AALBORG UNIVERSITY

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Abstract: In Europe, coastal areas are great zones of settlement and play a vital role in the wealth of many nations. Over the past 50 years, the population living in European coastal municipalities has more than doubled and in 2001, it reached 70 million inhabitants. The total value of economic assets located within 500 meters of the European coastline was estimated at between € 500 and 1,000 billion in 2000. [THESEUS, 2010]

This PhD stipend is affiliated with the 4 year research project THESEUS (*"Innovative technologies for safer European coasts in a changing climate*") funded by the European Commission (6.5 million Euro). The objective of the project is to study the application of innovative combined coastal mitigation and adaptation technologies generally aiming at delivering a safe (or low-risk) coast for human use/development and healthy coastal habitats as sea levels rise and climate changes (and the European economy continues to grow). The general aim of this PhD project is to develop and evaluate innovative methods for mitigation of flooding and coastal erosion hazard in the context of increasing storminess and sea level rise.

The PhD project will be related mainly to experimental testing of various innovative methods for improving the safety of European coasts in a changing climate. These methods will among others be upgrade of existing defenses (dikes, breakwaters etc.) and reduction of wave energy at the coasts by utilization of wave energy converters placed offshore. Concerning the use of wave energy converters for coastal protection, an additional numerical study will be performed, where the numerical model is calibrated and validated against the experimental test data. Thereby, it is possible to apply the evaluated wave energy converters at any shoreline. Moreover, the consequences of overtopping waves on dikes will be investigated in oblique- and short-crested waves which can be used to more realistically evaluate the consequence of sea water level rise.

Supervisor: Associate Professor Thomas Lykke Andersen

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