

Testing the effects of an acoustic harassment device on the behaviour of harbour porpoises (*Phocoena phocoena*)

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AHD (Sealscarer) and Wind Farms??

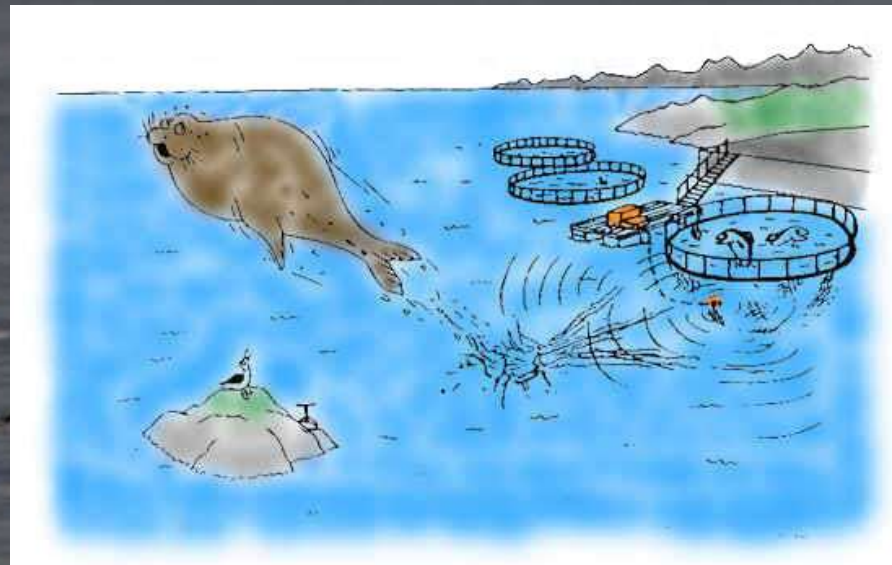
- regularly used to deter seals from fish farms
- show deterrence effect on harbour porpoises up to over 1km
[Johnston 2002, Olesiuk et al. 2002]

→ Deterrence of harbour porpoises during windfarm construction



Is AHD an effective mitigation measure?

- Efficiency of deterring effect.
- Range of deterring effect.



Seal scarer: Lofitech



Technical details:

Frequency: 14 kHz

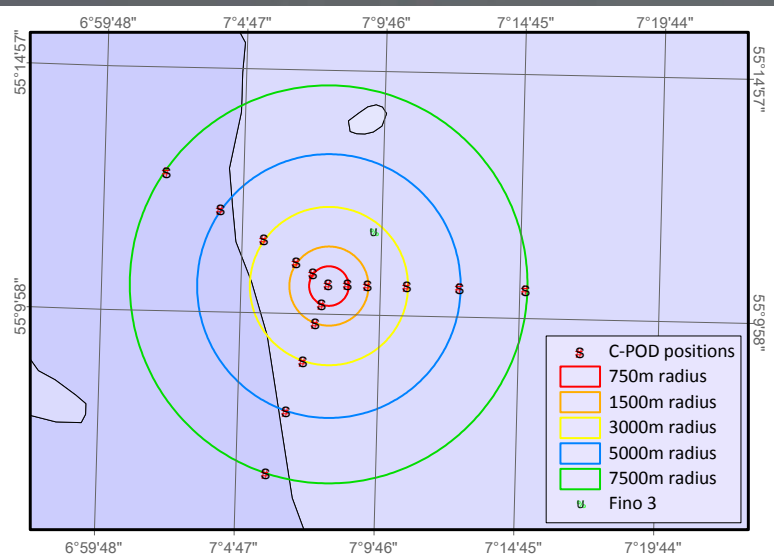
Signal duration: 0.5 sec

Repetition rate: random, between <1 to 40 sec

Source level: ~ 189dB re 1 μ Pa @ 1m (rms)

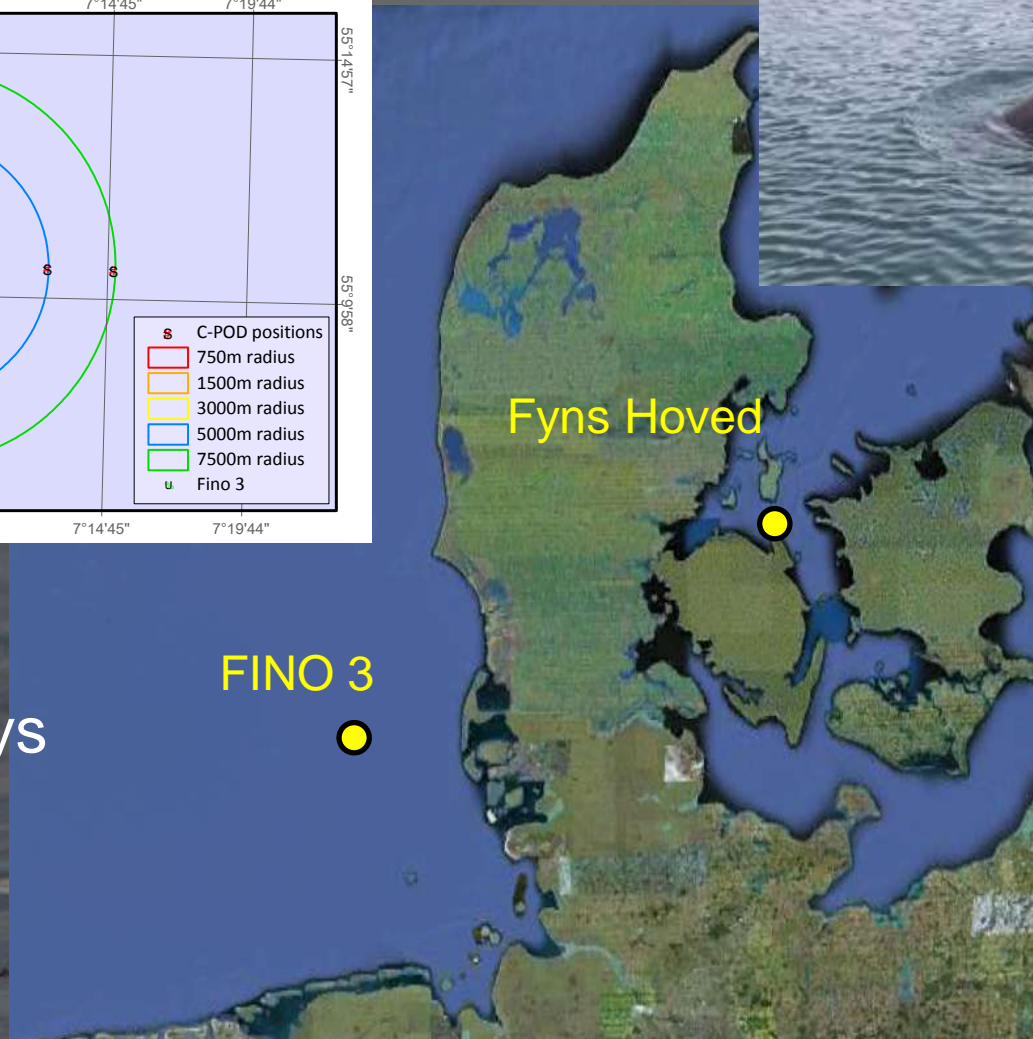


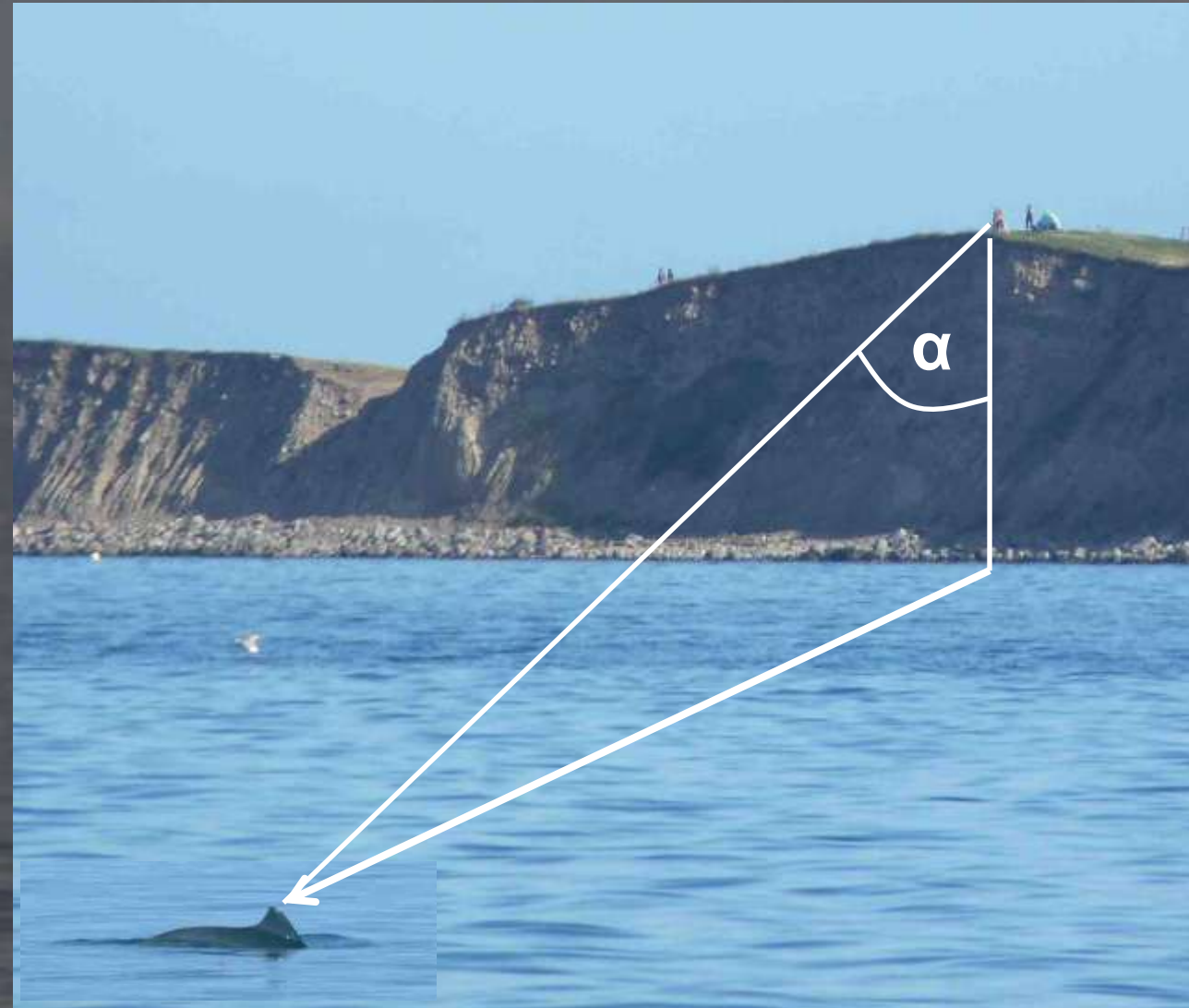
Two study sites:



PAM
Observation
from a cliff

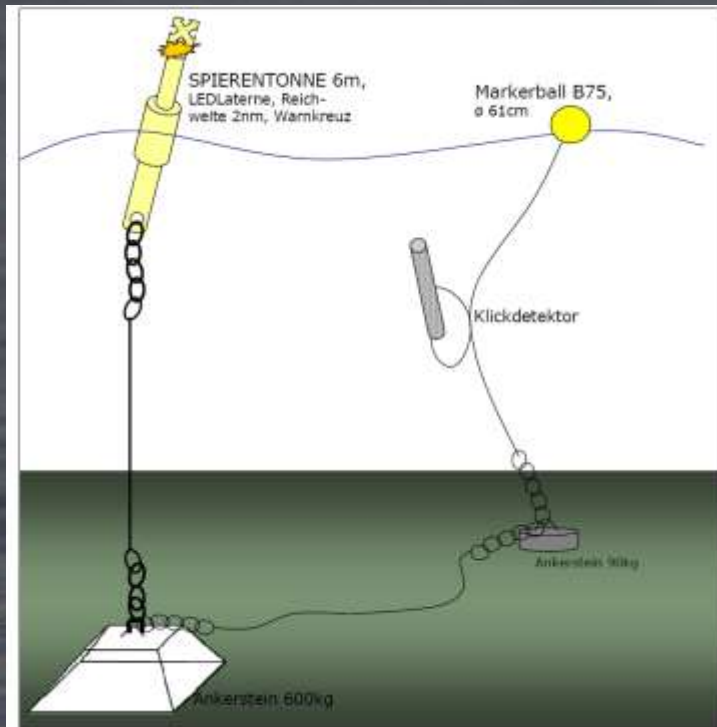
PAM
Aerial surveys





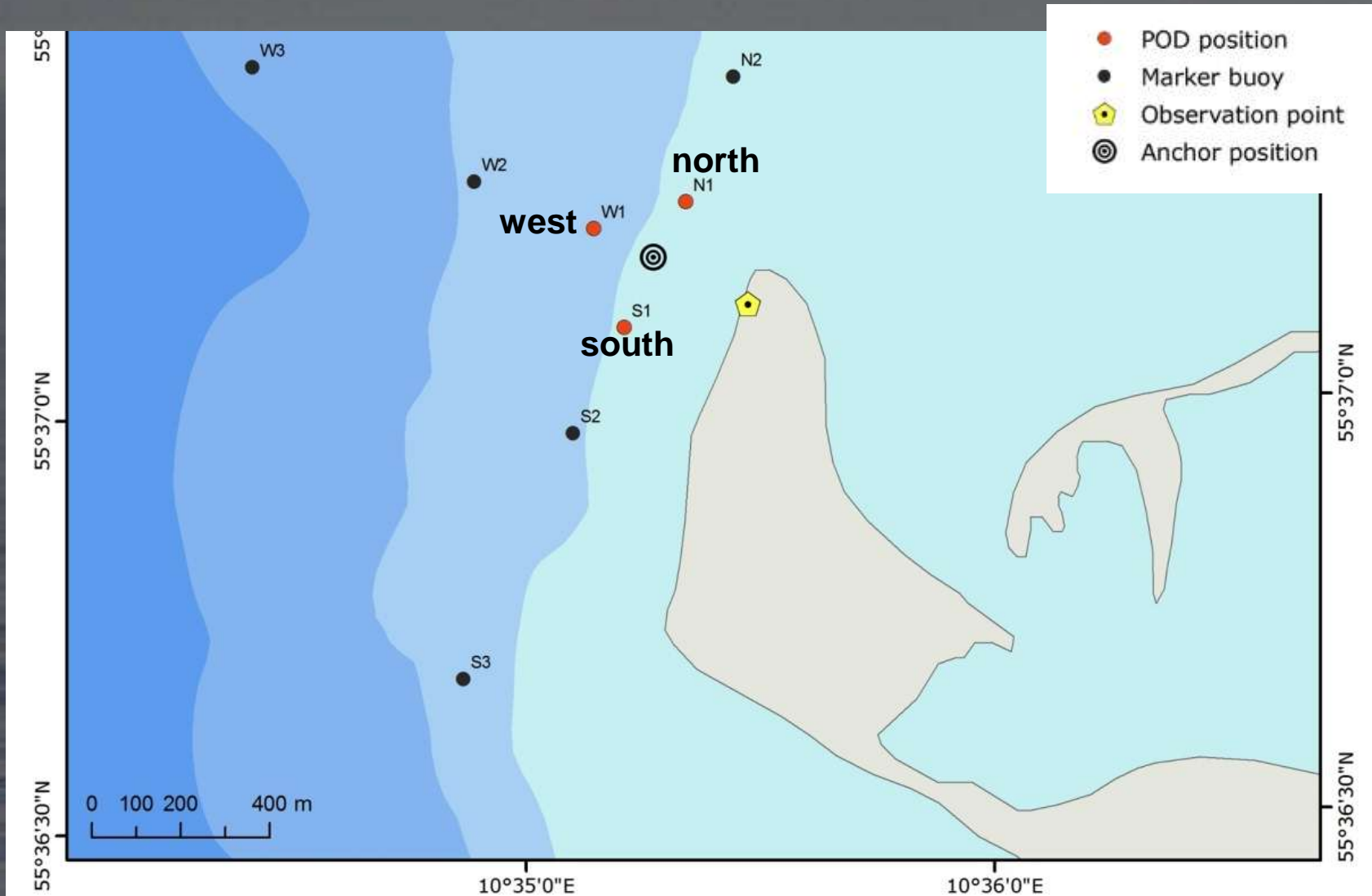
- PAM: 3 C-PODs in 450m distance
- Visual: Theodolite tracking rates
- Reponse study
- Measurements of noise levels

Passive Acoustic Monitoring: C-POD



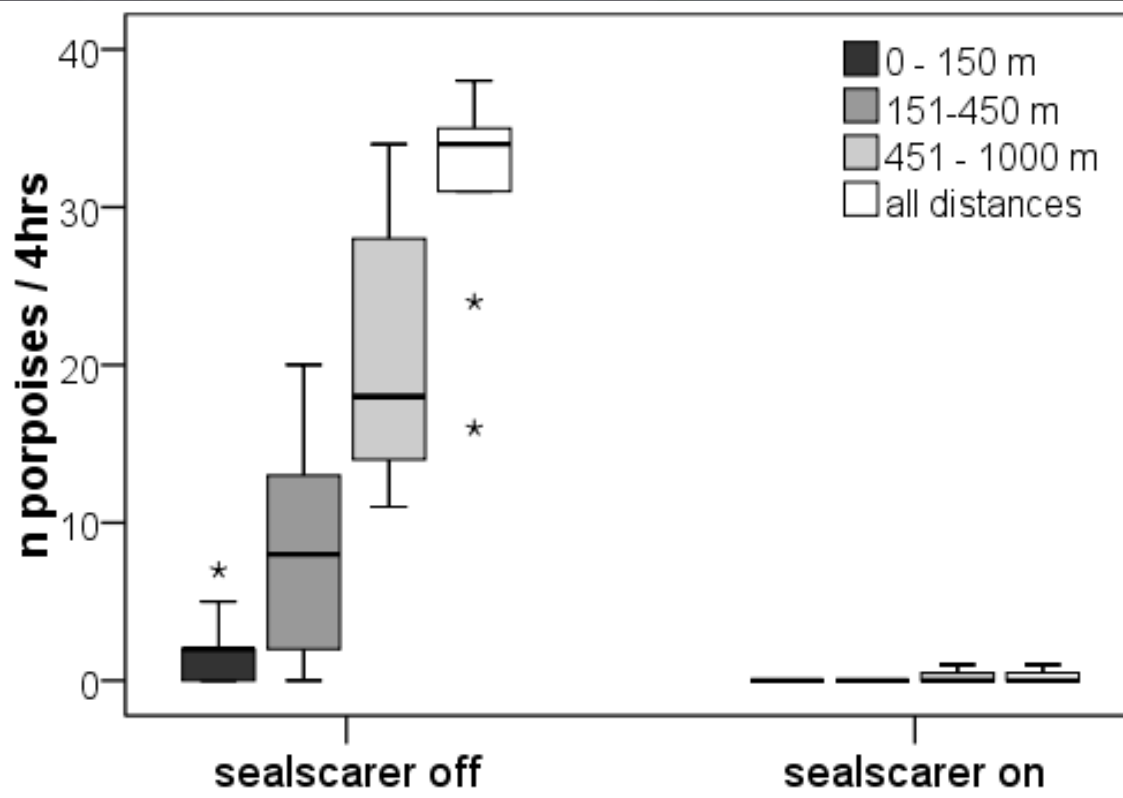
- Hydrophone
- Filter
- Electronic
- Batteries
- SD-Card

PAM: 3 C-PODs in 450m distance



Visual observations:

Sighting rates were significantly lower when sealscarer was active.



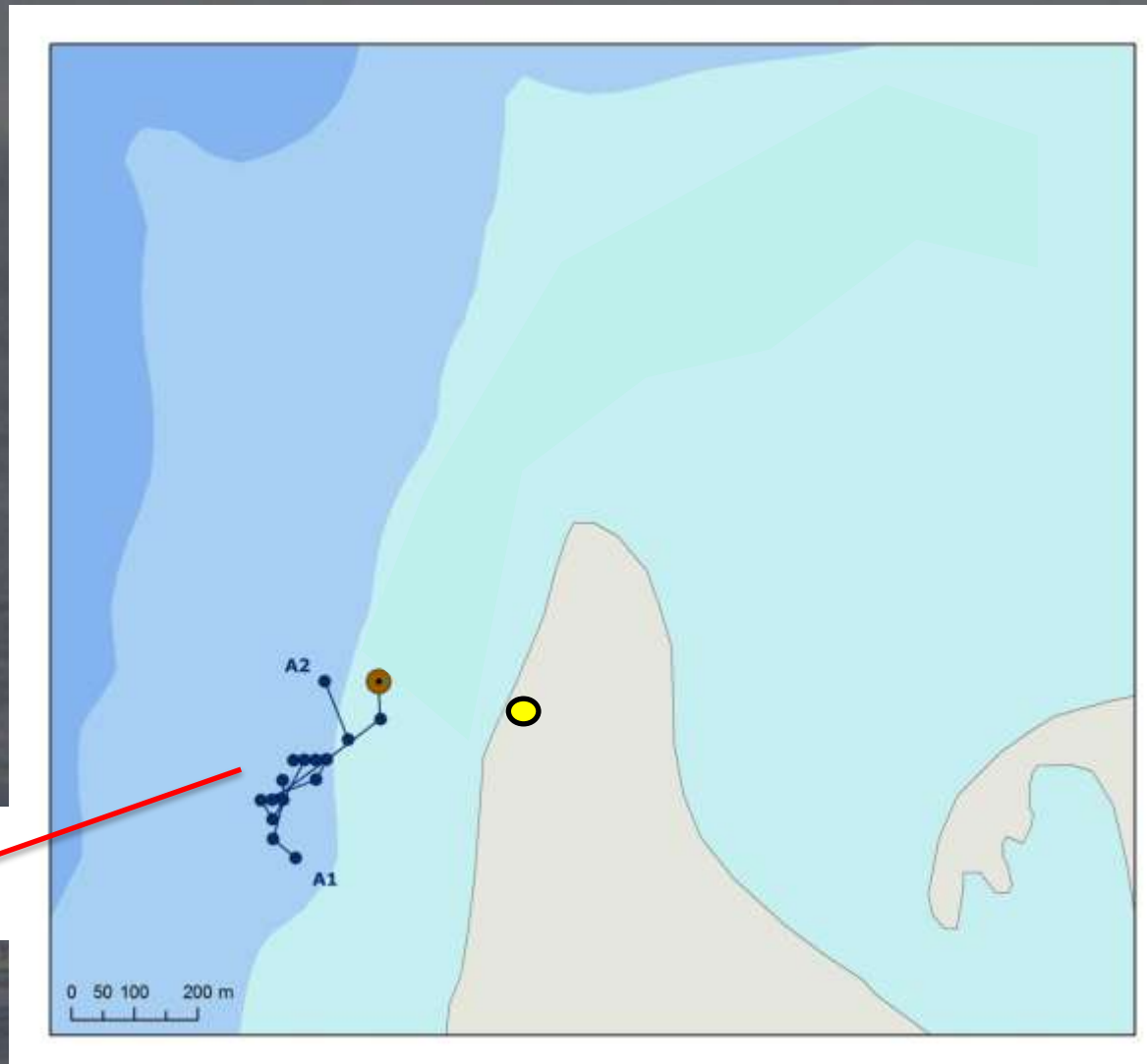
n = 9 days

n = 7 days

Only two porpoises could be detected during 28 hours of sealscarer activity.

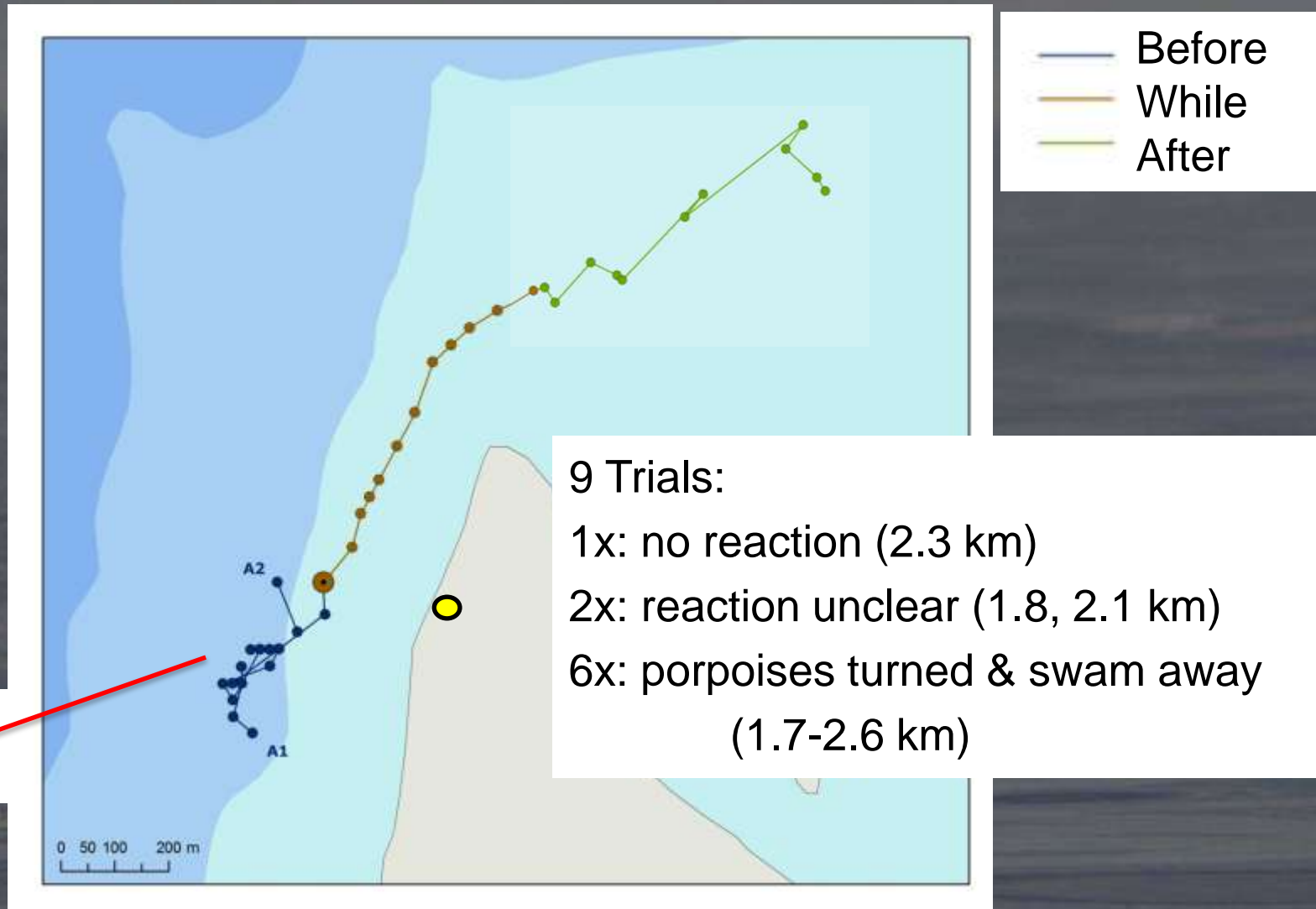
Minimum approach distance: 800m

Response study: 9 trials



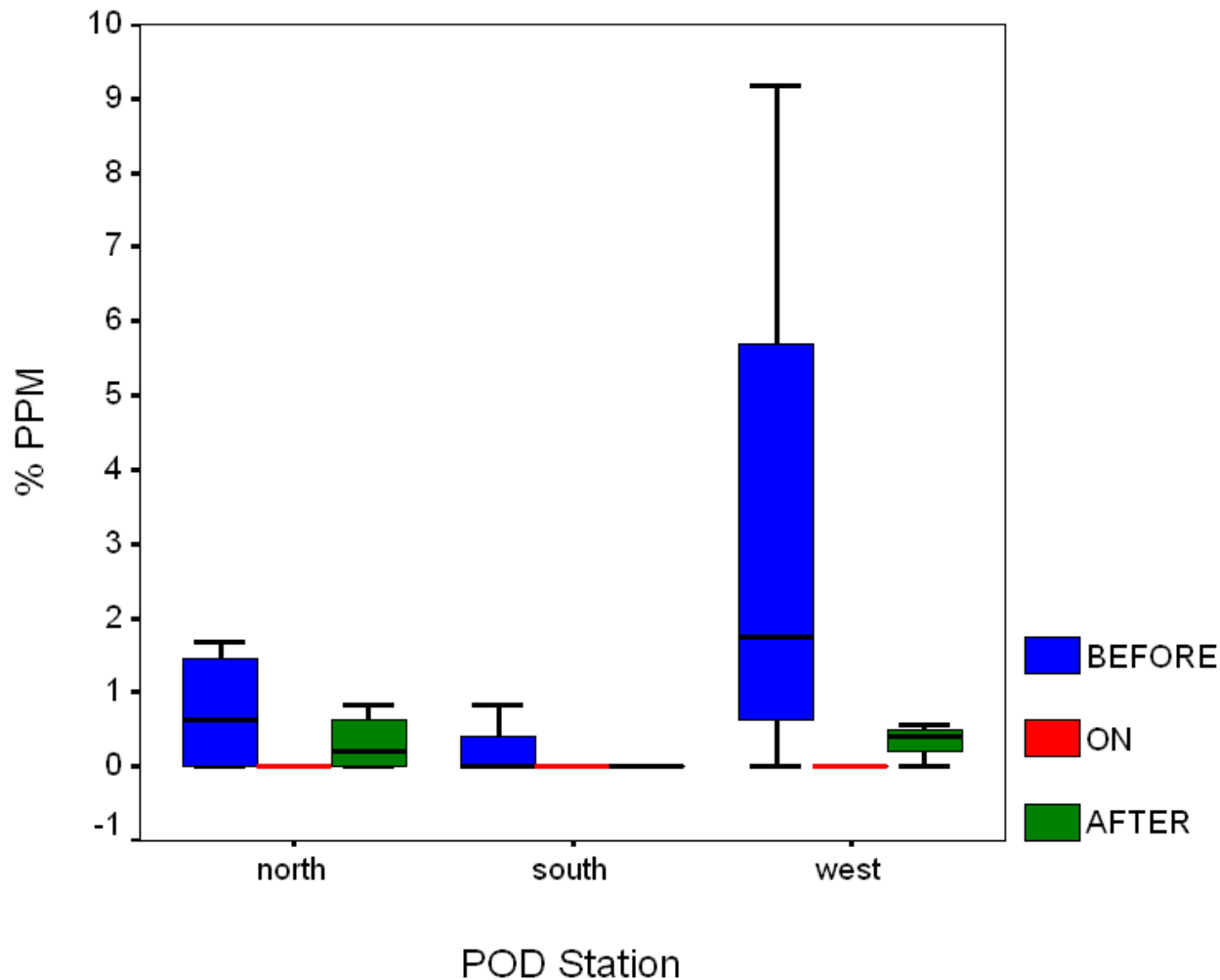
AHD in
2.6km

Response study: 9 trials



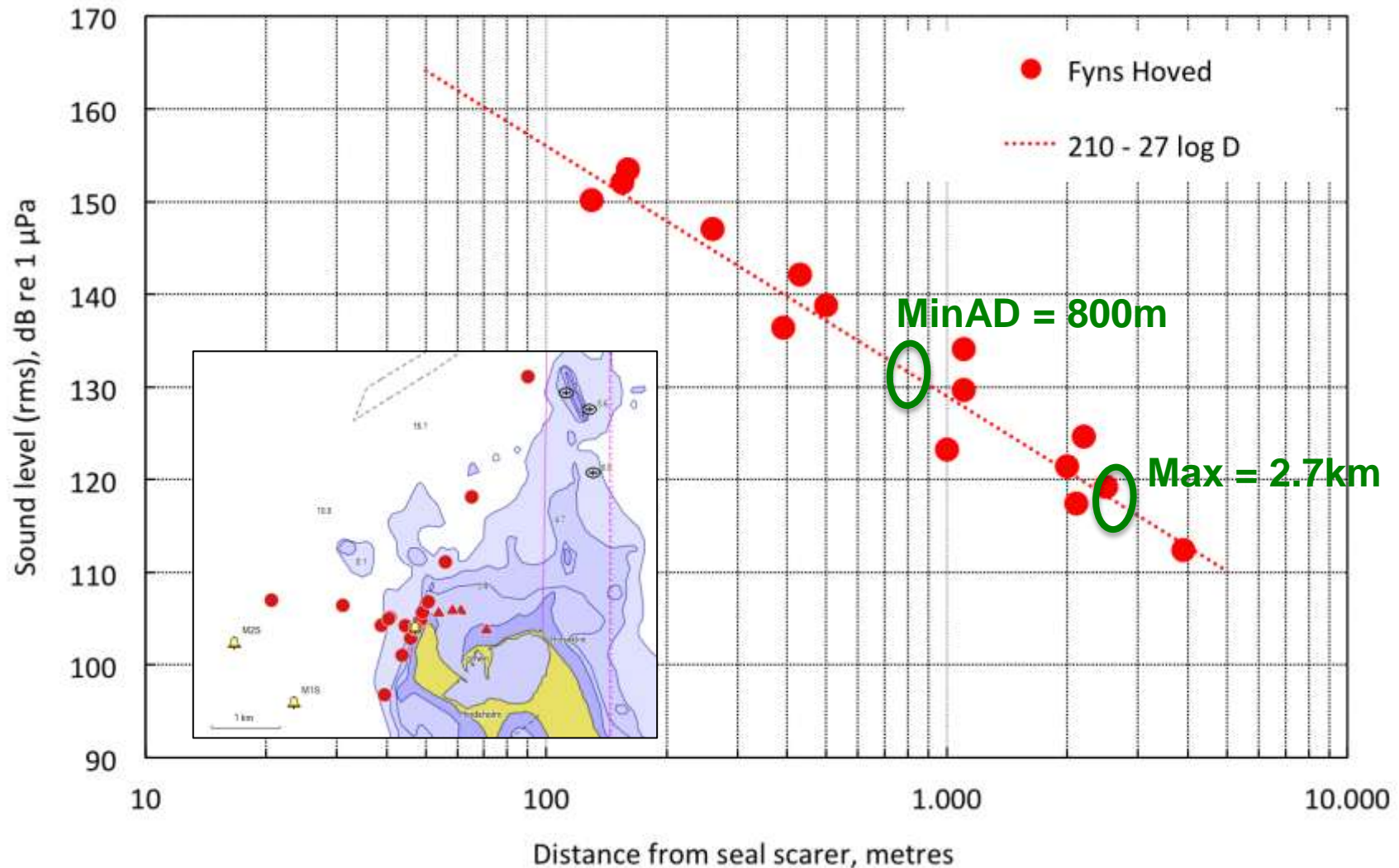
RESULTS

C-PODs: porpoise detections in 4 hours
before, while and after sealscarer activity.



No porpoise
could be
detected during
sealscarer
activity!

Noise levels at certain distances.



- Both acoustic and visual observations show a highly significant deterring effect of the sealscarer on harbour porpoises.
- Sighting rates within a 1km radius were reduced down to 1%.
- Closest approach distance was 800 m (~132 dB).
- Porpoises still reacted when the sealscarer was active at a distance of 2.6 km (~118 dB).
(In the North Sea significant less activity up to 7.5 km (~116 dB))



What does this mean for Offshore wind farm construction?

- The application of a sealscarer can help to reduce the risk of harbour porpoise injury during offshore pile driving.
- The risk is clearly reduced but cannot be excluded:
 - Is 800m sufficient to completely avoid injury?
 - North Sea experiments showed one detection <400m.
- Noise reduction very important!
- The use of sealscarer should be reduced to the absolute necessary minimum (30min before the start of piling).
- Developing a specific porpoise scarer (soft start + more effective in close vicinity and less effective further away).

Magnus Wahlberg
Mats Amundin
for providing the theodolite

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Thank you for your attention!