GIS in the Surveillance and Management of Invasive Aquatic Plants

Gregory J. Bugbee

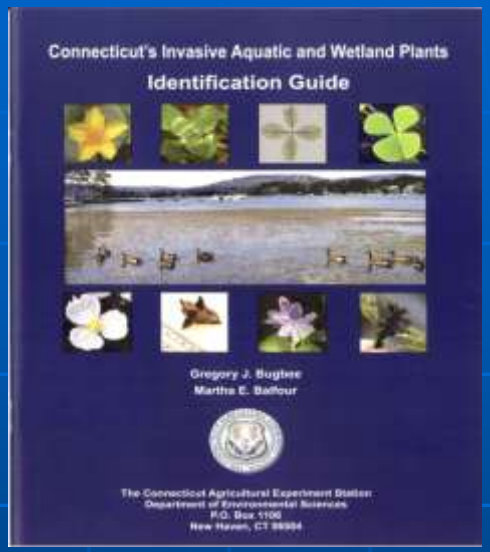
Connecticut Agricultural Experiment Station
Invasive Aquatic Plant Program

Invasive Aquatic Plants in Connecticut

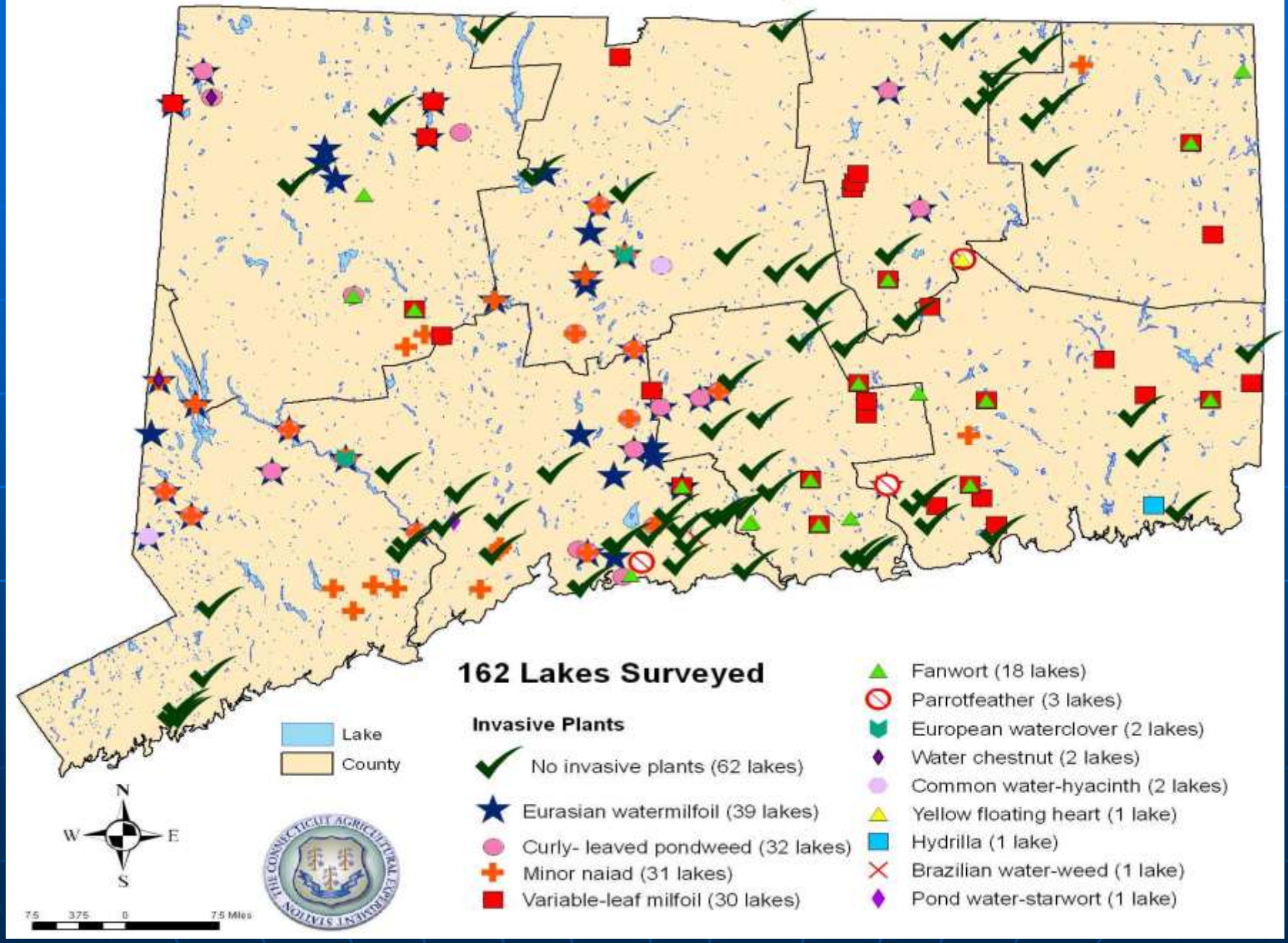
- **Displace native species**
- **Alter native ecosystems**
- **Reduce recreation**
- **Lower property values and tax revenue**
- **Interfere with navigation**

Connecticut's Most Common Invasive Aquatic Plants

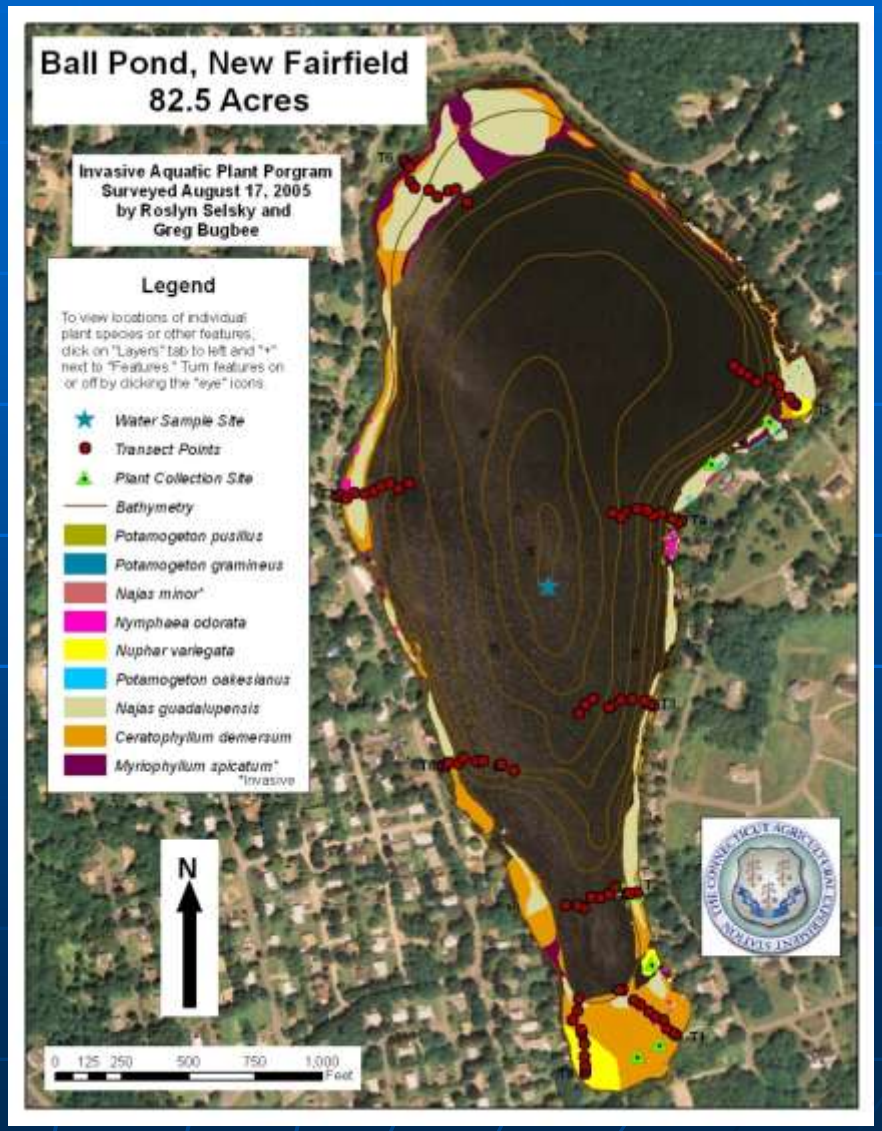
Identification guide available at www.ct.gov/caes/iapp



Locations of Invasive Plants Found by CAES IAPP 2004-2009



Vegetation Surveys

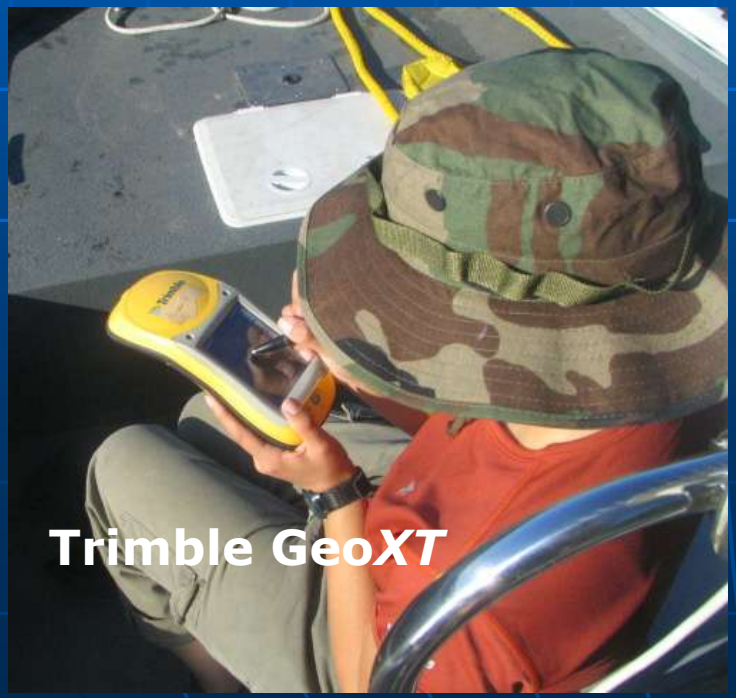


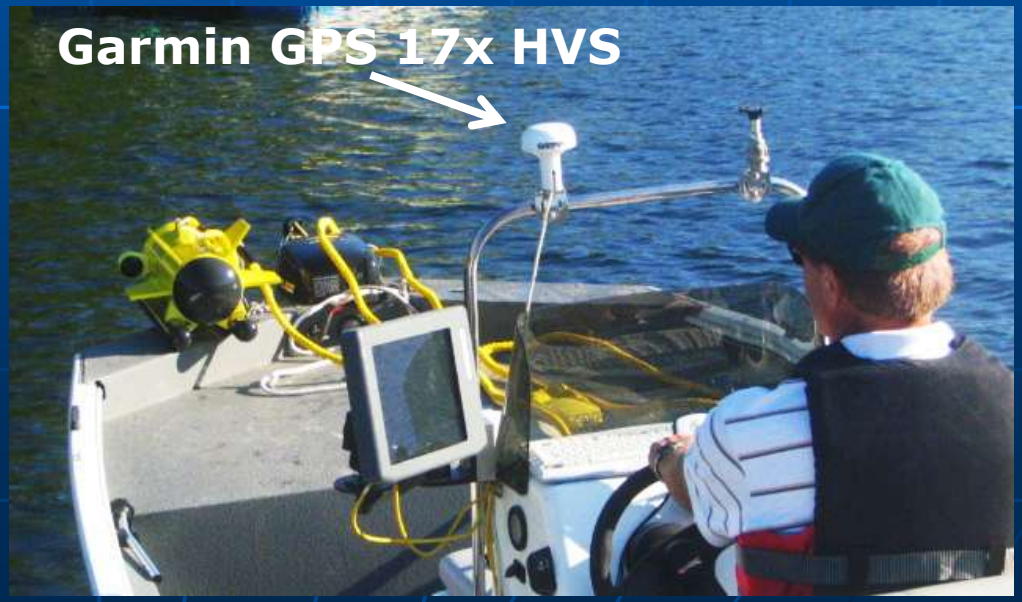
<u>Georeferenced</u>
Water sample sites
Transect points
Plant collection sites

<u>Base maps</u>
CT DEP lake layer
NAIP aerial imagery

Our Global Positioning Systems

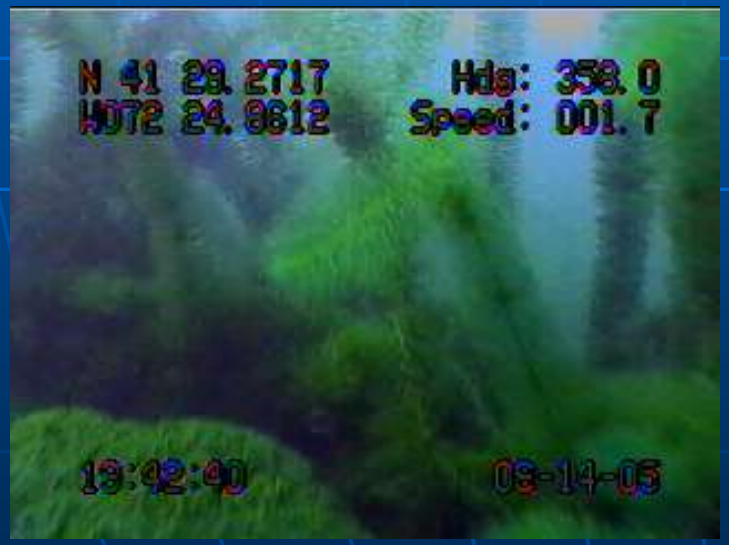
Garmin GPS 76



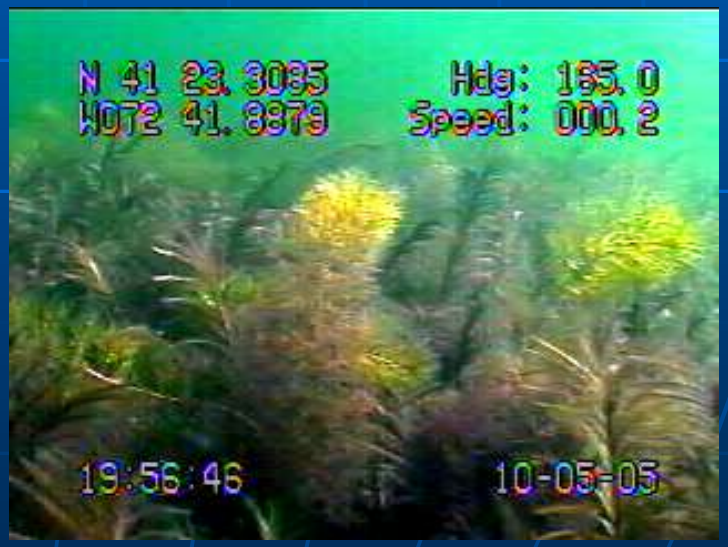


Georeferenced Underwater Pictures

Abundant native species help resist invasion

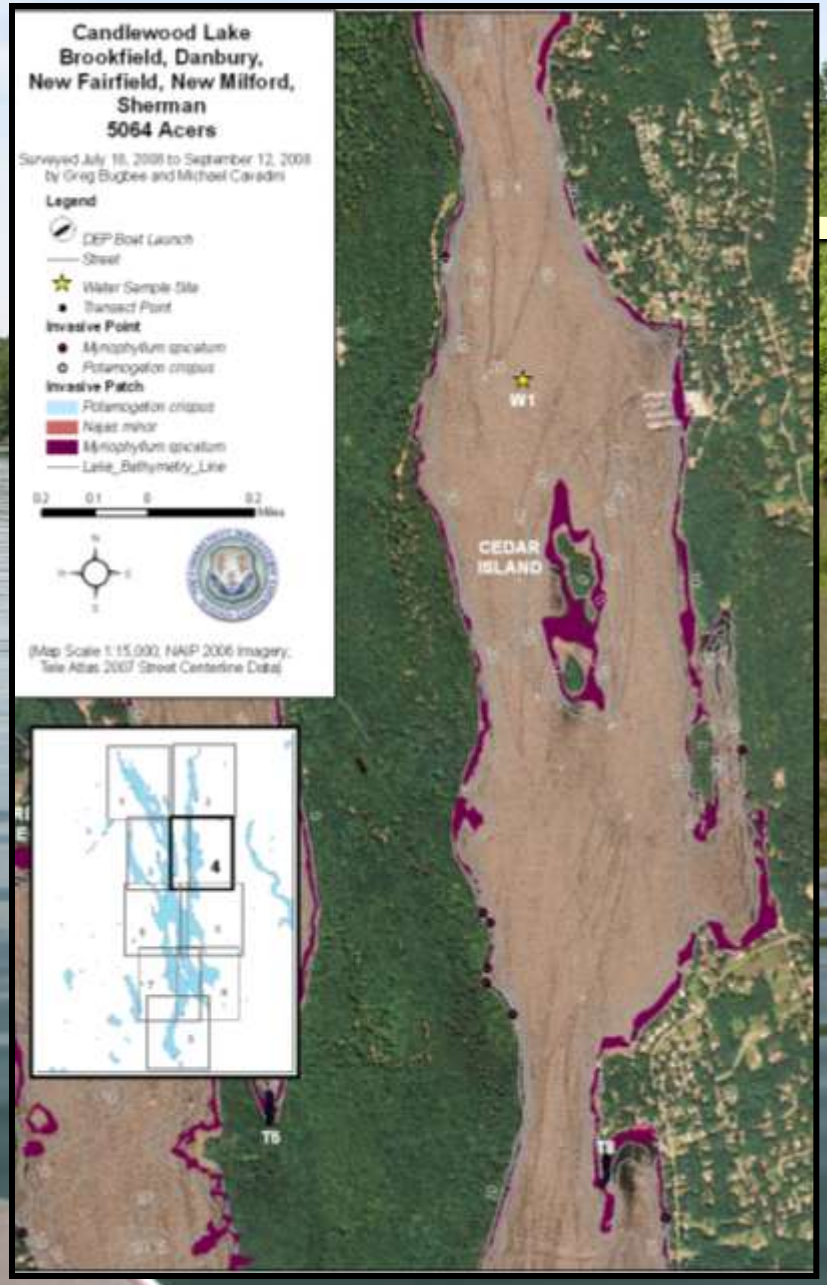


Invasive species
Variable water milfoil



Endangered species
Water marigold

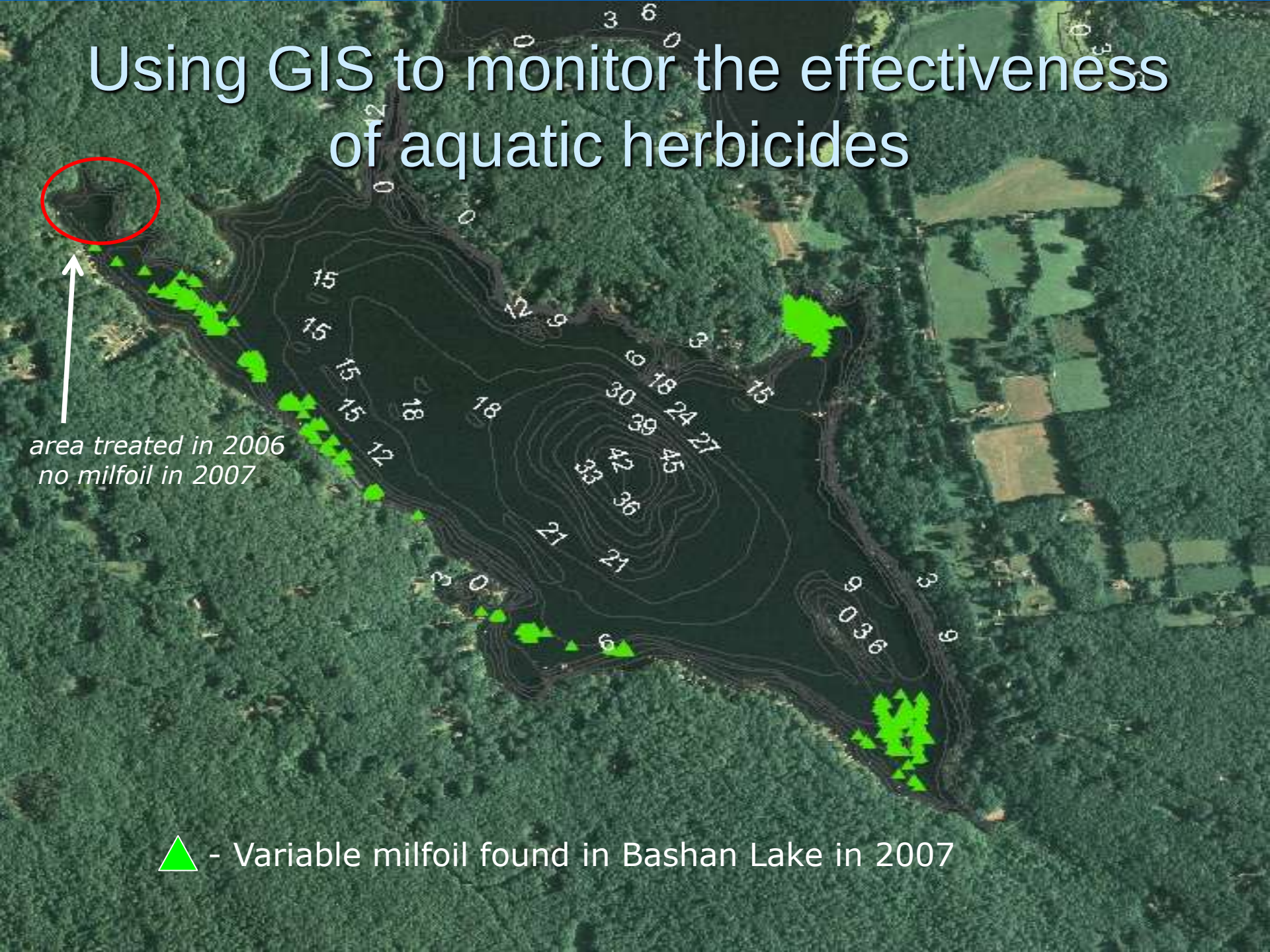
Candlewood Lake



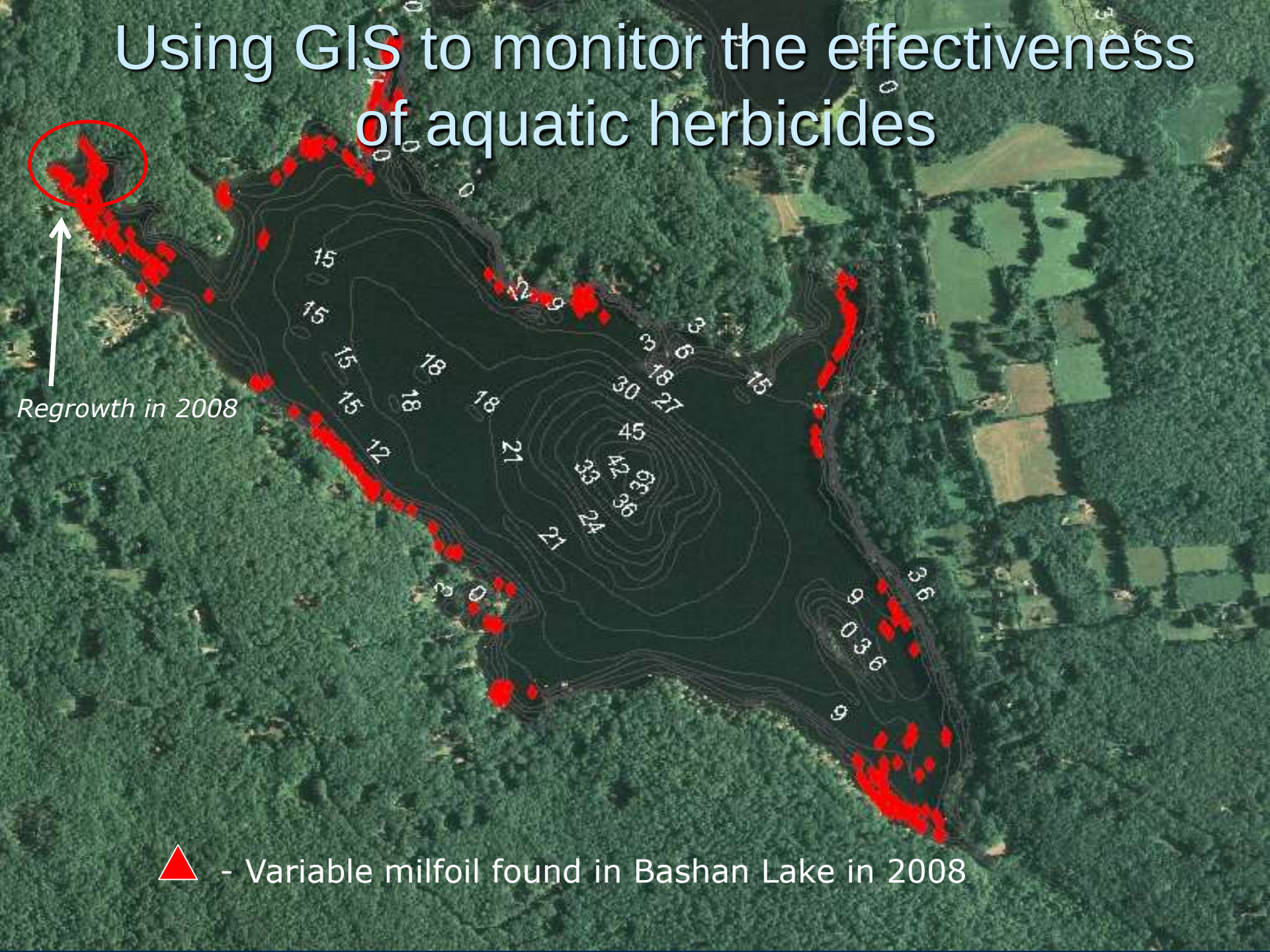
- Connecticut's largest lake
  - **5086 Acres**
  - **200 - 500 acres of Eurasian milfoil depending on depth and duration of winter drawdown**
  - **On-lake mapping and remote sensing utilized**

GIS used for tracking boat path when spreading herbicide

Using GIS to monitor the effectiveness of aquatic herbicides

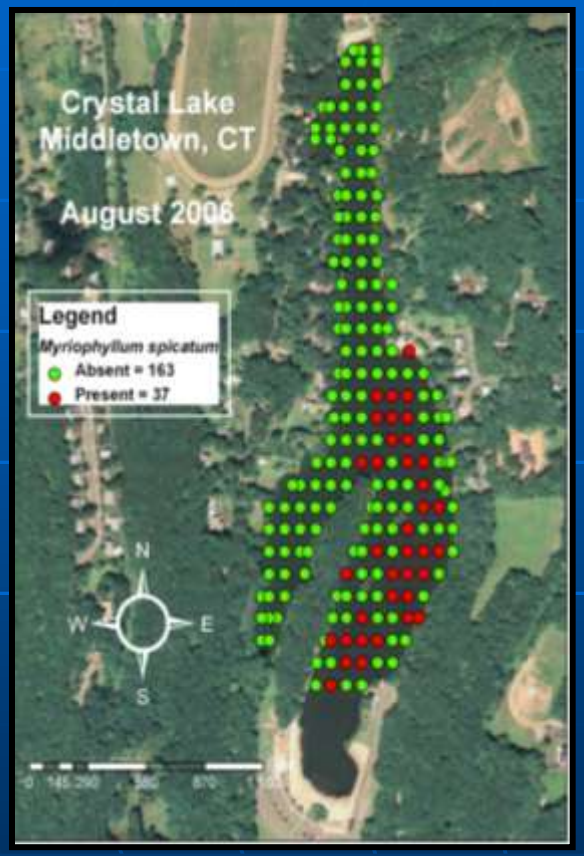


Using GIS to monitor the effectiveness of aquatic herbicides



Tracking the Effectiveness of Herbicides in Controlling Invasive Aquatic Plants

Utilize GeoGrid With Points at One Second Latitude and Longitude Intervals



Aerial imagery
2008 United States Department of Agriculture (USDA)
National Agriculture Imagery Program (NAIP)
http://www.fsa.usda.gov

Resources Critical to Our GIS Work

- CT DEP GIS Data
  - www.ct.gov/dep
- National Agriculture Imagery Program (NAIP)
  - http://www.fsa.usda.gov
- ESRI Assist – Service Contract
  - http://support.esri.com
- *Northeast Arc Users Group* (NEARC)
  - *www.northeastarc.org*
- *CT Geospatial Council*
  - *www.ct.gov/gis*
- *Center for Land Use Education and Research (CLEAR)*
  - *http://clear.uconn.edu*

Utilizing the CAES IAPP Website

www.ct.gov/caes/iapp

CAES: Aquatic Plant Survey Program for Connecticut Lakes - Windows Internet Explorer

THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION

STATE OF CONNECTICUT

ABOUT US | PROGRAMS AND SERVICES | PUBLICATIONS | FORMS | CONTACT US | HOME

Search

Go

INVASIVE AQUATIC PLANTS PROGRAM

- PROGRAM INFORMATION
- SURVEY RESULTS
- CONTROL STUDIES
- PLANT INFORMATION
- PUBLICATIONS
- LINKS
- CONTACT US
- SITE MAP
- MAIN MENU

375 CONNECTICUT'S Anniversary!

CAES Main Laboratories
123 Huntington Street
New Haven, CT 06511-1106

P.O. Box 1106
New Haven, CT 06504-1106

INVASIVE AQUATIC PLANT PROGRAM

(CAES IAPP)

Invasive Aquatic Plant Advisories

Latest News ***Employment***

In 2002, scientists at the Connecticut Agricultural Experiment Station began surveying Connecticut lakes and ponds for invasive aquatic plants and investigating novel management options. Surveillance focuses on both invasive and native vegetation to quantify the effects of invasive species on aquatic ecosystems. This research allows us to track the spread and record the arrival of invasive aquatic plants. Surveys also provide baseline information to determine if the frequency and magnitude of invasions may be related water chemistry, sediment type, boat launches, watershed development and climate change. Management studies include tests on the effectiveness of herbicides, mechanical removal, water level

Questions?

Greg Bugbee
The Connecticut Agricultural Experiment Station
Department of Environmental Sciences
Invasive Aquatic Plant Program
123 Huntington St.
P.O. Box 1106
New Haven, CT 06504
gregory.bugbee@ct.gov
(203) 974-8512

www.ct.gov/caes/iapp