Association of Environmental and Engineering Geologists

Inland Empire Chapter, **Southern California Section**

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May 5, 2009 **Vol. 5, No. 5**

AEG Inland Empire Chapter May Monthly Meeting

Dr. Jeff Keaton

"Guidelines for Evaluating Scour at Bridge Foundations on Rock: Status of NCHRP Project 24-29"

Wednesday, May 20, 2009

5:00 – 6:20	Social	Carrows Banquet Room
6:20 – 7:20	Dinner	Carrows Banquet Room
7:30 - 8:30	Speaker Presentation	Carrows Banquet Room

Location

Carrows Restaurant, Murietta, CA

(Meeting Cost $20.00 to $25.00)
(Fund-raising donation suggested is $5.00, or more)
(*RSVP/Directions on page 4*)

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This Month's Speaker:

Jeffrey R. Keaton[1] and Su K. Mishra[2]

[1] Engineering Geologist, **MACTEC**, Los Angeles, CA
[2] Hydraulic Engineer, **Ayres Associates**, Sacramento, CA

Abstract

The essence of National Cooperative Highway Research Program Project 24-29 is geotechnical site characterization in scour-relevant terms for use by hydraulic engineers. The project goal is to develop guidelines for evaluating scour at bridge foundations on rock that can be integrated with the procedures of Federal Highway Administration Hydraulic Engineering Circular No. 18 (HEC-18). Rock scour in natural open channels appears to be related to five processes: 1) physical and chemical weathering that prepares rock surfaces for subsequent scour, 2) dissolution of soluble rocks, 3) cavitation 4) erosion and abrasion of degradable rocks, and 5) quarrying and plucking of jointed hard rocks. The definition of 'rock' for scour purposes is just as problematic as the definition of rock for other engineering applications. The physical properties

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Past Presidents; Frank Jordan, 2005; Gary Wallace, 2006; Rick Gundry, 2007, Mike Cook, 2008.

The AEG Inland Empire Chapter *Newsletter* is a monthly publication of the Inland Empire Chapter of the Southern California Section, Association of Environmental and Engineering Geologists. For more information visit websites shown in Newshead page 1 or for Officers, page 2.

Submittals: Deadline, 28th of the month. Employment notices, job position announcements, and advertisements can be posted for a minimal fee. *Newsletter* circulation about 170 in greater inland areas of southern California, and elsewhere.

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INLAND EMPIRE CHAPTER

of rock material can range from strong soil to much stronger than the best concrete. Benchmark materials being considered for rock in the context of scour are concrete and mortar. Rock with characteristics less than those of mortar probably will be highly susceptible to scour when exposed to the normal range of stream flows during the life of a bridge. Quantifying the rate of rock scour is a challenge because some rocks may be governed by a threshold hydraulic loading condition below which no scour occurs, but above which scour losses accumulate.

Five bridge sites representing a range of conditions were visited in 2008. Conditions evaluated consist of 1) over-consolidated ice-contact glacial till protected by a boulder armor, I-90 at Schoharie Creek, Montgomery County, New York, 2) Oligocene limestone, I-10 at Chipola River, Jackson County, Florida, 3) slaking Oligocene siltstone, SR-22 at Mill Creek, Polk County, Oregon, 4) stratified Jurassic sandstone and claystone forming a knickpoint and plunge pool, SR-262 at Montezuma Creek, San Juan County, Utah, and 5) Cretaceous siltstone, SR-273 at Sacramento River, Shasta County, California. A USGS stream gage on Schoharie Creek, New York, was also visited; this gage is in slabby Paleozoic sandstone.

Hydraulic loading conditions are being expressed in terms of stream power which can be accumulated over the life of a bridge structure. A probability-weighted approach has been developed for representing a statistically average year in terms of scour using data from Schoharie Creek in Montgomery County, New York, and Sacramento River at Redding, California. NCHRP Project 24-29 activities include field, laboratory, and modeling studies to refine the approach to quantifying rock scour at bridge sites.

Speaker

Jeffrey R. Keaton is a Senior Principal Engineering Geologist in the Los Angeles office of MACTEC Engineering and Consulting, Inc. He has degrees in Geological Engineering, Civil (Geotechnical) Engineering, and Geology. He is registered as a Professional Engineer and as a Professional Geologist in several states. He has been employed by consulting firms for nearly 40 years. He specializes in quantifying hazardous natural processes for siting and design of all types of facilities in all geologic environments. He is a Fellow of American Society of Civil Engineers and a Fellow of Geological Society of America. He is a member of the Technical Coordination Council of the Geo-Institute of ASCE, Chair of the *Engineering Geological Characterisation and Visualisation* Commission of International Association for Engineering Geology and the Environment, and a past president of AEG.

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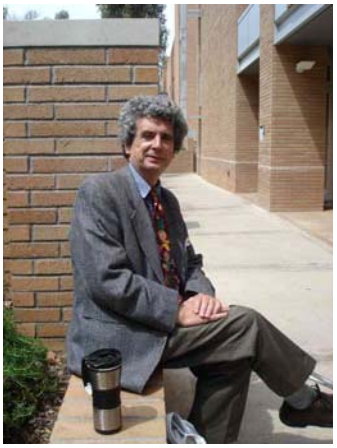
Jahns Lecture Pictures
More pictures on website:
http://www.aegsc.org/chapters/inlandempire/calendar/

Dr. Medley encouraging the use of 3D imagery.


Cal Poly Pomona attendees simulate the look through a narrow site investigation "window."


UC-Riverside lecture attendees.


Dr. Medley before the UCR lecture.

AEG INLAND EMPIRE CHAPTER

Chair's Message

May 2009

We want to thank the people who participated in and attended the series of talks given by **Dr. Ed Medley,** the 2009 AEG/GSA Richard H. Jahns Distinguished Lecturer. The faculty at each of the three regional universities (UC-Riverside, Cal Poly-Pomona, Cal State-San Bernardino) were supportive both in effort and funding – a gratifying trend that we hope continues. We sincerely want to thank Ed Medley for his marathon-like speaking effort, not only to give four talks to groups in the Inland Empire, but also all over the country – at last count this tallied to about 77 talks – WOW!! From "***Bimrocks***", to "***Elephants & Earthquakes***", to "***The Comforts of Ignorance and the Benefits of Arrogance,***" Ed showed that he is the proverbial showman and geopracticioner extroidinare. Finally, we want to thank the students at the three universities that came out for these talks. We want you to keep participating in AEG-Inland events – your participation is a win-win situation for you and Chapter members.

This month our meeting will be held at Carrows Restaurant in Murietta, CA. We are pleased to have **Dr. Jeff Keaton** talk to the Chapter. This is the third time that Jeff has spoken to the the Chapter and ALL of his talks are filled with mental challenges, useful techniques, and information you will not want to miss. Jeff will be speaking on, *"**Guidelines for Evaluating Scour at Bridge Foundations on Rock: Status of NCHRP Project 24-29**."* This is a subject we do not hear a lot about in arid lands, but bridge scour does occur in California. So attend and learn about this cutting edge research.

On Friday June 12, the Chapter will sponsor its **Annual Short Course**. The subject this year is, "***Expanding Geological Practice: New Areas & Methods.***" The subject matter falls into two categories:

1) Site Investigation Survey Methods-LiDAR, InSAR, GPS-GIS; and
2) State of Environmental Practice

The eight speakers represent industry, academia & research, and government. The event will be held at UCR-Extension. Registration cost for the day long event is $90 for AEG members and $20 for students – a great bargain and lunch is included!! See more details on the last page of this newsletter or on the Inland website:

http://www.aegsc.org/chapters/inlandempire/shortcourses/

See you in Murietta on May 20.
Kerry Cato, Chapter Chair

Future AEG Inland Chapter Meetings

June - Annual Chapter Short Course – see details below
July - Wednesday July 15th, Hemet, CA
"Land-Use Photography & Videography"
Woody Higdon , GEO-TECH IMAGERY, Oceanside
August - Wednesday August, 19th 2009, Riverside
"Groundwater Contamination at the Omega Chemical Corporation Superfund Site, Los Angeles County"
Dr. Tom Perina, CH2MHill, Riverside, CA
September - NO Chapter Meeting,
National Meeting at Lake Tahoe, CA

Annual AEG Inland Chapter Short Course

Expanding Geological Practice: New Areas & Methods"

Talks are in two technical areas:

1) **Site Investigation Survey Methods: GPS-GIS, InSAR, LiDAR**
2) **State of Environmental Practice**

- **Date: Friday June 12, 2009**
- **Location:**
  UC-Riverside, Extension Center, Riverside, CA
- **Cost**
  - $90 AEG members
  - $115 non-member Professional
  - $20 Students (limited number of student spaces available)

  Registration fee includes parking, lunch, 2 breaks
- **Schedule:**
  - 8:30 Registration
  - 9:00 – 12:10 Survey method talks
  - 12:10 – 1:40 Lunch
  - 1:40 – 4:15 Environmental talks
- For more information & brochure, see the AEG Inland website:
  http://www.aegsc.org/chapters/inlandempire/shortcourses/

May 20 Chapter Meeting Details and Location

RSVP REQUIRED:

- Advance RSVP required by Monday May 18, 2009
- E-Mail: akwgeotechnical@verizon.net
- Info needed: name, company, number attending, and specify meal selection (see below).

Meal choices:

- Cost: Professionals = $20 – 25; Students= $10 (with Student ID)
- Entree Selection: (Specify in RSVP message)
  - Chicken Mushroom Alfredo, $20.00
  - Norwegian Salmon, $23.00 (Charbroiled or Blackened)
  - Slow Roasted Prime Rib, $25.00
- Dinner side accompaniments include:
  - Seasonable dinner vegetables
  - Choice of baked potato, mashed potatoes, or rice
  - soup and salad are additional costs
  - Non-alcoholic drinks included at no cost
- Wine and beer available at an additional cost

Location:.
Carrows Restaurant
24640 Madison Avenue
Murietta, CA
(951) 461-2411

Directions to Meeting Location from Interstate-15

- EXIT at California Oaks/Kalmia Street. Proceed West on Kalmia.
- At light, TURN Left (South) onto Madison Avenue,
- Immediately TURN Left into Plaza Mall area to Carrows Restaurant.

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