Applying forest simulation modeling on selected ecosystems in Nevada

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The SIMPPLLE ("SIMulating vegetation Patterns and Processes at Landscape scaLEs") vegetation disturbance simulation model can be used for assessing ecological sensitivity of a given area. In the Great Basin there is a need to understand the interaction between species dynamics, wildfire regime, and climatic change. The model has been used to simulate successional processes, as well as disturbance regimes, in other regions of North America. This analysis examines how the SIMPPLLE model can be adapted to Great Basin environments by modifying species parameters and stand features such as canopy height and density. Two validation tests were performed to assess the performance of our Great Basin version of the SIMPPLLE model in the Snake Range of east-central Nevada. Results of multiple short-term (i.e., ten years long) SIMPPLLE simulations were compared to field collected data in one validation experiment, and to LANDFIRE modeled data in a second validation test. Both validation techniques found the SIMPPLLE model, with its current parameterization, to perform well for predicting vegetation types resulting from succession, but less so for predicting canopy height or density. This is most likely due to simulations of relatively short length, because disturbance events are infrequent enough that only low-severity fires were predicted by the model, and they typically do not affect vegetation type, canopy height or density, while parameters for succession might be modeling successional processes too rapidly.