

BIOL 690 [1 cr Spring 2018]**Student:** Sarah Kell, 20091493**Mentor:** Dr. Barbara Beckingham

Assistant Professor, Geology & Environmental Geoscience

Title of Project: Refining density separation methods for microplastic analysis of sediments**Project Description:**

Microplastic analysis in sediments can be challenging because of the need to physically isolate the microplastic particles/fibers from the complex sediment matrix. Density separation is one approach, and relies on the buoyancy of most plastic materials relative to the mineral fraction in sediments. It is possible that sediment texture or organic matter content may affect the density separation procedure. This independent study will develop and test protocols to evaluate the recovery of microplastic from organic-rich sediments with the goal of refining methodology.

Student Learning Outcomes:

- 1) Identify strengths and weaknesses in current methods
- 2) Develop and apply laboratory skills, including: keeping a detailed laboratory notebook, organizing samples and supplies, keeping work spaces clean and functional, and proper use of laboratory and field instrumentation
- 3) Synthesize results from several experiments to make a recommendation

Methods:

- 1) Formulate a sound set of QA/QC procedures for assessing weaknesses in the current sediment density separation methods
- 2) Perform set of tests in the field and laboratory (The Citadel and CofC Geochemistry Lab). All equipment required is available.
- 3) Quantify method performance using calculations for percent recovery, percent error, and standard statistical tests.

Timeline and Assessment:

Aspects of the independent study are outlined in the timeline below.

Jan	Feb	March	April
Reading relevant texts and literature			
Develop test procedures			
Lab/field testing			
Data analysis and reporting			

At the end of the Spring Semester, a letter grade will be assigned based on the following (% given in parenthesis).

Laboratory performance: (60%) Through training and practice the student is expected to reliably and carefully work in the field and laboratory. Student is expected to work on research the equivalent of 1 credit hour (3 hours per week), and to spend additional time outside of laboratory reading and developing related skills. Time will be spent to develop testing procedures, carry out procedures, and analyze results.

Research communication: (40%) The research activities will culminate in a written report at the end of the semester that will be drafted in the style of a scientific journal article.

Grading scheme

A	92-100	B+	91-87	C+	80-75	F	< 70
		B	86-81	C	74-70		