

The Coastal Waters Consortium Presents:

# Scientist Spotlight

## Dr. Annette Engel



### What is your role as a scientist for CWC?

We want to understand how microbial taxonomic and metabolic changes, based on targeted gene sequencing and metagenomics data, cascade through the entire marsh ecosystem. We work with other CWC researchers on marsh biogeochemistry and ecosystem food web dynamics.

### Can you summarize your oil spill research and describe any surprising findings you have come across?

We have been surprised by how much marsh microbial diversity has changed over such a short period of time. Pre-oil spill data from 2010 showed highly similar compositions, but through time and depending on what happened to the marsh, such as higher concentrations of contaminating oil or more frequent flooding from freshwater, microbial changes followed distinct patterns depending on the perturbation. Now, microbial communities at different marshes are dissimilar to each other, and the differences correlate to changes in flooding history, salinity effects, and dominant vegetation type.

The Coastal Waters Consortium's mission is to assess the chemical evolution, biological degradation, and environmental stresses of petroleum and dispersant within Gulf of Mexico coastal and shelf ecosystems.

### What is your educational background?

Wittenberg University, BS Geology (1995)  
University of Cincinnati, MS Geological Sciences (1997)  
University of Cincinnati, MS Biological Sciences (1999)  
University of Texas at Austin, PhD Geological Sciences (2004)

### What inspired you to become a scientist?

When I was 12, I met a biology professor from Wittenberg University (Ohio) inside a cave in Kentucky. From that moment on, I knew I wanted to be a professor too. Over time, I found it difficult to focus on just one science because geology is so interdisciplinary. My professors told me that I shouldn't feel constrained by scientific boundaries. Since then, I have been motivated to push beyond disciplinary boundaries, or even to tear those boundaries down.

### Can you describe what you enjoy the most about conducting scientific research?

Coastal habitats like salt marshes are susceptible to disturbance, such as from contamination like oil spills, or from hurricanes, and also from sea-level rise due to global climate change. However, because these disturbances have been occurring for decades, infrequent visitation and research in the marshes meant that changes due to disturbance went unnoticed. The CWC project has made us eye witnesses to how rapid changes (over months to years) can be, from the microbial level to the entire marsh ecosystem.

