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Breakout Room Discussion Session
Coastal & Compound Flooding (Day 1)

Facilitator: Mark Merrifield

Notetaker: Bingchen Liu

Group: Black

Location: Eckart 137

Morning Session: Coastal Flooding Discussion

What are the main factors that limit projections of coastal flooding in a changing climate?

- Include morphology
    - Lack of understanding of morphodynamics impact in flooding, especially in bay system
    - Considering Bathymetry change's impact on wave, how to incorporate bathy/morphology that into the models
- Code and modeling
    - Global forecast system, WW3 feed SWAN → BC, GFS bias in large wave events (tends to bias low). (e.g. off by factor of 2)
        - It's poorly calibrated. Need dedicated tuning.
    - Code: it goes unstable for unknown reason, probably due to the curvature of the bathy of the boundary. Solution: apply smoothing
    - TESELA: it's data driven at its core. Going to the future, could be conditions that we haven't seen. Random effects that come up and we haven't seen.
- Larger scale impact, crude, poorly capture impacts in urban areas.
- Data
    - Pacific islands: some places are data poor.
    - Need for data. Used to be a valid model. Data needs higher temporal resolution. (e.g. Sensitivity analysis for bathymetry, how does model and climate projection react to that)
    - Observation is lacking. Need good observations in mixed sediment beaches.
- Including effects coral reef in our analysis
    - How fast can coral grow? Can they keep up with sea level rise
- Include community values into the assessment.

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What are the highest research priorities for improving coastal flooding projections?

How to implement friction, dissipation, whether make is spatial vary or not.

What physics are we missing?

Surface and subsurface flow along with changing morphology and change in sediment.   Ground water plays into runup. They are coupled with beach faces.

Need a better handle on sediment supply and how that changes. Where sediments go. Need better sediment flux data. (E.g. West coast: supply from land. It has a shorter timescale.)

Over the next 5 years, what advances or resources would help to reduce uncertainties for coastal flooding projections?

- Observation
    - Better characterizing temporal and spatial variability.
    - Spatial variability in the nearshore doesn't represent well. (e.g. moving/erosion sandbar).

    - Getting data in long swell longer time period environments would be helpful.

- Community
    - Have a respiratory/ share codes. (e.g. bluemath)
    - Stronger community of practice: better communication, aware of what each other is doing.
    - Need consistent observation
- Long term erosion/change in morphology in the coastline.

Afternoon Session: Compound Flooding Discussion

What are the main factors that limit projections of coastal compound flooding in a changing climate?

What are the highest research priorities for improving compound flood projections?

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Over the next 5 years, what advances or resources would help to reduce uncertainties for compound flooding projections?