

Southwest Climate Assessment
Chapter 7 - Weather and Climate Extremes of the Future
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The Genesis

The Southwest Climate Alliance (SWCA; <http://www.southwestclimatealliance.org/>) convened potential authors of a comprehensive assessment for the SW US on 1-4 August, 2011 in Boulder, CO. The SWCA is a multi-institution consortium with the following host institutions: three NOAA RISAs (CLIMAS, CNAP, WWA), the Department of Interior Southwest Climate Science Center (SW CSC), the Western Regional Climate Center, University of California, Davis, and University of California Los Angeles. Participants included representatives from federal agencies, non-governmental organizations, academia, and professional organizations. Potential chapters were identified and there was general consensus to characterize and communicate confidence and uncertainty in the NCA process based on the new IPCC language

The Team proposes to produce a comprehensive technical report for the Southwest Region (~100 to 150 published pages) by the March 1, 2012 deadline for the NCA. They plan to engage stakeholders more fully, and then revise the report into their own assessment document during the summer of 2012. Contributing lead authors, and potential contributing authors were identified for the following chapters: The Changing Southwest, Weather and Climate of the Southwest, Evolving Weather and Climate Conditions of the Southwest, Observed Impacts of Climate Change, The Southwest Climate of the Future—Projections of Mean Climate, The southwest Climate of the Future—Extremes and Thresholds of Change, Natural Ecosystems, Coastal Ecosystems, Water, Agriculture and Ranching, Energy Impacts, SW Urban/Metropolitan, Transportation and Infrastructure, Impacts of Climate Change in the Southwest on Public Health, Impacts of Future Climate Change in the Southwest on Border Communities, Distinct cross-cutting concerns in Southwestern Native Communities, Solution Choices for a Sustainable Southwest, Moving Forward with Imperfect Information, Research Strategies for Addressing Uncertainties.

Climate Extremes Chapter

The lead authors along with contributing authors developed this chapter and below are the executive summary.

- Understanding how and why weather and climate extremes are expected to change in SW with evolving climate warming
- Summertime heat waves and wintertime cold snaps were considered – heat waves projected to increase along with more humidity expressing in nighttime temperatures.

- Significant implications for public health, agriculture, ecosystems, energy sector, etc.
 - Winter cold snaps are projected to diminish in frequency and intensity especially in low-lying coastal valleys and east of Front Range in the Rocky Mountains.
 - Projections of precipitation extremes are not consistent especially future extremes of the Monsoon is uncertain. There are indications of enhanced winter precipitation associated with atmospheric rivers with moderate uncertainty.
 - Floods from winter storms on the western slopes of Sierra Nevada range are projected to increase in frequency and intensity. Snowmelt driven spring and summertime floods are projected to diminish in frequency and intensity. Transition from hail to rain in the Front Range is expected increase flash flood risk, especially in eastern Colorado.
 - Drought as expressed in Colorado River flow is projected to become more frequent, intense and longer-lasting resulting in water deficits. However, northern Sierra Nevada watersheds may become wetter.
 - Santa Ana winds are expected to diminish in frequency and intensity but coastal S. California is projected to become drier and hotter.
- The region is fraught with important uncertainties in terms of future projections so we suggest caution in using these results for planning.