# Recent porpoise research at Fjord&Bælt

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FJORD&BÆLT

SDU
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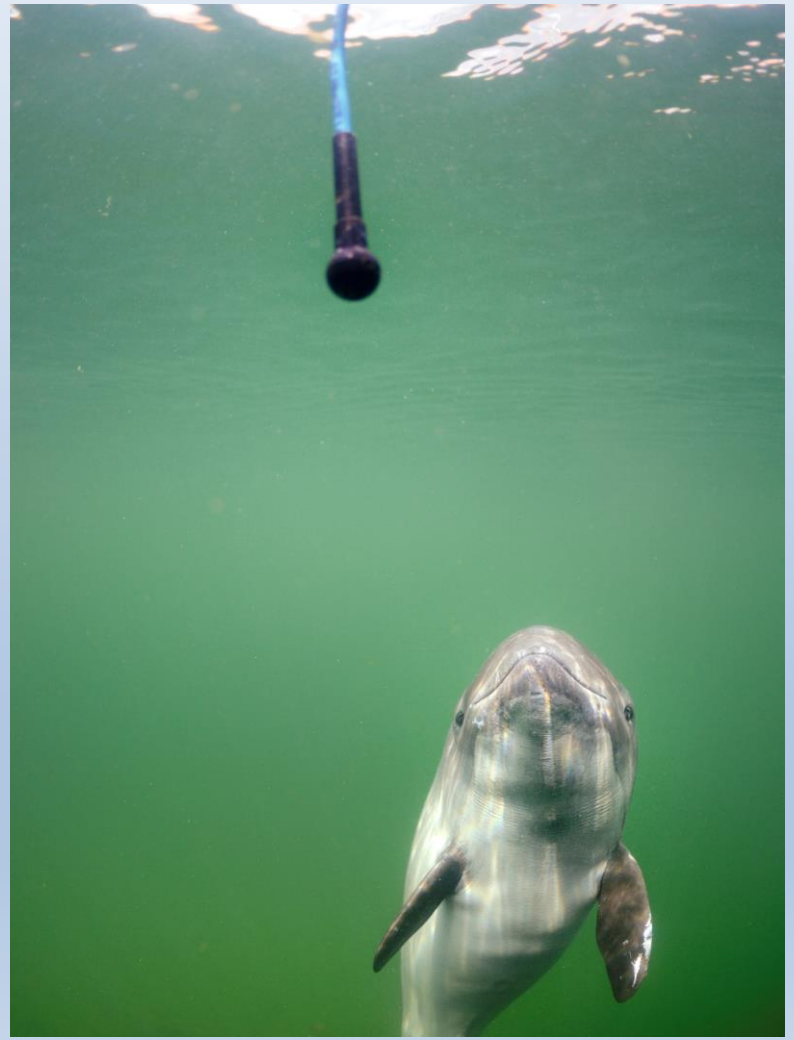
STIFTUNG TIERÄRZTLICHE HOCHSCHULE HANNOVER
17 78

# Trained animals for research

Started with 2 animals in 1997
4 animals in 2007
1 animal in 2020

Foto: Peter Verhoog

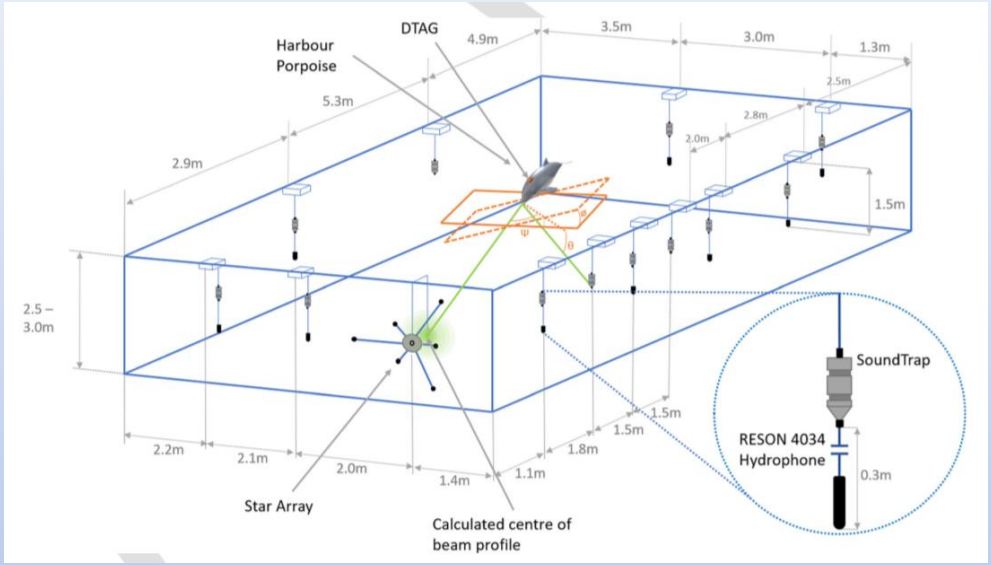
# Earlier work on echolocation, sound production and hearing

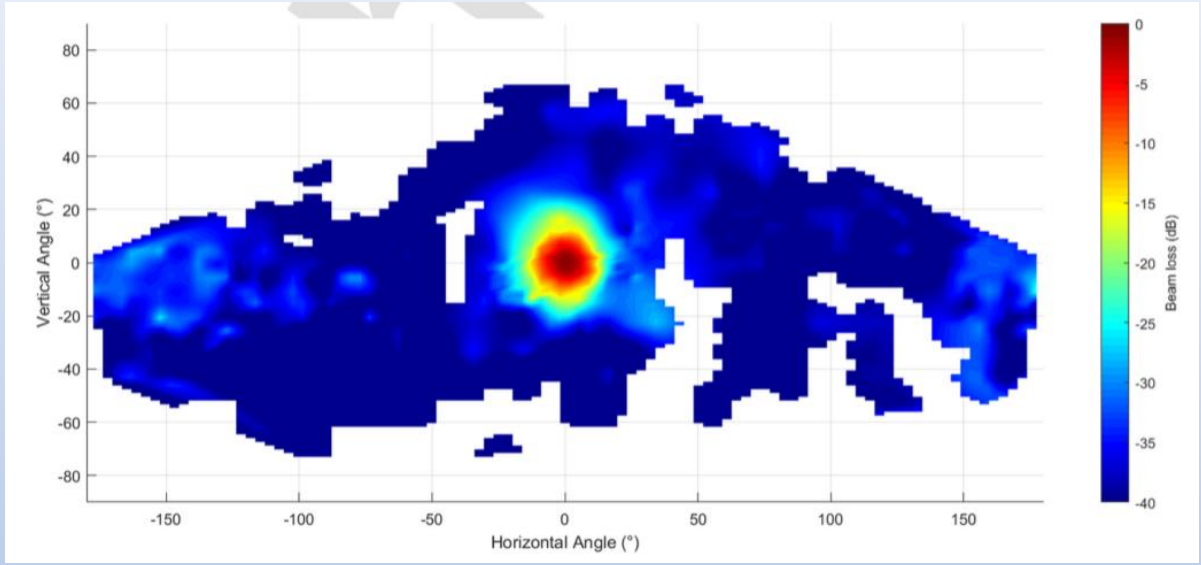


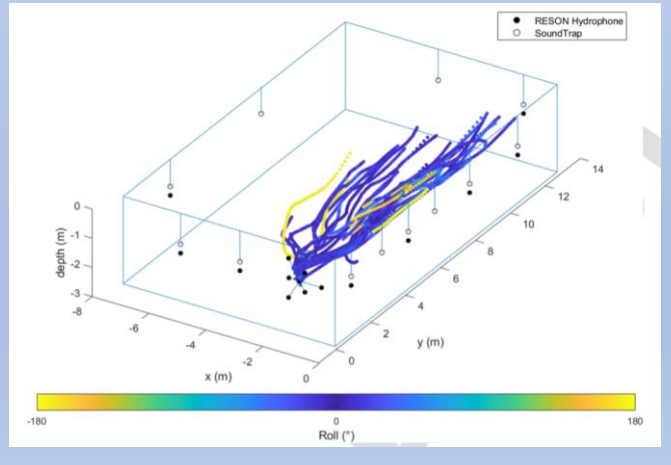
Solvin Zankl, Fjord&Bælt


Koblitz et al. 2008 JASA
Verfuss et al. 2005 and 2010, JEB
Teilmann et al. 2006 Mar. Mamm. Sci.
Deruiter et al. 2010 JEB
Wisniewska et al. 2012 JEB
Linnenschmidt et al. 2012 Proc. R. Soc. B
Linnenschmidt et al. 2013 Naturwissenschaften
Wisniewska et al. 2015 E-life
Dyndo et al. 2015 Sci. Rep.
Wahlberg et al. 2017 J Comp. Physiol.

# Harbour porpoise 3-D beam pattern



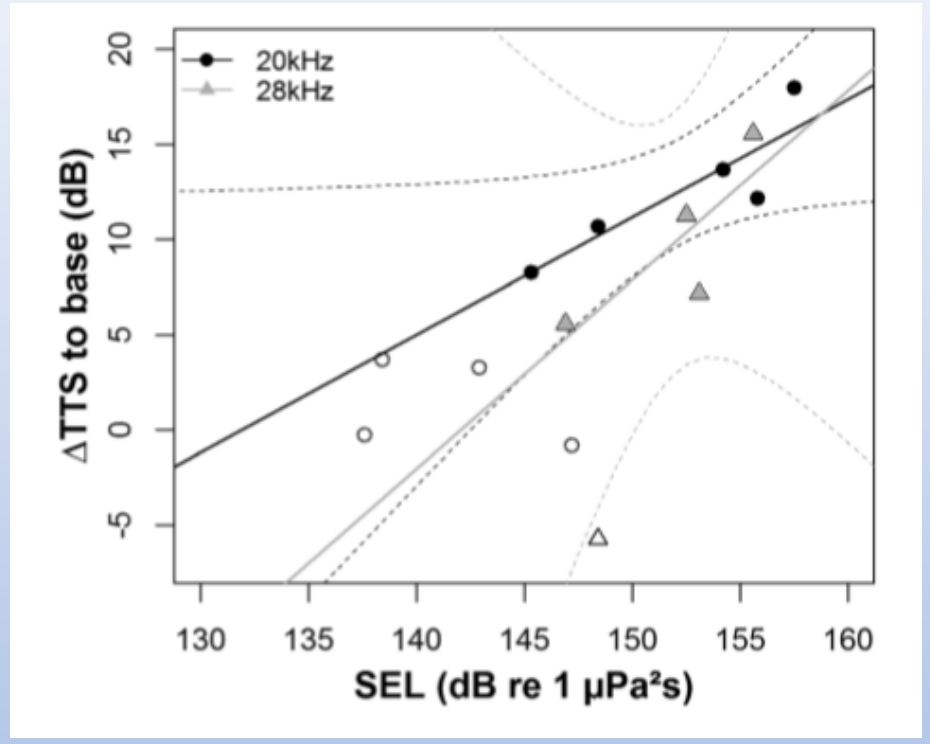



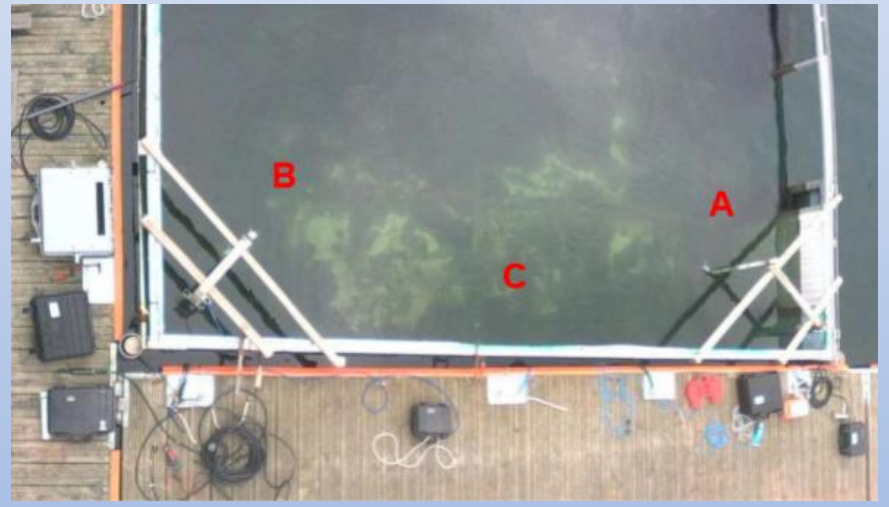

JASA ARTICLE

**High resolution three-dimensional beam radiation pattern of harbour porpoise clicks with implications for passive acoustic monitoring**

Jamie D. J. Macaulay,[1,a)] Chloe E. Malinka,[2,b)] Douglas Gillespie,[1,c)] and Peter T. Madsen[2,d)]

# Temporary Threshold Shift (TTS) due to seal scarers





**The use of seal scarers as a protective mitigation measure can induce hearing impairment in harbour porpoises**[a)]

Tobias Schaffeld,[1] Andreas Ruser,[1,b)] Benno Woelfing,[1] Johannes Baltzer,[1]
Jakob H. Kristensen,[2] Josefin Larsson,[2] Joseph G. Schnitzler,[1] and Ursula Siebert[1]

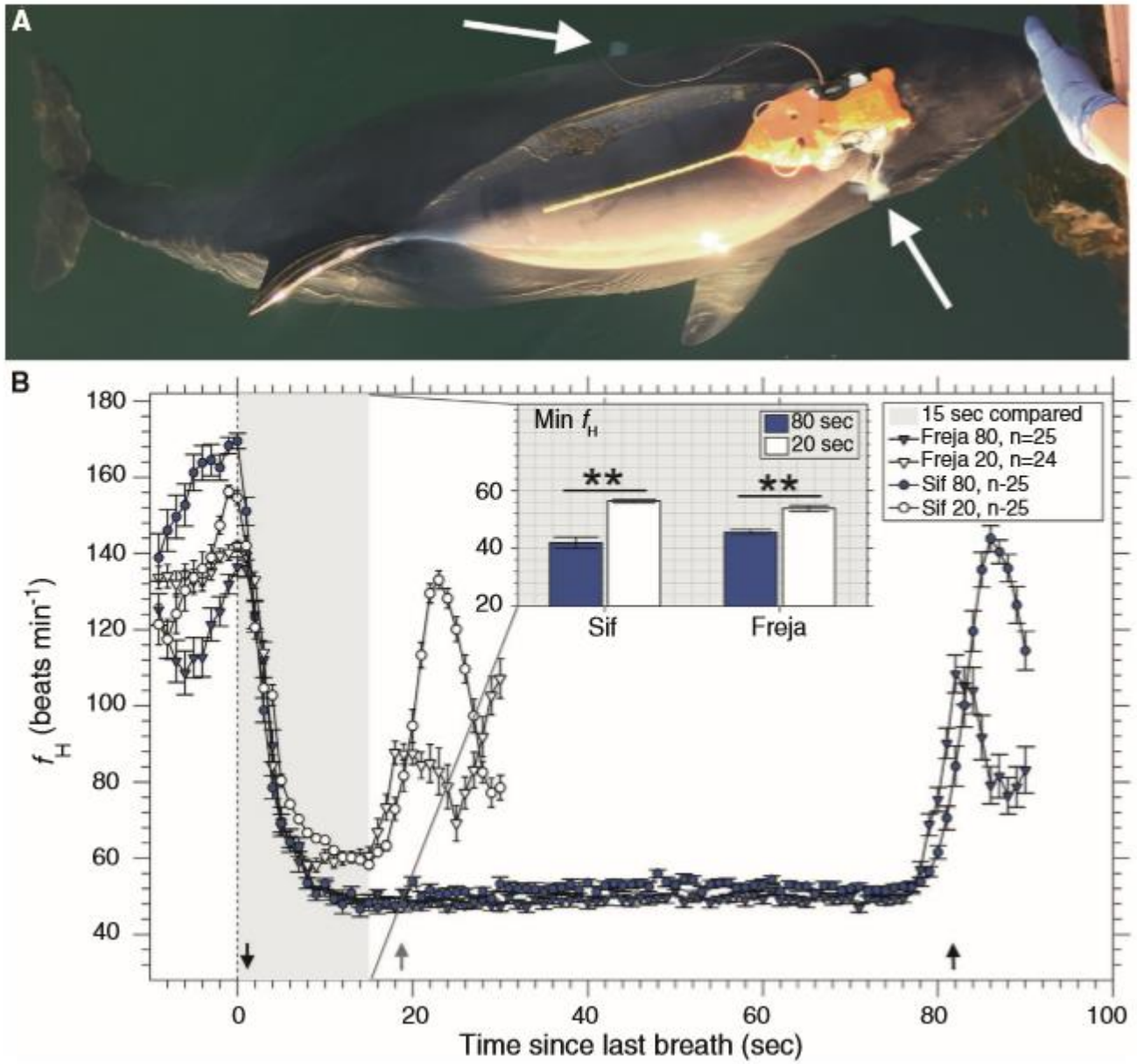
J. Acoust. Soc. Am. **146** (6), December 2019

Current Biology
Magazine

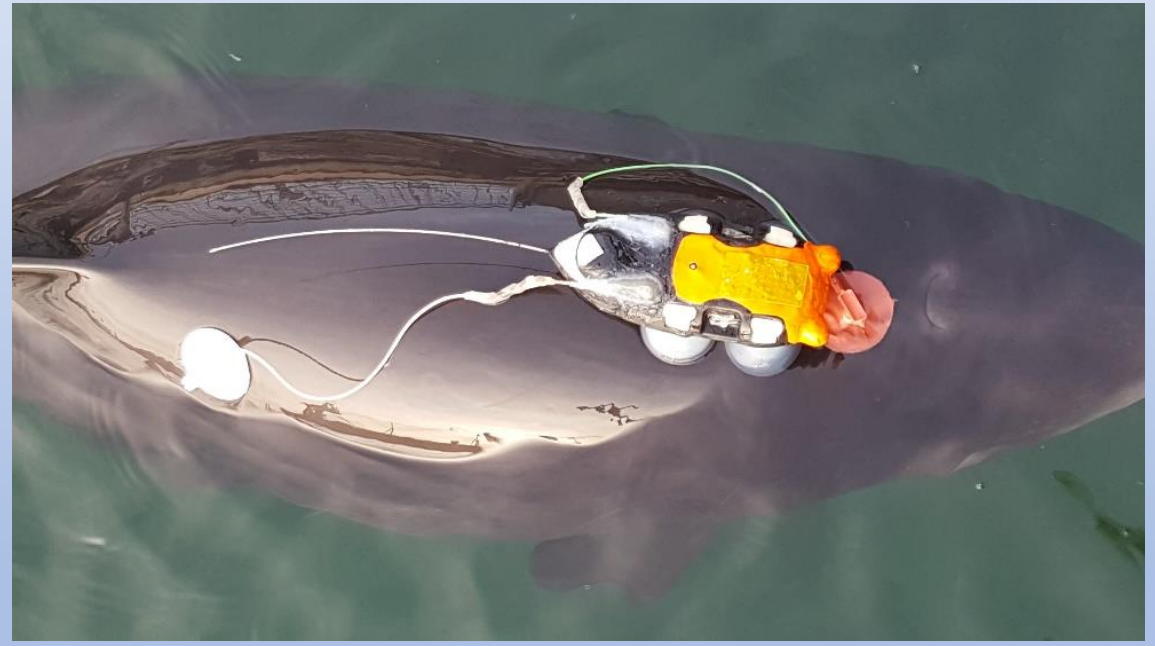
# Cognitive control of heart rate in diving harbor porpoises

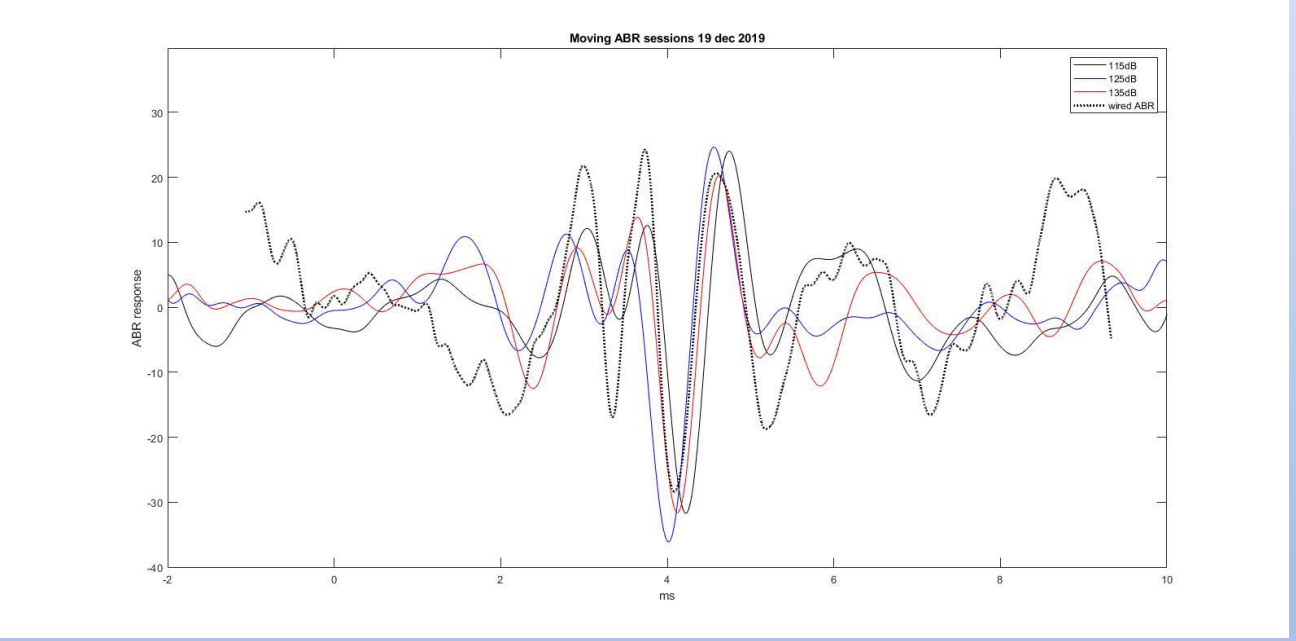
Siri L. Elmegaard[1,*], Mark Johnson[2], Peter T. Madsen[1,3], and Birgitte I. McDonald[1,4]

Tag development
Attachement methods



# DTAG ABR (Adam Smith, in prep.)



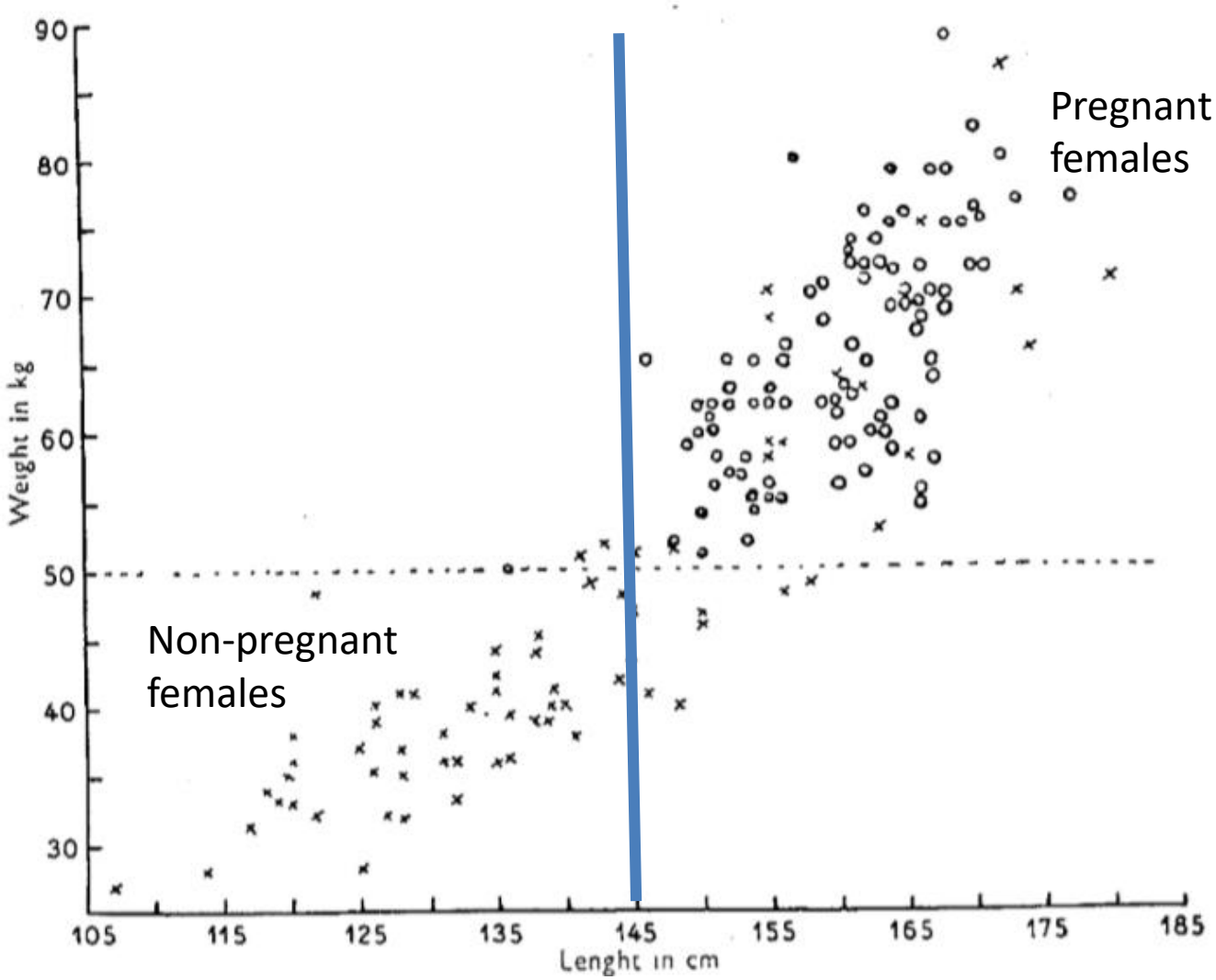


# Investigating the Potential Use of Environmental DNA (eDNA) for Genetic Monitoring of Marine Mammals

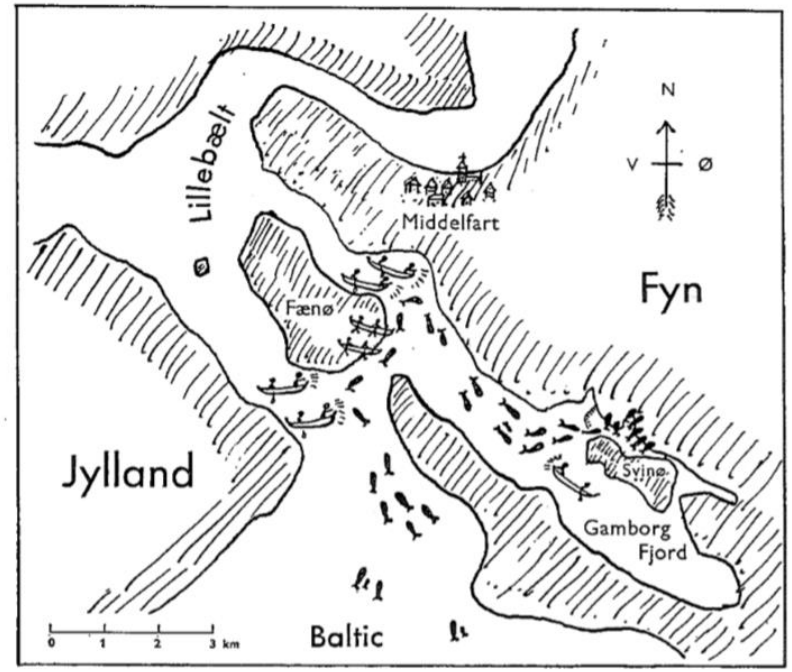
Andrew D. Foote[1*], Philip Francis Thomsen[1], Signe Sveegaard[2], Magnus Wahlberg[3,4], Jos Kielgast[1], Line A. Kyhn[2], Andreas B. Salling[1], Anders Galatius[2], Ludovic Orlando[1], M. Thomas P. Gilbert[1]


| | Genetic detection |
|---|---|
| **Location** | **Positive PCRs** |
| Positive control (DNA extracted from skin) | 3/3 |
| Fjord&Bælt pen | 3/3 |
| <10 m from F&B pen | 1/3 |
| >10 m from F&B pen | 0/3 |

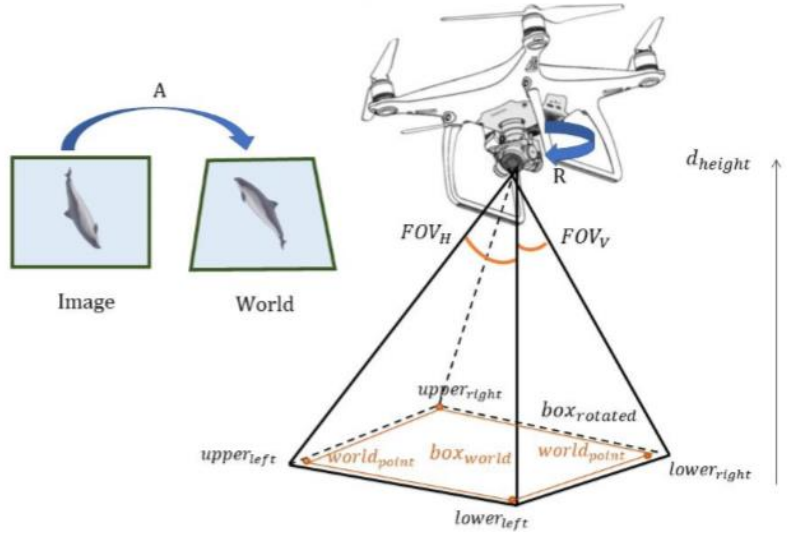
# Body size tells us about porpoises' lives



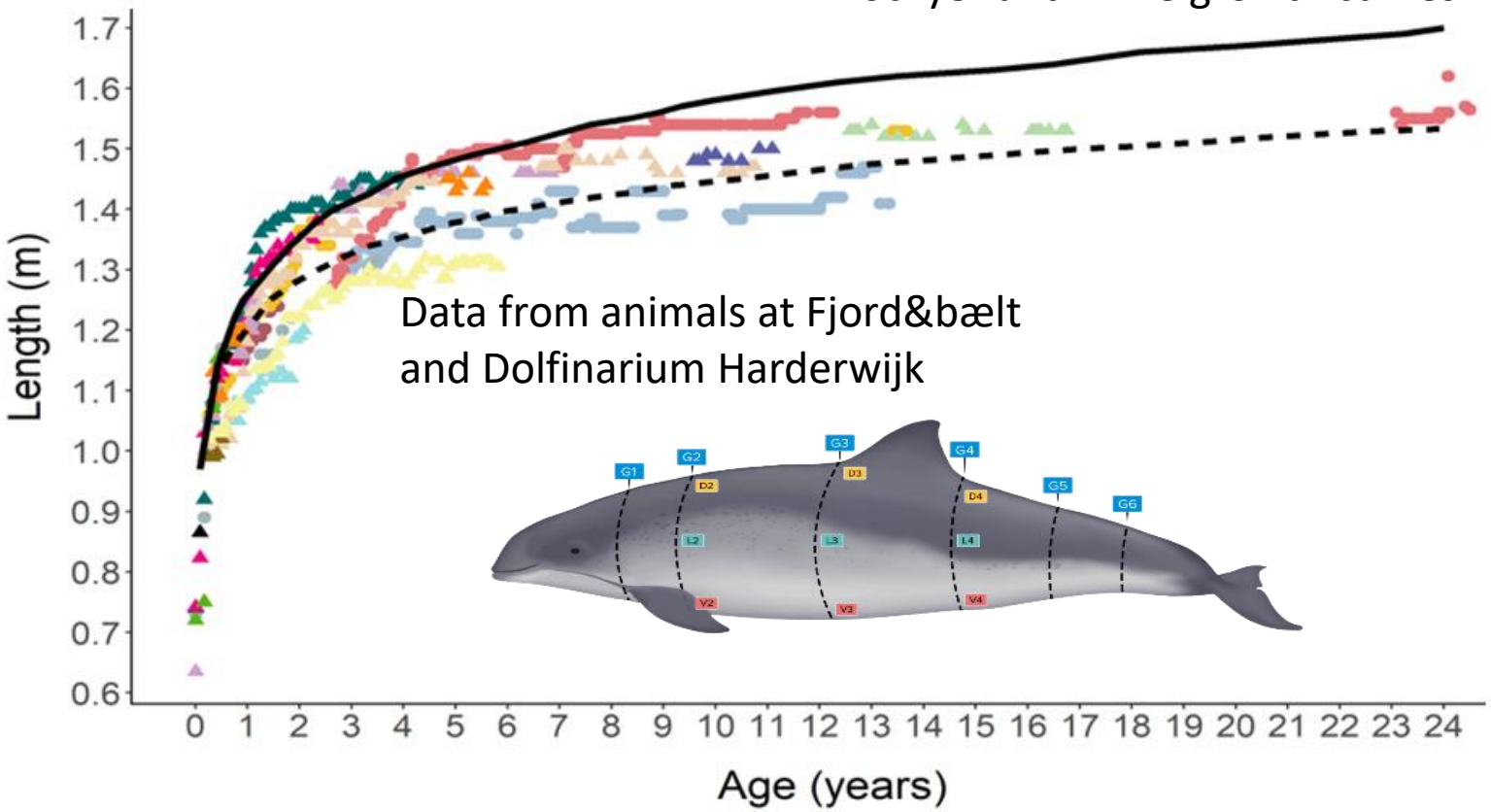

Ulrik Møhl 1955



# Growth, age and size

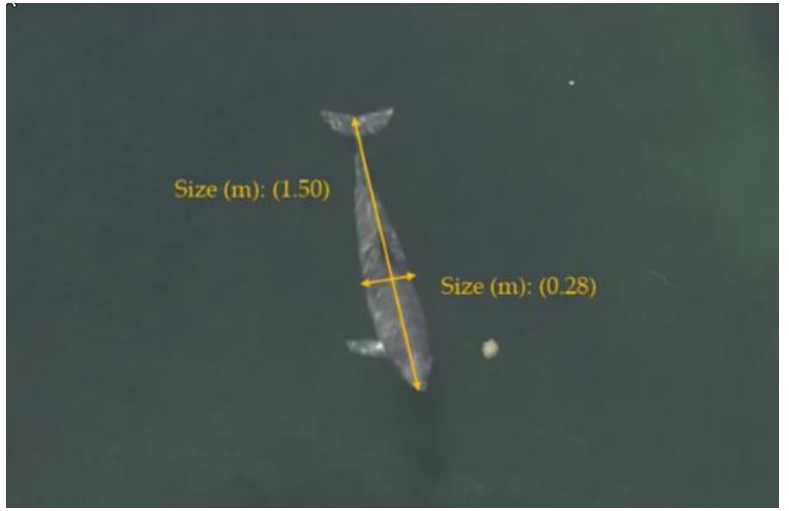



Lockyer and Kinze growth curves




Data from animals at Fjord&bælt
and Dolfinarium Harderwijk

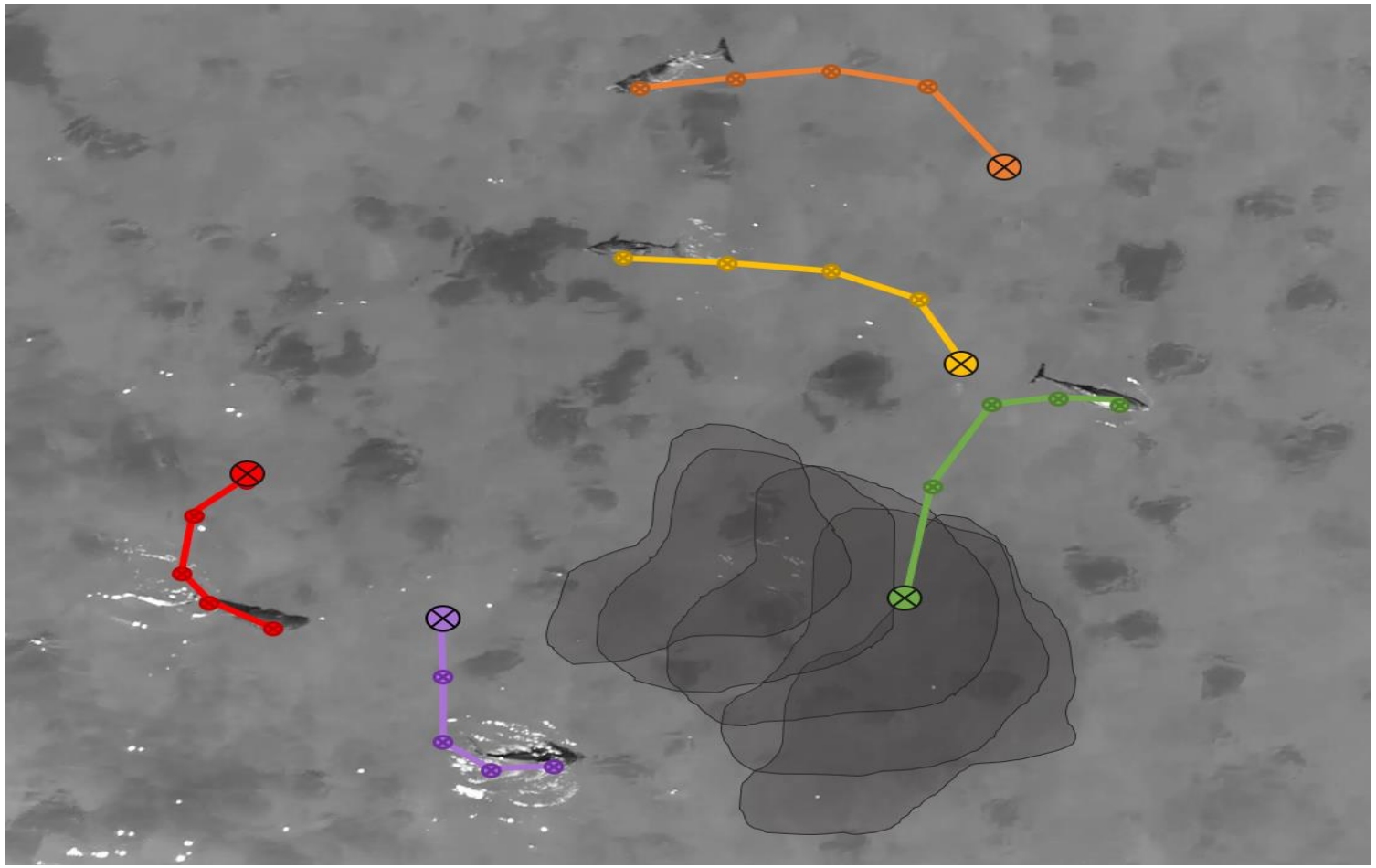


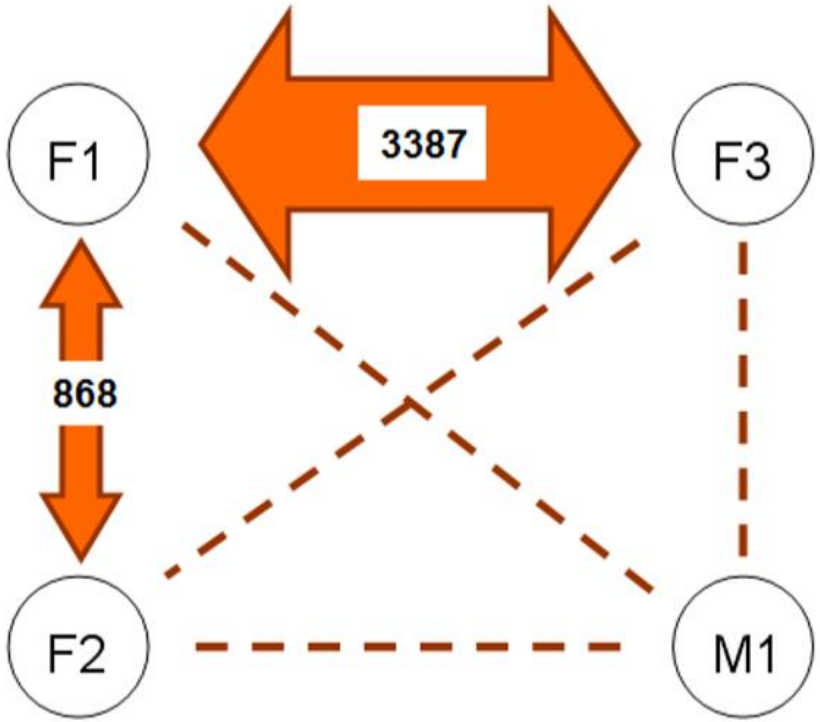




Accuracy within 10%

Stepien 2018 MSc thesis
Stepien et al., RSOS in rev.

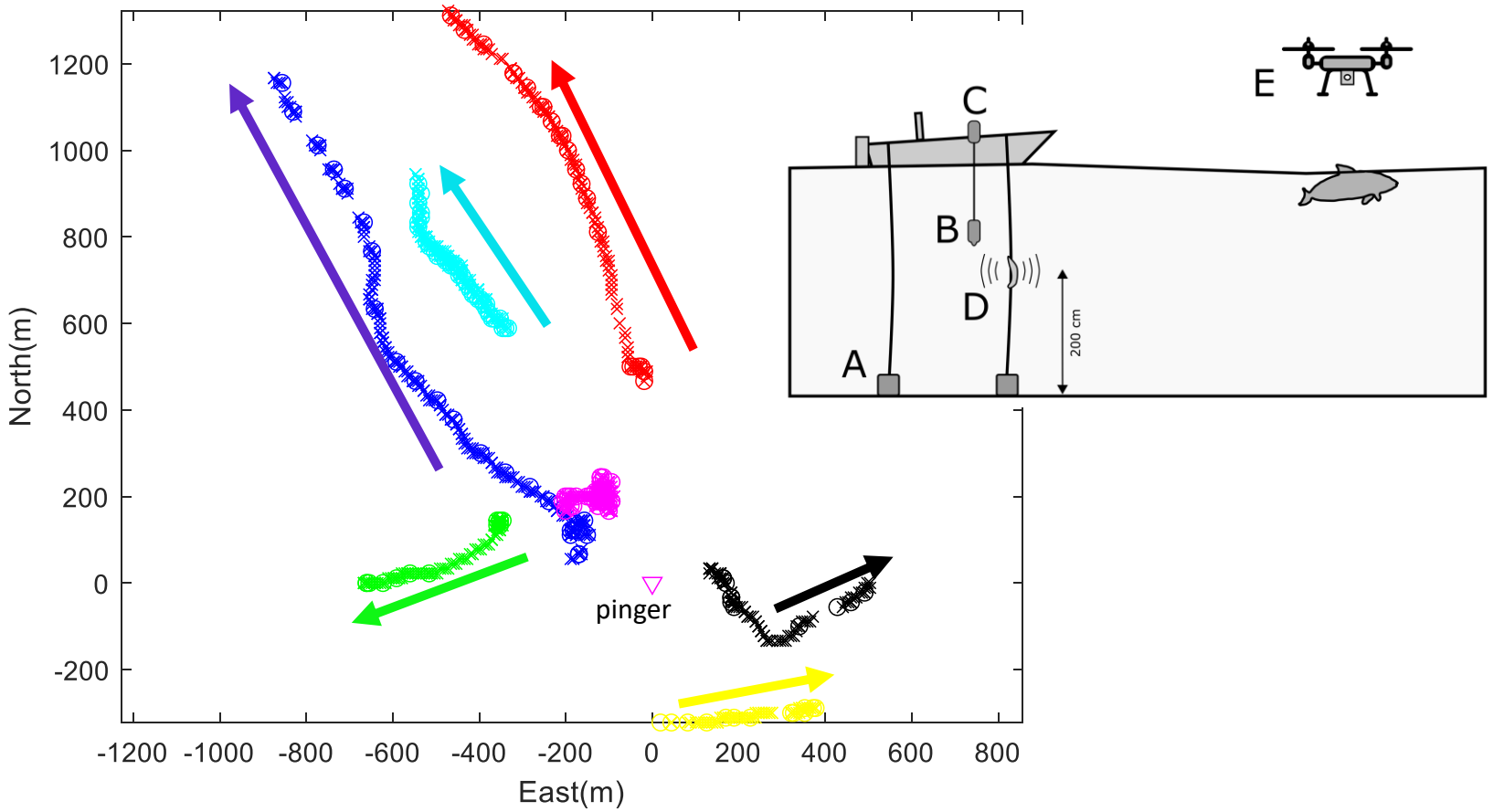
# Cooperating porpoises (Ortiz et al. in prep)

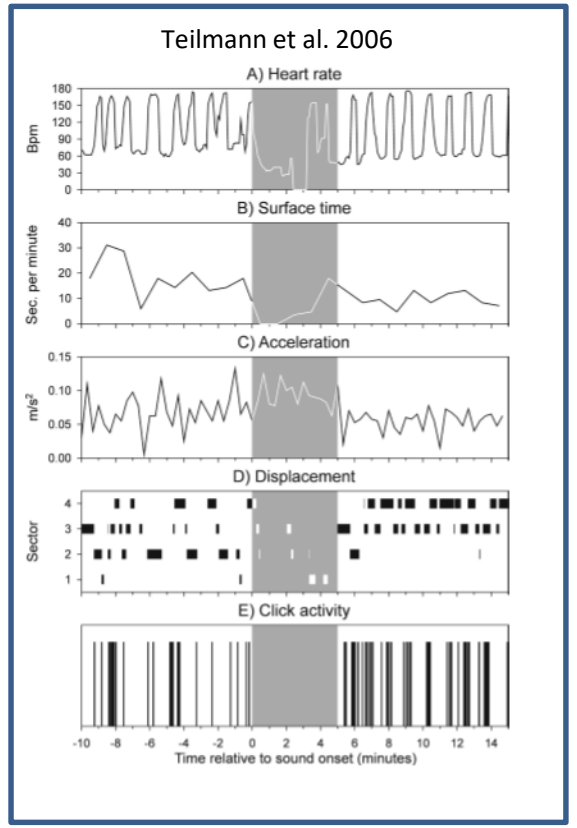





Porpoise association patterns at F&B
(Lara Delgado 2010, MSc thesis)

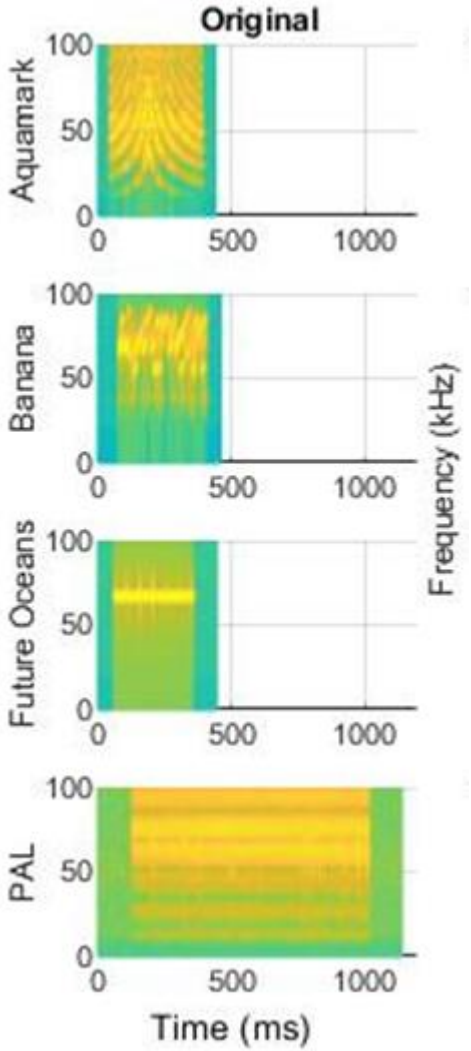
# Pinger playback (Brennecke et al., *in prep.*)

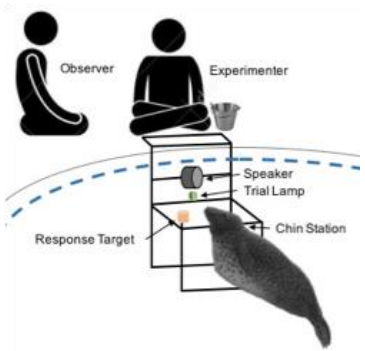


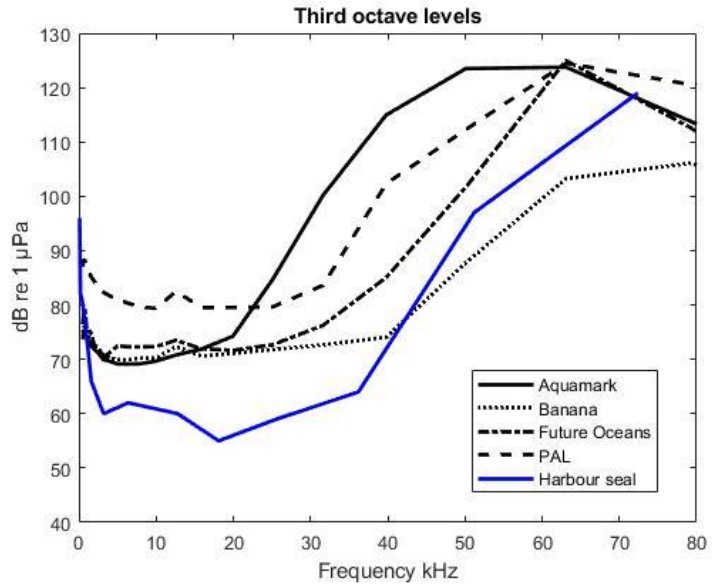



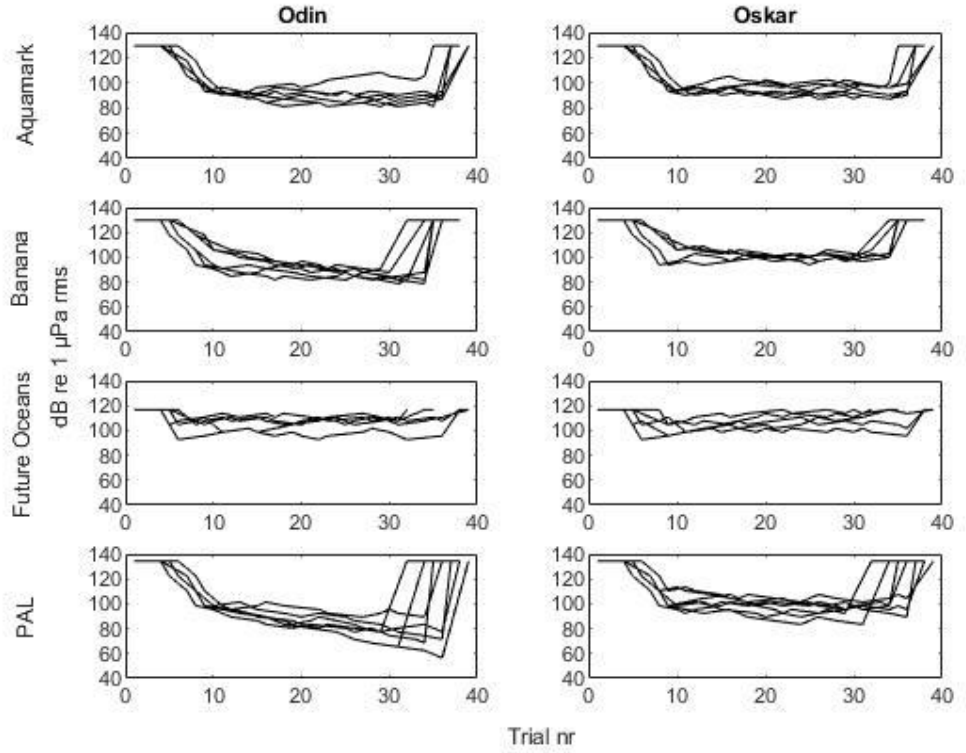

# Are seal-safe pingers seal-safe?

(Amundin / Königsson et al. in prep.)



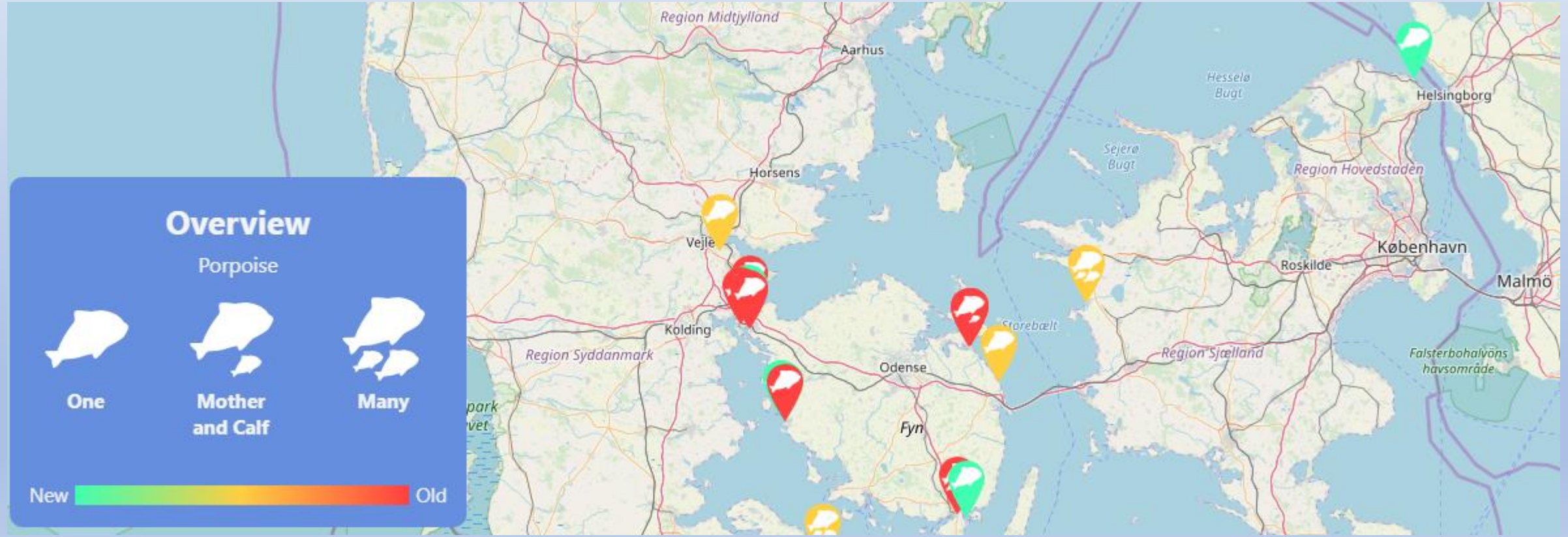



# The App ‘Marine tracker’: Citizen Science observations

Number of app downloads in 2019: 2,150

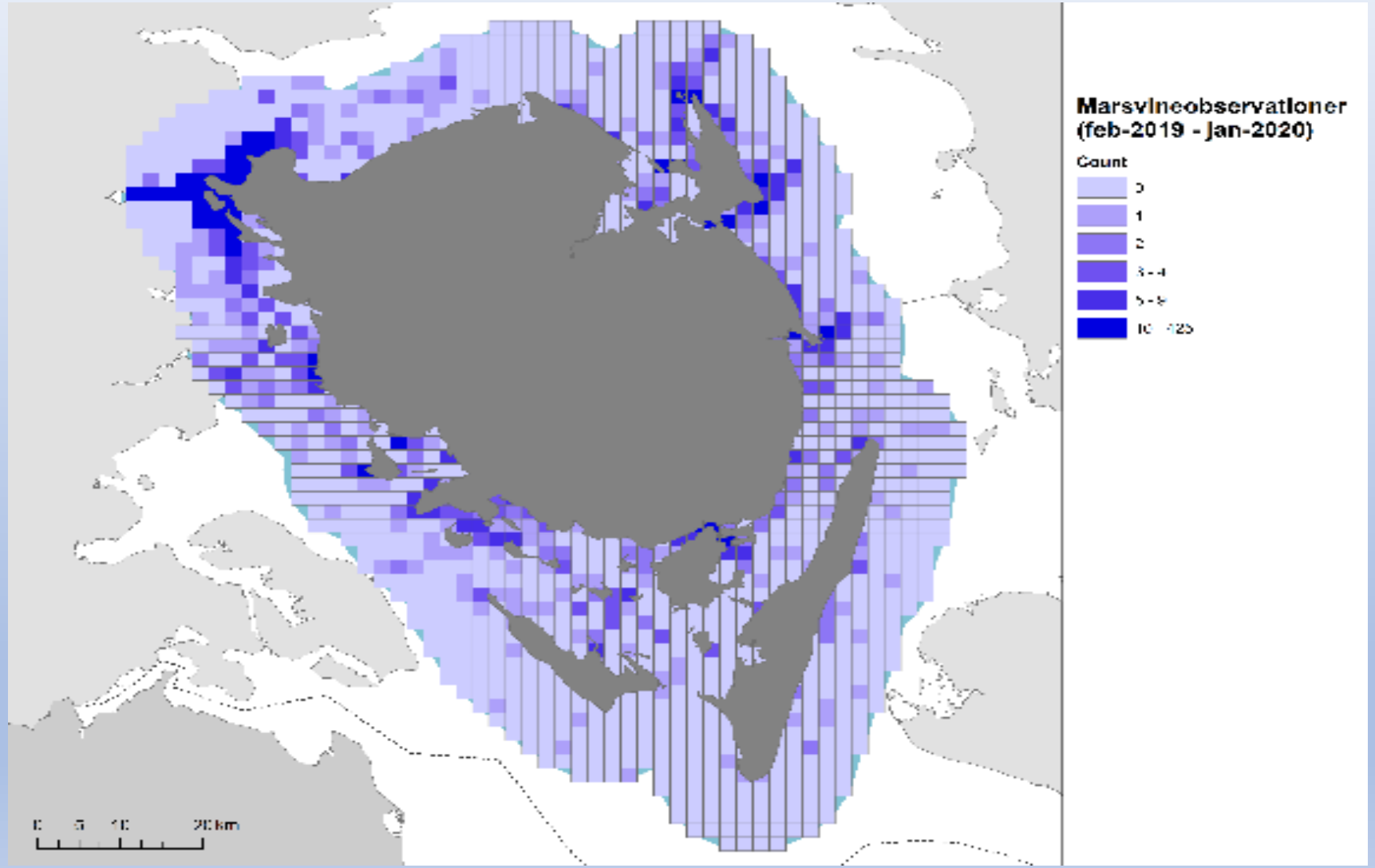
Number of porpoise observations: 4,719

| | |
|---|---|
| Single animals | 2287 obs. (49%) |
| Mother+calf | 815 obs. (17%) |
| Many animals | 1617 obs. (34%) |




https://marinebiologicalresearch.firebaseapp.com/

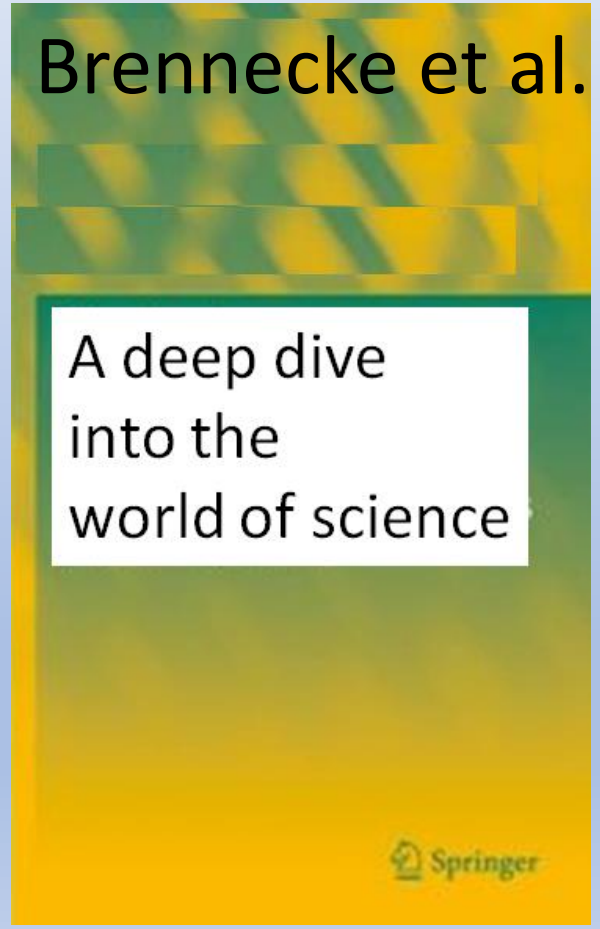
# Porpoise CS observations 2019 (courtesy S. Sveegaard, DCE-AU)



# Outreach

https://marine-mammals.com/

MARINE MAMMALS
science education



# Funding

Horizon 2020

Office of Naval Reserach

Bundesamt für Naturschutz

EU Strategic Fishery fund

Independent Research Fund Denmark

Danish Council of Independent Research

Carlsberg Foundation

**Questions?**
**Please contact me at**
**magnus@biology.sdu.dk**

FJORD&BÆLT

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