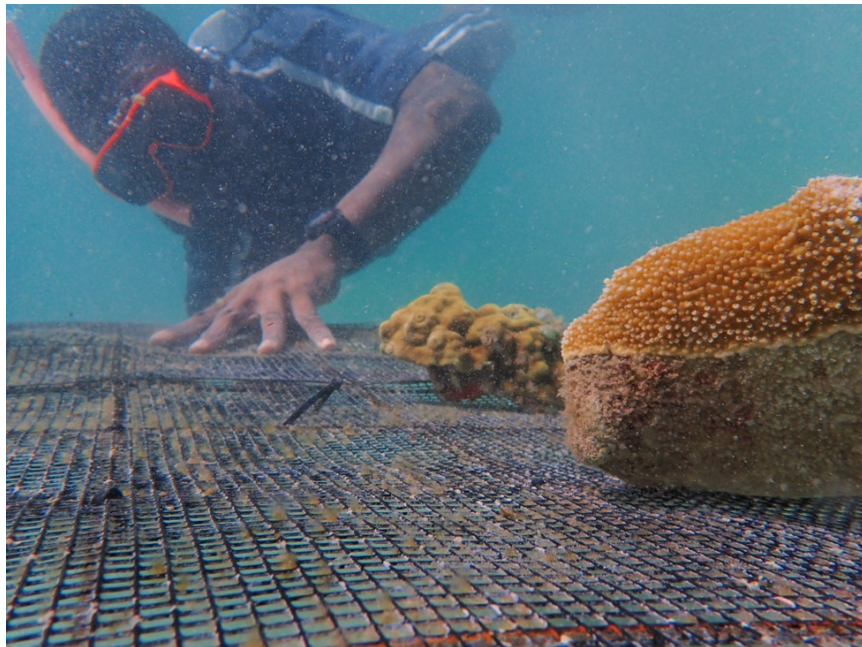


***WINDWARD
ISLANDS
RESEARCH
& EDUCATION
FOUNDATION***



2022 Annual Report

The cleaning of the quarantine table by a coral nursery assistant. Elkhorn coral (*Acropora palmata*) [front right] and Mustard Hill coral (*Porites asteroides*) [back left] are temporarily housed on the quarantine table awaiting micro-fragmentation. The micro-fragmentation process breaks the coral colony into small fragments, usually 1cm * 1cm based on the species of coral, utilizing a specialized band saw. This process stimulates the growth of the coral polyps up to 50 times normal growing rate. These corals are cleaned twice per week to mitigate coral stress or even mortality due to sedimentation and algal overgrowth.



Mission Statement

WINDREF seeks to advance health and sustainable environmental development through multi-disciplinary research and education programs. WINDREF strives for program excellence by promoting collaborative relationships between internationally recognized scholars and regional scientists, and by adhering to the highest ethical and academic standards in the design and conduct of research.

Goals

- To provide a scientific resource centre capable of coordinating international collaborative research of the highest caliber in the areas of medicine, medical and veterinary public health, environmental health, anthropology, sociology, ecology, marine and terrestrial biology, and ethics.
- To provide a first rate academic opportunity to scientists from the Caribbean and around the world through unique research opportunities that enhances the knowledge and welfare of local and international communities.
- To conduct applied scientific research for the benefit of community and health development at the local, national and international levels.
- To share relevant scientific information with local and international communities in the pursuit of evidence-based policies.

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Director's Report on WINDREF Activities in 2022

The Global SARS-CoV-2 pandemic dominated our lives for the first half of 2022 with the new Omicron variants, which were first detected in South Africa at the end of November 2021 and spread rapidly around the world and to Grenada. The second half of the year saw a global relaxation of travel and personal restrictions, and life returned, for much of the world, to normal. Grenada removed all restrictions and carnival was held, as usual, in August.

The WINDREF lab continued to provide rapid antigen tests throughout 2022, with positive cases providing an additional sample for PCR testing and those with a CT < 25 were sequenced. The BA5 variant remained as the dominant variant throughout the year. Testing and vaccination was performed by WINDREF core staff from August with the vaccines provided to SGU by the Government of Grenada. Vaccinations were halted in mid-December and will be resumed as early as possible in the Spring of 2023. We thank SGU, the Ministry of Health, PAHO, and the many volunteers, who formed a close partnership during the pandemic, which served our communities well.

Going forward, we must be mindful of the quote by Thomas Jefferson, who stated that "The price of freedom is eternal vigilance".

Four new research and education projects were started or extended in 2022 vis:
"Conscious Discipline Grenada" – Funded by The Becky Bailey Foundation (Landon & Waechter), "Alternatives to Violence Public Service Announcements: Addressing Physical Violence of Children in Grenada" – Funded by

UNICEF Spotlight Initiative (Landon & Waechter); this project was funded only in 2022. "Caribbean Research Ethics Education initiative (CREEi) Hastings Center Subgrant" – Funded by NIH Grants (Cox Macpherson) and, "Practical Climate Adaptation in Fisheries Interventions in Grenada" – Funded by the Food & Agricultural Organization (Noël & Baldeo).

Three projects were completed in 2022, including, the project on storytelling in education, the Global Challenges Research Fund, and the first phase of the Caribbean Cancer Portal. Twelve other WINDREF research and education programs were continued in 2022. The progress made in these various projects in 2022 are described in this Annual Report. WINDREF employs 40 individuals on these grants and an additional 60 individuals are provided with specific contracts to fulfil the goals of these projects. The funding received in 2022 was greater than any previous year and places WINDREF in a very healthy financial position going forward. The Foundation partners with a growing number of universities and global institutions, and has consolidated a number of its long-term projects which are providing community based solutions to a number of health and environmental issues. All of these projects resulted in a number of international conference presentations and peer reviewed publications listed in this report.

The Keith B. Taylor Memorial Lecture for 2022 was presented by Dr. Paul Garner entitled "Scandals in Global Public Health". Dr. Garner is Emeritus Professor at the Liverpool School of Tropical Medicine and has been a Senior Research Fellow of WINDREF for the past 15 years.



Dr. Paul Garner who delivered the KB Taylor Memorial Lecture on Wednesday, November 23rd, 2022.



Peter Hotez, MD, PhD, 2022 recipient of the Mike Fisher Memorial Award

The Mike Fisher Memorial Award for 2022 was awarded to Dr. Peter Hotez, MD, PhD. Dr. Hotez is the Dean of the National School of Tropical Medicine and Professor of Pediatrics and Molecular Virology & Microbiology at Baylor College of Medicine where he is also the Co-director of the Texas Children’s Center for Vaccine Development and Texas Children’s Hospital Endowed Chair of Tropical Pediatrics. Dr. Hotez is also the University Professor at Baylor University, Fellow in Disease and Poverty at the James A Baker III Institute for Public Policy, Senior Fellow at the Scowcroft Institute of International Affairs at Texas A&M University, Faculty Fellow with the Hagler Institute for Advanced Studies at Texas A&M University, and Health Policy Scholar in the Baylor Center for Medical Ethics and Health Policy. Dr. Hotez receives this award in recognition of his enormous contribution over many decades to the field of One Health through his work on many zoonotic infections, for which he is internationally recognized.

On behalf of the members of the Grenada, United Kingdom, and United States Boards of Trustees and Directors, I would like to thank our collaborators and donors for making 2022 a very successful year for WINDREF. We thank all of our donors for supporting the work of WINDREF over the past year, and look forward to another successful year in 2023.

**Calum N.L. Macpherson
Director, WINDREF**

WINDREF Organization

Board of Directors

- Baroness Howells of St. David's, OBE (Emeritus President)
- Calum N. L. Macpherson, PhD, DIC, FRSPH (Vice President & Director)
- Trevor P. Noël, MPH, PhD, FRSPH (Deputy Director)
- Margaret Lambert, MA, (Secretary/Treasurer)
- Karen Lawson, PhD
- Ellen Ratner, MEd, LLD
- Joseph Feldman, MD
- Esperance Schaefer, MD, MPH
- Kirani James, BSc, CBE
- George McGuire, MSc

Board of Trustees (United Kingdom)

- Baroness Howells of St. David, OBE , Emeritus President
- Lord Stevens of Kirkwhelpington, KStJ, QPM, DL, FRSA,
- Lord Trees of The Ross, DVM, PhD
- Neil Poulter, MD
- Patrick Orr
- Margaret Lambert, MA (Ex Officio)
- Calum Macpherson, PhD, DIC, FRSPH (Ex Officio)

Scientific Advisory Board

- John R. David, MD
- Malcolm A. Ferguson-Smith, MBChB, FRCP, FRCPath
- Calum Macpherson, PhD, DIC
- Anselm Hennis, MBBS, PhD, FRCP, FACP
- Ian McConnell, BVMS, FRSE, F. Med. Sci.
- Hugh Montgomery, MD
- Baron Peter Piot, MD, PhD, CMG, FRCP
- Neil Poulter, MD, PhD
- Melinda S. Sothorn, PhD, CEP
- Richard Scribner, MD, MPH
- Lord Trees of The Ross, DVM, PhD

- Joy St. John, BSc, MBBS, MPH
- Thomas Meade, CBE, DM, FRCP, FRS
- Graham Serjeant, MD, FRCP, CMG
- M.S Swaminathan, MBBS
- John Ferguson, MBChB, FRCGP

Administration—Grenada

It is with great sadness that Celia Edwards QC passed away during the year. Celia provided legal oversight for the establishment of WINDREF as an NGO in Grenada, and remained as our Legal Council for the following 29 years. We are truly indebted to Celia for her calm, intelligent guidance during her tenure.

- Dr. Randall Waechter, Grants Coordinator
- Mr. Kareem Coomansingh, Assistant Grants Coordinator
- Ms. Isha English, Assistant Administrator
- Mrs. Naomi Whyte, Executive Secretary
- Mrs. Yvette Simon, Secretary
- Ms. Leslie-Ann Seon, Legal Support
- Mr. Hayden Redhead, Program Manager
- Ms. Carol Forbes, Project Manager, Innovative Nature-based Solutions to Enhance Community Resilience
- Mrs. Ramona Otway, Accountant
- Mr. Michael Cahill, Legal Support, USA
- Mrs. Nakita Francis, Grants and Finance Officer
- Ms. Nikita Cudjoe, SARS-CoV-2 Program Manager
- Ms. Roberta Evans, Zika and Neurodevelopment Project Manager
- Mrs. Stephanie Holmes, Saving Brains Project Manager
- Mrs. Elsa Chitan, Lab Technician
- Ms. Nandy Noel, Data Manager

Administration—United States

WINDREF (USA) was established as a 501(c)3 non-profit organization to facilitate coordination of the USA activities and to administer

charitable donations from the United States and worldwide. Its goal is to enhance the development of WINDREF's research and educational programs. The offices are located in Great River, New York. Ms. Jennifer Rudolph provides administrative and logistical support, and Mr. Michael Cahill provides legal support

Administration—United Kingdom

WINDREF (UK) was set-up as a charitable trust in Winchester, England in 1999 to promote collaboration between WINDREF scientists and academic centers of research in the United Kingdom and the European community. A Board of Trustees was appointed in 1999 to oversee the activities of WINDREF (UK). The office is located in London. Mr. Patrick Orr serves as the WINDREF (UK) accountant, along with Mr. Stan Lee serves as the treasurer, provide oversight of the financial operation and charitable status of WINDREF (UK).

Senior Research Fellows

- Hugh W. Ferguson, BVM&S, PhD, Dipl. ACVP, MRCVS, FRCP
- Paul Fields, PhD
- Paul Garner, MBBS, MD
- Mary Glenn, PhD
- Duane Gubler, ScD
- Stephen Morse, PhD
- Leslie Ramsammy, PhD, DSc (Hon)
- Douglas Slater, MD, MPH
- Stanley Weiss, MD
- Melinda Southern, PhD
- Richard Schribner, MD, PhD
- Cheryl Cox-Macpherson, PhD
- Marios Loukas, MD, PhD
- A. Desiree LaBeaud, MD, MSc
- Hugh Sealy, PhD, P. Eng
- Timothy Endy, MD, MPH
- Roger Radix, MD, MPH, MIB, FRSPH
- Jonathan Ashcroft, MD, MSc
- Anselm Hennis, MBBS, PhD, FRCP, FACP

- Neil Poulter, MD, PhD

Research Fellows

- John Adamski, MD, MSc, MPH
- Muge Akpınar-Elci, MD, MPH
- Glennis Andall, PhD
- Charles Avgeris, MD, MSc
- Satish Bidaisee, DVM, MSPH, MSB, FRSPH, EdD
- Grant Burgess, PhD
- Reccia Charles, PhD
- Sonia Chehil, MD, FRCPC
- Andrea Easter-Pilcher, PhD
- Martin Forde, ScD
- Mark Gibson, MA
- Orazio Giliberti, MD
- Richard Kabuusu, DVM, MPH
- Victoria Kimotho, MPH
- Barbara Landon, PsyD
- Clare Morrall, PhD
- Shamdeo Persaud, MD, MPH
- Christine Richards, PhD, MPH
- Bonnie Rusk, MSc
- Karen Schioler, PhD
- Shanti Singh, MD, MPH
- Kamilah Thomas-Purcell, PhD, MPH
- Randall Waechter, BBA, PhD
- Trevor Noël, PhD, MPH
- Laura Colket, PhD
- Tracy Penny-Light, PhD
- Carlene Radix, MD, MPH
- Vishaka Vasuki, BVSC, MSc
- Michelle Fernandes, MRCPCH, DPhil
- Karen Blackmon, PhD
- Lindonne Glasgow, PhD, MPH
- Allana Roach, PhD

Research Scientists

Sadiq Al-Tamini, Sumita Asthana, Yitzhack Asulin, Bishara Baddour, Jean-Pierre Barakat, Matthew Beeson, Matthew Boles, William Brown, Ella Cameron, Nicholas Caputo, Rae Connolly, Abraham El-gross disfigurement

Sedfy, Daniel Firer, Kristy Fisher, Scott Forman, Brandon Francis, Vamsi Guntur, François Hallé, Anthony Junck, Megan Kaminskyj, Sebastian Kreitzschitz, Erik Lacy, Ede Tyrell, Richard Lehman, Jason Lowther, Setshidi Makwinja, Paul Mancuso, Baher Maximos, John McCormack, David Melamed, Kirk Minkus, Jerry Mitchell, Jessica Morlok, Kevin Neill, Bayela Nfila, Yolanda Ng, Michael Nillas, Andre Panagos, Barry Politi, Sandeep Pulim, Sean Ramsammy, Justin Rebo, Laura Robinson, Corey Schwartz, Sarah Scott, Christopher Skaff, Nadia Solomon, David Steinberg, Derrick Tlhoiwe, Sarah Treter, Nghia Truong, James Tsai, Dan Twyan, Frank Van Natta, Ru-Amir Walker, Juliette Williams, David Winkur, Colleen Wunderlich, Elliot Yung, Regan Schwartz, Katherine Brigman, Mmakgomo Coangae, Felicity Lillingston, Keith Bensen, Sadik Uddin, Rakesh Patel, Mathew Browne, Jessica Clayton, John Hollerman, Alan Rhoades, Nikita Cudjoe, Karen Brennan, Stephanie Holmes, Roberta Evans, Victor Ashby, Jeffon Telesford, Karla Farmer, Molly Ziegler, Christopher Gibson, Shanice McKain, Steve Nimrod, Elsa Chitan, Nandy Noel, Bhumika Sharma, Vanessa Matthew-Belmar, David Bhilhar, Elizabeth Thomas.

WINDREF Lectures

Research Lecture Series:

1994: Stephen Morse- “Emerging and Re-emerging Viruses”
1995: Stanley Weiss- “The HIV Pandemic”
1996: Duane Gubler- “Dengue: A global problem of increasing importance”
1997: Graham Sergeant- “Sickle Cell Disease”
1997: David C Clyde- “Health and Disease in Grenada: A historical perspective”
1998: Leslie Ramsammy- “Tackling our Agricultural and Medical Problems through One

Health One Medicine Approach”
1998: Robert Redfield- “The Epidemiology of HIV/Aids”
1999: MS Swaminathan- “The Green Revolution”

WINDREF Lecture Series:

2000: Sir Kenneth Stuart, MD, DSc (Hon)- “Caribbean Health Research Needs”
2001: Professor Adedokumbo Lucas, MD, DPH, DSc (Hon)- “International Collaboration for Health Research”
2002: Lord Walton of Detchant, MBBS, MD, DSc, MA (Oxon), FRCP- “A Doctor in the House”
2003: Professor David Molyneux, MA, PhD, DSc, FIBiol- “Success and Failure in Parasitic Disease Control: Lessons Learnt?”
2004: Lord Soulsby of Swaffham of Prior, MRCVS, DVSM, MA, C.Biol., F.I. Biol., DSc (Hon)- “Zoonoses, Old and New. . . the Price of Freedom is Eternal Vigilance”
2005: Mary-Jeanne Kreek, MD- “Drug Abuse and Addictions: Some Scientific Approaches to a Global Health Problem”
2006: Eric Ottesen, MD- “Understanding the Science, Attacking the Problem: Lymphatic Filariasis and Beyond”
2007: John Rouben David, MD- “Leishmaniasis: A novel approach to control visceral leishmaniasis and another to treat cutaneous leishmaniasis”
2008: Professor Sir Andrew Haines, MBBS MD FRCGP FFPHM FRCP FMedSci- “Climate Change, Energy Use and Health in the 21st Century”
2009: Yvette Sheline, MD- “Brain Imaging: New Insights into Neuropsychiatric Disorders”
2010: Valentin Fuster, MD, PhD- “The worldwide challenge of cardiovascular disease”
2012: Baron Peter Piot, MD- “Global health in a changing world”
2013: Robert Gallo, MD- “Viruses and Epi-

demics: Our attempts to control them with an emphasis on HIV and AIDS”

2014: John Strasswimmer, MD, PhD- “Dr Albert Schweitzer, his life, legacy and the future: A celebration of his centenary”

2014: Desiree LaBeaud, MD, MS- “Chikungunya and Dengue in Grenada and the Americas: What are we in for?”

2015: Ruth Macklin, PhD- “Ethical Challenges in Confronting Disasters: Some Lessons Learned”

2016: Ian McConnell, BVMS, PhD, MA, FRSE- “One Health: Lessons from the Past, and Future Opportunities”

2017: Kenneth R. Bridges, MD- “Rise of Sickle Cell Disease and Novel Approaches to its Treatment”

2018: Timothy Endy, MD, MPH- “Understanding Dengue Pathogenesis and Essential Areas for Research”

2019: Timothy Endy, MD, MPH- “Overview of Dengue disease research at SUNY Upstate Medical University and prospective primary dengue study with St George’s University/ WINDREF”

Distinguished speakers at the House of Lords WINDREF dinners

1999- Lord Walton of Detchant “A Doctor in the House”

2001- Lord Rix “A Wonderful World”

2008 Prof David Molyneux “The elimination of the neglected tropical diseases”

2010 Lord Sebastian Coe “Sport for Health in the Caribbean: The Inspiration of the Olympics” and Professor Alan Fenwick “The Changing face of the neglected tropical diseases”.

2014 Prof Gareth Williams “The Global Challenge of Diabetes” and Professor Harry Rutter “Where next for obesity”

2017- Prof David Heymann “Global Health Looking for the Future”

2018 Dr Richard Horton “ Global Health in a wounded World” and Kirani James “Sports for Health”

Mike Fisher Memorial Award Recipients

Mike Fisher graduated from King’s College, London with a PhD in chemistry/ pharmacology. He joined Merck in 1957 and worked with them as vice president of research and headed a lab of 60 research scientists until 2004.

It was his scientific intellect and observational scholarship which led to perhaps his most profound discovery: that of the fungus, *Streptomyces avermectin* from which the drug ivermectin was derived. In the 1970’s his lab was receiving thousands of soil and plant samples from all over the world which he was screening for their effects on a number of organisms. One sample sent to Mike Fisher from Dr. Satoshi Omura from a golf course bunker in Japan, contained *S. avermectin* which was lethal to Mike’s lab mice and when others may have discarded the compound Mike persevered and tested ever more minute doses of the substance. He thus discovered a new powerful drug which was discovered to be effective against roundworm parasites. Mike received the Thomas Edison award for creative discovery and the veterinary and medical world received a compound that revolutionized the treatment and cure of a myriad of infectious diseases. Today as a result of the discovery of ivermectin over 35 million people no longer live under the threat of inevitably going blind from onchocerciasis (river blindness), millions more have been spared the gross disfigurement from lymphatic filariasis (elephantiasis and hydrocoele) and dogs and cats (heartworm), pigs, cattle, sheep, goats and horses live a healthier life because of ivermectin. Mike passed away at his Bel Air

plantation home in Grenada on 20th April 2005. So many people and animals have benefited from Mike’s work. In 2015, the Nobel Prize for Physiology or Medicine was awarded jointly to Drs. William C. Campbell and Satoshi Omura for their role in the discovery of ivermectin.

The Mike Fisher Memorial Award Recipients

- 2006 – Lord Lawson Soulsby
- 2007 – Dr. Keith B. Taylor
- 2008 – Lord May of Oxford
- 2009 – Dr. John David
- 2010 – Lord John Walton
- 2011 – Prof Ade Lucas
- 2012 – Dr. Donald Hopkins
- 2013 – Prof R.C. Andrew Thompson
- 2014 – Prof Alan Fenwick
- 2016 – Sir Gordon Conway
- 2017 – Dr. Charles R. Modica
- 2018 – Prof Sarah Cleaveland
- 2019 – Prof Janet Hemingway
- 2021—Prof Richard Horton

Current Research Projects.

COVID 19 Screening and Surveillance Programme Report and Vaccination Report

In March 2020, St. George’s University (SGU) School of Veterinary Medicine along with WINDREF collaborated with the Ministry of Health (MoH) for the testing of samples for SARS CoV2. The index case identified in Grenada was on 22 March 2020; a couple traveling from the United Kingdom.

In August 2020, SGU partnered with WINDREF to establish an ongoing screening/surveillance programme for testing of students, staff, fac-

ulty, contractors, significant others, or any individual who needs to visit the SGU True Blue Campus. SGU/WINDREF laboratory has achieved 100% concordance by the World Health Organisation – External Quality Assessment Programmer for the Detection of SARS CoV-2 by RT-PCR in 2020, 2021 and 2022 and is an approved SARS CoV-2 testing facility.

Mandatory screening sessions were held in August and September 2021, however surveillance throughout the campus continues daily, within the SGU community, to date. This is quite important since employees, students and visitors are represented in all parishes (Fig1).

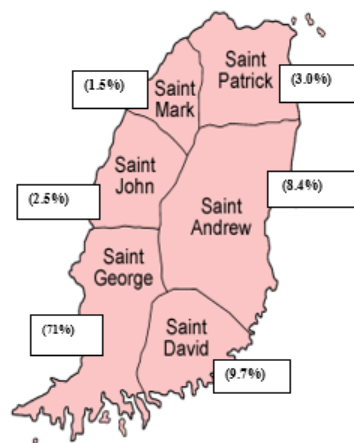


Figure 1: Showing the distribution of persons within the SGU Community

In January 2022, Grenada no longer required a pre-travel test upon arrival later followed by the United States in June 2022, this greatly reduced the testing rate for our on-campus testing programme.

By mid-December 2022, the SGU/WINDREF Screening programme had conducted over 10,000 tests for over 8,500 individuals, with an overall positivity rate of 6.8%.

The 35th Meeting of the WHO Programme, Budget and Administration Committee (PBAC) of the WHO Executive Board which served as a precursor to the World Health Assembly was attended by the Grenada delegation (which included former Minister of Health, Hon. Nikolas Steele, MP, Dr. Mayana Charles, MD Senior Medical Officer, (MOH) and Dr. Trevor Noël, PhD, MPH, WINDREF Deputy Director, (Fig. 2).



Figure 2: L to R Director-General, Dr. Tedros Adhanom Ghebreyesus, former Minister of Health, Hon. Nikolas Steele, MP and Deputy Director of WINDREF, Dr. Trevor Noël, PhD, MPH.

The PBAC/World Health Assembly was successful in identifying key areas in strengthening preparedness for and response to health emergencies in light of the SARS CoV2 pandemic.

In February 2022, WINDREF submitted 3 papers to the Caribbean Public Health Agency’s 66th Annual Conference “Digital Health”. All

papers were selected for oral presentation at the conference which was held at the Marriot Hotel in Kingston, Jamaica. The three papers were presented on behalf of the screening team as follows: Ms. Matthew-Belmar presented on “SARS-CoV-2 Variants and qRT-PCR Cycle Threshold Values”, Ms. Cudjoe presented on “The evolution of screening and diagnostic testing for SARS CoV2 in Grenada” and Dr. Calum Macpherson presented on “Rapid antigen tests: a screening tool for SARS-CoV-2 but not a diagnostic test”



Figure 3: WINDREF participants at the 66th Annual Conference, Jamaica. L to R Ms. Lorna Thomas (CARPHA), Dr. Calum Macpherson, Ms. Nikita Cudjoe, Mrs. Vanessa Matthew-Belmar, and Dr. Satesh Bidaisee

Sequencing

An important milestone is the identification of variants which is an important tool for global monitoring of SARS-CoV-2 viral evolution. Next-Generation Sequencing (NGS) platforms technologies are very informative in tracing the origin, spread and transmission chains, as

well as for monitoring the evolution of SARS-CoV-2. The SGU/WINDREF laboratory received 2 Next-Generation generation sequencers (Fig 4 and 5) in December 2021.



Figure 4: Drs. Macpherson and Noël with Vanessa Matthew receiving the Minlon MK1 Sequencer



Figure 6: Virtual training session conducted by Dr. Nikita Sahadeo (UWI) and her team with WINDREF researchers.

By mid-December 2022, we had sequenced 219 RT-PCR positive samples which had a CT value of < 25 . The first Delta and Omicron BA.1 variants were identified in January 2022, followed by Omicron BA.2 in March 2022 and BA.4 and BA.5 in August 2022, which is consistent with the national data. All results were shared with the Ministry of Health.

SARS-CoV-2 tests will be performed daily at WINDREF from Monday to Friday through the end of 2022 and at the start of the Spring term in 2023 when this service will be further evaluated.

Vaccination

This programme started in March 2021, assisting the Ministry of Health in administering and registering of persons at pop-up clinics and at mass vaccination drives. SGU mandated in June 2021 that students, staff, faculty and persons who visit the campus must be fully vaccinated against SARS-CoV-2. The SGU/MOH vaccination programme, facilitated this mandate in Open Modica on a weekly ba-



Figure 5: The Minlon MK1 Sequencer

WINDREF researchers, were trained virtually by collaborators from Professor Carrington's lab at UWI in Trinidad, specifically, under the direction of Dr. Nikita Sahadeo and her (Fig 6).



Figure 7: Chief Community Health Nurse, Nurse Telesford-Charles; Senior Community Health Nurse, Marva St. Paul and Acting Manager of the Expanded Programme on Immunization, Nurse Lyons from the Ministry of Health at the SGU Vaccination programme site in Open Modica

sis (Fig 7 and 8)
Over 2000 first and second doses, and over 100 booster doses were administered in the vaccination programme. This program continued on a weekly basis throughout 2022.



Figure 9: Students receiving their vaccine



Figure 8: Long queues of students, staff, faculty and members of the public waiting to receive their SARS CoV-2 vaccine



Figure 10: Staff and faculty members receiving their vaccine

In addition, the vaccination team worked at Gouyave Poly Clinic, St. John's, assisting in the administering of the available vaccines weekly.

The WINDREF laboratory collaborated with the Ministry of Health in being the primary national storage facility of Pfizer BioNTech (pediatric and adult), Moderna, AstraZenca and Johnson and Johnson vaccines donated by the COVID-19 Vaccines Global Access (COVAX) program and through this program, donations were also received from other countries (Fig 11). In addition, Grenada re-

ceived its first shipment of pediatric vaccines, Pfizer BioNTech (Fig 12).



Figure 12 L to R: Dr. Trevor Noël; Ms. Desiree Steven, Permanent Secretary Ministry of Health; US Chargé d'Affaires; Senator the Honorable Gayton LaCrette, Minister of Health; Ms. Hannah St. Paul, current Manager of the Expanded Programme on Immunization; Ms. Fiona Thompson, PAHO Grenada Country Representative and a DHL Representative receiving the first shipment of pediatric Pfizer BioNTech vaccine.



Figure 11: Ministry of Health/WINDREF/PAHO/WHO collaboration and cooperation receiving first vaccine donations from COVAX (PAHO/WHO) in addition, to donations from the Government of the Republic of South Korea

Prior to the storage of the Pfizer vaccines, Pfizer BioNTech along with PAHO/WHO, hosted a seminar regarding maintaining the cold chain and the use of Pfizer BioNTech vaccine; PAHO conducted a successful site visit to the WINDREF Research Institute, in ensuring all protocols were/ are maintained (Fig 13).



Figure 13 R to L: Victor Gomez, PAHO Cold Chain Consultant; Dr. Trevor Noël, Deputy Director (WINDREF); Semma Celine, Term 4 SOM @ St. George's University vaccine recipient; Dr. Stuart Gordon, SVM faculty @ St. George's University vaccine recipient; Dr. Jane Noël, SOM faculty @ St. George's University and physician vaccinator; Dr. Calum Macpherson, Director (WINDREF)

Acknowledgements

St. George's University
Pan American Health Organisation
Caribbean Public Health Agency
Government of Grenada, Ministry of Health
Department of Public Safety (DPS)
Nikita Cudjoe (Project Manager – SGU/
WINDREF COVID-19 Screening Programme)
Tania Khan (co- Project Manager – Vaccination
Team)
Elsa Chitan (Lab Manager)
Vanessa Matthew Belmar (School of Veteri-
nary Medicine)
Veronica Mapp-Alexander (Lab testing)
Sonalie Bollogama (WINDREF Researcher)
Basil Williams (WINDREF Researcher)
Markeda Fletcher (WINDREF Researcher)
Aiesha Levine (WINDREF Nurse)
Peter English (WINDREF Researcher)
Adam Noël (WINDREF Volunteer)
Maxine Macpherson (WINDREF Researcher)
Britania Jeremiah (WINDREF Nurse)
Kanisha Noel (WINDREF Nurse)
Amanda Mark (WINDREF Nurse)
Amelia Noel – Lewis (WINDREF Nurse)
Janine Welsh Ghatt (WINDREF Nurse)
Donella Telesford (Associate Director of Uni-
versity Surveys)
The Contact Tracing Team
Isha English (School of Graduate Studies)
Naomi Whyte (School of Graduate Studies)
Yvette Simon (School of Graduate Studies)
Dr. Jennifer Solomon (Director of Nursing Pro-
gram)
Dr. Johansen Sylvester (Director of the Cardiol-
ogy Program)
Dr. Orin Liddle (University Health Services)
Dr. Jane Noël (co- Project Manager – Vaccina-
tion Team, SOM Faculty)
Dr. Kathy Yearwood (Director of University
Health Services)
Dr. Satesh Bidaisee (Associate Dean of School
of Graduate Studies)

Dr. Trevor Noël (Deputy Director – WINDREF)
Dr. Calum Macpherson (Director – WINDREF)

Submitted by: Vaccination Team

One Health Project

WINDREF's One Health initiative continued in 2022 with a focus on education, research, community service and international collabora-
tions.

From the perspective of education, WINDREF team collaborated with the Ministry of Health to conduct awareness programs on Leptospi-
rosis and its prevention and control. School health promotion campaign was launched to develop knowledge of environmental and ani-
mal vector sources of Leptospirosis as well as practices and behaviors that will reduce the risk of exposure. Animal welfare and the bene-
fits of human and animals interactions was also applied to the St. George's University, Knowledge Bowl competition among second-
ary schools in Grenada. Study content and competition questions were provided towards the competition with an interest in promoting
healthy human and animal interactions.

In the context of research, WINDREF research fellows engaged in studies including *Toxocara canis* in puppies in Grenada, Snake enven-
omation among patients in Trinidad, antimicrobial residues among meat from abattoirs and medicinal properties of honey from Bees
in Grenada. Studies revealed that *T. canis* is prevalent among puppies in Grenada which presents a public health concern, persons ex-
posed to snake bites take inappropriate measures at the pre-hospital phase in Trinidad which requires for emergency and prolonged
care, antimicrobial agents were identified in meat for human consumption which is a con-

cern towards resistance and honey from bees in Grenada should be explored further towards definitive determination of its antimicrobial properties.

For community engagement, WINDREF team joined with Ministry of Health and Ministry of Agriculture in Grenada on a program for vector control in Grenada. Additionally, as part of its membership at the Caribbean Vectors Network (CariVecNet), a workplan with monitoring and evaluation strategies was developed towards assessment and implementation of vector control strategies for the Caribbean region. WINDREF together with CARPHA and CariVecNet initiative engaged stakeholders from government, private sector and civil society towards identifying opportunities to develop predictive models for vector borne diseases based on climatic indicators and strategically mobilize response agencies and mechanisms with a focus on prevention and control. The existing community education campaign for mosquito transmitted diseases was reviewed and a website on vector control for the region was launch: <http://carivecnet.carpha.org/>

WINDREF continued to partner with international collaborators on one health related activities. WINDREF contributed to training sessions and participated in hosting a fellow in Grenada as part of the UWI, PAHO, CARICOM, EU One Health Fellowship program with a focus on Climate and Health. WINDREF also continued its partnership with Kasetsart University, Center for One Health with the ongoing development of zoonoses surveillance with a focus on respiratory pathogens and wet market locations in South East Asia.

Submitted by Dr. Satesh Bidaisee

The Baroness Howells Sports for Health Program

The WINDREF/ Baroness Howells Sports for Health Program continued a hybrid modality into 2022 (onsite and online). The onsite location included the South St. George Police Station yard/field area while the online sessions were live streamed from the Point Saline location of the Royal Grenada Police Force. For 2022, 3 sessions are held per week with an average of 25 persons onsite and 50 persons online.

In 2022, Grenada saw the return of its carnival season and during the period July to August for 5 weeks, the onsite session was held at the Morne Rouge playing field and attracted over 125 persons. Health assessment of participants via self-reported data collection from online participants and in persons data collection from onsite participants noted that participants progressed from 2021 to 2022 through reduced Body Mass Index (BMI) and Waist to Hip Ratio (WHR). Additionally, the program engaged participants to examine their wellbeing using an Adult Wellbeing Assessment survey which revealed variable outcomes from suffering, surviving, and thriving.

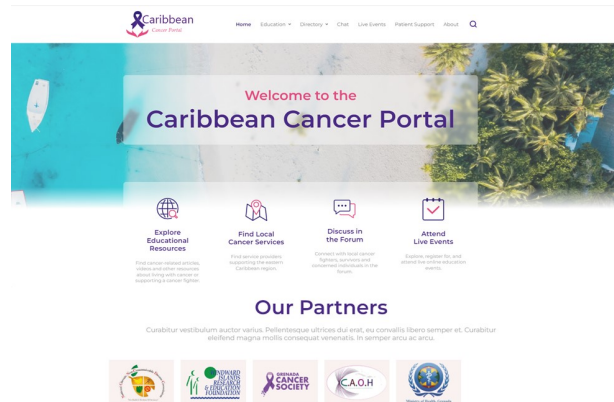
The program also engaged in international collaborations having partnered with the Organization of Eastern Caribbean States on Diabetes management during disasters including the SARS-CoV-2 pandemic. Additionally, the program collaborated with Kasetsart University, Thailand on a Sports for Health and Tourism program which included the application of stand up paddle board on the various rivers along Thailand as a community and tourist activity.



Submitted by Dr. Satesh Bidaisee

The Caribbean Cancer Portal

The Caribbean Cancer Portal was established to expand the range of services available for people affected by cancer in the Caribbean region, increase public access to cancer education and patient support services available through local and regional initiatives, and enhance decision-making by individuals regarding cancer prevention, treatment, and care. The first phase of the program was completed in 2022 with the development of a minimum viable product for delivery of live and asynchronous cancer education, directory of regional and international cancer services, patient discussion forum, and patient support services.



In September 2022, the Portal was piloted among selected persons, including individuals diagnosed with cancer, tertiary level students, academicians, persons not diagnosed with cancer, cancer support/program group representatives, and clinicians. The pilot included a 2-part survey: one survey assessed the esthetics, utility, and effectiveness of the portal, while the other survey assessed the utility and effectiveness of the cancer risk assessment tools. The results indicate user friendliness of the platform, usefulness for public education on cancer, and usefulness of

the information to support screening and early diagnosis.

Phase II of the program development will commence in 2023, intended to enhance the Portal, improve the utility and effectiveness, and scale up the activities and expand the program across countries in the Caribbean region, particularly, in the Eastern Caribbean. Ten areas of activities are expected to be undertaken over a 3-year period in this phase. The portal will be officially launched in 2023 providing unlimited access to the general public, cancer patients, and health practitioners.

Dr. Lindonne Telesford presented an abstract, titled, The Caribbean Cancer Portal: A Theory-based Approach to Addressing the Regional Cancer, in themed pavilion sessions at the World Cancer Congress in Geneva in October, 2022. Dr. Telesford also collaborated with Chief Medical Officer, Dr. Shawn Charles and a student in the Master of Public Health Program, Ms. Reeba Lewis to produce a paper, titled, The Cancer Epidemic in the Caribbean Region: Further Opportunities to Reverse the Disease Trend, which was published in the prestigious Lancet Regional Health – Americas Journal.

WINDREF acknowledges the support of the individuals and organizations represented on the Steering Committee: Ministry of Health in Grenada, Dr. Shawn Charles; Caribbean Association of Oncology and Hematology (CAOH), Dr. Owen Gabriel; Grenada Cancer Society (GCS), Dr. Sonia Nixon; Grenada National Chronic Non-communicable Disease Commission (NCNCDC), Dr. Caroline Noel; Ms. Sherry-Ann Joseph; and the program founders, Dr. Lindonne Telesford, Dr. Calum Macpherson and Mr. John Swope at St. George's University. Special thanks to the students in the Mas-

ter of Public Health Program at St. George's University for producing the education materials on prostate and cervical cancer. Ms. Sue Simon and Ms. Sarah Glushitz are specially thanked for formatting and including the illustration in the education manuals. WINDREF also thanks PAHO for providing technical support for the development of the portal.

Submitted by Dr. Lindonne Telesford, Mr. John Swope, and Dr. Calum Macpherson

Engaging Youths as Agents of Change

This school – based project in the tri – island state of Grenada, Carriacou and Petite Martinique engages Grade 4 students to aid in the mitigation of arboviral and feco – orally transmitted protozoal diseases by using a randomized – controlled study design among fifty – three public primary schools in Grenada, Carriacou and Petite Martinique. Twenty – seven (27) schools were selected to receive the educational intervention (case) and twenty – six (26) were randomized to no (control) schools (Fig. 1). This project assesses the knowledge, attitudes, and prevention practices regarding arboviral and feco-oral protozoan diseases. It also collects data on vector abundance at the school sites.



Figure 1: Distribution of the primary schools (N=53) in Grenada, Carriacou and Petite Martinique

Timeline

This project involves 3 phases; Phase 1: Base-line; Phase 2: 3 – month follow up; Phase 3: 6 – month follow up (Fig 2). Phase 1 was completed in December 2022. Phase 2, will commence in January 2023. Phase 3, is expected to start in April 2023.

In phase 2 and 3, students will be given the post questionnaire to assess the long-term knowledge, attitudes and practices (KAP) along with continued vector abundance measurements to assess and identify the school’s local environment for mosquito breeding sites and mosquito abundance, for further interventions.



Figure 2: Project timeline displaying

Case and Control Schools

The case school students undergo a pre-questionnaire (25 questions), power-point presentation, interactive teaching sessions with demonstrations of mosquito life cycle (Fig 3), water filtration (Fig 4), proper hand-washing (Fig 5), followed by a post – questionnaire (25 questions). See below for two exam-

ples of arboviral and feco-oral transmitted protozoan preventative questions (Fig 6).



Figure 3: Demonstration – Mosquito Life Cycle (egg, larvae, pupa, adult mosquito) at Chantimelle Government School, St. Patrick



Figure 4: Demonstration – Water filtration (student using a Brita filter) St. Andrew’s Methodist, St. Andrew



Figure 5: Demonstration – Proper hygiene (hand washing) at Chantimelle Government School, St. Patrick

19. What do you think:

Does turning over unused containers protect you against diseases caused by mosquito bites?

- A. Does Not Protect
- B. Protects a little
- C. Protects a lot

20. What do you think:

Will handwashing after using the bathroom and before eating protect you against diseases caused by feco-orally transmitted germs?

- A. Does Not Protect
- B. Protects a little
- C. Protects a lot

Figure 6: Examples of arboviral and feco-oral transmitted protozoan pre-

The control schools take a pre- and post-questionnaire (25 questions), without any intervention. (Fig 7,8).



Figure 7: Control school (delivery of pre-questionnaire) at St. Joseph’s Roman Catholic school, St. David

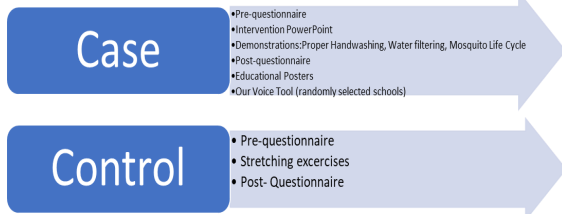


Figure 8: Case and Control Team As-

Our Voice Tool

The case school intervention cohort includes a subgroup that receives an additional intervention where students capture aspects of their schools’ environment that make it easy or hard to prevent diseases transmitted by mosquitoes using the “Our Voice” Discovery Tool mobile app from Stanford University. Students use the app installed in study tablets to record geotagged photos as well as audio comments of why they took the picture. Later in the same week, students review their collective data to brainstorm themes, solutions and identify potential allies to advocate for and make changes to mitigate vector-borne disease in a facilitated process. Our goal is to test the multi-level impacts of Engaging Young People as Agents of Change not only in preventing mosquito-borne diseases and feco-orally transmitted protozoans but also in improving local environments in a more sustainable way. Students are given study tablets to facilitate the data collection (Fig 9). Within 3-4 days, team members re-visit the school to facilitate Day 2 of Our Voice Session. Day 2 allows for brainstorming Strengths, Weaknesses, Opportunities and Threats (SWOT). (Fig 10)



Figure 9: Students using the Our Voice Discovery tool at Mt. Pleasant

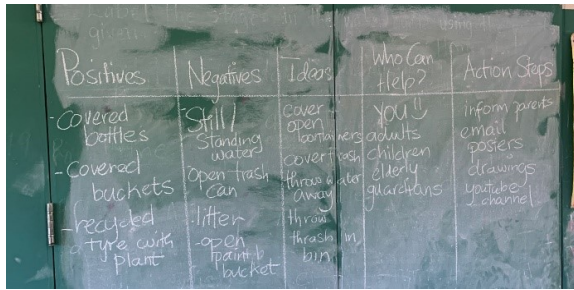


Figure 10: Discussion board (Day 2) of Our Voice Discovery tool at Constantine



Figure 12: Use of propopak, Ministry of Health Vector Control personnel (Capacity Building)

Vector Control Component

Ministry of Health; Vector Control personnel accompany case and control team to the various schools. The vector control personnel assess the school’s environment, place ovitraps (Fig 11) and use the propopak (Fig 12) to conduct assessments of mosquito vector abundance. The vector control personnel in Carriacou and Petite Martinique were also able to accompany the case and control teams during those educational interventions (Fig 13).



Figure 13: Case team and Vector Control Unit in Carriacou



Figure 11: Vector Control personnel setting of ovitraps

Phase 1: Preliminary Results

All data from the 53 primary school (case & control) was uploaded by the case/control team and School of Medicine (SOM) students into REDCap, a cloud base secure data platform. The data was analyzed and the preliminary results from September – December 2022, that have been reported by the case (intervention) group showed significant improvements in arboviral and protozoal disease knowledge (14.8% increase, $p=0.016$), attitudes (9.0% increase, $p<.0001$), and practices (19.0% increase, $p<.0001$) for primary school participants. The case (intervention)

participants also reported a 79.8% increase in correctly answering: “Where do *Aedes aegypti* female mosquitoes lay their eggs?” between pre and post-tests. In comparison, the control (no intervention) group only reported significant improvements in arboviral and protozoal disease behaviors (9.8% increase, $p < .0001$), but not in knowledge (4.1% decrease, $p = 0.46$) or practices (2.9% increase, $p = 0.15$). Using the Our Voice Discovery Tool app, students have recorded 291 photos (115 good and 153 bad for the environment) and 309 audio comments.

Volunteers:

St. George’s University, School of Medicine students (Lashawnd Johnson (Term 4), Arani Thirunavukarasu (Term 4), Nicole Nguyen (Term 5))

Collaborators

This study is a collaboration / cooperation among the Windward Islands Research and Education Foundation, Stanford University; Dr. LaBeaud Lab and Dr. King Lab, Government of Grenada, Ministry of Education and Ministry of Health.



Submitted by (Alphabetized):

Ann Banchoff (Stanford University)
Basil Williams (WINDREF)
Bethel Bayrau (Stanford University)
Markeda Fletcher (WINDREF)
Nikita Cudjoe (WINDREF)

Prathik Kalva (Stanford University)
Sarah Telesford (WINDREF)
Zakaria Doueiri (Stanford University)
Dr. Abby King (Stanford University)
Dr. Desiree LaBeaud (WINDREF & Stanford University) – Co - Principal Investigator
Dr. Trevor Noël (WINDREF & St. George’s University) – Co – Principal Investigator

Caribbean Research Ethics Education initiative (CREEi)

In 2022, the first group of fifteen competitively selected fellows completed the requirements for and received the CREEi master’s degree in bioethics (MScB) from Clarkson University. This group of fellows included four English-speakers and eleven Spanish-speakers. They were admitted in May 2020 and completed much of the program during the pandemic. Of the fifteen fellows, 2 were forced by circumstances to take an extended leave of absence but one of them later joined the 2nd cohort and the other later joined the 3rd and final cohort of fellows.

To build upon the accomplishments of CREEi and its graduates, PI Macpherson invited a partnership with the Hastings Center to apply for a competitive NIH administrative supplement. The Hastings Center (<https://www.thehastingscenter.org/>) was “critical to establishing the field of bioethics in 1969 ... [it] is the oldest independent, nonpartisan, interdisciplinary research institute of its kind in the world.” The supplement was awarded and the successful partnership is underway as the CREEi-Hastings Center Bioethics Scholars Program (BSP).

The BSP provides additional professional development to eight CREEi graduates (four English speakers and four Spanish speakers).

It is a model educational program for advancing critical thinking and writing skills among LMIC professionals in English and Spanish languages. Its scholars are in the process of being mentored to develop a bioethics case study on an issue relevant to their work and region, and their work will be compiled into a case-book made publicly accessible in both languages through the websites of the parent grant (CREEi), The Hastings Center, the Bioethics Society of the English-speaking Caribbean, and the Unidad de Bioetica at the Universidad Autónoma de Querétaro.

Individual mentoring in critical thinking and writing over nearly one year will prepare scholars to publish in leading journals, and a collaborative publication will be developed to make the program available for adaptation to other countries and contexts. The BSP will strengthen bioethics discourse and education by increasing representation of low resource countries of the Caribbean basin in international bioethics discourse in two languages; and by enhancing regional capacity to negotiate for equitable international research partnerships. This work will lead to better fulfillment of CIOMS (2016) ethical requirements for international research. Consequently, international research conducted in this region may better address host country health priorities, use more locally appropriate study designs, and deliver more fair and proportionate benefits to participants and host institutions and countries.

In 2023, CREEi will complete its delivery of the BSP while continuing to deliver its MScB curriculum to the two remaining cohorts. Having established the Center for Global Bioethics (CGB) in WINDREF last year, the CGB will deliver its 2nd annual webinar in English with live interpretation to Spanish in March 2023

on the topic of public trust in medicine and science.

Submitted by Dr. Cheryl Cox Macpherson

Innovative Nature-based Solutions to Enhance Community Resilience in Grenada (ING) Program

Background

We are in the second year of the Innovative Nature-Based Solutions to Enhance Community Resilience in Grenada – ING Project. The project is environmentally focused and aimed at enhancing the lives of community members within the Grenville Bay Area, specifically Soubise through training, education, and Nature-based solutions (NbS) to increase their adaptative capacity to climate change. This collaborative effort is between the Windward Islands Research and Education Foundation (WINDREF) and The Nature Conservancy (TNC) with full support from the Government of Grenada. The project is funded by Caribbean Biodiversity Fund (CBF) under the Eco-System Based Adaptation Facility (EbA), with funding of US\$1,065,571. Because of the timeframe allocated for the completion of this project, implementation is pivotal to ensure we achieve the following objectives:

1. To improve coastal protection from the impacts of storm surges, coastal flooding, and shoreline erosion, through reef restoration and shoreline stabilization.
2. To improve the socio-economic resilience of the community to climate change through enhanced sustainable and alternative livelihoods focused on the conservation of important ecosystems.
3. To improve awareness and community engagement on NbS and approach which can reduce the vulnerability of coastal communities to climate change impacts.

Interventions for the year 2022

The first major activity for the project commenced with the launch which took place on the 12th of May 2022 at Soubise green space. The event saw participation from government ministers, WINDREF representatives, and TNC representatives, highlighting the inception story of this project and the many benefits it will bring to the community.

With the continued resurgence of Covid-19 cases, challenges of supply chain and human resource management remained an issue resulting in delayed shipments, scarcity of supplies, and insufficient staffing. Amidst all those hurdles, the team managed to get all the groundwork completed and was on its way toward the implementation phase.

The collection of Baseline data was paramount in ensuring targets were met for key components such as water quality, beach profiling, and a Knowledge, Attitude, and Practice (KAP) Survey.



Figure 1: Beach profiling baseline assessments being conducted.

During the year, preparatory work on the Knowledge Aptitude and Practices Survey (KAPs) was completed with volunteers from TA Marryshow Community College and St. George’s University expressing interest to be

a part of the training to conduct those surveys in January 2023.



Figure 2: Red mangroves growing in the recently constructed plant nursery.

May 2022 saw the establishment of our plant nursery in the community of Soubise. At the nursery, the propagation of mangroves and other carefully selected coastal plant species such as neem, vetiver grass, and sea grape, was done for the sole purpose of achieving our shoreline stabilization target.



Figure 3: Plant nursery assistant rendering care to growing red mangrove seedlings.

Within the month of September, we managed to outplant a total of one thousand,

three hundred and fifty (1350) well-developed mangrove outplants in the coastal areas of Telescope, Simon, Pearls, and Conference. These selected areas were all vulnerable to high-energy wave activities resulting in coastal degradation.



Figure 4: Coral nursery assistants removing algae and sediments from the coral table at the



Figure 6: Coral gardeners being shown the process of coral table construction

Later that year, the project commenced its coral reef restoration component, utilizing fishermen within the Grenville Bay Area to implement and monitor the activities. The ING project facilitated the training of ten (10) fishermen.

This training entailed a theoretical component that looked at the importance and best practices for the survival of coral reefs, and a practical component that engage the fishermen in coral nursery construction and micro-fragmentation techniques.



Figure 5: Coral nursery assistant demonstrating micro fragmentation techniques on coral fragment.

At the end of the training, 1200 coral fragments were outplanted into the in-water coral nursery and will be monitored over the next six months to be later outplanted onto the nearshore reef complex.

At the end of the year 2022, the project engaged over 50 individuals within the Grenville Bay Area and was able to train approximately 20 residents in either plant or coral nursery techniques, of which 12 individuals are currently contracted by the project. We are also pleased to report that the coral assistant team consists entirely of fishermen with a vested interest in the project's outcomes.

The project aimed at involving the people within the community of Soubise and surrounding areas by engaging those qualified persons to be part of the team, thus ensuring stewardship and sustainability upon project completion. We can boast that despite the many challenges faced at the start of 2022, the ING team remained committed, focused, and steadfast in following through with its objectives.

Upcoming Activities for 2023

- Completion of the KAP survey.
- Community stakeholder engagement with a sea moss workshop component.

- School outreach and field trip facilitation.
- Establishment of an on-land coral lab.
- Engineering the design of the hybrid green-grey shoreline stabilization model.

Submitted by Ms. Carol Forbes and Mr. Kendon James

Fisheries Projects 2020 – 2023

In June 2020, WINDREF signed a Letter of Agreement (LOA) with the Food and Agriculture Organization of the United Nations (FAO) to implement fourteen (14) one (1) week Fishing Captain Training Courses throughout the tri-island state in collaboration with the



Figure 5: Coral Reef Training Workshop (component 7)

Ministry of Climate Resilience, Environment, Forestry, Fisheries and Disaster Management under the “Climate Change Adaptation of the fisheries sector in the Eastern Caribbean (CC4FISH) Project”. This project was the first of three projects that were carried out by grants awarded to WINDREF in collaboration and cooperation with Ministry of Fisheries.

Project 1: 1. Project Title: “Services Towards Regional Implementation of the Climate Change Adaptation of the Fisheries Sector in the Eastern Caribbean Project (CC4FISH)”

This training program has successfully completed fourteen (14) courses; thereby training a total of three hundred and one (301) current fishing captains from the six (6) fishing districts (i.e. St. George, St. John, St. Mark, St.



Figure 1: Closing ceremony for Gouyave Captain’s training module



Figure 2: WINDREF’s Deputy Director, Dr. Trevor Noël presenting graduation package to one of the 301 captain participants.



Figure 3: Graduation ceremony for all 301 Captains at the end of the training course.

Andrew, St. Patrick and Carriacou and Petite Martinique) (Figure 1, 2 and 3). The fourteen (14) training courses were held between July 27th to November 20th 2020. The courses covered twelve (12) modules including; rules of the road, navigation, conflict resolution, global positions systems, seamanship and boat handling, VHF communication, Safety at sea, distress procedures/search and rescue, first aid, marine conservation, fisheries regulations and outboard engine care and maintenance.

Project 2: Development of a Framework for a Risk Assessment on the Implementation of a Gear- Marking System in Grenada

In June 2021, WINDREF signed a letter of Agreement with the FAO to implement the project for a 'Development of a Framework for a Risk Assessment on the Implementation of a Gear- Marking System in Grenada'

The following were the activities implemented:

Activity 1. Collated Grenadian Fisheries profile data to allow the implementation of a risk-based approach to determine the needs and requirements of gear marking systems in Grenada.

Activity 2. Organized and delivered the workshop where the framework to develop a risk-based assessment to implement gear marking systems were developed. (Figure 4)

Activity 3. Conducted a Risk Assessment based on criterion/framework developed in the workshop.

Project 3: Provision of Practical Climate Change Adaptation in Fisheries Interventions in Grenada

In October 2022, WINDREF signed the third Letter of Agreement with the FAO to implement the project for 'Provision of Practical Climate Change Adaptation in Fisheries Interventions in Grenada.'

This project commenced in November 2022, and will run for 13 months.

The following are the activities that are to be implemented over the next 13 months for the Fisheries sector in Grenada:

1. Pilot test of a bulbous bow for fuel efficiency on one (1) long-line fishing vessel in Grenada.
2. Training of 100 fishers in Safety at Sea and Captaincy. Five (5) one-week training courses in the five (5) main fishing districts in Grenada.
3. Review and updating Grenada's Safety at Sea regulations.
4. Developing a curriculum for a vocational school for fisheries in Grenada.
5. Assessing the energy needs of the four (4) fish Centers and proposing the costs and benefits of solar powered energy.
6. Conducting a Climate Finance workshop for key stakeholders.
7. Coral Reef Restoration programme for one coastal reef with importance for fisheries.
8. Training of fishers in fisheries and aquaculture response to emergencies (FARE)



Figure 4: Participants at the stakeholder workshop



Figure 6: Fabricating Coral Trees (component 7)



Figure 7: Coral Tree deployment (component 7)



Figure 8: Consultation with St. George's fishers (component 3)

Oscar Montgomery Environmental Foundation Grant Summary Report

2020 Grant Approved June 2020 for \$10,000 USD

2021 Grant Approved March 2021 for \$80,000 USD

Study Dates: August 2020 through March 2023

Collaborators

Kate Charles and Clare Morrall, Ocean Spirits, Inc. (Grenada)

Martin Attrell and Clare Embling, University of Plymouth (U.K.)

Brian Shamblin, University of Georgia (USA)

MSc student: Naomi Westlake, University of Plymouth (U.K.)

Research Objectives

There were two primary objectives of this project: 1) Characterize Caille Island as the index nesting ground in Grenada for critically endangered hawksbill sea turtles; 2) Identify the origin and migration corridors of Grenada's critically endangered hawksbill sea turtle and endangered green sea turtle aggregates.

Immediate research objectives include: 1) Monitoring and recording nesting activities and characteristics and reproductive success for hawksbill sea turtles on Caille Island; 2) Characterizing overall health of nesting hawksbill sea turtles using clinically examination, infectious disease testing, and biochemistry analysis; 3) Produce health assessments and identification of genetic haplotypes and the corresponding nesting/foraging grounds in foraging hawksbill and green turtles and nesting hawksbill turtles; 4) Qualitative description of the family population structure and genetic diversity of sea turtles in Grenada; 5) Track 6+ months of sea turtle movement data within and outside of Grenada's territorial waters use

All three projects were/are supervised by WINDREF's Deputy Director, Dr. Trevor Noël and Coordinated by Fisheries Consultant, Roland A. Baldeo.

Submitted by: Dr. Trevor Noël and Roland A. Baldeo.

satellite tags to; 6) Associate genetic and satellite tag data to provide comprehensive analysis of regions and habitats critically important to sea turtle conservation; 7) Prioritize stakeholders with shared intrinsic and extrinsic investments in Grenada's sea turtles for further conservation and research collaboration.

Research Summary To Date

The data collection period of the study concluded August 5, 2022. In water sampling provided morphometric data, health assessments, flipper tagging, and sampling from 47 green turtles and 19 hawksbill turtles. Thirteen female hawksbill turtles were assessed, tagged, and sampled on-island and 60 nesting activities were recorded on the nesting grounds during nesting and daytime assessments. Camera traps and temperature loggers were collected on August 31st and that data is currently being analyzed.

Serology was run at the University of Georgia, Infectious Disease Laboratory for chelonid alphaherpesvirus 5 testing. Samples were interpreted to be free of virus-specific antibodies indicating that this aggregate of sea turtles has no signs of previous infection. That data is welcomed as we have seen fibropapillomatosis in previous aggregates and are monitoring disease spread through the green and hawksbill sea turtles in Grenada.

DNA samples are being analyzed by Brian Shamblin to run the genomic analysis. Samples from data will be combined with the 2021 preliminary study which collected data from 19 foraging green turtles and 8 foraging and 11 nesting hawksbill turtles and with samples collected from 2017-2020 as part of previous studies. In total, there are samples from 121 foraging green turtles, 50 foraging hawksbill turtles, and 24 nesting hawksbill samples that

will be used in the genomic analysis portion of this study.

We were not able to deploy satellite tags this nesting season due to the timeframe of receiving them in Grenada. We plan to deploy the tags in the 2023 nesting season.

Submitted by Dr. David Marancik

Global Water Partnership-Caribbean (GWP-C)

GWP-C Provides Funding to Support Partners' Implementation of IWRM Projects in the Caribbean

Six (6) Partners of the Global Water Partnership-Caribbean (GWP-C) secured grant funding from the organisation, and each successfully implemented a small-scale Integrated Water Resources Management (IWRM) project in 2022. These Partners include:

1. Montserrat Utilities Limited (MUL) for their project on "Groundwater Management in Montserrat."
2. The Centre for Resource Management and Environmental Studies (CERMES) of The University of the West Indies (UWI) Cave Hill Campus for their project on "Hydrogeological Mapping in Barbados."
3. The National Hydrological Service of Belize for their project on "Hydrogeological Mapping in Belize."
4. The University of Guyana (UG) for their project on "IWRM Capacity Building in Guyana."
5. Dominica Water and Sewerage Company Limited (DOWASCO) for their project on "IWRM Capacity Building in Dominica."
6. Caribbean Centre of Excellence for Sustainable Livelihoods (COESL) for their project on "IWRM Capacity Building in Barbados."

Learn more by [downloading the Project Summary Brief here](#).

GWP-C Signs MOU with CCCCC to Establish a Framework for Collaboration on Water and Climate Initiatives

In February 2022, the Global Water Partnership-Caribbean (GWP-C) entered into a Memorandum of Understanding (MOU) with the Caribbean Community Climate Change Centre (CCCCC), formalising a collaborative relationship between both organisations in the development and implementation of water and climate-related initiatives in the region.

GWP-C Develops Action Framework for IWRM for the CARICOM Region

The Caribbean Public Health Agency (CARPHA), a partner in the Integrating Water, Land and Ecosystems Management in Caribbean Small Island Developing States (IWEco) project, was subcontracted to execute activities under project component 3 (policy & legislation), which falls under the development of a Regional Action Framework for Integrated Water Resources Management (IWRM) for the CARICOM Region; a component to be implemented in collaboration with the Organisation of Eastern Caribbean States (OECS).

Global Water Partnership-Caribbean (GWP-C) was contracted in 2021 to develop the Regional Action Framework for IWRM for the Caribbean, which it completed. As part of the process of creating the IWRM Framework for the Caribbean, GWP-C hosted several regional stakeholder consultations to get inputs from stakeholders from the ten (10) IWEco member states (Antigua and Barbuda, Cuba, Dominican Republic, Grenada, Saint Lucia, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Barbados, Jamaica, and Trinidad and

Tobago).

GWP-C Gained Seven (7) Partners in 2022

The Global Water Partnership-Caribbean (GWP-C) network continued to grow in 2022 with the addition of seven (7) Partners:

- ReThink Youth {St. Lucia}
- Groupement des Jeunes Universitaires pour l'Avancement d'Haiti (GJUPAH) {Haiti}
- Kinderuniversiteit Suriname (Children's University Suriname) {Suriname}
- Caribbean WaterNet {regional headquarters in Trinidad and Tobago}
- Union Island Environmental Alliance (UIEA) {St. Vincent and the Grenadines}
- Instituto Nacional de Recursos Hidráulicos (INRH) {Cuba}
- Nanoaguador Project GRUPO LISAR {Cuba}

GWP-C and Partner Agencies Host First-Ever International Online Training Programme on the Preparation of SFDs for Caribbean Countries

The Global Water Partnership-Caribbean (GWP-C), in partnership with GEF CReW+, UNEP Caribbean Environment Programme and Cartagena Convention Secretariat, the Centre for Science and Environment (CSE) and Caribbean WaterNet (Cap-Net), held a first-of-its-kind international online training on the "Preparation of Shit Flow Diagrams (SFDs) for Caribbean Countries."

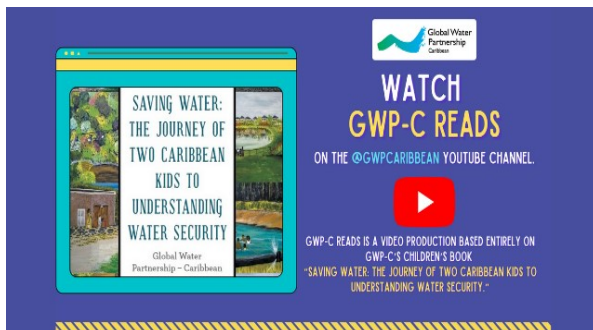
An excreta flow diagram (also often described as a shit flow diagram) offers a new and innovative way to engage sanitation experts, political leaders and civil society in coordinated discussions on identifying areas for intervention across the sanitation chain in cities.

Twenty-eight (28) participants from the following countries participated in the training: Barbados, Belize, Curaçao, Dominica, Grenada, Guyana, Jamaica, St. Lucia, St. Vincent and the Grenadines, Turks and Caicos Islands, The Bahamas, Montserrat and Trinidad and Tobago.

GWP-C provided grant funding to participants from Caribbean countries who completed Part 2 of the training to prepare in-country SFDs. Learn more about the training here.

"GWP-C Reads" Premieres – A Video Production Based on GWP-C's First-Ever Children's Book

In 2021, the Global Water Partnership-Caribbean (GWP-C) launched its first-ever children's book titled "Saving Water: The Journey of Two Caribbean Kids to Understanding Water Security". The book is available on Amazon in Kindle (e-book) and paperback versions.



On March 26th, 2022, during the week of World Water Day, GWP-C was pleased to premiere its storytelling project "GWP-C Reads" on its YouTube Channel: <https://bit.ly/3LQB5Ky>

GWP-C Reads is a video production based entirely on GWP-C's children's book "Saving Wa-

ter: The Journey of Two Caribbean Kids to Understanding Water Security." Learn more.

Explore GWP-C's Redesigned Rainwater Harvesting ToolBox

Global Water Partnership-Caribbean's (GWP-C's) online Rainwater Harvesting (RWH) ToolBox was launched in 2011 and, to this day, remains one of the primary resource kits of literature and information to support the promotion of RWH in the Caribbean.

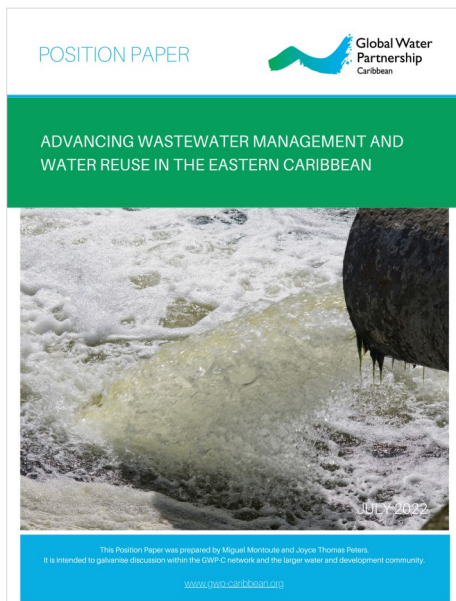


The ToolBox comprises a range of information such as technical products, publications, videos, posters, fact sheets, reports, brochures, tools and more. Given the value of this online platform, GWP-C felt it was time that the ToolBox underwent a complete redesign to give it a fresh and modern look. On World Water Day (WWD), March 22nd, 2022, GWP-C launched the redesigned platform: www.caribbeanrainwaterharvestingtoolbox.com

GWP-C Technical Committee Produces Two (2) Perspectives Papers

In 2022, the Global Water Partnership-Caribbean (GWP-C) produced two (2) Perspectives Papers authored by GWP-C Technical Committee (TEC) Members:

- Integrating ICT in the Caribbean Water and Sanitation Sector: Impacts, Opportunities and Limitations
- Advancing Wastewater Management and Water Reuse in the Eastern Caribbean



GWP-C Held Two (2) IWWM Workshops for Youth and the Media

The Global Water Partnership-Caribbean

(GWP-C), in collaboration with the Global Environment Facility-funded (GEF) CREW+ and the United Nations Environment Programme Caribbean Environment Programme (CEP) and Cartagena Convention Secretariat, hosted Integrated Water and Wastewater Management (IWWM) Workshops in 2022. The IWWM Workshops focused on the roles of Youth and the Media in Caribbean Wastewater Management. They were open to Caribbean Youth and Journalists residing in GWP-C Partner or Caribbean CREW+ countries. Learn more about the workshops.

GWP-C and its Partners Support Four (4) Regional IWWM Projects

The Global Water Partnership-Caribbean (GWP-C), in collaboration with the United Nations Environment Programme (UNEP) Cartagena Convention Secretariat/Caribbean Environment Programme (CEP), have funded several projects under the Multilateral Environmental Agreements in ACP Countries.

In response to a call for "Short-Term Small-Scale Integrated Water and Wastewater Management (IWWM) Projects in the Caribbean", four (4) GWP-C Partners have secured grant funding from the organisation and its Partners to implement an IWWM project in their respective countries:

- Integrated Health Outreach for their project on "Water Treatment Systems in Antigua and Barbuda."
- Dominica Water and Sewerage Company Ltd. for their project on "Constructed Wetland for Wastewater Treatment in Dominica."
- Brightline Institute and Global Partnership Inc. for their project on "Constructed Wetland for Wastewater Treatment in

the Dominican Republic."

- Richmond Vale Academy (RVA) for their project on "Greywater Systems in St. Vincent and the Grenadines."

Learn more: GWP-C Supports Implementation of IWWM Projects in the Caribbean.

GWP-C Launches App – A Platform for Caribbean and Other Water Professionals to Connect

The Global Water Partnership-Caribbean (GWP-C) has launched the "GWP Caribbean" App, which is available for download now in Google Play and the App Store.



The GWP Caribbean App provides a social platform for Caribbean and other water professionals to connect, collaborate, and share ideas, knowledge and opportunities. It can also act as a community of practice for persons with a shared vision of working towards a water-secure Caribbean. Learn more.

Finalists from Jamaica and Trinidad and Tobago Deliver Winning Pitches in the 2022 Young Caribbean Water Entrepreneurs Shark

Tank Competition

The Global Water Partnership-Caribbean (GWP-C) Young Caribbean Water Entrepreneurs Shark Tank Competition provides a unique opportunity for young persons from the Caribbean aged 18 to 34 years to pitch innovative and impactful water-related projects or ideas to support better water resources management in their community, country or the Caribbean region. The 2022 competition culminated with seven (7) finalists pitching their projects or ideas under two (2) categories. Under each category, a prize of US\$4,000 was awarded for the best pitch:

Category 1:

- Water and Agriculture
- Water and Climate
- Water and Health
- Water and Energy
- Water and Tourism

Category 2:

- Integrated Water and Wastewater Management (IWWM)

The introduction of Category 2 under the theme Integrated Water and Wastewater Management (IWWM) and the award of US\$4,000 was made possible through GWP-C's partnership with the United Nations Environment Programme Caribbean Environment Programme (CEP) and Cartagena Convention Secretariat through the Global Environment Facility-funded (GEF) CReW+ Project to support awareness raising and strengthening capacity in the area of IWWM in the Caribbean.

THE CATEGORY 1 WINNERS (Water Management)

The winner under Category 1 of the competi-

tion is the duo of Dean Morris (31 years) and Nicholas Kee (27 years) from Jamaica. Dean delivered the winning pitch, securing US\$4,000 to advance their "Kee Farms" project under the themes "Water and Agriculture and Water and Climate."



Dean Morris – Part of the winning duo (under category 1) of the 2022 GWP-C Young Caribbean Water Entrepreneurs Shark Tank Competition.



Nicholas Kee – Part of the winning duo (under category 1) of the 2022 GWP-C Young Caribbean Water Entrepreneurs Shark Tank Competition.

THE CATEGORY 2 WINNER (Integrated Water and Wastewater Management – IWWM)

The winner under Category 2 of the competition is 20-year-old Keston Singh from Trinidad and Tobago. He delivered the winning pitch, securing US\$4,000 to advance his new project idea, "Aqua Clean", under the theme "Integrated Water and Wastewater Management (IWWM)."

Learn more about the winners and their projects here.



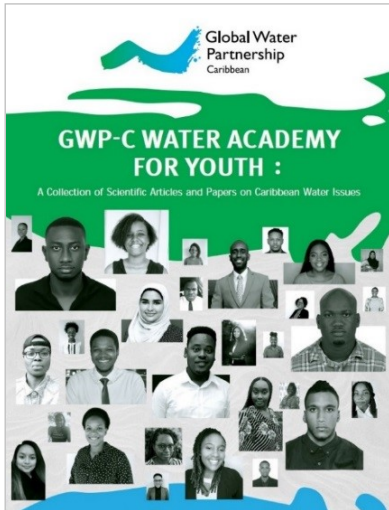
Keston Singh – Winner (under category 2) of the 2022 GWP-C Young Caribbean Water Entrepreneurs Shark Tank Competition.

The GWP-C Water Academy for Youth (GWP-C WAY) Magazine is Out Now!

In 2021, GWP-C held its first-ever Water Academy for Youth (GWP-C WAY). The three-month training programme is designed for young Caribbean leaders and professionals between the ages of 20 and 35 to build their capacity in Integrated Water Resources Management (IWRM). The Academy also equips them with various skills to provide sustainable solutions to Caribbean water issues.

To capture various highlights from the Academy and to showcase some of the work of the

2021 Cohort, GWP-C released the GWP-C WAY Magazine! Download the GWP-C WAY Magazine here.



Caribbean Kids and Teens Learn the Importance of Toilets and the Environment

The Global Water Partnership-Caribbean (GWP-C) commemorated World Toilet Day on November 19th, by offering two (2) free virtual short courses targeted at Caribbean kids (7 – 10 years) and teens (13 – 16 years). GWP-C partnered with FLUSH (Facilitated Learning for Universal Sanitation and Hygiene) on this activity, facilitating both courses.



Submitted by: GWP-C team

Caribbean Cooperative MRV Hub

The Caribbean Cooperative Measurement, Reporting & Verification Hub (the MRV Hub) is a 5-year initiative supported by the German Federal Ministry of the Environment, Nature Conservation, and Nuclear Safety's International Climate Initiative (IKI).



MRV Hub Annual Meeting 2022, 11th May, Grenada

Membership consist of the 12 English-Speaking CARICOM Countries with the Greenhouse Gas Management Institute (GHGMI) as lead implementing partner and additional support provided by the Regional Collabora-

tion Centre of the UNFCCC (RCC-STG), Global Support Programme (GSP) of the UNDP/ UNEP, with WINDREF serving as the institutional host.

MRV Hub Annual Meeting 2022

On May 11 & 12, 2022, the MRV Hub hosted its 4th Annual Meeting. The meeting was attended by over 30 representatives in-person and several virtually, including Country Focal Points and other representatives, GHGMI & MRV Hub Staff and representatives from the OECS Secretariat, GIZ-Grenada and the UNFCCC RCC-STG.

MRV Hub at COP27

The MRV Hub in 2022 continued its effort to enhance the negotiating teams for Caribbean Small Island Developing States (SIDS) at the 27th Climate Change Conference of Parties (COP27) from November 6 to 18, 2022. COP27 saw the MRV Hub technical members of staff supporting their countries in the negotiating streams of Mitigation, Climate Science & Transparency. The team provided their national delegations wider distribution to cover critical areas of national and regional interest while also supporting the broader negotiating group of the Alliance of Small Island States (AOSIS) by providing their expert opinions and insights into the discussions on other thematic areas such as loss and damage, climate finance, and Article 6 of the Paris Agreement (carbon markets).

The MRV Hub hosted and participated in several side events, including: MRV Hub Side Event – “A Cooperative Approach to Improving MRV Systems” hosted by the Government of Grenada; IICA Side Event on how digitalization is seen as a game-changer for accelerating and scaling-up innovative ideas and actions for strengthening climate resilience and

food and nutrition security in the Americas; MRV Hub Side Event – “Caribbean Cooperation – Best Practices in Regional Cooperation for the Implementation of the Paris Agreement”; and GHGMI Side Event – “Capacity Building opportunities for expansion under the Enhanced Transparency Framework”.

The MRV Hub COP27 team comprised:

Ryan Deosaran – MRV Hub Program Manager and Trinidad & Tobago Delegation

Cheryl Jeffers – MRV Hub Program Officer and St. Kitts & Nevis Delegation

Benise Joseph – MRV Hub Senior Program Associate and Saint Lucia Delegation

Brittany Meighan – MRV Hub Program Associate and Belize Delegation

Wiley Barbour – MRV Hub Programme Director

Molly White – GHGMI, Director, Education Program

MRV Hub Summer Academy 2022

Since its inception in July 2020 the MRV Hub Summer Academy training program has maintained a virtual format to accommodate the many challenges faced during the COVID-19 pandemic; while still empowering MRV Hub Member country staff in the greenhouse gas inventory field. In this 3rd year of the Academy the virtual training was supplemented by a 2nd component in the form of an in-person one-week Capstone Program.

Virtual Training Component

The 3rd annual MRV Hub Summer Academy, 7-week online training took place 16-30 Sep 2022. Each of the 12 MRV Hub member countries were invited to nominate 2 participants to attend the virtual training program tailored to build the GHG accounting capacity of entry level personnel attached to relevant ministries with responsibility for environment

and climate. This year's cohort included over 25 experts from MRV Hub member countries and organizational partners.

In-person Capstone Program

The 2022 Capstone Program took place in Grenada from 3–7 Oct and welcomed 11 delegates from MRV Hub Member countries. The theme for Capstone 2022 was COOPERATION, with outcomes from this year's Capstone Program including mapping of institutional arrangements, preliminary emission estimates for forestry sector, mapping of carbon sequestration pathways for turtle seagrass.

The Modelling & Projections Programme | First Virtual LEAP Training Course

On May 30, 2022, the MPP released its Virtual Course on the Low Emissions Analysis Platform (LEAP) software. The Greenhouse Gas Management Institute (GHGMI) and the Stockholm Environment Institute (SEI), the inventors of LEAP, provided funding for this training. The MPP anticipates that these courses will help to strengthen regional capacity to perform mitigation evaluations and update Nationally Determined Contributions (NDC).

The workshop included 19 participants from 11 Caribbean nations and was intended for new professionals interested in climate change mitigation unfamiliar with the LEAP program.

IKI Regional Exchange Workshop

The MRV Hub participated in the IKI Exchange Workshop for Central America and the Caribbean, which took place in San Jose, 17-18 May 2022.

MRV Hub Program Director (Mr. Wiley Barbour) and Project Coordinator (Mr. Hayden Redhead) shared their experiences, ideas, and suggestions with the event's organizers and other guests. IKI initiatives from the target region were gathered to, receive IKI news updates, discover and share learnt lessons, explore deeper the concepts and concerns of "knowledge management". Multiple panels were organized in Spanish and English to present and debate regional concerns. Several proposals were prepared for IKI's consideration, including, but not limited to; creating additional possibilities for projects to exchange knowledge, best practices, solutions, etc.; creating opportunities for exchanges of employees and resources across project countries.

Partnership & Networking

Carbon Footprints and Accounting

On Jan 12, 2022, the MRV Hub, in collaboration with GHGMI and SEI, participated in a round table discussion on the topic of carbon footprints and carbon accounting. Members of all three organizations discussed and debated the following question: In the effort to curb the effects of climate change, what part should individual and organizational carbon accounting and action play? What does this have to do with our work? For instance, how do we talk about responsibility and agency when it comes to reducing greenhouse gas emissions?

Capacity Building Talk with Small and Medium-sized Enterprises (SMEs)

The MRV Hub was featured at the 4th Capacity-Building Talk, titled "Strengthening the capabilities of small and medium-sized firms (SMEs) to engage in climate action and embrace new possibilities." This conference

aimed to explore how enhancing SMEs' capabilities might help them better handle climate change issues, contribute to national emission reduction objectives, and open up new avenues for business.

ETF Workshop

On May 9 & 10, 2022, the UNFCCC Secretariat and the MRV Hub jointly organized a technical hands-on training workshop for the Caribbean region on transitioning to the ETF and tracking progress in implementing and achieving NDCs. The workshop took place in Grenada and focused on assisting countries in strengthening their domestic capacity to continue implementing the Convention's existing MRV arrangements and prepare for the ETF's implementation. Sessions were facilitated by the UNFCCC Transparency Division representatives Mr. Jigme & Ms. Tugba Icmeli.

The Third Caribbean AGYLE Carbon Markets Webinar

The MRV Hub attended the 3rd Caribbean AGYLE Carbon Markets Webinar. As stipulated in the Paris Agreement (PA), the international community resolved in 2015 to limit the global temperature rise to less than 1.5 degrees Celsius in an effort to avert the climate disaster. Based on their Nationally Determined Contributions, the PA defines climate change goals for all Parties (NDCs). Article 6 of the PA calls for carbon markets to combat climate change while promoting sustainable development and enhancing ambition. The purpose of the webinar was to increase awareness of carbon pricing techniques and possibilities for young people to implement Article 6.

LAC Climate Week 2022

The 2022 Latin America and the Caribbean Climate week (LACCW 2022) was hosted by

the Government of the Dominican Republic and took place 18-22 Jul in Santo Domingo.

As part of the Climate Week activities, the MRV Hub held a side event discussing "The role of regional cooperation in improving MRV systems and NDC reporting". Drawing on work in several Caribbean countries, the event explored the linkages between transparency and MRV systems. A panel of representatives from MRV Hub member countries shared their experiences.

MRV Hub collaboration with Inter-American Institute for Cooperation on Agriculture (IICA)

The MRV Hub facilitated through the Inter-American Institute for Cooperation on Agriculture (IICA) a series of workshops focused on nine target countries (The Bahamas, Belize, Dominica, Haiti, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, and Trinidad & Tobago) participating in the GCF-Readiness Project titled "Strengthening the Foundation for a Climate Responsive Agricultural Sector in the Caribbean" (GCF CARICOM AgREADY, in short).

The first workshop, "Virtual Training Programme for Agriculture" was held 22nd Mar – 7th Apr 2022, aimed to improve the enabling conditions to design, implement and evaluate options for enhanced climate data collection action in the agricultural sector by strengthening policies, capacities, frameworks, methods and institutional arrangements.

The second workshop series, "Data collection sensitization and training for national facilitators and extension officers (national level training)", or "Train-the-Trainer workshop", aimed to build capacity and sensitize local farmer organization representatives and ex-

tension officers to the importance of accurate data collection, types of data to collect, data archiving and the relevance of the data collection to the inventory and to the country.

The final workshop, titled “Agriculture GHG Inventory Improvement Action Plans Regional Workshop” saw a total of 15 representatives from the nine participating countries join the MRV Hub and IICA facilitators in Trinidad & Tobago from 27th – 28th Jul 2022.

UWI Open Campus Pilot Project

The Government of Trinidad & Tobago through the Min. of Planning & Development (MPD), and together with the United Nations Development Programme, developed a certification program for GHG inventorying and quality assurance and quality control procedures in Trinidad & Tobago to build capacity in meeting the reporting requirements as a ratified signatory to the Paris Agreement. The vision of this program is to ensure that all relevant stakeholders have the capacity to perform all identified procedural elements inclusive of calculated GHG emission estimates and that their submissions are in line with the TACCC (transparency, accuracy, completeness, comparability and consistency) principles.

The MRV Hub previously supported the development of the components of the training program and now has supported the facilitation of the course UGHG011: Greenhouse gas (GHG) Inventorying and Quality Assurance / Quality Control Workshop offered at the University of the West Indies (UWI) Open Campus. The course was held from 26th Sep to 10th Oct 2022 and was intended to build capacity and establish a minimum acceptable standard for measurement, reporting and

verification of GHG emissions, to satisfy possible legal requirements pursuant to mainstreaming Trinidad & Tobago’s MRV System into national legislation.

MRV Hub Secretariat Updates

Launch of Website

On September 1, the MRV Hub launched its official website at www.mrvhub.org. This website launch is in line with the goals of MRV Hub, in providing a one-stop virtual space to communicate our work.

The site features information on the MRV Hub and on the broader MRV context, current, and upcoming programs and services offered, a news and events calendar, and a glimpse of the MRV Hub team. The site is intended to grow into a virtual home through which the MRV Hub will interact with member countries and partners and which can be a vehicle for regional national and organizational sharing and networking.

Transition Plans

The MRV Hub will transition to an independent organization in 2023 and a Transition Committee has been selected to oversee the transition phase and met for the first time on 9th Nov 2022 at COP27 in Egypt. Discussions at the meeting surrounded future MRV Hub finances, creation of a business plan, sustainability and organizational structures. Members are Ms. Shanna Emmanuel from Saint Lucia; Dr. Lennox Gladden from Belize as Transition Committee Chair and Dr. Spencer Thomas from Grenada as Regional Advisor.

Development of MRV Hub Mission, Vision
A “Mission” and “Vision” for the institutionalized MRV Hub has been submitted to the Steering Committee and Transition Committee for review.

Mission: “The MRV Hub seeks to strengthen climate change transparency, measurement, reporting and verification systems in the region through the enhancement of national and regional technical and institutional capacities, forging solutions for evidence-based policymaking”.

Vision: “To be the driving force that empowers the Region to enhance its transparency frameworks, supporting global climate goals”.

New Regional Collaboration Center (RCC) Leads

The region welcomed new RCC Leads, Ms. Mayra Santaella at Regional Collaboration Center St. George’s (RCC-STG) and Ms. Fabiana Rodrigues at Regional Collaboration Centre Panama (RCC Panama).

New MRV Hub Staff

Jul 2022: The MRV Hub Team welcomed Ms. Cheryl Jeffers from St. Kitts & Nevis as the new MRV Hub Program Officer. This sees the growth of the MRV Hub Caribbean Core Team to 8 Staff members.

Submitted by Mr. Hayden Redhead

The UNFCCC Regional Collaboration Center for the Caribbean (RCC St George’s)

Introduction

Adapting to the new reality of the COVID-19 pandemic, the RCC St George’s continued their activities under the leadership of Vintura Silva and Carlos Ruiz Garvia in 2021 and 2022, respectively, with Ama Kissiwah Boateng as the Research Officer. Towards the end of 2022, the RCC welcomed Mayra Santaella as the new Regional Lead and Patrick Munyaneza as the Regional Article 6 Expert. WIN-

DREF’s Dr Randall Waechter, Ms Isha English, and Mrs Nakita Francis Williams continued to provide support in managing the Center’s finances.



New RCC Members: Mayra Santaella (Regional Lead) & Patrick Munyaneza (Regional Article 6 Expert)

The RCC St. George’s collaborated effectively with Party and non-Party stakeholders in various activities, including climate change adaptation, mitigation, transparency, climate finance and capacity building for climate action.

Adaptation

Workshop on UN4NAPs

In the run-up to COP26, RCC St. George’s organized a workshop to bring together Parties and relevant partners to explore opportunities to accelerate their National Adaptation Plans (NAPs) by tapping into the broad expertise of the UN and intergovernmental organizations. The UN4NAPs is an UN-wide partnership initiative to scale up technical support to formulate and implement NAPs, initially to Least Developed Countries and Small Island Developing States.

Strengthening health and climate change in Latin America and the Caribbean

RCC St George’s and RCC Panama co-hosted a side event on “Strengthening health and climate change in the LAC region” during the 27th Conference of Parties (COP27). The ses-

sion aimed to encourage countries to submit their National Adaptation Plans (NAPs) that include health aspects via facilitating their understanding of the HNAP process, illustrated with success stories and lessons learned in the LAC region.



Adaptation Strategies & Mitigating Loss & Damage in the Region

The RCC St. George’s facilitated the participation of the ING Project (Innovative Nature-Based Solutions to Enhance Community Resilience in Grenada) during the Jubilee Caribbean’s Conference on Debt & Climate Change, in Grenada. The project representatives Mr. Kendon James (Technical Officer) and Mrs. Carol Forbes (Project Manager) showcased examples of adaptation strategies in the project, including coral reef restoration, shoreline stabilization, sea moss farming aiming to tackle water quality issues and to provide socio-economic improvement. As

explained by the project team during the event, the implementation of the project included several community engagements to increase the knowledge, awareness, and participation of the community members on climate change and the use of nature-based solutions to help in dealing with the impending impacts of climate change on their community. The participants of the event warmly welcomed the project initiatives, and highlighted the importance of sharing the knowledge among communities and across the region for potential replicability.

Mitigation

CDM transition to Article 6

2021 and 2022 were challenging years due to uncertainty around the future of CDM under Article 6 of the Paris Agreement. As a part of the Latin American and Caribbean Climate Week, RCC St. George’s facilitated the CDM Designated National Authority (DNA) Regional Forum, which provided an avenue for DNAs in the region to discuss temporary measures under the CDM, the transition of CDM activities, and Article 6 and readiness to implement Article 6, including capacity-building needs for the LAC region in implementing Article 6.

NDCs/LT-LEDs

The RCC St. George’s collaborated with the NDC Partnership, the United Nations Development Program (UNDP), the Caribbean Cooperative Monitoring Reporting and Verification Hub (CCMRVH), the Alliance of Small Island States (AOSIS), Climate Analytics, and the Inter-American Development Bank (IDB) successfully delivered the 2nd edition of the Caribbean NDC Support Virtual Exchange Series. The three-part virtual events allowed participants to engage with experts on topics related to NDC implementation, Long-term

climate change strategies (LT-LEDS) and best practices for implementing NDCs in the energy sector, which is vital for the region. Additionally, an informative webinar was held to share details of the NDC Synthesis Report, and LT-LEDS Synthesis Report prepared in 2022 with Parties in Latin America and the Caribbean. It was an opportunity for development partners such as the NDC Partnership, 2050 Pathways Platform and UNEP to share information on accessing support to develop or update NDCs and LT-LEDS.

Collaborative Instruments for Ambitious Climate Action (CiACA)

RCC St. George's continued to provide direct technical support to countries through the Collaborative Instruments for Ambitious Climate Action (CiACA) initiative. The CiACA initiative assists parties in the development of carbon pricing instruments for implementing their Nationally Determined Contributions (NDC) under the Paris Agreement and foster cooperative climate action with other jurisdictions. It builds on existing NDC support projects, promotes awareness of carbon pricing and explores possibilities of joining carbon markets. As part of the initiative, an opportunity study on developing Carbon Pricing Approaches was conducted in Trinidad and Tobago.

Transparency

The first in-person regional hands-on training workshop on transitioning to the enhanced transparency framework (ETF), the tracking of progress in implementing and achieving nationally determined contributions (NDCs) was held on 9 and 10 May 2022, in St George's, Grenada, in collaboration with the Caribbean Cooperative MRV

Hub and with a contribution of the World Resources Institute (WRI). The workshop aimed at enhancing the technical capacities of national experts of the Caribbean region who are involved in preparing NDCs, tracking the progress of implementation and achievement of NDCs as well as preparing NCs/BURs and BTRs. At the workshop's closure, participants provided positive feedback, expressing their appreciation for organising such a relevant and timely workshop and expressed further interest and enthusiasm for follow-up workshops. The suggested topics for future workshops included best practices on institutional arrangements, in-depth case studies on applying common reporting tables, GHG inventories, adaptation monitoring and evaluation, and reporting on FTC support needed and received.



Climate finance

As part of the COP-mandated Needs-Based Finance (NBF) Project, and with the support of RCC Saint George's, a climate finance strategy workshop was convened by the OECS and hosted by the Government of Saint Lucia on the 13th and 14th of September 2022. The workshop was opened by the Hon. Mr. Shawn Edward, Minister of Environment, Education and Sustainable Development of Saint Lucia and was

attended by 26 participants, including 2 experts from the Environment and Finance Ministries respectively, of each of the OECS member States represented. Partners in attendance included the German Agency for International Cooperation and several Commonwealth advisors on climate finance.

The workshop allowed country experts to share experiences and exchange information on their climate finance needs and ways to address common challenges. As a result, the six eastern Caribbean independent Islands, in close collaboration with the OECS, concluded the technical assessment on climate finance in the region and adopted, at the technical level, a regional Climate Finance Access and Mobilization Strategy. The proposed strategy aims to ensure that climate finance can be effectively accessed, mobilized, and scaled up to contribute to the region's climate and development goals between 2022 and 2030. Moving forward to understand the requirements in developing a pipeline of regional projects, participants also agreed to hold a climate finance training workshop in early 2023, together with operating entities of the financial mechanisms (GCF, GEF, AF), and



Cross-cutting areas

Latin America and Caribbean Climate Week- Latin America and Caribbean Climate Week

wrapped up on 22 July 2022 in Santo Domingo. The week engaged and empowered stakeholders to drive climate action across countries. It opened a platform to explore:

1. Resilience against climate risks
2. The transition to a low-emission economy
3. Partnerships to solve pressing challenges

Explore the LACCW 2022 Output Report and Event Programme to learn more about how these discussions represented a step toward COP27

Youth engagement

The Government of Antigua and Barbuda and RCC St. George's launched the AGYLE Caribbean during Latin America and the Caribbean Climate Week 2021 in collaboration with UNICEF, Alliance of Small Island States (AOSIS), The Caribbean Community Climate Change Center (5Cs), UK COP26, Delegation of the European Union to Barbados, The Eastern Caribbean States, the OECS and CARICOM/CARIFORUM and the Caribbean Youth Environment Network (CYEN). The AGYLE Caribbean aims to develop and build on the existing capacity of youth from diverse stakeholder groups in the region by training academy participants through three thematic pillars: (1) Climate leadership Academy (2) knowledge sharing platform, and (3) Green Business Incubator. Over three webinars, the Caribbean AGYLE engaged more than 40 young people across the region on crucial climate change topics. These informed how young people could help shape a resilient, low-emission future for the Caribbean and contribute to global climate action. On 23 May 2022, the third and final AGYLE webinar was held to improve knowledge of Carbon markets among young people in the region. The webinar raised awareness on car-

bon markets as a policy instrument, the foundations of the UNFCCC, the journey from the Kyoto Protocol to the Paris Agreement and Article 6. The 2nd AGYLE webinar was held on 10 March under the leadership of the Government of Antigua and Barbuda to share insights on young people's role in building resilience against COVID-19 and the climate crisis. Fleur Newman from the UNFCCC Secretariat delivered the opening remarks, sharing the urgent need for elevating the voices of the most vulnerable and marginalised whose lives are deeply affected by climate change and the covid pandemic so that their ideas and perspectives are embedded in action for climate mitigation and adaptation. The event also featured a panel discussion with UNFCCC National ACE Focal Points, who shared insights on how young people can better be integrated into critical decision-making by providing an avenue for building climate resilience.

Communication and outreach

Throughout 2021 and 2022, RCC St. George's increased communication and outreach efforts by regularly publishing news articles and disseminating bi-monthly newsletters to engage internal and external stakeholders. RCC St. George's stayed connected with its stakeholders using the following channels:

RCC St. George's Webpage

RCC St. George's Newsletters

RCC St. George's Brochure

Submitted by Ms. Mayra Santaella

Conscious Discipline Grenada

Schools

Schools in Grenada finally re-opened following the COVID-19 pandemic on January 10th,

2022. The Conscious Discipline (CD) Coaches were re-granted permission to go back into schools in term 2 at the end of January 2022. Three (3) coaches made weekly visits to four (4) schools each, for a total of twelve (12) schools receiving CD coaching. Thirty-seven teachers, responsible for 401 children received coaching. Masks were still being worn and teachers were getting to meet students in person for the first time since school started in September 2021. The regular stresses associated with the start of the term were apparent and teachers noted that some of the children, particularly those who had not been able to participate in classes via Zoom, found it very difficult to adapt back to life in school after, in effect, missing the first term. The skill of Composure was utilized to help teachers and children readjust to school life. Teachers were coached to lead by example and compose themselves as stressful situations arose, to then be able to help children self-regulate. Many teachers were still a little worried about close contact and some connecting activities were modified to reflect teacher concerns over safety. While touch was reduced for this period, coaches placed emphasis on the other elements of connection - eye contact, presence, and play. As the term progressed safety and connection were re-emphasized, The School Family was re-established, and schools began to move back towards normal.

It was extremely gratifying to receive positive feedback from the Ministry of Education. "The MOE really appreciates this kind of collaboration as our children learn to self-regulate."



Connecting through the “I Love You” ritual.

and guides children towards being helpful to others. One teacher commented that the children “prefer to be noticed than receive a gold star.” With the emphasis on being helpful, all students were assigned jobs. As each child contributes to the school family by completing a job, he or she experiences the benefits of being of service whilst satisfying the brain’s requirement for interdependence. This lays the foundation for a connected, compassionate school culture.

At the end of February 2022 a funding agreement was signed between the Becky Bailey foundation and WINDREF to support the expansion of the Saving Brains Grenada/CD intervention through December 2023. The goal was to recruit sixty (60) new pre-primary and primary schools into the Saving Brains Grenada program. Thirty (30) schools commenced in September 2022 and an additional thirty (30) will commence in September 2023. To promote interest in CD and to help with school recruitment, principal investigator Dr Barbara Landon and project manager Ms. Stephanie Holmes held a 10-week online CD Foundation training course for parents, teachers and caregivers beginning in April 2022. The weekly sessions were well received by over 70 participants from Grenada, St. Lucia, Barbados, Jamaica, Trinidad & Tobago, Dominica, Suriname, USA, Ethiopia, and Nigeria.

Throughout the summer 2022 term, coaching centered on building connections. Teachers were encouraged to notice and comment on the positive actions carried out by the children rather than focusing on their mistakes. Noticing in this way focuses everyone’s attention on the behaviour that teachers want to see more of, reinforces what the child has accomplished

School Family jobs



Sweeper



Line leader

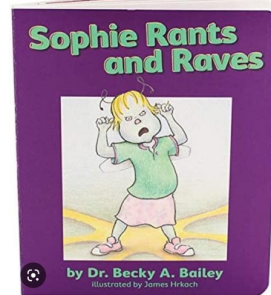
In close collaboration and consultation with the Grenada Ministry of Education, in May 2022 the CD coaching team provided a short presentation about the Saving Brains Grenada program to the principals of 60 pre-primary and primary schools. From this presentation 30 new pre-primary and primary schools, as listed below, were recruited to commence the Saving Brains Grenada program in September 2022.

Pre-Primary Schools starting Sep 2022	Primary Schools starting Sep 2022
Mt. Rose SDA	Crochu
St. Theresa's - Vincennes	St Georges Anglican
St. Andrews Methodist	Corinth
Boca Pre	Windsor Forest
Ebenezer Learning Centre	Uganda Martrs, Happy Hill
Pomme Rose - St Joseph's RC	Grand Roy Gvt
Chantimelle	Rose Hill Infant
Green Street	Blessed Sacrament
Springs (until Dec 2022)	St. Louis RC
St. David's RC (start Jan 2023)	Beaulieu
Non Pareil	Morne Jaloux - St Joseph's RC
Snell Hall	Beausejour
St. Michaels Byelands	Beacon
La Digue	Concord
La Borie	
Woburn - St. Micaels	
Grand Mal	

The recruitment of 2 additional school coaches was necessary to accommodate the increase in the number of schools. Ms. Christiana Lashington, a former school principal and CD enthusiast was recruited to the team in March 2022. Ms. Desere LaQua who

was eagerly implementing CD as teacher in charge at one of the intervention schools agreed to join the team at the end of the school year in June 2022. Ms. LaQua was offered a scholarship to the annual CD Training Course in Orlando Florida to enhance her coaching skills.

From September 2022, with five coaches on board, each Saving Brains coach was responsible for six schools, visiting the schools every two weeks and having one-to-one Zoom meetings to check on progress in between each visit. A total of forty (40) teachers, responsible for five hundred and twenty-eight (528) children received CD coaching in their classrooms from September to December 2022. Each school received a CD Teacher Book and a set of Sophie or Shubert books, a unique set of books designed to build character through conflict for both children and adults.



Beacon Schools receiving Conscious Discipline (teacher) Book and Sophie books.

The focus for the first few weeks of school was on creating a safe and welcoming school environment by offering children an individual choice of greeting and starting the day with a Brainsmart Start.



the children, reminding them to STAR (Stop, Take a deep Breath and Relax) at times of stress. As the term progressed and the children began to master this skill, they in turn became the teachers and often had to remind the adults to calm themselves at times of stress, as one child reminded his teacher: “wait miss – you have to relax.”



Greetings

Teachers were introduced to the CD Brain State model, which shows the relationship between internal state and external behaviour. This model is the foundation of CD and is crucial to understanding how different brain states affect perceptions and both adult and child behaviour. The rest of the term was spent focusing on building the school family and the skill of composure (STAR). Teachers initially began working with



Children practicing ‘Balloon Breath’

Many children also took these skills home with them. One parent expressed surprise when her child said: “when you and daddy are upset Smile Take a deep breath and Relax.” Parents began to show interest in what they were hearing from school and CD presentations were given at PTA meetings in 8 schools prior to the end of the calendar year in December 2022.

In November 2022 Saving Brains Grenada’s 3 most experienced coaches Jerry Bascombe, HalieyAnn Green and Curlyn Jeffrey were invited to attend the CD Advanced Training institute in Texas to work towards becoming certified CD instructors. Unfortunately, due to vaccination status, slow visa processing times and high costs they were unable to attend. The invitation has been extended however until the next training course in 2023 and the team is hopeful that they will be able to attend.

Community

In late 2022 the Saving Brains Grenada team signed a memorandum of understanding with the Roving Caregivers to provide CD training to four hundred and forty-four (444) parents with 482 children across selected Grenada communities in which the Roving Caregivers are active. Training takes place within the parent’s home on a weekly basis.

The Saving Brains Grenada coaches also offered a week-long workshop for parents with their children in the school summer break from 25th – 29th July 2022. A total of 15 parents along with 35 children attended.

Parents and children attend summer workshop

The Saving Brains bus (i.e., mobile resource unit) had been off the road for an extended period due to the COVID-19 lockdown and unfortunately is no longer road worthy. In October 2022 the Roving Caregivers piloted providing group community classes in community centers and/or church halls to replace the Saving Brains bus group classes. Eight parents were able to attend all 3 classes offered for the St. Georges community between October 18th and November 24th in River Road.



Community class at River Road for St. George’s parents

The same program will be repeated for parents in St. Patrick’s from February 2023. Then will move on to St. David’s and St. Andrew’s.

SUMMARY

Throughout 2022, the coaches began to see a gradual shift in the perspective of many teachers and a willingness to try a different approach to discipline. Teachers are practic-

ing composure strategies with the students and are becoming more aware of the need to compose themselves at times of stress. Although neither group has yet mastered composure, the coaching is going both ways, with the teachers helping students and students reminding the teachers to breathe when they begin to lose control. In addition, the coaches and teachers have noticed a more pleasant and cooperative ambiance in the classroom as the school family is emphasized.

In the words of Teacher Carlene Williams:
“Since I started using Conscious Discipline strategies ..I realize that the children are better able to self regulate. They are more compassionate and aware of others’ feelings . They also enjoy seeing their teacher being part of the relaxation process . I also observed that the classroom energy is much more calm when (Brainsmart Start) is done before they set off to work and play.”

Teachers, who have observed Conscious Discipline coached classrooms, and were initially skeptical, have been amazed at how the Conscious Discipline coaches have been able to connect with some of the most difficult children. These teachers are now ready and intrigued to learn more.

One-to-one parent classes, lead by the roving caregivers, in the parent’s homes, have continued. A pilot of community classes within in local community halls have taken place in St. Georges and this will be extended to St. Patrick’s, St. David’s and St. Andrew’s in 2023.

Goals for 2023 are to:

1. Continue working with the existing teachers and students to create ‘model’ Conscious Discipline classrooms.

2. Spread Conscious Discipline further throughout the school, as other teachers observe the calm energy of the Conscious Discipline classrooms.
3. Promote more continuity between home and school with a Conscious Discipline coach presenting at a minimum one PTA meeting per school.
4. Recruit 30 new teachers for coaching in September 2023 through a 10-week Conscious Discipline Foundation training course, April – May 2022.
5. Gain acceptance to the Advanced institute training for a minimum of three Conscious Discipline coaches
6. To continue 1-2-1 parent classes and community classes in collaboration with the roving caregivers.

Submitted by the CCCN Team

Neuropsychological Assessments

ASSESSMENTS

Assessment, one of the four key pillars of the Caribbean Center for Child Neurodevelopment, is an important aspect of early child development work. They allow interventionists to determine if their programme is having a positive impact on child development and if so, the extent of that impact. Neurodevelopmental assessment also allows us to determine the status of early child development. The Assessment team currently consists of 4 Caribbean natives who work primarily in participant homes, health centers and preschools across Grenada. The team is supervised by Ms. Roberta Evans, who is a native Grenadian and has obtained a master’s degree in Psychology.

ZIKA GRENADA

In this prospective cohort study, children born to Zika infected and uninfected mothers were followed for the last 5 years (2017-2022) to determine if the Zika virus impacts infant and child neurodevelopment. Data collected during the first four years largely indicate no detectable neurodevelopmental differences between the Zika exposed and unexposed groups. At two-years of age visual acuity deficits were detected in the Zika exposed group, but at ages three and four these deficits were no longer apparent. Approximately 20% (n=75) of the original cohort was followed at year five. At the final assessment, trained Early Childhood Assessors administered a comprehensive neuropsychological battery to the children including the Neuropsychological Assessment (NEPSY-II), Grenada Learning and Memory Scale (GLAMS), Reynolds Intellectual Assessment Scales, Second Edition (RIAS-2), and home environmental profile questionnaires (demographics, food security, maternal mental health, home observations) to the mothers enrolled in the study. Nurses completed physical assessments on the children and obtained blood and buccal swab samples to determine the child's Zika status. Data collection for this project has now ended as all the children in the cohort have turned 5. Data analysis on the 5-year outcomes and publication of results will take place in 2023.

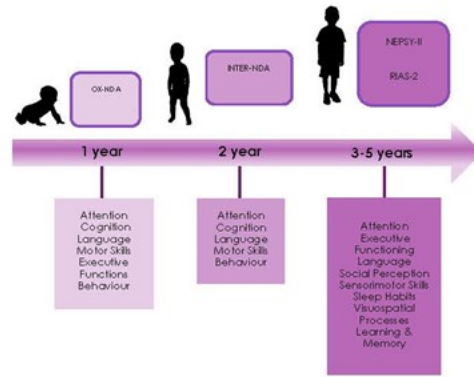


Figure 2 Neurodevelopmental Assessments Completed at Each Timepoint

SARS-CoV-2 GRENADA

The Saving Brains Grenada Team at the CCCN has established considerable expertise in examining the potential impact of maternal viral infection on prenatal and postnatal child brain development. The team is thus well-placed to examine the potential impact of maternal SARS-CoV-2 infection on child brain development. Following a prospective cohort study design, IRB clearance (IRB# 21044), and collection of information about pregnant women through the Grenada Ministry of Health and health clinics, the Saving Brains Grenada team began enrolling mothers into the study in June 2022. The primary aim is to determine if there are any neurodevelopmental differences between children born to mothers infected with SARS-CoV-2 during pregnancy versus children born to mothers not infected with SARS-CoV-2 during pregnancy. Currently, the team collects home environment and maternal health data, in addition to obtaining a blood sample from the mother to ascertain COVID-19 status during pregnancy. After this initial visit, mothers are visited within a month of giving birth so that a nurse can perform a physical

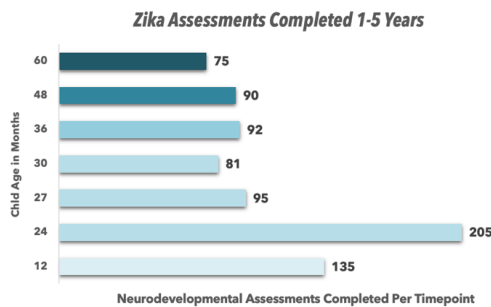
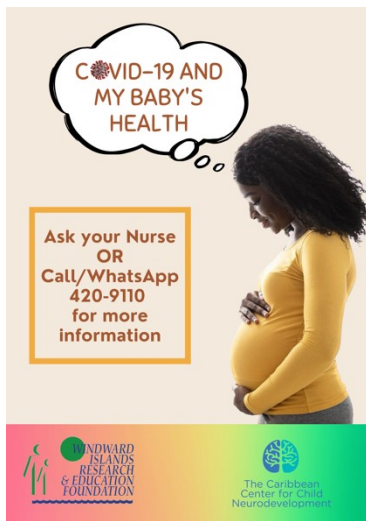


Figure i. Zika Assessments Completed

assessment on the newborn and retrieve another maternal blood sample to determine COVID-19 status in the final trimester of pregnancy.

The study is slated to run until the first year of the infant's life when a neurodevelopmental assessment will be performed. So far, the team has collected data from approximately 90 mothers and plans to actively recruit more pregnant women into the study until June 2023.



GLAMS GRENADA

In March 2022, through the support of the Charles Matthews Fund from the International Neuropsychological Society, Global Engagement Committee (INS GEC), the Saving Brains Grenada team successfully held a virtual and in-person workshop on “Strengthening Capacity for Neuropsychological Assessment in the Caribbean.” During the workshop, the team successfully introduced its very own internally-developed neurodevelopmental assessment measure called the Grenada Learning and Memory Scale (GLAMS). The positive feedback from

the conference attendees encouraged the team to continue developing the GLAMS. With the GLAMS successfully piloted in previous studies for over a year, funding to explore the psychometric properties of the GLAMS was sought and obtained through the Charles Matthews Fund at the INS. For this project, the team intends to collect test-retest and interrater reliability and explore convergent and divergent validity in various assessment environments. The goal is to make the GLAMS available to clinical and research communities in low-resource regions. The team hopes to complete data collection in February 2023, analyze the data and submit a peer-reviewed manuscript presenting the validated GLAMS to the world by April of 2023.

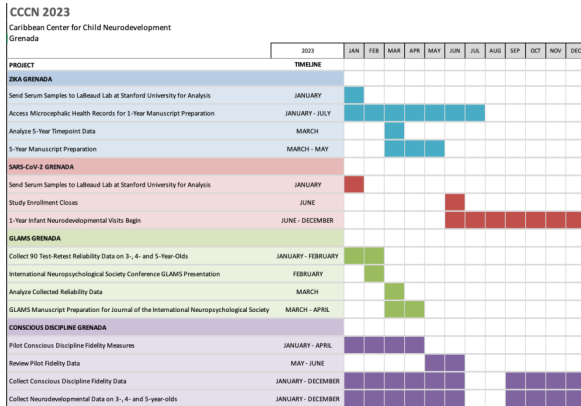
CONSCIOUS DISCIPLINE GRENADA

As part of the ongoing Conscious Discipline (CD) School Intervention program, the Saving Brains Grenada Assessment Team piloted the Classroom Assessment Scoring System (CLASS) to assess its feasibility as a CD fidelity measure for teachers and adult caregivers. In combination with other measures, our team aims to create a profile of assessments that will closely monitor and evaluate the adherence to the CD model. The Assessment team hopes to pilot this battery for continued use in the first quarter of 2023.

PLANS FOR 2023

The Caribbean Center for Child Neurodevelopment will continue assessment into 2023. In the first quarter of the year, the assessment team will focus primarily on collecting psychometric data for the GLAMS project and piloting fidelity measures for the Conscious Discipline Project. Throughout the

year manuscripts detailing assessment findings will be prepared and submitted.



Submitted by the CCCN Team

UNICEF 2022 Spotlight Initiative STAR Public Service Announcements in Grenada, West Indies Report

Authors and contributors: Elizabeth D. Thomas, Lauren Mohammed, Toni Murray, Rashida Isaac, Jesma Noel, Roberta Evans, Lauren Orlando, Randall Waechter, Barbara Landon

Background and objectives

One in every four Grenadian women has experienced physical violence in their lifetime (1). The short and long-term effects of violence on women’s health include physical injury, poor reproductive health, and poor mental health. Violence against women also negatively impacts child health and family health (2). The Spotlight Initiative is a United Nations-supported effort to eliminate all forms of violence against women and girls, globally.

As part of this effort, the Caribbean Center for Child Neurodevelopment (CCCN) at the

Windward Islands Research and Education Foundation (WINDREF) partnered with UNICEF to create a series of public service announcements (PSAs) to encourage alternatives to violence in Grenada, West Indies. Part of the mission of the CCCN and its flagship programme, Saving Brains Grenada (SBG), is to prevent family violence and harmful child-rearing practices that can negatively impact the development of a child’s brain in early life (3). SBG does this by promoting child-rearing skills that increase the social-emotional connection between caregiver and child. SBG’s approach is grounded in the Conscious Discipline (CD) curriculum, where caregivers are taught concrete skills that build safety, predictability, attachment, and conflict management between themselves and young children (4).

For the Spotlight Initiative PSAs, the CCCN team took guidance from the CD skill of composure, which aims to promote recognition of one’s emotional state (e.g., anger) and use skills to manage and regulate those difficult emotions. Rather than allowing an emotional state to drive behavior, thereby risking a decline into violence, the skill of composure encourages each of us to stop, take a deep breath, and relax (S-T-A-R). As such, the theme of this PSA series was “STAR – eliminate violence”. In consultation with community stakeholders, the CCCN team selected scenarios for the PSAs common in Grenada and the region that could lead to violence, including: a woman being harassed in public, an unruly classroom frustrating a teacher, a family squabble, and a child upset with the outcome of a sporting event. A song was developed in collaboration with Grenadian musical

artists to accompany videos and for separate radio spots.



Figure 1 Screenshots from campaign videos

Evaluation of health media campaigns is critical for better understanding of how to promote behavior change and improve public health (5-7). Evaluations also help implementers understand how the campaign operated in the target community. This report describes an overview of the methods and results of a pre- and post-campaign evaluation for the Spotlight Initiative PSAs.

Methods

A pre-campaign survey was completed in June 2022 across three locations in Grenada (St. George’s Town Center, Grand Anse, and Grenville Town Center). The survey was an intercept survey, where study team members recruited adults from public spaces at the three locations (e.g., bus terminal, shopping center) for a face-to-face interview. Adults were eligible to participate if they were 18

years of age or older and residents of Grenada. Surveys were conducted consecutively over 1–2-hour time periods in a convenience sample of adults. The survey asked participants about their media exposure, including whether and how often they listened to the radio, watched television, and used social media platforms. Participants were also asked if they were aware of any existing violence prevention messaging in the media, and if they were familiar with “S-T-A-R”. The pre-campaign survey is provided in Appendix A. Clearance for the survey implementation and data collection was provided by the St. George’s University (SGU) Institutional Review Board (IRB).

The PSA series formally ran from July through August 2022 on major radio and television channels, and was also shared on two major Facebook news sources in Grenada. Although the campaign formally ended in August, media partners continued to share the series into September.

From October to December 2022, a post-campaign survey was completed across the same three locations as the pre-campaign survey, following the same methods. In the post-campaign survey, participants were again asked if they were aware of any existing violence prevention messaging in the media in the last two months, and if they were familiar with “S-T-A-R.” Participants were also shown screenshot images of the four campaign videos, and an approximately 5-second sample of the campaign song was played. Participants were asked to indicate if they had seen the videos or heard the song; if they had, they were asked additional questions about the content. Lastly, participants were asked about their opinion of violence against women and girls and children in Gre-

nada. The post-campaign survey is provided in Appendix B.

Results

Sample

In total, 313 adults completed the pre-campaign survey and 286 completed the post-campaign survey (Table 1). In both and the pre- and post-campaign evaluation, the majority of participants were 18-44 years old (71.6-76.9%), with fewer participants in age groups above 45 years. There was an almost even distribution between female and male participants at both time points.

	Pre-campaign survey		Post-campaign survey	
	Number of respondents	%	Number of respondents	%
	(n = 313)		(n = 286)	
Age (years)*				
18-24	70	22.4	72	25.2
25-34	84	26.8	91	31.8
34-44	70	22.4	57	19.9
45-54	35	11.2	34	11.9
55-64	24	7.7	20	7.0
65-74	22	7.0	10	3.5
75+	5	1.6	2	0.7
Sex**				
Female	157	50.3	148	51.7
Male	155	49.7	138	48.3
Parish/dependency of residence				
St. Andrew	94	30.0	93	32.5
St. David	31	9.9	36	12.6
St. George	148	47.3	124	43.4
St. John	15	4.8	14	4.9
St. Mark	6	1.9	2	0.7
St. Patrick	18	5.8	14	4.9
Carriacou	1	0.3	3	1.0

*Three missing values for age **One missing value

Table 1 Sample characteristics

Pre-campaign survey results

Media exposure

Prior to the campaign, most participants (74%) reported at least some exposure to radio, television, or social media. Eight par-

ticipants (2.5%) reported no media exposure. Almost one-third of participants (31%) said they listened to the radio every day in the last week, but close to half (42.5%) said they did not listen to it at all. Reported television exposure was similar to that of radio exposure. Almost half of participants (46%) said they had not watched television in the last week. Most participants (56%) said they used Facebook every day in the last week, and 80% said they viewed it at least one day. TikTok and Instagram use was lower, but still had roughly 25-30% of participants reporting daily use. Twitter use was very low: 90% of participants reported no use in the last week. There were trends in media use by age group, with social media use higher for participants ages 18-44 compared to other media channels, but the reverse was true for participants 55 years and older; those older than 55 reported greater use of radio and television than social media. There were no notable trends when comparing female and male participants.

Exposure to media advertisements about violence

One-quarter of participants (24%) said they had heard or seen an advertisement campaigning to end violence in the last month. Thirty-six participants (11.5%) said they had previously heard of “S-T-A-R”, though only two were able to correctly identify that it stands for “Stop, Take a Deep Breath, And Relax”. Of the 31 participants who said they had previously heard of “S-T-A-R”, approximately one-third had reported hearing or seeing an advertisement campaigning to end violence in the last month. Neither of the participants familiar with what S-T-A-R stands for reporting hearing or seeing an

advertisement about ending violence in the last month.

Post-campaign survey results

Exposure to media advertisements about violence

In the post-campaign survey, 37% of participants said they had heard or seen an advertisement campaigning to end violence in the last two months. Forty-three participants (15.1%) said they had previously heard of “S-T-A-R”, and 12 were able to correctly identify what it stands for. However, 3 of the 12 said they had not seen or heard any advertisement about ending violence in the last two months.

Exposure to Spotlight Initiative public service announcements

When asked to indicate which videos they had seen, 20 participants (7.0%) said they had seen the video about the teacher, and the same number said they had seen the video about the family squabble. Forty-four participants (15.4%) said they had seen the video about the sporting event and 25 (8.8%) said they had seen the video about the woman being harassed in public. A total of 79 participants said they had seen at least one video, and most (46 participants; 57.5%) said they had seen it on the television or through social media (23 participants; 35.0%). Most participants (202; 70.6%) said they had not seen any of the four videos.

When asked about the campaign song, 54.1% of participants said they had heard it. The most common channels where the song was reportedly heard was radio (101 participants), television (39 participants), and social media (20 participants).

Of the 173 participants who had seen the video and/or heard the song, 150 (86.7%) said they had not discussed it with anyone. For those who said they had discussed the video or song with someone, 10 (5.8%) said they had discussed it with a friend and 8 (4.6%) said they had discussed it with a child.

When asked if they had recently been in a situation where they had decided to stop, take a deep breath, and relax, 72.2% of participants said they had, and almost all said that it had helped the situation. Similarly, 64.0% said they had recently been in a situation where they asked someone else to stop, take a deep breath, and relax, and most said that it had helped the situation. This question was asked of all participants, regardless of their exposure to the campaign advertisements, so it is likely that many of these responses reflected a practice unrelated to the campaign, rather than a practice of “STAR-ing”.

When asked about their opinion of violence as a problem in Grenada, with a response of “1” indicating “Not a problem at all” and a response of “5” indicating “A very big problem”, 148 (51.8%) said violence against women and girls was “A very big problem” and 140 (48.9%) said violence against children was “A very big problem” (Figure 1). For both

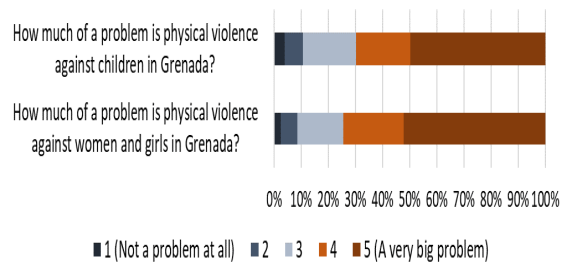


Figure 2 Participants' opinions on the problem

questions, a large majority of participants rated each problem either a “4” or “5”.

Observations and lessons learned

In conducting this evaluation, several important lessons have been learned for present and future efforts involving related media campaigns in this setting.

First, the question asking about participants’ understanding of S-T-A-R was difficult for some to understand in both the pre- and post-survey, even with modifications to the post-survey question based in pre-survey findings. Participants’ ability to recall the meaning of S-T-A-R was low in both surveys, though higher in the post-survey. One possible reason for this result is that the question was not well-understood. Another possible reason is that the media spots were too short, or contained too much content, for participants to be able to understand the meaning of S-T-A-R. Future campaigns should consider having a clearer “ask” or statement included to make the intent of the message or campaign content clear to viewers and listeners.

Second, most participants did not recall seeing any of the four campaign videos, but half recalled hearing the song. One possible explanation is that the videos were not shared as widely or frequently as the song was played. Another possible explanation is that the screenshots selected to ask this question were not easily identified by participants as coming from the campaign videos. Future campaign videos might consider having more recognizable content as campaign-specific, to encourage participant recall of certain images as being affiliated with the campaign.

Third, most participants said that violence in Grenada is a very big problem, both against

women and girls, and children. This indicates that there is an urgent need for continued efforts to address both the root cause and effects of violence in these and other populations in this setting. Additional qualitative data were collected during this evaluation that will be analyzed to provide further insights on how to improve future efforts to address this need in this population.

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Appendix A – Pre-campaign survey

Recruitment script and screening

Hello! We are conducting a brief survey in preparation for a media campaign for public health. Do you have 5 minutes to answer a few questions?

S1 Are you a resident of Grenada?

0=No (individual is not eligible to participate)
1=Yes

S2 What Parish or dependency do you reside in?

- 1=Saint George
- 2=Saint Andrew
- 3=Saint David
- 4=Saint John
- 5=Saint Mark
- 6=Saint Patrick
- 7=Carriacou
- 8=Petite Martinique

S3 What is your age?

- 0=Less than 18 years old (individual is not eligible to participate)
- 1=18-24 years old
- 2=25-34 years old
- 3=35-44 years old
- 4=45-54 years old
- 5=55-64 years old
- 6=65-74 years old
- 7=75 years or older

S4 Participant sex

- 0=Male
- 1=Female
- 2=Other

Only adult (18 or older) residents of Grenada, Carriacou, or Petite Martinique are able to participate. If the participant is not a resident of Grenada, or is below 18, please let them know they cannot participate and thank them for their time.

Screening check (circle one): 0=Not eligible
1=Eligible

Pre-campaign verbal consent request

We are conducting a brief survey in preparation for a media campaign for public health. In this survey, we will ask you questions about your media use and whether or not you have seen or heard of certain messages in the media. We will not collect your name or any other identifiable information. The survey will take approximately 5 minutes. The results will help us to understand media use in Grenada and people’s familiarity with our campaign. Your participation is completely voluntary. Do you have any questions about the survey? Do you agree to participate?

Consent check (circle one): 0=Does not agree to participate 1=Agrees to participate

Pre-campaign survey

Q1 How many days in the last week have you listened to the radio?

0=None (skip to Q3)	1=1 day	2=2 days	3=3 days
4=4 days	5=5 days	6=6 days	7=7 days (every day)

Q2 In the last week, what radio channels have you listened to? (Circle/record all that apply)

1=GBN	2=MTV	3=Boss FM	4=Power FM
5=Wee FM	6=Other (specify)		

Q3 How many days in the last week have you watched television?

0=None (skip to Q5)	1=1 day	2=2 days	3=3 days
4=4 days	5=5 days	6=6 days	7=7 days (every day)

Q4 In the last week, what television channels have you watched? (Circle/record all that apply)

1=GBN	2=MTV	3=GIS	4=Other (specify)
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Q5 How many days in the last week have you used Facebook?

0=None (skip to Q7)	1=1 day	2=2 days	3=3 days
4=4 days	5=5 days	6=6 days	7=7 days (every day)

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Q6 In the last week, what news sites have you used on Facebook? (Circle/record all that apply)

- 1=GBN 2=MTV 3=GIS 4=Mikey Live
5=Lexan TV 6=Other (specify)

Q7 How many days in the last week have you used Instagram?

- 0=None 1=1 day 2=2 days 3=3 days
4=4 days 5=5 days 6=6 days 7=7 days (every day)

Q8 How many days in the last week have you used TikTok?

- 0=None 1=1 day 2=2 days 3=3 days
4=4 days 5=5 days 6=6 days 7=7 days (every day)

Q9 How many days in the last week have you used Twitter?

- 0=None 1=1 day 2=2 days 3=3 days
4=4 days 5=5 days 6=6 days 7=7 days (every day)

Q10 In the past month, have you seen or heard any advertisements campaigning to end violence?

- 0=No 1=Yes

Q11 Have you ever heard of STAR (S, T, A, R)?

- 0=No (End survey) 1=Yes

Q12 If yes, what does STAR stand for?

- 0=Incorrect response 1=Correct response (Stop, Take A Deep Breath, And Relax)

End: That is the end of our survey. Thank you so much for your time! Have a good day.

S4 Participant sex

- Male Female Other/Unknown

Only adult (18 or older) residents of Grenada, Carriacou, or Petite Martinique are able to participate. If the participant is not a resident of Grenada, or is below 18, please let them know they cannot participate and thank them for their time.

Screening check (circle one): Not eligible Eligible

Post-campaign verbal consent request

We are conducting a brief survey about a recent media campaign. In this survey, we will ask you questions about advertisements in the media that you may have seen. We will not collect your name or any other identifiable information. The survey will take approximately 5-10 minutes. The results will help us to understand how our campaign was received. Your participation is completely voluntary. Do you have any questions about the survey? Do you agree to participate?

Consent check (circle one): Does not agree to participate Agrees to participate

Post-campaign survey

Q1 In the past 2 months, have you seen or heard any advertisements about ending violence?

- No Yes

Q2 Have you ever heard of something called "S-T-A-R", like the word "STAR", but where each letter stands for something else?

- No (SKIP to Q4) Yes

Q3 If yes, what does STAR stand for?

- Incorrect response Correct response

Q4a-d Here are some screenshots of recent advertisements that were part of our campaign. Have you seen any of these? (Ask the participant to tell you or point to the ones they saw. If the participant answers "no" to all, then SKIP to Q5.)

	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Not sure/Does not remember
	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Not sure/Does not remember
	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Not sure/Does not remember
	<input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Not sure/Does not remember

Q4e Where did you see these videos? (Select all that apply.)

- Television
 Social media
 Messaging App
 Not sure/Does not remember
 Other: _____

Q4f What was the main message of these videos? What was this video trying to say?

Q4g Did you find the video(s) relevant to your life? No Yes Both/Mixed response

If yes, which one was most relevant/why?

If no, why not?

Q5a Here is a clip of a song that was part of our campaign. Have you heard it? (Play music clip with phone.) No (SKIP to Q6) Yes

Appendix B – Post-campaign survey

Recruitment script and screening

Hello! We are conducting a brief survey about a recent media campaign. Do you have 5-10 minutes to answer a few questions?

S1 Are you a resident of Grenada?

- No (individual is not eligible to participate, END SURVEY) Yes

S2 What Parish or dependency do you reside in?

- Saint George
 Saint Andrew
 Saint David
 Saint John
 Saint Mark
 Saint Patrick
 Carriacou
 Petite Martinique

S3 What is your age?

- Less than 18 years old (individual is not eligible to participate, END SURVEY)
 18-24 years old
 25-34 years old
 35-44 years old
 45-54 years old
 55-64 years old
 65-74 years old
 75 years or older

Q5b Where did you hear this song? (Select all that apply.)

Television

Radio

Social media

Messaging App

Not sure/Does not remember

Other: _____

Q5c What was the main message of the song? What was it trying to say?

****Q6** You saw one of the videos or heard our song. Did you discuss it with anyone else? If yes, who? (Mark all that apply.)

No, I did not discuss it with anyone else

Yes, friend Yes, child Yes, parent

Yes, spouse Yes, other relative Yes, other

Q7a Have you been in a situation recently where you decided to Stop, Take a Deep Breath, and Relax? No (SKIP to Q8) Yes

Q7b (If yes) Did it help the situation? No Yes

Q8a Have you been in a situation recently where you asked someone else to Stop, Take a Deep Breath, and Relax? No (SKIP to Q9) Yes

Q8b (If yes) Did it help the situation? No Yes

Q9a In the last 2 months, aside from our videos and radio spots, have you seen or heard of any other advertisements about ending violence? No (SKIP to Q10) Yes

Q9b (If yes) Can you describe these other advertisements?

Q10 What media channels do you access/use? (Select all that apply.)

Television

Radio

Social media

Messaging App

Other: _____

Q11 On a scale of 1 to 5, with 1 being "not a problem at all" to 5 being "a very big problem", in your opinion, how much of a problem is physical violence against women and girls in Grenada?

1--2--3--4--5

Q12 On a scale of 1 to 5, with 1 being "not a problem at all" to 5 being "a very big problem", in your opinion, how much of a problem is physical violence against children in Grenada?

1--2--3--4--5

Q13 Do you have any feedback about the videos or song that you would like to share?

Q13 Do you have any feedback about the videos or song that you would like to share?

Q14 Do you have any advice for us for future violence prevention campaigns?

End That is the end of our survey. Our campaign was about trying to end violence in Grenada. There are many situations in life that create difficult emotions that might result in violence. Our goal is to encourage people to Stop, Take a Deep Breath, and Relax, or "Be a STAR" in these situations. This is one way that we can reduce the risk that a situation will end in violence. Thank you so much for your time today! Have a good day.

The Grenada Wastewater Treatment and Recycling Project

Funded in 2021 by the Grenada Development Bank, the Wastewater Treatment and Recycling Project. This three year initiative aims to recycle the wastewater from the black and grey water from the Princess Alice Hospital to re-purpose it for agricultural use. This will provide the local farmers in the Mirabeau area with a sustainable water supply, which has recently become less reliable given the impacts of climate change on what was a predictable rainy and dry season. This project is a collaborative initiative with the National Water and Sewage Authority (NAWASA), the Ministry of Health, several local NGO's, local community members, and international partners. An innovative water treatment processing plant will be imported from collaborators in Scotland, and the filtration system utilizes recycled glass instead of sand for purifying the water. The unit will be powered using solar power and will be the first of its kind in the region. Should this pilot project prove successful, it will be replicated in many other Small Island Developing States in the region, and potentially, elsewhere. The program recycles glass bottles, reduces the impact of mining sand for water filtration units, and provides a clean safe sustainable water supply which has minimal running cost. Its aim will be to mitigate the impact of climate change in rural communities. In 2022, numerous discussions were held with all stakeholders, and the project was revised to include black water. It is hoped to construct and import the equipment for this project in 2023.

Submitted by Calum Macpherson and Lindonne Telesford

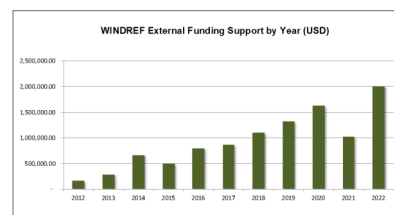
Submitted by the CCCN Team

External Grants and Funding

We thank all the donors who have made WINDREF’s work possible in 2022:

- Global Water Partnership (GWP) – For the GWP Caribbean Regional Office
- National Institutes of Health, Fogarty International Center – For the Caribbean Research Ethics Initiative (CREEi) and CREEi supplement
- St. George’s University – For the SARS-COV -2 Testing Program
- Stanford University – For the Engaging Young Persons as Agents of Change project and Zika follow-up study
- Stanford University – For the Zika Child Neurodevelopment Follow-up Study
- UK Research and Innovation Global Challenges Research Fund (GCRF) via the British Institute in East Africa – For the Global Health and Clean Water project
- UNICEF Spotlight Initiative – For the Saving Brains Grenada Scale-up project and Combatting Violence Against Women and Girls: Development of GBV Victims’ Rights Policy for Grenada
- United Nations Food and Agriculture Organization (FAO) – For the Practical Climate Adaptation in Fisheries Interventions in Grenada project
- United Nations Framework Convention on Climate Change Secretariat (UNFCCC) Secretariat – For the Caribbean Regional Collaborating Center St. George’s
- Caribbean Biodiversity Fund, Ecosystem - based Adaptation Facility – For the Innovative Nature-based Solutions to Enhance Community Resilience in Grenada project
- German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety, International Climate Initiative (via the Greenhouse Gas Management Institute) – For the WINDREF-based Measurement, Reporting & Verification Hub (CCMRVH)
- Pan American Health Organization (PAHO) – For the Perspectives on Breast and Cervical Cancer Screening in Windward Islands project
- Becky Bailey Foundation – For the Conscious Discipline Grenada project
- American Psychological Association Helping Hands Grant – For the Novel Reintegration into the Community Program
- National Oceanography Centre – For the Resilience in Larval Connectivity Study
- Caribbean Development Bank – For the Grenada Wastewater Treatment and Recycling Project
- Oscar Montgomery Environmental Foundation – Sea Turtle Research

Total funding received in 2022 was \$2.01 million. This was a 96% increase from the previous year, which marked the bottom of the COVID-19-related funding dip. Funding in 2022 still represented a 23% increase over the funding received in 2020, prior to the full impact of the COVID-19 pandemic on research activities. With the pandemic behind us, it is reassuring to see that WINDREF has regained its upward trajectory of external funding.



2022 Grant Applications

Eight grant applications were submitted to external funding agencies in 2022. The total potential value of these grant applications was \$1.94 million USD. Five of these applications were successful and two are still waiting for a final decision about funding (green = funded, black = waiting for a decision, red = not funded):

- Landon & Waechter. *Conscious Discipline Grenada (Becky Bailey Foundation)*.
- Landon & Waechter. *Alternatives to Violence Public Service Announcements: Addressing Physical Violence of Children in Grenada (UNICEF Spotlight Initiative)*.
- Cox Macpherson. *Caribbean Research Ethics Education initiative Hastings Center Subgrant Agreement (NIH Fogarty International Center)*
- Waechter, Fernandes, Koster. *BRAINTIME A Whole-child Approach to Brain Development through Playful Parenting (LEGO Foundation)*
- Noël & Baldeo. *Practical Climate Adaptation in Fisheries Interventions in Grenada (Food & Agricultural Organization FAO)*
- Roopnarine & Tegzes. *Leveraging Inter-professional Education and Collaborations to Advance One Health (Council on International Veterinary Medical Education CIVME)*
- Crane & Dopkin. *Novel Reintegration into the Community Program (American Psychological Association Helping Hands Grant)*
- Werners, Wills, Fajt, Hawes, Vercelli, Andover. *Threshold concepts and capabilities in veterinary pharmacology; an international students' perspective (Council on International Veterinary Medical Education CIVME),*

Non-communicable Diseases

- The Elimination of the Soil Transmitted Helminths from Grenada and Beyond
- Perspectives on the Uptake of Breast and Cervical Cancer Screening in the English-Speaking Windward Islands: A Collaborative Approach
- Woman to Woman: A Cervical Cancer Education Program for Grenadian Women
- Genetic Correlates of the Addictive Diseases: Cocaine, Alcohol and Marijuana Addiction -Grenada, WI, Dr. Mary- Jeanne Kreek, Kreek Laboratory, Rockefeller University. \$60,000.
- The Effectiveness of Life Seasons' Diabet-X in reducing HbA1c among Grenadians with Metabolic Syndrome. LifeSeasons. \$100,000.
- Neglected Tropical Diseases (NTDs) and Rheumatic Fever in Grenada: a project to prevent/eliminate helminthic and rheumatic fever infections among children (5-15 years of age). Bartholomew J. Lawson Foundation. \$41,903.
- Angiotensin converting enzyme and angiotensinogen gene polymorphisms in the Grenadian population: relation to hypertension
- Development of a decision rule for screening Obstructive Sleep Apnea and its epidemiologic relevance to the people of Grenada
- Prevalence and associated risk factors of hypertension in a sample population of native Caribbean's in Grenada, West Indies
- Assessing the prevalence of diabetic complications by examining type I and type II adult diabetics for signs of retinopathy, neuropathy, nephropathy and dermatological changes associated

- with poor glucose control within the native Caribbean population of Grenada
- Hypertension management and control in two Caribbean countries
- Assessment of the effectiveness of broad-spectrum treatment to children with protozoan and nemathelminthic parasitic infections on diarrhea and school attendance
- The effects of iron-deficiency anemia on cognition and behavior in infants
- Diurnal variation of urinary endothelin-I and blood pressure: related hypertension
- Alcohol consumption in Grenada
- The incidence and mortality of cancer in Grenada over the ten-year period: 1990-1999
- The prevalence of abnormal haemoglobin traits in Grenadian secondary school adolescents
- Knowledge, attitudes, beliefs and practices of sickle cell anemia in Grenadian primary and secondary school children.
- Decompression sickness among the indigenous fishing population in Grenada: Assessing the burden of disease
- WINDREF / SGU Hurricane Relief
- Spice Research Program
- Sulfate-reducing bacteria in oxidized freshwater of tropical mangroves
- Novel antibiotics from tropical marine environments: drug development in Grenada
- Study of the mutacin C-7A
- Gram-negative bacteria isolated from aquatic environments of Grenada (61.4° W, 12.0°N), West Indies
- Identification of bacteria producing antibiotics isolated from deep marine biofilms of Grenada.
- SGU Environmental Testing Unit (ETU)
- Post-hurricane water surveillance in problematic areas of Grenada
- Evaluation of the relocation potential for villagers residing in Queen Elizabeth National Park, Uganda
- Study of the calls of the spotted hyena at feeding
- Survey on the attitude of villagers in Queen Elizabeth National Park, Uganda towards the threat of lions, leopards and hyenas
- Epidemiology of human injuries resulting from wildlife in ten villages within Queen Elizabeth National Park, Uganda
- Rural Ugandan village perspective on lion, leopard and hyena conservation
- Epidemiology of human injuries by wildlife in six villages within Queen Elizabeth National Park, Uganda
- Prevalence of *Campylobacter fetus* subspecies *venerealis* and other microorganisms in the reproductive tracts of cattle from the southern region of Santo Domingo, Dominican Republic
- Antimicrobial properties of skin secretions from *Eleutherodactylus johnstonei* on bacteriological isolates
- Examination and analysis of prostate cancer in Grenada
- A Church-based intervention to improve hypertension prevention and control among women in Grenada
- Occupational Health Problems among Nutmeg Factories Workers, SGU Small Research Grant Initiative
- Sport for Health Programme
- Grenada School Nutrition Study: Evidence to Inform Policy
- Genetic Correlates of the Addictive Diseases: Cocaine, Alcohol and Marijuana Addiction -Grenada

- Promoting Resilience Among Medical Students: A Comparison of Mindfulness, Yoga, and Exercise
- Grand Challenges Canada – For the Saving Brains Grenada Scale-up project
- UNICEF – For the Saving Brains Grenada Scale-up project and Combatting Violence Against Women and Girls: Development of GBV Victims’ Rights Policy for Grenada

Infectious Diseases

- LaBeaud, Waechter, Blackmon, Noël, Landon, & Macpherson. Zika and Neurodevelopment among Infants in Grenada: 36-month Assessment. Stanford University
- LaBeaud, Noël, & Macpherson. Engaging Young People as Agents of Change. Stanford University.
- Neurodevelopment and Vector-borne Diseases: Building Research Capacity in the Tropics. National Institutes of Health - Fogarty International Center. \$298,938.
- Assessment of Neurocognitive Functioning in 2-year-old ZIKV-exposed Children. USAID via jhpiego. \$63,867.
- The Spectrum of Zika Disease in Grenada. Stanford University. \$13,601.
- The Spectrum of Zika Disease in Grenada. Stanford University. \$34,992.
- Zika Surveillance in the Southern Caribbean and Reference Lab Support. Naval Medical Research Center. \$80,000.
- Investigation of the prevalence of SIV in the mona monkey (*Cercopithecus mona*) in Grenada
- Seroprevalence of HIV-I and HIV-II in pregnant women in Grenada, W.I. – their knowledge of AIDS and their exposure hazards to the virus
- A cross sectional study of the current status of *Schistosoma mansoni* in St. Lucia by field surveys and supplementary data collection
- Identification and characterization of hantaviruses among the mammal population of Grenada
- HIV/AIDS health education and evaluation program in Grenada
- The seroprevalence of *Toxoplasma gondii* in a population of pregnant women and cats in Grenada, West Indies
- The efficiency of diagnosing women of *Toxoplasma gondii* using PCR techniques in comparison with ELISA
- Dengue virus in Grenada: seroprevalence and associated risk factors
- A current appraisal of dengue virus in Grenada –serotype analysis and vector assessment
- A site receptivity study determining the threat of reintroduction of malaria into Grenada through the study of *Anopheline* spp. mosquito vectors
- Chlamydial infection among STD clinic attenders in Grenada
- Fever in Grenada
- Mosquitoes and tourism in Grenada
- Effectiveness of a formula feeding/ weaning intervention program in preventing transmission of HTLV-1 from seropositive mothers to newborns in Grenada
- A multi-center longitudinal research study of the behavioral significance of the prevalence of HIV-1 infection in pregnant women and their babies on the islands of Grenada and St. Vincent
- A multi-center longitudinal research study of the ethical analysis of informed consent of the prevalence of HIV-1 infection in pregnant women and their babies

- St. Vincent
- Streptococcal program in St. Vincent
- Isolating Tcells from Rheumatic Fever positive blood: immunofluorescent assay of T lymphocytes via fluorescently labeled monoclonal antibodies
- Possible genetic predisposition to Rheumatic Fever: demonstrating the inheritance fashion of non-HLA B lymphocyte alloantigen D8/17, a marker for Rheumatic Fever
- ELISA antibody titres against group A streptococcal M protein moiety and cell wall N-Acetyl-D-Glucosamine in Grenadian Rheumatic Fever patients
- Evaluating the effectiveness of educational methods in the prevention of Rheumatic Fever and knowledge, awareness and practices
- Prevalence of intestinal helminth infections in rural Grenadian school children
- Cystic echinococcosis in Morocco and Uganda
- Macpherson, C.N.L.. Elimination of Lymphatic Filariasis in Guyana Program
- Noël, T. Neglected Tropical Diseases and Rheumatic Fever in Grenada: A project to prevent/eliminate helminthic and rheumatic fever infections among children (5-15 years of age)
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- Heath, C., LaBeaud, D., Macpherson, C., & Noël, T. (2016). Characterization of Immune Factors of Chronic Chikungunya Disease. American Society for Tropical Medicine & Hygiene Robert E. Shope International Fellowship.
- Determining the role of IL-15 in mediating function of viral-specific CD8+ T cells in the myelopathogenesis of HTLV-1: symptomatic versus asymptomatic patients
- Intestinal protozoan infections in 6-12 year old children in Grenada
- Intestinal helminth infections in 6-12-year-old children in Grenada
- The prevalence of intestinal parasites in school children in rural Guyana
- The prevalence of filariasis and its effects on children aged 8-14 in the central corentyne region of rural Guyana
- The prevalence of streptococcal infection in school children aged 5 -15 years in Grenada, Carriacou and Petit Martinique
- Studies examining the elimination of lymphatic filariasis as a public health problem in Guyana
- Seroprevalence of heartworm infection in dogs in Grenada
- Dengue in Grenada
- Assessing the potential risk factors of dengue and dengue hemorrhagic fever in the tri-island state of Grenada, Carriacou and Petit Martinique
- A comparative study to find out if there is an association between sexual practices and knowledge in adult populations of Botswana and Grenada with the prevalence of HIV/AIDS
- HIV/AIDS in rural Botswana differentiating between informing and educating
- Evaluating the level of perceived fear and desensitization towards HIV/AIDS in Botswana
- Rheumatic Fever in Grenada

- Janssen (via State University of New York) – For the Dengue Surveillance in a Caribbean Travel Population

Unique Projects

- Cox Macpherson, Waechter & Macpherson. Caribbean Research Ethics Education Initiative. NIH-Fogarty International Center.
- McGlade, Gibb, Temmerman, OkelloOriale, Michieka, Forrester, & Macpherson. Health, Polluted Water and Soils: Pathways to Impact. UK Research and Innovation, Global Challenges Research Fund, Global Engagement Networks.
- Penny Light & Colket. The Center for Research on Storytelling in Education - Spring 2021 Research Conference. Spencer Foundation
- Caribbean Research Ethics Education Initiative (CREEi)
- Knowledge, Attitudes, and Practices Regarding Rabies in Grenada: A Cross Sectional Study. Pan-American Health Organization/Government of Grenada. \$10,007.
- Building Climate Resilient Health Systems in the Caribbean: A One Health Approach. Pan-American Health Organization (PAHO). \$20,380.
- Janicke, H., & Stone, D. (2018). Microgrant Award - Council on International Veterinary Medical Education. \$9,500.
- In-country Project Coordinator for the Eastern Caribbean Marine Managed Areas Network (ECMMAN) Project. The Nature Conservancy. \$68,109.
- Caribbean Research Ethics Education Initiative (CREEi). Fogarty International Center National Institutes of Health. \$1,100,000
- Conservation Leadership in the Caribbean (CLiC). U.S. Fish and Wildlife Service, Division of International Affairs, via the International Fund for Animal Welfare (IFAW). \$325,205.
- Characterization of five amphibians inhabiting Grenada and subsequent isolation and antimicrobial assay of potential antibiotics derived from their skin
- Mona monkey studies in West Africa
- Investigation of medicinal plants in Grenada
- Use of medicinal plants in Grenada
- Medicinal drugs from the sea: what do Grenada's waters have to offer?
- Beekeeping in Grenada: effects of the mite *Varroa jacobsoni* and its control
- Effects of Grenadian medicinal plants on endemic microbial causes of diarrhoeal diseases
- The neurobiological basis of hypoglycemia associated autonomic failure
- Stimulation of angiotensin 4 in cardiac fibroblasts activates matrix metalloproteinases through MAP kinases pathways: A model for astrocytes
- REM sleep and memory
- NDA Toolkit & No -Objection Procedure and the Establishment of a Monitoring, Reporting and Verification System (MRVS) -Saint Vincent and the Grenadines
- Center for Research on Storytelling in Education (CRSE)
- The Spencer Foundation – For the Center for Research on Storytelling in Education
- St. George's University – For the One Health Research Initiative
- United Nations Food and Agriculture Organization (FAO) – For the Caribbean CC4 Fish project
- US Fish and Wildlife Service – For the Consumer Behavior Change Campaign

- and Intelligence-led Conservation Capacity Assessment to Address the Illegal Wildlife Trade in Trinidad and Tobago
- WS Atkins International Limited – For the Blue Economy Assessment project
- WINDREF Associated Research Publications (21)**
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- Czaran V, Edwards J, Buchweitz J, Finney C, Chikweto A, Butler BP, Marancik D (2022). Occurrence of Histamine Toxicity and Metal and Mineral Contaminants in Invasive Lionfish (Pterois volitans) in Grenada, West Indies. Caribbean Journal of Science 52 (1), 114-125, 2022.
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MLA , Rhonda Pinckney, Wayne Sylvester, Satesh Bidaisee, Calum N.L Macpherson (2022). Man’s best friend and our shared infectious diseases CABI Reviews 2022 doi.org/10.1079/cabireviews202217052
- Maity S, Jazia Wray, Tamara Coffin, Reetuparna Nath, Shreya Nauhria, Ramsagar Sah, Randall Waechter, Prakash Ramdass, Samal Nauhria (2022). Academic and Social Impact of Menstrual Disturbances in Female Medical Students: A Systematic Review and Meta-Analysis Front Med (Lausanne) 2022 Feb 15;9:821908 10.3389/fmed.2022.821908.
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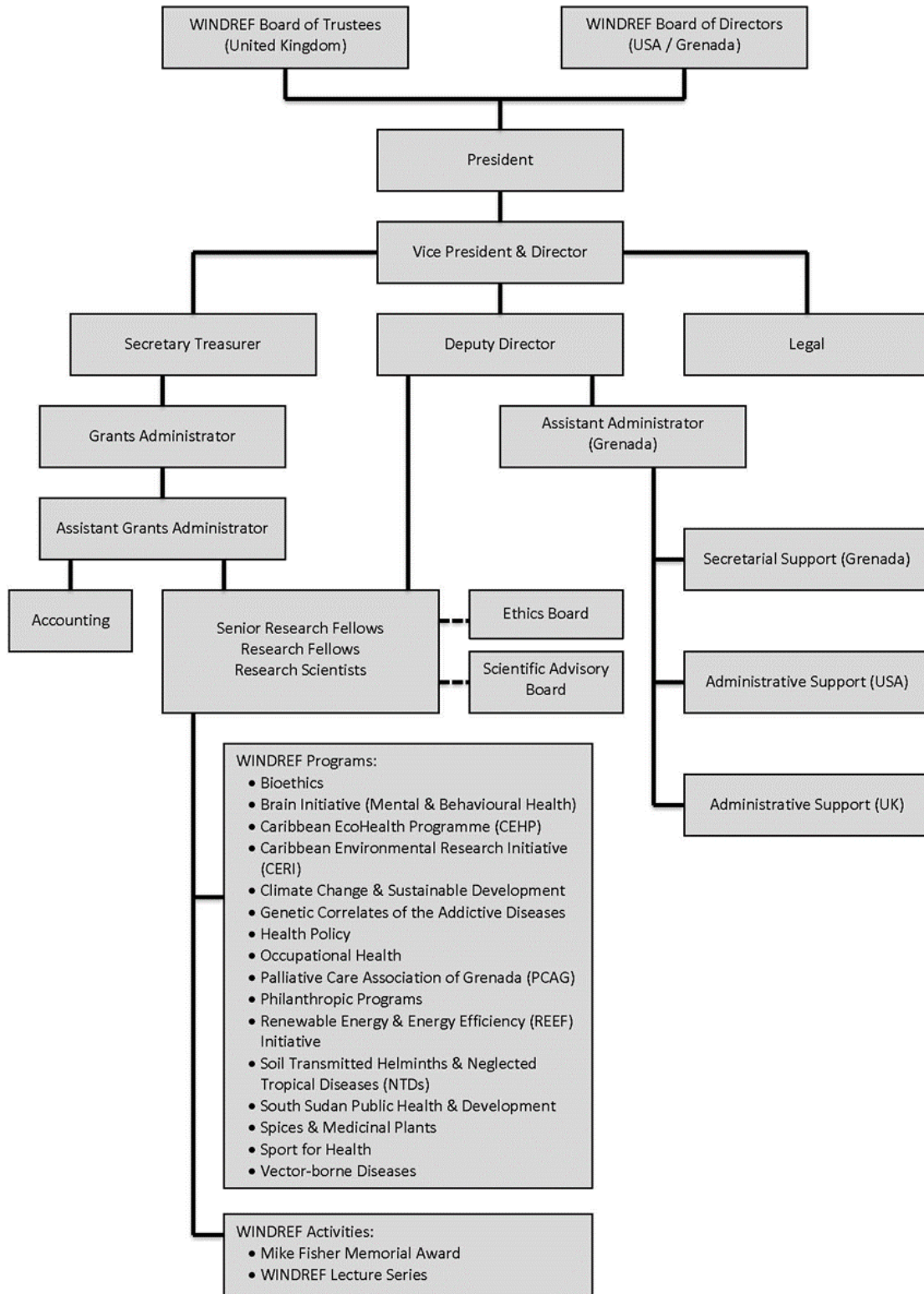
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- Abstracts/Presentations at International Conferences (0)**
- Thesis Defenses (14)**
- Dr. India Paharsingh: "Establishing hematological and biochemical reference intervals in Grenadian Pothounds" January 12th, 2022
- Ms. Maxine Macpherson: "Determining the Prevalence of Ecto and Endoparasitic Zoonoses in Young and Adult Dogs in Grenada, West Indies" January 19th 2022
- Dr. Wayne Sylvester: "Strategies for the Elimination of *Toxocara canis* in Grenada, West Indies" March 2nd 2022
- Ms. Molly Ziegler: "An overview of toxocarasis and the public health significance of *Toxocara canis* in Grenada: a seroprevalence study" March 9th 2022
- Huidi Shucheng: "Therapeutic Effect and Mechanism of Cannabidiol in the Management of Psoriasis" April 6th 2022
- Ms. Maxine Macpherson: "Determining the Prevalence of Ecto and Endoparasitic Zoonoses in Young and Adult Dogs in Grenada, West Indies" April 13th 2022
- Dr. Rachael George-St. Bernard: "Morphometry of the Achilles Tendon" April 27th 2022
- Ms. Ashleigh McLeish: "Identification of Zoonotic Bacteria of the Order Rickettsiales in Tissues, Blood and Ectoparasites of Mongooses (*Herpestes auropunctatus*) in Grenada, West Indies" May 4th 2022
- Ms. Taylor Hanna: "Analysis of Oncogenic Mutation Panel Among a Cohort of Grenadians with Personal or Familial History of Cancer" May 18th 2022
- Ms. Alyssa Ungemach: "Development of an infectious disease challenge model in tilapia and testing pathogenicity of an emerging fish pathogen" October 19th 2022
- Ms. Jacqueline (Paige) Coughlin: "Molecular identification and genetic characterization of *Aliarcobacter* species isolated from indigenous chickens in Grenada, West Indies" October 26th 2022
- Ms. Emily Meade: "An investigation of the physical characteristics and in vitro antimicrobial activities of local honey sold by beekeepers and supermarkets in Grenada, West Indies" November 2nd 2022
- Ms. Cathryn Waylan: "Detection and Molecular Characterization of *Toxoplasma gondii* in Cats from Grenada, West Indies" November 9th 2022
- Mrs. Erica Hazel-Ann Brathwaite: "Fungal Disease in Dogs and Cats in Grenada" November 16th 2022
- Ms. Dinielle White: "Synthesis of polyethylene glycol capped carbon nanoparti-

cles and evaluation of their antibacterial activity in vitro" December 14th 2022

Graduate Seminars (23)

- Dr. Laura Colket and Mr. Asher Mains: "Making Thinking Visible: Using Canva for Visual Communications in Academic Contexts" February 9th 2022
- Dr. Howard Dryden: "Climate change, Pollution and Public Health: Innovations for the Future" February 16th 2022
- Dr. Satesh Bidaissee: "Survival of the Fittest: A One Health Perspective" March 16th 2022
- Dr. Ron Scapp: "Yes, Multiculturalism Still: Cultural Diversity and Health Care Education" March 23rd 2022
- Dr. Derrick Aarons: "Vital Communications in Medicine" March 30th 2022
- Dr. John Stuart Gilleard: "Molecular genetic investigations of drug resistance in gastrointestinal nematode parasites: from animals to humans and One Health" April 20th 2022
- Dr. Andrew Jameton: "Ethical Adaptation of Health Care and Research Systems to Climate Change" May 11th 2022
- C Hatcher, et al. : "Assessment of Pre-Hospital Measures on Outcomes in Snake Envenomation" August 24th 2022
- L Dass, et al.: "Yoga for Smoking Cessation: A Review of Effectiveness and Feasibility on Sex Differences" August 24th 2022
- R Thomas, et al.: "Investigating the role Private Health Insurance plays in Universal Health Coverage in the Eastern Caribbean States" August 24th 2022
- C J Noël, et al.: "Vaccine Hesitancy: The Grenada Experience" August 31st 2022
- C N L Macpherson et al. : "Rapid antigen tests: a screening tool for SARS-CoV-2 but not a diagnostic test" August 31st 2022
- N Cudjoe et al.: "The evolution of screening and diagnostic testing for SARS CoV2 in Grenada" August 31st 2022
- V Matthew-Belmar et al. : "SARS-CoV-2 Variants and qRT-PCR Cycle Threshold Values" August 31st 2022
- Dr. Helen Bhola-Paul: "Leadership Experiences of Organization Open Innovation in Caribbean Small and Medium Enterprises" September 14th 2022
- Dr. Wendy Grenade: "Regional Health Security: An Antidote for COVID-19 among Caribbean SIDS" September 21st 2022
- Dr. Zanifa Payne: "Financial Literacy and the Business Performance of Grenadian Small Business Owners: A Non-Experimental Correlational Study" September 28th 2022
- Dr. Brendon La Grenade: "Influence of Medical Education Scholarships on Reducing Physician Shortages" October 5th 2022
- Ms. Martha Preddie and Library team (Beverly Adams-Baptiste, Suzanne Papparo, Cheryl Sylvester): "Founder's Library: Supporting Research Through Information" October 12th 2022
- Dr. Paul Garner: "Scandals in Global Public Health" November 23rd 2022
- Dr. Paul Pounder: "Social entrepreneurship and cultural contextualization: A review" November 30th 2022
- Dr. Tracy Penny Light: "Change as/for Learning in higher Education: Reflections on Discourses of Change" December 7th 2022

WINDREF Organizational Chart



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