youngermost 30 ka age of the final eruption is implicitly indicated by lake succession analysis and palynological data obtained by new drillings made in the ≤20 m-thick loose lake sediments of the younger crater (St. Ana). As for the character of the final explosive activity, volcanological observations imply that both volcanic products could somehow belong to lava dome activities, i.e. explosive collapse of growing lava dome rather than collapse of an eruption column.

In order to constrain the age of the eruptions more directly we carried out U-He measurements on zircons. The obtained U-He ages for zircons separated from the pumices of the Tusnad and Bixad localities reproduced those ages obtained by radiocarbon dating. These data can be accepted as eruption ages only in the case if the zircons were crystallized at least >200 ka. Our interpretation based on the combined textural and geochemical observation seems to fit with this requirement. In agreement, new biotite Ar-Ar ages from Tusnád, Bixad and other localities that yielded apparently older ages (of 270 to 470 ka) suggest that magma crystallization started to occur significantly earlier than the final eruptions. As for zircon formation we suggest that they were growing in a granodioritic crystal mush and their margins were crystallized at low temperature from a rhyolitic melt. If this hypothesis is correct, then we can assume long-lived magma chambers beneath Ciomadul. Age of the main lava dome formation is still unclear, but it could be much younger than previously thought.

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Submerged Holocene Baltic landscapes (The SINCOS project)

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Sea level change has to be regarded as a global problem, influencing the human population not only in present days. Even in early phases of cultural development human populations have been faced with marine transgressions and changes of climate and the natural environment.

In order to investigate longer termed trends (on the millennial time scale) the Baltic Sea has been selected as a model region for an interdisciplinary research project SINCOS (Sinking Coasts – Geosphere Ecosphere and Anthroposphere of the Holocene Southern Baltic Sea) because changes in crustal vertical displacement interacting with eustatically driven sea level rise and climatic–meteorological influence to coastal morphogenesis can be studied in an exceptional manner, here. In the southern Baltic area where sinking coasts cause permanent transgression of the sea, remnants of human settlements are preserved under water, recording the reaction of the human population living in the ancient coastal zones since Mesolithic times.

As study area served the southern coast of the Baltic Sea where the process of a retreating coastline initialized by the Littorina transgression about 8 000 cal. BP that shifted the environment from fresh water to brackish/marine conditions can be studied here directly in relation to global sea level rise.

For the development of a model first, proxy data have been acquired in order to reconstruct the process and the effect of Littorina transgression within the research area. Data acquisition was mainly bound to sea expeditions. By methods of marine geology and underwater archaeology samples and information have been acquired which did provide the proxy–data for the reconstruction of palaeoclimate, sea level rise, palaeoecology and socio–economic development of the human population having lived along the palaeo–coastlines.

Modelling procedures have been used for the historical reconstruction of palaeolandscapes submerged by the Holocene sea level rise.

For the historical reconstruction a GIS approach was deployed to derive transgression–regression scenarios for the development of the Baltic Sea basin after the Littorina

transgression. Regional and local models have been elaborated for the time span between 8 000 and 3 000 cal BP – a time of rapid sea level rise. As key areas for local models served the Wismar Bight, the Darss–Zingst Peninsula, and Rügen Island.

Rockslide mechanics reconstruction using FEM and photoplastic modelling

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On a steep eastern slope under a Celtic site of Obří Hrad in the Šumava Mts. (South Bohemia), a complex, multi-generation rockslide was identified. Detailed mapping of the site revealed several systems of rockslide scarps, corresponding to respective deformation generations. Following research was aimed to assess the current behaviour of the slope and likely mechanics of the rockslide. Reconstruction was difficult as the rockslides were not very fresh, and the accumulations were practically removed by the fluvial processes from the narrow valley floor. Numerous research methods were applied. The depth and profile of the potentially unstable slope was investigated using geophysical methods. Several monitoring systems to assess the current movements were installed, including automatic extensometers, rod dilatometers and steel tape extensometers. Detailed measurements of tectonic joints and foliation structures were performed to investigate geometrical predispositions for sliding. Relative dating of the scarps was performed using the Schmidthammer test, comparing the scarps to other exposed rocks. Based on these analyses, a hypothesis on the rockslide formation and mechanics was formulated and tested using two independent methods: FEM calculations in the FLAC software, and photoplastic models, simulating the behaviour of the tectonically fractured rock massif. The preliminary results of these techniques illustrate the possible mechanics of the sliding while the monitoring systems offer a frame for the timescale of the events.

Changing seasonality patterns from Miocene Climate Optimum to Miocene Climate Transition deduced from the Crassostrea isotope archive

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The Western Tethyan estuarine oyster *Crassostrea gryphoides* (Schlotheim, 1813) is geologically long lived. Appearing in the Oligocene it persists up to the Pliocene in the entire Western Tethys. With sizes of over 80 cm length, it is the largest Miocene bivalve in the Western Tethys Region. Its modern congeners are economically important in shellfish farming. Therefore, numerous studies focused on the biology and ecology of *Crassostrea* including several sclerochronological studies Herein we measured 5 shells from the Miocene Climate Optimum (MCO) and the subsequent Miocene Climate Transition (MCT) to evaluate changes of seasonality patterns.

MCO shells exhibit highly regular seasonal rhythms of warm-wet and dry-cool seasons. Optimal conditions resulted in extraordinary growth rates. Estuarine waters during the MCO in Central Europe display a seasonal temperature range of c. 9-10°C. Absolute water temperatures have ranged from 17-19°C during cool seasons and up to 28°C in warm seasons. Already during the early phase of the MCO, the growth rates are declining. Still, a very regular and well expressed seasonality is dominating, but extreme climate events did occur. The seasonal temperature range is still c. 9°C but the cool season temperature is slightly lower