THE NEED FOR DATABASES AND VIEWERS TO SUPPORT DECISION MAKING AND LEARNING

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Coastal management - general
Coastal regions provide multiple and important benefits to society (safety against flooding, fresh water supply, nature, environmental quality). Therefore, various actors in society are affected by coastal management (or the lacking in coastal management). Different actors may not only have different interest, but can also possess different information (data) on the biophysical coastal system and coastal functions (needs, demands and benefits), or have different access to this information.

Why is it not possible for actors to 'fly' through *all* available data and Coastal State Indicators at once, comparing the development of different indicators, for different time-periods and for different areas? Could this not support the decision making by coastal managers and the draw up of expert advise by scientists and engineers?

Data management and dissemination – pilot Dutch case
In order to optimize the coastal management strategy in the Netherlands, insight in the (long & short term) development of the system is required, in particular the past, present and expected future trends in sediment volumes and distributions (*present* state). Likewise, the present and future societal need and demands on coastal functions are vital (the *desired* benefits). Data is an important resource to gain insight in this *present* and *desired* state. In addition, data analyses result in determining the *efficiency* of previous interventions: learning from the obtained feedback.

Although data is available for the Dutch coastal system, it is frequently not public available and usually not stored in international, uniform standards which makes an integral analyses severe. By developing and/or applying existing state-of-the-art techniques to share and visualize data a group of Dutch scientists attempt to contribute to fulfill the desire to easily 'fly' through all coastal data. One of the assets is a general toolbox to plot any data type in Google Earth (examples are given in Figure 1). With this toolbox it has become very easy for marine and coastal experts to disseminate their data via Google Earth. It enables the coastal community to make its data available to end-users and the general public with only little effort. What we are in fact trying to build is an analog of YouTube for viewing marine and coastal data: 'DataTube'.

Based on this new, easy accessible database and knowledge obtained in current research programs, a thorough description of the functioning of all coastal sections along the Dutch coast is drawn up. In these so-called Coastal Registers long term, large scale morphological changes due to sea level rise and large scale interventions (closure of tidal inlets) are related to short term development in coastal indicators, sediment distribution patterns are related to safety levels and environmental quality, nourishments related to sediment redistributions etc. The final goal is to draw up guidelines for sustainable coastal management for all various coastal sections taking all available data in account, using (learning) from the feedback of the coastal system.

Figure 1: Examples of a general toolbox to plot any data type in Google Earth. Data credits: Rijkswaterstaat. Plot credits: Deltares and Van Oord. Image credit: Google Earth™ mapping services. More examples (pilots) are available on the following websites: http://publicwiki.deltares.nl/display/KV/Kustviewer & http://test.kustviewer.lizard.net

Figure 1a: Plot of JarKus transects around the Eastern Scheldt barrier from 1965 to 2010. The color represents the time at which a profile was collected (blue =old, red=recent). This makes the morphological development (erosion and deposition) clearly visible. Available data: X-Y-Z value per transect per year.

Figure 1b: Example of JarKus transect in one year with beach line indicators overlaid. Available data: Coastal state indicator (e.g. beach width) per transect per year.
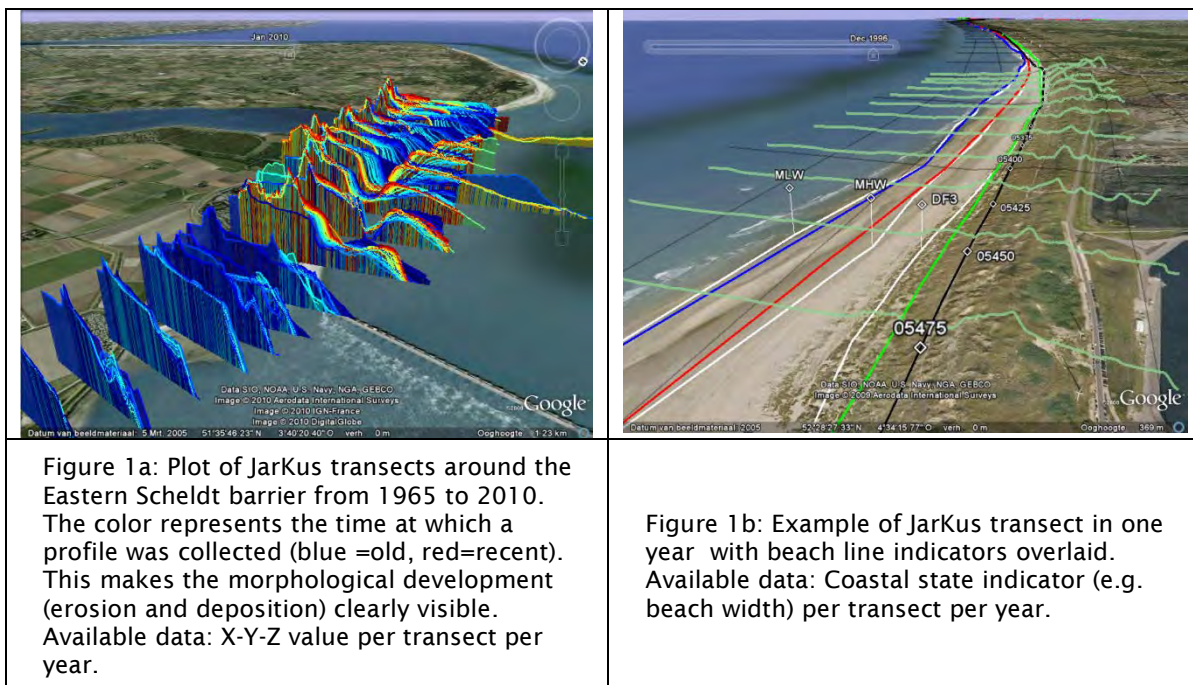
Figure 1c: Map of bathymetry (height) dataset in 2008. Available data: X-Y-Z value per gridcell per measurement.
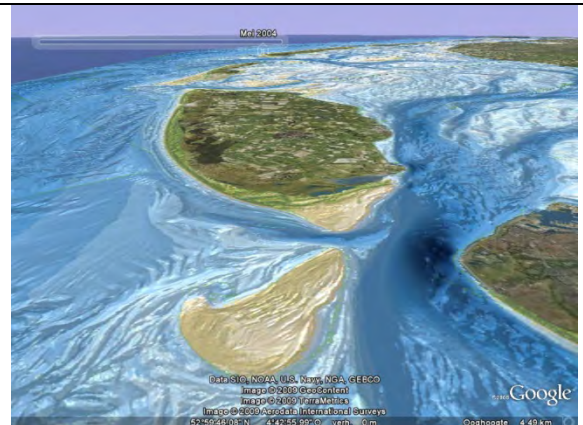

Figure 1d: Map of bathymetry (depth) dataset in May 2004. Available data: X-Y-Z value per gridcell per measurement.
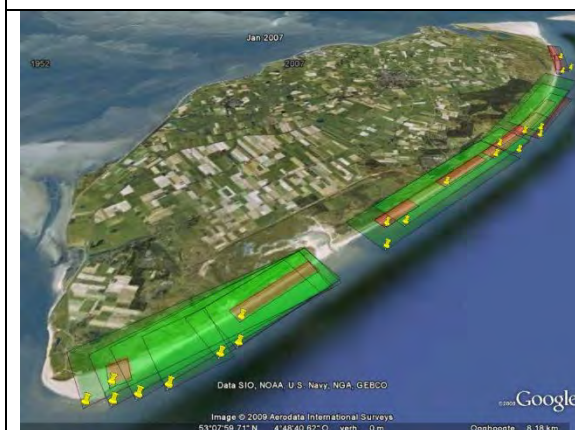

Figure 1e: Example of plot of beach and foreshore nourishments since 1952. The area indicates the sand volume (assumed 1 m thick), the color indicates the nourishment type. Available data: Nourishment characteristics per nourishment.

Figure 1f: Example of graphs of the development of coastal indicators (right axis) and nourishments (left axis) for a selected Jarkus transect in Google Earth. Available data: Coastal state indicator per transect per year.