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Please fill in your manuscript title.	Call For Industry Action: Deep-time Subsurface Paleoclimate Reference Dataset	
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Abstract

Objectives/Scope: *Is Industry doing everything possible to aid global climate research?* While geologists bring enormous expertise to the discussion of climate change, the subsurface is largely out of reach for paleoclimate researchers. Atmospheric scientists, meteorologists, and oceanographers leverage historic and live-sensor data from the NASA Earth Observing System, ARGO buoys, and a vast network of thermometers. What is the equivalent dataset for geoscientists? *The Deep-time Digital Earth Program proposes creating a ‘Type Log’ approach to the study of deep-time lithofacies, depositional environments, and paleoenvironments.* Paleoclimate can be studied using IODP cores, outcrops, and proxy data. While these data are necessary, we would argue that they are insufficient. A well-characterized, and curated set of subsurface data are not readily available to global researchers. National and state-level funding constraints impede global and regional compilations, and subsurface data are held proprietary by many national and international oil companies, ministries, and geological surveys. This leaves any global researcher with an insurmountable task: finding the data and making them accessible, interoperable, and reusable (FAIR) to their research questions.

Methods, Procedures, Process: *The industry has an opportunity to catalyze a paleoclimate research renaissance.* With the advent of AI and data-driven research, the establishment of a large, clean, subsurface dataset that adheres to FAIR Principles may provide insight into the causes of rapid climate change and carbon cycles in the deep geologic past. To alleviate concerns about the Proprietary nature of data for such an effort, we propose a registry of a ‘Type logs’ for all basins and sub-basins pulled from merely a) dry holes, b) deepest wells, c) paired basin center/margin wells, or d) wells older than two years. We propose that this registry be created by crowdsourcing an effort with NOCs, IOCs, national surveys, scientific societies, and academics to identify the most critical wells. They would seek to identify only the most critical wells from a paleogeographic perspective and to use only data pertinent to contemporary climate issues.

Results, Observations, Conclusions: *The data that is ‘out’ includes anything that bears on volumes or productivity* - such as permeability, porosity, or test information that bears on the productivity of any given interval. The data that is ‘in’ this dataset would include: location information, tops, ages, lithology, biostratigraphy, depositional environment, well logs, maturity indicators, and organic information to track the impact of change of carbon stores in the subsurface.

Novel/Additive Information: We are now actively testing the ideas, and once a prototype is complete, we will approach funding agencies such as national science foundations, NOCs & IOCs for support. With this crowdsourced database, the industry can contribute to climate change mitigation by providing global scientists with a previously unavailable perspective on deep-time climate evolution.