SIO253 Fall 2017

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Interactions of Oceanic Plates and the Continental Margin of California

One goal of the class is to inform and interest students, especially those coming from out-of-state, in the dynamic geology and (mainly Cenozoic) geologic history of Alta California and Baja California and the adjacent offshore regions. A particular emphasis is how offshore geologic events have influenced onshore geology, and vice versa.

The general format of the class will be for me to lecture on Thursday, and then assign one or two short papers (related to the subject of the lecture) and questions about them that I'll ask you to answer by email to me before 0900 Tuesday. We'll then discuss the questions and your answers at the beginning of Tuesday's class…. When we're done with that, I'll lecture some more. The final exam will be a take-home with questions for students to ponder during the assigned "Finals Week", sending me your answers before the date I have to post grades for the class.

I'd like to schedule a 1-day or 2-day (weekend) class field trip into the desert at some mutually agreeable time.

Topics to be covered in the 10 weeks of class will include:

1. Early tectonic history… origins of this continental margin and of the Pacific plate, and the beginnings of subduction.
2. Cretaceous crustal accretion and formation of the Peninsular Range and Sierra Nevada batholiths.
3. Active and inactive Californian subduction zones, and the geologic effects of their subducted slabs beneath a broad area of western North America (Basin-and-Range, Rocky Mountains, Sierra Madre).
4. Formation of oceanic and continental microplates between the Pacific and North American plates, and the origin of the San Andreas Fault System.
5. Creation of the (mainly offshore) Californian continental borderlands.
6. Tectonic and volcanic activity on Baja California, and along its western margin.
7. Opening of Gulf of California, and its recent transition from rifting to seafloor spreading
8. Volcanic, tectonic, and hydrothermal activity in the Salton Trough, the subaerial part of the Gulf of California
9. Uplift of the Sierra Nevada and adjacent ranges, creation of the Sierra microplate, and deformation of the Juan de Fuca microplate