

## DEVELOPMENT AND APPLICATION OF A FLOOD RISK ANALYSIS FOR COASTAL REGIONS

C. Grimm<sup>1</sup>, D. Bachmann<sup>2</sup> and H. Schüttrumpf<sup>3</sup>

**Paper topic:** Coastal risks and management, including climate change

### 1. Introduction

In 2012 the German public commemorated the 50<sup>th</sup> anniversary of the North Sea flood of 1962. Over 340 people died and approx. 28,000 apartments or houses were damaged. Within the last 50 years huge efforts were made and a lot of money was spent on coastal protection measures in Germany. The positive results of these measures are proven by the fact that the peak water level of 1962 was exceeded by 8 storm surge events in the city of Hamburg with appreciably less damage and no loss of life.

Regardless of the positive developments on coastal protection measures the expected global climate change requires a re-evaluation of coastal protection measures and flood risk management strategies for coastal regions. The practical realisation of risk adaption and mitigation is a major task for all coastal authorities. The development of methods and computer based tools to support this process is one of the major challenges for research.

### 2. PROMAIDES and flood risk analysis

At the Institute of Hydraulic Engineering and Water Resources Management (IWW) of the RWTH Aachen University a modular designed decision support system, PROMAIDES, was developed to support the selection of flood protection measures (Bachmann, 2012; Bachmann et al. 2012). The main advantages of the developed software tool PROMAIDES are:

- integral aspects of flood risk analysis (reliability analysis, hydrodynamic analysis and analysis of consequences) in one software package (Figure 1),
- identification of possible risk mitigation measures and
- estimation of construction costs for risk mitigation measures as a reliable base for decision makers.

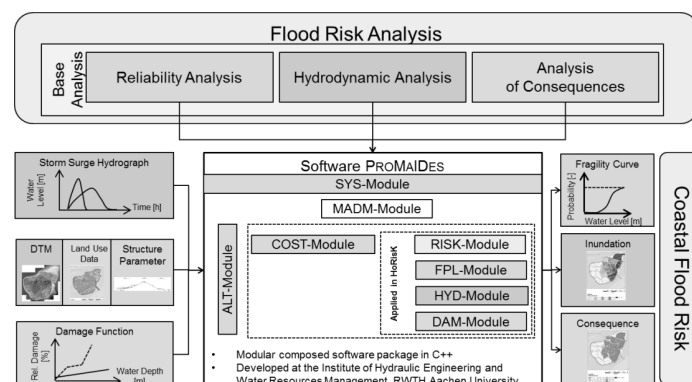


Figure 1. Flood risk analysis and base analyses as implemented in PROMAIDES.

<sup>1</sup> Institute of Hydraulic Engineering and Water Resources Management, RWTH Aachen University, Aachen, Germany. grimm@iww.rwth-aachen.de

<sup>2</sup> Institute of Hydraulic Engineering and Water Resources Management, RWTH Aachen University, Aachen, Germany. bachmann@iww.rwth-aachen.de

<sup>3</sup> Institute of Hydraulic Engineering and Water Resources Management, RWTH Aachen University, Aachen, Germany. schuettrumpf@iww.rwth-aachen.de

### 3. Flood risk analysis for Markgrafenheide

The developed flood risk analyses and the associated software package ProMaIDes is tested and verified on four study sites in the northern part of Germany (Figure 2).

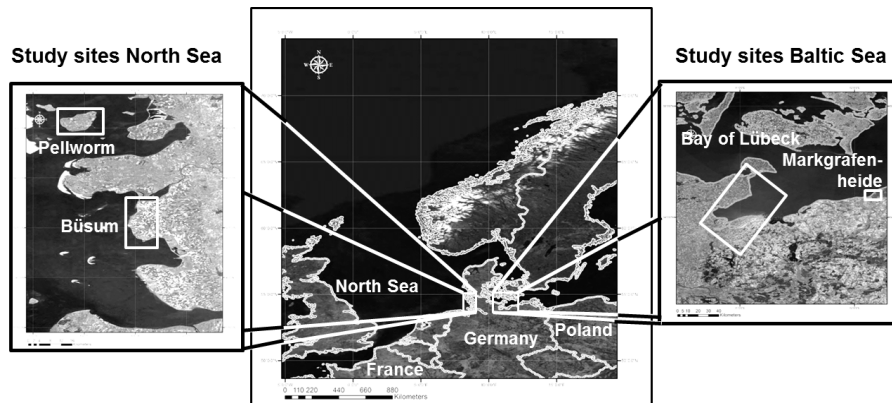


Figure 2: Study sites for flood risk analyses with PROMAIDES

Grimm et al., 2012 presented preliminary results of the developed flood risk analysis for the study site Pellworm. In the upcoming 6<sup>th</sup> SCAR we present final results of the flood risk analysis and the three base analyses for the study site Markgrafenheide. We discuss the results and compare them with the state of the art flood risk assessment in the German federated state of Mecklenburg-Vorpommern.

### Acknowledgements

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### References

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