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### Fond D'Or Waters Keep No Secrets

Jean Giraudoux, a French novelist, once remarked that ***"Water is the one substance from which the earth can conceal nothing; it sucks out its innermost secrets and brings them to our very lips"***. In St. Lucia, the residents of the Fond D'Or Watershed have proved this to be true. Health clinics continue to record local cases of water-related diseases such as gastroenteritis, ear, eye and skin infections.

This comes as no surprise as river water quality testing, facilitated by the GEF-IWCAM Demonstration Project, reveals high levels of *Escherichia coli* bacteria. *Escherichia coli*, more commonly referred to as *E.coli* bacteria are found in the guts of animals and, when found in water, are indicators of fecal contamination.

Pig farms appear to be culpable for the deteriorating quality of the rivers as there has been a proliferation of pig farms in the watershed over the years. It does not take a stretch of the imagination to realize the ripple

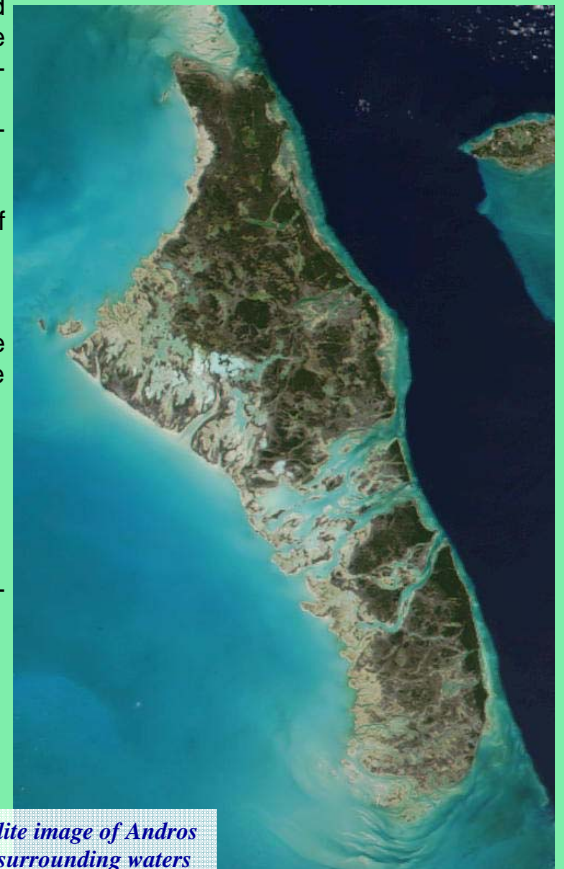
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### Managing the Sensitive Coastal and Freshwater Resources of 'The Big Yard'

**- GEF-IWCAM's Demonstration Project in Andros, The Bahamas**

Bahamians affectionately call Andros "The Big Yard". This, the largest island in the Bahamian Archipelago, and the fifth largest island in the wider Caribbean, is also home of the Bahamas' largest freshwater aquifers, vast tidal creek wetlands, and one of the world's largest barrier reefs, a nursery that supports diverse sea life well beyond Bahamian territorial waters. Indeed, it is not hard

to argue the national and regional importance of effectively managing the sensitive coastal and fresh water resources of Andros.



*Satellite image of Andros and surrounding waters*

*(Continued on page 2)*



*Community meeting held in Fresh Creek, Andros*



*Conducting an Ecological Habitat Survey of a tidal creek wetland*

## BACKGROUND ON THE GEF-IWCAM PROJECT:

*The Global Environment Facility-funded Integrating Watershed and Coastal Areas Management in Caribbean Small Island Developing States (GEF-IWCAM) Project was approved by the Global Environment Facility (GEF) in May 2004. Implementing agencies are the United Nations Environment Programme (UNEP) and the United Nations Development Programme (UNDP). Executing agencies are the Secretariat of the Cartagena Convention (UNEP-CAR/RCU), the Caribbean Environmental Health Institute (CEHI) and the UN Office for Project Services (UNOPS). The thirteen participating SIDS are: Antigua and Barbuda, The Bahamas, Barbados, Cuba, Grenada, Dominica, Dominican Republic, Haiti, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, and Trinidad and Tobago. The length of the Project is 5 years and commenced in the second quarter of 2005. It is expected to end in July 2011. The Project Coordinating Unit is located at the CEHI, as agreed by the Implementing and Executing Agencies and the participating countries.*

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In pursuit of this objective, The Bahamas Government, through The Bahamas Environment, Science and Technology (BEST) Commission of the Ministry of the Environment is implementing the objectives of the GEF-IWCAM Project in the island of Andros through a demonstration project. This Project is titled: **"Land and Sea Use Planning for Water Recharge Protection and Management in Andros, Bahamas"**. The primary initiative to protect these rich resources is the development of a novel Land and Sea Use Plan (LSUP). The Nature Conservancy (TNC), through its Bahamas office is supporting BEST in execution of the following activities on Andros:

- Preparing zoning of land and sea areas for future use, development and conservation.
- Developing an Ecotourism Plan.
- Conducting a Marine and Terrestrial Resource Survey.
- Mapping of the islands biodiversity, including a process of identifying threats and concerns for biodiversity conservation.
- Coordinating an Economic Valuation of Resources and Biodiversity of the island.
- Developing a Water Conservation Strategy, and small-scale demonstration of reducing water wastage.
- Developing a Community Management and Self-Regulation Strategy.
- Coordinating Community Awareness and Educational Programmes to sensitize the community to project benefits.

Some of the environmental concerns being assessed are:

- Over-extraction and wastage of freshwater from groundwater extraction wells.
- Destruction and deterioration of important ecosystems including mangroves, wetlands and shorelines, as a result of poor development practices.
- Inadequate disposal of solid and liquid waste.
- Vegetation and habitat loss due to indiscriminate land clearing, rock and sand mining.
- Lack of resources to manage and monitor existing protected areas.

The Government appreciates that addressing these concerns, over such a wide area requires solutions built through partnership. This is why the people of Andros, although sparsely settled throughout the island, are centre-stage in the GEF-IWCAM Andros Demonstration Project.

To facilitate public participation, the Bahamas Government has been convening community awareness and project strategy meetings in the major settlements of Andros. Community leaders demonstrate their support for the project by assisting technical experts with survey activities, facilitating project meetings, taking advantage of available resources from local government and non-government organizations (NGO's) to execute project objectives,

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*Tidal creek wetland near a pine forest*

and making announcements on radio and during religious meetings. Schools are invaluable centres for sharing information about the GEF-IWCAM Project. Teachers lead their students in the creation of informative project posters, and some students have been invited to participate in research activities and surveys.

Geographical Information Systems (GIS) stakeholder meetings also have been held with experts from government and NGO's to inform and encourage participation in the formation of a data collection, sharing and management mechanism. A GIS training workshop is also being made available to all GIS stakeholders to ensure that the end-users of the multi-sector GIS system understand how to manage and use data made available through this project.

During these meetings, various sources of existing Andros data were collected and evaluated, and are now being used in the development of the Project. TNC, the primary NGO project partner, has also completed a Rapid Ecological Assessment of the west coast of Andros and developed a Conservation Area Plan which is included as a component of the Project master plan.

However in order to work consistently and uniformly in such a large territory, technical experts must be able to spatially define the project boundaries and the biological targets requiring assessment. In fulfillment of this need, the general project boundary to be managed by the LSUP was defined using topographic maps, and satellite imagery. Geographic and political boundaries were established, incorporating the terrestrial and marine environments of Andros.

Preliminary findings of the Rapid Ecological Assessment also assisted in defining spatial distribution characteristics of several biological target species, including bonefish, sea turtles, and the West Indian flamingo, which was documented for the first time along the western coastline of Andros.

This aggregation of imagery and data allowed for the establishment of the following natural resource targets as the baseline inventory of land and sea biodiversity:

- Freshwater Reserves
- Land Crab
- Conch

- Hawksbill, green and loggerhead turtles
- Spawning Aggregations (Grouper and bonefish)
- Andros Rock Iguana
- Pinelands
- Dry Broadleaf Evergreen Formations (Coppice)
- Mangroves/ Wetlands (Saline and freshwater)
- Tidal Creeks
- Unconsolidated seafloor (Sea grass, sand, mud)
- Blue holes (Marine and terrestrial)
- Beach and Coastal Strands
- Marine Mammals
- Coral Reef (Star coral, Elkhorn coral, reef patch, platform margin, & coral walls)
- Seabirds

Additionally, RapidEye Imagery for the entire project boundary was procured and is available to the Bahamas National GIS Centre. A map will also be accessible by project closure, allowing non-GIS specialists to access imagery without GIS software. The Bahamas project partners are also mobilizing their remote sensing capabilities to develop detailed land use and marine habitat maps. This is an unprecedented effort for The Bahamas, and provides the most comprehensive compilation of mapped data on Androsian habitats ever attempted. Extensive collaborations with scientists, experts, and other stakeholders with local knowledge are underway, and have been significant investments of project time.

A California based think tank, will conduct an economic evaluation of the islands resources; the results are expected to provide useful insight to both local government, and policy makers in directing development on Andros.

The GEF-IWCAM Andros Demonstration Project represents a novel and invaluable approach to protecting freshwater, coastal, and marine resources throughout The Bahamas and the wider Caribbean.

***This article was contributed by the Bahamas Environment, Science and Technology (BEST) Commission.***



*Enjoying one of the largest blue holes in Andros*

## Bountiful Harvest — Innovation in Cuba's Demo Project



1

The GEF-IWCAM Demonstration Project in Cuba, “*Application of IWCAM Concepts at Cienfuegos Bay and Watershed*”, has been varied in its approach, ranging from support for establishment of a comprehensive monitoring programme to education of primary school students on the IWCAM approach.

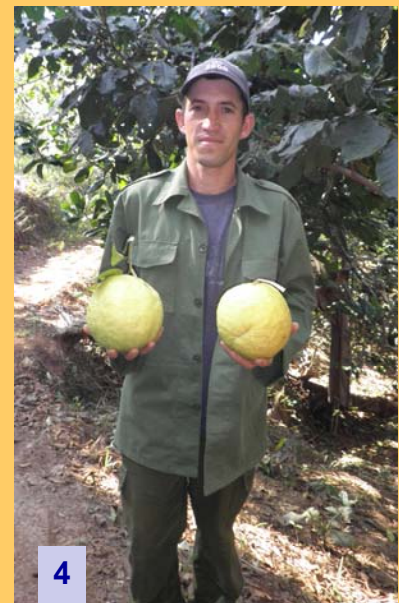


2

Among notable achievements have been their agricultural activities, in both soil conservation and agro-forestry. Last year, we featured photos from the Sarduy Farm (see the March 2009 newsletter). This year, we are pleased to share photos from the La Sabanita, La Sierrita, and San Juan Farms in Cienfuegos Province.



3



4



5

1. View from the Upper Cienfuegos Watershed.
2. Bananas are grown at La Sabanita, for consumption and sale.
3. Decorative plants are also grown at La Sabanita, perhaps for sale in the future.
4. Citrus is grown among the native trees.
5. Shade-grown coffee is being dried—both for consumption and sale (a high-value crop).



6. 7. 8. The San Juan farm cultivates micro-organisms to assist in the process of composting and fertilization. This technology, while simple, is innovative and proving to be highly effective.

9. 10. Livestock on the San Juan Farm are raised in a very sustainable manner. Great care is given to their grazing and their waste is effectively re-used. Animal products from the farm are then sold to government for use as part of the children's feeding programmes.

La Sabanita and La Sierrita are agro-forestry farms which focus upon maintaining forest cover and/or reforestation, while producing significant agricultural yields. Cuban counterparts have provided these farmers with technical guidance and material support while testing out new and innovative techniques.

The San Juan farm is a well-established farm that, with the support of the GEF-IWCAM Project, is focusing its efforts on soil conservation, through the cultivation of specific organisms for composting and fertilizing, irrigation techniques, and other practices.

More information on these and other activities can be obtained from the Demonstration Project Manager, Alain Munoz Caravaca at: [alain@gestion.ceac.cu](mailto:alain@gestion.ceac.cu)



## St. Lucia's Water Resource Management Agency benefits from TCC with Jamaica



*F. Monero and J. Mathurin meet with B. Fernandez, Managing Director, and H. Thomas, Deputy Managing Director, WRA*

Among its goals, the GEF-IWCAM project seeks to improve the capacity of Participating Countries in areas related to watershed and coastal areas management. The project has identified Technical Cooperation among Countries (TCC) as an effective means of achieving this goal. In this regard, in October 2009, the Project provided financial support for two staff members of St. Lucia's newly established Water Resource Management Agency (WRMA) to undergo a two-week secondment (from October 26 to November 7, 2009) in various aspects of water management at Jamaica's Water Resource Authority (WRA).

The WRA was considered to be most suitable for training, because of its highly qualified, professional and technical staff, its experience working with varied water resources (both ground and surface water) and its leading role in water management in the Caribbean.

The overall objective of the secondment was to provide an opportunity for the WRMA to understudy the operations and management of a functional entity responsible for managing water resources. This exposure would contribute to building the capacity required within the WRMA to carry out its mandate, that is, to manage the water resources of Saint Lucia in a sustainable manner through principles of integrated water resources management. With its increased capacity in areas such as water resources monitoring, planning and assessment, integrated watershed and water resources management, and water resources conservation, the WRMA will be better positioned to enhance and facilitate the exit strategy of the GEF-IWCAM project and to replicate the good practices and lessons learnt under the local and regional GEF-IWCAM demo projects.

Mr. Faustinus Monero, Acting Director, and Mr. Junior Mathurin, Field Technician, participated in the training. In order to maximize the two weeks allotted to the exercise, Mr. Monero focused on the institutional and management aspects of the WRA, while Mr. Mathurin focused on the field work and other practical and technical aspects of the WRA.

Mr. Monero was engaged in a series of meetings and discussions with management, including all Head of Units within the WRA, to assess their vision, role, structure, operations, past challenges and constraints, and strategies to overcome these challenges. Mr. Mathurin was in the meantime assigned to the Resource Monitoring Unit (RMU) to understudy its activities. Exposing Mr. Mathurin to hydro-metry, stream gauging, and data processing was a high priority, because of the need of WRMA to obtain hydrological data and to reestablish the national hydrological network that was destroyed by Tropical Storm Debbie. The reestablishment of the network is long overdue and is now an urgent priority. When fully established, the hydrological network will generate data that would be critical for climate change studies, drought monitoring, and water allocation purposes.

Following the secondment, Mr. Monero reported that this technical cooperation was a perfect and timely opportunity to expose the officers of the WRMA to the operations and management of a leading water resource management agency. The two weeks were well utilized to build capacity in field work, practical, technical, and managerial issues. The activities and experiences were enriching and well designed to achieve the intended objectives. The WRMA has recently resumed stream flow measurement, that is, spot measurement, and will be sourcing funding to reestablish the hydrological network island-wide.

TCC is a valuable facility which countries should consider as they seek to develop their human resources as well as technical programmes. In this way countries with limited financial, human and other resources can benefit from those with more expertise and experience in specific areas.



*J. Mathurin: Bore hole level measurement in the field*

## Planning for Tomorrow's Water Needs, Today



The IWCAM Regional Project Coordinator (RPC) participated, along with UNEP CAR/RCU and CEHI, in a National IWRM Symposium, convened from February 24-25, 2010 in Kingston, Jamaica. This symposium, under the theme: *Planning for Tomorrow's Water Needs, Today*, was organized, based on a meeting held last year between GEF-IWCAM, CEHI and the Government of Jamaica (GoJ).

The symposium sought to bring together all relevant stakeholders within Jamaica to review and assist in the revision of the existing

Water Sector Policy and Master Plan. In the end, it was hoped that the feedback from participants would inform the preparation of a new Water Sector Policy and assist in future planning.

Four GEF-IWCAM participating countries, Antigua & Barbuda, the Bahamas, St. Lucia and St. Kitts participated. The majority of participants were from Jamaica, and included representatives from across the island, from agencies such as NEPA, WRA, NWC, Rural Water Supply Ltd, National Irrigation Commission Ltd, and the private sector. More than fifty persons actively participated in the event, over two days.

The symposium covered Energy & Water, Tourism, Agriculture/Irrigation and the Environment. The GEF-IWCAM Demo Project Manager for Jamaica presented on the *Model for Sustainable Watershed Management: Case of the Drivers River Project*. Priorities for consideration in revising the water sector policy, as identified by the breakout groups included: *Alternative sources; efficient use and/or reuse of water; role of private sector; housing settlement patterns; public awareness and education; and household on-site sewerage systems and public health risks.*

## Sharing GEF-IWCAM Climate and Water Experiences in South America

GEF-IWCAM Technical Coordinator, Sasha Beth Gottlieb, once again found herself in the southern part of the Americas, attending a workshop aimed at training journalists and communicators on water issues with a focus on the challenge of climate change. The workshop which took place in Montevideo, Uruguay, 10-12 December 2009 was jointly sponsored by UN Water and UN Habitat was targeted to journalists and communicators on water issues. See the presentation at: <http://www.iwcam.org/resources/project-coordination-unit-presentations/gef-iwcam-presentation-about-water-and-climate-change-communication-and-outreach-spanish-presentacion-de-gef-iwcam-sobre-comunicacion-y-concientizacion-relacionadas-con-agua-y-clima-espanol/view>



Pocitos Beach, Montevideo

(Continued from page 1) ...**Fond D'or Waters on WWD 2010**

effect! Farmers rely on water abstraction for the purpose of irrigation. If they can help it, no one wants to water crops with dirty water, especially water which is laden with fecal matter and bacteria.

This has prompted the Caribbean Agricultural Research and Development Institute (CARDI) to enter a collaborative partnership with a family owned and operated pig farm (the Mathurin pig farm), to implement a pilot and demonstration Payment for Environmental Services (PES) programme. This PES programme is a watershed management incentive. It encourages pig farmers to adopt sustainable environmental practices which result in major benefits to the society.

As part of the agreement, the pilot pig farm is currently undergoing renovations and construction to include: a separator (for the separation of liquid and solid components of the waste); a two-chambered septic tank (for the capture of the liquid waste); a soakaway (for filtering by the soil); and a composting shed (for dry treatment of the solid component of waste in order for it to be used as manure).

The pig farm, in the later phases of the project, is expected to employ additional treatment methods. Biological treatment through Effective Micro-organism (EM) technology is expected to positively influence the break down of organic matter and result in additional reductions in *E.coli* counts. EM technology has been used successfully in Latin American countries and in other parts of the world.

This means that as compensation for improved water quality CARDI will provide the Mathurins with technical assistance. Technical assistance will take the form of: training to enable the Mathurins to manage the modified pig farm; transferring of EM technology; and, educating the Mathurins on the preparation of the EM solution.

Monitoring through systematic testing will determine the effectiveness of these initiatives in improving water quality. After all, water keeps no secrets!

***This article was provided by the GEF-IWCAM St. Lucia Demonstration Project***

The Caribbean Environmental Health Institute (CEHI)  
presents the

*Fifth Biennial Caribbean Environmental Forum and Exhibition CEF-5*

in conjunction with

2<sup>nd</sup> Caribbean Sustainable Energy Forum  
&  
15<sup>th</sup> Wider Caribbean Waste Management Conference (ReCaribe)

June 21 - 25, 2010  
Rose Hall Resort, Montego Bay  
JAMAICA



For more information check the CEF-5 website at <http://www.cehi.org.lc/cef5/index.htm>  
or contact the CEF secretariat at [cef5@cehi.org.lc](mailto:cef5@cehi.org.lc).

## World Water Day 2010: Clean Water for a Healthy World

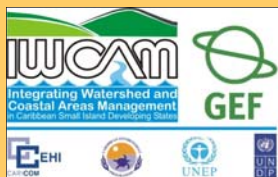
International World Water Day is held annually on 22 March as a means of focusing attention on the importance of freshwater and advocating for the sustainable management of freshwater resources.

An international day to celebrate freshwater was recommended at the 1992 United Nations Conference on Environment and Development (UNCED). The United Nations General Assembly responded by designating 22 March 1993 as the first World Water Day.

Each year, World Water Day highlights a specific aspect of freshwater. This year the theme is: **“Clean Water for a Healthy World”**.

Check the website out for additional information and resources:

<http://www.unwater.org/worldwaterday/flashindex.html>



*Participating Country Focal Points, Demonstration Projects and others are invited to submit articles. Please contact Donna Spencer at [dspencer@cehi.org.lc](mailto:dspencer@cehi.org.lc)*

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