

Isotope Geology II field trip to Barbados (W4888)

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This proposal requests airfare for a field trip for 12 students in Isotope Geology II and their T.A. to study the uplifted reefs on the island of Barbados during the spring term. I will lead the field trip and cover my own expenses. I will seek additional funding sources to help further defray student out of pocket expenses for this optional field trip. As the Climate Center committee is well aware, Barbados is a spectacular field site due the remarkable exposures of uplifted reefs marking sea level high stands that correspond to the Earth's precessional cycles. It is one of only two locations in the world where students can walk more than one million years of sea level history. The top of the island is karstic topography where it is possible to enter local caves to view speleothems formation in an equally spectacular setting. It was the early reef mapping and Th/U dating work of Broecker, Mesollella, and Matthews in the 1960's that revived the Milankovitch Theory. Prior to the field trip, all students in the class will have completed a Th/U dating lab where they will take coral or speleothems samples of their choosing and make a Th/U age determination including all clean room, column chemistry, mass spectrometry, data reduction, and age calculation. Using this training, we will examine the field setting and the diagenetic environment and processes. Many basic principles of sea level research, isotope geochemistry, reef morphology, diagenesis, tectonics, and stratigraphy will be utilized in the field work. A morning and evening lecture on topics pertinent the daily field trips will presented including critiques of recent papers that present Th/U, sea level, and speleothem data from Barbados. Students will read the relevant literature before the field trip and while in Barbados. We will also examine the pelagic Oceanic Formation and folded and faulted Scotland District that underlies the coral cap but is exposed on the east coast.