RCL	Collaborative Research: Integrated Thermochronologic And Structural Investigation of the Saudi Arabian Red Sea Rift Margin: Implications for the Rupturing Of Continental Lithosphere	
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Many fundamental processes that control continental rifting and lead to continental lithosphere rupture and seafloor spreading are poorly understood. The Tertiary Red Sea rift system is one of the best-exposed continental rifts, and much progress has been made in understanding its plate tectonic framework and modern strain field. However, a limited knowledge of how extensional strain is *spatially* and *temporally* distributed along its continental margins, particularly in Saudi Arabia, has made it difficult to adequately evaluate and test models for the dynamic evolution of this rift system.

In order to elucidate the dynamics of rupturing of the continental lithosphere in the Red Sea more fully, the evolution of rifting in time and space must be understood. Our NSF-Margins project has gained full scientific and logistical aid from the Saudi Geological Survey (SGS) and thus presents a unique opportunity to study the geodynamic evolution of the eastern margin of the rift system. With this unprecedented help from the SGS, we are undertaking a comprehensive and systematic study involving apatite fission-track and (U-Th)/He thermochronology and structural mapping along the central and northern Red Sea rift margin in Saudi Arabia.

- Stockli spent 3 weeks in Saudi Arabia (Jan 2004), collecting 162 exhumed fault block samples from within the rift and E-W transects that cover the entire width of the exposed basement rocks bordering the Red Sea. Apatite fission-track and (U-Th)/He analysis (commencing shortly) will help us to directly determine timing, geometry, and amount of extension far inland from the modern Red Sea basin; discriminate rigid vs. non-rigid rifting models; and quantify erosional exhumation during rift flank uplift. Our investigation will contribute to a comprehensive understanding of the Red Sea and would greatly benefit from funding of other geophysical projects in the Red Sea NSF-Margins initiative.

- A post-doctoral researcher, Dr. S. Brichau, and a graduate research assistant, T. Blackburn, have been hired, and will work with our team in Saudi Arabia conducting structural mapping and geo- and thermo- chronological work.

- The project currently supports three (2 KU, 1 UPenn) undergraduate research assistants helping with mineral separation and analysis of samples.

- The unique collaboration with the SGS has greatly facilitated our project both scientifically and logistically. The 2004 field season involved several of their scientists; an aspect that is vital for the success of our ambitious collaboration.

Terror attacks in Saudi Arabia in 2003 and a travel warning from the U.S. State Dept. have complicated the logistics. Much time has been spent ensuring fieldwork safety and convincing our institutions to allow students to travel to Saudi Arabia.