

XBeach skillbed report

summary report

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XBeach skillbed report

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Chapter 1

Introduction

The XBeach code and related functionalities develop fast. As a result there is a need from modelers and code developers to develop a tool that gives insight in the effect of code developments on model performance. The XBeach skillbed tries to fulfill this need by running a range of tests including analytical solutions, laboratory tests and practical field cases every week with the latest code. This report contains a summary of the latest changes and tests. For a full description of the performed tests is referred to the status update reports.

Chapter 2

Release information

2.1 Release notes

We have been working on a lot of cool stuff that still needs to be described in more detail:

- hard structures
- multiple sediment fractions
- bed load and suspended load
- output options
- wave schemes
- non-hydrostatic model
- wave shap parameterization
- drifters
- river outflow
- boundary condition stuff
- ...

2.2 Change log

Chapter 3

Overview

In the table below the statuses of all tests found in the skillbed are summarized. In case a test is ignored or has failed, the corresponding message is given in the column “Message”. Please note that success or failure of the test runs are given in column “Run status”, while the success or failure of the Matlab analyses are given in column “Matlab status”. The last columns provide an overview of the main characteristics of each test.

Tests can be run multiple times using different settings. Different runs are identified by a run name, which follows after the test name and a dot sign. If a test is run once only, it is common use to name the run *default*.

Table 3.1: Status overview skillbed tests

| Test | Run | Status | Matlab | Default settings | Configuration | Waves* | Water levels** | Fractions | Morphology | Hard layers | Groundwater flow |
|-------------------|-----------|--------|--------|------------------|---------------|--------|----------------|-----------|------------|-------------|------------------|
| 1953_storm_surge | default | ✗ | ✗ | | 1D | WG | V | 1 | ✓ | | |
| 1976_storm_surge | raai3400 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| 1976_storm_surge | raai568 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| 1976_storm_surge | raai6050 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| Assateague_Island | profA | ✓ | ✗ | | 1D | ST | C | 1 | ✓ | | |
| Assateague_Island | profB1 | ✗ | ✗ | | 1D | ST | C | 1 | ✓ | | |
| Assateague_Island | profB2 | ✗ | ✗ | | 1D | ST | C | 1 | ✓ | | |
| Assateague_Island | profC | ✗ | ✗ | | 1D | ST | C | 1 | ✓ | | |
| Boers_1C | custom | ✓ | ✓ | | 1D | WG | C | 1 | | | |
| Boers_1C | default | ✓ | ✓ | | 1D | WG | C | 1 | | | |
| CarrierGreenspan | default | ✓ | ✓ | | 1D | ST | C | 1 | | | |
| Curvi_Island | default | ✓ | ✓ | | 2D | WG | C | 1 | | | |
| DUROS | refere... | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| DUROS | transe... | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| DUROS | transe... | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| DUROS | transe... | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| DUROS | transe... | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| DUROS | transe... | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |

Table 3.1: Status overview skillbed tests

| Test | Run | Status | Matlab | Default settings | Configuration | Waves* | Water levels** | Fractions | Morphology | Hard layers | Groundwater flow |
|----------------------|-----------|--------|--------|------------------|---------------|--------|----------------|-----------|------------|-------------|------------------|
| DUROS | transe... | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| DUROS | transe... | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| DUROS | transe... | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| DUROS | transe... | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| DUROS | transe... | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| DUROS | transe... | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| DUROS | transe... | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| DUROS | transe... | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| DUROS | transe... | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| DUROS | transe... | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| DUROS | transe... | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| DUROS | transe... | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| DUROS | transe... | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| DUROS | transe... | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| DUROS | transe... | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| DUROS | transe... | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| DUROS | transe... | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| DUROS | transe... | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| DUROS | transe... | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Delilah_199010131000 | default | ✓ | ✓ | | 2D | WG | C | 1 | | | |
| Deltaflume2006 | DP01 | ✓ | ✓ | | 1D | WG | C | 2 | ✓ | | |
| Deltaflume2006 | DP02 | ✓ | ✓ | | 1D | WG | C | 2 | ✓ | | |
| Deltaflume2006 | T01 | ✓ | ✓ | | 1D | WG | C | 2 | ✓ | | |
| Deltaflume2006 | T01_zebra | ✓ | ✓ | | 1D | WG | C | 2 | ✓ | | |
| Deltaflume2006 | T02 | ✓ | ✓ | | 1D | WG | C | 2 | ✓ | | |
| Deltaflume2006 | T03 | ✓ | ✓ | | 1D | WG | C | 2 | ✓ | | |
| Deltaflume2006 | T04 | ✓ | ✓ | | 1D | WG | C | 2 | ✓ | | |
| DeltaflumeH298 | T1 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | ✓ | |
| DeltaflumeH298 | T2 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | ✓ | |
| DeltaflumeH298 | T3 | ✗ | ✗ | | 1D | WG | C | 1 | ✓ | ✓ | |
| DeltaflumeLIP11D | 1B | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| DeltaflumeLIP11D | 1C | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| DeltaflumeLIP11D | 2E | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Deltaflume_H4731 | T11 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | ✓ | |
| Deltaflume_H4731 | T12 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | ✓ | |
| Deltaflume_H4731 | T14 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | ✓ | |
| Deltaflume_M1263_III | Test-1 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Deltaflume_M1263_III | Test-2 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Deltaflume_M1263_III | Test-3 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Deltaflume_M1263_III | Test-4 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Deltaflume_M1263_III | Test-5 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Deltaflume_M1797 | T01 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |

Table 3.1: Status overview skillbed tests

| Test | Run | Status | Matlab | Default settings | Configuration | Waves* | Water levels** | Fractions | Morphology | Hard layers | Groundwater flow |
|----------------------|-----------|--------|--------|------------------|---------------|--------|----------------|-----------|------------|-------------|------------------|
| Deltaflume_M1797 | T02 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| Drifters | default | ✗ | ✗ | | 2D | ? | C | 1 | | | |
| GWK86 | T01 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| GWK86 | T02 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| GWK86 | T03 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| GWK86 | T04 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| GWK86 | T05 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| GWK86 | T06 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| GWK98 | A9 | ✗ | ✗ | | 1D | WG | C | 1 | ✓ | | |
| GWK98 | B2 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| GWK98 | C2 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| GWK98 | F1 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| GWK98 | H2 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| MICORE_Cadiz_Urb... | north | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| MICORE_Dziwnow_Spit | 386 | ✗ | ✗ | | 1D | WG | V | 1 | ✓ | | |
| MICORE_Kamchia_S... | pr04 | ✗ | ✗ | | 1D | WG | V | 1 | ✓ | | |
| MICORE_Lido_di_Dante | mar201... | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| MICORE_Mariakerk... | s116a | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | ✓ | |
| MICORE_Praia_de_Faro | event9 | ✗ | ✗ | | 1D | WG | V | 1 | ✓ | | |
| Netcdf | default | ✗ | ✓ | | 1D | ST | C | 1 | | | |
| Ningaloo_reef | default | ✗ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| River_Outflow | default | ✗ | ✓ | | 2D | ST | C | 1 | ✓ | | |
| Scheldtflume_H4265 | T01 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Scheldtflume_H4265 | T02 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Scheldtflume_H4265 | T02a | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Scheldtflume_H4265 | T03 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Scheldtflume_H4265 | T11 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Scheldtflume_H4265 | T12 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Scheldtflume_H4265 | T13 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Scheldtflume_M1819_I | T01 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| Scheldtflume_M1819_I | T02 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| Scheldtflume_M1819_I | T03 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| Scheldtflume_M1819_I | T04 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| Scheldtflume_M1819_I | T05 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| Scheldtflume_M1819_I | T06 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| Scheldtflume_M1819_I | T07 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| Scheldtflume_M1819_I | T08 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| Scheldtflume_M1819_I | T09 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| Scheldtflume_M1819_I | T10 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| Scheldtflume_M1819_I | T11 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| Scheldtflume_M1819_I | T12 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| Scheldtflume_M1819_I | T13 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |

Table 3.1: Status overview skillbed tests

| Test | Run | Status | Matlab | Default settings | Configuration | Waves* | Water levels** | Fractions | Morphology | Hard layers | Groundwater flow |
|----------------------|------|--------|--------|------------------|---------------|--------|----------------|-----------|------------|-------------|------------------|
| Scheldtflume_M1819_I | T14 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| Scheldtflume_M1819_I | T21 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| Scheldtflume_M1819_I | T22 | ✗ | ✗ | | 1D | WG | V | 1 | ✓ | | |
| Scheldtflume_M1819_I | T23 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| Scheldtflume_M1819_I | T24 | ✗ | ✗ | | 1D | WG | V | 1 | ✓ | | |
| Scheldtflume_M1819_I | T25 | ✗ | ✗ | | 1D | WG | V | 1 | ✓ | | |
| Scheldtflume_M1819_I | T26 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| Scheldtflume_M1819_I | T27 | ✗ | ✗ | | 1D | WG | V | 1 | ✓ | | |
| Scheldtflume_M1819_I | T28 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| Scheldtflume_M1819_I | T29 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | | |
| Scheldtflume_M18... | T01 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | ✓ | |
| Scheldtflume_M18... | T02 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | ✓ | |
| Scheldtflume_M18... | T03 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | ✓ | |
| Scheldtflume_M18... | T04 | ✓ | ✓ | | 1D | WG | V | 1 | ✓ | ✓ | |
| Windflume_M1263_I | AT33 | ✗ | ✗ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | AT47 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | AT61 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | AT71 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | AT91 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | AT95 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | BT13 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | BT15 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | BT17 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | BT23 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | BT25 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | BT27 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | BT45 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | BT62 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | BT72 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | BT92 | ✗ | ✗ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | BT96 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | CT14 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | CT16 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | CT18 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | CT24 | ✗ | ✗ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | CT26 | ✗ | ✗ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | CT28 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | CT46 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | CT63 | ✗ | ✗ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | CT73 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | CT93 | ✗ | ✗ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | CT97 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |

Table 3.1: Status overview skillbed tests

| Test | Run | Status | Matlab | Default settings | Configuration | Waves* | Water levels** | Fractions | Morphology | Hard layers | Groundwater flow |
|---------------------|-----------|--------|--------|------------------|---------------|--------|----------------|-----------|------------|-------------|------------------|
| Windflume_M1263_I | DT34 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | DT48 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | DT64 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | DT74 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | DT94 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_I | DT98 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_II | 101 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_II | 105 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_II | 111 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_II | 115 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_II | 121 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_II | 122 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_II | 123 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_II | 124 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_II | 125 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_II | 126 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_II | 127 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Windflume_M1263_II | 128 | ✓ | ✓ | | 1D | WG | C | 1 | ✓ | | |
| Zelt_Case1 | default | ✗ | ✗ | | 2D | WG | C | 1 | | | |
| Zwin_T01 | default | ✓ | ✓ | | 2D | ST | V | 1 | ✓ | | |
| long_wave_propag... | default | ✗ | ✗ | | 1D | ST | C | 1 | | | |
| longcrested_refr... | 1bin_a... | ✓ | ✓ | | 2D | WG | C | 1 | | | |
| longcrested_refr... | 1bin_a... | ✓ | ✓ | | 2D | WG | C | 1 | | | |
| longcrested_refr... | 1bin_a... | ✓ | ✓ | | 2D | WG | C | 1 | | | |
| longcrested_refr... | 3bin_a... | ✓ | ✓ | | 2D | WG | C | 1 | | | |
| longcrested_refr... | 3bin_a... | ✓ | ✓ | | 2D | WG | C | 1 | | | |
| longcrested_refr... | 3bin_a... | ✓ | ✓ | | 2D | WG | C | 1 | | | |
| longcrested_refr... | 5bin_a... | ✓ | ✓ | | 2D | WG | C | 1 | | | |
| longcrested_refr... | 5bin_a... | ✓ | ✓ | | 2D | WG | C | 1 | | | |
| longcrested_refr... | 5bin_a... | ✓ | ✓ | | 2D | WG | C | 1 | | | |
| longcrested_refr... | 10deg | ✗ | ✗ | | 1D | ST | C | 1 | | | |
| longcrested_refr... | 2p5deg | ✗ | ✗ | | 1D | ST | C | 1 | | | |
| longcrested_refr... | 5deg | ✗ | ✗ | | 1D | ST | C | 1 | | | |
| longcrested_refr... | snellius | ✗ | ✗ | | 1D | ST | C | 1 | | | |
| tideonly | blanke... | ✓ | ✓ | | 2D | ST | V | 1 | | | |
| tideonly | default | ✓ | ✓ | | 2D | ST | V | 1 | | | |

* ST = stationary, WG = wave groups, NH = non-hydrostatic

** C = constant, V = varying