



ICDP Workshop on Scientific Drilling:

Coring Paleocene-Eocene Thermal Maximum transects, mid-Atlantic U.S. Coastal Plain: Constraining timing and cause of carbon injection and ecosystem response

June 22, 2022, virtually and at Rutgers University, New Brunswick, New Jersey, USA

August 24, 2022, at MARUM, University of Bremen, Germany
during the 12th Climatic and Biotic Events of the Paleogene (CBEP12) conference

August 31, 2022, at Grieghallen, Bergen, Norway
during the International Conference in Paleoceanography (ICP14)

November 17, 2022, virtually and at Rutgers University, New Brunswick, New Jersey, USA

Despite over 25 years of intense study, the cause(s) of and responses to the Paleocene-Eocene Thermal Maximum (PETM) and attendant Carbon Isotopic Excursion (CIE) remain enigmatic and intriguing, as the release of over 2,000 Gigatons of carbon at the Paleocene/Eocene (P/E) boundary provides the closest geological analog to modern anthropogenic CO₂ emissions. Deep-sea sections recording the CIE are generally thin (<1 m) due to its short duration (<200 kyr), and records of the CIE are generally truncated owing to the corrosive conditions in bottom waters at the onset of the PETM, causing dissolution of carbonate sediments on the seafloor. In contrast, thick sections (>15 m) recording the CIE occur along the mid-Atlantic U.S. margin in New Jersey, Maryland, and likely in Delaware. These sections generally have an expanded record of the CIE; therefore, drilling of these sections probably represents the best opportunity to study the PETM onset in a level of detail that will transform our understanding of this important event. Previous drilling in this region crossed the paleoshelf from inner neritic to deep neritic (>100 m) paleodepths and provided important constraints on this major event, but existing cores are either depleted or contain stratigraphic gaps due to the patchwork distribution of the successions, updip dissolution, diagenesis, and the discontinuous nature of coastal zone sedimentation, all problems which can be addressed with new cores.

Members of the international scientific community are invited to attend a scientific drilling workshop during which the coring of transects to collect new material needed to evaluate the CIE will be planned. New material will be used to: 1) evaluate the rapidity of the CIE onset and lead-lag relationships of carbon injection, temperature rise, and sedimentation changes; 2) evaluate any relationship between extraterrestrial impact and climate; 3) study the biotic effects of the PETM on the paleoshelf, with a postulated major deoxygenation in thermocline and bottom waters, a eukaryote “black out” due to excessive temperatures, and the development of an unusual nannofossil assemblage suggestive of photic zone acidification. The coring plan will include sites that record the Cretaceous/Paleogene (K/Pg) boundary as well as other extreme climate intervals, e.g. Eocene hyperthermals. The goals of the workshop are to: 1) develop a detailed scientific and drilling plan leading to a Full ICDP Drilling Proposal; 2) form international, discipline-based research teams to develop ideas and collaborations; and 3) compile secondary scientific objectives and corresponding experiments for those teams.

In order to maximize scientifically and demographically diverse participation, this hybrid workshop is planned in multiple stages: 1) A half-day webinar on June 22 devoted to discussions related to the science of the PETM and a presentation of potential drill sites. This webinar will be interactive and also recorded and made available for sharing. 2) Town hall meetings at the 12th Climatic and Biotic Events of the Paleogene (CBEP12) conference held 22-25 August, 2022, at MARUM, University of Bremen, Germany and the International Conference in Paleoceanography (ICP14) scheduled for 29 August-2 September, in Bergen, Norway. Duplicate presentations of the preliminary drilling plan and a summary of the scientific topics discussed in June will engage and encourage researchers develop plans to participate in core analyses. 3) A November 17 hybrid workshop will finalize the drilling proposal and begin to assemble teams for post-drilling science.

Scientists wishing to contribute to this workshop are invited to apply with contact details, a 1-page CV, and a 1-page summary of their relevant expertise and intended project contribution to Marci Robinson at mmrobinson@usgs.gov and Ken Miller at kmg@eps.rutgers.edu by **June 10, 2022**. Meeting details will be communicated to participants via email. Partial and full travel funding is available for a limited number of participants to the November hybrid meeting in New Brunswick, NJ, thanks to the support of ICDP; please indicate in your application if in-person attendance is requested. A scientific committee will prepare invitations and offers of travel support (full or partial), based on the relevance of the applicants' research to the goals of the workshop, the workshop budget, and the need for balanced disciplines. We seek a diverse group representing all career stages and broad international participation. We especially encourage applications from scientists whose expertise complements that of existing project participants.