portside
CARIBBEAN

PMAC – Portside Caribbean Port Management Workshop a Final Report

The port is 'the critical component'

AN OVERVIEW OF THE 2018 CARIBBEAN PORT MANAGEMENT WORKSHOP

BY MIKE JARRETT

Many came to Panama with the howling winds of hurricane destruction still fresh in memory. It was only January and the Caribbean and Southern USA had taken a severe battering from several hurricanes less than six months earlier; leaving a death toll that was still being tallied up to the time of writing.

They came with the hope of finding solutions but also with a determination to address problems, natural and man-made. At the end, participants attending the inaugural Caribbean Port Management Workshop felt that it was an important annual event for port authorities and marine facility owners and operators; port planners and designers; and, port management personnel. Indeed, representatives from two countries immediately indicated an interest in hosting the next workshops: Jamaica in January 2019 and Curacao in January 2020.

ANCHOR POINT

As I said in a previous editorial, this inaugural event became the anchor point for a process to create a new, apolitical regional forum of decision-makers that have been assigned the monumental task of managing sustainable development but with limited resources.

PHILOSOPHY, MISSION, METHODOLOGY

Three questions came to mind as the initial thoughts for this event took form: Why? What? How?

- Philosophically, the workshop was built on the notion that, in the normal course of development, in fair weather and in the process of recovery from disasters, the port is *the critical component;* and that all involved in their design, construction and operation need to be in dialogue.
- The mission was to create a new and unique channel for discussion and exchange of best practices across the region.
- The concept for content delivery and feedback embraced non-traditional methods of information exchange; two-way communication techniques; and, preferably, provide a hands-on, shirtsleeves learning experience. In this regard, the planning team often recited the line *'workshop, not talk shop'.*

On Day 1, two tracks of information were presented simultaneously in different rooms. Track 1 covered a range of subject and issues related to Climate Change. Track 2 addressed Disaster Preparedness and Relief. Track 3, on Day 2 had two segments and was arranged as a plenary chaired by Dr. Everton Walters, CBE, entitled Regional Management Strategies.

TRACK 1: CLIMATE CHANGE

Information and data were presented under the topics:

- **Ecosystem services used to protect coasts and harbours** by Jesper Goodley Dannisøe of DHI
- **Use of remote sensing technologies for bathymetry and monitoring** by Rasmus E. Borgstrøm
- **Climate change expectancies for the Caribbean region** by Carlinton Burrell, Climate Innovation Centre, Caribbean
- **Shoreline management and a changing climate** by Berry Elfrink of DHI Group
- **Optimising harbour designs to cope with climate changes** by Danker Kolijn, CBCL
- **Use of a novel port management system with focus on water-related challenges** by Henrik Kofoed-Hansen, DHI

Track 1 gave participants an opportunity to look at the global effects of climate change and to review the latest satellite-based technology and systems for designing, sustaining or expanding harbours and port facilities.

Presenters made the point that we are now living in an era in which climate change has started to have a major impact on societies. In this regard, the port cannot be separated and must be seen as being in symbiosis with the sea, the land and the society. The port also needs to change and adapt. This was the focal point for Track 1.

LIVELY DISCUSSION

Through six different inputs, various tools and concepts for climate change adaptation was discussed. A lively discussion filled the room as participants freely shared their own experiences and, in the process, brought different experiences, approaches and strategies into consideration. This, at the very least, was a model exercise in the exchange of best practices

Also highlighted in Track 1 was that: advanced technology was available and that many of the tools were global; that initiatives to protect a city in Asia, for example, could readily utilise the same tools and approaches as those used in the Caribbean; and, *vice versa.*

Participants in Track 1 agreed that despite the urgencies forced on us by the awesome and destructive forces unleashed by hurricanes, it was just as important to urgently address the less forceful manifestations of climate change, including sea level rise and torrential rainfall, which are already a reality.

"This inaugural event became the anchor point for a process to create a new, apolitical regional forum of decision-makers that have been assigned the monumental task of managing sustainable development but with limited resources"

It was felt that governments and port operators must actively prepare for increasing sea levels and heavy rainfall and the consequential effects (*e.g.* flash flooding) as matters of urgent priority.

TRACK 2: DISASTER PREPAREDNESS /RELIEF

Information and data were presented under the topics:

- **Tier1/2 Oil spill & firefighting response**
  by Jim Elliott, Chairman American Salvage Association
- **Incident management planning for oil spills**
  by Cdr. Keith Donahue, Rac/Rempeit-C
- **Tier-3 Oil spill response**
  by Paul A. Schuler, Director Regional External Affairs, Oil Spill Response Ltd.
- **Past Hurricane Season Relief Efforts – Lessons Learned**
  by Capt. van Eerden, Commander of Dutch Navy frigate Zr. Ms. Pelikaan
- **Salvage operations in hurricane-affected ports**
  by Cesar Corcuera T&T Salvage, Panama
- **After the Perfect Storm: rebuilding a cruise destination**
  by Alexander Gumbs, Port of St. Maarten; and, Julie-Anne Burrowes, Onboard Marketing Inc.

Track 2 gave participants an opportunity to review and discuss trending techniques and strategies for disaster management and response.

Presenters delivered convincing arguments and data to prove that the impact of major disasters on the national economies of the region was increasing. In this regard, governments were urged to adopt integrated disaster management plans that have a wider scope than just the port area. Such plans, it was argued, should include stakeholder risk and impact assessments as well as a tiered approach to preparing for and reacting to disasters.

Integrated plans, it was said, should include procedures to upscale to higher alert levels and, when events escalate, to engage international help.

TRAINING EMPHASISED

Training was emphasised and there was consensus that all private and public sector stakeholders involved must be trained. For example, plans must be in place to facilitate the rapid acquisition and deployment of tier 3 oil spill equipment. All customs, immigration and permit arrangements must already be in place and tested so as to facilitate the quick deployment of equipment and personnel from outside the country to the affected locations.

For outside military assistance in the case of natural disasters, like earthquakes and hurricanes, procedural matters must be addressed by officials and authorities in 'good time', because, as was pointed out, government services and communication systems may not be functional at the time such permits are required. In this regard, emergency procedures should be established beforehand by way of diplomatic channels and internationally, through regional organisations.

It was felt that PMAC can assist its member-ports to: (a) bring together stakeholders on the regional level; (b) assist in updating and distributing national disaster management plans; and, (c) oversee regional drills and exercises in preparation for hurricane seasons.

TRACK 3: REGIONAL MANAGEMENT STRATEGIES

- **Disaster management and the critical role of the maritime industry**
  by Dr. Kornel Brown
- **Capacity Building in Port Logistics for Disaster Risk Management**
  by Jorge Durán, Inter-American
- **FORUM: Building a Regional Disaster Assistance and Relief Network**
  - an inter-agency discussion

The first of the two segments in Track 3 featured presentations by Dr. Kornel Brown of the Caribbean Maritime University and Jorge Durán of the Inter-American Committee on Ports. This was followed by a discussion forum of all participants, entitled: Building a Regional Disaster Assistance and Relief Network.

This latter discussion, which generated much interest prior to the event and brought attendance from a number of regional organizations including CARICOM and CEDEMA, the World Meteorological Organization (WMO) and Regional Logistics Centre for Humanitarian Assistance (CLRAH) located in Panama.

Discussions towards the establishment of a quick-response regional disaster assistance and relief network brought a wealth of ideas and perspectives to the forum. The idea that the entire region faces the reality of hurricanes every year and that this was a normal condition of living in the Tropics was the context for much of the ideas and statements presented. Indeed, hurricanes are 'normal' to the Caribbean and that it was for the people of the Caribbean to structure a response to this annual eventuality.

As one participant (Steve Cosham of Bermuda) wrote afterwards: "Hurricanes, earthquakes, tsunamis and droughts happen and there is nothing we can do to stop them, BUT what we can do is to take these natural disasters and turn them into hazards; hazards that naturally occur; that if we (properly) prepare for them, when they do occur we will be as ready as we can be."

The consensus at the end of Track 3 was that the building of a regional disaster response network, involving many countries and regional institutions, required further discussion. The host organizations – PMAC, CMU and PORTSIDE CARIBBEAN pledged to facilitate the continuation of this dialogue. ●

KEYNOTE SPEAKERS

Carlos Manuel Gómez Rudy - Panama

Hernan Ayala-Rubio - Puerto Rico

Sherman Williams - Anguilla

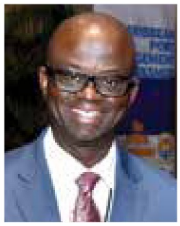
THE PRESENTERS

FRITZ PINNOCK

Professor Fritz Pinnock is President of the Caribbean Maritime University. A Doctor of Philosophy in Sustainable Cruise Tourism (University of the West Indies), he holds an a M.Sc. degree in International Shipping and Logistics from the University of Plymouth, United Kingdom and a B.Sc. (Hons.) in Economics and Accounting (Management Studies) from the University of the West Indies, Mona Campus, Jamaica. Prof Pinnock is also a Fellow of the Chartered Institute of Logistics Transport (FCILT), UK and a Fellow of the Chartered Management Institute (FCMI), UK. He has been a Fellow of the British Institute of Management (MBIM) since 1991, and the Institute of Logistics and Distribution Management (MILDM). Prof Pinnock is also a Justice of the Peace for Kingston.

He is the author of Marine Terminal Operations & Management, published in Canada, and currently being used at the Caribbean Maritime Institute; and, Caribbean Cruise Tourism: Power Relations Among Stakeholders, 2012, LAP Lambert Academic Publishing, Germany.

He has published numerous academic peer review and industry articles, magazines and journals worldwide in multiple languages, including French, German and Spanish. He is a contributing writer and columnist (The Human Factor) of Caribbean Maritime and Portside Caribbean magazines.



IBRAHIM AJAGUNNA

Professor Ibrahim Aladeusi Ajagunna is Vice President of Academic Affairs of the Caribbean Maritime University. He holds a Doctor of Philosophy from the University of the West Indies, Jamaica, a Master of Science degree from Sheffield Hallam University, UK, a Higher National Diploma from the Federal Polytechnic, Idah, Nigeria; a Post-Graduate Diploma in Education from the University of Technology, Jamaica and an Advanced Diploma in Teaching from the City and Guilds of London, among other certifications.

He has special skills in curriculum development, education administration and leadership, strategic management and tourism. Professor Ajagunna also has more than nine years in integrating operations in logistics and supply chain management as well as port reorganization. For the past nine Professor Ajagunna held the position of Director of the School of Academic Studies at the Caribbean Maritime Institute (now Caribbean Maritime University) where he has transformed the academic landscape of the University. During this period, he has also developed and added nine Bachelor of Science Degrees and two Master of Science Degrees to the suite of programmes. He was also instrumental in the process of obtaining both national and international accreditations for these degrees.

STEPHEN LAWSON RHODEN

Dr. Stephen Lawson Rhoden is currently Associate Vice President of the Engineering and Applied Technology Faculty at the Caribbean Maritime University. He has over 15 years of experience combined in industry and academia, where he has worked for the University of Central Florida, the Florida Solar Energy Center, Youngstown State University, Kroff Inc. and RHO-Energy Consulting Ltd. Dr. Rhoden has graduated with a double BSc in Chemistry and Computer Science from the University of the West Indies, Mona Campus. He received his MSc in Industrial Chemistry and his PhD in Chemistry from the University of Central Florida in Orlando. He is also a Certified Energy Manager (CEM). He has worked on anti-cancer drug discovery, hydrogen fuel cells, photovoltaic materials, photo-electrochemistry, slick-water hydraulic fracking, and sustainable development. Dr. Rhoden is a member of the American Chemical Society, the International Association of Hydrogen Energy, The Electrochemical Society and the Association of Energy Engineers.

JESPER DANNISØE

Jesper Goodley Dannisøe is a biologist and he has been working with environmental issues for 30+ years in more than 40 countries. In the Caribbean he has been assessing the effects of urban storm water release to the coastal areas of Trinidad and Tobago and with the consequences for coral reefs expected from a construction of a new cruise pier in the Cayman Islands. He has been working with assessments of climate changes and creating higher resilience in urban areas in Asia, working with green infrastructure elements. His presentation at the inaugural PMAC-PORTSIDE Caribbean Port Management Workshop will explore the possibilities to work with nature to increase resilience in a Caribbean context. Working with nature is looking at natural ecosystems, which can be utilized in a way where they can provide services on a daily basis and act as mitigating factors during storms. An example is increasing areas with mangrove, where the mangrove will provide shelter and feeding possibilities for fish and shellfish but act as a mitigating factor during storms, where mangroves can take out some of the force from waves.

JAN SIERHUIS

Jan Sierhuis is the director of the MAC since 2010 and is responsible for overseeing the Curacao ship register and the maritime activities in Curacao's territorial waters. Prior to that, he was an independent maritime consultant, after working 14 years as business development manager for the Curacao Port Authority (CPA), where he was involved in the development of the cruise business in Curacao and the Caribbean. He led the Curacao Cruise Action Group and was a Group B Chairman in the Caribbean Shipping Association and a past PMAC member. He started his career in Curacao in 1990 at the trade department in Curacao, after graduating in political science at the Erasmus University Rotterdam, the Netherlands, in 1989. He has over 25 years of experience in Caribbean trade, transportation and tourism.

ALBERT MARTIS

Dr. Albert Martis is currently Vice President WMO Regional Association IV (North America, Central America and the Caribbean). He has held positions as: Head Climate Research Division at Meteorological Service Netherlands Antilles & Aruba; Member Caribbean Climate Outlook Forum Committee; Member Group Regional Climate Center RAIV; Member Expert Team on National Networks and Observations in Support of Climate Applications; WMO Commission for Climatology) Delegate/Reviewer Intergovernmental Panel on Climate Change (2007 Nobel Peace Prize). He was Director Meteorological Service Netherlands Antilles and Aruba; Permanent Representative of the Netherlands Antilles and Aruba with the WMO; Director Meteorological Department Curacao; Permanent Representative of Curacao and St. Maarten with the WMO; Co-Chair Panel of WMO Commission for Climatology Experts, on Climate Information for Adaptation and Risk Management; Chair RA IV Working Group Disaster Risk Reduction; and, Member of the Executive Council of the WMO.

CARLOS MANUEL GÓMEZ RUDY

Dr. Carlos Manuel Gómez Rudy has more than 23 years of experience in the maritime, logistics and transportation industry. He is the Administrator of the Regional Logistics Center for Humanitarian Assistance, an operational office of the Ministry of Government, being the first Humanitarian Hub in Latin America. He is a former Director and Senior Consultant in CEL Associates, Senior Researcher in Georgia Tech Panama Logistics & Innovation Center, and Managing Director in Sopisco Panama Shipping. He has a PhD in Business Economics, specialized in logistics and transportation. He is also a full professor and leading researcher at the University of Panama focused in Corporate Analysis and Logistics Management.

RASMUS E. BORGSTRØM

Rasmus Eskerod Borgstrøm is a geographer with core competencies in satellite based Earth observations of the coastal environment. He heads DHI GRAS which, for more than 15 years, has provided cost-efficient remote sensing services, such as bathymetry mapping, water quality monitoring and mapping of coastal zone vegetation and coastal dynamics based on satellite imagery. His presentation at the Caribbean Port Management Workshop will provide examples of this work and demonstrate how these services can be obtained and applied in the Caribbean region.

CARLINTON BURRELL

Carlinton G. Burrell has been addressing climate change challenges through clean tech innovation in the Caribbean by stimulating new business ventures. As head of the Caribbean Climate Innovation Center (CCIC), a World Bank Initiative with the Government of Canada, he has been supporting the development of and enabling the ecosystem to foster innovative and growth-oriented enterprises in the region. Mr. Burrell has been establishing regional capacity to support clean tech start-ups and early-stage companies, which underscores his contribution to the emergence of new domestic green industries

DANKER KOLIJN

Mr. Kolijn has contributed to various multidisciplinary coastal engineering studies and research initiatives in the Caribbean and elsewhere. Most recently Mr. Kolijn assisted in the 2017 hurricane relief efforts in the Turks and Caicos Islands, assessing coastal hurricane impact along the shorelines and at port facilities of Grand Turk, Providenciales, and South Caicos. Mr. Kolijn has worked on shoreline protection and coastal zone management projects throughout the Caribbean. Project scope typically considers the effects of both climate change and anthropogenic influence on resilience, environment and economic activities. Mr. Kolijn will be speaking about his 2017 post-Hurricane assessment in TCI and how coastal and port infrastructure on SIDS can prepare for the future. Mr. Kolijn holds a MSc. in Coastal Engineering from the Technical University Delft in the Netherlands and is currently practicing as a coastal engineer at CBCL Limited, in Halifax, Canada. Mr. Kolijn will address the 2017 Hurricane season and its impact on the ports of Small Island Developing States in the Caribbean. The many ports of the Caribbean region played a vital role in delivery of aid and assistance during the Hurricane. Mr. Kolijn will share some of the observations made during a rapid post-hurricane shoreline assessment conducted by CBCL in the Turks and Caicos Islands.

HENRIK KOFOED-HANSEN

Henrik has more than 25 years of professional experience in the field of port, coastal and offshore engineering with emphasis on metocean processes and data, water-structure-ship interactions, port optimization and advanced numerical and physical modelling. Henrik has been involved in product development and management of DHI's marine modelling software tools and participated in several R&D and project activities worldwide and in the Caribbean in relation to port and marine infrastructure optimization in a changing climate. A novel integrated approach for optimizing access channel capacity and port operability was presented in Portside Caribbean magazine's 2017 June-September edition. At the inaugural Caribbean Port Management Workshop, his presentation addresses the new approach and its successful application in port expansion projects worldwide. The key business drivers behind the novel approach are not only to reduce the CAPEX related to expansion projects but also OPEX as it will be demonstrated during the presentation. The other good news is the reduced impact on the surrounding water environment due to less capital and maintenance dredging. This novel port management system won the prestigious Dredging and Port Construction (DPC) Innovation Award 2017 as most Innovative Support Service.

CDR. KEITH DONAHUE

Commander Keith M. Donohue is currently seconded to the International Maritime Organization, a specialized agency of the United Nations, at the Regional Activity Center/Regional Marine Pollution Emergency Information and Training Center for the Wider Caribbean Region (RAC/REMPEITC-Caribe) in Curacao. In this position he works directly with nations and territories to assist with the ratification and implementation of international conventions and protocols aimed at preventing and responding to oil spills and other threats to the marine environment throughout the Caribbean. Prior to this assignment he served as Commanding Officer of the Pacific Strike Team, dealing with oil, hazardous material, weapons of mass destruction and natural disasters around the world; International Port Security Liaison Officer throughout Europe, Africa and Middle East; Chief of Response in Port Arthur Texas; and Environmental Specialist at U.S. Coast Guard Headquarters developing and implementing the U.S. mandatory ballast water management program. He holds a Master of Arts in Marine Affairs from the University of Rhode Island; a Bachelor of Science Degree in Chemical Oceanography from Florida Institute of Technology; and Merchant Mariner Credentials for Uninspected Passenger Vessels and Inland Vessels. He holds the highest Incident Commander qualifications, is an Incident Command System Instructor, and a Master Exercise Practitioner. His personal awards include two Meritorious Service Medals, five CG Commendation Medals, two CG Achievement Medals, two Humanitarian Service Medals, the Commandant's Letter of Commendation Ribbon, and the Overseas Service Ribbon.

JIM ELLIOTT

Jim Elliott currently serves as both President of the American Salvage Association and Vice President of T&T Salvage, an international marine salvage company. Mr. Elliott previously served as a senior U.S. Coast Guard officer with a career spanning over 25-years. As Vice President of T&T Salvage, he is responsible for managing worldwide marine salvage, heavy lift, commercial diving and emergency response operations. With well over two decades of leadership experience in maritime operations, he has numerous qualifications in incident management and marine casualty response operations, including the highest U.S. Incident Commander certification and Captain of the Port designations. Mr. Elliott holds a Bachelor of Science in Environment Management with distinction, a Master of Environmental Policy with honors, and a Master of Arts in National Security and Strategic Studies with highest distinction from the U.S. Naval War College.

PAUL A. SCHULER

Mr. Schuler is the Director of External Affairs for the Americas for Oil Spill Response Limited (OSRL). Formerly he was CEO of Clean Caribbean & Americas (CCA). He is a recognized expert on international aspects of oil spill preparedness and response, in particular on the science and use of dispersants to combat oil spills.

CAPT. MENNO VAN EERDEN

Lieutenant Commander Menno van der Eerden was born March 2nd 1979 in the Netherlands. He started his education as officer-candidate in 1997 at the Royal Netherlands Naval College. Promoted to Sub Lieutenant in 2000, he started sailing on board the frigates HNLMS Pieter Florisz and HNLMS Witte de With as junior watch officer. After this, he graduated at the Royal Netherlands Naval College and University of Amsterdam in Management studies. Thereafter Lieutenant Commander Van der Eerden reports on board HNLMS Middelburg as a Mine hunting Officer. During his time on board he completed the Mine Countermeasure Vessel Operational Sea Training, followed by a Standing NATO Mine Countermeasure Vessel Group deployment in the Northern parts of Europe. As part of this deployment he took part in a number of mine clearance operations in the Baltic Sea.

Early 2004 Van der Eerden starts on board HNLMS Thetis to become a diving officer, after which he is stationed as deputy head of the Diving and EOD Group. He is involved in bomb disposal and explosive clearance, both in the Netherlands and abroad. His next job is Executive Officer of HNLMS Makkum. Again the working-up program of the Mine Countermeasure Vessel Operational Sea Training and a deployment of the Standing NATO Mine Countermeasure Vessel Group North are completed. And again a number of mine clearance operations in the Baltic Sea are executed.

In 2007 Lieutenant Commander Van der Eerden was sent to Afghanistan to act as the deputy head of J1 department of Regional Command South in Kandahar. When he returned to the Netherlands a posting followed as deputy commander of the Maritime Company in the just established Defence Explosive Ordnance Disposal Command. Late 2009 he is sent to Afghanistan once more, this time as Staff officer Counter Improvised Explosive Devices as part of the Task Force Uruzgan staff in Tarin Kowt.

After this second time in Afghanistan, Lieutenant Commander Van der Eerden took up a new assignment on board HNLMS Amsterdam. HNLMS Amsterdam is tasked to conduct anti-piracy operations along the coast of Somalia. During these operations 43 pirates were captured.

Then Van der Eerden reported to the Belgian-Dutch Operational School in Den Helder to become a Principal Warfare Officer and specialized as navigating officer. As Principal Warfare Officer and Navigating Officer he was stationed on board HNLMS Amsterdam and HNLMS Groningen. Thereafter he was posted in the Defence EOD Command again, this time as part of the staff.

December 11, 2015 Lieutenant Commander van der Eerden assumed command of HNLMS Pelikaan.

CESAR CORCUERA

Cesar Corcuera graduated from SUNY Maritime College with a Bachelor of Engineering degree in Naval Architecture. He also holds a Marine Engineers license and has a Master of Science degree in Ocean Engineering from Stevens Institute of Technology. He is the Technical Manager of Latin America of T&T Salvage and is responsible for providing technical support in company marine salvage and non-salvage operations and business development in Latin America. He acts as on-site coordinator, Assistant to Salvage Master and as Project Manager on some company projects.

His prior experience includes more than 20 years of work as principal surveyor and station manager for Det Norske Veritas Class Society in Panama. As manager/principal surveyor Mr. Corcuera was responsible for the daily operation of the Panama, Curacao, Venezuela and Port of Spain stations, survey coordination within the group, marketing, training/coaching, budgeting, area customer service manager, financial results, survey & audits, HSE training and safety of the personnel. He also served as Perito Naval and Technical Advisor to the Judge of the Second Tribunal Maritime of Panama in one case, and as technical advisor to a local law firm in others legal cases. After graduating from SUNY Maritime, Mr. Corcuera worked on the New York firm C. R. Cushing & Co. as a Naval Architect. Here, he performed numerous computerized analysis, hull scientific studies, ships plan approval, preliminary conceptual designs of containerships, and vessels conversions.

ALEXANDER GUMBS

Alexander Gumbs is the Business Development Officer at Port St. Maarten Group of Companies. Alexander returned to St. Maarten in 2012 after completing his studies in The Netherlands with a degree in Marketing, Retailing & Franchising. Alexander is one of the young business professionals awarded in 2015 for his contributions to the tourism industry by the St. Maarten Tourism Bureau in preparing the port facilities as outlined in its Hurricane Season Port Readiness Plan in preparation for the arrival of Hurricane Irma. Post-Irma, the primary focus was to regain lost business and this key role, which included communicating with cruise line executives, stakeholders and the local media regarding cruise business development, was given to Alexander.

JULIE-ANNE BURROWES

Julie-Anne Burrowes is a cruise industry strategist with a primary concentration on product and destination development and marketing. After spending more than 18 years working in the cruise sector, Ms Burrowes understands what drives success in the industry – it's how well you connect, communicate and partner. With a diverse background shaped by her work experience within the public and private sectors, her passion is to influence cruise tourism growth strategies and initiatives that are economically and socially sustainable. She seeks to develop linkages between cruise tourism and other segments to enrich the livelihoods of local communities. Julie-Anne Burrowes has previously held senior positions within the Florida-Caribbean Cruise Association (FCCA), and the Barbados Tourism Authority (now the Barbados Tourism Marketing Inc.). In her present capacity as an independent consultant, she is working in concert with agencies from several destinations to establish a regional cruise marketing partnership. She holds a Masters degree in Business Administration (MBA) from the University of Surrey.

EVERTON WALTERS

Dr. Everton Walters CBE has been involved in the maritime industry for more than 47 years, most of which (41 years) has been at Barbados Port Inc. He retired as CEO of Barbados' main port in 2011 but has maintained a close and active relationship with the maritime community of the Caribbean region. A graduate in Economics and Marine Studies from the University of the West Indies and Wales College of Cardiff. , Dr. Walters is recognized as having considerable professional skills in port operations, having completed various courses of study at Louisiana State University and the Port of Antwerp. He has been a director of many organizations, including the Inter-American Committee on Ports (CIP) for 19 years and served as Vice-Chairman of the Executive Board. He was chair of the Port Management Association of the Caribbean (PMAC) for eight years and is currently retained by the PMAC as its Consultant.

KORNEL BROWN

Dr. Kornel A Brown is currently the Associate Vice President for the Caribbean Maritime University's (CMU) Faculty of Advanced Skills and Professional Development. Over the last 15 years, Dr. Brown has worked internationally as an education and training consultant. His areas of specialization are: Education Programme Planning, Implementation, Coordination and Evaluation; Curriculum Design and Evaluation; Competency-based Training/Lesson Design and Delivery; The Theory and Associated Practices of Transformational Learning; The Foundations and Application of Critical Thinking; 6) Behavior Modification and Change Management; Design, Implement, and Evaluate of Workplace Training Interventions and Performance Management Systems; as well as Workplace and Community-based Mediation and Conflict Management.
Dr. Brown holds a Doctor of Education Degree with specialization in Adult Learning and Continuing Education from National Louis University (NLU), Chicago, USA.
A Master of Education in Teaching, Learning and Assessment, also from National Louis University (NLU); a Master of Science Degree in Continuing and Vocational Education from the University of Wisconsin – Madison, USA; a Bachelor of Science Degree from Lincoln University, Missouri, USA; an Associate of Science Degree from CASE, Portland, Jamaica. Dr. Brown is also a Certified Logical Framework Facilitator, and a certified Mediation and Conflict Management Practitioner.

JORGE DURAN

For close to 30 years, Jorge Duran has worked with the governments and private sector of the Americas in the design and implementation of development projects in Latin America and the Caribbean. Since 2003 Mr. Duran has served at the Organization of American States (OAS) as Senior Advisor in Technology for Development, Senior Manager for Municipal Development and Capacity Building, in 2012 as Chief of the Office of Science, Technology and Innovation and, since 2013, as Chief of the Secretariat of the Inter-American Committee on Ports (CIP) of the Executive Secretariat for Integral Development (SEDI). Previously, Mr. Duran was Director of Regional Cooperation (1995-2000) and then Vice-President of International Affairs (2000-2002) at the Latin American Institute of Educational Communication (ILCE) in Mexico City. Other positions include Advisor in Science and Technology Policy for the Presidency of Mexico (1990-1992) and Special Assistant to the Mexican Ambassador at the U.N. (1994). Mr. Duran has also been an Associate Professor at the Tecnológico of Monterrey (1997-2000) and the Universidad Iberoamericana (1995-1997) where he designed and taught courses in Latin America's Political Economy and History. Mr. Duran has Masters Degrees in International Affairs and Science and Technology Policy, from The George Washington University and a double major in Psychology and Latin American Studies from The American University in Washington DC. •

Final Report photos courtesy of Jason Jarrett – PEWTER

CARIBBEAN PORT MANAGEMENT WORKSHOP

PANAMA, January 22 - 24, 2018

FINAL REPORT

BY IBRAHIM AJAGUNNA AND STEPHEN RHODEN, CARIBBEAN MARITIME UNIVERSITY

INTRODUCTION

Tropical Hurricanes; Recent phenomena: Impacts, Destination and Outlook; Recent Hurricane Experiences
A Regional Lifeline: The regional Logistics Centre for Hurricane Assistance

TRACK 1:

Ecosystem services used to protect coasts and harbours

Presenter: Jesper Goodley Dannisøe, DHI

BACKGROUND:

DHI is an associate member of the Port Management Association of the Caribbean. The Global company has worked on everything related to water: Ports, Rivers, Reservoirs, Factories, Oceans, Cities, and anything that has to do with water. Previously, Denmark owned some Caribbean islands and, in 1917, sold the islands to the United States of America for 25 million dollars. In 1964 the Danish company, DHI, was started as a research and consulting firm working with ports. The west coast of Denmark has many ports but also a very harsh environment, with storms as well. DHI helped to develop ports that are sustainable under extreme weather conditions. They have modeled and studied wave and sand transport around ports. They have 1,100 employees worldwide. Of that number, 350 are in Denmark. Today, DHI has test facilities that can model harbours on a smaller scale, with the intent to design optimal ports. The models can be exposed to wind, currents and waves and collectively allow study of what an optimal port should be. Build-up in tanks can move stones around in a pier based on the waves that are impacting them.

The World Meteorological Organization in an earlier presentation pointed out that the Caribbean needs to work with natural artifacts such as: mangroves, coral reefs and other features in our ecosystems. A coral reef for example provides many benefits: protection for myriad species including fish and crustacea; recreational pastimes for people that visit the coasts; and, can also attenuate incident waves. Mangroves are also very good for coastal protection. But, unfortunately, mangroves have been removed from many places, such as beaches and agricultural systems, in order to facilitate construction and infrastructural development. Mangroves are a great resource for protecting coastal regions and for mitigating the effects of storm surges.

Looking inwards from the sea to land, there are the ports in between, which integrate the land and the sea. Forests are great ecosystem resources that effectively control loss of valuable soil by limiting the run-off of surface water coming down mountains. Forests store the water and minimize the possibility of flooding and run-off at the port site.

Islands are generally categorised under two main headings: (i) coral reef based (low-lying islands) and (ii) volcanic based (mountainous features). Notwithstanding these two generalisations, islands are, individually, rather different in their features. The Caribbean must therefore employ the correct tools and strategies for each island, in order to ensure sustainability.

For example, the Turks and Caicos Islands are low-lying with a very big reef area and this provides some protection. They therefore have possibilities for ecosystem services.

It can be discussed how to use these services to protect the country. It is heartbreaking to hear people talk about the damage to their national infrastructure caused by natural disasters. This makes one think about how citizens can work together to make their countries more resilient. In many circumstances, concerns have focused on what was coming from the sea. But this should not be at the expense of careful assessment of that which comes from the landside, including heavy rains and surface water run-off from higher ground through the ports.

In many countries, over the years, most damage was caused by destruction of forests and illegal farming of hillside lands above the various catchments. This has exposed these islands to severe landslides which cause blockages in the waterways.

Dr. Albert Martis

Adrian Hilaire (centre) - St. Lucia

Past experience must be used and acted on. It is important to realize that a harbour is not an isolated geographical feature. Harbours are connected to both the ocean and the land. So they must be viewed more holistically in order to build more resilience into our systems.

The spending of millions of dollars is what will have to take place sometimes for protecting Caribbean countries.

Work with artificial reefs in new areas and in areas that have been destroyed because of different operations.

All corals are looking for a hard bottom on which to settle. Corals don't establish a base in sand. The unfortunate fact is that, in the Caribbean, we have lost a lot of the solid sea floor. However, if we can create a hard sea floor, artificial reefs will, in a few years, provide a home for many species of corals, plants and animals.

These reefs provide an expanding habitat for biodiversity.

There is also recreational value. Different reefs provide an expanded area and diversity for recreational activity such as diving. And, very importantly, the reefs also protect the coastline from erosion caused by waves.

Mangroves, on the other hand, are actually easier to work with because they get their roots deep into the sand and are not too exposed to the elements. However, we should find alternative areas to place the mangroves.

Some of the pictures we have seen suggest that humans are, in part, creating the problem. There is a problem with mangroves in that they need to have enough land behind to be able to adapt to rising sea levels. The main exercise should be getting back to where we were in the past; and, reinstalling some of those things, which will help create value.

Digital elevation models can be accessed on the internet but can also be made locally by LIDAR, a laser system attached to a drone. Land use can be determined and digital elevations can be mapped simultaneously with this technique. This can be used to determine a vulnerability index, where areas of high vulnerability are coloured red and those that are not so vulnerable showing lighter colours. This can be related to the port areas and around them.

Data available from satellite images can be used to make decisions on altering the landscape to make flood water flow easier.

Making a sensitivity map (with sensitivity rankings of high medium and low); and, creating a flooding risk of high, medium and low. These can be combined in a matrix, so as to allow simple identification of the low, medium and high-risk areas. These help with producing vulnerability maps which can be used for planning.

Even though some vegetation exists, there may be something more we can do to avoid excess water coming down.

Nourishing the existing and available ecosystems can provide benefits for all to enjoy.

Information from space – in support of disaster risk management in the Caribbean region

Presenter: Henrik Kofoed-Hansen

BACKGROUND:

Satellites have been in use for 40 to 50 years. They can facilitate monitoring of the evolution of coastal areas and how coastal systems develop.

- Satellite data support and facilitate meteorology and modeling.
- Satellite data give a wide area of view and render detailed information.
- Satellite data are important and can produce accurate models.

An important question to ask is: are ports in the Caribbean using satellite data in planning, management and operations?

While the answer to this may be 'no', many ports are integrating weather forecasting into their planning and are viewing and reviewing their assets with the use of satellites. In this regard, satellites have become important tools to survey and assess disasters. Indeed, satellites are now used to provide bathymetric data, especially in shallow water. This technology can be used to assess coastline changes, coastal tides and vegetation changes.

With this tool, historic and spatial loading can be accurately measured. Monitoring climate change is difficult. And the future is unknown. But, we can now get cost-efficient data collection. It is freely available from USA and European Space agencies. Not many people work in the field and hence many do not yet know about it.

Satellite derived bathymetry allows detailed information from 2-metre to 10-metre resolution. It can also be effectively used for navigational analysis. Doing regular physical surveying is very expensive and time intensive. However, satellite bathymetry can produce cost-effective results look in water that is preferably less than 20 to 25m.

The Caribbean is one of the best areas in the world to use the information from satellites.

The use of satellites at Little Abaco Island in Bahamas is a good example of how they derive the bathymetry down to 2-metre resolutions.

Antigua is also another example, with a nautical chart that was generated by the United Kingdom Hydrographic Office.

It was easy and cheap to get bathymetry and vegetative data after and before the 2017 hurricane season.

Other examples include the Port of Brisbane in Australia. There was a feature that had a non-traditional, very long navigation channel with unique sandbank features. Frequent satellite surveys are done to ensure the safety of the navigation data. The satellite data was also used to get an overview to plan when the navigation channel was to be dredged.

It normally costs about US$10,000 to do a regular survey. But the data can be obtained cheaper or for free, which allows for surveys to be done frequently, even daily.

Alexander Gumbs shares the experiences of the Port of Sint Maarten and in dealing with the hurricane devastation of 2017.

PMAC Executive Secretary Glenn Roach (l) and Mike Jarrett reflect satisfaction with the proceedings.

Caribbean Climate Change Innovation (CCIC): Climate Change Expectancies for the Caribbean

Presenter: Carlinton Burrell

BACKGROUND:

The Climate Change Innovation Centre (CCIC) was founded as an initiative of the World Bank and funded by the Canadian Government. The CCIC was managed by Jamaica's Scientific Research Council (SRC) and the Caribbean Industrial Research Institute in Trinidad and Tobago. The goal of the organization was to develop climate smart technologies and business models in the Caribbean. The organization was located in the Caribbean, Morocco, Ghana, Ethiopia, Kenya, Vietnam, and South Africa. The organization meets twice a year and met last year (2017) in Nairobi, Kenya and in Shanghai, China. It discusses best practices; how to develop climate-smart technologies through entrepreneurship; and, how to deploy these solutions in various regions.

Climate change can be difficult to understand but we have to understand climate change itself to create solutions and resolve climate change issues. It is important to outline the relationship between climate change and contemporary events. Dr. Albert Martis, Regional Chair of the World Meteorological Organization (WMO), who gave a keynote presentation on the first day of the Workshop *('Tropical Hurricanes: Recent phenomena: Impacts, Destruction, Outlook')* mentioned that disasters in the Caribbean region were having a significant impact.

He said that there were six deadly hurricanes that affected the Caribbean in 2017, proving that climate change was a significant effect on the region. There were three significant floods in Trinidad and Tobago in 2017. And there was a severe drought in Panama, even as they brought on stream a new set of locks that use less water to transport ships across the Panama Canal. This he described as adaptation and mitigation.

Storm surges caused significant damage to of Dominica and many other Caribbean territories. Landslides created tragedies in Peru and Colombia in 2017 and a tsunami, occurred north of Honduras early in 2018. Dr. Martis said a tsunami warning in the Asian region is not unusual but he said that he was surprised that there was a tsunami warning in the Caribbean region.

There are a few things to understand about climate change. We have to be aware. We have to be able to incentivize solutions. We cannot develop preventive and resilient technologies that allow us to be aware; to mitigate; and, to adapt. Temperatures are increasing. Drought periods are longer. Intensity of rainfall is increasing. Sea levels are rising.

An increase in global temperatures of 4°C (four degrees Celsius) in the next eight years will increase see levels by 80 cm. Small island-states are at risk for many different disasters and natural hazards.

Countries of the Caribbean tend to have undiversified economies; exposure to the global economy; and, a severe dependency on imports. There is no luxury of economies of scale in the Caribbean. For this reason, disasters tend to cost billions of dollars.

There were significantly more deaths in 2016 than 2011. Each year had four hurricanes. But, whereas 744 deaths were recorded in 2016, the death count in 2011 was 114. This is strong evidence to support other observations that hurricanes are getting stronger and that climate change is real.

Hurricanes are more intense. They travel longer distances; produce stronger sustained winds; and, affect more countries.

Looking at the impacts of climate change on seaports, given that the world's merchant fleet had reached 1.12 billion tons of carbon dioxide (CO_2) emissions (based on a United Nations study), the effects on ports are dependent on two things:

- location; and,
- the topographical nature of the area in which the port is located.

Ports are especially vulnerable to: sea levels rise; storm surges; high wind speeds and flooding.

As regards high-speed winds, the acquisition of better crane technologies, able to withstand high velocity winds is imperative.

Panama, for example, is ranked 14th among countries that are most exposed to multiple disasters. The largest piece of the pie chart is 'flooding' at 59%. Next largest disaster is 'drought'. In Panama, there are six months of drought and six months of flooding. These are very significant numbers.

HAZARD NOT DISASTER

Hurricanes are not a natural disaster. They are a natural hazard. It is when we are not prepared they become a natural disaster.

When we are prepared for a hurricane we can see it as a significant source of potable, useful water for example.

The following are some of the remedial solutions:

- The Climate Change Innovation Centre (CCIC) supports entrepreneurs working to find innovative solutions to address and adapt to climate change.
- Building out the CleanTech sector in the Caribbean Region.
- Developing and adapting new business models for extreme weather conditions.
- Collaborate with ecosystem players to build sustainable economies.

These are a few examples of what CCIC does when they meet in the Caribbean.

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DEVELOPMENT OF TOTAL LOGISTICS FACILITY, GLOBAL LOGISTICS CENTRE AND PORT DEVELOPMENT CORNERSTONES OF THRUST.

The Government of Jamaica declared that the island will be established as the premier logistics node for the Americas as part of a Global Logistics Hub Initiative. The initiative has been touted as one of the measures to reposition the country on a path to economic growth. The Government's Logistics Hub Initiative has been driven by a number of factors including trade opportunities resulting from the expansion of the Panama Canal; location on important trade routes; and proximity to a population of close to a billion people from North to South America that can easily be accessed from Jamaica.

Kingston Wharves active entry, by becoming more vertically integrated in the logistics chain, was catalyzed by the redevelopment of the Moon Palace Jamaica Grande Hotel in Ocho Rios. KWL was approached to provide logistics services to what was at the time, the newest 5-star hotel in the Palace Resort Chain. Hotel furniture and equipment were warehoused in the free zone and delivered on a just-in-time basis during construction. It was the success of this venture which led to an approach by a new entrant into the local car dealership market to provide logistics services in relation to motor vehicles. The arrangement contemplated the use of KWL's free zone car park to store domestic and transshipment motor units, with the intention to also warehouse car parts in the future. On the outbound side, KWL would also pick and handle motor units to fulfil domestic or transshipment orders, as well as deliver motor units to the Client's domestic location.

This venture led to plans being developed which has now grown into the Global Auto Logistics Centre on lands of the Tinson Pen Airport. This facility provides services to ATL Automotive and Jetcon Cars, among the largest new and used car dealers respectively.

KWL also looked at the facilities available for consolidating and deconsolidating of cargo coming to the island particularly for those customers who were break-bulk shippers. The conditions under which customers were required to do business with us was less than ideal.

The Total Logistics Facility (TLF) is a 160,000 square foot intelligently designed warehouse housing integrated KWL customer service support and customs processing as a one stop logistics and warehousing solution envisioned for operations 24 hours daily; 7 days per week. This facility is the single largest warehouse operating within the boundaries of the Jamaican port system and special economic zones enabling the relocation of activities that took place on dock resulting in more acreage for on port activities as well as enabling the entry into fourth-party logistics (4PL).

These two developments have both complemented the ongoing modernization of the berth facilities. A number of shipping lines continue to show confidence with the port being the largest transhipment port for motor vehicles. Its portfolio of clients is blue chip as it is the regional hub for Seaboard Marine and Hoegh Autoliners. It also handles significant cargo volumes for shipping lines such as Crowley, Evergreen, Maersk, Hapag Lloyd and Cosco. This includes the handling of domestic and transshipment Full Container Loads (FCL) and Less than Container Loads (LCL).

Carlos Manuel Gómez Rudy introduces the CLRAH to the first-day plenary.

Henrik Kofoed-Hansen

Carlinton Burrell, Track 1 presentation: Climate Change Expectancies for the Caribbean Region'.

Shoreline Management and Climate Change

Presenter: Jesper Goodley Dannisøe

BACKGROUND:

Many ports and harbours are close to beaches and shorelines. And the dynamics of the shorelines affect ports and harbours directly.

Wave power will increase due to climate change. But extreme events that are consistently increasing in magnitude will be occurring. This leads to significant changes in the equilibrium plan for beaches.

Ports in the Caribbean need to decide what equilibrium configuration they can create with their infrastructures.

The direction of the wave incident on the beaches is changing for certain geographic locations. And a few degrees change in the wave incident will change the sand and sediments at the beaches.

If we study these changes, we can more accurately predict outcomes that are to be expected.

Whatever we do in terms of harbour design, we must ensure that sand can pass by and not get into the port. The cost of sand removal from ports can be very expensive. If it keeps returning to the port area, it would be a continual problem with a recurring cost.

Ports must be designed for climate adaptation. We must build infrastructure that protects ourselves. We can implement new economic plans and new legislation to determine the types of dykes and protective systems we need for survival.

Significant flooding is caused by sea level rises as the storm surge breaches the barrier level and run over the top.

Will the barriers now in place be sufficient to protect our coastal areas against constantly rising sea levels and that projected for the future?

To assist with this, we must begin research on modeling in order to make better predictions. A step-by-step adaptation is important.

We must begin working now.

Analyses of events in Denmark were done by DHI. A 100 year-event in 2012 in Esbjerg will be a 2.5 year-event in 2100. This is also the same for Copenhagen. We do know that these events are occurring, and we can be sure to do something about it.

CARIBBEAN WAVES

Wave conditions were studied at four places in the Caribbean, from 1980 to 2016. The wave compass in the four places was very different. It showed that it was necessary to study Caribbean wave conditions in more than one place. We cannot assume all situations are alike.

More information can be gleaned from the changes in wave direction of multiple islands in the same area. A time series of wave incidents at Antigua for 1980 to 2016 was presented. Differences in wave energy and wave angle were shown to be changing. When there are changes in the wave mechanics, there will be changes in the beaches.

Wave changes for the Turks and Caicos Islands remained relatively minimal during this period (1980 to 2016).

The Central part of the Cayman basin showed a change of waves direction. And it can be shown that there is a change in how the sand settles around the beach.

EROSION

Beaches are impacted by Longshore sediment deficit when waves from a certain angle will move sand in a certain direction. This chronic erosion occurs constantly. Acute erosion is where waves take away part of the land. The storm surges that accelerate acute erosion must be studied and the implementation of sustainable mangrove solutions can help with this significantly.

An aerial image can be used to tell the wave direction. And that means that the sand transport direction can be determined also. Google Earth for example gives a slider to look at pictures relative to different years. We are able to see if the perturbations are typical. And sometimes they are moving in the opposite direction.

An example of an area in Conceicao de Barra, Brasil, where the mean wave direction and the new mean wave direction were not in equilibrium, was discussed.

The implementations we make today will have to adapt to conditions 10 to 20 to 50 years from now. But no one can predict exact answers. It is therefore important that we comprehend that what we construct today may have to be changed in the future.

WORKING WITH NATURE

Building without knowledge and respect for nature and the environment is another bad choice too often made. Sometimes it is a matter of bad advice from consultants. This is happening all over the world. Hotels have been built only to find a year later that they have no beach. This was as a result of not studying and working with nature. Wave direction in 1970 had completely changed 35 years later shifting the direction of erosion and accretion and hence transport of the sand. It is not possible for us to see what nature will do in the future. It will always do whatever it likes.

We need to allow for natural movement of shorelines. If an area is considered a risk, we should establish high quality beaches without use of rigid coastal structures. We must first know the sand movement before we can build such a structure. And, if a port is to be developed, the consultant cannot look only at the port, but must look at the long stretches surrounding the port.

Sustainable good quality beaches can be created if we work with nature. We need to know that there are game changers which cannot be predicted. But we can study extreme events by using modeling of the wave height and storm surges and use this to help determine how we must build.

Dr. Everton Walters, Professor Fritz Pinnock and Mike Jarrett – a moment aside to discuss long-range issues.

Julie-Anne Burrowes spoke about rebuilding a cruise destination after a perfect storm.

Lessons learnt from 2017 hurricane season climate change scenarios and mitigating opportunities

Presenter: Danker Koliin

BACKGROUND:

The year 2017 was the seventh most active season since 2005 with 1851 the first year since historical data was recorded. The season was very active, due to three main factors: (1) sea surface temperature, (2) regional pressure and (3) wind shear.

Drawing example from 1980 to present showed that, in 2017, the Caribbean Sea's surface temperature was higher (by about a half a degree) than the world average.

Secondly there was a significantly lower pressure in the Caribbean region. This creates low-lying moisture which fuels hurricanes.

When there is low wind shear there is no resistance to hurricanes going forward, strengthening and causing destruction.

The main trend is that hurricanes are more intense with higher rainfall; but not necessarily more hurricanes.

The Business Monitor International stated in 2017 that "Hurricanes will remain the single greatest threat to Caribbean economies over the long term." The devastation that occurred in Sint Maarten and the British Virgin Islands was shown as a reference.

BUILD BACK BETTER

An assessment of the economic impact from hurricane Irma alone was greater than the GDP of some Caribbean island states. One of the main focal points for the Caribbean should be how to build back better and be more 'climate change resilient' infrastructure.

Despite setbacks, there are opportunities for the Caribbean region at this time to build back better. A study by the International Monetary Fund (IMF) in 2018 showed that reconstruction efforts in 2018 are likely to accelerate GDP growth in the Caribbean. Royal Caribbean was ahead of its forecasts even though there were revenue losses from the 2017 hurricane season. And a report from Caribbean Development Bank (CDB) showed that there was growth in Gateway Container movement forecasted.

It is also projected that there will be growth in GDP; container traffic; and, potential increases in transshipment. What we can look at are some strategies where we either decide to protect, accommodate, retreat or avoid. The cost increases as we decide to shift to protect or to accommodate. But the costs decrease as we decide to retreat or avoid. And in the Caribbean, where resources and funds are limited, it makes this very difficult. So creative solutions will be necessary and are to be driven by informed decisions. There are difficult decisions with respect to hurricane events which may expose vulnerabilities but often illustrate where to start planning.

TURKS AND CAICOS

For example, a rapid shoreline assessment was done by CBCL for the Government of the Turks and Caicos Islands before the hurricanes came in 2017. Irma hit the islands as a category 5 hurricane, with wind speeds of 270 km/h. A few weeks later hurricane Maria traveled to the north of the islands as a category 3 event. It was much slower but did significant damage.

CBCL then went to work to do a rapid shoreline assessment. This included working with the Department of Environment on a beach transit survey. CBCL compared surveys done on the beach prior to the hurricane and also before and after other hurricane events. CBCL also visited some ports, such as South Dock. The ports gave a clear illustration of their role in vital hurricane recovery efforts.

All ports were open for business and were running at full capacity to receive various supplies. Some ports had very little damage to them as a consequence of the hurricanes, while others were affected to a greater extent. The Caicos bank acted as infrastructure to limit damage to the South Dock. South Caicos was very exposed to waves from the north and thus experienced more damage.

Some immediate challenges experienced were security, power, impact on the staff, environmental effects and navigational.

Countries are far more reliant on seaports as ships bring far more resources in comparison to airplanes. This means there is the need for adequate investment in maritime capacity so as to build resiliency.

Besides hurricanes there will be storm surges and sea level rise, which is projected to be higher in the Caribbean than other regions. If there are temperature effects, these can lead to droughts but also extreme flooding. Rainfall intensity can also add to these effects as we saw with hurricane Harvey and the severe rainfall which followed.

DYNAMIC MOORING

An alternative solution to the Caribbean is that it can accommodate, by working with what it has. The implementation of a dynamic mooring solution is an option.

The dynamic mooring system can be connected to the mooring line and this will reduce vessel motion by more than 90%. The dynamic mooring solution can be used in open ports with exposure to high wind and wave energy.

Adaptation to flooding can be a situation in which a berm network is built around storage tanks. This will protect from the flash flooding that may occur during a hurricane.

To assist with water flow, drainage features and strategies to consider include storage ponds, levees and dams, site grading and permeable infrastructure. Other solutions for accommodation include raised generators, encased utilities and building level barriers.

ADVOCATE FOR INVESTMENT

Sea level rise is interesting in that we hear about the melting of the ice caps and the glaciers. There is a significant rise in sea level based on thermal expansion of the sea water itself as the ocean is getting warmer. Importantly, port managers can advocate for investment in critical port infrastructure, identify critical weaknesses and chose solutions based on sound science and engineering and make choices based on resiliency of investments made.

Cmndr. Menno van der Eerden of the Royal Dutch Navy addressed the topic: Past Hurricane Season Relief Efforts – Lessons Learned. [Track 2].

A lighter moment ... and there were a few.

Use of a novel port management system with focus on water-related challenges

Presenter: Henrik Kofoed-Hansen

BACKGROUND:

In the coming years there will be the trend of increasing vessel size, which is directly proportional to increasing the capacity of ports needed. The ports will also have to comply with even stricter guidelines and concerns. As ports adjust to a greener profile, which is trending now as more important, there will be significant port expansion costs associated with the stricter guidelines.

Many ports spend millions of dollars more than necessary to adapt to these larger ships because they use conventional methods of port design and planning. These conventional methods often produce conservative estimates in the design phase. This leads to expanded costs and potentially intensifying the environmental impacts.

DHI began working with some major ports to develop an accurate solution to optimize channel capacity and port operability. The solution has been used at 10 ports on three continents. DHI won an award from Dredging and Port Construction (DPC) for Innovation in 2017 for this solution. The solution developed was Non-linear Channel Optimization Simulator (NCOS) Online.

The system can be used for strategic planning and also for operational port management.

The platform helps to support channel expansion, berth upgrades and CAPEX Optimization. From an operational execution standpoint there is the traffic management, berth operability and OPEX optimization.

NCOS Online can:

- Effectively manage constricted vessel traffic in ports and terminals,
- Assist with long-term planning based on locally representative weather conditions,
- Optimize vessel traffic based on running 7-day detailed forecasts of winds, waves and hydrodynamics,
- Support all vessel classes,
- Effectively interact between multiple concurrent users, and
- Automatically log and process key performance-based statistics.

The most important was that NCOS can support unlimited user groups such as port regulators, port operators, port authorities and vessel operators. Each will make different decisions if they are not all aware of the information and decisions of the other groups.

This NCOS solution allows them to talk together and make decisions together. The online system with vessel and environmental data, such as wind, tide, currents and wave fields, is also a feature. The same technology as bridge simulators is used and placed on the cloud or on high performance computing servers. This includes a very good foundation of accurate environmental data. This foundation can be used to simulate the motion of the vessel with respect to changes in the environment.

DHI asked a few ship captains to install some equipment to measure and study actual ship movement during a full-scale mission. If the model and actual measurement were the same, the model would be validated. In addition, a second model validation in which DHI used the variation in the actual data and the model are shown to be similar.

Henrik said this would be seen as acceptable by the software, and a ship could enter the channel and be ok. But using a traditional format like plank guidelines, this data showed that the ship would not be able to navigate the channel correctly and would be grounded.

SAVINGS IN DREDGING

If we can use NCOS Online accurately, significant savings in dredging can be realized. A good example is the port of Brisbane in Australia, which cannot be compared directly to ports in the Caribbean.

The Port of Brisbane has a long navigation channel. However, the main challenge was to accommodate larger ships in the port through a 90 km navigation channel. There are significant challenges in water depth and tide that must be considered for the transit.

Initially, DHI conducted a strategic design optimization of the shipping channel to accommodate 8,500 teu. Optimization of the port expansion resulted in a 9-million cubic metres reduction of dredging requirements; the equivalent of 100 million dollars in cost-savings. The first 8500 teu ship entered the port in October 2016 with no further dredging necessary.

Dredging companies, while better at reducing the impact on the environment, can only gain from using DHI's port solution to improve port and terminal safety. Caribbean ports should take advantage of the greater cloud computing power that is now available.

COMMITTING TO JOINT COOPERATION: Caribbean Maritime University, PMAC and the Caribbean Disaster Emergency Management Agency (CDEMA) signed a Memorandum of Understanding during the event, pledging to work together in regional initiatives.

Mike Jarrett - keeping things on track.

FEELING SUCCESS: Jesper Dannisoe and Jan Sierhuis ... members of the PORTSIDE CARIBBEAN TEAM, designers and moderators of Track 1 and Track 2 (respectively).

TRACK 2

Disaster preparedness and relief

The risk of very large oil spills increasing subsequent to fluctuation of the markets for oil and gas exploration and tanker trade. Likewise, the risks of hurricane are increasing as global warming gives rising seawater temperature, resulting in more and heavier categories of hurricane. With Global warming therefore, both the environmental and port sectors find themselves in a gloomy situation where protecting and preserving the future is of core importance. The process of risk assessment & mitigation is not only crucial from business continuity, but also from the viewpoint of public responsibility. Therefore, planning for disasters of any kind begins with planning for infrastructure, security and emergency plans, cooperating with local and regional stakeholders in jointly practicing oil spill and emergency plans. As evidenced in 2017, the devastating power of the hurricanes which swept through the Caribbean demonstrate that, the capacity and resources of Caribbean countries and its regional ports to plan, invest and react effectively to very large disasters are insufficient. With the 2017 experience still fresh in our minds, it can be concluded that no one country can do it by itself, but reliance and on a regional approach to management and mitigation.

Incident management planning for oil spills

Presenter: Cdr. Keith Donahue, Rac/Rempeit-C

BACKGROUND:

The highlight of this presentation was international conventions on oil pollution and cooperation strategy, with some emphasis on the Cartagena convention on oil spill protocol.

The question was raised on multilateral and bilateral plan hierarchy, which includes: regional international plan, national plan, area of port plan and plan for terminal, installation and vessel plans. In this context, the overall responsibility of all stakeholders with significant or minimal input; who the lead agency; and support agencies were examined. Cooperation between all industry players was emphasised as being of utmost importance.

Another focus of the presentation was contingency planning for complex responses; non-emergency environment; and, a form of planning which must be free from pressure and developed with consensus among all stakeholders. There are five key functions for the stakeholders, including: (1) command for operation; (2) planning for future operations; (3) conduct of operations; (4) logistics for the necessary support (communication, equipment, personnel and transportation); and, (5) control and record keeping of finances (to include cost recovery, claims for damages and insurance and compensation).

The discussion delved into tiers 1, 2 and 3 of operations: Tier 1 being limited operational spills, which can be handled on location by the operators; Tier 2 being larger operational and accidental spills, to be handled at the national level, requiring assistance from national authorities and stakeholders; and, large Tier 3 accidental spills, which require international assistance and cooperation.

The point was made that port contingency plans must include procedures for dealing with a sudden escalation of the scale and level of oil spills, as many smaller ports and destinations lack the resources to effectively combat spills at the local and/or national levels.

Oil spill and firefighting responses - the role of the salvage Industry

Presenter: Jim Elliott

BACKGROUND:

Presently, the effectiveness of on-water oil recovery technology remains in the range of 10% to 25%. Some statistics from 2014 and 2015, as shown in the table below, support this assertion.

ISU Pollution Prevention Survey Results		
Number of services	2014	2015
Bunker fuel	216	185
Oil cargo	83,698	66,247
Chemicals	194,880	666,416
Bulk polluting/hazardous	102,939	35,744
TEU – tonnes equivalent	901,373	722,160
Other pollutants	356,265 (23,751 TEU@15 tonnes/TEU)	330,015 (21,941 TEU@15 tonnes/TEU)
Totals	16,244	65,282
Number of services	1,655,399	1,885,864

In the process Marine Firefighting Services during salvage, key personnel include (but are not limited to) the following:

- Salvage Master, Salvage Engineer and Fire Officers
- Naval Architecture and Engineering Incident Command Support
- Experienced Salvage Technicians
- Dewatering
- Support Vessels
- External Firefighting Teams
- Unmanned Aerial Vehicles
- Lightering
- Logistics
- Portable Equipment
- Thermal Imaging

Jorge Durán, Inter-American Committee on Ports (CIP)

TRACK 3: Dr. Kornel A Brown: Disaster management and the critical role of the maritime industry.

Marine Firefighting Services are divided into assessment and operations categories. In addition to near and offshore response, there is an additional category added for at pier response.

Remote assessment and consultation mean contacting the salvage and/or marine firefighting resource providers by phone or other means of communications to discuss and assess the situation. The person contacted must be competent to consult on a determination of the appropriate course of action and initiation of a response plan.

On-site fire assessment means that a marine firefighting professional is on scene at a safe distance from the vessel or on board who can determine the steps needed to control and extinguish a marine fire, in accordance with a vessel's stability and structural integrity assessment. The first item requires a phone conversation, but the second requires someone on scene.

This may be a difficult standard to meet in some areas. Salvage companies have been working on resolving this issue for months for some areas of the country.

Oil spill and firefighting selection criteria include:

1. currently working in response service
2. documented history of participation in successful salvage and/or marine firefighting operations, including equipment deployment
3. owns or has contracts for equipment needed to perform response services
4. has personnel with documented training certification and degree experience
5. has 24-hour availability of personnel and equipment and history of response times compatible with the regulation
6. has on-going continuous training programme
7. has successful record of participation in drills and exercises
8. has salvage and marine firefighting plans used and approved during real incidents
9. has membership in relevant national and/or international organizations
10. has insurance that covers the salvage and/or marine firefighting services which they intend to provide
11. has sufficient up front capital to support an operation
12. has equipment and experience to work in the specific regional geographic environments where the vessel operates
13. has the logistical and transportation support capability required to sustain operations
14. has the capability to implement the necessary engineering, administrative and personal protective equipment controls to safeguard the health and safety of their workers
15. has familiarity with the salvage and marine firefighting protocol contained in the local ACPs for each COTP area for which they are contracted

In terms of response, priority should focus on safety of life, situation stabilization, implementation of a defensive action and a focus on resource availability.

Oil spills contribute to environmental threats as evidenced in the following:

- At least 300 known large shipwrecks in the Caribbean present a risk to natural and economic resources
- Eighty percent of wrecks are WWII-era; 90% are at least 50 years old – vessels that may easily leak
- Caribbean wrecks may contain 10 to 30 times as much oil as spilled from the *Exxon Valdez,* as well as other hazards – chemicals and munitions.
- Potentially-leaking wrecks threaten ecological resources, fisheries, and the US$53–74 billion tourism economy

Some lessons learnt from are:

- Salvage is time critical.
- It is important to activate vessel response plan.
- As much as possible, keep oil in the ship.
- Pay now or pay more later - key role of salvage industry in non-floating oil detection and recovery.
- Proactively remove oil from sunken ship.

Tier 3 Oil Spill – Preparedness and Response

Presenter: Paul A. Schuler

BACKGROUND:

Oil spills can be prevented but not hurricane and earth quakes. While this may be so, there have been many cases of oil spills in the Caribbean. In this regard, it is important to have a proper training plan for preparedness.

In an event of disaster, there are two options. One is to do nothing. The other is to actively monitor to reduce natural degradation, source control for containment, recovery and clean up.

Key response strategies address: issues of health and safety; resources that are at risk; what response resource is available; and, what are realistic expectations among others. Other imperatives include: undertaking a risk assessment to determine environmental sensitivity; examining how tiered preparedness and response evolved; and, logistics planning.

Challenges in preparedness and response may include: landing permit; dealing with customs and immigration; and, work permit issues, access and security. In any event, successful response depends on competent personnel, who can work to a well-developed plan that is adequately resourced and regularly exercised.

Keith M. Donohue

Leo Anglin - Cayman Islands (left).

Joanne Persad, CDEMA, Programme Manager, Preparedness and Response participates in lively discussion on building a region-wide, quick-response assistance and relief network.

Disaster Relief from a Military Perspective - Royal Dutch Navy

Presenters: Lt. Cdr. Eerden and Lt. Goedhart

The presentation focuses on a number of areas and issue, which are summarized here.

- Task involved which are to protect the Kingdom of the Netherlands, support legal order, support civilian authorities as they operate under military authority.
- The Navy's regular task in the Caribbean focuses on regional cooperation in the combatting of the illegal trade in drugs. There is always one vessel based at the Royal Dutch Navy base in Willemstad, Curaçao, with operational support based in Oranjestad, Aruba, and Philipsburg, St. Maarten;
- In Curaçao, there is also a contingent of marine and army support.
- In terms of humanitarian assistance, this is divided into requests for 'soft' and 'hard' interventions.
- Hard interventions include the use of force to restore law and order. It is usually limited to the countries of the Kingdom.
- Soft interventions focus on immediate humanitarian aid and assisting local authorities to regain control of the situation. They may, however, include actions to protect ship, crew and cargo and also prevent looting, which usually occurs directly after disaster takes place. The boundaries of 'soft' interventions were discussed and it was emphasised that the receiving government always remains in final control and the operational command orders determine the actions on location.
- It is important to realize that receiving countries must request assistance from the Kingdom ***via*** diplomatic channels. And central command determines the goals of the operation. In many instances, the relief vessel steams up to international waters that border the requesting territory, awaiting final orders and approval from the receiving government to enter its territorial waters.
- The presenters looked at phases for disaster relief, which include relief, rehabilitation and development, with particular focus on humanitarian aid and lifesaving; damage assessment with supporting equipment; public security and riot control and restoration of pattern of life.
- Crucial to these during disaster relief is particular focus on logistics, a complex playing field consisting of multiple players with diverse interest and the fact that time is a critical component.
- With military operations, the key to success is an integrated approach, which speaks to one goal one strategy. However, a key problem in disaster response and relief is the time it takes to get approval to provide the needed relief. Nevertheless, opportunities for support are guided by both strategic and tactical level and approaches.
- Some questions and discussions follow after, particularly on the boundaries of humanitarian military interventions in foreign countries.

Trinidad and Tobago Salvage: A case of Salvage Operations in Puerto Rico after Hurricane Maria

Presenter Cesar Corcuera

The Caribbean being what it is requires frequent and periodic risk assessment of port and terminals with focus on natural and man-made disasters and cases of ship accidents. In 2017 alone, for example, four hurricanes, Irma, Harvey, Nate and Maria hit Puerto Rico.

Hurricane Irma was the strongest Atlantic basin hurricane ever outside the Gulf of Mexico and the Caribbean Sea. It lasted as a hurricane from August 31 until September 11. The storm, which stretched 650 miles from east to west, affected at least nine US states, turning streets into rivers, ripping down power lines, uprooting trees and cutting off coastal communities.

The after effect of Maria included loss of power, which had a ripple effect on the country. Most challenges faced in the salvage of boats were in respect of complexity in obtaining permission for such salvage or removal. Some thought provoking question were: Are we ready to respond whenever there is a disaster? And, what about the salvage time which is critical to avert other disaster such as oil pollution etc.?

After the perfect storm, rebuilding a cruise destination: St. Maarten

Presenter: Alexander Gumbs

BACKGROUND:

Resilience was a key factor to success in the rebound of St. Maarten from the hurricane disaster, in which cruise operations was restored within three months and cargo operation within 2 weeks.

The rebuilding of Sint Maarten was phenomenal. This was so because of a partnership between all stakeholders for their active involvement in the rebuild process. Critical to this success was that the country had an open ear to all the stakeholders including the cruise company.

Whilst most amenities were restored (over 80% on average), it was expected that by end of February (2018), the entire country would be back to normal.

As the cruise industry recovered and was back in operation some three months after the hurricane, the hotel industry needed an estimated 12 to 18 months to recover. Local boutique hotels were already back in business.

The efforts to get cruise ships back to the St. Maarten required cooperation between all stakeholders including tours operators, ground transportation; and operators of attractions and facilities, to receive tourists. Direct communication with the cruise industry, and with individual cruise lines, is critical, and the reaction of the cruise industry has been heartwarming and supportive.

PMAC Vice Chair, Darwin Telemaque makes a point from the floor.

Ibrahim Ajagunna delivers part 1 of Rapporteurs Report.

The message from the industry was that the disaster was an opportunity to bounce back better than ever, and that pro-active destinations will receive support and possibly increased business. The local challenge was to ensure that this profits all stakeholders and the entire community.

After the perfect storm – An industry perspective

Presenter: Julie-Anne Burrowes

BACKGROUND:

During the hurricane season of 2017, many cruise destinations in the Caribbean were severely impacted leading to significant implications for tourism in general and cruise in particular. However, with a relatively short period, the cruise tourism rebounded to optimum operations.

The cruise industry is one of the most resilient of tourism's sub-sectors. With its massive vessels, it can quickly move assets and customers away from crisis areas to protect their safety. And, similarly, cruise lines can move supplies and resources to affected areas to assist with relief and recovery operations.

Key players include the travel agents and the cruise lines, whose contribution to recovery was in excess of US$30million.

The agents play a major role in getting the industry message across that the Caribbean is open for business and safe for travel. The result of the industry campaign was resurgence in bookings for Caribbean cruises.

This also had a positive effect on the stay-over (hotel accommodation) sectors in the Caribbean. Key to success was: quick response from all stakeholders; vessel mobility and redeployment; and, strong travel agent distribution channel. Challenges to rebuild however included adaptation to climate change and focus on carrying capacity, redesign and modification of ports, focus on sustainability, promotion of institutional cooperation and implementation of standards across all ports.

CONCLUSION

A large portion of the losses in 2011 was caused by one catastrophe; the earthquake and tsunami in Japan. Losses in 2017 were largely traceable to extreme weather. Estimates are that 97% were weather-related, well above the 85% average since 1980.

If climate change brings more frequent extreme weather, as much as others expect, last year's loss levels may become depressingly familiar. Already, the data show many more frequent high-loss events.

Since 2000, lots of them are weather-related than in the two preceding decades. The 2017 disaster were particularly concentrated in North America (including the Caribbean), with 83% of global losses; half of those were in America alone, hitting that country's insurers particularly hard. Fitch, a ratings agency, expects the 'combined ratio' for American property-and-casualty insurers to rise from 100.7% in 2016 (meaning costs and claim payouts just exceeded premium revenue) to 104.4% in 2017. This implies a substantial underwriting loss for the industry.

Even Warren Buffett's Berkshire Hathaway looks poised for its first full-year underwriting loss in 15 years. It took a $3bn hit from the three hurricanes and an earthquake in Mexico.

For all the gloom, the 2017 losses were also proof of the resilience of the reinsurance industry. Insurers have long spread catastrophe risk by taking out reinsurance policies. This time, reinsurers had such ample capital buffers that they are expected to suffer only a small dent, of around 5 to 7% of capital. And 2017 was also the biggest test so far of reinsurance provided directly by investors, whether through catastrophe bonds or 'collateralized reinsurance', where a fund manager puts up collateral to cover potential claims.

These forms of 'alternative capital', which reached $89bn in mid-2017, now make up around 14% of total reinsurance capital, up from 4% in 2006, according to Aon, a broker. Their performance has been remarkably smooth. Investor demand has held up and many asset managers in the field have raised new money since the losses. Demand may yet grow further, says Paul Schultz, head of Aon's capital-markets arm, since the yields on alternative capital are poised to rise because of growth in reinsurance premiums. Mr. Schultz's concerns lie elsewhere: he laments that the proportion of all losses covered by insurance "is still too small". Governments or uninsured retains much risk. Offloading more to private markets would benefit governments, property owners and the insurance industry alike.

Disaster Management and the Critical Role of Ports

By Kornel A Brown

BACKGROUND:

This presentation attended deliberately to the research informed perspectives and best practices that must inform management decisions aimed at mitigating the impacts of natural disasters.

The presenter, in an effort to avoid being overly generalized, placed sharp focus on the contextual imperatives of the Caribbean region. Given the almost routine occurrences of natural disasters across the region, the presentation addressed disaster management

Stephen Rhoden delivers part 2 of Rapporteurs Report.

in what is considered to be two equally important areas of focus: The first area of focus, infrastructural capacity building, addressed the kinds of man-made structures, as well as environmental conservation practices, that will prevent and/or significantly reduce damage/destruction when there is a disaster event. Central to this aspect of the presentation was the urgent call for research informed engineering and construction of facilities that will sustain little or no damage when there is a disaster event.

The second area, human capacity building, placed primary focus on the kinds of training and development that must be addressed in order to ensure that people employed across the maritime industry have the requisite learning (*i.e.* knowledge, skills, and attitudes) that will enable them to prepare for natural disasters, as well as to operate during and after a disaster event. Specific to this focus on human capacity building, the presentation highlighted, as prerequisites, the urgent need for the maritime industry to focus priority attention on training that emphasizes Competency-based Capacity Building.

It was also established that the level and effectiveness for disaster preparedness and/or responsiveness is highly contingent on having individuals who have the training and the discipline to take informed action. Accordingly, the essential elements of an informed action were explored.

The presentation concluded with an affirmed call for the maritime industry to, as an immediate priority, design, implement and sustain a vibrant disaster management plan, fully capable of mitigating against man-made events, and that is responsive to imminent, as well as unexpected natural disasters. ●

OUT AND ABOUT











THE PARTICIPANTS

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