



Local Research Projects Foster Student Learning in a Growing Undergraduate Department

Earth and Oceanographic Science
Bowdoin College
Brunswick, Maine

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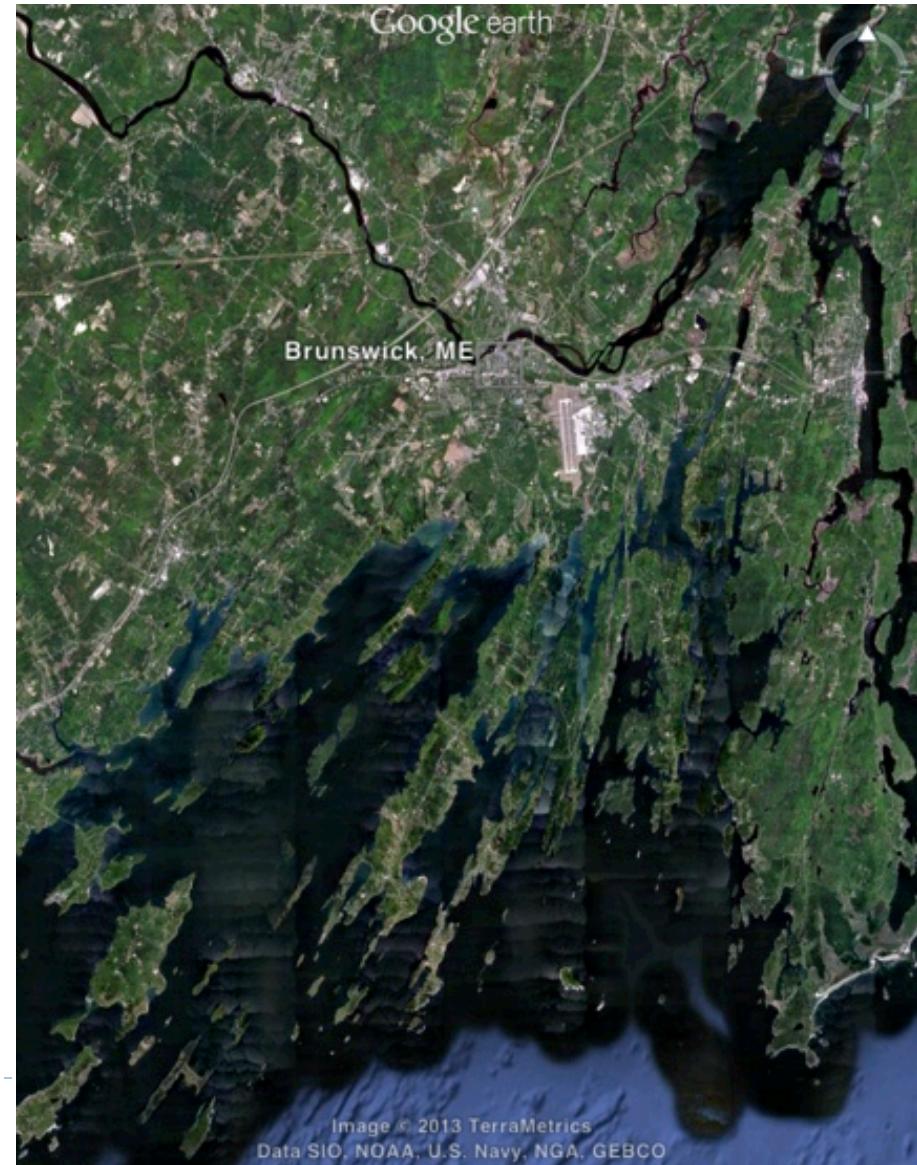
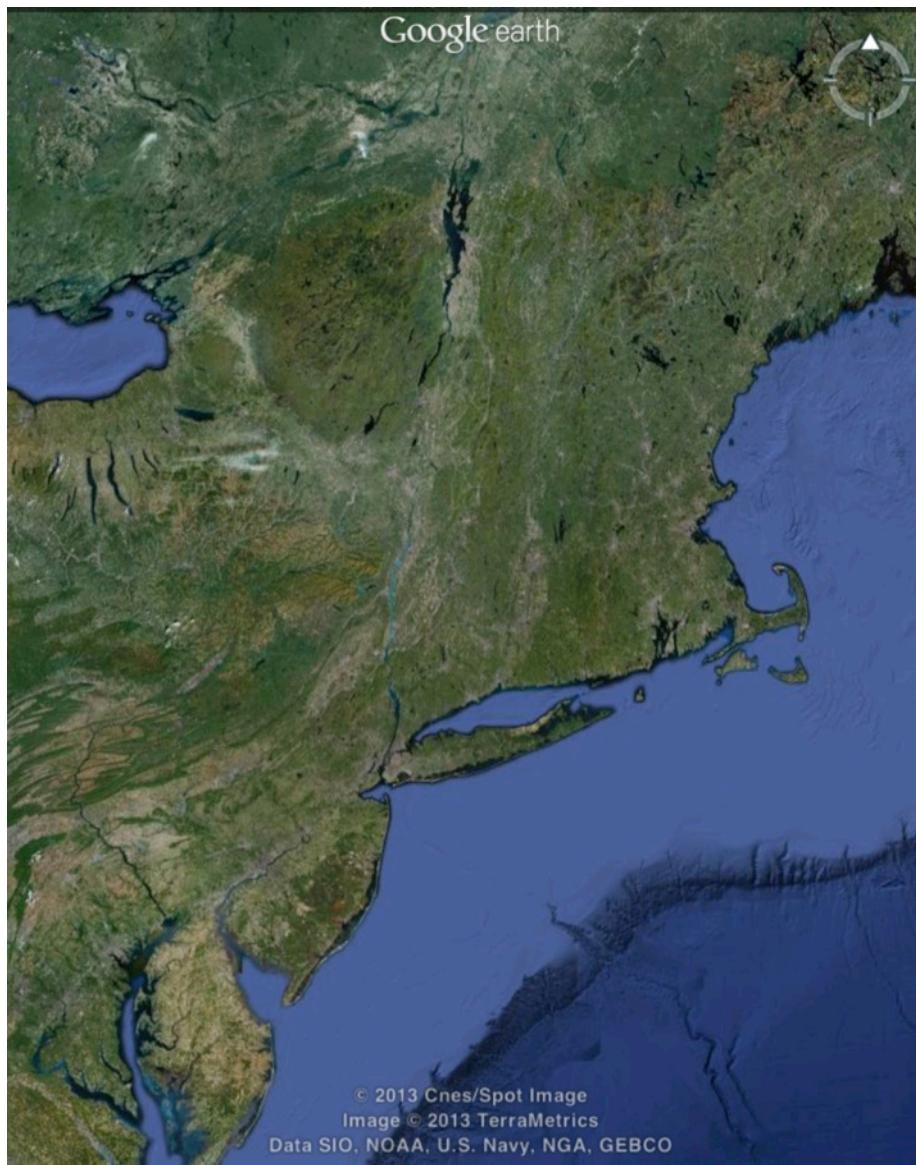
Local research projects foster student learning



- ▶ Connecting students with place
- ▶ New curriculum for majors
- ▶ Examples
 - ▶ Research projects in introductory courses
 - ▶ Real-time data
 - ▶ Student research during the semester and summer
 - ▶ Departmental field seminars
- ▶ Results
 - ▶ 4-fold increase in # of majors
 - ▶ Students skilled in observational & analytical techniques
 - ▶ Students familiar with how earth's systems operate in local area

▶ *Students collecting sample during profile of Somes Sound. Departmental Field Seminar 2011.*

Connecting students with place



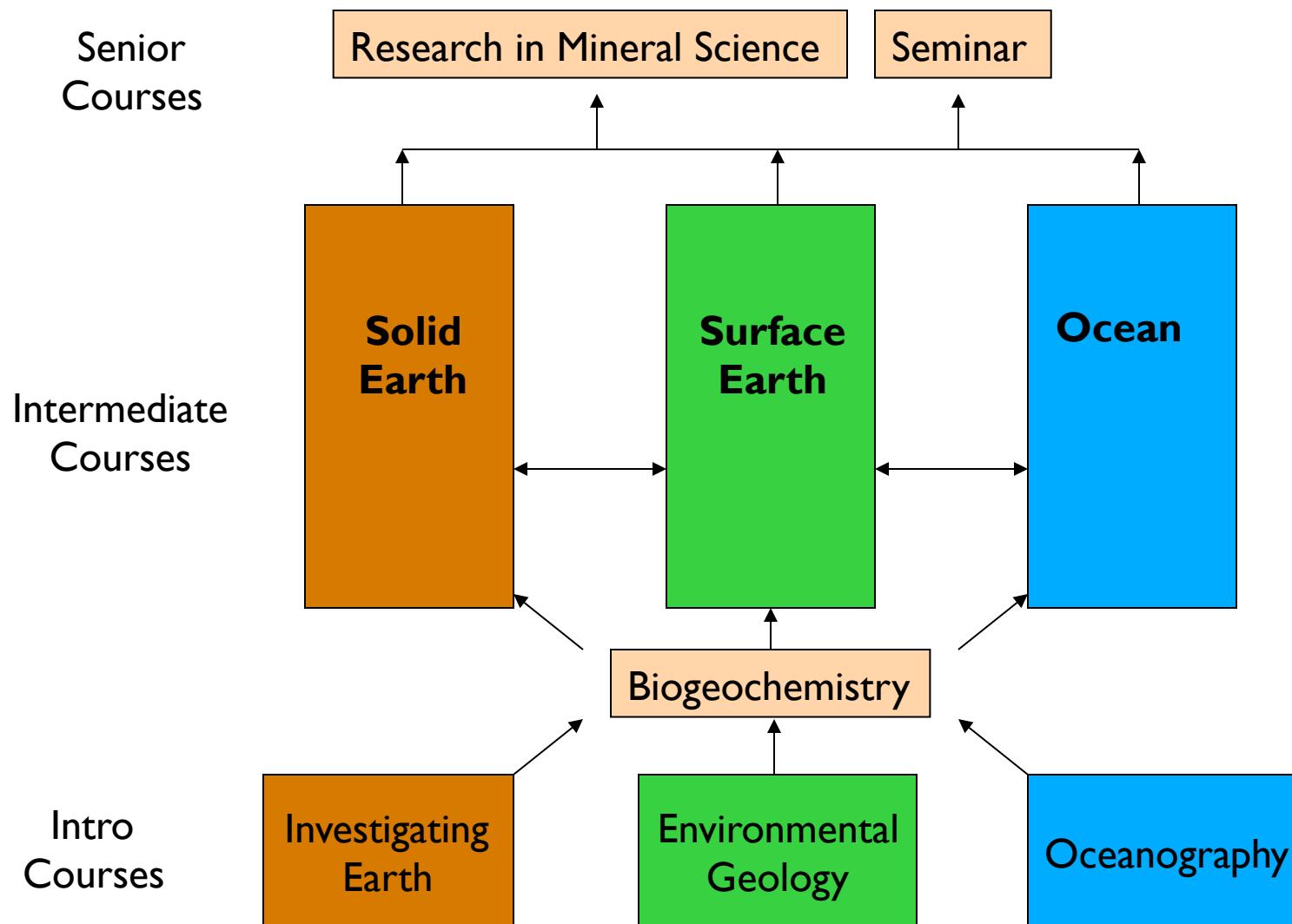
Connecting Students with Place: a new curriculum

- ▶ Capitalizes on college's coastal Maine location
- ▶ In line with college's mission:
"To count nature a familiar acquaintance" *
- ▶ Supported by administration
- ▶ Emphasizes student research
- ▶ Helps students learn how earth's systems operate



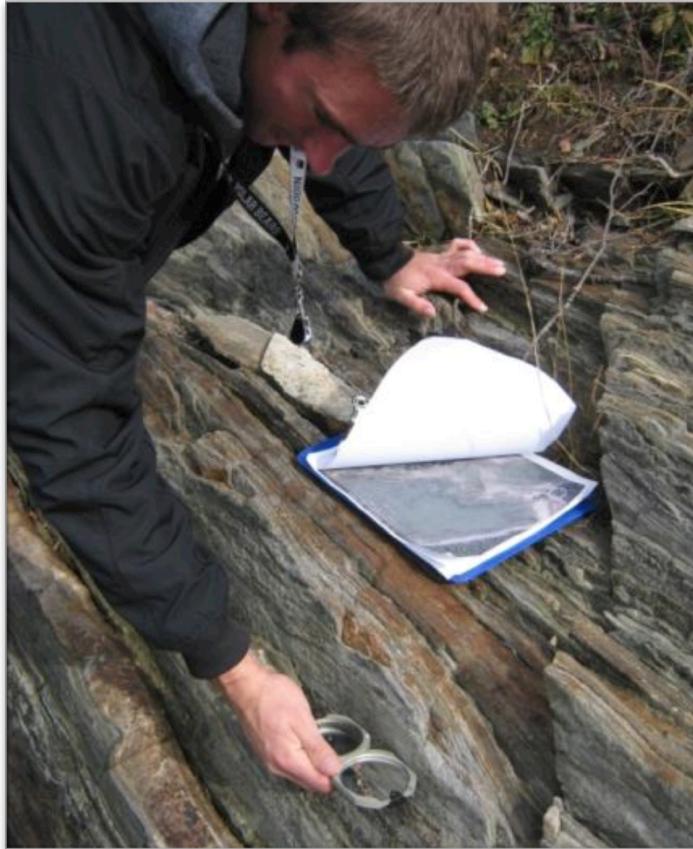
▶ * Selection from "Offer of the College" by William DeWitt Hyde, President of Bowdoin College 1885 – 1917.

New Curriculum



► Approved in 2010; 2014 class is first to graduate under new requirements.

Examples



Small group petrology and structural geology research projects in field and lab.

- ▶ Investigating Earth – introductory course

Examples



Service-learning projects using real-time water-quality, lake profiling, and stream-flow data.

- ▶ Environmental geology and hydrology – introductory course

Examples



Students use MatLab to visualize data they collect from ships in local coastal waters.



Students conduct research using data obtained from the college's real-time oceanographic mooring.

Examples

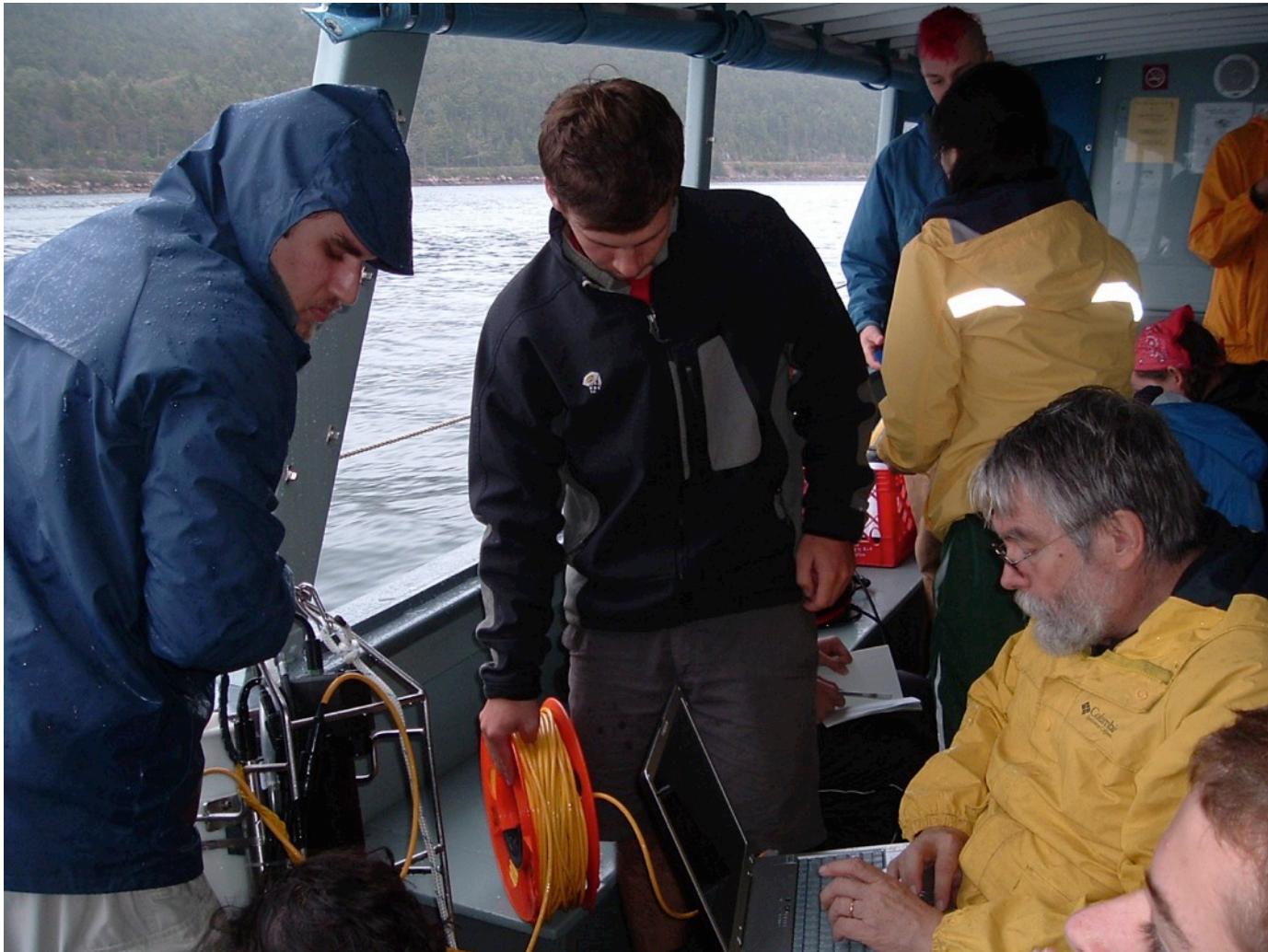


Students design, propose, implement and present their own projects by applying analytical techniques introduced in the course.

For example, using nutrient spectrophotometry to analyze local soil or water samples.

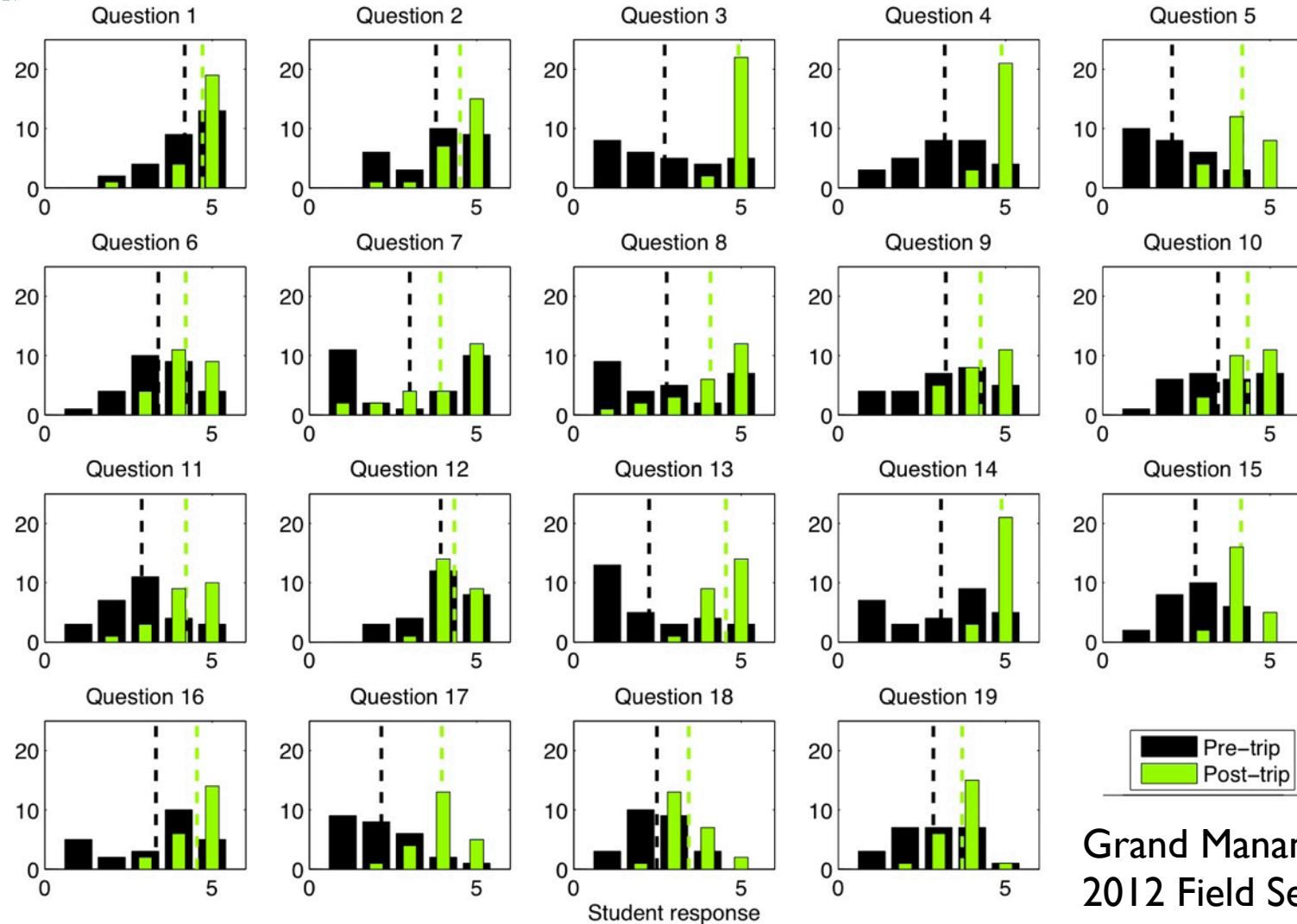
- ▶ Biogeochemistry – required 200 level course

Examples: department field seminars



- ▶ Launching the CTD: Somes Sound profile 2011.

Results: Pre- & Post- Field Seminar Survey



Grand Manan
2012 Field Seminar

► Knowledge survey: *I* = *I have no idea*; *3* = *I think I know this*; *5* = *I'm certain of this answer*

Results: increase in number of faculty



Rachel Beane



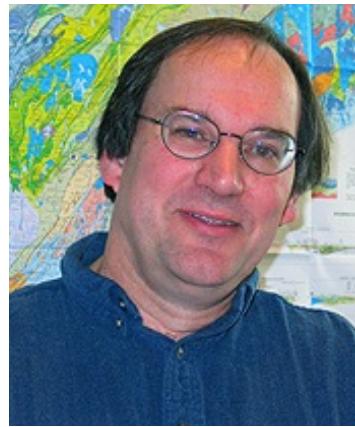
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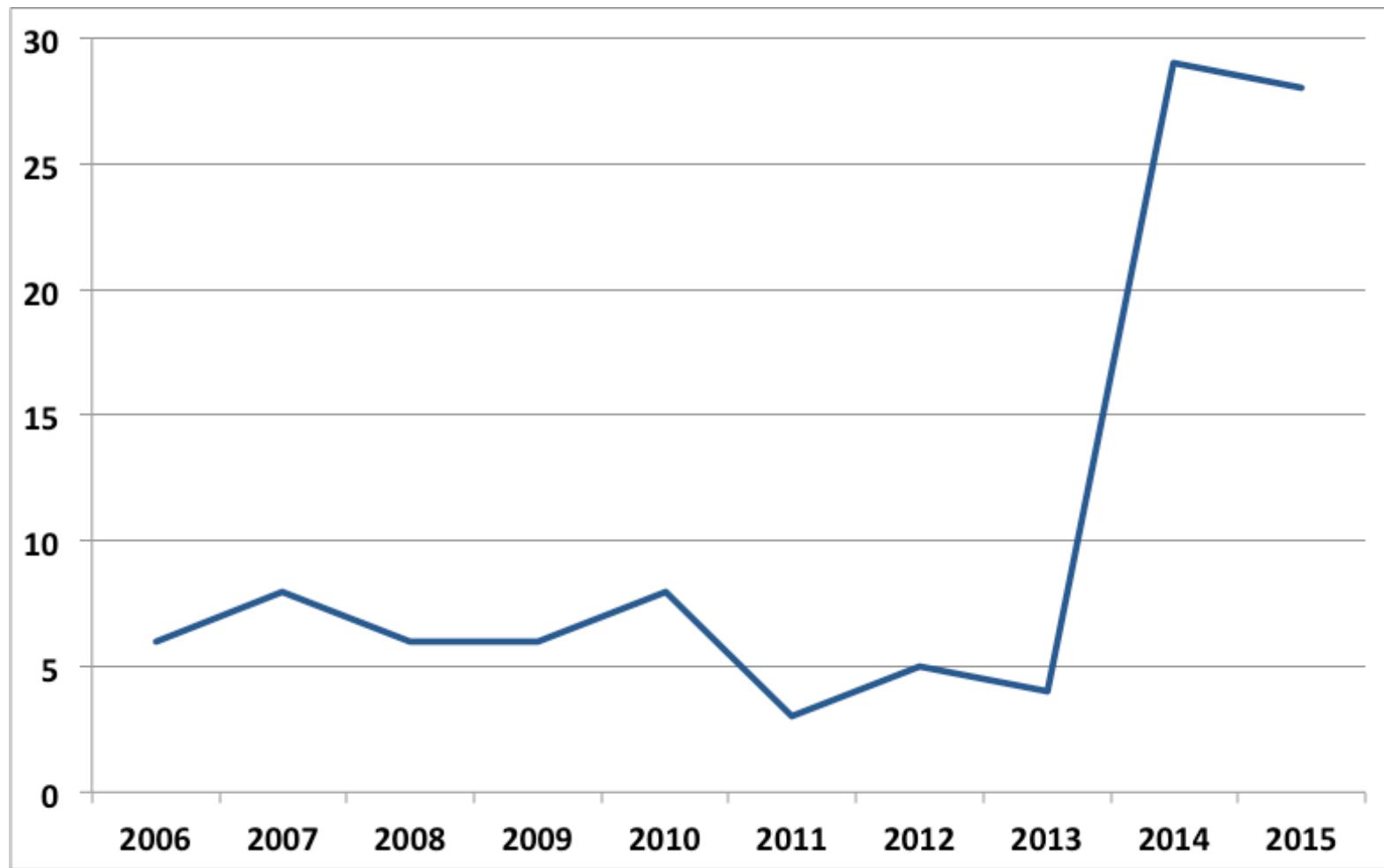
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Results: large increase in number of majors



► 2010: New curriculum approved.

2014: First class graduating under new curriculum.

Results: Students are...

- excited to do science.
- asking questions.
- making observations.
- testing hypotheses.
- conducting analyses.
- making interpretations.
- working together.
- learning about the region.



► Grand Manan 2012 Departmental Field Seminar. Students filtering water for total suspended solids and chlorophyll analyses.

Acknowledgements to:



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- Colby College
- University of Maine

