Evaluation and Improvement of the Atmospheric Data Acquisition System aboard R/V *Kilo Moana*

A THESIS SUBMITTED TO
THE GLOBAL ENVIRONMENTAL SCIENCE
UNDERGRADUATE DIVISION IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
BACHELOR OF SCIENCE
IN
GLOBAL ENVIRONMENTAL SCIENCE
DECEMBER 2014

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ABSTRACT

The research vessel *Kilo Moana* (KM) has proven itself to be an example of how a good platform for atmospheric observation can produce sub-optimal data. The major issues with most shipboard meteorological systems are: sensor location, wiring, and post-processing/ calibration. Those components of shipboard meteorological measurements were the primary focus of this study.

This inquiry was broken up into five sections: inter-comparison, wind monitor direction test, wind monitor location test, sensor wiring, and post-processing script editing. The inter-comparison study was completed between the KM, NOAA vessel *Hiialakai*, and the WHOTS 8 buoy, during June of 2012 when all three meteorological platforms were located at Station ALOHA. Air temperature, relative humidity, wind speed, and wind direction were the atmospheric variables compared in this portion of the study. The wind monitor direction test researched the existence of a reported "dead spot" that RM Young Marine Wind Monitors experience through a bench test performed on six sensors within their respective calibration dates. The wind monitor location test occured in the summer of 2014, comparing standard deviations of wind speed and direction while the starboard side wind monitor aboard the KM was located in three different locations on the meteorological mast. Sensor wiring refers to the re-wiring of certain sensors on board the KM in an attempt to decrease noise interference with ultrasonic wind speed measurements. Post-processing scripts on board the KM were reviewed for completeness and date quality.

Kilo Moana has the capability to become a very good ship for meteorological observations, especially irradiance measurements. However sensor location, wiring, and post-processing/ calibration issues continue to plague the KM. Currently the SAMOS accuracy targets are not being met with respect to air temperature, relative humidity, wind speed, and wind direction. With continued efforts to combat these issues, the KM has the potential to provide excellent quality data.