

# **GY403 Structural Geology Lab**

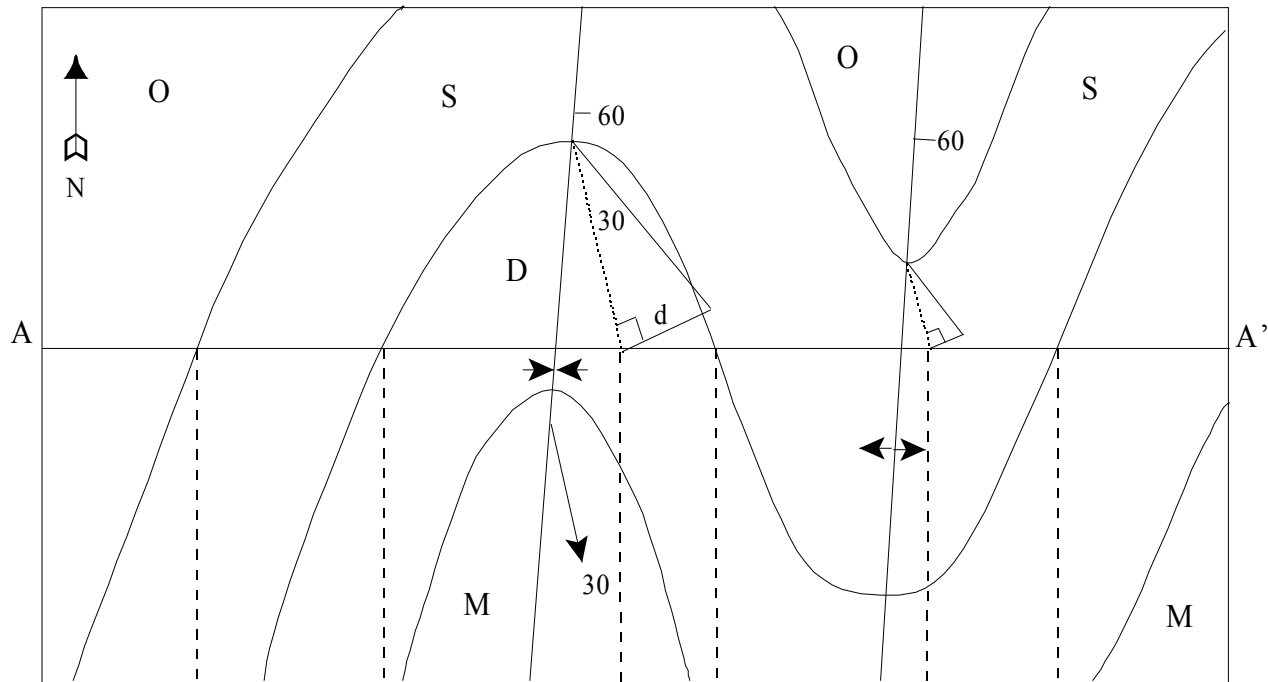
**Lab 14: Geologic Cross Sections**

# Cross-Section Elements

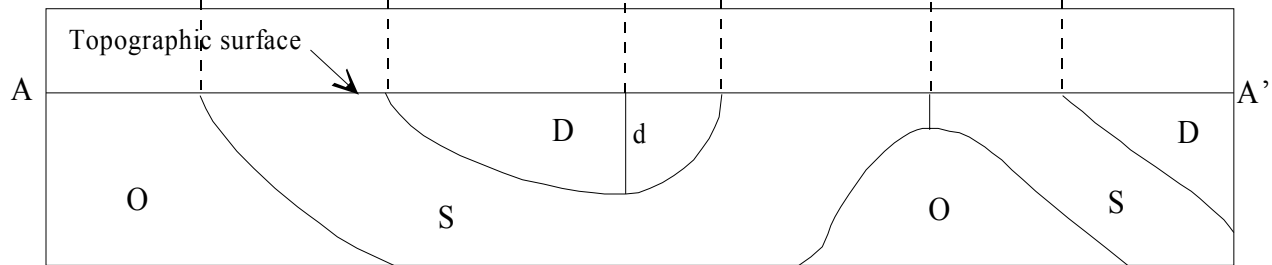
- Topographic profile of land surface
- Vertical Exaggeration (Vertical scale / Horizontal scale)
- Prominent landform features (rivers, streams, peaks, towns, etc.)
- Compass direction at ends of cross-section
- Cross-section line end labels (A-A', B-B', etc.)
- Verbal and graphical scales for horizontal and vertical axes

# Example Cross-Section

Geologic Map



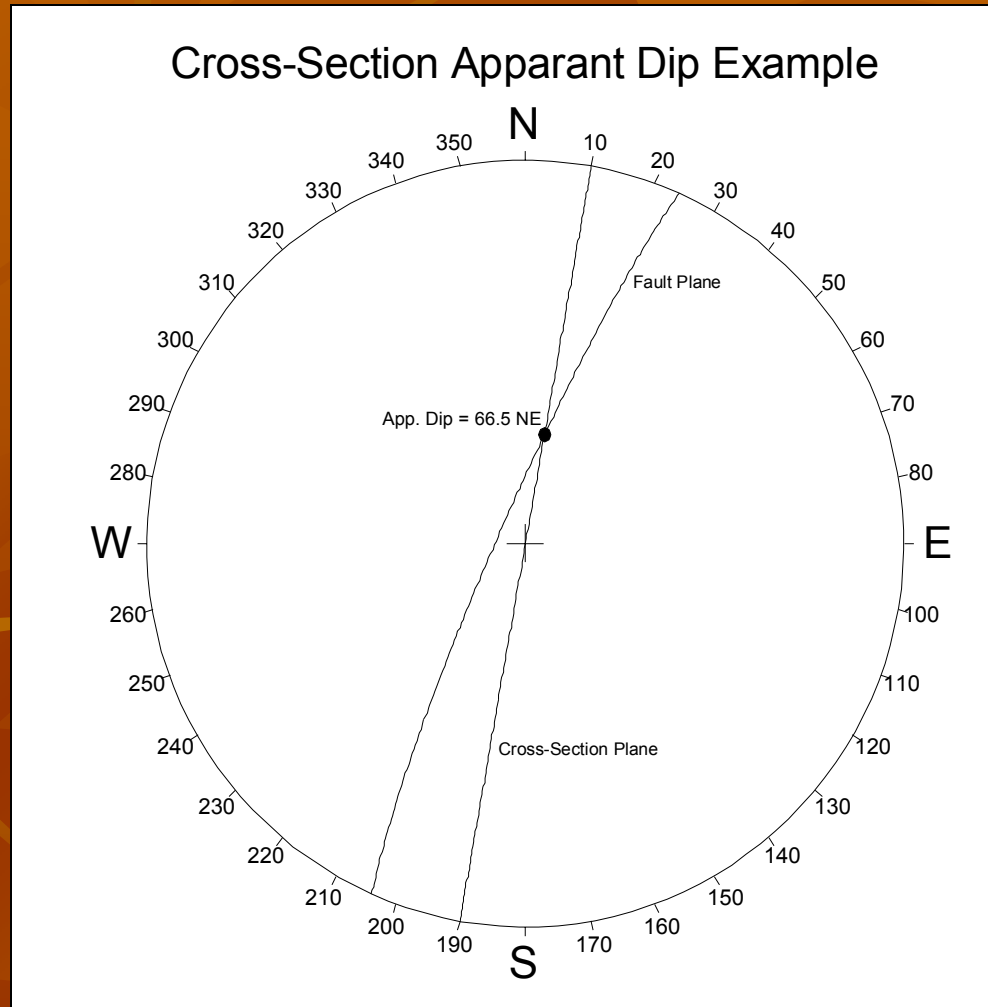
Cross-Section



# Cross Section Constraints

- Any structures (folds, faults, etc.) that would project to the vertical cross-section plane should appear on the cross section.
- Strike & dip markers near the cross section line should be used to constrain the dip of planar structures (bedding, foliation, faults, etc.)
- If the strike of the marker is not perpendicular to the cross section a stereonet should be used to calculate the correct apparent dip.
- If the VE is not equal to 1.0 the apparent dip must be adjusted mathematically
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# Stereonet Example of Apparent Dip Calculation



# Apparent Dip Correction

- Cross section is plotted on stereonet as a vertical plane
- Intersection of cross section plane with bedding strike and dip yields the apparent dip measured in the cross section plane
- Note the end of the cross section from which the apparent dip angle is measured (similar to a rake angle)
- If the VE is not equal to 1.0:
  - Take the tangent of the apparent dip
  - Multiply the ratio \* the VE
  - Take the ArcTan of the result
  - Example:  $\text{ArcTan} (\text{Tan} (50) * 4) = 78$

# Other Hints and Strategies

- Use your knowledge of the stratigraphy to constrain the cross section. If the beds keep a constant thickness on the map use that in the cross section.
- If the compass direction of the cross section changes note the change in direction on the cross section, otherwise, the technique does not change
- You will need to calculate the plunge & bearing of the hinge to project a map-scale fold to the cross section so you may need to measure and plot bedding from the entire map area affected by the folding to get a good fit.