

EaES 350 Laboratory 6: Sedimentary structures I

So far, we have focused our attention primarily on the texture and composition of sediments and sedimentary rocks. An important aspect of both basic and applied sedimentary geology is the need to infer depositional processes and environments. This is helpful for predicting facies distributions and sedimentary architecture at locations from where no observations are available. Facies models play a pivotal role in making such predictions, but facies models can only be used if the facies associations and facies successions provide sufficient information to identify the depositional environment. This approach is particularly important in the study and interpretation of ancient sedimentary rocks where the depositional setting is initially unknown.

Sedimentary structures can provide extremely valuable information to contribute to this. We will therefore spend two labs on the description, identification, and interpretation of some of the more common sedimentary structures. We will examine lacquer peels that have been made in exposed, unconsolidated sediments, as well as some hand specimens and a core sample of sedimentary rocks. As always, make sure you handle the materials with care... they are very fragile!

The first and crucial step is to make a careful and detailed description of the sedimentary structures – without good observations, any interpretation will be useless. Therefore, the main purpose of this lab is to give you some training in making observations. For each lacquer peel, hand specimen, or core sample, make a sketch that shows the key features (i.e., set boundaries, cross stratification, mud drapes, fossils etc.). In addition, provide a short description that provides information on grain size, the type of sedimentary structures, the nature of fossils, and any other features you consider to be relevant. Make sure you use terminology consistent with what has been used in class. The first thing you will have to determine is the orientation; what is up and down? All the objects of study have one or more clues that can help you answer this question. Use all theory that has been discussed in class and you can find in your textbook. Wherever appropriate, infer the paleocurrent direction. Finally, speculate on the origin and depositional environment of the sediments you have analyzed.