The Benthic Ecology of Beaufort's Dyke

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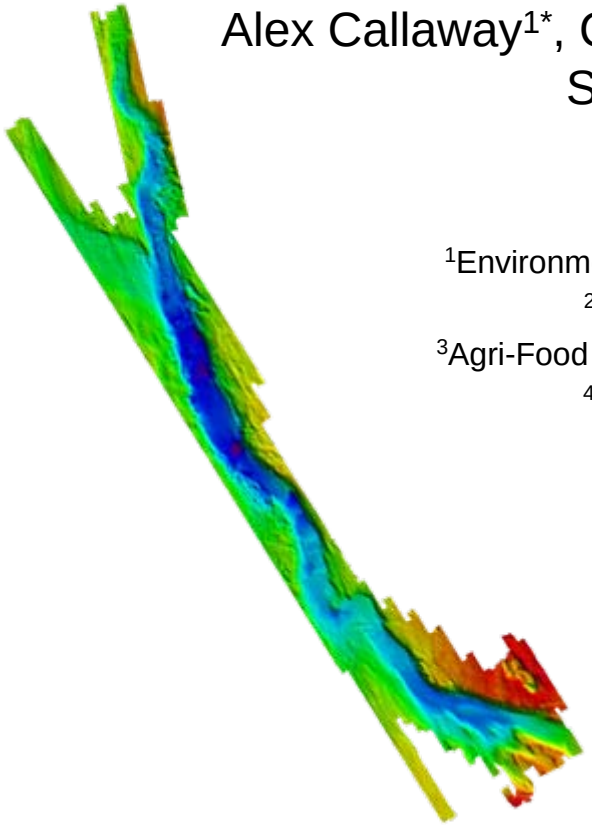
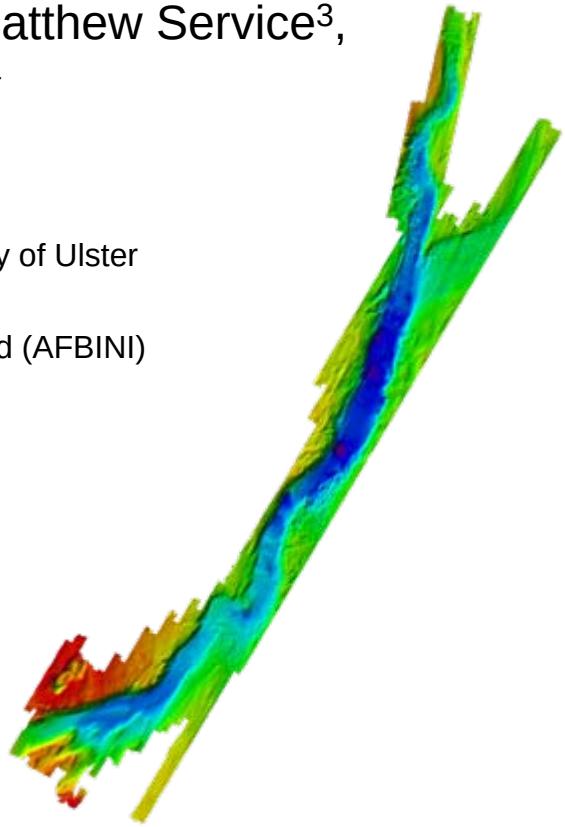
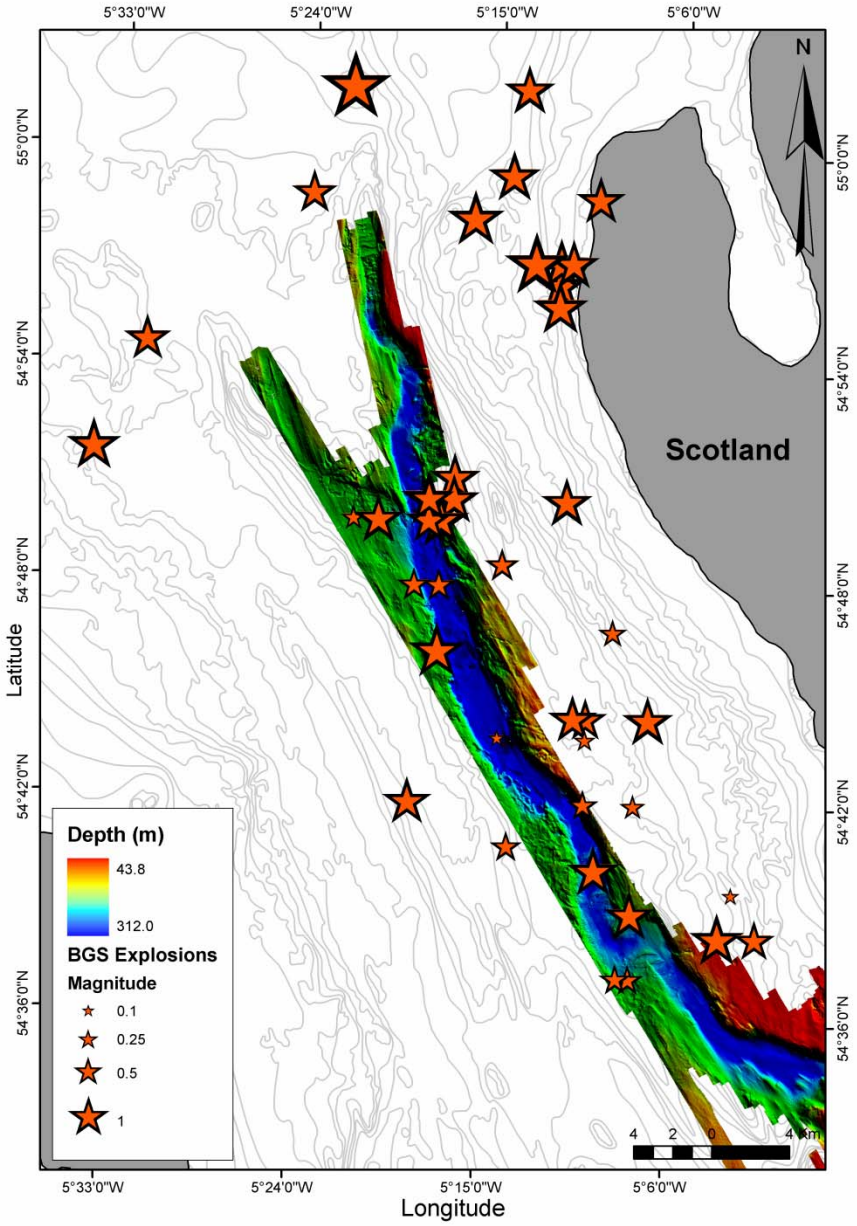




Presentation Aims

- Project Background
- Project Aims
- Methodology and data obtained
- Results and conclusions
- Subsequent objectives

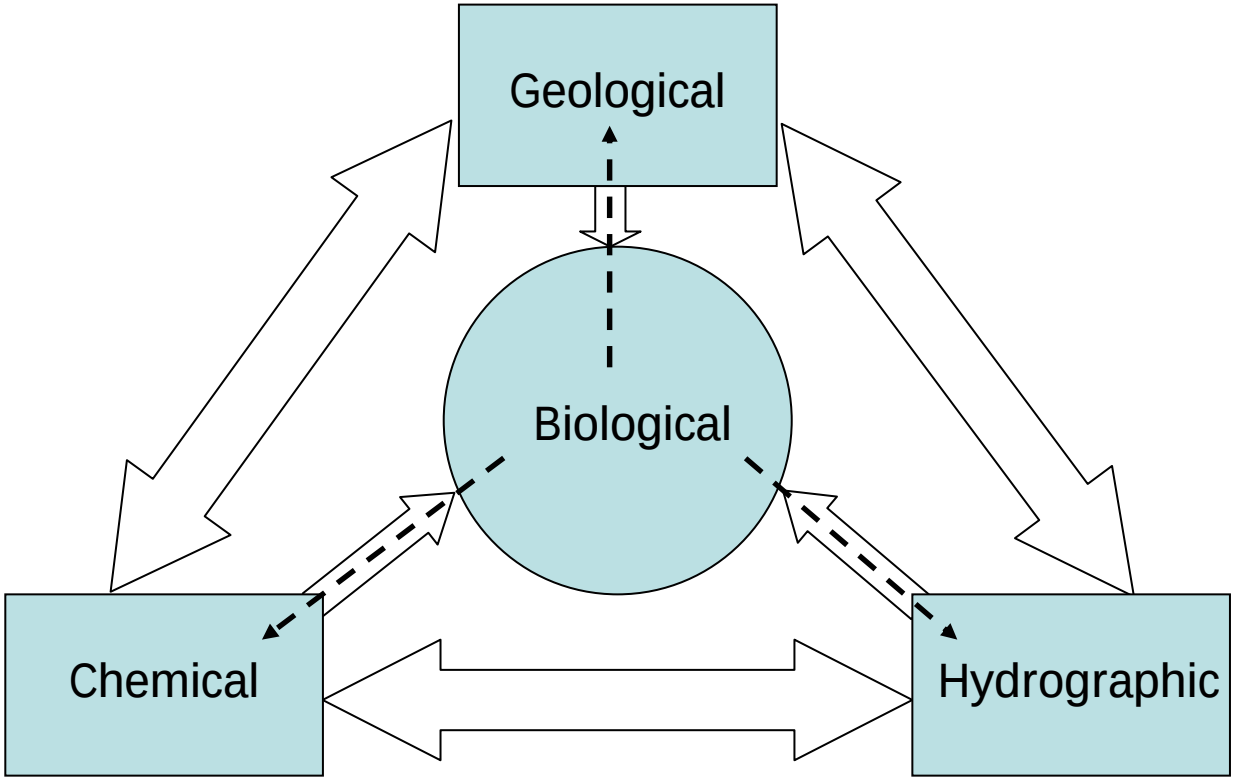


The distribution and magnitude of explosions in the vicinity of Beaufort's Dyke. Adapted from Ford et al., 2005. Analysis of Explosions in the BGS Seismic Database in the Area of Beaufort's Dyke, 1992-2004.

Beaufort’s Dyke

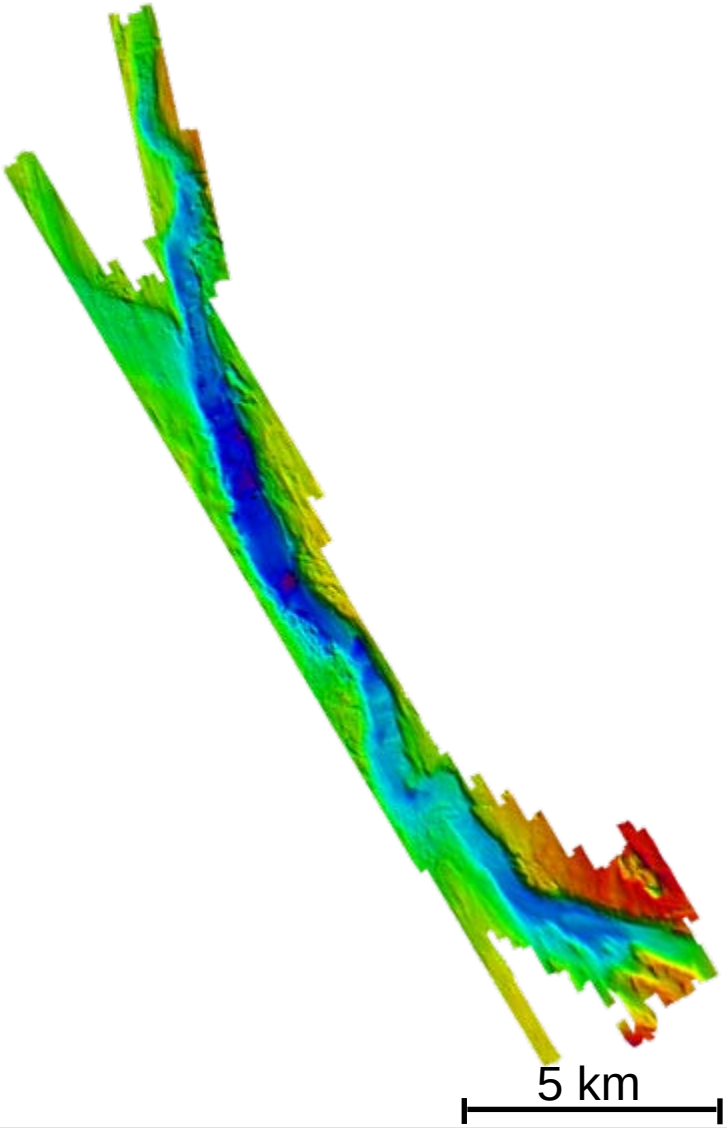
- One of the deepest areas of the European continental shelf
- Munitions’ disposal ground from 1945 – 1972
- First ecological study of the area

Project Aim

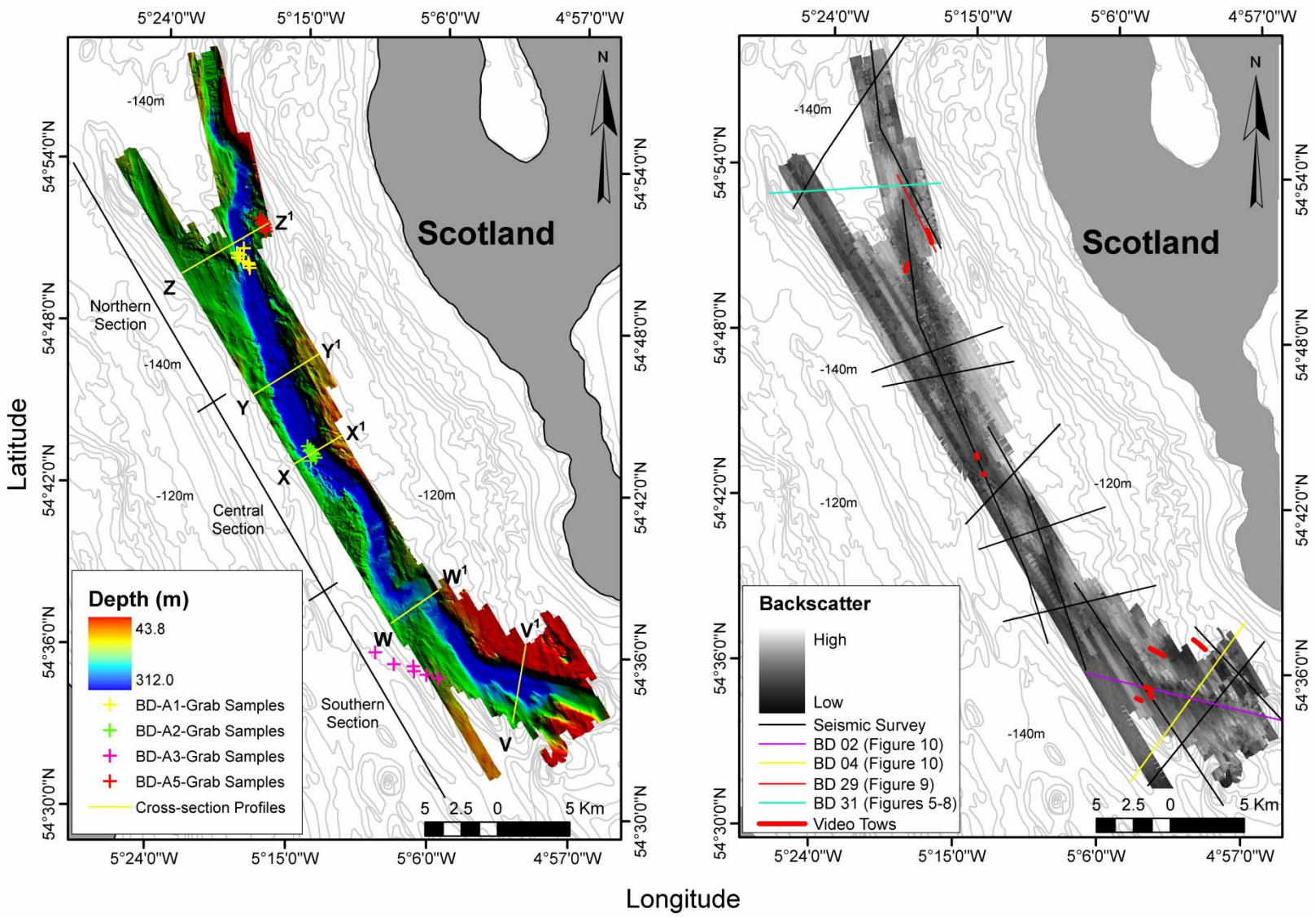


Methods and Data Obtained

Acoustic Surveys from *RV Corystes*

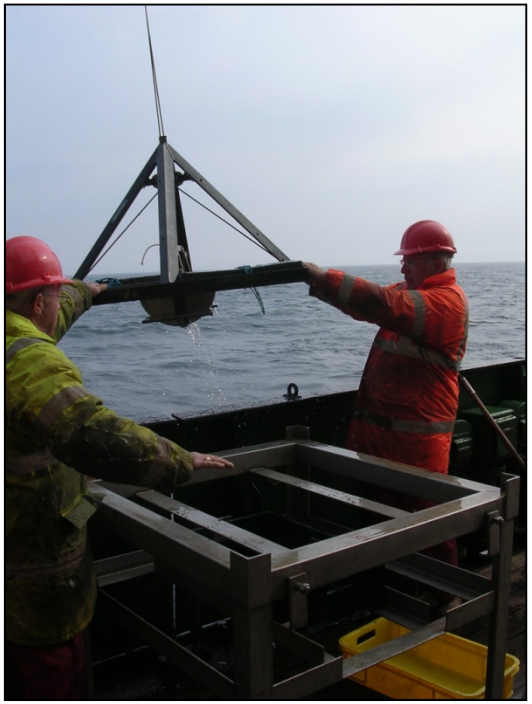


Data Obtained



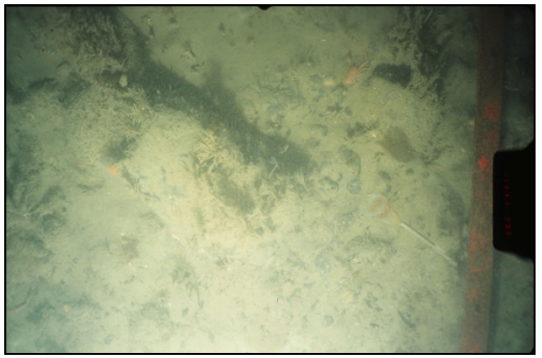
Ground-truthing

- Day grab – sediment and taxa samples

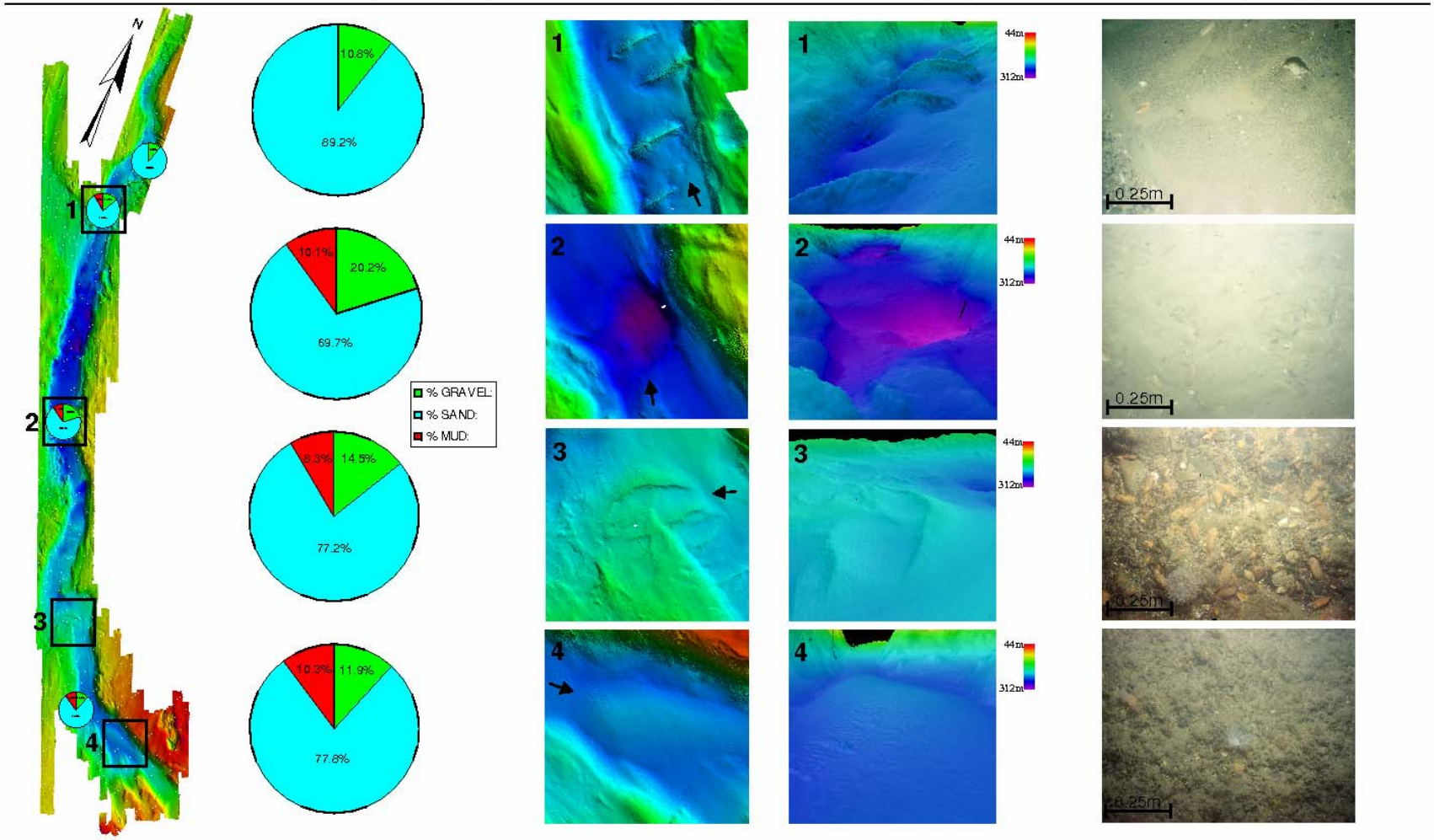


Ground-truthing

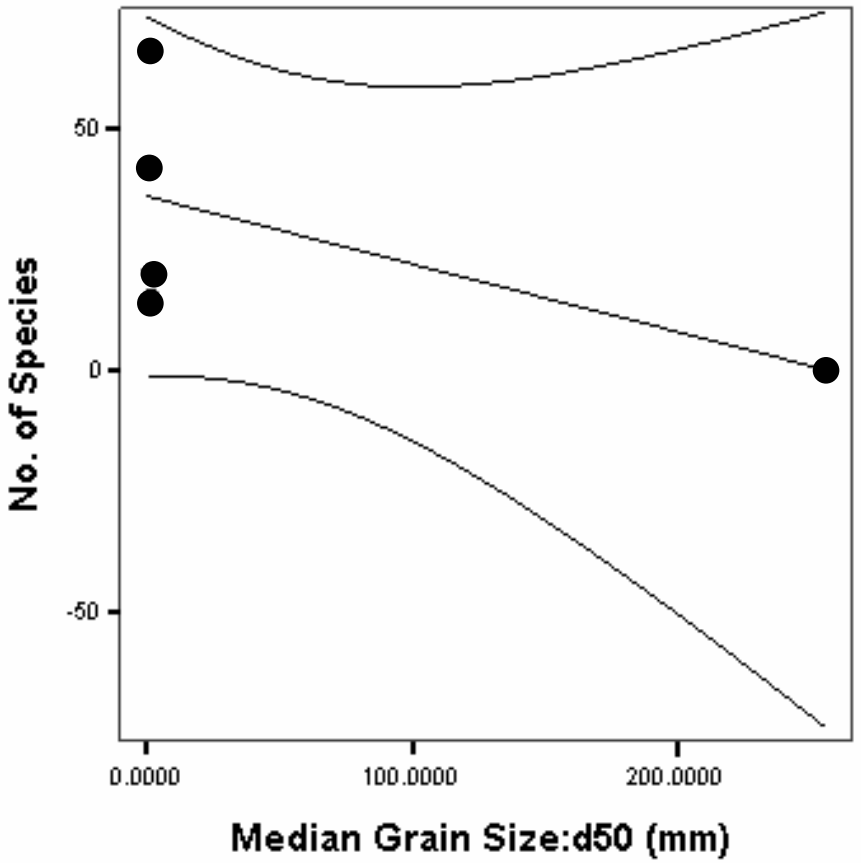
- Underwater video drop frame and tow sled – undisturbed sediment and taxa assemblages



Combining Data

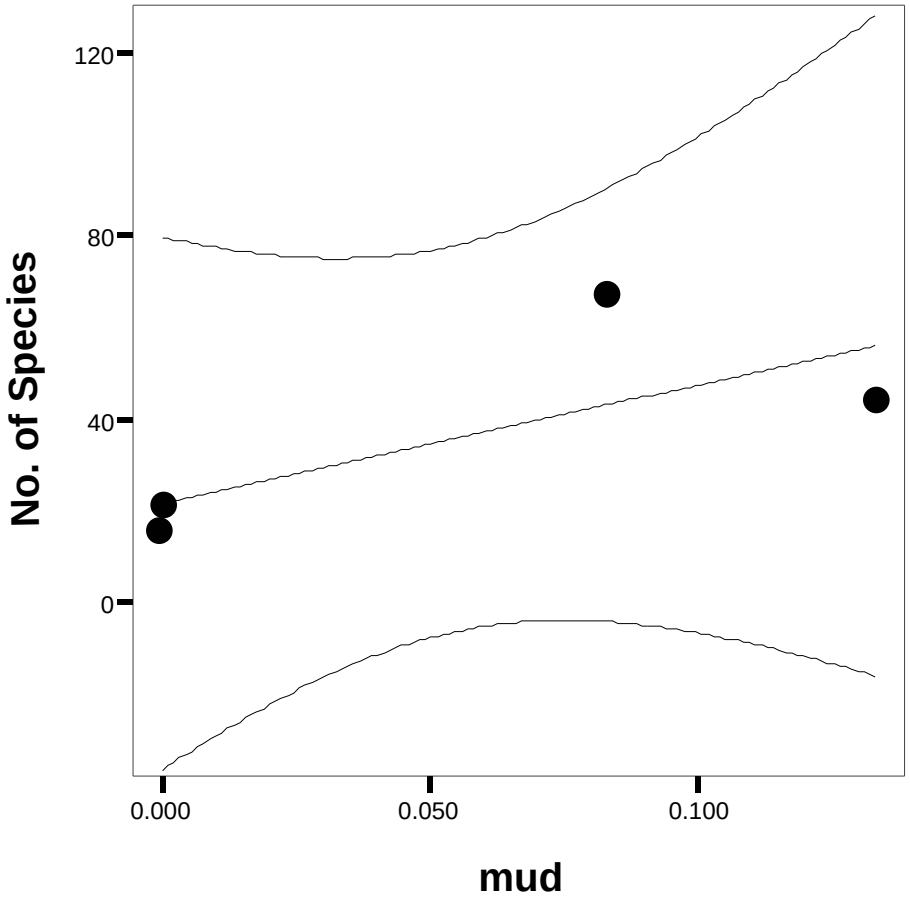


Effects on Infauna



- Negative relationship between particle size and number of species.
- $R^2 = 0.39$

Effect on Infauna

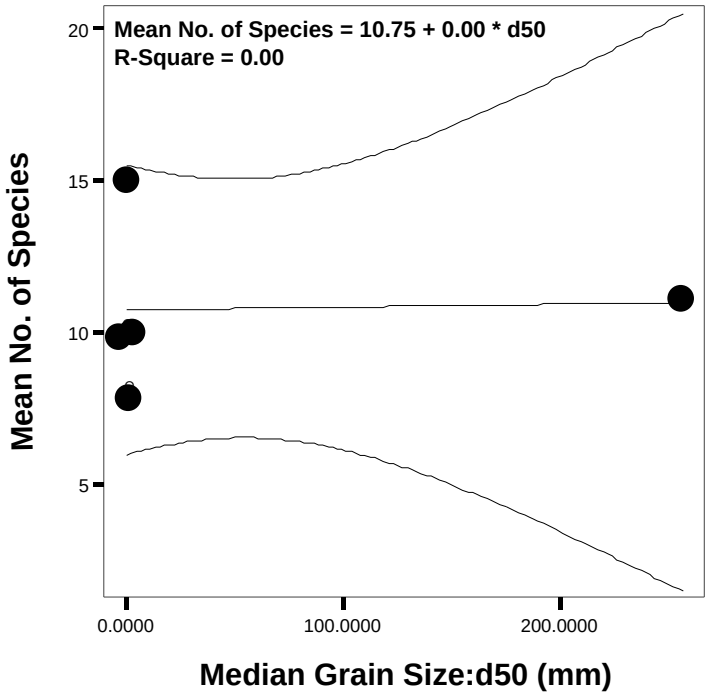


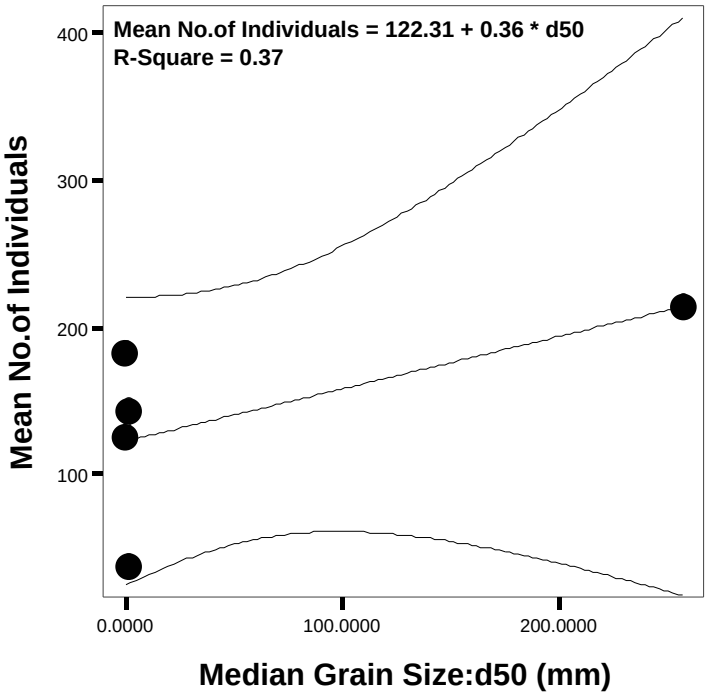
Linear Regression with
95.00% Mean Prediction Interval

No. of Species = 21.76 + 259.19 * mud
R-Square = 0.53

- Positive relationship between mud content and number of species
- $R^2 = 0.53$

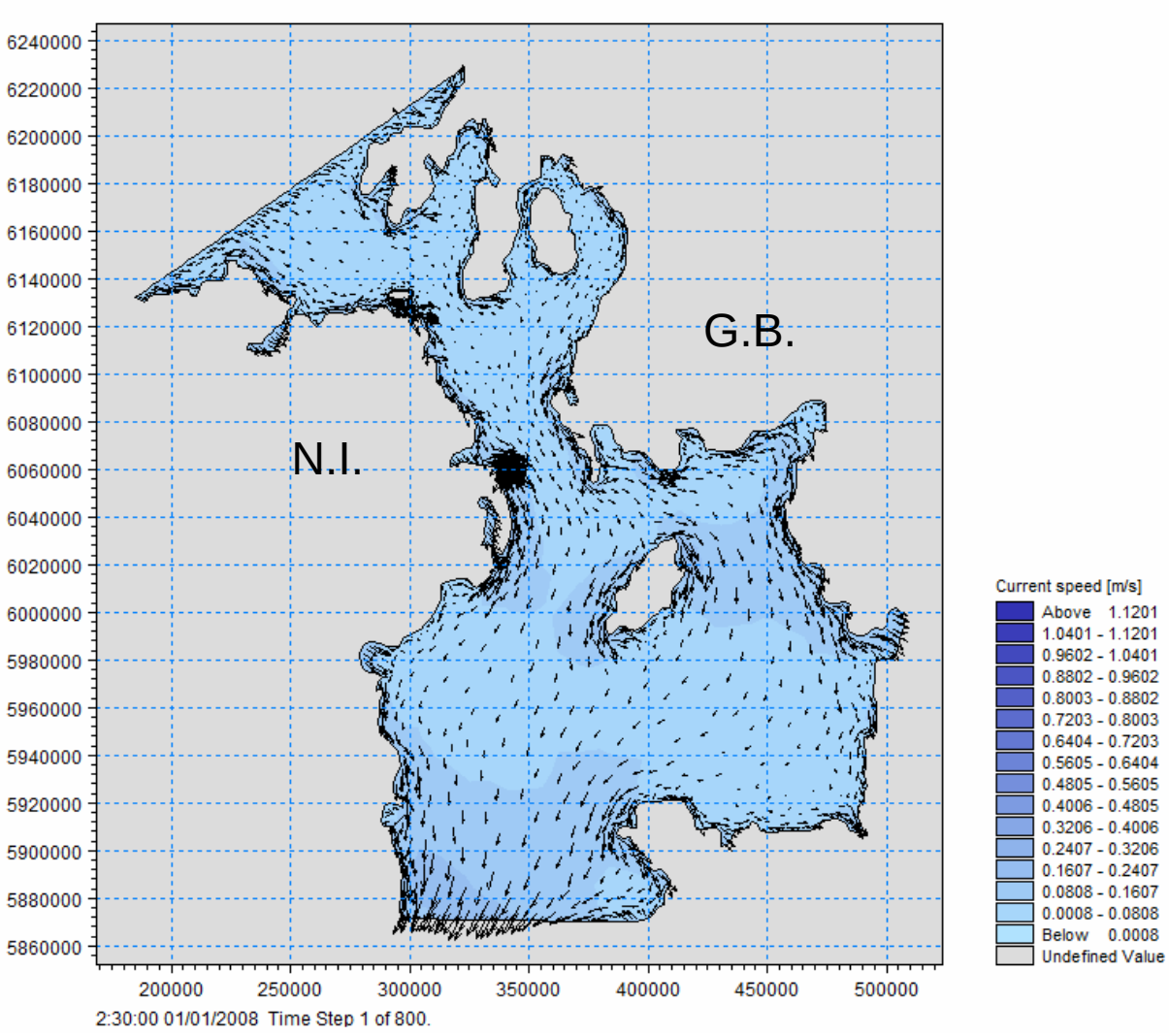
Effects on Epifauna



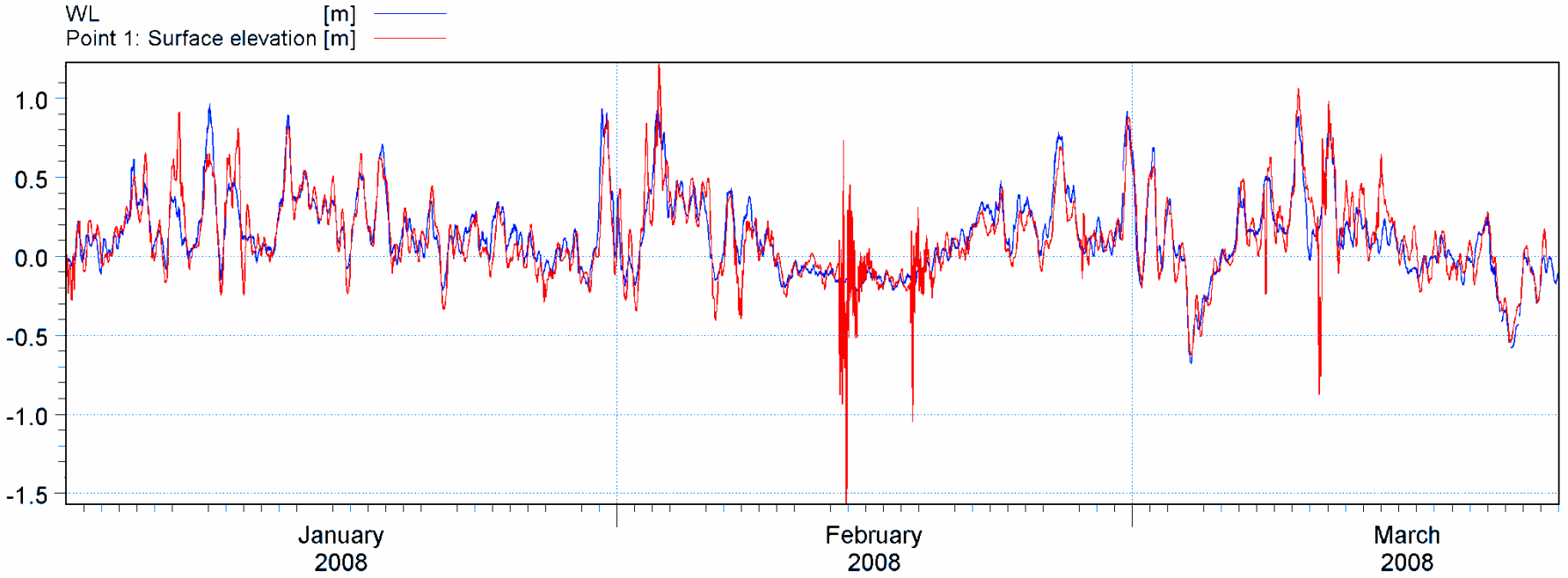


- No relationship between particle size and number of species. $R^2 = 0.00$
- Weak relationship between particle size and number of individuals. $R^2 = 0.37$

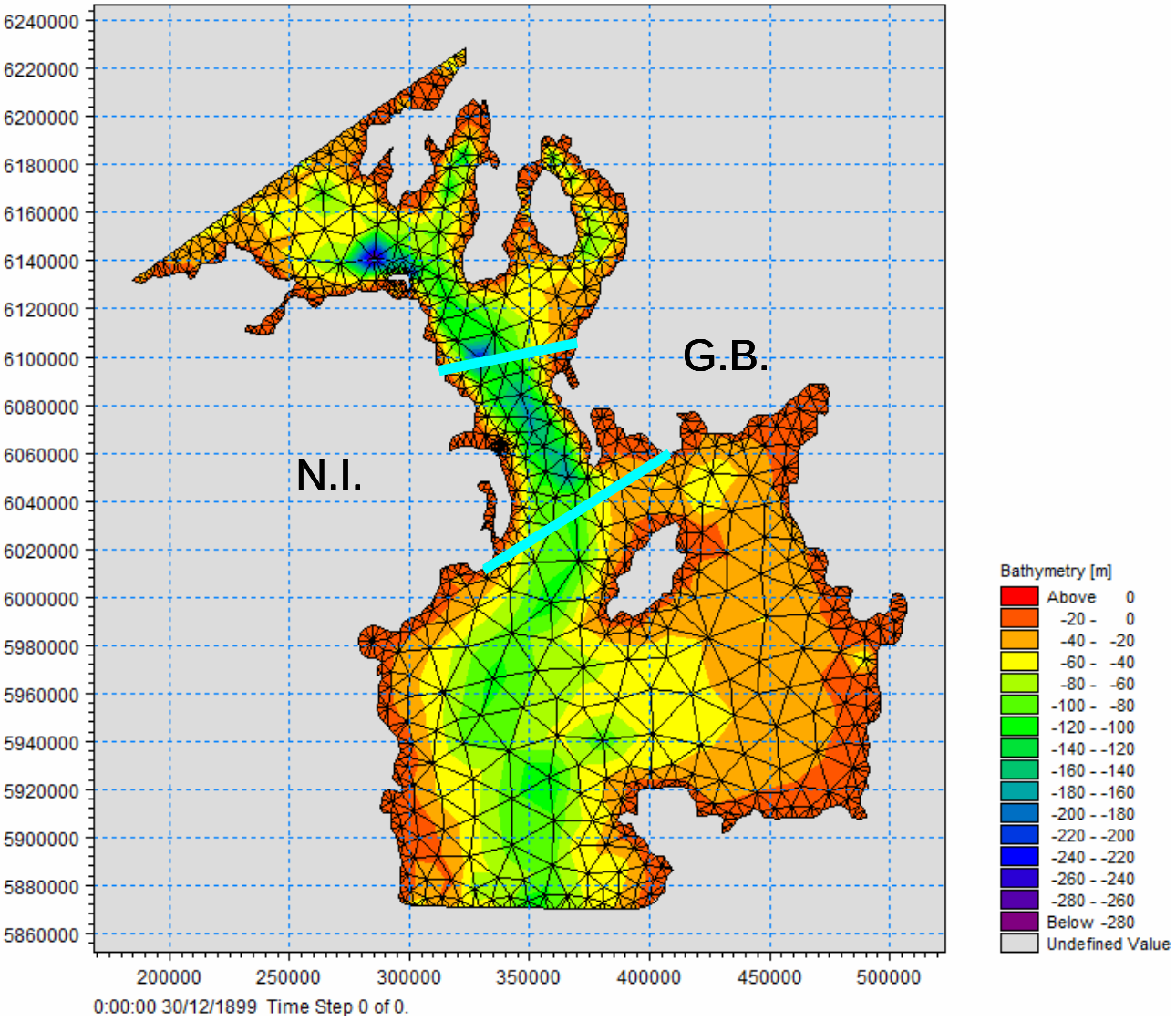
Regional Model



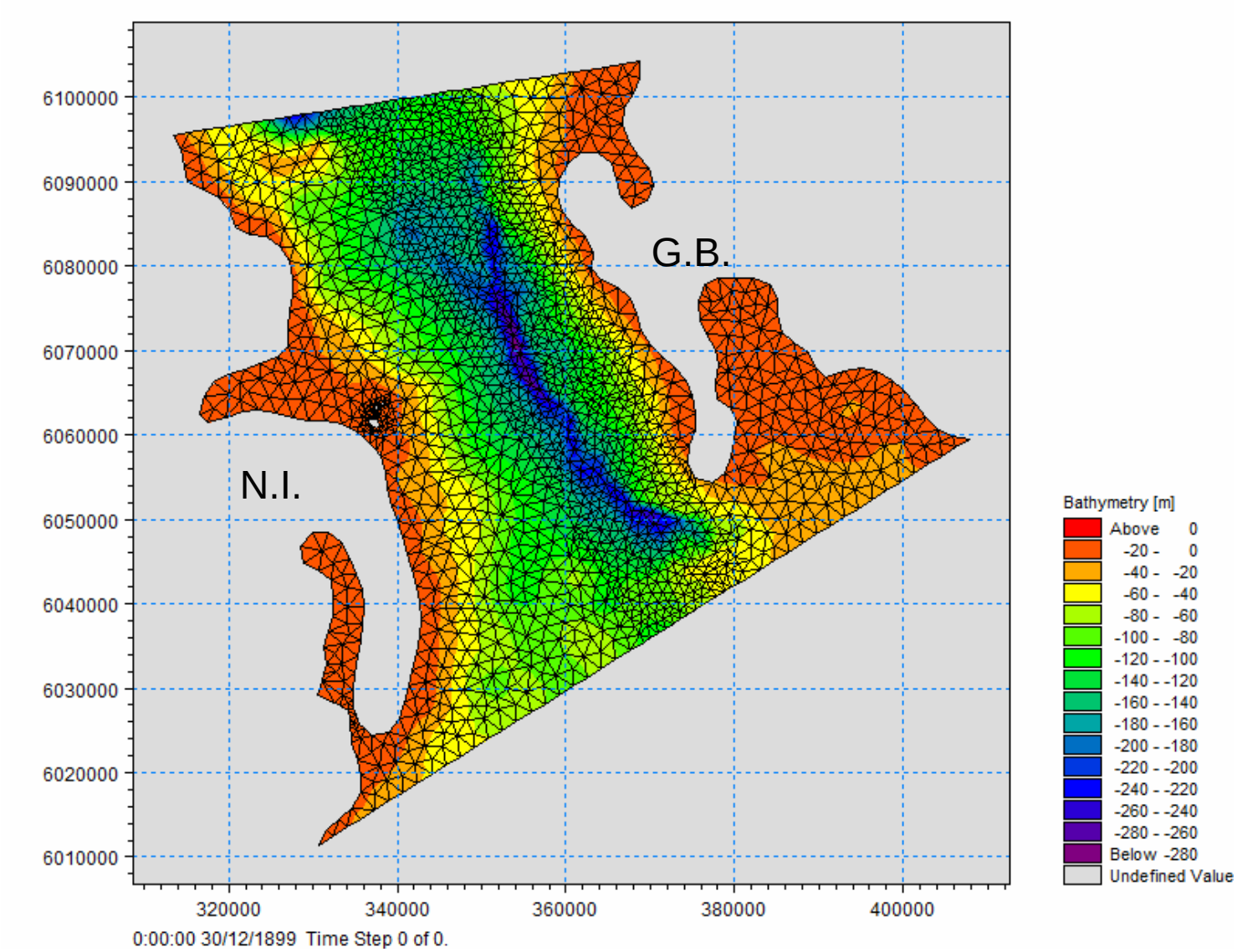
Calibration



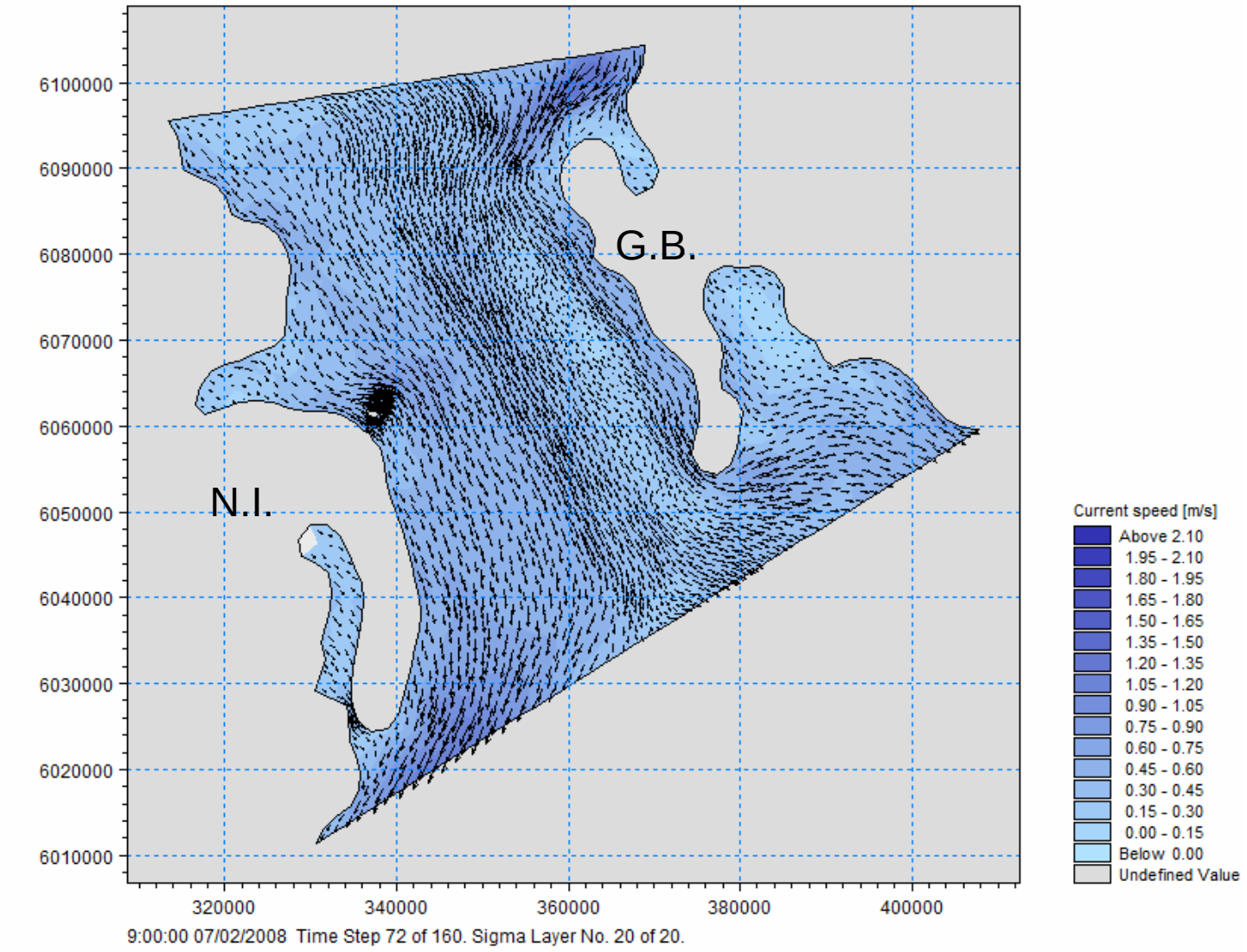
Boundary Extraction



Interpolated Mesh



Local Model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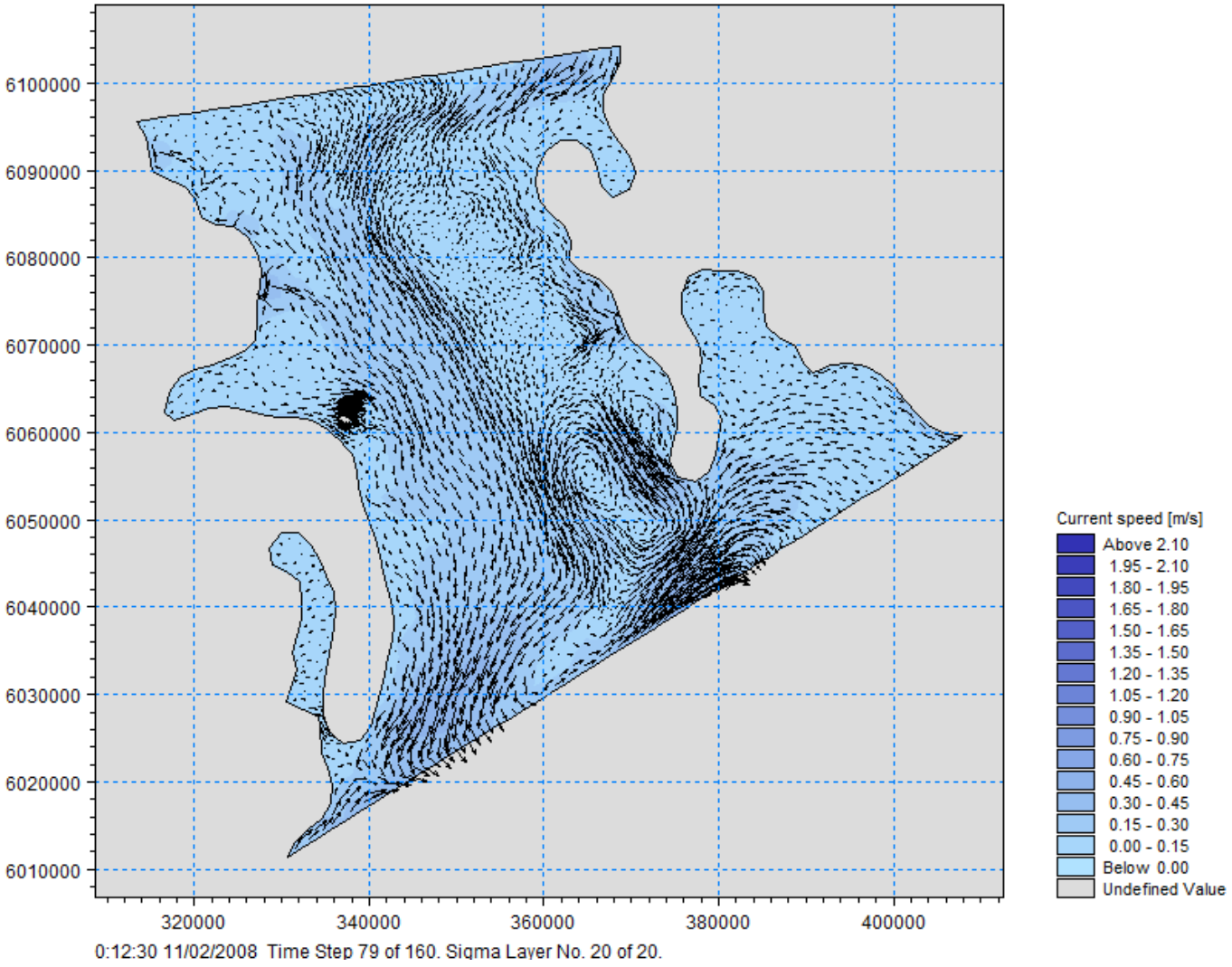
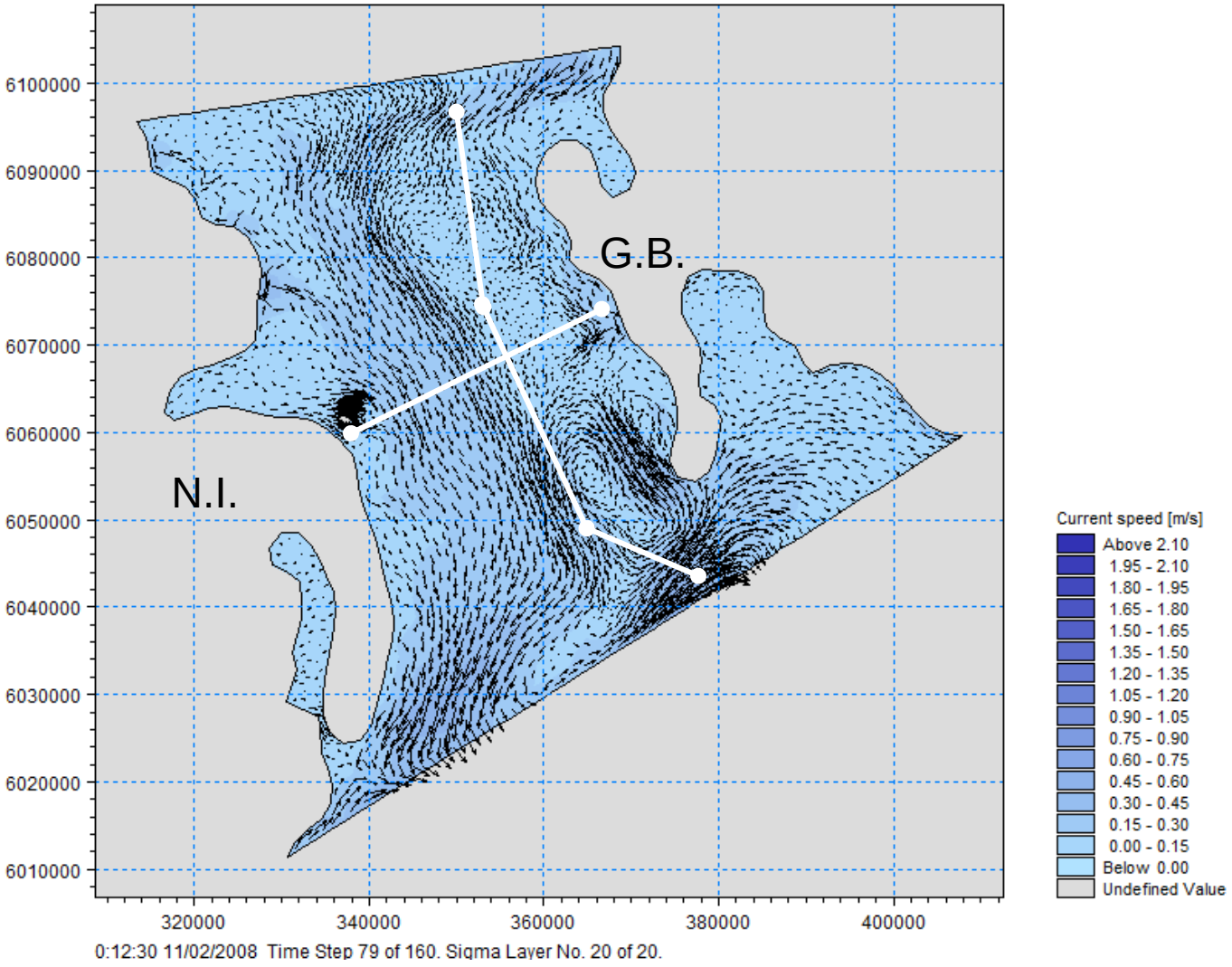
G.B.
N.I.
9:00:00 07/02/2008 Time Step 72 of 160. Sigma Layer No. 20 of 20.
Current speed [m/s]
Above 2.10
1.95 - 2.10
1.80 - 1.95
1.65 - 1.80
1.50 - 1.65
1.35 - 1.50
1.20 - 1.35
1.05 - 1.20
0.90 - 1.05
0.75 - 0.90
0.60 - 0.75
0.45 - 0.60
0.30 - 0.45
0.15 - 0.30
0.00 - 0.15
Below 0.00
Undefined Value

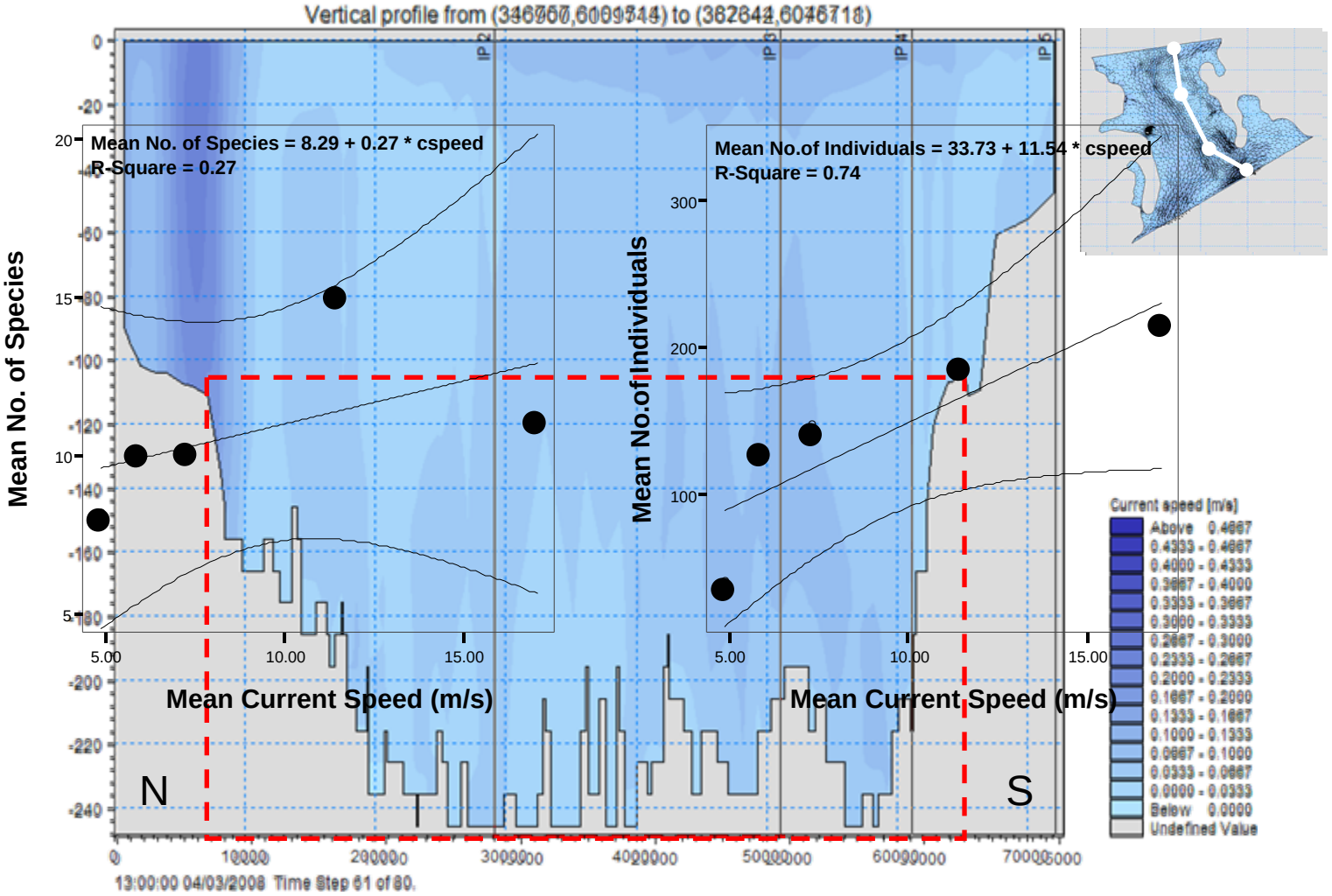
Surface Current Patterns



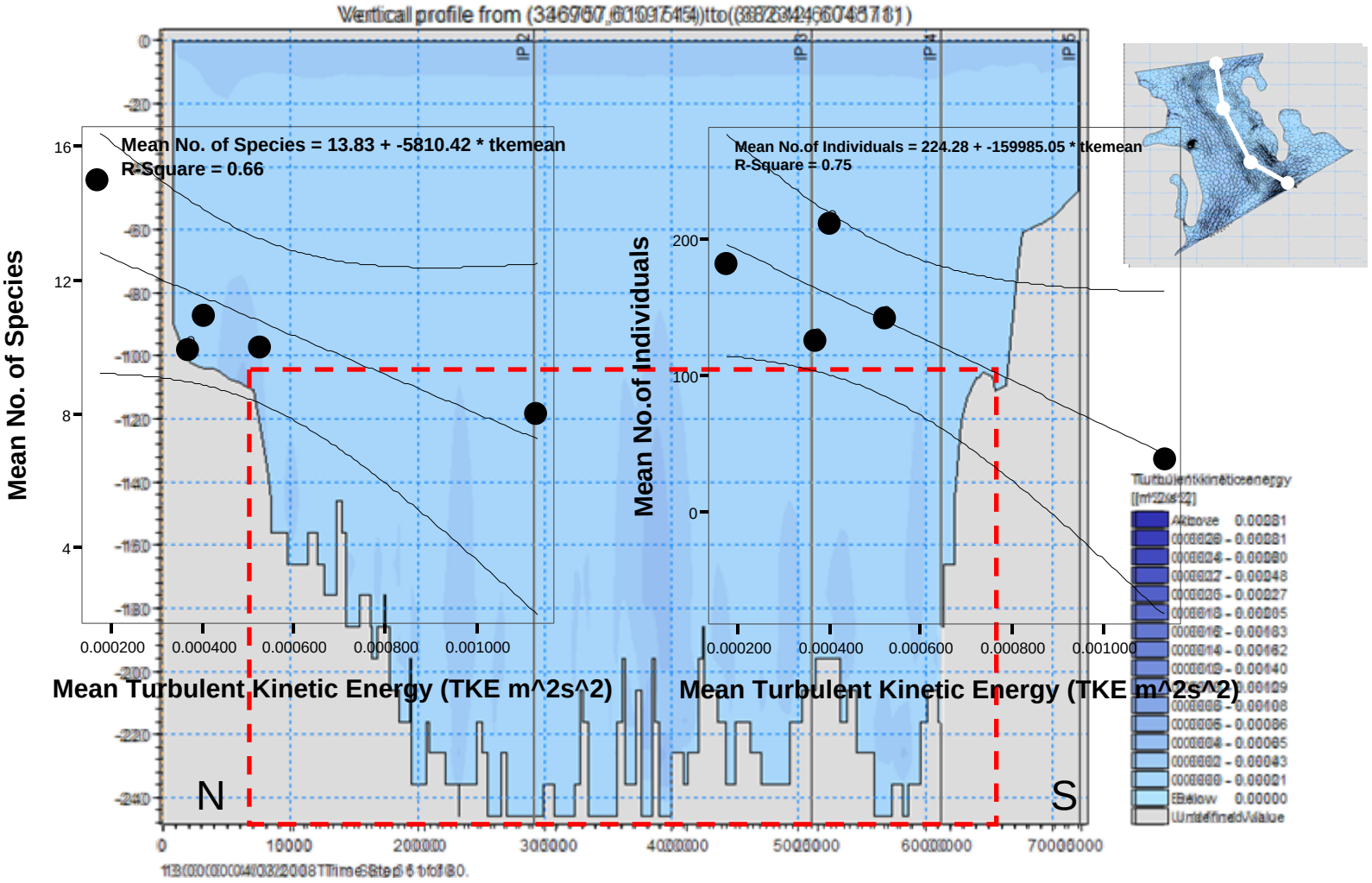
Model Profiles



Current Speed



Turbulent Kinetic Energy (TKE)



Conclusions

- Complex surface current patterns reproduced.
- Flow structure of water column revealed by 3D model.
- Dominant southerly flow over model period.
- Major effects of hydrodynamics on sediment probably occurred when sea level was lower.

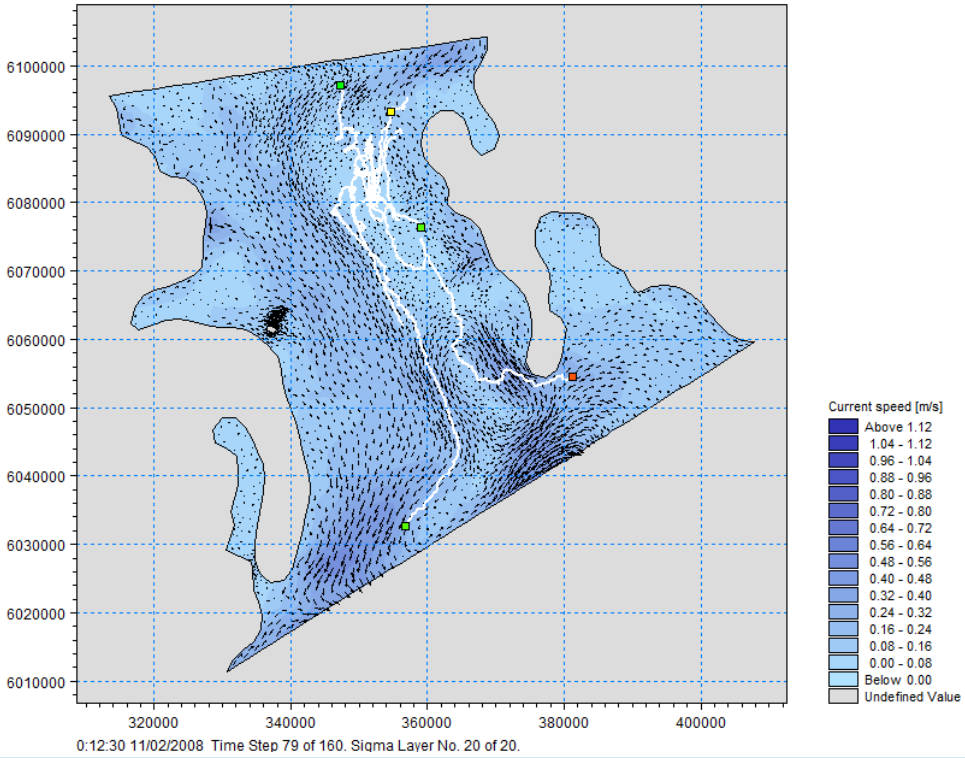
Conclusions

- Sediment exerts primary control on Infauna.
- Current speed effects negligible on diversity but marked on populaton
- Turbulence effects strong in certain areas
- Depositional environment overall

Future Work

Sediment contamination as a result of munitions dumping around Beaufort's Dyke

- Heavy metal concentrations
- Source or sink?



I would like to thank...

- Department for Employment and Learning for financial support

- AFBI for project support

- The Captain and crew of *RV Corystes* for their help, patience and tolerance

- Richard Hartley for GRADISTAT analysis

- DHI for provision of MIKE Labkit to A. Callaway

Thank you for Listening

Any Questions?