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Understanding how social-ecological systems can be resilient to climate change poses one of the most pressing problems today. This is especially true in the Pacific Islands, which are considered to be especially at risk to the effects of climate change. The local ecological knowledge (LEK) systems developed by Pacific Islanders over millennia have allowed them to adapt to living in highly uncertain conditions and to be resilient to many of the extreme climatic events that characterize the islands. However, the complex patterns and processes involved in these LEK systems, and their potential to enhance resilience to climate change today (and global environmental change more broadly), are poorly understood. We present an interdisciplinary research project that employs a ridge-to-reef approach to assess the relationships between LEK systems and social-ecological resilience to climate change in Fiji. We ask: Is LEK correlated with indicators of social-ecological resilience and adaptive capacity, and if so, how? We focus on LEK in terms of the knowledge, management and governance associated with traditional agroforests and near-shore marine fisheries; and our methods include household surveys, focus group discussions, and ecological surveys in agroforests and near-shore reefs in 20 communities across Fiji. We present our approach and preliminary results, and invite others working in Oceania to share our methodology to help build comparative research.

CBM-05.4, July 10, AUSAID2, 11:15

Prioritizing catchment agricultural management practice change through marine risk assessment in the Great Barrier Reef

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The iconic Great Barrier Reef (GBR) in Australia faces continuing and increasing threats from human activities including climate change, agricultural pollution and large scale port development pollution. The current degradation of many GBR ecosystems including, for example, reduction in coral cover and seagrass health and severely reduced dugong populations are linked to declining water quality in the GBR. Suspended sediment, nutrients and pesticides loads discharged to the GBR from agricultural and coastal development have increased greatly in the last 150 years. These pollutants disperse into the GBR during high flow river discharge and damage GBR ecosystems including coral reefs and seagrass meadows. Reef Plan, the joint Australian and Queensland Governments program to address land-sourced pollution, provides funding to farmers, matched by the farmers themselves, for improved management practices to reduce pollution. A requirement of a cost effective program of this type is the ability to prioritise where and how such funding should be applied in the GBR Catchment. We have developed and applied a risk assessment method to inform investment prioritisation and guide policy makers and catchment managers on the key land-based pollutants of greatest risk to the health of GBR coral reefs and seagrass meadows. The risk assessment uses a Multi Criteria Analysis approach with qualitative and semi-quantitative information on the influence of individual rivers in the 6 natural resource management (NRM) regions on coral reefs and seagrass meadows. Relative risk was

estimated from the habitat areas (coral reefs and seagrass) exposed to defined pollutant thresholds (observed or modelled) and this was combined with river pollutant load information to develop priorities for regional management areas within the GBR Catchment. The assessment showed distinct differences between NRM regions and between catchments within the regions in terms of potential impact from each pollutant and for coral reefs and seagrass meadows. The results, in conjunction with information on pollutant generation from dominant land uses in the GBR Catchment, are used to inform investment priorities both between and within NRM regions.

CBM-05.5, July 10, AUSAID2, 11:30

Hazard assessment for water quality threats to Torres Strait marine waters and ecosystems

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The Torres Strait marine environment is of national and international significance. It includes critical coral reef and seagrass habitats, many species of fish, invertebrates and turtles, and one of the largest dugong populations globally. The region faces global pressures, such as increasing shipping traffic, demand for peak oil and impacts associated with climate change that could have complex impacts on Torres Strait's environmental assets, particularly when combined with local pressures. We undertook a qualitative assessment of the key threats to the Torres Strait region from water quality issues. The supporting information included analysis of remote sensing imagery, development of a hydrodynamic model, island inspections and a desktop review of previous studies. We concluded that the current hazards to the environmental values of the region from water quality are relatively minor, and are specific to local areas. However, a number of important future threats were identified. Most importantly, the potential hazards from the transit of large ships through the region, including oil or chemical spills and groundings, are of greatest concern due to the potential for long term retention in the Straits. Large scale development in Papua New Guinea including gas platforms, oil palm expansion and port development may also be significant. This study has provided the first hazard assessment of water quality issues in the Torres Strait region and provides guidance for environmental managers to make decisions regarding the relative importance of pollutant sources at a range of scales.

CBM-05.6, July 10, AUSAID2, 11:45

Prioritizing cost-effective management projects to improve water quality in the Great Barrier Reef

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Half of the Great Barrier Reef's (GBR) coral cover has been lost since 1985. One of the most significant threats to the GBR is the declining water quality from land-based run-off. A significant amount of funding has been committed by the Australian government to invest in catchment management in order to improve downstream water quality. However, a transparent and economically sound investment prioritisation process for the allocation of funds does not exist. Here we present an approach that explicitly considers the economic costs, feasibility, and