

Munitions clearing as possible cause of death for unusually high harbour porpoise stranding numbers



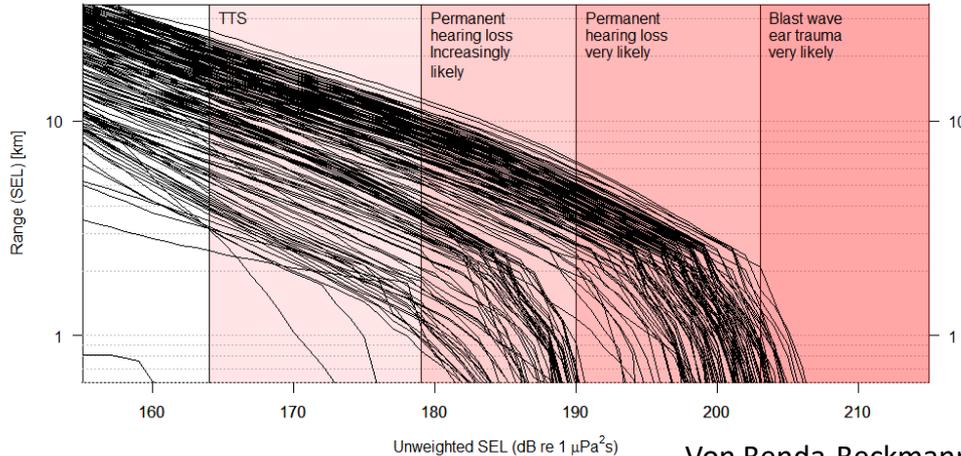
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Photo: Matthias Meinsen, NABU Website

- Explosions can kill porpoises
- Harbour porpoises require a vital hearing for their orientation and prey capture because they use their bio-sonar
- Permanent hearing loss by large explosions is increasingly likely at distances of 12 to 7 km (von Benda-Beckmann et al. 2015)

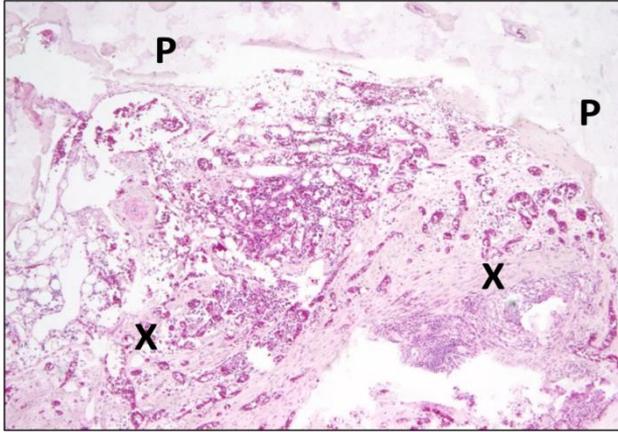
Estimated effect distances - near bottom



Von Benda-Beckmann et al. 2015

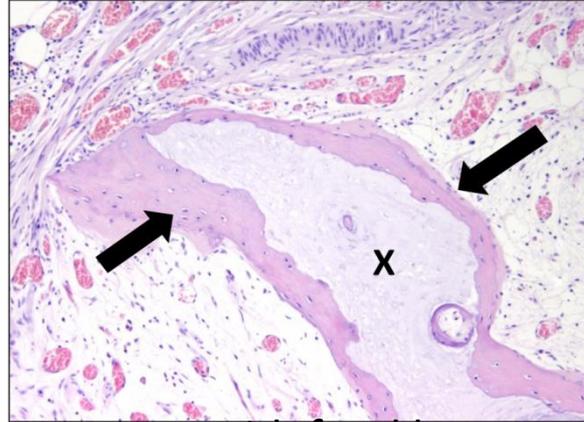


Microscopic investigation of inner ear tissues:



Perioticum (P)

Complete destruction of the inner ear with replacement by granulation tissue (x)
(=indication of healing)

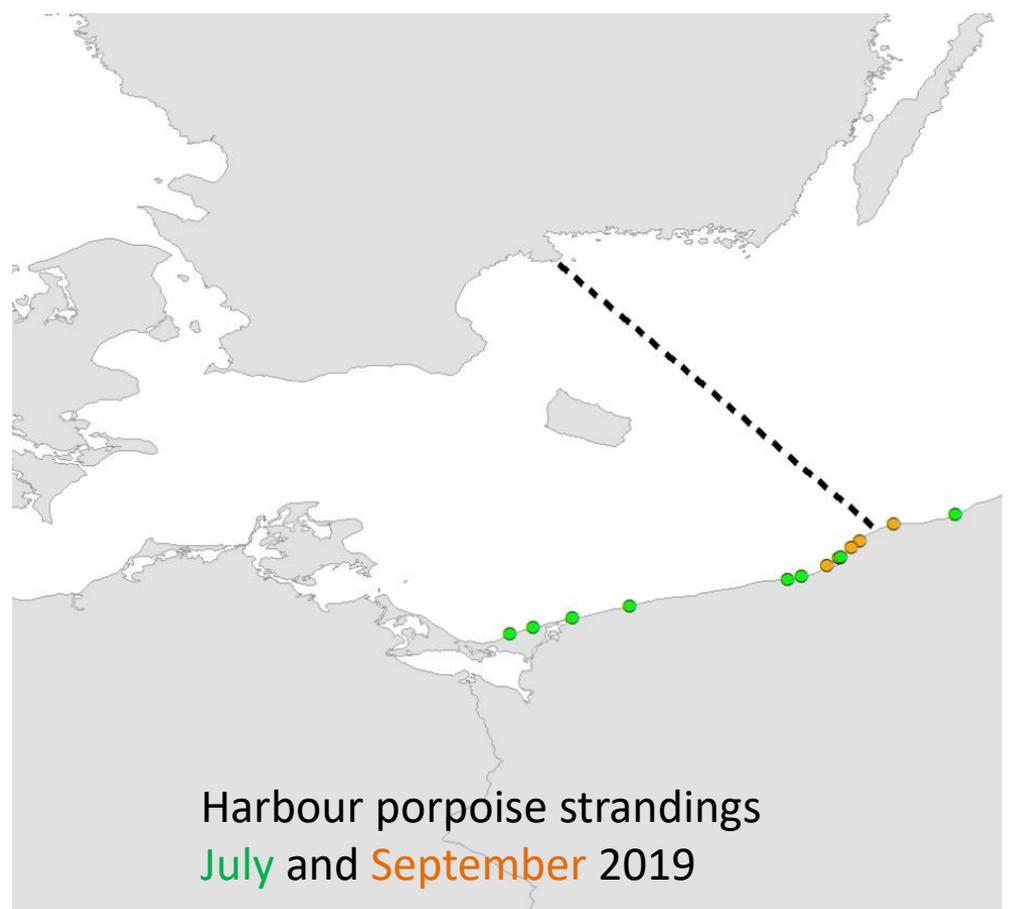


Inner ear with focal bone sequester of necrotic bone (x) and vital ear bone (←)

- This animal died in a fishing net
- Injuries of ear tissues can be determined only in fresh animals
- Wounds can possibly heal but the ear is no longer functional
- Reason for bycatches might be hearing impairment
- Pingers won't work for deaf porpoises

- High number of strandings in Poland 2019
- Unknown origin of strandings
- State of carcasses indicate that animals could have died far away

- Average surface currents from West and North
- Reverse drifting model could help
- Daily surface current data are available (e. g. from BSH)



Munitions clearing as possible cause of death?

Nordstream 2 (26 August 2019 completion in RU,FI,SE,DE

58 detonations May/June **2018** in Finland, bubble curtain used for large charges; 2019?

Denmark permission granted as late as **October 2019**

Swedish Navy 2019

„No detonations“ (but how about UXO companies?)

Danish Navy 2019

21 Detonations in Fehmarn Belt and Kiel Bight 13 Sep-26 Nov 2019 (only one in September)

NATO exercise 29 Aug – 18 Sep 2019

45 detonations in Germany (Fehmarn Belt) in harbour porpoise nursing area

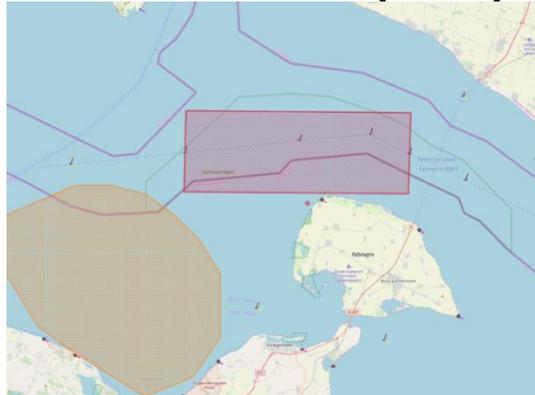
Windfarm cluster Rönne Bank including cables

?

➤ **Freely accessible contemporary data on explosions needed**

Update on the NATO detonations in Natura 2000 site Fehmarn Belt in Aug 2019

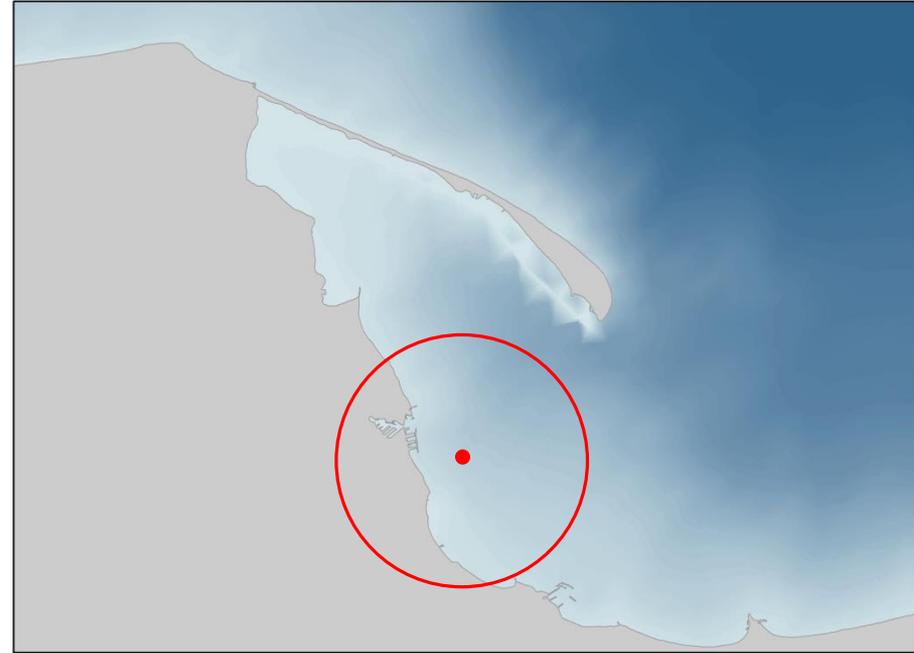
- 45 detonations of British WWII ground mines in Fehmarn Belt in a MPA which is a harbour porpoise nursing area (during nursing period)
- Germany is still investigating the case
- Working group of Ministries of Defence, Environment and Transport
- Noise loggers and PODs were in the water during detonations
- Expected results: (1) Noise radiation model, (2) assessment of the (in-) effectiveness of mitigation measures conducted (i.e. deterrence), (3) results of ear examinations stranded harbour porpoises – **Report will be published by the Federal Ministry for the Environment (BMU) in summer 2020** (in German)



More trouble ahead

Currently there are plans to explode a WWII mine 3 km off the coast of Gdynia in the entrance of Puck Bay (PL) next week!

- Puck Bay is an important area for the Baltic Proper harbour porpoise as indicated by sightings, bycatches and acoustic data (e. g., Skóra & Kuklik 2003).
- For mitigation, a German provider of bubble curtains offered a bubble curtain at no cost. It is now a matter of political willingness and quick decisions to avoid a disaster for harbour porpoises of the Baltic Proper population.



Planned detonation site and 10 km radius as a very rough approximation of possible hearing damage for harbour porpoises