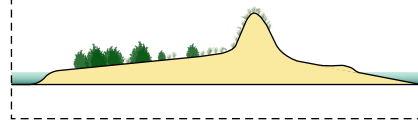


0) Initialize Model

Elevation, vegetation type & density, high water event (HWE) climatology

Back-barrier

Ocean

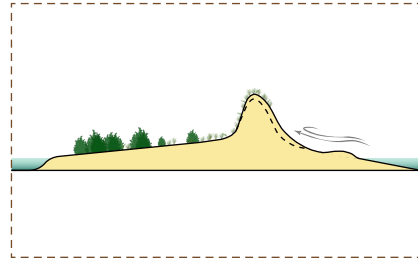
**1) Aeolian Component**Time Step: 7.3 d (50^{-1} y)

Determines entrainment, transport, and deposition of sand slabs at each cell

Main Inputs: erosion & deposition probabilities (proxy for wind climate), topography, density of vegetation

Repeat
2x

Updated elevation

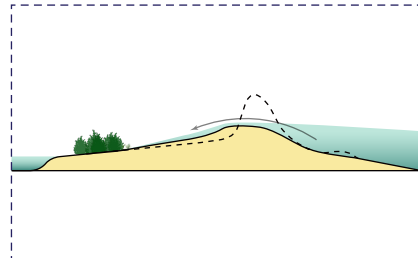
**2) Marine Component**Time Step: 14.6 d (25^{-1} y)

Determines if HWE occurs, then sediment transport across the beach, dune face, and barrier interior; also determines if vegetated cells become bare through HWE inundation

Main Inputs: HWE water level and duration, topography, vegetation type & density, sediment transport parameters

Substeps
to avoid
instabilities

If storm occurred: Updated
elevation & vegetation density,
net beach & overwash flux

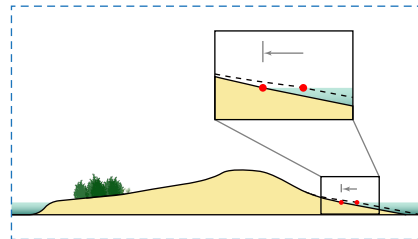


Updated
elevation,
vegetation
density, &
shoreline

3) Shoreline ComponentTime Step: 14.6 d (25^{-1} y)

Determines shoreline position and adjusts the shoreline by adding (progradation) or removing (erosion) elevation

Main Inputs: relative sea-level rise, shoreface sediment flux, beach and overwash flux, alongshore diffusion



Repeat
25x

Updated elevation and vegetation
density, net erosion/deposition

4) Vegetation Component

Time Step: 365 d (1 y)

Determines whether bare cells become vegetated through germination or lateral expansion, and changes in plant density through growth and decay

Main Inputs: net erosion/deposition, veg growth functions

Updated vegetation
type & density

