# Chromium isotope variability in modern ocean

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Scheiderich *et al*. (2015) observed variations with depth and water mass of $\delta^{53}$Cr and [Cr] in the oceans which they attributed to redox reactions involving interconversions of Cr(VI) and Cr(III) and water mass mixing. Data for open ocean waters (unaffected by riverine inputs or sea ice formation and melting) from the Atlantic, Pacific and Arctic define a correlation line with a slope of -0.80 ± 0.03‰ (2σ) (see Figure). Because of the very different geographic regions of the samples, the correlation cannot be explained by two-component mixing, and is instead considered to be the result of closed system Rayleigh fractionation characterized by: (1) reduction of Cr(VI) in surface waters, (2) transfer of the reduced Cr(III) on settling particles into deep waters and ocean sediments, and (3) re-release of the reduced Cr(III) back into seawater in the form of soluble Cr(III)-organic complexes, and/or re-oxidized Cr(VI). Redox cycling of Cr in the oceans drives surface waters towards heavy Cr isotope compositions and deep waters towards light Cr isotope compositions.

As we have been processing more seawater from the Pacific (Station PAPA) and Arctic (Beaufort Sea), we can already confirm that our newest data plot along with Scheiderich *et al*. (2015) data, on the same correlation line (see Figure). New data from the Pacific oxygen minimum zone will be presented and discussed.