出國報告（出國類別：開會）

參加第 37 屆國際海岸工程研討會 (ICCE)出國報告

服務機關：海洋委員會、國家海洋研究院
姓名職稱：孫嘉良 科長、李孟學 副研究員
派赴國家/地區：澳洲雪梨
出國期間：111 年 12 月 3 日至 111 年 12 月 11 日
報告日期：112 年 2 月 18 日

摘要

此次參加第 37 屆國際海岸工程研討會(The 37th International Conference on Costal Engineering)，於 2022 年 12 月 4 日至 12 月 9 日在澳洲雪梨(Sydney, Australia) International Convention Center 舉辦，這是該地第 3 次舉辦 ICCE 研討會(1980 年第 17 屆、2000 年第 27 屆與今年第 37 屆)。今年主題展示海岸工程最新現況與科學，共計有 7 項交流活動、3 場主題演講及 473 場論文發表，除了與國內學者共同發表論文外，亦參與本會業務相關有前瞻性的論文場次，希望藉此可吸收較尖端的海洋科技觀念，並與相關國際專家學者建立溝通管道，提升本會技術量能及人脈。本報告並提出「深耕在地文化、善用原民智慧」、「善用臺灣優勢、促進海洋應用」、「放眼世界、累積核心」、「性別平等、善待女性」等 4 項心得及相關之 3 項建議，期可賡續增進海洋科技研究發展。

目次

圖目次

壹、 目的

為瞭解國際海岸工程相關技術發展情形，以利本會政策擬定及相關計畫推展，本會規劃由本會與國海院同仁共 2 人出席該項研討會，並由國海院發表相關研究成果，提高我國國際能見度。

本次研討會係疫情後首次恢復實體辦理，議程摘述如下

一、 時間及地點：111 年 12 月 4 日至 12 月 9 日，於澳洲雪梨舉辦。

二、 本屆主題為「當前海岸工程的藝術與科學」，包括：

（一） 主要講者與議題：

1. Mr Brett Rowling 主講「原民觀點：澳洲海岸線探索及海洋工程技術」。
2. Professor Peter Nielsen 主講「與海岸為伍及 18 次 ICCE 的職業生涯」。
3. Dr Katherine L. Brodie 主講「美國陸軍現地研究設施(USACE Field Research Facility (FRF))在海岸觀測的過去與未來展望」。

（二） 技術參觀海岸工程案例：雪梨北部海灘（海岸侵蝕與改善計畫）、雪梨港（港口工程與管理）、雪梨鸚鵡島（海軍船塢及原住民文化）。

（三） 海岸工程技術會 17 場次、海報發表 2 展次、年輕學者交流會、海岸工程中女性議題交流會。

ICCE 是全球最大的海岸工程會議，本會自成立以來、至近年因疫情影響，尚無實體參與國際海洋科學及工程技術相關會議或參訪情事。鑒於國際參與交流及最新海洋技術發展之掌握，對於本會政策規劃統合有助益，並與相關國際專家學者建立溝通管道，以提升技術量能及人脈。

貳、 過程

國際海岸工程研討會(International Conference on Coastal Engineering , ICCE) 隸屬美國土木工程學會 ASCE 下轄之海岸、海洋、港口和河流學會(Coasts, Oceans, Ports, and Rivers Institute, COPRI)，為每二年舉辦一次之大型海岸工程研討會，是目前世界上最重要的海岸工程之國際研討會，並輪流在世界各國許多主要城市舉行。本次第 37 屆國際海岸工程研討會於 2022 年 12 月 4 日至 12 月 9 日在澳洲雪梨(Sydney, Australia) International Convention Center 舉辦，這是該地第 3 次舉辦 ICCE 研討會(1980 年第 17 屆、2000 年第 27 屆與今年第 37 屆)。今年主題展示海岸工程最新現況與科學，共計有 7 項交流活動、3 場主題演講及 473 場論文發表。每日參與過程如下表，並詳述如後。

ICCE 雪梨研討會行程表					
台灣日期	台灣星期	主題	時間 (以當地時間為準)	主要行程	地點/說明
12/3	六	交通移動	1900-2036	交通：高鐵左營至高鐵桃園	0678 車次，行車時間 1 小時 36 分鐘
12/3 12/4	六 日	交通移動	2355-1215	交通：桃園機場-雪梨機場	華航 CI-51 班次飛行時間約 9 小時 20 分鐘。
12/4	日	入住	1400	飯店 check in	達令港濱樂雅酒店 PARKROYAL Darling Harbour, Sydney
		報到	1500-1800 1800-1930	開放報到 歡迎酒會	Pyrmont Foyer, Level 2, International Convention Centre, Sydney
12/5	一	全體會議	0830-1030	歡迎詞 開幕表演 專題演講 頒獎	Pyrmont Theare
		休息	1030-1100	早茶	
		技術會議	1100--1300	Section 1~6	C2.1~C2.5, Pyrmont Theare
		休息	1300-1400	午餐	
		技術會議	1400-1600	Section 7~12	C2.1~C2.5, Pyrmont Theare
		海報交流	1600-1730	Poster Session and Social Reception	Room C2.6 and Pyrmont Foyer, Level 2, International Convention Centre Sydney
12/6	二	技術會議	0830-1030	Section 13~18	C2.1~C2.5, Pyrmont Theare
		休息	1030-1100	早茶	Pyrmont Foyer, Level 2, International Convention Centre, Sydney
		技術會議	1100-1300	C2.3 Section21(1100-1120) 李孟學、許城榕共同發表發表 19~24 Section	C2.1~C2.5, Pyrmont Theare
		休息	1300-1400	午餐	Pyrmont Foyer, Level 2, International Convention Centre, Sydney
		技術會議	1400-1620	Section 25~30	C2.1~C2.5, Pyrmont Theare
		休息	1620-1645	下午茶	Pyrmont Foyer, Level 2, International Convention Centre, Sydney
		交流	1700-1830	Women in Coastal Engineering Event	Pyrmont Theatre, Level 2, International Convention Centre Sydney
12/7	三	全體會議	0830-0920	專題演講	Pyrmont Theare
		休息	0920-1000	早茶	Pyrmont Foyer, Level 2, International Convention Centre, Sydney
		技術會議	1000-1220	Section 31~36	C2.1~C2.5, Pyrmont Theare
		休息	1220-1300	午餐	Pyrmont Foyer, Level 2, International Convention Centre, Sydney

ICCE 雪梨研討會行程表					
台灣日期	台灣星期	主題	時間 (以當地時間為準)	主要行程	地點/說明
		技術之旅	1300-1800	Cockatoo Island Technical Tour	Departs: ICC Sydney Wharf Returns: ICC Sydney Wharf
12/8	四	技術會議	0830-1030	Section 37~42	C2.1~C2.5, Pyrmont Theare
		休息	1030-1100	早茶	Pyrmont Foyer, Level 2, International Convention Centre, Sydney
		技術會議	1100-1300	Section 43~48 C2.3Section 45 許誠榕主持	C2.1~C2.5, Pyrmont Theare
		休息	1300-1400	午餐	Pyrmont Foyer, Level 2, International Convention Centre, Sydney
		技術會議	1400-1600	Section 49~54	C2.1~C2.5, Pyrmont Theare
		休息	1600-1630	下午茶	
		技術會議	1630-1810	Section 55~60	C2.1~C2.5, Pyrmont Theare
		交流	1830-2030	Young Professionals Networking Function	Hilton Sydney Hotel, Level 4, 488 George St Sydney
12/9	五	全體會議	0830-0920	專題演講	Pyrmont Theare
		休息	0920-1000	早茶	Pyrmont Foyer, Level 2, International Convention Centre, Sydney
		技術會議	1000-1200	Section 61~66	C2.1~C2.5, Pyrmont Theare
		休息	1200-1300	午餐	Pyrmont Foyer, Level 2, International Convention Centre, Sydney
		技術會議	1300-1500	Section 67~72	C2.1~C2.5, Pyrmont Theare
		休息	1500-1530	下午茶	Pyrmont Foyer, Level 2, International Convention Centre, Sydney
		技術會議	1530-1730	Section 73~78	C2.1~C2.5, Pyrmont Theare
		交流	1900-2300	Conference Gala Dinner	Grand Ballroom, Level 6, International Convention Centre Sydney
12/10	六	交通移動	1800-1830	交通：飯店至雪梨機場	行車時間 30 分鐘
12/10 12/11	六 日	交通移動	2210-0430	交通：桃園機場-雪梨機場	華航 CI-52 班次飛行時間約 9 小時 20 分鐘。
12/11	日	交通移動	0649-0840	交通：高鐵桃園-高鐵左營	0803 車次，行車時間 1 小時 51 分鐘

一、 12 月 4 日報到與歡迎酒會：

報到時可發現今年台灣到訪人數較少，當日相遇有中央研究院劉立方院士、港灣研究中心林雅雯科長、中央大學黃志誠教授及中山大學博士後研究員許城榕博士等 4 人。歡迎酒會為新南威爾斯大學水工研究室(UNSW Sydney Water Research Laboratory)贊助，由 Kristen D Splinter 博士代表該校致詞並歡迎參與者。

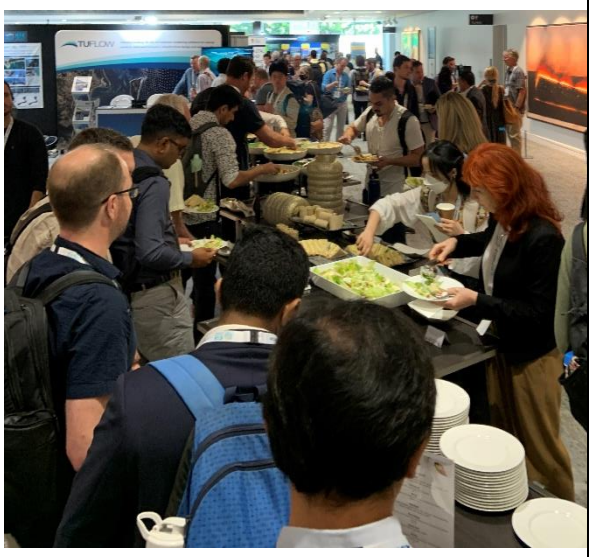
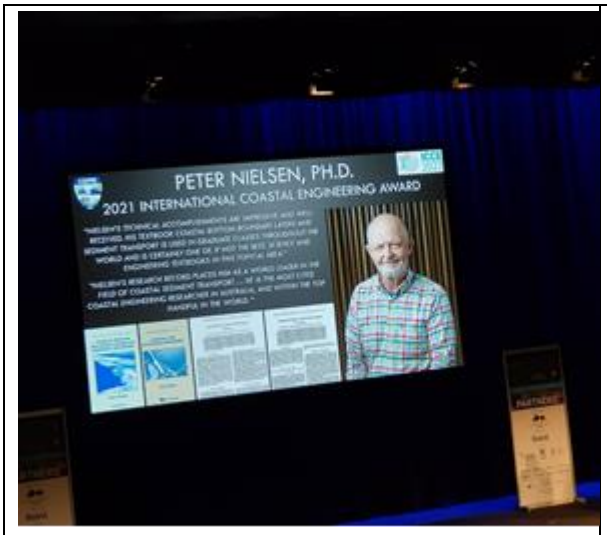



圖 1　12 月 4 日會議活動

二、 12 月 5 日開幕式、主題演講與研討會：

●開幕式

首先舉行為開幕式分別由會議共同主持人-澳大利亞工程師協會首席執行官 Romilly Madew 及國會議員 Hon. Robert Stokes 致詞，並頒發 2021 年及 2022 年之國際海岸工程獎，2021 年由澳洲昆士蘭大學 Prof. Peter Nielsen 獲獎，而 2022 年獲獎人為美國陸軍工兵團名譽資深研究科學家 Dr. Jane Mckee Smith。



2021 年國際海岸工程獎-Prof. Peter Nielsen 獲獎

2022 年國際海岸工程獎-Dr. Jane Mckee Smith 獲獎

圖 2　12 月 5 日開幕式

●主題演講

主題演講由澳洲核子科技組織(ANSTO)研究化學家 Brett Rowling 先生就澳洲海岸之探測與工程-原住民視角題目進行演講。Brett Rowling 直接傳承自新南威爾州中部海岸 Wannungine/Guri Ngai 國之鹽水民族 Bungoree 與 Matora。Bungoree 是國家的名人，他使 Matthew Flinders 在 1802 至 1803 年能夠第一位完成環繞澳洲航行的紀錄。Bungoree 觀察並體驗了每個原住民和 Torres 海峽島民國家獨有的實用科學和工程解決方案。Brett 延續其祖先的傳奇，主要工作是確定和促進文化相似性，這可以加強當前的工程和科學實務，以實現更適合澳大利亞可持續發展的選項。演講中說明了澳洲港灣演進及 Guri 文化的工程智慧，並表達出各族皆是同源，如同茂盛的樹枝底下皆是來自相同樹幹。

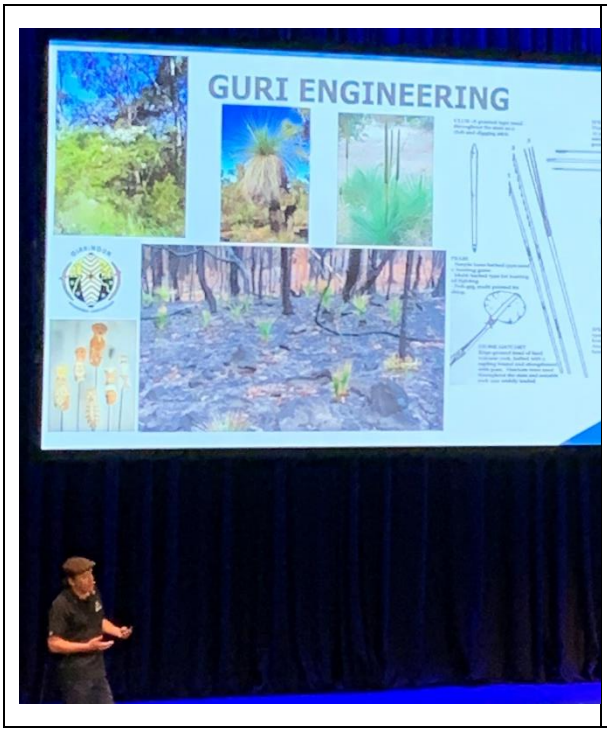


圖 3　Brett Rowling 主題演講

●研討會

研討會主題分為波浪越波(Wave Overtopping)、海岸溢淹(Coastal Flooding and Inundation)、衛星遙測(Satellite Remote Sensing)、儀器與傳感器(Sensing and Instrumentation)、海岸工程漂砂動力(Sediment Dynamics at Engineered Coasts)、自然工程(Nature-Based Solutions)、海嘯(Tsunami)、風浪(Wind Waves)及溯升及沖涮(Runup and Swash) 9 個主題總計 58 個研究發表。

【衛星遙測】研究發表：

本場次座談由 Dr. Erwin Bergsma（法國 CNES）擔任主持人，各研究學者發表內容摘陳如下：

（一） Dr. Bruno Castelle (法國波爾多大學)

▲發表主題：SATELLITE-DERIVED SANDY SHORELINE CHANGE (1984-2020) AND PRIMARY DRIVERS IN SW FRANCE

內容重點：利用 1984-2020 之衛星影像分析近 40 年法國西南部沙岸變遷，並以▲數值模式研究造成沙岸變遷之主要驅動力。

（二） Mauricio González (西班牙 IHCantabria 研究中心)

▲發表主題：ADVANCES ON THE USE OF SATELLITE DERIVED PRODUCTS TO DETECT COASTAL CHANGES: DEMONSTRATION CASE ON THE COAST OF SPAIN。

▲內容重點：介紹 IHCantabria 研究中心所開發之衛星影像分析軟體，可進行衛星影像 1D、2D 及 3D 之衍生產品之分析，如水線分析、海岸變遷分析、近岸水深分析等，並以西班牙的海岸為例。

（三） Arjen Luijendijk (荷蘭台夫特理工大學)

▲發表主題：UNRAVELLING THE DRIVERS OF SHORELINE CHANGE。

▲內容重點：利用長期衛星影像分析全球海岸線變遷熱點分析，並進行全球海岸季節性之變化分析，且討論其變遷原因。

【儀器與傳感器】研究發表：

本場次座談由 Dr. Adam Fincham（美國 University of Southern California）擔任主持人，各研究學者發表內容摘陳如下：

（一） Toshinori Ishikawa (日本中央大學)：

▲發表主題：RIP CURRENT DETECTION IN AN OPEN AREA AND ALONG JETTY USING AI。

▲內容重點：主要討論如何應用 YOLO 模型辨識 2 種離岸流(RIP Current)，分別為開放水域間歇發生的快閃離岸流，以及沿著堤防發生的固定離岸流並可結合通訊技術進行示警與救援，以增進海域遊憩安全。

（二） Jeff Hansen (澳洲西澳大學)

▲發表主題：DISPLACEMENT BASED COMPARISON OF ACCELEROMETER AND LOW-COST GNSS WAVE BUOYS。

▲內容重點：主要介紹利用與分析利用 GNSS 波浪浮標於西澳海域量測之波浪特性，其分析結果其 GNSS 浮標於小浪時與大型浮標結果一致，而大浪時其結果較不相同。

（三） Takaaki Shigematsu (大阪都立大學)：

▲發表主題：PTV MEASUREMENTS OF FLOW IN THE WAKE OF POROUS MEDIA。

▲內容重點：利用 PTV 量測技術，量測在不同流速及不同結構物孔隙形式，而均勻流流經孔隙結構物所產生之尾流(wake)特性。

（四） Takehiko Nose (日本東京大學)：

▲發表主題：APPLICATION OF DRIFTING WAVE-ICE BUOY FOR OCEAN DEPLOYMENT。

▲內容重點：主要討論東大所開發之海冰波浪浮標，驗證儀器精度，並討論誤差原因，且於實驗室水槽，進行誤差驗證。

【風浪】研究發表：

本場次座談由 Dr. Jane McKee Smith（美國陸軍工兵團）擔任主持人，各研究學者發表內容摘陳如下：

（一） Elysia Andrews (昆士蘭政府水工實驗室)

▲發表主題：A 40-YEAR WAVE CLIMATOLOGY OF SOUTH EAST QUEENSLAND, USING MODELLED AND IN-SITU WAVE OBSERVATIONS。

▲內容重點：利用數值模式進行 40 年昆士蘭東南海岸之波浪模擬，討論此範圍之波候，其結果顯示此範圍海域之東南區波浪最大，但其模式於颱風波浪驗證不理想。

（二） Ian Young (澳洲墨爾本大學)

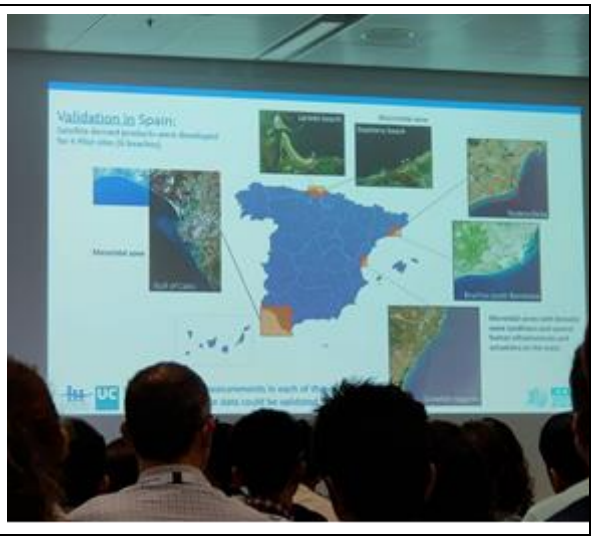
▲發表主題：THE PHYSICAL PROCESSES ACTIVE IN TROPICAL CYCLONE WAVE GENERATION。

▲內容重點：利用 NDBC 浮標觀測資料進行颱風風場之形態與造波特性分析。

（三） Mangala Amunugama (日本 Ecoh Corporation)

▲發表主題：APPLICABILITY OF ATMOSPHERIC REANALYSIS DATA FOR THE REPRODUCTION OF TYPHOONINDUCED STORM SURGE IN JAPAN。

▲內容重點：利用 ECWMF 之 ERA5 再分析場風場資料與日本氣象廳之風場資料，進行颱風暴潮之推算，其結果以 ERA5 風場結果較佳。



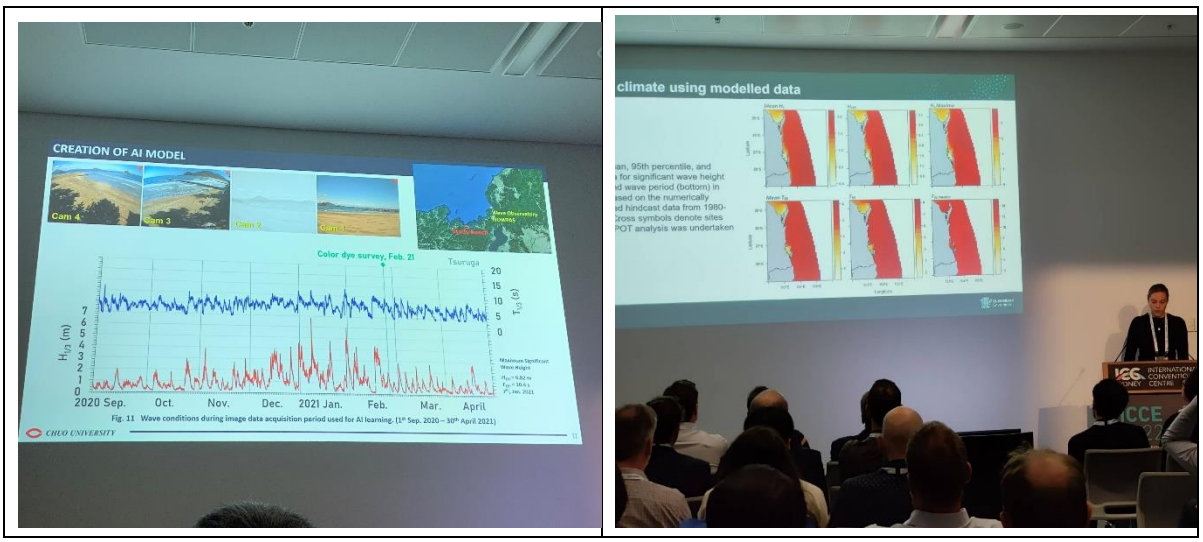


圖 4　12 月 5 日研討會活動

三、 12 月 6 日研討會及交流活動：

●研討會：

本日研討會主題分為護堤、沙丘和海灘侵蝕(Berm, Dune and Beach Erosion)、珊瑚礁流體力學(Reef Hyodynamic)、波浪數值模擬(Numerical Modelling - Waves)、波浪結構物交互作用(Wave - Structure Impacts and Interactions)、越波風險與監測(Wave Overtopping Hazards and Monitoring)、自然工程(Nature-Based Solutions)、風浪(Wind Waves)、海岸沉積物與輸送(Coastal Sediments and Transport)、海岸溢淹(Coastal Flooding and Inundation)、AI 與深度學習(AI and Deep Learning)、河口水動力(Estuary Hyodynamics)、數值模擬(Numerical Modelling)、渠道管理(Channel Management)、結構設計與性能(Structure Design and Performance)、海岸監測(Coastal Monitoring)及溯升及沖涮(Shore Protection Structures) 16 個主題總計 112 個研究發表。

【珊瑚礁流體力學】研究發表：

本場次座談由 Dr.　Javier Lopez Lara （西班牙 IHCantabria）擔任主持人，各研究學者發表內容摘陳如下：

（一） Adam Fincham,　(美國南加洲大學)

▲發表主題： THE EFFECT OF REEF GEOMETRY ON BREAKING WAVE SHAPE. COMPUTATIONAL AND FIELD DATA COMPARATIVE STUDY

▲內容重點：利用高解析度數值模式配合移動網格法建置珊瑚礁海岸波浪模式，模擬波浪行經珊瑚礁之碎波型態，並配合現場觀測資料包含 UVA 觀測、ADV 流場量測及壓力計等。模式結果與觀測資料相當一致。

（二） Dave Callaghan (法國昆士蘭大學)

▲發表主題：ON-REEF CYCLONIC WAVE CLIMATE THROUGHOUT THE GREAT BARRIER REEF

▲內容重點：利用波浪數值模式模擬颱風浪行經大保礁之波浪變化，而颱風風場需先經校驗與實測資料吻合，波浪模擬與實測資料之比較呈現結果相當一致。

（三） Jarrod Den (澳洲 Baird 公司)

▲發表主題： WAVE TRANSMISSION OVER A WIDE NEARSHORE REEF

▲內容重點：利用 OPENFOAM 模式建立珊瑚礁地形之波浪形式，並與水工模型試驗結果比較，討論波浪於珊瑚礁地形之波浪衰減現象。

（四） Tony Bergoe (丹麥, Niras 公司)

▲發表主題： WAVE TRANSFORMATION ON CORAL REEFS:COMPARISON OF A CFD MODEL AND PHYSICAL MODEL TESTS OF A MALDIVIAN REVETMENT

▲內容重點：利用數值模式及水工模型試驗討論波浪傳輸在珊瑚礁地形上之 MALDIVIAN 護岸受力分析。

（五） Alireza Valizadeh (澳洲 DHI 公司)

▲發表主題： YEPPOON SURF POOL: FULL-SCALE VALIDATION OF A CFD MODEL

▲內容重點：利用 OPENFOAM 建立人工造浪池，並搭配衝浪選手進行衝浪運動分析，進行全面性模式驗證，結果相當好。其人工造浪池可同時造成 5 種不同等級之浪，供不同程度之衝浪者使用。由於數值模式可完全的模擬出人工造浪，下一階段規劃數值模式結合 VR 技術，供民眾 VR 衝浪。

【風浪】研究發表：

本場次座談由 Dr. Ian Young （澳洲墨爾本大學）擔任主持人，各研究學者發表內容摘陳如下：

（一） Shoko Sato (日本京都大學)：

▲發表主題： MODELING OF WIND-WAVE GROWTH IN STRONG WIND CONDITIONS BASED ON PHASERESOLVING WAVE MODEL

▲內容重點：於 XBeach 模式以 Mile 風浪理論建置風浪模組(尚在開發中)。

（二） Jane McKee Smith (美國陸軍工兵團)

▲發表主題： ADVANCES IN UNSTRUCTURED WAVEWATCH III AND APPLICATIONS TO NEARSHORE WAVES 。

▲內容重點：開發 WAVEWATCH III 模式非結構網格模組，並應用於近岸颱風波浪模擬，其結果顯示於近岸網格加密與實測資料驗證結果相當良好。

（三） Manuel Corrales Gonzalez (義大利熱亞那大學)：

▲發表主題： WAVE HINDCAST IN THE PACIFIC OCEAN OF CENTRAL AMERICA BY USING UNSTRUCTURED MESH

▲內容重點：以非網格波浪模式，進行中美洲太平洋波浪模擬，其結果顯示網格於近岸加密對近岸波浪模擬改善不明顯，對於深水波改善相當大。

【海岸沉積物與輸送】研究發表：

本場次座談由 Dr. Peter Nielsen （澳洲昆士蘭大學）擔任主持人，各研究學者發表內容摘陳如下：

（一） Cheng-Jung Hsu 許城榕 (國家海洋研究院)

▲發表主題： ASSESSMENT OF WAVE-INDUCED MOMENTARY SEABED LIQUEFACTION

▲內容重點：就建立壓力梯度與海床發生不穩定性方面，飽和度與滲透性有其重要性。由於低滲透性與出現空氣，這兩種情形都會放大孔隙壓力消散，因此海床具有瞬時液化的潛在風險。而完全飽和的沉積物處於非線性波浪情形下，液化的

可能性低。

（二） Nick Brilli (維吉尼亞理工學院暨州立大學)

▲發表主題： A SIMPLE LABORATORY CALIBRATION FOR MITIGATING SEAWATER EFFECTS ON SOIL MOISTURE SENSORS

▲內容重點：使用現地資料並在研究室發展一種可以減輕鹽水情形下過度估計濕度的校正方案。因此可在海岸環境中收集正確的溼度資料。

（三） Caroline Hoch (佛羅里達理工學院)

▲發表主題： PREDICTION NEAR-BED SEDIMENT TRANSPORT THROUGH PARTICLE IMAGE VELOCIMERTRY

▲內容重點：以無因次參數之函數量化並預測有效海床厚度，可使海床形態學改善模型。預測沈積物輸送的量化速度，不僅可以增加侵蝕成因之理解，還可以全面改善海岸韌性。

【AI 與深度學習】研究發表：

本場次座談由 Dr. Takaaki Shigematsu （大阪公立大學）擔任主持人，各研究學者發表內容摘陳如下：

（一） Qin Chen (美國東北大學)

▲發表主題： PHYSICS-INFORMED DEEP LEARNING OF NEARSHORE WAVE PROCESSES

▲內容重點：針對近岸研究提出 NWnets 模式，結合物理-資訊的神經網絡深度學習模型 PINN(Physics-informed Neuro Network)。PINN 可準確重建近岸波場、估計波高及遙測水深，並且經由實驗室或現場量測來發掘新的參數化函數。

（二） Sooyoul Kim (熊本大學)

▲發表主題： ONE DAY AHEAD WAVE PREDICTIONS USING A HYBRID ALGORITHM OF LONG-SHORT TERM MEMORY AND NEURAL NETWORK FOR MARINE CONSTRUCTIONS

▲內容重點：開發了一種由 LSTM 和 ANN 組成的混合機器學習演算法，結合提前 24 小時全球波浪預報（JMA GWM 和 NOAA WW3）及其相應的觀測結果（NOWPHAS）來預測日立那珂港提前 24 小時的近岸有效波高。

（三） Edward Atkin (eCoast 公司)

▲發表主題： APPLICATION OF DEEP LEARNING OBJECT DETECTION TO SURFING WAVE QUALITY

▲內容重點：說明將機器學習技術應用於紐西蘭西海岸 Waikeri（Manu 灣）衝浪點的遠程攝影系統 (RCS) 收集的傾斜影像，以有效監測衝浪剝離角的方法及其效果。

【海岸監測】研究發表：

本場次座談由 Dr. Annette Grilli （美國羅德島大學）擔任主持人，各研究學者發表內容摘陳如下：

（一） Mitchell Harley (新南威爾斯大學)

▲發表主題： COASTSNAP: A GLOBAL CITIZEN SCIENCE PROGRAM TO MONITOR CHANGING COASTLINES

▲內容重點：開發 COASTSNAP 軟體，可利用手機進行海岸監測，由於操作簡單，從 2019 年至今全球已 24 個國家使用。

（二） Christopher Drummond (新南威爾斯大學)

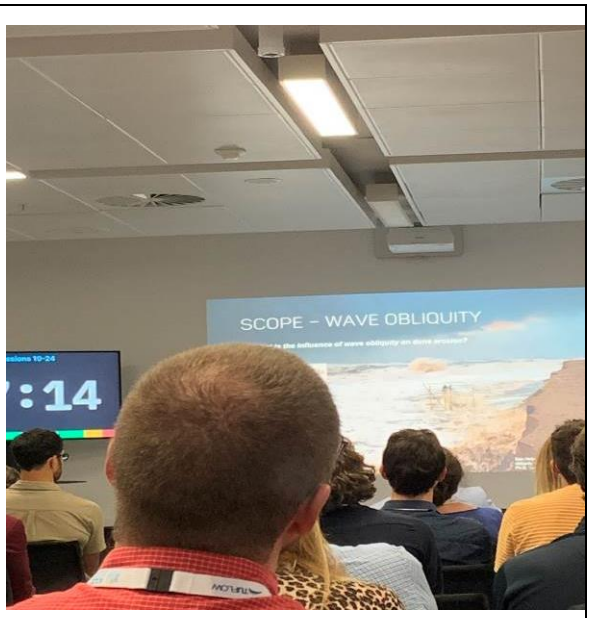
▲發表主題： BIG COASTAL MANAGEMENT REQUIRES BIG COASTAL MONITORING: TWO DECADES OF OPERATIONAL COASTAL IMAGING AT AUSTRALIA’ S GOLD COAST

▲內容重點：簡介澳洲黃金海岸以攝影機進行 20 年的海岸監測成果，如利用影像分析進行海岸線變遷分析，利用 AI 深度學習進行海岸遊客統計等應用。

（三） Brian McFall (美國陸軍工兵團)

▲發表主題： SANDSNAP – AMASSING A BEACH GRAIN SIZE DATABASE IN THE UNITED STATES

▲內容重點：開發一手機 app，供民眾拍攝各地海灘沙之照片，以 AI 深度學習辨識海灘沙粒徑，以建置粒徑資料庫。APP 容易上手，但當有一些問題需解決，如以手機定位可能被更改位置造成位置資料錯誤以及目前 AI 粒徑辨識技術精度尚待改善。



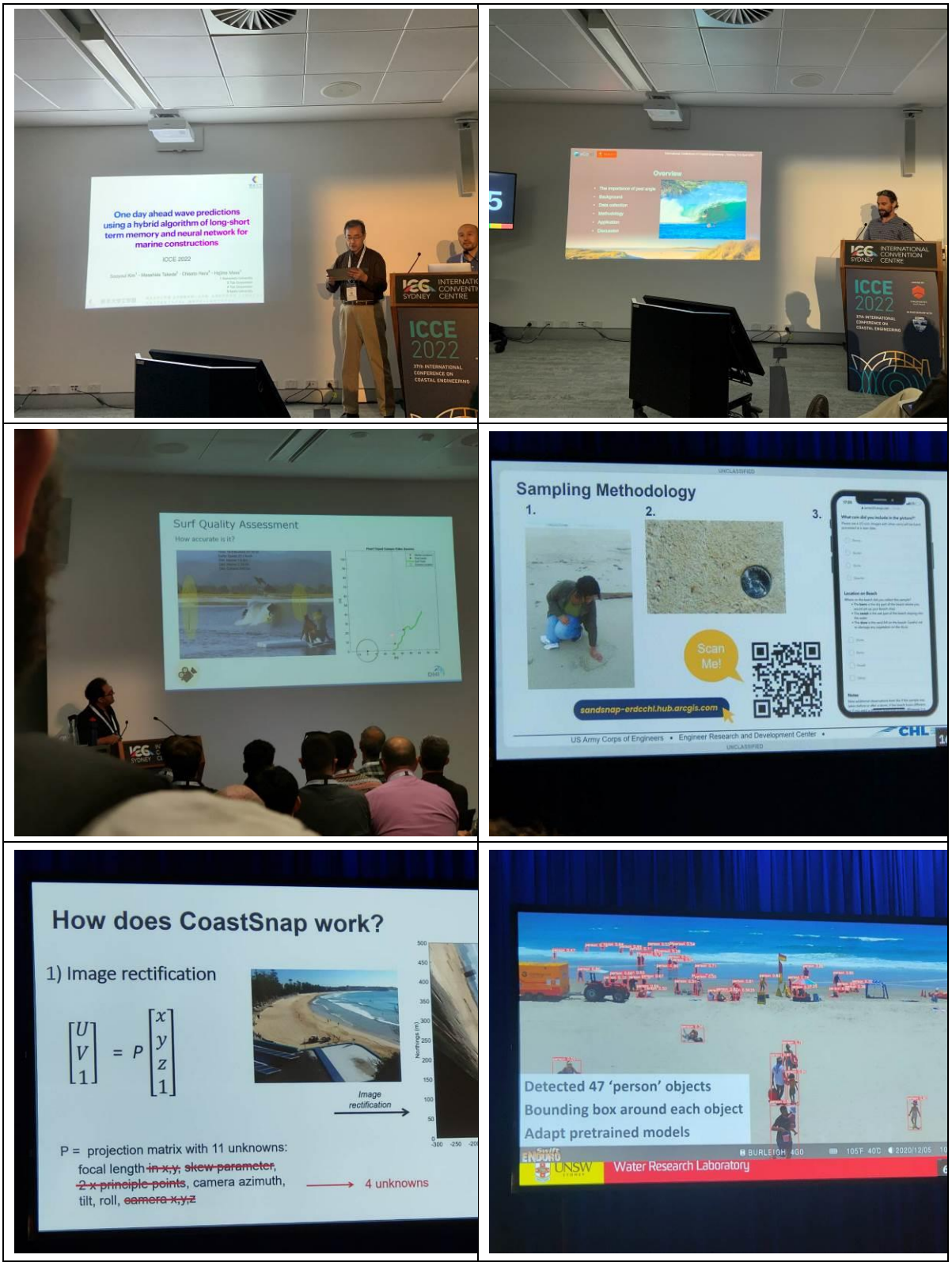


圖 5　12 月 6 日研討會活動

●交流活動：

大會規劃活動：

今日交流活動主題為「海岸工程中的女性(Women in Coastal Engineering)」，由 Royal Haskoning DHV 公司贊助，邀請新南威爾斯大學水工研究室(Water Research Laboratory, UNSW Sydney)的資深講師 Kristen D Splinter 博士擔任主持人、及臥龍岡大學空間分析研

究室(Spatial Analysis Laboratories, University of Wollongong)的助理教授 Sarah Hamylton 博士、雪梨北部海灘委員會(Northern Beaches Council, Sydney)的專案經理 Davena Bond、畢業於坎塔布里亞大學 (University of Cantabria)的土木工程師 Cristina Izaguirre 及荷蘭 Royal HaskoningDHV 公司的澳洲總經理 Sarah Budd 等 4 位海岸工程女性代表擔任與談人，分享在海岸工程界女性工作者在性別多樣性、包容性、職業道路選擇(兼職與專職等)、輔導和工作生活平衡(兼顧子女養育)等面向相關經驗，並藉由相關話題開啟後續交流活動。

本會與各國人員交流摘要：

1. 昆士蘭政府水工研究室(Queensland Government Hydraulics Laboratory, QGHL)：

   該水工研究室負責 2 大業務，一為水文浮標觀測營運，另一為水槽服務。其中水文浮標觀測營運由政府全額支應，免費提供相關資料蒐集與應用；水槽服務則對於海岸工程專案進行試驗與模擬，對外營運接受專案委託並收取相關費用。本會全國海洋資料庫之水文資料收集與應用及未來船模實驗室亦可與其交流，汲取其資料處理及水槽營運經驗，相關詢問可透過電子郵件等與其海岸工程師 Nick Naderi 聯繫。

2. 新南威爾斯大學水工研究室(Water Research Laboratory, UNSW Sydney)：

   Kristen D Splinter 於 12 月 4 日歡迎酒會即偕同其 10 歲女兒 Grace 歡迎各界與會，並強調家庭友善活動之重要性，該水工研究室有 6 座不同尺寸與功能之水槽，並有沙灘車及無人機等相關水工研究設備，並歡迎與其後續交流。

3. Royal HaskoningDHV 公司：

   該公司提供暴洪預測及預警服務，其全球洪水風險工具可提供準確及全面的資訊，相關顧客包含政府機關與企業，未來本會若有運用海氣象工具之需求或諮詢亦可與其工程師 Matthijs Bos 等聯繫。

4. BLUEMONT 公司：

   其產品主要為岩石網袋，標榜可回收再生之特性，可鋪設於海岸及離岸風電場等，以自然工法及生態友善方式防止海岸侵蝕及固定基座與電纜，未來希望可參與台灣相關海岸工程專案。

圖 6　12 月 6 日交流活動

四、　12 月 7 日主題演講、研討會、交流及技術之旅：

●主題演講：

本日首先舉行主題演講由美國陸軍工兵團(USACE)資深研究海洋學家 Katherine L. Brodie 女士以美國陸軍工兵團海岸觀測之現場研究設施 (FRF)之歷史與未來進行演講，演講詳細交待美國陸軍工兵團的 FRF 之演進，並介紹 USACE 利用光達(Lidar)量測波浪

溯升及波浪碎波波形之量測。

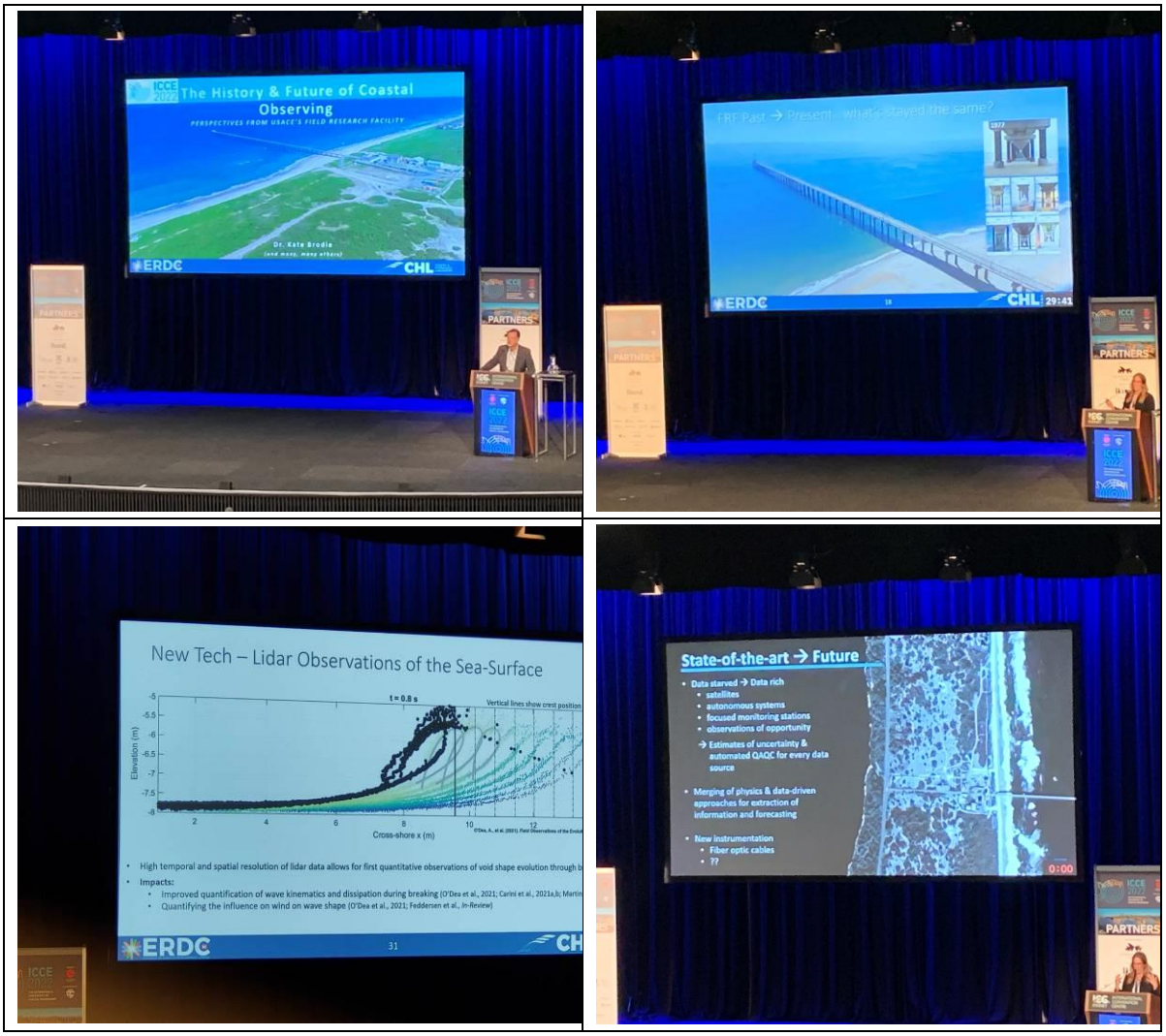


圖 7　12 月 7 日主題演講

●研討會

本日研討會主題分為紊流與混合(Turbulence and Mixing)、流體與結構物交互作用(Fluid Structure Interaction)、數值模擬(Numerical Modelling)、海岸管理(Coastal Management)、底床與漂沙(Seabed and Sediments)及氣候變遷與風險(Climate Change and Risk) 6 個主題總計 40 個研究發表。

【紊流與混合】研究發表：

本場次座談由 Dr. Claudio Neves（巴西里約熱內盧聯邦大學）擔任主持人，各研究學者發表內容摘陳如下:

（一）　Annalisa De Leo (義大利熱那亞大學)

▲發表主題：EXPERIMENTAL STUDY OF LAGRANGIAN MIXING IN WEAKLY DISSIPATIVE TIDAL CHANNELS

▲內容重點：利用影像分析技術，進行水工模型試驗分析感潮河道之 Lagrangian 混合分析，試驗提供在耗散感潮河道之頻散的良好說明。

（二）　Zhi-Cheng Huang 黃志誠教授(臺灣中央大學)

▲發表主題：FIELD OBSERVATIONS OF TURBULENCE AND SUSPENDED SEDIMENTS OVER AN INTERTIDAL REEF

▲內容重點：本研究主要利用大學現場觀測儀器包含 OBS、LISST、ADCP、ADV 等，於藻礁區進行近岸剖面水文及漂沙量測與分析。

【流體與結構物交互作用】研究發表：

本場次座談由 Dr. Marion Tissier(荷蘭台夫特理工大學）擔任主持人，各研究學者發表內容摘陳如下：

(1) Enda Murphy (加拿大國家研究委員會)：

▲發表主題：NUMERICAL SIMULATION OF DRIFTWOOD TRANSPORT BY WAVES IN A LABORATORY BASIN

▲內容重點：利用平面水工模型試驗，進行漂流木水工模試驗，並使用 XBeach 模式依據 Kimura & Kitazono(2019)進行漂流木運動模組開發，並進行漂流木傳輸模擬。其結果顯示標流木對於擴散系統相敏感。

【數值模擬】研究發表：

本場次座談由 Dr. Christoph Troch（南非 CSIR）擔任主持人，各研究學者發表內容摘陳如下：

（一） Shengzhe Wang (美國科羅拉多丹佛分校)

▲發表主題：SPH AND ANALYTICAL MODELING OF AN URBAN FLOATING STRUCTURE FOR COASTAL EXPANSION

▲內容重點：模塊化浮動結構 (MFS) 為沿海特大城市的開發提供了一種替代傳統土地開墾之替代方案。 然而，目前還沒有針對 MFS 結構進行分析和設計指南。此研究提出利用受規則波或不規則波影響的傳統矩形浮橋對 MFS 進行動態分析，為獲得適當阻尼比以光滑粒子流體動力學 (SPH) 模擬比較典型 MFS 結構，並利用線性波理論的封閉形式公式證明能夠計算搖擺(sway)、起伏(heave)和橫搖(roll)的響應振幅算子 (RAO)。最後提供了一種易於理解的浮動結構動態分析方法。

（二） Ben Williams (澳洲西澳大學)：

▲發表主題：NOWCASTING INFRAGRAVITY WAVE HEIGHT WITHIN A HARBOUR USING AN ARTIFICIAL NEURAL NETWORK

▲內容重點：利用澳洲 Prot Kembia Waverider Buoy(PKWRB)之深水浮標觀測資料及 Kembia 港內的 ADCP 利用 ANN 技術進行港內亞重力波之現報模式開發。

【海岸管理】研究發表：

本場次座談由 Dr. Yoshimitsu Tajima（東京大學）擔任主持人，各研究學者發表內容摘陳如下：

（一） Maria Maza (西班牙坎塔布里亞大學 IHCantabria 研究中心)

▲發表主題：EXPERIMENTAL ANALYSIS OF HYBRID SOLUTIONS FOR COASTAL PROTECTION

▲內容重點：以一組結合各種不同種類植物生態系與緩坡的混和解決方案，分析其各種不同組合下相關的溯升高度。研究結果顯示與依據 Eurotop 估計的結果不一致，凸顯了要正確估計溯升高度，尚需要新公式，這個新公式應該要將剛性結構

的特徵和生態系統的特徵納入考量。

（二） Telica Mussington (Smith Warner 國際公司/牙買加曼徹斯特大學)：

▲發表主題：COASTAL SETBACK PRACTICES IN THE CARIBBEAN AND OTHER SIDS: A TOOL FOR ENHANCING RESILIENCE

▲內容重點：分別以來自於澳洲與東加勒比海的方法的國際海岸緩衝帶設置實例來探討。評估其面對真實颶風事件(2004 年的 Ivan 颶風)下暴潮與波浪侵入的情形。2 模式與真實損害的觀察間有良好的相關性。並提出調整建議，以更能符合適用於小島的情形，並推廣並非一種方法可以適用所有情形的概念。針對安全區域，可縮小緩衝帶，而針對脆弱區域則應發展極大化在此被縮小的緩衝帶。

（三） Matt Rivers (紐西蘭奧克蘭理事會)：

▲發表主題：AUCKLAND COUNCIL'S PROGRESS ON SUSTAINABLE SHORELINE ADAPTATION PLANS

▲內容重點：討論奧克蘭理事會在海岸線調適計劃的經驗教訓、成功、挑戰和侷限性，以及實施所需的後續步驟。奧克蘭理事會對大部分海岸採取了不主動干預的策略，以獲得眾多自然海岸中的好處，並兼顧奧克蘭理事會的支出。如果關鍵基礎設施或有價值的社區資產處於危險之中且無法搬遷，則採用維持海岸線(如築堤防護)或有限干預策略。隨著未來海平面上升，沿海災害增加，當前的策略變得無法因應，因此通常需要轉變戰略。因此，撤退管理是未來越來越多採用的策略。

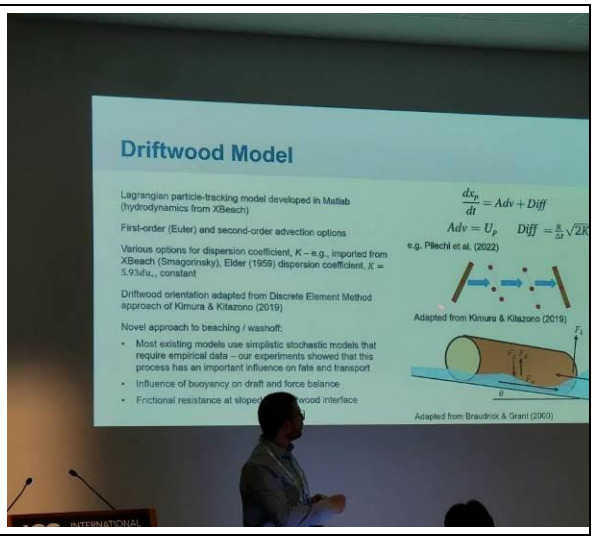
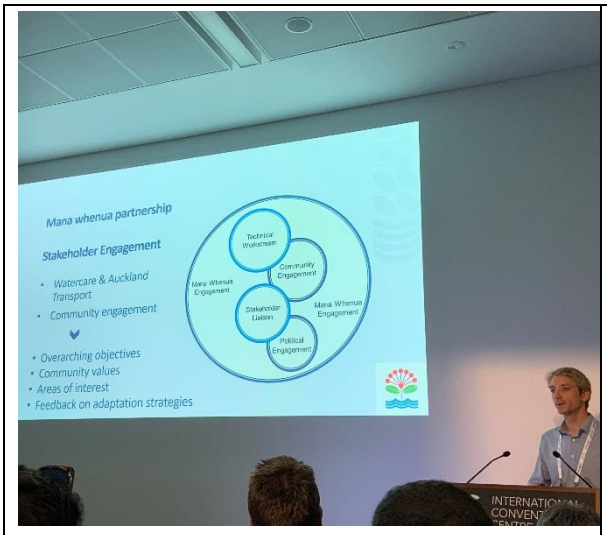


圖 8　12 月 7 日研討會活動

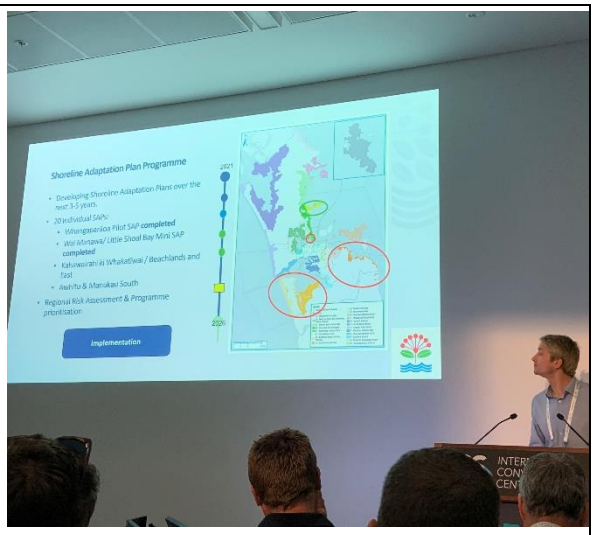
●交流：

本次與奧克蘭理事會資深海岸專員 Matt Rivers 交流政府之海岸管理策略，雙方認為策略計畫涉及許多利害關係人，非常不容易，而且因應環境變化及氣候變遷，策略將隨之改變，其中溝通是非常重要的事情。另外，計畫落實應結合到法定流程，例如

相關之海岸管理計畫，就可考慮結合至都市計畫，藉由都市計畫及土地使用分區管制等相關法令，將海岸管理計畫策略反映至土地分區管制中。後續若需借重奧克蘭相關經驗，將可再以 email 等方式與 Matt Rivers 聯繫。



Matt Rivers 簡報策略計畫涉及許多利害關係人



Matt Rivers 簡報奧克蘭海岸調適計畫進程

圖 9　12 月 7 日交流活動

●技術參觀：Cockatoo Island

鸚鵡島是聯合國教科文組織世界遺產，位於雪梨港內帕拉馬塔河和萊恩科夫河的交匯處。鸚鵡島是海港內幾個島嶼中最大的一個，這些島嶼曾經是樹木繁茂的砂岩小丘。鸚鵡島（傳統名稱 Wa-rea-mah）與居住在該地區及其周邊地區數萬年的澳洲原住民有著密切的聯繫，自 1800 年代中期歐洲殖民以來，該島發生了翻天覆地的變化，該島以前用作囚犯刑罰監獄，然從 1870 年起，鸚鵡島變成了一個主要的海軍艦艇造船廠。1913 年，鸚鵡島成為澳大利亞皇家海軍的官方造船廠，二戰期間是西南太平洋的主要修船廠。在此可以看到一個島嶼的利用及變遷與人文環境有極大的關係，小島受海圍繞的特性使它被建設成為監獄、造船廠及觀光地點等，隨著時代變遷，遍布的文物建築和船塢則成為重要且珍貴的紀錄。

圖 10　12 月 7 日技術參觀

五、 12 月 8 日研討會及交流：

●研討會

本日研討會主題分為風暴潮危害評估和模擬(Storm Surge Hazards Assessment and Modelling)、海嘯、船波和墳壩波(Tsunami, Ship and Dam Break Waves)、海岸演化與氣候(Coastal Evolution and Climate)、波浪模擬(Wave Modelling)、風沙和沖刷帶輸砂(Aoelian and Swash Sediment Transport)、自然工法(Nature-Based Solutions)、結構物與砂交互作用(Structure and Sediment Interactions)、海岸輸砂(Coastal Sediments and Transport)、海岸演化(Coastal Evolution)、船舶繫纜(Ship Mooring)、海岸危害(Coastal Hazards)、亞重力波(Infragravity Waves)、風電場與浮式結構物(Wind Farms and Floating Structures)、水道、沙嘴與都市海岸溢淹 (Inlets, Spits and Urban Coastal Flooding)、海岸演化模擬(Modelling Coastal Evolution)、海岸管理(Coastal Management)、海嘯(Tsunami)、防波堤設計(Breakwater Design)、氣候調適能力(Climate Resilience and Adaptation)、海岸線模擬與預測(Shoreline Modelling & Prediction)等 20 個主題總計 135 個研究發表。

【海岸演化與氣候】研究發表：

本場次座談由 Dr. Bruce Jaffe（美國地質調查局）擔任主持人，各研究學者發表內容摘陳如下:

（一） Takaaki Uda (日本 PWRI 國立研究開發法人土木研究所)

▲發表主題： SHORELINE VARIATION OF AN ISLAND IN RESPONSE TO CHANGE IN WAVE DIRECTION

▲內容重點：以沖繩知念半島外 3 公里處的駒鹿島作為研究地點，於 2019 年 7 月 13 日對其岸線變化進行了現地觀測，並利用衛星圖像調查了岸線變化情況。結果島後方尖狀前沿的形狀分為三種類型（圓形、細長橢圓形和拉長橢圓形）。模型計算顯示，在北向入射的波浪作用下，圓形沙島（類型 1）向細長橢圓形(類型 II)的變形可獲得很好的解釋，印證了波高分布會誘發輸沙之假設。

【波浪模擬】研究發表：

本場次座談由 Dr. Jeff Hansen（澳洲西澳大學）擔任主持人，各研究學者發表內容摘陳如下:

（一） Minh Thang Tran (南韓 Sejong University)

▲發表主題： GENERATION OF LINEAR WAVES WITH BOTTOM WAVE MAKERS IN A FLUME: AN EFFICIENT WAY TO PREVENT REFLECTED WAVES

▲內容重點：理論解析及數值方法發展新型造波方法-底床造波，進行三角形及長方形二種方式造波。

（二） Kevin Martins (波爾多大學)

▲發表主題： NON-LINEAR DISPERSION EFFECTS IN NEARSHORE WAVES: PERSPECTIVES FOR DEPTHINVERSION APPLICATIONS 。

▲內容重點：開發利用光達即時量測波高週期反演算近岸地形水深技術，目前試驗結果以布斯尼克斯方程式反算結果最佳。

（三） Sunil Mohanlal (法國 LHSV)

▲發表主題： SIMULATION OF STEEPNESS-LIMITED BREAKING WAVES IN A FULLY

NONLINEAR POTENTIAL FLOW MODEL。

▲內容重點：以完全非線性勢能流模式，進行碎波極限條件分析與碎波能量消散分析。

（四） Yana Saprykina (俄羅斯科學院希爾紹夫海洋研究所)

▲發表主題： MODELLING OF SPILLING AND PLUNGING BREAKING WAVES IN SPECTRAL MODELS。

▲內容重點:討論波浪模式-相位解析模式與相位平均模式之捲波碎波與溢波碎波，其研究結果顯示相位解析模式與相位平均模式在模擬碎波消散時，需使用不同的非線性項。

（五） Jinghua Wang (香港理工學院大學)

▲發表主題： MODELING INFRA-GRAVITY WAVES USING SCHISM-WWMIII BASED ON IMPROVED FORMULAS AND COUPLING APPROACH。

▲內容重點：基於 SCHISM-WWMIII 波流耦合模式，開發可計算亞重力波之相位平均波浪模式。

【自然工法】研究發表：

本場次座談由 Dr. Rodger Tomlinson（澳洲格里菲斯大學）擔任主持人，各研究學者發表內容摘陳如下:

（一） Katherine Dafforn (澳洲麥覺理大學)

▲發表主題： CAN LIVING SEAWALLS BE DESIGNED TO IMPROVE BIOSECURITY?

▲內容重點：生態工程計畫例如活力海堤計畫會透過增加複雜性與表面積來提升生物多樣性，但使入侵物種獲益的程度尚未明確。運用 6 種具有提升棲地功能的水泥板設計(5 種複雜型式及 1 種平面型式)改裝在海堤上試驗，結果顯示在中高潮位區域無論是複雜型式或平面型式的水泥板對入侵物種增加數量與豐富度都非常少。相對地，在低潮位區域則對入侵物種提供了約 75%的覆蓋及 50%的豐富度，且在某些情形下複雜型式會比平面型式的水泥板多出 50%的數量及多樣性。對入侵物種支持因子的相關知識，可對未來設計生態工程之發明運用時減少生態安全風險。

【海岸輸砂】研究發表：

本場次座談由許城榕博士(國家海洋研究院)擔任主持人，各研究學者發表內容摘陳如下：

（一） Ly TrungNguyen (臺灣中央大學)：

▲發表主題： REAL-TIME MONITORING OF HYODYNAMICS AND SUSPENDED SEDIMENT CONCENTRATIONS IN A COASTAL REEF

▲內容重點：利用 OBS 在藻礁進行流場及懸砂監測，其觀測結顯示近幾年冬季藻礁上懸砂濃度比夏季大。

（二） Ana Colina Alonso (荷蘭台夫特理工學院)：

▲發表主題：FACTORS CONTROLLING THE EQUILIBRIUM SEDIMENT COMPOSITION IN SAND-MUD TIDAL。

▲內容重點：利用影響因子控制沉積分衡式的方式，建立潮汐作用下是泥與沙混

合地形之漂砂，並與實測資料驗證，提供一泥與沙數值模擬方法。

（三） Pushpa Dissanayake (德國 Kiel University)：

▲發表主題： EFFECT OF LARGE-SCALE FORCING ON THE LOCAL SEDIMENT TRANSPORT POTENTIAL AT THE SCHLESWIG-HOLSTEIN BALTIC SEA COAST

▲內容重點：利以多尺度網格模式討論由風造成之水位變化所產生的海域輸砂特性。

（四） Allison Penko (美國 NRL)：

▲發表主題：PROBABILISTIC PREDICTIONS OF EQUILIBRIUM RIPPLE GEOMETRY FOR TIME-DEPENDENT SEAFLOOR MODELING。

▲內容重點：利用美國海軍長期蒐集之海域地形資料，開發 SeaMoRE 模式，可由水文資料模擬地形變化，部份模組是以機器學習模組開發，部份模組則是利用經驗式開發如沙漣模擬。

【海岸演化】研究發表：

本場次座談由 Aline Pieterse 博士(比利时 IMDC 公司)擔任主持人，各研究學者發表內容摘陳如下：

（一） Pasquale Filianoti (義大利雷焦卡拉布里亞地中海大學)：

▲發表主題：THE EVOLUTION TREND OF A BEACH IN CONSEQUENCE OF THE BUILDING OF COASTAL STRUCTURES

▲內容重點：藉由比較兩個不同解析解來分析波浪與海岸結構物之間的交互作用造成之岸線變形。在相同假設條件下，這兩種解析會依據不同方式納入由結構物誘發的波浪繞涉現象，而發展出不同的外觀。

【船舶繫纜】研究發表：

本場次座談由 Jesper Nielsen 博士(澳洲 Seaport OPX 公司)擔任主持人，各研究學者發表內容摘陳如下：

（一） Enrique Pena (西班牙拉科魯尼亞大學)：

▲發表主題：AI- BASED DECISION-MAKING TOOLS FOR PORT MANAGEMENT: SHIP-INFRASTRUCTURE OPERABILITY AND OVERTOPPING

▲內容重點：本研究導入的混和模型可在 RMSE 及 R2 獲得令人滿意的表現。研究提出的泊位安全停留標準亦已納入做為決策標準。越波模型採用簡單的隨機森林(Random Forest)機器學習模式，可於分類是否發生越波方面，獲得令人滿意的改善。而這些標準是建立在越波現象發生時相關參數的資料分析，不但要依據波高、潮位、風速及風向等海洋資訊，還要納入沿著防波堤的發生強度與頻率等資訊。

【海岸危害】研究發表：

本場次座談由 Karin Bryan 博士(紐西蘭懷卡托大學)擔任主持人，各研究學者發表內容摘陳如下：

（一） Christo Rautenbach (紐西蘭 NIWA 公司)：

▲發表主題：INTERPRETABLE ARTIFICIAL INTELLIGENCE FOR RIP CURRENT DETECTION AND LOCALIZATION

▲內容重點：相較於傳統僅應用 CNN 的 AI 模式，本研究運用可判讀型 AI，綜合開

源海上離岸流分類來增加標註，並以不同角度旋轉變形及增加雜訊干擾等方法擴大資料來大幅改善模式與資料。可判讀型 AI 改善了 2 方面表現：預測並標註離岸流發生地點、檢驗演算法不足之處並指出資料/模型潛在可改善之處。目前本研究的演算法可在 90%以上的時間正確分類並標註離岸流發生處。

（二） Adam D. Switzer (新加坡南洋理工大學)：

▲發表主題：UTILISING GEOSCIENTIFIC INSIGHTS INTO PAST COASTAL HAZARD EVENTS FOR COASTAL ENGINEERING

▲內容重點：要運用物理基礎模型來建立極端海岸災害事件模式必須將長期非儀器紀錄資料與過去環境變化上多面向的地球科學資訊納入模型。本研究針對如何取得這些相關資料提出各面向的建議。

（三） Haruki Toguchi (日本中央大學)：

▲發表主題：STUDY OF DETERMINING RISK LEVEL REGARDING SWIMMING CONDITION ON BATHING BEACH USING AI

▲內容重點：本研究提出納入累計救生員數量、昨日救生員數量、波向、波浪週期、氣溫、波高、高潮水準、平日、假日、禮拜幾等因素納入資料學習，可算出門檻值而將海域情形建議分類為紅、黃、藍三種海域安全狀態旗幟。經由驗證模型可在研究標的海灘提出正確的海域安全旗幟建議，並防止淹水意外。

【防波堤設計】研究發表：

本場次座談由 Jessica Podoski 博士(美國陸軍工兵團)擔任主持人，各研究學者發表內容摘陳如下：

（一） Carl Wehlitz (南非 CSIR 公司)：

▲發表主題：DETACHED BREAKWATERS PROTECT LARGE MARINE INFRASTRUCTURE FROM SEVERE STORMS

▲內容重點：在南非的 Richards 灣案例中，對於原本需要複雜且昂貴的改善措施，改為應用離岸堤的方式作為替代方案，而且因離岸堤可獨立建造，因此可以不影響既有設施進行興建。經由實證運用相似大小的離岸堤可對其他港灣的類似港口設施。

圖 11　12 月 8 日研討會活動

●交流(含本日主題活動：Young Professionals Networking Function)

本次與澳洲曼利水工實驗室(Manly Hydraulics Laboratory, MHL)主任(Director)Edward Couriel 交流其相關業務。MHL 是澳洲新南威爾斯州政府規劃和環境部水利司下的一個事業單位，利用物理和數值模型、澳洲國家檢測協會 NATA（National Association of Testing Authorities）認可的設施以及水、下水道、雨水、灌溉、沿海、河流和環境系統方面的

廣泛數據收集計畫，提供與海岸和水利工程以及水流保障相關的專業和公正的建議。Edward Couriel 主任以其攤位展示的《Between Wind & Water》一書內所述新南威爾斯州海岸水道與港口的發展歷史，表示新南威爾斯得以發展，即與 MHL 所做的服務息息相關，從監測、模式到決策支援工具一應俱全。並表示該實驗室亦曾與泰國政府合作，建立海洋資料蒐集設施與資料庫，未來若有相關需求可從大處著眼、小處著手，從小計畫開始進行合作，後續若需借重 MHL 相關經驗，將可再以 email 等方式與 Edward Couriel 主任聯繫。

此外，大會特別安排青年專業人士社交活動，提供年輕（以及內心年輕）的行業專業人士與同事交流、與過去的熟人更新近況並在輕鬆的氛圍中結識新朋友的機會，藉此機會與各國參加者社交互動，建立一些初步印象。

圖 12　12 月 8 日交流活動

六、　12 月 9 日主題演講、研討會及交流：

●主題演講：

本日首先舉行主題演講由 2021 年國際海岸工程獎得主澳洲昆士蘭大學 Prof. Peter Nielsen 主講，題目為 “A Career with Coastal Processes and 18 ICCEs” 主要說明近四十年來近岸漂砂研究發展歷程與個人經歷分享。Peter Nielsen 1978 年起開始參加 ICCE，今年為他參與的第 19 次。他在丹麥完成學業後，到雪梨大學做博士後研究獲取地理學家如何進行海岸作用的研究方法。隨後在美國佛羅里達大學任教，之後在澳洲新南威爾斯洲海岸管理單位開展他的家庭與事業，並在澳洲昆士蘭大學授課，且濃縮他在波浪邊界層流與漂砂的知識寫成〈Coastal bottom boundary layers and sediment transport〉一書，成為該領域的主流教科書，後續並出版〈Coastal and estuarine processes〉講述強制性長波相關研究。

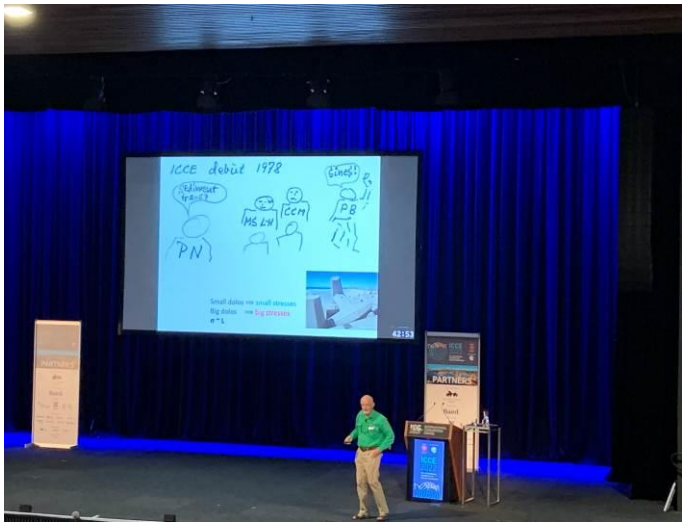


圖 13　12 月 9 日主題演講

●研討會：

本日研討會主題分為氣候變遷(Climate Change)、防波堤設計與創新 (Breakwater Design and Innovation)、暴潮(Storm Surge)、波浪變換、潮波和設計標準 (Wave Transformation, Bores and Design Criteria)、海岸演化(Coastal Evolution)、疏浚養灘(Sand Bypassing and Nourishment)、防波堤與沉箱(Breakwater and Caisson Structures)、波浪力學與轉換(Wave Mechanics and Transformation)、越波(Wave Overtopping)、植被消波(Wave Attenuation by Vegetation)、河口地形動力學(Estuary Morphodynamics)、海堤、堤壩和護岸 (Seawalls, Levees and Revetments)、異常波浪(Extreme Waves)、地形變化-觀測和數值(Morphological Change - Observations and Modelling)、波浪模擬(Wave Modelling)、植被與海岸保護(Vegetation and Coastal Protection)等 16 個主題總計 104 個研究發表。

【波浪變換、潮波和設計標準】研究發表：

本場次座談由 Dr. Kevin Haas（美國喬治亞理工學院）擔任主持人，各研究學者發表內容摘陳如下:

（一） Ignacio Barranco (英國 Hr Wallingford 公司)

▲發表主題： CHARACTERISTICS OF BORES GENERATED BY DIFFERENT MECHANISIMS IN THE LABORATORY

▲內容重點：介紹二種在實驗造潮波的方法，一個是以潰壩形式造波，一種以造波機造波，二種所造出之潮波形式不一樣，可以依據研究需求自行選擇。

（二） Matthew Farthing (美國陸軍工兵團)

▲發表主題： SCALABLE REAL-TIME DATA ASSIMILATION WITH VARIOUS DATA TYPES FOR ACCURATE SPATIOTEMPORAL NEARSHORE BATHYMETRY ESTIMATION

▲內容重點：利用美國陸軍工兵團 FRF 長期觀測資料進行即時地資料同化技術開發。

【氣候變遷】研究發表：

本場次座談由 Dr. Patrick Lynett (美國南加洲大學)擔任主持人，各研究學者發表內容摘陳如下：

（一） Tomoya Shimura (日本京都大學)：

▲發表主題： GLOBAL OCEAN WAVES AND STORM SURGE CHANGES UNDER A WARMING CLIMATE

▲內容重點：利用數值模式模擬 IPCC AR6 極端氣候條件下，全球波候之改變，及海溫上升海平面上升全球暴潮之變化，其結果顯示颱風強度可能增加數量減少，及台灣平均暴潮水位在全球暖化下情境下可能減少。

（二） Francois Flocard (澳洲新南威爾斯大學)：

▲發表主題：GLOBAL WAVE CLIMATE TRENDS: WHAT DO THE SOUTHERN HEMISPHERE WAVE BUOYS TELL US?

▲內容重點：利用澳洲長期浮標波浪資料進行波候變化分析，其結果顯示於南半球波浪增強情況不顯著，波候變強變弱與其資料選擇起始點習習相關。

【越波】研究發表：

本場次座談由 Dr. Ian Coghlan (澳洲新南威爾斯大學 Water Research Laboratory)擔任主持人，各研究學者發表內容摘陳如下：

（一） Marie-Pierre Delisle (美國 UCLA)：

▲發表主題： BEACH GROUNDWATER IMPACTS ON WAVE OVERTOPPING FLOODING

▲內容重點：利用 OPENFOAM 模式波浪與泥沙耦合模組(SedOlaFlow)分別模擬潮波於沙質斜坡與塊石斜坡上溯升，與地下水面之交互作用。

【植被消波】研究發表：

本場次座談由 Dr. Shari Gallop (紐西蘭懷卡託大學)擔任主持人，各研究學者發表內容摘陳如下：

（一） Daniel Cox (美國俄勒岡州立大學)：

▲發表主題： ARE REDUCED-SCALE EXPERIMENTS OF WAVE DAMPING BY VEGETATION SUITABLE FOR ENGINEERING WITH NATURE?

▲內容重點：海岸工程中由植被產生的波浪阻尼主要透過參數化表達式來表示波高衰減，其中從縮尺模型推導得到的經驗係數 CD 需要計入尺度效應。由雷諾數參數化的 CD 值會有比較小的不確定性。

（二） Nery Contti Neto (澳洲西澳大學/Nortek 公司)：

▲發表主題： CONVENTIONAL APPROACHES MAY OVERPREDICT WAVE DISSIPATION BY SEAGRASS MEADOWS

▲內容重點：波浪頻譜減衰中海草床扮演顯著角色，然而有效葉片長度與垂直消能等因素應該列入考量，以免高估海岸保護效果。

（三） Ganga Caldera (加拿大國立科學研究所)：

▲發表主題： WAVE ATTENUATION OF SALTMARSH VEGETATION UNDER STORM CONDITIONS

▲內容重點：整體而言，因為波浪淺化及其他非線性作用，在植被坡的波浪衰減作用相較於在平坦的植被潮灘為小。植物的成熟度以及在地面上與地面下的生物質量是非常重要的因子，其決定了在極端波浪下波浪衰減狀況與效果決定植物耐久度。

（四） Che-Wei Chang (日本京都大學)：

▲發表主題： WAVE ATTENUATION OF SALTMARSH VEGETATION UNDER STORM CONDITIONS

▲內容重點：利用 3D 列印技術，製作紅樹林根部結構物，並利用水工模型試驗，討論紅樹林消波特性。

（五） N Hari Ram (印度理工學院馬德拉斯分校)：

▲發表主題： INVESTIGATION OF SPECTRAL ENERGY DISTRIBUTION IN WAVE GROUPS DUE TO PRESENCE OF VEGETATION

▲內容重點：能量消散主要從能量被轉移到更高的諧波產生。前沿植被會將能量從主頻率轉移到更高的諧波；後端植被則將此轉移後的能量消散掉。植被帶經由將能量從高諧波除去之外，同時也減少了波浪的非線性。另外，觀察到具有露出陡度接近 2 倍波峰陡度的植被帶能夠消散更高能量。

【異常波浪】研究發表：

本場次座談由 Dr. Nobuhito Mori (日本京都大學)擔任主持人，各研究學者發表內容摘陳如下：

（一） Ryota Nakamura(日本新瀉大學)：

▲發表主題： SIMULATION OF CONTAINER DRIFT UNDER EXTREME HYODYNAMIC CONDITIONS

▲內容重點：利用 SPH 數值模式，模擬二個集水箱在極端潮波下運動情況，並討論二個集水箱間距寬度對於集水箱運動之影響。

（二） Zuorui Lyu, The University of Tokyo, Japan (澳洲雪梨大學)：

▲發表主題： ON THE PROBABILITY OF UNIDIRECTIONAL NONLINEAR EXTREME WAVES IN THE PRESENCE OF WAVE REFLECTION

▲內容重點：主要利用水工模形試驗及數值模擬進行駐波上 Peregriner 波形，討論其異常波浪之特性

（三） Zuorui Lyu (日本東京大學)：

▲發表主題： THE OCCURRENCE OF EXTREME WAVE HEIGHT IN A TWO-DIMENSIONAL RANDOM WAVEFIELD IN COASTAL AREA

▲內容重點：主要利用數值模擬進行四波交互作用下，隨機波在產生異常波浪，並討論異常波浪之特性。

【植被與海岸保護】研究發表：

本場次座談由 Dr. Daniel Cox (美國俄勒岡州立大學)擔任主持人，各研究學者發表內容摘陳如下：

（一） Joe El Rahi (比利時根特大學)：

▲發表主題： NUMERICAL SIMULATION OF WAVE-INDUCED VEGETATION DYNAMICS USING A PARTITIONED COUPLING BETWEEN THE SPH METHOD AND AN FEA STRUCTURAL SOLVER

▲內容重點：在 DualSPHysics 中以新的方法建立植物動態模型。內嵌的耦合方式可以不使用擬合參數，在 3-D 環境解算細結構動態。此模型在實驗結果下具有效性，並於力量及左右移動動態顯現完美一致。而在結果的差異顯示了結構特性上

植物模型的相依性。此數值方法提供了一種可用於研究植物動態與放大尺度用於大型領域模型的工程工具。

（二） Acacia Markov (加拿大渥太華大學)：

▲發表主題： NEW INSIGHTS ON USING SCALED MARSH PLANT SURROGATES FOR WAVE ATTENUATION

▲內容重點：以小尺度一般坡度的潮灘植被代理者模型研究波浪衰減情形。結果顯示在相同外觀及種植密度下，考量以剛性或撓性因素來製作模型，獲得類似的波高衰減結果；但代理者模型設定不同的的直徑與種植密度，則會影響波高衰減結果。

（三） José Partida-ramírez (墨西哥國立自治大學)：

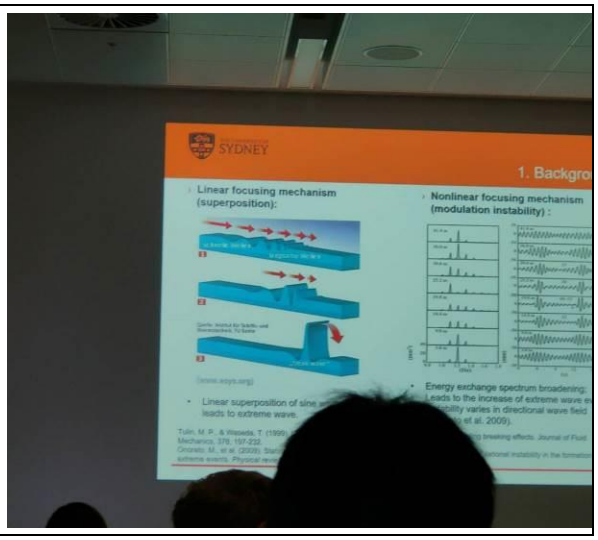
▲發表主題： WAVE TRANSMISSION AND DISSIPATION BY HYBRID (VEGETATED WITH MANGROVE) BREAKWATERS

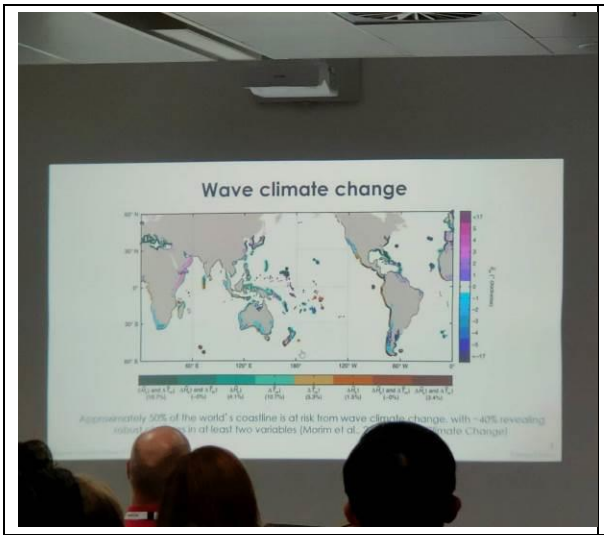
▲內容重點：所提出的結合紅樹林與防波堤共構的結構可以明顯削減更多比例由一般或極端波浪帶來的入射能量。種植的紅樹林愈多則有較多反射及較少傳遞。可藉由減少核心中材料的大小來改善此結構的性能。在波浪侵蝕下，結構前緣會有一定程度的損壞，因此在設置的初期幾年會需要維護，直到生態系統可以自行調節為止。

（四） Gosse Jan Steendam (荷蘭 Infram Hydren)：

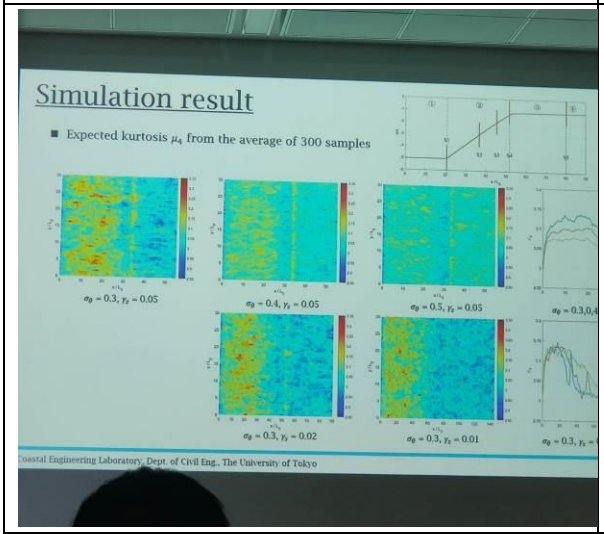
▲發表主題： GRASS SOD PULLING TESTS TO DETERMINE RESISTANCE AGAINST EROSION BY WAVE OVERTOPPING

▲內容重點：檢討及調整分析 GSP(Grass SOD Pulling)的方法。新的測試方法可以涵蓋不同生態及生物多樣性，促使多花的植物與草的混合可於 2022/2023 冬天納入時程。這些測試皆已與越波測試結果驗證其結果。



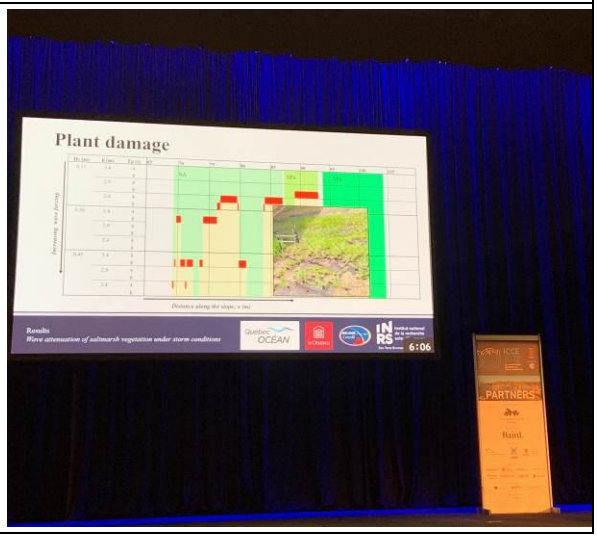

Wave climate change


hrwallingford
NUS
ICCE 2022
Characteristics of bores generated by different mechanisms in the laboratory
Dr. Ignacio Barranco, Prof. Philip Liu and Dr. Ian Chandler
09/12/2022
INTERNATIONAL CONVENTION CENTRE


Simulation result
Expected kurtosis μ_4 from the average of 300 samples
$\sigma_\theta = 0.3, \gamma_s = 0.05$
$\sigma_\theta = 0.4, \gamma_s = 0.05$
$\sigma_\theta = 0.5, \gamma_s = 0.05$
$\sigma_\theta = 0.3, \gamma_s = 0.02$
$\sigma_\theta = 0.3, \gamma_s = 0.01$
Coastal Engineering Laboratory, Dept. of Civil Eng., The University of Tokyo


Swash infiltration
UCLA
Sand
Gravel
11:21


NORTEK
UWA
Conventional approaches may overpredict wave dissipation by seagrass meadows
PARTNERS


Plant damage
Results
Wave attenuation of saltmarsh vegetation under storm conditions
6:06
PARTNERS

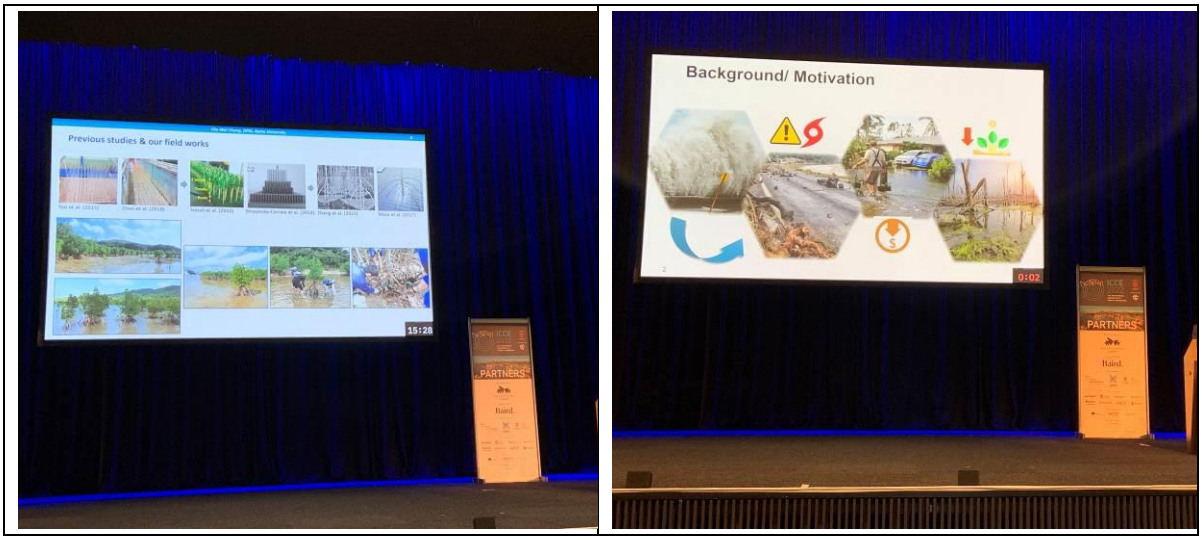


圖 14　12 月 9 日研討會活動

●交流：(含本日主題活動：Conference Gala Dinner)

本次與 EOMAP 資深專案科學家 Emily Twiggs 交流衛星遙測相關業務。EOMAP 為澳洲公司，從事海洋及淡水環境之光學遙測，支援產業及政府對於海岸及濕地生態管理已完成數百項專案計畫，專精於衛星反演水深(SDB)、海床分類(生態棲地)以及水質監控服務。針對相關需求 EOMAP 樂於提供專業意見與服務，可與 Emily Twiggs 以 email 提出相關需求及詢問。

大會安排在 ICC Sydney 的宴會廳，慶祝第 37 屆 ICCE 的結束，在輕鬆的環境中與新老朋友告別。宴會中特別透過中央大學黃志誠教授引薦，與 2021 年國際海岸工程獎得主澳洲昆士蘭大學 Peter Nielsen 教授寒暄恭賀得獎並合影，建立初步關係。

圖 15　12 月 9 日交流活動

參、 心得及建議

一、心得

（一） 深耕在地文化、善用原民智慧：藉由 Brett Rowling 的主題演講，以原住民視角探討澳洲海岸之探測與工程，據以加強當前的工程和科學實務，以實現更適合澳大利亞可持續發展的選項，演講中說明了澳洲港灣演進及 Guri 文化的工程智慧，並表達出各族皆是同源，如同茂盛的樹枝底下皆是來自相同樹幹。我國原住民族眾多，其中亦有海洋原住民如蘭嶼達悟族，我們應該多了解我國海洋原住民之文化與其智慧，應可擴充我國海洋內涵。

（二） 善用臺灣優勢、促進海洋應用：經由美國陸軍工兵團(USACE)資深研究海洋學家 Katherine L. Brodie 女士之主題演講介紹了美國陸軍工兵團海岸觀測之現場研究設施 (FRF)之歷史與未來，並介紹 USACE 目前發展光達(Lidar)量測波浪之成果。美國陸軍工兵團對於近岸波浪量測投入大量觀測設備及持續精進其觀測技術，我國近岸海氣象觀測技術之開發投入相對較少，相較於美國尚屬落後，應發揮我科技產業硬體設計及製造優勢，推動海洋之發展如物聯網、硬體開發等，使我國於此領域可佔一席之地。

（三） 放眼世界、累積核心：觀察 2021 年國際海岸工程獎得主澳洲昆士蘭大學 Prof. Peter Nielsen 四十年來近岸漂砂研究發展歷程及其經歷，其在丹麥啟蒙成長、在澳洲研究、在美國任教，最後在澳洲開展家庭與事業，雖每一階段不同的機緣促使他赴不同國家發展，但皆累積其海岸工程專業核心。Prof. Peter Nielsen 於漂砂研究投入近四十年之精力研究，並於 1978 年起開始參加 ICCE，今年為他參與的第 19 次，持續發表其研究成果，漸漸建立其學術地位，成為一代海岸漂砂領域大師。ICCE 也是一樣，從 1950 年美國加州開始第一屆，每 1~3 年(基本上 2 年)在不同國家舉辦一屆，累積至今(第 37 屆)已經是全球最大海岸工程會議。因此，無論在個人或組織發展上，應放眼世界、累積核心，終究能成長，有所成就。此外，海洋學研單位也應藉由參加國際研討會等交流活動分享研究成果，有效提升在海洋領域之學術地位與人脈。

（四） 性別平等、善待女性：「海岸工程中的女性(Women in Coastal Engineering)」交流活動，使我們瞭解海岸工程界女性參與議題及相關影響，對於女性而言在家庭與工作間取得平衡是影響其發展的重要因素，因為女性通常須配合家庭養育子女需要而割捨一些發展機會或職位。同事間的體諒、包容與配合，以及政府提供的子女養育資源，可以讓女性更無後顧之憂，順利在海岸工程界發展。在臺灣，性別意識抬頭，政府也對於營造性別友善工作環境十分重視，本會也有相關措施，並對於委員性別比率有要求，單一性別不宜低於 1/3，並於委辦案件契約中亦要求

不得有性別歧視等，期可營造良好性別友善工作環境，促使女性在海洋事務一同投入與發展。

二、建議

（一） 我國為一海洋國家，應需要積極的參與國際研討會。除了可展現我國海洋科學研究量能，更可提升本國國際能見度，藉由與世界各國專家的相互討論，除了可以強化本身的研究訓練與質量，更可藉此建立國際人脈，可謂一舉數得。

（二） 下屆第 38 屆國際海岸工程研討會已訂於 2024 年 9 月 8 日~14 日於義大利羅馬舉辦，本會應持續派員參加以維持國際能見度與持續吸收海洋工程新知。

（三） 未來本會參加相關海洋或海岸工程研討會，可及早進行投稿研議作業，研議更多投稿發表內容，以擴大參與及交流。

附錄

議程

37th International Conference on Coastal Engineering Program

Program Current as of 6 December 2022, Subject to change

Please download the App to ensure you have the latest program updates

Sunday 04 December 2022

1300 - 1530	**Exhibition Build and Move In**
1500 - 1800	**Registrations Open**
1800 - 1930	**Welcome Reception** Pyrmont Foyer, Level 2, International Convention Centre Sydney

Monday 05 December 2022

0730 - 1700	**Registrations Open**
0830 - 1030	**Plenary Session** Pyrmont Theare, International Convention Centre, Sydney
0830 - 0935	Welcome to Country & Conference Welcome, Ian Turner, Joint-Chair, ICCE 2022 Conference Co-Host Welcome, Romilly Madew, CEO, Engineers Australia Minister Welcome & Official Opening, The Hon. Robert Stokes MP, Minister for Infrastructure, Minister for Cities, and Minister for Active Transport Kari Performance "Djapana Sunset Dreaming"
0935 - 1015	Keynote Address: The Exploration and Engineering of Australia's Coastline: An Indigenous Perspective Brett Rowling Research Chemist ANSTO NST Isotope Tracing in Natural Systems
1015 - 1030	Co-Host CERC Welcome and CERC Award Presentations, Patrick Lynett and Daniel Cox Platinum Sponsor: Baird
1030 - 1100	**Morning Tea**
1100 - 1300	**Technical Sessions**

Session	Session 1 Wave Overtopping 1	Session 2 Coastal Flooding and Inundation 1	Session 3 Satellite Remote Sensing 1	Session 4 Sensing and Instrumentation	Session 5 Sediment Dynamics at Engineered Coasts	Session 6 Nature-Based Solutions 1
Room	Room C2.1	Room C2.2	Room C2.3	Room C2.4	Room C2.5	Pyrmont Theare
Chair	Amir Etemad-Shahidi	Laura Cagigal	Erwin Bergsma	Adam Fincham	Andrew McCowan	Grzegorz Rozynski
1100 - 1120	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	MIXED-SEDIMENT DYNAMICS AT A BACK-BARRIER BEACH NOURISHMENT Jorn Bosma, Utrecht University, Netherlands	ECOENGINEERING FRESHWATER FLOWS FOR ESTUARY HYDROLOGICAL STATE Shari L. Gallop, University of Waikato & PDP (Pattle Delamore Partners Ltd), New Zealand
1120 - 1140	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 Gonzalez Roiguez, Fundación Instituto De Hidúulica Ambiental, Spain	CHALLENGES IN AUTOMATION OF QUALITY CONTROL FOR TIDE GAUGE DATA Felix Soltau, University of Siegen, Germany	UNDERSTANDING 3D SAND WAVE DYNAMICS FOR ENGINEERING PURPOSES Pauline Overes, University of Twente, Deltares, Netherlands	CREEK RESTORATION EFFECTS ON TIDAL DYNAMICS IN MANGROVES Erik Horstman, University of Twente, Netherlands
1140 - 1200	STOCHASTIC BOUNDARY UNCERTAINTY IN MEAN WAVE OVERTOPPING RATE ESTIMATES Nikos 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	IMPACT OF LONGSHORE SEDIMENT TRANSPORT ON THE DESIGN AND MAINTENANCE OF LOW-ENERGY, NON-TIDAL SANDY BEACHES Anne Ton, Delft University of Technology, Netherlands	ESTUARINE SENSITIVITY TO NATURE-BASED SALT INTRUSION MITIGATION MEASURES Gijs Hendrickx, Delft University of Technology, Netherlands
1200 - 1220	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 Weerasinghe, 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	IMPACT OF THE SHIP WAVES AND TIDAL FORCES ON THE SEDIMENT RE-SUSPENSION IN INLAND WATERWAYS Mainak Chakraborty, Indian Institute of Technology, Mass, India	WAVE DRAG COEFFICIENT USEFUL FOR NATURE: SEAGRASS-BASED COASTAL PROTECTION DESIGN IN ESTUARIES Alice Twomey, University of Queensland, Australia
1220 – 1240	WAVE OVERTOPPING OVER A DIKE FOR VARIABLE WATER LEVEL Maximilian Streicher, Gent University, Belgium	XBEACH IMPLEMENTATION IN THE NEW NATIONAL COASTAL FLOOD RISK ASSESSMENT FRAMEWORK FOR THE DUTCH COAST Rinse Wilmink, Rijkswaterstaat, Netherlands	EXPANDING COASTSAT SHORELINE DETECTION ALGORITHM TO TRACK COASTAL VEGETATION AND URBAN CHARACTERISTICS FROM SATELLITE DATA Adriana Lanza, Northeastern University, United States	APPLICATION OF DRIFTING WAVE-ICE BUOY FOR OCEAN DEPLOYMENT Takehiko Nose, The University of Tokyo, Japan	BENEFICIAL USE OF DREDGED MATERIAL AND FATE OF PLACED SAND USING A HYBRID COSMOS-XBEACH SEDIMENT BUDGET MODEL Rebecca Quan, Baird, Australia	DOES COASTAL WETLAND RESTORATION WORK AS A CLIMATE CHANGE ADAPTATION STRATEGY? THE CASE OF THE SOUTH-EAST OF SICILY COAST Massimiliano Marino, University of Catania, Italy
1240 - 1300	WAVE OVERTOPPING REDUCTION BY MODULAR CONCRETE ARMOUR UNITS Pieter Bakker, DMC, The Netherlands	AN INTER-COMPARISON STUDY OF GREEN AND GRAY STRUCTURE EFFECTS ON OVERLAND FLOW FLOODING AND FORCE ON COASTAL BUILDINGS Sungwon Shin, Hanyang University, South Korea	UNRAVELLING THE DRIVERS OF SHORELINE CHANGE Arjen Luijendijk, Deltares / TU Delft, Netherlands		ESTIMATING ALONGSHORE SEDIMENT TRANSPORT FROM EDGED ACCESS CHANNELS Bart Roest, KU Leuven, Belgium	
1300 - 1400	**Lunch**					
1400 - 1600	**Technical Sessions**					

Session	Session 7 Tsunami 1	Session 8 Wave Overtopping 2	Session 9 Satellite Remote Sensing 2	Session 10 Wind Waves 1	Session 11 Runup and Swash	Session 12 Nature-Based Solutions 2
Room	Room C2.1	Room C2.2	Room C2.3	Room C2.4	Room C2.5	Pyrmont Theare
Chair	Chari Pattisaratchi	Marcel van Gent	Kilian Vos	Jane McKee Smith	Tom Baldock	Bill Dally
1400 - 1420	3D NUMERICAL MODELLING OF FIVE SUBMARINE LANDSLIDE SCENARIOS IN PERTH CANYON, AUSTRALIA TO ASSESS TSUNAMIGENIC HAZARD Elise Buller, University of Newcastle, Australia	COMPARING RESPONSE-BASED AND EVENT-BASED OVERTOPPING DESIGN Abigail Stehno, U.S. Army Corps of Engineer Research and Development Center (ERDC), United States		A 40 YEAR WAVE CLIMATOLOGY OF SOUTH EAST QUEENSLAND, USING MODELLED AND IN-SITU WAVE OBSERVATIONS Elysia Andrews, Queensland Goverment Hydraulics Laboratory, Australia	WAVE TRANSFORMATION AND RUNUP VARIABILITY DUE TO WAVE PHASE UNCERTAINTY Spicer Bak, USACE - ERDC, Field Research Facility, United States	UNDERSTANDING THE BENEFITS AND LIMITATIONS OF NATURE BASED SOLUTIONS Nigel Pontee, Jacobs, United Kingdom
1420 - 1440	LANDSLIDE TSUNAMI HAZARD ASSESSMENT: A NUMERICAL MODEL FOR THE SIMULATION OF MULTIPLE LANDSLIDE-INDUCED TSUNAMIS SCENARIOS IN A MONTE CARLO FRAMEWORK Claudia Cecioni, University of Roma TRE, Italy	WAVE OVERTOPPING MITIGATION BY A VERTICAL WALL OR A WAVE RETURN WALL AT THE END OF A PITCHED ROCK SLOPE Martin Klabbers, Advisian Pty Ltd, Australia	MAPPING COASTAL TYPOLOGY USING PUBLICLY AVAILABLE EARTH OBSERVATION DATA AND DEEP NEURAL NETWORKS Floris Calkoen, Deltares, Netherlands	UNRAVELING MULTIMODAL NEARSHORE WIND-WAVE FIELDS ON THE DUTCH SHOREFACE Stefan Aarninkhof, TU Delft, Netherlands	HOW BEACH STATE INFLUENCES WAVE RUNUP ON A PERCHED BEACH IN SOUTHWESTERN AUSTRALIA Carly Portch, The University of Western Australia, Australia	COLLABORATIVE LIVING LABORATORIES TO INFORM CANADIAN DESIGN GUIDANCE FOR COASTAL NATURE-BASED SOLUTIONS Enda Murphy, National Research Council Canada, Canada
1440 - 1500	THREE-DIMENSIONAL PHISICAL MODELING OF LANDSLIDE-GENERATED TSUNAMIS Tomoyuki Takabatake, Kindai University, Japan	EXPERIMENTAL STUDY ON WAVE OVERTOPPING OF DOUBLE PARAPET TYPE SEAWALL Naoki Tsuruta, Port and Airport Research Institute, Japan	S2SHORES: A PYTHON LIBRARY FOR ESTIMATING COASTAL BATHYMETRY Erwin Bergsma, CNES, France	THE PHYSICAL PROCESSES ACTIVE IN TROPICAL CYCLONE WAVE GENERATION Ian Young, University of Melbourne, Australia	ESTIMATION OF RANDOM WAVE RUN-UP USING A SPECTRAL TRANSFER FUNCTION Takenori Shimozono, The University of Tokyo, Japan	NATURE-BASED FLOOD RISK REDUCTION VIA MULTIPLE LINES OF DEFENSE Vincent Vuik, Delft University of Technology, Netherlands
1500 - 1520	SEISMIC AND TSUNAMI HAZARD ASSESSMENT OF COASTAL BUILDINGS IN WEST COAST OF JAPAN Takuya Miyashita, Kyoto University, Japan	WAVE OVERTOPPING CHARACTERISTICS FOR A DOUBLE VERTICAL WALL AND THE EFFECT OF PARAPETS Bart-Jan van der Spek, C International, Netherlands	ASSESSING SHORELINE EDGE DETECTION FOR THE IMPROVEMENT OF COASTAL IMAGING TECHNIQUES Siegmund Nuyts, Cnrs, France	APPLICABILITY OF ATMOSPHERIC REANALYSIS DATA FOR THE REPRODUCTION OF TYPHOON-INDUCED STORM SURGE IN JAPAN Mangala Amunugama, Ecoh Corporation, Japan	SWASH FLOWS GENERATED BY A TRAIN OF SOLITARY WAVES ON A PLANAR SLOPE In Mei Sou, National University of Singapore, Singapore	FIRST PROJECT OF BIODIVERSITY RESTORATION OF COASTAL AREAS IN POLAND Grzegorz Rozynski, Institute of Hyo-engineering, Polish Academy of Sciences, Poland
1520 - 1540	INSHORE TSUNAMI HAZARD INCLUDING BATHYMETRIC AND EPISTEMIC UNCERTAINTY – A DESIGN METHODOLOGY Zachariah Couper, BMT Global, Australia	INFLUENCE FACTORS FOR CREST WIDTH, ROUGHNESS AND WAVE PERIOD ON OVERTOPPING OF RUBBLE MOUND STRUCTURES Koen Van Doorslaer, Deme, Belgium	SATELLITE-DERIVED SHORELINE DYNAMICS AT THE GERMAN BALTIC SEA Jan Tiede, Leibniz University Hanover, Deutschland	COMPARISON OF FIELD AND FORECAST METOCEAN DATA IN THE GERMAN BIGHT Lukas Froehling, Leibniz University Hannover, Germany	THE CONTRIBUTION OF WAVE RUNUP TO COASTAL FLOODING AT NORFOLK (VA,USA) DURING EXTREME EVENTS Christopher Lashley, University of Delaware, United States	A GLOBAL CHARACTERISATION OF COASTAL REGIONS TO GUIDE NATURE-BASED SOLUTIONS TO SEA TURTLE NESTING BEACHES Jakob Christiaanse, Delft University of Technology, Netherlands
1540 -1600	TSUNAMI RUN-UP CONSIDERING TIME VARIATION OF DENSITY OF INUNDATION WATER Hideo Matsutomi, Chuo University, Japan	WAVE OVERTOPPING AT DIKES AND BREAKWATERS UNDER OBLIQUE WAVE ATTACK Marcel Van Gent, Tu Delft | Deltares, Netherlands	SATELLITE DERIVED BATHYMETRY FOR MONITORING NEARSHORE DYNAMICS Etiënne Kras, Deltares, Netherlands	MULTI-SCALE WAVE MODELLING: FIELD VALIDATION IN FAXE BAY, DENMARK Ms Anna Adell, Lund University, Sweden	INVESTIGATION OF DIRECTIONAL SPREADING EFFECT ON WAVE RUN-UP USING SWASH Tomohiro Suzuki, Flanders Hydulics Research, Belgium	BIODIVERSITY BENEFITS OF SCALING UP MARINE ECO-ENGINEERING Melanie Bishop, Macquarie University, Australia
1600 - 1730	**Poster Session and Social Reception** Room C2.6 and Pyrmont Foyer, Level 2, International Convention Centre Sydney					

Tuesday 06 December 2022

0730 - 1800	Registrations Open					
0830 - 1030	Technical Sessions					
Session	Session 13 Berm, Dune and Beach Erosion	Session 14 Numerical Modelling - Waves	Session 15 Reef Hyodynamics	Session 16 Wave - Structure Impacts and Interactions 1	Session 17 Wave Overtopping Hazards and Monitoring	Session 18 Nature-Based Solutions 3
Room	Room C2.1	Room C2.2	Room C2.3	Room C2.4	Room C2.5	Pyrmont Theare
Chair	James Carley	David Taylor	Javier Lopez Lara	Ben Modra	Stephan Grilli	Stefan Aarninkhof
0830 - 0850	BERM MIGRATION UNDER SCALED STORM EVENTS Emily Chapman, University of Delaware, United States	3D VELOCITY FIELDS WITH 2DH NUMERICAL STABILITY: A 3D ANALYTICAL-NUMERICAL MODULE FOR 2DH NUMERICAL MODELS Thalles Araujo, University of Western Australia | Federal University of Rio de Janeiro, Brazil	THE EFFECT OF REEF GEOMETRY ON BREAKING WAVE SHAPE. COMPUTATIONAL AND FIELD DATA COMPARATIVE STUDY. Adam Fincham, University of Southern California, United States	CONFINED-CREST IMPACT: THE INFLUENCE OF THE TOE BERM ON THE IMPULSIVE LOAD CONDITIONS Myrta Castellino, Sapienza University of Rome, Italy	HUMAN STABILITY ON SLOPES UNDER OVERTOPPING WAVES Davide Wuthrich, Delft University of Technology, Netherlands	PRESERVING THE LAST OF ILLINOIS' SHORELINE: ECOLOGICALLY-DRIVEN SHORLINE STABILIZATION TECHNIQUES FOR INLAND LAKES Margaret Boshek, Moffatt & Nichol, United States
0850 - 0910	OBSERVATIONS FROM A CONTROLLED DUNE EROSION EXPERIMENT UNDER VARIABLE WATER LEVELS, WAVES, AND INTERNAL DUNE MOISTURE CONTENT Stefano Conti, Water Research Laboratory UNSW Sydney, Australia	THE NUMERICAL RECREATION OF EXPERIMENTALLY GENERATED NONLINEAR IRREGULAR WAVES Samuel Draycott, University of Manchester, United Kingdom	ON-REEF CYCLONIC WAVE CLIMATE THROUGHOUT THE GREAT BARRIER REEF Dave Callaghan, University of Queensland, Australia	VIOLENT AND IMPULSIVE WAVE OVERTOPPING AT VERTICAL WALLS WITH LARGE FREEBOARDS Leopoldo Franco, University of Roma Tre, Italy	COASTAL WAVE OVERTOPPING: NEW NOWCAST AND MONITORING TECHNOLOGIES Jenny Brown, National Oceanography Centre, United Kingdom	NATURE-BASED SOLUTIONS ON MEGA-BIODIVERSE COASTS: EXPERIENCES AND CHALLENGES IN MEXICO Rodolfo Silva-Casarin, Universidad Nacional Autonoma de Mexico, Mexico
0910 - 0930	COUPLED MODELLING OF DUNES AND COASTS – THE CODAC MODEL Caroline Hallin, TU Delft / Lund University, Sweden	ASSESSING A COST-EFFICIENT METHODOLOGY FOR LONG TERM WAVE COMPUTATION Giovanni Besio, University of Genoa, Italy	WAVE TRANSMISSION OVER A WIDE NEARSHORE REEF Jarrod Dent, Baird, Australia	SUB-NAPPE AIR CAVITY PRESSURE DURING OVERFLOW OF A VERTICAL STRUCTURE Taeksang Kim, University of Michigan, United States	DIRECT HAZARD FROM WAVE OVERTOPPING: A REVIEW AND FORWARD LOOK Tom Bruce, University of Edinburgh, United Kingdom	FROM EXPERIMENT TO INTERVENTION: SCALING UP MARINE ECO-ENGINEERING Mariana Meyer Pinto, UNSW, Australia
0930 - 0950	PARAMETERIZING DUNE RESILIENCE FROM COLLISION THROUGH INUNDATION Matthew Janssen, Stevens Institute of Technology, United States	NONHYDROSTATIC AND MESH-FREE COMPUTATIONAL FLUID DYNAMICS MODEL COMPARISONS OF SURF ZONE HYDRODYNAMICS BY PLUNGING IRREGULAR WAVES Ryan Lowe, University of Western Australia, Australia	WAVE TRANSFORMATION ON CORAL REEFS: COMPARISON OF A CFD MODEL AND PHYSICAL MODEL TESTS OF A MALDIVIAN REVETMENT. Tony Bergoe, Niras, Denmark	ON THE BEHAVIOR OF A TETHERED CYLINDER ARRAY UNDER IRREGULAR WAVES Matteo Lorenzo, Università Degli Studi Di Torino, Italy	FAIRY BOWER OVERTOPPING MONITORING AND DECISION SUPPORT SYSTEM Ian Coghlan, UNSW Water Research Laboratory, Australia	GRAY LEADS TO GREEN IN THE BLUE: BUILDING INFRASTRUCTURE TO ENHANCE COASTAL HABITAT Tundi Agardy, Baird & Associates, United States
0950 - 1010	~~EROSION AND ACCRETION MECHANISM OF DUNE BEACH SYSTEM DURING AN ENTIRE STORM: LARGE-SCALE WAVE FLUME TEST AND NUMERICAL SIMULATION~~ ~~Eunju Lee, Honyang University, South Korea~~	COMPARATIVE ASSESSMENT OF NON-CONSERVATIVE AND CONSERVATIVE RANS FORMULATIONS FOR COASTAL APPLICATIONS INVOLVING BREAKING WAVES Shaswat Saincher, Indian Institute of Technology Madras, India	THE INFLUENCE OF CORAL REEF SPUR AND GROOVE MORPHOLOGY ON WAVE ATTENUATION Lachlan Perris, University of Sydney, Australia	ANALYSIS ON FAILURE CAUSES OF DOCK DUE TO ABNORMAL WIND WAVES Kyu-Tae Shim, Catholic Kwandong University, South Korea	IMPACT OF INCLUDING OVERTOPPING IN HYODYNAMIC MODELLING FOR COASTAL INUNDATION IN PORT PHILLIP BAY Raymond Cohen, CSIRO Data61, Australia	REINFORCING ECOSYSTEM ENGINEERS WITH ENHANCED VEGETATION AND AN ARTIFICIAL REEF ALONG THE US RHODE ISLAND COASTAL BARRIER SYSTEMS Annette Grilli, University of Rhode Island, United States
1010 - 1030	WAVE CHARACTERISTICS CAUSING COASTAL DAMAGE AROUND THE TYPHOON STORM ZONE: ANALYSIS AT OSATO COAST FOR TYPHOON NO. 19, 2019 Kosuke Nakagawa, Tokushima University, Japan	YEPPOON SURF POOL: FULL-SCALE VALIDATION OF A CFD MODEL Alireza Valizadeh, DHI Water And Environment, Australia		FIELD MEASUREMENTS OF WAVE INTERACTIONS WITH A DIKE ON A SHALLOW FORESHORE USING AN "ARTIFICIAL DIKE" CONCEPT Vincent Gruwez, Ghent University, Belgium	THE EFFECT OF WIND STRESS ON WAVE OVERTOPPING ON VERTICAL SEAWALL Sara Tuozzo, University of Naples Federico II, Italy	SEASONAL DRIVERS FOR MANGROVE SEEDLING ESTABLISHMENT Rik Gijsman, University of Twente, Netherlands
1030 - 1100	Morning Tea					
1100 - 1300	Technical Sessions					
Session	Session 19 Dune Erosion, breaching and Recovery	Session 20 Wind Waves 2	Session 21 Coastal Sediments and Transport 1	Session 22 Shore Protection Structures	Session 23 Wave - Structure Impacts and Interactions 2	Session 24 Coastal Flooding and Inundation 2
Room	Room C2.1	Room C2.2	Room C2.3	Room C2.4	Room C2.5	Pyrmont Theare
Chair	Arjen Luijendijk	Ian Young	Peter Nielsen	Chris Bender	Kojiro Suzuki	Sungwon Shin
1100 - 1120	CART MODEL FOR PREDICTING DUNE EROSION BASED ON STORM INTENSITY AND BEACH MORPHOLOGY Jon Miller, Stevens Institute of Technology, United States	MODELLED AND OBSERVED IMAPCT OF THE APRIL 2021 SOUTHERN OCEAN STORM Alberto Meucci, University of Melbourne, Australia	ASSESSMENT OF WAVE-INDUCED MOMENTARY SEABED LIQUEFACTION Cheng-Jung Hsu, National Academy of Marine Research, Taiwan	BED PROTECTION FOR EXTREME STORM SURGE INFLOW THROUGH FAILING SLUICEGATES Richard de Rover, Delta Marine Consultants, Netherlands	PHYSICAL EXPERIMENTS ON OVERHANGING PARAPETS UNDER NON-BREAKING WAVE CONDITIONS Dimitrios Dermentzoglou, Delft University of Technology, Netherlands	WHAT DRIVES EXTREME EVENTS? EVALUATING THE MAJOR CONTRIBUTORS TO TOTAL WATER LEVELS ALONG THE U.S. ATLANTIC COAST Gabrielle Quadrado, University of Florida, United States
1120 - 1140	STRENGTHENING COASTAL DEFENCE WITH ARTIFICIAL DUNES Pieter Rauwoens, KU Leuven, Belgium	MODELING OF WIND-WAVE GROWTH IN STRONG WIND CONDITIONS BASED ON PHASE-RESOLVING WAVE MODEL Shoko Sato, Kyoto University, Japan	A SIMPLE LABORATORY CALIBRATION FOR MITIGATING SEAWATER EFFECTS ON SOIL MOISTURE SENSORS Nick Brilli, Virginia Tech, United States	SCOUR PROCESSES AROUND A COLUMN ON A SLOPED BEACH INDUCED BY BROKEN SOLITARY WAVES Alexander Schendel, Ludwig-Franzius-Institute, Leibniz University Hannover, Germany	IMPLICATIONS OF SECOND-ORDER WAVE GENERATION FOR USE IN WAVE-STRUCTURE RESPONSE EXPERIMENTS William Mortimer, Plymouth University, United Kingdom	AN EFFICIENT HYBRID IMPACT SWELL INUNDATION SYSTEM FOR SMALL ISLANDS Laura Cagigal, Universidad de Cantabria, Spain
1140 - 1200	THE EFFECT OF WAVE OBLIQUITY ON DUNE EROSION: A FIELD EXPERIMENT Paul Van Wiechen, Delft University of Technology, Netherlands	ADVANCES IN UNSTRUCTURED WAVEWATCH III AND APPLICATIONS TO NEARSHORE WAVES Jane McKee Smith, Us Army Engineer Research And Development Center, United States	PREDICTING NEAR-BED SEDIMENT TRANSPORT THROUGH PARTICLE IMAGE VELOCIMETRY Caroline Hoch, Florida Institute of Technology, United States	FRAGILITY ANALYSIS OF DUNES REINFORCED WITH GEOSYNTHETIC SAND CONTAINERS Chris Baxter, University of Rhode Island, United States	WAVE INDUCED LOADS ON RECURVES ATOP A SEAWALL ON A SLOPED SEABED Dimitris Stagonas, University of Cyprus, Cyprus	THE EFFECT OF HARBOR DEVELOPMENTS ON HIGH-TIDE FLOODING IN MIAMI (FL) Francesco De Leo, University of Genoa, Italy
1200 - 1220	OBSERVATION AND NUMERICAL MODELING OF A DUNE OVERWASH AND BREACHING EVENT Maria Winters, University of California, Los Angeles, United States	COMPUTATIONALLY EFFICIENT TROPICAL CYCLONE PARAMETRIC WIND-WAVE MODEL Guisela Grossmann-Matheson, The University of Melbourne, Australia	EFFECT OF GRAIN SHAPE ON BEDLOAD TRANSPORT OF CORAL GRAVELS UNDER TURBULENT FLOW Lilei Mao, The University of Tokyo, Japan	EROSION MITIGATION DESIGN IN THE ARCTIC CONSIDERING CLIMATE CHANGE IMPACTS Fred Scott, Baird, Canada	TSUNAMI WAVE LOADING ON A STRUCTURAL ARRAY PARTIALLY SHELTERED BY A SEAWALL Zhongduo Zhang, University of Notre Dame, United States	MULTIVARIATE COASTAL FLOOD RISK ALONG THE US PACIFIC Joseph Lucey, University of California, Los Angeles, United States
1220 – 1240	QUANTIFYING THE WAVE-DRIVEN RECOVERY OF SANDY BEACHES FOLLOWING STORM EROSION Matthew Phillips, Manly Hyaulics Laboratory, Australia	REVISITING WAVE PROPAGATION UNDER AIR FLOW IN COASTAL AREAS Edgar Mendoza-Baldwin, Universidad Nacional Autonoma De Mexico, Mexico	TUMBLING EXPERIMENT FOR THE ESTIMATION OF ABRASION AND MASS LOSS OF COASTAL SEDIMENTS FROM AN ARTIFICIAL COARSE-CLASTIC BEACH Luca Martinelli, University of Padova, Italy	THE INFLUENCE OF SUBMERGED COASTAL STRUCTURES ON NEARSHORE HYODYNAMICS Renan Silva, University of Western Australia, Australia	ON WAVE TRANSMISSION OF RUBBLE-MOUND SUBMERGED BREAKWATERS IN LARGE TIDAL EXCURSION Elisa Leone, University of Salento, Italy	THE TIDE IS HIGH: NEW INSIGHTS ON COASTAL FLOODING TRENDS AND FUTURES Ben Hague, Australian Bureau of Meteorology, Australia
1240 - 1300	THE SELECTION AND DESIGN OF VEGETATED DUNES AS PREFERRED MAIN COASTAL PROTECTION SYSTEM FOR BEIRA, MOZAMBIQUE Odelinde Nieuwenhuis, Royal HaskoningDHV, Netherlands	WAVE HINDCAST IN THE PACIFIC OCEAN OF CENTRAL AMERICA BY USING UNSTRUCTURED MESH Manuel Corrales Gonzalez, University of Genoa, Italy	INCLUSION OF CONTACT FRICTION FOR PARTICLE-BASED SIMULATION OF SEDIMENT TRANSPORT OVER MOBILE BED Zhe Cao, The University of Liverpool, United Kingdom	STABLITY OF TEMPORARILY PLACED LARGE SANDBAGS AGAINST WAVES Kojiro Suzuki, Port And Airport Research Institute, Japan	TECHNOLOGY-DRIVEN APPROACH TO THE MODELLING AND DESIGN OF ARTIFICIAL SURF REEFS Evan Watterson, Bluecoast Consulting Engineers, Australia	MULTI-HAZARD RISK ASSESSMENT FOR TONGATAPU - A COASTAL INUNDATION LENS Edward Rowe, Arup, Australia
1300 - 1400	Lunch					
1400 - 1620	Technical Sessions					
Session	Session 25 AI and Deep Learning	Session 26 Estuary Hyodynamics	Session 27 Numerical Modelling 1	Session 28 Channel Management	Session 29 Structure Design and Performance	Session 30 Coastal Monitoring
Room	Room C2.1	Room C2.2	Room C2.3	Room C2.4	Room C2.5	Pyrmont Theare
Chair	Takaaki Shigematsu	Alessano Romano	Vincent Gruwez	Liliana Pinheiro	Kane Satterthwaite	Annette Grilli
1400 - 1420	WIND AND WAVE TRAINED ARTIFICIAL NEURAL NETWORKS FOR THE FORECASTING OF WAVE CLIMATE IN HARBOUR AREA Luca Cavallaro, University of Catania, Italy	EFFECTS OF ESTUARY'S GEOMETRY AND BATHYMETRY ON EXTREME WATER LEVELS. STUDY CASE: MANUKAU HARBOUR, NEW ZEALAND. Wagner Luis Langer Costa, University of Waikato, New Zealand	COMPARISON OF NUMERICAL AND EMPIRICAL ESTIMATES OF WAVE CONDITIONS IN THE LEE OF A DETACHED BREAKWATER Jim Churchill, Baird Australia, Australia	OPTIMIZING MAINTAINED BED LEVELS IN PORTS BASED ON PORT ACCESSIBILITY Floor Bakker, Delft University of Technology, Netherlands	STABILITY ANALYSIS OF OLD BREAKWATERS: CASE STUDIES OF FAILURES AND SUCCESSES William Allsop, William Allsop Consulting Ltd, United Kingdom	CAN APPLE LIDAR CAMERAS BE RELIABLY USED FOR COASTAL MONITORING? Kristen Splinter, Water Research Laboratory, UNSW Sydney, Australia
1420 - 1440	PHYSICS-INFORMED DEEP LEARNING OF NEARSHORE WAVE PROCESSES Qin Chen, Northeastern University, United States	ANISOTROPIC EDDY VISCOSITY - A BENCHMARK CASE STUDY IN AN IDEALISED TIDAL ESTUARY Greg Collecutt, BMT (TUFLOW) , Australia	NUMERICAL EXPERIMENTS ON OVERHANGING PARAPETS UNDER NON-BREAKING WAVE CONDITIONS Paolo De Girolamo, Sapienza University of Rome, Italy	PORT OF NEWCASTLE, NSW, AUSTRALIA - MAINTENANCE DREDGING AND UNCONFINED SEA DISPOSAL OF EDGE MATERIAL Greg Britton, Royal HaskoningDHV, Australia	A COMPOSITE MODELLING APPROACH FOR THE RETROFITTING AND REHABILITATION OF AN HISTORICAL COASTAL ASSET Corrado Altomare, Universitat Politècnica De Catalunya-BarcelonaTech, Spain	COASTSNAP: A GLOBAL CITIZEN SCIENCE PROGRAM TO MONITOR CHANGING COASTLINES Mitchell Harley, UNSW Water Research Laboratory, Australia
1440 - 1500	A PREDICTIVE EQUATION FOR WAVE SETUP THROUGH THE USE OF GENETIC PROGRAMMING Charline Delinghaus, University of Auckland, New Zealand	SEA LEVEL RISE IMPLICATIONS FOR ESTUARINE MODELLING AND MANAGEMENT Danial Khojasteh, UNSW Water Research Laboratory, Australia	A VALIDATION OF WAVE LOADS ON CREST WALLS ON TOP OF COMPOSITE BREAKWATERS USING OPENFOAM Marisol Irias Mata, Deltares, Netherlands	CORPUS CHRISTI SHIP CHANNEL DEEPENING PROJECT: OVERVIEW & MODELING APPROACH TO ASSESS ENVIRONMENTAL IMPACTS Rob Nairn, Baird and Associates, Canada	DEALING WITH AN EXISTENTIAL THREAT FROM CLIMATE CHANGE AT EBEYE, MARSHALL ISLANDS: STRUCTURAL PROTECTION AGAINST STORM EROSION AND WAVE OVERTOPPING Patrick Lawless, Royal HaskoningDHV, Australia	MULTI-PLATFORM MONITORING OF COASTAL EROSION AT A POCKET BEACH Bapentire Donatus Angnuureng, University of Cape Coast, Ghana

1500 - 1520	SIGNIFICANT WAVE HEIGHT PREDICTION USING TRANSFER LEARNING **Yuki Obara, Niigata University, Japan**	THE IMPACT OF RESTORED FRESHWATER INFLOW ON TIDAL DISTORTION IN A SHALLOW ESTUARY **Mojgan Razzaghi, University of Waikato, New Zealand**	COMPUTER SIMULATION OF WAVE OVERTOPPING RATE ON VERTICAL WALL BY BOUSSINESQ WAVE MODEL **Moon Su Kwak, Civil Engineering of Myongji College, South Korea**	INVESTIGATION INTO HOUSTON SHIP CHANNEL SHOALING AT THE BAYPORT FLARE IN GALVESTON BAY **Josh Joubert, Texas A&M University, United States**	REDESIGN OF TUTUKAKA MARINA FOR TSUNAMI RESILIENCE **Jose Borrero, eCoast Marine Consulting and Research, New Zealand**	BIG COASTAL MANAGEMENT REQUIRES BIG COASTAL MONITORING: TWO DECADES OF OPERATIONAL COASTAL IMAGING AT AUSTRALIA' S GOLD COAST **Christopher Drummond, UNSW Water Research Laboratory, Australia**
1520 - 1540	RECOVERY OF SURFACE WAVES FROM BOTTOM PRESSURE BY NEURAL NETWORK WITH BISPECTRUM **Hiyori Yoshino, University, Japan**	HYDRODYNAMIC MODELING OF AN INLET WITH ESTUARINE SHORELINE PROTECTION **Anna Wargula, Us Naval Academy, United States**	A CLOSED-FORM SOLUTION FOR INTERACTIONS BETWEEN WAVES AND AN ARRAY OF FISH NET CAGES **Mingyuan Ma, Griffith University, Australia**	MECHANICS OF SHOALING AT THE HOUSTON SHIP CHANNEL'S BAYPORT FLARE **Patrick Kerr, US Army Corps of Engineers, United States**	ANCIENT AND CONTEMPORARY COASTAL ENGINEERING STRUCTURES UNIQUE TO AUSTRALIA **James Carley, UNSW Water Research Laboratory, Australia**	STUDY OF METHOD FOR DETECTING OCCURANCE OF RIP CURRENT USING IMAGE ANALYSIS **Ryo Shimada, Chuo University, Japan**
1540 -1600	ONE DAY AHEAD WAVE PREDICTIONS USING A HYBRID ALGORITHM OF LONG-SHORT TERM MEMORY AND NEURAL NETWORK FOR MARINE CONSTRUCTIONS **Sooyoul Kim, Kumamoto University, Japan**	HYDRODYNAMIC CLASSIFICATION OF ESTUARIES: CHALLENGES AND ALTERNATE APPROACHES **Hannah Power, University of Newcastle, Australia**	EXAMINATION OF ANALYSIS METHOD FOR HYAULIC MODEL EXPERIMENT UTILIZING RGBD IMAGES AND DUALSPHYSICS **Yusei Miyashita, Coastal Engineering Group, Graduate School of Science and Technology, Niigata University, Japan**	HIGHWAYS IN THE COASTAL ENVIRONMENT: NEW USA GUIDANCE **Scott Douglass, South Coast Engineers, United States**	RECENT ADVANCES IN TSUNAMI DESIGN OF COASTAL STRUCTURES **Ian Robertson, University of Hawaii, United States**	SANDSNAP – AMASSING A BEACH GRAIN SIZE DATABASE IN THE UNITED STATES **Brian McFall, US Army Corps of Engineers - Coastal & Hysulics Laboratory, United States**
1600 - 1620	APPLICATION OF DEEP LEARNING OBJECT DETECTION TO SURFING WAVE QUALITY **Edward Atkin, eCoast, New Zealand**	INFLUENCE OF SALINITY WEDGE ON FLOW AND SEDIMENT DIVERSION THROUGH A COMPLEX DELTAIC SYSTEM **Thomas Everett, Mott MacDonald, United States**	MONTE CARLO SIMULATION OF BARRIER-ISLAND SYSTEMS AND TSUNAMI HAZARDS **Jennifer Irish, Virginia Tech, United States**	EQUILIBRIUM MORPHOLOGY MODEL APPLIED THROUGHOUT THE EXTENSIVE NAVIGATION CHANNEL NETWORK OF THE GOLD COAST WATERWAYS, AUSTRALIA **Jesper Nielsen, Seaport OPX, Australia**	FIRST APPLICATIONS OF XBLOCPLUS : EXPERIENCES FROM AFSLUITDIJK AND VISTULA SPIT PROJECTS **Zi Qian Yang, Delta Marine Consultants, Singapore**	APPLICATION OF HISTORICAL DATA FROM SATELLITE IMAGERY TO IMPROVE UNDERSTANDING OF COMPLEX NEARSHORE DYNAMICS **Edward Albada, EOMAP, West Indies**
1620 - 1645	**Afternoon Tea**					
1700 - 1830	**Women in Coastal Engineering Event** Pyrmont Theatre, Level 2, International Convention Centre Sydney					
Wednesday 07 December 2022						
0800 - 1300	**Registrations Open**					
0830 - 0920	**Plenary Session** **Pyrmont Theare**					
0830 - 0920	**Introduction** **Keynote Address: The History and Future of Coastal Observing at the USACE Field Research Facility (FRF)** **Katherine L. Brodie** **Senior Research Oceanographer, Field Research Facility** **U.S. Army Engineer Research and Development Center**					
0920 - 1000	**Morning Tea**					
1000 - 1200	**Technical Sessions**					
Session	**Session 31** **Turbulence and Mixing**	**Session 32** **Fluid Structure Interaction**	**Session 33** **Numerical Modelling 2**	**Session 34** **Coastal Management 1**	**Session 35** **Seabed and Sediments**	**Session 36** **Climate Change and Risk**
Room	**Room C2.1**	**Room C2.2**	**Room C2.3**	**Room C2.4**	**Room C2.5**	**Pyrmont Theare**
Chair	**Claudio Neves**	**Marion Tissier**	**Christoph Troch**	**Yoshimitsu Tajima**	**Pushpa Dissanayake**	**Jenny Brown**
1000 - 1020	EXPERIMENTAL STUDY OF LAGRANGIAN MIXING IN WEAKLY DISSIPATIVE TIDAL CHANNELS **Annalisa De Leo, Universit‡ Degli Studi Di Genova, Italy**	NUMERICAL STUDY ON THE INTERACTION BETWEEN PERIODIC WAVES AND A FLEXIBLE WALL **Zhengyu Hu, National University of Singapore, Singapore**	MULTIPHASE SPH SIMULATION FOR INCHAMBER IMPACT PRESSURE ON VERTICAL BREAKWATER WITH WAVE ABSOPTION CHAMBER **Krisna Pawitan, Princeton University, United States**	EXPERIMENTAL ANALYSIS OF HYBRID SOLUTIONS FOR COASTAL PROTECTION **Maria Maza, IHCantabria, Universidad de Cantabria, Spain**	SCALE EFFECT IN LOCAL SCOUR AROUND AN OFFSHORE PILE **Yota Enomoto, Chuo University, Japan**	INSURABILITY AND SUSTAINABLE RISK MANAGEMENT OF ACTIONS OF THE SEA' IN A CHANGING CLIMATE **Joanna Aldridge, IAG, Australia**
1020 - 1040	FIELD OBSERVATIONS OF TURBULENCE AND SUSPENDED SEDIMENTS OVER AN INTERTIDAL REEF **Zhi-Cheng Huang, Graduate Institute of Hyological And Oceanic Sciences, National Central University, Taiwan**	EXPERIMENTAL AND NUMERICAL STUDY ON OBLIQUE WAVE-IN-DECK LOADS **Hongchao Wang, Technology Centre for Offshore and Marine, Singapore, Singapore**	LARGE EDDY SIMULATIONS OF BREAKING WAVE IMPACT ON A VERTICAL WALL ATTACHED WITH PARAPET **Shaswat Saincher, Indian Institute of Technology Madras, India**	COASTAL MAREJADAS FORECAST SYSTEM. VALIDATION AND INSTITUTIONAL LINK IN CHILE. **Mauricio Molina, Universidad De Valparaiso, Chile**	MIGRATION AND BURIAL TENDENCIES OF VARIABLE DENSITY MUNITIONS: INITIAL RESULTS FROM A LARGE-SCALE STUDY **Manoj Kumar Gangadharan, University of Delaware, United States**	CLIMATE CHANGE IMPACTS ON REEF TOP ISLANDS **Stuart Bettington, Royal HaskoningDHV, Australia**
1040 - 1100	APPLICATION OF VENTURI DIFFUSER DESIGN FOR HYPERSALINE WASTEWATER DISCHARGE INTO THE MARINE ENIVRONMENT **Rhian Wardley, Baird Australia Pty Ltd, Australia**	NUMERICAL SIMULATION OF DRIFTWOOD TRANSPORT BY WAVES IN A LABORATORY BASIN **Enda Murphy, National Research Council Canada, Canada**	EFFICIENTLY FORECASTING 2-DIMENSIONAL SPECTRA INSIDE SHELTERED PORTS USING SPECTRAL AND PHASE-RESOLVING WAVE MODELS **Jacob Suhr, SeaportOPX, Australia**	COASTAL SETBACK PRACTICES IN THE CARIBBEAN AND OTHER SIDS: A TOOL FOR ENHANCING RESILIENCE **Telica Mussington, Smith Warner Intl. /University of Manchester, Jamaica**	NEW STANDARDS FOR MITIGATING EDGING IMPACTS IN SENSITIVE HABITATS **Kasper Kaergaard, DHI, Denmark**	QUANTIFYING THE BELGIAN COAST'S RESILIENCE AGAINST SEA LEVEL RISE (USING XBEACH & SWASH MODELLING) **Sieglien De Roo, Ghent University / Flanders Hysulics Research, Belgium**
1100 - 1120	TURBULENCE MODELLING OF INCIPIENT WAVE BREAKING ON A VERTICAL CYLINDER ON A SLOPED BED **Yuzhu Pearl Li, National Unversity of Singapore, Singapore**	FLEXIBLE FLUID STRUCTURE INTERACTION OF A FLEXIBLE PLANT MODEL FOR NATURE-BASED SOLUTIONS **Ross Henteleff, University of Ottawa, Canada**	SPH AND ANALYTICAL MODELING OF AN URBAN FLOATING STRUCTURE FOR COASTAL EXPANSION **Shengzhe Wang, University of Colorado Denver, United States**	AUCKLAND COUNCIL'S PROGRESS ON SUSTAINABLE SHORELINE ADAPTATION PLANS **Matt Rivers, Auckland Council, New Zealand**	A 2500-YEAR SEA LEVEL RECORD FROM PHRA THONG ISLAND, THAILAND **Rahul Kumar, Asian School of the Environment, Nanyang Technological University Singapore, Singapore**	IMPACT OF CLIMATE CHANGE-INDUCED SEA ICE RETREAT ON ARCTIC STORM SURGES **Joseph Kim, University of Ottawa, Canada**
1120 - 1140	THE NUMERICAL ANALYSIS OF MIXING DEPTH AND THE THICKNESS OF BBL CONSIDERING THE SUBMERGED AQUATIC VEGETATION AND WIND STRESS **Hiroki Matsumoto, Port And Airport Research Institute, Japan**	SCOUR AMPLIFICATION CAUSED BY STRUCTURE PROXIMITY IN EXTREME FLOWS **Philippe April-lequere, University of Ottawa, Canada**	NOWCASTING INFRAGRAVITY WAVE HEIGHT WITHIN A HARBOUR USING AN ARTIFICIAL NEURAL NETWORK **Ben Williams, University of Western Australia, Australia**	IDENTIFYING TRENDS IN RESPONSES TO HURRICANE AND CLIMATE CHANGE COMMUNICATION TOOLS **Wanyun Shao, University of Alabama, United States**	AUSSEABED: A NATIONAL PROGRAM OF COLLABORATION TO MAXIMISE AUSTRALIA'S SEABED MAPPING EFFORTS **Timothy Ingleton, New South Wales Department of Planning And Environment, Australia**	CLIMATE CHANGE RISK TO MARITIME BOUNDARIES: A TAILORED METHODOLOGY FOR THE BLUE PACIFIC **Cristina Izaguirre, The Pacific Community (SPC), Fiji**
1140 - 1200	MULTI-OBJECTIVE OPTIMISATION AND COASTAL IMPACT ASSESSMENTS OF WAVE FARMS **Daniel Raj David, University of Western Australia, Australia**	EXPERIMENTAL WAKE DYNAMICS OF PILES WITH ARTIFICIAL BIOFOULING IN WAVES **Clemens Krautwald, Tu Braunschweig, Germany**	MODELLING WAVE-STRUCTURE INTERACTION WITH A NEW COMPRESSIBLE TWO-PHASE FLOW SOLVER **Barbara Zanuttigh, University of Bologna, Italy**	USING AN AGENT-BASED MODEL TO SIMULATE THE IMPACTS OF AN APPLIED DYNAMIC ADAPTIVE PATHWAYS PLAN **Andrew Allison, NIWA Taihoro Nukurangi, New Zealand**	ANALYSIS OF VERTICAL LAND MOTIONS ALONG THE CHILEAN COAST CONSIDERING SEA-LEVEL VARIABILITY, EARTHQUAKE, AND CRUSTAL DEFORMATION OF SUBDUCTION ZONES **Francisco Molteni Perez, Universidad de Valparaíso, Chile**	ADAPTING TO CLIMATE CHANGE: RISK-BASED SHORELINE MANAGEMENT PLANNING s **Sian John, Royal HaskoningDHV, Australia**
1200 - 1220		APPLICATION OF SMOOTHED PARTICLE HYDODYNAMICS ON A LOW LEVEL QUAY DECK **Wim Van Alboom, Seco, Belgium**	MODELING COASTAL WATER TABLE FLUCTUATIONS USING PFLOTRAN **Margit Maple, University of California Los Angeles, United States**	FIELD SURVEY AND MODELLING OF THE 30 OCTOBER 2020 SAMOS TSUNAMI IN THE GREEK ISLANDS **Costas Synolakis, University of Southern California, United States**		A MIXED METHOD TRADITIONAL KNOWLEDGE STUDY OF COASTAL FACTOR CORRELATION TO DECLINING SEA ICE IN RESOLUTE BAY, NUNAVUT **Alexana Forsythe, University of Ottawa, Canada**
1220 - 1300	**Lunch**					
1300 - 1800	**Technical Tours**					
1800 - 1930	**CERC Open Meeting** C2.3, Level 2, International Convention Centre Sydney					
Thursday 08 December 2022						
0800 - 1800	**Registrations Open**					
0830 - 1030	**Technical Sessions**					
Session	**Session 37** **Storm Surge Hazards Assessment and Modelling**	**Session 38** **Tsunami, Ship and Dam Break Waves**	**Session 39** **Coastal Evolution and Climate**	**Session 40** **Wave Modelling 1**	**Session 41** **Aoelian and Swash Sediment Transport**	**Session 42** **Nature-Based Solutions 4**
Room	**Room C2.1**	**Room C2.2**	**Room C2.3**	**Room C2.4**	**Room C2.5**	**Pyrmont Theare**
Chair	**Francois Flocard**	**Hannah Power**	**Bruce Jaffe**	**Jeff Hansen**	**Caroline Hallin**	**Rodger Tomlinson**
0830 - 0850	SURVEY OF STORM SURGE DUE TO TYPHOON RAI IN DECEMBER 2021 IN THE PHILIPPINES **Tomoya Shibayama, Waseda University, Japan**	VESSEL WAKE INDUCED DYNAMICS IN A SHALLOW-BAY ENVIRONMENT **Jens Figlus, Texas A&M University, United States**	EFFECTS OF STOCHASTIC WAVE FORCING ON EQUILIBRIUM SHORELINE RESPONSE ACROSS THE 21ST CENTURY INCLUDING SEA-LEVEL RISE **Maurizio D'Anna, U Epoc 5805 Universite De Bordeaux, France**	GENERATION OF LINEAR WAVES WITH BOTTOM WAVE MAKERS IN A FLUME: AN EFFICIENT WAY TO PREVENT REFLECTED WAVES **Minh Thang Tran, Sejong University, South Korea**	FIELD STUDY FOR WIND-BLOWN SAND ON THE SWASH ZONE **Akiyoshi Katano, Ecoh Corporation, Japan**	BIOMIMICRY OF NATURAL REEF HYODYNAMICS IN AN ARTIFICIAL SPUR AND GROOVE REEF FORMATION **Emilee Wissmach, Florida Institute of Technology, United States**
0850 - 0910	PROBABILISTIC FORECASTING SYSTEM OF STORM SURGE USING A STOCHASTIC TYPHOON MODEL **Yoshimitsu Tajima, The University of Tokyo, Japan**	CHARACTERIZING TRAILING WAVES FROM CARGO SHIP WAKE **Kevin Haas, GA Tech, United States**	LITTORAL DRIFT GRADIENTS ON THE PORTUGUESE COASTAL SECTOR ESMORIZ-NAZARÉ: PAST AND FUTURE TRENDS **Ana Margarida Ferreira, University of Aveiro, Portugal**	NON-LINEAR DISPERSION EFFECTS IN NEARSHORE WAVES: PERSPECTIVES FOR DEPTH-INVERSION APPLICATIONS **Kevin Martins, U 5805 EPOC, University of Bordeaux, Australia**	EFFECTS OF SHELLS ON AEOLIAN SEDIMENT TRANSPORT ON A NATURAL BEACH **Glenn Strypsteen, Ku Leuven - Campus Brugge, Belgium**	~~EXPERIMENTAL EVALUATION OF THE PERFORMANCE OF A HYBRID ARTIFICIAL CORAL REEF WITH BRAIN AND STAGHORN CORALS~~ ~~**Seyedmohammaco Ghiasian, University of Miami, United States**~~

0910 - 0930	NATIONAL ASSESSMENT OF HURRICANE-INDUCED COASTAL EROSION HAZARDS IN PUERTO RICO **Legna Torres-Garcia, U.S. Geological Survey, United States**	TRANSITION OF TSUNAMI-LIKE LONG WAVES FROM A BASIN INTO A CHANNEL WITH OUTFLOW JET **Samuel Salemink-Harry, Oregon State University, United States**	ARE GLOBAL CHANGES IN WAVE AND STORM SURGE CONDITIONS CORRELATED WITH COASTAL EROSION/ACCRETION? **Mandana Ghanavati, University of Melbourne, Australia**	SIMULATION OF STEEPNESS-LIMITED BREAKING WAVES IN A FULLY NONLINEAR POTENTIAL FLOW MODEL **Sunil Mohanlal, LHSV, ENPC, France**	IMPLICATIONS OF SPATIAL GRAIN SIZE VARIABILITY FOR AEOLIAN TRANSPORT **Christa van Ijzendoorn, Delft University of Technology, Netherlands**	LARGE SCALE LABORATORY OBSERVATIONS OF WAVE FORCE REDUCTION ON COASTAL BUILDINGS BY AN IDEALIZED MANGROVE FOREST **Peo Lomonaco, Oregon State University, United States**
0930 - 0950	HURRICANE RISK INFORMATION DIFFUSION MODEL: THEORETICAL FORMULATION AND EVIDENCE **Elissa Yeates, USACE Coastal and Hydraulics Laboratory, United States**	NUMERICAL MODELLING OF TSUNAMIS GENERATED BY GRANULAR LANDSLIDES IN OPENFOAM **Alessano Romano, Roma Tre University, Italy**	PSEUDO GLOBAL WARMING EXPERIMENTS OF BEACH MORPHOLOGICAL CHANGE: CASE STUDY IN NIIGATA COAST CAUSED BY TYPHOON LUPIT (2021) **Kota Ohizumi, CTI Engineering Co., Ltd., Japan**	MODELLING OF SPILLING AND PLUNGING BREAKING WAVES IN SPECTRAL MODELS **Yana Saprykina, Shirshov Institute of Oceanology of Russian Academy of Sciences, Russian Federation**	SPATIO-TEMPORAL VARIATION OF SHOREWARD AEOLIAN SAND TRANSPORT MEASURED USING NEAR-CONTINUOUS LASER SCANNING **Sander Vos, Delft University of Technology, Netherlands**	CONSTRUCTED OYSTER REEFS AS SEDIMENT STABILISERS AND ECOLOGICAL ENGINEERS: A DUTCH CASE STUDY **Anneke Van Den Brink, DPE, Australia**
0950 - 1010	THE EFFECT OF TROPICAL CYCLONES' TRANSLATION SPEEDS AND LANDFALL ANGLES ON MAXIMUM SURGE HEIGHTS ALONG IDEALIZED COASTS **Xiaojuan Qian, Korea University, South Korea**	DEEP LEARNING TO PREDICT TSUNAMI HEIGHT AT THE SHORELINE USING OCEAN BOTTOM PRESSURE DATA **Willington Renteria, University of Southern California, United States**	SHORELINE VARIATION OF AN ISLAND IN RESPONSE TO CHANGE IN WAVE DIRECTION **Takaaki Uda, Public Works Research Center, Japan**	MODELING INFRA-GRAVITY WAVES USING SCHISM-WWMIII BASED ON IMPROVED FORMULAS AND COUPLING APPROACH **Jinghua Wang, The Hong Kong Polytechnic University, Hong Kong**	DEPTH-RESOLVED MODELLING OF SEDIMENT FLUXES UNDER BICHROMATIC WAVES IN THE SWASH ZONE **Joost Kranenborg, University of Twente, Netherlands**	ROCK ARMOUR: A BENTHIC HABITAT PROVIDING VALUABLE ECOSYSTEM SERVICES IN THE CARIBBEAN SEA **Philip Warner, Smith Warner International Ltd., United States**
1010 - 1030	SHORT TERM SPATIALLY DENSE PREDICTION OF STORM SURGE ALONG THE NEW ZEALAND COASTLINE **Karin Bryan, University of Waikato, New Zealand**	BEHAVIOR OF VARIABLE DENSITY MUNITIONS UNDER DAM BREAK FORCING **Temitope Idowu, University of Delaware, United States**	IMPACTS OF SLR-UPSCALED NOURISHMENT SCENARIOS ON DECADAL CROSS-SHORE DYNAMICS **Tosca Kettler, TU Delft, Netherlands**		FIELD OBSERVATIONS OF SEDIMENT PARTICLE MOVEMENTS IN THE SWASH ZONE USING FLUORESCENT SAND **Takayuki Suzuki, Yokohama National University, Japan**	CAN LIVING SEAWALLS BE DESIGNED TO IMPROVE BIOSECURITY? **Katherine Dafforn, Macquarie University, Australia**
1030 - 1100	**Morning Tea**					
1100 - 1300	**Technical Sessions**					
Session	**Session 43** **Coastal Management 2**	**Session 44** **Structure and Sediment Interactions**	**Session 45** **Coastal Sediments and Transport 2**	**Session 46** **Coastal Evolution 1**	**Session 47** **Ship Mooring**	**Session 48** **Coastal Hazards**
Room	**Room C2.1**	**Room C2.2**	**Room C2.3**	**Room C2.4**	**Room C2.5**	**Pyrmont Theare**
Chair	**Maria Maza**	**Kasper Kaergaard**	**Cheng-Jung Hsu**	**Aline Pieterse**	**Jesper Nielsen**	**Karin Bryan**
1100 - 1120	COASTAL MANAGEMENT CASE STUDY - QUINNS BEACH, CITY OF WANNEROO, WESTERN AUSTRALIA **Rory Ellyard, City of Wanneroo, Australia**	ESTIMATING SEDIMENT GENERATION FROM ROCK CONSTRUCTION WORKS **Christopher Adamantidis, Advisian Pty Ltd, Australia**	REAL-TIME MONITORING OF HYODYNAMICS AND SUSPENDED SEDIMENT CONCENTRATIONS IN A COASTAL REEF **Ly TrungNguyen, Graduate Inst. of Hyological and Oceanic Sciences, National Central University, Taiwan**	THE EVOLUTION TREND OF A BEACH IN CONSEQUENCE OF THE BUILDING OF COASTAL STRUCTURES **Pasquale Filianoti, University Mediterranea of Reggio Calabria, Italy**	PROPAGATION OF CARGO SHIP WAKE INTO SECONDARY CHANNELS **Alexana Muscalus, GA Tech, United States**	INTERACTIVE VISUALIZATION FOR COASTAL HAZARDS **Patrick Lynett, University of Southern California, United States**
1120 - 1140	THE ROBIN HOOD APPROACH TO COASTAL MANAGEMENT – SAND HARVESTING THROUGH THE EYES OF BEACH SCRAPOLOGISTS **Marc Daley, Department of Planning and Environment, Australia**	STABILITY OF BURIED SCOUR PROTECTION IN SHALLOW COASTAL WATERS **Nils B. Kerpen, Ludwig-Franzius-Institut, Uni Hannover, Germany**	FACTORS CONTROLLING THE EQUILIBRIUM SEDIMENT COMPOSITION IN SAND-MUD TIDAL BASINS **Ana Colina Alonso, Delft University of Technology, Netherlands**	COASTAL DUNES CHANGES ALONG THE WESTERN COAST OF EUROPE **Olivier Burvingt, Univ. Bordeaux, France**	AI- BASED DECISION-MAKING TOOLS FOR PORT MANAGEMENT: SHIP-INFRASTRUCTURE OPERABILITY AND OVERTOPPING **Enrique Pena, University of A Coruña, Spain**	A MULTI-SCALE STORM COASTAL STORM HAZARDS EARLY WARNING SYSTEM FOR AUSTRALIA **Christopher Leaman, UNSW, Australia**
1140 - 1200	COST BENEFIT ANALYSIS IN COASTAL MANAGEMENT – USEFUL OR FLAWED? **Ron Cox, Water Research Laboratory UNSW, Australia**	BEACH BUILDINGS ON POLES AND THEIR IMPLICATIONS FOR DUNEWARD SEDIMENT TRANSPORT: A NUMERICAL STUDY **Paran Pourteimouri, University of Twente, Netherlands**	EFFECT OF LARGE-SCALE FORCING ON THE LOCAL SEDIMENT TRANSPORT POTENTIAL AT THE SCHLESWIG-HOLSTEIN BALTIC SEA COAST **Pushpa Dissanayake, Kiel University, Germany**	EFFECTS OF CONSTITUENT MATERIAL PROPERTIES ON EROSION OF FLAT BED AND RECESSION OF BLUFF **Ali Farhadzadeh, Stony Brook University, United States**	NEURAL NETWORKS FOR OPTIMIZATION OF AN EARLY WARNING SYSTEM FOR MOORED SHIPS IN HARBOURS **Liliana Pinheiro, LNEC, Portugal**	INTERPRETABLE ARTIFICIAL INTELLIGENCE FOR RIP CURRENT DETECTION AND LOCALIZATION **Christo Rautenbach, NIWA, New Zealand**
1200 - 1220	AFTER THE 1972 STOCKHOLM CONFERENCE: 50 YEARS OF COASTAL MANAGEMENT IN PORTUGAL **Carlos Coelho, University of Aveiro, Portugal**	TURBULENT BORES–INDUCED SCOUR AND PORE PRESSURE VARIATIONS AROUND A VERTICAL STRUCTURE **Marieh Rajaie, University of Ottawa, Canada**	PROBABILISTIC PREDICTIONS OF EQUILIBRIUM RIPPLE GEOMETRY FOR TIME-DEPENDENT SEAFLOOR MODELING **Allison Penko, U.S. Naval Research Laboratory, United States**	LONG TERM MORPHOLOGIC MODELLING OF DELTA DEVELOPMENT IN BRETON SOUND RESULTING FROM A PROPOSED DIVERSION STRUCTURE **Qimiao Lu, Baird, Australia**	MOORED SHIP MOTION FORECAST TOOL FOR THE PORT OF NGQURA **Christophe Troch, Council For Scientific And Industrial Research (CSIR), South Africa**	UTILISING GEOSCIENTIFIC INSIGHTS INTO PAST COASTAL HAZARD EVENTS FOR COASTAL ENGINEERING **Adam D. Switzer, Earth Observatory of Singapore, Nanyang Technological University, Singapore**
1220 - 1240	A PATH TOWARDS HOLISTIC COASTAL ZONE MANAGEMENT IN TEXAS LEVERAGING SIGNIFICANT INVESTMENTS IN DATA COLLECTION, PLANNING, AND IMPLEMENTATION **Coraggio Maglio, DCCM, United States**	SPATIO-TEMPORAL ANALYSIS OF SCOUR AROUND JACKET TYPE OFFSHORE FOUNDATIONS UNDER CLEAR WATER AND LIVE BED CONDITIONS **Ramish Satari, Leibniz University Hannover, Germany**	STORM AND TSUNAMI OVERWASH SEDIMENT TRANSPORT INFERRED FROM RECENT DEPOSITS **Bruce Jaffe, United States Geological Survey, United States**	COASTAL 'OMNI-LINE': MULTI-SCALE DATA SYNTHESIS, TOP-DOWN AND BOTTOM-UP **Jak McCarroll, Department of Environment, Land, Water And Planning, Australia**	CHANNEL WAVE REFRACTION EFFECT ON MOORED LNG CARRIERS **Wim van der Molen, Baird Australia Pty Ltd, Australia**	STUDY OF DETERMINING RISK LEVEL REGARDING SWIMMING CONDITION ON BATHING BEACH USING **Al Haruki Toguchi, Chuo University, Japan**
1240 - 1300	UPDATE ON THE STABILITY FOUR ESTUARIES ON THE AUSTRALIAN SOUTH-EASTERN SEABOARD **Angus Gordon, Coastal Zone Management And Planning, Australia**	40 YEARS OF FLEXIBLE SCOUR APRONS: ATLANTIC AND PACIFIC COAST CASE HISTORIES **Christopher Brown, Seabee Developments, United Kingdom**	NEARSHORE SCALAR TRANSPORT MODEL WITH VIRTUAL REALITY ENVIRONMENT **Soonchool Hwang, Kores University, South Korea**	EROSION HOTSPOTS AND BAR DYNAMICS ON THE DANISH WESTCOAST **Nikolai Sorensen, Danish Coastal Authority, Denmark**	MONITORING MOORED BOAT MOTIONS INDUCED BY WAKE FROM PASSING VESSELS. A CASE STUDY: WILLIAMSTOWN MARITIME PRECINT **Daniel Machado, BMT, Australia**	PROBABILISTIC APPROACHES FOR ASSESSING EROSION HAZARD ALONG NEW SOUTH WALES MID NORTH COAST **Michael Thomson, JBPacific, Australia**
1300 - 1400	**Lunch**					
1400 - 1600	**Technical Sessions**					
Session	**Session 49** **Infragravity Waves**	**Session 50** **Wind Farms and Floating Structures**	**Session 51** **Inlets, Spits and Urban Coastal Flooding**	**Session 52** **Modelling Coastal Evolution**	**Session 53** **Coastal Management 3**	**Session 54** **Tsunami 2**
Room	**Room C2.1**	**Room C2.2**	**Room C2.3**	**Room C2.4**	**Room C2.5**	**Pyrmont Theare**
Chair	**Gary Blumberg**	**Leopoldo Franco**	**Ana Vila-Concejo**	**Jak McCarroll**	**Ron Cox**	**Claudia Cecioni**
1400 - 1420	CHARACTERISATION OF INFRAGRAVITY WAVES AND THEIR ASSOCIATED HYODYNAMICS PROCESSES IN MESO-MACRO TIDAL LAGOON **Paul Bayle, TUDelft / BRGM - Ifremer, Netherlands**	CHALLENGES IN DESIGNING A WIND FARM ON AN ERODING BEACH ALONG THE DUTCH COAST **Anne de Beer, Royal HaskoningDHV, Netherlands**	INFLUENCE OF EBB-DELTA DYNAMICS ON EVOLUTION OF INLET-INTERRUPTED COASTS **Janaka Bamunawala, University of Moratuwa, Netherlands**	APPLICATION OF EQUILIBRIUM-BASED SHORELINE EVOLUTION MODELING TO DIVERSE COASTAL ENVIRONMENTS **Camilo Jaramillo Cardona, Fundacion Instituto De Hisulica Ambiental, Spain**	AN ADAPTIVE PATHWAY TO COASTAL RESILIENCE **Adam Hosking, Jacobs, United Kingdom**	THE JANUARY 2022 TONGA-HUNGA HA'APAI TSUNAMI WAVES ON THE EAST COAST OF AUSTRALIA, AND COMPARISON TO PREVIOUS EVENTS **Sam Maddox, Manly Hydraulics Laboratory, Australia**
1420 - 1440	FREE AND BOUND WAVES IN THE COASTAL ZONE: FIELD, LABORATORY AND NUMERICAL EXPERIMENTS **Sergey Kuznetsov, Shirshov Institute of Oceanology of Russian Academy of Sciences, Russian Federation**	AN EXPERIMENTAL STUDY ON A COMPLIANT FLOATING PLATFORM WITH A FRONT BARRIER UNDER WAVE ACTION **Cheng Bi, Nanyang Technological University, Singapore**	MONITORING OF THE COASTAL DYNAMICS ON THE SAND SPIT AT TORTUGUEROS BEACH, MEXICO **Mireille Escudero, Universidad Nacional Autónoma De México, Mexico**	NEW PROCESS BASED EQUATION FOR A STATIC EQUILIBRIUM BEACH PLANFORM **June Gainza, Bluecoast Consulting Engineers, Australia**	DEVELOPING LARGE-SCALE AND FAST COMPOUND FLOOD MODELS FOR AUSTRALIAN COASTLINES **Tim Leijnse, Deltares | VU Amsterdam, Netherlands**	NUMERICAL SIMULATION OF TSUNAMI IMPACT FROM THE 1/15/22 ERUPTION OF THE HUNGA TONGA - HUNGA HA'APAI VOLCANO **Stephan Grilli, University of Rhode Island, United States**
1440 - 1500	CONTRIBUTION OF INFRAGRAVITY WAVES TO STORM WATER LEVEL ALONG A LARGE INLET: IMPLICATIONS FOR FLOODING AND OVERTOPPING HAZARDS **Alexane Nicolae Lerma, Brgm, France**	HYDROSTATIC STABILITY EXPLORATION ON FLOATING STRUCTURES USING MACHINE LEARNING **Hamid ElDarwich, Princeton University, United States**	EFFECTS OF WAVE SKEWNESS AND ASYMMETRY ON THE EVOLUTION OF FIRE ISLAND, NEW YORK **Muhammed Said Parlak, Istanbul Bilgi University, Turkey**	MODELLING OF BEACH STATE VARIABILITY **Blessing Nwanosike, Swansea University, United Kingdom**	CASE STUDY OF INTEGRATED COASTAL ZONE MANAGEMENT IN IVORY COAST: STABILIZATION OF MIGRATING TIDAL INLET BY SOFT PROTECTION MEASURES **Aurelie Le Dissez, Artelia, France**	METEOROLOGICAL TSUNAMIS FROM ATMOSPHERIC EFFECTS AND VOLCANIC ERUPTIONS – A HAZARD FOR COASTAL REGIONS AND PORTS **Pattiaratchi Charitha, The University of Western Australia, Australia**
1500 - 1520	CROSS-SHORE TRANSFORMATION OF BOUND AND FREE INFRAGRAVITY WAVES OFF THE DUTCH COAST **Marion Tissier, Delft University of Technology, Netherlands**	DESIGN OF A FLOATING PLATFORM FOR AN INNOVATIVE DUCTED WIND TURBINE **Luana Gumari, University Mediterranea of Reggio Calabria, Italy**	MIGRATION AND WELDING OF AN ESTUARINE BARRIER-SPIT IVEN BY DELTA EVOLUTION AND STORMS **Mike Kinsela, University of Newcastle, Australia**	AN INTEGRATED MACHINE LEARNING - PROBABILISTIC APPROACH TO PREDICT BEACH VOLUME CHANGE **Aline Pieterse, IMDC, Belgium**	MULTI-YEAR MONITORING TO DISTINGUISH ENVIRONMENTAL IMPACTS DUE TO WATERFRONT CONSTRUCTION FROM AMBIENT ENVIRONMENTAL CHANGE **Kevin MacIntosh, Baird & Associates, Canada**	TSUNAMI FLOW PARAMETERS INFLUENCING PORT DAMAGE: A CASE-STUDY OF THE 2011 TOHOKU TSUNAMI **Constance Ting Chua, Nanyang Technological University, Singapore**
1520 - 1540	LONG WAVES FORCED BY SYMMETRIC AND ASYMMETRIC WAVE GROUPS **Tom Baldock, University of Queensland, Australia**	EFFECT OF TSUNAMI INDUCED CURRENTS ON FLOATING PONTOONS WITH THE MOORING LINES **Bergüzer Ozbahceci, Izmir Institute of Technology, Turkey**	NUMERICAL MODELING OF SHINNECOCK INLET, NEW YORK, FOR COASTAL EROSION CONTROL SUPPORT AND INLET SEDIMENT MANAGEMENT **Lihwa Lin, Us Army Corps of Engineers, United States**	CROSS-SHORE BEACH PROFILE SIMULATION IN THE SWASH ZONE OF NARRABEEN-COLLAROY BEACH **Mohammad Tabasi, Yokohama National University, Japan**	COASTAUS: APPLICATION OF THE COAST TOOL TO THE PORTUGUESE WEST COASTLINE **Ané Cardoso, RSe Consulting Engineers, Portugal**	EFFECTIVENESS OF TSUNAMI MITIGATION STRUCTURES ON UNDERUTILIZED URBAN AREAS: A CASE STUDY ON REDUCING DAMAGE CAUSED BY TSUNAMI TO BUILDINGS **Moe Takino, Tokushima University, Japan**
1540 - 1600	INFRAGRAVITY WAVES AT A TIDAL INLET **Ad Reniers, Delft University of Technology, Netherlands**	HYDRODYNAMIC BEHAVIOR OF SUBMERGED FLOATING BRIDGE WITH SUSPENSION SUPPRORT AFTER CABLE FAILURE **Deokhee Won, Halla University, South Korea**	COMPOUND URBAN COASTAL FLOOD MODELLING: INTEGRATING TIDE, WAVES, PRECIPITATION AND HYDRAULIC INFRASTRUCTURE **Boxiang Tang, University of California Los Angeles, United States**	PREDICTION OF TOPOGRAPHIC CHANGES ON ENSHUNADA COAST CONSIDERING EFFECT OF BOTH WAVES AND WINDBLOWN SAND **Takuya Yokota, Coastal Engineering Laboratory Co., Ltd, Japan**	THE IMPACT OF EXTREME WATER LEVELS ON TORONTO ISLAND PARK AND INCREASING RESILIENCE AGAINST FUTURE FLOOD EVENTS **Jennifer Crilly, Baird, Australia**	DEVELOPMENT OF SMARTPHONE APPLICATION TO SUPPORT TSUNAMI EVACUATION **Dawn Han, Waseda University, Japan**
1600 -1630	**Afternoon Tea**					
1630 - 1810	**Technical Sessions**					

Session	Session 55 Tsunami 3	Session 56 Breakwater Design	Session 57 Climate Resilience and Adaptation	Session 58 Shoreline Modelling & Prediction	Session 59 Coastal Management 4	Session 60 Nature-Based Solutions 5
Room	Room C2.1	Room C2.2	Room C2.3	Room C2.4	Room C2.5	Pyrmont Theare
Chair	Tom Bruce	Jessica Podoski	Spicer Bak	Kristen Splinter	Ravi Jayaratne	Ioan Nistor
1630 - 1650	~~INVESTIGATING DEBRIS TRANSPORT DURING EXTREME COASTAL EVENTS~~ ~~Cicem Ezgi Cinar, University of Southern California, United States~~	MAXIMUM MOMENTUM FLUX FOR STABILITY ANALYSIS OF MODEL AND PROTOTYPE BREAKWATERS Ina Jayewardene, Manly Hydulics Laboratory, Australia	CLIMATE RESILIENT COASTAL SOLUTIONS IN THE CARIBBEAN CONTEXT Amaury Camarena, CBCI, Canada	REDUCED-COMPLEXITY MODELING OF CROSS-SHORE AND LONGSHORE BEACH EVOLUTION Marissa Yates, Cerema Risk, Water, Sea And Coasts, France	PALM BEACH SHORELINE PROJECT: INNOVATIVE COASTAL MANAGEMENT SOLUTION Shannon Hunt, City of Gold Coast, Australia	EFFECTIVENESS OF CORAL REEF RESTORATION IN WAVE ATTENUATION APPLICATIONS Justin Geldard, The University of Western Australia, Australia
1650 - 1710	PROBABILISTIC APPROACH FOR PREDICTING THE IFT OF BODIES BY TSUNAMIS Keisuke Haga, Chuo University, Japan	MODELING MACRO ROUGHNESS WITH A POROUS MEDIA. EXAMPLE OF THE ARTHA BREAKWATER Pierre-Antoine Poncet, Universitée De Pau Pays De L'adour, France	MANAGING UNCERTAINTIES IN URBAN DEVELOPMENT AND CLIMATE CHANGE ADAPTATION: A CASE STUDY IN ADAPTATION USING DAPP IN SKIVE, DENMARK Rick Kool, NIRAS, Denmark	TEST OF LSTM NETWORKS IN LONG-TERM BEACH MORPHOLOGICAL CHANGES Masayuki Banno, Port and Airport Research Institute, Japan	MONITORING OF THE PALM BEACH ARTIFICIAL REEF Paul Prenzler, Royal HaskoningDHV, Australia	MODELING CORAL REEF RESTORATION TO REDUCE COASTAL HAZARDS FROM SCALES OF CENTIMETERS TO KILOMETERS Curt Storlazzi, U.S. Geological Survey, United States
1710 - 1730	MODELLING OF DEBRIS MOTION IVEN BY TSUNAMI WAVE BREAKING Chiaki Tsurudome, Central Research Institute of Electric Power Industry, Japan	DETACHED BREAKWATERS PROTECT LARGE MARINE INFRASTRUCTURE FROM SEVERE STORMS Carl Wehlitz, CSIR, South Africa	THE IMPLICATIONS OF TRANSITIONAL CLIMATE REGIONS ON COASTAL RISK I txaso Oderiz Martinez, Universidad Nacional Autonoma de Mexico, Mexico	A DEEP LEARNING MODEL TO PREDICT SHORELINE CHANGE Ernesto Eduardo Gomez de la Pena, University of Auckland, New Zealand	INVESTIGATING EDGE PLACEMENT OPTIMISATION TO BENEFIT SURF AMENITY Nick Naderi, Queensland Government, Australia	ENGINEERED FRINGING REEFS: ENGINEERING WITH NATURE SOLUTIONS FOR COASTAL EROSION CONTROL Matthew Allen, MMA Offshore, Australia
1730 - 1750	FROM OFFSHORE TO ONSHORE PROBABILISTIC TSUNAMI HAZARD ASSESSMENT WITH QUANTIFIED UNCERTAINTY: EFFICIENT MONTE CARLO TECHNIQUES Gareth Davies, Geoscience Australia, Australia	THE VAN DER MEER FORMULA FOR ROCK SLOPE STABILITY AT SHALLOW WATER Jentsje Van Der Meer, Van Der Meer Consulting, Netherlands	ADAPTATION ASSESMENT OF PORT INFRASTRUCTURES FOR CLIMATE CHANGE FOR COMPOUND IMPACTS Javier Lara, IHCantabria - Universidad de Cantabria, Spain	MODELLING SHORELINE EVOLUTION AT COLLAROY-NARRABEEN, DUE TO COMBINED CROSS-SHORE AND LONGSHORE SEDIMENT TRANSPORT PROCESSES Emily Hunt, UOP, United Kingdom	OVERVIEW OF THE COASTAL TEXAS MEGA PROJECT Patrick Kerr, US Army Corps of Engineers, United States	OYSTER REEF AND MUSSEL BED SURROGATES SUBJECTED TO WAVES Jan Christian Hitzegrad, Leichtweiß-institute For Hyaulic Engineering And Water Resources, Technische Universität Braunschweig, Braunschweig, G, Germany
1750 - 1810	NON-STATIONARY PROBABILISTIC TSUNAMI HAZARD ASSESSMENTS INCORPORATING TIDES AND SEA LEVEL RISE Philip Liu, NUS, Singapore	INCORPORATING CLIMATE CHANGE RESILIENCE INTO A BREAKWATER REPAIR: A CASE STUDY AT HILO, HAWAII Jessica Podoski, US Army Corps of Engineers, Honolulu District, United States	COUPLING REMOTE SENSING IMAGERY AND NUMERICAL MODELS TO QUANTIFY THE RESILIENCE OF COASTAL MARSHES TO CLIMATE CHANGE Sergio Fagherazzi, Boston University, United States	PREDICTING SHORELINE EVOLUTION IN A CHANGING WAVE CLIMATE Raimundo Ibaceta, Water Research Laboratory - UNSW Sydney, Australia	DIGITAL TWINNING AS A DECISION SUPPORT TOOL FOR RESILIENCE PLANNING OF COASTAL INTERMODAL TRANSPORTATION NETWORKS Anibal Tafur, Rice University, United States	SHELL HASH: A NATURE-BASED SOLUTION FOR BEACHFRONT COASTAL RESILIENCE? Bill Dally, University of North Florida, United States
1830 - 2030	Young Professionals Networking Function Hilton Sydney Hotel, Level 4, 488 George St Sydney					

Friday 09 December 2022

0800 - 1700	Registrations Open
0830 - 0920	Plenary Session Pyrmont Theare
0830 - 0920	Introduction Keynote Address: A Career with Coastal Processes and 18 ICCEs Peter Nielsen Professor School of Civil Engineering, The University of Queensland, Queensland
0920 - 1000	Morning Tea
1000 - 1200	Technical Sessions

Session	Session 61 Climate Change	Session 62 Breakwater Design and Innovation	Session 63 Storm Surge 1	Session 64 Wave Transformation, Bores and Design Criteria	Session 65 Coastal Evolution 2	Session 66 Sand Bypassing and Nourishment
Room	Room C2.1	Room C2.2	Room C2.3	Room C2.4	Room C2.5	Pyrmont Theare
Chair	Patrick Lynett	Chris Brown	Dave Callaghan	Kevin Haas	Evan Watterson	Jennifer Irish
1000 - 1020	DOWNSCALING CLIMATE PROJECTIONS TOWARDS COASTAL HYDDYNAMICS MODELS Luis Germano Biolchi, Arpae-SIMC, Italy	INNOVATIVE SEAWALL DESIGN DEVELOPMENT IN NSW, AUSTRALIA: 4 RECENT CASE STUDIES Natalie Patterson, Royal HaskoningDHV, Australia	APPLICATION OF THE MODIFIED LINEAR SUPERPOSITION METHOD FOR TIDE AND STORM SURGE INTERACTION — TROPICAL AND EXTRA-TROPICAL CYCLONES Christopher Bender, Taylor Engineering, Inc., United States	INVESTIGATIONS OF BORE-BORE CAPTURE ON A MACROTIDAL BEACH Ms Rosanne Hart, The University of Newcastle, Australia	REPEATABILITY OF MORPHOLOGICAL CHANGE ON A SANDY BEACH ACROSS MULTIPLE TIMESCALES Chris Blenkinsopp, University of Bath, United Kingdom	FEASIBILITY STUDY OF SAND BYPASS AT AVEIRO AND FIGUEIRA DA FOZ INLETS Celso Pinto, Portuguese Environment Agency (APA), Portugal
1020 - 1040	THE WAVE CLIMATE OF SOUTH-EAST AUSTRALIA AND FUTURE WAVE PROJECTION BY THE END OF 21ST CENTURY Jin Liu, University of Melbourne, Australia	THE DESIGN AND CONSTRUCTION OF BREAKWATER ON BAMBOO PILE FOUNDATION AT PATIMBAN PORT DEVELOPMENT PROJECT Phuong Dong Le, Oriental Consultants Global, Indonesia	ANALYSIS OF STORM SURGE CHARACTERISTICS BASED ON TYPHOON PROPERTIES Jung-A Yang, Korea University, South Korea	CHARACTERISTICS OF BORES GENERATED BY DIFFERENT MECHANISIMS IN THE LABORATORY Ignacio Barranco, Hr Wallingford, United Kingdom	STUDY OF CROSS-SHORE PROFILES AT SOUTH COASTS OF THE CASPIAN SEA UNDER RAPID CHANGES IN WATER LEVEL Ioan Nistor, University of Ottawa, Canada	TWEED SAND BYPASSING TRANSITION PROJECT Matthew Harry, Transport For NSW, Australia
1040 - 1100	EVALUATION OF BIAS CORRECTION METHODS FOR DETERMINING FUTURE DESIGN WAVE HEIGHT BASED ON MEGA-ENSEMBLE CLIMATE PROJECTION Kunihiro Watanabe, National Institute For Land And Infrastructure Management, Japan	PHYSICAL MODELLING OF ROCK BAGS FOR COASTAL PROTECTION APPLICATION Dan Messiter, Royal HaskoningDHV, Australia	STORM TIDE IN A DATA RICH COASTAL EMBAYMENT FINDING THE MISSING SURGE Mitchell Smith, Tuflow, Australia	SCALABLE REAL-TIME DATA ASSIMILATION WITH VARIOUS DATA TYPES FOR ACCURATE SPATIOTEMPORAL NEARSHORE BATHYMETRY ESTIMATION Matthew Farthing, U.S. Army Corps of Engineer Research and Development Center, United States	A PROCESS-BASED NUMERICAL MODEL OF SHORE FACE PROFILE EVOLUTION Dean Patterson, University of Queensland, Australia	ARTIFICIAL SAND BYPASS SYSTEMS: FIXED, MOBILE, AND MIXED SYSTEMS. Ricardo Carvalho, OCEANING-Engenheiros Consultores OEC, Lda., Portugal
1100 - 1120	GLOBAL OCEAN WAVES AND STORM SURGE CHANGES UNDER A WARMING CLIMATE Tomoya Shimura, Kyoto University, Japan	PHYSICAL EVALUATION OF THE HYODYNAMIC STABILITY OF AN ECO-ENGINEERED ARMOURING UNIT Jorge Gutierrez Martinez, Econcrete, Spain	ASSESSMENT OF UNCERTAINTY IN ESTIMATING FUTURE EXTREME STORM SURGE EVENTS IN OSAKA BAY USING LARGE ENSEMBLE TYPHOON DATA Sota Nakajo, Osaka Metropolitan University, Japan	WAVE TRANSFORMATION ON A ROCKY SHORE: FROM FIELD WORK ON RE ISLAND TO 3D MODELING Heloise Michaud, Shom, France	TOPOGRAPHIC RESPONSE TO HIGH WAVES AND SUBSEQUENT BEACH RECOVERY ON CHIGASAKI COAST Takahisa Tamura, Kanagawa Prefecture, Japan, Japan	WA'S FIRST LARGE SCALE BENEFICIAL USE BEACH NOURISHMENT PROJECT: LESSONS LEARNED Demont Hansen, Department of Transport Maritime, Australia
1120 - 1140	FUTURE PREDICTION OF WIND VELOCITY AND SIGNIFICANT WAVE HEIGHT IN THE COMPLETELY ICE-FREE ARCTIC OCEAN UNDER RCP8.5 SCENARIO Yudai Aoki, Niigata University, Japan	GUIDELINES FOR INSTALLING MULTI-USE AND ECO-FEATURES DURING BREAKWATER UPGRADES Patrick Dwyer, DPI Fisheries, Australia	SUITABLE BOUNDARY LOCATION IDENTIFCATION FOR RAINFALL-RUNOFF AND SURGE MODEL COUPLING TO EVALUATE COMPOUND FLOOD HAZARDS IN COASTAL REGIONS Mohammad Islam, Us Army Corps of Engineer-Galveston District, United States	A METHOD TO DETERMINE WAVE DESIGN CRITERIA WITH HIGHER ACCURACY Julia Soares, Water Technology, Australia	INFLUENCE ON EVENT-SPECIFIC CALIBRATION DATA IN MODELLING SUBAERIAL STORM EROSION UNDER COMPLEX BATHYMETRY Hyeok Jin, Geosystem Research, South Korea	USING SHALLOW NEARSHORE BERM NOURISHMENTS TO ENHANCE BEACH WIDTH Matthieu De Schipper, Delft University of Technology, Netherlands
1140 - 1200	GLOBAL WAVE CLIMATE TRENDS: WHAT DO THE SOUTHERN HEMISPHERE WAVE BUOYS TELL US? Francois Flocard, UNSW WRL, Australia	IT DOES NOT HAVE TO BE SO HARD! APPROACHES TO FORESOHRE MANAGEMENT USING ADAPTIVE NATURE-BASED SULUTIONS AND LIVING FORESHORES Nick Lewis, Royal HaskonigDHV, Australia	STUDY OF STORM TIDE MODELING IN THE PEARL RIVER ESTUARY Edward Shen, Guangzhou Maritime University, China		VERIFYING THE EROSION CHARACTERISTICS OF BEACH USING NUMERICAL SIMULATION AND LONG-TERM SURVEY DATA Hyun Dong Kim, University of Florida, United States	LIFE-CYCLE ANALYSES OF SUBAERIAL BEACH NOURISHMENTS WITH CONCURRENT NEARSHORE PLACEMENT OF EDGED SEDIMENT Doug Krafft, USACE ERDC, United States
1200 - 1300	Lunch (12:15 - 12:50 Pyrmont Theatre: Journals Q&A)					
1300 - 1500	Technical Sessions					

Session	Session 67 Storm Surge 2	Session 68 Breakwater and Caisson Structures	Session 69 Coastal Evolution 3	Session 70 Wave Mechanics and Transformation	Session 71 Wave Overtopping 3	Session 72 Wave Attenuation by Vegetation
Room	Room C2.1	Room C2.2	Room C2.3	Room C2.4	Room C2.5	Pyrmont Theare
Chair	Keisuke Nakayama	Gildas Colleter	Takaaki Uda	Patrick Lynett	Ian Coghlan	Shari Gallop
1300 - 1320	EXTREME STORM SURGES DUE TO GLOBAL WARMING IN EAST ASIA BASED ON A MAXIMUM POTENTIAL STORM SURGE MODEL Nobuhito Mori, Kyoto University, Japan	PEAK DIFFERENTIAL TIDAL PRESSURES FOR ROCK WALL RECLAMATION AREAS Damian Dryden, Port of Townsville Ltd, Australia	INVESTIGATION INTO THE MECHANISMS OF CREST GROWTH ON GRAVEL BERMS Oliver Foss, University of Bath, United Kingdom	DIRECTIONAL SPECTRA OF INFRAGRAVITY WAVES DURING STORMY CONDITIONS Yoshinao Matsuba, The University of Tokyo, Japan	BEACH GROUNDWATER IMPACTS ON WAVE OVERTOPPING FLOODING Marie-Pierre Delisle, UCLA, United States	ARE REDUCED-SCALE EXPERIMENTS OF WAVE DAMPING BY VEGETATION SUITABLE FOR ENGINEERING WITH NATURE? Cox Daniel, Oregon State University, Australia
1320 - 1340	LONG-TERM PROJECTION OF EXTREME STORM SURGE IN JAPAN USING MAXIMUM POTENTIAL STORM SURGE HEIGHT MODEL BASED ON HIGHRESMIP EXPERIMENT Shun Ito, Kyoto University, Japan	STABILITY OF RUBBLE MOUND STRUCTURES UNDER OBLIQUE WAVE ATTACK Amir Etemad Shahidi, Griffith University, Australia	NUMERICAL SIMULATION OF GRAVEL NOURISHMENT TO THE SEISHO COASTLINE IN JAPAN Yuya Funahashi, Waseda University, Japan	RELATING WAVE GEOMETRY AND SURFACE DYNAMICS TO SUBSURFACE VELOCITIES Tyler McCormack, Northeastern University, United States	EVALUATION OF OVERTOPPING MODEL PERFORMANCE USING NOVEL EXPERIMENTAL DATA FROM INDUSTRIAL DESIGN PROJECTS Steven Downie, Arup, United Kingdom	CLASSIC APPROACH ON WAVE DISSIPATION BY SEAGRASS MEADOWS MAY OVERPREDICT COASTAL PROTECTION Nery Contti Neto, UWA/Nortek, Australia
1340 - 1400	FORECAST VERIFICATION OF AN ENSEMBLE TROPICAL CYCLONE STORM SURGE SYSTEM Huy Tran, The Bureau of Meteorology, Australia	APIA PORT BREAKWATER RECONSTRUCTION Kane Satterthwaite, Beca Ltd, New Zealand	MORPHOLOGICAL RESPONSE OF THE NEARSHORE SEABED DUE TO OFFSHORE PRECONDITIONING FEATURES Shaw Mead, eCoast Marine Consulting and Research, New Zealand	DAMPING OF FINITE AMPLITUDE SOLITARY WAVES IN A FLUME Yufei Wang, National University of Singapore, Singapore	TYPHOON JEBI-INDUCED FLOOD MODELING DUE TO WAVE OVERTOPPING/RUNUP AND REVERSE FLOW AT KANSAI AIRPORT Junbeom Jo, Kumamoto University, Japan	WAVE ATTENUATION OF SALTMARSH VEGETATION UNDER STORM CONDITIONS Genge Calders, Institut National De La Recherche Scientifique, Canada

1400 - 1420	CHARACTERISTICS ON CYCLONE AND STORM SURGE IN BEIRA CITY, MOZAMBIQUE **Daiki Tsujio, Pacific Consultants Co., Ltd., Japan**	THE INFLUENCE OF A CROWN WALL ON WAVE OVERTOPPING OVER BREAKWATERS **Mads Roge Elup, Aalborg University, Denmark**	APPLICATION OF A NUMERICAL MODEL AND BATHYMETRIC INVERSION ALGORITHMS TO ENHANCE UNDERSTANDING OF NEARSHORE CHANGE **Elora Oades, Queen's University, Canada**	COMPARISON OF FLOW DYNAMICS AND AIR ENTRAINMENT UNDER LABORATORY PLUNGING AND SPILLING BREAKING WAVES **Byoungjoon Na, Korea Institute of Ocean Science And Technology, South Korea**	ASSESMENT OF WAVE OVERTOPPING ON REEF-FRONTED SHORES **Alejano Moar, UQ, Australia**	MANGROVE AND ITS IMPACTS ON WATER WAVES: A MODEL-SCALE LABORATORY STUDY USING 3D REPLICAS OF TYPICAL RHIZOPHORA **Che-Wei Chang, Kyoto University, Japan**
1420 - 1440	ANALYTICAL STUDY ON EFFECTS OF TIDE ON STORM SURGE DEVIATIONS **Yoshihiko Ide, Kyushu University, Japan**	PROGRESSION OF MEAN DAMAGE ON A MOUND BREAKWATER IN ITS SERVICE LIFE **Miguel Santamaria, University of Granada, Spain**	FIELD OBSERVATIONS AND MODELING OF BEACH CUSP EVOLUTION IN THE PRESENCE OF AN ARTIFICIAL VEGETATION PATCH **Maqsood Mansur, Northeastern University, United States**	ORBITAL VELOCITIES DUE TO BICHROMATIC-BIDIRECTIONAL WAVES **Claudio Neves, Federal University of Rio De Janeiro, Brazil**	PHYSICAL MODELLING OF SOLITARY WAVE OVERTOPPING IN THE PRESENCE OF A COASTAL DUNE **Dhavalkumar Patel, The University of Queensland, Australia**	INVESTIGATION OF SPECTRAL ENERGY DISTRIBUTION IN WAVE GROUPS DUE TO PRESENCE OF VEGETATION **N Hari Ram, Indian Institute of Technology Madras, India**
1440 - 1500	WAVES AND STORM SURGES OF TROPICAL CYCLONES OVER THE ARABIAN SEA: FUTURE PROJECTIONS AND UNCERTAINTY ANALYSIS **Zahra Ranji, Kntoosi University of Technology, Iran**	DESIGN AND VERIFICATION OF A FRICTION COEFFICIENT OF CAISSON FOUNDATION **James Wong, Maritime and Port Authority of Singapore** **Yadong Zhang, Surbana Jurong Consultants Pte Ltd, Singapore**	TOPOGRAPHIC OBSERVATION OF THE TIDAL FLAT AT THE MOUTH OF THE SHIRAKAWA RIVER DURING THE PASSAGE OF TYPHOON NO.9 AND NO.10 USING OPTICAL FIBERS **Takashi Yamano, Toyo Construction Co, Japan**	WAVE TRANSFORMATION OVER PALM BEACH REEF **Ralph Daniels, Queensland Goverment Hydraulics Laboratory, Australia**	ADVANCES IN COASTAL FLOODING AND OVERTOPPING INVESTIGATIONS USING A 3D PHASE-RESOLVING WAVE MODEL **Stephan Kistner, PRDW, South Africa**	
1500 - 1530	**Afternoon Tea**					
1530 - 1730	**Technical Sessions**					
Session	**Session 73** **Estuary Morphodynamics**	**Session 74** **Seawalls, Levees and Revetments**	**Session 75** **Extreme Waves**	**Session 76** **Morphological Change - Observations and Modelling**	**Session 77** **Wave Modelling 2**	**Session 78** **Vegetation and Coastal Protection**
Room	**Room C2.1**	**Room C2.2**	**Room C2.3**	**Room C2.4**	**Room C2.5**	**Pyrmont Theare**
Chair	**Giorgio Bellotti**	**Ed Couriel**	**Nobuhito Mori**	**Mireille Escudero**	**Giovanni Besio**	**Daniel Cox**
1530 - 1550	MORPHODYNAMICS AT THE MOUTH OF A BAR-BUILT ESTUARY: CARMEL RIVER, CA, USA **Mara Orescanin, Naval Postgraduate School, United States**	EXPERIMENTAL INVESTIGATION OF DENSITY EFFECT ON TSUNAMI BORE FORCES ON VERTICAL WALLS **Taro Arikawa, Chuo University, Japan**	SIMULATION OF CONTAINER DRIFT UNDER EXTREME HYODYNAMIC CONDITIONS **Ryota Nakamura, Niigata University, Japan**	MORPHOLOGICAL CHANGES TO THE PORTSEA (VICTORIA) COASTLINE FOLLOWING SHIPPING CHANNEL DEEPENING **Andrew McCowan, Water Technology Pty Ltd, Australia**	IMPROVING ANALYTICAL WAVE DAMPING MODELS FOR WOODY VEGETATION **Su Kalloe, TU Delft, Netherlands**	NUMERICAL SIMULATION OF WAVE-INDUCED VEGETATION DYNAMICS USING A PARTITIONED COUPLING BETWEEN THE SPH METHOD AND AN FEA STRUCTURAL SOLVER **Joe El Rahi, Ghent University, Belgium**
1550 - 1610	ESTUARINE-WIDE SEDIMENT DYNAMICS UNDER HUMAN INTERVENTIONS AND CLIMATE CHANGE EFFECTS: AN IDEALISED MODEL STUDY **Rutger Siemes, University of Twente, Netherlands**	MONITORING OF A DYNAMIC REVETMENT DURING A SPRING TIDAL CYCLE IN NORTH COVE, WASHINGTON STATE, USA **George Kaminsky, Washington State Department of Ecology, United States**	FUTURE CHANGES IN EXTREME WAVES AND THEIR SEASONALITY IN THE MEDITERRANEAN SEA **Anea Lira Loarca, University of Genoa, Italy**	OBSERVATIONS AND MODELING OF EROSION AND RECOVERY OF A COUPLED BEACH-DUNE SYSTEM **Joseph Long, University of North Carolina Wilmington, United States**	SHYTCWAVES: A STOP-MOTION HYBRID TC-INDUCED WAVES METAMODEL **Sara O. Van Vloten, University of Cantabria, Spain**	NEW INSIGHTS ON USING SCALED MARSH PLANT SURROGATES FOR WAVE ATTENUATION **Acacia Markov, University of Ottawa, Canada**
1610 - 1630	NUMERICAL MODELING OF BAR-BUILT ESTUARIES AND IMPLICATIONS FOR THE MANAGEMENT OF INTERMITTENT INLETS **Liliana Velasquez, US Naval Academy, United States**	QUANTIFYING RISKS FOR COASTAL LEVEE DESIGNS ALONG THE U.S. GULF COAST **Alexander Nelson, U.S. Army Corps of Engineers, United States**	EXTREME WAVE CLIMATE OF THE NEW SOUTH WALES COAST **Sean Garber, Baird, Australia**	APPLICATION OF CROSS-SHORE MORPHOLOGICAL MODELS FOR PERCHED BEACHES **Merel Kroeders, DEME Group, Belgium**	PYCNOCLINE THICKNESS EFFECT ON INTERNAL WAVE BREAKING OVER A UNIFORM SLOPE **Keisuke Nakayama, Kobe University, Japan**	DIRECTIONALITY OF THREE-POINT BENDING TESTS WITH SALT MARSH SPECIES SPARTINA ANGLICA IN DORMANCY **Kara Keimer, Technische Universität Braunschweig, Germany**
1630 - 1650	STORM MORPHODYNAMICS AND DECADAL EVOLUTION OF BEACHES IN MODIFIED ESTUARIES AND BAYS **Ana Vila-Concejo, The University of Sydney, Australia**	DESIGN SCOUR LEVELS FOR DUNE REVETMENTS AND SEAWALLS **Alexander Nielsen, Advisian Pty Ltd, Australia**	ON THE PROBABILITY OF UNIDIRECTIONAL NONLINEAR EXTREME WAVES IN THE PRESENCE OF WAVE REFLECTION **Yuchen He, The University of Sydney, Australia**	DECADAL EVOLUTION OF CORAL ISLANDS IN A CHANGING OCEAN AND CLIMATE **Thomas Fellowes, The University of Sydney, Australia**	APPLICABLE RANGE OF PERIODICAL WAVE THEORIES UPDATING LE MEHAUTE'S CHART **Kuifeng Zhao, Surbana Jurong Consultants Pte Ltd, Singapore**	WAVE TRANSMISSION AND DISSIPATION BY HYBRID (VEGETATED WITH MANGROVE) BREAKWATERS **José Partida-ramírez, Universidad Nacional Autónoma De México, Mexico**
1650 - 1710	MORPHODYNAMICS OF TWO RIVERINE ESTUARIES IN NSW **Madelaine Broadfoot, University of Newcastle, Australia**	ASSESSMENT OF THE FAILURE PROBABILITY OF UPGRADED RUBBLE-MOUND BREAKWATERS **Enrico Foti, University of Catania, Italy**	EXTREME WAVES IN SHALLOW WATER AND EDGED CHANNELS FOR DIRECTIONAL SEAS **David Taylor, Baird, Australia**	THE EFFICACY OF ANCHORED LARGE WOODY DEBRIS ON BEACH MORPHOLOGY: A PHYSICAL MODEL STUDY **Jessica Wilson, DHI Group, Canada**	MULTI-LINEAR-ELEMENT DEPTH-INTEGRATED MODELS FOR FLOWS WITH A FREE SURFACE **Zhengtong Yang, Tcoms, Singapore**	GRASS SOD PULLING TESTS TO DETERMINE RESISTANCE AGAINST EROSION BY WAVE OVERTOPPING **Gosse Jan Steendam, Infram Hyen, Netherlands**
1710 - 1730	ADVANCING SEDIMENT SOLUTIONS IN THE SEVEN MILE ISLAND INNOVATION LAB **Monica Chasten, US Army Corps of Engineers, United States**	EFFECT OF GRAVEL PARTICLE SIZE ON THE RESHAPING OF DYNAMIC REVETMENTS **Dario Sirianni, University of Ottawa, Canada**	THE OCCURRENCE OF EXTREME WAVE HEIGHT IN A TWO-DIMENSIONAL RANDOM WAVEFIELD IN COASTAL AREA **Zuorui Lyu, The University of Tokyo, Japan**	HOW MUCH LONGER CAN AN OLD SEAWALL LAST? DESIGN, CONSTRUCTION AND MAINTENANCE LESSONS TAUGHT BY NORTH CRONULLA/PRINCE STREET SEAWALL **Adrian Turnbull**		
1900 - 2300	**Conference Gala Dinner** Grand Ballroom, Level 6, International Convention Centre Sydney					

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