*Method Flow cytometry analyses*

For the detection of autofluorescent phototrophic bacteria in the water column, flow cytometry was used to determine chlorophyll/bacteriochlorophyll and phycobilin signatures. We used a BD Accuri C6 cytometer (Becton Dickinson, San José, CA, USA) device equipped with two lasers (488 nm, 680 nm), two scatter detectors, and four fluorescence detectors (lasers 488 nm: FL1 = 533/30, FL2 = 585/40, FL3 = 670; laser 640 nm: FL4 = 670). Two parameters were used for event characterization: forward scatter (FSC) and 90° light scatter (SSC).

For the identification of phototrophic bacteria, a first forward scatter threshold of FSC-H 10’000 was applied to exclude debris and abiotic particles. Subsequently a FL3-A > 1’100 threshold was applied using FL3 (red fluorescence), to select cells emitting autofluorescence due to chlorophyll and bacteriochlorophyll. For cyanobacteria, the 640-nm red laser was used to excite phycocyanins in the light-harvesting phycobilisomes with emissions detected in FL4 (675 ± 12.5 nm). A FL4-A > 1’100 was applied to select cells emitting autofluorescence due to phycocyanin. Sample analysis was limited to 50 µL with fluidic flow rate of 66 µL min-1 and samples were diluted if necessary in order to achieve a maximum of 1’000 events per mL. Among phototrophic sulfur bacteria, large-celled PSB *C*. *okenii* (7 µm) and GSB *Chlorobium* spp. (0.8 µm) were clearly separated from other populations in SSC vs FSC dot-plots. PSB *C*. *okenii*, GSB *Chlorobium* and cyanobacteria gating permitted their respective counts.

For estimation of total cell counts, samples were stained with SYBR green I (Molecular Probes, Eugene, Oreg.). Samples were stained with 1:10’000 (vol/vol) SYBR green I, incubated 13 minutes at 37°C in the dark. Histogram of counts vs green fluorescence (FL1 > 1’100) allowed quantifying total cells.