Pacific Petroleum Geology
NEWSLETTER
Pacific Section • American Association of Petroleum Geologists
May and June 2025

Save the Date!

Pacific Section AAPG
Western Region SPE
Joint Meeting

The week of April 12, 2026

2024-2025 Officers

Staff

Contents

Editor's Comments: Good news, follow members: we are going to have a Pacific Section meeting in Bakersfield! Held in conjunction with SPE's Western Region, the meeting will include technical sessions, field trips and more. Detailed planning is underway, but for now mark your calendars for the week of April 12, 2026. See President Amy Spaziani's article on **page 3** for further discussion.

Submit an Article to the Pacific Petroleum Newsletter!

- CONTACT THE EDITOR at editor@PSAAPG.org
- Images (graphics, photos, and scans) must be at least 300 dpi resolution. Text should be at least 600 dpi.
- Scanned photos, illustrations (line art) or logos should preferably be submitted as a .tif, .gif, or .bmp; .jpeg

President's Letter **May/June 2025**

Greetings Pacific Section Members,

Happy Summer! It feels as though this year has flown by, because June 30th is the end of the Pacific Section (and AAPG) fiscal year, and the end of my tenure as president. This is, therefore, my last president's message, and it has been an honor to serve this section. I have learned much about the Pacific Section, made many contacts and friends, and learned a lot about the inner workings of a non-profit, scientific organization. It has been a VERY fun and rewarding experience!

As I reflect on the last year as a volunteer and president of a scientific organization, I've been thinking more about what persuades people to volunteer. Unfortunately, volunteerism has dropped off in many aspects, particularly since Covid. We not only see it in our Section, but in other professional organizations and AAPG national. I even see it in my sons' activities – a lack of parent volunteers to coach baseball or schedule soccer games! When did we become so busy that we can't set aside a little time for things that really matter to us?

AAPG president Deborah Sacrey wrote an excellent president's column on volunteerism and AAPG in the December 2024 Explorer and a few points stood out to me: 1) give people a reason to volunteer, and 2) a "fit for purpose" for volunteers. I see the latter as defined roles. Well, I have both for our community. I'll start with the roles.

As we move into the new fiscal year, we are lacking a critical role in our executive committee, that of the president-elect. The president, or president-elect of the Pacific Section is a three-year commitment: president-elect, president, and past president. I will be transitioning into my role as past-president this month. This executive leadership role has tremendous opportunity to shape the agenda for the organization, to lead the section and shape it into what matters in our scientific community. It can be a lot of work, but the president also has a great committee behind them, ready to jump in and assist or take over projects when one committee member gets too busy. But why take on such a laborious role? Networking, contacts, leadership experience, not just within the Pacific Section, but also at the national AAPG level as well. My time volunteering with PSAAPG has been very beneficial to my career, but it has also been an immense pleasure to get to know and work with my fellow executive committee members and meet and work with section leaders across the country.

With the new fiscal year, new committee chairs are selected or in many cases re-selected, due to lack of volunteers. We will be looking for several volunteers to fill those committee positions. Current committees include the awards, publications, membership, student scholarships, and teacher of the year. The Pacific Section is also looking for another person to run for the Advisory Council Representative to AAPG – we have one candidate but need at least one other to hold an election.

Finally, there is BIG news within our section! The Pacific Section of AAPG is joining forces with SPE Western Hemisphere in April 2026 to hold a joint meeting in Bakersfield. We are actively seeking volunteers to participate on several committees, including the program, exhibit and sponsorship, marketing and advertisement, student posters, field trips and short courses coordinators, and awards. As part of a committee for this conference, you have the opportunity to shape the conference and topics of what matters most to you, your scientific interests, and your career. This is an excellent opportunity to advance your knowledge base, hone organizational skills, and network across the Pacific Section and SPE! You do not need experience, just a willingness to donate a bit of your time.

I am very excited about the SPE Western Hemisphere/Pacific Section AAPG Joint meeting and I hope that all of you will save the date. The program chairs have put together a list of topics ranging from carbon capture and underground storage to geothermal, to enhanced oil recovery and thermal operations and much more. A call for papers and abstracts will go out very soon. I hope you will consider submitting an abstract to present. The program committee is considering a very wide range of topics. I hope you will all consider donating a bit of your time as well to this exciting event and/or the Pacific Section. Trust me, we have a role for you.

In closing, I will be handing the reins of this organization over to the very capable hands of Dan Steward, whose energy and ideas are unmatched. If you haven't had a chance to read up on the next Pacific Section president, you can read his interview and bio in the March/April 2024 newsletter. To all my Pacific Section friends and colleagues – have a wonderful summer! I will be looking forward to seeing pictures from summer vacations and travels, and I may even ask you to submit a few for a newsletter if they have some rocks in them!

Thank you all for a wonderful year,

Amy Spaziani

Advertisements in the PSAAPG Newsletter

The Pacific Section- AAPG is revamping the advertisements included in the newsletter. This includes:

- New lower rates
- New Submission Method
- New Multiple Avenues of Advertising

Members	Single Issue	Year (6 issues)
Full Page	$100	$250
Half Page	$50	$125
Business Card	$30	$75

The PSAAPG will have a new form for you to submit your advertisement and payment. Link to form will be posted on PSAAPG Website and emailed to members and friends of PSAAPG soon.

What can you submit?
Market your business whether it be for geologic consulting, field trips, educational training/ courses.

Where will your advertisement be placed?

PSAAPG Newsletter (single issue and year-round package)

PSAAPG Website (year-round package only)

PSAAPG LinkedIn page (single issue and year-round package)

2025 Scholarhsip Winners of the Affiliated Societies of the Pacific Section AAPG

Local geological societies awarded 14 scholarships this spring to undergraduate and graduate students attending universities in the Pacific Section. Scholarships are funded by the societies and the Pacific Section AAPG Foundation. Scholarships were presented at the societies' monthly meeting in April and May. Thank you to the local societies for coordinating this annual effort, and to Cynthia Huggins and Becca Schempp for organizing at the Pacific Section.

Alaska Geological Society

The AGS awarded one Pacific Section AAPG-funded scholarship this Spring to Xochitl Munoz, an undergraduate student attending the University of Alaska Fairbanks.

Los Angeles Basin Geological Society

From Karla Tucker, LABGS Scholarship Program Coordinator

This year LABGS, in partnership with PSAAPG, gave scholarships to 2 CSULB and CSUF undergraduate geology students to support them in their summer field classes and 1 CSULB graduate geology student to support his Master's degree. Our April LABGS meeting was held at 4 Sons Brewing in Huntington Beach, where we celebrated our scholarship awardees.

Carlos Aldana
Undergraduate student at CSULB

One of the moments of geology that I really enjoyed was my trip to Lake Isabella. Our goal of the trip was to describe rock units, map the shear zone and note shear sense indicators. I had a chance to observe signs of ductile deformation, just as I saw it in my structural geology textbook. Even though my tent got flipped and flooded, I still think of this trip as an overall positive experience.

Matthew Garcia
Undergraduate student at CSUF

We camped next to Anne Lake, located in the central Sierra Nevada Mountains, north of the Sierra National Forest, from mid-July to mid-August 2022. Every morning for weeks, weather permitting, we would set out from camp in pairs and begin the day of exploring our mapping area (around 20 sq. km), hiking for miles in pursuit of mapping contacts between the different members of the JLP (Jackass Lakes Pluton) and collecting rock samples for analysis back on campus. This mapping expedition wasn't all smooth sailing, with wildfire smoke and occasional hail/thunderstorms, but it was such a rewarding experience, and one that I will always remember fondly. I will always be grateful to Dr. Memeti for giving me the opportunity to tag along with her students on this amazing field experience.

Aaron Martin
Graduate student at CSULB

My favorite geology experience, which I believe is shared amongst many others, was my summer field camp with CSULB during 2023. Four weeks filled with camping, hiking, and mapping, all while sharing this experience with friends we have made along the way. We were fortunate to split our four weeks into four different mapping areas, with each having their own unique scenery: near Goblin Valley State Park in Central Utah, Flaming Gorge near the Utah-Wyoming border, within the Carson Range between South Lake Tahoe and Gardnerville, and Lily Lake just southwest of Lake Tahoe. These four weeks I spent with my class have created everlasting memories that I hold dear to my heart. From marching through the desert sands in high heat to getting consistently rained out at 4pm for 3 days straight. From being absolutely caked with dirt from a week's worth of work (I know, only a week) to taking one of the most memorable showers of my life. From hiking all day to playing campfire songs with my friends all night. I can go on and on. I believe summer field class is what makes this major so unique and special, where you not only get the chance to improve yourself as a geologist, but you get to create lifelong memories with those around you.

San Joaquin Geological Society

From Ron Foster, SJGS President

The 2025 SJGS Fall Fiesta raised $6,000, which was generously matched by the Pacific Section AAPG with an additional $4,000, allowing SJGS to award ten $1,000 scholarships on April 8 during our annual Student Night. Recipients were students from California State University, Bakersfield and Fresno State.

Henry Sanchez
California State University, Bakersfield

I am a senior geology student at CSUB. I was born in Bakersfield, CA., and hold dual citizenship in USA and El Salvador. After graduation, I hope to enter the field of engineering geology in the sectors of civil, mining, and/or oil and gas. During my leisure, I enjoy reading the biographies of prominent historical figures, hiking and camping throughout the Southern Sierra, I also enjoy traveling to El Salvador and visiting Pre-Columbian historical sites.

I plan to use the scholarship to fund my Field Camp to the Anti-Atlas Mountains in Morocco. I will have the opportunity to map the stratigraphic units that record the transition from the end of Precambrian conglomerate and quartzite and Cambrian transgression of dolomite sequences.

Madison Tarpley
California State University, Bakersfield

My name is Madison Tarpley, a senior geology major graduating this spring semester from Cal State Bakersfield. I am currently the President of the Geology Club. Last summer, I was given the opportunity to work at Lawerence Berkeley National Lab on Hydrogen emissions associated with chromite deposits in California's ophiolite complexes. After graduation I will be attending the University of St. Andrews' field camp in Scotland learning about the birthplace of geology. Following field camp, I'll return to Lawerence Berkeley National Lab and plan to pursue a Master of Science in Geology.

For the Scholarship I plan on using it towards my field camp in Scotland to help cover the cost of field gear and other essentials for my time in Scotland.

Braedon Scarry
California State University, Bakersfield

I'm a senior geology student at CSU Bakersfield, graduating this May, and a proud Marine Corps veteran. My time in the military instilled discipline and leadership, which shape how I approach both academic and community responsibilities. As an active member of the Veterans Club, I'm dedicated to supporting fellow veterans, organizing events, and helping create a strong support network on campus. I'm passionate about giving back to the community and hope to continue to do so as I pursue my master's at CSUB.

With this scholarship, I plan to apply the funds toward attending field camp and further expenses of my master's degree. This support allows me to continue my educational journey and get closer to my career goals. As I prepare to welcome my first child at the end of this year, finances are becoming tight, and this scholarship will help me remain focused on my studies.

Eder Tavera
California State University, Bakersfield

My name is Eder Tavera, and I am a senior geology student at CSUB. I am veteran of the global war on terror, and I served for six years as a U.S. Army Infantry soldier. I am a father of two young men who are my motivation to continue to progress as a student and as a person.

I will be graduating with my B.S. in Geology this coming May, and I am hopeful to start graduate school at CSUB in the coming fall semester. My career goal in the geologic sciences is to earn my master's degree and start my career as a field geologist for the U.S.G.S. I plan to use this scholarship to cover my travel expenses to and from Idaho State University for summer field camp.

Thank you, San Joaquin Geological Society, for helping me and other aspiring geologists with this financial help. I am extremely grateful for your generous scholarship!

Garrett Cooper
California State University, Bakersfield

Hi, I'm Garrett Cooper, an undergraduate student at California State University, Bakersfield, majoring in Geology. I have a strong interest in Paleoclimatology, Oceanography, Geophysics, and the use of remote sensing technologies. Throughout my academic journey, I've had the privilege of working alongside Dr. Cruz, where I helped characterize sediment dynamics in the Southern California Margin. Additionally, I've had the opportunity to work with Dr. Crewdson in developing a flood prevention map, using a total station survey instrument. I've also gained hands-on experience with advanced equipment such as the ICP-MS, the Mastersizer 2000 grain size analyzer, and drones, to which have used to analyze geomorphology, and potentially finding faults, along with characterizing displacement and other useful field mapping processes.

This scholarship will play a crucial role in supporting and furthering my education. I plan to use it for my field camp this winter in Hawaii, as well as to purchase essential equipment for an upcoming research cruise in Iceland with Dr. Rathburn this summer. The extensive nature of the equipment I need for these projects, as well as the high cost of many of these items, this support will be invaluable in ensuring I have the proper gear to conduct field research effectively and help offset the cost for field camp.

Ultimately, this scholarship will help me further my academic and professional development in the geologic sciences, and I am incredibly grateful for the opportunity to receive this assistance.

Tyler Garza
California State University, Bakersfield

My name is Tyler Garza and I am currently a Senior in geology at CSUB. I have tried a lot of different areas in geology, however geochemical analysis is my main focus. I have done internships throughout the US including the Smithsonian Museum of Natural History as well as worked at Lawerence Berkeley National Laboratory.

I will be using the Scholarship to help fund my field camp expense.

Elijah Swanson
California State University, Bakersfield

Howdy! I'm Elijah Swanson, a fourth-year undergraduate student studying Geology and Communication at CSUB. Currently, I work as a peer advisor, geology tutor, K-12 science demonstrator, research intern, and lab rat. My research is in carbon sequestration and hydrogen storage. After graduation, I plan to pursue a master's degree and work my way up to a PhD with as many teaching opportunities as possible. I plan to use this scholarship to attend field camp, which I am in the process of deciding. Your support helps me achieve my goals of making science more accessible!

Triston Xiong (pronounced “Shong”)
Fresno State

I am a first generation Hmong-American with my family escaping the war in Vietnam and finding asylum in the US as well as the second generation in my family to pursue higher education. That pursuit for higher education has taken me down the route of Environmental Science with a focus on soil and water to maintain the health of the Central Valley. I plan to go further with my education and pursue a PhD program following my graduation at Fresno State. I also plan to use my education and understanding of the processes that created the Central Valley to protect the region and the people who call it home. My main goal in my career is to make a difference in my field and try to create a better world for the generations preceding myself.

This scholarship would go towards my current research focusing on the saline aspect of Biochar and towards my plans to pursue a graduate program following Fresno State.

Sergio Medina
Fresno State

I am a geologist from Colombia currently pursuing my master's degree in Geology at California State University, Fresno. My research focuses on using stable isotopes and elemental analyses to understand environmental changes during the Paleocene-Eocene Thermal Maximum (PETM). Additionally, I have experience as an exploration geologist in the oil and gas industry. My goal is to build a strong foundation in research and develop the skills necessary to apply advanced geochemical and geological techniques to exploration geology. At the same time, I hope to contribute to climate change research by bridging insights from past environmental shifts with modern challenges.

I plan to use the scholarship to fully fund my research project by covering the costs of stable carbon isotope analyses needed to develop my C:N ratio study during the PETM. Although I already have the sedimentary samples from Lodo Gulch, the laboratory analyses—averaging about $10.08 per sample at UC Merced—are essential for generating the necessary data. Additionally, I will allocate funds for poster presentations and publication fees to share my findings with the scientific community.

Maggie Izumi
California State University, Bakersfield

My name is Maggie Izumi and I am a senior geology student at CSU Bakersfield. My main research interest is geophysics, and I have been lucky enough to have furthered my research and knowledge at Lawerence Berkeley National Laboratory. I will be attending field camp this fall in Hawaii on the Big Island and will pursue my Master's in Geology at CSU Bakersfield the following spring semester.

The Pacific Section received two letters expressing gratitude for the scholarships, which are reprinted below.

Pacific Section of the American Association of Petroleum Geologists Foundation and the San Joaquin Geological Society
Cynthia Huggins, Amy Spaziani, Ron Foster, and Becca Schempp

May 5th, 2025

Dear PSAAPG and SJGS Scholarship Committee,

I am writing to express my sincere gratitude for being selected as a recipient of the PSAAPG and SJGS Scholarship. I would like to extend my heartfelt thanks to Amy Spaziani, Ron Foster, Cynthia Huggins, and Becca Schempp for making this opportunity possible.

Receiving this scholarship on April 7th, 2025, was an incredible honor, and I am deeply appreciative of your generous support. Your investment in my education has had a meaningful impact on my academic journey.

This coming fall, I will be attending California State University, Bakersfield to continue working toward my goal of becoming a professional geologist. I will be enrolling in upper-division, 5000-level courses as part of my Master's degree program. My passion for geology was strongly influenced by my professor, James May, at Taft College. His mentorship and encouragement played a significant role in shaping my academic path and career aspirations.

Looking ahead, I hope to secure a geoscience position where I can not only contribute to the field but also inspire and support the next generation—just as my mentors have done for me.

Thank you again for your generosity. This scholarship has brought me closer to achieving my dreams, and I am truly grateful for your support.

Sincerely,
Garrett Cooper

May 9, 2025

Dear PSAAPG Foundation and San Joaquin Geological Society,

I am writing to sincerely thank you and your society members for awarding me a 2025 PSAAPG Foundation and SJGS scholarship. I am deeply honored and incredibly grateful for your support of my educational journey.

This scholarship will significantly ease the financial burden of field camp this coming winter and will allow me to focus more on my academic, professional, and personal growth. With this in mind, I also hope to attend more future SJGS events and become more involved in your community.

Your investment in my future is truly inspiring, and I am committed to working hard and making the most of this opportunity. I hope to one day give back to others, just as you have generously given to me.

Thank you once again for your support and confidence in my potential. It means more than words can express.

Warmest regards,

Maggie Izumi
mizumi@csub.edu
Senior Geology student CSU Bakersfield

Travels in Antarctica and Patagonia; 2024-2025

Dan Schwartz and Cynthia Huggins

Part 2: Patagonia

Patagonia geology

The geology of Patagonia has been studied for many years, but there is renewed interest in the basin fill turbidites from several academic programs tied to analog studies in support of exploration and development, and from the mining side of economic geology. Figure 23 displays an economic geology map showing the location of established or prospective gold, silver, copper and lead deposits along the Andean back arc. Most are dated to 150 -160 Mya. Most are epithermal or porphyry deposits. The area of our trip is shown in the red box, south of active mining.

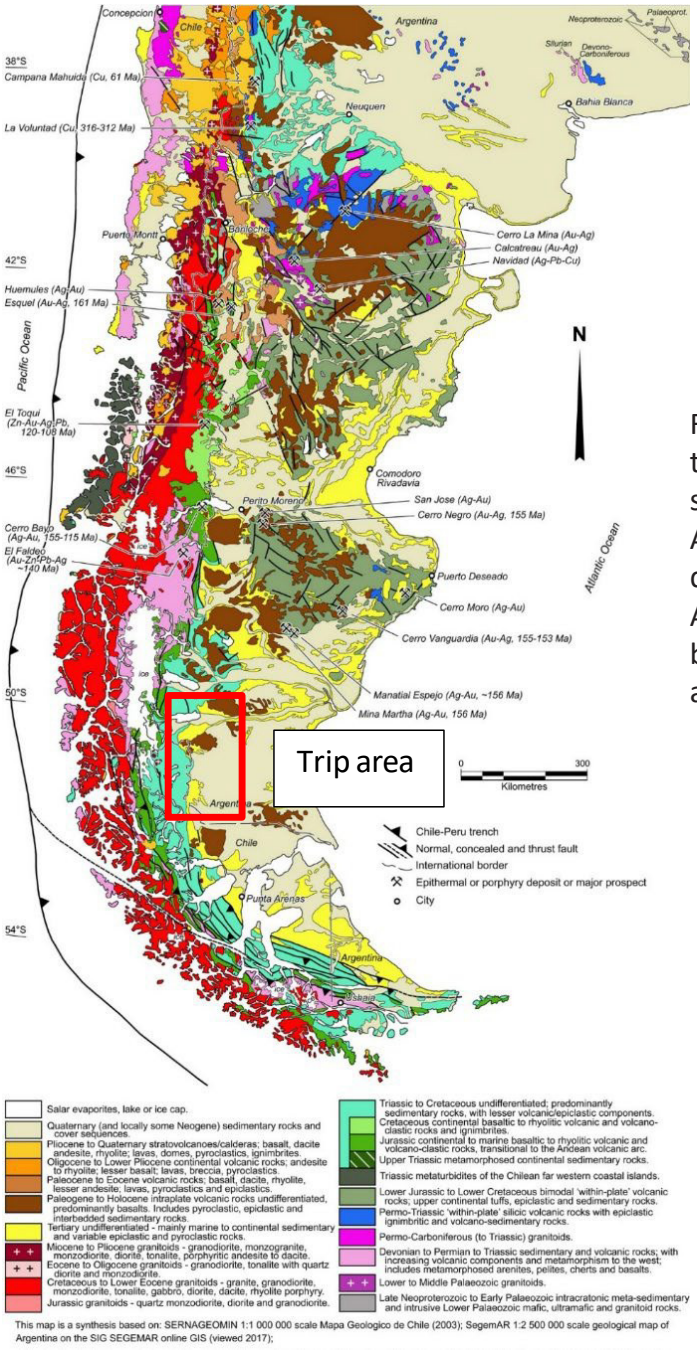

Figure 23. Map displaying tectonic and geologic setting of epithermal Au/Ag and porphyry Cu deposits in Southern Andes and Patagonia. Red box outlines approximate area of the trip.

The Mesozoic geology of Patagonia most investigated for analog studies is in the Torres del Paine National Park region of southern Patagonia in the Magallanes Basin. Figure 24 displays the geology of the region as well as key outcrop locations studied by academics and E&P geologists. Locations of stops made during our geological excursion are indicated with yellow stars. Figure numbers are adjacent to the stars.

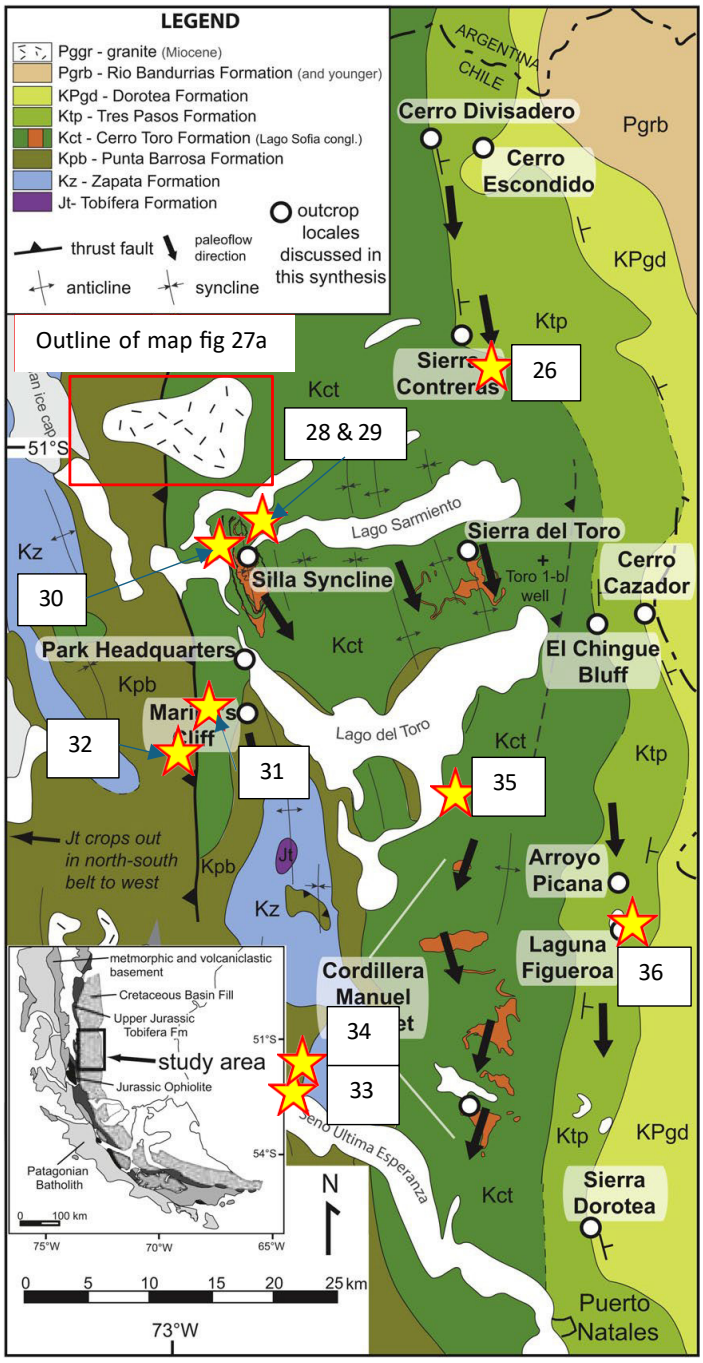

Fig. 24. Simplified geologic map of Ultima Esperanza District, southern Chile, showing the major lithostratigraphic units of the Cretaceous Magallanes Basin. The dominant paleocurrent direction for the three deep-water formations (Punta Barrosa, Cerro Toro, and Tres Pasos) is south to southeast, which was parallel to the Andean orogenic belt during the Late Cretaceous. Formations are younger and progressively less structurally deformed to the east. Outcrop locations for analog studies are highlighted. Paleocurrent summary arrows derived from many measurements for each formation. Refer to Fig. 25 for a generalized stratigraphic column. (Romans et al., 2011)

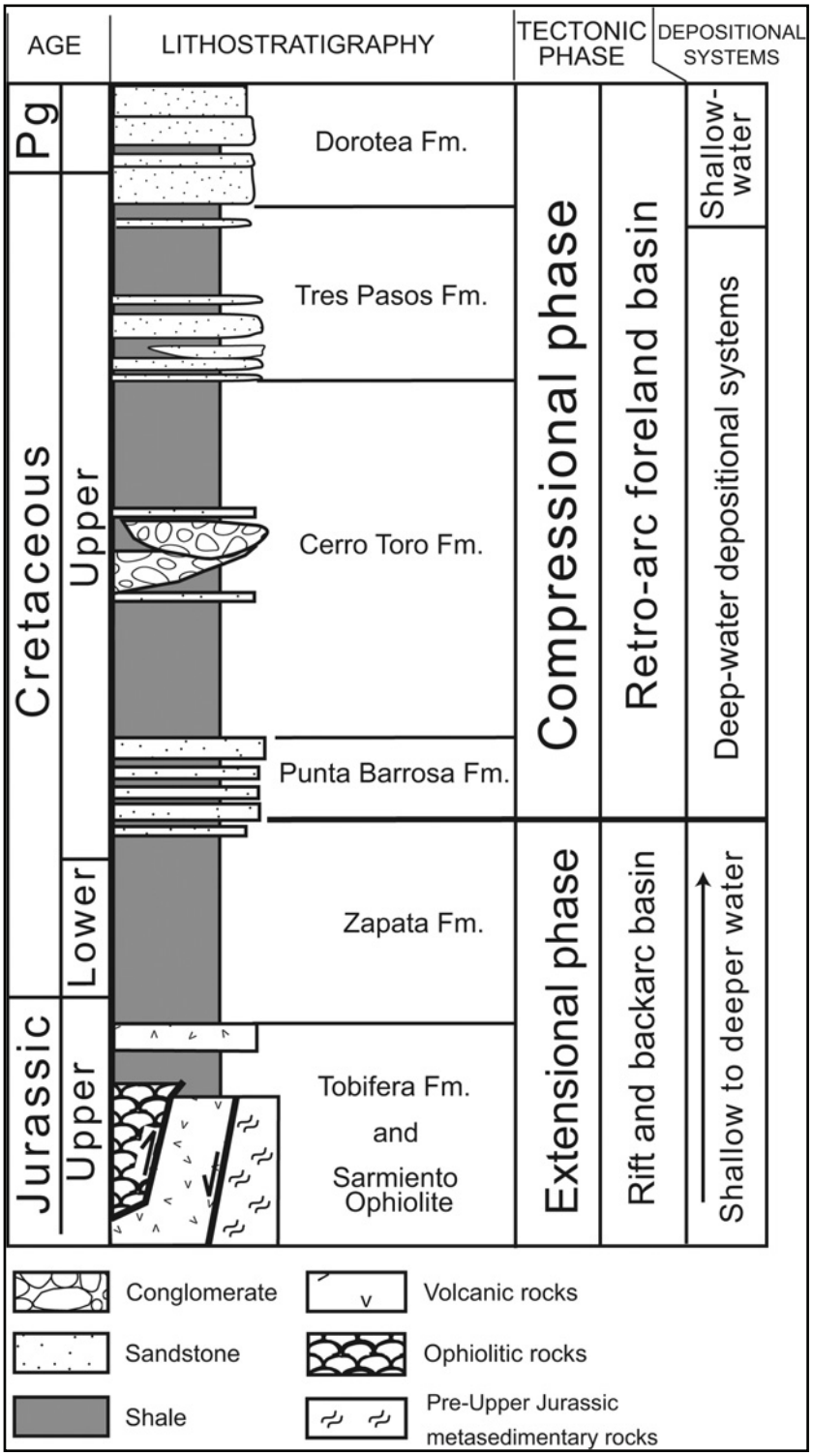

Fig. 25a. Generalized stratigraphic column for the Magallanes Basin in Ultima Esperanza District, southern Chile. Major lithostratigraphic formations are associated with tectonic phases and basin types. Modified from Romans et al. (2010). (Romans et al., 2011)

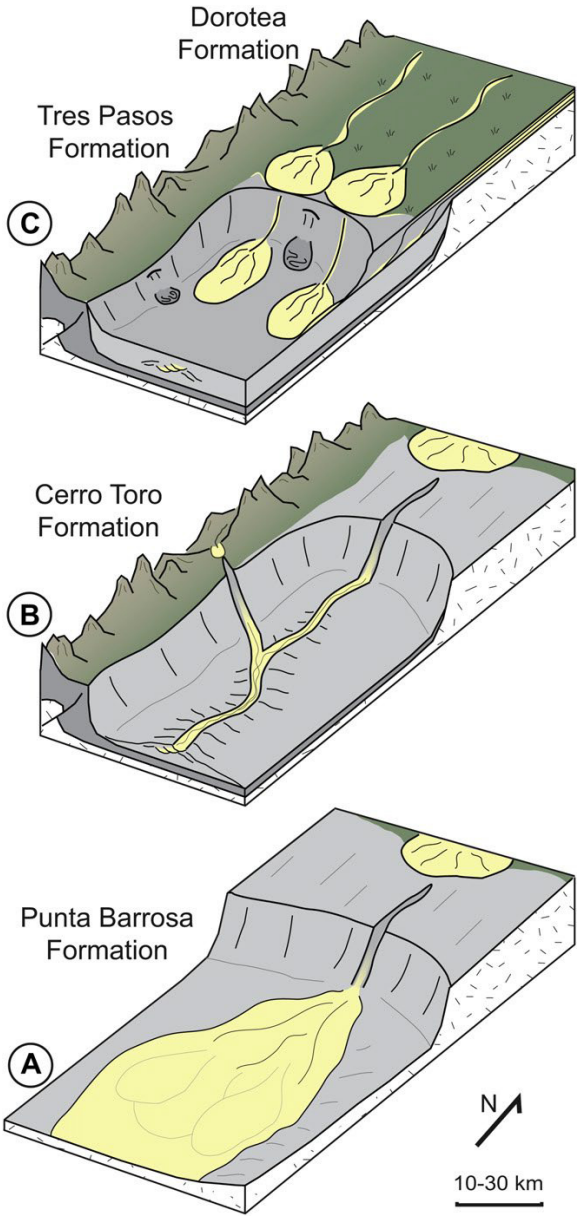

Fig. 25b. Schematic block diagrams depicting the dominant style of deep-water deposition and associated architecture in the Magallanes Basin. Position of transition from fully continental crust in north to attenuated crust in south inherited from older Rocas Verdes back arc basin. The nature of the basin margin adjacent to the fold-thrust belt is not preserved because of younger deformation and is, therefore, interpretive. (A) The oldest phase of coarse-grained deep-water deposition represented by the Punta Barrosa Formation, which is characterized by tabular to slightly lenticular sandstone bodies interpreted to represent deposition in an unconfined setting. Eastward thinning and potential pinch out suggests potential ponding against forebulge. (B) The Cerro Toro Formation is characterized by a fore-deep axial channel-levee system filled with conglomeratic channel deposits. Silla Syncline outcrop depicted as major tributary to axial system, which is constrained by paleocurrents (Fig. 24), distinct architectural style, provenance data (Romans et al., 2010) and has been suggested by previous workers. Provenance data also indicates timing of thrust-sheet emplacement and associated foredeep subsidence coincident with Cerro Toro deposition. (C) The final phase of deep-water sedimentation is represented by the genetically linked Tres Pasos (slope) and Dorotea (deltaic/shelfal) Formations. Deep-water accommodation was ultimately filled as the Tres Pasos slope systems prograded southward. (Romans et al., 2011)

Our geological excursion started near our lodgings at the Awasi Resort, near the star with where the photograph in Figure 26 was taken. The guanaco shown in the foliage with the mountains in the background is related to the camel and alpaca. It is the main food source for the cougar that sits at the top of the food chain. While we saw many guanaco, we only 'saw" one cougar, from a distance, on a ridge above a group of guanaco.

Figure 26. Guanaco "posing" before the Sierra del Paine. View to the west from Cerro Guido, west of Awasi Resort. The light rock exposed in the spires is Miocene granite. The overlying (right) and underlying strata (left) are Upper Cretaceous deep marine deposits referred to as "Country-rock flysch" by Leuthold et al., 2012.

The mountains in the distance behind the guanaco are the Torres del Paine. This feature is unique as it is formed by the intrusion of a Miocene laccolith comprised of granite emplaced as a series of sills, into the Upper Cretaceous basin fill strata comprised of deep water deposits. Figure 27 from Leuthold et al., 2012 illustrates the location of the granitic complex (27a), a overview photograph of the complex (27b), and a line drawing of the complex. Leuthold et al. refer to the Upper Cretaceous strata as Country rock flysch.

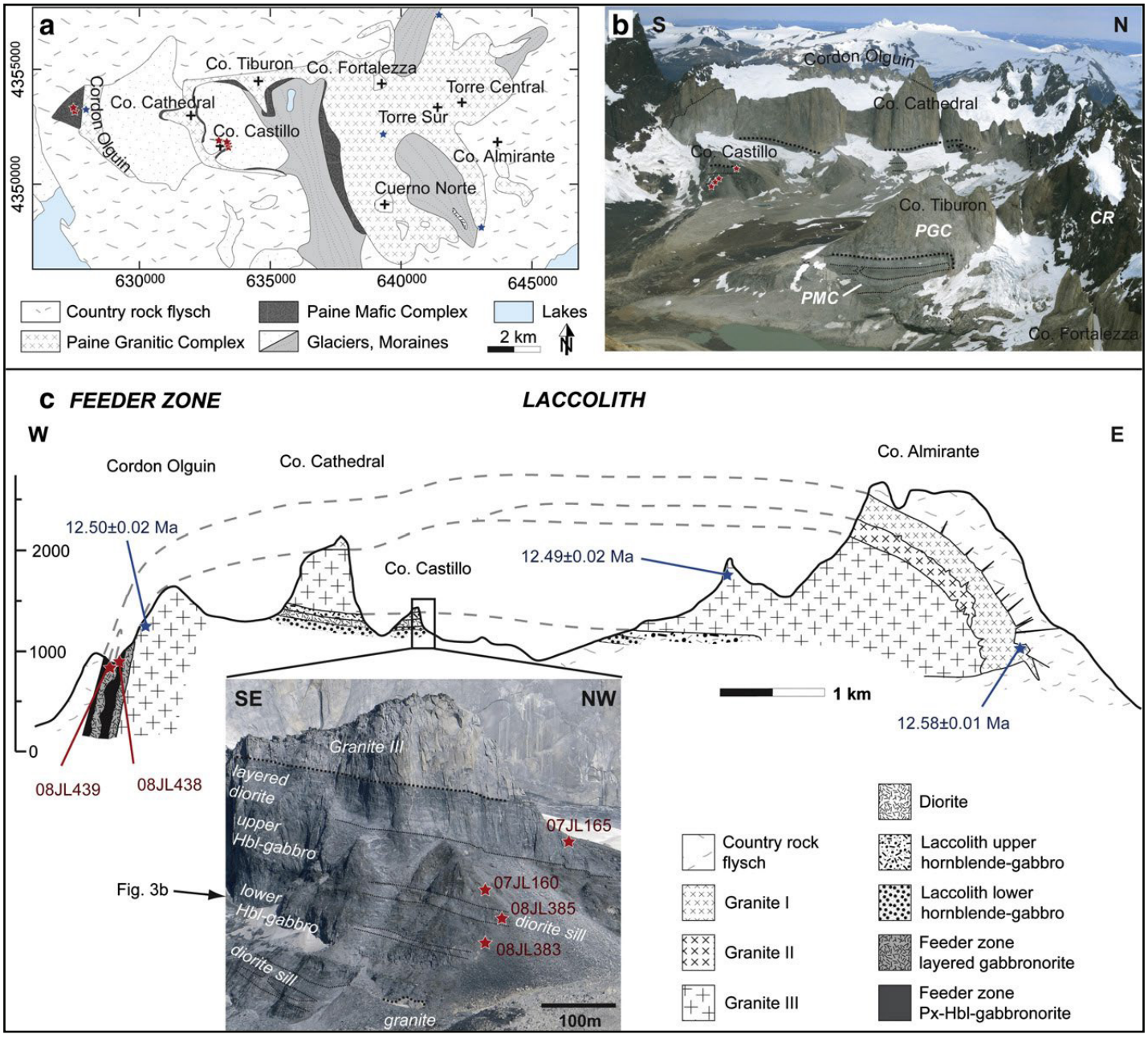

Figure 27. The Torres del Paine intrusive complex and surrounding country rocks. (a) Simplified geological map (modified after Michel et al., 2008); (b) Panorama photograph of the Torres del Paine mafic complex (PMC), the Paine granitic complex (PGC) and the country rock flysch (CR) photograph taken by Robert Bodner, from the Co. Fortalezza summit, toward west). Each identified granitic and mafic unit was built up by stacking of several meter to decameter thick sills. The locations of the dated samples from the Paine mafic complex are indicated by red stars, and the dated samples from the Paine granitic complex (Michel et al., 2008) are indicated by blue stars. The feeder zone is located westward of the Cordon Olguin Crest. (c) W–E section through the Torres de Paine intrusive complex, modified after Michel et al. (2008). Granites I and III ages have been recalculated from Michel et al. (2008) (see text for details). The detailed photograph of the Co. Castillo outcrop shows the relationship between the individual laccolith mafic units, as well as the sharp contact with the overlying granite (granite III unit). (Leuthold et al., 2012)

During our excursion, we were able to get various views of the Torres del Paine. Figure 28 displays the complex from the southeast, with Laguna Amargo in the foreground. The glacial lakes in Patagonia vary in turbidity with distance from glacial melt sources. Laguna Amargo is separated from the glacial melt by many kilometers and has little glacial flour. It is characterized by the presence of bacterial mats on the shoreline that reflect an evaporative genesis.

Figure 28. Photograph of Torres del Paine from Laguna Amarga looking northwest. The glacial lake has an evaporative deposit at the shoreline formed from bacterial action. The mountains contain Cretaceous flysch intruded by Miocene granite as illustrated in Figure 27. In the foreground is Upper Cretaceous flysch that was metamorphosed by the granitic intrusion.

The Upper Cretaceous flysch is the basin fill sequence that is the target of extensive academic and industry investigation. The Cerro Toro Formation has been extensively investigated and is a muddy system with thin-bedded turbidites and occasional channel complexes (Figure 29). The Cerro Toro Formation is characterized by a foredeep-axial channel-levee system filled with conglomeratic channel deposits. (Romans et al., 2011). Figures 24 and 25a&b illustrate the location of the outcrop and the setting of the deposition. The outcrop does not display the characteristic Lago Sofia conglomerate mapped in orange in Figure 24.

Figure 29. Outcrop photograph of Upper Cretaceous Cerro Toro Formation thin bedded deep marine sedimentary rock with a thick bedded unit in the center of the view. Sandstone bed is incised by a channel that is subsequently filled with shale. Our guide Pablo and Cynthia for scale. Road-cut near Lago Nordenskjold.

During our time in Torres del Paine National Park, we had the opportunity to view glacial lakes and take a river cruise to view glaciers. The most scenic back drop was always the spires and laccolith of the mountains. Figure 30 displays one of the glacial lakes, Lago Pehoe, which is fed by the Rio Paine, which drains one of the glaciers. Figure 31 displays the Rio Serrano, a meandering river that connects the National Park to the Pacific Ocean via the Seno Ultima Esperanza fiord with Puerto Natales on its shore (Figure 24).

Rio Serrano has a rapid that requires fording. Figure 32 displays the rapid, with erosional remnants of early Upper Cretaceous Punta Barrosa Formation, the lower most unit of the basin fill sequence described in Figures 24 and 25a&b.

Figure 30. Photograph of Torres del Paine from Lago Pehoe. This glacial lake is colored blue as a result of glacial run-off from Rio Paine into Lago Pehoe. View to the north.

Figure 31. Photograph of Rio Serrano valley with Torres del Paine in the distance. View to the north. We travelled by boat on the Rio Serrano to view active glaciers in the Cordillera Sarmiento Gamboa. Note that the water in Rio Serrano is relatively clear.

Figure 32. Photograph of rapids on Rio Serrano. The color of the water is related to the glacial outwash which entered Rio Serrano from Rio Grey, which drains the Grey Glacier to the north. Rio Serrano flows through the early Upper Cretaceous Punta Barrosa Formation exposed on the outcrop cut by the rapids.

A two-hour boat ride took us to down the Rio Serrano and into the Seno Ultima Esperanza. We saw a receding glacier (Figure 33) with the terminus of the glacier on eroded bed rock. The glacier feeds a braided meltwater outwash stream. Hanging valleys and glacial remnants are visible above the tongue of the glacier.

Figure 33. A receding glacier melts into Seno Ultima Esperanza. View to the north, from the Esperanza, downstream from the Rio Serrano flooded delta. The terminus of the glacier has minimal moraine detritus, appearing to sit on eroded bedrock. It feeds a braided meltwater stream that drains into the fjord. Visible to the right side of the glacier are hanging valleys with scarp fronted glaciers.

The boat trip took us back up the Rio Serrano, where we stopped at the Serrano Glacier and Laguna Serrano. This receding glacial tongue sheds ice blocks directly into Laguna Serrano (Figure 34). The Serrano Glacier has receded several kilometers in the past 200 years. Glacial polish can be seen on the bedrock above the glacier and in the foreground. Blocks of ice floating in Laguna Serrano often contain glacial erratic debris.

Figure 34. Receding Serrano Glacier at Laguna Serrano. Lake drains into the drowned delta of Rio Serrano as it drains into Seno Ultima Esperanza.

The day following the Rio Serrano trip, we were on horseback, looking at the marshland that forms a bird sanctuary as well as the Lago Sofia Conglomerate in cliffs above the Lago del Torro. Figure 25 displays the horseback riders (with safety helmets of course).

Figure 35. On horseback above the Rio de las Chinas upstream of Lago del Toro. The cliffs in the background contain Lago Sofia Conglomerate in the Cerro Toro Formation. See Figure 24 for the location of the setting.

Our last day in Patagonia was spent driving from Awasi to Puerto Natales. During this two-hour ride we stopped at Laguna Figueroa to view the Tres Pasos Formation. This base of slope system is the final fill stage of Cretaceous sedimentation. Figure 36 displays the outcrop from below. To better understand the section excerpts from Macauley and Hubbard, (2012) are provided in Figures 37 and 38. The Tres Pasos base of slope depositional system is part of the prograding slope system during the final stage of basin fill (Figure 37). The formation is characterized by thin to medium bedded fan lobe sandstones cut by channels that are filled with thick bedded to massive sandstones (Figure 38). The unit becomes amalgamated away from the channel margin.

Figure 36. Outcrop of Tres Pasos Formation of late Upper Cretaceous age. It represents a toe-of- slope depositional system in the southward prograding basin fill sequence.

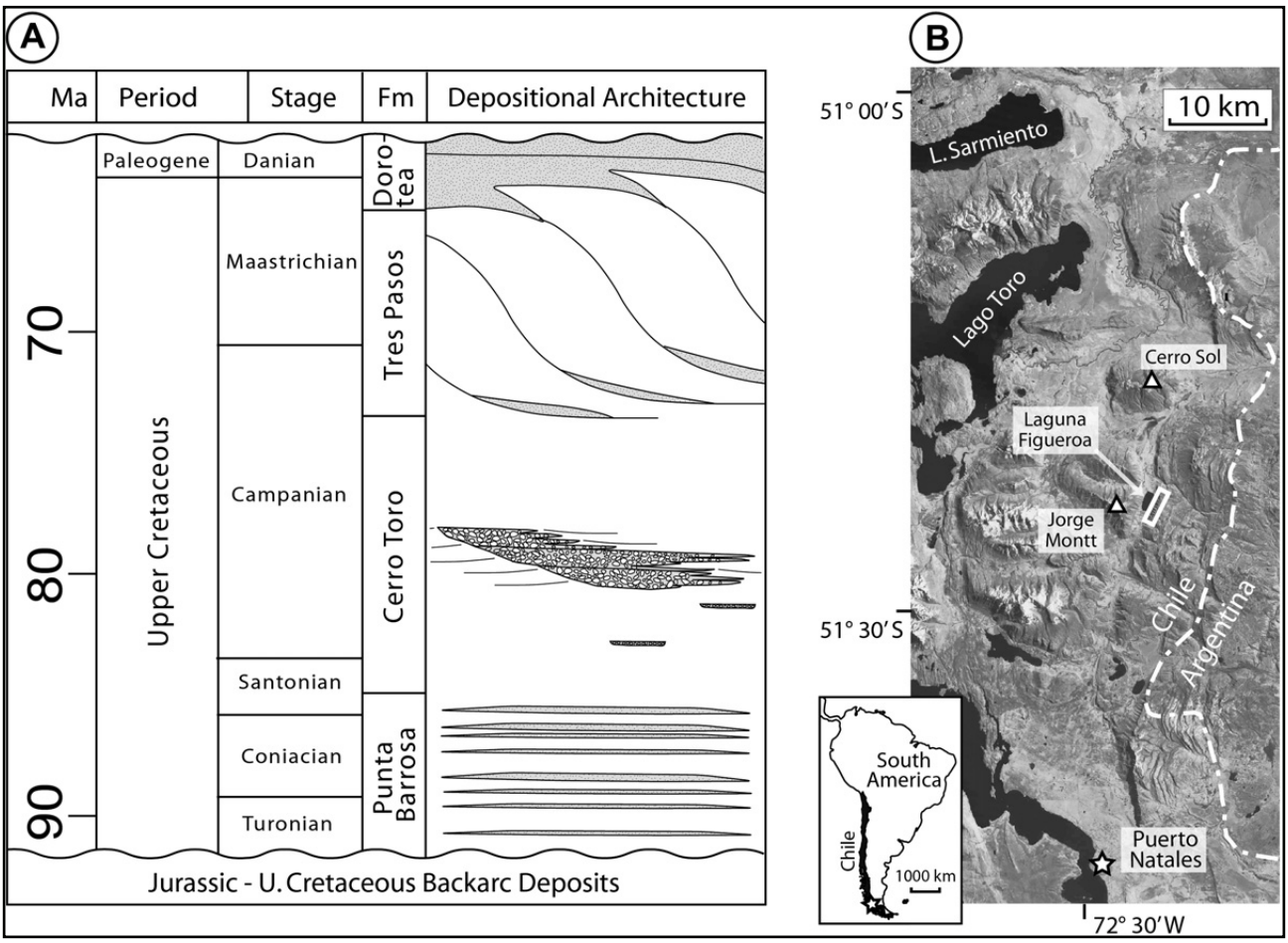

Figure 37. (A) Magallanes foreland basin stratigraphy (from Hubbard et al., 2010). Bathyal conditions persisted during the deposition of the Punta Barrosa and Cerro Toro Formations. The Tres Pasos and Dorotea Formations record the progradational in-filling of the Cretaceous foredeep. Slope channel sandstones deposited at the base of a high relief (>800 m) slope, part of the Tres Pasos Formation, are the focus of this study. (B) Study area overview. The Tres Pasos slope channel strata of interest are present in the area highlighted, adjacent to Laguna Figueroa. Inset map of South America shows the location of the regional satellite image featured (star). (Macauley and Hubbard, 2012)

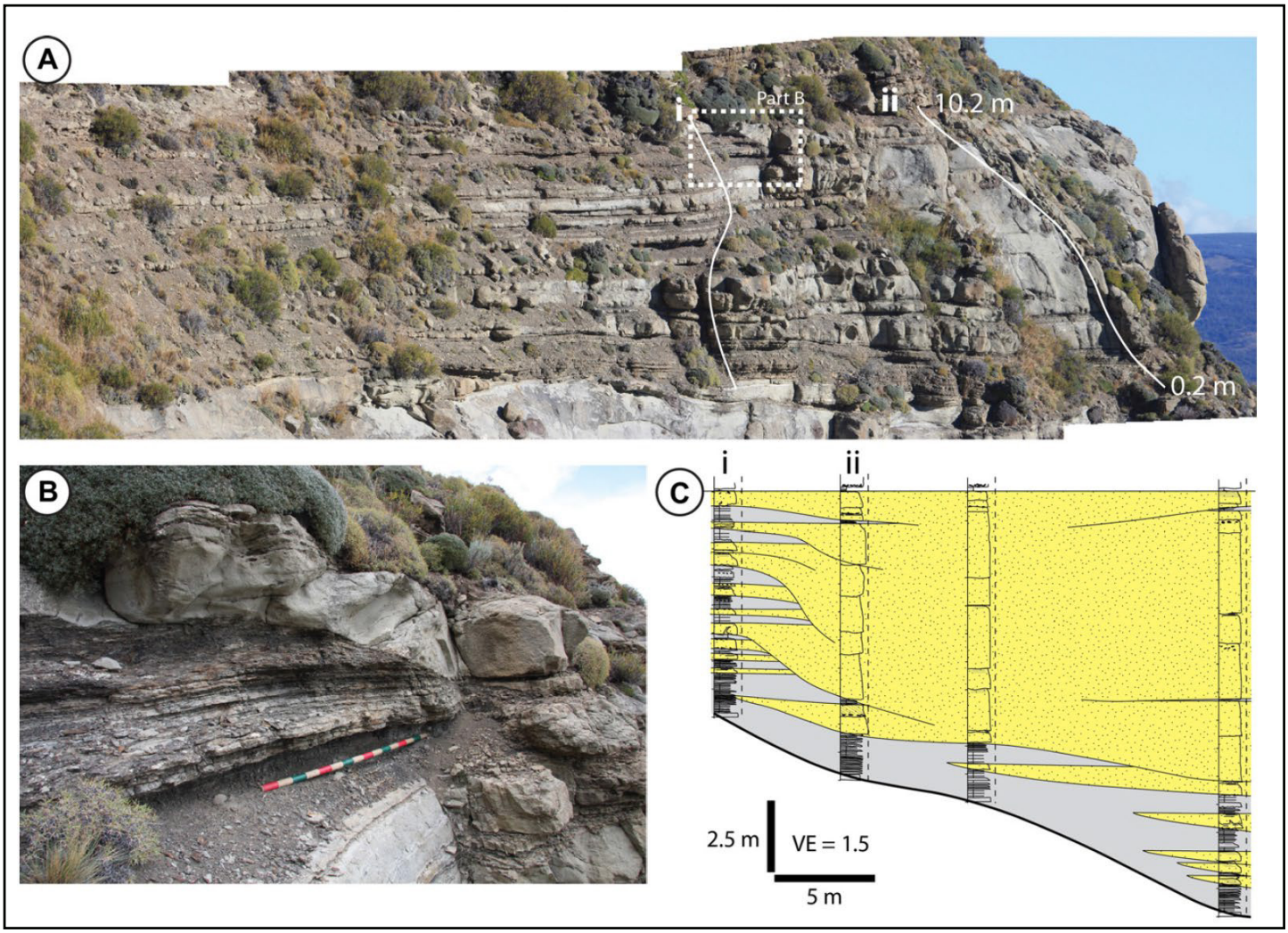

Figure 38. Architecture of a channel element margin in the Tres Pasos Formation. (A) Photomosaic of a channel element 15 m thick characterized by the lateral transition from axis to margin over <30 m. (B) Photograph demonstrating the erosional nature of beds associated with the transition from sandstone dominated elements to siltstone dominated elements. Location of photo outlined in white in Part A. (C) Cross-section of the margin depicted in Parts A and B. The locations of two of the measured sections in Part C, labeled i and ii, are highlighted in Part A. The area captured in this figure is outlined in Figure 37B. (Macauley and Hubbard, 2012)

Conclusions

Our trip to Antarctica and Patagonia turned out to be a full bucket list experience. What started as a wine and sightseeing trip morphed into a geological experience that we both fully appreciated. The submersible trip brought home the deposition of Monterey Formation. Diatoms and zooplankton pellets were settling to the bottom and coating everything with ooze. On the basis of the extensive in-fauna , it was apparent that the sea floor was oxygenated. The depositional process was there, but the setting was different and bioturbation was taking place.

The extensive Cretaceous deep marine depositional systems in Patagonia brought to mind the Miocene-Pliocene deep-water deposits we encountered in California. These Patagonian deposits make very good analogues for California as well as the North Sea, west Africa, and the Gulf of Mexico. Observing the glaciers, lakes, and rivers was a wonderful experience. I have not spent that much time on rivers since grad school.

If you can get to Antarctica and Patagonia, you will not regret it. We encourage you to add these locales to your bucket list.

References in chronological order.

Adie, E. J., 1969. Geologic Map of Antarctica, Sheet 1, Northern Antarctic Peninsula. Plate 1, Folio 12-Geology, Antarctic map folio series. American Geographical Society.

Ford, A. B. and D.L. Schmidt, 1978. The Antarctic and its Geology. U.S. Department of the Interior, Geological Survey. Printing office: 1978-261-226/50.

Birkenmajer, K., 1995. Geology of the Gerlache Strait, West Antarctica, I. Arctowski Peninsula. Institute of Geological Sciences, Polish Academy of Sciences, Senacka 3, 31-002 Krakow, Poland. P. 47-60.

Riley, T. R., P. T. Leat, R. J. Pankhurst, and C. Harris, 2001. Origins of large volume rhyolitic volcanism in the Antarctic Peninsula and Patagonia by crustal melting. Journal of Petrology, Volume 42, Issue 6, June 2001, Pages 1043–1065.

Miller, H., 2007. History of views on the relative positions of Antarctica and South America: A 100 year tango between Patagonia and the Antarctic Peninsula. U.S.G.S and National Academies. OF-2007-1047. Short Research Paper 041.

Romans, B.W., A. Fildani, S.M. Hubbard, J.A. Covault, J.C. Fosdick, and S.A. Graham, 2011. Evolution of deep-water stratigraphic architecture, Magallanes Basin, Chile. Marine and Petroleum Geology V. 28, pp 612-628.

Leuthold, J., O. Muntener, L.P. Baumgartner, B. Putlitz, M. Ovtcharova, and U. Schaltegger. Time resolved construction of a bimodal laccolith (Torres del Paine, Patagonia). Earth and Planetary Science Letters 325-326, pp 85-92.

Macauley, R.V., and S.M. Hubbard, 2012. Slope channel sedimentary processes and stratigraphic stacking, Cretaceous Tres Pasos Formation slope system, Chilean Patagonia. Marine and Petroleum Geology. Pp 1-17.

Ramos, V.A. and M. Naipauer, 2014. Patagonia: where does it come from? Journal of Iberian Geology, V. 40 No. 2, pp 367-379.

Burton-Johnson, A., and T.R. Riley, 2015. Autochthonous v. accreted terrane development of continental margins: a revised in situ tectonic history of the Antarctic Peninsula. Journal of the Geological Society, Vol. 172, pp 822-835.

Alaska Geological Society

Yesterday, Today and Tomorrow

President:	Ken Helmold
Past President:	Monte Mabry
Vice President:	Dave Buthman
Treasurer:	Victoria Jones
Secretary:	Adam Manzer

Summary of AGS Accomplishments for 2024 – 2025

- Held nine monthly meetings (September – May) with oral presentations on a variety of Alaskan topics. We encouraged in-person attendance but also offered virtual viewing to ensure the widest possible audience (e.g., USGS geologists in Reston, VA)

- Released nine monthly newsletters that served as announcements of the monthly meetings, informed members of current events, and usually contained short articles on Alaskan topics (e.g., Alaskan invertebrate fossils by Robert Blodgett)

- Working to update AGS bylaws (work in progress; some aspects are contentious)

- Awarded $12,500 in scholarships to five students: AGS Scholarships (Tabitha Nowark, Minh Pham, Claire Puleio), Don Richter Memorial Scholarship (Brandon Keough), and PSAAPG Scholarship (Xochitl Munoz)

- Inducted three new members to the Alaskan Pathfinders (William Dall, George Gryc, and Anita Harris)

- Held spring Technology Conference on the campus of University of Alaska Anchorage (April 24-26). The conference consisted of 1) a one-day pre-conference workshop on recent advances in North Slope exploration, 2) a full day of meetings featuring nine oral presentations and 13 poster displays, and 3) a one-day post-conference field trip in the greater Anchorage area. Attendance was 60+, profit is $500-$1500 (still calculating)

Anticipated AGS Accomplishments for 2025 – 2026

More of the same, including:

- Possibly hold a fall (September 2025?) field trip in southcentral Alaska (planning stage)
- Hold nine monthly meetings (September – May) with oral presentations on a variety of Alaskan topics. We will continue to encourage in-person attendance and will also offer virtual viewing to ensure the widest possible audience (e.g., USGS geologists in Reston, VA)
- Release nine monthly newsletters to serve as announcements of the monthly meetings and inform members of current events
- Complete update of AGS bylaws (with any luck)
- Award scholarships: AGS Scholarships, Don Richter Memorial Scholarship, and PSAAPG Scholarship
- Induct new members to the Alaskan Pathfinders
- Hold Technology Conference on the campus of University of Alaska Fairbanks (spring, 2026). Hopefully the conference will consist of 1) pre-conference workshop(s) 2) a full day of meetings featuring oral presentations and poster displays, and 3) post-conference field trip(s) in the greater Fairbanks area.

John Dunham

Written by Jon Schwalbach and Gregg Blake

Coast Geological Society member John Dunham passed away on Sunday, May 4th, in Ventura, California.

John Durham and Gregg Blake at a winery in Los Olivos

John started his career as a carbonate research geologist at the Unocal Research Center in Brea, CA, in 1978, shortly after receiving his PhD from the University of California, Riverside. For the next 10 years, John worked on carbonate research projects around North America, including working on the Monterey Formation. During his tenure at the Research Center, John met and later married his wife Michelle, who also worked in the geological group at the Research Center.

John was best known locally for his contributions studying the Monterey Formation. Working with the Unocal exploration team, he analyzed the Monterey outcrops along the coastline from the Santa Barbara area to the Mussel Rock area in the Santa Maria basin. His 1987 field guide, written with Gregg Blake, was a concise, practical description of Monterey outcrops on Vandenberg Air Force Base, and still provides a valuable reference today. He also became one of the experts in understanding the effect of the silica phase changes on potential Monterey reservoir sections. His research was instrumental in Unocal's successful bid for the primary tract of what became the offshore Point Pedernales Field. John was most proud of convincing management of the lease's potential and of outbidding some major oil companies, such as Exxon and Chevron, to become the field operator.

In 1988, John made the transition from research geologist to exploration geologist. He was instrumental in applying his knowledge of Monterey reservoirs to potential biogenic targets in the Mid-Cretaceous La Luna Formation of Venezuela and the La Luna equivalent, Naparima Hills Formation in Trinidad. Based on John's work, Unocal lease blocks in offshore Trinidad, and drilling three wildcat exploration wells looking for fractured biogenic reservoirs in the Naparima Hills section. The wells all found oil, but unfortunately, the fractures were filled with silica cement.

John transferred to Unocal Indonesia in 1997 and stayed there until the Chevron merger, retiring in 2006. He was on the exploration team looking at Unocal's frontier acreage in the Kutei basin. Because of his vast experience, John was well-versed in all the critical aspects of exploration and adept at

evaluating drilling risks in "wildcat" exploration environments. With the recommendation of the exploration team, Unocal drilled several wildcat exploration wells in the Kutei with moderate success.

After he retired from Chevron, John consulted for several independent companies in Indonesia, including Niko, Hess, and APEC, working on potential exploration plays in Indonesia, Malaysia, and Thailand. In 2013 he finally retired, and he and Michelle moved to Ventura, CA. Even in "retirement," John remained active, attending and presenting talks at local and international societies, including most recently at the GSA meeting this past fall in Anaheim. He also enjoyed a good vintage wine and would visit areas such as Napa Valley and Paso Robles with friends in search of the next "discovery." Retirement also afforded John time to refine his golf game, and he played regularly with friends for many years.

John will truly be missed for his gentlemanly demeanor and insightful wit. A few years ago, John and his wife Michelle endowed a fund for field studies with the Geology Department at UC Riverside in honor of his thesis advisor. In lieu of flowers or gifts, contributions in John's honor can be directed to the "UC Riverside Foundation, Mike Murphy Endowed Field Studies Fund." Use the embedded link or https://foundation.ucr.edu/#:~:text=Please%20make%20your%20check%20payable,Riverside%2C%20CA%2092517%2D5068.

Contorted Monterey Shale at Mussel Rock, Santa Maria Basin, California.
Photo by Tony Reid, taken while attending a MARS field trip, June 2013.

Member Society News

ATTENTION PACIFIC SECTION AAPG MEMBERS

- Do you have a talk you would like to give at a Pacific Section Society meeting?
- Most of the Pacific Section Societies are searching for talks to completed their monthly meeting schedules for 2025.
- You are encouraged to contact the Societies and inquire about the suitability of your talk for their audiences.

Alaska Geological Society
www.alaskageology.org

P. O . Box 101288
Anchorage, AK 99510

Monthly meetings are usually held on the last Thursday of the month. Most meetings are hybrids, using Google Meet, and in person at the BP Energy Center. Doors open 11:00 am.

AGS's summer break has started. Talks will resume in September.

President:	Ken Helmold	helmold@alaskan.com
President-Elect:	OPEN	
Vice-President:	Dave Buthman	byron7929@yahoo.com
Secretary:	Adam Manzer	adam.manzer@alaska.gov
Treasurer:	Veronica Jones	joneslynnveronica@gmail.com
Past-President:	Monte Mabry	mmabry@blm.gov

Coast Geological Society
coastgeo.org

P. O. Box 3055
Ventura, CA 93006

The Coast Geological Society has a new web site: coastgeo.org.

In-person meetings are the third Tuesday of the month at the Poinsettia Pavilion, 3451 Foothill Rd, Ventura, CA 93003

CGS's summer break has started. Talks will resume on Tuesday September 19, 2025.

President:	John Williams	CoastGeologicalPresident@gmail.com
Past-President:	Renee Richards	
Vice President:	Sabina Thomas	CoastGeologicalVicePresident@gmail.com
Secretary:	Nina Minga	CoastGeologicalSecretary@gmail.com
Treasurer:	David Arellano	CoastGeologicalTreasurer@gmail.com
Membership chair:	Phil Kinney	CoastGeologicalMembership@gmail.com
Webmaster/Tech Support:	Eric Heaton	CoastGeologicalWebmaster@gmail.com

(Continued on next page)

Los Angeles Basin Geological Society
www.labgs.org

Monthly dinner meetings are held on the 3rd Thursday at the Barrel Room of Four Sons Brewing, 18421 Gothard Street, Suite 100, Huntington Beach. Our Attitude Adjustment begins at 6 PM, Talk at 7 PM. See the most recent newsletter on their website for the latest details on upcoming talks and events.

LABGS monthly meeting will continue throuigh the summer. Check the web site for the next meeting.

President:	Dan Steward	daniel@ironhorseenergy.com
Vice President & Programs	Rick Behl	richard.behl@csulb.edu
Treasurer:	Daniel Rice	ricedaniel@213@gmail.com
Secretary:	Joseph Landeros	landerosjd@gmail.com
Scholarships:	Karla Tucker	ktkr2@aol.com
Webmaster	Joseph Landeros	landerosjd@gmail.com

Northern California Geological Society
www.ncgeolsoc.org

803 Orion #2
Hercules, CA 94547-1938

Meetings are at the Orinda Masonic Hall and online using Zoom on the fourth Wednesday of the month. Talks are 7:15 pm to 8:30 pm (social half-hour at 6:30 pm)

Next meeting: Wednesday, June 25, 2025
Speaker: Dr. Joseph Moore, University of Utah
Topic: “Geothermal Energy Development, the Frontier Observatory for Research in Geothermal, and Current Geothermal Activity in Utah”

President:	Jim O’Brient	j.obrient @ comcast.net
President-elect:	Phil Reed	philecreed@comcast.net
Past President:	Noelle Schoellkopf	NoellePrince @ sbcglobal.net
Treasurer:	Don Medwedeff	donmedwedeff@gmail.com
Recording Secretary:	John Karachewski	
Membership Chair:	Tom Barry	tomasbarry@aol.com
Newsletter Editor:	Mark Sorensen	msorensen@gilbaneco.com
Field Trip Coordinator:	Will Schweller	willschweller@yahoo.com
K-12 Program Co-Chairs:	OPEN	
Scholarships:	Phil Garbutt	plgarbutt@comcast.net

San Joaquin Geological Society
www.sanjoaquingeologicalsociety.org

P. O. Box 1056
Bakersfield, CA 93302

DINNER MEETINGS:
SJGS meetings are on the second Tuesday of the month at the American Legion Hall, 2020 H St Bakersfield, CA.

The SJGS is taking their summer break and monthly talks will resume in October.

Save the Date! The SJGS Fall Fiesta will be on Friday, September 19th.

President:	Ron Foster	ronleefoster@gmail.com
Past President:	Lisa Alpert	lisaalpert4@gmail.com
President-Elect:	Kari Hochstatter	khochstatter@gmail.com
Vice-President:	Martin Jimenez	martin.jimenez@conservation.ca.gov
Secretary:	Simmie Chehal	treasurer@psaapg.org
Treasurer:	John Porter	John.porter@blackknightllc.com
Webmaster:	Ivan Aburto	Ivan.Aburto@crc.com
HOD Delegate	Cynthia Huggins	Cahuggins747@gmail.com