It is unclear to me what assumptions the model makes about the rates of mixing within the mixed layer.

Estimates of photosynthetic rates based on in situ incubations typically involve suspending incubation bottles at fixed depths so that there is no possibility for vertical movement. In 1978 John Marra (Marine Biology 46:203–208) explored the implications of this compared to systematically alternating the irradiance to simulate vertical movement. He found that vertical movement increased production versus keeping the phytoplankton at a fixed depth. I would assume that similar issues would apply to UV light effects. Because the effects of UV are nonlinear, assuming that the phytoplankton move up and down rapidly would likely lead to different conclusions than assuming that they stay at a fixed depth within the mixed layer. It is unclear to me what the model assumes about vertical movement. That might be something to explore in the future.

How to deal with the CFC problem seems to be a work in progress. The initial fix was hydrochlorofluorocarbons (HCFCs), and then came hydrofluorocarbons (HFCs). The former are unsatisfactory because they still contain chlorine, and the latter are unsatisfactory because they are potent greenhouse gases. Both have been mandated to be phased out. In the meantime, the residence time of chlorine in the stratosphere is 40–100 years, which explains why there has been little perceptible improvement in the ozone hole (https://ozonewatch.gsfc.nasa.gov/).

There is a lot of discussion in the paper about coccolithophores. I have attached a very recent paper by Bradley and Laws (Water 16(22): 3184 https://doi.org/10.3390/w16223184) that concerns effects of elevated $CO_2$, temperature, and nutrient limitation on *Emiliania huxleyi*. This is one strain of *E. huxleyi*, and not all strains can be expected to behave in the same way. The PIC/POC ratio was greater than 1.0, and calcification was surprisingly insensitive to increases of $pCO_2$.