

## **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. Sensed data is prolific and growing, so improvements in the data fusion and data analysis phase of research are becoming increasingly necessary. We describe the integration of remotely sensed data from the Smart Environmental Monitoring and Analysis Technologies (SEMAT) initiative with static data available from the Tropical Data Hub (TDH) for use in hypothesis testing in the Semantic Reef system. SEMAT is developing new sensor network technologies and processing methodologies for environmental applications. The TDH is an open data collaborative model where the data and metadata is exposed for discovery and publication. Data from the TDH is available for integration with other datasets such as live data streams from SEMAT for multi-disciplinary hypotheses. 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 environmental sustainability and/or alerts to phenomena such as algal blooms and coral bleaching. Data is collated from various sources and integrated within one knowledge-base to infer outcomes from observational hypotheses. The semantic knowledge base allows for dynamic hypothesis modelling as the lines of enquiry dictate. The data that is collected via SEMAT and used to infer knowledge by the Semantic Reef system, such as an inferred causal factor of coral bleaching and the ensuing observation and outcome of that proposition, can be ingested to the TDH for data discovery, reuse, curation and publication.

## **Food for Thought: What we know, and how we know governance and coastal zone management, Australia**

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It is now well established that there are many threats to the ecological and social integrity of the coastal zone. Australia, with a huge coastline, is no exception. Despite multiple efforts to manage the coast, it remains a contested space. At the heart of this are conflicting discourses about its use and management, derived from differing stakeholder perceptions about the value, access to location of knowledge about the coast and management. By way of a discussion about the forms and constructs of knowledge this paper offers a reflection into the ways in which different knowledge domains influence and impact on one specific dimension of coastal zone management; the transmission of science into the governance domain. We find that until common agreements are made about what forms of knowledge are to be prioritised or identified within the management endeavour, and communication strategies about science into policy are fine tuned in accordance with these understandings, that the effectiveness of and understanding of science into future governance actions/frameworks will be impeded. We conclude with some recommendations for coastal governance in Australia.

## **Rebirth, growth and loss: Monitoring the change of coastal plant communities at Paradise Point, Gold Coast**

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Coastal and intertidal vegetation are important for the healthy functioning of our local waterways. In urban settings, these habitats are often disturbed to make way for new development to support our growing coastal population. There is value in understanding how each habitat reacts and recovers after such disturbances. Additionally external factors can play a role and understanding the potential for these to create additional pressure assists in developing effective long term management. The Salacia Waters Marine Plant Project was developed to monitor a range of coastal plants communities (dunes, seagrass and mangroves) and their recovery and resilience in response to a local development. The development of Salacia Waters is located at Paradise Point adjacent to the Gold Coast Broadwater. The project commenced in March 2011 and includes four key projects: