



CEE618 Field Assessment of Impacts of Changing Climate in Great Lakes

Summer 2008 for 8 weeks lectures/hands-on field class in Lake Superior
June 16, and 23 – Discussion and Lab (10:00 am – 4:00 pm)
July 14 – 21 (Apostle Island Field Trip)

July 28, Aug 4 and Aug 11 – Data Analysis and presentation (10:00 am – 12:00 pm)

Instructors: Chin Wu for Water Assessment
Dante Fratta for Geological Assessment
Trina McMahon for Environmental Microbes Assessment
Gene Clark Coastal Environment Assessment



Introduction

Recent studies show that changing climate has somehow resulted in low lake levels, shorter ice-covered periods, and increasing extreme storm events in Lake Superior. However little is known on the impacts of changing climate on nearshore (i) wave action and circulation, (ii) sediment transport and sub-bottom geological substrates, and (iii) water quality and habitats/microbial activities. We (Wu, Fratta, McMahon, and Clark) propose to offer an inter-disciplinary summer class to address these impacts. The class would consist of (1) general introduction for changing climate, monitoring instruments, and data analysis technique, (2) one-week field work at the nearshore areas in Lake Superior (Michigan Island, Little Sand Bay Harbor, and Sea Cave, (3) final report of assessment of the changing climate impacts.

Class Objectives:

- Address the impacts of changing climate on the nearshore area in Lake Superior through literature review, data compiling, collection, and analysis.
- Use state-of-the art field/lab instruments to conduct water, geological, and environmental assessments.
- Learn and use the-state-of-art data analysis techniques (time series analysis, spectral analysis, Hilbert and wavelet analysis, and statistics) to assess the impacts of changing climates

Field Site:

Lake Superior is the largest of the Great Lakes and deep enough to hold the combined water in all the other Great Lakes. In 2007 water level is at its lowest point in eight decades. Shorelines are dozens of yards wider than usual, giving sunbathers wider beaches but also exposing mucky bottomlands and rotting vegetation. At the nearshore of Bayfield, wave climate and circulation have affected balance of longshore sediment transport, yielding dramatically downcutting of sediment beds. This is particular true in the area of Apostle Islands (see Fig). We will work with staff at the National Park Services to address the impact of changing climate at the Apostle Islands lakeshore.



Geo Engineering

Environmental Fluid Mechanics Laboratory

