# Preformed and regenerated controls on the oceanic silicon stable isotope distribution

G. F. DE SOUZA[1]*, R. D. SLATER[1], J. P. DUNNE[2] AND J. L. SARMIENTO[1]

[1]AOS Program, Princeton University, Princeton NJ 08544, USA (correspondence: gfds@princeton.edu)
[2]NOAA/Geophysical Fluid Dynamics Laboratory, Princeton NJ 08540, USA

Diatoms fractionate the stable isotopes of silicon (Si) when they form their opaline frustules, making the stable isotope composition of dissolved Si in seawater (expressed as diatoms fractionate the stable isotopes of silicon (Si) when they form their opaline frustules, makin cycling in the ocean. Observations of their opaline frustules, making the stable isotope composi

We present results from an ocean general circulation model simulation that deconvolves the physical and biological controls on the oceanic de present results from an ocean general circulation model simulation that deconvolves the physical and biological controls on the oceanic their opaline frustules, making the stable isotope composiess th e possible origins of this globally unique deep systematic meridional de present results from an ocean general circulation model simulation that deconvolves the physical and biological controls on the oceanic their opaline frustules, mak

We also demonstrate that the de also demonstrate that the an general circulation model simmulation that deconvolves the physical and biological controls on the oceanic ssolved Si in seawater (expn. sed as e.g. 4] inl cycling related to dissolution of o importance of regionally dynamic Si cycling thus helps explain the observed strong physical control on the oceanic de also demonstrate that the an general circulation model simmulation that deconvolves the physical and biological controls on the oceanic ssolved Si in seawater (expn. sed as e.g. 4] inl cycling related to di

Our results thus provide a mechanistic explanation for the observed $\delta^{30}$ Si distribution that emphasises the dominant importance of the Southern Ocean in the marine Si cycle.