masses. The median $K_{\mathrm{med}}(490)$ and maximum $K_{\max}(490)$ expected to be sampled during a particular buoy deployment can be estimated from satellite ocean color images, combined with radiometric profiles from previous research cruises and optical buoy deployments in that water mass regime. Given that information, a reasonable guideline for $K_{\mathrm{med}}(490) \le 0.1\ \mathrm{m}^{-1}$ situations would be to place a single wire-mounted set of $E_{\mathrm{d}}(z,\lambda)$ and $L_{\mathrm{u}}(z,\lambda)$ at a depth midway between the minimum and median values of z_{90}, *i.e.* at $\hat{z}_{90} = \left[\frac{K_{\mathrm{med}}(490) + K_{\max}(490)}{2}\right]^{-1}$ m , and if available, a second such radiometer package could be mounted at $\frac{\hat{z}_{90}}{2}$ m .

The approach used on the GoMOOS moorings, for example, is to place the $E_{\mathrm{d}}(z,\lambda)$ sensors at the surface and at the yearly averaged 90% light level depth (for the 490 nm wavelength), typically 3 m and 18 m for the nearshore coastal moorings, and 5 m and 30 m for the more oligotrophic, deep basin moorings. The GoMOOS moored arrays have only have one $L_{\mathrm{u}}(z,\lambda)$ sensor placed at 3m, a depth as near as to the surface as the mooring configuration will allow, and to minimize the effects of shadowing.

Platform shading effects on wire-mounted $E_{\mathrm{d}}(z,\lambda)$ and $E_{\mathrm{u}}(z,\lambda)$ ***spectral irradiance*** sensors are similar to the ship shadow effects discussed in Volume III, Chapter 2 (Section 2.2), but are considerably reduced by the much smaller size of a buoy, compared to a ship.

Upwelling radiance sensors may be mounted either on the underside of a buoy hull, to measure $L_{\mathrm{u}}(z,\lambda,\theta',\phi)$ at a depth $z \cong 1$ m , and/or on a mooring cable at fixed depths (often paired with a downwelling irradiance sensor) to measure $L_{\mathrm{u}}(z,\lambda)$ in a nadir-viewing geometry.

- ***Platform shading effects for wire-mounted radiance sensors*** are directly analogous to ship shadow (and reflection) effects, again mitigated by the relatively small size of a buoy Volume III, Chapter 2 (Section 2.2). For the larger buoys $(r \ge 0.5\ \mathrm{m})$, at least, the uncertainties associated with platform shading for a wire-mounted measurement configuration are better understood, and more widely accepted within the ocean color community, than are those associated with hull-mounted configurations.
- For a ***hull-mounted radiance sensor, the shadows and reflections*** due to a buoy hull are more directly analogous to the instrument self-shading case for a sensor radius equal to half the buoy hull diameter. When a nadir-viewing radiometer is mounted in the center of a buoy hull, the instrument self-shading correction protocol (Volume III, Chapter 2. Section 2.4) based on Gordon and Ding (1992) is directly applicable. The correction will be large in even clear, Case I water masses, however, and shading will significantly increase the uncertainty of water-leaving radiances derived from such measurements. In an attempt to reduce shading, some investigators have mounted radiance sensors near the edge of the buoy hull, and in some cases have pointed the radiometer radially away from the buoy center at a nadir angle $\theta' > 0$. In either of these cases, a modified self-shading correction algorithm must be devised, and validated to correct for platform shading and to determine the uncertainty of the resulting water-leaving radiance.
- For ***profiling moorings***, shading of downwelling radiometers is often not an issue. This may not the case for upwelling sensors where engineering considerations may dictate a profiling package having a fairly large diameter.

Perhaps the most significant factor distinguishing subsurface radiometric measurements using buoy arrays from similar shipboard measurements is ***biofouling*** due to growth of marine organism on optical collectors and windows during prolonged, unattended deployments.

Historically, anti-fouling chemical compounds were applied to optical surfaces in an attempt to prevent microbial growth and settlement of larvae of sessile invertebrates. The results of this chemical approach were typically unsatisfactory. In some recorded cases, biofouling was actually enhanced when chemical anti-fouling compounds provided a rougher surface for organism attachments (McLean *et al.* 1997). In general, the toxicity and limited retention time of antifouling compounds was proved to be undesirable.