

Final Reporting Workshop

Caribbean Coastal Pollution Project (CCPP)

2-3 December 2009

Montego Bay, Jamaica

Assessment, Monitoring and Management of Persistent Organic Pollutants (POP) and Persistent Toxic Substances (PTS) in the Coastal Ecosystems of the Wider Caribbean Region

Report of the workshop



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1. Introduction

The Caribbean Coastal Pollution Project (CCPP) aims at the assessment, monitoring and management of Persistent Organic Pollutants (POPs) and Persistent Toxic Substances (PTS) in the Coastal Ecosystems of the Wider Caribbean Region (WCR) and commenced in September 2007. It is being funded by the World Bank through the Canada Persistent Organic Pollutants Fund from the Canadian International Development Agency (CIDA) as well as by UNU-INWEH. The purpose of CCPP is to build a network among environmental managers, analytical laboratories, and other appropriate governmental agencies in countries of the WCR that will be key in measuring, evaluating and then reducing pollution from POPs and other PTS in coastal marine environments. These reductions can be achieved through changes to behaviour that stem releases of pollutants into the environment in upstream agriculture and industry.

A Planning Workshop held in November 2007 reviewed the status of POPs and PTS pollution in the marine environment, rivers and other water bodies close to coastal areas of the eight countries covered by the project (Belize, Dominican Republic, Guatemala, Honduras, Jamaica, México, St Lucia and Trinidad & Tobago). It discussed the obligations of these countries under the Stockholm Convention, and presented an overview of other initiatives/partners dealing with similar issues in the region. It also discussed and refined the scope and implementation modalities of the project.

This was followed by a Regional Workshop in June 2008 in Chaguramas, Trinidad that aimed to consolidate commitment from the participants to join a regional network including the eight participating countries and to finalize the program of activities to be undertaken commencing during the second half of 2008 and during 2009. The workshop also aimed at identifying possible links, collaborations with other activities and/or partners in the region, and to share knowledge and experience on POPs and PTS monitoring in aquatic environments.

The Regional Workshop was followed by an Interim Reporting Workshop held at the Reef Yucatan Hotel in Progreso, Mexico from 20-21 January 2009. This workshop aimed at providing an update on project activities, as well as discussing problems encountered, and suggestions for improvement. It also presented and discussed the research projects, laboratory capacity enhancement, training and monitoring activities planned for 2009 and plans for extending this project beyond the end of 2009.

This Final Reporting Workshop aimed to provide a final update on the project activities, reflect on its achievements, discuss some of the problems encountered, identify gaps, and discuss needs for improvement. It also presented data available from the white grunt monitoring programme and the two research projects as well as the database developed for the monitoring data. Finally, it discussed a possible next phase of the CCPP beyond 2009.

2. Summary of the Workshop

The workshop was held at the Holiday Inn Sunspree Resort, Montego Bay, Jamaica from 2-3 December 2009. All logistical arrangements for the workshop were made by UWI Mona, and Caribbean Academy of Sciences (CAS). Simultaneous interpretation in Spanish and English was provided during the workshop. It was attended by 35 participants including representatives from Universities, laboratories, coastal management agencies, NGOs and Ministries involved in the project, as well as representatives from The World Bank, Ozone/POPs focal area of UNEP Division of GEF – Regional Office for North America, the UNEP Caribbean Environment Programme (CEP) office in Jamaica and the Caribbean EcoHealth Programme (CEHP).

Wednesday, 2nd December

Session 1: Opening and welcome

Dr. Peter Sale, UNU-INWEH, Canada opened the workshop at 9.00 am, welcomed the participants and briefly presented the goals of this workshop. Dr. Tara Dasgupta, Pesticides laboratory, University of West Indies, Jamaica welcomed the participants to Montego Bay and to this workshop and presented some research and analytical activities and projects on POPs that the UWI pesticides laboratory is involved in. This was followed by short self-introductions from all participants.

Session 2: Update on project and monitoring programme

An update on overall project progress was presented by Hanneke Van Lavieren, UNU-INWEH, Canada. This presentation also included a short overview on the status of the white grunt monitoring programme during 2008 and 2009. This was followed by 5- 10 minute updates on sampling from each of the country partners involved in this monitoring programme (Belize, Dominican Republic, Guatemala, Honduras, Jamaica, Mexico, St. Lucia, Trinidad & Tobago). These updates included a discussion of problems encountered as well as short descriptions of sampling sites as well as potential sources of POPs at each site. Summary:

Isaias Majil, Belize: sampling was completed for 2008 and for 2009 at all sites. A dedicated freezer was bought for this sampling programme. The main sources of POPs are: sugar cane, cattle/livestock, rivers (mostly in the rainy season); banana and citrus farming, shrimp farms; city run off. In the Sapodilla cays sources could be rivers coming from Guatemala (Puerto Cortes).

Ramon Delanoy, Dominican Republic: sources include industry (mainly in Haina), citrus, ports, sugar cane. Challenges; planning; the weather; logistics (vehicle); other work conflict; storage;

Bessie Oliva, Guatemala: challenges during the first round of sampling in 2008; succeeded in finding new sites to sample and found fish during 2009. Problems encountered with identification of fish and bad weather. Main sources of POPs are river outflows, banana, pineapple and citrus.

Kay Boden, Honduras: Problems encountered with: customs clearance paperwork, permit, only one enterprise to send samples with, no freezers but only cooling system to store, shipment delays, thawed samples. Kay also indicated that they do not require sampling money for this round and we could use this for analysis.

Anthony Greenaway, Jamaica: Problems encountered: first round in the time frame given no fish found so then some fishermen were asked to collect them, logistical issues, thawed samples, no white grunt found at two sites. Sampling round 2: started collecting at 4 sites; remaining 4 sites difficult due to weather. Sources of POPs are: runoff watersheds, limestone on west side, citrus, sugar cane, cattle, banana, coffee, small scale farming, rivers, tourism.

Jose Calderon – Mexico: Only 2 sites not sampled so far. 2008 round: 9 sites sampled; 2009 round: 11 sites sampled. Problems encountered: identification, coordination of collectors at Puerto Aventuras, no time in combination with other work. Sources of POPs: agriculture near Belize and Guatemala; sugar mills: pig farming, poultry, sewage, cattle, golf courses.

Thomas Nelson, St Lucia: 6 sites sampled – changed one site. Sources of POPs: banana farming, industry, tourism, crude oil. Problems with: logistics, and delays in arranging fishermen. Dept of Fisheries should be included in collection from the start. The Dept should arrange storage, collection etc. The need to get a dedicated freezer.

Wendy Norville, Trinidad and Tobago: 2008 sampling round: all sites sampled. 2009 sampling round: 4 sites sampled in Trinidad and 2 sites Tobago pending. Sources of POPs: agriculture, rivers, urban run off, industry, and shipping.

This was followed by a presentation by **Dr. Gerardo Gold, CINVESTAV, Merida Mexico who presented data on biomarkers in the white grunt (*Haemulon plumieri*) and levels of organic pollutants in sediments from the Mesoamerican Barrier Reef** as part of the MBRS project. Within the MBRS project, 13 sites were sampled and 5 fish were collected per site. They found some data that were above the EPA guidelines, mostly around Belize and Guatemala and he suggested that the contaminants of main concern were: DDTs and lindane.

Roberto Rivas from the Gulf of Honduras indicated that he also collected white grunt as part of the Gulf of Honduras project during 2008 and analyzed these data in a lab in the USA. When the data are available we can access it. Based on all these data, the white grunt could become a so called “Bio indicator species” for the Caribbean. Is white grunt a good bio indicator? Should we do a research project to compare the data?

After lunch, the preliminary **monitoring results for the white grunt were presented by Dr. Ken Drouillard, University of Windsor, Canada**. He presented analysis data from Trinidad (6 samples (6 sites)); St. Lucia (5 samples (5 sites)) ; Jamaica (7 samples (7 sites)) ; and Belize (26 samples (5 sites)). Only a small portion of designated samples have been completed to date from Jamaica, St. Lucia, Trinidad, Belize. We are still expecting data from Honduras, Guatemala, Mexico, Dominican Republic. PCBs found were all below the US limits. Jamaica, Trinidad and Belize dominated by lower congener profiles and St. Lucia had a greater abundance of higher KOW PCBs, possibly different source profile? More data are required to confirm this.

No major hot-spots were identified from completed samples. All POPs compounds in white grunt dorsal muscle are low relative to fish consumption advisory triggers. This is partly due to low trophic position and lipid content of chosen bioindicator species. Quality assurance issues flagged and should be pursued. There is a need for careful chromatogram reading and analysis with GC MS.

A discussion followed on the data and discussed the following questions; are there any POPs hotspots, or none? Are we looking at the wrong chemicals? Is POPs contamination a real problem in the coastal areas in this region. A presentation followed by **Hanneke van Lavieren and Dr. Chris Metcalfe on the Monitoring database**. A short discussion followed this session on the data, and database. The issue of property rights was raised and the need to define who can use the data for their own purposes. How to involve students? Access to data? Where it will be based? Who will maintain it? The need to link it to other databases in this region was also mentioned. Most mentioned it would be a useful tool and hoped it would become openly available. It was noted that one issue is the turnover of personnel and other capacity issues.

Hanneke Van Lavieren briefly presented an overview of all the problems encountered within the monitoring programme during the course of the project. A short general discussion followed on the different problems encountered and how to improve the time needed for sampling and sending of samples to the regional laboratories. Participants agreed that the experiences learnt from the first sampling round will ensure a much better turn over during the next round.

[Session 3: Update on laboratory capacity assessments](#)

Dr. Chris Metcalfe presented an update on the capacity building activities within the project. This included an overview of training of laboratory staff, Laboratory equipment upgrades, instructional video etc. It was noted that as a next step, the satellite laboratories (those that are not involved in analysis) can possibly do the extractions of the fish samples before sending them to the regional labs in either Jamaica or Mexico for analysis.

Dr. Ken Drouillard reported on the implementation of the baseline POPS monitoring program & interlaboratory assessment results. A short overview was given on the requirements and

procedures of quality control procedures in laboratories. It presented the outcome of the inter-laboratory comparison exercise between the two regional labs (UWI Jamaica and CINVESTAV Mexico) and the two Canadian labs at the Universities of Windsor and Trent, using certified reference material provided by IAEA Monaco lab (Tuna Homogenate). The results showed that overall the results were in reasonable agreement amongst the four laboratories. For PCBs overall the UWI laboratory in Jamaica had good results, and the CINVESTAV laboratory had quite a few points off. For OCs it showed that CINVESTAV had a better performance with no points off, and UWI had a few points off. Some improvements to ensure better quality of data are needed in future. These could include external audits of regional laboratories by independent quality managers and documentation of QA/QC, quality control charts etc.; development of cross regional quality assessment reports; and participation in international round-robin testing programs.

Presentations followed by the regional laboratories on their **experiences with the monitoring programme and inter lab comparison exercise and difficulties and problems encountered.**

Raymond Reid, UWI indicated they had some problems with the stocking up of certain laboratory apparatus, delays in importing glassware, power problems and problems with retraining lab staff. Gerardo Gold, CINVESTAV indicated the delay in receiving samples, problems with customs and import tax; delays in extraction and delay in delivery of the GC ECD machine.

Thursday 3rd December

Session 4: Update on research projects

Results of the two demonstration research projects as part of the project were presented.

Dr. Chris Metcalfe presented his results of passive samplers in the Yucatan Mexico during 2008/2009. Title of this presentation was: **Wastewater Contamination in Freshwater Aquifers in the Maya Riviera, Mexico.** At the 5 caves/aquifers sampled, a range of contaminants was found such as pesticides, non prescription drugs, personal care products and illegal drugs. Levels were moderate to low and higher at sites near to golf courses and tourist resorts. Marea Hatzolis suggested that we link to the work done on aquifer contamination under the Coral Reef Targeted Research project (CRTR) in Puerto Morales Mexico by Roberto Iglesias.

Dr. Ken Drouillard and Ms. Ann Tenneil, a graduate student at UWI Mona in Jamaica presented data from the project: **Spatial distribution of Persistent Organic Pollutants using oysters as biomonitors.** They found there was no significant difference between Jamaica and Trinidad sites in the PCB profiles. Average levels were low compared to the Detroit River. All compounds found were found at levels lower than US guidelines.

A short discussion followed on sampling techniques used. A suggestion was made to compare the results found from the white runt monitoring, the passive samplers and the oysters. It was

also mentioned that we should consider sampling other fish species (edible ones). Should we make a stronger link to human health? Species eaten differ per country and so do fish consumption rates. Are we looking at the right chemicals? For example other chemicals are problems in the region such as: Tributyl tin, an anti fouling chemical is an issue in the Caribbean. It was also suggested that the project could involve more local students and researchers. Involve the other labs more in the monitoring programme as well if we have a next phase.

Session 5: Specific awareness and knowledge building presentations

Dr. Chris Metcalfe **discussed emerging POPs and PTS**. He gave an overview of the different chemicals in the original dirty dozen and the nasty nine added in May 2009, their sources, impacts and levels elsewhere. Dr. Metcalfe indicated that many POPs sources moved from the northern hemisphere to southern during the past decades. The first data on PDBEs from this region were presented for samples of the white grunt from Belize. Levels found compare to levels found in herring in the Baltic Sea.

This was followed by a presentation from Ms. Christine Wellington UNEP DGEF Regional Office for North America, on: **The ‘Nasty Nine’: 9 New POPs of the Stockholm Convention, the response of the GEF, and the setting of priorities in the Caribbean region**. Ms.

Wellington presented the strategic priorities of the Chemicals Focal Area for the GEF V replenishment. The goal of the GEF’s chemicals program draft GEF-5 strategy seeks to:

- a) Consolidate the persistent organic pollutants and ozone layer depletion focal areas.
- b) Broaden the scope of GEF’s engagement with the sound management of chemicals (including recognition of the chemicals and waste Convention clusters); and to
- c) Initiate work on mercury.

The 3 objectives for the Chemicals focal area for GEF V are:

- 1) Phase out POPs and reduce POPs releases;
- 2) Phase out ODS and reduce ODS releases; and
- 3) Pilot sound chemicals management and mercury reduction.

In the next phase of this project, linking to the countries’ National Implementation Plans for the Stockholm Convention is crucial. It was mentioned in a discussion that followed that many countries need more support to implement their NIPs, as well as that most countries in this region are going to attend a meeting in Panama in January 2010 to review and update their NIPs. This meeting outcome may be important as input to the next phase proposal for CCPP.

Session 6: Plans for the future and updates from partners

This session started with a presentation by Dr. Peter Sale of the **proposal prepared by UNU INWEH for a possible follow-up phase to the CCPP project**, application for possible GEV V funding and the next steps. This was followed by short updates from project donors/partners:

- Marea Hatzliolis, World Bank
- Christine Wellington, UNEP/DGEF RONA

- Nadia Deen Ferguson, Assessment & Management of Pollution (AMEP) sub-programme of UNEP CAR/RCU & Reducing Pesticide Run-off into the Caribbean Sea Project (UNEP GEF-REPCar)
- Lyndon Robertson, CEHP project
- Roberto Rivas, Gulf of Honduras Project

Short presentations were then given by some of the new members to the network/project on related activities in their countries, their willingness to become part of the project as well as their mandates:

- Danelia Sabillon, CESCO SERNA
- Ana Dolores Arevalo, Ministry of Environment, Guatemala
- Gillian Guthrie, Ministry of Environment, Jamaica
- Kendrick Gordon, Department of Environment, Belize

A short general discussion followed on the proposal from UNU INWEH for a possible follow up phase to the CCPP and the roles of each partner, next steps in planning process & closing remarks.

[Future steps for the project](#)

The following components were suggested as part of a possible follow up proposal:

1. Build capacity to manage pollution:
 - Build capacity in regional laboratories and management agencies to sample, analyze, evaluate, and remediate chemical pollution in coastal waters
 - Requires technical training and education on pollution risk management, new instrumentation, enhanced budgets, new integration of agency efforts
2. Build regional monitoring program with public reporting of status and trends:
 - Build region-wide comprehensive monitoring program with open database and ‘state of the coasts’ reporting every 4th year
 - Build on use of White Grunt model, expand effort to new pollutants and in other ways as appropriate and within capability, and share data
3. Report publicly to assess improvements:
 - A concerted effort to change values and perceptions and build support for sustainable coastal management
 - Build community understanding of costs of pollution and need for mitigation
 - Substantial, with outreach to schools, stakeholders, government, general public
 - Driven by local agencies, NGOs, with science input
4. Set of local demonstration projects providing local positive outcomes:
 - Series of local demonstration projects appropriate to the capacity-building effort, and designed to show benefits of improved management

- Design them to include new science, build knowledge, encourage adaptive management, solve specific problems identified as locally important, and integrate to other projects happening in the region where possible
5. Substantial public education program on the value of sustainably managed coasts:
 - A concerted effort to change values and perceptions and build support for sustainable coastal management
 - Build community understanding of costs of pollution and need for mitigation
 - Substantial, with outreach to schools, stakeholders, government, general public
 - Driven by local agencies, NGOs, with science input
 6. Administrative structure facilitating inter-agency and multi-national deliberation and consultation:
 - Administrative structure for project that will foster deliberations across agencies and between neighboring states
 - Structure must link local components into the regional goals
 - Structure might have a post-project life as a regional consultative body
 - Details will be driven by existing structures in participating states
 - A way to link management to government

Some steps to be taken in order to develop this project:

1. Build support among critical participants in each country; consider additional countries
2. Build understanding/cooperation with other projects operating in the region
3. Ensure commitment from World Bank
4. Build support within the GEF for this project
5. Seek matching funds, support of country GEF representatives, and commitments from participating countries

1. Annexes



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Agenda

Final Reporting Workshop

Caribbean Coastal Pollution Project (CCPP)

Assessment, Monitoring & Management of Persistent Organic Pollutants (POPs) & Persistent Toxic Substances (PTS) in the Coastal Ecosystems of the Wider Caribbean Region

Holiday Inn Hotel, Montego Bay, Jamaica
2-3rd December 2009

Wednesday, 2nd December

Session 1: Opening and welcome

8:30 Registration

9.00-9.15 **Welcome and opening remarks**

Peter Sale, UNU-INWEH, Canada

Tara Dasgupta, University of West Indies, Jamaica

Personal introduction by each participant

Session 2: Update on project and monitoring programme

9.15-10.00 Update on overall project progress
Hanneke Van Lavieren, UNU-INWEH, Canada

10.00-10.45 Short overview on status of 2009 white grunt sampling (5 minutes each country)
Belize, Dominican Republic, Guatemala, Honduras, Jamaica, Mexico, St. Lucia, Trinidad & Tobago

10.45-11.00 *Coffee break*

11.00-11.30 Preliminary monitoring data,
Ken Drouillard, University of Windsor, Canada

11.30-12.00 White grunt in MBRS project

Gerardo Gold

12.00-13.30 *Lunch*

13.30-14.00 **Monitoring database**, Chris Metcalfe and Hanneke Van Lavieren

14.00-14.30 General discussion: Problems encountered in monitoring programme and how we can improve this

Hanneke Van Lavieren

Session 3: Update on laboratory capacity assessments

14.30-15.00 Laboratory upgrades, instructional training video, training in Canada, Chris Metcalfe

15.00-15.30 *Coffee break*

15.30-16.00 Results of the laboratory inter-comparison exercise, Ken Drouillard

16.00- 17.00 **Presentation by regional laboratories- experiences and difficulties with extractions, analysis, database etc.**

Raymond Reid and Gerardo Gold, CINVESTAV, México

17.00 Workshop adjourned

*** Evening Social Event ***

Thursday, 3rd December

Session 4: [Update on research projects](#)

9.00-9.30 **Passive sampler project in the Yucatan Peninsula**, Chris Metcalfe

9.30-10.00 **Quantitative biomonitoring of POPs in Caribbean coastal zones using oysters**, Ken Drouillard

10.00-10.30 **General Discussion: Next steps research? *What else is needed so that the database becomes web-based with regional and open access? What training is needed for regional laboratories to reach independence? What other capacity building activities do we need if we move to next phase?*** Chris Metcalfe, Hanneke Van Lavieren and Ken Drouillard

10.30-11.00 *Coffee break*

Session 5: [Specific awareness and knowledge building presentations](#)

11.00-12.00 **The 9 new Stockholm Convention POPs – what are they and what does this mean? Other chemicals we can focus on?** Chris Metcalfe

'Nasty Nine': 9 New POPs of the Stockholm Convention, the Response of the GEF, and the setting of priorities in the Caribbean region.

Christine Wellington, UNEP DGEF/RONA, USA

12.00-13.30 *Lunch break*

Session 6: Plans for the future and updates from partners

13.30 - 14.00 **Presentation of proposal for follow-up phase and next steps**, Peter Sale

14.00 – 16.00 **Short updates from Partners (5 - 10 min each)**

Marea Hatziolis, World Bank

Christine Wellington, UNEP GEF

Nadia Deen Ferguson, Assessment & Management of Pollution (AMEP) sub-programme of UNEP

CAR/RCU & Reducing Pesticide Run-off into the Caribbean Sea Project (UNEP GEF-REPCar)

Lyndon Robertson, CEHP project

Roberto Rivas, Gulf of Honduras Project

15.00 – 15.15 *Coffee Break – to be taken within session*

New participants, short overview of initiatives in their countries:

Danelia Sabillon, CESCO SERNA

Ana Dolores Arevalo, Ministry of Environment, Guatemala

Gillian Guthrie, Ministry of Environment, Jamaica

Kendrick Gordon, Department of Environment, Belize

16.00-17.00 **General discussion: *proposal phase 3, role of each partner, how to reach the public, need for stakeholder & public consultations and advice, next steps in planning process & closing remarks.***

Peter Sale and Hanneke Van Lavieren

***** 17.00 - Workshop Close *****



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Participants List

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2-3rd December 2009, Montego Bay, Jamaica

#	Participant	Organization	Email
Belize			
1	Isaias Majil	Fisheries Department Ministry of Agriculture, Fisheries & Cooperatives P.O. Box 148, Princess Margaret Drive, Belize City, Belize Tel: 501-223 2623 ext. 24	isaias.majil@gmail.com
2	Kenrick Gordon	Environment Technician Department of Environment 10/12 Ambergris Avenue Belmopan, Belize	kenrickgordondoe@yahoo.com; envirodept@btl.net
Dominican Republic			
3	César Augusto Pérez	Departamento de Monitoreo Ambiental para Calidad de Agua Subsecretaria de Gestión Ambiental Secretaria de Estado de Medio Ambiente y Recursos Naturales Ave. 27 de Febrero Esq. Tiradentes Plaza Merengue, 2do. Piso Ensache Naco, Santo Domingo Tel: 809-4720686 Fax: 809-472-1198	cesaraugusto420@hotmail.com

4	Ramón Delanoy de la Cruz	Lab. Ciencias Nucleares, Instituto de Fisica Universidad Autonoma de Santo Domingo Santo Domingo, Republica Dominicana Tel: 1 809 689-7184 Cell: 1 809 330-2709	ramondelanoy@yahoo.com
Guatemala			
5	Ana Dolores Arevalo	Stockholm Convention Ministry of Environment and Natural Resources Guatemala	mcastillo@marn.gob.gt; convenios@marn.gob.gt
6	Bessie Oliva	Laboratorio de Investigacion, Depart. de Análisis Inorgánico Universidad de San Carlos de Guatemala Edificio T-12 Segundo Nivel Ciudad Universitaria Zona 12, Guatemala Tel: (502) 2288 7808 Fax: (502) 2476 7728	bessieoliva@yahoo.com; bessie2@intelnett.com
Honduras			
7	Danelia Sabillon Rodriguez	Directora General Centro de Estudios y Control de Contaminantes (CESCCO) / Secretaría de Recursos Naturales y Ambiente (SERNA) Tegucigalpa, HONDURAS Tel: (504) 239 0194/231 1006/232 6317 Fax: (504)239 0954	dsabillon@serna.gob.hn; danelia.sabillon@yahoo.com
8	Kay Regine Bodden Heustis	Unidad de Gestión Ambiental Municipalidad de Puerto Cortes (UGAM) Barrio Copen 5 calle, 9 avenida Estadio Excelsior Segunda Planta, Honduras	ugampc@gmail.com
9	Roberto Rivas	Gulf of Honduras Project TDA/SAP Puerto Cortes, Honduras Tel: (504) 665 23 43 Tel/Fax: (504) 665 3072	robrivasa@yahoo.com
Jamaica			
10	George Williams	Bryans Bay Fishing Village Port Antonio, Portland Jamaica	
11	Gillian Guthrie	Environmental Management Division Ministry of Environment 16a Half Way Tree Road Kingston 5, Jamaica	emdmle@yahoo.com

12	Raymond Reid	Senior Analyst, Pesticide Research Laboratory Department of Chemistry The University of the West Indies (UWI) Mona, Kingston 7, Jamaica W.I. Tel: 876-512-3116/426-6978 Fax/Phone: 876-970-3878 Fax: 876-977-1835/970-3878	raymond.reid@uwimona.edu.jm
13	Tara Dasgupta	Emeritus Professor of Chemistry President, Caribbean Academy of Sciences Manager & Head, Pesticide Research Laboratory The University of the West Indies (UWI) Mona, Kingston 7 Jamaica W.I.	tara.dasgupta@uwimona.edu.jm
14	Tony Greenaway	Senior Lecturer, Applied Chemistry The University of the West Indies (UWI) Mona, Kingston 7, Jamaica W.I. Tel: (876) 927-1910 Tel: (876) 512-3029 Fax: (876) 977 1835	anthony.greenaway@uwimona.edu.jm
15	Ann Tenneil O' Connor	Student The University of the West Indies (UWI) Mona, Kingston 7, Jamaica W.I.	
Mexico			
16	Albert Franquesa	Conservacion de Agua Dulce Amigos de Siaan Ka'an Calle Fuego # 2, Mza 10, SM. 4 Cancún, Quintana Roo, México C.P. 77511 Apartado Postal 770 Tel: +52 (998) 892 29 58 y 59	afranquesa@amigosdesiankaan.org
17	José Juan Dominguez Calderón	Subdirector Técnico Reserva de la Biosfera Banco Chinchorro Región Península de Yucatán y Caribe Mexicano CONANP Subdirector Av. Insurgente 445 2do piso, 77039, Chetumal Quintana Roo, México Tel: +52 983 2854623	jdominguez@conanp.gob.mx
St. Lucia			

18	Thomas Nelson	Fisheries Biologist Department of Fisheries Ministry of Agriculture, Lands, Forestry and Fisheries Pointe Seraphine, Castries, St. Lucia Tel:(758)468-4141/4135(work) Cell:(758)716-0836 Fax:(758)452-3853	tomfinch90@hotmail.com
19	Yaneldis Boullon- Anthony	Analytical Chemist and Pesticide & Toxic Chemicals Board representative Research and Development Division Ministry of Agriculture, Lands, Forestry and Fisheries Union Agricultural Station Castries, Saint Lucia Tel: (758) 468 5600/4 Fax: (758) 450 3206	yanedelgado@gmail.com
Trinidad and Tobago			
20	Nicole John- Thomas	Lecturer Department of Chemistry Faculty of Sciences and Agriculture The University of the West Indies (UWI) St. Augustine, Trinidad and Tobago Tel: 1-868-662-6013	Nicole.John@sta.uwi.edu
21	Wendy Norville	Research Officer/Chemist Institute of Marine Affairs (IMA) Marine Chemistry Department Hilltop Lane, Chaguaramas Trinidad, West Indies	wnorville@ima.gov.tt
Partners			
22	Christine Wellington Moore	Task Manager Ozone/POPsUNEP DGEF/RONA900 17 th Street, NW, Suite 506 Washington, DC 20006, USA Tel: +1 (202) 974-1303 Fax: +1 (202) 223-2004	christine.wellington- moore@unep.org
23	Lyndon Robertson	Caribbean EcoHealth Programme (CEHP) & Atlantis Mobile Laboratory (AML) Ross University School of Medicine P.O. Box 266, Picard, Portsmouth Commonwealth of Dominica Tel: 767 445 5355 Ext. 6315 Tel: 767 255 6315	CEHPAtlantis@gmail.com

24	Marea Hatziolis	International Waters Specialist The World Bank, MC5-523 1818 H Street, NW Washington DC, 20433, USA	Mhatziolos@worldbank.org
25	Nadia-Deen Ferguson	AMEP Assistant Programme Officer UNEP CAR /RCU 14-20 Port Royal Street Kingston, Jamaica WI	ndf@cep.unep.org
Coordinators			
26	Chris Metcalfe	Professor and Institute Director Trent University & Institute for Watershed Sciences 1600 West Bank Drive Peterborough, Ontario, K9J 7B8, Canada Tel: (705) 748-1011 ext. 7272 Fax: 705-748 1569	cmetcalfe@trentu.ca
27	Englebert Davis	Caribbean Academy of Sciences - Secretariat 2 Plymouth Crescent University of the West Indies Mona, Kingston 7 Tel/Fax: (876) 977-7764	englebert@caswi.org
28	Gerardo Gold Bouchot	CINVESTAV Unidad Mérida Km. 6 Antigua Carretera a Progreso Apdo. Postal 73, Cordemex, 97310 Mérida, Yucatan, México Tel: +52 (999) 981-2927 Fax: +52 (999) 942-9461	ggold@mda.cinvestav.mx
29	Hanneke Van Lavieren	Programme Officer, Coastal Zones United Nations University - International Network on Water, Environment & Health (UNU-INWEH) 175 Longwood Road South, Suite 204 Hamilton, ON L8P OA1, CANADA Tel: +1 905 667 5494 Fax: +1 905 667 5510	vanlav@inweh.unu.edu
30	Ken Drouillard	Head, Organic Analytical Laboratory Associate Professor, Biological Sciences Great Lakes Institute for Environmental Research University of Windsor 401 Sunset Ave. Windsor, ON, N9B 3P4, Canada Tel: (519) 253-3000 ext. 4744 Fax: (519) 971-3616	kgd@uwindsor.ca

31	Peter Sale	Assistant Director, UNU-INWEH Professor Emeritus, University of Windsor 1047 Brandy Crest Road, RR#1 Port Carling, Ontario, Canada P0B 1J0 Tel: +1-705-764-3359 Fax: +1-705-764-3360	sale@uwindsor.ca
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