



California's Fifth Climate Change Assessment
Draft Research Topics

Working Lands, Waters and Biodiversity

This category includes California's Fifth Climate Change topic suggestions regarding climate impacts to lands and waters that are managed to fulfill some service for society, including agriculture, timberlands, rangelands, aquaculture, fisheries, and lands used for mining, 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	
WLWB 1	Effects of various agricultural and land management practices, including benefits or impacts to adjacent 30x30 conserved areas and the effects of manure management, enteric fermentation feed additives, compost application, and other soil management on carbon sequestration/storage in soil and release of greenhouse gases emissions into the atmosphere.
WLWB 2	Impacts of climate change on carbon fluxes in the state's working lands (the extent to which climate impacts threaten the stability of the stored carbon or decrease sequestration rates on California's lands).
WLWB 3	The impacts and cascading effects of climate change (including extreme heat and drought) on agriculture and viticulture. This includes cascading effects of extreme heat and drought on agricultural and viticulture productivity, including food security and prices and economic viability; and understanding how competing uses for water during periods of drought impact agricultural/viticulture production.
WLWB 4	Projected impact of groundwater management strategies on agriculture (including a potential shift in crops produced).
WLWB 5	Identification of practices and modifications needed to maintain agricultural and viticultural productivity to respond to climate change, including during drought and extreme heat events (e.g., exploring cover cropping or water-use efficiency as a drought management response).
WLWB 6	Effects of deforestation for agricultural/viticulture development on biodiversity, localized weather patterns, and surface and groundwater availability.
WLWB 7	Impacts of climate change on native and non-native pollinator species, their geographical distributions, and the services they provide. Identify agricultural management options to support these pollinator populations.
WLWB 8	Impacts of shifting agricultural practices to address drought and habitat availability for waterbirds, salmonids, and other species historically associated with wetlands.



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WLWB 9	The efficacy of different funding mechanisms to incentivize biodiversity conservation and protection as well as moving marginal lands into uses with lower water use and/or managed for carbon sequestration.
WLWB 10	Impacts of harmful algal blooms on inland and coastal fisheries and ecosystem biodiversity.
WLWB 11	The role of lakes and floodplains in maintaining resilient water supply for irrigation during periods of drought, including potential opportunities and benefits of refilling historic lakes (e.g. Tule Lake, Lower Klamath).
WLWB 12	Effects of climate change on CA Native American tribes' traditional food sources and culturally important species.
WLWB 13	The effects of alternative food system practices (e.g., localizing food supply, changing methods of raising ruminants, etc.) on habitat connectivity, conservation area management, greenhouse gas reduction and carbon sequestration/storage.
WLWB 14	Impact of GHG emissions, specifically nitrous oxide, as it relates to dairy effluent irrigation applications when comparing conventional flood irrigation to subsurface drip irrigation.
WLWB 15	Connections between the application of pesticides, impacts to native and invasive species, greenhouse gas emissions and carbon sequestration potential. This might include alternatives to pesticides (e.g., integrated pest management and compost application).
WLWB 16	The relationship of soil organic matter, hydrological and biological function to nutrient efficiency and nutrient cycling in row crops, rangelands, orchards and vineyards, forests, and mine reclamation areas.
WLWB 17	The effects of soil salinity from changes in salinity at water intakes and other hazards such as PFAS on agricultural production. This includes whether there are particular soils and regions where specific organic amendments cannot be applied over the long-term because of salt or toxin buildup and identifying potential impacts natural lands and waters in the region.
WLWB 18	Identifying the drivers of soil salinity and what soil management practices are needed to bolster against these effects on crop production in the face of persistent drought and rising sea levels.
WLWB 19	Improving existing forest simulators and harvesting scheduling models for California vegetation types to incorporate climate change for long-term growth and vegetation dynamics projections.
WLWB 20	Identifying what forest management practices should be employed to maximize snowpack retention and headwater resources.
WLWB 21	Understanding how land management actions affect water temperatures in natural waters, aquifers, and other downstream systems.
WLWB 22	Tracking changes in wildfire behavior and modeling. This includes how Status Puffs change the fire environment, under which circumstances they occur and how Vapor Pressure Deficit affects plant stress.



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WLWB 23	Climate change drivers behind extreme wildfire conditions, fuel characteristics and loading, canopy cover, and vegetation stress.
WLWB 24	Impacts of post-wildfire compost application on burn scar recovery and tree planting survivor rates.
WLWB 25	Climate change impacts on land tenure and small farmer access to farmland.
WLWB 26	Impacts of climate change on salmon fisheries and listed salmonid species.
WLWB 27	Impacts of climate-driven extreme events on California's outdoor-based tourism economy (e.g., the impacts of wildfire on fishing, or other activities).
WLWB 28	The economic impacts of converting California farmland to large solar fields on food security.