

Parameters	Units or values	Estimated uncertainty (%)	Evaluation
Wind speed (ω_{10})	0.2-5.4 m s ⁻¹	n.a.	From Jiuzhi weather stations
Water–air temperature	11.2–15.6 °C	n.a.	Recorded with probe in the chamber; sensitive to temperature results
Molecular diffusion of ²²² Rn in water (D_m)	9.2×10^{-6} – 1.0×10^{-5} cm ² s ⁻¹	n.a.	1.16×10^{-6} at 20 °C; adjustable for temperature
Molecular diffusion of ²²² Rn in sediments (D_s)	2.2×10^{-6} – 2.5×10^{-5} cm ² s ⁻¹	n.a.	Adjusted for temperature, sediment porosity
Dynamic viscosity (μ)	1.1×10^{-3} – 1.3×10^{-3} cm ² s ⁻¹	n.a.	Calculated based on water temperature, density, and salinity
Schmidt number (S_c)	1078.6–1371.6 (–)	n.a.	Calculated as the ratio of ν to D_m
Water depth (H)	4.4 m	n.a.	Epilimnion depth of Ximen Co Lake
Decay constant ²²² Rn (λ_{222})	0.186 d ⁻¹	n.a.	Constant
Groundwater endmember ²²² Rn (C_{gw})	$11\,200 \pm 1200$ Bq m ⁻³	8 site dependent for Ximen Co Lake	Measured; final result for water flux inversely proportional to ²²² Rn groundwater concentration
Lake water endmember ²²² Rn (C_l)	21.6 – 418.8 Bq m ⁻³	15 %–25 %	Measured with RAD 7 AQUA
Ambient air ²²² Rn (C_{air})	1.51 ± 0.97 Bq m ⁻³	15 %–25 %	Measured with RAD 7 under open-loop conditions
Atmospheric ²²² Rn (C_a)	1.5 ± 1.0 Bq m ⁻³	20 %–25 %	Measured or assumed value, model not sensitive to radon in air variation
$K_{air/water}$	0.29–0.33 (–)	n.a.	Calculated based on temperature in the chamber and salinity in lake water
Porosity n	0.31	n.a.	Assumed based on the literature
Tortuosity θ	2.05	n.a.	Calculated based on porosity
Piston velocity (κ)	0.004–1.11 m d ⁻¹	20 %–25 %	Calculated from Eq. (S3)
²²⁶ Ra concentration in lake waters (C_{226Ra})	0.01 Bq m ⁻³	≈ 10 %	Measured with RAD7
Diffusive flux of ²²² Rn (F_{diff})	0.68–213.5 Bq m ⁻² d ⁻¹	n.a.	Calculated from Eq. (S9)
Atmospheric flux of ²²² Rn (F_{atm})	0.7–213.5 Bq m ⁻² d ⁻¹	n.a.	Calculated from Eq. (S1)
Groundwater flux of ²²² Rn (F_{gw})	14.7–349.8 Bq m ⁻² d ⁻¹	n.a.	Calculated from Eq. (1)
Inventory of ²²² Rn (I)	Bq m ⁻²	n.a.	Measured with RAD7 AQUA
Groundwater discharge (Q_{gw})	10.3 ± 8.2 (3.5–38.6) mm d ⁻¹	n.a.	Calculated from Eq. (1)