Classroom Lessons From Geoscience Undergraduate Research and Presentations

WAYNE HAMILTON AND JOE YELDERMAN JR,

BAYLOR UNIVERSITY

MONDAY 10-23-17

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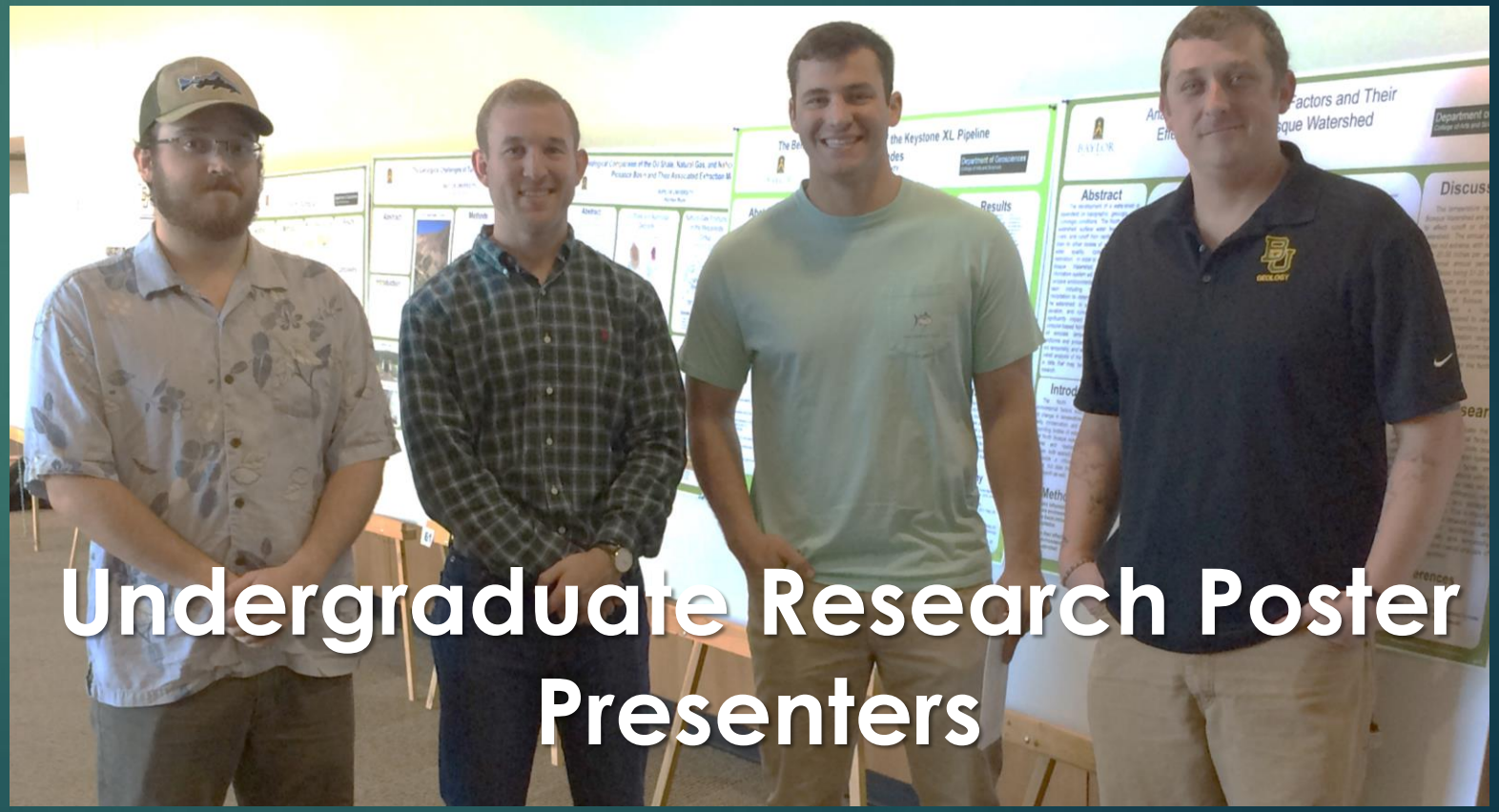

Presentation Overview

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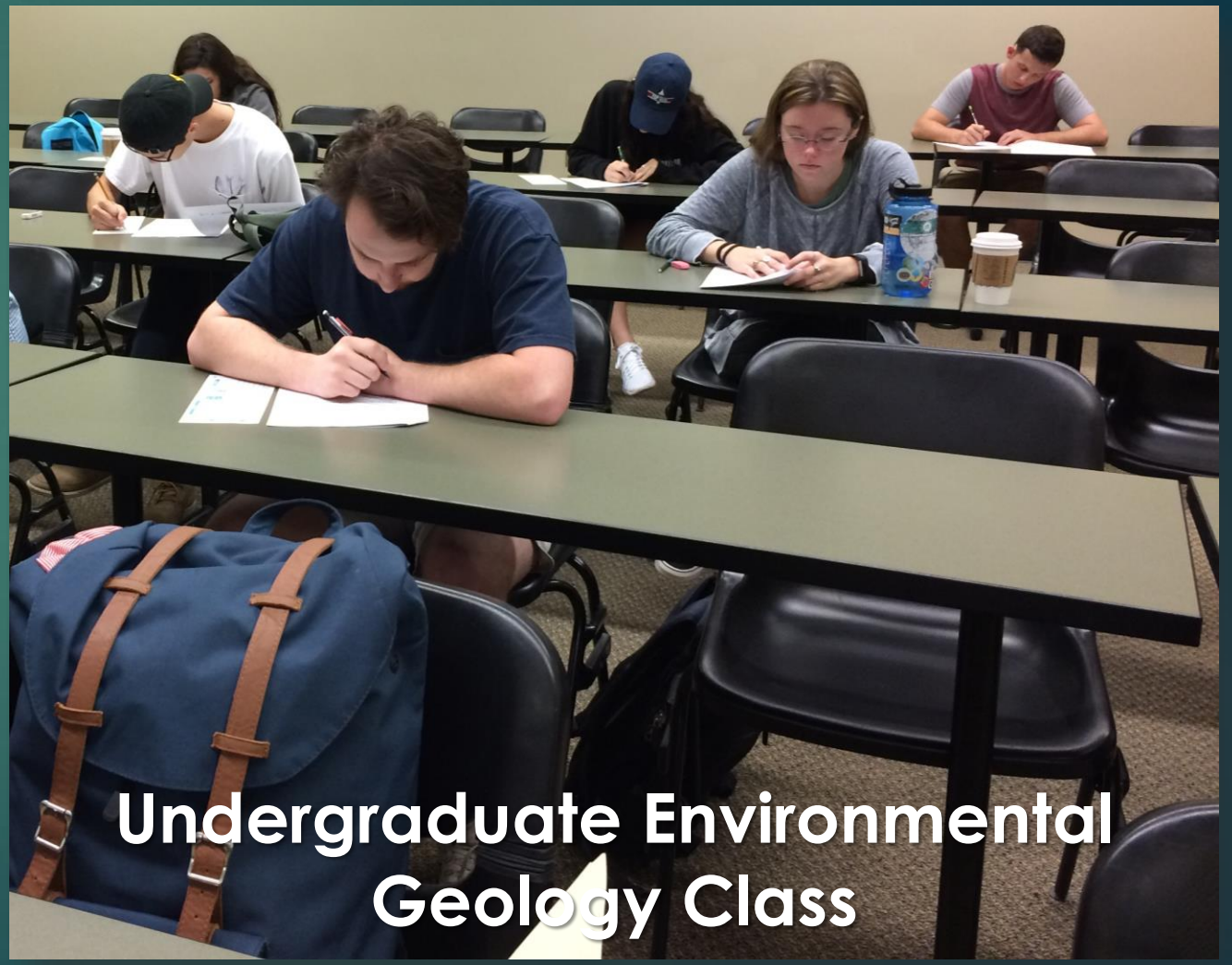
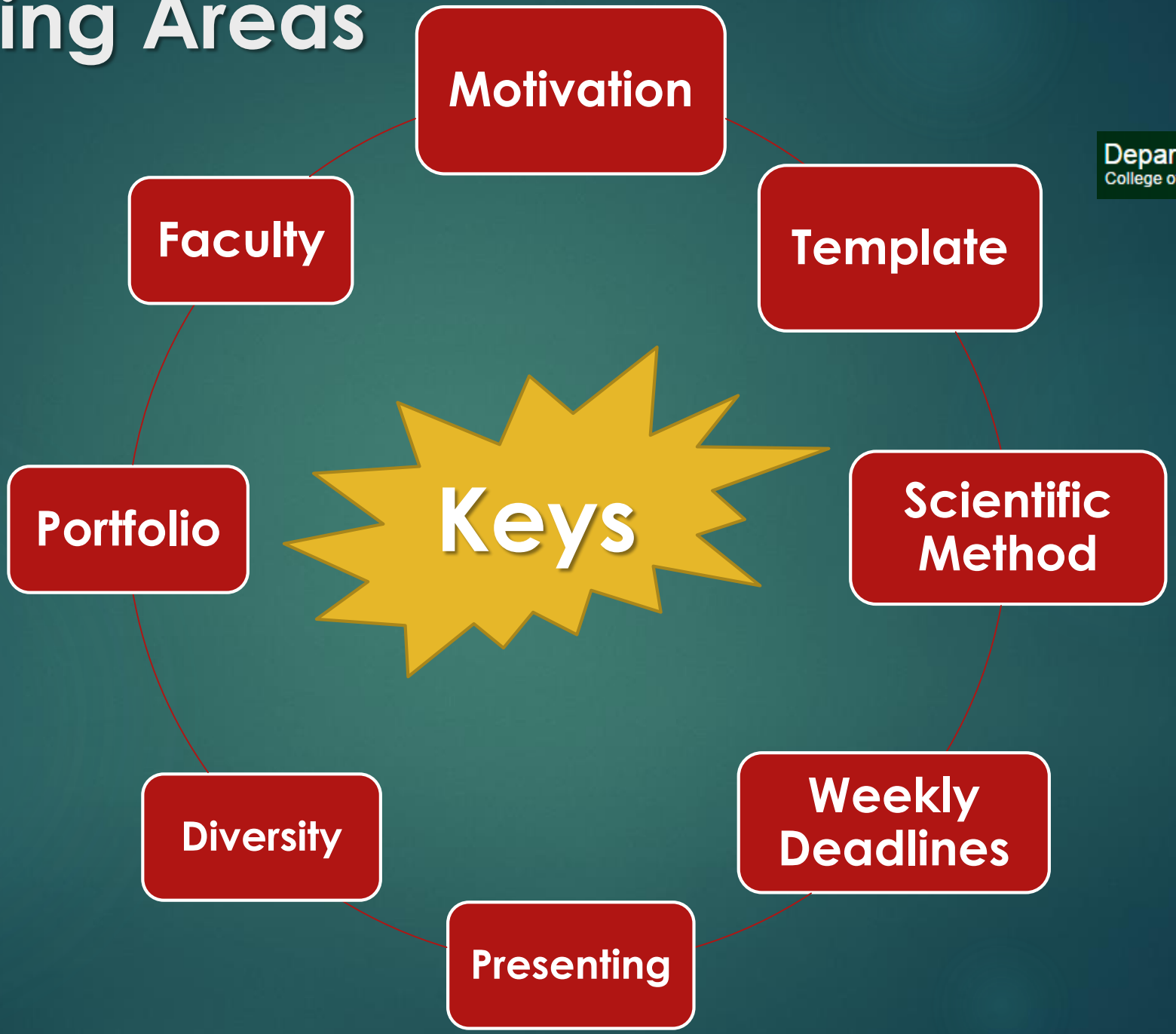
- **Geosciences Research Lessons Learned**
  - What **Worked**: Eight Learning Areas
  - **Improvements**: Four Key Thoughts
  - **Baylor wide** undergraduate research
- **Conclusions**
  - Key Learnings and Next Steps



Eight Learning Areas



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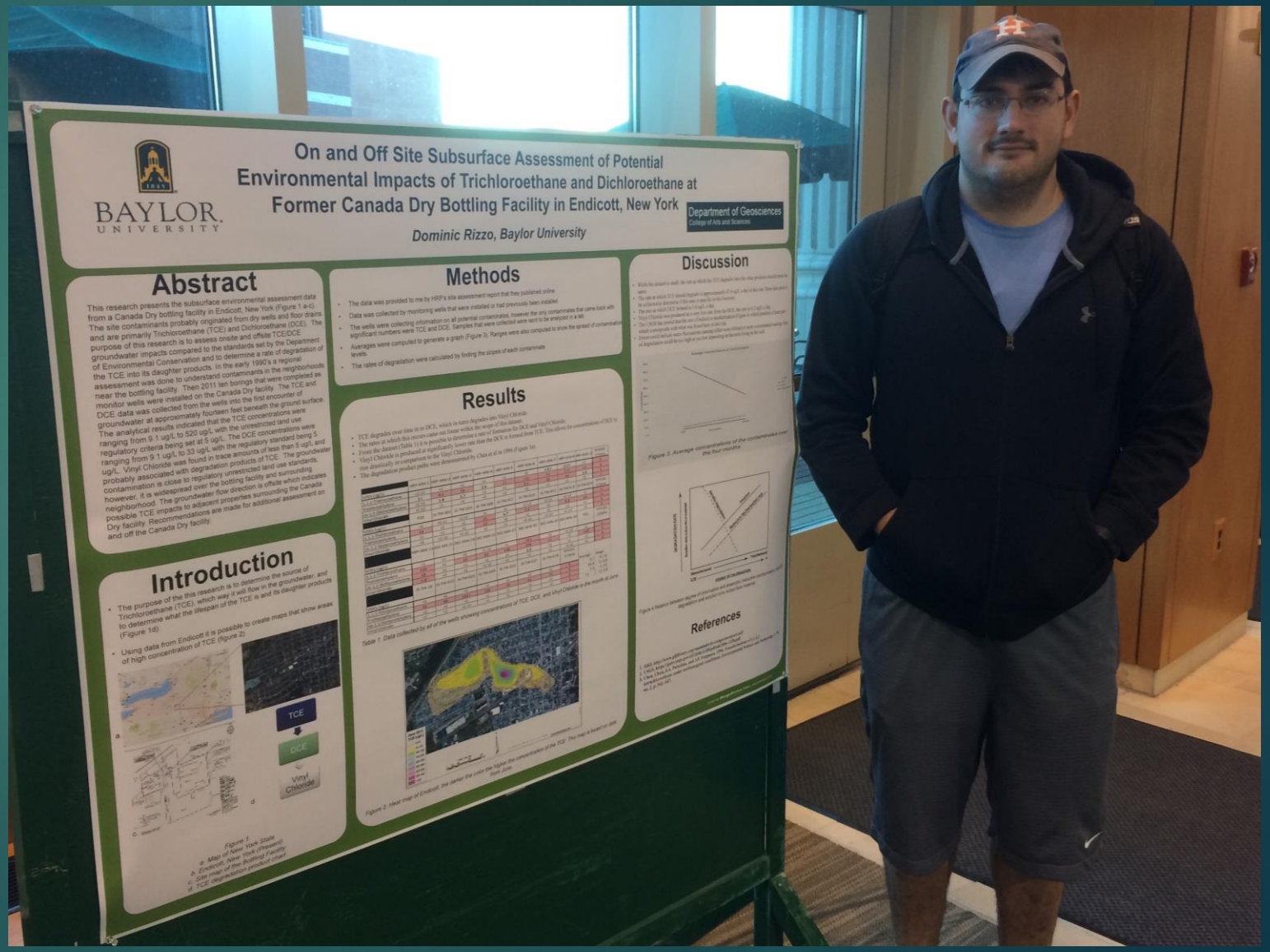
Motivation

- Student's Topic
- Discussed teacher
- Weekly Updated
- Displayed
- Evaluated



Baylor's Undergraduate Research

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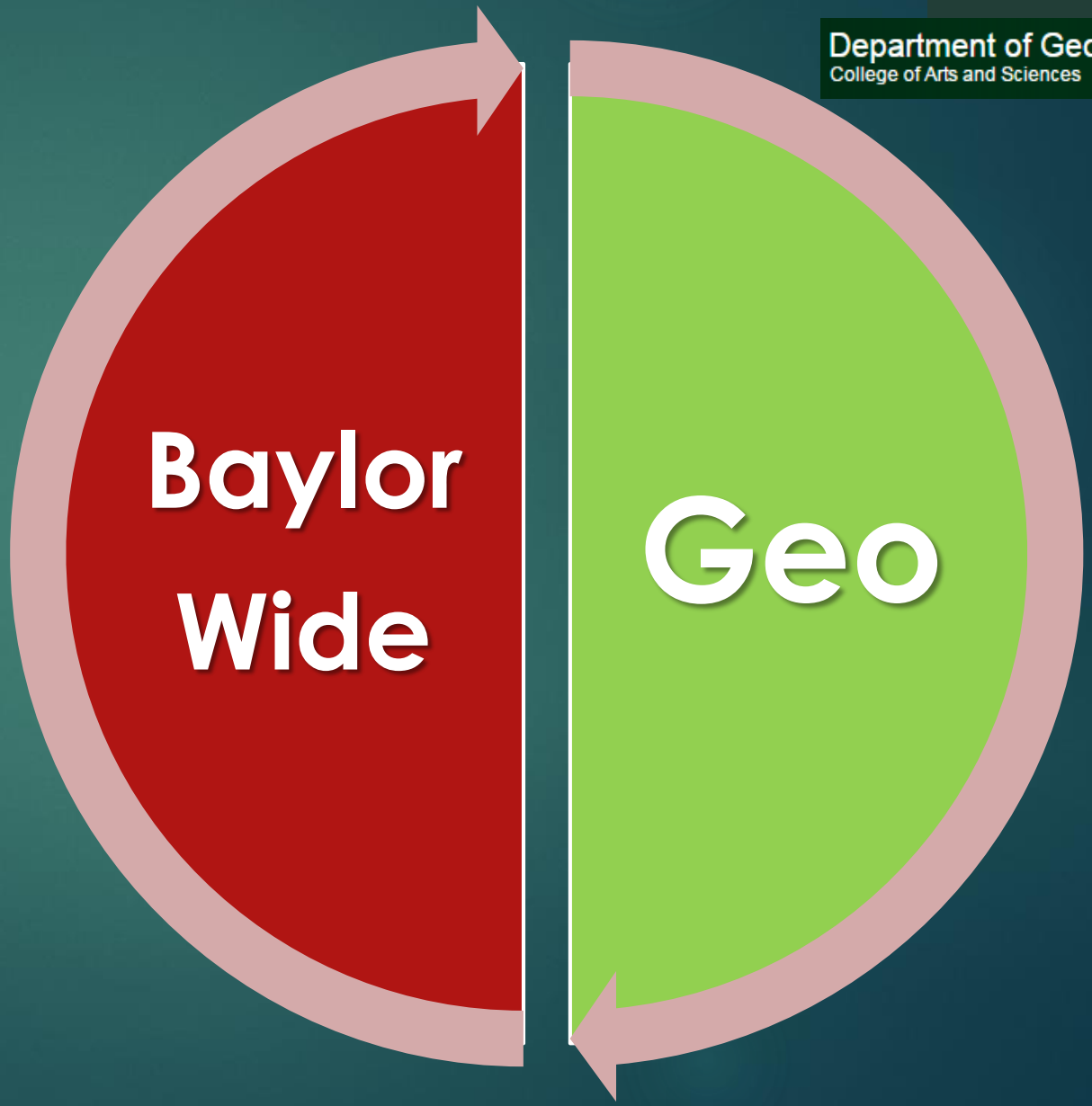
Other Undergraduate Disciplines

1. Economics
2. Engineering
3. Communications
4. Religion
5. Family and Consumer Sciences
6. Modern Foreign Languages
7. Statistics
8. Family and Consumer Sciences
9. Health, Human Performance and Recreation
10. Physics
11. Psychology
12. Chemistry



Template

- Starting Point
- Key Areas
- Just Start
- Works for Most Projects
- Compare and Contrast
- Format Challenges
- Best Practices

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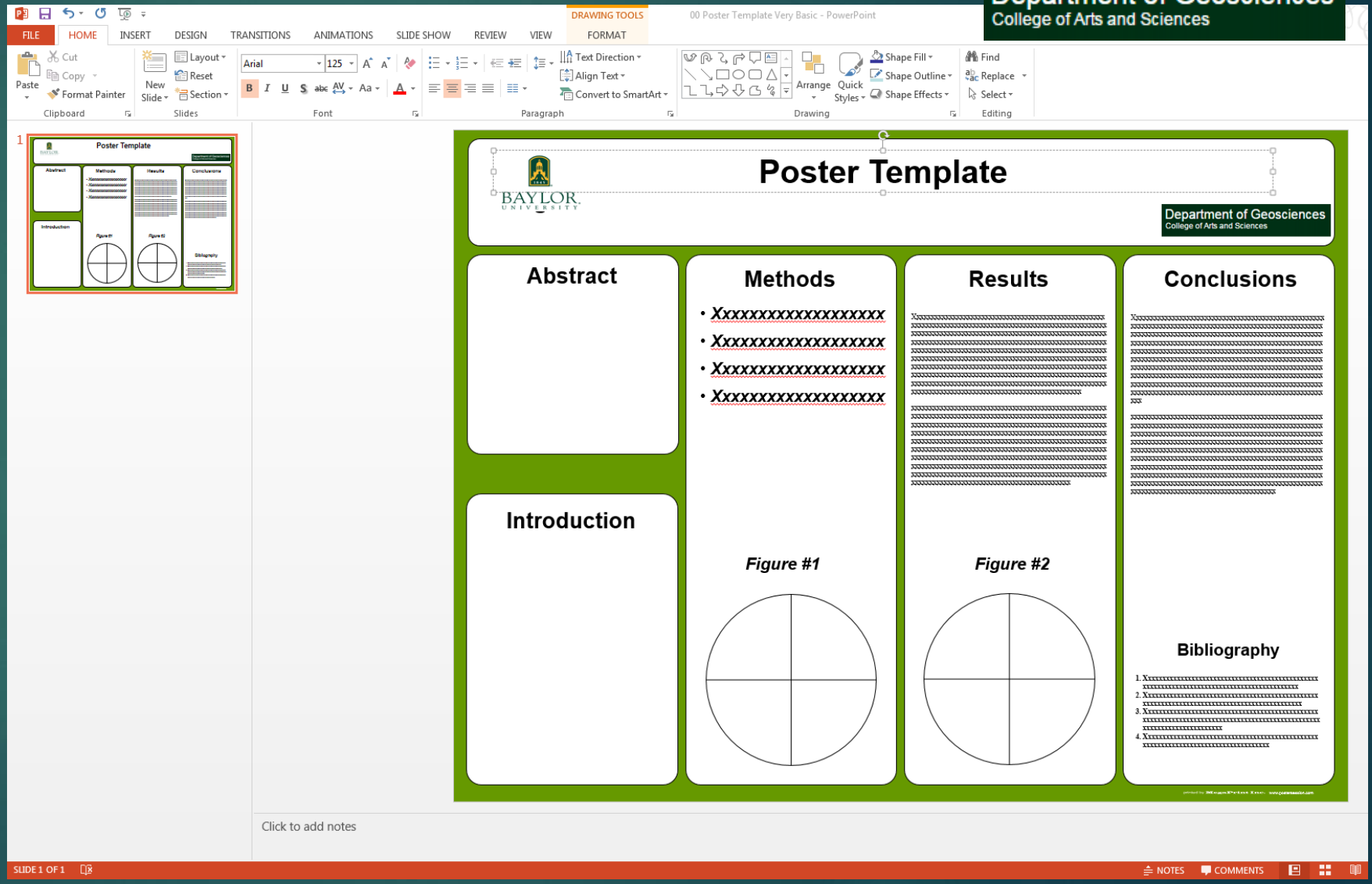
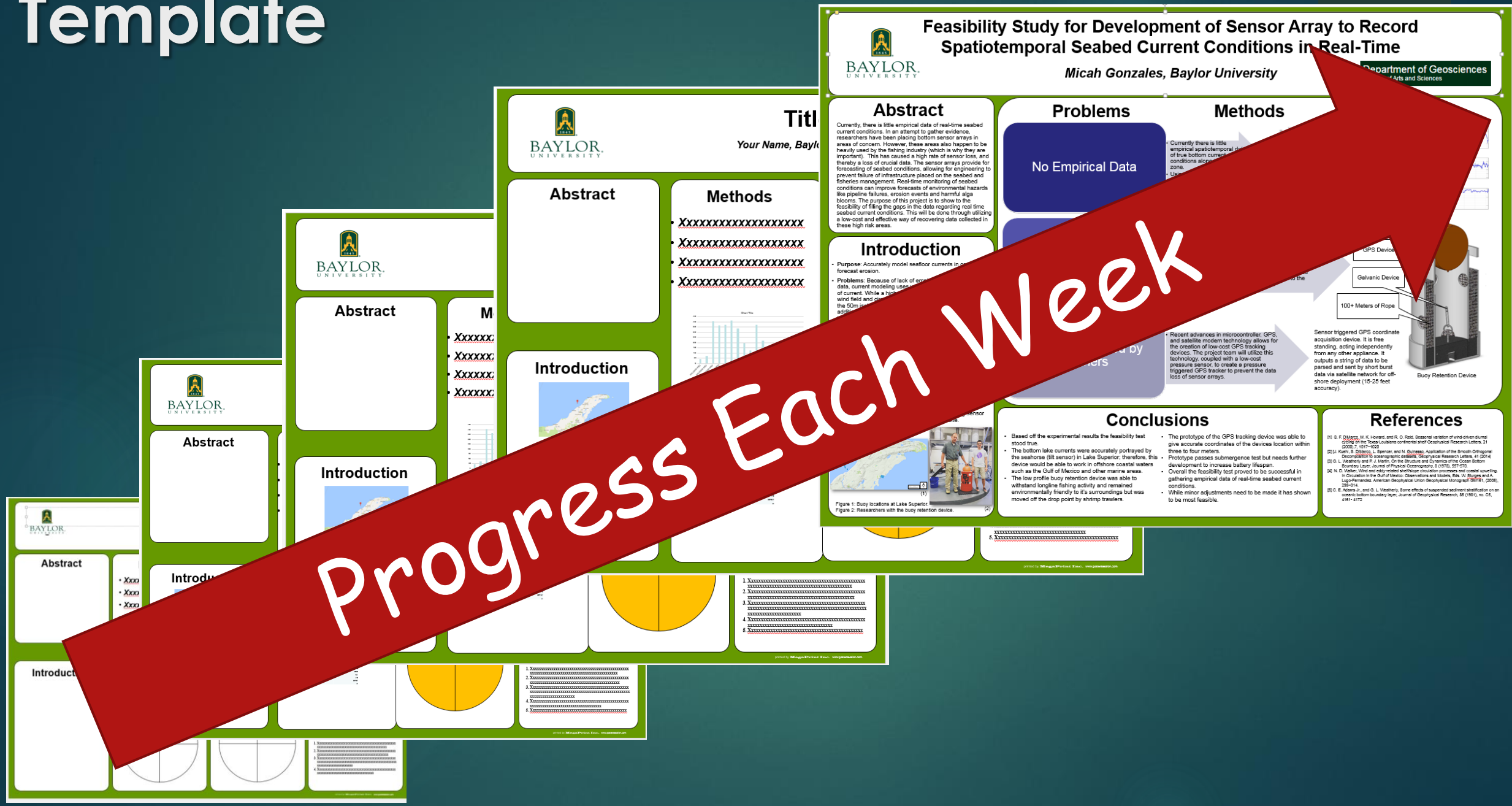


Template


Feasibility Study for Development of Sensor Array to Record Spatiotemporal Seabed Current Conditions in Real-Time
Micah Gonzales, Baylor University
Department of Geosciences
Abstract
Problems
Methods
No Empirical Data
Introduction
Conclusions
References
Progress Each Week

Scientific Method

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Each Week We'll Focus on each part of your poster

- Abstract
- Purpose
- Introduction
- Data
- Interpretation
- Conclusions

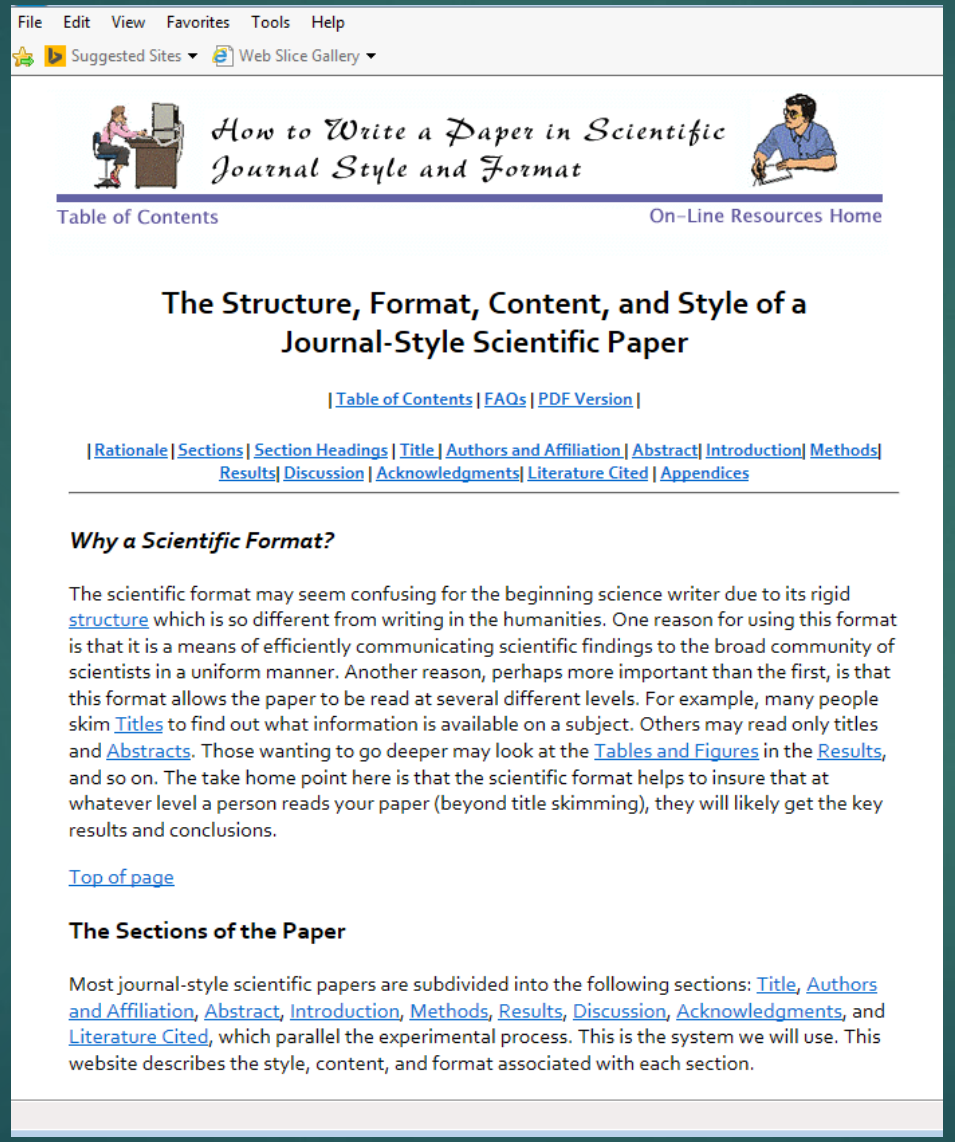
Abstract Due Before Research Completed

Tension or Balance: Each Section Vs Overall View

You'll present class to keep current

Scientific Method

- Details
- Provided Sections
- Explanation
- Guidance
- Discuss Each Week



File Edit View Favorites Tools Help

Suggested Sites ▾ Web Slice Gallery ▾

How to Write a Paper in Scientific Journal Style and Format

Table of Contents | On-Line Resources Home

The Structure, Format, Content, and Style of a Journal-Style Scientific Paper

| Table of Contents | FAQs | PDF Version |

| Rationale | Sections | Section Headings | Title | Authors and Affiliation | Abstract | Introduction | Methods | Results | Discussion | Acknowledgments | Literature Cited | Appendices

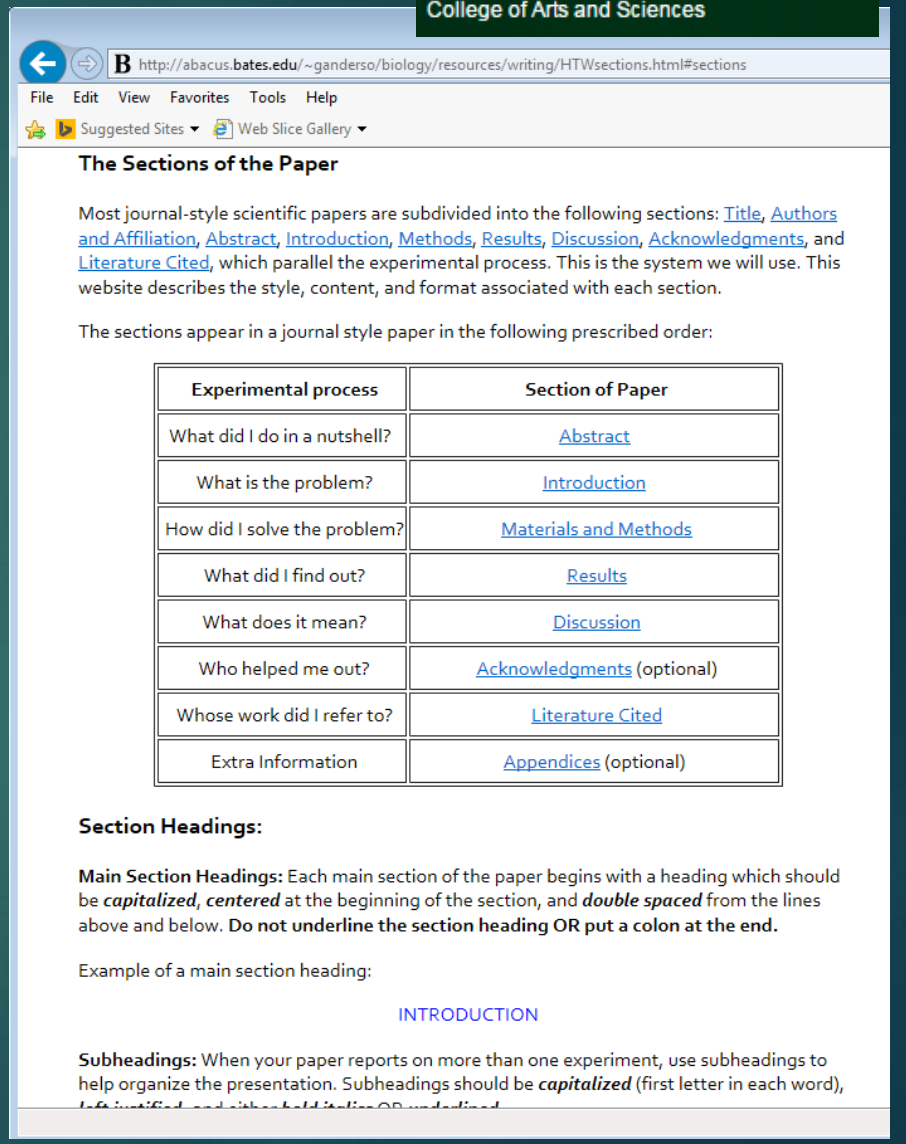
Why a Scientific Format?

The scientific format may seem confusing for the beginning science writer due to its rigid structure which is so different from writing in the humanities. One reason for using this format is that it is a means of efficiently communicating scientific findings to the broad community of scientists in a uniform manner. Another reason, perhaps more important than the first, is that this format allows the paper to be read at several different levels. For example, many people skim Titles to find out what information is available on a subject. Others may read only titles and Abstracts. Those wanting to go deeper may look at the Tables and Figures in the Results, and so on. The take home point here is that the scientific format helps to insure that at whatever level a person reads your paper (beyond title skimming), they will likely get the key results and conclusions.

Top of page

The Sections of the Paper

Most journal-style scientific papers are subdivided into the following sections: Title, Authors and Affiliation, Abstract, Introduction, Methods, Results, Discussion, Acknowledgments, and Literature Cited, which parallel the experimental process. This is the system we will use. This website describes the style, content, and format associated with each section.



http://abacus.bates.edu/~ganderso/biology/resources/writing/HTWsections.html#sections

File Edit View Favorites Tools Help

Suggested Sites ▾ Web Slice Gallery ▾

The Sections of the Paper

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The sections appear in a journal style paper in the following prescribed order:

Experimental process	Section of Paper
What did I do in a nutshell?	Abstract
What is the problem?	Introduction
How did I solve the problem?	Materials and Methods
What did I find out?	Results
What does it mean?	Discussion
Who helped me out?	Acknowledgments (optional)
Whose work did I refer to?	Literature Cited
Extra Information	Appendices (optional)

Section Headings:

Main Section Headings: Each main section of the paper begins with a heading which should be ***capitalized***, ***centered*** at the beginning of the section, and ***double spaced*** from the lines above and below. **Do not underline the section heading OR put a colon at the end.**

Example of a main section heading:

INTRODUCTION

Subheadings: When your paper reports on more than one experiment, use subheadings to help organize the presentation. Subheadings should be ***capitalized*** (first letter in each word),

Reference: Abacus.bates.edu

Weekly Deadlines

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Assignments

Timing

40% of Grade

Topic Agreement 1/24/17 → Abstract to Wayne 1/31/17 → Abstract Submitted 2/7/17 → Class Progress Updates → Poster to Wayne 3/21/17 → Poster Displayed 3/29/17

60% of Class Grade

Weekly Deadlines

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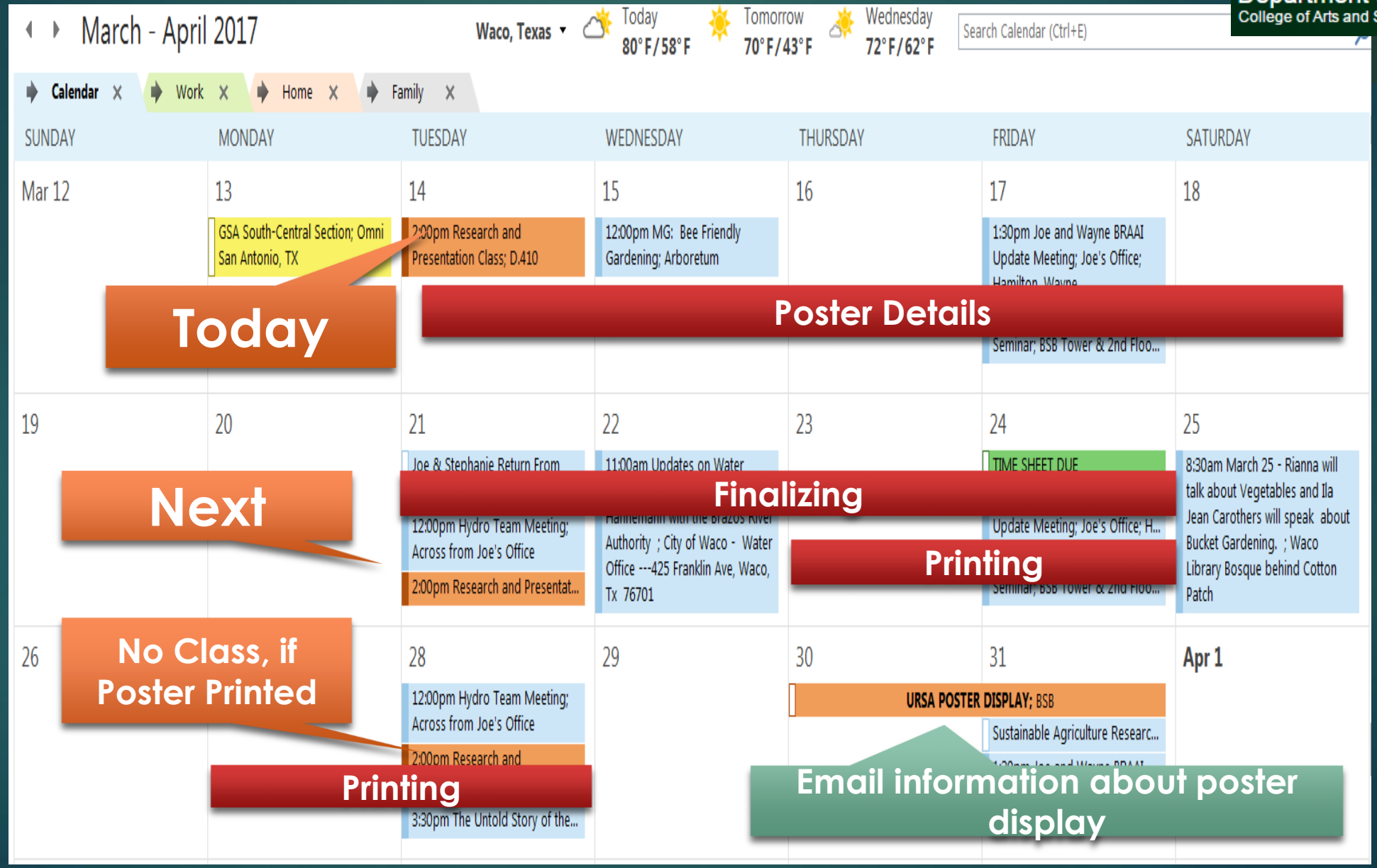

Presentations

- Each Student To Present
- Small Class Size: About Ten
- Peer to Peer Improvement
  - Like the Work Place
  - Students Added Things I Missed

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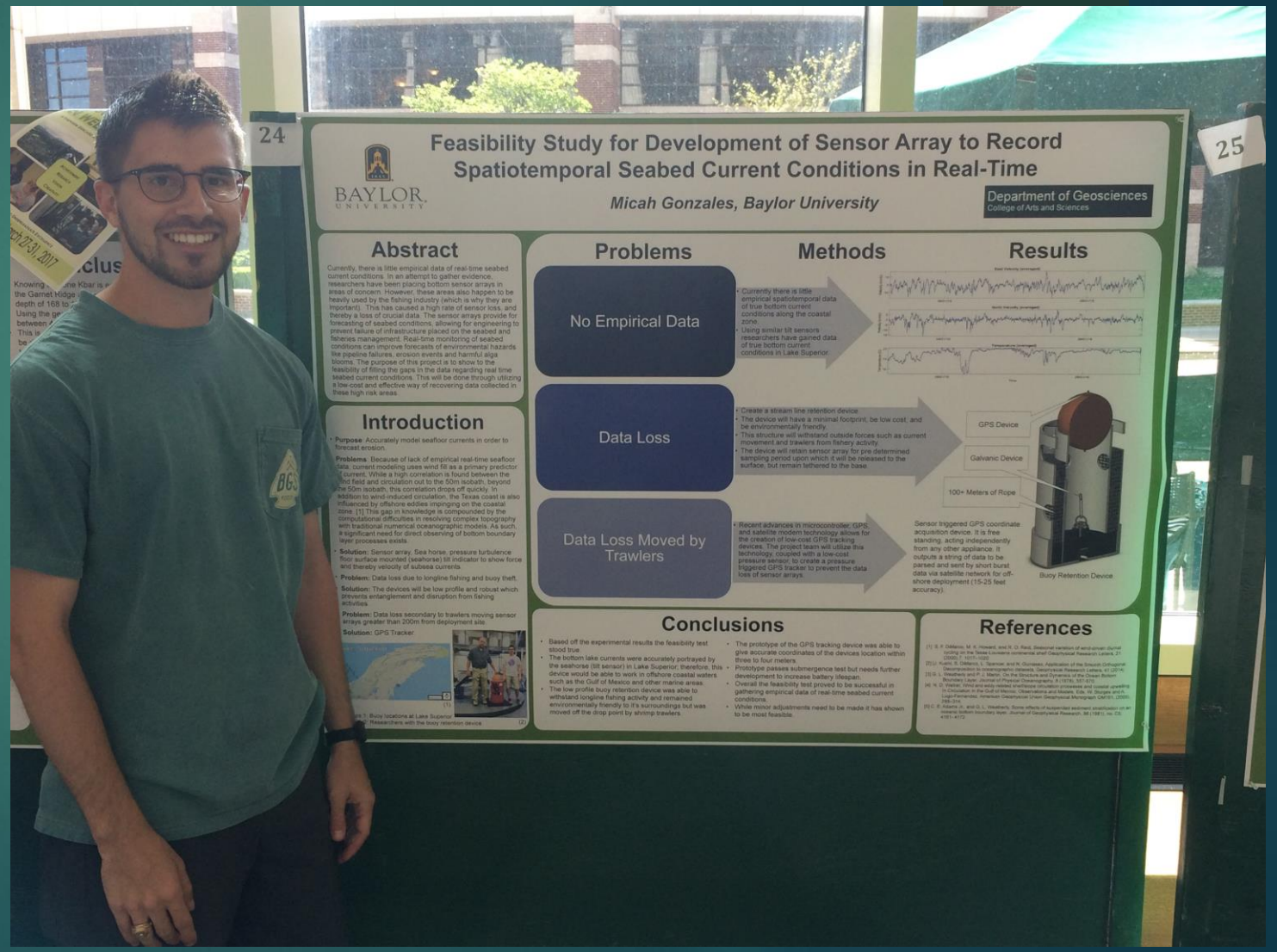

Diversity of Topics

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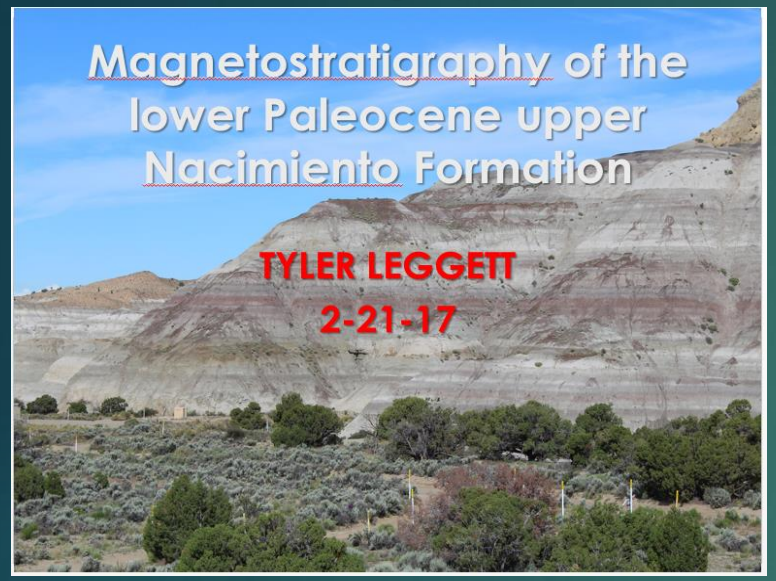
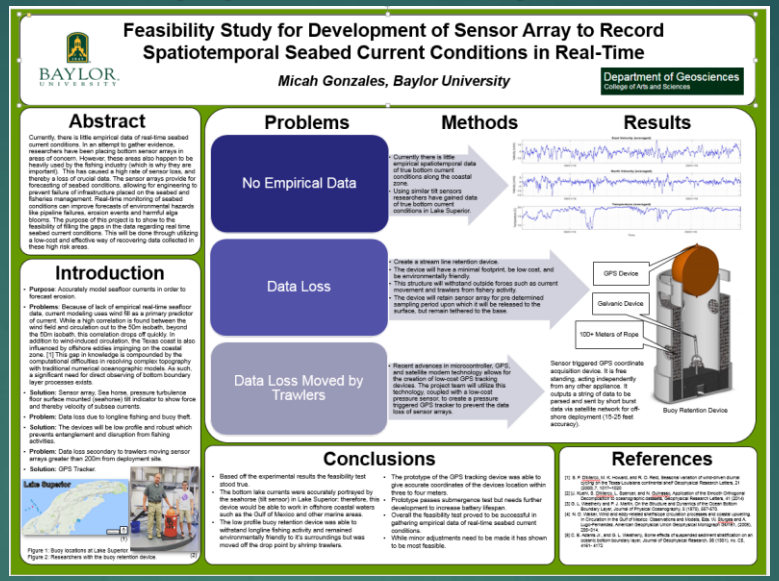
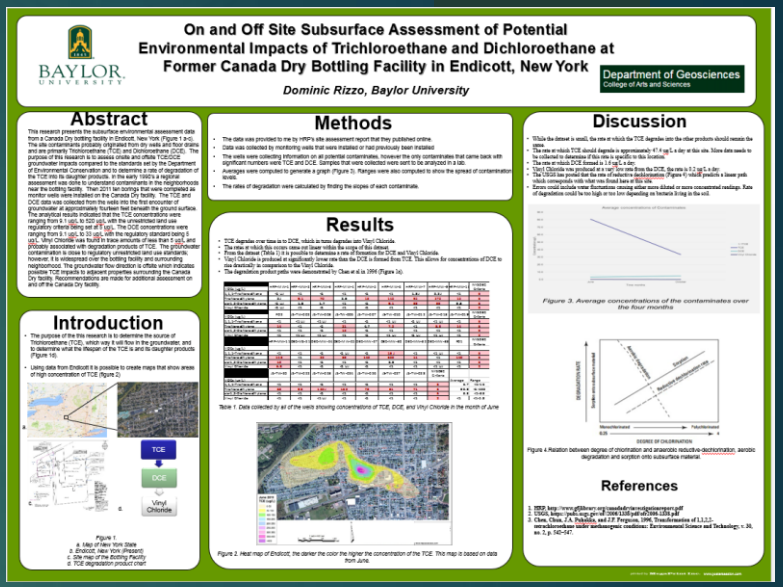
Stratigraphy



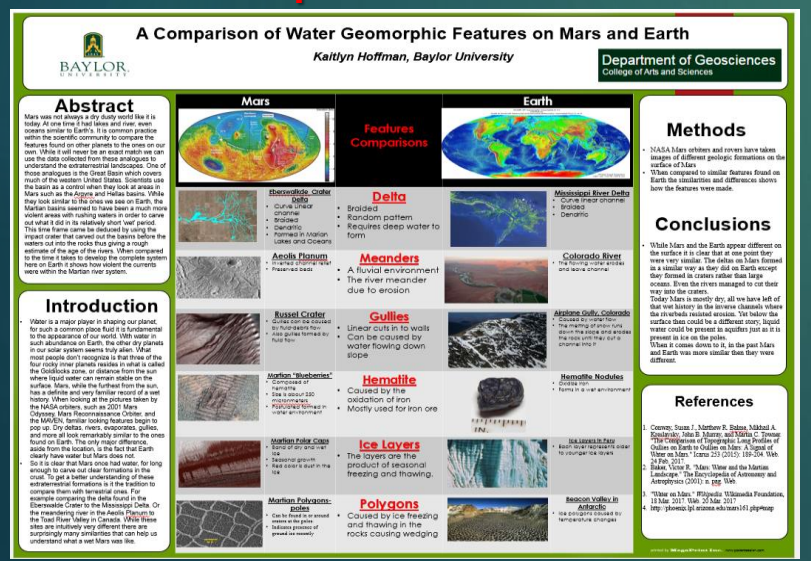
Equipment Development



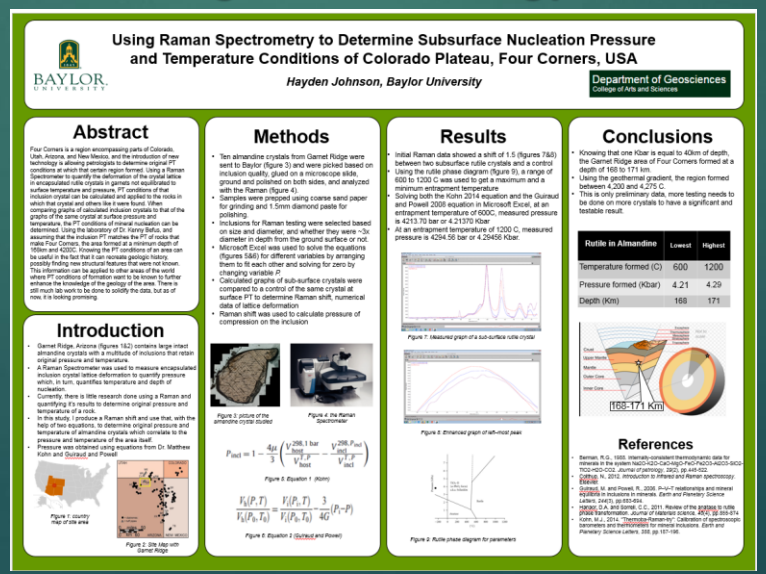
Site Assessment



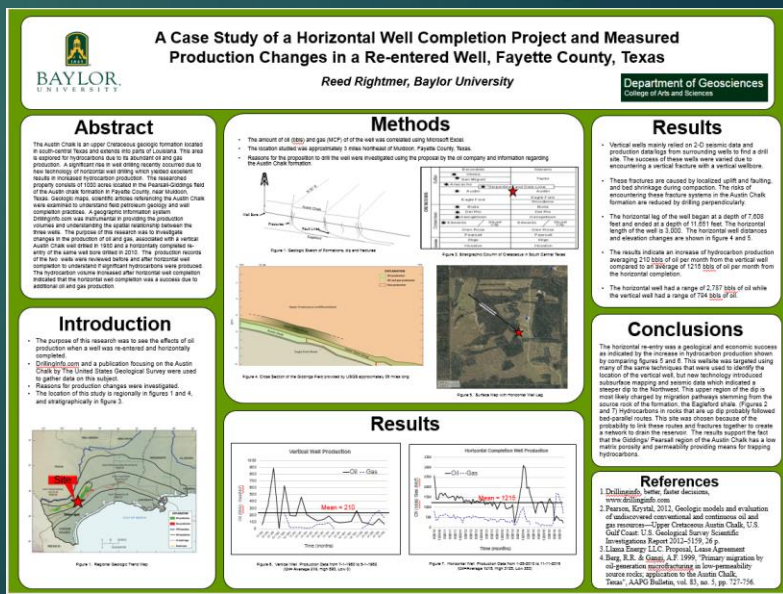
Compare & Contrast



Igneous Petrology



Petroleum Geology



Portfolio

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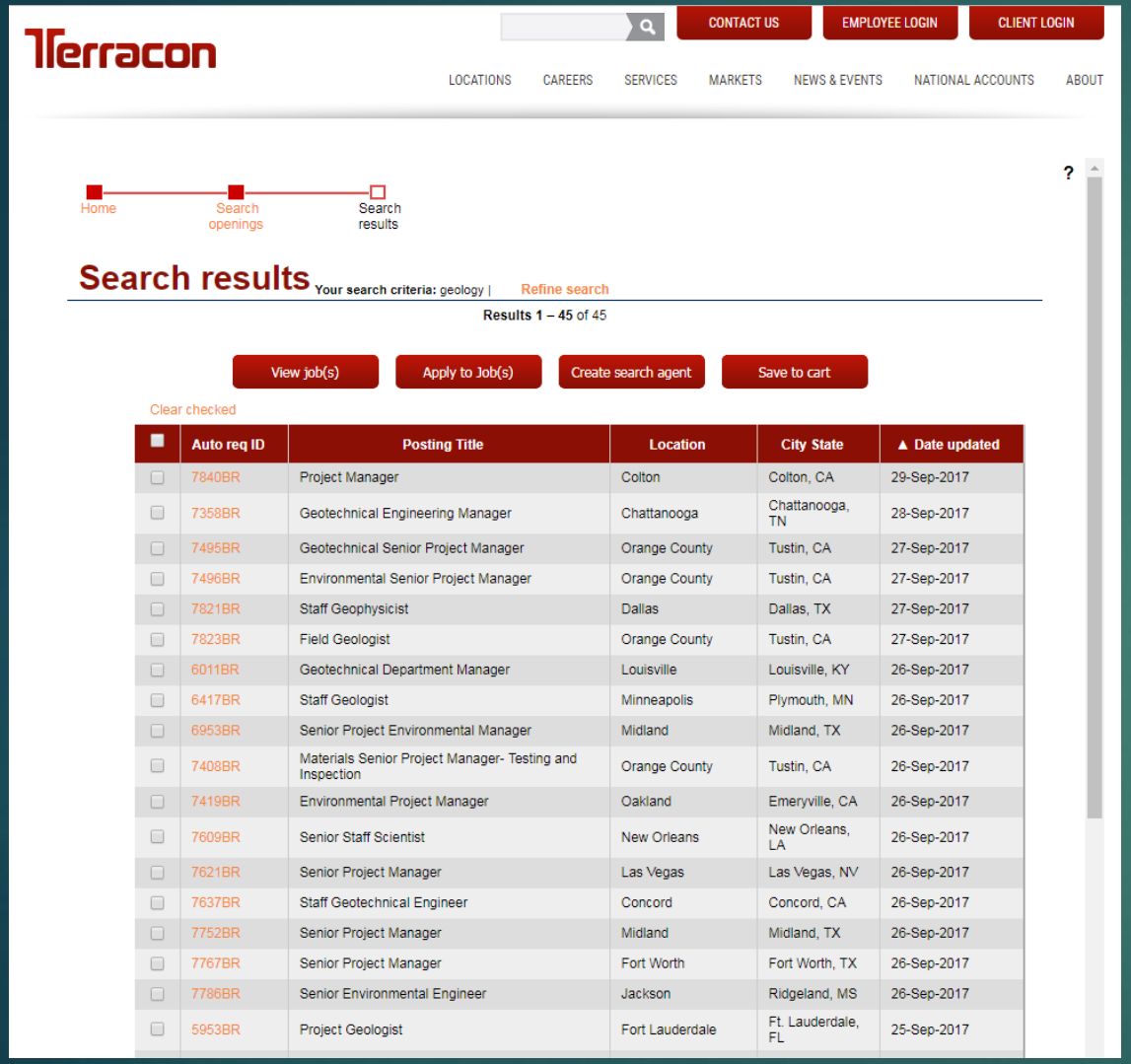
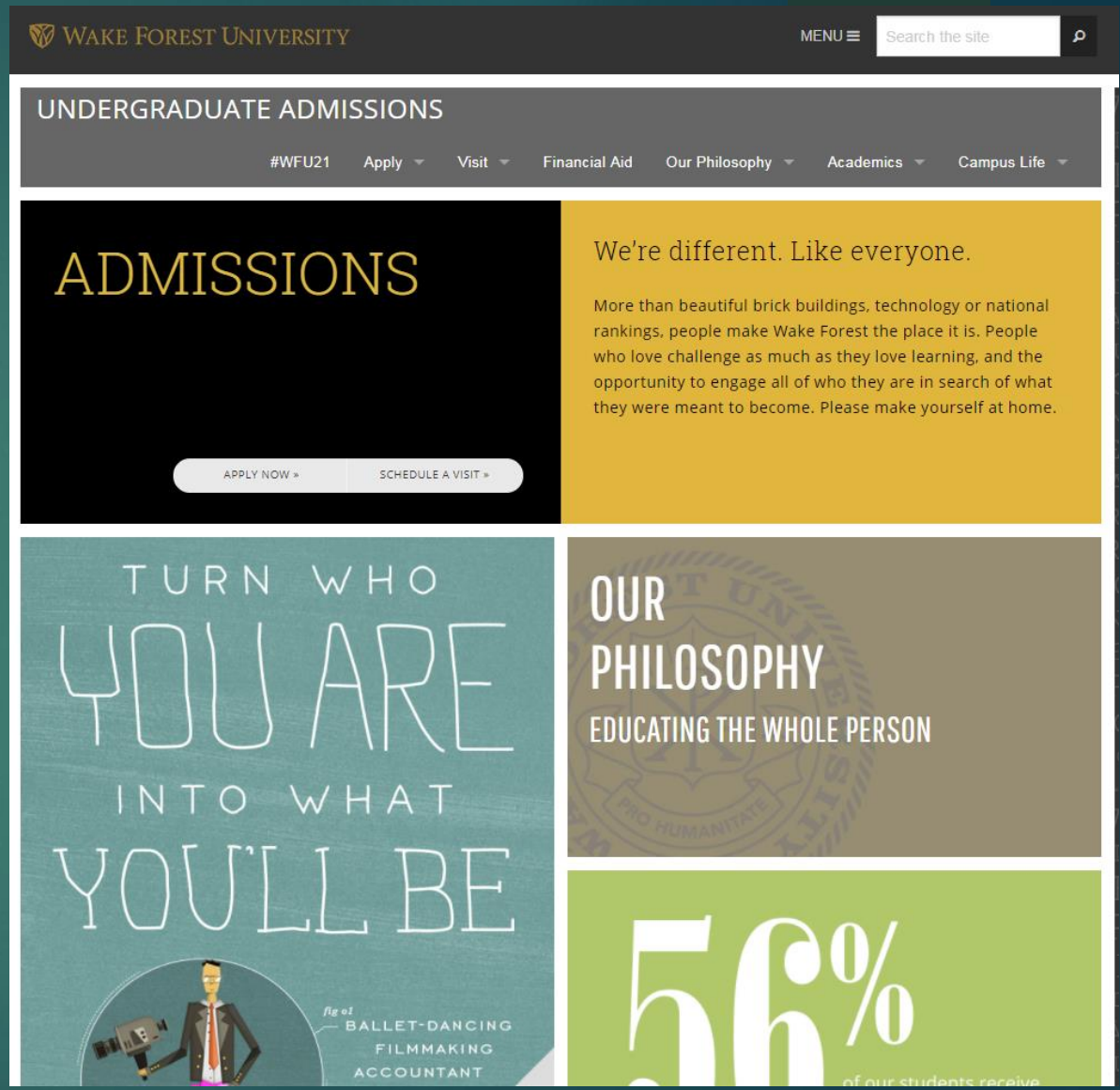


Auto req ID	Posting Title	Location	City State	▲ Date updated
7840BR	Project Manager	Colton	Colton, CA	29-Sep-2017
7358BR	Geotechnical Engineering Manager	Chattanooga	Chattanooga, TN	28-Sep-2017
7495BR	Geotechnical Senior Project Manager	Orange County	Tustin, CA	27-Sep-2017
7496BR	Environmental Senior Project Manager	Orange County	Tustin, CA	27-Sep-2017
7821BR	Staff Geophysicist	Dallas	Dallas, TX	27-Sep-2017
7823BR	Field Geologist	Orange County	Tustin, CA	27-Sep-2017
6011BR	Geotechnical Department Manager	Louisville	Louisville, KY	26-Sep-2017
6417BR	Staff Geologist	Minneapolis	Plymouth, MN	26-Sep-2017
6953BR	Senior Project Environmental Manager	Midland	Midland, TX	26-Sep-2017
7408BR	Materials Senior Project Manager- Testing and Inspection	Orange County	Tustin, CA	26-Sep-2017
7419BR	Environmental Project Manager	Oakland	Emeryville, CA	26-Sep-2017
7609BR	Senior Staff Scientist	New Orleans	New Orleans, LA	26-Sep-2017
7621BR	Senior Project Manager	Las Vegas	Las Vegas, NV	26-Sep-2017
7637BR	Staff Geotechnical Engineer	Concord	Concord, CA	26-Sep-2017
7752BR	Senior Project Manager	Midland	Midland, TX	26-Sep-2017
7767BR	Senior Project Manager	Fort Worth	Fort Worth, TX	26-Sep-2017
7786BR	Senior Environmental Engineer	Jackson	Ridgeland, MS	26-Sep-2017
5953BR	Project Geologist	Fort Lauderdale	Ft. Lauderdale, FL	25-Sep-2017



Internships & Careers

Graduate School

Improvements

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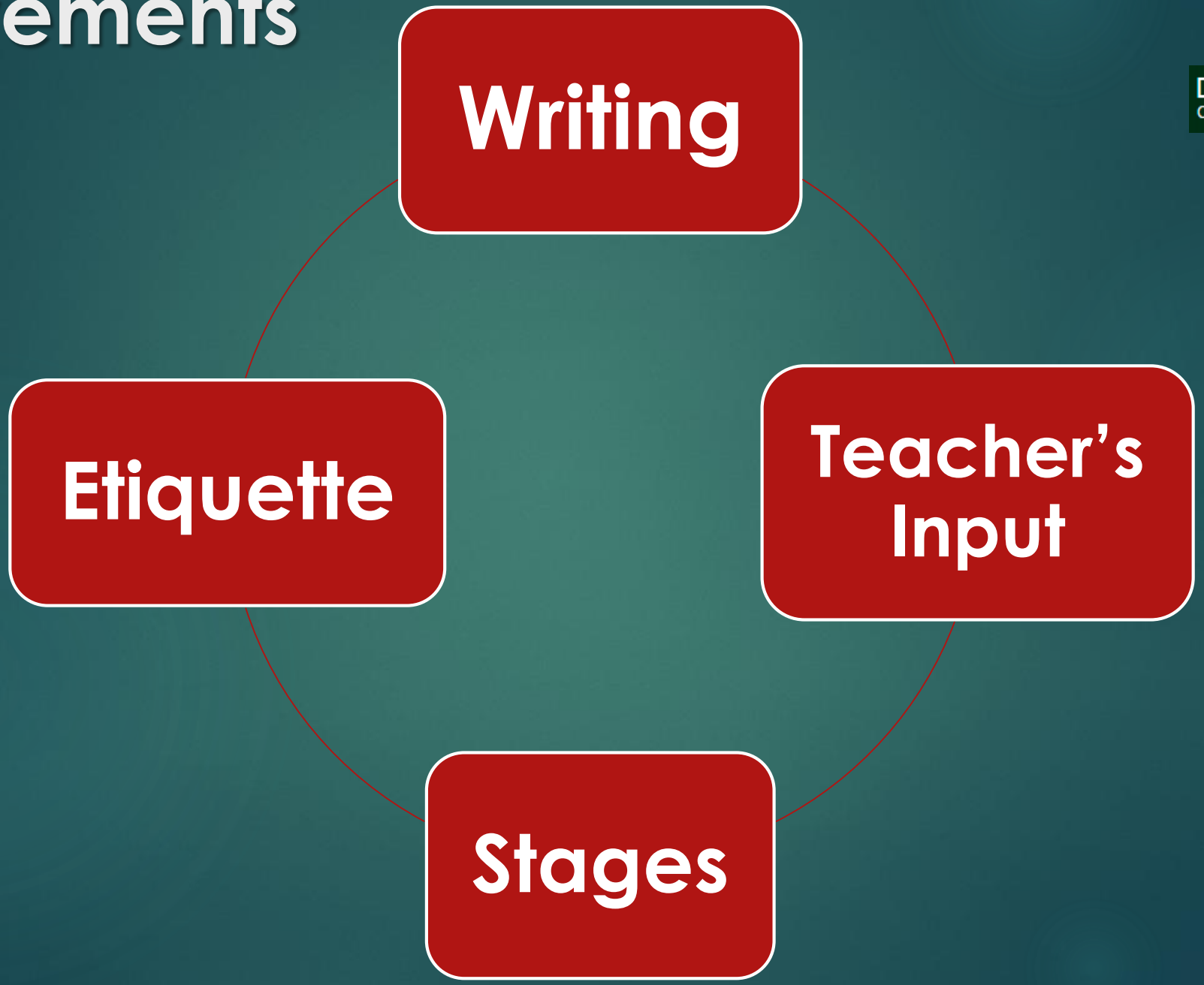
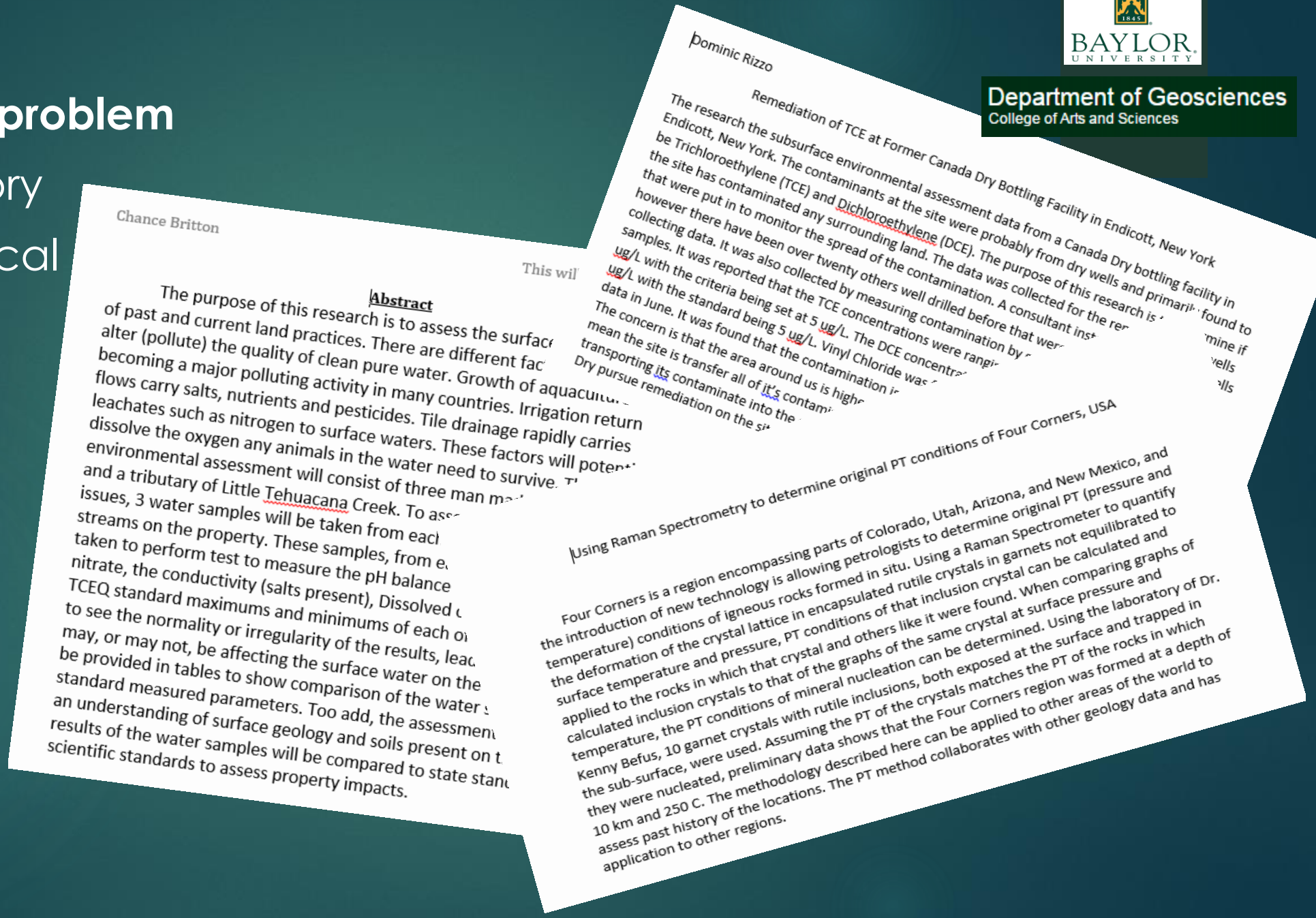


Writing

- Most **common problem**
- Not telling a story
- Clear and Logical
- Peer to Peer



Chance Britton

This wil

Abstract

The purpose of this research is to assess the surfac
of past and current land practices. There are different fac
alter (pollute) the quality of clean pure water. Growth of aquacu
becoming a major polluting activity in many countries. Irrigation return
flows carry salts, nutrients and pesticides. Tile drainage rapidly carries
leachates such as nitrogen to surface waters. These factors will poten
dissolve the oxygen any animals in the water need to survive.
environmental assessment will consist of three man ma
and a tributary of Little Tehuacana Creek. To ass
issues, 3 water samples will be taken from eac
streams on the property. These samples, from e
taken to perform test to measure the pH balance
nitrate, the conductivity (salts present), Dissolved
TCEQ standard maximums and minimums of each o
to see the normality or irregularity of the results, lea
may, or may not, be affecting the surface water on the
be provided in tables to show comparison of the water
standard measured parameters. Too add, the assessmen
an understanding of surface geology and soils present on t
results of the water samples will be compared to state stan
scientific standards to assess property impacts.

Dominic Rizzo

Remediation of TCE at Former Canada Dry Bottling Facility in Endicott, New York

The research the subsurface environmental assessment data from a Canada Dry bottling facility in Endicott, New York. The contaminants at the site were probably from dry wells and primari found to be Trichloroethylene (TCE) and Dichloroethylene (DCE). The purpose of this research is the site has contaminated any surrounding land. The data was collected for the re that were put in to monitor the spread of the contamination. A consultant inst however there have been over twenty others well drilled before that wer collecting data. It was also collected by measuring contamination by samples. It was reported that the TCE concentrations were rangi ug/L with the criteria being set at 5 ug/L. The DCE concentra ug/L with the standard being 5 ug/L. Vinyl Chloride was data in June. It was found that the contamination i The concern is that the area around us is high mean the site is transfer all of it's contam transporting its contaminate into the Dry pursue remediation on the si mine if wells lls

Using Raman Spectrometry to determine original PT conditions of Four Corners, USA

Four Corners is a region encompassing parts of Colorado, Utah, Arizona, and New Mexico, and the introduction of new technology is allowing petrologists to determine original PT (pressure and temperature) conditions of igneous rocks formed in situ. Using a Raman Spectrometer to quantify the deformation of the crystal lattice in encapsulated rutile crystals in garnets not equilibrated to surface temperature and pressure, PT conditions of that inclusion crystal can be calculated and applied to the rocks in which that crystal and others like it were found. When comparing graphs of calculated inclusion crystals to that of the graphs of the same crystal at surface pressure and temperature, the PT conditions of mineral nucleation can be determined. Using the laboratory of Dr. Kenny Befus, 10 garnet crystals with rutile inclusions, both exposed at the surface and trapped in the sub-surface, were used. Assuming the PT of the crystals matches the PT of the rocks in which they were nucleated, preliminary data shows that the Four Corners region was formed at a depth of 10 km and 250 C. The methodology described here can be applied to other areas of the world to assess past history of the locations. The PT method collaborates with other geology data and has application to other regions.

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Teacher's Input

- Coaching but **not doing**
- Rewriting and Rewriting
- Organization
- Logical

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Wayne's comments, 1-31-16

Author: Kolton Sundquist

Post Title:

Abstract

Research in the geological aspects of land use planning is extremely important for the safest and most environmentally conscious development of the natural environment for use in urban building. The implication of safely using natural land for building purposes affects everyone that comes into contact with urban structures around the globe. The research being done involves a specific case study in Malibu, California, in which costal landslides led to the destruction of houses after the cliff side on which they were built had collapsed. In order to confront, contain, and eliminate the problem of losing urban structures due to landslides as a result of poor land use planning, the affected areas must be studied and the geological data collected must be used in the future land use of similar sites. The geological data collected from various sources will then be compiled and studied in order to determine the underlying geological constrains for the region. By studying the affected areas and using geological data collected a conclusion regarding the potential hazards and geological constraints of the area in question can be made. Proper land use planning and preventative measures can then be taken using the geological data compiled on the landslide sites found in Malibu. The resulting conclusions may also be applied to the improvement of land planning on sites with deferring geographical settings but similar geological make up as the case study site.

Did a very quick review...saw this link. Looks like there is enough information for your research topic.
http://www.malibugeology.com/articles.html

Wayne Hamilton
Add a title.

Wayne Hamilton
Could these geological inputs apply to more than buildings? For example citing dams, roads, tunnels? Primarily, buildings, but to roads and tunnels for example.

Wayne Hamilton
I like the topic, suspect since it is California there are regulatory criteria for building on slopes. So possibly regulatory input to your research topic.

Also are there maps that would depict past landslides and help with predicting future landslides. Maps and photos add a lot to your poster.

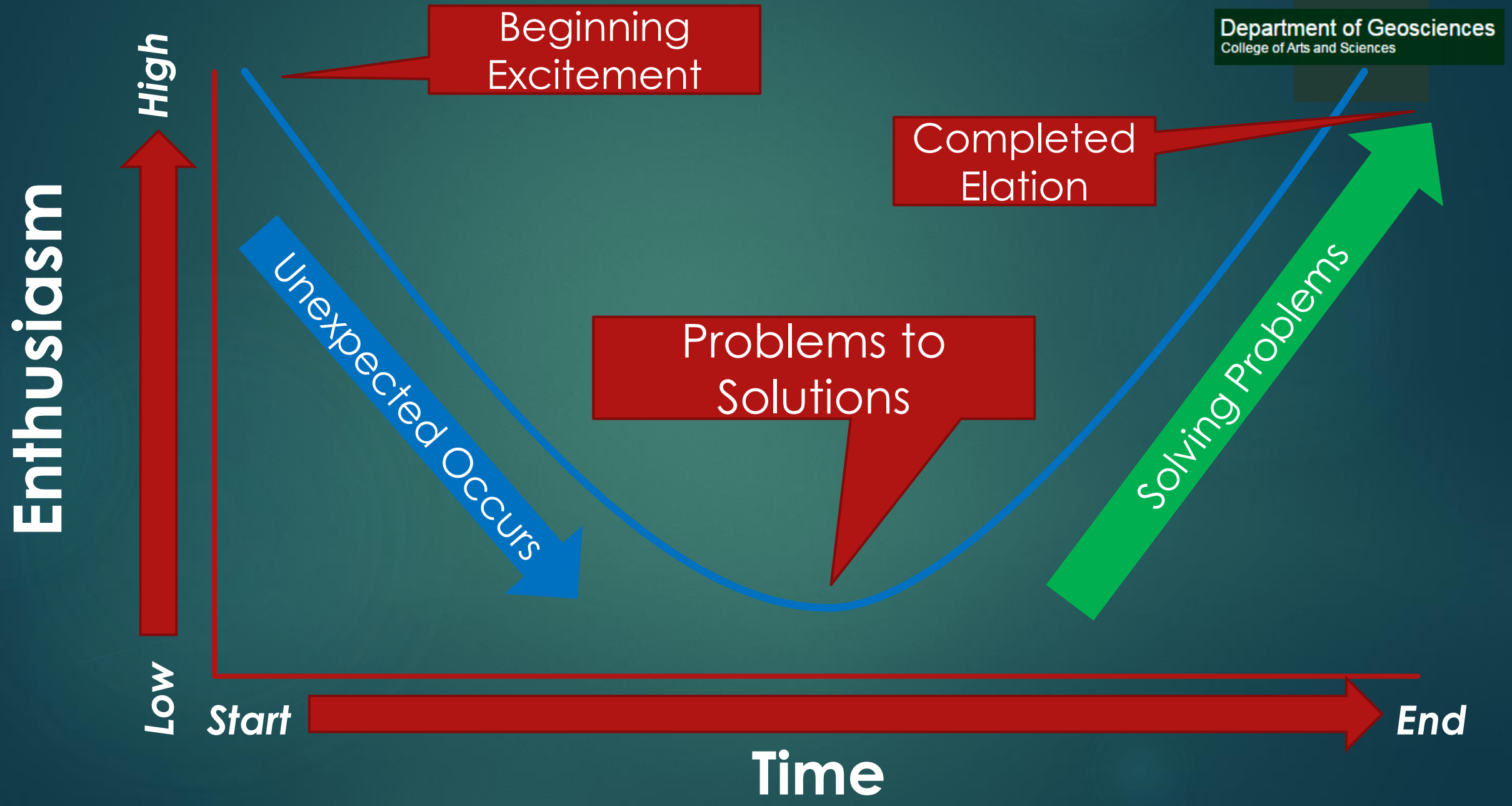
Wayne Hamilton
Can you add any potential hazards here? Keep it brief, but list what you know now.

Wayne Hamilton
Like the "potential hazards" comment above, can you tell me any of the "geological constraints"? Suspect it would be soil or rock type, faults, fracture, groundwater depth...ect.

Wayne Hamilton
Use "similar" instead of deferring. Furthermore I really like learnings being applying to other areas of the USA/globe. That adds to your poster/presentation/paper scope.

Wayne Hamilton

Research Stages



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Poster "Etiquette"

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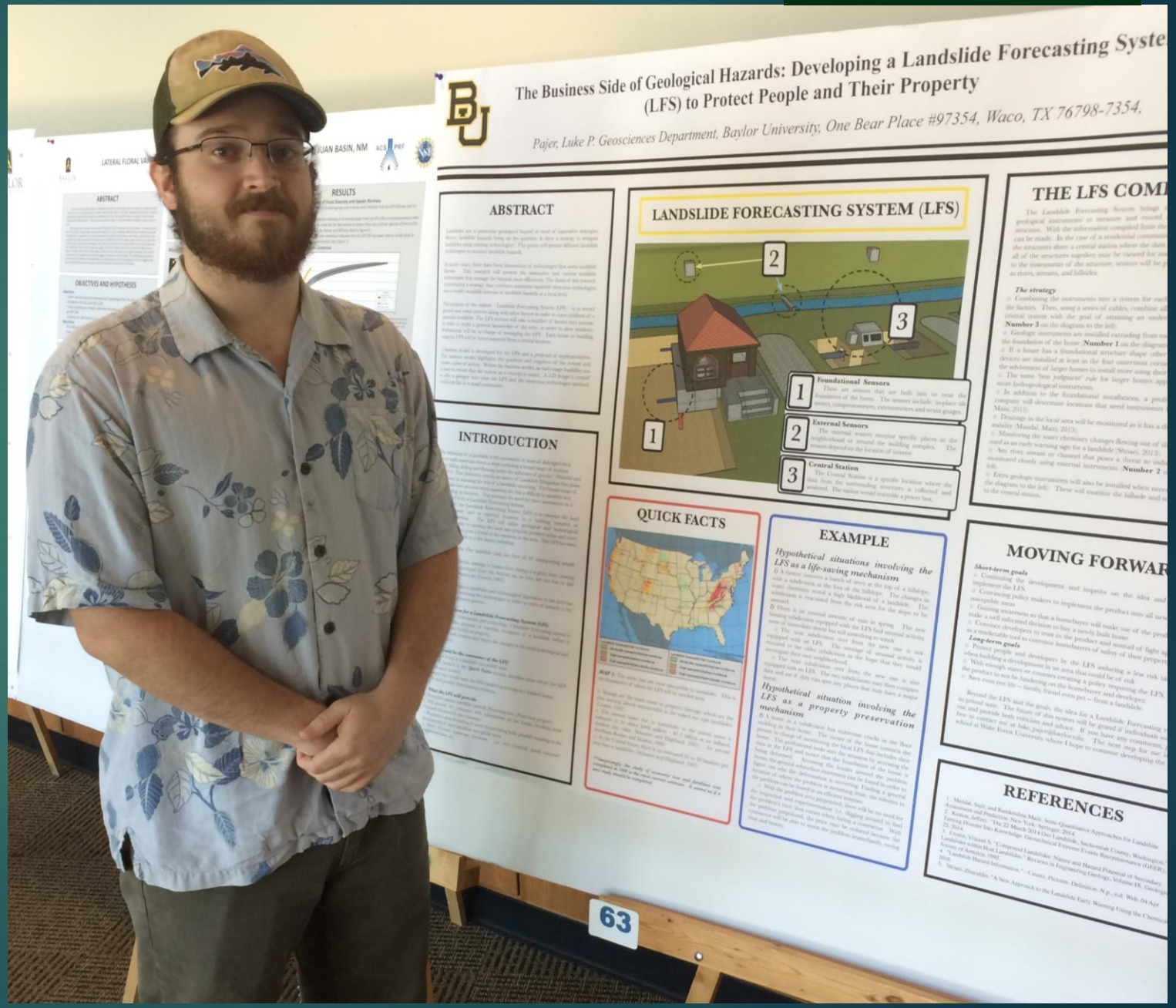
- **Dialog** with
  - Visitors
    - Non-Geosciences
    - Faculty
    - Students
  - Judges

- "**Dead Time**" at poster
  - How to Keep motivated?



Summary

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- **Lessons Learning**
  - Student Motivation
  - Teacher Leadership
- **Improvement Areas**
  - Writing and Rewriting
  - Etiquette
- **Long Term Benefits**
  - Graduate School/Career

Continue the Discussion

Poster: On the Cutting Edge: Fifteen Years of Impacts on Geoscience Education

Monday, October 23, 4:30-6:30 p.m.

Booth 180
Poster 163-12

TEACHING A SUBSURFACE SIMULATED SUBJECT OUTDOORS: HOW TO LEVERAGE TIME FOR FIELD HYDROGEOLOGY