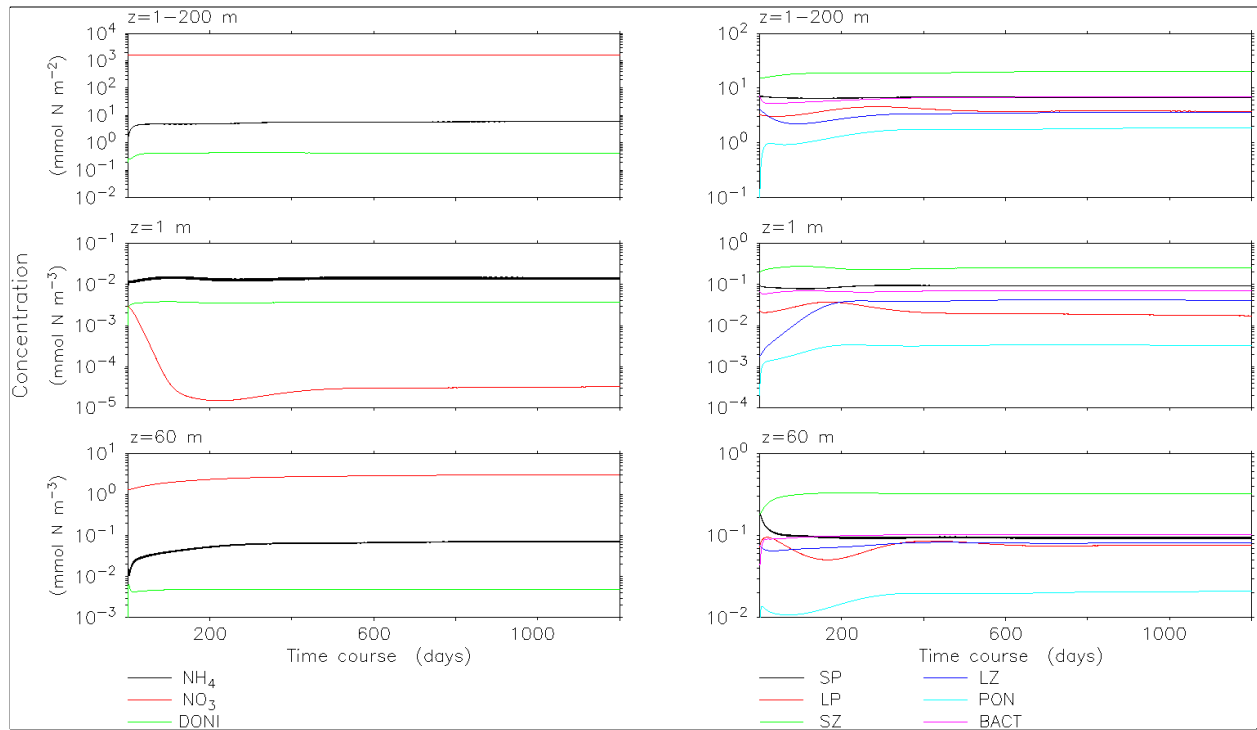
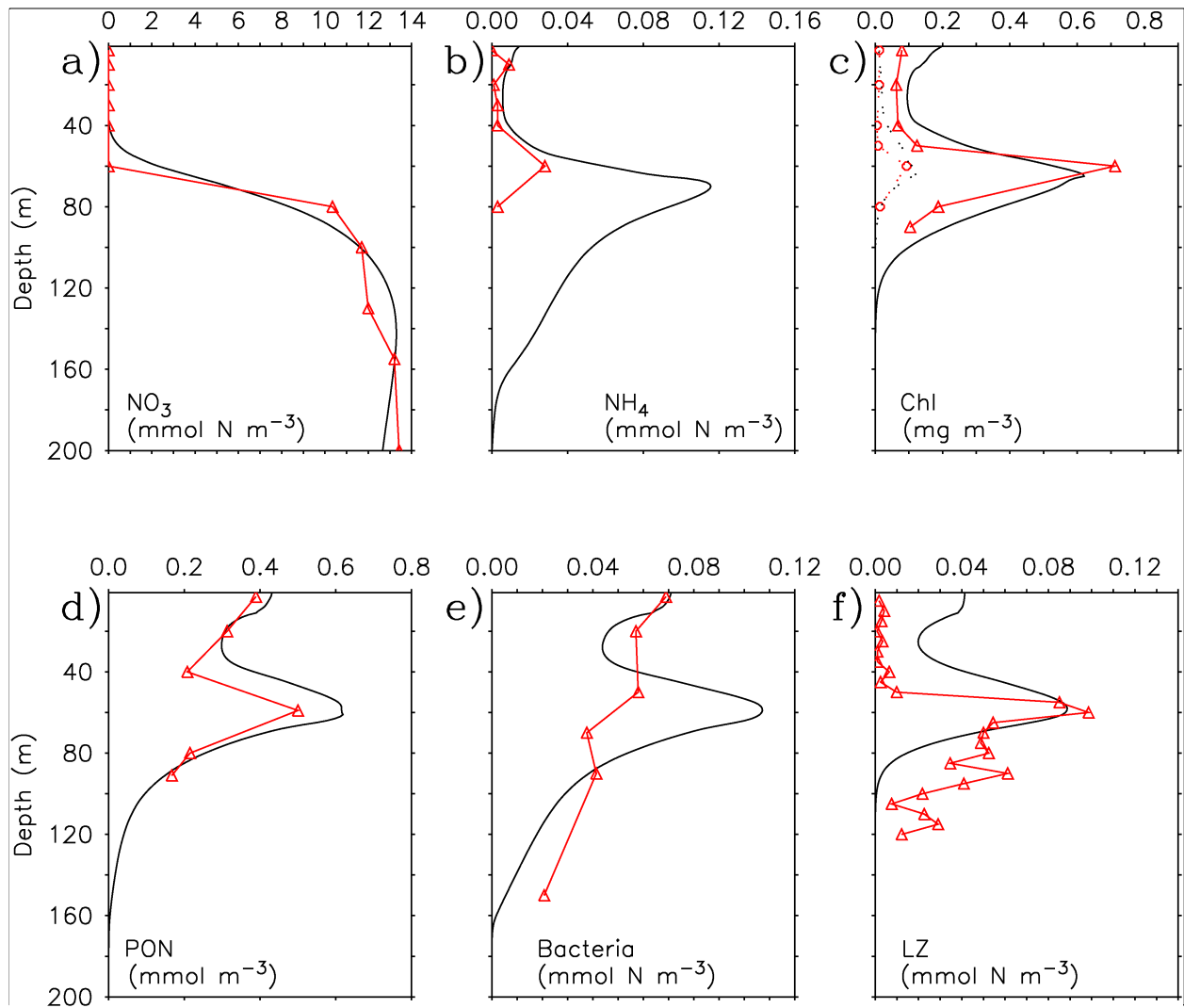


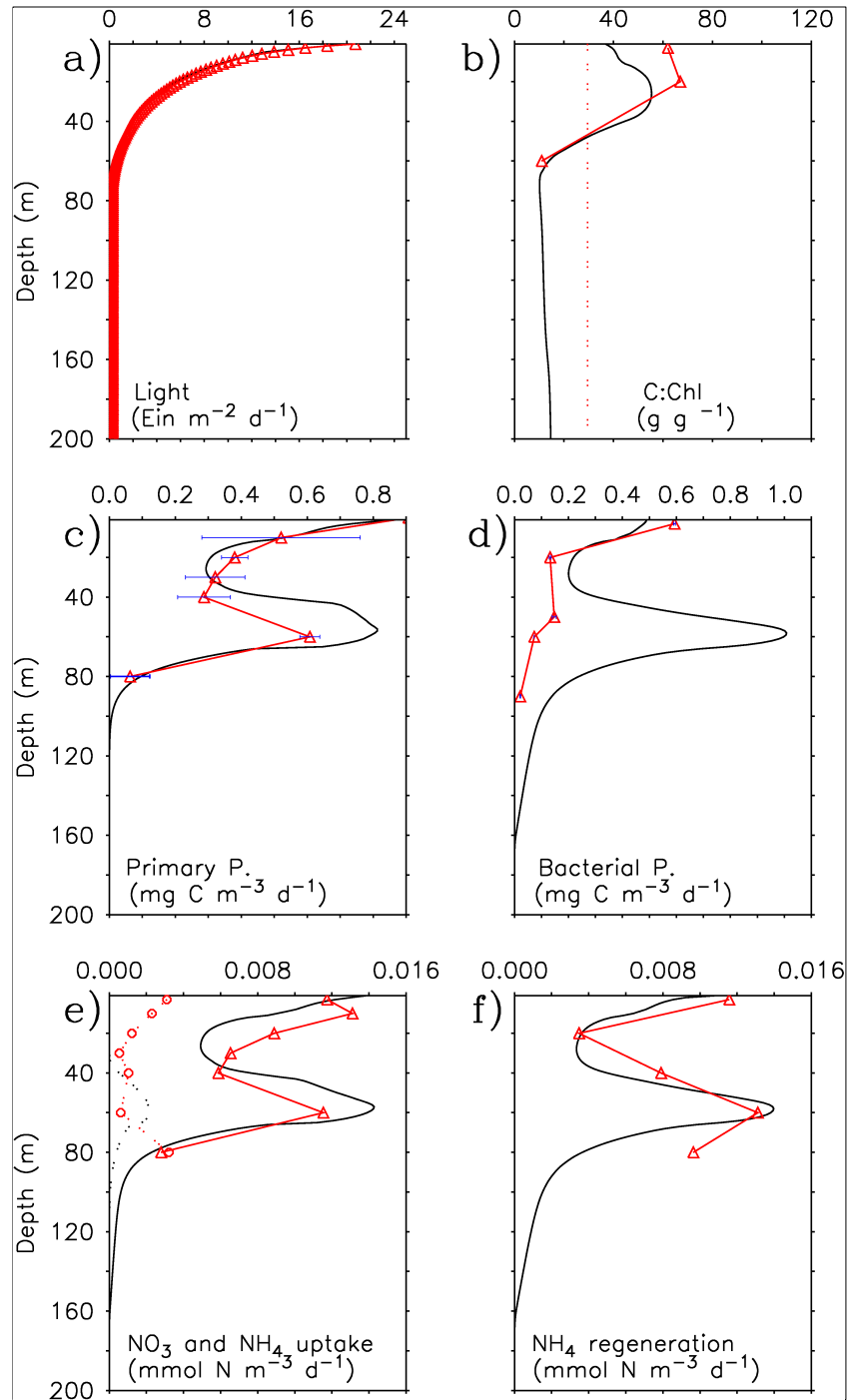
**Figure 3.** Conceptual diagram of the plankton ecosystem model. The 10 state variables are nitrate (NO<sub>3</sub>), ammonium (NH<sub>4</sub>), Large (>5μm) and small (<5μm) phytoplankton, copepods, protozooplankton, bacteria, detrital particulate and dissolved organic nitrogen (PON and DONI, respectively), and refractory dissolved organic nitrogen (DONr). Green, red and blue arrows represent nutrients uptake, grazing and nitrogen recycling, respectively.



**Figure 4.** Time course of the model state variables in the dissolved (left panels) and particulate (right panels) form integrated over the numerical domain (upper panels), at the surface (middle panels) and within the DCM (lower panels).



**Figure 5.** Model-data comparisons (scalars) for the “standard” run. Model outputs are in black and observations in red: a)  $\text{NO}_3$ , b)  $\text{NH}_4$ , c) Chl for SP and LP (in the model, full and dashed lines, respectively; in observations, triangles and circles, respectively), d) total PON (i.e. sum of LP, SP, SZ, BACT and detrital PON in the model), e) biomass of bacteria and f) LZ.



**Figure 6.** Model-data comparisons (rates) for the “standard” run. Model outputs are in black and observations in red: a) downwelling PAR, b) C:Chl ratio (for SP in the model; for the observations derived from Claustre et al. (1999) (see text for details); the vertical dashed line is the mean C:Chl ratio according to DuRand et al. (2002) and Sherr et al. (2003)), c) primary production, d) bacterial production, e)  $\text{NH}_4$  and  $\text{NO}_3$  uptake (in the model, full and dashed lines, respectively; in the observations, triangles and circles, respectively) and f)  $\text{NH}_4$  regeneration. On panels c) and d), standard deviations appear in blue.