

About the structure of this database

Contact address:

George Postma, Sedimentology, Faculty of Geosciences, Utrecht University, POBOX 80.021, 3508TA, Utrecht , The Netherlands. gpostma@geo.uu.nl

Aim of the research

The data presented in this database contributes to verification and quantification of the sequence stratigraphical concept and the systems dynamics in response to auto- and allocyclic forcing.

Structure of the database

The folder structure is outlined in Fig. 1. The blank folders represent areas of present research interest, but where the full database is under construction or not made available, as yet.

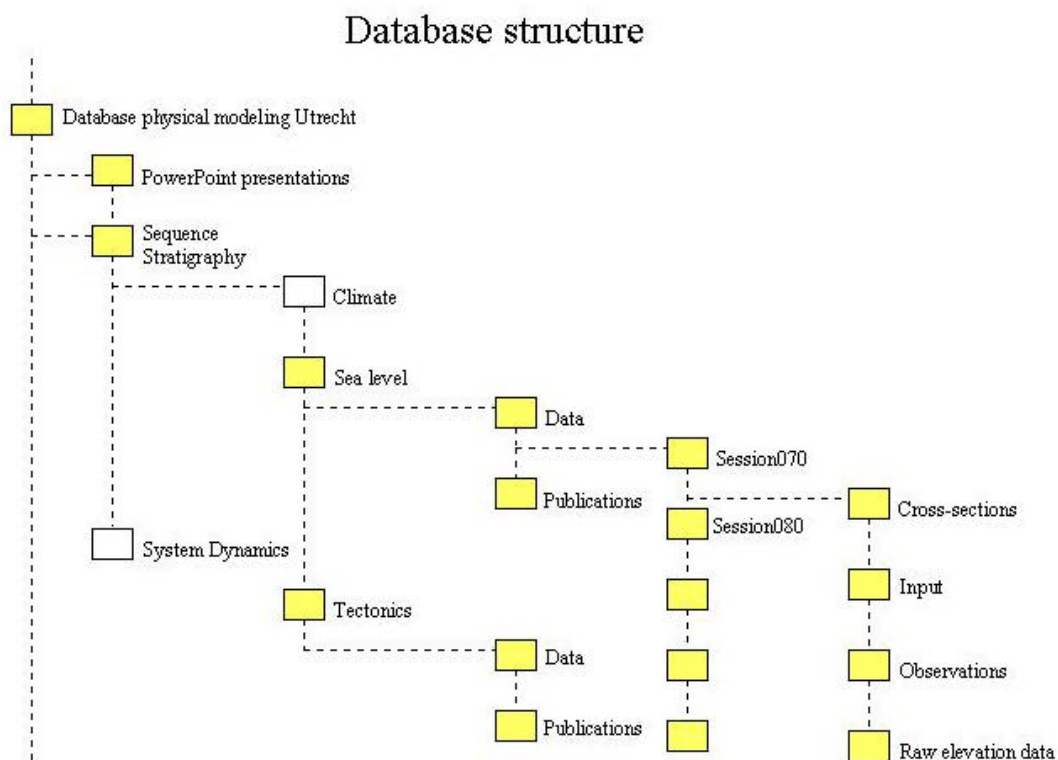


Fig. 1 -- Folder hierarchy

The PowerPoint presentations that are included in this database are meant to give the database user an impression of the aim of the research, its scope and the experimental set up at Utrecht University. The folder Sequence Stratigraphy contains all data related to sedimentary systems response to allocyclic forcing. The folder Systems Dynamics refers to the experiments that are done to reveal the autocyclic behaviour of sedimentary systems.

Under the folders Climate, Sea level and Tectonics we have put the folders Data and Publications, the latter with articles in .pdf format. The appropriate references are given in a separate file in the same Publication folder.

Experiments we have called 'Sessions***' (e.g. session100), all archived under Database/Sequence Stratigraphy/Sea level/Data/, with each session having his own folder. An overview of the content of each session is given in the form of two .pdf files: ~/Data/ sea level curves for each session and ~/Data/summary description for each section. Each session folder contains information on input and output data. The latter contains data in the form of .dat, excel, .jpeg and .pdf files.

Experimental procedure

The set-up consists of a 4 x 4 x 1 m main tank, which is connected to a rectangular duct of 4 x 0.11 x 0.5 m (Fig. 2). A water pump circulates water from the main tank to the upstream end of the duct. The discharge is measured by a flow meter. A sediment feeder at the upstream end of the duct consists of an adjustable funnel above a conveyor belt, allowing regular supply of a given quantity of sediment. The discharge and sediment feeder replace the

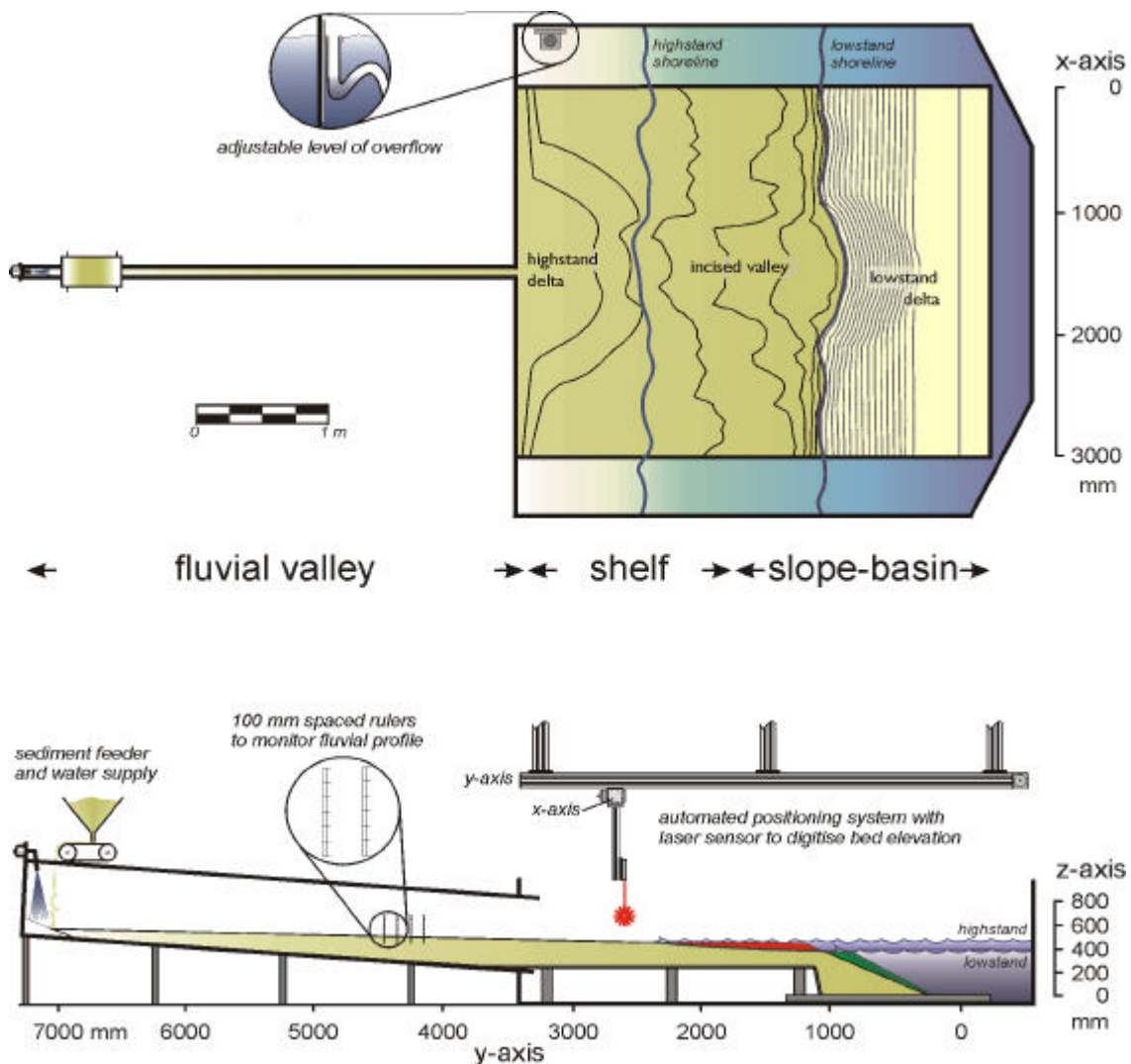


Fig. 2—Experimental setup

drainage basin, supplying sediment load through the fluvial valley at a constant rate. The water level in the tank is controlled by a manually adjustable overflow. A table of 3 x 3.4 m in the main tank supports a sand cover that forms the coastal plain-shelf-slope topography.

Essential for the quantitative evaluation of the analogue model results is the use of an automated x-y positioning system equipped with a Dynavision SPR-2 laser sensor that enables high resolution measurements of the bed elevation with an accuracy of 0.4 mm in x, y, and z directions. With a default grid spacing of 2 cm, it took 15 hours to complete an elevation grid of the shelf-slope configuration in the main tank. The data is given in the folder 'Raw elevation data' in the form of an excel file. The first sheet shows the number of scans taken in between successive runs (session is normally divided into runs of five hours duration each), their label (e.g. LSH 020.410) refers to run-number and gives the time period in hours from the start of each experiment. Each sheet in the file gives data for a scan. We used Surfer 7.0 to produce digital elevation maps, but of course also other software that work with grid files can be used. Subtraction of the data sets of subsequent scans in Surfer resulted in the contour maps showing net amount of sediment erosion and deposition that are shown in .pdf in the folder 'Observations'. Changes of the fluvial valley's stream profile were measured by means of rulers that were attached to the valley's glass wall at 10 cm spacing. These measurements are included in the .dat file (Tcros***.dat) in the folder cross-sections, or are separately listed as 'valley elevation data' (session 400 in the folder Tectonics/data/session400).

In session70 we give an example of an excel file made from the T070cros.dat file of the cross-section. The crsmp070.pdf file gives the position of that cross-section. The x,y data and the .dat file for the cross-section can be produced with Surfer 7.0.

In addition to the measurements there have been observations that are described in a standard form and given as obs.pdf's. Photographs, and pictures of laquerpeels made after the experiment was done are included as .jpeg files where appropriate.

Acknowledgements

The project "Physical modelling at a sedimentary systems scale" has been initiated by Dr. George Postma at the Department of Geology in Utrecht in 1993 and is still ongoing. The sea-level database is the result of experimental work by Max Van Heijst (PhD) in the period 1994-2000. He was assisted by a number of master research students: Wessel van Kesteren, Marco de Kleine, Rory Dalman and Alexander Okx to collect the data. The work was sponsored by Shell Research, Rijswijk, The Netherlands, on instigation of R.G de Jong and G.W.M. de Ruiter both from Shell. The database on climate will be based on the ongoing work of A.P. Van den Berg, and that on the System dynamics by M. Van Dijk. The construction of the database presented here is made possible through E.C. funding of Eurodelta project (contract nr. EVK3-CT2001-20001).