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Background

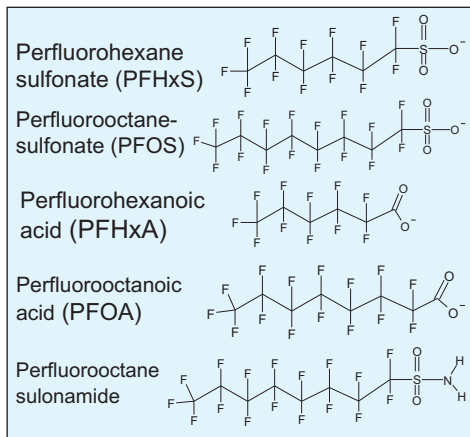
During the past decade, the identification of new of perfluorinated alkylated substances (= PFAS) in environmental samples has opened a new chapter within the various disciplines of environmental sciences.

PFAS residues are virtually both lipophobic and hydrophobic. These unique physico-chemical properties are still a considerable challenge for environmental scientists.

Objectives

Six Nordic countries participated in this screening study (Denmark, Faroe Islands, Finland Iceland, Norway and Sweden). The here presented screening exercise on occurrence, distribution and fate of PFAS in the Nordic environment confirmed that PFAS was present in all samples analysed. Compound specific distribution patterns in the different sample types were found.

The following PFAS compounds were analysed:

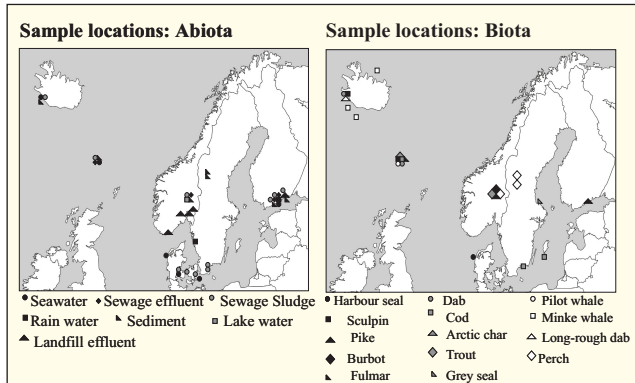


Analysis

Trace analysis of PFAS have been performed jointly by NILU and ITM. Liquid chromatographic (LC) methods coupled to mass selective detection has been used for PFAS quantification.

Abiotic samples were analysed by NILU using LC-Time-of-Flight mass spectrometry (MS-TOF).

Biotic samples were quantified by ITM using LC- triple quadrupole mass spectrometry.



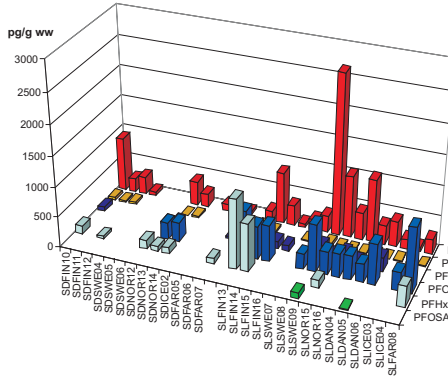
Results:

Sediment and sewage sludge

Abbreviations:

FIN = Finland, ICE = Iceland, DAN = Denmark, NOR = Norway, FAR = Faroe Islands, SWE = Sweden

SD = Sediment, SS = Sewage sludge

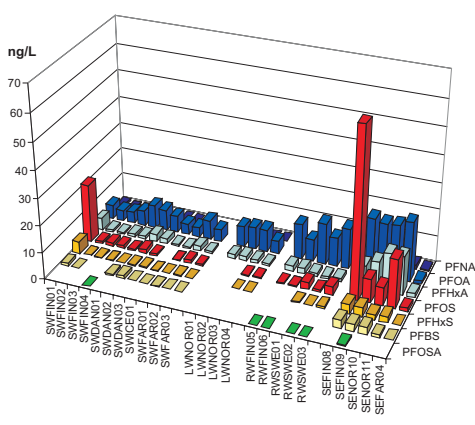


PFOS is usually dominating the Sediment and Sewage samples
Sewage > Sediment

Water samples

Abbreviations:

LF = Landfill effluent, SW = Sea water, LW = Lake water, RW = Rain water, SE = Sewage effluent

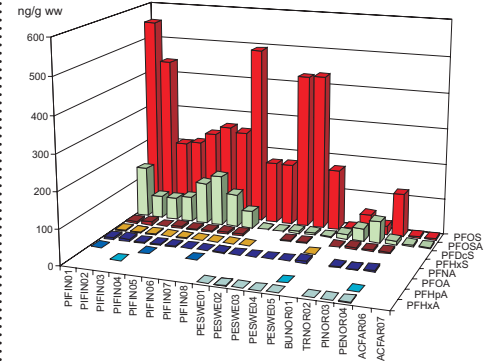


PFOA is dominating in water.
Landfill effluent >> Sewage effluent > rain water > Lake/sea

Fresh water fish

Abbreviations:

PI = Pike, PE = Perch, BU = Burbot, AC = Arctic char, TR = Rainbow trout

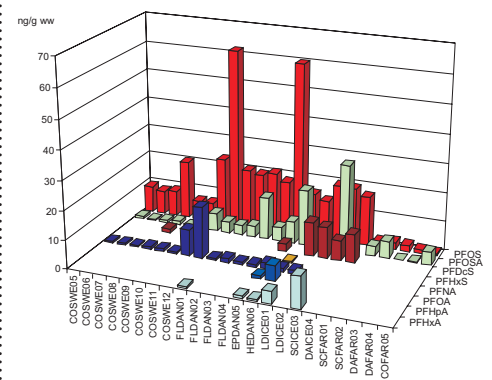


PFOS and PFOA are dominating.

Marine fish

Abbreviations:

PE = Perch, SC = Sculpin, LD = long-rough dab, DA = dab, EP = Eelpout, HE = Herring, FL = Flounder.

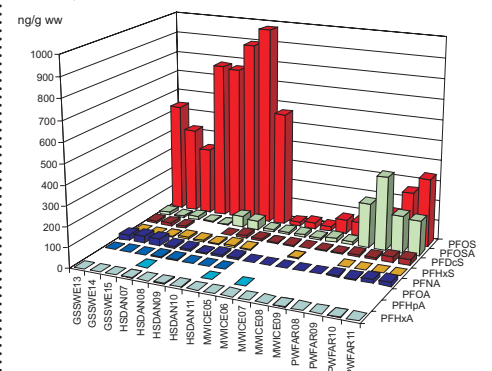


Species specific PFAS patterns.

Marine mammals

Abbreviations:

GS = Grey seal, HS = Harbour seal, MW = Minke whale, PW = Pilot whale



Species specific PFAS patterns.
Marine mammals >> marine fish = bioaccumulation?

Reference

The complete report is available at www.sft.no/nyheter/dokumenter/pfas_nmr2004.pdf

Acknowledgements

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