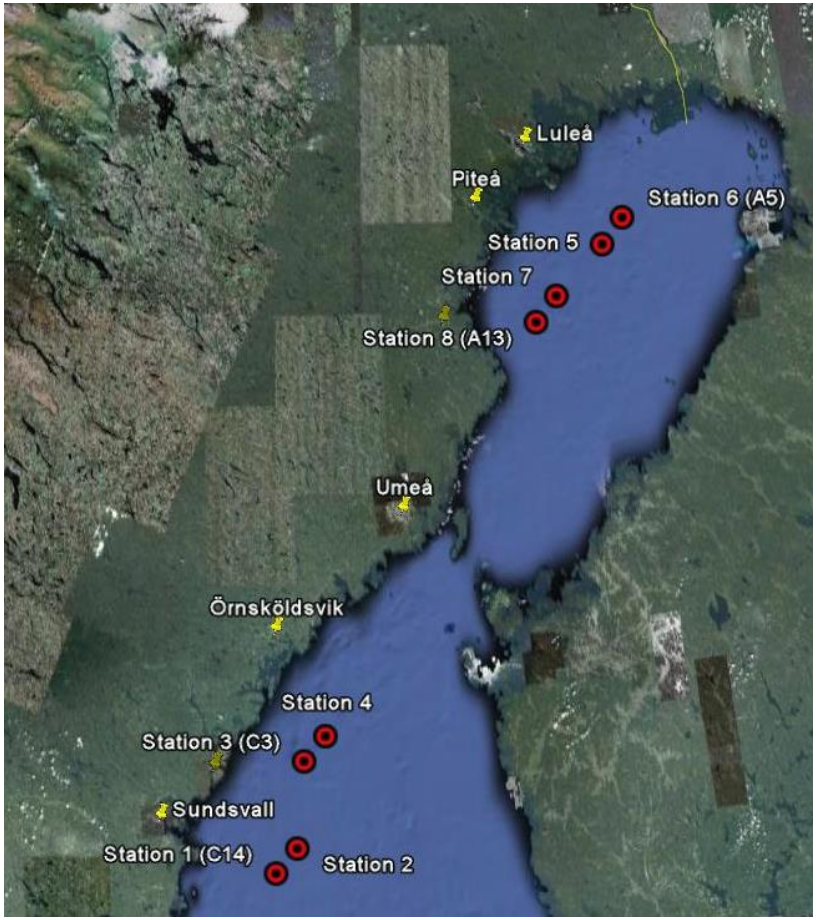
Figure captions

1. Sampling locations for water (red circles), passive air (Krycklan = K, Holmön = H, Sandskär = S), and hi-vol air (H).
2. Mean concentrations of organohalogen compounds in BB-BS surface water (pg L^{-1}). Compound abbreviations are given in the text and as a footnote to Table 1.
3. Mean concentrations of organochlorine compounds in air, comparison of passive (Table 8) and hi-vol (Table 9) measurements.
4. Combined passive and hi-vol data sets for organohalogen sets in air. For comparison with abundances in seawater, the order of presentation is the same as in Figure 2.
5. Seasonal trends for selected OCPs in air from the network of passive sampling measurements.
6. Water/air fugacity ratios (FR) (Table 12). A and B. Comparing FRs at 5°C and 15°C, assuming no binding to DOC. C and D. Comparing FRs at 15°C, without and with adjustment for binding to DOC.
7. Deposition (D, positive, shown downwards) and volatilisation (V, negative, shown upwards) fluxes (ng m^{-2} d^{-1}) of OCPs at 0°C and 15°C (Table 13).
8. Estimated loadings to BB by gas deposition (D) and volatilisation (V), kg y^{-1}, under the present situation and in a future scenario of 2-3°C temperature rise and loss of ice cover.
9. Ratios of *trans*-chlordane/*cis*-chlordane (TC/CC) in air at passive sampling stations Krycklan (KRY), Holmön (HOL) and Sandskär (SKR) and from hi-vol sampling at HOL and from shipboard. The dotted red line indicates the TC/CC ratio in technical chlordane.
10. Top: Structures of the two mirror-image enantiomers of *trans*-chlordane (TC). Below: Enantiomer fractions, EF = (+)/[(+) + (–)], of TC in atmospheric samples. Nearly racemic TC in bulk deposition collected in Sweden, Iceland and Slovakia in 1971-73 (52), contrasted with nonracemic TC in hi-vol samples from Rörvik, Sweden and Pallas, Finland, 1998-2001 (52) and Alert, Canada 1994-2000 (showing means of winter maxima and summer minima) (49).
11. Seasonal cycles in the EFs of TC (top) and F_{TC} = TC/(TC+CC) in air at Alert, Canada. EF analysis by Liisa Jantunen, digital filtration data analysis by Hayley Hung, Environment Canada.
12. Top left and right: Mirror-image structures (enantiomers) of α-HCH and location of the Alert, Canada air monitoring station. Bottom left and right: Seasonal cycling of α-HCH EFs in air at Alert, and examples of profiles in two source types where enantioselective degradation of α-HCH has been reported: depletion of (+) (EF <0.5) in Arctic Ocean water and depletion of (–) (EF >0.5) in soils. EF analysis by Liisa Jantunen, digital filtration data analysis by Hayley Hung, Environment Canada.

July 2011



May 2012

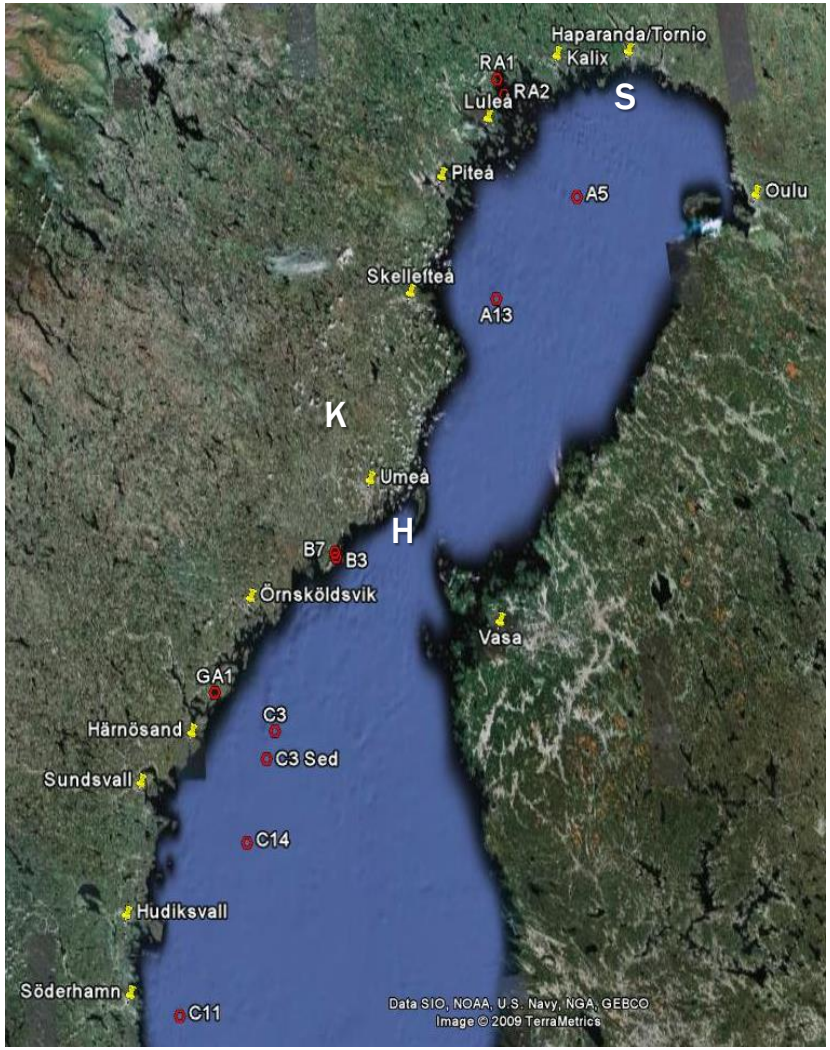


Figure 1

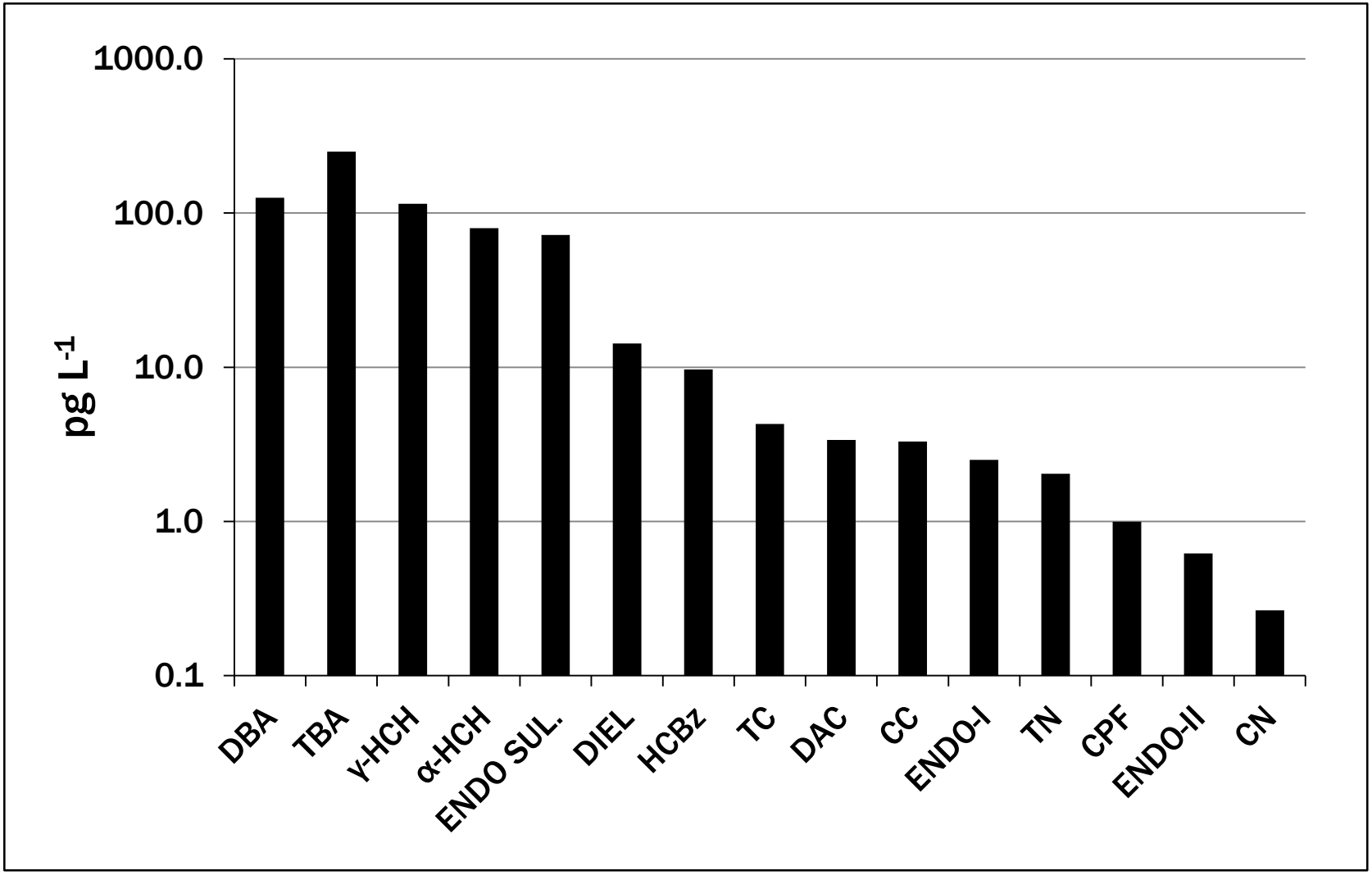

1000.0
100.0
10.0
1.0
0.1
pg L-1
DBA
TBA
γ-HCH
α-HCH
ENDO SUL.
DIEL
HCBz
TC
DAC
CC
ENDO-I
TN
CPF
ENDO-II
CN

Figure 2

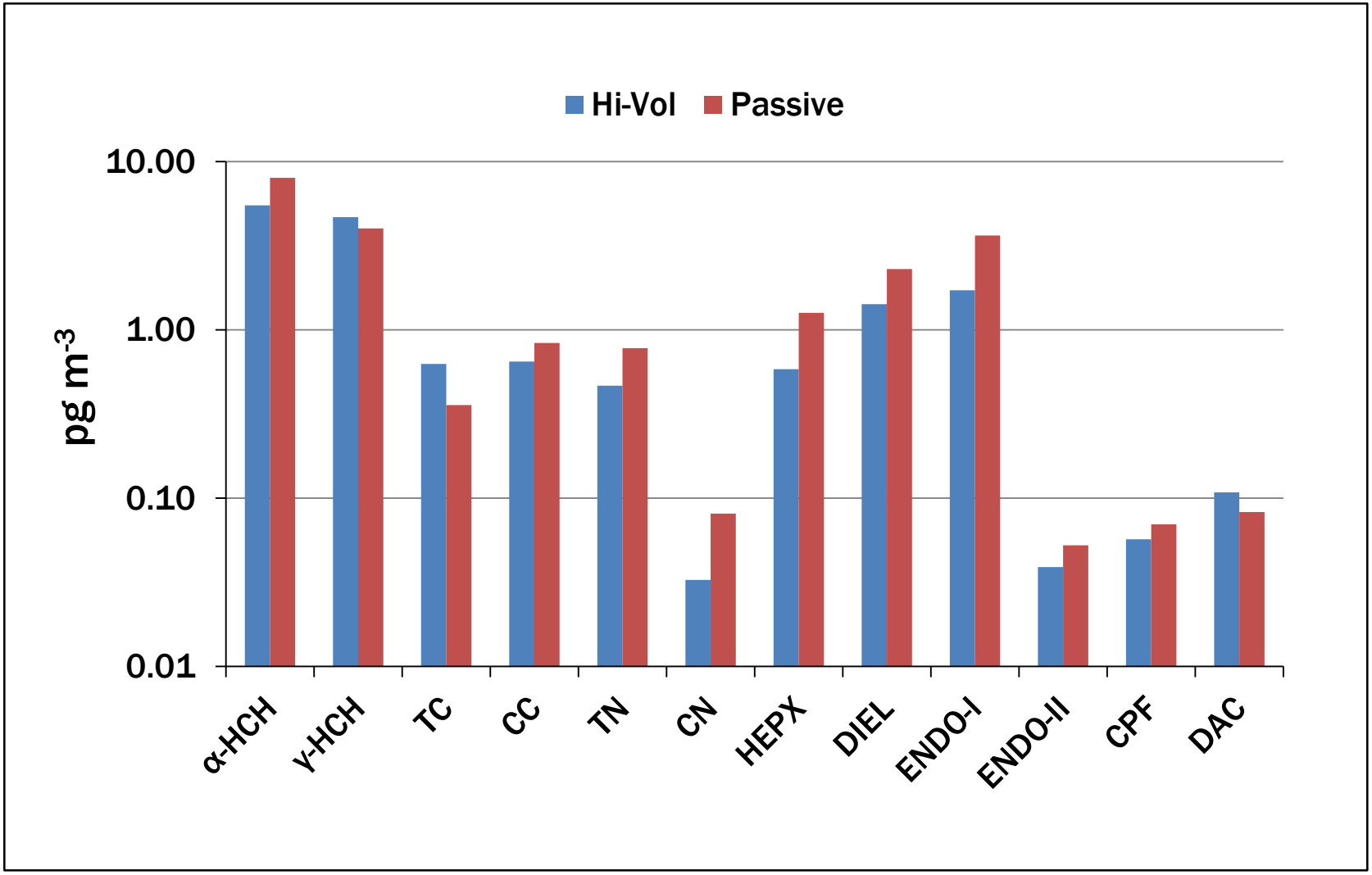

Hi-Vol
Passive
10.00
1.00
0.10
0.01
pg m-3
α-HCH
γ-HCH
TC
CC
TN
CN
HEPX
DIEL
ENDO-I
ENDO-II
CPF
DAC

Figure 3

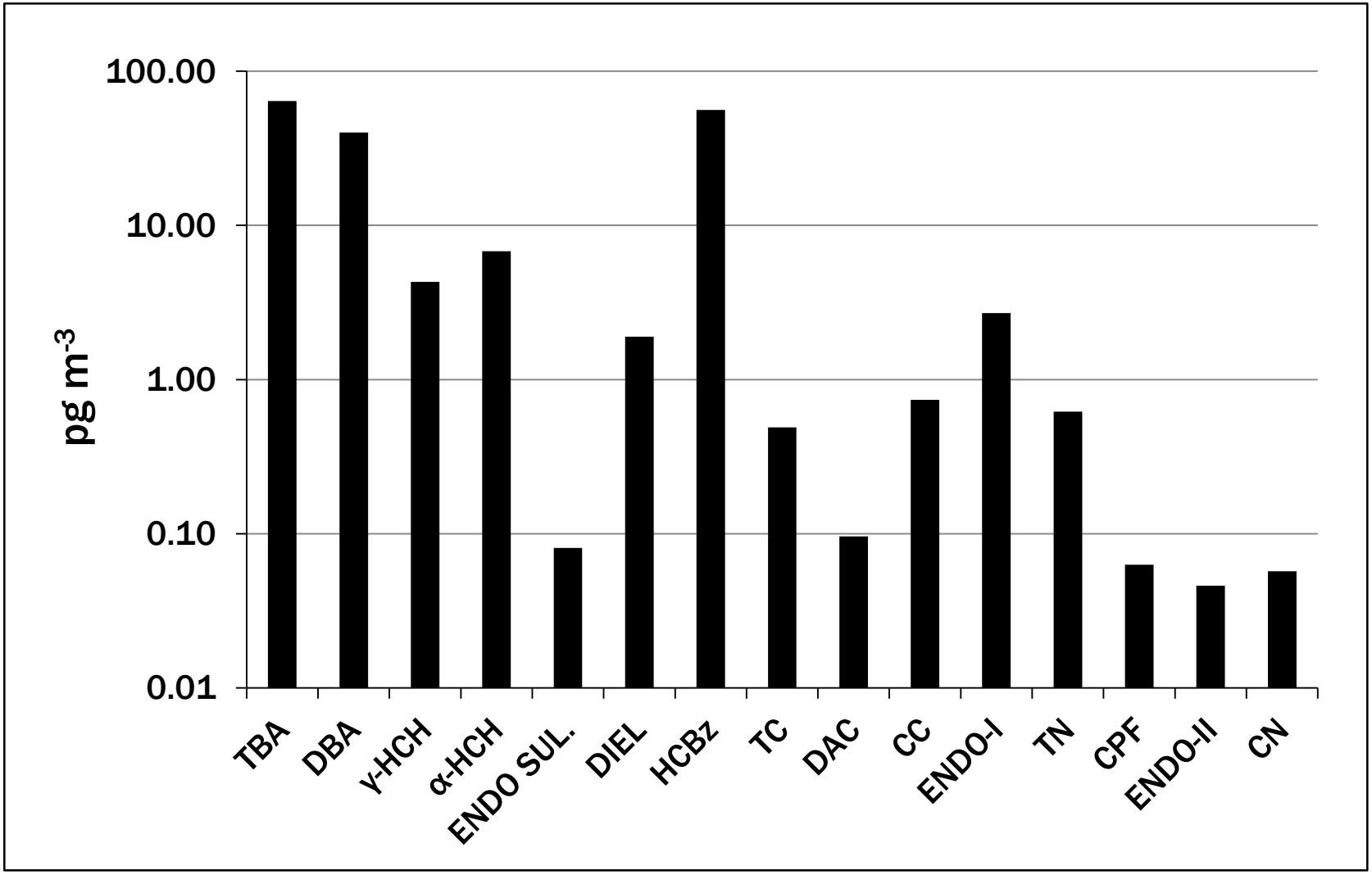

100.00
10.00
1.00
0.10
0.01
pg m-3
TBA
DBA
γ-HCH
α-HCH
ENDO SUL.
DIEL
HCBz
TC
DAC
CC
ENDO-I
TN
CPF
ENDO-II
CN

Figure 4

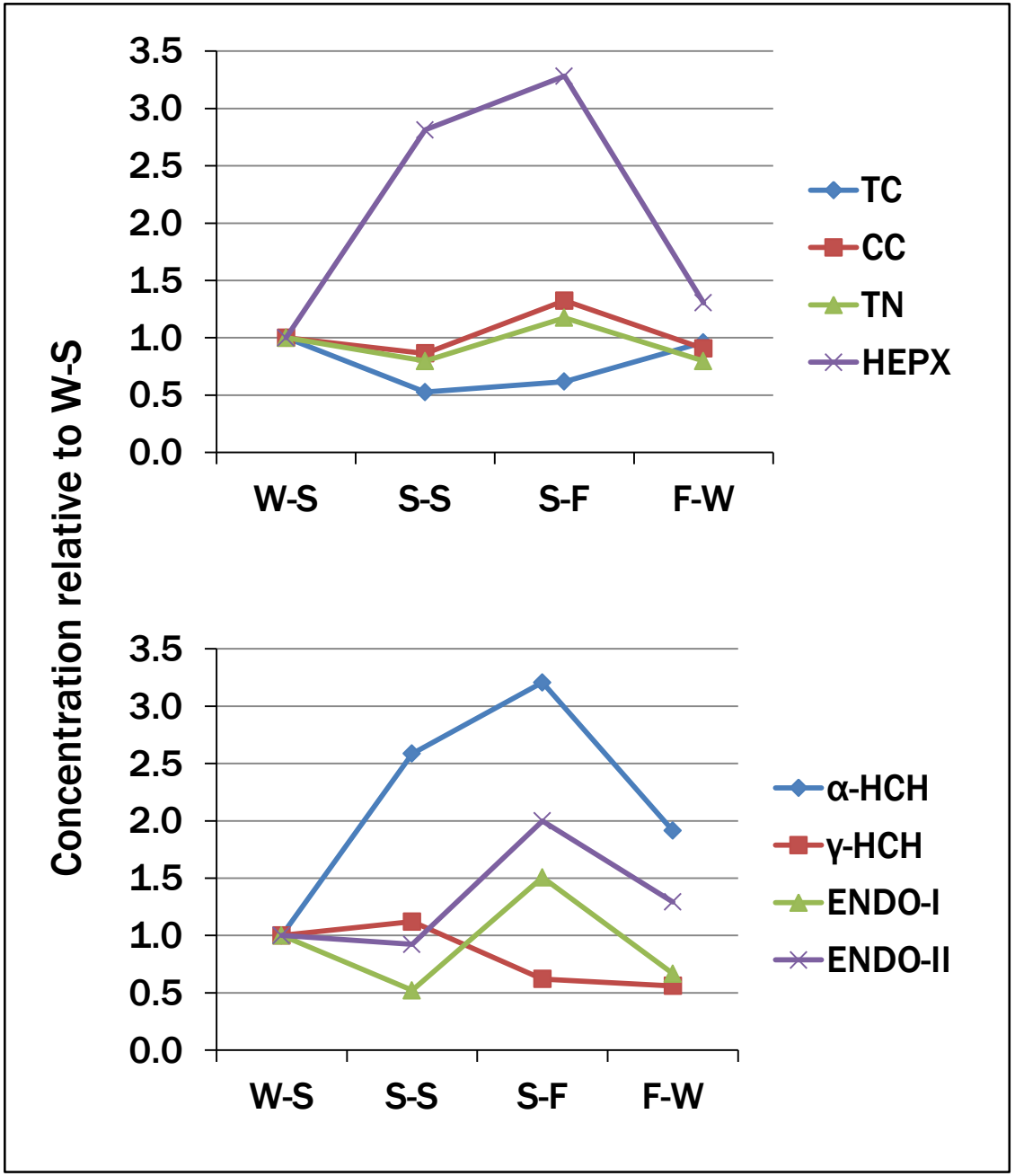

Concentration relative to W-S
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
W-S
S-S
S-F
F-W
TC
CC
TN
HEPX
α-HCH
γ-HCH
ENDO-I
ENDO-II

Figure 5

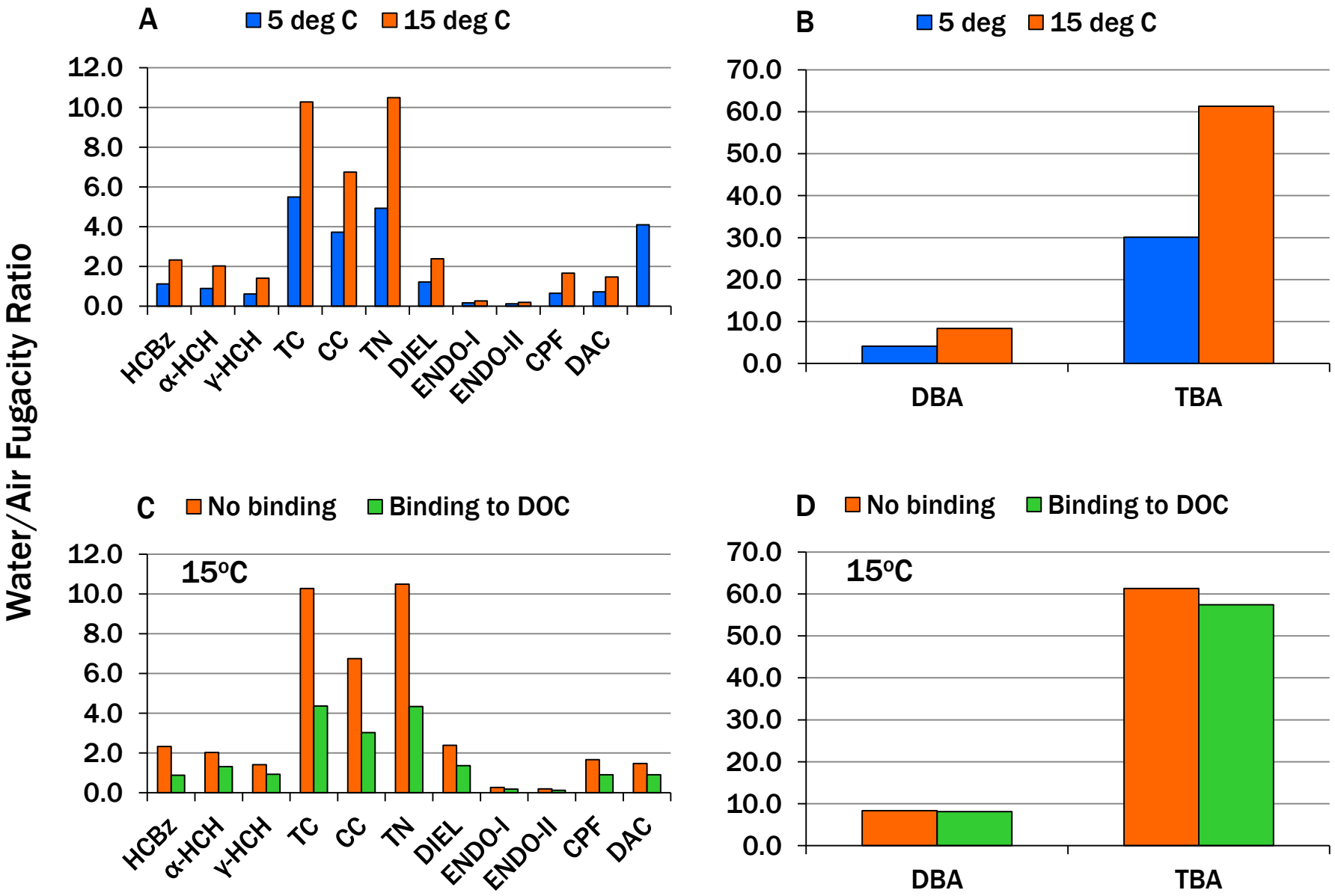

A
5 deg C
15 deg C
12.0
10.0
8.0
6.0
4.0
2.0
0.0
HCBz
α-HCH
γ-HCH
TC
CC
TN
DIEL
ENDO-I
ENDO-II
CPF
DAC
B
5 deg
15 deg C
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
DBA
TBA
Water/Air Fugacity Ratio
C
No binding
Binding to DOC
15°C
D
No binding
Binding to DOC
15°C

Figure 6

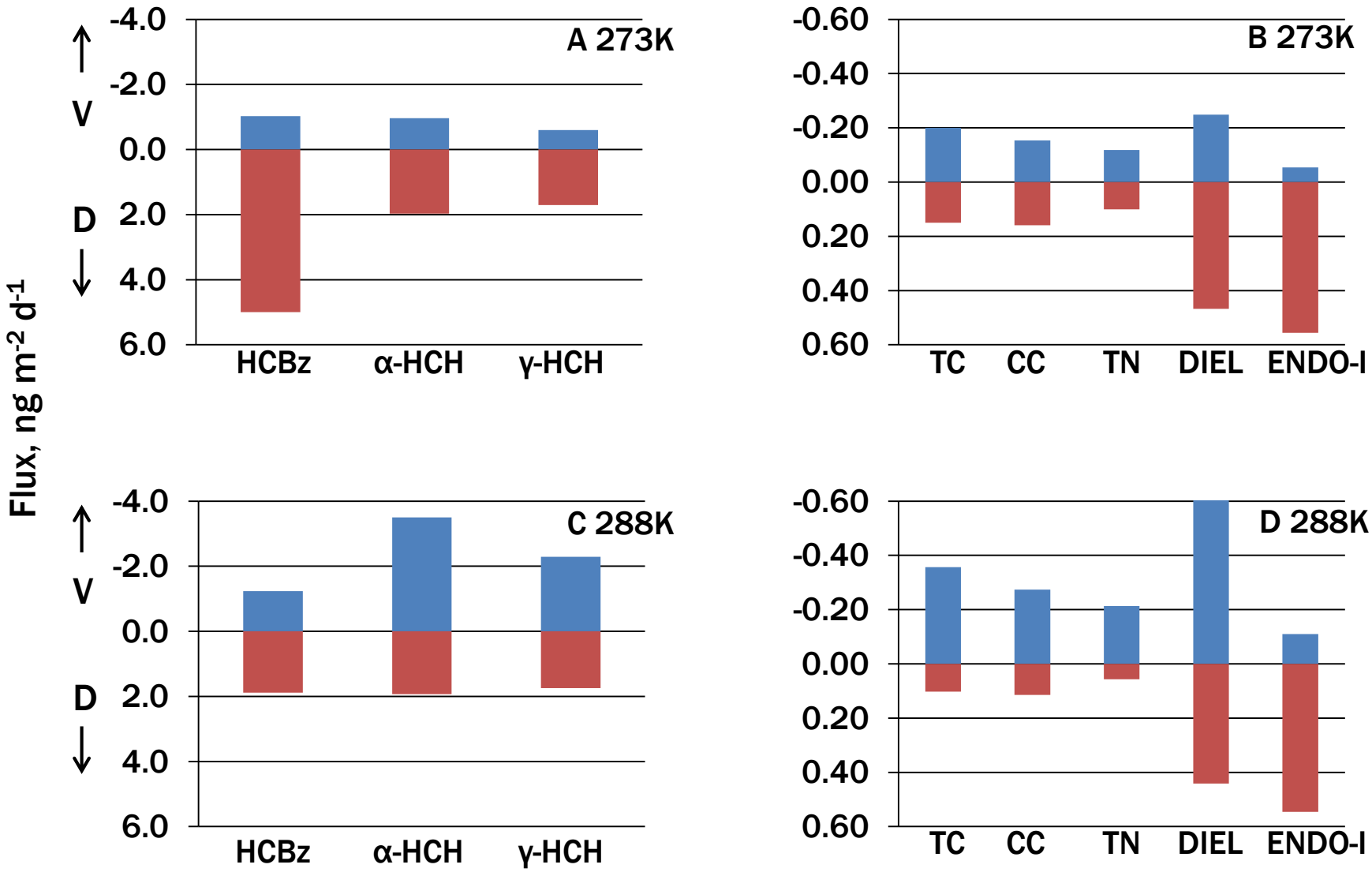

Flux, ng m-2 d-1
V
D
A 273K
-4.0
-2.0
0.0
2.0
4.0
6.0
HCBz
α-HCH
γ-HCH
B 273K
-0.60
-0.40
-0.20
0.00
0.20
0.40
0.60
TC
CC
TN
DIEL
ENDO-I
C 288K
D 288K

Figure 7

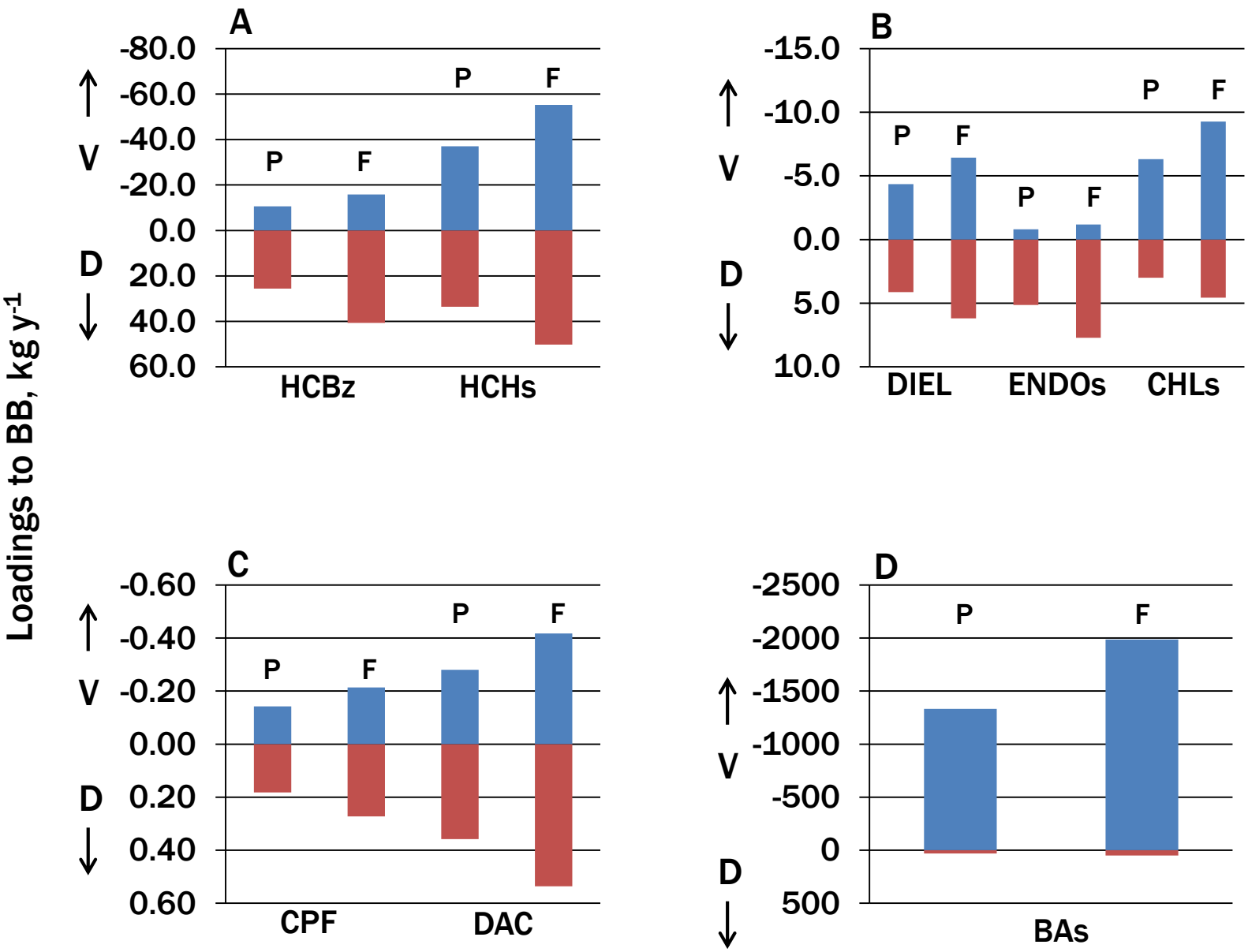

Loadings to BB, kg y-1
A
-80.0
-60.0
-40.0
-20.0
0.0
20.0
40.0
60.0
V
D
P
F
HCBz
HCHs
B
-15.0
-10.0
-5.0
0.0
5.0
10.0
DIEL
ENDOs
CHLs
C
-0.60
-0.40
-0.20
0.00
0.20
0.40
0.60
CPF
DAC
D
-2500
-2000
-1500
-1000
-500
0
500
BAs

Figure 8

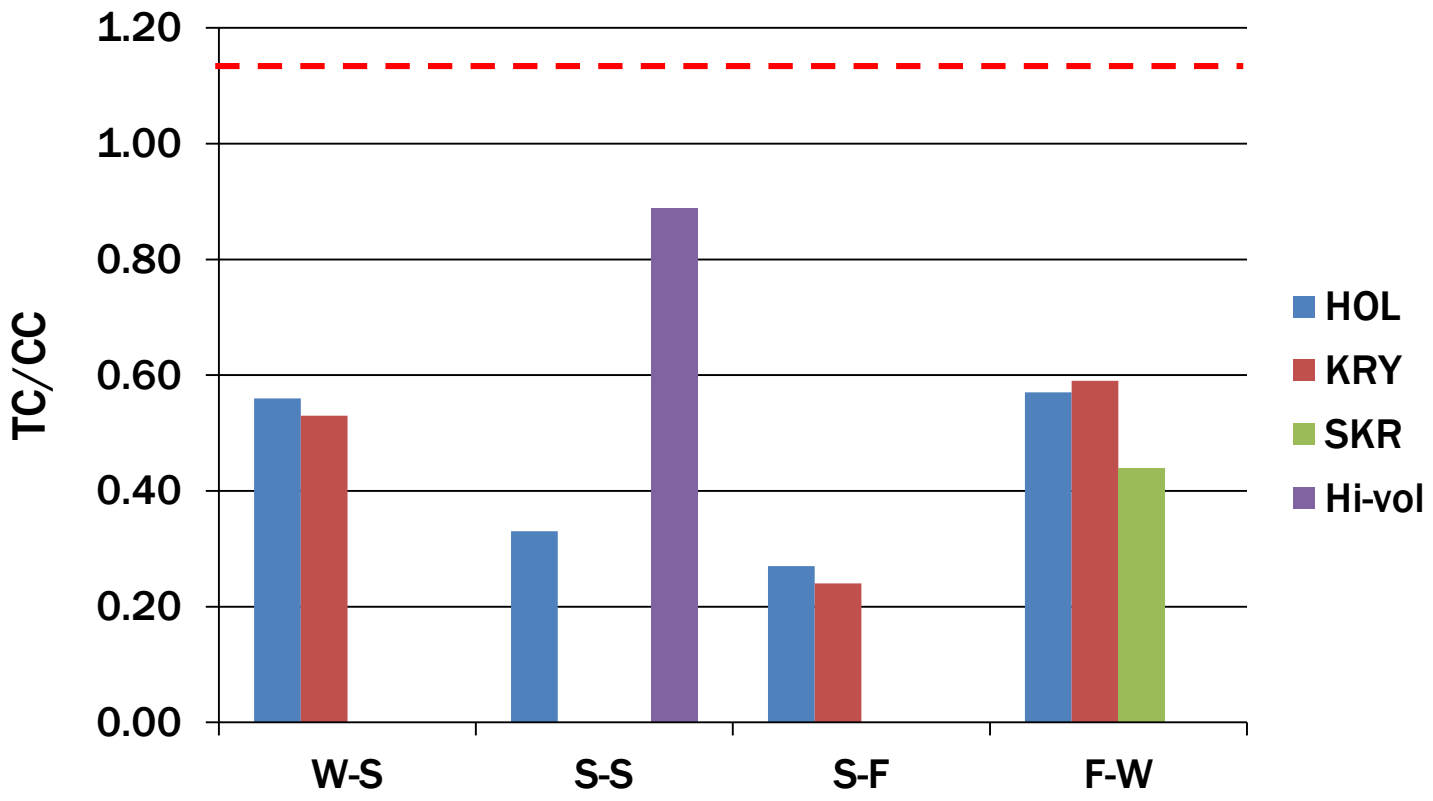


Figure 9

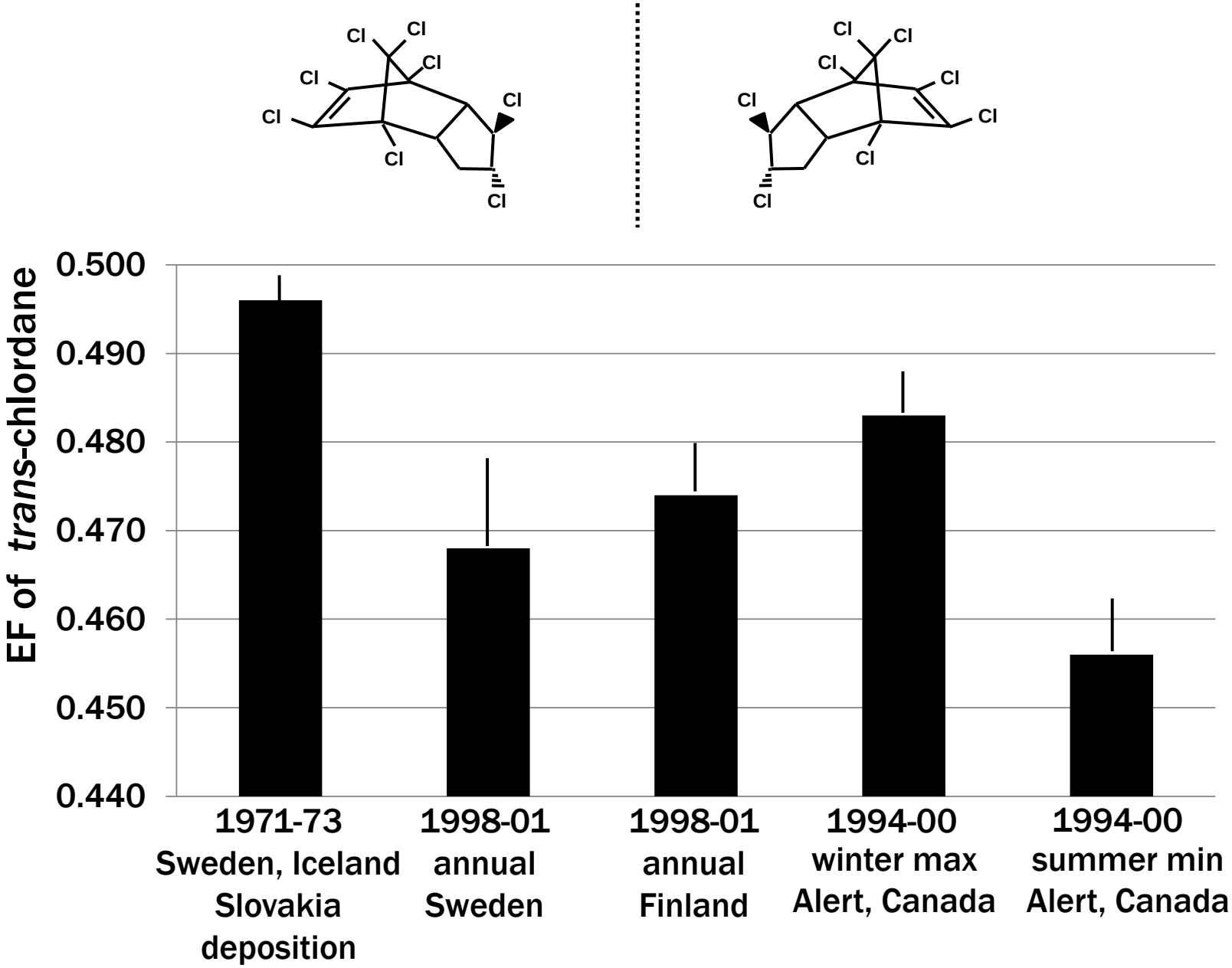

Cl
Cl
Cl
Cl
Cl
Cl
Cl
Cl
Cl
Cl
Cl
Cl
Cl
Cl
Cl
EF of trans-chlordane
0.500
0.490
0.480
0.470
0.460
0.450
0.440
1971-73
Sweden, Iceland
Slovakia
deposition
1998-01
annual
Sweden
1998-01
annual
Finland
1994-00
winter max
Alert, Canada
1994-00
summer min
Alert, Canada

Figure 10

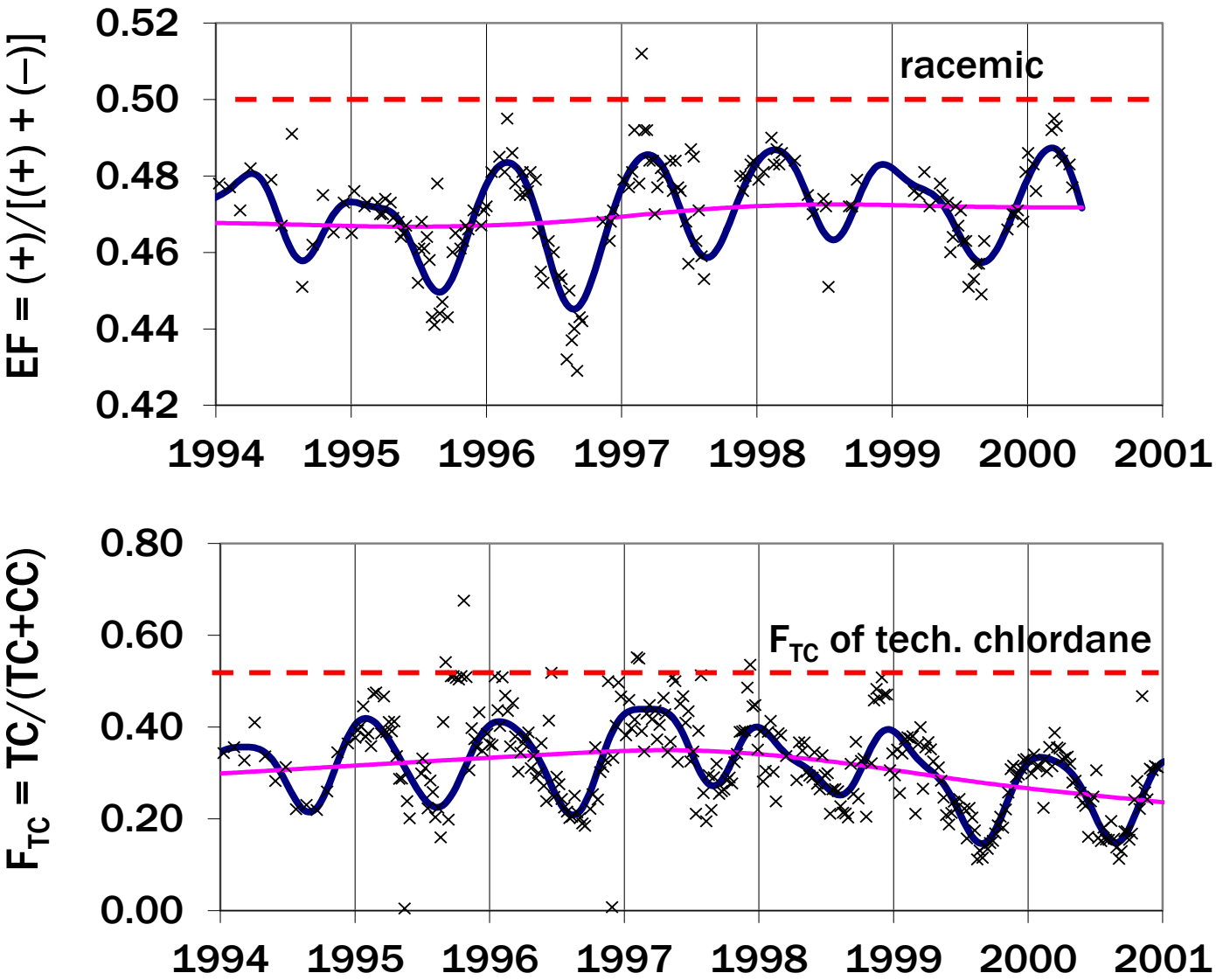
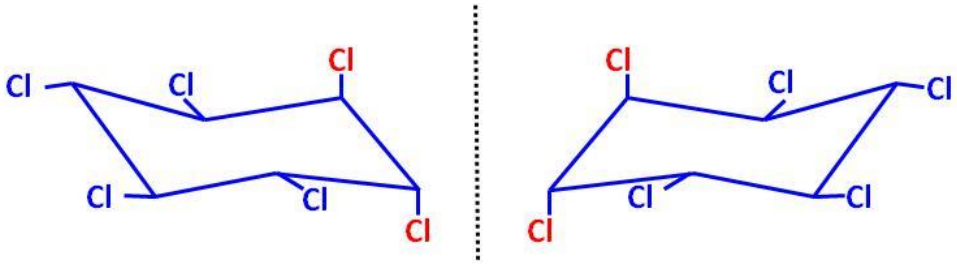
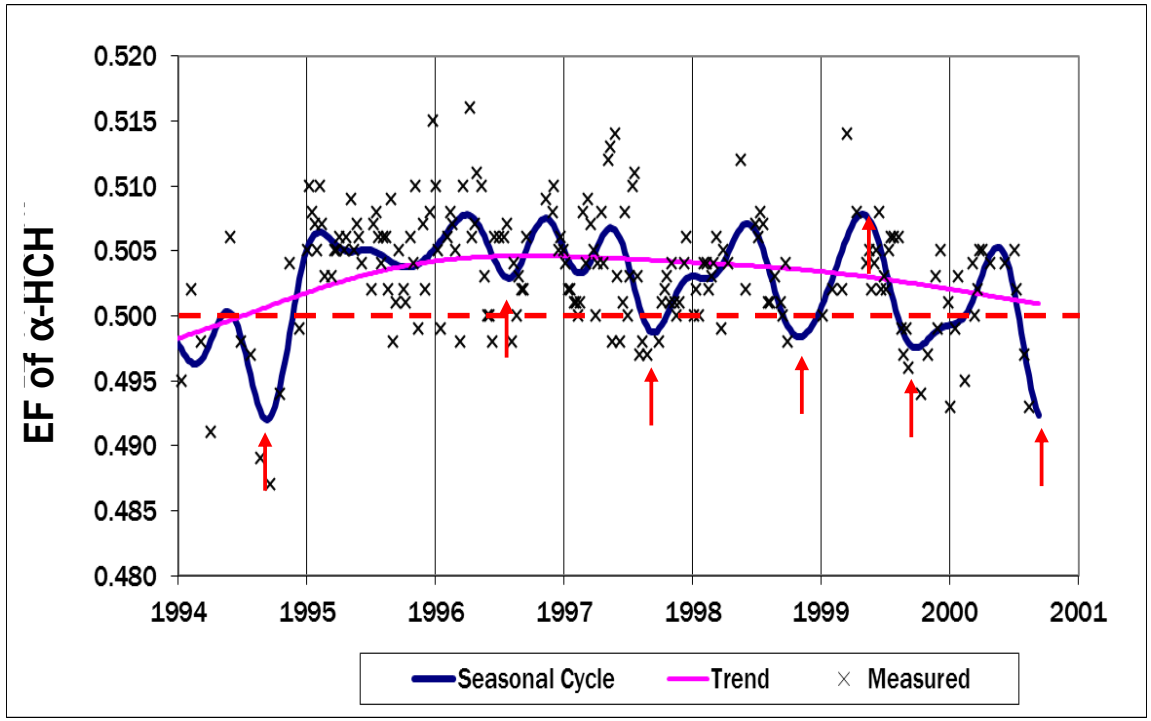
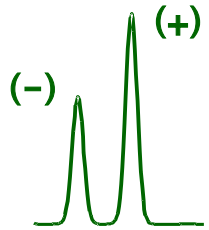

EF = (+)/[(+) + (–)]
0.52
0.50
0.48
0.46
0.44
0.42
racemic
1994
1995
1996
1997
1998
1999
2000
2001
F_TC = TC/(TC+CC)
0.80
0.60
0.40
0.20
0.00
F_TC of tech. chlordane
1994
1995
1996
1997
1998
1999
2000
2001

Figure 11

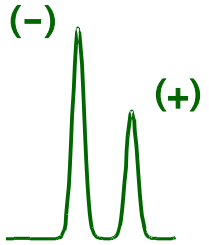






EF > 0.500

(–) degradation in soils



EF < 0.500

(+) degradation in Arctic Ocean

Figure 12