



ICDP Workshop on Scientific Drilling
GOE-DEEP: Gabon and Oxygenation of Earth – Drilling Early Earth Project
Trondheim, Norway, November 1-3, 2022

The first half of the Paleoproterozoic Era (c. 2500 – 2000 Ma) is one of the most extraordinary in Earth history, when surface environments and the biosphere underwent a redox transformation towards a planet rich in free oxygen (Great Oxidation Event). During the past two decades the international Earth science community has expended enormous research effort to understand this transformation, but many important problems remain unresolved and cause-and-effect relationships unknown.

To deepen understanding of this profound time, a new initiative, *GOE-DEEP (Gabon and Oxygenation of Earth – Drilling Early Earth Project)*, aims to obtain fresh drill cores from key stratigraphic intervals in the Paleoproterozoic Francevillien Basin of Gabon. This succession has experienced minimal deformation and minor thermal overprinting (below greenschist facies) and acquiring fresh core from these well-preserved rocks will provide an underpinning dataset to integrate sedimentological, stratigraphic, geochemical and geochronological information. This will enable researchers to significantly reduce uncertainties surrounding geochemical proxy signals and more confidently reconstruct original environmental conditions that led to the emergence of the modern aerobic Earth system.

Members of the international scientific community are invited to attend this ICDP-sponsored Workshop during which the scientific rationale and research objectives of GOE-DEEP will be discussed and drilling targets identified. The Workshop will focus on defining fundamental questions about the development of Earth's early biosphere-hydrosphere-atmosphere system and evolution of life. These include:

- What was the trend and nature of oxygen, carbon, sulfur, phosphorous and nitrogen cycles; were they responding to global factors or to conditions bespoke to individual sedimentary basins?
- What was the timing and tempo of the change in redox state of the ocean and atmosphere?
- What are the individual and composite trends in the isotopic and element ratio values of geochemical proxy records; how much influence do facies exert on those values?
- How are these events correlated globally and what is their timing, rate and duration?

Specific goals of the Workshop are to: (i) bring key researchers together to agree the scientific questions, plan collaborations and decide the analytical program; (ii) identify and prioritize stratigraphic targets; (iii) plan a community-guided, drill core and data-management/-archiving environment; (iv) discuss science themes, organize teams, and outline leaders' and members' responsibilities; (v) discuss financial support, logistical and legal issues of drilling, core handling and transport; and (vi) prepare a well-formulated draft for a full ICDP drilling proposal.

Scientists wishing to contribute to this workshop are invited to apply by submitting a single PDF file containing contact details, a 2-page CV summarizing your research experience and expertise, and a 1-page description of your interests and intended contribution to GOE-DEEP. A scientific committee will decide on invitations considering the relevance of the applicants' expertise to the goals of the project and the need for balance among disciplines. We welcome applicants from any field but particularly encourage those with interests that will complement existing expertise in the project. Preference will be given to scientists from ICDP member countries, early career scientists, and African scientists. **Applications should be sent to Dr Aivo Lepland (aivo.lepland@ngu.no) by July 15, 2022.** Note that costs to attend the Workshop will be covered as much as possible with ICDP funds.