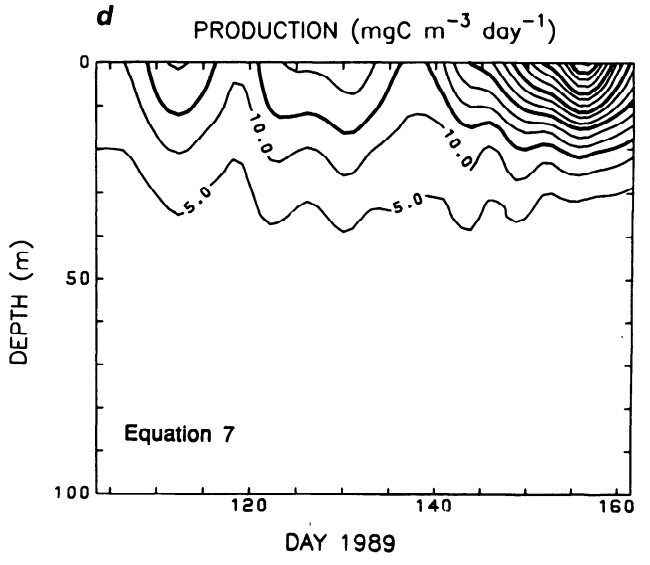


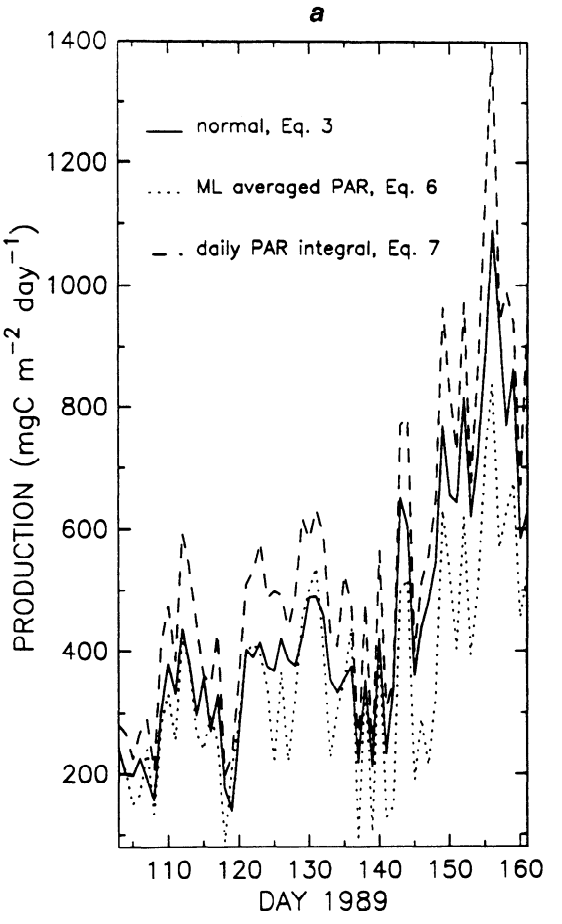
Figure 1. (continued).

which are helpful in comparing trends in the differences between various estimates. In addition, as noted before, we do not attempt to model the kinetics of photoadaptive and photoinhibitory responses [e.g., *Lewis et al.* 1984; *Gallegos and Platt*, 1985; *Cullen and Lewis*, 1988] but rather the average photosynthetic rates. In our model, the vertical mixing affects the photosynthetic rates, because phytoplankton cells are exposed to different average light intensities than if they were to remain at a fixed depth and, additionally, because of the implications of the curvilinearity of the P versus I relationship for the integration of primary productivity (see discussion in the last section).

Comparison of Model-Simulated Plankton Dynamics with Experimental Data

The results of the biophysical model of the phytoplankton bloom are considered below. Unfortunately, we could not make any direct comparison of the estimated productivity and specific loss rate L with in situ data, because such measurements were not done concurrently with the mooring measurements in 1989. Note that combining the biological and physical mixed layer models allows us to examine the relative balance between biomass production and losses. In our model, an increase in growth rate μ can be compensated by an increase in specific loss rate L. The results presented below were obtained with the numerical values for the model parameters summarized in Table 1.

The modeled vertical distribution of the water temperature is shown in Figure 3a. A comparison of this result with the temperature contours from the mooring data (Figure 3b) indicates that our model does not reproduce all of the temperature variability, especially events that appear deep in the water column. These features are likely to be attributable to mesoscale water mass variability, which cannot be



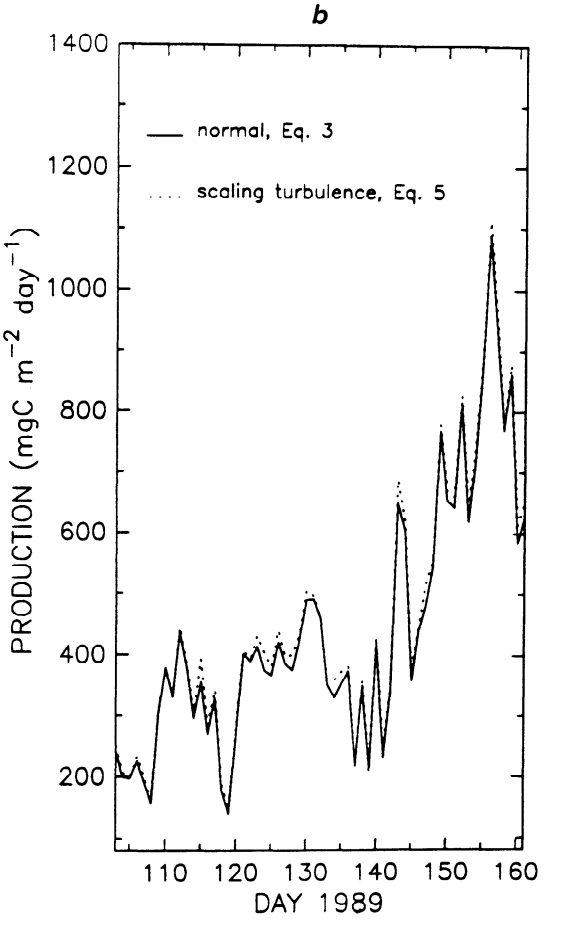


Figure 2. Time series of water column integrated gross primary production estimated using Kiefer-Mitchel model [*Kiefer and Mitchel*, 1983], mooring data, and equations (3), (5), (6), and (7) to parametrize E_0. See explanations in the text.