NEW GRANT OPPORTUNITY

EPA Wetland Program Development Grants

Policy and Implementation Committee

April 28, 2017

On-stream Habitats

Upstream Land-use Activities

Development
Upland agriculture

↓

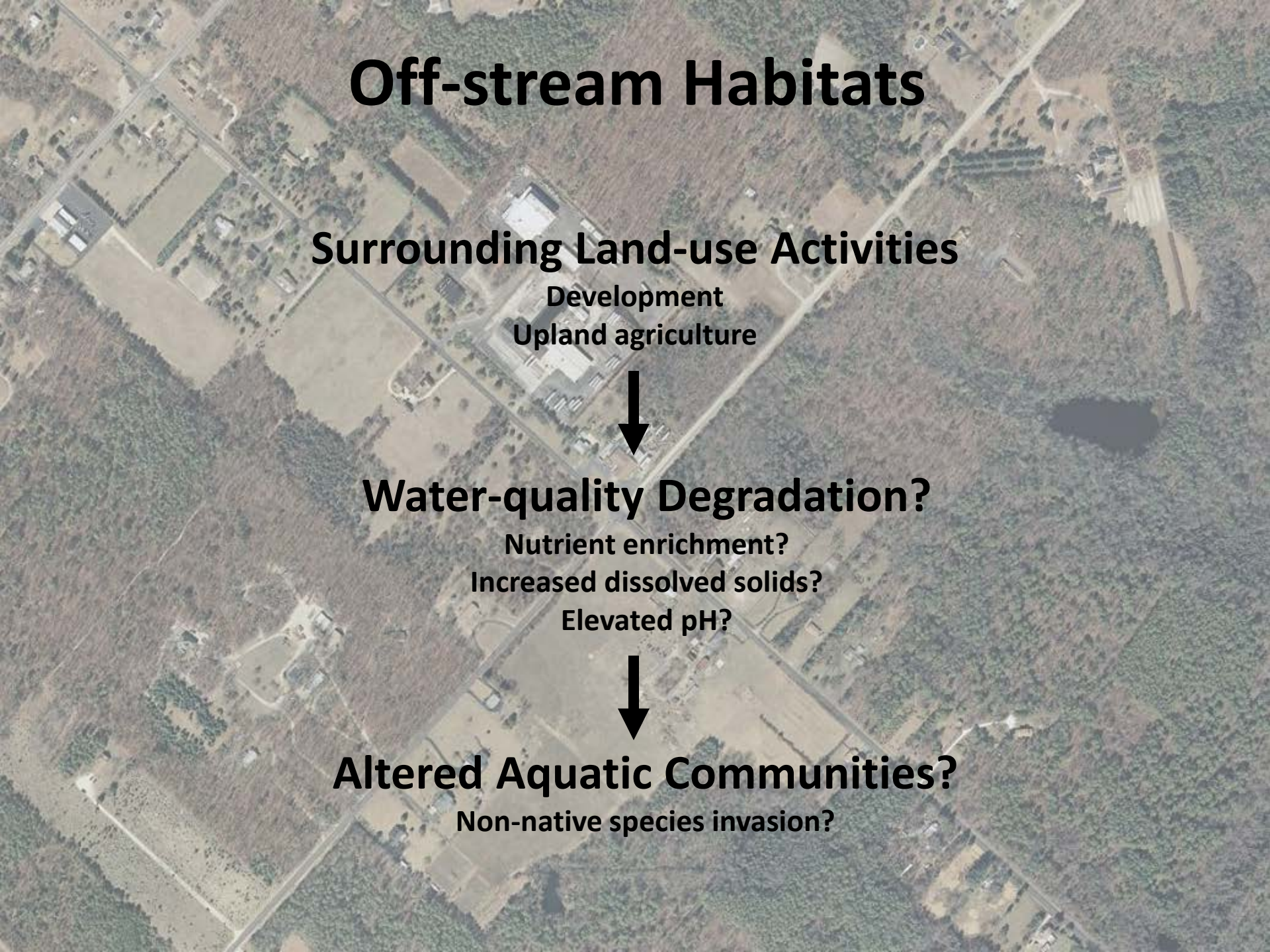
Water-quality Degradation

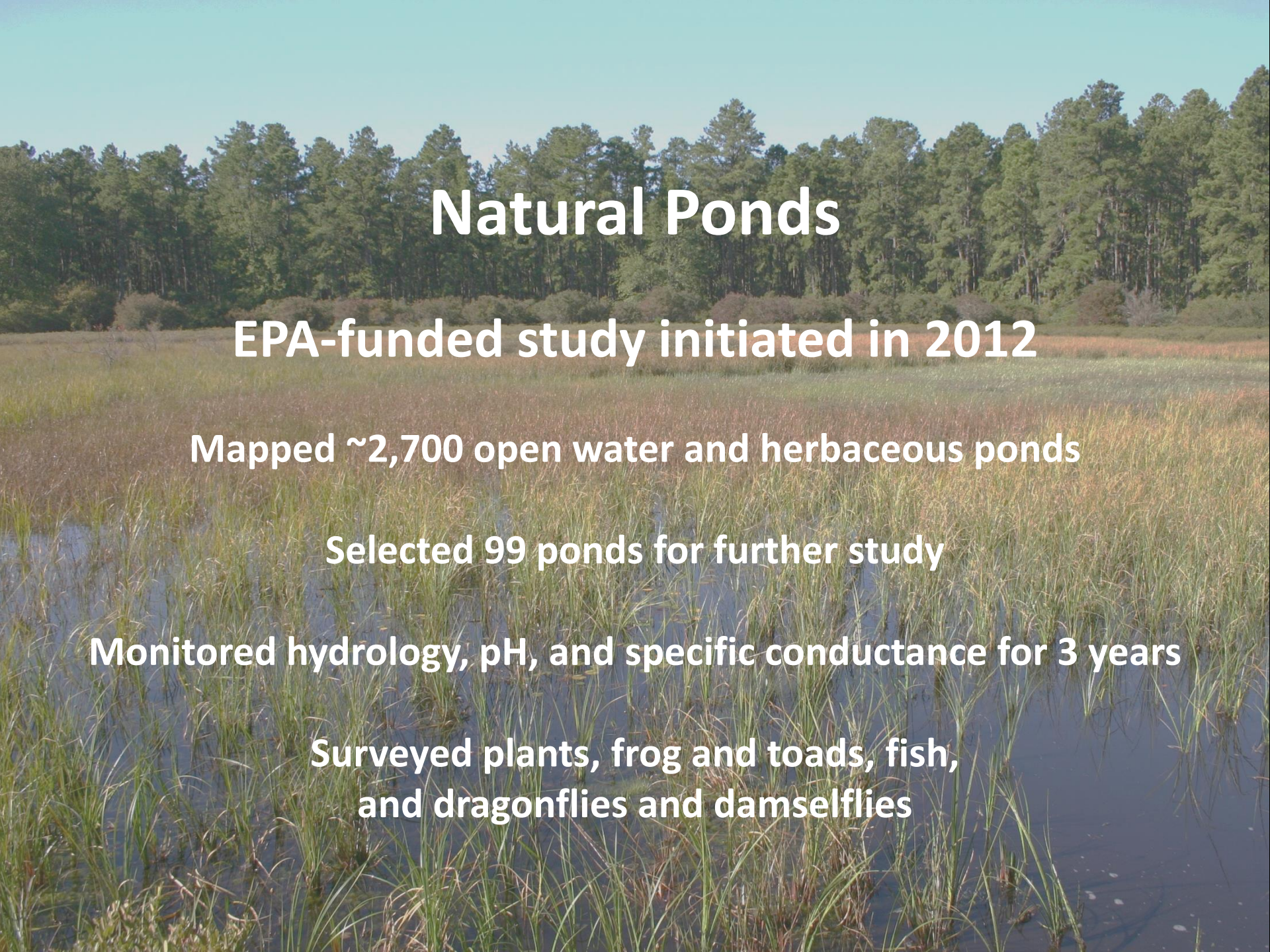
Nutrient enrichment
Increased dissolved solids
Elevated pH

↓

Altered Aquatic Communities

Non-native species invasion


Off-stream Habitats
Surrounding Land-use Activities
Development
Upland agriculture
Water-quality Degradation?
Nutrient enrichment?
Increased dissolved solids?
Elevated pH?
Altered Aquatic Communities?
Non-native species invasion?



Natural Ponds

EPA-funded study initiated in 2012

Mapped ~2,700 open water and herbaceous ponds

Selected 99 ponds for further study

Monitored hydrology, pH, and specific conductance for 3 years

Surveyed plants, frog and toads, fish,
and dragonflies and damselflies

Created Wetlands

EPA-funded study initiated in 2013

Mapped ~1,700 excavated ponds and ~1,400 stormwater basins

Selected 52 excavated ponds and 46 stormwater basins

Monitored hydrology, pH, and specific conductance for 3 years

Surveyed plants, frogs and toads, fish

Pesticides and Pathogens

Partnered with Kelly Smalling from USGS

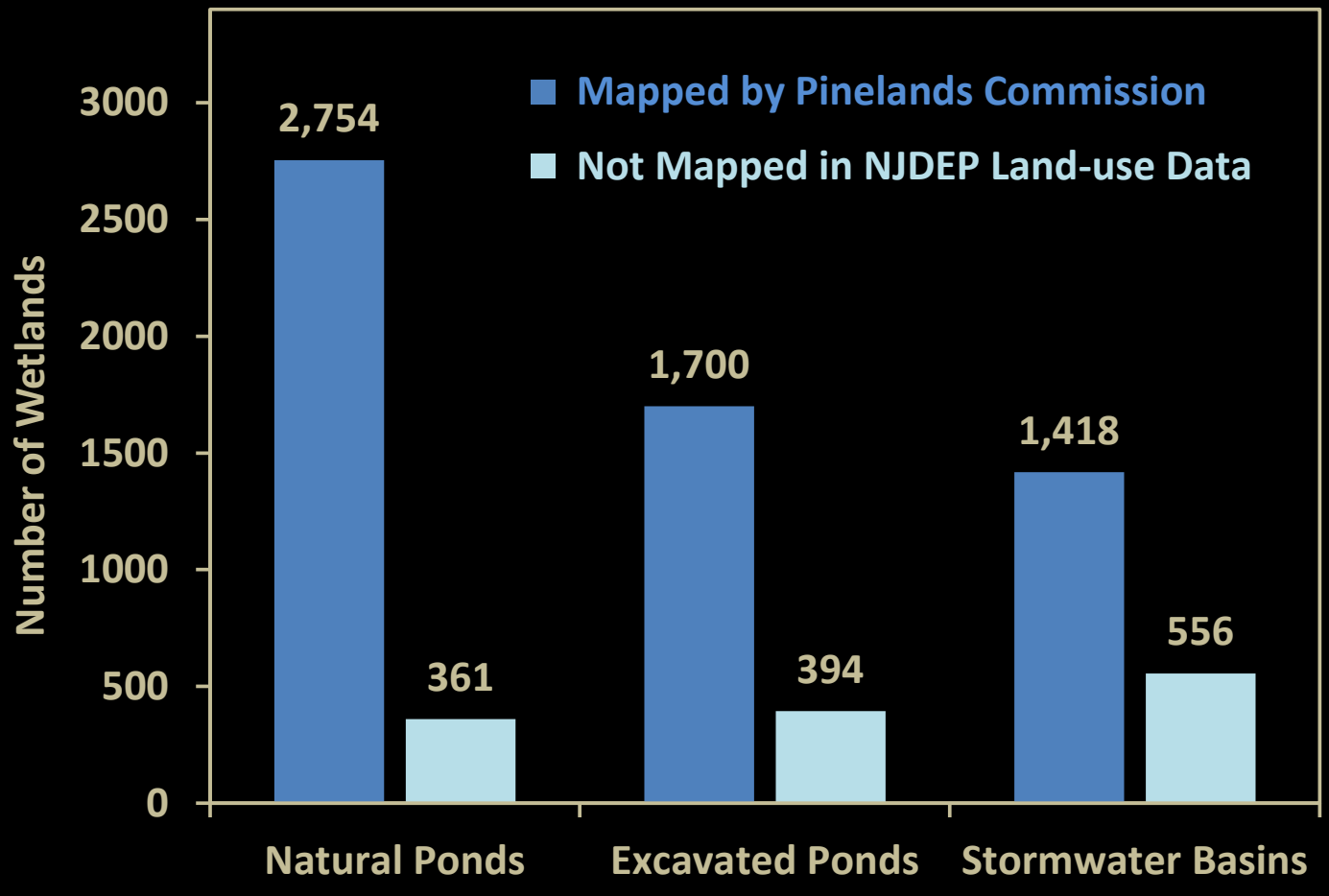
8 natural ponds, 8 excavated ponds, and 8 stormwater basins

High and low surrounding land use intensity

Sampled water, sediment, tadpole food, and tadpoles for pesticides

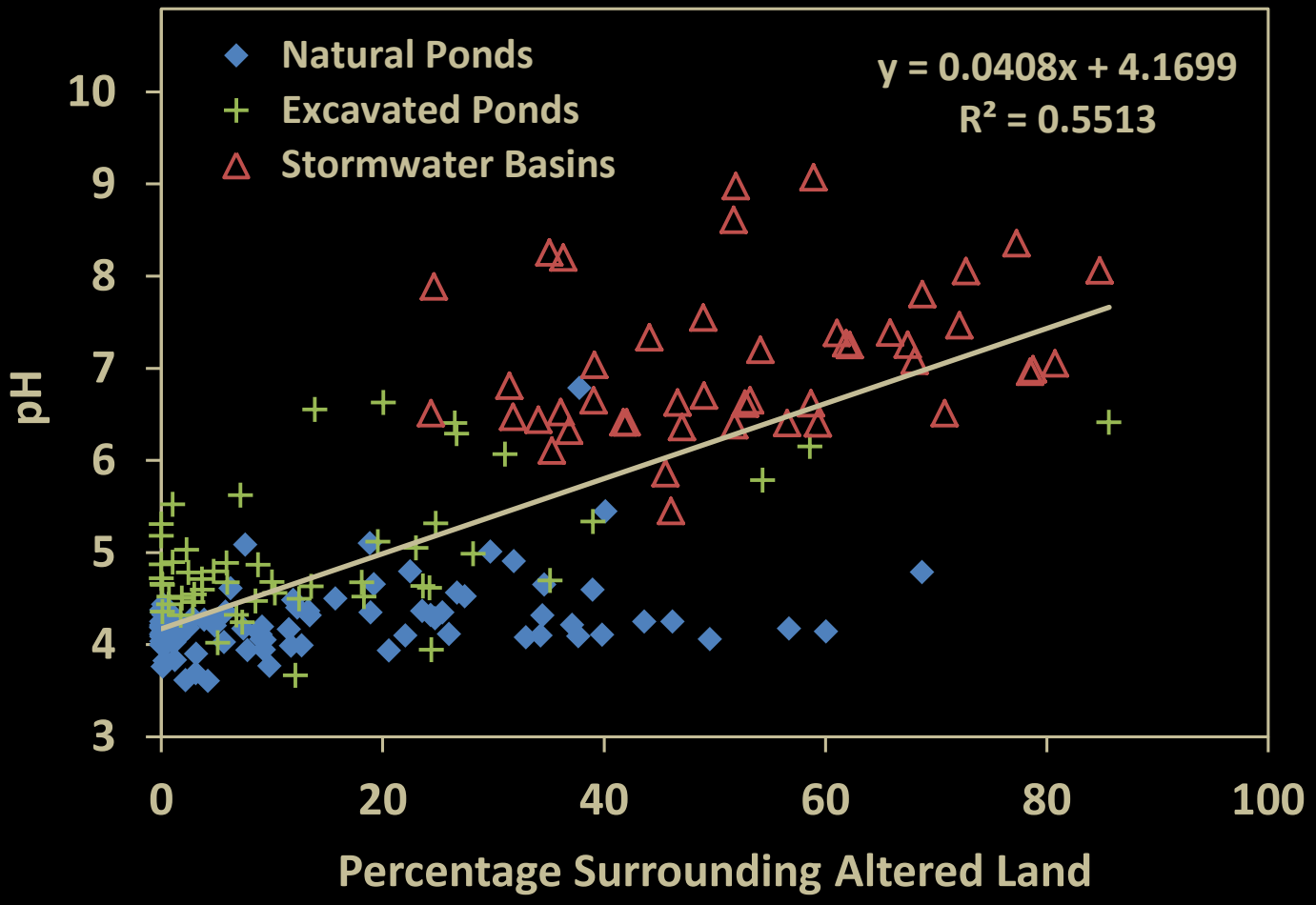
Swabbed tadpoles for amphibian pathogens

DRAFT Mapping Results



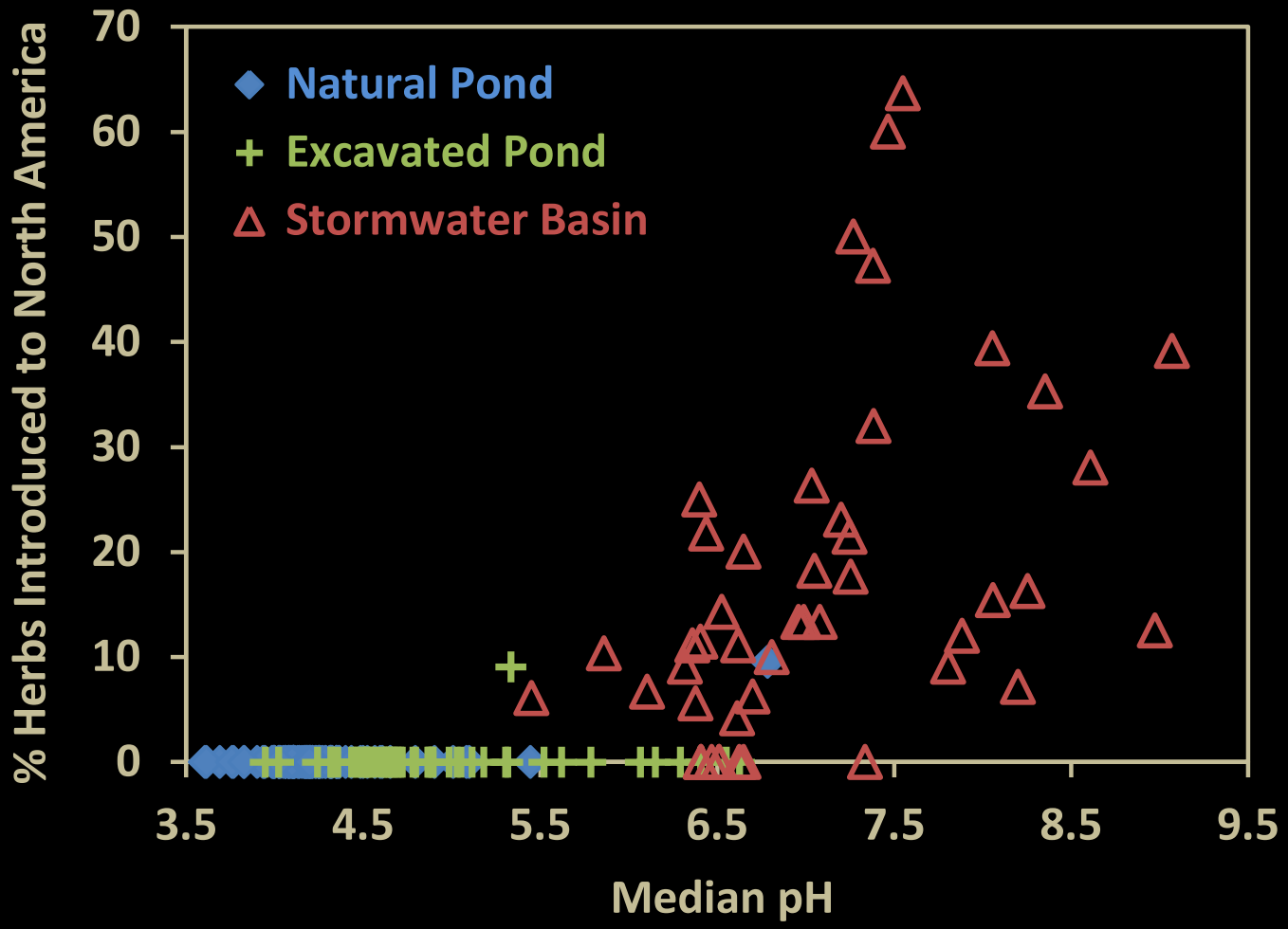
PC mapping resulted in an increase in the number of wetlands known in the Pinelands

DRAFT pH Results



Strong relationship between land use and pH among all wetland types

DRAFT Plant Results

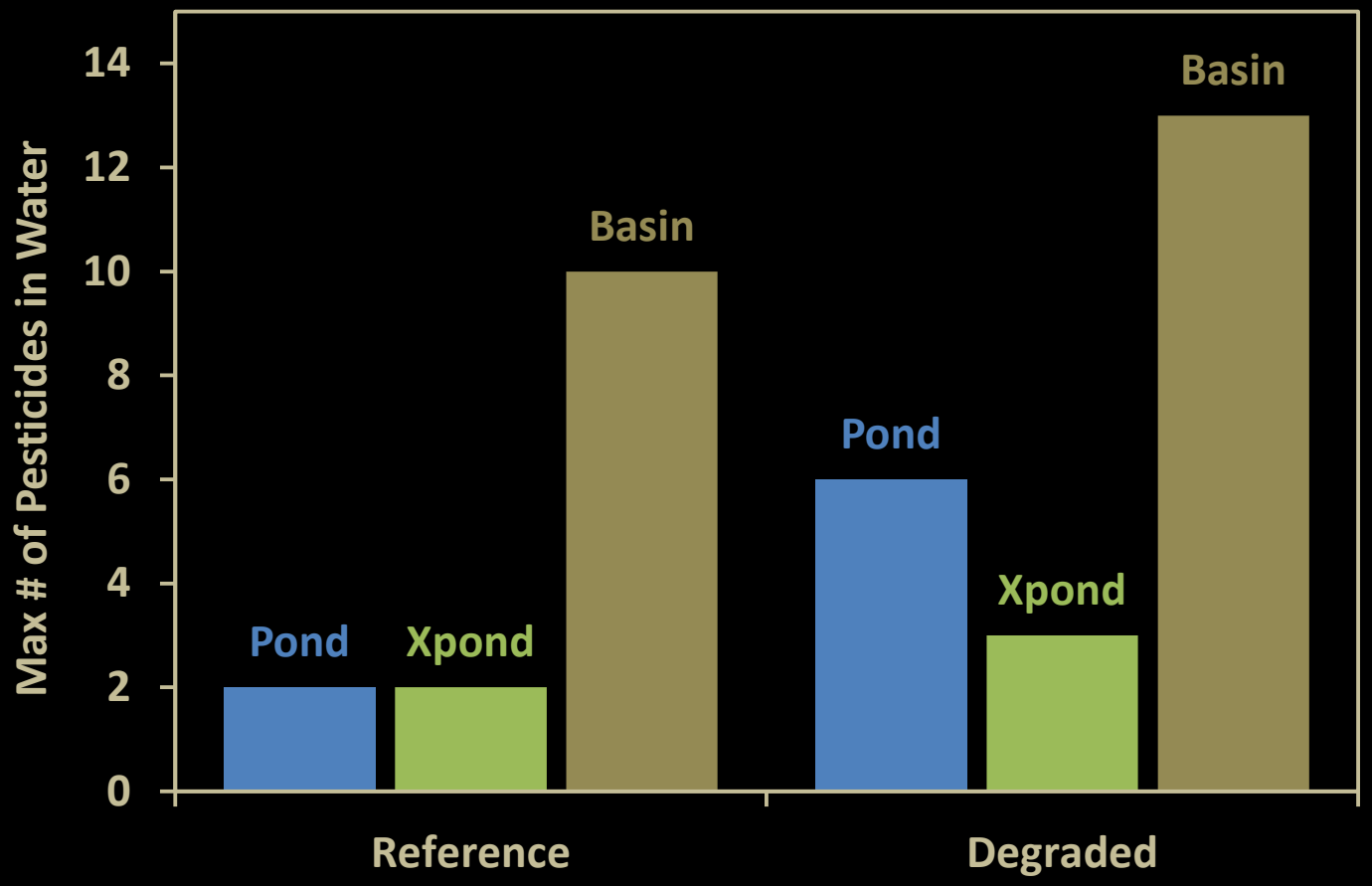


Basins displayed highest pH values

Introduced species mostly in basins

Natural and excavated ponds displayed good water quality

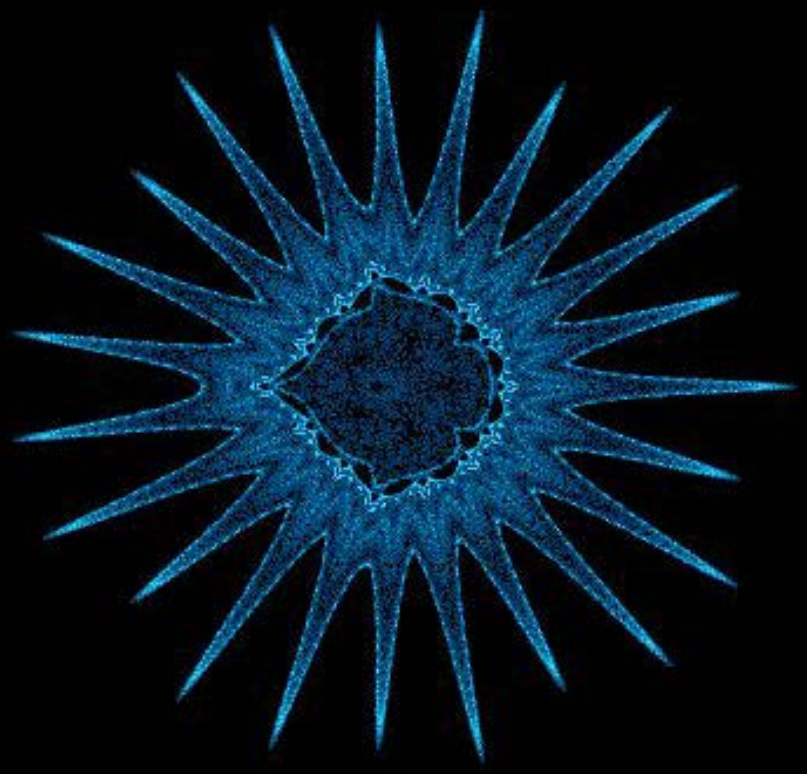
DRAFT Pesticide Results



Ponds and excavated ponds fewer chemicals than stormwater basins

More pesticides at degraded vs reference sites

New Proposed Study



“Effects of land use on water quality and microorganisms in natural ponds, excavated ponds, and stormwater basins”

Wetland Mapping

Mapped stormwater basins throughout the Pinelands using 2007 aerial photography

Update mapping using 2012 aerial photography

Most recent aerial photography served by NJDEP

Site Selection and Water Quality

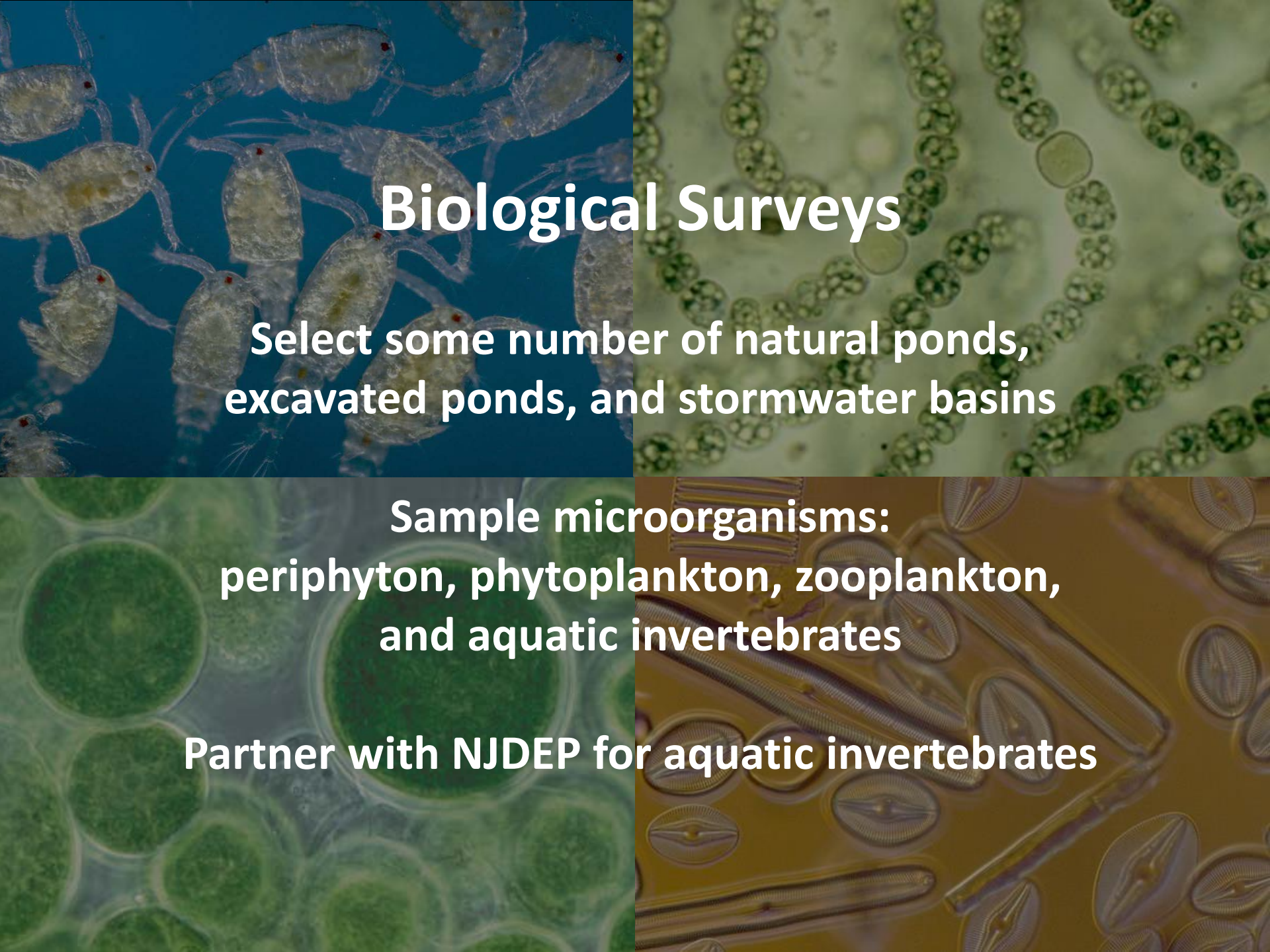
Use the existing pool of 197 sites and hydrology data

Select some number of natural ponds, excavated ponds, and stormwater basins

Partner with Kelly Smalling from USGS

Monitor pH, SC, DO, Cl, NO_2+NO_3, NH_4 (maybe PO_4) in the water

Sample metals and pesticides in water and maybe sediments



Biological Surveys

Select some number of natural ponds, excavated ponds, and stormwater basins

Sample microorganisms: periphyton, phytoplankton, zooplankton, and aquatic invertebrates

Partner with NJDEP for aquatic invertebrates

Timeline and Cost

Three years of field work (2018 - 2020)
One year to analyze data and write report (2021)

Maximum total cost ~$433,000
$325,000 from EPA (maximum provided)
$108,000 (25% Commission match)
PCF Fund - Science and Research
Maybe some USGS salary also

Products

Updated GIS layer of stormwater basins

Better define relationship between land use and basic WQ conditions in the three types of wetlands

Nutrient, metal, and pesticide inputs to each wetland type

Explore the use of microorganisms as indicators of ecological integrity in off-stream wetlands

Support

Will seek letters of support from:

Commission Science Advisory Committee
NJDEP Endangered and Nongame Species Program
NJDEP Bureau of Science, Research, and Environmental Health
NJDEP Bureau of Freshwater and Biological Monitoring
U.S. Geological Survey

Policy and Implementation Committee