



Comparing the Flooded-Area Frequency Distributions of Isolated Freshwater Wetlands: A Tool To Assess Wetland Health and Set Restoration Goals

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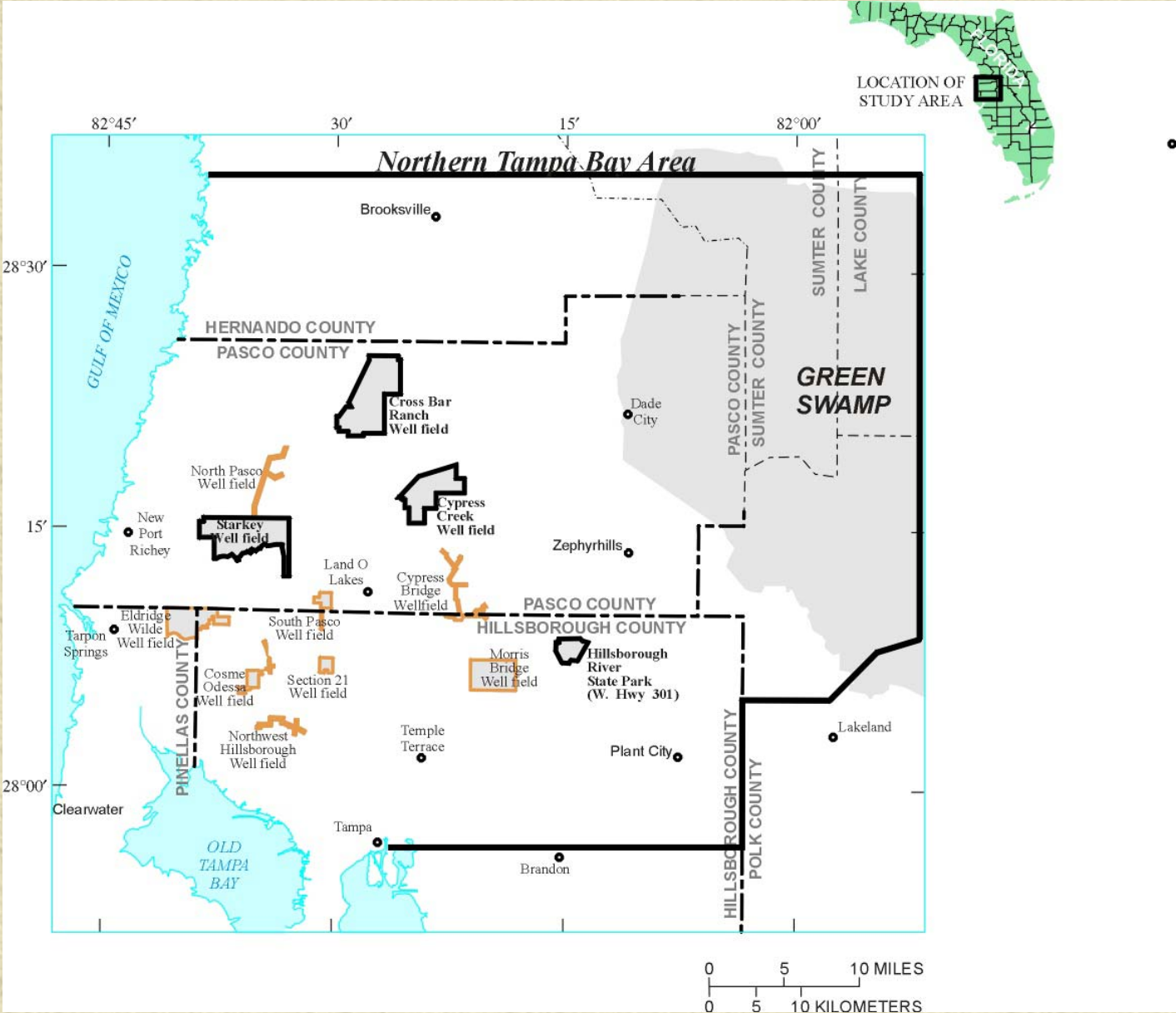
Tampa Bay Water

An aerial photograph of a wetland landscape. The terrain is a mosaic of red and dark, almost black, patches. The red areas are irregularly shaped and separated by thin, light-colored lines, possibly roads or ditches. The dark patches are also irregular and scattered throughout the red areas. The overall appearance is that of a fragmented wetland environment.

**Characteristic landscape showing isolated wetlands
north of Tampa, Florida**

**Starkey Wellfield
Area**

Study Area





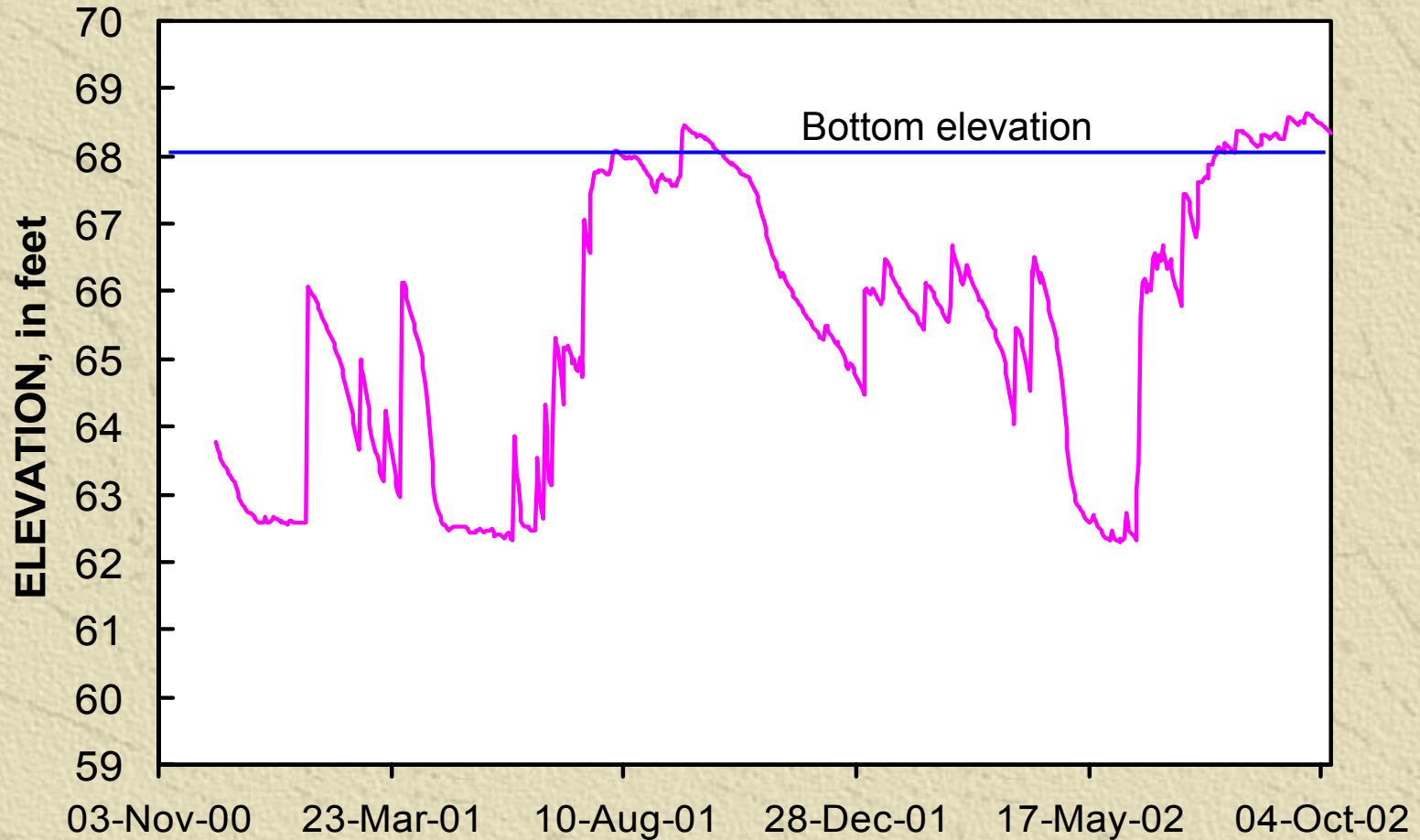
Range of hydrologic settings for study of marsh and cypress wetlands:

- ✦ Natural wetlands in hydrologic settings not impacted by ground-water pumping (**control**)
- ✦ Wetlands in hydrologic settings impacted by ground-water pumping (impacted/**impaired**)
- ✦ Wetlands in hydrologic settings impacted by ground-water pumping, and augmented for several years (**augmented**)

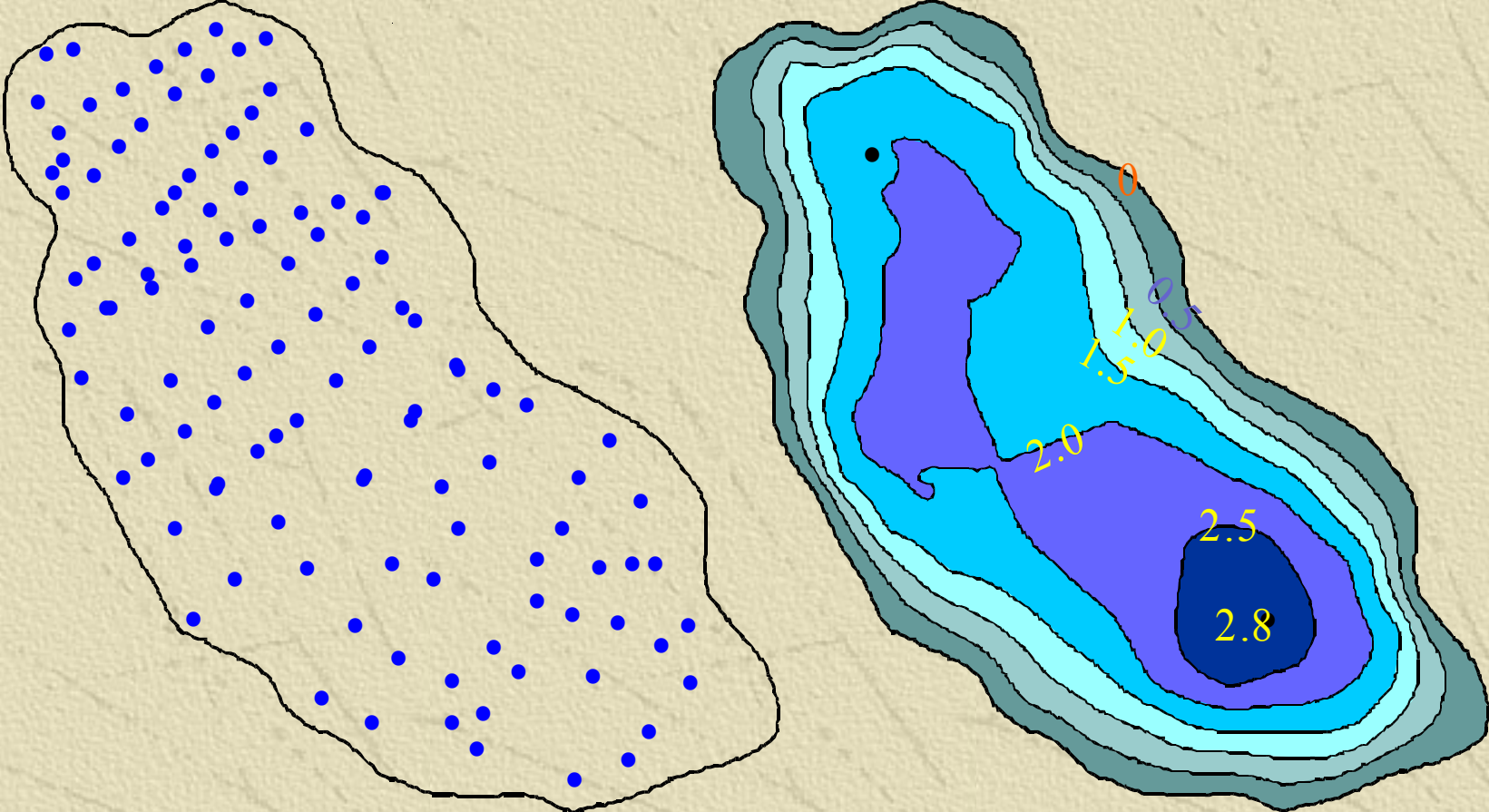
Why Study Wetland Inundation Frequencies?

- ✦ Health of wetlands historically determined by vegetation surveys
- ✦ Analysis of historical inundation frequencies offers a direct quantitative assessment of the health of a wetland
- ✦ Inundation patterns of a control wetland can be used to set augmentation goals

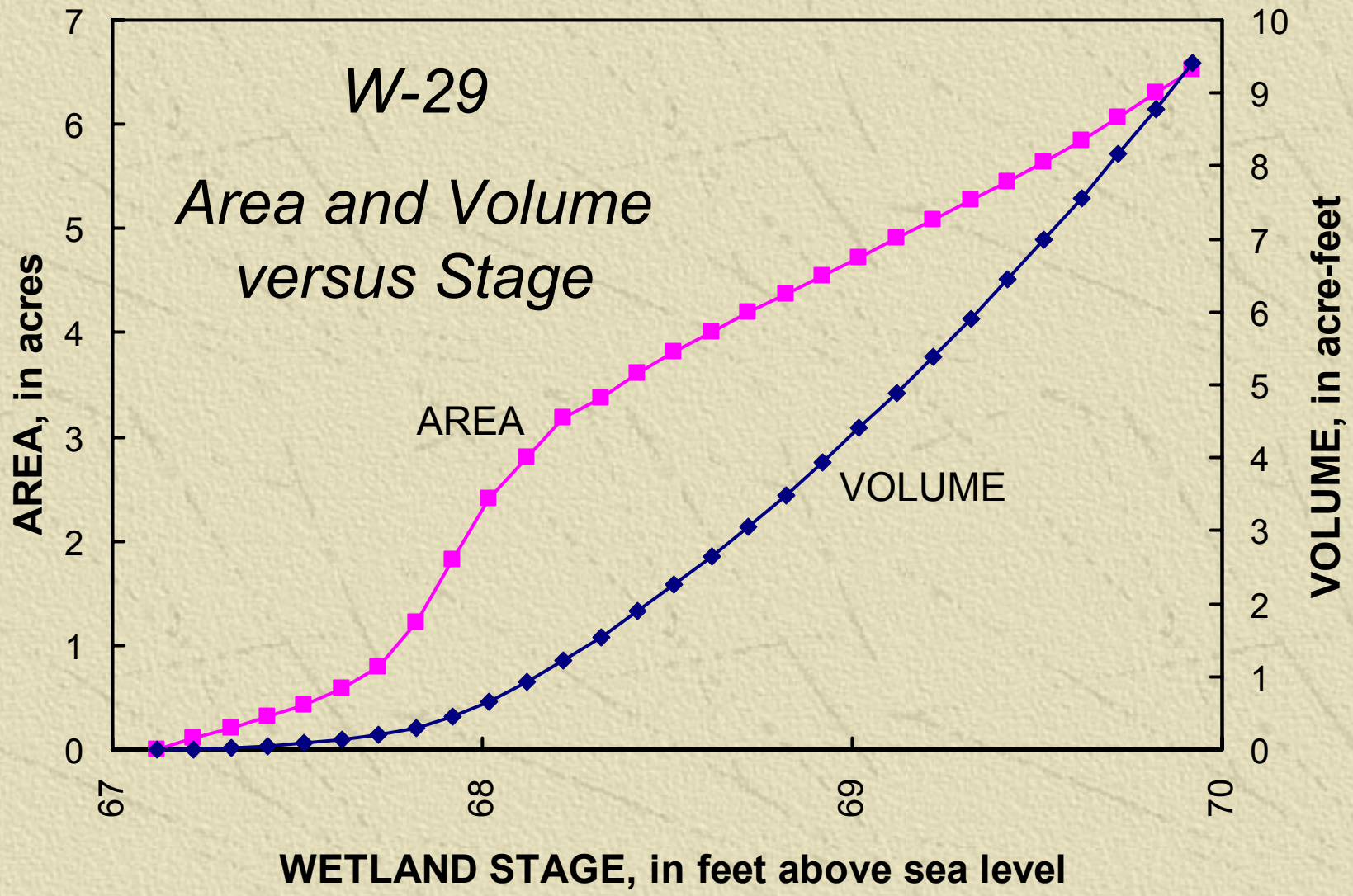
W-29 - Daily Water Levels Showing Flooded Periods



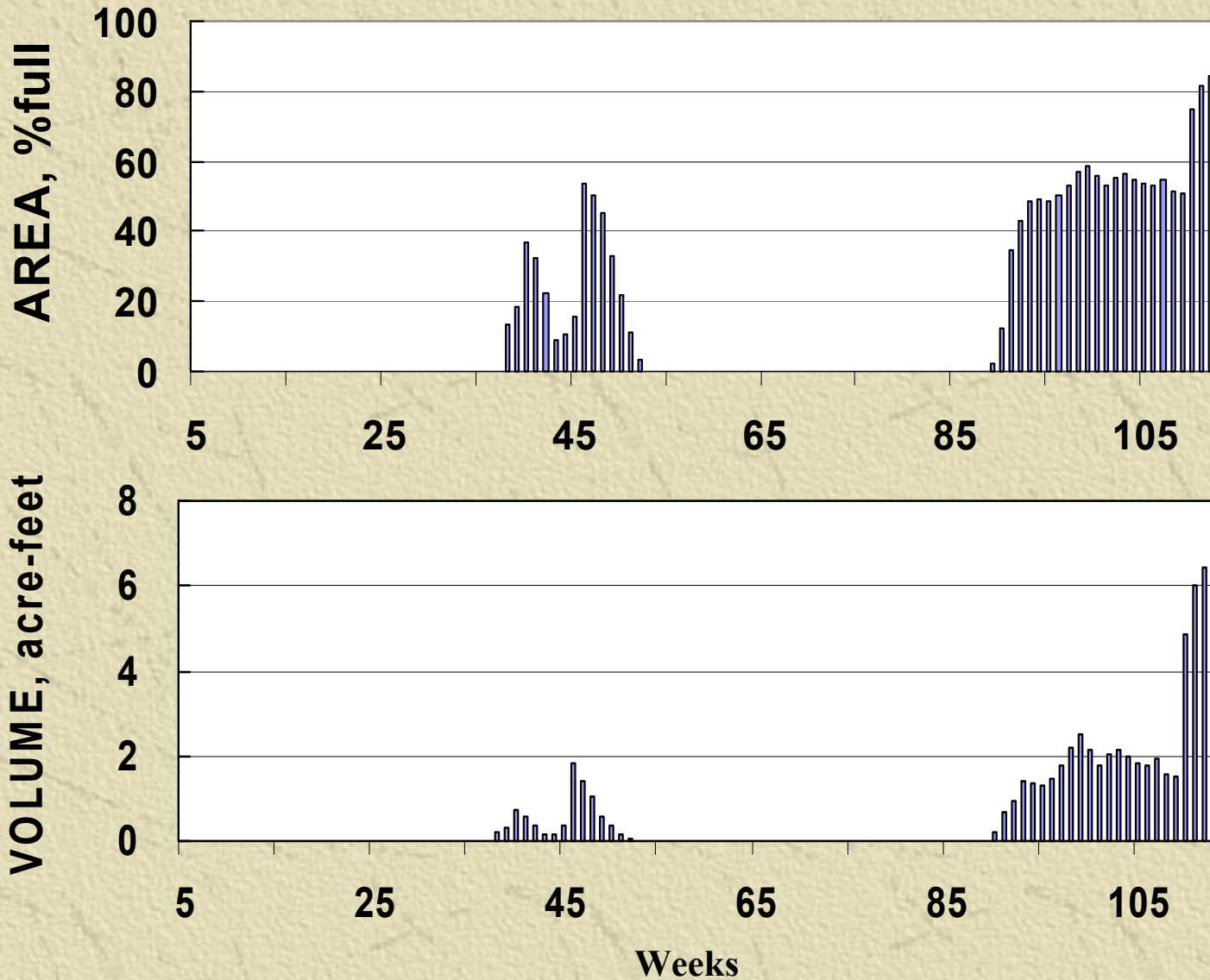
Marsh Wetland Bathymetry - Detailed Surveying



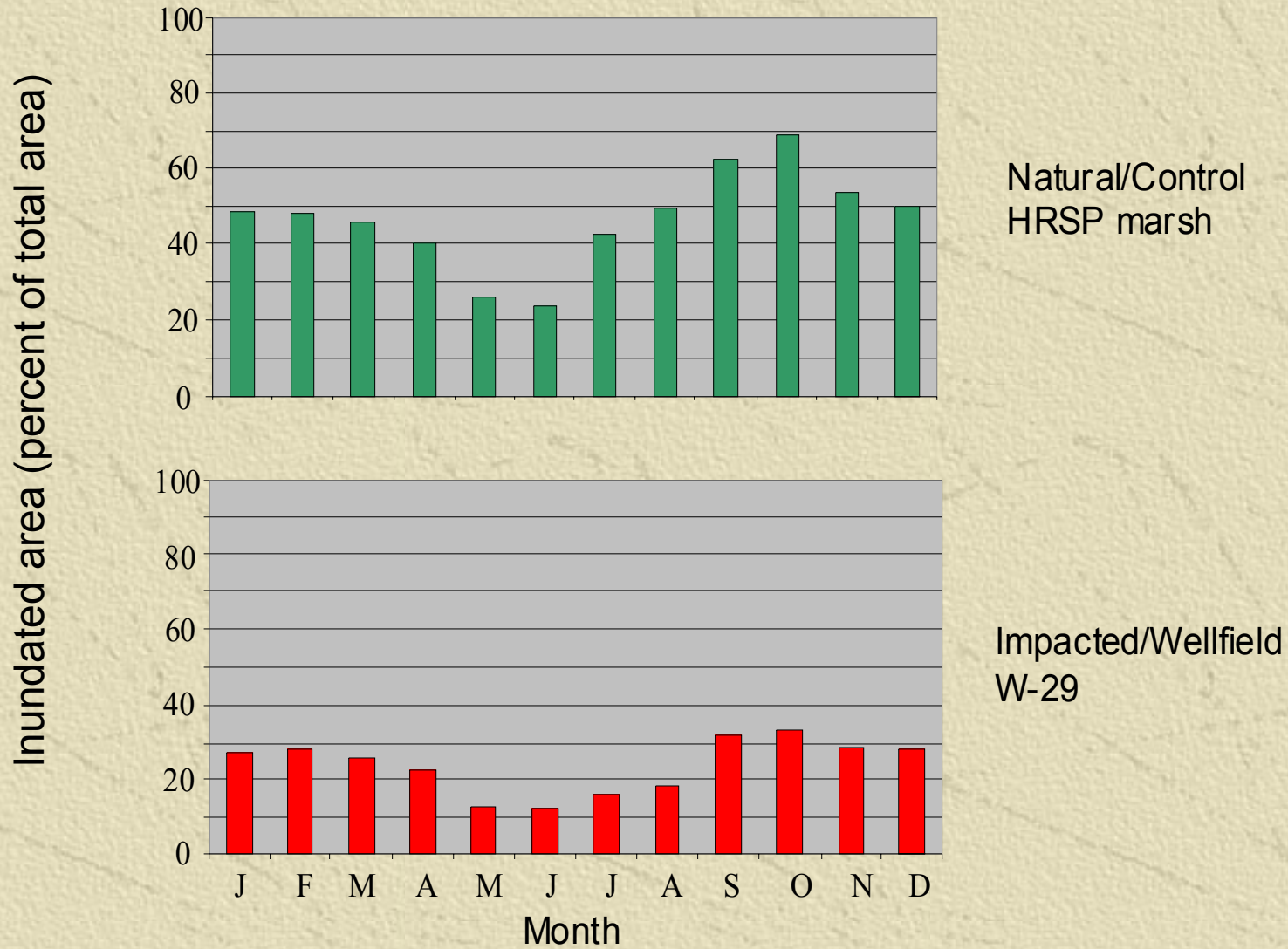
0 100 Meters



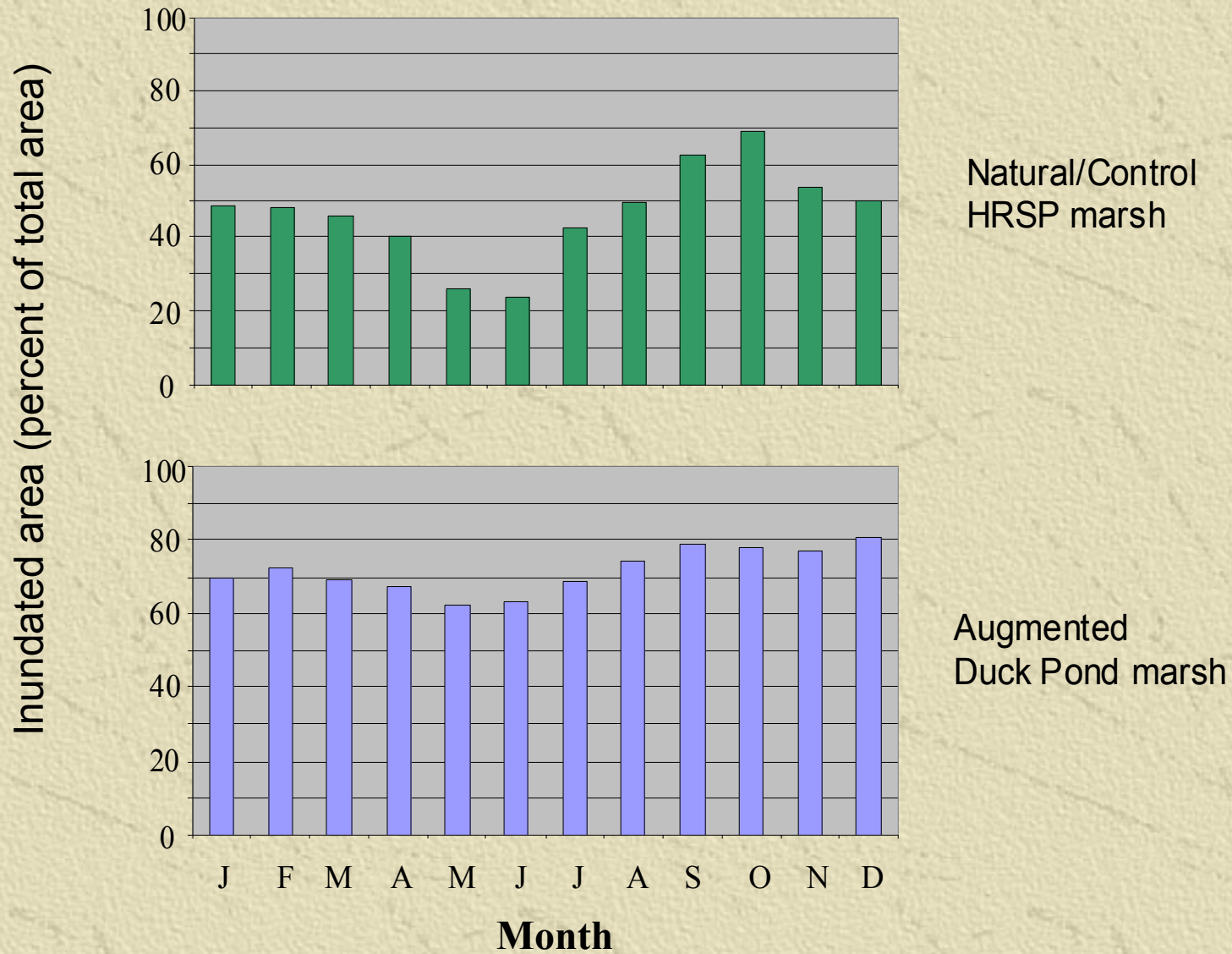
Weekly Average Wetland Area and Volume



Average Monthly Flooded Area Histograms for 16 Years of Historical Record (1988-2003)



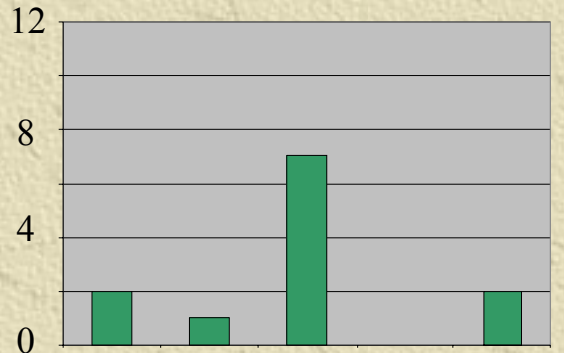
Average Monthly Flooded Area Histograms for 16 Years of Historical Record (1988-2003)



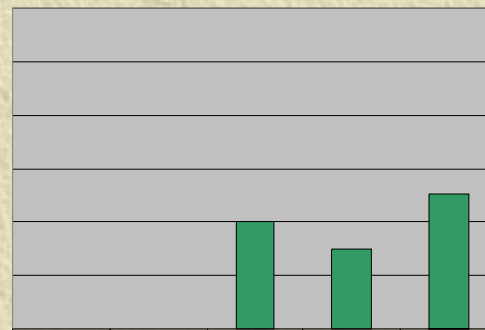
Flooded Area Histograms

Number of months

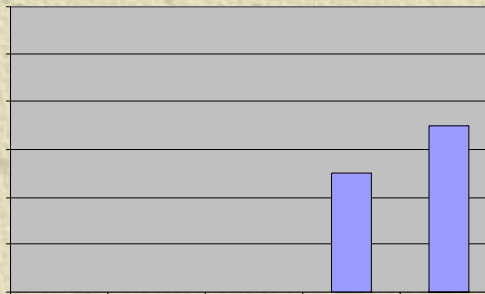
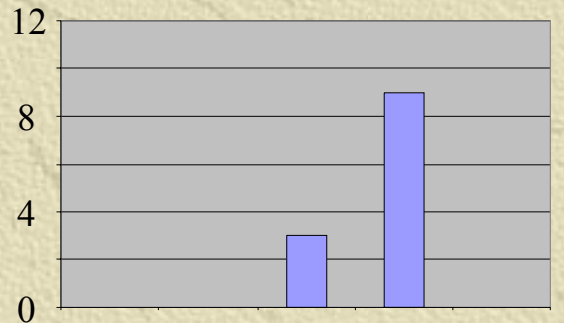
Average Rainfall Year
(8/2001-7/2002)



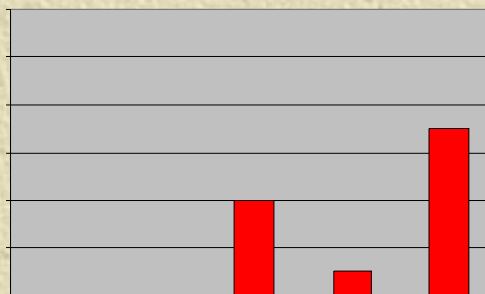
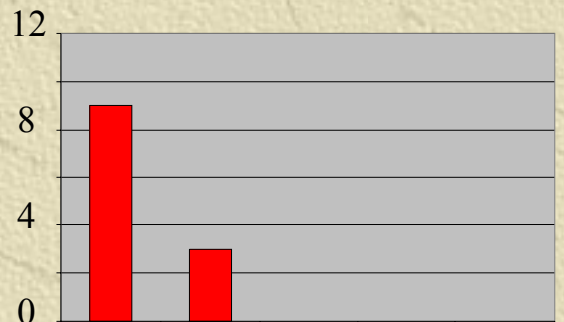
Above Average Rainfall Year
(8/2002-7/2003)



Natural/Control
HRSP marsh



Augmented
Duck Pond marsh



Impacted/Wellfield
W-29

Percent of total area inundated

Wetland Inundation Frequencies

- ✦ Assess wetland health by comparing long term average inundation frequencies
- ✦ Augmentation goals can be set to mimic the year to year hydrologic variation of natural wetlands

