



National Environmental
Research Program

TROPICAL ECOSYSTEMS *hub*

Program Outcome Summary 2013

Compiled by RTRC

Tropical Ecosystems Hub (2011-December 2014)

A \$61.9 million program comprising 38 projects and over 240 researchers which examines the environmental challenges facing the Great Barrier Reef, Wet Tropics rainforests and Torres Strait communities.

The program aims to deliver a contemporary understanding of the:

- Status and trends of key species and ecosystems of these internationally acclaimed environmental assets;
- Social and economic interactions between communities and their unique environment;
- Performance of existing environmental management arrangements; and
- Options for adaptation and new management approaches to enhance ecological, social and cultural resilience in our changing environment.

The Hub has a strong focus on Science Communication and Knowledge Brokering including:

- The E-atlas: a website with a comprehensive mapping system and data visualisation tools for presenting research data in an accessible form and available to the public.
- Program Implementation Groups, comprising Project Leaders and Research Users that meet biannually to assist project performance and information transfer.
- Contestable Funds for communication activities: a pool of funds allocated for complementary knowledge transfer projects.
- Biannual Hub Conference which brings all Project Teams and Research Users together to inform on the outcomes of the research undertaken in the Hub.

Hub website (www.nerptropical.edu.au) featuring:

- Project technical reports
- Journal articles
- Fact sheets
- Project updates
- Media and all other forms of project communication products

Distribution of Hub information to more than 800 identified recipients in the form of:

- Bimonthly electronic newsletters.
- Biannual project snapshot reports.
- Weekly NERP Chirp articles for distribution to the entire NERP Network.

The Hub also has a dedicated Indigenous Engagement Strategy and Implementation Plan, which was developed with Indigenous partners from the region. There is a strong focus on the transfer of knowledge into projects and knowledge repatriation back to the Indigenous community.

Great Barrier Reef

A \$42.9 million subprogram comprising 20 projects addressing water quality and biodiversity on the Great Barrier Reef, the Tropical Ecosystems Hub research program contributed important outcomes for uptake in policy and management in 2013.

In particular the Great Barrier Reef projects have contributed significantly to the development of the Australian Government's Reef Rescue II Program, the Queensland and Australian Government's Great Barrier Reef Strategic Assessments and the GBRMPA Outlook Report.



Program outcomes in 2013 include the:

- Identification of destructive densities of Crown of Thorns Starfish in the Lizard Island area. These are the highest densities recorded in 28 years of surveys. On a request from the Marine Tourism Industry the Australian Government responded with further investment in the direct eradication of COTS; and committed a further \$2m for Key Tourism Site protection and COTS population management.
 - Production of multifaceted vulnerability maps for identifying critical coastal catchments for priority Reef Rescue II investment in the mitigation of poor water quality impacts associated with land use.
 - Identification of the impacts of suspended sediment on light availability to critical Great Barrier Reef habitats. This will provide important input to the dredging, port development and spoil dumping issues in the Great Barrier Reef World Heritage Area.
 - Detected the chronic effects and toxic thresholds of pesticides on seagrass and corals. These results will be made available to the Australian Pesticides and Veterinary Medicines Authority for consideration in the national pesticide registration process.
 - Critical thresholds found for the cumulative effects of declining water quality and changing seawater chemistry on seagrass. These results will contribute directly to the development of guidelines for the protection of seagrasses.
- Determination of the population structures and dispersal dynamics for coral trout species associated with the rezoning of the GBRMP. This information has important implications for determining the effectiveness of spatial zoning for conservation and fishery yield.
 - Determination of the migration and foraging patterns for Great Barrier Reef seabirds. The results indicate that shearwater seabirds migrate through the world's largest tuna fishery. The results imply the need for an international approach and agreement to conserve these species.



Wet Tropics Rainforest

A \$10.7 million subprogram comprising 11 projects, the Tropical Ecosystems Hub Wet Tropics rainforests program has contributed significantly to the development of spatial planning options in the Wet Tropics World Heritage Area. The research has contributed directly to the prioritisation of conservation planning and rehabilitation effort associated with the changing climate.

Program outcomes in 2013 include the:

- Identification and mapping of important climate refugia in the Wet Tropics. These maps form a critical component of the Wet Tropics conservation planning, particularly for zoning to deliver species and habitat protection. This approach was highlighted at the IUCN Climate Change Specialist Group meeting in December 2013.
- Production of a monthly census of spectacled flying-fox populations. This information has underpinned the management processes, at all levels of government, to enhance the focus on conservation of this important rainforest pollinator. There have been increasing calls for improved management of flying fox for both urban amenity and disease control.
- Development of prioritisation models for weeds that occur in or adjacent to the Wet Tropics. This information will contribute to control strategies across various natural resource management regions. This information has been incorporated into a Pest Adaptation Response Strategy.
- Development of a decision support model for cost effective revegetation and restoration of critical habitat across large areas in the tropics. This information will significantly increase the value for money from regional natural resource management investment.



Torres Strait Communities

A \$8.3 million subprogram comprising six projects, the Tropical Ecosystems Hub Torres Strait program has contributed vital information to the management of land and sea resources that underpin the culture and livelihoods of the people of Torres Strait.

Program outcomes in 2013 include the:

- Improvement of biosecurity detection methodology across the PNG/Torres Strait zone, which is needed to inform environmental disease management interventions in a changing climate.
- Finding that Flatback turtles in northwestern Torres Strait travel more than 5,000km while foraging. This result highlights the need for international cooperation in Torres Strait turtle conservation and fisheries management.
- Identification of 91 new coral species and a number of new fish species that had not been observed previously in the Torres Strait. Comparative surveys from 100 years ago showed that temperature sensitive corals (*Seriatopora* sp.) had greatly decreased.
- Successful training of local Indigenous Rangers to undertake monitoring of key indicators of coral health and biodiversity; and management of sensitive coastal ecosystems, such as mangroves and wetlands.

e-Atlas

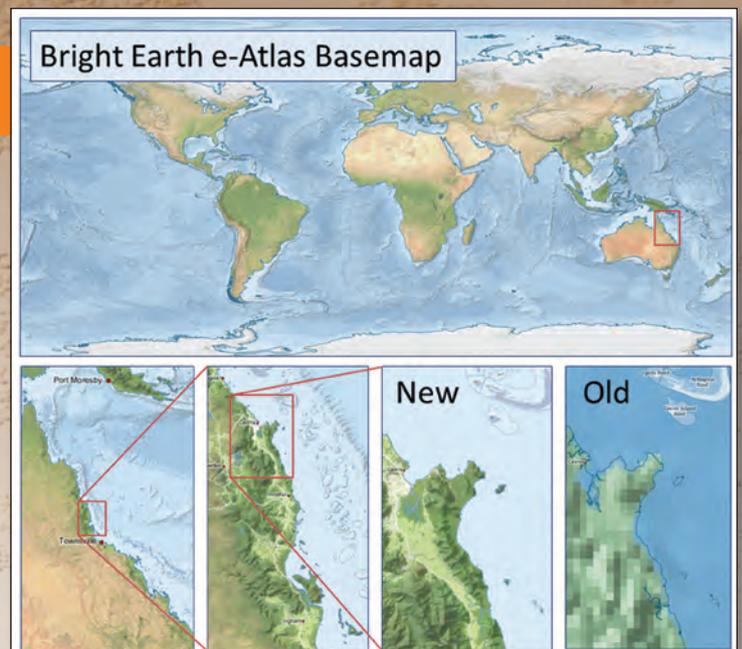
The **e-Atlas** is a website, mapping system and set of data visualisation tools for presenting research data in an accessible form that promotes greater use of this information.

The e-Atlas:

- Serves as the primary data and knowledge repository for all NERP Tropical Ecosystems Hub projects.
- Captures and records research outcomes, making them available to research-users.
- Hosts meta-data records, providing an enduring repository for raw data.
- Develops and hosts web visualisations to allow viewing of information using a simple and intuitive interface.
- Assists scientists with data discovery and allowing environmental managers to access and investigate research data.

Each geographical node of the Tropical Ecosystems Hub has a strong connection with its corresponding regional management agencies (Great Barrier Reef Marine Park Authority, Wet Tropics Management Authority and Torres Strait Regional Authority).

The e-atlas works closely with each of these agencies and other research users to establish the systems, tools and products to maximise the benefit from the Tropical Ecosystems Hub research program.



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The Reef and Rainforest Research Centre administers the Australian Government's National Environmental Research Program Tropical Ecosystems Hub.



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