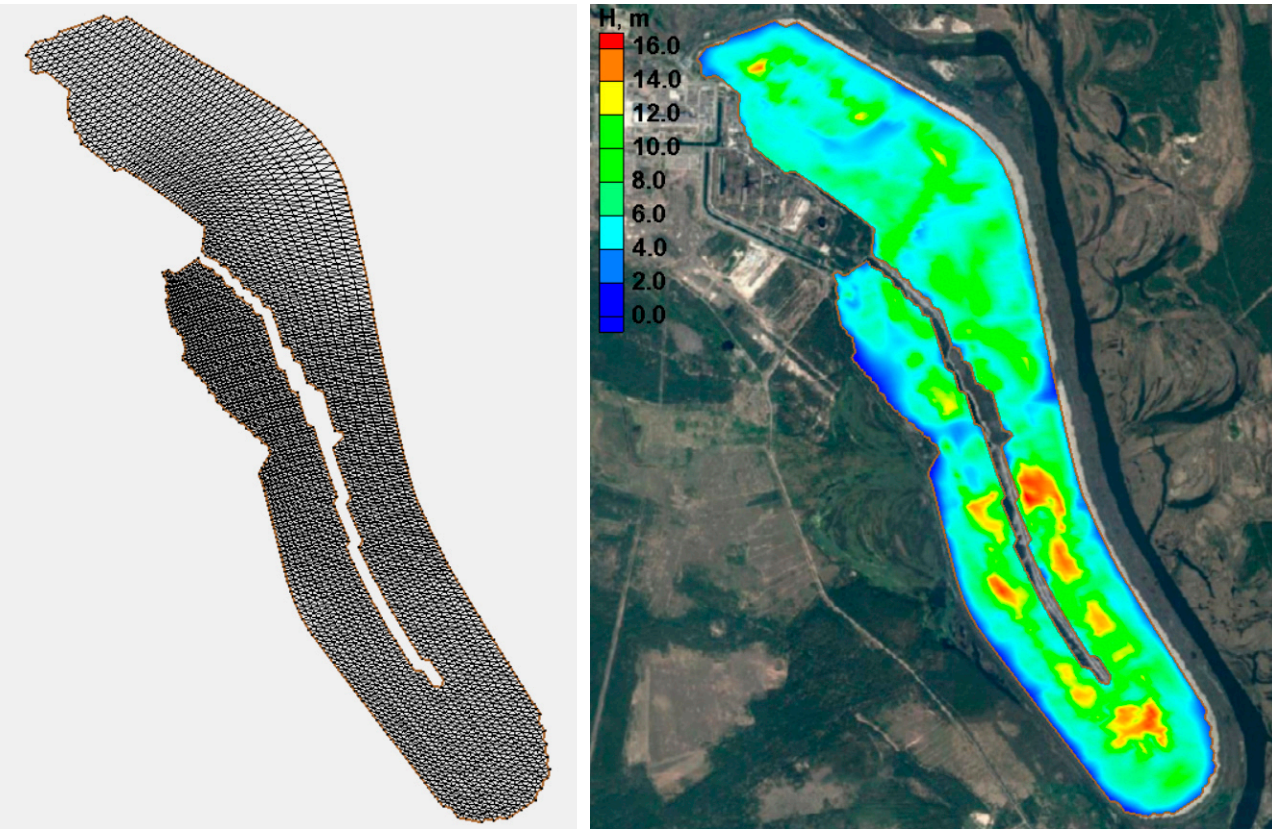
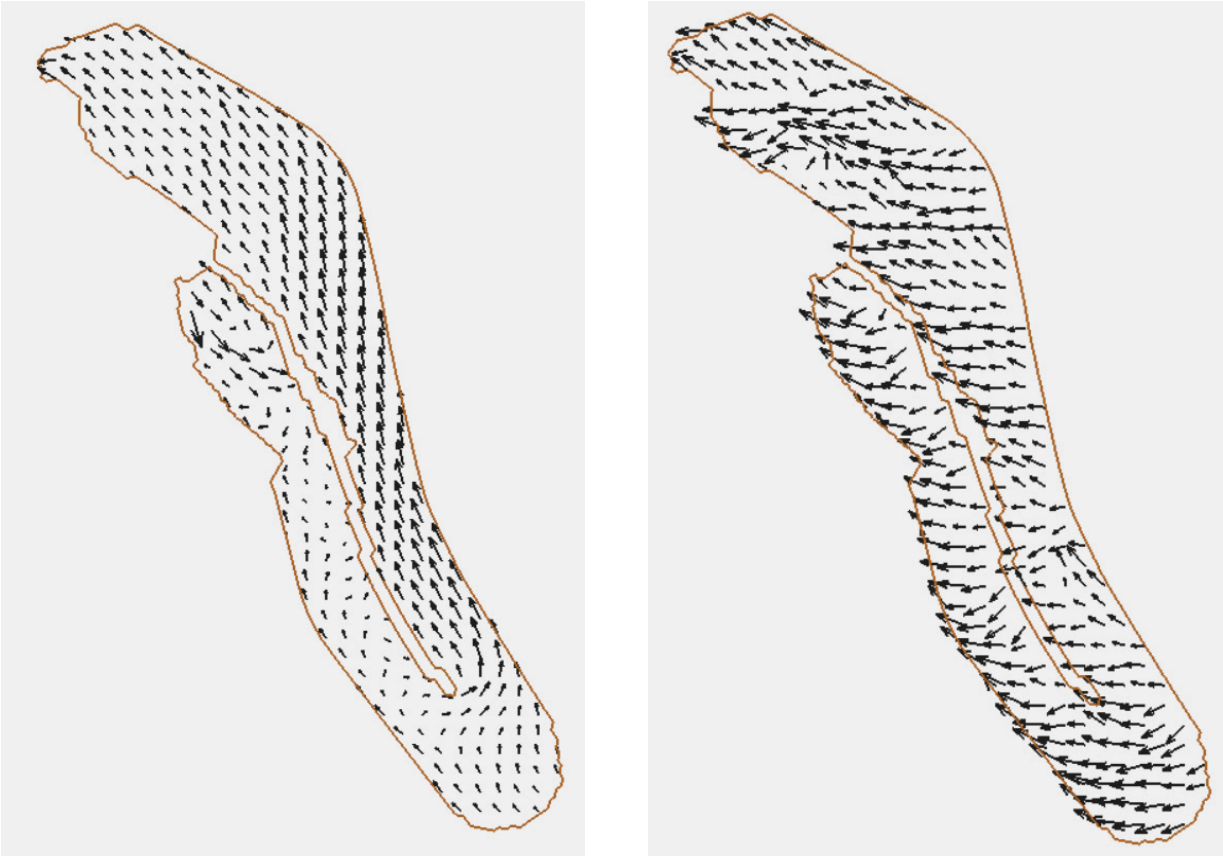
Supplementary Material



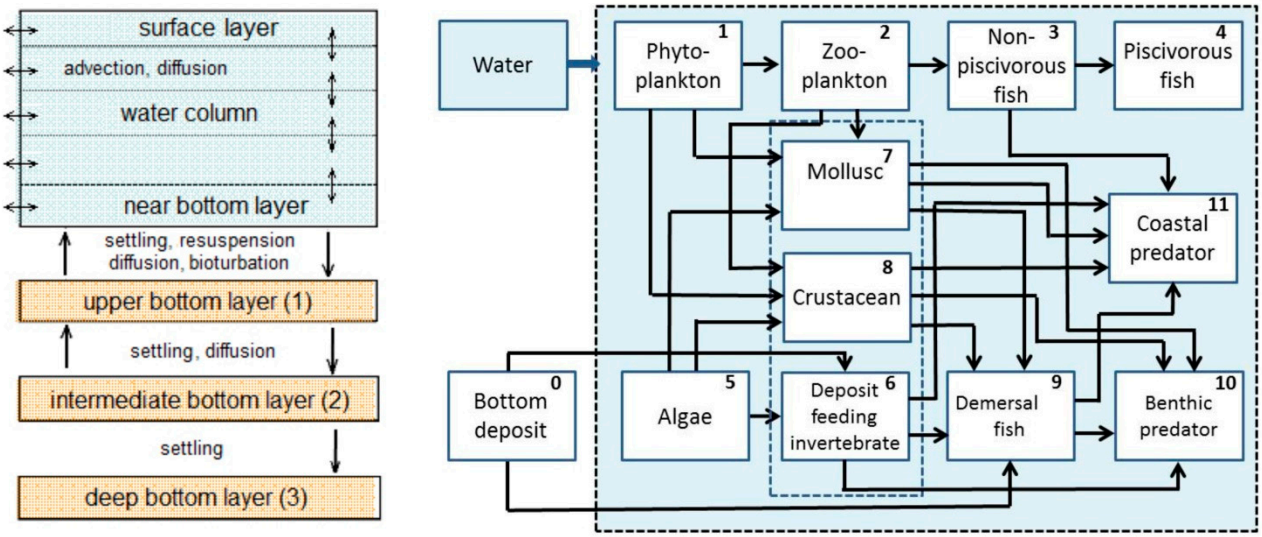
(a) (b)

Figure S1. Numerical grid for the THREETOX model (a) and bathymetry of the CP before water level drawdown (b).



(a) (b)

Figure S2. Examples of the surface currents simulated by the THREETOX model. They correspond to stable circulation as for June 1991 when three units were in operation (a) and variable circulation that follows changes of wind speed and direction as for June 2010 when ChNPP was decommissioned (b).



(a) (b)

Figure S3. Structure of a box system in the POSEIDON-R model (a) and scheme of radionuclide transfers from the water and bottom sediment boxes to aquatic organisms (b). 11 types of aquatic organisms are considered in the model.

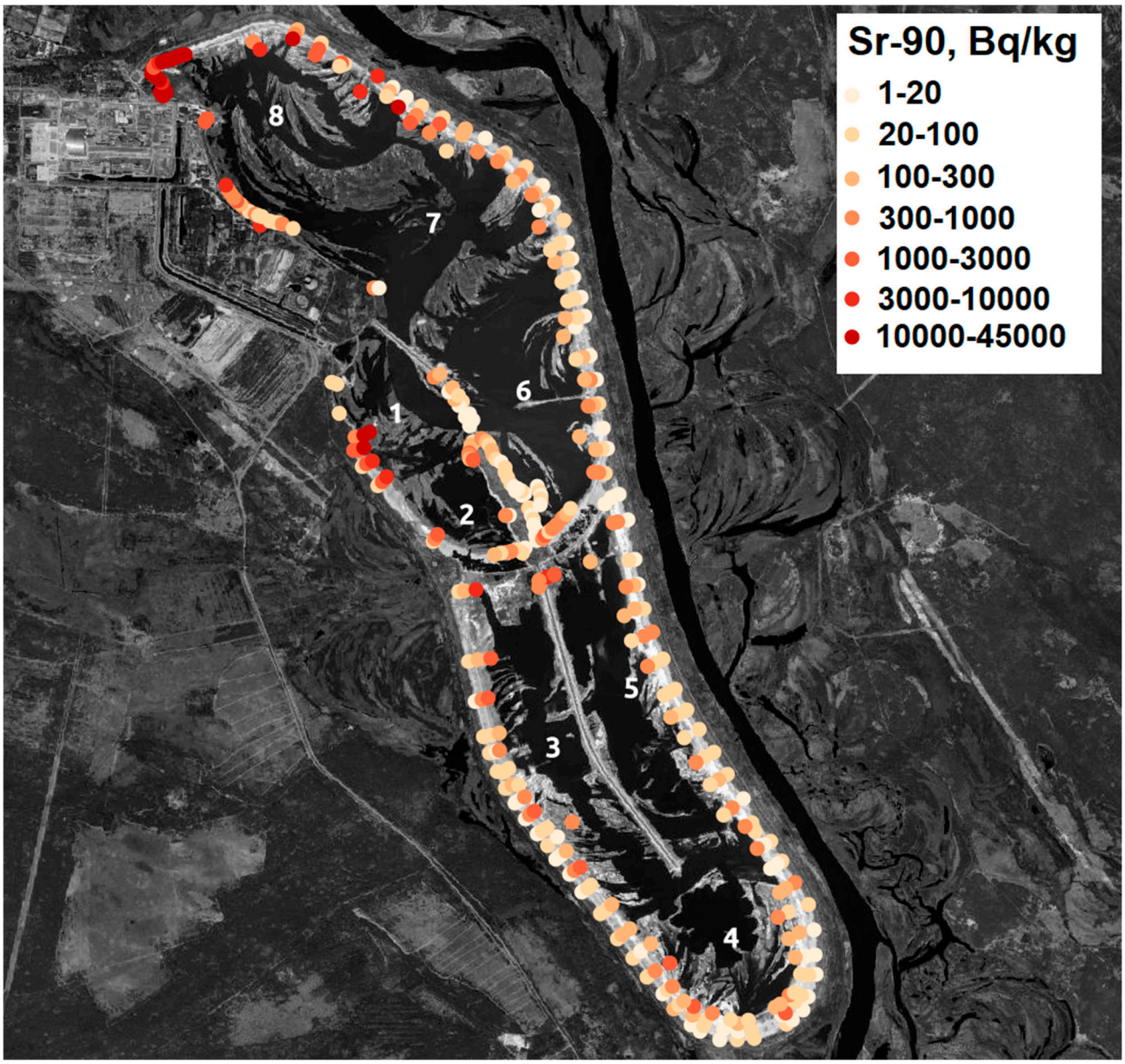


Figure S4. Measurement data of the ^{90}Sr concentration in the top sediment layer (0-5 cm) on the dried areas of the ChNPP Cooling Pond. Numbers from 1 to 8 denote sectors, which are considered in the POSEIDON-F model.

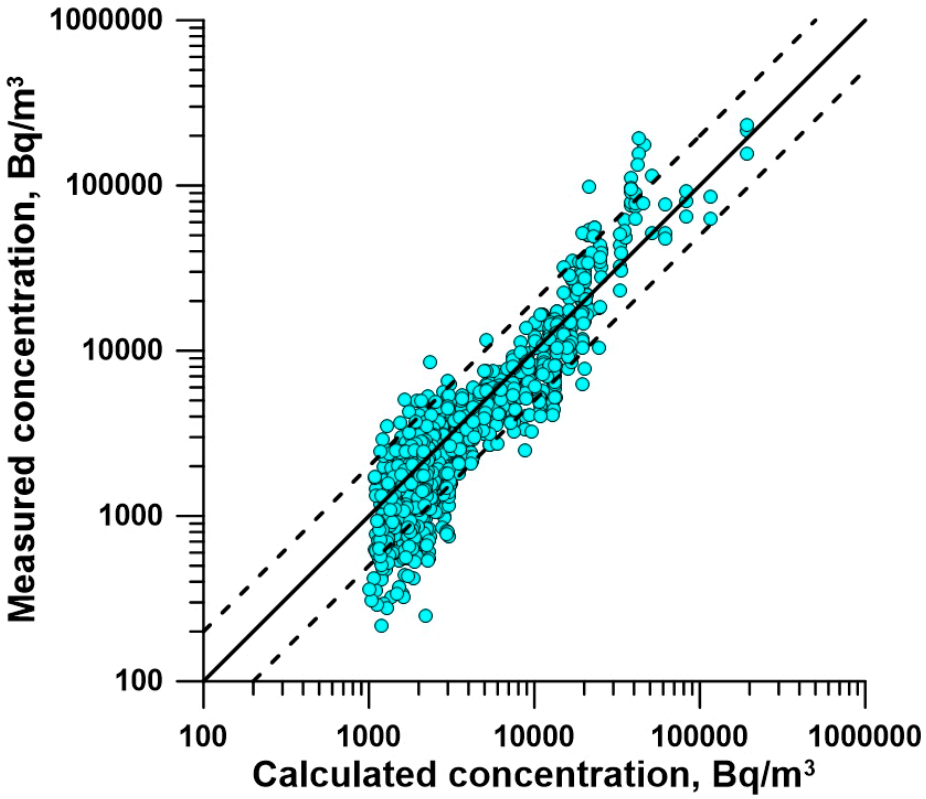


Figure S5. Calculated and measured concentrations of ^{137}Cs in water. The dashed lines indicate ratios of 2 and ½ for calculated-to measured values.

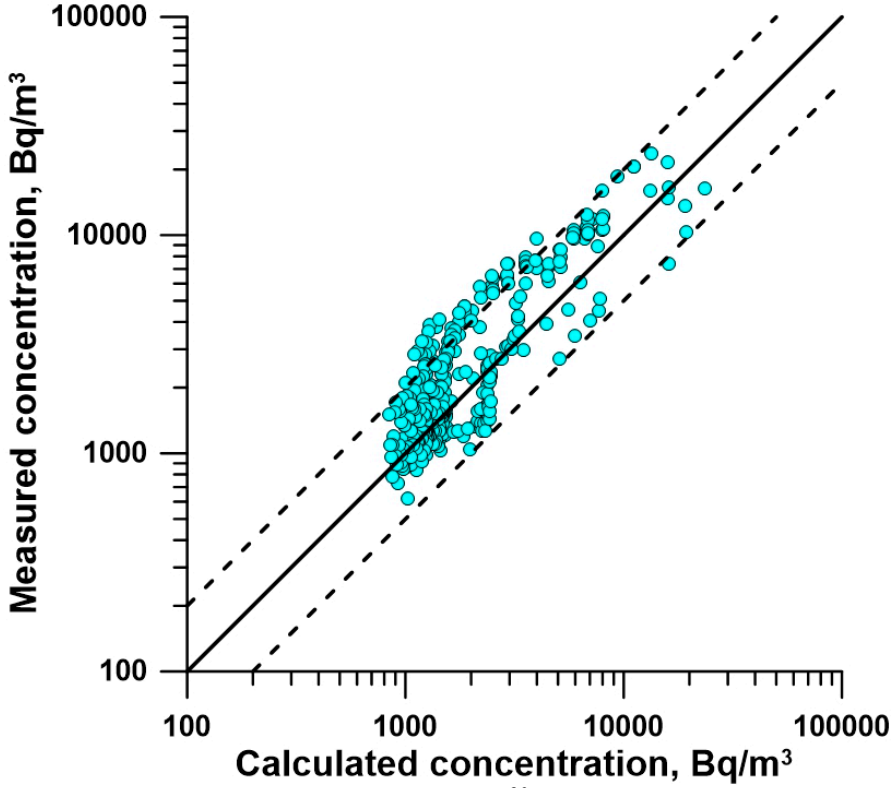


Figure S6. Calculated and measured concentrations of ^{90}Sr in water. The dashed lines indicate ratios of 2 and ½ for calculated-to measured values.