Previous scholars set up 21 groundwater level observation wells and 6 freshwater lens thickness observation points on the island and obtained a series of measured data [36]. We use these data to validate the model:

(1) Verification of groundwater level:

The relative errors between the measured and simulated values of groundwater level are shown in Table 1, ranging from 0.38% to 3.64%

(2) Verification of freshwater lens thickness:

The relative errors between the measured and simulated values of freshwater lens thickness are shown in Table 2, ranging from 0.74% to 8.33%.

It can be judged that the simulation results of the model fit well with the actual ones, which means the numerical model has high fitting accuracy.

Table S1. Comparison of simulated and measured values of groundwater level

Well number	Simulated value/m	Measured value/m	Relative Error/%
01	25.20	26.08	3.36
02	25.23	25.32	0.38
03	25.25	26.10	3.27
04	25.25	26.13	3.36
05	25.25	26.17	3.51
06	25.24	25.85	2.34
07	25.23	26.17	3.59
08	25.21	26.02	3.10
09	25.22	26.01	3.02
10	25.24	26.01	2.97
11	25.25	25.92	2.58
12	25.25	26.01	2.94
13	25.22	25.96	2.84
14	25.22	25.88	2.54
15	25.20	26.00	3.07
16	25.23	25.84	2.35
17	25.24	26.00	2.91
18	25.25	26.20	3.64
19	25.25	26.07	3.16
20	25.23	26.06	3.21
21	25.23	25.99	2.91

Table S2. Comparison of simulated and measured values of freshwater lens thickness

Point number	Simulated value/m	Measured value/m	Relative Error/%
TH01	3.40	3.20	6.25
TH02	4.00	4.30	6.98
TH03	6.50	6.00	8.33
TH04	7.00	6.50	7.69
TH05	8.80	8.40	4.76
TH06	13.40	13.50	0.74