

Field Laboratory for Ocean Sea State Investigation and Experimentation: FLOSSIE Intra-Measurement Evaluation

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The NOAA-National Data Buoy Center (NOAA-NDBC) and Environment Canada (EC) have been operating a network of meteorological and wave measurement sites in the Atlantic, Pacific, Gulf of Mexico and Great Lakes for the past four decades. The platforms used by these two agencies vary from discus buoys of varying sizes to a standard 6-m (6N) Navy Oceanographic and Meteorological Automatic Device, or NOMAD buoy. These data sets have been instrumental in the evaluation of wave model results in a hindcast or forecasting mode, calibration/validation of satellite-based remote sensing algorithms estimating the significant wave height from altimeters, and wave properties from SAR images, research efforts studying the role of surface-gravity wind waves on atmosphere-ocean coupling, coastal inundation and erosion studies, and wave energy resource assessment.

Of particular interest to this meeting is the use of these in situ measurements in the investigation of wave climate trend and variability. These data have been widely used to assess the trends in the wave climate (e.g. Komar and Allan, 2008; Ruggiero et al., 2010; and Menéndez et al., 2008). However, over the period of record there have been numerous modifications to the hull, sensor, and payload (on-board analysis package) that can affect long-term records (Gemrich et al., 2011; Livermont et. al, 2015).

In 2012, a plan for an experiment (FLOSSIE) was developed where a 6N hull would be configured with all historical sensor, and payload packages used by NOAA-NDBC during the past four decades. The data will provide a means to account for temporal changes in payloads and sensor systems by NOAA-NDBC while evaluating the accuracy of the archive data sets. In addition to the NOAA-NDBC sensor (and payload systems), Environment Canada also provided their sensor and payload, and AXYS™ has provided their new sensor system (TRIAXYS) and payload, that will be used to directly assess differences between historical EC and NOAA-NDBC 6N buoy records.

FLOSSIE was deployed in August 2015 in Monterey Canyon with the multiple sensor/payload systems as part of an existing Buoy Farm (multiple wave measurement platforms). The domain is populated with a Datawell™ directional waverider buoy, a NOAA-NDBC standard 3-m discus buoy containing a HIPPY and 3DGM sensor and payload systems, and AXYS™ will also deploy a TRIAXYS buoy system. These entire buoy systems will be evaluated using WaveEval Tools (Jensen et al. 2011) and the results presented that will have an impact on present and historical wave data records for climate trend and variability analyses.

Oral

- **Data homogenization (benchmarking, bias adjustments, step change analysis, metadata)**