

DEPARTMENT OF GEOLOGY
College of Arts & Sciences

SUMMER RESEARCH OPPORTUNITIES
FOR UNDERGRADUATE WOMEN

APPLICATION DEADLINE: MARCH 1, 2004

The Department of Geology is pleased to offer the following research project(s) for the summer of 2004. Interested students are urged to contact the faculty member(s) directing the project that most interests them. By contacting the faculty member, you can discover more about the project, learn what your responsibilities will be, and if possible, develop a timetable for the twelve-week research period.

The Geographic and Environmental Distributions of Taxa During Recoveries From Mass Extinctions

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As part of my ongoing research on the history of global biodiversity*, I have been investigating biological recoveries from major extinction events in earth history. These *mass extinctions* are thought to have been caused by worldwide physical catastrophes, and their aftermaths were characterized by fairly rapid recoveries in biodiversity. Because physical conditions in the immediate aftermaths of extinctions might still have been fairly stressful, researchers have theorized that species originating at those times would have been unusually tolerant of a wide range of environmental conditions and, further, that this tolerance would have permitted them to survive through a variety of subsequent physical stresses for unusually long intervals of geological time. Recently, I demonstrated that, indeed, the taxa originating after several mass extinctions had average durations that were significantly longer than those originating at other times (Miller and Foote 2003). However, it has not been demonstrated directly that these taxa actually were unusually widespread, either geographically or environmentally. The student will work with me on the development and analysis of a database to address this issue. The student will collect data from literature sources on the occurrences of organisms during key intervals. These data will be entered directly into an online database, called *The Paleobiology Database* (<http://paleodb.org>). Using these and other data already available in the database, we will conduct a series of numerical analyses intended to compare the geographic and environmental ranges of long-duration versus short-duration taxa during these key intervals.

Reference:

Miller, A.I. and Foote, M. 2003. Increased longevities of post-Paleozoic marine genera following mass extinctions. *Science* 302: 1030-1032.

**Global biodiversity* can be defined simply as: the number of different kinds of organisms living on the planet. Researchers are assessing current levels biodiversity by attempting to conduct an inventory of all known living species on earth. Paleontologists have sought to assess the *history* of biodiversity by using the fossil record to assess changes through time in the numbers of species, genera, and families.