umerc + METS

Lessons Learned in Developing a Lightweight Wave Powered Desalination System

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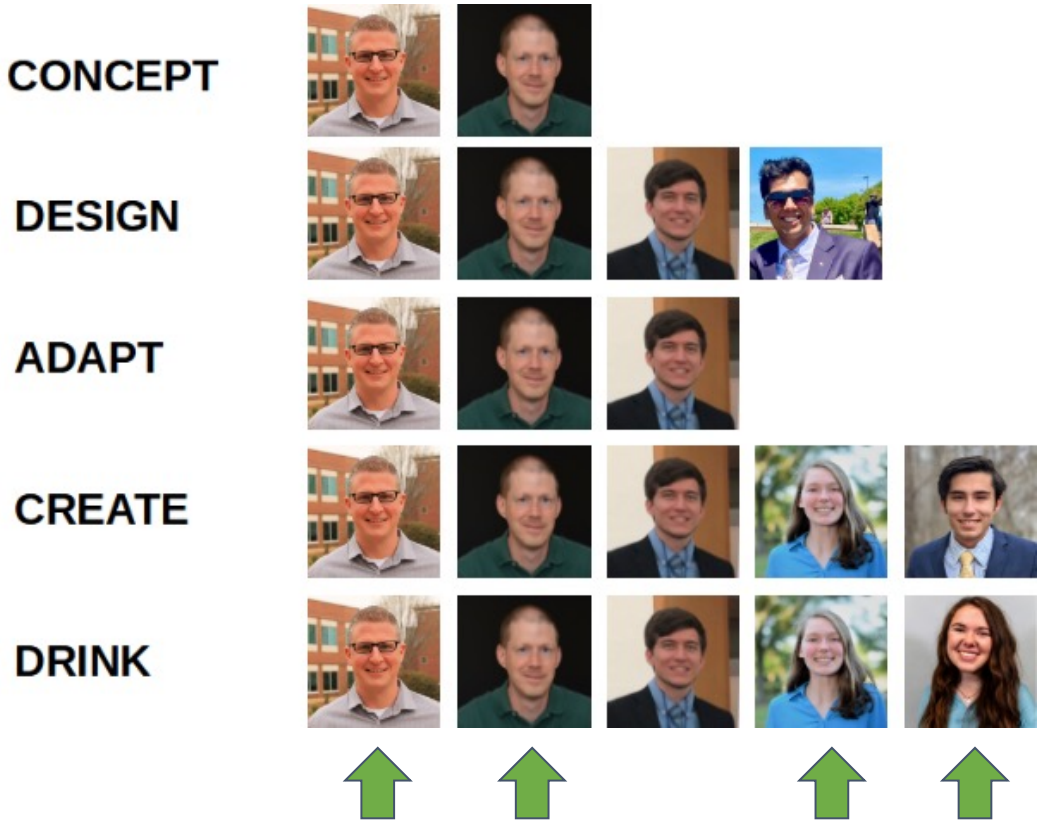
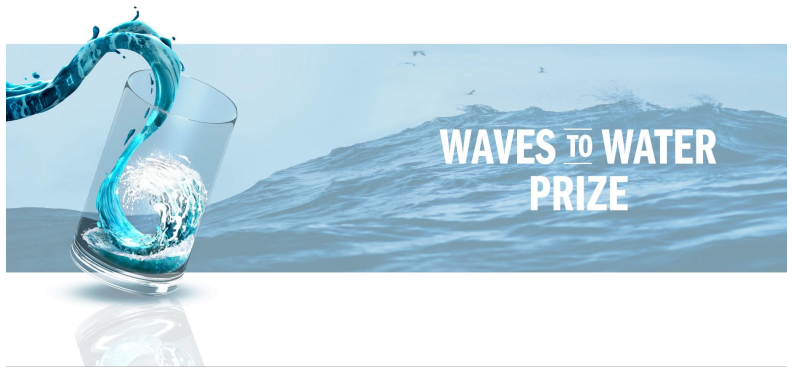
Water Bros Desal was one of the teams competing in the Waves to Water Prize.



WATER BROS DESALINATION

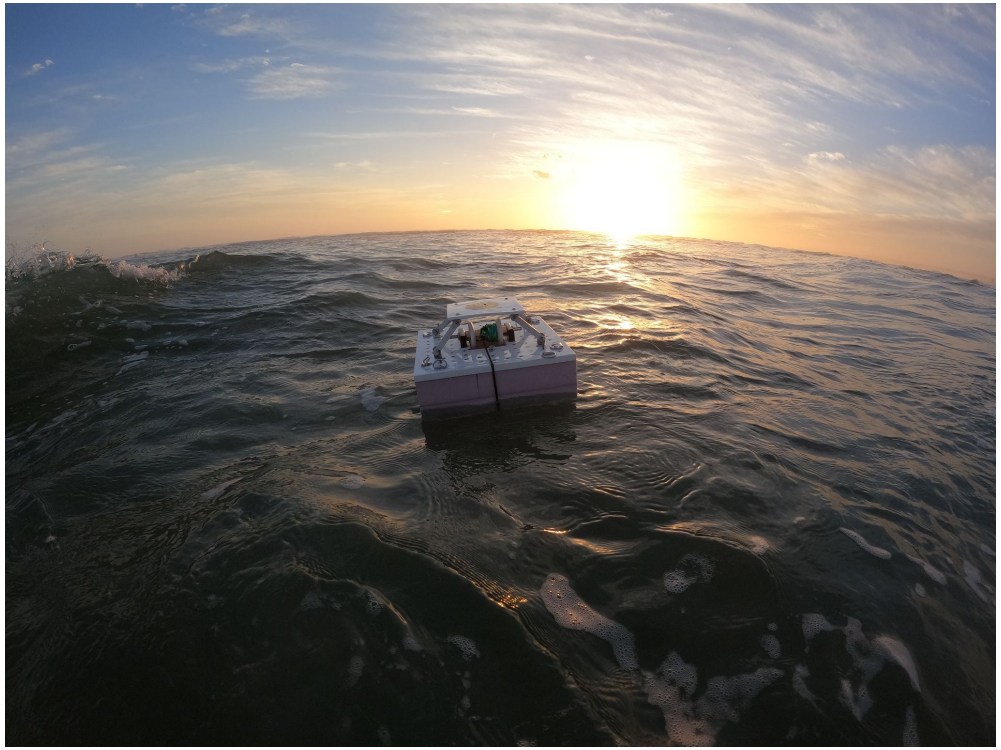


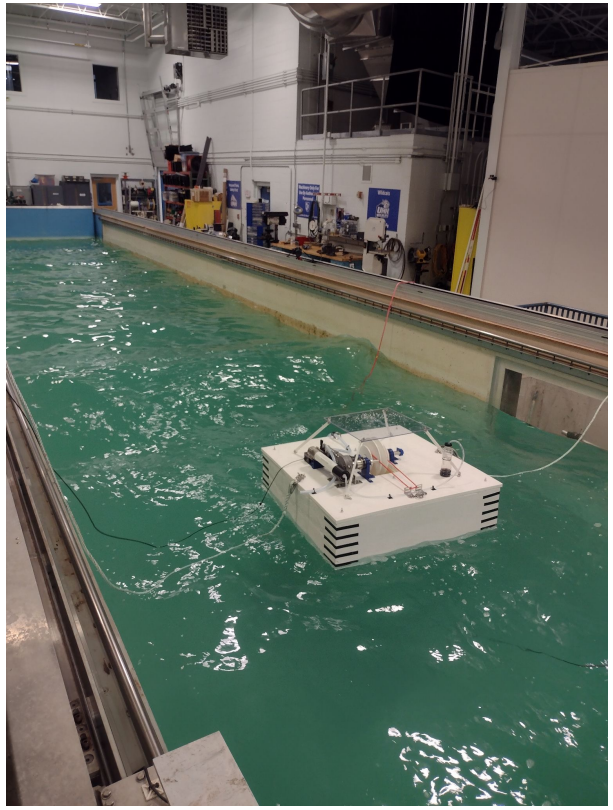
Lessons learned to us means recognizing what you did well, and what could have been improved.

<u>Things we did well</u>

- Prototyping
- Early and often test article deployment
- Building off existing tools and

Don’t wait to get a prototype in the water.



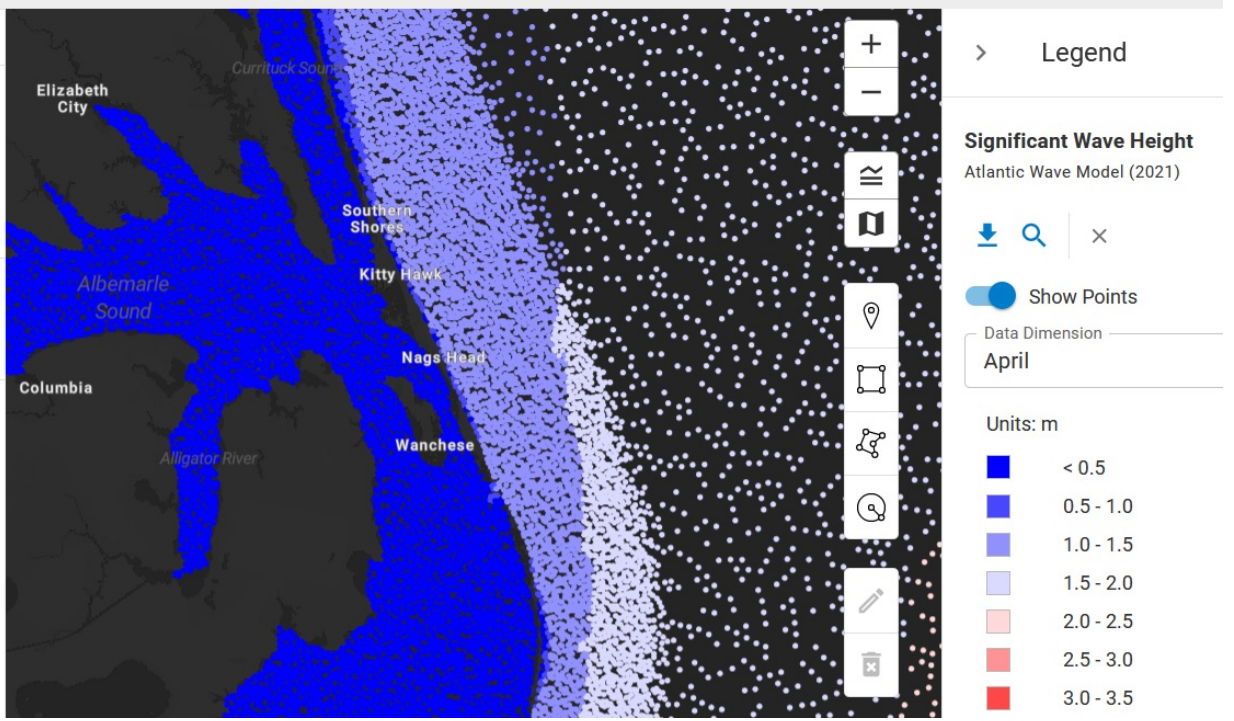


Take advantage of the resources and tools that are already available.

WEC-Sim
Wave Energy Converter
SIMulator

https://wec-sim.github.io/WEC-Sim

TEAMER
Testing & Expertise for Marine Energy



https://maps.nrel.gov/marine-energy-atlas/

Published technical specifications give insights into scenarios/loading you might not consider.

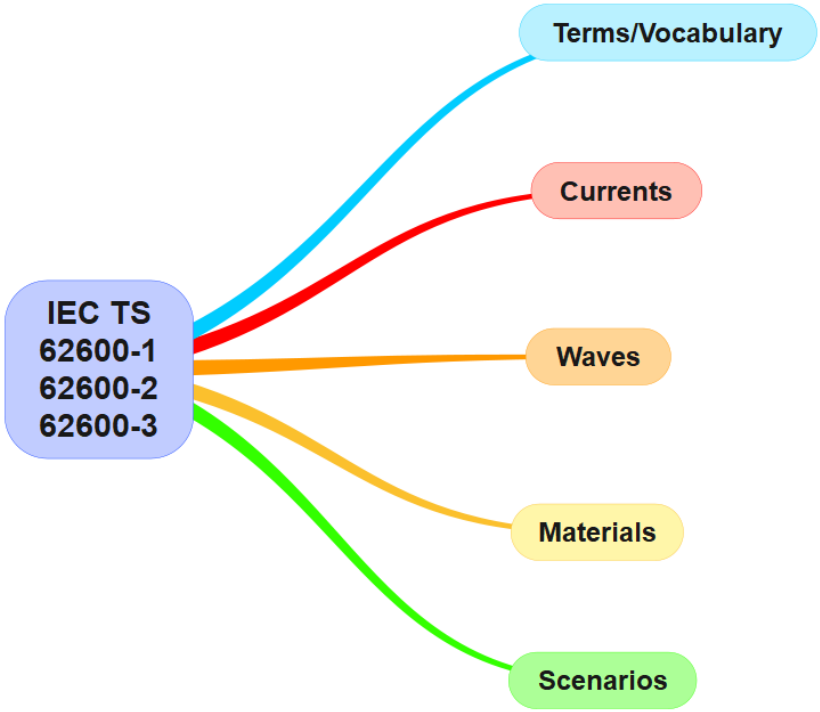

IEC TS 62600-300

Edition 1.0 2019-09

TECHNICAL SPECIFICATION

colour inside

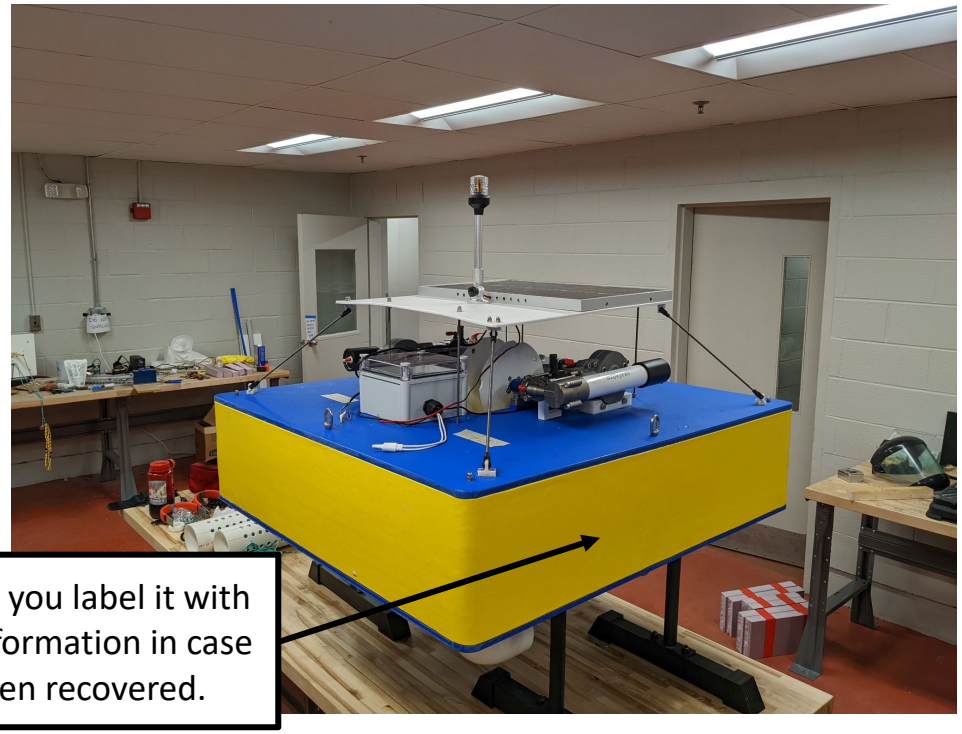
Marine energy – Wave, tidal and other water current converters –
Part 300: Electricity producing river energy converters – Power performance assessment



Areas where we could improve:

- Making the device easier to understand
- Respect that extreme events can happen
- Be mindful of high-performance ropes
- Don't skimp on the electronics and sensors

The odds are you will not be deploying your device personally, so make it easily understood.



Make sure you label it with contact information in case it is lost then recovered.

(photo credit: UNC Coastal Studies Institute)

Pay heed to those extreme conditions. We had a component that wasn't perfect but, would only fail under extreme loading…..

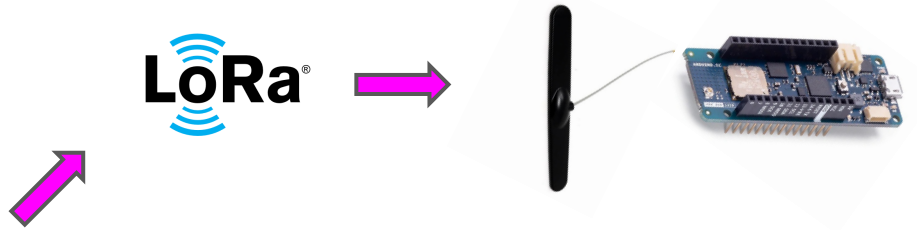
High performance rope comes with advantages, but don't forget the limitations

- Typical knots don't hold well with slippery ropes
- Splices are a better choice when possible
- Sand in the rope may cause early failure due to abrasion

https://youtu.be/P7gI4YF0D2Y?t=22

(photo credit: UNC Coastal Studies Institute)

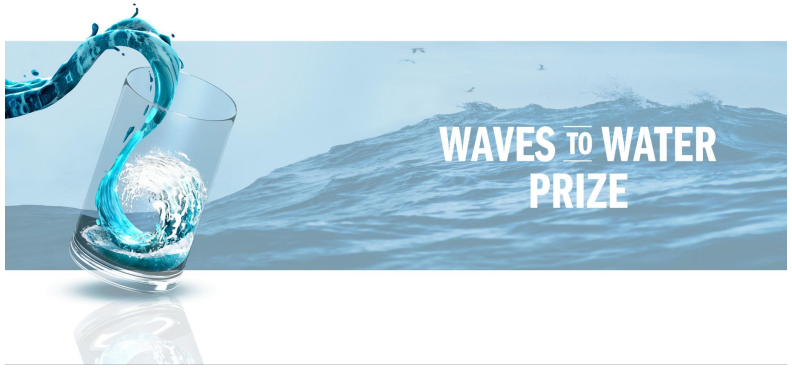
Don’t skimp on the instrumentation and communication. When your device is out there all alone in the water, you’ll want to know what is going on.



Data Collected:
Hall sensor 1 and 2
Acc. X, Y, Z, gyro. X, Y, Z
TDS 1 and 2, temp.

Date Transmitted:
Alarm status, stat. data from all sensors, simplified waveforms

Acknowledgements



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Questions?