PYROLOGIX
A VIBRANT PLANET COMPANY

CalOEIS Wildfire Safety Advisory Board
Re: Draft Recommendations to the Office of Energy Infrastructure Safety (Docket #2025-WSAB-WSAB)

May 16, 2025

Pyrologix, a wildfire risk analysis and research organization, is pleased to offer our support for the WSAB conclusions (§4.7) and recommendations (§4.8) for the Office of Energy Infrastructure Safety. Pyrologix is a subsidiary of Vibrant Planet – a hybrid organization comprising a 501(c)(3) and a mission-driven Public Benefit Corporation. We develop risk management tools for wildland resilience, community protection, and grid safety and reliability. Below we provide more detail and supporting information.

§4.8.1: In support of *model testing and comparison*: We recognize that all models are imperfect representations of reality, adopt different approaches and simplifications, and entail myriad sources and types of uncertainty[1]. By embracing a "many models" perspective, prediction and decision making are improved[2]. Ensembles are particularly valuable where they find disagreement, providing an opportunity for greater learning and insight.

§4.8.2: In support of more *standardized and rigorous validation*: We believe this is essential for defensibility and transparency of high-stakes decisions. There is an opportunity here for the wildfire science community to more formally embrace probabilistic forecast verification, learning from practices for example that are common in meteorological applications[3]. Recent validation efforts in the US can serve as a roadmap and provide benchmarks for future research and development in this area[4,5].

§4.8.3: In support of improved *characterization of uncertainties and probabilities* in model outputs: We understand this is particularly important for estimating the potential for extreme events that may not be well-captured in existing approaches[6]. Exceedance probability curves can help provide insight into right tails for daily spread events[7] as well as incident-level[8] and landscape-scale consequences[9].

Thank you for your consideration.
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[2] Page, S.E., 2018. Why "many-model thinkers" make better decisions. Harvard Business Review, p.19.
[3] Allaire, F., Filippi, J.B. and Mallet, V., 2020. Generation and evaluation of an ensemble of wildland fire simulations. International journal of wildland fire, 29(2), pp.160-173.
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[5] Moran, C., Thompson, M., Young, B., Scott, J. and Jaffe, M., 2025. Benchmarking performance of annual burn probability modeling against subsequent wildfire activity in California. [In revisions, Scientific Reports; https://doi.org/10.21203/rs.3.rs-6116619/v1]
[6] Mitchell, J.W., 2023. Analysis of utility wildfire risk assessments and mitigations in California. Fire safety journal, 140, p.103879.
[7] Thompson, M.P., Nguyen, D., Moran, C.J., Scott, J., Wei, Y. and Young, B., 2024. Simulating Daily Large Fire Spread Events in the Northern Front Range, Colorado, USA. Fire, 7(11), p.395.
[8] Thompson, M., Calkin, D., Scott, J.H. and Hand, M., 2016. Uncertainty and probability in wildfire management decision support: an example from the United States. Natural Hazard Uncertainty Assessment: Modeling and Decision Support, pp.31-41.
[9] McEvoy, A., Kerns, B.K. and Kim, J.B., 2021. Hazards of risk: Identifying plausible community wildfire disasters in low-frequency fire regimes. Forests, 12(7), p.934.