

Session #37 at the Open Science Conference of the Earth System Science Partnership (ESSP),  
9-12 November 2006, Beijing

### **Sea-level Rise, Vulnerability and Impacts**

Convenors: S. Wilson and N. Harvey

Issues: Given present uncertainties in sea-level rise and variability and expected impact scenarios, what determines the vulnerability of coastal systems and how can the impact of sea level rise be avoided and/or mitigated.

#### ***Detailed projections of coastal climate change until 2100 in N Europe***

Hans von Storch, Katja Woth, Ralf Weisse, Burkhardt Rockel, and Lidia Gaslikova

In a concerted effort of a series of quasi-realistic models of the regional atmosphere, the hydrodynamics of the North Sea and of the wave conditions, global climate change scenarios prepared for IPCC are downscaled to a high-resolution grid presentation of storminess, currents, water levels and wave heights in Northern Europe and particularly in the North Sea area. In this way, possible and plausible future developments are derived with an hourly time increment.

The analysis of the changing conditions indicates that for most parts of Northern Europe, storminess will increase at least in the domain of the North Sea. Maximum wind speeds may increase by about 10% accordingly, storm surge heights may rise by some 20 cm in the German Bight. Adding these increases to the expected mean sea level rise, higher storm water levels in Hamburg of 60 and more cm are plausible for the end of the 21<sup>st</sup> century. In this scenario, high waves in the German Bight may grow by another 20 cm. With such expectations for the end of the century, it appears unlikely that any man-made changes in the wind conditions and related effects in coastal zones can be detected within the next couple of decades.

The resulting hourly, high-resolution data set forms another of two major components of the data set COASTDAT, which is provided by the Institute for Coastal Research at GKSS to a variety of clients dealing mainly with coastal defence.