

Advances in Platforms and Sensor Technologies to Support Integrated Management.

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As pelagic ecosystems continue to be stressed by human encroachment, it becomes increasingly important to have improved information about species distribution and abundance for integrated management. With improvements in sensor technologies and deployment from a variety of platforms, opportunities exist for obtaining this information. In the case of optics and acoustics, the ever-decreasing costs with enhanced performance presents new opportunities. In addition, many benefits can be envisioned by deploying these new sensors using swarms of smaller, ultra quiet, autonomous underwater vehicles. In this presentation I will present results from my group that have addressed these issues on several frontiers. In one case, we measured in situ wide-band target strength with concurrent optical imaging of zooplankton to identify the taxa, size, and orientation dependence. We have also developed a new scanning laser LIDAR imaging system for autonomous vehicle deployment that could be combined with active sonar to achieve similar results obtained with the plankton, only now on larger, more motile organisms. Our current program in developing very small underwater vehicles recently resulted in measurement of 3-dimensional currents using a swarm of 16 miniature, self-ballasting vehicles. Equipped with a sensitive hydrophone the mini-floats are envisioned to be useful in measuring sonic landscapes. With increasing demand for quantitative assessment of ecosystem status, the development of a next generation of less expensive, more definitive tools for providing this information beckons.