

A full version of the GCERC-*newsletter* (including figures) can be found under <http://kfki.baw.de> as of March 15,2003

### **Editorial**

#### **Coastal Zone Management – Challenge and Necessity:**

Do we need an integrated coastal zone management (ICZM) in Germany? Let us look at one example: during the past few weeks the pros and cons of the new deepwater port at Wilhelmshaven have been discussed fervently. Politicians are being accused of taking decisions behind closed doors, various cost estimates are surfacing, and the impact on the coastal environment has apparently not been researched properly. All of this shows that such a project affects the entire socio-economic environment and that the public should be involved at an early stage of planning.

Consequently, the EU has demanded of its member states to develop and realise concepts for an ICZM. Thus, an interaction between the various stake holders across regional, provincial and national borders is required.

The intention of the Federal Ministry for Education and Research – BMBF – to initiate and support research projects on a sustainable ICZM was already published in the previous issue of the GCERC newsletter. Within the period of tender invitation 14 proposals have been received of which the most promising are to be selected for realisation. A combination of various ideas and modules is possible.

Many important preliminary studies in the field of ecosystem research, coastal engineering etc. have been carried out, some of them through BMBF support. Therefore, some useful information about the stress limitations through climatic and man-made changes of the coastal zone is at hand. Financial support through BMBF will help to concentrate the expertise which is already spread throughout the country with a focus on an ICZM. The results may contribute to a strengthening of the German consulting industry internationally, based on an ICZM concept and strategy.

However, the realisation of such measures requires the necessary financial means. In view of dwindling resources, priorities have to be defined in public coffers. We need to emphasize the achieved goals and demonstrate the necessity of new measures to the public.

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How does all this affect coastal engineering? Through its brochures 'GCERC – 25 Years of Research in Coastal Engineering' and 'Research Concept of GCERC 2001', GCERC has shown that it is on the right path. Moreover, special issues of 'Die Küste' such as volume 63, 'Global Storm Surges', contribute to a better acceptance in public. I am convinced that through an increased involvement in ICZM and its various discussion panels in the coastal community coastal engineers can emphasize and stress the validity of their contribution to ICZM.

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### **Project News**

Under the project management of Dr. -Ing. habil. Peter Milbradt ([milbradt@smileconsult.de](mailto:milbradt@smileconsult.de)), smile-Consult GmbH, selected bathymetry data of the German North Sea Coast will be processed and, with metadata attached, be made available on a web-portal. In the GCERC-project **KODIBA – Development and Implementation of Methods for the Processing of Consistent Digital Bathymetries**, algorithms for the generation of consistent bathymetries from sounding data will be developed and tested. In the process, particularly systematic errors will be identified and corrected.

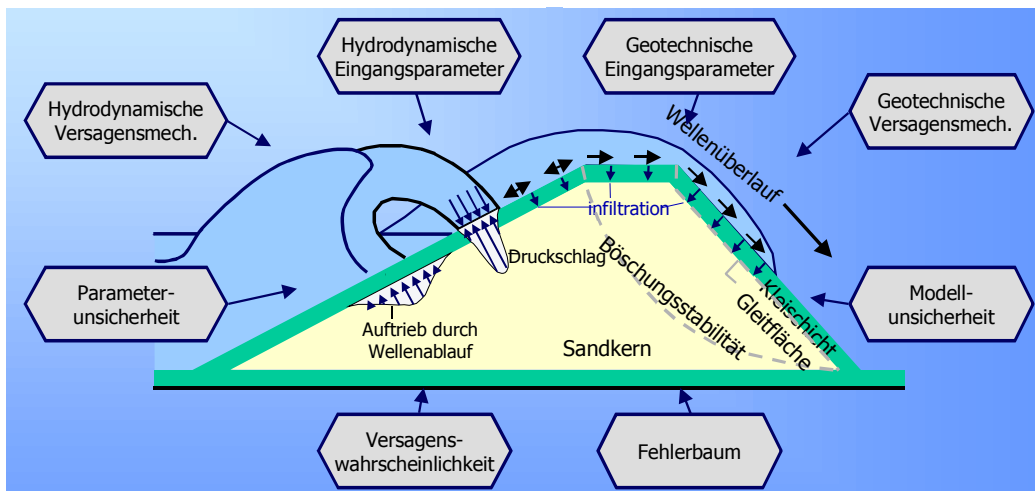
The necessary metadata will be generated, and the bathymetry data are to be processed through a digital terrain model and plotted. A close harmonization with the GCERC-project **NOKIS** is guaranteed. The project started in October 2002 and will terminate after two years' time.

What is the likelihood of the occurrence of unusually high storm surges? This is the key question of the new GCERC-project **MUSE: Model-Supported Investigation of Extreme Storm Surge Events With a Small Frequency of Occurrence** which commenced with a duration of 3 years under the management of Prof. Dr.-Ing. Jürgen Jensen ([Jensen@fb10.uni-siegen.de](mailto:Jensen@fb10.uni-siegen.de)) in June 2002.

The ultimate goal of the investigation is the calculation by the German Weather Service (DWD) of physically feasible weather scenarios resp. wind fields on the basis of wind set-up calculations using the prediction models of the German Maritime Institute (BSH). Researchers at the University of Siegen (fwu) will use statistical methods and sensitivity analysis to evaluate these results with respect to a better estimate of the likelihood of occurrence. Investigations by BSH will be carried out with two operational forecast models ( 2D and 3D). The required physically consistent weather scenarios originate from a forecast model of DWD. A critical comparison of simulated and recorded data of storm surges in the North Sea, particularly in the German Bight, will follow.

The results can be used to answer questions regarding climatic changes and their impact on socio-economic aspects in the coastal zone.

The GCERC-research project **Prodeich – Probabilistic Design for Sea Dikes –** ([h.oumeraci@tu-bs.de](mailto:h.oumeraci@tu-bs.de)) principally was a feasibility study for such methods. The project was completed in the fall of 2002. In coastal engineering, probabilistic design methods can generally be applied to quantify the safety margin of coastal protection works. The methods used are based on existing and newly defined failure mechanisms for exemplary dikes. The results were compared with those of conventional deterministic calculation procedures. Consequently, the general feasibility of probabilistic design methods could be demonstrated.

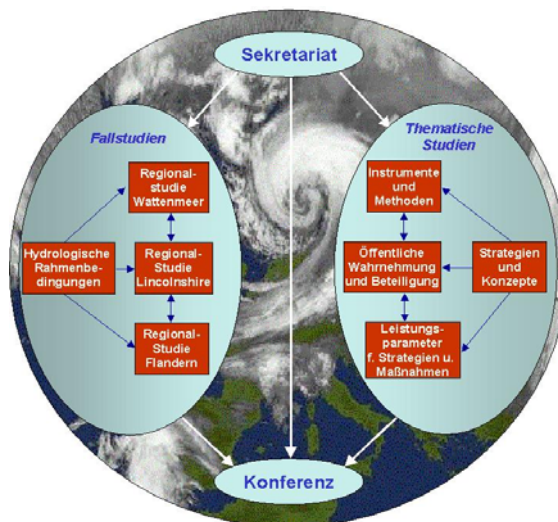


The analysis has shown that the overall likelihood of the failure of a sea dike can be determined using the suggested design method. For dikes designed according to current principles and with present crown elevations, the most important failure mechanisms are erosion processes on the outer slopes. In particular, the uncertainties connected with the design water level represent an important influence on the likelihood of failure of the single mechanism as well as on the overall failure likelihood. However, results also show that a lot of assumptions need to be made as to the definition of uncertainties and the equations of the borderline state. Further research needs can be derived from the presented results which represent the fundamentals for a risk analysis of a coastal region threatened by flooding.

The protection of the population against storm surges in the southern North Sea with its low lying coastal regions is of utmost importance. Under management of the Ministry for Rural Affairs and Planning, Agriculture and Tourism ([matthias.hamann@mlr.landsh.de](mailto:matthias.hamann@mlr.landsh.de)) the coastal protection agencies of the countries bordering on the North Sea, Denmark, Germany, Belgium, Great Britain and the Netherlands, will cooperate in a trans-national project.

Funding from the **Interreg IIIb – Programme of the European Union** covers 50% of the total of 1.6 Mill. € which have been set aside for this project to improve risk management for low-lying areas threatened by flooding. The project with its 8 sub-projects is carried out by six institutions, and the exchange of expertise extends to the following areas:

- Comparison and evaluation of national strategies and concepts for risk management
- Non-technical measures for risk minimization (e.g. basic damage insurance or other forms of collateral, flood warning systems, awareness generation, removal/retraction of dikes, instruments for spatial planning)
- Risk awareness of the public, stakeholder participation
- Development of efficiency parameters for measures and strategies of risk-based management
- Comparison of various design methods for dikes and for the definition of hydrological boundary conditions
- Methods of risk evaluation for areas endangered by flooding (calculation of the likelihood of flooding and of potential damage); investigation in three pilot areas: Lincolnshire, Flanders and South-West Jutland.



Contact groups, which accompany the various case studies, have been formed in order to look after local and regional interests. They are composed of representatives of coastal interest groups and authorities and are being informed about progress and results of the project on a regular basis. In addition, every sub-project will hold a workshop to which local institutions and experts are invited. These workshops cover overall project results as well as regionally important issues. An international conference is scheduled to be held at the final stages of the project in the spring of 2005. On this occasion, all results of the sub-projects will be publicly presented and discussed with experts and stakeholders. Pertinent information can be found at <http://www.comrisk.org>.

The research project **03KIS015 – Run-up of Obliquely Attacking Waves** – was completed after 2.5 years duration in December 2002. Research was carried out cooperatively by the Leichtweiß Institut of the Technical University of Braunschweig ([h.oumeraci@tu-bs.de](mailto:h.oumeraci@tu-bs.de)) and the Franzius Institut of the University of Hannover ([Claus.Zimmermann@fi.uni-hannover.de](mailto:Claus.Zimmermann@fi.uni-hannover.de)).

The ultimate goal of the project was the definition of the influence of the wave attack angle on run-up and overtopping on sea dikes. This research was instigated by similar investigations in the past leading to diverging conclusions. Results had indicated both

an increase and a reduction in run-up height for waves attacking at a slight angle towards the perpendicular direction. Moreover, different results had been obtained for short- and long-crested waves.

The project was carried out in two phases. Phase I included physical model tests with a dike of linear slope 1:6 in the directional wave basin of the Coastal Hydraulics Centre (CHC) in Ottawa, Canada. This facility, where both long- and short-crested waves can be reliably generated, was chosen because of its international reputation. Due to a powerful and sophisticated generation technique and absorptive basin walls spurious boundary and model effects can be excluded.



*Wave Basin of CHC  
Ottawa/Canada*

Based on the results obtained in the basin of CHC, one could demonstrate that no significant difference for run-up and overtopping exists between short- and long-crested waves. This led to conclude that additional tests could be run in a facility with only long-crested wave generation capability. Moreover, test results already indicated that no significant increase in run-up of oblique waves exists in comparison with perpendicularly attacking waves.

The wave basin of Franzius Institute was chosen for the second phase with long-crested waves. These tests incorporated the extension of investigations towards other dike profiles (slope 1:3, dikes with a berm, a broken slope e.g. 1:3 – 1:6) and additional sea states (e.g. prototype spectra). It could be shown that the slope influences the directional function  $\gamma_\theta$ , while berms or broken slopes do not generate major changes.

Milestone reports and the final report for this project can be found at <http://kfki.baw.de> for downloading. Comments and questions can be directed towards Dr.-Ing. H. Schüttrumpf ([schuettrumpf@hamburg.baw.de](mailto:schuettrumpf@hamburg.baw.de)) and Dr.-Ing. K.-F. Daemrich ([daekf@fi.uni-hannover.de](mailto:daekf@fi.uni-hannover.de)).

The project **03KIS027 - NOKIS – North and Baltic Sea Metadata Information System** for coastal research and engineering has been running since March 2001. In close cooperation, federal and provincial authorities working in coastal engineering and



environmental research offer metadata about their existing data banks through a common web portal. The use of standardized metadata according to ISO19115 permits an efficient search for information on the basis of spatial and temporal reference .

During a workshop held on February 20, 2003 the status of the project was presented (<http://nokis.baw.de>) and potential users had the chance to utter their expectations for the future course of the investigation. Main task beside the agreement on a common **metadata standard** was the development of a suitable **metadata editor** for the generation of 'data about data'. This was achieved only by everyday interaction between the partners in this pilot project and software producers.

The availability of data about GCERC was a major part of the project. Meanwhile, all issues of the coastal engineering journal 'Die Küste' have been catalogued and show abstracts of all articles together with the reference lists. Furthermore, access is given to proceedings of



international conferences as well as of the annual *GCERC status seminar for coastal engineering*. All GCERC research projects are listed, and milestone as well as final reports can be accessed. The information system can be easily extended; in addition to data about some projects concerning Integrated Coastal Zone Management, all metadata banks maintained at the German Coastal Institute GKSS are accessible.

Via key words a search for information relevant to the coast will therefore yield references towards reports, documentations and data about a variety of research activities. NOKIS's claim to becoming the revolving centre of coastal research is about to be realised.

Starting April 15, 2003, the web-OPAC of the **GCERC scientific library** will grant an online customer search and the option to order literature.

### News from the Head Office

#### 1. New research coordinator

At the end of January, Peter Petersen will take his retirement after almost 15 years as the research coordinator for GCERC. Since his nomination for this position in 1988, many research projects have been successfully concluded through his initiative and activity. Thanks to his tireless commitment far beyond normal working hours, he has succeeded in channelling new ideas, putting them into the right direction and realising feasible projects. Through his calm attitude he has contributed to the solution of conflicts and given guidance in discussions for the sake of the research community.

On behalf of the coastal engineering community I would like to thank Mr. Petersen for his commitment and work in the spirit of coastal engineering research. We all wish him all the best for the future.

His successor in the position of research coordinator is Frank Thorenz. GCERC – *newsletter* wishes him well and success in his endeavours for the new task.

Volker Barthel  
Managing Director

## **2. International Conference on Coastal Engineering 2008 – ICCE'08**

In July 2002 GCERC's Dr.-Ing. Barthel and Dr.-Ing. Schüttrumpf, BAW, participated in a meeting of the US Coastal Engineering Research Council (CERC) during the 28th ICCE in Cardiff, Wales, UK. They presented Germany's application and invitation to host the 31st ICCE. In a subsequent meeting, CERC decided to accept this invitation and announced its decision during the conference banquet on the last day of the ICCE.

In the meantime, a provisional Local Organising Committee, LOC (P), has discussed various possibilities for the conference venue (or: various possible venues/sites for the conference – that would be more precise). After serious consideration, the LOC (P) has decided to hold the conference in Hamburg. Parts of the ongoing preparations include the choosing of a logo and a motto for the ICCE'08. Everyone living at or dealing with the coast is called on to participate in a contest to come up with a suitable design for the logo and/or motto which would best symbolize the conference venue as well as coastal engineering research in general. Suggestions and proposals can be sent (pref. by e-mail) to the GCERC Main Office ([kfki-sekretariat@cux.wsd-nord.de](mailto:kfki-sekretariat@cux.wsd-nord.de)) by March 31, 2003.

After evaluation by a jury the following prizes will be awarded:

1. 200.- €
2. 100.- €
3. 5 issues of the journal 'Die Küste' of your choice

The LOC (P) appreciates your participation and effort and hopes that staff members of authorities, regional offices and consulting firms working at the coast will actively support ICCE'08 in Hamburg, Germany.

## **3. 'Die Küste', issues 65 and 66**

The final print and delivery of the special issues 65 (recommendations of the working group on coastal structures – EAK 2002) and 66 (The Baltic Sea) of 'Die Küste' have been delayed due to extremely time-consuming processes in editing and correction of the galley-proofs. However, we expect the EAK2002 to be delivered in April and the issues 'Baltic Sea' in June 2003. Orders can be placed via the GCERC-Main Office, the GCERC Library or directly to the publishing house Boyens + Co, Heide, Germany.

**4.** We would also like to draw your attention one more time to the special issue No. 63 of 'Die Küste' '**Global Strom Surges**' (in English). A table of contents can be found

on **GCERC's website** (<http://kfki.baw.de>). For only 28.-- € you will find the scientific basis of origin, evolution and effects as well as case studies of storm surges around the world– with some emphasis on the North Sea and the Baltic Sea. Orders can be placed via the GCERC main office, the GCERC Library or directly with the publishing house Boyens and Co, POB 1880, 25738 Heide, Germany.

### Events 2003

- 18. – 23.05.2003**                      **Coastal Sediments '03**  
Clearwaterbeach, Florida  
<http://www.coastalsediments.net>
- 10. – 13.06.2003**                      **Tagung der Arbeitsgemeinschaft Norddeutscher Geologen  
Neubrandenburg**  
e-mail: [elke.stejsjal@lung.mv-regierung.de](mailto:elke.stejsjal@lung.mv-regierung.de)
- 24. – 29.08.2003**                      **XXX IAHR Congress**  
Thessaloniki, Griechenland  
<http://iahr2003.internet.gr/>
- 26. – 29.08.2003**                      **Coastal Structures Conference 2003**  
Portland, Oregon (USA)  
<http://www.asce.org/conferences>
- 15. – 19.09.2003**                      **COPEDEC VI**  
Colombo, Sri Lanka  
[Copedec@lhi.lk](mailto:Copedec@lhi.lk)
- 28. – 30.09.2003**                      **KRING van Zeewerende Ingenieurs**  
tentatively in Denmark
- 15. – 17.10.2003**                      **Conference on Coastal Management**  
Brighton, UK  
e-mail: [penny.ryan@ice.org.uk](mailto:penny.ryan@ice.org.uk)
- 29./30.10.2003**                      **GCERC –Scientific Seminar on Coastal Engineering/ of the  
GCERC Expert Commission in Bremerhaven**  
<http://kfki.baw.de>

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***Please, contact the GCERC Head Office before July 31, 2003.***