

Iron regulates the biological carbon pump in the Southern Ocean

Two orders of magnitude uncertainty in the ocean iron cycle

Strong deficiencies in how current models represent Southern Ocean iron cycle – implications for projections of carbon uptake changes

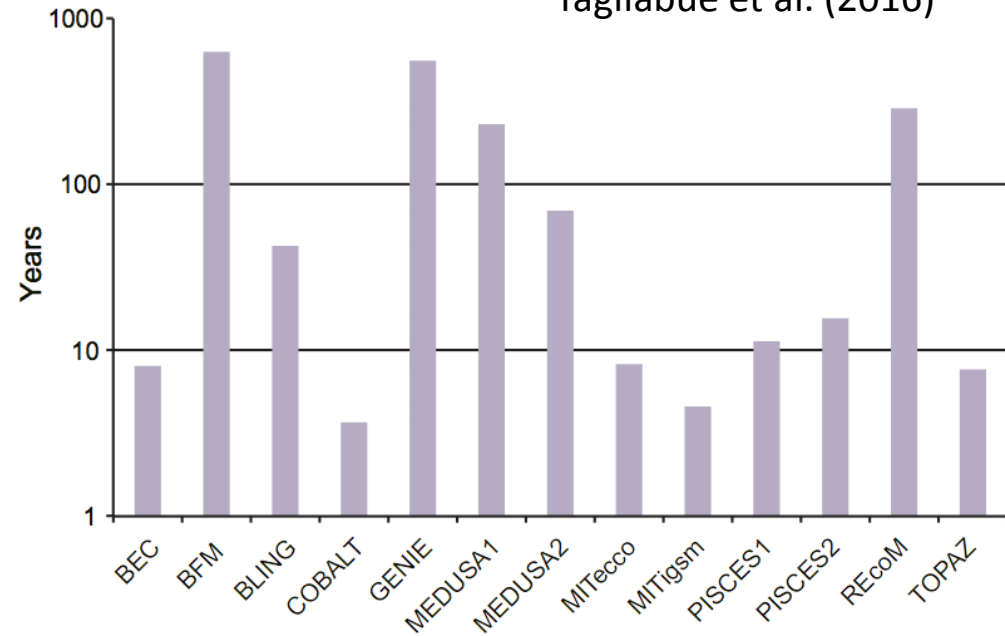
But a data poor region, no new section data since the IPY

A real paucity of data from key seasonal transitions

Alessandro Tagliabue
University of Liverpool

Residence Time

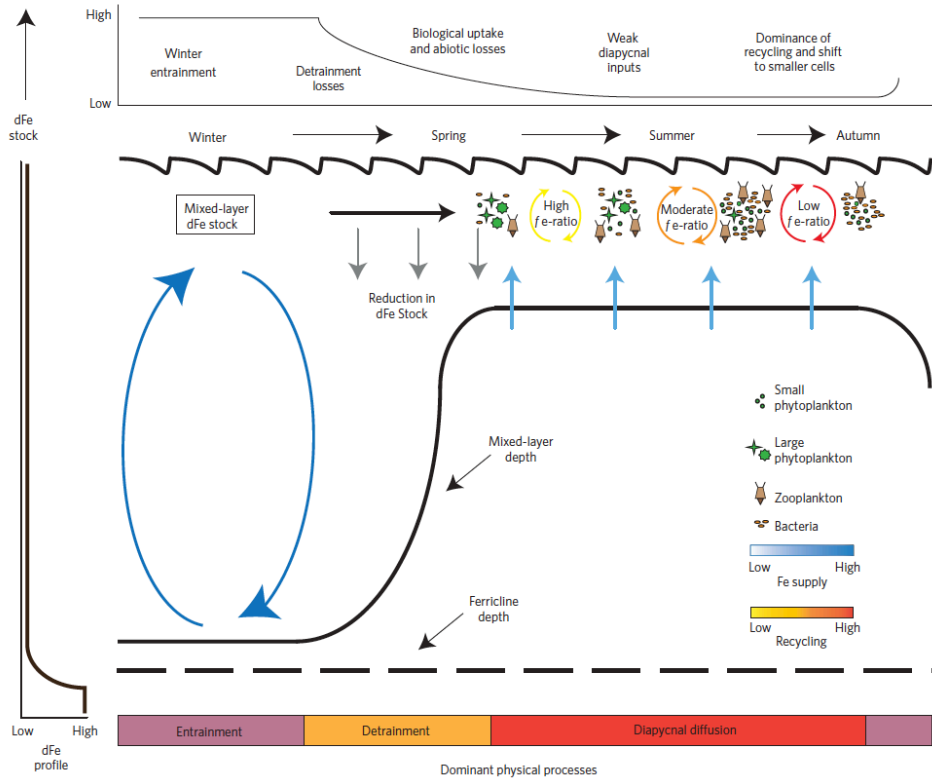
Tagliabue et al. (2016)



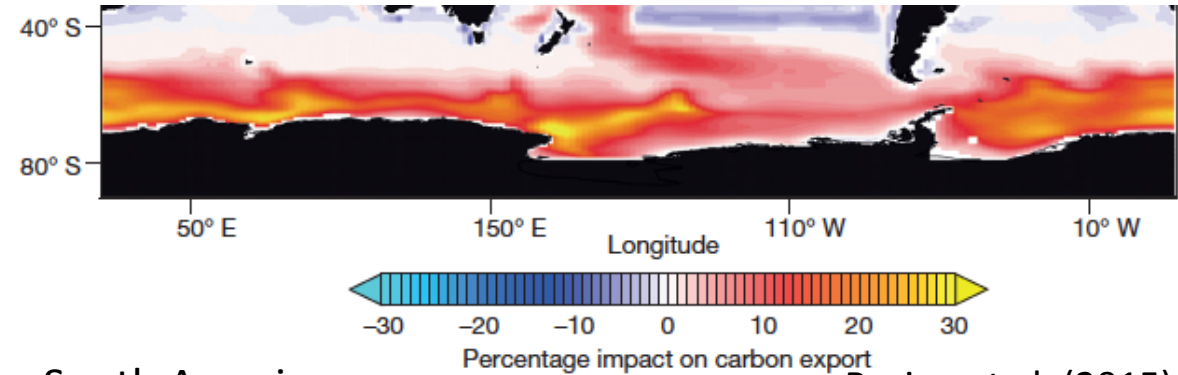
Ocean regions	J	A	S	O	N	D	J	F	M	A	M	J	# of months	N	Mean dFe ± std deviation (nM)
PAC SANT													5	45	0.14 ± 0.10
PAC ANT													5	141	0.15 ± 0.08
ATL SANT													5	58	0.30 ± 0.55
ATL ANT													6	226	0.47 ± 0.69
IND SANT													8	323	0.23 ± 0.20
IND ANT													6	206	0.43 ± 0.51

Tagliabue et al. (2012)

What do we know (need to know) about the Southern Ocean Carbon-Iron cycle?

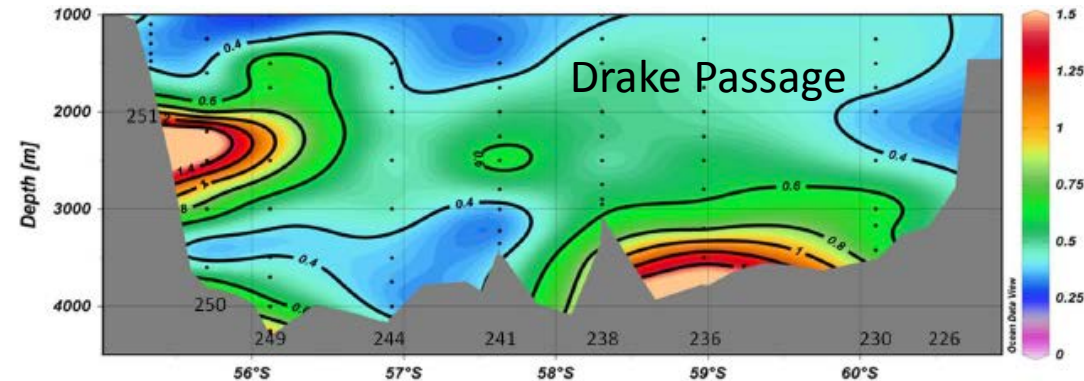


Tagliabue et al. (2014)



Resing et al. (2015)

South America



Klunder et al. (2014)

Dominant role for winter mixing
 What about horizontal iron input from topography?

Hydrothermal iron supports the biological pump
 What transport pathways from Pacific to Atlantic?