

## Climate Host Mapping of *Phytophthora ramorum*, Causal Agent of Sudden Oak Death

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We generated a risk map for the conterminous United States that visualized areas at-risk for *P. ramorum* infection based on climate suitability and host presence. We used the North Carolina State University-Animal and Plant Health Inspection Service Plant Pest Forecasting System (NAPPFASST) to perform the climate modeling (Borchert and Magarey, 2004). Our climate match model was based on 10 year historical daily data. The model parameters were: 1) minimum daily temperature  $\geq 3^{\circ}\text{C}$ , 2) optimum daily temperature of  $20^{\circ}\text{C}$ , 3) maximum daily temperature  $\leq 28^{\circ}\text{C}$ , 4)  $\geq 12$  hours of accumulated leaf wetness and 5)  $\geq 60$  accumulated days meeting these conditions annually (Huberli *et al.*, 2003; Orlikowski and Szkuta, 2002; Tooley and Kyde, 2005; Werres *et al.*, 2001). We converted the 10 year climate match frequency output to percentages.

We used both hardwood and understory hosts in the risk map. We obtained the hardwood host layer from the National Land Cover Dataset for the conterminous United States (Vogelmann *et al.*, 2001). This data layer expresses forest composition in percentages. We queried this data set for all hardwoods plus fifty percent of mixed forests. We obtained the understory host layer from NatureServe (2002). We estimated the distribution of seven Ericaceae hosts of *P. ramorum* as a shapefile and converted this to a raster. This raster was converted to percentages by dividing it by seven and multiplying by 100. These layers were visualized at a one  $\text{km}^2$  resolution.

We generated the risk map by summing the climate, hardwood hosts and understory hosts percentages and dividing the total by three. The raster spatial resolution was one  $\text{km}^2$ . We then masked out areas where: 1) no climate match occurred, 2) no hardwood hosts occurred, 3) no understory hosts occurred and 4) the lethal cold temperature for *P. ramorum*, i.e.  $-25^{\circ}\text{C}$ , occurred for at least one day during January (DEFRA, 2004).

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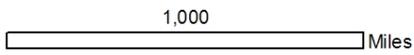
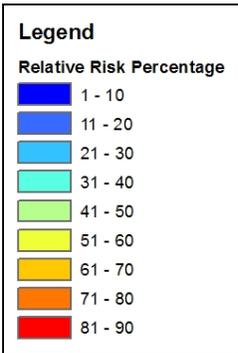
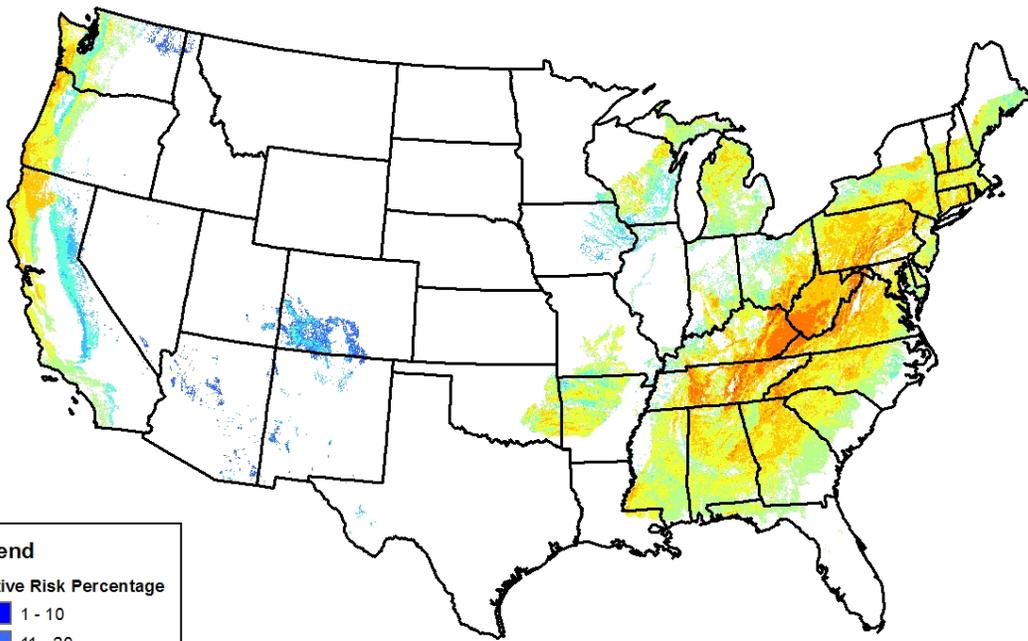
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Sources: DEFRA, 2004; Huberli et al., 2003; NAPPFAST, 2006; NatureServe, 2002; Orlikowski and Szkuta, 2002; Tooley et al., 2005; Vogelmann et al., 2001; Werres et al., 2001  
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