Effects of Coastal Urbanization: Hydrology and Soil Morphology

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Objectives

- Document hydrologic patterns in coastal riparian settings altered by the addition of HTM.
- Investigate the relationships between soil morphology and hydrologic patterns in coastal anthropogenic soils.

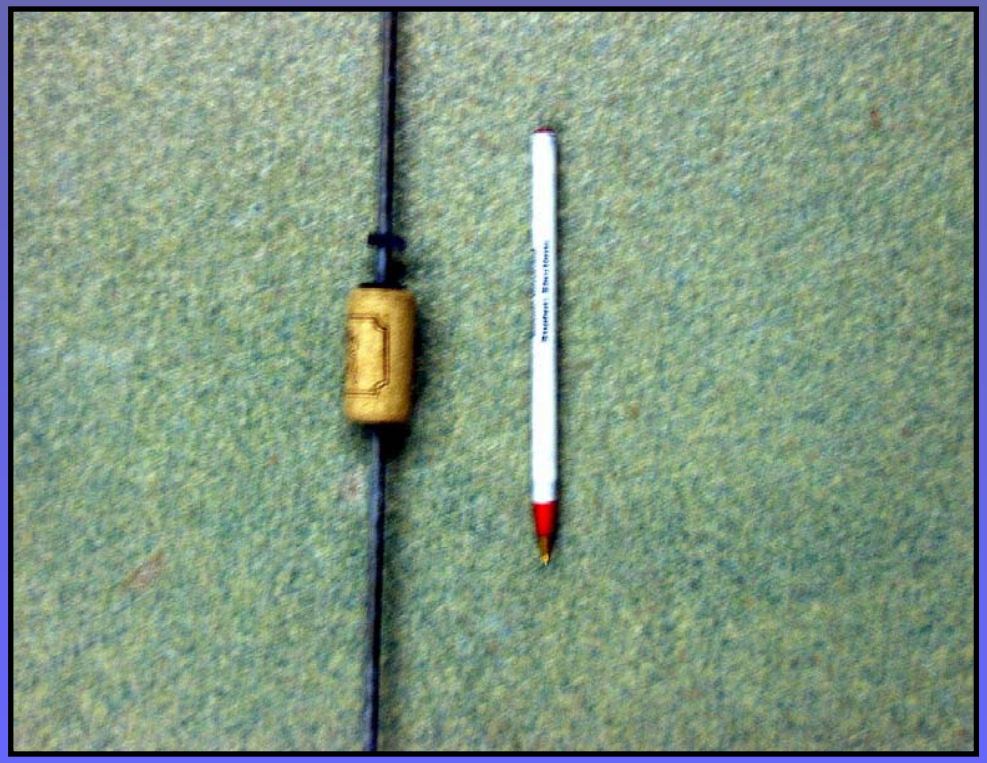
Site Selection:
Compare 1939 and 1997 Photos

1997 Orthophoto

1939 Aerial Photo

Water Table Wells In HTM

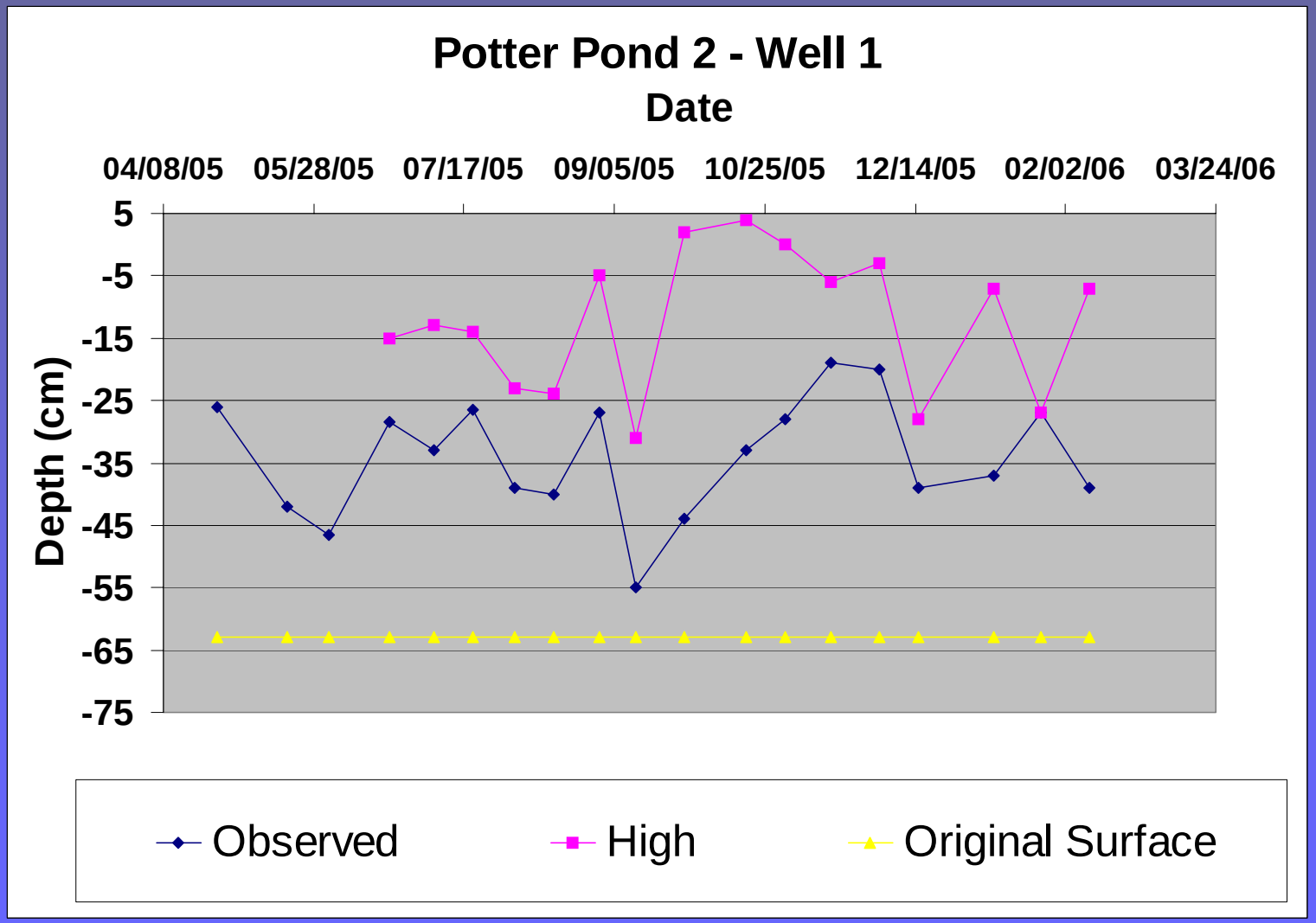
- Installed at least 2 wells per site
- Placed on a transect perpendicular to water
- Outfitted wells with MWTRD (Gizmo) (see Morgan and Stolt, 2004)



Observations On HTM in Estuarine Riparian Zones

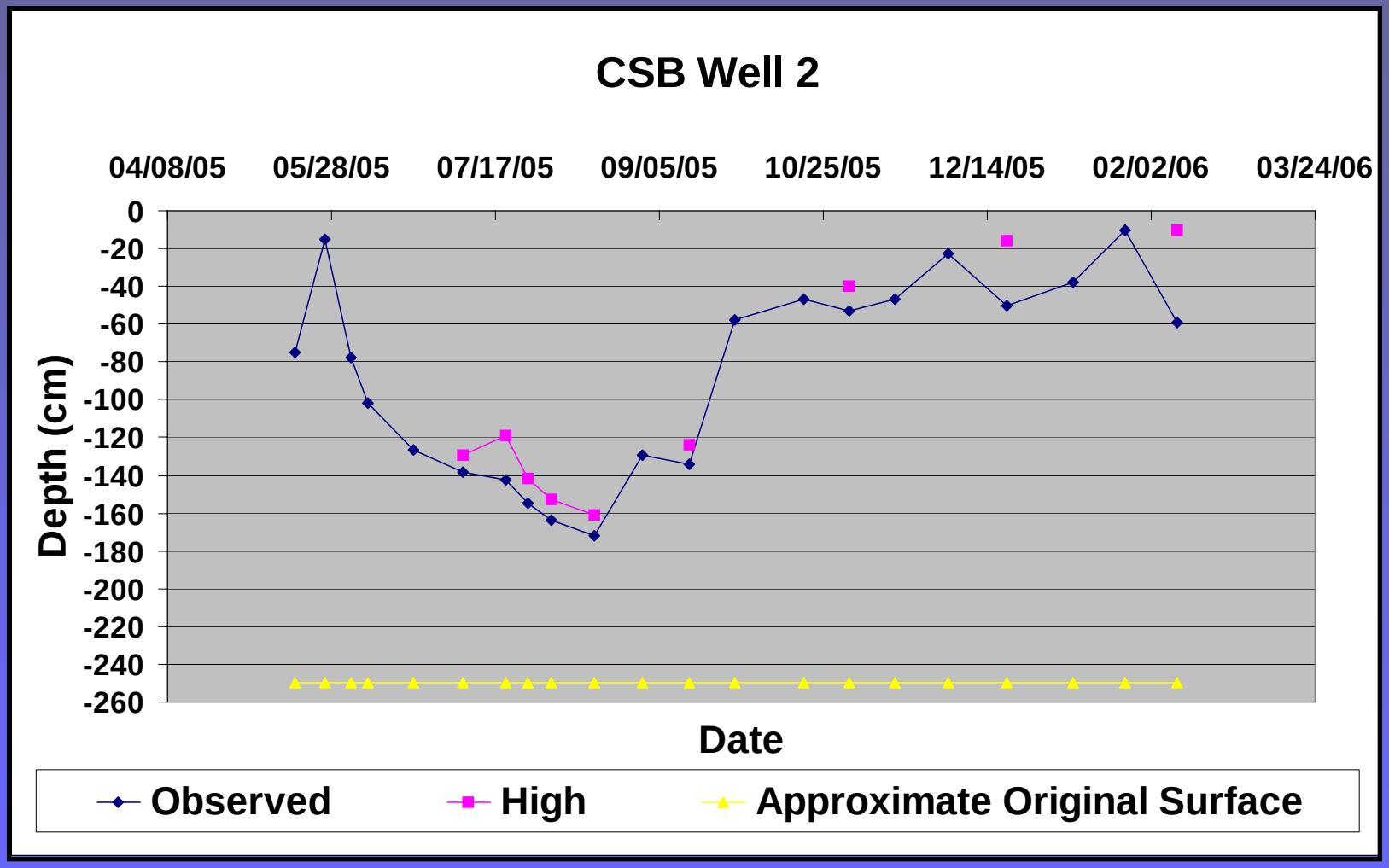
- Thickness of 53 to 270 cm
- Typically sandy
- HTM Sources:
  - Dredged subaqueous soils
  - Offsite materials with and without artifacts

13 of 18 wells in HTM: Water tables above the original surface most or all of the time.



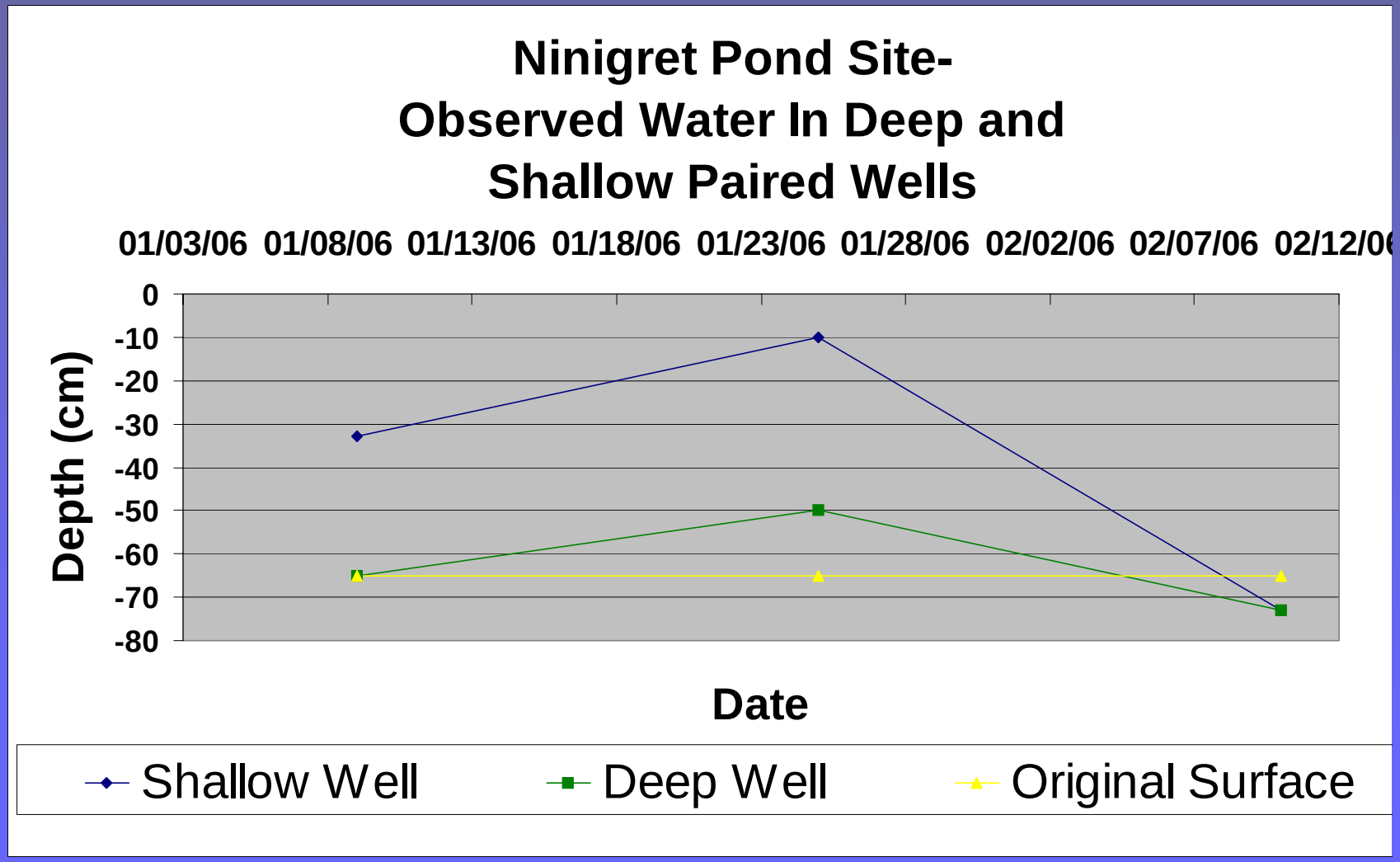
- **Hydric conditions**
- **Tidal influence**

Water table level may be >2 m above original marsh surface.

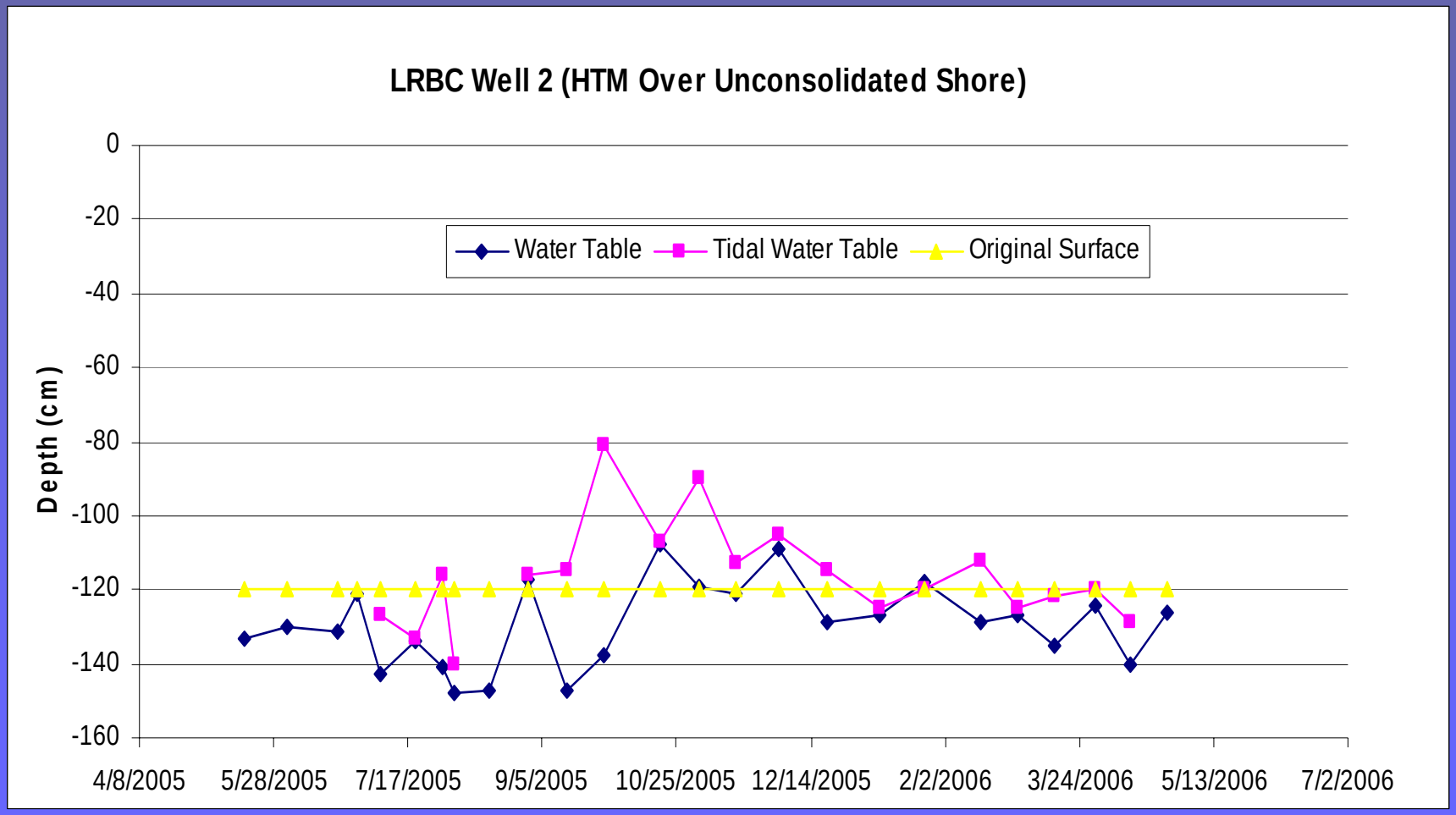


Water table levels may show seasonal and tidal fluctuations.

‘Perched’ Water Tables Can Develop at Times



Water levels remained at or below original surface when unconsolidated shore materials were covered.



Morphologic Observations of Coastal Soils formed in HTM

- Redoximorphic features
- Gleization
- Humification
- Sulfidization (?)

In general, RMFs formed where water table levels occurred.