

**TAKING IT TO THE NEXT DIMENSION:
RECENT EXAMPLES WHERE 3D MAKES
ALL THE DIFFERENCE.**

DHI UK & Ireland Symposium 2023

Jack Shipton

13th June 2023



AGENDA

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Introduction

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Study Sites

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Field Data

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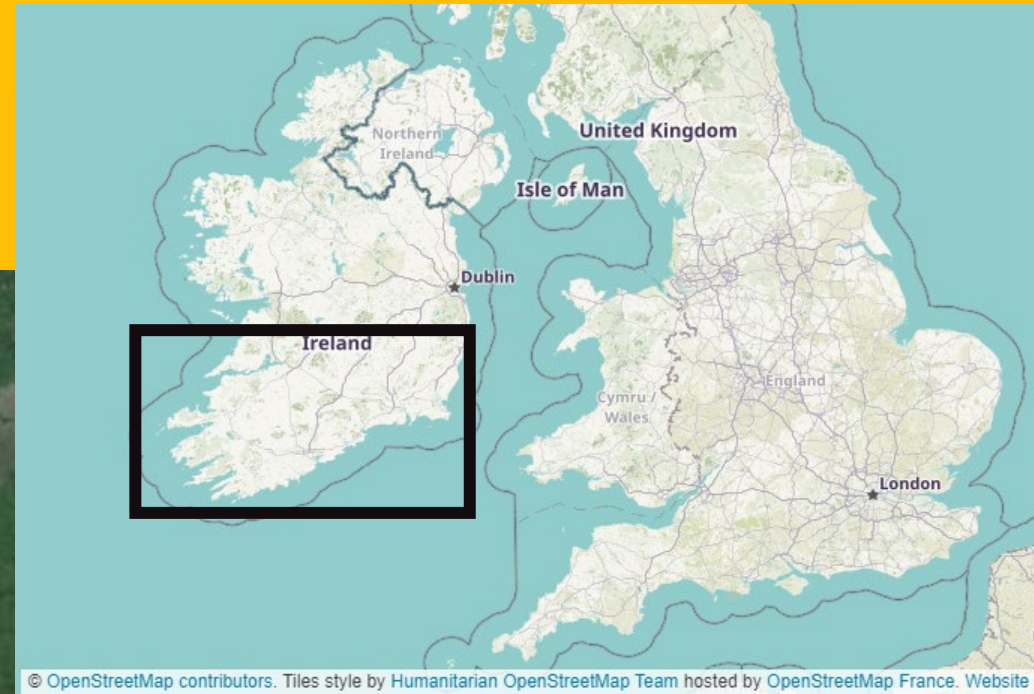
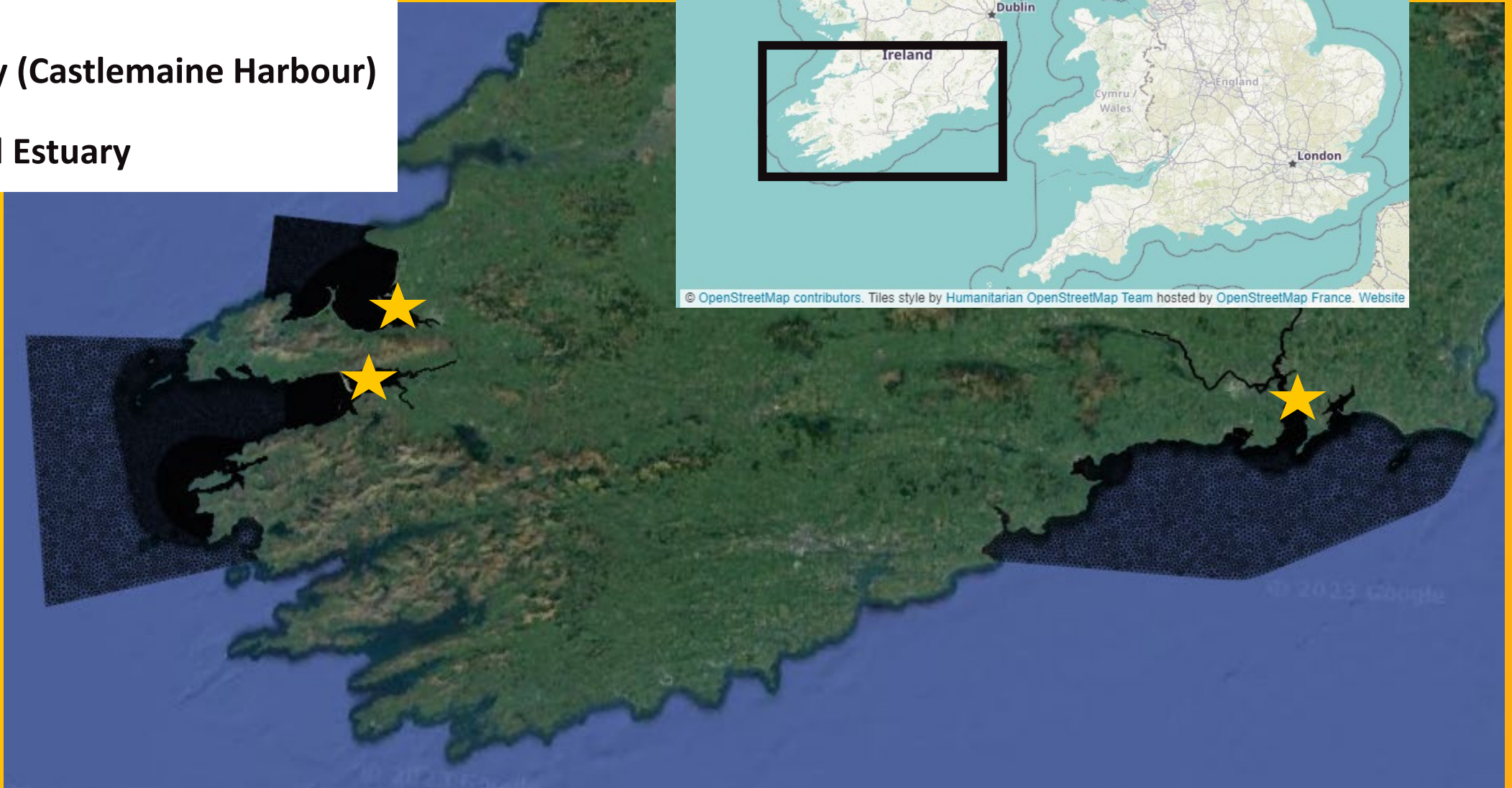
Concluding Remarks

you'll be
amazed
where
you find
intertek

Total Quality. Assured.

STUDY AREAS

- Tralee Bay
- Dingle Bay (Castlemaine Harbour)
- Waterford Estuary



PROJECT INTRODUCTION

Client: Nicholas O'Dwyer, on behalf of Uisce Éireann

Project Scope: Modelling WQ impacts from UE assets, with respect to local protected shellfisheries.

Part of the National WwTP Disinfection Programme

Field Surveys:

Waterford: August 2019

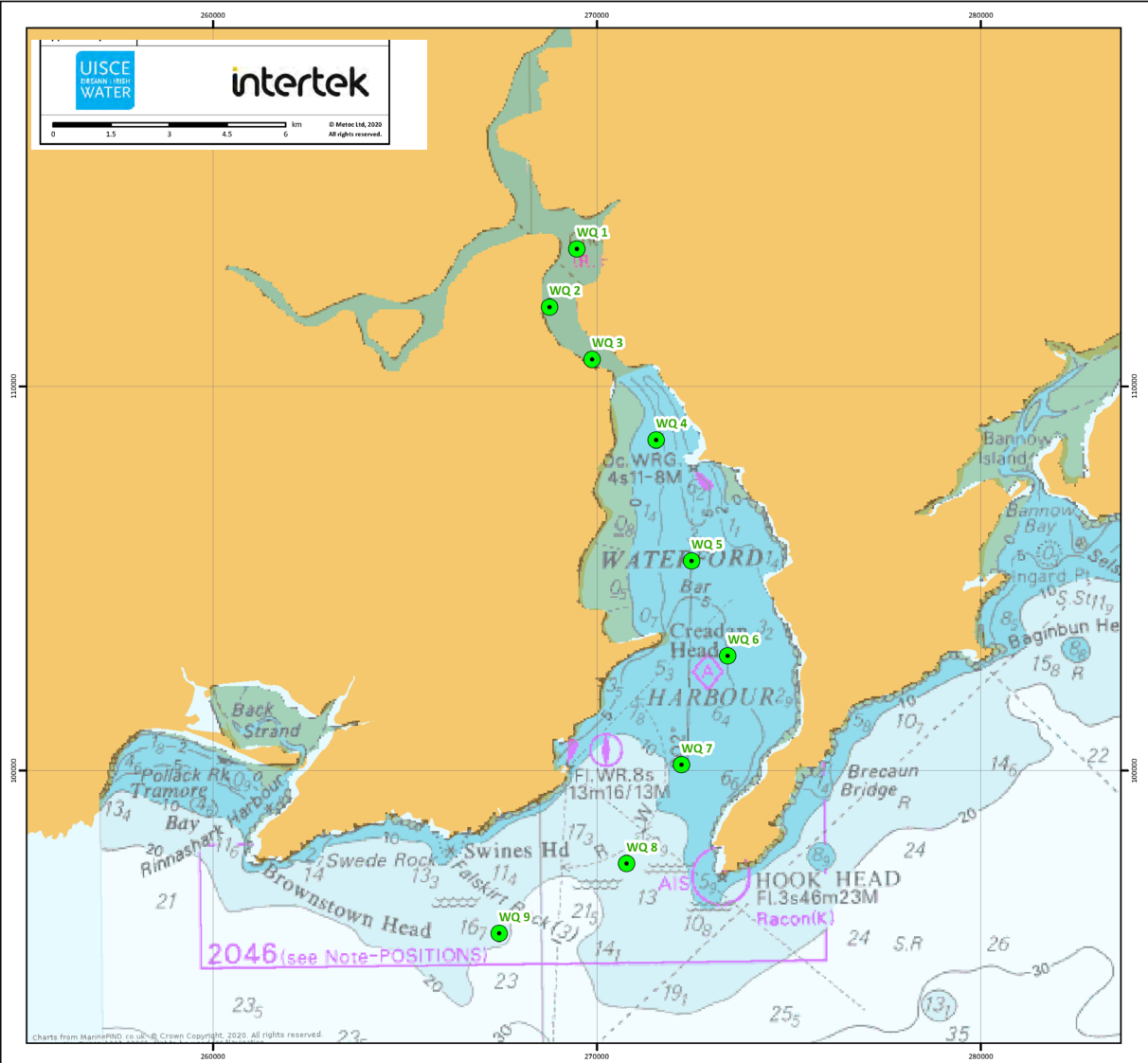
Tralee & Dingle Bay: April / May 2022

Project Approach:

- UE TSM (Modelling guidance & procedures)
- Pollutant modelling using transport module
- Survey campaign to support model calibration
- Calibration of dispersion via temperature & salinity
- Freshwater inputs modelled as time series or percentile flows, depending on scenario

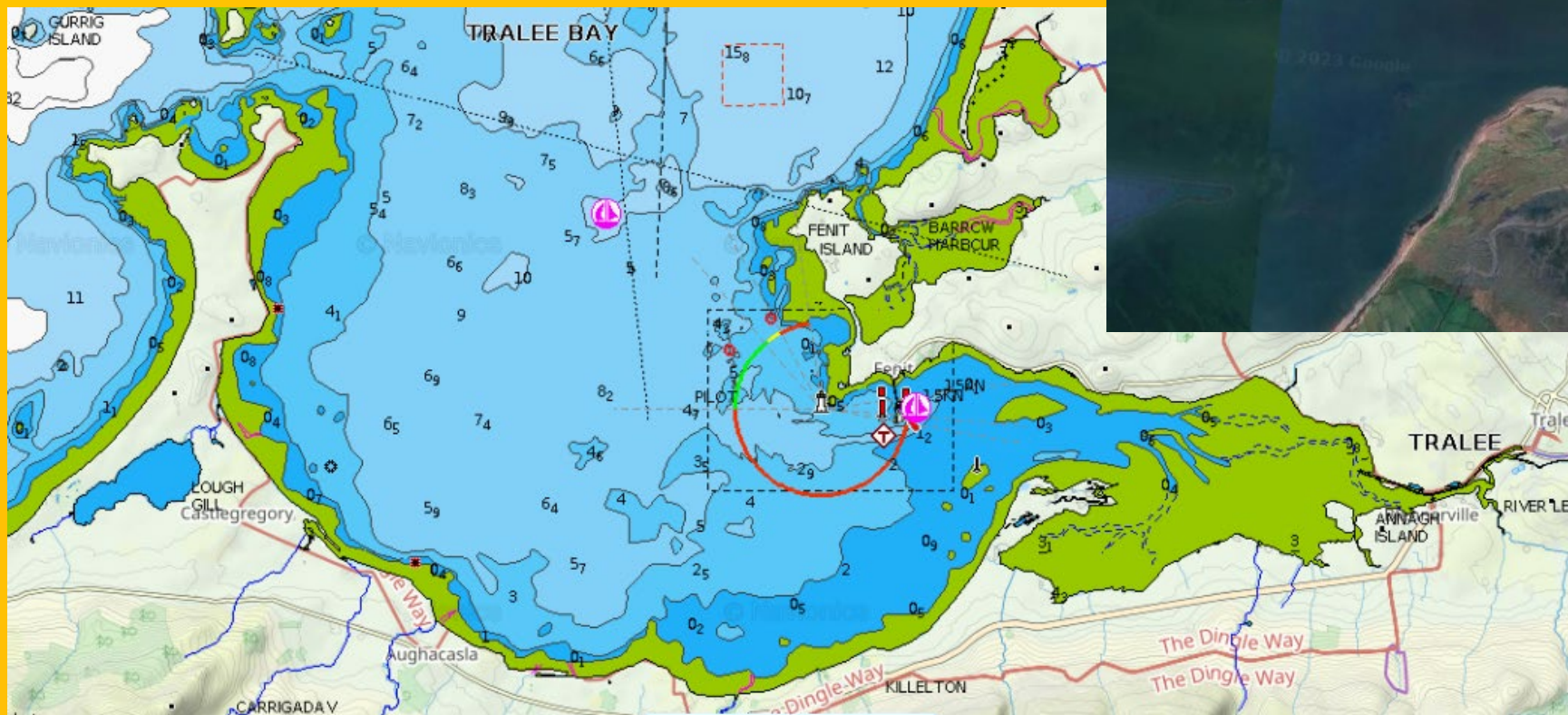


WATERFORD ESTUARY

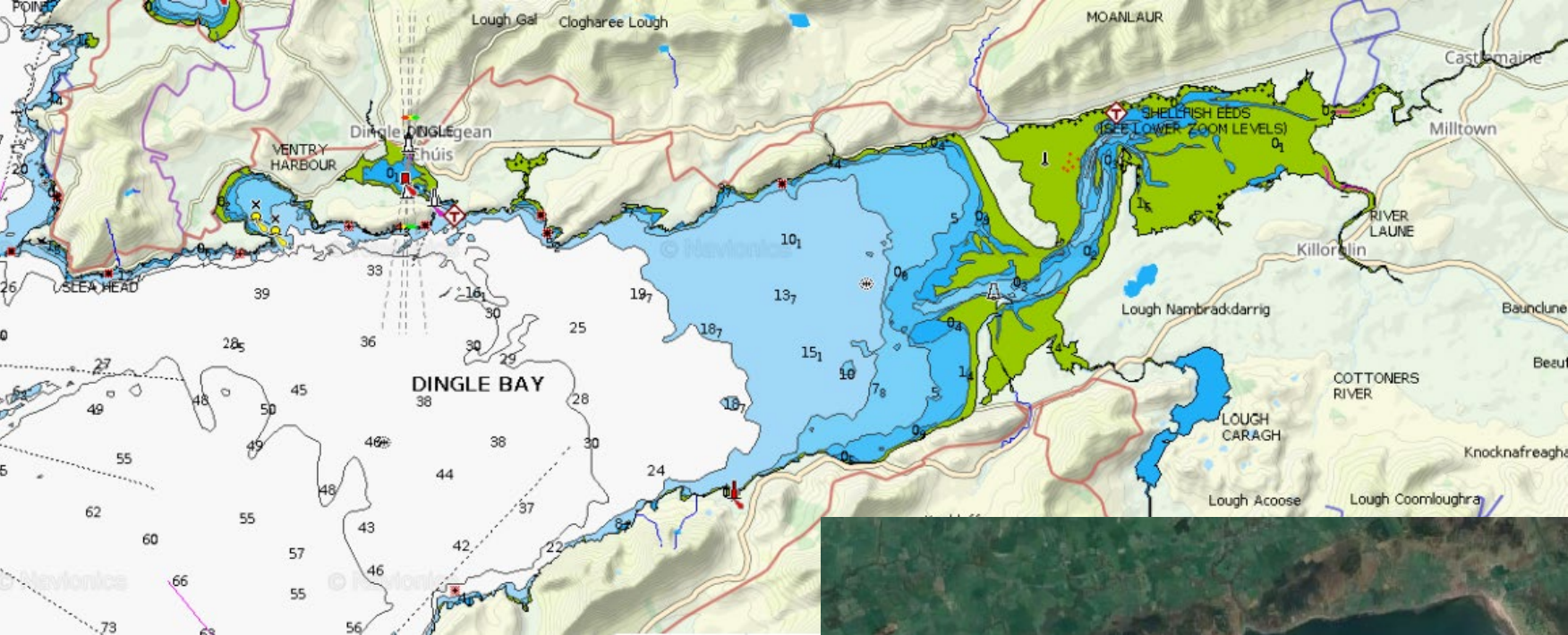


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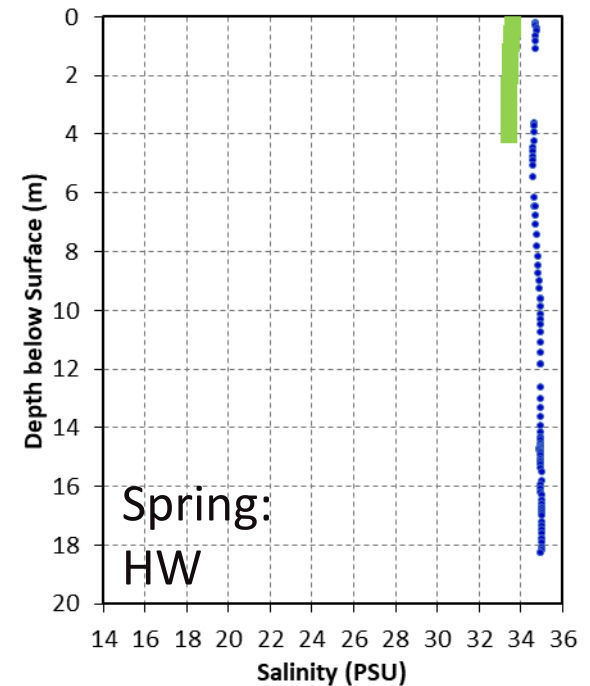
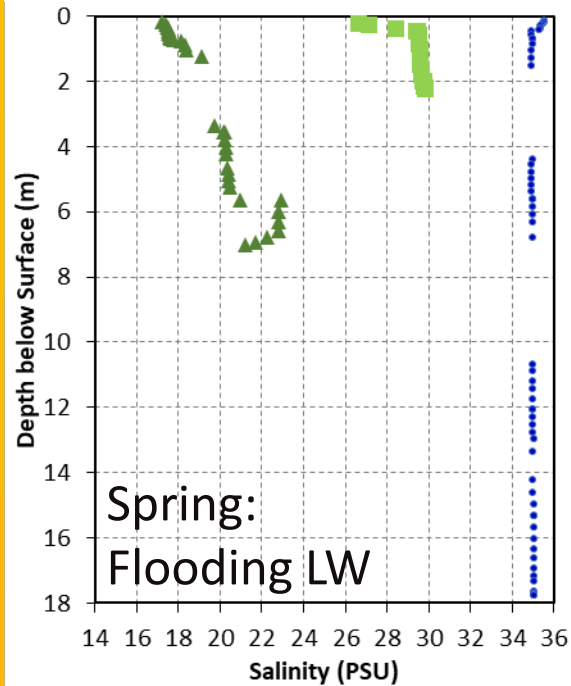
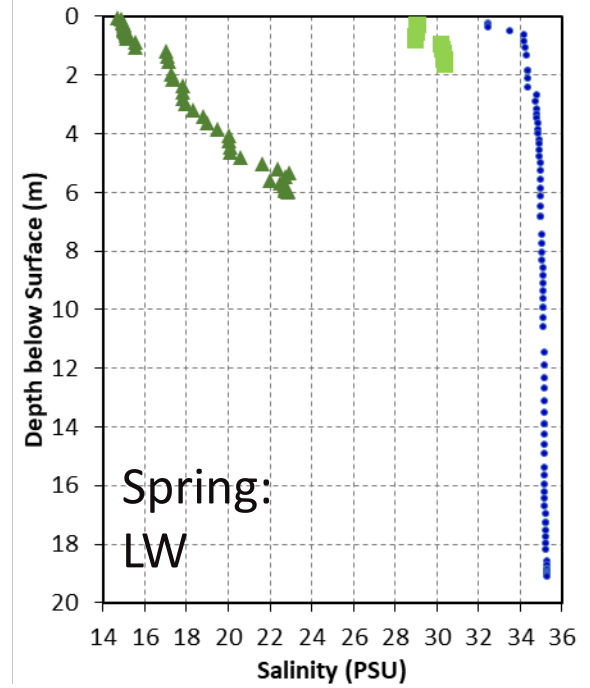
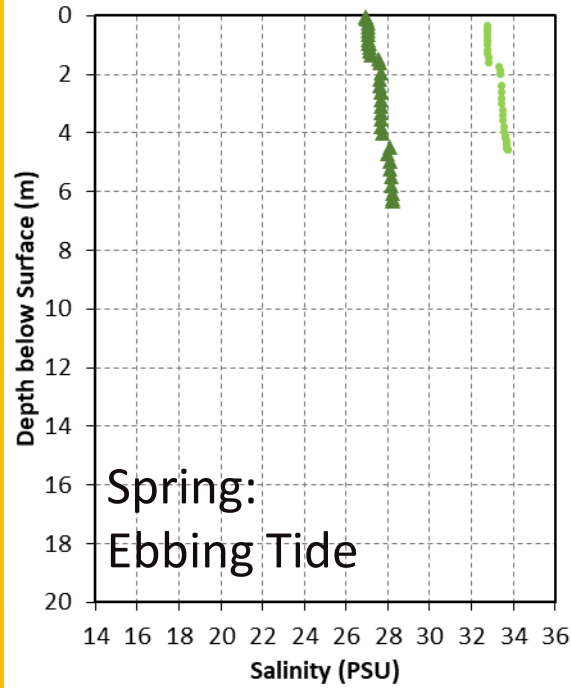
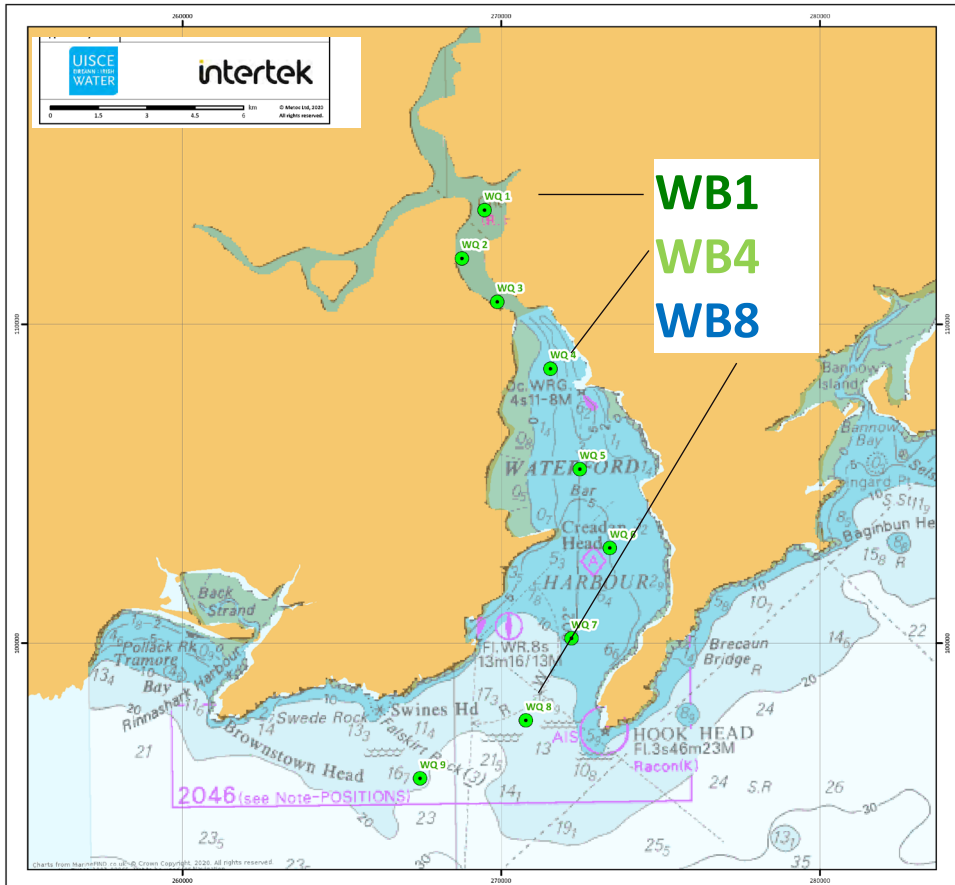
TRALEE BAY



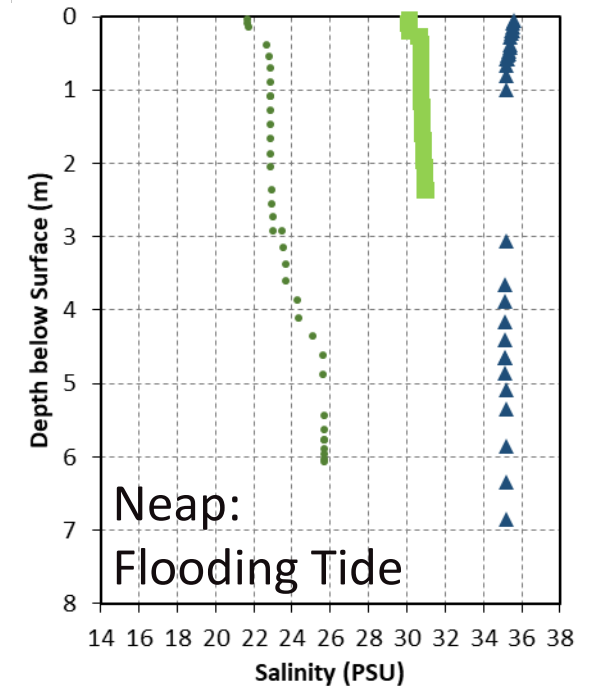
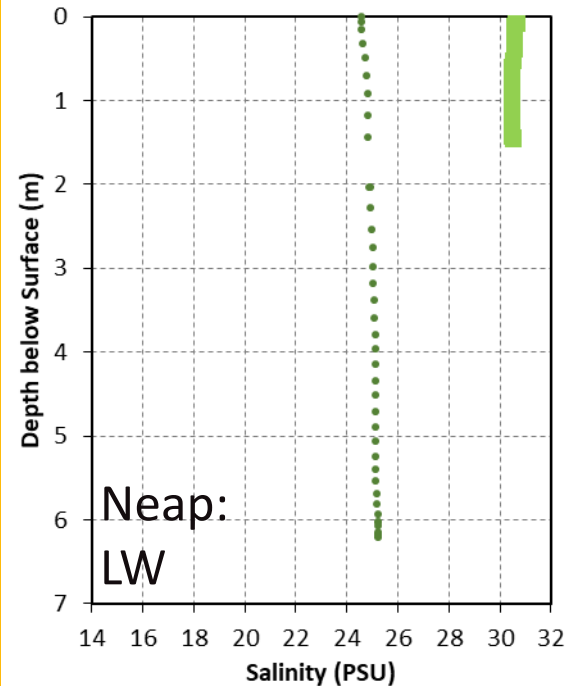
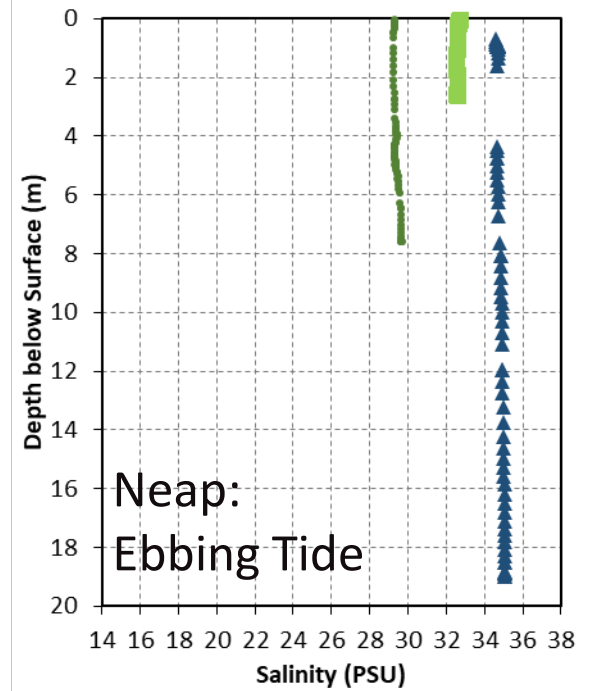
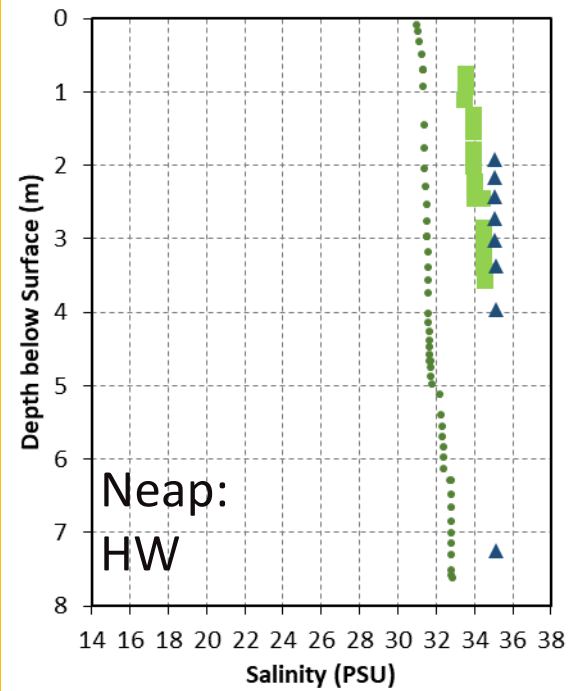
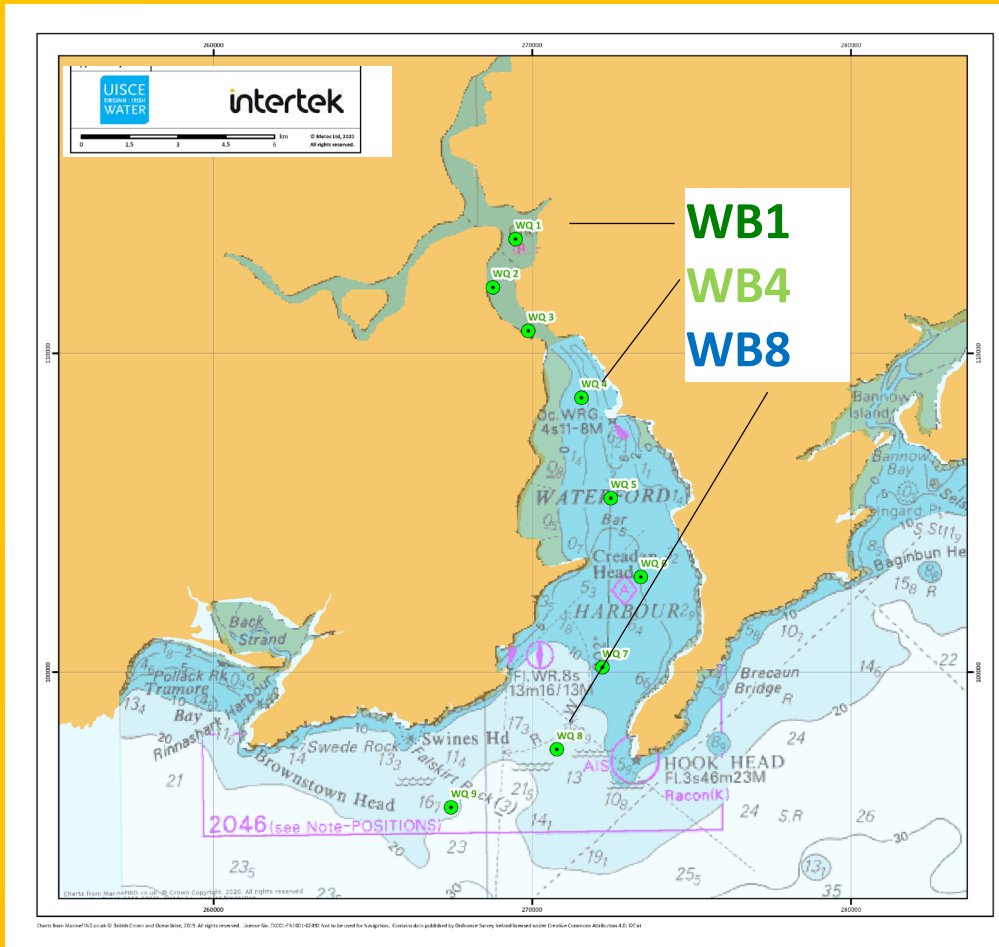
DINGLE BAY / CASTLEMAINE HARBOUR



WATERFORD SALINITY SPRING TIDE



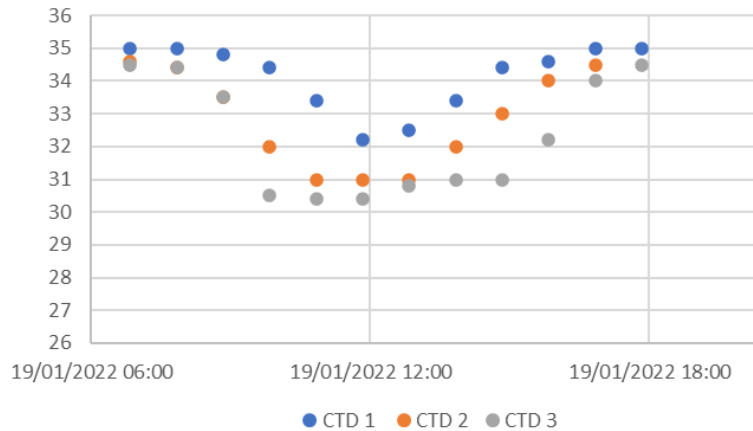
WATERFORD SALINITY NEAP TIDE



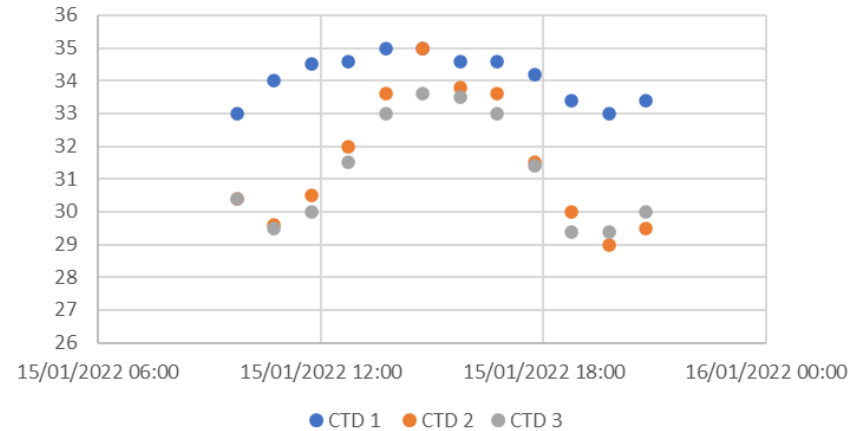
TRALEE SALINITY



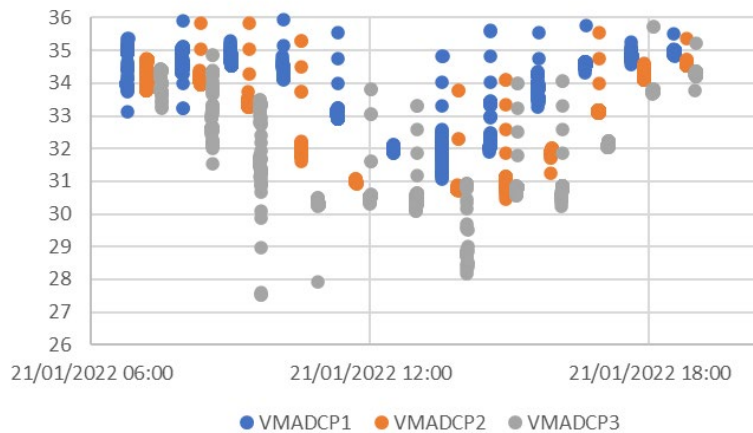
Spring Tide - Tralee CTD (Average)



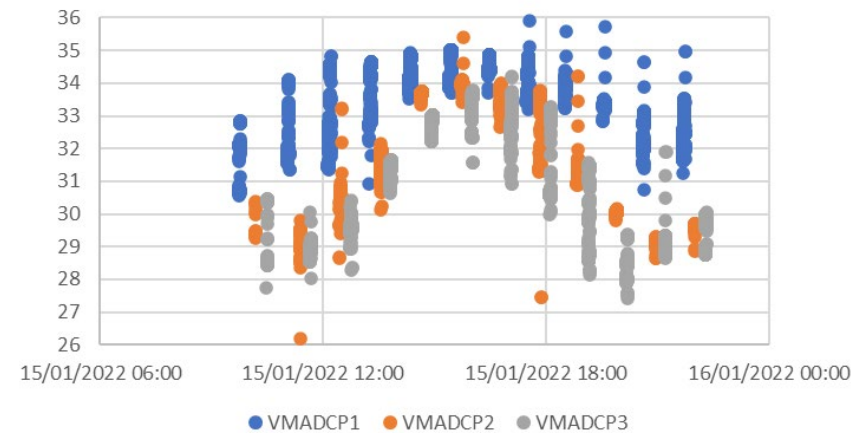
Neap Tide - Tralee CTD (Average)



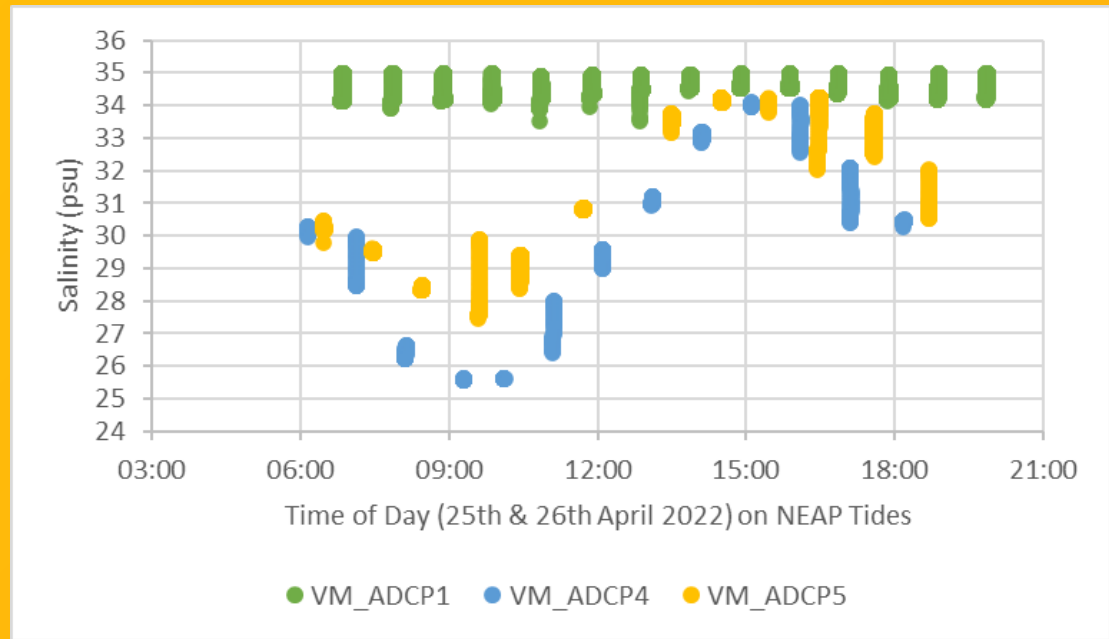
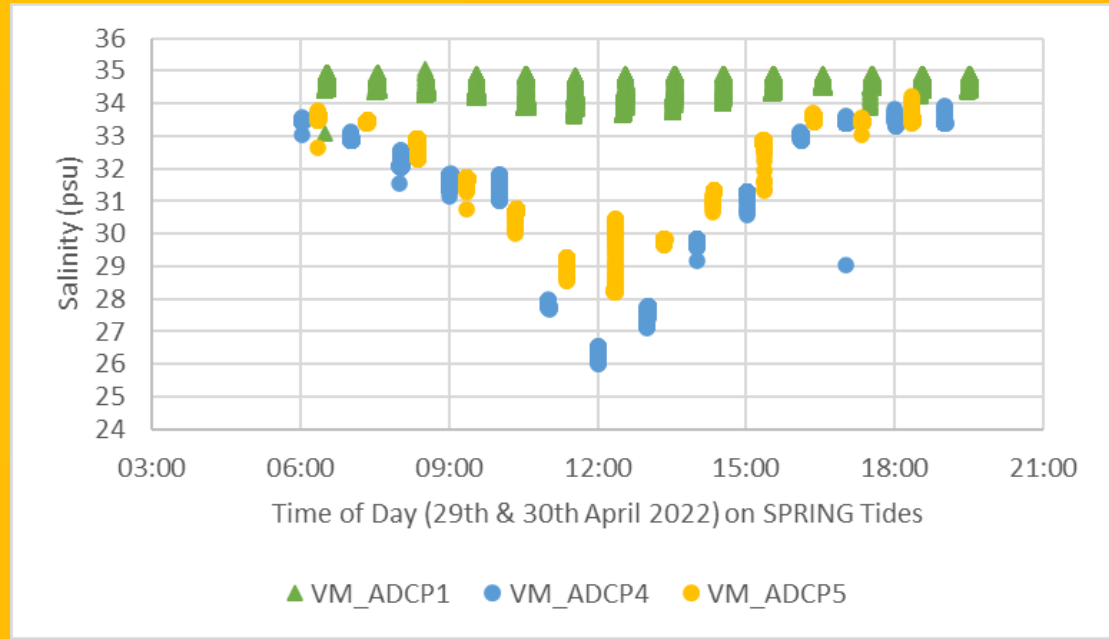
Tralee Salinity Data (Spring Tie)



Tralee Salinity Data (Neap Tide)



DINGLE BAY SALINITY





CALIBRATION OUTCOMES



Very pleasing HD calibration from the outset

Open Boundaries from:

- DHI Global Tide Tool (Waterford)
- FES 2014 (Dingle Bay & Tralee)

Very good salinity calibration at Tralee

Overall patterns good at Waterford & Dingle Bay, but a continuous **under prediction** of salinity

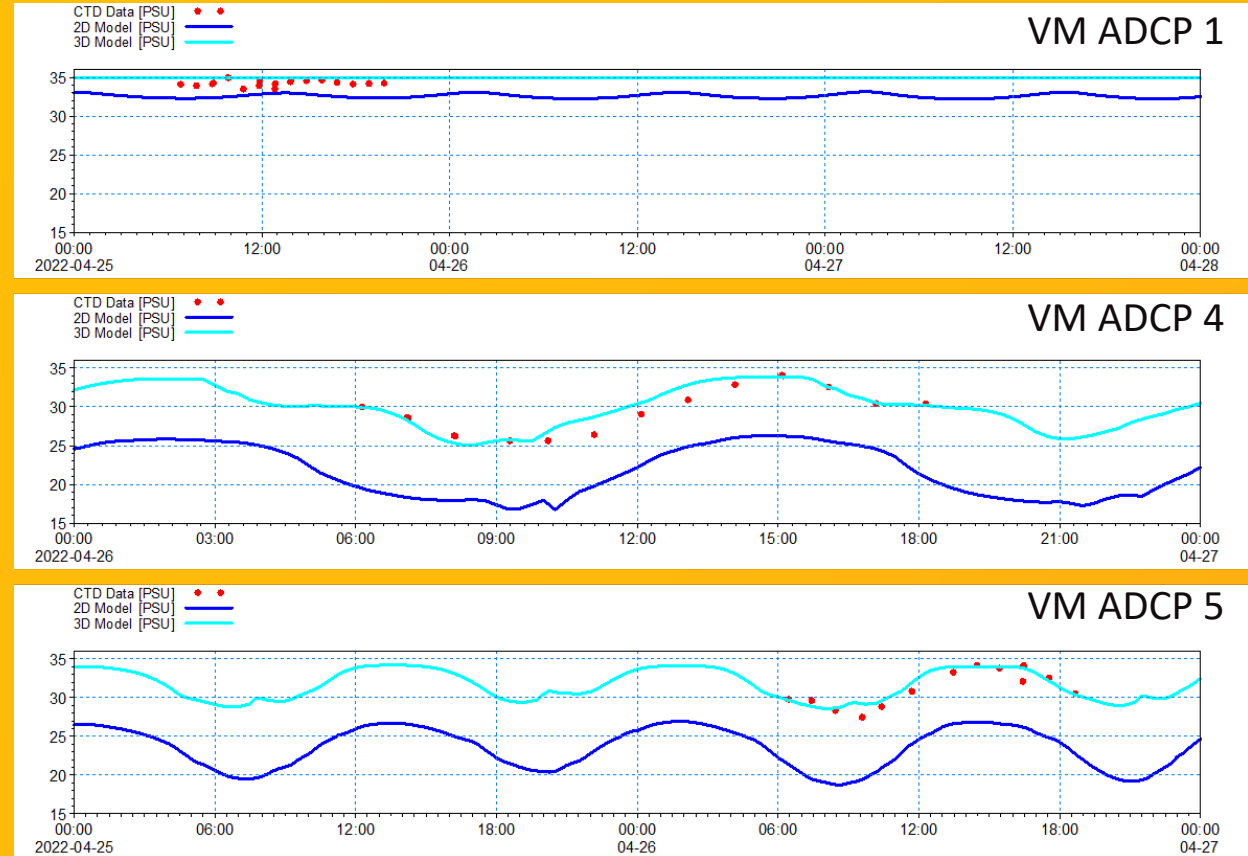
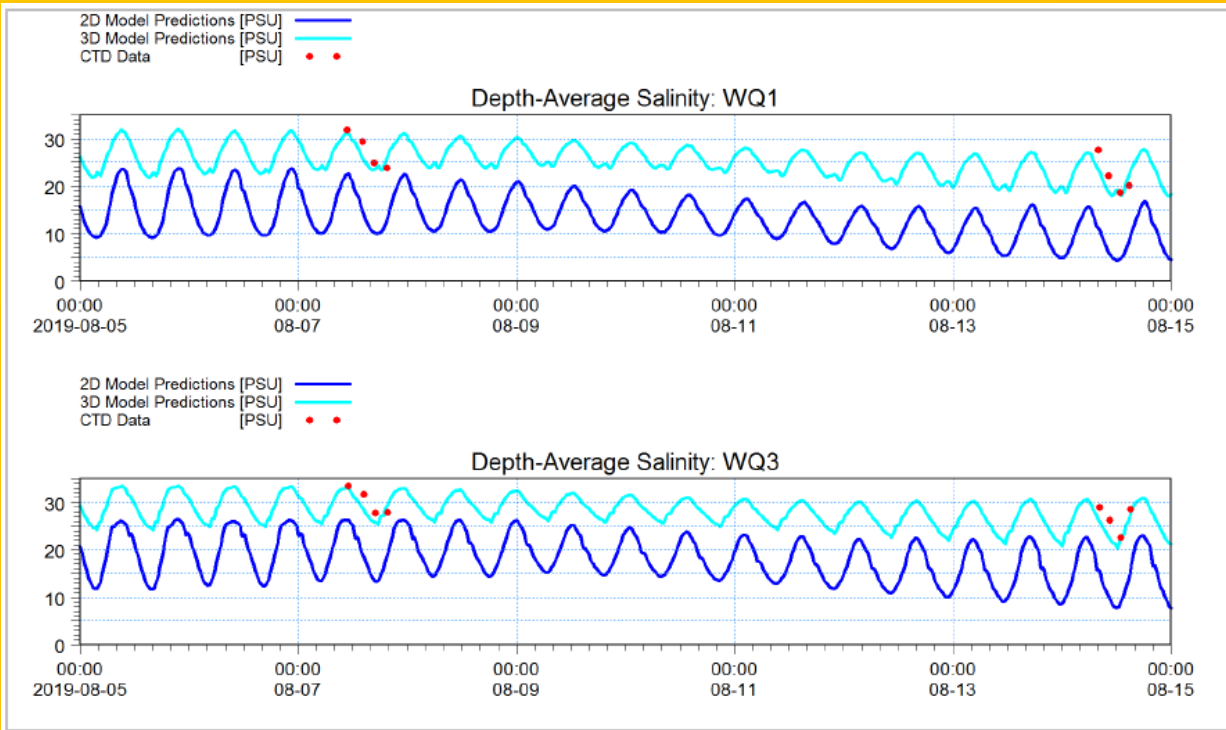
Multiple sensitivity tests undertaken to improve salinity calibration (dispersion, scaling of input rivers, spin up durations, bathymetry edits...!)

CONVERSION TO 3D



Waterford

Dingle Bay





CLOSING REMARKS



- Experience of modelling was at odds with conclusions from the data review
- Significant changes to project program & budget taking the 3D approach
- Most important: developing a tool that includes the right level of complexity

Thank you for your attention!

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