

# *Offshore development in the North Sea*

## *INTERACTIONS BETWEEN FISH, SCIENTISTS AND THE INDUSTRY*

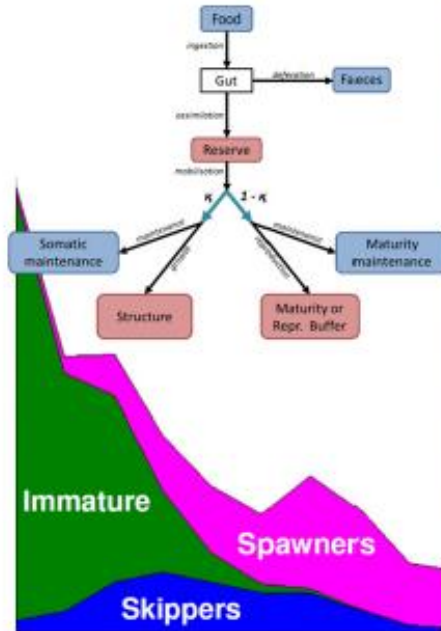
Inge van der Knaap | December 6<sup>th</sup> 2018



# EFFECTS OF SEISMIC SOUND EXPOSURE ON ATLANTIC COD

I

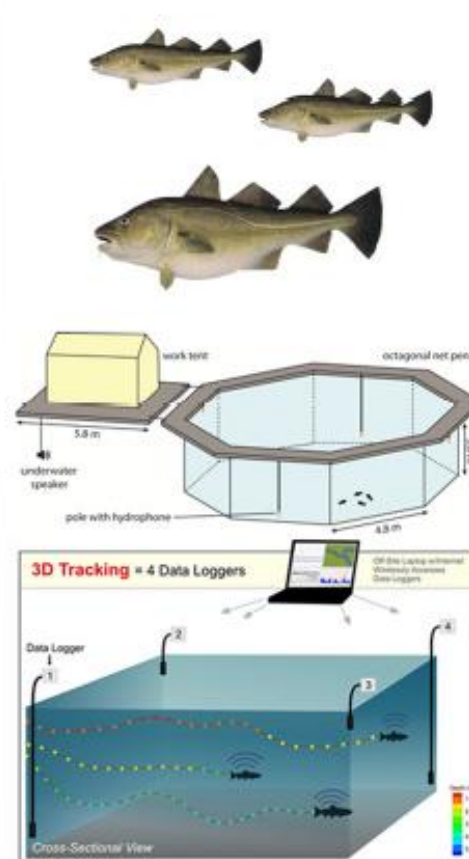
$$\dot{p}_c = \frac{\{\dot{p}_{Am}\}[E]V^{2/3}}{[E_m]} - [E] \frac{dV}{dt}$$



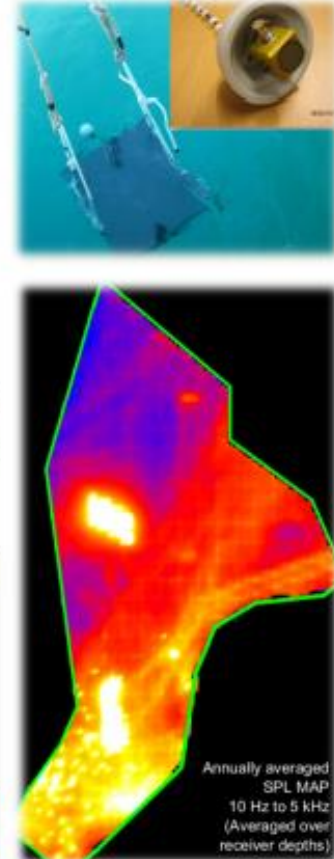
II



III



IV



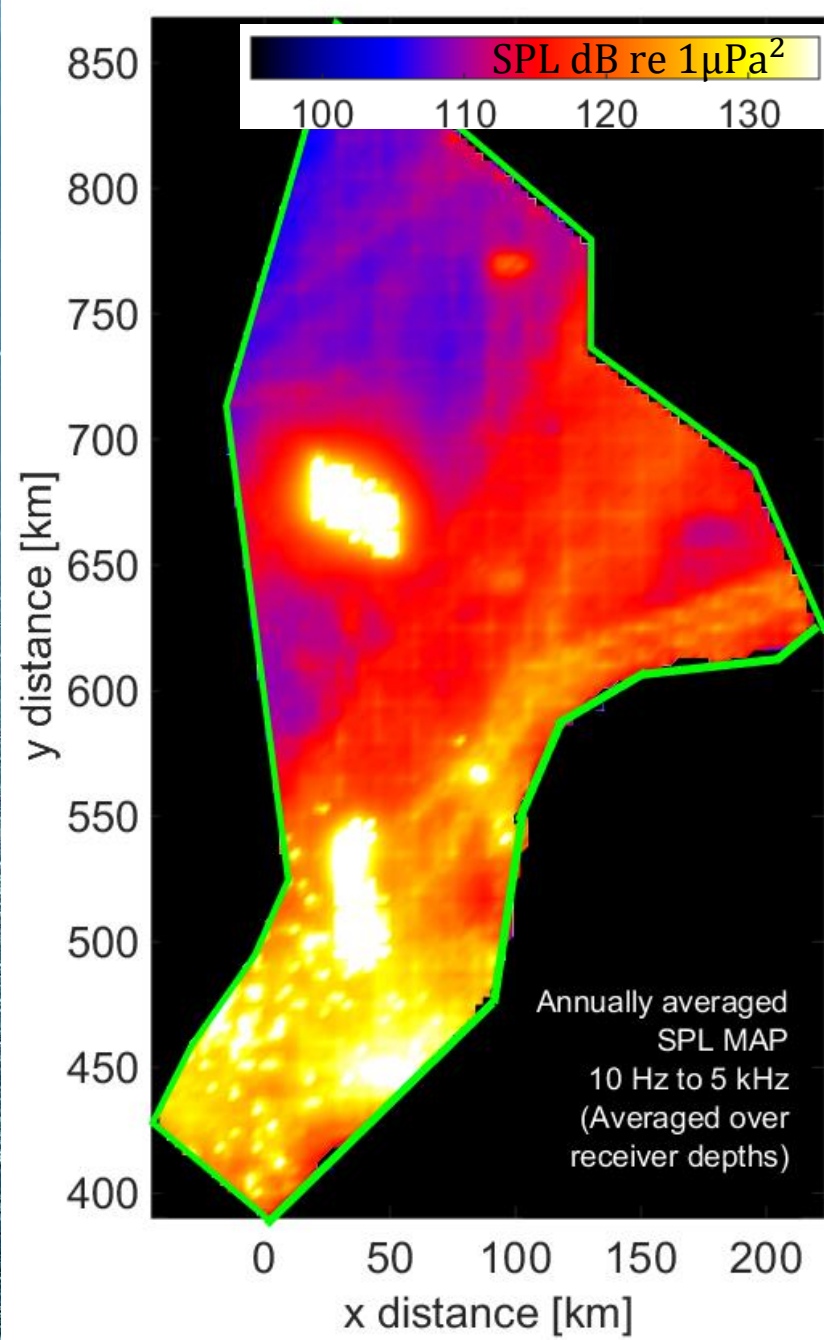


Image: PGS

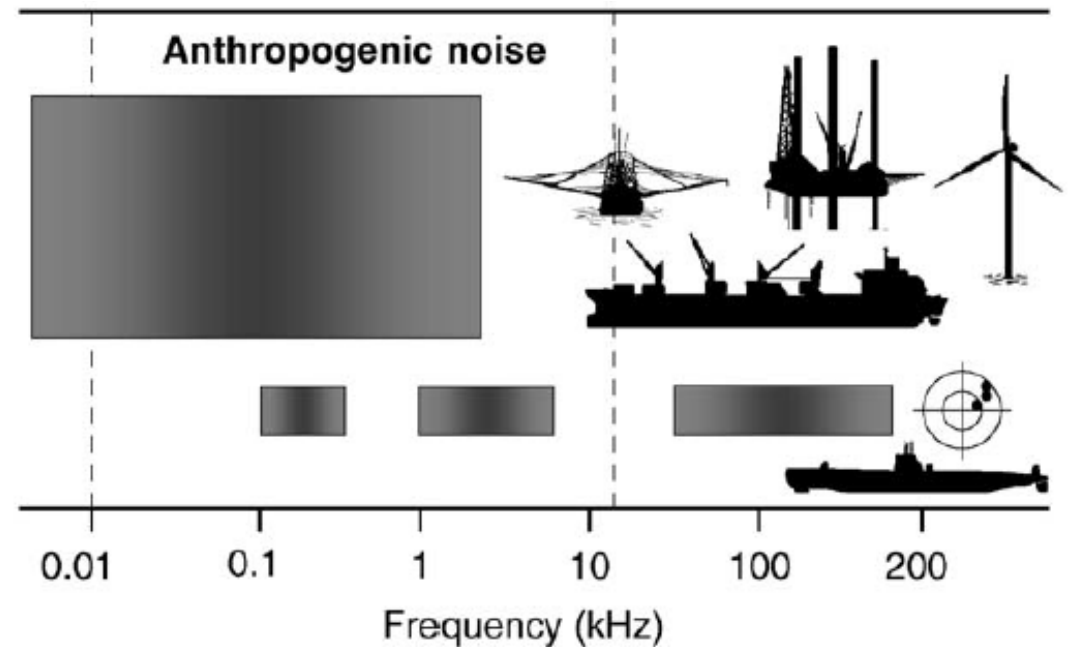
Özkan Sertlek (2016)



# HOW COULD SEISMIC SOUND EFFECT FISH?

Offshore man-made sound can cause:

- ❖ Damage & death
- ❖ Masking & distraction
- ❖ Physiology stress
- ❖ Behavioural disturbance





## THE E&P SOUND & MARINE LIFE JOINT INDUSTRY PROGRAMME

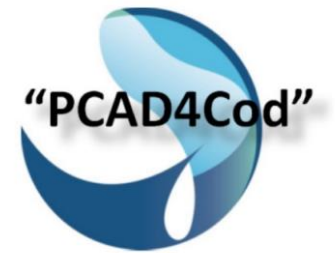
The Joint Industry Programme, or JIP, supports research to help increase understanding of the effect of sound on marine life generated by oil and gas exploration and production activity. The research helps governments make regulatory decisions based on the best science and the industry develop effective mitigation strategies. This helps us supply much needed energy to people around the world. Deliverables of the JIP can be found [here](#)

SCROLL TO DIVE INTO THE ISSUE ▼

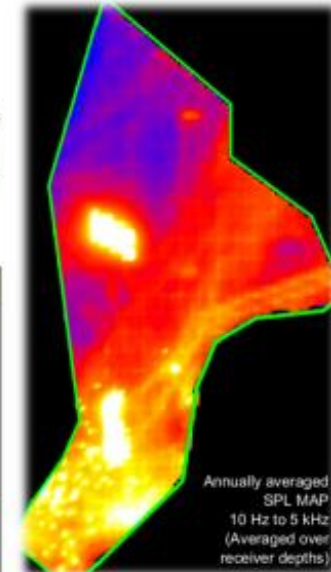
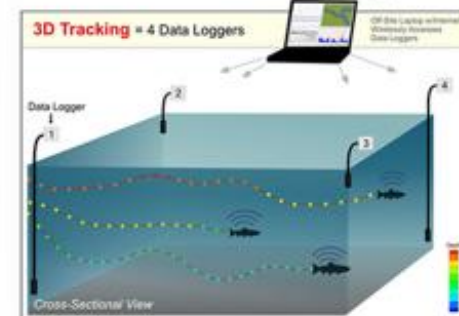
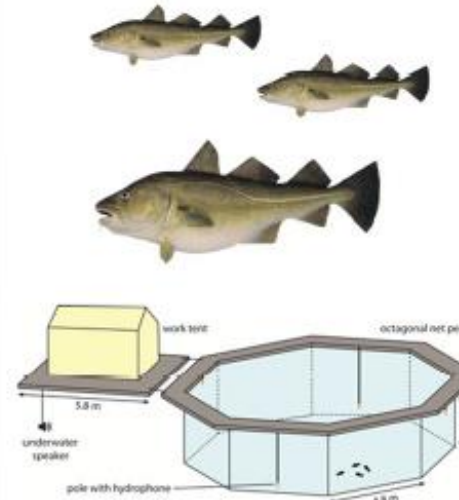
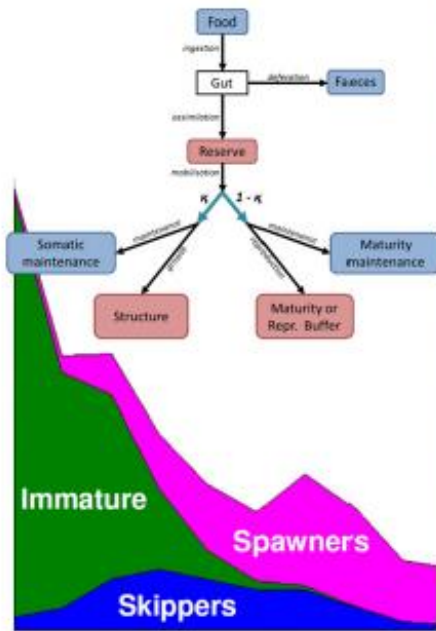
<http://www.soundandmarinelife.org>



# RESULTS OF PCAD4COD



$$\dot{p}_C = \frac{\{\dot{p}_{Am}\}[E]V^{2/3}}{[E_m]} - [E] \frac{dV}{dt}$$



A man with a ponytail is fishing from a boat on the ocean. He is holding a fishing rod that is bent, indicating a catch. In the background, several wind turbines are visible on the horizon under a clear sky. The word "Questions?" is overlaid in large white text in the center of the image.

# Questions?

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Picture: J. Campbell