deployed for at most 2 weeks before the package was recovered and new batteries installed. All data were stored in memory (RAM) and transmitted via packet radio to the supporting ship when it was in range (~5 Km to 10 Km depending on sea state). In contrast to equatorial mooring applications, no hard drive was included in this configuration of the OASIS.

The unique nature and increased vulnerability of profiling moorings can necessitate specialized logic on the part of the controller. Two way communications with a shore-based server allows the updating of mission and scheduling files. Amongst other parameters mission files can determine profile speed, the systems activated, and the minimum profile depth. Increasing the minimum profile depth is an effective method to prevent instrument damage during bad weather. Inclement conditions may also be detected, for example, from the vertical motion of profiling vehicle and/or the wave height from bottom a mounted pressure sensor, and subsequently acted on by the controller. A default, or safe, mission program to be used by the controller in the absence of shore communication may be advantageous. In common with other type of moorings a low-power standby mode can be entered between activity periods. An example of a simple control sequence upon waking is:

1. establish communications with the shore station to check for updated mission or scheduling files,
2. perform the profile, and stream some data in real-time,
3. preprocess the profile data for telemetry, and
4. transmit this data to the shore station.

3.6 DATA ANALYSIS AND QUALITY CONTROL METHODS

As described above, the data recorded by an array of sensors mounted on a buoy are retrieved either remotely via a telecommunications link, or by directly downloading it when the buoy is visited for service or retrieval. As with methods of measurement and instrument deployment (Sect. 3.4 above), many aspect of data processing, analysis and quality control are already covered by protocols specified for similar shipboard measurements. Radiometric characterization and calibration requirements and conversion of sensor counts to irradiance and radiance units must follow the protocols described in Volume II (Chapters 2 and 3) and Volume III (Chapter 2), with adjustments to account for:

1. in-water spectral irradiance and radiance measurements at only 1 to 3 depths in the water column,
2. prolonged sensor operation for weeks to months without hands-on stability checks and cleaning, and
3. bio-fouling of submerged optical surfaces, and contamination of above-water sensors by deposition of dust, salt and/or bird droppings.

Similarly, IOP sensors are calibrated, and the data processed, analyzed and checked for quality, following the protocols described in Volume IV, with adjustments for the special circumstances applicable to sensors deployed on buoys.

The following subsections describe recommended methods for handling *Above-Water Spectral Irradiance Data*, *In-Water Radiometric Data*, *Absorption and Beam Attenuation Data*, *Backscattering Data*, and *Chlorophyll a Fluorescence Data*, respectively. The contents of each subsection describe procedures for ***Data Processing***, ***Data Analysis*** and ***Quality Control***, in that order. In general terms:

- "***Data Processing***" covers conversion of sensor response counts to engineering and scientific measurement units, including adjustments for pre- and post-deployment sensor calibration results.
- "***Data Analysis***" covers methods for determining derived quantities such as, for example, water-leaving radiance, diffuse attenuation coefficients, volume scattering coefficients and backscattering.
- "***Quality Control***" describes methods for analyzing the time series of each measurement, together with derived quantities, for internal consistency, symptoms of instrument failure, symptoms of biofouling, consistency with other on-board measurement channels and/or sensors, and consistency with external information (*e.g.* SeaWiFS water-leaving radiance spectra comparisons with measured upwelled radiance spectra).