International Conference on Coastal Engineering (ICCE) 2022

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ICCE 2022

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- Sessions attended and Key Learnings
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- Benefits of attending the conference (to the Agency)
- Issues raised that Jamaica needs to address in a policy

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Overview

The International Conference on Coastal Engineering (ICCE) is the premier coastal engineering conference held biennially under the auspices of the Coastal Engineering Research Council of COPRI (Coasts, Oceans, Ports, and Rivers Institute).

Date:4-9 December 2022

Location: International Conference Centre, Sydney, Australia

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Technical Sessions			
Session 1 **Wave Overtopping 1**	**Session 2** **Coastal Flooding and Inundation 1**	**Session 3** **Satellite Remote Sensing 1**	**Session 4** **Sensing and Instrumentation**
Room C2.1	**Room C2.2**	**Room C2.3**	**Room C2.4**
Amir Etemad-Shahidi	**Laura Cagigal**	**Erwin Bergsma**	**Adam Fincham**
MODELLING WAVE OVERTOPPING AND WAVE IMPACTS BY MEANS OF IMAGE CLUSTERING TECHNIQUES **Elisa Dallavalle, University of Bologna, Italy**	HEC-RAS BASED COMPOUND FLOOD ANALYSIS FOR PROJECT PLANNING AND DESIGN **Maxwell Agnew, US Army Corps of Engineers, United States**	SATELLITE-DERIVED SANDY SHORELINE CHANGE (1984-2020) AND PRIMARY IVERS IN SW FRANCE **Bruno Castelle, CNRS / Univ. Bordeaux, France**	RIP CURRENT DETECTION IN AN OPEN AREA AND ALONG JETTY USING AI **Toshinori Ishikawa, Chuo University, Japan**
EXPERIMENTAL INVESTIGATIONS INTO THE EFFECT OF STRONG WINDS ON WAVE OVERTOPPING AT A VERTICAL SEAWALL **Naoto Inagaki, Waseda University, Japan**	DEVELOPMENT OF FLOOD RISK REDUCTION INVESTMENT STRATEGIES THROUGH GLOBAL FLOOD RISK TOOL AND APPLICATION OF ADAPTATION PATHWAYS **Matthijs Bos, Royal Haskoning DHV, Singapore**	ADVANCES ON THE USE OF SATELLITE DERIVED PRODUCTS TO DETECT COASTAL CHANGES: DEMONSTRATION CASE ON THE COAST OF SPAIN **Ernesto Mauricio González Roíguez, Fundación Instituto De Hiáulica Ambiental, Spain**	CHALLENGES IN AUTOMATION OF QUALITY CONTROL FOR TIDE GAUGE DATA **Felix Soltau, University of Siegen, Germany**
OCHASTIC BOUNDARY UNCERTAINTY IN MEAN WAVE OVERTOPPING RATE ESTIMATES **kos Kalligeris, National Observatory of Athens, Greece**	EXTREME RAINFALL-RUNOFF MODELING DURING REMNANTS OF IDA IN NEW YORK **Rob Nairn, Baird and Associates, Canada**	CLASSIFYING AND QUANTIFYING COASTAL CHANGE IN SCOTLAND USING SATELLITE-DERIVED COASTAL BOUNDARIES **Freya Muir, University of Glasgow, United Kingdom**	DISPLACEMENT BASED COMPARISON OF ACCELEROMETER AND LOW-COST GNSS WAVE BUOYS **Jeff Hansen, University of Western Australia, Australia**
AVERAGE OVERTOPPING DISCHARGE PREDICTION FOR BERM BREAKWATERS **Thomas Lykke Andersen, Aalborg University, Denmark**	FLOOD MODELLING USING CSIRO DATA61'S MODELLING TOOLKIT CFAST - A CASE STUDY OF THE RIVERVIEW FAMILY CARAVAN PARK IN VICTORIA **Vihan Weeraratne, Monash University / CSIRO Data61, Australia**	SPATIAL VARIABILITY IN BEACH-FACE SLOPES FROM SATELLITE REMOTE SENSING **Kilian Vos, UNSW, Australia**	PTV MEASUREMENTS OF FLOW IN THE WAKE OF POROUS MEDIA **Takaaki Shigematsu, Osaka Metropolitan University, Japan**

Sessions Attended and Key Learnings

BENEFICIAL USE OF DREDGED MATERIAL AND FATE OF PLACED SAND USING A HYBRID COSMOS-XBEACH SEDIMENT BUDGET MODEL by Rebecca Quan, Baird, Australia

- Highlights
  - Dredge material as beach nourishment
  - Importance of sediment characterization

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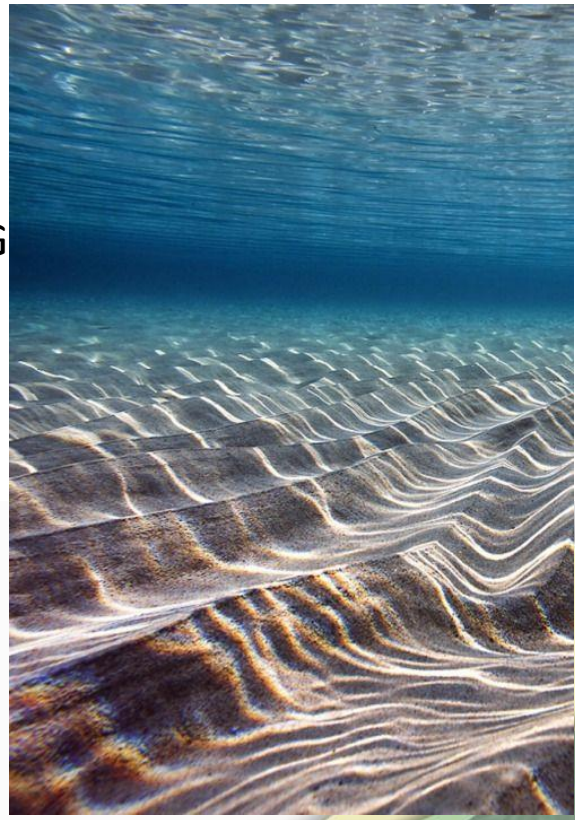
Sessions Attended and Key Learnings

UNDERSTANDING 3D SAND WAVE DYNAMICS FOR ENGINEERING PURPOSES by Pauline Overes, University of Twente, Deltares, Netherlands



- Highlights
  - Introduced to the concept of sand waves
  - Impact on infrastructure eg. Buried cables,
  - rigs and other off-shore engineering applications
  - Benefits of using 2DV model set-up vs a 3D model

Sessions Attended and Key Learnings

ROCK ARMOUR: A BENTHIC HABITAT PROVIDING VALUABLE ECOSYSTEM SERVICES IN THE CARIBBEAN SEA
By Philip Warner, Smith Warner International Ltd., United States

- Highlights
  - Nature Based solutions
  - Relativity of ‘increase’ in biodiversity

Technical Tours

Northern Beaches Tour

Highlights

-Policy and management for coastal areas units
-Stakeholder involvement
- Coastal engineering and marine biology synergy

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Narrabeen Beach

Policy and management for coastal areas units

National Environment and Planning Agency

Managing and protecting Jamaica's land, wood, water & air

Collaroy Beach

National Environment and Planning Agency

Managing and protecting Jamaica's land, wood, water & air

Stakeholder involvement

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Bio walls to increase Biodiversity

Technical Tours

- Sydney Institute of Marine Science (SIMS)
- Macquarie University

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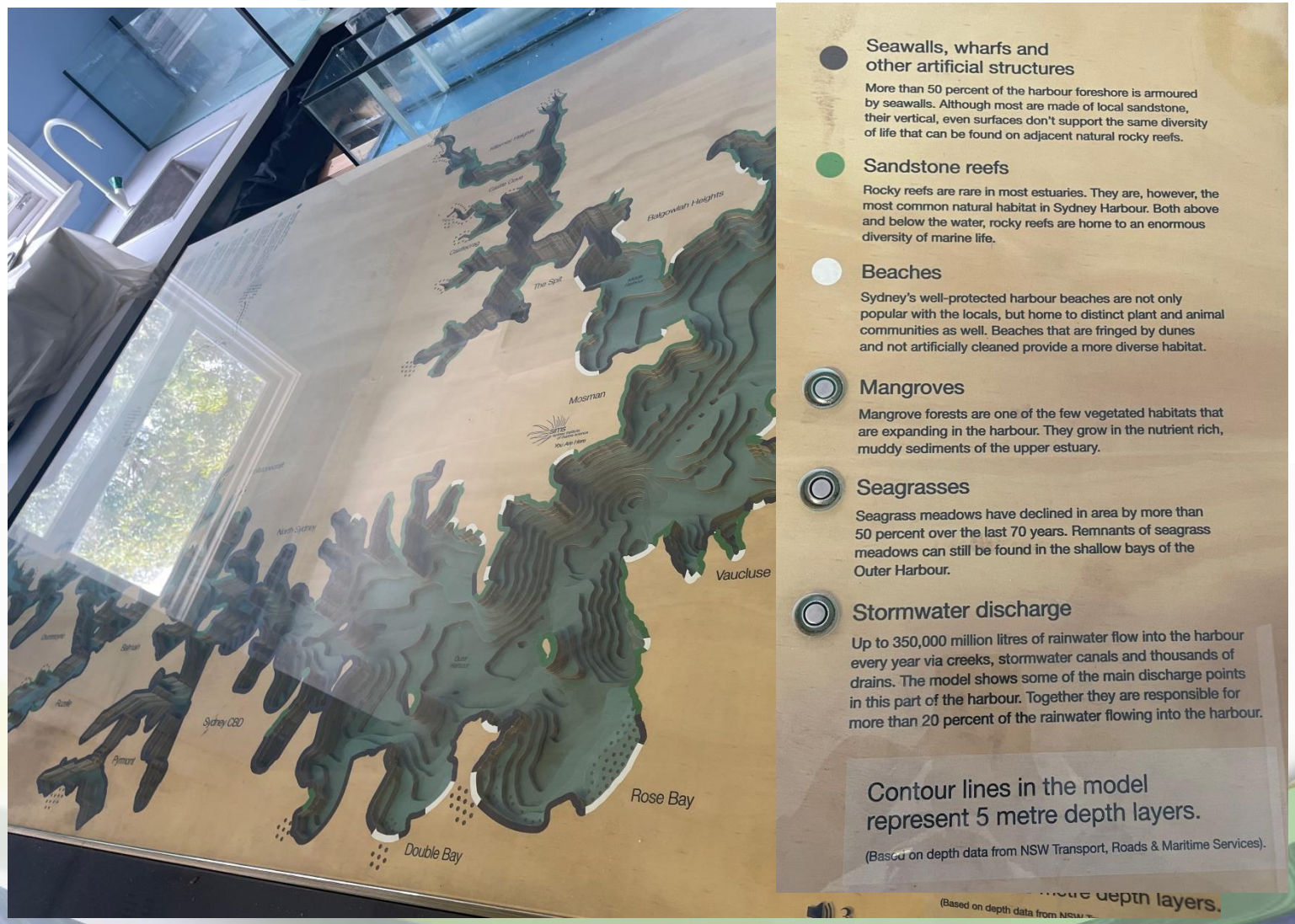

National Environment and Planning Agency

Managing and protecting Jamaica's land, wood, water & air

APPLIED BIOSCIENCES
Faculty of Science and Engineering

MACQUARIE University

Engineering bleaching resistance in corals

Research project overview

This project is focused to further understand genetic mechanisms that support an enhanced thermal tolerance of coral associated microalgae.

Coral reefs provide a habitat to ~25% of the species in the marine environment, support the livelihood for ~500 million people on the planet and are of significant economic and cultural value. However, corals have experienced mass bleaching and mass mortalities due to high seawater temperatures caused by climate change. Climate models predict that further warming will continue and mass coral bleaching will become an annual event on most reefs within this century. According to the IUCN, coral reefs are the ecosystems moving most rapidly towards extinction.

For their survival, corals rely on their symbiosis with single celled microalgae. The microalgae provide most of the coral's nutrition via translocation of photosynthates and also play a crucial part in the thermal tolerance of corals. It is however unclear which genomic adaptations directly contribute to an increased thermal tolerance of the coral and their symbiotic microalgae.

This project investigates molecular mechanisms and genomic adaptations that lead to an increased thermal tolerance of symbiotic microalgae. Using molecular techniques, such as genome sequencing, transcriptomics and amplicon sequencing, we analyse adaptations among thermally tolerant and sensitive microalgae species and their associated bacterial communities. This project also compares physiological characteristics of thermally tolerant and sensitive microalgae with flow cytometry and photosynthetic measurements. We cultivate the microalgae in the PC2 laboratory at Macquarie University for direct comparisons and experimental assessments of their thermal tolerance capacities.

The outcomes will provide more information regarding the molecular mechanisms that can reduce heat stress impacts for the microalgae. Due to the quick deterioration of coral reefs, the understanding of adaptations that support coral thermal tolerance is a key factor in developing conservation management strategies and associated interventions for reef recovery.

FUNDING:

Commonwealth Scientific and Industrial Research Organisation (CSIRO), Macquarie University

PARTNERS:

Commonwealth Scientific and Industrial Research Organisation (CSIRO), Synthetic Biology Future Science Platform, ARC Centre for Synthetic Biology, University of Melbourne, Australian Institute of Marine Science.

Image supplied by Patrick Buerger

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Benefits of attending the conference

- Networking
- Capacity building
  - Agency's internal process flows
  - Stakeholder involvement

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Thank You