

## Palaeo sea-level and ice-sheet databases: problems, strategies and perspectives

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Databases of palaeoclimate data have driven many major developments in understanding the Earth system. The measurement and interpretation of palaeo sea-level and ice-sheet data that form such databases pose considerable challenges to the scientific communities that use them for further analyses. In this paper, we build on the experience of the PALSEA (PALeo constraints on SEA level rise) community, which is a working group inside the PAGES (Past Global Changes) project, to describe the challenges and best strategies that can be adopted to build a self-consistent and standardised database of geological and geochemical data related to palaeo sea levels and ice sheets. Our aim in this paper is to identify key points that need attention and subsequent funding when undertaking the task of database creation. We conclude that any sea-level or ice-sheet database must be divided into three instances: i) measurement; ii) interpretation; iii) database creation. Measurement should include position, age, description of geological features, and quantification of uncertainties. All must be described as objectively as possible. Interpretation can be subjective, but it should always include uncertainties and include all the possible interpretations, without unjustified a priori exclusions. We propose that, in the creation of a database, an approach based on Accessibility, Transparency, Trust, Availability, Continued updating, Completeness and Communication of content (ATTAC3) must be adopted. Also, it is essential to consider the community structure that creates and benefits of a database. We conclude that funding sources should consider to address not only the creation of original data in specific research-question oriented projects, but also include the possibility to use part of the funding for IT-related and database creation tasks, which are essential to guarantee accessibility and maintenance of the collected data.