

# ***EAB Hangover***

Evaluating impacts of emerald ash borer on forest vegetation  
in eastern North America

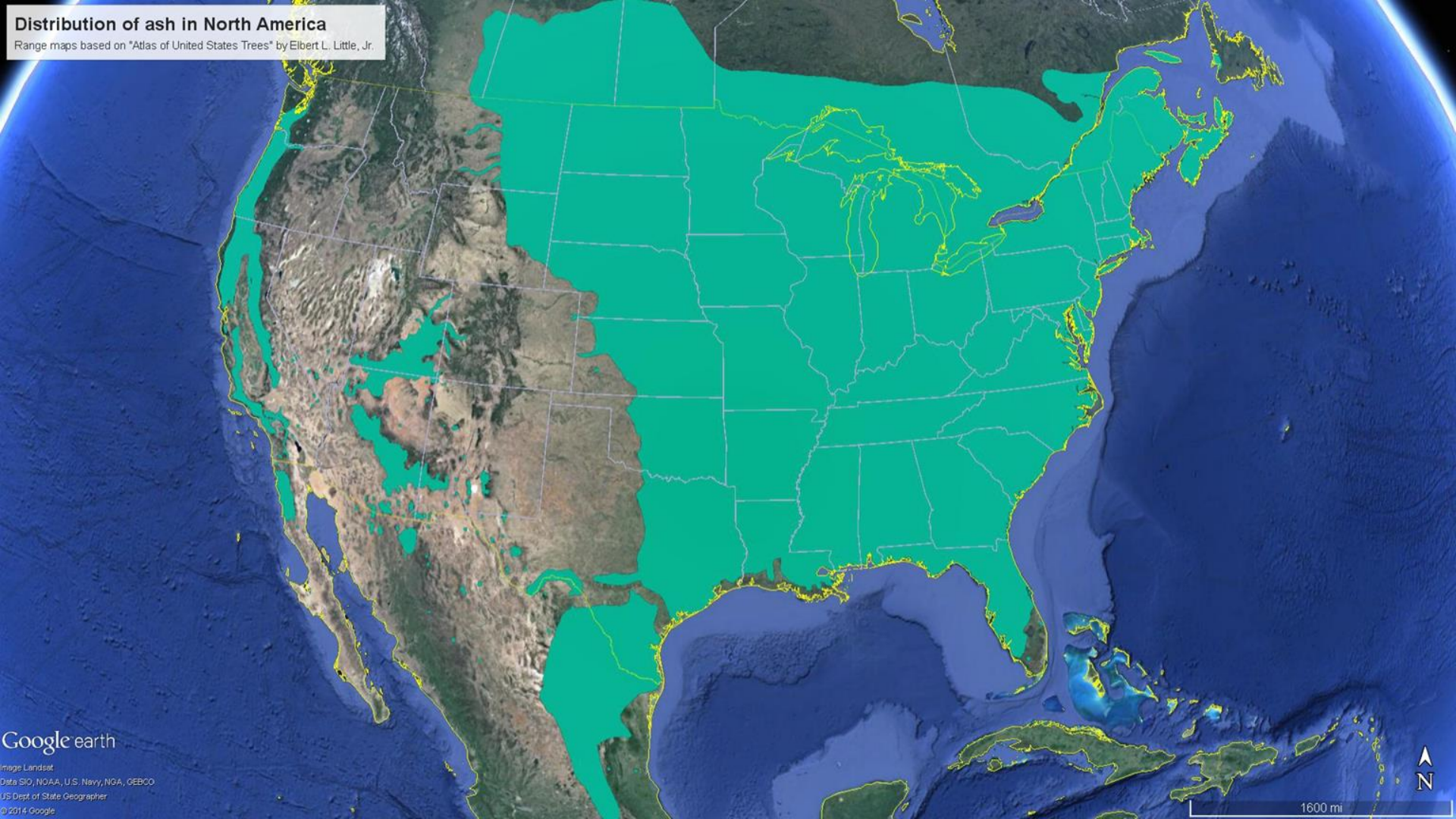


Jason S. Kilgore, Washington & Jefferson College  
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# emerald ash borer (*Agrilus planipennis*)





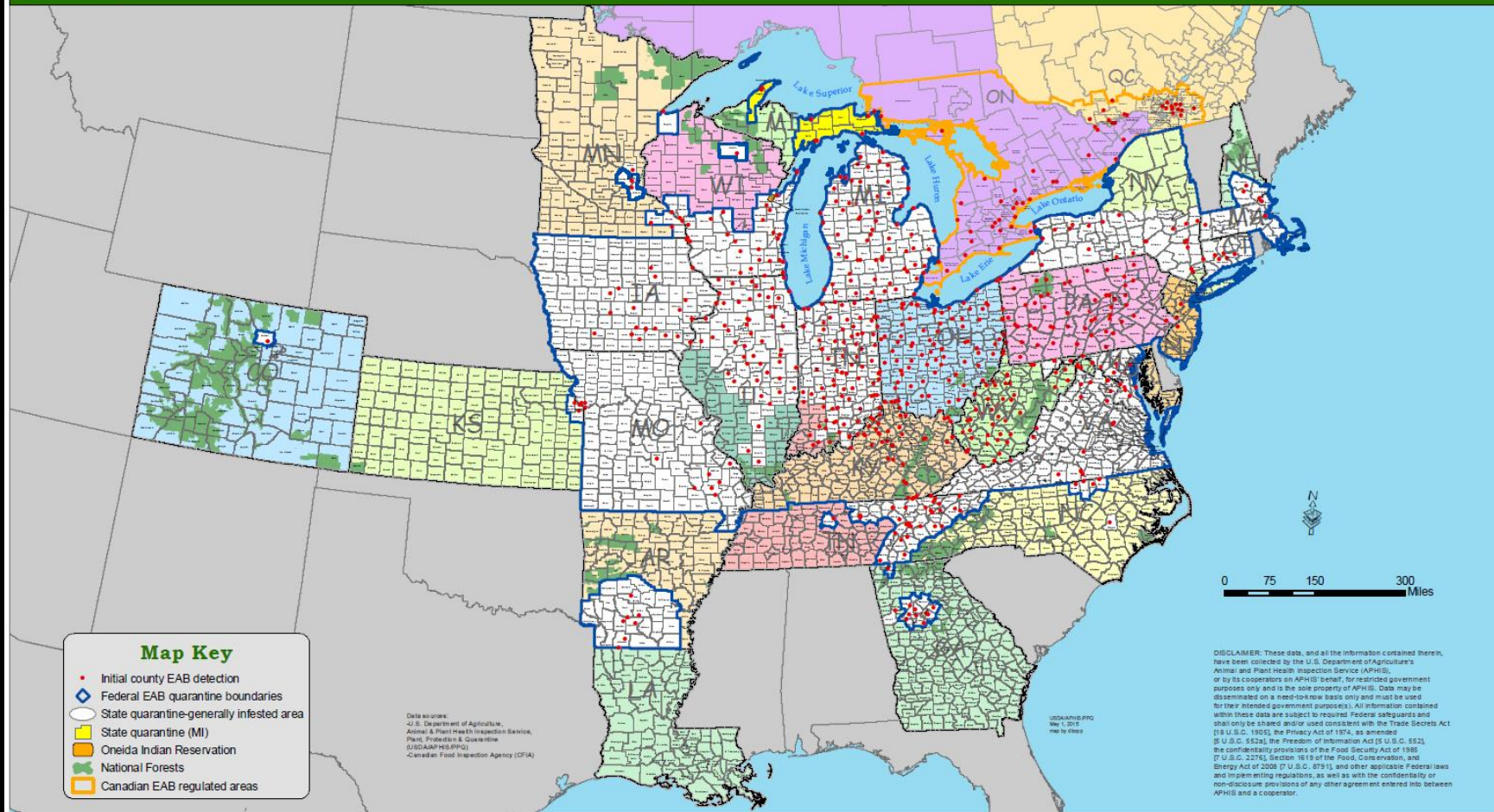


**Distribution of ash in North America**  
Range maps based on "Atlas of United States Trees" by Elbert L. Little, Jr.

# Cooperative Emerald Ash Borer Project

Initial county EAB detections in North America

May 1, 2015





# Impacts of EAB thus far

- Altered light regime
- Altered nutrient cycling & carbon storage
- Blue ash has higher resistance, but still dies



# EAB Impacts Study: hypotheses

- ❖ **Water stress** affects *rate of ash decline* (continentally)
- ❖ **Increased light availability** leads to *increased seedling density* and *sapling growth rate*
- ❖ **Increased light availability** in high ash plots leads to shift toward *shade-intolerant tree species* and *more invasive plants*
- ❖ Certain **invasive plants** have a *disproportionate effect* on post-invasion diversity, growth rate of native trees, and time to canopy closure.



# EREN

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## PERMANENT FOREST PLOT PROJECT

### Contacts:

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Erin Lindquist, Meredith College, [erinlind@meredith.edu](mailto:erinlind@meredith.edu)

Initiated: 2012

### Description:

The goal of this project is to establish a set of permanent research plots throughout the United States and Canada that will allow faculty and students to address questions related to tree biomass, carbon accumulation, invasive species, and disturbance patterns across a range of sites and ecoregions.

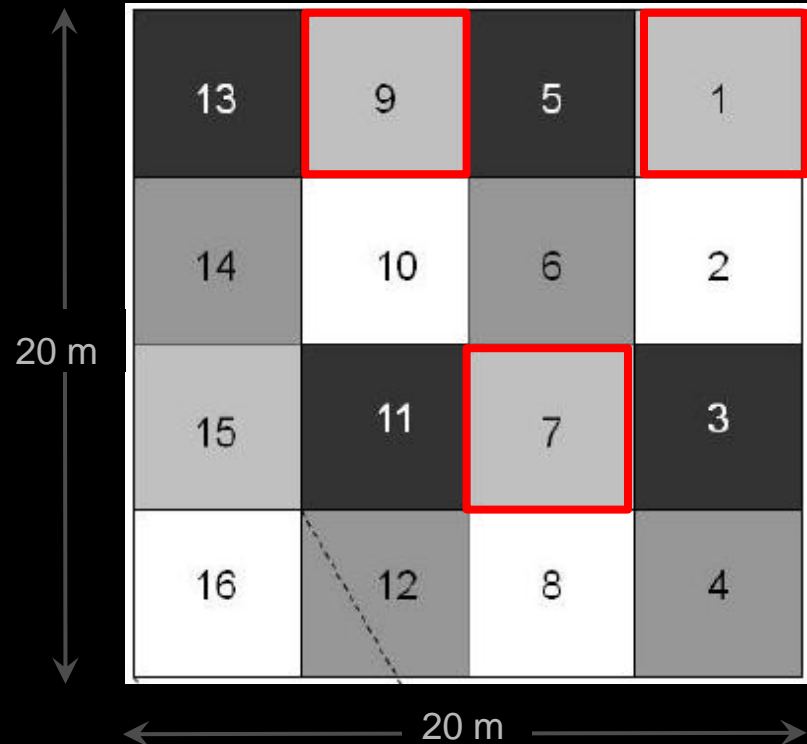
# PFPP variables (Plot & Subplot)

## Trees: (400 m<sup>2</sup> Plot)

- species, tag
- inventory status
- DBH, soundness
- *opt: crown class, height*
- tree damage

## Small Stems: (25 m<sup>2</sup> Subplot)

- species, tally





# EAB variables (Plot)

## EAB Indicators:

- Ash rating
- Ash tree breakup
- EAB exit holes



<http://labs.russell.wisc.edu/eab/files/2011/06/D-shaped-exit-holes.jpeg>



<http://vil.carpentersville.il.us/images/EAB/Canopy%20Dieback%20of%20an%20Ash%20Tree.jpg>

# Understory variables (Subplot)

## Understory Community:

- Canopy cover
- Shrub/saplings (0.3-1.37 m tall)
  - Species, tally

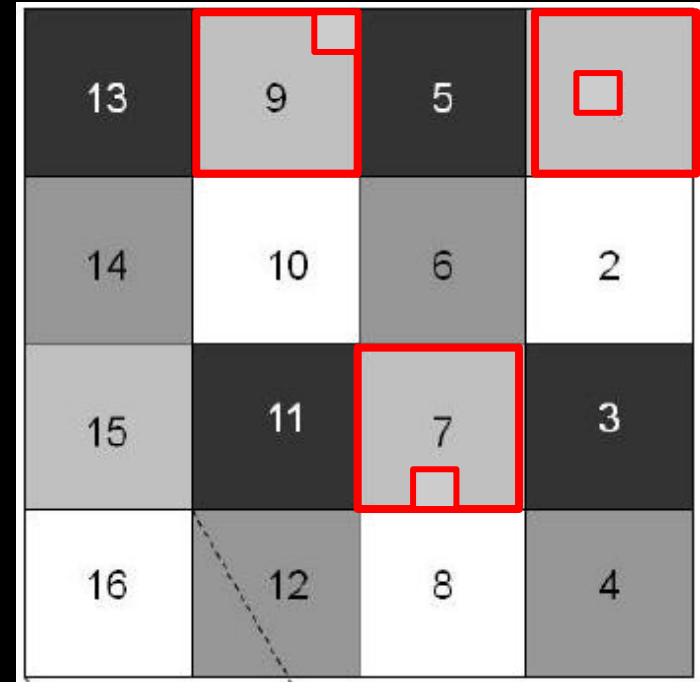


13	9	5	1
14	10	6	2
15	11	7	3
16	12	8	4

# Understory variables (Miniplot, 1 m<sup>2</sup>)

## Understory Community:

- Woody seedlings and herbaceous plants
  - Species, tally, cover class

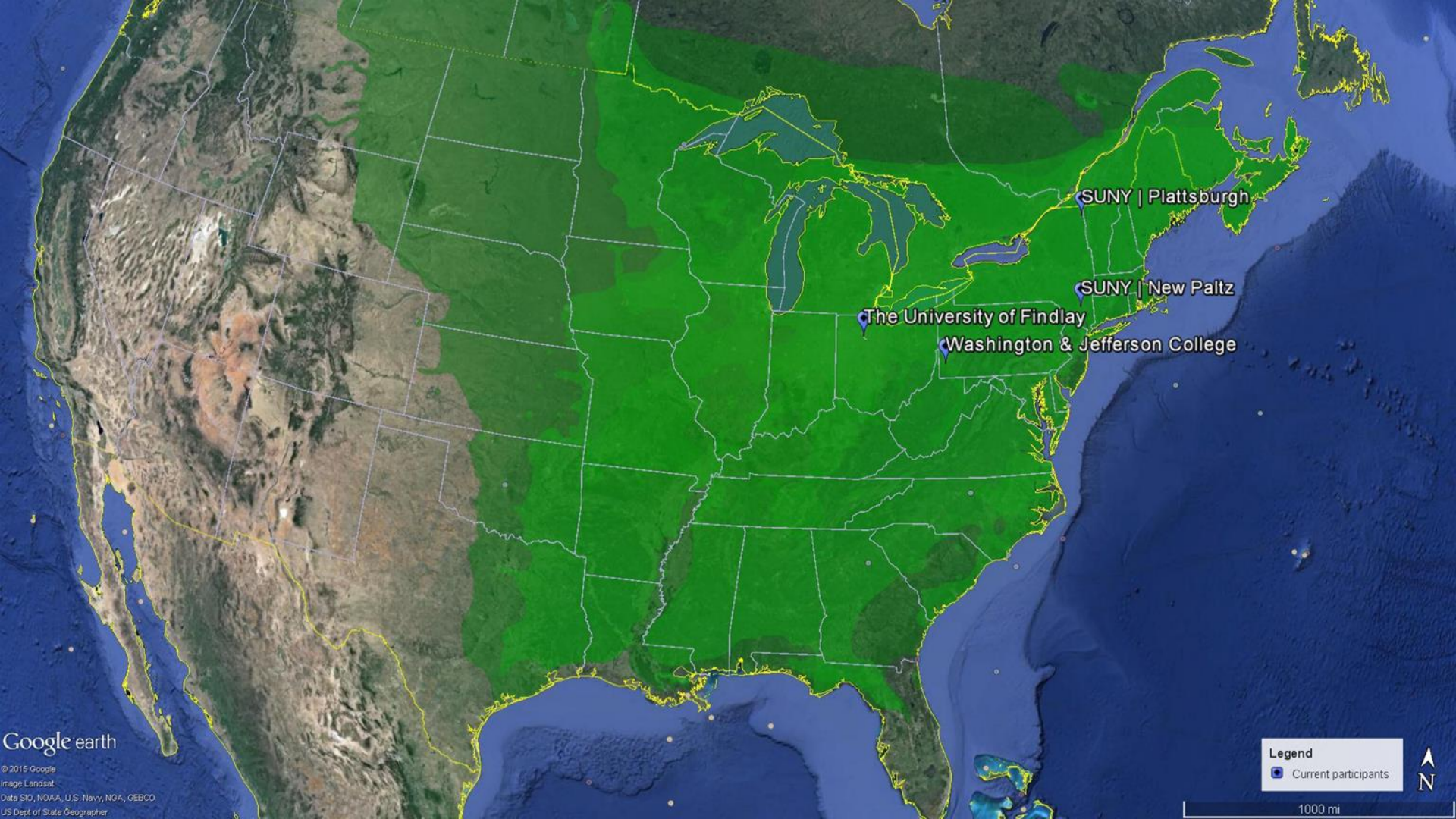




# Distribution vectors (GIS)

## Distances to:

- Major roads and expressways
- Streams and rivers
- Railroads
- Shipping ports
- Distribution centers and manufacturers receiving goods on foreign pallets



SUNY | Plattsburgh

SUNY | New Paltz

The University of Findlay

Washington & Jefferson College

Google earth

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Image Landsat  
Data SIO, NOAA, U.S. Navy, NGA, GEBCO  
US Dept of State Geographer

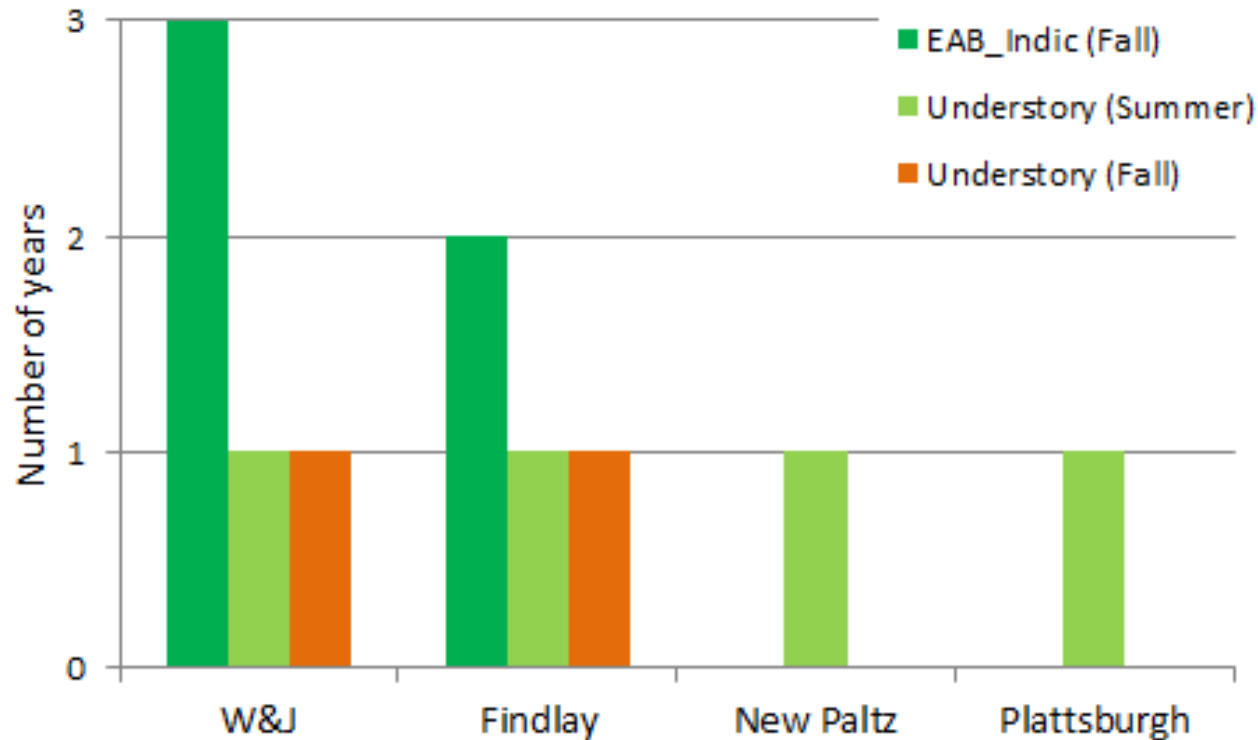
**Legend**

-  Current participants

1000 mi

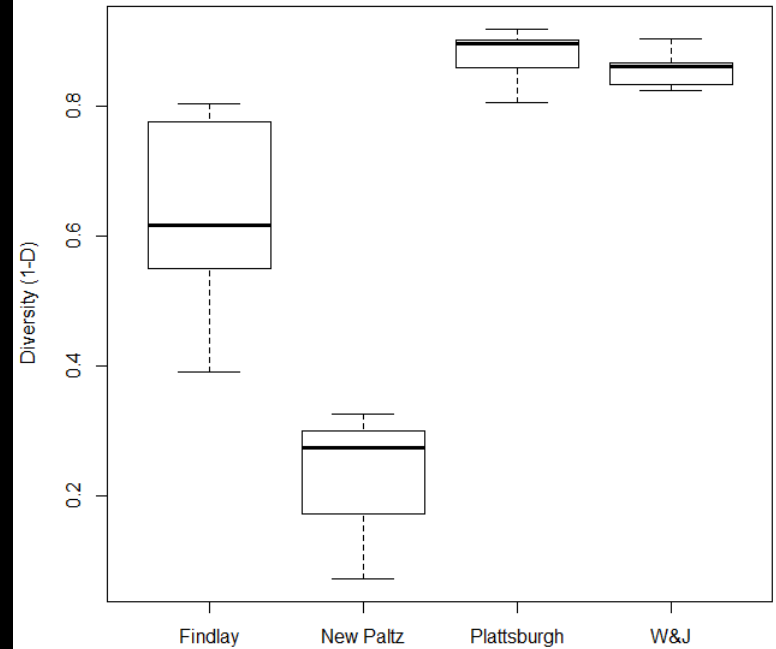
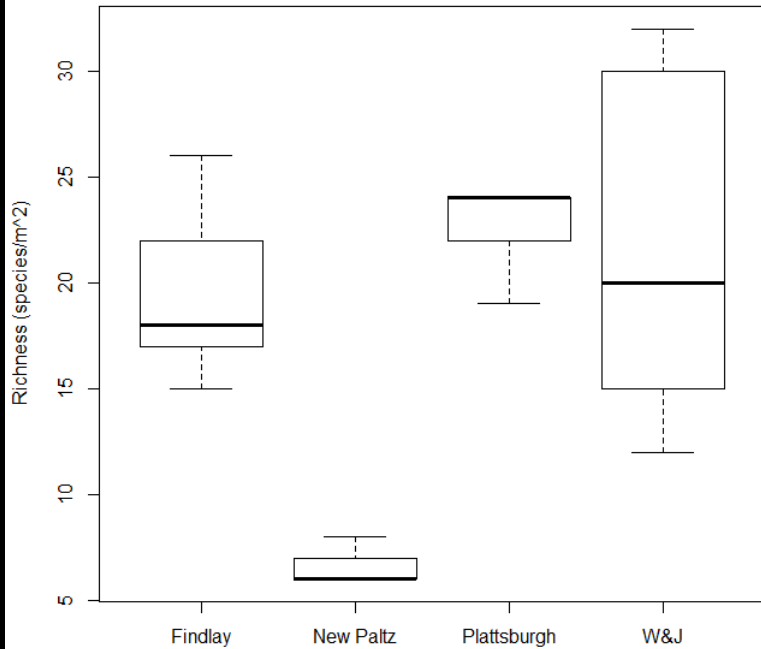


# Baseline data: Collection effort





# Baseline data: Miniplot diversity



# Initial results: mature ash

## **UF (Ohio) and W&J (Pennsylvania)**

- Similar mature ash density (67-71 trees/ha) and overstory (22%)
- EAB documented in Hancock County (2005) and Washington County (2009)
- Ash mortality higher at UF (99%) than W&J (0%, but 23% with EAB symptoms)

# Data collection & curriculum

## Undergraduate students

- General ecology, field biology, etc.
- Upper-level ecology or research courses

## Understory variables

- May – July

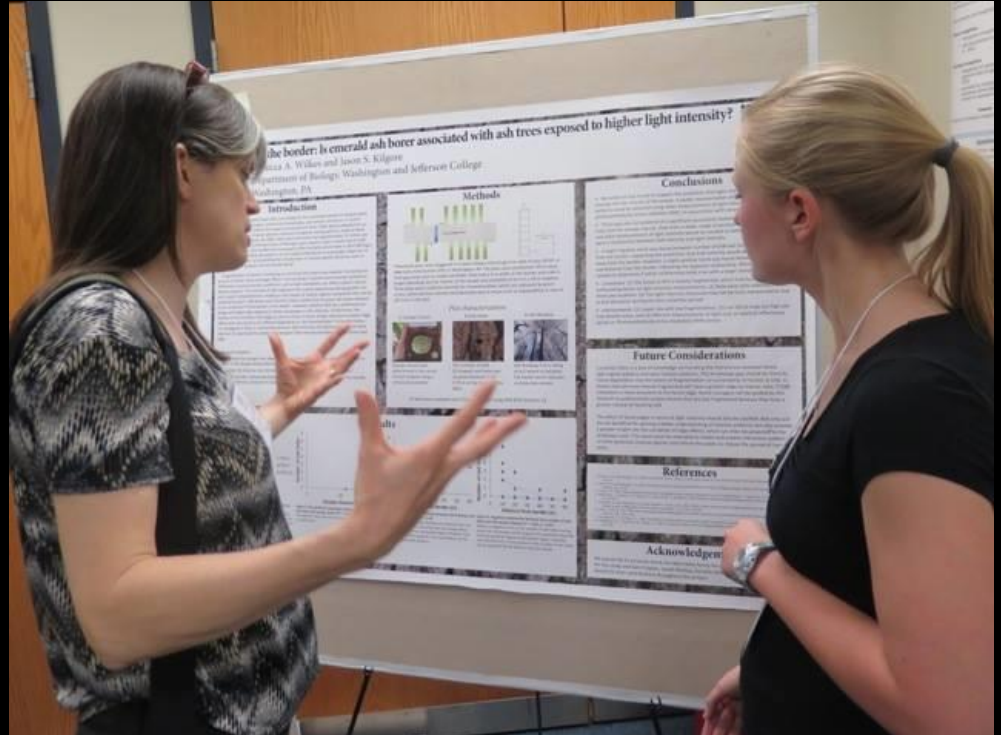




# Student outcomes

## Science literacy Collaboration Conferences

- College, regional, national (BSA, ESA)



# Future

**Do you have ash?**



## **Community data analyses (Spring 2016)**

- Conferences (BSA/ESA)
- Manuscripts



## EMERALD ASH BORER PROJECT

### Contact:

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*Initiated: 2013*

### Objective:

The objective of this project is to address questions related to the loss of ash (*Fraxinus* spp.) trees in forest communities, especially those impacted by emerald ash borer (EAB, *Agilus planipennis*). In addition to the data collected by the EREN Permanent Forest Plot Project (PFPP), this project calls for additional data specific to EAB infestation, ash decline and loss, and response by understory plants.

### Protocols:

[EAB Protocols](#)

### EREN Updates

[EREN the focus of Organised Oral Session at ESA 2014 in Sacramento, CA on Friday morning, August 15](#)

A number of EREN members are presenting during an organised oral session on Friday morning, August 15 at the Ecological Society Meetings being held in Sacramento, CA. ... [\[Read More...\]](#)

[EREN2014 All Members Meeting Presentations](#)

Copies of the presentations are now available on the EREN website under 'News and Pubs' ... [\[Read More...\]](#)

[EREN 2014 All Members](#)