Pacific Petroleum Geology

NEWSLETTER

Pacific Section • American Association of Petroleum Geologists

March and April 2025

San Andreas Fault Field Trip: Parkfield to Carrizo Plains

SJGS Highlights, Page 31

2024-2025 Officers

Staff

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Editor's Comments:

Thanks to all those that voted to approve the changes to the Pacific Section's Constitution and Bylaws. Voters overwhelmingly approved the changes that will help expedite decision making by the Executive Committee.

This month's cover photograph is by Ron Foster, President of the SJGS, and shows John Porter at the famous Wallace Creek site on the San Andreas Fault. The SJGS field trip is one of several recent activities in our affiliated societies acknowledging the 100th anniversary of the Pacific Section. See page 31 for more on SJGS activities in 2024 and 2025.

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 **March/April 2025**

Greetings Pacific Section Members,

It feels like the past two months have flown by, perhaps due to the fury of activity that has been going on in our Section. Not one but two meetings in Bakersfield, AGS's annual meeting in Anchorage, field trips in Carrizo National Monument, and (by the time this prints) the Santa Barbara fold belt. SPE, GSA and AEG, had or is holding meetings and field trips around California. Scholarships (totaling $12,000 from PSAAPG) have been handed out to well-deserving students at society meetings, and each section has had their respective ongoing dinner and lunch meetings. Thankfully, we have our new web calendar to keep your geologic schedule up to date!

I was fortunate to attend and present at one of these events, the Orphan and Idle Wells Conference in March. This was an interesting event for me because it was not a geological or subsurface conference. Rather, this conference was a mix of lawyers, traders, environmentalists, geologists, hydrogeologists, chemists, biologists, geophysicists, engineers, political scientists, regulators and policy analysts from NGOs, local, state and federal governments, service companies, and operators. It was the most diverse crowd I have ever presented to, and the discussions were both challenging and thought-provoking. Presentations and discussion topics in the meeting fell into a few categories: regulations and funding for cleaning up orphaned wells; measuring methane emissions around orphaned and abandoned wells; technological advances in locating orphaned wells; carbon credits and market; and repurposing idle or marginal wells. While I found the repurposing discussions to be the most exciting topic, the numbers of orphan and abandoned wells are staggering to me. The EPA estimated there is over 2 million idle or orphan wells across the United States, with approximately 40,000 of those wells in California. While that number is low in comparison to areas such as Appalachia, it still highlights the need for a focus on planning for end of life within the lifecycle of petroleum extraction. Wells that are not abandoned can leak and release methane into the atmosphere adding to greenhouse gas emissions. The best quote I've heard from these presentations was by Staci Tarusco of Rebellion Engineering Solutions: "How can we tell our kids to clean up their room if we can't clean up our backyard?"

There are conflicting views on what this means, but most importantly, all groups, no matter what "side" you are on, want to do the right thing, to plug these wells properly, and protect human health and the environment. Unfortunately, we don't always agree regarding how to do this. What needs to be isolated? Is it critical to isolate every formation? What about formations that have been commingled for fifty or a hundred years? What about wells that have been sidetracked and plugged? What if there isn't casing in the hole? What if log data or well histories are unavailable or do not exist? What if there is junk in the hole that can't be retrieved? There are so many variables, and the older the wells, the more variables there are to be considered. Regulations regarding abandonments have become increasingly stricter, requiring every hydrocarbon bearing formation to be isolated, and often requiring that wells abandoned prior

to modern day standards are re-abandoned. This is, of course, a positive improvement in the way wells had been abandoned throughout much of the 1900s, increasing the safety and effectiveness of abandonments, particularly in areas such as Los Angeles where an entire city has been built over top oil fields with a 160-year history of well drilling, production, and abandonment.

One topic that emerged from the meeting is the question regarding could we inflict more harm than good with blanket regulations? Particularly with older wells, a blanket approach to abandonment is not ideal. The subsurface and well history needs full evaluation, often in areas that have lacked geological analysis for decades, and often decisions must be made that take risk into account. For example, the decision to re-abandon a sidetrack carries risks on either side, but this must be adequately evaluated to make the best decision. This is where geoscientists should be entering the discussion. First, we need to make sure that the subsurface interpretation supports the decisions for abandonment. If the original hole of a well did not penetrate hydrocarbons, surely the risk of re-abandonment is higher than that of leaving the plug intact. Second, many geologists, particularly those who have worked in more exploratory roles, are well trained in evaluating and communicating risk and can apply this skill set towards recommendations for abandonment procedures.

Overall, I was very impressed with the positive nature of the conference and the discussions. With such a diverse crowd, one might expect that there could be some tense moments during certain topics, but this was not the case. Discussions and questions were positive and respectful. Unfortunately, the group was more siloed beyond the main speaker and questions. In breakout sessions and informal discussions, different entities seemed to only seek out other entities that shared common views. Progress will only happen in this area of industry if we proactively seek discussions with all stakeholders. This is critical as there is much opportunity in reuse and repurposing, not only individual wellbores but portions of or entire fields.

A few housekeeping items as we move toward the end of the AAPG fiscal year: First, please remember to renew your AAPG membership. This is different from your Pacific Section membership, and, depending on your affiliated society, different from your society membership. Second, we are looking for volunteers to help us with move forward with initiatives in the Pacific Section that promote and benefit the geosciences and energy. Volunteering your time is not only a way to give back to our geoscience community but also can benefit your career and research. We are currently looking for volunteers to run for positions on the executive committee and on committees for activities such as planning core workshops and conferences. You do NOT have to be in Bakersfield or California to volunteer! If you are interested or have questions, please reach out to me for more information.

As the spring conference season is winding down, I hope everyone got to attend a few presentations and see some rocks.

Best,

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)

A Noted Passing

Contributed by Pete Barker (retired ARCO geologist)

Harrison C. (Harry) Jamison, age 100, died March 4, 2025 in Tucson, Arizona. Harry (who came to Alaska working for Richfield Oil Company, later to become ARCO) was well known to a wide variety of people in Alaska. He was one of the pivotal individuals who advocated for the drilling of Prudhoe Bay State No.1, the discovery well for the Prudhoe Bay Oil Field.

Prudhoe Bay State No. 1, the discovery well for the Prudhoe Bay field, was drilled in 1968 by ARCO/ Exxon. It is shown here enclosed in a metal building, circa 1969. Photo from Alaska's Digital Archives: https://vilda.alaska.edu/digital/collection/cdmg11/id/3658/

From the Bakersfield *Californian*, April 16, 2025

Lawsuit challenges state's landmark oil-field setbacks law

By John Cox

An oil and gas-related lawsuit filed against state government Wednesday challenges a landmark law banning new drilling or well maintenance within 3,200 feet of sensitive sites such as homes, potentially affecting 15,000 wells statewide.

The plaintiffs, two Long Beach royalty owners, allege a 2022 state law known as Senate Bill 1137 violated their constitutional right to due process and amounted to an illegal taking of private property. They are demanding a jury trial.

The complaint filed in Los Angeles County Superior Court has come 10 months after the California Independent Petroleum Association trade group switched tactics on the eve of a key deadline, saying it would sue the Newsom administration instead of using California's voter referendum process to try to overturn SB 1137.

Defendants named in the case are the state of California, its Department of Conservation and the agency's oil industry regulatory arm, known as the California Geologic Energy Management Division.

A spokesman for CalGEM said the state had not been served with the suit and would not comment on pending litigation.

SB 1137 represented a major loss for the oil industry and a big win for environmental justice groups contending oil field activity causes pollution that endangers the health of people living or working nearby.

Plaintiffs Monte Beard Sr. and Merry Vanderwaal, a brother and sister receiving about $3,600 each in royalty income per year, say in the lawsuit they inherited property rights to subsurface oil and gas reserves purchased by their maternal grandfather in 1929.

Their suit alleges the so-called setbacks law violates procedural and substantive due process, equal protection under the law and represents inverse condemnation.

It goes on to say SB 1137 effectively prohibits them from reworking or maintaining existing oil and gas wells or development of new ones. It asserts the law is not based on facts or science and is "wholly arbitrary."

The complaint requests that the court order the state to halt enforcement of the law and compel the Newsom administration to issue all necessary oil permits.

It asks the court to find that SB 1137 is unconstitutional and unenforceable because it goes against the U.S. and state constitutions' guarantee of due process, as well as equal protection and taking of property for public use without just compensation.

The suit by Beard and Vanderwaal estimates that half a million individuals in California, and their families, receive oil and gas royalty payments.

SB 1137 imposes monitoring requirements and leak detection devices on oil facilities located within the 3,200-foot buffer zones. It limits how much noise, light and dust may come from wells and petroleum production facilities.

The suit alleges studies commissioned by different state and regional government agencies to assess potential health risks from exposure to oil and gas pollution "categorically do not support statewide imposition of a 3,200-foot setback."

It says that as the oil and gas wells on the plaintiffs' property age, they require maintenance, along with redrilling and sidetracking to keep producing petroleum.

"Without the ability to repair and replace inoperative wells, (the plaintiffs) will lose the ability to extract the underground hydrocarbons, and in turn, the petitioners and other royalty owners will be directly harmed by the taking of their property interest and the right to all or substantially all economic benefit from their property."

★ ★ ★

From the Bakersfield *Californian*, March 26, 2025

Digitizing for posterity:
Donation funds West Kern Oil Museum's preservation project

By John Cox

Among the West Kern Oil Museum's archives is this photo of oil workers paddling through the Lakeview Gusher, a blowout that released an estimated 9 million barrels of crude oil over a period of 18 months starting in March 1910.

Photo courtesy West Kern Oil Museum

Anyone walking into the West Kern Oil Museum in Taft can get an eyeful of the people and activities that helped shape the county's signature industry.

But for a deeper look at the personal histories of individuals who spent their careers in local oil fields over the

years — and staff members periodically receive requests of that kind — it takes a lot of work to dig through the museum's vast trove of photos and other resources.

That process is expected to get a lot easier thanks to a local oil producer's recent donation to support the digitization of the museum's archives.

Starting in probably 2026 and continuing for years to come, the museum will be putting online thousands of documents, photographs, newspaper stories, videos and digital representations of its many artifacts.

To this will be added oral histories as recorded by students of Taft Union High School as part of an educational project planned to begin as soon as this year.

Besides benefiting relatives of oil workers, the effort is expected to preserve fragile items for future review by academics studying the area's history.

"The center will not only safeguard invaluable artifacts and records but will also create new opportunities for students and researchers to engage with the legacy of energy in California," President and CEO Leon Francisco of California Resources Corp. — the company that made the $20,000 donation earlier this year — said in a news release.

"CRC is proud to support the West Kern Oil Museum and the development of the West Kern Research Center, which will ensure the history of Kern County's oil industry is preserved for future generations."

The museum's acting director, Arianna Mace, said Wednesday the company's contribution will fund the purchase of equipment for digitizing records of all kinds, which until now is something "we just don't have the capability to do."

Such work takes time, and Mace said the first items might not go online until next year. She added that the museum staffed primarily by volunteers has already made strides in uploading some of its information to an online database.

No decision has been made yet on how much it will cost researchers to gain access to the online archive, but Mace said viewers may be required to pay for membership to the museum, which costs about $25 per year. Entry to the museum is free of charge but a donation is requested.

The museum located at 1168 Wood St. was established by a group of local women in 1973. In addition to having more than 100,000 photographs, along with every issue of the Taft Midway Driller newspaper on microfilm, it hosts exhibits ranging from the history of local oil production to Native American occupation of the area to vintage automobiles.

Getting it all into digital form, then putting it on the internet for the world to see, isn't going to be a quick process, Mace emphasized.

"We're just scratching the surface right now," she said. "This is going to be an ongoing project, and we're really just starting with the photographs first. This is going to take definitely some time."

Travels in Antarctica and Patagonia; 2024-2025

Dan Schwartz and Cynthia Huggins

Part 1: Antarctica

Introduction

Antarctica has long been on our bucket list and we found ourselves with the opportunity to do so with friends from our "wine world", a group that has been pulled together by Ian Adamo, a sommelier and Paso Robles restaurant owner. Additionally, some friends wanted to add a trip to Patagonia on the tail end of the cruise, so we jumped at the opportunity. You do not always have time to spend south of the 40th latitude, so we thought we would make the most of it. Besides, we have had many friends and colleagues take Stanford University trips to look at the Cenozoic turbidites in Torres del Paine, and we felt we better find out what all the excitement is about.

We flew from Los Angeles to Buenos Aries over Christmas, and we all thought it would be a major event. It was a non-event in Argentina. No decorations, celebrations, or festivities whatso-ever. So, we took the opportunity to see the sights and have very nice meals with very pleasant wines. Nothing to complain about.

After five days, we flew from Buenos Aires to Ushuaia, Argentina, in Tierra del Fuego, where we boarded the ship for our 11-day round trip cruise across Drake's Passage to the Antarctic Peninsula. The cruise took us along the west coast of the Peninsula, including numerous islands. We had a number of zodiac (raft) trips and landings at stops along the way and took a submersible dive down to ~150 meters. The scenery is amazing, with ice of all sizes and shapes, dramatic geology (mostly volcanic and magmatic), and fantastic animals (penguins, sea birds, whales, and seals). While the Drake's passage southward was relatively calm (2-3 meter seas), the northward leg was rougher (10-14 meter seas). The ship was steered on a course that minimized the roughness, and we returned to Ushuaia in a bit over 1.5 days.

Upon our return to Argentina, we boarded a flight to El Calafate, Argentina. From El Calafate we drove about six hours, across the Chilean border to the Awasi Resort in the Torres del Paine National Park. The park and the hotel are magnificent. Patagonian geology is dramatic and scenic. There is an amazing combination of Cretaceous basin fill deep marine strata that, in the center of the park, is intruded by a granite laccolith. Each day we would leave the hotel and drive to different portions of the park and look at stratigraphy, glaciers, lakes, or rivers. We boated to view glaciers and glacial lakes, and rode horses to flood plains, rivers and marshes. A truly memorable experience.

Sadly after five days, we left the Awasi Patagonia and flew back to Los Angeles via Santiago.

Geological excursion of Antarctica and Patagonia

The geologic story of Antarctica and Patagonia are tied by plate tectonics associated with the evolution of western margin of Gondwana to the present disposition of the South American and Antarctic Plates. Figure 1 displays the current tectonic setting of the main continental plates separated by the oceanic Scotia Plate. Our trip took us along the west coast of the Antarctic Peninsula and South

Shetland Islands, and to the Austral Basin of Southern Chile. For this photo-excursion, we will show older geology first, then address younger formations. While this is not the order we saw them in on our trip, it may help the reader to understand the origin of the stratigraphy and the relationships between the two continental exposures. We will discuss Antarctica first, then Chilian Patagonia. At the end of this document we have included a reference list, in chronological order. It is indicative of the interest in the topic of Antarctica and Patagonia, especially in the very recent publications. We encourage the reader to look at the documents. They provide a good starting point for your study of the subject.

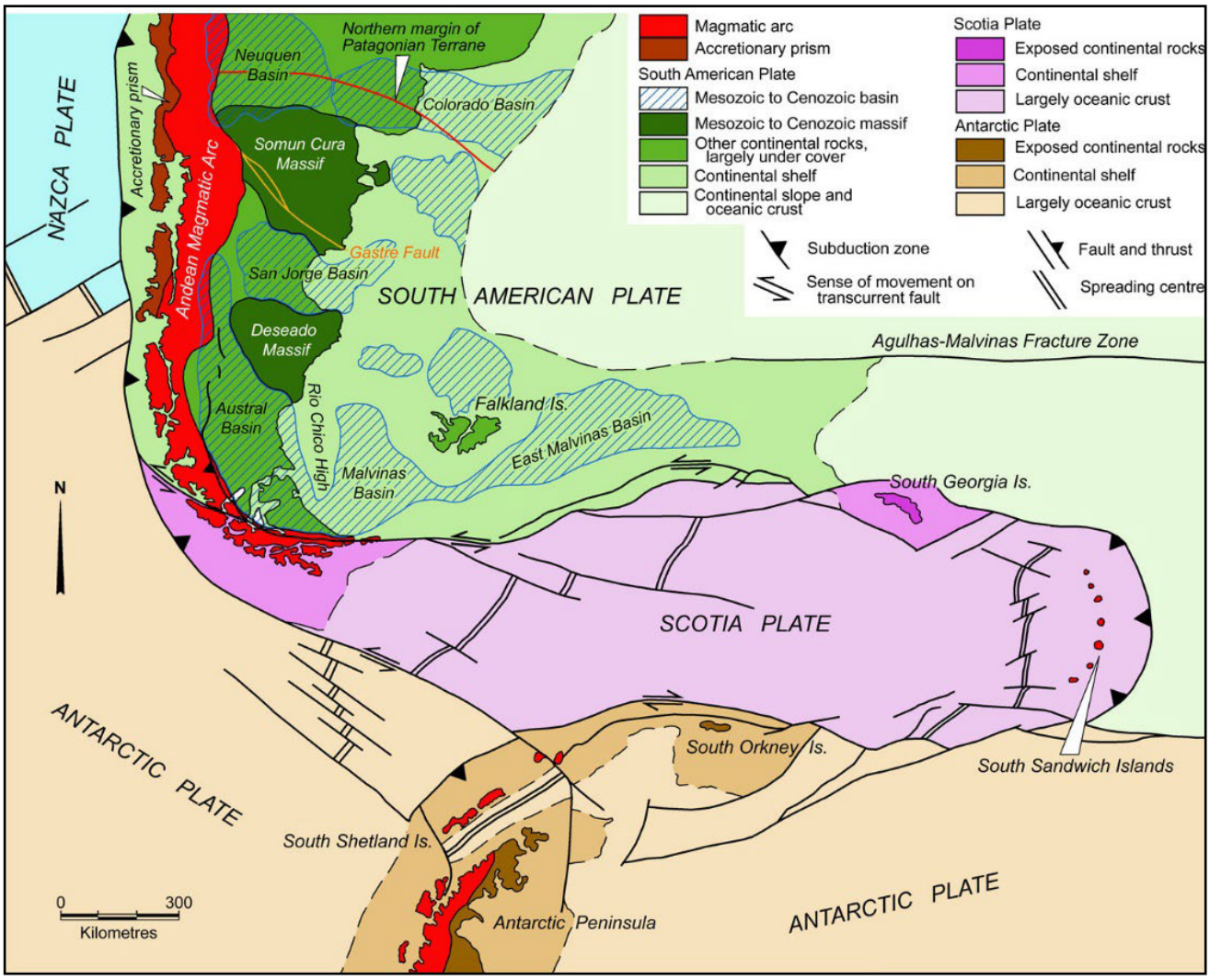

Figure 1. Current tectonic setting and architecture of the Southern Andes / Patagonia Terrrane and the northern Antarctic Peninsula, separated by the Scotia Plate.

Tectonics of western Gondwana

Gondwana was a super continent comprised of tectonic plates that now represent South America, Africa, Antarctica, Australia, Zealandia, Arabia, and the Indian subcontinent. It formed 800 Mya to 530 Mya by accretion of several cratons. It was the largest tectonic block comprised of continental crust during the Paleozoic. It fused with Laurasia in the Carboniferous and formed Pangaea. In the Triassic, Gondwana started to separate from Laurasia and then started to fragment in the early Jurassic (~180 Mya). The final stages of break-up was the fragmentation of a land bridge that separated Antarctica from South America and Australia, and the formation of the Drake and Tasmanian Passages in the

Paleogene (66-23 Mya). Figure 2 displays a map of western Gondwana in the Permo-Triassic. The red linear features represent the Jurassic to Cenozoic magmatic arcs resulting from subduction of the Pacific Plate oceanic crust under the South American and Antarctica Plates. The Andean Magmatic Arc and the Antarctic Peninsula, highlighted in red are the western margin of Gondwana. The green area west of the arc is the Patagonian Terrane in southern South America and comparable rocks adjacent to the eastern side of the Antarctic Peninsula. These Paleozoic rocks overlie oceanic crust and older Proterozoic basement terranes. The eastward protrusion of the magmatic arc crosses Terra del Fuego and forms the only portion of the Andean arc in Argentina, north of the Beagle Channel near Ushuaia (Figure 3).

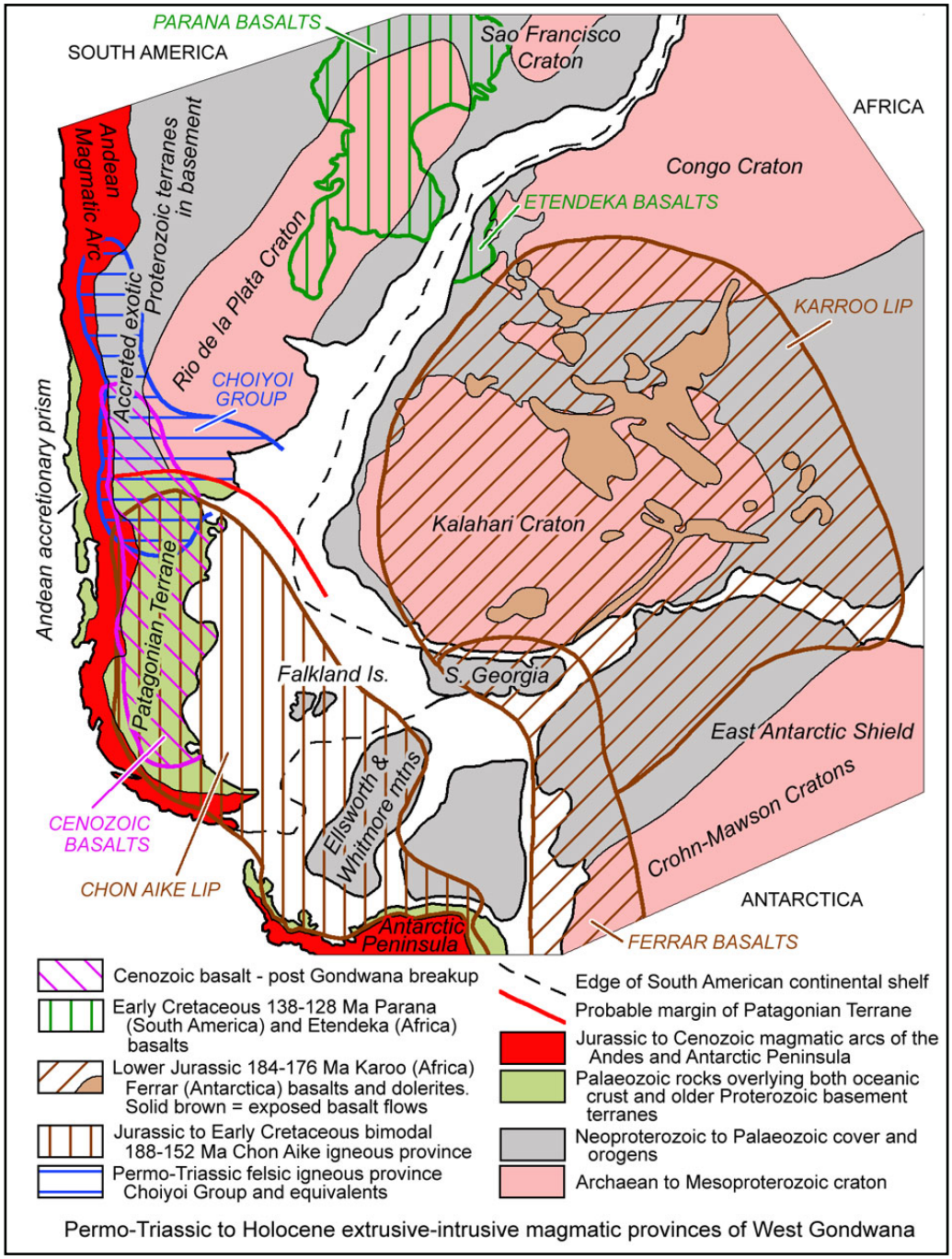

Figure 2. The western margin of West Gondwana in the Permo-Triassic with an overprint of extrusive-intrusive magmatic provinces.

Figure 3. Northward view of the southernmost Andes Mountains from the Beagle Channel, Tierra del Fuego, Argentina. This is the only portion of Argentina that is west of the Andes Mountains.

Our cruise from Ushuaia to the Antarctic Peninsula crossed the Drake Passage and reached the islands west of the Peninsula after two days of sailing. The area of the cruise is illustrated on Figure 4a, with a detailed area in Figure 4b. We saw geology associated with Western and Central Domains (WD and CD on the map). The visited units are represented on the map (Neogene – Recent alkaline volcanic rocks: yellow; Smith Island - Elephant Island metamorphic rock: medium blue; Jurassic – Paleogene arc volcanic rocks: medium green; and Jurassic to Cenozoic intrusive rocks: red. See the Legend on Figure 4a.

Figure 4b displays the detail from the area outlined on figure 4a. Figure 5 displays the geological map of the area with more detail on locations and island names.

Figure 5 displays the geological map by Aide (1969) with the addition of place names of main locations and yellow stars indicating actual stops and photograph locations.

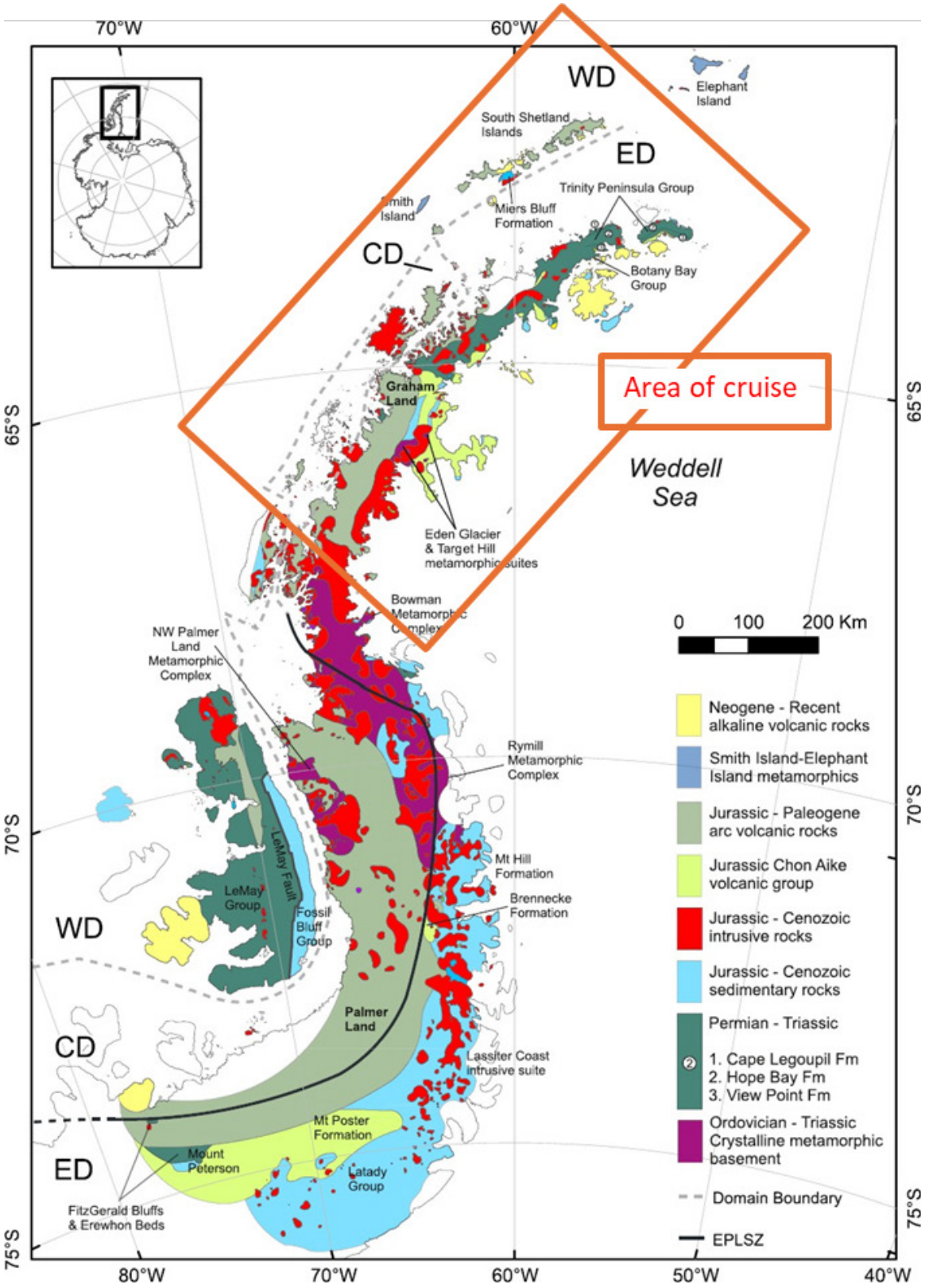

Figure 4a. Geologic map of the Antarctic Peninsula from Burton-Johnson and Riley (2015). The principal crystalline metamorphic basement and metasedimentary units are shown. The terrane boundaries are from Vaughan and Storey (2000) and are depicted as WD: Western Domain; CD Central Domain; ED: Eastern Domain.

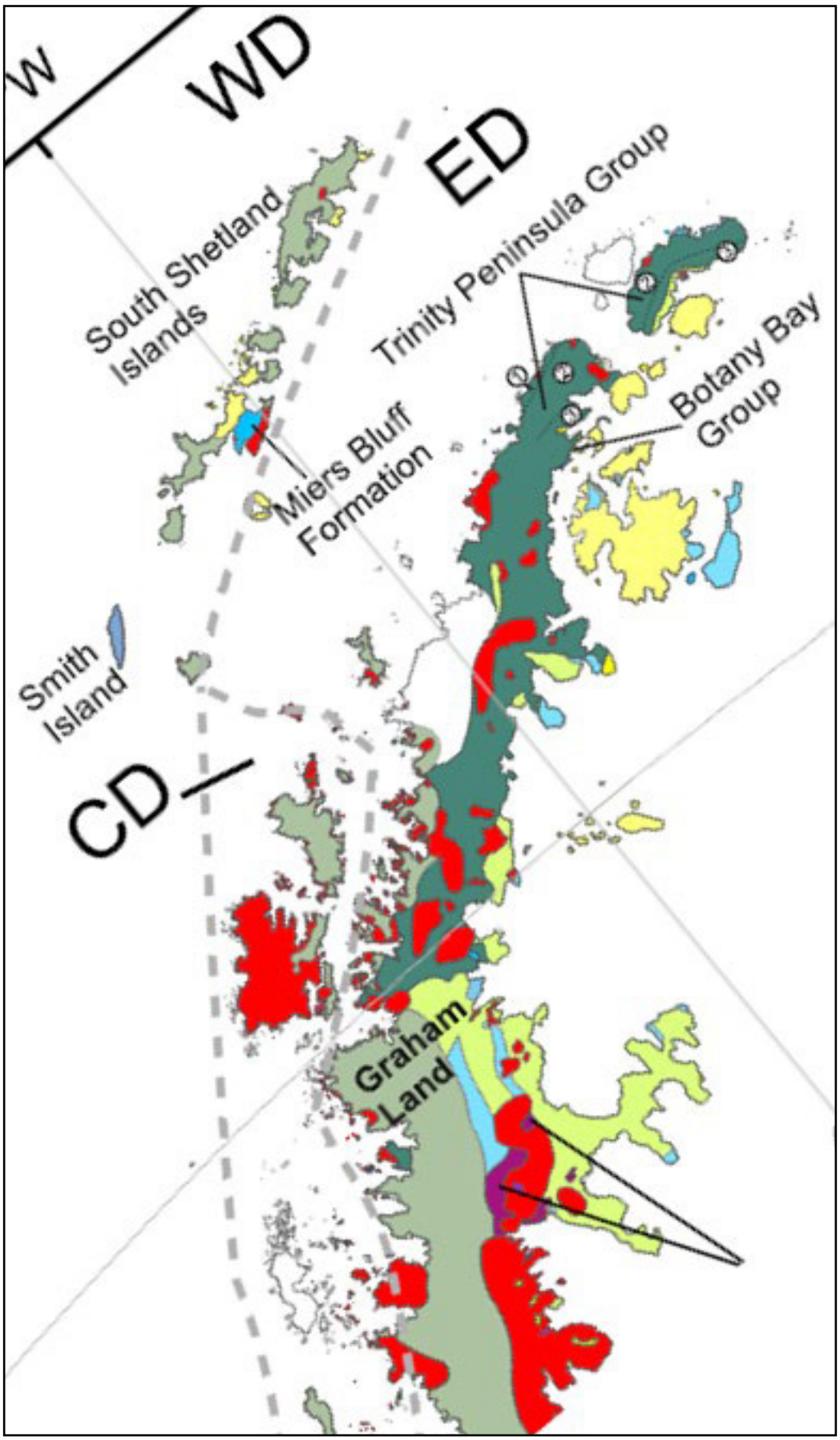

Figure 4b. Detailed map from Figure 4a depicting the Antarctic Peninsula and western islands. The legend for the geological units is provided on figure 4a.

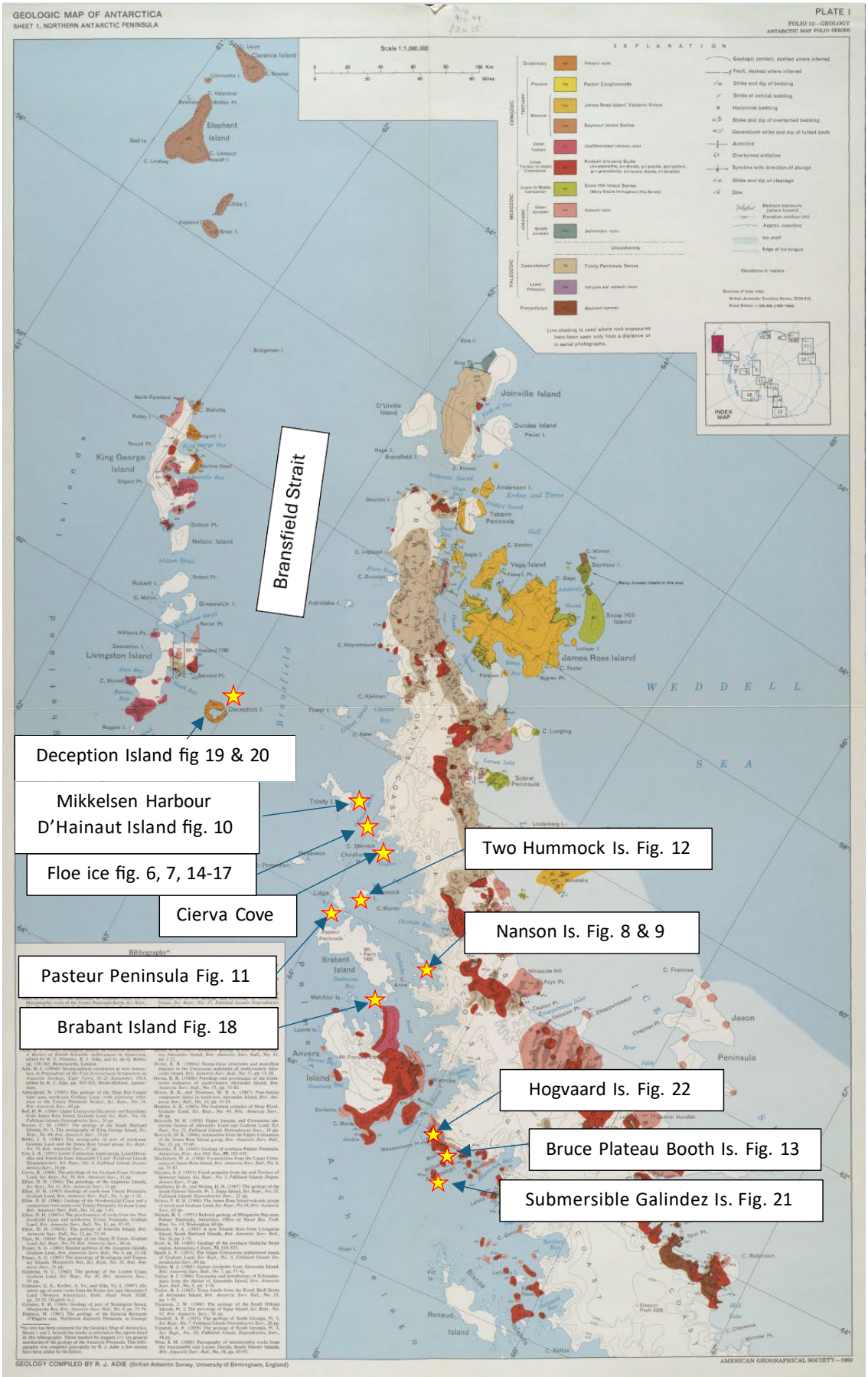

Figure 5. Geologic Map of the Antarctic Peninsula (Adie, 1969). Stars indicate cruise stops.

Figures 6 – 21 are photographs taken during the cruise. Geologic age of the visible strata is provided in the figure caption.

Figure 6. Floe ice off the coast of the Detroit Plateau, west of Davis Coast and south of Trinity Island. The Davis Coast in this area is predominantly Jurassic – Paleocene are volcanic rocks with occasional Jurassic – Cenozoic intrusive rocks.

Figure 7. Arched iceberg off Detroit Plateau, west of Davis Coast and south of Trinity Island. The Davis Coast in this area is predominantly Jurassic – Paleocene are volcanic rocks with occasional Jurassic – Cenozoic intrusive rocks.

Figure 8. Floe ice with a rhyolite glacial erratic from the east side of Gerlach Straight off the Danco Coast south of Nansen Island.

Figure 9. Ice berg off Danko Coast near Nanson Island.

Figure 10. d'Hautnet Island whaling camp. Near Trinity Island. Jurassic – Cenozoic Intrusive rocks in Jurassic to Paleocene arc volcanic rocks.

Figure 11. Rock-fall spike surrounded by ice flows off Pasteur Peninsula on the northern shore of Brabant Island. Steeply dipping sills of Jurassic – Cenozoic intrusive rocks.

Figure 12. Penguins on Two Hummock Island. Jurassic – Paleogene arc volcanics.

Figure 13. Bruce Plateau south of Booth Island. Jurassic – Cenozoic intrusive rocks

Figure 14. Humpback in ice floe off Graham Land, south of Trinity Island. Landmass composed of Jurassic – Paleogene arc volcanic rocks.

Figure 15. Seal on ice floe south of Trinity Island.

Figure 16. Iceberg with glacial erratic and turquoise water.

Figure 17. Chinstrap penguins are preparing to enter the Southern Ocean from a small island south of Trinity Island, near Graham land. Outcrops of Mesozoic volcanics.

Figure 18. Ice sheet break-up on the southern shore of Brabant Island.

Figure 19. East Coast of Deception Island, which is a remnant of a Neogene to Recent Volcano, comprised of alkaline volcanic rocks.

Figure 20. Penguin colony on black sand beach at the edge of an outwash fan draining the eastern flank of the volcano at Deception Island.

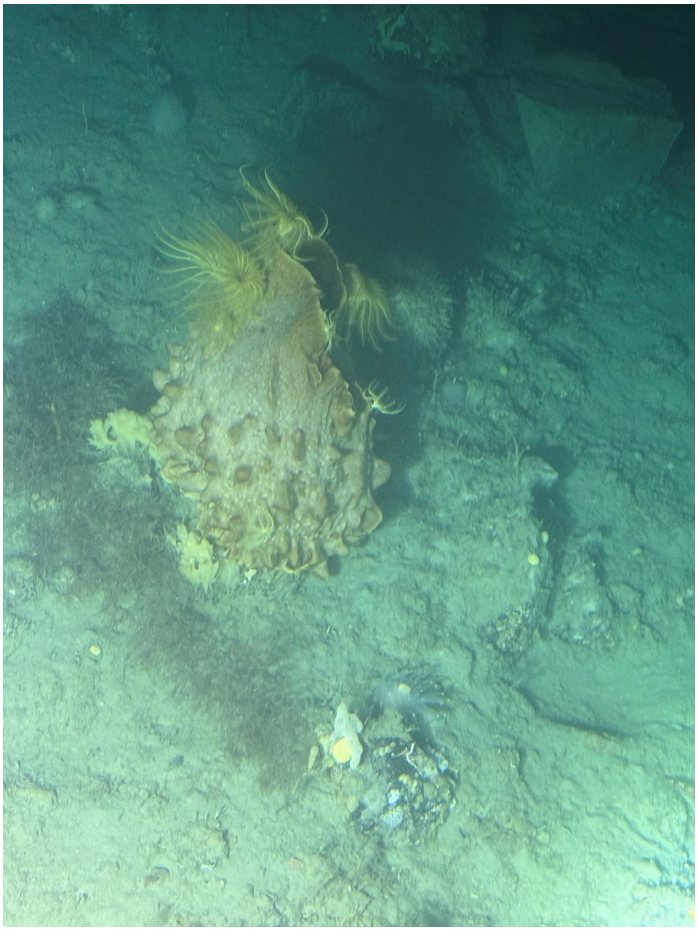

Figure 21. Barrel sponge with sea stars on rocky seabed with pelagic mud covering. Submersible dive off Galindez Island, west of the Bruce Plateau. Depth: 154 meters.

Figure 22. The authors on sills within Jurassic – Cenozoic intrusive rocks on Hogvaard Island.

Our trip to Antarctica was memorable and inspiring. The rocks and animals are amazing, and the ice is eerie. The bucket list can be checked!

NEXT NEWSLETTER: PART 2, PATAGONIA

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THE SIBERIAN ORIGIN OF THE ALEXANDER TERRANE OF SOUTHEAST ALASKA

by Robert B. Blodgett, Andrew W. Tainter (Blodgett & Associates LLC - Geological & Paleontological Consulting, Anchorage, Alaska), and David M. Rohr (Sul Ross State Univ., Alpine, Texas)

Our on-going studies of the paleontology and stratigraphy of the Alexander terrane (Fig. 1) of Southeast Alaska have focused on Silurian-Devonian faunas of this region in order to further resolve the paleobiogeographic affinities and origin of this well-known allochthonous terrane (see Fig. 2 for a generalized stratigraphic section of the Silurian-Devonian rocks of southern Southeast Alaska). Shelly faunal groups such as brachiopods, gastropods, bivalves, rugose corals, and sphinctozoan sponges have proven to be very useful in this regard. Upper Silurian (mostly Ludlow) brachiopods and gastropods from the Heceta Limestone on western Prince of Wales Island and neighboring smaller islands as well as from the Willoughby Limestone to the north in Glacier Bay are strictly non-Laurentian (non-North American) in character. The brachiopods, dominated by large pentameroid genera such as *Brooksina*, *Cymbidium*, *Kirkidium*, and *Harpidium* (see Fig. 3 for photos of Southeast Alaskan representatives of these genera), are similar at the genus level with faunas of Siberia (including Northeast Russia), the Urals, and central Asia. At the species level, however, the ties are clearly indicative of very close alliance with those of Northeast Russia (Omulevka terrane of the Kolyma region) (see Fig. 4 for photos of NE Russian examples, also Fig. 8 for location of Omulevka terrane). Gastropods are less clear as to their affinities, but show closest affinities to Eurasian taxa. The Upper Silurian bivalves are dominated by the genus *Pycinodesma* in the carbonate platform facies (Fig. 5). This genus to date is known only from the Alexander terrane. Aphrosalpingid sponges (Fig. 6) are abundant in the Upper Silurian microbial reef buildups of the Alexander terrane (as well as the Farewell terrane of SW Alaska), and are known elsewhere only from the Urals and the Salair region of Siberia. Lower and Middle Devonian brachiopod faunas of the Alexander terrane (from both the Wadleigh Limestone on Prince of Wales Island and the Black Cap Limestone of Glacier Bay) consistently show their strongest affinities with those of Siberia (especially to Northeast Russia (i.e. Kolyma region), Taimyr, and the Salair region), as well as with the Farewell terrane of Southwest Alaska.

Lower Devonian (Emsian) gastropods from the Alexander terrane are known primarily from Kasaan Island (east side of Prince of Wales Island) and show close affinities with similar age faunas of the Barrandian of the Czech Republic and the Carnic Alps (Austria-Italy border). Lower Middle Devonian (Eifelian) gastropods from the Wadleigh Limestone and Black Cap Limestone at the species level are nearly all identical with species known from the Cheeneetnuk Limestone of the Farewell terrane of Southwest Alaska (but unknown in Laurentian rocks of this age). Typical genera include the genera *Cheeneetnukia*, *Astralites*, *Kitakamispira*, *Paffrathopsis*, and *Euryzone* (Fig. 7). Also present in association with these gastropod-rich collections is the dasyclad alga genus *Coelotrochium*, found in great abundance in Eifelian age strata of the Farewell and Livengood terranes of interior Alaska, but unknown in Laurentian rocks

In summary, the paleobiogeographic affinities of Alexander terrane faunas of Silurian and Devonian age clearly point to a non-Laurentian origin. Their closely similar character with those of Siberia, especially with Northeast Russia (Kolyma region), clearly indicate that the Alexander terrane, as well as the faunally allied Farewell terrane of Southwest Alaska, originated as blocks rifted from this region, probably during an major rifting event which occurred during Late Devonian time.

CONCLUSIONS

Our earlier studies of Ordovician, Silurian and Devonian faunas of the Alexander terrane demonstrate close faunal ties with both Siberia and the Urals (Blodgett et al., 2002; 2003; Rohr and Blodgett, 2008; Rohr et al., 2008). However, further detailed study of the Silurian brachiopods of the Heceta Limestone shows strongest alliance with that of Bizonskaya Suite of the Omulevsk Mountains, which occurs in the Omulevka terrane of northeast Russia (see Fig. 8 for location of Omulevka terrane). On this basis we suggest that the Alexander terrane, along with the faunally allied Farewell terrane of southwest Alaska and the Eastern Klamath terrane of northern California, probably all originated as tectonic blocks which were rifted from the eastern margin of the Siberian paleocontinent during Late Devonian time (Blodgett and Boucot, 2009; Blodgett *et al*., 2010). The striking similarities in age and lithology between the Karheen Formation (Alexander terrane of Southeast Alaska) and the Mirninskaya Suite (Omulevka terrane of Northeast Russia) are especially compelling evidence of this alliance. Endemic faunas (brachiopods, gastropods) from Early and Middle Devonian strata of the Alexander and Farewell terrane likewise show their strongest analogues in Northeast Russia. We suggest that more detailed paleobiogeographic studies of post-Middle Devonian age fossil faunas of the Alexander terrane are in order to better constrain subsequent wanderings of this terrane. Faunal affinities of Late Triassic fossils from the Alexander terrane indicate that at this time it was situated in a tropical setting in the eastern part of the Panthalassa Ocean, close to the western margin of the Americas.

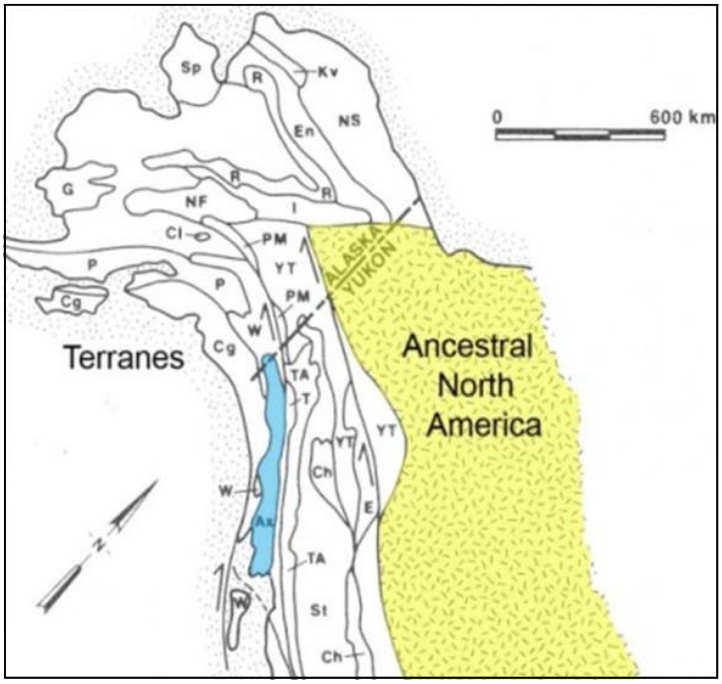

Figure 1. Index map showing location of Alexander terrane (in blue) with respect to Alaska (modified from Coney *et al*., 1980).

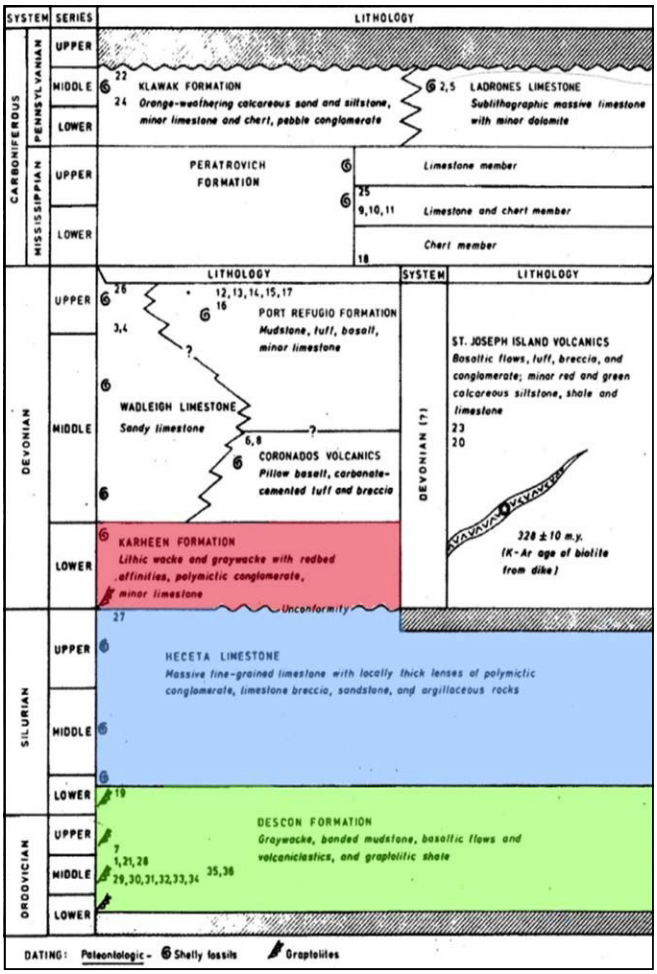

Figure 2. Generalized stratigraphic section (from Van der Voo *et al*., 1980) for western Prince of Wales Island and adjoining smaller westerly islands .Descon Formation shown in green, Heceta Limestone in blue, Karheen Formation in red, and Wadleigh Limestone in white. The Karheen Formation when proposed was thought to be of late Silurian-Early Devonian age, and more recent papers ascribe it an Early Devonian age. However, the red beds of the Karheen have only yielded late Silurian age fauna.

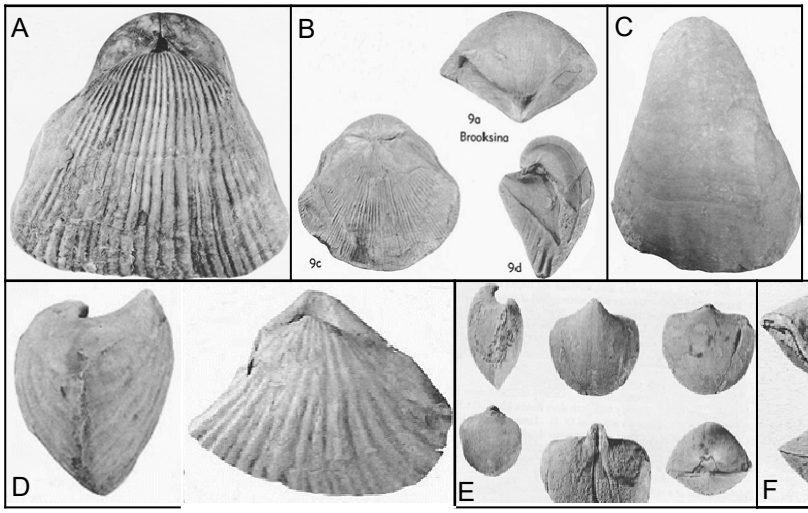

Figure 3. Typical Ludlow (upper Silurian) age brachiopods of the Heceta Limestone on Prince of Wales Island and smaller westerly outboard islands. **A.** *Kirkidium alaskense* (Kirk & Amsden). **B.** *Brooksina alaskensis* Kirk. **C.** *Harpidium insignis* Kirk. **D.** *Cymbidium acutum* Kirk. **E.** *Alaskospira dunbari* Kirk & Amsden. **F.** *Atrypoidea tenuis* (Kirk & Amsden).

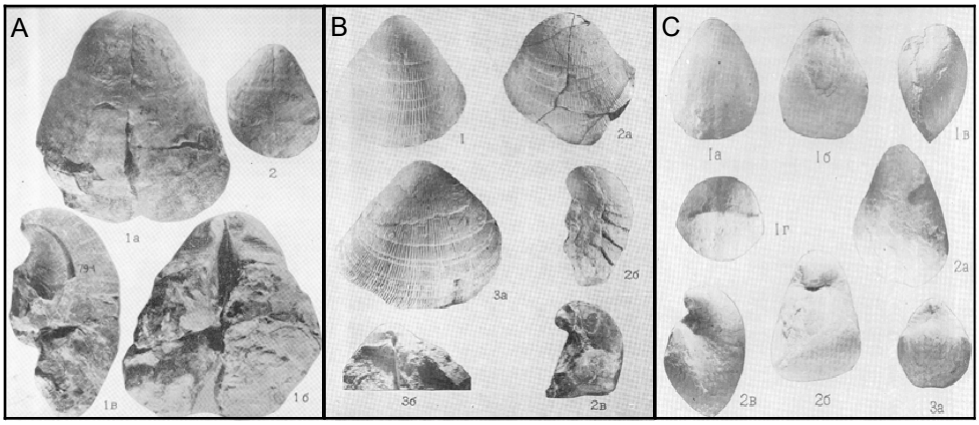

Figure 4. Typical early Ludlow age brachiopods from the Bizonskaya Suite of Northeast Russia (photos from Nikolaev *et al*., 1975). **A**. *Conchidium knighti kolymensis* Nikolaev. We regard this as a variant of *Kirkidium alaskense* (Kirk & Amsden) of SoutheastAlaska. **B.** *Brooksina urultunensis* Nikolaev. We regard this as a synonym of *B. alaskensis* Kirk, as was done earlier by Russian workers. C. *Harpidium insignis* Kirk. The same species occurs in South Alaska.

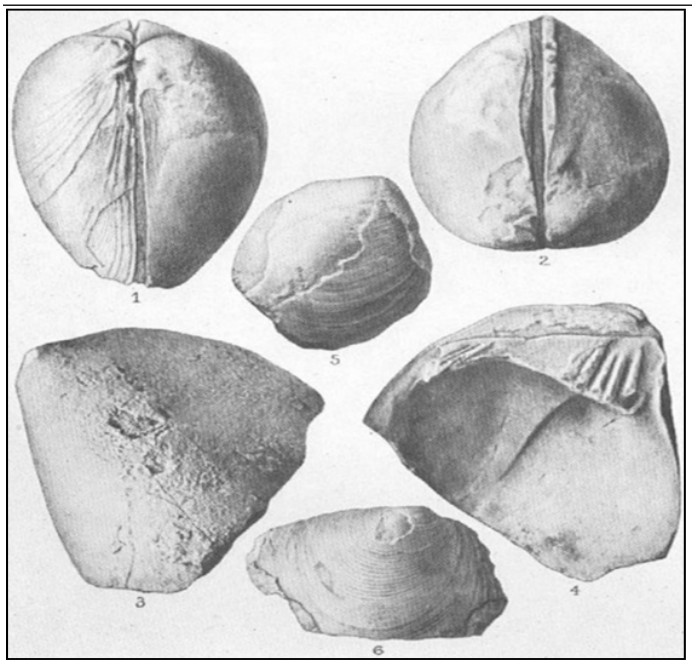

Figure 5. *Pycinodesma giganteum* (Kirk, 1928). This bivalve was based on specimens collected by Edwin Kirk in 1917 from an island on the NE side of Willoughby Island (Willoughby Limestone). This Upper Silurian genus is endemic to the Alexander terrane of SE Alaska, but is recognized elsewhere in the Kennel Creek Limestone of NE Chichagof Island, and Heceta Limestone of Prince of Wales Island.

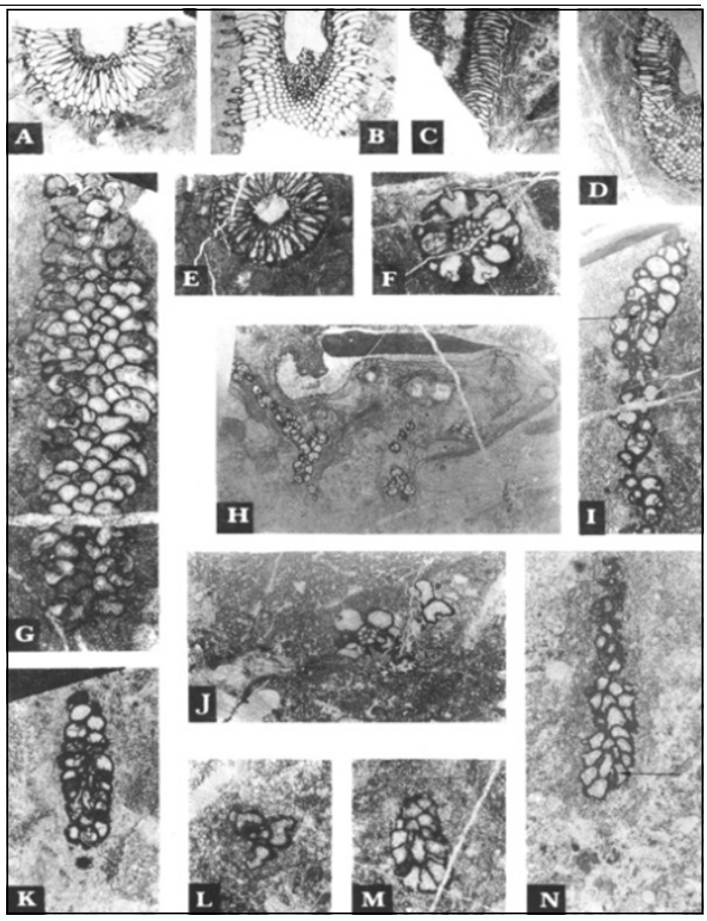

Figure 6. Aphrosalpingid sphinctozoan sponges – Known only from from late Silurian (Ludlow) algal reef complexes of the Alexander and Farewell terranes of southern Alaska, the Ural Mountains and Kuznetsk Basin of Siberia.

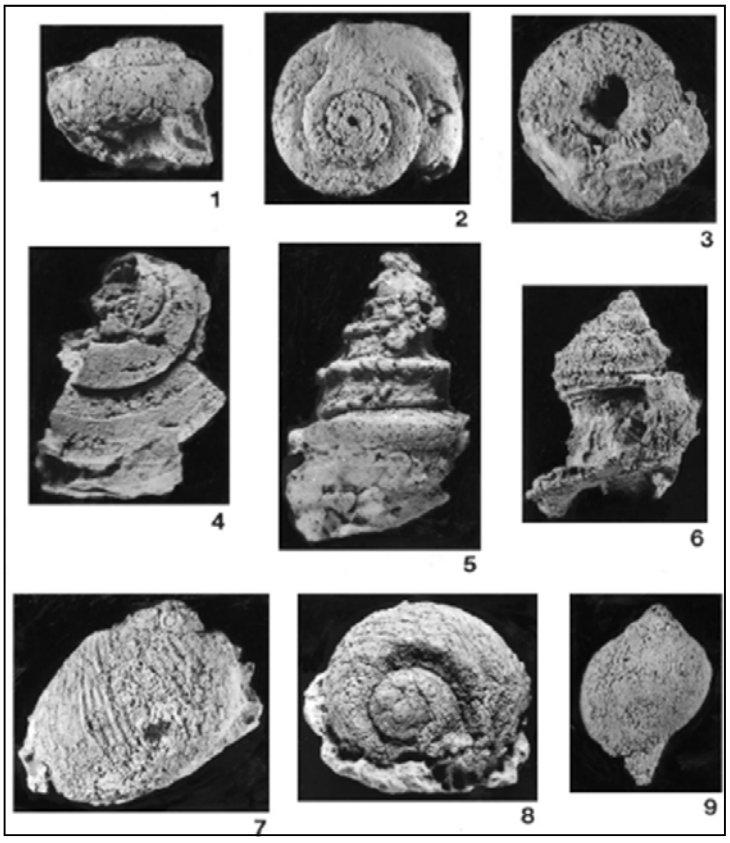

Figure 7. Typical Eifelian (Early Middle Devonian) gastropods from the Wadleigh Limestone on the western side of Prince of Wales Island.. Genera and species in common with the coeval Cheeneetnuk Limestone of the Farewell terrane of west-central Alaska and an unnamed formation in the Livengood terrane of east-central Alaska include *Cheeneetnukia frydai* Blodgett & Cook, 2002 (Fig. 5), *Kitakamispira ormistoni* (Blodgett, 1992) (Fig. 6), and *Paffrathopsis* sp. (Figs. 7-8). [Photos from Blodgett *et al*., 2003)

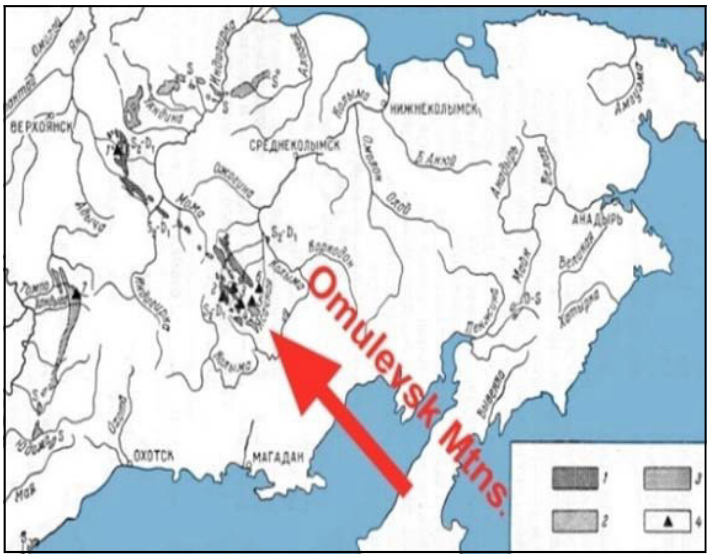

Figure 8. Map showing location of the Omulevsk Mountains (Omulevka terrane) and areas of Silurian outcrops in Northeast Russia [modified from Nikolaev (1973)] which share nearly identical upper Silurian brachiopods with those of Southeast Alaska.

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SJGS 2024–2025 Season Kickoff and Highlights

Ron Foster
President, San Joaquin Geological Society

The San Joaquin Geological Society (SJGS) launched its 2024–2025 season with a successful scholarship fundraising event—the annual Fall Fiesta—thanks to the generous support of our community. We're grateful to our cash donors, raffle item contributors, dedicated volunteers, and all who attended and made the evening a success.

After many wonderful years at the home of Dan Schwartz and Cynthia Huggins, this year's event moved to a new location, graciously hosted by Jim Connors. The Fall Fiesta raised $6,000, which was generously matched by the Pacific Section AAPG (PSAAPG) 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.

We were also proud to honor Kellyn Hardin, a teacher at Porterville High School, as the SJGS Teacher of the Year—a well-deserved recognition for her commitment to geoscience education.

Boosting Engagement and Attendance

Increasing attendance at SJGS dinner meetings has been a key focus this year, responding to a notable decline in participation in recent years. This trend aligns with reductions in geoscience staff within the regional oil and gas industry and decreased oil and gas specific geoscience research at nearby universities. Additional feedback from non-members pointed to after-hours time conflicts and meeting locations as barriers to participation.

Despite these challenges, we're pleased to report that attendance nearly doubled, with several meetings drawing well above the typical 30–40 attendees. This growth is thanks to a combination of targeted efforts:

1. Compelling Presentations – Diverse, informative, and engaging talks encouraged more students and professionals to attend.

2. Student Sponsorships – Generous sponsorships covered registration costs for students at multiple meetings.

3. Academic Incentives – Professors provided extra credit to students who attended, helping to drive participation.

4. New Lunchtime Meeting – We hosted a well-received lunchtime meeting at a new, more centrally located venue—our first lunch meeting in recent memory.

Additionally, SJGS hosted a lively Happy Hour at Lengthwise Brewery on February 1, offering a relaxed setting for members to connect and network.

SJGS Field Trip: The San Andreas Fault from Parkfield to the Carrizo Plain In Celebration of the Pacific Section's 100-year Anniversary Saturday, April 12, 2025

Summary and Photographs by Ron Foster, President of SJGS

To continue the celebration of 100 years of the Pacific Section AAPG, SJGS hosted a field trip on April 12 exploring the geology, tectonics, and history of the Western San Joaquin Valley and Eastern Coast Ranges, with a special focus on the San Andreas Fault Zone. The trip was expertly led by Gregg Wilkerson, Mike Ponek, and Dr. Matthew Herman, and participants received an impressive guidebook—funded by PSAAPG in honor of the centennial celebration.

Dr. Matthew Herman at Wallace Creek


John Porter looking down San Andreas fault with offset Wallace Creek


Gregg Wilkerson at retrofitted pipeline

Group photo at Parkfield, CA

Dr. Matthew Herman at Parkfield next to bridge offset by San Andreas fault

Group looking down at 1880s grated oil mine shaft

Group looking at spring-sourced pond along San Andreas fault

★ ★ ★

New Revised and Update PS AAPG Logo

blurry old logo from 2004

sharp new 2025 logo

Our PS AAPG logo debuted in the January-February 2004 Pacific Petroleum Geologists Newsletter. Tom Hopps wrote the following introduction for the new symbol of our association:

> Finally!! After 80 years, Pacific Section AAPG has its own logo. We have used the AAPG logo for so long, it was challenging to design a new logo that felt right. But, working with the logo committee, Galina Richardson (who also designed the logo for the 2003 convention in Long Beach) did a superb job. The goal was to create a logo that would embody the essence of Pacific Section while retaining the flavor of AAPG. With suggestions from Larry Knauer, Bob Countryman, and me. Galina created the logo you see here. The shape and theme of the AAPG logo are preserved, with the yellow-orange ring surrounding a blue interior on which the Pacific Section states have replaced the world. Stars designate the location of our local societies.

Over the years, the quality of the image has degraded as copies were made from copies of the original. In addition, any original artwork or graphic files have disappeared.

Ken Helmold, President of the AGS, updated the logo for use during the April 2025 Technical Conference in Anchorage. He provided Adobe Illustrator and PDF files to the Pacific Section that uses full vector graphics, so it's extremely sharp at all magnifications. Note that the five gold stars representing the active affiliated societies.

Thank you to Ken, for providing a much-needed, high-quality image.

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.

Next meeting: May 14, 2025
Speaker: Kirsten Fristad, Chief Gelogist, Graphite On

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.

The CGS is planning a Spring 2025 field trip on Saturday May 3rd to mark the 100th anniversary of the 1925 Santa Barbara Earthquake. Check the website for more information.

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

Next Meeting: May 20, 2025
Speaker: Dr. Kristin Morell, Ph.D. - UC Santa Barbara
Topic: Active onland faults in subduction zones

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

Check the website for updates on updates for meetings.

President:	Dan Steward	daniel@ironhorsenergy.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:May 28, 2025 6:30 pm (annual dinner meeting)
Speaker: Dr Walter Alvarez, UC Berkeley
Topic: The Origin and History of Cenozoic Megalake Sudd, Along The River Nile in Sudan and South Sudan

June 25, 2025 7:15 pm (6:30 social time)
Speaker: Dr. Joseph Moore, University of Utah
Topic: Geothermal Energy Development in Utah: Current and Future Activities

President:	Jim O'Brient	j.obrient @ comcast.net
President-elect:	Phil Reed	philecreed@comcast.net
Past President:	Noelle Schoellkopf	NoellePrince @ sbcglobal.net
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Recording Secretary:	John Karachewski	
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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.

Next Dinner Meeting: Tuesday, May 13th
Speakers: Donald G. Hill, Ph.D. and Qianru Qi, Ph.D.
Topic: Surface & Wireline Borehole Geophysical Measurements in Geothermal Exploration & Repurposing Idle Oil and Gas Wells as Low-Temperature Commercial Heat Source

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