

How to take field notes and make an outcrop sketch

Taking Field Notes

General description of the outcrop, date of visit, who with, weather:

- Geographic location (what roads did you take, how far/in what direction did you walk from the road/parking spot, sketch map, notes about outcrop ownership)
- Written description of the exposure – dimensions, condition of the outcrop(s)
- A sketch of the outcrop with a scale bar for both vertical and horizontal. Include major features like the geometry of sedimentary units, faults, covered areas. Include the cardinal direction you are facing to make the sketch, and the location of the base of your measured section.
- Basic geology: rock types, formation names if known
- Your notes should be sufficiently clear so that someone unfamiliar with the outcrop could understand them in order to reconstruct what you did and what you found.

Observations at the level of the stratigraphic unit:

- Thickness and geometry of stratigraphic units (individual beds are not the focus here)
- Note *prominent* individual beds, if present.
- Coarsening-up or fining-up trends through the unit (or bed, AND the section as a whole).
- Thinning-up or thickening-up trends of beds through the unit.
- Nature of unit contacts (sharp or gradational, distinctive features of the surface).
- Note any features suggesting a hiatus, or an environmental change not otherwise captured by juxtaposed rocks.
- Additional small sketches of any interesting details or stratigraphic relationships.

Geological Sketching

Why sketch geology?

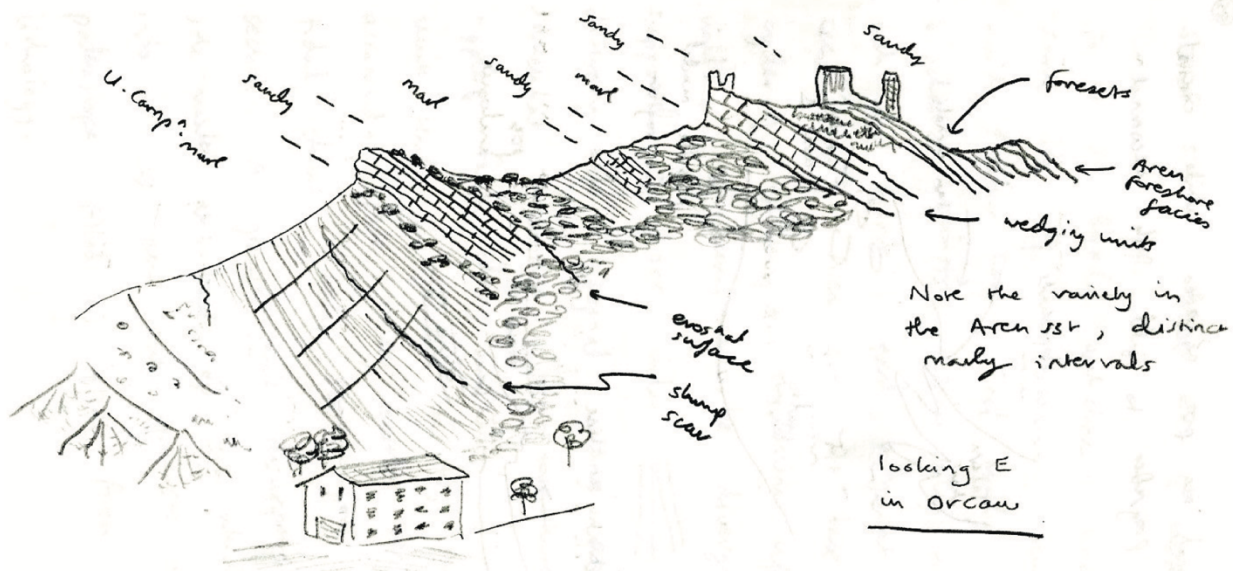
- The purpose of a geological field sketching is to:
 - Sharpen your own observations,
 - Record the relationships and shapes of geological features,
 - Summarize the geology,
 - And work out how the three-dimensional shape of the geology interacts with the geometry of the landscape.
- It is **not** to produce a pleasing creative impression of an outcrop.
- Field sketches are DATA (when done well)!

10 general principles of geological drawing for sedimentology/stratigraphy:

1. Both drawing AND labeling/annotating are important
2. When sketching by hand, use a sharp pencil only. Don't use pens or colored pencils.
3. Use clear, continuous lines.
4. Avoid using cross-hatching or shading – keep your sketch clear.

5. Accuracy is paramount. It shows good observation. Remember that observation is assisted by understanding, so a good knowledge of theory goes alongside good drawing. Don't draw what you *think* you should see (textbook-style figures). Draw what you *observe*.
6. Guidelines can help. Start with faint lines of the horizon, the base of an outcrop, etc. to frame the scale.
7. Make the drawing large enough!
8. Correct mistakes. (Again, use a pencil. And the eraser.)
9. Include a title.
10. Include a scale.

Example outcrop sketch:



Noad, 2016

For future field trips, there are a few other notes you should make in your field notebook (some of these apply virtually, others do not):

- Time of day, weather, memorable events (lunch? wildlife?), and thoughts and feelings while completing the work.
- Standing back from the outcrop (or to the side, looking obliquely), look at the stratigraphy, zoom your eyes in and out – try to ‘see’ the largest sedimentary structures or stratigraphic features that might possibly be present. These will be hypotheses initially, to be tested by hand-specimen and bed-level examination.
 - e.g., any lenticularity in rock bodies, any non-layer-cake stratigraphy (i.e., pinch-outs & diverging beds), any overall trends from bottom to top of local record, any apparent cyclicity at meter- or coarser-scale?
- Before you leave the site – be sure to mark on your initial map or sketch exactly where you ended up measuring section(s), any offsets made in order to complete the section, and explain your reasoning for choices made.

General advice for note-taking in the field:

- Start by “seeing the forest” before zeroing in on one tree (or bed). Get a sense of the likely units for description in the outcrop **before** you start although these might change, develop a plan for your available time, including with an eye to weather. **“Plans are useless, but planning is indispensable.”** - Eisenhower
- Remember, your notes should be sufficiently clear so that someone unfamiliar with the outcrop could understand them in order to reconstruct what you did and what you found.
 - This is also for self-preservation – you’d be surprised how much one can forget – good notes mean less time redoing what you’ve already done, and being able to help others re-locate a study area or have information in the case the stratigraphy becomes inaccessible (deterioration with time, suburban development, flooding by dams, etc.).
- Good notes also make writing geologic reports a lot easier. You should be thinking about possible environmental significance of the rocks and of up-section trends while actually in the field: that is a good time to test your hypotheses.
 - Your notebook can include notes such as ‘shoreface?’ or ‘swamp?’, to remind you of ideas that came to mind, even though **your final measured section will display observed features only.**

References

Kidwell, S.K., various notes on field geology and stratigraphy techniques that inspired and contributed to this reference.

Noad, J., 2016. The (Forgotten?) Art of Geological Field Sketches, AAPG Annual Convention and Exhibition, Calgary, Alberta, Canada. Search and Discovery Article #41853.

Oxford Cambridge and RSA, 2018. Geology Drawing Skills Handbook, Geological Drawing, Version 1, <https://www.ocr.org.uk/Images/500028-geology-drawing-skills-handbook.pdf>.