# NSF Geo Directorate Programs and CSU Awardees

Moderated by:
Dr. Frank A. Gomez
Executive Director, STEM-NET
Office of the Chancellor


https://www2.calstate.edu/impact-of-the-csu/research/stem-net

***Frank A. Gomez*** *CSU Office of the Chancellor* *fgomez@calstate.edu*

# NSF Geo Directorate Programs and CSU Awardees

## Speakers

**Jennifer Wenner and Laura Lautz, National Science Foundation**
Navigating NSF

**Valbone Memeti, Cal State Fullerton**
The Temporal and Spatial Behavior of Magma Plumbing Systems as seen through the Geochemical and Geochronologic Lens of Minerals

**Rachel Teasdale, Chico State**
Discipline-Based Education Research in Geology: How are Student Learning and Interest Influenced by TA beliefs in Introductory Courses?

**Nathan Onderdonk, Cal State Long Beach**
Doing Active Tectonics Research in Southern California and Strategies for Funding Local Field Work

**Kathryn Metcalf, Cal State Fullerton**
What Happened During the First Half of the India-Asia Collision?

**Amelia Vankeuren, Sacramento State**
How Do Multigenerational Households Navigate Care and Safety during the COVID-19 Pandemic?

CALIFORNIA STATE UNIVERSITY
FULLERTON

# The Temporal and Spatial Behavior of Magma Plumbing Systems as Seen through the Geochemical and Geochronologic Lens of Minerals


*Dr. Valbone (Vali) Memeti – Cal State Fullerton*

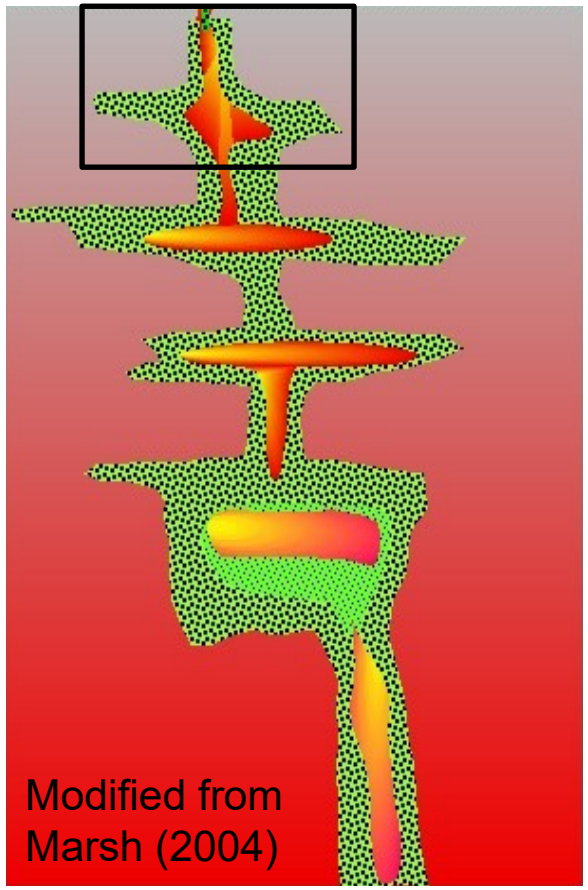
*Collaborators: Drs. Katie Ardill (Sac State), Cal Barnes (Texas Tech), Scott Paterson (USC), Blair Schoene (Princeton U)*

**Valbone Memeti,** Associate Professor

Cal State Fullerton, Geological Sciences

vmemeti@fullerton.edu

# What I do…



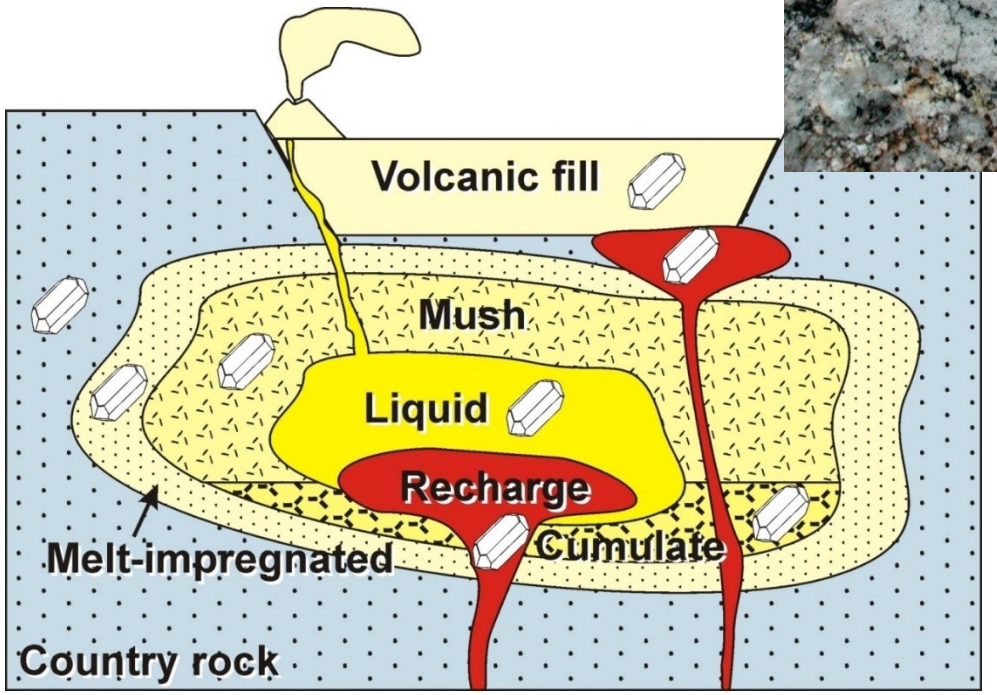

volcanic and subvolcanic upper crust

Yosemite

middle crust

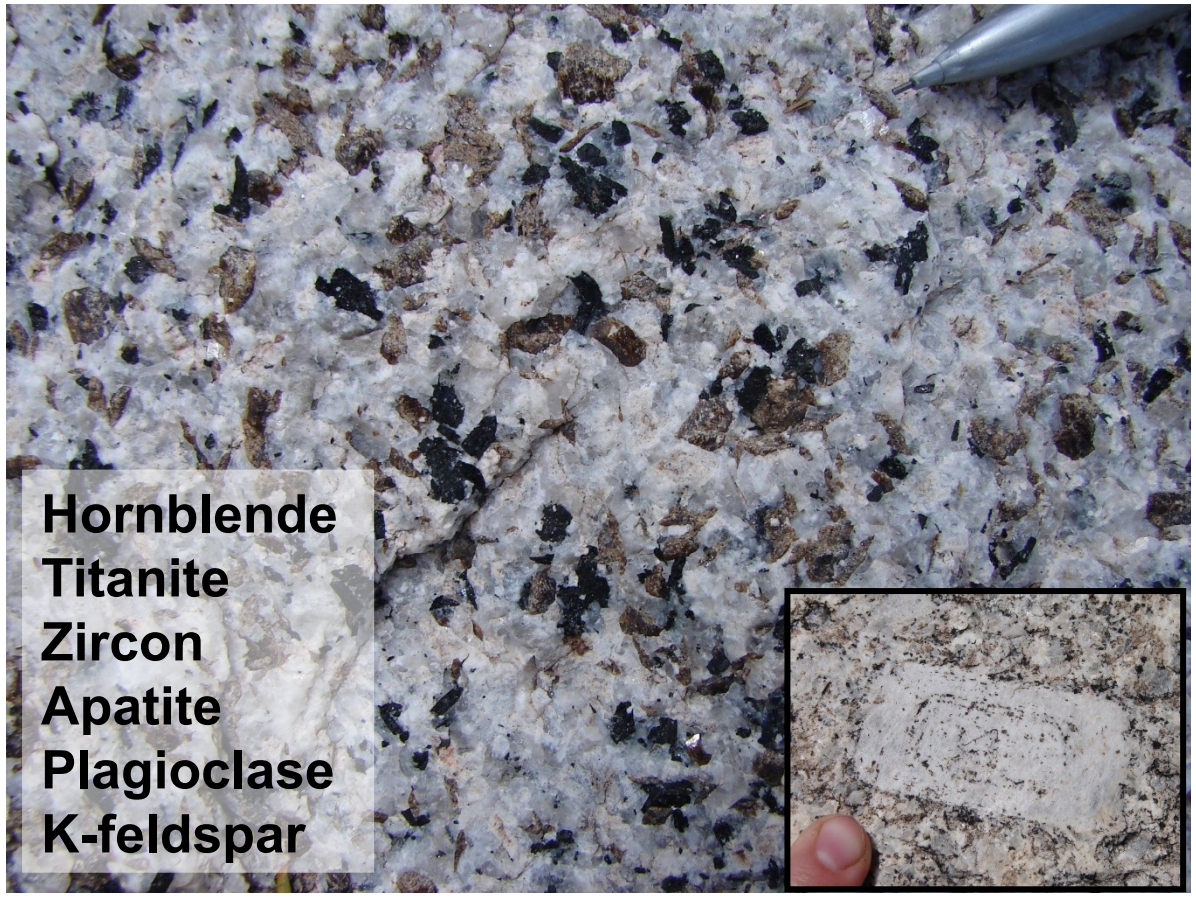
lower crust

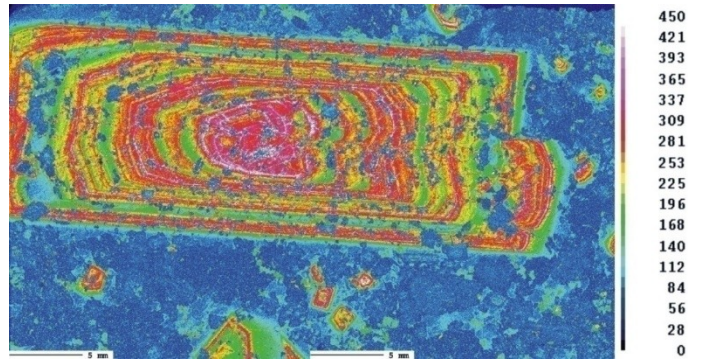
Kfs megacryst 6 cm across

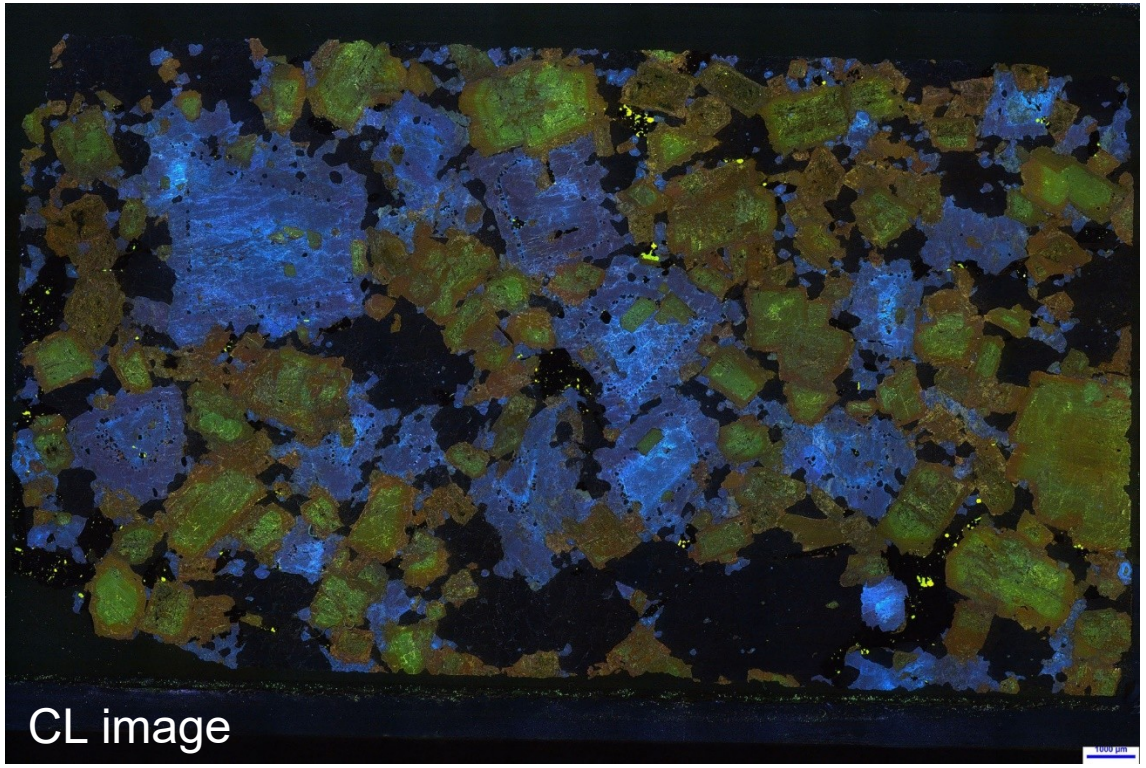



Reid (2003)

# Unravel Magmatic Histories through Mineral Zoning

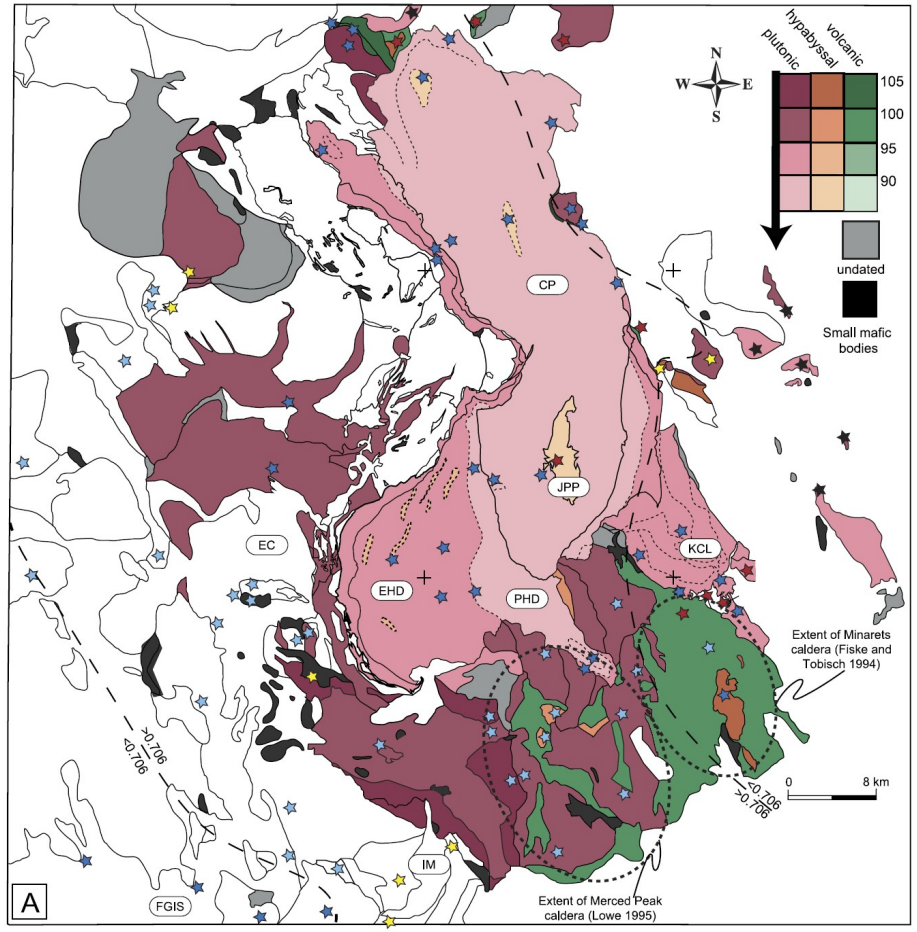


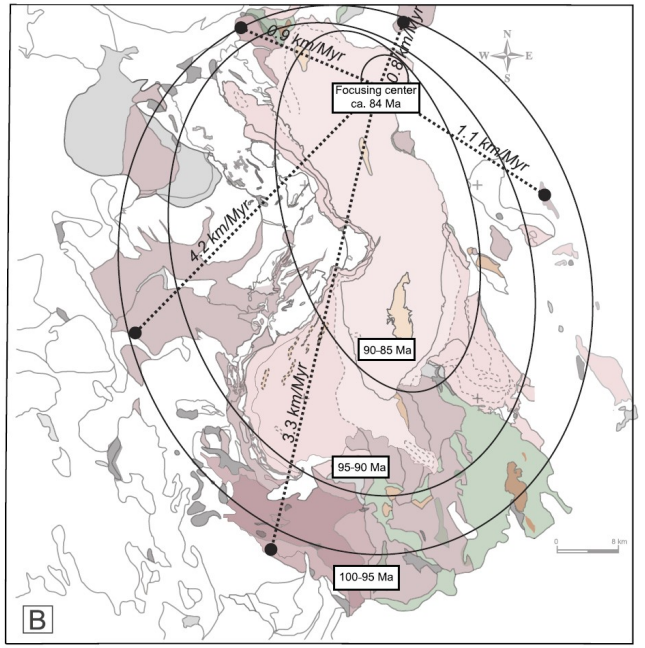



# NSF funded project

# Collaborative Research: RUI: Examining the Temporal, Spatial and Geochemical Focusing of Magmatism During a Continental Arc Flare-up



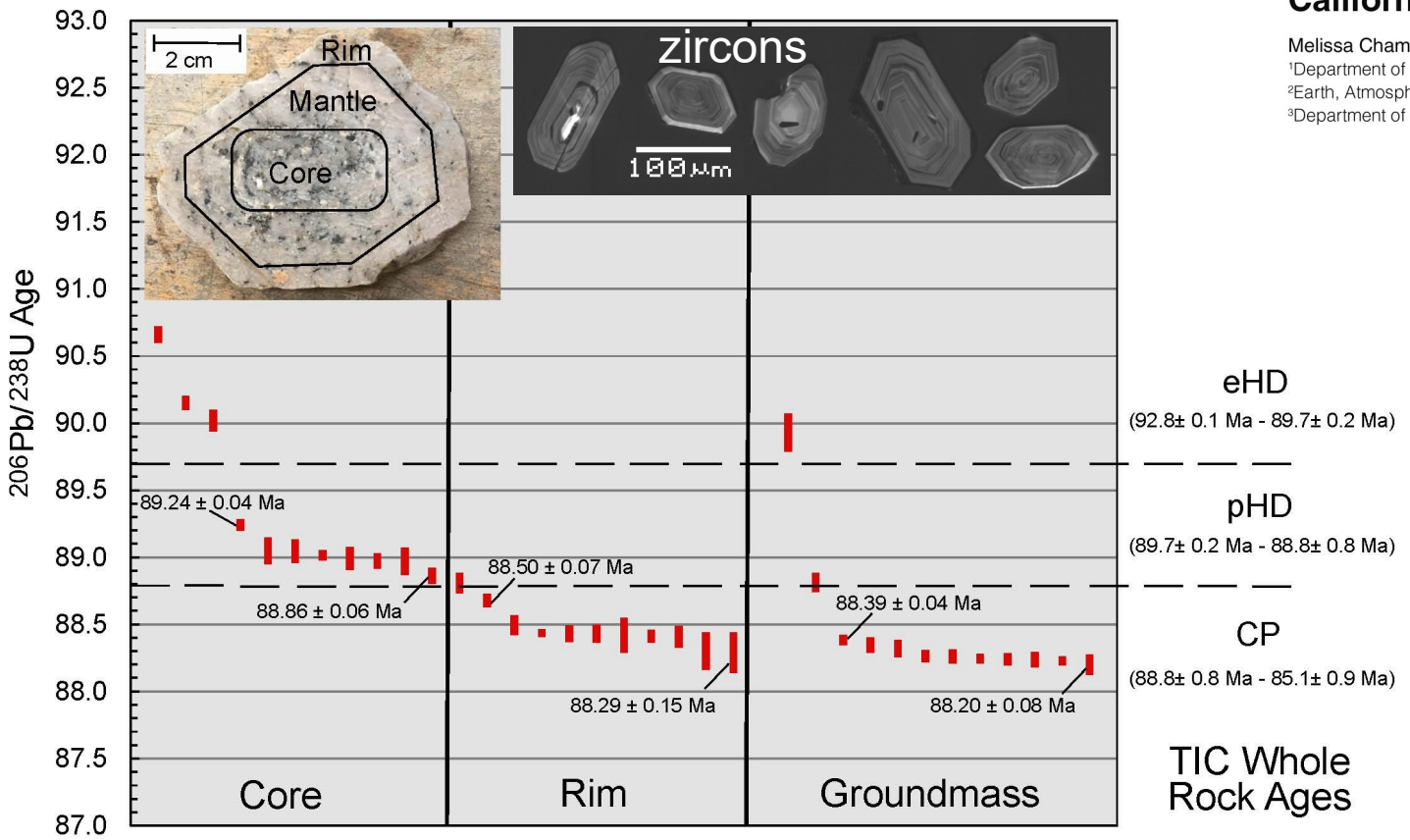




Ardill et al. (2018), EPSL

GEOLOGY | THE GEOLOGICAL SOCIETY OF AMERICA®
https://doi.org/10.1130/G46873.1
Manuscript received 31 July 2019
Revised manuscript received 4 December 2019
Manuscript accepted 18 December 2019



# CA-ID-TIMS Zircon Geochronology




## Half a million years of magmatic history recorded in a K-feldspar megacryst of the Tuolumne Intrusive Complex, California, USA

Melissa Chambers[1], Valbone Memeti[1], Michael P. Eddy[2] and Blair Schoene[3]
[1]Department of Geological Sciences, California State University Fullerton, Fullerton, California 92831, USA
[2]Earth, Atmospheric, and Planetary Sciences Department, Purdue University, West Lafayette, Indiana 47907, USA
[3]Department of Geosciences, Princeton University, Princeton, New Jersey 08544, USA

Melissa Chambers, MS

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The California State University

# The Temporal and Spatial Behavior of Magma Plumbing Systems as seen through the Geochemical and Geochronologic Lens of Minerals

## Undergraduate Yosemite Projects

GEOSPHERE

GEOSPHERE, v. 17

https://doi.org/10.1130/GES02233.1

15 figures; 1 table; 1 set of supplemental files

### A tale of five enclaves: Mineral perspectives on origins of mafic enclaves in the Tuolumne Intrusive Complex

C.G. Barnes[1], K. Werts[1], V. Memeti[2], S.R. Paterson[3], and R. Bremer[2]

[1]Department of Geosciences, Texas Tech University, Lubbock, Texas 79409-1053, USA
[2]Department of Geological Sciences, California State University, Fullerton, Fullerton, California 92834, USA
[3]Department of Earth Sciences, University of Southern California, Los Angeles, California 90089, USA

**Undergraduate student:** sampling petrography and whole rock XRF

**Undergraduate student J. Ayers**
Field mapping, petrography and whole rock XRF also, my lab assistant!

…other undergraduates have also done Cathodoluminscence imaging in my lab or used the EMP at UCLA or LA-ICPMS at Texas Tech, CSUN

# The Temporal and Spatial Behavior of Magma Plumbing Systems as seen through the Geochemical and Geochronologic Lens of Minerals

## Lessons Learned

- NSF funding allowed me to involve undergraduate and graduate students in all aspects of research
  - Field work/mapping
  - Lab work (in-house and collaborating labs)
  - Data interpretation
  - Conference presentations
  - Peer-reviewed publications
- When there's funding, everyone wins! ☺
  - Students are involved in state-of-the-art projects
  - PI advances research agenda

# The Temporal and Spatial Behavior of Magma Plumbing Systems as seen through the Geochemical and Geochronologic Lens of Minerals

## Lessons Learned

- RUI's are great because you write an Impact Statement and can emphasize...
  - CSUF's diverse student body (also HSI)
  - Mandatory senior thesis: 11 undergrads involved (5 Latinx, 6 female); 3 MS grads (2 female)
  - Highlight great impact on then untenured Assistant Professor
  - Separate pot of $$ for RUIs?
- Other lessons learned…
  - Get teaching release time instead of extra summer salary
  - Get graduate student tuition and RA salary
  - Get stipends/salary for undergraduate students to be more DEI friendly
  - Include more senior collaborators and collaborators with labs (great for student training)
  - Pre-tenure: Stick with projects you have good background in.

# The Temporal and Spatial Behavior of Magma Plumbing Systems as seen through the Geochemical and Geochronologic Lens of Minerals

## Next Steps/Long-Term Plans

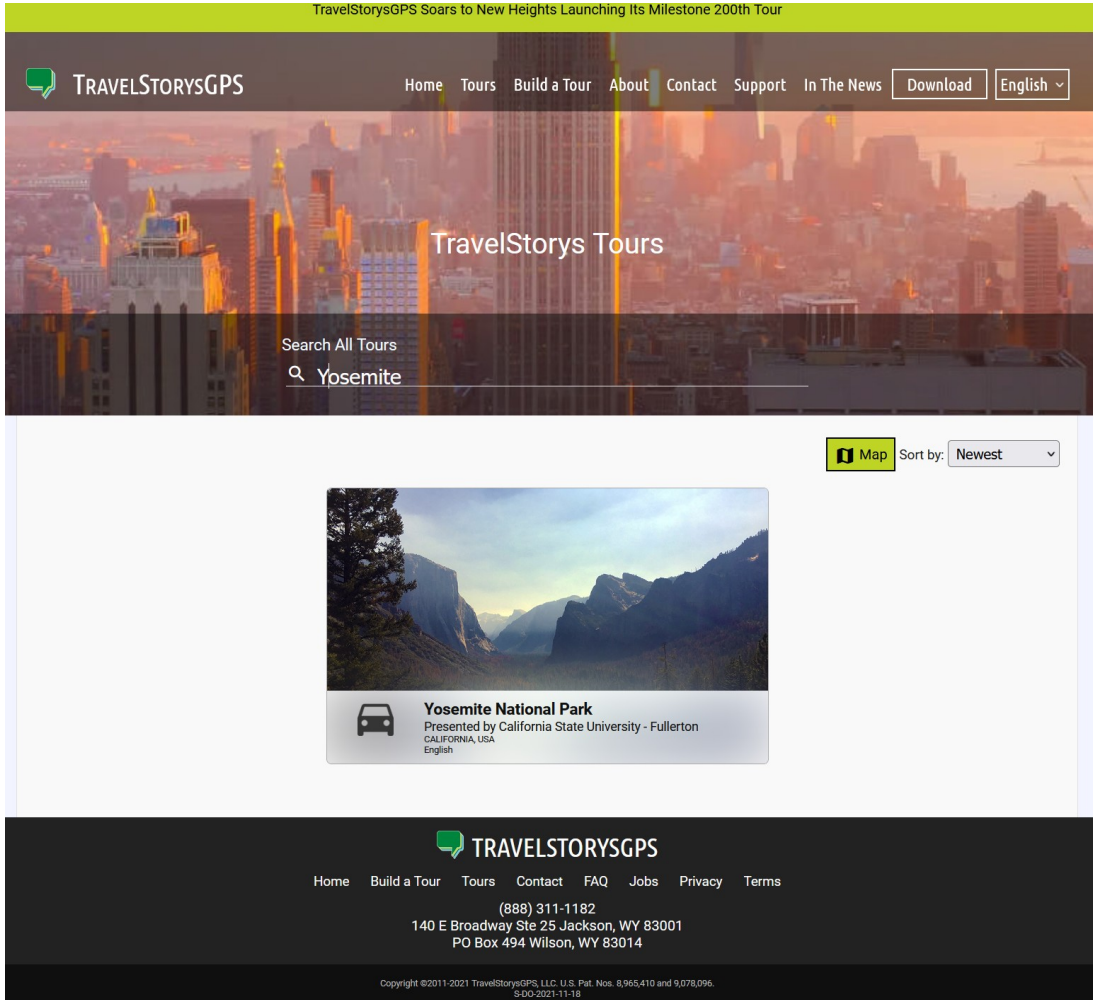
- Write a new NSF proposal with Princeton lab to expand K-feldspar megacryst zircon geochronology
- Develop new projects on arc magmatism
- Interested in new collaborations to study time and length scales of magma processes (both volcanic and plutonic)

# There's an app for everything!

https://travelstorys.com/tours/#Yosemite

**A story of Fire and Ice –**
**a self-guided audio-tour**

Mobile app by CSUF students mentored by CSUF faculty (Bursztyn & Memeti), with help from Katie Ardill, now Sac State.



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# The Temporal and Spatial Behavior of Magma Plumbing Systems as seen through the Geochemical and Geochronologic Lens of Minerals

## Questions?

**Valbone Memeti**
Campus: Cal State Fullerton
Department: Geological Sciences
Email Address: vmemeti@fullerton.edu

# Discipline-Based Education Research in Geology: How are Student Learning and Interest Influenced by TA beliefs in Introductory Courses?

*Rachel Teasdale, CSU, Chico, Geological & Environmental Sciences*

*Katherine Ryker, Univ South Carolina*
*Kelsey Bitting, Elon University*

**Rachel Teasdale**, Professor

CSU, Chico Geological & Environmental Sciences

rteasdale@csuchico.edu

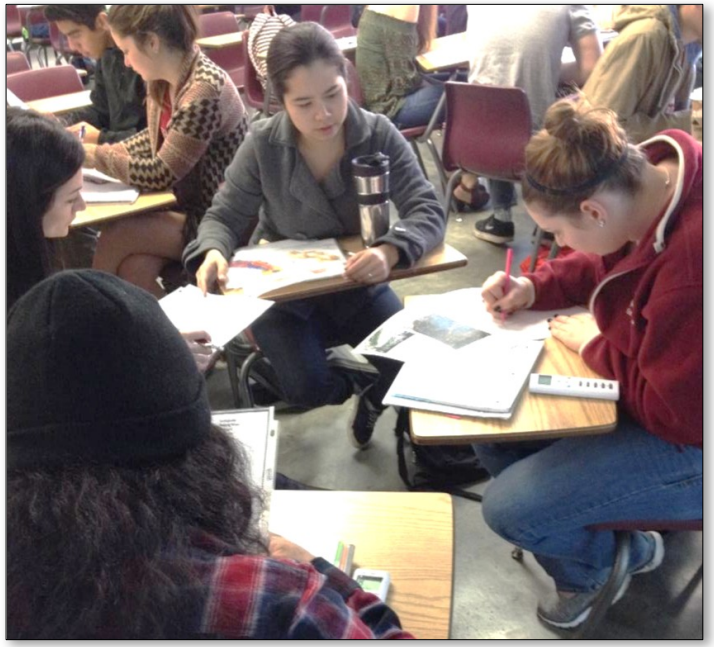
California State University

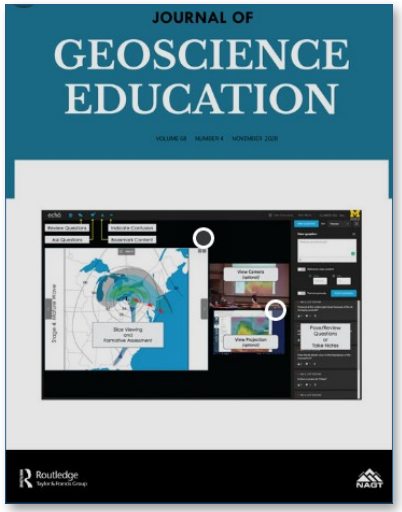
# Discipline-Based Education Research in Geology: How are Student Learning and Interest Influenced by TA beliefs in Introductory Courses?

## Geoscience Education Research

**DBER & GER**

- Reflective teaching & geoscience *research*
- IRB, RTP





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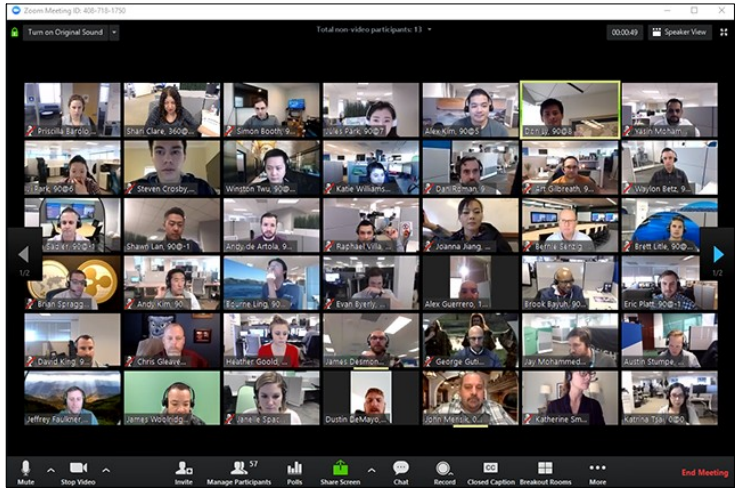
# Discipline-Based Education Research in Geology: How are Student Learning and Interest Influenced by TA beliefs in Introductory Courses?

## Geoscience Education Research

**DBER & GER**

- Reflective teaching & geoscience *research*
- IRB, RTP

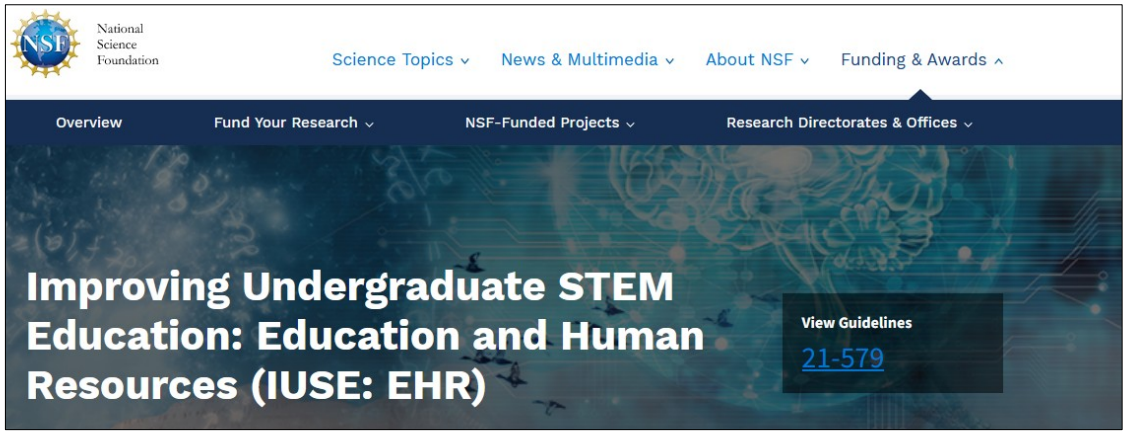
- 2020 Project Challenges: COVID!



# Geoscience Education Research Funding

## NSF- IUSE: EHR

- Emphasis: *research*
- RQs address program-specific research criteria
  - Theoretical frameworks
    Building on existing research to advance research on teaching & learning
- Read solicitation, talk to program officer




**Solicitation: 21-579**

**Program Guidelines**

**Award Information**

The program estimates that approximately $63,000,000 will be available for new awards per fiscal year. See section III below for

**Estimated Number of Awards**

105 - The program estimates making awards for 60 Level 1 projects, 35 Level 2 and 3 projects, and 10 Capacity-Building projects



https://beta.nsf.gov/funding/opportunities/improving-undergraduate-stem-education-education-and-human-resources-iuse-ehr

California State University

# Discipline-Based Education Research in Geology: How are Student Learning and Interest Influenced by TA beliefs in Introductory Courses?

## Project Overview

**Overarching Research Objectives:**

1. Improve instructional training for TAs
2. Improve student learning in intro geoscience lab courses

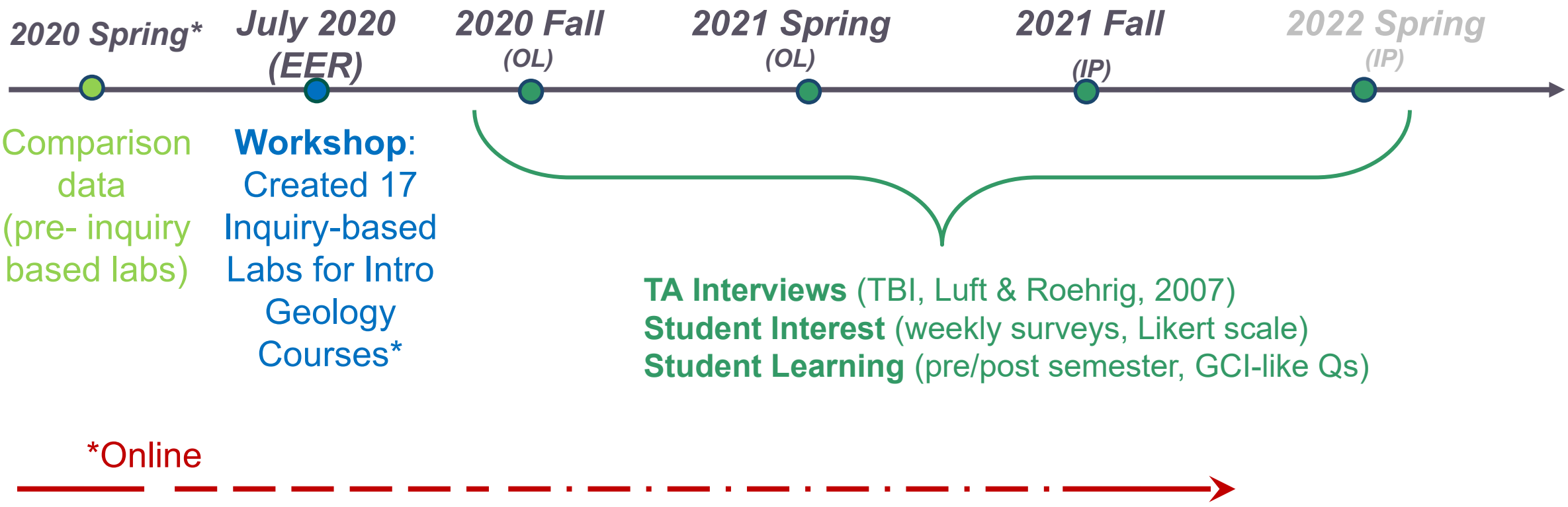
**Research Questions:**

1. How does teaching inquiry-based labs influence geology **TA's beliefs** about teaching and learning?

2. How is student learning influenced by the level of inquiry, TA beliefs, and student interest?

# Activities

5 semesters: 5 PhD-granting institutions, 21 TAs, hundreds of students in 7 courses, each use ≥ 3 inquiry labs






*Free, editable labs available at: www.serc.carleton.edu/inquiry_intro_geo/index.html

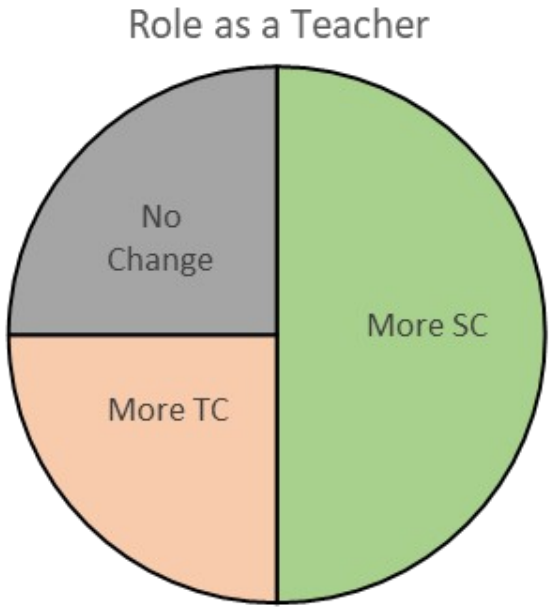
# Results (in progress)

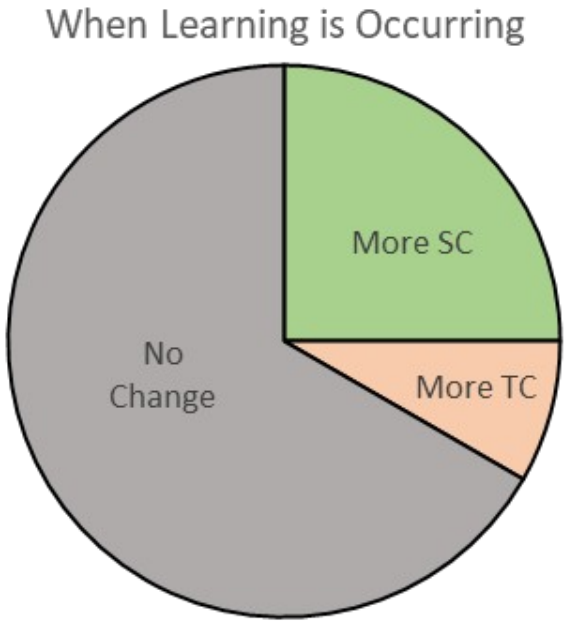
**RQ1: TA beliefs**

## Discipline-Based Education Research in Geology: How are Student Learning and Interest Influenced by TA beliefs in Introductory Courses?

Coded interviews (TBI) quantify teacher focused vs. student focused beliefs changes from start → end of semester

- How do you describe your role as a teacher? (Q2)
- How do you know when learning is occurring in your classroom? (Q7)



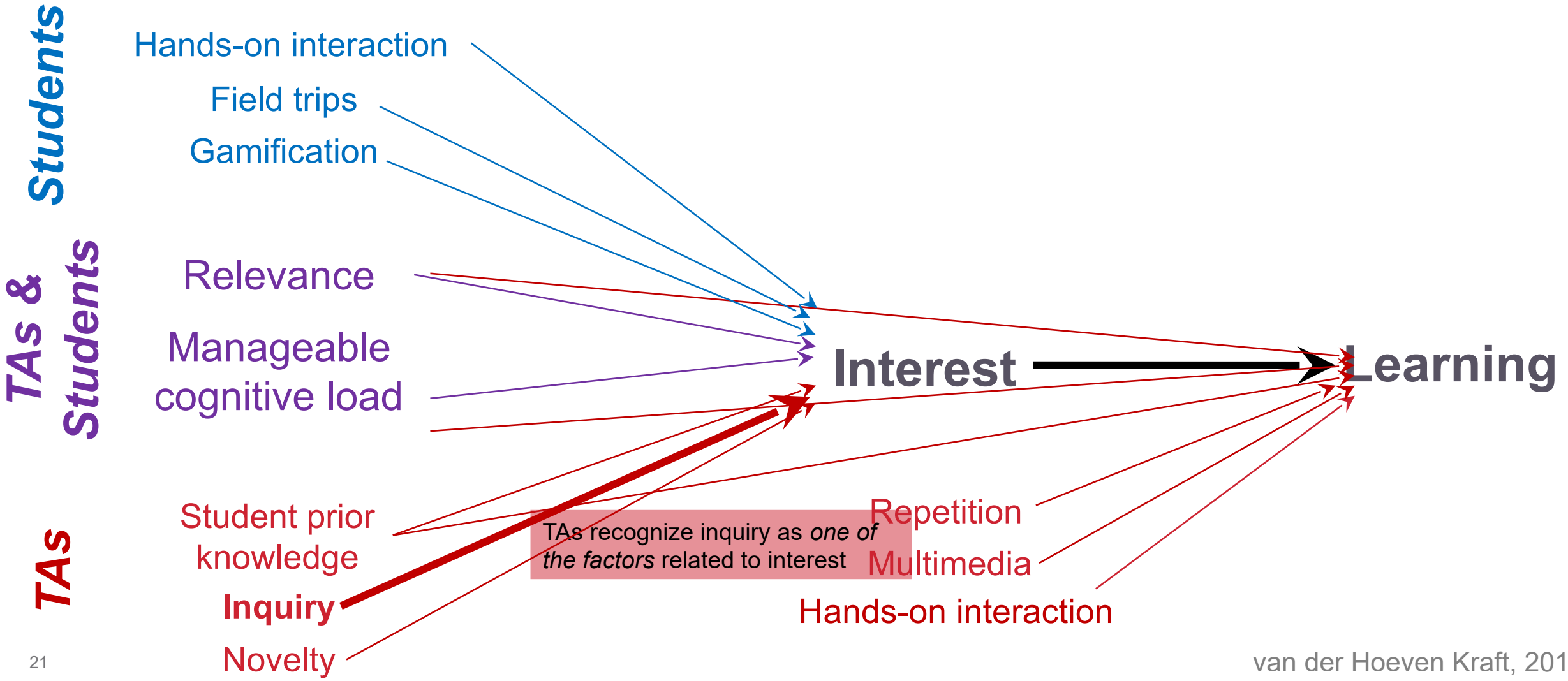

TAs with less teaching experience have a larger shift in beliefs about teaching, than experienced TA's

*Donat et al, EER, 2021*

# Results (in progress)

**RQ2: Student learning**
(spring 2021)

## Discipline-Based Education Research in Geology: How are Student Learning and Interest Influenced by TA beliefs in Introductory Courses?



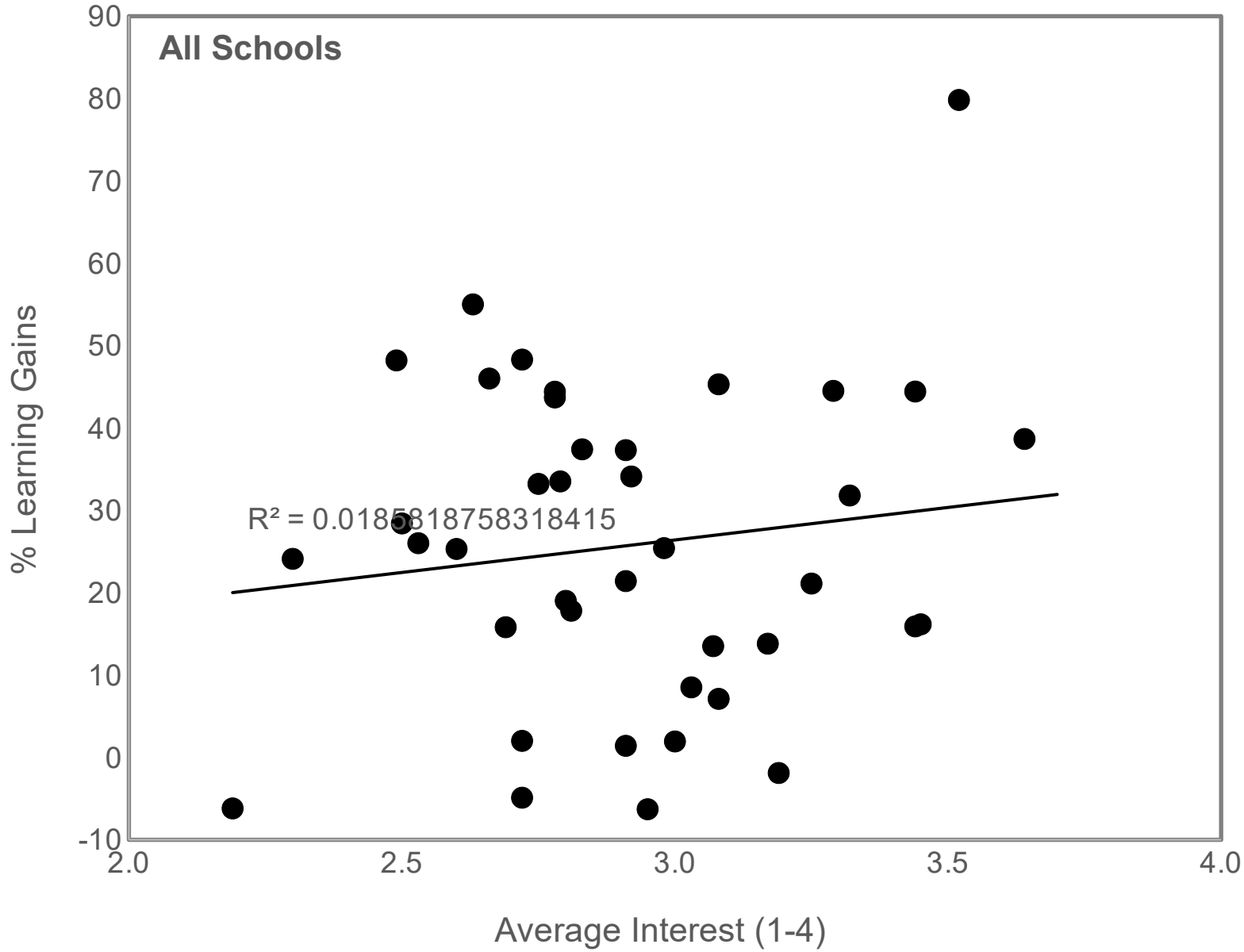



van der Hoeven Kraft, 2017

# Results (in progress)

**RQ2: Student learning**

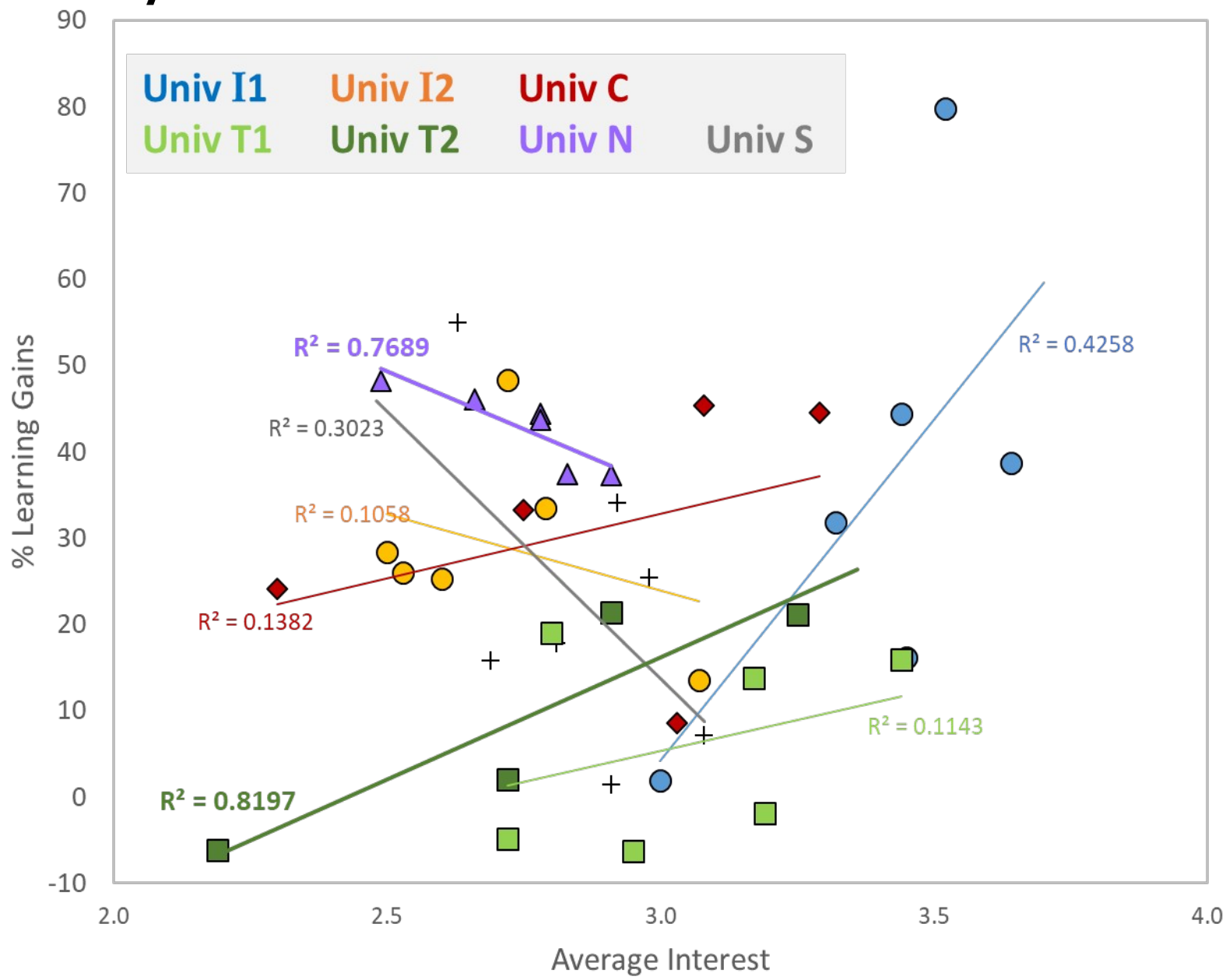
(spring 2021)



# Results (in progress)

**RQ2: Student learning**

(spring 2021)



## Moving Forward

**RQ1 TA beliefs:**

- Ongoing interviews, analyses
- Impacts for TA training

**RQ2 Student learning:**

- Collecting learning & interest data
- Integration of student data, TA beliefs, inquiry level
- Hierarchical Linear Modeling (HLM) to determine most important driving factors for student learning

**New RQs:**

- Is inquiry effective in supporting learning by all students (e.g. mitigate performance inequities)? *(Davis et al., 2022)*
- Differences in learning & interest in online vs. in person inquiry-based labs?

# Discipline-Based Education Research in Geology: How are Student Learning and Interest Influenced by TA beliefs in Introductory Courses?

## Summary & Lessons Learned

Utility of education research for CSU faculty
Pursuing NSF Education Research Funding

**Research Results**

- *Lots* of data!
- Opportunities for collaboration, including with (under) grad students

**COVID-19:**

- Flexibility “in the field” collecting data
- Opportunities for new questions

# Questions?

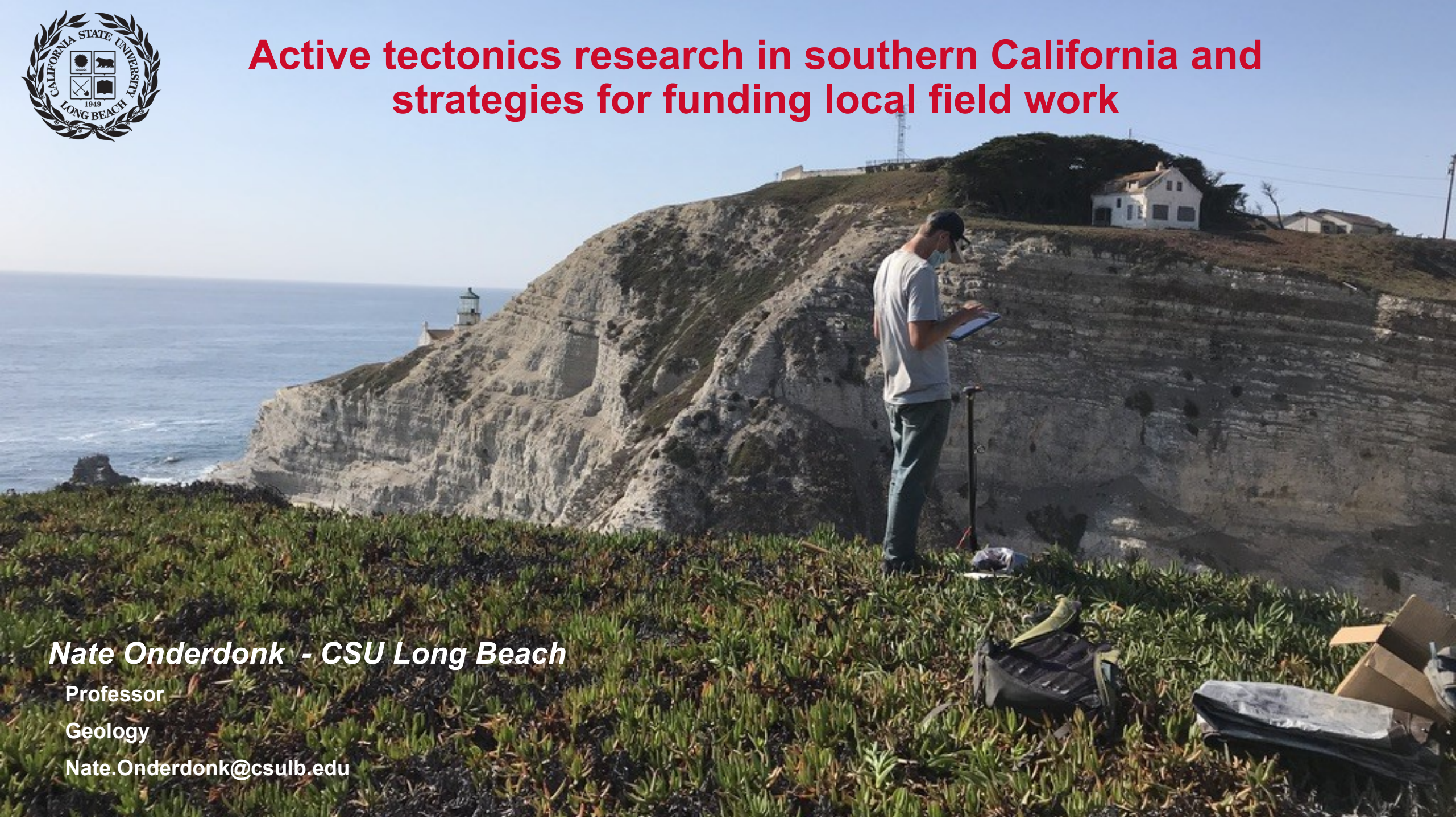
Discipline-based education research in geology: How are student learning and interest influenced by TA beliefs in introductory courses?

**Rachel Teasdale**
CSU, Chico Geological & Environmental Sciences
rteasdale@csuchico.edu

*Free, editable inquiry-based labs available at: www.serc.carleton.edu/inquiry_intro_geo/index.html

**NSF-IUSE Solicitation: 21-579**
https://beta.nsf.gov/funding/opportunities/improving-undergraduate-stem-education-education-and-human-resources-iuse-ehr

# Active tectonics research in southern California and strategies for funding local field work




*Nate Onderdonk - CSU Long Beach*

Professor

Geology

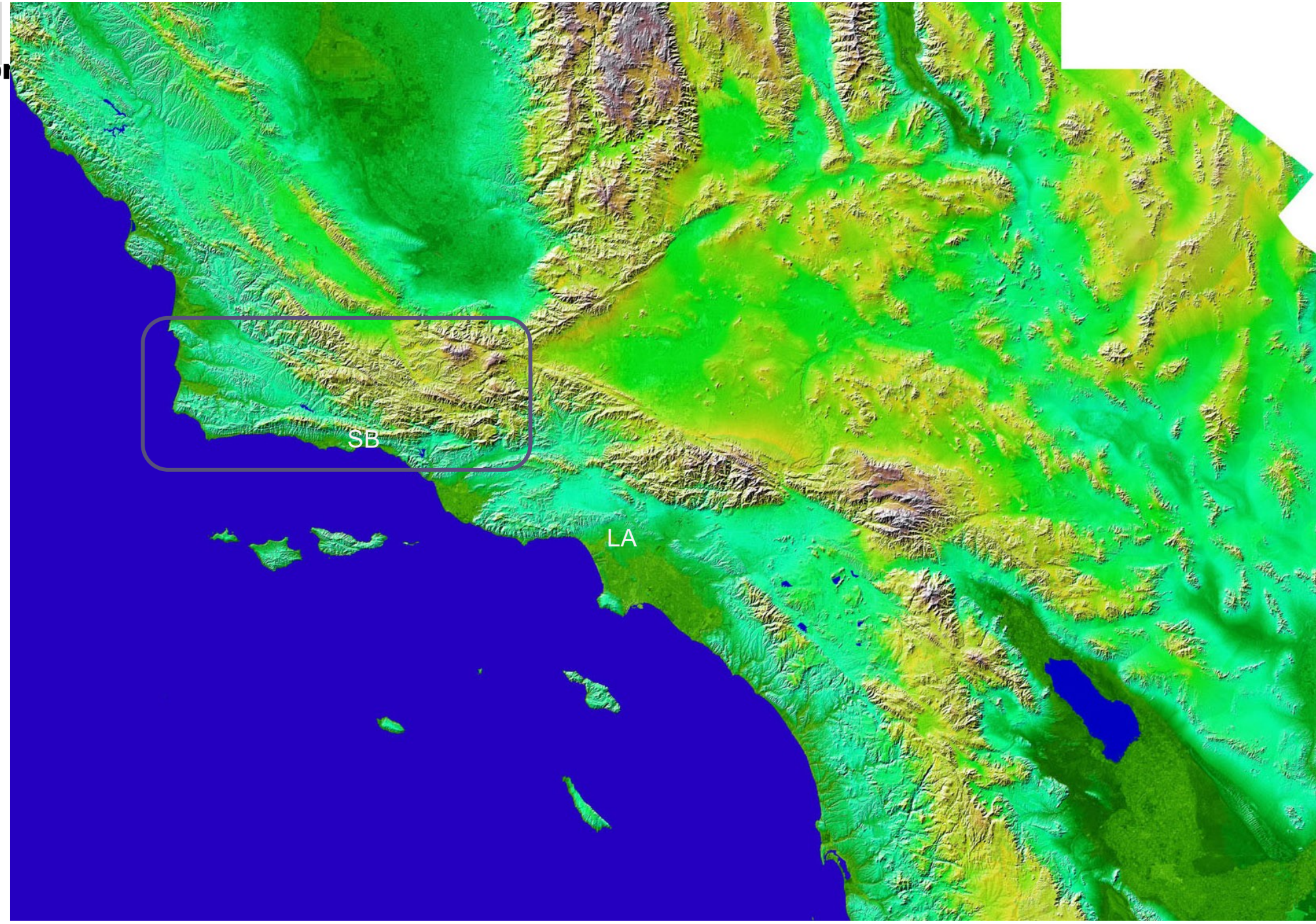
Nate.Onderdonk@csulb.edu

# Project Overview

Mountain building

- how do mountains grow?

Looking at the western Transverse Ranges



# Activities

The California State University

Field and LIDAR mapping of river terraces

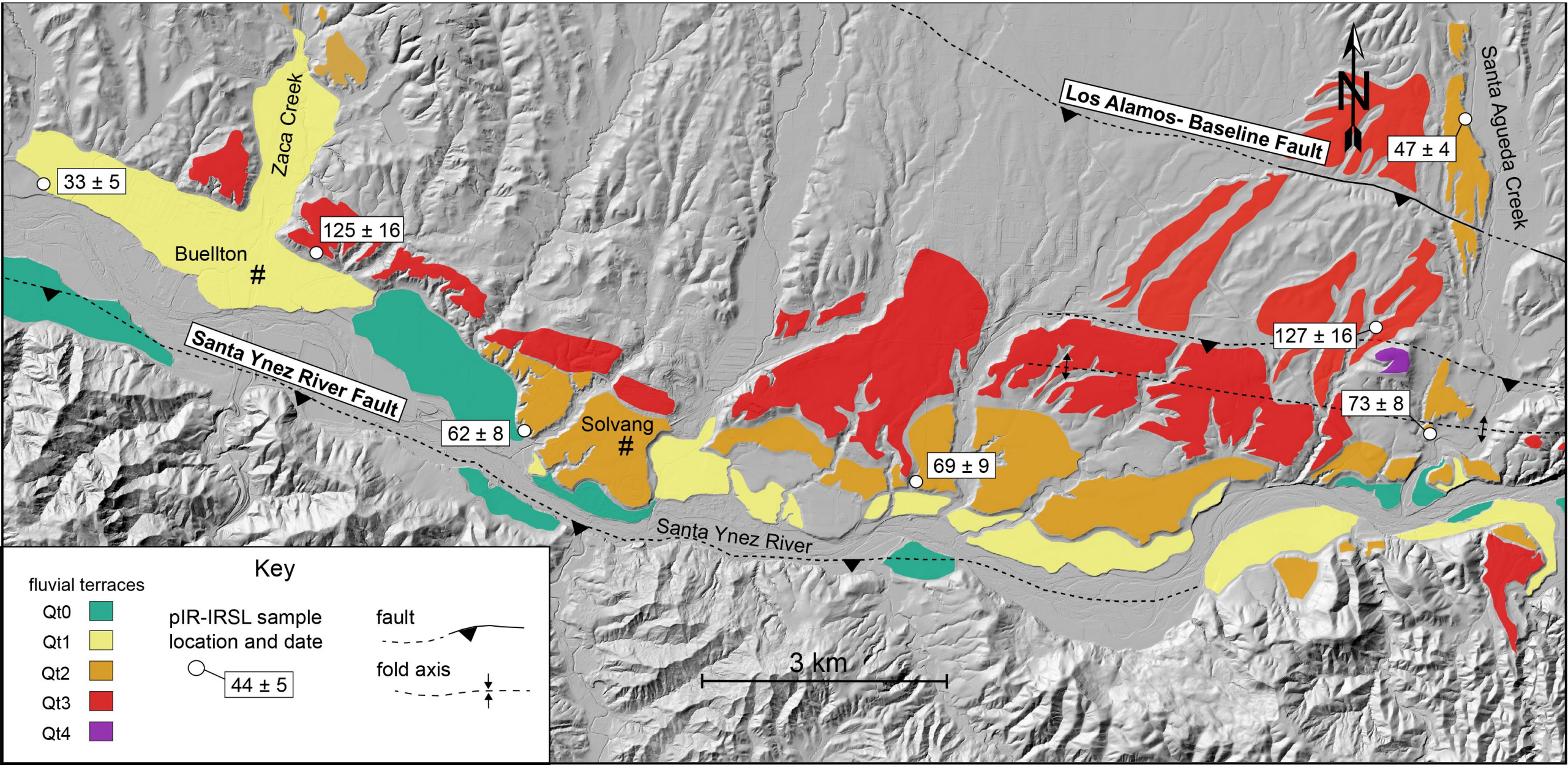
GPS surveys

Luminescence dating of terrace deposits

# Results

Mapped and dated three regional terrace levels

The California State University

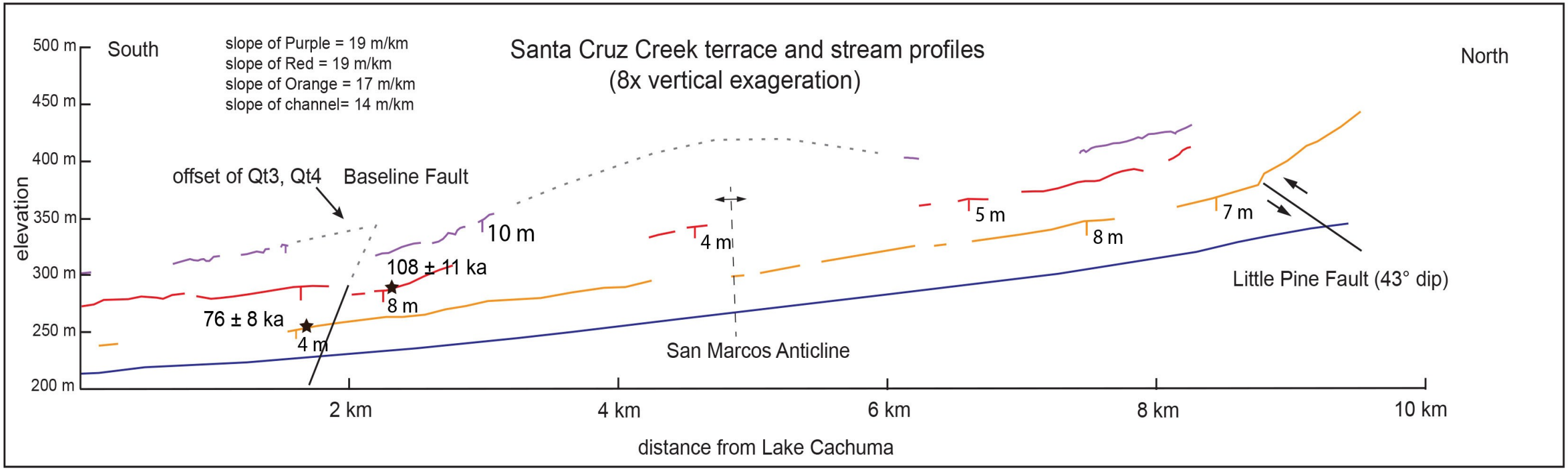


# Results

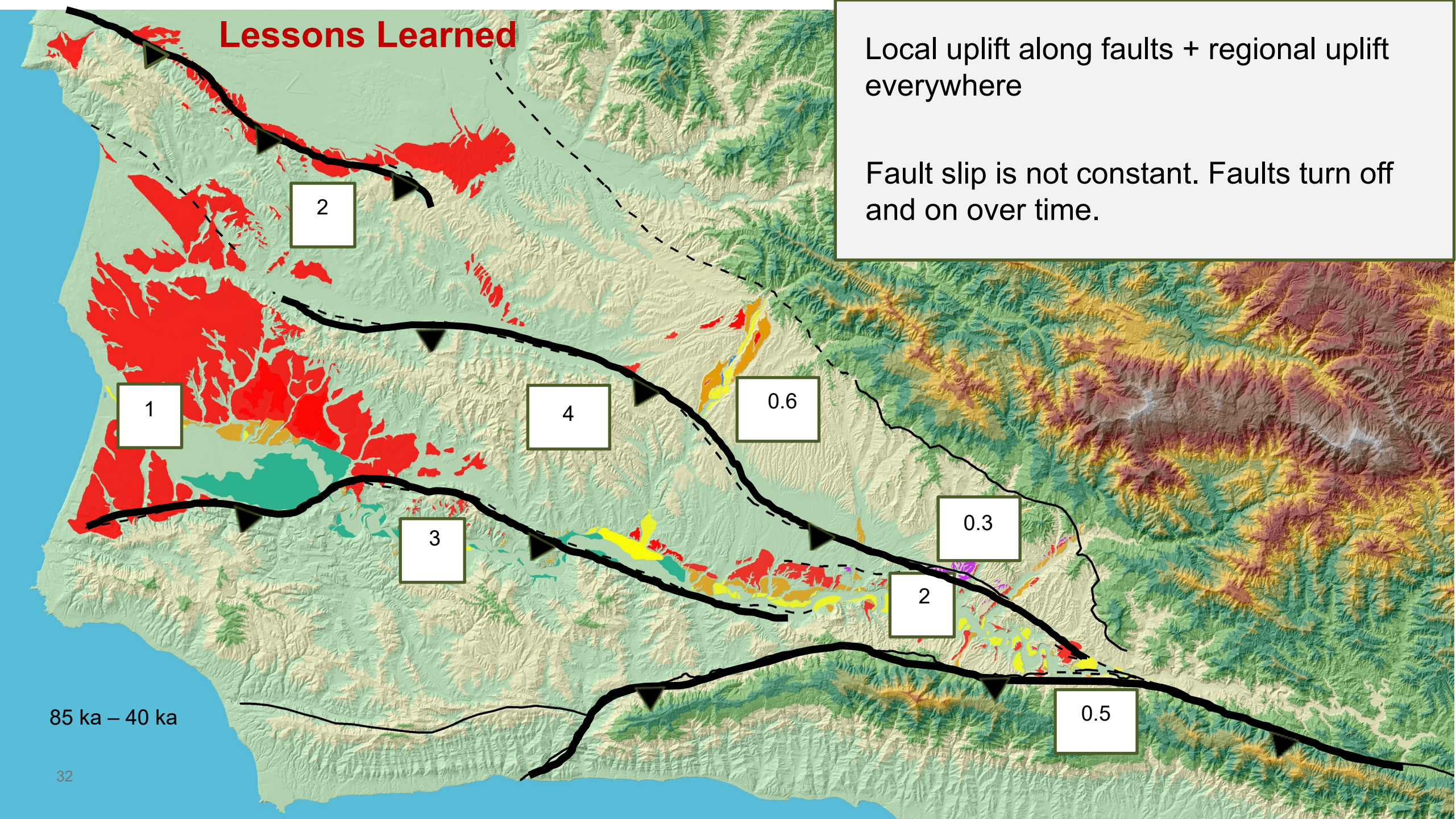
The California State University

Profiles show folding and faulting of the terraces

Ages and heights of terraces allow us to calculate uplift rates



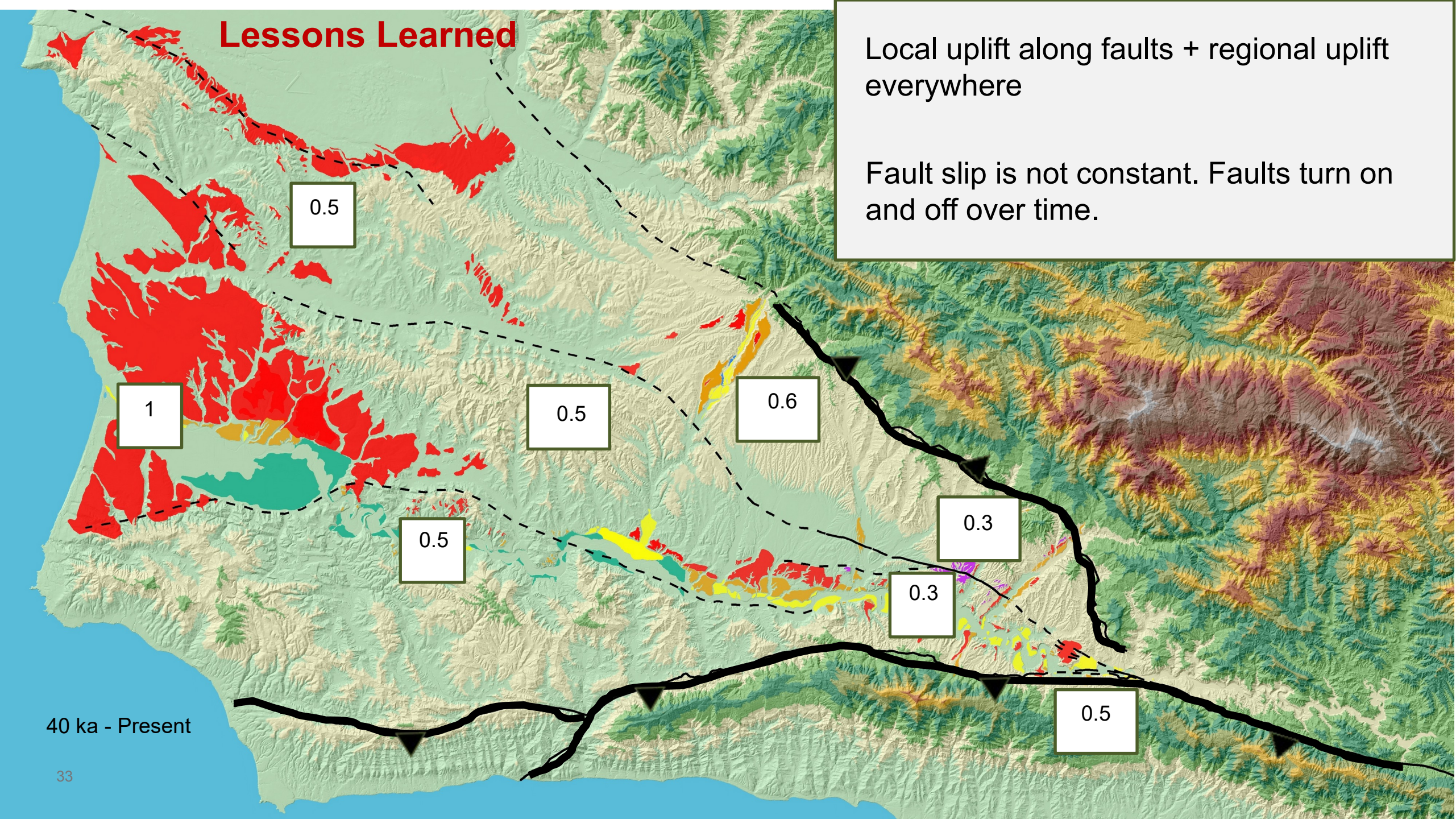
# Lessons Learned




Local uplift along faults + regional uplift everywhere

Fault slip is not constant. Faults turn off and on over time.

# Lessons Learned

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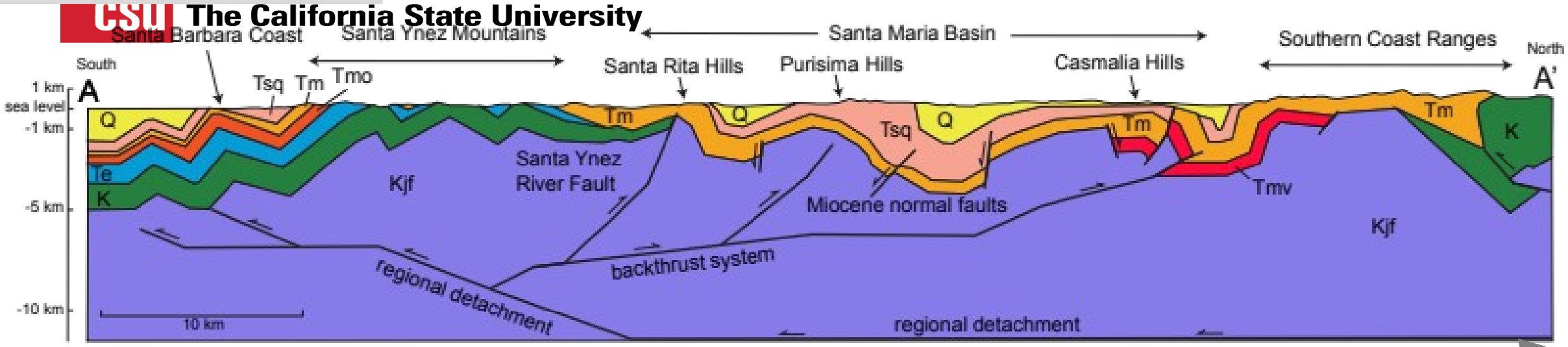
# Lessons Learned

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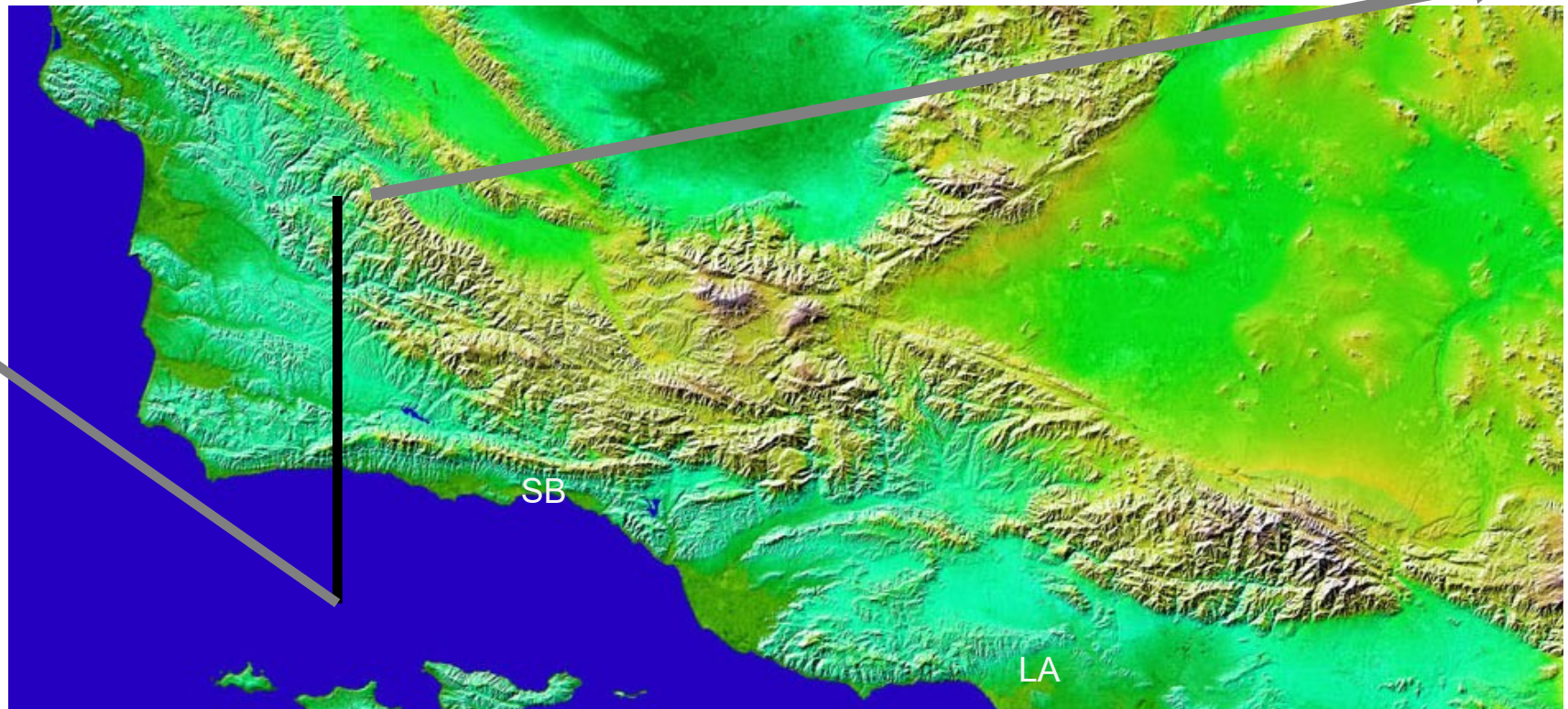
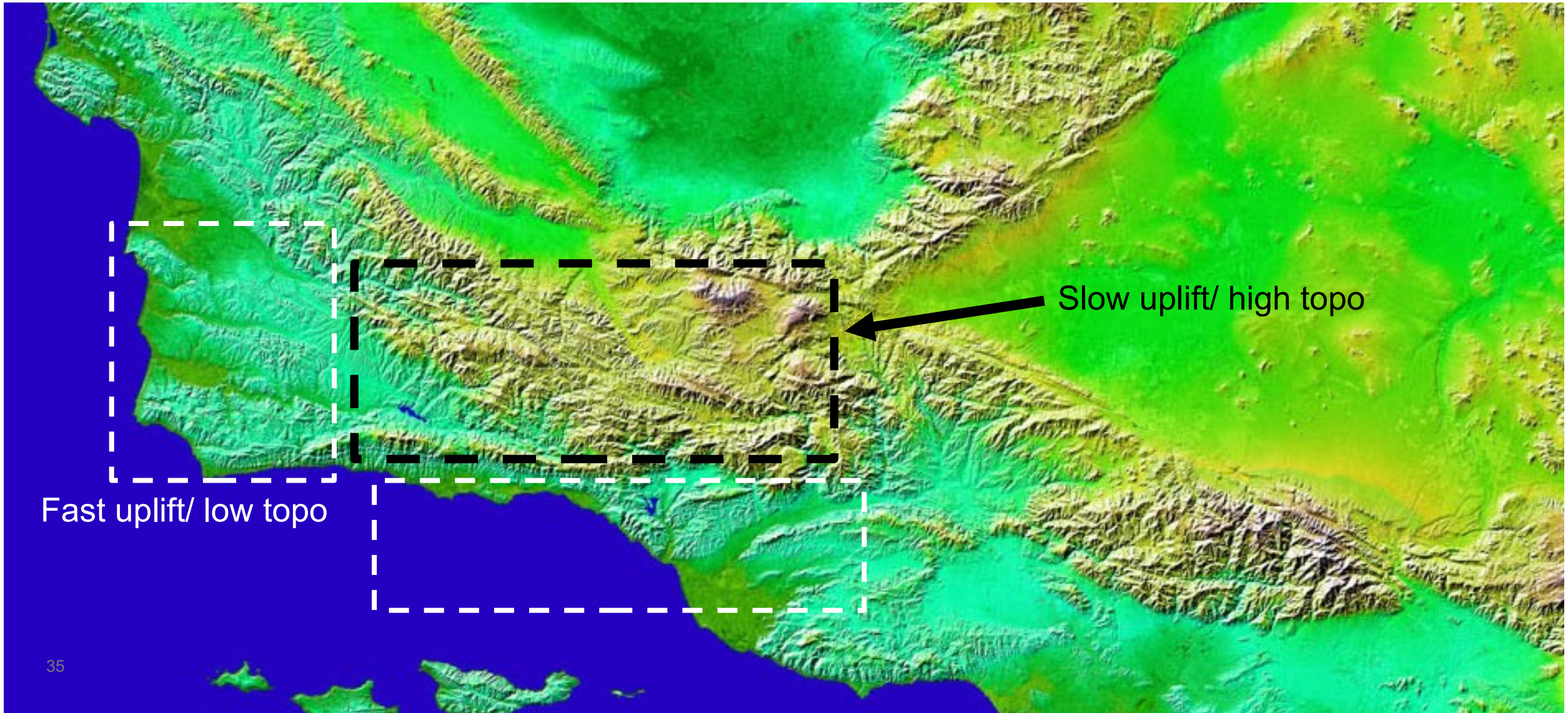


# Next Steps/Long-Term Plans

The California State University

Fast uplift rates do not correlate with high topography. Why?



# Funding Strategies



- Local field work is cheap- can fund and involve a lot of students
- Find an area you are interested in. The big Science questions will come later.
- Propose work that you are already doing
- Go after the small grants- they are easier to apply for and they add up!

# Questions?

## Contact Information:

Nate Onderdonk
CSULB Geological Sciences

Nate.Onderdonk@csulb.edu

Follow us on Instagram @CSULB_Geology

# What Happened During the First Half of the India-Asia Collision?

*Kate Metcalf – Cal State Fullerton*

*Collaborator: Delores Robinson – University of Alabama*

**Kate Metcalf**, Assistant Professor

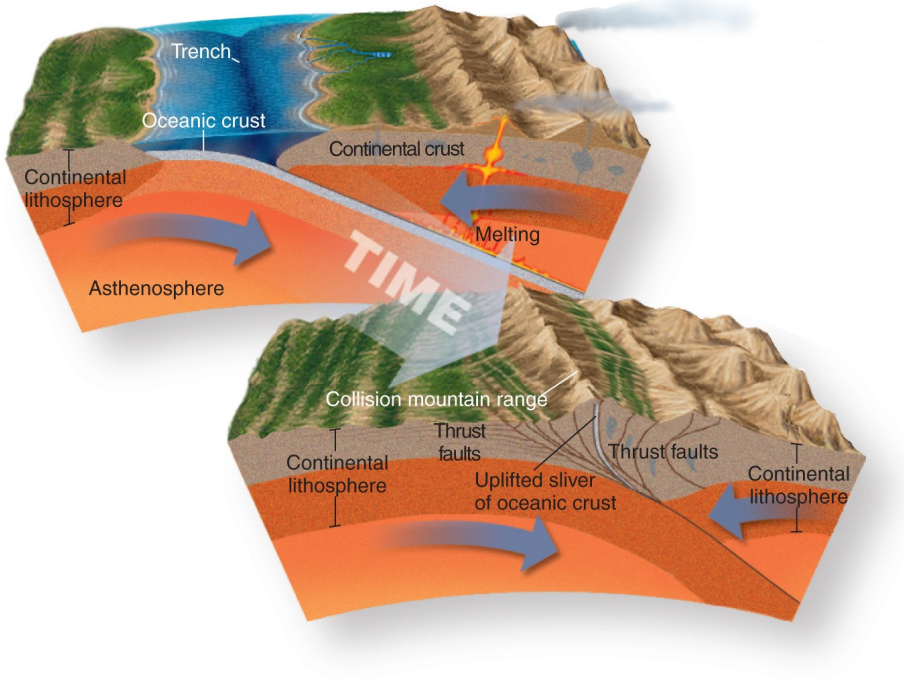
Cal State Fullerton, Department of Geological Sciences

kametcalf@fullerton.edu

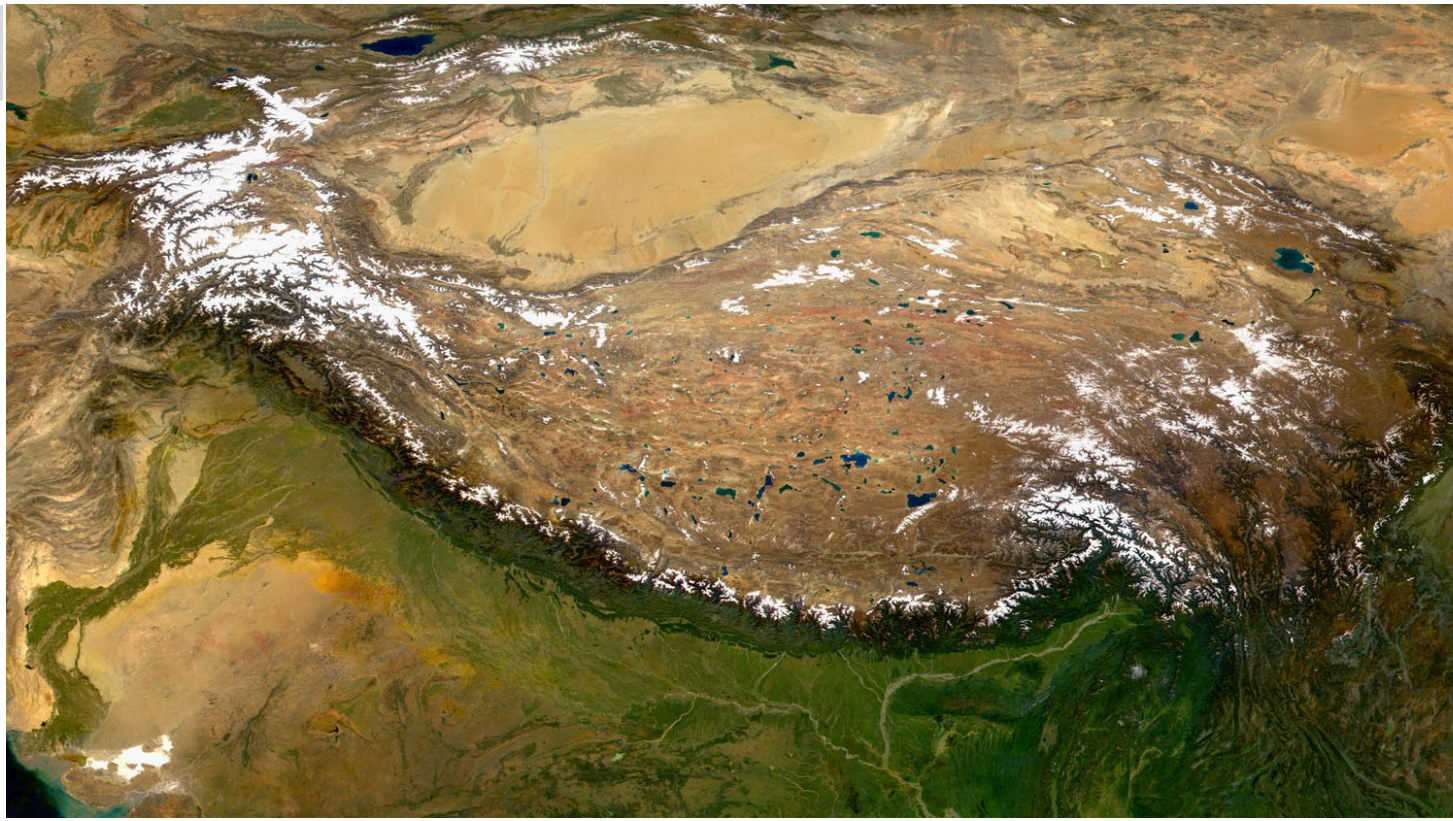
# What Happened During the First Half of the India-Asia Collision?

## Project Overview

- Textbook continent-continent collision





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# Project Overview

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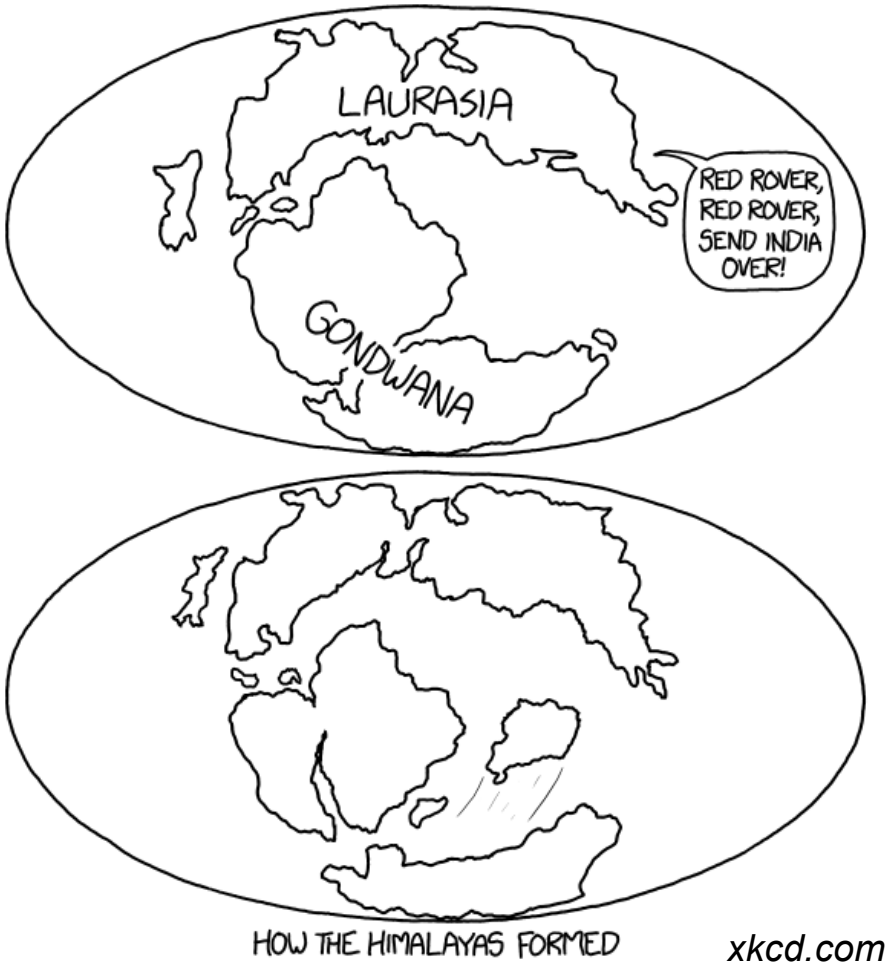
## What Happened During the First Half of the India-Asia Collision?



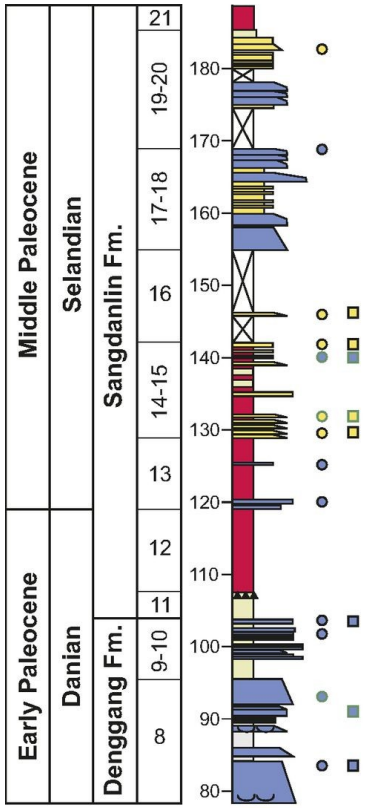

xkcd.com

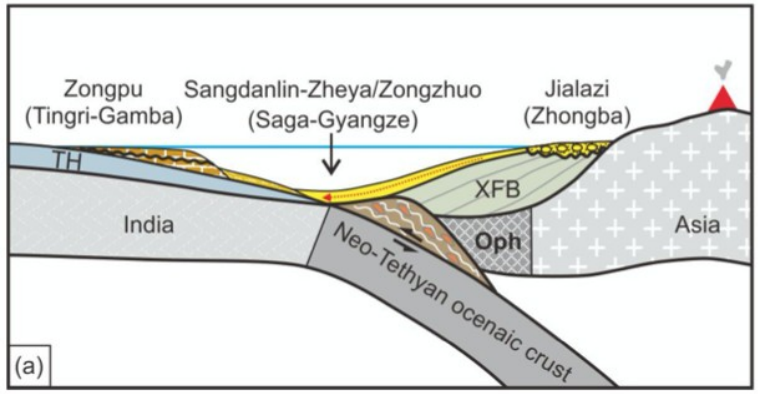
The California State University FULLERTON

# What Happened During the First Half of the India-Asia Collision?

## Project Overview

- Textbook continent-continent collision
- Collision ~60 Ma




*Hu et al., 2015*

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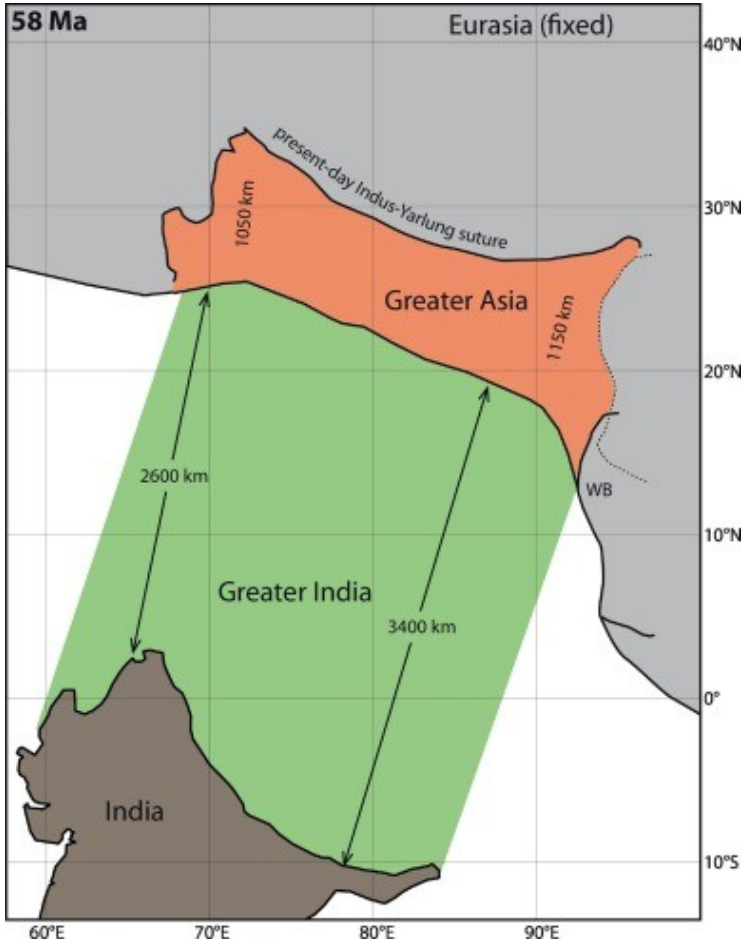
CALIFORNIA STATE UNIVERSITY FULLERTON

# Project Overview

- Textbook continent-continent collision
- Collision ~60 Ma

## What Happened During the First Half of the India-Asia Collision?

~2,600-3,400 km




*van Hinsbergen et al., 2018*

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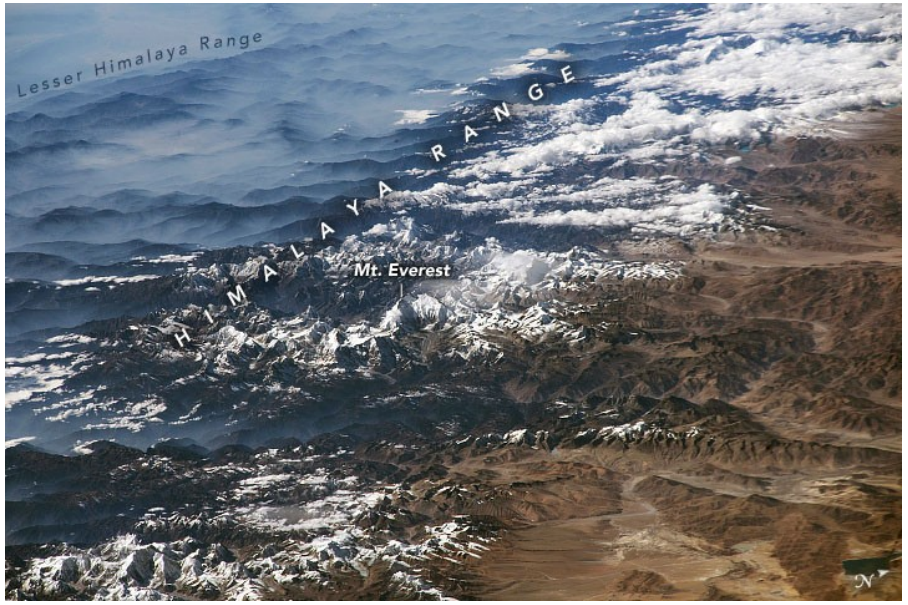
- Collision ~60 Ma

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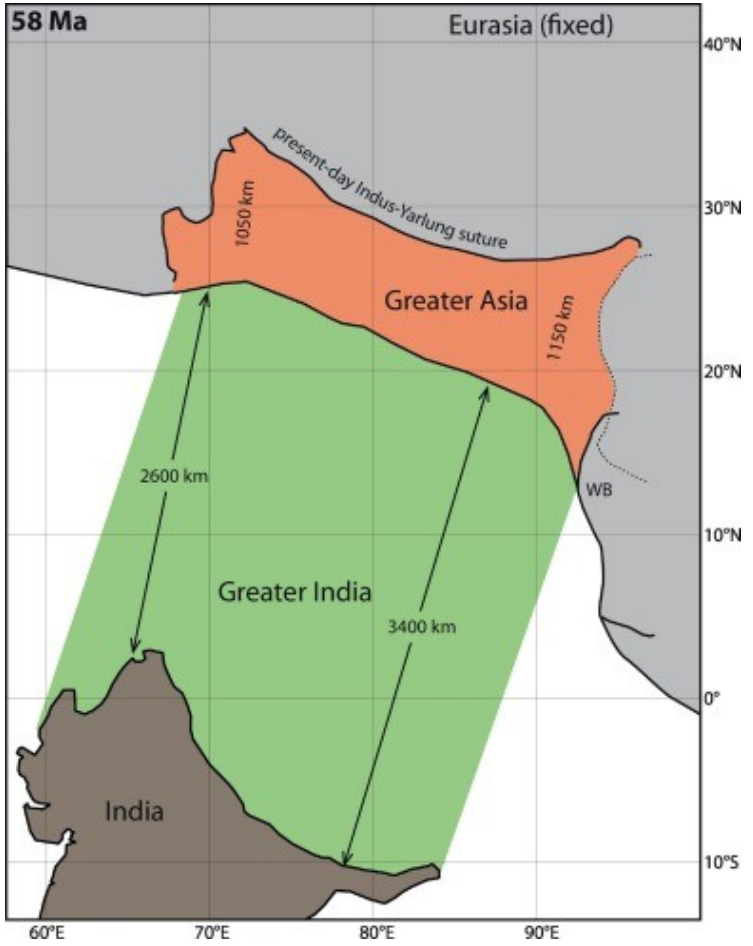


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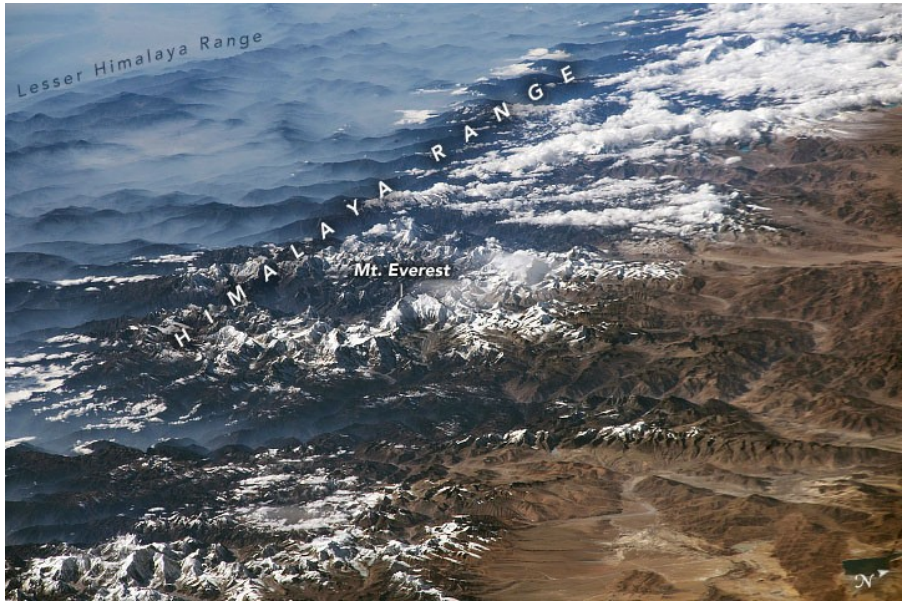


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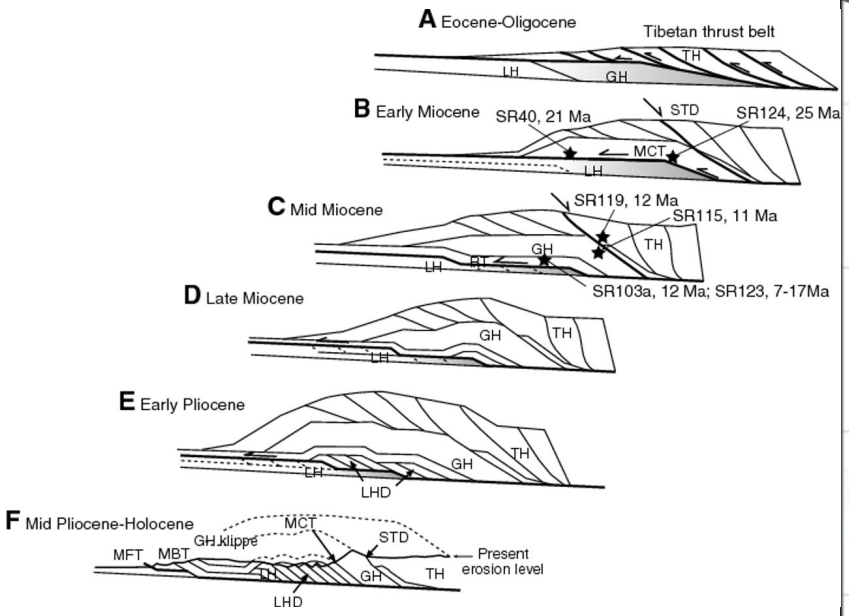
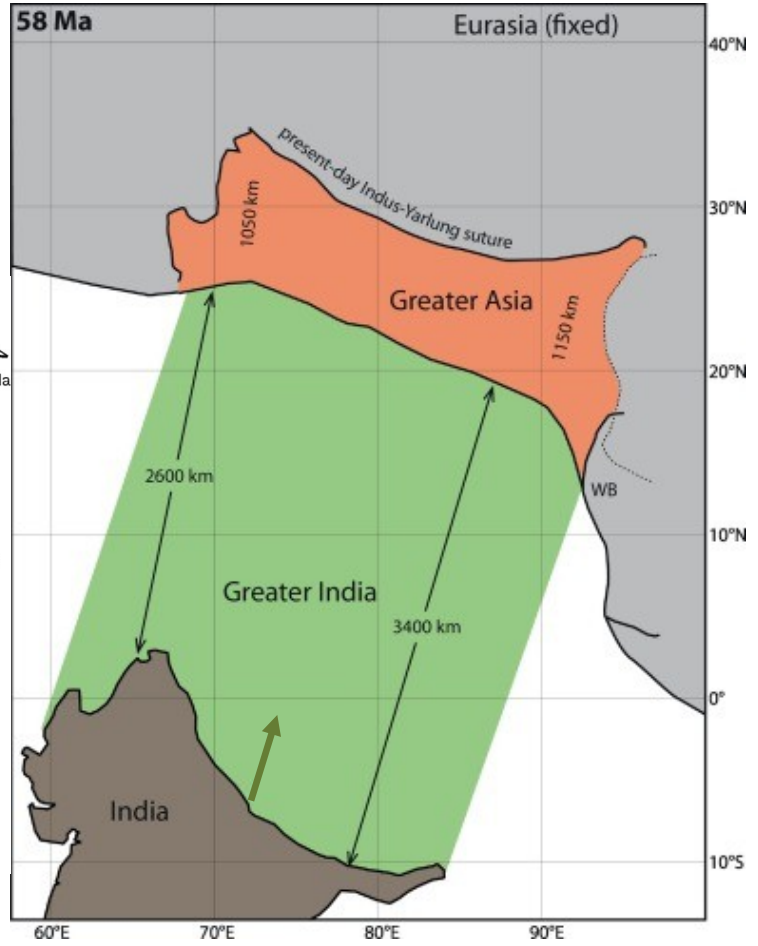



*Robinson et al., 2006*

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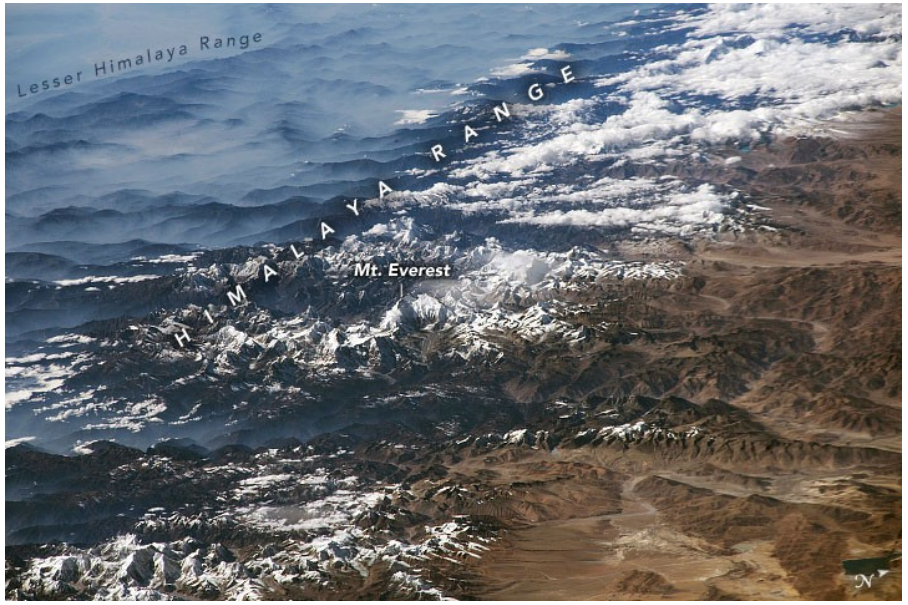


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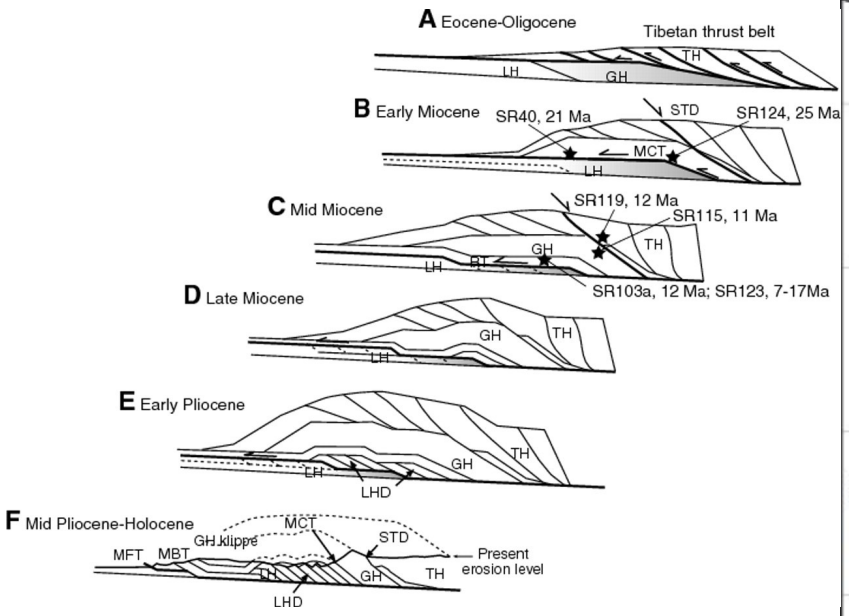
**~1,600-2,400 km missing shortening**

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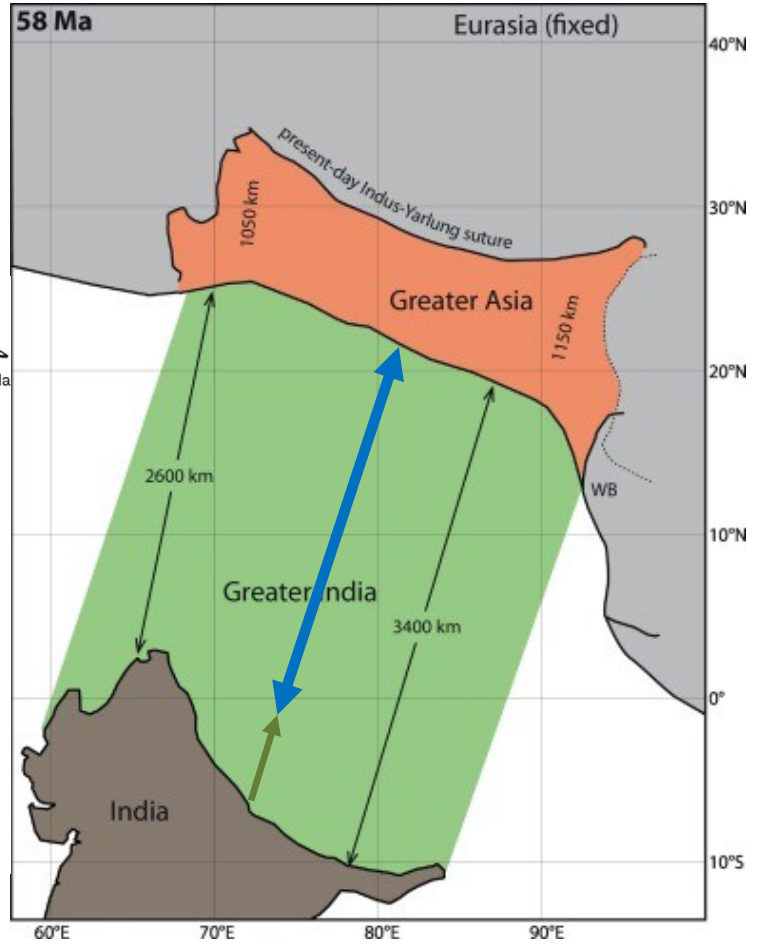


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The California State University

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- Textbook continent-continent collision
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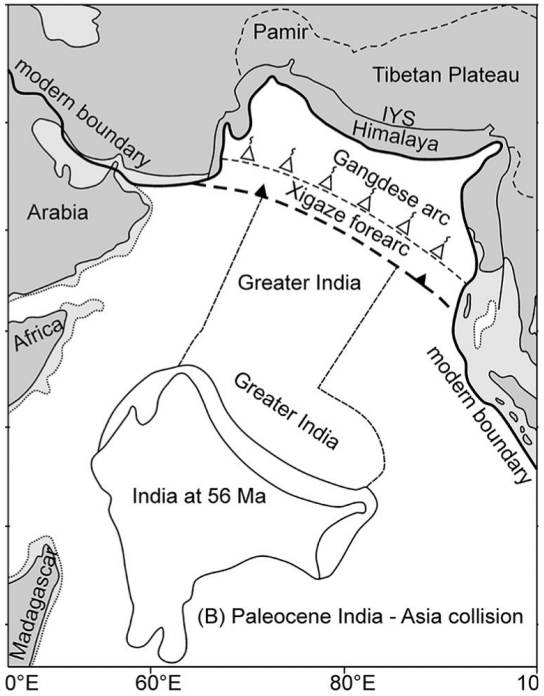
- 3 tectonic models




*Kapp and DeCelles, 2019*

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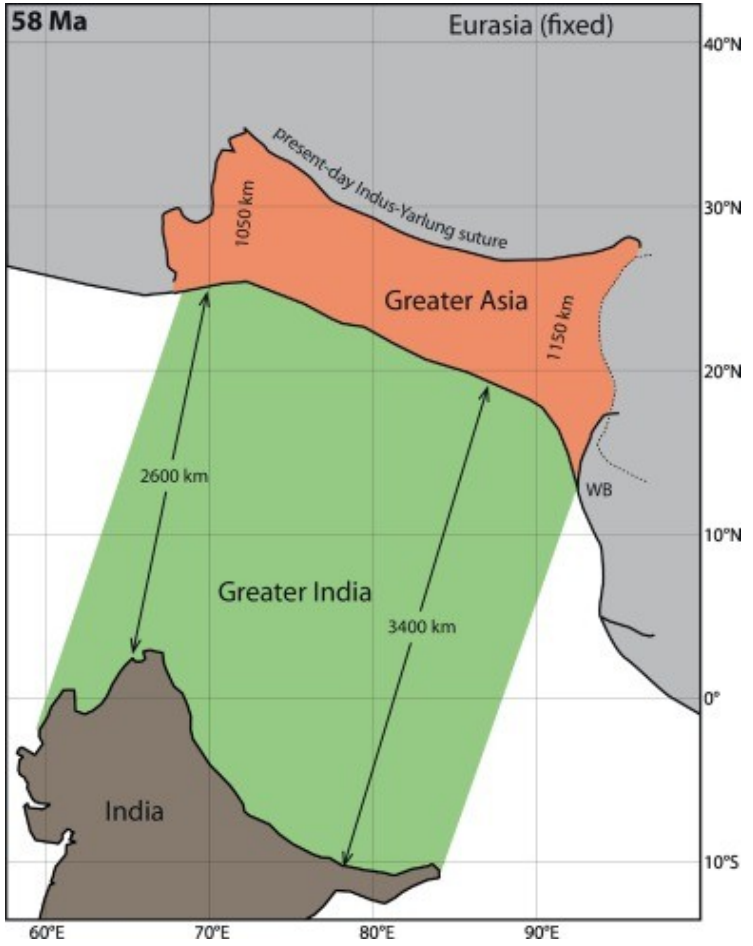


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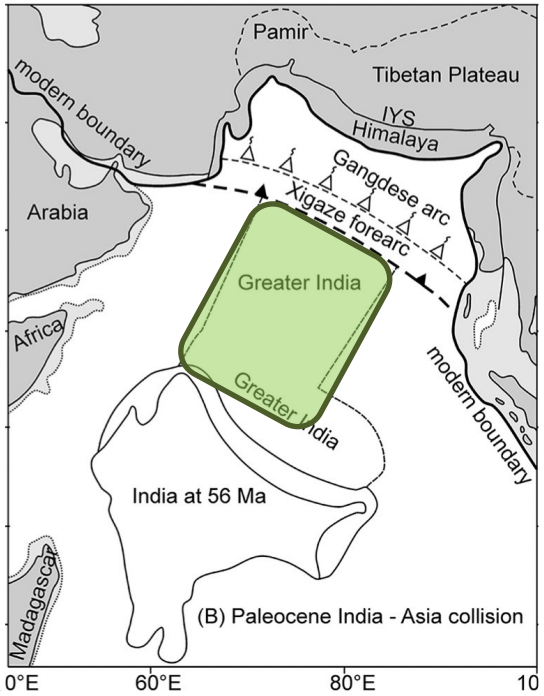


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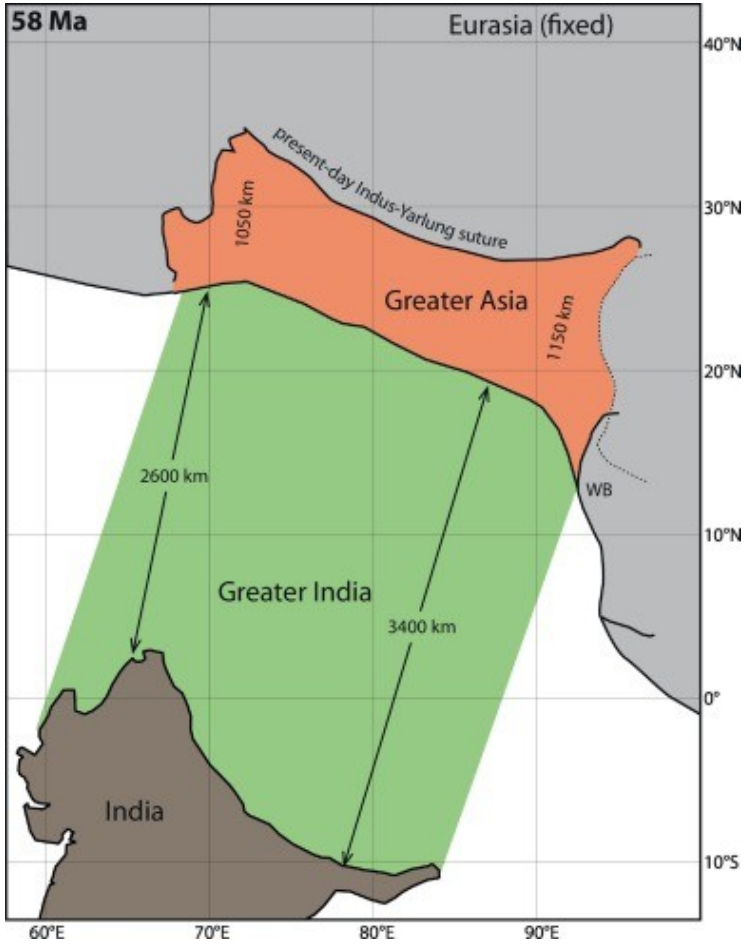


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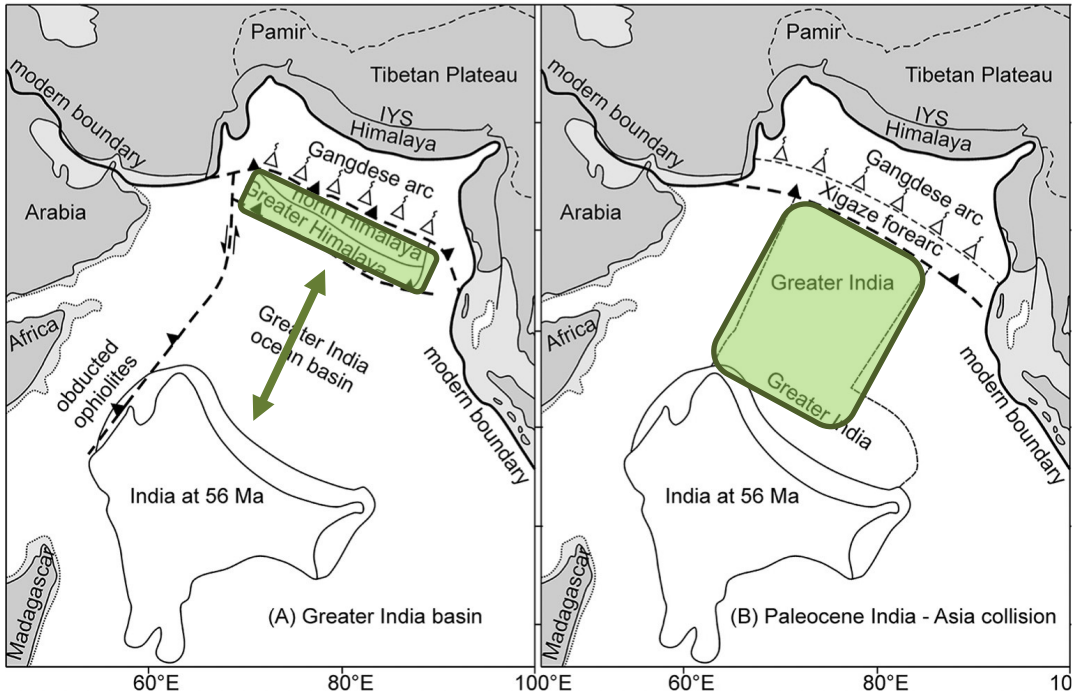


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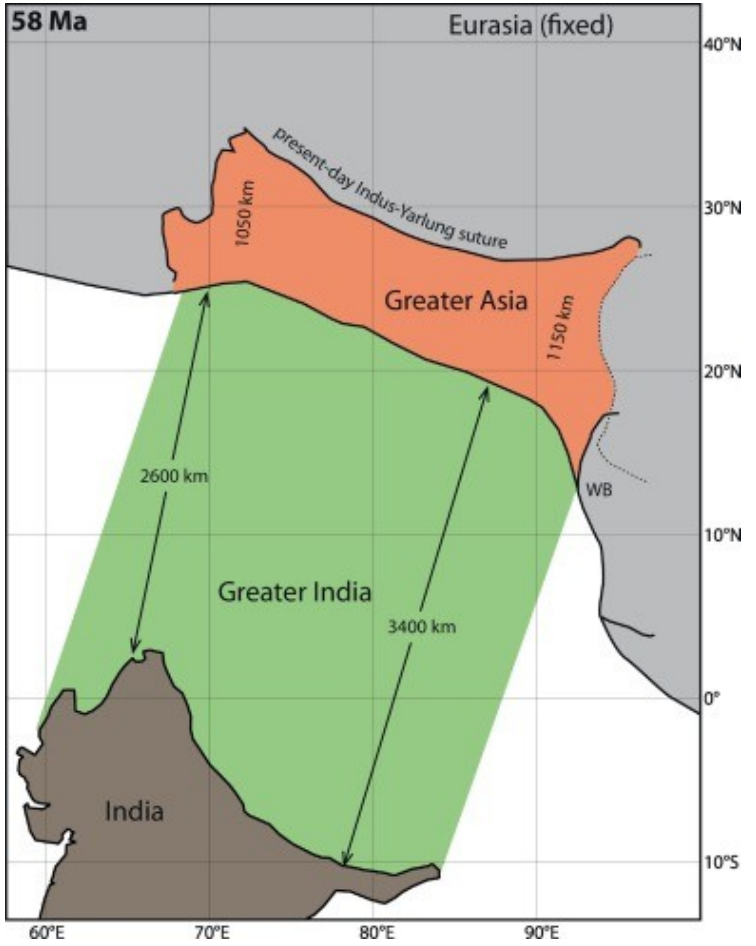


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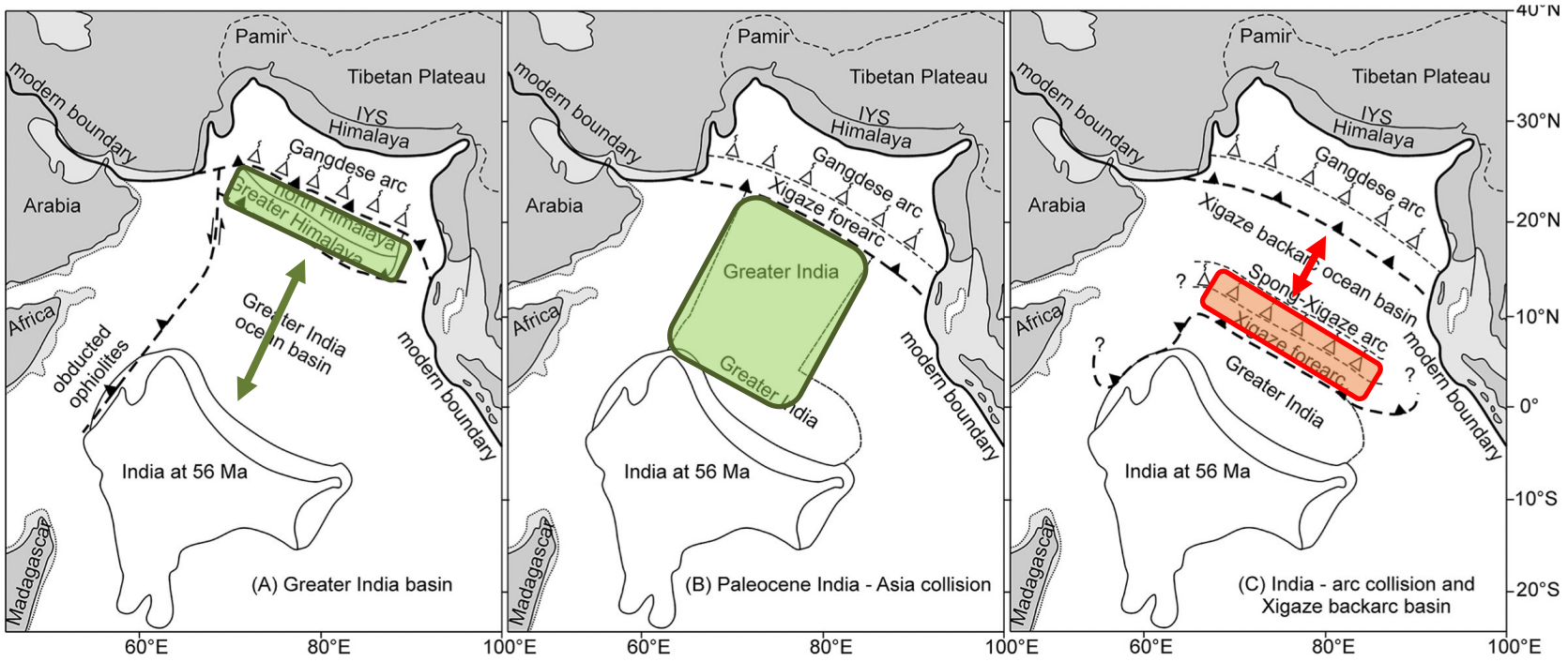


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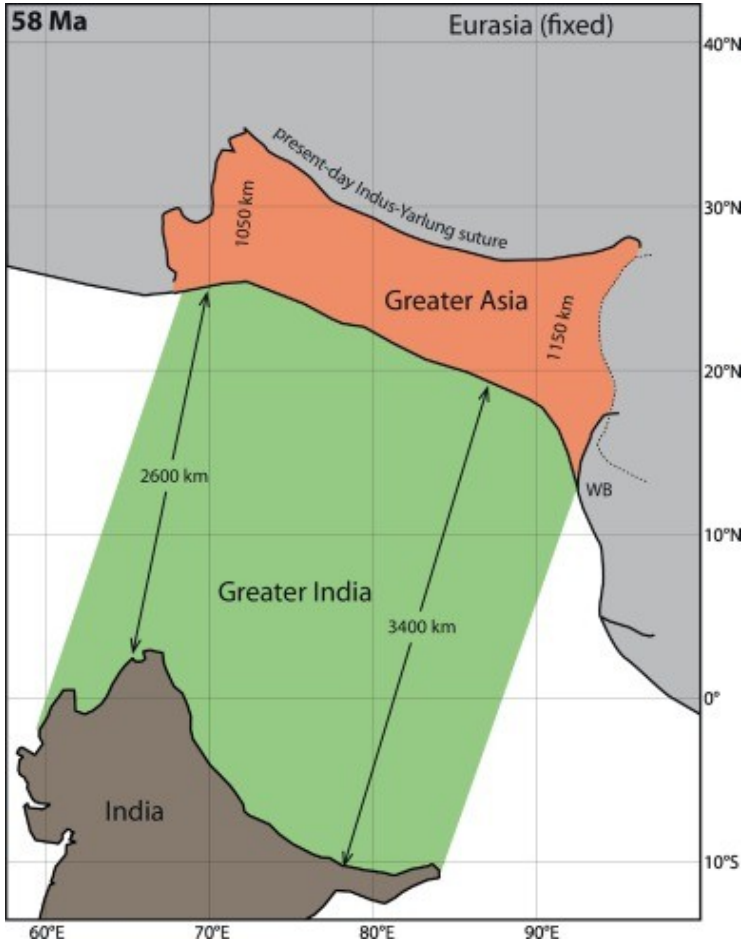


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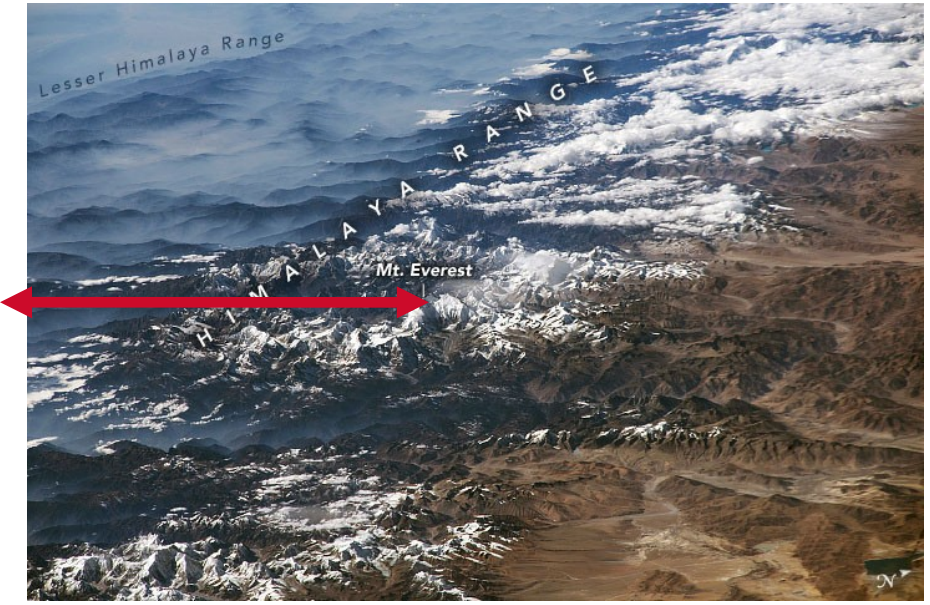


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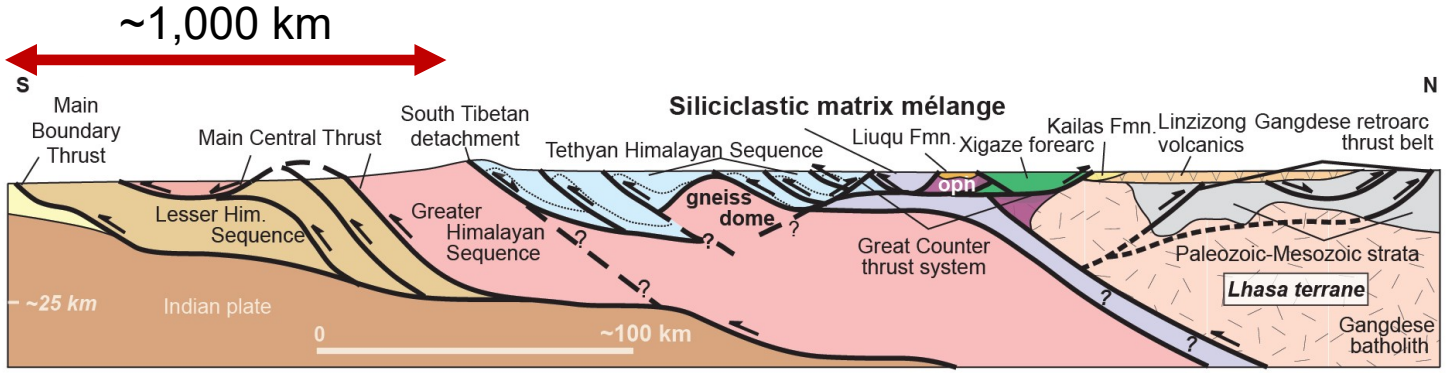


*Metcalf and Kapp, 2019*



***Kate Metcalf*** *CSU Fullerton* *kametcalf@fullerton.edu*

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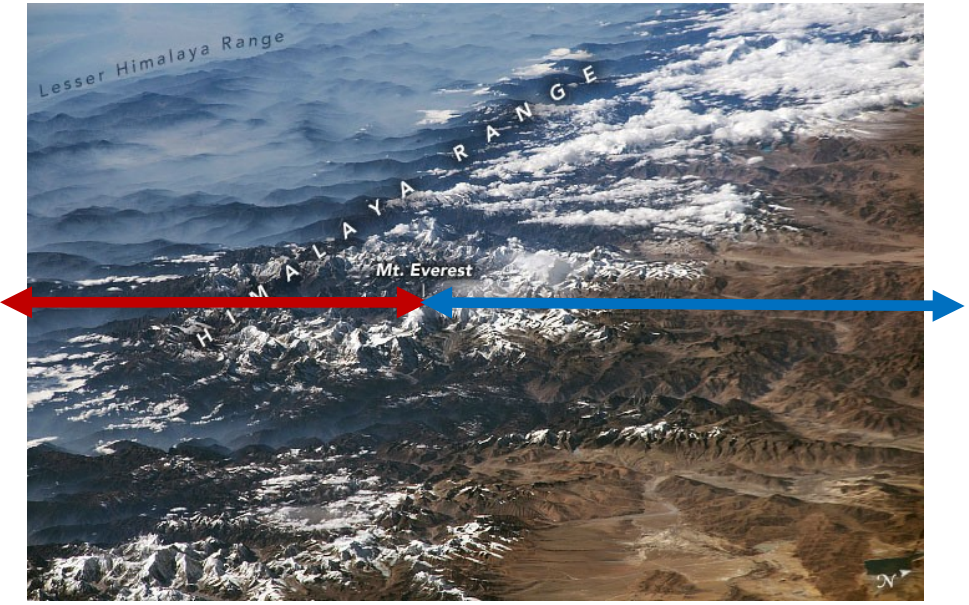
**HKT Workshop 2019**
Tethyan Himalaya and "missing" shortening greatest problems in the field

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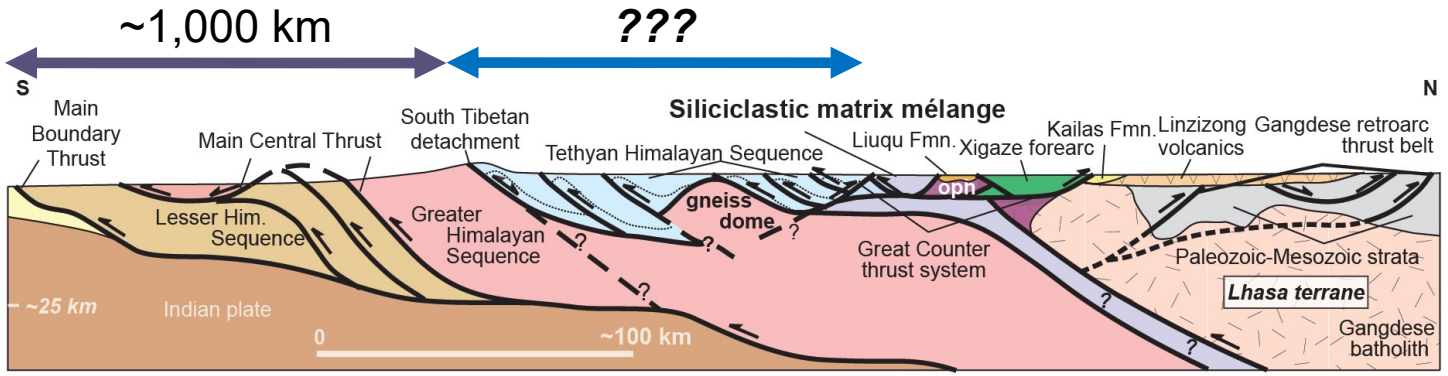


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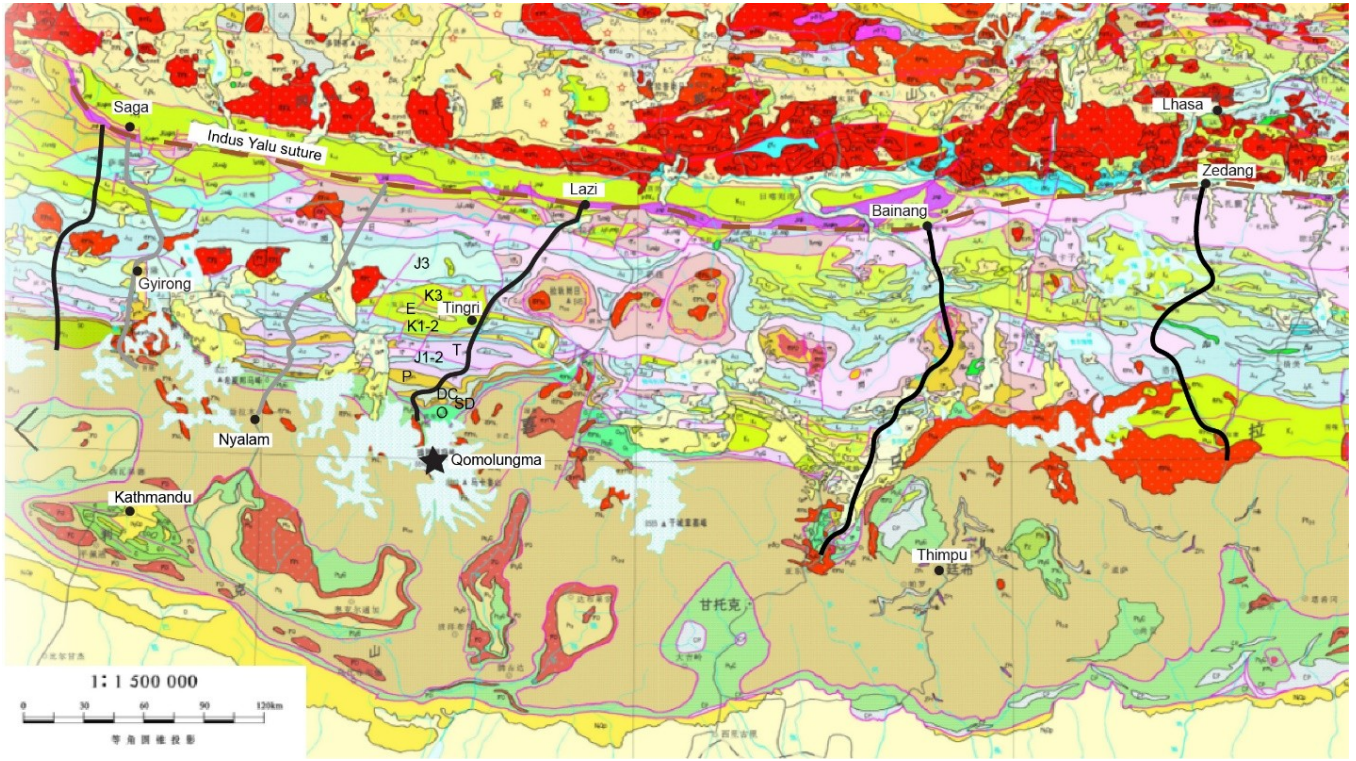
# What Happened During the First Half of the India-Asia Collision

## Activities

- 2 field seasons, 4 transects



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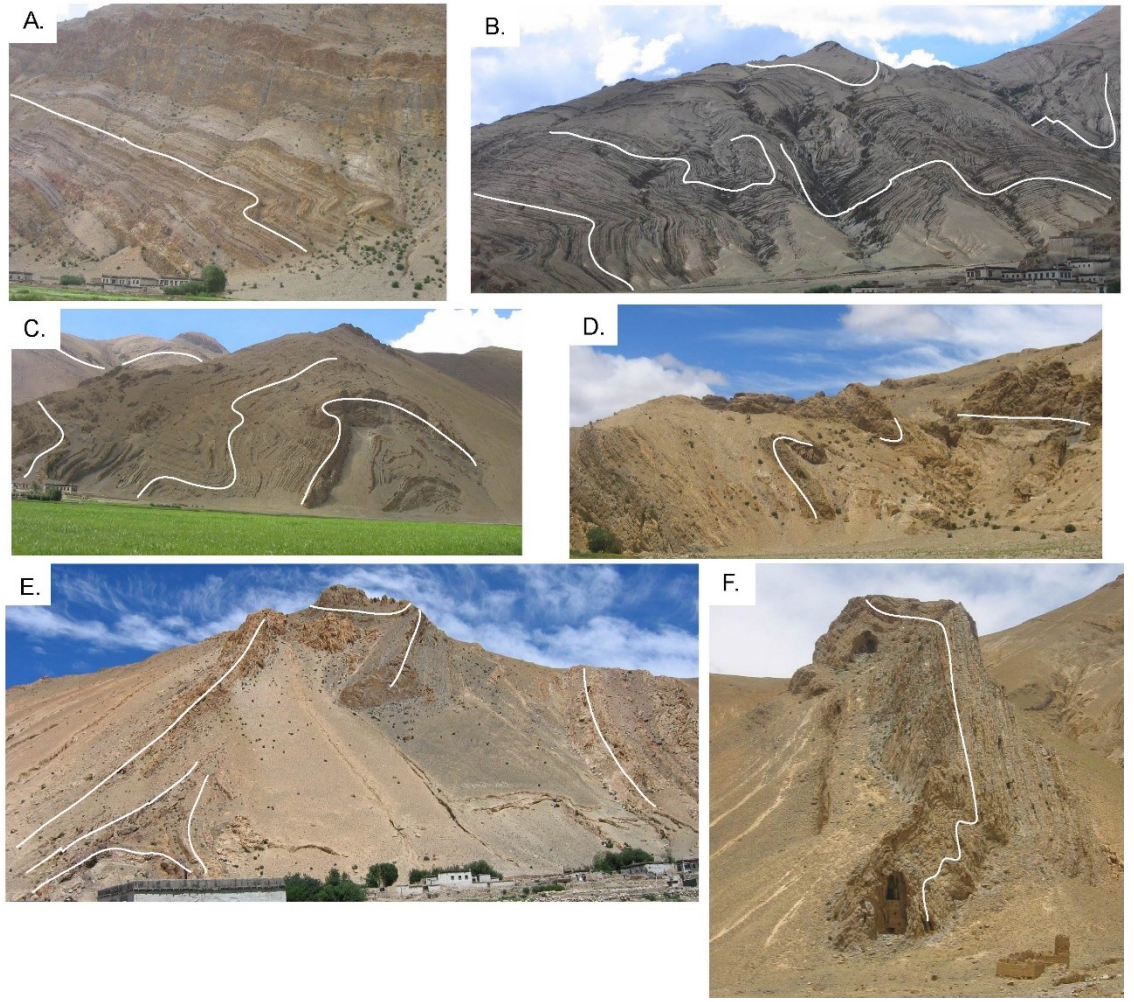
## Activities

- 2 field seasons, 4 transects
- Structure and provenance

## What Happened During the First Half of the India-Asia Collision



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- 2 field seasons, 4 transects
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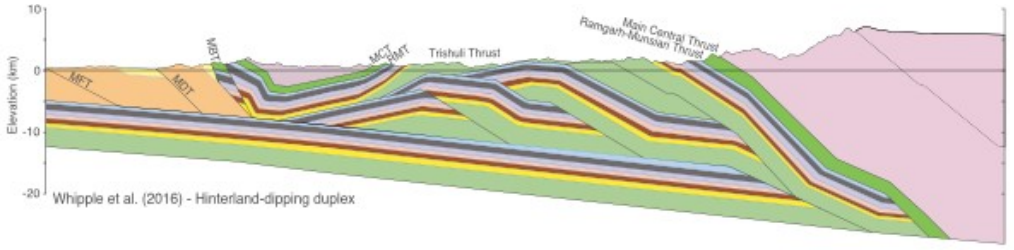


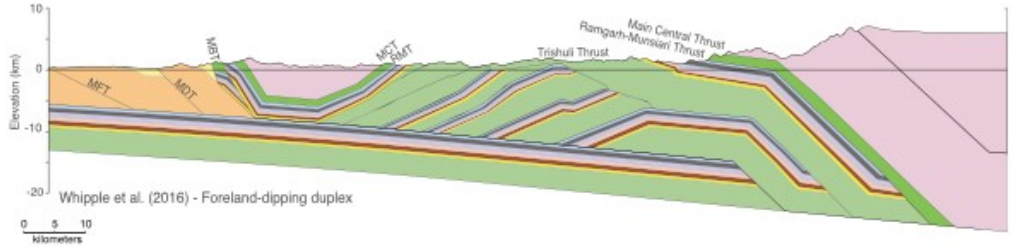


*Ghoshal et al., 2020*

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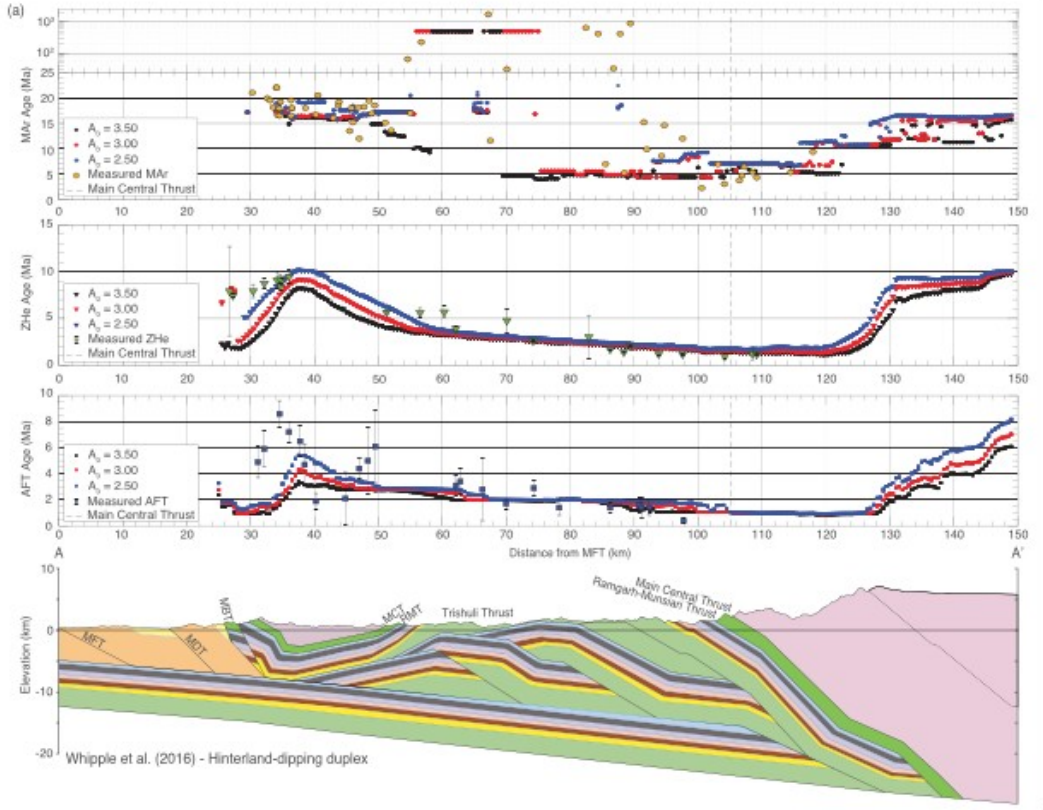


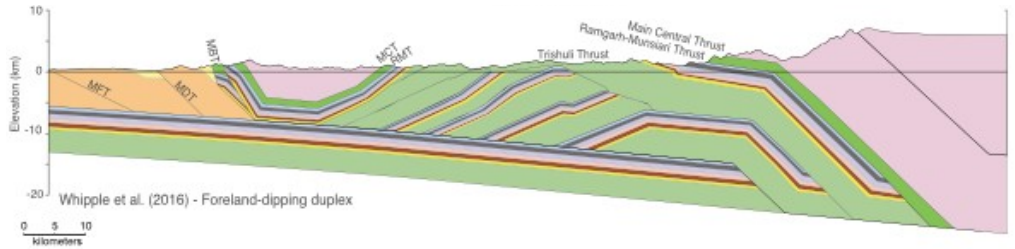


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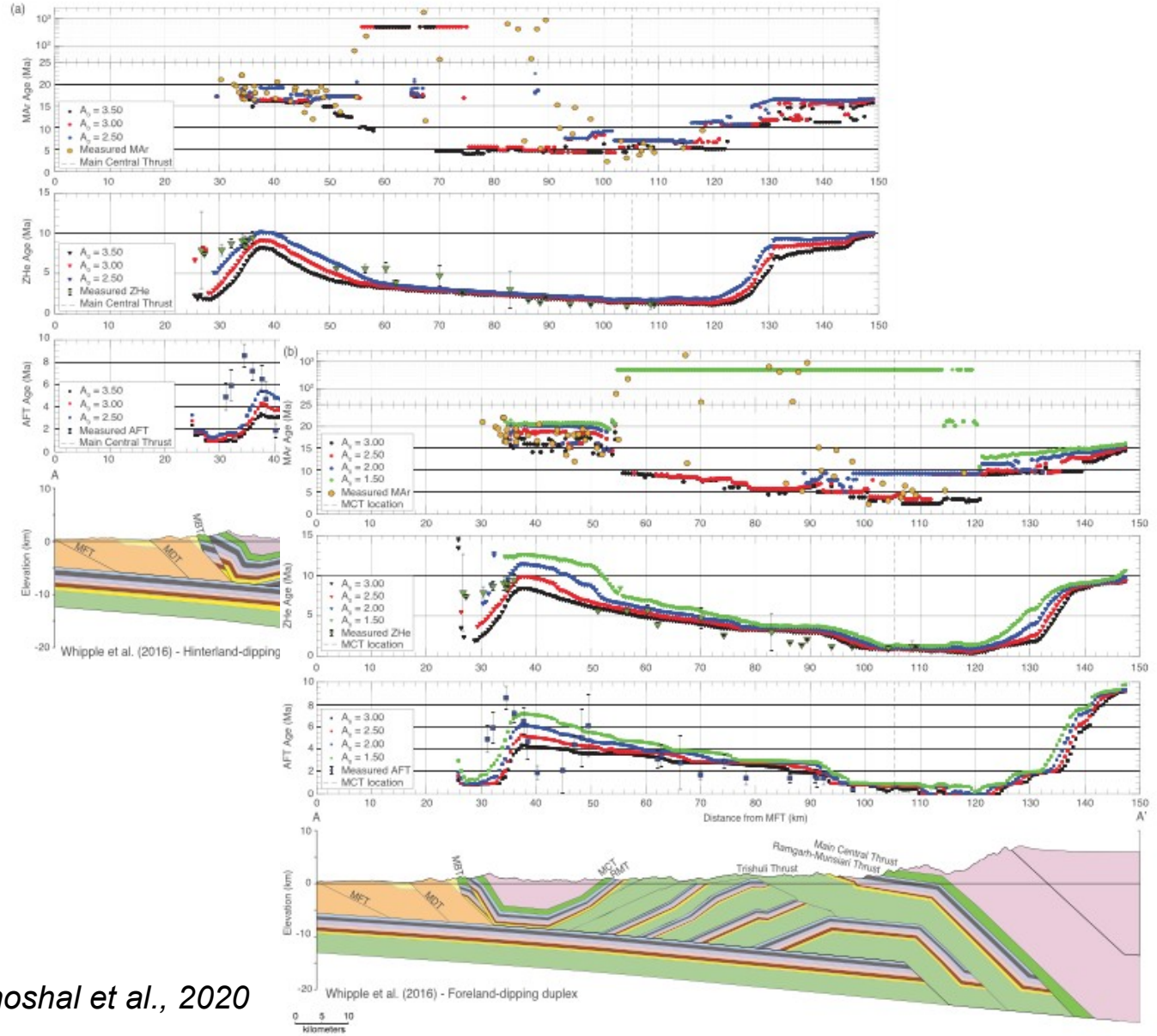


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  - Mid-career, female, full Professor mentoring pre-tenure, female, Assistant Professor

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  - International collaboration with colleagues in China
- Outreach in Communities
  - Increase awareness of geoscience research and careers, access to mentors and role models from underrepresented groups
  - 10 outreach events per year, work with existing programs

# What Happened During the First Half of the India-Asia Collision

## COVID-19

- Submitted early 2020
- Awarded August 2020

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## COVID-19

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- Prohibited travel in 2021, summer 2022 iffy
- Omicron adds to uncertainty
- Work with NSF program officer on extensions

## Lessons Learned

- Compelling problem and concrete plan

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- Networking and collaboration
  - Attend conferences and workshops, especially small focused
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- CSU student population is a strength
- Don’t put all your eggs in one basket
  - Have more local, less expensive parallel projects
  - Smaller internal grants

# Questions?

## Contact Information:

Kate Metcalf
CSU Fullerton
Department of Geological Sciences
(657) 278-3946
kametcalf@fullerton.edu

# Combating climate change with mantle rocks & Developing a cross-CSU undergraduate Hydrology research experience

*Amelia Vankeuren*

*Sacramento State*

**Dr. Amelia Vankeuren**, Associate Professor

Sacramento State, Geology Department

Vankeuren@csus.edu

## Acknowledgements

This material is based upon work supported by:

- The National Science Foundation under Grant Numbers 2127532, 2119762
- CSU STEM-NET Faculty Seed Grant
- CSU Council on Ocean Affairs, Science & Technology (COAST) Grant Development Program
- Sacramento State Incentive for Developing External Awards (IDEA) program

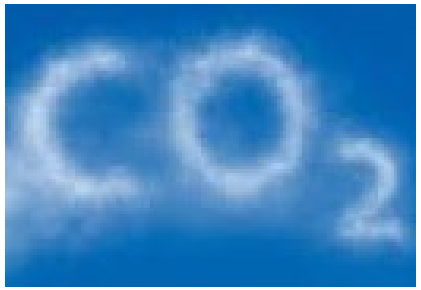
And would not be possible without my co-PIs:

- Dr. Martin Stute, Barnard College/Lamont-Doherty Earth Observatory
- Dr. Hilary McMillan, San Diego State University
- Dr. Jasper Oshun, Humboldt State University

# Project Overview

*Collaborative Research: RUI: Constraining peridotite alteration timescales with environmental tracers (3H, 39Ar, 14C and 81Kr)*

Division of Earth Sciences Geobiology and Low Temperature Geochemistry Program and Hydrology Program award




$H_2$

## Project Overview

# $CO_2$ mineralization requires 3 steps:

Carbon dioxide dissolution: $CO_2 + H_2O \rightarrow 2H^+ + CO_3^{2-}$

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Olivine: $Mg_2SiO_4 + 4H^+ \rightarrow 2\,Mg^{2+} + SiO_2 + 2H_2O$

Pyroxene: $CaMgSi_2O_6 + 4H^+ \rightarrow Ca^{2+} + Mg^{2+} + 2SiO_2 + 2H_2O$

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Carbonate mineral precipitation:

Calcite $Ca^{2+} + CO_3^{2-} \rightarrow CaCO_3$

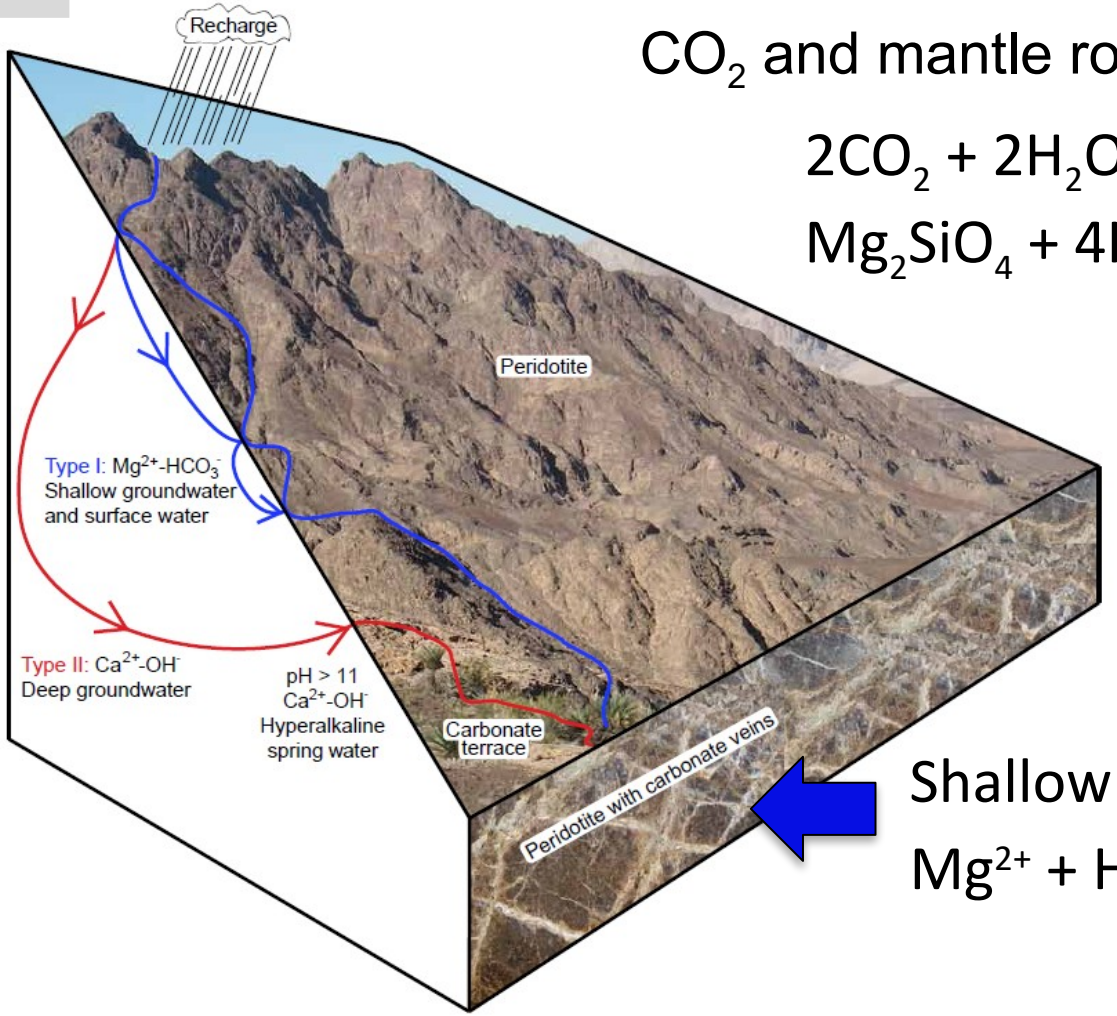
Magnesite $Mg^{2+} + CO_3^{2-} \rightarrow MgCO_3$

(limestone)

SACRAMENTO STATE
Redefine the Possible

# Combating Climate Change with Mantle Rocks
# Cross-CSU Undergrad Hydrology Research Experience

## Project Overview


$CO_2$ and mantle rock dissolution near the surface

$$2CO_2 + 2H_2O \rightarrow 2HCO_3^- + 2H^+$$

$$Mg_2SiO_4 + 4H^+ \rightarrow 2Mg^{2+} + SiO_2 + 2H_2O$$

Shallow $CO_2$ mineralization

$$Mg^{2+} + HCO_3^- \rightarrow MgCO_3 + H^+$$

SACRAMENTO STATE
Redefine the Possible

# Combating Climate Change with Mantle Rocks
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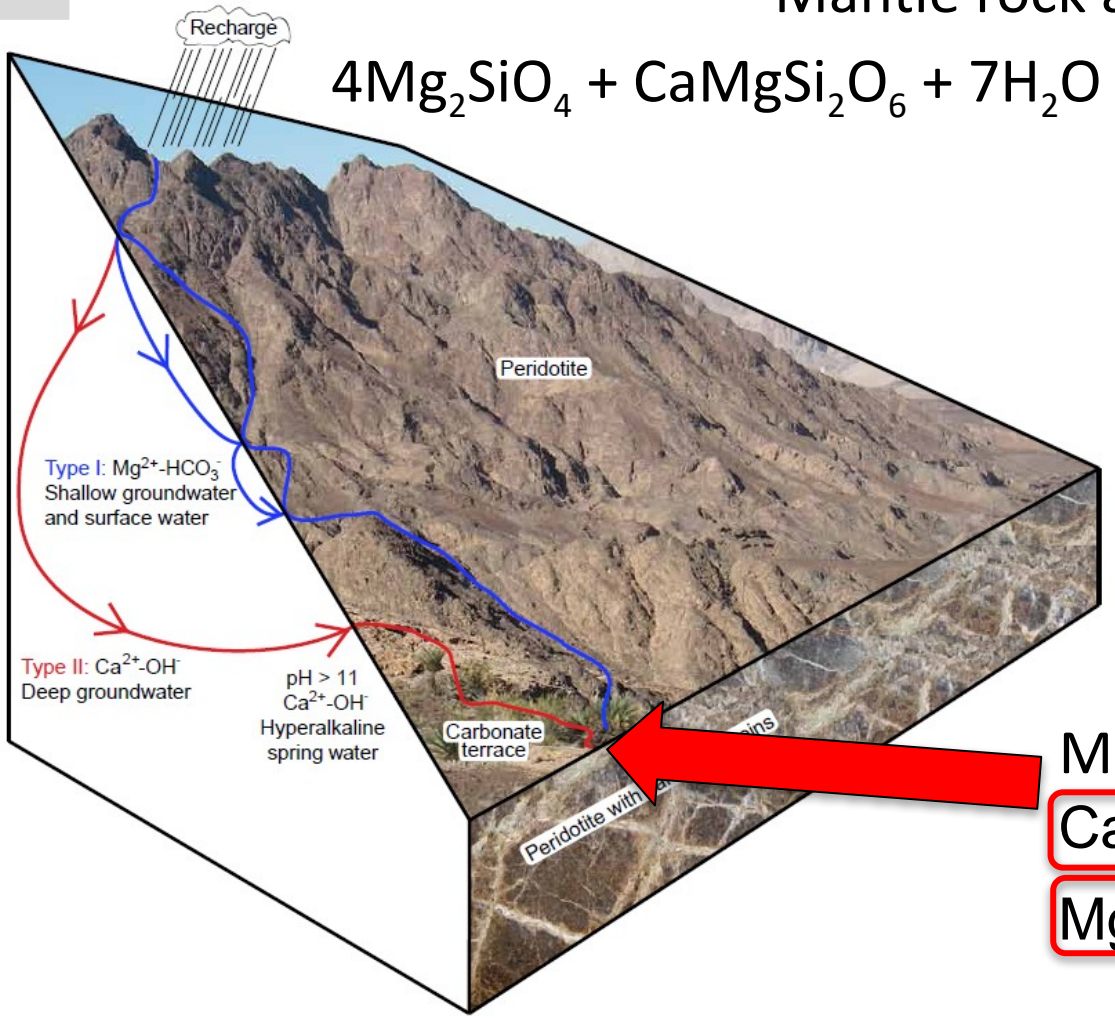
## Project Overview


Mantle rock alteration at depth

$$4Mg_2SiO_4 + CaMgSi_2O_6 + 7H_2O \rightarrow 3Mg_3Si_2O_5(OH)_4 + Ca^{2+} + 2OH^-$$



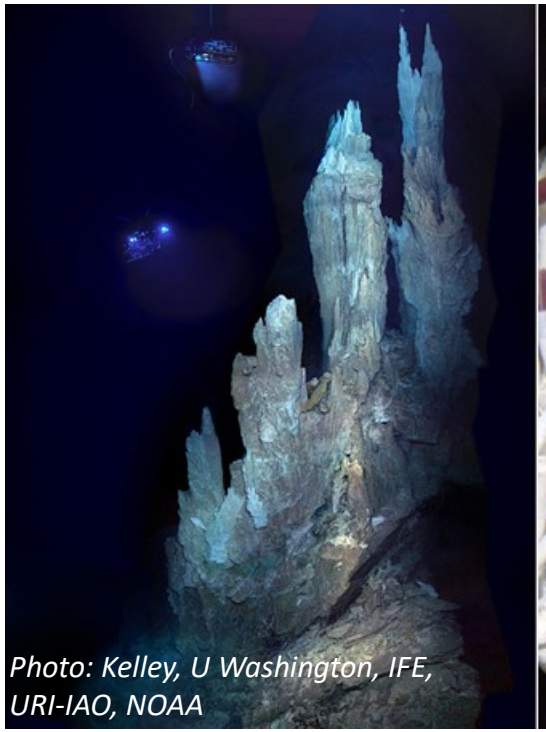

More shallow $CO_2$ mineralization

$$Ca^{2+} + 2OH^- + CO_2 \rightarrow CaCO_3 + H_2O$$

$$Mg^{2+} + Ca^{2+} + 2CO_3^{2-} \rightarrow CaMg(CO_3)_2$$

## Project Overview

$H_2$ from mantle rock alteration provided chemical energy for early life on Earth… and Mars?



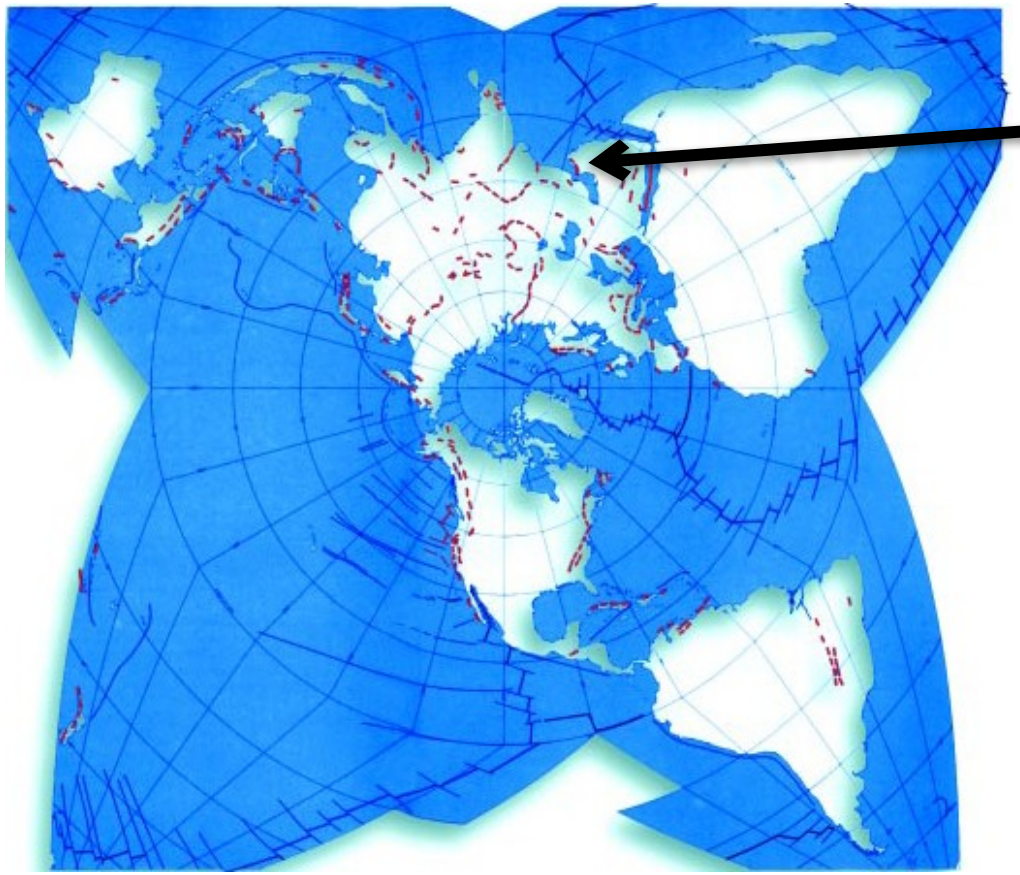


$$Mg_{1.8}Fe_{0.2}SiO_4 + H_20 \rightarrow Mg_3Si2O_5(OH)_4 + Mg(OH)_2 + Fe_3O_4 + H_2$$

## Project Overview

Mantle rocks are globally distributed and have huge CO2 storage capacity

--- Mantle rock



Oman capacity:
30 trillion tons $CO_2$

Global capacity:
100 trillion tons $CO_2$
>1000 years of emissions

Kelemen, 1998 *Oceanus*

## Project Overview

# California also has mantle rocks near CO2 sources


Harrison et al., 2004
*International Geology Review*

North Am. Carbon Atlas Part., 2012 *NETL*

## Activities

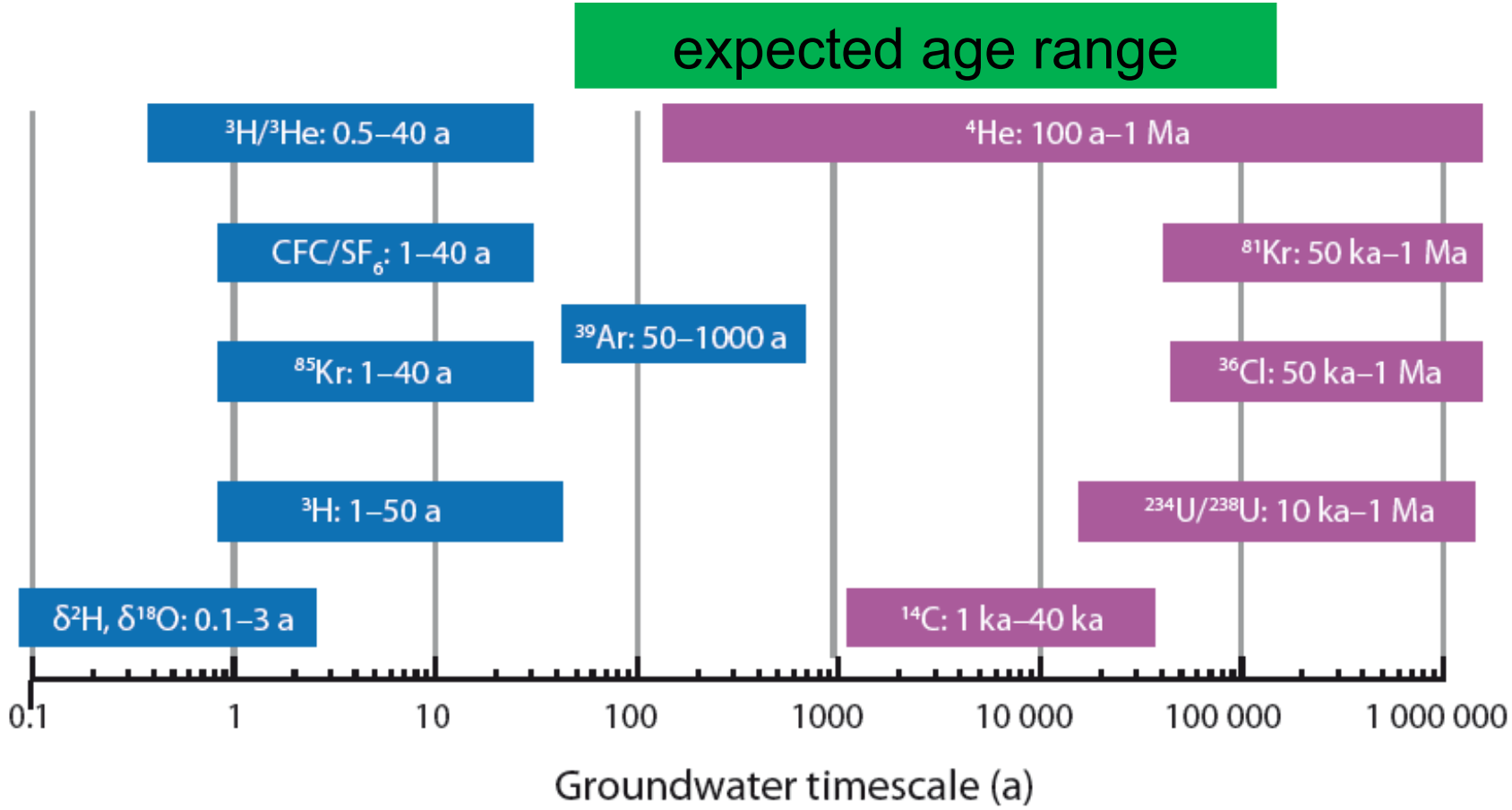
Research questions:

1) How long does the natural mantle rock alteration process take?
   - Groundwater ages provide maximum timeframe for chemical reaction

2) What is the source of $H_2$ in this groundwater?
   - Ongoing low temperature alteration, relic of high temperature alteration, or transport from another rock formation?

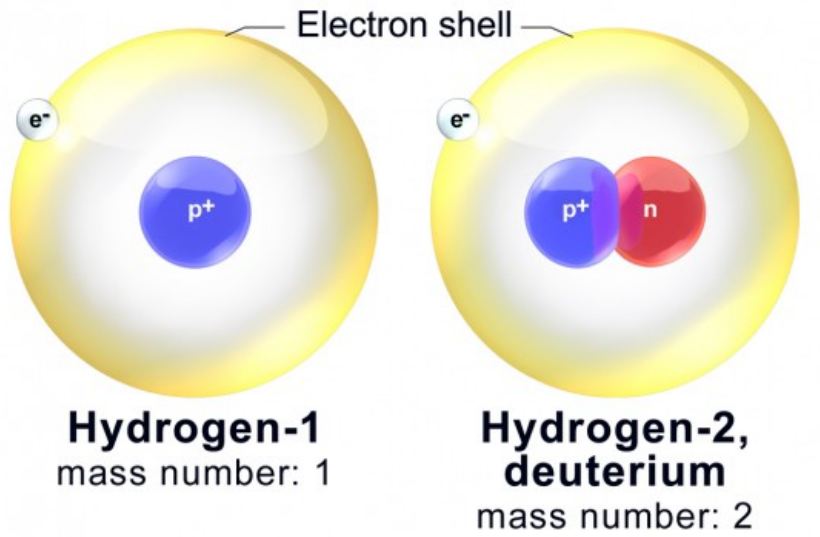
## Activities

# Objective 1: Date groundwater using novel environmental tracers



**Activities**

# Objective 2: Determine $H_2$ source in groundwater






***Amelia Vankeuren*** *Sacramento State Geology Department* *Vankeuren@csus.edu*

# Lessons Learned

1) Preliminary research funded by CSU STEM-NET Faculty Seed Grant
2) Collaborative proposal from multiple organizations
   - Sacramento State and Barnard College of Columbia University
3) Research in Undergraduate Institutions (RUI)
   - Allows 5 pages to describe impact on PI, department, and institution
   - Gives more space to justify funding assigned time
   - Helps PO balance their portfolio
4) Took two submissions to get funded
   - Addressing reviewers' concerns made a more focused, feasible proposal
5) Sponsored Programs Office was great with edits, formatting, budget, etc.
6) Both efforts supported by CSUS Incentive for Developing External Award grants
   - Helped to have external deadline and monetary incentive

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Universit

**Combating Climate Change with Mantle Rocks**
**Cross-CSU Undergrad Hydrology Research Experience**

## Project Overview

*Developing a diverse hydrology workforce through an undergraduate hydrological research experience in a coastal California watershed*

Improving Undergraduate STEM Education: Pathways into the Earth, Ocean, Polar and Atmospheric & Geospace Sciences Undergraduate Preparation award

Objective: Recruit and retain diverse and interdisciplinary students to Hydrology

Collaboration between three CSUs:

- San Diego
- Sacramento
- Humboldt

SACRAMENTO STATE
Redefine the Possible

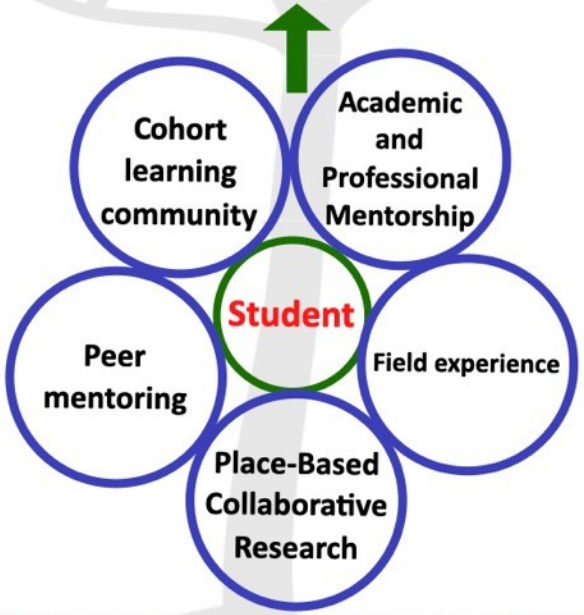
# Combating Climate Change with Mantle Rocks
# Cross-CSU Undergrad Hydrology Research Experience

## Project Overview

**Expected Outcomes:**

Heightened sense of belonging in the hydrologic sciences, in particular amongst URM students
Competence in conducting hydrologic research
Competence in presenting findings in oral and written modes
Development of professional skillset and confidence in speaking with professionals
Increased interest in pursuing research and an advanced degree

**Student learning ecosystem:**
**(GP-UP: *Collaborative Research: Developing a diverse hydrology workforce through an undergraduate hydrological research experience in a coastal California watershed*)**




**Students enter learning ecosystem with:**

**Possible barriers to success**

No prior experience in hydrologic sciences
Poor understanding of linkages between academics and real world
Lack of meaningful field experience
Lack of support
Lack of a sense of belonging/Imposter syndrome
No role models

**Possible Inherent strengths**

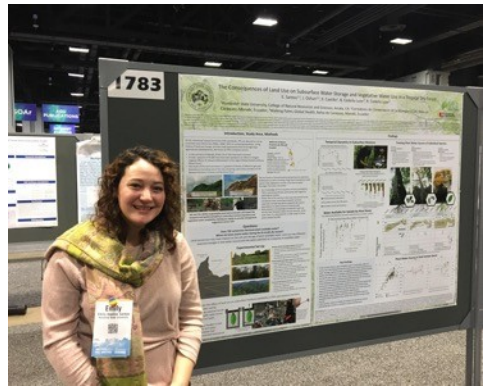
One or more technical skill
Cultural experiences
Language skills (Spanish or other)
Softer skills that are necessary for successful collaborative work

# Project Overview

## Hydrology Learning Ecosystem

Year-long experience with students and faculty from three campuses:

1) Spring preparatory course (1 unit)
2) 10-day summer field experience
3) Fall research and professional development course (3 units)

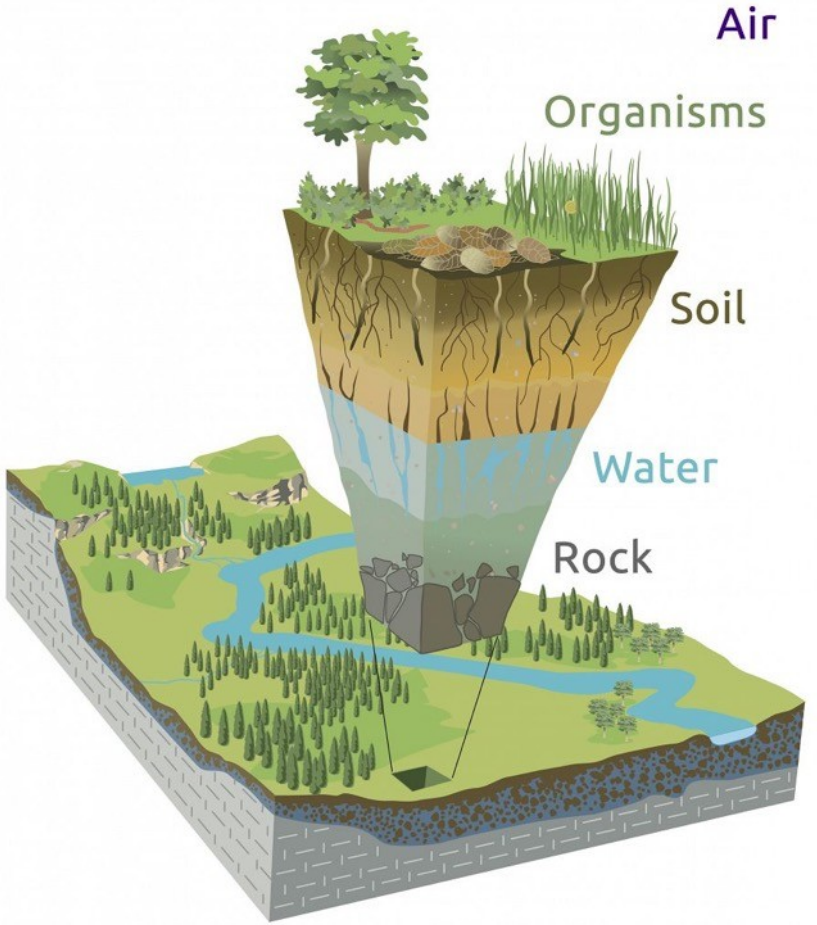


# Activities

## Hydrology Learning Ecosystem

Spring preparatory course (1 unit)

1) Introduction to Hydrology and the Critical Zone
2) Start faculty and peer mentoring
3) Prepare for the field experience
4) Team-building



# Activities

## Hydrology Learning Ecosystem

10-day summer field experience

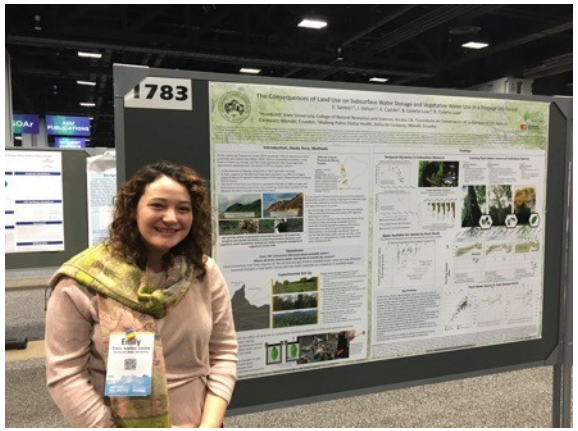
1) Stay in cabins at the Angelo Coast Range Reserve at the NSF Eel River Critical Zone Observatory
2) Learn about ongoing research
3) Get hands-on experience with Hydrology field techniques
4) Collect data for further research
5) Students paid a stipend for participating

# Activities

## Hydrology Learning Ecosystem

Fall course for sustained learning (3 units)

1) Research Skills
   - Use data from the field to answer research questions like how land use will affect watershed sustainability
   - Science communication
2) Professional development skills
   - Hear about Hydrology careers from professionals
   - Develop resume and apply for internships
   - Communicate research findings to stakeholders



# Lessons Learned

1) Collaborative proposal from multiple organizations
   - San Diego, Sacramento, Humboldt State
2) Release time of 3 units per PI to write proposal
   - Funded by CSU Council on Ocean Affairs, Science & Technology (COAST) Grant Development Program
3) Be flexible (e.g., willing to accept 10% budget cut)

## Summary

- Use the strengths of the CSU
  - PUI designation, many and strong broader impacts
- Find good collaborators
- Talk to POs before submission
- Be willing to revise and resubmit
- Work with campus Sponsored Programs Office
- Attend proposal writing workshops
  - NSF Grants Conference, CSU CO Developing/Revising a Proposal Workshop, etc.
- Get internal funding to support proposal development
  - e.g., COAST, WRPI, or home campus grant development programs

# Questions?

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# Next Steps/Closing Remarks

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Executive Director, STEM-NET
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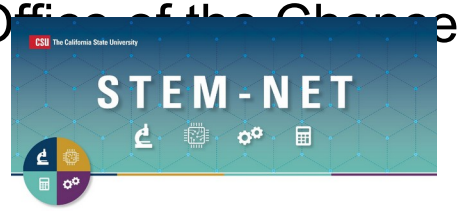


https://www2.calstate.edu/impact-of-the-csu/research/stem-net

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# STEM-NET COMMUNITY

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## Begin a Conversation with Colleagues and Join our Private CSU STEM-NET Facebook Group

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**THANK YOU FOR JOINING US TODAY!**

**For more information about STEM NET visit our website:**


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