



NORMAN and marine environment

Do we need a new Working Group?

Jaroslav Slobodnik

NORMAN General Assembly
2 December 2020



How did it all start...

- NORMAN GA Bilbao 2013 – **WG Marine environment voted down**
- EU/UNDP EMBLAS-II and EMBLAS-Plus projects in the Black Sea region – 2014 – 2020
 - <http://emblasproject.org/>
 - Massive use of NORMAN-developed tools: NTS, passive sampling, prioritisation, (microplastics), data in NDS/DSFP, support of the MSFD
- LIFE APEX, Systematic use of contaminant data from apex predators and their prey in chemicals management – 2018 – 2022
 - <https://lifeapex.eu/>
 - Inspired by EMBLAS, systematic use of ESBs and scientific sample collections in NHMs across Europe

EMBLAS - new approaches to monitoring

- **Non-target screening** (NDS, EMPODAT/DSFP)
- **Marine/riverine floating litter** (EC JRC)
- **Microplastics** (UoF, NIVA, UBA and BAM Germany)
- **Passive sampling** (RECETOX/NIVA)
- **DNA (eDNA)** – fish, phytoplankton, zooplankton, bacteria... (NIMRD Romania, University of Nanjing, DNAquaNet)
- **Antimicrobial Resistance** (UKRSCES, NIMRD)
- **Hypoxia** (Benthox project)





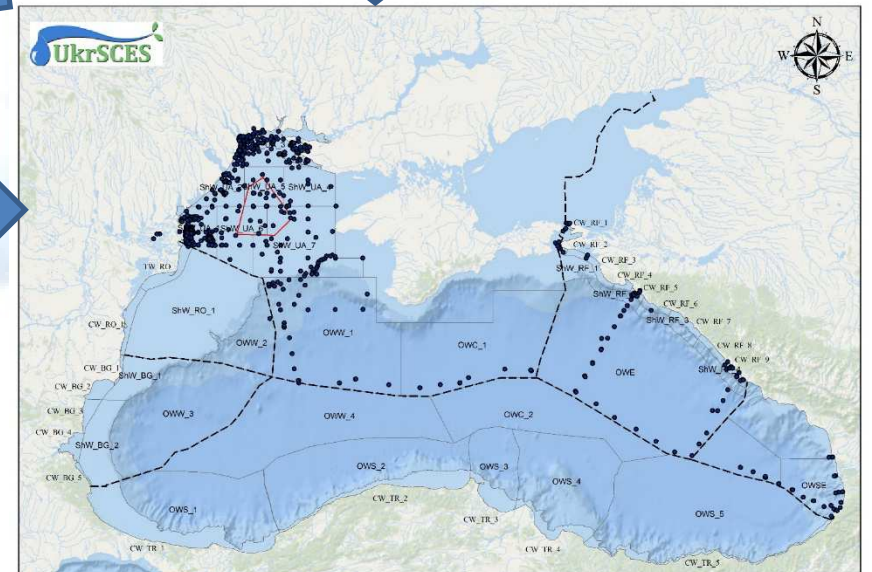
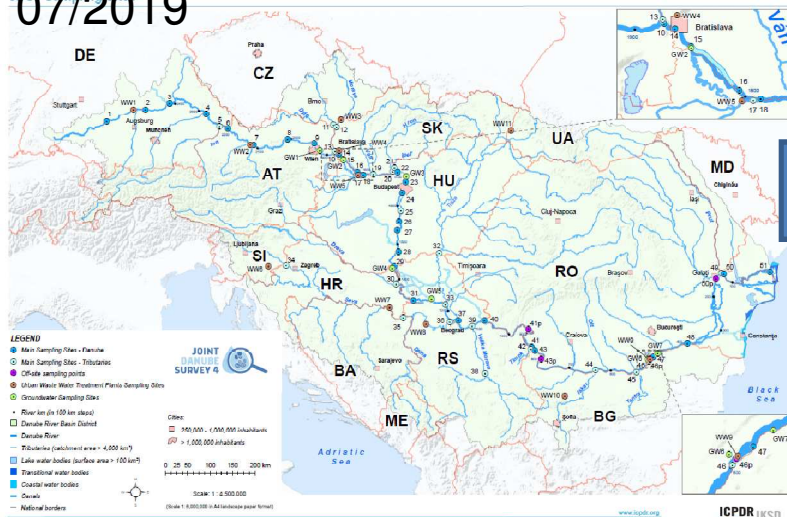
Black Sea and major in-flowing rivers investigated using NORMAN NTS and prioritisation methodology, data in NDS and DSFP

Diamanti et al., 2020, Analytical and Bioanalytical Chemistry 412(1), DOI: [10.1007/s00216-020-02648-y](https://doi.org/10.1007/s00216-020-02648-y)

OSCE, Dniester, 05/2019

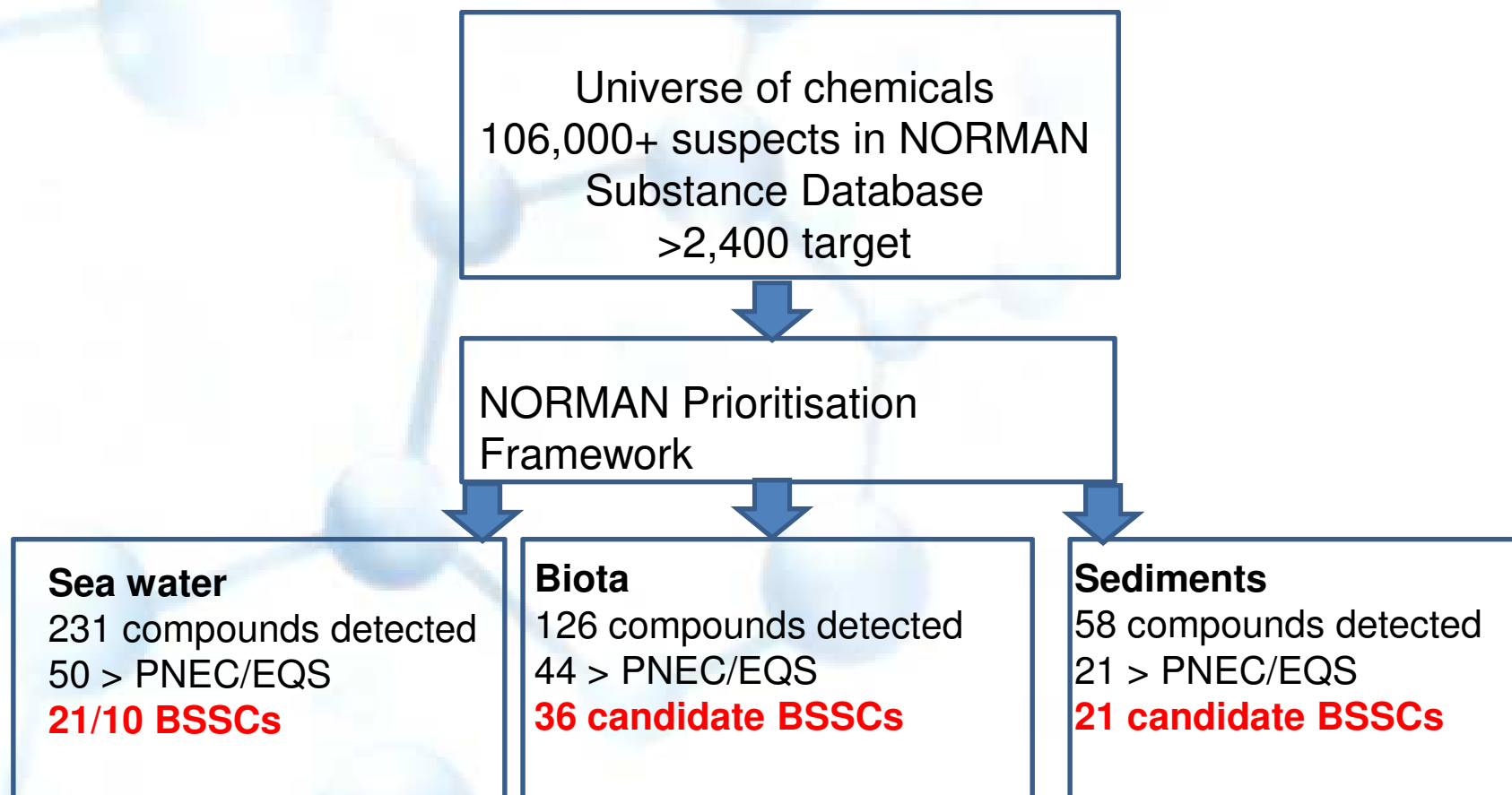


ICPDR, Joint Danube Survey 4, 06-07/2019





Black Sea Specific Contaminants – MSFD D8, D9



Who will monitor them/how?



This project is co-funded by the European Union

COUSTEAU

WWW.COUSTEAU.ORG
CUSTODIAN OF THE SEA
SINCE 1949

THE BLACK SEA AT A GLANCE

HIGHLY VULNERABLE

EMBLAS-Plus
Environmental Monitoring in the Black Sea



124 candidate Black Sea Specific Pollutants

What is the status of the Black Sea? Is it recovering?

BBC World News broadcast

<https://vimeo.com/378374393>

<https://www.bbc.com/news/av/science-environment-50578326/the-black-sea-can-europe-s-most-polluted-sea-be-saved>



Zernov's Phyllopl
the largest red al
field in the wor



BLACK SEA

Max. length: 1,175 km (730 mi)
Surface area: 436,402 km² (168,500 mi²)
Average depth: 1,253 m (4,109 ft)
Max. depth: 2,212 m (7,259 ft)
Water volume: 547,000 km³ (132,000 mi³)
Salinity: 13-23 g/Kg
Positive water balance: 3 km³/yr
Neighbouring countries: Bulgaria, Russia and Georgia

In black: Problems
In white: Highlights

maritime traffic
(noise pollution)



of the most famous inland seas
to dynamic marine ecosys-
sh and nutrient rich conditions,
oxygen free environment. Large
ificant amounts of sediments,
s solid waste and pollutants.
is the health of its inhabitants,
a and microscopic algae all the
ins and humans. Chemical and
all as litter are dangerous for all
Black Sea.

Environmental Monitoring of the Black
the environmental quality of the
et is co-financed by the Euro-
United Nations Development

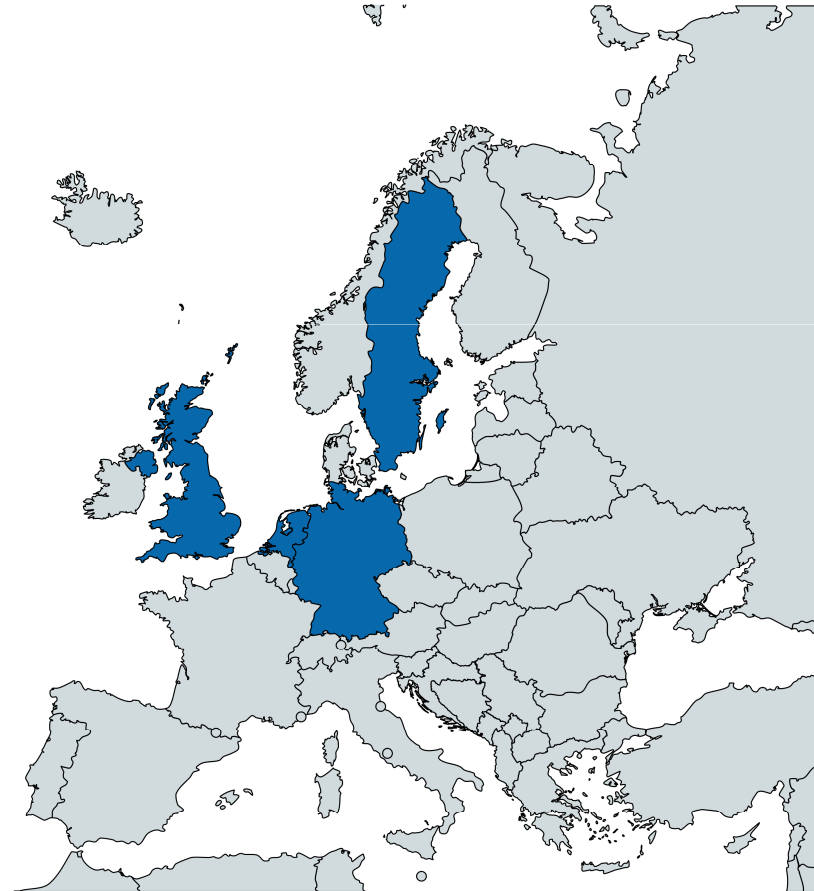
More information at: emblasproject.org



LIFE APEX

<https://lifeapex.eu/>

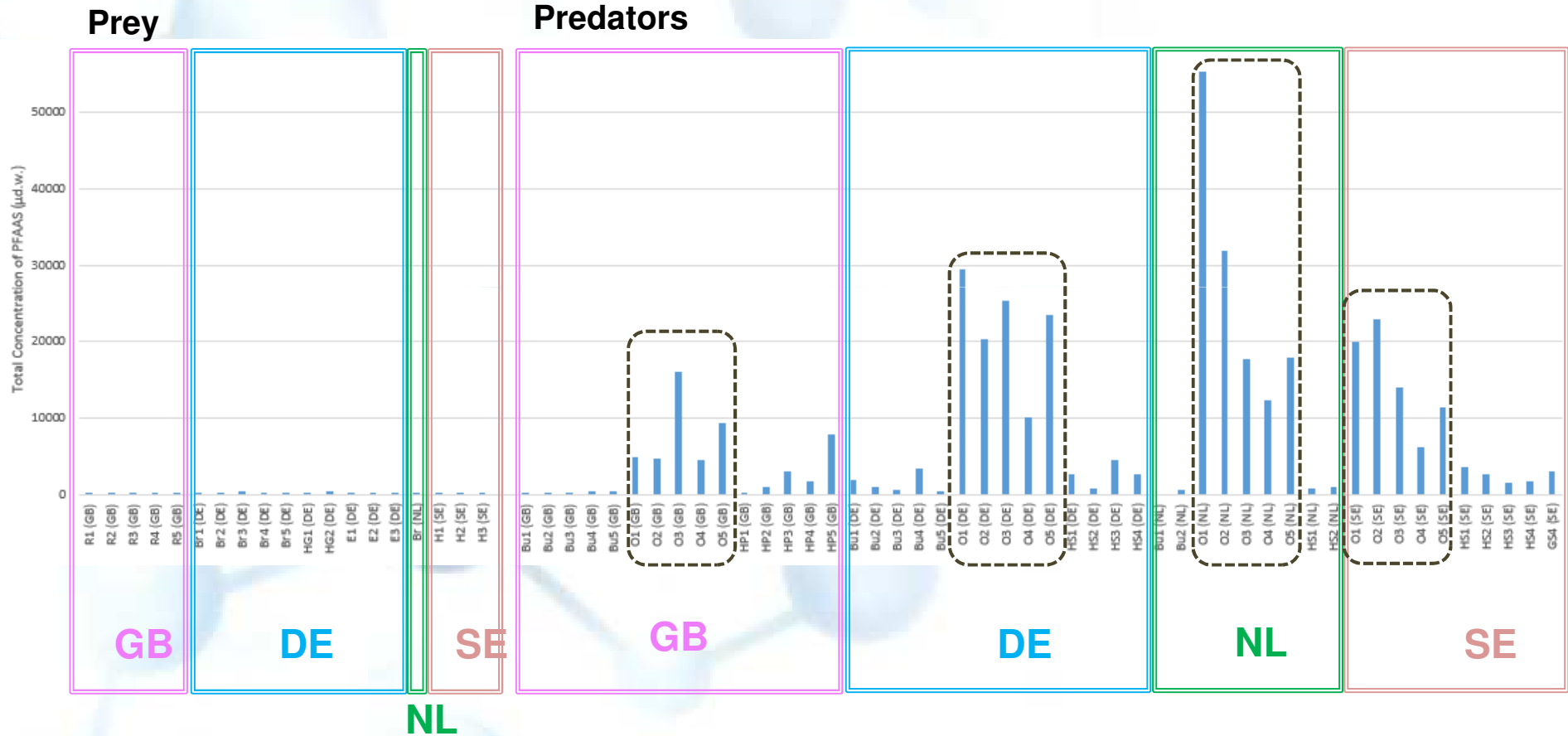
- Incl. marine mammals and their prey by NORMAN NTS
- **Tier 1 – Does it work?**
 - Samples from ESBs and NHMs in DE, NL, SE, UK
- **Tier 2 – Can we look back at the pollution pattern?**
 - ESBs and scientific collections from 2000 – 2019
- **Tier 3 – What do we see around Europe?**
 - Samples of top predators from all European Sea Regions
- **All data in LIFE APEX database System – fully compatible with NDS, ready to be transferred**





Results (Tier 1)

- Predators **MUCH!!! higher total PFAS concentration Vs** their prey
- **Otters** → highest concentrations among all predators in all tested countries
- Max total concentration → **55 mg/Kg d.w.**



...and in ESB samples (20 years) we can see how the concentrations of banned chemicals go down and concentrations of (sometimes not safer) replacements go up...



NORMAN and marine environment

Regional Sea Conventions

- North Sea – OSPAR
- Baltic Sea – HELCOM
- Black Sea – Black Sea Commission
- *Mediterranean Sea – MED POL*
- MSFD – Descriptors 8 & 9, Contaminants, Expert Groups
- Polar regions – Antarctica, Arctic region
- Ireland – EPA/Marine Institute, 6 biota samples
- Canada – Persistent, Emerging, and Organic Pollution in the Environment (PEOPLE) network; <http://www.people-network.ca/>



OSPAR

Convention for the Protection of the Marine Environment of
the North-East Atlantic

WG on Monitoring and on Trends and Effects of Substances in the Marine Environment
(MIME)

- **Associated member of NORMAN**
 - tbd at the meeting of HoD in December 2020; step-wise approach of cooperation
- **Areas of cooperation:**
 - **Ecotoxicology** – sharing PNECs
 - **Passive Sampling** – DCTs & know-how
 - **Wide-scope target and suspect screening**
 - **CONNECT project 2020 – 2021**, blue mussels samples; ICES database and NDS/DSFP
 - **NORMAN CEC prioritisation tools**
 - Data from CONNECT + ICES database; OSPAR Lists of Chemicals for Priority Action and Substances of Possible Concern (LCPA and LSPC)
 - **Chemicals in top predators and in polar regions** – LIFE APEX, JPA 2020
 - **Microplastics** – ILS and sharing know-how WG4



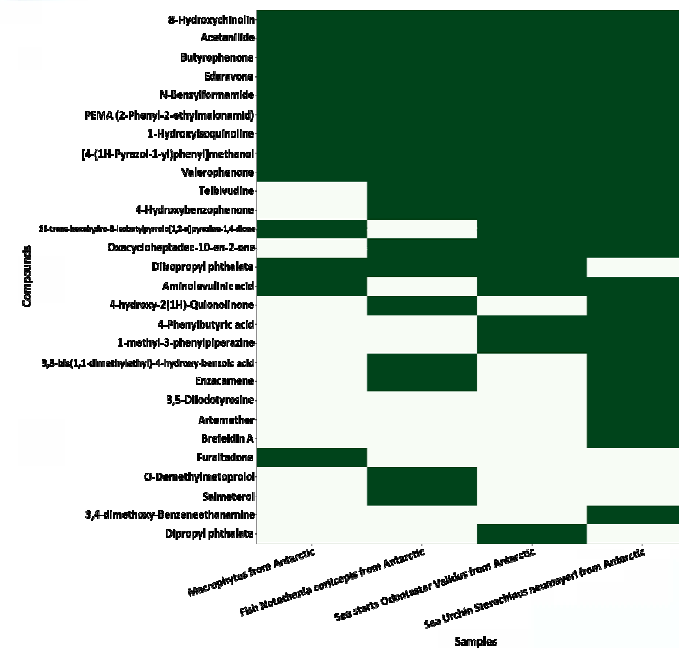
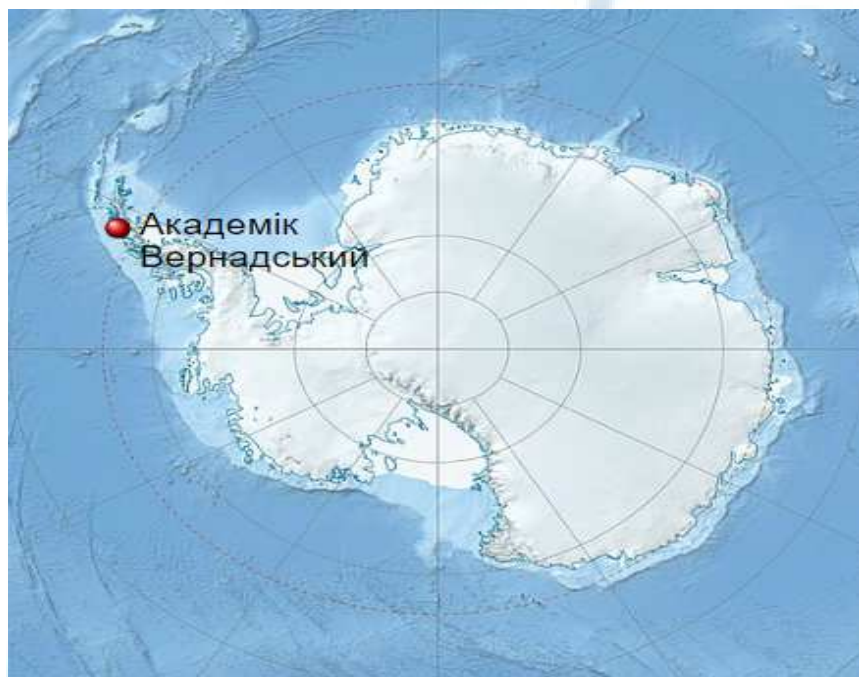
HELCOM

The Baltic Marine Environment Protection Commission – Helsinki Commission

- Proposal for regular screening of hazardous substances in the Baltic Sea region
 - Ministerial Declaration (2018) Brussels HELCOM Ministerial Meeting agreed **‘to identify the scale of problems of contaminants of emerging concern’**
 - Inspired by OSPAR, LIFE APEX, EMBLAS: wide-scope target and suspect screening of **ca. 90 biota samples** in 2021 - **Pre-EMPT project** (submitted)
 - An overview of hazardous substances in the Baltic Sea marine environment, at the broadest spatial coverage possible; use of ESBs
 - **NORMAN infrastructure for data archiving and assessment/prioritisation**
- Screening study on hazardous substances in marine mammals of the Baltic Sea
 - German Environment Agency, 2021
 - Inspired by LIFE APEX, **ca. 20 samples**

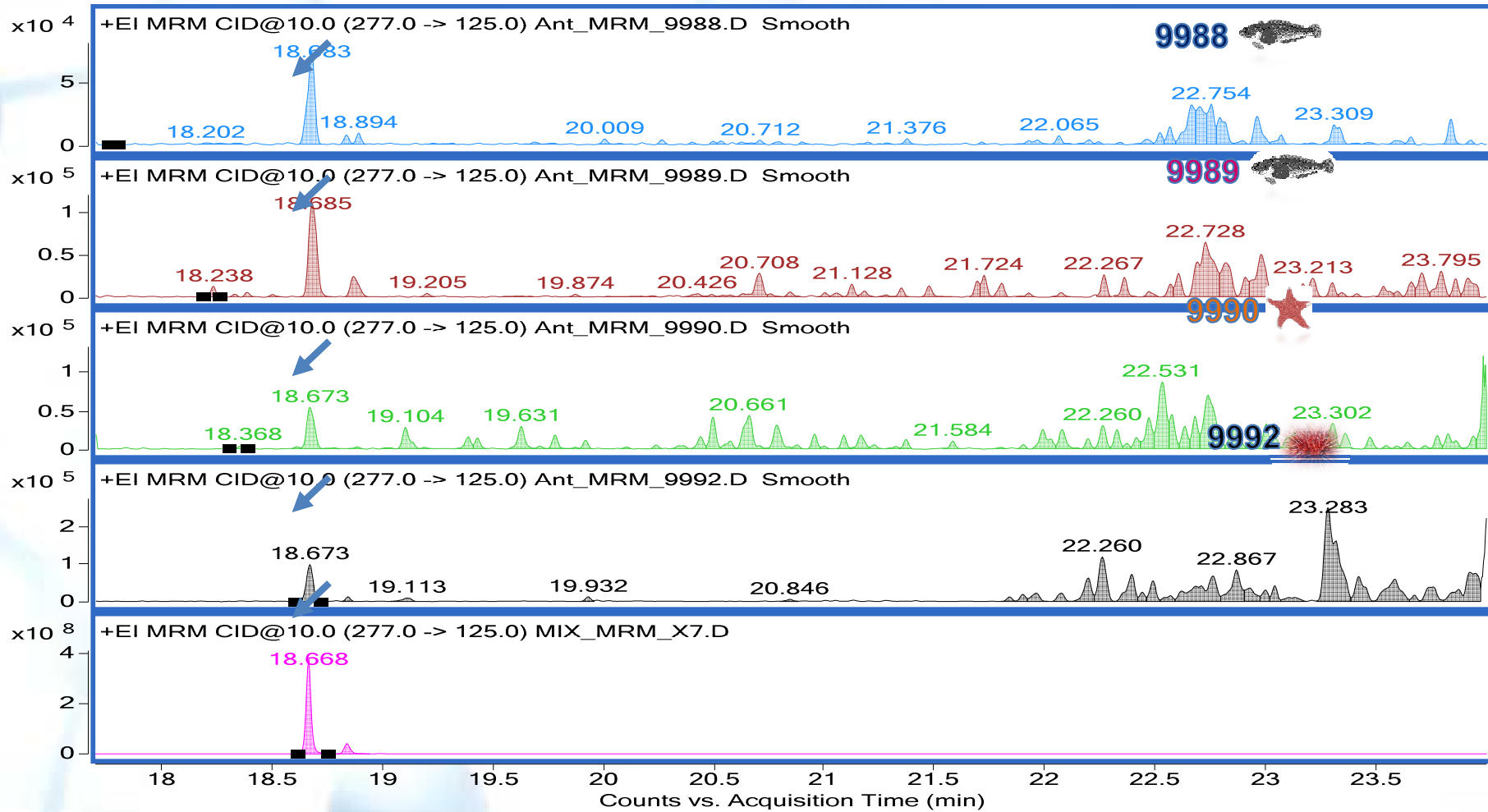
Polar regions

- **JPA 2019-2020 – 20 samples to be analysed using NORMAN NTS workflow**
- Cooperation with the Ukrainian National Antarctic Scientific Center of Ukraine - Vernadsky station (former UK)
- 4 samples 2019 – fish/sea stars/sea urchins/macrophytes, more samples being analysed in 2020 – penguin eggs, muscles, crab-eating seals etc.;





Tris(2-chlorisopropyl)phosphate – TCPP





**Do we need WG Marine
environment?**

WHO IS IN?