

A New Link Between Biological & Inorganic Zinc in the Ocean Cycle

3-ID

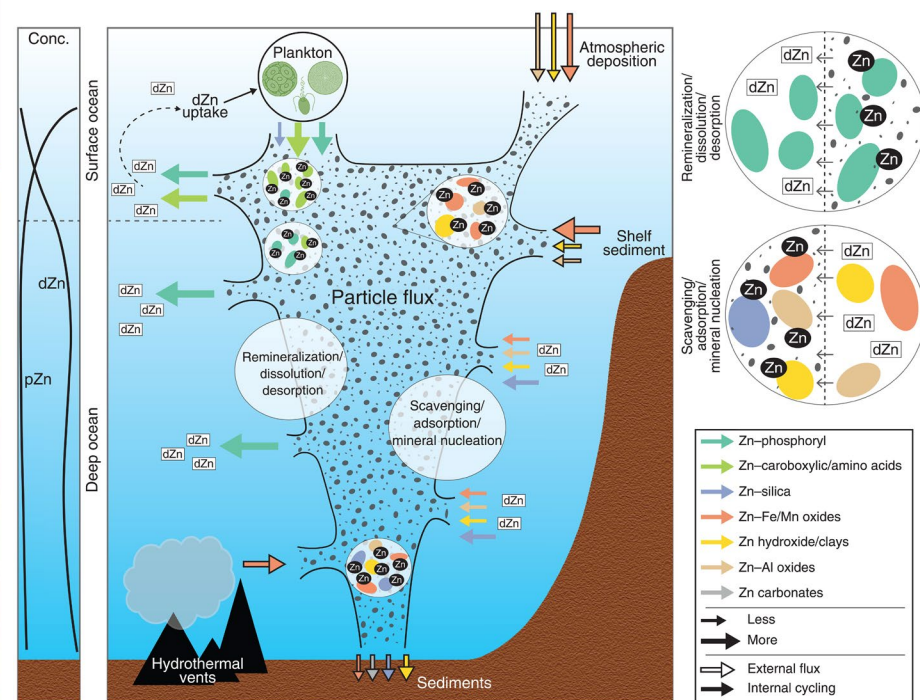
HXN

4-BM

XFM

8-ID

ISS



Left: Water-column pZn and dZn concentrations. Middle: pZn flux and composition; external pZn sources shown via colored arrows outlined in black & internal processes via colored arrows. Top right: Zn partitioning between pZn and dZn pools.

J. Duan, R. Cloete, J.C. Looke, A. Lanzirotti, M. Newville, A. Martinez-Garcia, D.M. Sigman, P.J. Lam, A.N. Roychoudhury, S.C.B. Myneni, *Science* Vol 384 Issue 6701 p. 1235-1240 (2024). DOI: [10.1126/science.adh8199](https://doi.org/10.1126/science.adh8199)

Work was performed in part at NSLS-II

National Synchrotron Light Source II

Scientific Achievement

Researchers studying dissolved & particulate zinc (dZn, pZn) in the ocean cycle found that Zn is handed off from biological sources to Zn in the form of inorganic particles.

Significance and Impact

This new facet of the Zn ocean cycle spotlights the impact of inorganic Zn particles on biological productivity.

Research Details

- Southern Ocean water samples were taken in summer and winter.
- Particulate Zn changes from Zn bound within organic cellular material to inorganic pools containing silica, metal oxides, & clays.
- The abundance of inorganic Zn pools increases with ocean depth.
- X-ray techniques, including at the XFM, ISS, & HXN beamlines at NSLS-II, were used to study Zn abundances and chemistry.