An overview of *Phytophthora ramorum* in Washington State

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- WSDA, DNR, and USDA-APHIS
- WSU's Katie Coats and Marianne Elliott

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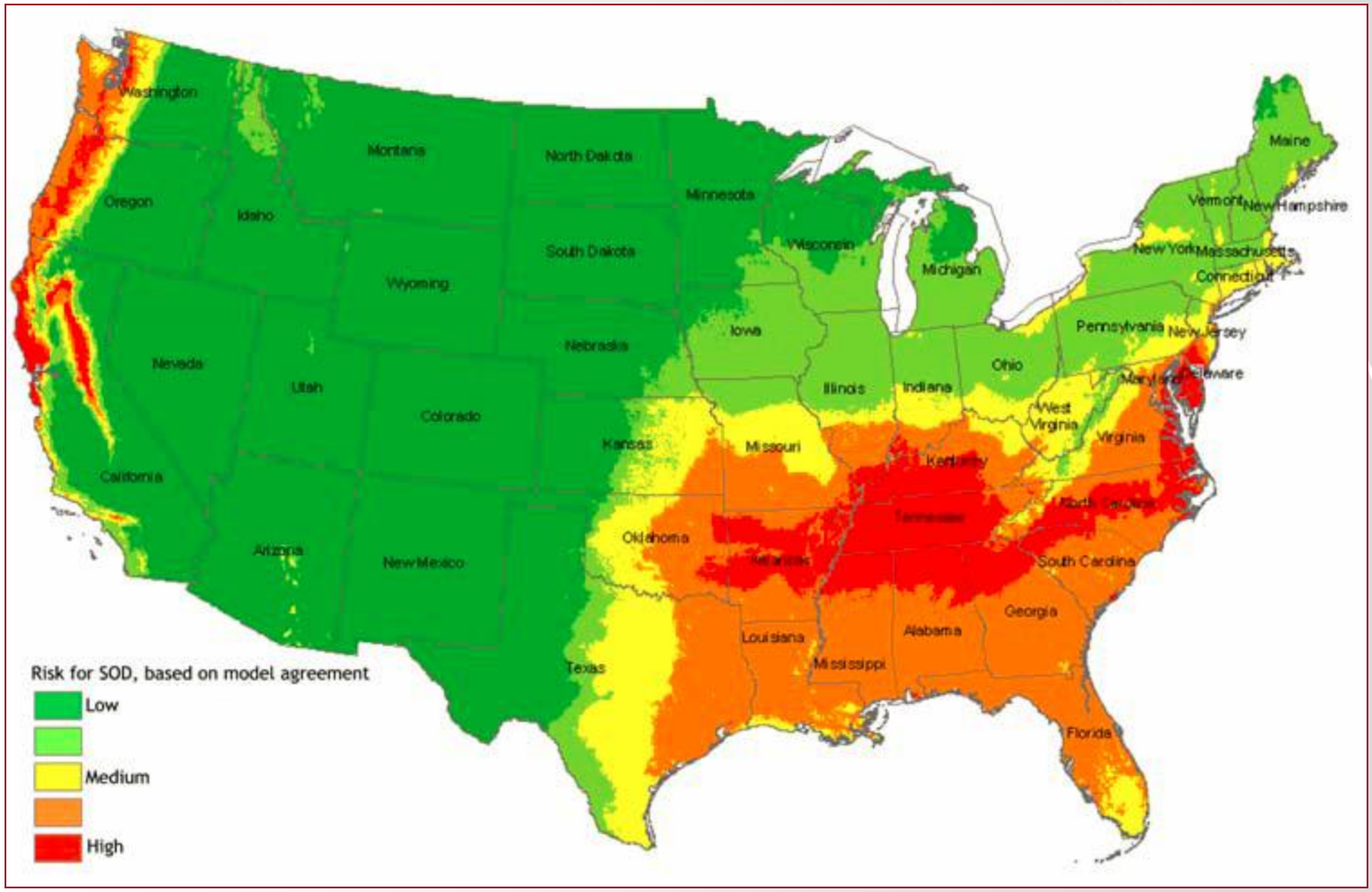
Sudden Oak Death Overview

Phytophthora ramorum

- Exotic pathogen (water mold)
- Origin is unknown
- Three clades (lineages) known (Ivors et al., 2006)
  - EU1 – Europe (A1)
  - NA1 – Most common in N. America (A2)
  - NA2 – “Washington” clade (A2)

Risk for Sudden Oak Death based on agreement between five spatially referenced models (Kelly et al., 2005)



Detection in Nursery Stock

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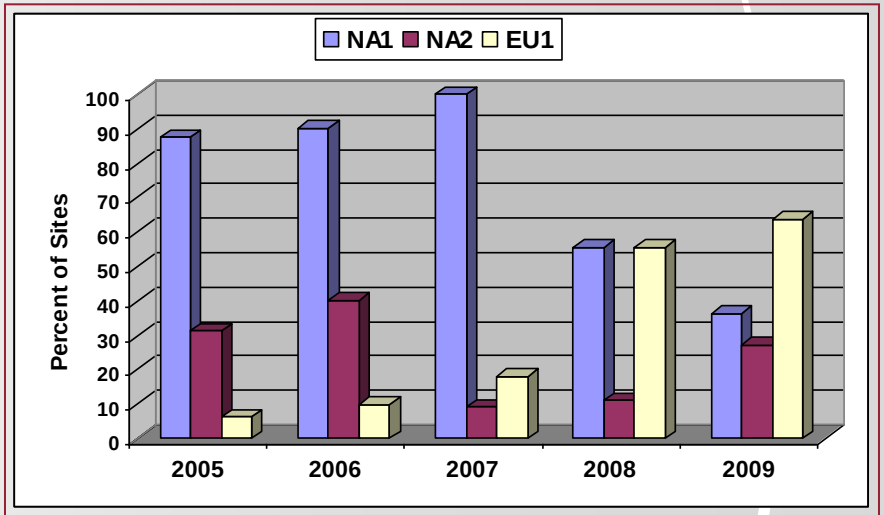
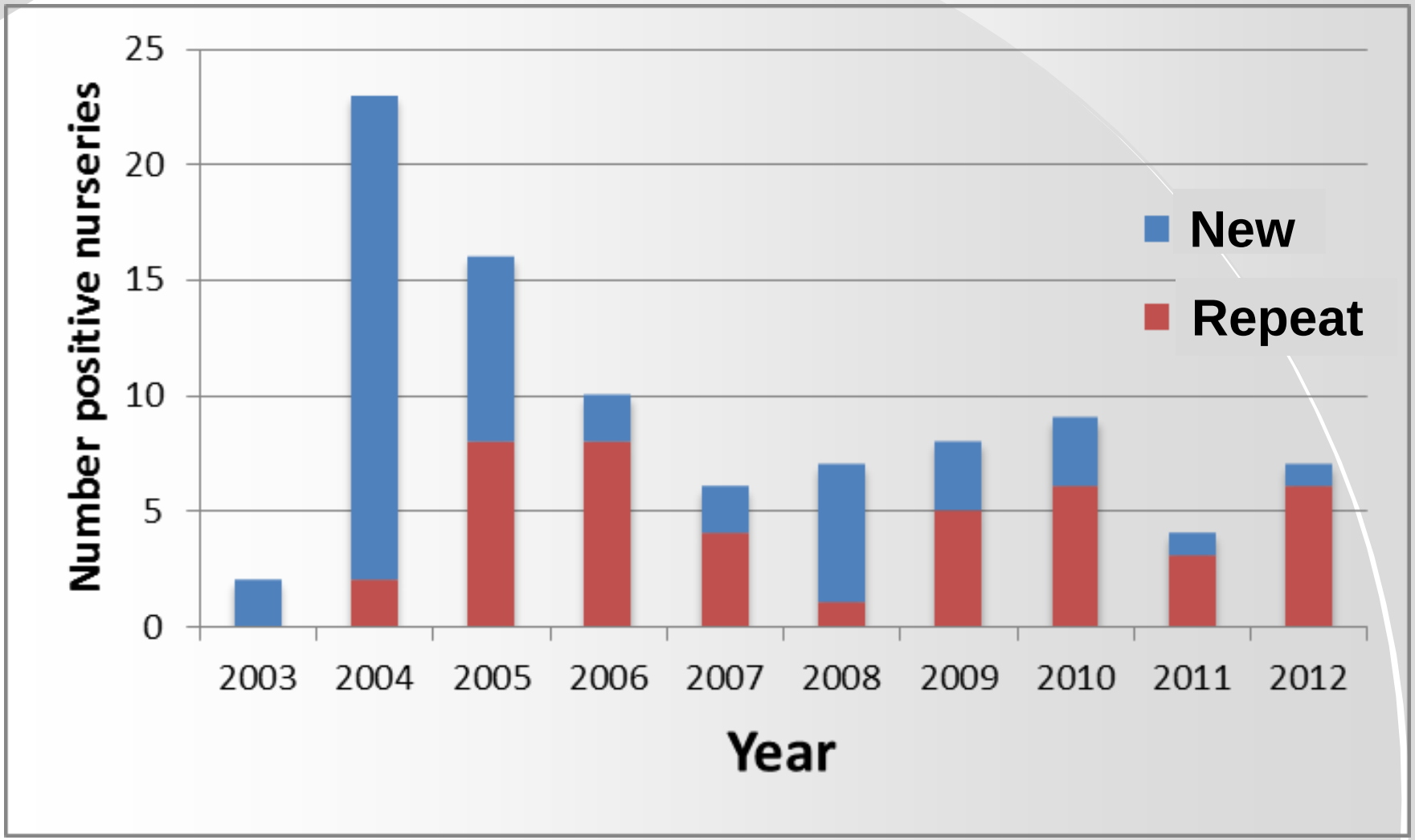
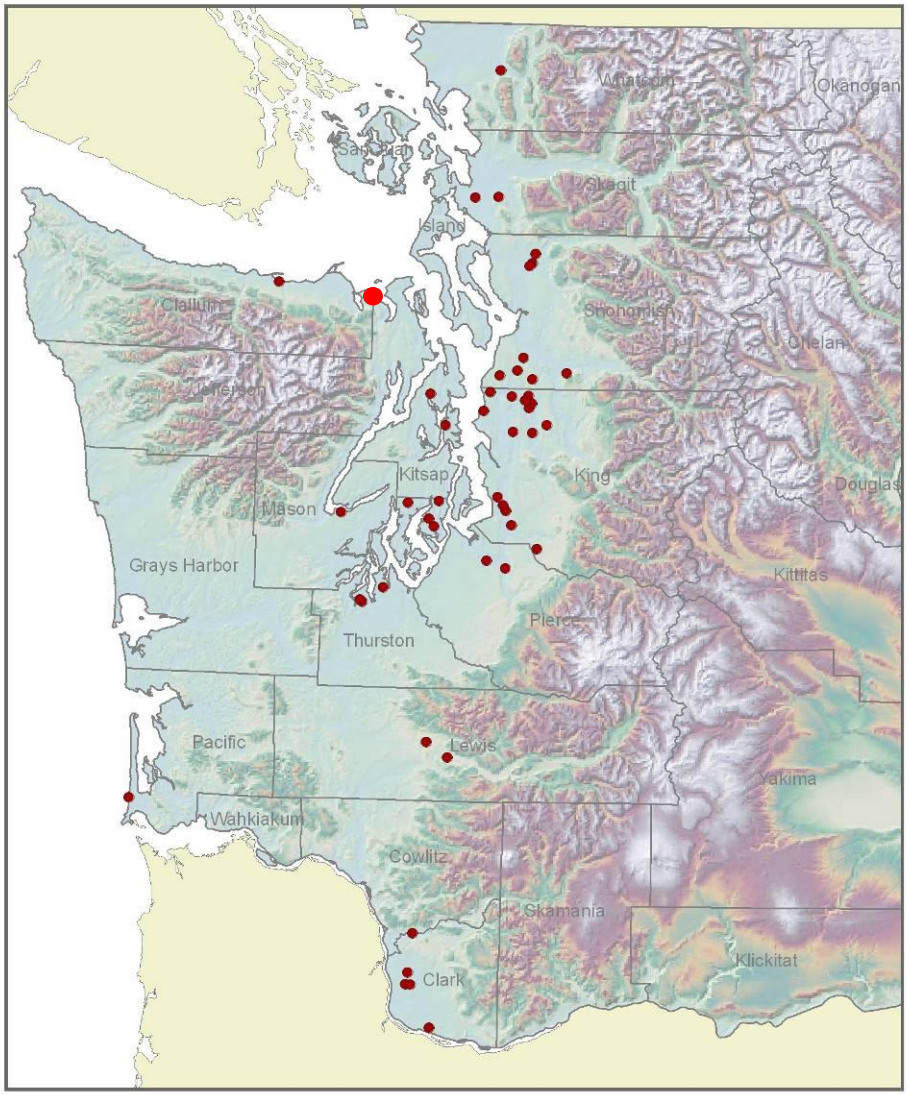
Detection of all 3 lineages



WSDA Nursery Surveys



WSDA Nursery Surveys



Western Washington
***P. ramorum* Positive Nursery Sites 2003-2012**

- A total of 49 nurseries

So far in 2012

- There has been six repeat nursery positives and one new positive nursery
- Two repeat nurseries also had positive water
- There has been one residential positive landscape site with subsequent spread to soil
- WSDA is no longer sampling water off the nursery site.

Most of the positives are repeat nurseries

Spread Via Infected Plant Material
Nursery No. 41 in Thurston Co., WA

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Water

Chronology

Plants at nursery
"+" 2008 – 2010. EU1

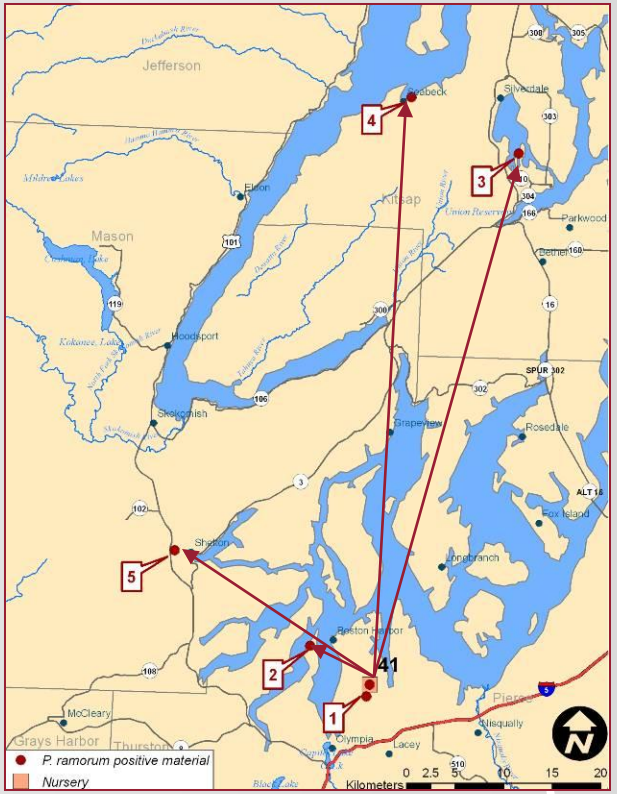
Soil at nursery
"+" 2008. EU1
"–" 2009, 2010

Water nursery
"+" 2008 – 2010. EU1

Trace forward sites
Plants (5): "+" 2008 –2010. EU1
Soil (3): "+" 2009, 2010. EU1

Off nursery site ditch
~~"+" 2010, 2011. EU1~~
"+" plant and soil 2012

Trace Forward Sites



Spread of *Phytophthora ramorum* in water from nurseries

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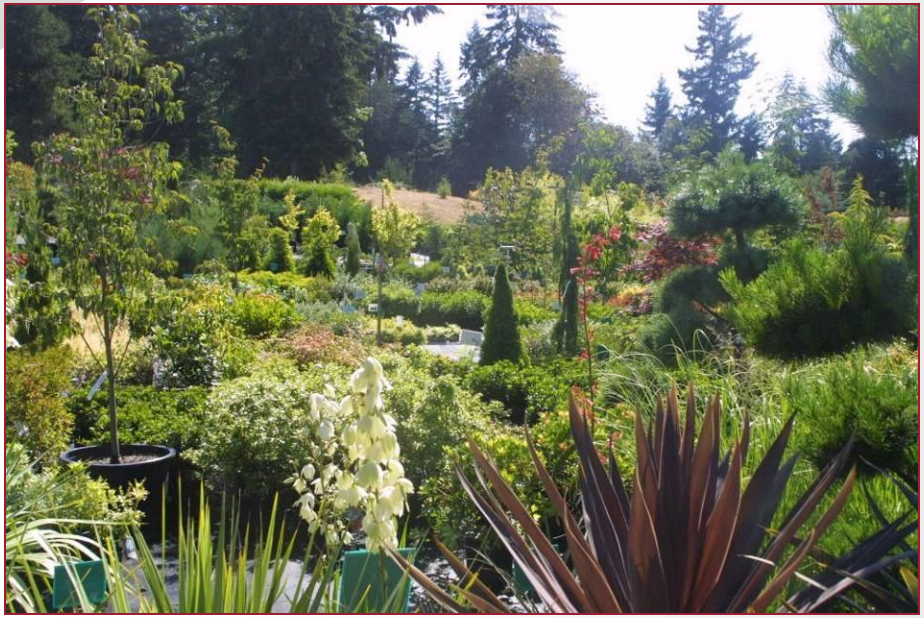
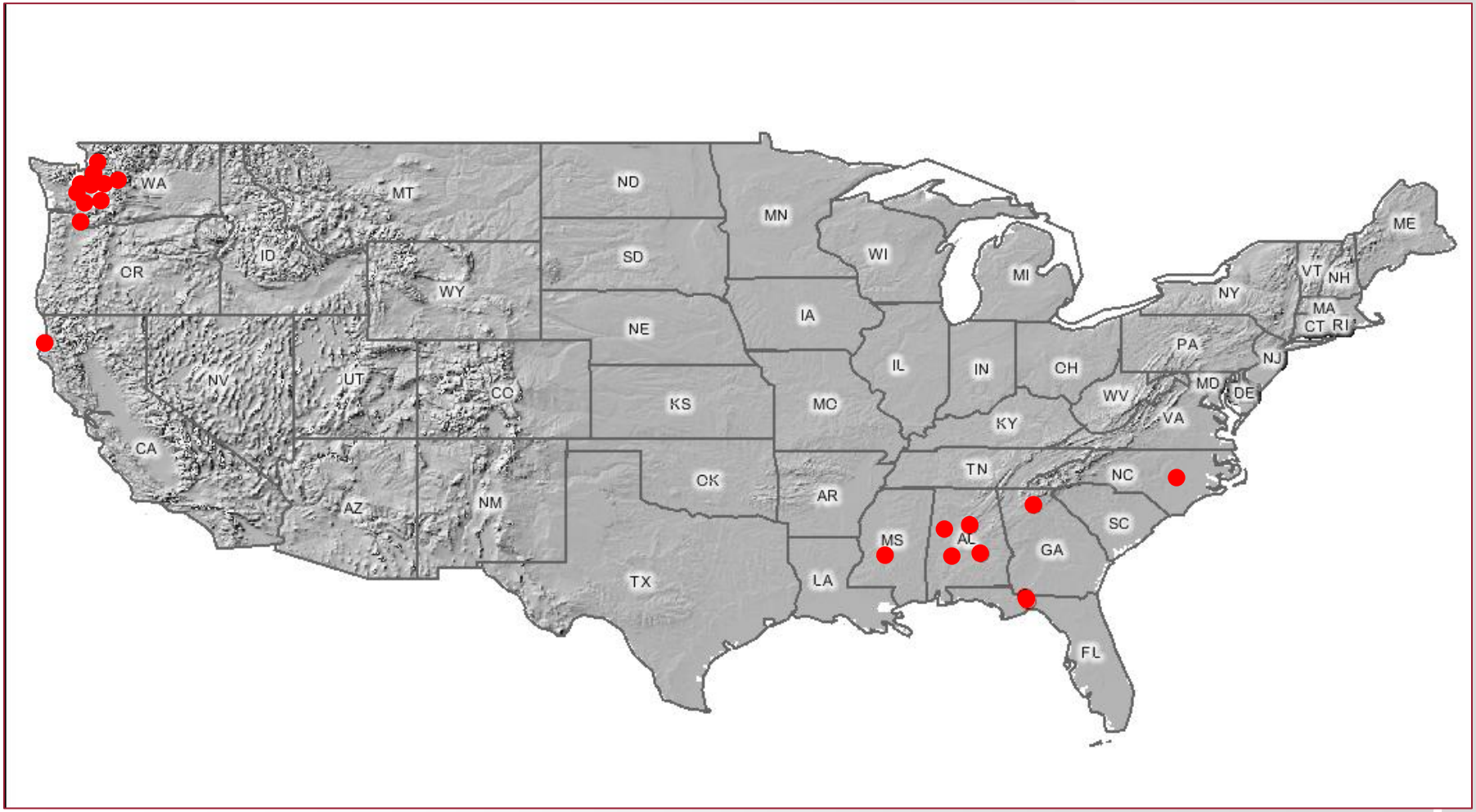


Spread of *P. ramorum* in water from nurseries



Nursery No. 45 in Pierce County, WA

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P. ramorum Detection in Waterways

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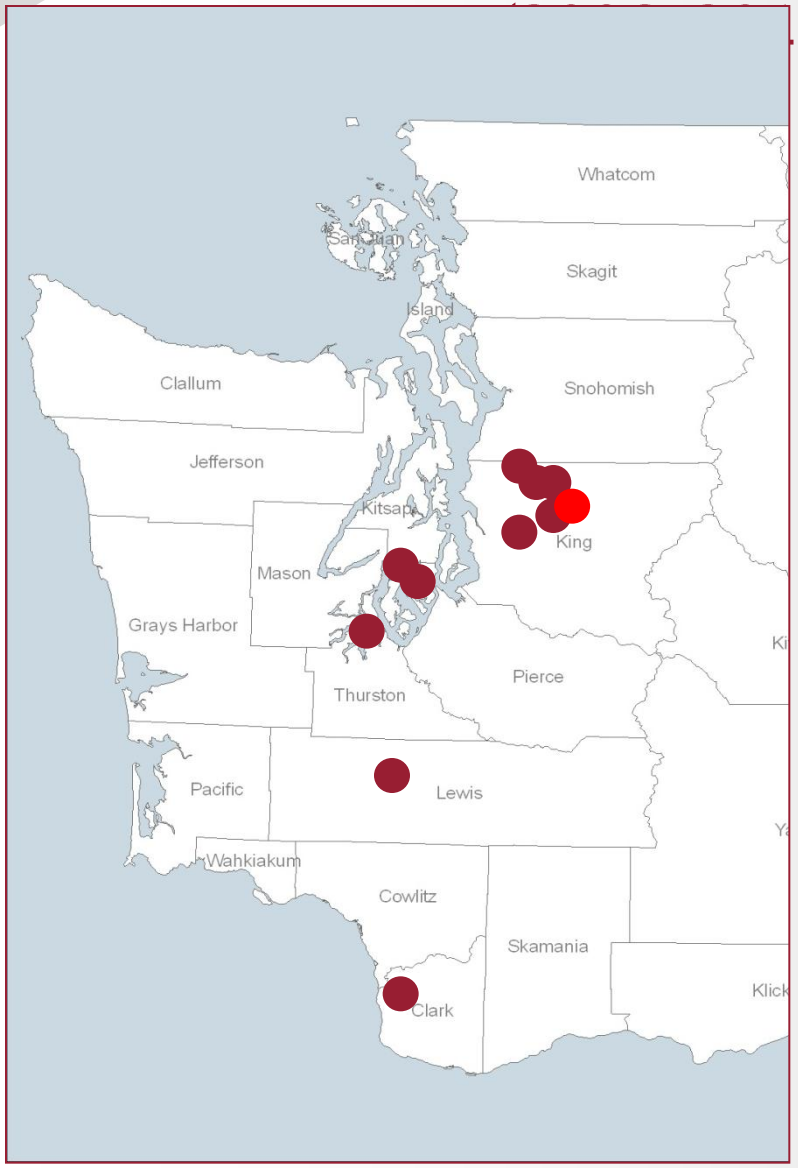

King County
- Sammamish River
- Ditch/pond by Nursery #34
- Little Bear Creek
- Woodin Creek (repeat '12)
- Industrial ditch
- Cottage Lake Creek (new '12)

Pierce County
- Rosedale Stream
- Ditch by Nursery #45

Thurston County
- Ditch by nursery #41

Lewis County
- Mill Creek (repeat '12)

Clark County
- Ditch by nursery #44 and Packard Creek

All three lineages have been detected in waterways in WA

Persistence in WA Waterways

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County	Waterway	Year						
		2006	2007	2008	2009	2010	2011	2012
King Co.	Sammamish River		****	****	****	****	****	
	Ditch/pond by #34		****	-----	****	****	****	
	L. Bear Creek					****	****	
	Woodin Creek					****	****	****
	Industrial ditch					****	****	
	Cottage Lk Ck							****
Pierce Co.	Rosedale Stream	****	****	****	****	****	****	
	Ditch by #45				****	****	****	
	Salal				****	-----	-----	
	Soil in ditch						****	
Thurston Co.	Ditch by #41					****	****	
Lewis Co.	Mill Creek						****	****
Clark Co.	Ditch by #44					****	****	
	Packard Creek						****	

Summary

- *P. ramorum* continues to be detected in WA nurseries.
- Most positives are repeat nurseries.
- *P. ramorum* continues to spread from nurseries via the movement of infected plant material and the flow of water off of positive nurseries.

Thank You

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