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Climate and wildfire in western North America

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The incidence of wildfire in western North America is governed by climatological, meteorological, and ecological controls that operate across a wide range of spatial and temporal scales. The climatological seasonal cycle controls the intrannual pattern of wildfire over the region. Interannual, seasonal, and monthly departures from climatological sea surface temperature and atmospheric circulation over the Pacific Ocean, coupled with attendant conditions over the adjacent continent, produce variations in the distribution of air masses, moisture flux, large-scale vertical motion and precipitation. Synoptic-scale climatological and meteorological conditions, such as lightning and wind associated with atmospheric instability and the surface water and energy balances mediate the ignition and spread of wildfires on daily to diurnal time scales. Fire outbreaks over western North America often form a coherent pattern associated with the temporal and spatial dynamics of circulation. The overall severity of a particular fire season is largely determined by the long-term integrated moisture state of live and dead fuels. We are investigating the hierarchical spatial and temporal controls of wildfires over the western US for the period 1980-2000. Our approach combines

historical records of wildfire, climatological and meteorological observations, reanalysis data sets (e.g., NCAR/NCEP and CRU), and simulations conducted with nested global and regional climate models and static and dynamic vegetation models. In our poster, we will present an overview of our research methods and specific examples of our results.