unambiguous conclusion of the paleopedogenetic situation. Therefore we took a monolithic bloc (195 cm height) of the section including both paleosols and the sample interval was then reduced in the laboratory to 1 cm distance. The result allows us to differentiate between two clearly separated paleosols in the section of Stillfried B. The reduced sample interval lead to new insights.

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Century scale land-sea correlation of Indian summer monsoon variability during past six millennia

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The Garhwal (Uttaranchal) Higher Himalaya lies along the northwestern limit of the Indian summer monsoon (ISM) system, and hence it is an important region for ISM studies on both global and regional scales. The continued retreat of Himalayan glaciers throughout the Holocene has resulted in initiation of peat accumulation on lateral moraines, meadows as well as in geomorphic depressions of newly exposed periglacial landmasses. Many pristine peat deposits located in remote alpine meadows and lateral moraines situated above 3500-m altitude in Central Higher Himalaya, therefore, are the excellent archives of Holocene climate and ISM records of the region. One of the best developed peat deposits of Uttaranchal Higher Himalaya representing last 6000-year climate history of the Gangotri area, was discovered in middle of the Dayara meadow (30°50′10.3″N and 78°33′27.57″E) situated at 3430-m altitude. The peat profile (1.04-m thick) was continuously sampled at one centimeter interval, constrained with four radiocarbon dates, and studied for multi-proxy climate records (pollen concentration/gm, percent organic matter and magnetic susceptibility of detrital influx). The preliminary data indicate decreased monsoon precipitation implying dry climate during 5900–5600, 5400–5200, 4700–3600, 2400–1300 and 900–600 cal BP intervals. These dry episodes were separated by relatively improved monsoon strength during intermittent periods. The relationships of these events with contemporary monsoon upwelling records (G. bulloides) from the Arabian Sea, established for the first time, reveals indubitable significance of Himalayan peat deposits for understanding the land-sea correlation of Indian summer monsoon variability during the Holocene period.

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Quaternary sedimentation in the Schirmacher Oasis, East Antarctica

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The interplay of the ocean, atmosphere and the cryosphere in the polar regions makes Antarctica a key in producing 'rapid' climatic change. It is probably the best climatic archives of the past & future, with terrestrial sediments, polar ice and marine sediments, covering centennial to millennial years climatic record. As a consequence, information on environmental changes during the recent history of the earth is stored in the deposits found. During the 25th Indian Antarctic Expedition 2005–2006, mapping of the palaeolakes and the drying lakes of the Schirmacher Oasis (SO) region of East Antarctica was done. This region known for over more than 80 pro-glacial, land locked and epi-shelf lakes. Evidences from the presence of > 1 m thick sedimentary fill in the SO show that the oasis must have been a host of big lake systems in the recent past. The present lakes interspersed over the area are the remnants of those huge water bodies which once occupied the oasis. Our observations record the presence of 6 major lakes in the Quaternary times. Several of these lakes have been reduced in size to mere lake lets and ponds. Thus the landlocked lakes of SO are under a threat of drying, possibly due to the combined effect of recession of glaciers feeding them, low melt water, low precipitation and high winds etc. A detailed lithological study of several sections in an east-west transact was made. Many fresh water lakes are still found in SO which are being continuously fed by the continental ice sheet and the ice shelf respectively while very few of the large landlocked lakes are presently existing in this ice free area. These lacustrine sediment fills are a very potential source of information to trace the Quaternary geological history and palaeoclimatic records. Of all the stratigraphic records, those from Antarctica have been amongst the most pivotal adding our understanding of climate change from the southern part of the globe. In the present work we hope to have bring in light that Antarctic palaeo-lacustrine sediment plays an important role in piecing together the history of environmental change in Antarctica and in turn, the key role that Antarctica plays in Earth system science. We are working on generating a multi-proxy (mineral magnetic, palynological, geochemical, sedimentological and chronological) record of the Quaternary climatic changes from these few well preserved Quaternary sections of this 98% ice covered continent.

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Multi-millennial simulations of the climate of the late Holocene

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The CSIRO Mk3L climate system model, a low-resolution coupled atmosphere-sea ice-ocean general circulation model, has been used to conduct multi-millennial simulations of the climate of the late Holocene. As part of Phase 2 of the Paleoclimate Modelling Intercomparison Project, equilibrium simulations have been conducted for pre-industrial conditions, and for the climate of the mid-Holocene. The control climate exhibits a high degree of stability, with the El Niño-Southern Oscillation being the dominant mode of internal variability. However, the simulated El Niño is weaker, and has a longer return period, than the observed phenomenon. The model is able to simulate the larger-scale features of the climate of the mid-Holocene, with increased summer temperatures at northern mid-latitudes, and cooling in the tropics. However, it is less successful at capturing some of the regional-scale features of the mid-Holocene climate, with the precipitation over northern Africa being deficient. The model simulates a ~13% reduction in the strength of El Niño, a much smaller decrease than that implied by the palaeoclimate record. Transient simulations of the climate of the late Holocene, from 6 ka BP to the present day, have also been conducted. The technique of Lorenz and Lohmann (2004) is employed, in which the rate of change in the Earth's orbital parameters is accelerated. The model simulates a gradual decrease in summer temperatures at northern mid-latitudes, a gradual warming in the tropics, and a strengthening of El Niño.