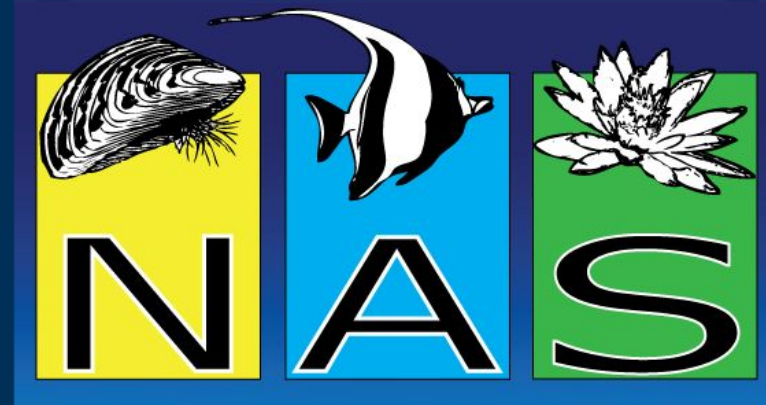




Range Expansions of Introduced Aquatic Plants in the USFWS Southeast Region – *Fall Update*

Ian Pfingsten¹ and Pam Fuller²

1 – Cherokee Nation Technologies, WARC, Gainesville, FL

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

Outline

- New NAS plant occurrences (2016-17)
- USFWS Region 4 NAS plant report summary
- Hurricane-affected drainages (NAS FAST) plant species densities



Waterhyacinth
(*Eichhornia crassipes*) @
Middle Brazos-Lake Whitney
1/17/2017



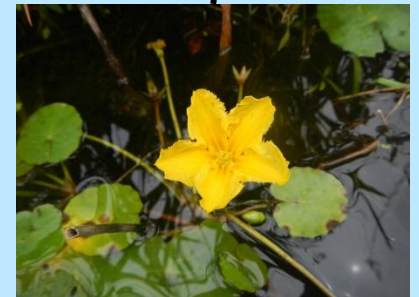
Cape blue waterlily
(*Nymphaea capensis*) @
Liberty County, TX
Pine Island Bayou
10/17/2016



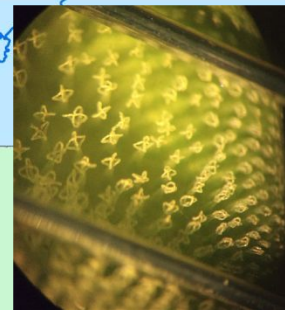
Giant salvinia
(*Salvinia molesta*) @
Pearl River County, MS
4/1/2016



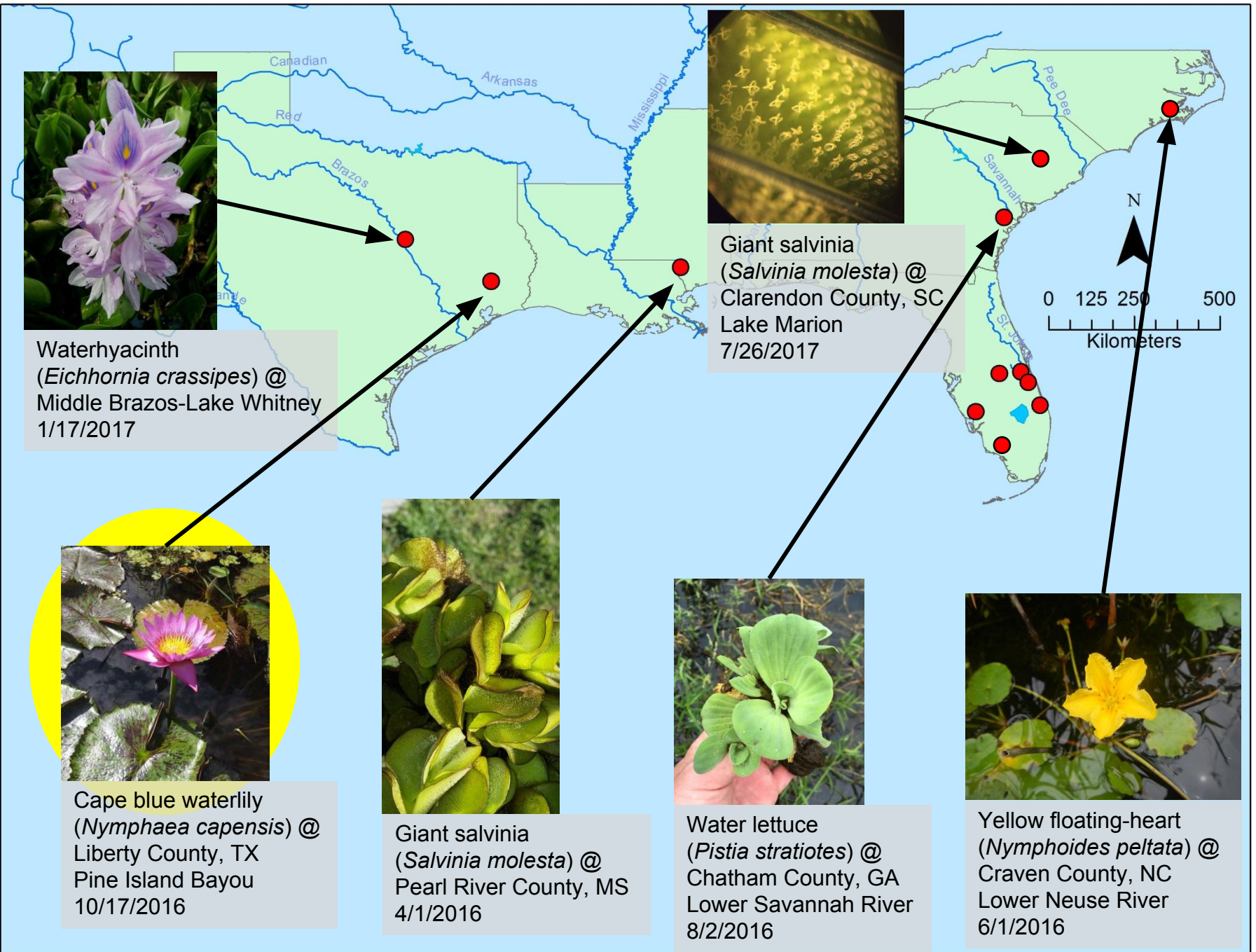
Water lettuce
(*Pistia stratiotes*) @
Chatham County, GA
Lower Savannah River
8/2/2016



Yellow floating-heart
(*Nymphoides peltata*) @
Craven County, NC
Lower Neuse River
6/1/2016



Giant salvinia
(*Salvinia molesta*) @
Clarendon County, SC
Lake Marion
7/26/2017





Tropical American watergrass
(*Luziola subintegra*) @
Brevard County, FL
Upper St. Johns River
10/27/2016



Red root floater
(*Phyllanthus fluitans*) @
Charlotte County, FL
7/27/2016



Crested floating-heart
(*Nymphoides cristata*) @
Indian River County, FL
5/1/2017



Roundleaf toothcup
(*Rotala rotundifolia*) @
Collier County, FL
Big Cypress Swamp
1/13/2016



Tropical nutrush
(*Scleria microcarpa*) @
Osceola County, FL, U.S.
Kissimmee drainage
8/26/2016

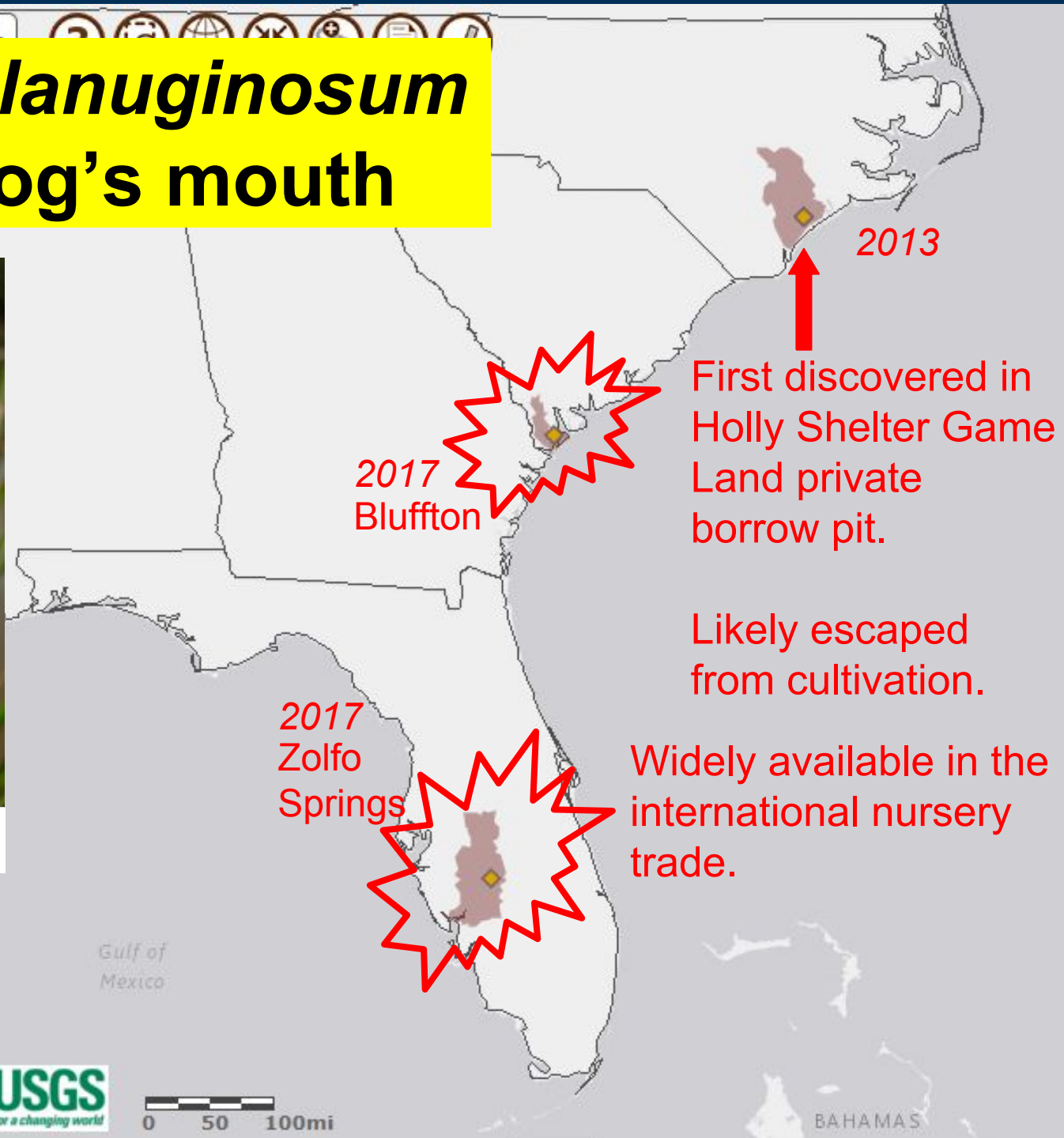


Feathered mosquitofern
(*Azolla pinnata*) @
Martin County, FL
2/6/2017

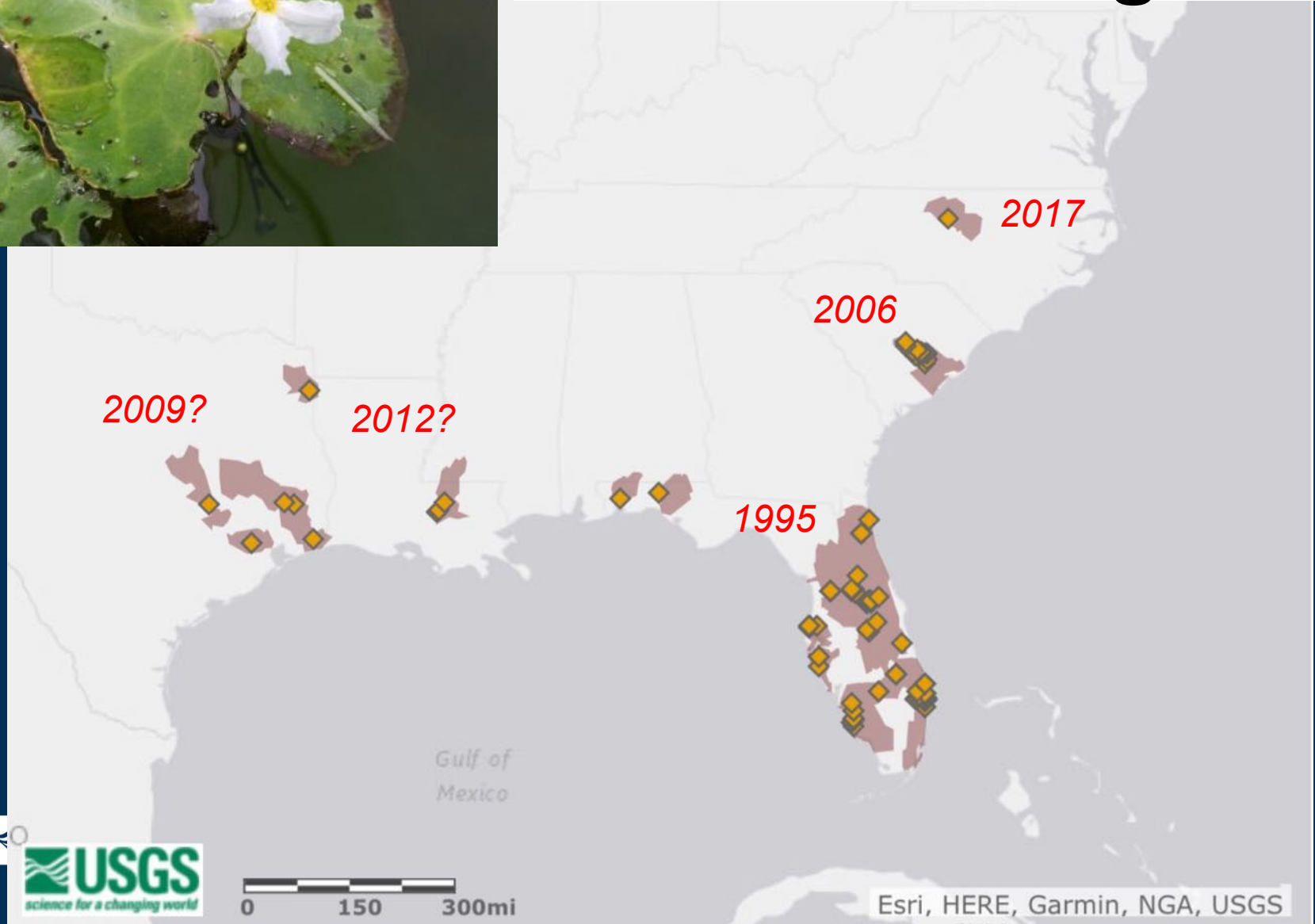
Philydrum lanuginosum woolly frog's mouth



By Schelle (Flickr: 7 January 2009) [CC BY 2.0], via Wikimedia Commons



Nymphoides cristata crested floating-heart





Caddo Lake

Big Thicket National Preserve

Brazos County pond

Lake Kimball

Baton Rouge ponds

Taylor Bayou

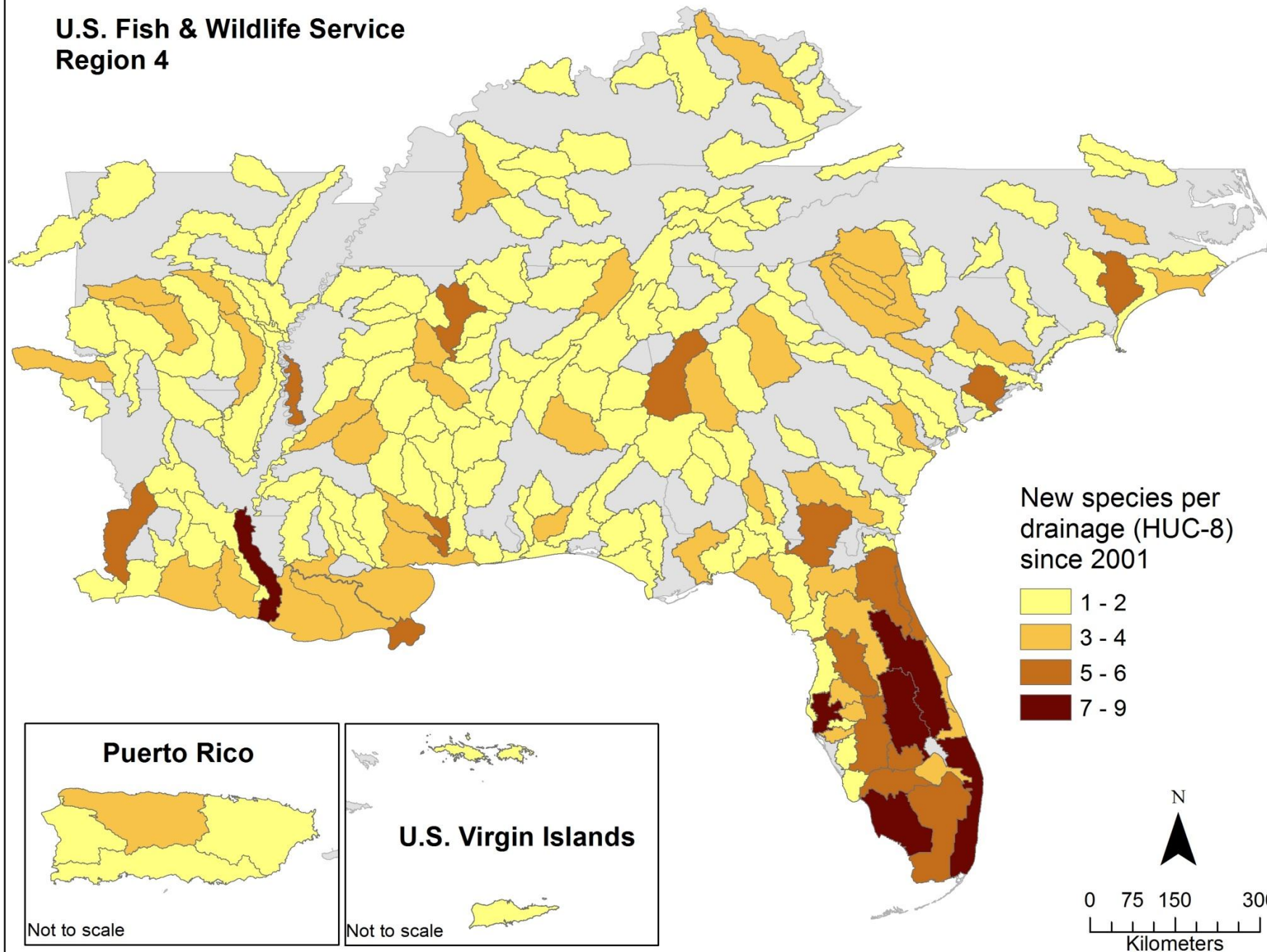
Arboretum Lake @
Houston Arboretum

USFWS Region 4: Southeastern U.S.



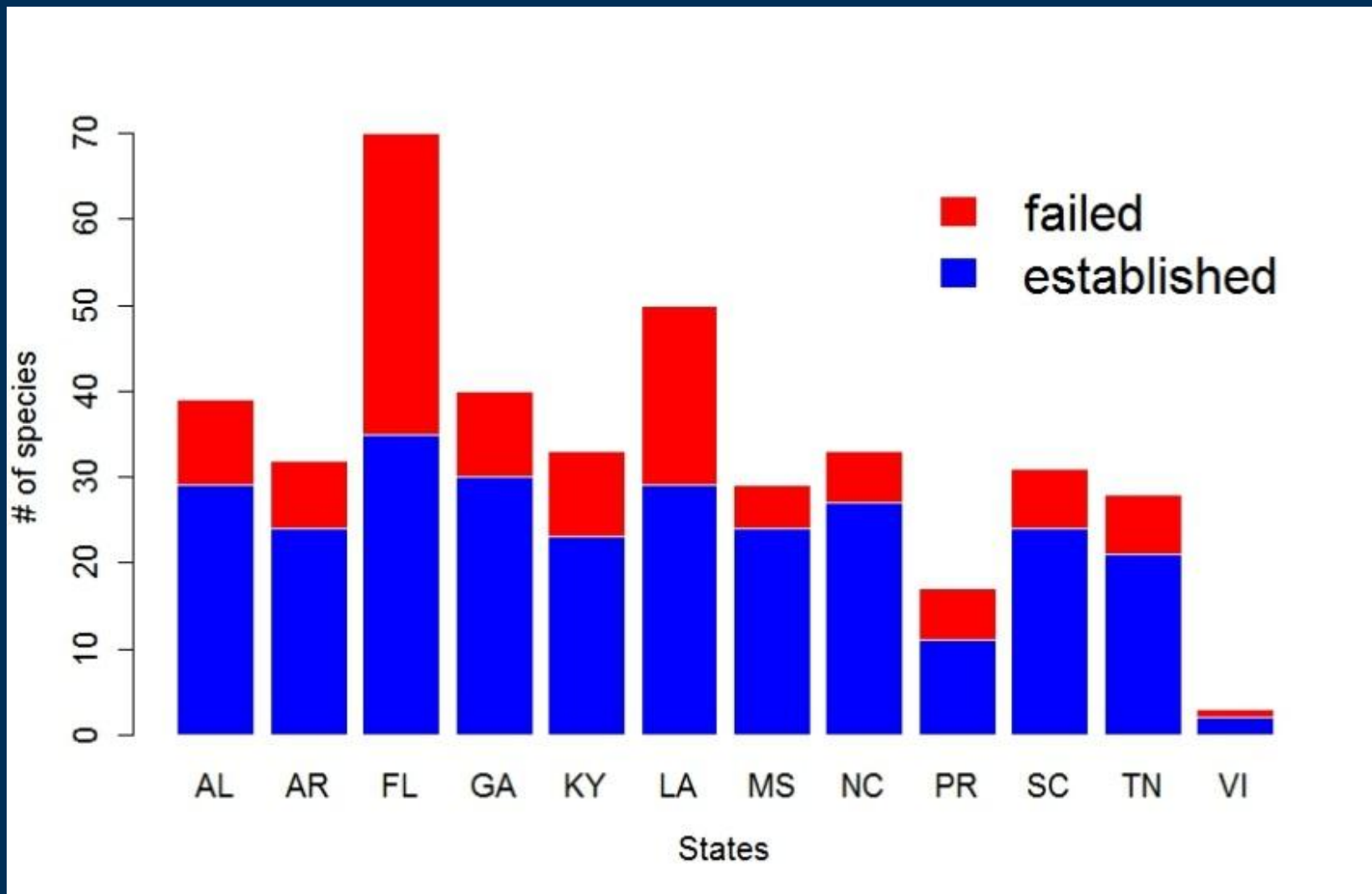
- Focus is on range expansion since 2001 by HUC-8 drainages
- 14 previously-established plant species
- 9 newly-introduced plant species
- Availability in commercial trade
 - (plantinfo.umn.edu)
- Risk assessments
 - (www.aphis.usda.gov & assessment.ifas.ufl.edu)

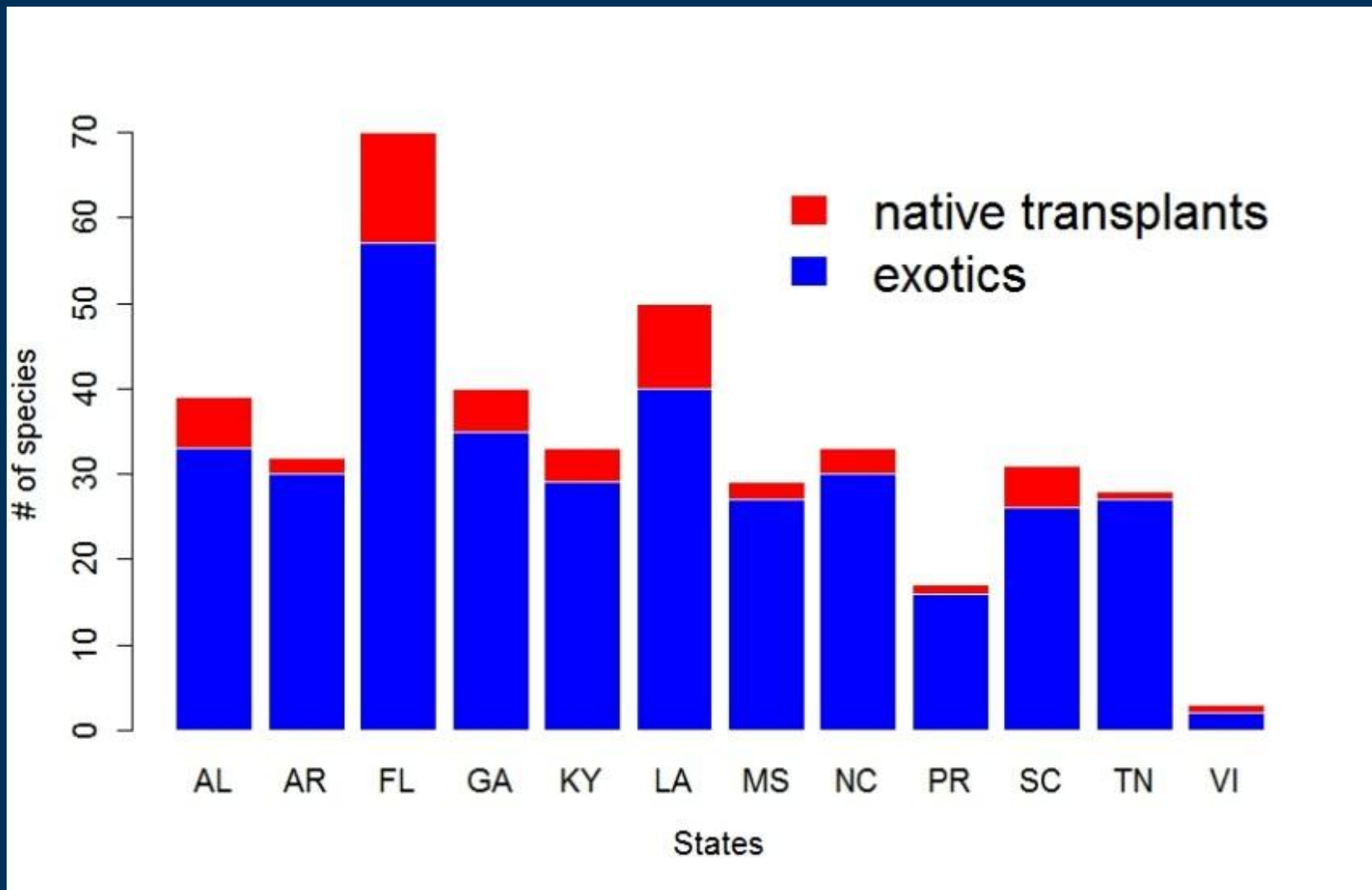
U.S. Fish & Wildlife Service Region 4



Species found in new drainages since 2001

Scientific name	Common name	# new HUC-8
<i>Myriophyllum aquaticum</i>	parrotfeather milfoil	45
<i>Alternanthera philoxeroides</i>	alligatorweed	41
<i>Hydrilla verticillata</i>	hydrilla (dio/mono)	40 (30/14)
<i>Salvinia molesta</i>	giant salvinia	34
<i>Ludwigia grandiflora</i>	large-flower primrose	31
<i>Eichhornia crassipes</i>	waterhyacinth	27
<i>Cyperus blepharoleptos</i>	Cuban bulrush	17
<i>Salvinia minima</i>	water spangles	16
<i>Nymphoides cristata</i>	crested floating-heart	15
<i>Myriophyllum spicatum</i>	Eurasian watermilfoil	12
<i>Pistia stratiotes</i>	water lettuce	12
<i>Marsilea mutica</i>	Australian water-clover	11
<i>Najas minor</i>	brittle waternymph	11
<i>Ludwigia hexapetala</i>	six-petal primrose	10





New species in the Southeastern U.S.

Scientific name	Common name	1 st Year	Status
<i>Aeschynomene fluitans</i>	giant water sensitive plant	2007	Established
<i>Azolla pinnata</i>	feathered mosquitofern	2007	Established
<i>Luziola subintegra</i>	Tropical American watergrass	2007	Established
<i>Marsilea mutica</i>	Australian water-clover	2001	<i>Unknown</i>
<i>Oenanthe javanica</i>	Java waterdropwort	2007	<i>Unknown</i>
<i>Philydrum lanuginosum</i>	wooly frogs mouth	2013	Established
<i>Phyllanthus fluitans</i>	red root floater	2010	Established
<i>Scleria microcarpa</i>	tropical nutrush	2016	Established
<i>Veronica beccabunga</i>	European speedwell	2009	<i>Unknown</i>

Hurricane Harvey

Legend

non-native aquatic plant species

0 - 5
6 - 10
11 - 15
16 - 20
21 - 25
26 - 30

Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

Hurricane Harvey

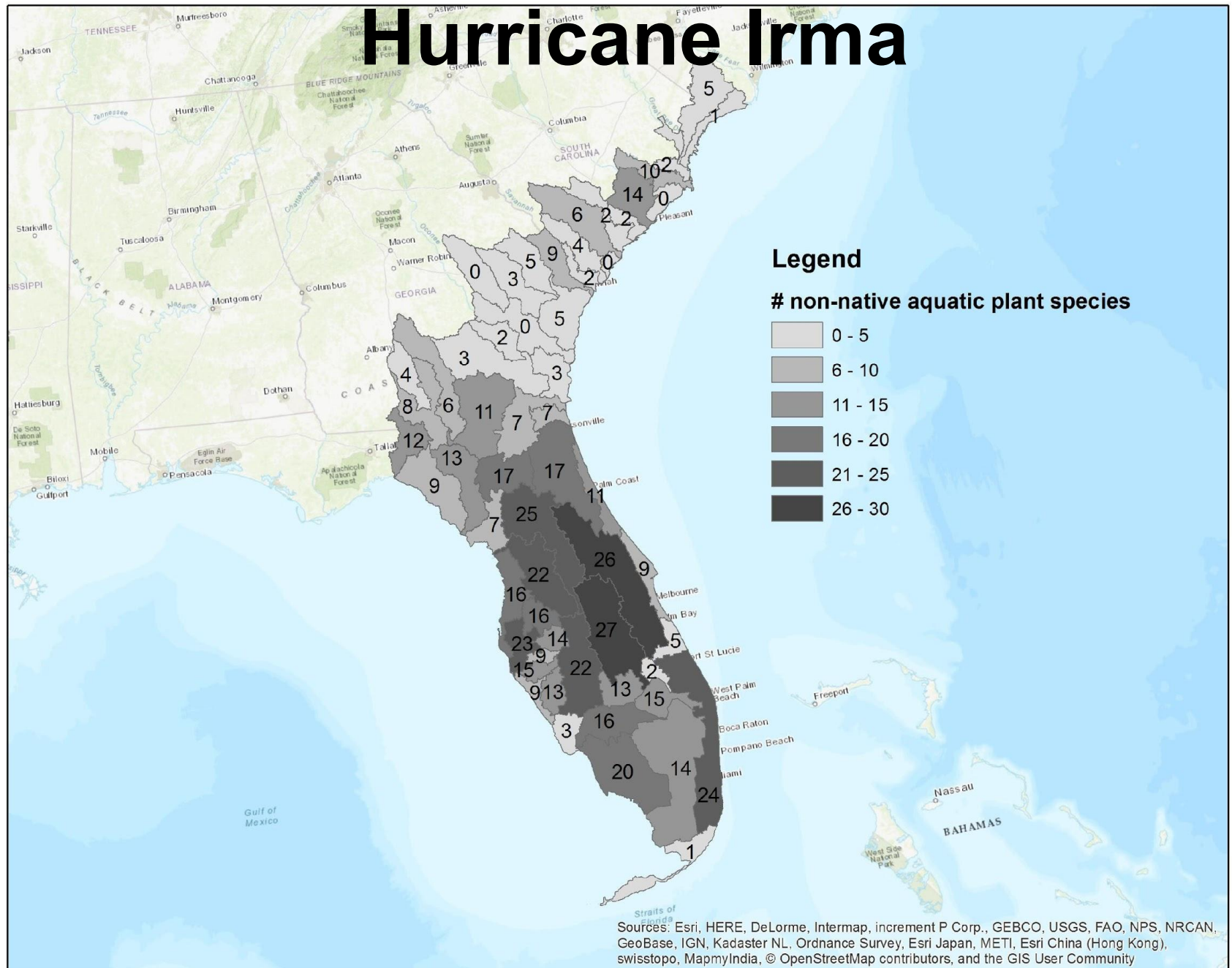
Legend

non-native aquatic plant species

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Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

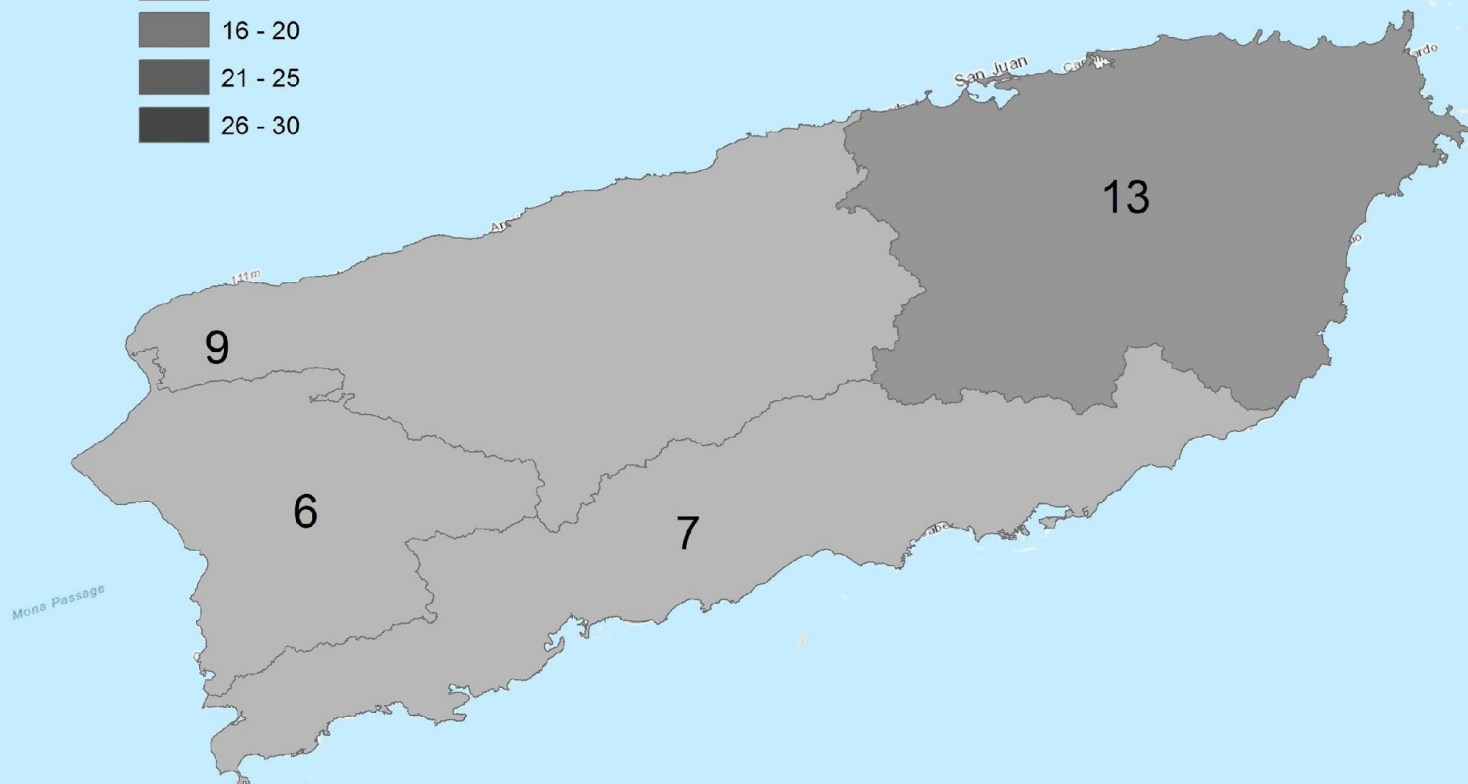
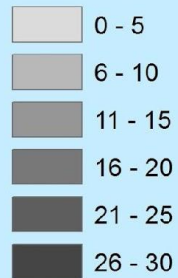
Hurricane Irma



Hurricane Maria

Legend

non-native aquatic plant species



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

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 - wdaniel@usgs.gov



Invertebrates



Bryozoans



Coelenterates



Crustaceans



Mollusks

Vertebrates



Amphibians



Fishes



Mammals



Reptiles

Plants



Plants