

# Oceanography Seminar

Dr. Kelly Dorgan  
Dauphin Island Sea Lab

## *Impacts of infauna on acoustic and geotechnical properties of sediments*

**1200 Thursday, May 23, 2019**  
Spanagel Hall, Room 316

Muddy marine sediments are elastic materials through which worms extend burrows by fracture. Infauna, animals living in marine sediments, modify sediment structure by burrowing, constructing burrows and tubes, and irrigating burrows. These activities can change the bulk porosity and density as well as create heterogeneity in sediment structure. Elastic fracture depends on two sediment material properties: fracture toughness and stiffness. Variability in the ratio of these properties has been shown to affect the behavior of burrowing worms. Very little data exists, however, on how these properties vary in the natural environment. The goal of this research is to determine how infauna modify both acoustic and geotechnical properties, as well as how these properties relate to each other. We have identified several problems with previous methods of measuring sediment fracture toughness and have developed and tested an instrument that addresses these problems. We test the hypothesis that these activities alter sound speed and attenuation in sediments by manipulating homogenized sediments to mimic animal activities. Each of these activities or functions is performed by multiple species of animals that comprise a functional group. Our results will help identify functional groups that have important impacts on sediment acoustics and will be used to interpret field data in which deviations from predicted sound speed and attenuation are correlated with different and diverse communities of infauna.