

Pilot study Forecasting Swimmer Safety around the Sand Engine

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Voor de regio

EcoShape
building with nature

Introduction

1. Motivation *Pilot Forecasting Swimmer Safety*
2. Operational model system CoSMoS
3. First results and experiences Sand Engine
4. Results Egmond aan Zee
5. Conclusions

20 Mm3
Summer 2011

Safety
Recreation
Nature value

Introduction

Motivation for studying swimmer safety - Sand Engine

Old situation:

- rips predictab
- fixed in space
- no long-term c

Present situation:

- from controle
- very dynamic,
- altered recrea

Pilot Forecasting Swimmer Safety

Pilot Forecasting swimmer safety Sand Engine

Goal: development of an operational information system to support lifeguards in their daily tasks

- Real-time forecast for next 1-2 days
- Based on numerical models combined with in-situ observations
- Predict timing, location and strength of rip currents
- To support lifeguards (and in future to inform general public?)
- Pilot phase: summer 2012/2013; evaluation: fall 2013

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Measurements

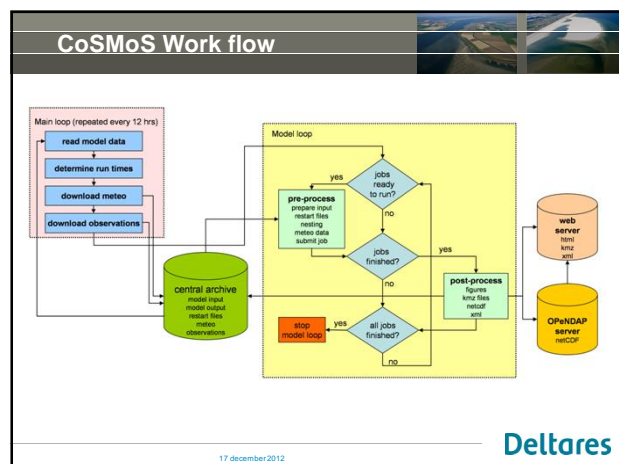
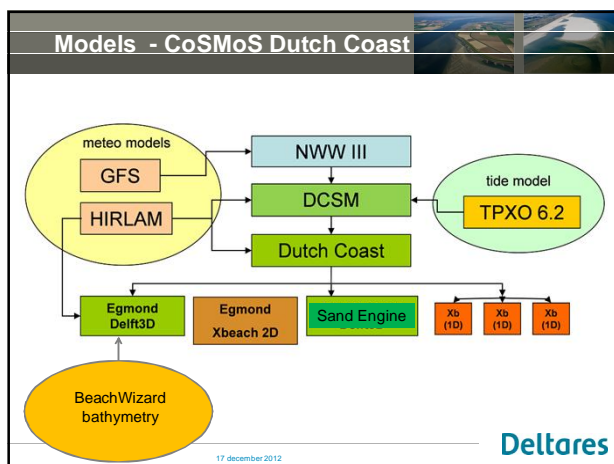
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CoSMoS modelling system

- Coastal Storm Modelling System
- Co-funded by USGS
- Uses WAVEWATCH III, Delft3D-FLOW, SWAN and XBeach
- Easily relocatable and easy to insert new model domains
 - Dutch coast
 - California
 - Hawaiian Islands
 - Gulf of Mexico
- Easy to run in forecast mode (real-time) or to study historic and future scenarios
- System runs on Windows machine
- Matlab based
- 48 hour forecasts (cycle every 12 hours)

17 december 2012

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BeachWizard model-data assimilation

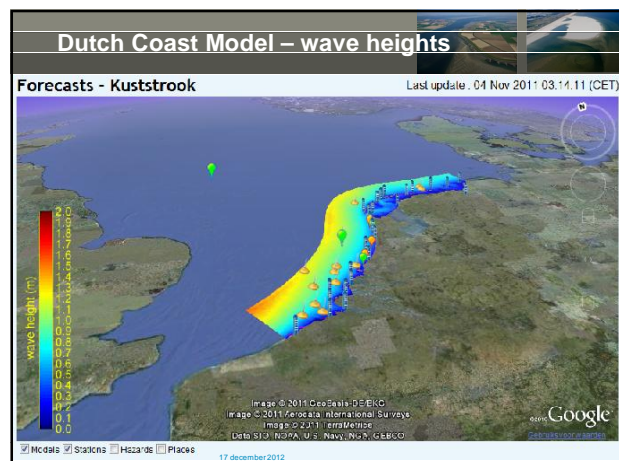
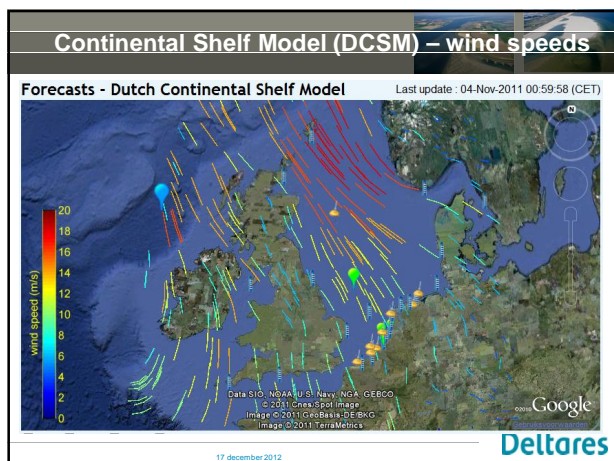
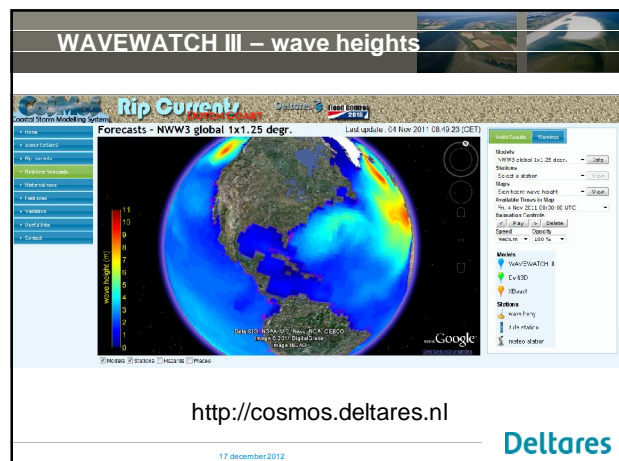
- We need up-to-date bathymetry
- Beach-dune erosion and run-up
- Timing, location of rip currents

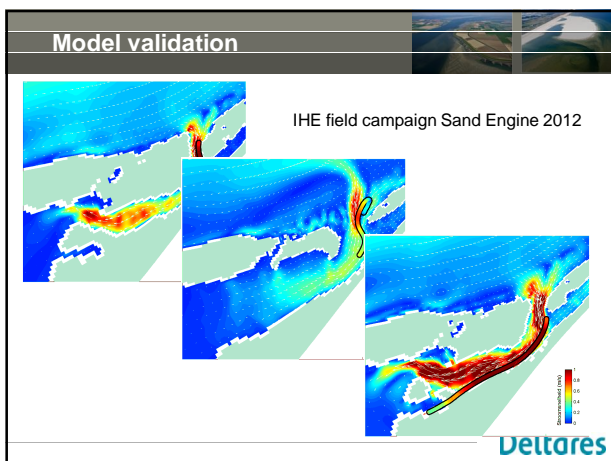
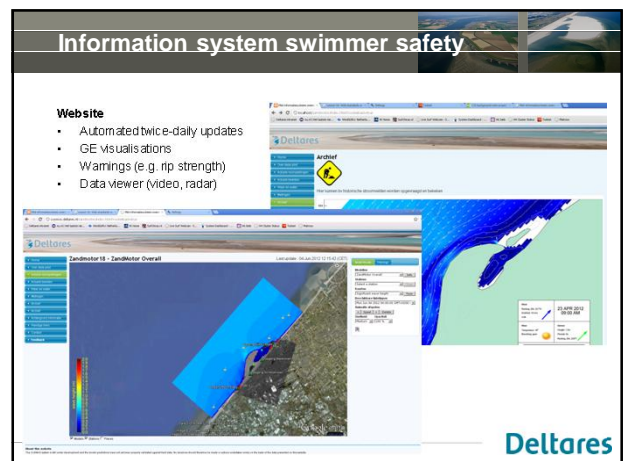
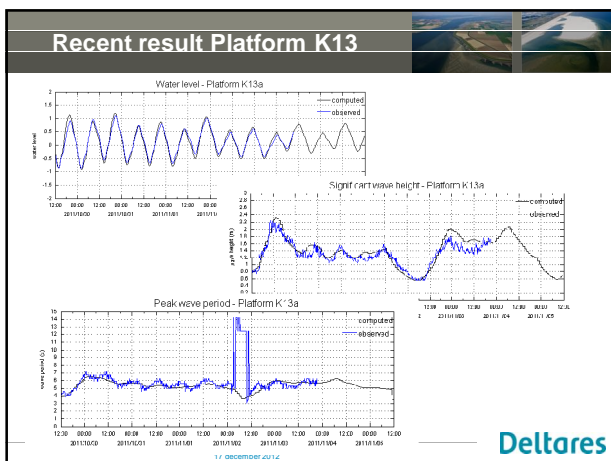
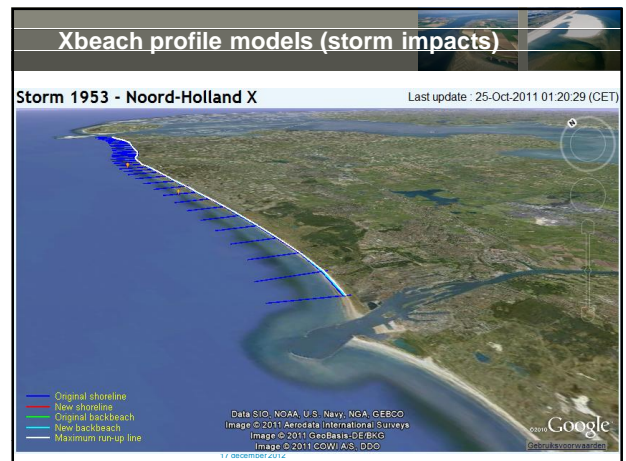
Egmond aan zee, 26 August 2009

- Compares observed wave dissipation patterns from ARGUS video imagery with computed patterns
- Adjusts model bathymetry where differences are found
- Uses relation between breaking wave height and local depth
- Operational at Egmond aan Zee (not yet at Sand Engine)

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Experiences summer season 2012

Introduction of system at lifeguards

Life guards are generally enthusiastic

Practical issues

- Busy volunteers
- Pc / internet facilities

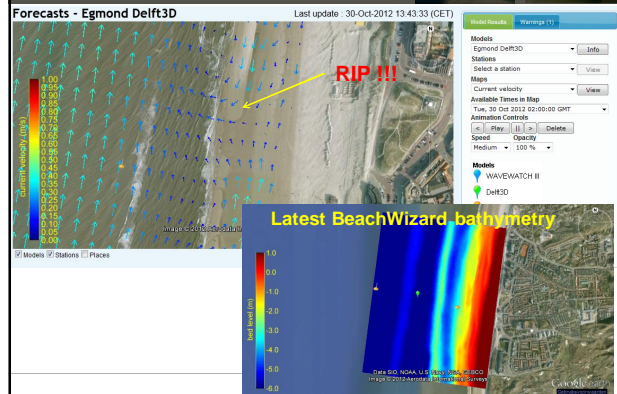
Some resistance to new procedures and technology

Simplicity is key!

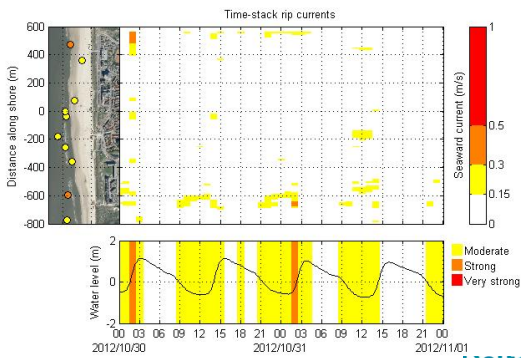


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Egmond aan Zee

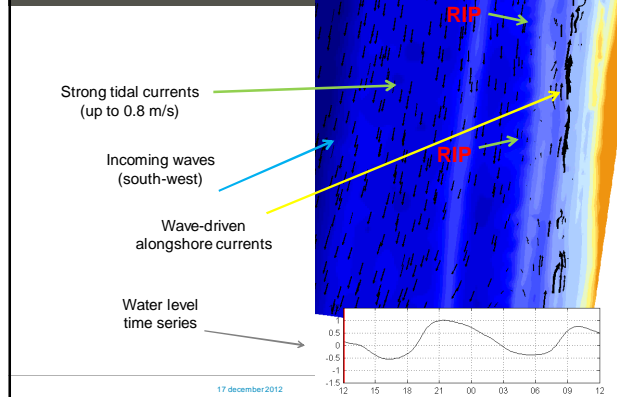


Rip current time stack



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Rip currents Egmond



Conclusions

- Development of a realtime nearshore forecast system
- Capable to predict general nearshore currents well (with minor offsets in timing / location)
- Up-to-date bathymetry crucial
 - in the high dynamic environment of the Sand Engine
 - to predict rip currents (rip channels)
- Integration of BeachWizard
 - operational at Egmond
 - work in progress at Sand Engine
- Needs (much) more validation! Preferably not just along the Dutch coast
- Implementation of system at lifeguard posts needs more attention
 - practical issues
 - simplicity is key

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