



Determining Asian Carp Expansion in Louisiana Waters Through Larval Fish Sampling

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USGS Wetlands Center, Lafayette Louisiana*

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PRIMARY OBJECTIVE:

Determine the degree of Asian Carp invasion and define the leading edge of reproductive expansion.

- LDWF received a small ANS grant from USFWS in 2013 and 2014 to sample for larval Asian Carp in Louisiana waters.
- Collected and archived Ichthyoplankton samples in late spring/summer of 2013, followed by repeated collections in 2014.
- Each district sampled 6 or 7 previously established river stations per month for May, June & July, 2013. 2014 sampling was conducted during April, May, and June to better target spawning season.
- Contract with Nicholls State University for sorting, ID, & cataloging of samples – Dr. Quenton Fontenot Laboratory



Target species: silver, bighead, grass and common carps. (Adult and sub-adult fish have proven difficult to sample with other standard gears.)



Target species: black carp. (One of four that have been identified in Louisiana).



SECONDARY OBJECTIVE:

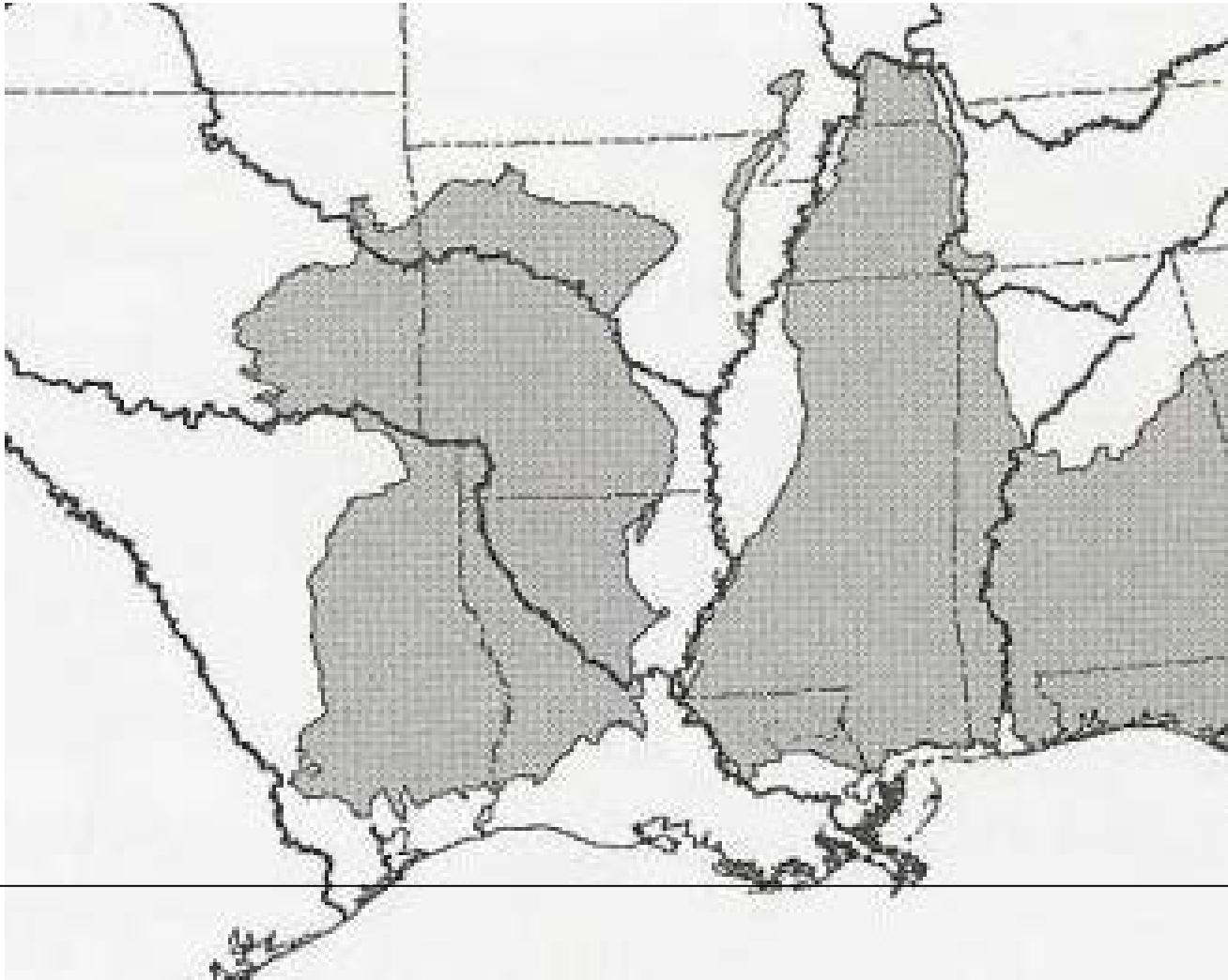
Water quality may influence the reproductive success of Asian Carp

- We sampled for Asian carp larvae in selected waters throughout Louisiana to test the theory that low alkalinity may inhibit Asian carp reproduction.
- A significant portion of Louisiana is characterized by low alkalinity soils. The results of our sampling could indicate the potential for Asian carp expansion into those areas.

(Note: Our hope is to find that Asian carp cannot establish self-sustaining populations in significant portions of Louisiana. If so, Asian carp may already have achieved their greatest potential range expansion in Louisiana.)



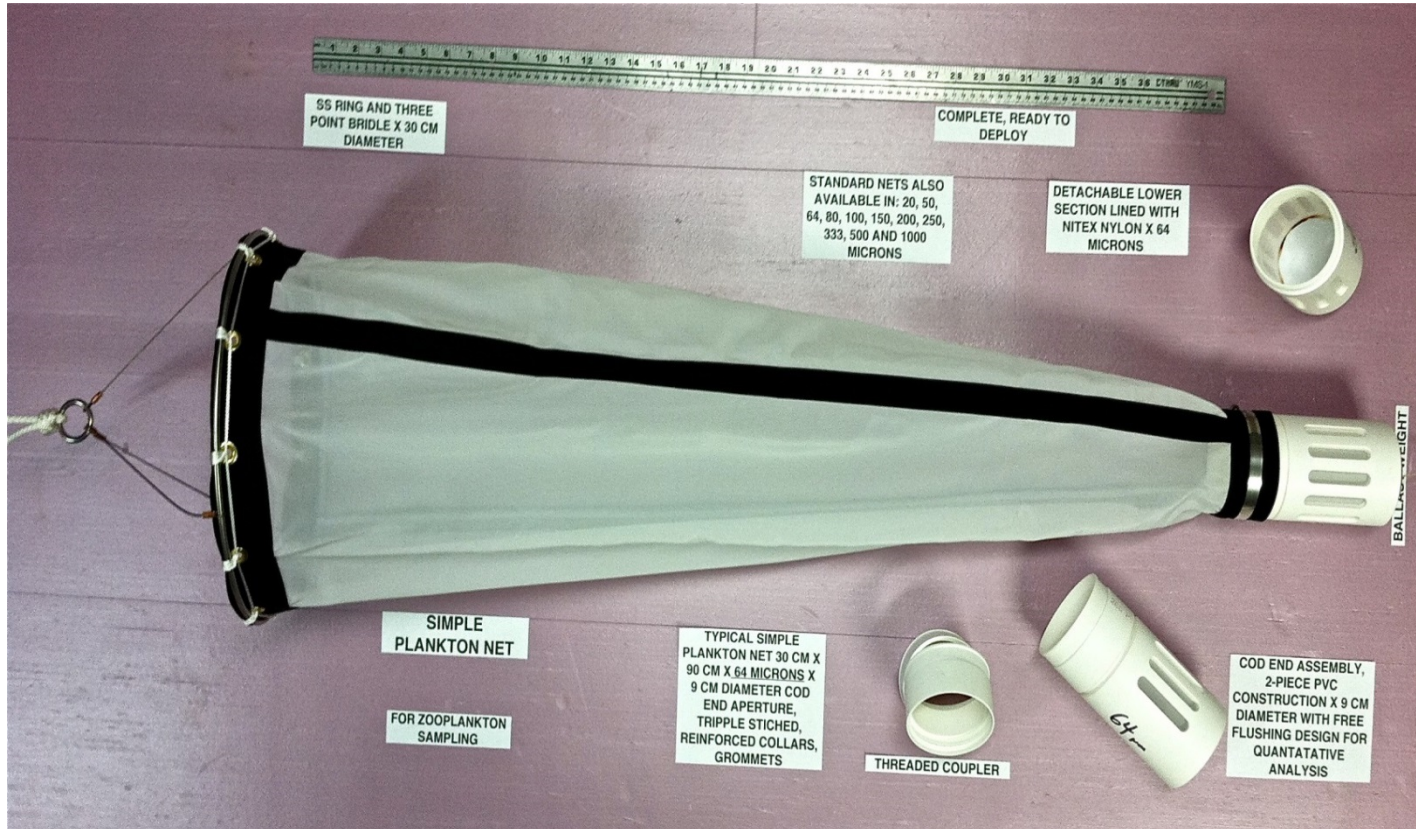
Ecoregions with Low Water Hardness



Methods



Gear and Methods: Standard 500 micron Ichthyoplankton Net



Standardized sampling methods and data collection

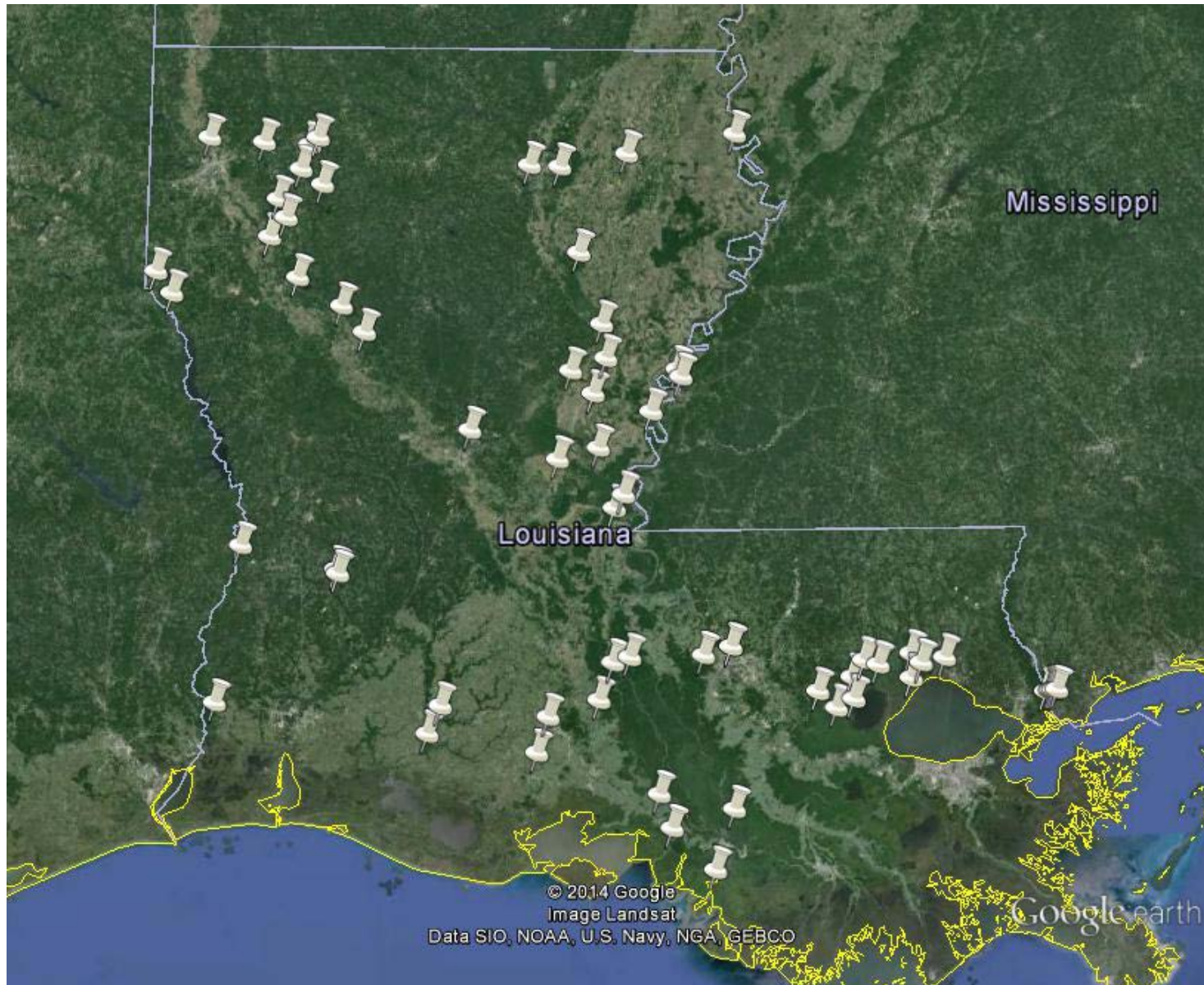
ICHTHYOPLANKTON SAMPLING DATA SHEET			
River: _____		Date: _____	
Station: _____		Time: _____	
GPS: _____			
Comments: _____			
Sample #:	Seconds:		
Flow Meter Begin: _____			
Flow Meter End: _____			
Sample #:	Seconds:		
Flow Meter Begin: _____			
Flow Meter End: _____			
Sample #:	Seconds:		
Flow Meter Begin: _____			
Flow Meter End: _____			
TOP			
Temperature C°	Conductivity:	DO: _____	
pH: _____	Turbidity:	NTU's	Secchi _____ cm

Gear Specifications:

- A. Conical net, preferably with a pre-cone cylinder to improve net performance
- B. Diameter/length ratio - 1:3
- C. Mouth Diameter - 50 cm
- D. Mesh size- 500 microns (μ)
- E. Stainless steel net mouth ring
- F. Three-point towing bridle consisting of ¼" twisted SS cable or equivalent
- G. 2 meter 1/2" braided nylon tow rope
- H. Cod end ring
- I. Rubber coated hose clamp
- J. 750 ml capacity cod end collection jar
- K. General Oceanic's Flow Meter with six-digital counters, mounted across the diameter of the net mouth, to assess volume of water filtered (m3) to calculate CPUE.



Larval Fish Sample Sites 2013 & 2014



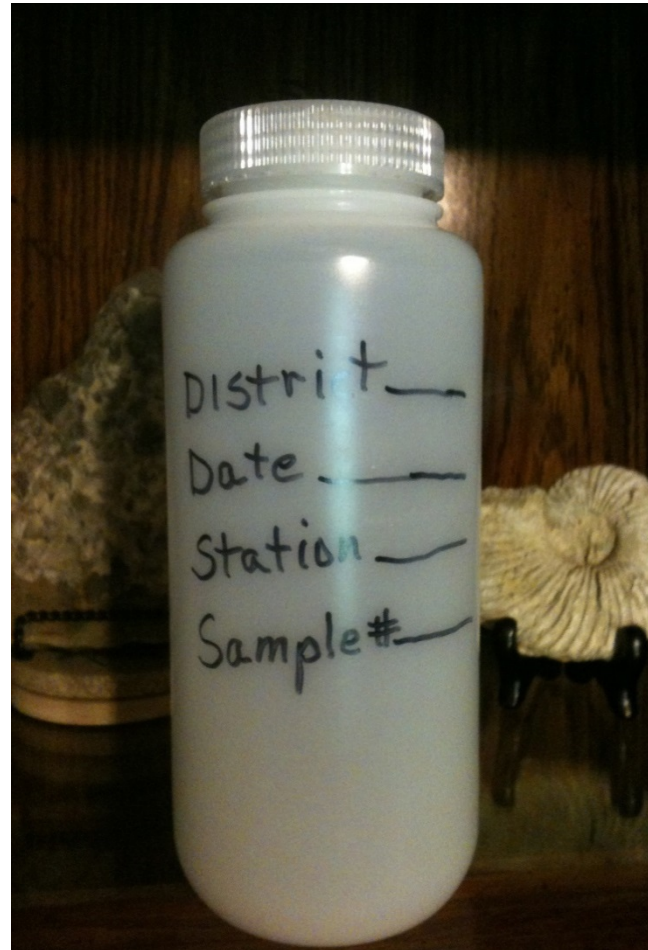
Larval Asian Carp Sampling – Towing Net on short outrigger



Larval Asian Carp Sampling- archiving samples



All larvae samples were fixed and stored in 1000 ml labeled plastic bottles in 70% ethanol.



Results



Larval Fish Samples 2013 & 2014

- 64 stations were sampled in 2013 for a total of 576 larval samples
- 61 stations were sampled in 2014 for a total of 549 larval samples
- 1125 total larval samples sorted and ID at Dr. Fontenot's lab at Nicholl's State University



Ichthyoplankton Identification Results 2013

<u>Family</u>	<u>Species</u>	<u>Total Number</u>
Clupeidae	Dorosoma spp.	14,325
Cyprinidae	Hypophthalmichthys spp.	3,174 (14%)
Cyprinidae	unconfirmed	1,081
Centrarchidae	Lepomis spp.	3,176
Catastomidae	unconfirmed	539
Atherinidae	unconfirmed	495
Scianidae	Aplodinotus grunniens	214
Poecilidae	Gambusia affinis	164
Syngnathidae	Syngnathus scovelli	22
Percichthyidae	Morone spp.	20
Lepisosteidae	Atractosteus spatula	10
Cyprinodontidae	unconfirmed	7
Percidae	unconfirmed	5
Ictaluridae	Ictalurus spp.	4
Cyprinidae	Cyprinus carpio	2
Cyprinidae	Ctenopharyngodon idella	2
Hemiramphidae	unconfirmed	2
Centrarchidae	Elassoma zonatum	1
Centrarchidae	Pomoxis spp.	1
Total:		23,113



Credit: Dr. Quenton Fontenot, Nicholl's State University

Ichthyoplankton Identification Results 2014

<u>Family</u>	<u>Species</u>	<u>Total Number</u>
Clupeidae	Dorosoma spp.	11,452
Catastomidae	unconfirmed	7,382
Cyprinidae	Hypophthalmichthys spp.	3,541 (14%)
Cyprinidae	unconfirmed	1,151
Centrarchidae	Lepomis spp.	868
Atherinidae	unconfirmed	575
Percichthyidae	Morone spp.	124
Scianidae	Aplodinotus grunniens	58
Lepisosteidae	Atractosteus spatula	15
Percidae	unconfirmed	9
Poecilidae	Gambusia affinis	8
Ictaluridae	Ictalurus spp.	6
Syngnathidae	Syngnathus scovelli	6
Centrarchidae	Pomoxis spp.	3
Cyprinodontidae	unconfirmed	2
Esocidae	Esox spp.	2
Anguillidae	Anguilla rostrata	1
Cyprinidae	Cyprinus carpio	2
Total:		25,206



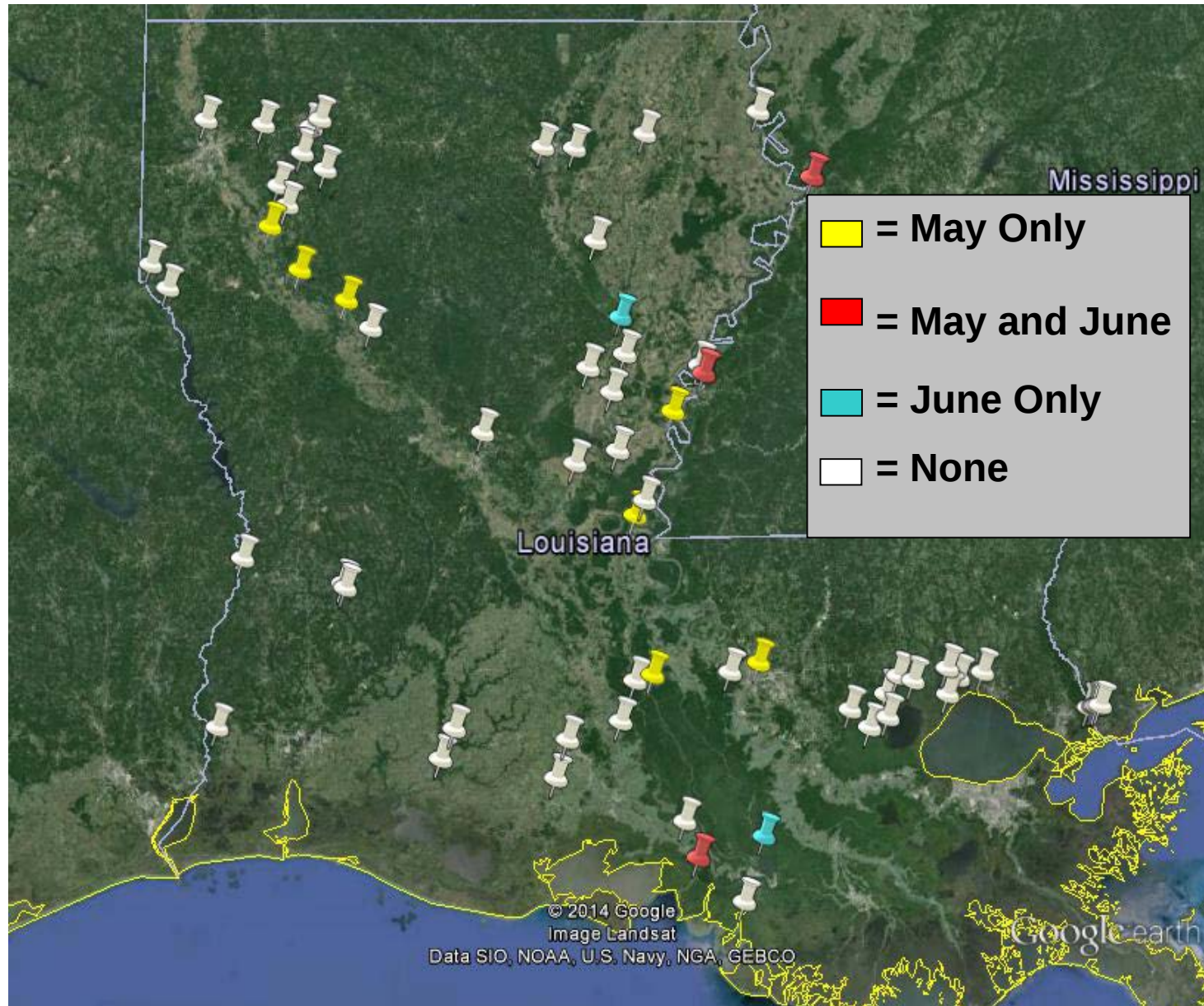
Credit: Dr. Quenton Fontenot, Nicholl's State University

Larval Asian Carp captured in the following rivers:

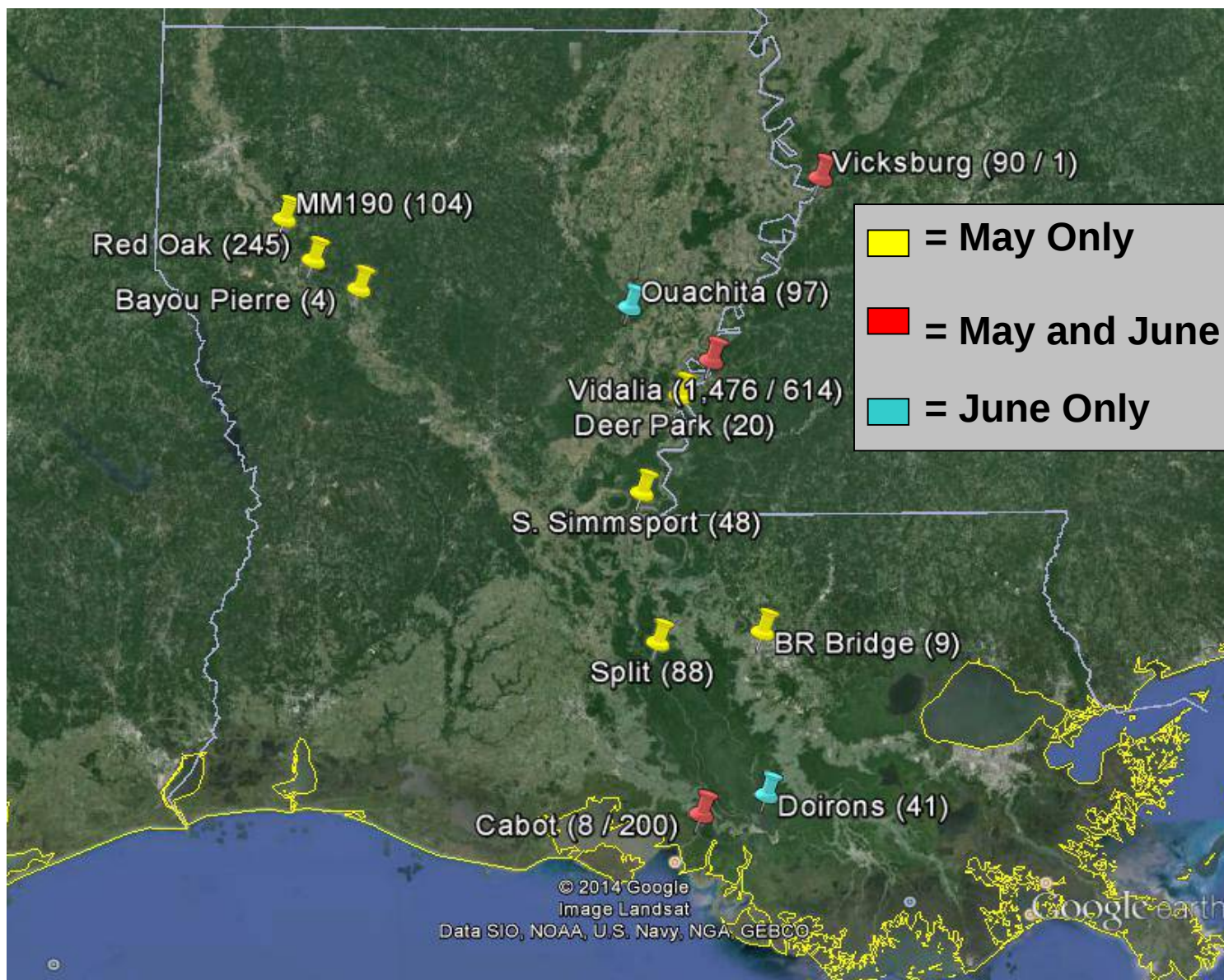
- Atchafalaya River
 - Mississippi River
 - Ouachita River
 - Red River
-
- All in rivers with relatively hard, alkaline waters



Presence and Absence of Asian Carp Larvae by Month



Monthly Abundance of Asian Carp Larvae by Site - 2013



Collection Sites with Yolk-sac Carp Larvae Collected



Summary

- Asian carp appear to be reproducing in only the largest rivers with relatively high alkalinity compared to the smaller adjacent gulf coast drainages.
- The month of May was shown to be peak spawning for bighead and silver carps in Louisiana
- LDWF should consider repeating the study in 5 years



QUESTIONS?



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