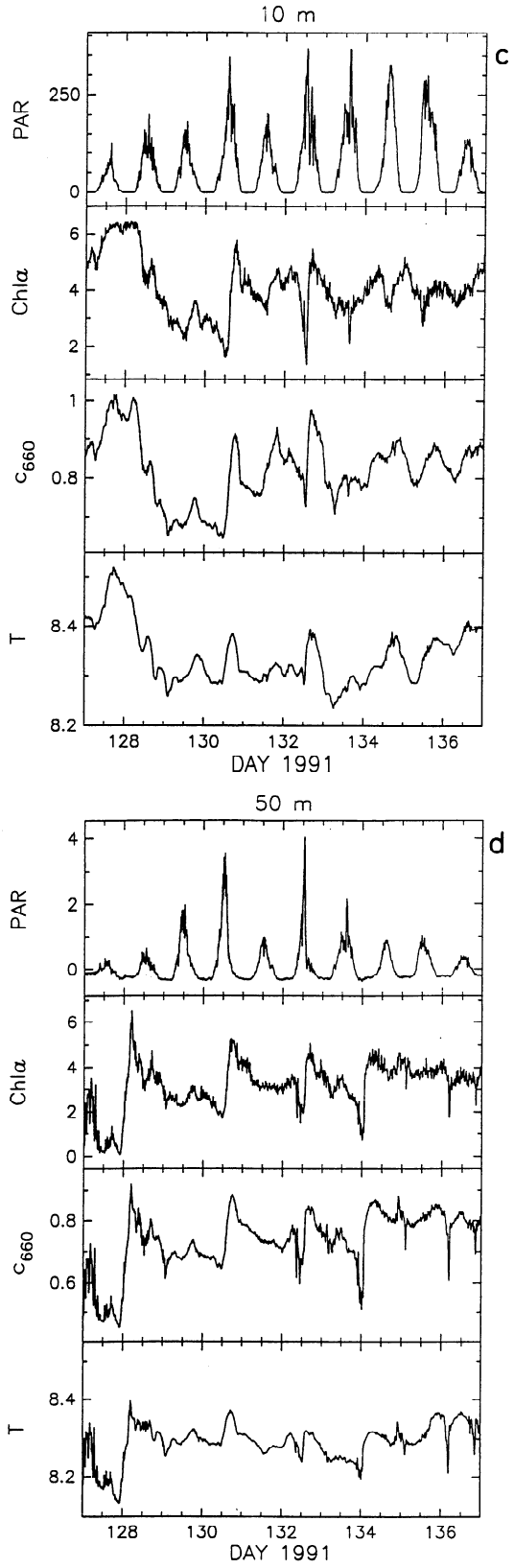

Figure 8. (continued)

optical parameters was extremely high, and deepwater phytoplankton biomass was much higher than would have been expected from the primary productivity estimates. These conditions changed around day 143 when surface waters stratified and the 0.05°C MLD was less than 20 m. During the time period of stable stratification, we observed strong blooming, but depth integrated phytoplankton biomass was lower than in "period 2". The fluorescence and c_{660} signals were much higher in surface waters than at depth, and characteristic diel cycles (in response to PAR variability) were present in fluorescence and c_{660} at 10-m depth. At greater depths, the variability in the bio-optical parameters was strong on a short timescale and correlated with water temperature.

It should be borne in mind, that during both observational periods (Figures 8 and 9) the surface water temperature displayed a daily cycle of variability. The theoretical description of such variability and its implications for mixed layer dynamics has been modeled by several authors [*Kondo et al.*, 1979; *Dickey and Simpson*, 1983; *Price et al.*, 1986; *Woods and Barkmann*, 1986]. According to the results of these models, turbulent mixing of the surface waters extends to shallower depths during the day than at night because solar heating inhibits the mixing associated with wind action. The precise amplitude of the daily thermocline depends on the weather, especially cloud cover and winds, which may enhance or decrease the changes related to seasonal variability. Note that the diel thermal cycle is of special importance for biological/physical feedbacks since this timescale coincides with the generation time of individual phytoplankters.

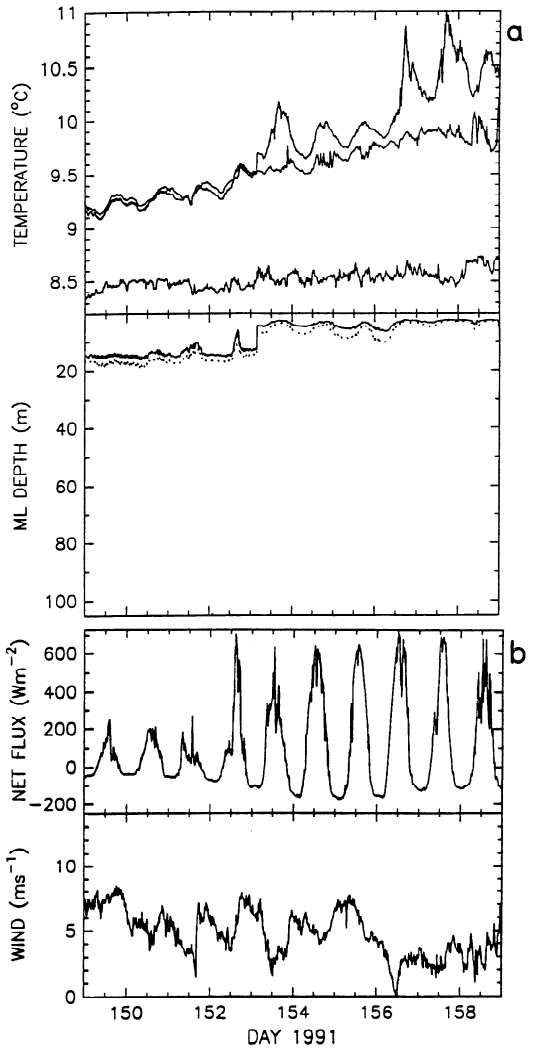

Figure 9. Same as Figure 8, but for the period of little variability in MLD.