GIS2 Final Project

Effect of temporal sea level variations on the formation of prehistoric Oregon coast sand dunes

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Overview

• Shoreline Recession Simulation

• Pleistocene shoreline width /dune depth correlation

• Arc Scene Visualization

• Conclusions / lessons learned
Sea Level Variations

Study Area
Google Earth Animation

- Modified KML sea level rise code
- Animation using time slider
- Limitations
  - Can’t create movie with time animation
  - Limited to Google Earth imagery

• Animation

Correlation between Pleistocene shore width and Pleistocene dune depth

- Limited to sites with large number of data points
  - Florence
  - Newport
  - Bandon
• Analysis of:
  - sum of all Pleistocene layers
  - Pleistocene loess layers only
Correlation between Pleistocene shore width and Pleistocene dune depth

• Process
  – Create Map in ArcMap with:
    • Bathymetry layer, georeferenced sampling points
  – Use Near tool to determine distance to closest Pleistocene shoreline
    • Bathymetric data started at 200 meters
  – Export table to Excel
    • Calculate correlation coefficient
Arc Scene Visualization

- Visualize Dune Layers
  - Newport
  - Bandon

- Create layers from points
  - Inverse Distance Weighting: Top
  - Inverse Distance Weighting: Thickness
  - Convert Raster to Points then Points to Polygons
IDW Interpolation

Newport
Conclusions / Lessons Learned

- Low correlation between Pleistocene shoreline width and dune depth
- Obtain expertise in phenomena being studied
- 3D tools can enhance understanding of processes and data