



**US Army Corps  
of Engineers**

**Interpreting the Sedimentary Record:  
Theory and Field Methods**



Great Lakes Maritime Academy, Room 112, at  
Northwestern Michigan College - Great Lakes Campus  
715 E. Front Street at Barlow Avenue  
Traverse City, MI

15-19 August 2011

Presented By:  
U.S. Army Corps of Engineers, Detroit District  
Great Lakes Hydraulics and Hydrology Office  
With Support from the Great Lakes Commission

**15 AUGUST (Monday) – Glacial Sediment**

- |               |  |   |
|---------------|--|---|
| 8:00 – 8:30   | Introduction<br>Class Overview<br>Great Lakes Tributary Modeling Program   | (Jim Selegean,<br>USACE – Detroit District) |
| 8:30 – 10:30  | Identification of Glacial Sediment <ul style="list-style-type: none"> <li>• Glacial (till)</li> <li>• Glaciofluvial (outwash)</li> <li>• Glaciolacustrine (bedded sands, silts and clays)</li> </ul>             | (Grahame Larson,<br>MSU Geology Dept.)      |
| 10:30 – 10:45 | BREAK  |   |
| 10:45 – 12:00 | Identification of Glacial Sediment (continued) <ul style="list-style-type: none"> <li>• Glacial (till)</li> <li>• Glaciofluvial (outwash)</li> <li>• Glaciolacustrine (bedded sands, silts and clays)</li> </ul> | (Grahame Larson,<br>MSU Geology Dept.)      |
| 12:00 – 1:00  | LUNCH while traveling to field site  |   |
| 1:00 – 6:00   | Interpret Glacial Sediments in the Field <ul style="list-style-type: none"> <li>• Glacial (till)</li> <li>• Glaciofluvial (outwash)</li> <li>• Glaciolacustrine (bedded sands, silts and clays)</li> </ul>       | (Grahame Larson,<br>MSU Geology Dept.)      |
| ≥ 7:00        | Icebreaker at hotel (Bayshore Resort) – Informal gathering to eat, drink and get to know your classmates. (833 East Front Street, Traverse City, MI 49684, (800) 634-4401)                                       |   |

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**16 AUGUST (Tuesday) – Fluvial and Pond Sediment**

8:00 – 8:45	Fluvial Environments and Features <ul style="list-style-type: none"><li>• Fluvial</li><li>• Lacustrine/Pond</li><li>• Man-made</li></ul>	(Faith Fitzpatrick, USGS, Madison, WI)
8:45 – 9:30	Field Identification	(Faith Fitzpatrick, USGS, Madison, WI)
9:30 – 10:00	Soils	(Faith Fitzpatrick, USGS, Madison, WI)
10:00 – 10:15	BREAK	
10:15 – 11:15	Reconstructing Alluvial and Lacustrine Sed. Environments <ul style="list-style-type: none"><li>• Pre-field Characterization</li><li>• Field Methods</li><li>• Laboratory Methods</li></ul>	(Faith Fitzpatrick, USGS, Madison, WI)
11:15 – 12:15	Examples	(Faith Fitzpatrick, USGS, Madison, WI)
12:15 – 1:00	LUNCH while traveling to field site	
1:00 – 6:00	Interpret Fluvial/Pond Sediments in the Field <ul style="list-style-type: none"><li>• Deltas</li><li>• Channels</li><li>• Floodplains</li><li>• Buried soils</li><li>• Terraces</li></ul>	(Faith Fitzpatrick, USGS, Madison, WI)

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**17 AUGUST (Wednesday) – Terraces and Aeolian Sediment**

- 8:00 – 10:00 Introduction to Terraces and Aeolian Sediment (Alan Arbogast,  
MSU Geography Dept.)
- 10:00 – 10:15 BREAK
- 10:15 – 11:15 Identification of Terraces (Alan Arbogast,  
MSU Geography Dept.)
- Geomorphology
  - Terrace Types and Significance
  - Field Identification
  - Depositional Environment
  - Sediments and Bedding Types
  - Misc. Field Tests/Methods
- 11:15 - 12:15 Identification of Aeolian Sediment (Alan Arbogast,  
MSU Geography Dept.)
- Geomorphology
  - Aeolian Deposit Types and Significance
  - Field Identification
  - Depositional Environment
  - Sediments and Bedding Types
  - Misc. Field Tests/Methods
- 12:15 – 1:00 LUNCH while traveling to field site
- 1:00 – 6:00 Interpret Terraces/Aeolian Sediments in the Field (Alan Arbogast,  
MSU Geography Dept.)
- Visit Manistee River Terrace Sites
  - Visit Aeolian Sand Sites
  - Visit Quiz Site

## **Interpreting the Sedimentary Record: Theory and Field Methods**

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### **18 AUGUST (Thursday) – Coastal Features and Deposits**

- 8:00 – 9:00 Introduction to the Coastal Depositional System (Todd Thompson, Indiana Geological Survey)
- Controls on Shoreline Sedimentation
  - Coastal Process and Littoral Transport
  - Shoreline Behavior
  - Shoreline Features
- 9:00 – 10:00 Identification of Coastal Facies (Todd Thompson, Indiana Geological Survey)
- Types
  - Characteristics
- 10:00 – 10:15 BREAK
- 10:15- 11:15 Coastal Sequences (Todd Thompson, Indiana Geological Survey)
- Transgressive
  - Regressive/Aggradational
- 11:15 – 12:15 Chronostratigraphic Techniques (John Johnston, University of Toronto)
- Applications
  - Short-lived vs. Long-lived Isotopes (Cs<sup>137</sup>, Pb<sup>210</sup> and C<sup>14</sup>)
  - Optically Stimulated Luminescence (OSL)
- 12:15 – 1:00 LUNCH while traveling to field site
- 1:00 – 6:00 Interpret Features in the Field (Todd Thompson and John Johnston)
- Visit modern Peterson Beach
  - Visit Platte Lake Strandplain
  - Demonstrate Vibracoring
- ≥8:00 Sediment Transport Movie Night (hotel breakfast room)

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**19 AUGUST (Friday) – Examining Modern Sediment Sources and Sinks**

- 8:00 – 9:00 Overview of field site (Jim Selegean,  
USACE – Detroit District)
- 9:00 – 9:30 Travel to Boardman River
- 9:30 – 2:00 Field identification of fluvial sediment sources and sinks and the examination of other items of fluvial significance on Boardman River. Canoes will put in at Ranch Rudolph and take out at Brown Bridge Dam. Trip will pass through impoundment delta and the wedge of incision created by a partial draw-down. We will examine the composition of the point bars, bed and banks and discuss the significance of these features.

END OF CLASS