Sudden oak Death affects on the dynamics of dead wood

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Why dead wood is important

- Fuels/ potential fire impacts
- Dead wood is an important source of CO_2
- Habitat for mammals, reptiles, insects, and microbes

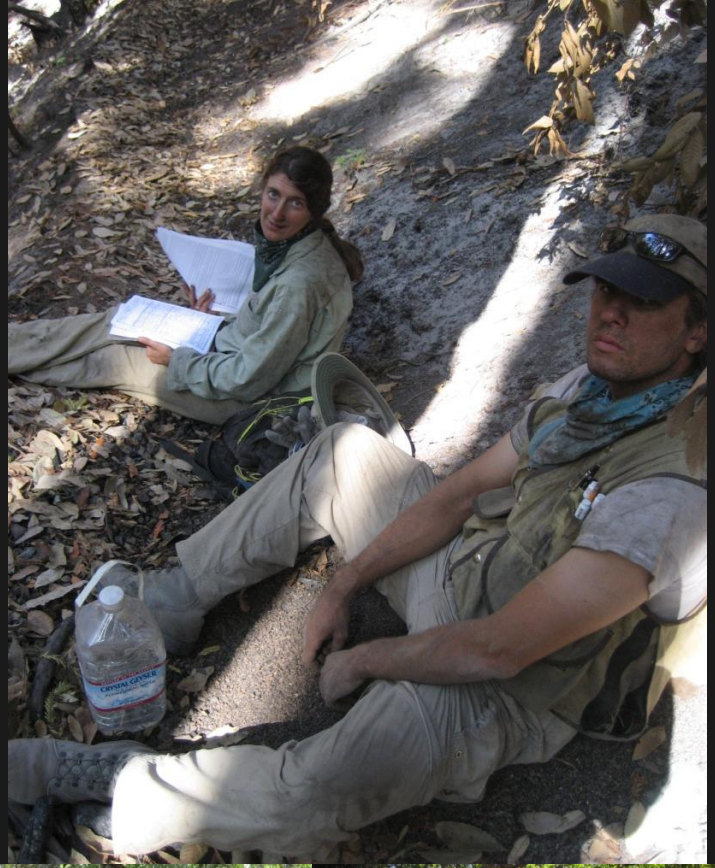
- Coarse woody debris (CWD) > 10-20 cm diameter
- Snags and logs (standing vs down)
- Logs decay more rapidly than snags
- As wood decays, it losses mass and structure

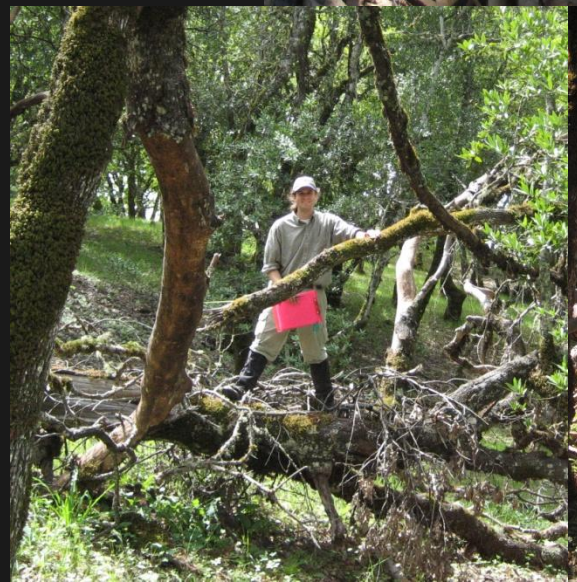
Goals

- Understand (quantify) drivers of dead wood accumulation
- Predict the location, timing, and duration of wood generated by sudden oak death
- Develop management tools appropriate for oak and tanoak forests

Field Surveys

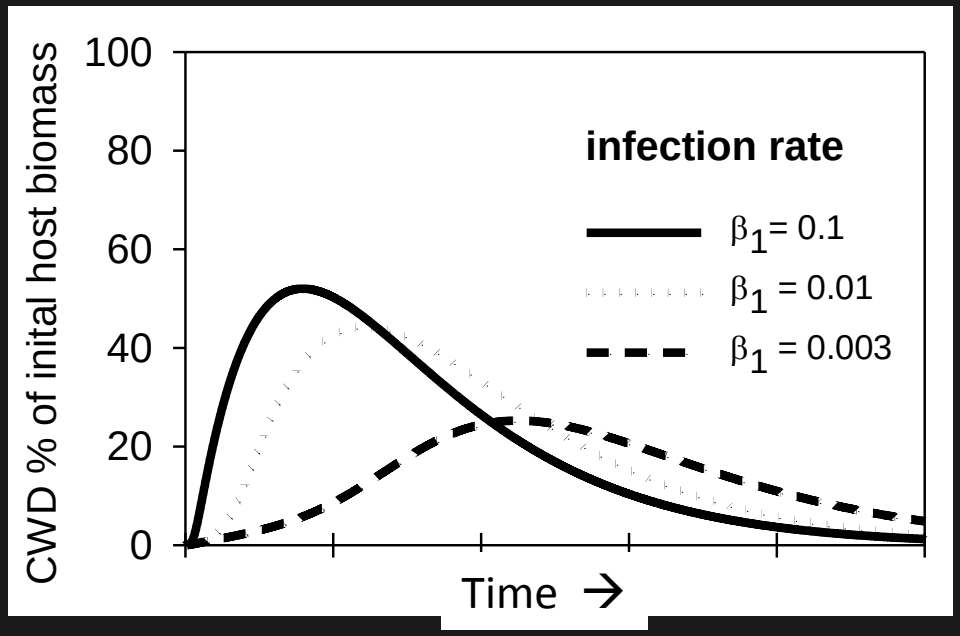
- Repeated measurements of dead wood, tree mortality, tree infection by *P. ramorum*
- Brown's transects
- Several plot networks:
  - Big Sur (Burned and unburned)
  - Redwood forests (Monterey to Sonoma; Maloney),
  - Redwood and mixed evergreen Sonoma to Del Norte





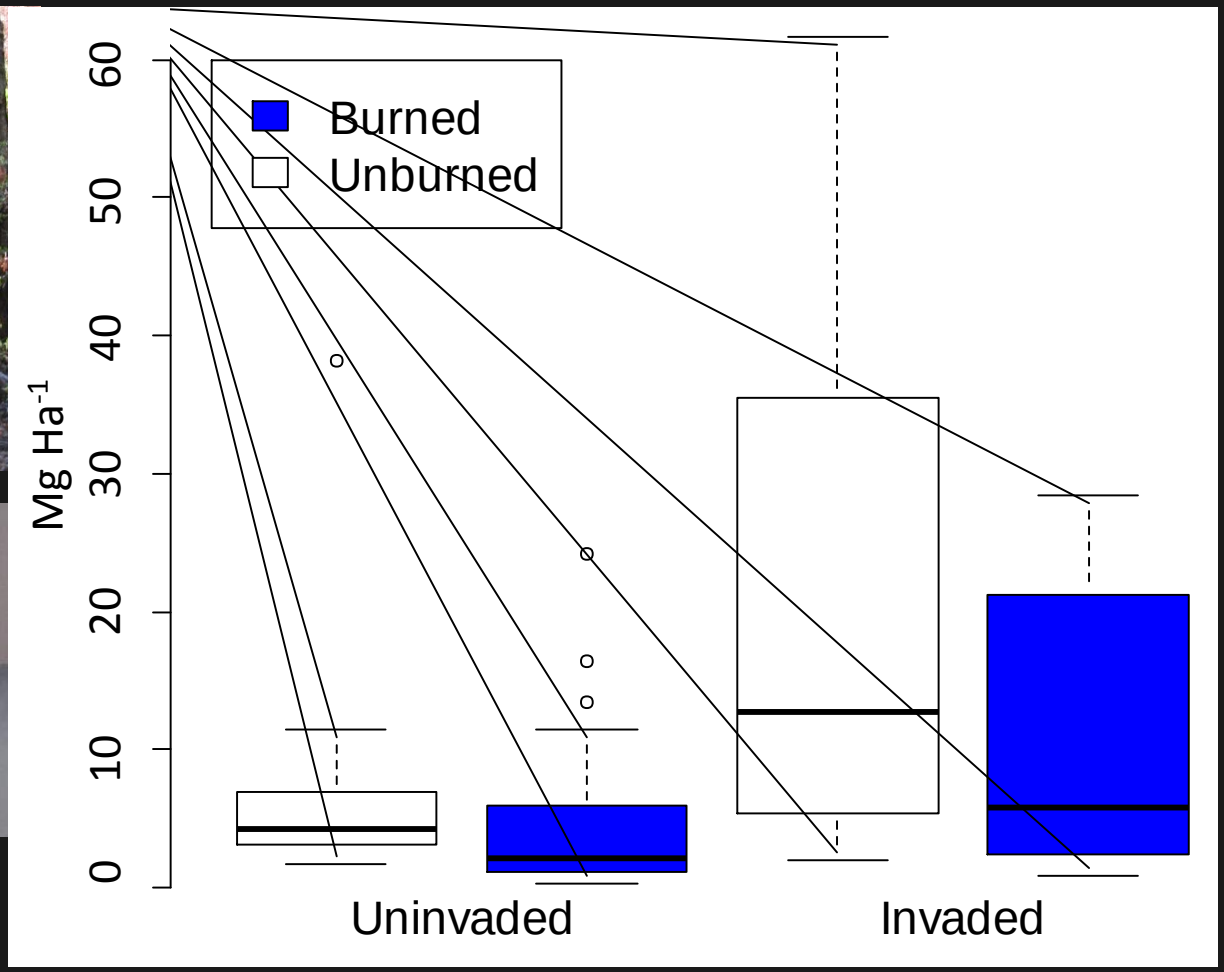
Woody debris and disease

- The literature is biased to study of fire, harvest, etc
- Disease is selective
- Not all hosts are infected or die at the same rate
- Wood accumulation is gradual
- Maximum amounts may be lower compared to fire



Cobb et al 2012

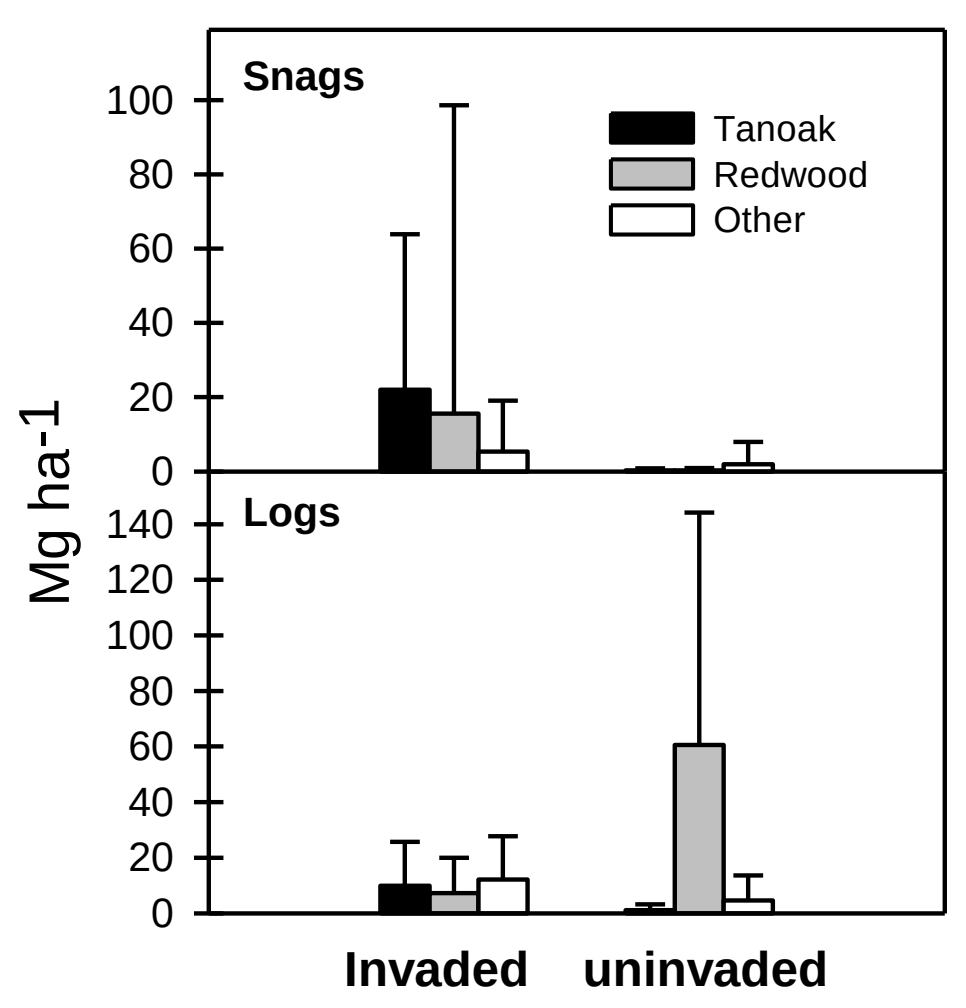
Fine and coarse woody debris 2-3 years following the basin fire



P. ramorum < 0.001
Fire = 0.024
Interaction = NS

Disease increases wood amounts

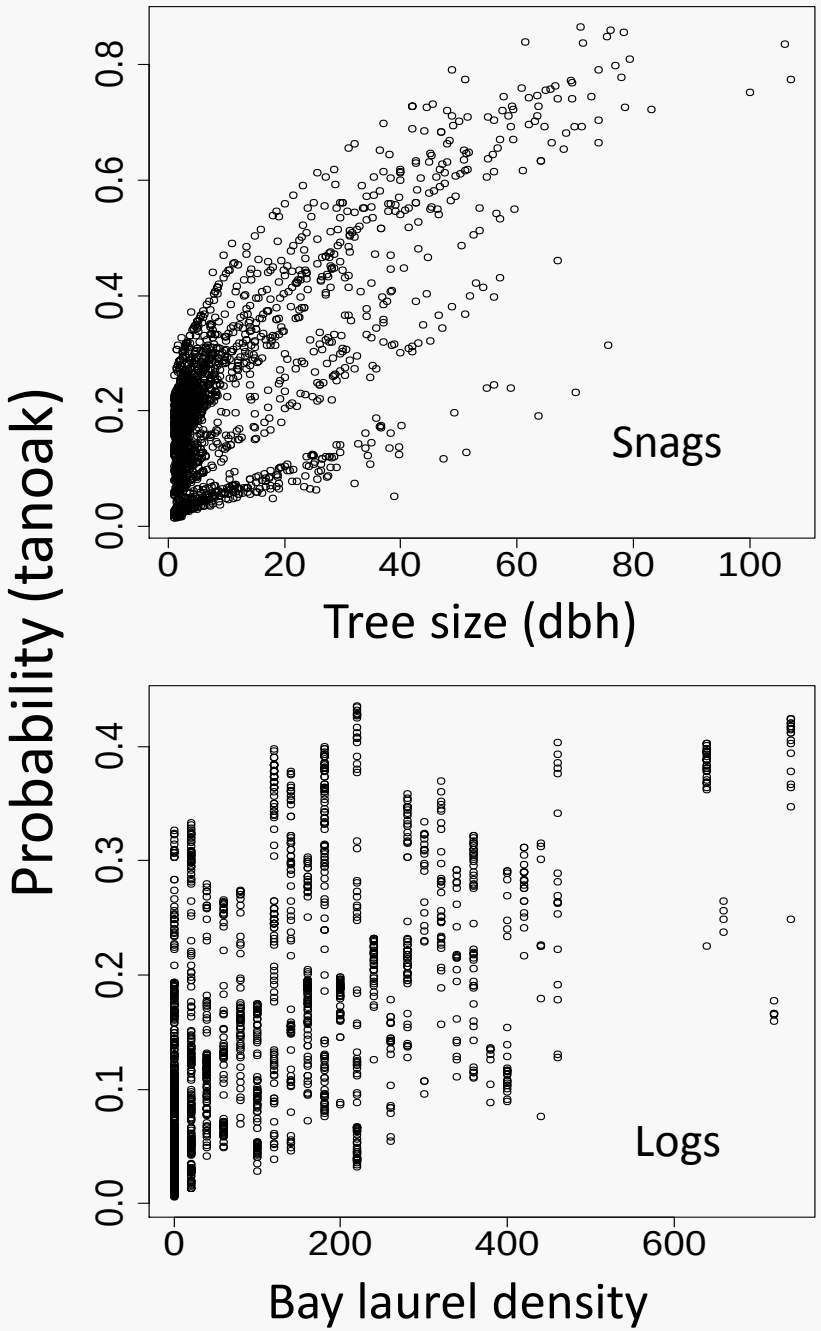
- In our redwood plot network more wood was in snags than logs in 2008
- Background amounts of wood can be high, but are not due to sudden oak death



Cobb et al 2012

Host mortality

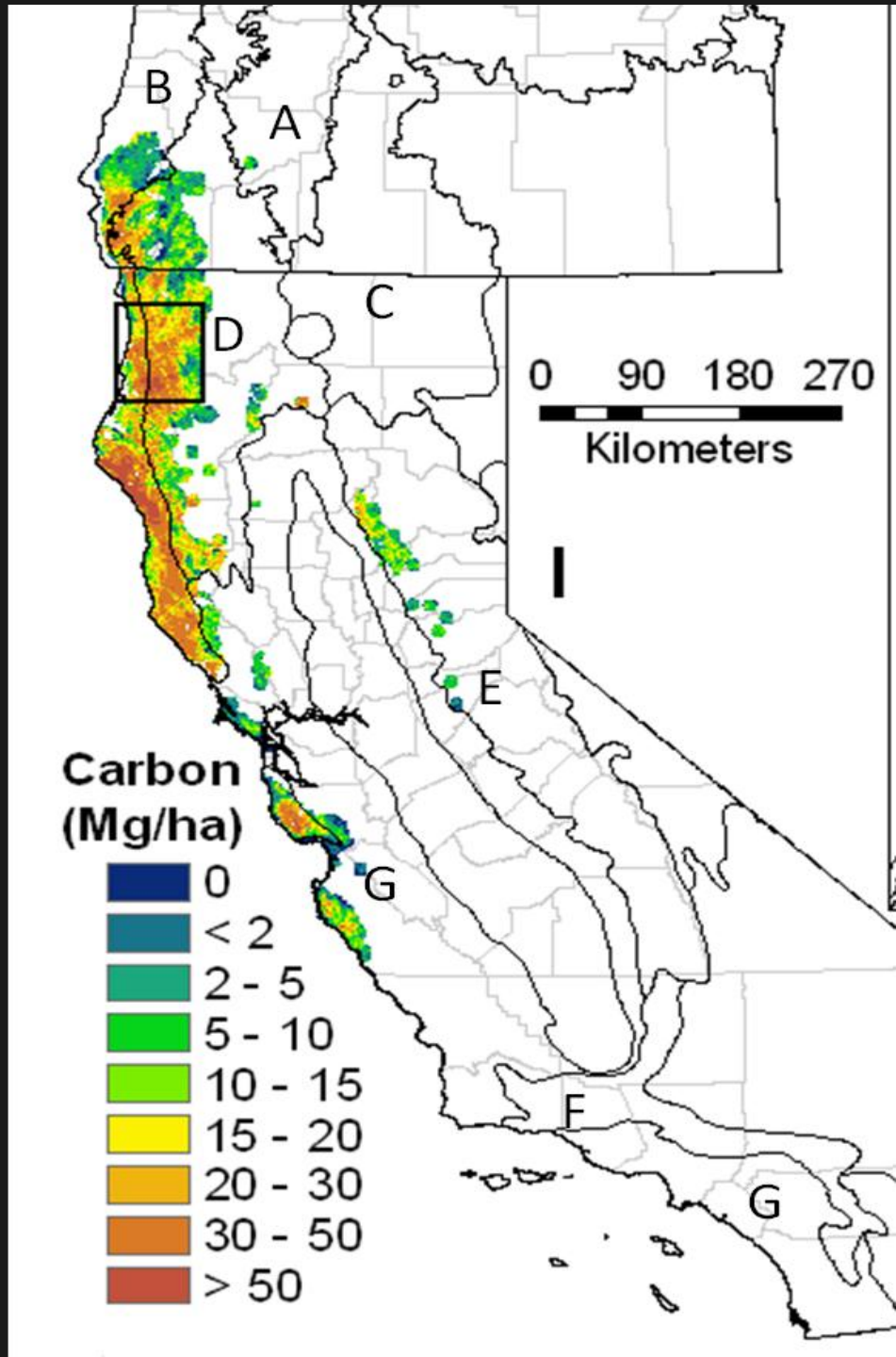
- Wood accumulation is dependent on mortality factors
  - Prevalence of infected hosts
  - Initial host biomass



Landscape level prediction

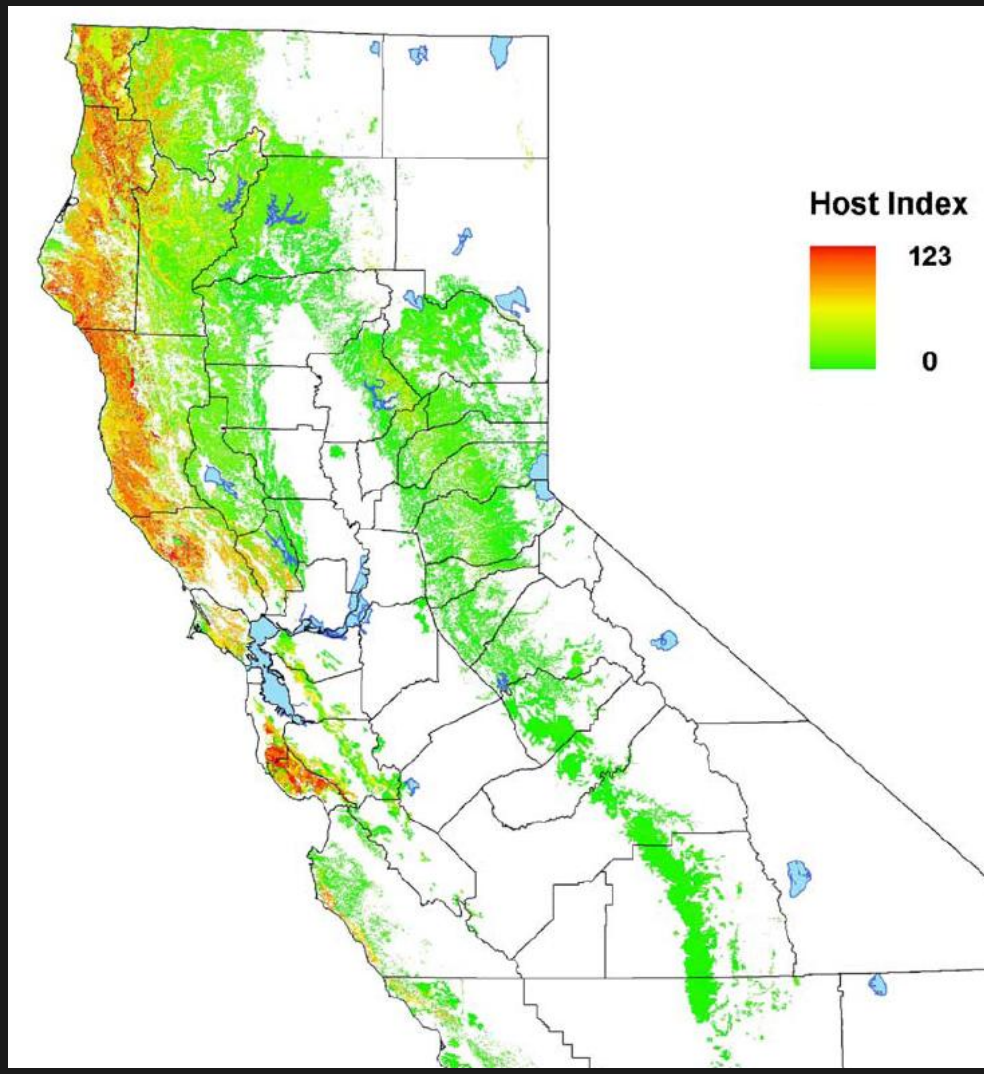
- Tanoak biomass is greatest and most contiguous in the north
- A significant amount of C could be released by SOD

Lamsal et al 2011



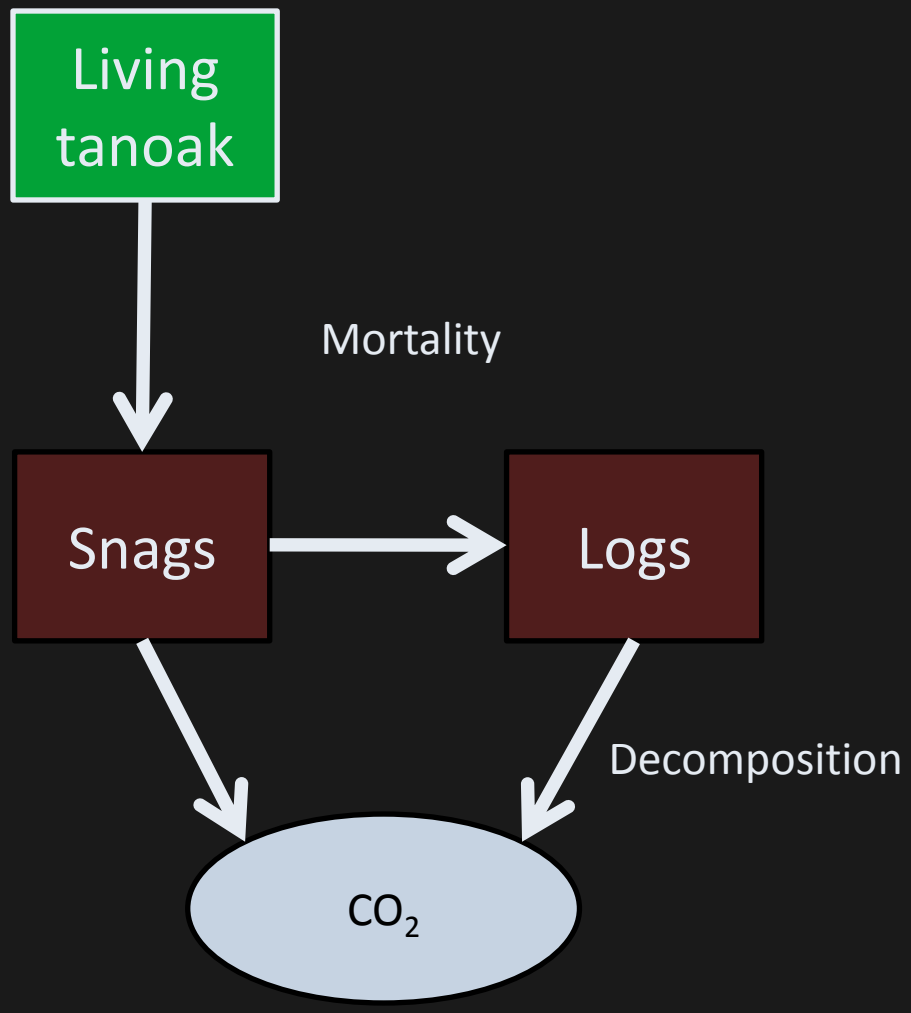
Highest Risk overlaps with greatest host biomass

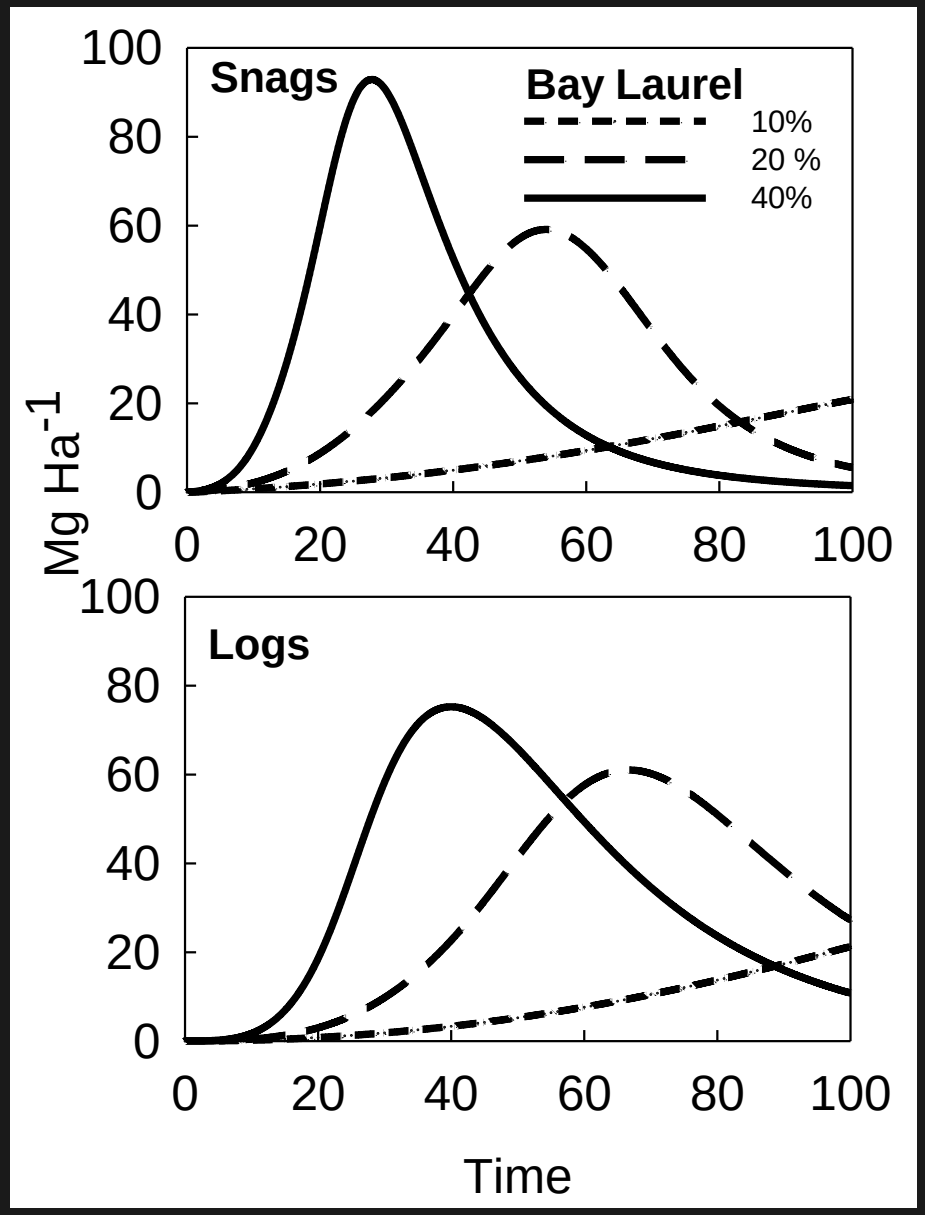
- Risk of pathogen establishment is greatest in regions with highest tanoak biomass (North)



Meentemeyer et al. 2011

Predicting amounts and duration



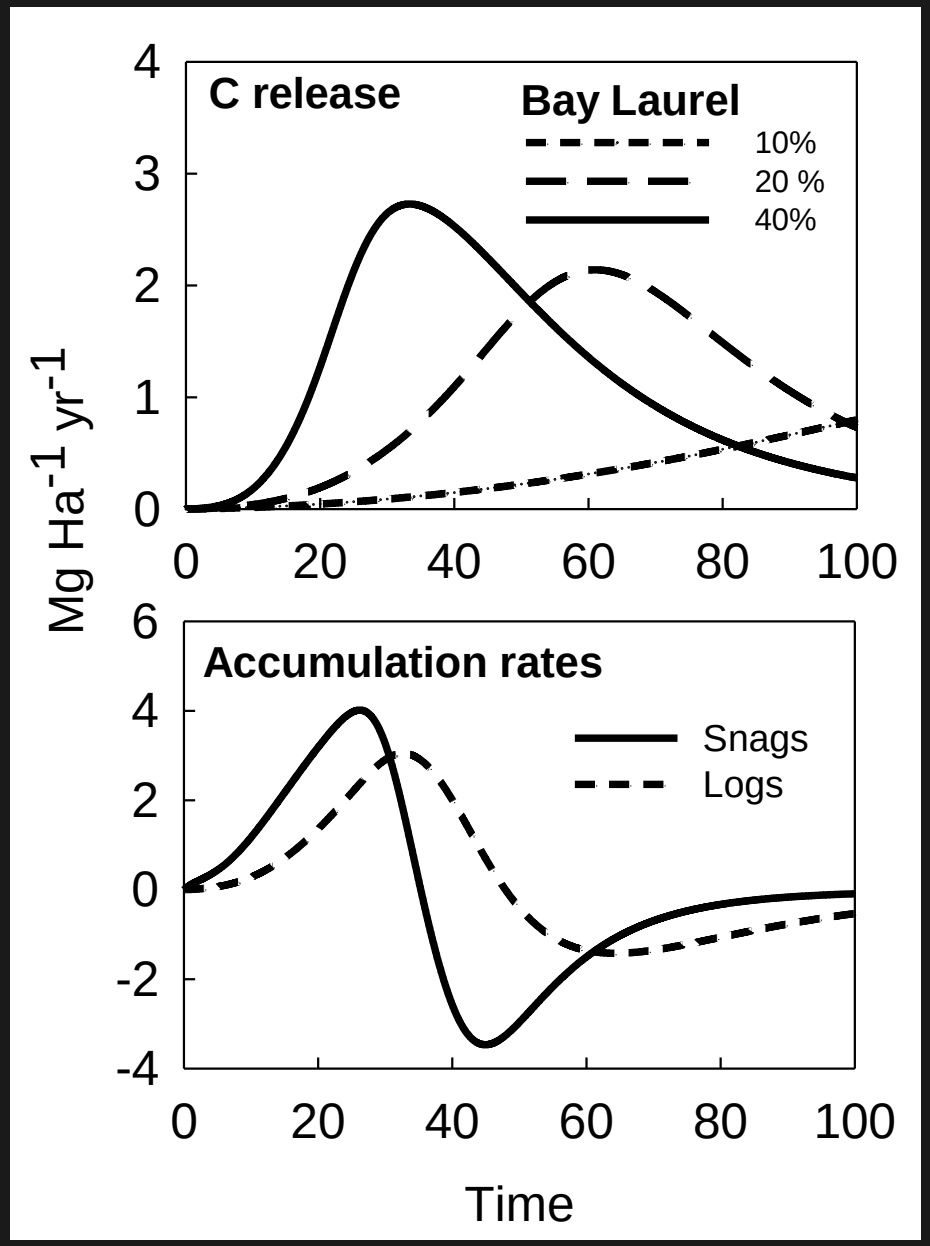


Ecosystems 2012; Cobb, Filipe, et al J Ecol 2012

Predicting amounts and duration

Model Results:

- Bay laurel increases rates of accumulation
- Amount of wood is dependent on tanoak biomass
- Snags accumulate first, followed by logs



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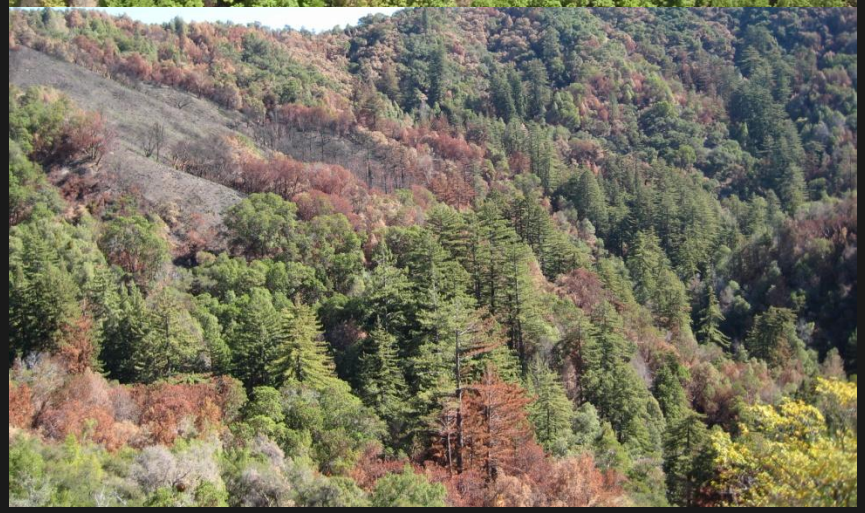
Management of dead wood

- Faster infection rates = greater wood accumulation
- If fuel levels are a concern, addressing disease will help
- Does SOD impact state or regional green house gas goals?



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