## Vegetation transition and sedimentary responses to fault-induced sea level rise

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The objective of this proposal is to fill the gap in knowledge about salt marsh vegetation transitions and sedimentary responses to fault-induced or exacerbated relative sea level (RSL) rise.

Specific objectives of this project are to:

1. Quantify contemporary and historical activity of growth faults and measure their contributions to local rates of RSL rise
2. Test the hypothesis that wetland accretion rates match rates of RSL rise on each respective side of growth faults

Recently activated growth faults on Matagorda Peninsulas, Texas will be studied. This site is unique from a Department of Energy (DOE) perspective – it provides carbon (via natural gas production) that may contribute to climate change, it has experienced differential subsidence on either side of the fault due to this sub-surface resource extraction, and it can serve as a valuable research site to increase scientific knowledge on the ecological effects of accelerated rates of sea level rise.

Recent and historical activity of the fault will be investigated through sediment horizon identification and high-precision surveying. Historical accretion rates will be quantified over multiple timescales of interest using radioisotope analysis ($^{7}$Be, $^{210}$Pb, $^{137}$Cs). Plant community transitions at the landscape scale will be referenced within the context of the faulting chronology, using remotely sensed imagery.

To serve both DOE scientists and public policymakers, deliverables will include a final report and international journal publications focused on salt marsh and sedimentary responses to faulting. This study will determine the responsiveness of wetland accretion rates and coupled vegetative transition to discrete changes in RSL rise, with global implications for wetlands sustainability.