

Geology 376/GLE 401 Coastal Geomorphology

Instructors: Professors Dave Mickelson and Chin Wu

Objectives:

This course covers the topics on how waves are developed, travel and break on the shore, sediment transport, and depositional and erosional landforms. Field projects will include calculation of wave run-up, wave impact heights, beach and nearshore sediment volumes, sediment budgets, seasonal changes in the beach, and impacts of engineering structures.

Course outline:

- Sept. 8 Intro to beach morphology and sediments/ monitoring techniques (D,W)
11 FIELD TRIP (D,W)
15 Wave processes (W)
22 Wave processes (W)
29 Waves and currents, short-term water level change (W)
- Oct. 6 Beach profile evolution and sediments, long term water level change (W,D)
13 Classification of coasts, coastal settings (D)
16 FIELD TRIP (D,W)
20 Plate tectonics, rocky coast processes and landforms (D)
27 Bluff dynamics Great lakes and marine (D)
- Nov. 3 Landforms of accretionary coasts – spits, bars, barriers (D)
10 Coastal structures (W)
13 FIELD TRIP (D,W)
17 Coastal management issues (Invited speakers)
24 No class – project work only
- Dec. 1 Student presentations
8 Student presentations
15 Student presentations
21 FINAL EXAM 7:25 am Tuesday

Grading: Grades will be based on the following:

Homework 30%

Final exam 30%

Final project (web site and oral presentation) 40%

Time and location:

Wednesday: 1:20-3:15 pm, @ 212 Weeks Hall.

- Early part of the semester is lecture format. The remaining part of the semester is seminar format.
- Field trips: September 11, October 16, and November 13.

Textbook:

- Davis, R. A. and Fitzgerald, D. M. 2004, Beaches and Coasts. Blackwell

Other references:

- Bird, E. C.F. 1993, *Submerging Coasts*, Wiley.
- Bryant, E. 2001, *Tsunami*, Cambridge University Press.
- Carter, R.W.G. 1988, *Coastal Environments*, Academic Press.
- Carter, R.W.G. and Woodroffe, C.D. 1994, *Coastal Evolution*, C.U.P.
- Davies, J.L. 1980 *Geographical Variation in Coastal Development*, Longman.
- Davis, R.A. 1978, *Coastal Sedimentary Environments*, Springer Verlag.
- Hansom, J.D. 1988, *Coasts*, Cambridge University Press.
- Haslett, S. K., 2003, *Coastal Systems*, Routledge.
- Houghton, J.T. 1997, *Global warming, the complete briefing*. C.U.P.
- Masselink, G and Hughes, M. G. 2003, *Introduction to coastal processes and geomorphology*. Arnold.
- May, V. J. and Hansom, J. D. 2003, *The Coastal Geomorphology of Great Britain*. GCR Series No. 28, Joint Nature
- Conservation Committee, Peterborough. Open University, 1993, *Waves, Tides and Shallow-water Processes*. Pergamon.
- Pethick, J.S. 1984, *Introduction to Coastal Geomorphology*, Longmans.
- Trenhaile, A.S. 1997, *Coastal dynamics and landforms*, Oxford University Press.
- Woodroffe, C.D. 2002, *Coasts: form, process and evolution*. Cambridge University Press.