

# Ecological Considerations in Setting Lake Regulation Targets for Lake Apopka and the Harris Chain

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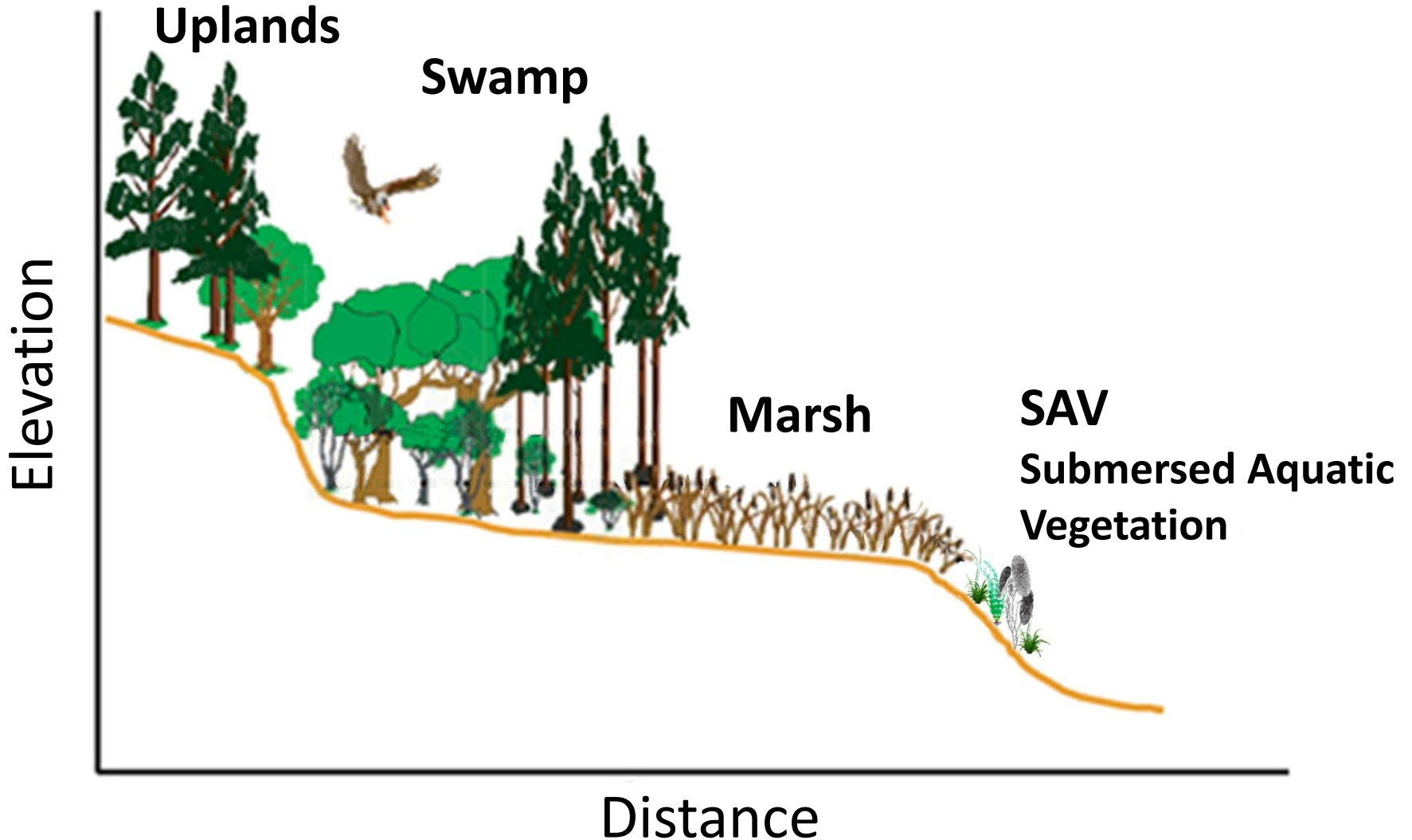
Division of Water Resources

St. John's River Water Management District

# Goals and Constraints

- Our primary ecological goal in setting targets for water levels in Lake Apopka and the Harris Chain is **healthy lake and floodplain wetland plant communities for fish & wildlife**
- Our primary economic constraint is flood control
- Other important considerations are water quality, recreation, navigation, and water storage & supply

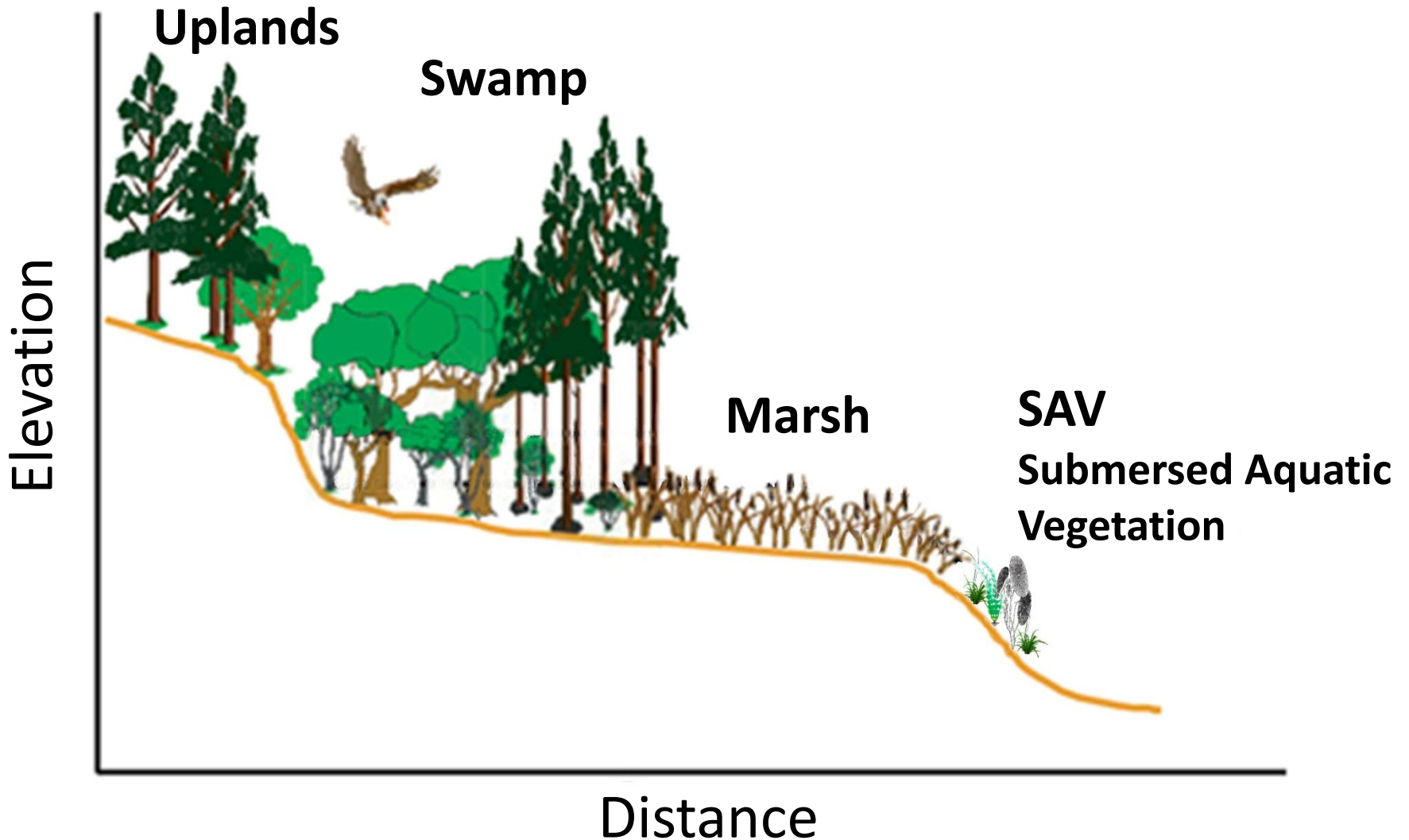
# Lake Littoral Wetland Communities



# Ecological Value of Lake Littoral Wetlands

- Aquatic plant production and diversity
- Habitat for fish, birds, mammals, reptiles, and prey species
- Fish spawning and juvenile nursery areas
- Protection of shorelines from erosion
- Water quality protection

# Lake Littoral Wetland Communities



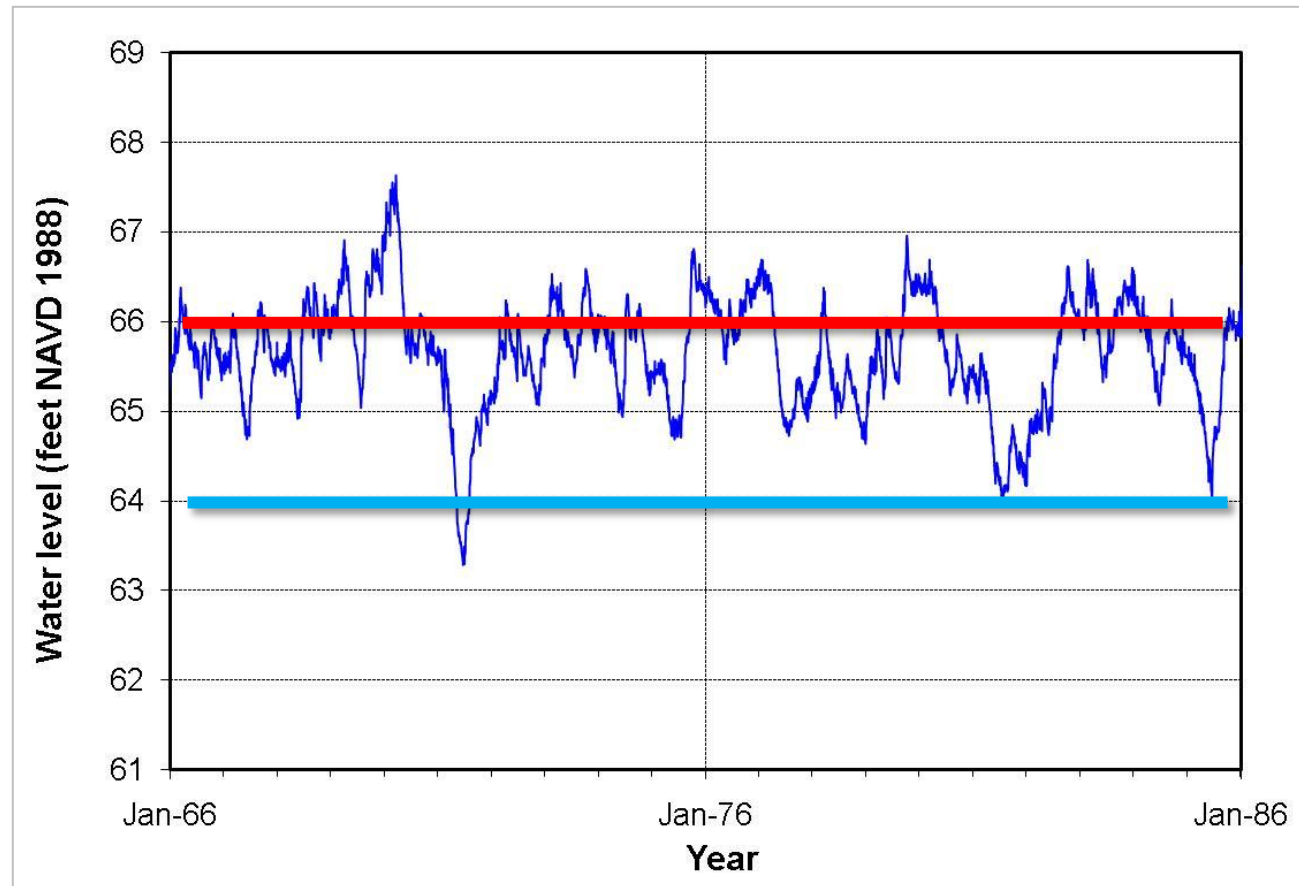
# Two Sets of Lake Level Targets

## Similar but Different

- Minimum Flows and Levels (MFL)
  - Targets must be protected (District rule)
  - Targets are minimums (more water is OK)
  - Purpose is to prevent over-use of water
  - Goal is to prevent “significant harm”
- Lake Level Regulation
  - Targets used for modeling of regulation schedules
  - Targets require both high and low levels (more water is not always OK)
  - Purpose is fluctuation in lake levels for healthy littoral wetland communities
  - Goal is to create optimal conditions

# Lake Level Targets are Defined Statistically

- 1) **Magnitude**  
(how high or low)
- 2) **Duration**  
(how long)
- 3) **Return Interval**  
(how often)



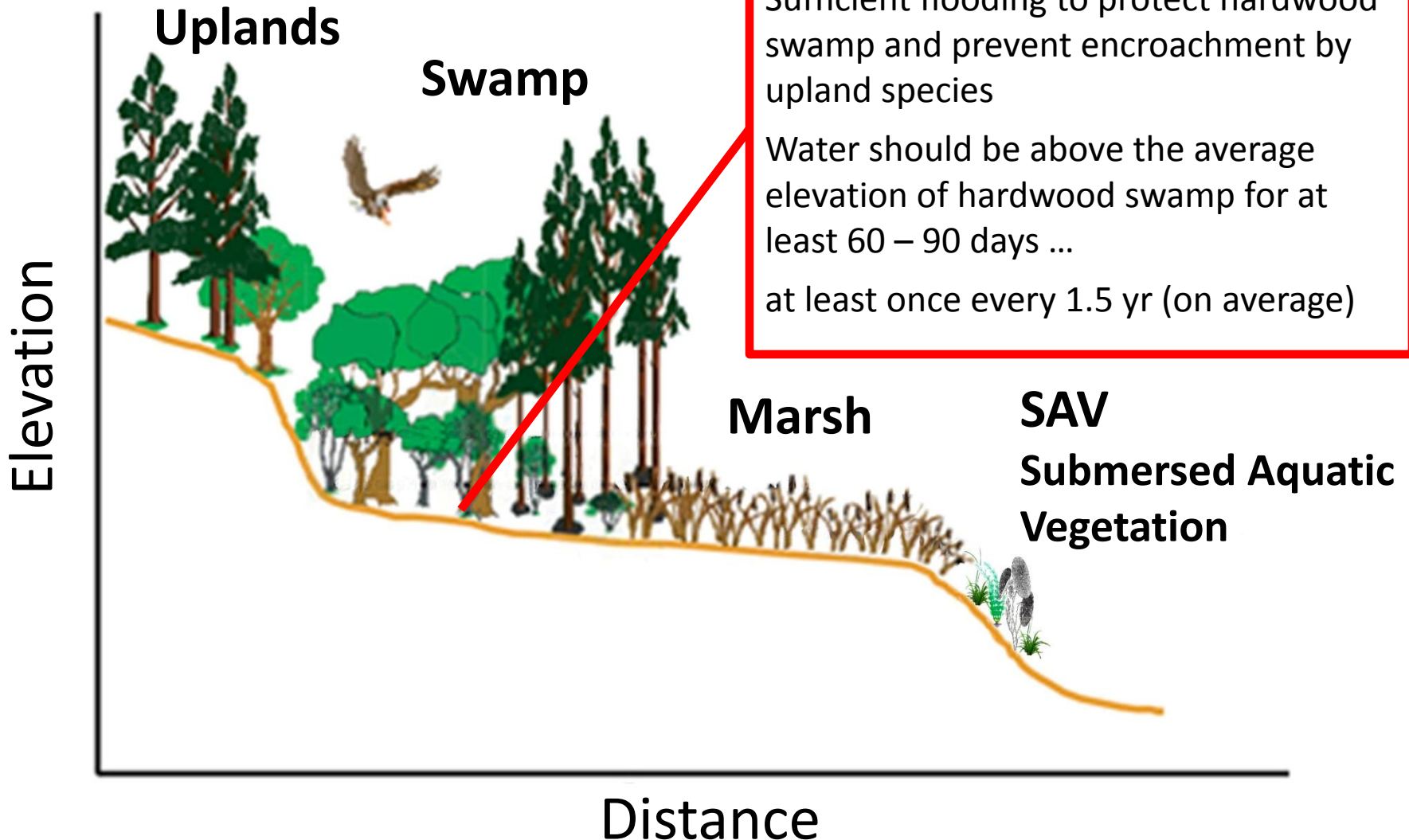
# Target High Water Level

## High Target

Sufficient flooding to protect hardwood swamp and prevent encroachment by upland species

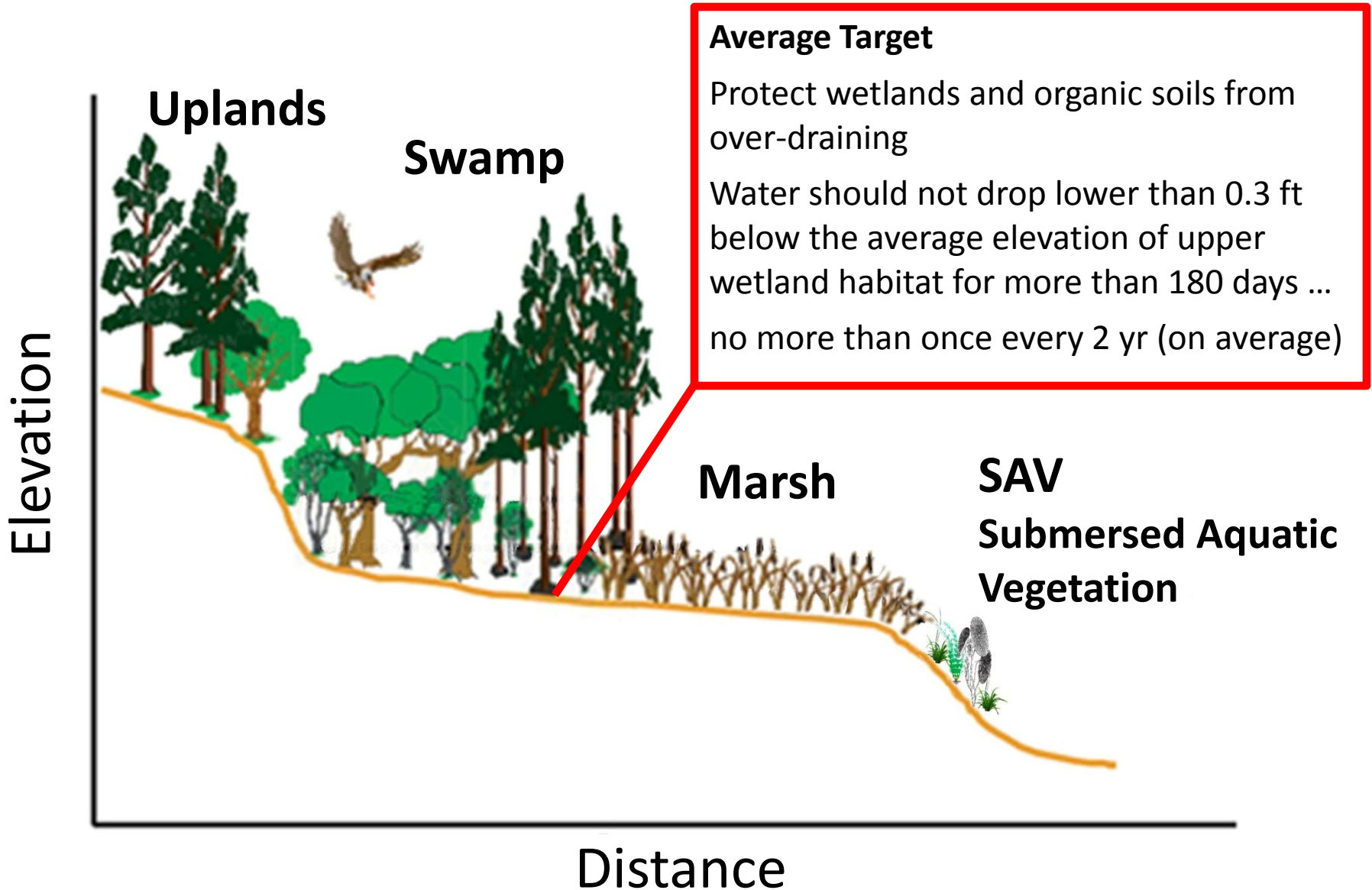
Water should be above the average elevation of hardwood swamp for at least 60 – 90 days ...

at least once every 1.5 yr (on average)

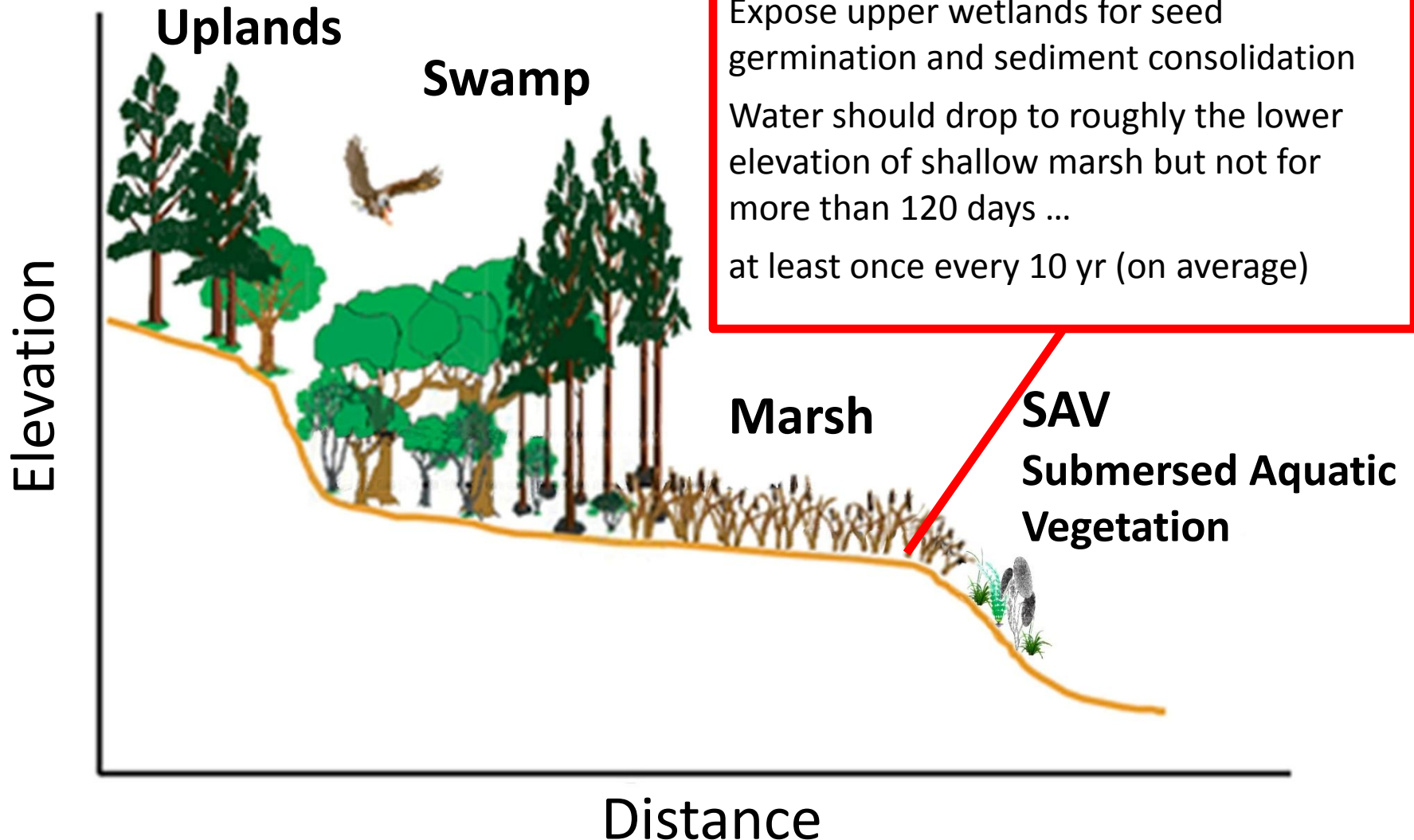




# Target Average Water Level

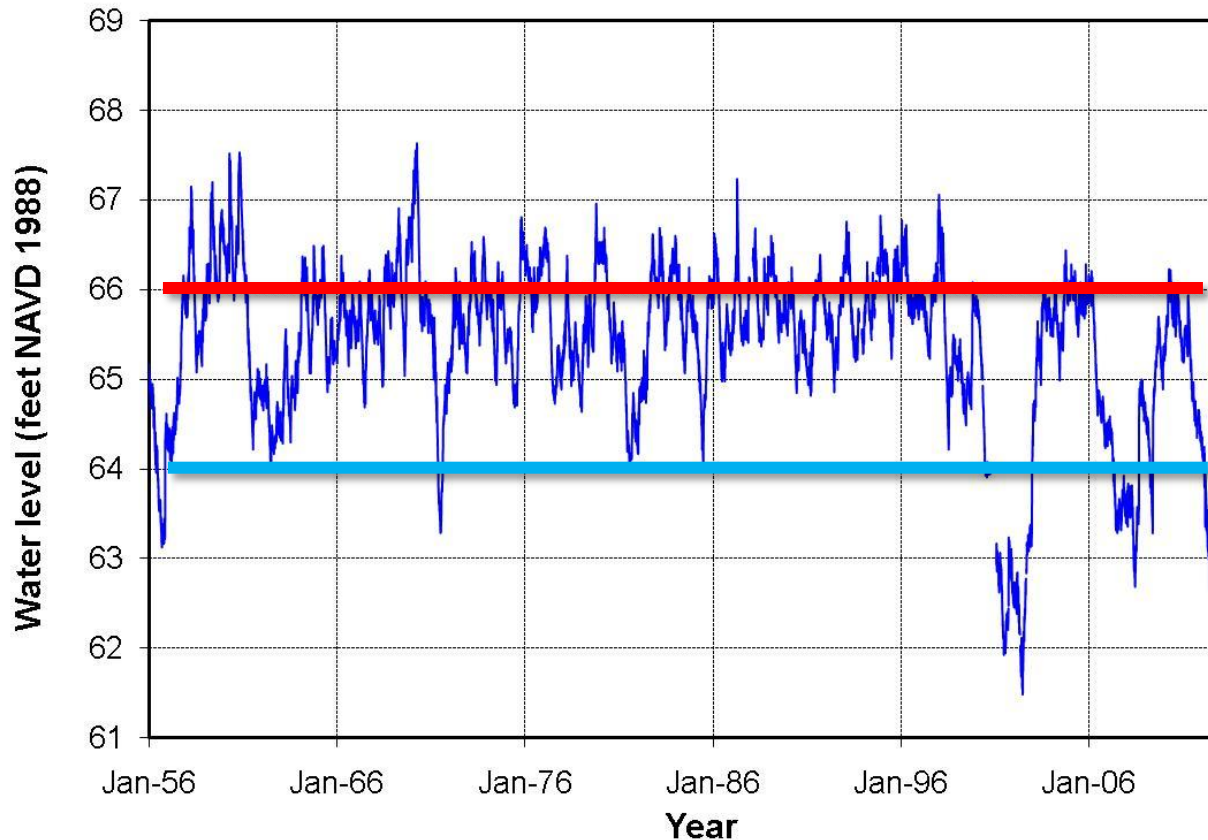


# Target Low Water Level



# Whether Lake Level Targets Are Met Is Determined Statistically

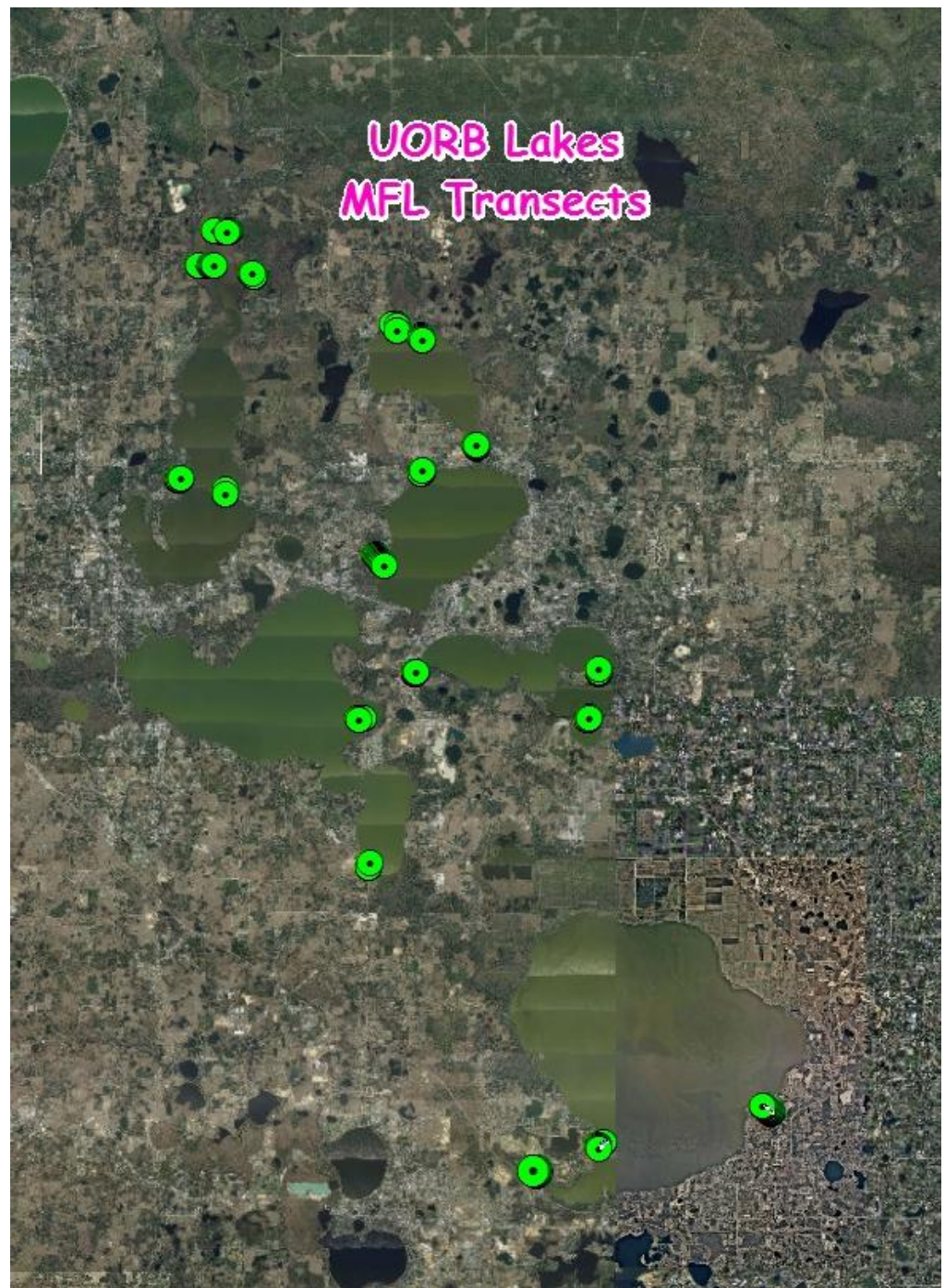
Actual or modeled lake levels over a long period are compared with targets. Were levels exceeded (magnitude)? For how long (duration)? How frequently did this occur (how often)?



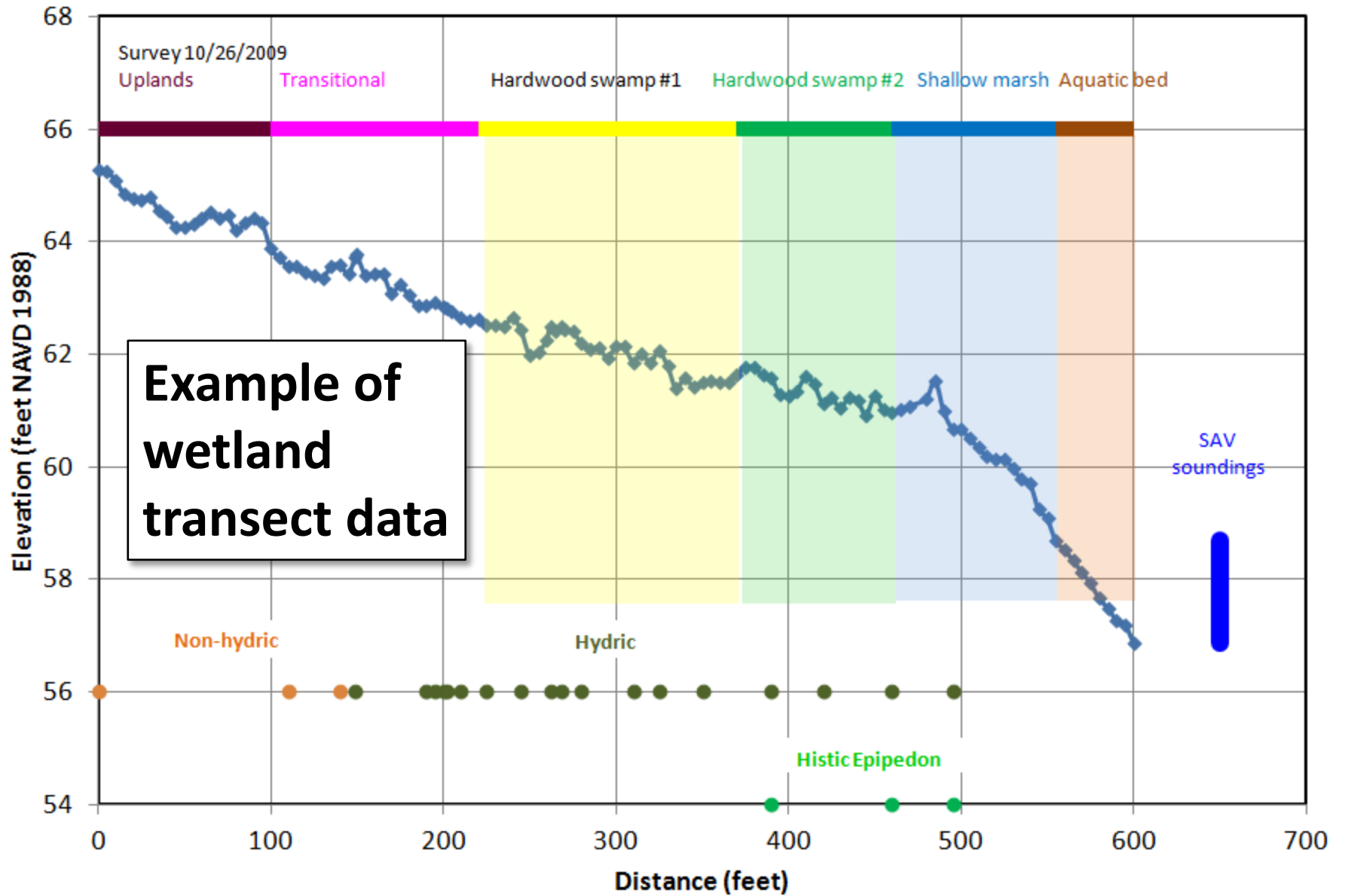


Data from 20 field wetland transects are used to set target levels

- Up to 2,485 ft long
- Vegetation
- Soils
- Survey (horizontal and vertical)



# Lake Dora Transect 2 - Trimble Park



# Ecological Value of Lake Level Fluctuation (1)

- Increased areas of wetland and submersed vegetation habitat
  - Sufficient flooding of floodplain habitat
  - No encroachment by upland plants
  - Protection of organic soils
- Seed germination in exposed sediments
- Consolidation of exposed sediments
- Expansion to deeper areas during low-water periods

# Ecological Value of Lake Level Fluctuation (2)

- Benefits to fish & wildlife
  - Increases in wetland and submersed aquatic vegetation habitat
  - Production of invertebrates and forage fish
  - Nesting, spawning, and feeding habitat
  - Consolidation of near-shore sediments
- Water quality improvements
  - Increases in wetlands habitat - filter runoff
  - Reduction in resuspension of soft sediments, resulting from consolidation and stabilization by vegetation

End