

2015 CHaMP Camp Workshop

Structural equation modeling of fish-habitat relationships

June 4, 2015

7:45 a.m. – 8:45 a.m.

Presenter Seth White, Columbia River Inter-Tribal Fish Commission

- Objectives:** Provide an overview of the utility and process of structural equation modeling (SEM) to support exploration and hypothesis testing of fish-habitat relationships.
- Software needs:** None. Software discussed will include SPSS Amos and various packages in R statistical software including 'lavaan', 'semPlot', and 'MINE'.
- Additional Resources:** Strong coffee, a whip, and a huge tub of ice water.

Abstract:

Structural equation modeling (SEM) is a statistical tool based on path analysis that accounts for both direct and indirect effects of interrelated predictor variables. Moreover, SEM is a powerful instrument for developing and testing hypotheses about the causal pathways leading to increased benefit or degradation of conditions for a species of concern. This latter feature of SEM allows the researcher to use knowledge gleaned from discussions with local agency biologists or direct observations of the system under study. This presentation is in two parts: (1) a general overview of SEMs and way they have been used to explore and test ecological hypotheses, and (2) provide an example of step-by-step procedures for building a simple SEM linking CHaMP metrics to fish densities. Ways in which SEM can complement data mining or machine learning will also be discussed.