Dust deposition to the south west Pacific ocean over the last glacial-interglacial transition

ZANNA CHASE[1*], AXEL DURAND[1], PRIYA KITCHENER[1], TARYN NOBLE[2], ANTONI ROSELL-MELÉ[3], XAVIER RUIZ[3] AND ASHLEY TOWNSEND[4]

[1]Institute for Marine and Antarctic Studies, University of Tasmania, Hobart, Australia (*Zanna.Chase@utas.edu.au; Axel.Durand@utas.edu.au; priyak@utas.edu.au)

[2]Centre of Excellence in Ore Deposits, University of Tasmania, Hobart, Australia (Taryn.Noble@utas.edu.au)

[3]Universitat Autònoma de Barcelona, Barecelona, Spain (antoni.rosell@uab.cat)

[4]Central Science Laboratory, University of Tasmania, Hobart, Australia (Ashley.Townsend@utas.edu.au)

Increased delivery of iron-rich dust to the Subantarctic ocean during is believed to be responsible for about 30% of the lower atmospheric CO_2 concentrations during glacial periods [1]. However, the geographic extent and magnitude of dust-stimulated iron fertilization is poorly constrained.

Traditionally Patagonia was thought to supply most of the dust to the Southern Ocean. However, recent modeling [2] and isotope analysis of ice cores [3] now suggest Australia and New Zealand may be a important dust sources, particularly during interglacial periods. Lamy et al. [4] found that dust deposition to the Eastern Pacific Southern Ocean was 3-fold higher during glacial periods compared to interglacial periods, suggesting that Australia and New Zealand were important dust sources also during *glacial* periods.

Here we present terrigenous flux reconstructions from DSDP Site 593 (Challenger Plateau), and ODP Sites 1171 and 1172 (Tasman Rise and Plateau) covering the last deglaciation. All sites record a greater flux of both inorganic (232Th, Ti and Al) and organic (n-alkanes) proxies of terrigenous material during the glacial period, suggesting transport by wind not currents. Some decoupling between organic and inorganic proxies is seen at Site 1171, with evidence for increased n-alkane flux without accompanying inorganic flux. Overall, fluxes are smilar to those recorded in the eastern Pacific [4], suggesting the south Pacific experienced roughly uniform iron fertilization over the last glacial period.

[1] Kohfeld *et al*. (2005), *Science* **308**, 74-78. [2] Albani *et al*. (2011), *Climate Dynamics* **38**, 1731-1755. [3] Revel-Rolland *et al*. (2006), *EPSL* **249**, 1-13. [4] Lamy *et al*. (2014), *Science* **343**, 403-407.