Pacific Petroleum Geology
NEWSLETTER
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2015 Pacific Section Convention. Oxnard, CA.

2014-2015 Officers

Staff

COVER PHOTO: A lone fisherman tries his luck during an unusually large summer swell at Point Mugu. Anacapa Island looms in the distance. Point Mugu will be one of the fantastic field trips offered at the 2015 PSAAPG Convention in Oxnard, CA (see field trips description on p. 20). Photo courtesy of Jerry Nichols.

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John T. Williams, Pacific Section AAPG President's Letter

William "Strata" Smith Loved His Job!

The story of William "Strata" Smith is one of personal genius coupled with dogged stubbornness. He was on a collision course with the earthly realities of 18th century English classes, fraught with jealousy, envy, and pettiness. Author and geologist, Simon Winchester has brought Smith to life through his 2001 book – *The Map That Changed the World: William Smith and the Birth of Modern Geology.*

Winchester's story is the featured All Convention Luncheon Speaker at the National AAPG "ACE" Annual Convention and Exposition in Denver, Colorado, May 31-June 3, 2015. I consider this book a must read. Winchesters' story telling is captivating, and his historical perspective of our science is exceptionally valuable to professional development.

It is hard to comprehend a time when "faunal succession" coupled with "superposition" was not equally understood. It is truly humbling that the discovery of faunal succession was reserved for a "simple yeoman." The epiphany that William Smith (1769-1839) experienced after his first realization of this fundamental geologic knowledge must have been beyond exciting. He was the first person in history to recognize faunal succession (1798), and that similar looking rocks could be distinguished by their fossils. Once he had realized and expounded upon his ideas with a few close associates, the science of stratigraphy was born. They immediately recognized the importance and magnitude of his work. Although Smith was encouraged by his friends, it took him many years to accomplish and complete the first true geologic map.

Very early in his life William Smith demonstrated unique observational talents including a love for collecting and organizing fossils. *Clypeus ploti*, the pound stone, was a noteworthy species known in his home village as a reliable method to weigh cheese. Later, as a geologic explorer and mapmaker, he acted on his exceptionally keen observational and intuitive talents. He used his discovery to single-handedly map all of England, Wales, and portions of Scotland. His beautifully hand colored map and cross-sections were officially dated August 1, 1815: the first true geologic map.

Smith never attended college, to the chagrin of his noble contemporaries. He was trained on the job as surveyor and became a noted canal builder. This led him to other applied geologic accomplishments. Smith was the first person to use and understand the cyclothem while building canals across England. He is also remembered for his "Herculean Labor," years of endless travel, crisscrossing his Island and advancing his mapping vision. Against all odds, he single-handedly completed his expansive geologic mapping venture, to complete the map. He was doggedly stubborn about geology. Smith received no tax credits or corporate aid, no scholarship or prestigious grants-in-aid.

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Being of "simple yeoman stock," Smith attended local schools, loved fossils, and was mentored in surveying. The elites of his time were dumfounded by his discoveries and accomplishments. He confounded his contemporaries and he endured by overcoming personal adversities and gut wrenching disappointments. "Strata" Smith embodied applied geology and keen observational ability. His adversaries artfully attempted to discredit, subvert, and steal his work including having him thrown into debtors prison. He suffered humiliating and heart-wrenching set backs, both romantically and professionally, but no set back would break his love for geology. Smith was his own worst enemy financially and emotionally. Finally, before it was too late, a few close geologic community friends came to his aid. They arranged for him to be acknowledged as the founding father and practitioner of English geology. Smith was recognized as the first true stratigrapher and geologic mapmaker.

William "Strata" Smith is an exceptional icon for petroleum geologists and all practitioners of applied geologic sciences, especially in the current market adversity. Don't forget that Smith never got the memo that "It can't be done" because he loved his job.

Best Wishes in a Troubled Time,
PSAAPG President 2014-2015
John T. Williams

William Smith, 1769-1839

Questions for the Curious: (find answers on page 22)

1- Clypeus ploti, was locally known by the villagers as?
2- Williams Smith first expounded on it in 1798 - What is Faunal Succession?
3- Cyclothem – What is it?

Greg "Strider" Hummel

July 5, 1956 - December 31, 2014

Greg Hummel departed from a new trailhead this New Years eve after a long bout with that terrible disease ALS. He faced this challenge with all the strength, grace and humor that he always possessed in life. His parting shot with this terrible disease was in his mantra, that was printed on the back of the "Team Hummel 77" T-shirts at the ALS awareness walk in La Verne this last October, "No Regrets, No Fears, No Worries, No Tears". But this is the end of the story; let's go back to the beginning.

Greg grew up in Southern California; his dad was an engineer and manager at the Shell refinery where Greg worked as a young roustabout. In the early 70's, the family moved to Australia for a couple of years. This is where Greg was first introduced to backpacking with the scouts, along with cricket and rugby. The family returned to the U. S. during Greg's high school years, and as a 6' 7" freshman he was immediately pressed into service as center of the basketball team. He played all through high school; it was here that he met his sweetheart for life, Laurie. Her 5' 3" frame would have seemed a miss-match to strangers, but her stature matched his own and they would be partners in every sense of the word for life.

He finished his high school basketball career at 6' 9 ½" and was recruited to play at UC Santa Barbara for the mighty Gauchos'. After finishing the PCT in 1977 and returning to play at UCSB for his Junior and senior years, his coach was a bit miffed because his pace down the court had slowed some but when he planted himself on the low post no one could move him. The Gaucho's were scheduled to play UCLA at Pauley Pavilion early in the season the announcer informed the crowd that Greg Hummel had just finished hiking the Pacific Crest Trail from Mexico to Canada for which he received a standing ovation.

It was after his first geology course at UCSB that Greg elected to change majors. He loved the "story in the rocks" and solving the puzzle. He called it detective work like his grandfather who solved criminal cases for the Denver police department.

It was between his sophomore and junior years at UCSB that he got this wild idea to hike the PCT. In 1977 only a couple dozen people had hiked the entire 2300 mile trail from Mexico to Canada. This is where I first met "The Great Albino Zulu Warrior". We had seen his huge "Bigfoot" prints on the trail and marveled at the space between the "Striders" steps, long before we ever met. The first time I saw Greg he was sitting on a picnic bench table with his feet on the bench seat, wearing a "Smokey the Bear" ranger hat with this ridiculous, fake leopard skin hat band. He was all elbows and knees, eating a half gallon of Neapolitan ice cream with a massive serving spoon. "You must be Strider", I asked. "That's what they call me" he said. This would be his trail name for the rest of his hiking career.

After our first meeting we would meet several times along the trail. We had separated in the Southern Sierra when Greg was caught in an early May snow storm that year that dropped over 4 feet of snow in the High Sierra. He was hiking solo and was scaling the 13,153' Forester Pass in a blizzard. After crossing the snow filled icy avalanche chute at the top of the pass he was confronted with a massive over-hanging cornice that he could not climb over. After cutting out a cave through the ice, he was able to crawl through to the other side. He had two more days of hiking through snow drifts that sometimes reached to his chest. His food was running low before he could descend over Kearsarge Pass to resupply at Independence. This would test his physical and mental limits but his will was as tough as his body. He would admit years later that he was a "little bit" scared.

On the 4th of July, 1977 we crossed paths again; Greg was sitting in the shade along state highway 89 near the PCT Trail crossing, just before McArthur-Burney Falls State Park. We were both hiking solo at that time and made plans to hike together; we would end up hiking the rest of the way together, climbing 14,411' Mt. Rainer with our friend Jeff Z. and crossing the Canadian border on September 7 th.

(Continued on next page)

Greg returned to finish his BS in geology at UCSB in 1979 and went on to graduate studies at Colorado State. He was working part time at a consulting firm when he was offered a job with AMACCO in Denver. (He said that he got the nod because they had a company basketball team). He worked in the Rockies and Kansas until the down turn in 1986. He returned to Southern California again, settling in Diamond Bar. He and his brother ran a successful campaign signs and advertising business for a number of years, but geology was always his first love. This led to working with Armstrong Petroleum, generating prospects in the Sacramento Valley, Gill Ranch and Newport. He worked with Briteburn Energy Partners, in downtown Los Angeles with part of his time field mapping for development of the Orcutt Field near Santa Maria. During this time he served as Vice President of The Pacific Section AAPG. After tiring of the commute into LA, he helped ERG restore production, acquire potential leases and develop Cat Canyon. His last post was for E & B Natural Resources, where he became involved in mapping the Torrance Field offshore for the future development of the Hermosa Beach Project.

The team of Hacker & Hummel gave their first talk on the geology of the Pacific Crest Trail to the Santa Barbara Geologic group early in 2000 at Jeff Rayner's request. We repeated the show titled "5 Million Steps over 5 Billion Years" the Geology of the Pacific Crest Trail to numerous hiking groups and later for the LA Basin, San Joaquin and Coast Geologic societies. It really took me about 5 million steps; Greg probably did it with less than 3 million. The last performance in March at the Coast Geologic Society was unfortunately a solo performance as his illness had progressed to the point where he was unable to attend.

Greg's other love was hiking, and in particular the Pacific Crest Trail. He founded the ADZPCTKO (Annual Day Zero Pacific Crest Trail Kick Off) which takes place every April at the Lake Moreno Camp Grounds about 20 miles north of the Mexican border. This annual event, which started out cooking hamburgers and hot dogs at a campsite along the PCT, has become the largest gathering of hikers on the West Coast. The gathering brings hundreds of hikers together to view the latest innovations in ultralite hiking gear, water reports, trail closures, postal service, education, US Forest service, BLM, "Pack Intervention" for novice hikers and all manner of related hiker-friendly issues. The ADZPCTKO was started in an effort to give back to new hikers for what the trail had meant to Greg, and repay all the random acts kindness that he had received from so many strangers, "Trail Angels" along the way. He also found time to be the past president of the west coast chapter of ALDHA (American Long Distance Hikers Association) which hands out the "Triple Crown" to hikers who have walked the 3 big National Scenic Trails, The Pacific Crest Trail, The Appalachian Trail and the Continental Divide Trail. He also appeared in the National Geographic special "Americas Wild Places" featuring the Pacific Crest Trail.

Greg and I, along with our wives and two of Greg's children, Molly & Travis, recently had a final adventure together. Greg spoke many times of stopping to plant trees at Oso Meadows while hiking the Trail in '77 to raise a little money and was provided all the food he could carry out. It was his wish to go back and see how big the trees had grown since he planted them, 37 years ago. We arrived late in the afternoon as the sun was setting Greg was struggling to walk with Travis holding him up. We managed to see the trees he had planted standing tall on the hillside across the meadow that was once a burned down tree fall. Greg's face beamed and a smile spread from ear to ear; though he could no longer speak because the disease had taken his voice an audible sigh of joy escaped his lips. It took all his strength, like hiking over Forester Pass in the snow in 1977, but he celebrated his life like he always did.

His celebration of life took place at the Diamond Center on Sunday afternoon February 8th. The family had hundreds of pine saplings wrapped up for planting in his honor with the Oso Meadow story on display. There were 400 available seats in the center and many still standing at the door to celebrate "Striders" life.

To say Greg cast a tall shadow is an understatement and a rather bad pun. He will be sorely missed by all who knew him. My special thanks to Laurie and the Kids who let me share their dad on so many wonderful adventures. Special thanks to Steve Layton and E & B Natural Resources for their support during Greg's struggle with ALS.

I will be looking for "Strider" somewhere up the trail. He will be sitting by the campfire waiting for me to arrive.

Paul "Nohawk" Hacker
PCT '77
2/13/2015

Dear friends and colleagues,

As we approach our much anticipated event of the year – The 2015 PACIFIC SECTION CONVENTION, May 3-5, I'd like to remind you of some important and exciting events being held.

Come network with colleagues, make new friends, learn fresh ideas and new approaches to old challenges.

We have a stimulating array of field trips, including some that will be lead by some of our local legends like John Harris, Rick Behl, Greg Gordon, Thom Davis and Jim Boles (p. 20).

Our highly anticipated short courses feature a Monterey Core Workshop (a big hit in the past), a Petrophysics class, a Sequence Strat for Students workshop as well as an Environmental Permitting course (p. 20).

Please also, don't forget your significant others and family members. We will be offering some fun activities including wine tasting, a visit to the Ronald Reagan Library and a cruise aboard the Scarlett Belle (a beautiful paddlewheel riverboat).

We are also very excited to announce that we have some fantastic keynote speakers like Charles Sternbach (DPA Luncheon) and Alex Epstein (All Convention Luncheon) that are sure to tantalize your imaginations and give you some good food for thought (p. 18).

On another note, its that exciting time of year again: the PSAAPG Officer Elections. On the following pages you will find short bios of the candidates. Keep an eye out for your election ballots in the mail. Thank you candidates for your service and eagerness to be involved!

Sincerely,
Vaughn

President-elect

Robert Horton

EDUCATION

- B.S. Geology, 1973, State University of New York at Binghamton
- M.S. Geology 1977, University of Tennessee
- Ph.D. Geology, Geochemistry minor, 1985, Colorado School of Mines

EMPLOYMENT

- CSUB, Professor, 1992-present
- CSUB, Chair – Department of Geological Sciences, 2009-2012
- CSUB, Assistant Vice President for Grants, Research, and Sponsored Programs, 2007-2009
- CSUB, Chair – Department of Physics and Geology, 1992-1998, 2005-2006, 2009-2013
- CSUB, Professor various, 1984-1992
- Consultant, Denver, 1983-1984
- Anaconda Minerals Co., Research Geochemist, 1982-1983
- Bendix Field Engineering Corp., Senior Geologist, 1978-1979
- Bendix Field Engineering Corp., Geologist, 1977-1978
- Getty Minerals Corp., Geologist, 1976-1977

PRIOR SERVICE

- PSAAPG, Convention Technical Session Chair, 1991
- AAPG House of Delegates, 1991-1997
- AAPG HoD Alternate Delegate, 1997-2003, 2012-2015
- AAPG HoD Rules Committee, 1994-1996
- AAPG HoD Credentials Committee, 1996
- AAPG Distinguished Lecturer Committee, 2000-2003
- AAPG Committee for Preservation of Core Samples 1996-2001
- AAPG Annual Meeting, Topical Session Convener, 1996, 2001
- SJGS President, VP, Sec, range from 1986-1991
- SEPM Pacific Section, Vice President, 1994-95
- California Well Sample Repository, Director, 1995-present
- AAPG, A. I. Levorsen Award, 1993
- AAPG Pacific Section, Outstanding Educator Award, 1997
- 21 Publications and 63 Convention Presentations

Becca Lanners

EDUCATION

- BS in Geology from California State University, Long Beach. 2010
- MS in Geology from California State University, Long Beach. 2013

EMPLOYMENT

- Geologist at California Resource Corporation. November 2014 – Present.
- Geologist at Occidental Oil and Gas: 2013 – 2014
- Geoscience Specialist at Occidental Oil and Gas: 2011 – 2013
- Geotechnical Intern at Occidental Oil and Gas: 2009-2011

PRIOR SERVICE

- Secretary, Los Angeles Basin Geological Society: 2009-2011.
- Secretary, Pacific Section AAPG: 2011-2013
- Liaison to Student Chapters, PSAAPG: 2013- Present

Vice president

Kathleen J Miller

EDUCATION

- BS Geophysical Engineering, Montana Tech of the University of Montana, Butte Montana - 2003.
- MS Geophysical Engineering, Montana Tech of the University of Montana, Butte Montana - 2004

EMPLOYMENT

- Chevron USA, Bakersfield - Geologist. 2004-Present

PRIOR SERVICE
- Member of San Joaquin Geological Society (SJGS)

Laura Merrill Bazeley

EDUCATION

- B.S. in geology in 1975 from the State University of New York at Binghamton
- M.S. degree in geology in 1978 from the University of Delaware
- California Professional Geologist and a California Certified Hydrogeologist

EMPLOYMENT
- WZI Inc., Senior Technical Advisor 2006 – present.
- Consultant to various firms on environmental issues. 2006 to 1997:
- WZI Inc., Geologist to Manager of California Operations. 1997 to 1987:
- Consulting Geologist, Petroleum and Environmental Geology. 1986 to 1987:
- ARCO Oil and Gas, Exploration Geologist Western U.S. 1979 to 1986:

PRIOR SERVICE
- Secretary and President of the San Joaquin Geological Society, Secretary of the Pacific Section AAPG, Newsletter Editor from 1988 to 1991.
- Co-chair the DEG session at the PSAAPG Annual convention. 2014 & 2015.
- She has authored and co-authored a number of technical presentations for AAPG, PSAAPG and SJGS.

Secretary

Aaron Hebeler

EDUCATION

- California State University Northridge, MS Geology
- San Diego State University, BS Geology

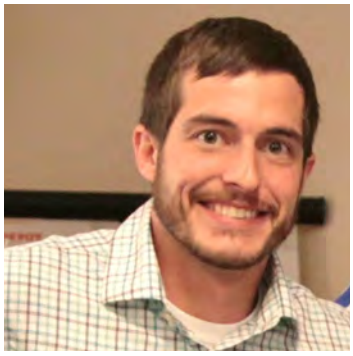
EMPLOYMENT

- Occidental Petroleum Vintage, Development Geologist 2010-2014
- California Resources Cooperation, Exploration Geologist 2015-Present

PRIOR SERVICE

- AAPG Imperial Barrel Award Participant; SDSU 2008

Shane Peterson



EDUCATION

- University of Wisconsin Eau Claire, BS Geology
- San Diego State University, MS Geology

EMPLOYMENT

- Geologist, Chevron E&P 2.5 yrs.
- SDSU Teaching Associate, 2 yrs.

PRIOR SERVICE

- Committee Member Annual Pacific Section Student Chapter Leadership summit 2014
- Committee Member Annual PSAAPG Convention 2014
- SDSU Student Chapter -Member at large 2010-2012

Treasurer-elect

Lisa A. Alpert

EDUCATION

- Ph. D. Geophysics, USC, 2012
- M. S. Geology, CSU Los Angeles, 2006
- B. S. Geology, CSU Los Angeles, 2003

EMPLOYMENT
- Aera Energy LLC, Bakersfield, Exploration Geophysicist, 2014
- Aera Energy LLC, Bakersfield, Geologist, 2012
- Bookkeeper, Quickbooks expert, various employers, Los Angeles area, 1995 – 2007

PRIOR SERVICE
- Member of AAPG, SEG, AGU, GSA

Marc Cooper

EDUCATION

- M. S. Geology, Louisiana State University
- B. S. Geology, Louisiana State University

EMPLOYMENT
- Senior Geologist, California Resources Corp / Oxy, 3 yrs.
- Geologist, Marathon Oil Company, 4 yrs.

PRIOR SERVICE
- PSAAPG Field Trip Leader, East-Side SJV, 2014
- AAPG Student Chapter at LSU – President, 2004-05

Historic Development of Fracturing and Hydraulic Fracturing
Part II – The Birth of the Petroleum Engineer (1930s-1950s)

Introduction

This article is Part II in a series of four historical write-ups covering the development of fracturing and hydraulic fracturing (well completion and stimulation techniques). Part l (Jan-Feb issue of 2015 PPG) covered the period of "**Explosives and Guns.**" Part II describes the birth of the Petroleum Engineers (roughly 1930s – 1950s). Part Ill will be featured in the next issue of PPG. It will focus on the crazy sixties.

The idea to write this series came from the fact that hydraulic fracturing has become a highly visible and controversial topic recently. This is evidenced by multitudes of news articles, regulatory workshops, local public hearings, documentaries, and films such as *Gasland, FrackNation and Promised Land*. With all the media attention, one is led to believe that hydraulic fracturing is a novel technology, only recently becoming utilized in oil fields. The truth of course is that downhole stimulation can be traced back as far back as the early 1800's.

The historic development of fracturing and hydraulic fracturing techniques for well stimulation began with the period of Explosives and Guns. As discussed in Part I of this series, the fracturing of the formation surrounding a well with the use of explosives and arms technology developed during times of war, starting with the Battle of Fredericksburg and then World War I (Testa, 2015). Part II of this story involves the use of non-explosive fluids, new processes, and the beginning of the age of the petroleum engineer. During the 1930s, and into the 1940s and 1950s, two techniques were experimented and eventually developed: matrix acidizing treatment and the development of the Hydrafrac Process.

Matrix Acidizing Treatment

By the 1930s, a concept slowly developed which capitalized on the injection of non-explosive fluids, or acids, which enhanced production by creating a flow channel in the formation to the well. Along with shooting as discussed in Part I, acidizing was one of the earliest methods developed for increasing well production.

Matrix simulation is a technique whereas a solvent is injected into the formation to dissolve some of the material present, which improves or increase permeability of the formation, thus improving production. Important to note is that such techniques are called "matrix" treatments because the solvent is injected at pressures below that which would cause fracturing (i.e., below the parting pressure). The objective is to significantly enhance or recover permeability near the wellbore, rather than affect a significant portion of the reservoir. Acidizing is the most common matrix simulation technique, in which an acid solution is injected into the formation with the intent to dissolve certain minerals in the formation. Other solvents used include organic solvents with the purpose of dissolving asphaltenes, parrafins, waxes, or other organic materials.

The most common acids used are hydrochloric acid (HCl) and hydrofluoric acid (HF). HCl is used primarily to dissolve carbonate minerals. Mixtures of HCl and hydrofluoric acid (HF) are used to attack silicate minerals such as clays and feldspars. Other acids, particularly some weak organic acids, are used in special applications, such as high-temperature wells. Being a near-wellbore treatment, in sandstone formations acid reaction is within one foot of the wellbore; whereas, in carbonates, acid reaction is within a few inches to as much as 10 feet from the well bore. Thus, this treatment is of limited benefit in an undamaged well, but significantly enhances productivity where near-wellbore damage is present.

The idea of using acid to dissolve the limestone, thus opening channels through which the oil could flow into the well first appears to have been developed in United States. Patent No. 556,669 was issued on March 17, 1896, to Herman Frasch, with a half interest being assigned to John W. Van Dyke (Figures 1 and 2). In lieu of exploding torpedoes, Frasch developed what he described as a new and superior method for increasing oil production. The essence of this method was the introduction of a large solution of HCl in the oil well, with fresh water being added later to force the acid further into the limestone. Frasch recommended the use of commercial hydrochloric acid containing from 30% to 40% by weight of the acid gas HCl, and further recommended that the acid remain in the well for twelve hours. A suitably arranged packer was to be used to confine the acid to the lower or oil-yielding portion of the well hole.

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Frasch also recognized that the hydrochloric acid was likely to corrode the metal well equipment. Hence, the patent suggested that the regular well tubing be removed and that an enameled or lead-lined pipe be inserted to conduct the acid down into the well, "or it may be otherwise made proof against corrosion." An additional suggestion was that an alkaline liquid be introduced to neutralize the acid after it had performed its function.

Frasch (1896) described the technique first used in 1895 in which HCl is injected into a limestone formation, where it reacts to create channels and enhanced porosity and permeability within the rock. His process required the pipe to be lined with rubber or some other corrosion-resistant coating. Corrosion inhibitors were not envisioned as yet. Although initial impressive results were reported, their actual use declined likely due to corrosion. It would be 30 years later when the Gypsy Oil Company found a way to inhibit HCl and remove calcium sulfate deposits. The inhibitor was developed earlier in the steel industry for the acid pickling of metals.

Frasch's method proved successful in disintegrating limestone rock and increasing the flow of oil. The record shows that at least fourteen commercial wells near Lima, Ohio, were treated with this process in 1895 and 1896, resulting in substantial production increases in most instances. Wide publicity was given to these operations. But despite this success, Frasch and Van Dyke soon discontinued their work along these lines. The reasons for this abandonment are not clear but a relatively undeveloped oil industry may be cause, although others contended that the method was so cumbersome and expensive that it was commercially impracticable.

The Modern Era of Acidizing

The modern era of acidizing began on February 11, 1932, with work being done by the Dow Chemical Company. Early treatments were performed in an attempt to dispose of surplus HCl; however, these acid disposal wells were soon observed to accept fluids at an increasing rate. Later treatments on brine-producing wells at the Dow plant located in Midland, Michigan, resulted in increased brine flow. It was this observation that led to using this process for enhancing oil production.

The treatment consisted of siphoning 500 gallons of HCl containing two gallons of an arsenic inhibitor into a well owned by Pure Oil Company, and displaced it with an oil flush. The goal was an attempt to dispose of excess HCl, but it was also noted that these acid disposal wells accepted fluids. This event was the first use of an inhibited acid within a limestone formation, producing 16 barrels of oil per day from a well that was previously dry. The use of inhibited acid to treat oil wells spread quickly, and the Dow Well Service Group was formed to exploit this new process. The first two words of the company's name were combined, becoming Dowell, Inc., in November 1932. Other service companies soon followed. Within three years, acidizing was practiced widely.

The first hydraulic fracturing treatments were probably performed with acid, although they were not recognized at the time. Wells in tight carbonate formations would usually not accept acid until a critical pressure was reached. However, after this pressure was reached, acid could be easily injected at high rates. It was later recognized that these wells had been hydraulically fractured. For this reason, later hydraulic fracturing patents were never enforced against acid fracturing treatments.

The Hydrafrac Process

The first paper published on hydraulic fracturing, or also referred to at the time as the "*hydrafrac*" process was by J.B. Clark with Stanolind Oil and Gas Company, Tulsa Oklahoma, titled "*A Hydraulic Process for Increasing the Productivity of Wells*" (Clark, 1949), who also credited R.F. Farris, C.R. Fast, G.C. Howard, J.A. Stinson, and other members of Stanolind Oil and Gas Company. The paper was first presented however at the American Institute of Mining Engineers, Petroleum Division Fall Meeting, held in Dallas, Texas, from October 1-4, 1948. At the time of publication, the Hydrafrac process had been applied to 23 wells in seven fields, with sustained increase in production in 11 wells. Riley "Floyd" Farris and Bob Fast with Standolind Oil in Tulsa Oklahoma, first used the Hydrafrac process in limestone in the Klepper #1 well in the Hugoton natural gas field in southwestern Kansas, using a napalm-thickened gasoline in November 1946. Other locations for field tests also included the Frannie field in Wyoming, East Texas field, Rangely field in Colorado, and East Sasakwa field in Oklahoma.

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The process consisted of two steps (Figures 3 and 4). The first step consisted with the injection of "*a viscous liquid containing a granular material, such as sand for a propping agent, high hydraulic pressure to fracture the formation*". The second step was to cause "*the viscous liquid to change from a high to a low viscosity so that it may be readily displaced*." The initial viscous liquid used consisted of an oil such as crude oil or gasoline, with an added "bodying" agent. Napalm gel was used in the majority of experiments reflecting availability and cost.

Summary

The Hydrafrac process was applied to wells partially depleted, but it was also remarked at the time that new wells could improve their productivity by application of the process. The concluding statement by Clark in his 1949 paper was "*It is significant that the value of the oil and gas produced to date through the benefits of this process has already exceeded the combined cost of research, development, and all field tests.*"

Other important papers published during the mid-Century included Fast (1946), Howard and Fast (1950), Farris (1952), Hubbert and Willis (1957). Concurrent with Clark's work in 1949, other important studies were being undertaken including evaluating the time spent for cement to set and gain a given minimum strength (Fast (1946), and the possibility of squeezing outward into a formation an impermeable lens or pancake of cement at select elevations in a well bore to control the migration of undesirable fluids into the producing well (Howard and Fast, 1950). These techniques were mechanically related to three other phenomena: 1) pressure parting in water-injection wells in secondary-recovery operations; 2) lost circulation during drilling; and 3) the breakdown of formations during squeeze-cementing operations. These three phenomena all appeared to involve the formation of open fractures by pressure applied in a well bore. Hubbert and Willis (1957) noted that hydraulic-fracturing techniques for well stimulation were one of the major developments in petroleum engineering over the past decade. In order to evaluate the ability of a Hydrafrac treatment to effect a sustained increase in well production, data were accumulated on the first 65 wells in 26 fields treated by Stanolind, and the treatment was found to be capable of affecting a sustained increase in production (Farris, 1952).

Since Clark's work in 1949, the use of Hydrafrac techniques had progressively expanded such that, by the end of 1955, more than 100,000 individual treatments had been performed (Hubbert and Willis, 1957). Gold (2014) would make note that this early period of innovation and well stimulation would lessen the role of the wildcatter, and commence the beginning of the age of the petroleum engineer.

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(Continued on next page)

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Figure 1. United States chemist Herman Frasch (1851-1914).who developed the sulfur mining process and a method for removing sulfur from crude oil, both referred to as the Frasch process.

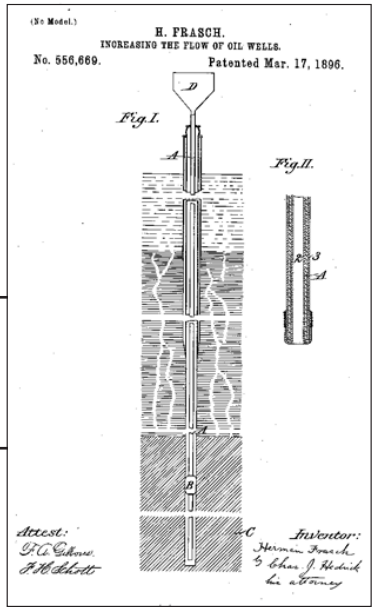


Figure 2. Herman Frasch U.S. Patent No. 556,669 illustrating the increasing the flow of oil in a well (Frasch, 1896).

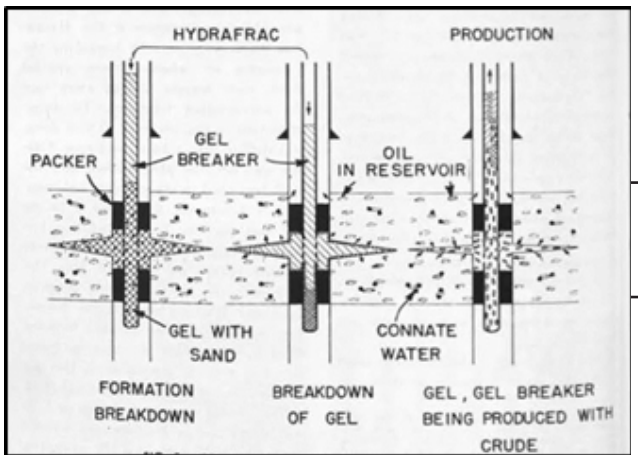


Figure 3. Sequence of steps in the Hydrafrac process (Clark, 1949).

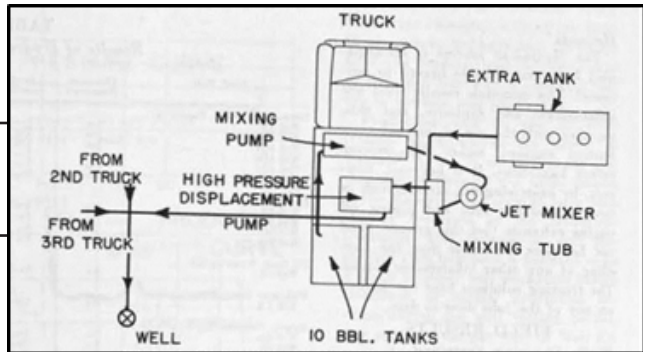


Figure 4. Typical well set-up for the Hydrafrac process (Clark, 1949).

Catch the Energy Wave!!

At the 2015 Pacific Section Convention

May 3-5, 2015

Come one, come all -- Petroleum geologists, geophysicists, groundwater geologists, engineers, you name it! Spouses and families will have a great time too at this terrific location on the beach. Close proximity to Channel Islands National Park, two scenic harbors, the Reagan Presidential Library, and fantastic field trip geology. Thrilling talks and camaraderie coming up – Cowabunga!!!

Plan on making the trip to the Mandalay Beach Hotel & Resort Embassy Suites, 2101 Mandalay Beach Road, Oxnard, CA 93035

Also seeking Sponsors and Exhibitors

Contact: General Chair Joan Barminski at Joan.Barminski@boem.gov

Hosted by the Coast Geological Society www.coastgeologicalsociety.org

Coast Geological Society
Established 1948
Coast Geological Society, P.O. Box 3055, Ventura, CA 93006

Exhibitor space is now available for 2015 Pacific Section Convention

Exhibitor Booths are now available for the 2015 Pacific Section Convention. The event will be held at the Mandalay Beach Hotel & Resort in Oxnard, California from May 3-5, 2015.

Exhibits provide you and your company or organization a great venue for interacting with petroleum and geoscience professionals, students, and educators from across the western states.

Over 500 people are expected to attend and ample opportunity to visit your booth will be afforded during the Icebreaker on Sunday May 3rd and each day of the convention. Socializing opportunities in the Exhibit Hall will bring people together for collegial information exchange as they view new products and services, talk with sales reps, and network with colleagues in the business of geology.

Exhibitors will be recognized through logo and name placements in the Convention Announcement, Convention Program, PSAAPG Newsletter and Website, and Convention Site Banners.

The Exhibit Hall is an integral part of the Pacific Section Convention, and is always well-subscribed and well-attended. Be a part of the gathering in May 2015 by displaying your products or services.

Please contact Exhibit Chair Eric Kroh at ekroh@slb.com for information or with questions.

2015 PSAAPG Convention Sponsorship Opportunities

It is time to support the upcoming PSAAPG Convention as a Sponsor! The Convention will be May 3-5, 2015, at the Mandalay Beach Hotel & Resort in Oxnard, CA. This is a true beachfront location with miles of sandy shoreline at the hotel doorstep.
As a Convention Sponsor, you will support the most prestigious gathering of petroleum and geoscience professionals, educators, and students in California. More than 500 attendees are expected in 2015. Sponsors receive wide recognition through logo/name placements in the Convention Announcement, Convention Program, PSAAPG Newsletter and Website, and Convention Site Banners. More than thirty sponsors participated last year. This year sponsors can choose from five sponsorship levels.

- Platinum $10,000
- Gold $5,000
- Silver $2,500
- Bronze $1,000
- Patron $250

Convention sponsors are not only critical to the funding of the convention but help the PSAAPG fulfill its mission of increasing professionalism, supporting education, funding student scholarships, and producing and conserving professional publications.
Please contact me for sponsorship information or with questions:
Mike Nelson, Sponsorship Chair, 805-890-2922, mnelson@dcorllc.com

PSAAPG All Convention Luncheon Speaker: 4 May 2015

Alex Epstein - Energy expert and author of the national bestseller *The Moral Case for Fossil Fuels*.

Alex is the president and founder of the Center for Industrial Progress (CIP), a for-profit think tank championing fossil fuels.

In a culture where fossil fuels are often condemned as "dirty", Epstein argues that they are actually the life-giving energy of our modern world – and therefore should be celebrated, not demonized.

A philosopher by training, Epstein challenges many of our era's popular notions about energy, industry, and environment, routinely engaging environmentalists in open debate over the big picture benefits of fossil fuels. His work has garnered both heavy praise from supporters and fierce opposition from adversaries.

Epstein's writings on energy have been published in *The Wall Street Journal, Forbes, and Investor's Business Daily*, among hundreds of other publications. A highly sought-after speaker, he has spoken on the economic and environmental benefits of fossil fuels at dozens of universities, including Stanford, Duke, Rice, and UCLA. He has also defended fossil fuel energy in debates against Greenpeace, 350.org, and the Sierra Club. Alex's think tank, CIP, regularly consults with industry in and outside of America, where his keynote appearances and company strategy sessions have inspired and galvanized industry professionals, from high-level executives to workers in the field.

DPA Luncheon, May 5, 2015

Dr. Charles Sternbach – DPA Featured speaker – founder of the AAPG Playmaker program and forum!!

During his 4 years as president-elect, president, and past president of AAPG's Division of Professional Affairs (DPA) Charles created, organized, and moderated Playmaker Panels. He founded the AAPG Playmaker program and chairs DPA's Playmaker Committee. Charles loves hearing oil finders tell discovery stories. He is pleased others share this interest. To facilitate presentations on discoveries, Charles encourages organizers to create Playmaker Forums wherever explorers gather.

ABSTRACT:

"Heritage of Discovery: Resources for Explorers". AAPG and its Division of Professional Affairs (DPA) can help today's explorer with both technical and professional resources accessible on the internet. These include:

Charles will demonstrate how explorers can access valuable information from the internet on desktop, laptop, tablet or mobile device. Many geoscientists already watch a video presentation during their lunch hour of legendary explorers explain how they made major discoveries. Some geoscientists watch a talk with their team in a conference room and discuss elements of success. You can too! These presentations form an important part of our geoscience heritage. Each of us has the duty to employ this heritage so that we may improve it for those who come after us.

PSAAPG Spouse Activities

Bring your guest or spouse to the Convention. They will enjoy the ambience at the beach and harbor area, and can visit nearby locales on both Monday and Tuesday. Here's the lineup!

Monday, May 4th. Ronald Reagan Library

In a storied career that spanned over 5 decades, Ronald Reagan inspired American's to act and achieve even more than they imagined. His legacy thrives at the Reagan Library where events and exhibits rediscover his values, actions and spirit of determination. Join the spouses on a day trip to Thousand Oaks with a guided tour of the Library, lunch included.

Tuesday, May 5th. Historic Downtown Ventura

Historic Downtown Ventura includes charming and eclectic shops, unique art galleries, wine/beer tasting venues and great restaurants. Also, in historic downtown cultural district sets Father Serra's 9th Mission, the last one he established in his lifetime. San Buenaventura City Hall features a historic architectural style all of its own. Ventura County Art and History Museum is a must see. An easy Walking Tour including a Group lunch at Capriccio's.

Monday and Tuesday. Wine Tasting

Wine Tasting in our Private Presidential Hospitality Suite - Beach Front View. Spouses gather in the Suite to enjoy the view, the weather, good wine (snacks) and great conversation.

Monday Evening Dinner Activity: Riverboat Cruise

Cruises Aboard Southern California's Newest Paddlewheel Riverboat.
The Scarlett Belle is a beautiful Paddlewheel Riverboat built specifically for an all inclusive social event experience. situated in the beautiful Channel Islands Harbor, escape to a beach paradise with cool breezes, palm trees, majestic mountains, and spectacular sunsets. Celebrate in style with up to 150 friends and family members. Sit back, and enjoy panoramic views of the harbor from our fully enclosed upper deck. Experience an Exquisitely prepared dinner while you cruise

2015 PSAAPG Convention Field Trips:

The PSAAPG is pleased to announce that seven field trips are planned for this year's convention, representing a wide variety of geological topics and settings, located within an easy drive of the Oxnard-Ventura area.

On Saturday, May 2, *the Modern Coastal Environments* trip will include visits to various locales along the California coast to observe current depositional systems at work. Also on Saturday we'll have a *Ventura Basin Seeps Tour* in which numerous active seeps in the Ventura area will be visited and discussed. These trips will be led by Alex Simms of UCSB and John Harris of Numerical Solutions respectively.

On Sunday, May 3, we have two more exciting trips planned. Rick Behl's Monterey field trip will visit several Miocene outcrops between Paradise Cove and Point Mugu, and will be a great opportunity for those interested in learning more about Monterey stratigraphy in the northerly part of the Los Angeles Basin. Clastic to siliceous sequences will be observed, as well as numerous sedimentary structures, and there will also be some discussion on tectonic evolution of this part of the California coast.
We also have a Sespe Formation field trip planned for Sunday which although still somewhat tentative may include visits to both proximal and distal Sespe outcrops and possibly an opportunity to view some Sespe core.

Following the completion of the technical sessions on Tuesday afternoon, Greg Gordon will lead a field trip into the eastern Ventura Basin on Wednesday, May 6, to view Modelo Formation submarine fan architecture and lithofacies distribution. Then on the following day, May 7, you'll have the opportunity to study Ventura Basin hydrocarbon habitats with a special emphasis on the complex structural geology in this highly deformed setting. Thom Davis will be leading that trip. Finally, last but not least, we plan a full day excursion to Santa Cruz Island on Friday, May 8, to view fascinating outcrops in the seldom visited south central part of the island, including spectacular fossil beds, conglomerate and breccia that reveal intraplate motion and deformation, and volcaniclastic "Monterey-like" sequences with an unknown source. Dr. Jim Boles of UCSB will lead this trip to the largest island in Channel Islands National Park.

2015 PSAAPG Convention Short Courses:

During the convention, four short courses, on a range of technical and regulatory topics will be provided by experienced industry professionals. In addition to these four courses a workshop will be held for K-12 teachers to help them bring earth science and geology to the classroom.

On Saturday and Sunday Morgan Sullivan of Chevron will provide a sequence stratigraphy course for students only. This course will provide a historical perspective on the development of stratigraphy in general while primarily focusing on the development of sequence stratigraphy. A mix of lectures and hands-on exercises will be provided, utilizing datasets that were instrumental in formulating concepts of sequence stratigraphy.

On Saturday, the Monterey Formation core workshop will feature a number of cores not displayed previously and will focus on techniques for sequence stratigraphy, reservoir characterization, and exploration that apply not only to the Monterey, but also to mudstone reservoirs globally. There will be hands-on applications, discussions, and core viewing, along with a bar-b-que lunch. The course will be held at the Shell/Aera Clubhouse at Ventura field, and the instructors are AAPG distinguished lecturer and recent Berg Researcher Award recipient Kevin Bohacs, and Dan Schwartz and Jon Schwalbach, who together have multi-decades of experience working with Monterey rocks in exploration, development, and research settings.

Brent Miyazake, Bill Gorham, and Michael Smith of AECOM will provide a course on environmental permitting on Tuesday. Environmental permitting typically presents many challenges to project implementation, especially in California. Permit requirements range from compliance with the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA), to characterizing seasonal wetlands, identifying threatened and endangered species or running specialized models for air quality permits. Many permits require substantial studies, analyses and documentation.

(Continued on next page)

Strategic planning and early project coordination is necessary to minimizes potential schedule delays. The workshop will provides guidance to address a range of environmental permits typically required to initiate upstream oil and gas projects.

On Wednesday Thomas Howard, Dan Pignatiello, and Deborah Olson will instruct a petrophysics course. This course will cover a range of topics beginning with a brief overview of logging techniques as well as how to effectively work with ancient logs. Other topics covered will include Archie's Equation, an overview of shaly sand methods, and other petrophysical problems that may be suggested by course participants.

Short Course Details

Title: Sequence Stratigraphy for Students
Instructor: Morgan Sullivan (Chevron)
Date: Saturday and Sunday, May 2-3, 2015
Description: This two day short course, for students only, provides a historical perspective on the development of stratigraphy in general and focuses on the development of sequence stratigraphy in particular. Sequence stratigraphy is a methodology that uses stratal surfaces to subdivide the stratigraphic record. This methodology allows the identification of coeval facies, documents the time-transgressive nature of classic lithostratigraphic units, and provides geoscientists with an additional way to analyze and subdivide the stratigraphic record. We provide a mix of lectures and hands-on exercises utilizing datasets that were instrumental in formulating concepts of sequence stratigraphy.

Title: Understanding and Streamlining the Environmental Permitting Process for Upstream Oil & Gas – Formula for Success
Instructor: Brent Miyazake, Bill Gorham & Michael Smith (AECOM)
Date: Tuesday May 5, 2015
Description: Environmental permitting typically presents many challenges to project implementation, especially in California. Permit requirements range from compliance with the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA), to characterizing seasonal wetlands, identifying threatened and endangered species or running specialized models for air quality permits. Many permits require substantial studies, analyses and documentation.

Strategic planning and early project coordination minimizes potential schedule delays. When is the best time and what is the optimal process to initiate strategic planning and early project coordination to ensure project success?

The workshop will address this question and provides guidance to address a range of environmental permits typically required to initiate upstream oil and gas projects.

Title: Monterey Core Workshop
Instructors: Jon Schwalbach & Kevin Bohacs (Aera)
Date: Saturday May 2, 2015
Description: On Saturday, the Monterey Formation core workshop will feature a number of cores not displayed previously and will focus on techniques for sequence stratigraphy, reservoir characterization, and exploration that apply not only to the Monterey, but also to mudstone reservoirs globally. There will be hands-on applications, discussions, and core viewing, along with a bar-b-que lunch. The course will be held at the Shell/Aera Clubhouse at Ventura field, and the instructors are AAPG distinguished lecturer and recent Berg Researcher Award recipient Kevin Bohacs, and Dan Schwartz and Jon Schwalbach, who together have multi-decades of experience working with Monterey rocks in exploration, development, and research settings.

Title: Petrophysics
Instructors: Thomas Howard, Dan Pignatiello & Deborah Olson
Date: Wednesday May 6, 2015
Description: This course will cover a range of topics beginning with a brief overview of logging techniques as well as how to work effectively with ancient logs. Other topics covered will include Archie's Equation, an overview of shaly sand methods, and other petrophysical problems that may be suggested by course participants.

Alaska Geological Society Membership Renewal:

Dear AGS Member,
In May, 2015 the Alaska Geological Society will cease to print and mail out the monthly newsletter and all future newsletters will go out as electronic (pdf) files attached to e-mails. The AGS Board of Director's decision to distribute newsletters in solely an electronic format was reached because the preparation and mail-out of printed newsletters is one of the largest costs borne by the Society and is not offset by revenues from dues, thus eroding the reserve scholarship funds. At present our membership roster lists 263 past and present members, most receiving printed newsletters, with 97 active members (dues paid through November 2015).

To continue to receive the AGS newsletters after May 2015, you will need: 1) to be an active member (annual dues paid up); and 2) to provide the Society with a functional e-mail address. Membership renewals or submissions of updated e-mail addresses can be done through the AGS web page at http://www.alaskageology.org/membershipSUBMIT.htm or by e-mail to membership@alaskageology.org, respectively. If you want to find out your membership status please contact the AGS at membership@alaskageology.org and we will be happy to reply with a check of our records. The AGS membership dues cycle starts on November 1st of each year.

ANSWERS TO PRESIDENT'S MESSAGE QUESTIONS, page 5:

1- Pound Stone.
2- Faunal succession is a means of finding stratigraphic order – through the knowledge of diagnostic fossils in each rock layer.
The principle of faunal succession, also known as the law of faunal succession, is based on the observation that sedimentary rock strata contain fossilized flora and fauna, and that these fossils succeed each other vertically in a specific, reliable order that can be identified over wide horizontal distances.
3- In geology, cyclothems are alternating stratigraphic sequences of marine and non-marine sediments, sometimes interbedded with coal seams. Historically, the term was defined by the European coal geologists that worked in coal basins formed during the Carboniferous and earliest Permian periods. The cyclothems consist of repeated sequences, each typically several meters thick, of sandstone resting upon an erosional surface, passing upwards to pelites (finer-grained than sandstone) and topped by coal.

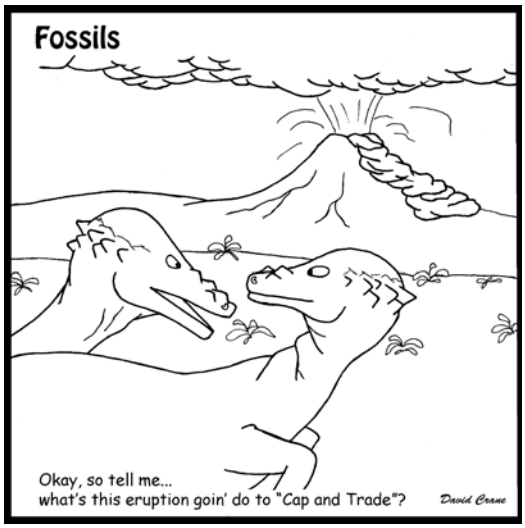
Tenure-Track Faculty Position in Sedimentary Geology / Earth System Science, California State Polytechnic University, Pomona

The Geological Sciences Department invites applications for an Assistant Professor tenure-track appointment beginning September 2015. Applicants must hold a PhD in Geology or a related field by August 2015. The ideal candidate will have teaching and research interests that link shallow lithosphere sedimentary processes with specialized fields such as Sedimentology, Stratigraphy, Earth History, Global Environmental Change, Critical Zone Science, Energy Resources, Basin Analysis, Marine Geology. We seek a versatile faculty member to teach Sedimentary Geology and Earth Time and Life, and contribute to instruction of courses such as Blue Planet, Petroleum Geology, Oceanography, Meteorology, Coastal Processes, Geotectonics, GIS Applications and our popular Field Modules that utilize modern digital mapping tools and instrumentation. The successful candidate is expected to ensure that our curriculum in their specialty area remains current, engage students in research and supervise MS and Senior theses. He/she should have experience with field studies and data collection using modern instrumentation. Preferred qualifications include demonstrated success with external funding, established ties to research institutions, petroleum industry or government agencies and interest in developing intradepartmental and cross-campus collaborations. Applicants must submit a signed application form (see http://academic.csupomona.edu/faculty/docs/application.pdf), letter of interest, CV, statement of teaching and research interests, and contact information for five professional references. A campus interview, three formal reference letters and official confirmation of degree transcripts are required of all finalists. Initial screening begins January 7, 2015. Mail application materials to Search Committee Chair, Geological Sciences Department, California State Polytechnic University, Pomona, CA 91768. Cal Poly Pomona is an affirmative action, equal opportunity employer. Full Position Description: http://geology.csupomona.edu/employment.htm.

Alaska Geological Society

Alaska Geological Society luncheon meetings are held at the BP Energy Center in Anchorage, Alaska.
The meetings are typically scheduled on the 3rd Thursday of each month 11:30 AM – 1:00 PM

March 19th, 2015, 11:30-1:00 pm
Speaker: Phil Manning, University of Manchester – AAPG Distinguished Lecturer. "Arctic Dinosaur Evolution"



Coast Geological Society

March 16th, 2015
Speaker: Dr. Alexander Simms, Professor at UCSB.
Talk will be on Bayhead Deltas

April 20th, 2015
Speaker: Dr. Michael Malaska, NASA, JPL.
"Exploring Titan's Earthlike landscape"

L.A. Basin Geological Society

March 26th, 2015
Speaker: Jay Namson
"Fold and Thrust Belt Structural Style of the Southern Coast Ranges & Western Transverse Ranges"

April 23rd, 2015
Speaker: Shannon Higgins Borchardt "Geomechanics of Unconventional Reservoirs"

Northern California Geological Society

March 25th, 2015, 7:00pm
Speaker: Dr. Jake Lowenstern, USGS
"The Yellowstone Volcano: Past, Present and Future -Monitoring the sleeping giant beneath Yellowstone National Park"

April 29th, 2015, 7:00pm
Speaker: Dr. Robert B. Miller, Professor and Chair of Geology, San Jose State University
"Interpretations of Magmatic Fabrics and Structures: Insights from the Sierra Nevada and North Cascades"

Field trips
Saturday March 21st, 2015
Leader: Dr. Todd J. Greene, California State University, Chico
"Anatomy and provenance of a deep-water boulder conglomeratic submarine canyon in the Upper Cretaceous Panoche Formation (Cenomanian), Great Valley Group, San Luis Reservoir, central California"

Saturday April 25th, 2015
Leader: Dr. Allegra Hasford Scheirer and Dr. Leslie B. Magoon, Stanford University
"An undefined Petroleum system along the Santa Cruz County coast, California"

Northwest Energy Association

March 19th, 2015
Speaker: Yumei Wang, DOGAMI
"Oregon's Preparation for a Cascadia Seismic Event"

April 16th, 2015
Speaker: Charlie Stinson, CS Energy
"Compressed Air Energy Storage Project Test Results"

Sacramento Petroleum Association

2015 SPA membership. Please send to: SPA, P.O. Box 1844, Folsom, CA 95763-1844.
Still $15/year, (or $20/yr. for hardcopy).

San Joaquin Geological Society

March 10th, 2015
Speaker: Dr Gary Acton
Title to be published via SJGS announcements

April 14th, 2015
Speaker: Jason Saleeby, Caltech
Title to be published via SJGS announcements

April 15th, 2015
Dr Saleeby is leading a field trip to the eastern side of the San Joaquin basin and the Southern Sierra, for the SJGS.

Alaska Geological Society

www.alaskageology.org

P. O . Box 101288
Anchorage, AK 99510

Contact: Eric Cannon
eccannon@gmail.com

Luncheon meetings are held monthly September through May, usually on the third Thursday of the month, at the BP Energy Center (1014 Energy Court) from 11:30 a.m. to 1:00 p.m. The hot lunch cost is $20 for members with reservations; $22 for non-members with reservations; and $25 without reservations. The box lunch cost is $13 for members with reservations, $15 for non-members with reservations, and $18 without reservations. For reservations, call the AGS reservation voice mail at 907-258-9059 or contact David Hite at hiteconsult@acsalaska.net by noon on Monday before the meeting.

President:	Matt Frankforter	mfrankforter@hilcorp.com
President-Elect:	Keith Torrance	ktorrance at apcservicesllc.com
Vice-President:	Monty Mabry	monte.mabry@bp.com
Secretary:	Eric Cannon	eric_cannon@golder.com
Treasurer:	Alan Hunter	paleoman@mac.com
Past-President:	Ken Helmold	ken.helmold@alaska.gov

Coast Geological Society

www.coastgeologicalsociety.org

P. O. Box 3055
Ventura, CA 93006

Contact: Peter Morris
805.745.2149

Dinner meetings are held monthly September through May, on the third Tuesday of the month, at Poinsettia Pavilion, 3451 Foothill Road in Ventura. Social hour starts at 6:00 p.m., dinner is served at 7:00 p.m., and the talk starts at 8:00 p.m.
The cost of dinner with reservations is $20 (members), $25 (non-members), or $10 (students and K-12 teachers).
For reservations, please email Bonnie Walters (secretary@coastgeologicalsociety.org), and should be made by 4:00 p.m. on the Friday before the meeting.

President:	Bob Blackmur	president@coastgeologicalsociety.org
Past President:	Peter Morris	pastpresident@coastgeologicalsociety.org
Vice President:	Bonnie Walters	vicepresident@coastgeologicalsociety.org
Secretary:	Alastair Haddow	secretary@coastgeologicalsociety.org
Treasurer:	Theresa Heirshberg	treasurer@coastgeologicalsociety.org
Membership:	Nick Kunstek	membership@coastgeologicalsociety.org
Webmaster:	Whit Skaling	webmaster@coastgeologicalsociety.org

Los Angeles Basin Geological Society

www.labgs.org

Contact: Jean Kulla
949-500-3095

Luncheon meetings are held monthly September and October; and January through June, usually on the fourth Thursday of the month, at The Grand at Willow Street Conference Centre (4101 E. Willow Street) in Long Beach. Lunch is served at 11:30 a.m., and the talk starts at 12:15 p.m. The cost is $25 (with reservations), $30 (without reservations), $20 for retired members, and $5 for students. Reservations can be made online at www.labgs.org or by contacting Graham Wilson at 562-326-5278 or GWilson@SHPI.net Reservations must be made prior to Tuesday before the meeting.

President:	Jean B. Kulla	k2mobile@MSN.com
Vice President	Katherine Kovac	kovac_km@yahoo.com
Treasurer:	Bert Vogler	hvogler@kleinfelder.com
Secretary:	Graham Wilson	Gwilson@SHPI.net
Scholarships:	Karla Tucker	ktkr2@aol.com

Northern California Geological Society

www.ncgeolsoc.org

9 Bramblewood Court
Danville, CA 94506-1130

Contact: Barb Matz
Barbara.Matz@CBIFederalServices.com

Evening meetings are held monthly September through May, usually on the last Wednesday of the month, at the Masonic Center (9 Altarinda Road) in Orinda. Social hour starts at 6:30 p.m., and the talk starts at 7:00 p.m. (no dinner).
For reservations, contact Dan Day at danday94@pacbell.net before the meeting.
Cost is $5 per regular member; $1 per student member; and $1 per K-12 teachers.

(Continued on next page)

NCGS Officers:

President:	Will Schweller	willschweller@yahoo.com
President-elect:	vacant	vacant
Program Chair:	John Karachewski	cageo@sbcglobal.net
Secretary	Dan Day	danday94@pacbell.net
Treasurer	Phil Reed	philecreed@yahoo.com
Membership Chair	Tom Barry	tomasbarry@aol.com
Newsletter Editor	Mark Detterman	mdetter1@gmail.com
Field Trip Coordinator	Tridib Guha	tridibguha@yahoo.com
Past President	Phil Reed	philecreed@yahoo.com
Scholarships	Phil Garbutt	plgarbutt@comcast.net

Northwest Energy Association
www.nwenergy.us

P. O. Box 6679
Portland, OR 97228-6679

Contact:
Jim Jackson or John Armentrout

Luncheon meetings are held monthly September through May, on the third Thursday of the month, at the Multnomah Athletic Club (1849 SW. Salmon Street) in Portland, Oregon. Meeting time is at 11:45 AM to 1:00 PM (speaker about 12:15 PM). The cost is $25 for members and $30 for non-members. For information or reservations email NWEnergyAssociation@gmail.com, or our Postal Box: Northwest Energy Association, P.O. Box 6679, Portland, Oregon 97228-6679.

President	John Armentrout	jarmenrock@gmail.com
Vice-President	Bill Rodgers	wlrodgers@stoel.com
Past President	Jim Jackson	jackson.js@comcast.net
Treasurer	Barb Portwood	bbportwood@gmail.com
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House of Delegates:	John Armentrout, Anne Fix	

Sacramento Petroleum Association

P. O. Box 1844
Folsom, CA 95763-1844

Contact: David Hartley
530.304.4277

Luncheon meetings held monthly January through November, on the third Wednesday of the month.
Location: Club Pheasant Restaurant in West Sacramento. The meetings starts at noon. The cost is $16 - $20.
For information or reservations, contact Pam Ceccarelli.

President:	Jerry Reedy	JWR5532@aol.com
Vice-President:	David Hartley	drilmax1@aol.com
Secretary	Derek Jones	djones@gasbiz.com
Editor/Treasurer	Pam Ceccarelli	pc626@comcast.net

San Joaquin Geological Society
www.sanjoaquingeologicalsociety.org

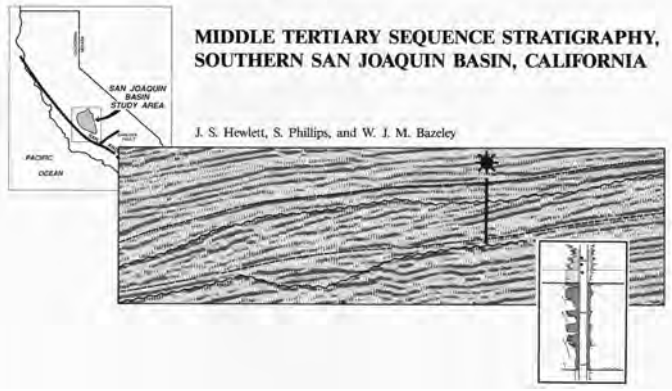
P. O. Box 1056
Bakersfield, CA 93302

Contact: Laura Bazeley
lbazeley@wziinc.com

We have dinner meetings on the second Tuesday of the month at the American Legion Hall at 2020 "H Street" in Bakersfield. There is an icebreaker at 6:00 p.m., dinner at 7:00 p.m., and a talk at 8:00 p.m.
Dinner is $25 for members with reservations and $30.00 for nonmembers and members without reservations. Students may attend for free.

President:	Anne Draucker	AnneDraucker@chevron.com
Past President:	Laura Bazeley	lbazeley@wziinc.com
President-Elect:	Ariel Auffant	aauffant@chevron.com
Vice-President:	Greg Gordon	gsgordon@aeraenergy.com
Secretary:	John Abeid	John.Abeid@chevron.com
Treasurer:	Corine Armstrong	Corine.Armstrong@chevron.com

PSAAPG Has A New Publication – MP 51



"This publication follows from a technical project in the ARCO sequence stratigraphy group in Plano, Texas. This study was published as an internal company research report in 1989 in the early days of sequence stratigraphy. Twenty-five years later, the authors chose to not alter the original text and figures except to satisfy a few publication requirements – we hope the studies contribute to understanding the future exploration potential of the southern San Joaquin basin."
Originally published in-house in 1989 by ARCO: Hewlett, J. S., Phillips, S., & Bazeley, W. J. M.

This is an 11" X 24" spiral-bound book with B/W and color figures, 73 p. (1st edited version)

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