

# **MODEL CAPABILITY, SUITABILITY AND LIMITATIONS**

# MODEL CAPABILITY

## What to consider when choosing to set up an XBeach-G model

- XBeach-G (in this GUI) is a 1D model. It assumes longshore uniformity.
  - Apply the model only on coastal sections that are longshore uniform (no groyn sections, not close to harbour moles, etc.)
  - The model is not good at computing waves from large angle of incidence. Only apply the model with close to normally incident waves ( $\pm 30^\circ$ ). Standard in GUI will impose normally incident waves.

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- XBeach-G is designed for pure gravel beaches.
  - Applying the model on mixed-sand-gravel beaches or composite beaches requires additional consideration of the groundwater parameters in the model.
  - No transport mechanisms are included for sandy material in XBeach-G. Predictions of morphology of MSG or composite beaches are likely to be incorrect.

# MODEL CAPABILITY

## What to consider when choosing to set up an XBeach-G model

- Good predictions of wave run-up are dependent on reliable data or estimates of hydrodynamic forcing and beach properties.
  - Consider using a spread of input parameters in the model to indicate the spread in model results

# MODEL CAPABILITY

## What to consider when choosing to set up an XBeach-G model

- The model has only been designed and validated for energetic / storm conditions
  - This model is not the correct model to evaluate long-term morphodynamic change, especially that due to longshore transport gradients

# MODEL CAPABILITY

## What to consider when analysing XBeach-G model results

- It is only a model
- Given bad or incorrect input data, the model will always produce bad output
- Always check against measurement data and / or common sense

# MODEL CAPABILITY

## What to consider when analysing XBeach-G model results

- Model hydrodynamics have been validated against physical model data and data collected at 4 field sites
- Model results will still depend on good input data (in particular cross-shore profile and wave forcing conditions)
- Predictions of wave run-up will vary for different time series realisations of the same input wave spectrum

# MODEL CAPABILITY

## What to consider when analysing XBeach-G model results

- Model morphodynamics have not been validated, so collect some information (profil change) with which to calibrate at your site
- Morphodynamic change may be dominated by longshore transport gradients, which are not modelled in XBeach-G