Listening for Canaries in a Tornado:

Acoustic Monitoring for Harbour Porpoise at the FORCE Site.

Jason Wood[1], Anna Redden[2], Dom Tollit[1], Jeremy Broome[2], Cormac Booth[3]

1) *SMRU Canada Ltd.*
2) *Acadia Centre for Estuarine Research*
3) *SMRU Marine Ltd.*

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Background

- Harbour porpoise
  - -Coastal N hemisphere species
  - -Species of concern due to disturbance sensitivity and protected status
- Potential impacts at tidal sites
  - -Collision
  - -Reef/barrier effect
  - -Acoustic disturbance

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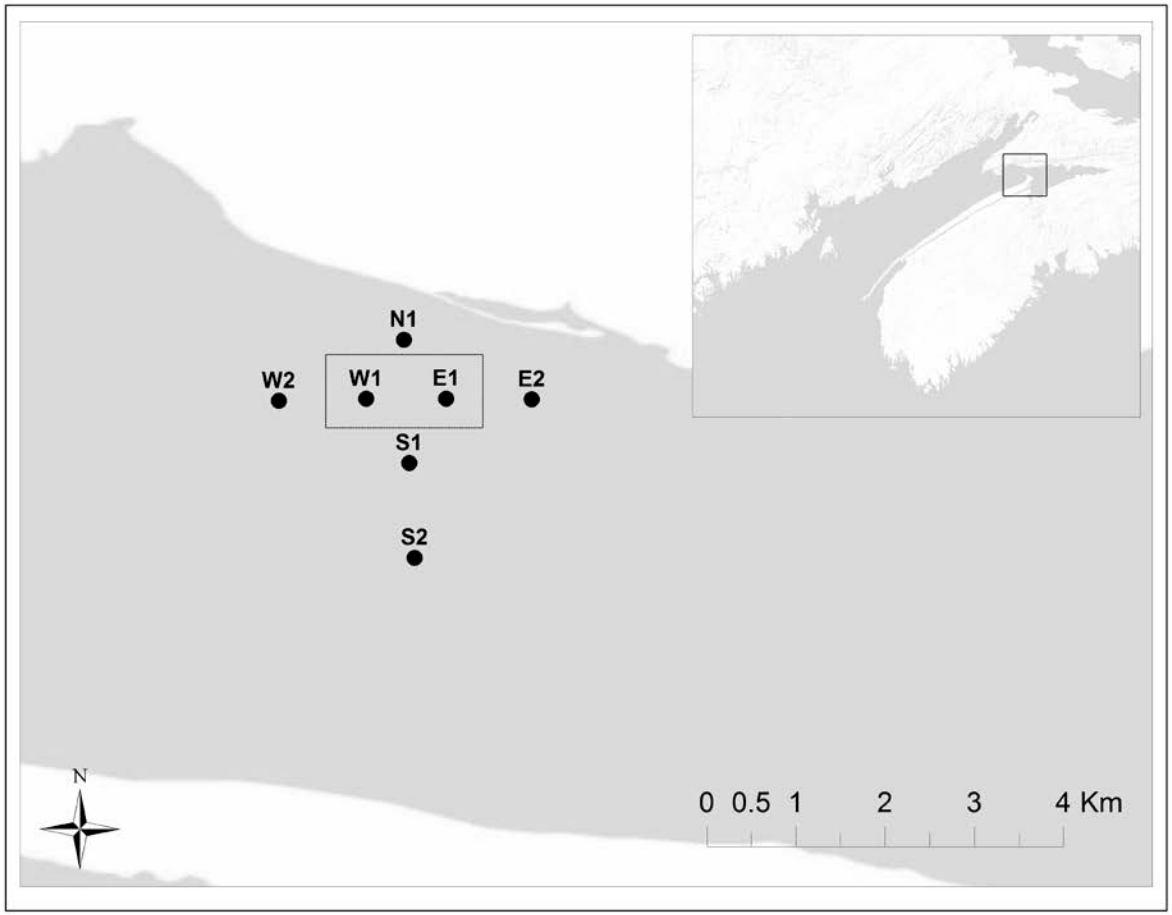
Data Collection

- C-POD acoustic click detector
- 25-85 m depth
- May – Nov 2011/2012
- 1,342 days of data



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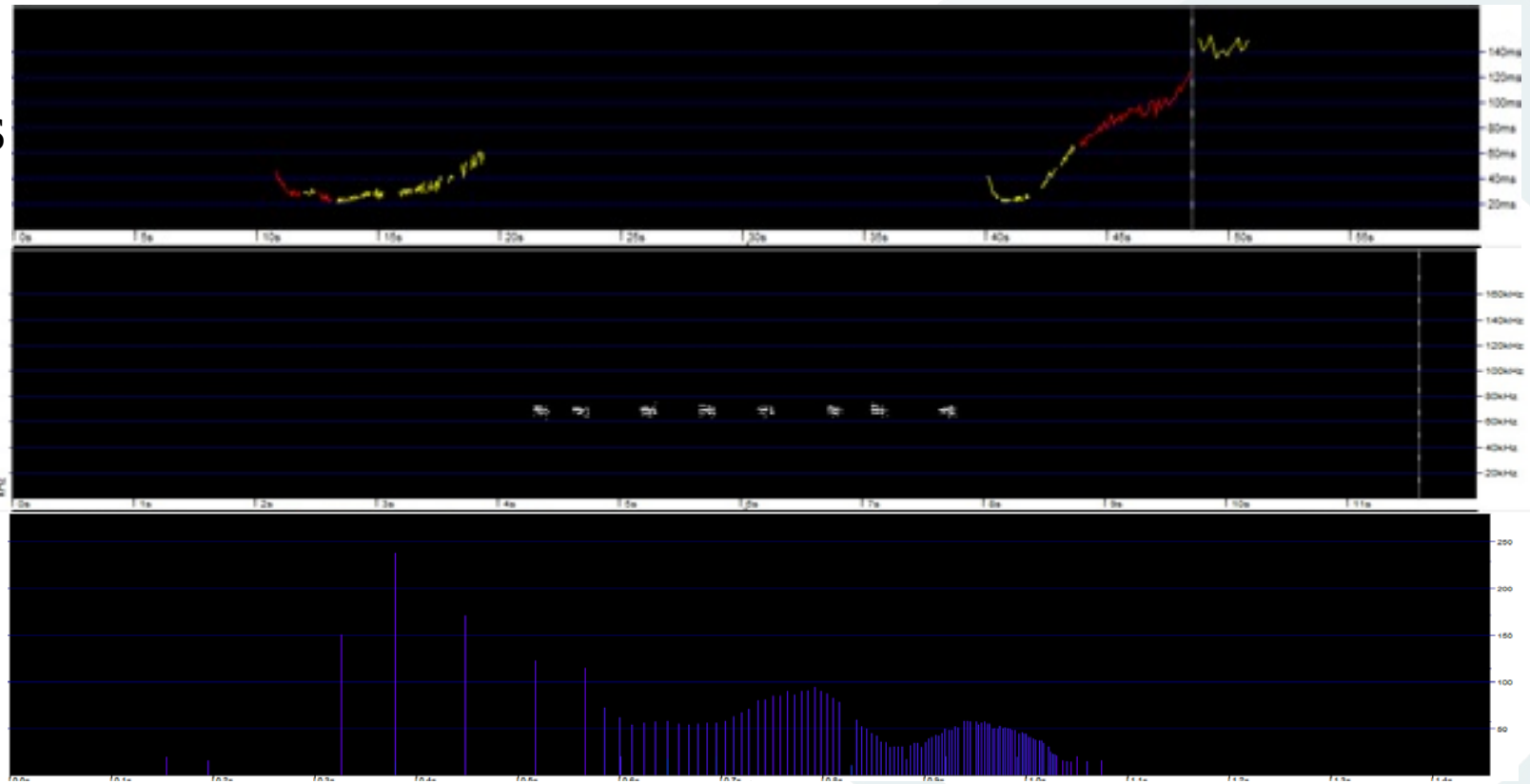
Data Analysis: Click Classification

WUTS

Vemco

Porpoise



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Data Analysis: GAM/GEE

Candidate Covariate	Retained in Model?
Pod ID	No - due to singularities with pods 1616 and 1880 always being in the same location
Location	Yes
Area	No - due to singularities with location (only W1 & E1 in FORCE area)
Click Max	Yes
% Time Lost (sediment noise)	Yes
Day Night Index	Yes
Julian Day	Yes
Temperature	No - due to collinearity with Julian Day
Tidal Velocity	Yes
Tidal Height	Yes

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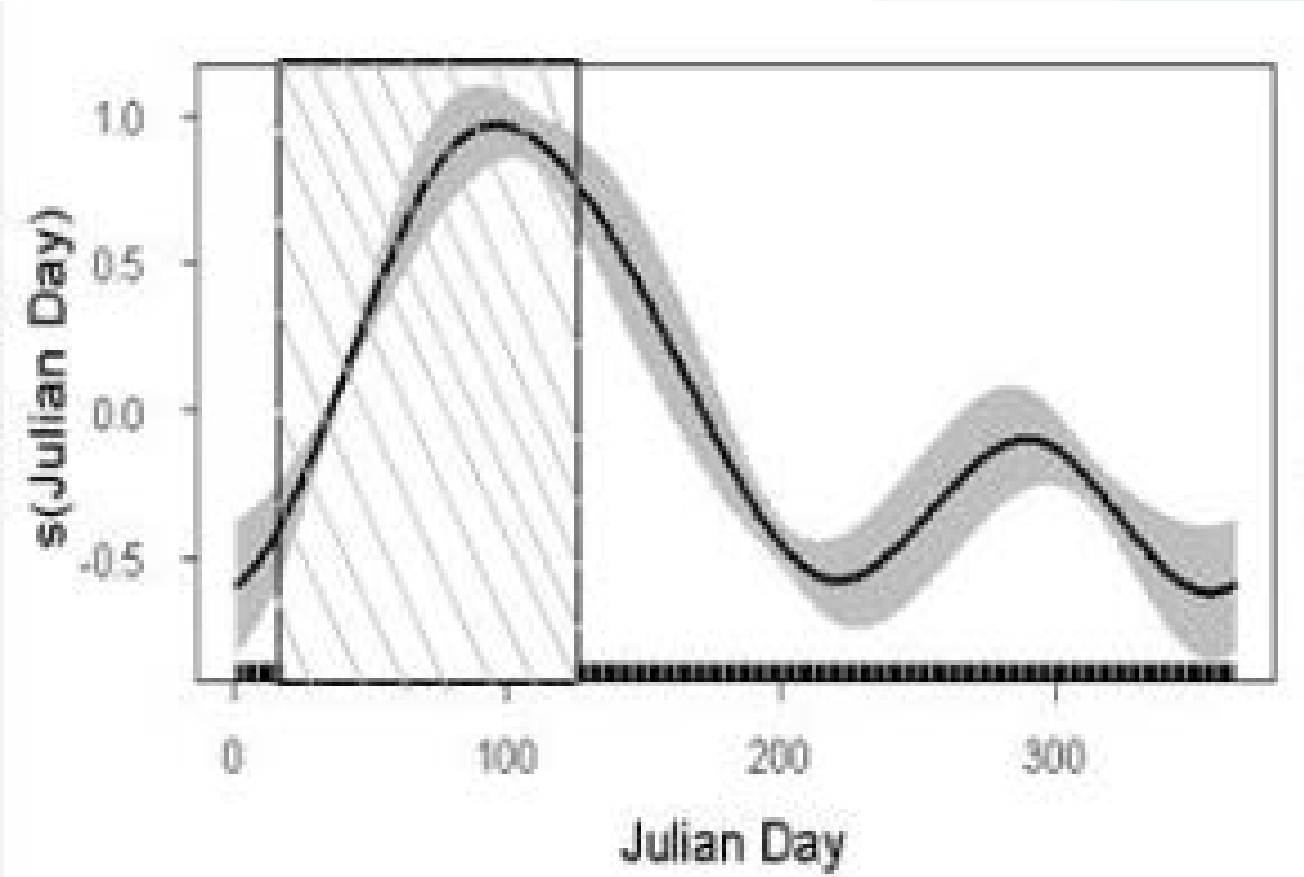
Results: Seasonality



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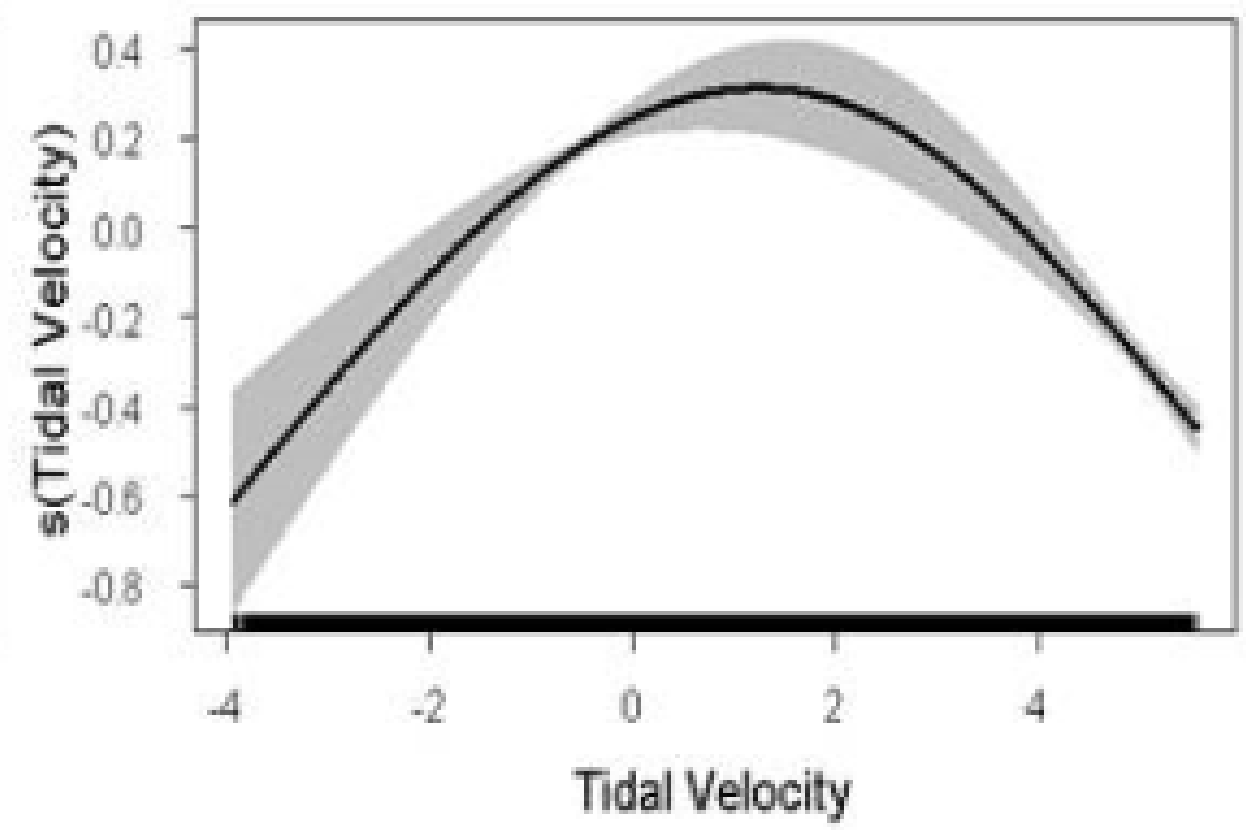
Results: Tidal Velocity



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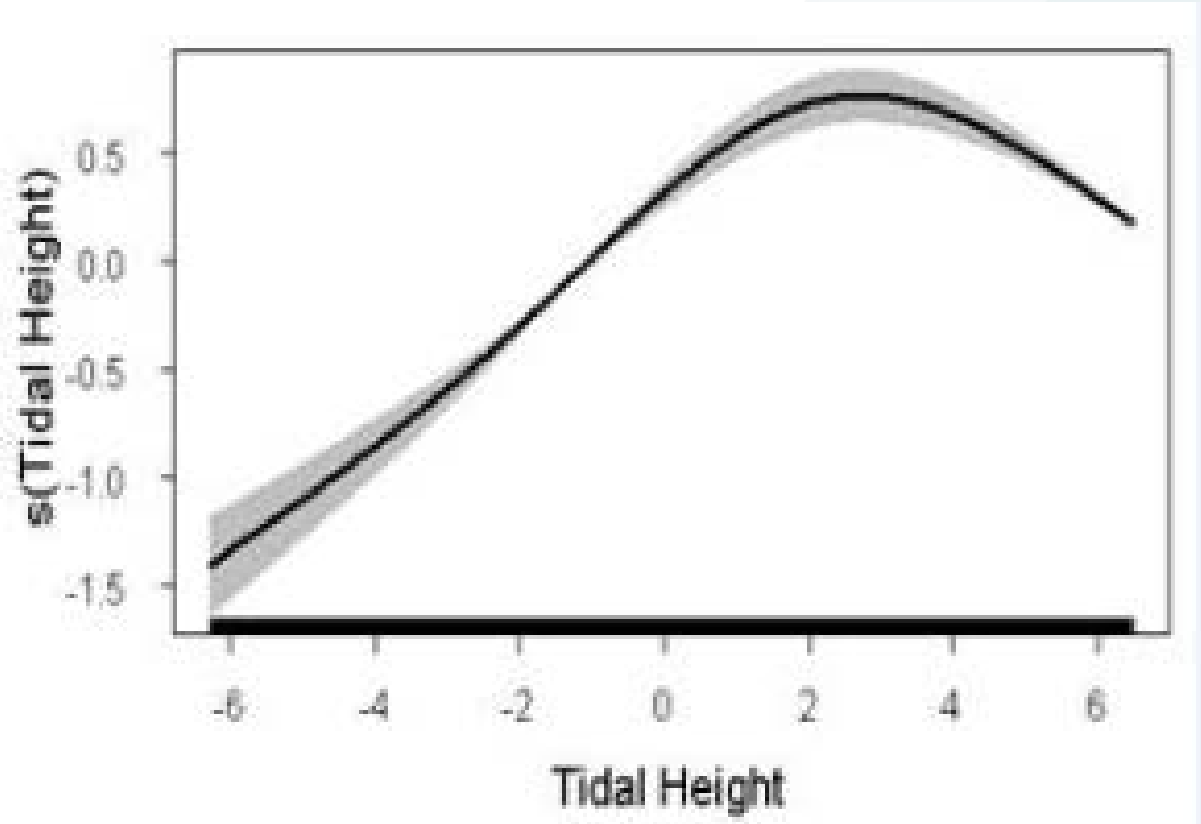
Results: Tidal Height



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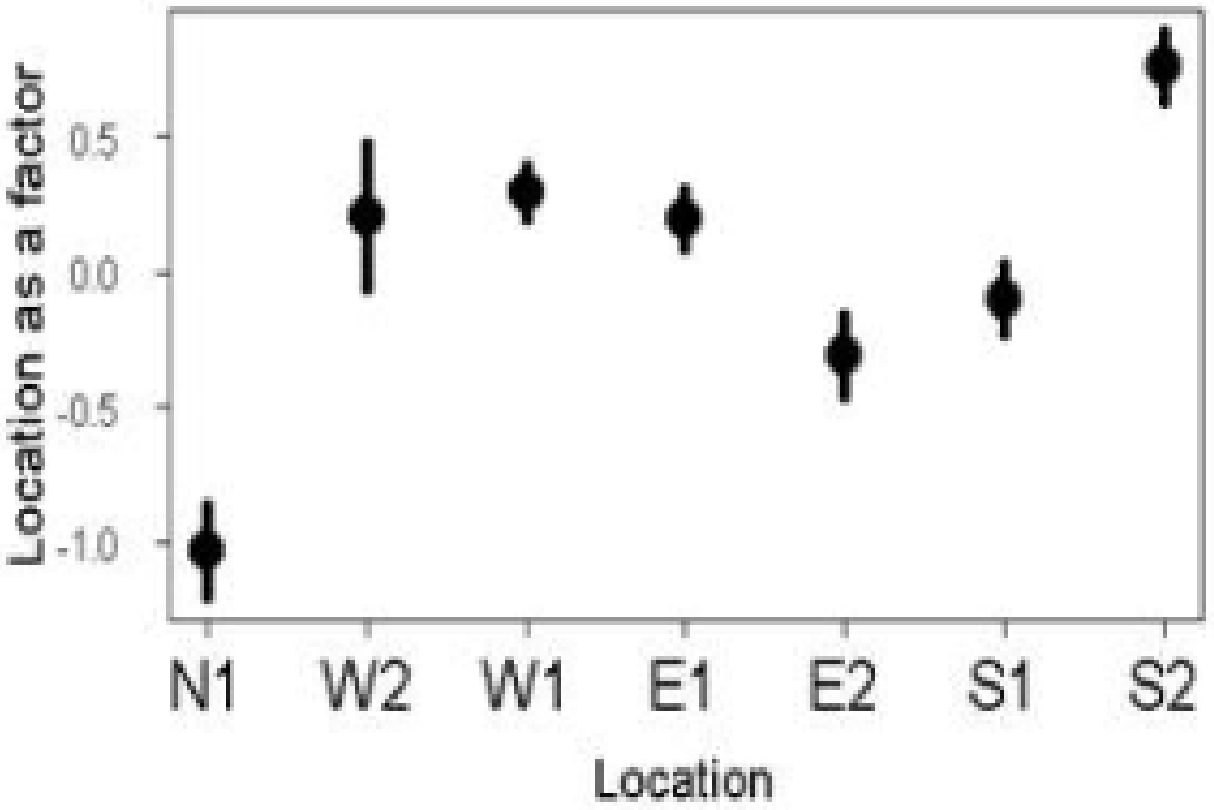
Results: Location (Depth)



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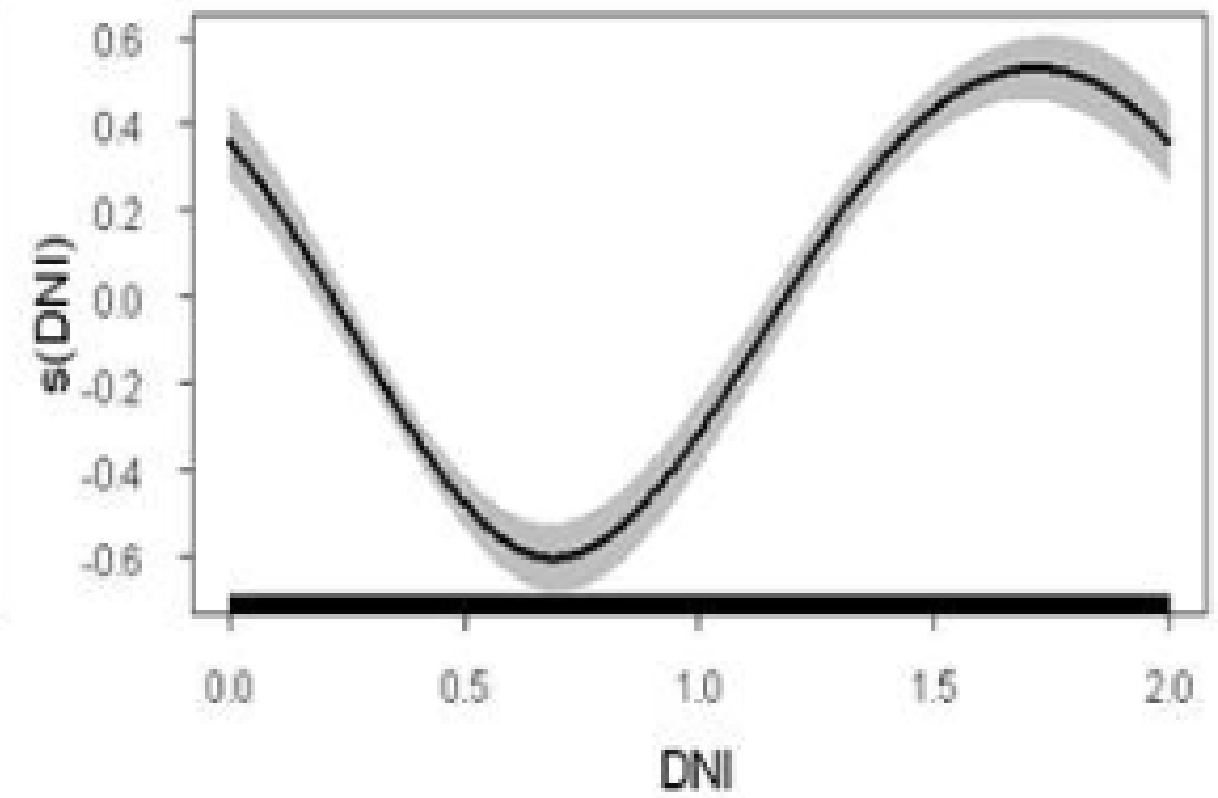
Results: Diel Patterns



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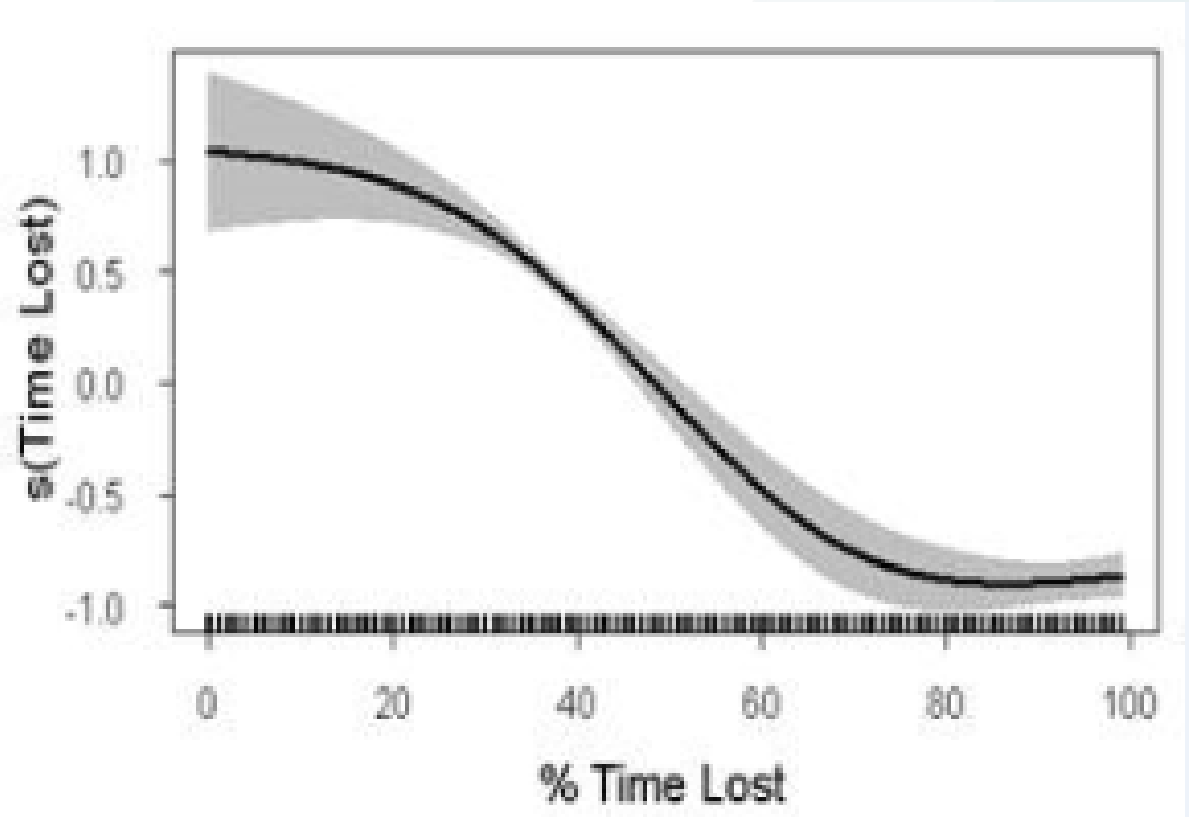
Results: Bedload Noise



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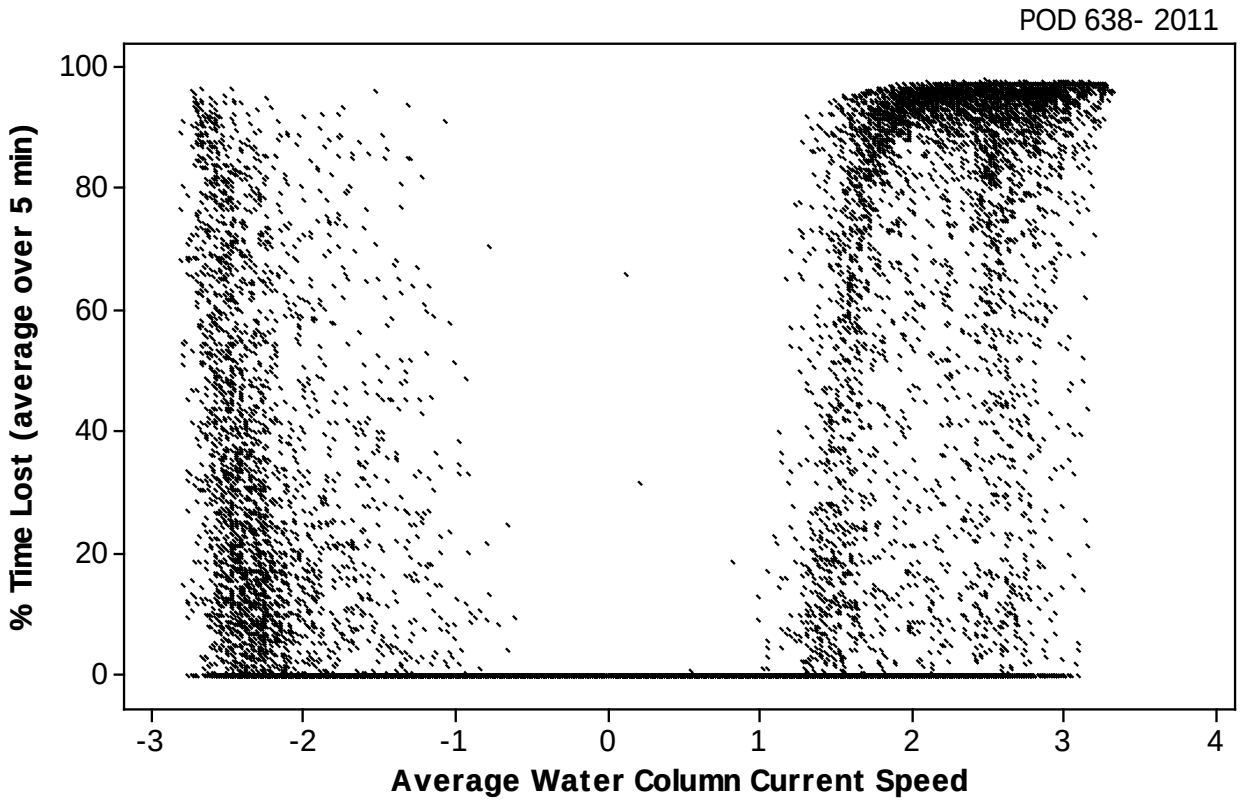
Discussion: Bedload Noise



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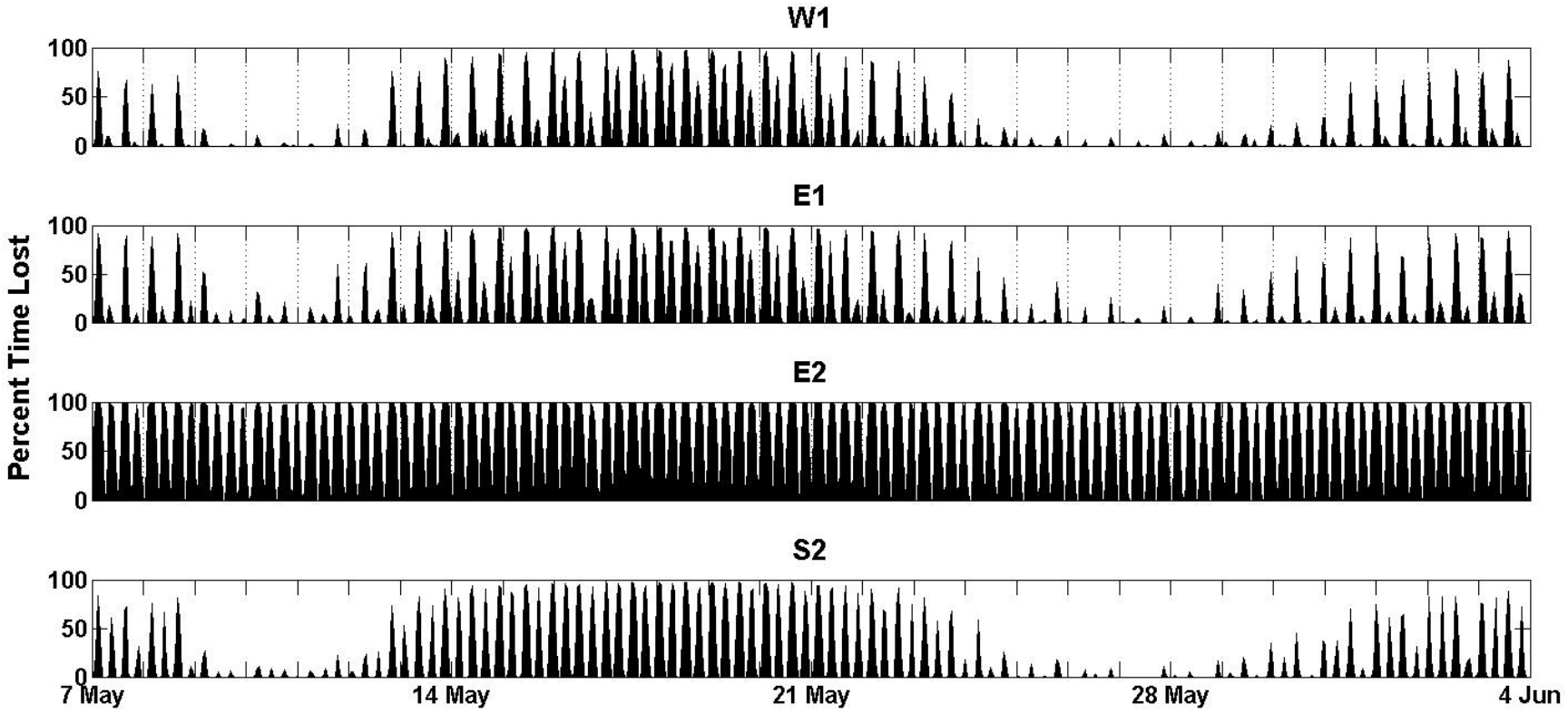
Discussion: Location



Spring Tides | Neap Tides

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Conclusions

- Harbour porpoise habitat use
  -Tidal velocity/height vs. turbulence/upwelling
- Acoustic monitoring of tidal sites can be done
  -mooring design
  -location of units
  -height of units
  -statistical models

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