2017 Fall Semester
Duke Marine Lab Research Independent Study
(updated 28 June 2017)

Humberto Diaz - Tropical marine ecology; aquaculture
Room 210, Lab 7 (Bookhout); (252) 504-7611; hdiaz@duke.edu

Effects of acidity on:
1) Settlement and early growth of barnacles.
Larval culture and settlement of the barnacle Amphibalanus amphitites on glass panels coated with silicone will be registered under an under laboratory conditions at different pH conditions. Barnacle growth will be measured weekly using digital photography. After 4 weeks, barnacle adhesion will be determined.
2) Orientation responses of hermit crabs in presence of different chemical cues.
While under the influence of several odor sources that evoke the presence of refuge or predators, we will study the changes in orientation responses that might occur when media pH varies.
3) Food ingestion ratio of pink shrimps.
Food ingestion will be determined under artificial increased levels of acidity as well as a response to competition for food while in a confined space.

Jim Hench - Shallow-water physical oceanography, physical-biological interactions, and marine technology
Room 308/309, Lab 7 (Bookhout); (650) 759-6639; jim.hench@duke.edu

Research in the Hench Lab focuses on hydrodynamics of estuaries and coral reefs and its effects on transport processes. In marine systems, all chemical and biological processes are imbedded in moving fluid. Fluid motion affects the transport of contaminants, sediment, fluxes of particulates seen by benthic organisms, forces imposed on organisms, and larval dispersion and connectivity of marine populations. Thus, understanding water motion is central to many questions in marine science and conservation. We have openings for undergraduate research on these topics: 1) Understanding high-frequency internal waves in a highly stratified shallow estuary; 2) High-resolution circulation/wave modeling around coral reef lagoons and islands. In all projects, students will receive training in quantitative data analysis methods and modeling techniques. Experience using Matlab preferred but not required. More information can be found on Hench's website: http://people.duke.edu/~jlh82/ and by contacting Dr. Hench.

Dan Holstein – marine connectivity modeling
Room 311, Lab 7 (Bookhout); (252) 504-7636; dmh54@duke.edu

Dr. Holstein's research is focused the biological and physical factors that affect metapopulations of coral reef organisms through population connectivity including: the exchange of individuals or larvae between sub-populations, resilience from disturbances, evaluating the role of refugia in metapopulation persistence, and avoiding extinction. More information on Dr. Holstein's research can found on his website: http://www.danielmholstein.com. Students interested in working on marine connectivity modeling and population network analysis should contact Dr. Holstein for further information.

Dana Hunt - Marine microbial ecology; drivers of bacterial diversity; bacterial responses to emerging pollutants

Pilkey 104C; (252) 504-7542; dana.hunt@duke.edu

The Hunt lab conducts research on Marine Microbial Ecology. Bacteria are the most diverse organisms on earth and play a pivotal role in planetary cycling of nutrients and energy. Yet, we have a poor understanding of the factors that drive their diversity and dynamics in the environment. Independent study students in the Hunt Lab use a range of tools from culturing to PCR to learn more about the ecology of marine microbes. Past undergraduate students have assisted with local field work, examined how climate change may alter microbial populations, and identified new types of bacteria from marine organisms. Some background in microbiology or molecular biology is preferred but not required. For more information about the research see Dr. Hunt's website (http://oceanography.ml.duke.edu/hunt/).

Zackary Johnson - Biological oceanography and biotechnology
Room 104, Pilkey Lab; (252) 504-7543; zij@duke.edu

The Johnson Lab studies the abundance, diversity and activity of marine microbes – the most abundant and important organisms in the global ocean. We study biological oceanography, marine molecular ecology, marine microbiology and biogeochemistry. Together with Hunt lab our group will be conducting experiments on the effects of ocean acidification and temperature rise on microbial populations in coastal and open ocean waters. Students interested in working with our group on this project should email Dr. Johnson to discuss further details.

Dave Johnston -
Room 315, Lab 7 (Bookhout); (252) 504-7593; david.johnston@duke.edu

Interested students are encouraged to contact Dr. Johnston to discuss project ideas.

Doug Nowacek - Marine conservation, bioacoustics, marine mammals
Room 117, Lab 7 (Bookhout); (252) 504-7566 doug.nowacek@duke.edu

Dr. Nowacek will not be advising independent study projects during Fall 2017.

Dan Rittschof – Animal behavior, behavioral and chemical ecology, toxicology
Room 310, Lab 7 (Bookhout); (252) 504-7634; ritt@duke.edu

Topics: 1) Location and impacts of fluorescent nanoplastics consumed by anemones, local corals, or invertebrate larvae; 2) Identification of feeding stimulants for snails, crabs and barnacles from clean plastics; 3) Proteomics of blue crab larval release pheromones; 4) Analysis of basketball teams using optimal foraging theory for comparison with humpback whale foraging; 5) Customized projects with local invertebrates based on your personal interests.

Tom Schultz – Marine genetics and genomics
Room 214, Lab 7 (Bookhout); (252) 504-7641; tom.schultz@duke.edu

My lab uses genetic and genomic approaches to address questions in conservation genetics. Specific topics include hybridization of landlocked river herring species, genetic analyses of juvenile summer flounder, analyses of blue crab populations, and genetic adaptations of *Fundulus* to toxic PAH

contamination at an EPA Superfund site. In addition we have been using next-generation sequencing to characterize tidal rhythms at a molecular level in mole crabs.

Brian Silliman -
Room 315, Lab 7 (Bookhout); (252) 504-7593; david.johnston@duke.edu

Interested students are encouraged to contact Dr. Silliman to discuss project ideas.