

NCK; the road ahead

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INTRODUCTION

Twenty years of NCK is a milestone that asks for both celebration and reflection. Reflection on what we have accomplished in those years and some thoughts on where we want, or need, to go in the coming years. Job Dronkers' contribution gives a first-hand report on the history of coastal research in The Netherlands, the founding of NCK and the 'winding road' that led us to where we stand today. My contribution will address the road ahead. It reflects my personal ideas and is by no means an official NCK policy plan.

NCK, THE FIRST 20 YEARS

The Netherlands Centre for Coastal Research NCK is not what the name suggests: a building where a predominantly scientific staff researches the ins and outs of the Dutch coast. In fact, it is more or less the opposite: it is a platform for the exchange of knowledge and expertise, the sharing of data and tools, and collaboration of scientists from different disciplines and with different backgrounds that work in different institutes. The Centre works as a network, a network that provides access to knowledge, experience, facilities, etc. As Job describes, NCK never was a programming or co-ordinating organization in coastal research. Instead, it was, and still is, a network organization that encourages and facilitates transfer of knowledge, from one research discipline to the other and from senior, experienced researchers to junior ones. Thus, the expertise of the entire coastal research community is available to that same community. Important ways to accomplish this are part-time secondment of senior staff of applied research institutes to universities, the yearly symposium "NCK-days" and the bi-yearly NCK Summer School. The "NCK-days" provide an opportunity for PhD and masters students to present their plans, ideas and results, both orally and as posters, and to learn from the feedback they will get, usually in the form of animated discussions. This is the sound basis of the NCK network. The large number of 'alumni' of the network that continues to attend these symposia strengthens this. The NCK Summer School is a must for all PhD students working within the NCK partner institutes. Both the lecture programme and the case studies presented in the Summer School reflect the wide range of subjects that is covered by the NCK partners. Finally, NCK partners have joined forces to write research proposals for national and European funding organizations in the past. And they will continue to do so.

NCK IN 2012

So where do we stand today? Concentrating on the national level, we see an increasing call for coastal development. The national programme to reinforce the so-called 'weak links' in the coastal defence sparked off a series of plans for upgrading of the local infrastructure, especially in coastal towns, in combination with the improvement of the sea defences. However, several plans are not directly related to coastal defence issues but are concentrating on local spatial planning, in some cases including seaward extensions of the coastline. Simultaneously, coastal maintenance with sand nourishment has proven to be successful in stopping structural erosion of the coast. Repeated nourishment of the coast of North- and South-Holland has stabilized or locally even prograded the coastline. This success triggered studies into optimization of the nourishment strategy (Can we reach the same effect with less effort? Can we reach more effect, or less negative impact, with the same effort?) and inspired plans for large-scale interventions with sand. The trend over the last decade is one of increasing volumes of individual nourishments, from beach nourishments of several hundred thousand cubic meters of sand, to shoreface nourishments of up to 2 million cubic meters, to channel-wall nourishments of more than 5 million cubic meters. It culminated in the mega-nourishment *Zandmotor* that has been created along the coast of southern South-Holland in 2011. The presumed beneficial effects of the *Zandmotor* have already inspired plans for new mega-nourishments elsewhere. This recent trend in (spatial) planning for coastal development is illustrated by the Delta Programme Kust. Coastal safety has become one of the issues for the future of our coast instead of being the leading issue. Moreover, spatial planners are, in general, unaware of the functioning of the natural coastal system. Applying the latest insights and knowledge of the functioning of the natural coastal system in the process of planning and designing for the future might pay off in designs more in line with nature, resulting, e.g., in smaller costs for maintenance of the design in the long run. Unfortunately, coastal experts are presently hardly involved in this planning process.

More generally, experts need clients and stakeholders to ask the right questions in order to be able to give relevant answers. But how can non-experts identify the right questions? This is a challenge for the years to come: How can the coastal research community introduce its expertise and experience in the societal discussions on coastal matters? This is not only a matter of presentation, of 'show and tell', but also of learning to appreciate

the issues that play a role in the decision making. Generally speaking, scientific and/or technical arguments are competing with political, economic, administrative and other arguments, leading to decisions that are not always recognized by experts. Learning to appreciate the complexity of decision making, e.g., by participating in such a process, will improve the communication between experts and non-experts. Serious gaming might prove to be a valuable tool in this.

WHERE ARE WE HEADING?

NCK and the outside world

Does the changing outside world ask for a new or different NCK? The world in which we have to operate is becoming increasingly complex. New skills and capabilities are necessary to continue our work: learning to understand coastal systems and sharing that knowledge with society. That brings up the 'classic' discussion within NCK: Do we need to expand our network with new disciplines and partners or should we stick to the present mix of partners and seek co-operation with other parties and/or networks? A serious risk of expansion is a decline in interest and enthusiasm of the students and staff of the present partners that might not appreciate or recognize the relevance of new subjects for their daily work. This would seriously hamper the functioning of the network. So, what is the connection between the present partners? Presently we incorporate disciplines with their basis in physical and biological processes that result in erosion, transport and deposition of sediments, leading to changes in (geo-) morphology and, on a larger scale, changes of landscapes both above and below sea level. The overarching subject of NCK is the functioning and evolution of sedimentary coastal systems, both in a natural state and man-influenced. My suggestion is that parties that fit this picture should be welcome to participate in our network.

Another question is: Does the outside world know, or even better, recognize NCK as the expert network on sedimentary coastal systems? Discussions with parties outside the field of operation of NCK lead to the conclusion that this is not always the case. Apparently, one of the recommendations for the future of NCK that was noted in 2007¹ still holds: "... create an external NCK profile through external networking". This is a subject that needs urgent action!

New developments

Apart from ongoing research on more traditional subjects such as sediment transport, surf-zone bar behaviour, etc., we have seen an increasing attention over the past years for subjects such as:

- The interaction of beaches and dunes, including aeolian transport processes;
- The interaction of hydrodynamic and aeolian processes on the beach and the numerical modeling of that interaction;
- The application of numerical process models for time scales of decades and centuries, resulting in building of stratigraphy of complete coastal systems; and
- An expansion of the interest in the morphodynamics of muddy coasts and a starting interest in gravel dynamics.

The introduction of new, cheap and increasingly smaller sensors and highly mobile and easy-to-launch platforms have made quickly deployable monitoring methods reality. A good example is NEMO, the jet-ski based echo-sounding system that has proven its value in the monitoring of the progress of the reinforcement of the Delfland coast. These new monitoring systems have boosted data gathering in the field and will likely lead to increased understanding of short-term variability of coastal morphology. Moreover, the launching of smart data bases with flexible data formats and open-access facilities such as Google Earth and Open Earth, permits fast combination of data and realistic presentation of data. This will likely become a standard for the coming years.

New developments in the world of process modeling such as the on-line coupling of model systems, more realistic schematization of boundary conditions and the growing number of state-of-the-art, open-source numerical models all open up new possibilities for research and bring models within reach of new research groups.

All above-mentioned developments show that coastal research in The Netherlands is alive and kicking. In the years to come, it will continue on 3 tracks, that are complimentary:

1. Expansion of system knowledge, based on observations and data collection in the field, and enabling the building of hypotheses on functioning of coastal systems;
2. Modeling, both numerically and conceptually of natural systems; and
3. Experimenting, both in the field and lab and numerically, to test hypotheses.

The implementation and subsequent evolution of large-scale sandy interventions, such as the *Zandmotor* and the artificial dunes at Vlugtenburg along the Delfland coast, not only is an excellent chance to deepen our understanding of that coastal system, it also creates new opportunities for co-operation in research. The latter is illustrated by the leading role that NCK partners have in proposing and execution of research in this area. Hopefully we can transplant that model of operation to other areas.

We have got work to do!

¹ Hoekstra, P, JPM Mulder, MJF Stive, SJHM Hulscher & M van Koningsveld, 2007. NCK – Past, present and future. In: Book of Abstracts, 15th Anniversary NCK – International Symposium IJmuiden, June 13-15, 2007, p. 45-51.