

Invasive Species on the Mainstem Ohio River

Rob Tewes

Senior Aquatic Biologist; ORSANCO



Background

The Ohio River has been subject to invasions from exotic aquatic species since at least the mid to late 1800's when Common Carp began gaining a foot-hold in the basin.



Common Carp (*Cyprinus carpio*)

More recently (since the late 1990's) two new carp species, Bighead Carp and Silver Carp, and a submerged aquatic plant (*Hydrilla verticillata*) are all currently experiencing population explosions in the river at the expense of native species.

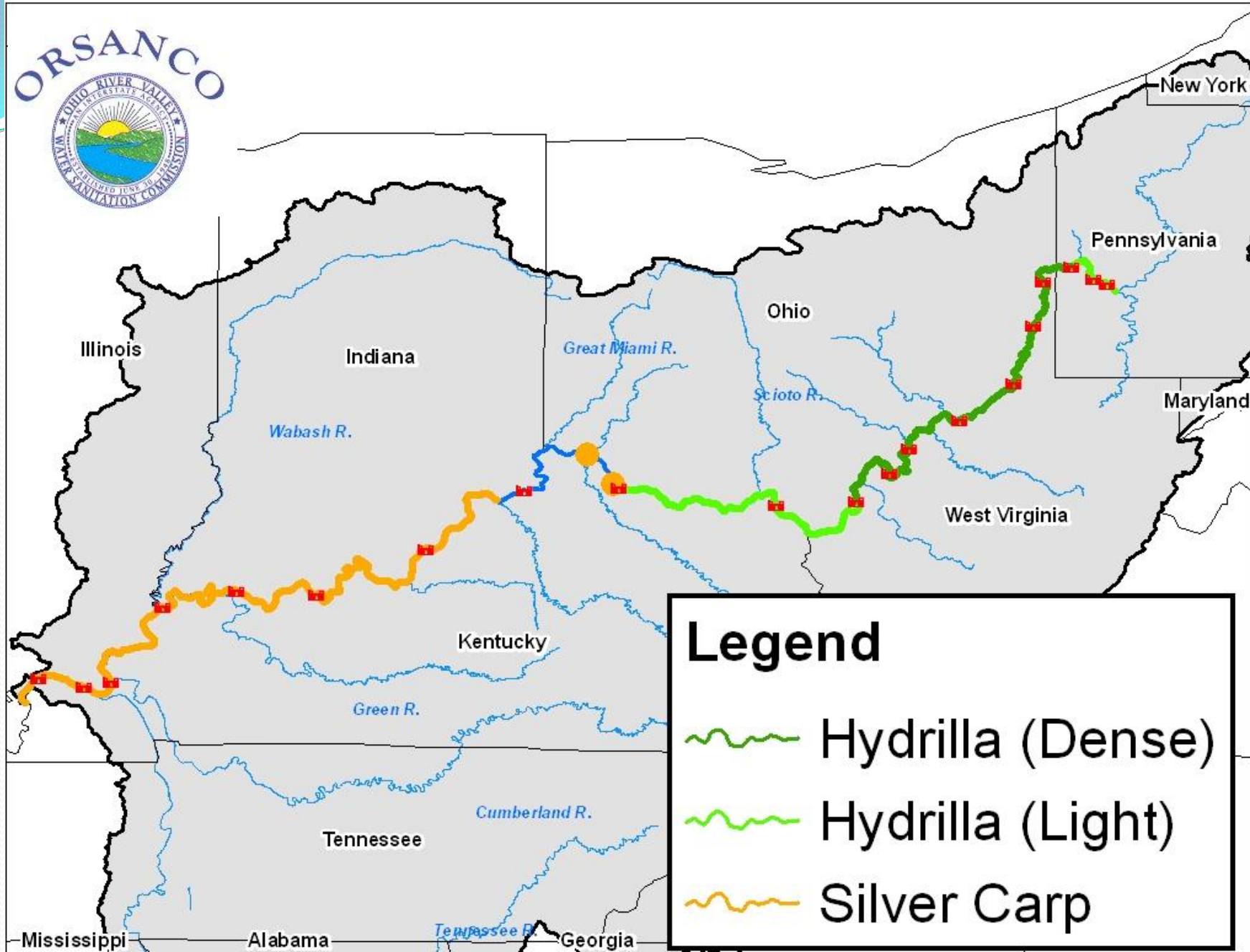


Bighead Carp (*Hypophthalmichthys nobilis*)






Silver Carp (*Hypophthalmichthys molitrix*)





Legend

-  Hydrilla (Dense)
-  Hydrilla (Light)
-  Silver Carp

Background

Although found in the river as early as 1983, Bighead and Silver Carp did not start becoming nuisance species until the late 1990's.



Introduced from China, both species migrated up the Mississippi River and became established in the lower Ohio River. Currently they are spreading upstream with the leading edges of their populations believed to be upstream of Cincinnati, OH.

Current Control Efforts: Tracking

Efforts to reduce populations in the Ohio River have been primarily state-driven.

U.S. Fish & Wildlife (USFWS) has been working with several state agencies to track the leading edge of the invasion.

USFWS recently assisted West Virginia Department of Natural Resources and Kentucky Department of Fish & Wildlife Resources (KYDFWR) to place stationary receivers between Willow Island L&D and Meldahl L&D to track carp movements via telemetry.



Current Control Efforts: Environmental DNA

Efforts have included 200 water samples collected from Pittsburgh, PA to Wheeling, WV that were tested for carp DNA (two tested positive).



Several agencies collaborated to test water samples from the Muskingum River in Ohio and detected genetic material from bighead carp in 10 of 222 samples.



PA conducted a 2015 eDNA survey, finding positive results for bighead carp in 5 of 260 samples.



Current Control Efforts: Removal

In the spring of 2013, KYDFWR hosted the first ever commercial fishing event which successfully removed 42 tons of carp from Barkley and Kentucky lakes.

IN IL and KY are working to encourage more people to eat Silver Carp as a means of population control.



ORSANCO Involvement: Tracking

ORSANCO biologists have been indirectly involved in carp monitoring and removal efforts, participating in workshops and meetings and reporting when encountered in our routine sampling.

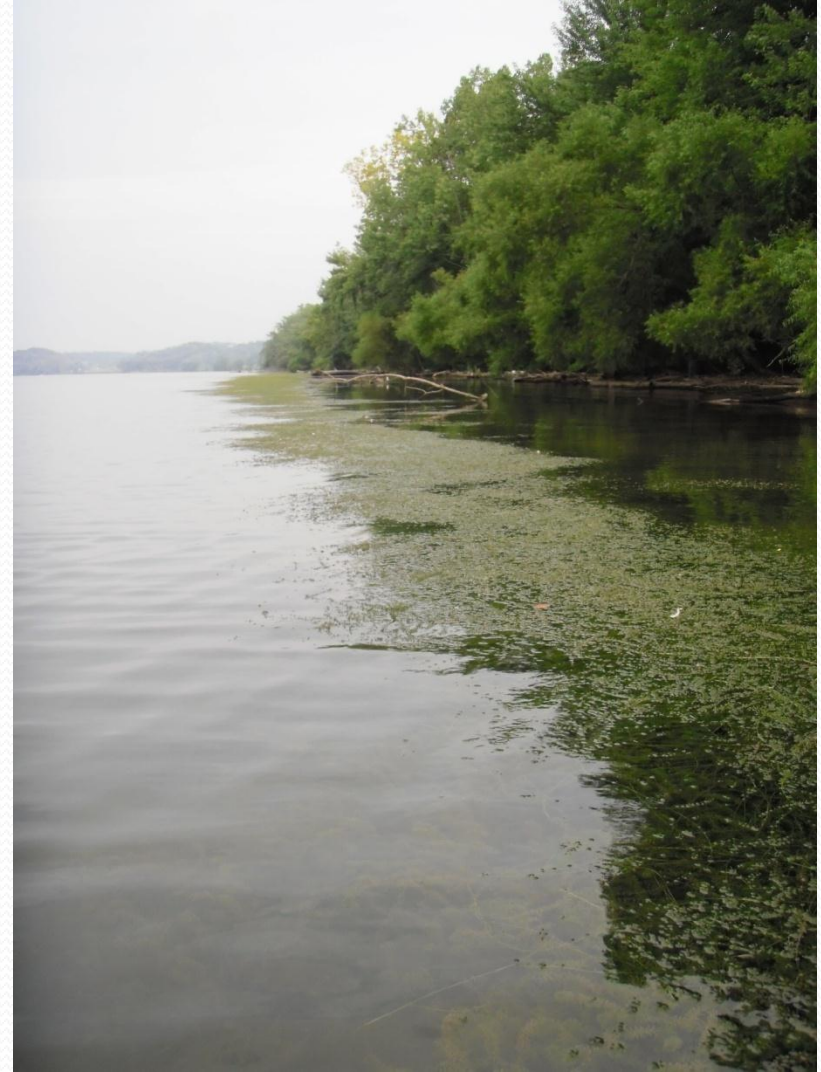
- The furthest upstream records in ORSANCO's database are:
 - ORMI 463.5 - mouth of the Little Miami River
 - ORMI 440 - middle-river fixed station sampling location



ORSANCO Involvement: *Hydrilla*

ORSANCO biologists have had a limited role in working with other agencies to develop monitoring and eradication plans for the invasive submerged plant, *Hydrilla* (*Hydrilla verticillata*).

This nuisance species was first observed in the upper sections of the Ohio River in the mid-2000's. It has since spread upstream into the Monongahela River and downstream to below Greenup L&D.

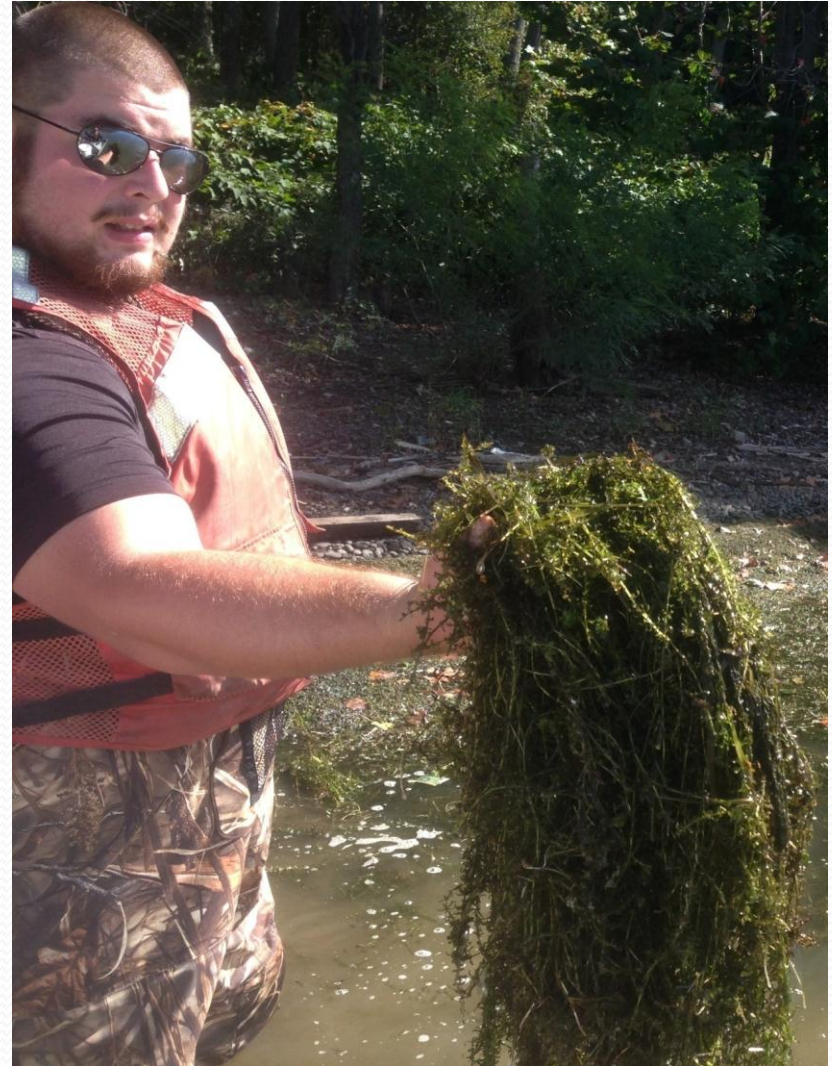


ORSANCO Involvement: *Hydrilla*

The Ohio River contains the monoecious type: male and female together.

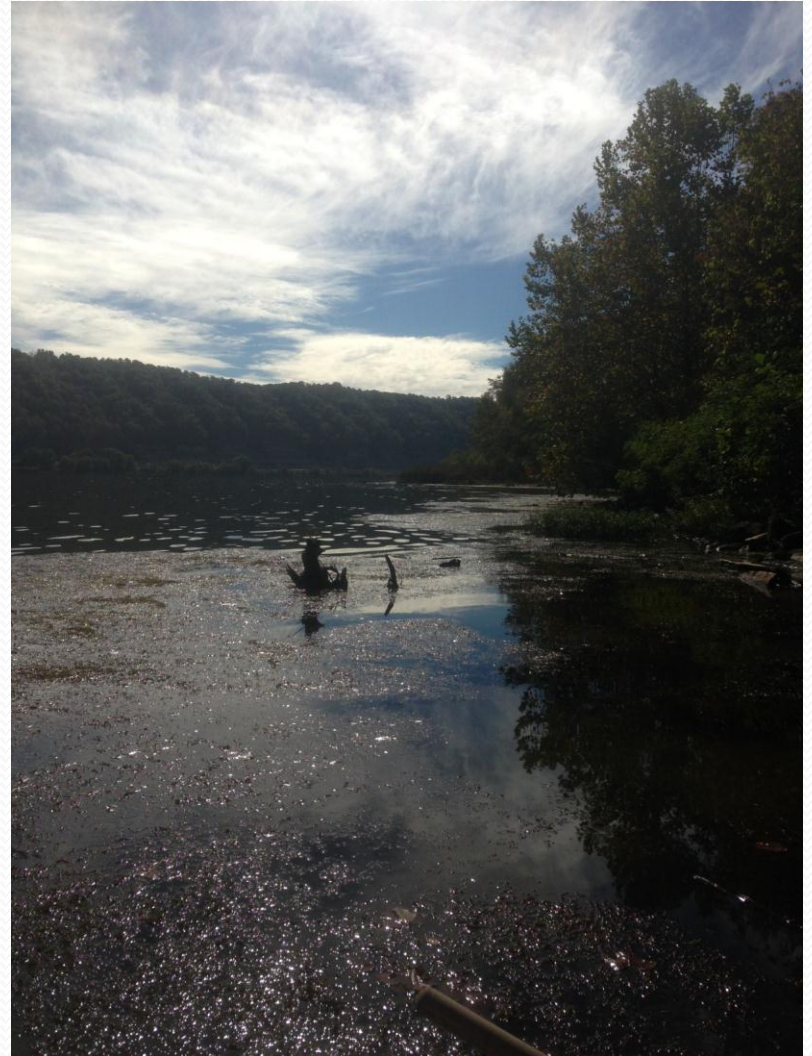
- Highly invasive; rapid growth/expansion
- Highly fecund, tubers remain viable for years.

ORSANCO biologists attended an information exchange workshop on methods to eradicate the plant hosted by ORBFHP and the Appalachian Ohio Weed Control Partnership.



Effects of *Hydrilla* on Fish Populations

In 2013 we observed an assemblage shift from pelagic piscivores and suckers to one dominated by centrarchids, bluntnose minnow, and common carp.



Shifting Assemblages



10x



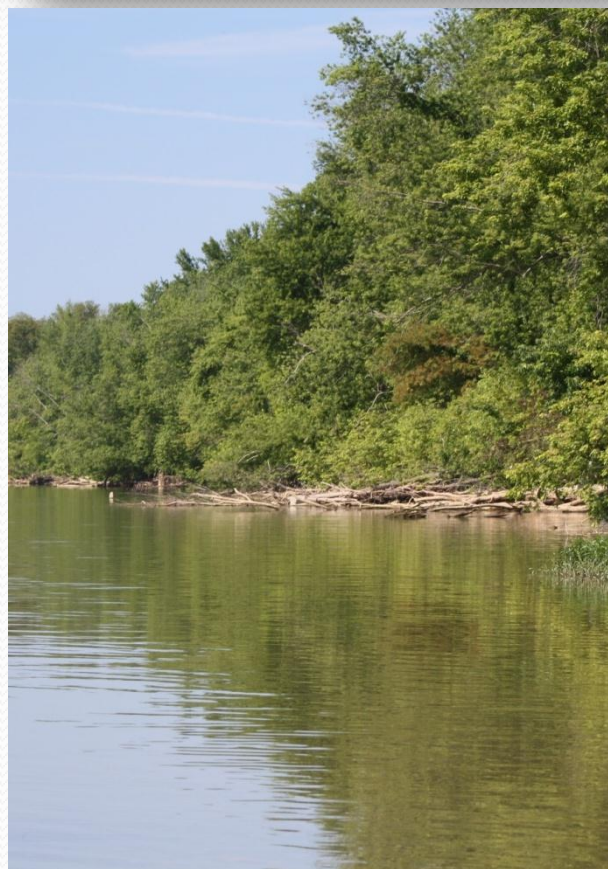
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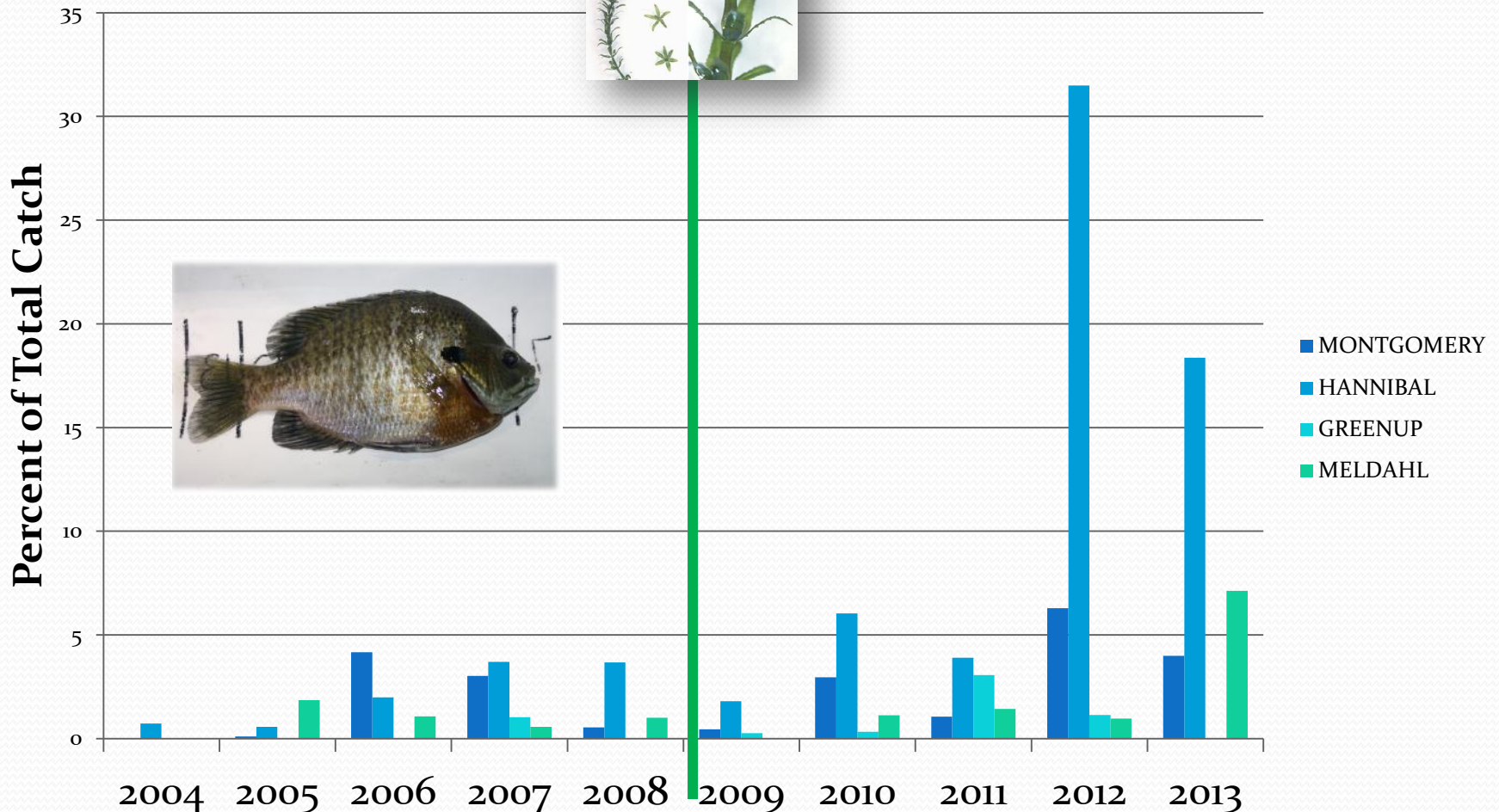
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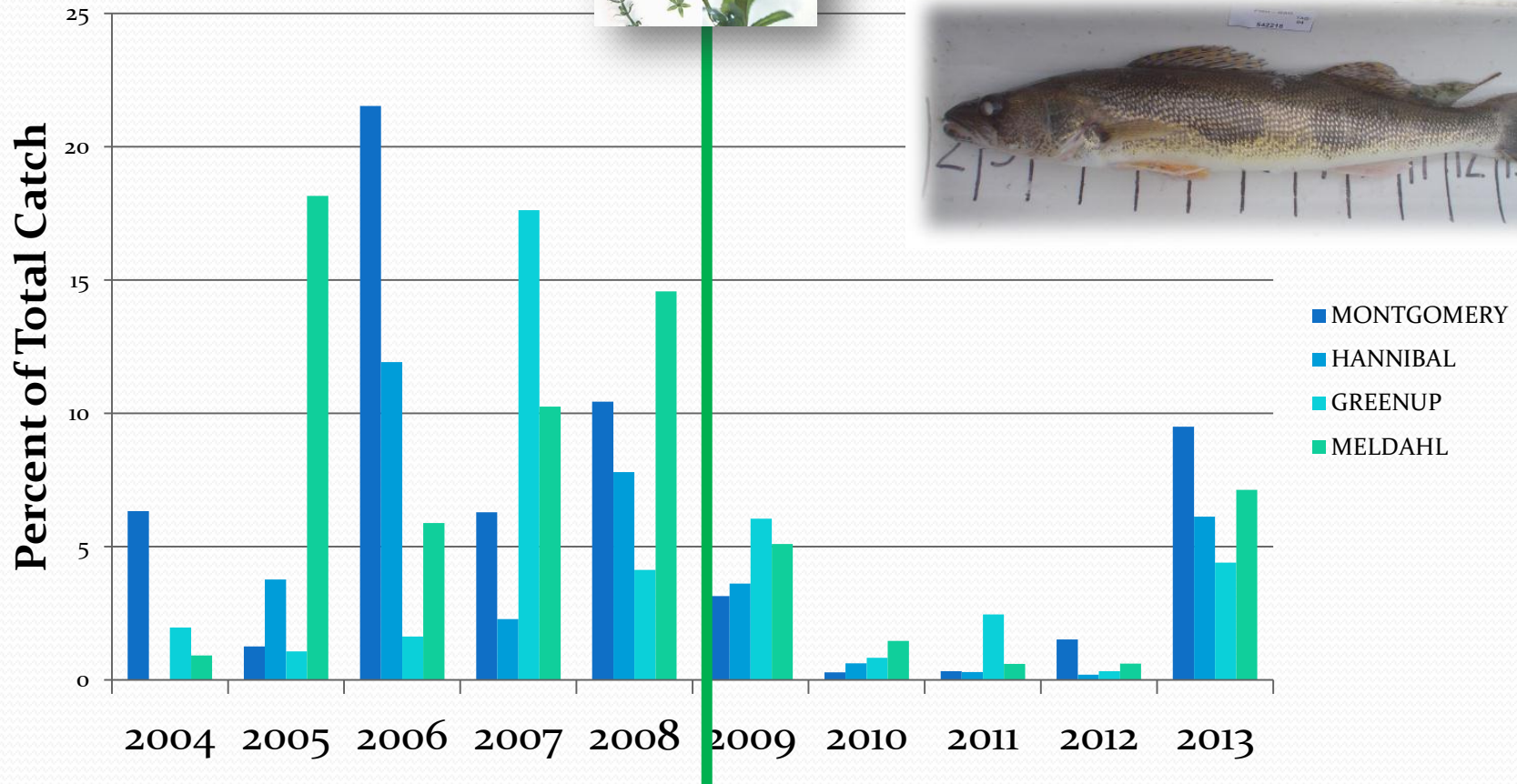
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Species shift observed in *Hydrilla* Infested Pools (Fixed Station Data)

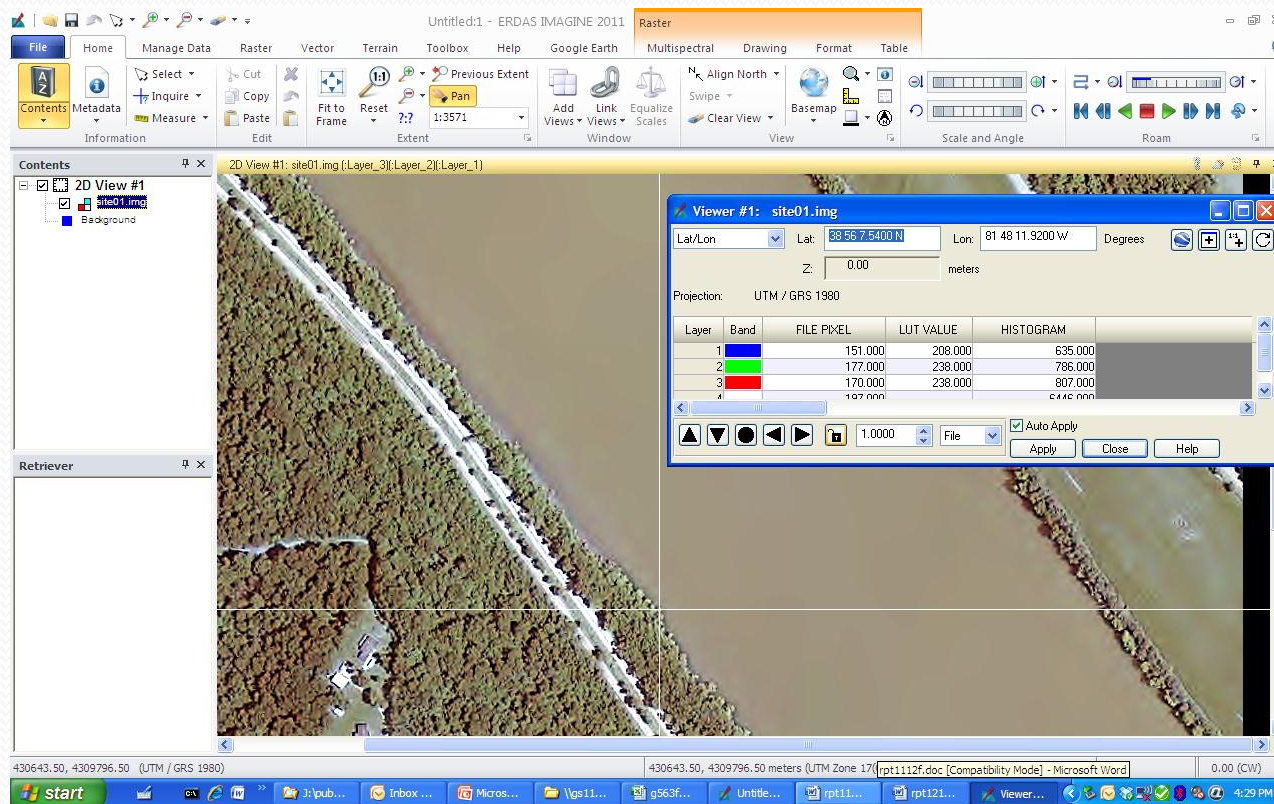


Species shift observed in *Hydrilla* Infested Pools (Fixed Station Data)



ORSANCO Involvement: Remote Sensing

ORSANCO biologists worked with the Ohio River Basin Fish Habitat Partnership (ORBFHP) and researchers from Northwest Missouri State University to develop remote sensing techniques using satellite imagery to detect when and where dense beds of submerged aquatic vegetation (presumably *Hydrilla*) appear on the shorelines.



NORTHWEST
MISSOURI STATE
UNIVERSITY



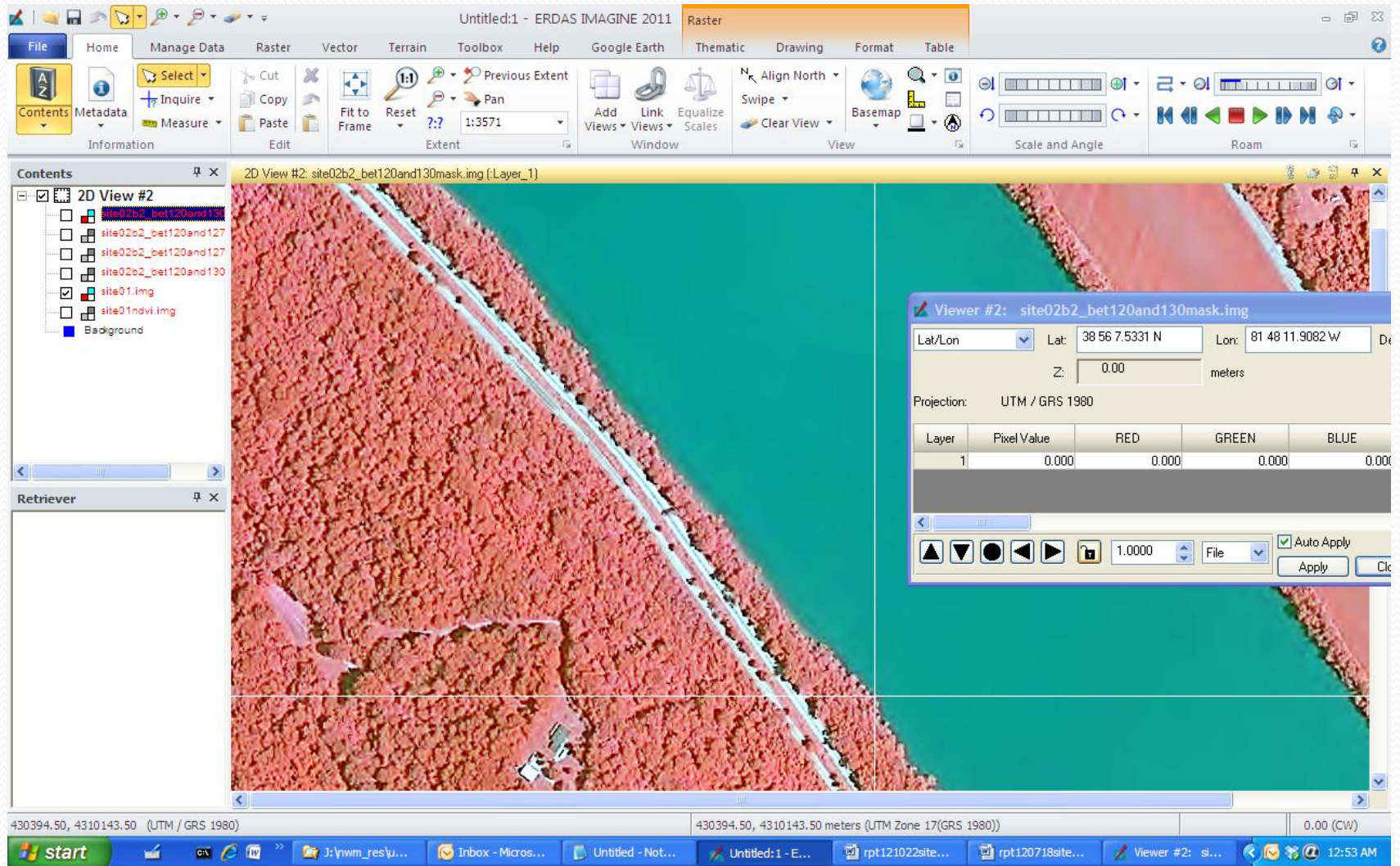
NATIONAL
FISH HABITAT
ACTION PLAN



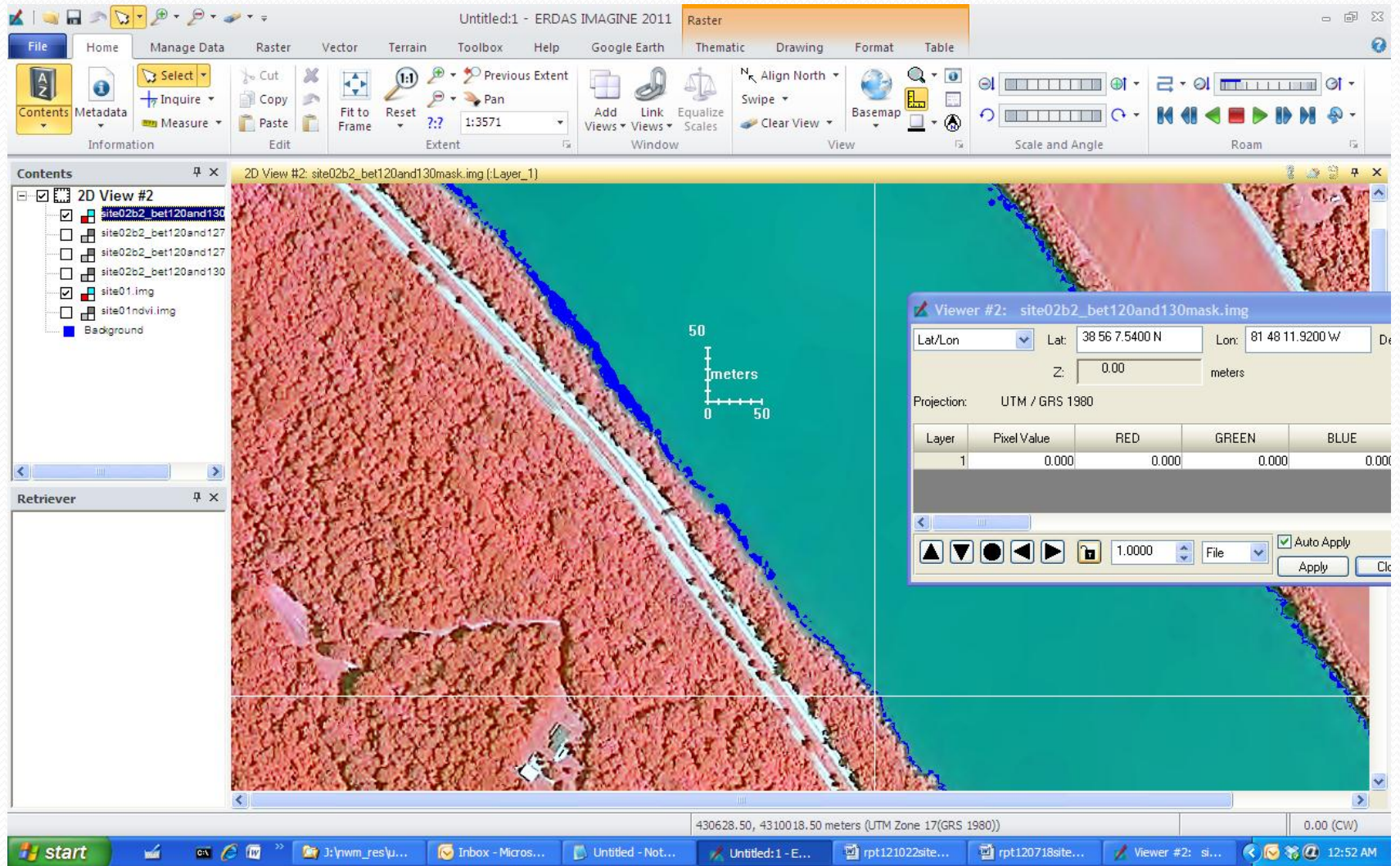
The Ohio River Valley Water Sanitation Commission (ORSANCO)
Biological and Research Programs



NAIP 2011 Color Infrared



Detection of Aquatic Invasive



Questions?

