CCRES

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Healthy habitat: A shallow reef off Sarappo Keke Island, a 'no-take' zone within a district Marine Conservation Area of the Pangkajene Islands area off Pangkep, South Sulawesi. Indonesia.
Photo: P. Mumby

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FRONT COVER: Busuanga, Palawan, Philippines.
Photo: P. Mumby

LEADERSHIP MESSAGE

We're part of a system, a complex ecosystem

EVERYTHING IS CONNECTED

You cannot solve a problem in respect to coral reefs unless you look at how people are using the oceans and, beyond that, the multitude of factors — from food security to energy use — which affect their lives.

At the Capturing Coral Reef and Related Ecosystem Services (CCRES) project, our multi-disciplinary research agenda covers fish ecology, systems thinking, marine biology, ecological economics, social science, engineering, business innovation, governance and institutions, psychology, and marketing communications.

Crossing research boundaries can be a challenge in itself. Most of the CCRES scientists find themselves outside their comfort zones at some point. Yet what we've learnt is that, while it may not be easy, there is a huge power in bringing people from different disciplines and backgrounds together.

It's exhilarating — people involved in CCRES can change the world and this impact isn't defined by their particular interests. By mixing things up and looking at things through new lenses, we believe we will discover better solutions.

Integration across disciplines, institutions, geographies and cultures is fundamental to how CCRES research will respond to some of the 'wicked' problems facing coastal communities in the East Asia-Pacific region.

We're convinced the complexity of the challenge for people in the region, including climate change, food insecurity, coastal development and population growth — requires a wisdom borne of multiple perspectives.

CCRES is integrating technical knowledge and expertise to address the problems. This starts with setting questions, which cut across the themes of ecosystem services, business transformation, system dynamics and behavioural change.

Once these questions are agreed, the task of exploring potential solutions involves collaborative research, consultation with on-ground practitioners, and cooperation with technical projects in the region.

This cooperative spirit has provided us with a solid platform to move forward on an innovative and challenging research agenda to benefit communities living along low-lying coastlines in the East Asia-Pacific region.

What has also excited us is the level of commitment, knowledge and expertise in the countries we are working in, as they grapple with the complexity of managing coastal resources during a time of constant change.

Following this past year of scoping and planning and through establishing solid, on-ground partnerships and collaborations with regional projects, governments, research institutions, local businesses, NGOs and communities, the CCRES project is now progressing strongly at two pilot sites in Indonesia and the Philippines.

We thank those involved to date and look forward to reaching some significant milestones in 2015.

Melanie King
Professor Peter Mumby
Mark Paterson
Professor Mark Milstein and
Dr Carl Smith.

A gleaner at El Nido Cove, El Nido, Palawan, Philippines.
Photo: M. Paterson

Lunch on the reef: Children in the Philippines.
Photo: H. Trebilco

2014 HIGHLIGHTS

Setting course for an exciting journey

Year One of the CCRES project was defined as a 'scoping year' to determine appropriate pilot sites, to plan on-ground activities in detail, and to develop the partnerships and collaborations required to undertake the activities in the Philippines and Indonesia.

Key activities over the past year have included detailed planning for the implementation of the research activities at the pilot sites; development of major partnerships and collaborations across the region; the establishment of activity teams to work on-ground; the development of the stakeholder networks required for the outreach components of the activities; and major announcements and launches of the pilot sites in the Philippines and Indonesia. Outlined are some of the highlights from the year.

On 6 November 2013, the World Bank and The University of Queensland (UQ) signed off on the Head Agreement which confirmed the UQ Global Change Institute as the Project Executing Partner. This signifies a start to unlocking the economic and social value of marine ecosystems to give an incentive to local communities, businesses and policy makers to preserve them (and their services) for future generations.

NOVEMBER 2013

World Bank, Global Environment Facility and The University of Queensland (UQ) sign agreement to unlock wealth streams in East Asia-Pacific

The Head Agreement to formally signify the commencement of CCRES was signed by University of Queensland (UQ) President and Vice-Chancellor, Professor Peter Høj, and World Bank Director of Operations, Dr Ethel Sennhauser at World Bank Headquarters in Washington DC.

Dr Marea Hatziolos farewelled

CCRES bid a sad farewell to their World Bank Team Leader Dr Marea Hatziolos in early November. Marea was the champion and leader of CCRES, and was also responsible for oversighting and managing its precursor, Coral Reef Targeted Research and Capacity Building for Management Project.

JANUARY

El Nido picked as pilot site

El Nido, a tiny, bustling municipality on the northern-most tip of the island of Palawan, bordering the South China Sea, south-west of Manila, is chosen as our pilot site in the Philippines.

FEBRUARY

Meet 'n' greet in the Philippines

As part of an Inception Meeting in the Philippines the CCRES project team meets stakeholders in El Nido, the pilot site, Puerto Princesa, the capital of Palawan, and Manila, the nation's capital.

MARCH

CCRES gets 'tick of approval'

CCRES is endorsed by the Protected Areas Management Board which governs the El Nido-Taytay Managed Resource Protected Area, one of 10 priority conservation sites in the Philippines.

CCRES joins forces with PEMSEA

CCRES joins PEMSEA partnership to assist in applying knowledge management to scale up partnership investments for sustainable development of large marine ecosystems of East Asia and their coasts.

Regional networking

CCRES participates in the 2nd Asian Regional Targeted Workshop for GEF International Waters Projects.

APRIL

We welcome 'in-country' partners

Three influential stakeholders, the Department of Environment and Natural Resources, through the Biodiversity Management Bureau, the Palawan Council for Sustainable Development, and the El Nido Local Government — representing national, provincial and local levels of government — join CCRES as 'in-country' partners for the Philippines.

MAY

Indonesian Planning commences

The planning for an Indonesian pilot site and implementation of CCRES activities commences with a visit to government agencies and other stakeholders in Jakarta and Makassar.

CCRES opens Manila office

CCRES sets up an office in the Philippines, provided by the University of Philippines Marine Science Institute (UPMSI) at the University's Diliman campus in Quezon City, Manila.

Coming together (L to R): Philippines partners Nelson Devandera, Anthony Charlemagne Yu, Dr Annette Juinio-Meñez, Michael Pido, Melanie King, Mundita Lim and Raffy Cabate.
Photo: K. Sampson

JUNE

Fieldwork begins in Palawan

UPMSI kicks off their fieldwork in El Nido conducting mangrove and seagrass surveys, oceanographic surveys and Teardrop tows.

Indonesia makes us welcome

During a mission to Jakarta CCRES attends a series of Coral Reef Rehabilitation and Management Program- Coral Triangle Initiative (COREMAP-CTI) and World Bank Mission meetings, hosted by the World Bank Indonesia and the Indonesian Government's Ministry of Marine Affairs and Fisheries (MMAF) and Indonesian Institute of Sciences (LIPI).

First post-docs, PhDs join project

CCRES welcomed postdoctoral fellows Dr Alice Rogers, The University of Queensland, Dr Vera Horigue and PhD students Aya Carino and Lei Solera from UPMSI.

JULY

CCRES Board meets for first time

The first meeting of the CCRES Advisory Board, comprising global, regional and national representatives from funding, partner and stakeholder organisations, is chaired by Emeritus Professor Edgardo Gomez, from the UPMSI in Manila.

Launching in the Philippines

The University of the Philippines, together with The University of Queensland, officially launched the CCRES Project in Manila in July 2014. More than 50 guests from 33 affiliations, including representatives from our in-country partners, attended the launch, which was hosted by the UPMSI.

AUGUST

CCRES investigates pilot sites in South Sulawesi

The CCRES leadership team visits Selayar and Pangkep in South Sulawesi to investigate locations for a pilot site in Indonesia. The team, including representatives from Cornell University, The University of Queensland and Currie Communications, is hosted by the World Bank Indonesia and the Ministry for Marine Affairs and Fisheries (MMAF).

UPMSI's Dr Gomez named National Scientist

The highest national recognition for Filipinos involved in physical sciences and technology was awarded to eminent CCRES scientist Edgardo Gomez by Philippines president Benigno Aquino III.

SEPTEMBER

Academic peers recognise UPMSI's Perry Aliño

A distinguished member of the CCRES team quantifying the value and market potential of coral reef and mangrove ecosystem services, Dr. Porfirio (Perry) Alexander Aliño, is honoured by his peers at the National Academy of Science and Technology (NAST) in the Philippines. NAST Philippines has conferred the title of 'Academician' to Perry in the field of Marine Chemical Ecology.

Indonesian delegation visits UQ

A high level delegation from the Ministry of Marine Affairs and Fisheries (MMAF) and the national planning ministry (Bappenas) met with CCRES UQ-based researchers and the project executing agency to ensure linkages between COREMAP-CTI and CCRES continue, and to build an understanding of Australian/ Queensland planning and zoning practices.

OCTOBER

Selayar chosen as pilot site in Indonesia

The Regency of Selayar, an archipelago of 130 islands (26 inhabited) in South Sulawesi, is chosen as the pilot site for the CCRES Project in Indonesia. Covering an area of 10,503.69 km^2, including 9,146.66 km^2 of sea and 1,357.03 km^2 land, Selayar encompasses a wide expanse of coral, including the third-largest coral atoll in the world.

Contributing to Bappenas International Development Program

Professor Peter Mumby and Melanie King were invited to present to a delegation from Bappenas on 'Bridging Research to Policy' as part of an International Development Program.

NOVEMBER

Building capacity, technology in Palawan

CCRES project partners from the Palawan State University, Palawan Council for Sustainable Development, El Nido Foundation, UPMSI, and El Nido local government attend a systems thinking training workshop at Palawan State University, Puerto Princesa City.

Meeting local stakeholders

Members of the CCRES team meet with local government representatives, barangay and village leaders, business owners, tourism operators, the women's cooperative, fisherfolk and reef guardsmen in a series of meetings coordinated by the El Nido Foundation to gain insight into socio-ecological problems.

DECEMBER

Base model on coastal defence for El Nido complete

Professor Tom Baldock and his team complete the base model for El Nido designed to develop model wave energy and hydrodynamics across reefs and behind reefs and at shorelines backed by important habitats.

SCIENCE AND DISCOVERY

Pushing research boundaries, frontiers

The CCRES project demonstrates how developing world coastal communities can sustainably capture the benefits provided by ecosystem services, while at the same time improving the governance of natural resources by driving forward their inclusion in systems of national accounts.

CCRES is making explicit the value of 'blue' natural capital and ecosystem services to coastal communities and other stakeholders in the management of a country's natural assets for sustainable development.

CCRES is promoting the application and uptake of model approaches in local planning frameworks; undertaking ecological and economic valuation studies; developing innovative tools and models to support decision-making and new opportunities for eco-business development, and; communicating the results to promote uptake across stakeholders.

Despite year one being a scoping year, the year has already seen progress towards the development of new knowledge and information for stakeholders in the Philippines, with some initial work also underway in Indonesia.

More than 450 million people in the East Asia-Pacific region live below the poverty line, and the livelihoods of many are being further threatened by degradation of coral reefs, mangroves and seagrass beds, due to pollution, unsustainable development, overfishing and climate change.

MEET THE TEAM

UPMSI'S DR GOMEZ NAMED NATIONAL SCIENTIST

THE highest national recognition for Filipinos involved in physical sciences and technology was awarded to eminent CCRES scientist Edgardo Gomez by Philippines president Benigno Aquino III.

President Aquino conferred Professor Gomez as a National Scientist in recognition of his studies on the reproduction of marine invertebrates, which prevented the extinction of true giant clams.

Working with governments, businesses and communities in Indonesia and the Philippines, the CCRES Project's research will initially assist in improving conservation and business planning for coastlines on the islands of Palawan and Selayar where our pilot sites have been established.

Reef fish of the ornamental export trade, Bali, Indonesia.
Photo: A. Edwards

PILOT SITE

EL NIDO: OUR PILOT SITE IN THE PHILIPPINES

EL Nido is a coastal municipality in the north of Palawan in the Philippines. With 18 barangays and covering 465 km², the municipality has been declared a managed resource protected area due to its high marine and terrestrial biodiversity.

Historically, fishing and agriculture have been the main industries in El Nido. Once a boutique tourism location, increasing publicity on the area's dramatic natural beauty and world-class diving in recent years has fuelled the local tourism industry, particularly the backpacker market. The main town, Población, is developing rapidly to cater for increasing tourism. The local population is expanding as immigrants arrive from other areas in the Philippines seeking work in the growing economy.

These and other pressures have the potential to impact the ecosystem services provided by the area's coral reefs, mangroves and seagrass beds. Work done by CCRES with coastal communities in El Nido will support the development of toolkits and spatial planning models that will demonstrate the value provided by the ecosystem services. The information will also be used to identify opportunities to support or enhance sustainable businesses which rely on the area's coastal resources.

Sunset at Commando Beach, El Nido, Palawan, Philippines.
Photo: T. Gilliland

FAST FACTS

- **Land area of 465.10 km²**
- **Bounded by three bodies of water: Linapacan Strait (Luzon Sea), Taytay Bay (Sulu Sea), and Bacuit Bay (West Philippine Sea)**
- **16 of its 18 barangays are coastal**
- **Population: 36,191 (NSCB, 2010)**
  - **95% of the population are migrants**
  - **4.77% annual population growth rate**
- **Largest industries: agriculture, fishing, and tourism (WWF, 2005)**
- **Known locally and internationally as a tourist destination**
- **Number of tourists: Approx. 10,000 in 1994; 50,876 in 2012 (Source: MTO)**
- **El Nido — Taytay Managed Resource Protected Area (ENTRMPA)**
  - **The El Nido-Taytay Managed Resource Protected Area was established on 8 October 1998**
  - **The National Integrated Protected Areas System (NIPAS) and Sustainable Environmental Plan (SEP) Acts are the legal bases for protection**
- **Three major marine habitats, coral reefs, seagrass and mangroves, are present.**
  - **About 800 fish species**
  - **More than 100 species of coral**
  - **Eight species of seagrass**
  - **Nesting area of three species of endangered sea turtles: hawksbill, green sea, and olive ridley**
  - **Large marine vertebrates such as dolphins, whales, manta rays and the dugong have been sighted here**

INDONESIA

PILOT SITE

SELAYAR: OUR PILOT SITE IN INDONESIA

SELAYAR is an archipelago of 130 islands (26 of which are inhabited) in South Sulawesi.

Selayar has 60 village-level marine protected areas, covering 52 coastal villages, a national marine park, Takabonerate, 11 sub-districts, 57 coastal Villages and 74 non-coastal villages.

Covering a total area of 10,503.69 km^2, including of 9,146.66 km^2 of sea and 1,357.03 km^2 of land, Selayar encompasses a wide expanse of coral, including the third-largest coral atoll in the world.

The waters of Selayar are a meeting place for currents from the Indian and Pacific oceans and border deep ocean waters. This geography gives rise to rich and fertile pelagic fishery resources with high economic value, such as tuna and skipjack, and supports fish exports to Bali and Hong Kong.

As well as the potential of its fisheries, Selayar's coastlines have potential for development of marine tourism, supported by the white sand, and the many coral reefs and turtle nesting sites.

Selayar faces obstacles and challenges because of the over-exploitation of reef fish using destructive methods and extensive coral mining. In addition, marine fisheries infrastructure is still relatively minimal.

The fish market on the harbour at Benteng, Selayar.
Photo: M. Paterson

FAST FACTS

- An archipelago of 130 islands (26 of which are inhabited)
- Approx. 90% of the total area of 10,503.69 km^2 is marine
- 11 sub-districts, capital Benteng
- Population: approx. 130,000
  - Selayar Island (100,000 people) — 60% farmers
  - Smaller islands (30,000 people) — 90% fisherman
- Largest industries: Fisheries and agriculture (coconut, clove, oranges, rice, nutmeg)
- Two small, foreign-owned tourism resorts, four dive operators
- Protected, conserved marine areas
  - Sixty village-level marine protected areas (MPAs)
  - Two district-level Marine Conservation Areas (MCAs) — Gusung and Kayuadi
  - A national marine park, Takabonerate (incl. third-largest coral atoll in the world)

SCIENCE IN FOCUS
ESTIMATING CHANGES TO COMMUNITY STRUCTURE AND FISHERIES PRODUCTIVITY

For a clear explanation of why the structural complexity of coral reef habitats is vital for fisheries productivity, look no further than the work being undertaken by Dr Alice Rogers. For CCRES, Dr Rogers is seeking to assign value to the services provided by coral reefs and related ecosystems, and inform management decisions to maximise sustainable service provision.

Combining theoretical and empirical approaches, Dr Rogers is hoping to answer key questions about the conservation, restoration and management of coral reef ecosystems and the services they provide.

Dr Rogers' work is focusing on how local and global impacts alter the productivity and value of coral reef fisheries.

At present, Dr Rogers is developing size-based food web models to estimate changes in community structure and fisheries productivity, in response to habitat degradation and declining reef complexity, as well as variation in planktonic and benthic productivity and fishing pressure.

MONITORING ECOSYSTEMS AND HABITAT IN THE PHILIPPINES

Identifying priority sites for ecosystem conservation requires knowledge on connectivity and habitat quality. One stream of activity within CCRES involves the development of a larval dispersal model that can provide information on the strength of connectivity between reefs in Bacuit Bay, El Nido.

Understanding connectivity will help determine linkages between reef systems which may have an impact on overall ecosystem health and resilience.

The team from UPMSI has conducted three boat surveys in Bacuit Bay over the last year to obtain profiles of ocean currents. The most recent survey was completed in November. The field observations will now be compared with the results of a 3D hydrodynamic model which is being developed for Bacuit Bay.

The dispersal of larvae is largely determined by ocean currents that transport larvae between distant habitat patches. Knowing how ocean currents vary spatially and how the hydrodynamic regime changes with, say, the tides or with the seasons, allows researchers to better capture the extent of dispersal.

A clown fish in a magnificent anemone in the Selayar islands, Indonesia.
Photo: P. Mumby

Science in action: Bayosa Aya Cariño (front) and Anabel Gammaru measure physical properties such as temperature and salinity, El Nido, Palawan, Philippines.
Photo: L Solera

Measuring mangrove girth, El Nido, Palawan, Philippines.
M. Samson

Monitoring sediment volumes, El Nido, Palawan, Philippines.

SCIENCE IN FOCUS
VALUING ECOSYSTEMS FOR COASTAL DEFENCE

Reefs, beaches and mangroves protect infrastructure, communities and ecosystems from inundation and erosion, as well as being resources in their own right.

CCRES researchers led by Professor Tom Baldock are seeking to determine the value these systems have as coastal defences, and to evaluate how changes in one system will affect the ecology and function of dependent habitats (e.g. reef-seagrass-mangroves).

Development of broad-scale and local scale hydrodynamic models (currents and waves) to model wave energy and hydrodynamics across reefs and behind reefs and at shorelines backed by important habitats has commenced with the base model for El Nido ready for testing on-ground in early 2015.

UNDERSTANDING SEDIMENT TRAPPING CAPACITY OF MANGROVES AND SEAGRASSES, AND HOW THESE HABITATS SUPPORT COASTAL DEFENCE

Researchers from the Marine Science Institute at the University of the Philippines and De La Salle University, have been investigating the sediment trapping capacity of mangroves and seagrasses — two other priority ecosystems under consideration in the project.

Trapping sediment is one of the most important ecological functions that these two habitats provide. Filtering upland runoff protects the adjacent habitats from siltation that can have harmful effects on coral reefs and reduce water quality which in turn impacts marine life and fisheries.

Data gathered in field surveys in May and November 2014 is now being analysed to further understand the importance of mangroves and seagrasses in filtering upland runoff.

UNDERSTANDING THE INTERACTIONS BETWEEN TOURISM AND COMMERCIAL FISHING

Small-scale nearshore fisheries provide an important source of protein and sustainable livelihoods in developing countries. Yet, for a number of reasons, small-scale fisheries pose particular challenges for marine conservation efforts. Past and current efforts at reforming fishery management have focused narrowly on the fishing sector and on fishing households. However, the livelihoods of fishing and non-fishing households in these communities are deeply intertwined, and households depend on a diversity of activities connected, directly or indirectly, with the marine environment. The fishing and marine tourism sectors act as a conduit through which the benefits of fishery management reform and habitat conservation enter the local economy.

Because the local economy-wide impacts of a policy intervention are currently omitted from most policy analyses, a central goal of the research undertaken by Professor Jim Sanchirico is researching whether and when the inclusion of these effects is critical in designing and evaluating marine conservation interventions.

In El Nido the community is facing a number of challenges and opportunities. Firstly, there has been a significant population increase (6%) led by a growth in the tourism industry. Secondly, while the fishing sector is mainly artisanal fishers that fish the nearby waters, the fish stocks are overfished. Given these challenges, which are not abating, there is a need to better understand the trade-offs among increasing economic returns from tourism, population growth, and restoring the ecosystem that made and continues to make El Nido a destination location.

Utilising the Bio-LEWIE modelling framework to help model the trade-offs facing this community, CCRES aims to provide stakeholders with insights into the different policy interventions they can use to manage their local economy and ecosystem.

The research underway will make it possible to study the short and long-term impacts of marine conservation interventions on local economies and on specific household groups, while providing a basis for designing and implementing measures to facilitate adjustment.

In addition, the new tool can be used to measure the value of the fishing and tourism sector (and improvements therein) in the local and regional economy.

Tourism development dominates the foreshore in El Nido Town, Palawan, Philippines.
Photo: M. King

Morning catch: Fish netted off the beach at El Nido Cove, Palawan, Philippines.
Photo: M. Paterson

Ominous sign: Canopies of the seaweed, Sargassum, crowd coral at Busuanga, Palawan, Philippines.
Photo: P. Mumby

EXAMINING ECOSYSTEM FILTRATION SERVICES FOR HUMAN AND REEF HEALTH

There may be a natural way to reduce levels of disease-causing pollutants entering coastal reefs.

Ecosystem filtration of toxins, nutrients and pathogenic microorganisms provided by coastal seagrasses and mangroves are one of the potentially highest value ecosystem services provided by natural marine ecosystems.

Research led by Professor Drew Harvell and Dr Joleah Lamb is assessing the level by which intact seagrass meadows reduce pollutants to both humans and reef health in coastal regions of Indonesia. Initial research is quantifying the benefits and value of the filtration ecosystem service and revealing the linkages between the health of marine ecosystems and their ability to filter.

During the year study sites in the Spermonde Island region in South Sulawesi have been chosen. At each island environmental parameters, seagrass cover and diversity measurements and water samples have been collected within intact seagrass meadows and outside of seagrass meadows. Coral health and disease surveys were conducted to examine whether seagrass meadows influence the prevalence of diseases or other indicators of compromised health of adjacent reef corals. This data will now be used to examine links between coastal filtration services and the prevalence of compromised health and diseases affecting reef corals.

MAKING SENSE OF MARINE PLANNING IN INDONESIA

Marine spatial planning in Indonesia is complex. Planners grapple with a variety of inter-connecting economic, social and ecological issues across different spatial and time scales.

The issues include income growth, fisheries sector sustainability, habitat destruction, erosion, tidal flooding, sanitation, community access to marine resources and strengthening local institutions.

The response by local government in Indonesia to address this web of inter-connectivity, according to Dr Firdaus Agung, Deputy Director for Conservation Use at the Ministry of Marine Affairs and Fisheries (MMAF), is the development of an integrated coastal management (ICM) document, comprising four hierarchical plans:

- Strategic plan (20-year timescale);
- Zonation plan (20-year timescale);
- Management plan (coordination and how they will achieve objectives and engage with stakeholders — 5-year timescale); and an
- Action plan (2-year timescale).

Dr Agung, who has been an integral part of planning CCRES activities in Indonesia, led a delegation of marine conservation and planning officials from the Indonesian Government (MMAF and Bappenas) on a visit to the Global Change Institute at The University of Queensland for meetings with the CCRES team.

CONNECTING WITH COMMUNITIES THROUGH TECHNOLOGY

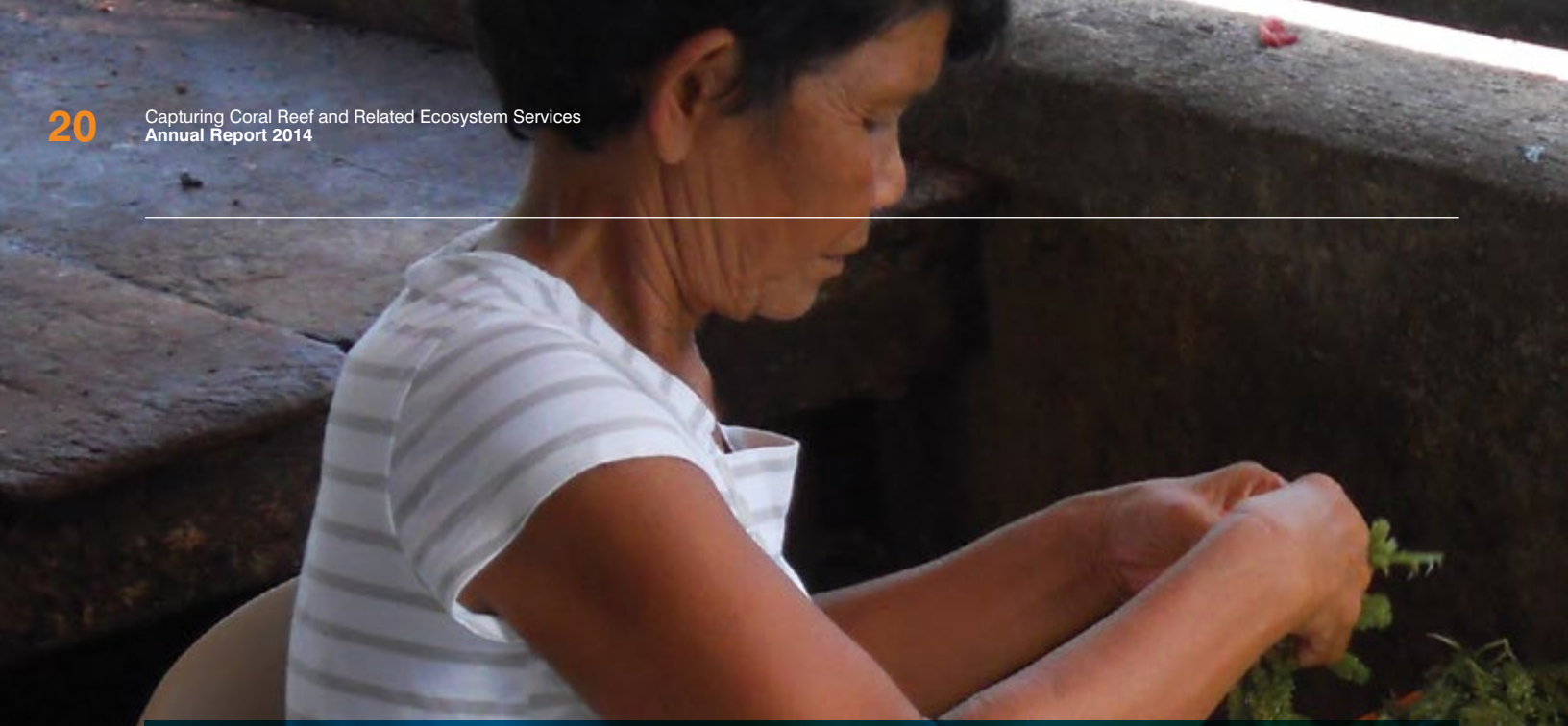
The Capturing Coral Reef and Related Ecosystem Services (CCRES) Project is using new technologies to engage with communities in El Nido to investigate socio-ecological problems such as food insecurity, fish catch decline, mangrove loss and water pollution.

Four local Philippines-based teams composed of members familiar with local systems, language and culture facilitated discussions with local stakeholders at the pilot site of El Nido to gain information on various aspects of food insecurity, fish catch decline, mangrove loss and water pollution.

In these discussions they use iPads and a new iPad App developed by the CCRES team called SESAMME (Socio-Ecological Systems App for Mental Model Elicitation). SESAMME allows focus group teams to build socio-ecological system models with stakeholder groups in a visually-interactive way using drag and drop icons and Google maps. Portable LCD pico projectors, which do not require a power source, support on-site discussions.

These new techniques can enhance data collection and generate output more quickly. The use of such interactive technology is also a fresh way to inspire interest among local communities.

Systems thinking is the science of understanding the relationship between the behaviour of a system and its structure. The structure of a system is made up of system components and their interactions. These interactions determine how the system behaves, so if we can unravel these interactions then we can better predict and manage system behaviour.



MEET THE TEAM
FEEDBACK LOOPS, SYSTEMS THINKING

WHAT makes CCRES different? Well, the answer may depend on who in the CCRES team you ask.

Dr Carl Smith, leader of the systems modelling component, will tell you it's how CCRES will bring a 'whole of system' business thinking to the way in which coastal communities manage their natural capital assets to support sustainable livelihoods.

As a beekeeper, Dr Smith understands instinctively how the ecological and the economic can work in harmony — yet, with a background in traditional agricultural science, he is used to looking at livelihoods which are in conflict with ecosystems and degrade the services they provide.

"In the CCRES project we are trying to turn that around and develop businesses and livelihoods that actually enhance and support ecosystem services," said Carl whose role in CCRES is to investigate the links between ecological and socio-economic systems.

"We will model those relationships so that we can see how livelihoods can be designed that either maintain ecosystem services or enhance them. We can design experiments that test different scenarios and see what happens if the ecology changes."

Carl is working closely with Dr Mark Milstein from the Center for Sustainable Global Enterprise at the Johnson School of Management at Cornell University on the CCRES project. Their work is demonstrating how communities can combine local knowledge with business knowledge and decision-making tools to create complementary suites of businesses that promote social, environmental and financial outcomes.

"What excites me about CCRES is the opportunity to design livelihoods and businesses which work in harmony with ecology and enhance ecosystem services, while at the same time providing communities with income and employment," said Carl.

"Like the bees and their honey, we need healthy ecosystems for food security and wellbeing. CCRES allows us to look at the whole system to work out what opportunities exist and what trade-offs may be necessary to ensure coastal ecosystems can continue to provide these things."

Dr Carl Smith: Seeking harmony between economics and ecology.
Photo: G. Sheehan

Ocean harvest: Selling seaweed at the local market, Batanyan Island, Cebu, Philippines.
Photo: A. Edwards

Coastal livelihood: A local fisherman at Wakatobi, Indonesia.
Photo: A. Edwards

PARTNERSHIPS, PEOPLE AND ENGAGEMENT

Collaboration, teamwork: it's who you know

Year One has been very active in terms of establishing partnerships and building a community of stakeholders. We have focused significant effort on establishing partnerships and relationships, and building our team of experts.

We took time to research, analyse and prioritise stakeholders and their networks to ensure we are establishing connections which will support delivery of the project and ensure it has long-term impact.

We have since commenced engagement with local, national and regional stakeholders with significant results which will enable the project to work effectively at the pilot sites and to ensure a greater uptake of the tools and models developed.

Warm welcome: Mark Milstein, Cornell University, meets locals at Benteng, Selayar.
Photo: M. Milstein

In Year One we developed a communications, engagement and outreach strategy to guide this activity for the life of the project. This is supported by a Philippines workplan, drafted in conjunction with country partners. Development was underpinned by a robust stakeholder analysis for the region and for the Philippines. A similar analysis for Indonesia is underway.

The CCRES team undertook direct engagement with local stakeholders and beneficiaries at the pilot sites. An initial visit to Selayar in August resulted in confirmation of this location as the pilot site.

In El Nido, where implementation of CCRES is further advanced, members of the CCRES team met with local government representatives, barangay and village leaders, business owners, tourism operators, the women's cooperative, fisherfolk and reef guardsmen to gain insight into some of the key socio-ecological problems faced by the El Nido municipality. Discussions focussed on issues such as mangrove loss, fish catch decline, water pollution and food insecurity. We also explored business and resource use activities. The information gleaned helped to refine activity focus and will inform several aspects of the CCRES project.

Furthermore, through our social media platforms Twitter and Facebook, and a series of email bulletins, we kept partners and stakeholders up to date with the progress of the project.

Local and national partnerships will underpin the implementation of CCRES. The involvement of local communities, government and businesses as partners is critical to ensuring the findings are relevant, practical and accurate.

WELCOMING CCRES PARTNERS

Partnerships and collaborations are central to how the CCRES project operates both internationally and on-ground at the pilot sites.

The fortunes of CCRES will depend in no small part on the partnerships the project forms with groups from the private, public and non-profit sectors in the Philippines and Indonesia.

During the past year, the leadership group has been developing these partnerships to ensure a more effective implementation of activities and uptake of the knowledge and outputs generated through the research effort.

Whilst the project is still finalising partnerships, we are proud to announce the following partners and collaborators:

International

- The World Bank
- Global Environment Facility
- The University of Queensland
  - Global Change Institute
  - School of Biological Sciences
  - School of Agriculture and Food Sciences
  - School of Civil Engineering
  - UQ Business School
  - School of Psychology
  - Centre for Biodiversity and Conservation Science
- Cornell University
  - Center for Sustainable Global Enterprise, Johnson School of Management
  - Department of Ecology and Evolutionary Biology
- University of California, Davis
- Currie Communications

Philippines

- University of the Philippines, Marine Science Institute
- Department of Environment and Natural Resources
- Palawan Council for Sustainable Development
- El Nido Local Government Unit
- El Nido Foundation
- Palawan State University
- De La Salle University

Indonesia

- Ministry for Marine Affairs and Fisheries
- Bogor Agricultural University, Center for Coastal and Marine Resources Studies
- University of Hasanuddin
- DINAS Marine and Fisheries, Selayar

LAUNCHING CCRES IN THE PHILIPPINES

The University of the Philippines, together with The University of Queensland, officially launched the CCRES Project in Manila in July this year. More than 50 guests from 33 affiliations attended the launch, which was hosted by the University of the Philippines, Marine Science Institute.

Dr Annette Menez, Director of UP's Marine Science Institute, summed up the importance of the work:

"Unlocking the economic and social value of coastal ecosystems gives an incentive to local communities, businesses, investors and policy-makers to preserve them (and their services) for future generations."

During the launch, CCRES formally welcomed partnerships with:

- the University of Philippines Marine Science Institute;
- the Department of Environment and Natural Resources, through the Biodiversity Management Bureau;
- the Palawan Council for Sustainable Development;
- the El Nido Local Government Unit (LGU);
- the El Nido Foundation; and
- the Palawan State University.

These 'in-country' partners were presented with indigenous Australian message sticks by the Project Executing Agency, the UQ Global Change Institute, during a Coming Together ceremony in Manila.

Prof. Edgardo Gomez, UPMSI, and Mark Paterson, Currie Communications, at the Philippines launch.
Photo: K. Sampson

Dr Annette Menez, UPMSI, and Melanie King, UQ, officially unveil the CCRES project in the Philippines.
Photo: M. Paterson

Coconut harvesting: In order to supplement their income people from Bontolebang Village, Selayar, turn to chopping coconut flesh for selling to the district buyer.
Photo: M. King

MEET THE TEAM
HARYUNANI (YUNI) KUMOLORARAS

IBU Haryunani (Yuni) Kumoloraras has a spirit for learning.

Our Jakarta-based Indonesian Country Coordinator — an advisor to the World Bank Indonesia and a specialist in community micro-finance, project leadership and group facilitation — craves knowledge.

Yuni brings that yearning to CCRES, following stints at COREMAP II and COREMAP CTI, working on Community Development and Access to Micro Finance, with the Directorate General of Coastal and Small Islands at the Ministry of Marine Affairs and Fisheries, and the Environment Unit at the World Bank Indonesia.

"I'm excited about joining CCRES because it gives me the chance to work with the best professors from several international universities and to learn about global best-practice," said Ibu Yuni.

"I get the opportunity to learn new, challenging things, especially how to value coastal ecosystem services, why they are so important to communities, and how to develop marine spatial plans."

For Ibu Yuni, Selayar is an ideal location for the CCRES pilot site in Indonesia.

"The island of Selayar is not too small and it's not too big, it's clean and the weather is nice. The food (especially spicy food) and hospitality of the people make it welcoming too," said Ibu Yuni.

No achievement makes Ibu Yuni prouder than completing a challenging task on-time. Through her faith and prayer, she finds the stamina and persistence to work hard to solve complex problems.

"I feel most happy when I'm able to help poor, honest people change their lives for the better," she said.

MEDIA ARTICLE
THE PHILIPPINE STAR

THE PHILIPPINE STAR ABSTRACT

PHL, AUSTRALIA LAUNCH PROJECT ON CORAL REEFS, MANGROVES

By Rhodina Villanueva
July 11, 2014

MANILA, Philippines — The Philippines and Australia have launched a project that aims to determine the value and market potential of local coral reef and mangrove ecosystem services, environment officials announced yesterday.

Under the Capturing Coral Reef and Related Ecosystem Services (CCRES) project, the two countries will come up with innovative models for valuing mangrove, sea grass and coral reef ecosystem services.

"The move aims to enhance the sustainability of marine-based enterprises and marine spatial planning in select coastal communities in the Philippines," said Theresa Mundita Lim, director of the Biodiversity Management Bureau, an attached agency of the Department of Environment and Natural Resources.

Lim said the agency is looking forward to implementing the project, which recognizes the value of blue capital and its potential for growth.

"The project will help us convince stakeholders that the environment is a good investment as it benefits the communities," she said.

Information generated from this project will be translated into new policies or will update existing ones to replicate the undertaking in other coastal communities.

Aside from the Philippines, the CCRES project will also be implemented in Indonesia for a period of five years.

As the implementing agency, the Global Environmental Facility (GEF) has committed $4.5 million for the project through the World Bank.

"Coastal communities can develop new eco-friendly and sustainable enterprises to increase revenue and improve their resilience to climate change impact," Lim said.

Childhood chores: Children collect mangrove wood to use for firewood on Batanyan Island, Cebu, the Philippines.
Photo: A. Edwards

PARTNERING TO SCALE UP AND REPLICATE KNOWLEDGE IN THE REGION

CCRES has been invited to partner with PEMSEA in delivering on their initiative "Applying Knowledge Management to Scale up Partnership Investments for Sustainable Development of Large Marine Ecosystems of East Asia and their Coasts". In March, PEMSEA convened a gathering of World Bank regional investment projects to explore how we can fill the gap in sharing of information and lessons across the region in a harmonised manner. PEMSEA aims to develop a platform which enables the scope and coverage for enabling, capturing, integrating and sharing knowledge across multiple sectors and among countries for improved governance and sustainable development of coasts and oceans of the East Asian Seas region.

This PEMSEA initiative addresses the need for conversion and integration of new information and knowledge into innovative policies and development programs, scaling up and replicating initiatives, and increased commitments of resources and new investments by the public and private sectors. This key initiative aims to facilitate interaction among policymakers, implementers, networks and investors, and address gaps in necessary skills and services to move from policy and planning into actions and investments through intergovernmental arrangements and communities of practice at the regional, national and local levels.

KNOWLEDGE EXCHANGE
UQ HOSTS INDONESIAN MMAF AND BAPPENAS OFFICIALS

IN September, CCRES hosted a visit by Indonesian Government marine conservation and planning officials. The aim of the visit for the delegation was two-fold:

- To further CCRES-COREMAP-CTI (Coral Reef Rehabilitation Management Program-Coral Triangle Initiative) discussions; and
- To learn more about how marine conservation planning approaches and methods in Australia might be able to be applied in an Indonesian context.

During the visit the seven-member delegation, comprising representatives from the Ministry of Marine Affairs and Fisheries (MMAF) and Bappenas, met with Queensland government agencies and UQ researchers, and attended briefings by the Great Barrier Park Marine Authority (GBMPA) and the Healthy Waterways project.

Didi Sadili (left), Ibu Anita Setianingsih and Dr. Firdaus Agung, review the Healthy Waterways Report Card (2013).
Photo: M. King

Team meeting: The CCRES team on a field trip off Miniloc Island, El Nido, Palawan, Philippines.

OUR PEOPLE

Multi-disciplinary teams working across borders, cultures

With the confirmation of partners, the CCRES team was consolidated during the year with the necessary skills to deliver the project.

The team is multi-disciplinary, made up of international and in-country specialists who bring a unique range of skills to the project.

These include:

- agricultural science
- business management
- computational modelling
- coral reef taxonomy
- ecology
- environmental science
- food security
- marine biology
- conservation planning
- engineering
- natural resource management
- stakeholder communications and engagement
- systems modelling
- governance and policy
- project management

While the CCRES team will work primarily at the local level with governments and local communities, it will make all information and resources available through the project's knowledge management platform for replication and uptake at the national, regional and global levels.

ADVISORY BOARD

The CCRES Advisory Board met for the first time in 2014. Their role is to provide independent oversight of the annual workplans and budgets; advice on the linkages and synergies with World Bank investment projects and other regional and national projects and activities; and advice and linkages on project outputs to policy and management. Board members are:

- Mr Harideep Singh (World Bank)
- Undersecretary Anna Teh (Department of Environment and Natural Resources, Philippines)
- Ms Carolina V. Figueroa-Geron (Philippines Rural Development Project)
- Dr Stephanie Sieber and Ms Maya Villaluz (Wealth Accounting for the Valuation of Ecosystem Services Project)
- Mr Adrian Ross (Partnerships in Environmental Management for the Seas of East Asia, PEMSEA)
- Dr Zainal Arifin (Lembaga Ilmu Pengetahuan Indonesia (LIPI))
- Dr Firdaus Agung (COREMAP-CTI and Ministry of Marine Affairs and Fisheries, Indonesia)
- Professor Andrew Griffiths (The University of Queensland)
- Ms Melanie King, Ex-officio (Senior Advisor, Project Executing Agency)

LEADERSHIP GROUP

The CCRES Leadership Group consists of the component team leaders and the project director/senior advisor with external input as required. Leadership Group members are:

- Professor Peter Mumby, Chief Scientist (The University of Queensland)
- Professor Mark Milstein (Cornell University)
- Dr Carl Smith (The University of Queensland)
- Mr Mark Paterson (Currie Communications)
- Ms Melanie King (The University of Queensland)

CCRES MEMBERS

Management

Ms Melanie King, Project Director

Ms Kristen Sampson, Project Manager

Ms Miledel (Mags) Quibilan, Philippines Country Coordinator

Ms Lyn Riveral

Ms Noreen (Kubi) Follosco

Ms Harjunani Kumoloraras, Indonesia Country Coordinator

Main image: The Advisory Board, Leadership Group and Management Team met for the first time in Manila during July 2014.

Inset: Undersecretary Annaliza Teh, Department of Environment and Natural Resources, Philippines, and Miledel Quibilan, UPMSI.

Component One
Quantifying the value and market potential of coral reef and mangrove ecosystem services

The University of Queensland
Professor Peter Mumby, Chief Scientist and Team Leader
Professor Tom Baldock
Dr Alice Rogers
Mr Nicholas Wolff
Dr David Callaghan
Dr Behnam Shabani

University of California, Davis
Professor Jim Sanchirico
Mr Ted Gilliland

Cornell University
Professor Drew Harvell
Dr Joleah Lamb

University of the Philippines
Professor Cesar Villanoy
Professor Perry Aliño
Ms Leilani Solera
Dr Vera Horigue
Ms Bayosa Aya Cariño

De La Salle University
Dr Al Licuanan
Dr Maricar Samson

Hasanuddin University
Professor Jamal Jompa
Ms Nur Abu

Component Two
Forging community-led innovation in capturing and sustaining benefits from marine ecosystem services and enhancing resilience in the face of climate change

Cornell University
Professor Mark Milstein, Team Leader

The University of Queensland
Dr Carl Smith
Dr Russell Richards
Mr Siham Affata
Ms Melanie King

Palawan State University
Dr Aynon Gonzales
Dr Patrick Regoniel
Dr Roy Bero
Dr Agustin Miraflores, Jr
Dr Marissa Pontillas
Ms Eva Marie Ponce de Leon
Ms Gianina Decano
Mr Mark Buncag

Palawan Council for Sustainable Development Staff
Mr John Pontillas
Ms Glenda Cadigal
Ms Grace Palatino
Ms Janet Felizarte
Mr Benjamin Adriano Jr

El Nido Foundation
Ms Irma (Mauis) Rose C. Marcelo
Mr Lloyd Lumbania
Mr Rogelio Manlavi
Mr Gelei dela Cruz
Ms Pattie Lumbania

Component Three
Promoting behavioural change through outreach, decision support and regional learning

Currie Communications
Mr Mark Paterson, Team Leader
Ms Gabrielle Sheehan

The University of Queensland
Ms Melanie King
Professor Matt Sanders
Mr John Pickering

Chief scientist Peter Mumby, UQ, (left) discusses marine spatial planning with government officials in South Sulawesi, Indonesia.
Photo: M. Paterson

Mangrove inspection during a visit to Bantayan Island, Cebu, Philippines.
Photo: A. Edwards

MEET THE TEAM

MILEDEL (MAGS) QUIBILAN

"MY happy place" is how Miledel Christine (Mags) Quibilan describes El Nido, a municipality in Palawan selected as a pilot site in the Philippines for the CCRES project.

A coral reef ecologist by trade, Mags has worked among the coral reefs of Palawan for almost 20 years researching and monitoring the effects of coral bleaching, infestations by Crown-of-Thorns starfish and local disturbances, such as higher boat traffic and pollution caused by the increasing number of tourists coming to El Nido. Over the years, she has seen a significant change in the health of the reefs and a reduction in the abundance of sea life.

"Reefs can heal themselves but this ability and their rate of recovery is upset by the man-made disturbances," said Mags.

"If we maintain this track — if we don't change our ways — reefs, mangroves and seagrass beds will look very different. Lives and fisheries will change.

"The CCRES project will help us to demonstrate how the ecological conditions of our coral reefs, mangroves and seagrasses are linked with the social and economic aspects of life in coastal communities," she said.

"Decision support tools from the project will help people visualise and understand the consequences of their actions and make their own decisions about the future.

"We have a chance to change, and better protect the marine environment."

Mags will coordinate the CCRES project in the Philippines and work with national and local partners and stakeholders to ensure the project delivers relevant outcomes that can be taken up at the local, national and regional level.

Mags is currently completing her PhD at the Marine Science Institute, University of the Philippines Diliman in coral reef ecology.

Her interests include marine conservation planning, marine protected area management, and climate change impacts on the marine environment. As well as being a passionate conservationist, Mags loves to travel and is a self-confessed "foodie" with strong interests in Asian cooking.

FINANCIAL OVERVIEW

Investing in the future of coastal communities

GEF Funding Budget approved for the period:

1 July 2013 to 30 June 2014: **USD $431,455** and;

1 July 2014 to 30 June 2015: **USD $996,795**

Budget executed up to 31 December 2014 (GEF Funding source): **USD $431,836.71**

UQ Funding Budget approved for the period:

1 July 2013 to 30 June 2014: **AUD $280,500** and;

1 July 2014 to 30 June 2015: **AUD $490,000**

Budget executed up to 31 December 2014 (UQ Funding source): **AUD $698,262.80**

DISBURSEMENTS

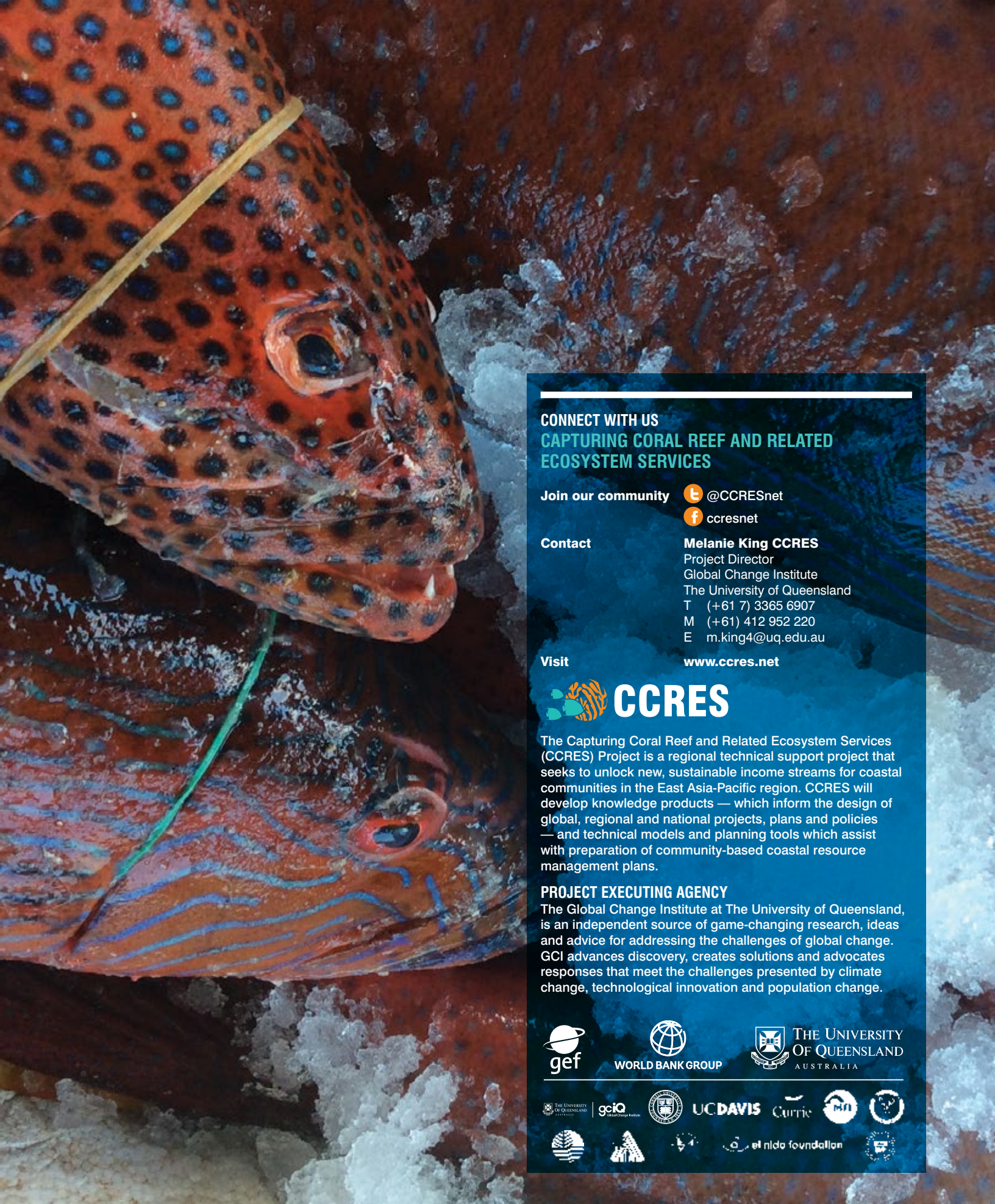
Disbursements for the 2013/14 reporting period has seen approximately 10% of the overall funds for the project disbursed. The project is on track to finalise remaining project payments prior to year three funding releases.

Expenditure for year one also reflects approved payments following successful contract variations for year two released prior to 31 December 2014.

Disbursements for the GEF and UQ funds for the period: 1 July 2013 to 31 December 2014 are as follows:

FUNDING SOURCE	FUNDS APPROVED 1 JULY 2013 TO 30 JUNE 2015	FUNDS EXPENDED 1 JULY 2013 TO 31 DECEMBER 2014
GEF Funds	USD $966.795	USD $431,836.71
UQ Funds	AUD $770,500	AUD $698,262.80

Market fresh: Mussels for sale at Purerto Princesa market, Palawan, Philippines.
Photo: M. Paterson



CONNECT WITH US

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CCRES

The Capturing Coral Reef and Related Ecosystem Services (CCRES) Project is a regional technical support project that seeks to unlock new, sustainable income streams for coastal communities in the East Asia-Pacific region. CCRES will develop knowledge products — which inform the design of global, regional and national projects, plans and policies — and technical models and planning tools which assist with preparation of community-based coastal resource management plans.

PROJECT EXECUTING AGENCY

The Global Change Institute at The University of Queensland, is an independent source of game-changing research, ideas and advice for addressing the challenges of global change. GCI advances discovery, creates solutions and advocates responses that meet the challenges presented by climate change, technological innovation and population change.

gef

WORLD BANK GROUP

The University Of Queensland AUSTRALIA

el nido foundation