

# Caribbean Water Insight



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Working toward a **water secure** Caribbean

## GWP-C's Strategic Direction in 2013

### **Strategic Goal 1: Ensure water is a key part of sustainable national development.**

- Support Integrated Water Resources Management (IWRM) planning and implementation in at least two Caribbean countries.
- Support Caribbean Ministers with responsibility for Water Resources Management in providing leadership and coordination in water resources management.
- Advocacy and policy engagement at the political and decision-making level on the need for integrating water security and climate resilience in development planning and decision-making.

### **Strategic Goal 2: Address critical development challenges.**

- Help Caribbean communities by putting solutions in place for addressing critical water security challenges to enhance climate resilience.
- Lend support to key development sectors to help them understand the principles of IWRM and its linkages to critical development issues.

### **Strategic Goal 3: Reinforce knowledge sharing and communications.**

- Build knowledge and capacity of various stakeholders for enhancing water security and climate resilience.
- Develop various tools to share knowledge with stakeholders on IWRM issues and challenges to aid in decision making.
- Encourage partners and stakeholders to share information across the GWP-C network and the region through GWP-C communication tools and programmes.

### **Strategic Goal 4: Build a more effective network.**

- Engage strategic allies and stakeholders to integrate water security and climate resilience in the development process.
- Create avenues for the GWP-C network to provide leadership and guidance on IWRM issues at the regional, national and global level.
- Provide support to the global strategy process and identify regional priorities for the Caribbean.

## Message from the Regional Coordinator: GWP-C's Strategic Direction - 2013 and Onwards

Dear Partners,

I wish you all a Happy New Year and the very best in 2013!

With your support and that of our strategic allies, GWP-C was able to make some notable achievements in 2012. Partners were able to see a tangible reflection of the work of the Partnership when GWP-C produced its first ever Annual Report in 2012, highlighting our work over the previous year. You can look forward to receiving a similar review of 2012 soon.

2012 showed steady growth in the Partnership, with GWP-C gaining a total of five (5) new partners each from different countries - Antigua; Trinidad and Tobago; Jamaica; the United States Virgin Islands; and Canada.

Through GWP-C's consistent advocacy in the region, it has received the commitment of nine (9) Caribbean Ministers of Water to provide leadership in addressing water security and climate change. Furthermore, the Ministers have endorsed the development of the GWP-C Water, Climate and Development Programme (WACDEP), which aims to support adaptation of Caribbean states to climate variability and change.

Other highlights include technical advice to the government of Grenada on the implementation of its Integrated Water Resources Management (IWRM) Policy; advancement of the GWP-C supported IWRM Policy and Roadmap for Guyana including facilitation of a stakeholder consultation and review of the draft documents; Water Use Efficiency (WUE) training for farmers and agricultural officers in Barbados; as well as technical assistance and knowledge sharing on rainwater harvesting (RWH) with various stakeholders throughout the year.

GWP-C is increasingly being recognised as a leading development agency in the water sector and has garnered greater media attention and visibility throughout the region with coverage of GWP-C events on both print and electronic media.

Additionally, in an effort to do more to engage Caribbean media practitioners and inspire them to report more on IWRM and water issues in the region, GWP-C launched its first ever Media Awards on Water in 2012. The competition, which created a buzz amongst the Caribbean media fraternity, resulted in an expansion of GWP-C's Journalists Network on IWRM.

As we enter 2013 the GWP-C Water, Climate and Development Programme (WACDEP) for the Caribbean is set to take off and will undoubtedly transform the scope of our operations. With an increased budget of €700, 000 to be pumped into the advancement of the WACDEP over the next two years, the prospects for GWP-C are high.

These additional funds will be used as seed-funding to leverage greater financial resources from international and regional donors and as co-funding for collaboration with others.

This year represents the final year of the current five-year (2009-2013) global strategy of the Global Water Partnership (GWP) network. The development of a new global strategy “Towards 2020” is underway, which means that GWP-C will continue to evolve in preparation for a new strategic vision for the network.

Helping to define and contribute to the new global strategy and a Caribbean 5 year strategy will call for GWP-C to engage *you*, its Partners even more.

This is indeed one of GWP-C’s priorities for this year with 2013 being declared the International Year of Water Cooperation by the United Nations. It presents the perfect platform for GWP-C to continue its efforts to actively engage you in its activities and to promote water cooperation on a national, regional and global level.

As we journey into new initiatives and as we grow, we also look forward to engaging more stakeholders outside of the ‘water box’ and fostering stronger partnerships.

2013 will definitely be a dynamic and challenging year for the GWP-C. Let’s think big and work together to contribute to the vision of a water secure Caribbean!

Best Wishes,

**Avril Alexander**  
***Regional Coordinator, GWP-C***

## 2013: International Year of Water Cooperation



**2013** has been declared the **International Year of Water Cooperation** by the United Nations. The objective of the International Year of Water Cooperation is to raise awareness on the potential for increased cooperation and on the challenges facing water management, taking into account the increase in demand for water access, allocation and services.

Given that water cooperation is multi-dimensional in nature, it encompasses cultural, educational, scientific, religious, ethical, social, political, legal, institutional and economic dimensions.

Throughout the year, the Global Water Partnership-Caribbean (GWP-C) will carry out various activities under the theme “Water Cooperation in the Caribbean.”

As part of the Global Water Partnership (GWP) network, GWP-C believes that partnerships make a difference through cooperation. It sees “Water Cooperation” as:

- Sharing the benefits of water.
- Achievable and the only way to achieve a water secure future.
- Important at different levels; from local to regional and global.
- Bringing stakeholders together with a common vision to develop and agree on a plan.
- A means of bridging divides amongst people and institutions.

Visit the GWP-C website [www.gwp-caribbean.org](http://www.gwp-caribbean.org) to keep abreast of its activities to commemorate the International Year of Water Cooperation.

World Water Day 2013  
International Year of Water Cooperation

World Water Day 2013 takes place on March 22nd and is dedicated to the theme “Water Cooperation.” For more information on World Water Day and Water Cooperation visit [www.unwater.org](http://www.unwater.org).



The massive earthquake that struck Haiti in January 2010, left in its aftermath a country completely devastated. Amidst the widespread destruction was the reality that people did not have access to safe water and proper sanitation.

Since the earthquake, local, regional and international organisations have been playing a role in working toward better water and sanitation access in Haiti. Among those entities is Haiti Survie; an environmental organisation based in Haiti that engages in activities related to sustainable development; climate change; environmental protection; and strengthening of the agricultural sector which is the stronghold of the country's economy.

Here's a look at some of the work Haiti Survie has been doing since the 2010 earthquake to help the people of Haiti:

### Improving Living Conditions of Communities

Through the support of Christian Aid, an international development charity, Haiti Survie has initiated projects to help communities improve their living conditions. In addition to activities related to strengthening the economic capacity of households, the organisation has made the management of water and sanitation a priority.

Since August 2010, Haiti Survie has built over 222 homes to meet appropriate earthquake/hurricane resistant standards. Each house was built with a storage and water sanitation unit. The goal is to enable families to live in better conditions and limit the spread of certain diseases.



House constructed in the town of Anse-a-Pitre.



House constructed in the village of Malfety.

### Strengthening Environmental Management

For better environmental management, Haiti Survie also included in its activities a component on post-earthquake reforestation. In 2011 the organisation produced and planted more than 90,000 seedlings (forest and fruit) and in 2012 the production totaled around 50,000 seedlings.

The reforestation activity has a dual purpose, that being, the protection of watersheds in the fight against land degradation and also to provide an economical alternative for families.



Nursery for seedling production.

### Strengthening Livelihoods

To strengthen livelihoods, Haiti Survie has established a set of activities to strengthen the resources of vulnerable communities by providing economic alternatives such as:

- Egg Production - 5000 hens were distributed to 100 women's groups with 50 hens per group of 10 people.



An egg production unit.

- Supporting two fishing businesses - Two fishing businesses in the town of Anse-a-Pitre located in the southeast province of Haiti were provided with fishing equipment and a refrigerator, as well as energy conservation products.
- Building the Goat Market - 600 goats were distributed in a village known as Bayaha.



The women seen here are beneficiaries of eggs produced from the hens distributed to the women's groups.

- Support to Agricultural Production - Maize seeds, beans and sorghum along with agricultural tools were distributed to farmers to facilitate their work.

Haiti Survie has also been working to strengthen the capacity of civil society groups to better manage disaster. In some rural areas, civil society groups received training and equipment to be effective in responding to disasters. Haiti Survie has also implemented a water management programme which involves building family cisterns for the collection of rainwater.

These are just some of the efforts that Haiti Survie has undertaken to help in restoring the ecosystem and livelihoods of various communities in Haiti since the earthquake.

The organisation remains true to its mission; "fighting for building a prosperous Haitian society where the environment is protected."

Information and photos provided by:  
Haiti Survie

## Climate Resilience is Water Resilience: GWP-C Pioneers Water and Climate Programme for the Caribbean



The reality of climate change cannot be ignored and preparing for its impacts is no small feat. Small Island Developing States (SIDS) are deemed to be some of the most vulnerable countries in the world to climate change. This is in part attributed to sea-level rise, coupled with the small size of these territories amidst growing populations and other development challenges. Of these development challenges, achieving water security remains an enduring issue which will only be further exacerbated by the threat of climate change.

It's no secret therefore that the way water is managed in countries goes hand in hand with their ability to adapt to the impacts of climate change. This simply means that building climate resilience is about building water resilience.

But are we in the Caribbean doing enough to build water security for development in a changing climate? This is one of the main reasons why Global Water Partnership-Caribbean (GWP-C) is embarking on a groundbreaking initiative called the Water, Climate and Development Programme (WACDEP) for the Caribbean.

The Programme is perhaps one of the few of its kind in the region as it is designed to support Caribbean countries adapt to climate change through the implementation of better water policies, strategies, programmes and other water related actions.

The idea to develop such a unique programme for the Caribbean region was spurred by the Global Water Partnership (GWP) network-wide focus on water and climate change. In 2011, the global organisation established a clearly defined strategic direction geared at aligning water and its management with climate change adaptation.

With the view that water security provides a focus for adaptation strategies and a framework for action, the GWP requested that all of its thirteen (13) regional arms which includes GWP-C, develop a water and climate proposal with region specific programmes and activities. With inputs from the entire network, the GWP produced a global water and climate proposal, targeting the Department for International Development (DFID) as its major donor for possible funding of water and climate programmes in GWP regions.

At the regional level, GWP-C as a key stakeholder in water security has a role to play in climate change adaptation; a fact which was recognised by the Caribbean Community Climate Change Centre (CCCCC) which identified the GWP-C as one of the implementation agencies for climate change adaptation actions related to water management in the Caribbean Community (CARICOM) Implementation Plan for a Regional Framework for Achieving Development Resilient to Climate Change.



The CCCCC has partnered with the GWP-C to roll out its WACDEP for the Caribbean which aims to directly support the CARICOM agenda on climate change. GWP-C sees that its WACDEP will add critical depth to the Regional Framework for Achieving Development Resilient to Climate Change and will help to address important gaps in climate change information and research with respect to water resources in the Caribbean.

The WACDEP for the Caribbean is expected to span at least two years (2013 - 2015) and although it is in its development stages, the Programme has received encouraging support from stakeholders across the region, as well as actual and potential funders/partners.

At the 8th Annual High Level Session (HLS) of Caribbean Water Ministers, convened by GWP-C and its partner the Caribbean Water and Wastewater Association (CWWA) in October 2012, nine Caribbean Ministers including two Deputy Prime Ministers present at the Session, endorsed GWP-C's Water, Climate and Development Programme (WACDEP).

The Ministers present at the Forum recommended that GWP-C and its partners further develop the WACDEP and other relevant initiatives for the Caribbean region to support the implementation of water related adaptation actions with the CARICOM Regional Framework for Achieving Development Resilient to Climate Change and other adaptation priorities at the national level.

To advance the Programme, GWP-C saw that regional stakeholder support was vital and decided to bring together key climate change stakeholders in the region to allow them to provide input into the WACDEP's framework. To facilitate this process, GWP-C held a two-day regional stakeholder workshop in St. Lucia in November 2012.



Regional stakeholders at the GWP-C Water, Climate and Development Programme (WACDEP) Workshop in St. Lucia in November 2012.

More than 30 practitioners from across the region attended the workshop and provided valuable feedback on issues and related actions on the Programme's core components. These areas include:

- Regional Cooperation in Water Management
- National Development and Sector Plans
- No/Low Regret Investments in Regional and National Development
- Project Preparation and Financing
- Demonstration Projects
- Knowledge and Awareness
- Capacity Development
- Governance and Fundraising

Stakeholders also provided inputs on possible risks and mitigation measures involved in implementing the WACDEP for the Caribbean, as well as strategies for facilitating buy-in from stakeholders at all levels.

Coupled with attaining feedback from stakeholders on finalising the Programme’s implementation plan, GWP-C participated in the 18th Conference of the Parties (COP 18) of the United Nations Framework Convention on Climate Change (UNFCCC) held in Doha, Qatar in late 2012. GWP-C saw the COP 18 as a viable and timely opportunity to engage with key development players from across the globe in an effort to mobilise funding and stakeholders at various levels for its WACDEP.

Mr. Ermath Harrington, a regional Consultant contracted by GWP-C to provide technical guidance in creating the implementation plan for the WACDEP for the Caribbean and who also facilitated the WACDEP Stakeholder Workshop in St. Lucia, represented GWP-C at the COP 18.

At COP 18, the WACDEP for the Caribbean was presented to a panel of the CARICOM Climate Change Negotiators who expressed a lot of interest in the Programme. Coming out of the session, representatives from Belize, Jamaica, Grenada and Antigua urged that they be the four (4) pilot countries in the WACDEP.



Mr. Ermath Harrington is seen here making a presentation to the CARICOM Climate Change Negotiators on the GWP-C WACDEP.

Within the framework of the WACDEP, along with regional activities, four pilot countries will be initially chosen to carry out in-depth demonstration projects aimed at enhancing climate resilience. At the Conference, GWP-C also had the opportunity to liaise with the Global Environment Facility (GEF); the African Ministers’ Council on Water (AMCOW); heads of Caribbean delegations attending the COP 18; among other stakeholders.

In addition to this, GWP-C was among the Global Water Partnership (GWP) Press conference briefing team on the Water, Climate and Development Programme (WACDEP) at the COP 18. This enabled the GWP team to share and answer various questions on the WACDEP and its benefits to regions across the globe.



Mr. Ermath Harrington (2nd from the right) is seen here representing GWP-C on the Global Water Partnership (GWP) Press Briefing Team at COP 18.

Confirmed success for the GWP network came at the COP 18 in Doha, when the Department for International Development (DFID) announced that its Water Security Programme was officially approved. Under the United Kingdom (UK) Water Security Programme, GWP has received funding of €9 million through to March 2015.

The funding from the DFID will be spread amongst the 13 regions of the GWP network to assist with the development of their Water and Climate Programmes. Out of the grant, the Global Water Partnership-Caribbean (GWP-C) will receive €700,000 for the period (2013 - 2015) for its WACDEP. With this initial seed-funding, the WACDEP for the Caribbean has a unique opportunity to promote real positive change in Caribbean countries in the areas of water security and climate resilience.

While climate change mitigation must take into account adaptation for agriculture, energy, coasts, ecosystems, and human health; effective adaptation will come about in part by transforming the way we manage our water resources. It is GWP-C's vision that the Water, Climate and Development Programme (WACDEP) for the Caribbean will engage everyone; stakeholders on the ground and at the highest decision making level.

### A Call for Greater Climate-Smart Adaptation in Smallholder Agriculture



While climate change is a global phenomenon, those living in rural areas in Small Island Developing States (SIDS) face greater risks. Their vulnerability depends on intrinsic factors such as the local landscape; changes in land use patterns by intensified agriculture; deforestation; soil degradation; soil erosion; and the use of chemical fertilisers.

Deforestation and soil erosion result in considerable quantities of carbon dioxide being released into the atmosphere. The Intergovernmental Panel on Climate Change (IPCC) says that agriculture accounts for at least ¼ of all the world's greenhouse gas emissions.

In this regard, adaptation to climate change in agriculture requires technological efforts, both large scale (such as building river barriers to protect farms from floods) and at a smaller scale at the farm level (such as irrigation facilities which make production less dependent on the rain).

Adaptation can also refer to adopting “new” farming practices, such as vermicomposting. This practice involves using earthworms to turn organic wastes into very high quality compost. This is probably one of the best ways of composting kitchen wastes. Essentially, the process helps to improve the organic content of a soil and at the same time acts as a means of coping and adapting to climate change.



More than most sectors, agriculture will feel the impacts of climate change forcing farmers to continually adapt. Farmers can help to reduce greenhouse gas emissions by reducing the use of chemical fertilisers; by minimising the use of fossil fuels; incorporating nitrogen into the soil; avoiding the loss of organic matter; and improving the use of manure. At the same time, farmers can help cut off carbon by restoring the natural vegetation where this is possible; as well as avoiding deforestation and efficiently managing their soils.

Throughout history, farmers have always had to cope with the environment that surrounds them and adapt to it. In the process, they have developed specific farming systems which perform best in their given situation.

Most small-scale farmers have to deal with insufficient resources, and many are trying to grow crops in marginal soils which are less fertile, or deal with recurrent pests and diseases. Additionally, the rate at which the climate is changing and the resulting situations, whether a temporary dry period or a hurricane, only adds to the list of challenges and to the sense of urgency.

Adaptation to climate change requires a proactive approach. Farmers need to be able to cope with a sudden flood, but it is better if they are prepared for it. Farmers have to make the transition to practices that are more environmentally sound and have the potential to contribute to the long-term sustainability of agriculture. In some areas, the changes may well exceed the adaptation capacity of the people.

In Trinidad and Tobago for example, soil fertility and water management are critical issues to be addressed to cope with climate change.

Rocrops Agrotec, a smallholder farm in central Trinidad has over the past 25 years, successfully implemented adaptation measures to mitigate against the effects of climate change. The farm once stood as degraded and acidic sugar cane lands which had reverted to native grasses capable of regenerating after annual fires.



Initial soil condition (heavy clay soils) at Rocrops Agrotec in 1990.

The initial soil of the farm was extremely acidic with very low availability of plant nutrients. Physically, these heavy clay soils suffered from impeded drainage in the wet season, dryness and cracking in the dry season and were dense and compact on the surface and subsoil.



During the period 1985- 2010, Rocrops has, through a combination of strategic planning and farm management, been able to transform the former degraded sugar cane lands to produce a wide range of vegetables and fruit crops.





Ameliorated land at Rocrops Agrotec. Integrated cropping is seen here with limes, dasheen and dwarf pomegranates.

It is evident that fixing the soil is critical to sustainable agriculture. There are no simple 'silver bullet' solutions to the complex problems of land degradation and soil management as it takes years to fix soil.

The need for climate-smart agriculture in the region and around the globe for smallholder farms cannot be overlooked. This is because many of these smallholder farms provide a large percentage of food in developing economies. Also, smallholder farmers are especially exposed to climate change as their farms are often located on vulnerable and marginal landscapes.

Approaches such as those used by Rocrops Agrotec are valuable adaptation methods being employed in smallholder agriculture and can serve as an example to other farmers in the region. Irrespective of the threat of climate change, there is a growing acknowledgement that agriculture and food systems need to be dynamic to facilitate sustainable agriculture.

Contributor: Rocrops Agrotec



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**Eco-ribbean: A Climate of Change** is an exciting interactive resource on climate change for Caribbean students. It contains captivating games, puzzles and simulations, as well as stunning videos and photos that facilitate and deepen one's knowledge of climate change in the region.

The general public can also benefit from this compelling multi-sensory DVD which was developed by the National Institute of Higher Education Research, Science and Technology (NIHERST) with the support of the United Nations Development Programme (UNDP) in Trinidad and Tobago and the Caribbean Council for Science and Technology (CCST).

For more information or to request a copy of "Eco-ribbean: A Climate of Change" please send your questions to [eco-ribbean@niherst.gov.tt](mailto:eco-ribbean@niherst.gov.tt).



**MEDIA**

**2013**

## **AWARDS ON WATER**

Global Water Partnership-Caribbean (GWP-C) wants to inspire journalists in the region to report more on water issues through its **Media Awards on Water**. To observe the International Year of Water Cooperation, the 2013 GWP-C Media Awards on Water will have a special focus on the theme “Water Cooperation in the Caribbean.”

Caribbean journalists in the areas of print, television, radio and multi-media are therefore asked to submit original, published pieces on topics such as: Water Cooperation in the Caribbean; Water Cooperation: Bridging Divides; Water Cooperation Initiatives; Water in Crisis; Water Conservation; Water and Environment; Integrated Water Resources Management (IWRM); Climate Change; among other topics. The overall winner of the competition will receive a Cash Prize (in US\$) and an Award. Prizes will also be awarded to notable entries in the competition.

The Media Awards on Water runs from January 1st - April 12th, 2013.

Visit [www.gwp-caribbean.org](http://www.gwp-caribbean.org) for all the details.

### **GWP-C Journalists Network on IWRM**

The GWP-C Journalists Network on Integrated Water Resources Management (IWRM) is a body of journalists from the Caribbean region that are empowered to build awareness on water related issues in their country and/region.

If you are a Caribbean journalist interested in becoming a member of this Network, go to [www.gwp-caribbean.org](http://www.gwp-caribbean.org) for details.

## Climate Change Effects on Streamflow Regimes in Trinidad

The issue of climate change and its effect on water resources has been a pressing topic of research globally due to the inextricable link between water and climate; however limited work in this area has been conducted in the Caribbean region.

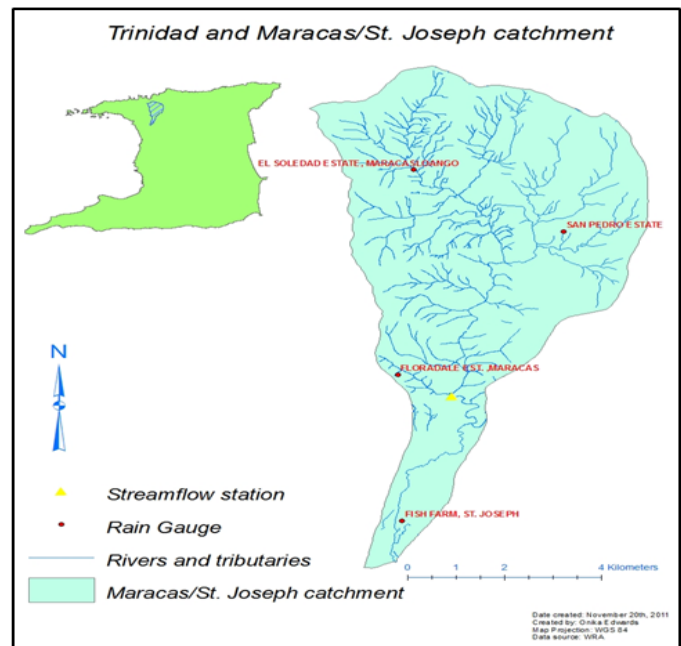
In light of this, one graduate student Ms. Onika Edwards at the Centre for Resource Management and Environmental Studies (CERMES) at The University of the West Indies (UWI), Cave Hill Campus in Barbados, decided to explore this area by making it the topic of her final research paper at the Centre.

According to Ms. Edwards “It is important that detailed studies assessing the implications of climate change on water resources in the Caribbean be conducted, as Small Island Developing States are one of the most vulnerable to the effects of climate change, due to size, inadequate institutional resilience; among other factors.”

To address this gap, her research paper focused on the effect of climate change on streamflow regimes in an important water catchment known as St. Joseph, located in the northern range of Trinidad (See Figure 1).

The study also provided a framework for other catchments to be assessed so that management strategies could be put in place to buffer the predicted impacts of climate change on the available surface water supplies.

To achieve the objective of the study, hydrological modeling was carried out on the catchment to simulate runoff under climate change projections. The results were then compared to measured baseline streamflow values converted from hourly stage readings obtained from the Water Resources Agency (WRA) of Trinidad and Tobago.



**Figure 1** - Map showing the St. Joseph catchment (study area) and its geographic location on the island.

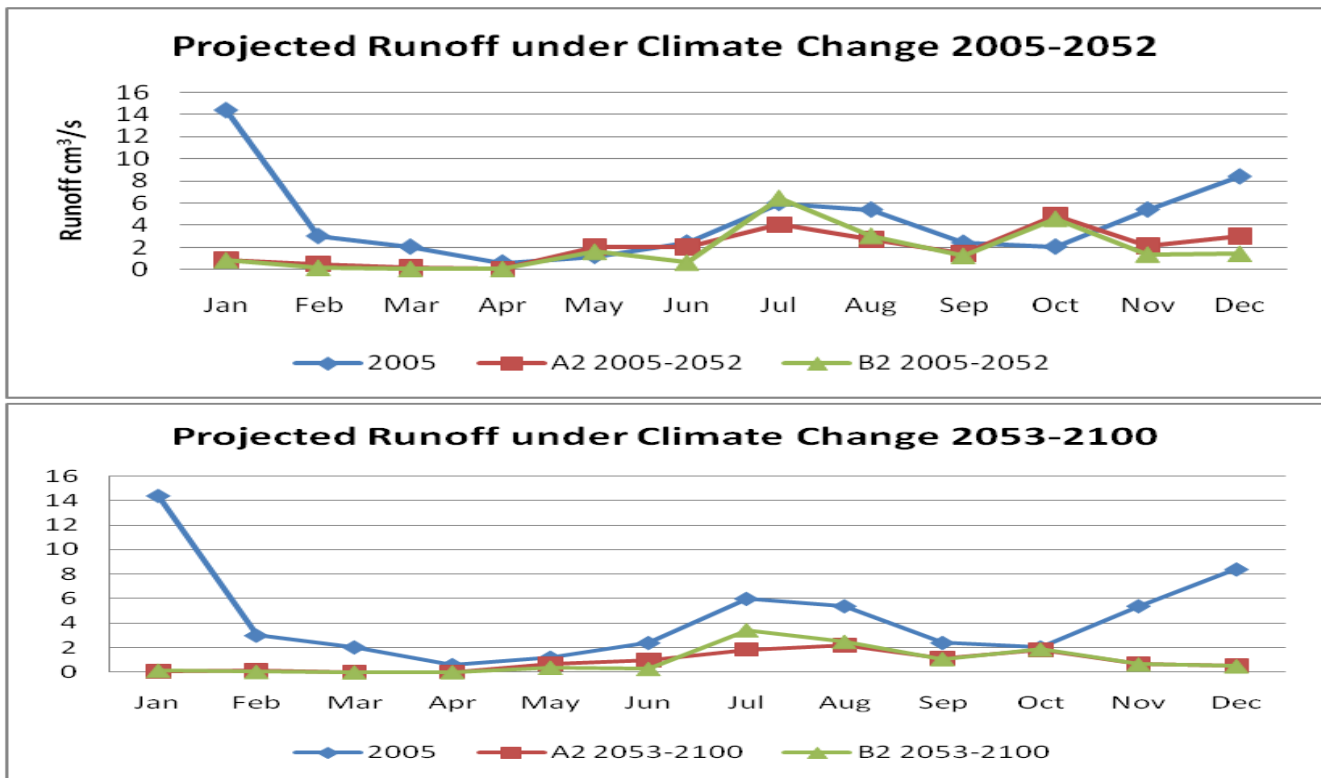
The Food and Agriculture Organisation (FAO) rainfall-runoff model component of the Water Evaluation And Planning (WEAP) software was used. This required specific parameters such as precipitation, effective precipitation, evapotranspiration, crop coefficient and area.

[Continued on the following page...](#)

See Mini Glossary of Research Terms on Pages 16 & 17.

The dynamically downscaled Regional Climate Model (RCM) known as PRECIS (Providing Regional Climates for Impacts Studies) was used to obtain projections of rainfall and evapotranspiration for the catchment area for the periods 2005-2052 and 2053-2100 under the A2 and B2 climate scenarios (See Figure 2 below).

This model has been successfully used in several countries, and has recently (2003) been used in the Caribbean by the Caribbean Community Climate Change Centre (CCCCC) under the PRECIS Caribbean Initiative. Data limitations (particularly streamflow) however, prevented an optimal calibration and verification process, but the model was deemed reasonably effective to be used to simulate runoff for the catchment.



**Figure 2 - Projected runoff changes under climate change.**

When the climate projections were applied to the hydrological model, reduction in annual runoff of 55-60% were simulated for the period 2005-2052 and a reduction of approximately 80% for the 2052-2100 period (as compared to 2005 baseline values) (Refer to Figure 2).

It was noted that the streamflow regime coincides with the dry and rainy seasons and that the dry season regime is projected to experience the greatest reduction in streamflow of up to 99% by 2100. On the other hand, the rainy season regime is projected to experience a reduction in streamflow of a maximum of 68%.

[Continued on the following page...](#)



The possible implication of these changes in streamflow is the severe restriction on the ability to supply domestic water to the catchment, as there are two intakes that extract water from the St. Joseph river to supply nearby communities. This implication is of major importance to water managers and needs to be taken into consideration in their management strategies. Other implications include the possible changes in stream ecology as well as changes in fluvial geomorphology.

The findings of this study were presented at the Caribbean Water and Wastewater Association (CWWA) Conference held in The Bahamas in October 2012, where it was well received. Inquiries were made about the follow-up of the study and what is being done with the findings by the relevant authorities. The results of the study are available but have not yet been used or applied. Although the data is available it emphasises the need to raise awareness throughout the Caribbean of the impacts of climate change and the need to factor these into long-term water management plans.

Ms. Edwards' research forms part of her final requirements to attain her Master of Science Degree in Natural Resource and Environmental Management (with a Water Resources Specialisation) at the Centre for Resource Management and Environmental Studies (CERMES).

**Contributor: Ms. Onika Edwards (Graduate Student), Centre for Resource Management and Environmental Studies (CERMES)**

#### Mini Glossary of Research Terms

**Area** - The size of a surface.

**Baseline** - Any datum against which change is measured. It might be a "current baseline," in which case it represents observable, present-day conditions. It might also be a "future baseline," which is a projected future set of conditions excluding the driving factor of interest.

**Climate Change** - A change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods.

**Crop Coefficient** - Crop coefficients are determined experimentally. It is the ratio between the maximum water loss (evapotranspiration) of a particular crop at a given stage in its growth and either the potential water loss for a reference crop.

**Ecology** - The science of the relationships between organisms and their environment.

**Effective Precipitation** - The part of precipitation that reaches stream channels as runoff. Also known as effective rainfall.

**Evapotranspiration** - The combined process of evaporation from the earth's surface and transpiration from vegetation.

**Fluvial** - Of or relating to or found in a river.

**Geomorphology** - The scientific study of landforms and the processes that shape them.

**Hydrological Modeling** - The use of small-scale physical models, mathematical analogues, and computer simulations to characterise the likely behaviour of real hydrologic (The scientific study of the properties, distribution, and effects of water on the earth's surface, in the soil and underlying rocks, and in the atmosphere) features and systems.

**PRECIS (Providing Regional Climates for Impacts Studies)** - A type of regional climate modeling system.

Glossary of Research Terms continued on the following page...

## Mini Glossary of Research Terms

**PRECIS Caribbean Initiative** - Visit [www.eclac.org](http://www.eclac.org) for information on the Initiative.

**Regional Climate Model (RCM)** - A more dynamically consistent way than statistical downscaling to produce a regional forecast.

**Runoff** - That part of precipitation that does not evaporate. In some countries, runoff implies surface runoff only.

**Streamflow** - Water within a river channel.

**Water Catchment** - Also referred to as a drainage basin; it is an area drained by a river or body of water. It includes all areas that gather rainfall and direct it to a particular stream, river or body of standing water.

**Water Evaluation And Planning (WEAP) System** - This is a PC based surface and groundwater resource simulation tool, based on water balance accounting principles, which can test alternative sets of conditions of both supply and demand. The user can project changes in water demand, supply, and pollution over a long-term planning horizon to develop adaptive management strategies.

## Photo of the Issue



**The Photo of the Issue** is of the Monkey River in Belize which shows the extent of beach erosion and the unsuccessful efforts by community members to address the problem. With sea-level rise and storm surges, the Monkey River community is likely to be at greater risk from climate change.

**Photo by:** Dr. Adrian Cashman, Centre for Resource Management and Environmental Studies (CERMES).

## Water Courses

### International Water Law Programme

Application Deadline: February 7th, 2013

The Global Water Partnership (GWP) together with the University of Dundee will offer scholarships for 30 participants to undertake a module in International Water Law, in Dundee from June 10<sup>th</sup> - 21<sup>st</sup>, 2013.

**Target Groups:** Persons working in water resources; persons with a law degree and environmental science background; mid-to high level practitioners and professionals from governments, non-governmental organisations (NGOs), international organisations, academia, and the private sector.


Applicants from the Caribbean region must be recommended by a partner/member of the Global Water Partnership-Caribbean (GWP-C).

For more details on the Scholarship Programme visit [www.gwp-caribbean.org](http://www.gwp-caribbean.org).

### 2013 Integrated Water Management Programmes



Master of Integrated Water Management



Graduate Certificate in IWM (Water Planning)

The International WaterCentre (IWC) based in Australia is currently offering postgraduate programmes in Integrated Water Management.

For more information visit: [www.watercentre.org](http://www.watercentre.org)



Professional Certificate in Strategic Water Planning  
20th - 23rd May 2013, London, UK

The International Centre for Parliamentary Studies (ICPS) is offering a Professional Certificate in Strategic Water Planning from May 20th - 23rd, 2013 in London.

For more information on the course visit [www.strategicwater.parlicentre.org](http://www.strategicwater.parlicentre.org).



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# Caribbean Water Insight

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