

RARE EARTH ELEMENT VARIATION IN GUADALUPE DELTA SOILS, TEXAS GULF
COAST: DILUTION BY CHANGES IN SEDIMENT INFLUX OR BY CARBONATE
PEDOGENESIS?

Ronald L. Parker

Department of Geology and Geophysics
Texas A & M University

Rare earth elements (REE) are used as tracers of geochemical processes and changes in provenance because they are unreactive during chemical weathering, diagenesis and metamorphic alteration of sediment. Because REE are quantitatively transferred, REE composition of sediments faithfully reflect that of source rocks.

This study is part of an investigation of geochemical fluxes in the Texas Gulf Coast. The objective was to determine whether Holocene climatic variation may be represented by geochemical markers in derivative sediments. Four 3 meter soil cores were collected from the ancient and modern Guadalupe Delta. Intervals rich in clays and organic matter (based on observation) were selected for analyses. Concentrations of As, Ba, Br, Cd, Ce, Co, Cr, Cs, Eu, Fe, Ga, Gd, Hf, Hg, La, Lu, Mo, Na, Nd, Rb, Sb, Sc, Se, Sm, Sr, Ta, Tb, Th, U, W, Yb, Zn and Zr were made on 16 samples of dried soil. Determinations were performed by the Center for Chemical Characterization at Texas A & M University via Delayed Neutron Activation Analyses (DNAA). REE data were normalized against the North American Shale Composite (NASC, Gromet *et. al.*, 1984) and plotted on a semi-logarithmic scale of relative concentration vs. atomic number.

The resulting "spider diagrams" exhibit in the concentration of individual REE and overall patterns that are indicative of geochemical processes. In one core (ML-1) a systematic decrease in the overall