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**comments on the forthcoming solicitation regarding climate scenarios and analyses**

*Additional submitted attachment is included below.*



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California Energy Commission  
1516 Ninth Street  
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To the California Energy Commission,

In response to the request for comments on the forthcoming solicitation regarding climate scenarios and analyses, we are writing on behalf of the UCLA Center for Climate Science to submit the following summary of related work and suggestions for your consideration.

In our work we have found that successful stakeholder adoption requires engagement early in the process, as well as the provision of data in formats with which users are comfortable. The CEC should be aware of some ongoing efforts in this vein. Our Center is a participant in the DOE-funded HyperFACETS project, which involves a stakeholder engagement component for two storylines about California flooding and fire risk associated with precipitation changes. Our other work with the Los Angeles County Flood Control District and the Department of Water and Power similarly involves deep engagement with stakeholders, focused on downscaling scenarios to build storylines of major stressors to their systems.

Additionally, as a part of these projects, and a UC Laboratory Fees Research Program-funded initiative to study fire risk, our Center is producing dynamically downscaled simulations of multiple realizations of several CMIP6 global climate models using the Weather Research and Forecasting model. These simulations will cover the State of California at 9km resolution and provide 3km resolution for subdomains over much of the state. The dataset will include all of the self-consistent hourly fields required to force land-surface modeling, a valuable resource to the State. Along with ongoing work on hybrid downscaling methods, these efforts complement products like LOCA. Efforts to compare downscaling products remain a continuing need.

In addition to making the CEC aware of these complementary efforts, we also wish to emphasize the importance of making as many realizations as possible available to stakeholders. Historical validation should focus on capturing large-scale mean circulation (e.g., correct placement of the jet stream) and capturing historical interannual variance to remove the truly poor models, but still include all of the models that meet these minimum requirements. If some prefer a simplification with fewer model outputs, guidance can be provided about which to prioritize for which use.

Other stakeholders with a more sophisticated grasp of risk quantification may want as many models and scenarios as possible. Additionally, multiple realizations of the same model can be important to capture the internal variability, which is so large for California precipitation -- numerous possible time-evolutions of floods and droughts are possible and can be considered in planning. So the availability of multiple realizations should also be a factor in model selection.

It is important not to over-correct to the one historical time series that we have, given the large natural variability in this region. While bias-corrected products may be needed for some applications, they should be accompanied by guidelines on when/how to use these products. Bias correction can introduce additional uncertainties depending on the dataset used to bias correct and the method, so both "raw" and bias-corrected downscaling should be provided.

Admittedly it is a communication challenge to convey how to properly use the climate projections. Projections should be presented in such a way that emphasizes the processes that are more certain, even if the timeline is not, and the large uncertainty that comes from the emission scenario, which is not a science question. To synthesize top-down and bottom-up approaches, it is important that local California data users consult with experts to assess how downscaled climate projections should be used. Case studies written up about the unexpected twists in this bottom-up process could be included in the data guidelines.

Sincerely,



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