

**5**<sup>TH</sup>

**ANNUAL REPORT**

**ANNIVERSARY  
EDITION**

**2014 - 2015**

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## ACKNOWLEDGMENTS

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We thank our Steering Committee for their time and dedication in providing oversight and guidance to the Institute. Our local partner organizations who continue to support our national level efforts and who continuously engage us to partner on system level approaches for natural resource management. These include Ya'axché Conservation Trust, Belize Audubon Society, Fisheries Department, Forest Department, Wildlife Conservation Society, Turneffe Atoll Sustainability Association, among others.

The UB ERI also graciously acknowledges all the invaluable assistance received from supporting UB Departments throughout the Academic Year. In particular we wish to thank Physical Plant and Safety, Finance and Accounts, Information and Communications Technology, Office of Public Information, Human Resource Management, Science Department, the Provost Office and the President's Office.

Finally all our achievements would be impossible without the dedicated staff at the UB ERI. Our gratitude goes out to our hard working student volunteers, student assistants, the staff of the Calabash Caye Field Station, our administrative and field based staff in our various programs.

<b>AAUS</b>	American Academy of Underwater Sciences
<b>BAHA</b>	Belize Agricultural Health Authority
<b>BFD</b>	Belize Fisheries Department
<b>BFREE</b>	Belize Foundation for Research and Environmental Education
<b>BLPA</b>	Belize Livestock Producers Association
<b>BNRM</b>	Bachelor's in Natural Resource Management
<b>CAP</b>	Conservation Action Planning/Plan
<b>CARPIMS</b>	Caribbean and Pacific Islands Mobility Scheme
<b>CATIE</b>	Centro Agronómico Tropical de Investigación y Enseñanza
<b>CBWS</b>	Cockscomb Basin Wildlife Sanctuary
<b>CBC</b>	Central Belize Corridor
<b>CCFS</b>	Calabash Caye Field Station
<b>ECPA</b>	Energy Climate Partnership of the Americas
<b>FMASS</b>	Faculty of Management and Social Sciences
<b>FST</b>	Faculty of Science and Technology
<b>GEM</b>	Global Ecosystems Monitoring
<b>GIS</b>	Geographic Information System
<b>GIZ</b>	Deutsche Gesellschaft für Internationale Zusammenarbeit
<b>GPS</b>	Global Positioning System
<b>IDB</b>	Inter-American Development Bank
<b>LAMP</b>	Long-term Atoll Monitoring Program
<b>MSBC</b>	Mesoamerican Society for Biology and Conservation
<b>NPAS</b>	National Protected Areas System/Secretariat
<b>NRM</b>	Natural Resources Management
<b>NTPPAM</b>	National Training Program for Protected Areas Management
<b>Oak</b>	Oak Foundation
<b>ODK</b>	Open Data Kit
<b>RELCOM</b>	Latin American Network for Bat Conservation
<b>SPAGS</b>	Spawning Aggregation
<b>TASA</b>	Turneffe Atoll Sustainability Association
<b>TIDE</b>	Toledo Institute for Development and Environment
<b>UB</b>	University of Belize
<b>UB ERI</b>	University of Belize Environmental Research Institute
<b>UWI</b>	University of the West Indies
<b>Ya'axché</b>	Ya'axché Conservation Trust



The University of Belize Environmental Research Institute (UB ERI), under the joint directorship of Dr. Leandra Cho-Ricketts and Dr. Elma Kay, continued to deliver on its mandate during the Academic Year August 2014 to July 2015. As in past years, it focused on information-gathering and research in the marine environment, utilising principally its Calabash Caye base in the Turneffe Atoll; and on expanding its information base in relation to the state of the country's forests and its wildlife, particularly in relation to the preservation of a sustainable balance between the livestock operations of private farmers and the maintenance of a habitat for jaguar, puma, and other native carnivores. All these activities supported, and were integrated into, its teaching operations, both formally as part of the University's Natural Resource Management programmes at the Associate's and Bachelor's levels (and including the Master's level joint biodiversity programme with three other foreign universities), and at the community-based level, by itself and jointly with public and private sector institutions (local and foreign), to help local populations develop and maintain sustainable marine- and terrestrial-based livelihoods.

As part of its activities, the UB ERI also hosted a large number of visitors at the Calabash Caye Field Station from both local and external teaching institutions as part of those institutions' own training programmes for their students and researchers.

An important event in the development of the Institute during the year was the start of construction of modern accommodation and presentation facilities at Calabash Caye, with funding from the Oak Foundation, the Fondation Bertarelli, and the University itself. The facilities, when completed, will allow the UB ERI to expand substantially its capacity

to host visitors, and it is expected that its programme offerings, particularly to external visitors, will expand significantly over time with further expansion of the physical hosting arrangements.

Another element of UB ERI's activities involved the continued monitoring of the Central Belize Corridor, along which animal species move in both north-south directions across the George Price Highway that completely divides the country into two halves. The results of the monitoring activities, and indeed the results of all of UB ERI's operations, were shared with the public on local television talk-shows and in more traditional academic presentations both domestically and abroad, and are available on the UB ERI website.

During the year, UB ERI partnered with a number of institutions in its research work and in the delivery of its programmes, and raised the majority of its funding through those partnerships. While this has been of significant benefit to both UB ERI and the University of Belize, the potential scaling-down of grant support from these partnerships, has resulted in growing efforts within UB ERI and the University to build sustainability into the future. UB ERI will be actively seeking various strategies for expanding partnerships and creating income-generating opportunities to continue supporting its work.

UB ERI has demonstrated its capacity to make a substantial and significant contributions to environmental knowledge and management capacity in Belize, and it can expect to be required to make an even greater contribution in the years ahead.



The UB ERI celebrated this milestone with various supporting donors and partners, along with University departments that have assisted the Institute during the last 5 years to focus its efforts under its three programs: Research and Monitoring, Training and Fellowships and Communications and Outreach.

There has been significant progress in wildlife research in the Central Belize Corridor and Cockscomb Basin Wildlife Sanctuary with at least 5 publications on wild (game) meat as a shared resource and interactions between jaguar populations and their habitats. A Conservation Action Plan for the Central Belize Corridor has been developed that will serve as a guide for management of this important area consisting of protected areas and private lands. The marine program has focused work in the Turneffe Atoll Marine Reserve, where we have established long-term monitoring of ecosystems and species health. Data from this program is used to inform the management of the marine reserve through annual summaries on ecosystem health. Finally through partnership with the Belize Forest Department, we have built national capacity for long-term forest monitoring. Through collaboration with national partners and the Ministry of Forestry, Fisheries and Sustainable Development, the UB ERI has developed a draft National Biodiversity Monitoring Program to track Belize's biodiversity health and state of its protected areas.

We have trained over 60 students in various research and field techniques through internships, thesis projects and volunteer programs and annually delivered 4 field and modular courses within the Natural Resources Management Program to over 60 students within this BNRM program. The UB ERI has implemented two multi-year research fellowships focused on jaguars interactions with

other populations and communities and the sea cucumber fishery, sea cucumber populations and life history. In partnership with the National Protected Areas Secretariat and PACT, we developed and implemented a national training program for protected areas management, which trained 85 participants from 23 different organizations engaged in the management of protected areas. Lastly, through the regional MSc in Biodiversity Conservation and Sustainable Development, the University has provided graduate training with the UB ERI coordinating the program and completed supervision of 10 graduate students.

We have provided technical input, coordination services and data management through various national networks and national committees, such as the National Climate Change Committee, National Protected Areas Technical Committee, National Coral Reef Monitoring Network, among others, and through the national databases that we create and maintain. We have also provided access to our publications and other national reports/publications through our website and online research repository.

We are quite happy that after five years of expanding, enhancing and marketing the Calabash Caye Field Station as a centre of excellence in marine science, the field station has increased its revenue base and is now managed to profitability. It has gone from revenue of BZ \$90,000.00 in 2009-10 to BZ \$425,428.00 in 2013-14.

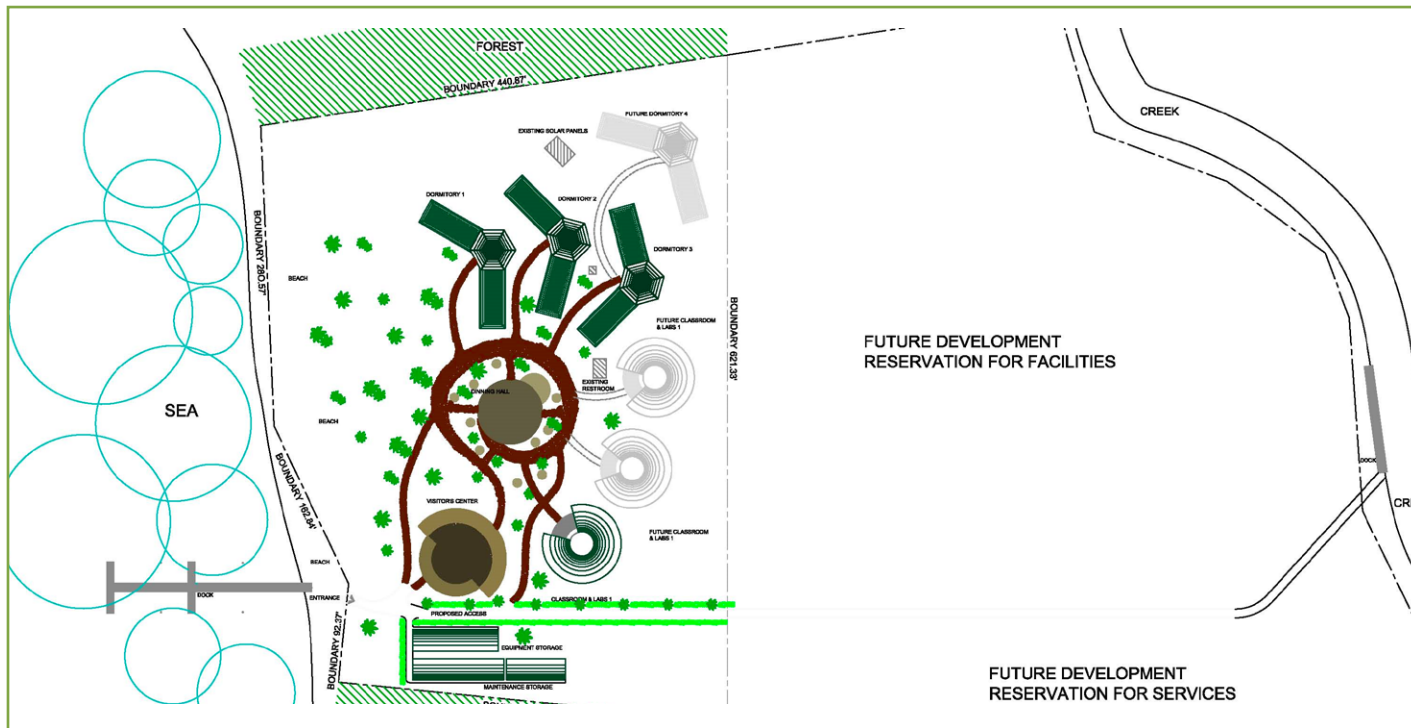
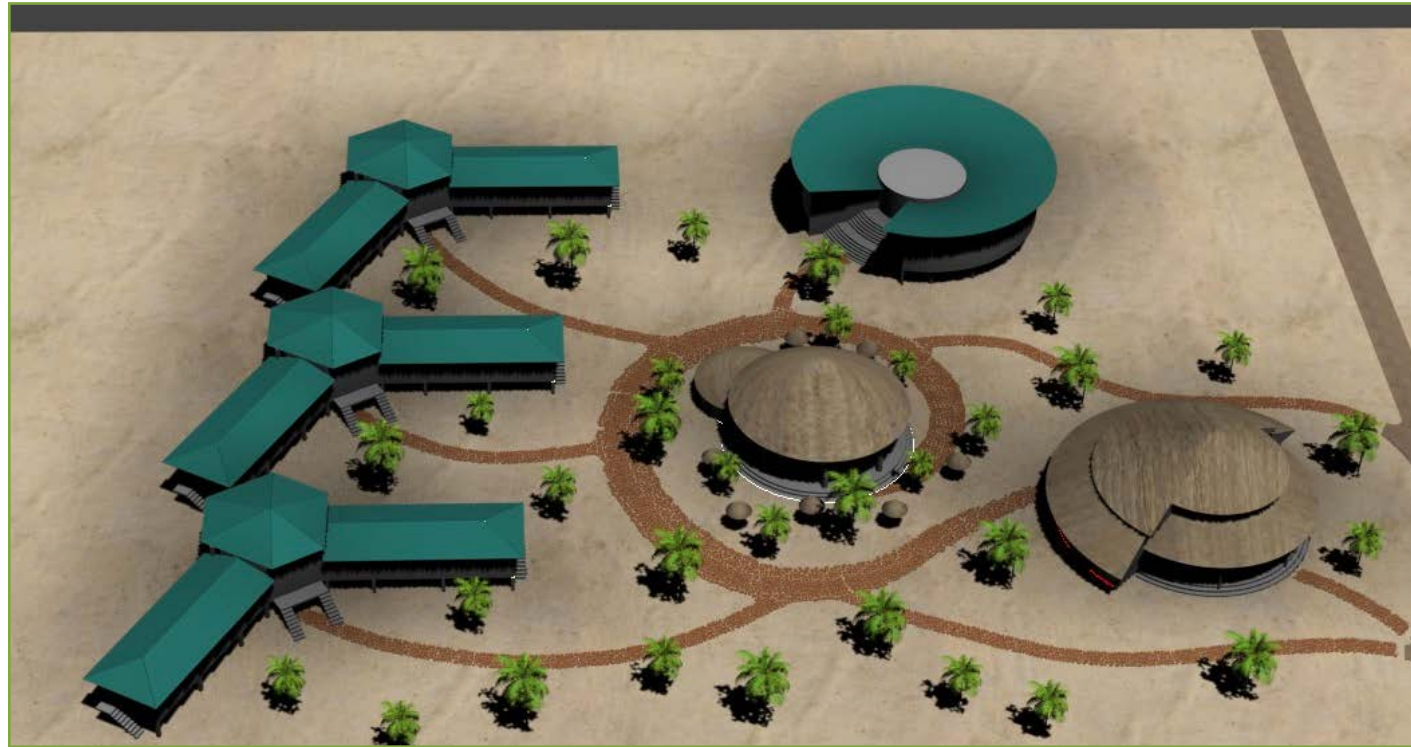
As we look to the future we hope to build our programs to respond to the needs of natural resource managers, the public and private sectors to ensure that Belize achieves sustainable use of its wealth of biodiversity and natural resources for the benefit of all.



# INSTITUTIONAL STRENGTHENING & SUSTAINABILITY

## CCFS Master Plan

A master plan for CCFS was completed with full plans for the visitor centre and classrooms. This plan presents the long-term vision for upgrading and expanding the field station to become a center of excellence and accommodate cutting edge research and training in marine sciences.



## Strengthening Our Human Resources

UB ERI staff continuously build their skills and knowledge set. Below are a few of the training opportunities that our staff members were involved in throughout the year:

**Bats Bio-acoustic Training**  
Monitoring Officer, Ivanna Waight-Cho



Identifying bat during bats bio-acoustic training

**Allometric Equations Workshop**  
Monitoring Officer, Ivanna Waight-Cho

**Video and Media Symposium**  
Admin/Marketing Officer, Pia Gregoire

**Customer Service Training**  
CCFS staff



Monitoring Officer holding bat in preparation for release



Monitoring Officer receiving bats bio-acoustic training



### Calabash Caye Field Station

#### Construction of Staff and Visitor Quarters

Construction on the CCFS Staff and Visitor Quarters began in March 2015 by Coleman Construction with Mahung & Partners Ltd. providing oversight as the project manager. The building project is expected to take 6 months with completion in August 2015. The new building will house all staff and increases the station's visitor capacity by up to 14 persons.



Initial phase of Staff and Visitor Quarters, May 20, 2015



Initial phase of Staff and Visitor Quarters

#### Visiting Groups

During August 2014 to July 2015, our field station staff hosted a total of twenty-six (26) visiting groups with a total of 458 visitors. Of these groups eleven (11) were foreign groups and fifteen (15) were local groups; the equivalent of which accounted for 2,966 total guest days at CCFS and generated \$389,062 in revenue. There were five (5) first time visitors to the field station. Some of the universities that visited us include: Meryhurst University, Iowa State University, University of North Georgia, and the University of New Brunswick.



University of New Brunswick



John Abbott Community College



Boston University



University of North Georgia



Mercyhurst University



# CAPACITY BUILDING

## UB Academic Programs

### Wildlife Management

Dr. Bart Harmsen (Panthera Wildlife Fellow) and our two wildlife biologists delivered NRMP 4452 Wildlife Management course from January 18 to February 5, 2015. Thirty-one students were taught the basic principles of wildlife management, ecology and conservation biology, where possible using Belizean or regional examples. The course also included population survival and corridor ecology highlighting the current work in the Central Belize Corridor by the wildlife team of UB ERI.

### Forest Ecology and Management Course

Dr. Elma Kay taught the NRMP 4402 Tropical Forest Ecology and Management course from February 9 to March 6, 2015. Twenty-one students were enrolled in the class and this year among other activities, the class visited and compared logging operations in Laguna Seca and the Mountain Pine Ridge, worked in a teak plantation, and completed a controlled burn in Deep River Forest Reserve with the Southern Fire Working Group, led by Mr. Mario Muschamp of TIDE.

### Fisheries and Aquaculture Management

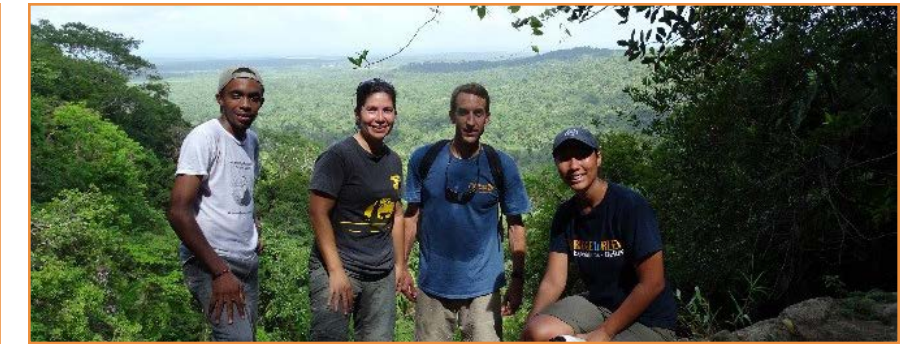
Dr. Leandra Cho-Ricketts delivered the NRMP 4502 Fisheries and Aquaculture Management course to seventeen students from March 10 to April 14, 2015. The course provided students with basic fisheries management theory and applied field activities monitoring fisheries catch, conducting fisheries surveys, comparing CPUE and exploring farm management and production.

### Field Methods and Assessment Course

Ivanna Waight-Cho delivered the NRMP 4153 Field Methods course with assistance from Dr. Ricketts, Dr. Kay and several guest lecturers during May 28 to June 15, 2015. The marine component was conducted from May 28 to June 5 at the Calabash Caye Field Station where students were introduced to various methodologies for monitoring mangroves, seagrass, coral reef, fish, diadema, marine mammals, and mega-fauna. The terrestrial component was conducted from June 7 to June 15 which focused on methods for monitoring wildlife, freshwater macroinvertebrates, birds, and plants.

### Regional Master in Biodiversity Conservation and Sustainable Development

This academic year, Drs. Kay and Ricketts worked closely with three CARPIMS students in the M.Sc. program supervising their data collection efforts, analysis and research paper preparation. In December 2014, Diana Seecharra, did her oral presentation on the perception of stakeholders in Placencia and Seine Bight on sustainable tourism and its impacts. Janille Huggins and Yinka Jagbir gave oral presentations in May 2015 on the perceptions and knowledge of farmers on Genetically Modified Crops (GMOs) and Mapping Fishing Activities in the Multiple-Use Turneffe Atoll Marine Reserve in Belize, respectively. Dr. Ricketts delivered the BIOL 6210 Marine Field Practicum course to one MSc student concurrently with the Field Methods class at CCFS during March 28 to June 10.



◀ Dr. Kay and Dr. Finkral with interns



Intern Yamira Novelo in the field ▶

### Internships

Dr. Kay and Dr. Finkral of The Forestland Group co-supervised two professional forest management interns, Denver Cayetano, a recent UB graduate, and Andria Rosado, Galen University student. The interns worked with logging field crews on the ground, tested and developed guidelines for completing stock surveys, created maps for annual plan of operations and collected pre-harvest data for a study on the impacts of reduced impact logging on mahogany regeneration.

▼ Dr. Kay and Dr. Finkral with interns



UB ERI hosted three interns from the BSc NRM program from June 22 - August 7, 2015. Shantel Espadas and Jonathan Lazos assisted with sea turtle nesting monitoring, mangrove health surveys and Acropora mapping. Wildlife Intern, Yamira Novelo, maintained the landscape survey database and assisted in fieldwork when necessary. Additionally, she produced a paper on the data collected which she was invited to present at UB GIS symposium in November 2015.

### On-going collaboration with Forest Department

The UB ERI continues to work on the curation of the National Herbarium at the Forest Department through its Student Assistant Program. Elizabeth Torres continues to work as the Herbarium Assistant updating the national plant collection database.

### Capacity-building for forest management and monitoring

In January, in collaboration with the Forest Department and with the support of the GIZ Selva Maya Program, the UB ERI organized a permanent sample plot monitoring workshop for stakeholders at the Hillbank Field Station. Dr. Percival Cho from the Forest Department and Programme for Belize staff delivered the measurement component of the training and Dr. Elma Kay of the UB ERI and Dr. Steven Brewer, Research Associate at Belize Foundation for Research and Environmental Education (BFREE) delivered the plant taxonomy component of the training. As part of this effort, UB ERI Student Assistant, Salvador Mesh, worked with Dr. Percival Cho of the Forest Department to compile a permanent sample plot monitoring manual which is available online.





Permanent sample plot monitoring workshop participants

In March 2015, Dr. Jack Putz of University of Florida delivered a workshop to UB and the Forest Department, private sector and protected areas co-management organization staff on the design and execution of forest management research. A course on reduced impact logging techniques was also delivered by the Guyana Forestry Training Centre to private sector parties and Forest Department staff as part of the collaboration with the Energy Climate Partnership of the Americas (ECPA) Fellow, Dr. Alavalapatli and The Forestland Group.

### Professional Development

#### National Training Program for Protected Areas Management

The implementation of the National Training Program for Protected Area Managers (NTPPAM) continued through support from the Protected Areas Conservation Trust (PACT). The UB ERI delivered a Financial Management Level 2 course to 11 participants from 9 organizations as well as a Research and Monitoring 2 course delivered by Drs. Kay and Ricketts, and Ms. Olatz Gartzia of the Ya'axché Conservation Trust to 9 biologists, mostly from the Fisheries and Forest Departments; Wildtracks also delivered an Advanced Management Planning Course in November in collaboration with the National Protected Areas Secretariat (NPAS).

#### Hydrological Modelling Workshop

Under the CARIBSAVE project, a two-day workshop on Assessing Potential Impacts of Climate Change on Belize's Water Resources was held at the George Price Centre for Peace and Development from August 14-15, 2014. The workshop was led by Emil Cherrington with assistance from UB ERI's, Dr. Elma Kay and Ivanna Waight-Cho. The workshop provided hands on exercises on hydrological modelling with the use of the Non-point Source Pollution and Erosion Conversion Tool (N-SPECT). A total of 21 participants from both governmental and non-governmental organizations attended the workshop.



Dr. Elma Kay and Ivanna Waight-Cho with participants of the second stakeholder workshop - part 2



## National Environmental and Natural Resources Management Research Agenda

A national workshop to review the status of research priorities under the 2010 National Environmental and NRM Research Agenda was held on October 23-24, 2014 at the Radisson Fort George Hotel and Marina. Thirty stakeholders developed new and revised research priorities for the period 2015-2020.



Terrestrial working group led by Dr. Kay



Marine working group led by Dr. Ricketts

## Wildlife

### Farm Improvement and Monitoring Program

The wildlife team worked with six farmers on the farm improvement and monitoring program to develop a site-specific strategy to improve livestock security on each farm. The strategies for better livestock security being implemented are: Solar Electric Fences, Guard Animal and Critter Gritter (Predator noise repelling device). During this period jaguar presence was detected in four farms and pumas were detected in two of the farms. A total of five attacks were reported by these farmers. The monitoring continues on nine of eleven farms established.

### Visiting Experts and Researchers

In collaboration with Panthera, our Wildlife Biologist facilitated the visit of Rafael Hoogestijn, Panthera Special Advisor, in June 2015. Rafael visited the project farms and gave advice about how to improve livestock management and security. Rafael and Rebecca Foster ran a workshop entitled Jaguars and Livestock for farmers in Toledo and staff at Ya'axché Conservation Trust. Rogerio Carvalho, representative of Germisul, visited project sites and met with farmers and members of the San Felipe Belize Livestock Producers Association (BLPA) branch in July 2015 and gave suggestions on the appropriate grass type to be planted.

▼ Guard Donkeys



Visit to Mr. Juan Herrera's Farm where he met the guard donkey "Napoleon"



Rogerio's farm visit



Rogerio's visit with members of the San Felipe BLPA

Alice Ball, Ph.D candidate from the University of Southampton visited the UB ERI in May 2015 and experienced a little of the field work in the Cockscomb Basin. She also presented "Modelling anthropogenic impacts on jaguar movements in wildlife corridors".

### UB ERI and Panthera Belize Visit Panthera Guatemala

In August UB ERI and Panthera Belize, along with Panthera Honduras, met with park rangers from Rio Dulce, Guatemala on regional efforts in jaguar conservation. During the 3-day exchange the park rangers learned about current efforts in both Honduras and Belize, Belize's human-jaguar conflict program, and jaguar and ocelot ecology.



Wildlife Biologist, Emma Sanchez, providing training on the use of camera traps to Guatemalan park rangers



Ms. Yahaira Urbina presenting on jaguar conflict program in Belize to the park rangers of Guatemala



Dr. Bart Harmsen presenting ecology of felids to park rangers of Guatemala

### Landscape Camera Surveys

Cameras were deployed at 29 camera stations within an agricultural landscape of approximately 320 km<sup>2</sup> in and around Central Belize Corridor and maintained for four months (March - July 2015). Preliminary analysis showed that 17 jaguar individuals were identified of which 12 were previously detected in 2014.

### Jaguar trapping/Live trapping

Jaguar trapping was conducted through snare traps in the month of February. In total there were 9 snares operational at the peak of trapping. Four animals were caught from the snares including two male jaguars, a male puma and a male tapir. The tapir walked away without any injury, and no data were collected from this capture. The cats were all fitted with a GPS collar to track their movements for a year and half. One jaguar captured was old, about 11 years with two broken canines and blind in one eye. A collar was placed on it to provide valuable data on how an old compromised individual would live.



Jaguar at CBWS



Puma with collar at CBWS





Ben with collar at CBWS



First camera capture of Oldman with collar at CBWS

Annual Camera Trap Survey

The annual survey (March to July) produced ~620 captures of jaguars of ~30 individuals, 12 were females and 17 were males. There are three captures which are unknown individuals. One new female turned out to be a cub photographed in 2011. She was photographed close to where she was captured as a cub, indicating that she has settled within or next to the home range of her mother. Puma captures were ~290 of which ~91 captures were from the collared puma. The high level of capture for the single collared puma suggests a much lower number of pumas within the basin compared to jaguars.

Southern Corridor Collaborations

Ya'axché Conservation Trust repeated camera trap surveys in 2014 at 15 locations within their co-managed areas between October-December 2014 and January-February 2015. There was a total of 24 Jaguar captures, 26 captures of pumas, 15 captures of ocelots, 11 captures of margays, and 2 for Jaguarundis. With regards to prey there were 19 captures of pacas while there were 10 captures between nine banded armadillos and white lipped peccaries (Table 1). Five male and 3 female jaguars were confirmed through the photos. However, there was a high number of jaguar photos in which the sex was difficult to identify. This also applies to pumas and ocelots.

Species	Total
Jaguar	24
Jaguarundi	2
Margay	11
Puma	26
Ocelot	15
Paca	19
NBArmadillo	4
WLPeccary	6
<b>Grand Total</b>	<b>107</b>

Total number of captures for the 5 cats and their prey in Ya'axché 2014-2015 camera survey



Photograph of jaguar (M14-3TOL) displaying a marking behaviour called tree scraping. Jaguars are known for this but this is the first documentation of this behaviour

Marine

Turneffe Ecosystems Health

Ecosystem health surveys were completed in August 2014 for 23 reef sites, 10 seagrass sites and 5 mangrove sites at Turneffe Atoll. This is the fifth year of data collection which started in 2010 and data was collected with the assistance of UB ERI, FST staff and student volunteers. New sites were added in order to include sites within the management zones to be able to compare ecosystem health between conservation and general use zones.

The 2013 Turneffe Ecosystem Health Report was completed in November 2014, published and disseminated. Coral reefs had poor health but seagrass and mangroves were in good health. The 2014 Ecosystem Health Report was completed in July 2015. The overall health of seagrass and mangroves remained good, however, coral reefs continued to show poor health.

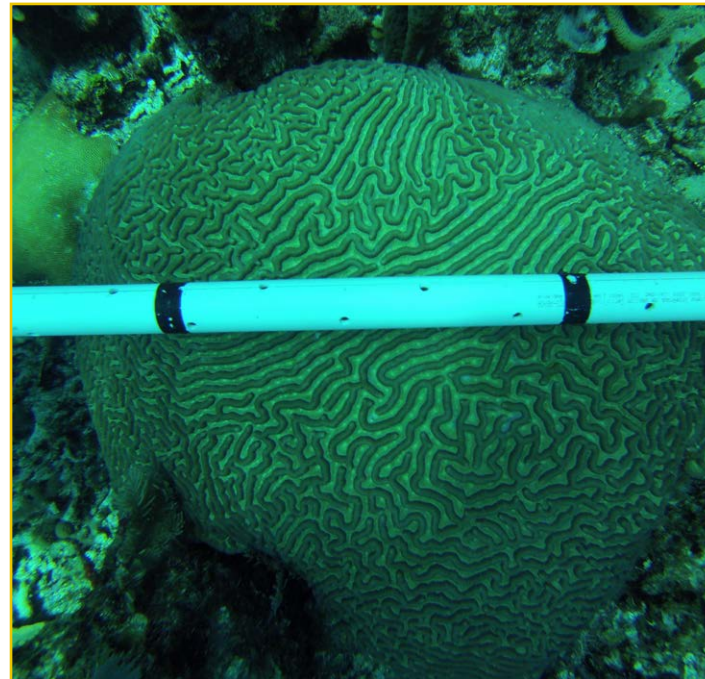


Monitoring activities at Turneffe Atoll.



**Coral Bleaching**

Coral bleaching monitoring was conducted at 9 sites in September and October, 2014 and again in February. Two new sites were added to include 2 conservation zones (Zone IIA and Zone IV) in the atoll. Very little to no bleaching was observed.



**Queen Conch Surveys**

Conch surveys were conducted before the season opened (October 1<sup>st</sup>, 2014) at 34 conch sites. Sites surveyed represented all management zones for comparison of conch populations between zones. Conch tissue samples were collected and forwarded to the Belize Fisheries Department. The survey data were also shared with the Fisheries Department to inform their National Conch Survey.

**Seagrass Net Monitoring**

The Seagrass Net monitoring was renewed in August 2014 on a biennial basis. Field data and specimen samples were collected from the two sites and processed with the assistance of student volunteers.



**Nassau Grouper SPAGs**

Nassau grouper spawning aggregation monitoring was conducted in January and February 2015. The highest mean count of 496 Nassau groupers was observed in January. The team consisted of our four scientific divers and 2 student diver-in-training.

**Spiny Lobster Surveys**

Lobster surveys were conducted at 26 sites in Turneffe Atoll. The 2014/15 Lobster LAMP survey report was completed and shared with TASA. This provided information on the abundance of spiny lobsters just before opening and after closure of the season. Abundance was low at the close of the season with 22 lobsters per hectare vs. 47 lobsters per hectare at the start.

**MAR Alliance Annual Megafauna Surveys (April 2015)**

During April 13-17, Victor Alamina assisted Dr. Rachel Graham of MAR Alliance with the annual monitoring of megafauna in Turneffe using long-lines, baited remotely operated vehicles and in-water surveys.

**Diadema Population Study**

In July, a *Diadema* population study was completed at 11 sites by 4 staff and 5 student volunteers. Data on distribution, abundance, age and predator abundance will be analyzed to present the status of this keystone herbivore at Turneffe.

**Sea Cucumber Research**

Marine Fellow, Dr. Arlenie Rogers, conducted training with students and fishermen on sea cucumber data collection methodology from February 2014 to September 2015. A total of 14 fishermen, 1 BFD officer and 36 UB students were trained in reproductive cycle data collection. One student was trained to do histology studies, 2 students successfully completed their Independent Thesis Project on sea cucumber, and a total of 4 students were trained in sea cucumber weight conversion. Monthly data on reproductive organs was collected for a period of 19 months. Organs collected over a 15-month period were histologically processed at the Central Pathology Lab in Belize City and pictures for 5 months of data have been taken at the BAHA lab.



**Data Management Support**

A new SPAGs online front end is fully operational and a reporting feature for annual counts was created to give reports on maximum mean counts. The sea turtle database was completed and will be tested by the Sea Turtle Network members. The online database for reef health monitoring continues to be developed with a target of early 2016 for testing.

The Eprints database was linked to Google Analytics to track where visitors are coming from for the repository. A presentation on the Eprints repository and how to use it was made to stakeholders at the National Environmental and NRM Research Agenda workshop.

A livestock database was developed and testing of this application is ongoing along with testing the utility of a mobile data entry tool, Open Data Kit (ODK), to enable quick and easy data uploads from the field. The wildlife camera trap database was also refined and is being tested internally to ensure full functionality and accuracy.

**Darwin Sustainable Forestry Project**

At the start of the academic year, UB ERI entered into a partnership with Oxford University and the Forest Department for the implementation of a new Darwin project entitled “Biodiversity Conservation through Poverty Alleviation: Enabling Sustainable Forestry in Belize”. The goal of this project is to advance institutional and communal knowledge and technical capacity in forest management to support a shift to sustainable forestry that reduces overharvesting and forest degradation and promotes economic welfare. A Forest Biologist, Shanelly Carillo has been hired for this project and is currently working with Dr. Percival Cho, Post-doctoral Fellow at Oxford University under the same project to set up existing 1 ha permanent sample plots at Las Cuevas and Hillbank as intensive Global Ecosystem Monitoring (GEM) network plots. These plots will be used to measure total carbon flux through broadleaf forest systems and require very detailed measurements.



# COMMUNICATIONS & OUTREACH

## Central Belize Corridor Conservation Action Planning

In partnership with the Ministry of Forestry, Fisheries and Sustainable Development, and with the support of Panthera, the Selva Maya Program of the German Cooperation Agency (GIZ) and a multi-stakeholder 15-member task force, the UB ERI completed the Conservation Action Plan (CAP) for the Central Belize Corridor (CBC). The highly participatory consultative process gathered over 120 individual stakeholders representing government agencies, non-governmental organizations, community-based organizations, private land-owners, community residents and developers. Stakeholders defined and prioritized management targets in the corridor, the threats to these targets and the strategies that they want to be a part of implementing in order to achieve the goal of a *functioning Central Belize Corridor through actions that balance our social, cultural and economic well-being*. The plan was launched in February 2015.



## UB ERI 5<sup>th</sup> Anniversary Celebrations

UB ERI successfully hosted its 5th anniversary celebrations during which key partners/donors were recognized including departments within the University. Recognized at the event were our main donors and partners: the OAK Foundation, Panthera and the Ministry of Forestry, Fisheries and Sustainable Development. We also acknowledged our UB family for all their support of our work and our national NGO partners.



## Marketing & Visibility

In March 2015, shortly after our 5<sup>th</sup> Anniversary celebrations we launched our new logo.



UB ERI participated in various outreach activities throughout the year which resulted in a number of students registering to volunteer with the Institute including the NRM Orientation held at the UB Auditorium, UB's Semester Kick Off activities on September 18, FST Open Day Expo on November 28, and Earth Day activities on April 22, 2015.



In October 2014 we developed a visibility plan for the Institute which resulted in a series of media appearances:

- Dr. Ricketts and Ivanna Waight-Cho appeared on Wake Up Belize (WUB) on October 23, 2014 to discuss the revision of Belize's NRM Research Agenda and CCFS.
- Dr. Elma Kay appeared on Open Your Eyes on November 3, 2014 to discuss the National Training Program for Protected Areas Management.
- Ivanna Blanco, Nicole Craig and student volunteers appeared on Love FM's Morning Show on November 27, 2014 to discuss the CCFS and the 2014 Turneffe Atoll Ecosystem Health Report.
- Dr. Arlenie Perez and student volunteers discussed her Sea Cucumber research on Love FM's Morning show on December 9, 2014.
- Dr. Ricketts, Kathya Castenada, and Pia Gregoire on the occasion of the UB ERI's 5<sup>th</sup> Anniversary celebrations appeared on Open Your Eyes on February 24, 2015 to discuss the Institute, its accomplishments over the past 5 years, and the way forward.
- Yahaira Urbina (UB ERI Wildlife Biologist) joined Rebecca Foster (Panthera Belize Director) and Edgar Correa (Jaguar Officer) on Open Your Eyes in March 2015. They discussed the conflict between humans and jaguars, encouraged the general public to report issues of conflict with wildlife to the Forest Department, and promoted anti-predation strategies.

**Mainstreaming Biodiversity, Ecosystem Services and Coastal Resilience in Tourism Development**  
 UB ERI signed a consultancy with IDB in February to conduct an ecosystem service mapping and review for the Mainstreaming Biodiversity, Ecosystem Services and Coastal Resilience in Tourism Development Project using available data layers to create maps on protected areas, forest cover, land use etc. for the four destinations of interest; and maps illustrating ecosystem services (carbon, coastal protection etc.) and threats (fire, deforestation) per destination. The review includes calculations for area (ha) of watershed, carbon, mangrove and the economic value of these for the study areas. This consultancy runs from February-August 2015. The outputs will guide the development of the Sustainable Tourism Development Project Phase 2.



**Oceana Sponsored Primary School Trip**

The UB ERI hosted an educational trip by Oceana to the CCFS on January 24, 2015. Fifteen students aged 11 to 13 from the Central Christian Primary School visited the station where our Marine Biologist and Field Technician delivered a fun presentation to the students on our science program, along with an interactive reef and marine experiences.



Students of the Central Christian Primary School at CCFS

**American Academy of Underwater Sciences (AAUS) Symposium**

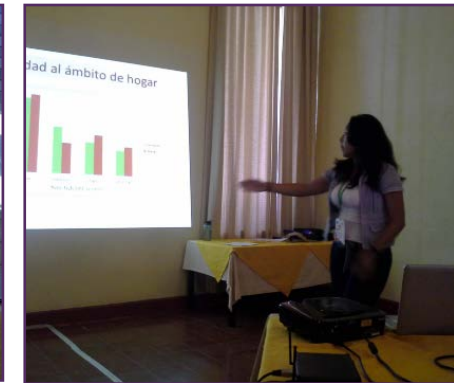
The Dive Safety Officer and CCFS Station Manager represented UB at the American Academy of Underwater Sciences (AAUS) symposium in Sitka, Alaska, September 9-13, 2014 where a presentation was made on the UB Scientific Diving Program and how the UB ERI uses science diving to inform management of the Turneffe Atoll Marine Reserve.

**XVIII MSBC Regional Congress, Copan, Honduras**

The UB ERI/Panthera wildlife team participated in the XVIII MSBC Congress held in Copan Ruinas, Honduras from October 13-17, 2014. Dr. Elma Kay, Dr. Bart Harmsen, Dr. Rebecca Foster, Ms. Yahaira Urbina and Ms. Emma Sanchez participated as presenters for the congress. Dr. Kay presented the main results of research from the CARIBSAVE funded project in partnership with CATHALAC, "Assessing the potential impacts of land use and climate change on Belize's water resources". Bart Harmsen's presentation was entitled "Camera trapping large carnivores: lessons learned from a 10 year study in the Cockscomb Basin, Belize" and Dr. Foster presented an "Overview of human-jaguar conflict in Belize". Ms. Sanchez made a Spanish presentation on "Long-term spatial dynamics of Ocelots in Cockscomb Basin, Belize" while Ms. Urbina presented on "Predators' presence in a human-influenced landscape, Belize".



Yahaira Urbina presenting at XVIII MSBC Regional Congress, Copan, Honduras



Emma Sanchez presenting at the XVIII MSBC Congress, Copan Ruinas, Honduras



Wildlife Biologist delivering presentation at the IX NRM Annual Symposium

**19<sup>th</sup> NRM Annual Symposium**

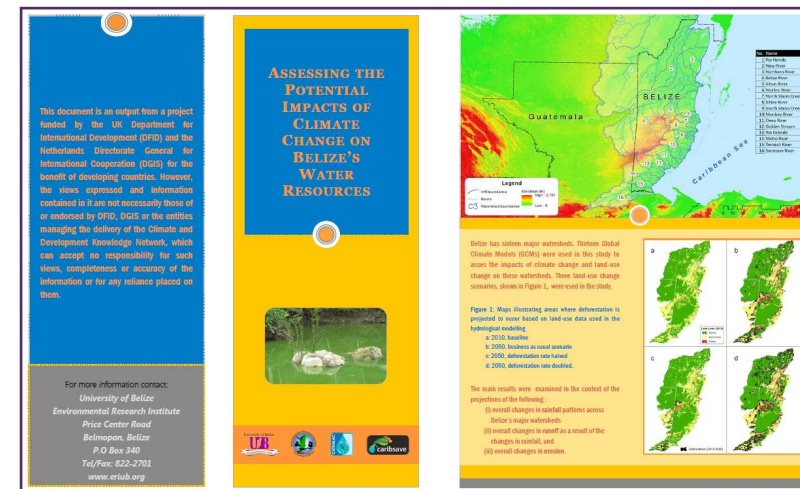
UB ERI delivered presentations at the NRM Symposium held on March 25, 2015 at the George Price Centre for Peace and Development. Our Science Director (Terrestrial) presented on "The impacts of climate and land use change on Belize's water resources" while the Marine Biologist presented the 2014 Ecosystem Health report and the Wildlife Biologist presented on "Predators' presence in a human-influenced landscape, Belize".

**Publications**

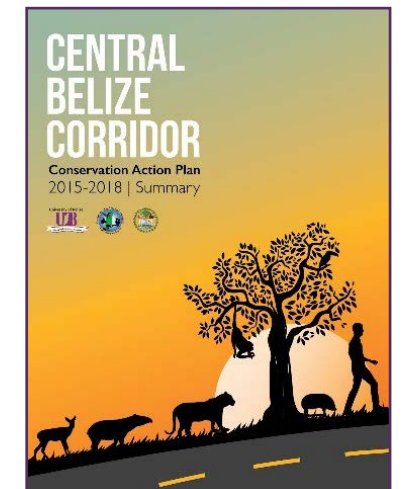
**Assessing the Potential Impacts of Climate Change on Belize's Water Resources**

A final brochure on findings and a policy brief were put together for the CARIBSAVE project. These have both been made available to the funders and should become available to the wider public very soon.

The Central Belize Corridor Conservation Action Plan report was launched on February 26, 2015 with printed summaries.



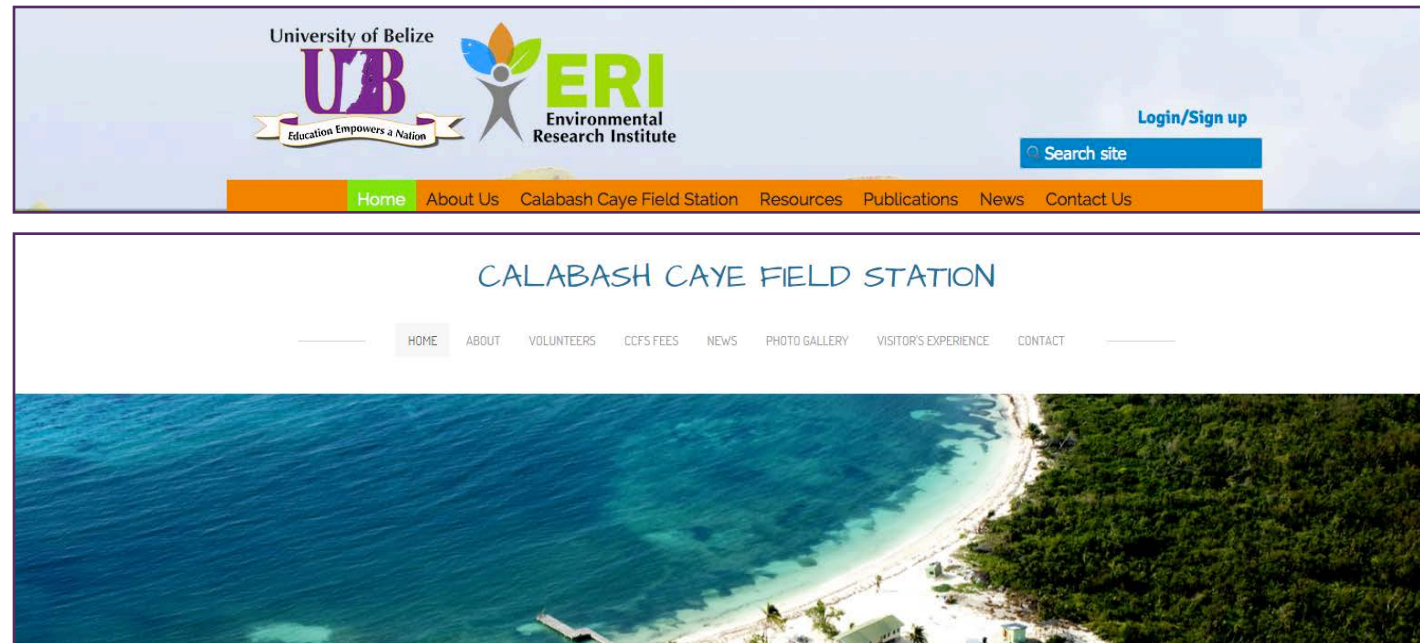
CARIBSAVE project brochure



CBC CAP Report



The Institute launched a new and more interactive website [www.uberibz.org](http://www.uberibz.org) on May 1, 2015. The site also includes a newly developed CCFS page.



Articles

Watkins, A., Noble, J. Foster, R. J., Harmsen, B. J. & Doncaster, C. P. (2014) A spatially explicit agent-based model of the interactions between jaguar populations and their habitats. *Ecological Modelling*, 306: SI 268-277

Marcos G. Lopes, Joares May Junior, Rebecca J Foster<sup>2,4</sup>, Bart J Harmsen<sup>2,4</sup>, Emma Sanchez<sup>2,4</sup>, Thiago F. Martins<sup>1</sup>, Howard Quigley<sup>2</sup>, Arlei Marcilil,<sup>5</sup> and Marcelo B. Labruna.(In press). Ticks and rickettsiae from wildlife in Belize, Central America. *PARASITES AND VECTORS*.

**New Discoveries**

In August 2014, among the large number of pictures collected in the field, a new species never before recorded in CBWS was discovered. A naked-tailed armadillo was pictured by a camera station 15 km up the Victoria Peak trail. Two other pictures of the same species were identified at different locations. The likelihood of capturing one is very low due to its fossorial behaviour (living underground).

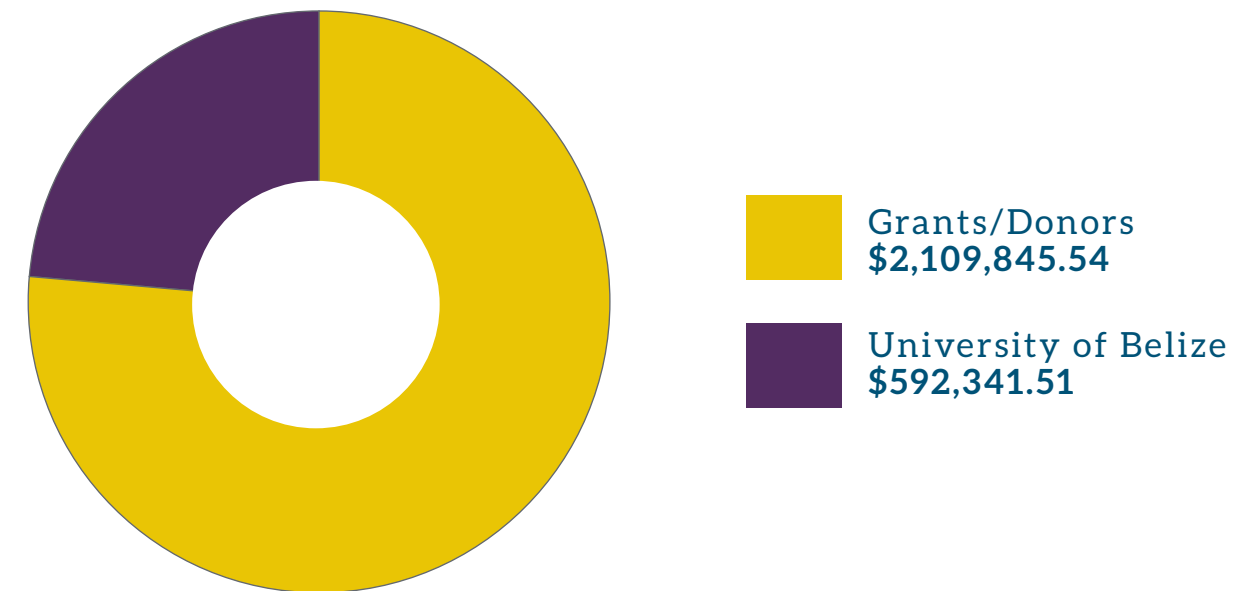


Three photos that exist from the 2014 CBWS database.

# FINANCIAL OVERVIEW

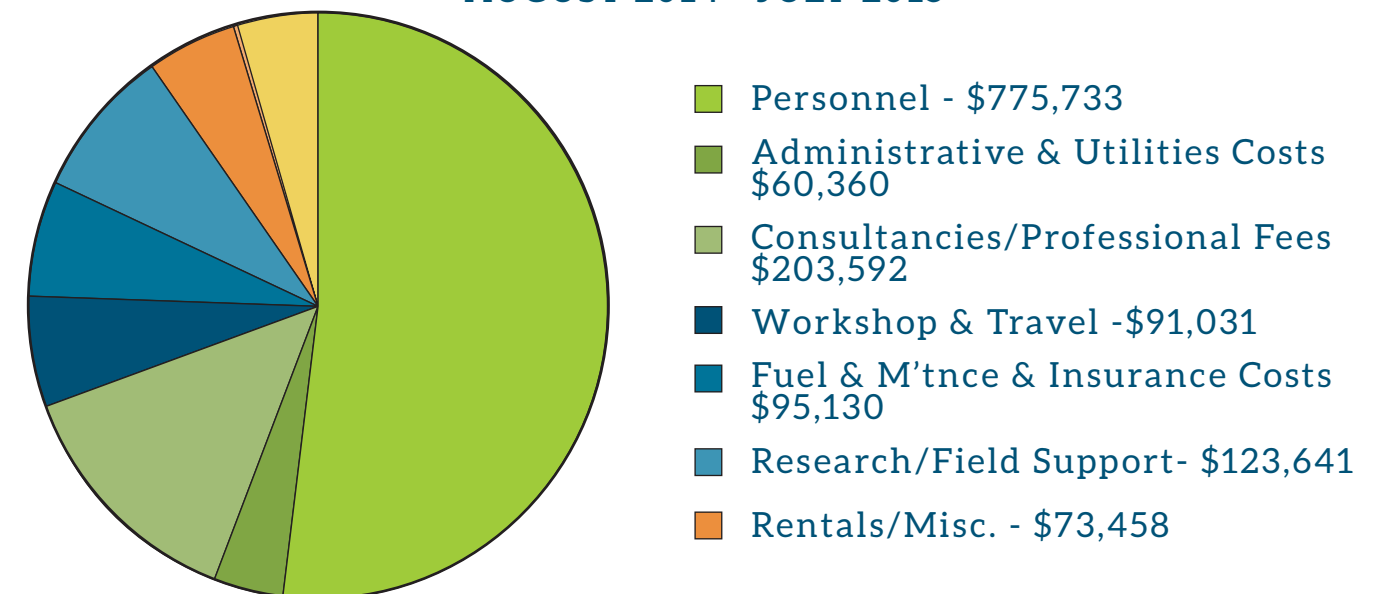
For the Academic Year ending July 31, 2015, UB ERI and by extension the Calabash Caye Field Station benefited from the support of its local and foreign partners, in advancing its various programs.

## TOTAL FUNDS MANAGED OVER THE PERIOD AUGUST 2014 - JULY 2015



The funding received was spent on the activities under the Institute's strategic objectives. The chart below gives an exploded view of all expenditure associated with the UB ERI's activities for the Academic Year.

## OPERATIONAL EXPENDITURE OVER THE PERIOD AUGUST 2014 - JULY 2015





## FINANCIAL OVERVIEW

The unaudited figures below show a comparison of our financial position over the last two years. The most significant change in our net assets was the construction costs associated with the CCFS Staff and Researcher Quarters.

ENVIRONMENTAL RESEARCH INSTITUTE BALANCE SHEET COMPARATIVE REPORT (2015 & 2014)		
ASSETS	2015	2014
<b>Current Assets</b>		
Imprest (Petty Cash)	\$ -	\$ -
Checking account-Scotiabank	\$ 596,196.57	\$ 1025,643.00
Other- assets:		
Employee Advance		
Receivables	\$ 3,464.25	\$ 25,286.65
Prepaid Ins	\$ -	\$ 2,714.96
<b>Total Current Assets</b>	<b>\$ 599,660.82</b>	<b>\$ 1053,644.61</b>
<b>Fixed Assets</b>		
Equipment:		
ERI funded	\$ 107,951.53	\$ 107,046.37
Accm depr-ERI assets	\$ (73,348.45)	\$ (57,377.36)
Panthera funded	\$ 69,304.46	\$ 30,229.36
Accm depr Panthera assets	\$ (29,560.88)	\$ (19,381.30)
Darwin funded	\$ 9,628.43	\$ 9,628.43
Accm depr Darwin assets	\$ (8,543.12)	\$ (7,586.31)
GIZ	\$ 26,136.58	\$ 3,925.04
Accm depr GIZ assets	\$ (4,664.49)	\$ (258.44)
OAK funded	\$ 787,095.61	\$ 723,311.95
Accum depr-OAK	\$ (453,416.41)	\$ (327,035.96)
CARIBSAVE funded	\$ 3,185.16	\$ 3,185.16
Accum depr-CARIBSAVE	\$ (729.93)	\$ -
CCFS Staff & Researcher Qrts(CIP)	\$ 520,875.21	\$ -
ERI Bldg	\$ 78,803.81	\$ 78,801.16
Accum depr-ERI Bldg	\$ (16,506.30)	\$ (8,626.18)
CATIE funded	\$ 741.56	\$ 741.56
<b>Sub-Total</b>	<b>\$ 1016,952.77</b>	<b>\$ 536,603.48</b>
<b>Total Fixed Assets</b>		
<b>TOTAL ASSETS</b>	<b>\$ 1616,613.59</b>	<b>\$ 1590,248.09</b>
<b>LIABILITIES &amp; EQUITY</b>		
<b>Current Liabilities:</b>		
Accounts Payable	\$ 14,884.81	\$ 20,607.44
Wages payable	\$ 389.65	\$ 966.63
Social Security payable	\$ 52.00	\$ 65.96
	\$ 15,326.46	\$ 21,640.03
<b>Capital Projects:</b>		
CCFS Staff Qrts (Bertarelli Grant)	\$ 39,034.99	\$ -
IDB Project	\$ 16,965.76	\$ -
	\$ 56,000.75	\$ -
<b>Equity:</b>		
Equity b/f prior yr	\$ 1568,608.06	\$ 1060,186.56
Adj to PACT II a/c	\$ -	\$ (7.81)
Net Income	\$ (23,321.68)	\$ 508,429.31
<b>Sub Total</b>	<b>\$ 1545,286.38</b>	<b>\$ 1568,608.06</b>
<b>TOTAL LIABILITIES</b>	<b>\$ 1616,613.59</b>	<b>\$ 1590,248.09</b>

## STAFF

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Inacio Cortez	Caretaker	<a href="mailto:lcortez@ub.edu.bz">lcortez@ub.edu.bz</a>
Justin Hall	Caretaker	<a href="mailto:jhall@ub.edu.bz">jhall@ub.edu.bz</a>



# STEERING COMMITTEE

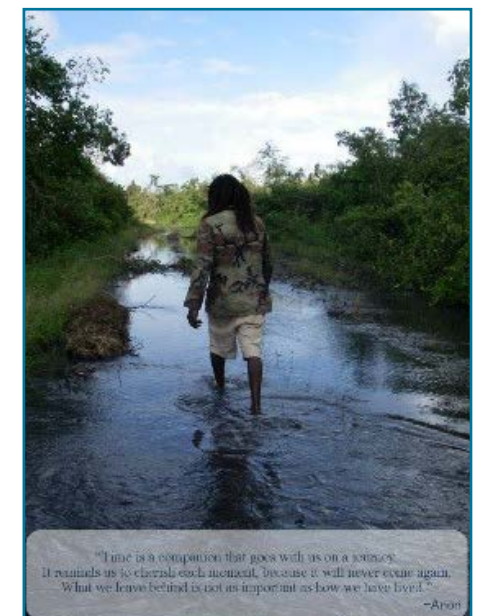
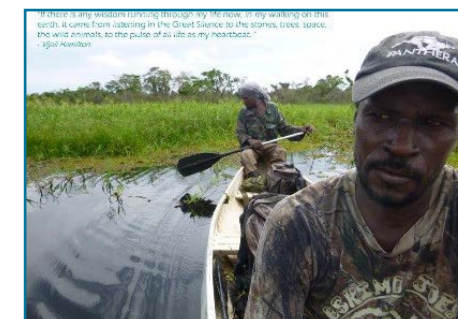
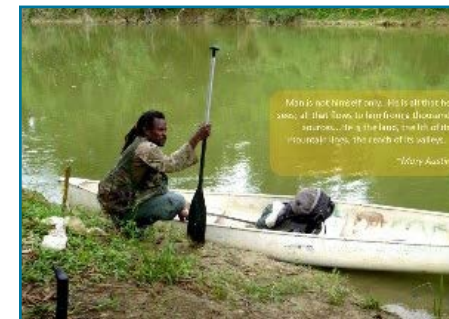
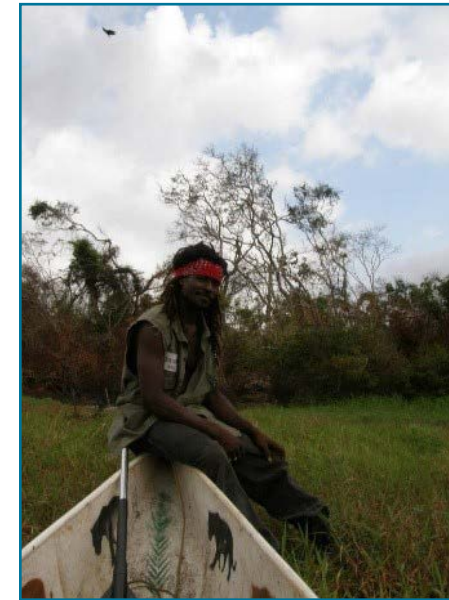
Name	Organization
Dr. Wilma Wright	Chair/Interim Provost, UB
Dr. Leandra Cho-Ricketts	Administrative Director, UB ERI
Dr. Pio Saqui	Dean, Faculty of Science & Technology
Mrs. Sherlene Julien	Finance Director, UB
Ms. Nadia Bood	International NGO Representative, WWF
Mr. Mauricio Mejia	Alternate, International NGO Representative WWF
Mr. Glegg Watson	Private Sector Representative
Mr. Jose Perez	Private Sector Representative, APAMO
Mrs. Beverly Wade	Fisheries Department
Mr. James Azueta	Alternate, Fisheries Department
Mr. Trevor Roe	Private Sector Representative, Roe Group of Companies
Mr. Brian Lin	Private Sector Representative, BELTRAIDE
Mrs. Rasheda Garcia	Forest Department Representative
Mr. George Headley	Private Sector Representative, Bull Run Overseas Ltd.

## STUDENT ASSISTANTS

Name	Position
Bay Rivas	Office Assistant
Caramyn Reid	Office Assistant
Elizabeth Torres	Herbarium Assistant
Kristin Vernon	Database Assistant
Yamira Novelo	Panthera Database Assistant
Zana Wade	Publications Assistant

## In memory of Arturo "Ben" Ramos

In March 2015 the wildlife team's Field Operation Manager, Arturo Ramos, passed away suddenly. He had been working with us since 2009 mainly in the Central Belize Corridor and the Cockscomb Basin Wildlife Sanctuary. He is surely missed.







[WWW.UBERIBZ.ORG](http://WWW.UBERIBZ.ORG)

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