

Progress report on “Factors Responsible for Limiting the Degradation Rate of Exxon Valdez Oil in Prince William Sound Beaches”.

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The studies were conducted on two sheltered (lentic) beaches in Eleanor Island in Prince William Sound. They are:

Beach 1: EL056C at coordinates: 147° 34' 37.21" W; 60° 33' 4.56" N (Figure 1)

Beach 2: EL058B at coordinates: 147° 34' 17.42" W ; 60 33' 45.57" N (Figure 2)

The distance between beaches was about a mile by sea.

The crew that conducted the studies consisted of nine people from Temple University (Dr. Boufadel, one postdoc, and seven graduate students). The duration of the study was 13 days. The work proceeded according to the overall plan in the proposal; topographic surveys of the beaches were obtained, two transects were established on each beach, and measurements of nutrients and dissolved oxygen (DO) were conducted, followed by the tracer studies (using lithium nitrate, LiNO₃). Figures 3 and 4 show the topographic survey results along with the emplacement of the wells. On each beach, the transects were labeled R and L representing the right and left sides when facing the beach, respectively. The wells were numbered 1 through 6 starting from the most landward well.

Each transect consisted of six sampling locations for water level and for solutes. The water level was measured by placing a LevelLogger sensor in a slotted PVC pipe that was capped. The sensor measures the water pressure (primary measurement) and temperature (secondary measurement). Adjacent to the slotted PVC pipe, a stainless steel multiport sampling well was placed and it allowed us to take samples at four depths in the beach (approximately at the depths of 25 cm, 50 cm, 75 cm, and 100 cm). The solutes of interest were nutrients (nitrate, phosphate, and ammonia), dissolved oxygen (DO), and the tracer, lithium nitrate).

Currently, only the data provided by the LevelSensor are available (i.e., water level and beach water temperature). We report in Figure 5 some of the results for Well R6 of Beach1.

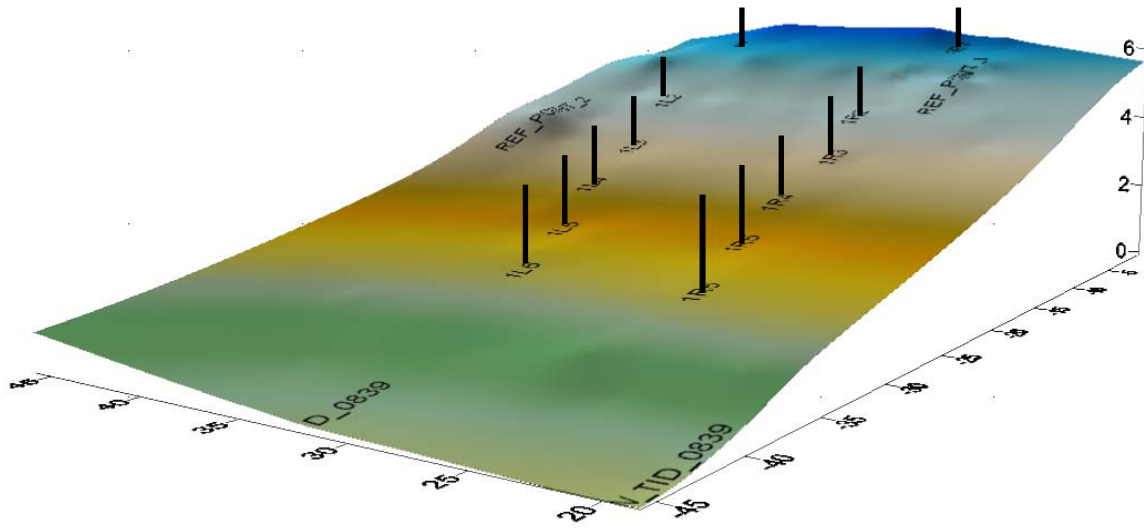


Figure 1: Photo of Beach 1. Note the wells along two transects.



Figure 2: Photo of Beach 2. Note the wells along two transects.

Beach 1



Beach 2

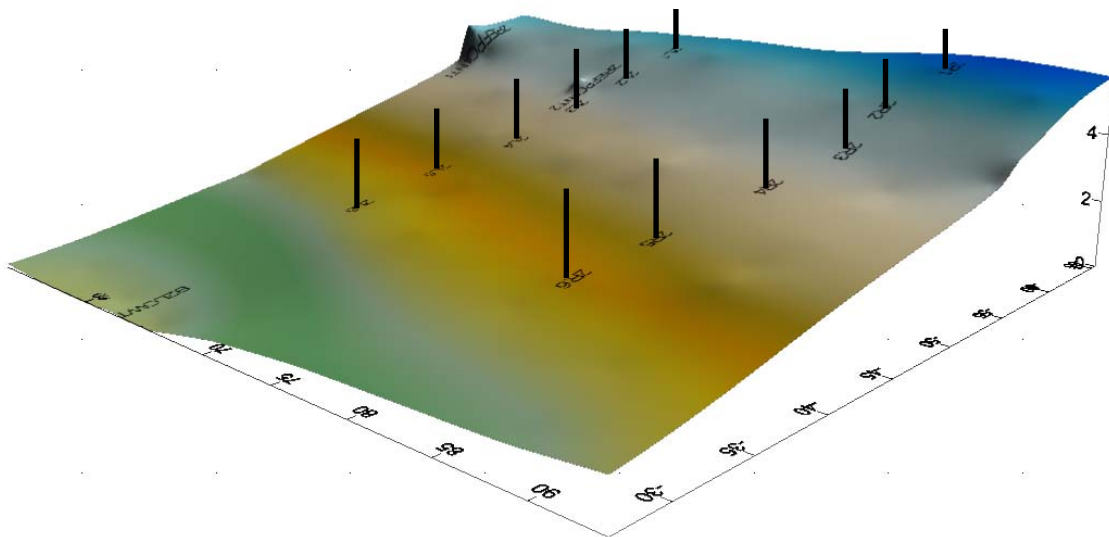


Figure 3: Topography of Beach 1 (E056) and Beach 2 (E058) along with location of wells. All distances are in meter. The most seaward location represents the lowest low tide.



Figure 4: Placing of the water level well (the white PVC pipe) and the multiport sampling wells prior to refilling the pit.

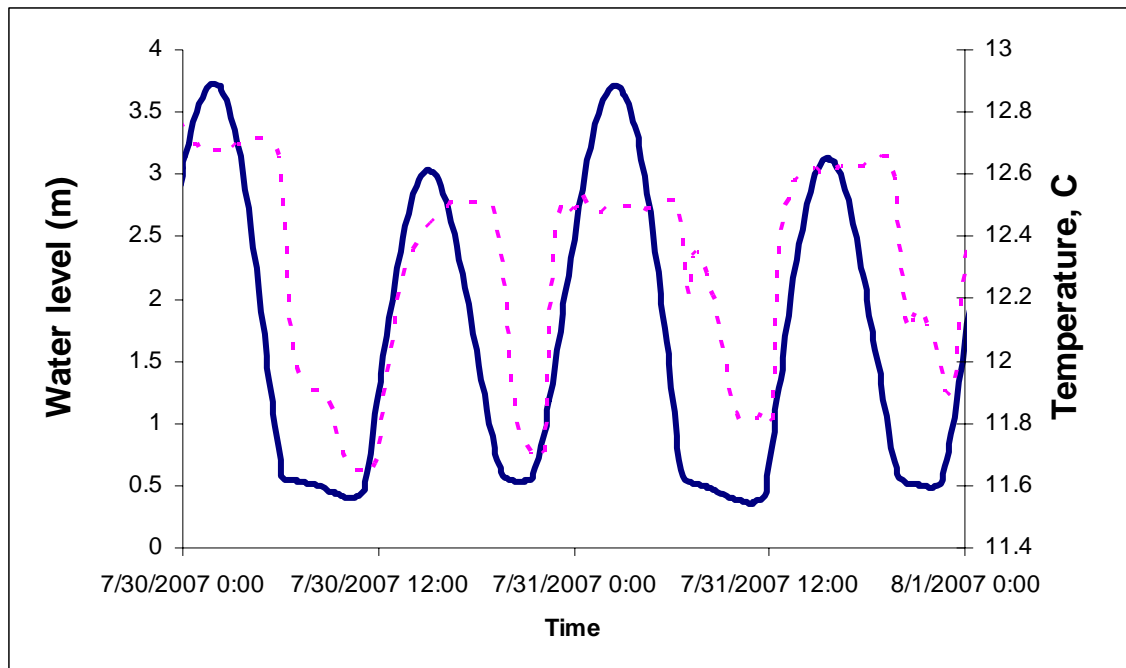


Figure 5: Variation of the water level (solid line) and temperature (dashed line) at Well R6 of Beach 1. Note the increase of the water temperature with the tide, which suggests that seawater enters the beach as the tide rises.