CONCLUSIONS AND RECOMMENDATIONS OF THE WORKING GROUPS

On the last day of the workshop, discussions in three subgroups were held. The discussions focussed on Coastal Morphology, Engineering Structures and their Hydrodynamic Interactions and on Environmental Aspects and Integrated Modelling.

1. Coastal Morphology

Participants: Ping Dong, Dorina Dragancheva, Razvan Mateescu, Boyan Savov, Jens Schefferman, Rui Taborda, Ekaterina Trifonova, Claus Zimmermann, Robert Dean (chair)

The morphological working group adopted a scope of identifying needs to ensure the availability of: (1) An adequate understanding of the physics underlying coastal and nearshore processes, and (2) The associated information/data resources to provide guidance for future decisions related to coastal morphological changes. This scope encompasses effects of relative sea level change and reduction in sediment supply, each which can induce erosional pressure on the beach and nearshore systems and each of which can be due to both natural and/or anthropogenic causes. The array of possible responses to erosional pressure include: (1) Retreat, (2) Coastal armouring, (3) Beach nourishment, and (4) Combinations of these. The appropriate response for a particular scenario will require improved decision making tools than are now available and an incorrect response could be quite expensive, both monetarily and sociologically.

1.1 Data Collection and Processing

Long-term data should be organized, stored and made available for future generations and decision making. These data should include shoreline positions and nearshore bathymetry. I International level standards should be defined how to measure and how to store data. Surveys of available sediment resources with attention to both quality and quantity are needed. Also this information should be available via standardised databases. Take advantage of “Experiments of Opportunity” to develop a better understanding of nearshore processes.

1.2 Consultancy and Relation with Clients

Recognize the uncertainties in morphological prediction. Educate clients to have realistic expectations. Prior to recommending an approach, attempt to understand the system, i.e. is the shelf a source of sink of sand? Assume greater responsibility in developing and ensuring adherence to appropriate coastal legislation. Encourage multidisciplinary and integrated approaches. Coastal structures have the potential for substantial negative impacts to adjacent beach systems which should be considered in design. Consider the setting.

C. Zimmermann et al. (eds.), Environmentally Friendly Coastal Protection, 267-271.

1.3 Future Developments

Recognize the possibility of Global Climate Change and consider adaptive responses. Tools (models) are needed to evaluate coastal response to sea level rise and/or reduction in sediment supply without engineered responses. Methods are needed of separating the shoreline and nearshore effects of natural and anthropogenic causes. Also tools are needed to evaluate the effects of coastal protection structures and the maintenance. All tools should incorporate the best understanding of the relevant physics. It is therefore necessary to look for case studies which clarify and hopefully quantify the processes, for example of large interruptions in longshore sediment transport or reductions in sediment supply.

Finally the group concluded that workshops of this type should be continued to promote technology transfer and to ensure more consistency.

2. Discussion on Engineering Structures and their Hydrodynamic Interactions

Participants: Lorenzo Capietti, Sevket Cokgor, Kristjo Daskalov, Marcel van Gent, Pedro Lomonaco, Stig Magnar Lιιves, Tomasz Marcinkowski, Valeri Penchev, Joan Pope, Panayotis Prinos, Francisco Sancho, Henk Jan Verhagen (chair)

From the discussion it followed that in general the main problem is not so much the limits in specialised knowledge, as well the implementation and application. In spite of this, some deficiencies were identified in the ongoing research programmes. The discussion addressed four relevant issues:

2.1 Research Issues

Within this issue, the discussion concentrated on the need for further research. Modern computational techniques make it very well possible to make mathematical descriptions of nearly all processes and to compute hydrodynamic behaviour in detail. Of course calibration of the mathematical models is essential, and is usually done using physical models. The continuous need for calibration and verification of mathematical models using physical models was stressed. Regarding the interaction of water and sand and/or mud beds, mathematical models are much more complicated, but still very possible. However, calibration and verification is much more complicated because of the difficulty to make physical models coupling the hydrodynamics with sediment transport. Consequently it was concluded that there is a lack of knowledge related to scour processes. Prediction of scour is essential for the stability of a structure. Therefore insight in scour processes is important. On the other hand, if well monitored, scour can be observed and in many cases scour can be stopped by using appropriate bed protection (dumping of stone).

Morphological models give at this moment very acceptable predictions for long term coastal protection; in order to apply these models some kind of "dominant wave climate" is used. However, it is questionable if the same mathematical models (especially the same calibration factors) can be used in case of extreme hydraulic loads, which is usually the design condition for an engineering structure.

In general it was concluded that for many research results it takes too much time before these results are implemented in the daily design routine. This is largely caused by the fact that researchers are usually not interested in contributing to design manuals, because research funding cannot be used for design manuals (Universities usually provide money to research groups related to the number of scientific publications, preferably in Journals, not read by designers; contributions to a design manual are often not considered as scientific publications, and therefore not appreciated accordingly).

2.2 Guidance for Structure Performance

It was concluded that often coastal managers lack guidance on when to apply a structure and if a structure can be applied, what is the best structure to be applied. Design guidelines for the structure are usually clear, but the morphological effects are difficult to generalise, they are very case dependent. So, regarding morphological effects of structures, one should always perform site specific studies. It is very important that managers realise that they should not try to solve local, isolated problems without considering the whole system.

Quite some guidance is needed for the managers of low crested structures. It is expected that the European DELOS program will provide the required knowledge. Of course there is now a need to disseminate the findings and conclusions in the form of guidelines to coastal managers.

2.3 Information to Decision Makers

It was concluded that communication with decision makers is often a problem. Very often this depends on the definition of "success". For example nearshore nourishments are considered successful to maintain the long term sediment balance for a coastal stretch, but they may not be successful in providing a wide beach during the next tourist season. It is important to define the performance standard. Project goals have to be defined clearly in terms understandable by the public. Results of research should be put in forms for both public and political understanding.

2.4 Failures

Failures are inherent to the construction process. However, failures are seldom reported in detail, especially when the failures are not too large, and no official enquiry is made. Even a greater problem are "non-functioning" structures. Many patented structures have been presented, and applied in some field tests. In cases where such structures did not provide the required results, usually no extensive report regarding this structure is presented. Consequently potential users elsewhere are not aware of the non-effective performance. It is therefore suggested that a database be developed containing results of experimental structures. The database should to be set up with care. It is not the intention to blame persons or organizations, but only to prevent that the same mistake is made twice.

The same database can be used to report on "experiments of opportunity". For example if a temporary structure for some reason is not removed and exposed to an overload, the behaviour of this structure may provide useful information. Reporting on such a case is important

3. Environmental Aspects and Integrated Modelling

Participants: Doina Botzan, Jose Cortezon, Jose Juanes, Gytautas Ignatavičus, Vitalij Ivanov, Anna Ivanova, Grzegorz Rozynski, Iwona Szalucka, Nicolaj Lissev, Margaret Johnsen, Stephan Mai, Dano Roelvink (chair)

The environmental working group tried to make an inventory of the status of environmental aspects and integrated modelling in the countries of the participants. This inventory was focussed on a number of aspects.

3.1 Climate Change

In Germany and Holland historical trends are accounted for as a minimum. In Holland the IPCC recommendations are taken into account; this leads to a special concern for the tidal inlets and near estuaries. In Germany no accelerated sealevel rise is considered, but a fixed additional safety factor of 50 cm for important hydraulic structures is taken into account. In Poland the issue is very controversial, in the US the government is minimising the discussion, it is there difficult to find consensus. The UK follows active planning and mitigation, e.g. Humber shoreline management plan.

3.2 Public Acceptance

The working group concluded that there is a need for improvement of the public acceptance of necessary coastal protection. This could be achieved by:

- Better information on risk of doing nothing;
- Integrated CZM, much participation;
- Long-term process to reduce mistrust of government;
- Educate children, in a balanced manner;
- Adapting to public concerns;
- Difficult to deal with very negative attitudes.

3.3 "Environmentally-Friendly Structures"?

It is difficult to give a good definition of an environmentally-friendly structure. Aesthetic aspects are extremely important but subjective. It should in any case have no negative effects on water quality and one should consider the role of the structure within the whole coastal cell. Some participants consider that a minimum requirement is to have a beach at all. In this respect EU directives on habitats are relevant for important habitats on sea bottom. Because of developments at the coast control of water quality is important. The effluent from hotels should always be treated before it is discharged into the sea. Hotel owners often look only to short term profit, and are therefore less interested in water quality control; they become only interested when they observe a decrease in guests because of the pollution, but at that moment measures are already too late. In Romania this is a significant problem.

The lack of land (e.g. at the Crimea) triggers reclamation works. When not properly designed, such works may also worsen the water quality. Mathematical modelling is in

such cases needed to predict the effects. Usually bad effects are predicted due to altered circulation, added effluents, problems related to dredging in sensitive areas. In situations with strong enough tidal currents, deep dredging pits may be preferable to wide shallow pits; this is not possible in other seas because of occurrence of anoxic situations.

3.4 Protection of Soft Cliff Coasts

On a number of places, notably in Poland, accelerated cliff erosion is observed due to increased storminess. In many cases the costs are very high in relation to the value of the land, so perhaps one should sacrifice the area in many cases. In some cases this results in an unofficial "do nothing" policy (e.g. in Romania, due to limited economic governmental resources and no interest with some private investors, like hotel owners).

In some cases retarding toe erosion may be a solution. In a few cases hard defences (e.g. at some places along the Bulgarian coast) have been constructed with the aim to stop toe erosion.

3.5 Integration

There is a strong need for further integration of physical, biological and social points of view for ICZM. Meetings and discussions are often too much mono-disciplinary (e.g. at this workshop there is only one biologist). However, it is difficult to establish communication between disciplines. Interdisciplinary research is not always accepted as "serious". In any case one should integrate disciplines within institutes. Accomplishment of this objective requires a critical mass.

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