

Supplementary Materials

In this section, some more layouts of the numerical model parameters and results are shown.

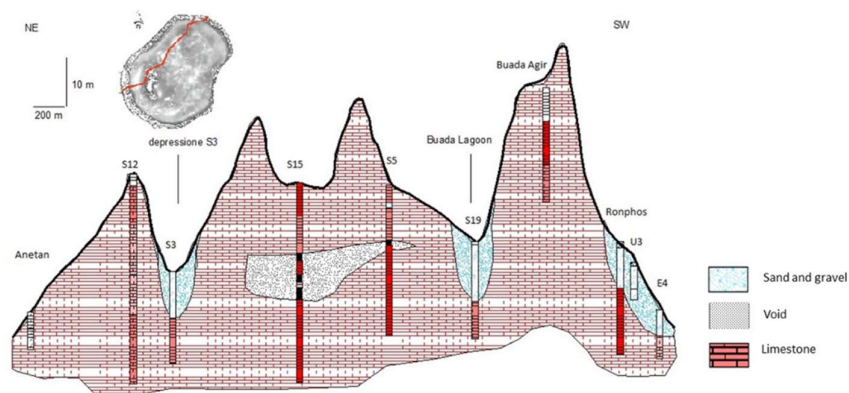


Figure S1. Hydrogeological section profile of Nauru island.

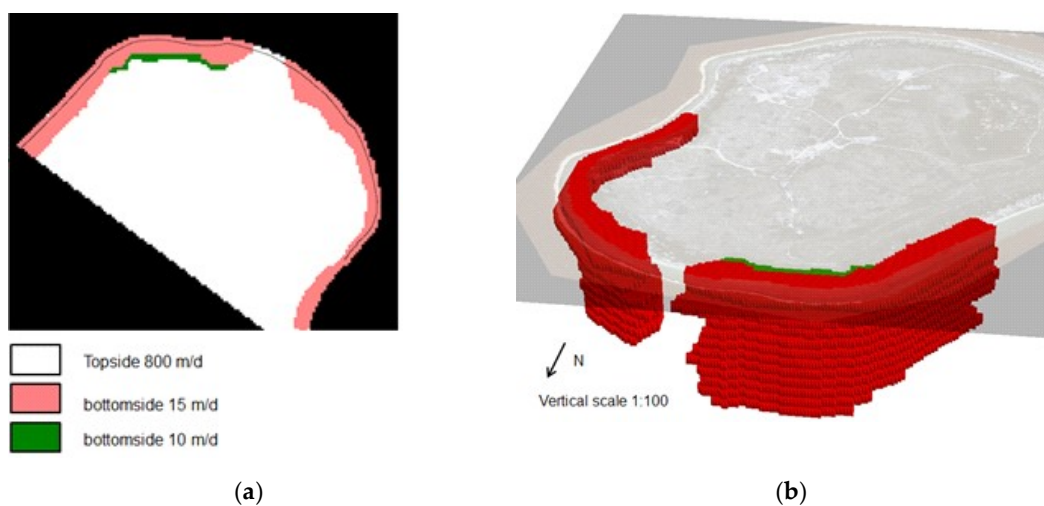


Figure S2. Plan and 3D representation of the hydraulic conductivity distribution in the numerical model; red and green color correspond to K values of sand deposits that, based on stratigraphy, was indicatively attributed from layer 1 to layer 12 in the West area and from layer 1 to layer 7 in the eastern part; the with color corresponds to K value of limestone that constitutes the entire Topside and the small outcrop along the Bottomside.

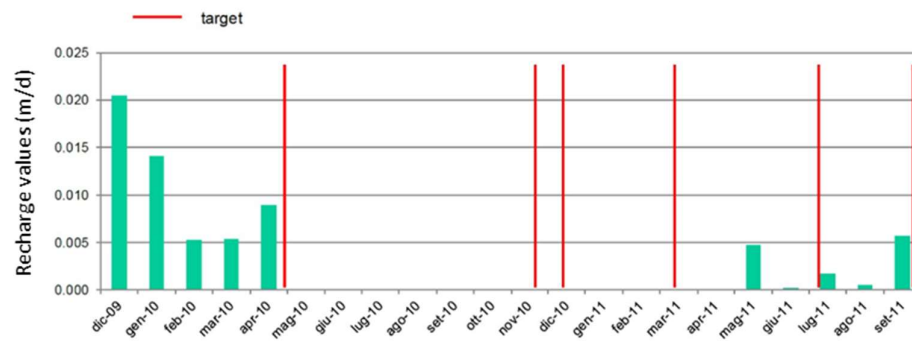


Figure S3. Recharge values (m/d) adopted in the model n.2 for each monthly Stress Period and the 6 monitoring campaigns (red lines).

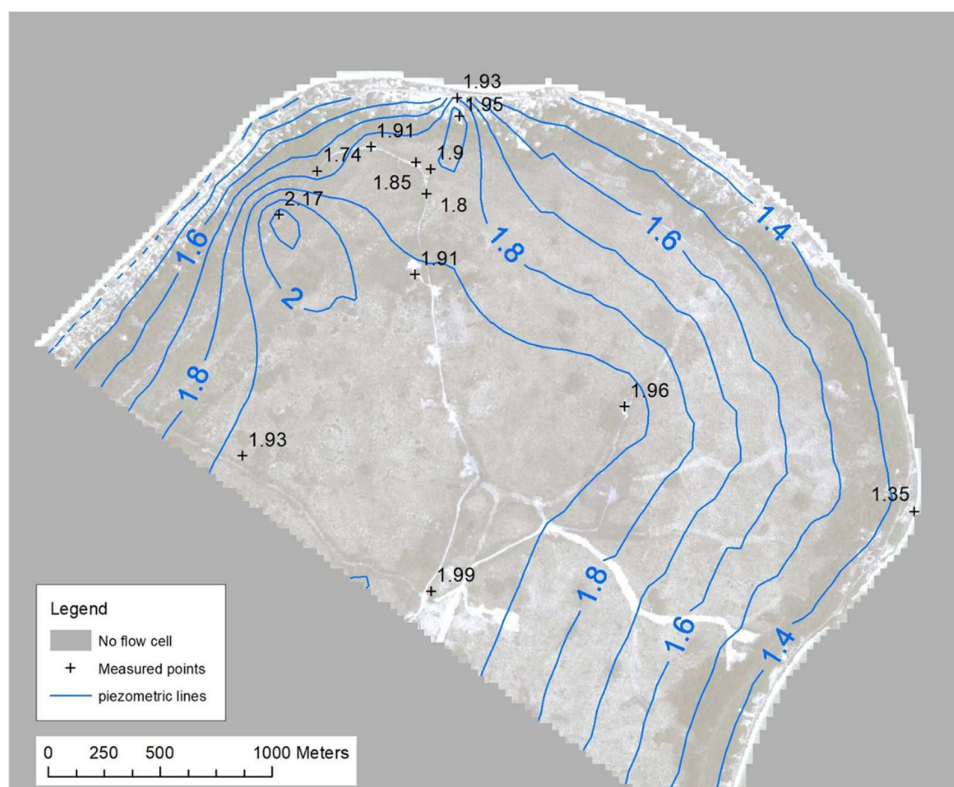


Figure S4. Measured hydraulic heads compared with simulated hydraulic heads after calibration process.

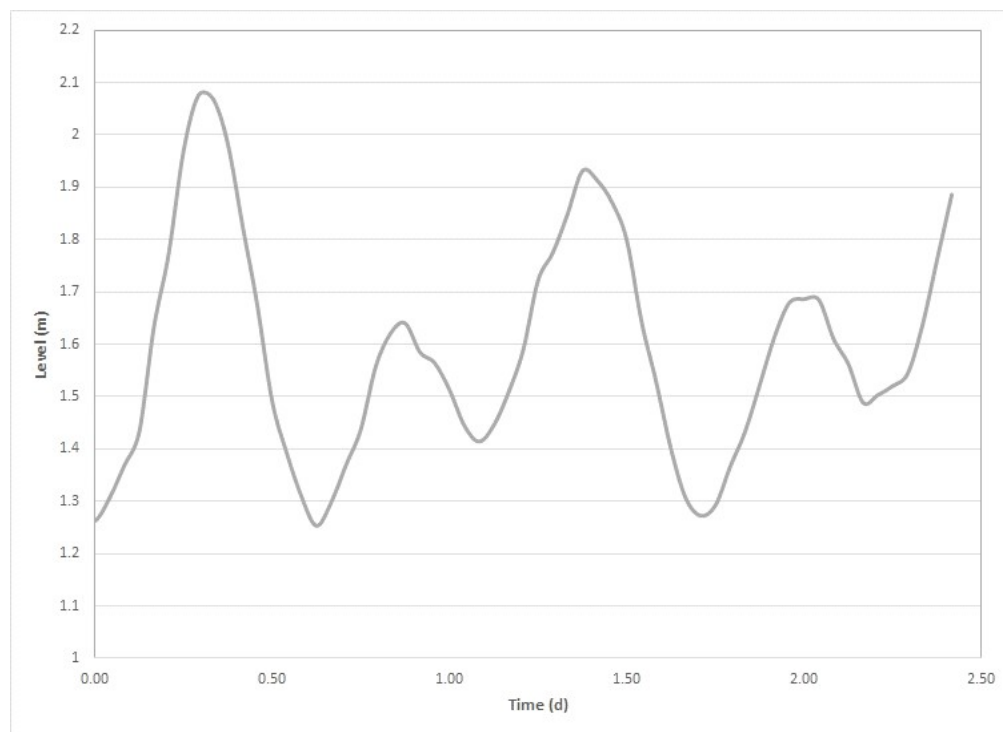


Figure S5. Sea levels (RL) attributed at the boundary condition for the model n.3 in order to reproduce the sea level variations.

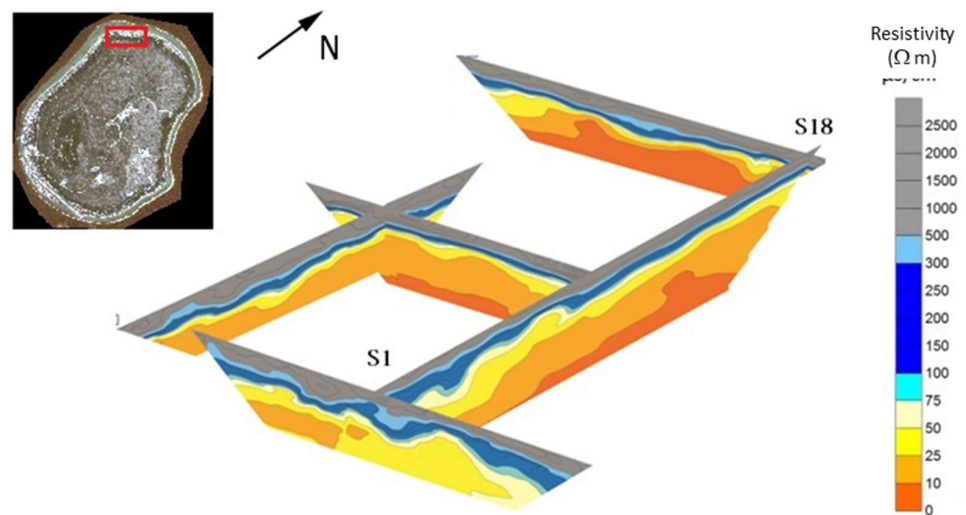


Figure S6. 3D representation of resistivity values detected through geoelectrical investigations at Capelle area.

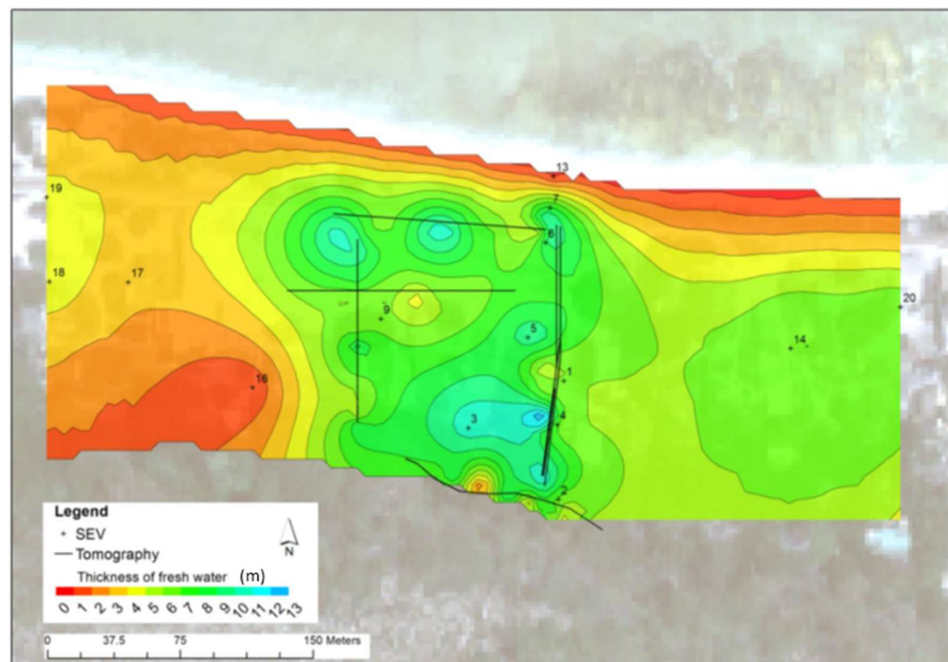


Figure S7. Freshwater thickness distribution in Capelle area considering 75 Ωm as separation limit between fresh and brackish water.

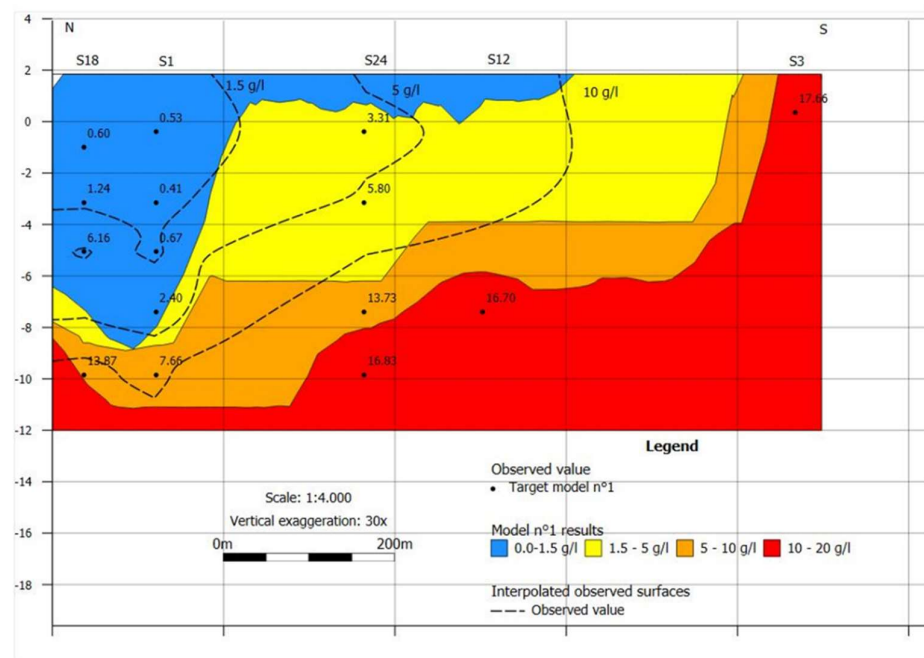


Figure S8. Observed concentration values compared with simulated ones.

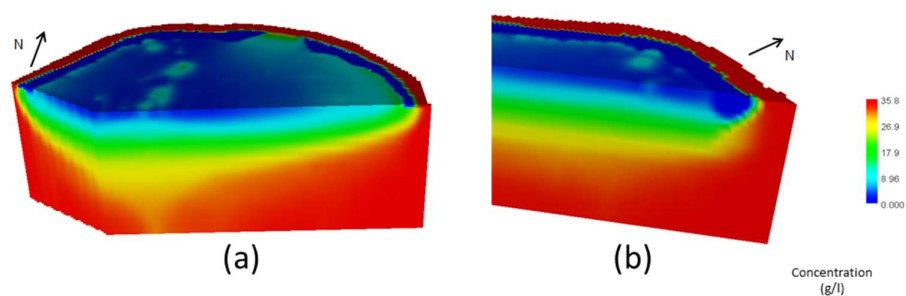


Figure S9. Model n.1, 3D representation of salt concentrations in groundwater in November 2009 (a) in the model domain and (b) along a cross section passing through Capelle area.

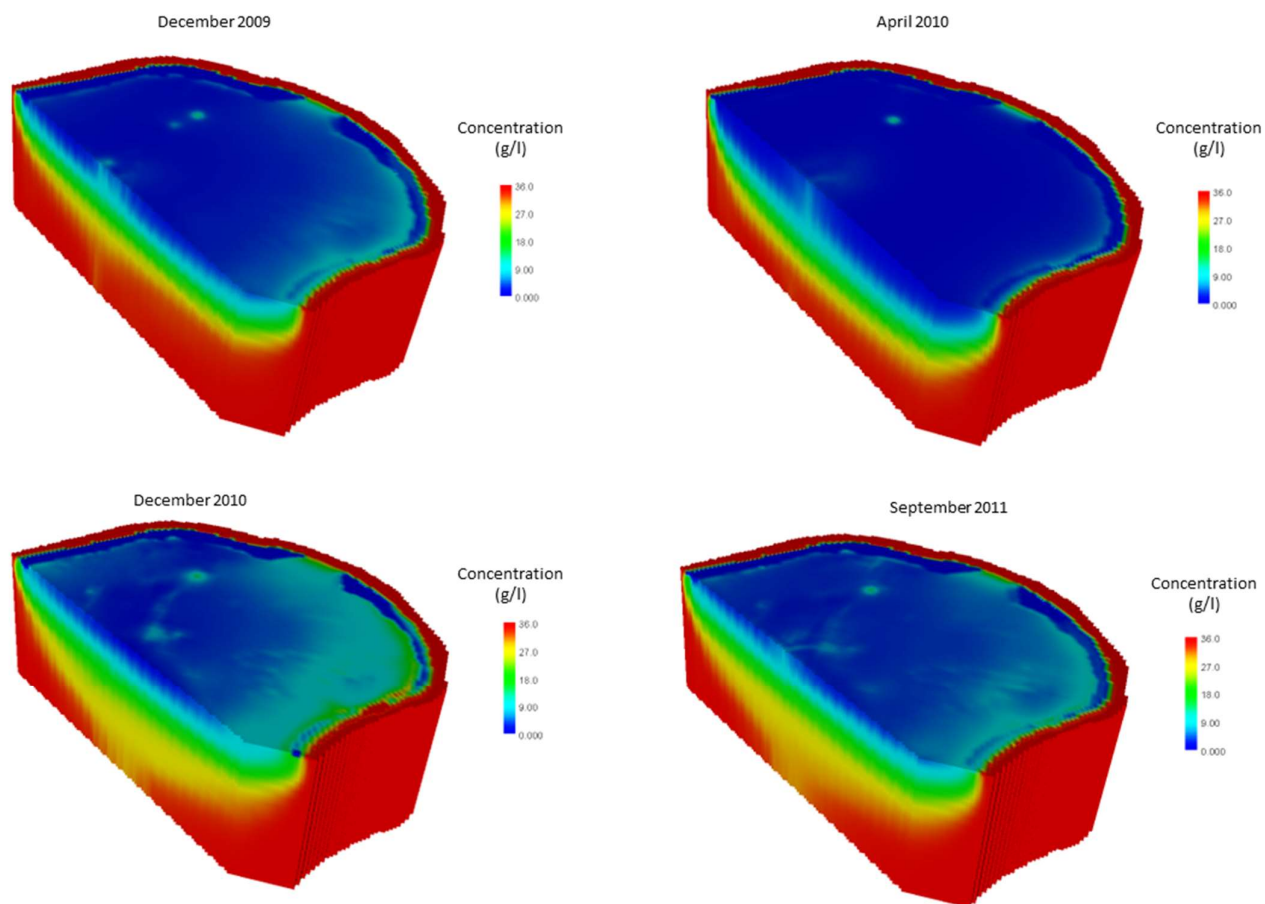
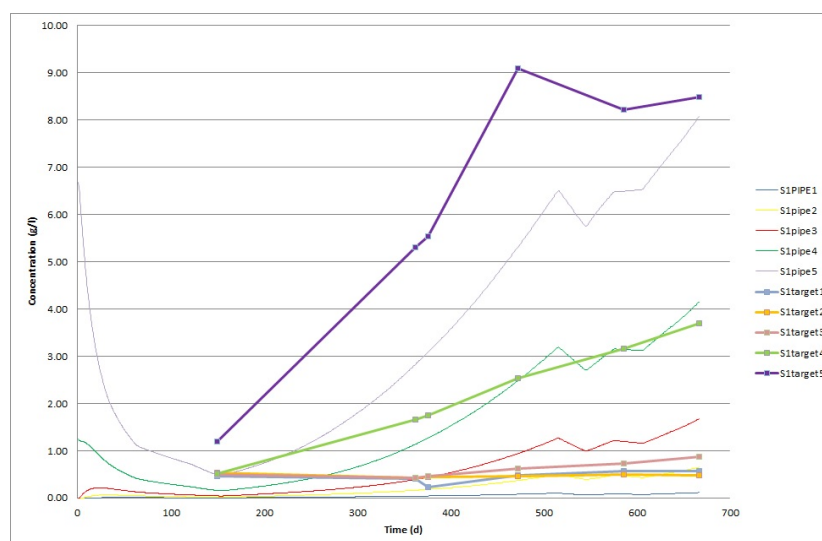
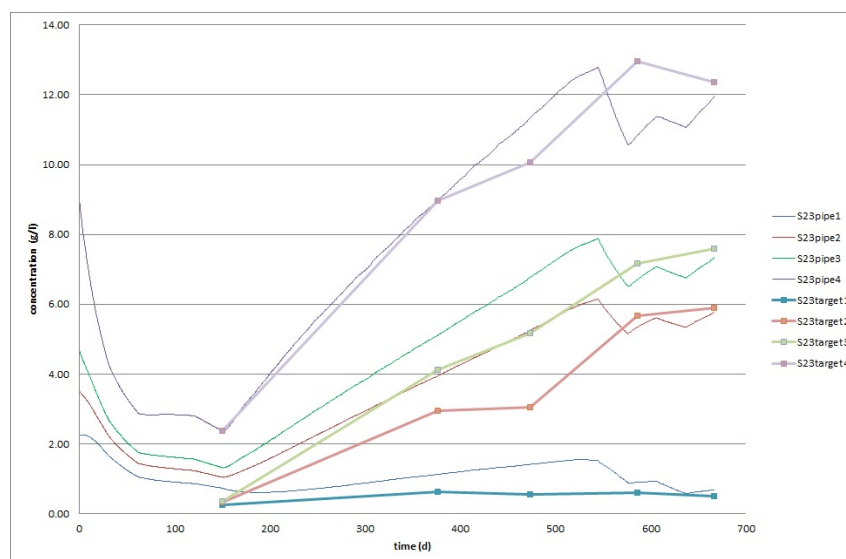


Figure S10. Model n.2, 3D concentration representation (g/L) for unsteady-state simulation run from December 2009 (SP1) to September 2011 (SP22).



(a)



(b)

Figure S11. Model n.2, simulated versus observed concentrations from December 2009 to September 2011 in (a) S1 and (b) S23 monitoring wells /respectively Bottomside and Topside.

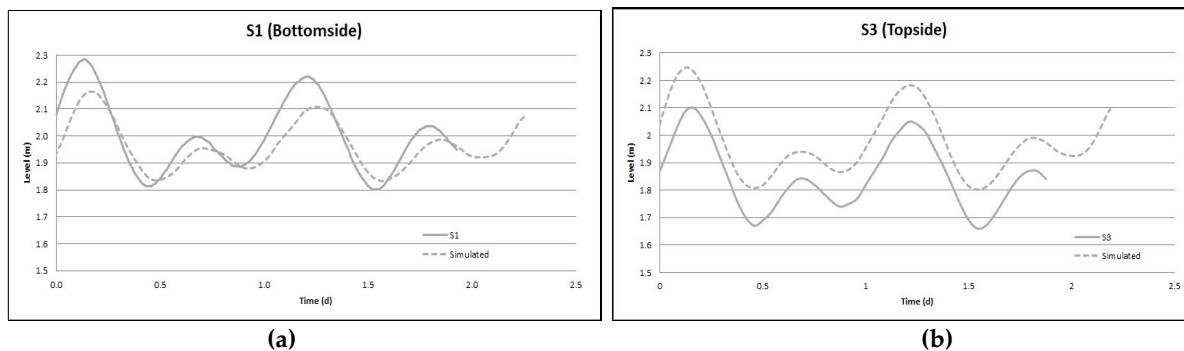


Figure S12. Observed and simulated groundwater levels (RL) resulting from the 2 days simulations in monitoring wells S1 (a) and S3 (b).

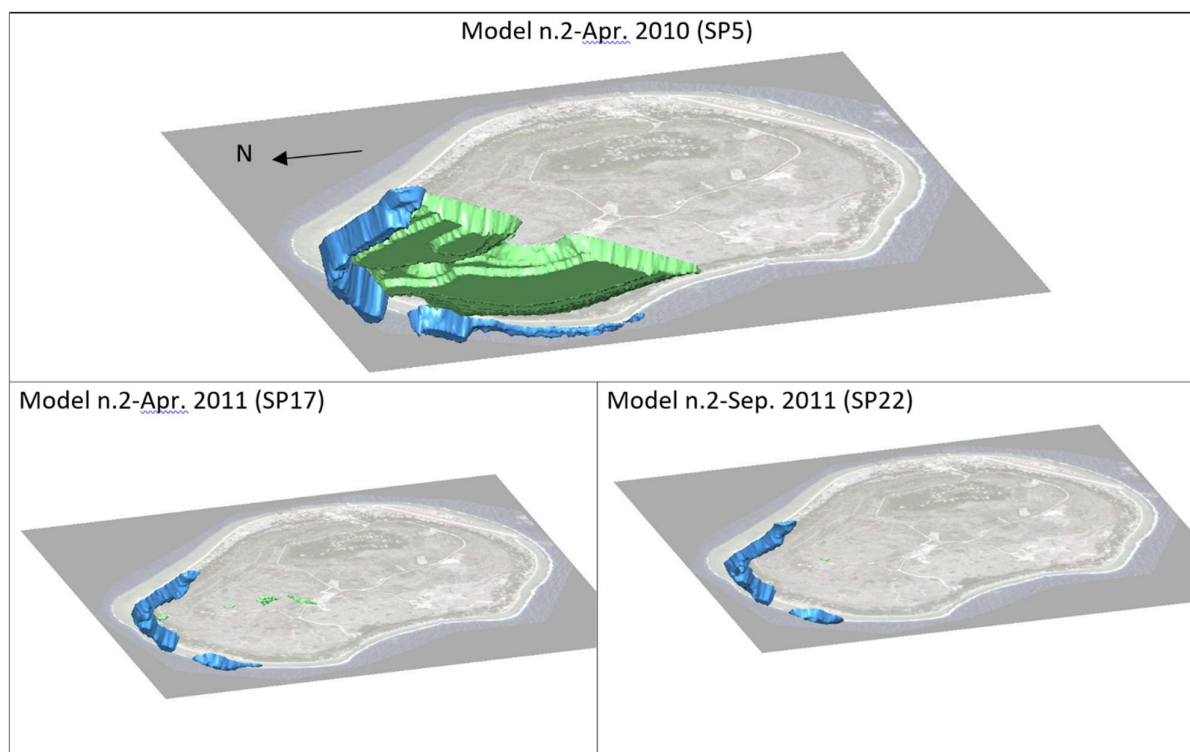


Figure S13. Representation through Leapfrog of the model n.2 unsteady state results, in blue the fresh groundwater body along the Bottomside and in green under the Topside; the view is from the bottom of the model and 1.5 Kg/m^3 is the represented concentration surface that shows the shrinking of the fresh groundwater in 1.5 years