

HOW 4-DIMENSIONAL THINKING FROM MULTIPLE PERSPECTIVES CAN HELP AVOID THE LIBERTY VALANCE EFFECT WHEN EVALUATING AND RESPONDING TO CHANGE IN ALPINE AND SUBALPINE ECOSYSTEMS (1H)

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Alpine and subalpine ecosystems are generally considered to be the most vulnerable in the Sierra Nevada to climatic shifts. This is due primarily to several overly simplistic assumptions though, and while it is almost certain that high elevation zone ecosystems will change this process will likely not follow simple transitional pathways. Additionally, retrospective studies of shifts in species ranges in the Sierra Nevada suffer from the “two-point problem”, where inferences made from just two points in time are weakened by an inappropriate historical timeframe (lack of a third point) or are confounded by processes that are parallel with, but not necessarily related to, shifts in climate. Uncritical acceptance of these assumptions and the results from retrospective studies could lead to unnecessary, inappropriate, or even counterproductive management actions. Therefore, the goal of this workshop is to develop a framework that will help managers evaluate evidence related to ecological patterns and processes in high elevation zone ecosystems, with a particular emphasis on the relationship between variability and uncertainty. The framework is not meant to steer managers towards a particular conclusion, but to enable them to avoid “the Liberty Valance effect”, a concept taken from a classic movie where a hidden event lead to erroneous conclusions about what was thought to be an obvious outcome. Discussions will be centered on six core principles: (1) changes in high elevation ecosystems are occurring, but...; (2)...the magnitude and direction of change vary spatially and temporally, so...; (3) ...there will be substantial uncertainty for any given forecast, therefore...; (4) management plans should be hypothesis-based and include alternative scenarios that, over time, can be tested and evaluated; (5) to the greatest extent possible, management plans must be data rather than belief driven and reflect ecological reality; and, (6) when data are not available, basic ecological principles will be used to evaluate assumptions justifying management plans. Participants will be encouraged to think in two separate but related perspectives; an ecological one and a management one. 4-dimensional thinking means that participants will be encouraged to think in terms of hidden processes, spatial variation, temporal variation, and uncertainty.

Key words: alternative states, heterogeneity, hidden processes, uncertainty, variation