A 30 second summary of the Rafter and Sigman (2015) paper in Limnology & Oceanography: Spatial distribution and temporal variation of nitrate nitrogen and oxygen isotopes in the upper equatorial Pacific Ocean

Bottom Line: The air-sea partitioning of carbon dioxide is strongly influenced by plants grown on the nutrient nitrate. Estimating this "new production" requires identifying the subsurface source of surface nitrate—a job for which nitrate isotopes are uniquely qualified.

I exploited the predictable change in nitrate $\delta^{15}N$ and $\delta^{18}O$ caused by nitrate assimilation to identify the subsurface source of water upwelled along the equator (the first geochemical estimate of its kind).

I use these observations to quantify nitrate utilization—and thereby new production-and find a clear relationship with upwelling strength. I suggest this is because there is less internal cycling of iron (required for nitrate utilization) when upwelling is stronger.

