

Trade and Forest Invasives Working Group, Fall 2009 Update

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and Mike Springborn

Structure of the Study

- Work Group 1, assessing the economic impact of forest invaders introduced to date, and developing predictive model of future economic impacts
- Work Group 2, assessing the benefits and costs of phytosanitary policy, using ISPM 15 as a case study for developing a generalizable analytic framework

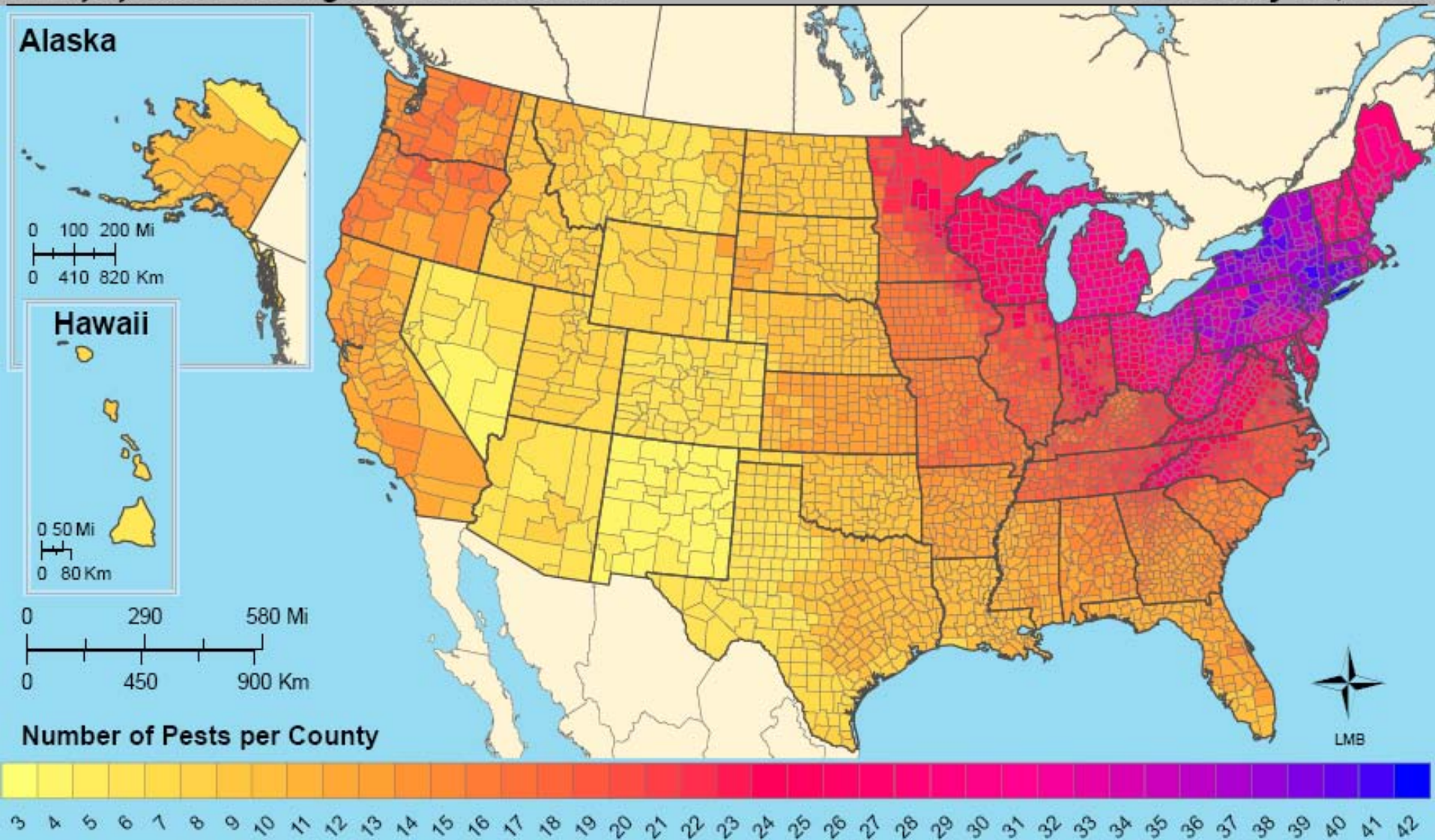


Alien Forest Pest Explorer

Species Richness

www.fs.fed.us/ne/morgantown/4557/AFPE/

as of July 28, 2008



USDA
Forest Service



Northern
Research Station

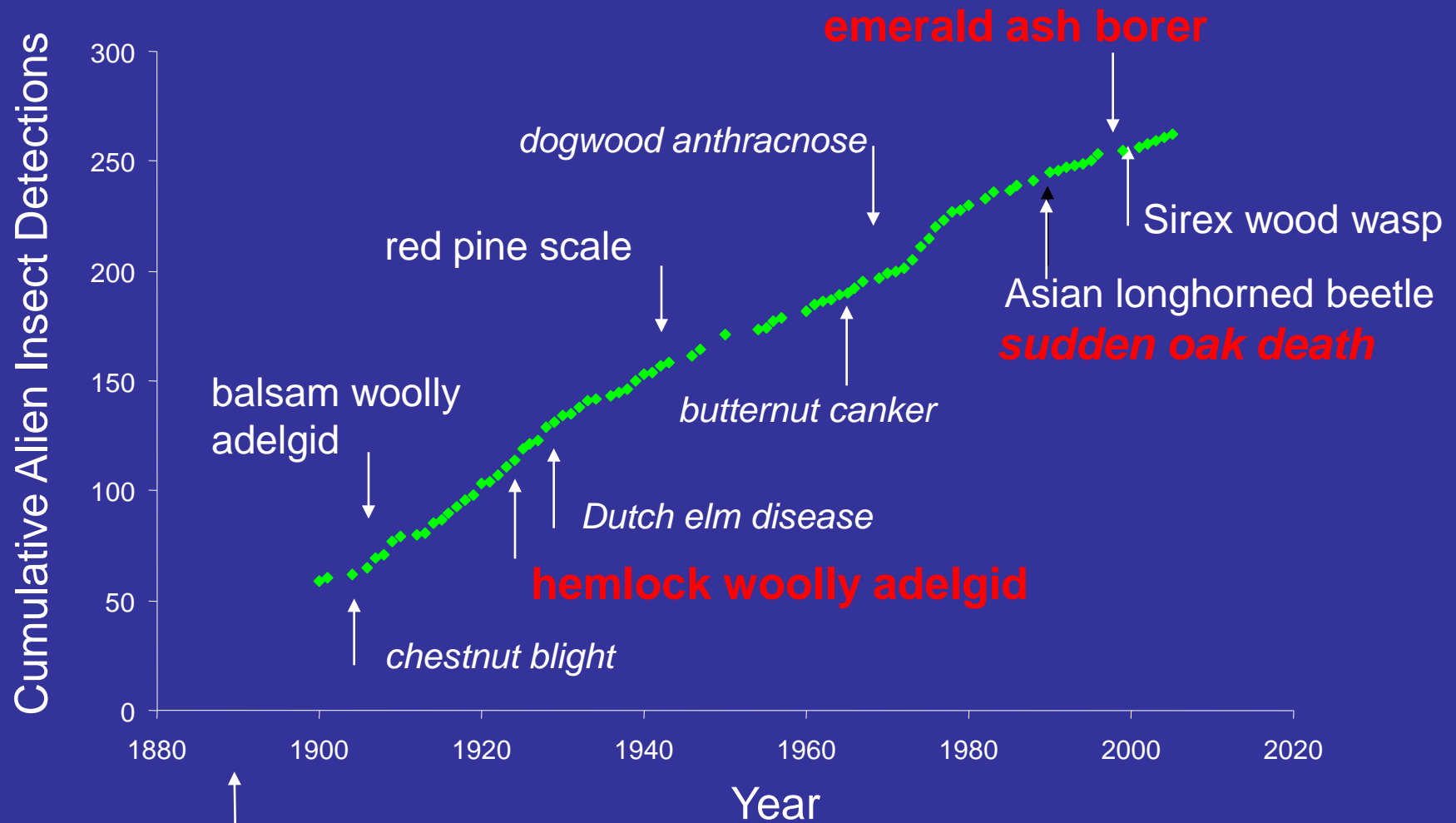


Forest Health Technology
Enterprise Team



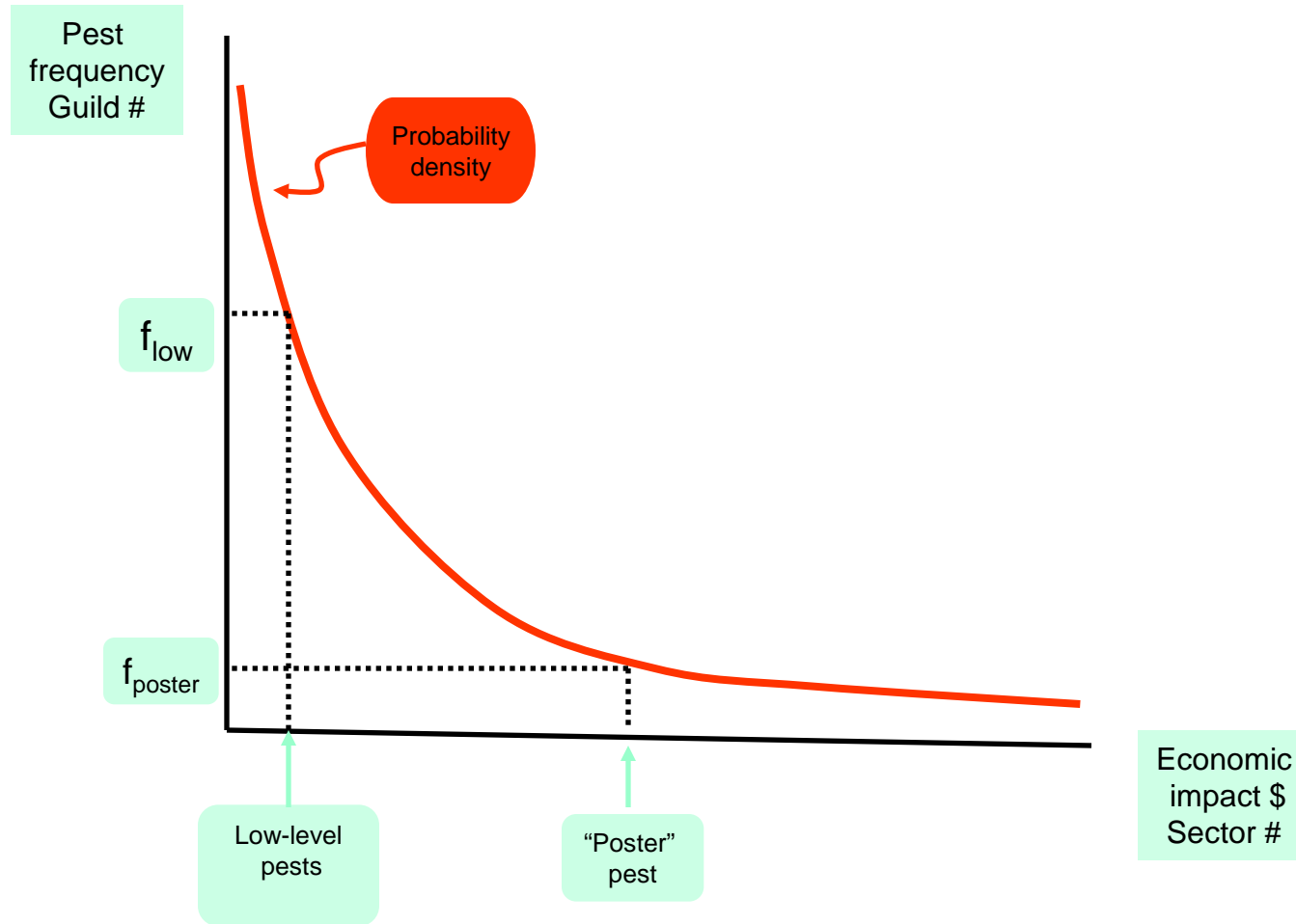
Remote Sensing
Applications Center

Some Notable Insect & Disease Introductions



Pre 1900: **gypsy moth**, beech scale, larch casebearer, *white pine blister rust*

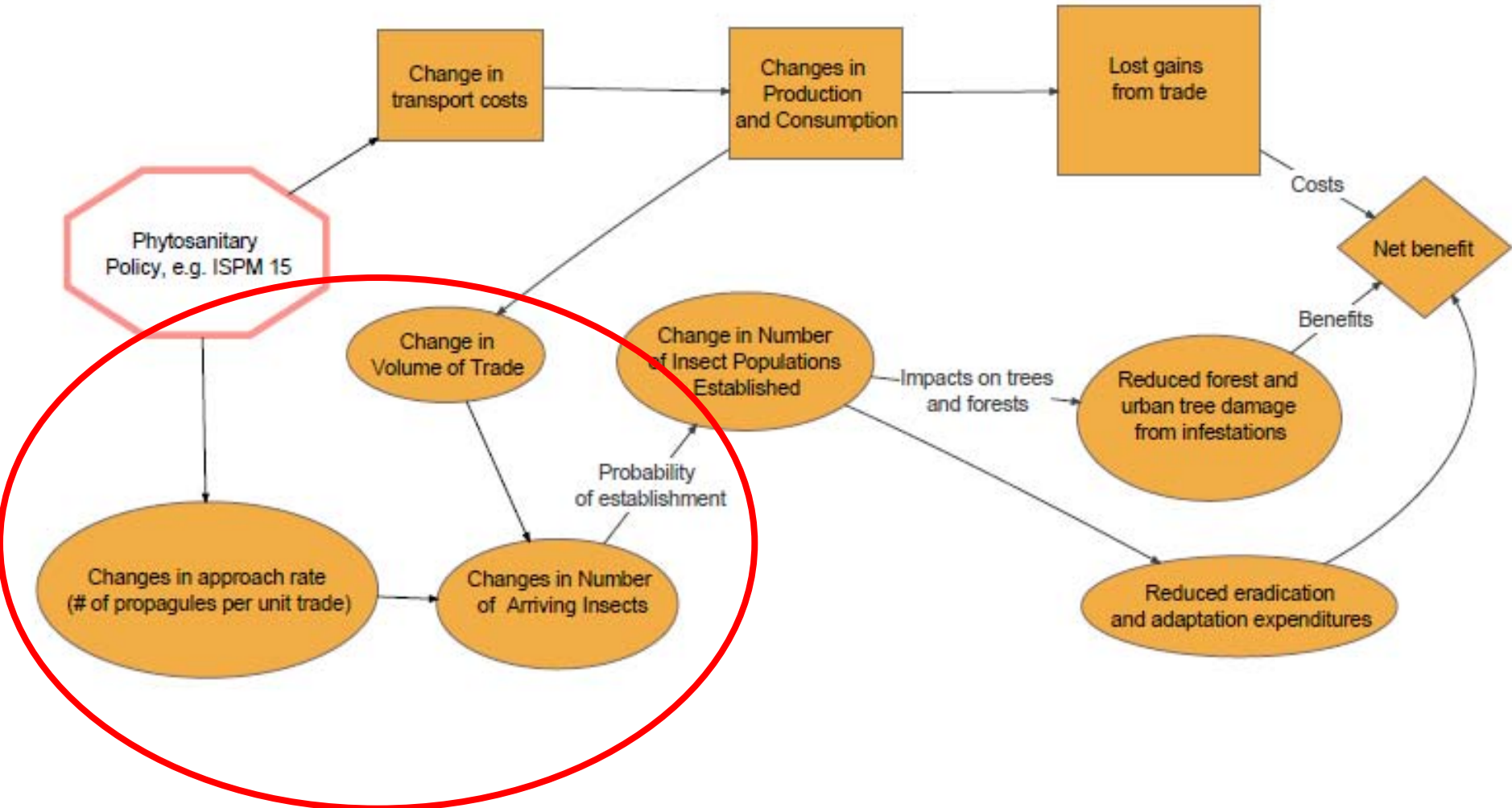
Economic impacts are random variables



Beyond Economic Damage: Why do we need an analytic framework?

- Ensure effectiveness
- Assess benefits relative to costs
- Provide guidance to ensure efficiency in future efforts (P4P, domestic SWP policy)

The analytic framework

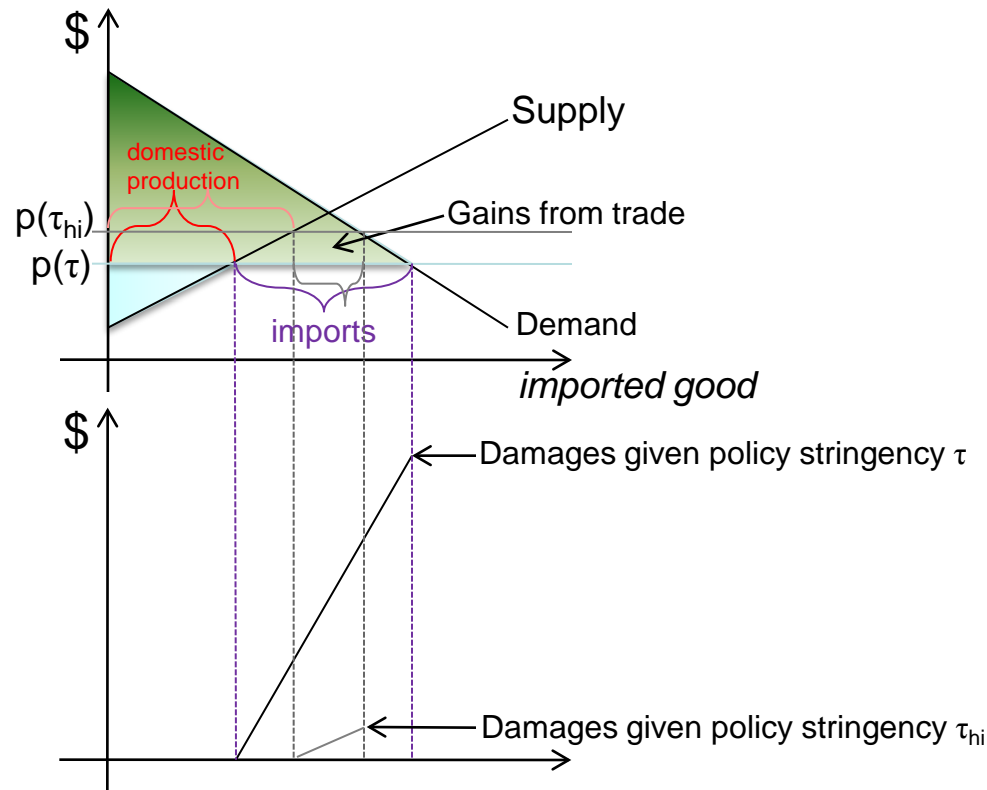


Changes in Approach Rate

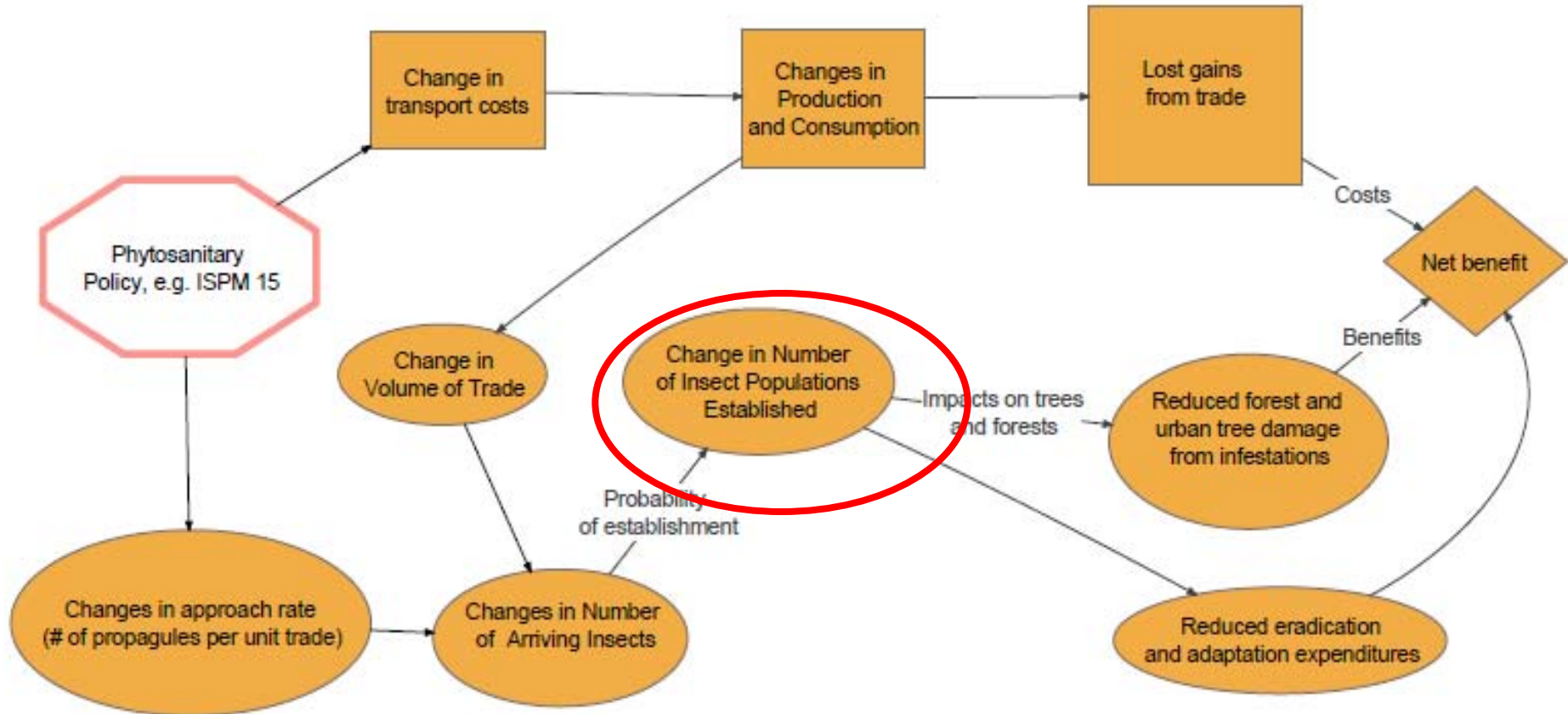
- AQIM data— statistically robust, similar number of observations pre and post ISPM 15, should have high statistical power if ISPM effectiveness is $>80\%$
- Pest ID data— very large number of observations, not random, negative results not recorded, subject to many sources of variability.
- Data from other countries.



Changes in the Volume of Trade

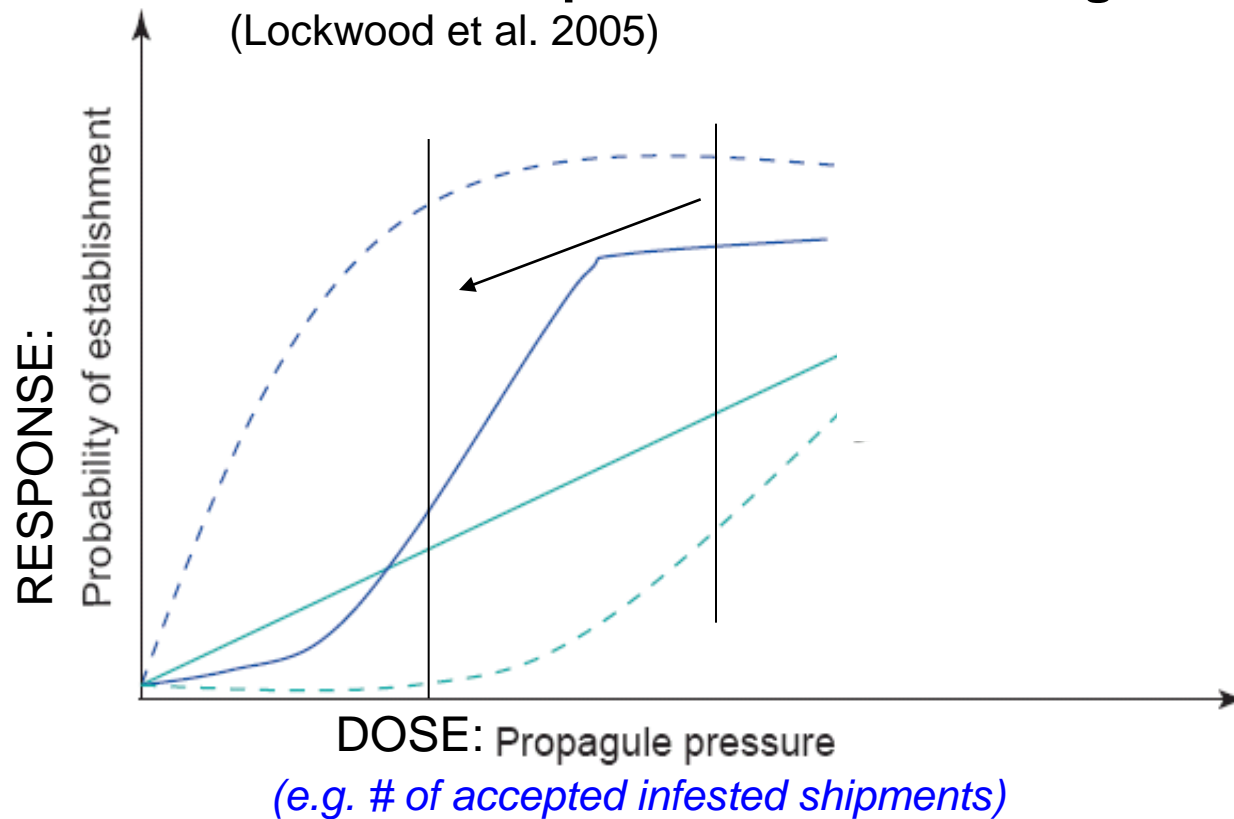


The analytic framework

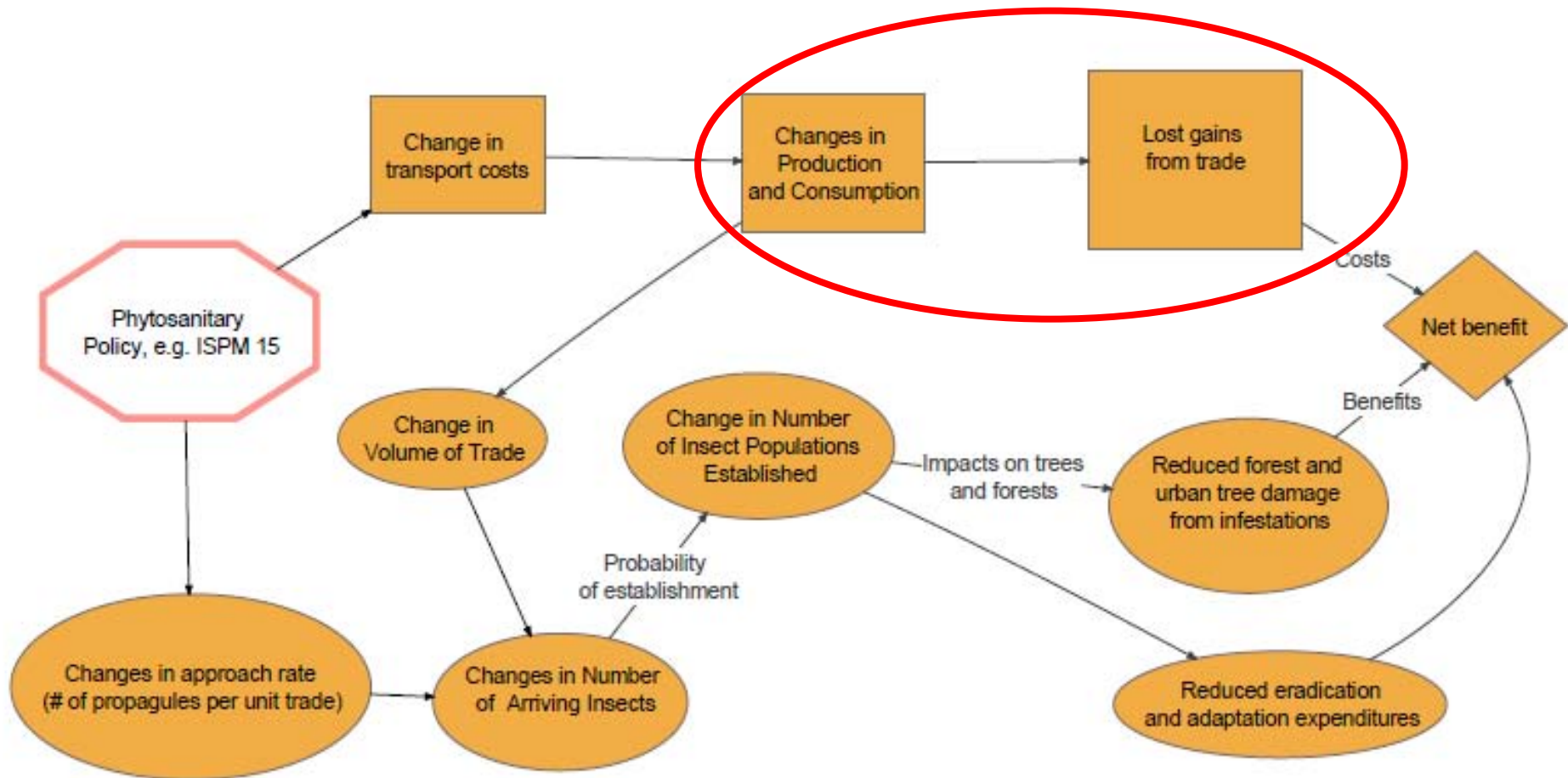


Changes in Establishment

The dose-response curve of biological invasions
(Lockwood et al. 2005)



The analytic framework

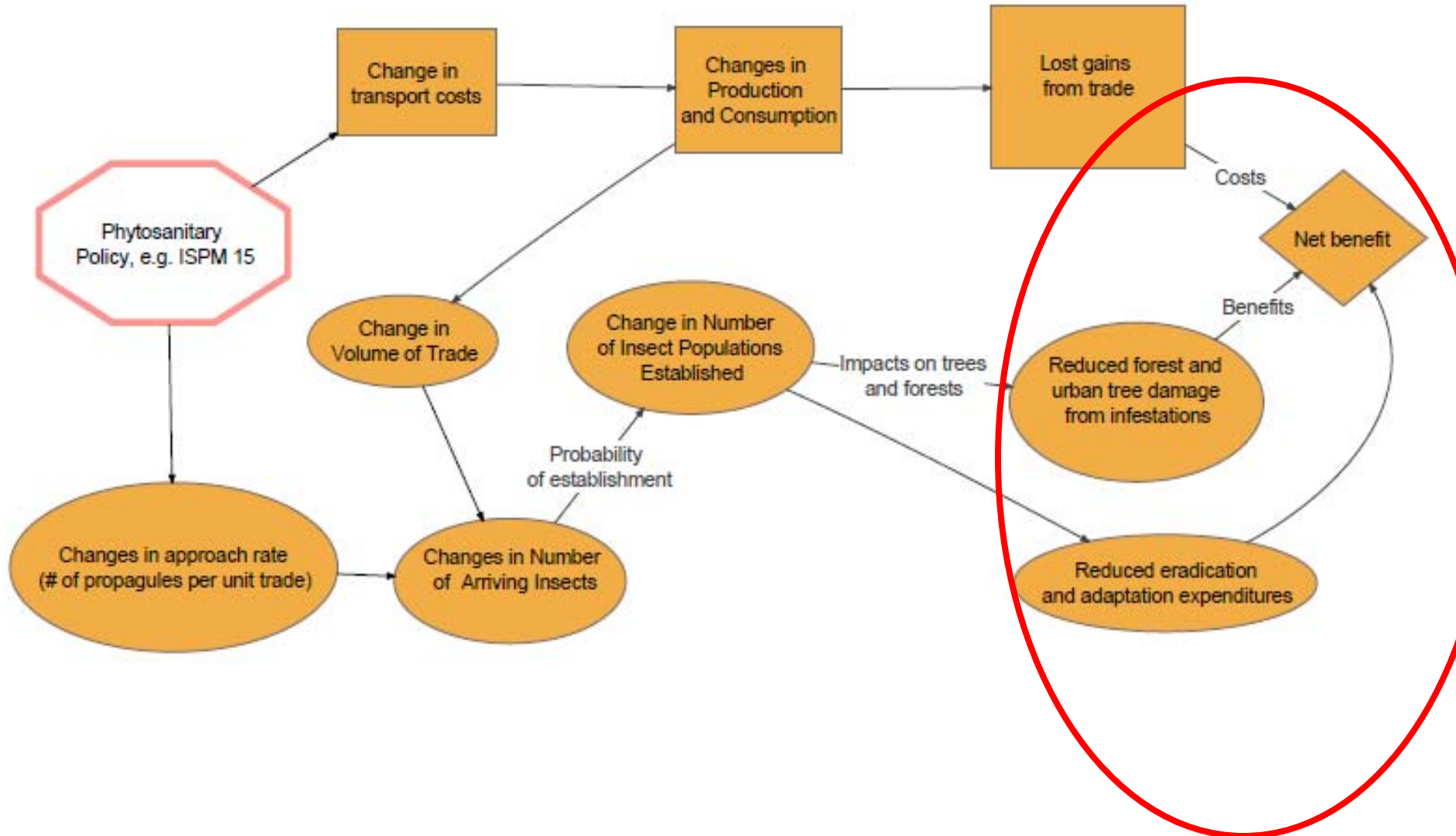


Estimating Lost Gains from Trade

- Trade impacts of ISPM 15
 - More expensive imports
 - Changing trade partners and commodities
- Global Trade Analysis Project
 - Multiple commodities using WPM
 - Bilateral trade
- Scenarios
 - Current ISPM 15
 - Higher heat treatment
 - US domestic trade?
- New pest pathways?



The analytic framework



Putting it all together: Cost Benefit Analysis

- Benefits = averted damages and response costs
 - Reduced approach rates
 - reduced expected establishments
 - expect \$X of avoided damage and eradication and adaptation costs.
- Costs based on lost gains from trade
 - 1) *Some trade is eliminated , and*
 - (2) *Remaining trade is more expensive, reducing the surplus generated.*

Extensions of the Analysis

- A theoretical economics paper looking at the import of the analysis in other resource economics settings
- An analysis of the implications of the results for one ongoing regulatory effort, the work to develop improved phytosanitary protocols for plants for planting

Expected timeline

- Aiming to have all analyses completed and papers submitted to journals by April of 2010.
- Emails for comments or suggestions:

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