



Polder2C's: a unique opportunity for full-scale tests

Magdeburg (September 30, 2021)

Contact: Stephan Rikkert (s.j.h.rikkert@tudelft.nl)

www.polder2cs.eu

Introduction video

Interreg 
2 Seas Mers Zeeën
Polder2C's

European Regional Development Fund



This project has received funding from the Interreg 2 Seas programme 2014-2020 co-funded by the European Regional Development Fund under subsidy contract No [2S07-023]

The Polder2C's project



- **MAIN FOCUS:**
Protection against, and adaptation to the consequences of climate change in coastal regions
- **The Hedwige and Prosper polder:**
6 km² turned into tidal nature area
- **“Playground for hydraulic engineers”:**
3 km of levee for testing



The Polder2C's project



Focus areas

- Flood Defences (WP1)
 - Destructive full-scale tests: Continuous overflow, wave overtopping, wave impact, levee breach growth;
- Emergency Response (WP2)
 - Inspection (APP2C), emergency measures (placement and testing), damage repair, breach closure;
- Knowledge Infrastructure (WP3)
 - Educating the next generation, sharing knowledge (toolboxes, data wizard), student involvement;

WP1 - Flood defences and full-scale testing



Goal

Improve our understanding of how levees behave under varying loading conditions

WP1 activities: Continuous overflow experiments

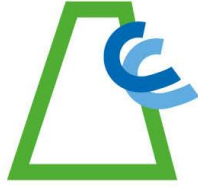
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WP1 activities: Continuous overflow experiments

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Scenarios:

- Varying grass heights;
- Anomalies:
 - Animal burrows;
 - Vegetation;
 - A cliff;
- Emergency repair measures;
- Concrete stairs.



WP1 activities: Continuous overflow experiments

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EPDM



Coconut



Tyvek

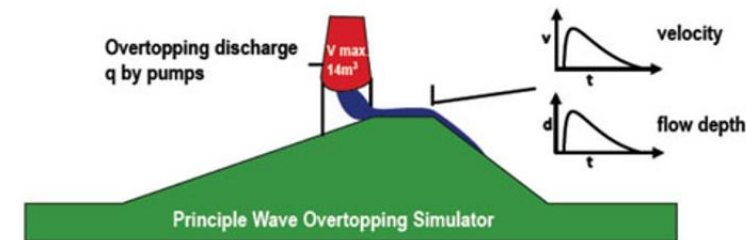
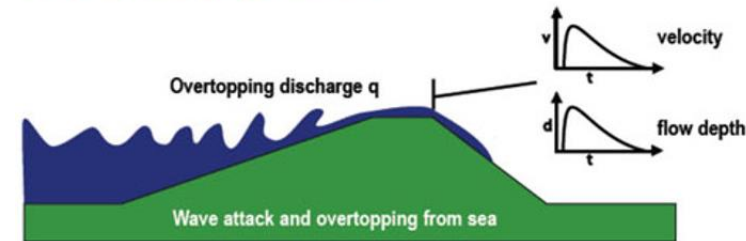


WP1 activities: Wave overtopping experiments

Scenarios:

- Reference;
- Presence of a tree;
- Obstacle (brick wall) on levee slope/toe ;
- Animal burrows + mitigation measures;
- Lime treated clay (RWS, Lhoist).

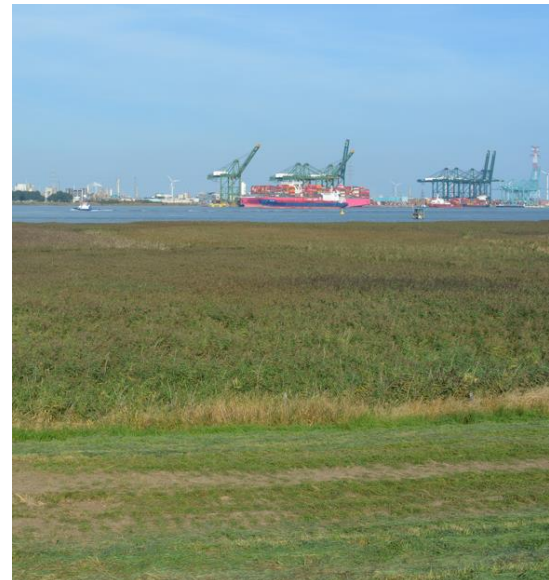
Wave Overtopping Simulator



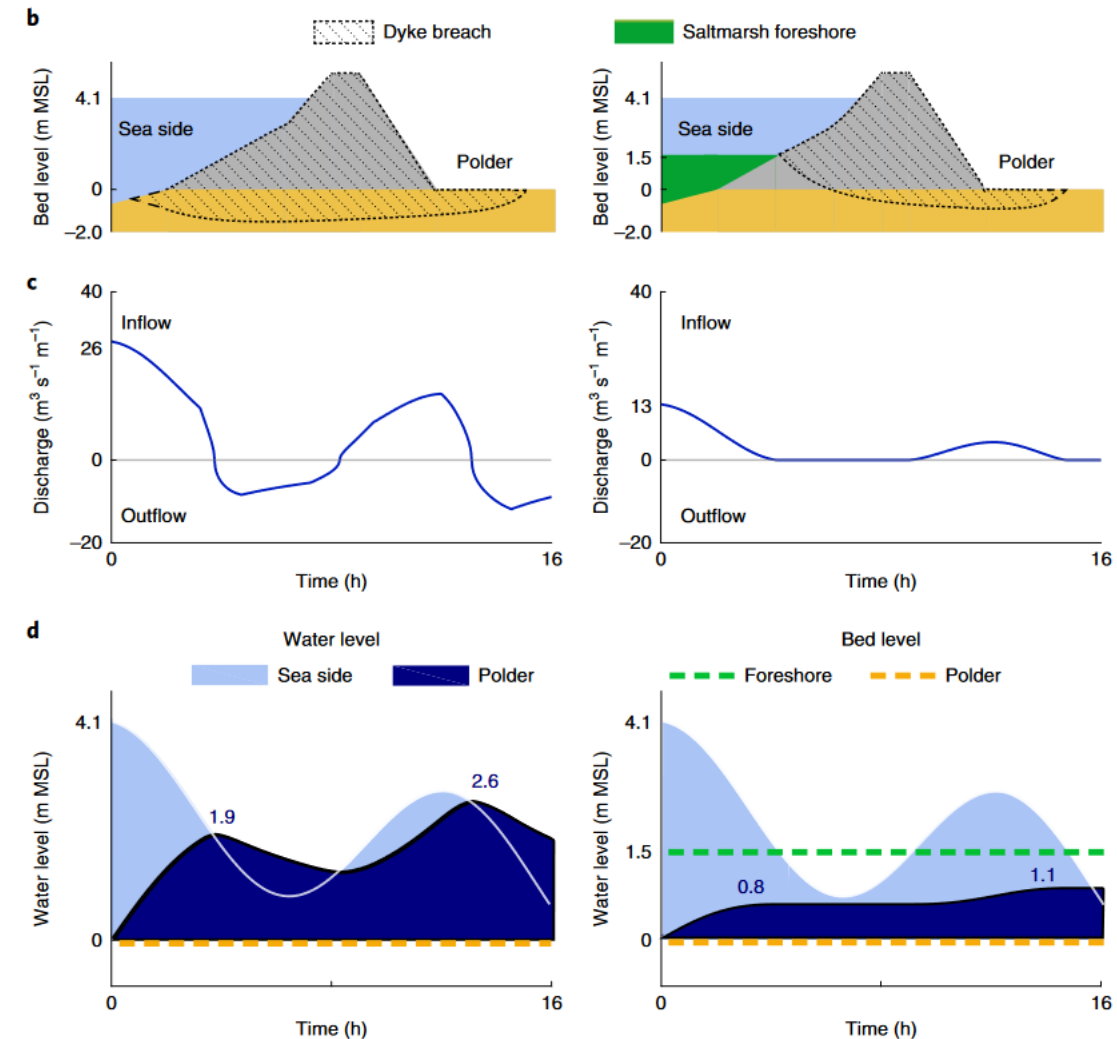
WP1 activities: Effect of tidal marsh on breach growth

Assess the effects of the presence of tidal marsh on breach growth:

- Breach experiment WITH tidal marsh
- Breach experiment WITHOUT tidal marsh



In collaboration with the Dutch Research Council (NWO)



WP1 activities: Wave impact



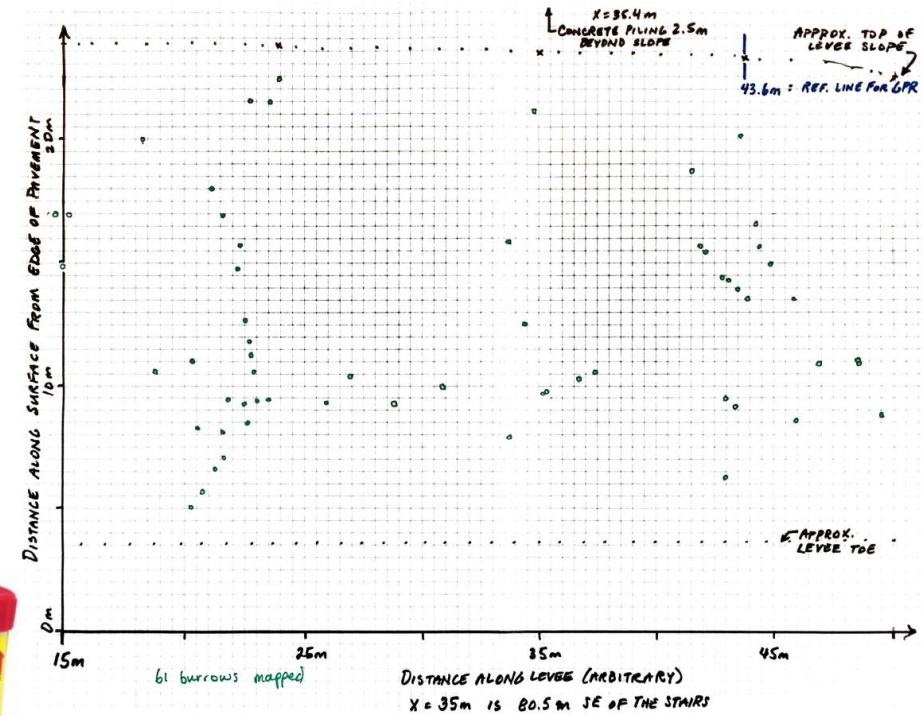
Scenarios:

- Reference;
- Emergency measures (Levee Challenge);
- Kinetic tiles;
- Turf/debris (in collaboration with Wageningen University)



WP1 activities: Animal burrow detection + mitigation

- Non-destructive detection techniques
Visual, Smoke test, (2D/3D) Ground Penetrating Radar (GPR), Electrical resistivity tomography (ERT)
- Destructive detection techniques
Grouting and excavating



WP2 – Emergency response



Goal

Test current and new emergency response practices in full-scale experiments and exercises

Learn from them and improve where possible.

WP3 – Knowledge infrastructure



Goal

Collect and share knowledge and data:

- *Educating the next generation*
- *Turning our results into useful tools and datasets*

WP3 – Knowledge infrastructure

- Toolboxes;
- Data wizard;
- Colloquium;
- Educational videos;
- Bsc- & Msc-theses and internships;
- Winter School;
- Levee challenge.



WP3 – Knowledge infrastructure



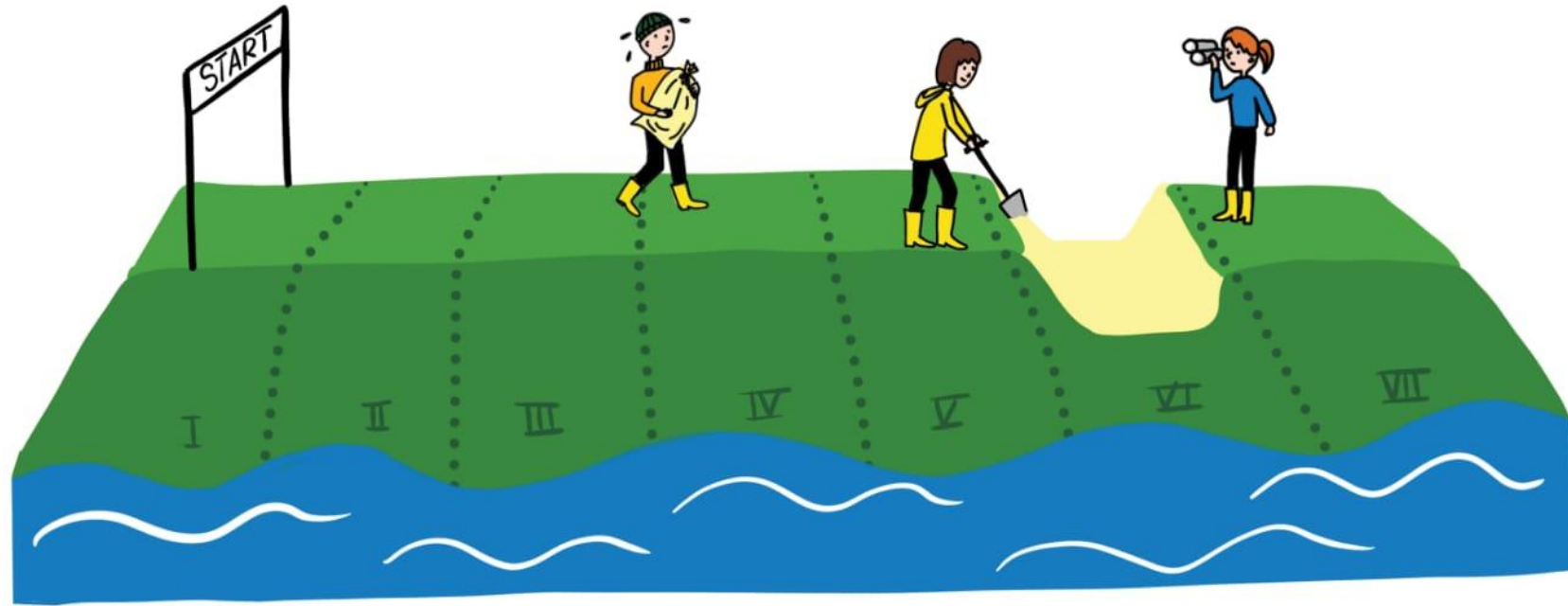
Data Wizard: to make our collected data easily accessible to the public!

- Collection of knowledge from:
 - Literature reviews
 - Results and lessons learned from WP1, WP2
 - Data files
 - ...
- Integration of toolboxes in the wizard



FIELDWORK FOR FLOOD RESILIENCE

WINTER SCHOOL 2.0



Climate adaptive flood defences | Emergency response | Knowledge Infrastructure

WHO

PhD & MSc students and
young professionals in
flood protection

WHAT

In-class education
and
field training

WHERE

JC Prosperpolder
Sint-Engelbertusstraat 5
9130 Kieldrecht

SAVE THE DATE

JANUARY
31

2022

FEBRUARY
4

THE Levee CHALLENGE

EDITION
2022

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Are you a master's student and interested in technical training and civil, hydraulic and geotechnical engineering?
Join the second edition of the Levee Challenge!

Register now → www.polder2cs.eu/events

Participation & collaboration



- Levee breaching, continuous overflow, wave overtopping, wave impact
- Modelling of hydrodynamics and erosion
- Twin sites
- Levee inspection and emergency response activities
- Testing innovations: repair measures, mobile barriers, etc.
- Winter School (31 January-4 February, 2022)
- Levee challenge (Q1, 2022)



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