshops and webinars, and can take from a few months to multiple years to compile. CCVAs developed by WWETAC are published as peer-reviewed General Technical Reports, making them a source for the “best available science.”

What information is in a CCVA?

WWETAC CCVAs generally include:

- **Overviews of the study region:** Descriptions of local ecological and social conditions and how they have changed over time. This section may be a useful resource for new employees to learn about where they are working.
- **Descriptions of historical, present, and future climate:** Summaries of historical changes in climate, contemporary climate patterns, and projected future changes.
- **Chapters summarizing climate change vulnerabilities by resource area:** Descriptions of how changes in climate effect ecosystems, recreation, wildlife species, and hydrology are standard parts of our CCVAs, but other resource areas may be included. They synthesize peer-reviewed literature, modeling results, maps, and analysis from subject-area experts. These chapters are useful when prioritizing management actions and resource allocation.
- **Adaptation strategies and tactics:** CCVAs also provide sets of adaptation strategies and tactics tailored to local context and developed through science-management partnerships. These actions can be incorporated into land management plan direction, silvicultural prescriptions, project design, and monitoring efforts.

What is vulnerability?



There are many definitions of vulnerability, but in resource management, vulnerability* is viewed through three components:

- **Exposure:** The amount or magnitude of climate effects a location or resource will experience. This can include direct effects like increased temperatures or reduced precipitation, or indirect effects like vegetation changes and altered disturbance regimes.
- **Sensitivity:** A measure of how responsive a subject is to climate change exposure. For example, two ecosystems may experience the same exposure to climate effects, but have a different sensitivity to that exposure.
- **Adaptive Capacity:** The ability of a system or species to cope with change, or in this case, climate effects. This capacity may be an innate biological or ecological capability, like a species being able to move to follow more favorable conditions, or it may involve human intervention and management practices, like implementing novel silviculture practices.

**This definition of vulnerability comes from the fourth IPCC report (IPCC 2007)*

What are CCVAs for?

CCVAs are relevant for a number of the Forest Service's functions, including:

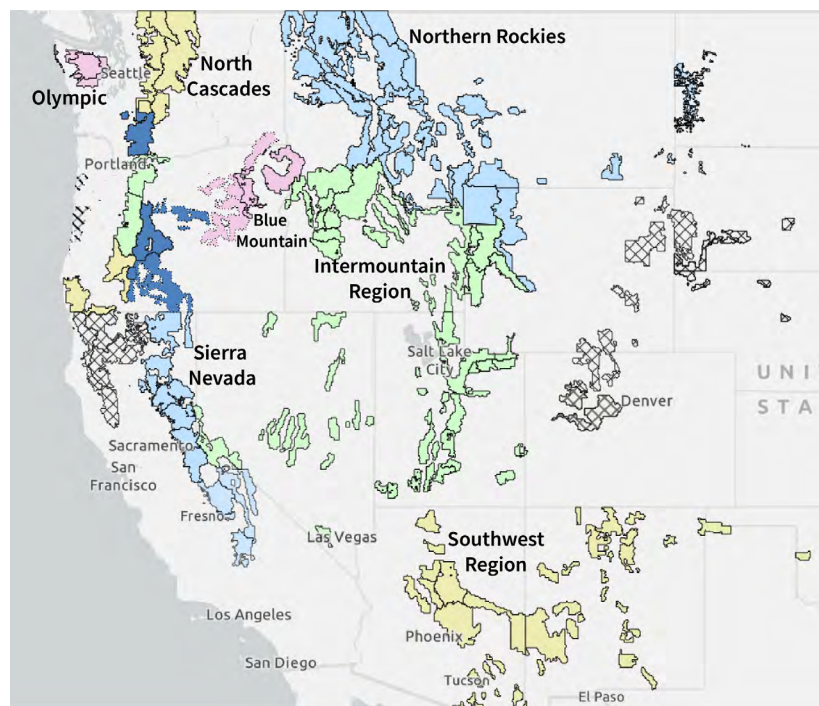
- **Land management plan revision:** Help planners address requirements in the 2012 planning rule to consider climate change when planning for ecological integrity and multiple uses (36 CFR 219).
- **Environmental analysis and decision-making:** Help units consider climate change in National Environmental Policy Act (NEPA) analyses.
- **Strategic planning:** Contain maps, descriptions of relative vulnerabilities of species and places, and other information that can inform management plans.
- **Public engagement:** Provide a source for best available science that staff can rely on when discussing ongoing environmental change with the public.
- **Funding proposals:** Strengthen proposals for funding from the Collaborative Forest Landscape Restoration Program, Joint Chiefs Landscape Restoration Program, and deferred maintenance funding authorized by the Great American Outdoors Act.

WWETAC involvement in CCVAs

WWETAC scientists and staff have taken a leading role in many of the CCVAs across the Western United States. We partner with many other entities both inside and outside the Forest Service to provide complete and timely information to managers.

Climate Adaptation Library

The information in the CCVAs has also been distilled in the [Climate Adaptation Library](#), for ease of use. This tool is a searchable online database of over 900 adaptation tactics. These tactics were developed by resource managers from the USDA Forest Service and other entities in workshops across the Western U.S.



A map of most, but not all, of the areas covered by WWETAC Climate Change Vulnerability Assessments

Available WWETAC CCVAs

Alaska

- [Chugach](#)

Intermountain Region

- [Part 1](#)
- [Part 2](#)

Pacific Northwest Region

- [Columbia River](#)
- [Mount Hood & Willamette](#)
- [Blue Mountains](#)
- [Southwest Washington](#)
- [South-central Oregon](#)
- [Southwest Oregon](#)
- [North Cascades](#)
- [Olympic Peninsula](#)
- [Oregon Coast](#)

Pacific Southwest Region

- [Sierra Nevada](#)

Northern Region

- [Northern Rockies pt 1](#)
- [Northern Rockies pt 2](#)

Southwestern Region

- [Socioeconomic vulnerability assessment](#)

To learn more about WWETAC's CCVA work, contact Jessica Halofsky (jessica.halofsky@usda.gov), or check out the Forest Service's [Climate Change Vulnerability Assessments Across the Nation storymap](#).

The Western Wildland Environmental Threat Assessment Center (WWETAC) develops and communicates the latest scientific understanding of environmental threats to the Western United States. We conduct applied science and provide tools and information to help land managers assess and respond to environmental threats, leading to more resilient landscapes. To learn more, visit <https://research.fs.usda.gov/pnw/centers/wwetac>.

USDA is an equal opportunity provider, employer, and lender.