

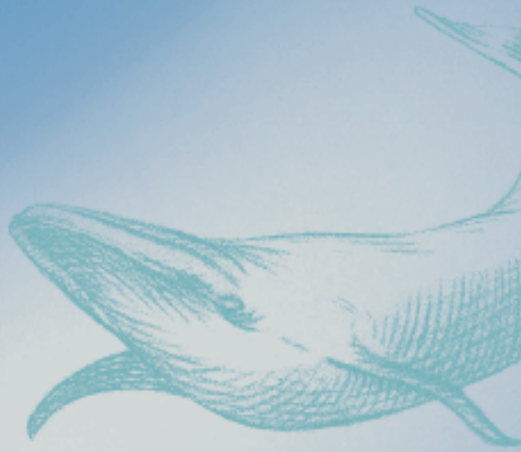

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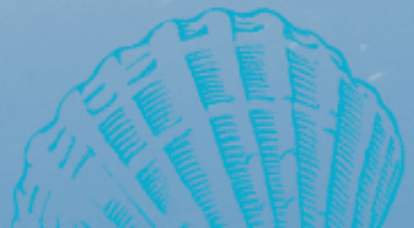

Catch and gear monitoring in purse seines

Seine geometry and fish behaviour

By Maria Tenningen

INSTITUTE OF MARINE RESEARCH
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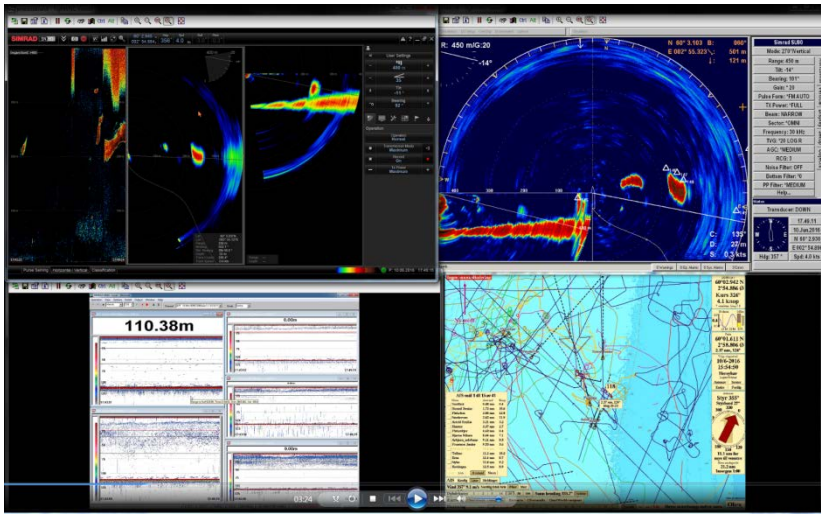
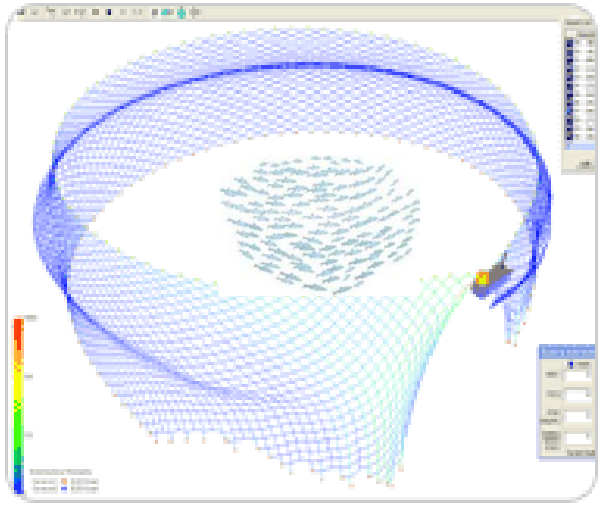
Next generation catch monitoring





SimuPurse, mpsl Korea

Improved control of the catch process and understanding of the interaction between the catch and the gear

→ improved catch efficiency
→ fewer gear injuries
→ higher quality catches and better fish welfare

How far have we come in CRISP?

Work package 2.
Gear and catch monitoring systems in purse seine

2.3. ”In-Seine” sonar technology for catch control
2.4 Catch monitoring system in purse seine
2.5. Monitoring seine geometry and performance

2.3. ”In-Seine” sonar technology for catch control

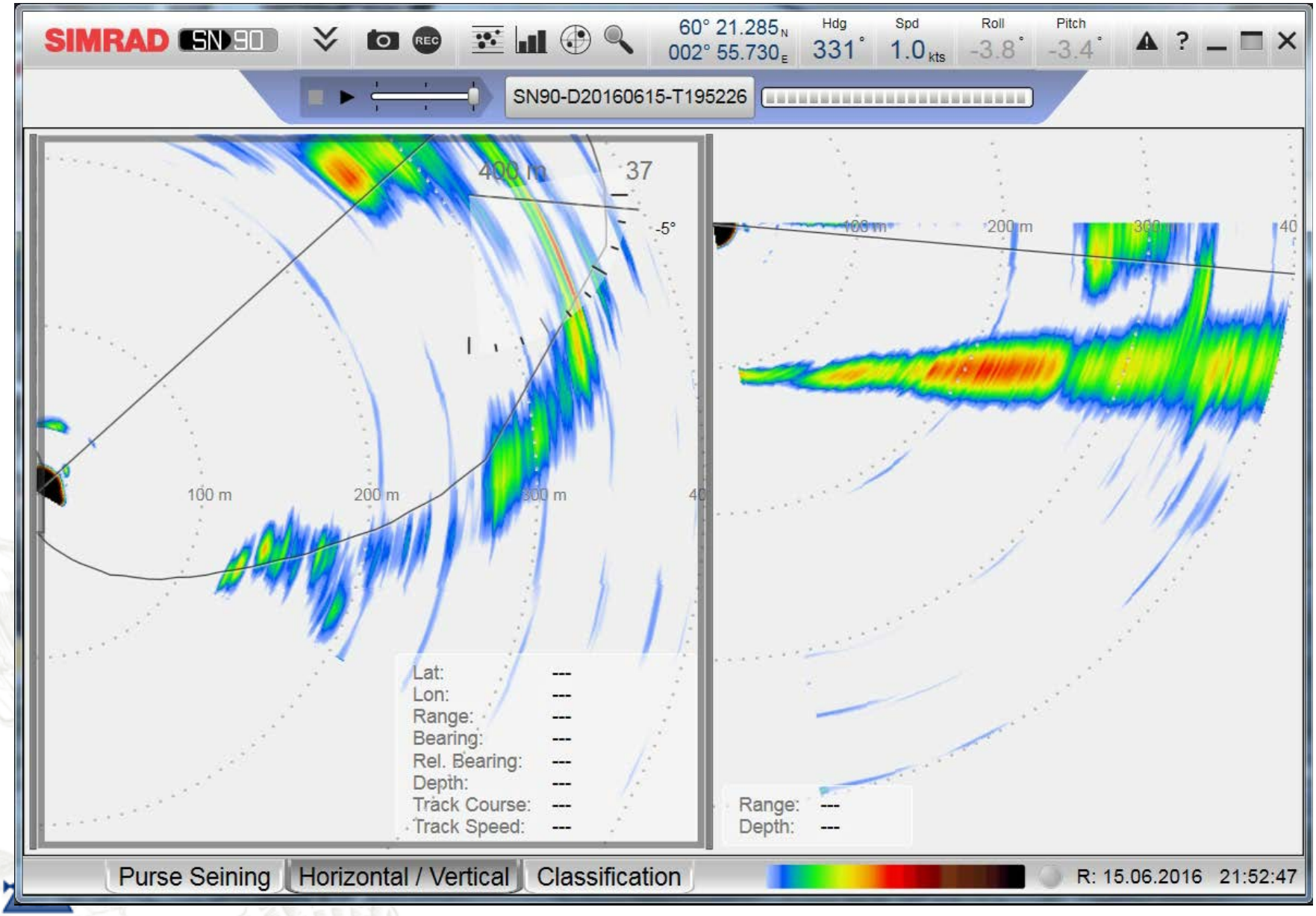
Objectives:

• Adapt current acoustic in-seine sonar technology for estimate catch quantity in an early phase of a purse seining

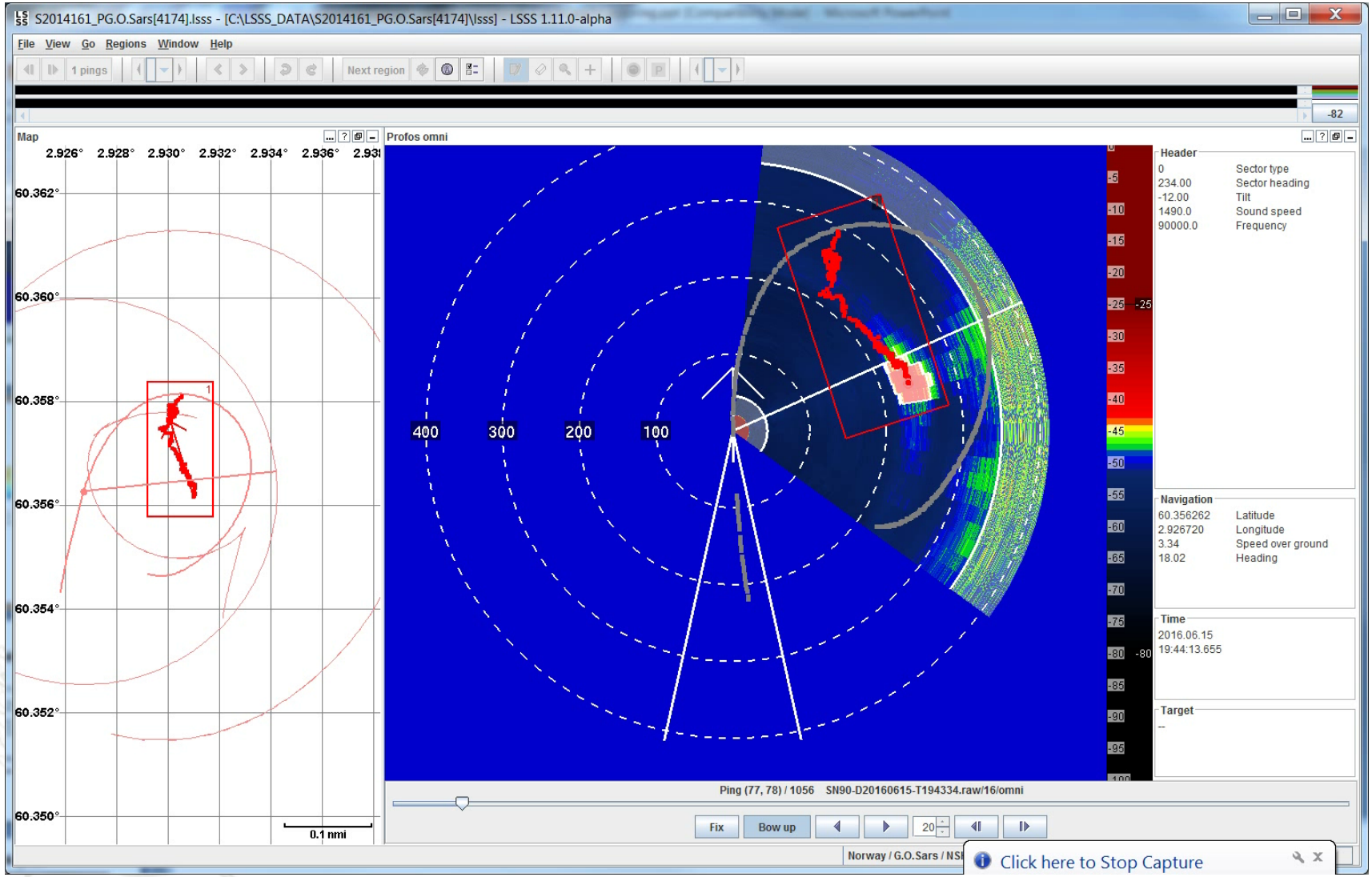
• Development of tools for monitoring of catch and gear during the shooting and pursing phases

• Characterize catch dynamics and interactions with the net during the shooting and pursing phases

Development of tools: Simrad SN90



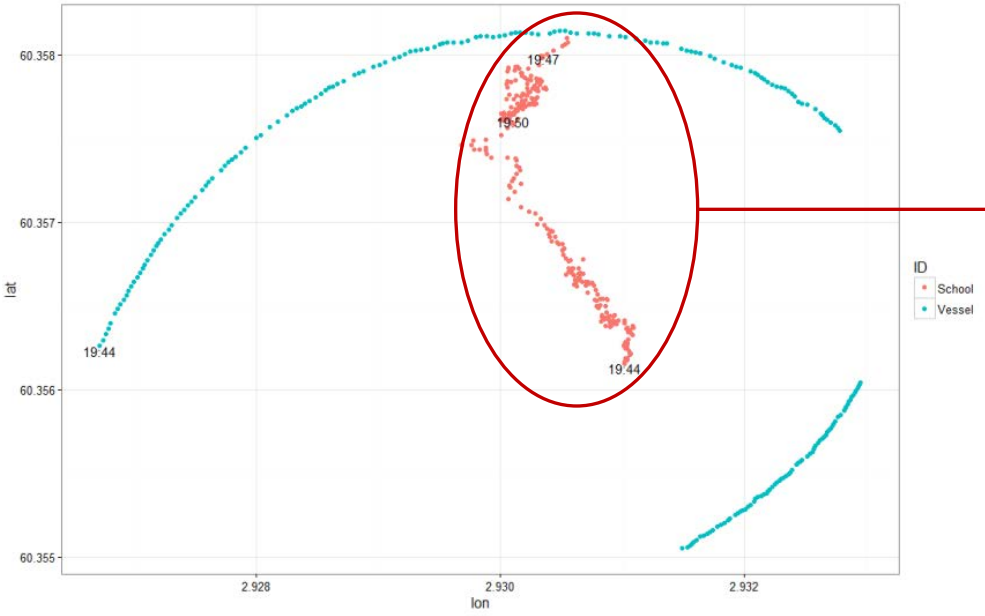
Development of tools: PROFOS (LSSS, IMR)



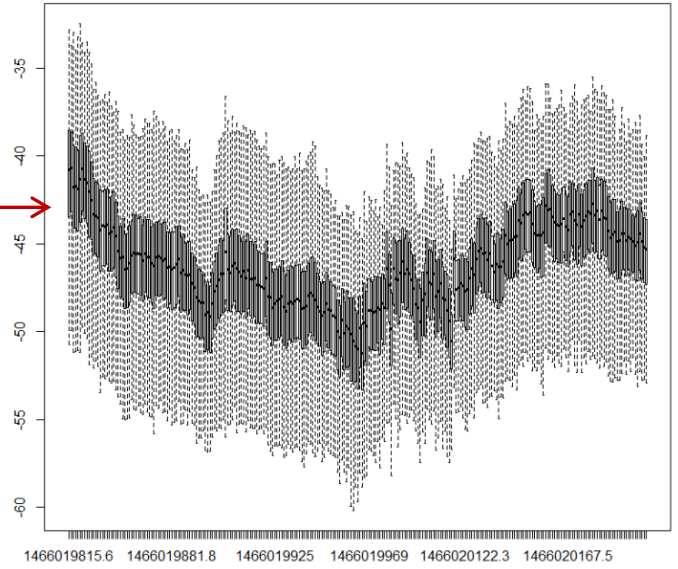
Catch dynamics

(data analyses is under progress)

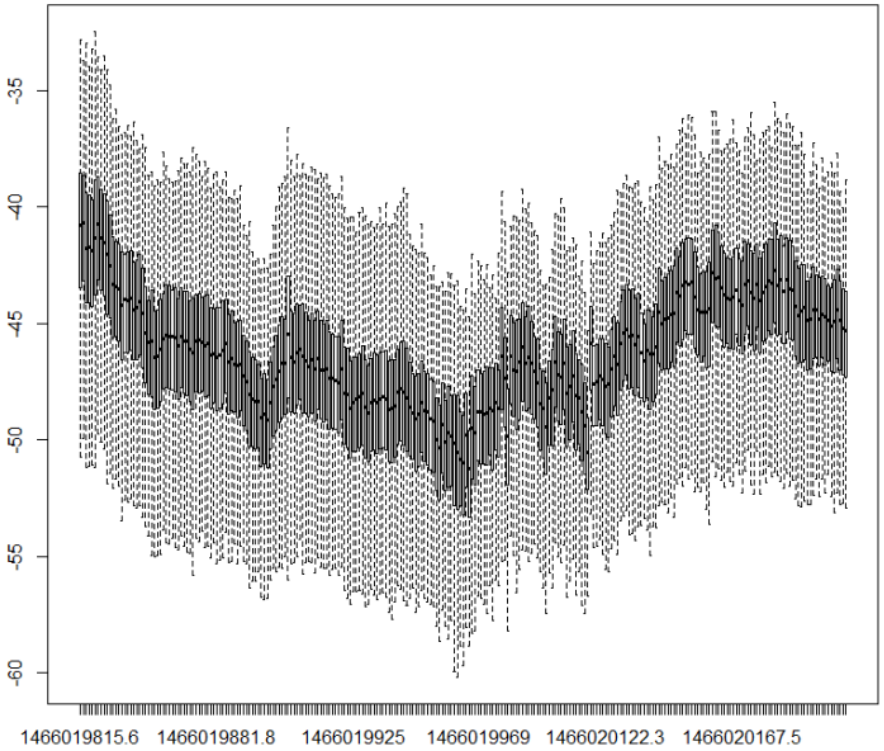
School swimming speed and direction and spatial distribution

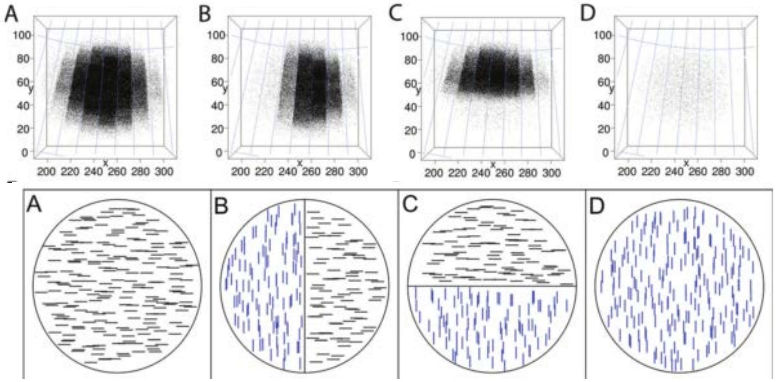


School backscatter strength (Sv): Density and fish orientation



Scattering directivity: Backscatter patterns in time and space can inform about school behaviour





Holmin et al. 2012

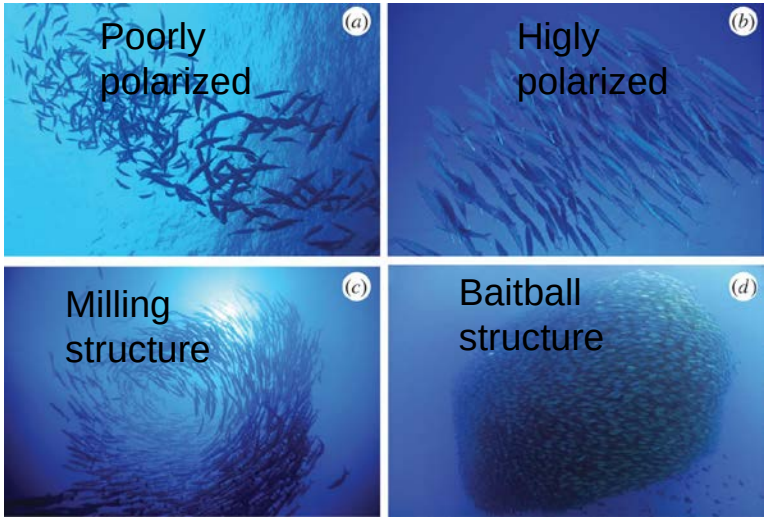


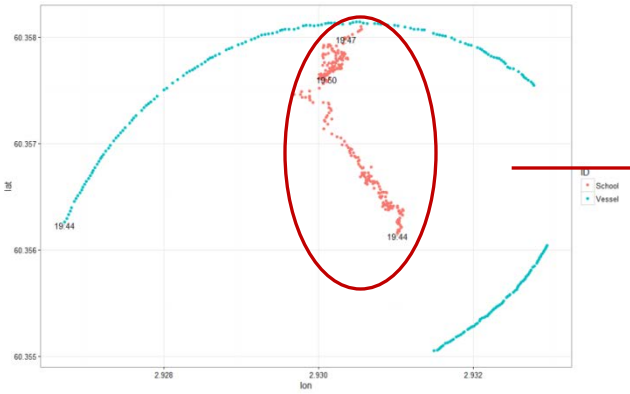
Image from Lopez et al., 2012

RedSlip, NFR

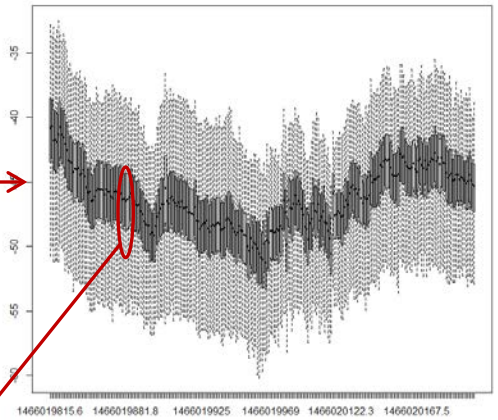
Catch dynamics

(data analyses is under progress)

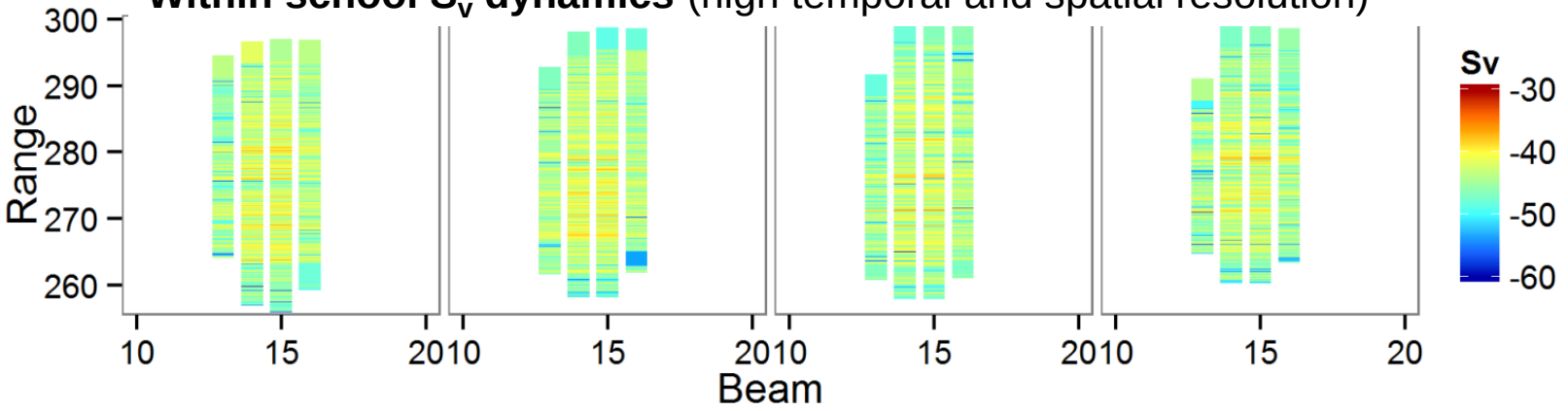
School swimming speed and direction and spatial distribution



School backscatter strength (Sv): Density and fish orientation



Within school S_v dynamics (high temporal and spatial resolution)



2.5 Monitoring seine geometry and performance

Objectives

To improve the control of purse seine performance through visualization of the net in real-time during shooting, pursing and hauling.

To improve control of sinking speed, depth and position of the gear relative to the surrounded fish school, the sea bed and the vessel.

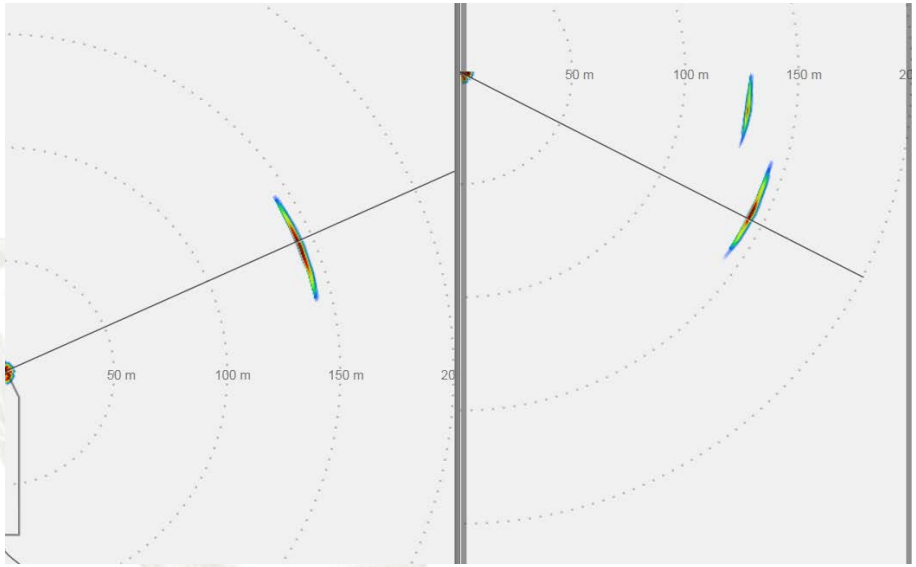
3D positioning sensors

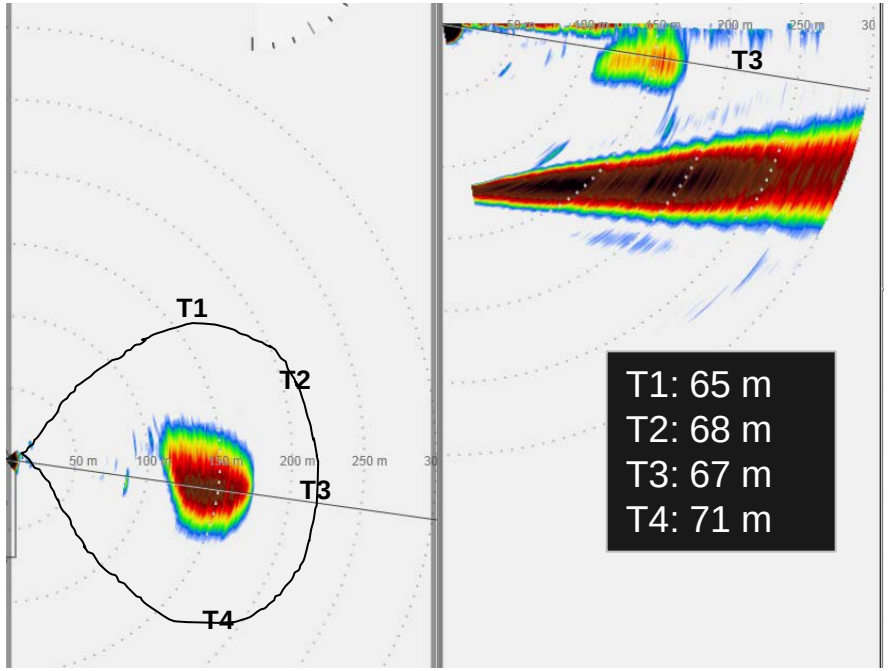
Currently:

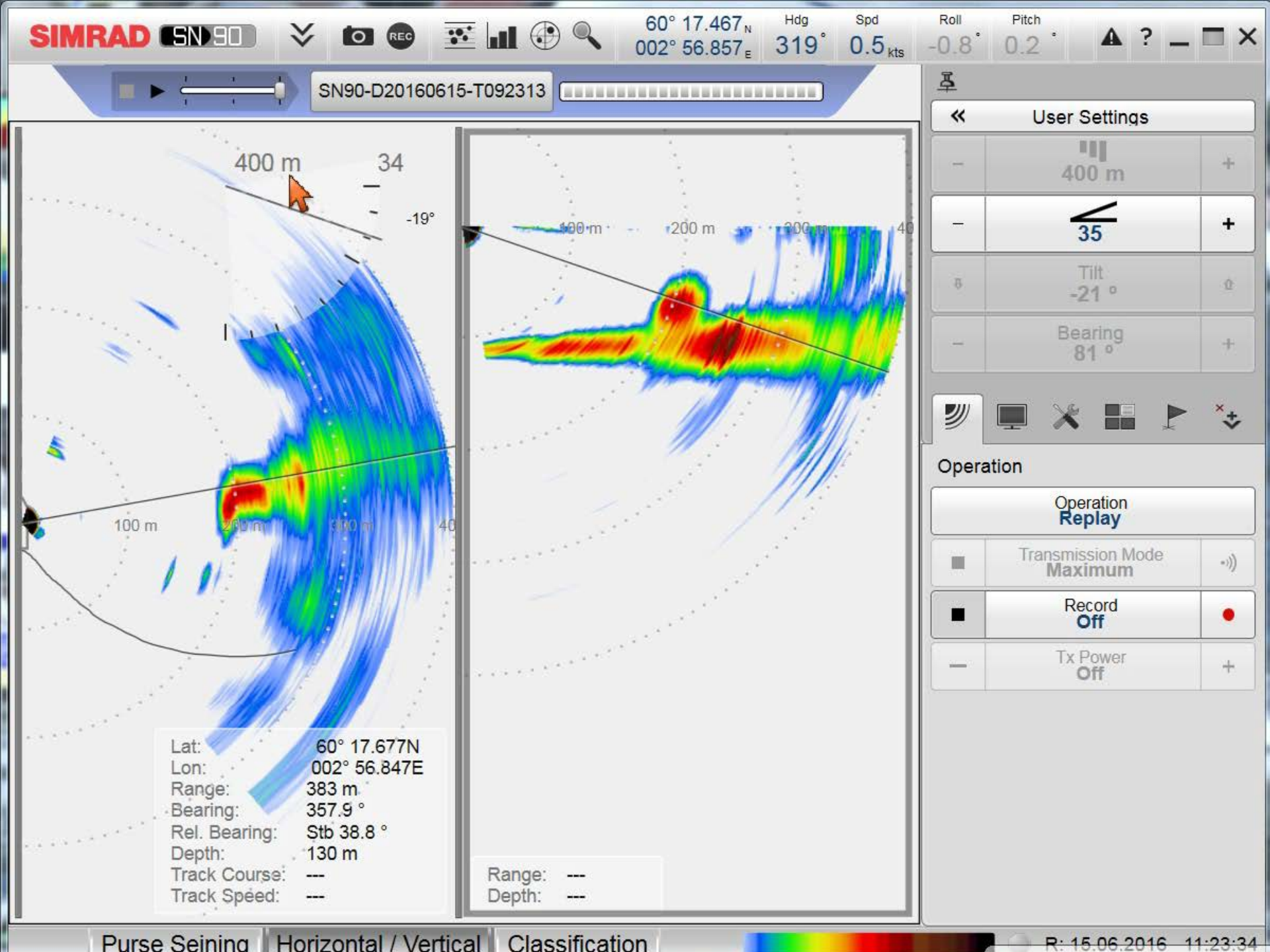
- Positions as echoes in SN90
- Separate tp mode

Next steps:

- Integrated into fishing mode
- Visual and numeric output
- Smaller transponders





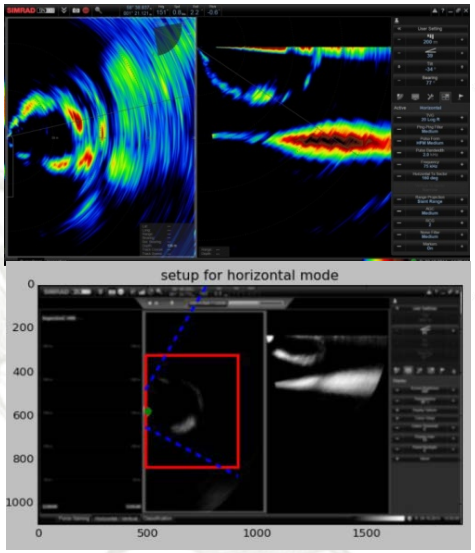

SIMRAD SN90
60° 17.467 N
002° 56.857 E
Hdg 319 °
Spd 0.5 kts
Roll -0.8 °
Pitch 0.2 °
SN90-D20160615-T092313
User Settings
400 m
35
Tilt -21 °
Bearing 81 °
Operation
Operation Replay
Transmission Mode Maximum
Record Off
Tx Power Off
400 m
34
-19°
100 m
200 m
300 m
Lat: 60° 17.677N
Lon: 002° 56.847E
Range: 383 m
Bearing: 357.9 °
Rel. Bearing: Stb 38.8 °
Depth: 130 m
Track Course: ---
Track Speed: ---
Range: ---
Depth: ---
Purse Seining
Horizontal / Vertical
Classification
R: 15.06.2016 11:23:34

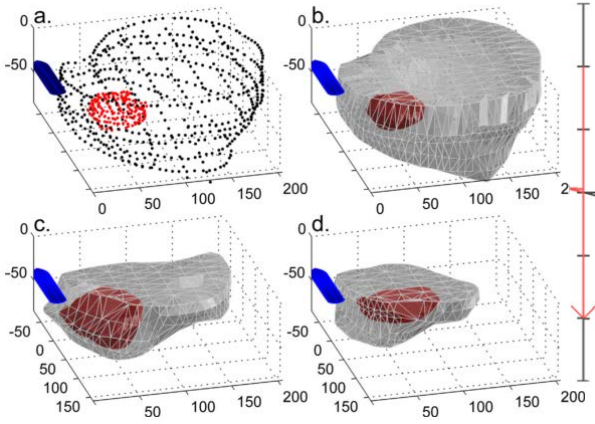
A remaining challenge:

Monitoring after the seine is pursed

- Is it needed?
  - Yes, better fish welfare → reduced mortality & improved quality
- Achievable with currently available sonars??

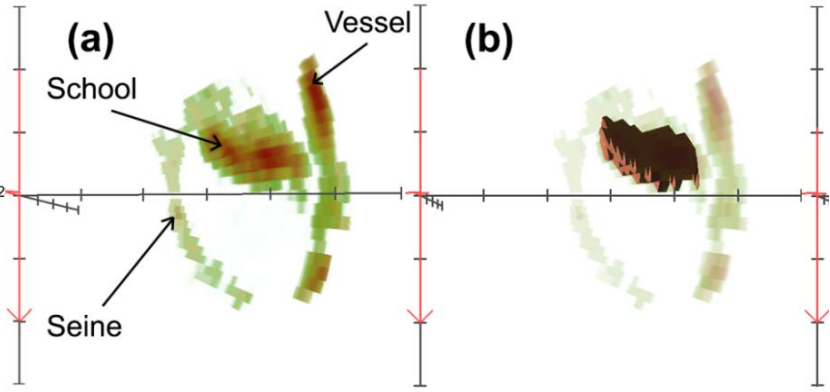
Purse seine volume





(Tenningen, M., Peña, H, and Macaulay, G.J. 2015)

School behaviour

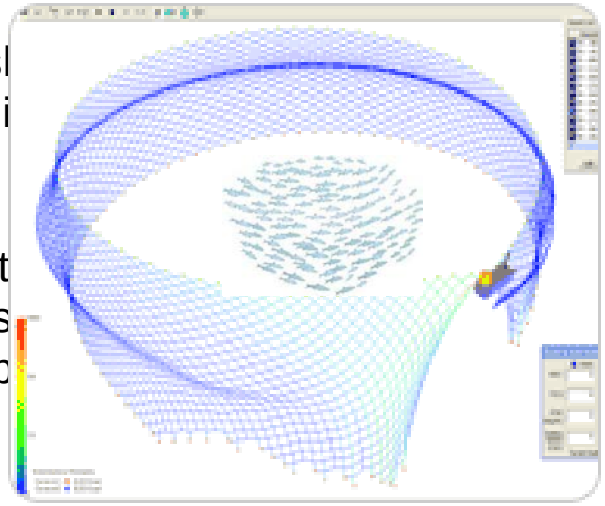


(Tenningen, M., Rieucau, G., Macaulay, G.J., Peña, H., and Korneliussen, R. In Press)

PhD proposal to Simrad and in cooperation with Korean or other experts within net modeling

Aim

to develop a mathematical model for describing the 3D sh
sparsely spaced 3D seine sensors, during the whole fishi

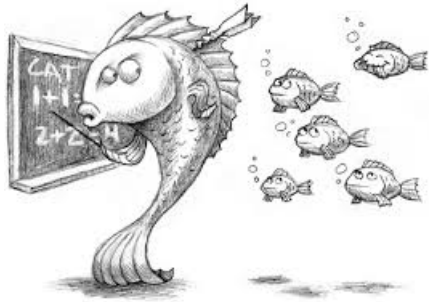


Output

- Understanding of the 3D gear behaviour under different
- A prototype tool that when used in real time provides fis
the gear and when combined with school information imp
quality and fish welfare.

Competencies:

- Simrad – seine sensors and positioning
- IMR – experimental expertise, links to fishing industry, scientific need, co-host
- XXXX – marine modelling
- University – academic rigour, Ph.D. programme, co-host of student



Héctor Peña, Gavin Macaulay and me

Thank you

We cannot develop or improve something we don’t know the current state of.