



# San Joaquin Geological Society

**Date:** Tuesday, January 12, 2016

**Time:** 6:00 PM Social Hour  
7:00 PM Dinner  
8:00 PM Lecture

**Place:** Eagles Lodge  
1718 17<sup>th</sup> Street, Bakersfield, CA 93302

**PSAAPG Members & Mesozoics**  
\$25 with reservation  
\$30 without reservation

**Non PSAAPG Members**  
\$30 with reservation

**Full-time Students with ID:**  
\$10 - Courtesy of Chevron & California Resources Corp.

**\* RSVP \***

**By: Sunday, January 10, 2016**

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## ***Non-accretionary Versus Accretionary Megathrust Slip Accommodation at Depths of ~15 to 30 km: Two styles of Strain Localization.***

Presented by John Wakabayashi, California State University, Fresno

**Abstract:** Geology of the Franciscan subduction complex, California, suggests that megathrust slip at depths of ~15 to 30 km is accommodated in accretionary or non-accretionary modes. During non-accretion or subduction erosion, megathrust slip is accommodated in a narrow zone <50 m thick, based on the narrow primary fault zones separating different accreted units. In contrast, accretion of a unit in a subduction complex involves its transfer from the subducting to the upper plate. During the time a unit is accreted, megathrust slip is accommodated by faults along the upper and lower contacts of the accreted unit as well as internal faults that imbricate the unit. In an accretionary mode, the zone of megathrust slip accommodation is the thickness of the accreted unit, which reaches several km. Subduction slip for a time period can be estimated by plate motion models, and the amount of megathrust slip accommodated during accretion may be crudely estimated by considering the thickness of the repeated imbricates in various accreted units (300-500 m), the total structural thickness accreted in a given time period (10-20 km between 80 and 120 Ma), and a maximum across strike (downdip) extent for an accreted unit (~30 km). 80-120 Ma, the time of accretion of the Eastern and Central Belts of the complex, corresponded to about 3100 km of margin-normal subduction. During this time, slip accommodated by accretion of units at their region of greatest structural thickness may have ranged from 1200 km, for a thicker 'peel' of 500 m, to 2000 km, for a thinner 'peel' of 300 m; this slip estimate range is about 40 to 60 percent of the total subduction slip during that period. This suggests that even during this 40 Ma period of net accretion, about half of the slip (and about half of the time) was associated with non-accreting events. Although subject to multiple sources of uncertainty, more refined geochronology can test this estimate.

**Bio:** John Wakabayashi is a San Francisco Bay Area native who moved to Fresno in 2005 to begin his academic career as a geology professor at California State University, Fresno. He received his B.A. in Geology from UC Berkeley, and his PhD in Geology from UC Davis (advisor: Eldridge Moores). He is a Professional Geologist (California) and a Fellow of the Geological Society of America. After graduating from Davis he worked in the engineering and environmental geology field for 16 years, the last 13 years as an independent consultant based in Hayward, before becoming an academic. (See expanded Bio on <http://sanjoaquingeologicalsociety.org/next-event/>.)

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