

## CAN VOLUNTEERS CONTRIBUTE TO INVASIVE SPECIES DETECTION AND SCIENCE?

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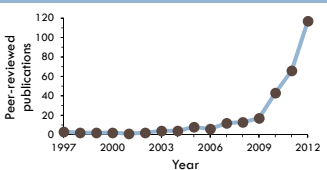
## WISCONSIN'S FIRST DETECTOR NETWORK = WIFDN




Network of volunteers in WI, formed 2013


## What is Citizen Science?

□ Partnership between scientists and the public to address research questions of common interest



Peer-reviewed publications

Year




Slide: Abe Miller-Rushing, NPS, SERC Institute

## Assessing Benefits and Challenges

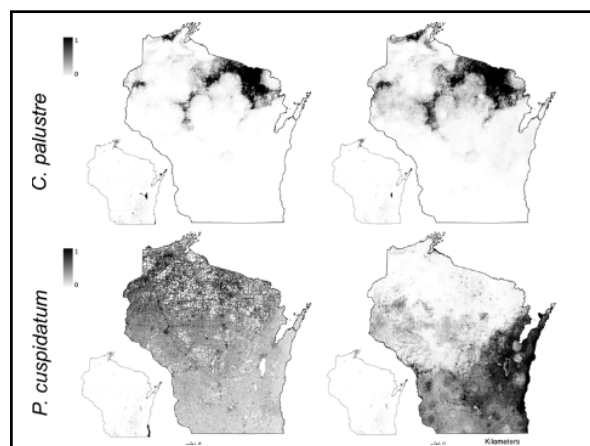
Benefits	Challenges
<ul style="list-style-type: none"> <li>□ Data collection across spatial and temporal scales</li> <li>□ Data relevant to local conservation issues</li> <li>□ Connects scientific research to public outreach and education</li> <li>□ Changes in attitudes and behavior</li> </ul>	<ul style="list-style-type: none"> <li>□ Data quality               <ul style="list-style-type: none"> <li>▢ Increase in data variability</li> <li>▢ Inconspicuous species commonly misidentified</li> </ul> </li> <li>□ Data management</li> <li>□ Skeptics</li> </ul>

## Professional + Volunteer observations

*C. palustris*



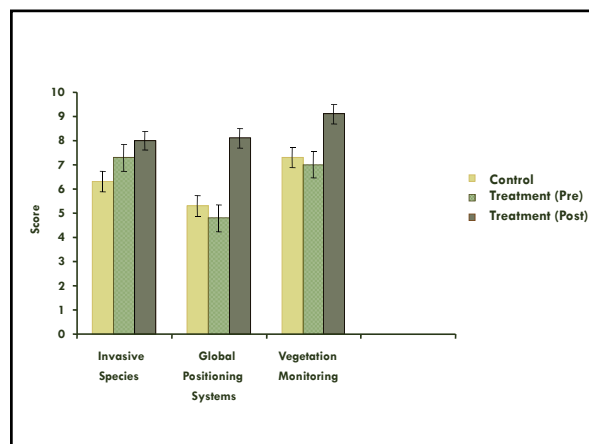
	Garlic mustard	Japanese Barberry	Eurasian Marsh thistle	Japanese knotweed	Wild Parsnip
Professional	72	64	63	58	62
Volunteer	60	61	58	56	6





### Tested the ability of volunteers to identify invasive plants

- 2009 recruited volunteers and professionals to participate Madison + Ft Collins
- Professionals (WI 31, CO 21)
  - ▢ Faculty, graduate students, land managers
- Volunteers (WI 31, CO 28)
  - ▢ People involved in an existing volunteer network
- Gave 1 day of training
  - ▢ Plant ID and other "skill tests"
  - ▢ GPS, Vegetation monitoring



### Tested the ability of volunteers to identify invasive plants

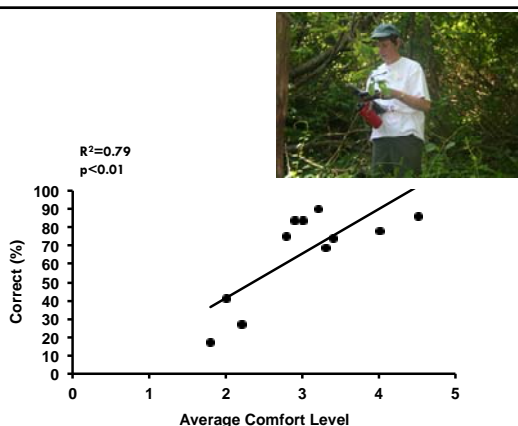
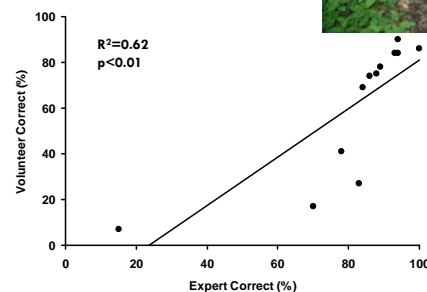
- Selected 6 species at each site.
  - ▢ 3 easy to ID
  - ▢ 3 hard to ID
- 125 plants along established trails

**Table 2** Six species taught during the two trainings in Wisconsin and Colorado, including identification difficulty classification

Scientific name	Common name	State	Identification difficulty
<i>R. cathartica</i> L.	Common Buckthorn	WI	Easy
<i>Hesperis matronalis</i> L.	Dame's Rocket	WI	Easy
<i>Alliaria petiolata</i> (M. Bieb.) Cavara & Grande	Garlic Mustard	WI	Easy
<i>R. frangula</i> Mill.	Glossy Buckthorn	WI	Difficult
<i>O. circulatorius</i> Thunb.	Asian Bittersweet	WI	Difficult
<i>Lonicera</i> sp. L.	Honeysuckle	WI	Difficult
<i>E. esula</i> L.	Leafy Spurge	CO	Easy
<i>Linaria dalmatica</i> (L.) Mill.	Dalmatian Toadflax	CO	Easy
<i>Elaeagnus angustifolia</i> L.	Russian Olive	CO	Easy
<i>Carduus nutans</i> L.	Musk Thistle	CO	Difficult
<i>Cynoglossum officinale</i> L.	Houndstongue	CO	Difficult
<i>Cardaria draba</i> (L.) Desv.	Whitetop	CO	Difficult

### Species identification

- ▢ 85% professional vs 70% volunteer
- ▢ 82% conspicuous vs 65% inconspicuous



### Additional Research: Data Quality

#### Protocols Tested in Field

- Genet and Sargent 2003
- Boudreau and Yan 2004
- Delaney et al. 2008
- Crall et al. 2011
- 40 pubs in 2012-2013

#### Other Solutions

- Statistics to overcome sampling design limitations
  - ▢ Kery et al. 2010
  - ▢ Snall et al. 2011
- Online Tools
  - ▢ Smart filters (Bonter and Cooper 2012)
  - ▢ Verification procedures

## How we do deal with data quality?

Allows opportunity for us to verify

Smartphone app/website

- Georeferenced pictures emailed to experts
- Experts can be categorized based on
  - ▢ Location
  - ▢ Species
  - ▢ Regulatory status
- Easy for plants, some insects, hard for diseases



## Assessing Benefits and Challenges

### Benefits

- Connects scientific research to public outreach and education
- Data collection across spatial and temporal scales
- Data relevant to local conservation issues
- Changes in attitudes and behavior

### Challenges

- Data quality
  - ▢ Increase in data variability
  - ▢ Inconspicuous species commonly misidentified
- **Data management**
- **Skeptics**

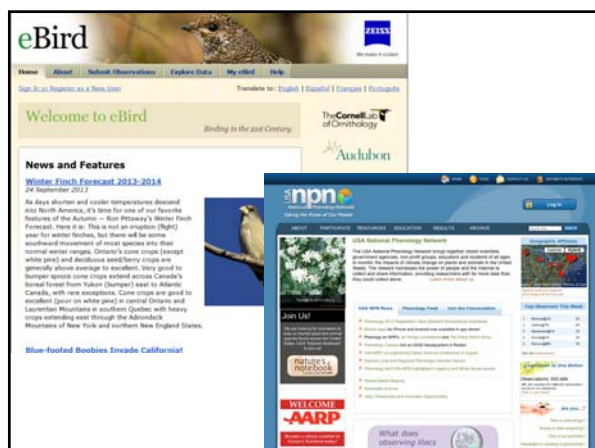
## Where people store data?

Results from 2007



## Creating tools to improve reporting

- Websites/Applications
  - ▢ Provide users with outputs that may be a benefit
  - ▢ Tracking/mapping system
  - ▢ Reporting system
  - ▢ Assistance in identification
- Developing networks/organizations



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### Benefits

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## Quotes from Skeptics

- **"I may come round to thinking that this term has a place in the scientific lexicon the day the US medical community agrees to use the term 'citizen surgeons' to describe well-meaning souls with a day's medical training..."**

## Final Thoughts

- Citizens/volunteers can be used to successfully in science
  - ▣ Training, Ddata quality
- Citizen scientists want to interact
  - ▣ Communication needs to be two-way
- Citizen scientists are not general public
  - ▣ More scientifically literate
  - ▣ Slightly positive attitude toward science
  - ▣ Strong positive attitude toward environment

## WISCONSIN'S FIRST DETECTOR NETWORK = WIFDN



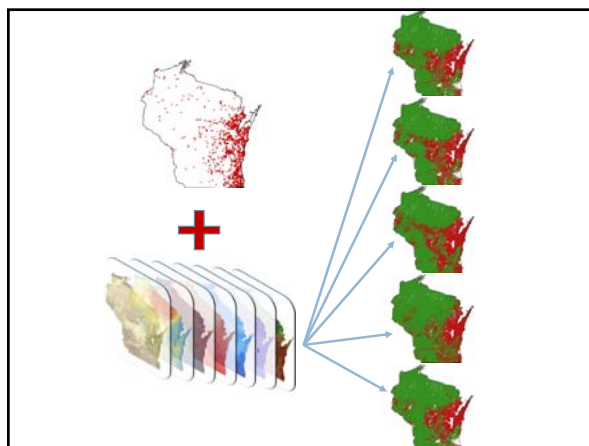
## Summary of Impact

	2014	2015	Total
Participants (online + workshops)	100	305	405
Volunteer hours	517	1,883	2,400
GLEDN Invasive species reports	350	711	1,061
Cerceris insects collected	200	211	411

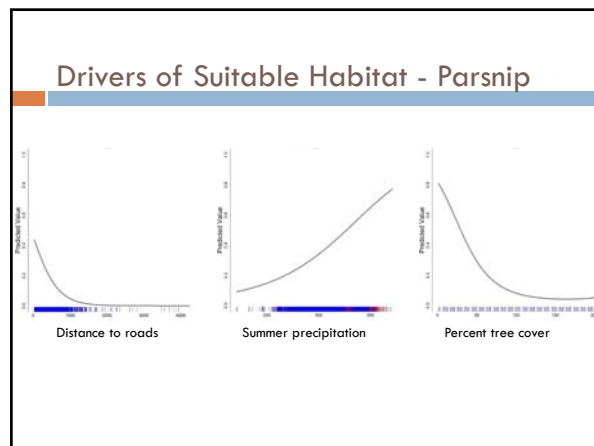
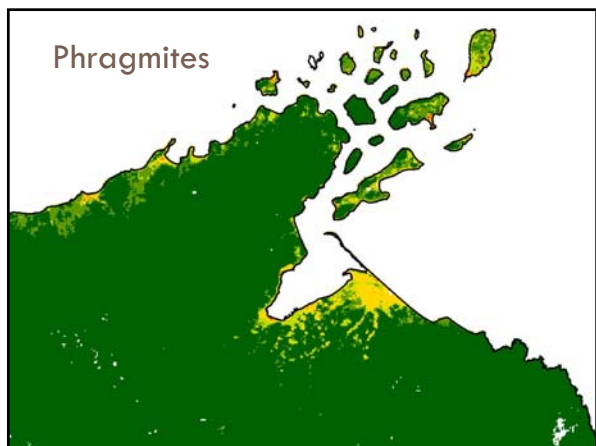
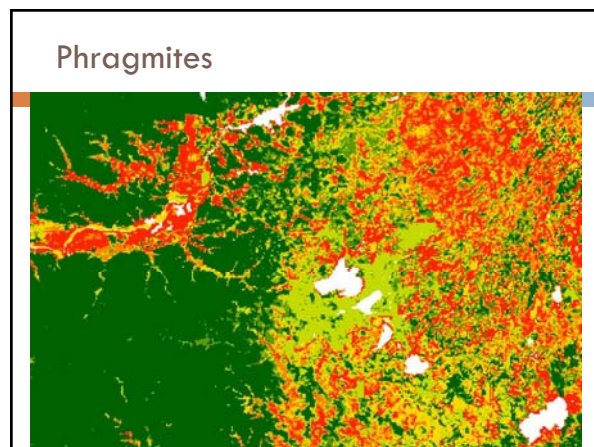
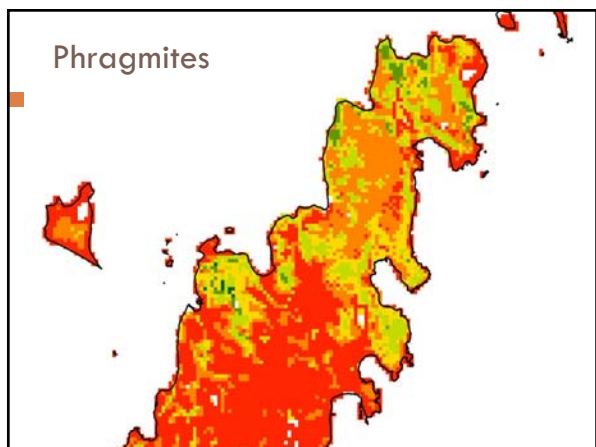
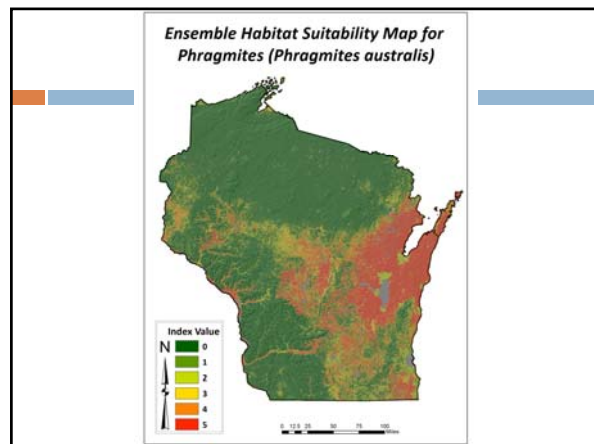
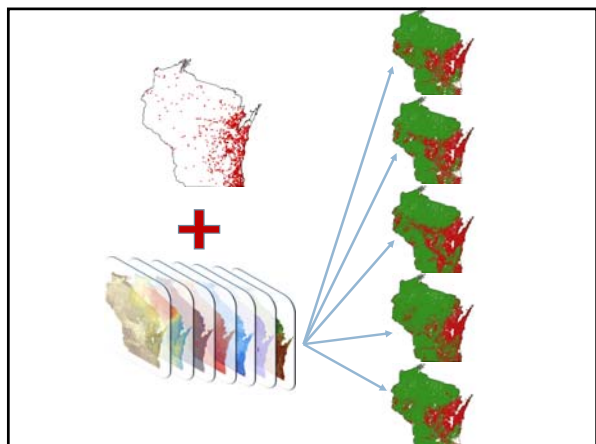
Educational events by WIFDN members also important but difficult to summarize

This information is assisting us in predictive modeling efforts in WI!

- See handout.....







## Questions/Discussion

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