

The Future World Seen Through the Recent Past

Nicole Petit-Maire, MMSH, Aix-en-Provence, France

The Earth's climate tends towards a new glacial, through an alternation of cooler/warmer episodes, but man-induced atmospheric pollution increases the natural greenhouse effect which, according to models, should result within a few decades into a global warming of *ca* 1°- 4° C. It is therefore a priority to outline the *natural variability* of the continental environments corresponding with a few degrees difference relative to nowadays, in order to define the continental areas at risk and mark the strictly human environmental changes liable to occur in a near future. Thus, maps of the world environments during the last climatic extremes (the Last Glacial Maximum-LGM, the Holocene Optimum-HOP) corresponding respectively to – 4.5° C and +2° C relative to the present global values, based upon geological multidisciplinary data, were prepared at a 1:25 000 000 scale. The difference in the Earth's aspects at only 10 ka distance is astounding. The extension of ice-sheets, emerged or flooded land, tropical deserts and rain forests induced vast losses or gains in many areas. Land bridges were established throughout E- Asia and Australasia, allowing anthropozoic migrations. In E-Siberia, the emerged continental shelf was connected to the N-American one. On all continents, the increased power of dry trade winds enhanced active deposition of loess or sand. The activity and range of both the African and Asian monsoons lessened considerably. In Africa, the northern limit of the Inter-Tropical Front lowered some 400 km towards the equator inducing a correlative southern extension of the desert. The HOP warm scenario looks much more similar to the present one, since we are only a few ka from it, within the same interglacial phase. Nevertheless, sharp differences appear: a warmer/wetter Earth resulting from temperatures 1.5° to 2° C higher than nowadays. In Eurasia, the tundra has retreated far to the N, it has disappeared from South America. Rain forests have extended and boreal forests have replaced the steppes in many areas of N-Europe and E-Siberia. No aeolian active deposition exists any more. The monsoonal range has extended some 400 km to the N relative to nowadays, inducing major hydrological changes: lakes in N-Africa and Australia settled in many depressions and rainfall fed active run-off.