

## GEOLOGIC MAPPING - C

1. **DESCRIPTION:** Students will demonstrate understanding in the construction and use of topographic maps, geologic maps, and seismic reflection profiles and their use in forming interpretations regarding geo-hazard risk and subsurface structure.

**A TEAM OF UP TO:** 2

**APPROXIMATE TIME:** 50 min

2. **EVENT PARAMETERS:** Each **team member** is permitted to bring one three-ring binder (any size) containing information in any form from any source. The material must be 3-hole punched and inserted into the rings (notebook sleeves are allowable). Each team must have a protractor, ruler, non-programmable calculator, colored pencils, and an equal-area projection stereonet with tracing paper and pin.
3. **THE COMPETITION:** Using information, which may include topographic maps, geologic maps, USGS quadrangles, seismic reflection profiles, drill cores, well logs, photographs, satellite images, paleomagnetic data, gravity surveys, map projections, or stereonets, participants will be asked to complete activities, using all available information to:
  - a. Be knowledgeable about latitude/longitude, UTM, map projections, geologic time scale, methods for relative age dating, unconformities, field measurements (strike, dip, trend, plunge), major depositional environments, basics of rock formation, and plate tectonics
  - b. Interpret map signatures of intrusions, subsurface geometries, deformation sequences, and buried depositional features
  - c. Identify fold geometries, fault types, erosional patterns and, major structural elements (synforms, antiforms, synclines, anticlines, basins, monoclines, domes, saddles, etc)
  - d. Construct cross-sections (faults, folds, growth strata, etc), topographic profiles, topographic maps, new projections of mapped features, and stereonet projections of measured features
  - e. Determine bed thicknesses, true dip, levels of geo-hazard risk, and orientations of planes from points
4. **SCORING:** All questions will have been assigned a predetermined number of points. The highest score wins. Selected questions having differentiated weights will be used to break ties.

**Recommended Resources:** All reference and training resources including the **Bio/Earth CD** are available on the Official Science Olympiad Store and Website at <http://www.soinc.org>