Guanajuato and Michoacan. Many of the drier intervals recorded in the lake sediments are also present in tree ring records, but a direct comparison is not straight forward. Studies of the modern NAM have highlighted a number of ocean-atmosphere configurations that affect the strength of the monsoon. As described in Jones et al. (this meeting), ENSO and PDO cyclicities are present in the Juanacatlán core and their effects can be identified. The possible role of solar forcing has been investigated by comparing the Ti record against reconstructed solar output. There is a good match indicating the dry conditions in the monsoon region correspond to periods of low solar output. The combination of proxies used here provides both a long term perspective on drought and insights into its impacts.

0369

Late Glacial and Holocene environmental history of a buried ice-wedge system, Barrow, Alaska

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The Barrow, Alaska area is one of the best-studied arctic regions, including permafrost research. However, stable isotope techniques have been used only sparsely, especially to characterise different types of ground ice. The application of hydrogen and oxygen isotopes for palaeoclimate studies in ice wedge ice is useful for reconstructing winter temperatures, whereas pollen reflect summer conditions. Ice wedges are principally formed by repeated frost cracking and percolation of meltwater of winter snow into frost cracks, forming ice veins, containing, under certain circumstances, the winter signal of the year of its formation. The current study provides new information related to environmental changes during the late Glacial — early Holocene transition. A small permafrost tunnel was excavated in the early 1960s by a team lead by one of the authors (Brown). The 9-meter long excavation into a massive complex of vertically foliated ice at the 3–6 m depth revealed organic residues in the ice that were radiocarbon dated at between 11,000 and 14,000 years BP. The excavation was reopened in 2003 and sampled in 2004 and 2006 by the Potsdam team for stable isotope, sedimentological and palynological analyses. Since in the 1960s neither AMS dating techniques nor stable isotope studies were readily available, the first step was to refine the age estimate of the buried ice in order to improve our understanding of the genesis of the buried ice within the tunnel. Isotope geochemistry indicates the intersection of two, isotopically different, ice wedges ($\delta^{18}O$ of –24‰ and –26‰, respectively), suggesting different phases of the regional climatic history, and also as reflected in methane contents of wedge ice. Five direct AMS dating of organic matter (lemming droppings, leaves) within the ice wedge ice of between 12,370±60 and 10,290±45 ^{14}C years indicate ice wedge growth at the end of Late Pleistocene (Bølling-Allerød). An AMS date of 21,670±500 ^{14}C years at the lateral contact of the wedge and the surrounding sediments reveals a possible extension of the chronology beyond the Late Glacial Maximum. The ice wedge is buried under 2–3 m of ice- and organic-rich sandy silt of Early Holocene age (10,380±50 and 9930±40 ^{14}C years), The upper-most section contains a cryoturbated, organic-rich soil and ice-rich permafrost (945±40 ^{14}C years) with large, active ice wedges.

0040

The INQUA scale project: results and future directions

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Macroseismic intensity is today, and will remain in the future, a key parameter in seismology, engineering seismology and earthquake geology, primarily because (A) it allows to derive quantitative information on source characteristics for historical seismic events, and (B) it is a critical information for obtaining attenuation relationships in seismic hazard analyses.

The most widely used intensity scales, such as the de Rossi-Forel; MCS, the Omori, the Modified Mercalli, and the MSK scales are based on a hierarchical classification of effects regarding (a) humans, (b) built environment and (c) natural environment. The diagnostic effects for the lower degrees are essentially those on people and animals, for the intermediate degrees those on objects and buildings, for the highest degrees those on the natural surroundings. The effects on the ground reported in the scales include primary, tectonic features such as landscape modifications due to regional uplift/subsidence and faulting, and secondary, mostly shaking-induced phenomena, such as ground cracks, slope instabilities, and liquefaction. These effects are often cited in historical and contemporary reports and have the advantage of not generally being influenced by human practices, many of them depending on source parameters and local geology alone. The outstanding progress of paleoseismological and Quaternary geology research in the past decades makes available an entirely new knowledge for understanding the response of the physical environment to seismicity. In fact, today in many cases, and especially for the epicentral area of the strong seismic events, observation on ground effects provide more consistent intensity measurements than observation on damage, which is strongly influenced by the cultural and socio-economical situation of the affected area.

This has been the rationale for developing the INQUA scale, a new intensity scale based only on coseismic environmental effects, introduced at the 2003 XVI INQUA Congress in Reno, USA. The INQUA scale project has been developed in order to test this scale for a trial period of 4 years; the final version of the scale will be presented during the XVII INQUA Congress in Cairns. This paper will take advantage from the several case studies examined by project participants worldwide for analyzing the critical features of the INQUA 2007 scale, and the impact that this new tool can have for the understanding of Quaternary seismicity and the mitigation of future earthquake effects on the society.

1135

Active shortening, Quaternary capable faults, and seismic hazard in the Western Southern Alps, Italy

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Two damaging historical earthquakes with estimated magnitude in the order of 6.0 to 6.5 struck the central Po Plain during the Middle Ages: