

Water Properties Sensor (WPS)

Phase I FINAL REPORT

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Phase I Project Summary

Identification and Significance of Innovation:

In this project we have achieved new and innovative solutions for measuring the properties of oceanic, coastal, and fresh water. And we have a technical approach, for building in Phase II a miniature man-portable Marine Observatory that will simultaneously and easily collect visible band spectral inherent and apparent optical properties along with the physical properties of water.

Technical Objectives and Work Plan:

The technical objectives of this Phase I project were to determine the scientific, technical feasibility, and commercial merit of the proposed WPS system. We achieved all of these objectives and believe that our design concepts meet NASA's SBIR 2009 Subtopic S1.08 in-water operational requirements, to measure full visible band spectral inherent and apparent optical properties simultaneously with the physical O₂, pH, temperature, salinity, and depth properties. Kaitech's concepts provide oceanographers with a set of comprehensive measurement capabilities for determining the water's radiological and biological components while minimizing labor requirements and improving reliability. In addition, the WPS's design is miniaturized, man-portable, singly deployable, easy to operate, fouling resistant, and affordable.

Technical Accomplishments:

The technical approach was to conceptualize, synthesize, and actualize the designs for the WPS system. The accomplishments were 1) Designed five innovative spectral inherent and apparent optical properties instruments. 2) Selected six physical property instruments. 3) Designed the adaptor to hold the above instruments. 4) Integrated the above into a deployable (WPS) system to measure the geospatial information of in situ oceanic, coastal, and fresh water's fundamental marine processes.

NASA Application(s):

Our Water Properties Sensor (WPS) designs are configured to support NASA's Ocean Biology and Biogeochemistry and Applied Sciences programs, its Integrated Ocean Observing System (IOOS), field studies, regional coastal research, and the gathering of in situ water measurements fundamental to the measurement, calibration, and validation of NASA's satellite programs. The anticipated results of this R/R&D effort, is that a proven fully functional, integrated, rugged, and low cost marine measuring system will be available for the first time for oceanographic studies.

Non-NASA Commercial Application(s):

Kaitech's business plan suggests that there are a number of potential Non-NASA applications for the WPS system. Our projections are that federal agencies, state governments, environmental laboratories and oceanographic research scientists will be the first commercial users. To meet these applications affordability will be a significant factor

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