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Supplement of

MITgcm-RN v1.0: modeling the transport and fate of radionuclides released from nuclear power plants wastewater in the global ocean using MITgcm_c65i with the radionuclide module

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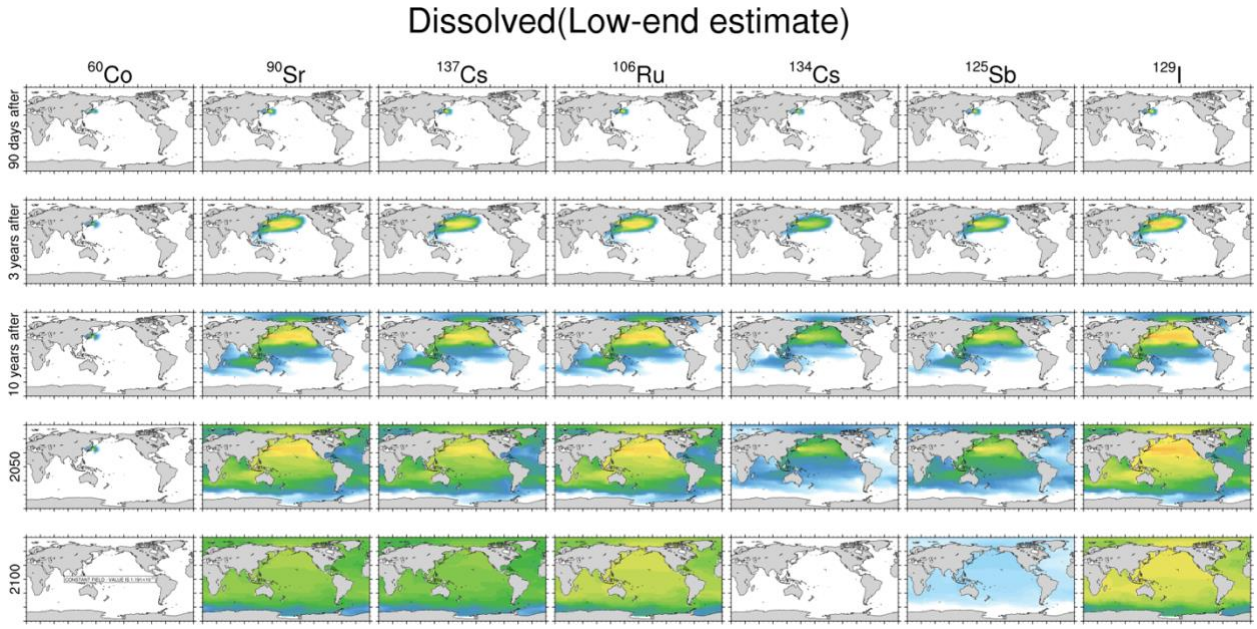
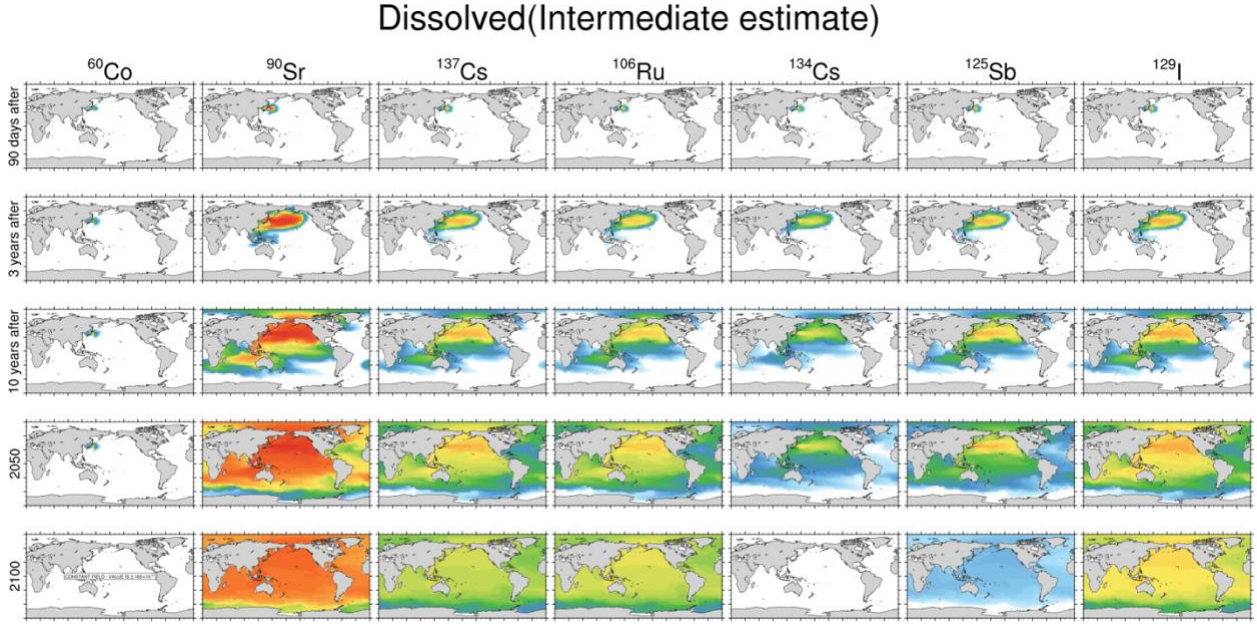

Dissolved(Low-end estimate)
^{60}Co
^{90}Sr
^{137}Cs
^{106}Ru
^{134}Cs
^{125}Sb
^{129}I
90 days after
3 years after
10 years after
2050
2100


Dissolved(Intermediate estimate)
^{60}Co
^{90}Sr
^{137}Cs
^{106}Ru
^{134}Cs
^{125}Sb
^{129}I
90 days after
3 years after
10 years after
2050
2100

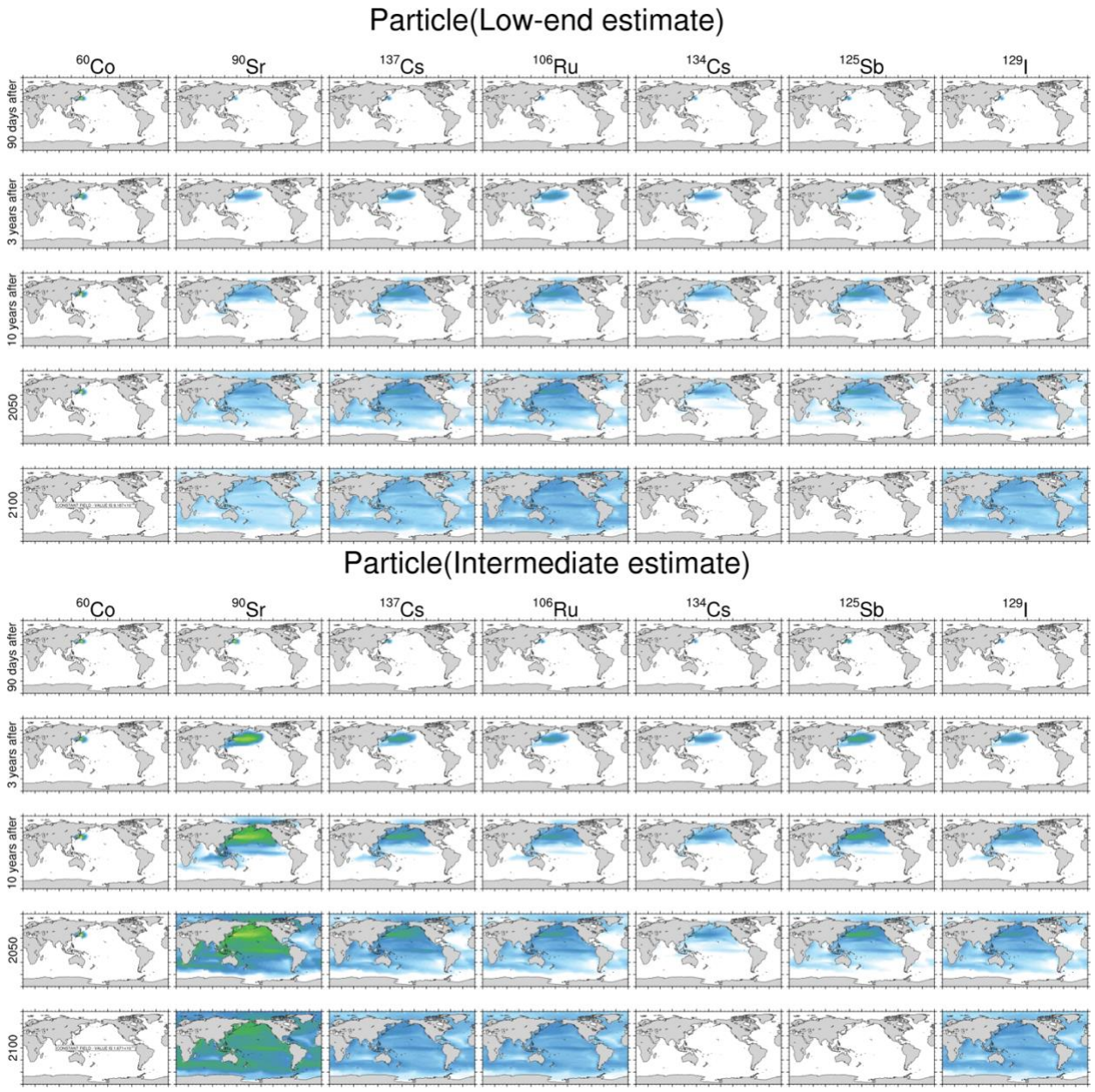
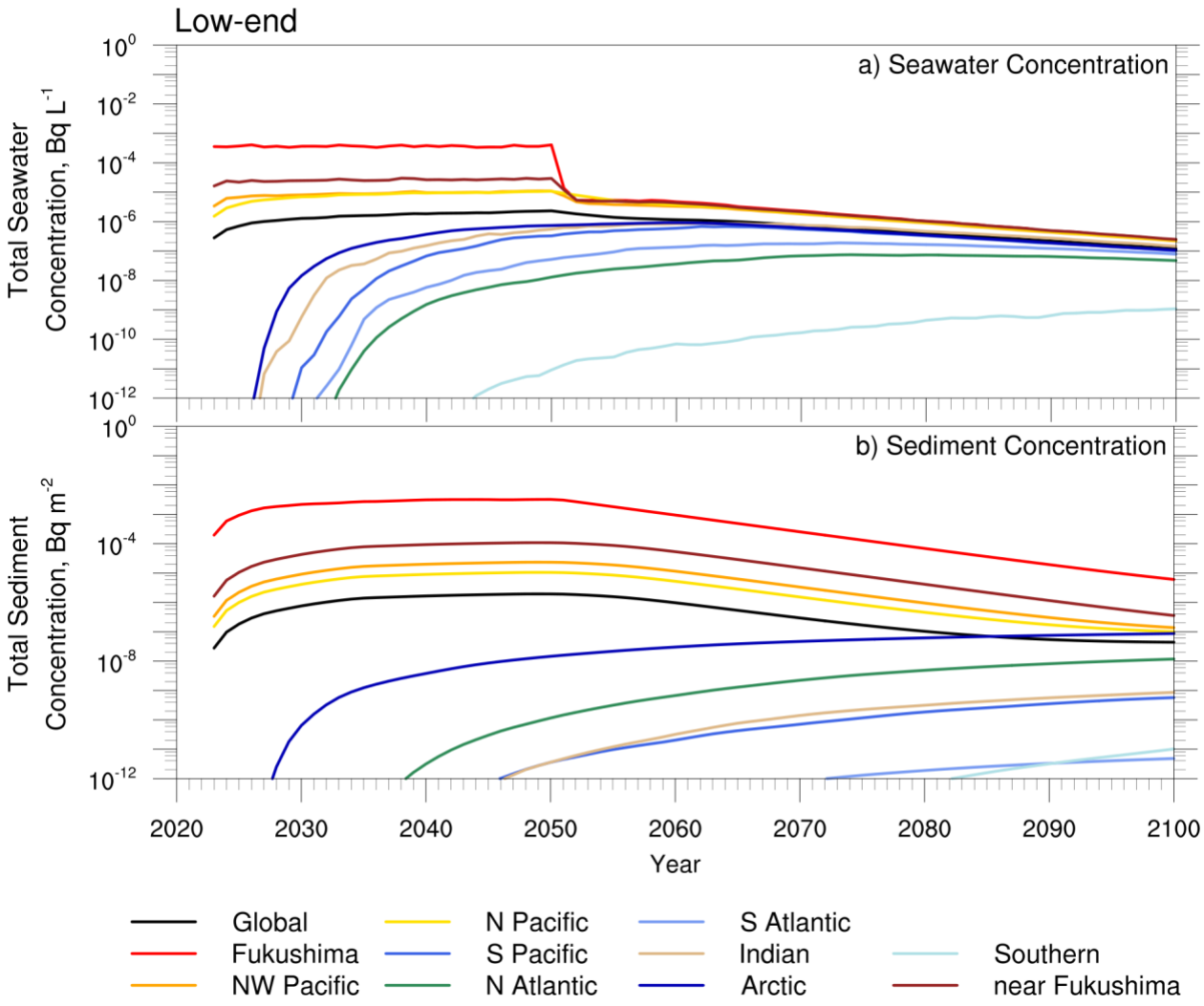


Figure S1. Projected spatial distribution of dissolved and particulate primary radionuclides in the seawater in the 21st century ocean under three scenarios.


Low-end
a) Seawater Concentration
b) Sediment Concentration
Total Seawater Concentration, Bq L-1
Total Sediment Concentration, Bq m-2
10^0
10^-2
10^-4
10^-6
10^-8
10^-10
10^-12
2020
2030
2040
2050
2060
2070
2080
2090
2100
Year
Global
Fukushima
NW Pacific
N Pacific
S Pacific
N Atlantic
S Atlantic
Indian
Arctic
Southern
near Fukushima

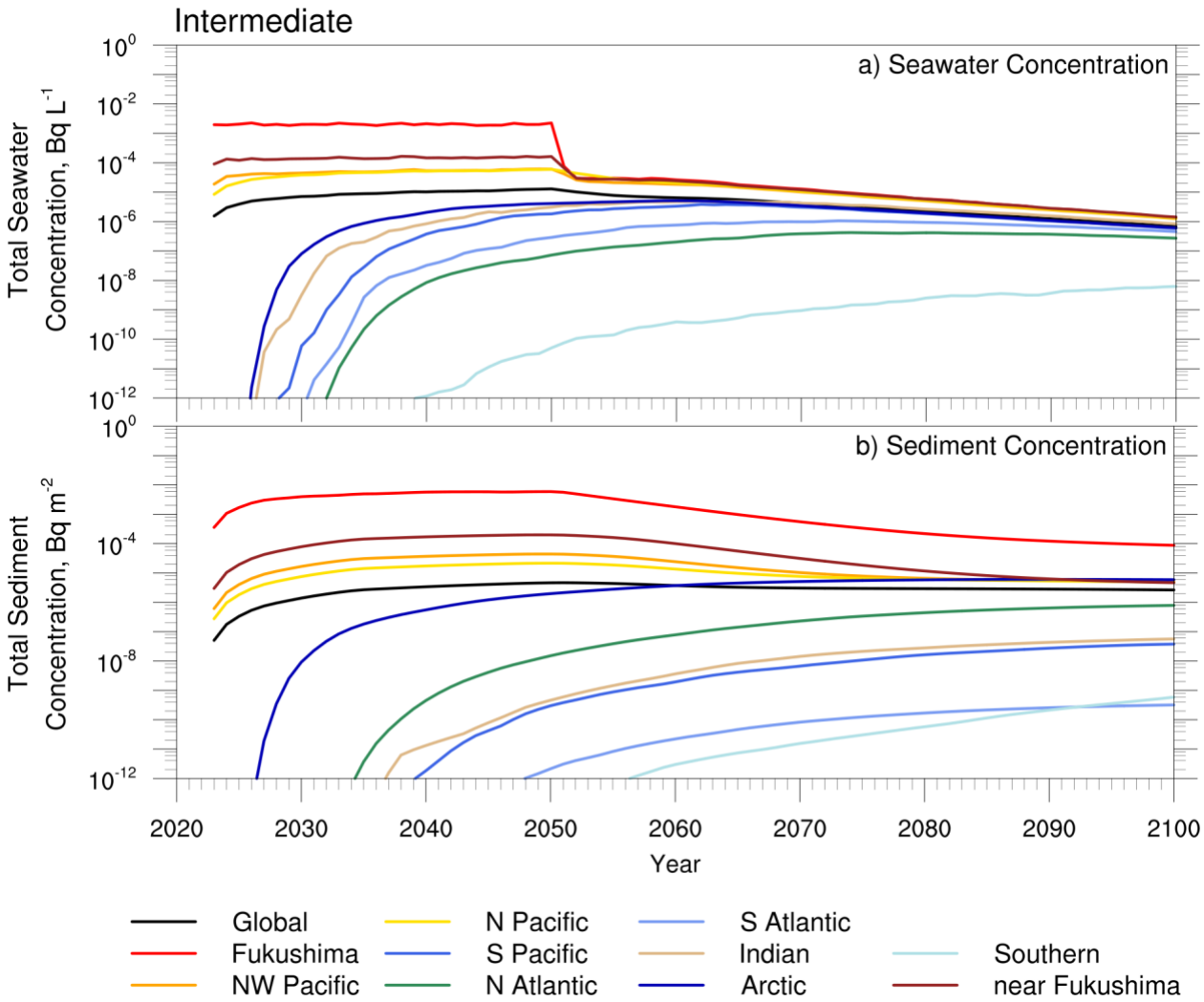


Figure S2. Projected total radionuclide a) concentrations and b) sedimentation fluxes over different ocean basins for low-end and intermedia scenarios.

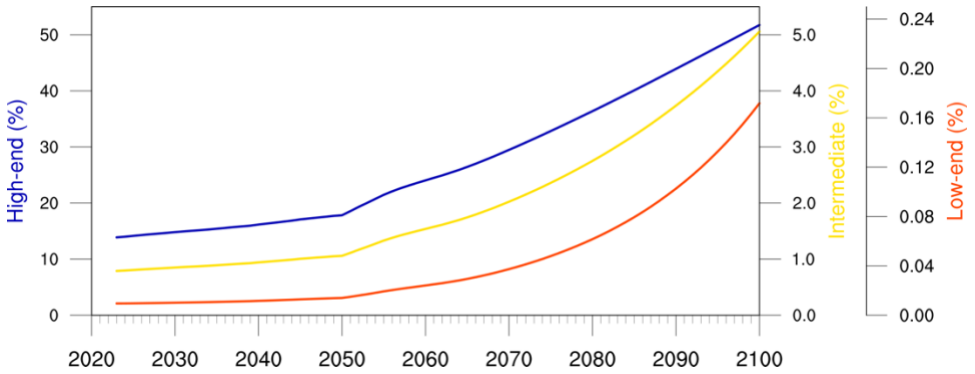


Figure S3. Global average fraction of primary seven nuclides over the total nuclide concentrations. Blue, yellow, and red curves are for high-, intermediate, and low-end emission scenarios, respectively. Note each with a separate y-axis.

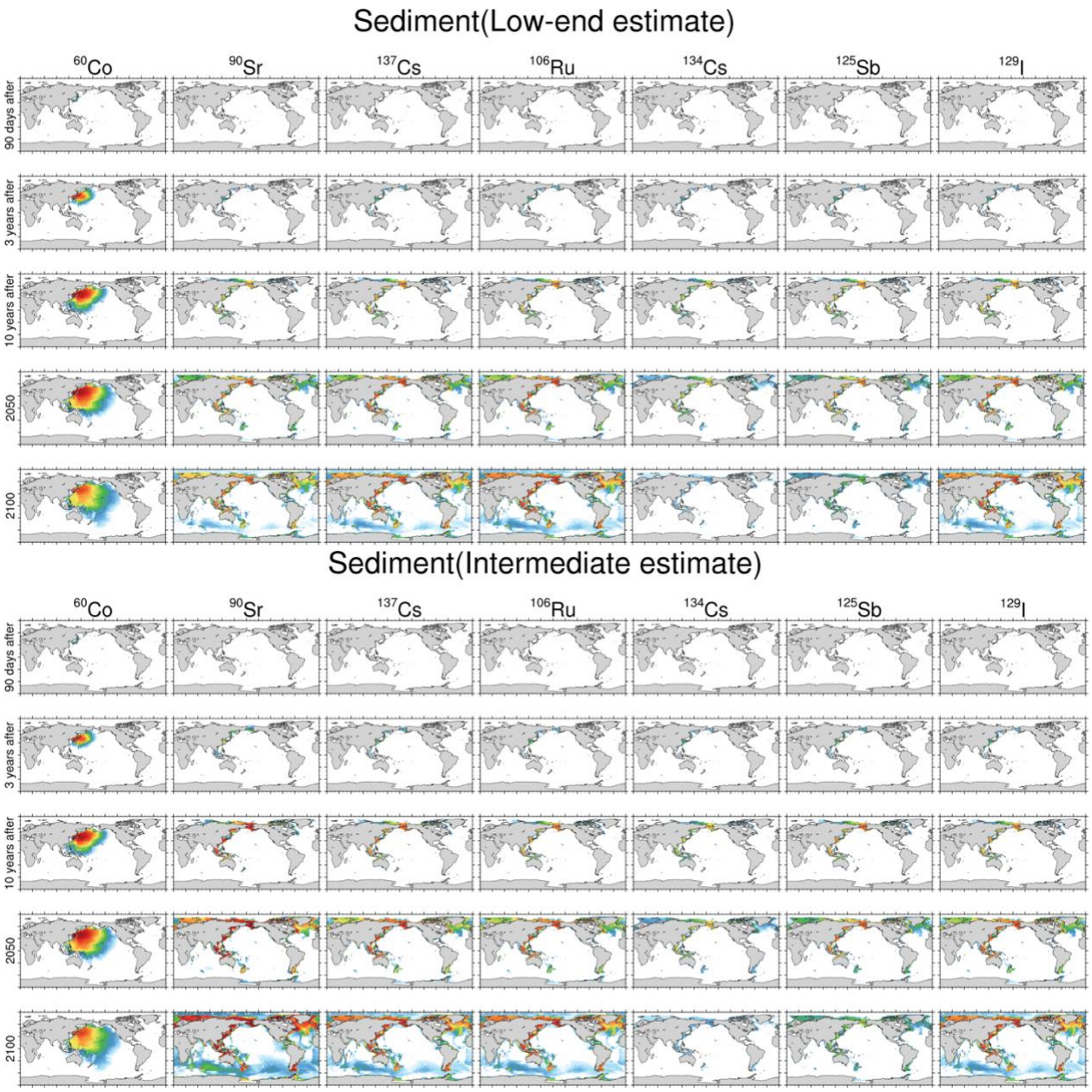


Figure S4. Projected spatial distribution of the sediment flux of primary seven radionuclides in the 21st century ocean under the low and intermedia scenarios.

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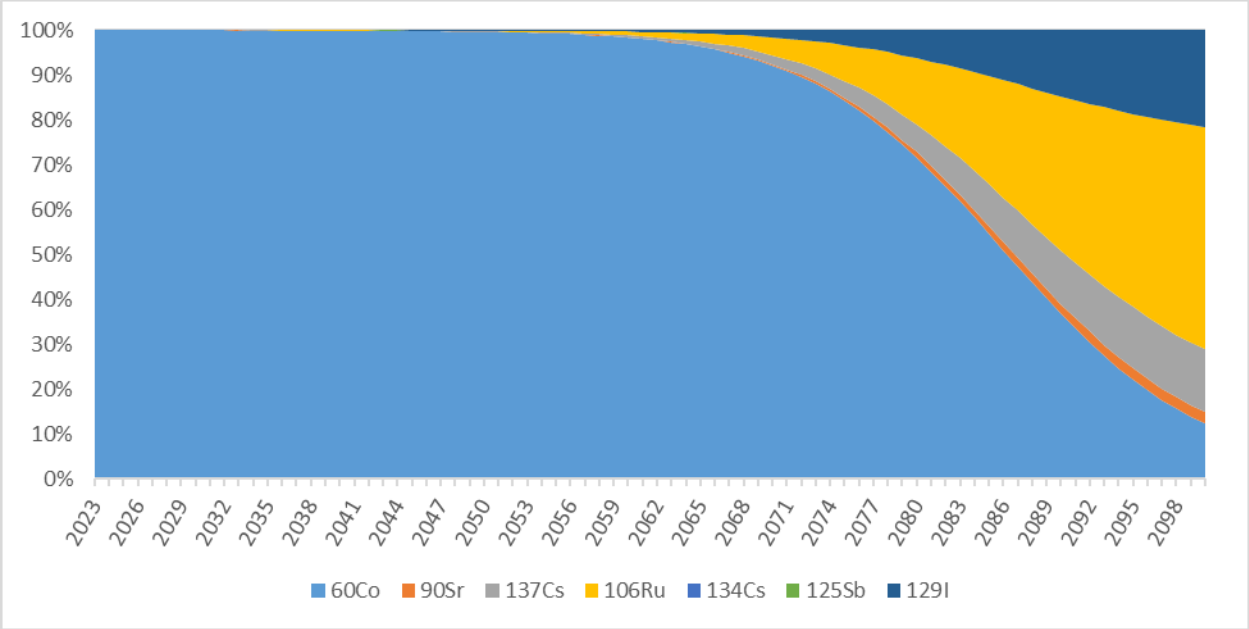
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0%
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2062
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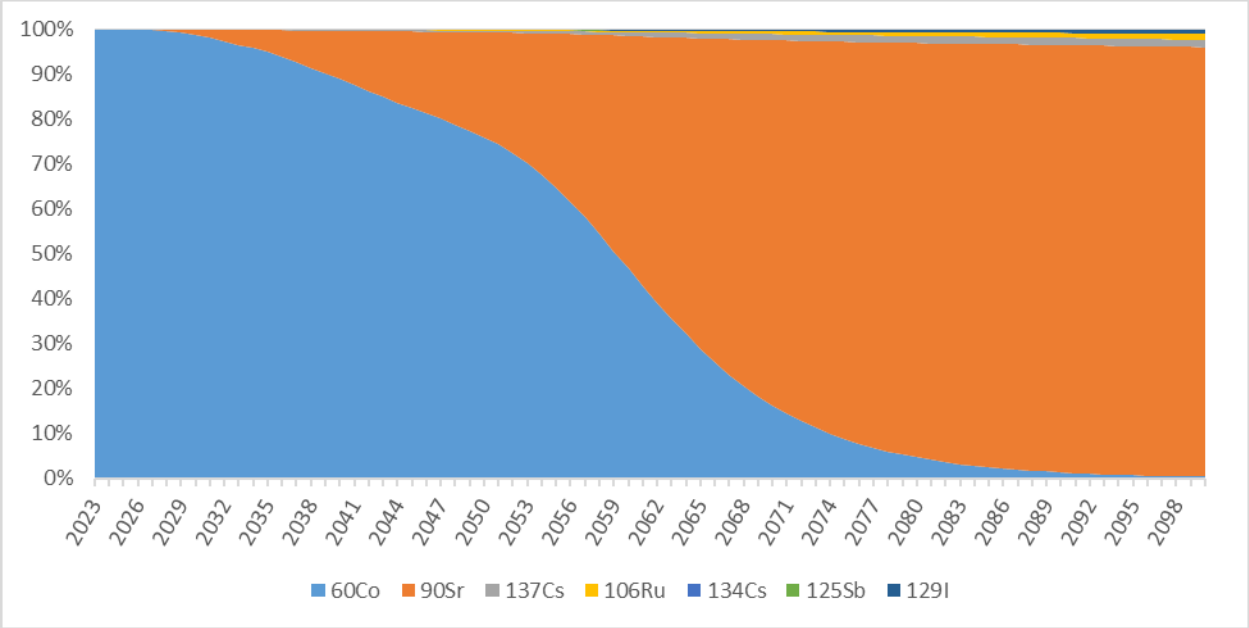
2071
2074
2077
2080
2083
2086
2089
2092
2095
2098
60Co
90Sr
137Cs
106Ru
134Cs
125Sb
129I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60Co
90Sr
137Cs
106Ru
134Cs
125Sb
129I

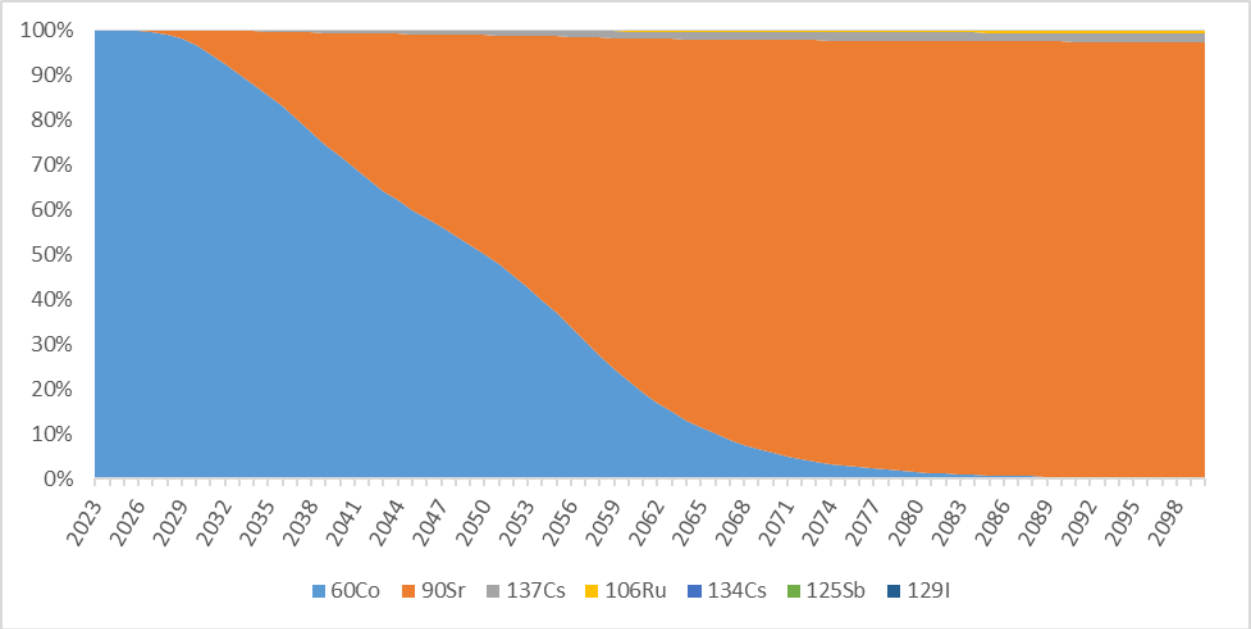

Figure S5. Relative contribution of different nuclides in the global sediments (from top to bottom are low-end scenario, intermediate scenario, and high-end scenario, respectively).

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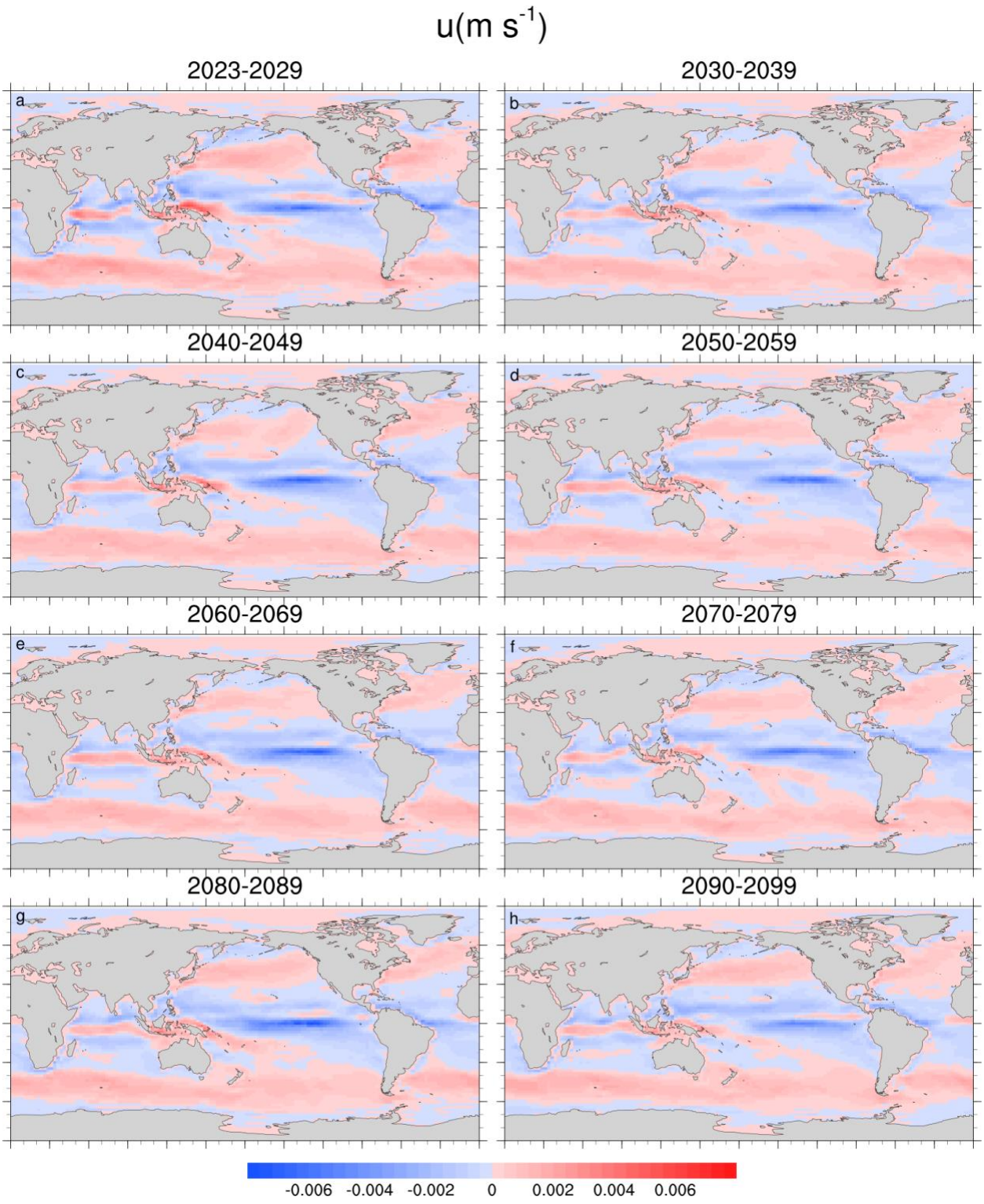

Figure S6. Surface ocean current velocities: U

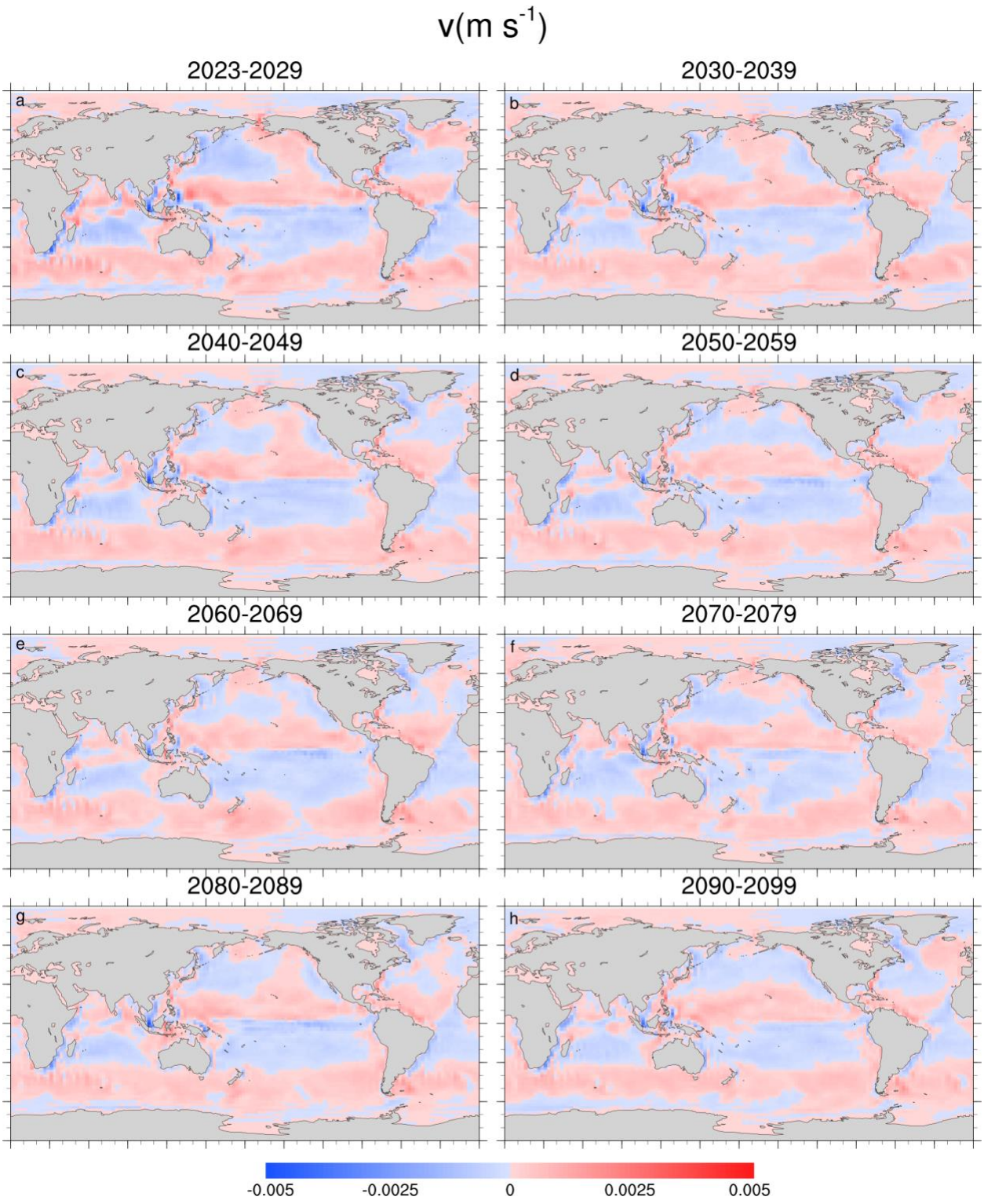

Figure S7. Surface ocean current velocities: V

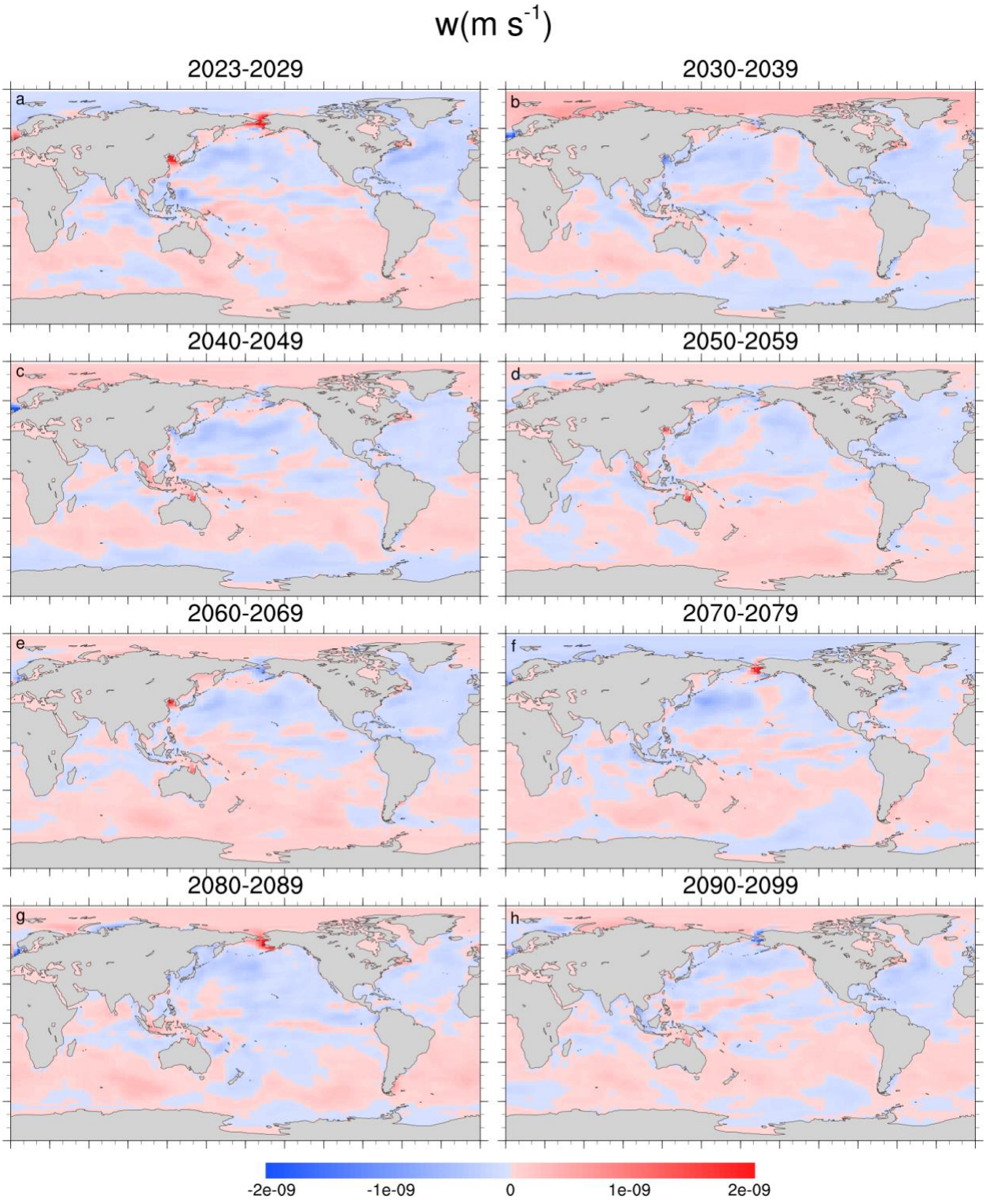

Figure S8. Surface ocean current velocities: W

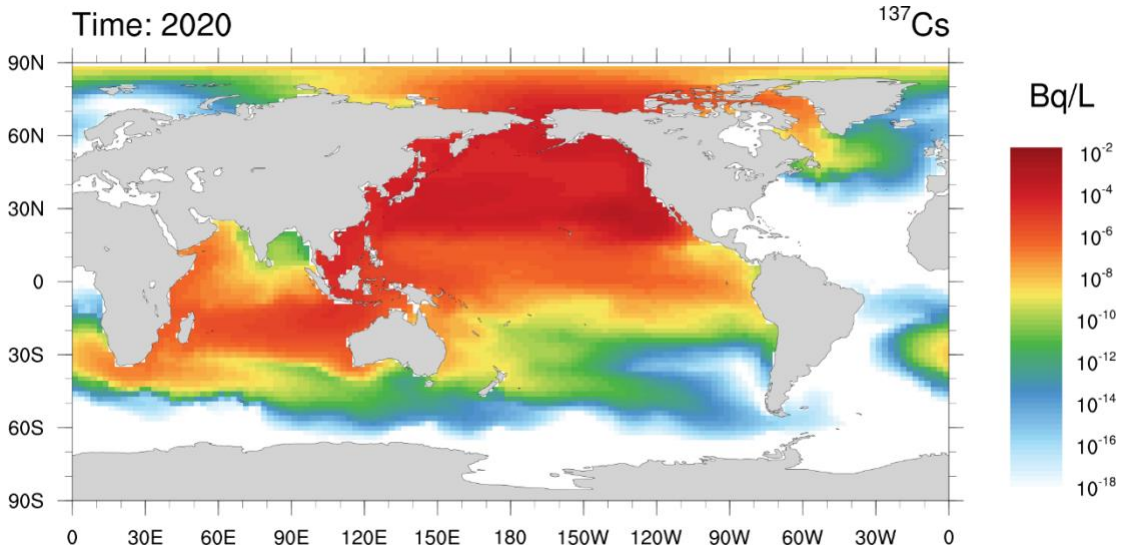

Figure S9. Global distribution of simulated ^{137}Cs in 2020 from the verification scenario experiment.