

## Quiz 7: Subduction (Ch. 9)

1. What controls the limits (in space) of the Wadati-Benioff Zone?

simplest answer: rock stiffness/low stress at the shallow end, temperature-driven transition to plastic flow at the deep end

2. Explain the process of tectonic underplating in accretionary wedges.

Sediments subduct along with the down going plate. if the plate boundary fault steps down through the sub ducting sediments, a portion of the sediments effectively join the over-riding plate, adding a block of sediments at depth.

3. Name three diagenetic processes affecting subducting materials which can affect the rheologic properties of the plate boundary.

opal diagenesis, clay transition to micas, organic maturation, alteration mineral dehydration (e.g. zeolites, amphiboles), compaction, etc.

4. Two processes which add sediments to the wedge are: deposition in forearc basins, and frontal accretion. How can these two environments be distinguished in the rock record?

Frontal accretion - imbricate thrust packages of trench/pelagic sediments which dip landward, often steeply (to vertical), intense isoclinal folding and bedding parallel thrusts. Forearc basins: flat lying, folded in upright gentle- to open folds. Both environments show horizontal shortening.