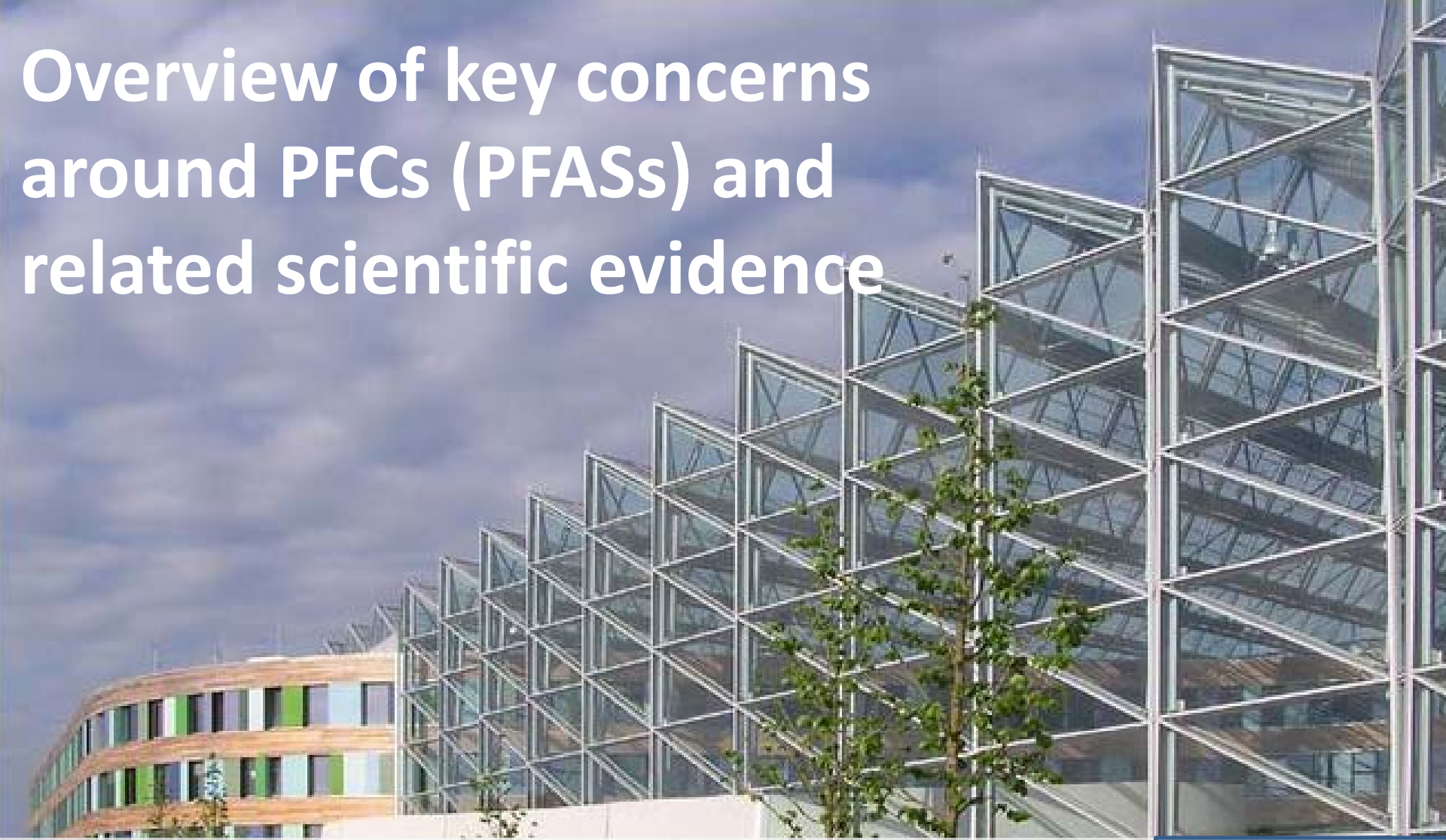
Overview of key concerns around PFCs (PFASs) and related scientific evidence



Lena Vierke
Federal Environment Agency, Germany

Side event COP 6, 29. April 2013 Geneva

Umwelt Bundes Amt
For our Environment


11.04.13 | Umweltskandal

PFT-Mammutprozess endet ohne Verurteilung

Prozess um PFT-Umweltskandal: Geldauflagen eingestellt

Donnerstag, 11. April 2013, 11:04 Uhr

...prozess eingestellt: Schuldige am PFT-Skandal nicht verurteilt

German newspapers

PFC-Scandal

Use of contaminated soil improver, contamination of drinking water

→ 6 Million €uros to repair damages

Outline

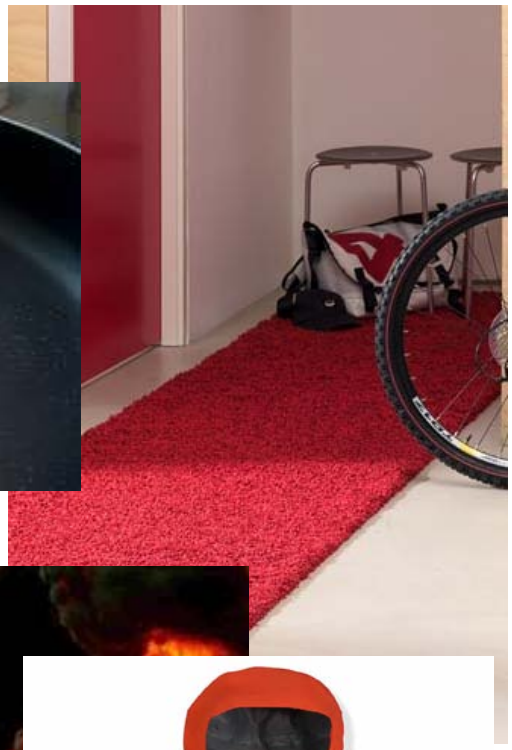
- Properties
- Uses and sources
- Concerns
- Alternatives

Properties of (some) PFASs

- Chemically and thermally stable
- Water, dirt and grease repellent
- High surface tension potential
- Very low friction properties

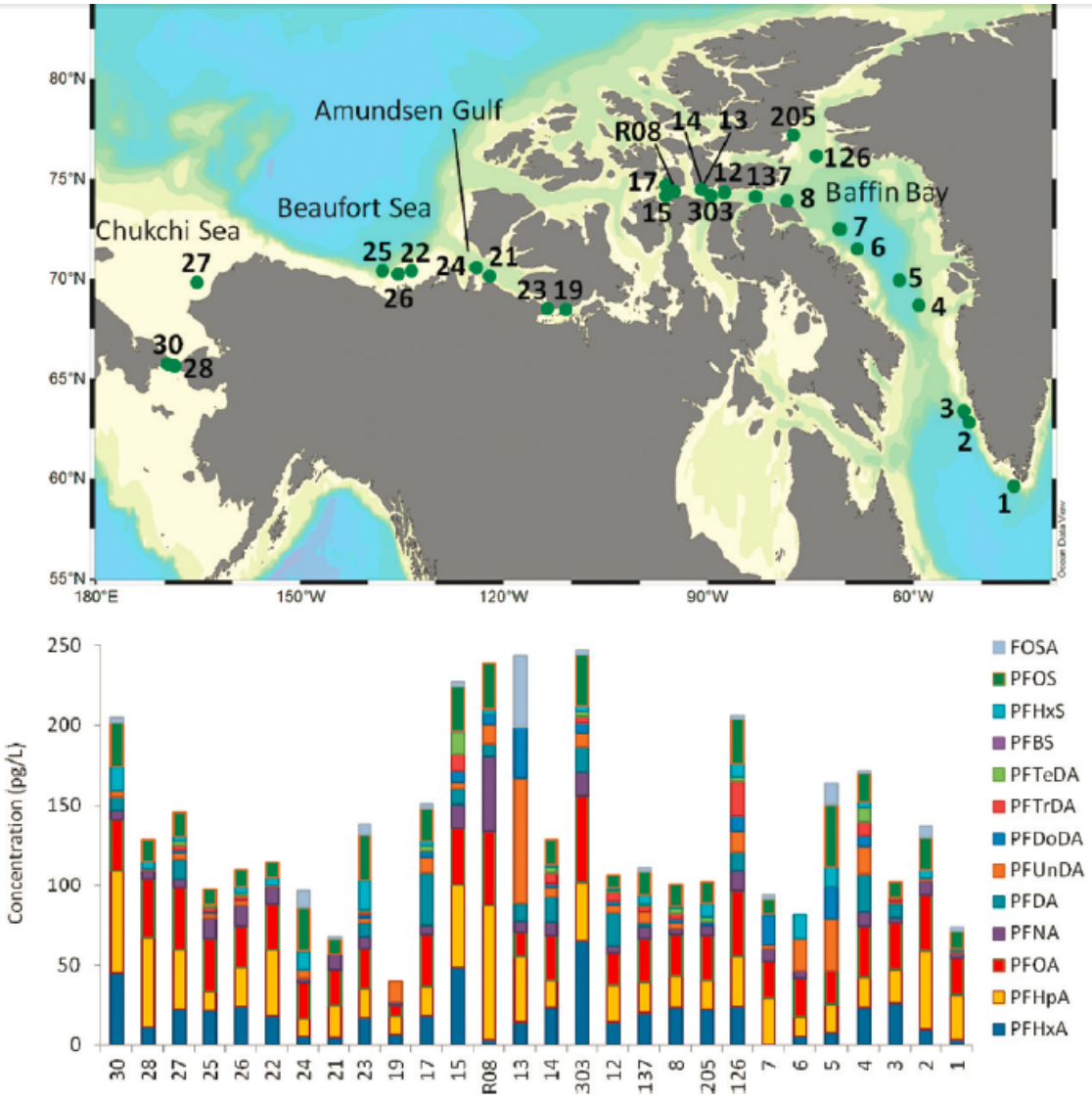
- Persistent in the environment
- Bioaccumulative
- Toxic (i.e. for reproduction)

Uses and sources of PFASs



- Production and processing facilities
- Facilities of downstream users
- Residues in products
- Emissions during life-cycle of products containing PFASs

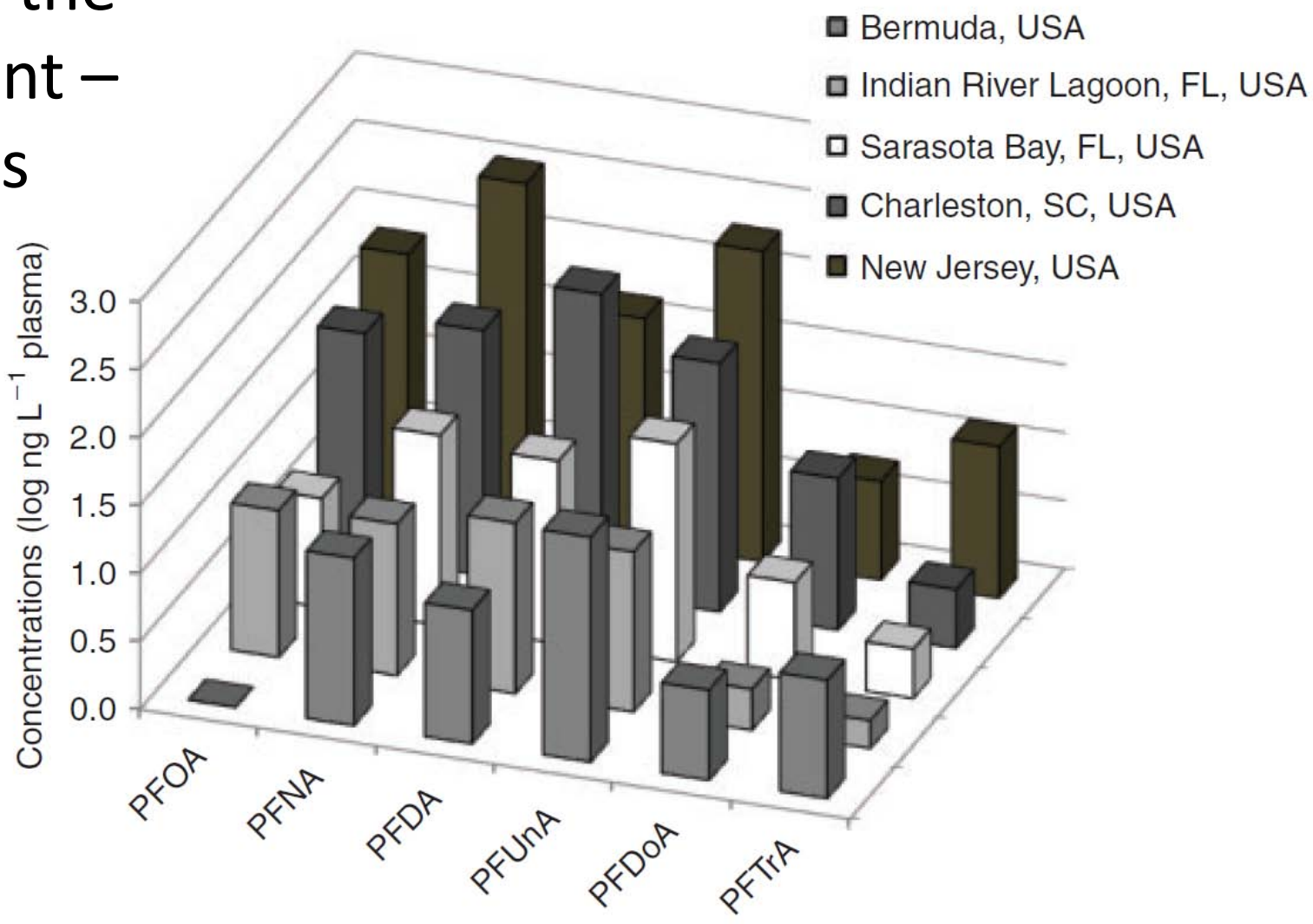
Findings in the environment – Arctic water



J.P. Benskin et al. 2012 Environ. Sci. Technol. 46, 5815–5823

Figure 3. ∑PFAAs (pg/L) for the 2005 *Oden* cruise (Greenland to Chukchi Sea; samples 1–30) and 2008 *Amundsen* cruise (North Baffin Bay; samples 126–303). Relative profiles are provided in Figure S4 (Supporting Information). R08 represents the average of two sites near Resolute Bay (n = 2 samples/site) sampled in 2008 and analyzed at CCIW as part of the CCIW/AIST interlaboratory study.

Findings in the environment – Dolphins



I. T. Cousins et al. 2011 Environ. Chem. 8, 339-354

Findings in humans – human blood

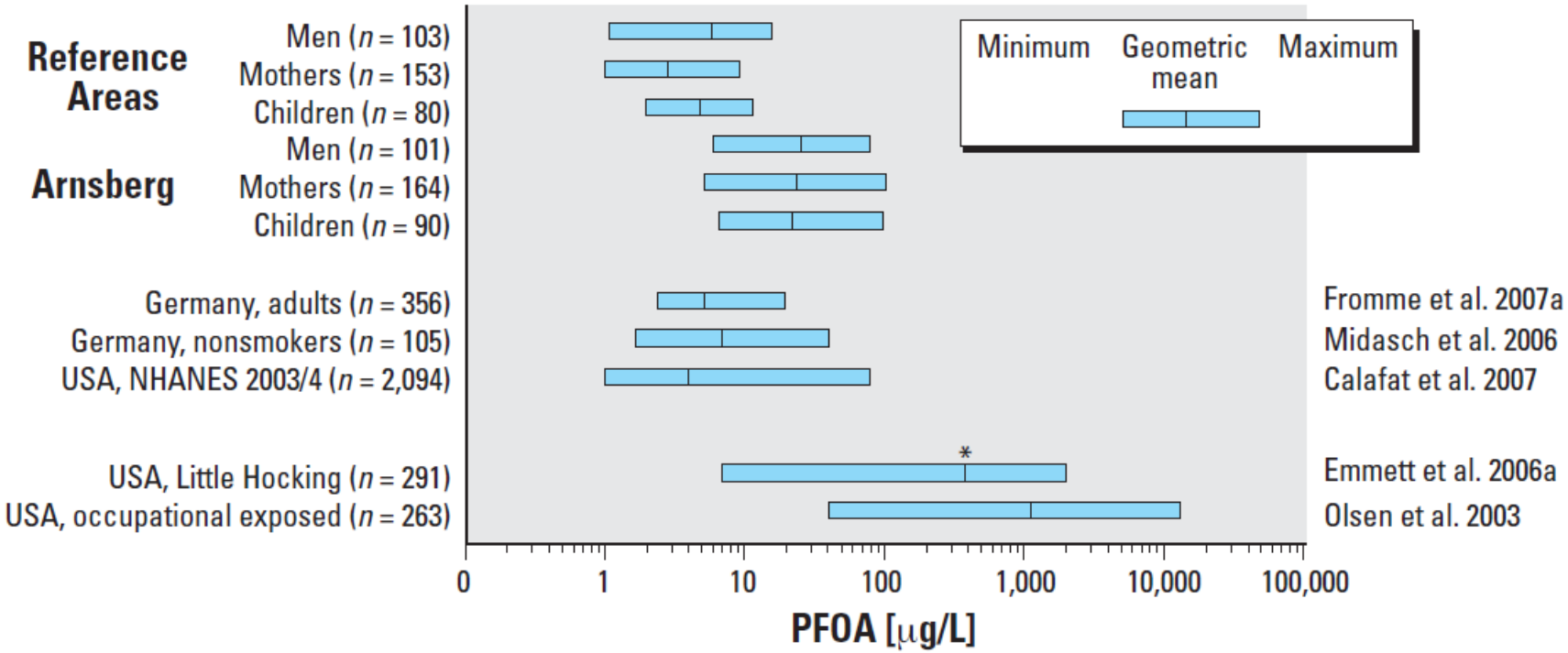


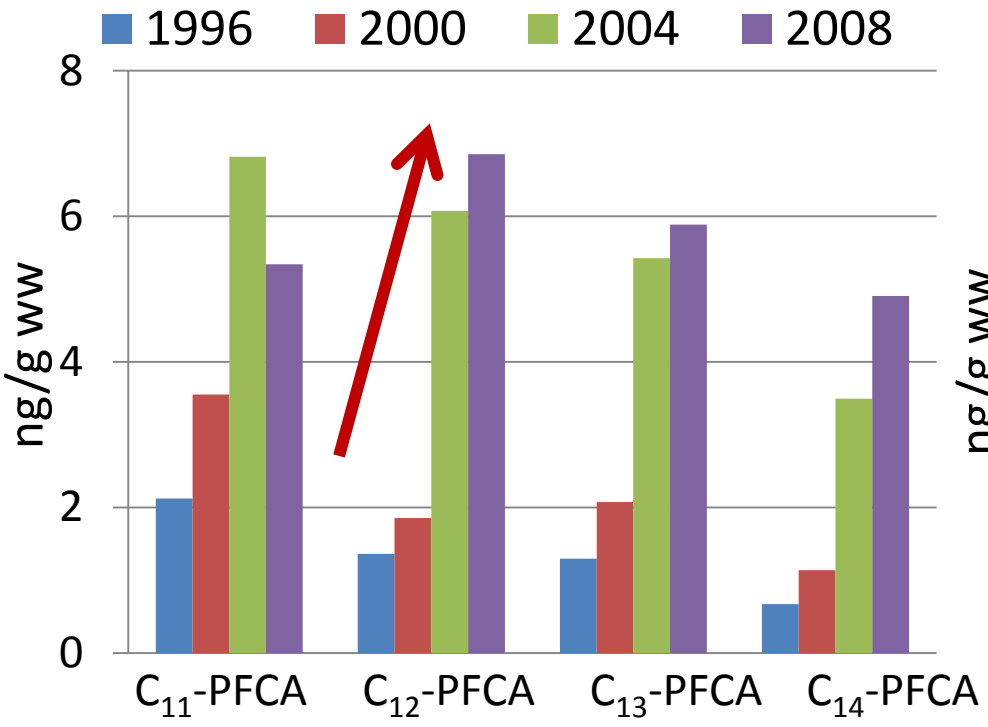
Figure 3. PFOA concentrations in human blood in Arnsberg and reference areas compared with national and international data.
*Median instead of geometric mean.

J. Hölzer et al. 2008 Environ. Health. Persp. 116: 651 - 657

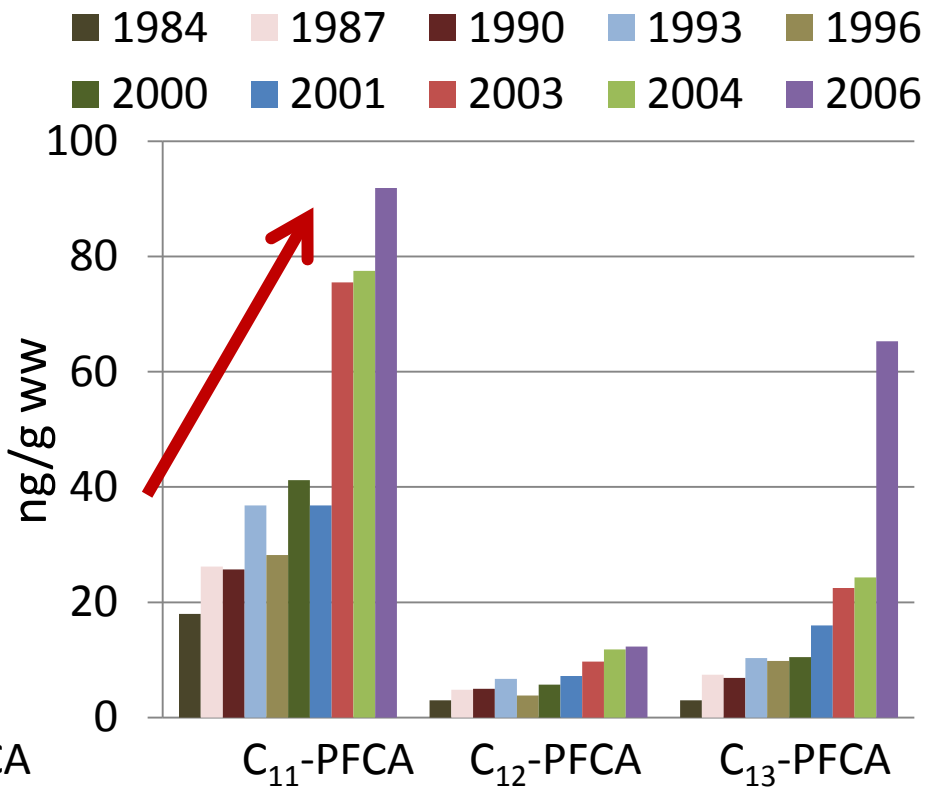
Concerns of PFASs especially long-chain PFCAs and PFSAs

- Findings and distribution in surface water
- Long-range transport and findings in remote areas
- Occurrence in food and in drinking water
- Occurrence in blood samples and breast milk of the general population
- Findings and accumulation in food webs and top predators
- Environmental persistence
- Toxicological profile (PFOA and PFOS Reprotoxic Cat. 1 B)

Increasing trends of long chain PFCAs



Concentrations of PFCAs in bream liver (*Abramis brama*), Germany (n=4)
(Theobald et al. 2011)



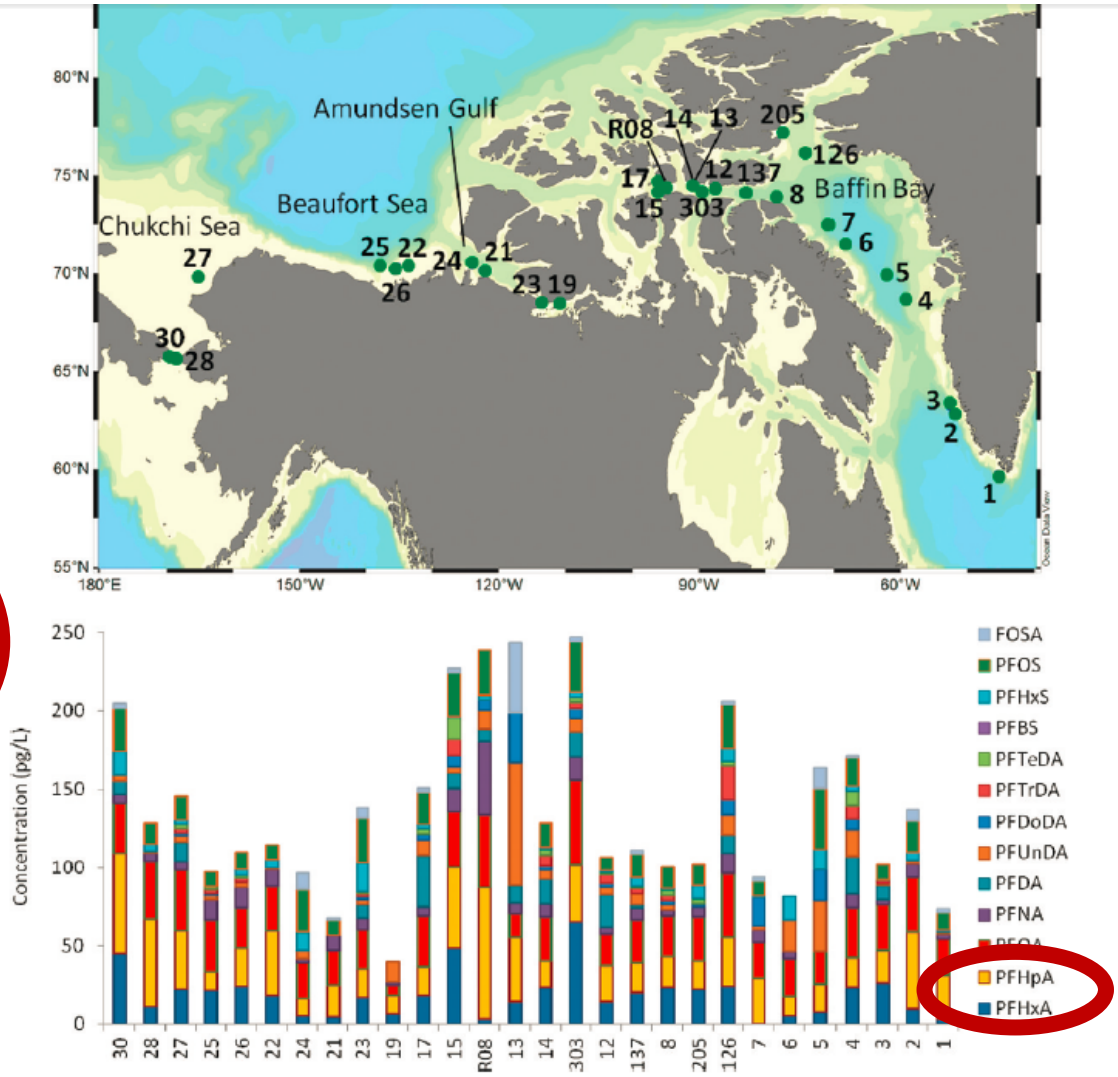
Concentrations of PFCAs in polar bear liver (*Ursus maritimus*), Greenland (n=1-19)
(Dietz et al. 2008)

Alternatives for long chain PFCAs and PFSAs

- Shorter chain PFASs
- Non-fluorine substances
- Non-chemical techniques

Findings in the environment – Arctic water

Alternatives already found in the environment



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J.P. Benskin et al. 2012 Environ. Sci. Technol. 46, 5815–5823

Conclusion

- Human and environmental exposure with PFASs is of concern
- Some regulatory measure already in force
- Concentrations in the environment (partly) still increasing
- Alternatives available but little public information

→ Need for action on a global scale

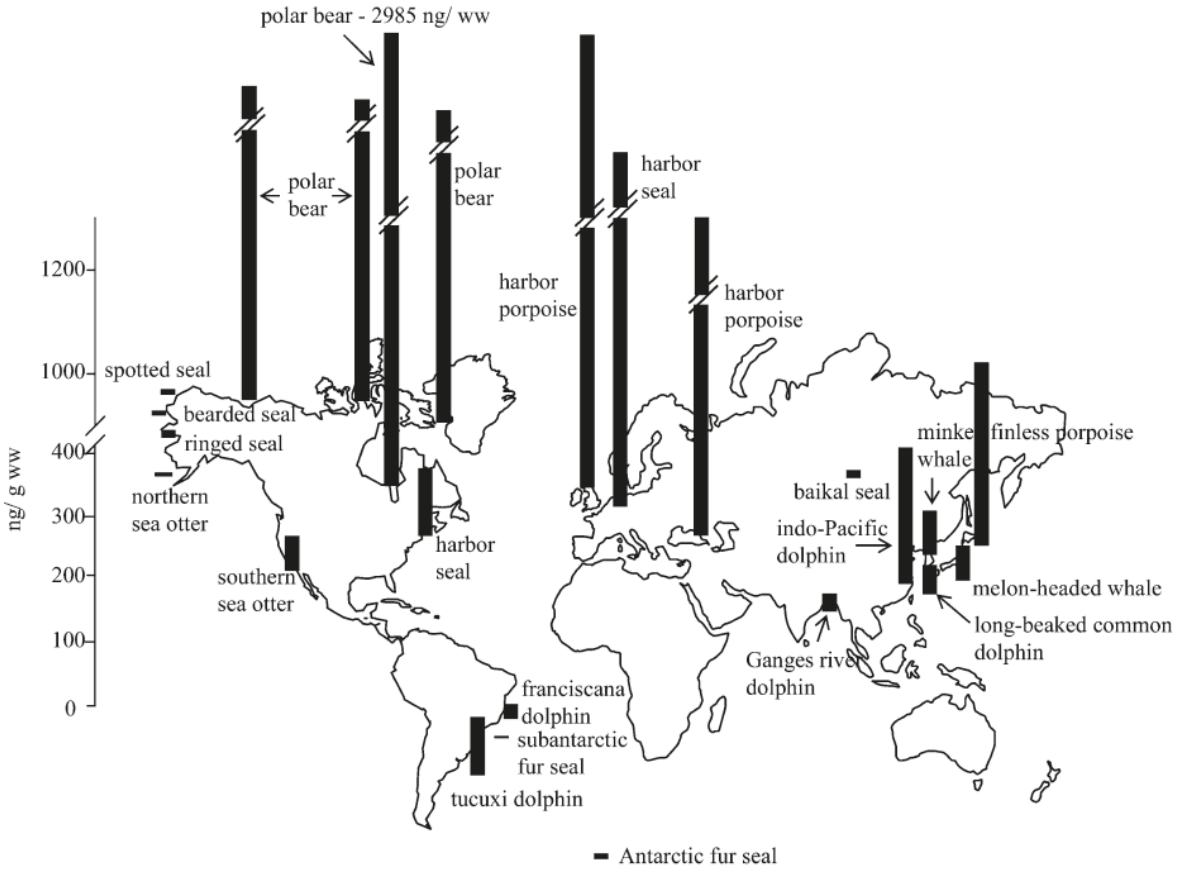

Figure 1. Recently reported (2006–2010) PFOS concentrations in liver of marine mammals worldwide.[6–8,10,12,13,15,19,21,30,36,65–67,102–104]

Thank you for your attention!

M. Houde et al. 2011 ES&T 45: 7962-7973.

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Umwelt Bundes Amt
Für Mensch und Umwelt