



University of Belize



# ENVIRONMENTAL RESEARCH INSTITUTE

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**Annual Report  
2011–2012**

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## ...VISION...

As the premiere environmental research institute in Belize and highly respected in the region, ERI provides sound science and creates a culture of evidence-based decision-making in the public and private sector in areas relevant to sustainable development.

## ...MISSION...

The Environmental Research Institute continuously builds national scientific capacity for the effective management, sustainable use and conservation of Belize's natural resources.

# ACRONYMS

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<b>APAMO</b>	Association of Protected Area Management Organizations
<b>BAS</b>	Belize Audubon Society
<b>CBC</b>	Central Belize Corridor
<b>CATHALAC</b>	Water Center for the Humid Tropics of Latin America and the Caribbean
<b>CBWS</b>	Cockscomb Basin Wildlife Sanctuary
<b>CCCCC</b>	Caribbean Community Climate Change Center
<b>CCFS</b>	Calabash Caye Field Station
<b>CREWS</b>	Coral Reef Early Warning System
<b>CSU</b>	Colorado State University
<b>ERI</b>	Environmental Research Institute
<b>ERI-SC</b>	ERI-Steering Committee
<b>EU</b>	European Union
<b>FD</b>	Forest Department
<b>FST</b>	Faculty of Science and Technology
<b>GEF</b>	Global Environment Facility
<b>ICT</b>	Information and Communication Technology
<b>KRAs</b>	Key Result Areas
<b>LAMP</b>	Long-term Atoll Monitoring Protocol
<b>LIC</b>	Land Information Center
<b>MBRS</b>	Mesoamerican Barrier Reef System
<b>MNRE</b>	Ministry of Natural Resources and the Environment
<b>NGO</b>	Non Governmental Organization
<b>NPAS</b>	National Protected Areas Secretariat
<b>NPASP</b>	National Protected Areas System Plan
<b>NPATC</b>	National Protected Areas Technical Committee
<b>NRM</b>	Natural Resources Management
<b>NRMP</b>	NRM Program
<b>PACT</b>	Protected Areas Conservation Trust
<b>SACD</b>	Sarteneja Alliance for Conservation and Development
<b>SEA</b>	Southern Environmental Association
<b>SPAG</b>	Spawning Aggregation
<b>TASC</b>	Turneffe Atoll Sustainability Council
<b>TIDE</b>	Toledo Institute for Development and Environment
<b>TNC</b>	The Nature Conservancy
<b>UB</b>	University of Belize
<b>UNCW</b>	University of North Carolina Wilmington
<b>UNDP</b>	United Nations Development Programme
<b>UWI</b>	University of the West Indies
<b>WCS</b>	Wildlife Conservation Society
<b>WWF</b>	World Wildlife Fund
<b>Ya'axché</b>	Ya'axché Conservation Trust (YCT)

# ACKNOWLEDGEMENTS

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The ERI thanks all of its partners and friends for their contribution and support to the Institute during the 2011-2012 academic year. We especially acknowledge our major partners, the Oak Foundation and Panthera for their tremendous and consistent support. We thank the United Kingdom's Darwin Initiative and our main project partners in the UK: University of Southampton, University of Edinburgh and RBGE; we also thank CATIE, WWF, WCS, TNC, UNCW, Seagrass Net, TSA, the Oceanic Society for their support and contribution to our programs; our Caribbean partner Universities: UWI-St. Augustine, Anton de Kom University of Suriname and University of Guyana for working with us on the Regional M.Sc. Biodiversity Conservation and Sustainable Development Program; our local partners and collaborators: NPAS, the Forest Department, the Fisheries Department, the Land Information Center, BAS, Ya'axché Conservation Trust, TIDE, SEA and SACD.

We especially thank our ERI-SC for providing oversight for our operations and programs throughout the academic year and thank the University President, Provost and the Board of Trustees for continuing to have confidence in and supporting our work. There are also many UB offices/departments that provide constant support to us. We wish to especially acknowledge: the Office of the Provost, the Finance Office, the Accounts Office, the Admissions Office, the Registrar's Office, the Science Department, the ICT Department, the Physical Plant Department, the Office of Public Information and the Department of Public Safety.

Finally, we thank all the volunteers who have dedicated their time and resources to making the ERI Programs a success; especially, Corinne Klein, our Volunteer Research and Education Officer at the CCFS from February-July 2012, our crew of UB student volunteers who help us routinely with our marine monitoring and other volunteers who help with our wildlife and botanical work.



# PRESIDENT'S MESSAGE...

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**Cary Fraser, Ph.D.**  
President, University of Belize

The 2011-2012 academic year has seen continued progress on many fronts for the ERI and its role as both a resource for the University and for the wider society. That role is performed in multiple fora – as a training institution for students and researchers, as an advisory mechanism for national policy, as a partner with regional and international institutions, and, importantly as a source for well-considered evidence-based assessments on issues of environmental management. The ERI stands as a model for other units within the University and for the University's development as a strategic asset for building intellectual and professional capacity within Belize and the wider circum-Caribbean region.

“

**...the University should be the foundation stone for the training of successive generations of leaders and skilled people who can work to improve life for all Belizeans...as educators, we need to emphasize that university-level education is designed ultimately to create decision-makers for the wider society.**

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# Overview Of The Past Year

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**Elma Kay , Ph.D.**

Administrative Director  
&  
Science Director (Terrestrial)

I am pleased to share the highlights of our work at the UB ERI during the 2011-2012 academic year. Following up on our 2010-2015 Strategic Plan, we completed and started implementation of both our business plan, and new ERI-SC charter and operating procedures. Our vibrant crew of 27 full time and part-time staff, including our four student assistants, continued to work on our three main programs.

Through our *Research and Monitoring Program*, we began the development of the National Biodiversity Monitoring Program, a critical element and gap for evidence-based management of our National Protected Areas System and natural resources. We expanded our marine monitoring at the Calabash Caye Field Station in the Turneffe Atoll and also our work investigating the social and economic aspects of wildlife use.

Our *Training and Fellowships Program* was expanded through the addition of our Marine Research Fellow, Dr. Perez-Rogers, who is focusing her research efforts on investigating the status and potential of the sea cucumber fishery. We also completed the development of the National Training Program for Protected Areas Management and started offering the Regional Master of Science Program in Sustainable Development and Biodiversity Conservation.

Finally, under the *Communications & Outreach Program* we continued to coordinate and participate in various networks and national committees, and improved our databases, website and Publications Repository to make scientific information more available to stakeholders and the public. I hope you enjoy the details of these highlights and more as you go through the report.







## **IMPROVING GOVERNANCE & MANAGEMENT**

*Institutional Strengthening and Sustainability*

# POLICIES AND PROCEDURES MANUAL

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The Operational Policies and Procedures (OPP) Manual was developed to provide the parameters that will govern the daily operations of the ERI. The manual will serve to guide the ERI staff in the responsible execution of their duties as it details their basic rights and responsibilities while they are employed by the University to work at the ERI. The manual was necessary, particularly because the ERI staff often work in the context of duties and responsibilities that are new to the University. The policies and procedures set forth are key in allowing for a productive and equitable environment. The manual draws upon exist-

ing University of Belize (UB) policies and procedures, in some instances further articulating these for clarity, while in other instances modifying or adding new policies and procedures to reflect current best practices in the administration and management of operations. The ERI, therefore, considers the manual a “living document” and expects to continuously update it to adapt to new, operational best practices as well as to reflect and better address changes in the work environment. It is also our hope that the manual will assist the University in its current efforts to further articulate its overall policies and procedures.

## STEERING COMMITTEE CHARTER

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The ERI Steering Committee charter and operating procedures were developed in September 2011. The committee’s functions and membership were also reviewed and expanded. Highlights of this process included recommendations to engage the Steering Committee in fund-raising initiatives for the Institute, to increase private sector representatives by two, to include BELTRAIDE and to include the Dean of the Faculty of Science and Technology at UB to ensure continuous exchange of information and collaboration between the two departments. The charter and revised membership recommendations were accepted in June 2012 and are being implemented.





# BUSINESS PLAN

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This year we developed a Business Plan for the ERI which includes a Resource Mobilization Strategy, income generating strategies for ERI through a variety of technical services and training, an increased revenue stream for the CCFS, as well as a strategy for the re-investment of revenue generated by the ERI into its programs.

The plan also recommended strategies for more effective marketing of CCFS programs and services and for ERI to focus on marketing its programs and develop a system to receive donations and sponsorship of programs. The business plan is for a 10-year period from 2011-2021.



## CALABASH CAYE FIELD STATION

During 2011-12, the Calabash Caye Field Station (CCFS) exceeded revenue projections earning BZ\$240,961.36; this was BZ\$66,521.36 more than expected. The station hosted 503 visitors and a total of 24 groups of which half were foreign; of the local groups, half were from UB. The consistent increase in visits over the past three years is a result of more active marketing and promotion of the field station among contacts, and through the ERI website.

The CCFS was fully able to maintain efficient operations despite not having rebuilt the building and pier damaged during the 2010 hurricane. Fundraising for the rebuilding continues in order to obtain a match for the Oak Challenge Grant of BZ\$400,000. Thus far, BZ\$25,000 has been committed by the Belize Social Security Board. Building plans are also being finalized to solicit donations from the private sector.

The field station received further infrastructure upgrades and repairs as part of continued efforts to restore the station after hurricane damage. There was also significant laboratory, diving and field equipment obtained for the station, boosting its capacity for long-term research. Two study abroad courses have been developed for the CCFS: a 200-level tropical marine ecology course and a 400-level coral reef ecology course. These courses are being marketed to foreign students for enrollment in December 2012 and June-July 2013. Local students will also be able to enroll to promote student exchange.



# **The Calabash Caye Field Station**

**“Dedicated to excellence in  
marine science education and  
research.”**





## PARTNER SUPPORT

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We hosted our first Partner Recognition Ceremony in January 2012 to mark the 2-year anniversary of the ERI launch. This ceremony acknowledged partners that have shown support to us since our launch in 2009. Select partners we recognized included: Oak Foundation, Panthera Foundation, the UK Darwin Initiative and the Belize Fisheries Department. We honored these partners for their significant contribution to the ERI and their tremendous support of its programs.



## ERI GREEN BUILDING

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This year, we also completed a Feasibility Study on the ERI building concept and fundraising for the building. The study reported that the vision of the ERI and the “green” building is worthy of pursuing and has potential, but recommended that the ERI needs to become more known internationally before a capital campaign can be launched. Recommendations were made to revise the building concept within the larger applied science programmatic target of the University. The study also highlighted the need for an adequately staffed Development Office at the University that can support a fundraising effort of this magnitude.







**ACHIEVING ACADEMIC EXCELLENCE:  
BUILDING AN INCLUSIVE LEARNER-CENTERED NETWORK  
CAPACITY BUILDING**





# TEACHING

## *Undergraduate teaching*

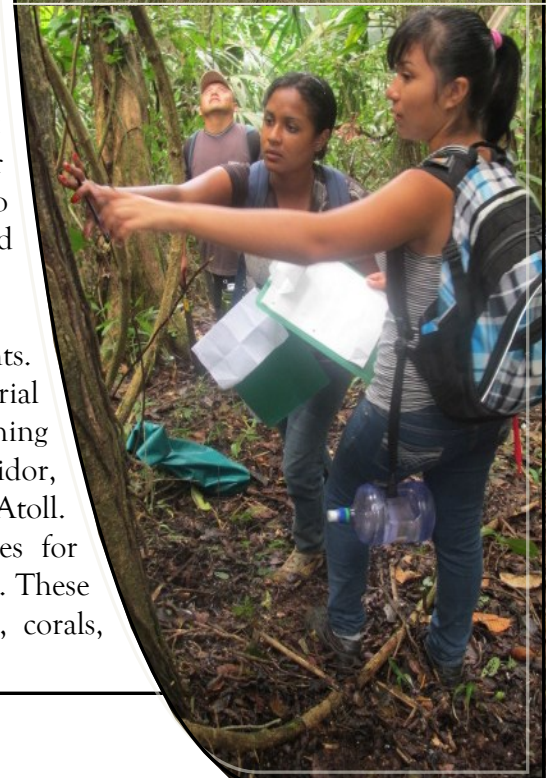
ERI staff delivered four required courses in the B.Sc. in Natural Resources Management Program (NRMP) during 2011-12. These courses included: Wildlife Management, Fisheries and Aquaculture Management, Forest Ecology and Management, and Field Methods. They are modular field or field-based courses that give students hands-on and applied experience, each running over a 4-week period.

The 'Wildlife Management' course had an enrollment of 12. In addition to learning about the theoretical and methodological issues of wildlife management, the students were exposed to hands-on field research through the Large Mammal Corridor Project. They participated in camera trapping, live capture of medium-large mammals and telemetry.

The 'Fisheries and Aquaculture Management' and 'Forest Ecology and Management' courses had 11 students each. In addition to building their theoretical knowledge, students also had a field component for both courses. For the Fisheries and Aquaculture Management course, students had a 5-day field session in Turneffe where they practiced fisheries independent surveys of conch, finfish and lobster, joined local fishers to conduct deep sea fishing and conducted surveys to identify conch nursery areas. The class also visited two shrimp farms in the south: Royal Maya Shrimp Farm and Belize Aquaculture Ltd., to learn about the different type of culture systems being used in Belize.

In the 'Tropical Forest Ecology and Management' course students had a series of lectures at the Belmopan campus including guest lectures on Agroforestry (Guillermo Detlefsen, CATIE), Reduced Emissions from Deforestation and Forest Degradation (Leon Westby, Forest Department) and Conservation Finance (Alejandro Martinez, The Nature Conservancy). This was followed by a one-week field component that allowed students to get hands-on training and exposure in different areas of forest ecology and management by sampling tree diversity, digging soil pits for characterizing soils, conducting fire monitoring and through several visits to logging operations in the Mountain Pine Ridge, Chiquibul, Gallon Jug, and visits to plantations in the Cayo District.

The 'Field Methods' course was the largest to date with a total of 25 students. This was delivered as a field course in May and June 2012 with a terrestrial and a marine component. Students spent 2-3 weeks in the field learning various sampling methodologies and working in the Central Belize Corridor, St. Herman's/Blue Hole National Park, the Sibun River and the Turneffe Atoll. Through hands-on activities the course exposed students to techniques for assessment and monitoring of various groups of organisms and ecosystems. These groups included plants, mammals, birds, macro invertebrates, reef fish, corals, seagrass, mangroves, dolphins, sea turtles and sharks/rays.





# FELLOWSHIPS

In 2011, ERI awarded the Marine Research Fellowship to Dr. Arlenie Perez from the University of Belize's Faculty of Science and Technology. Her research is entitled "The Status, Distribution and Abundance of Sea Cucumbers in Belize with an assessment of the Potential for Sustainable Mariculture". During this year, Dr. Perez completed a socioeconomic study on the sea cucumber fishery and also completed a density abundance and distribution study of sea cucumbers in Belize. A full technical report and a decision-makers summary on the socioeconomic study of the sea cucumber fishery are available online at: <http://www.eriub.org/publications/eri-reports-publications.html>.

Dr. Perez joins Dr. Bart Harmsen, who continues as the Panthera Jaguar Research Fellow in Wildlife Conservation at the ERI leading wildlife research and training in the Central Belize Corridor and Cockscomb Basin Wildlife Sanctuary.



## INTERNSHIPS AND VOLUNTEERS

During the academic year, the ERI hosted 13 students from the NRM Program in the Faculty of Science and Technology, University of Belize. These interns worked with staff under the Wildlife and Marine programs. Students were engaged in analysis of camera trapping data, radio-tracking of peccaries, interviews on predation of livestock by jaguars, sea turtle nesting monitoring, lionfish surveys and gut content analysis and species inventory at Calabash Caye. The students were enthusiastic and all did a great job gaining invaluable field and research experience.



The CCFS also hosted two foreign interns from Texas A&M University during May-June 2012. These interns joined the four UB interns at Calabash to conduct the sea turtle nesting monitoring, lionfish surveys and gut content analysis and species inventory. In 2011-12, the ERI continued to recruit and engage UB student volunteers to assist with data collection for the monitoring of marine ecosystems and fisheries health. This year the ERI trained a total of 15 volunteers in marine survey techniques and coral and fish ID. Five of these student volunteers were certified in Open Water SCUBA and assisted with the MBRS data collection in June-July. In addition to UB student volunteers, during July, the CCFS hosted a Mexican student volunteer for 3 weeks who assisted with coral bleaching and fisheries monitoring.



# UNDERGRADUATE THESIS

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This academic year, Dr. Kay supervised the completion of one student thesis project by Seleni Cruz. Seleni's thesis, "Assessment of the Aboveground Carbon Stock at the Big Falls Farm, Belize" focused on sampling a small number of plots in order to determine the total amount of plots that would have to be surveyed for a full carbon stock assessment of a large farm in the Central Belize Corridor.



*Seleni cutting and pressing plant specimens*

# TRAINING OF PROFESSIONALS

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In October 2011 the ERI in collaboration with Ya'axché Conservation Trust and Center for Protected Areas Management Training (CPAMT) at Colorado State University (CSU) completed the development of the National Training Program for Protected Areas Management. This program is targeted for delivery to natural resource management professionals in Belize and was developed through the Global Environment Facility (GEF) funded project: "Strengthening National Capacities for the Operationalization, Consolidation and Sustainability of



*Belize's Protected Areas System*" (SNC.PAS Project) implemented by the National Protected Areas Secretariat (NPAS), Ministry of Natural Resources and the Environment with support from the UNDP. The goal of this program is to develop national capacity for protected areas management to enhance and sustain management of the National Protected Areas System. Fourteen courses in six priority areas were developed. The six priority areas are: *Research and Monitoring for Protected Areas (PAs) Management, Institutional Capacity & Strengthening, Ranger Training, Conservation and PA Sustainable Financing, PA Management Effectiveness and PA Management Planning*. By the end of the academic year, the SNC.PAS Project and the Protected Areas Conservation Trust had already committed to support the delivery of at least the first two years of the training program. Delivery of courses is expected to commence in late 2012.



# GRADUATE STUDIES

## *M.Sc. in Biodiversity Conservation & Sustainable Development*

The University of Belize offered the first year of the Regional M.Sc. in Biodiversity Conservation and Sustainable Development in collaboration with our partners at UWI-St. Augustine, University of Guyana and ADEKUS. As the focal point for this program at UB, the ERI worked with the Office of the Provost and several other UB offices and departments to coordinate the delivery of the first two semesters of the program, the intersession and the July field course. More than 40 graduate students from Trinidad and Tobago, Guyana, Suriname, and including 10 from Belize, started the program. In semester one, a group of professors from the UB Science Department and the ERI delivered the Characteristics of Biodiversity course for the program via online distance learning (ODL); Dr. Arlenie Perez of the Science Department, who is our ERI Marine Research Fellow coordinated the course. In the second semester, Dr. Filiberto Penados, Research Director at UB delivered the Socio-ecology course, also via ODL. In July 2012, Dr. Bart Harmsen, our ERI Wildlife Research Fellow travelled to Suriname to teach the first field course offered under the program along with Dr. Paul Ouboter of ADEKUS and Dr. Howard Nelson of UWI-St. Augustine. Two Belizean students successfully completed this course. By the end of the academic year, seven Belizean students remained in the program as part time students with two others having deferred commencement of the program until September 2012.



Dr. Elma Kay & Dr. Arlenie Perez (center) meet with M.Sc. students





**CONTRIBUTING TO NATIONAL AND LOCAL DEVELOPMENT**

*Research and Monitoring*





# MARINE MONITORING AND RESEARCH

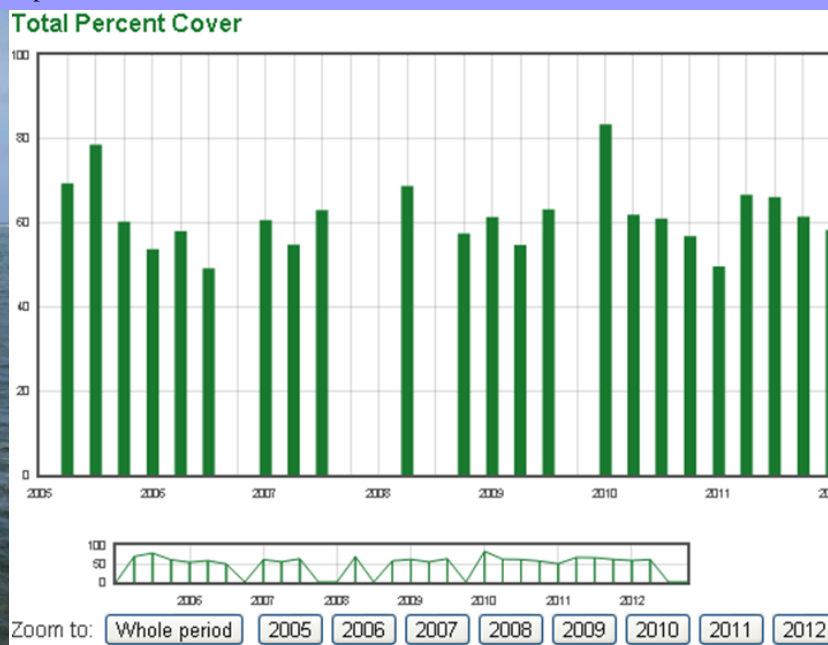
## *Ecosystems*

Our ERI marine team continued crucial monitoring of Turneffe Atoll's ecosystems for a third year with surveys of coral reef health, seagrass and mangrove health and productivity. MBRS Synoptic Monitoring was conducted during the months of June and July 2012. We carried out surveys with the assistance of Dr. Michelle Paddock of the Oceanic Society and the ERI marine volunteers. Trends in ecosystems health from 2010-2012 will be posted on our website.

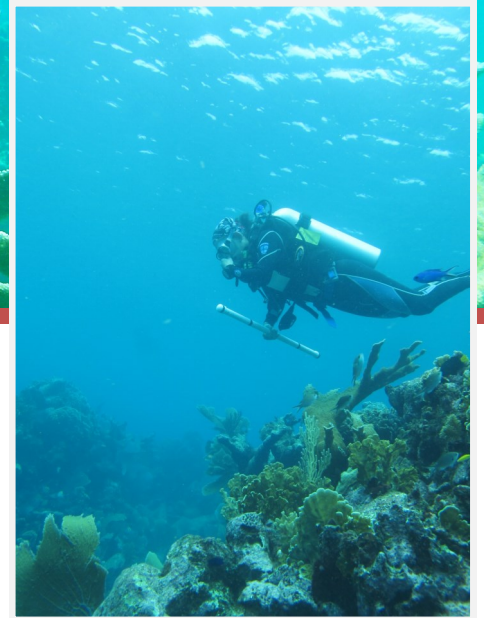
We also continued quarterly Seagrass Net monitoring at the two sites in Turneffe with the help of student volunteers. All field data has been uploaded to the online database and results are available at:

<http://seagrassnet.org/research>.

Student volunteers collecting seagrass data & an example of information as viewed in the online database.







## Corals

We also tracked the response of corals to elevated sea surface temperatures through coral bleaching monitoring. We monitored eight (8) sites during September 2011 to February 2012 at Turneffe Atoll. Field data was entered into the NCRMN Database and a summary of results for the period was posted to the website. Celso Cawich, our Marine Biologist presented the national coral bleaching results for 2009-2011 at the June 2012 Coastal Zone summit in Belize City.

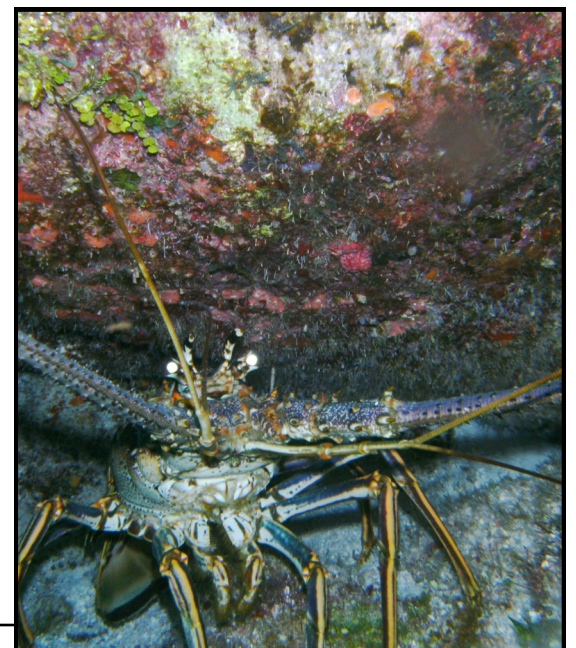
The report is available at : [http://www.coastalzonebelize.org/wp-content/uploads/pdfs/coral\\_bleaching.pdf](http://www.coastalzonebelize.org/wp-content/uploads/pdfs/coral_bleaching.pdf).

Our staff conducted night dives during the months of September and October 2011 to check for coral spawning near the CCFS. We observed coral spawning in September for Lobed Star Coral (*Montastraea annularis*) and Boulder Star Coral (*Montastraea faveolata*.)

## Commercial Species (Conch and Lobster)

We commenced the LAMP (Long-term Atoll Monitoring Program) surveys for queen conch (*Strombus gigas*) in October 2011 with the identification of five fishing grounds and one nursery area. We will do follow-up surveys with the opening and closing of the season.

We conducted in-water lobster (*Panulirus argus*) surveys at four reef sites near the CCFS in February 2012, prior to the closing of the season, and again in June 2012, prior to the opening of the season. We conduct monitoring bi-annually according to the LAMP manual and will establish a total of 20 sites around the atoll.





## *Sea Turtles*

We carried out an in-water turtle survey at Turneffe Atoll in collaboration with ECOMAR, with the assistance of ERI student volunteers and a local fishermen of Turneffe Atoll. This was done as part of the National Sea Turtle In-water Survey. Three species of sea turtles were sighted at Turneffe Atoll: hawksbill, green and loggerhead sea turtles. National results indicated that Turneffe Atoll had the highest number of hawksbill turtles sighted. National survey results can be obtained at <http://www.ecomarbelize.org/in-water-scientific-surveys.html>.



Our sea turtle nesting monitoring program was continued through collaboration with tourism stakeholders and students. On February 2012, there was a hawksbill turtle nest reported at Turneffe Flat's Resort with a hatchling success of about 80%. In April 2012, four false crawls were found on the southern end of the Calabash Caye, but no nest was confirmed. UB student interns continued monitoring during June-July 2012 but no nesting activity was observed.

## *Fish Spawning Aggregations (SPAGS)*

We also conducted Reef fish spawning aggregation (SPAGS) monitoring at 5 historic SPAG's sites (Caye Bokel, Calabash Caye, Soldier Caye, Dog Flea Caye, and Mauger Caye) during January and February 2012. Our team found active dog snapper aggregations near Mauger Caye and Caye Bokel in January, with approximately 1000 fish. In February 2012, an active SPAG site was identified at Soldier Caye. The highest total count in February was at Caye Bokel with 800 dog snappers. No active Nassau grouper SPAG sites were observed. Other species observed included Bar Jacks, Bermuda Chubs and Dog snappers.







## WILDLIFE RESEARCH

In June 2012 we completed the Darwin Initiative-funded Central Belize Corridor (CBC) Large Mammal Project. The Wildlife team is currently analyzing the large dataset of telemetry and camera trap data that the project generated. ERI has already gleaned important information on the impact of degradation on the fauna in the area over the three-year period of the study. We plan to extend and expand our work in Central Belize and to also initiate work in the Southern Belize Corridor.

### *Camera trapping*

*Cockscomb Basin Wildlife Sanctuary (CBWS):* We completed the 2012 Cockscomb camera survey with the highest number of individual jaguars (24) captured in any survey to date, most likely due to a new model of Panthera camera used. The survey was completed by a UB NRM graduate, Emma Sanchez. The survey indicated that six (6) of the 24 individuals were 10 years or older and three (3) of these individuals were at least 12 years old. This is the oldest age that has ever been recorded for jaguars in the wild. Similarly 10 year old ocelots were recorded; these cats were first recorded in 2003 and their documented persistence represents a record for science. Our CBWS database holds a unique dataset that is unmatched by any other jaguar dataset.

*Belize River/Labouring Creek Jaguar Corridor Wildlife Sanctuary (LCJCWS):* We placed cameras along the Belize River stretch of the LCJCWS on both sides of the river shores to monitor jaguars and their prey. We observed a minimum of six (6) jaguars using the shore lines and three (3) of these regularly cross the Belize River. The frequency of photographs also indicates that there is a healthy number of collared peccaries in the area.

### *Live trapping and telemetry*

In the 2011-12 academic year, our wildlife program concentrated on capturing peccaries. For this, new methods of safe capture were developed that were both time efficient and cost effective. Successful captures of peccaries occurred on two occasions: in December 2011 with a single male collared peccary and in June 2012 with a small herd of two males and a single female.

### *Nationwide survey of jaguar conflict, hunting and knowledge of wildlife laws*

Another UB NRM graduate, Yahaira Urbina, had the opportunity to complete a year-long diploma course in monitoring wild cats. Under the guidance of the ERI wildlife program she developed a questionnaire concerning: jaguar conflict, hunting and knowledge of wildlife law and conducted 3000 interviews nationwide, with funding from the Darwin Initiative Project. The surveys covered 4% of all Belizean households. ERI, Panthera researchers and the Wildlife Conservation Research Unit of Oxford University are currently analyzing the data obtained.



## FOREST MONITORING

In May 2012, the University signed a Cooperation Agreement with CATIE. Under this agreement, CATIE and the ERI are to work in Belize through the regional FINNFOR project aimed at improving forest management in Central America. As part of this work, by the end of the academic year, we were able to: continue the upkeep and maintenance of plant collections at the National Herbarium in collaboration with the Forest Department, receive training from Percival Cho of University of Lancaster in the re-measurement of broad leaf forest permanent sample plots (PSPs), receive training from CATIE in the establishment and measurement of PSPs in agroforestry systems in El Salvador, re-measure agro-forestry plots in the Cayo District in Belize, and commence the development of a National Strategy for Long-term Forest Monitoring through a multi-stakeholder process involving government agencies, non-governmental organizations, academia and the private sector.



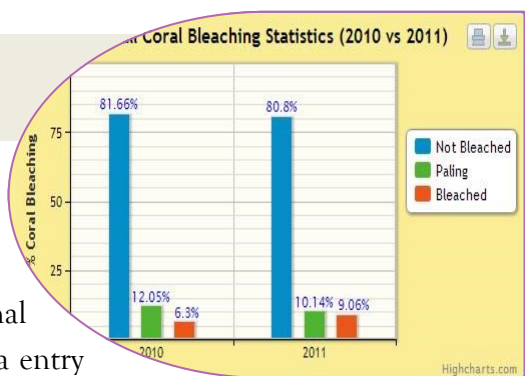
## BIODIVERSITY MONITORING

Another national initiative that we commenced in 2011-12 was the development of the National Biodiversity Monitoring Program. The National Protected Areas System Plan (NPASP) tasks the University of Belize with the development of this program. Efforts completed during this year included a survey of biodiversity monitoring activities in Belize. We presented the diagnostic report for this survey at the first national biodiversity workshop in April 2012. We also developed the goal and objectives of the program and finalized these at the second national workshop in July 2012; participants selected preliminary indicators for the program through an online survey and at the second workshop. Finally, “expert” working groups were identified to provide guidance in selecting final biodiversity indicators and protocols for the program.



## DATABASE SUPPORT

In 2011-12 we provided greater database support to national networks through the work of our database unit. Our Database Administrator, Nicole Weatherburne completed the development, customization and enhancement of the SPAGS database and the full dataset was transferred from the original TNC database. The coral bleaching database was enhanced and the coral data entry application and web reporting application were customized based on the National Coral Reef Monitoring Network's input. The coral database login page was redesigned to include interactive maps and summary results. This can be viewed at [www.eriub.org>Databases>NCRMN Coral Bleaching Database](http://www.eriub.org/Databases/NCRMN%20Coral%20Bleaching%20Database). We provided training in the use of the coral database to network members and began designing an online wildlife database for reporting wildlife sightings. We also updated the ERI's publications repository which may be accessed through the ERI website ([www.eriub.org>ERI Publications> ERI Publications Repository](http://www.eriub.org/ERI%20Publications/ERI%20Publications%20Repository)). Since its establishment in 2010, we have lodged a total of 1240 publications in the repository and have had more than 11,000 visits to it.







**CONTRIBUTING TO NATIONAL AND LOCAL DEVELOPMENT, AND IMPROVING  
GOVERNANCE & MANAGEMENT**

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**COMMUNICATION & OUTREACH**



# WORKSHOPS AND CONFERENCES

## *National Biodiversity Monitoring Program*

We facilitated two workshops on April 26 and July 5, 2012, where Ivanna Waight, our Monitoring Officer, presented the results of a marine and terrestrial monitoring activities survey in Belize. During these workshops, the goal and objectives of the program were developed and finalized, and preliminary indicators were reviewed by participants in marine and terrestrial working groups. Participants also identified resource persons for the expert working groups, which assist in finalizing indicators and developing protocols for the program.



***Group discussions on objectives for the NBMP***



***Terrestrial (left) and marine (right) working groups discussing the suggested indicators at the 2<sup>nd</sup> NBMP workshop.***



## PARTNERSHIPS AND NETWORKS

In 2011-12 we continued to build national and international partnerships. The Institute actively implemented its MOU with Oceanic Society through joint monitoring and discussions on arrangements for closer working arrangements and a potential Fellow. An active partnership has been forged with the Caribbean Community Climate Change Center (CCCCC) for oceanographic and climate monitoring and research. The first output of this partnership is a Coral Reef Early Warning System (CREWS) station being donated by the CCCCC. Through an MOU with the CCCCC, ERI will not only maintain the buoy and use it to monitor sea surface temperatures and other oceanographic conditions as part of the coral bleaching monitoring program, but will also pursue collaborative research with NOAA and other researchers. ERI is also in discussions with WWF on the development of a mangrove adaptation project for Belize and also partnered with them on a submission to the CARIBSAVE Partnership Caribbean Climate and Development Research Call, which was successful.

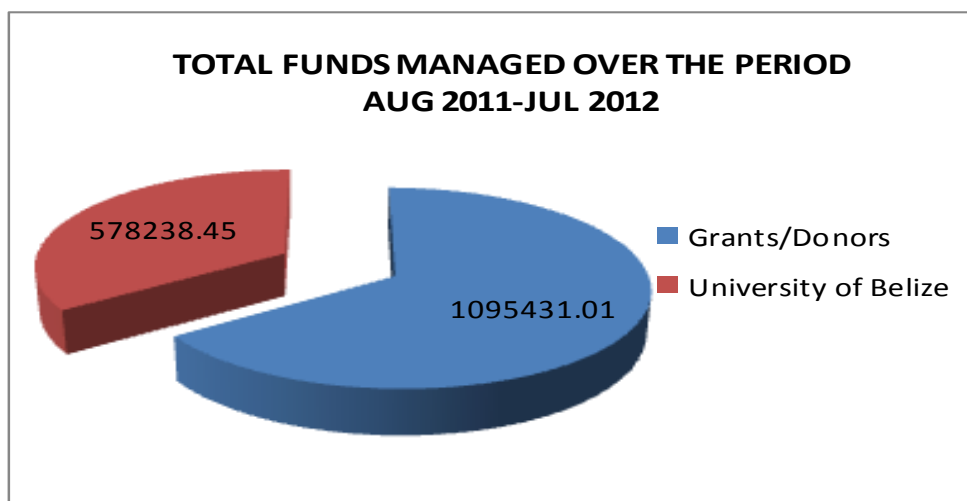
## SERVICE ON NATIONAL COMMITTEES

ERI Staff serve on various national and scientific committees focused on the sustainable management of Belize's natural resources. This academic year Dr. Kay continued to serve on the National Protected Areas Technical Committee, the National Steering Committee for the Global Environment Facility Small Grants Program and the Belize National Climate Change Committee. Dr. Cho-Ricketts served as the Chair of the Belize SPAG Working Group that helps the Fisheries Department in the management of the Nassau Grouper fishery. She also sat on the National Coral Reef Monitoring Network along with the Marine Biologist. She continued to be a member of the Local Consultative Body of the GEF Small Grants Program, a member of the board of the Turneffe Atoll Sustainability Association, a member of the Coastal Zone Advisory Council and the Coastal Zone Task Force appointed by the Minister of Forestry, Fisheries and Sustainable Development. The ERI Marine Biologist also sits on the Sea Turtle Monitoring Network.

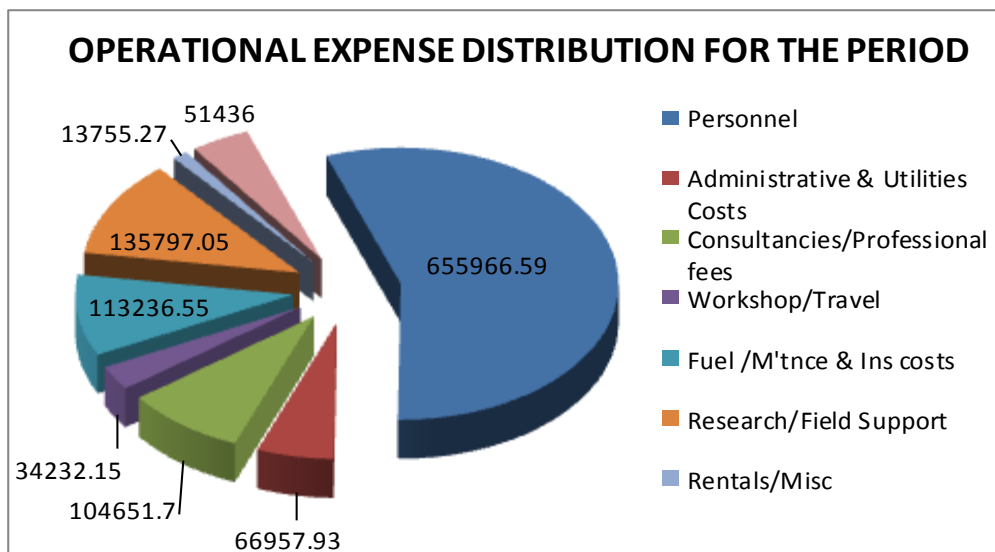


# FINANCIAL OVERVIEW

For the Academic Year 2011-12, the financial support base for the operations of the ERI and the Calabash Caye Field Station (CCFS) was generated from two main sources: Grants/Donations (OAK Foundation, Panthera and Darwin being the largest contributors), and an expense budget from the University of Belize. Together, these funds supported the activities at the ERI and the Calabash Caye Field Station.



A breakdown of expenditure associated with this resource pool, is represented in the chart below :



In summary, our spending in 2011-12 covered the following:

- ◆ Hosting of 21 groups at the field station, mainly science based students and researchers; which accounted for a total of 2,051 total guest days at the Caye.
- ◆ Support for our wildlife and marine programs, in the Central Belize Corridor and Turneffe respectively, and the National Herbarium and forest monitoring program.
- ◆ Capacity building through student training, student assistantships and two research fellowships.
- ◆ Database support to national monitoring networks and data management.



# FINANCIAL OVERVIEW

Additionally, the figures below provide a comparison of our financial position over the last two years and highlight the movement in our asset base over the period. 2011 figures have been subjected to audit and based on the findings are fairly stated in all material respects.

Environmental Research Institute   Balance Sheet   Comparative Report (2011 & 2012)		
ASSETS	2012	2011
<u>Current Assets</u>		
Imprest (Petty Cash	\$472.05	\$ —
Checking account—Scotiabank	\$233,933.77	\$633,433.81
<u>Other-assets:</u>		
Employee Advance	\$ —	
Receivables	\$ —	\$6,867.29
Prepaid Ins	\$4,396.50	\$1,921.69
<b>Total Current Assets</b>	<b>\$238,802.32</b>	<b>\$642,222.79</b>
<b>FIXED ASSETS</b>		
<u>Equipment:</u>		
ERI Funded	\$103,064.87	\$40,364.87
Accm depr-ERI assets	\$(20,512.76)	\$(8,941.96)
Panthera Funded	\$49,018.68	\$38,903.68
Accmm depr Panthera Assets	\$(10,275.89)	\$(4,598.71)
Darwin Funded	\$9,628.43	\$9,628.43
Accm depr Darwin Assets	\$(4,286.05)	\$(864.09)
OAK Funded	\$617,039.94	\$482,037.37
Accm depr-OAK	\$(129,142.76)	\$(66,549.70)
CATIE Funded	\$741.56	\$ —
<b>Sub Total</b>	<b>\$615,276.02</b>	<b>\$489,987.89</b>
<b>TOTAL FIXED ASSETS</b>	<b>\$854,078.34</b>	<b>\$1,132,210.68</b>
<b>LIABILITIES &amp; EQUITY</b>		
<u>Current Liabilities:</u>		
Accounts Payable	\$395.00	\$7,333.43
Wages Payable	\$430.08	\$ —
Social Security Payable	\$48.00	\$ —
	<u>\$873.08</u>	<u>\$7,333.43</u>
<u>Equity:</u>		
Equity b/f prior yr		
Net Income	\$1,124,877.25	\$743,317.05
	\$(271,671.99)	\$381,560.20
<b>Sub Total</b>	<b>\$853,205.26</b>	<b>\$1,124,877.25</b>
<b>TOTAL LIABILITIES</b>	<b>\$854,078.34</b>	<b>\$1,132,210.68</b>

# ERI STEERING COMMITTEE:

*Ismael Hoare, Ph.D	UB Provost—ERI-SC Chairperson	UB
Sandra Miranda	UB Director of Finance	UB
Elma Kay, Ph.D	ERI Administrative Director (ex-officio member)	UB
George Headley	Private Sector Representative	Bull Run Overseas Ltd.
Trevor Roe	Private Sector Representative	G.A. Roe & Sons Ltd.
Beverly Wade	Fisheries Administrator	Fisheries Department
James Azueta	Alternate for Fisheries Administrator	Fisheries Department
Wilber Sabido	Chief Forest Officer	Forest Department
Rasheda Garcia	Alternate for Chief Forest Officer	Forest Department
*Celia Mahung	Executive Director of an organization representing APAMO	TIDE
*James Foley	Alternate for ED of an organization representing APAMO	TIDE
Nadia Bood	International Environmental NGO Representative	WWF
Maurico Mejia	Alternate for the International Environmental NGO Representative	WWF

\* Served part of the year



# THE ERI TEAM

Name	Position	Date of Inception	Organization funding salary
Elma Kay, Ph.D.	Admin Director & Science Director (Terrestrial)	1-Sep-09	UB
Leandra Cho-Ricketts, Ph.D.	Science Director (Marine)	1-Sep-09	UB
Ian Sangster	Administrative/Financial Manager	1-Feb-10	UB
Julissa Bardalez	Administrative Assistant	1-Dec-09	UB
Kenneth Gale	Station Manager, CCFS	1-Feb-09	UB
Teresa Catzim	Head Cook, CCFS	Prior to 2009	UB
Inacio Cortez	Caretaker, CCFS	Prior to 2009	UB
Albert Cherrington Jr.	Boat Captain, CCFS	Prior to 2009	UB
Margarita Hernandez	Assistant Cook	22-Apr-11	UB
*Irma Leiva	Relief Cook	1-June-11	UB
*Christopher Encalada	Boat Captain, CCFS	3-Oct-11	UB
Bart Harmsen, Ph.D.	Panthera Jaguar Research Fellow	1-Feb-10	Panthera
*Marvin Vasquez	Field Assistant	21-Nov-2011	Panthera
*Emma Sanchez	Field Technician	01-Mar-2012	Panthera
Celso Cawich	Marine Biologist	1-Feb-10	Oak Foundation
Jani Salazar	Field Technician	5-Sept-11	Oak Foundation
Nicole Weatherburne	Database Manager	8-Aug-2011	Oak Foundation
Ivanna Waight	Monitoring Officer	1-Jan-12	Oak Foundation
German Lopez	Darwin Botanist	1-Feb-10	Darwin Initiative
Said Gutierrez	Darwin Wildlife Biologist	1-Feb-10	Darwin Initiative
Arturo Ramos	Field Operations Manager	1-Apr-10	Darwin Initiative
*Michael Brakeman	Field Assistant –Large Mammal Corridor Project	1-Feb-11	Darwin Initiative
*Christopher Estrada	Field Assistant –Large Mammal Corridor Project	1-Feb-11	Darwin Initiative

\* *Part-time positions*





# APPENDICES

## STAFF MATTERS

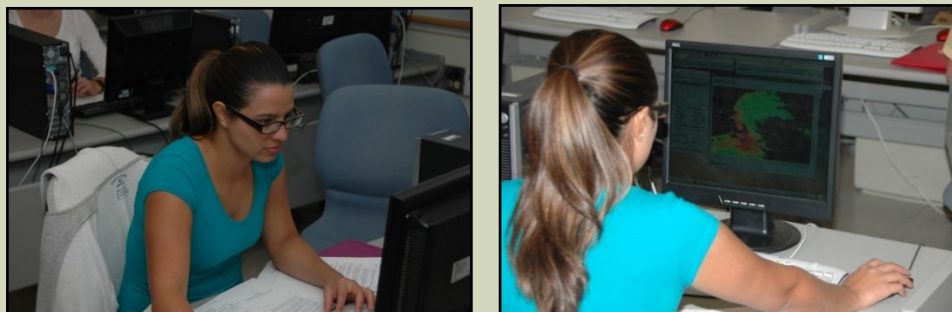
### *Departure of Said Gutierrez, Wildlife Biologist*

Said Gutierrez who has been with the ERI from the start of the Darwin Initiative Large Mammal project has left for further studies in the United Kingdom. Based on contacts made through the project, he received a Darwin Initiative scholarship for an MSc course in Exeter, UK. The ERI is excited that a young Belizean has been given this opportunity and expects to see him back in Belize armed with all the new techniques and knowledge that he gained.

### *Training*

The Database Administrator, Nicole Weatherburne, participated in a GIS Technology Summit for ICT Professionals hosted by ESRI and Total Business Solutions Ltd. (TBSL) in Belize City from January 16<sup>th</sup>-17<sup>th</sup> 2012. The workshop focused on discussing the importance of GIS and real world uses of GIS and explaining the basic concepts of GIS.

ERI's Monitoring Officer, Ivanna Waight, received training in Assessing Student Learning, Open & Advanced Open Water SCUBA certification, Water Quality monitoring for the marine zone for the Gulf of Honduras Project and Satellite Remote Sensing in Biological Oceanography.



*Working on practical exercises at Cornell University for the remote sensing on biological oceanography training course*



*Group picture of the participants, teacher assistants and lecturer of the course.*



### *Training cont....*

German Lopez, Darwin Botanist, received substantial training in herbarium curation, data basing, cataloguing and filing of plant specimens. In January 2012, German once more participated in a 12-day field course in plant taxonomy and identification. In addition, he participated in a 2-week field training in the establishment and measurement of 1ha sample plots for the collection of pine density data. Through the CATIE/ERI project, German has been the recipient of both in-country and regional training in the establishment and measurement of permanent sample plots within agroforestry areas and in the use of DATALATIF software. German received field training, provided by CATIE in the re-measurement of silvo-pastoral plots located in the Cayo District as well as a 1-week training in the establishment of agroforestry permanent sample plots, the re-measurement of two permanent sample plots (in broadleaf forest) located at Las Cuevas, Chiquibul.



*German filing and data basing specimens at the National Herbarium*

ERI's Marine Biologist, Celso Cawich, received MAR leadership training in August 2011, September 2011 and March 2012 in Placencia, Mexico and Guatemala, respectively. He attended the MARINE INVEST workshop where the participants were familiarized with the modeling tool used in mapping and valuing ecosystems services for the present and future scenarios. He also received training in Remote Sensing, DNA bar coding for field specimen preparation, Basic and Advanced First Aid Training, Rescue, Dive Master and Scientific Dive training.



### PHOTO CREDITS

Photos are recorded from top to bottom going in a clockwise direction

Denver T. Cayetano

Cover Page –Photo 1 & 3  
Table of Contents –Photo 1  
Page 8 (top-bottom) — Photos 2,3 & 6  
Page 13 – Photos 1 & 2  
Page 15—Photo 1  
Page 28— Header  
Page 30 – Header

Dr. Leandra Cho-Ricketts

Cover Page –Photo 2  
Page 4 – Photo 2  
Page 8 (top-bottom) – Photos 4 & 5  
Page 10 – Photo 1  
Page 11 – Photo 1  
Page 15 – Background Photo  
Page 16— Photo 1

Dr. Elma Kay

Page 10 – Photo 2 & 3  
Page 11 – Photo 3

Office of Public Information, University of Belize

Cover Page - Photo 4  
Page 7— Photo 2



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