



Noteworthy distribution changes to non-native aquatic plants in the U.S. since 2015

Ian Pfingsten¹ and Pam Fuller²

1 – Cherokee Nation Technologies, WARC, Gainesville, FL

2 – USGS, Wetland and Aquatic Research Center, Gainesville, FL

Nonindigenous Aquatic Species Database - Plants

- Over 90,000 records for 150+ nonindigenous plant species in the U.S.
- Obligate wetland species throughout U.S.
 - USACE National Wetland Plant List (Lichvar et al. 2016)
- Mostly freshwater species

nas.er.usgs.gov



Lichvar, R.W., Banks, D.L., Kirchner, W.N., and Melvin, N.C., 2016, The National Wetland Plant List: 2016 wetland ratings: Phytoneuron, v. 2016, no. 30, p. 1-17, at <http://www.phytoneuron.net/2016Phytoneuron/30PhytoN-WetlandRatings2016.pdf>.

Terminology

- Nonindigenous – any species introduced outside of its native range
 - Includes ‘exotics’ and ‘transplants’
 - No claims about invasiveness or value judgments



Invertebrates

Organisms tracked



Bryozoans



Coelenterates



Crustaceans



Mollusks

Vertebrates



Amphibians



Fishes



Mammals



Reptiles

Plants



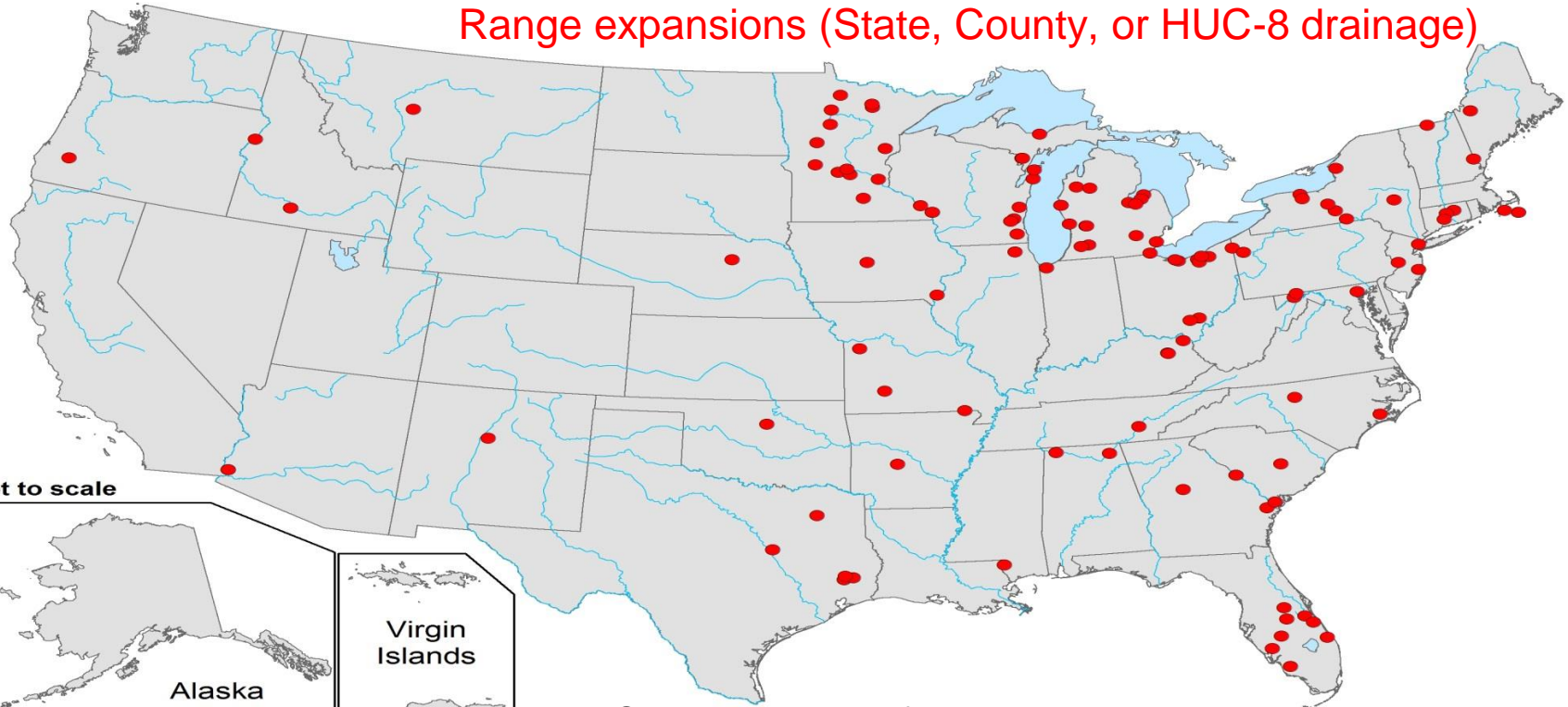
Plants

- Aquatic organisms introduced to fresh, brackish, and marine waters of USA

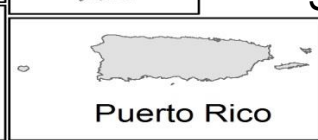
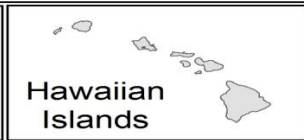
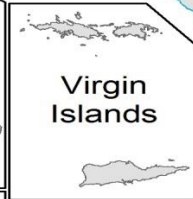
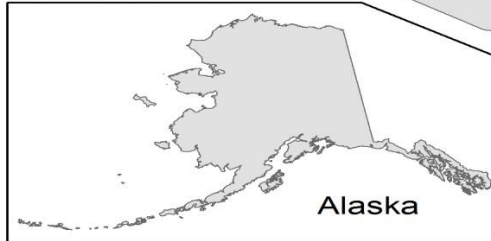
Data sources

- Herbaria/Museums
- Peer-reviewed literature
- *Federal, state, and regional surveys/reports*
- *NAS public sighting reports*
- Occurrence databases

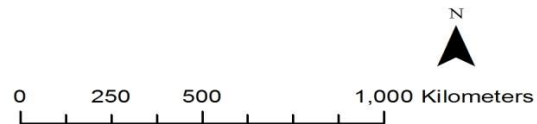
Range expansions (State, County, or HUC-8 drainage)



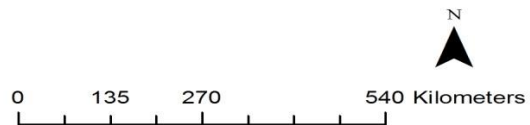
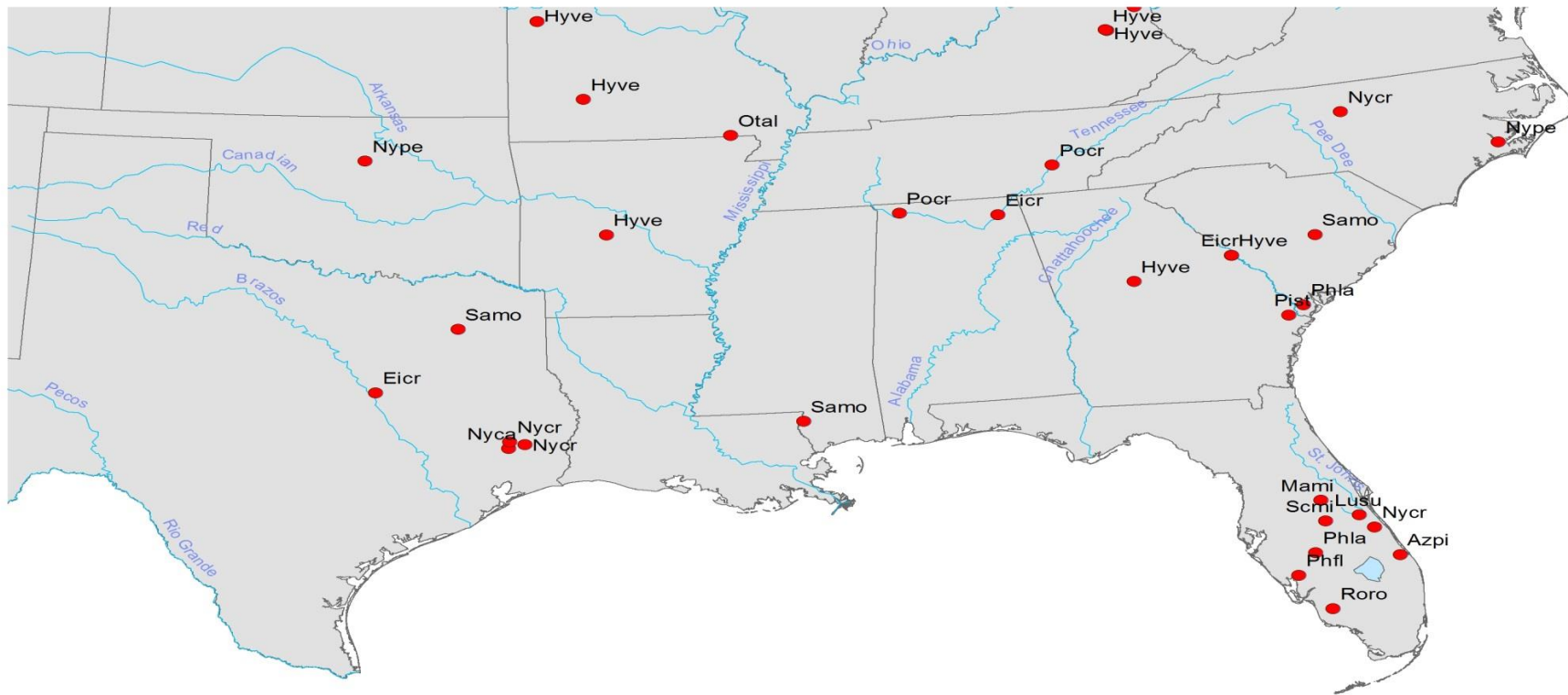
Insets not to scale



Some populations failed or were eradicated.









Red root floater
(*Phyllanthus fluitans*) @
Charlotte County, FL



Tropical American watergrass
(*Luziola subintegra*) @
Brevard County, FL
Upper St. Johns River



Crested floating-heart
(*Nymphoides cristata*) @
Indian River County, FL



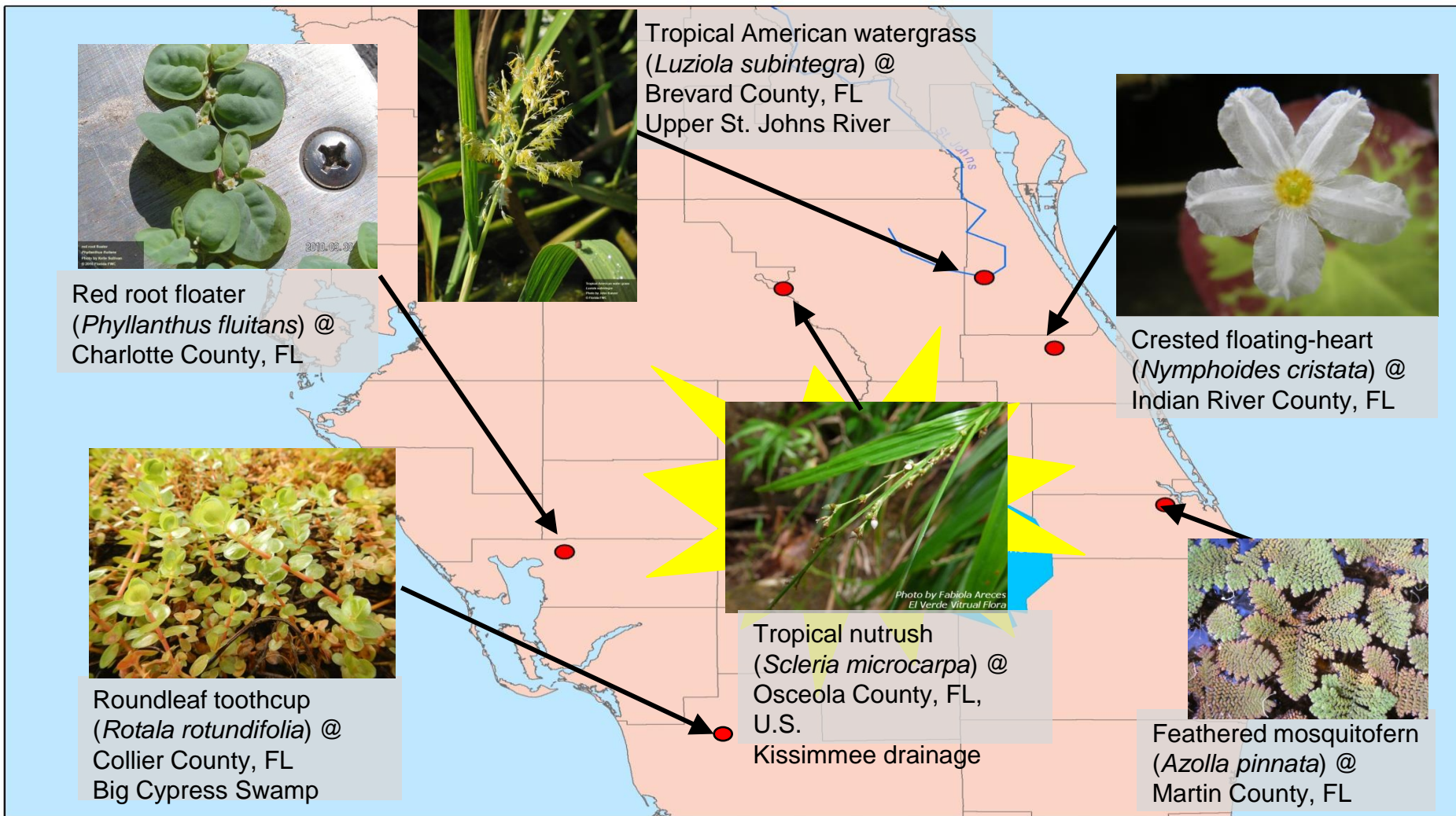
Roundleaf toothcup
(*Rotala rotundifolia*) @
Collier County, FL
Big Cypress Swamp

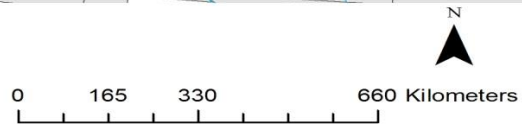


Tropical nutrush
(*Scleria microcarpa*) @
Osceola County, FL,
U.S.
Kissimmee drainage

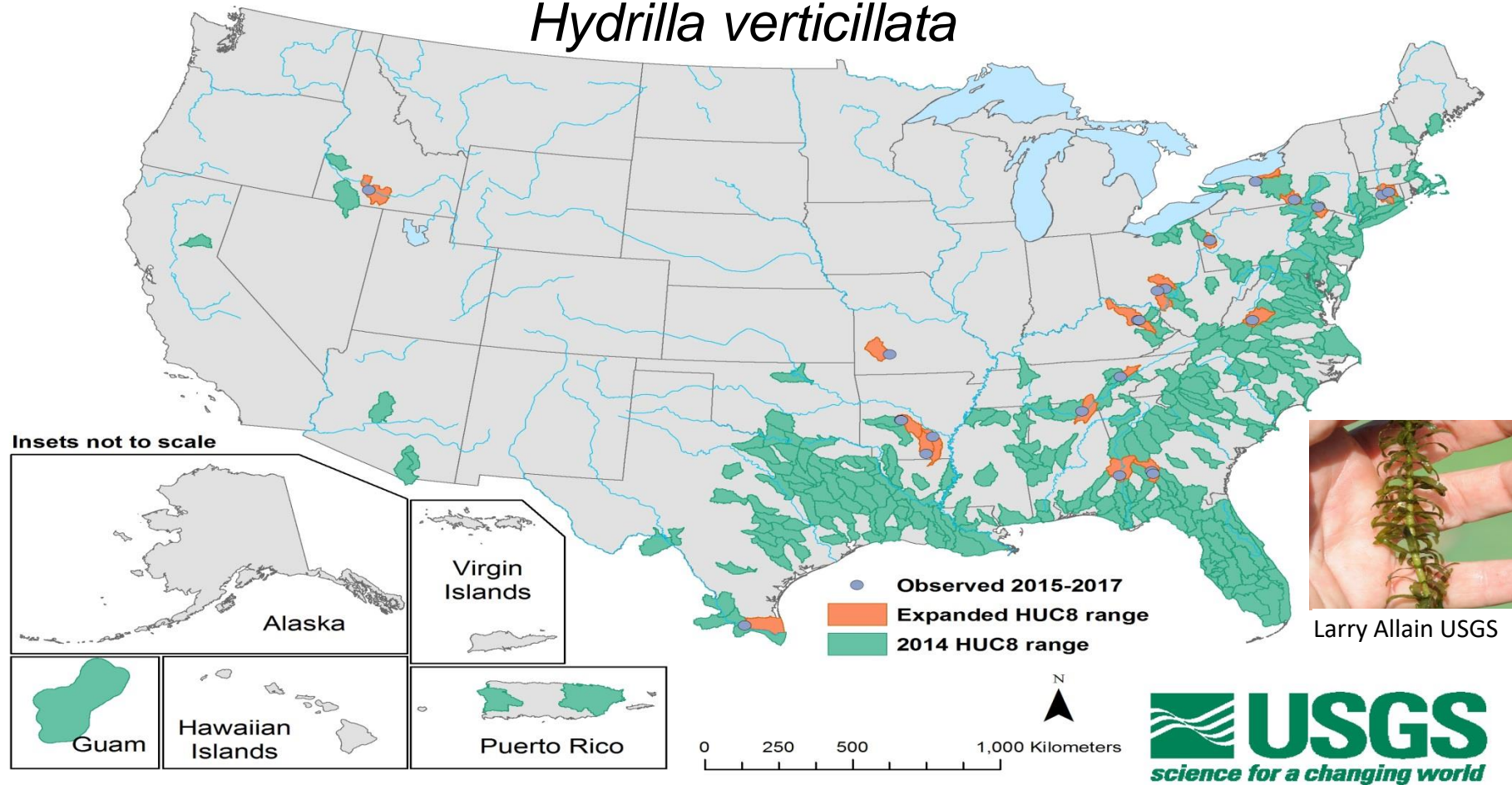


Feathered mosquitofern
(*Azolla pinnata*) @
Martin County, FL



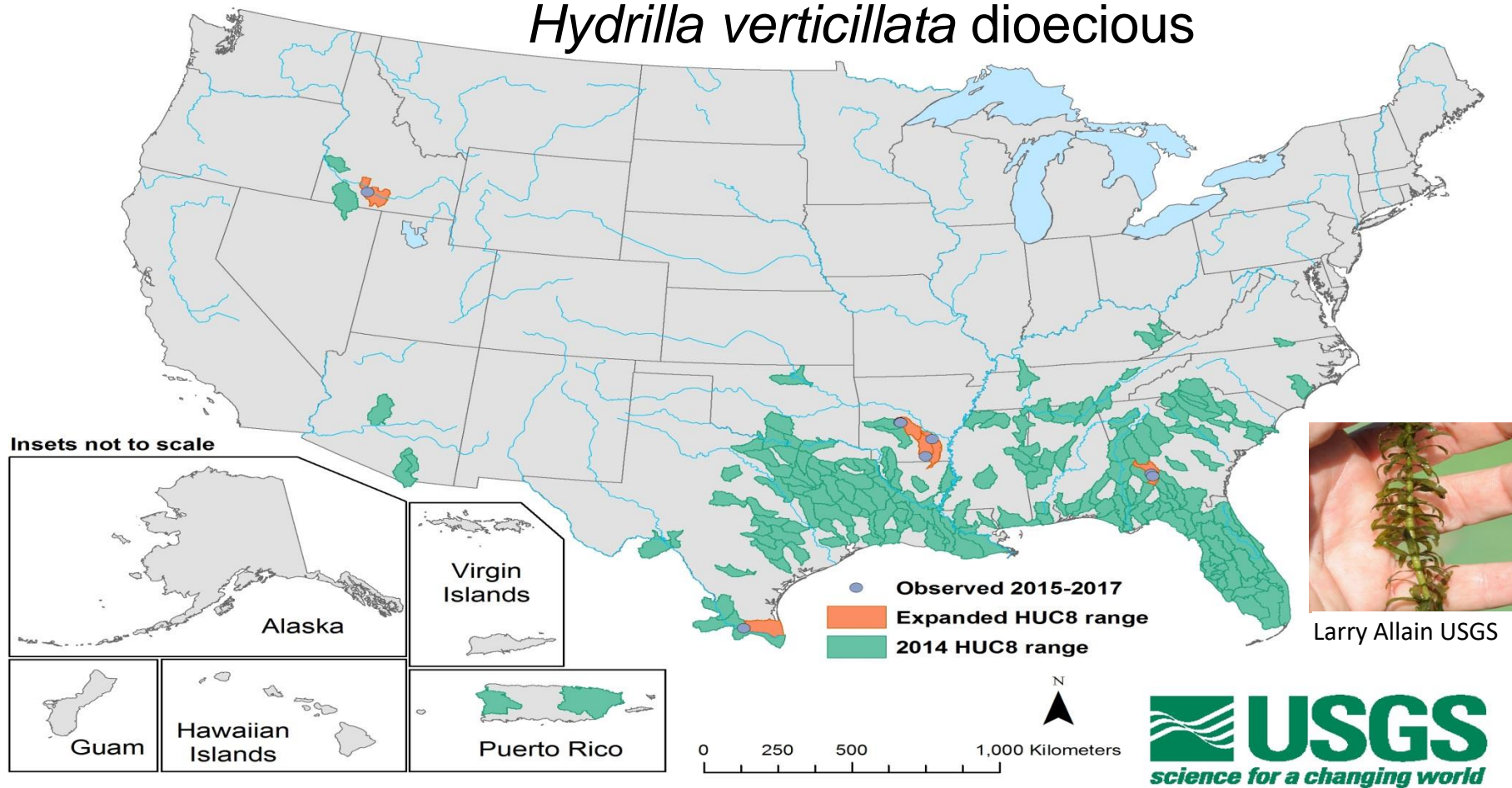


Hydrilla verticillata

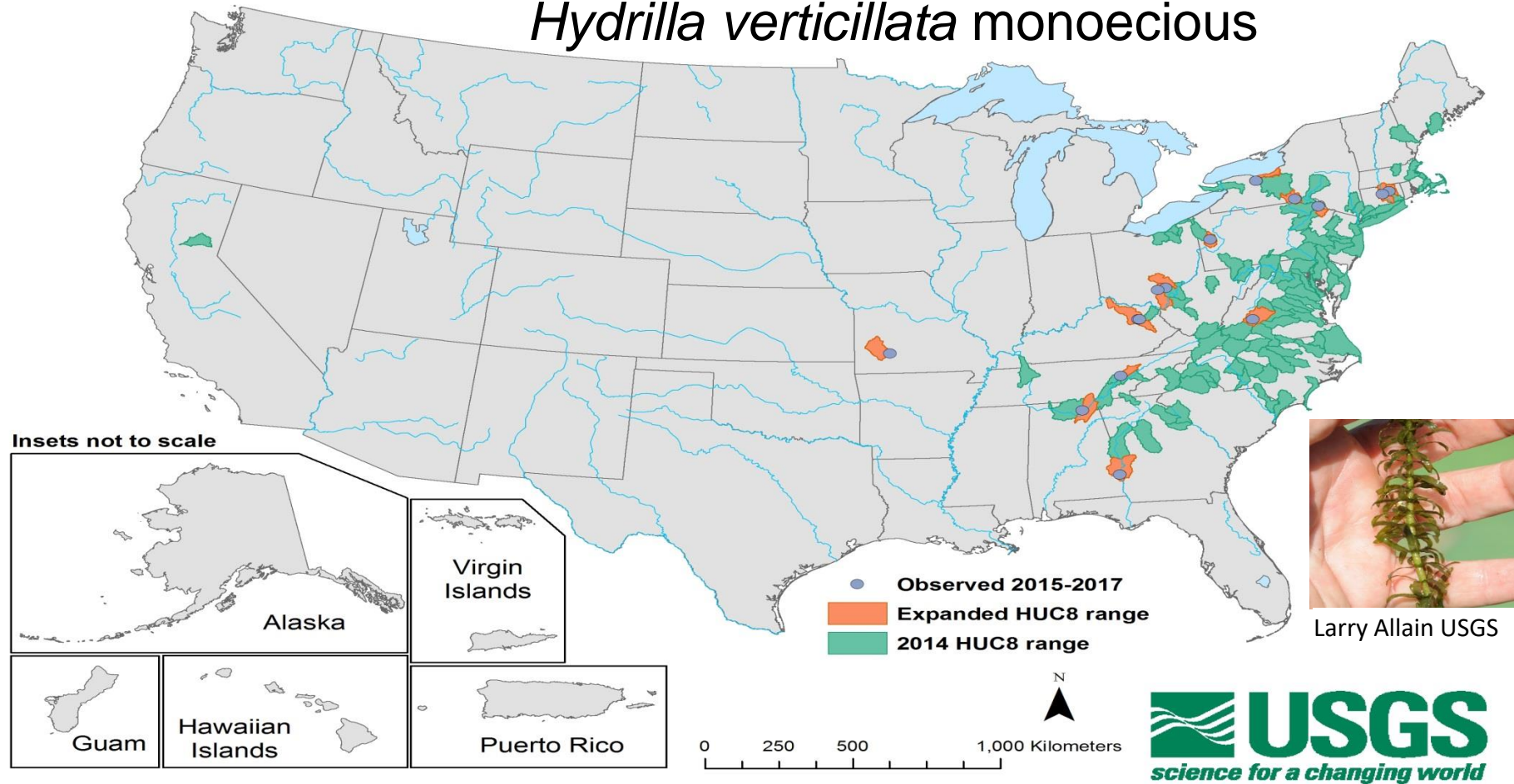


Larry Allain USGS

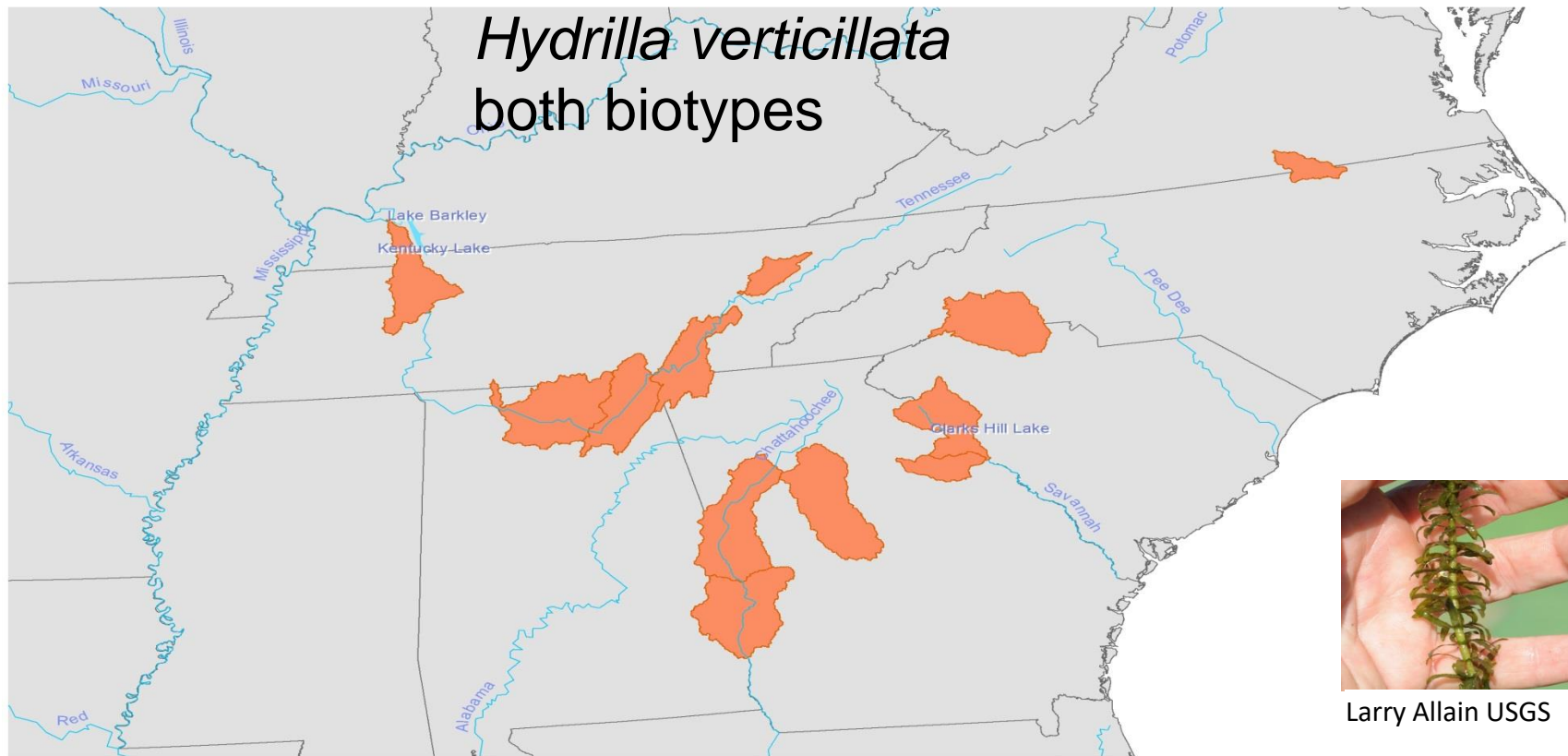
Hydrilla verticillata dioecious



Hydrilla verticillata monoecious

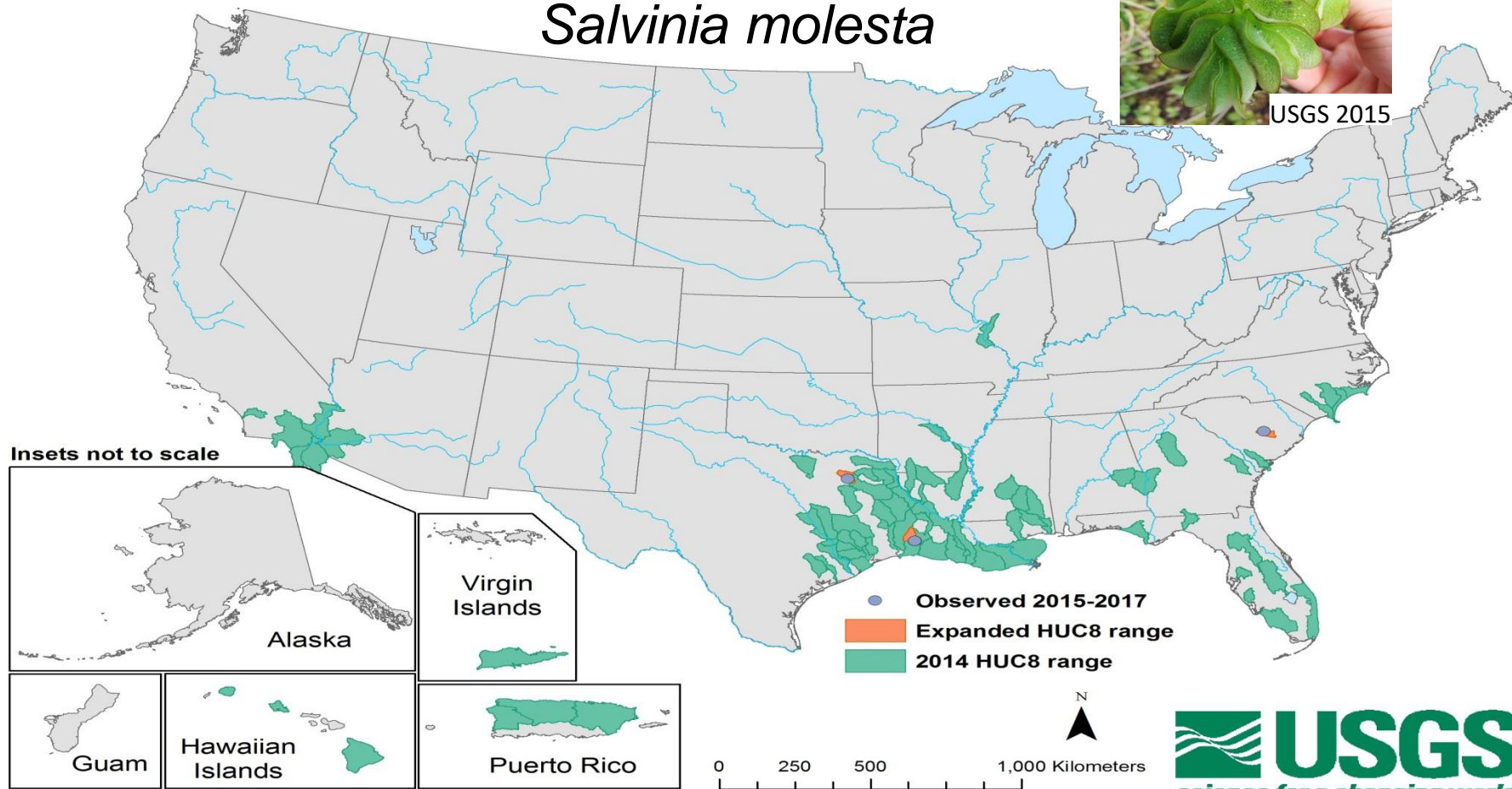


Hydrilla verticillata both biotypes



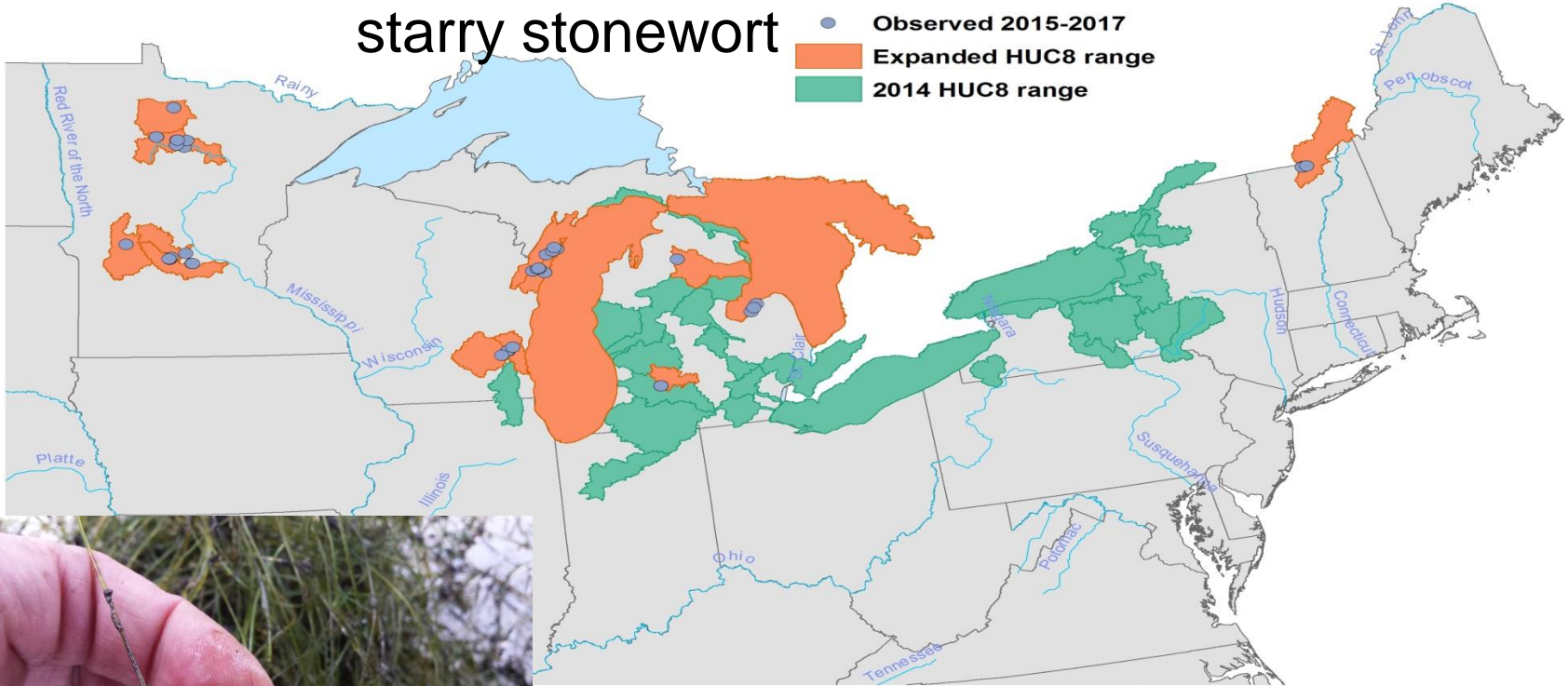
Larry Allain USGS

Salvinia molesta

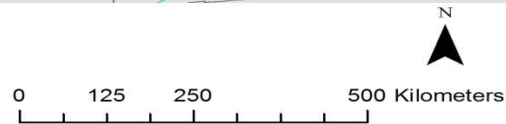


Nitellopsis obtusa starry stonewort

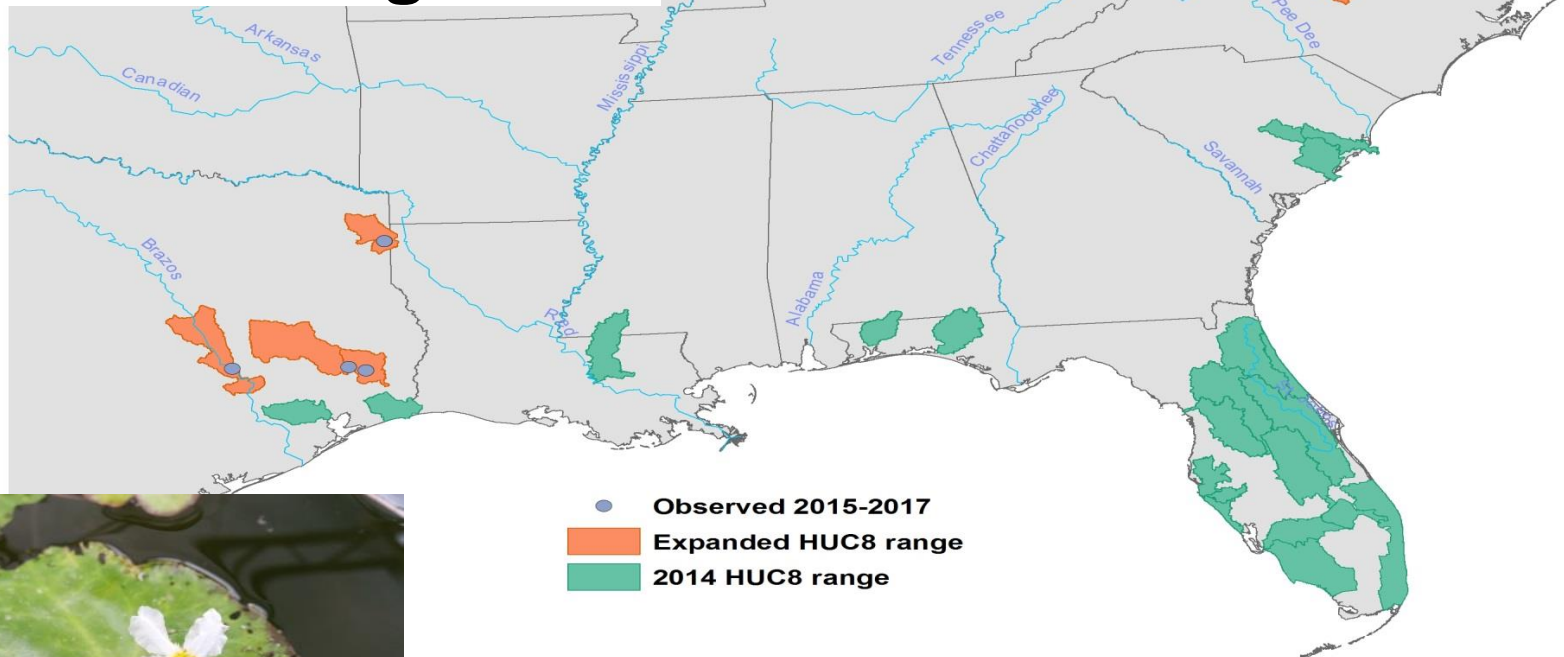
- Observed 2015-2017
- Expanded HUC8 range
- 2014 HUC8 range



Jim Grazio PA DEP 2015



Nymphoides cristata crested floating-heart



- Observed 2015-2017
- Expanded HUC8 range
- 2014 HUC8 range

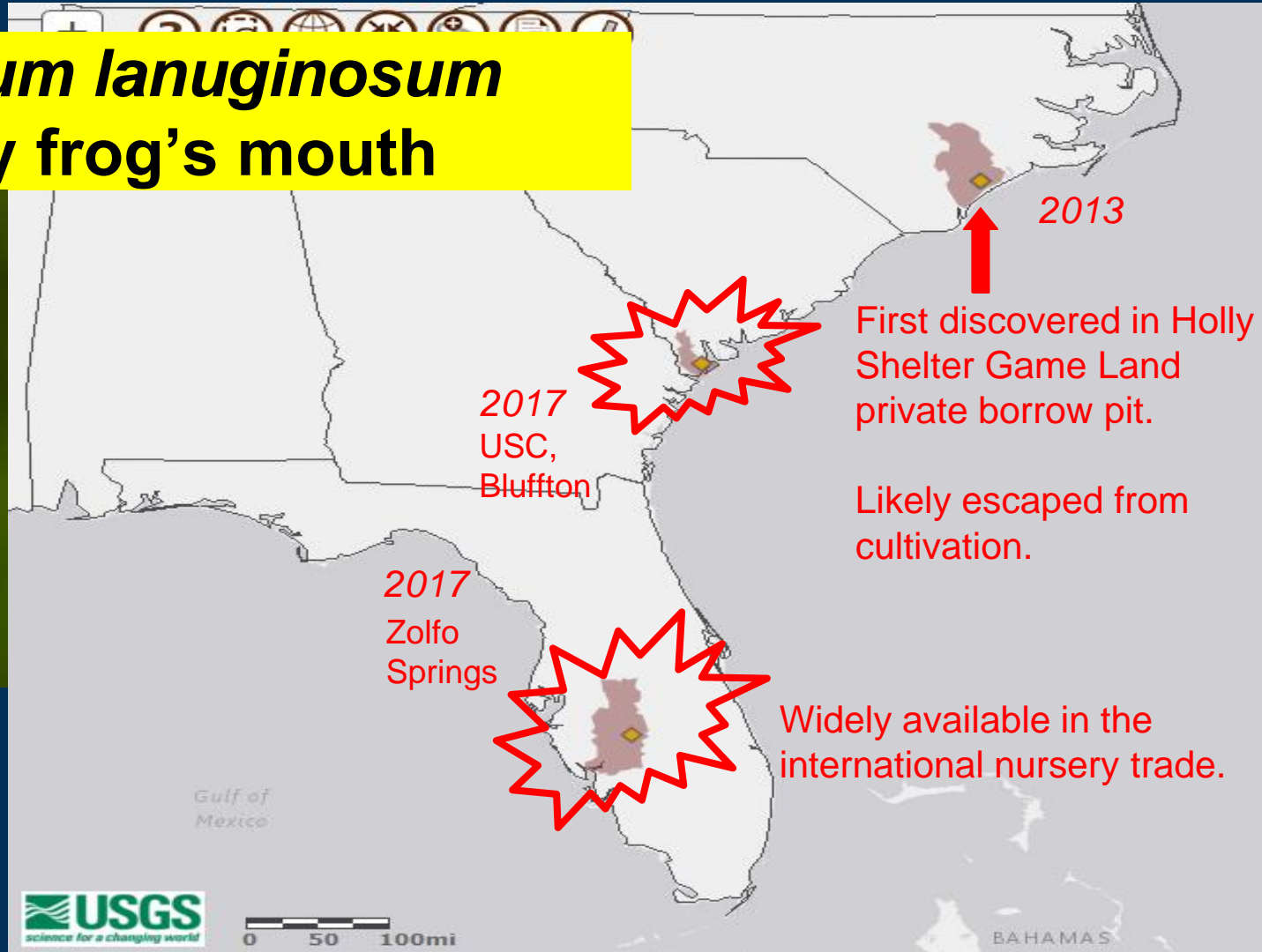


I. Pfingsten USGS 2016

Philydrum lanuginosum woolly frog's mouth



Keith Bradley 2017



Conclusions

Great Lakes States still receiving many new introductions of established US species

Florida has the most new aquatic plant species

Reports seem biased by high profile species and human-utilized recreational areas

Send us your sightings

- Sighting reports
 - usgs.gov/stopANS
- Ian (Plants)
 - ipfingsten@usgs.gov
- Amy (Carps & Dreissenids)
 - abenson@usgs.gov
- Matt (Fishes)
 - mneilson@usgs.gov
- Wes (Everything else)
 - wdaniel@usgs.gov

