



# SAN DIEGO ASSOCIATION OF GEOLOGISTS

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## SDAG MEETING ANNOUNCEMENT

**WEDNESDAY, July 16, 2014**

### **A Geochemical Approach to Determine Sources and Movement of Saline Groundwater in a Coastal Aquifer**

*Presented by:*

Dr. Robert Anders  
United States Geological Survey  
CaWSC, San Diego Projects Office

- Where:** Casa Machado (see next page for a map)  
3750 John J. Montgomery Dr. San Diego, 92123
- When:** 5:30 pm – Social Hour  
6:30 pm – Dinner  
7:30 pm – Program
- Dinner:** Deluxe Mexican Buffet. Shrimp, Chicken and Beef Fajitas, & Cheese Enchiladas. Cash bar
- Cost:** \$30 per person, \$5 discount for members, STUDENTS and PROFESSORS: \$15. Add \$5 if you did not make a reservation.

**Reservations:** Make your reservation online at [www.sandiegogeologists.org](http://www.sandiegogeologists.org) **no later than noon, Monday, July 14th.** Reservations well in advance of the deadline are MUCH appreciated.



**RESERVATIONS CANNOT BE GUARANTEED AFTER MONDAY AT 12 NOON BUT THEY ARE ALWAYS PREFERRED OVER WALK-INS**

## **ABSTRACT**

For many population centers in coastal areas, future development of the local groundwater resources is limited by the presence of saline groundwater in some parts of the coastal aquifer system. For a study in the coastal San Diego area of southern California, an isotopic approach was used to investigate the sources and movement of saline groundwater. Chemical and isotopic data were collected from multiple-depth monitoring-well sites near the San Diego coastline at discrete intervals to depths of more than 650 meters. The groundwater samples were analyzed for major and minor ions, the stable isotopes of hydrogen, oxygen, and strontium, and radioactive isotopes of tritium and carbon-14. Each chemical and isotopic tracer preserves some aspect of the hydrologic history of the groundwater ranging from the chemical characteristics (major and minor ions), to the source of water (stable isotopes of oxygen and hydrogen), to the types of rock encountered in the groundwater flow system (strontium isotopes), to time-since-recharge (tritium and carbon-14). By using sodium-to-calcium mass ratios, in combination with the isotopic data, the occurrence of saline groundwater as a result of seawater intrusion was distinguishable from groundwater in a previously-saline aquifer that has been “flushed” by fresher continental recharge. The systematic analysis of these tracers indicate that the sources and movement of saline groundwater are dominated by: 1) regional flow of higher-elevation precipitation that recharged many thousands of years ago along deep flowpaths; 2) recharge of local precipitation in relatively shallower portions of the flow system; and 3) intrusion of seawater that primarily entered the aquifer system during pre-modern times. Use of multiple chemical and isotopic tracers provides unique insight regarding the processes affecting groundwater quality, enabling local water agencies to assess the groundwater resources in the coastal aquifer system and begin to reduce the area's reliance on imported water.

## **SPEAKER BIO**

**Robert Anders** is a Research Hydrologist with the U.S. Geological Survey. During his career with the USGS, Robert has focused his research on the application of water-quality and environmental tracers to develop a more comprehensive understanding of the fate and transport of anthropogenic contamination associated with regional ground-water systems. Studies commonly involve analysis of chemical, microbiological, and isotopic data collected from surface- and ground-water samples,

completion of field-scale infiltration experiments using wastewater tracers and surrogates for enteric pathogens, and development of geochemical and mathematical models. Robert's educational background includes receiving a BS and MS in Geological Sciences from San Diego State University and a PhD in Civil Engineering from the University of California in Irvine.

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## SDAG MEETING SCHEDULE

Meetings are usually held on the 3rd Wednesday of the month but may change to accommodate the speaker and meeting place schedules. Check here for updates.

August 20, 2014	Monte Marshall – A Tale of Two Shields, The Canadian and Baltic
September 17, 2014	Jill Krezoski – The Mineralogy of Mars
October 2014	Field Trip !!!

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## 2014 EXECUTIVE COMMITTEE

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## PRESIDENT'S CORNER



So from where is Brian writing this particular “Corner”? You’ll never guess, sitting on the toe of a Quaternary-aged landslide deposit well above the western Antelope Valley. I would like the opportunity to thank my friends up at the South Coast Geological Society, who helped pull off a great joint meeting up at El Adobe last month. I am very much looking forward to the first couple weeks of October, where I plan on attending back to back field trips on successive weekends, somehow.

This month, Dr. Robert Anders will update us on the latest from the U.S. Geological Survey (USGS) San Diego Hydrogeology project, particularly from a geochemical perspective. This one will be of interest to any geologists living and/or working here in San Diego, as the work is enlightening and adds a great amount of detail to the story behind the water we all know is right under our feet.

For the record, there’s no sign of water anywhere above or below this Antelope Valley landslide, and based on the borehole photography and sampling, it’s looking like a rock fall deposit. This close to the San Andreas, there are a few of them around.

Brian J. Olson  
2014 SDAG President

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**Geology Photo of the Month**  
*Got Sand?*  
Somewhere in Kuwait



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# ANNOUNCEMENTS

## SDAG 2014 FIELD TRIP

### **“Traversing a Transform Boundary – Regional Tectonics, San Diego to the Salton Trough”**

October 10 – 12, 2014

On this field trip we will explore the interaction of the major faults of Southern California to accommodate for motion between the Pacific and North American Plates. We will consider the tectonic evolution of the region and observe resulting landforms.

More information on the field trip to follow!

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**CALL FOR ARTICLES!** SDAG invites members to submit articles on their current research or an interesting project they are working on for publication in the monthly newsletter. The article should be no more than 1 page in length. Photos are welcomed; too. Please submit articles to the SDAG secretary via email.

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**CALL FOR PHOTOS!** SDAG invites members to submit photographs of an interesting geologic feature for publication in a new section of the newsletter – “Photo of the Month”. Please submit your photo along with a caption to the SDAG secretary via email.

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**SDAG RESEARCH TOOL** A comprehensive listing of all papers published by SDAG, whether as annual field trip guidebooks or special publications, is now available on our website. Entries are sorted by primary author, or chronologically by date of publication, from our first guidebook in 1972, through the Palms to the Pines, and finally up the San Luis Rey River in 2013. These can be accessed or downloaded as .pdf files. They are fully searchable in Adobe Reader or Acrobat, so if you are researching a topic, "tsunami" for example, you can search for that keyword. This listing will be updated as new books are published. Thanks to Greg Peterson and Hargis + Associates, Inc., for making this possible. See the links below:

[http://www.sandiegogeologists.org/SDAG\\_Pubs\\_authors.pdf](http://www.sandiegogeologists.org/SDAG_Pubs_authors.pdf)

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## ANNOUNCEMENTS (con't)

### Geology Books for Sale

Local geologist has a large collection of historic books for sale on coastal geology, sedimentology, marine geology, and oceanography, many of which are out of print. If interested, please email the SDAG VP for contact information [geologyjen@yahoo.com](mailto:geologyjen@yahoo.com)

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The 2014 GSA Annual Meeting will be held from October 19th to the 22nd, 2014  
in Vancouver, BC Canada at the Vancouver Convention Centre

Information on the meeting can be found at  
<http://community.geosociety.org/gsa2014/home/>

The Abstract Deadline is: 29 July 2014  
Registration Deadline is: 15 September 2014

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for future reference:  
The 2015 GSA Annual Meeting will be November 1 - 4, 2015  
in Baltimore, MD, at the Baltimore Convention Center

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## **ICE COLD GOLD SEASON 2**

The first season of ICE COLD GOLD was but a glimpse of Greenland's power and potential. This season, the threats and rewards are multiplied. Nothing about Greenland is implied; a new world is about to be defined. In the ruby-packed second season of ICE COLD GOLD, our spirited team of American miners returns to the most remote mining location on the planet with its eyes on a prize. With possibly the world's largest ruby in the Arctic glinting within reach, Sixty Degree Resources stretches the logistical challenge of



returning to its deposit to life-threatening, thin extremes. In Greenland, some of the rules remain the same. The window to the mining season is tight, and with no roads within thousands of miles, Sixty Degree Resources must travel to the most remote mining region in the world by boat and helicopter to reach its deposit. Then, the team must sling in thousands of pounds of heavy-duty mining equipment to get the job done. Nearly killing themselves for what they believe, these ballsy American miners bare all their emotions in chapter two of this life-threatening journey. The odds are stacked against them - with time being their worst enemy - as they face 24-hour sunlight, massive glaciers, unknown wildlife and remote, uncharted territories no American miner ever has set foot on before.

*See Ice Cold Gold Thursdays at 10:00 pm on Animal Planet*

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## JOB OPENINGS

**CSU, San Bernardino, Temporary Teaching Position:** The California State University - San Bernardino Department of Geological Sciences is seeking a temporary teaching replacement for Dr. Erik Melchiorre during his 2015-16 sabbatical. Specifically, the Department needs someone to teach the required classes for the environmental geology option. The courses are GEOL 375 Groundwater Hydrology, which is taught in the Fall, it is a lecture course with a total of 4 hours of lecture a week, dates and times when it can be offered are negotiable. The other course is GEOL 376-Field Methods in Hydrology which is offered in the winter quarter, this has 2 hours of lecture and 6 hours of lab per week, again days and times when it can be offered are negotiable.

If you are interested, direct any questions to Dr. Alan L. Smith, Chair, Department of Geological Sciences at (909) 537-5409, [alsmith@csusb.edu](mailto:alsmith@csusb.edu)

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*de maximis, inc.*, a nationwide firm specializing in project coordination, currently has opportunities for contract employees to provide services in Ecuador. We currently have an opportunity to provide these services and it is our understanding that there are several positions available. We understand that the initial assignment is 1 year. At least one position will require full time presence in Ecuador and the other positions could be done on a rotational basis. Strong Spanish skills are essential as well as 3 to 10 years of professional experience. Work assignments and logistics will be handled from domestic *de maximis* offices.

**Project Staff and Project Managers:** Candidates would have a B.S. Degree in Environmental Science with either an Engineering or Geology degree as a plus. Candidate should have 3 to 10 years relevant experience in the environmental consulting industry. Candidates need to have demonstrated site investigation knowledge, work plan and report preparation, task management, cost estimating and scheduling experience. The candidates should be detail oriented and have excellent verbal and written communication skills. Professional Geologist or Engineer or ability to obtain within two years, and Masters degree is a plus. Positions will be based in Ecuador (initially), and will require travel and field work.

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No phone calls. Qualified candidates should send resumes, along with a cover letter summarizing experience and salary requirements to:

*de maximis, inc.*  
Attention: Jack Keener  
1322 Scott St, Suite 104  
San Diego, CA 92106  
[jkeener@demaximis.com](mailto:jkeener@demaximis.com)

and,  
Steve Myers  
Albany, New York  
[smyers@demaximis.com](mailto:smyers@demaximis.com)

## SEEKING JOB OPPORTUNITIES

**Graduating with BS in Geological Sciences:** Hi there, SDAG. This is Matan A. Salmon, your 2014 SDAG secretary. This month I will be graduating from Cal State Fullerton with a BS in Geological Sciences and am currently on the hunt for work in San Diego. I'm looking to get into either the hydrogeological, geotechnical, or environmental fields and would greatly appreciate any help with this transition. Through the fantastic program at CSUF I've gained extensive experience in field techniques, lab procedures, and report writing across a broad range of disciplines within geology. If you're looking for an eager, hard working, details oriented, and computer savvy individual, I am your man.

Feel free to send any job postings, questions, or suggestions to my email: [matansalmon@gmail.com](mailto:matansalmon@gmail.com). Thank you, in advance, for any help.

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**Geological Engineer:** I am an outgoing and enthusiastic geologic engineer with several years experience working on geological field projects, writing technical reports, and completing rigorous data analysis on large and complex data sets. Through my experience I have developed the ability to think critically, learn quickly, and communicate exceptionally both at the technical and non-technical level. I am an MS graduate with a degree in geological engineering from South Dakota School of Mines and Technology. I have 3 years of experience doing geotechnical investigations, geochemical assessments, and groundwater modeling at compromised sites and underground environments. Detailed work experience, education and more at <http://www.linkedin.com/pub/tessa-van-beek/51/46a/272> . Email Tessa Van Beek at [tessaj@gmail.com](mailto:tessaj@gmail.com) for more information.

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**Qualifications Summary and Objective:** I have 14 years experience directing surface water quality monitoring programs with a proven record of excelling in monitoring plan implementation, quality control, public notification and continuous improvement in operational effectiveness and efficiency. I have built and maintained relationships with key staff in academia, industry, and all levels of government in San Diego and California. I have a widely applicable skill set which includes: analytical thinking, communication and writing skills, data analysis and management, inter and intra-agency project coordination, and staff supervision and training. My objective is to obtain a career position with an industry leader where I can contribute my skills to build the success of my employer as well grow professionally. Detailed work experience, education and more at [www.linkedin.com/in/cbclifton2010](http://www.linkedin.com/in/cbclifton2010). Email [cbc2006@cox.net](mailto:cbc2006@cox.net) or 619-964-1776.

Contact: Clay Clifton

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**ENGINEERING GEOLOGIST-** California PG, MS Geology, over 13 years of applied geotechnical experience, proficient in geotechnical investigations, hazard evaluations, geophysical surveys, construction management and quality control, engineering analyses, special interest in earthquake-hazard and seismic design related applications, strong problem-solving and organizational skills. Detailed resume upon request: Anna, 201-407-7461, [Afyodorova103@gmail.com](mailto:Afyodorova103@gmail.com)

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**ENTRY-LEVEL ENVIRONMENTAL SCIENTIST** - I am a recent UCSB graduate with a double major in Environmental Studies (BS) and Geology (BS, Earth Systems emphasis) who is looking to begin a career in environmental consulting. I have prior lab experience in both professional and academic settings. I am looking to establish myself with a passionate and hard working environmental firm in the San Diego region. For further information about my credentials and work experience please contact Georgi Chertkov at [georgichertkov@gmail.com](mailto:georgichertkov@gmail.com) or call me at 505-412-3107.

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## **Request for Sponsors: 2014 SDAG/SDGS and Publication SPONSORS**

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