



AGS NEWSLETTER

ARIZONA GEOLOGICAL SOCIETY, INC., APRIL 2007

DINNER MEETING, APRIL 3, 2007

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U.S. Geological Survey, Tucson, Arizona

Geologic Constraints on the Evolution of the San Andreas Fault System, Southern California

ABSTRACT – The San Andreas fault system has developed in response to dextral shear along the Pacific-North American plate boundary. In concert with plate triple-junction migrations, this transform boundary has grown at the expense of convergent motion along the disappearing boundary between the Farallon and North American plates. However, both on the seafloor off California (where transitional microplates were formed, then abandoned) and on-shore (where the geological record reveals variations in magnitude and timing of displacement along and across a broad plate margin), the dynamic transition from convergent to translational tectonics has been more complex than any geometric model that simply extends the transform fault between migrating triple junctions.

Long before the advent of plate tectonics, the San Andreas fault had been mapped continuously from the Salton Trough-Gulf of California north-northwest to Cape Mendocino. The 1,200-km-long structure was known to have a cumulative dextral displacement of hundreds of kilometers and a few early investigators had even proposed that displacement was linked to the separation of peninsular Baja California from mainland Mexico.

Documentation of seafloor-spreading in the early 1960s, followed by recognition of the role of trans-

CALENDAR OF EVENTS

- April 28: AGS Spring Field Trip – Rosemont Ranch (See page 3 and visit the AGS web site for details.)
- May 1: AGS Dinner Meeting – Mary Poulton, University of Arizona, *Pattern Recognition Technologies in the Minerals Sector*
- June 5: AGS Dinner Meeting – Eric Seedorff, University of Arizona, *The End of Detachment Faults*
- July 3: AGS Dinner Meeting – Congresswoman Gabrielle Giffords, U.S House of Representatives, *Title of Talk – TBA*

form faults, provided a powerful paradigm for understanding the evolution of the San Andreas fault system. This paradigm inspired new on-land studies showing that a displacement of about 300 km on the San Andreas fault in central California matched transform displacement associated with opening of the Gulf of California. Meanwhile, reinterpretation of displacements on the San Andreas and San Gabriel faults in southern California led to revised measurements of 240 km and 60 km, respectively—yielding a total of 300 km. The large discrepancy between 300 km and the far-greater transform movement expected from the plate motions and the kinematics of triple-junction evolution led to hypothesizing displacement

(ABSTRACT continued on page 3)

Dinner Meeting Schedule — Inn Suites, 475 North Granada, Tucson

To reserve your place for dinner, please call 520-663-5295 before 5 pm, Friday, March 30, 2007. Indicate if a low-salt or vegetarian meal is required. Please cancel if you are unable to attend.

Cost: With reservation: Members \$20, Guest \$22, Students \$7. Without a reservation, \$2 additional.

Cash Bar @ 6 pm

Dinner @ 7 pm

Talk @ 8 pm



UPDATE — Below is the list of Short Courses for the 2007 Ores & Orogenesis Symposium, with two course descriptions. Please visit the web site for additional information (www.agssymposium.org).

1. Monday, Sept. 24: Mineral Resource Estimation, Steve Ristorcelli and Michael Gustin Monday

Description: The process of evaluation of mineral resources is often heavily weighted at the final stages (estimation) rather than at the early stages (sampling and geologic evaluation). This can ultimately result in an economic evaluation or assessment without a solid base, as unsteady as an inverted pyramid. The evaluation of mineral projects must proceed from fundamentally sound data that has been placed in the proper geologic context. It must be based on the applications of logical parameters and on interpretations of the most knowledgeable personnel involved. Each phase of deposit definition and project development carries with it a technical, often complex, discipline of its own, each with several alternate methods, all of which must be tied together in a consistent and geologically sound manner.

During this short course, the participants will become familiar with the processes involved in evaluating, developing and estimating a mineral resource, beginning with sampling and continuing through to estimating and classifying a resource. The course will cover the technical aspects of projects: sampling methods, subsampling procedures, quality control issues on all phases, defining pertinent geology, statistical analyses of analytical and geologic data, mineral domain modeling, estimation techniques, and regulatory requirements for reporting the defined resource. The course will compare different methods used in each stage, philosophies of project development, corporate needs, public disclosures, and project

requirements. Real-world examples will be presented and discussed. The participant in this class should come away with a good understanding of a pragmatic integrated approach to resource estimation, armed with case histories and the ability to better makeThe participant in this class should come away with a good understanding of a pragmatic integrated approach to resource estimation, armed with case histories and the ability to better make assessments on their own.

2. Monday, Sept. 24: NI 43-101 Reporting Process, Allan Moran, Greg Gossan, and others

Description: This course looks at the NI 43-101 reporting process from the perspective of the Securities Regulators and those in industry who prepare the reports. This course will give you the information you need to fully understand the process. It will examine the NI 43-101 reporting process from the perspective of the regulations; what is required, when, in what format, the obligations of the Qualified Person, and what is new in the process. In addition, the construction of NI 43-101 reports will be presented from the Industry perspective; do's and don'ts, suggestions, and pitfalls. Civil liabilities of being a Qualified Person will also be addressed. This is an opportunity to hear from the regulators what they expect in a NI 43-101 Technical Report, and to hear from Industry how to do it right, with the opportunity to add value to the owner's property in the process.

Short courses for which descriptions are not yet available:

3. Tuesday, Sept. 25: Uranium Deposit Models, Karen Wenrich, Michel Cuney, and Phil Goodell

4. Tuesday, Sept. 25: Ore Fluids, Robert J. Bodnar

5. Sunday, Sept. 30 to Monday, Oct. 1: Whole Lava Love, Charles Ferguson

Creationists make it sound as though a 'theory' is something you dreamt up after being drunk all night.

— Isaac Asimov (1920-1992)

Other Geoscience News

35th Annual Geoscience Symposium GeoDaze 2007 April 12-14

GeoDaze is a student-run symposium organized by the Department of Geosciences at the University of Arizona. The purpose of GeoDaze is to provide students a forum in which to present their research and to receive valuable feedback from faculty, alumni, and their peers. Please register at www.geo.arizona.edu/geodaze/2007.

GeoDaze Field Trip Saturday, April 14th, 2007

Title: Laramide Multiphase Folding, Late Cretaceous Magmatism, and Cenozoic Extension and Sedimentation in the Mt. Fagan and Cienga Gap Area, Eastern Margin of the Tucson Basin

Leader: Charles Ferguson

Additional Information: *U of A website.*

ABSTRACT, continued
boundary transform system commonly has been viewed as having stepped inland to open the Gulf of California and create the San Andreas fault.

The geologic record, however, indicates that dextral shear associated with growth of the San Andreas system has been active on-land since the Pacific and North American plates began interacting, as early as *ca* 30 Ma — and that the San Andreas fault itself has been active nearly that long. Strain-budget calculations show that shear is and has been distributed across a broad plate boundary. Balanced palinspastic reconstruction of Proterozoic through Cenozoic bedrock terranes in southern California constrains the location, magnitude, and timing of displacements on successively older groups of faults in the overall San Andreas fault system over the last ~20 Ma. The evolutionary sequence of faulting in turn constrains models for on-land development of the plate margin transform (e.g., the *oldest* strand of the southernmost San Andreas system is the farthest east) and it defines distinct provincial kinematic regimes that reflect differing responses of various crustal blocks to the underlying dynamics of the transform boundary.

Member News:

Welcome to new members John Lufkin, Consulting Geologist; Harrison Matson, P.G., Western Range Services, Inc.; and Jon Trujillo, Geologist, War Eagle Mining. As of mid March 2007, we have 383 AGS members.

AGS Spring Field Trip to Rosemont Ranch Saturday, April 28, 2007

Thanks to the generosity of Augusta Resource, AGS is planning a Spring Field Trip to the Rosemont property on April 28. Details are still being worked out, but should be fleshed out by the April dinner meeting. This will be a full-day trip led by Augusta Resource geologists, engineers, and others. Several options are being considered, and the trip may be split into two or more groups to accommodate different interests. Expect moderate to difficult hiking. Bring plenty of water, sun protection, and sturdy hiking boots. Four wheel drive or high clearance SUVs are needed, so we will be carpooling. If you have a suitable vehicle that can carry 4 or 5 passengers, please consider bringing it. Space is limited to 25 people, so sign up early.

Meeting/carpool location: TBA

Time: TBA (approximately 7:15 AM on the NW side, 8:00 AM, central. Out-of-towners can meet the group at the intersection of I-10 and State Highway 83 (SW side of freeway) at 8:45 AM.)

Cost: TBA

Contact: Rich Brown:

rbrown@clearcreekassociates.com

ORES & OROGENESIS registration will be online by April 1, 2007. Interested parties will be able to register at a reduced early-bird rate (through May 15) by following the registration links on the O&O website (www.azgssymposium.org).



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For information on ordering AGS
publications, visit
www.arizonageologicalsoc.org.

AGS books and maps are also sold at the dinner
meeting and by the
Arizona Geological Survey.



Current membership stands at 383. As always, please keep us up-to-date as you move, change jobs, or E-mail address. Thanks to all our wonderful Membership Directory Sponsors for a great directory.

2007 AGS MEMBERSHIP APPLICATION OR RENEWAL FORM

Please mail check with membership form to: Arizona Geological Society, P.O. Box 40952, Tucson, AZ 85717. Dues (circle one): 1 year: \$15; 2 years: \$30; 3 years: \$40. Full-time students receive free membership (E-mail only). However, a membership application form must be returned to AGS annually to remain on the membership list.

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If registered geologist or engineer, indicate registration number and state: _____

Enclosed is a _____ tax-deductible contribution to the J. Harold Courtright Scholarship Fund.

Enclosed is a _____ tax-deductible contribution for the 2007 AGS Symposium.