# Update on white-beaked dolphin sample archive

## 25th ASCOBANS Advisory Committee Meeting

Stralsund, 17-19 September 2019

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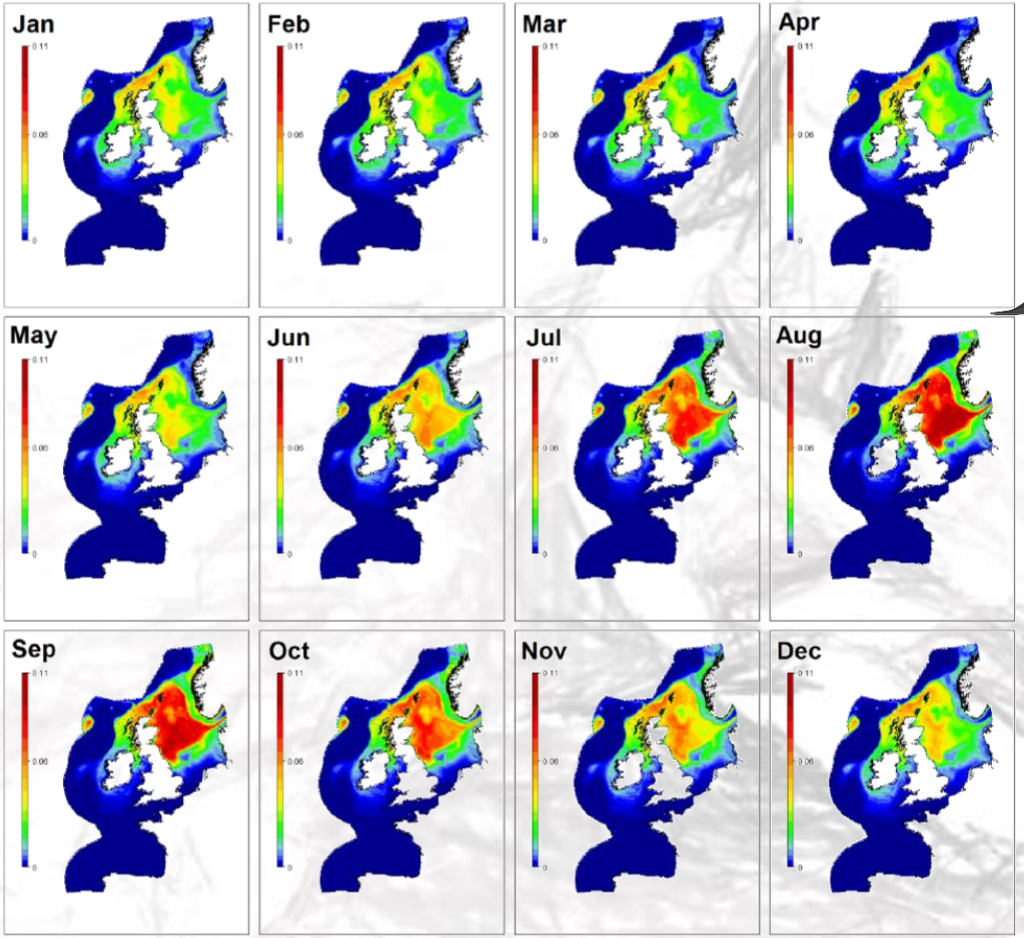
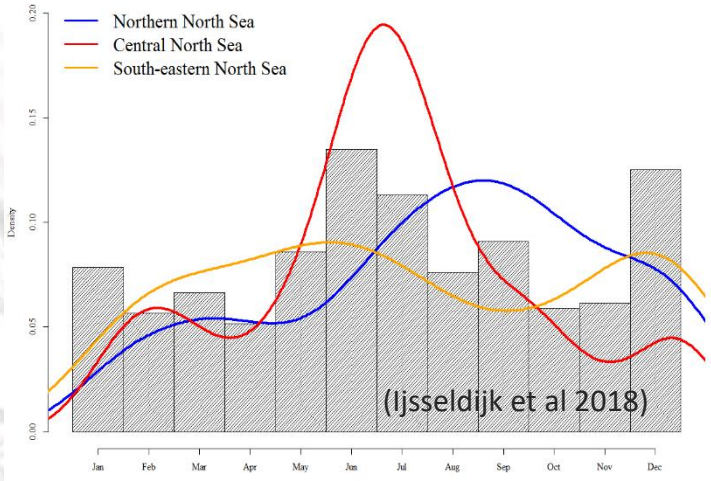
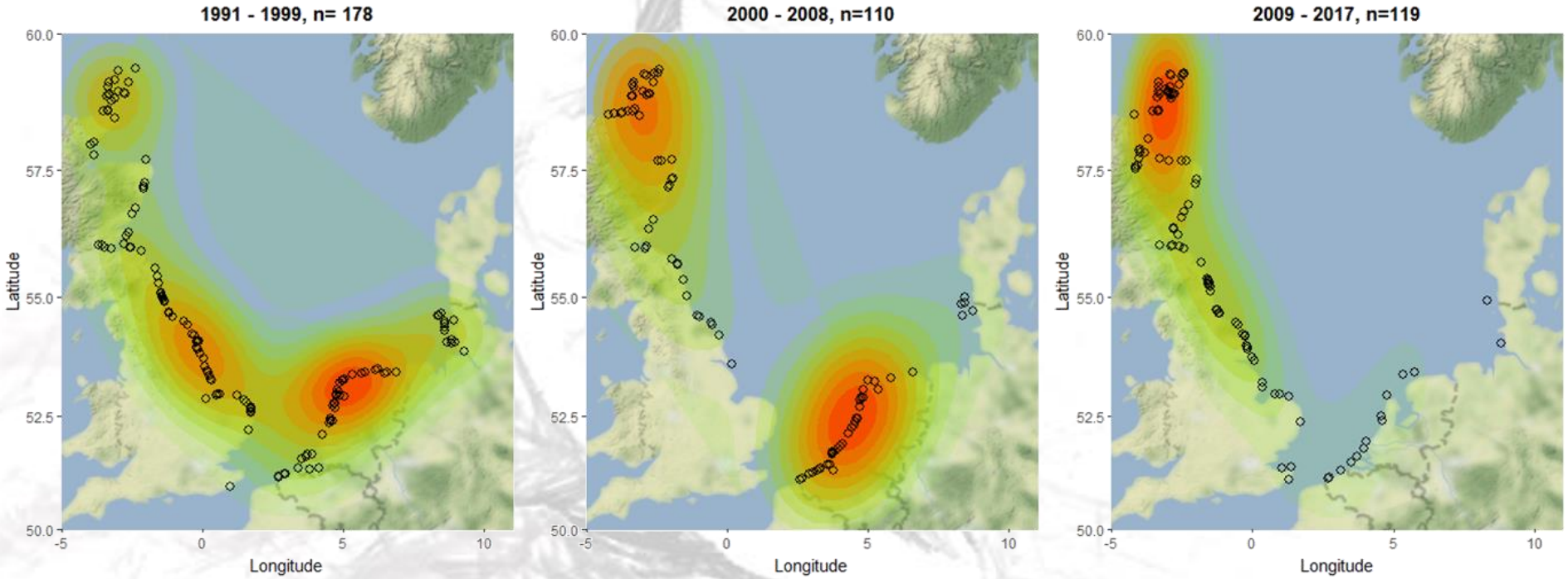
# WBD seasonal distribution




**Source:** MERP Project

# WBD strandings distribution




Ijsseldijk LL, Brownlow A, Davison NJ, et al. Spatiotemporal trends in white-beaked dolphin strandings along the North Sea coast from 1991 – 2017. Lutra. 2017;61(1):153-163.

# Questions asked of ASCOBANS strandings networks

1. Number of WBD strandings or bycatch cases recorded and over what time period?

2. Number/proportion of dead animals which were sampled or necropsied?

3. Type of samples collected and stored?
4. If samples have been archived, processed and if additional data is available, for example on
   a) Diet analysis
   b) Contaminants
   c) Stable isotopes
   d) Fatty acids
   e) Teeth aging

5. Are there any samples stored which are awaiting processing should funding be available?

# WBD strandings and necropsy record

| Country | Total number of strandings reported | Number of cases with samples | Time range | % of cases |
|---|---|---|---|---|
| Belgium | 10 | 10 | 1990-current | 6% |
| Germany | 27[b] | 27 | 1990--current | 15% |
| Netherlands | 11[a] | 6 | 2008-current | 3% |
| France | 31 | 14 | 1981-current | 8% |
| UK- E+W | 110 | 34 | 1990-current | 19% |
| UK- Scotland | 180 | 84[c] | 1992-current | 48% |
| **Total** | **359** | **175** | | **100%** |

a) Database of >240 cases from NL going back to 1940's, with around 40 being examined, however most necropsy data and samples from post 2008.
b) Most cases from Germany pre 2010
c) Most recent cases and samples from UK in past 20 years have stranded in Scotland

# WBD samples or data archives

| Sample type | France | Germany | NL | Belgium | UK-Scotland | UK E+W | Grand Total |
|---|---|---|---|---|---|---|---|
| Gonads | 14 | 6 | 11 | 10 | 67 | 34 | 142 |
| Samples suitable for genetic analysis | 14 | 5 | 11 | 10 | 40 | 34 | 114 |
| Stomach contents for diet and microplastic studies | 0 | 0 | 0 | 0 | 25 | 12 | 37 |
| Stomach contents for diet studies | 14 | 6 | 11 | 10 | 31 | 34 | 106 |
| Teeth | 14 | 15 | 11 | 10 | 66 | 34 | 150 |
| Tissues frozen @-20'C (eg contaminants) | 14 | 12 | 11 | 10 | 48 | 34 | 129 |
| Tissues frozen @-80'C (eg 'omics' work, microbiology) | 0 | 7 | 0 | 10 | 12 | 20 | 49 |
| **Grand Total** | **70** | **51** | **55** | **60** | **289** | **202** | **727** |

a) Some variation in samples available. Earlier cases largely restricted to genetic and teeth tissues
b) Micro/nano plastic samples suitable for analysis only from most recent cases
c) Genetic archive largely skin and muscle frozen at -20’C or stored in ethanol.

| UK-Scotland | Suitable samples exist in archive? | Samples processed? | Samples awaiting analysis | Samples archived indefinitely awaiting resource/funding | Data published/in public domain? |
|---|---|---|---|---|---|
| Diet analysis | 0 | 31 | 4 | | No |
| Contaminants | 65 | 9 | | 56 | No |
| Stable isotopes | 66 | | | | |
| Fatty acids | 66 | | | | |
| Teeth aging | 36 | 29 | 3 | 4 | No |
| Other (please add) | | | | | |
| Gonads | | 19 | 9 | 2 | No |
| Liver (contaminants) | 48 | 2 | | 46 | |
| Muscle (contaminants/genetics) | 30 | | | 30 | |
| Kidney (contaminants) | 42 | | | 42 | |
| Virology (spleen, lung, brain) | 12 | 3 | | | |

# Analysis of samples

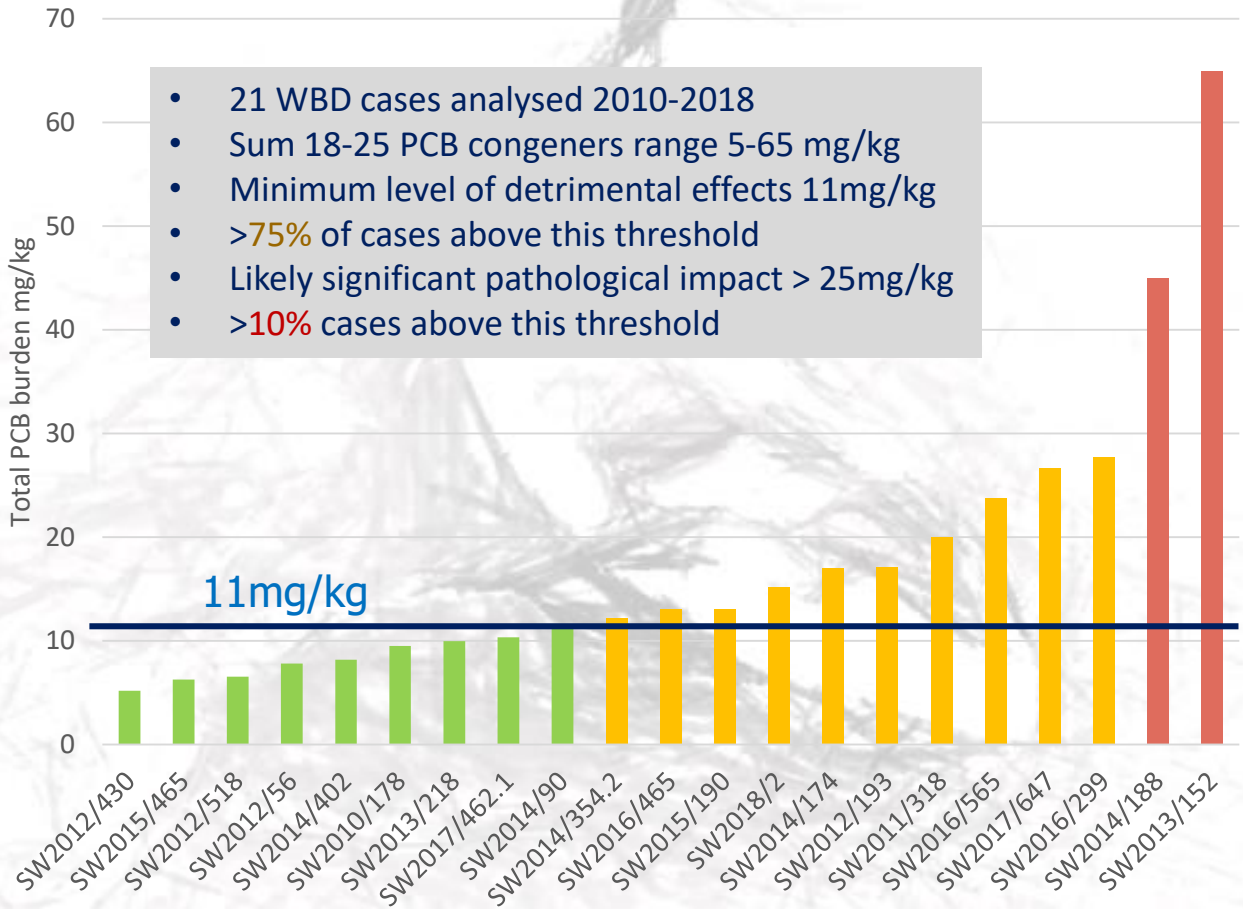
- UK: Between 25 and 100% samples processed, mostly on ad-hoc funding. Contaminant analysis recently undertaken- publication in prep
- NL: Some contaminant and diet analysis work analysed and published
- Germany: Diet and teeth analysis complete on most cases, contaminant work in progress
- France: Genetic analysis, most other tissues archived
- Belgium-?

Jansen, O. E. (2013). Fishing for food: feeding ecology of harbour porpoises Phocoena phocoena and white-beaked dolphins Lagenorhynchus albirostris in Dutch waters.

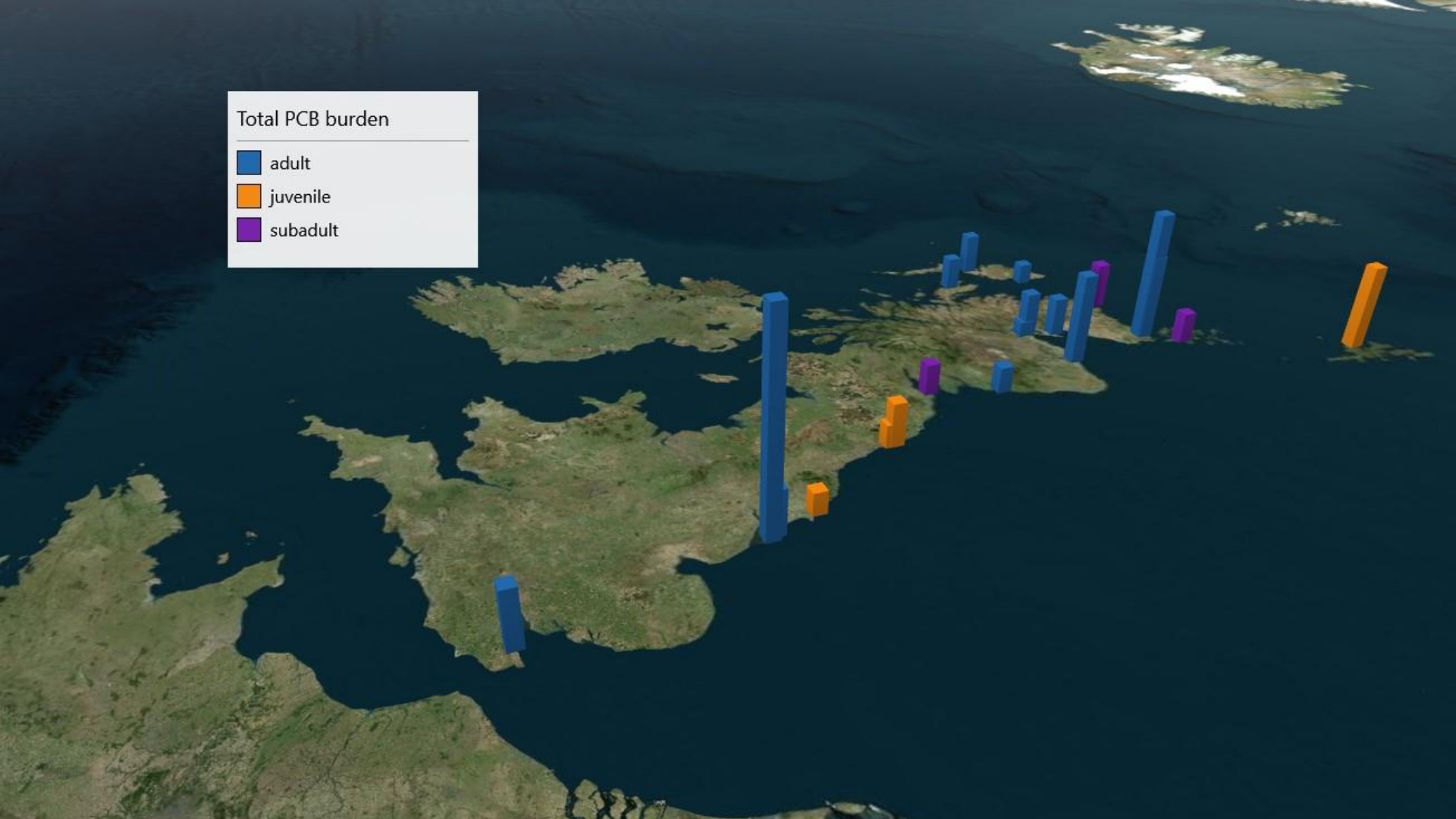
Banguera-Hinestroza, et al (2010) The influence of glacial epochs and habitat dependence on the diversity and phylogeography of a coastal dolphin species: Lagenorhynchus albirostris. Conservation Genetics

# UK WBD contaminant burden- preliminary results

Lagenorhynchus albirostris ranked sum total PCB burden (n=21)




- 21 WBD cases analysed 2010-2018
- Sum 18-25 PCB congeners range 5-65 mg/kg
- Minimum level of detrimental effects 11mg/kg
- >75% of cases above this threshold
- Likely significant pathological impact > 25mg/kg
- >10% cases above this threshold


Total PCB burden
adult
juvenile
subadult

# Conclusions and recommendations

- Evidence from strandings record of a northern range shift-
  - Water temperature?
  - Infectious disease?
  - Prey?
  - Climate change?

- Requirement to better understand population parameters for these species and drivers for this observed change- some work already in process to this aim but could be improved

Lagenorhynchus are at a trophic level between harbour porpoise and killer whales and possibly similar to BND- making them useful indicator species.

- This species is useful for deriving wider parameters of ecosystem health.

# Conclusions and recommendations

- White beaked dolphin and Atlantic white-sided dolphin strandings should be included as priority species for investigation.

- Analysis of current samples archive is encouraged, in particular from networks at margins of current distribution and for historical samples

- Emphasis of value in collaboration/data sharing between strandings networks would enable a wider, ecosystem approach to any analysis.

Suggested analysis:

| | |
|---|---|
| ➢ Genetics:-, diversity, connectivity- fine-scale population structure | $ |
| ➢ Contaminants: blubber analysis PCBs, BDEs, HBCD | $$$ |
| ➢ Feeding ecology: diet, stomach contents, fatty acids? | $$ |
| ➢ Life history: teeth, gonadal assessment | $$ |