

Supporting dynamic hypothesis modelling and alerts in marine environments.

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Linking data and data fusion are important processes in knowledge discovery in all areas of research. However, there are massive amounts of scientific data being produced that cannot be effectively processed to its full potential. Sensor data is prolific and growing. Improvements in the data fusion and data analysis phase of research are increasingly imperative due to the exponential growth of sensed data. Here, we describe the integration of remotely sensed data with web available static data for use in hypothesis testing and the analysis phase of research. The Semantic Reef system combines semantic technologies such as well-defined ontologies and logic systems with scientific workflows to enable dynamic hypothesis-based research on sustainability and climate change and/or alerts to phenomena such as algal blooms and coral bleaching.

The Semantic Reef system collates data from various sources, integrates within one knowledge base and infers outcomes from observational hypotheses dynamically as the lines of enquiry dictate. The data sources here include live data streams from the SEMAT intelligent sensor network initiative

Currently, developments in the Semantic Sensor Web community explore more efficient methods for the reuse, correlation and integration of web-based data sets and live data streams.

This paper applies the data fusion concepts from the Semantic Reef architecture to the SEMAT intelligent sensor network initiative. The data that is collected via SEMAT and the inferred knowledge from the Semantic Reef system are then ingested to the Tropical Data Hub for data discovery, reuse, curation and publication.