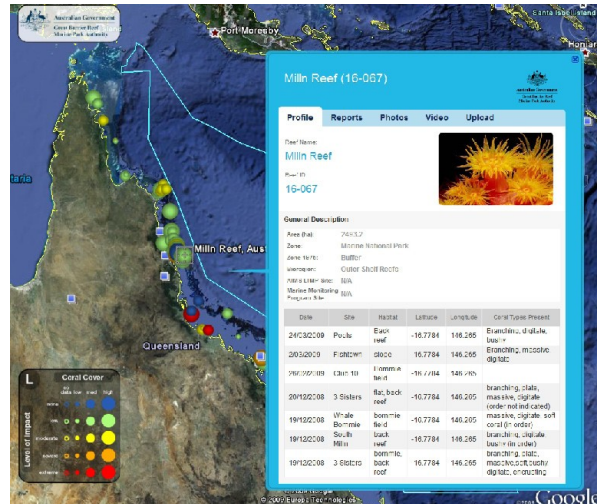


Mapping Reef Health Using Google Earth

Supporting management responses to climate change incidents



Summary

The newly developed Reef Health spatial mapping tool captures and displays data from the Great Barrier Reef Marine Park Authority's (GBRMPAs) impact monitoring programs as a colour coded layer in Google Earth. The maps will improve understanding of the relationships between impacts and environmental stress, coral health, resilience and recovery in the Great Barrier Reef Marine Park.

Background

Climate change is affecting reefs around the world and is a significant threat to the long-term health of the Great Barrier Reef. Every summer brings a significant risk of damage from coral bleaching and other ecosystem impacts. The GBRMPA coordinates several Reef monitoring programs, including BleachWatch, Eye on the Reef, Reef Health Impact Survey and other field management programs, which regularly generate data on coral reef status and health.

It was identified that there was a need to build capacity for the data from these different monitoring programs to be combined and represented spatially.

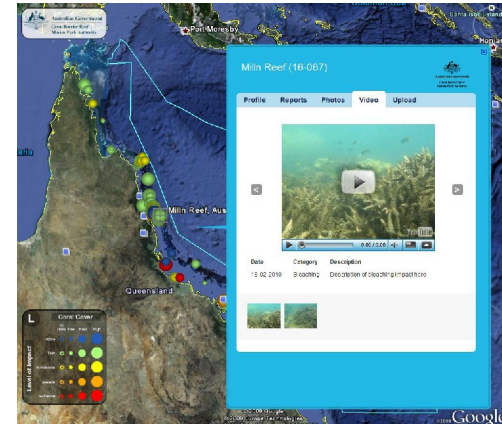
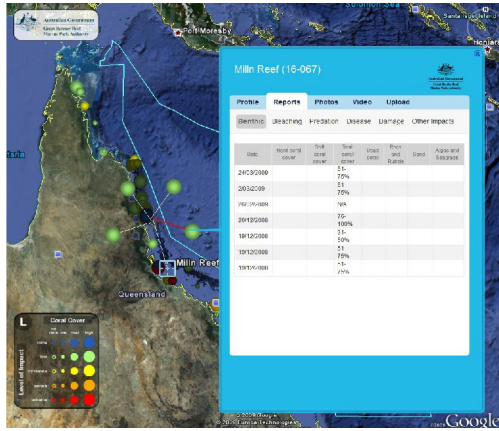
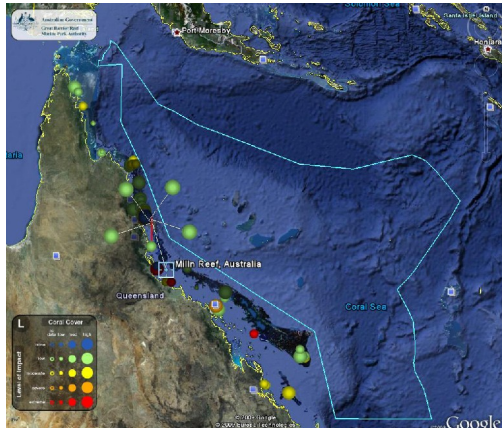
The GBRMPA have automated the upload of combined monitoring data into a spatial mapping system based on Google Earth. The result is the Reef Health Status and Indicator layer. This cost-effective tool allows the GBRMPA to map and assess the extent and severity of impacts such as bleaching, disease outbreaks, cyclone damage and rainfall events on the Great Barrier Reef at a variety of scales.

The use of the Google Earth platform means that any authorised person involved in an incident response can easily access and use up to date impact data to support management decisions.

Objectives

- 1) Delivery of a working Google Earth layer (KML) with established linkages to database information.
- 2) In-house capacity to update and transfer monitoring knowledge to internal stakeholders and general public in real-time.
- 3) Automation of KML production from GIS spatial systems.
- 4) Upload of additional information from external data sources.

Project name: GEKML Phase 1
Project code: 1.3A.406.1.08
Outcome: B1.4
Year: 2008–2009
Bulletin type: Final



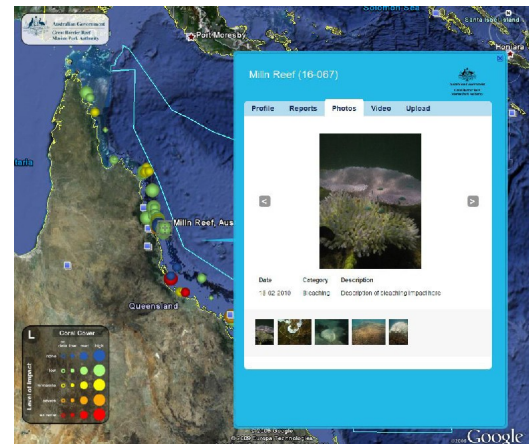
Outcomes

1) Real time links to outputs from databases such as BleachWatch, Eye on the Reef, Reef Health Impact Summary and qualitative data provided by the community. Reef managers will benefit through the development of spatial tools that enable them to rapidly evaluate cumulative impacts such as the extreme temperature, salinity and cyclone events that occurred in 2008/09. The KML can support adaptive management.

2) Increased capacity for GBRMPA to provide summary information which will allow trend analysis and progressive real time monitoring and reporting on the Reef's status. The KML will enhance efforts to evaluate, describe and communicate the severity and extent of climate change impacts in a manner that is compatible with the e-Atlas and valuable for future resilience based management.

3) Enhanced capacity for community and industry to provide GBRMPA with qualitative long term monitoring information. The new KML will build upon the ReefTemp suite of remote sensing tools that are already being

used by GBRMPA to assess and monitor the threat of coral bleaching each summer, and will enhance and prove ReefTemp predictions by overlaying spatial and temporal dimensions of field assessment reports against the background sea surface temperature (SST), sea surface temperature anomalies (SST+), degree heating days (DHD) and heating rate (HR) images.



Future Directions

- 1) Development of an integrated monitoring and assessment protocol for all community monitoring programs
- 2) Creation of a single integrated database for all combined reef health data
- 3) Development and implementation of an overarching training program for monitoring of coral health, complete with training and communication materials.



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