Modelling Group
WATER NEW ZEALAND

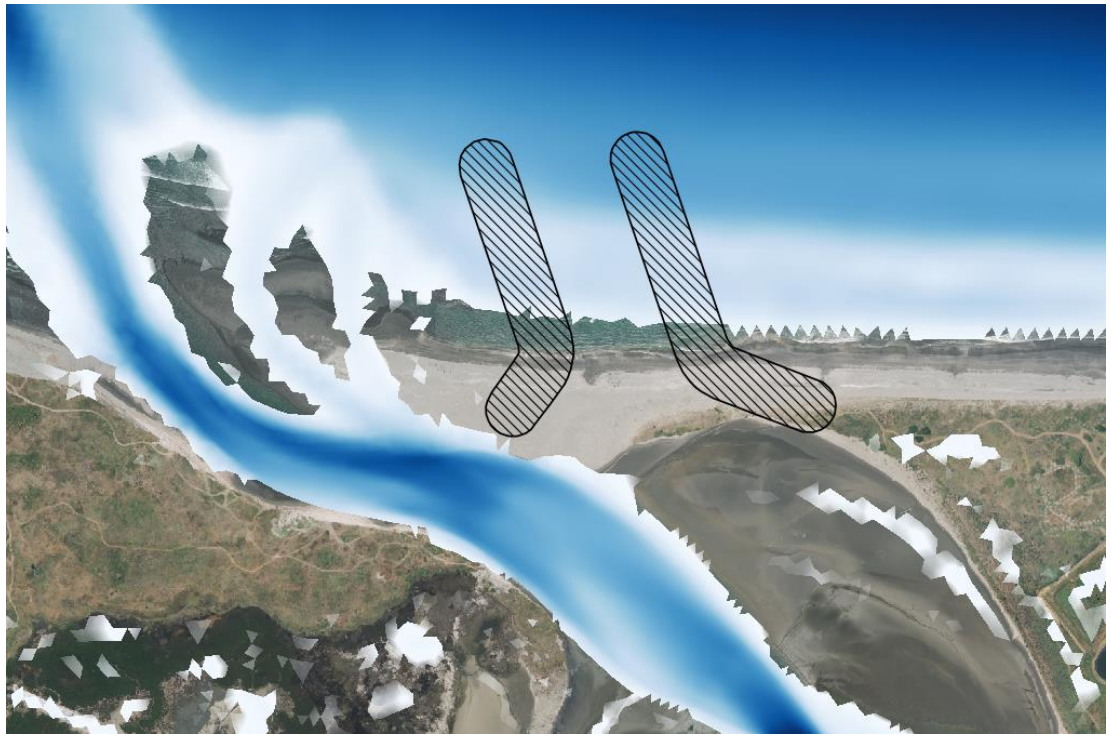
Modelling Symposium

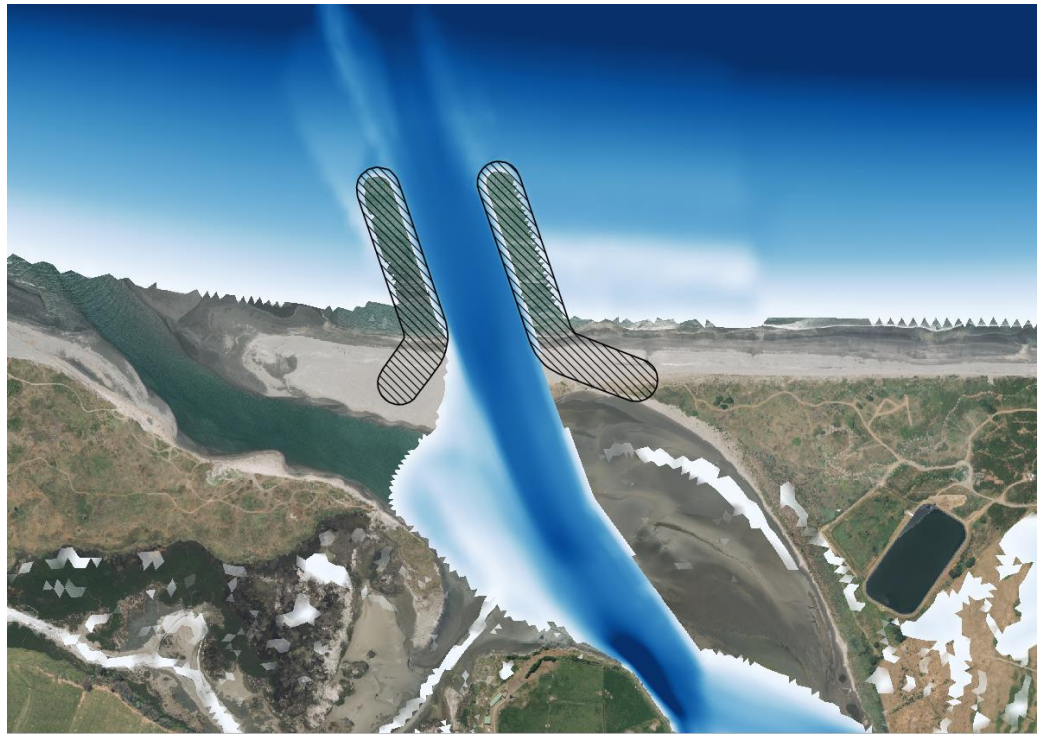
COMPARATIVE ANALYSIS OF RIVER MOUTH GEOMETRY USING A 2D MORPHOLOGICAL MODEL

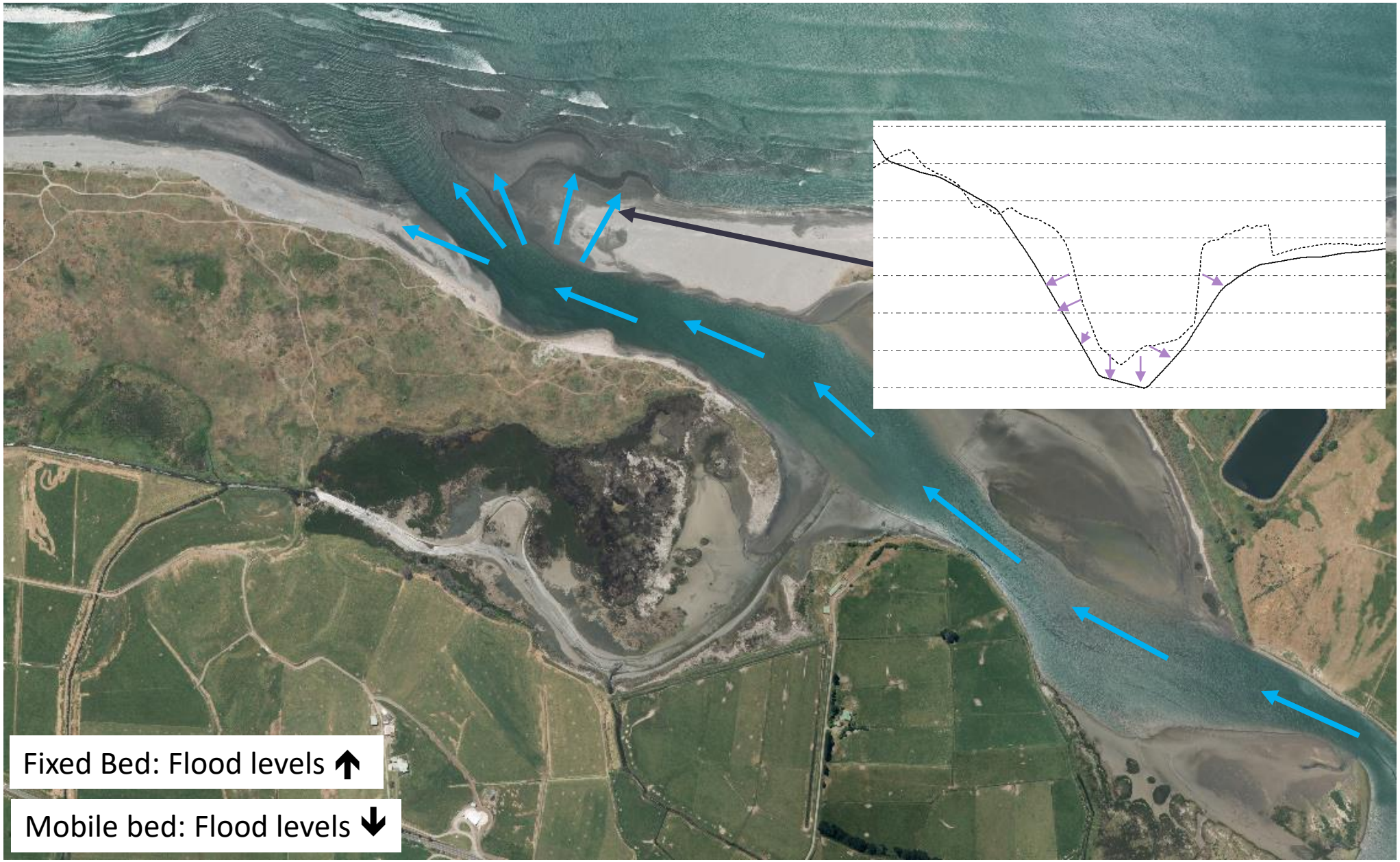
Presented by
Alex White and Mark Pennington

water NEW ZEALAND
The New Zealand Water & Wastes Association Waiora Aotearoa

Model Purpose






Fixed Bed: Flood levels ↑
Mobile bed: Flood levels ↓

Model uses


Breakwaters/Training Walls
River Mouth Closure
Dredged Channel
A3 SCALE 1:10000
0 0,1 0,2 0,3 0,4 0,5 (km)

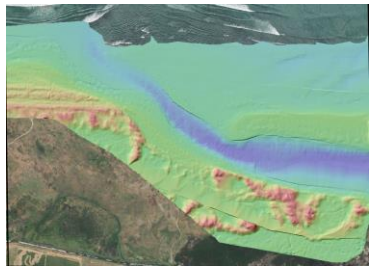
2015/2017 – Publicly available imagery

May 2022 – First Bathymetric Survey

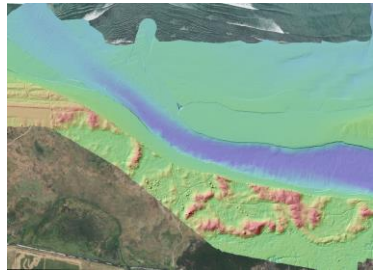
January 2023 – Second Bathymetric Survey

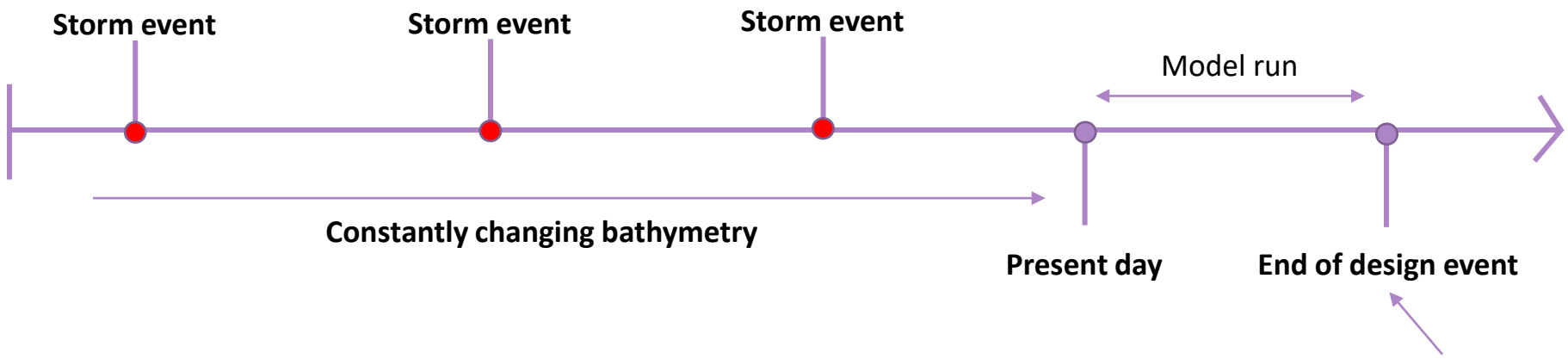
Coastal processes (not modelled)

May 2022 Bathymetric Survey



January 2023 Bathymetric Survey



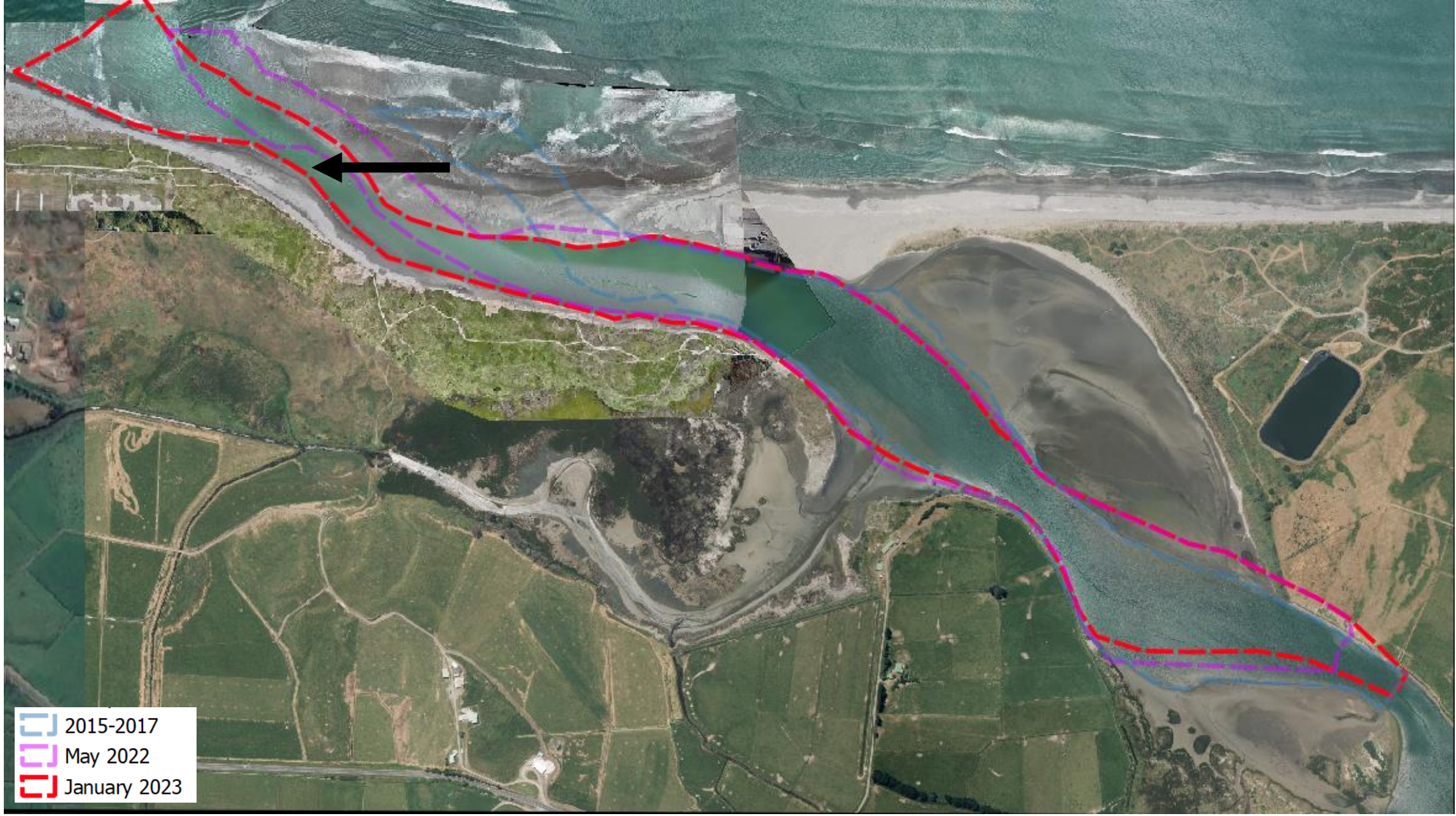


Could we have predicted this?

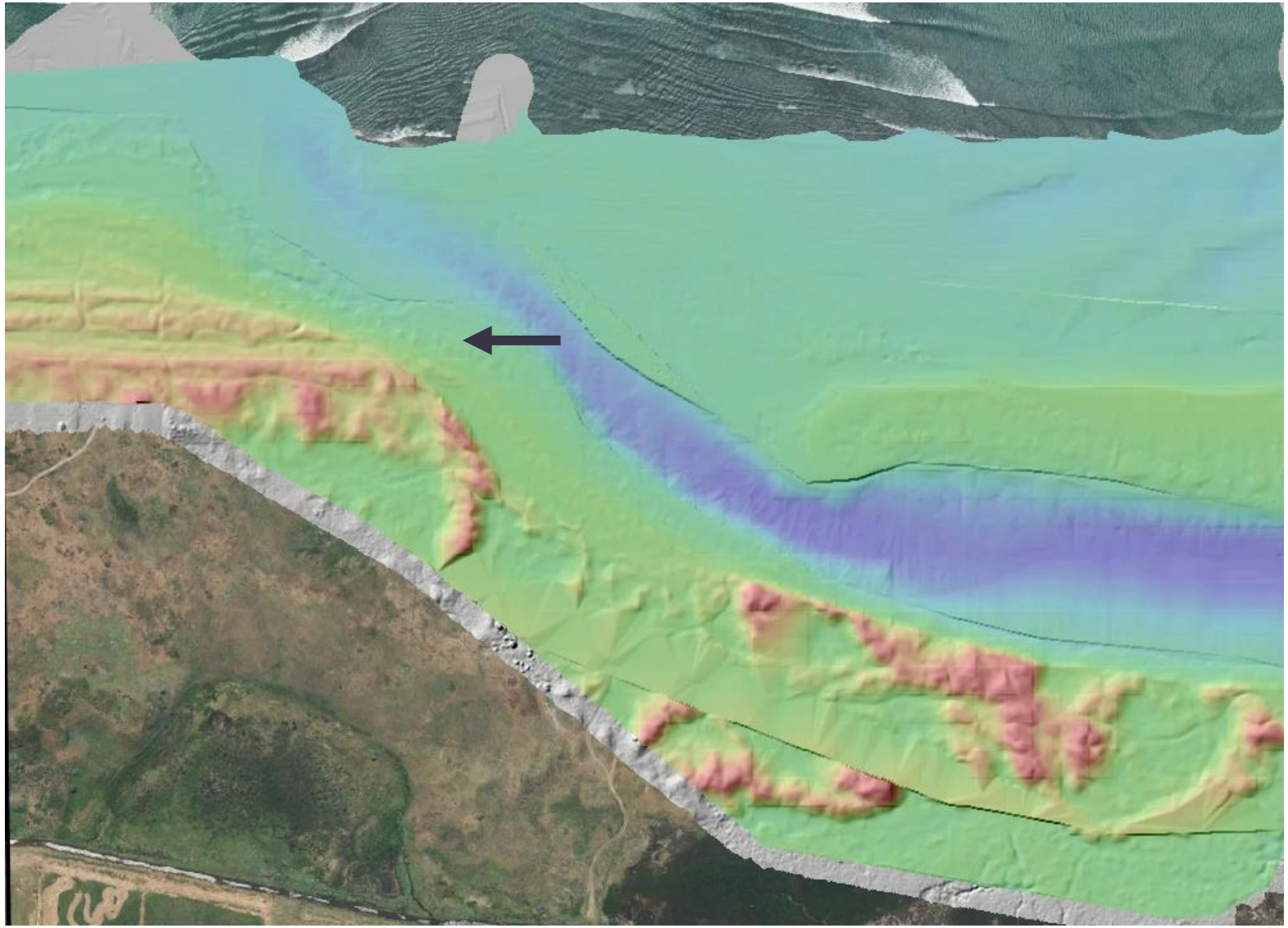
2015/2017 – Publicly available imagery

May 2022 – First Bathymetric Survey

January 2023 – Second Bathymetric Survey

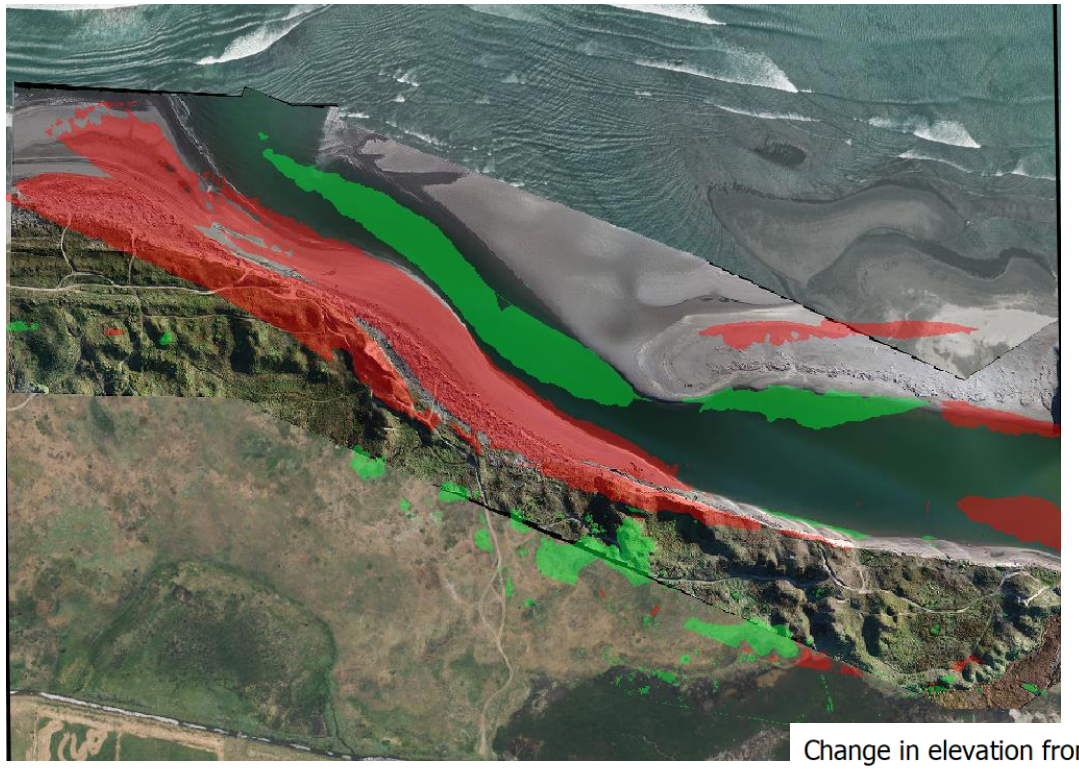


May 2022 – First Bathymetric Survey → **January 2023** – Second Bathymetric Survey

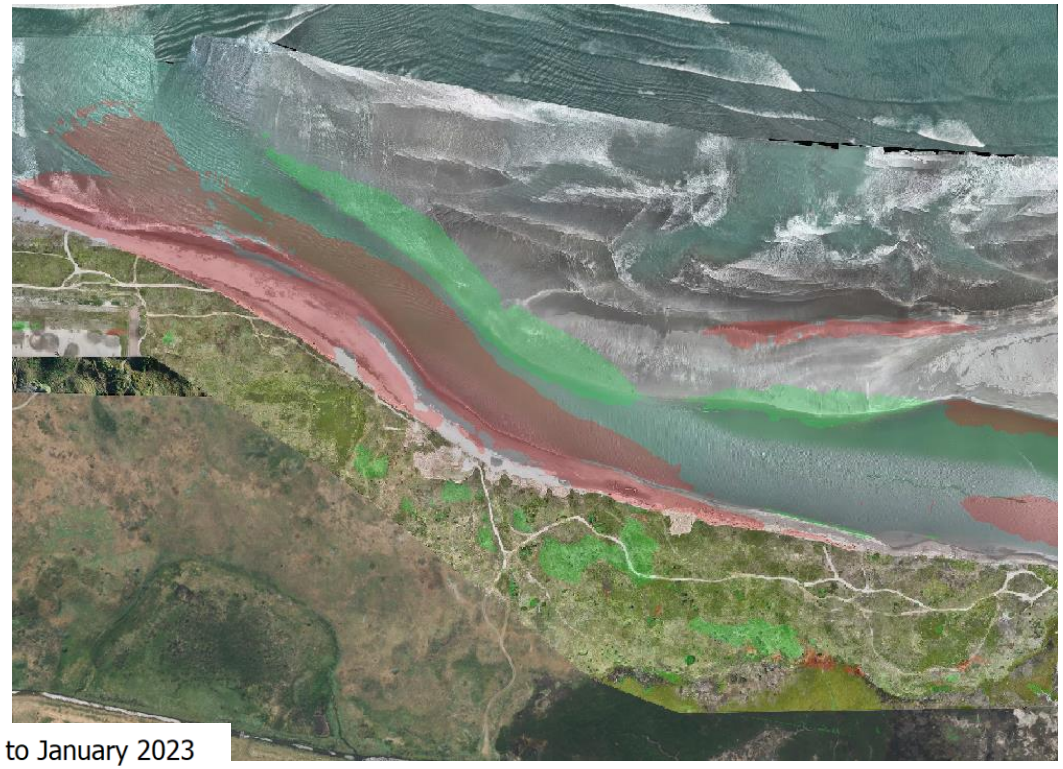


Change in Bathymetry

May 2022 Aerial



Jan 2023 Aerial



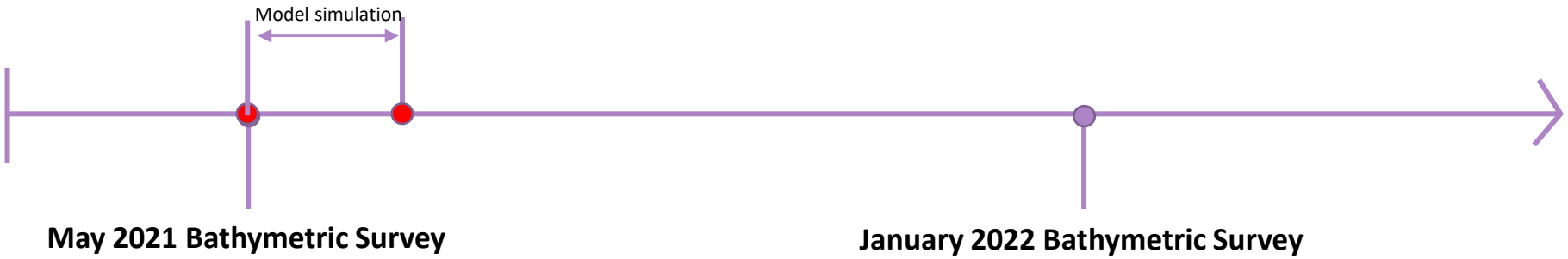
Change in elevation from May 2022 to January 2023

Decrease in elevation

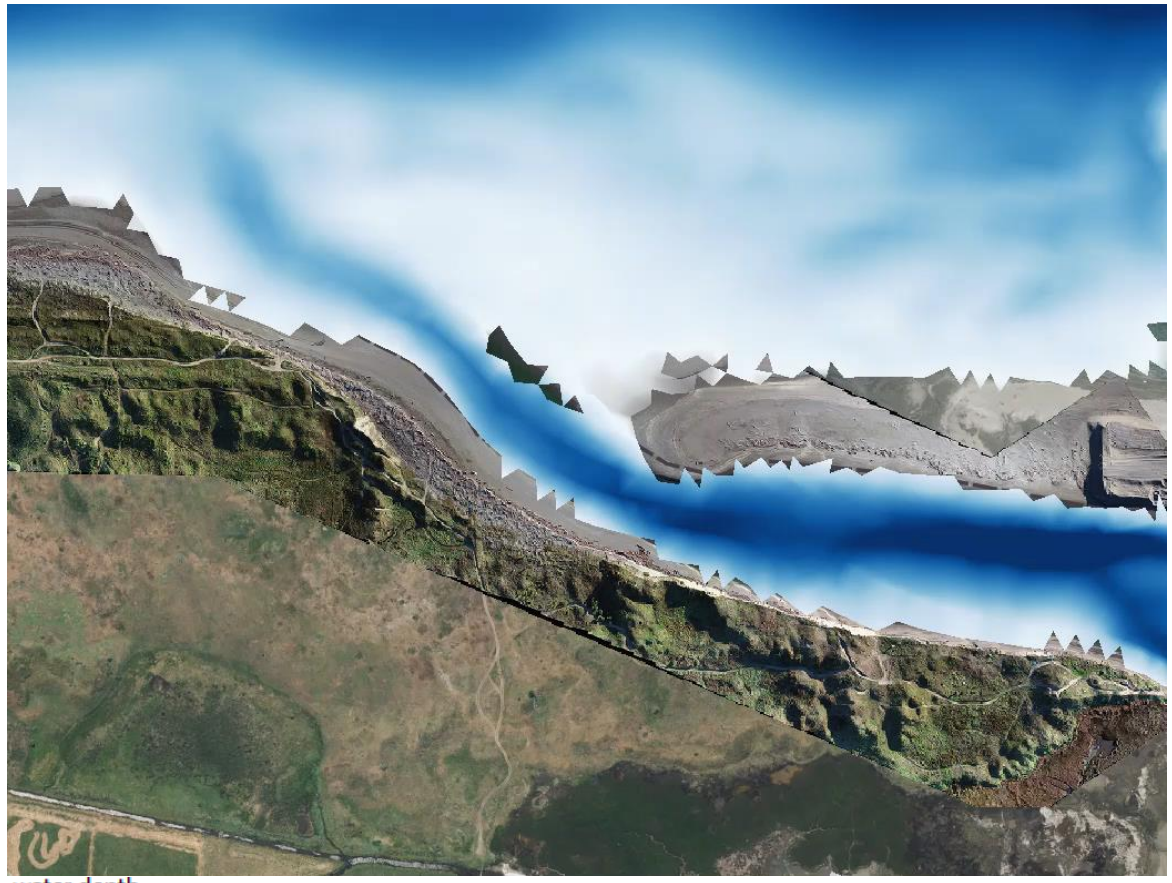
Increase in elevation

Model Configuration

- Month long simulation
- Output interval 1 day
- Recorded inflows and tidal boundary



May – June model run

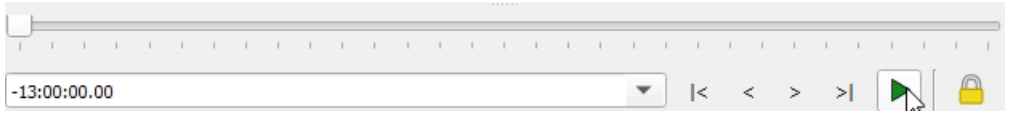


water depth

4

0

Velocity vectors



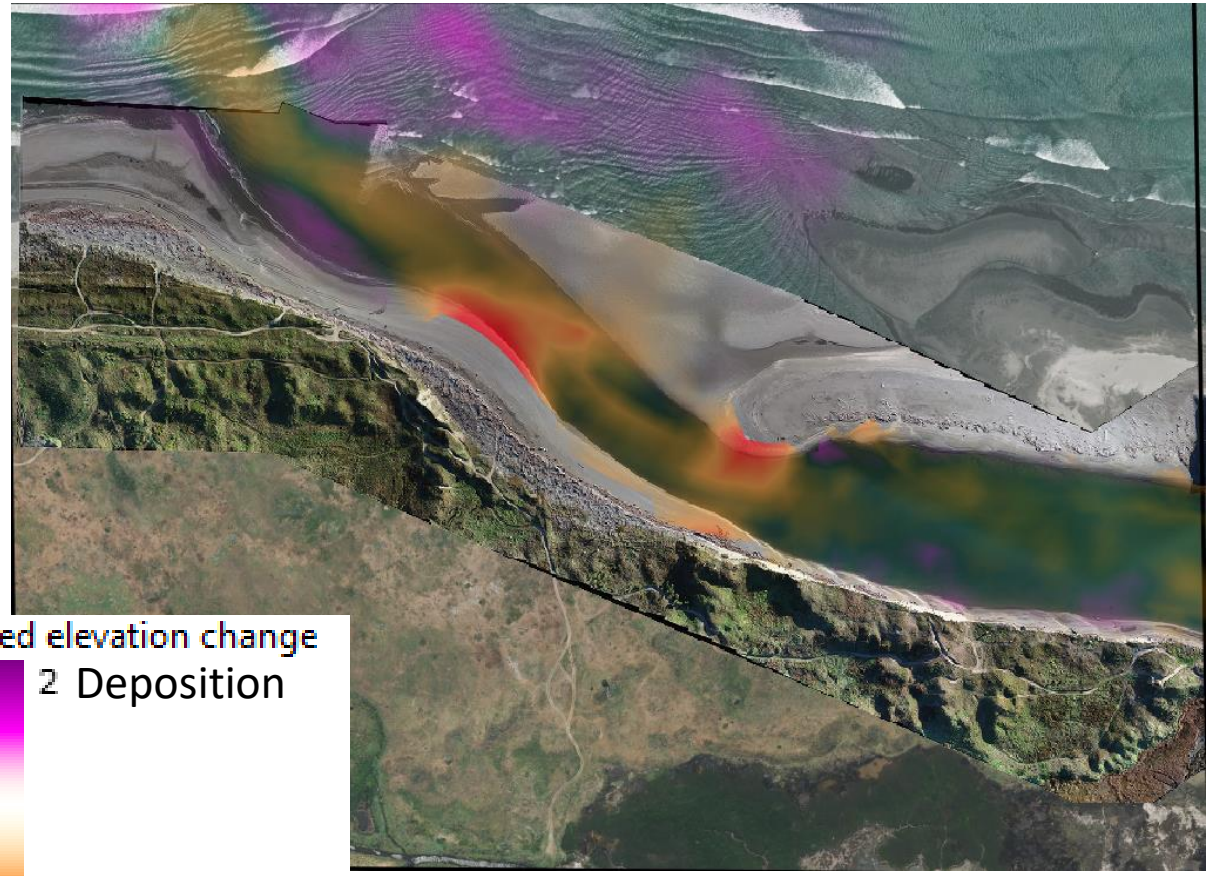
bed elevation change

2 Deposition

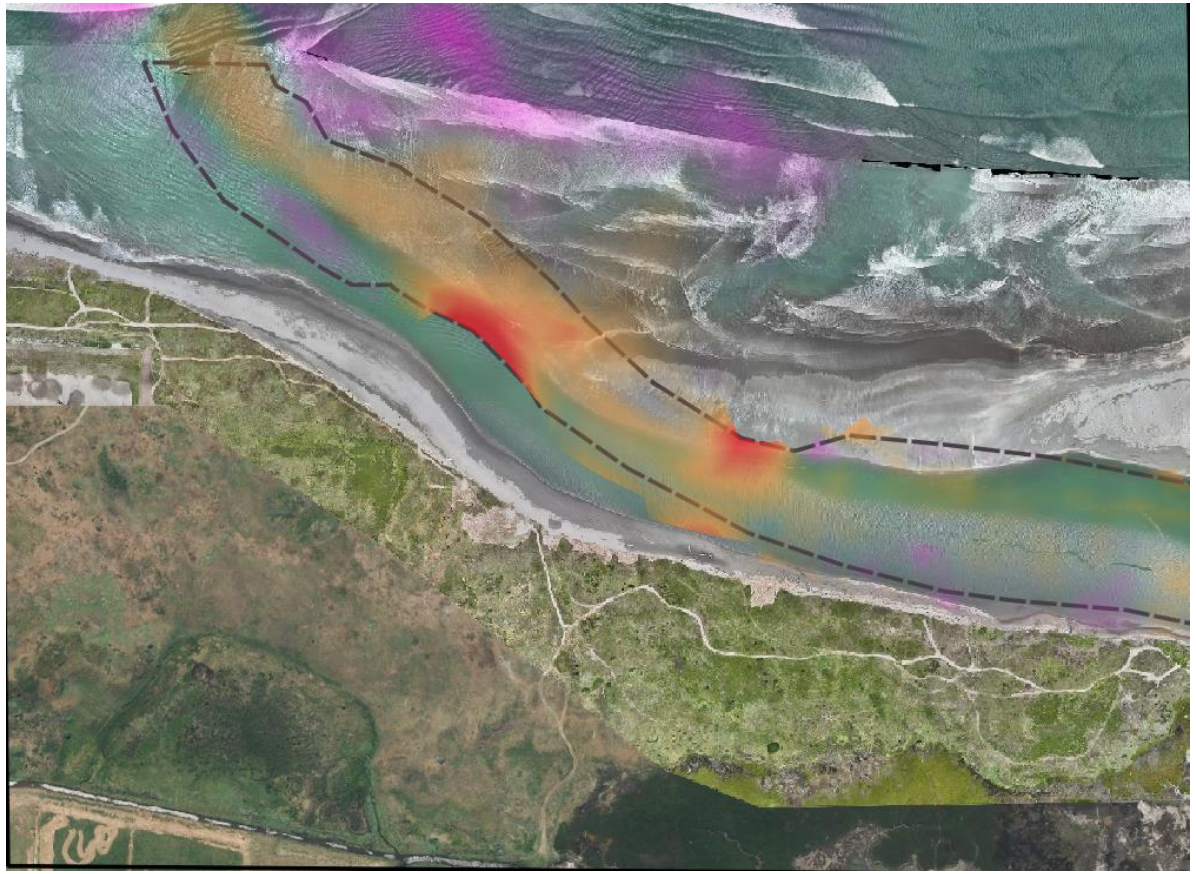
-2 Scour

Bed elevation change

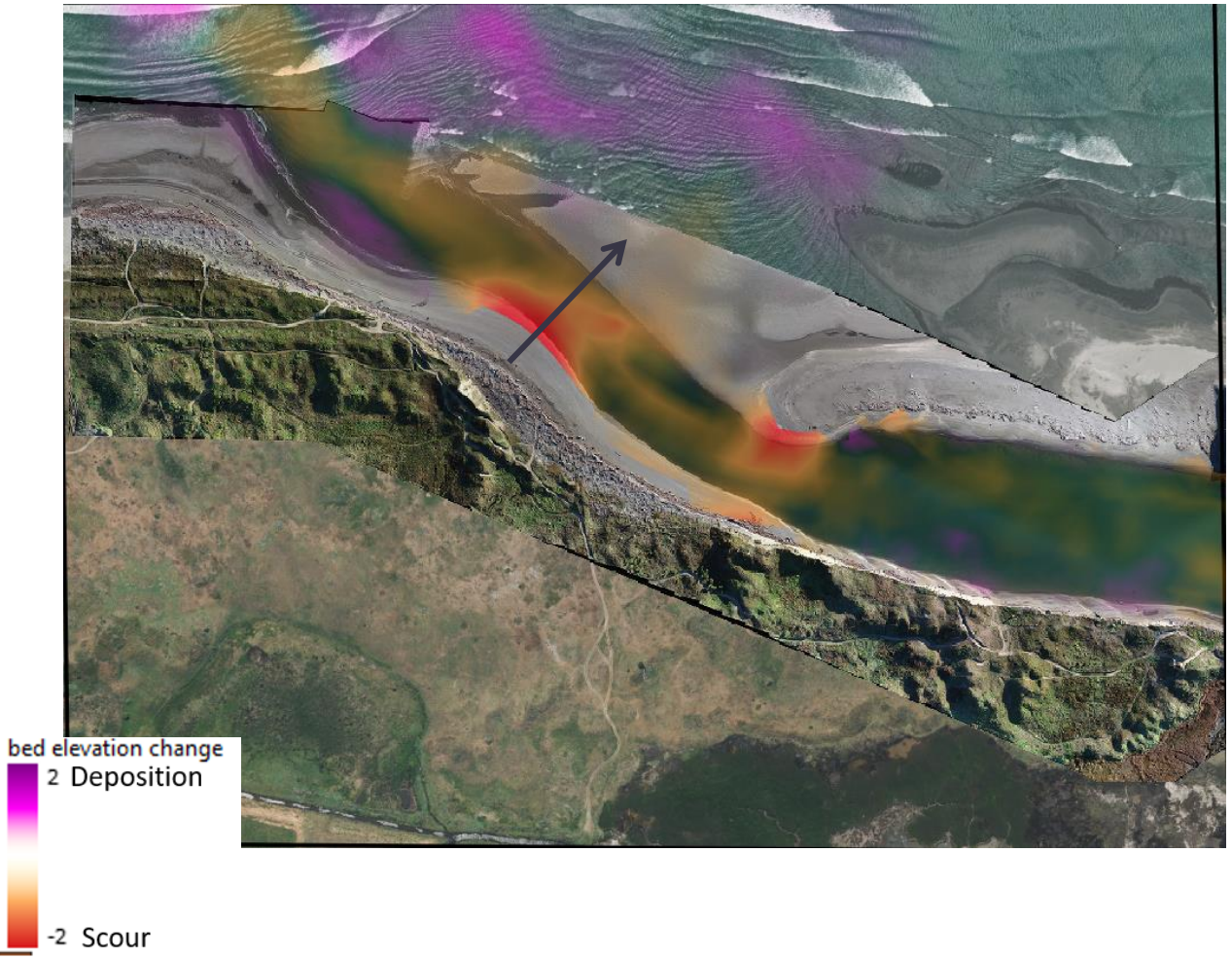
May 2022 Aerial

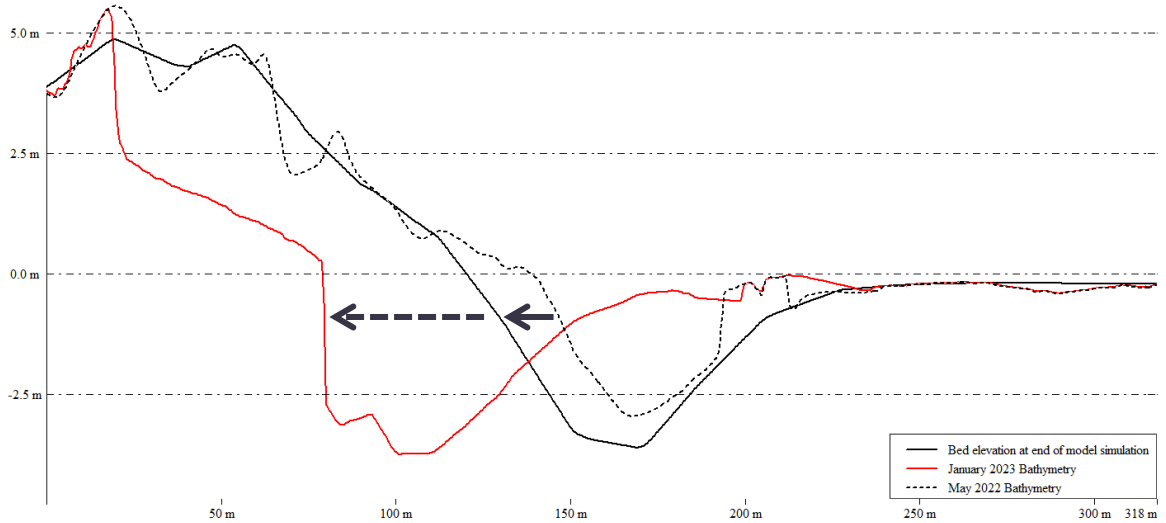


Jan 2023 Aerial

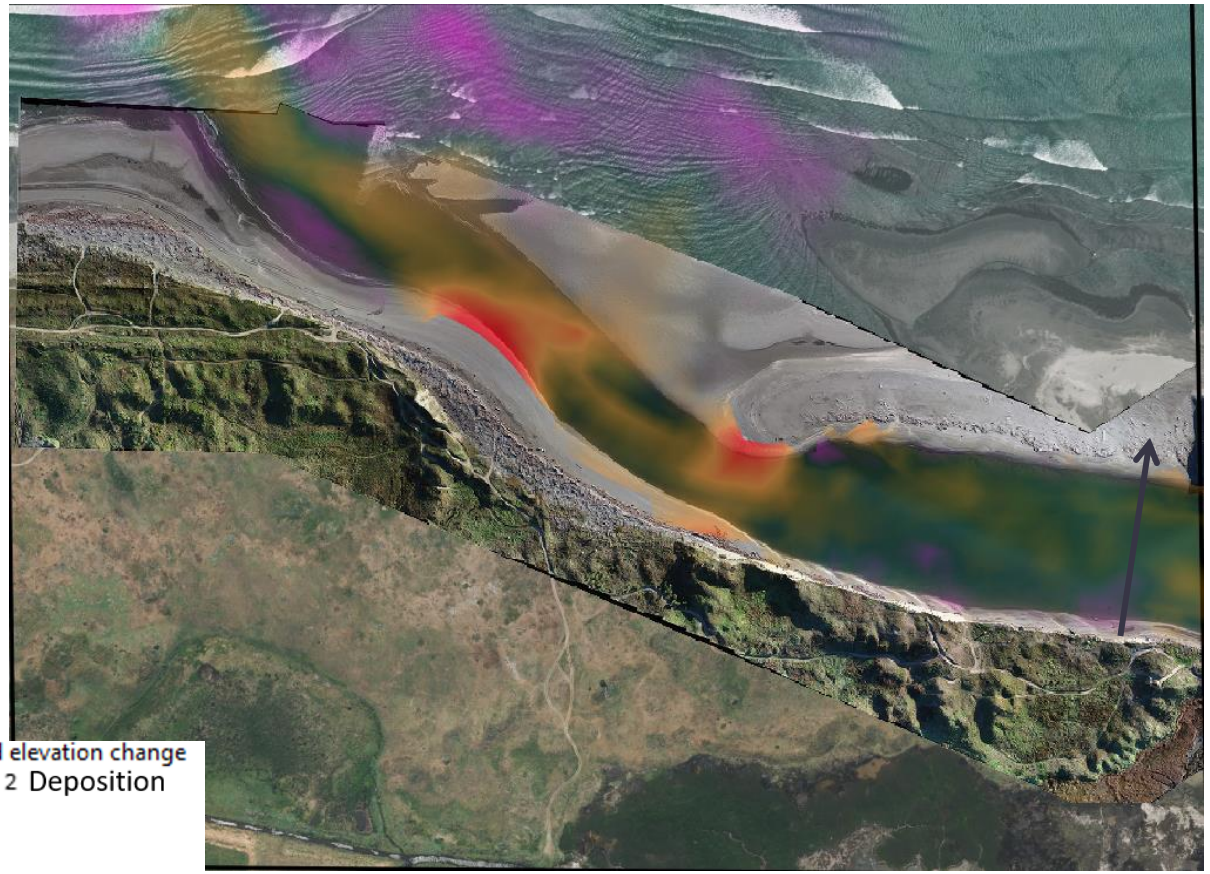


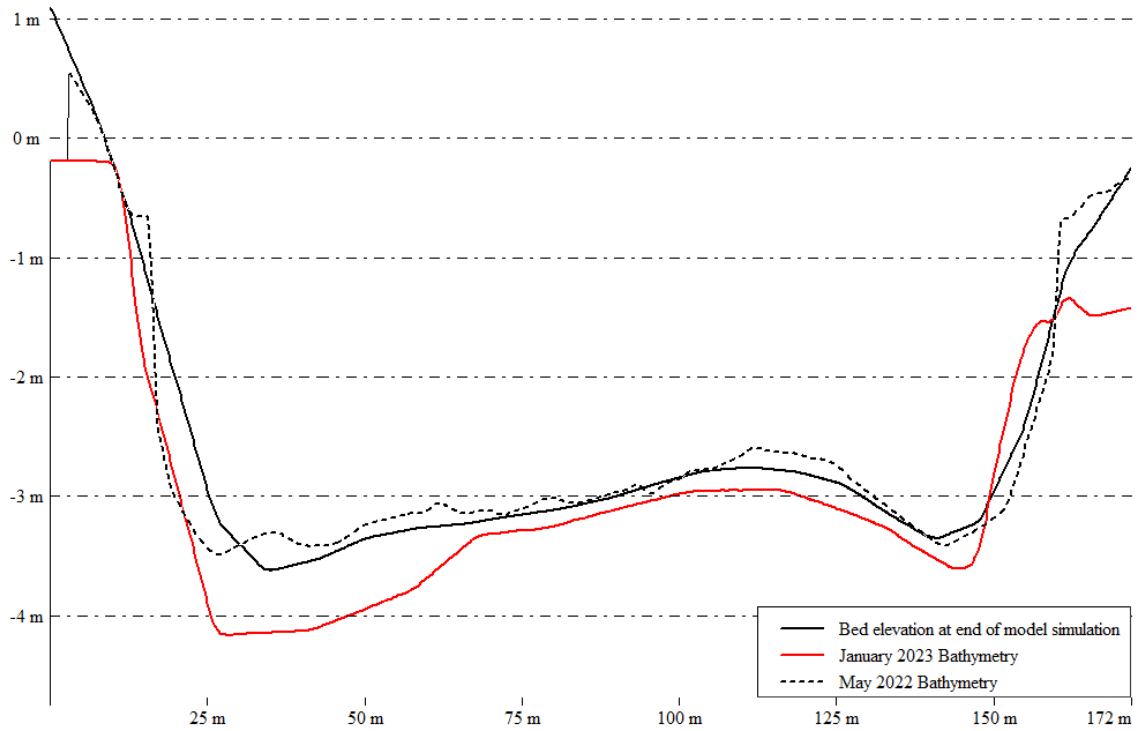
Change in bed profile



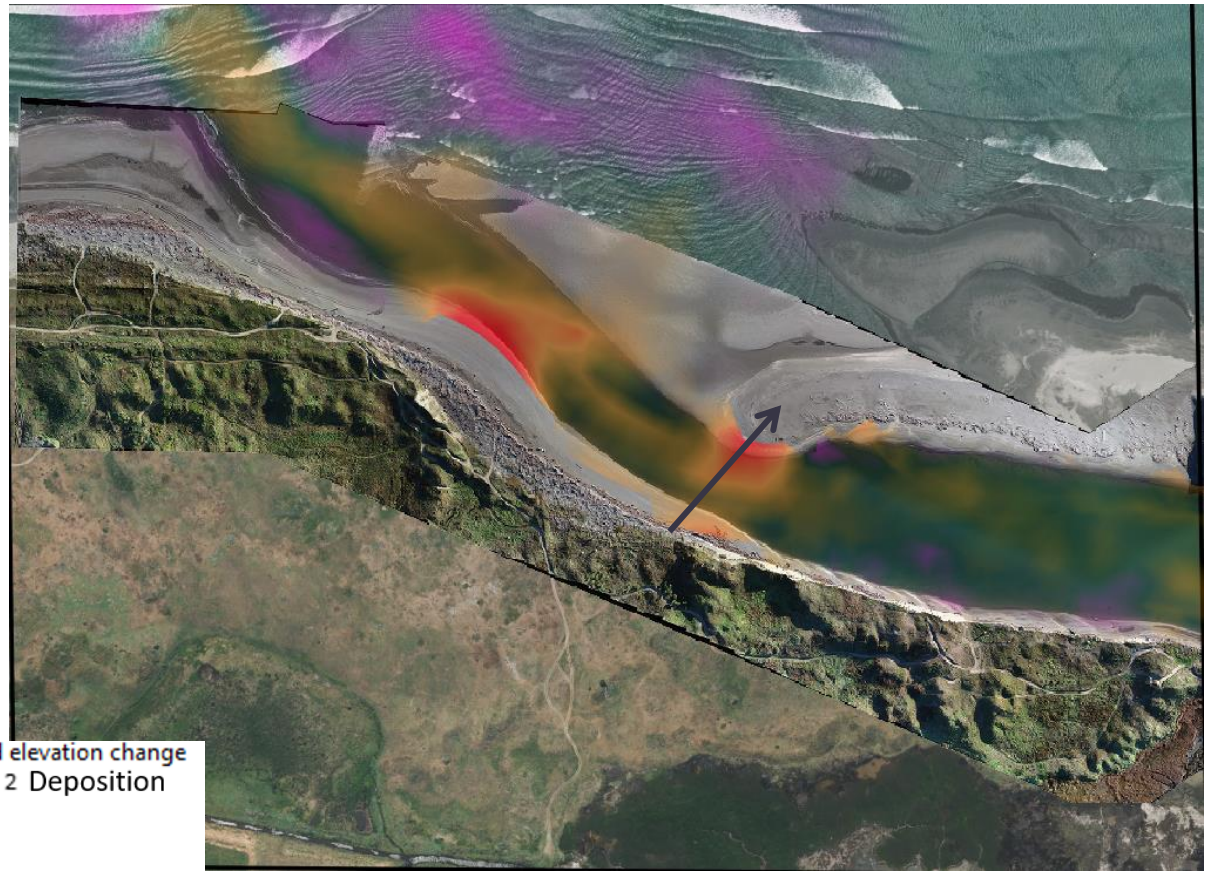


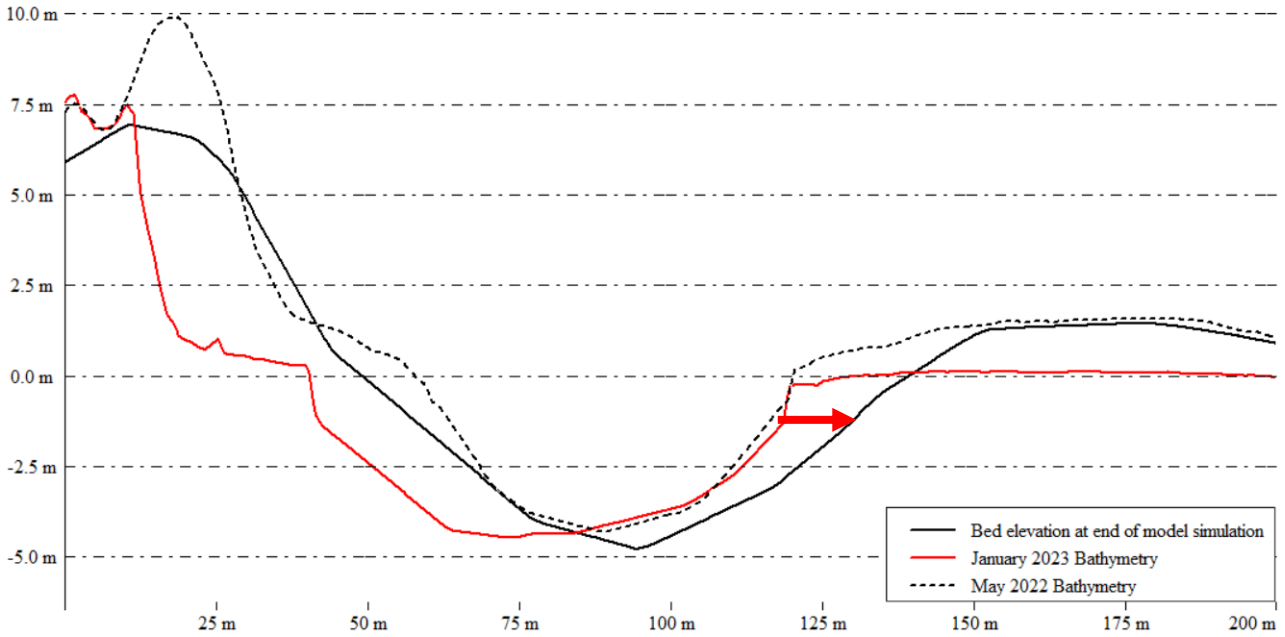
Change in bed profile



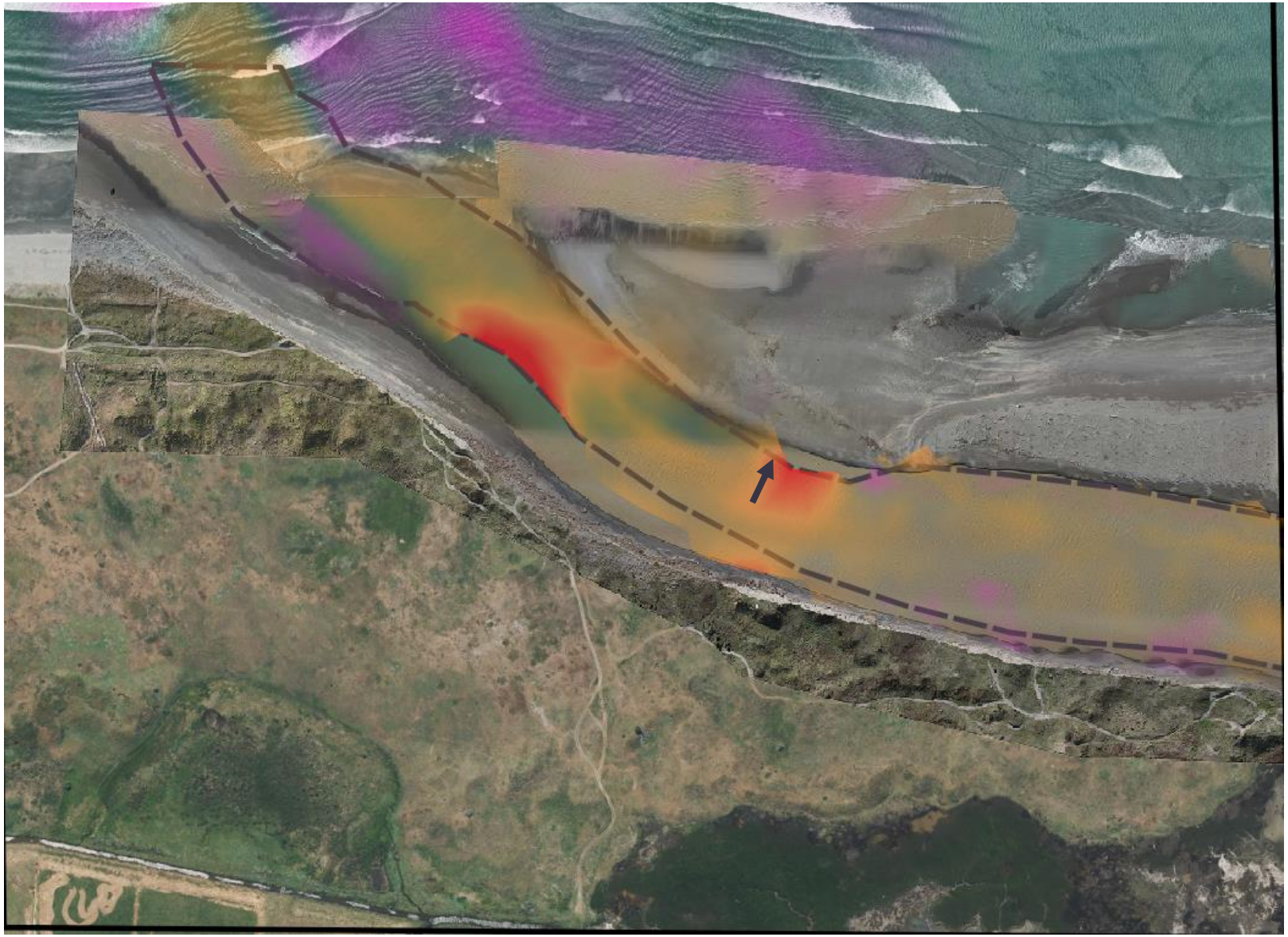


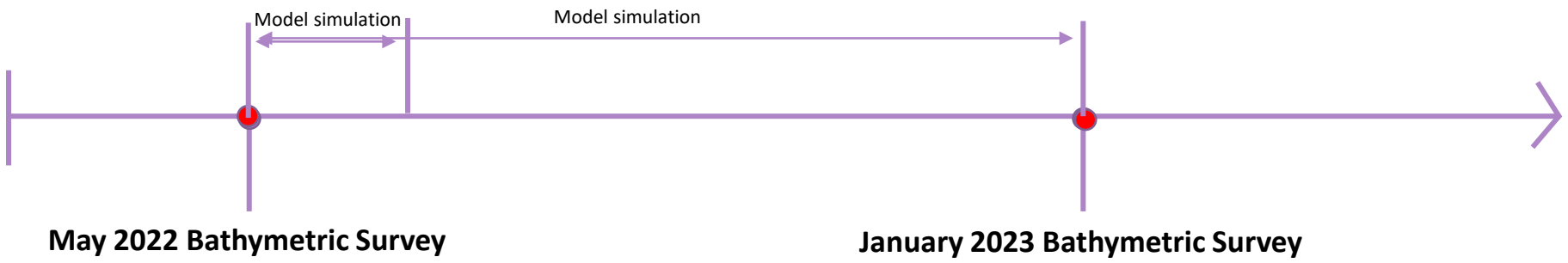
Change in bed profile





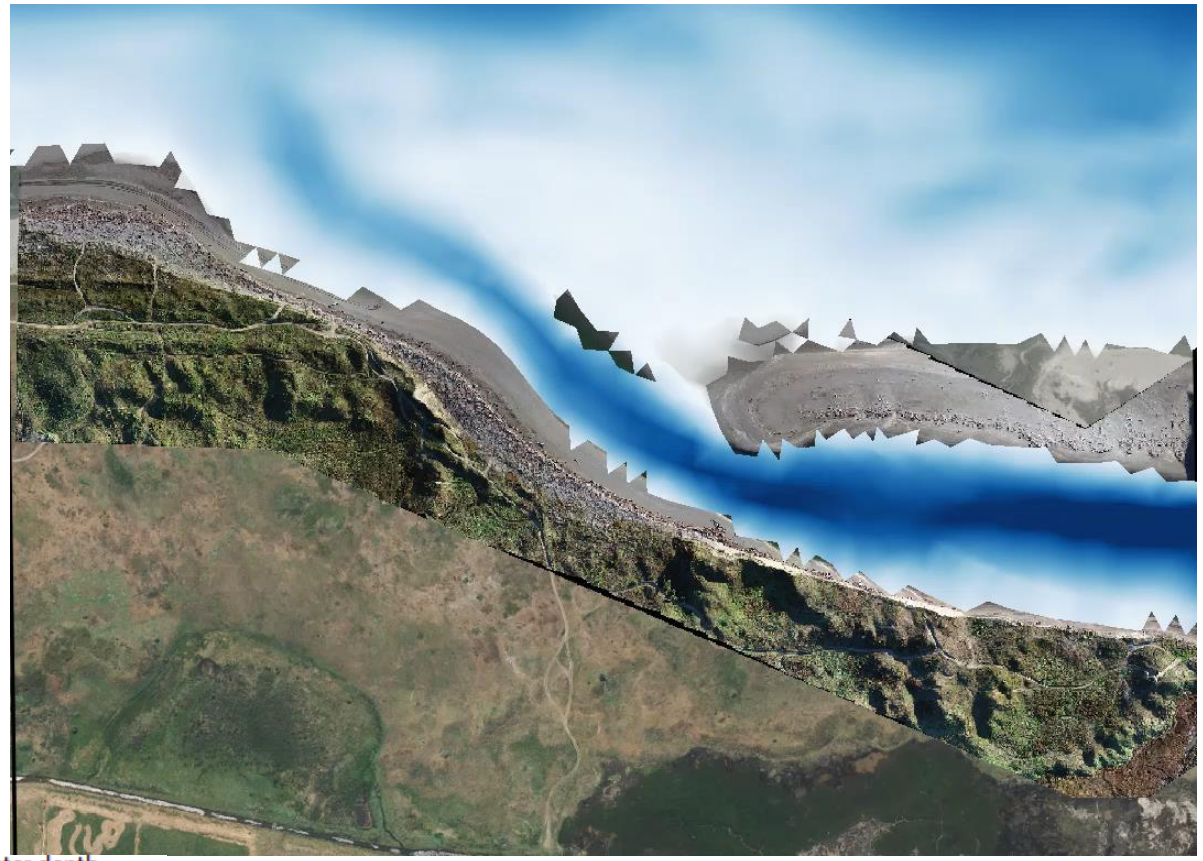
July 2022 Aerial





- Simulated from 22 May 2022 to 31 Jan 2023 (~6050 hours or ~250 days)
- Recorded inflows
- Output interval 1 week

May 2022 – Feb 2023 Model run

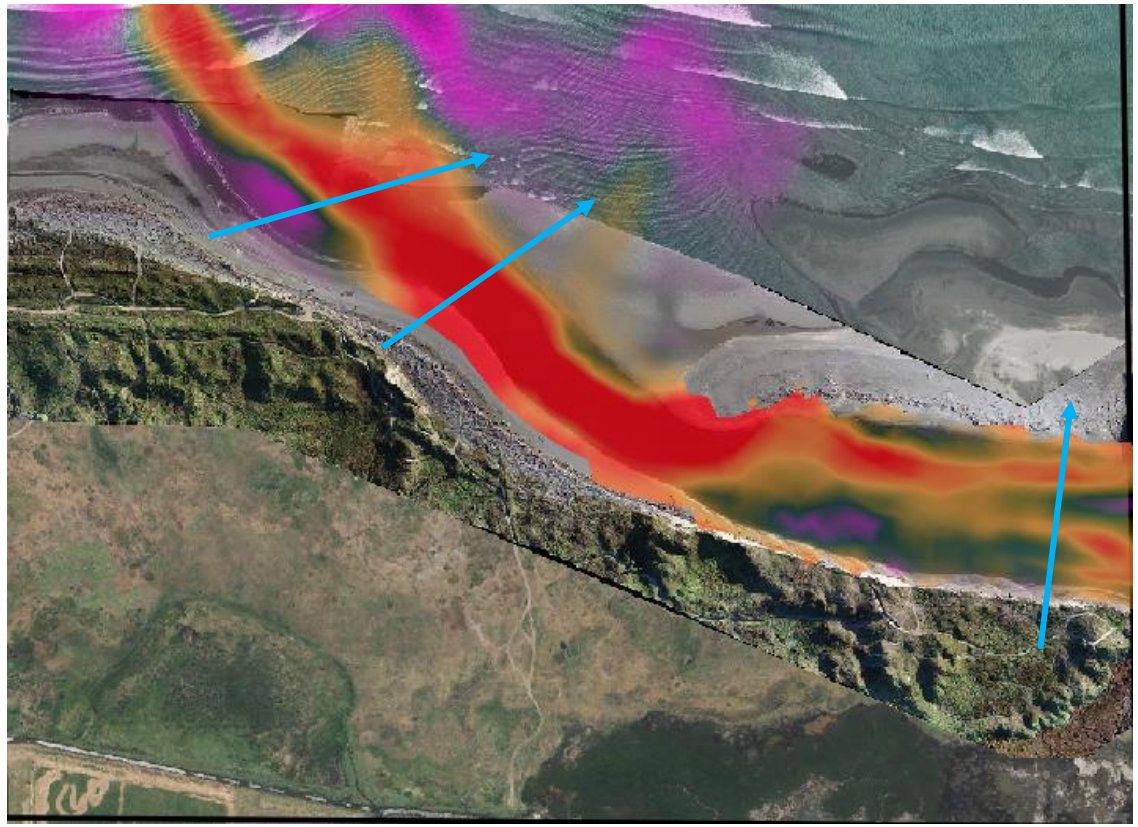


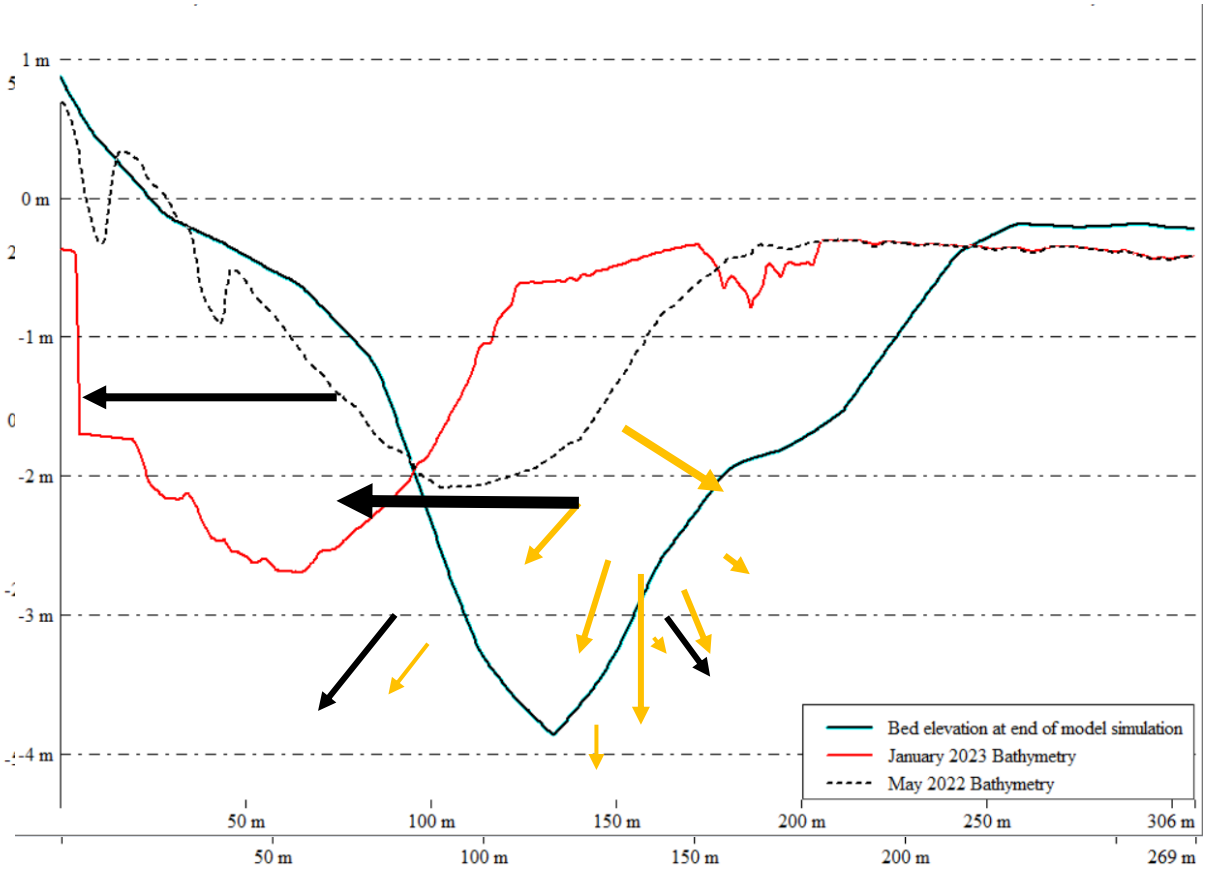
water depth
4
0

-13:00:00.00

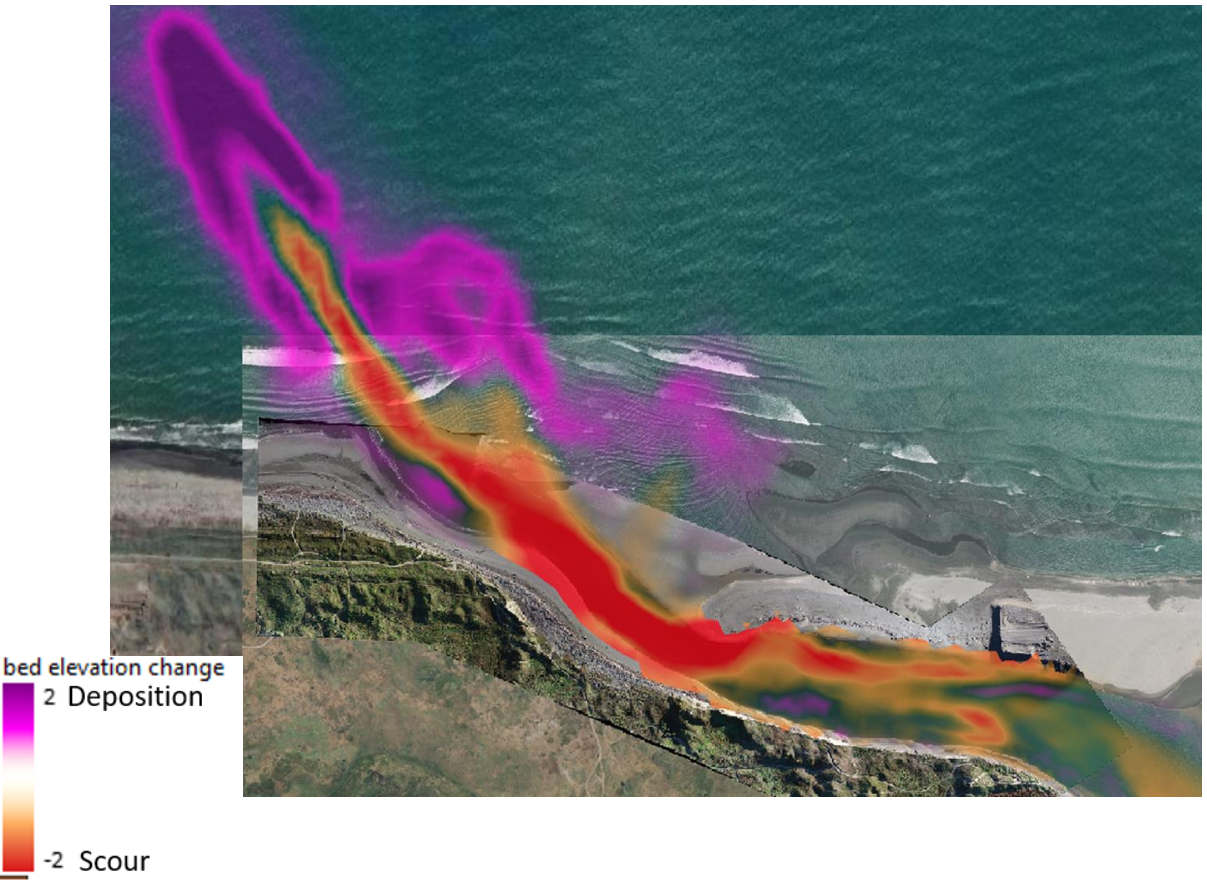
bed elevation change
2 Deposition
-2 Scour

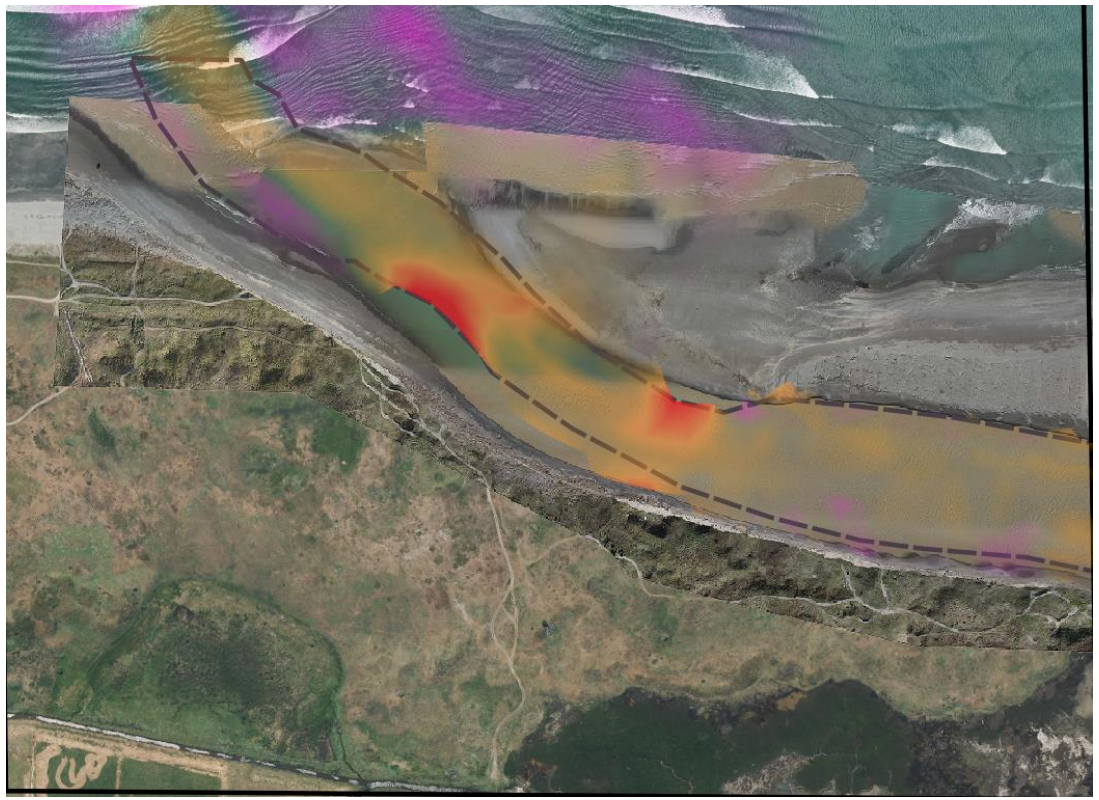
Change in bed profile





Conclusions





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Thank you!
Questions? Patai?

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