



Geog 4/527: Fluvial Geomorphology

Spring 2016; 2:00-3:20 Tues-Thurs
 Prof. Patricia McDowell

Course content and goals: The course covers four themes.

- Processes that shape river channels
- Ecological interactions in the channel and riparian zone
- How channels and floodplains evolve through time
- River restoration and human impacts on river channels

The learning objectives are:

- Understand and be able to apply basic concepts of river behavior such as channel-flow interactions, sediment transport, channel morphology, channel-ecological interactions, etc.
- Analyze river hydrology, sediment transport and morphology using spreadsheets and simple models.
- Understand and be able to apply basic field skills in fluvial geomorphology.
- Effectively use relevant web pages and geospatial tools to collect information and solve problems about rivers.
- Demonstrate effective written, verbal and graphic communication skills.

Grading: Test 1 30%, Test 2 20%, exercises 60% (6 labs @ 10 pts each). For undergrads, your lowest lab score will be dropped. For grad students, all 7 labs will count and your score calculated on that basis.

Course Format: Class meets twice a week, with lecture and discussion interwoven. There is no separate lab meeting; labs will be introduced in class. Two labs require you come on a field trip, usually offered on a weekend day or Friday afternoon. (If you cannot come on field trips, see Pat McDowell for alternatives.) There is a transportation fee (\$5-10) for those who go on the field trips.

Schedule: This schedule may change. Lecture topics may shift around.

| Week | Topics | Labs |
|------|----------------------------------------|--------------------------------------------|
| 1 | Flow regimes | 1: River discharge |
| 2 | Sediment sources, sediment budgets | 2: Sediment budget |
| 3 | Flow hydraulics in the channel | 3: Flow and resistance |
| 4 | Sediment erosion and deposition | 4: Sediment entrainment and transportation |
| 5 | Channel form; Test 1 | |
| 6 | Reach morphology, channel planform | 5: Channel cross-section (field trip) |
| 7 | Channel ecology and large woody debris | 6: Reach analysis |
| 8 | Floodplains, longitudinal profile | |
| 9 | Rive restoration | 7: Restoration (field trip) |
| 10 | River management, Test 2 | |