



ICLEA - The Virtual Institute of Integrated Climate and Landscape Evolution Analyses

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Since 2012, the partner of the virtual institute ICLEA from Germany and Poland view on past changes as natural experiments as a guidebook for better anticipation of future changes and their impacts. Since the natural evolution became increasingly superimposed by human impacts since the Neolithic we include an in-depth discussion of impacts of climate and environment change on societies and vice versa.

Understanding causes and effects of present-day climate change on landscapes and the human habitat faces two main challenges,

(I) too short time series of instrumental observation that do not cover the full range of variability since mechanisms of climate change and landscape evolution work on different time scales, which often not susceptible to human perception, and,

(II) distinct regional differences due to the location with respect to oceanic/continental climatic influences, the geological underground, and the history and intensity of anthropogenic land-use.

Both challenges are central for the ICLEA research strategy and demand a high degree of interdisciplinary. In particular, the need to link observations and measurements of ongoing changes with information from the past taken from natural archives requires joint work of scientists with very different time perspectives. On the one hand, scientists that work at geological time scales of thousands and more years and, on the other hand, those observing and investigating recent processes at short time scales.

Five complementary work packages (WP) are established according to the key research aspects:

WP 1 focused on monitoring mainly hydrology and soil moisture as well as meteorological parameters.

WP 2 is linking present day and future monitoring data with the most recent past through analyzing satellite images. This WP will further provide larger spatial scales.

WP 3-5 are focused on different natural archives to obtain a broad variety of high quality proxy data. Tree rings provide sub-seasonal data for the last centuries up to few millennia, varved lake sediments cover the entire research time interval at seasonal to decadal resolution and palaeosoils and geomorphological features also cover the entire period but not continuously and with lower resolution. Complementary information, like climate, tree ecophysiological and limnological data etc., are provided by cooperation with associated partners.

In these five WP the partner focusing their research capacities and expertise in ICLEA. We offers young researchers an interdisciplinary and structured education and promote their early independence through coaching and mentoring. Postdoctoral rotation positions promote dissemination of information and expertise between disciplines. ICLEA results are published in about 80 peer reviewed scientific articles and available for the scientific community.

The long-term mission of the Virtual Institute is to provide a substantiated data basis for sustained environmental maintenance based on a profound process understanding at all relevant time scales. Aim is to explore processes of climate and landscape evolution in an historical cultural landscape extending from northeastern Germany into northwestern Poland. The northern-central European lowlands is facilitated as a natural laboratory providing an ideal case for utilizing a systematic and holistic approach.

Further information about ICLEA: www.iclea.de