# A framework for combining in situ and satellite SST data: the Global Ocean Data Assimilation Experiment (GODAE) High Resolution Sea Surface Temperature Pilot Project (GHRSST-PP)

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The primary aim of the Global Ocean Data Assimilation Experiment (GODAE) High Resolution Sea Surface Temperature Pilot Project (GHRSST-PP) is to develop and operate a demonstration system that will deliver high-resolution (better than 10 km and ~ 6 hourly) global coverage SST data products operationally in near real time for the diverse needs of GODAE and the wider scientific community. A new generation of global coverage SST data products will be derived and served to the international user community by combining complementary Level-2 (L2) satellite and in situ observations in real time (6 hourly).

There are obvious synergy benefits to such an approach but their practical realisation is complicated by characteristic differences that exist between measurements of SST obtained from subsurface situ sensors, satellite microwave radiometers and, infrared radiometer systems. Furthermore, diurnal variability of SST within a 24 hour period, manifest as both warm layer and cool skin deviations, introduces additional uncertainty for direct inter-comparison and the implementation of data merging strategies.

Definitions of SST in the upper 10 m of the water column provide a necessary theoretical framework to understand the information content and relationships between complementary measurements of SST. The framework developed by the GHRSST-PP Science Team is presented which attempts to achieve the closest possible coincidence between definitions of SST and what can be measured operationally using in situ and satellite systems, bearing in mind current scientific knowledge and understanding of how the near surface thermal structure of the ocean behaves in nature. Finally, the GHRSST-PP diagnostic and validation strategy that has been designed to provide a virtual laboratory for the inter-comparison and development of satellite SST bias correction statistics is presented.