SOLAS SSC Position statement on large-scale ocean fertilisation

Large-scale fertilisation of the ocean is being actively promoted by various commercial organisations as a strategy to reduce atmospheric CO2 levels. However the current scientific evidence indicates that this will not significantly increase carbon transfer into the deep ocean or lower atmospheric CO2. Furthermore there may be negative impacts of iron fertilization including dissolved oxygen depletion, altered trace gas emissions that affect climate and air quality, changes in biodiversity, and decreased productivity in other oceanic regions. It is then critical and essential that robust and independent scientific verification is undertaken before large-scale fertilisation is considered. Given our present lack of knowledge, the judgement of the SOLAS SSC is that ocean fertilisation will be ineffective and potentially deleterious, and should not be used as a strategy for offsetting CO2 emissions

References

Bakker, D. C. E., 2003, Storage of carbon dioxide by greening the oceans? In: SCOPE/GCP Rapid Assessment Project. Towards CO2 stabilization: Issues, strategies and consequences. SCOPE Special Issue, Island Press.

Boyd. P. W., Law, C. S., Wong, C. S., Noriji, Y., Tsuda, A., Levasseur, M., Takeda, S., et al 2004, The decline and fate of an iron-induced subarctic phytoplankton bloom. Nature 428:549-553.

Chisholm, S. W., Falkowski, P. G. & J. J. Cullen, 2001, Dis-Crediting Ocean Fertilization. Science 294:309-310. 12 October 2001.

Gnanadesikan, A., Sarmiento, J. L. & R. D. Slater, 2003, Effects of patchy ocean fertilization on atmospheric carbon dioxide and biological production. Global Biogeochemical Cycles, 17(2), 19/1-7 doi:10.1029/2002GB001940.

Jin, X. and Gruber, H., 2003, Offsetting the radiative benefit of ocean iron fertilisation by enhancing N2O emissions. Geophys. Res. Letters. 30(24): 2249- doi: 10.1029/2003GL018458.

Law, C. S. and R. D. Ling, 2001, Nitrous oxide fluxes in the Antarctic Circumpolar Current, and the potential response to increased iron availability. Deep-Sea Rtes. II 48(11). 2509-2528.

Liss, P. S., Chuck, A., Bakker, D. and S, Turner, 2005, Ocean fertilization with iron: effects on climate and air quality. TELLUS Series B-Chemical and Physical Meteorology 57(3): 269-271 Jul 2005

Zeebe, R. E. and Archer, D., 2005, Feasibility of ocean fertilization and its impact on future atmospheric CO2 levels. Geophys. Res. Lett. 32, L09703, doi: 10.1029/2005GL022449, 2005