

## **An Analysis of Evaporation Ducting for use in Developing Ground Truth Propagation for the Tropical Air-Sea Propagation Study 2013**

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The Tropical Air-Sea Propagation Study (TAPS) 2013 was sponsored by the Australian Defence Science and Technology Organisation (DSTO) and conducted during the timeframe of 25 November through 05 December 2013 in the areas of Ingham Airfield, Lucinda Jetty, Orpheus Island and Myrmidon Reef, QLD, AU. The stated goals for study include: measurements of vertical profiles of temperature, moisture, pressure and wind velocity in the atmospheric boundary layer and in the surface layer over land and water; validation of mesoscale numerical weather model prediction of refractive index structure in the tropical littoral environment; development and validation of techniques for blending surface layer models with mixed layer profiles from mesoscale numerical weather prediction.

As a precursor to preparing a range dependent refractivity data set as ground truth to support stated goals, an analysis of the Lucinda Jetty bulk meteorological measurements by DSTO will be conducted. The Navy Surface Layer Model (NAVSLaM v1.0) evaporation duct model will ingest bulk meteorological measurements taken at the Lucinda Jetty and provide duct height and flux profiles. A comparison of the evaporation duct model flux profiles will be made to direct flux measurements collocated with the bulk data on the Lucinda Jetty. This analysis will support similar calculus for evaporation duct height from range dependent meteorological measurements taken aboard the RV Cape Ferguson. These evaporation ducts, combined with the range dependent atmospheric profiles measured by NSWCD from the RV Cape Ferguson will allow for the creation of control two-dimensional propagation factor fields to validate engineering metrics for radar, communication and electronic warfare systems.