

# Lesson 1

Background:

Herbicide Resistance in Aquatics and Description of  
Aquatic Plant Management Venues and Plant Types



# Objectives:

By the end of this lesson you will:

Recognize key differences between aquatic plant control and crop management that effect herbicide use in water





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Learn how plant types influence selection of herbicide mode, amount, and application frequency

# Uses and Functions of Aquatic Systems:

The uses and functions of aquatic systems greatly influence plant management strategies within these waters. Waters can generally be divided into **Man-made** systems and **Natural** or modified natural systems.



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- any amount of aquatic macrophyte growth may be considered as undesirable
- are similar to commercial crop herbicide application strategies
  - plants are generally subject to maximum control efforts with low emphasis on selectivity





## Man-made systems:

- include water storage basins, conveyance, control, irrigation, and potable
- any amount of

Note: Man-made systems also include thousands of water feature ponds in which non-desirable plants and algae are intensively managed. While technically man-made, these systems are managed for aesthetic reasons and often to promote non-target plants and animals.



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- control strategies need to effectively control 1-2 target plants while conserving multiple native or other valuable species
- selectivity considerations may:
  - limit available herbicide active ingredients
  - limit rates and timing of herbicide applications
  - influence cost and amount of control effort





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Conserving or enhancing desirable species is equally or more important than control of a target plant

# Plant Types in Aquatic Systems Include:

Emergent  
Floating  
Submersed  
Algae



# Emergent Plants



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- selectivity concerns may reduce the number of available herbicides
  - i.e., when controlling invasive grasses growing among native grasses or other desirable species



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  - frequent spot applications for selective control among more desirable plant species
- injecting herbicides into water for root uptake is becoming more common



# Submersed Plants



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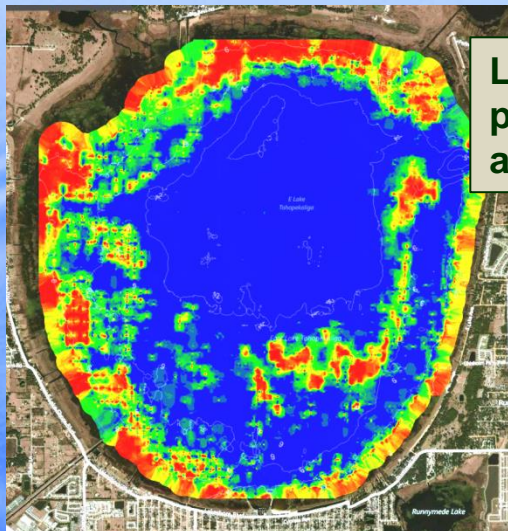
- include invasive plants like hydrilla and Eurasian watermilfoil in natural systems
- pondweeds and other species in water conveyance systems



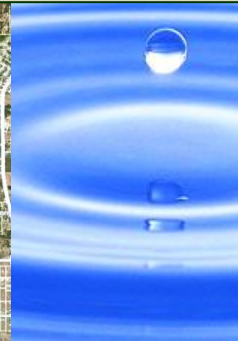
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- pondweeds and other species in water conveyance systems
- native submersed plants may be managed in natural areas, especially in late season for access and recreation



Late season native Illinois pondweed growth in 12,000-acre East Lake Toho, FL





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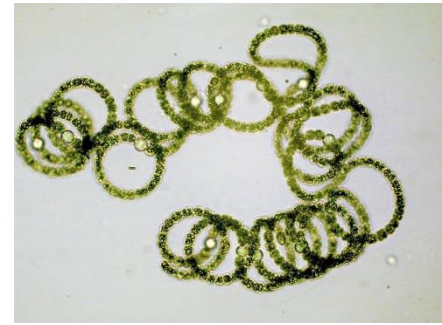
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- pre-emergent strategies are rarely applicable for submersed plant control

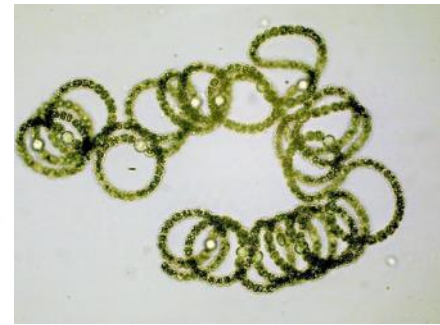


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- few realistic alternatives to copper
  - most aquatic herbicides do not have algal activity at label rates

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- In natural aquatic systems, one or two plants, usually invasive plants, are targeted among many desirable plants and animals
- Submersed plant control is most strikingly different from commercial crop management
- Conserving or enhancing desirable species is equally or more important than control of a target plant in natural aquatic systems