

Association of Environmental and Engineering Geologists  
California Central Coast Chapter, Southern California Section

[www.aegsc.org/chapters/centralcoast](http://www.aegsc.org/chapters/centralcoast)

Robert J. Urban, Chapter President  
William "Bill" Tracy, Chapter Vice President

Jim Steele, Chapter Treasurer  
Michael Busby, Chapter Secretary

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APRIL 2007 MEETING NOTICE

## **AEG STUDENT NIGHT 2007**

### **Geochemical Signatures of Rapid Carbonate Crystallization in Well Scales**

**Grace Giles**  
Graduate Student  
University of California at Santa Barbara

### **Groundwater flowpaths and aquifer interactions in the Floridan aquifer system, southern Florida**

**Sheila K. Morrissey**  
Graduate Student  
University of California at Santa Barbara

### **Optimization of Landfill Compaction Practices**

**Shawna Von Stockhausen**  
Graduate Student  
California Polytechnic State University

Wednesday, April 25, 2007

**Rusty's Pizza, Goleta**  
(RSVP/Directions below)

6:00 pm- 7:00 pm Social Hour  
7:00 pm – 8:00 pm Chapter Meeting

*The April meeting does not have a sponsor.*

**Student Speakers & Biographies:**

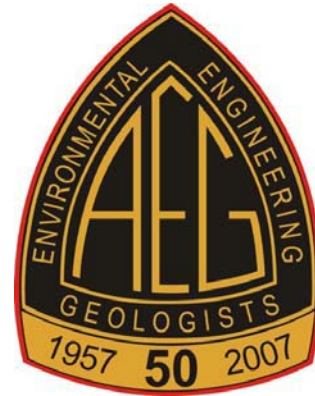
Student Night will include the following graduate student presenters: *Ms. Grace Giles, Ms. Sheila Morrissey, and Ms. Shawna Von Stockhausen.*

**Grace F. Giles:** Grace completed her Bachelor's in Geology at UC Santa Barbara. As an undergrad, she created educational geo-animations with Tanya Atwater and completed a senior thesis under Frank Spera on thermodynamics of mineral phase transitions. She is currently finishing up her Masters research on the isotopic and trace element composition of carbonate well scales under Jim Boles at UC Santa Barbara. Her work has been presented at AGU and AAPG conferences and will be presented at the 12th International Symposium for Water-Rock Interaction in China this summer.

**Sheila K. Morrissey:** Sheila earned a BS in geology from UCLA and worked as an environmental consultant for NMWW, Inc. and Geologic Services Corporation. While working, she took evening classes towards a master's degree in hydrogeology from Cal State Los Angeles. Sheila received a National Science Foundation Graduate Teaching Fellowship for the 2004-2005 school year, allowing her to work on research full time while leading labs and field trips for West Covina High School 9<sup>th</sup>-grade earth science classes. Inspired by her UCSB-alum MS advisor, Dr. Laura

Rademacher, Sheila came to UCSB in 2005 to work towards a PhD under Dr. Jordan Clark.

**Shawna Von Stockhausen:** Shawna is currently a graduate student at California Polytechnic State University (Cal Poly), San Luis Obispo. Shawna will graduate with a M.S. in Civil and Environmental Engineering this June. Her thesis is on the topic of the optimization of landfill compaction. Shawna's undergraduate work was also completed at Cal Poly. Shawna first became interested in Geotechnical Engineering after she worked as an intern with the Tunnel Group for Hatch Mott MacDonald. For the last several years she has been involved with Engineers Without Borders-Cal Poly's international project in Nicaragua.



## **Student Abstracts**

# **Geochemical Signatures of Rapid Carbonate Crystallization in Well Scales**

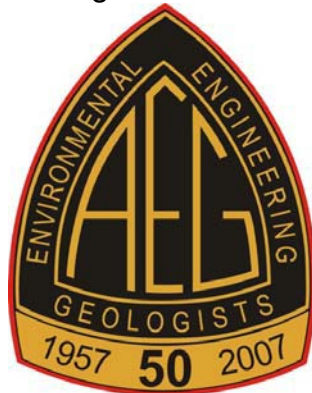
By

**Grace Giles**  
**Graduate Student**  
**University of California at Santa Barbara**

Los Angeles Basin and San Joaquin basin carbonate well scales show isotopic disequilibrium and highly variable magnesium content, apparently due to rapid CO<sub>2</sub> degassing and crystallization. The effect of rapid crystallization on carbonate geochemistry is studied with well scales, because they form with known fluid composition, temperature, and pressure changes. Calcite scales and their respective waters have been analyzed for geochemical and isotopic composition and incorporated with reservoir data.

The  $\delta^{18}\text{O}$  of scales is up to 10‰ more positive than expected for equilibrium with pore water. This deviation from equilibrium temperature-dependent fractionation is linear, suggesting that greater precipitation rates (i.e. larger pressure differentials) increase isotopic disequilibrium. Rapid CO<sub>2</sub> degassing preferentially strips the lighter isotopes from the water, leaving precipitated calcite enriched in <sup>13</sup>C. Most of the scale samples have positive  $\delta^{13}\text{C}$  values (+0.31 to +28.7‰) indicating rapid CO<sub>2</sub> degassing. Assuming a constant input fluid composition, a positive correlation of carbon and oxygen isotopes is evidence of rapid crystallization. Vertical sample sets from different depths of the tubing and horizontal sample sets from transects of thick samples all show positive  $\delta^{13}\text{C}/\delta^{18}\text{O}$  slopes (typically +0.9 to +5.5), which is intermediate of Hendy's (1971) proposed rapid degassing range for  $\delta^{13}\text{C}/\delta^{18}\text{O}$  co-variation of +0.6 to +8.3.

Analyzed calcite scales from waters with low  $[\text{Mg}^{2+}]/[\text{Ca}^{2+}]$  ratios and wells with minimal temperature and fluid composition change show 4 to 16 mole percent Mg content. The wellbore conditions suggest that precipitation rate, rather than temperature or saturation levels, is controlling the Mg content of the scales.



# **Groundwater flowpaths and aquifer interactions in the Floridan aquifer system, southern Florida**

By

**Sheila K. Morrissey**  
**Graduate Student**  
**University of California at Santa Barbara**

TDS, stable isotopes of water, radiocarbon and dissolved noble gases were sampled in the Upper, Middle, and Lower Floridan aquifers in southern Florida to interpret groundwater flow patterns, intra-aquifer interactions, groundwater ages and recharge temperatures. An understanding of the movement of groundwater in the Floridan aquifer system is necessary for the proposed use of aquifer storage and recovery wells near Lake Okeechobee as part of the Florida Everglades Restoration Plan. The Lower Floridan had low He concentrations, high radiocarbon concentrations and noble gas recharge temperatures identical to modern seawater collected from the Straits of Florida. These data are consistent with previously published seawater circulation models through the Lower Floridan. Near the recharge area in Osceola County, Upper Floridan He concentrations were only slightly above the He solubility equilibrium value. He concentrations increased with age towards the eastern and western coasts, providing a relative chronology. TDS in Upper Floridan groundwaters were low in the recharge area and increased towards the coasts due to dissolution of aquifer rock and, in some cases, seawater intrusion. Noble gas recharge temperatures near the recharge area were similar to the present mean annual air temperature. Downgradient, lower noble gas recharge temperatures reflected 5 degree C cooler temperatures from the last glacial period. Few samples had recharge temperatures intermediate between the glacial and Holocene end members, indicating that there is little leakage from the surficial aquifers to the Upper Floridan downgradient from the recharge area and the paleoclimate record has been preserved.



# Optimization of Landfill Compaction Practices

By

**Shawna Von Stockhausen**

**Graduate Student**

**California Polytechnic State University**

This study was conducted to develop procedures for optimization of waste compaction at Municipal Solid Waste (MSW) Landfills. Optimization using GPS technology can improve waste containment efficiency, resulting in conservation of land and environmental resources. A fundamental understanding of waste compaction processes or widely acceptable guidelines for industry use are currently not available. A field study was conducted to identify the baseline parameters and conditions that control compaction of wastes. Large-scale field compaction analyses were conducted in a test plot that was part of an active landfill cell at Riverview Land Preserve (a municipal government operated, MSW landfill in Riverview, Michigan). The field study was conducted at a scale appropriate to the waste management industry with sample sizes of approximately 355 kN (40 tons). A GPS system was used to make the required geometric calculations for determination of in field densities and placement efficiency of wastes in a manner that has not been previously possible. Results indicate that compaction of wastes is highly variable during normal operation at a landfill. Measured compacted dry unit weights ranged from 0.9 to 8.0+ kN/m<sup>3</sup> (average 4.8 kN/m<sup>3</sup>). A strong relationship existed between moisture content and compacted dry unit weight. Optimal moisture content of approximately 65% resulted in a maximum dry unit weight of approximately 8.5 kN/m<sup>3</sup>. Much lower dry unit weights (4 kN/m<sup>3</sup>) resulted for both dry and wet of optimum conditions. Significant cost savings and environmental conservation can be achieved by manipulating moisture content during waste compaction.



## Chapter President Message

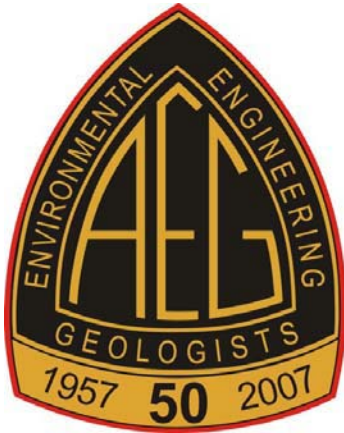
Greetings CA Central Coast Chapter:

I am pleased to announce that this month is our Second Annual Student Night. We will have three presentations by students attending UCSB and CalPoly. One of the presenters shall be awarded the Dr. John W. Williams scholarship. The scholarship is in the amount of \$500 and all student presenters will be given an annual membership to AEG.

Please note that the 50<sup>th</sup> Anniversary of AEG is this year and being celebrated at the Annual Meeting to be held this September in Los Angeles, CA. For further information, check out the Announcements section of this newsletter and the AEG National website.

I hope all is going well for you and look forward to seeing at the upcoming meeting!

Best of regards,  
Robert J. Urban  
Chapter President  
AEG CA Central Coast Chapter



## Announcements

Please email announcements to [lavapoet@verizon.net](mailto:lavapoet@verizon.net), thank you.

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**CALL FOR ABSTRACTS FOR  
AEG'S 50TH ANNIVERSARY ANNUAL  
MEETING  
DUE DATE IS APRIL 1, 2007**

**September 24 - 29, 2007 ~  
Sheraton Universal Hotel ~ Los  
Angeles, California**

## **Golden Anniversary in the Golden State**

Abstracts are welcome related to the following technical session topics as well as any subject in environmental and engineering geology. Technical session topics include but are not limited to: coastal/floodplain processes, environmental issues, construction geology, field geology, dams, forensic geology, professional practice, geomorphology, geophysics, geotechnics, landslides/slope stability, subsidence, natural hazards, remote sensing/GIS, rock mechanics, seismology, site characterizatton, soil mechanics, ethics, and tunneling.

Abstracts may also be submitted for the following symposia:

1. Paleoseismology and Active Faulting
2. Perspectives on Regulatory Review
3. The Future of Environmental and Engineering Geology -- A Global Perspective
4. Engineering Challenges of Mine Reclamation
5. Levees Protecting Urban Population Centers: Are New Standards Needed?
6. Tunneling
7. Solvilng Diverse Problems with Groundwater Models
8. Advances in Subsurface Characterization Techniques and Environmental Investigations
9. Dam Removal and Decommissioning
10. Operating Dam Analysis and Remediation
11. Draped Rockfall Protection Systems

We welcome multiple abstracts. However, if available space fills up, we will contact you and ask you to withdraw all but one or

have you present the second (or third, etc.) as a poster session. We will do our best to accommodate everyone to achieve the best technical meeting possible.

"Instructions for Writing and Submitting your Abstract" can be found on the AEG-2007 web page (go to [www.aegweb.org](http://www.aegweb.org) and click on the annual meeting logo at the bottom of the home page).

Abstracts may be submitted to Julie Keaton as an attachment to an e-mail to [aegjuliek@aol.com](mailto:aegjuliek@aol.com)

Online abstract submittal should be up and running shortly.

If you have any questions, please call me.

Julie Keaton, Meetings Director

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## Please mark your calendar for the following upcoming Chapter Meetings.

**May 17, 2007 – John Moylan**  
- 2007 AEG & GSA Distinguished  
Jahns Lecturer -

“Geologic Influences on Midcontent Dams”

### **Potential Speakers:**

**Dr. Scott Minor (USGS)** – Geology & Neotectonics of the Santa Barbara Coastal Plain

**Dr. John Izbicki (USGS)** – “Fecal contamination of urban streams and beach area of Santa Barbara”

Know of someone that could give a presentation to the Chapter or would you like to hear about a particular subject? Email your requests for speakers or topics

to your Chapter President at:  
[lavapoet@verizon.net](mailto:lavapoet@verizon.net)

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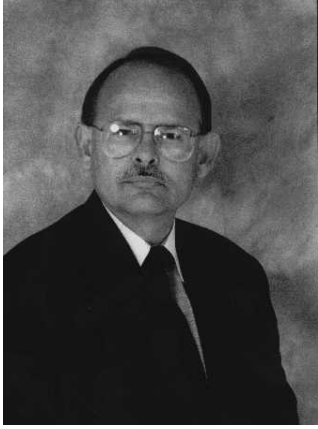
## 2<sup>nd</sup> Annual Student Night

Student night involves two aspects of recognizing and supporting the future of our profession: (1) awarding a deserving student the Chapter’s Dr. John W. Williams Scholarship and (2) listening to students present their research projects in the form of short (15 to 20 minute) presentations.

Applications for the Chapter scholarship will be posted on the Chapter website and distributed to regional universities and colleges in the near future. Last year, the scholarship was awarded in the amount of 500 dollars and may be increased this year. For further information or an application or to express your interest in delivering a presentation to the Chapter, contact the Chapter President.



## AEG CA Central Coast Chapter Dr. John W. Williams Scholarship



Dr. John W. Williams is an active AEG member of the San Francisco Section, professor of engineering geology and Department Chair at San Jose State University (1976 – present), and former AEG National President (1988), secretary, and Vice President. Dr. Williams has served as the Association of State Boards of Geology (ASBOG) President and a founding Officer and President of the Engineering Geology Foundation (1996). In addition to acting as President for a number of additional organizations, Dr. Williams has served as Chair on: the Examination Committee for the California Board of Registration for Geologists and Geophysicists (1978-2000), the Ethics Committee for the ASBOG (2002 – present), and the Examination Committee for ASBOG (2002 – present). Dr. Williams acts as the advisor to the San Francisco Section Student Chapter and has throughout his career encouraged student membership and participation in AEG.

Dr. Williams has received numerous awards over the years of service to AEG and our profession. He has received the Floyd T. Johnston Service Award (1998) from AEG and the Meritorious Service Award (1992) from the Engineering Geology Division of the Geological Society of America.

Dr. Williams earned doctorate (1970) and masters of science (1968) degrees in geology from Stanford University and a bachelors of science (1967) degree in geology from the College of William and Mary, VA. Dr. Williams is a licensed Professional Geologist, Certified Hydrogeologist, and a Certified Engineering Geologist. He began his career working

for the California Division of Mines and Geology (now the California Geological Survey) from 1971 through 1976 then became a professor at San Jose State University in 1976 and has continued teaching through the present. Many consulting geologists have received mentorship from Dr. Williams and even a greater number of geologists are aware of Dr. Williams bringing attention to the importance of ethics and ethics training to geo-professionals.

The CA Central Coast Chapter recognizes the important contributions of Dr. Williams to AEG and our profession. We hope that our scholarship brings awareness of Dr. Williams' contributions to future professional geologists.

To make a donation to the Dr. John W. Williams Scholarship fund, please contact Robert Urban at [robert\\_urban@urscorp.com](mailto:robert_urban@urscorp.com). All scholarship donors will be recognized on our Chapter's website.

**Dr. John W. Williams Scholarship  
2007 List of Donors**  
*Mr. & Mrs. Richard Stout  
Mr. & Mrs. Robert J. Urban  
Dr. John W. Williams*

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### Chapter Sponsors



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ATTN: Wendy Pierce

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**JULIE MOORE**  
GEOLOGIST/ACCOUNT REPRESENTATIVE  
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OEC has twice sponsored a Chapter meeting, thank you OEC!



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The Association of Environmental & Engineering Geologists CA Central Coast Chapter is currently seeking monthly meeting sponsorship. Benefits of becoming a monthly meeting sponsor include: 1) sponsor's name or logo placed on our Chapter website indicating the month of sponsorship, 2) listing as a Corporate Sponsor in our monthly newsletter, and 3) recognition at the monthly meeting. Our Chapter is asking for a donation of \$150 for

becoming a monthly meeting sponsor . . . a small price for the recognition that you contribute to the professional society that best embodies our professional practice.

## **Directions to Meeting**

### **Monthly Meetings**

Monthly meetings will take place on the last Wednesday of every month at Rusty's Pizza in Goleta. Social hour begins at 6 pm; the meeting begins at 7pm.

For more information or to be added to the CA Central Coast Chapter email list, please contact Robert Urban via email at [robert\\_urban@urscorp.com](mailto:robert_urban@urscorp.com).

### **Location:**

Rusty's Pizza, 270 Storke Road, Goleta (Santa Barbara)

### **Directions:**

1. Driving Northbound or Southbound on Highway 101;
2. Exit on Storke Road;
3. Turn Left (if you were traveling northbound), Right (if you were traveling southbound);
4. Turn Left at the first stoplight past Hollister Road;
5. Rusty's is on the left.

### **Donation/Cost:**

AEG members = \$15; non-AEG members = \$20; Students = \$5

Please: If you plan on attending the meeting, please email [lavapoet@verizon.net](mailto:lavapoet@verizon.net) a confirmation of your attendance by the Tuesday preceding the meeting date. This greatly helps in ordering the food for attendees. However, if you forget to email, please still do attend the meeting. Thank you.

## **JOB POSTINGS**

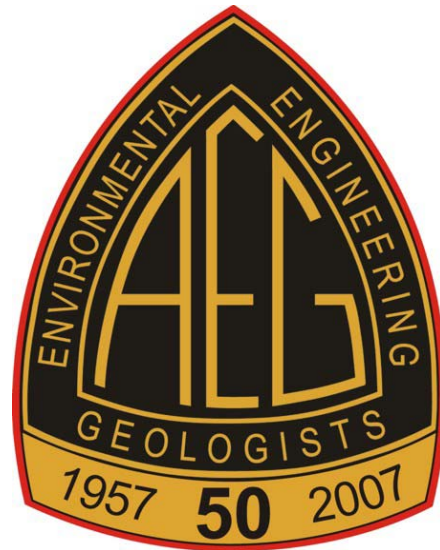
If you would like to place a job announcement, please email the listing to [lavapoet@verizon.net](mailto:lavapoet@verizon.net), thank you!



URS Corporation is seeking top professional geologists for career positions at our Santa Barbara and Santa Maria offices. For further information, please contact Mr. David Bernal, PG by email at: [David\\_Bernal@urscorp.com](mailto:David_Bernal@urscorp.com)

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Contact Information**

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