Q&A Advancing Coastal Resilience

Qu #	Question	Answer(s)
1	If it doesn't get covered during the presentations: where's the best place to start for a surface/stormwater TUFLOW modeller wanting to get in to coastal modelling (background in coastal geomorphology)	live answered
2	surprised not to see SPH as one of the coastal modelling platform which seems quite promising. What is your point of view on this modelling method for wave overtopping?	Typically we undertake probabilistic assessments of overtopping for design work so there is a computational limitation when needing to run 10000+ events. Hence SPH and CFD models are not widely used in industry for wave overtopping yet.
3	What are common projects that use SWAN?	
4	XBEACH What projects might use this?	A few project examples we've used it in are Coastal Processes Assessment, Deriving wave design conditions for coastal structures
5	Have any studies been conducted to assess the reduction in wave heights due to natural ecosystems?	Yes, there are numerous out there looking at the impact of ecosystems such as mangroves, sea grass, oyster beds, etc. Most of the work has been based on flumes in the lab or numerical models (i.e. XBeach).
		Hi Alexandra.I appreciate your reply.It would be great to know the benefits due to natural ecosystems.
		A good report is the World Bank WAVES report. It includes a range of publications on the effect of vegetation. From memory, 30m of mangroves can reduce wave heights by 30%. So mangrove forests need to be wide.
		Thank you very much Daniel for sharing the reference publications.
6	I remember seeing mention of coastal applications for HECRAS - where does HECRAS fit in the suite of coastal models?	HEC-RAS can be used for tidal inundation modelling.
7	Can you elaborate the solution for North Wales? What is a standard seawall protection?	The North Wales design is a double layer of rock armour, with a rear concrete wall.
8	Are there any guidelines on how,where and when to best employ nature-based solutions for coastal resilience?	These guidelines are a good starting point in Australia I find https://nespclimate.com.au/wp-content/uploads/2021/05/Nature-Based-Methods_Final_05052021.pdf
		Emma, thanks so much for sharing the link for the guidelines.
9	Is vegetation roughness included in your modelling, and if so, does it help mitgate onshore damage?	Yes roughness is considered when modelling vegetation. The amount of wave dissipation varies depending on water level and vegetation type - but yes it does help.
10	There is a model where extent of inundation is determined using the elevation of coastal area ad height of tidal wave or ht of the storm surge. What is your opinion about this approach? Thanks!	There is a model where extent of inundation is determined using the elevation of coastal area ad height of tidal wave or ht of the storm surge. What is your opinion about this approach? Thanks!
		Yes either TUFLOW or HEC-RAS is typically used for this.
11	Are the Neural Network data readily available and free for use?	https://www.deltares.nl/en/software-and-data/products/overtopping-neural-network
		Another good free tool is from HR Wallingford: https://www.overtopping.co.uk/
12	What are key challenges that you have experienced in coastal modelling?	Model run times! Computers get faster, so we then make our models more detailed. We always need to balance level of compexity with runtimes (ideally 8 hours so they run overnight).
13	How do you factor in blockages or dampening effects from Mangroves in your models?	Meaning, how do you model them?
14	Can HEC RAS be used to simulate rain + storm surge + stormwater system which can no longer drain water in sea because of high water level in the sea?	Can HEC RAS be used to simulate rain + storm surge + stormwater system which can no longer drain water in sea because of high water level in the sea?
15	How do you get into Coastal Engineering at an Entry Level?	
16	How do you model boat wakes?	
17	Is there biodegradable geo fab?	jute matting

18	How do artificial reefs rate to protect beaches from erosion?	
19	How long does mangrove take to grow to a size that is effectove at attenuation of wave energy?	You can find lots of good research from the Cambridge university research docs (https://www.jbs.cam.ac.uk/2022/using-mangrove-forests-to-fight-climate-change/). They have been doing lots of testing, and according to their research you need at least 10-year-old mangroves to be really effective. If they are not ready a big storm can destroy them.
20	IS any of the sediment transport models capable of modelling Sand_bypassing system such as the one at the Gold Coast Seaway?	Hi Mahnaz, UNIBEST and LITPACK are good longshore sediment transport models that are used for projects such as the Gold Coast Seaways. They are 2 models I did not touch on - and need to get added to this Coastal 101 session.
		Sorry to ask again Daniel, I know some of them can model longshore sediment transport, my question is does any one has the capability of defining sink and source for sand like sandbypassing system?
		Yes, both can introduce sources and sinks
21	Hi Da, what kind of computer resources do you apply for your coastal modeling for consulting projects?	
22	How can predictions in beach erosion help in preparing beach management or coastal zone management plans?	Hi Wesley, understanding the extent of beach erosion helps establish building setback lines so people dont move too close to the coastline.
		Hi Daniel .Due to climate change, is it really possible to predict high tide lines to predict the and fix the buffer zones for coastal land-use planning?
23	How expensive are those ecologically enhanced rocks vs normal rock?	The construction industry is challenging right now, but as a rule of thumb: A rock armour revetment can cost between $6000 to $10000/m, and a rock fillet design will be around half this amount.
24	Whats the turn around time for a physical model?	Depends on the complexity of the model, usually 1-2 months to get the first results
25	'@ Ben, can you please quickly expand on the floating mangroves?	
26	can we visit the labs in Australia?	
27	For delta area, what is the best model to use?	
28	Typically, in most of the numerical modelling, we have only longitudinal parameters and very limited inclusion of vertical parameters. What does physical modelling suggest us about vertical parameters to include in our numerical modelling? From my PhD conclusion, vertical force is almost equally important as a drag in coastal regions.	
29	Pls how long do you think a modeling will be considered a long term?	
30	how to calculate roughness of mangrove?	
31	Have you done physical or numerical models of vessel wakes?	Yes, we can use CFD for boat wakes. However we often need to capture physical data to understand wakes from complex hull shapes.
32	Thanks so much everyone involved for a fascinating and informative session	
33	Do you model coastal groundwater contamination from sea level rise, and loss of potable water sources?	