

## References

- Abbott, A. N., B. A. Haley, and J. McManus (2015a), Bottoms up: Sedimentary control of the deep North Pacific Ocean's epsilon(Nd) signature, *Geology*, 43(11), 1035-1038, doi: 10.1130/G37114.1.
- Abbott, A. N., B. A. Haley, J. McManus, and C. E. Reimers (2015b), The sedimentary flux of dissolved rare earth elements to the ocean, *Geochim Cosmochim Acta*, 154, 186-200, doi: <https://doi.org/10.1016/j.gca.2015.01.010>.
- Abbott, A. N., B. A. Haley, and J. McManus (2016), The impact of sedimentary coatings on the diagenetic Nd flux, *Earth Planet Sc Lett*, 449, 217-227, doi: 10.1016/j.epsl.2016.06.001.
- Abbott, A. N. (2019), A benthic flux from calcareous sediments results in non-conservative neodymium behavior during lateral transport: A study from the Tasman Sea, *Geology*, 47(4), 363-366, doi: 10.1130/G45904.1.
- Arsouze, T., J. C. Dutay, F. Lacan, and C. Jeandel (2007), Modeling the neodymium isotopic composition with a global ocean circulation model, *Chem Geol*, 239(1), 165-177, doi: <https://doi.org/10.1016/j.chemgeo.2006.12.006>.
- Arsouze, T., J. C. Dutay, F. Lacan, and C. Jeandel (2009), Reconstructing the Nd oceanic cycle using a coupled dynamical – biogeochemical model, *Biogeosciences*, 6(12), 2829-2846, doi: 10.5194/bg-6-2829-2009.
- Bacon, M. P., and R. F. Anderson (1982), Distribution of Thorium Isotopes between Dissolved and Particulate Forms in the Deep-Sea, *Journal of Geophysical Research-Oceans and Atmospheres*, 87(Nc3), 2045-2056.
- Basak, C., H. Fröllje, F. Lamy, R. Gersonde, V. Benz, R. F. Anderson, M. Molina-Kescher, and K. Pahnke (2018), Breakup of last glacial deep stratification in the South Pacific, *Science*, 359(6378), 900, doi: 10.1126/science.aao2473.
- Bertram, C. J., and H. Elderfield (1993), The geochemical balance of the rare earth elements and neodymium isotopes in the oceans, *Geochim Cosmochim Acta*, 57(9), 1957-1986, doi: [https://doi.org/10.1016/0016-7037\(93\)90087-D](https://doi.org/10.1016/0016-7037(93)90087-D).
- Böhm, E., J. Lippold, M. Gutjahr, M. Frank, P. Blaser, B. Antz, J. Fohlmeister, N. Frank, M. B. Andersen, and M. Deininger (2015), Strong and deep Atlantic meridional overturning circulation during the last glacial cycle, *Nature*, 517(7532), 73-U170, doi: 10.1038/nature14059.
- Broecker, W. S., and E. Maier-Reimer (1992), The influence of air and sea exchange on the carbon isotope distribution in the sea, *Global Biogeochem. Cycles*, 6(3), 315-320, doi: 10.1029/92gb01672.
- Byrne, R. H., and K.-H. Kim (1990), Rare earth element scavenging in seawater, *Geochim Cosmochim Acta*, 54(10), 2645-2656, doi: [https://doi.org/10.1016/0016-7037\(90\)90002-3](https://doi.org/10.1016/0016-7037(90)90002-3).

- Byrne, R. H., and E. R. Sholkovitz (1996), Chapter 158 Marine chemistry and geochemistry of the lanthanides, in Handbook on the Physics and Chemistry of Rare Earths, edited, pp. 497-593, Elsevier.
- Crowley, T. J. (1992), North Atlantic Deep Water Cools the Southern Hemisphere, *Paleoceanography*, 7(4), 489-497.
- Dale, A. W., L. Nickelsen, F. Scholz, C. Hensen, A. Oschlies, and K. Wallmann (2015), A revised global estimate of dissolved iron fluxes from marine sediments, *Global Biogeochem Cy*, 29(5), 691-707, doi: 10.1002/2014GB005017.
- Du, J., B. A. Haley, and A. C. Mix (2016), Neodymium isotopes in authigenic phases, bottom waters and detrital sediments in the Gulf of Alaska and their implications for paleo-circulation reconstruction, *Geochim Cosmochim Ac*, 193, 14-35, doi: <https://doi.org/10.1016/j.gca.2016.08.005>.
- Du, J., B. A. Haley, A. C. Mix, M. H. Walczak, and S. K. Praetorius (2018), Flushing of the deep Pacific Ocean and the deglacial rise of atmospheric CO<sub>2</sub> concentrations, *Nat Geosci*, 11(10), 749-755, doi: 10.1038/s41561-018-0205-6.
- Du, J. (2019), The Global Overturning Circulation Since the Last Glacial Maximum Based on Marine Authigenic Neodymium Isotopes, Oregon State University, Corvallis.
- Elderfield, H., M. Whitfield, J. D. Burton, M. P. Bacon, S. Liss Peter, H. Charnock, E. Lovelock James, S. Liss Peter, and M. Whitfield (1988), The oceanic chemistry of the rare-earth elements, *Philosophical Transactions of the Royal Society of London. Series A, Mathematical and Physical Sciences*, 325(1583), 105-126, doi: 10.1098/rsta.1988.0046.
- Fliedert, T. v. d., M. Frank, D.-C. Lee, A. N. Halliday, B. C. Reynolds, and J. R. Hein (2004), New constraints on the sources and behavior of neodymium and hafnium in seawater from Pacific Ocean ferromanganese crusts, *Geochim Cosmochim Ac*, 68(19), 3827-3843, doi: <https://doi.org/10.1016/j.gca.2004.03.009>.
- Frank, M. (2002), RADIOGENIC ISOTOPES: TRACERS OF PAST OCEAN CIRCULATION AND EROSIONAL INPUT, *Reviews of Geophysics*, 40(1), 1-1-1-38, doi: 10.1029/2000RG000094.
- Friedrich, T., A. Timmermann, T. Stichel, and K. Pahnke (2014), Ocean circulation reconstructions from  $\epsilon\text{Nd}$ : A model-based feasibility study, *Paleoceanography*, 29(11), 1003-1023, doi: doi:10.1002/2014PA002658.
- Frierson, D. M. W., Y.-T. Hwang, N. S. Fuckar, R. Seager, S. M. Kang, A. Donohoe, E. A. Maroon, X. Liu, and D. S. Battisti (2013), Contribution of ocean overturning circulation to tropical rainfall peak in the Northern Hemisphere, *Nature Geosci*, 6(11), 940-944, doi: 10.1038/ngeo1987.

- Galbraith, E., and C. de Lavergne (2019), Response of a comprehensive climate model to a broad range of external forcings: relevance for deep ocean ventilation and the development of late Cenozoic ice ages, *Clim Dynam*, 52(1), 653-679, doi: 10.1007/s00382-018-4157-8.
- Galbraith, E. D., M. Kienast, E. D. Galbraith, M. Kienast, A. L. Albuquerque, M. A. Altabet, F. Batista, D. Bianchi, S. E. Calvert, S. Contreras, X. Crosta, R. De Pol-Holz, N. Dubois, J. Etourneau, R. Francois, T.-C. Hsu, T. Ivanochko, S. L. Jaccard, S.-J. Kao, T. Kiefer, S. Kienast, M. F. Lehmann, P. Martinez, M. McCarthy, A. N. Meckler, A. Mix, J. Mobius, T. F. Pedersen, L. Pichevin, T. M. Quan, R. S. Robinson, E. Ryabenko, A. Schmittner, R. Schneider, A. Schneider-Mor, M. Shigemitsu, D. Sinclair, C. Somes, A. S. Studer, J.-E. Tesdal, R. Thunell, and J.-Y. Terence Yang (2013), The acceleration of oceanic denitrification during deglacial warming, *Nature Geosci*, 6, 579-584, doi: 10.1038/ngeo1832.
- Gardner, W. D., M. J. Richardson, and A. V. Mishonov (2018), Global assessment of benthic nepheloid layers and linkage with upper ocean dynamics, *Earth Planet Sc Lett*, 482, 126-134, doi: <https://doi.org/10.1016/j.epsl.2017.11.008>.
- Gebbie, G., and P. Huybers (2012), The Mean Age of Ocean Waters Inferred from Radiocarbon Observations: Sensitivity to Surface Sources and Accounting for Mixing Histories, *J Phys Oceanogr*, 42(2), 291-305, doi: 10.1175/JPO-D-11-043.1.
- Gebbie, G. (2014), How much did Glacial North Atlantic Water shoal?, *Paleoceanography*, 29(3), 190-209, doi: doi:10.1002/2013PA002557.
- Goldstein, S. J., and S. B. Jacobsen (1987), The Nd and Sr isotopic systematics of river-water dissolved material: Implications for the sources of Nd and Sr in seawater, *Chemical Geology: Isotope Geoscience section*, 66(3), 245-272, doi: [https://doi.org/10.1016/0168-9622\(87\)90045-5](https://doi.org/10.1016/0168-9622(87)90045-5).
- Goldstein, S. L., and S. R. Hemming (2003), 6.17 - Long-lived Isotopic Tracers in Oceanography, Paleooceanography, and Ice-sheet Dynamics, in *Treatise on Geochemistry*, edited by H. D. Holland and K. K. Turekian, pp. 453-489, Pergamon, Oxford.
- GEOTRACES Planning Group (2006), *GEOTRACES Science Plan Rep.*, Scientific Committee on Oceanic Research, Baltimore, Maryland.
- Gu, S., Z. Liu, A. Jahn, J. Rempfer, J. Zhang, and F. Joos (2019), Modeling Neodymium Isotopes in the Ocean Component of the Community Earth System Model (CESM1), *Journal of Advances in Modeling Earth Systems*, 11(3), 624-640, doi: 10.1029/2018MS001538.
- Haley, B. A., and G. P. Klinkhammer (2003), Complete separation of rare earth elements from small volume seawater samples by automated ion chromatography: method development and application to benthic flux, *Mar Chem*, 82(3-4), 197-220, doi: 10.1016/S0304-4203(03)00070-7.

- Haley, B. A., G. P. Klinkhammer, and J. McManus (2004), Rare earth elements in pore waters of marine sediments, *Geochim Cosmochim Acta*, 68(6), 1265-1279, doi: <https://doi.org/10.1016/j.gca.2003.09.012>.
- Haley, B. A., J. Du, A. N. Abbott, and J. McManus (2017), The Impact of Benthic Processes on Rare Earth Element and Neodymium Isotope Distributions in the Oceans, *Frontiers in Marine Science*, 4(426), doi: 10.3389/fmars.2017.00426.
- Hayes, C. T., R. F. Anderson, M. Q. Fleisher, K.-F. Huang, L. F. Robinson, Y. Lu, H. Cheng, R. L. Edwards, and S. B. Moran (2015), 230Th and 231Pa on GEOTRACES GA03, the U.S. GEOTRACES North Atlantic transect, and implications for modern and paleoceanographic chemical fluxes, *Deep Sea Research Part II: Topical Studies in Oceanography*, 116, 29-41, doi: <http://dx.doi.org/10.1016/j.dsr2.2014.07.007>.
- Howe, J. N. W., A. M. Piotrowski, T. L. Noble, S. Mulitza, C. M. Chiessi, and G. Bayon (2016), North Atlantic Deep Water Production during the Last Glacial Maximum, *Nature communications*, 7, 11765, doi: 10.1038/ncomms11765.
- Jeandel, C., T. Arsouze, F. Lacan, P. Téchiné, and J. C. Dutay (2007), Isotopic Nd compositions and concentrations of the lithogenic inputs into the ocean: A compilation, with an emphasis on the margins, *Chem Geol*, 239(1), 156-164, doi: <https://doi.org/10.1016/j.chemgeo.2006.11.013>.
- Jeandel, C. (2016), Overview of the mechanisms that could explain the ‘Boundary Exchange’ at the land–ocean contact, *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 374(2081), 20150287, doi: 10.1098/rsta.2015.0287.
- Johannesson, K. H., and D. J. Burdige (2007), Balancing the global oceanic neodymium budget: Evaluating the role of groundwater, *Earth Planet Sc Lett*, 253(1), 129-142, doi: <https://doi.org/10.1016/j.epsl.2006.10.021>.
- Jones, C. D., T. L. Frölicher, C. Koven, A. H. MacDougall, H. D. Matthews, K. Zickfeld, J. Rogelj, K. B. Tokarska, N. P. Gillett, T. Ilyina, M. Meinshausen, N. Mengis, R. Sférian, M. Eby, and F. A. Burger (2019), The Zero Emissions Commitment Model Intercomparison Project (ZECMIP) contribution to C4MIP: quantifying committed climate changes following zero carbon emissions, *Geosci. Model Dev.*, 12(10), 4375-4385, doi: 10.5194/gmd-12-4375-2019.
- Jones, K. M., S. P. Khatiwala, S. L. Goldstein, S. R. Hemming, and T. van de Flierdt (2008), Modeling the distribution of Nd isotopes in the oceans using an ocean general circulation model, *Earth Planet Sc Lett*, 272(3), 610-619, doi: <https://doi.org/10.1016/j.epsl.2008.05.027>.
- Khatiwala, S. (2007), A computational framework for simulation of biogeochemical tracers in the ocean, *Global Biogeochem Cy*, 21(3), GB3001, doi: 10.1029/2007gb002923.
- Khatiwala, S., A. Schmittner, and J. Muglia (2019), Air-sea disequilibrium enhances ocean carbon storage during glacial periods, *Science Advances*, 5(6), doi: 10.1126/sciadv.aaw4981.

- Kurahashi-Nakamura, T., A. Paul, and M. Losch (2017), Dynamical reconstruction of the global ocean state during the Last Glacial Maximum, *Paleoceanography*, 32(4), 326–350, doi: 10.1002/2016PA003001.
- Kvale, K. F., K. J. Meissner, D. P. Keller, M. Eby, and A. Schmittner (2015), Explicit Planktic Calcifiers in the University of Victoria Earth System Climate Model, Version 2.9, *Atmos Ocean*, 53(3), 332-350, doi: 10.1080/07055900.2015.1049112.
- Kvale, K. F., S. Khatiwala, H. Dietze, I. Kriest, and A. Oeschies (2017), Evaluation of the transport matrix method for simulation of ocean biogeochemical tracers, *Geosci. Model Dev.*, 10(6), 2425-2445, doi: 10.5194/gmd-10-2425-2017.
- Lacan, F., and C. Jeandel (2005), Neodymium isotopes as a new tool for quantifying exchange fluxes at the continent–ocean interface, *Earth Planet Sc Lett*, 232(3), 245-257, doi: <https://doi.org/10.1016/j.epsl.2005.01.004>.
- Lacan, F., K. Tachikawa, and C. Jeandel (2012), Neodymium isotopic composition of the oceans: A compilation of seawater data, *Chem Geol*, 300-301, 177-184, doi: <https://doi.org/10.1016/j.chemgeo.2012.01.019>.
- Legrand, P., and C. Wunsch (1995), Constraints from Paleotracer Data on the North-Atlantic Circulation during the Last Glacial Maximum, *Paleoceanography*, 10(6), 1011-1045.
- Lerner, P., O. Marchal, P. J. Lam, W. Gardner, M. J. Richardson, and A. Mishonov (2020), A model study of the relative influences of scavenging and circulation on <sup>230</sup>Th and <sup>231</sup>Pa in the western North Atlantic, *Deep Sea Research Part I: Oceanographic Research Papers*, 155, 103159, doi: <https://doi.org/10.1016/j.dsr.2019.103159>.
- Luo, Y.-R., and R. H. Byrne (2001), Yttrium and Rare Earth Element Complexation by Chloride Ions at 25°C, *Journal of Solution Chemistry*, 30(9), 837-845, doi: 10.1023/A:1012292417793.
- Luo, Y.-R., and R. H. Byrne (2004), Carbonate complexation of yttrium and the rare earth elements in natural waters, *Geochim Cosmochim Acta*, 68(4), 691-699, doi: [https://doi.org/10.1016/S0016-7037\(03\)00495-2](https://doi.org/10.1016/S0016-7037(03)00495-2).
- Lynch-Stieglitz, J. (2017), The Atlantic Meridional Overturning Circulation and Abrupt Climate Change, *Annual Review of Marine Science*, 9(1), 83-104, doi: 10.1146/annurev-marine-010816-060415.
- Martin, E. E., K. G. MacLeod, A. Jiménez Berrocoso, and E. Bourbon (2012), Water mass circulation on Demerara Rise during the Late Cretaceous based on Nd isotopes, *Earth Planet Sc Lett*, 327-328, 111-120, doi: <https://doi.org/10.1016/j.epsl.2012.01.037>.
- Matthews, H. D., N. P. Gillett, P. A. Stott, and K. Zickfeld (2009), The proportionality of global warming to cumulative carbon emissions, *Nature*, 459(7248), 829-U823, doi: Doi 10.1038/Nature08047.

- McManus, J. F., R. Francois, J. M. Gherardi, L. D. Keigwin, and S. Brown-Leger (2004), Collapse and rapid resumption of Atlantic meridional circulation linked to deglacial climate changes, *Nature*, 428(6985), 834-837.
- Menviel, L., J. Yu, F. Joos, A. Mouchet, K. J. Meissner, and M. H. England (2017), Poorly ventilated deep ocean at the Last Glacial Maximum inferred from carbon isotopes: A data-model comparison study, *Paleoceanography*, 32(1), 2-17, doi: 10.1002/2016PA003024.
- Millero, F. J. (1992), Stability constants for the formation of rare earth-inorganic complexes as a function of ionic strength, *Geochim Cosmochim Acta*, 56(8), 3123-3132, doi: [https://doi.org/10.1016/0016-7037\(92\)90293-R](https://doi.org/10.1016/0016-7037(92)90293-R).
- Muglia, J., C. J. Somes, L. Nickelsen, and A. Schmittner (2017), Combined effects of atmospheric and seafloor iron fluxes to the glacial ocean, *Paleoceanography*, 32(11), 1204-1218, doi: 10.1002/2016PA003077.
- Muglia, J., L. C. Skinner, and A. Schmittner (2018), Weak overturning circulation and high Southern Ocean nutrient utilization maximized glacial ocean carbon, *Earth Planet Sc Lett*, 496, 47-56, doi: 10.1016/j.epsl.2018.05.038.
- Muratli, J. M., J. McManus, A. Mix, and Z. Chase (2012), Dissolution of fluoride complexes following microwave-assisted hydrofluoric acid digestion of marine sediments, *Talanta*, 89, 195-200, doi: <https://doi.org/10.1016/j.talanta.2011.11.081>.
- Nickelsen, L., D. P. Keller, and A. Oschlies (2014), A dynamic marine iron cycle module coupled to the University of Victoria Earth System Model: the Kiel Marine Biogeochemical Model 2 (KMBM2) for UVic 2.9, *Geosci. Model Dev. Discuss.*, 7(6), 8505-8563, doi: 10.5194/gmdd-7-8505-2014.
- Olsen, A., R. M. Key, S. van Heuven, S. K. Lauvset, A. Velo, X. Lin, C. Schirnick, A. Kozyr, T. Tanhua, M. Hoppema, S. Jutterström, R. Steinfeldt, E. Jeansson, M. Ishii, F. F. Pérez, and T. Suzuki (2016), The Global Ocean Data Analysis Project version 2 (GLODAPv2) – an internally consistent data product for the world ocean, doi: 10.5194/essd-8-297-2016.
- Parsons, L. A., J. Yin, J. T. Overpeck, R. J. Stouffer, and S. Malyshev (2014), Influence of the Atlantic Meridional Overturning Circulation on the monsoon rainfall and carbon balance of the American tropics, *Geophys Res Lett*, 41(1), 146-151, doi: 10.1002/2013GL058454.
- Peterson, C. D., L. E. Lisiecki, and J. V. Stern (2014), Deglacial whole-ocean delta C-13 change estimated from 480 benthic foraminiferal records, *Paleoceanography*, 29(6), 549-563, doi: 10.1002/2013pa002552.
- Piotrowski, A. M., S. L. Goldstein, S. R. Hemming, and R. G. Fairbanks (2004), Intensification and variability of ocean thermohaline circulation through the last deglaciation, *Earth Planet Sc Lett*, 225(1), 205-220, doi: <https://doi.org/10.1016/j.epsl.2004.06.002>.
- Rempfer, J., T. F. Stocker, F. Joos, J.-C. Dutay, and M. Siddall (2011), Modelling Nd-isotopes with a coarse resolution ocean circulation model: Sensitivities to model parameters and

- source/sink distributions, *Geochim Cosmochim Acta*, 75(20), 5927-5950, doi: <https://doi.org/10.1016/j.gca.2011.07.044>.
- Rempfer, J., T. F. Stocker, F. Joos, and J.-C. Dutay (2012), Sensitivity of Nd isotopic composition in seawater to changes in Nd sources and paleoceanographic implications, *Journal of Geophysical Research: Oceans*, 117(C12), doi: 10.1029/2012JC008161.
- Schijf, J., E. A. Christenson, and R. H. Byrne (2015), YREE scavenging in seawater: A new look at an old model, *Mar Chem*, 177, 460-471, doi: <https://doi.org/10.1016/j.marchem.2015.06.010>.
- Schmittner, A. (2005), Decline of the marine ecosystem caused by a reduction in the Atlantic overturning circulation, *Nature*, 434(7033), 628-633.
- Schmittner, A., A. Oschlies, X. Giraud, M. Eby, and H. L. Simmons (2005), A global model of the marine ecosystem for long-term simulations: Sensitivity to ocean mixing, buoyancy forcing, particle sinking, and dissolved organic matter cycling, *Global Biogeochem Cy*, 19(3), -, doi: doi:10.1029/2004GB002283.
- Schmittner, A., E. D. Galbraith, S. W. Hostetler, T. F. Pedersen, and R. Zhang (2007), Large fluctuations of dissolved oxygen in the Indian and Pacific oceans during Dansgaard-Oeschger oscillations caused by variations of North Atlantic Deep Water subduction, *Paleoceanography*, 22(3), PA3207, doi: doi:10.1029/2006PA001384.
- Schmittner, A., A. Oschlies, H. D. Matthews, and E. D. Galbraith (2008), Future changes in climate, ocean circulation, ecosystems, and biogeochemical cycling simulated for a business-as-usual CO<sub>2</sub> emission scenario until year 4000 AD, *Global Biogeochem Cy*, 22(1), GB1013, doi: Doi 10.1029/2007gb002953.
- Schmittner, A., N. Gruber, A. C. Mix, R. M. Key, A. Tagliabue, and T. K. Westberry (2013), Biology and air-sea gas exchange controls on the distribution of carbon isotope ratios ( $\delta^{13}\text{C}$ ) in the ocean, *Biogeosciences*, 10(9), 5793-5816, doi: 10.5194/bg-10-5793-2013.
- Schmittner, A., and G. D. Egbert (2014), An improved parameterization of tidal mixing for ocean models, *Geoscientific Model Development*, 7(1), 211-224, doi: 10.5194/gmd-7-211-2014.
- Schmittner, A., and D. C. Lund (2015), Early deglacial Atlantic overturning decline and its role in atmospheric CO<sub>2</sub> rise inferred from carbon isotopes ( $\delta^{13}\text{C}$ ), *Clim. Past*, 11(2), 135-152, doi: 10.5194/cp-11-135-2015.
- Schmittner, A., and C. J. Somes (2016), Complementary constraints from carbon ( $^{13}\text{C}$ ) and nitrogen ( $^{15}\text{N}$ ) isotopes on the glacial ocean's soft-tissue biological pump, *Paleoceanography*, 669-693, doi: 10.1002/2015PA002905.
- Schmittner, A., H. C. Bostock, O. Cartapanis, W. B. Curry, H. L. Filipsson, E. D. Galbraith, J. Gottschalk, J. C. Herguera, B. Hoogakker, S. L. Jaccard, L. E. Lisiecki, D. C. Lund, G. Martinez-Mendez, J. Lynch-Stieglitz, A. Mackensen, E. Michel, A. C. Mix, D. W. Oppo, C. D. Peterson, J. Repschlager, E. L. Sikes, H. J. Spero, and C. Waelbroeck (2017),

- Calibration of the carbon isotope composition (C-13) of benthic foraminifera, *Paleoceanography*, 32(6), 512-530, doi: 10.1002/2016pa003072.
- Sholkovitz, E. R. (1989), Artifacts associated with the chemical leaching of sediments for rare-earth elements, *Chem Geol*, 77(1), 47-51, doi: [https://doi.org/10.1016/0009-2541\(89\)90014-4](https://doi.org/10.1016/0009-2541(89)90014-4).
- Sholkovitz, E. R., W. M. Landing, and B. L. Lewis (1994), Ocean particle chemistry: The fractionation of rare earth elements between suspended particles and seawater, *Geochim Cosmochim Acta*, 58(6), 1567-1579, doi: [https://doi.org/10.1016/0016-7037\(94\)90559-2](https://doi.org/10.1016/0016-7037(94)90559-2).
- Siddall, M., S. Khatiwala, T. van de Flierdt, K. Jones, S. L. Goldstein, S. Hemming, and R. F. Anderson (2008), Towards explaining the Nd paradox using reversible scavenging in an ocean general circulation model, *Earth Planet Sc Lett*, 274(3), 448-461, doi: 10.1016/j.epsl.2008.07.044.
- Sikes, E. L., K. A. Allen, and D. C. Lund (2017), Enhanced  $\delta^{13}\text{C}$  and  $\delta^{18}\text{O}$  Differences Between the South Atlantic and South Pacific During the Last Glaciation: The Deep Gateway Hypothesis, *Paleoceanography*, 32(10), 1000-1017, doi: 10.1002/2017PA003118.
- Skinner, L. C., F. Primeau, E. Freeman, M. de la Fuente, P. A. Goodwin, J. Gottschalk, E. Huang, I. N. McCave, T. L. Noble, and A. E. Scrivner (2017), Radiocarbon constraints on the glacial ocean circulation and its impact on atmospheric  $\text{CO}_2$ , *Nature communications*, 8, 16010, doi: 10.1038/ncomms16010.
- Somes, C. J., A. Schmittner, and M. A. Altabet (2010a), Nitrogen isotope simulations show the importance of atmospheric iron deposition for nitrogen fixation across the Pacific Ocean, *Geophys Res Lett*, 37, L23605, doi: 10.1029/2010gl044537.
- Somes, C. J., A. Schmittner, E. D. Galbraith, M. F. Lehmann, M. A. Altabet, J. P. Montoya, R. M. Letelier, A. C. Mix, A. Bourbonnais, and M. Eby (2010b), Simulating the global distribution of nitrogen isotopes in the ocean, *Global Biogeochem Cy*, 24, GB4019, doi: 10.1029/2009gb003767.
- Somes, C. J., A. Oschlies, and A. Schmittner (2013), Isotopic constraints on the pre-industrial oceanic nitrogen budget, *Biogeosciences*, 10(9), 5889-5910, doi: 10.5194/bg-10-5889-2013.
- Somes, C. J., and A. Oschlies (2015), On the influence of “non-Redfield” dissolved organic nutrient dynamics on the spatial distribution of  $\text{N}_2$  fixation and the size of the marine fixed nitrogen inventory, *Global Biogeochem Cy*, 29(7), 973-993, doi: 10.1002/2014GB005050.
- Somes, C. J., A. Schmittner, J. Muglia, and A. Oschlies (2017), A Three-Dimensional Model of the Marine Nitrogen Cycle during the Last Glacial Maximum Constrained by Sedimentary Isotopes, *Frontiers in Marine Science*, 4(108), doi: 10.3389/fmars.2017.00108.

- Stanley, G. J., and O. A. Saenko (2014), Bottom-Enhanced Diapycnal Mixing Driven by Mesoscale Eddies: Sensitivity to Wind Energy Supply, *J Phys Oceanogr*, 44(1), 68-85, doi: 10.1175/Jpo-D-13-0116.1.
- Stanley, J. K., and R. H. Byrne (1990), The influence of solution chemistry on REE uptake by *Ulva lactuca* L. in seawater, *Geochim Cosmochim Acta*, 54(6), 1587-1595, doi: [https://doi.org/10.1016/0016-7037\(90\)90393-Y](https://doi.org/10.1016/0016-7037(90)90393-Y).
- Tachikawa, K., C. Jeandel, A. Vangriesheim, and B. Dupré (1999), Distribution of rare earth elements and neodymium isotopes in suspended particles of the tropical Atlantic Ocean (EUMELI site), *Deep Sea Research Part I: Oceanographic Research Papers*, 46(5), 733-755, doi: [https://doi.org/10.1016/S0967-0637\(98\)00089-2](https://doi.org/10.1016/S0967-0637(98)00089-2).
- Tachikawa, K., V. Athias, and C. Jeandel (2003), Neodymium budget in the modern ocean and paleo-oceanographic implications, *Journal of Geophysical Research: Oceans*, 108(C8), doi: 10.1029/1999JC000285.
- Tachikawa, K., T. Arsouze, G. Bayon, A. Bory, C. Colin, J.-C. Dutay, N. Frank, X. Giraud, A. T. Gourelan, C. Jeandel, F. Lacan, L. Meynadier, P. Montagna, A. M. Piotrowski, Y. Plancherel, E. Pucéat, M. Roy-Barman, and C. Waelbroeck (2017), The large-scale evolution of neodymium isotopic composition in the global modern and Holocene ocean revealed from seawater and archive data, *Chem Geol*, 457, 131-148, doi: <https://doi.org/10.1016/j.chemgeo.2017.03.018>.
- van de Flierdt, T., M. Griffiths Alexander, M. Lambelet, H. Little Susan, T. Stichel, and J. Wilson David (2016), Neodymium in the oceans: a global database, a regional comparison and implications for palaeoceanographic research, *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 374(2081), 20150293, doi: 10.1098/rsta.2015.0293.
- Weaver, A. J., M. Eby, E. C. Wiebe, C. M. Bitz, P. B. Duffy, T. L. Ewen, A. F. Fanning, M. M. Holland, A. MacFadyen, H. D. Matthews, K. J. Meissner, O. Saenko, A. Schmittner, H. X. Wang, and M. Yoshimori (2001), The UVic Earth System Climate Model: Model description, climatology, and applications to past, present and future climates, *Atmos Ocean*, 39(4), 361-428.
- Wilmes, S. B., A. Schmittner, and J. A. M. Green (2019), Glacial ice sheet extent effects on modeled tidal mixing and the global overturning circulation, *Paleoceanography and Paleoclimatology*, 34(8), doi: 10.1029/2019PA003644.
- Zhao, N., O. Marchal, L. Keigwin, D. Amrhein, and G. Gebbie (2018), A Synthesis of Deglacial Deep-Sea Radiocarbon Records and Their (In)Consistency With Modern Ocean Ventilation, *Paleoceanography and Paleoclimatology*, 33(2), 128-151, doi: 10.1002/2017PA003174.