San Joaquin Geological Society

Date: **Tuesday, December 14, 2010**

Time: **6 pm Social Hour**
7 pm Dinner
8 pm Lecture

Place: **American Legion Hall**

Cost: **PSAAPG Members & Mesozoics**
$20 w/reservation
$25 without reservation

Non PSAAPG Members
$25 w/reservation
$30 without reservation
Full-time Students with ID:
Free, Courtesy of Chevron

Wheeler Ridge: Stratigraphic and Structural Review

Presented by Gary Henley II

BIO

Anticipated M.S. in Geology June 2011. Finishing Masters' thesis on the stratigraphic variation and structural geology of the Wheeler Ridge oil field.

ABSTRACT

The Wheeler Ridge anticline is located at the southern end of the San Joaquin Valley. The North Tejon, Wind Gap, and Wheeler Ridge oil fields produce proximal to the Wheeler Ridge anticline. A review of the stratigraphy of the Wheeler Ridge oil field shows evidence for late Miocene uplift that produced two distinct unconformities. The uplift created a wedge stratigraphy on the North flank of the Wheeler Ridge anticline within the Upper Fruitvale, Santa Margarita, and the undifferentiated Etchegoin, San Joaquin, Tulare. The lower unconformity shows evidence of uplift that eroded approximately 250 feet of the Lower Fruitvale. The Upper Fruitvale is interpreted to non-conformably overlie the Lower Fruitvale. The upper unconformity cuts approximately 440 feet out of the Upper Fruitvale, completely removing it to the south of the Wheeler Ridge anticline, and up to 70 feet in the Lower Fruitvale. The Santa Margarita Formation onlaps onto the upper unconformity surface. The Santa Margarita has been subdivided into the SM1, SM2 "H", SM2 "Z", SM2 "M", and SM2 "L" parasequences. The SM2 "L" and SM2 "M" onlap onto the upper unconformity. SM2 "Z" is the first Santa Margarita sequence to deposit throughout the field area, and top the Upper Miocene Wheeler Ridge anticline. Due to the ongoing folding in the Miocene the Etchegoin, San Joaquin, and Tulare undifferentiated have a wedge shaped stratigraphy increasing in thickness to the North. A model is put forth to explain the two unconformities and wedge stratigraphy. The model shows uplift at two distinct periods in the Upper Miocene. The anticline is interpreted to be a fault propagation fold cored by the Wheeler Ridge Thrust, which splays into at least two faults in the Upper Miocene formations. The wedge shape stratigraphy demonstrates the complexity and stratigraphic variation in the southern San Joaquin. The model proposed offers a different interpretation of the faulting at Wheeler Ridge and suggest regional uplift of the area before the formation of the present Wheeler Ridge thrust system.

Sedimentation in an Active Fold and Thrust Belt, Santa Barbara Basin, CA: Spatial and Temporal Evolution from 1.0 Ma to Present

Presented by Courtney Marshall

BIO

Graduate degree: M.S. in Geology at Cal State University, Long Beach 2010 working under Rick Behl at CSULB, Chris Sorlien at UCSB, and Craig Nicholson at UCSB

ABSTRACT

The east-west-trending Santa Barbara Basin is part of an active fold and thrust belt within the Western Transverse Ranges province related to block rotation and north-south transpression associated with a continental transform plate boundary. This setting provides an excellent opportunity to study the relation between tectonics and sedimentation within a dynamic margin setting. Isopach maps derived from high-quality grids of seismic reflection profiles document dramatic shifts in location, shape, and accumulation rate of sedimentary depocenters in Santa Barbara Channel during the last 1 Myr. Isopach maps are defined by distinctive sequence boundaries and other stratigraphic horizons identified on deep-penetration industry multichannel seismic (MCS) data, and high-resolution MCS and USGS towed chirp data acquired during 2005 and 2008 research cruises. Horizon ages were assigned based on correlation to well-dated ODP Site 893, a previously recognized 1-Ma horizon derived from industry well logs, and interpolation between dated tephra layers, biostratigraphic markers, and MIS climate transitions identified from oxygen isotopic analysis of recovered cores that sample strata back to ~700 ka. Horizons were interpreted and correlated across the eastern and central basin, extending beyond ODP Site 893, then gridded. Isopach thickness maps were created from the gridded horizons, first in two-way travel time, then converted to depth and volume. Sedimentation rates were highest between 1 Ma and ~500 ka, but then decreased owing possibly to diversion of sediment into Santa Monica Bay with the initiation of the Hueneme fan. Since ~710 ka, most basin sedimentation has been focused within a WNW-ESE-trending offshore trough located between the North Channel and Oak Ridge fault systems. Continued uplift across these two bounding fault systems and further development of the structurally complex northern shelf and south-bounding Mid-Channel anticline is reflected in the 3-dimensional geometry and spatial pattern of sedimentation and constriction of the main central trough. Evolution of these depocenters thus reflects the growth history of faults and folds, and related subsidence and development of seafloor morphology, while changes in sedimentation rates reflect either a decrease in the sediment supply entering the Santa Barbara Basin via the Santa Clara River, or divergence of the Santa Clara River elsewhere, due most like to related regional tectonics, and the initiation of the Hueneme Fan.

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*** *RSVP* ***

By Friday, December 10, 2010

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