

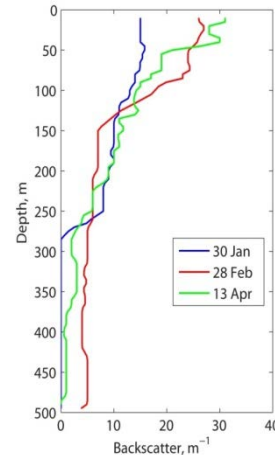
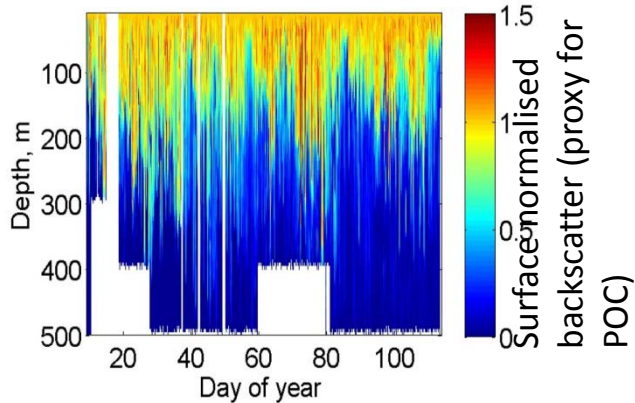
Potential Roles Contributions from NOC-OBE

- Challenge 2
 - How is upwelled DIC and nutrient transformed into downwelled nutrient and DIC field,
 - will this change –What are key processes to get right in models – are they correct now?
 - Existing models have diversity of behaviour – good representation of biology may be key to getting this right
 - Does DOC contribute to this?
 - Planktonic uptake regulated by light, nutrients (fe)
 - Particles and zooplankton – need to measure things year round using e.g. gliders.
- Keen on applying skills to upper and lower limb proposals
- Currently contemplating proposal to upper limb – would be interested in hearing from potential partners

Batman and the UK ESM

We have the capability to run global biogeochemical models substantially faster using the Transport Matrix method. We are currently extracting the Transport Matrix for NEMO and building a MEDUSA sub-component under the NERC BATMAN project. We already run MIT-GCM and ECCO with a variety of biogeochemical models.

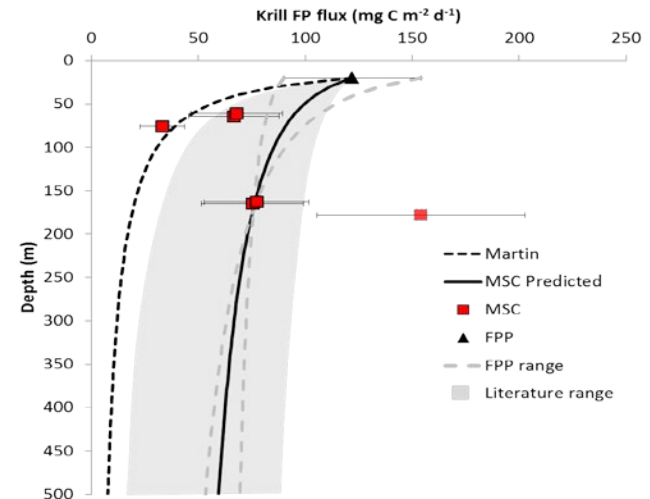
Particle Flux using various tools (Lampitt, Henson, Sanders)



Standard suite of variables, PLUS potential to retrieve POC flux and remineralisation length scale

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- Particle imaging
 - In situ particle sinking rates
- ^{234}Th depletions
 - Broad scale estimates of export flux
- Drifting sediment traps
 - Profile of remineralisation
- Discrete particle capture devices
 - Which particles sink
- Respirometry
 - How fast are they turned over – what regulates this?

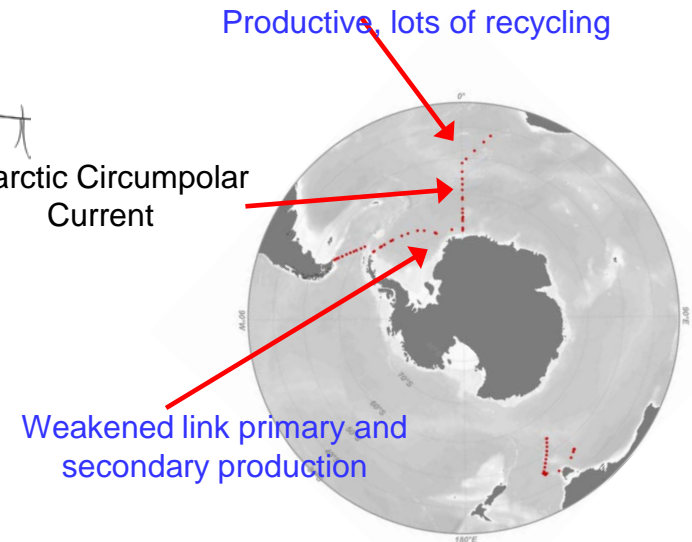
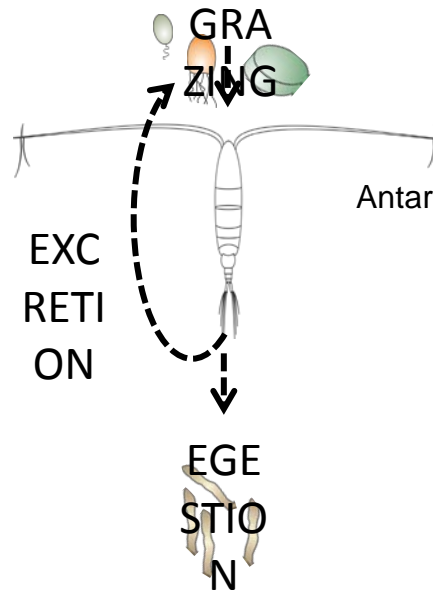
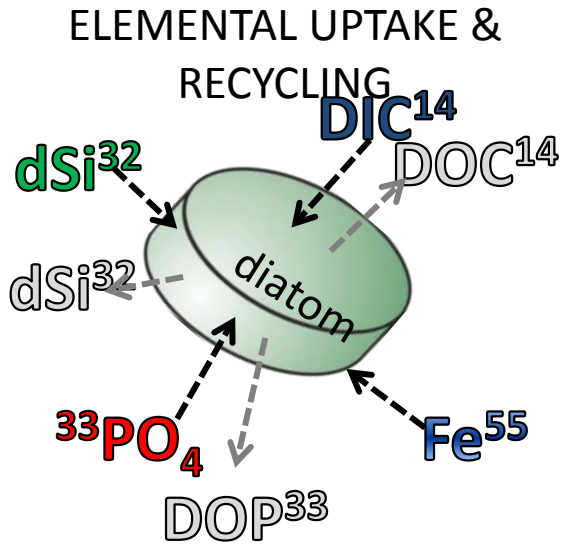


Planktonic production + grazing

*uptake stoichiometry (C:Si:P:Fe)
& elemental release as drivers
of biological pump efficiency*

*"...low summer phytoplankton
biomass in SO is primarily
explained by zooplankton"* Le
Quéré et al. 2016

Hypothesis: Microbial loop and viral shunt are significant drivers of DOM/nutrient cycling and carbon flow in the Southern Ocean



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*e.g. [Fe] as control on C:Si:P uptake & release?
Light, [Fe] & [Si] as control on ρDOC & ρDOP?*



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