[PS]Geochemical and Foraminiferal Responses to Anthropogenic Activities Along the Coastal Regions of Matagorda and Brazoria Counties, Texas*

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Abstract

Coastal regions in developed areas are subject to varying anthropogenic activities, resulting in contamination, pollution, and biologic disturbances, among other effects. Employing analyses from various disciplines allows scientists to reveal short-and-long-term impacts associated with the development of these areas. This study hypothesizes that higher developed areas will have remarkably different results than those areas with less anthropogenic input. This is supported by previous studies in other coastal regions with representations of various degrees of anthropogenic disturbance. Three initial study sites, with multiple locations at each site, were examined along coastal areas of Matagorda and Brazoria counties, Texas, and represent different proximities to anthropogenic influences. The initial surface samples that were collected provided a number of geochemical and biologic data, which allowed for additional sampling. A total of 9 one-foot cores were subsequently collected at each location to provide a greater framework for this study. Initial geochemical analyses from the surface samples at the studied locations recorded the values of 34 elements, including Ba, Mg, Ca, and Mn and trace elements such as Sr, U, and V. Cluster results using the elemental compositions provided the similarities and dissimilarities among the initial nine samples. High-resolution microbiological foraminiferal analyses will allow identification of changes in productivity, temperature, salinity, and oxygen levels. In addition, total organic carbon, Helical CT scans, assemblage composition, and lithologic descriptions are being conducted to increase our understanding of temporal and lateral changes associated with coastal environmental disturbances. This poster shows the preliminary results of this work in progress. In the future, these analyses can be applied to varied coastal areas to determine the environmental impact of runoff, building and road development, and contamination, as well as provide a baseline for areas prior to any environmental catastrophes.

GEOCHEMICAL AND FORAMINIFERAL RESPONSES TO ANTHROPOGENIC ACTIVITIES ALONG THE COASTAL REGIONS OF MATAGORDA AND BRAZORIA COUNTIES, TEXAS

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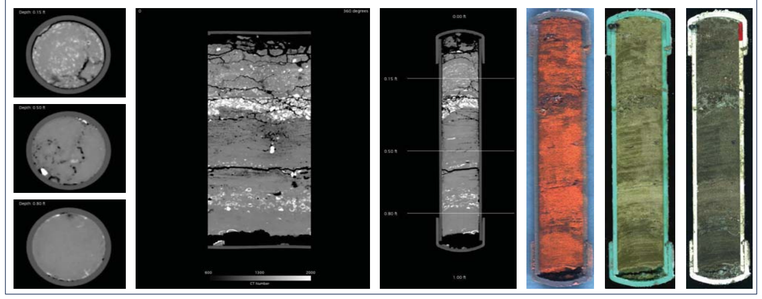
ABSTRACT

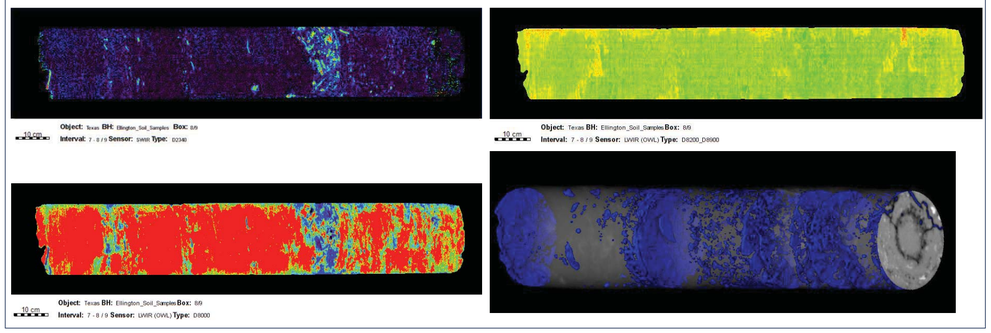
Coastal regions in developed areas are subject to anthropogenic activities, resulting in contamination, pollution, and biologic disturbances, among other effects. Employing analyses from various disciplines allows scientists to reveal short-and-long-term impacts associated with the development of these areas. This study hypothesizes that highly developed areas will show remarkably different results than the areas with less anthropogenic activities. This is supported by previous studies in other coastal regions with representations of various degrees of anthropogenic disturbance. Three study sites, with multiple locations at each, were examined along the coastal areas of Matagorda and Brazoria counties, Texas, and represent different proximities to anthropogenic influences. The surface samples that were collected provided a number of geochemical and biologic data, which allowed for additional sampling. A total of 9 one-foot cores were subsequently collected to provide a greater framework for this study. Initial geochemical analyses from the surface samples at the studied locations recorded the values of 34 elements, including Ba, Mg, Ca, Mn, and trace elements such as Sr, U, and V. Cluster results using the elemental compositions suggested the similarities and dissimilarities among the initial surface samples. High-resolution microbiological foraminiferal analyses allow identification of changes in productivity, temperature, salinity, and oxygen levels. In addition, total organic carbon, Helical CT scans, assemblage composition, and lithologic descriptions are being conducted to increase our understanding of temporal and spatial changes associated with coastal environmental disturbances. This poster shows the preliminary results of this work in progress. In future, these analyses can be applied to various coastal areas to determine environmental impacts of runoff, building/road development, contamination, and provide a baseline for areas prior to any environmental catastrophes.

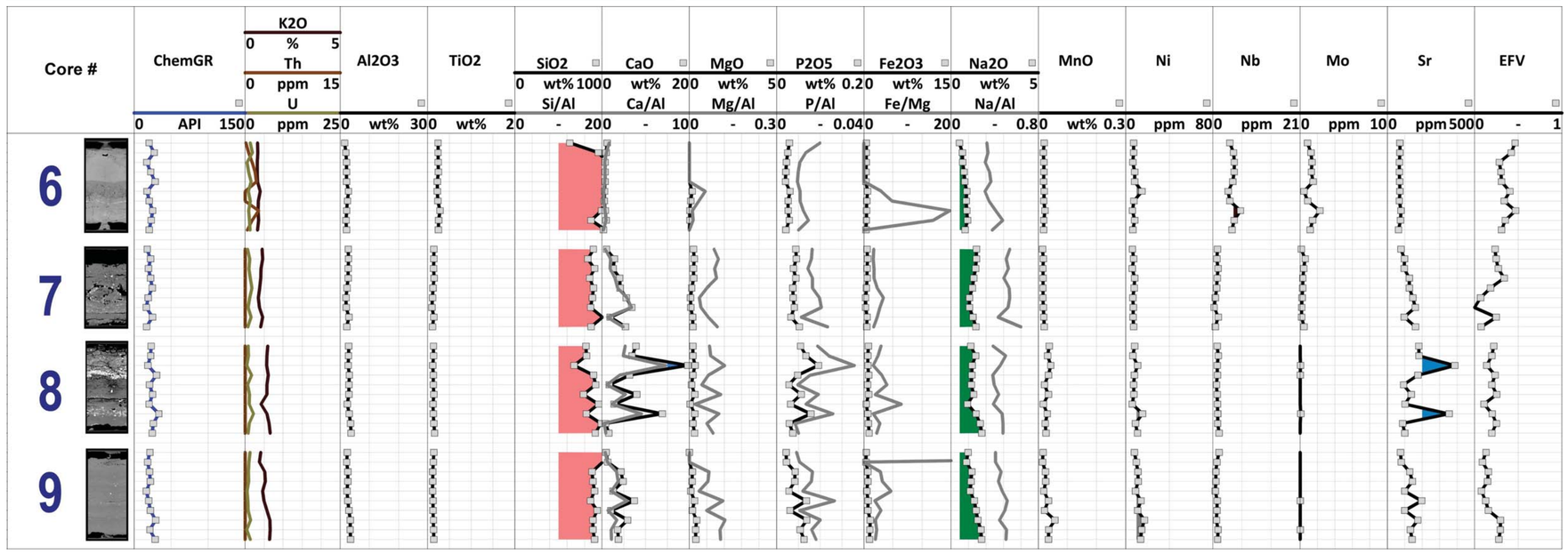
RESULTS

- Helical CT Images
- RGB (0.16 mm resolution)
- False Color Composite



- Hyperspectral Images
- SWIR and LWIR





METHODS

- Helical CT Images
- Hyperspectral Images
- X-ray Fluorescence (XRF) analysis
- Foraminiferal assemblage analysis

CONCLUSIONS

The preliminary results using multiple types of analyses suggest that:

1) The shell size of foraminiferal assemblages of the three sites is relatively small
2) The lateral and temporal assemblages of the studied cores are dominated by few foraminiferal species
3) Core 8 in location 3 shows significant increase in Ca, P, and Sr
4) Increased Fe/Mg ratio in core 6 from location 3 may suggest a reduced microenvironment

ACKNOWLEDGMENTS

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