University of Rhode Island Department of Ocean Engineering

OCE 311
Marine Geomechanics Laboratory
Spring Semester, 2007

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Assignments: The results of the laboratory experiments should be submitted as a **laboratory report** to Chris Baxter and Kate Moran according to the guidelines set up at the beginning of the course.

Lecture Topics:

- Introduction to Marine Geomechanics (Geotechnical Engineering)
- Engineering Properties of Sediments
- Effective Stress/Shear strength of sediments
- Multi-Sensor Core Logger
- Acoustic properties of sediments
- Sampling of marine sediments
- Phase relationships

Laboratory Assignments:

- Obtain cores and grab-samples from Narragansett Bay
- Multi-Sensor Core Logger
- Core Processing (core splitting, lithology, water content, bulk density, vane shear strength)
- Atterberg Limits
- Grain-size analysis

Writing Center: Students in this class are encouraged to visit URI's Writing Center – located in Room 313, Independence Hall – at any time during the semester. There, you will work for 30 minutes with an experienced writing tutor. Each meeting, you should expect to work on only one or two issues; you can always return for more. You and your tutor will decide together what will help you the most for each assignment. For example, your tutor might work with you on paragraphing, sentence clarity, sharpening thesis statements, documenting sources, using appropriate evidence, or understanding and practicing specific grammatical concepts. Know that URI Writing Center tutors will not edit or proofread for you; rather, they will teach you proofreading strategies you can use yourself. Their goal is to help you become a better writer, and this requires both time and effort on your part. Appointments are encouraged (call them at 4-4690), but you may also drop in and see if a tutor is available. For more information, go to the URI Writing Center's website at http://www.uri.edu/aec/wc/index.php.

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Key Concepts

1. Properties of sediments depend on particle size, water content, and composition.
2. Sediments have "memory"
3. Effective stress

Educational Objectives

By the end of this module, you should be able to…

- Explain in your own words the concept of effective stress.
- Calculate phase relationships (weight-volume quantities such as water content, bulk density, and dry density).
- Explain how sediments have "memory" of past stress history and why this is important.
- Perform a variety of laboratory tests on sediments, including water content, bulk density, vane shear strength, consolidation, strength, and grain size analysis.
- Describe different methods of sampling.
- Calculate the effective stress distribution in sediments as a function of depth.
- Describe what types of problems geotechnical engineers work on.
- Correlate physical properties of core samples to acoustic properties of sediments.