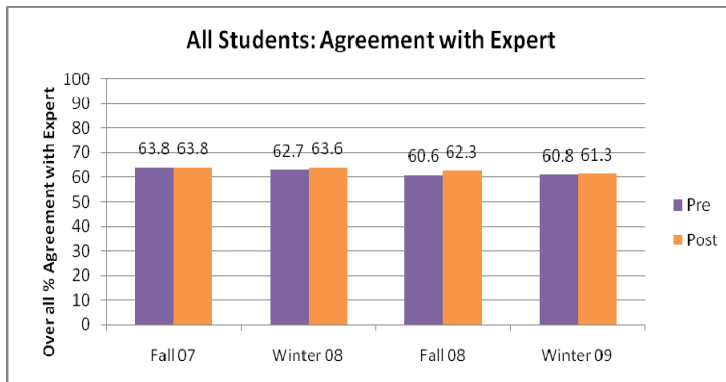


## Quantifying Student Attitudes in EOS

Alison Jolley, [ajolley@eos.ubc.ca](mailto:ajolley@eos.ubc.ca)

On average, our students do not develop more expert-like attitudes, based on four terms of results from the Student Attitudes about Earth Science Survey (SAESS\*).

\* See next page



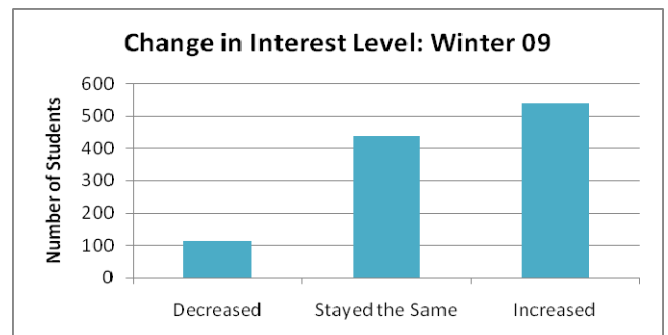
Attitudes don't get better, but they don't get worse either (Fig. 1), which is different from results in the Physics and Chemistry departments at the University of Colorado. The Colorado Learning Attitudes about Science Survey (CLASS) shows that students typically become 10-20% more novice-like after taking introductory courses<sup>1</sup>.

**Figure 1:** Overall percentage agreement with expert opinion for all students.

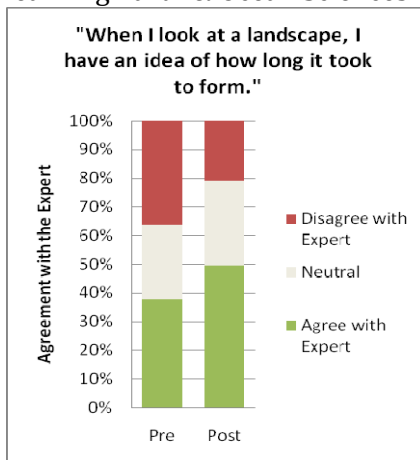
Changes in pedagogy at the University of Colorado have significantly improved attitude shifts, and CLASS results now show a result similar to ours – little change overall (<http://www.colorado.edu/sei/class/>). Can we do even better?

**Good news:** Although attitudes may not get more expert-like over one course, many students continue to report that their interest level in Earth and Ocean Sciences increased (Fig. 2).

**Figure 2:** Post-course change in interest level rating.

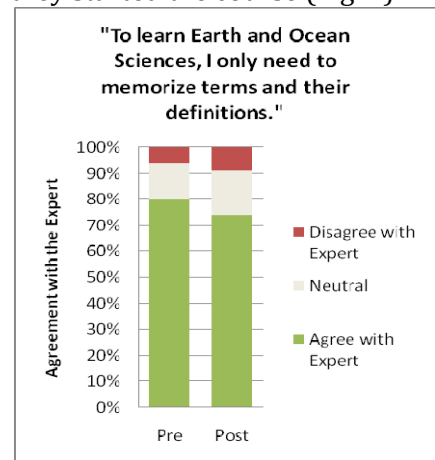


**Mixed news:** On average (including intro and upper-level courses), students report increased confidence in their understanding of geologic time (Fig. 3). Interestingly, students in 3<sup>rd</sup> year majors courses shift away from the expert view on this statement, while students in intro courses shift toward the expert view. An upper-level reality check? Unfortunately, after taking an EOS course, about 25% of students think that learning Earth & Ocean Sciences is about memorization, more than when they started the course (Fig. 4).

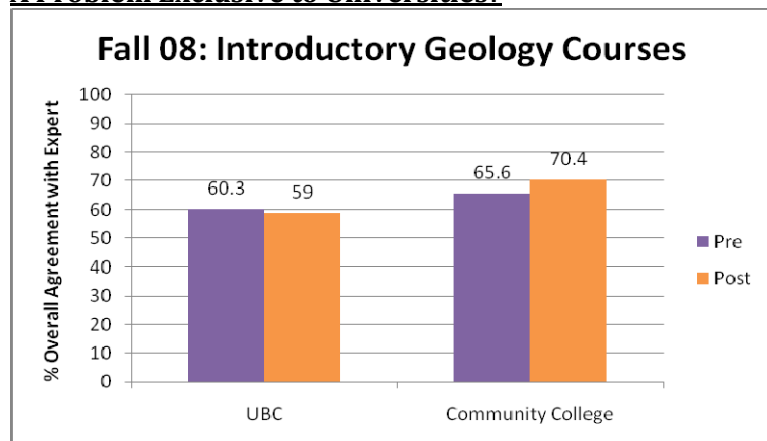


**Figure 3 (left):** On average, more students agree with the expert response to this statement about geologic time after taking an EOS course.

**Figure 4 (right):** On average, students shift away from the expert response to this statement about memorization after taking an EOS course.



## A Problem Exclusive to Universities?



Preliminary results with the Geology department at CU are similar to ours, but introductory geology students at a community college showed positive attitudinal gains. What are they doing differently?

**Figure 5:** Percent change in student answers from similar introductory geology courses at UBC and a community college in Oregon.

## About SAESS

It is a 10 minute survey that is currently offered in over 20 EOS courses each term. The current version of the survey (V3.5) contains 35 Likert scale statements (5 point, strongly disagree to strongly agree) relating to a variety of categories including real world connections and quantitative understanding, as well as a rating scale and free response question on personal interest. The survey is administered online both at the beginning and end of term, with instructors typically offering 1% bonus towards the course grade if students complete both (we need both for the data to be useful, and offering a small reward greatly increases the number of responses).

### SAESS Goals:

- Establish students' beliefs about the nature and relevance of Earth and Ocean Science
- Determine whether students approach Earth and Ocean Science the same way that scientists do
- Reveal the effects of course innovations on student attitudes and interest

## SAESS Currently

The project is led by STLF Erin Lane, who has hired an undergraduate research assistant (me!) for the summer (supported by a Skylight Grant) to continue the work on SAESS. Preliminary analysis of two years of data is complete and we are now working on categorizing the responses and writing a paper for publication. Individual summaries for instructors have also been emailed out.

## We Need Your Help!

Before we can publish a detailed paper about SAESS, final validation and expert responses for the current version are needed. We have opened up the survey for faculty and grad students to fill out online, so please take 10 minutes to help us out! Log on to <http://www.eos.ubc.ca/scripts/courses/saess/survey.html>, using the user name saess, the password earth, and select Aoss 102 as the course enrolled. Thank you!

## Get Your Students Involved in SAESS

Want to see if your students' views change over the course of the term? You can use this information to help you decide what to maintain or change for your class in the future.

Email Erin Lane ([elane@eos.ubc.ca](mailto:elane@eos.ubc.ca)) if you're interested.

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<sup>1</sup> Adams, W.K. et al. (2006). New instrument for measuring student beliefs about physics and learning physics: The Colorado Learning Attitudes about Science Survey. *Physical Review Special Topics – Physics Education Research*. 2(010101), 1-14.

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**Contact EOS-SEI:** To talk about your course(s) or teaching and learning in general, visit EOS-South 361, or contact Francis Jones ([fjones@eos.ubc.ca](mailto:fjones@eos.ubc.ca)), Brett Gilley ([bgilley@eos.ubc.ca](mailto:bgilley@eos.ubc.ca)), Erin Lane ([elane@eos.ubc.ca](mailto:elane@eos.ubc.ca)), Josh Caulkins ([jcaulkins@eos.ubc.ca](mailto:jcaulkins@eos.ubc.ca)) or Sara Harris ([sharris@eos.ubc.ca](mailto:sharris@eos.ubc.ca)). See also <http://www.eos.ubc.ca/research/cwsei/>.