SEDIMENTARY BASINS: TECTONICS AND MECHANICS

READING ASSIGNMENTS

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text(s):
required: C.J. Busby and R.V. Ingersoll, editors, 1995, Tectonics of Sedimentary Basins:
Blackwell Science, Cambridge, Massachusetts, 579 p.; referred to in reading list as BIB book
Blackwell Scientific Publishing (we will use parts of several chapters of this, but you can
probably get by without buying it -- share one with a couple friends, or look for a used one)
other readings: From time to time, other readings will be assigned. Photocopies of those papers
will be available in Snee reading room.

August 30

1. introduction (philosophy, scope, work expectations); overview of basin classification; independent
   variables in basin system (subsidence, supply, surface processes, eustatic sea level)
   *Busby and Ingersoll, chapter 1 of BIB, p. 1-9

week of Sept. 2

Part 1: Mechanical Principles

2. mechanical introduction (isostasy/uplift/subsidence -- scales and rates)
   *Jordan (chapter 9 of BIB, p. 334)

3. heat flow and cooling of the lithosphere
   *Allen & Allen, chapt 2 (section 2.2, p. 27-34)
   *Leeder (chapt 3 of BIB), p. 120 and 121, including figures 3.2-3.4

4. rheologies; intro to bending of elastic plates
   *Allen & Allen, chapt 2 (section 2.3, p. 34-39), chapt. 4 ( section 4.1-4.4, p. 93-109);
   *Jordan (chapter 9 of BIB, p. 334-337)

HOMEWORK 1: Isostasy (due Sept. 6)
week of September 9

5. flexure (continued): examples for oceanic lithosphere and continental lithosphere; comparison of Airy compensation and regional (flexurally supported) compensation; equations for flexure of distributed loads

HOMEWORK 2: Flexure (due Sept. 13)

**Part 2: Application of the mechanical principles to the real earth: uncertainties and complexities**

6. in-plane stress; relaxation of elastic strength

7. Temporal and spatial variations of flexural rigidity on continents; see again last week's Allen & Allen assignment from chapter 4 (p. 100-108) and the Watts (1992) paper listed above