

Pacific Petroleum Geology



Pacific Section • American Association of Petroleum Geologists

September and October 2023

Proposed Changes to the Pacific Section Constitution and By-laws



Review proposed changes and reply to the Pacific Section Executive Committee

see page 6

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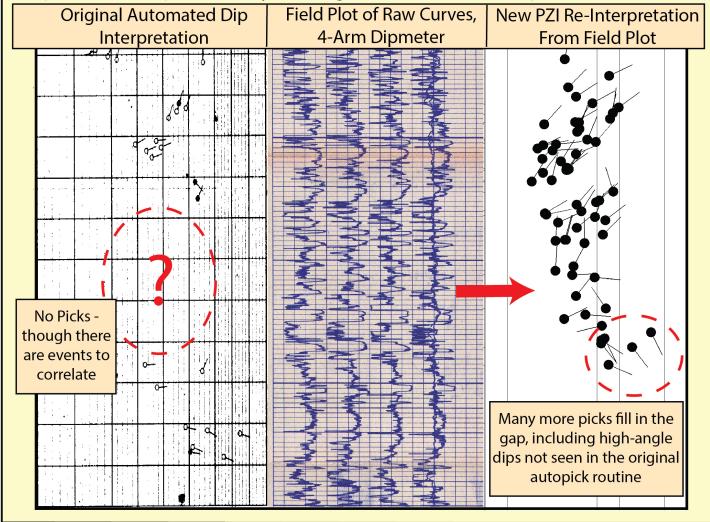
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Treasurer-Elect	Lisa Alpert 310-351-6977 LAAlpert@aeraenergy.com treasurer@psaapg.org	Editor's Comments: It has been 22 years since the PS AAPG's Constitution and By-laws were modified. Our organization is much different now than it was in 2011. Our membership is much smaller, and		
Past President	Plamen Ganev 310-562-8654	few	e of the local societies are s have disbanded. Our Execu ty to make decisions is hand	tive Committee's
Editor-in-Chief	Tony Reid 661-303-7817 tonyr0209@gmail.com editor@psaapg.org	The Com orga	meetings are tied to a speci changes proposed should h nmittee's meetings reach a c nization become active aga proposed changes and if yo	nelp the Executive quorum, and help our in. Please review
Staff			cerns, please contact me at	
Web Master	Mike Clark 661-378-8134 rocksniffer@aol.com	•	Submit an Article Pacific Petroleum No	ewsletter!
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preferably be submitted as a .tif, .gif, or .bmp; .jpeg

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Dear fellow PS-AAPG members,

As we start getting into cooler weather here in the Central Valley of California, it's the perfect time for us to get out and look at some rocks! This letter is a reminder for all of us to get others out there with us. Teach them about earth processes, earth history, and dinosaurs or fossils. Many of us studied geology or earth science because we wanted to be outside or, let's be honest, we loved dinosaurs as kids.

I have had some recent opportunities to get others outside to experience what I find fascinating about geology, and I thought I would share them with you - to inspire you to share your passion with others.

Last month, I co-led a field trip to Utah's Uinta Basin where we took a group of geoscientists and engineers to study the Green River and Wasatch formations. It is amazing how getting out of the office, stepping back to basics, and teaching other disciplines about the importance of reservoir



characterization can spark new ideas around reservoir continuity, fluid flow, and fluid recovery. We discussed different outcrop scale discontinuities in reservoirs and how they could lead to differences in the production we see in wells only 1000-2000 feet apart. Visualizing this through outcrop work was a great reminder that similar petrophysical log characteristics at the same reservoir depths from well to well may not always correlate, and knowing your depositional and structural systems will help to improve your understanding of formation or flow unit connectivity.





The success of the integrated trip in Utah had me out this morning with a few coworkers looking to build something similar on the east side of the San Joaquin Basin. What makes or breaks a reservoir in a California super basin is not always obvious, but structural elements like those below play a part.





And for those of you with younger kids or who volunteer with youth groups, take every chance you can to share your knowledge with our future generations. Over the summer, I took a road trip to Colorado with my two kids. We had a lot of fun together in Dinosaur National Monument, learning what a Camarasaurus was and hiking some of the trails to find dinosaur bones. We also hiked back into an old gold and silver mine in Ouray, Colorado, where we learned how to identify the ore and how it was mined by hand. The trip sparked their enthusiasm and imaginations and I have the rocks and dinosaur drawings to prove it.



If you would like to share ideas for field trips, lead a field trip, or share a recent geology trip you were on, please reach out to me at president@psaapg.org.

In closing this month, I want to ask our PS-AAPG members to take a few minutes to review and comment on the 3 suggested changes to the constitution and by-laws. These changes will make it easier for the executive committee to make and pass decisions for the organization and to support our member societies.

All the Best.

Kristy Whitaker President

Proposed Changes to the Pacific Section AAPG Constitution and By-laws Pacific Section AAPG Executive Committee

The Pacific Section Executive Committee is currently dealing with a serious problem: the inability to reach a quorum for our meetings. Decisions are not being made because meeting attendance is poor. Part of the problem is that one office, the Vice-President, is not filled. Another problem is two of our affiliated societies are no longer active (Sacramento Petroleum Association and Northwest Energy Association).

Three modifications to the Constitution and By-laws (C&B) are proposed by the Executive Committee that will address how the quorum is redefined, and, if approved by the PSAAPG membership, will help the Executive Committee make more timely decisions. In the following pages, we are publishing the entire C&B which includes the proposed changes, and we are asking for your feedback.

Modification 1: Elimination of the office of Vice-President

Edits to the C&B include removal of all references to the Vice-President, including transferring duties to the President-Elect.

Discussion: There are two reasons to eliminate the office of Vice-President: (1) with the addition of the President-Elect, the Vice President has few tasks, and (2) even before the Pandemic, finding officer candidates has been very difficult. Eliminating the office will help the Executive Committee in their decision making by helping to reduce the number of members necessary to reach a quorum.

Modification 2: Redefinition of affiliated geologic societies as active affiliated geologic societies

Edits modify Section 2 of Article IV to define the Executive Committee as consisting of elected officers and representatives of active affiliated societies, and adds a definition of active affiliated societies as having their own executive committee and being involved with the Pacific Section Executive Committee within the last two years.

Discussion: Recently, two of the seven affiliated geological societies in the Pacific Section became inactive. Removing inactive affiliated societies will have a positive effect on the Pacific Section Executive Committee meeting by permitting a lower quorum requirement for decision making. Inactive affiliated societies may rejoin the Pacific Section if they reestablish their executive committees.

Modification 3: Redefinition of a quorum for conducting business for the Pacific Section Executive Committee

The edits to Section 2 of Article VII remove the current quorum of 8 members of the Executive Committee, and defines the new quorum as half of the Executive Committee members, plus one.

Discussion: Currently the number of members required to reach a quorum for meetings is 8. However, with two inactive affiliated societies and no Vice-President, reaching a quorum in meeting is rare. This slows decision making, and approval of motions may stretch out over months. The new definition of a quorum is a floating number, and the quorum may change as affiliated societies become inactive or reactivated.

The entire C&B is presented beginning on the following pages. The three modifications are highlighted in red, with deleted text as strike-outs, and new text. Please review the recommended changes. If you have comments on these specific changes, please email your comment to Tony Reid at editor@psaapg.org.

CONSTITUTION AND BYLAWS PACIFIC SECTION OF THE AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS Adopted September, 1924

Amended July 2011

Proposed Updates with strike-outs and new text, October 2023

CONSTITUTION

ARTICLE I. NAME

This organization, whose area of interest comprises the Pacific Coastal Region, shall be known as "Pacific Section of the American Association of Petroleum Geologists" and is hereinafter referred to as "PSAAPG."

ARTICLE II. PURPOSE

SECTION 1.

The purpose of PSAAPG shall be to provide for discussion of subjects and problems coming within the scope of the profession and to advance the science of geology and the professional well-being of our members. PSAAPG, by such intercourse, will promote the advancement and aims of the American Association of Petroleum Geologists (hereafter referred to as "AAPG") as set forth in its Constitution, By-laws and Code of Ethics.

SECTION 2.

PSAAPG is a non-profit [501(c)(6)] corporation, and no portion of the financial assets inures to the benefit of any private individual or member.

SECTION 3.

PSAAPG may affiliate with any other geological organization in order to further its purposes and to cooperate in activities including but not limited to the annual convention, newsletter, directory, and publication sales.

ARTICLE III. MEMBERSHIP

SECTION 1.

The members of PSAAPG shall consist of persons concerned with or furthering the professional applications of the geological sciences.

SECTION 2.

Various classifications of memberships and the qualifications thereof shall be established by the By-laws of PSAAPG.

ARTICLE IV. OFFICERS

SECTION 1.

The elected officers of PSAAPG shall be a President, a Vice-President, a President-Elect, the immediate Past-President, a Secretary, a Treasurer, a Treasurer-Elect, and an Editor-in-Chief. The officers shall assume their duties at the beginning of the membership year next following their election as hereinafter provided. The duties of the officers are defined in the By-laws. During the absence of the President, the President-Elect shall assume the duties. In the event of the death or resignation of the President, the President-Elect shall succeed to the office and title of President. Should the President-Elect be unable to serve in this capacity, the duties and title of President shall be assumed by (first) the Vice-President, or (second) the Secretary. In the event of a vacancy of any office, other than the President and immediate Past-President, the Executive Committee shall appoint an active member to fill the vacancy. In making such an appointment, the Executive Committee shall give due consideration to appointing a member from the nominees at the last previous election.

Please see
Modification 1
for discussion
 of the
elimination of
the office of
Vice- President

SECTION 2.

There shall be an Executive Committee consisting of the President, President-Elect, Past President, Vice-President, Secretary, Treasurer, Treasurer-Elect, Editor-in-Chief, and one representative selected from each active affiliated geological society approved by their existing Executive Committee. An active affiliated geological society is defined as an affiliated society of AAPG that has an Executive Committee and has participated in at least one of the Pacific Section's Executive Committee meetings within the last two years.

Please see
Modification 2
for discussion
defining
affiliated
societies as
active

SECTION 3.

The President, Vice-President, Secretary, Treasurer, and Editor-in-Chief of PSAAPG can not hold elected office concurrently in AAPG or affiliated societies of AAPG, with the exception of the AAPG House of Delegates. If the President, Vice-President, Secretary, Treasurer, or Editor-in-Chief chooses to serve as an officer in AAPG or an affiliated society, then the Executive Committee will appoint a replacement.

ARTICLE V. PROPERTY

SECTION 1.

Property of PSAAPG includes logo, letterhead, newsletter, website, publications (copyright and inventory), contracts, funds held in banks and any other asset of PSAAPG.

SECTION 2.

The Executive Committee of PSAAPG is responsible for the management of PSAAPG's property.

SECTION 3.

In the event of the dissolution of PSAAPG, PSAAPG shall distribute any assets remaining after the discharge of all liabilities, for charitable, scientific, or educational purposes. Under these circumstances, no member of PSAAPG shall have any right to or interest in the property or assets of PSAAPG.

ARTICLE VI. FUNDS

SECTION 1.

The Executive Committee shall establish the fiscal year, review the financial position of PSAAPG, and have a current financial statement available at each annual business meeting. Annual dues of PSAAPG shall be payable in advance in an amount established by the membership at the annual business meeting. The Executive Committee shall not have authority to levy assessments against the membership and shall not have the authority to increase annual dues.

SECTION 2.

The funds of PSAAPG shall be deposited to the credit of Pacific Section of the American Association of Petroleum Geologists in any federally insured depository selected by the Treasurer or Treasurer-Elect but not to exceed the limit insured by the Federal Deposit Insurance Corporation. Whenever necessary, the President shall certify to the authority of the Treasurer and Treasurer-Elect in administering PSAAPG's accounts by providing the depository bank with a notice of the Treasurer's and Treasurer-Elect's selection and with a true copy of this Constitution. The Treasurer and Treasurer-Elect shall have authority to issue checks against the bank account so established, on the Treasurer's or Treasurer-Elect's sole signature, but in the event of the Treasurer's or Treasurer-Elect's absence, withdrawals or payments by check may be made on the signature of the President. The identity and authority of the President and the circumstances relating to the absence of the Treasurer and Treasurer-Elect shall be certified to by the Executive Committee if so required by the depository bank.

ARTICLE VII. MEETINGS

SECTION 1.

The Pacific Section shall hold an annual convention meeting at a location approved by the Executive Committee. If the annual meeting of AAPG is held in the regional area of PSAAPG, the Pacific Section will not hold their annual convention meeting that year.

SECTION 2.

The Executive Committee shall conduct business meetings at the annual meeting and at such other times during the year and at such places as designated by the President or a majority of the Executive Committee. Robert's Rules of Order shall apply at all meetings. A quorum shall consist of eight (8) one half plus one of the members of the Executive Committee.

Please see
Modification 3
for discussion of
changing how a
quorum is
determined

SECTION 3.

At the annual convention meeting, the Executive Committee will hold a public meeting for the Pacific Section membership. The purpose of the meeting is to inform members of the activities of the Executive Committee and its committees, to encourage input from the membership, and to vote on adjustments to annual dues.

ARTICLE VIII. ELECTIONS

SECTION 1.

The Past-President of the Pacific Section of the American Association of Petroleum Geologists, with the approval of the Executive Committee, shall appoint a nominating committee at least three (3) months prior to the beginning of the next membership year of the Pacific Section, consisting of four (4) members, two (2) of whom shall be Past-Presidents of the Pacific Section. The nominating committee shall, each year, select two (2) candidates for each of the following offices: President-Elect, Vice-President, Treasurer-Elect, and Secretary, and every other year shall select two (2) candidates for the office of Editor-in-Chief. All candidates for positions as officers of PSAAPG shall be current members in good standing of the Pacific Section. The final slate of candidates shall be approved by the Executive Committee. The slate of the candidates shall be announced in the "Pacific Petroleum Geologist Newsletter" at least six (6) weeks prior to the election. Additional nominations may be made by written petition of twenty-five (25) or more members of the Pacific Section in good standing, received by the Secretary within two (2) weeks following the publication of the nominating committee slate of candidates. The Executive Committee shall have the authority to name an additional nominee in case of necessity, to assure two candidates for each office. Voting shall be by mailed ballot. The Secretary shall set a date for counting ballots and shall mail ballots to all members not less than six (6) weeks prior to this date. A candidate receiving a plurality of votes is the winner of the election. In the case of 3 or more candidates, elections will be held using procedures outlined in the AAPG Constitution and By-laws.

SECTION 2.

In matters pertaining solely to the business of PSAAPG, all Active and Honorary Members of PSAAPG may vote. In matters pertaining to the Advisory Council and other official business of The American Association of Petroleum Geologists, only Active and Honorary Members of that Association as assigned to PSAAPG shall be qualified to vote.

SECTION 3.

This Constitution and By-Laws may be amended by a mail ballot. Ballots concerning such amendments shall be mailed upon the authority of the Executive Committee or upon receipt by the Secretary of a Petition for Amendment signed by fifty (50) or more members in good standing. A two thirds majority of the ballots returned and received by PSAAPG by the closing date noted on the ballot shall be required to pass any amendment.

BY-LAWS

ARTICLE I. TERMS FOR OFFICERS

SECTION 1. PRESIDENT-ELECT

The President-Elect is elected annually and the term of office shall be for three (3) years. The President-Elect's term is served in three parts: during the first year as President-Elect, during the second year as President, and during the third year as Past-President. Presidential terms will overlap and are intended to help provide continuity as new officers are elected.

SECTION 2. VICE-PRESIDENT

The Vice-President is elected annually and the term of office shall be for one (1) year.

SECTION 32. TREASURER-ELECT

The Treasurer-Elect is elected annually and the term of office shall be for two (2) years. The Treasurer-Elect's term is served in two parts: during the first year as Treasurer-Elect, and during the second year as Treasurer. The Treasurer's terms are overlapping and are intended to help provide continuity as new officers are elected.

SECTION 43. SECRETARY

The Secretary is elected annually and the term of office shall be for one (1) year.

SECTION 54. EDITOR-IN-CHIEF

The Editor-in-Chief is elected biannually and the term of office shall be for two (2) years.

ARTICLE II. DUTIES OF OFFICERS

SECTION 1. PRESIDENT

Duties of the President are to (1) communicate activities of PSAAPG to the members at annual convention meetings and in the Newsletter, (2) be the voice of PSAAPG in dealings with government agencies, other geological societies, and the public, (3) liaise with AAPG on current and planned activities of PSAAPG, and provide written beginning-of-year business plan and end-of-year state-of-Section reports, (4) set meeting dates and agendas of Executive Committee meeting and chair meetings, (5) review standing and ad hoc committees and

appoint committee chairs, (6) define the annual goals of this Society, the Executive Committee, and the standing and ad hoc committees, (7) provide direction and assign projects to the Vice-President and President-Elect, and (8) serve as an ex officio member of the Pacific Section AAPG Foundation.

SECTION 2. PRESIDENT-ELECT

Duties of the President-Elect are to (1) serve on the Executive Committee and at least one other committee, (2) perform ad hoc tasks assigned by the President or Executive Committee, (3) assist the President to develop goals of PSAAPG, (4) represent PSAAPG as needed on behalf of the President, and (4)(5) succeed the President should the office become vacant.

SECTION 3. PAST-PRESIDENT

Duties of the Past-President are to (1) serve as chair of the Nomination Committee, and (2) act as mentor for the President and President-Elect.

SECTION 4. VICE-PRESIDENT

Duties of the Vice-President are to (1) represent PSAAPG as needed on behalf of the President, (2) serve on the Executive Committee and at least one other committee, (3) perform ad hoc tasks assigned by the President and Executive Committee.

SECTION 54. TREASURER

Duties of the Treasurer are to (1) keep the financial books of PSAAPG in order, supervise contracted bookkeepers and tax preparers, and interact with financial institutions, (2) pay invoices, expenses, and other debts of PSAAPG that are approved by the Executive Committee, (3) prepare and report financial statements for the Executive Committee, (4) serve on the Executive Committee and the Committee on Finance, (5) mentor the Treasurer-Elect, and (6) serve as an ex officio member of the Pacific Section AAPG Foundation.

SECTION 65. TREASURER-ELECT

Duties of the Treasurer-Elect are to (1) serve on the Executive Committee and the Committee on Finance, and (2) prepare to assume the office of Treasure by performing activities at the direction of the Treasurer.

SECTION 76. SECRETARY

Duties of the Secretary are to (1) take and archive minutes of meetings of the Executive Committee, (2) prepare and distribute agendas prior to meetings, (3) serve on the Executive Committee, and (4) assist the President with meeting logistics, organization and execution.

SECTION 87. EDITOR-IN-CHIEF

Duties of the Editor-in-Chief are to (1) prepare and publish PSAAPG's Pacific Petroleum Geologist Newsletter, (2) supervise and edit information in PSAAPG's website, (3) serve on the Executive Committee, and (4) select a Webmaster, an Advertisement Coordinator, and an assistant Newsletter Editor.

ARTICLE III. MEMBERSHIP

SECTION 1. MEMBERSHIP

Membership in PSAAPG shall consist of the following classifications:

- a) Active Members
- b) Honorary Members
- c) Non-member Subscribers

SECTION 2. ELECTION TO MEMBERSHIP

Every candidate for admission as a Member shall submit an application on an application form authorized by the Executive Committee and signed by the applicant. The Executive Committee shall be the sole judge of the eligibility of the applicant for membership and the adequacy of the applicant's qualifications. If the Executive Committee, after due consideration, judges that the applicant's qualifications meet the requirements of the Constitution and these By-laws, the committee shall cause to be published in the Newsletter or by other suitable means, the applicant's name. Any member, of whatever classification, who resigns, or who forfeits membership for nonpayment of dues ceases to have any rights in PSAAPG.

SECTION 3. DEFINITION OF TERM: "ACTIVE MEMBER"

A member in good standing who is engaged in the practice of geology, the teaching of geology, or holds a degree in a geological science from a college of acceptable academic standards.

SECTION 4. DEFINITION OF TERM: "HONORARY MEMBER"

The Executive Committee may honor each year the accomplishments and distinguished service to PSAAPG and profession by one or more Active Members by designating them as Honorary Members. The Active Member honored must be a member in good standing of PSAAPG. Honorary Members shall be exempt from all future dues of PSAAPG.

SECTION 5. DEFINITION OF TERM: "NON-MEMBER SUBSCRIBERS"

Other persons, not qualified to be Active Members of PSAAPG may join and receive PSAAPG's publication "Pacific Petroleum Geologist Newsletter". Non-member subscribers shall not have the right to vote or hold office, but may otherwise participate in the activities of PSAAPG.

ARTICLE IV. COMMITTEES

SECTION 1. STANDING COMMITTEES

PSAAPG shall establish and maintain the following standing committees:

- a) Committee on Finance
- b) Committee on Membership
- c) Committee on Publications
- d) Committee on Directories
- e) Committee on Honors and Awards
- f) Committee on Conventions

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- e) Committee on Honors and Awards
- f) Committee on Conventions

SECTION 2. APPOINTMENTS AND TENURE

The President shall appoint all committee chairs and co-chairs and fill vacancies whenever they occur. The committee chairs and co-chairs shall appoint all vice-chairs and members for their respective committees. The Executive Committee may remove any committee chairs or co-chairs of the Standing Committees. The chair or co-chair may remove any vice-chair or member of their committees. The term of office of a member of a standing committee shall be one (1) year. Chairs may succeed themselves from year to year if reappointed by each succeeding President. The President may create at their discretion ad hoc committees and appoint chairs. Ad hoc committees have specific goals, are temporary, and expire at the end of the appointing President's term.

SECTION 3. COMMITTEE ON FINANCE

The primary function of the Committee on Finance shall be to prepare a fiscal budget for approval by the Executive Committee. The Treasurer and Treasurer-Elect shall serve as ex officio members and no other member of the Executive Committee shall serve as member of the Finance Committee.

SECTION 4. COMMITTEE ON MEMBERSHIP

The primary function of the Committee on Membership shall be to encourage applications for membership and to review and act upon such applications on behalf of, and with the approval of, the Executive Committee.

SECTION 5. COMMITTEE ON PUBLICATIONS

The primary function of the Committee on Publications shall be to advise the Executive Committee on proposed publications, estimate costs and pricing and potential sales, oversee editorial and printing processes, handle the storage and sale of the publications and maintain adequate records of costs, sales and inventory. The Chair may name a member of the committee as Managing Editor and, upon approval of the Executive Committee, the Chair may assign a number of the listed Committee functions to the Managing Editor.

SECTION 6. COMMITTEE ON DIRECTORIES

The primary function of the Committee on Directories shall be to update the membership directory of the Pacific Section of the American Association of Petroleum Geologists as directed by the Executive Committee. Compilation of the Directory shall be coordinated with the Pacific Coast Section Society of Exploration Geophysicists and the Pacific Section Society for Sedimentary Geology (SEPM) and it shall be formally published as mutually agreed upon.

SECTION 7. COMMITTEE ON HONORS AND AWARDS

The primary function of the Committee on Honors and Awards shall be to recommend to the Executive Committee recipients for all honors and awards. All recommendations for these honors and awards by Section members or other Section Committees shall first be considered by this Committee before being presented to the Executive Committee for approval. Following Executive Committee approval, the awards will be presented at the Annual Convention of PSAAPG, or the Annual Convention of AAPG if held in California.

SECTION 8. COMMITTEE ON CONVENTIONS

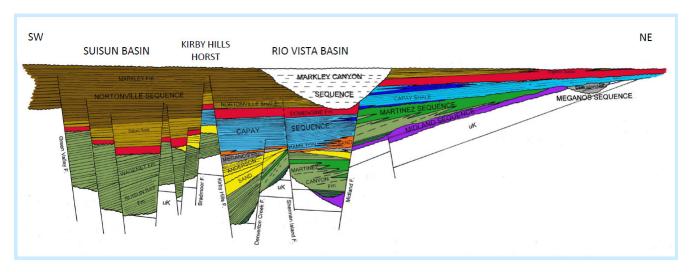
The primary function of the Committee on Conventions shall be to initiate planning for the Section's Annual Convention, advise the Executive Committee on site selection and convention budgeting, and assist each year's Annual Convention's General Chair, as requested. The Committee will also assure that appropriate accounting standards and procedures are maintained. It will compile and maintain Convention records, statistics and guidelines for use by future Annual Convention General Chairs. The members of the Committee will include the Past-President, President-Elect, General Chair of the current Annual Convention; the General Chairs, when appointed, for the following three Annual Conventions and the President of the host Society of the current Convention.

Remember, please send your comments on the proposed changes to the Constitution and By-laws to:

Tony Reid
Chair, Constitution and By-laws Committee editor@psaapg.org



Pacific Section AAPG Digital Publication CD 7 Advances in the Geology of the Sacramento and Northern San Joaquin Basins since PSAAPG Miscellaneous Publications 41 and 43



This volume is an important contribution to the geology of the Great Valley and captures much of Vic Cherven's work during his 50 years of research in the valley. His paper on the Northern Diablo Range incorporates a great variety of surface and subsurface data, some of which were supplied by Al Almgren, to identify and map a dozen submarine fans that were deposited during the last 35 million years of the Cretaceous Period. The paper on the early Tertiary sequence stratigraphy of the southern Sacramento Basin also makes extensive use of data supplied by Al and others, and is an exceptionally detailed and comprehensive analysis of the interplay between tectonics, sedimentation, and eustacy. A companion paper summarizes and clarifies the nomenclature used for these lower Tertiary strata and describes previously unrecognized members of several formations. A third paper on these lower Tertiary rocks illustrates them in a highly detailed structural cross section that extends more than 30 miles across the basin and includes 50 closely-spaced gas wells.

At the other end of the scale are two papers that look in detail at individual formations in local areas. One paper describes the stratigraphy and alluvial-fan facies of the Valley Springs Formation in its type area, and a second paper, co-authored with Pete Fischer and Scott Hector, is a detailed study of the facies, geometry, and gas production from two lobes of the Winters submarine fan in the Walnut Grove gas field.

Included in the 2023 version of the CD is a dedication to Al Almgren, the renowned California micropaleontologist and stratigrapher who died in 2020 at the age of 100. Al and Vic Cherven were friends for almost 40 years, and Al provided paleo data for Vic's dissertation. Over the years Vic and Al had dozens of discussions about the geology of the Central Valley, and Al's influence on Vic is demonstrated throughout the articles in this volume. Scott and Vic intended to dedicate a volume as early as 2011, and with this second printing of Volume CD 7 we are able to include Mark Filewicz's eloquent dedication to Al.

Advances in the Geology of the Sacramento and Northern San Joaquin Basins since PSAAPG Miscellaneous Publications 41 and 43

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Prefaceiv
DEDICATION: ALVIN ARNOLD ALMGREN Mark Filewicz
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Geology Hike to View the Franciscan Complex Along the San Luis Obispo County Coast

Tony Reid Pacific Section AAPG Editor-in-Chief

The cliffs above the beaches of Southern and Central California contain fascinating exposures of deep-water sandstones and the Monterey suite of fine-grained rocks, formations that make up much of the state's geology. But the geologic hike I will profile today contains exposures that highlight another major class of rocks in California – the Franciscan Complex. The rocks we will see along this hike are exposed in beach cliffs along the San Luis Obispo County coast between the towns of Cayucos and Harmony in Estero Bluffs State Park, on the coast side of Highway 1 (Figure 1 and 2).

Thanks to a new geologic map of the Cayucos Quadrangle by Delattre (2016), some of the basic building blocks of the Franciscan Complex can be easily viewed in the park's



Figure 1. Location map of Estero Bluffs State Park. Map from Estero Bluffs State Park brochure.



Figure 2. Map of Estero Bluffs State Park showing park area and trails, stops along the hike, and area of geologic map in Figure 3. Parking at San Geronimo Road is recommended to begin the hike. Map from Estero Bluffs State Park brochure.

beach bluffs, including crushed sandstone, basalt, and radiolarian chert (Figure 3). To simplify the origin of the Franciscan, it consists of Mesozoic to Early Cenozoic slabs of oceanic crust (with its overlying deep-water sediments) accreted onto the western edge of the North American plate. There is a mountain of literature out there that provides further details about the origin of the Franciscan.

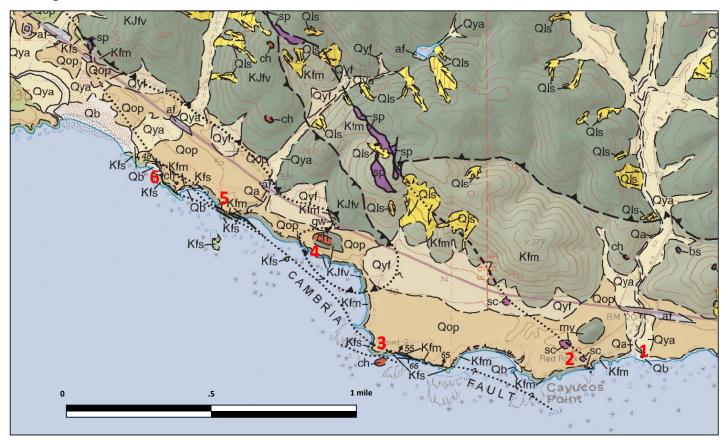


Figure 3. Portion of the Cayucos quadrangle geologic map of Delattre (2016) should the hike route, with stop location numbers in red. Quaternary units along the bluff trails include Holocene beach and alluvial deposits (Qb and Qa), Holocene to late Pleistocene alluvial fan and floodplain deposits (Qyf and Qya), and late Pleistocene marine terrace deposits (Qop). Franciscan-related units include Jurassic-Cretaceous metavolcanic rocks (KJfv), Late Cretaceous mélange and Sandstone of Cambria (Kfm and Kfs), silica-carbonate rocks (sc), chert (ch), and metavolcanic rocks (mv).

The Franciscan is usually poorly exposed because of forest cover, deep soils, or landslides. Outcrops may also be difficult to reach (Point Sal, for example). But the beach cliffs northwest of Cayucos provides a nearly continuous exposure of various rocks type for over 4 miles. Also visible are structural features including a low-angle reverse fault and a possible active late Quaternary thrust fault.

The park consists mostly of an undeveloped Quaternary marine terrace. In addition to the Franciscan rocks exposed in the bluffs, a few more resistant Franciscan outcrops poke up through the terrace; they may have been sea stacks or small islands during interglacial times of high sea level.

The route I will describe is about 6 miles round trip. Your hike can be lengthened or shortened depending on your plans. I recommend starting your hike at the San Geronimo parking area located about ½ mile beyond where Highway 1 narrows from four lines to two as you head west from Cayucos. Turn left at San Geronimo Road, being careful as you cross oncoming

traffic. There is easy access from the parking area to the trails along the seaward edge of the terrace. There are several other parking areas along Highway 1, but access to trails may involve scrambling down steep slopes to the beginning of the trails.

From the San Geronimo parking area, it is about a 0.2 mile walk to the bluffs. The hill to your right is made of resistant metavolcanic rocks (mv on Figure 3). The bluffs are 10 to 20 feet high, near vertical at some locations and in other places easily traversed to access to small pocket beaches. A branch of the trail heads east toward Cayucos, but stay to your right and you will quickly descend to one of the few easily accessible beaches in the park (Stop 1). Here, San Geronimo Creek usually has a pool of water behind the beach. Outcrops of Kfm – Franciscan mélange – are present on either side of the shallow walls of San Geronimo Creek. Delattre (2016) describes the mélange as a "chaotic mixture of fragmented, fault-bounded, metamorphic rock masses embedded in a penetratively sheered mixture of argillite and metasandstone." At this location, as well as east toward Cayucos, the cliff exposures consist of hard greenish-brown sandstone, with faint suggestions of bedding (Figure 4), and in others spots, containing large clasts of reddish chert in a matrix of highly fractured sandstone (Figure 5).



Figure 4. Example of Franciscan mélange just west of Stop 1 consisting of hard bedded and possibly folded sandstone.

At the west edge of the beach, the trail continues up through the metasandstone and terrace outcrops to the surface of the terrace. Continue west about 0.2 mile and you will get a view to the north of a metavolcanic knob that protrudes about 60 feet above the terrace (Figure 6). A little further and just off the trail to your right crops out brown to reddish brown boulders about 10 feet high (Stop 2; Figure 7). Delattre (2016) describes this small outcrop as hydrothermally altered serpentinite (sc on Figure 3) and part of the Coast Range Ophilite. The brush around this outcrop is dense, and I suggest viewing only



Figure 5. Close-up view of mélange containing dark greenish brown sandstone and clasts of reddish chert (center of photo).



Figure 6. At Stop 2, a small hill containing meta-volcanic rock protrudes above the terrace. This hill may have been a small island during deposition of the marine terrace.

from the trail because there may be poison oak mixed with the other vegetation.

The point of land to the left is Estero Point, also called Cayucos Point, and is the southernmost point of the park. Sea stacks consisting of resistant fragments of mélange are resting spots for pelicans, sea lions and seals.

From Stop 2, walk about a mile to the next point of land. Where the coast turns sharply to the north (Stop 3), you will see to the south a large reddish chert sea stack with a coating of guano (Figure 8). Delattre (2016) maps the Cambria fault as separating the Franciscan mélange we have been observing from the sandstone of Cambria. The fault zone here is poorly exposed and is mostly covered by water. The Cambria fault trends west-northwest and stays close to shore for the next half mile.

The trail turns almost due north, following the shoreline of a small bay. Ahead is another resistant knob, and below in the bluff face, outcrops of reddish and bluish units we will see up close at the next stop. A low angle reverse fault separates this unit from the underlying Franciscan mélange we have followed since reaching the bluffs at Stop 1. The unit above the fault is identified by Delattre as containing Franciscan metavolcanic rocks (KJfv on Figure 3; Figure 9). Follow the trail as it curves to the northwest to Stop 4, about half a mile from Stop 3.

The bluffs at Stop 4 are higher and steeper than anywhere in the park. Please be careful as you peek over cliff edge to the rocks below. The waves have cut excellent exposures of bedded reddish radiolarian chert (Figure 10). Blueish rocks may be metamorphosed basalt, and in places appear to take on a pillowy shape (Figure 11).



Figure 7. Boulders of silica-carbonate rock, attributed by Delattre (2016) as hydrothermally altered serpentinite.



Figure 8. The small island just offshore contains (under the guano) reddish chert. The Cambria fault, mostly hidden in the water, separates the island from the Franciscan mélange we have seen so far.



Figure 9. Looking northwest from near Stop 3, the small hill above the bluffs contains Jurassic-Cretaceous metavolcanic rocks. In the steep bluffs are exposures of reddish chert possibly bluish volcanic rocks. A folded reverse fault underlies the metavolcanic suite of rocks (see Figure 3).



Figure 10. At Stop 4, steep bluff below the red hill contain bedded radiolarian chert and blue-green to dark brown meta-volcanic beds (?).

The rocks below the steep bluff may be accessible from Stop 3 at low tide. The radiolarian chert can be visited more safely by taking one of the several trails to the top of the knob located just north of the steep area of the bluff (Figure 12). The top of the knob also offers a great panoramic view of the park.

Continue northwest on the bluff trail about half a mile to Stop 5, where the Cambria fault makes landfall (Figure 3). The sandstone of Cambria is Late Cretaceous in age (Delattre, 2016) and consists of yellowish orange sandstone, and is very distinctive from the units we have seen earlier (Figure 13). The Cambria fault is not well exposed here, so head northwest along the bluff trail another quarter mile to the last point of land before reaching a broad beach (Stop 6). The sandstone of Cambria is well exposed, and outcrops can be viewed up close, but be careful because the outcrop surface is very irregular. As you look toward the beach, you will see a good profile of the terrace stratigraphy (Figure 14). The Quaternary terrace includes large boulders of the same sandstone as the adjacent sandstone outcrop, indicating erosion of the sandstone of Cambria by waves and deposition of the boulders behind the exposed outcrop. A zone of crushed rock between the terrace and sandstone of Cambria (Figure 15) is probably the Cambria fault mapped by Delattre (2016). The fault is likely younger than the Late Pleistocene terrace, and further northwest, the Cambria fault is identified on the California Geological Survey's online map as Late Quaternary in age.



Figure 11. The blue-green rocks in the center have a 'lumpy' texture and may be pillow basalts. Delattre reports pillow basalts are present in the Franciscan metavolcanics.



Figure 12. The small hill north of Stop 4 is composed mostly of reddish chert. A small quarry on the south face of the hill exposes more chert. The top of the hill offers a great



Figure 13. The yellow-orange sandstone at Stop 5 is called sandstone of Cambria by Delattre, and is separated from the Franciscan mélange by the Cambria fault. Access to

At this point, you can explore the beaches or tide pool, or head back to the parking area.

Trails are mostly in good condition on the terrace surface. The trail crosses several creek gullies and these are a little more challenging but crossable. Trails are commonly wet during the rainy season. When it rains, the terrace soils absorb the moisture and it slowly trickles downshope. Near the cliff edge, where the soil zone is exposed, the shallow groundwater emerges, forming a muddy mess. As the trails dry out, large mud cracks form, and some wide enough to swallow a foot, so keep your eyes on the trail. Keep on the trails; poison oak is in the gullies but can be passed without contact.

The park has no restrooms or water. There is little shade so apply plenty of sub block.

Reference:

Delattre, M., 2016, Preliminary geologic map of the Cayucos 7.5' quadrangle, San Luis Obispo County, California: California Geological Survey, Preliminary Geologic Maps PGM-16-03, 1:24,000.

Figure 15. Close-up view of the crushed zone between the terrace and the sandstone of Cambria. Note pen for scale.



Figure 14. View of the sandstone of Cambria (lower right) and of boulders up to 3 feet in diameter in the Quaternary terrace. The terrace boulders are the same composition as the sandstone of Cambria.



Submit your geology hike to the PPG Newsletter!

What's your favorite geology hike? A geology hike is an informal hike in a scenic area where you can see some interesting geology. It could be a hike you do with family or friends, or with other geologists, or with your dog. It's not a field trip, although the site might have been included in a formal field trip in the past.

Given the abundance of public lands and outcrops across the Pacific Section, there are almost no limits to the number of geology hikes in our region. If you have a favorite hike, please consider submitting a description of the route for publication in the Pacific Petroleum Geologist Newsletter. I plan on publishing at least one hike per edition.

Here are some guidelines:

- 1. Hikes should be on public lands and on established trails.
- 2. Hikes should be safe and on good trails, with no rock climbing, brush bashing, wave dodging, or bear wrestling required.
- 3. Hikes should be of geologic interest, but fun for family and friends
- 4. Your discussion should include directions to the hike's starting point, a description of the trail and of the geology along the walking route. Please include a geologic map and photos. Also note any hazards, such as parking security, critter cautions, or weather constraints.

To submit your geology hike, or for more information, please contact Tony Reid at editor@psaapg.org.

San Joaquin Geological Society Holds Annual Fall Fiesta

Photos by Lisa Albert

The San Joaquin Geological Society held its annual Fall Fiesta on Friday September 22 at the home of Dan Schwartz and Cynthia Huggins. The 72 geologists, spouses and children in attendance enjoyed street tacos and Mexican ice creams on a pleasant fall evening. Participants viewed the amazing selection of raffle prizes that ranged from wine to horse riding lessons. The numerous donations and corporate sponsors was encouraging to see.. Thank you SJGS Executive Committee for organizing this fun even.

Funds raised will be used for student scholarships.





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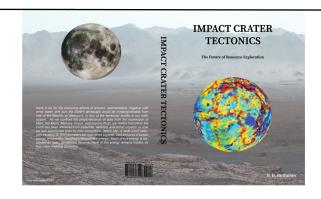
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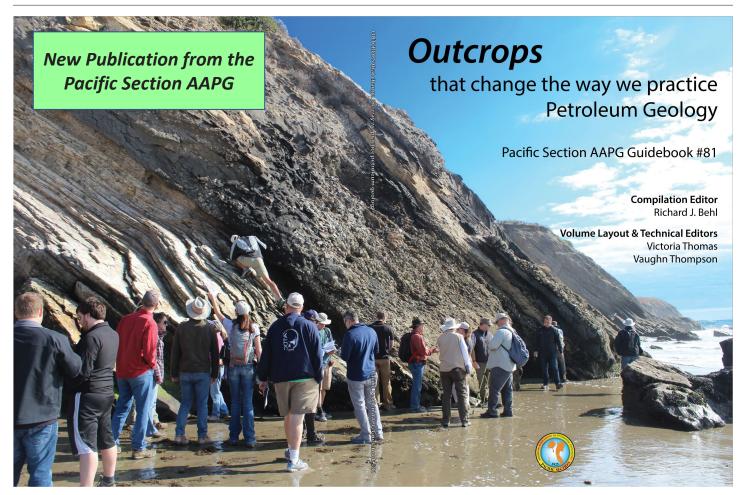
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Member Society News

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: Monday, October 30; talk 11:30 am-12:30 pm

Speaker: Elizabeth Miller, Department of Earth and Planetary Sciences, Stanford University

Topic: The Brooks Range, Alaska: An orogenic belt with a complex history

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Coast Geological Society

P. O. Box 3055 http://www.psaapg.info/cgs/index.html Ventura, CA 93006

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

Please visit the CGS website for information on upcoming meetings.

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Los Angeles Basin Geological Society

www.labgs.org

Luncheon meetings have a new venue: Signal Hill Petroleum located at 2633 Cherry Ave, Signal HIll, CA (562-595-6440, Brady Barto, ext. 5233). Meetings are on the fourth Thursday of the month, from 11:30 am to 1

Check the website for information on the next talk.

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(Continued on next page)

Northern California Geological Society

803 Orion #2

www.ncgeolsoc.org

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 pm to 8:30 pm (social half-hour at 6:30 pm)

Next meeting: Wednesday October 25, 2023 Speaker: Linda Dismore Smith, Chevron (Ret)

Topic: Climate Change: Evidence and Possible Tipping Points

November 15, 2023

Speaker: Jeff Unruh, Lettis Consultants International Inc.

Topic: Seismic Hazard Evaluation of the West Tracy Fault at Byron, CA, for State Water Infrastructure

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Northwest Energy Association

P. O. Box 6679 Portland, OR 97228 Contact: Jim Jackson or John Armentrout

No activities are planned at this time. There is no active website.

Sacramento Petroleum Association

The Sacramento Petrtoleum Association has shut down. The last meeting was on April 19, 2023.

San Joaquin Geological Society P. O. Box 1056

www.sanjoaquingeologicalsociety.org 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 Meeting: November 14 at 6 pm Speaker: John Donohue, Bear Energy

Topic: Sources and Uses of US Energy, Can Alternative Energy Replace Carbon

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