Agri-Food and Biosciences Institute as Data Collectors and Data Consumers to enhance sustainability of the Irish Sea *Nephrops norvegicus* (L.) industry

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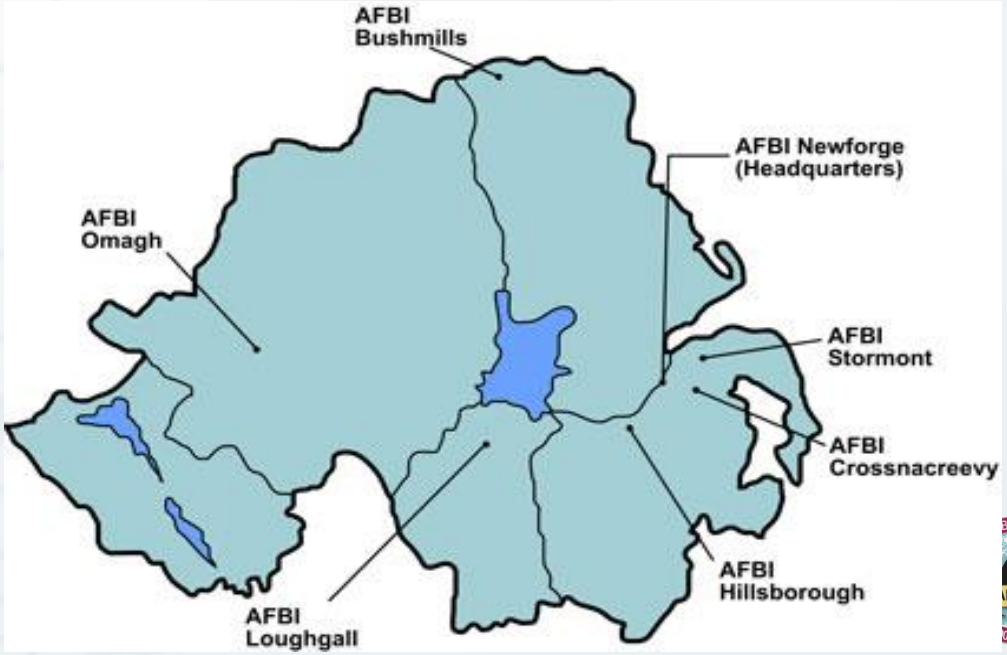
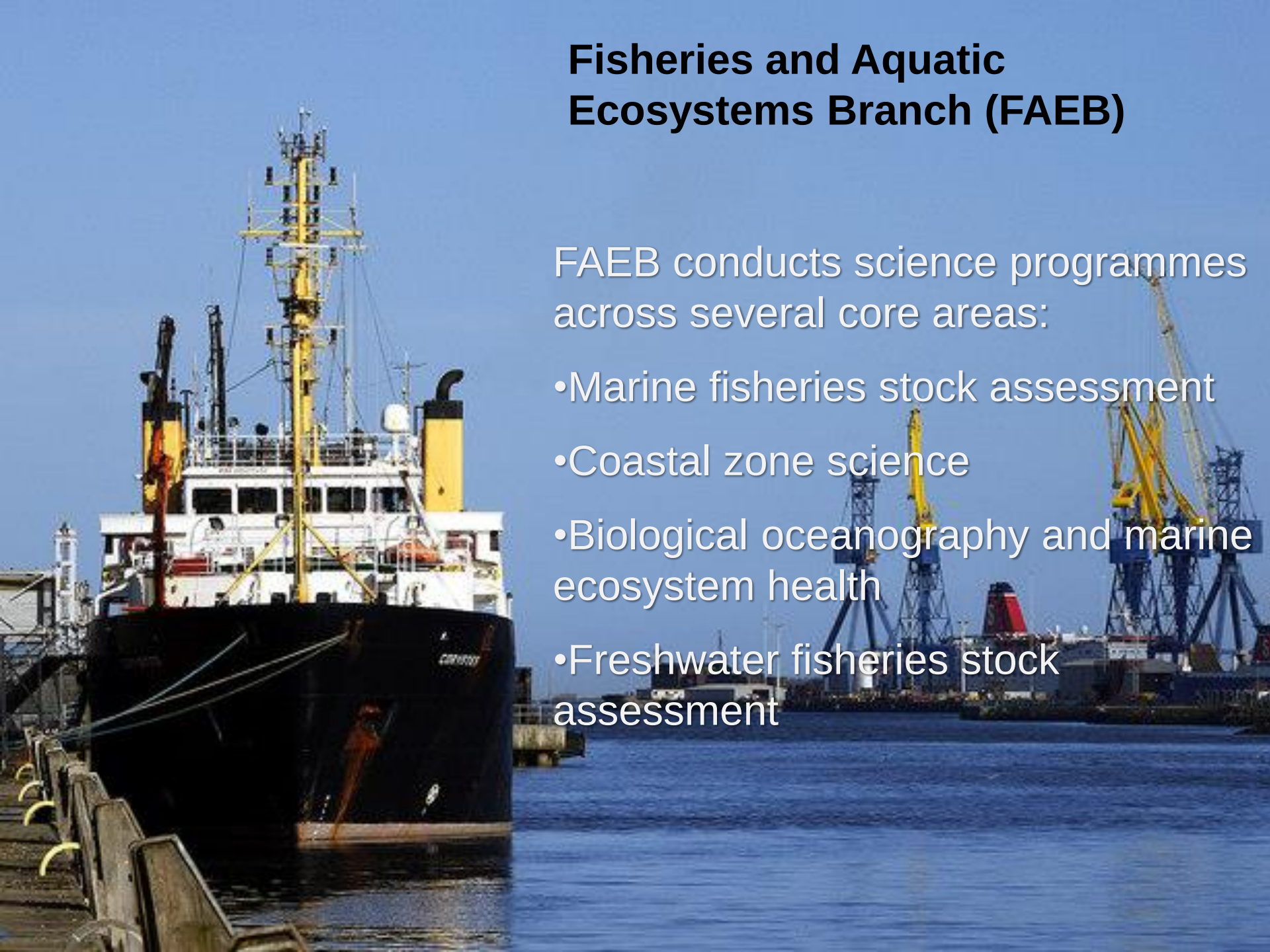
About AFBI

- **AFBI is based at seven sites across the Northern Ireland, with its Headquarters at Newforge Lane, Belfast.**

- The AFBI sites are located at Newforge Lane, (Belfast), Crossnacreevy, Hillsborough, Stoney Road (Stormont), Loughgall, Bushmills and Omagh.





Fisheries and Aquatic Ecosystems Branch (FAEB)

FAEB conducts science programmes across several core areas:

- Marine fisheries stock assessment
- Coastal zone science
- Biological oceanography and marine ecosystem health
- Freshwater fisheries stock assessment

Case Studies

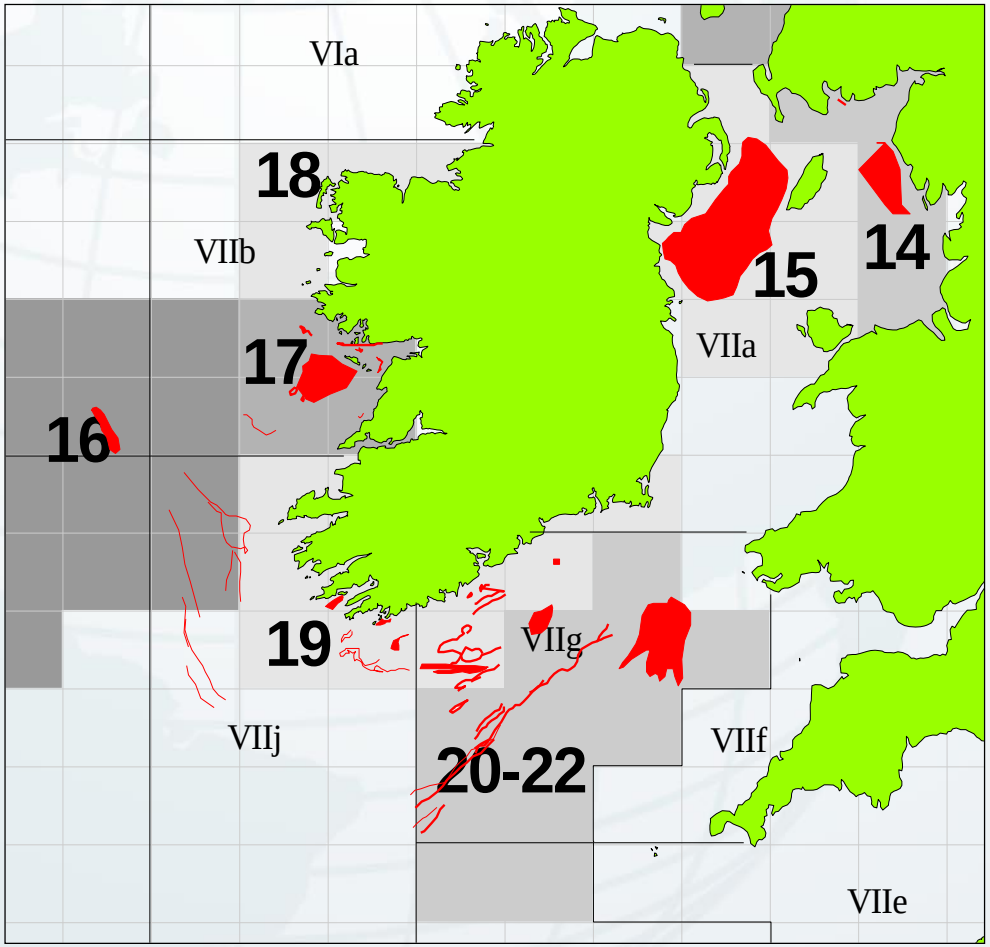
Data Producers

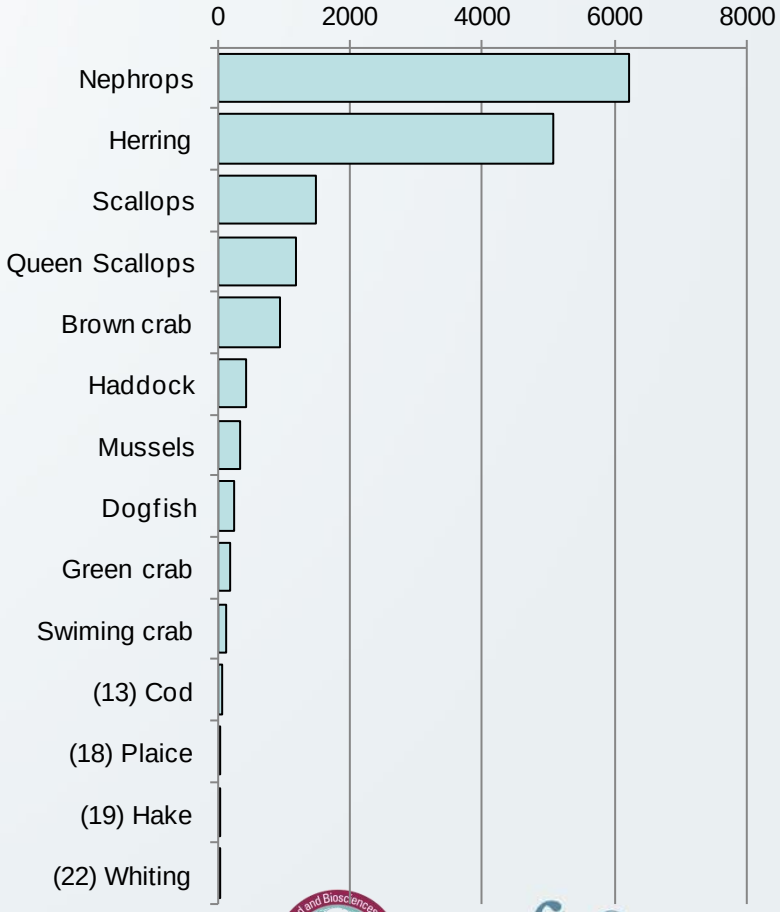
Collection of data on the scientific Research Vessel Corystes using Under Water Television Camera (UWTV) survey to provide fisheries independent data for stock assessment of *Nephrops norvegicus* (L.)

Data Consumers

Designating UK Marine Conservation Zones (MCZs) in valuable fishing areas: A case study of the Irish Sea *Nephrops norvegicus* (L.) grounds

Northern Irish fishing industry





Case Study 1

Collection of data on the scientific Research Vessel Corystes using Under Water Television Camera (UWTV) survey to provide fisheries independent data for stock assessment of *Nephrops norvegicus* (L.)

Summary of 2016 dedicated surveys

- 25th July – 3rd August 2016: UWTV survey: AFBI, MI, Cefas
- 9th – 13th August 2016: Trawl survey
- UWTV sledge was deployed over 165 times during the cruise, including re-do stations.
- In the western Irish Sea 100 stations in the randomised fixed 4.5 nm grid were successfully surveyed, with 10 re-dos (due to visibility)
- An additional 6 stations opportunistically surveyed in Belfast Lough (stations over similar areas as 2015).
- In the eastern Irish Sea 48 stations were completed in the eastern Irish Sea (with 2 re-dos).
- 24 stations in FU15 and 2 stations in FU14 were sampled by Nephrops trawl (50mm mesh size); 4 stations in FU15 and 6 stations in FU14 were sampled by 2m beam trawl (2 mm mesh size): 14,075 Nephrops measured.
- Groundfish Cruise CO4316: beam trawl targeted TV 'problem' areas: 8 stations targeted

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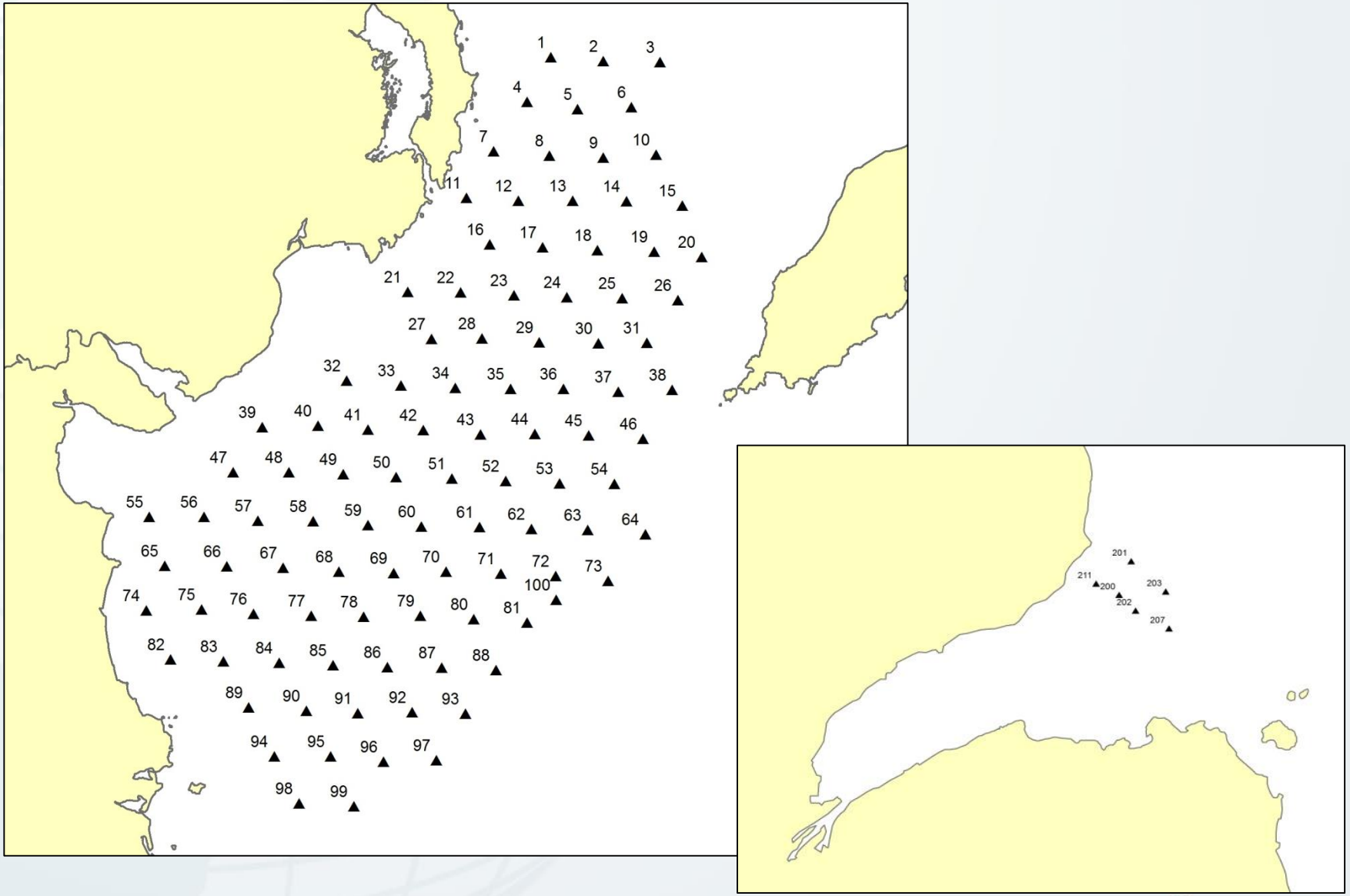
UWTV setup

- Similar setup to previous years:
  - 4 lasers (2 either side along base of field of view); 2 halogen lights; SD camera; USBL; CTD; MI Access database populated at sea
  - Sled runners replaced with wider runners and additional floats added to reduce sled sinkage into softest mud
- USBL fully operational (no failures) on all stations
- Sled sinkage reduced and consistently able to view 4 lasers on screen, providing reassurance re field of view
- Multiple issues with camera cable (which is not load bearing), DVD recorder failures.
- Implemented Lin's CCC to determine need for additional recounts
- Full business case submitted for replacement system to (a) replace cables with load-bearing ones, and (b) move to HD system… but dependent on funding….
- Database is being migrated to SQL (supported by AFBI) and QC queries and scripts stream-lined. Server being installed on ship for next year.



2016 FU15 UWTV stations

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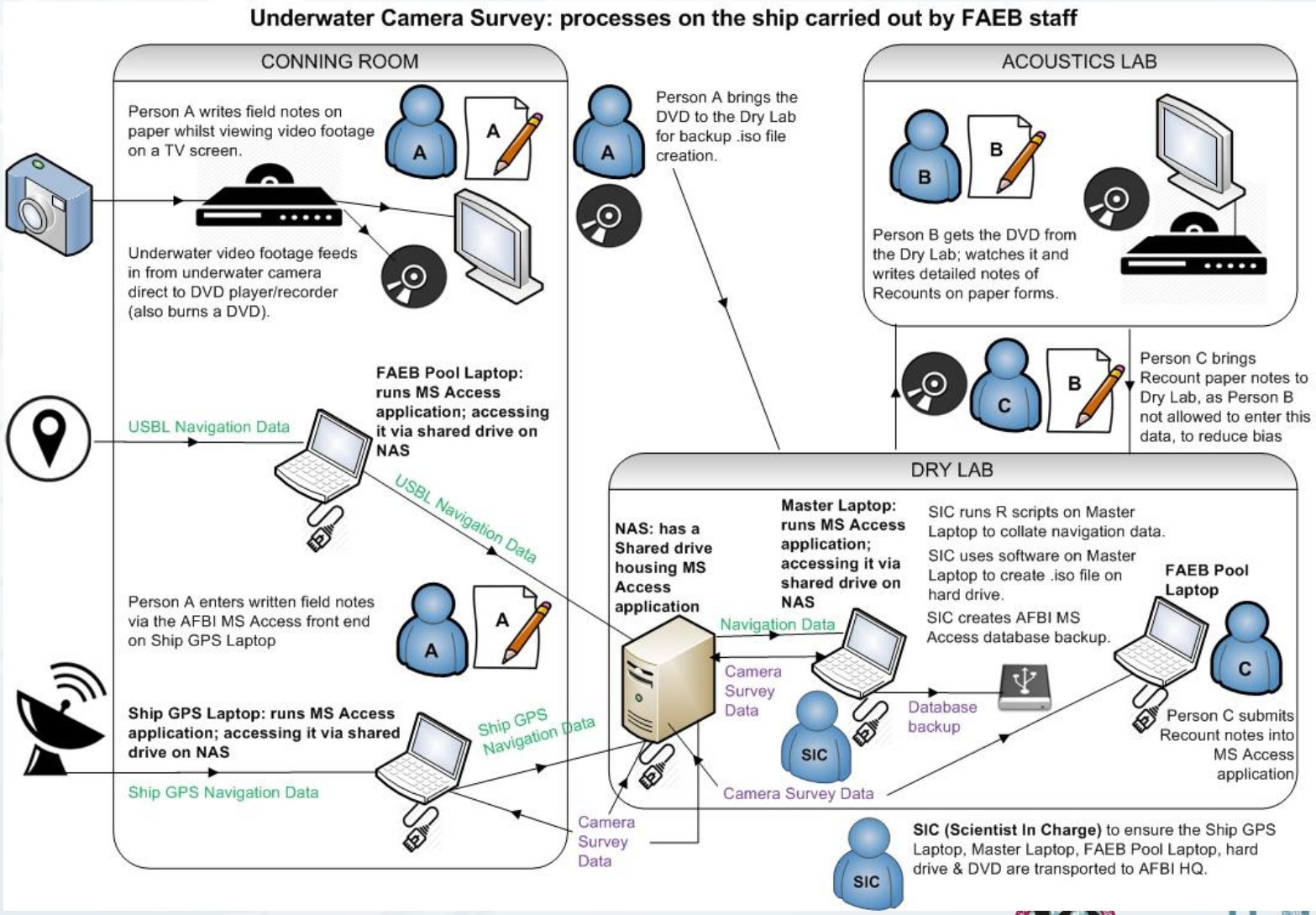
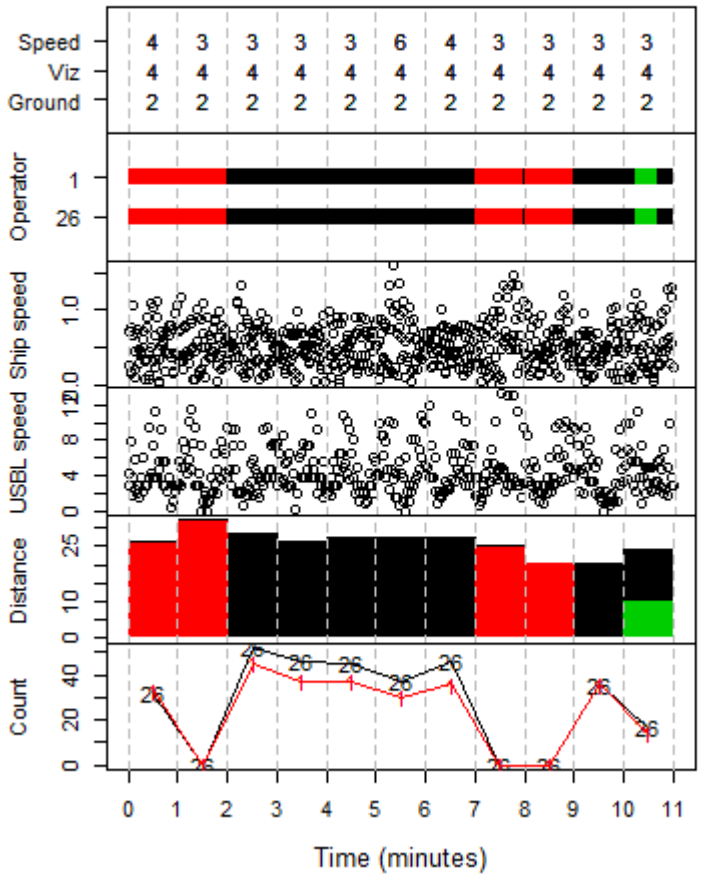
Data Flow at Sea

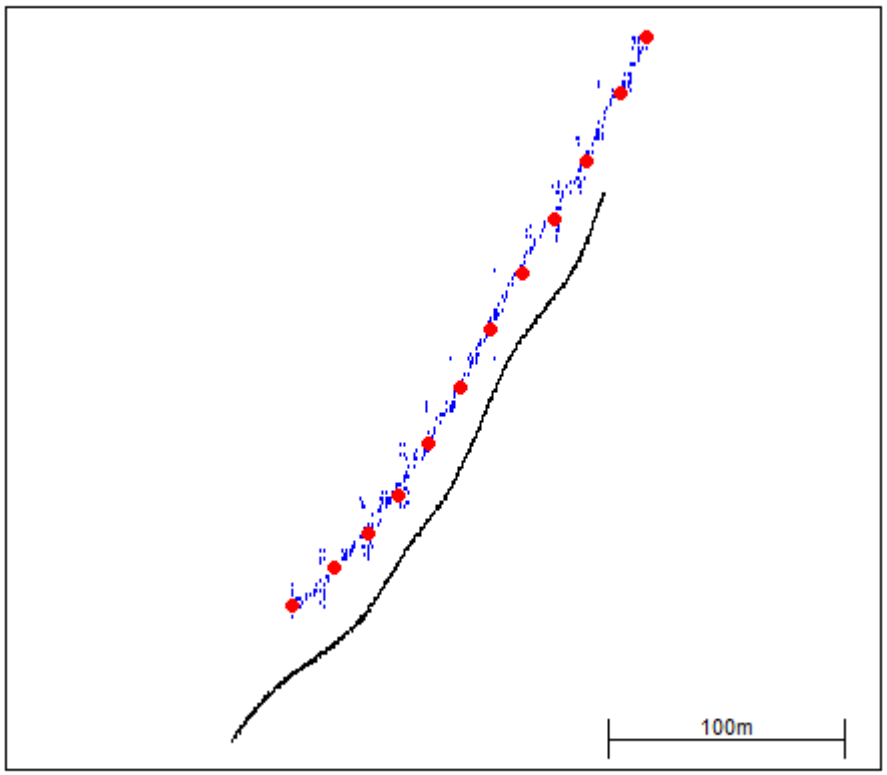


Nephrops burrows

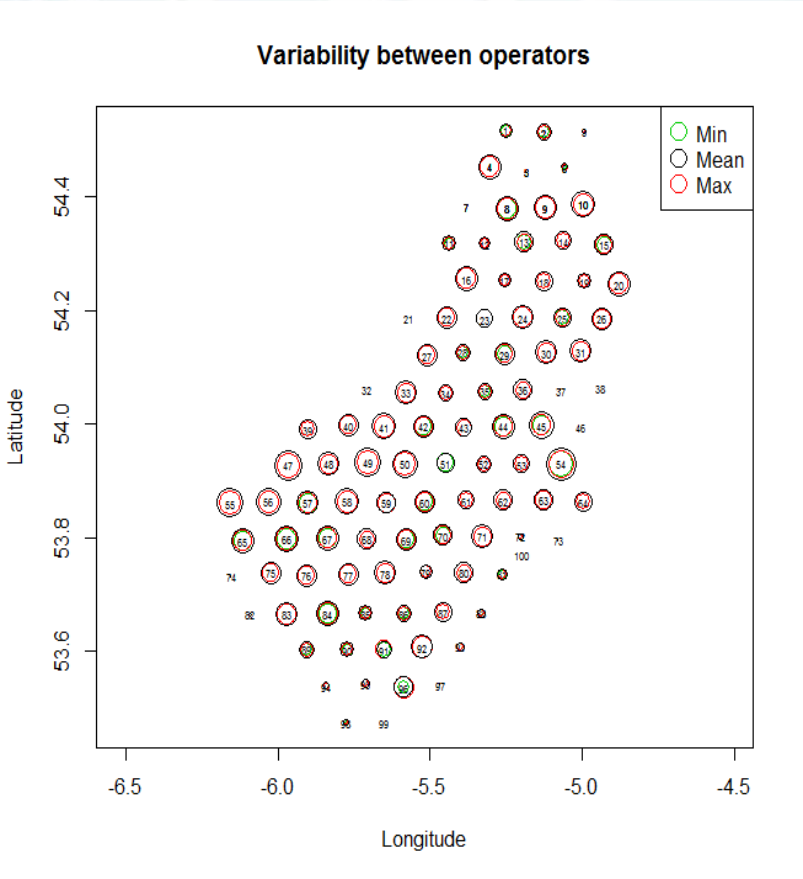
- Underwater Footage

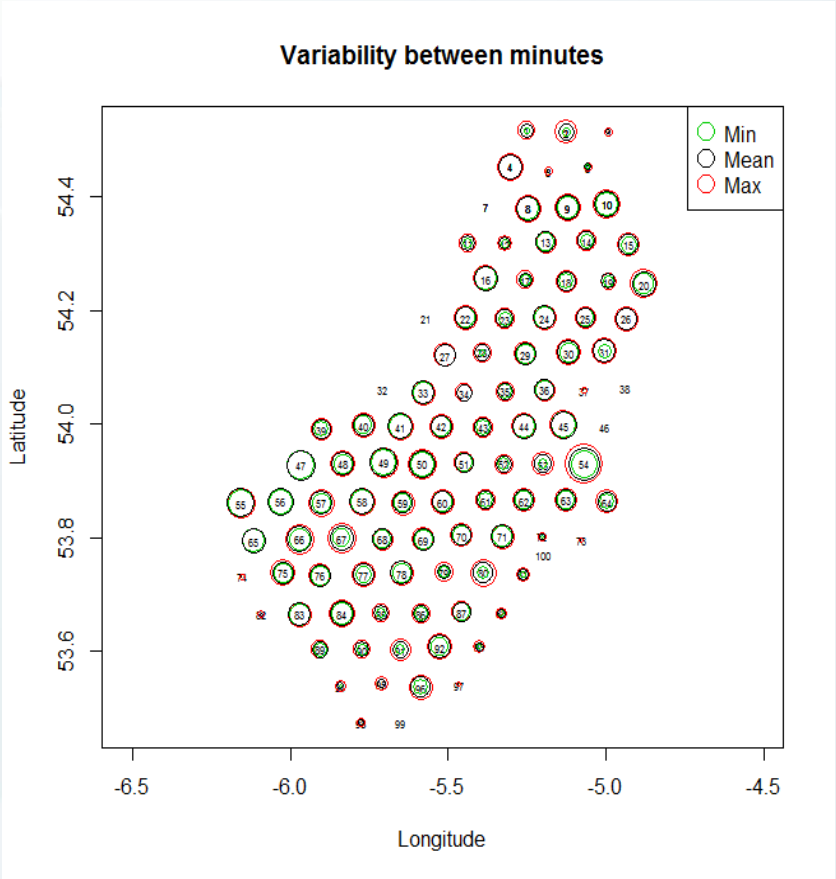
Data Visualisation for QA





Quality control: R scripts developed by MI





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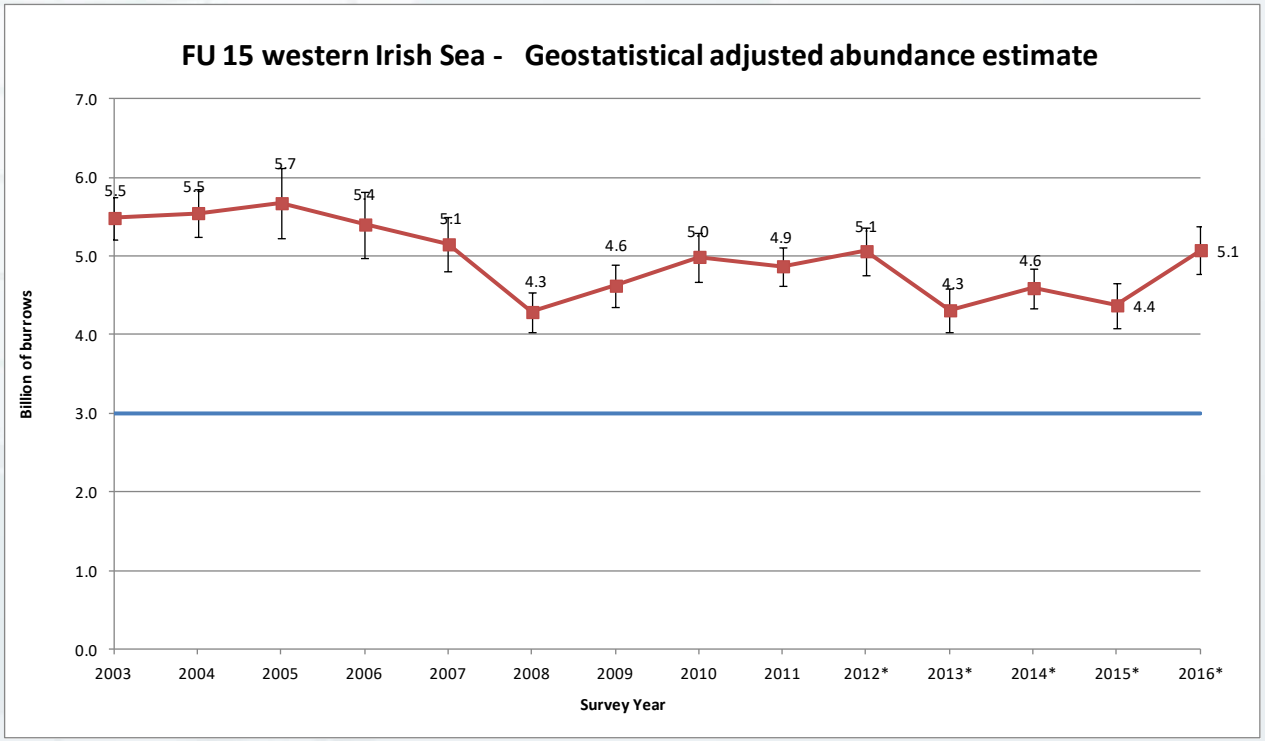
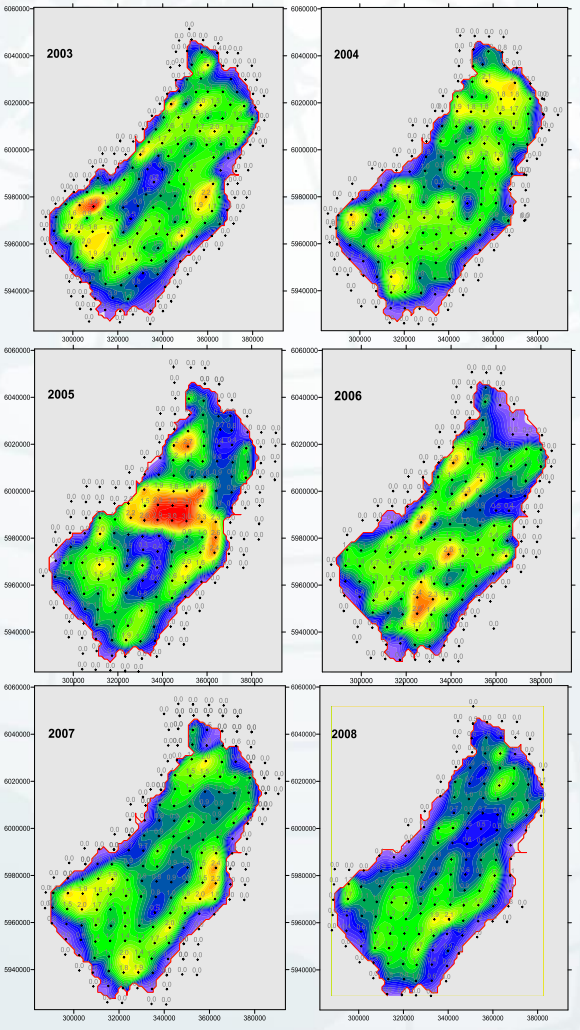
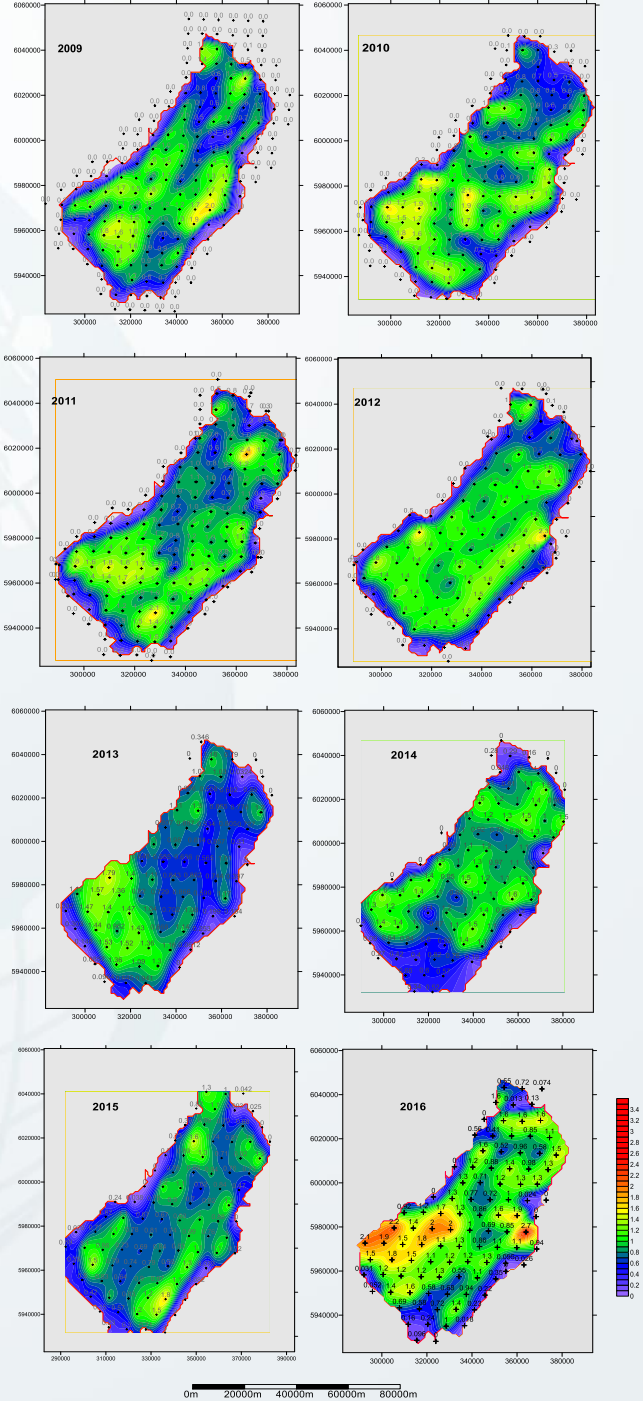
UWTV results: Two geostatistical analysis methods applied:

- Surfer method ('usual method') using variogram selection (exponential model) and kriging with same blanking file as previous years: **5.076 billion burrows (corrected)**
- R Geostats method (script by MI) using kriging and FU15 polygon: **5.156 billion burrows (corrected)** (CV = 3%)







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5.3.28 Norway lobst … Irish Sea, West)

ICES stock advice

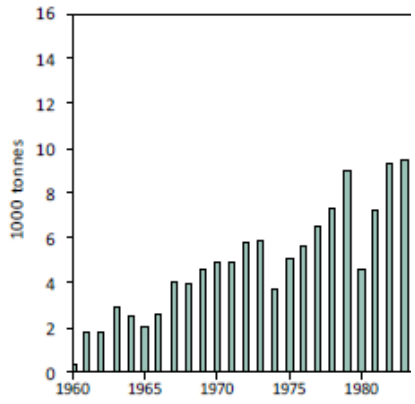
ICES advises that when the M … cards) should be no more than 8682 tonnes. If instead discar … there is no change in assumed discard survival rate, this impli …

To ensure that the stock in f … should be implemented at the functional unit level.

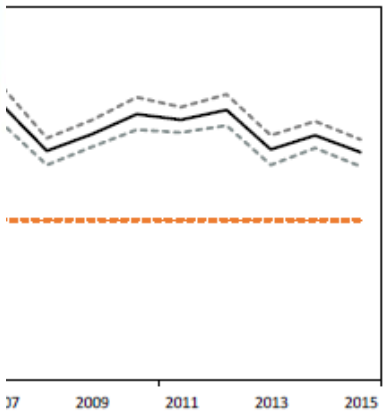
Stock development over time

Since 2003, stock abundanc … alculated as (landings + dead discards)/(abundance estimate …

C…



…ex - abundance



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Northern Ireland fishing quota up by £1.2m

16 December 2015 | Northern Ireland

The deal means 480 extra tonnes of prawns, worth about £1m.

Northern Ireland's fishing fleet is to benefit from an extra £1.2m worth of fish quota after two days of talks in Brussels.

There had been fears the annual negotiation over how much fish could be caught would result in big cuts for Northern Ireland.

But the deal means 480 extra tonnes of prawns and 160 extra tonnes of haddock will be available.

The extra prawns are worth about £1m and the haddock about £170,000.

10 YEAR ANNIVERSARY 2006-2016

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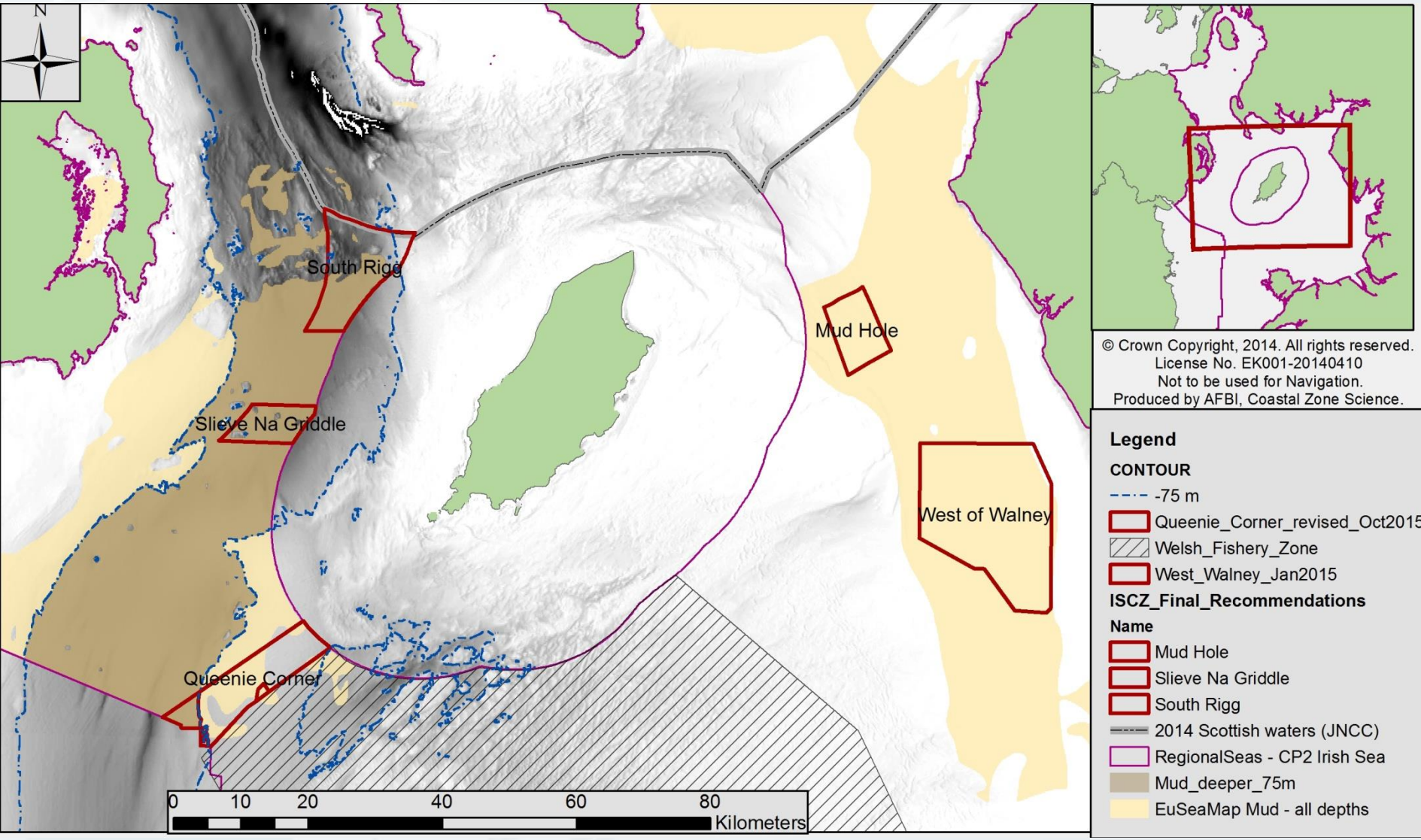
Case Study 2

Designating UK Marine Conservation Zones (MCZs) in valuable fishing areas: A case study of the Irish Sea *Nephrops norvegicus* (L.) grounds

Recap: Development of alternative sites

- August 2014: Agreement made to progress development of alternative MCZ sites proposals, using AFBI scientific data
  - October 2014: Stakeholder workshop (NI fishing industry reps, DARD, DOE, NGOs, JNCC, Natural England, AFBI) to sketch potential alternative sites, based on available EUNIS habitats, geopolitical boundaries and fishing effort data.
- March 2015: Potential alternative sites were reviewed in terms of habitat suitability to meet MCZ criteria, and also for potential for impact to fishing activity. Results were discussed in second Stakeholder workshop and final alternatives decided for proposal to Defra.



Legend

CONTOUR

-75 m

Queenie_Corner_revised_Oct2015

Welsh_Fishery_Zone

West_Walney_Jan2015

ISCZ_Final_Recommendations

Name

Mud Hole

Slieve Na Griddle

South Rigg

2014 Scottish waters (JNCC)

RegionalSeas - CP2 Irish Sea

Mud_deeper_75m

EuSeaMap Mud - all depths

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- August-Sept 2015: The proposed alternative MCZ sites including fisheries displacement considerations and habitat evidence were presented to SNIAC, published online & circulated to stakeholders http://www.seafish.org/media/publications/Seafish_2015_Alternative_MCZs_in_Irish_Seafinal.pdf
- Summer 2015: Due to paucity of habitat data over "Queenie Corner", additional grab sampling was completed. Data were analysed (infauna and particle size analysis) & site boundary drawn*
- November 2015: Queenie Corner boundary provided to Defra & JNCC
- January 2016: all habitat evidence for Queenie Corner provided to JNCC & Defra followed by meeting with JNCC (February 2016) to discuss data appraisal.
  - Conclusion: Good confidence in feature presence and extent for subtidal mud
- March 2016: Full evidence base presented in Seafish-AFBI report, to ensure good confidence in the feature extent – report published online and circulated to stakeholders: http://www.seafish.org/media/publications/Evidence_base_mud_MCZs_IrishSea_v1_2-FINAL.pdf
- September 2016: AFBI Multibeam survey of deeper section of Queenie Corner (data processing ongoing)
- February 2017: JNCC meeting to clarify Tranche 3 process

What changed between October 2014 workshop and January 2016 (final alternative MCZs data provision to JNCC):

- **Introduction of the Welsh Fishery Zone – reducing areas that could be designated for Tranche 3 of the MCZs process, which impacted on the "Queenie Corner" site*
- *Issues regarding interpretation of target areas – deeper than 20m? New depth band targets of 75-200m?*

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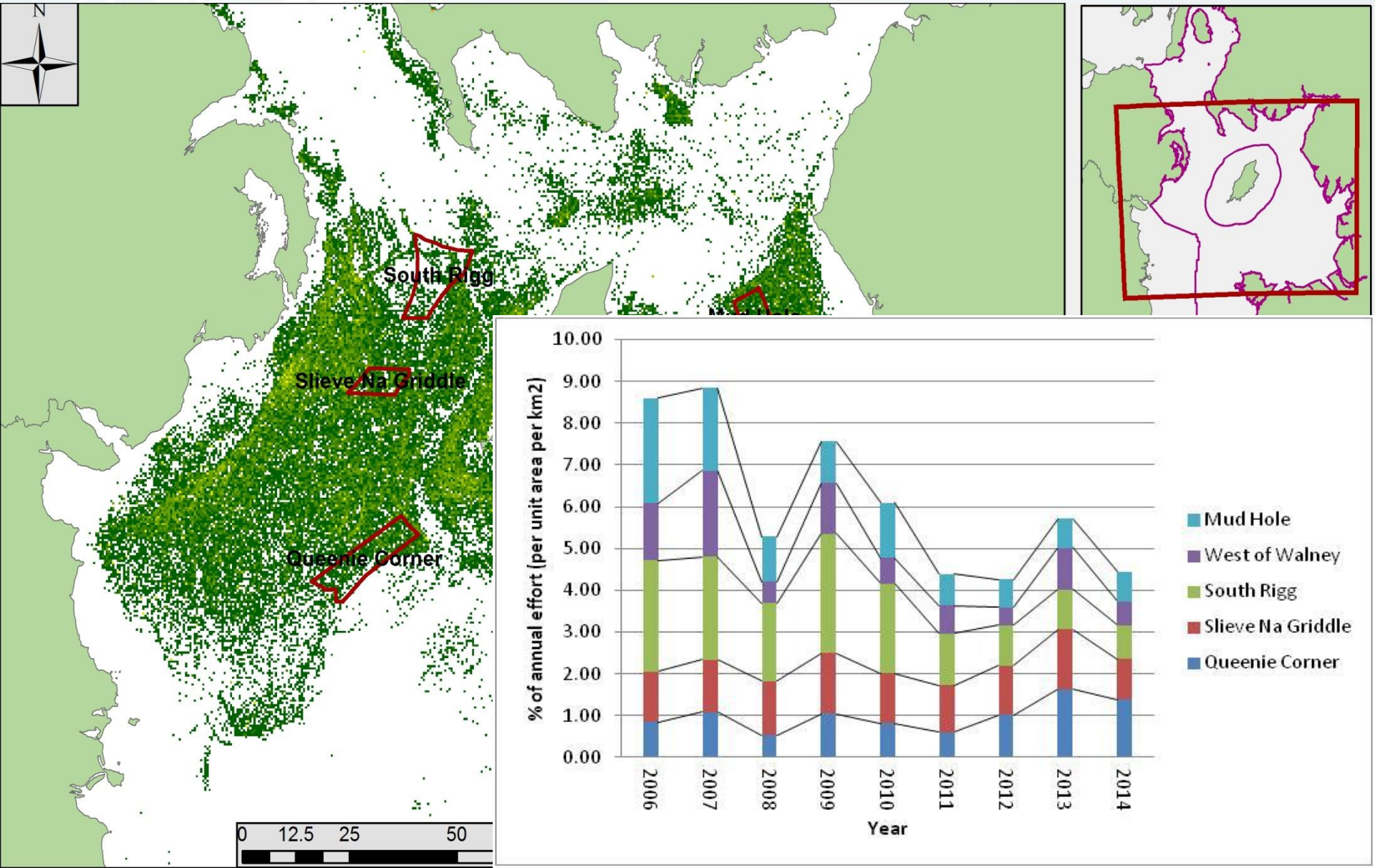
Comparison of NI otter trawling annual effort hours at the subtidal mud sites still under consideration



Conclusions

- Re-engaging stakeholders by making use of all available data sources & transparency has allowed development of ‘alternative sites’
- Lack of evidence of how closure will impact fishery through displacement of effort, loss of income, or wider ecological impact: more science needed! How could closures benefit the wider ecosystem & support fisheries?
- Ongoing issue of which site(s) could the alternative Queenie Corner site replace in Tranche 3: considerations of ecological connectivity and detailed socio-economics (e.g. access by certain communities/vessel lengths etc.)