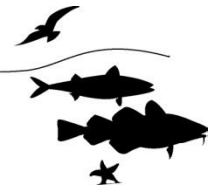




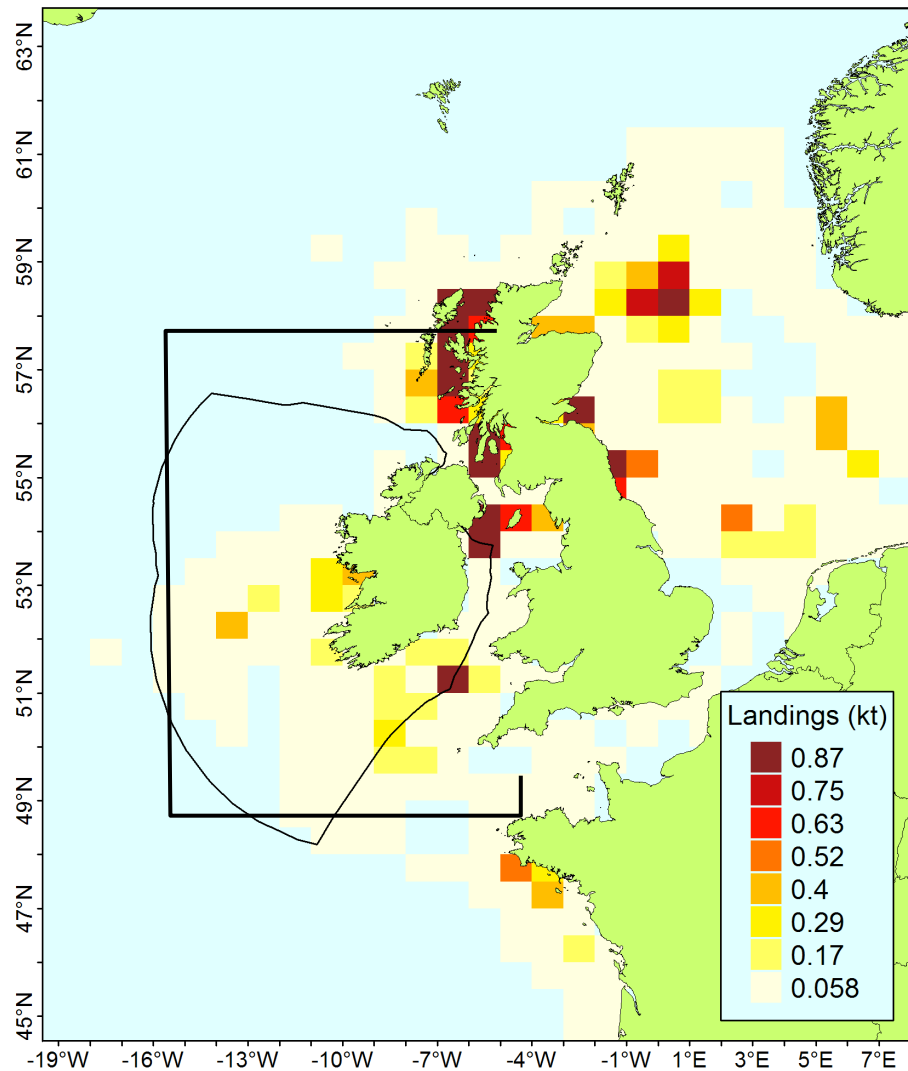
ICES Working Group on *Nephrops* Surveys (WGNEPS)



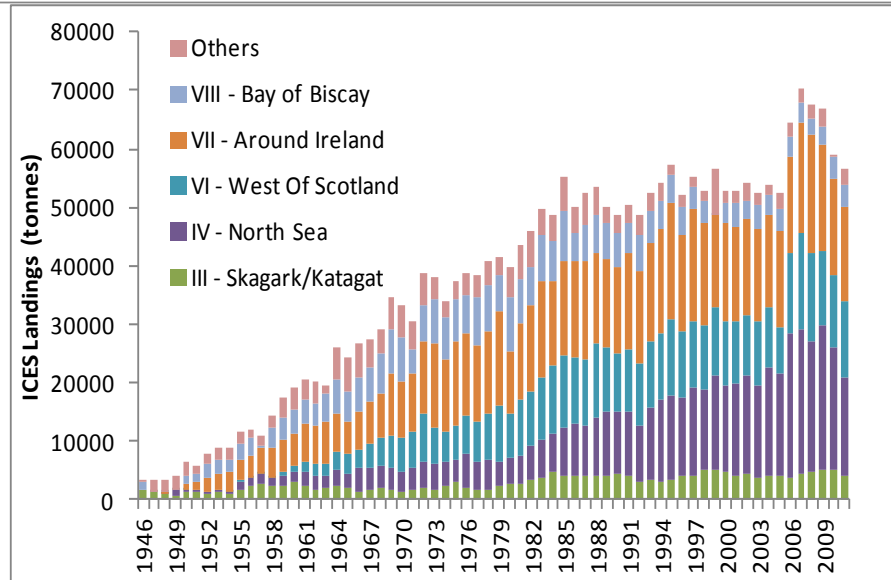
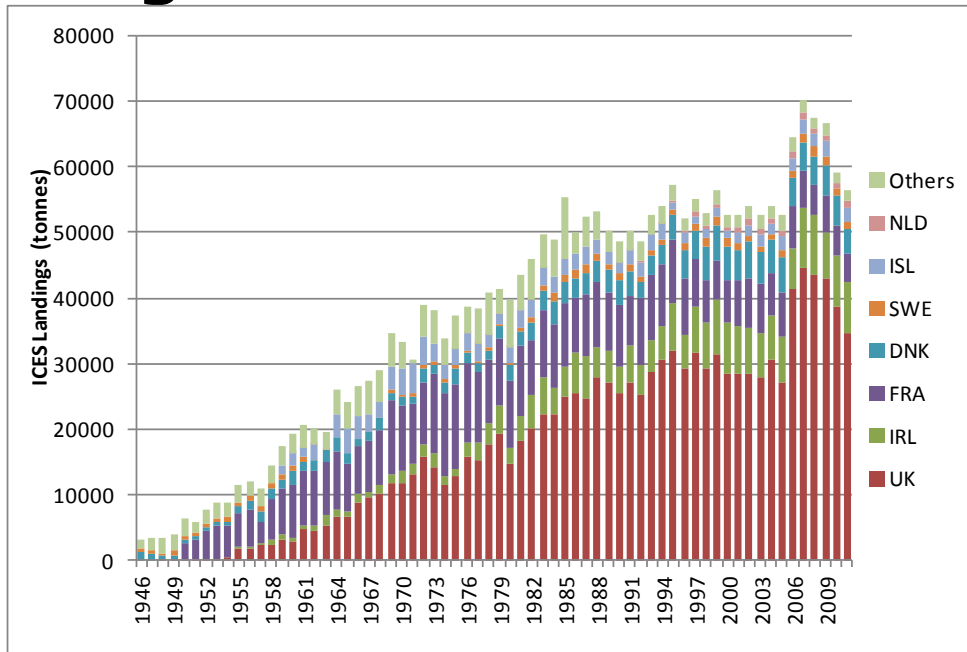
www.marine.ie

 **Marine Institute**
Foras na Mara

ICES Area *Nephrops* Landings



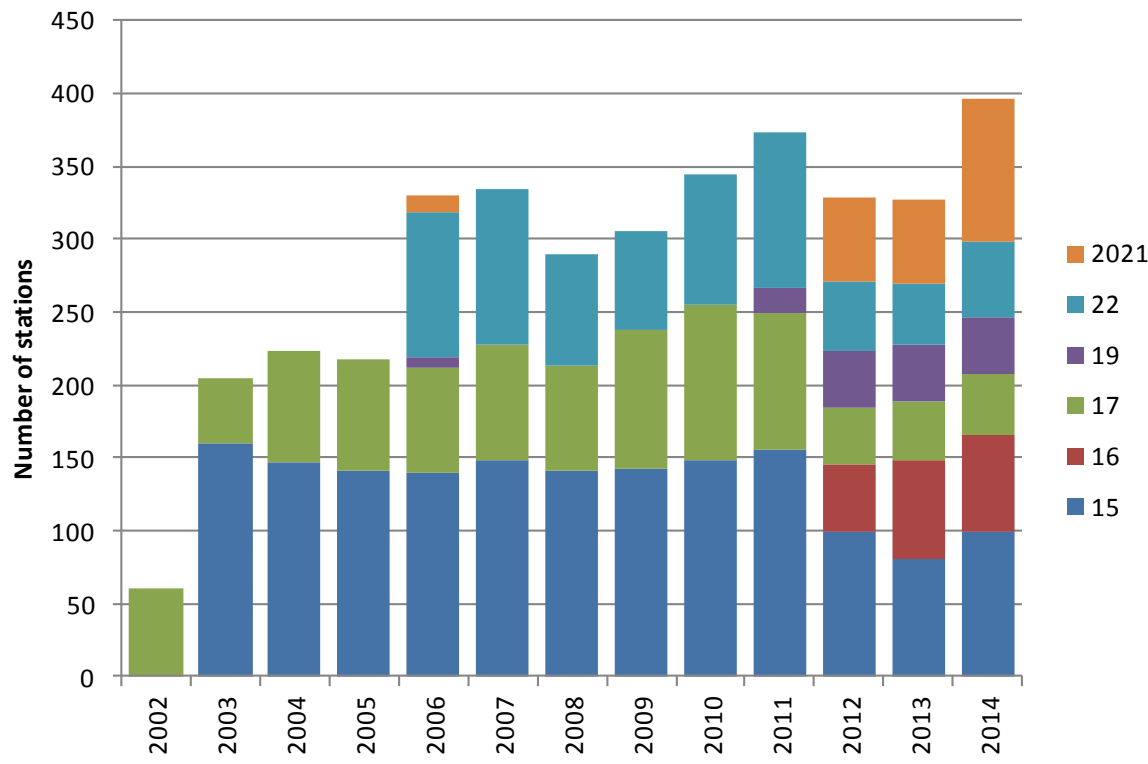
STECF Landings by Rectangle 2011



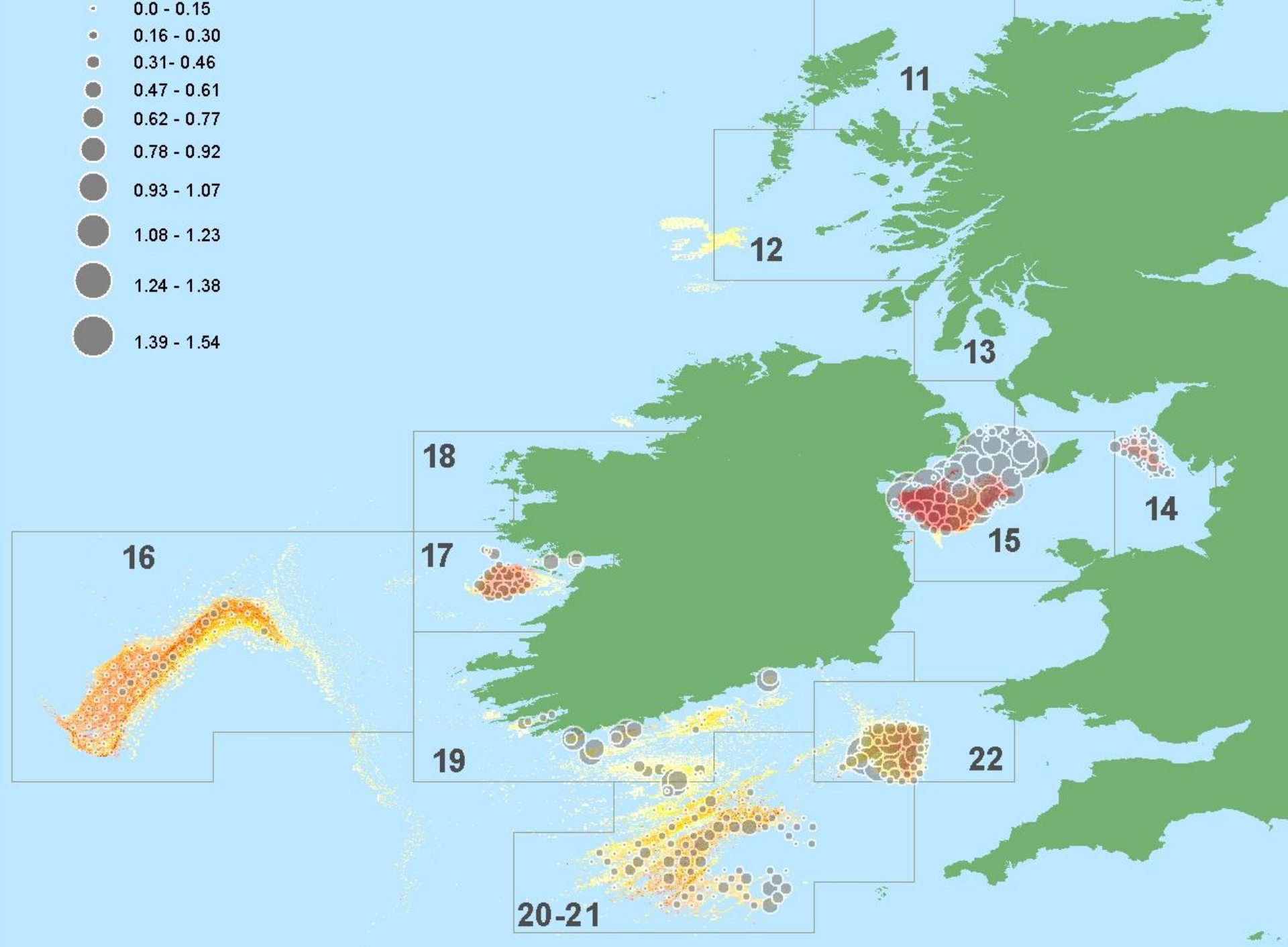
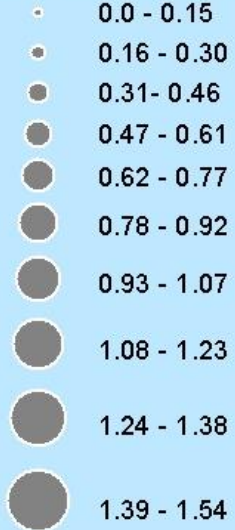
Value of the landings > € 270 Million

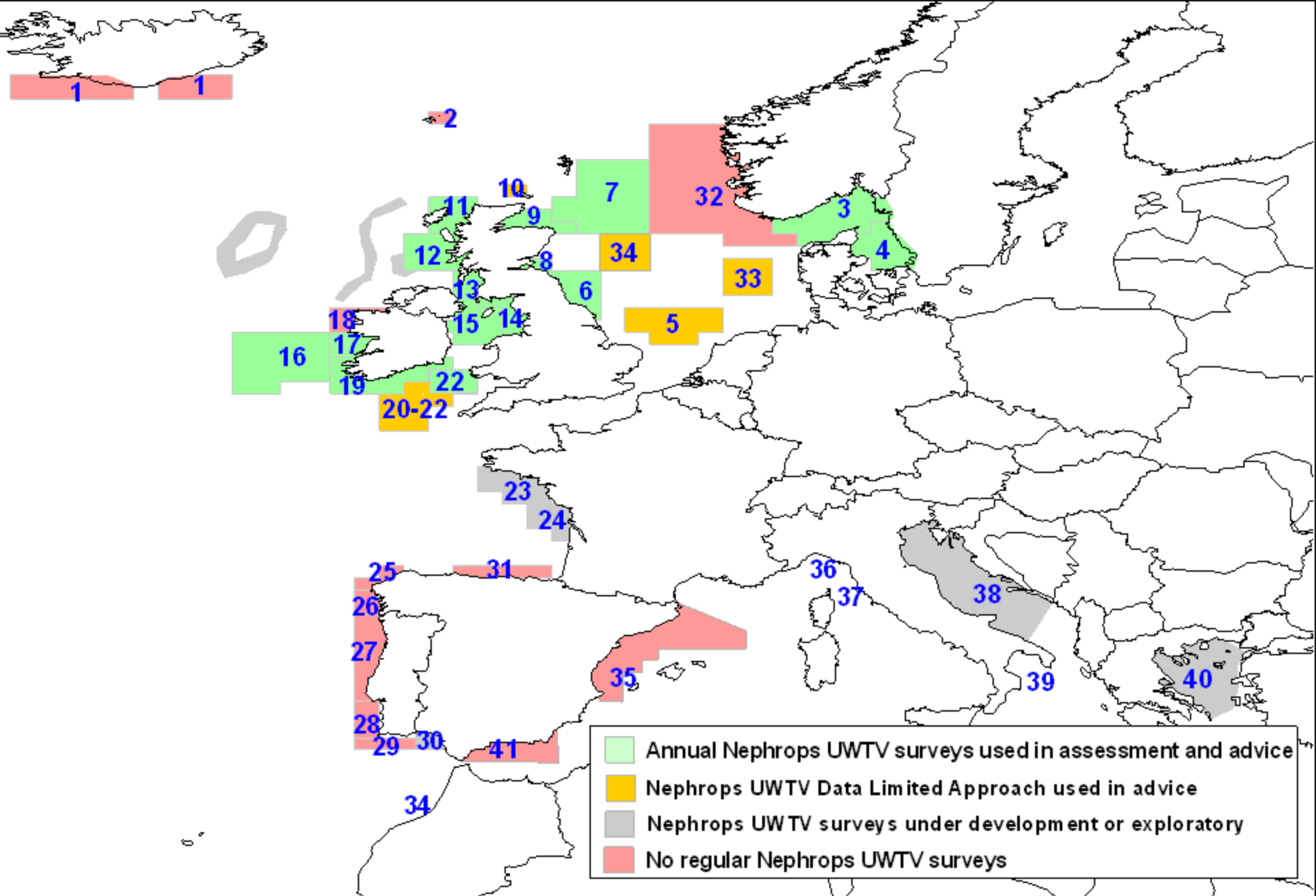


MI Coverage UWTV 2014



Full coverage for main FUs
Reduced grids in FU 15, 17 & 22 since 2012
~ 2,800 nmi covered on 3 x 10 day surveys.
~ 260 GB footage collected
301 TV stations (~400 including FU15)





WGNEPS - *Nephrops* UWTV survey Coverage in 2014

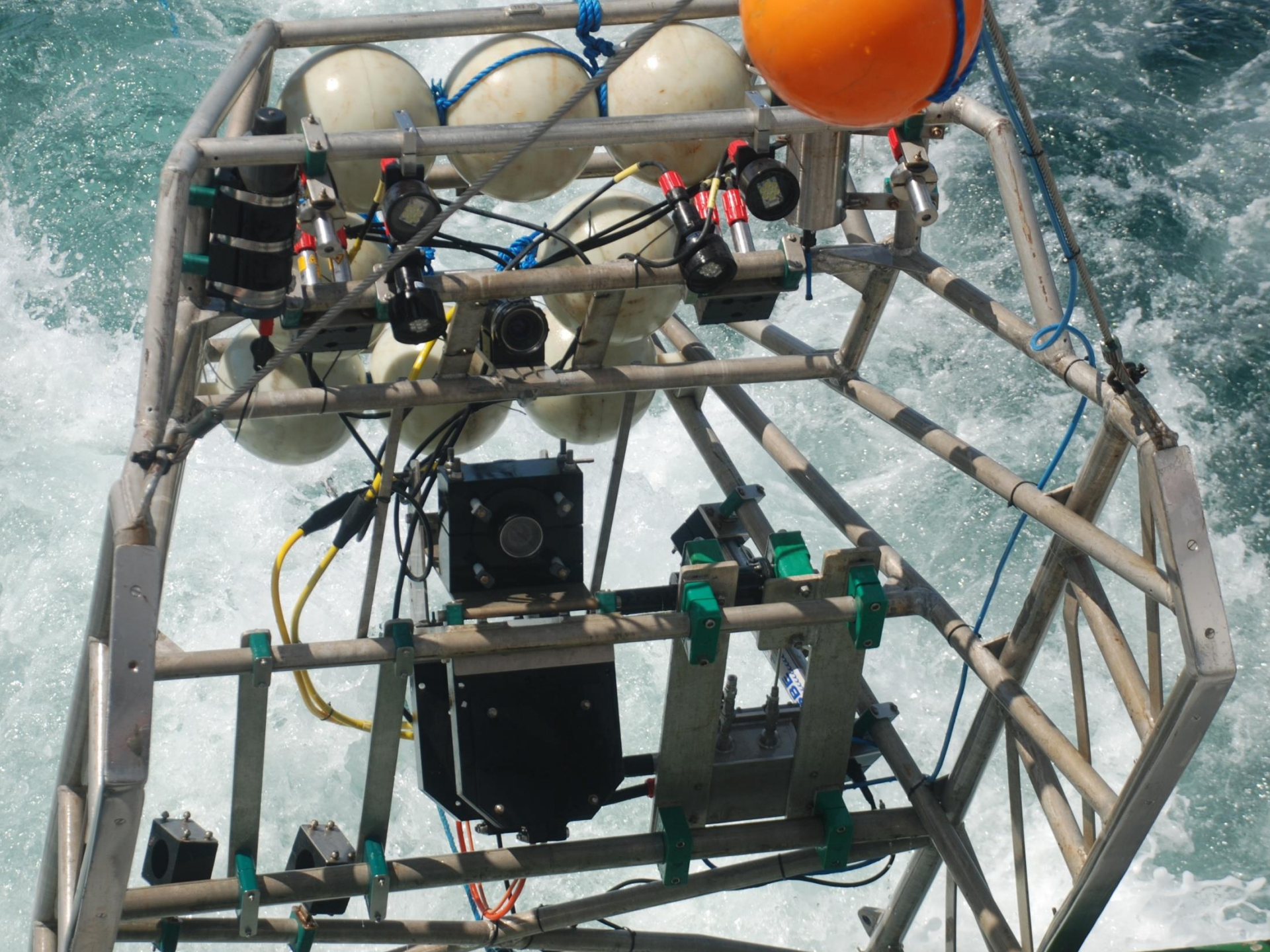






Figure 10. A screen shot of footage from the UWTV camera. Showing two burrow systems and an anemone

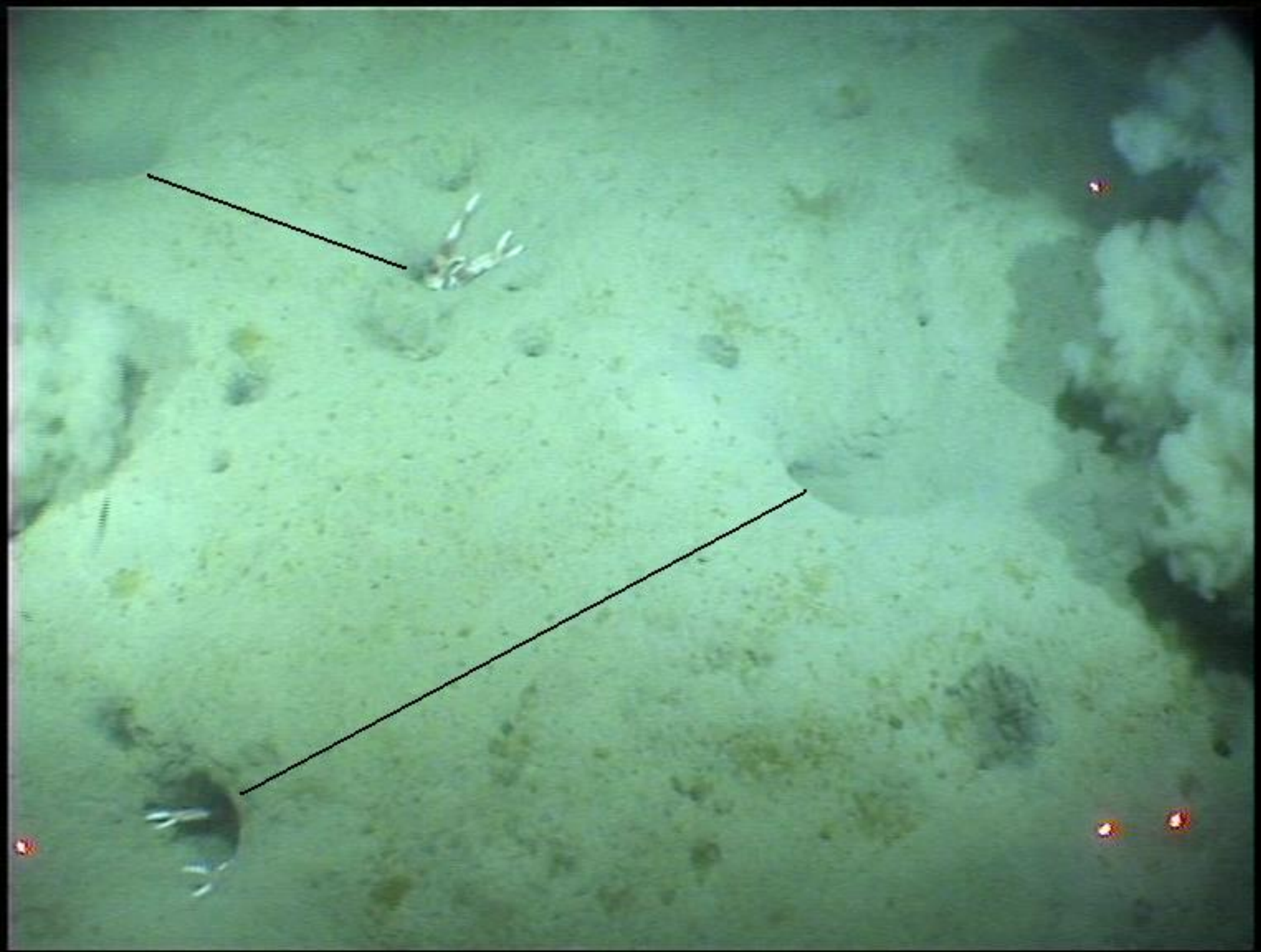




Figure 9. A screen shot of footage from the UWTV camera. The image clearly shows marks left after bottom trawling and a Nephrops burrow

Standard Protocols Across Countries

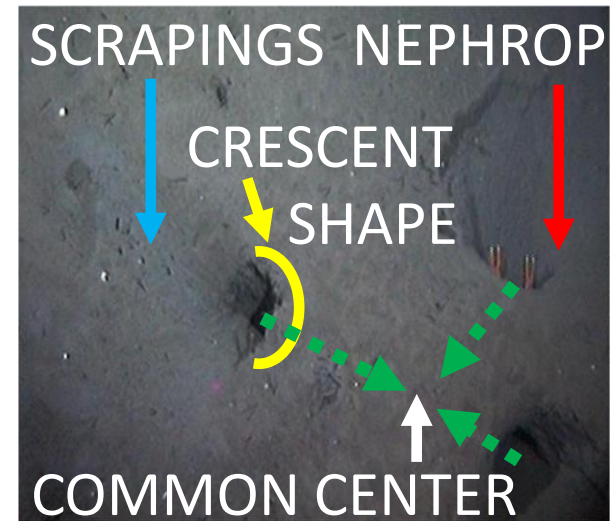
- 10 Mins of footage collected
- 7 minutes verified by 2 independent counters
- Counters trained & tested
- Variances checked
- Borrow systems counted not every hole
- A bit tedious, as videos may contain thousands of burrows.
- Most verification done at sea



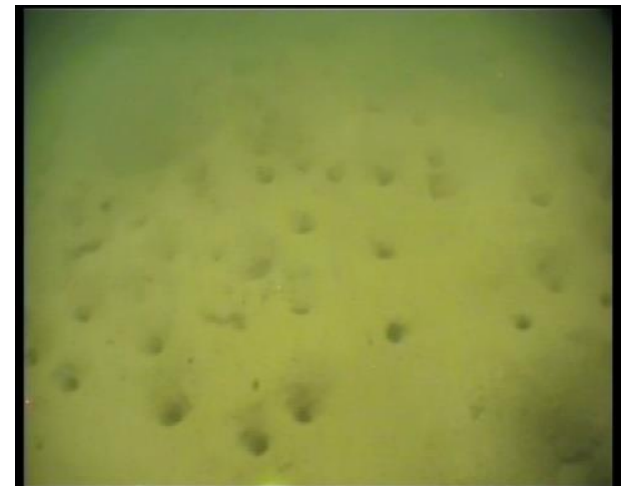
Tally Counter



Manual Analysis

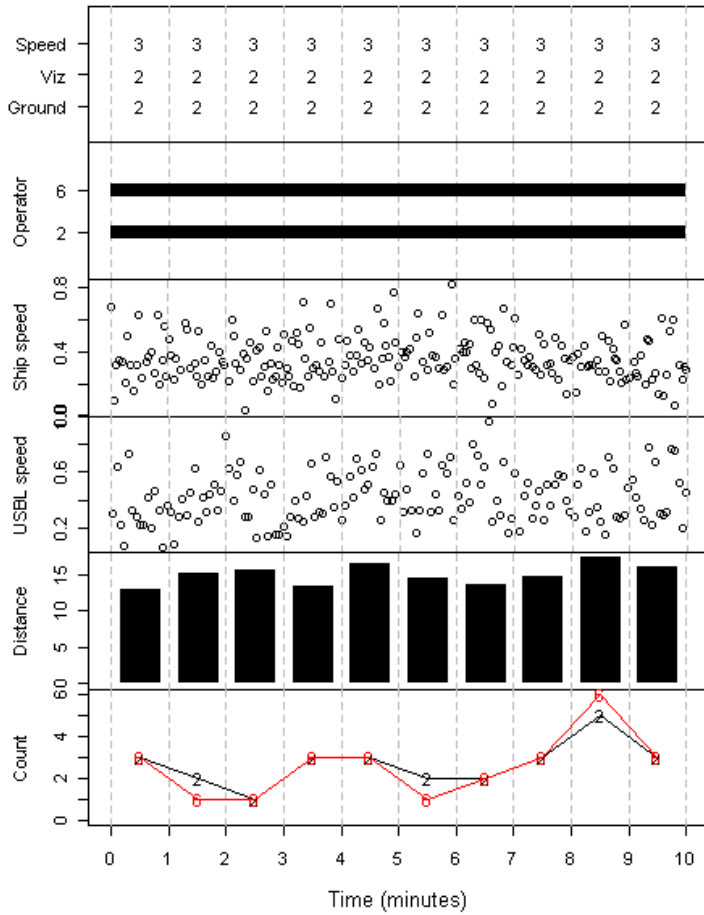


Nephrop Cluster



Sample Survey Frame

Station 49



USBL data used to estimate distance

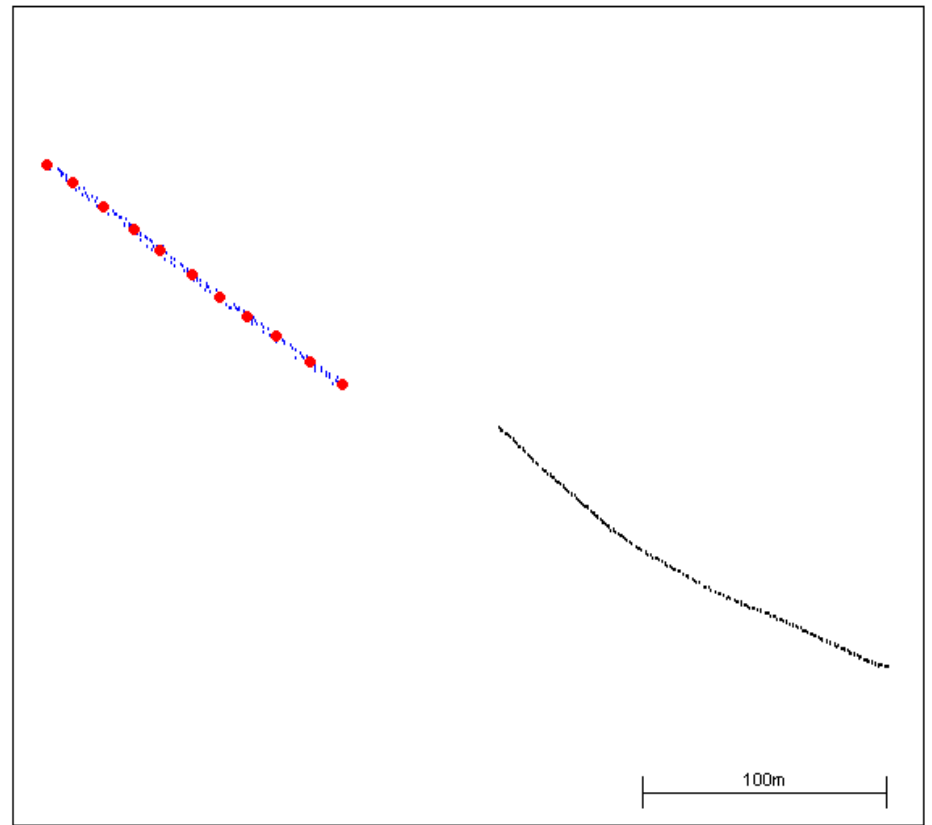


Figure 3. Porcupine Bank 2012 UWTV example quality control plot for the navigational and recount data.

QC plots & Procedures

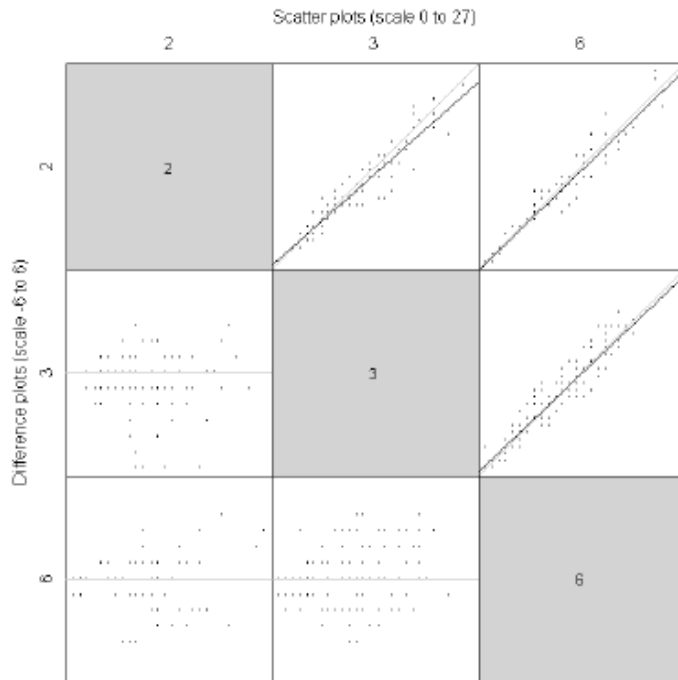


Figure 5: FU17 Aran grounds: Scatter plot analysis of counter correlations for the 2013 survey.

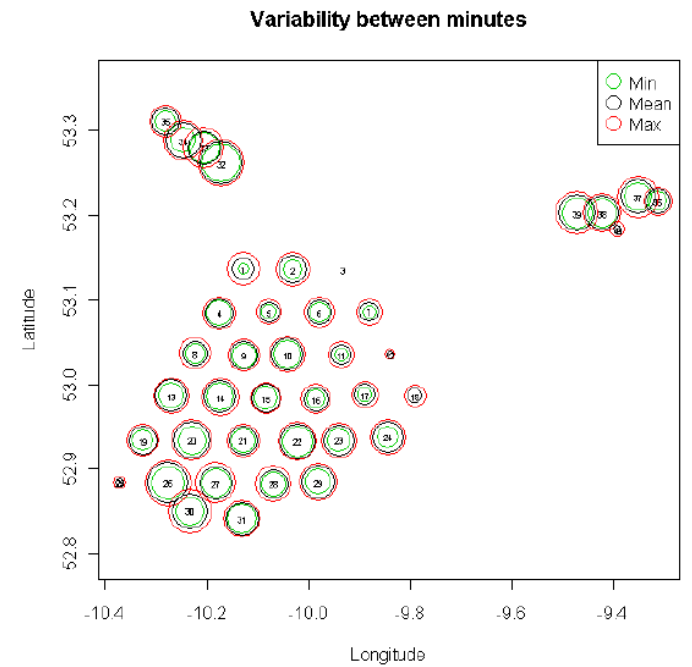


Figure 7: FU17 Aran grounds: Plot of the variability in density between minutes for each station in 2013.

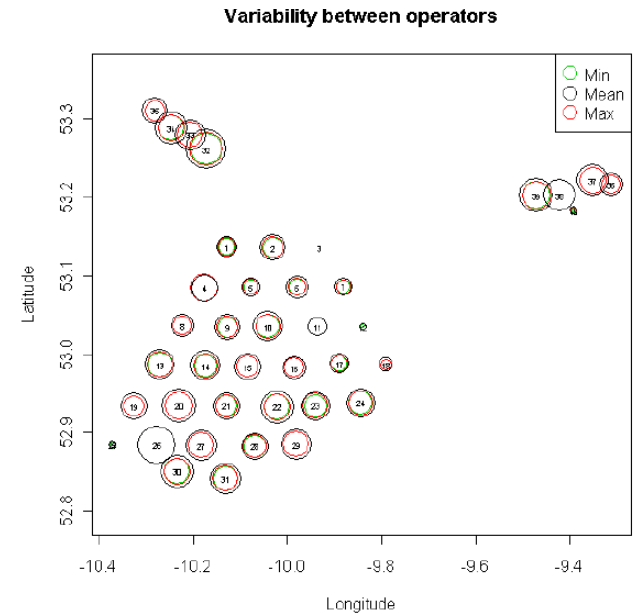
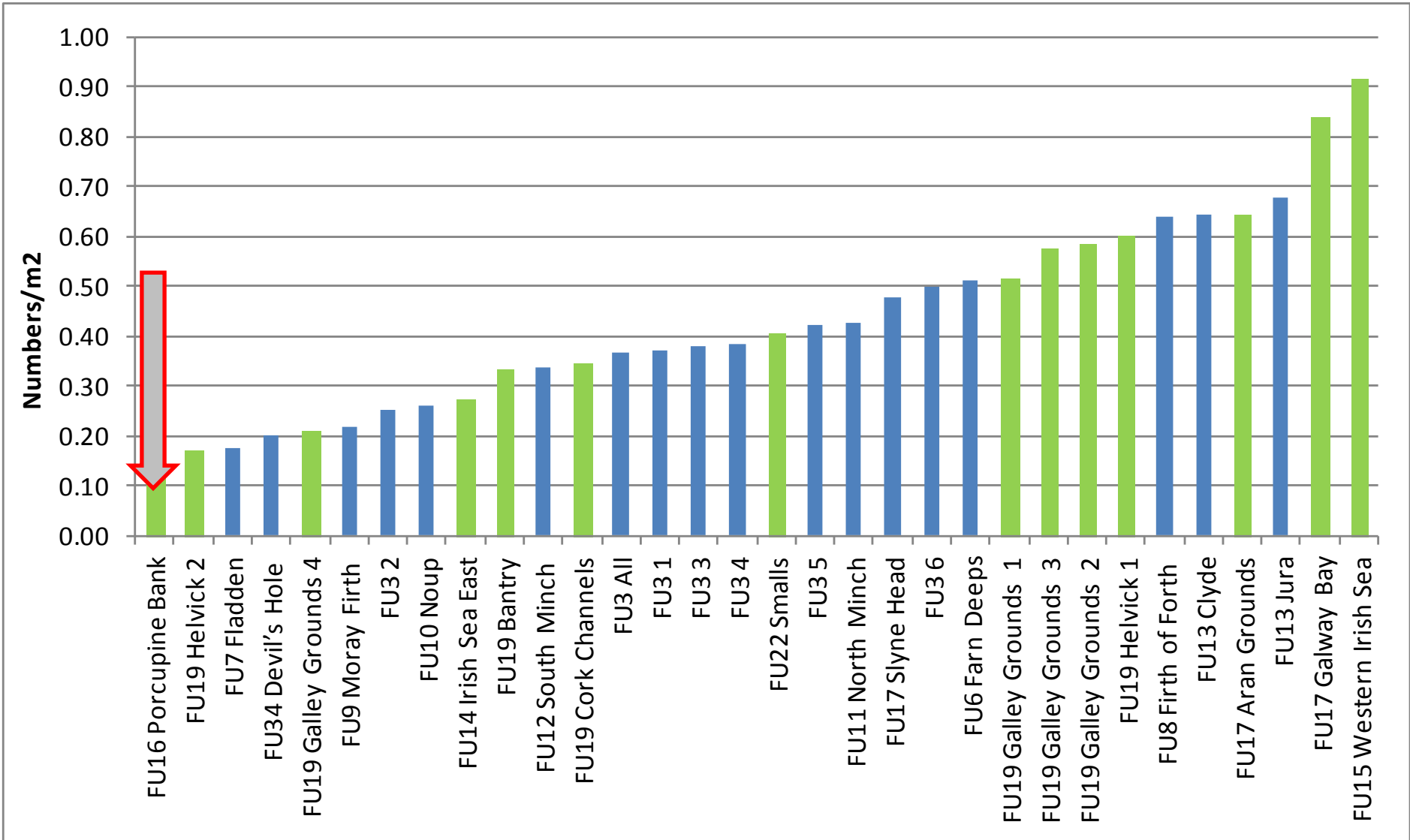


Figure 8: FU17 Aran grounds: Plot of the variability in density between operators (count) for each station in 2013.

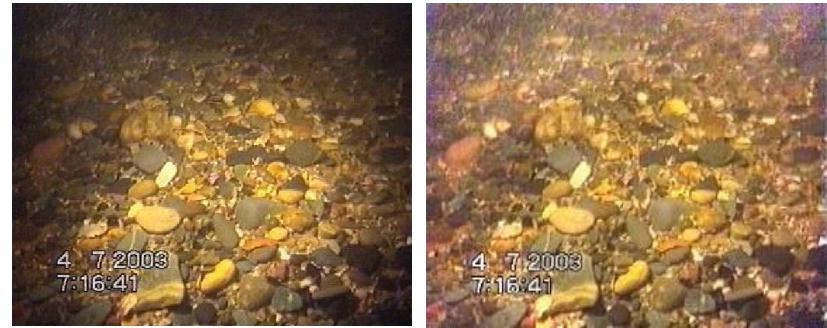
Ranked density for all FUs



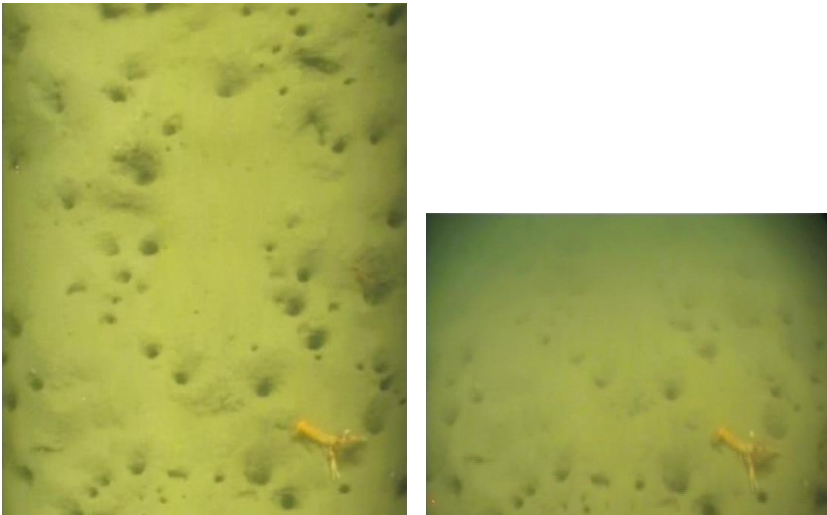
Our Approach

- Improve manual inspection with:-
 - image enhancement
 - content summarization
- Perform content analysis with mosaics to reduce verification to a single image

1) Image Enhancement



2) Content Summarization



3) Object Recognition



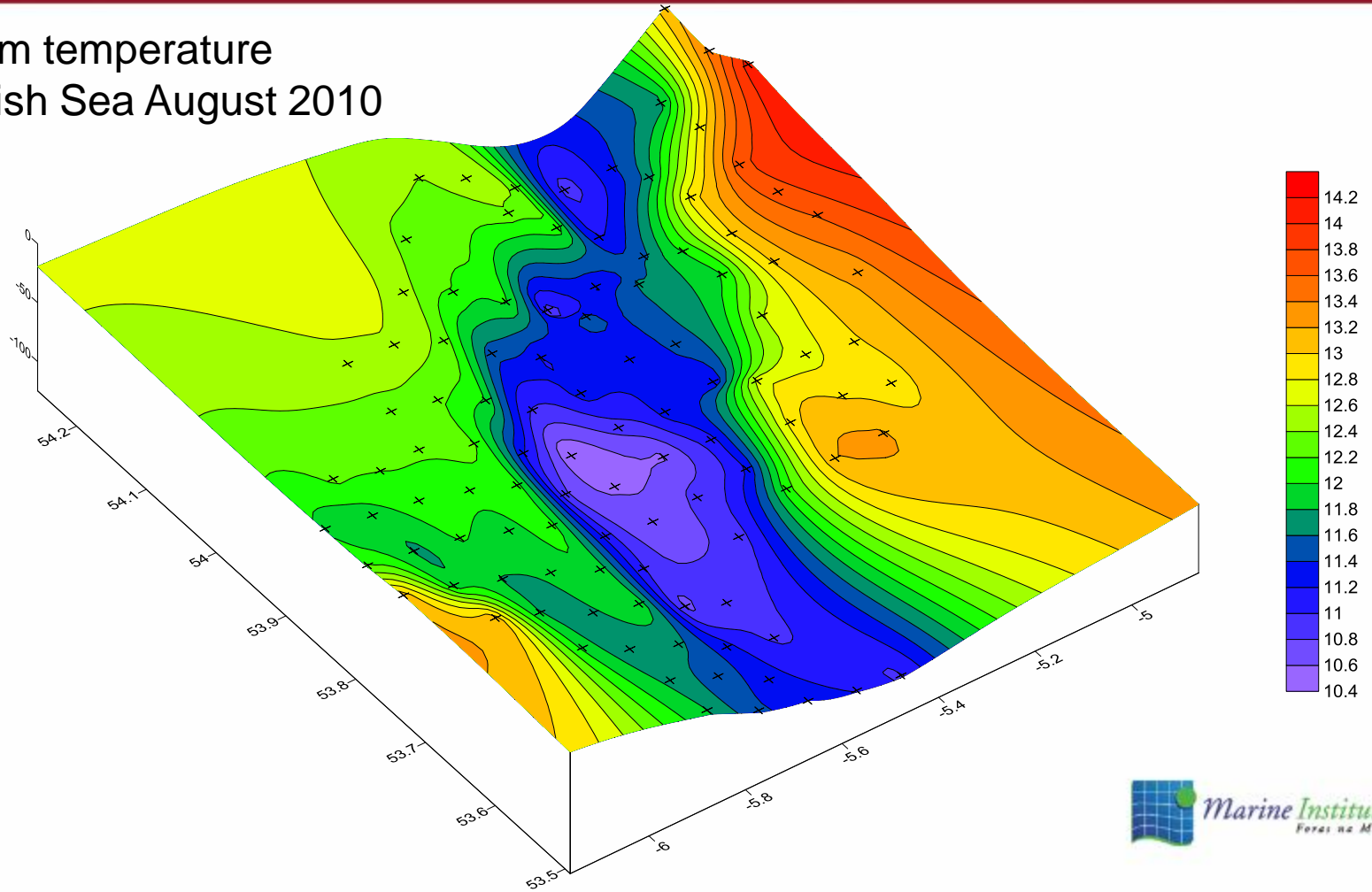
4) Clustering





CTD Data

3-D Bottom temperature
surface Irish Sea August 2010





State of the stock – FU17 Aran Grounds

