Hrönn Jörundsdóttir

POPs in seabirds from the Northeast Atlantic Ocean

Aim

To investigate distribution and trends of persistent organic pollutants in remote region, focus on the Northeast Atlantic Ocean

matís

Stockholm University

UNIVERSITY OF ICELAND

Naturhistoriska riksmuseet

NINA
Norsk institutt for naturforskning

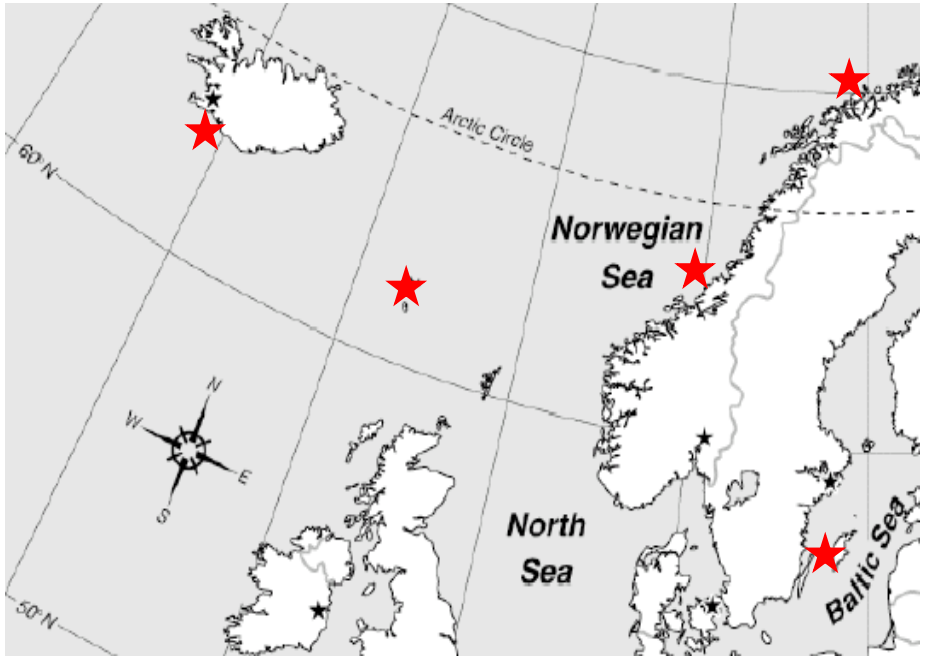
UNIVERSITY OF MANITOBA

SYDDANSK UNIVERSITET

norden

Material for spatial trend

Guillemot eggs from six locations, Vestmannaeyjar (Iceland), Sandøy (The Faroe Islands), Sklinna, Hjelmsøya and Bjørnøya (Norway) and Stora Karlsö (Sweden)



10 individual samples from each location, 1 g each

Bird species investigated specifically in Iceland

Arctic tern, M

Guillemot, R

Great skua, M

Eider, R

Fulmar, R

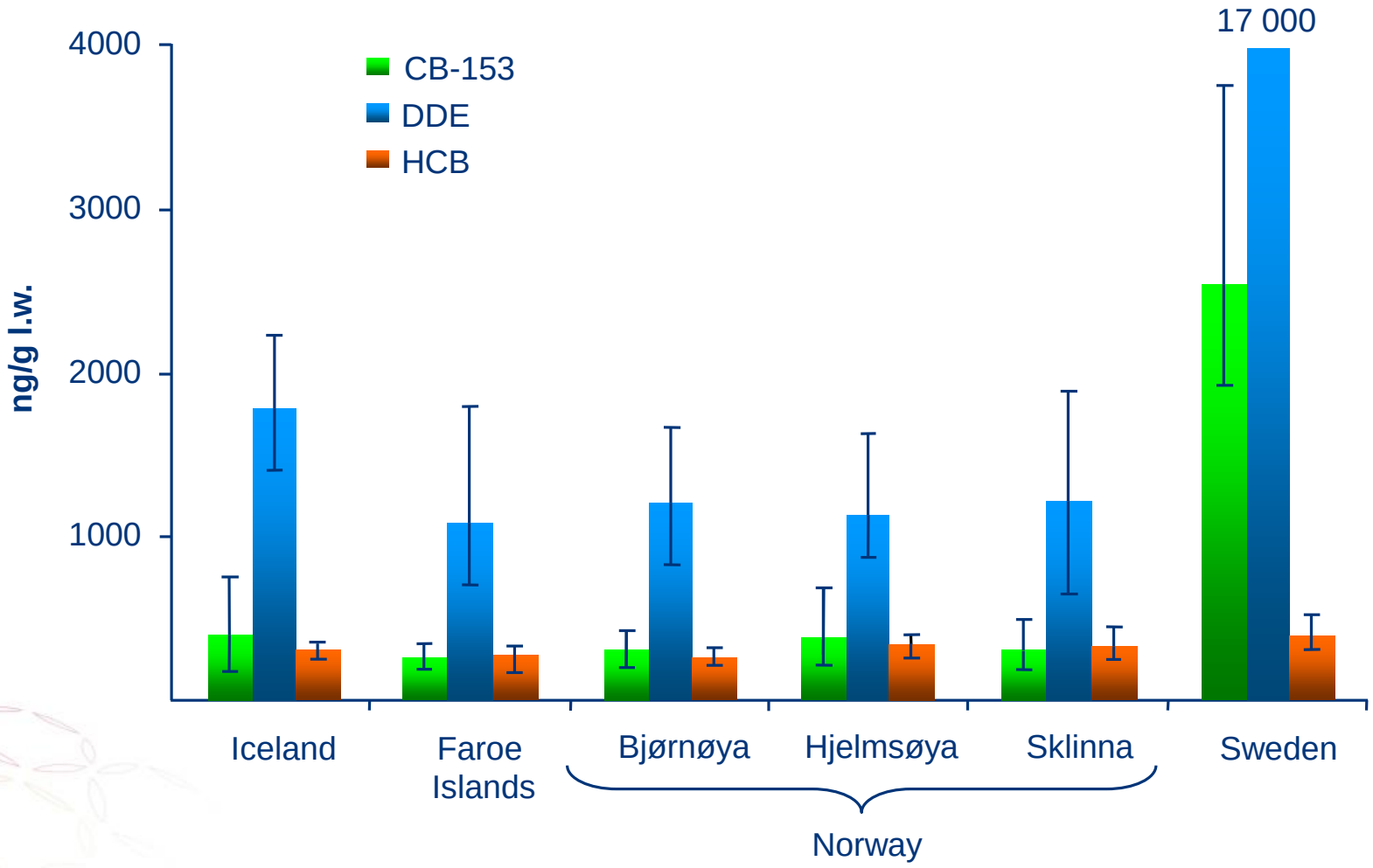
Lesser black-backed gull, M

Great black-backed gull, R

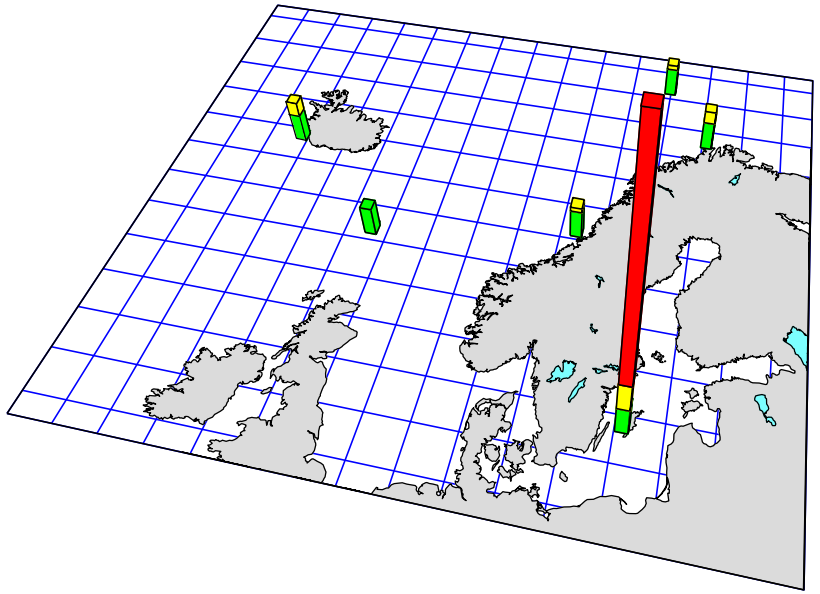
Photo: www.fuglar.is

Spatial distribution in the Northeast Atlantic Ocean

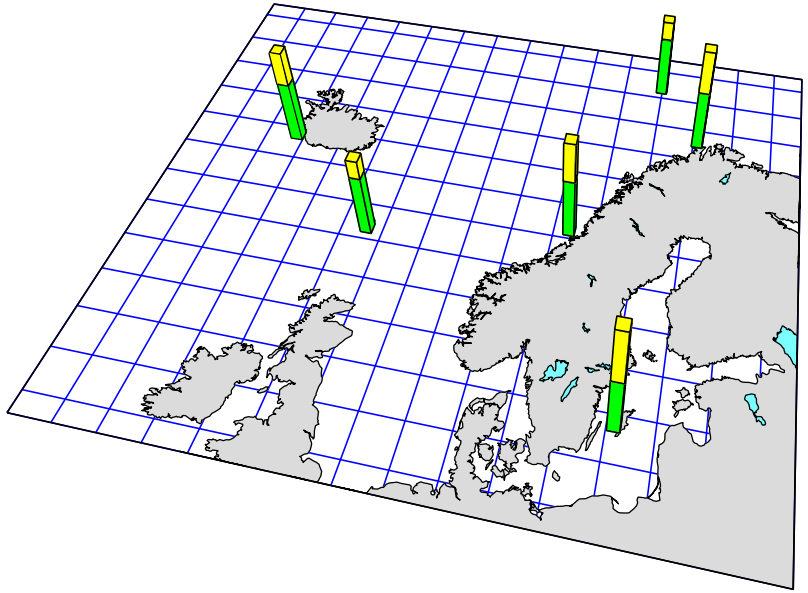
Results


17 000
4000
3000
2000
1000
ng/g l.w.
CB-153
DDE
HCB
Iceland
Faroe Islands
Bjørnøya
Hjelmsøya
Sklinna
Sweden
Norway

Results

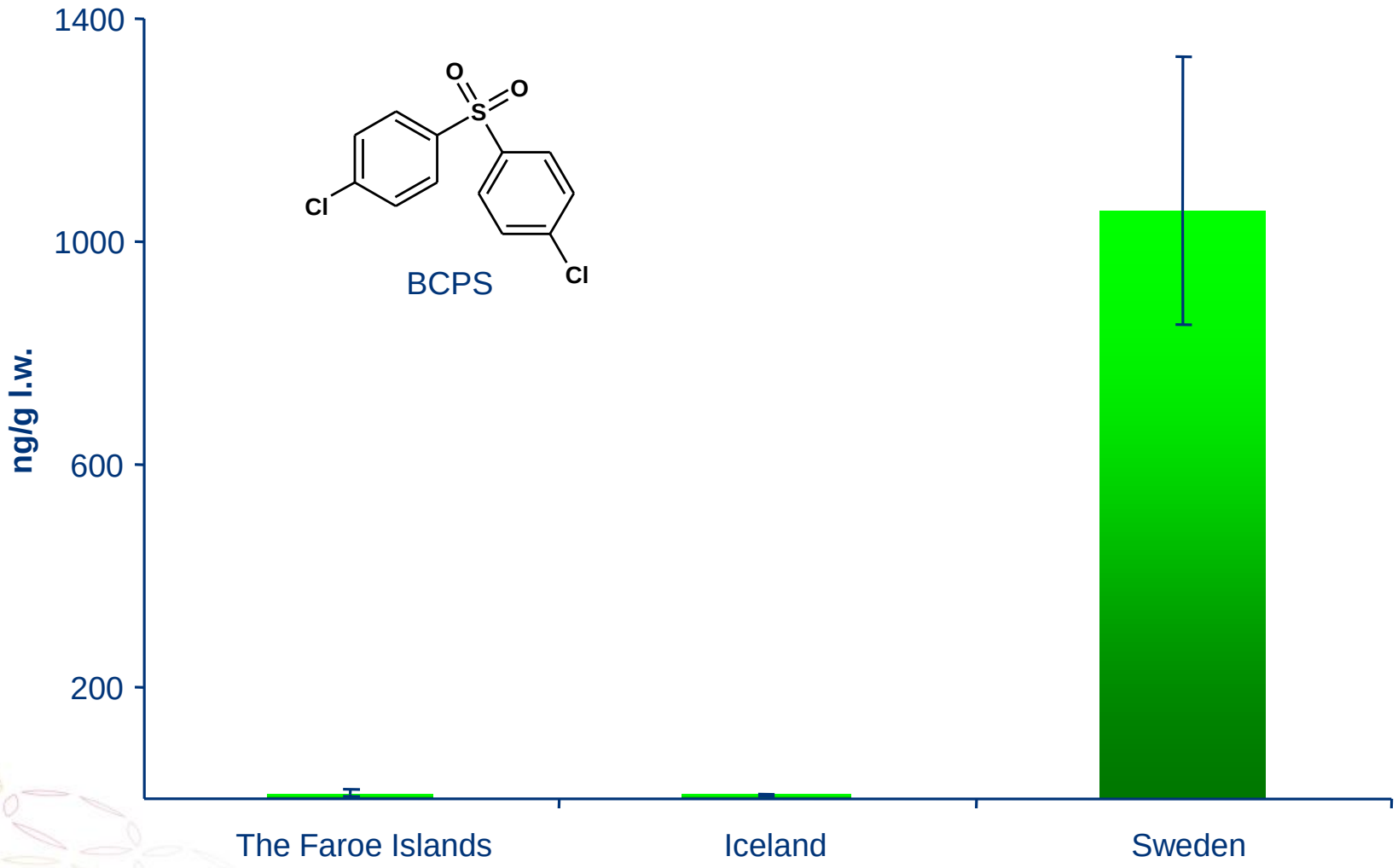


CB-153

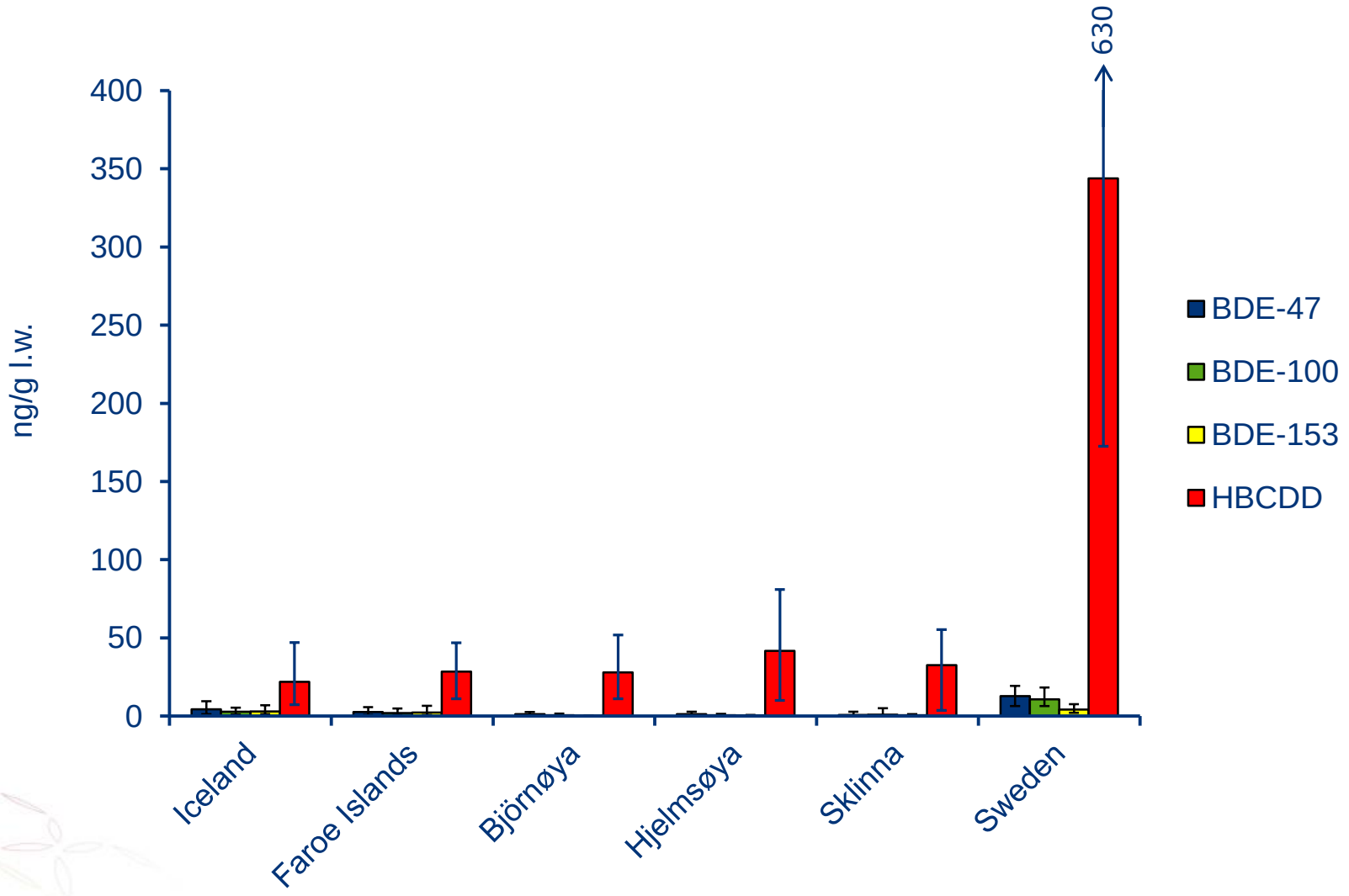


HCB

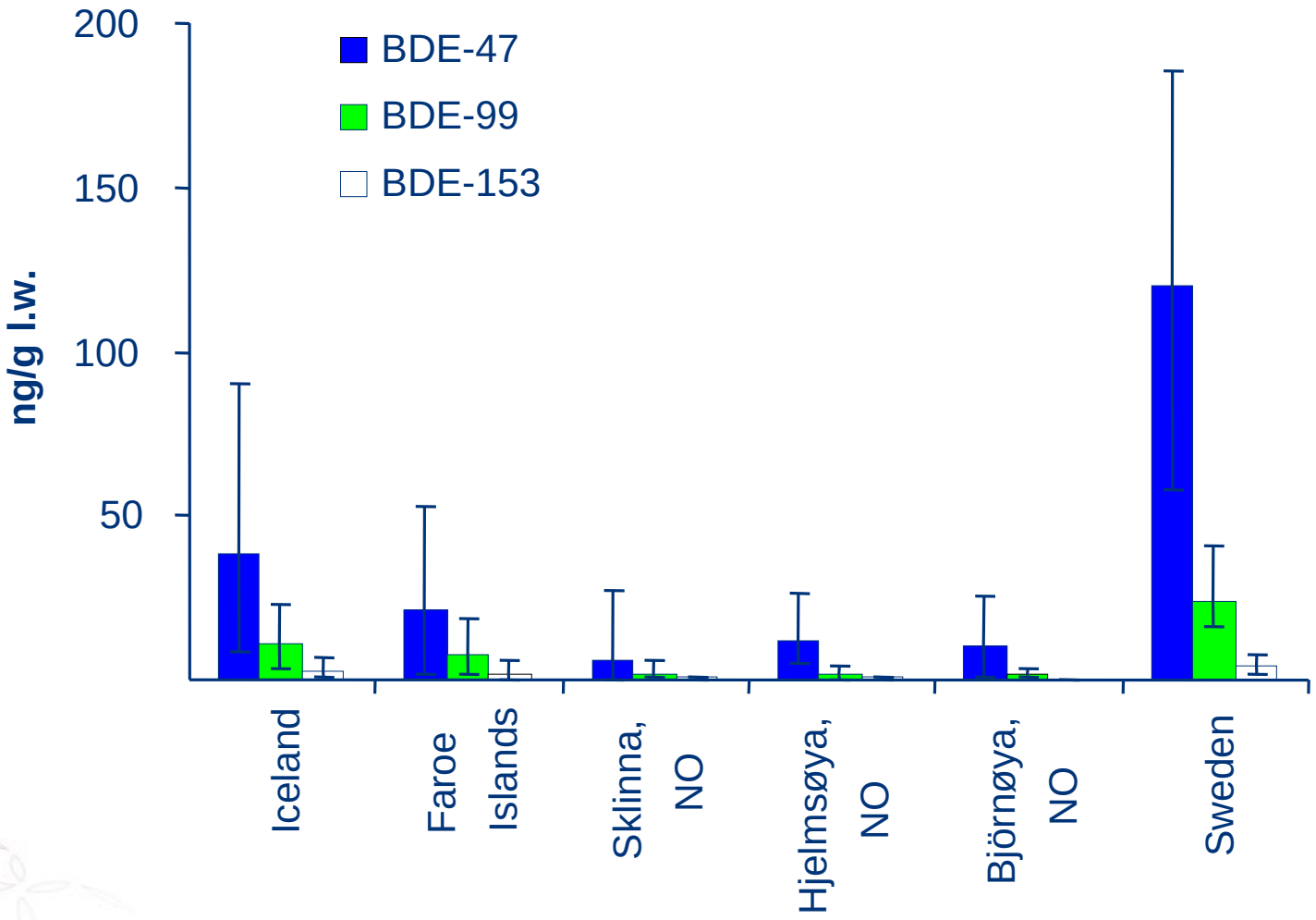
Results


1400
1000
600
200
ng/g l.w.
O
O
S
Cl
Cl
BCPS
The Faroe Islands
Iceland
Sweden

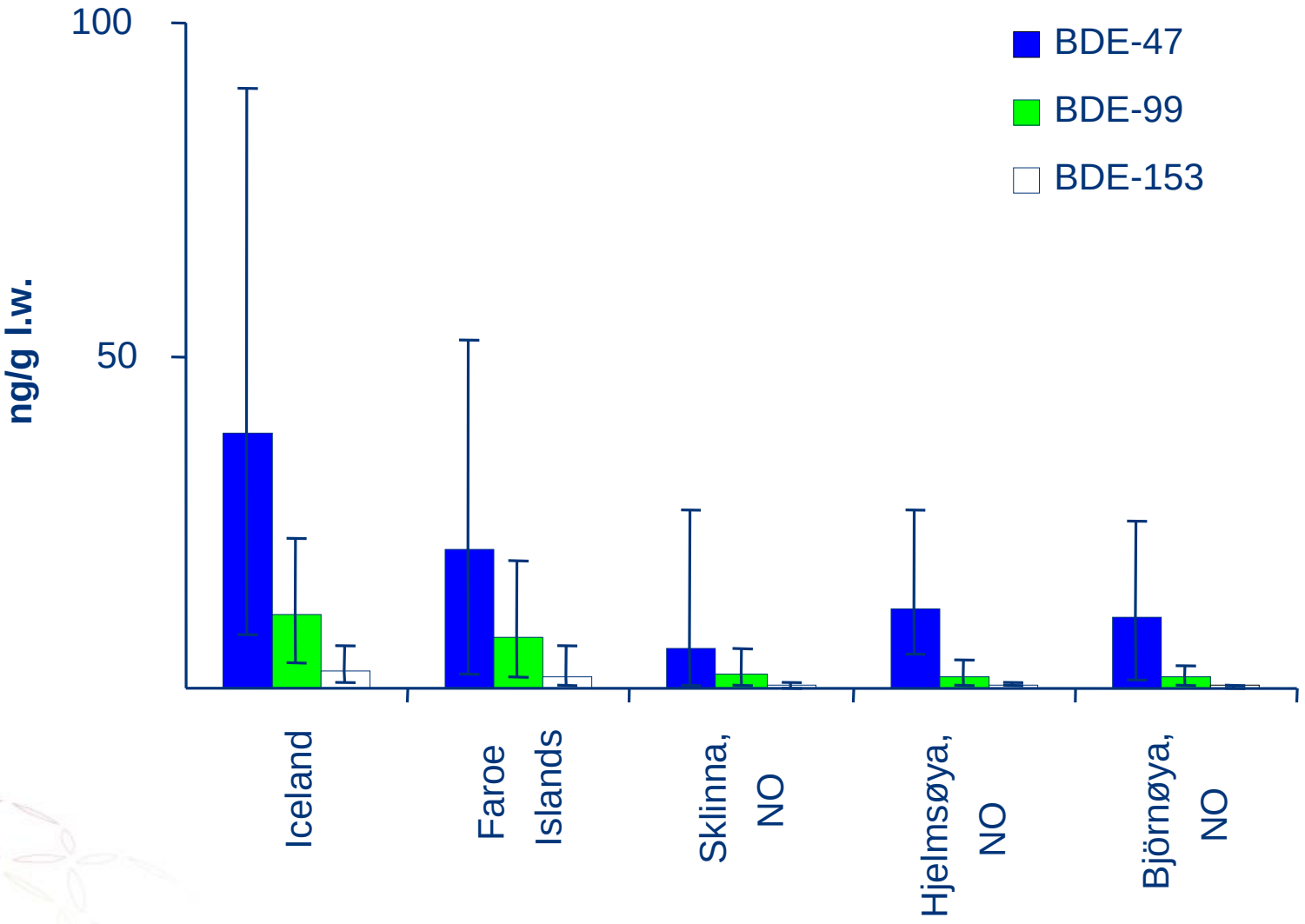
Results


630
400
350
300
250
200
150
100
50
0
ng/g l.w.
Iceland
Faroe Islands
Björnøya
Hjelmsøya
Sklinna
Sweden
BDE-47
BDE-100
BDE-153
HBCDD

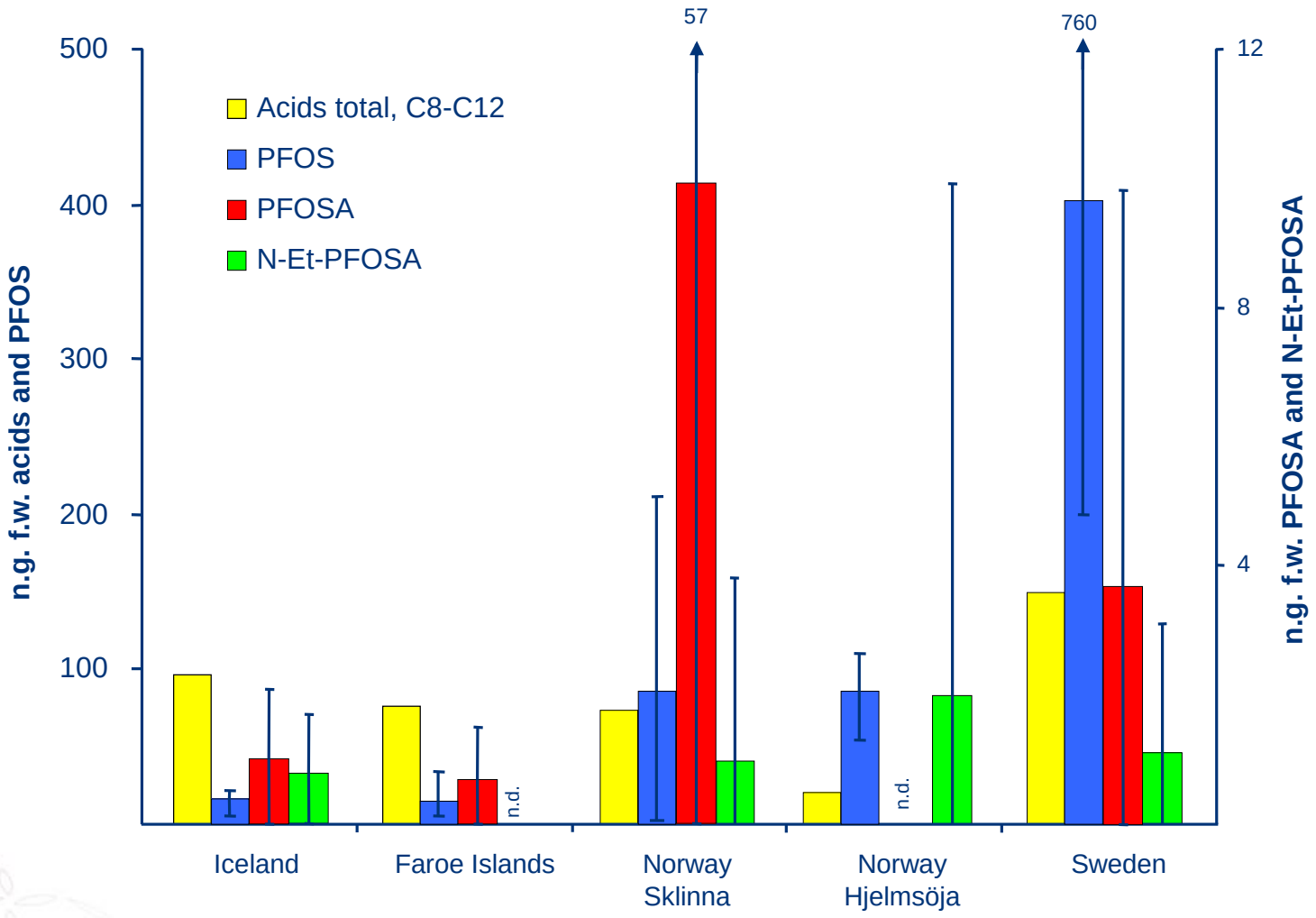
Results


200
150
100
50
ng/g l.w.
BDE-47
BDE-99
BDE-153
Iceland
Faroe Islands
Sklinna, NO
Hjelmsøya, NO
Björnøya, NO
Sweden

Results

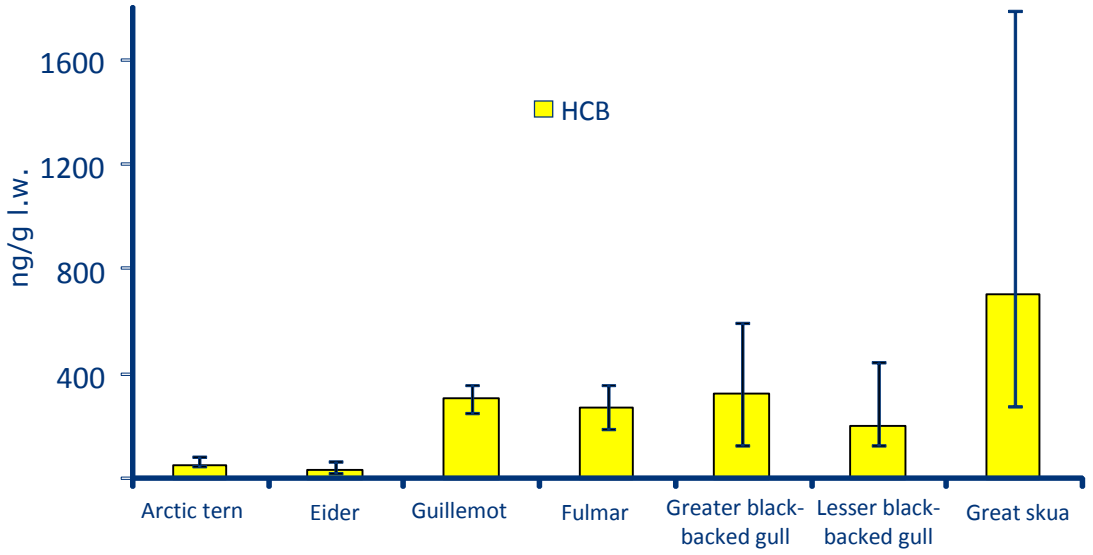

100
50
ng/g l.w.
BDE-47
BDE-99
BDE-153
Iceland
Faroe Islands
Sklinna, NO
Hjelmsøya, NO
Björnøya, NO

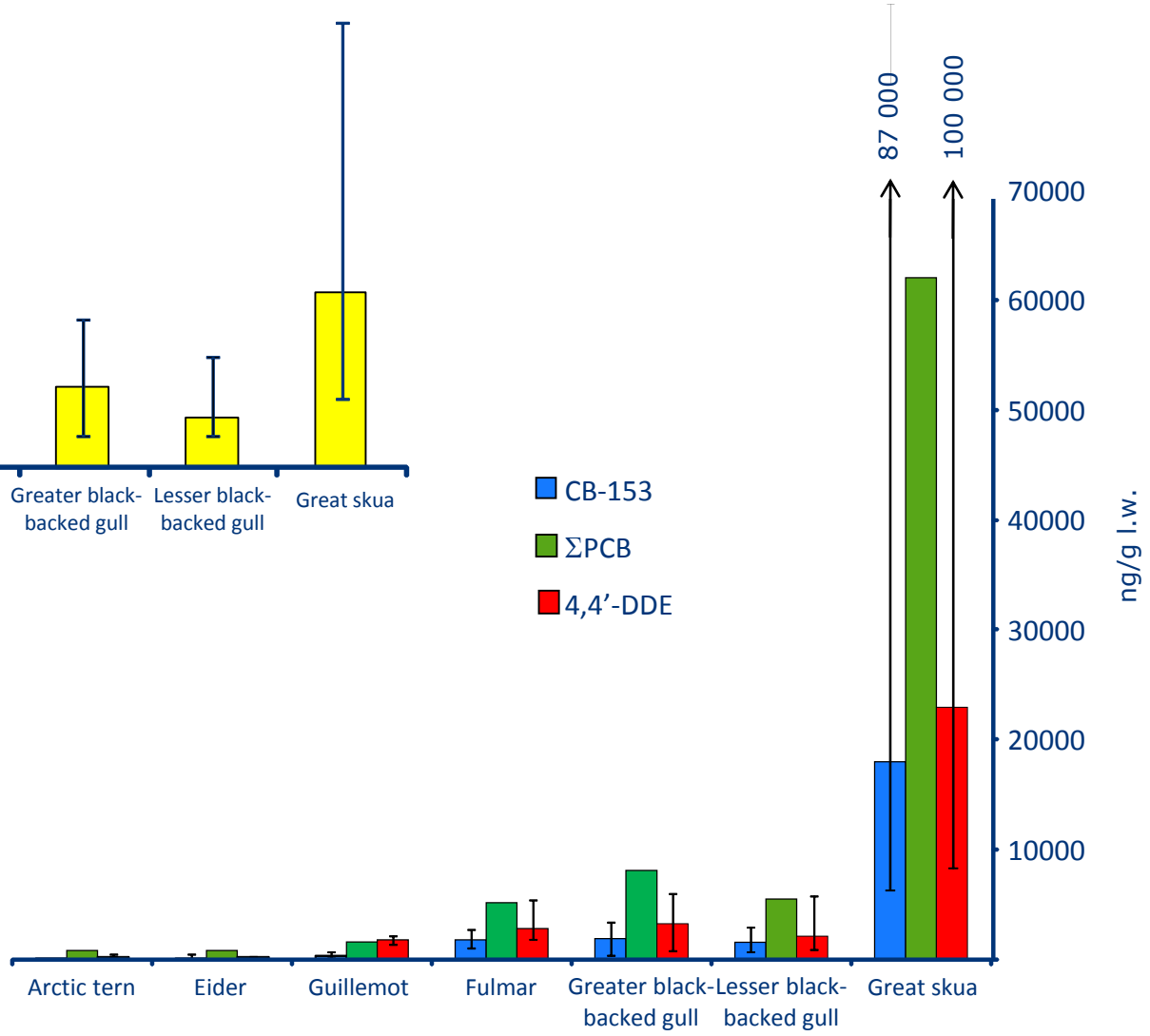
Results


57
760
500
400
300
200
100
12
8
4
Acids total, C8-C12
PFOS
PFOSA
N-Et-PFOSA
n.g. f.w. acids and PFOS
n.g. f.w. PFOSA and N-Et-PFOSA
n.d.
n.d.
Iceland
Faroe Islands
Norway
Sklinna
Norway
Hjelmsöja
Sweden

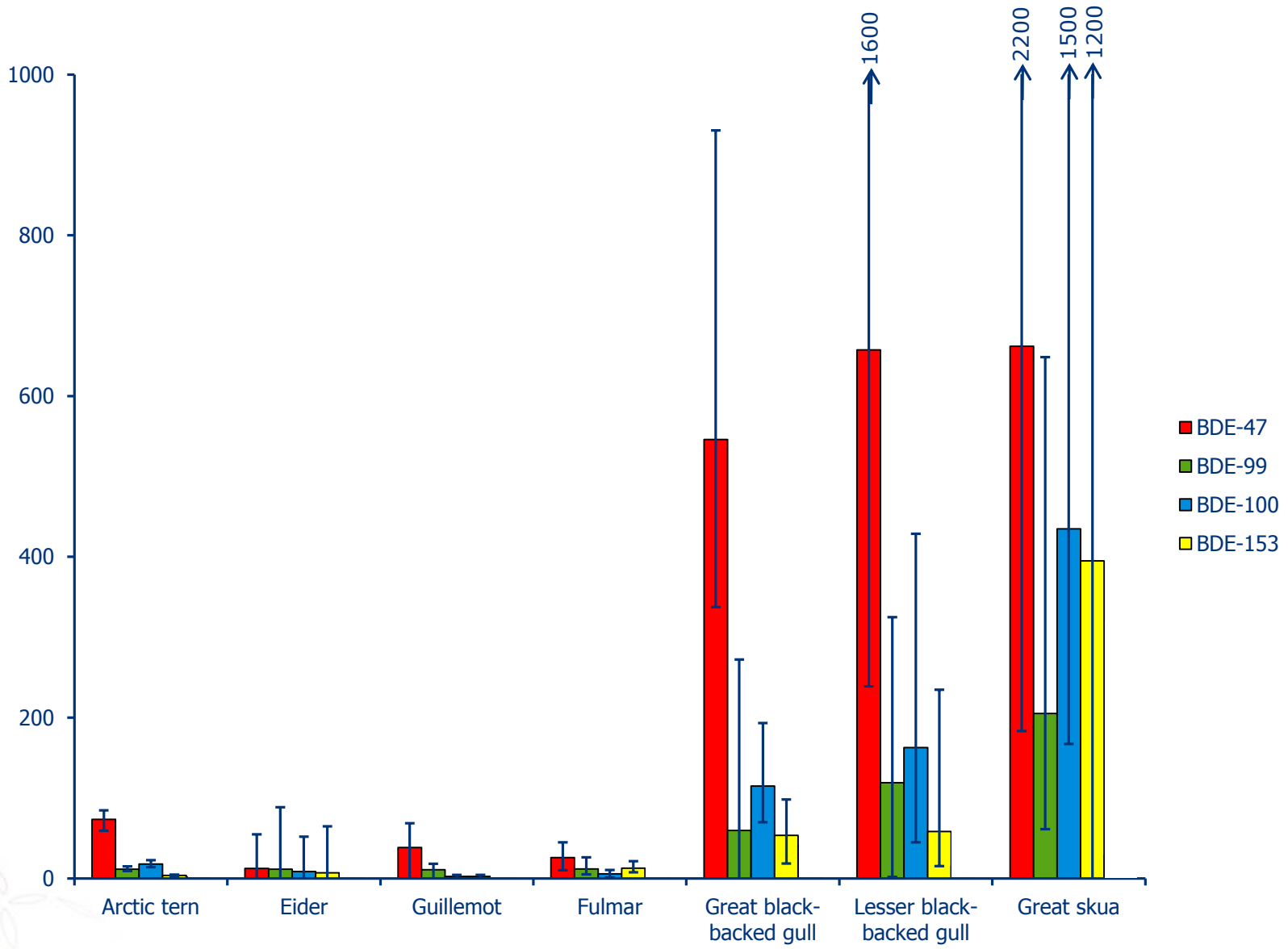
Investigation of the Icelandic environment

Results

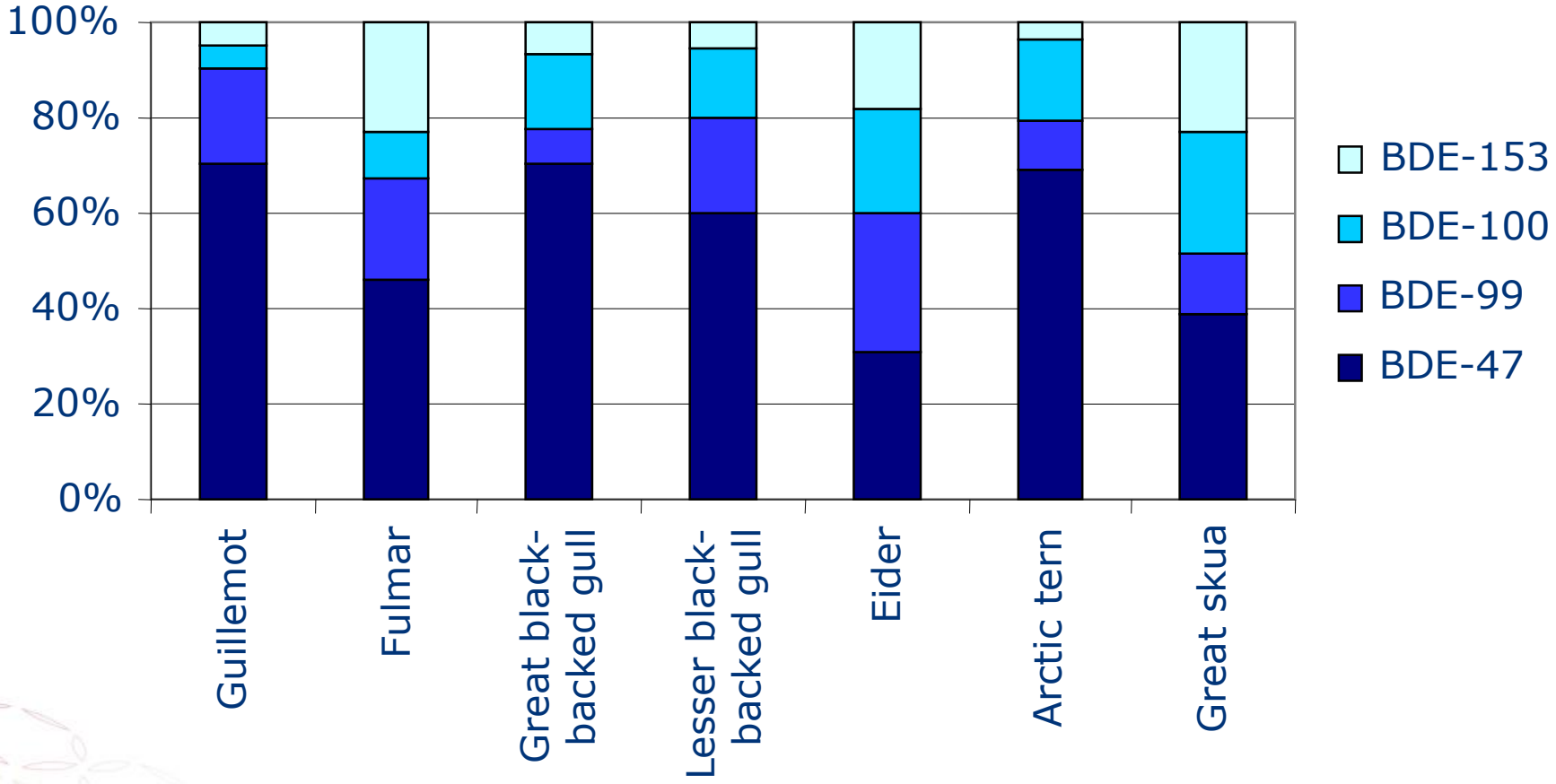

1600
1200
800
400
ng/g l.w.
HCB
Arctic tern
Eider
Guillemot
Fulmar
Greater black-backed gull
Lesser black-backed gull
Great skua


87 000
100 000
70000
60000
50000
40000
30000
20000
10000
ng/g l.w.
CB-153
ΣPCB
4,4'-DDE
Arctic tern
Eider
Guillemot
Fulmar
Greater black-backed gull
Lesser black-backed gull
Great skua

Results

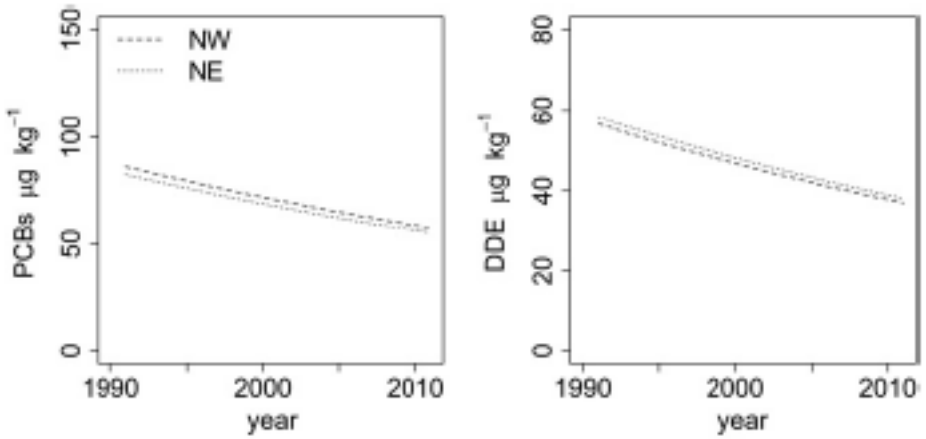

1000
800
600
400
200
0
1600
2200
1500
1200
Arctic tern
Eider
Guillemot
Fulmar
Great black-backed gull
Lesser black-backed gull
Great skua
BDE-47
BDE-99
BDE-100
BDE-153

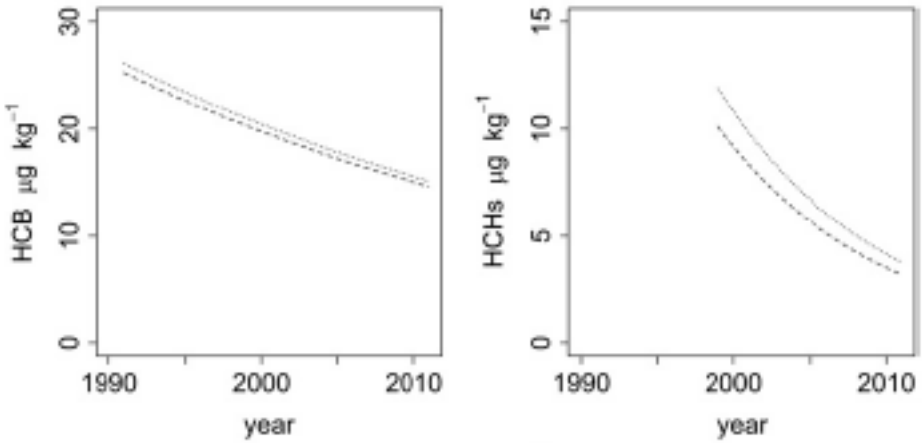
Results


100%
80%
60%
40%
20%
0%
Guillemot
Fulmar
Great black-backed gull
Lesser black-backed gull
Eider
Arctic tern
Great skua
BDE-153
BDE-100
BDE-99
BDE-47

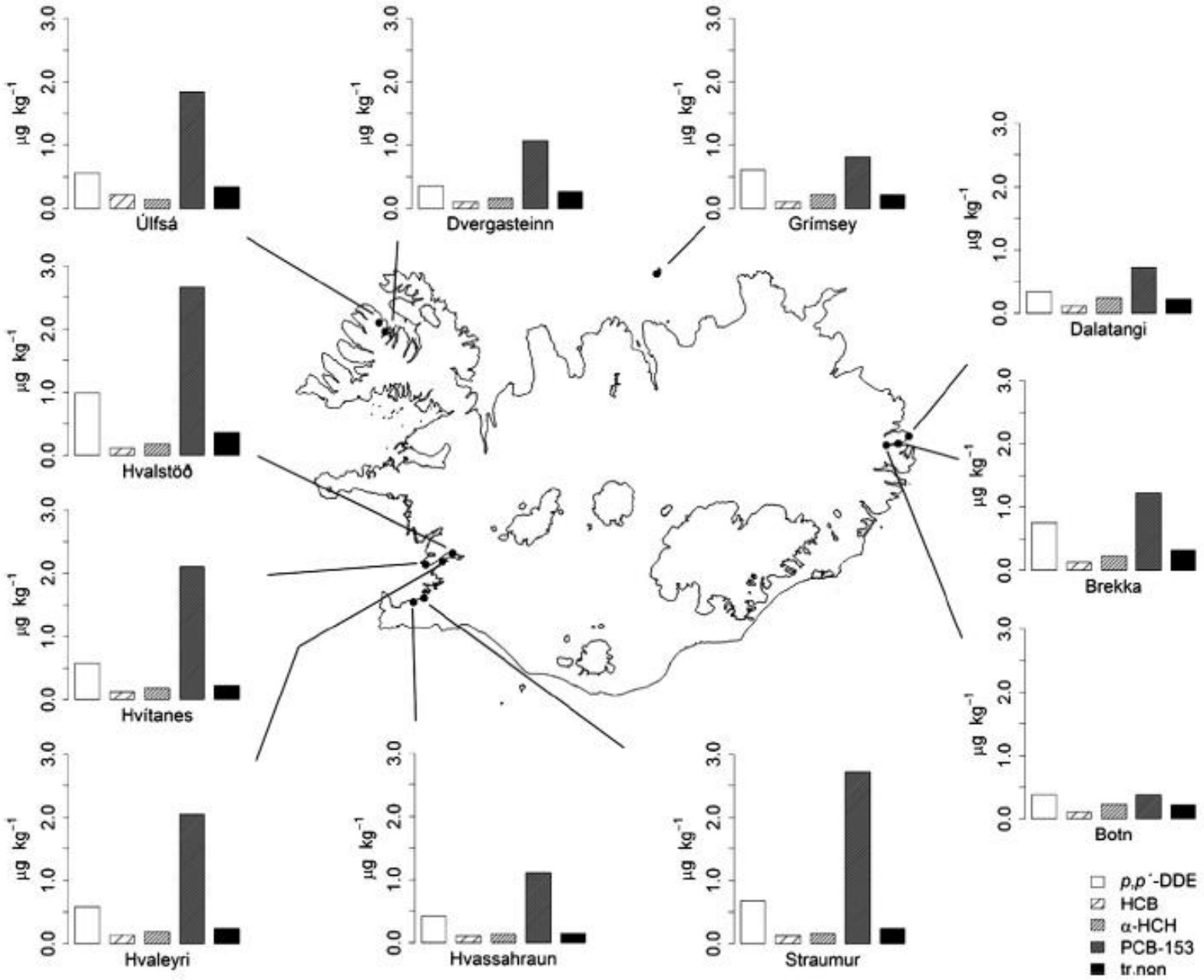
Further monitoring of the Icelandic marine biosphere

Temporal trends of POPs in cod from Iceland



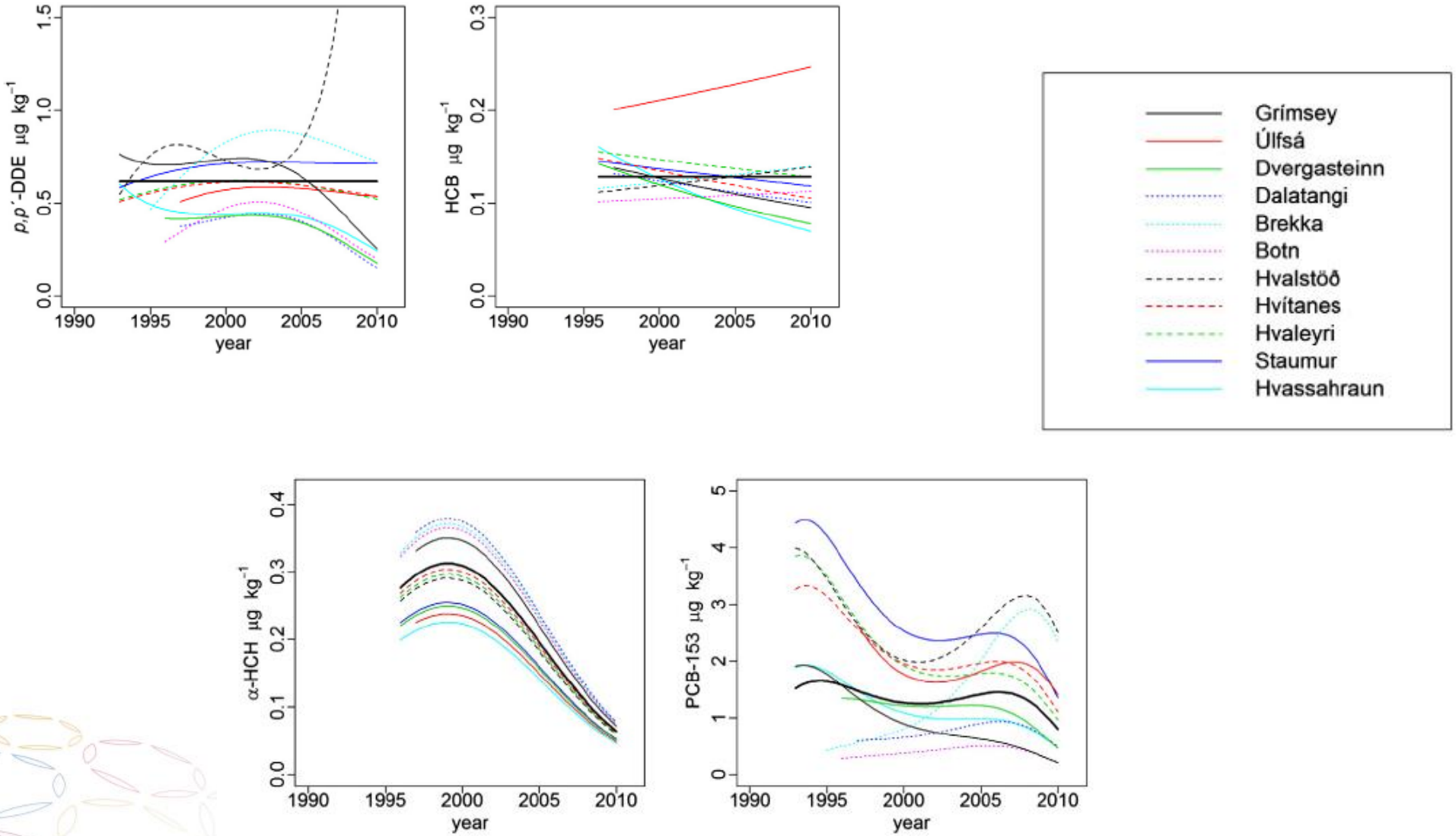


Sturludóttir et al., Sci. Total Environ. 2014, 476-477, 181-188.



Sturludóttir et al., Sci. Total Environ. 2013, 454-455, 500-509.

Temporal trends of POPs in mussels from Iceland



Conclusions

- **The Baltic Sea is more contaminated of most chlorinated and brominated compounds**
- **4,4’-DDE significantly higher in Icelandic eggs compared to Norwegian and Faroese eggs**
- **HCB shows a much more even spatial trend**
- **BCPS an isolated problem for the Baltic Sea**
- **HBCDD has a different spatial pattern than PBDEs**
- **PFAAs have not an uniform distribution pattern**

Conclusions

- **Considerable amount of organohalogenated compounds in Icelandic birds**
- **Great skua with alarmingly high concentrations**
- **Different source of PBDE contamination between bird species**
- **Low levels of organohalogenated compounds in Icelandic cod and mussels**
- **Decreasing trends of organohalogenated compounds in Icelandic envrionment**