

Mapping for Mastery: Evolution of the Oliver Field School, University of British Columbia

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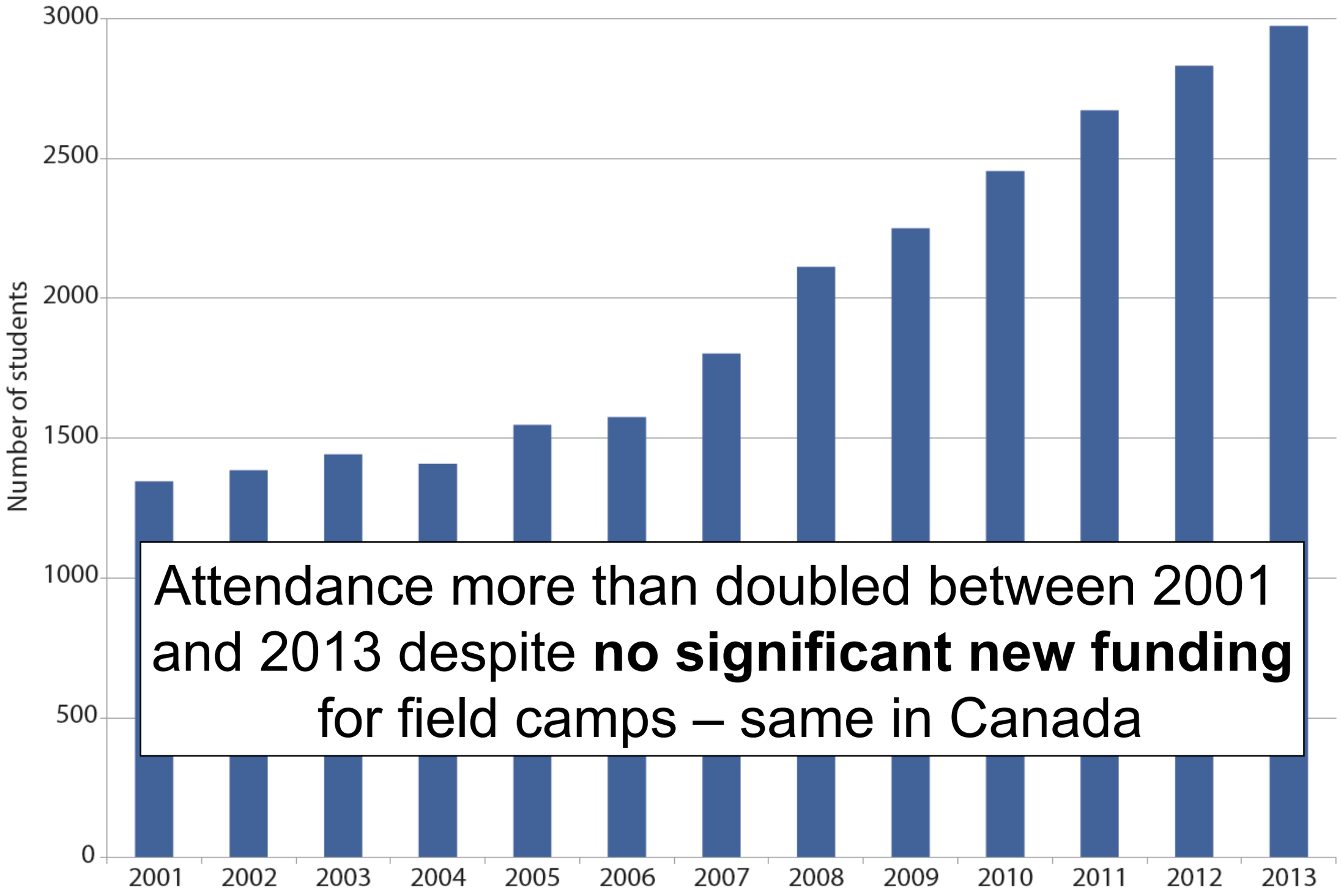
Overview

- The Value of Field School
- A Brief History of the UBC Field School
- Pedagogical Reform – What we did
- Results and Next Steps

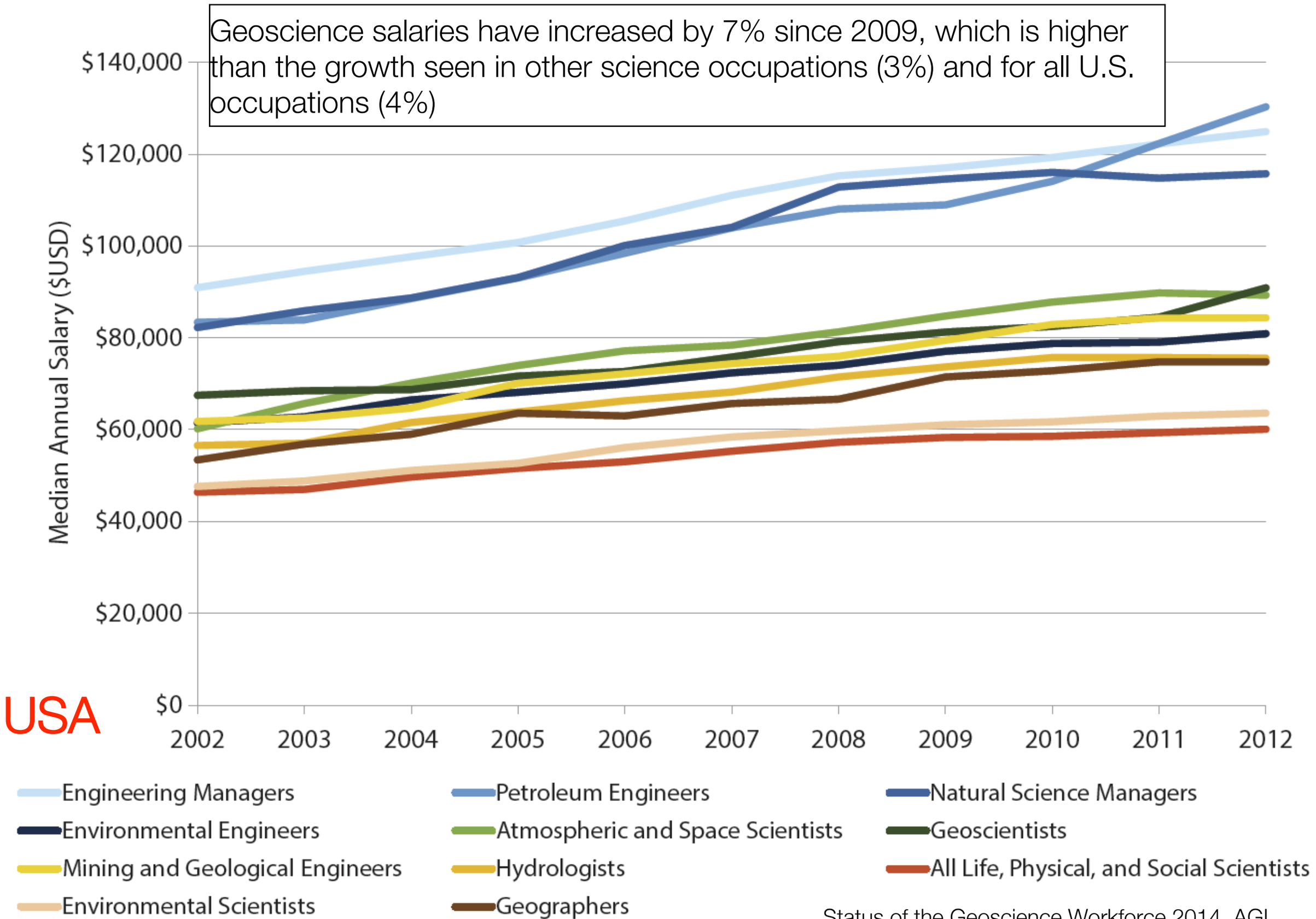
Figure 3.24: Field Camp Attendance, 2001-2013 (USA data only)



Data provided by Dr. Penelope Morton, UMN-Duluth

Status of the Geoscience Workforce 2014, AGI

Figure 4.8: Median Annual Salaries of Geoscience Occupations (2002-2012)



Status of the Geoscience Workforce 2014, AGI

AGI Geoscience Workforce Program; Data derived from the U.S. Bureau of Labor Statistics, National Occupational Employment and Wage Estimates

History of EOSC 328 - Field Geology

- Geological field school near Oliver, BC - a core program in our geological curriculum since 1950s (property purchased in 1961)
- Many different mapping exercises run over the years (e.g., Fairview, Shuswap, Ollala, Hedley)
- Taken at the end of 3rd year - it is a unique opportunity for students to integrate core geoscience knowledge

Third-year Field School Changes – Timeline

- **Pre-2009 – Numerous different exercises, different instructors**
- 2010 – New director of Oliver Field School – Ken Hickey
  - Field school becomes a “CWSEI course” in EOAS, includes a team of field geologists and pedagogy experts (the authors, Lucy Porritt, Kelly Russell, numerous excellent TAs)
  - Camp increased to 3 weeks, includes a 2-day "**Bootcamp**”
  - Introduces new White Lake Basin exercise
- 2010-2013 – Instructional reforms and data collection
- 2014 – launched the Integrated Okanagan Fault Mapping Exercise

Pedagogical Learning Outcomes

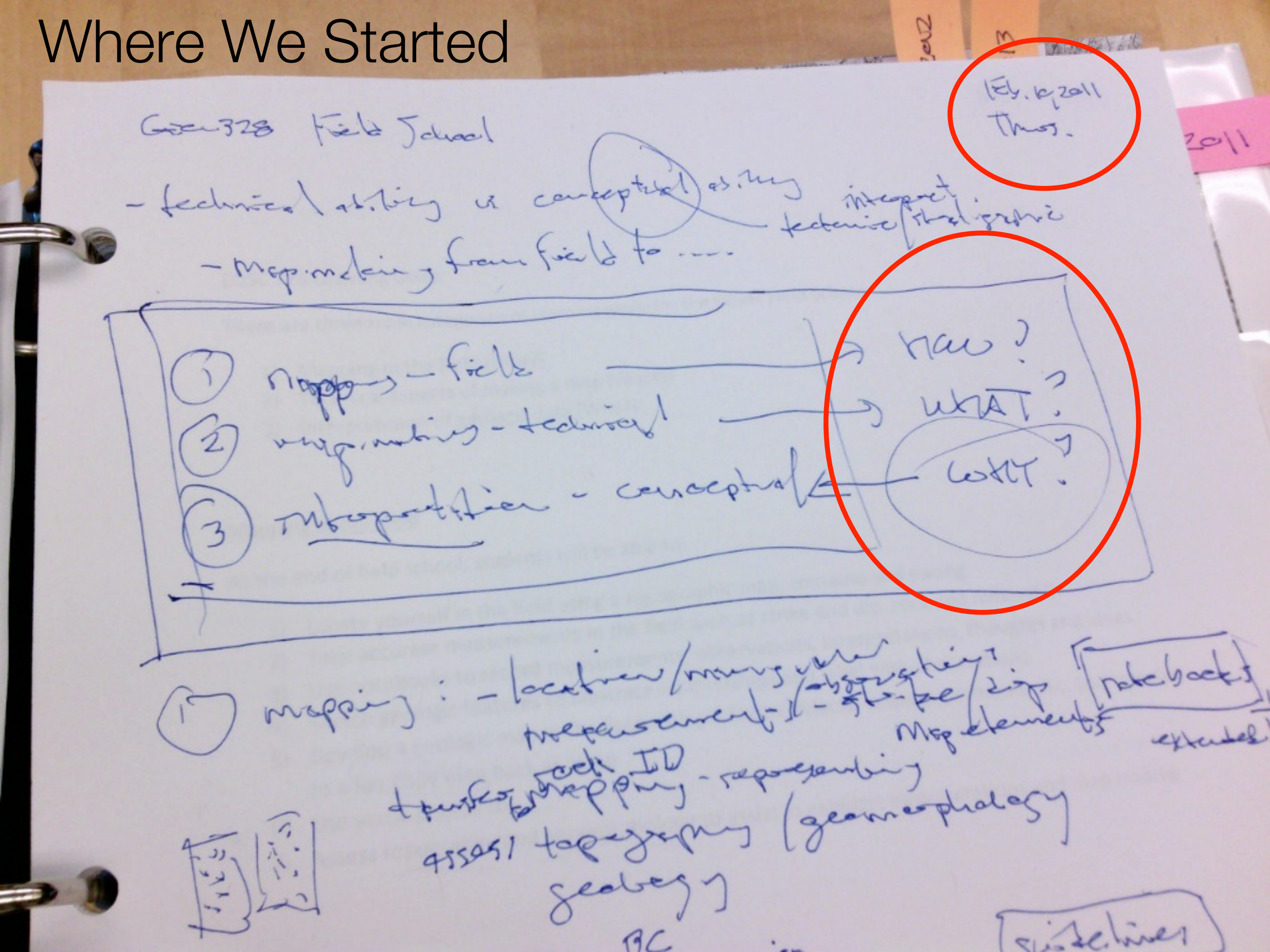
- Focus on: (i) developing proficiency (perhaps even expertise?) in geological mapping skills and field practices; and (ii) using geological mapping to solve geological problems

- Increase peer-to-peer learning (promoted by partner switching for every exercise)

- Planned and paced scaffolding – Focus on skill building and practice rather than “sink or swim”

- Ongoing course evaluation and evolution of pedagogical practices to improve student learning

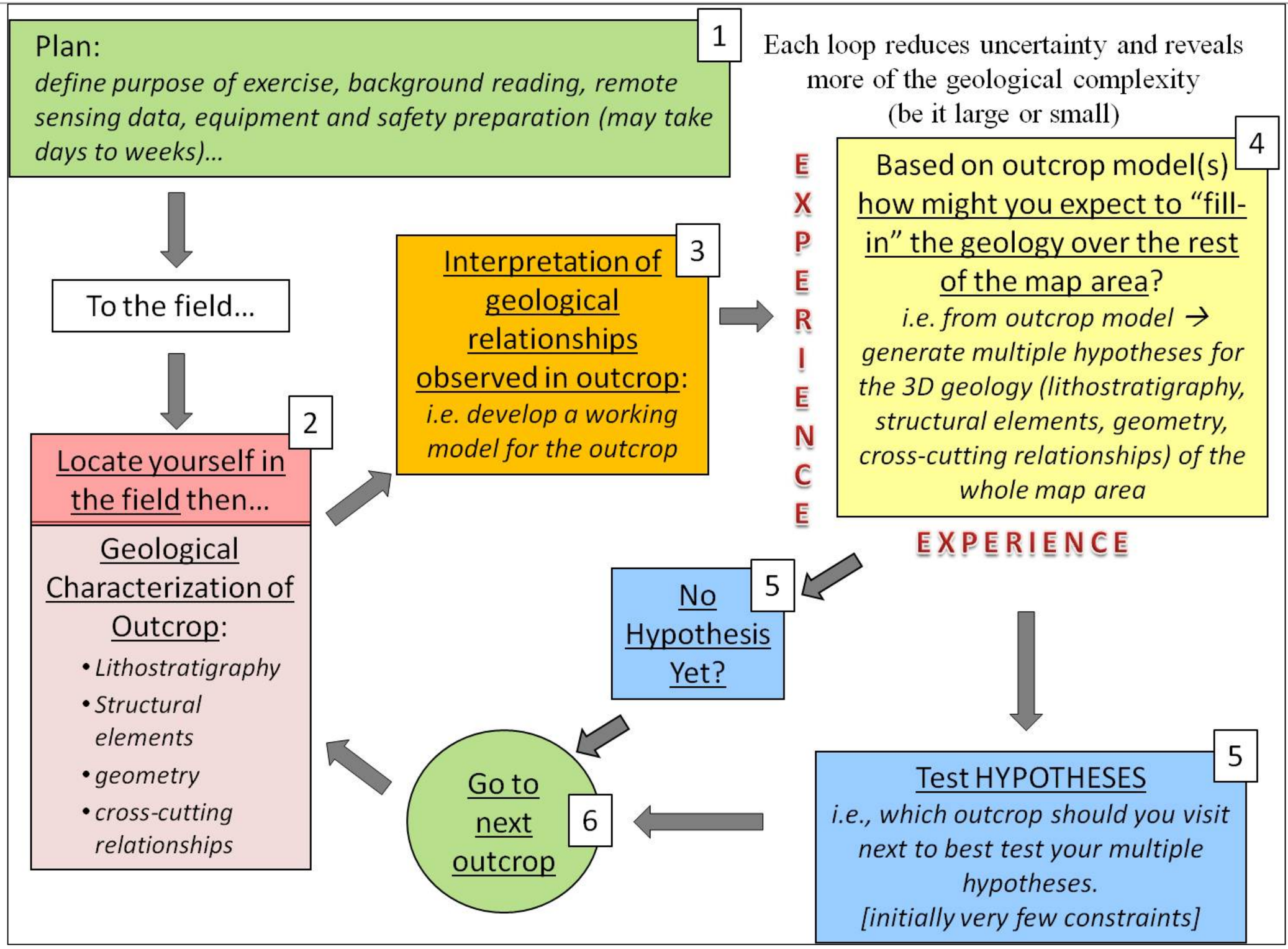
Where We Started



Methods and Data Collection

- Not a formal study – Goal to examine teaching, apply research, collect data, focus on improving student learning experience
- Developed “Boot-Camp” to build mapping-related skills
- Expert Task Analysis – Compare expert/novice mappers (2010)
- Extensive interviews with instructors, students, TAs, both in the field and back at camp (2010 and 2011)
- GPS trackers placed on student pairs as they mapped in the field (2010 and 2011)
- Assessed attitudes towards field work, 3D visualization, GCI
- On-going, course improvements 2011-2014

Expert Task Analysis



Expert Task Analysis – Mapping “Cheat Sheet”

Geologic Mapping Cheat Sheet
(Record all answers in your notebook)

1) This Outcrop:
    a) Where am I?
    b) What am I looking at?
2) Does this outcrop relate to the last one?
    a) If so, how? If not, why not?
3) Big Picture (Overall Geology)
    a) What are my ideas about the “big picture” of the overall geology?
    b) How does what I’m seeing fit (or not fit) with the “big picture?”
4) Next Outcrop:
    a) Where am I going next?
    b) Why am I going there?
5) Am I following my mapping plan?
    a) Why or why not?

Abandoned the use of the “cheat sheet” by 2011 after realizing that students no longer needed this level of scaffolding.

EOSC 328 Field Geology

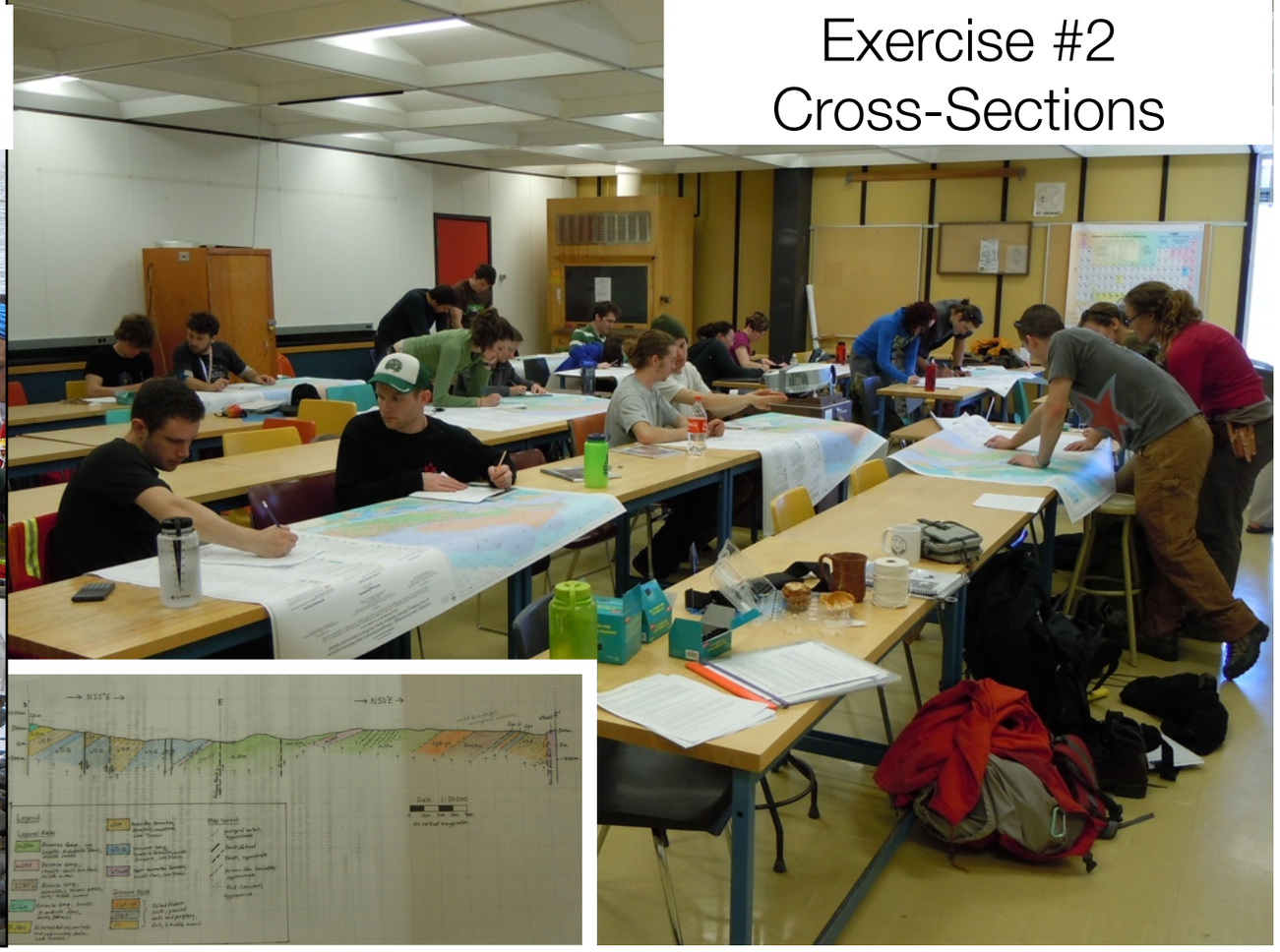
Welcome to BOOTCAMP!

"Where the Field Begins"

What: 2 Days of Intense Geo-Training!
When: Sat-Sun, April 30-May 1
Where: Outdoors + in EOS Main
First Meeting: EOS Main Room 121

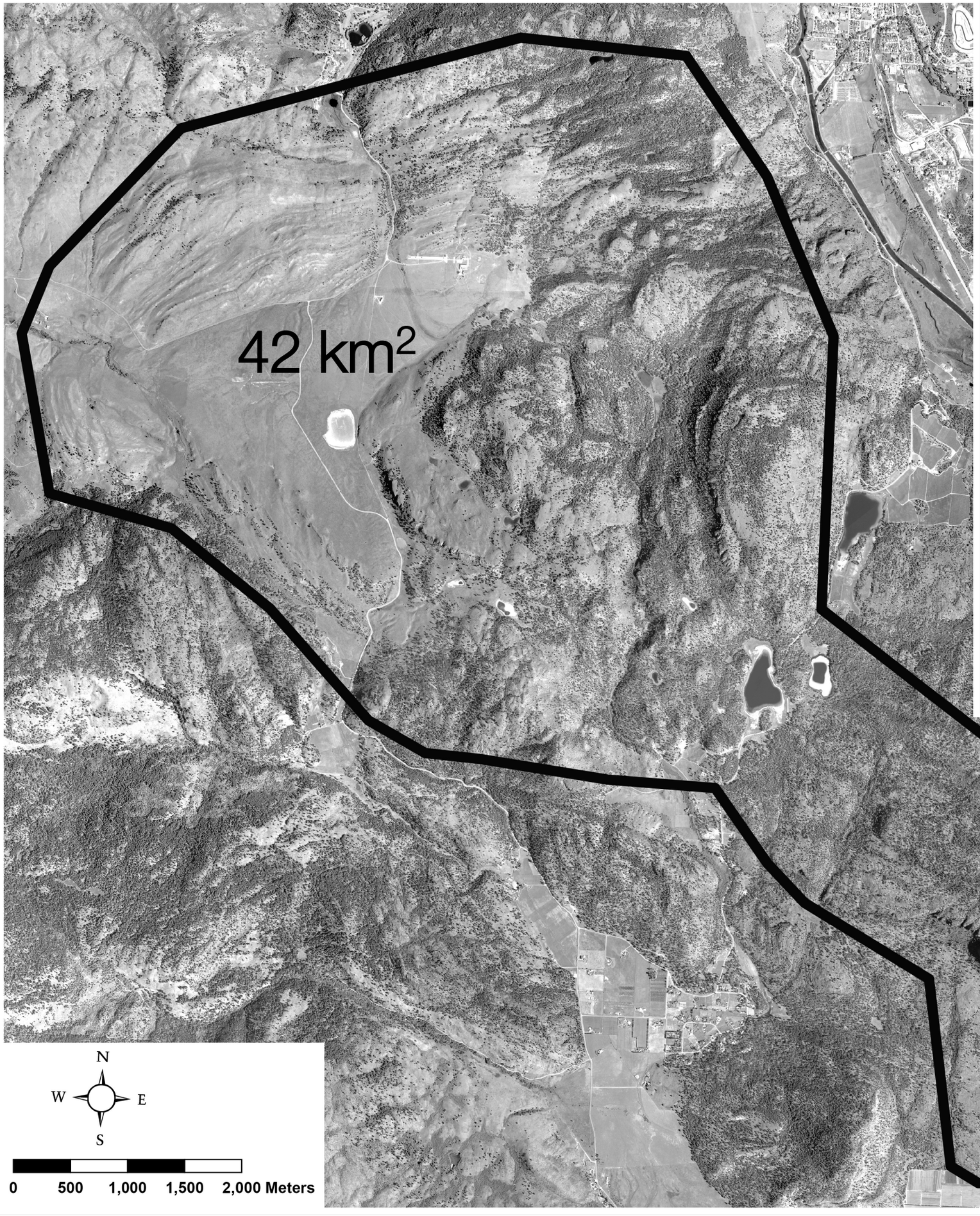
Exercise #1
Working in the Field

Exercise #2
Cross-Sections



Exercise #3
Compass Navigation

Exercise #4
Geomorph & Google Earth Mapping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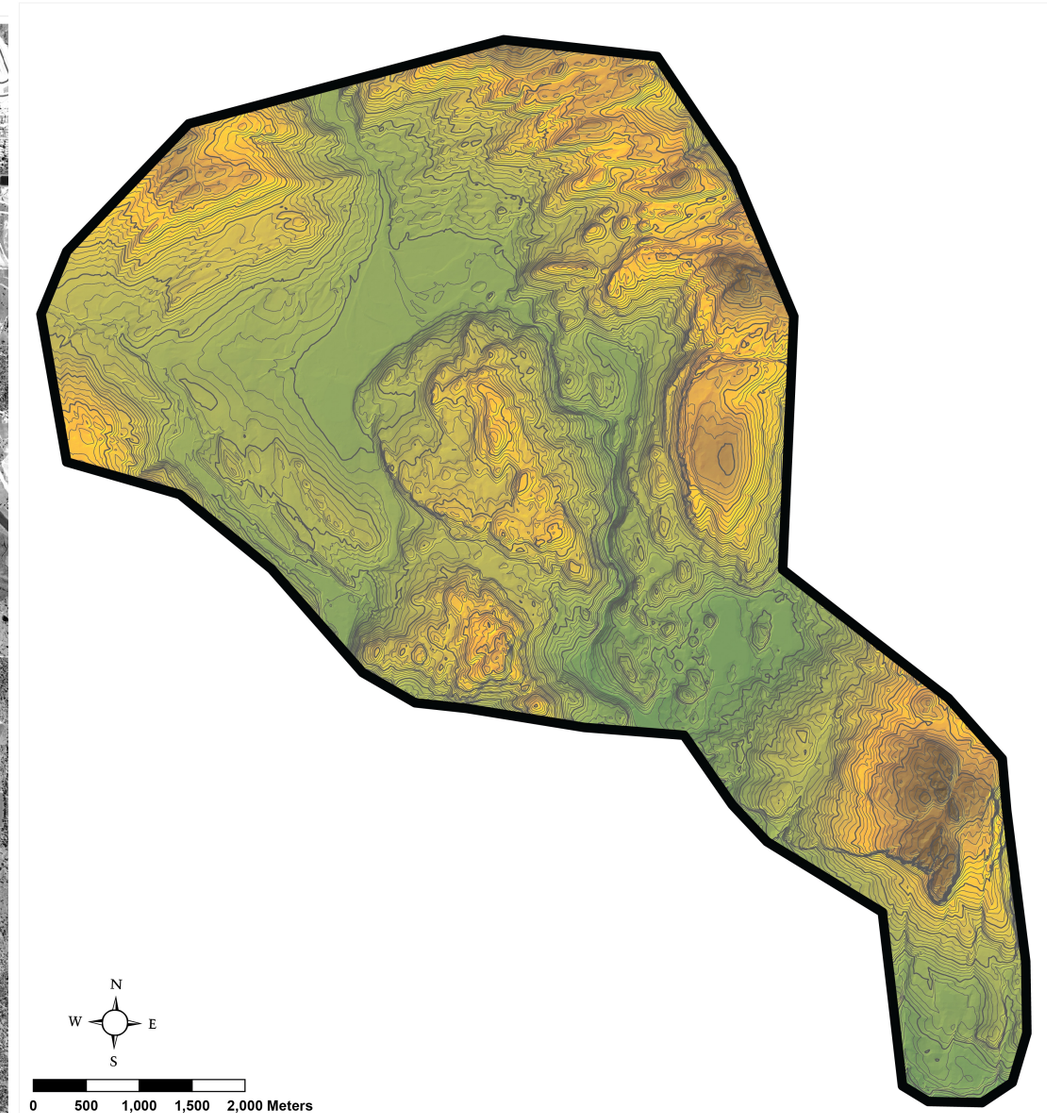
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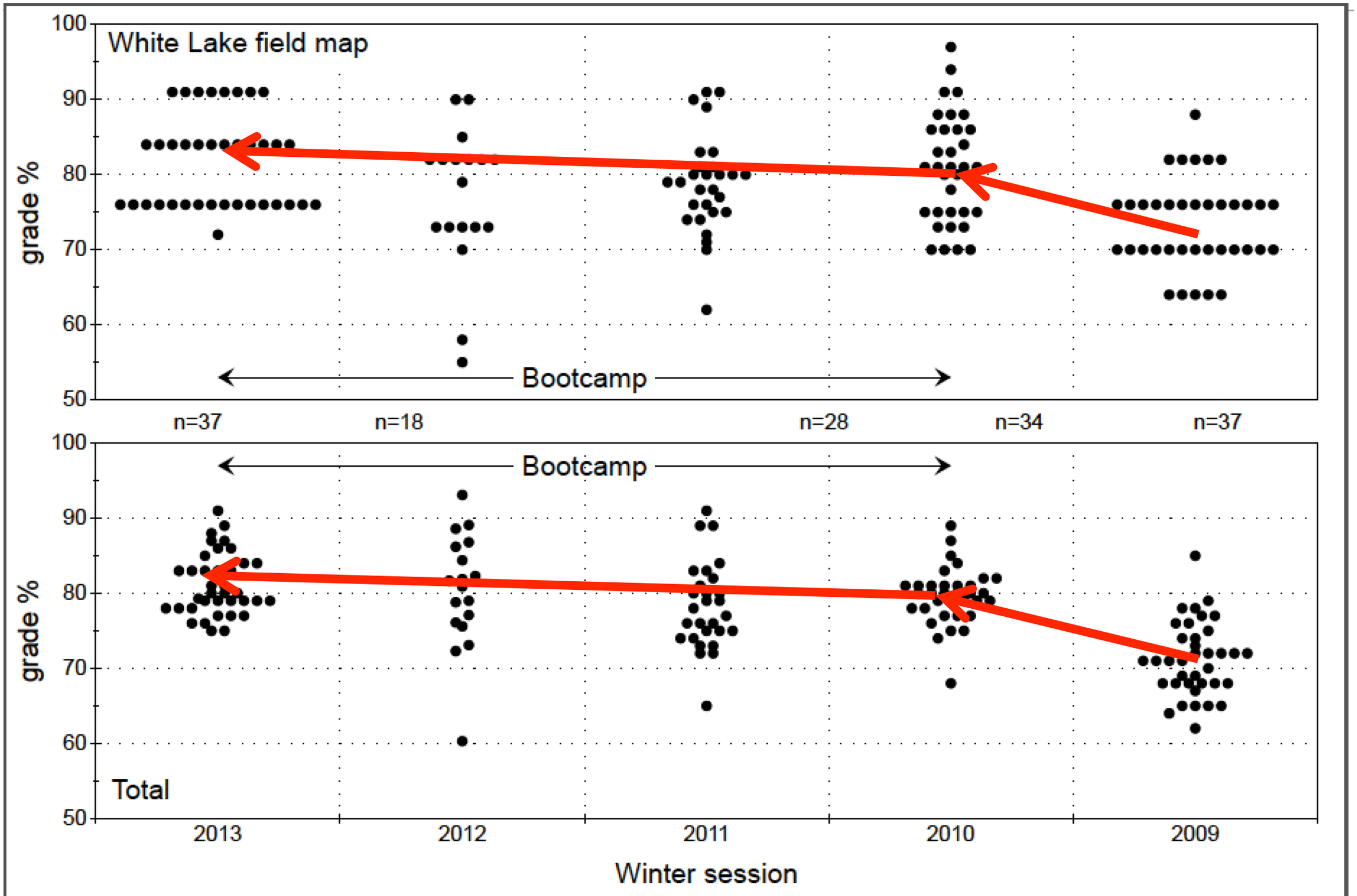
Okanagan Fault Integrated Mapping Exercise - 17 days

- Road Stratigraphic Log and Unit ID (0.5 day)
- Mapping of Unconformity (0.5 day)
- White Lake map area (7-days, 1:5000 scale, 6 km^2)
- Strip map (1 day, 1:7500 scale, 3 km^2)
- “Death” March - traverse through field area (1 day)
- Field check of previous geological map (1 day)
- Fault traverse (1 day)
- Mt Keoghan map area (4 day, 1:5000 scale, 3 km^2)
- Camp day - preparation of 1:10,000 scale compilation map and sections

How did they do?



Ah Moments and Next Steps

- Field Instructors saw need for significant changes, were convinced after seeing improvements after only one year

- Are the changes having an effect? Let's find out!...

- External mapping experts to grade all White Lake maps since 2009 (Using similar methods to work by Petcovic, Libarkin, Callahan and others)

- Is there systematic improvement in map quality over the past 5 years?

- What can we say about the process of EOSC 328 evolution that might be useful to other institutions?

Other Happy Results: Undergraduate Research

- Nicole Eriks – Digital Geological Map of 1:5000 White Lake Mapping Area

- Alex Colyer – Petrology and Geochemistry of White Lake Volcanic Rocks

- Melissa Friend – Building 3D Models of Topography and Structure

- Moses Towell – Kinematic Analysis of the Okanagan Fault (Poster is tomorrow, Wednesday, Paper #324-13)

Special thanks to Caitlin Callahan, Eric Riggs,
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Questions?