

Cook et al. 2019: Glacier algae accelerate melting of the south-western Greenland Ice Sheet, The Cryosphere.

Supp Info 3: Mineral dust sampling and particle size distribution (PSD).

High algal biomass ice samples were collected in sterile sample bags and melted at ambient temperatures (5-10 °C). The thawed samples were filtered onto glass fiber filters (0.7 µm pore size), from which the solids were removed into a glass jar using a stainless steel spatula. In 50 mL centrifuge tubes, the samples were treated using 30% H₂O₂ (w/w) (Honeywell Fluka™) to remove the organic fraction. The samples (1-2 g) were sonicated (VWR ultrasonic cleaner) in 45 mL of the H₂O₂ treatment for 10 min to disaggregate the material. The samples were left in the H₂O₂ treatment for 48 h, after which they were centrifuged for 10 min at 4000 rpm (Eppendorf centrifuge 5810). The supernatant was removed, and the H₂O₂ solution was replaced. This process was repeated up to ten times until no more organic oxidation was observed. The remaining mineral fraction was washed three times in water (Sartorius arium® pro ultrapure water), with centrifugation after each wash.

A 5 mg of H₂O₂-treated sample was suspended in 10 mL of ultrapure water. The sample was sonicated to disaggregate the grains. The suspension was dispersed onto a 0.2 µm polycarbonate filter (Sartorius Track-Etch Membrane, 0.2 µm). Once dry, a section of each filter was adhered to a stainless steel SEM stub using an adhesive carbon tab. The sample was coated with 8 nm of Ir (Agar high resolution sputter coater). The PSD was determined using a Zeiss Ultra Plus field emission scanning electron microscope (FE-SEM) operated at 20 kV. Automated particle counting software was used to determine the PSD in an area of approximately 1 mm².