
References


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multisensor and multangular techniques that, together with the latest improvements in accurate modeling of radiative properties of vegetation, allow for the retrieval of a broad range of vegetation properties at the leaf, canopy, and stand levels. Other presentations stressed the importance of data assimilation techniques to include observational data into Earth system models.

The TERRABITES and ABBA networks, funded by the intergovernmental framework for European Cooperation in Science and Technology (COST), plan to continue to organize symposia and workshops for the next 4 years. Scientists from North America as well as other parts of the globe are welcome to take part in these meetings to ensure international cooperation. More information is available at the network Web sites http://www.terrabites.net and http://www.ileaps.org/multisites/cost0804.

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Facilitating Progress on the Quaternary History of Sea Level Change


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Substantial uncertainty exists in projections of future sea level rise, due primarily to a lack of understanding about ice sheet dynamics. Paleo Constraints on Sea Level Rise (PALSEA) is a working group of the Past Global Changes (PAGES) project and the International Marine Global Change Studies (IMAGES) program that aims to extract information about ice sheet response to temperature change by examining the history of sea level over the Quaternary (spanning the past 2.5 million years). In particular, PALSEA focuses on the past 800,000 years, particularly interglacial periods, with a range of temperatures bracketing the modern.

PALSEA recently held a workshop at Woods Hole Oceanographic Institution (WHOI). Funded by IMAGES, PAGES, and WHOI’s Ocean and Climate Change Institute, the workshop focused on challenges in uranium-thorium (U-Th) coral dating. The meeting also included a public outreach event, “Where land and sea meet: Managing shoreline change over the next 100 years,” funded by WHOI’s Morss Colloquium.

Discussion at the workshop encompassed three themes. The first theme covered technical issues in U-Th mass spectrometry. As new developments in mass spectrometry continue to improve analytical precision, ensuring comparability of ages reported by different labs becomes crucial. Ideally, all measurements should be traceable to the same set of reference standards. Unfortunately, internationally recognized standards are not currently available. The consensus at the PALSEA workshop was that the time is ripe for the development of such standards, and a strategy for their production and distribution is under way, drawing on the experiences of EARTHTIME, an international initiative aimed at integrating high-precision geochronology and quantitative chron stratigraphy (http://www.earth-time.org).

The meeting included an informal U-Th dating interlab comparison involving 14 labs. Aliquots of mineral solutions (aragonite, uraninite) and powder (carbonate) were distributed and measured. The insight gained from this exercise was very useful, and a more comprehensive intercomparison is being planned.

Another theme covered was the open-system behavior of U-series nuclides. The impact of open-system behavior on age quality is well known, yet best practices for sample screening and age correction are still keenly debated. PALSEA workshop participants considered these key points: (1) Multiple replicates are crucial for establishing the uncertainty associated with sample heterogeneity; (2) stratigraphic consistency is useful for evaluating ages, and publications should include more stratigraphic detail; and (3) uniform initial 234U/238U criteria should be adopted for quality assurance and correction methods.

The third theme discussed was the development of a Quaternary sea level database. Relative sea level histories permit the reconstruction of former ice sheets, a fundamental boundary condition for modeling past climate. PALSEA suggests the following ice sheet guidelines for the Paleoclimate Modelling Intercomparison Project (PMIP): (1) Alternative ice sheet boundary conditions, generated by independent glacial isostatic adjustment (GIA) models, must be considered. (2) An existing database (see A. S. Dyke et al., Quat. Sci. Rev., 21, 9–31, 2002) that uses evidence of ice sheet extent should be used. (3) GIA models use different relative sea level databases, many with inconsistent or outdated reconstructions. To address this problem, PALSEA will develop an open-access, quality-controlled, and self-consistent database of relative sea level for use in isostatic models.

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