

# eReefs Hydrodynamic model

The [eReefs hydrodynamic model](#) predicts the movement of water and key environmental conditions (temperature, salinity, currents, tides).

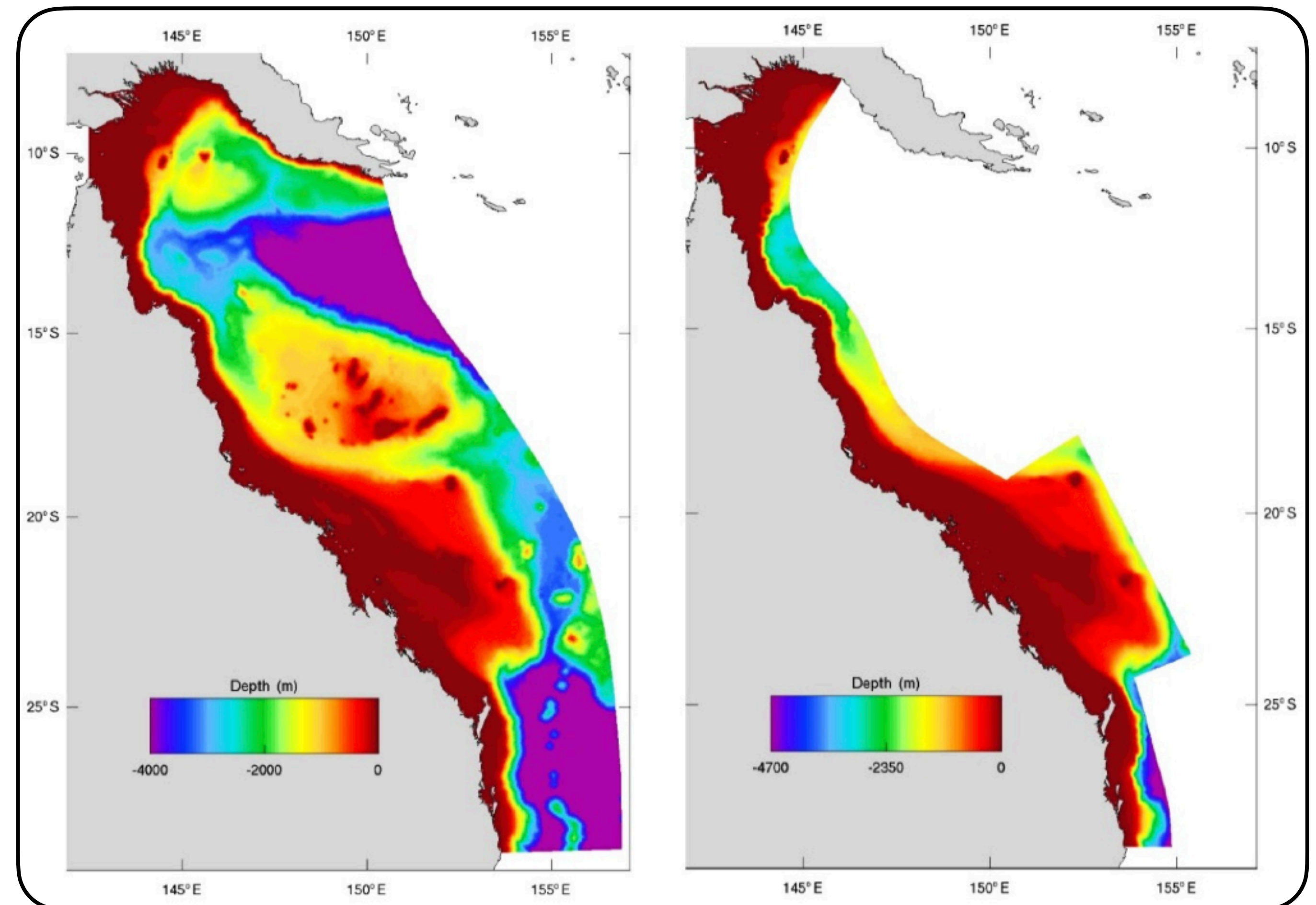
This model allows us to better understand:

- how cyclones mix the water,
- the location of potentially damaging heat waves,
- the ocean currents that disperse larvae of corals
- fresh water plumes from flooded rivers
- ...

This model is run with a 4 km and 1 km grid size.

The 4 km grid has a longer hindcast going back to **September 2010**, while the 1 km model starts in **December 2014**.

The 1 km model also only extends out to the edge of the GBR, whereas the 4 km model covers much of the Coral Sea.



*Model grid and bathymetry for the 4km (left) and 1km (right) resolution model*

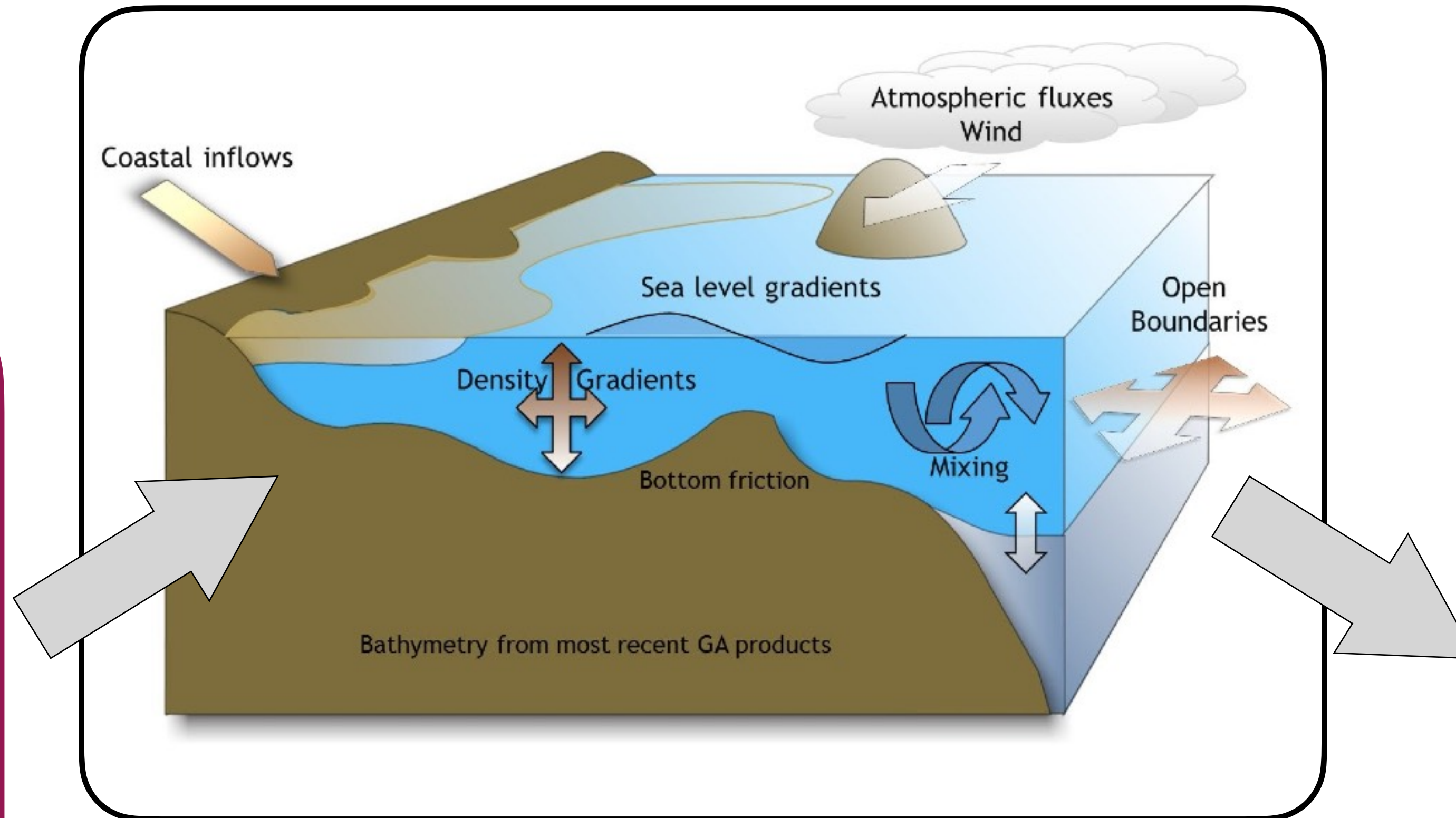
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More info  
Online Jupyter  
Book & links

## SHOC – Sparse Hydrodynamic Ocean Code

### Forcing (inputs)

- wind,
- atmospheric pressure gradients,
- surface heat and water fluxes and
- open-boundary conditions such as tides and low frequency ocean currents.



*Schematic representation of major forcing inputs for the SHOC hydrodynamic model*

### 4D Outputs

- velocity,
- temperature,
- salinity,
- density,
- passive tracers,
- mixing coefficients &
- sea-level.

4D Outputs: x-y-z-t