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Laurel A. Murray
July 2015

Project report to collect quality documents on climate change and development for the tri-island state of Grenada. Part of "Improving Access to Online Knowledge Resources on Climate and Development Phase 3".

Project Report CCCCC/IDS

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The work was undertaken by the lead consultant Dr. Laurel Murray, *Climate Change in Focus,* under the excellent supervision of Mr. Timo Baur, Clearinghouse Manager and Information Systems Advisor at the *Caribbean Community Climate Change Centre*.

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ACRONYMS & ABBREVIATIONS

AusAID	Australian Agency for International Development
CATIE	The Tropical Agricultural Research & Higher Education Centre
CBA	Community-based Adaptation
CBD	Convention on Biological Diversity
CCCCC	Caribbean Community Climate Change Centre
CDB	Caribbean Development Bank
CDERA	Caribbean Disaster Emergency Response Agency
CDKN	Climate & Development Knowledge Network
CEHI	Caribbean Environmental Health Institute
CEPAL	United Nations Economic Commission for Latin America & the Caribbean
CIAT	International Center for Tropcial Agriculture
CIMH	Caribbean Institute for Meteorology and Hydrology
CREDP	Caribbean Renewable Energy Development Programme
DFID	Department for International Development, United Kingdom
FAO	Food & Agriculture Organization of the United Nations
GEF	Global Environment Facility
GFDRR	Global Facility for Disaster Reduction & Recovery
GHG	Greenhouse Gas Emissions
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GRENLEC	Grenada Electrical Services Ltd.
GrenSol	Grenada Solar Power Ltd.
IIED	International Institute for Environment and Development
IISD	International Institute for Sustainable Development
IRENA	International Renewable Energy Agency
MALFFE	Ministry of Agriculture, Lands, Forestry, Fisheries & Environment
NAWASA	National Waterworks & Sewerage Authority, Grenada
OAS	Organization of American States
OECS	Organization of Eastern Caribbean States
PAHO	Pan American Health Organization
SE4ALL	Sustainable Energy for All
UNDESA	United Nations Department of Economic & Social Affairs
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNIFEM	United Nations Development Fund for Women
USAID	United States Agency for International Development

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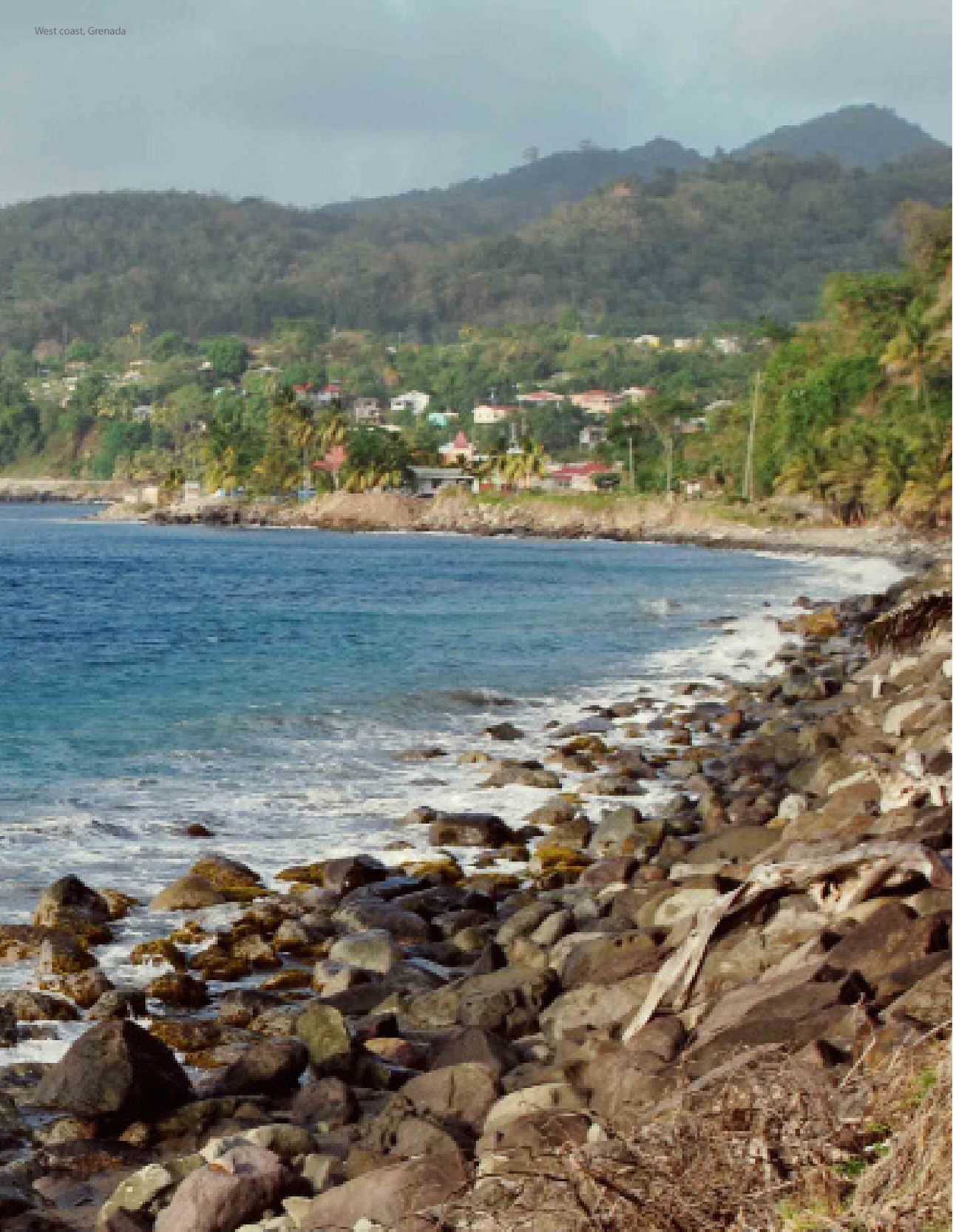


West coast, Grenada

CCCCC Regional Clearinghouse.

Online archive and information exchange

The Clearinghouse is the region's premier repository of information and data on climate change and development.

The Clearinghouse was initiated more than 15 years ago as part of the Caribbean Planning for Adaptation to Climate Change (CPACC) project.

It began with a few documents and currently stands with over one thousand seven hundred. Each month, new climate and development resources are added including books, toolkits, strategy documents, project reports, scientific studies and scholastic articles. Moreover, anyone can upload to the Clearinghouse making it a truly open resource for the Caribbean community.

More than eight thousand documents are downloaded from the Clearinghouse each month (peaking last year at eighteen thousand). It serves as a hub for knowledge-sharing on climate change both for and by the people of the Caribbean.

http://clearinghouse.caribbeanclimate.bz

01.

INTROUCTION TO THE PROJECT.

Three month micro-project

March to June 2015, funded under the project, "Improving Access to Online Knowledge Resources on Climate and Development Phase 3".


St. George's University of Medicine

AIM & OBJECTIVES

The aim of this project is to improve access to online knowledge on climate change and development for the small island state of Grenada.

Quality controlled documents with relevance to climate change in Grenada, Carriacou and Petite Martinique were collected, reviewed and made available on the CCCCC Regional Clearinghouse open access database in order to improve knowledge-sharing on climate and development. These will also be made available through the IDS Open Knowledge Hub.

01.

Over 3 months more than 70 documents were made available on the Clearinghouse for all to access.

Rationale and scope

Grenada is one of the most vulnerable countries in the Caribbean to the impacts of climate change. If no action is taken, the projected costs of climate change are estimated to rise to 111% of current GDP by 2100 (Bueno et al., 2008). Climate change has the potential to undo hard fought development; yet there exists few available climate change resources specific to the country.

Grenada is not alone. Climate content and data management is an issue for most countries, especially metadata (i.e. data about data). Combined with staff turnover within government, insufficient document management leads to the loss of knowledge about climate change. In Grenada, this problem is acute with no data management system for climate research nor government archive to retain and share such content. There is one archive at the water authority (NAWASA) which holds a few climate change and water studies, but overall little else is retained in-country. This severely limits our understanding of what climate change will mean for Grenada and stalls efforts to mainstream climate change and development. It further truncates the ability of both state and non-state actors to design innovative adaptation and mitigation projects which build from a community of best practice. It may also limit the ability of Grenada to secure climate finance if it does not have the quantity and quality of climate research to support funding efforts.

Organisations such as the Caribbean Community Climate Change Centre (CCCCC), Caribbean Institute for Meteorology and Hydrology (CIMH) and Caribbean Disaster Emergency Response Agency (CDERA), just to name a few, act in concert with the Government of Grenada to provide useful and timely information (See Page 14). However, more research is needed at the national-level, especially risk mapping and vulnerability assessments.

Recognising this, the CCCCC targeted the country to improve access to online knowledge resources on climate and development for Grenada, Carriacou and Petite Martinique. It represents a first step to bring all the resources available together in one place in order to support knowledge-sharing, and to help identify gaps where new climate research can take place. The content is now available digitally via the CCCCC Clearinghouse open-access system.

A major component of this project was a 2-week field trip in Grenada. In-country discussions with experts and government officials were required to capture a complete picture of the documents that do exist and the gaps and barriers for those that do not. In total, 33 expert respondents provided information for this project. These included government officials, regional and local nongoverment organisations, corporations and academics.

In total, 72 climate and development tools and documents were identified and are now publicly available on the CCCCC Regional Clearinghouse. For more information, refer to the document collection in Chapter 3.

National Archives
St. George's, Grenada

02.

GRENADA AND CLIMATE CHANGE.

About Grenada

Geography, climate and environmental resources

Grenada lies at the southern end of the string of the islands that form the Grenadines in the eastern Caribbean. The country is made up of six islands with a total geographical area of 344 km^2 and population of 108,000 (CARICOM, 2013). The main three islands are Grenada where the capital of St. George's is located, Carriacou and Petite Martinique. Fifty-nine per cent of the population lives in the parishes of St. George and St. Andrew on the main island, and most communities are within 1 km of the coast.

The country's small size disguises its rich abundance of biodiversity. Volcanic peaks slope downward through elfin woodlands (dwarfed forests), emerald mountane rainforests, dry lowlands, cactus shrub land and into the sea, dotted by mangroves and beaches. It has 450 species of flowering plants, over 150 species of bird including the critically-endangered Grenada dove and other animals such as the rare none-branded armadillo, Mono monkeys, hawksbill sea turtles, and nesting sites for green and leatherback sea turtles.

The climate is warm and humid year-round punctuated by dry (January to May) and wet seasons (June to December). The mean maximum temperature is 31.4 ^{o}C and the minimum is 26 ^{o}C (Government of Grenada, 2000). The climate is principally influenced by the subtropical cyclone belt and Inter-Tropical Convergence zone and also lies at the southern end of the Atlantic hurricane belt. Over the last ten years, Grenada has paid a heavy price for extreme weather events such as storms and hurricanes; especially Hurricane Ivan (2004) which destroyed 92% of the forest area and watersheds (Binger, et al. 2007). Grenada is also affected by the El Niño Southern Oscillation (ENSO).

The tall mountains, such as Mount St. Catherine (840m), trap trade wind to create their own micro-climate with heavier cloud cover and rainfall. Grenada relies on rainfall and surface water resources such as the Grand River and natural lakes such as Grand Etang and Lake Antoine. Ground water resources are typically only utilised in the dry season. All the watersheds are perennial and vary dramatically between the wet and dry seasons.

It is known as the "Island of Spice" and one of the world's largest exporters of nutmeg and mace crops. The second most important export crop is cocoa followed by tropical fruit such as bananas. Except for a few large estates such as Belmont, most farming is small-scale (less than ten acres). Overall, the soils of Grenada are fertile although much of the rich volcanic soil has been eroded away on the smaller islands.

Most of Grenada is privately-owned, often smallholdings passed down within families over many generations. The three main exceptions are the Grand Etang Forest Reserve, Mount St. Catherine and Belair Forest Reserve. One major obstacle to land use planning and forest management lies with abandoned land or fragmented and informal land tenancy. Title can be difficult to prove which hinders land acquisitions for renewable energy as well as comprehensive forestry management. The FAO (2014) determined that the country's forestry plan (1999) is outdated with poor implementation.

Grenada is made up of six islands at the southern end of the Grenadines

Country Statistics

- Located 12^{o}N lattitude and 61^{o}W
- Geographical area: 344 km^2
- Shelf area: 3,100 km^2
- Population: 103,000
- GDP: 835.6 million (2013)

21%

Tourism makes up 21.2% of the GDP (World Data Atlas, 2015). Resorts and cruise ships are the mainstay, with geotourism becoming an ever larger share of the sector.

02.

One promising tool to track the change in forest cover in Grenada is *Global Forest Change* which employs Google Earth to monitor forest loss around the world.

The waters surrounding Grenada were once as rich as the land but over-fishing, pollution and decline in coral reefs have caused the marine environment and fisheries sector to move into a state of decline. Large oceanic pelagic species such as Yellowfin tuna make up the majority of the fisheries sector, followed by demersals such as snapper, grouper and parrotfish and shellfish such as lobster and conch.

Tourism has replaced agriculture and fisheries as the dominant economic contributor, derived from the country's natural beauty. Most development is concentrated in Grand Anse in the parish of St. George where the airport is also located. Tourism is not confined to the sandy beaches and water activities, but also cultural events, hiking and adventure trips in the interior. That said, Grenada has witnessed a fall in tourist numbers in recent years and the sector faces obstacles owing to rising energy and food prices and environmental problems such as damage caused by hurricanes, pollution and water scarcity.

Climate change
Key impacts for Grenada

Grenada faces a cascade of impacts caused by the changing climate (See first National Communications for Grenada; Caribsave Climate Change Risk Atlas). This section will briefly outline the major impacts in broad strokes.

Climate models predict that sea levels will rise between 0.26 to 0.98m by 2100 (GIZ-ICASS). This will increase the rate of coastal erosion already observed and risk of salt water intrusion and storm surges. A one meter increase would put ports, the Maurice Bishop International Airport and 73% of the tourism infrastructure at risk (Caribsave, 2012). Sea level rise may also harm turtle nesting sites and other important coastal habitats. For more information, *Coastal Resilience* provides an online mapping portal to view the projected sea level rise and risk of flooding for Grenada.

Mean annual temperatures in Grenada have increased by approximately 0.6 ^{o}C since the 1960s at an average rate of 0.14 ^{o}C per decade (McSweeney et al., 2008). They are projected to increase a further 1-1.1 ^{o}C by 2030 and could reach as high as 4.3 ^{o}C by 2090 (McSweeny et al. 2008). The graph on next page shows the increase in mean observed daily temperatures for Grenada since the 1960s. A continued increase may likely lead to more heat waves which could impact human health, especially for vulnerable members of the population. Furthermore, 'downscaled model outputs from the Hadley Centre's PRECIS model, project a tendency towards drying, with a higher number of dry days and fewer consecutive wet days for the region' (Farrell et al., 2007). Drying and increase evapotranspiration caused by higher temperatures impact water resources, agriculture, food security and tourism.

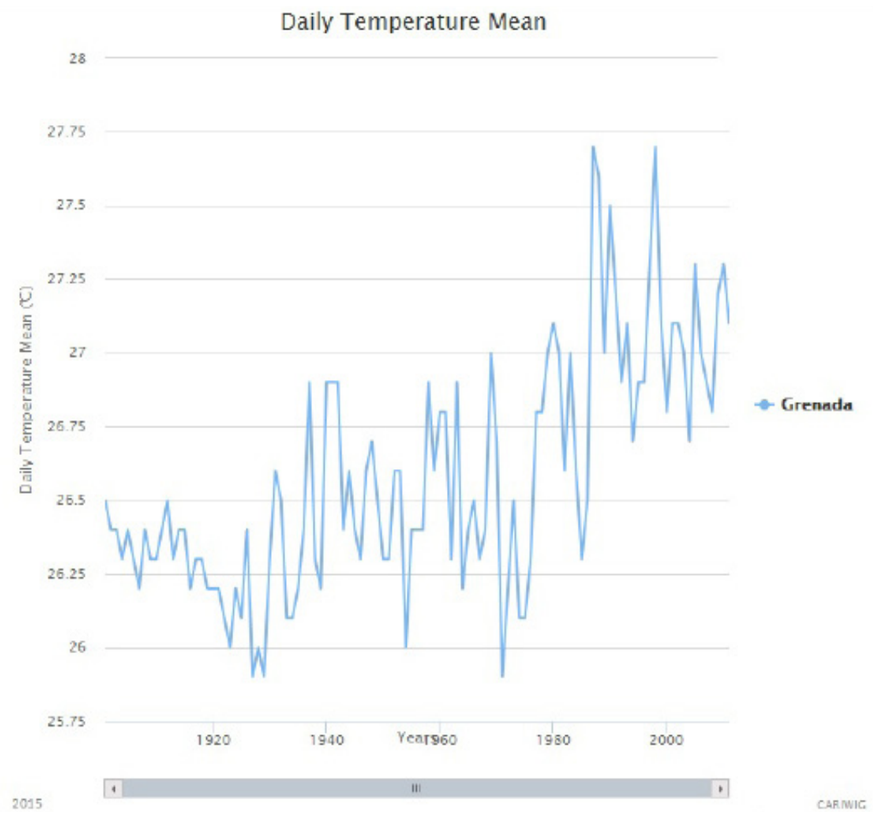
Climate models predict that mean annual precipitation will change by -61 to +23% by 2090, with the median across all the models pointing to an overall decrease of -13 to -21% by 2090 (McSweeny et al., 2008). Although Grenada is relatively rich in water resources, the country's infrastructure is already stressed and in urgent need of improvements: including widening the pipe network, installing more water storage tanks, and introducing automatic stations to measure rainfall and river data in real-time.

Higher temperatures and heavier precipitation may also lead to an increase in vector-borne diseases such as malaria, dengue (Caribsave, 2012) and chikungunya; as well as pest and diseases for livestock.

While annual precipitation may decrease for Grenada, rainfall is also becoming more erratic with flooding now witnessed in the dry season. In fact, major weather events such as storms and hurricanes are projected to become more frequent and extreme. Grenada is ranked 45th in the world for high mortality risk to hazards (Dilley at al., 2005). Even relatively small hurricanes can be comprehensive in their impact given the country's small size and economic and social vulnerability.

A stark demonstration was Hurricane Ivan (Category 3 in 2004) which killed 28 people, wiped out 92% of the forest area and watersheds (Binger et al., 2007) including 90% of the nutmeg plantations (World Bank, 2014), 80% of the electrical poles and significantly damaged 70% of buildings and stock (Binger et al., 2007). Ivan cost Grenada 212% of its GDP and put a heavy debt burden on the country. Grenada's infrastructure rests largely along the coast and steep mountain slopes which increases its risk profile to landslides, flash flooding and high winds. Extreme weather also poses a threat to roads, water networks and electrical grids. The poor enforcement of land use planning and construction codes mean that new builds are not always prepared for such future events (GFDRR, 2010; CARICOM, 2004).

Lastly, the coral reefs surrounding Grenada's islands are highly vulnerable to both coral bleaching caused by rising surface sea temperatures (SST) and acidification brought about by higher ocean pH levels. Models predict the highest regional SST for the Windward Islands of the Lesser Antilles (Simpson et al., 2009) and Grenada's reefs are ranked 20th in the world for vulnerability to ocean acidification (Huelsenbeck, 2012). This is exacerbated by over-fishing in some areas and pollution caused by poor waste management. Grenada is dependent on its seagrasses and reefs to support tourism, fisheries and related livelihoods; and as such, the country is disproportionately vulnerable to any further loss of its coral reef and marine biodiversity (Burke et al., 2012).



03.

Action on climate change

Grenada ratified the UNFCCC in 1994 and submitted its first National Communications in 2000 (unfortunately, efforts to create a second National Communications have stalled since 2006). Grenada also ratified the Kyoto Protocol in 2002. The country is not bound to any mandatory reduction targets in greenhouse gas emissions; however, it has pledged a 20% reduction in GHG emissions from fossil fuels by 2020, as well as minimum of 20% share of renewable sources in primary energy production by 2020.

In 2009, Grenada signed the Liliendaal Declaration along with the Governments of the Caribbean Community (CARICOM) at the thirteenth meeting of the conference in Liliendaal, Guyana from 2 - 5th July 2009. The declaration reaffirmed the principles and commitments of the UNFCCC and Kyoto protocol. It also emphasised that 'dangerous climate change is already occurring in all SIDS (small islands and low-lying coastal developing states) and that many SIDS will cease to exist without urgent, ambitious and decisive action by the international community to reduce global greenhouse gas emissions significantly and to support SIDS in their efforts to adapt to the adverse impacts of climate change, including through the provision of increased levels of financial and technical resources' (Government of Grenada, 2011).

Grenada is party to numerous Conventions, Protocols and international agreements with relevance for climate change (See Table below). There are also many government policies and plans, although respondents for this project noted that implementation lagged significantly behind, especially where landuse planning was concerned. Several of the collected documents in Chapter 3 address the technological, financial and institutional issues obstructing implementation (i.e. FAO, 2014; Thomas, 2005; Bass, 2000). Some of the relevant plans include: the Forest Policy and Action Plan (2000), the Biodiversity Strategy and Action Plan (2000), First National Communication on Climate Change (2000), the National Physical Development Plan (2003), the National Waste Management Strategy (2003), the National Environmental Policy and Management Strategy (2005), the National Development Strategy for Grenada (2007), National Climate Change Policy and Action Plan (draft plan 2007-2011), the Grenada Strategic (Investment) Policy Framework (2011), and the Grenada Vision 2030 (2012). Important upcoming bills and plans include the Electricity Supply Act and Coastal Zone Policy and Coastal Zone Management Roadmap (2015).

Conventions, Protocols and International Agreements	Year
Kyoto Protocol to the UN Framework Convention on Climate Change	2002
Hyogo Framework of Agreement (HFA)	2002
The United Nations Convention to Combat Desertification (UNCCD)	1997
The United Nations Framework Convention on Climate Change (UNFCCC)	1994
The Basel Convention on the Control of Trans-boundary Movement of Hazardous Waste	1989
The United Nations Convention on Biological Diversity (CBD)	1989
The Vienna Convention on the Protection of the Ozone Layer	1985
The United Nations Convention on the Law of the Sea (UNCLOS)	1982
The International Convention for the Prevention of Pollution from Ships (MARPOL)	1973

Over the years, there have been numerous climate change projects in Grenada. These include:

Caribbean Program for Adaptation to Global Climate Change (CPACC) (1997 - 2001) funded by OAS and the World Bank;

Initial National Communication Enabling Activity (1999 - 2003) funded by GEF and UNDP;

Mainstreaming Adaptation to Climate Change: Caribbean Community (MACC) (2003 - 2009) funded by the GEF Trust Fund;

Climate Change Self Assessment (2005 - 2006) funded by GEF and UNDP;

Assistance to Improve Local Agricultural Emergency Preparedness in Caribbean Countries Highly Prone to Hurricane Related Disasters (2006 - 2009) funded by FAO;

Preparedness for Climate Change (Phase I 2006 - 2009; Phase 2 - ongoing) funded by the Red Cross/Red Crescent Climate Centre;

Integrating Climate Change into National Sustainable Development Strategies and Plans in Latin America and the Caribbean (2008 - 2011) funded by UNDESA;

Pilot Program for Climate Resilience – Caribbean Regional Program (2008 - present) funded by the World Bank's Strategic Climate Fund;

CARIBSAVE Climate Change Risk Atlas (2010 - 2011) funded by DFID and AusAID;

Reduce Risks to Human & Natural Assets Resulting from Climate Change (RRACC) (2011 - present) funded by USAid and OECS;

At the Water's Edge: Coastal Resilience in Grenada and St. Vincent and the Grenadines (2011 - 2016) funded by The Nature Conservancy;

Eastern Caribbean Marine Managed Areas Network (ECMMAN) Project (2013 - 2017) funded by the German Federal Ministry for the Environment, the Nature Conservancy and Nuclear Safety (BMUB);

Integrated Climate Change Adaptation Strategies (ICCAS) in Grenada (2013 - 2016) funded by GIZ and UNDP;

Building Capacity for Coastal Ecosystem-based Adaptation in SIDS (2014 - 2016) funded by UNEP;

Implementing a "Ridge to Reef" Approach to Protecting Biodiversity and Ecosystem Functions within and around Protected Areas in Grenada (2014 - 2016) funded by GEF and UNDP.

Complementary programmes and projects include the Grenada Rural Enterprise Project, the National Food Security Programme, the Grenada Disaster Emergency Management Project, the National Infectious Disease Programme and Preventative Health and the Caribbean Hazard Mitigation and Capacity-Building Programme.

In 2014, Grenada re-established the National Climate Change Committee to act as the main advisory body on climate change and development for the Government of Grenada. It does not implement activities, but rather focuses its efforts on providing guidance and oversight on climate change plans including "climate-proofing" development activities. The Committee is comprised of 13 government members and four working groups: Mitigation, Adaptation, Finance and Sustainable Development. Climate change enquiries are directed through the Secretariat of the Committee, the climate change focal point at the Ministry of Agriculture, Lands, Forestry, Fisheries and Environment.

02.

This work is in line with the CARICOM's Implementation Plan fostering a 'regional framework for achieving development resilient to climate change", endorsed by the Heads of Government of CARICOM member states. Amongst others, the strategic goals of the implementation plan are to create a risk management ethic in decision making, and to promote climate change related data and information as public goods which can aid decision-making in building resilience and managing risk. The plan promotes 'an open-source and open access attitude' thereby 'providing the means by which all decision makers can share and make use of the best available information'. It also calls for governments to develop their own national clearing house facilities with free access to climate change related data and information. The CCCCC works on a regional level to support countries in gathering, analysing and disseminating information relevant to climate change. The Centre also encourages the sharing of resources, technical cooperation, and information exchanges with other climate change initiatives, particularly in small island developing states and the Americas.

Grenada has a long history of civic energy around environment and development. Unfortunately, activities by local people and non-profit organisations tend not to feature in climate change literature for Grenada as a whole (although they are found in publicly available project reports). This masks the sheer volume of climate-related activities on the ground, especially targeting forest conservation, water management, agroforestry and agriculture, and eco tourism.

To quote Earl Charles from *the Ministry of Tourism*, Grenadians "feel the impacts today" (Presentation, 2015). There are countless innovative projects which support livelihoods and foster local adaptive capacity to climate change. For example, tree replanting projects are seen throughout the islands, including mangrove replanting at True Bay, Woburn, Grenville Bay and nothern Telescope.

In 2014, a sustainable agriculture project was started at Mt. Moritz which supports local farmers and climate-smart practices. Another example is the *Goat Dairy Project* at Belmont estate which encourages traditional, low-intensity goat herds which are drought resilient, improve soil fertility, and increase food security for the islands. The partnership between the *Grenada Organic Cocoa Farmers Co-operative Society* and the *Grenada Cocoa Chocolate Company* is another instance where climate-smart agriculture reinforces local business and livelihoods. In fact, there are countless examples of sustainable agroforestry and agriculture throughout the country (although certification can be difficult to achieve with the majority of farming concentrated on small holdings).

Sustainable agroforestry and pasture
St. David's, Grenada

Goat Dairy Project
St. Patrick's, Grenada

In addition, there are awareness-raising activities such as Earth Day, biodiversity week and coastal awareness month, radio dramas targeting land degradation (*Caribbean Association for Youth Development and La Boucan Creative Centre*) and a farmer's market at the *Rainbow Inn* which teaches climate change and biodiversity.

Off the coast of Grenada, an underwater sculpture park was installed in 2006, where reduces visitor numbers for sensitive marine reserves by creating an alternative, novel attraction for tourists. The park was such a success it triggered similar work in other parts of the world. There are also examples of coral restoration including the Grenville Reef Engineering and Restoration Project (*The Nature Conservancy*) and the Grand Anse Reef Regeneration Project (GARRP).

The *St. Patrick's Environmental and Community Tourism Organization* (SPECTO) is another strong instance of community action. SPECTO organises community panel discussions, workshops, beach clean ups, and partners with scientists to protect the nesting sites for the critically-endangered leatherback sea turtle.

The Non State Actors Panel is also active in this space. Composed of civil society organisations, they work on climate resilience and poverty in a series of workshops and action plans. They have organised workshops around climate change and labour and produced an Action Plan for 'Alternative Growth and Poverty Reduction' (See Chapter 3) which highlights the synergy between renewable energy and poverty reduction for local Grenadians.

In contrast, renewable energy is one area where there has been little progress, especially for homes and small to medium-size enterprises (SMEs). The reason for this is the current billing policy with the sole energy utility company, GRENLEC, which makes small-scale solar and wind unaffordable in most cases. That said, the energy sector is undergoing major reform at the moment and new legislation may free up the space for renewable energy and independent power producers.

Another promising trend are sensitisation workshops offered to different communities and sectors within Grenada; as well as new research addressing climate change awareness for key stakeholders such as agriculture, health and the tourism industry (i.e. Kairi Consultants, 2013; Macpherson and Akpinar-Elci, 2015; Murray, 2013). *GIZ-ICCAS* offers climate risk management training using the CCORAL Risk Management tool-kit developed by the CCCCC to screen activities for future climate risks. The lead consultant was able to attend one of these training sessions for the tourism industry held on May 15th, 2015.

The collected documents in Chapter 3 reflect new changes afoot in the last couple years in Grenada, although literature on community-based adaptation (CBA) remains all but absent. Hopefully, climate and development literature will begin to capture community activities for both adaptation and renewable energy and demonstrate a balanced relationship between science and local knowledge.

03.

Find.
Collect.
SHARE.

Botanical Gardens
Annandale Falls,
Grenada

Grenada
COLLECTION

Overview of the collection strategy and summary of the climate and development documents for Grenada.

All documents are publicly available on the CCCCC Regional Clearinghouse, which can be searched by country:

http://clearinghouse.caribbeanclimate.bz

03.

Collection Strategy

The 3-month project included both a comprehensive desktop review for digital content on Grenada and interviews with key experts in-country. Ninety-two government and nongovernment contacts were approached, with 33 providing interviews and information. Access was also granted to the archives for both the National Disaster Management Agency (NaDMA) and National Water & Sewerage Authority (NAWASA), although relevant documents were only located in the latter.

Eleven Ministries and government agencies were approached to ensure all possible avenues were explored. The most useful government sources included the Ministry of Agriculture, Lands, Forestry, Fisheries & Environment (MALFFE) which is the climate change focal point and National Water and Sewerage Authority (NAWASA).

A second important source of information were non-profit organisations (NGOs) who are active in environment and development. They shared resources where possible, recommended additional contacts and provided information about the types of climate change activities in Grenada. Active funding NGOs in Grenada include The Nature Conservancy and the Grenada Red Cross Society.

Corporate sources were also useful such as the sole energy utility company, GRENLEC, and the private solar company, GrenSol Limited. Although there is little publicly available content on renewable energy for Grenada, they offered insights into the information barriers for the sector. These interviews were coupled with a "Climate Change and Tourism" sensitisation workshop, organised by GIZ and MALFFE in collaboration with Quinn Company. It allowed the consultant to meet those within the sector and learn about climate issues and activites for tourism in Grenada.

Academics from St. George's University of Medicine were also interviewed: those who undertake work on health and climate change - a vital yet understudied area of research. Information from the University of the West Indies (UWI) was also investigated.

Lastly, international and regional organisations proved to be a useful source for information as funding agencies for climate work in Grenada. These included UNEP, UNDP, FAO, World Bank, Economic Commission for Latin America and the Caribbean (ECLAC), Inter-American Development Bank (IDB), International Fund for Agricultural Development (IFAD), Organization of Eastern Caribbean States (OECS), Organization of American States (OAS), Caribbean Development Bank (CDB), Caribbean Meteorological Organzation, Caribbean Institute for Meteorology and Hydrology (CIMH), the Caribbean Environmental Health Institute (CEHI), and many others.

Ntaba Francis, GIZ-ICCAS Project/Grenada (right), at the Climate Change & Tourism Workshop, Public Workers' Union, Grenada, May 15th, 2015.

Overview of Findings

In total, 72 quality climate and development documents were assembled and are now publicly available on the CCCCC Regional Clearinghouse (published under the Creative Commons licence for educational purposes). The majority are technical reports (~ 45%), research reports and peer-reviewed articles (~30%) and policy reports and briefs (~28%). The remaining include project briefs and reports, guides, tools, workshop papers and reports, book chapters, maps and posters. Previously available documents and tools from the Clearinghouse are also included in this Chapter so as to provide a complete picture of climate change research and activities.

These documents cover a variety of sectors (See graph below) yet significant knowledge gaps were revealed within each. Overall there is a deficit of detailed risk mapping and cost-benefit analysis of adaptation and mitigation options (Simpson et al., 2009). There are also notable research gaps for health, forestry and fisheries, which in turn represent priority areas for future study.

Some of the major challenges for this project included publishing permission for the CCCCC open-access system. For example, there exist many feasibility studies for wind, solar and geothermal power for Grenada, Carriacou and Petite Martinique. However, this research is tied to projects which were never implemented and are thus unavailable for public use. More often, however, documents on climate change were lost over time, especially non-digitial content. This means that documents collected for this project do not represent all work on climate and development, but rather all available work. Fortunately, the resources for this project are now safeguarded within the CCCCC Clearinghouse, but it is a reminder of the need to store and management such digital content.

03.

Climate and development resources.

Cocoa plant,
St. David's, Grenada

Summary
Collected documents arranged by type and year

	YEAR	AUTHOR	PUBLISHER	LINK	Ecosystems & Biodiversity	Water	Disasters	Coasts	Agriculture & Food	Fisheries	Forests	Health	Energy	Tourism	Maps & Models
I. Technical Reports															
1. Waste-to-Energy Scoping Study for Grenada	2015	Silke Rothenberger	GIZ										X		
2. Climate Change Legislation in Grenada	2015	Michal Nachmany, et al.	Grantham Research Institute	http://www.lse.ac.uk/Grantham Institute/wp-content/uploads/2015.pdf		X			X	X	X	X	X	X	
3. Energy Snapshot: Grenada	2015	The National Renewable Energy Laboratory	Energy Transition Initiative	http://www.nrel.gov/docs/fy15osti/62699.pdf									X		
4. An Assessment of Mechanisms to Improve Energy Efficiency in the Transport Sector in Grenada, Saint Lucia and Saint Vincent and the Grenadines	2014	Elizabeth Emanuel and Charmaine Gomes	ECLAC	http://www.cepal.org/portofspain/noticias/documentosdetrabajo/6/54146/lcarl449.pdf									X		
5. Fifth National Report to the Convention on Biodiversity: Grenada	2014	Government of Grenada	CBD	https://www.cbd.int/doc/world/gd/gd-nr-05-en.pdf	X					X					
6. Grenada: Rapid Assessment and Gap Analysis	2014	SE4ALL	SE4ALL	http://www.se4all.org/wp-content/uploads/2014/01/Grenada-Rapid-Assesment-SE4ALLCountry-Profile-Grenada-120831-4.pdf									X		
7. Climate Change Knowledge, Attitudes and Behavioural Practices in the OECS: Report on the KAP Survey of Six Participating Member States	2013	Kairi Consultants Ltd.	OECS	http://iccas.gd/sites/default/files/resources/OECS%20KAP%20SURVEY%20-%20Final%20Report%20Volume%20I%20(Final%20Version%20Submited).pdf	X	X	X	X	X			X	X	X	

Technical Reports (cont'd)	YEAR	AUTHOR	PUBLISHER	LINK	Ecosystems & Biodiversity	Water	Disasters	Coasts	Agriculture & Food	Fisheries	Forests	Health	Energy	Tourism	Maps & Models
8. An Assessment of the Economic and Social Impacts of Climate Change on the Energy Sector in the Caribbean	2013	Ramón Martín, et al.	ECLAC	http://www.cepal.org/portofspain/noticias/documentosdetrabajo/8/49708/Energy.pdf									X	X	
9. An Assessment of the Economic and Social Impacts of Climate Change on the Tourism Sector in the Caribbean	2013	Winston Moore, et al.	ECLAC	http://www.cepal.org/portofspain/noticias/documentosdetrabajo/7/50177/lcarl394.pdf										X	
10. A Review of the Status of the Interconnection of Distributed Renewables to the Grid in CARICOM Countries*	2013	Herbert A Samuel	CREDP & GIZ	http://www.credp.org/Data/CREDP-GIZ_Interconnection_Report_Final_Oct_2013.pdf									X		
11. An Assessment of Fiscal and Regulatory Barriers to the Deployment of Energy Efficiency and Renewable Energy Technologies in Grenada*	2013	Elizabeth Emanuel, et al.	ECLAC	http://www.cepal.org/portofspain/noticias/documentosdetrabajo/5/51885/lcarw3.pdf									X		
12. An Assessment of the Economic Impact of Climate Change on the Water Sector in Grenada*	2014	ECLAC	ECLAC	http://www.eclac.org/portofspain/noticias/paginas/0/44160/Grenadalcarl329.pdf		X									
13. Review of Current and Planned Adaptation Action: The Caribbean*	2011	Dean Medeiros, et al.	IISD	https://www.iisd.org/pdf/2011/The_Caribbean_Adaptation_Action.pdf	X		X	X	X					X	
14. Disaster Risk Management in Latin America and the Caribbean Region: GFDRR Country Notes Grenada	2010	GFDRR	GRDRR	http://www.gfdrr.org/sites/gfdrr.org/files/documents/Grenada-2010.pdf			X								
15. Analysis of the Potential Solar Energy Market in the Caribbean*	2010	Anja Schwerin	CREDP	http://www.credp.org/Data/Solar_Market_Analysis_Caribbean.pdf									X		
16. Assessment of Progress Towards the Millennium Development Goals (MDGs) in Grenada	2010	Monica Williams	Government of Grenada	http://www.gov.gd/egov/docs/reports/Grenada_MDG_Progress_Assessment_Report_2010.pdf	X				X						
17. UNDP Climate Change Country Profiles: Grenada*	2010	C. McSweeney, et al.	School of Geography & Environment, University of Oxford	http://country-profiles.geog.ox.ac.uk/UNDP_reports/Grenada/Grenada.lowres.report.pdf		X								X	
18. Grenada National Protected Area System Gap Assessment	2007	James Byrne	Nature Conservancy	http://www.conservationgateway.org/ConservationByGeography/NorthAmerica/Caribbean/science/planning/Documents/Grenada%20National%20Protected%20Areas%20GAP%20Analysis%202.pdf	X				X						

Technical Reports (cont'd)	YEAR	AUTHOR	PUBLISHER	LINK	Ecosystems & Biodiversity	Water	Disasters	Coasts	Agriculture & Food	Fisheries	Forests	Health	Energy	Tourism	Maps & Models
19. Road Map Toward Integrated Water Resources Management Planning for Grenada	2007	CEHI	Government of Grenada	http://www.pacificwater.org/userfiles/file/IWRM/Toolboxes/planning%20process/IWRM%20Road%20Map_Grenada_April%2007.pdf		X									
20. The Case of Hurricane Ivan in Grenada (2004): Best Practices and Lessons Learned	2007	Avril Alexander	UNDP Barbados & OECS	http://crmi-undp.org/documents/documentos/13.pdf			X								
21. A Nation Rebuilding: An Assessment of Reconstruction and Economic Recovery One Year After Hurricane Ivan	2005	Francis Ghesquiere	World Bank	http://siteresources.worldbank.org/INTLACREGTOPHAZMAN/Resources/grenanda_rebuilding.pdf			X								
22. Grenada A Gender Impact Assessment of Hurricane Ivan - Making the Invisible Visible	2005	ECLAC	UNIFEM	http://www.cepal.org/publicaciones/xml/7/23217/l.48.pdf			X					X			
23. Survey on the Status of Disaster Preparedness in Grenada	2005	Arturo López-Portillo Contreras	CDERA	http://crmi-undp.org/documents/documentos/57.pdf			X								
24. National Capacity Self Assessment	2005	Spencer Thomas	GEF	https://www.thegef.org/gef/sites/thegef.org/files/documents/document/516.pdf	X										
25. Grenada: Macro-Socio-Economic Assessment of the damages caused by Hurricane Ivan	2004	OECS	OECS	http://www.gov.gd/egov/docs/reports/Ivan-Report-07-09-04.pdf			X					X			
26. Status of Hazard Map, Vulnerability Assessments and Digital Maps in the Caribbean: Grenada	2003	Jacob Opadeyi, et al.	CDERA	http://www.eird.org/wikien/images/Hazards_maps_Vulnerability_maps_Grenada.pdf			X								X
27. Vulnerability and Adaptation - A Regional Synthesis of the Vulnerability and Adaptation Component of Caribbean National Communications*	2002	Rawleston Moore	CARICOM	http://dms.caribbeanclimate.bz/M-Files/openfile.aspx?objtype=0&docid=6369	X	X	X	X	X	X	X	X	X	X	
28. Assessment of the Economic Impact of Climate Change on CARICOM Countries*	2002	Erik Haites	World Bank	http://www.margaree.ca/reports/ClimateChange-CARICOM.pdf					X	X		X		X	
29. Grenada's Coastal Vulnerability and Risk Assessment*	2002	Rawleston Moore and Leon Charles	CCCCC	http://dms.caribbeanclimate.bz/M-Files/openfile.aspx?objtype=0&docid=5722				X							
30. Coral and Fish Assessments for Grenada and Carriacou: Technical Assistance fore the Implementation of Component Six - Coastal Vulnerability and Ris Assessment for The Caribbean Planning for Adaptation to Global Climate Change Project (CPACC)*	2001	Angelique Brathwaite and André Miller	CCCCC	http://dms.caribbeanclimate.bz/M-Files/openfile.aspx?objtype=0&docid=4845	X					X					
31. National Report: Integrating Management of Watersheds and Coastal Areas	2001	Government of Grenada	Government of Grenada	http://iwlearn.net/iw-projects/1254/reports/Grenada-national-report.pdf		X									
32. Grenada's Initial Communication to the UNFCCC	2000	Government of Grenada	UNFCCC	http://unfccc.int/resource/docs/natc/grnnc1.pdf	X	X	X	X	X	X		X		X	

II. Research Articles & Reports	YEAR	AUTHOR	PUBLISHER	LINK	Ecosystems & Biodiversity	Water	Disasters	Coasts	Agriculture & Food	Fisheries	Forests	Health	Energy	Tourism	Maps & Models
1. Caribbean Heat Threatens Health, Well-being and the Future of Humanity	2015	Cheryl C. Macpherson and Muge Akpinar-Elci	Public Health Ethics	http://phe.oxfordjournals.org/content/early/2015/04/12/phe.phv008.full.pdf?keytype=ref&ijkey=AJAjnhWWQu0Ebm0								X			
2. The 2009/2010 Caribbean Drought: A Case Study	2015	Everson J. Peters	Disasters	http://onlinelibrary.wiley.com/doi/10.1111/disa.12123/full		X			X			X			
3. Assessing the Vulnerability to Climate Change of Small Scale Fisheries: The Grenada Example	2014	V.N. Agostini, et al.	Nature Conservancy	http://www.conservationgateway.org/ConservationByGeography/NorthAmerica/Caribbean/science/adaptation/Documents/Agostini%20et%20al%20ebook%20chapter-final.pdf						X					
4. Marine Protected Area Monitoring in the Nearshore Waters of Grenada, Eastern Caribbean: Benthic Cover and Fish Populations	2014	Robert Anderson, et al.	Journal of Tropical Biology	http://revistas.ucr.ac.cr/index.php/rbt/article/view/15922/15275	X					X				X	
5. Distribution of Mangrove Habitats of Grenada and the Grenadines	2014	Gregg E. Moore, et al.	Journal of Coastal Research	https://www.researchgate.net/publication/268445518_Distribution_of_Mangrove_Habitats_of_Grenada_and_the_Grenadines	X	X					X				
6. Forests and Climate Change in the Caribbean	2014	FAO	FAO	www.fao.org/3/a-i4220e.pdf							X				
7. Evidence of Demand for Microinsurance for Coping and Adaptation to Weather Extremes in the Caribbean	2013	Jonathan Lashley and Koko Warner	Climate Change	https://www.researchgate.net/publication/258161889_Evidence_of_demand_for_microinsurance_for_coping_and_adaptation_to_weather_extremes_in_the_Caribbean			X								
8. Ecosystem based approaches for climate change adaptation in Caribbean SIDS*	2013	Bruno Chatenoux and Alexander Wolf	UNEP, GRID-Geneva and ZMT Leibniz Center for Tropical Marine Biology	http://www.grid.unep.ch/products/3_Reports/EBA4CCA_CarribeanSIDS.pdf	X					X				X	
9. Nutrient and Sediment Inputs of the Beausejour River: The Impacts It May Have on the Adjacent Coral Reef System in the Moliniere Beausejour Marine Protected Area	2013	Stephen Nimrod, et al.	OAS	http://iccas.gd/sites/default/files/resources/Grenada%20ReefFix%20Final%20Report%202013%20(2).pdf	X										
10. Grenada Renewables Readiness Assessment*	2012	Gauri Singh, et al.	IRENA	http://www.irena.org/DocumentDownloads/Publications/Grenada_RRA.pdf									X		

Research Articles & Reports (cont'd)	YEAR	AUTHOR	PUBLISHER	LINK	Ecosystems & Biodiversity	Water	Disasters	Coasts	Agriculture & Food	Fisheries	Forests	Health	Energy	Tourism	Maps & Models
11. Road Map on Building A Green Economy for Sustainable Development in Carriacou, Petite Martinique, Grenada	2012	UNDESA & Government of Grenada	UNDESA	http://www.uncsd2012.org/content/documents/421Final%20Pub%20Road%20Map%20Carriacou%20&%20Petite%20Martinique%20Grenada%20%20June2012.pdf		X			X	X			X	X	
12. Policy Development for Innovative Renewable Energy Implementation in Island Regions	2011	Daniel Kammen and Rebekah Shirley	Energy Policy	http://rael.berkeley.edu/old_drupal/sites/default/files/Energy%20Policy_Shirley%20and%20Kammen%20.pdf									X		
13. United Nations Conference on Sustainable Development (RIO+20) National Preparatory Process: Background Paper	2011	Government of Grenada	UNCSD	https://sustainabledevelopment.un.org/content/documents/595grenadanatereport.pdf	X	X			X	X	X	X	X	X	
14. CARIWIN Community Water Strategy Background Document: Great River Water Watershed, Grenada	2009	Caribbean Water Initiative	Brace Centre for Water Resources, McGill, & CIMH	https://www.mcgill.ca/cariwin/files/cariwin/cws_grenada_december2009.pdf		X									
15. Fourth National Report of Grenada to the CBD	2009	Government of Grenada	UNDP	https://www.cbd.int/doc/world/gd/gd-nr-04-en.pdf	X	X			X		X				
16. The Caribbean and Climate Change: The Costs of Inaction*	2008	Ramón Bueno, et al.	Environmental Defense Fund	http://ase.tufts.edu/gdae/CaribbeanClimate.html		X	X							X	
17. Protracted Rainfall Decreases Temperature within Leatherback Turtle (Dermochelys coriacea) Clutches in Grenada, West Indies: Ecological Implications for a Species Displaying Temperature Dependent Sex Determination	2007	J.D.R. Houghton, et al.	Journal of Experimental Marine Biology & Ecology	http://www.swansea.ac.uk/bs/turtle/reprints/Houghton_etal_JEMBE_2007.pdf	X										
18. A Wind Energy Analysis of Grenada: An Estimation Using the 'Weibull' Density Function	2003	Daniel Weisser	Renewable Energy	http://www.sciencedirect.com/science/article/pii/S0960148103000168									X		
19. Implications of Seasonal and Diurnal Variations of Wind Velocity for Power Output Estimation of a Turbine: A Case Study of Grenada	2003	Daniel Weisser and T.J. Foxon	International Journal of Energy Research	http://onlinelibrary.wiley.com/doi/10.1002/er.938/abstract									X		
20. The Nutmeg and Spice Industry in Grenada: Innovations and Competitiveness	2003	Ranjit H. Singh, et al.	OAS & Secretariat of Science, Technology and Productive Innovation	https://www.researchgate.net/publication/275771715_Case_Study_-_THE_NUTMEG_AND_SPICE_INDUSTRY_IN_GRENADA._Singh_R._Sankat._C.K._and_Mujaffar_S					X						
21. Potential for Geothermal Development in Grenada, West Indies	1995	Gerald W. Huttrer and Donald E. Michels	Geothermal Energy	http://www.geothermal-energy.org/pdf/IGAstandard/WGC/1995/1-huttrer2.pdf									X		
III. Policy Plans, Briefs & Reports															
1. A New Paradigm for Caribbean Development: Transitioning to a Green Economy	2014	CDB	CDB	http://www.caribank.org/uploads/2014/05/Booklet_A-New-Paradigm-for-Caribbean-Development-Transitioning-to-a-Green-Economy.pdf									X		

Policy Plans, Briefs & Reports (cont'd)	YEAR	AUTHOR	PUBLISHER	LINK	Ecosystems & Biodiversity	Water	Disasters	Coasts	Agriculture & Food	Fisheries	Forests	Health	Energy	Tourism	Maps & Models
2. Climate-Smart Agriculture in Grenada	2014	World Bank, CIAT & CATIE	World Bank	https://ccafs.cgiar.org/publications/climate-smart-agriculture-grenada#.VY17hM6smZY					X						
3. Supplemental Material to Climate-Smart Agriculture in Grenada	2014	World Bank, CIAT & CATIE	World Bank	https://cgspace.cgiar.org/bitstream/handle/10568/51364/Supplementary-material_Grenada.pdf					X						
4. Grenada Protected Area System Plan - Part 2	2014	Mel Turner	OECS	http://gd.chm-cbd.net/biodiversity-grenada/national-reports/grenada-system-plan-part-2.pdf	X						X				
5. Perspectives from Civil Society on the Millennium Development Goals and Post-2015 Agenda: Focus on Small States and Vulnerability	2013	Laurel A. Murray	Commonwealth Foundation	http://dms.caribbeanclimate.bz/M-Files/openfile.aspx?objecttype=0&docid=6456								X			
6. National Progress Report on the Implementation of the Hyogo Framework for Action	2013	National Disaster Management Agency	Government of Grenada	http://www.preventionweb.net/files/32809_grd_NationalHFAprogress_2011-13.pdf			X								
7. Alternative Growth and Poverty Reduction Strategy: Management Action Plan	2013	André Vincent Henry	Non State Actors Panel of Grenada	http://ghta.org/files/resources/2013%2C_MARCH_-_MANAGEMENT_ACTION_PLAN_-_FOR_CIRCULATION.pdf			X		X						
8. Grenada, Carriacou and Petite Martinique Land Policy Issues Paper	2013	Edward Niles	OECS	http://www.oecs.org/publications/ssdd/unhabitat-project/642-grenada-land-policy-issues-paper-final/file			X	X	X		X				
9. The National Energy Policy of Grenada: A Low Carbon Development Strategy For Grenada, Carriacou and Petite Martinique*	2011	Government of Grenada	Government of Grenada	http://dms.caribbeanclimate.bz/webinfo/cdcfullmeta.php?id=6270&search=Grenada									X		
10. The Economics of Climate Change in the Caribbean*	2011	CEPAL	CEPAL	http://www.cepal.org/publicaciones/xml/2/45412/LCARL.346.pdf		X			X				X		
11. Grenada Growth and Poverty Reduction Strategy, 2012-2015	2011	Government of Grenada	CDB	http://www.caribbeanelections.com/eDocs/strategy/gd_strategy/gd_GPRS_2011.pdf					X	X		X			
12. Government of Grenada National Disaster Management Plan: Basic Plan*	2011	Government of Grenada	Government of Grenada	http://dms.caribbeanclimate.bz/M-Files/openfile.aspx?objtype=0&docid=5819			X								
13. Grenada National Climate Change Policy and Action 2007-2011	2011	Government of Grenada	World Bank	Annex 4: https://www.climateinvestmentfunds.org/cif/sites/climateinvestmentfunds.org/files/grenada_joint_mission_report_120710.pdf	X	X	X	X	X	X	X	X	X	X	
14. The National Environmental Summary Grenada	2010	Asha Singh	UNEP/ROLAC	http://www.unep.org/rso/Portals/118/Documents/NESs/ROLAC/Grenada%20_NES_2010_SIDS.pdf	X	X	X	X	X	X		X			

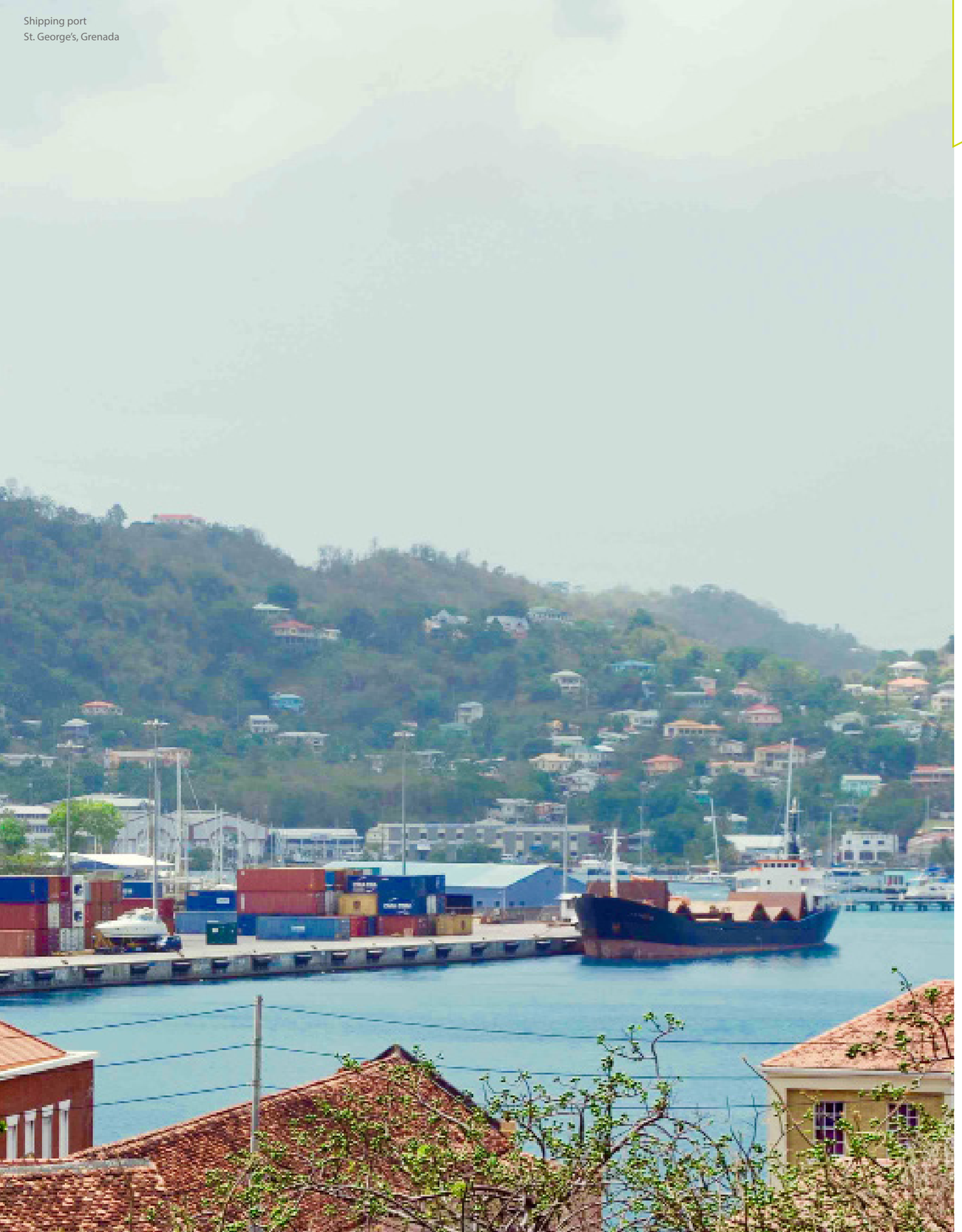
Policy Plans, Briefs & Reports (cont'd)	YEAR	AUTHOR	PUBLISHER	LINK	Ecosystems & Biodiversity	Water	Disasters	Coasts	Agriculture & Food	Fisheries	Forests	Health	Energy	Tourism	Maps & Models
15. Grenada Protected Area System Plan - Part 1	2009	Mel Turner	OECS	http://www.oas.org/dsd/IABIN/Component1/ReefFix/Grenada%20Book/SystemsPlan2/System%20Plan%20Part1%20Intro_Background.pdf	X						X				
16. Capacity Assessment of Geographic Information Systems Capabilities of the Caribbean: Regional Assessment Report	2007	The Water Center for the Humid Tropics of Latin America & the Caribbean	CEHI & UNEP	http://iwlearn.net/iw-projects/1254/reports/GEF-IW-CAM-GIS-Regional-%20Assessment-Report-FINAL-September-07.pdf											X
17. Towards a Sustainable Recovery for Grenada: National Consultation Report	2004	Government of Grenada	Government of Grenada	http://www.pnuma.org/sids_ing/documents/National%20Reports/Grenada%20Final%20Assessment%20Report.pdf	X	X	X		X		X		X	X	
18. Grenada National Hazard Mitigation Plan	2003	Linus Spencer Thomas	CDERA & CDB	http://www.caribank.org/wp-content/uploads/2012/03/GRN_national-HMitigation_policy.pdf			X								
19 National Physical Development Plan: Grenada-Carriacou-Petite Martinique	2003	Government of Grenada	Government of Grenada	uwispace.sta.uwi.edu/dspace/handle/2139/10669			X							X	
20. Participation in the Caribbean: A Review of Grenada's Forest Policy Process	2000	Stephen Bass	IIED	http://pubs.iied.org/pdfs/7559IIED.pdf							X				
IV. Poster															
1. Drought Early Warning and Risk Reduction: A Case Study of The Caribbean Drought of 2009-2010	2011	Adrian Trotman, et al.	CIMH	https://secureweb.mcgill.ca/cariwin/files/cariwin/dig_caribbean_drought_poster_0.pdf		X			X			X		X	
V. Project Briefs & Reports															
1. Grenville Pilot Reef Breakwater: Innovative Reef Engineering for Small Island States	2015	Nature Conservancy	Nature Conservancy	http://www.conservationgateway.org/ConservationByGeography/NorthAmerica/Caribbean/science/adaptation/Documents/Grenville%20Reef%20and%20AWE%20Project%20Update%20-%20Final.pdf	X									X	
2. Integrating Climate Change into National Sustainable Development Strategies and Plans in Latin America and the Caribbean: External Evaluation Report	2013	Roger Raufer	UNDESA	https://sustainabledevelopment.un.org/content/documents/1636Evaluation%20report%20DA%20ROA%20126%20March%202013.pdf		X		X					X	X	

Project Briefs & Reports (cont'd)	YEAR	AUTHOR	PUBLISHER	LINK	Ecosystems & Biodiversity	Water	Disasters	Coasts	Agriculture & Food	Fisheries	Forests	Health	Energy	Tourism	Maps & Models
3. Strengthening Climate Resilience: The Case of Grenada	2012	Sandra Prescod Dalrymple and Sarah Mason-Case	CDKN	http://cdkn.org/wp-content/uploads/2012/06/Grenada-Inside_Story_6pp_final_low-res1.pdf		X	X	X			X				X
4. Implementing Renewable Energy and Preventing Land Degradation: A Proposal for an Intervention in Nutmeg Industry in Grenada	2012	WINDREF	UNDP	http://www.bb.undp.org/content/dam/barbados/docs/projectdocs/energy/SGU_GEF_FINAL_REPORT.pdf					X				X		
5. Grenada Strategic Program for Climate Resilience (SPCR)*	2011	Government of Grenada	Climate Investment Funds	https://www.climateinvestmentfunds.org/cif/sites/climateinvestmentfunds.org/files/Grenada_SPCR_revised_20apr2011.pdf	X	X	X		X				X		
6. Good Agricultural Practices for Climate Risk Management in Grenada	2008	Dianne A. Roberts and Randolph Shears	FAO	http://www.fao.org/fileadmin/templates/tc/tce/pdf/Grenada_draft_final_report_May_2008.pdf					X						
VI. Guides															
1. The Caribsave Climate Change Risk Atlas: Climate Change Risk Profile for Grenada*	2012	CARIBSAVE	CCCCC	http://dms.caribbeanclimate.bz/M-Files/openfile.aspx?objtype=0&docid=5042	X	X	X		X	X	X	X			
2. Adapting to a Changing Climate in the Caribbean and South Pacific: Guide to the Integration of Climate Change Adaptation into the Environmental Impact Assessment (EIA) Process*	2004	CARICOM	Caribbean Community Secretariat	http://iwlearn.net/manuals/documents/mainstreaming-climate-change-marine-documents/guide-to-the-integration-of-climate-change-adaptation-into-the-environmental-impact-assessment-eia-process/at_download/file	X		X								
3. Wise Practice for Coping with Beach Erosion	1998	The National Science & Technology Council	UNESCO, CDB & Government of Grenada	http://www.unesco.org/csi/act/cosalc/grenb.pdf				X					X		
VII. Book Chapters															
1. Status of Coral Reefs of the Lesser Antilles: The French West Indies, The Netherlands Antilles, Anguilla, Antigua, Grenada, Trinidad and Tobago	2008	Claude Bouchon, et al.	Global Coral Reef Monitoring Network	http://caribsat.teledetection.fr/index.php?option=com_docman&task=doc_down-	X								X		
VIII. Maps															
1. Geographical Information System-Assisted Water Availability Analysis for Grenada: Map Compendium	2006	CEHI	UNEP	http://www.cehi.org.lc/Rain/print/Grenada-RWH-Maps.pdf		X									X

Maps (cont'd)	YEAR	AUTHOR	PUBLISHER	LINK	Ecosystems & Biodiversity	Water	Disasters	Coasts	Agriculture & Food	Fisheries	Forests	Health	Energy	Tourism	Maps & Models
2. Development of Coastal Erosion Hazard Maps: Grenada	2006	CEAC Solutions Co. Ltd.	CDERA	http://www.caribank.org/wp-content/uploads/2012/03/CoastalErosion_NontechinicalSummary_GRN.pdf				X							X
IX. Workshop Reports & Papers															
1. Water Information Systems Experts Planning and Development Workshop	2011	CEHI	CEHI	https://secureweb.mcgill.ca/cariwin/files/cariwin/wis_report_final_0.pdf		X									
2. Climate Change Awareness Workshop for Labour	2011	Sandra C.A. Ferguson	Non State Actors Advisory Panel	http://dms.caribbeanclimate.bz/M-Files/openfile.aspx?objecttype=0&docid=6457		X			X			X			
X. Tools															
1. CCORAL	2013	CCCCC	CCCCC	ccoral.caribbeanclimate.bz	X	X	X	X	X	X	X	X	X	X	
2. Health Sector Self-Assessment Tool for Disaster Risk Reduction	2010	PAHO	PAHO	http://www.preventionweb.net/files/15881_pahoselfassessmenttooloct2010.pdf			X					X			

Bathway Beach
Northeastern Grenada

Shipping port
St. George's, Grenada



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