



California's Fifth Climate Change Assessment
Draft Research Topics

Natural Lands and Biodiversity

This category includes California's Fifth Climate Change topic suggestions regarding climate impacts to natural terrestrial ecosystems, habitat, and biodiversity, including forests, deserts, shrublands/chaparral, urban forests/parks, grasslands, wetlands, and coastal lands throughout California, and how to respond to such impacts. **Each roundtable discussion includes considerations for equity, traditional knowledges, governance, and economics and financing.**

Draft Research Topics & Gaps for Discussion	
NLB 1	Impacts of climate change (including extreme events) on biodiversity, including what factors affect vulnerability and resilience, ways to identify the greatest threats to biodiversity caused by climate change, understanding how species will respond to climate change, and techniques and metrics for tracking and monitoring the impacts of climate change on biodiversity.
NLB 2	Understanding and identifying opportunities for species to adapt or be resilient to climate impacts. This includes identifying and understanding climate refugia and connectivity/migration pathways and corridors.
NLB 3	Impacts that climate change will have on invasive species and pests.
NLB 4	The role that restoration of blue carbon habitats (coastal wetlands, eelgrass, tidal marshes), deserts, mountain meadows, and shrublands/chaparral can play in achieving carbon neutrality and/or climate resilience and adaptation.
NLB 5	Combined heat and drought impacts on soil quality, soil dust levels, and resultant air quality changes in deserts and other California ecoregions.
NLB 6	Impacts of climate change on carbon fluxes on the state's natural and working lands (i.e., the extent that climate impacts threaten the stability of the stored carbon or decrease sequestration rates on California's lands).
NLB 7	The impacts of post wildfire compost application on burn scar recovery and tree planting survivor rates.
NLB 8	Impacts of climate change on the state's coastal sediment budgets, including opportunities to reuse sediment as a SLR adaptation strategy.
NLB 9	Effects of drought on fungi species, including reliant factors such as air and soil quality, and humidity, as well as the impact on fungi species important for traditional and cultural practices.
NLB 10	Impacts of climate change (i.e., increased instances of drought, pests, wildfire, etc.) on forest health and how cultural burning can build resilience to these impacts.
NLB 11	Climate change impacts on ecosystem structures, functions, and services.
NLB 12	Effects and consequences of climate change on restoration and management actions for adaptation and resilience, as well as necessary modifications to ensure actions are successful, including drought impacts and heat on prescribed fire burn windows, species migration informing biodiversity



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	conservation, sea level rise impacts on coastal wetland restoration, wildfire impacts on mountain meadow restoration.
NLB 13	Determining the appropriate densities for California's forests under a changed climate to inform desired conditions for thinning treatments.
NLB 14	Identification of the most effective strategies to manage forests for snowpack retention/headwater resources, including watershed yield measurement based on changes in forest density/basal area and restoration activities.
NLB 15	Understanding the appropriate pace, intensity, and location of forest treatments under a changing climate and identifying areas that should not be treated for ecological, social, cultural, or economic reasons.
NLB 16	Improved data on reforestation activities. This includes: the role of non-conifer species for reforestation under climate change (what species will be best suited where under a changing climate), assisted migration of tree species or tree genetics, carbon measurements, probability of natural regeneration, forest densities and spatial distribution, associated resilience benefits (biodiversity projection, mitigation of fire risk, etc.).
NLB 17	Effective types of greenspaces in urban communities for supporting biodiversity, achieving carbon neutrality, and building climate resilience.
NLB 18	Effects of large-scale forest management/treatments on streamflow, wetlands, and biodiversity.
NLB 19	Identification of the climate driven threats from geologic hazards related to sea level rise and resulting coastal erosion and landslide risks.
NLB 20	The role that process- or animal-based restoration (such as beaver restoration) can play in achieving the state's carbon neutrality and climate resilience goals.
NLB 21	Identification of potential wetland migration pathways to inform actions to build resilience to sea level rise.
NLB 22	Improvements to wildfire behavior modeling to inform predictive services, fire response, and forest management techniques (including old growth management). This includes: VPD (Vapor Pressure Deficit) role in EDD and plant stress, feedback between fire and environment, internal heat sources, role of Status Puffs, changes in monsoonal moisture patterns and lightning, improved indexes for atmospheric instability, fire weather trends, amount of ground fuels.
NLB 23	Avoided cost analysis looking at the probability of high severity wildfire and associated carbon costs in treated vs. untreated stands to help develop a more comprehensive/robust analysis of the cost of inaction.
NLB 24	Improved understanding of the combined effects extreme heat and drought on the composition and resilience of California's ecosystems and their ability to thrive.
NLB 25	Mechanisms to increase regional coordination for building ecosystem resilience, especially as species migrate across regions.