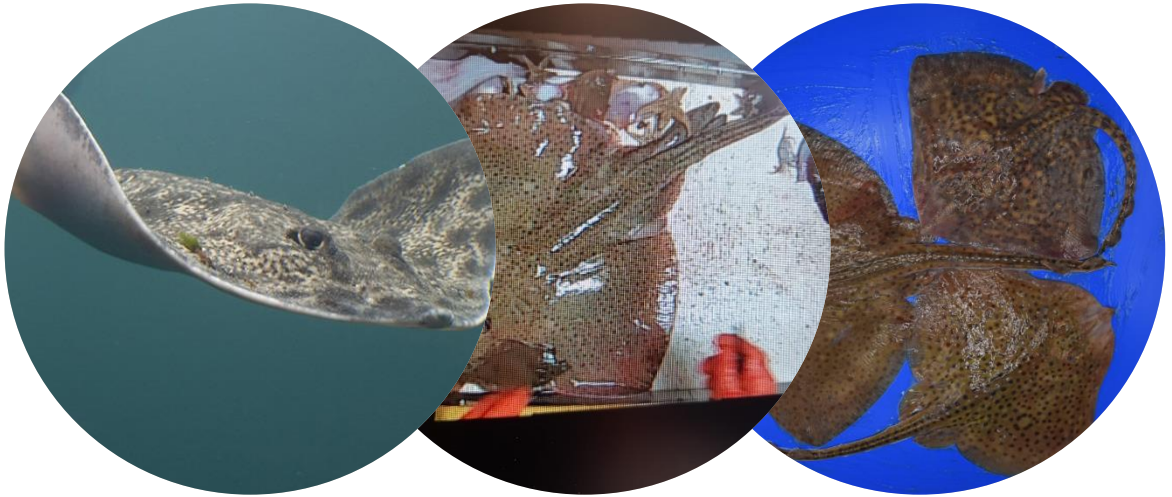
Innorays

“Improving our knowledge-base for North Sea rays using ‘Electronic Monitoring”

J. Batsleer, K. Bleeker, K. Molla Gazi, A.T.M. van Helmond, T. Zawadowski, A. Mencarelli and G.W. Kootstra



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The challenge of catch registration

- Skates and rays: Data-limited species

Landings well documented

Part of catch discarded at sea...?

- Support advice on catch opportunities (ICES)
- Support scientific advice (STECF)
- Support discard registration (Policy e.g. landing obligation)

Manual monitoring

Accurate identification

Labour intensive:

Small sample size
< 5% of total catch
< 1% of fleet

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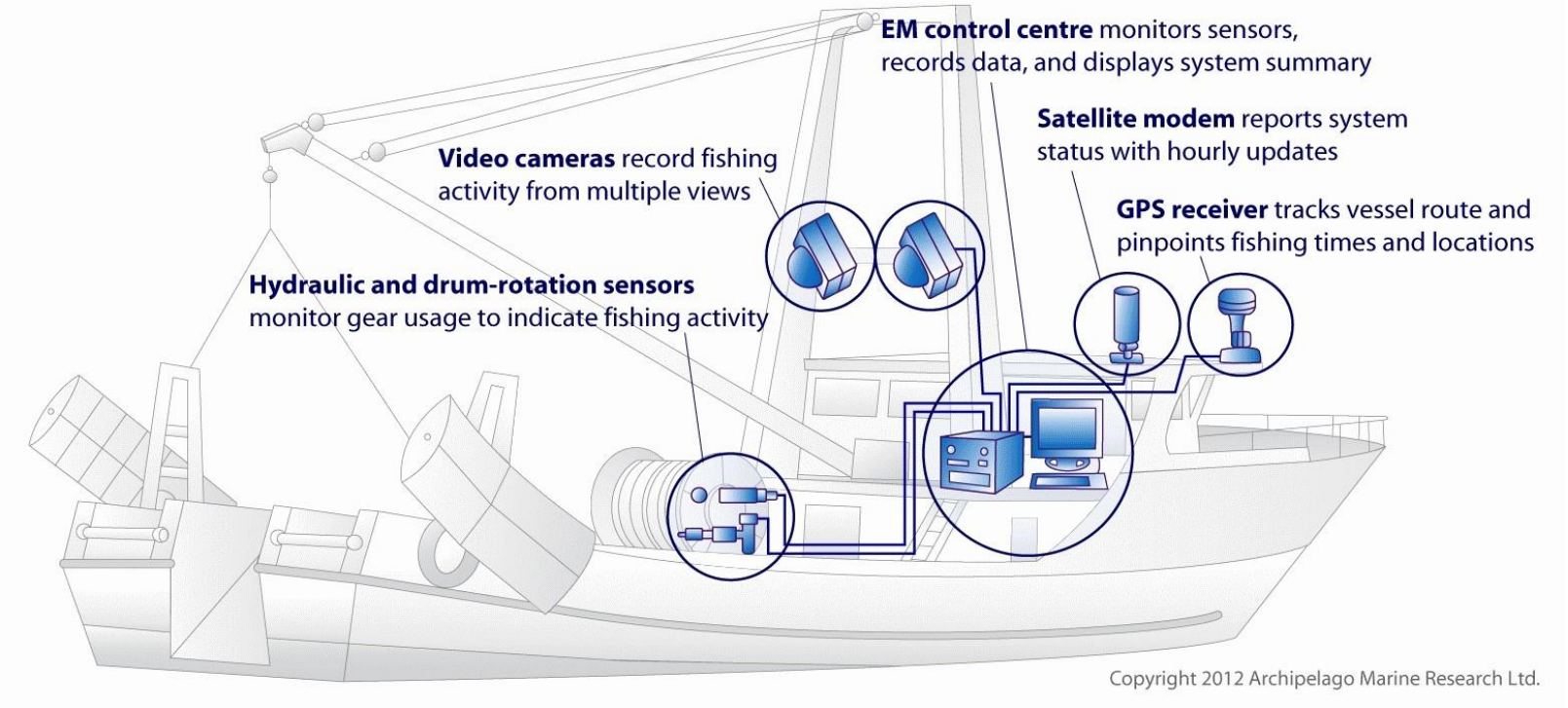
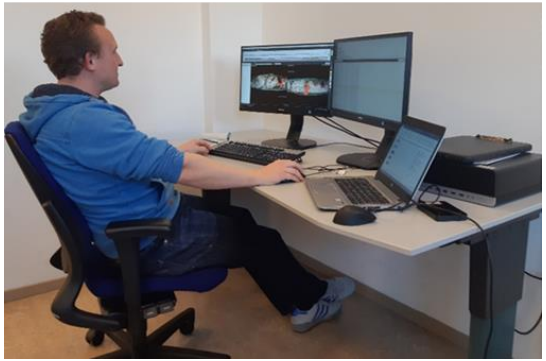
Electronic monitoring on-board



Manual review of the catch

Validation of manual review

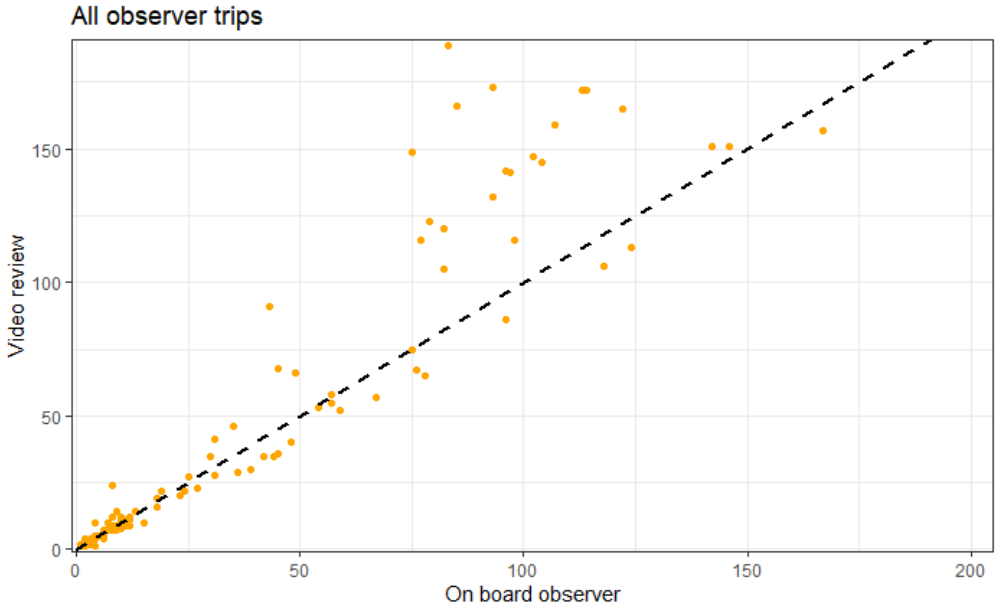
Manual review



On board observers

Observer vs video review

- Review ~ 57% of hauls
- Counting “rays”
    - Video review seems to see more!



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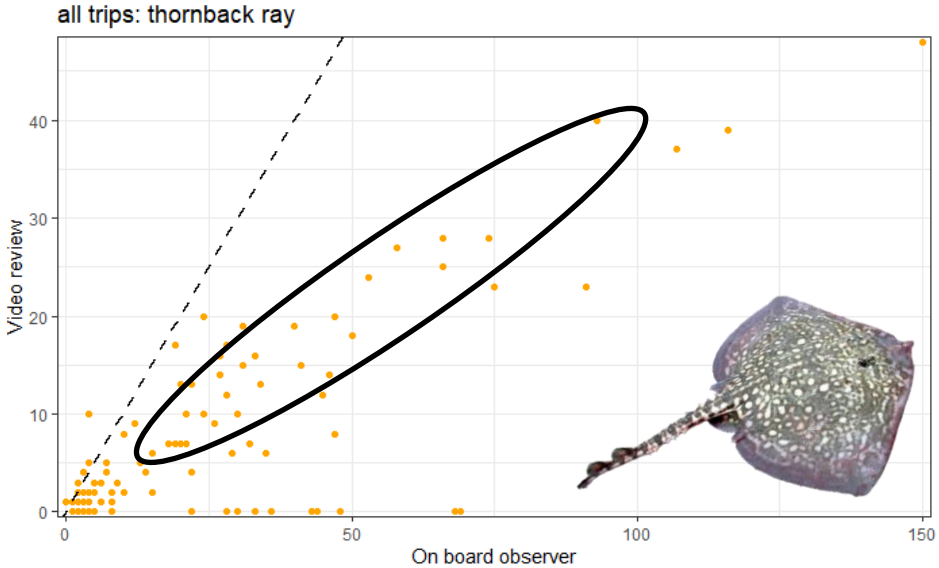
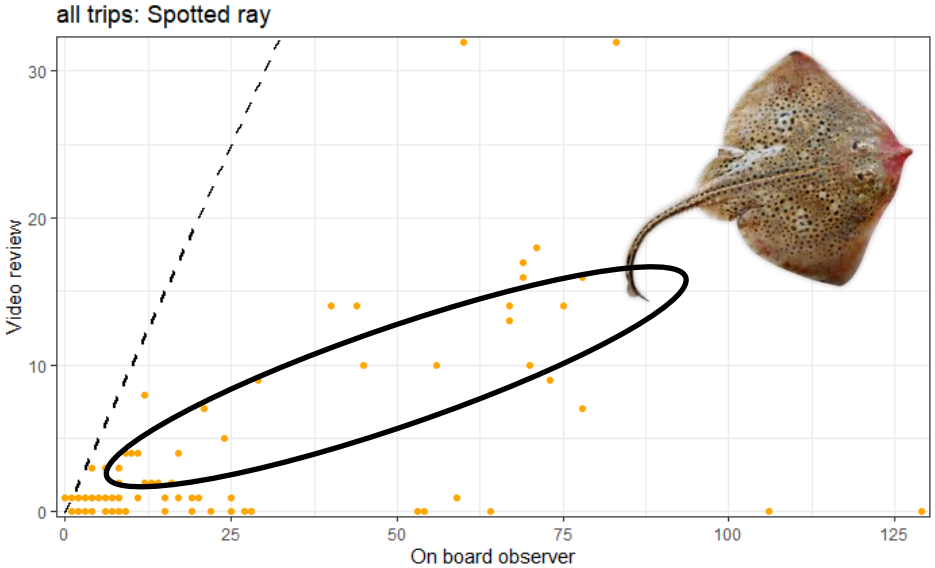
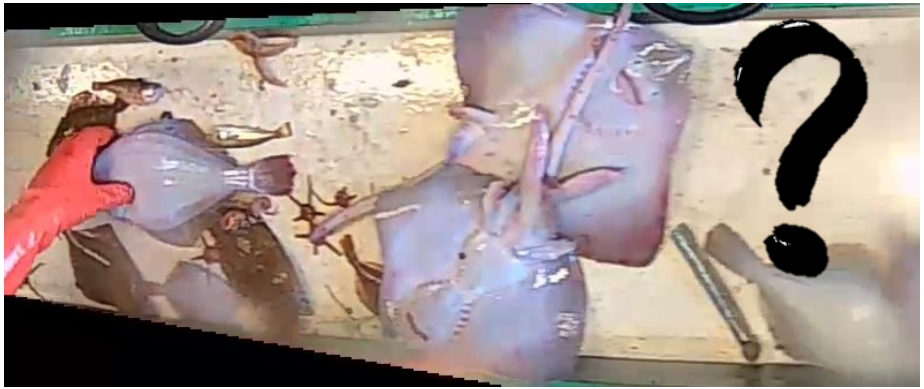
Observer vs video review

- Counting by species...
  - Underestimation by video review!





Pros and cons video review



Improved sampling coverage

Less costs

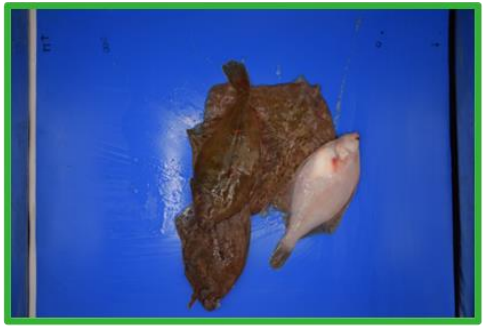
Manual review:

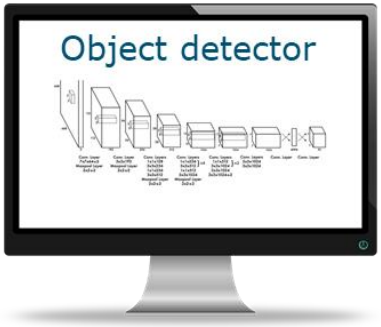
Time consuming

Species identification

Size/weight measurement

Use of computer vision technology

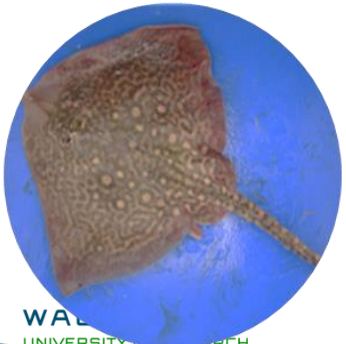


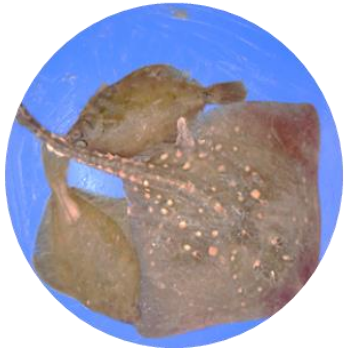


Low complexity

Mid complexity

High complexity





Automated counting system: phase 2

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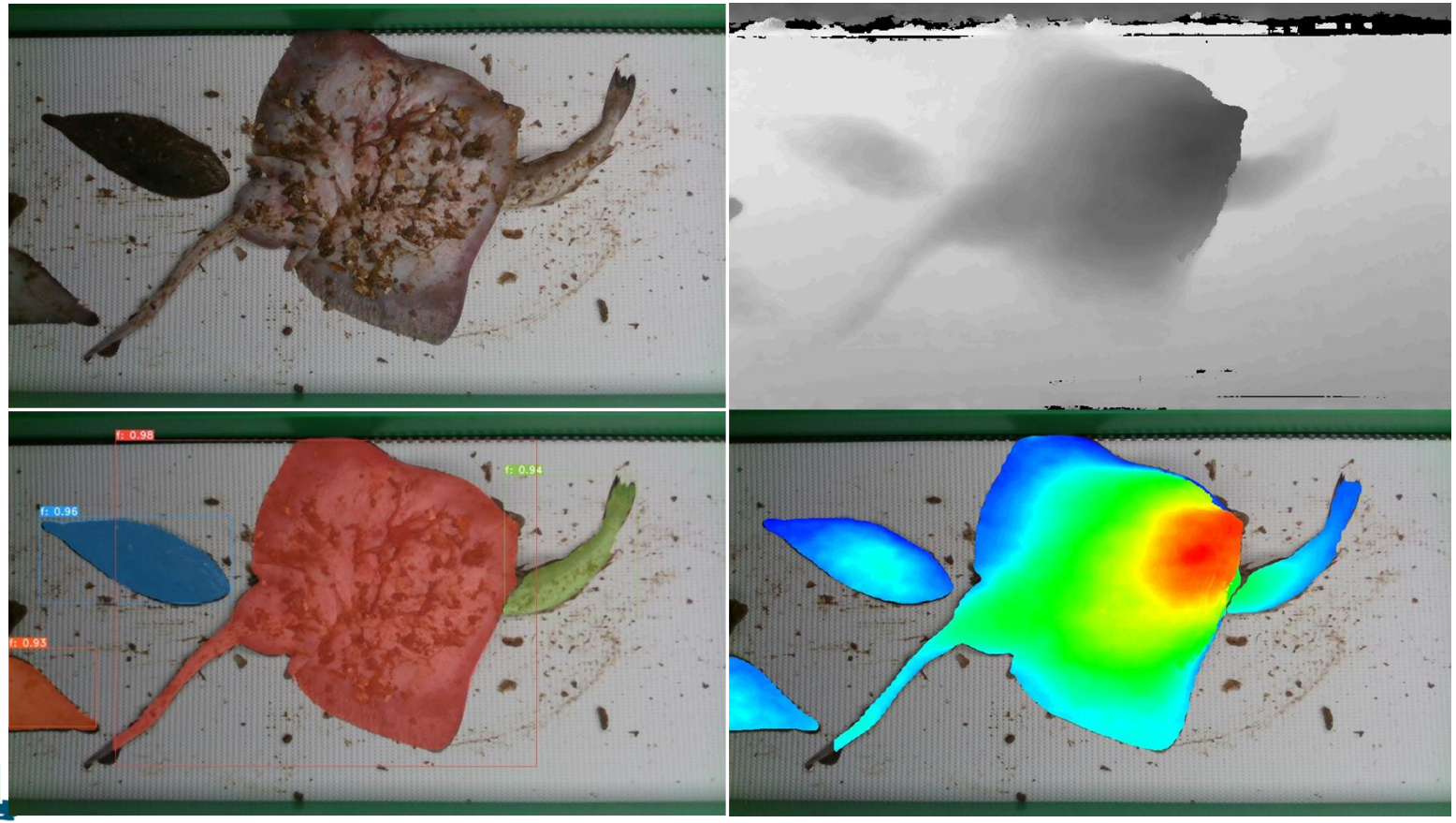
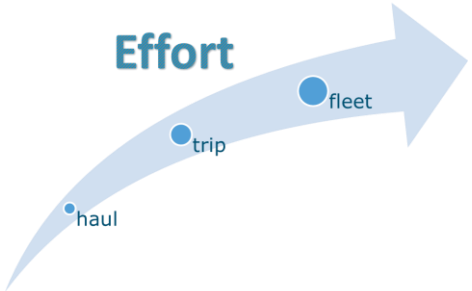
Automated counting, length and weight



Way forward

- Validate efficiency of EM (observer vs video review)
- Technical feasibility of computer vision
- Determine number of hauls to review (~57%)
- Improve estimates of ray catches to inform fisheries advice



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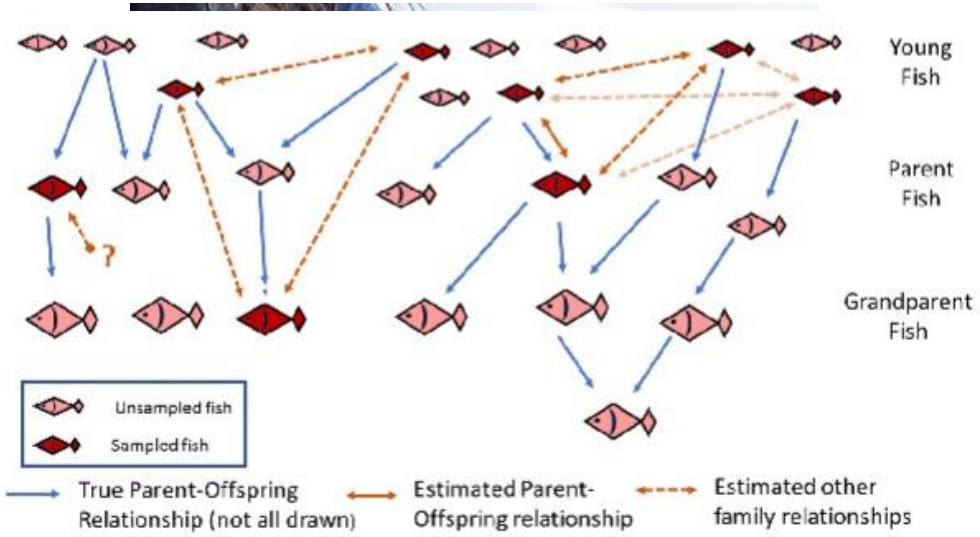
Close-kin Mark Recapture

- Population structure using genetic tools
  - Close-kin mark recapture



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Ifremer

DNA sampling

- North Sea and English Channel
- 2000 samples per species

- Thornback ray >2000
- **Blonde ray ~ 600**
- **Spotted ray ~ 1000**

- Smoothhound ~ 400
- Tope shark ~ 14
- Spurdog ~ 10
- Stingray ~ 15

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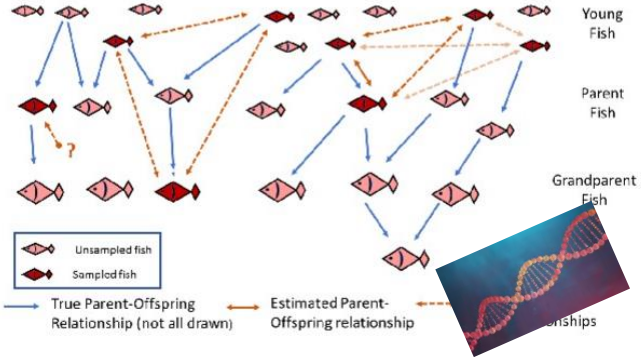
Combine all information

Close-kin mark recapture

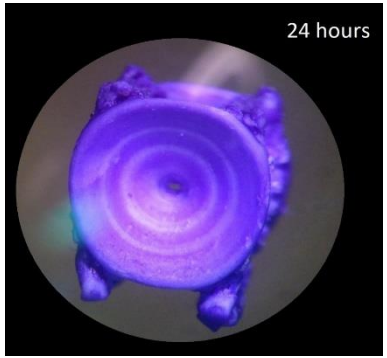


Tagging studies

Catch composition

Discard survival

Ageing and diet



Thank you for your attention.

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VisNed VISSERS MET TOEKOMST

Nederlandse Vissersbond

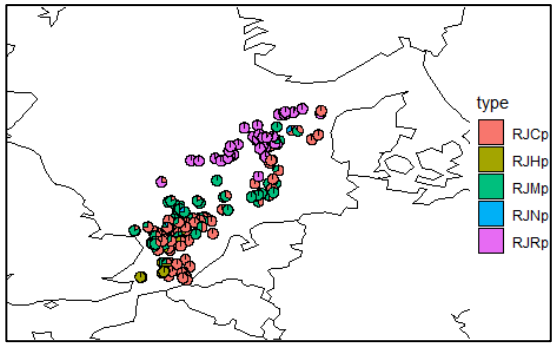
European Union, European Maritime and Fisheries Fund

Fisheries dependent CPUE index

- Species specific advice, but how to deal with undetermined rays?

- How to move from rays to a species-specific index?

Probability via distribution maps



Occurrence in the catch

Computer vision

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