

## Interactive modeling of storm impact

#### Interactive modeling: Déjà vu?

- Back to hands in the water: feel the model! (Fig 1)
- Interactive Modeling = social activity (Fig 2)

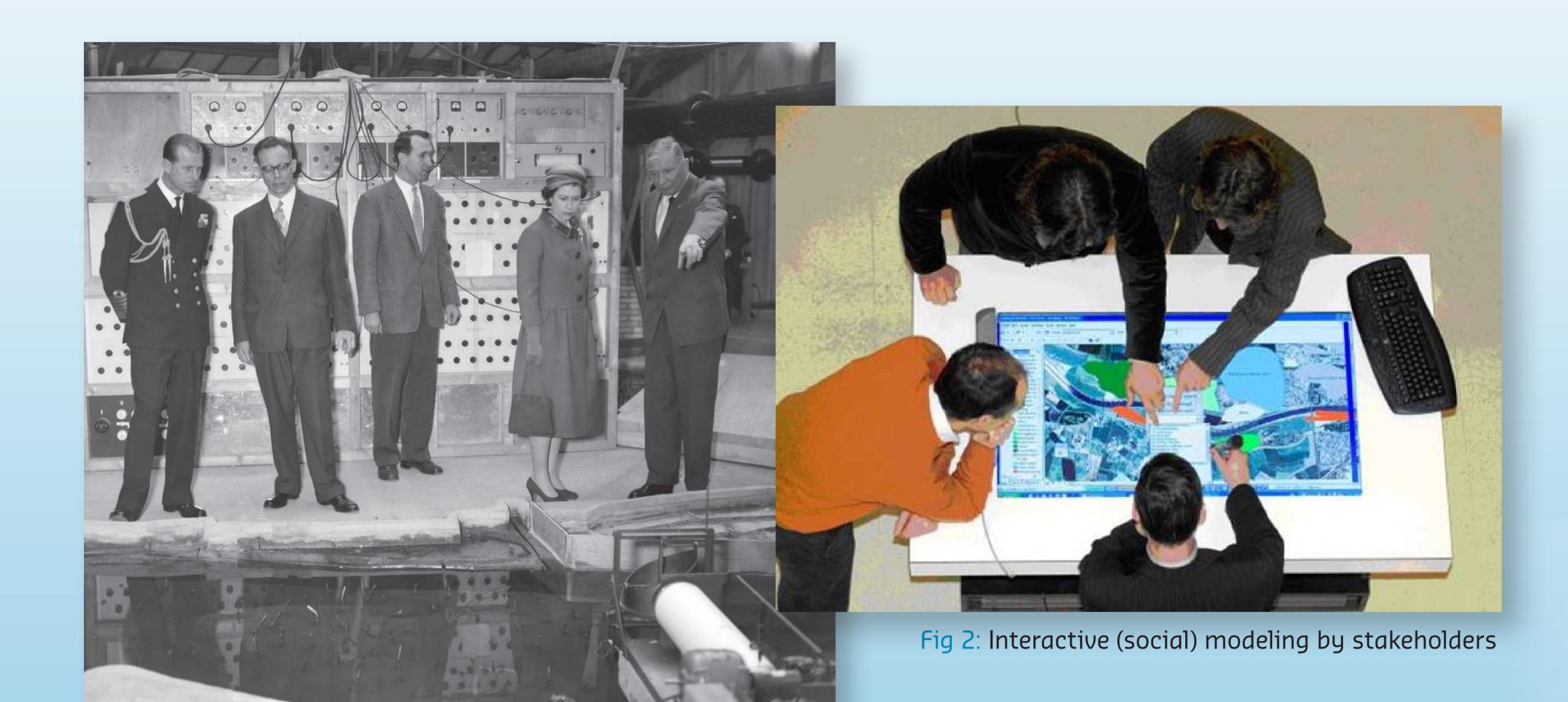


Fig 1: 27 March 1958: Queen Elizabeth II and prince Philip visit the physical lab of Delft Hydraulics (now Deltares) in The Netherlands

#### Model Interactivity

To make models more useable for the design and starting phase of a project, several model software packages have been made available in an interactive form. The Delft3D Flexible Mesh model of San Francisco is now interactive, as is the 1D version of the XBeach storm impact model. We foresee that in a few years interactive models will play an important role for communication with stakeholders, and as quick assessment tools for understanding hydro- and morphodynamic processes.

#### Model Software

XBeach

- Storm/hurricane impact
- Process-based
- Nearshore processes

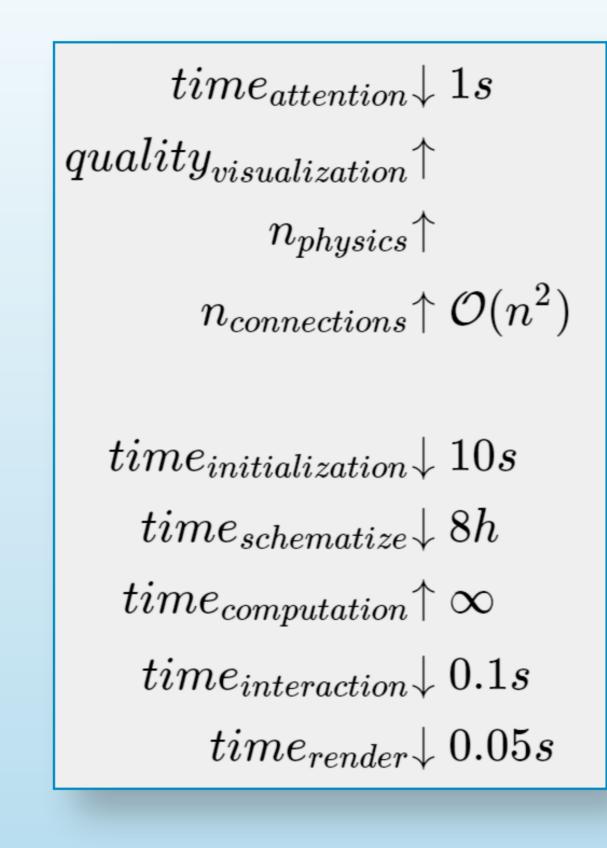


Delft3D-Flexible Mesh

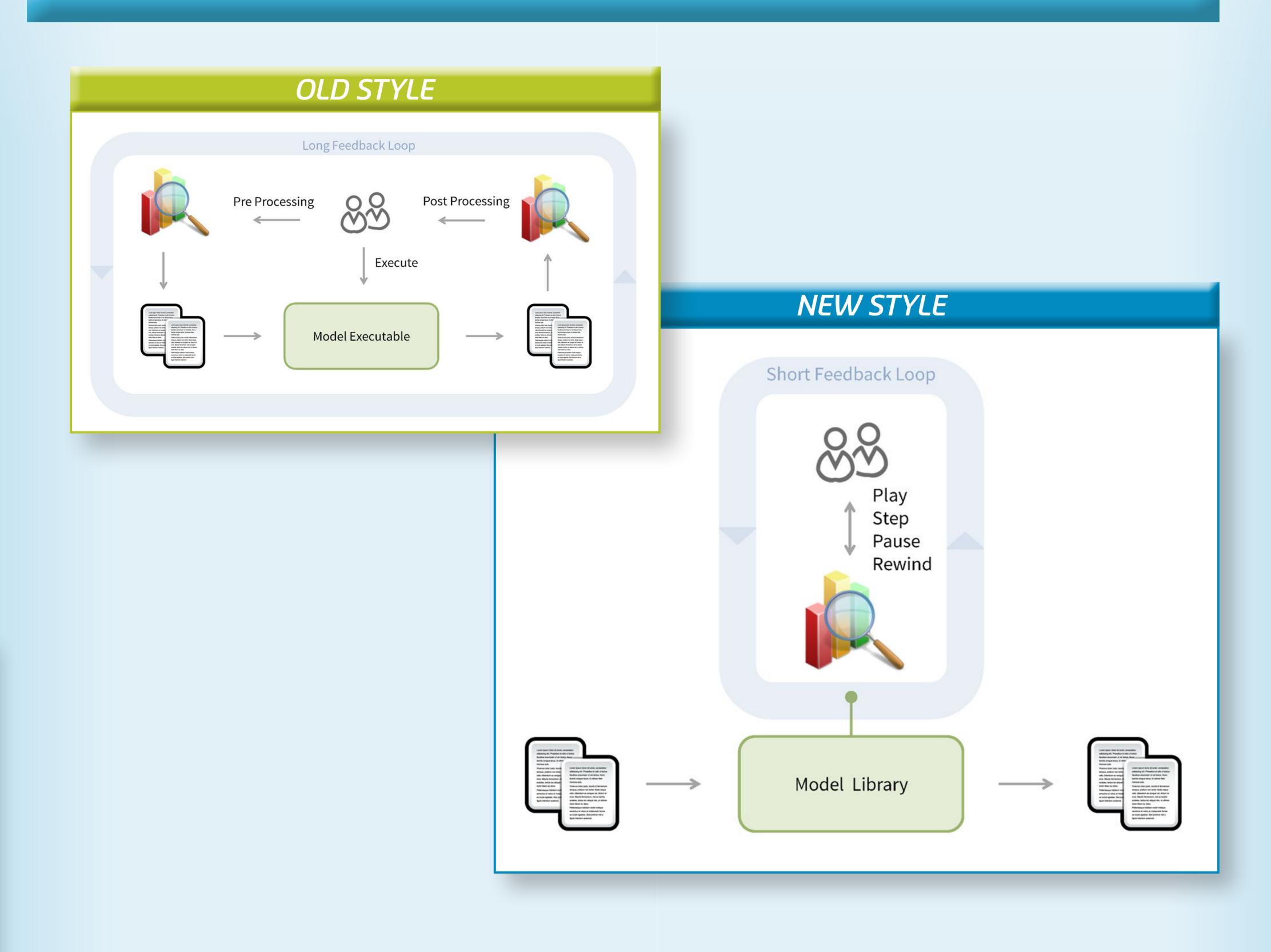
- Tide + surge
- Sediment transport
- Unstructured grids

#### Features

- Manually adjust model input while running
- Directly see effect of change in model behavior
- Communication tool for stakeholders
- Better understanding of physical behavior
- Rapid assessment for early stage of project



#### Modeling Work Flow



#### Developments

- Generic approach using Basic Model Interface (BMI) standard
- Web-based (HTML5), MATLAB, Python, C-Sharp



# New harbour design Load harbour design Save harbour design Close harbour design tool

Fig 5: Interactive GUI for the San Francisco Bay Model

Fig 4: Snapshot of the Harbor Design Tool

### Harbor Design Tool (Fig. 4)

- Effect of harbor structures
- Harbor siltation
- Longshore transport
- Delft3D-FM



#### Delta Shell Interactive GUI

- Effect of measures on hydrodynamics
- San Francisco Bay Model

www.dsd-usa.org



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