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Temporal changes in phytoplankton biomass and cellular properties; implications for the IMO Ballast Water Convention

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Table 1: Minimum/maximum and annual averages of flow cytometric measurements of total phytoplankton cells, integrated chlorophyll and relative contribution of fractions <10 and > 10 μm (based on flow cytometric separation of size, FS). Percentages are based on annual averages.

Den Oever:

Size fraction	phytoplankton [number/mL]				Integrated Chlor. [F0 _{FCM}]			
	Min	Max	Average \pm CV%	Number % of total	Min	Max	Integrated Chlor. \pm CV%	Integrated Chlor. (%)
total	1788	119677	27042 \pm 83		74400	4550000	1,146,072 \pm 81	
FS <10 μm	1689	110345	26059 \pm 75	96.3	48257	4203249	816,717 \pm 94	71.3
FS >10 μm	26	2661	982 \pm 73	3.6	63.0	274000	329,355 \pm 85	28.7

L4:

Size fraction	phytoplankton [number/mL]				Integrated Chlor. [F0 _{FCM}]			
	Min	Max	Average \pm CV%	Number % of total	Min	Max	Integrated Chlor. \pm CV%	Integrated Chlor. CV%
total	307	49429	12590 \pm 84		21523	2008952	595907 \pm 63	
FS <10μm	213	38344	9988 \pm 93	98	9526	1826536	422942 \pm 77	88
FS >10μm	4	1173	201 \pm 87	2	363	394890	57209 \pm 108	12

Table 2: Minimum/maximum, annual averages including the coefficient of variation (CV) of unfiltered and 10 µm mesh filtered fraction of phytoplankton biomass (PAM-F₀), total cell numbers, integrated chlorophyll values based on flow cytometric measurements, calculated number of cells and size classification on basis of FS values < or > 10 µm.

Den Oever:

sample type	size fraction	PAM-chlorophyll (F ₀)				phytoplankton [number/mL]			Integrated Chlor. [F ₀ FCM]		
		F ₀ Chlor. biomass min	F ₀ Chlor. biomass max	average F ₀ Chlor. biomass ± CV%	F ₀ Chlor. % of unfiltered	phytoplankton number average ± CV%	phytoplankton number % of unfiltered	phytoplankton number > 10 µm (%)	Integrated Chlor. ± CV%	Integrated chlor % of unfiltered	> 10 µm Integrated chlor (%)
unfiltered	total	81	17503	503 ± 66		27,042 ± 83			1,146,072 ± 81		
	FS <10 µm					26,059 ± 75	96		816,717 ± 94	71.3	
	FS >10 µm					982 ± 73	4	3.6	329,355 ± 85	28.7	28.7
10 µm mesh filtered	total (<10 µm)	32	888	232 ± 76	46	20,894 ± 82	77		603,719 ± 94	52.7	
>10 µm mesh filtered	calculated			270 ± 73	54	6148 ± 81	23	22.7	542,353 ± 79	47.3	47.3
	FS <10 µm					20,667 ± 89	76		554,539 ± 86	48.4	
	FS >10 µm					227 ± 86	0.8	1.1 (23)	49,180 ± 101	4.3	8.1 (14.9)

L4:

Sample type	Size fraction	F0 Chlor. Biomass min	F0 Chlor. Biomass max	Average F0 Chlor. Biomass \pm CV	F0 Chlor. % of unfiltered	Phytoplankton number average	Phytoplankton number % of unfiltered	Integrated Chl of unfiltered
Unfiltered	total	122	3767	793 \pm 70		12590 \pm 84		595907 \pm 63
	FS <10 μ m					9988 \pm 93	98	422942 \pm 77
	FS >10 μ m					201 \pm 87	2	57209 \pm 108
< 10 μ m mesh filtered	Calculated	20	3582	575 \pm 87	61.8	10777	85.6	369462
10 μ m mesh filtered	(>10 μ m)	2	992	355 \pm 84	38	1812	14.4	226445