Geoscience 001 Fall 2005
Field Trip: Reedsville Formation near Potter's Mills

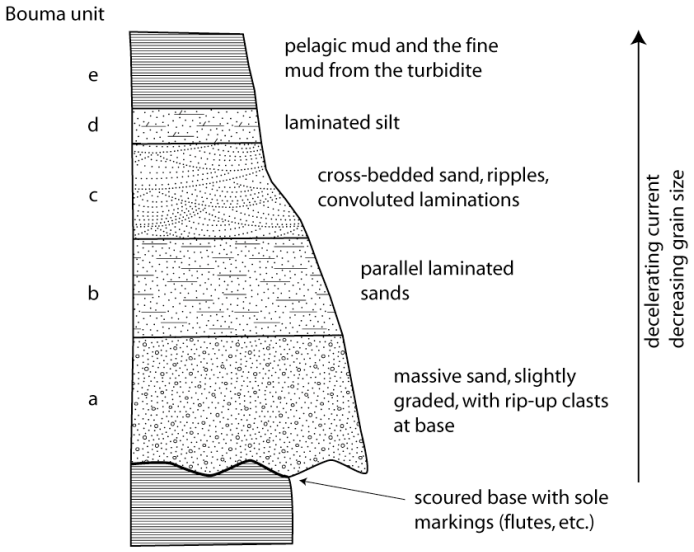
This is the first of two field trips to a large exposure south of Potter's Mills, approximately 12 miles east of State College. The purpose of this trip is to examine the Reedsville Formation, which is the next formation up-section from the Coburn Formation. The Reedsville is still within the Upper Ordovician period and has a total thickness in this area of around 200 m; we're going to look at the uppermost part of it, just below the overlying Bald Eagle Formation, which is the focus of a later field trip.

Have a glance at the upper Reedsville, seen at the far southern edge of this exposure; it is similar to the lower Reedsville in that it consists of this easily eroded sedimentary rock that you should be able to identify (i.e., identify this before proceeding). Work your way upsection, to the north, until you start seeing more resistant beds sticking out of the weaker material — this is the part of the Reedsville we want to focus on. Take a moment to figure out what the resistant beds are.

First, make a detailed 2 m stratigraphic column of a part of the Reedsville, paying close attention to the composition and bedding contacts and grain size variations within the resistant beds. Look for fossils too, since they will help us understand something about the depositional environment of the easily eroded parts of this formation. Are the bottoms of the resistant beds abrupt, or gradational transitions from the erodable beds? Are the tops abrupt or transitional? Are there grain size variations within the resistant beds? Do the resistant beds have identifiable grains in them? What might they be composed of mineralogically?

The following figure may be useful in thinking about these resistant layers:

The Idealized Turbidite

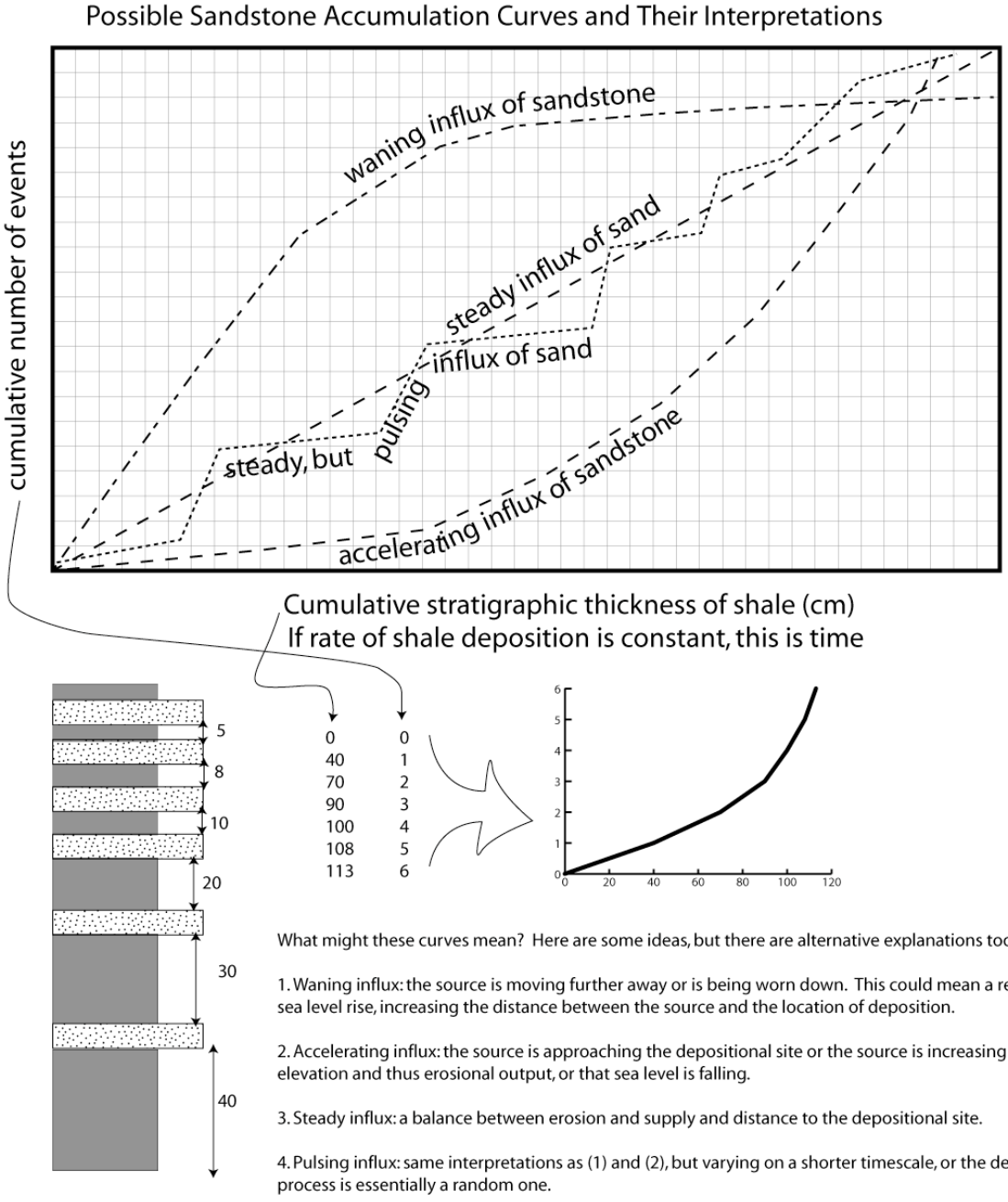


Closer to the source, you may see units a or a and b, further from the source, you may see c,d,e, or d,e

Next, make a series of faster measurements on the stratigraphic thickness of weak, erodable beds separated by successive resistant beds (i.e., the distance between successive sandstones, measured perpendicular to the layers). The purpose of this is to explore how the time between resistant beds changes as you go up-section, assuming that the erodable beds are deposited at a nearly constant rate. The data you want to collect here are simple — a column of numbers that represent the thickness of erodable beds (by this stage in the lab, you will know what these beds are) between adjacent resistant beds. If you call each resistant bed an event and give it a value of 1, then you'll have two columns of numbers to plot; the result of this will reveal something about how the frequency of resistant bed depositional events changed over time (see figure below).

What to Turn In:

Your stratigraphic column, the accumulation curve, and a couple of paragraphs that present your observations and interpretations about this sequence of rocks.



What might these curves mean? Here are some ideas, but there are alternative explanations too.

1. Waning influx: the source is moving further away or is being worn down. This could mean a relative sea level rise, increasing the distance between the source and the location of deposition.

2. Accelerating influx: the source is approaching the depositional site or the source is increasing in elevation and thus erosional output, or that sea level is falling.

3. Steady influx: a balance between erosion and supply and distance to the depositional site.

4. Pulsing influx: same interpretations as (1) and (2), but varying on a shorter timescale, or the delivery process is essentially a random one.