Washington State Grape Society
Annual Meeting and Trade Show

Nov 18, 2021

Phylloxera risk map update

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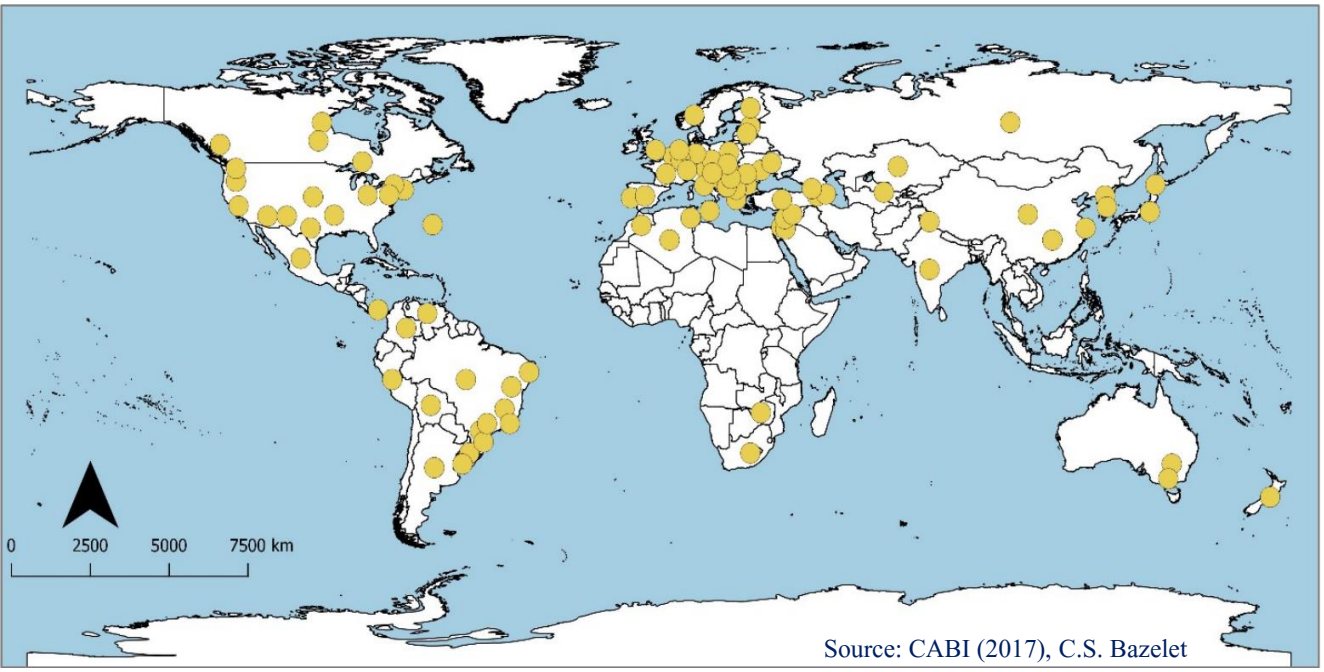
Global Phylloxera status

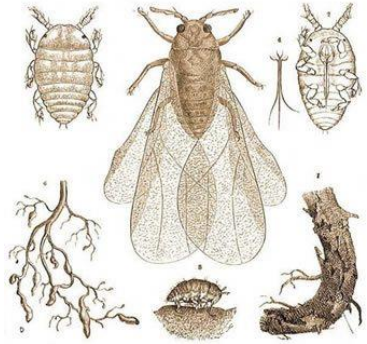


Source: CABI (2017), C.S. Bazelet

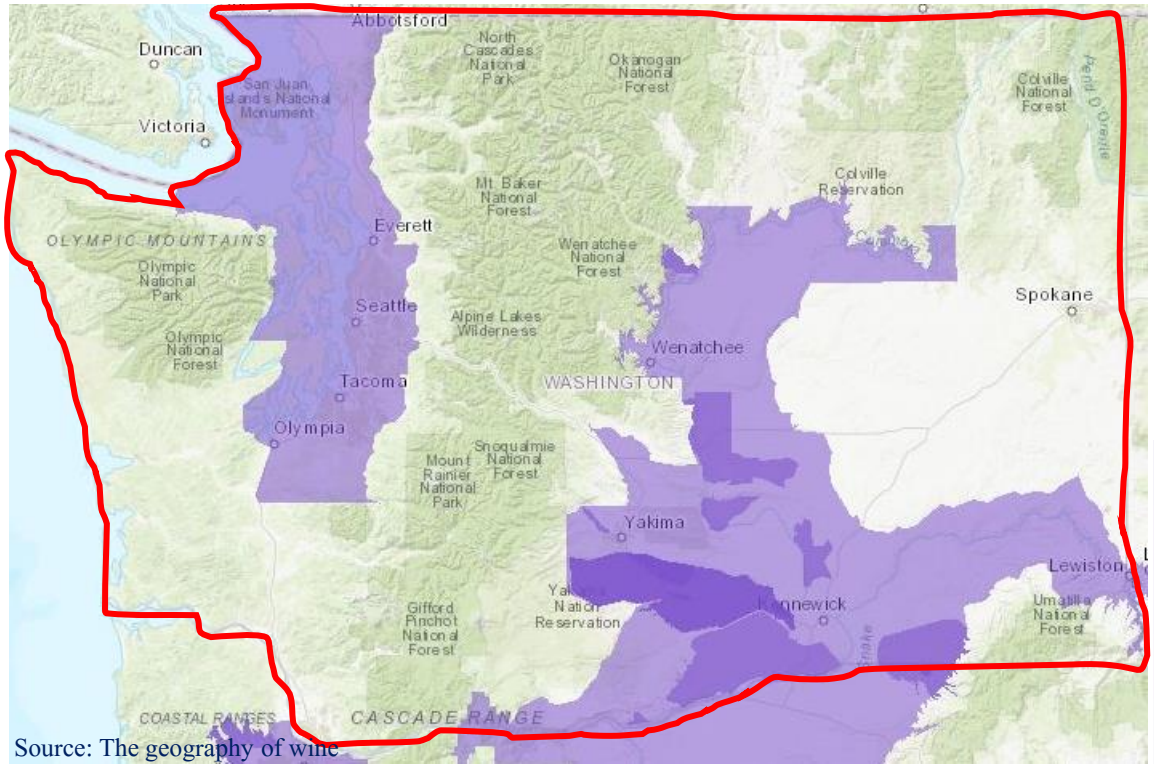

Source: Science photo library

Source: daily.seventfifty.com

- Feeds on wine roots and leaves
- Significant vine and production decline across the globe
- Reported in all the major grape growing regions
- Quarantine pest in Washington but several detections in 2019


Source: The Drinks Business

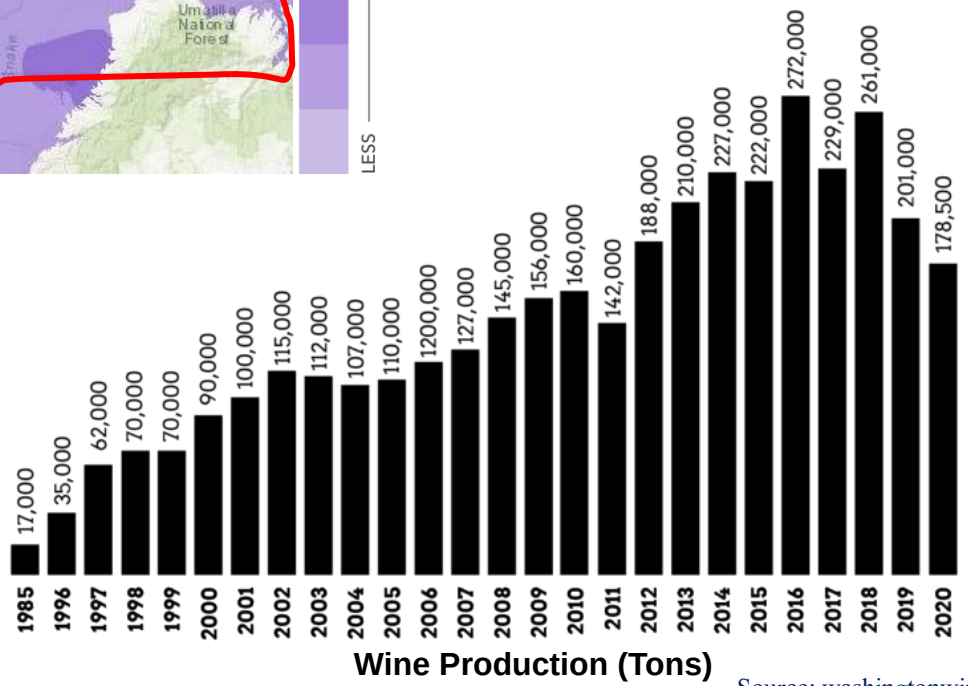
Grape production in Washington



Source: The geography of wine

- 2nd Largest wine producer
- Economic impact: $8B+

- 1,000+ wineries
- 400+ growers
- 60,000+ acres



Source: washingtonwine.org

Phylloxera management

- Remove vines/vineyard?
- Replant resistant rootstocks?
- All infected vineyards need management?
- Soil management?
- Laborious?
- Economics?
- Symptoms and risk assessment?

Phylloxera risk mapping

- **Purpose**
  - Identify vineyards under high, moderate, and low risks
  - Timely infestation assessment

- **Affecting factors**
  - Soil sand content: inversely proportional
  - Soil temperature: directly proportional

- **Data inputs**
  - Sand content map: USDA-NRCS and soilgrids
  - Soil temperature: WSU AgWeatherNet

Soil sand content map (depth: 0-3.3 ft)

Input data

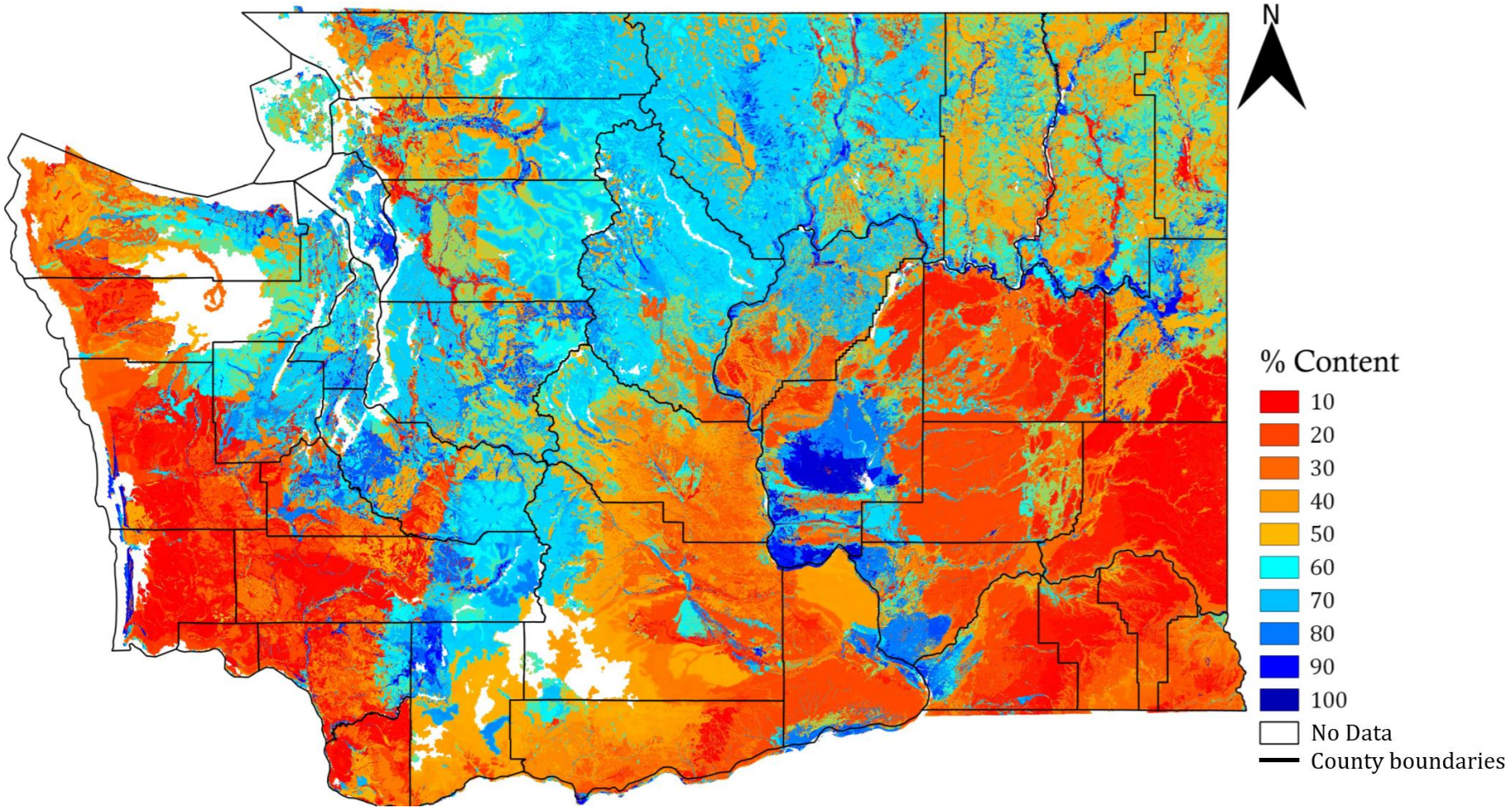
⇩

Data processing

⇩

Infestation risk mapping

Soil sand (%)	Risk
<65	High
65-80	Moderate
>80	Low



Soil temperature map (depth: 8.3 in, Jun-Aug, 2010-21)

Input data

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Data processing

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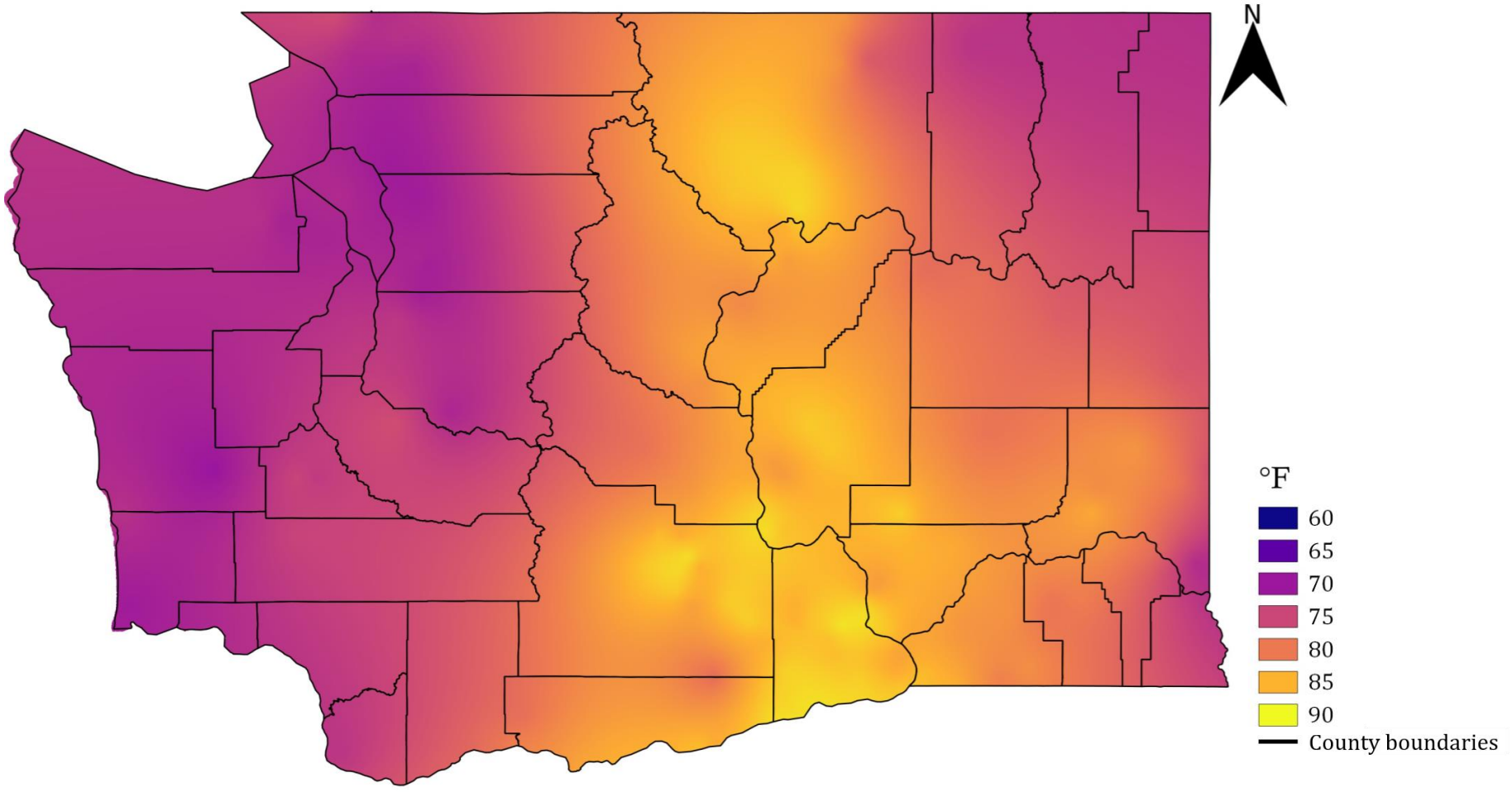
Infestation risk mapping

Soil temperature (°F)	Risk
64-81	High
59-64	Moderate
<59, >81	Low



Soil sand-based Phylloxera risk

Input data

⇩

Data processing

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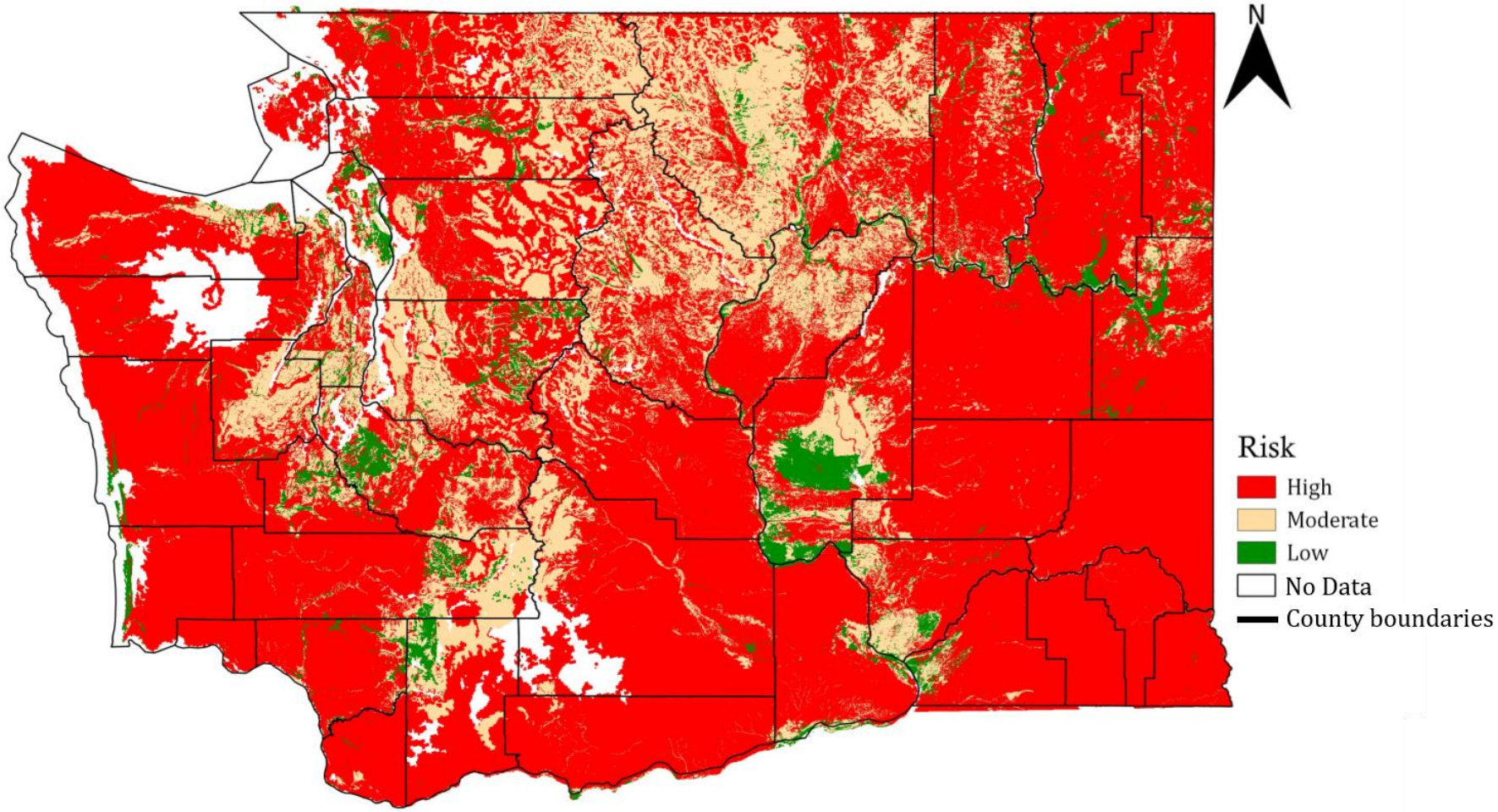
Infestation risk mapping

Risk	State's area	Validation (23 confirmed)
High	73.7%	96%
Moderate	21.6%	4%
Low	4.8%	-



Soil temperature-based risk

Input data

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Data processing

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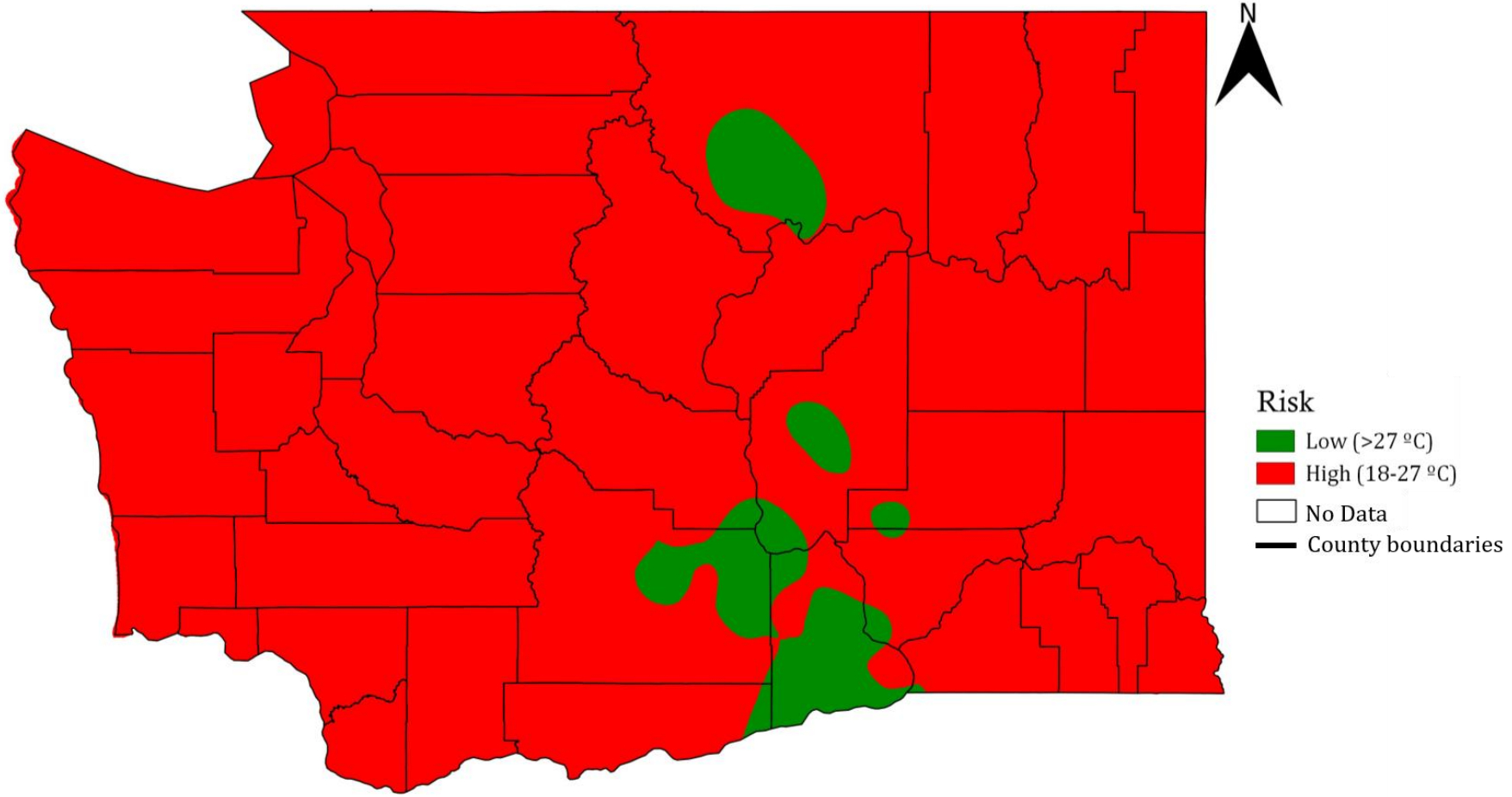
Infestation risk mapping

Risk	State's area	Validation (23 confirmed)
High	94.7%	43.5%
Moderate	-	-
Low	5.4%	56.5%



Combined risk (sand and soil temperature)

Input data

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Data processing

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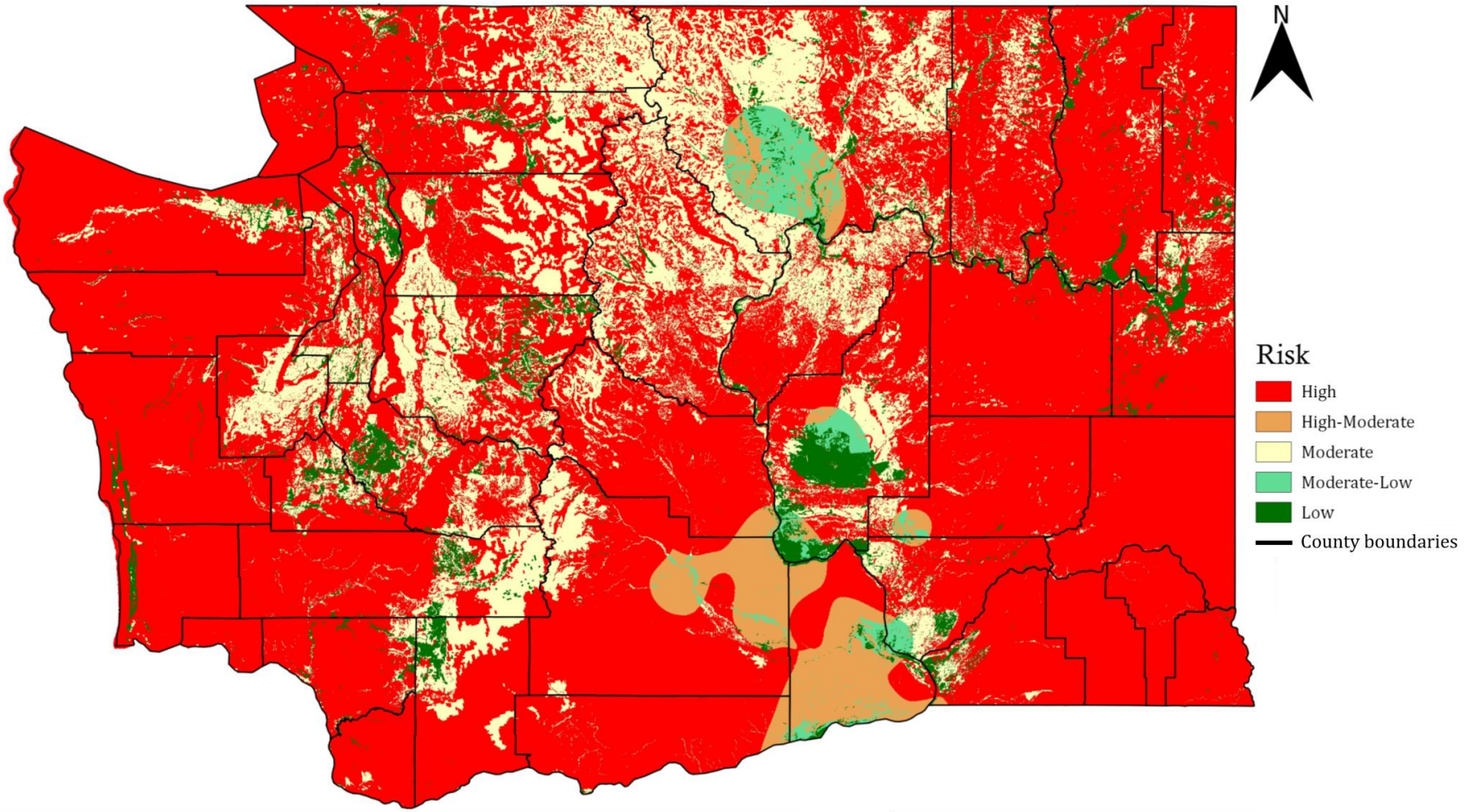
Infestation risk mapping

Risk			State's area	Validation (23 confirmed)
Sand-based	Temperature-based	Overall		
Low	Low	Low	4.8%	-
Low	High	Low		
Moderate	Low	Moderate-Low	1.7%	4.5%
Moderate	High	Moderate	19.6%	-
High	Low	High-Moderate	3.9%	52%
High	High	High	70%	43.5%



Combined risk (sand and soil temperature)

Risk			Explanation
Sand-based	Temperature-based	Overall	
Low	Low	Low	Sand content and temperature are not conducive
Low	High	Low	While sand content is not conducive, temperature is. The temperature will have an effect only if the sand content is reduced (e.g., by addition of organic matter) and phylloxera is introduced
Moderate	Low	Moderate-Low	Sand content is moderately conducive, but the temperature is not. This combination will reduce the overall risk of rapid development if phylloxera is introduced
Moderate	High	Moderate	Sand content is moderately conducive, and temperatures are optimal. Phylloxera could survive if introduced and could potentially thrive if soil sand content is reduced further
High	Low	High-Moderate	Sand content is ideal for rapid development, but soil temperature is not. Phylloxera development is possible, albeit at a slightly lower rate
High	High	High	Soil sand content and temperatures are ideal for the rapid phylloxera development

Conclusions

- **Soil sand content**: most influential factor
- **Sand temperature**: risk modifier
- 100% confirmed locations were moderate to high risk
- **Potential solutions**
  - Low risk: own rooted vines
  - High-moderate risks: replantation on resistant rootstocks
- **Risk prediction improvement** (Site-specific information)
  - Soil and weather information
  - Sanitation management (planting clean vines, vine removal, etc.)

Thank You

Questions/suggestions ?

USDA NIFA

USDA Natural Resources Conservation Service

WSDA

AgWeatherNet
Washington State University

For more information:

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