



Vernal sedimentation trends in north Norwegian fjords: temporary anomaly in particulate export related to *Phaeocystis pouchetii* proliferation

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We report data of a naturally occurring radionuclide, Th-234, an in situ tracer, to investigate vertical export of biogenic matter during a vernal bloom of *Phaeocystis pouchetii* in the fjords of northern Norway. The objective of this study was to assess the impact of *Phaeocystis pouchetii* proliferation on vertical export of particles. To optimise sampling of different stages of the bloom, three fjords with increasing oceanic influence (Balsfjord, Malangen fjord and Ullsfjord, respectively) were investigated in vernal period. Contrasting situations were encountered between the three fjords: the proliferation of *P. pouchetii* in Ullsfjord surface waters coincided with a drastic reduction of particulate Th-234 fluxes in traps, although POC (particulate organic carbon) and DMSP were exported and Th-234 was available in surface waters. When large colonies make up a significant fraction of the vertical flux, as observed in Ullsfjord in April 1997, there may be a large and rapid increase in the POC/234Th ratio. From our present investigation, we conclude the following: (1) special care must be taken when using Th-234 measurements for estimating particle fluxes and trap efficiencies in coastal systems. During the early stage of large cells bloom, like *Phaeocystis* proliferation, a complete data set will be require: high frequency 3D sampling, determination of POC / Th-234 ratios on suspended and sinking particles, properties of flocs, and the use of a non steady state model; (2) We hypothesize that the proliferation of large, fresh and unflocculated cells and their direct settling temporally affect the par-

titration of Th-234 within the in situ particles (high POC to Th-234 ratios) and delay, even prevent, the particulate export, via grazing or aggregate formation, of Th-234 and probably of similar particle-reactive elements.