MONITORING EFFECTS OF DEEP OCEAN OUTFALL DISCHARGE USING REMOTE DATA
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Abstract

Environmental problems caused in coastal waters by anthropogenic activities are analyzed. Complex technologies developed for analysis of remotely sensed satellite data combined with simultaneous oceanographic and meteorological are used to investigate the dispersion path of the wastewater plume discharged through a deep ocean outfall.

Treated effluent from the Sand Island Wastewater Treatment Plant is discharged through an outfall about 2 miles offshore at a depth of 70 meters into Mamala Bay. Wastewater is discharged through a diffuser to maximize initial dilution during its buoyancy phase. The measurements detected deep ocean processes and made it possible to track the wastewater plume within the study area.

Processing of high-resolution images from “Ikonos” satellite (~ 1 m panchromatic and ~ 4 m multispectral), revealed areas of anomalies at the ocean surface as well as in subsurface layer. These anomalies covered a relatively large area of the ocean in the study area (~ 10 km).

Surface and subsurface anomalies detected result from interaction of existing surface features with physical mechanisms such as internal waves related to the wastewater discharge. The structure of surface signature produced by deep turbulent sources depends on outfall operating mode, ambient currents, density stratification, depth, wind conditions and the variation of light scattering.

The problem, method of data acquisition and analysis and results are presented in this seminar.