Recent porpoise research at Fjord&Bælt

Magnus Wahlberg
Marine Biological Research Center, University of Southern Denmark
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

Koblitz et al. 2008 JASA
Verfuss et al. 2005 and 2010, JEB
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
Wahlberg et al. 2017 J Comp. Physiol.

Solvin Zankl, Fjord&Bælt
Harbour porpoise 3-D beam pattern

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

Jamie D. J. Macaulay,1,6 Chloe E. Malinka,2,6 Douglas Gillespie,1,3 and Peter T. Madsen2,6
Temporary Threshold Shift (TTS) due to seal scarers

Fjälling et al. 2006

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

Tobias Schaffeld,1 Andreas Ruser, 1,2 Benno Woelfling, 1 Johannes Baltzer, 1 Jakob H. Kristensen, 2 Josefin Larsson, 2 Joseph G. Schnitzler, 1 and Ursula Siebert1

J. Acoust. Soc. Am. 146 (6), December 2019
Cognitive control of heart rate in diving harbor porpoises

Siri L. Elmegaard¹,⁴, Mark Johnson²,
Peter T. Madsen¹,³,
and Birgitte I. MacDonald¹,⁴

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. Foote¹*, Philip Francis Thomsen¹*, Signe Sveegaard², Magnus Wahlberg³,⁴, Jos Kielgast¹, Line A. Kyhn², Andreas B. Salling¹, Anders Galatius², Ludovic Orlando¹, M. Thomas P. Gilbert¹

<table>
<thead>
<tr>
<th>Location</th>
<th>Genetic detection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive control (DNA extracted from skin)</td>
<td>3/3 Positive PCRs</td>
</tr>
<tr>
<td>Fjord&amp;Bælt pen</td>
<td>3/3 Positive PCRs</td>
</tr>
<tr>
<td>&lt;10 m from F&amp;B pen</td>
<td>1/3 Positive PCRs</td>
</tr>
<tr>
<td>&gt;10 m from F&amp;B pen</td>
<td>0/3 Positive PCRs</td>
</tr>
</tbody>
</table>
Body size tells us about porpoises’ lives

Non-pregnant females

Pregnant females

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.*)

Teilmann et al. 2006

Teilmann et al. 2006

A) Heart rate
B) Surface time
C) Acceleration
D) Displacement
E) Click activity

[Graph showing various data plots and images of dolphins]
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/
Outreach

https://marine-mammals.com/

Brennecke et al.

A deep dive into the world of science
Funding

Horizon 2020
Office of Naval Research
Bundesamt für Naturschutz
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Danish Council of Independent Research
Carlsberg Foundation

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