

Miljøgifter og mikroplast i Mjøsa – før og nå!



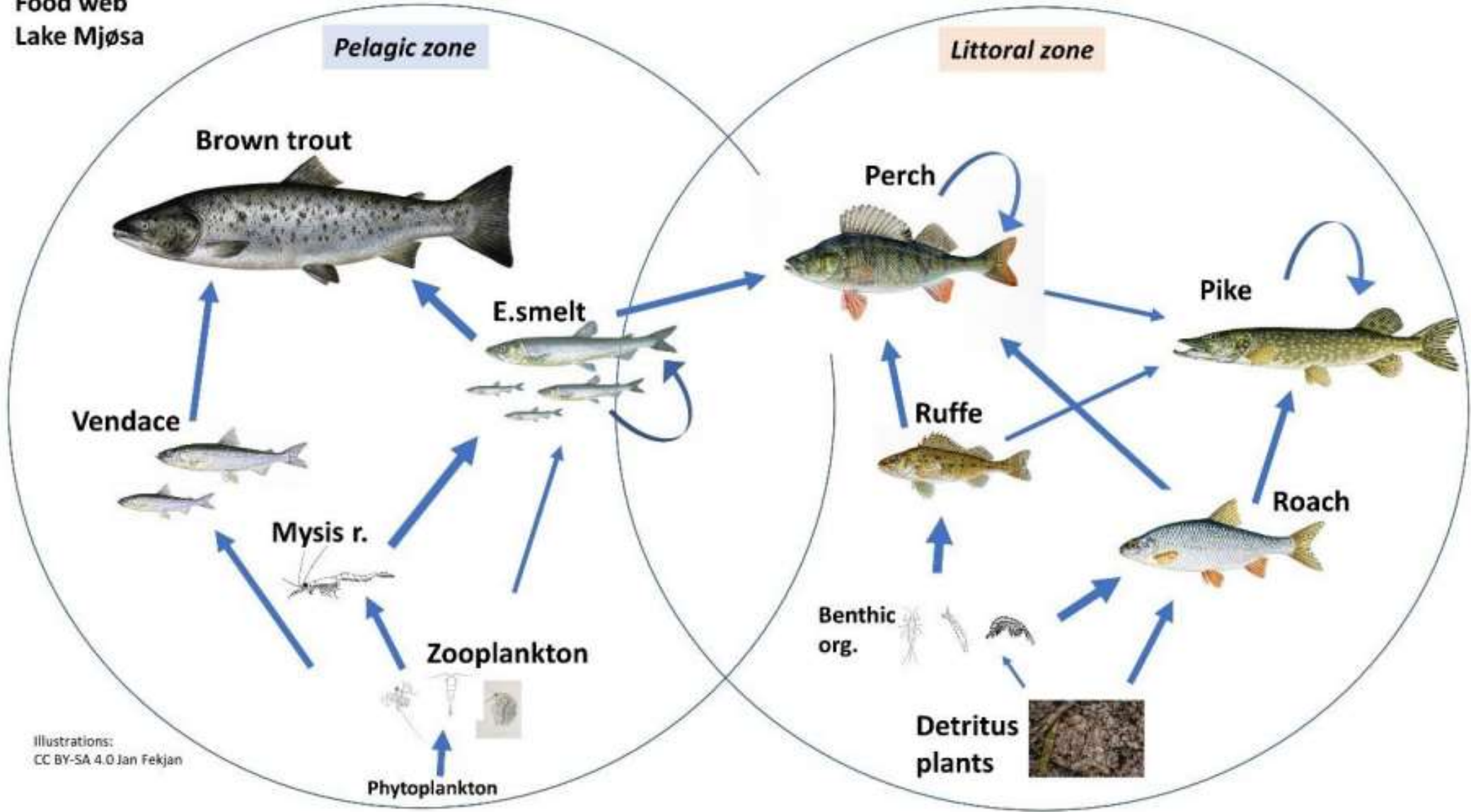
MILFERSK (Miljødirektoratet)

- Kvikksølv (Hg)
- Bromerte flammehemmere (polybromerte difenyletere, PBDE)
- Siloksaner (cVMS)
- Perfluorerte alkylforbindelser (PFAS)
- Alkylfenoler
- Bisfenoler
- Nye bromerte flammehemmere (nBFR)
- UV-kjemikalier
- Organiske fosforflammehemmere (oPFR) og dekloraner



Stabile isotoper ($\delta^{15}\text{N}$, $\delta^{13}\text{C}$), lipider, lengde, vekt, kondisjonsfaktor, alder og kjønn.

Food web
Lake Mjøsa



Illustrations:
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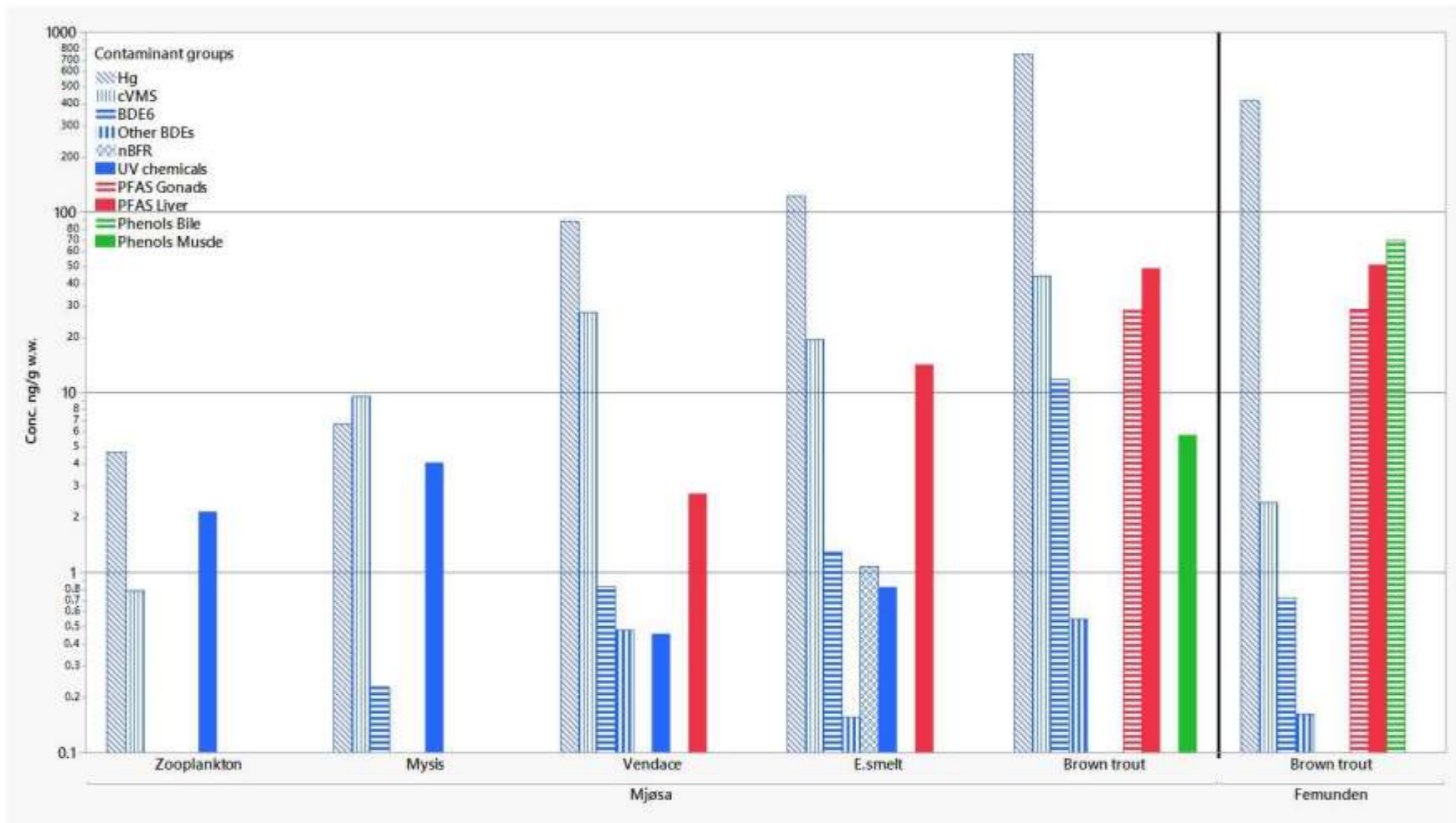
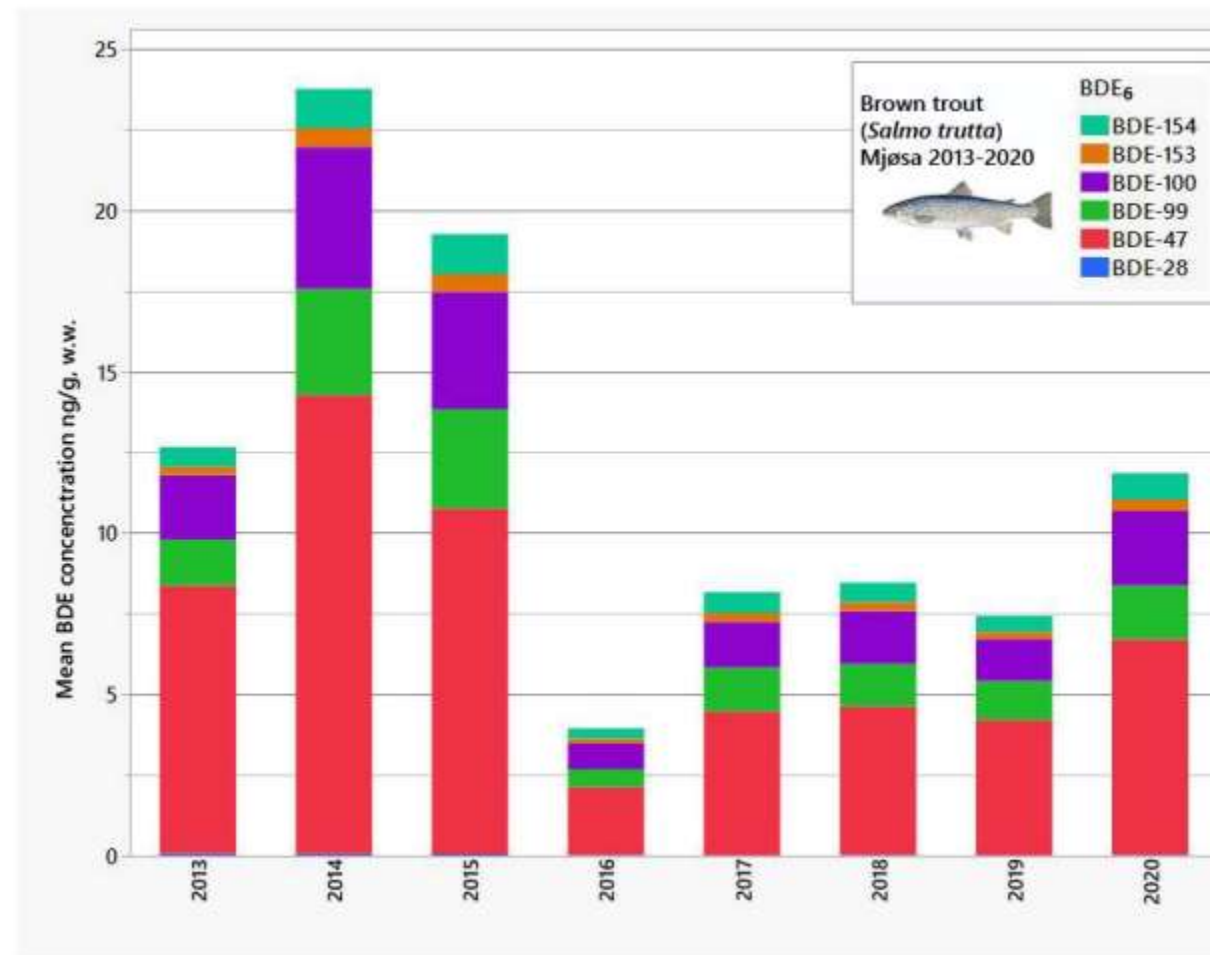
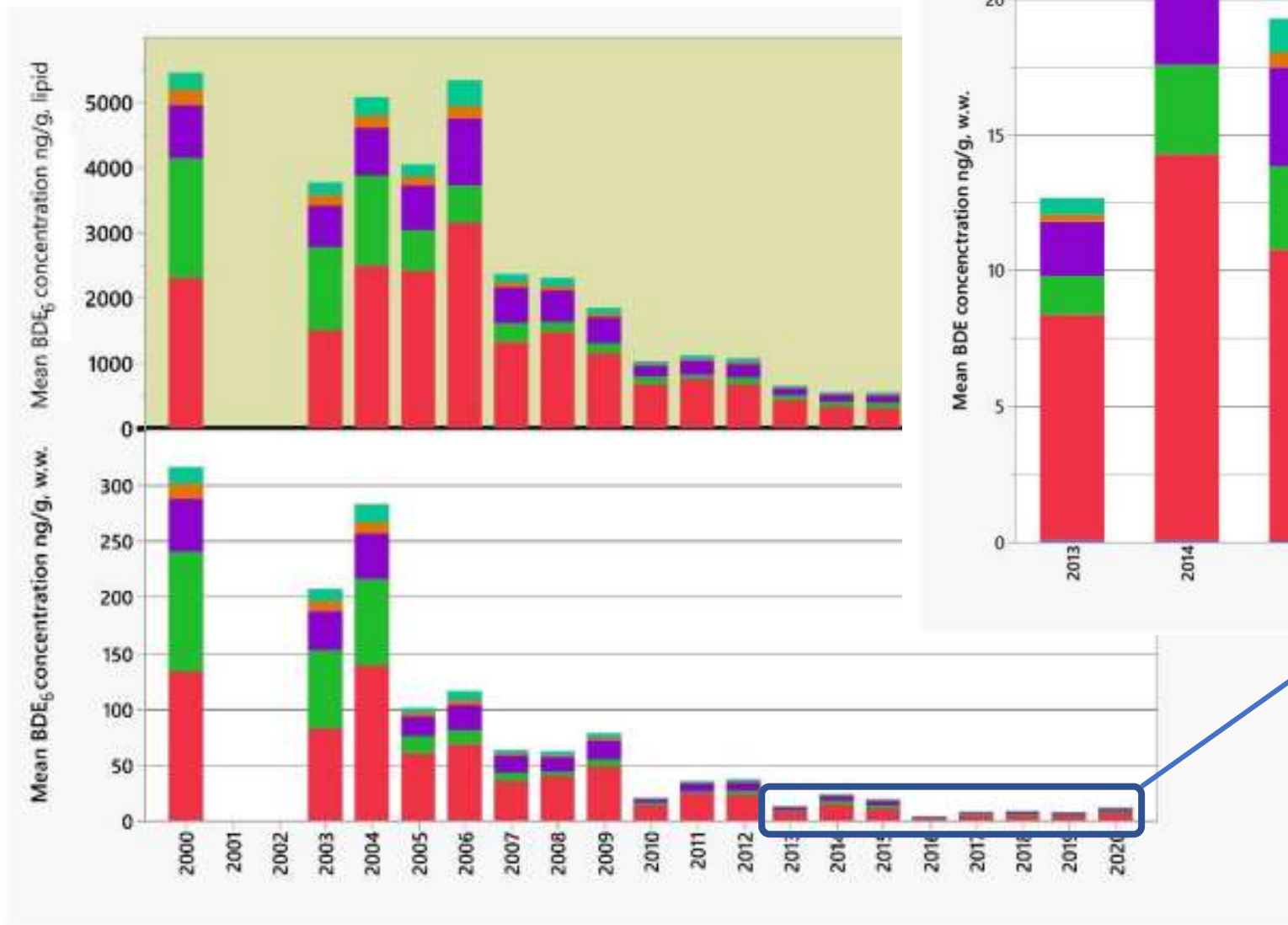


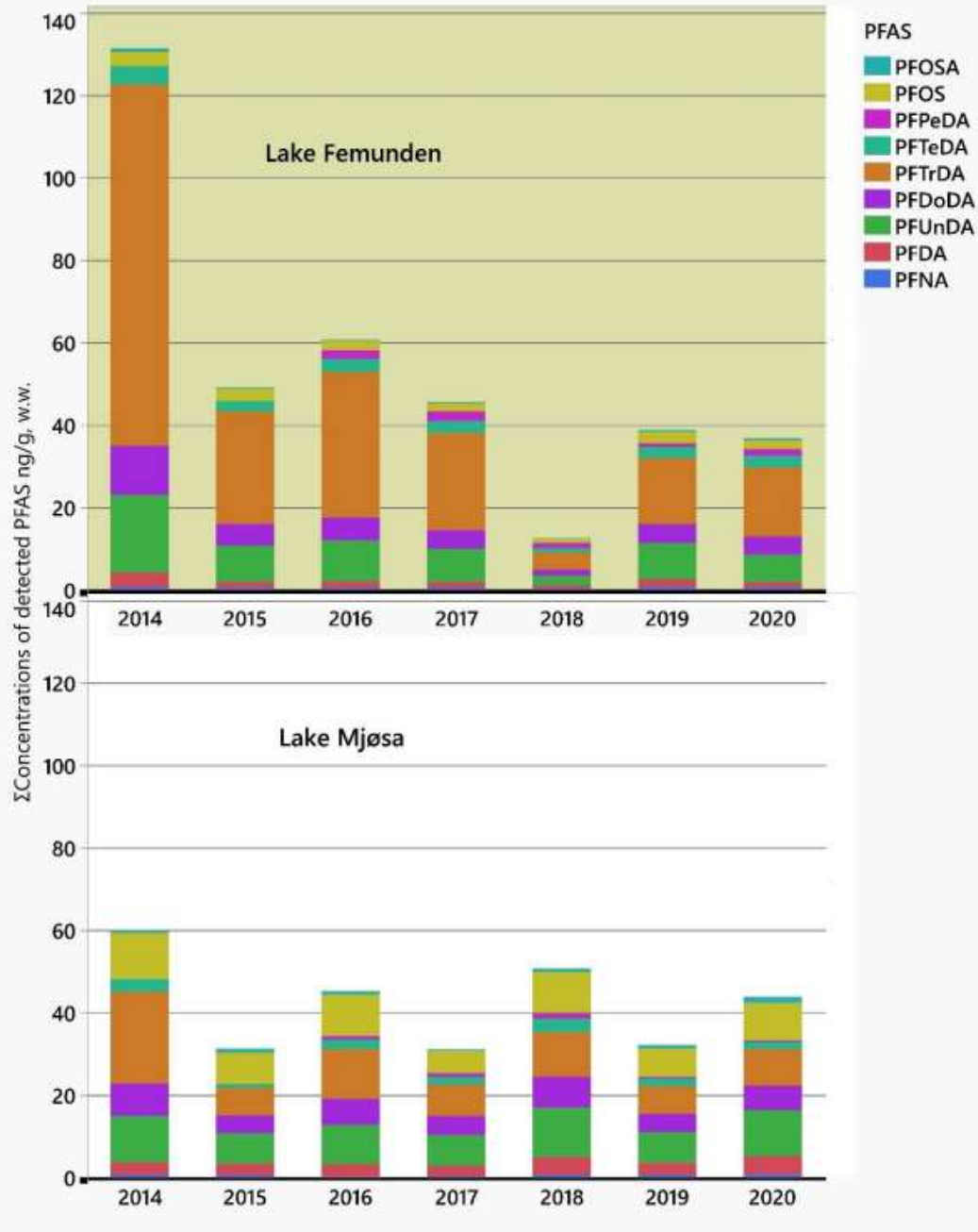
Figure 11. Overview of barplots with sum of all mean concentrations (ng/g w.w.) per contaminant group in all biota matrices collected in Lakes Mjøsa and Femunden in 2020. **Blue color:** wholebody (Zooplankton and Mysis) and muscle tissue (fish). **Red color:** PFAS in gonads and liver (fish). **Green color:** Phenols in bile and muscle (only brown trout).

Biota (Brown trout) in Lakes Mjøsa and Femunden 2017-2020				
Contaminant	EQS _{biota}	Concentration range (min- max) for brown trout		n > EQS
	<i>µg/kg w.w.</i>	<i>µg/kg w.w.</i>		<i>N out of total samples</i>
PBDEs (ΣBDE ₆)*	0.0085	Mjøsa	1.6 – 27	60/60
		Femunden	0.11 – 2.5	40/40
PFOS	9.1	Mjøsa	0.9 – 19.9	20/60
		Femunden	0.4 – 5.2	0/40
PFOA	91.3	< LOQ (both lakes)		0/100
Nonylphenol**	3000	< LOQ (both lakes)		0/116
Octylphenol**	0.004	< LOQ (both lakes)		0/116
cVMS (D5)	15 000	Mjøsa	2.6 – 120	0/60
		Femunden	< LOQ – 2.9	0/40
Hg	20	Mjøsa:	190 - 1500	60/60
		Femunden:	25 – 960	40/40

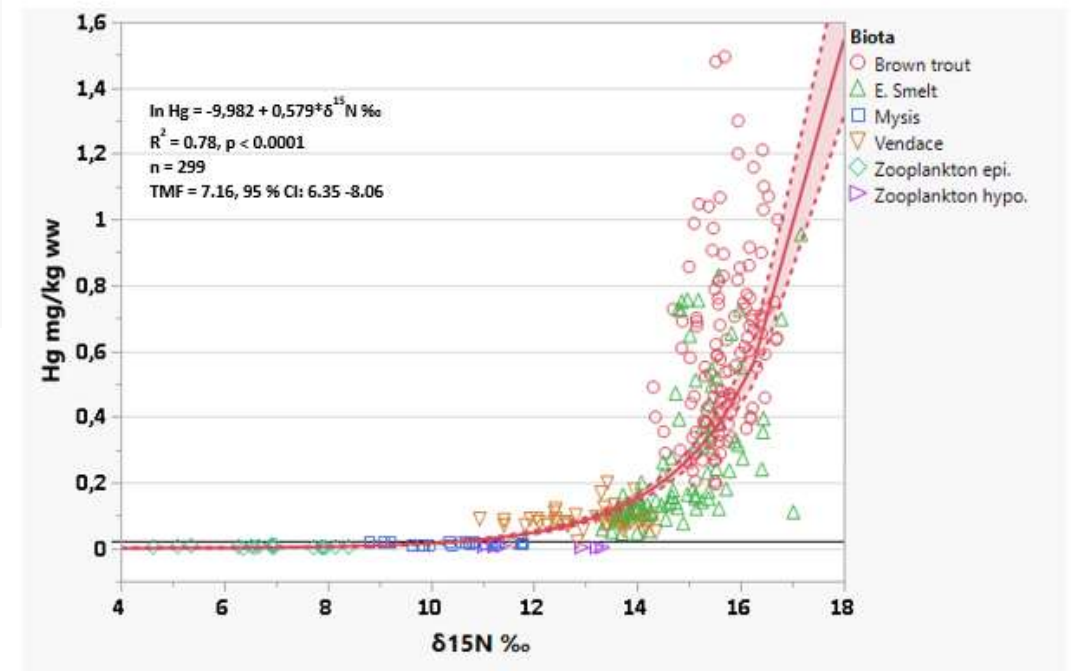
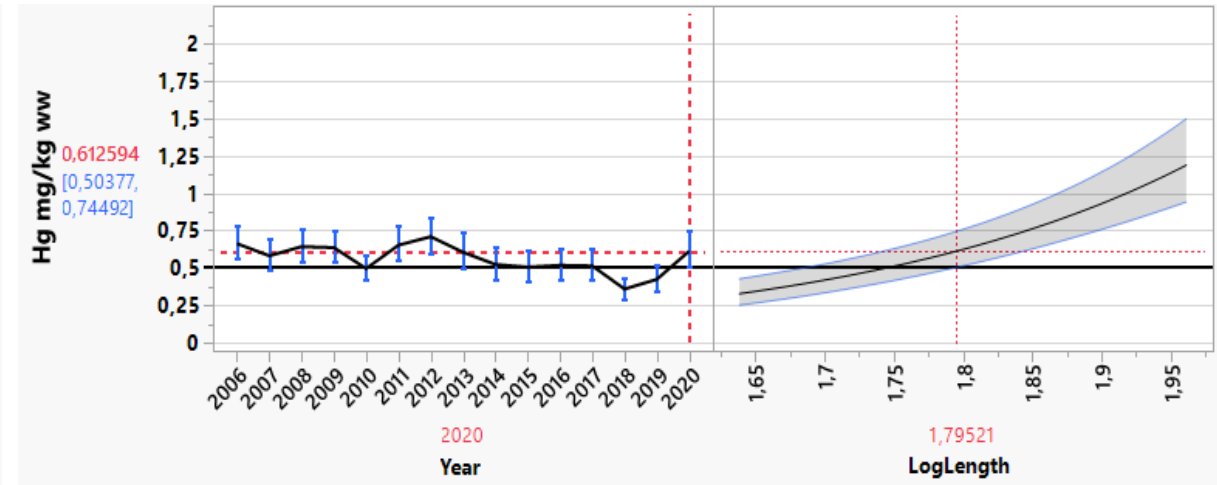
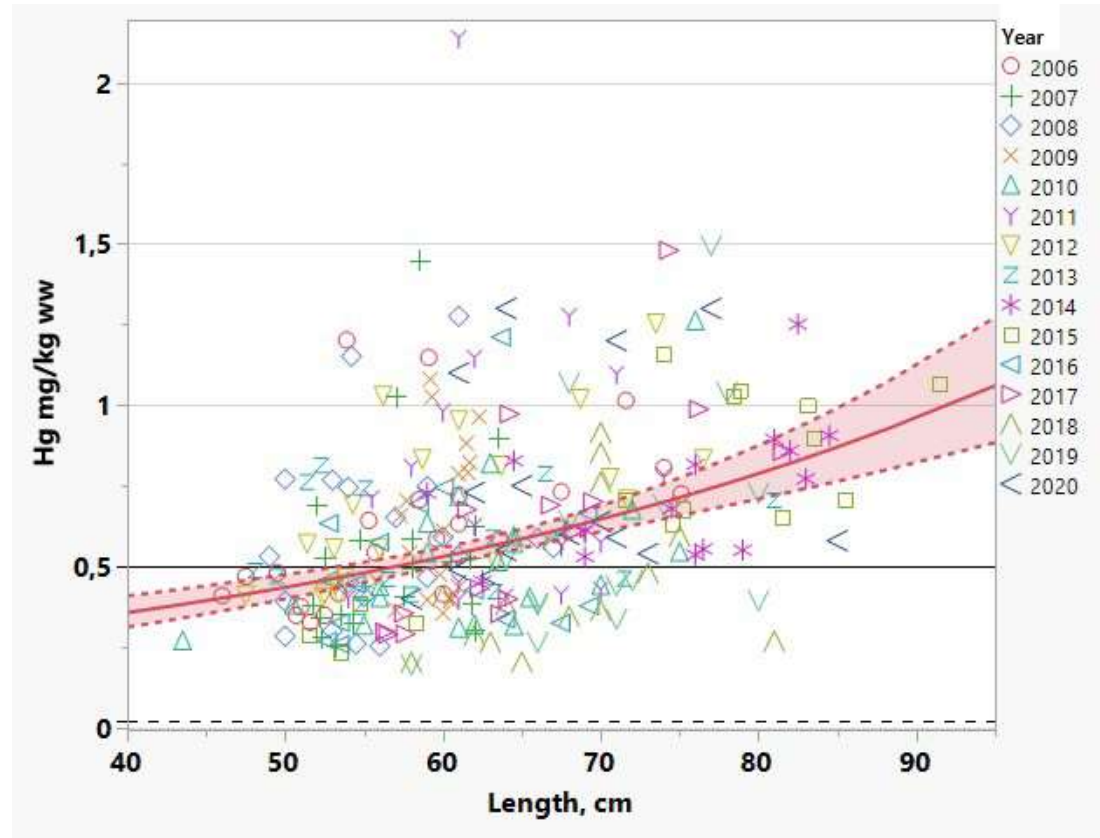
Bromerte flammehemmere



Perfluorerte alkylforbindelser (PFAS)



Kvikksølv



Miljøgifter i elvene (Vassdragsforbundet)

Stoff	Brumunda 1 (µg/kg)	Brumunda 2 (µg/kg)	Brumunda 3 (µg/kg)	EQS (µg/kg)	Stoff	Mesnaelva 1	Mesnaelva 2	Mesnaelva 3	EQS (µg/kg)
DEHP	< 1000	< 1000	< 1000	2 900	DEHP	< 1000	< 1000	< 1000	2 900
HBCD	0,03	0,05	0,07	167	HBCD	0,16	0,18	0,09	167
HCH	< 0,5	< 0,5	< 0,5	61	HCH	< 0,5	< 0,5	< 0,5	61
HCB	< 0,5	< 0,5	< 0,5	10	HCB	< 0,5	< 0,5	< 0,5	10
QCB	< 0,5	< 0,5	< 0,5	50	QCB	< 0,5	< 0,5	< 0,5	50
Hg	44	40	51	20	Hg	73	59	60	20
PBDE6	0,03	0,09	0,13	0,0085	PBDE6	0,47	0,54	0,30	0,0085
SCCP	<2,0	<2,0	<2,0	6 000	SCCP	<2,0	<2,0	<2,0	6 000
Fettinnhold (%)	1,7	1,8	1,8		Fettinnhold (%)	1,8	2,2	1,7	

Stoff	Hunnselva 1 (µg/kg)	Hunnselva 2 (µg/kg)	Hunnselva 3 (µg/kg)	EQS (µg/kg)	Stoff	Vikselva 1	Vikselva 2	Vikselva 3	EQS (µg/kg)
DEHP	< 1000	< 1000	< 1000	2 900	DEHP	< 1000	< 1000	< 1000	2 900
HBCD	0,04	I.D.**	0,05	167	HBCD	I.D.	I.D.**	I.D.	167
HCH	< 0,25	< 0,25	< 0,25	61	HCH	< 0,25	< 0,25	< 0,25	61
HCB	< 0,5	< 0,5	< 0,5	10	HCB	< 0,5	< 0,5	< 0,5	10
QCB	< 0,5	< 0,5	< 0,5	50	QCB	< 0,5	< 0,5	< 0,5	50
Hg	30	36	40	20	Hg	60	50	60	20
BDE6*	0,19	0,12	0,61	0,0085	BDE6*	0,02	0,10	0,03	0,0085
SCCP	<5,0	<5,0	<5,0	6 000	SCCP	<5,0	I.D.	I.D.	6 000
Fettinnhold (%)	2,0	1,7	2,4		Fettinnhold (%)	2,1	2,3	2,4	

* BDE 28, 47, 99, 100, 153, 154 **Ikke detektert

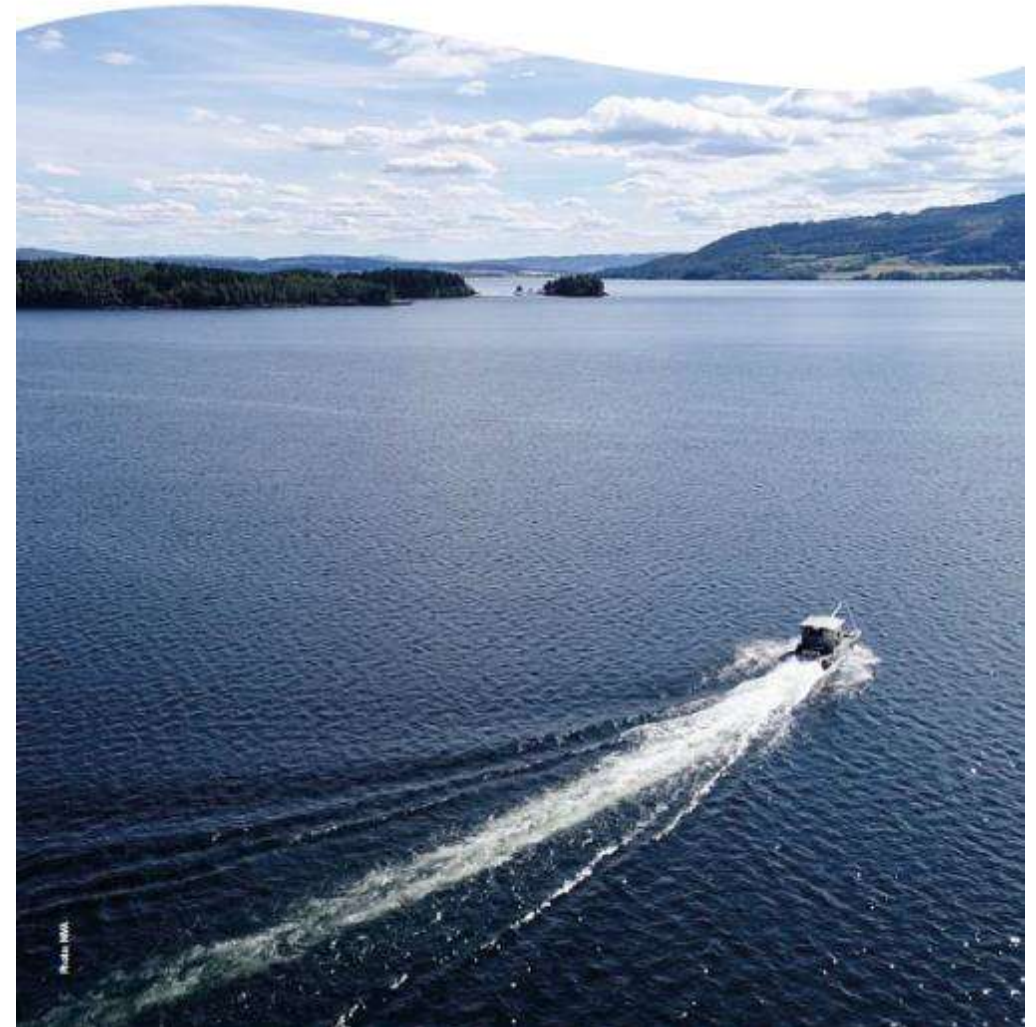
* BDE 28, 47, 99, 100, 153, 154 **Ikke detektert

Freshwater microplastics in Norway
 A first look at sediment, biota and historical plankton
 samples from Lake Mjøsa and Lake Femunden



Sample of *Mysis relicta* from Lake Mjøsa (Photo: Morten Jar

Asle Økelsrud 17.11.2022



Plankton - historiske prøver

Antall MP pr m³

