Possible biotic changes in the Yantgtze delta-estuary as a result from the Three Gorges Dam construction and global warming

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It's obvious that the Three Gorges Dam construction as well as global warming can leads through a cascade of top down causality(main reasons of changes in some part of river-estuarian system are situated upper) to salinization, eutrophication and another changes of Yangtze delta estuarian and coastal waters and as a result to destabilization of ecosystems .We discuss this top down cascade. We take into account that the structure of cause-effect relation chain is different on different temporal and spatial scales. Destabilization of ecosystem leads to decreasing of ecosystem immunity against alien species and increasing of number of alien species forming stable populations [1,6]. Can we evaluate ecosystem immunity? Can we predict what species have more chance to be new inhabitants in these waters? What possible ecosystem transformation will be resulted from it? What biotopes will be colonized at first? Using available our and published date for the Azov, Black, Caspian, Baltic seas and Great Lakes[1,2,3,6] we try to give some answers on these questions. Giving answers we take into account date on long-term biotic changes in saline lakes driving by changes of salinity in them[8].Sediment load reduction of the Changjiang after the Three Gorges Dam construction (from 480 Mt yr^{-1} to 150-200 Mt yr^{-1})[4] leads to decreasing of sediment accumulation rate in delta and sea and as result after some time to increasing of coastal erosion. We know a lot of such cases. Coastal erosion effects on eutrophication rate and turbidity, they both lead to decreasing of biodiversity[5].Different impacts of climate changes and the Dam on biota can drive its changes in different directions. Trying to predict all changes we need remember about limits for such predictions[7].

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Vulnerability to climatic changes on Mediterranean beaches: a modelling approach

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Climate change induced vulnerability is defined by the Intergovernmental Panel on Climate Change (IPCC) as the combination of sensitivity to climatic variations, probability of adverse climate change, and adaptive capacity. As stated

by the IPCC (Watson et al., 1997), the “*coastal systems should be considered vulnerable to changes in climate*”. In these areas, amongst the most serious impacts of sea-level rise (Nicholls, 1996) are erosion and marine inundation. Thus, the coast of metropolitan France, being composed of 30% sandy coasts, is potentially vulnerable.
Within this context, the present paper will give the methodology for the modeling approach to analyze the vulnerability of several beaches on the French coast. Here we will have more particularly a study on a Mediterranean beach. All theses studies are involved in the VULSACO project.
The coastal morphology evolution can not be represented with average climatic conditions but need to simulate the extreme events as the storms and therefore, in a long term approach, the morphological evolution is the result of the combination of storm events and calm periods.
The morphological evolution in the near shore region, including its large-scale features, was first investigated using a combination of a commercial 2DH model and a Multi1DH model (Camenen and Larroude, 2003, 2003b). Simulation of the wave-driven currents was carried out with Telemac, a finite-volume elements model, and the Sisyphe sand transport module served to compute sediment transport rates and bed evolution. Since the sediment transport in the surf zone is mainly controlled by undertow, an undertow model (based on Svendsen, 1984) was added to account for that process.
These models were used in the framework of a simulated meteorological cycle describing the seasonal evolution of hydrodynamic factors. Results from monthly 2DH evolution simulations show a perfect fit with field data obtained on the beaches in Sete (Certain, 2002). Morpho-hydrodynamic feedback of a bar having undergone reinforcing is also examined. All these assumptions should, of course, be systematically checked, the purpose of the exercise being to assess, through mid-term bathymetric evolution simulation. Then, vulnerability can be studied: the vulnerability of coast/beach will be defined and studied based on in-situ observations and model results will be taken into account as a modulator of the physical vulnerability.

Sea surface temperature and Mekong River discharge estimated by multi-element analysis of coral skeletons from the south of Vietnam

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Tropical climate is one of the most important factors connected with the global climate system. In addition, recent human activity has serious influences on the climate system, as most remarkably manifested as the global warming. On the other hand, we do not have enough accumulation of meteorological/environmental data for understanding the tropical-global connection and anthropogenic influences on global climate. The South China Sea (SCS), especially its southern part, is likely to be one of the most important regions in connection with the global climate system, because it is close to the Western Pacific Warm Pool that generates the world’s most active convection, and is also dominated by Southeast Asian monsoon. The meteorological data in the southern SCS are very limited, mostly spanning the past few decades after the late 1970s or early 1980s. To extend the limited meteorological data, a Vietnamese coral sample (Porites sp.) with annual bands of AD 1948-2000 was used as archives of the past climate and environment. The annual bands in the coral sample were visualized by X radiography and UV-luminescence photography and confirmed by ^{14}C measurements detecting a signal of atmospheric nuclear tests in the late 1950s and early 1960s.
The Sr/Ca, Mg/Ca and Ba/Ca ratios in the annual bands were determined at a temporal resolution of about one month, using a high-precision CCD simultaneous ICP-OES. The Sr/Ca time series shows clear annual cyclicity and is mainly controlled by sea-surface temperature (SST). In the coral sampling site, instrumental SST observation has been made since 1980. The instrumental SST data was compared with the Sr/Ca data to establish a Sr/Ca thermometer as follows: Sr/Ca (mmol/mol) = 9.905 − 0.03897 x SST (℃). Application of the thermometer to the whole Sr/Ca time series provides a SST reconstruction from 1948 to 2000. The