

Subaqueous Soils and Carbon Pools

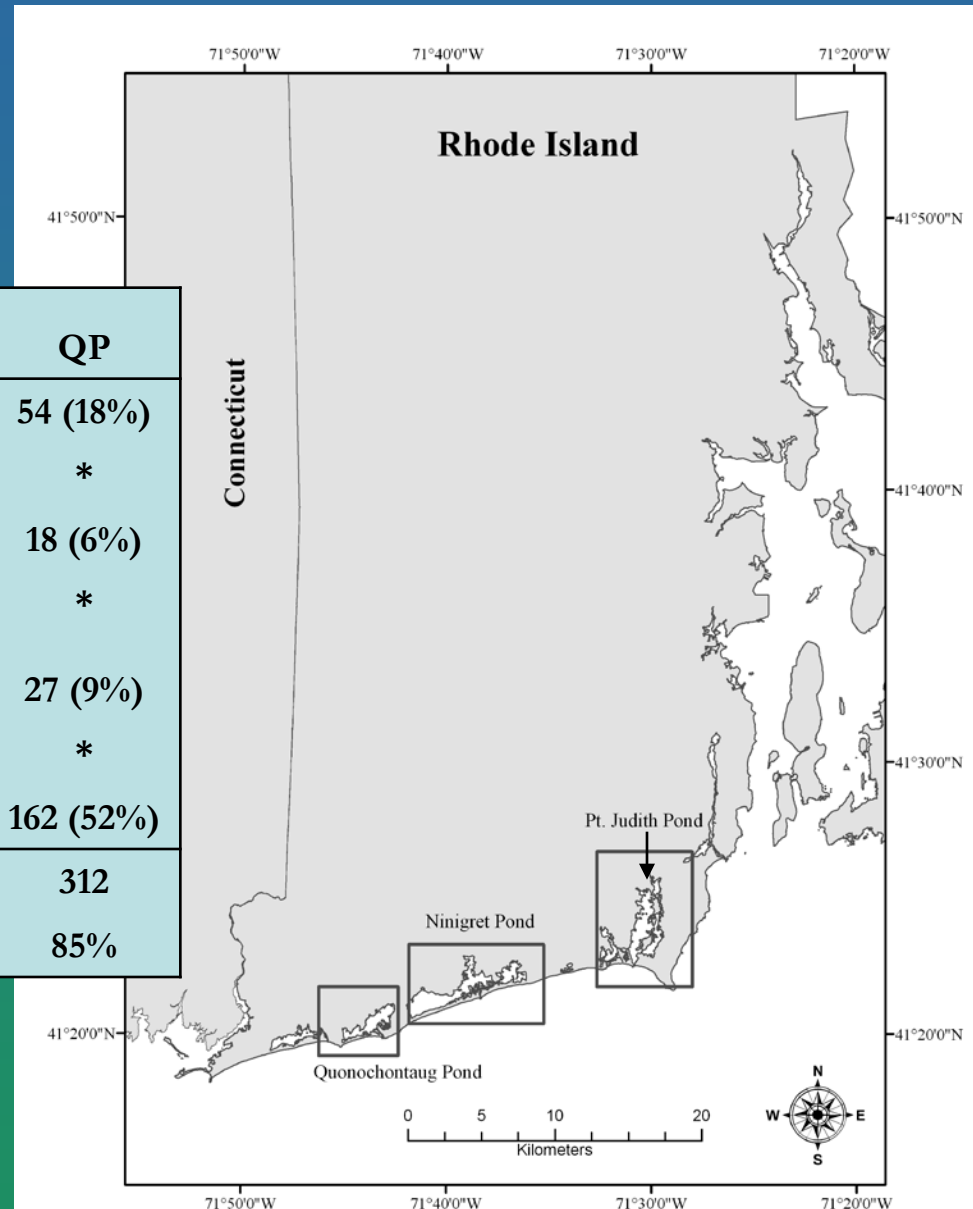
- Global warming concerns have sparked interest in investigating the global C cycle
- Upland and wetland SOC pools are often important carbon sinks
- Subaqueous soils have been largely overlooked in soil organic carbon pool studies
- More precise estimates of C sinks and sources are needed to better understand the global C cycle

Objectives

- Explore carbon storage and soil-landscape unit relationship
- Do SOC pools differ among soil type?
- Do subaqueous soils in Rhode Island coastal lagoons contain significant SOC pools?

Study Area

Landscape unit	NP	PJP	QP
FTDF	43 (7%)	126 (19%)	54 (18%)
FTDS	*	11 (2%)	*
WFF	135 (15%)	*	18 (6%)
WFS	25 (3%)	*	*
SMB	71 (8%)	40 (7%)	27 (9%)
MC	18 (2%)	39 (6%)	*
LB	289 (43%)	267 (41%)	162 (52%)
Area of Pond (ha)	678	650	312
Percentage of Area	78%	75%	85%

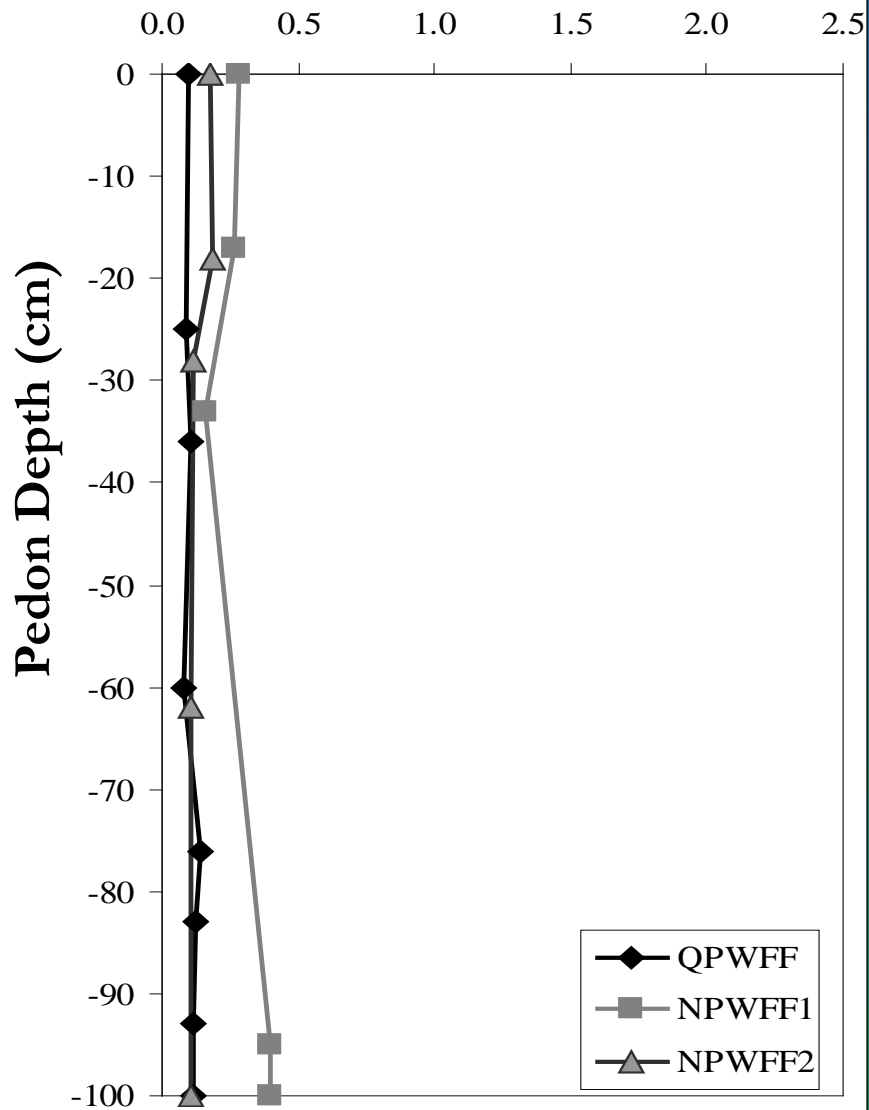


High Energy (WFF)

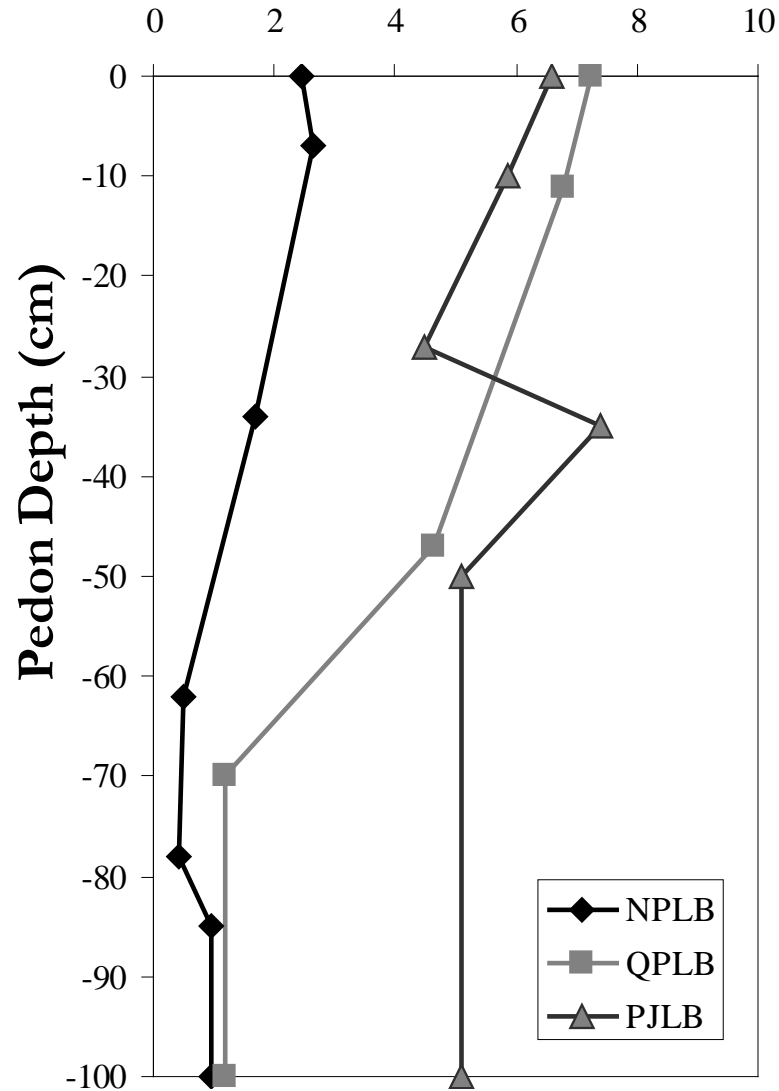
Results

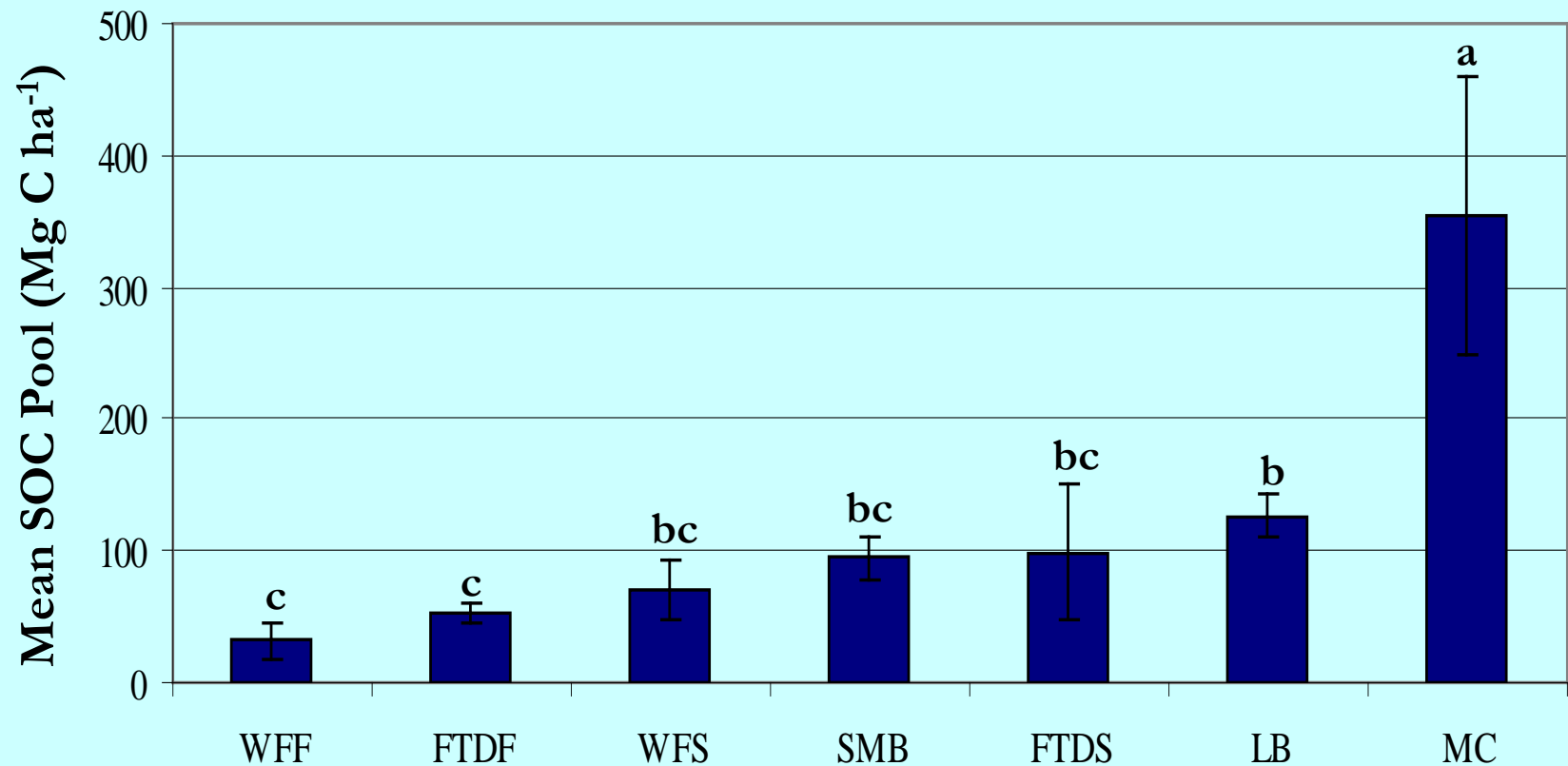
Low Energy (LB)

SOC (%)

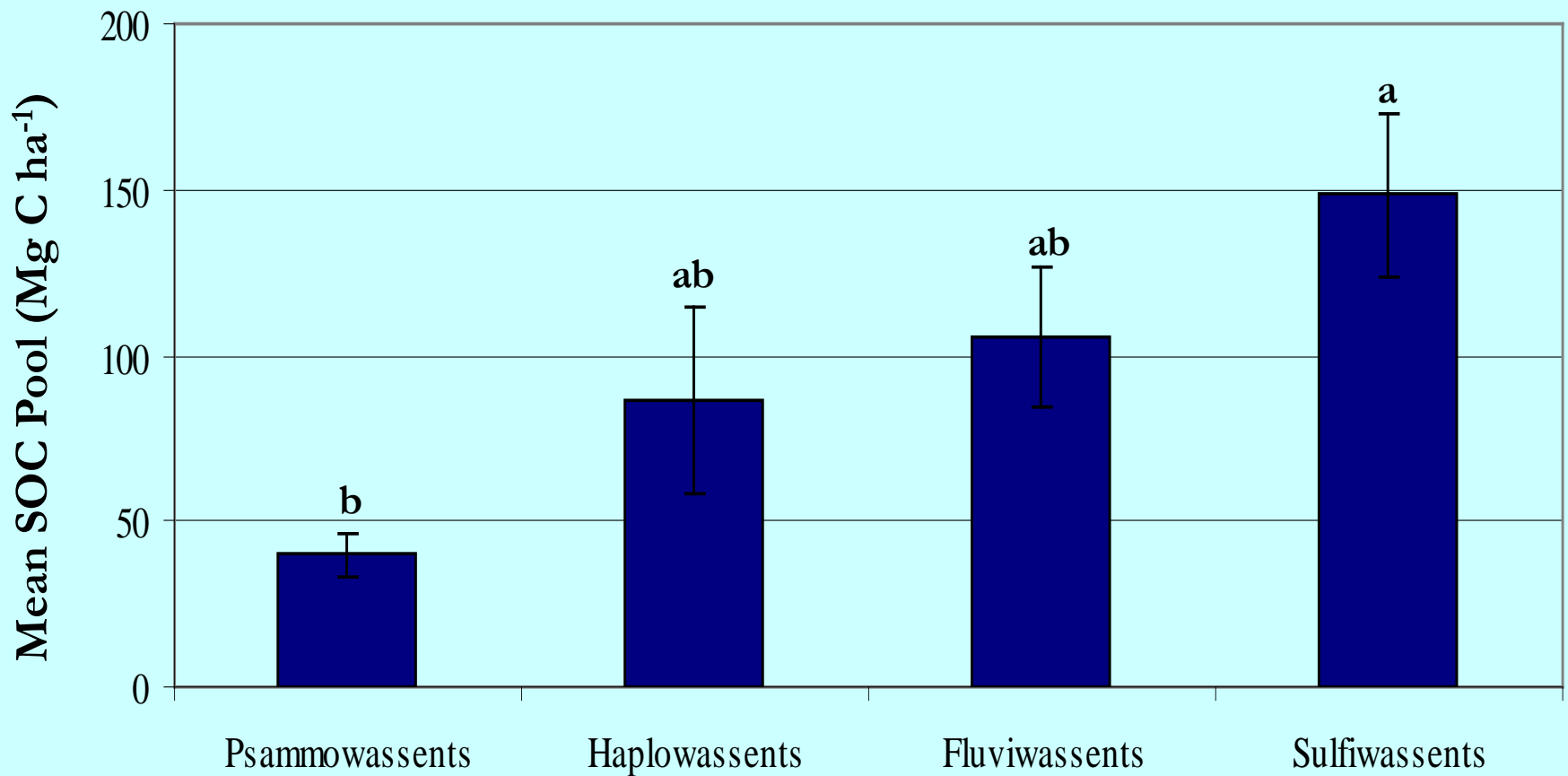


SOC (%)



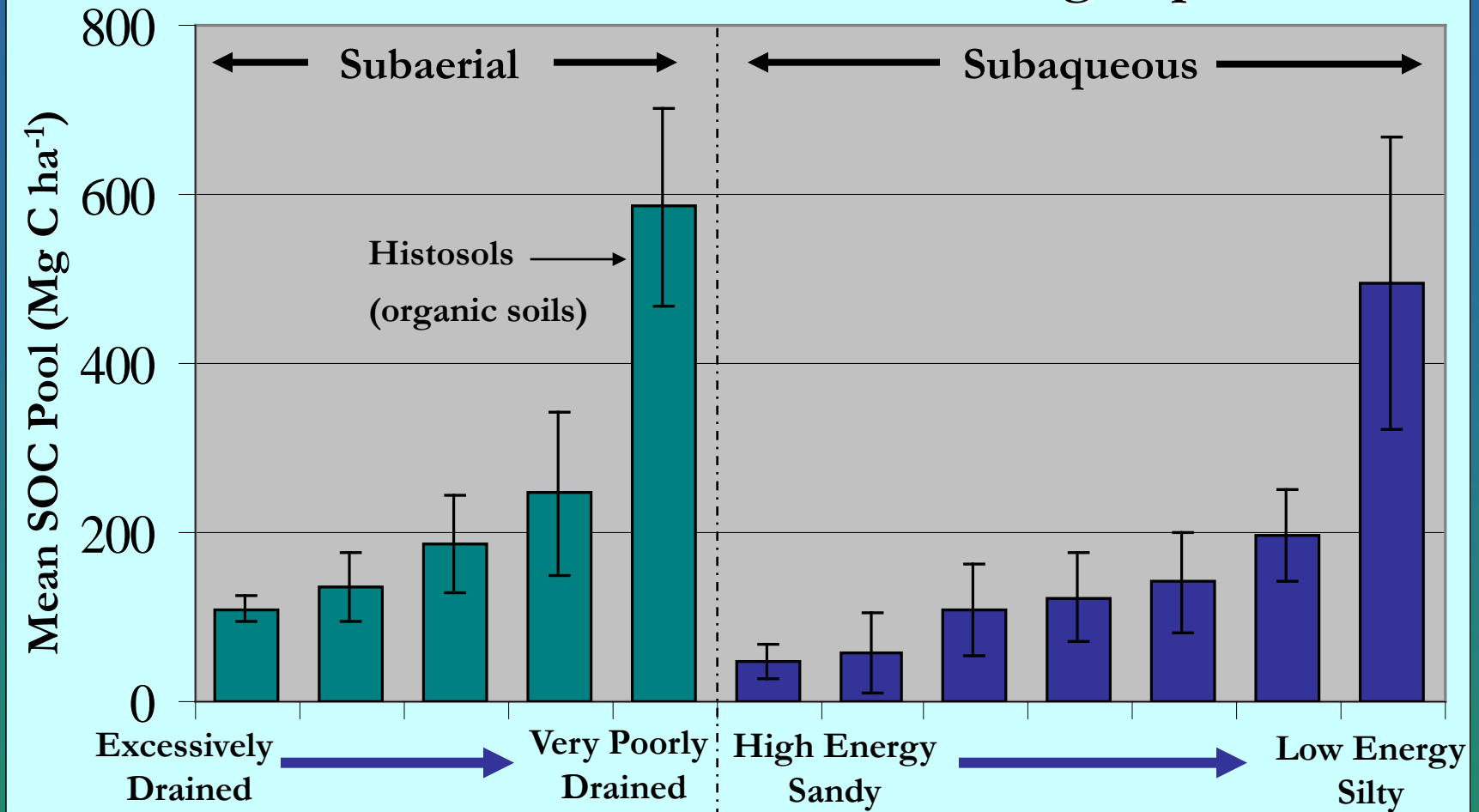


- MC units had highest SOC pools and highest variability
 - Due to buried O horizons and one organic soil (Wassist)
- LB units had higher SOC pools than the “Flat” units
- Similar relationships seen when each of the coastal lagoons are assessed individually



- Sulfiwassents have fine textures and presence of sulfides
- Sulfiwassents make up the majority of each coastal lagoons studied (> 50%)
- Similar relationships were seen when ponds were assessed individually

Mean SOC Pools in Select Soil Subgroups



- Subaerial data from forested upland and wetland soils
(Ricker, 2010 and Davis, 2004)
- SOC pools in subaqueous subgroups are comparable to forested soils in southern New England

Soil Organic Carbon Conclusions

- SOC pools significantly differed by soil great group and landscape unit
- Type of depositional environment and presence of buried O horizons important for SOC pools
- Subaqueous SOC pools are comparable to regional and national averages for subaerial SOC pools
- Should be included in global and regional estimates of soil organic carbon pools
- Sequestration rates need to be studied in these subaqueous soils.