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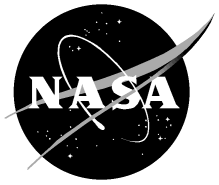

SeaWiFS Postlaunch Technical Report Series

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Volume 23, Tower-Perturbation Measurements in Above-Water Radiometry

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Chapter 1

In Situ Sampling Equipment

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Abstract

The *in situ* sampling equipment used during the tower-perturbation campaigns was a combination of the instruments normally used in the CoASTS Project and those needed for the specialized measurements associated with quantifying the perturbation of the tower in above-water radiance measurements. The former includes a large diversity of marine and atmospheric measurements for the calibration and validation of ocean color remote sensors, while the latter includes a new above-water optical system with a specialized positioning capability. CoASTS field activities have also been used as an opportunity to evaluate new instruments designed for the special circumstances associated with the coastal environment. Within this objective, the tower-perturbation campaigns were used to begin a preliminary evaluation of a new in-water profiler.

1.1 INTRODUCTION

The emphasis for the tower-perturbation experiments was on measuring the apparent optical properties (AOPs) of seawater. To accomplish this, the optical systems deployed at the AAOT were as follows:

1. The JRC version of the miniature NASA Environmental Sampling System (miniNESS),
2. The Wire-Stabilized Profiling Environmental Radiometer (WiSPER),
3. The micro NASA Environmental Sampling System (microNESS),
4. The micro Surface Acquisition System (microSAS), and
5. The SeaWiFS Photometer Revision for Incident Surface Measurements (SeaPRISM).

The first three instruments are in-water profiling systems, and the last two are above-water instruments. The microNESS instrument was included to compare this new profiler with the well-established capabilities of miniNESS and WiSPER in the coastal environment. The SeaPRISM instrument was included, because it was the first operational version of this new measurement system. Detailed descriptions of each measurement system are presented in Sect. 1.3.

In addition to the AOP measurements, a variety of other data, primarily associated with measuring the inherent optical properties (IOPs) of seawater, were collected to characterize the optical properties of the site in more detail:

6. Attenuation and absorption profiles at nine wavelengths by AC-9† measurements; and
7. *In vivo* spectral absorption of particulate matter and the concentration of colored dissolved organic matter (CDOM) through spectrophotometric techniques.

To ensure the AOP and IOP data can be understood in terms of the large-scale environmental properties, the following biological, hydrographic, and atmospheric data were collected:

8. Pigment concentration using the high performance liquid chromatography (HPLC) technique;
9. The concentration of total suspended matter (TSM) through gravimetric filter analysis;
10. Direct sun irradiance and sky radiance sequences by sun photometer measurements;

† Identification of commercial products to adequately specify or document the experimental problem does not imply recommendation or endorsement, nor does it imply that the equipment is necessarily the best available for the purpose.