**Examining the influence of biotic and abiotic factors from multiple spatial and temporal scales on interannual fluctuations of disease intensity in a novel wildland pathosystem: identifying hotspots and superspreaders**

My goal in this chapter is to disentangle the relationships among abiotic factors (e.g. climate, soils) and biotic factors (e.g. host density, diversity, disease prevalence) spanning multiple scales in order to identify their influence on sudden oak death disease intensity. I will utilize a longitudinal dataset containing eight years of microclimate data associated with annual stem level measurements of disease intensity collected across a heterogeneous landscape. Plot and stem level variables (e.g. disease metrics, microclimate) will be developed from these data, while I will use GIS to process broader and less direct measures of physical and biotic factors (e.g. elevation, host habitat). I will apply these data in a structural equation modeling framework that will enable examination and testing of hypothesized relationships among variables and comparison of multiple models. Comparing models within this framework will enable testing of hypothesized lag effects due to interannual variation in climate factors (e.g. temperature, precipitation). For example, I plan to examine the relative influence of the climate of previous year(s) in addition to the climate of the sample year on the disease intensity measured during that sample year at the plot level. Additionally, this could ideally be expanded to examine the spatiotemporal variation of infection intensity at the stem level to identify “superspreader” individuals in space and time.