

RCL

Collaborative Research: Seismic and Geologic study of Gulf of California Rifting and Magmatism (OCE 01-11738, 4/1/02 to 3/31/05, with Lizerralde and others)

Collaborative Research: The four-dimensional pattern of rifting in the southern Gulf of California (OCE 02-03616, 9/1/02 to 8/31/04, with Lonsdale)

Paul Umhoefer, Northern Arizona U

Main points:

- Conducting mapping and structural analysis of a rift segment and 2 accommodation zones along the Baja California coast, in order to better understand the early rifting and later oblique overprinting at the end of the central seismic transect.
- Working with the seismic processors to compare and contrast faulting and basin development on both sides of the Gulf of California, a critical aspect of the study. This comparison is just starting.
- Finishing study of a Pliocene basin on San Jose island at the end of the central seismic transect. The basin is of a critical age and location to evaluate ideas on how transform faults initiate.
- Studying the lower part of the Miocene to Quaternary Cabo basin, near the southern tip of the Baja peninsula, in order to evaluate the ties across the mouth of the Gulf of California and the early evolution of the rift. This basin is located on the NW end of the southern seismic transect. Umhoefer and other PIs will work on the Tres Marias islands near the SE end of the southern two transects to study a fragment of a Miocene to Pliocene basin.
- The Tres Marias islands and Cabo basin work will provide a critical comparison, as the two likely restore near to one another, perhaps across a simple horst. Both will be compared to a 'lower' sequence observed on new seismic reflection data. This sequence is clearly syn-rift, while an upper sequence is clearly unfaulted and post-rift. The lower sequence is correlative to the Miocene to Pliocene basinal strata on the Tres Marias islands, where micropaleontology has already been done, offering an exceptional opportunity to study the strata in detail, and to seismically analyze its geometry offshore.
- Largely completed identification and mapping of all large active faults in the southern Baja California peninsula and the islands with uplifted marine terraces. A second major GPS experiment covering the southern Baja California peninsula and a few islands is complete. The work has led to a new proposal; 'Neotectonics Across an Active Oblique-Divergent Plate Margin, Southern Gulf of California' (under review); which will combine GPS, tectonic geomorphology, paleoseismology, marine seismic & paleoseismology, and regional tectonics of the Gulf of California.
- Mexican professors and students from UABCS in La Paz, Mexico, are involved in our research as equal participants and collaborators.