WP3: Sea state forecasting and resource evaluation

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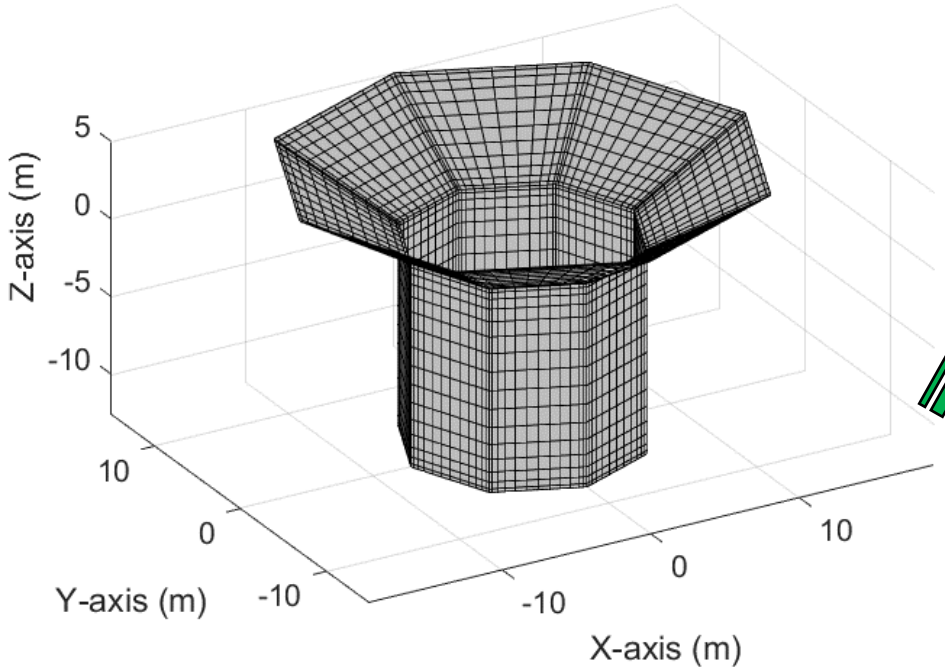
WP3 Remit

WP3 “Environmental Constraints and Efficiency of WEC”



Sheng et al., 2022

- Resource
- Performance
- Deployment

Overview

WP3 “Environmental Constraints and Efficiency of WEC”

- Resource characterization

  Beyond sea state, $H_{⅓}$ (building on SmartWave)

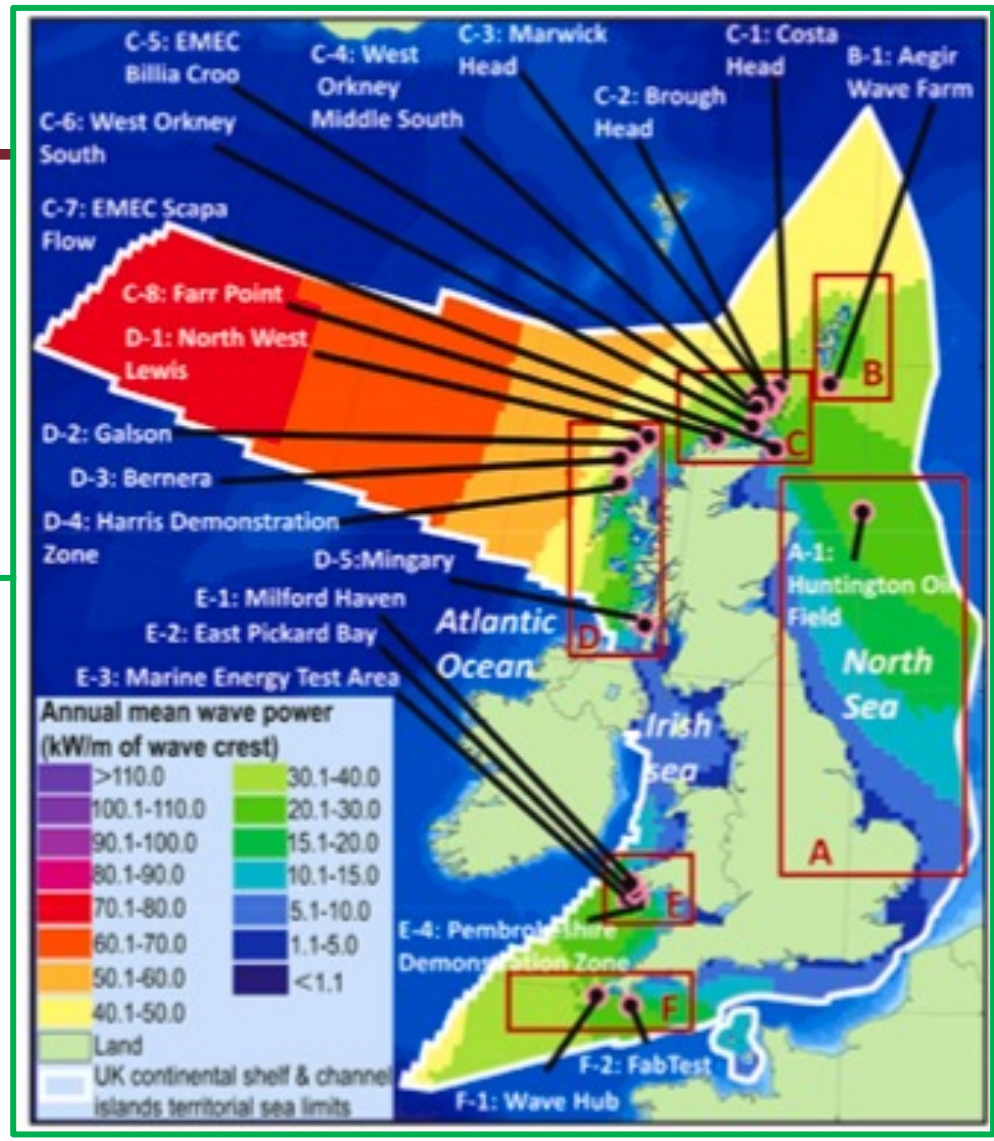
  - Wave frequency, *f, observed* mean wave power

  - Wavelength, λ
  - Wave direction, θ
  - Wave shape [and aspect ratio, λ/H]

    (transitional water depths, d $\lesssim \lambda/2$)

  - Variation: Daily – Seasonal, σ

  ➢ Implications for TALOS WEC efficiency (WP1)



Jin & Greaves, 2021

Overview

WP3 “Environmental Constraints and Efficiency of WEC”

- Resource characterization

  Beyond sea state, $H_{1/3}$ (building on SmartWave)

- [Remotely] assess WEC efficiency from sea state

  Lab scale experiments

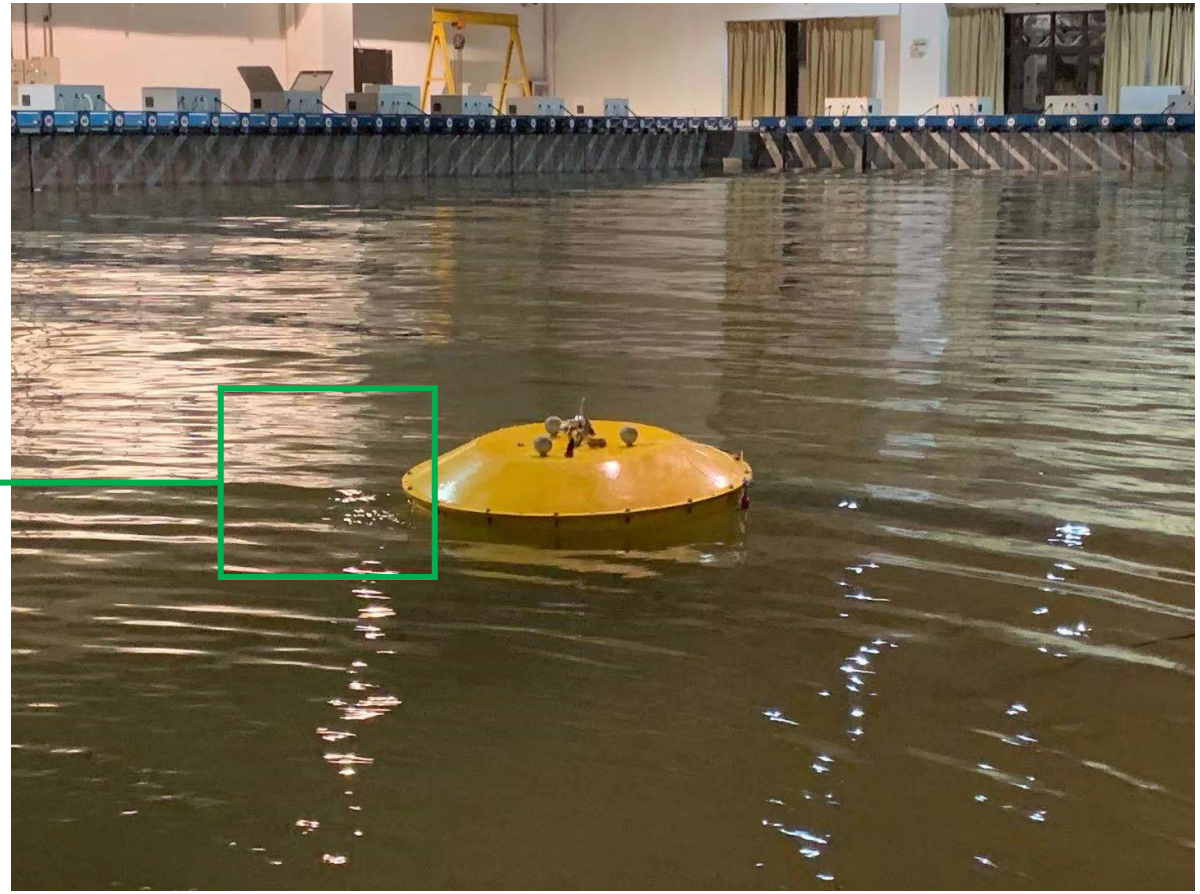
  - Quantify wave shadow
  - Assess efficiency & energy budget

  Generation = Wave energy

  x efficiency dissipation

  [+sinks/sources]

  ➢ Implications for TALOS PTO (WP2)



Professor Dahai Zhang, Tan Ming

Overview

WP3 “Environmental Constraints and Efficiency of WEC”

- Resource characterization

  Beyond sea state, $H_{1/3}$ (building on SmartWave)

- [Remotely] assess WEC efficiency

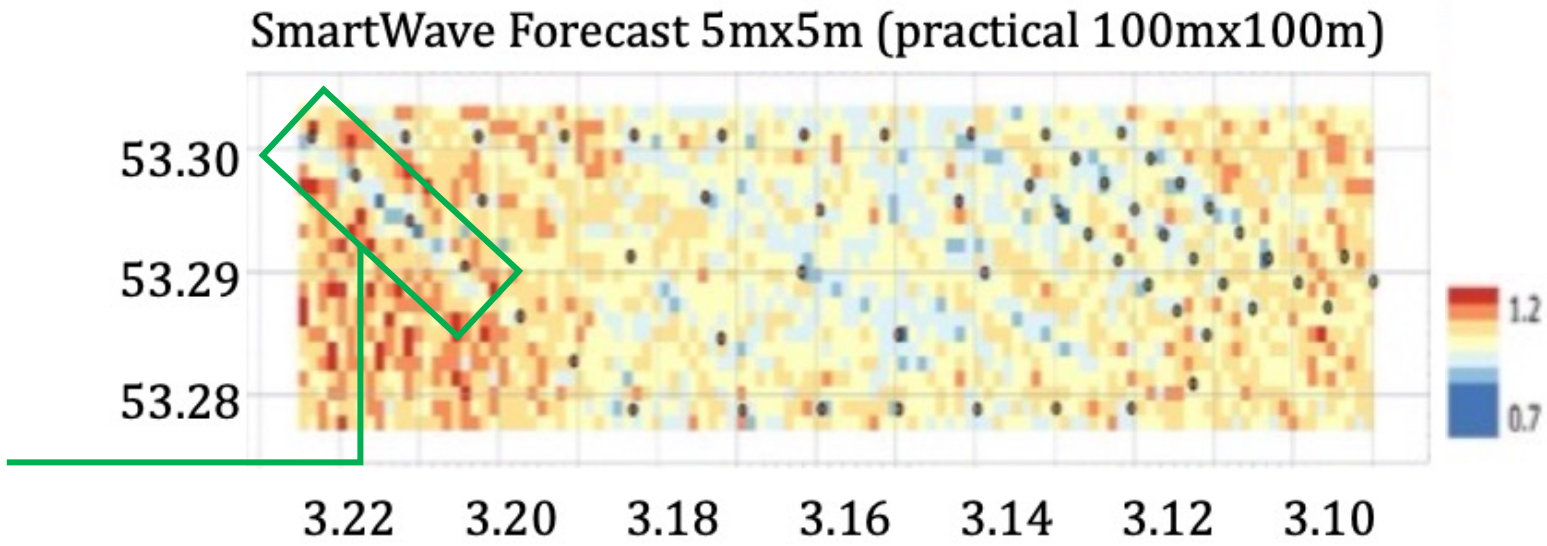
  Lab scale experiments

- Optimize WEC array output

  Assess Wave Shadow Interaction

  - Lab scale experiments
  - Existing ORE case studies

  ➢ Implications for LCoE(WP4)



Tapoglou et al., 2020

Updates

02/22 Researcher Co-I Dr Evdokia Tapoglou leaves
to join EU Commission Joint Research Center

02/22 Research Fellow Dr Igor Rizaev appointed
to deliver WP3

04/22 Delivery [delayed] of WP3 starts
2-month no-cost extension from Funder (UKRI EPSRC)

Tasks / Quarter	1	2	3	4	5	6	7	8	9	10	11	12	
WP3: Sea state forecasting and resource evaluation													
3.1 Resource characterisation													
3.2 WEC efficiency calculations in wave tanks													
3.3 Array effects													
WP4: Validation and Cost of Energy													
4.3 Levelised Cost of Energy													