

# School biomass estimates using digital omnidirectional fisheries sonar

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### **Motivation**



(range:1000 to 3000 m)

(range: 400 to 600 m)

Stages of comercial purse seining using omnidirectional fisheries sonars

- 1. Searching
- Preliminary inspection 2.
- 3. Selection of school candidate
- 4. Detailed school inspection (range: 150 to 300 m)

Skipper objectives

- School biomass
- School swiming direction and speed
- School behaviour to approaching vessel









#### Detailed school inspection of herring school in North sea November 2013 F/V "Artus"

Inspection.wmv





#### Detailed school inspection

# Sonar echo strength (Sv) changes during encircling a polarized school





#### **Biomass calculation**





#### Results

Schools processed

|                      |                       |              |          |         | - 12             | Herring offshore   |  |  |
|----------------------|-----------------------|--------------|----------|---------|------------------|--|--|--|
| Vessel               | Dates                 | Ship<br>days | Species  | Schools | <mark>2</mark> - | <ul> <li>Herring inshore</li> <li>Mackerel offshore</li> <li>Net pens</li> </ul> | A STATISTICS                           |  |
| GO Sars              | Nov. 2012             | 14           | Herring  | 20      | 89 -             |  | ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ |  |
| GO Sars<br>Artus     | Mar. 2013             | 28           | Herring  | 1       | - 89             |  | ,<br>Ni                                |  |
| GO Sars<br>Artus     | Nov. 2013             | 28           | Herring  | 7       | <mark>8</mark> - |  | 2                                      |  |
| GO Sars<br>Kings Bay | Oct. 2014             | 28           | Mackerel | 6       | - 83             |  |  |  |
|                      | Total of 98 ship days |              |          |         |                  | 1 7 3  | # - H                                  |  |

89

5

0

10

15

20

34 best quality schools 9 verified catches



## Procedure for school growing in post-processing software

#### School growing.wmv





#### Results from sonar measurements





#### Sonar and echo sounder measurements





### Sonar estimated and verified biomass of herring and mackerel





#### **Future activities**

#### Improvements in methodology

- Implement improved growing methods in post-procesing software
- Calibration in FM mode and vertical beams (done in October 2015)
- Improve side aspect target strength (TS)

#### Implementation for use in commercial fishery (2016?)

- Include a calibration facility in sonar software
- Implement biomass equations in sonar software



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And especially to the skippers and crew of:

R/V "GO Sars"





F/V "Artus"

F/V "Kings Bay"

