

Only a very small percentage of students in most structural geology courses will become structural geologists. Many, however, will someday use structural concepts and techniques to solve problems in other fields. We can help students see the relevance of structural geology to geological problem-solving, as well as better prepare them for future work in geology and geological engineering, by integrating problems that apply structural geology, but that come from other disciplines, into structural geology courses.

## Examples and Current Development Efforts of the Working Group



**Mineral exploration, exploitation**

- \* What tectonic/structural environments are structurally favorable for mineral deposit formation?
- \* What types of dilatant openings can form to host ore?
- \* How can we recognize ore deposits that have been disrupted by deformation?
- \* How do structures control the distribution of alteration assemblages locally and regionally?
- \* How to characterize the strength and failure potential of mined slopes and openings?

**Petroleum exploration, exploitation**

- \* What tectonic/structural environments are structurally favorable for hydrocarbon deposit formation?
- \* What structural traps are possible in petroleum systems?
- \* How can 4-way closure be determined in the subsurface?
- \* How can subsurface structure be inferred from surface structure?
- \* How can we predict the occurrence and structural character of fractured reservoirs?
- \* How do the presence and geometry of various structures (fractures, stylolites, etc.) affect hydrocarbon (fluid) production?
- \* How does rock fabric effect drilling efficiency?

**Engineering, environmental and hydrogeology**

- \* How can we determine and characterize the effect of fractures on fluid flow in the subsurface?
- \* How can we determine and characterize the effect of fractures and anisotropy on rock strength?
- \* What structural studies are important in characterizing nuclear and other waste sites, and construction sites?
- \* How do structures control the dispersion of chemicals in the surface and subsurface environment?
- \* How do structures control the occurrence and distribution of water resources?

**Geologic hazard assessment (volcanic, seismic, mass wasting)**

- \* What are tectonic/structural controls on volcanic and seismic hazards?
- \* What structural data are important in hazard assessment?
- \* How can we predict the effects of structure on slope stability?
- \* What are the effects of structure (and related fluid pressure) on the occurrence of induced seismicity and slope failure?

**Petrology (igneous/metamorphic)**

- \* How can deformation and strain gradients control metamorphic reactions?
- \* What structural controls affect the emplacement of igneous bodies?

**Climate studies**

- \* How can we assess the effects of climate on structure (such as the growth of mountain belts and strain rates of fault slip)?
- \* How can we assess the effects of structure on climate (such as orographic effects)?

**Geoarchaeology**

- \* What are the effects of structure on paleo-societies, and on the distribution and character of archeological sites?

**Planetary geology**

- \* What can we learn about the structure of terrestrial planets and its application to the study of earth history?

**Sedimentology/stratigraphy**

- \* How does structure control the architecture and stratigraphic nature of growth packages (fault and/or fold growth structure)?
- \* How can structure affect the distribution of sedimentary facies, such as string sands which may form in structurally-controlled bathymetric lows?
- \* What rheological and kinematic characteristics can be inferred from study of soft-sediment structures (folds, faults, cleavages, etc.)?

**Tectonic studies**

- \* How can focal mechanism studies used to infer plate motions and interactions?
- \* What is the relation of faults and folds to uplift and denudation, and the development of tectonic geomorphology

**Glaciology and analog studies**

- \* How can we use studies of ice deformation to infer the rheological behavior of rocks undergoing deformation
- \* How does bedrock structure affect the development of glaciers and ice sheets?

Our working group was inspired by these ideas, and members of the working group are currently developing the following activities for use in structural geology courses. As soon as activities are developed, we will post them in the Teaching Structural Geology Resources Collection.

- This assignment is an example of the kind of activity that can be developed to allow students to practice skills in structural geology and also explore the relevance of structural geology to another discipline.

***Do you have good examples to contribute??***

To submit an example, use our on-line submission form shown at right (information on tear-off sheet below).

On our web submission form we ask you to:

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*Want to join our working group?  
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