

Supplementary Materials

# Penguins as Sentinel Species for Monitoring Per- and Polyfluoroalkyl Substances (PFAS): Evaluation of Silicone Passive Samplers as a Non-Invasive Tool

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**Table S1.** List of 40 PFAS standards with their abbreviation, IUPAC name, CAS number, supplier information, and precursor ion.

Abbreviation	IUPAC Name	CAS No.	Supplier
<i>Perfluoroalkyl carboxylic acids</i>			
PFBA	Heptafluorobutanoic acid	375-22-4	Sigma Aldrich (Saint Louis, MO, USA)
PFPeA	Nonafluoropentanoic acid	2706-90-3	Sigma Aldrich (Saint Louis, MO, USA)
PFHxA	Undecafluorohexanoic acid	307-24-4	Matrix Scientific (Elgin, SC, USA)
PFHpA	Tridecafluoroheptanoic acid	375-85-9	Sigma Aldrich (Saint Louis, MO, USA)
PFOA	Pentadecafluorooctanoic acid	335-67-1	Sigma Aldrich (Saint Louis, MO, USA)
PFNA	Heptadecafluorononanoic acid	375-95-1	Tokyo Chemical Industry (Portland, OR, USA)
PFDA	Nonadecafluorodecanoic acid	335-76-2	Sigma Aldrich (Saint Louis, MO, USA)
PFUnA	Henicosafluoroundecanoic acid	2058-94-8	Sigma Aldrich (Saint Louis, MO, USA)
PFDoA	Tricosafluorododecanoic acid	307-55-1	Sigma Aldrich (Saint Louis, MO, USA)
PFTrDA	Pentacosfluorotridecanoic acid	72629-94-8	Sigma Aldrich (Saint Louis, MO, USA)
PFTeDA	Heptacosfluorotetradecanoic acid	376-06-7	Sigma Aldrich (Saint Louis, MO, USA)
<i>Perfluoroalkyl sulfonic acids</i>			
PFBS	Nonafluorobutane-1-sulfonic acid	375-73-5	Sigma Aldrich (Saint Louis, MO, USA)
PFPeS	Undecafluoropentane-1-sulfonic acid	2706-91-4	Toronto Research Chemicals (Toronto, ON, Canada)
PFHxS	Tridecafluorohexane-1-sulfonic acid	355-46-4	Toronto Research Chemicals (Toronto, ON, Canada)
PFHpS	Pentadecafluoroheptane-1-sulfonic acid	375-92-8	Toronto Research Chemicals (Toronto, ON, Canada)
PFOS	Heptadecafluorooctane-1-sulfonic acid	1763-23-1	Sigma Aldrich (Saint Louis, MO, USA)
PFNS	Nonadecafluorononane-1-sulfonic acid	68259-12-1	Toronto Research Chemicals (Toronto, ON, Canada)
PFDS	Henicosafluorodecane-1-sulfonic acid	335-77-3	Toronto Research Chemicals (Toronto, ON, Canada)
PFDoS	Pentacosfluorododecane-1-sulfonato	79780-39-5	Wellington Laboratories (Guelph, ON, Canada)
<i>Fluorotelomer sulfonic acids</i>			
4:2FTS	3,3,4,4,5,5,6,6,6-Nonafluorohexane-1-sulfonic acid	757124-72-4	Apollo Scientific (Stockport, Cheshire, UK)
6:2FTS	3,3,4,4,5,5,6,6,7,7,8,8,8-Tridecafluorooctane-1-sulfonic acid	27619-97-2	Sigma Aldrich (Saint Louis, MO, USA)
8:2FTS	3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-Heptadecafluorodecane-1-sulfonic acid	39108-34-4	Apollo Scientific (Stockport, Cheshire, UK)
<i>Fluorotelomer carboxylic acids</i>			
3:3 FTCA	4,4,5,5,6,6,6-Heptafluorohexanoic acid	356-02-5	Manchester Organics (Runcorn, Cheshire, UK)
5:3 FTCA	4,4,5,5,6,6,7,7,8,8,8-Undecafluorooctanoic acid	914637-49-3	SynQuest Laboratories (Alachua, FL, USA)
7:3 FTCA	4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-Pentadecafluorodecanoic acid	812-70-4	SynQuest Laboratories (Alachua, FL, USA)
<i>Perfluorosulfonamides</i>			



PFOSA	1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-Heptadecafluorooctane-1-sulfonamide	754-91-6	Sigma Aldrich (Saint Louis, MO, USA)
NMeFOSA	1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-Heptadecafluoro-N-methyloctane-1-sulfonamide	31506-32-8	Toronto Research Chemicals (Toronto, ON, Canada)
NEtFOSA	N-Ethyl-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctane-1-sulfonamide	4151-50-2	Toronto Research Chemicals (Toronto, ON, Canada)
NMeFOSAA	N-(1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-Heptadecafluorooctane-1-sulfonyl)-N-methylglycine	2355-31-9	Toronto Research Chemicals (Toronto, ON, Canada)
NEtFOSAA	N-Ethyl-N-(1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-heptadecafluorooctane-1-sulfonyl)glycine	2991-50-6	Toronto Research Chemicals (Toronto, ON, Canada)
NMeFOSE	1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-Heptadecafluoro-N-(2-hydroxyethyl)-N-methyloctane-1-sulfonamide	24448-09-7	Toronto Research Chemicals (Toronto, ON, Canada)
NEtFOSE	N-Ethyl-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8,8-epitadecafluoro-N-(2-hydroxyethyl)octane-1-sulfonamide	1691-99-2	Toronto Research Chemicals (Toronto, ON, Canada)
<i>Perfluoroethers</i>			
HFPO-DA	Azane;2,3,3,3-tetrafluoro-2-(1,1,2,2,3,3,3,3-heptafluoropropoxy)propanoic acid	13252-13-6	Santa Cruz Biotechnologies (Dallas, TX, USA)
ADONA	2,2,3-Trifluoro-3-[1,1,2,2,3,3-hexafluoro-3-(trifluoromethoxy)propoxy]propanoic acid	919005-14-4	Wellington Laboratories (Guelph, ON, Canada)
PFMPA	2,2,3,3-Tetrafluoro-3-(trifluoromethoxy)propanoic acid	377-73-1	Apollo Scientific (Stockport, Cheshire, UK)
PFMBA	2,2,3,3,4,4-Hexafluoro-4-(trifluoromethoxy)butanoic acid	863090-89-5	SynQuest Laboratories (Alachua, FL, USA)
NFDHA	Di fluoro[1,1,2,2-tetrafluoro-2-(trifluoromethoxy)ethoxy]acetic acid	151772-58-6	Apollo Scientific (Stockport, Cheshire, UK)
PFEESA	1,1,2,2-Tetrafluoro-2-(pentafluoroethoxy)ethane-1-sulfonic acid	113507-82-7	SynQuest Laboratories (Alachua, FL, USA)
<i>Chlorinated PFAS</i>			
9Cl-PF3ONS	2-[(6-Chloro-1,1,2,2,3,3,4,4,5,5,6,6-dodecafluorohexyloxy)-1,1,2,2-tetrafluoroethane-1-sulfonic acid	756426-58-1	Wellington Laboratories (Guelph, ON, Canada)
11Cl-PF3OUDS	2-[(8-Chloro-1,1,2,2,3,3,4,4,5,5,6,6,7,7,8,8-hexadecafluorooctyloxy)-1,1,2,2-tetrafluoroethane-1-sulfonic acid	763051-92-9	Wellington Laboratories (Guelph, ON, Canada)

**Table S2.** Wristband deployment and penguin identification.

Breeding Season	Band ID	Colony	Sex	Nest Status	Deployment Duration	Deployment Date	Recovery Date
2022–2023	SL 01	San Lorenzo	Male	2 chicks	Short (2 days)	22-Nov-2022	24-Nov-2022
2022–2023	SL 02	San Lorenzo	Female	2 chicks	Short (2 days)	22-Nov-2022	24-Nov-2022
2022–2023	SL 03	San Lorenzo	Female	2 chicks	Short (2 days)	22-Nov-2022	24-Nov-2022
2022–2023	SL 04	San Lorenzo	Female	2 chicks	Short (2 days)	22-Nov-2022	24-Nov-2022
2022–2023	SL 05	San Lorenzo	Male	2 chicks	Short (2 days)	22-Nov-2022	24-Nov-2022
2022–2023	SL 06	San Lorenzo	Unknown	2 chicks	Short (2 days)	22-Nov-2022	24-Nov-2022
2022–2023	SL 07	San Lorenzo	Female	2 chicks	Short (2 days)	22-Nov-2022	24-Nov-2022
2022–2023	SL 08	San Lorenzo	Male	2 chicks	Short (2 days)	22-Nov-2022	24-Nov-2022
2022–2023	SL 09	San Lorenzo	Female	2 chicks	Short (2 days)	22-Nov-2022	24-Nov-2022
2022–2023	SL 10	San Lorenzo	Female	2 chicks	Short (2 days)	22-Nov-2022	24-Nov-2022
2022–2023	CDB 01	Cabo Dos Bahías	Female	2 chicks	Short (2 days)	06-Dec-2022	08-Dec-2022
2022–2023	CDB 02	Cabo Dos Bahías	Female	1 chick	Short (2 days)	06-Dec-2022	08-Dec-2022
2022–2023	CDB 03	Cabo Dos Bahías	Female	2 chicks	Short (2 days)	06-Dec-2022	08-Dec-2022
2022–2023	CDB 04	Cabo Dos Bahías	Male	2 chicks	Short (2 days)	06-Dec-2022	08-Dec-2022
2022–2023	CDB 05	Cabo Dos Bahías	Female	1 chick	Short (2 days)	06-Dec-2022	08-Dec-2022
2022–2023	CDB 06	Cabo Dos Bahías	Male	2 chicks	Medium (3–5 days)	06-Dec-2022	11-Dec-2022
2022–2023	CDB 07	Cabo Dos Bahías	Female	1 chick	Short (2 days)	06-Dec-2022	08-Dec-2022
2022–2023	CDB 08	Cabo Dos Bahías	Male	2 chicks	Short (2 days)	06-Dec-2022	08-Dec-2022
2022–2023	CDB 09	Cabo Dos Bahías	Female	2 chicks	Short (2 days)	06-Dec-2022	08-Dec-2022
2022–2023	CDB 10	Cabo Dos Bahías	Male	1 chick	Medium (3–5 days)	06-Dec-2022	11-Dec-2022
2022–2023	CDB 11	Cabo Dos Bahías	Female	2 chicks	Medium (3–5 days)	06-Dec-2022	11-Dec-2022
2022–2023	CDB 12	Cabo Dos Bahías	Female	2 chicks	Medium (3–5 days)	06-Dec-2022	11-Dec-2022
2022–2023	CDB 13	Cabo Dos Bahías	Male	1 chick	Medium (3–5 days)	06-Dec-2022	11-Dec-2022
2022–2023	CDB 14	Cabo Dos Bahías	Male	1 chick	Short (2 days)	06-Dec-2022	08-Dec-2022
2022–2023	CDB 15	Cabo Dos Bahías	Female	2 chicks	Short (2 days)	06-Dec-2022	08-Dec-2022
2023–2024	CDB 01	Cabo Dos Bahías	Male	2 chicks	Short (2 days)	15-Dec-2023	17-Dec-2023
2023–2024	CDB 02	Cabo Dos Bahías	Male	2 chicks	Long (6–9 days)	15-Dec-2023	21-Dec-2023
2023–2024	CDB 03	Cabo Dos Bahías	Male	1 chick	Long (6–9 days)	15-Dec-2023	22-Dec-2023
2023–2024	CDB 04	Cabo Dos Bahías	Female	2 chicks	Short (2 days)	15-Dec-2023	17-Dec-2023
2023–2024	CDB 05	Cabo Dos Bahías	Female	2 chicks	Long (6–9 days)	15-Dec-2023	22-Dec-2023
2023–2024	CDB 06	Cabo Dos Bahías	Female	2 chicks	Long (6–9 days)	15-Dec-2023	22-Dec-2023
2023–2024	CDB 07	Cabo Dos Bahías	Female	2 chicks	Short (2 days)	15-Dec-2023	17-Dec-2023
2023–2024	CDB 08	Cabo Dos Bahías	Male	2 chicks	Long (6–9 days)	15-Dec-2023	22-Dec-2023
2023–2024	CDB 09	Cabo Dos Bahías	Female	2 chicks	Short (2 days)	15-Dec-2023	17-Dec-2023
2023–2024	CDB 11	Cabo Dos Bahías	Female	2 chicks	Very long (>10 days)	15-Dec-2023	01-Jan-2024
2023–2024	CDB 12	Cabo Dos Bahías	Male	2 chicks	Long (6–9 days)	15-Dec-2023	21-Dec-2023
2023–2024	CDB 13	Cabo Dos Bahías	Male	2 chicks	Short (2 days)	15-Dec-2023	17-Dec-2023
2023–2024	CDB 14	Cabo Dos Bahías	Male	2 chicks	Short (2 days)	15-Dec-2023	17-Dec-2023
2023–2024	CDB 15	Cabo Dos Bahías	Male	2 chicks	Long (6–9 days)	15-Dec-2023	21-Dec-2023
2023–2024	CDB 16	Cabo Dos Bahías	Male	1 chick	Short (2 days)	15-Dec-2023	17-Dec-2023

2023–2024	CDB 17	Cabo Dos Bahías	Female	2 chicks	Short (2 days)	15-Dec-2023	17-Dec-2023
2023–2024	CDB 18	Cabo Dos Bahías	Female	2 chicks	Short (2 days)	15-Dec-2023	17-Dec-2023
2023–2024	CDB 19	Cabo Dos Bahías	Male	2 chicks	Short (2 days)	15-Dec-2023	17-Dec-2023
2023–2024	CDB 20	Cabo Dos Bahías	Male	2 chicks	Long (6–9 days)	15-Dec-2023	21-Dec-2023
2024–2025	CDB 01	Cabo Dos Bahías	Female	1 chick	Long (6–9 days)	07-Dec-2024	16-Dec-2024
2024–2025	CDB 02	Cabo Dos Bahías	Female	2 chicks	Long (6–9 days)	07-Dec-2024	15-Dec-2024
2024–2025	CDB 04	Cabo Dos Bahías	Male	1 chick	Long (6–9 days)	07-Dec-2024	16-Dec-2024
2024–2025	CDB 05	Cabo Dos Bahías	Male	1 chick	Long (6–9 days)	07-Dec-2024	16-Dec-2024
2024–2025	CDB 06	Cabo Dos Bahías	Female	1 chick	Long (6–9 days)	07-Dec-2024	16-Dec-2024
2024–2025	CDB 07	Cabo Dos Bahías	Female	1 chick	Long (6–9 days)	07-Dec-2024	15-Dec-2024
2024–2025	CDB 08	Cabo Dos Bahías	Male	2 chicks	Long (6–9 days)	07-Dec-2024	16-Dec-2024
2024–2025	CDB 09	Cabo Dos Bahías	Male	1 chick	Long (6–9 days)	07-Dec-2024	15-Dec-2024
2024–2025	CDB 10	Cabo Dos Bahías	Male	1 chick	Long (6–9 days)	07-Dec-2024	16-Dec-2024
2024–2025	CDB 11	Cabo Dos Bahías	Female	1 chick	Long (6–9 days)	07-Dec-2024	15-Dec-2024
2024–2025	CDB 12	Cabo Dos Bahías	Female	2 chicks	Long (6–9 days)	07-Dec-2024	15-Dec-2024

**Table S3.** PFOS concentration (ng PFAS/g SPS band) in wristbands deployed on penguins.

Breeding Season	Band ID	PFPeA	PFHxA	PFHxS	PFHpA	PFOS	HFPO-DA	6:2 FTS	NMeFOSAA	NEtFOSAA
2022–2023	SL 01	0.3	ND	ND	ND	ND	ND	ND	ND	ND
2022–2023	SL 02	0.57	ND	ND	ND	ND	1.41	ND	ND	ND
2022–2023	SL 03	ND	ND	ND	ND	ND	1.22	ND	ND	ND
2022–2023	SL 04	ND	0.66	ND	ND	0.53	1.88	ND	0.5	ND
2022–2023	SL 05	0.17	ND	ND	0.22	ND	ND	ND	0.27	ND
2022–2023	SL 06	0.45	0.47	ND	ND	ND	ND	ND	ND	ND
2022–2023	SL 07	ND	ND	0.51	ND	ND	1.84	ND	ND	ND
2022–2023	SL 08	ND	0.48	ND	ND	ND	0.92	ND	ND	ND
2022–2023	SL 09	ND	ND	ND	ND	ND	ND	ND	ND	ND
2022–2023	SL 10	ND	ND	ND	ND	ND	ND	ND	ND	ND
2022–2023	CDB 01	0.58	0.76	ND	ND	ND	ND	ND	ND	ND
2022–2023	CDB 02	ND	0.33	ND	0.17	0.78	ND	ND	ND	ND
2022–2023	CDB 03	0.28	ND	0.73	ND	0.71	ND	ND	ND	ND
2022–2023	CDB 04	ND	ND	ND	ND	ND	1.12	ND	ND	ND
2022–2023	CDB 05	0.3	ND	ND	ND	ND	ND	ND	ND	ND
2022–2023	CDB 06	ND	ND	ND	ND	ND	ND	ND	ND	ND
2022–2023	CDB 07	ND	ND	ND	ND	ND	ND	ND	ND	ND
2022–2023	CDB 08	ND	ND	ND	ND	ND	ND	ND	ND	ND
2022–2023	CDB 09	1.1	ND	ND	ND	ND	ND	ND	ND	ND
2022–2023	CDB 10	ND	ND	ND	ND	16.23	ND	ND	ND	ND
2022–2023	CDB 11	0.47	1.19	ND	0.42	ND	ND	ND	ND	ND
2022–2023	CDB 12	ND	1.28	ND	0.22	ND	ND	1.15	ND	ND
2022–2023	CDB 13	1.22	3.23	ND	0.43	ND	1.09	ND	ND	ND
2022–2023	CDB 14	0.31	1.13	ND	0.24	ND	0.41	2.31	ND	ND
2022–2023	CDB 15	0.56	1.11	ND	ND	ND	ND	ND	ND	ND
2023–2024	CDB 01	0.4	1.11	ND	ND	ND	0.47	0.69	ND	ND
2023–2024	CDB 02	0.49	1.52	ND	0.2	ND	0.59	ND	ND	ND
2023–2024	CDB 03	0.21	1.51	ND	ND	ND	0.49	ND	ND	ND
2023–2024	CDB 04	0.74	1.75	ND	0.35	ND	0.5	ND	ND	0.33
2023–2024	CDB 05	0.22	0.99	ND	ND	0.33	ND	ND	ND	ND
2023–2024	CDB 06	ND	ND	ND	ND	ND	ND	ND	ND	0.57
2023–2024	CDB 07	0.23	0.9	0.64	ND	ND	ND	ND	ND	ND
2023–2024	CDB 08	0.2	ND	ND	ND	ND	ND	ND	0.34	ND
2023–2024	CDB 09	ND	ND	ND	ND	ND	ND	ND	0.25	ND
2023–2024	CDB 11	ND	ND	ND	ND	0.65	3.63	ND	ND	ND
2023–2024	CDB 12	0.66	1.23	ND	0.24	ND	0.47	ND	ND	ND
2023–2024	CDB 13	ND	0.65	ND	ND	ND	ND	ND	ND	ND
2023–2024	CDB 14	0.4	1.66	ND	ND	ND	ND	ND	ND	ND
2023–2024	CDB 15	0.3	1.96	ND	0.33	0.82	0.49	ND	ND	ND
2023–2024	CDB 16	ND	0.93	ND	0.31	ND	ND	3.34	ND	ND
2023–2024	CDB 17	0.36	1.18	ND	0.22	ND	0.55	1.87	ND	ND
2023–2024	CDB 18	0.66	0.67	ND	ND	ND	ND	1.59	ND	ND
2023–2024	CDB 19	0.58	1.82	ND	ND	ND	0.79	2.47	ND	0.38
2023–2024	CDB 20	ND	0.57	ND	ND	ND	ND	0.74	ND	ND
2024–2025	CDB 01	ND	0.48	ND	ND	ND	ND	0.79	ND	ND
2024–2025	CDB 02	0.48	ND	ND	ND	ND	ND	1.01	ND	ND
2024–2025	CDB 04	1.05	1.01	ND	ND	ND	ND	2.08	ND	ND
2024–2025	CDB 05	ND	0.49	ND	ND	ND	ND	0.88	ND	ND
2024–2025	CDB 06	0.3	ND	ND	ND	ND	ND	1.02	ND	ND
2024–2025	CDB 07	ND	ND	ND	ND	ND	ND	0.87	ND	ND
2024–2025	CDB 08	ND	0.48	ND	ND	ND	ND	0.93	ND	ND
2024–2025	CDB 09	0.39	0.59	ND	ND	ND	ND	1.01	ND	ND
2024–2025	CDB 10	1.13	0.95	ND	ND	ND	0.89	1.08	ND	ND
2024–2025	CDB 11	0.81	0.51	ND	ND	ND	0.92	1.1	ND	ND
2024–2025	CDB 12	3.95	5.12	ND	ND	ND	1.86	ND	ND	ND

Note: ND = Not detected.

**Table S4.** Mass spectrometry parameters and transitions. The source conditions include capillary temperature 220 °C, vaporizer temperature 210 °C, sheath gas 30 psi, aux gas pressure 2 psi, and spray voltage −3000 V.

Analyte	Precursor Ion	Product Ions	Single Reaction Monitoring Collision Energy (V)	Retention Time (Min)	Tube Lens
<i>Perfluoroalkyl carboxylic acids</i>					
PFBA	212.9	115.1	23	1.45	31
		168.9	12		
PFPeA	262.9	187.1	17	1.69	43
		218.9	11		
PFHxA	312.9	268.9	11	2.20	45
		297.1	13		
PFHpA	362.9	168.9	19	3.30	49
		318.9	12		
PFOA	412.8	168.9	19	5.19	70
		368.9	12		
PFNA	462.8	218.8	18	6.64	56
		418.9	13		
PFDA	512.9	268.9	18	7.73	66
		468.9	14		
PFUnA	562.9	268.8	19	8.61	68
		518.9	13		
PFDoA	612.9	318.8	20	9.33	78
		568.9	14		
PFTTrDA	662.9	354.9	31	9.92	73
		618.9	15		
PFTeDA	712.9	168.8	28	10.42	82
		668.9	15		
<i>Perfluoroalkyl sulfonic acids</i>					
PFBS	298.9	79.9	37	1.90	92
		98.8	34		
PFPeS	348.9	79.9	46	2.85	112
		98.8	37		
PFHxS	398.8	79.9	42	4.50	113
		98.8	36		
PFHpS	448.9	79.9	46	6.15	123
		98.8	40		
PFOS	498.8	79.9	50	7.28	135
		98.8	44		
PFNS	548.93	80.1	50	8.21	125
		98.91	51		
PFDS	598.9	79.9	59	8.95	149
		98.8	50		
PFDoS	698.9	80.1	55	10.09	135
		98.99	51		
<i>Fluorotelomer sulfonic acids</i>					
4:2FTS	326.9	79.9	31	2.00	102
		306.9	29		
6:2FTS	426.9	80.7	31	4.60	102
		406.9	23		
8:2FTS	526.9	80.2	39	7.44	127
		506.9	26		
<i>Fluorotelomer carboxylic acids</i>					
3:3 FTCA	240.997	117.02	31	3.50	89
		136.95	18		
5:3 FTCA	340.991	216.98	23	7.05	29
		237.03	17		
7:3 FTCA	441.001	317.02	22	9.21	107
		337.02	37		
<i>Perfluorosulfonamides</i>					
PFOSA	497.9	79.9	39	9.49	127
		478	22		
NMeFOSA	512	168.9	29	10.46	153
		218.9	25		
NEtFOSA	525.979	168.97	28	10.88	76
		219.01	25		
NMeFOSAA	569.9	418.9	21	8.86	113
		482.9	18		
NEtFOSAA	583.9	418.9	22	9.37	239
		525.9	21		
NMeFOSE	615.989	59.36	20	10.36	67
		59.06	59		
NEtFOSE	630.004	59.06	59	10.77	67
		59.06	59		
<i>Perfluoroethers</i>					
HFPO-DA	285.014	169.04	7	2.57	61
		185.06	17		
ADONA	377.1	85.1	42	3.74	47
		251.1	13		
PFMPA	229	136.03	22	1.49	70
		85	14		

PFMBA	278.992	85.01 235.33	14 6	1.83	51
NFDHA	294.955	85.02 201.03	22 12	2.10	57
PFEESA	314.9	83.4 135.1	20 25	2.32	73
<i>Chlorinated PFAS</i>					
9Cl-PF3ONS	530.7	83.2 350.9	44 23	7.90	74
11Cl-PF3OUdS	630.9	82.9 451	31 28	10.36	122

**Table S5.** List of PFAS limits of detection (LOD) and quantitation (LOQ).

Class	Chain Length	PFAS	LOD	LOQ	R <sup>2</sup>
Carboxylic Acids	4	PFBA	1.25	4.17	0.9990
	5	PFPeA	0.38	1.28	0.9997
	6	PFHxA	0.33	1.09	0.9990
	7	PFHpA	0.49	1.64	0.9993
	8	PFOA	1.55	5.17	0.9994
	9	PFNA	0.49	1.63	0.9999
	10	PFDA	0.46	1.54	0.9998
	11	PFUnA	0.61	2.04	0.9997
	12	PFDoA	0.37	1.22	0.9991
	13	PFTTrDA	0.48	1.61	0.9996
Sulfonic Acids	14	PFTeDA	0.21	0.69	0.9995
	4	PFBS	0.25	0.82	0.9979
	5	PFPeS	1.09	3.62	0.9990
	6	PFHxS	0.96	3.22	0.9996
	7	PFHpS	0.47	1.58	0.9987
	8	PFOS	6.42	21.40	0.9984
Fluorotelomer Sulfonic Acids	9	PFNS	17.13	57.12	0.9935
	10	PFDS	1.46	4.86	0.9983
	12	PFDoS	2.54	8.48	0.9978
Fluorotelomer Sulfonic Acids	6	4:2FTS	1.79	5.95	0.9989
	8	6:2 FTS	0.79	2.62	0.9998
	10	8:2 FTS	0.57	1.91	0.9989
Sulfonamides	8	FOSA	6.42	21.40	0.9984
	8	NMeFOSA	0.52	1.73	0.9992
	8	NEtFOSE	3.62	12.07	0.9994
Sulfonamidoacetic Acids	8	NMeFOSAA	0.38	1.27	0.9991
	8	NetFOSAA	0.40	1.35	0.9998
Sulfoamide Ethanol	8	NMeFOSE	2.76	9.21	0.9985
	8	NEtFOSE	3.62	12.07	0.9994
Ether Carboxylic Acids	5	HFPO-DA	0.95	3.18	0.9995
	9	ADONA	0.35	1.15	0.9998
	4	PFMPA	0.77	2.57	0.9996
	5	PFMBA	0.90	3.00	0.9997
	5	NFDHA	0.82	2.73	0.9988
Ether Sulfonic Acids	8	9Cl-PFO3NS	0.59	1.95	0.9977
	10	11Cl-PF3OUdS	0.57	1.89	0.9967
	4	PFEESA	0.79	2.62	0.9980
Fluorotelomer Carboxylic Acids	6	3:3 FTCA	0.74	2.47	0.9949
	8	5:3 FTCA	2.83	9.44	0.9982
	10	7:3 FTCA	1.48	4.93	0.9958

**Table S6.** PFAS extraction efficiencies from the recovery study.

Class	PFAS	Recovery (%)	Error (%)
Carboxylic Acids	PFBA	78.4	3.1
	PFPeA	83.1	9.0
	PFHxA	84.2	3.5
	PFHpA	77.9	5.9
	PFOA	82.6	11.6
	PFNA	74.4	7.6
	PFDA	70.6	3.8
	PFUnA	73.6	6.7
	PFDoA	76.8	8.6
	PFTTrDA	77.3	7.0

	PFTeDA	76.8	11.6	
	PFBS	101.3	18.9	
	PFPeS	84.1	6.3	
	PFHxS	73.5	10.7	
Sulfonic Acids	PFHpS	81.1	9.7	
	PFOS	84.9	16.1	
	PFNS	72.2	59.4	
	PFDS	85.8	6.8	
	PFDoS	86.4	15.8	
		4:2FTS	92.8	9.5
	Fluorotelomer Sulfonic Acid	6:2 FTS	82.6	10.4
8:2 FTS		78.3	6.6	
		FOSA	21.3	18.2
Sulfonamides	NEtFOSA	NA	NA	
	NMeFOSA	NA	NA	
		NMeFOSAA	61.2	3.8
Sulfonamidoacetic Acids	NetFOSAA	60.8	12.2	
		NMeFOSE	3.7	4.6
Sulfonamide Ethanol	NEtFOSE	25.1	13.7	
		HFPO-DA	72.2	10.3
Ether Carboxylic Acids	ADONA	74.8	9.5	
	PFMPA	79.8	16.1	
	PFMBA	83.8	7.7	
	NFDHA	78.2	11.4	
		9Cl-PFO3NS	80.7	9.0
Ether Sulfonic Acids	11Cl-PF3OUdS	85.2	10.7	
	PFEESA	83.0	12.7	
		3:3 FTCA	15.3	2.5
Fluorotelomer Carboxylic Acids	5:3 FTCA	27.2	3.6	
	7:3 FTCA	30.2	10.3	

Note: NA = Not applicable.

**Table S7.** Response factor pairing for PFAS quantification.

Native PFAS	Parent Ion	Surrogate PFAS	Parent Ion
PFOS	498.8	M8PFOS	506.9
PFBA	212.9	MPFBA	216.9
PFMPA	229	MPFBA	216.9
PFPeA	262.9	M5PFPeA	267.9
PFBS	298.9	M3PFBS	301.9
PFMBA	278.991	M5PFPeA	267.9
PFEESA	314.9	M3PFBS	301.9
NFDHA	294.955	M5PFHxA	318
4:2 FTS	326.9	M2-4:2FTS	328.9
PFHxA	312.9	M5PFHxA	318
HFPODA	285.014	M5PFPeA	267.9
3:3 FTCA	240.997	M5PFHxA	318
PFHpA	362.9	M4PFHpA	366.9
PFHXS	398.8	M3PFHxS	401.9
ADONA	377.1	M4PFHpA	366.9
6:2 FTS	426.9	M2-6:2FTS	428.9
PFHpS	448.9	M8PFOS	506.9
PFOA	412.8	M8PFOA	420.9
PFPeS	348.9	M3PFHxS	401.9
PFNA	462.8	M9PFNA	471.9
9ClPFO3NS	530.7	M8PFOS	420.9
5:3 FTCA	340.991	M8PFOA	420.9
8:2 FTS	526.9	M2-8:2FTS	526.9
PFDA	512.9	M6PFDA	518.9
NMeFOSAA	569.9	D3-N-MeFOSAA	573
PFDS	589.9	M2-8:2FTS	526.9
PFUnA	562.9	M7PFUnA	569.9
NetFOSAA	583.9	d5-N-ET-FOSAA	589

11Cl-PF3OUdS	630.9	M2-8:2FTS	526.9
PFDoA	612.9	MPFDOA	614.9
7:3 FTCA	441.001	M6PFDA	518.9
PFOA	497.9	M8FOSA	505.9
PFDoS	698.9	M2-8:2FTS	536.9
PFTTrDA	662.9	M2PFTeDA	714.9
PFTeDA	712.9	M2PFTeDA	714.9
N-MEFOSA	512	D3-N-MeFOSAA	573
NEtFOSE	630.004	d5-N-ET-FOSAA	589
NMEFOSE	615.989	D3-N-MeFOSAA	573
N-EtFOSA	525.979	d5-N-ET-FOSAA	589

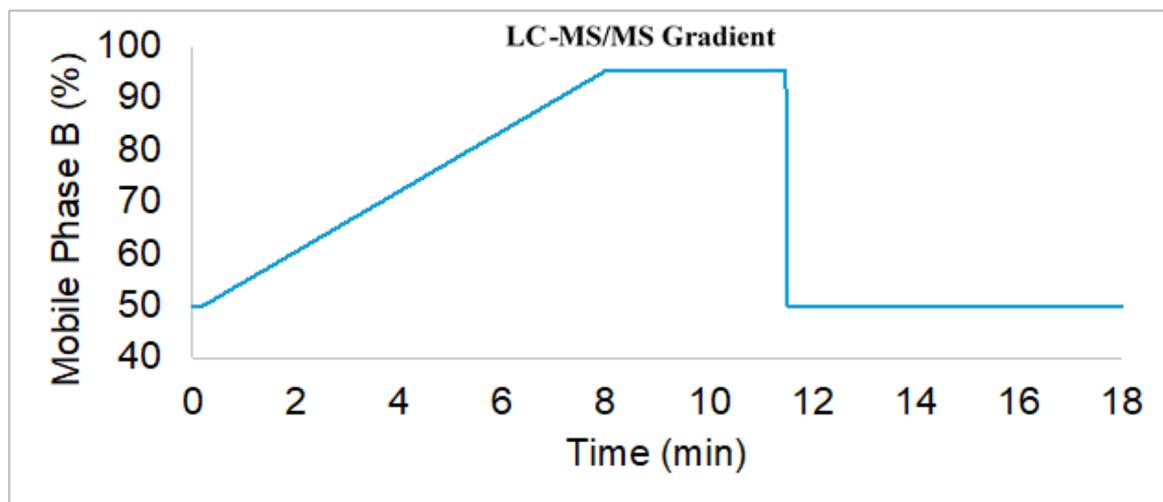
**Table S8.** *p*-values for statistical comparisons.

Variable	Comparison	P-value
Detection PFPeA	Colony-season cohort (df = 3)	0.0443
Detection PFPeA	Cabo Dos Bahías 2023–Cabo Dos Bahías 2024	0.0856
Detection PFPeA	Cabo Dos Bahías 2023–Cabo Dos Bahías 2025	1.0000
Detection PFPeA	Cabo Dos Bahías 2024–Cabo Dos Bahías 2025	1.0000
Detection PFPeA	Cabo Dos Bahías 2023–San Lorenzo 2023	1.0000
Detection PFPeA	Cabo Dos Bahías 2024–San Lorenzo 2023	0.2078
Detection PFPeA	Cabo Dos Bahías 2025–San Lorenzo 2023	1.0000
Detection PFPeA	Deployment period (df = 2)	0.6430
Detection PFPeA	Long deployment–Medium deployment	NA
Detection PFPeA	Long deployment–Short deployment	NA
Detection PFPeA	Medium deployment–Short deployment	NA
Detection PFHxA	Colony-season cohort (df = 3)	<0.0001
Detection PFHxA	Cabo Dos Bahías 2023–Cabo Dos Bahías 2024	<0.0001
Detection PFHxA	Cabo Dos Bahías 2023–Cabo Dos Bahías 2025	0.0896
Detection PFHxA	Cabo Dos Bahías 2024–Cabo Dos Bahías 2025	0.2709
Detection PFHxA	Cabo Dos Bahías 2023–San Lorenzo 2023	1.0000
Detection PFHxA	Cabo Dos Bahías 2024–San Lorenzo 2023	0.0006
Detection PFHxA	Cabo Dos Bahías 2025–San Lorenzo 2023	0.5167
Detection PFHxA	Deployment period (df = 2)	0.0103
Detection PFHxA	Long deployment–Medium deployment	0.0435
Detection PFHxA	Long deployment–Short deployment	0.0550
Detection PFHxA	Medium deployment–Short deployment	1.0000
Detection PFHxS	Colony-season cohort (df = 3)	0.2825
Detection PFHxS	Cabo Dos Bahías 2023–Cabo Dos Bahías 2024	NA
Detection PFHxS	Cabo Dos Bahías 2023–Cabo Dos Bahías 2025	NA
Detection PFHxS	Cabo Dos Bahías 2024–Cabo Dos Bahías 2025	NA
Detection PFHxS	Cabo Dos Bahías 2023–San Lorenzo 2023	NA
Detection PFHxS	Cabo Dos Bahías 2024–San Lorenzo 2023	NA
Detection PFHxS	Cabo Dos Bahías 2025–San Lorenzo 2023	NA
Detection PFHxS	Deployment period (df = 2)	0.2043
Detection PFHxS	Long deployment–Medium deployment	NA
Detection PFHxS	Long deployment–Short deployment	NA
Detection PFHxS	Medium deployment–Short deployment	NA
Detection PFHpA	Colony-season cohort (df = 3)	0.0005
Detection PFHpA	Cabo Dos Bahías 2023–Cabo Dos Bahías 2024	0.0231
Detection PFHpA	Cabo Dos Bahías 2023–Cabo Dos Bahías 2025	1.0000
Detection PFHpA	Cabo Dos Bahías 2024–Cabo Dos Bahías 2025	0.0210
Detection PFHpA	Cabo Dos Bahías 2023–San Lorenzo 2023	1.0000
Detection PFHpA	Cabo Dos Bahías 2024–San Lorenzo 2023	0.2444
Detection PFHpA	Cabo Dos Bahías 2025–San Lorenzo 2023	1.0000
Detection PFHpA	Deployment period (df = 2)	0.4093
Detection PFHpA	Long deployment–Medium deployment	NA
Detection PFHpA	Long deployment–Short deployment	NA
Detection PFHpA	Medium deployment–Short deployment	NA
Detection PFOS	Colony-season cohort (df = 3)	0.2340
Detection PFOS	Cabo Dos Bahías 2023–Cabo Dos Bahías 2024	NA
Detection PFOS	Cabo Dos Bahías 2023–Cabo Dos Bahías 2025	NA
Detection PFOS	Cabo Dos Bahías 2024–Cabo Dos Bahías 2025	NA

Detection PFOS	Cabo Dos Bahías 2023–San Lorenzo 2023	NA
Detection PFOS	Cabo Dos Bahías 2024–San Lorenzo 2023	NA
Detection PFOS	Cabo Dos Bahías 2025–San Lorenzo 2023	NA
Detection PFOS	Deployment period (df = 2)	0.4533
Detection PFOS	Long deployment–Medium deployment	NA
Detection PFOS	Long deployment–Short deployment	NA
Detection PFOS	Medium deployment–Short deployment	NA
Detection HFPO-DA	Colony-season cohort (df = 3)	0.0325
Detection HFPO-DA	Cabo Dos Bahías 2023–Cabo Dos Bahías 2024	0.1633
Detection HFPO-DA	Cabo Dos Bahías 2023–Cabo Dos Bahías 2025	1.0000
Detection HFPO-DA	Cabo Dos Bahías 2024–Cabo Dos Bahías 2025	0.3845
Detection HFPO-DA	Cabo Dos Bahías 2023–San Lorenzo 2023	0.4514
Detection HFPO-DA	Cabo Dos Bahías 2024–San Lorenzo 2023	1.0000
Detection HFPO-DA	Cabo Dos Bahías 2025–San Lorenzo 2023	1.0000
Detection HFPO-DA	Deployment period (df = 2)	0.6317
Detection HFPO-DA	Long deployment–Medium deployment	NA
Detection HFPO-DA	Long deployment–Short deployment	NA
Detection HFPO-DA	Medium deployment–Short deployment	NA
Detection 6:2 FTS	Colony-season cohort (df = 3)	<0.0001
Detection 6:2 FTS	Cabo Dos Bahías 2023–Cabo Dos Bahías 2024	0.0448
Detection 6:2 FTS	Cabo Dos Bahías 2023–Cabo Dos Bahías 2025	<0.0001
Detection 6:2 FTS	Cabo Dos Bahías 2024–Cabo Dos Bahías 2025	0.0058
Detection 6:2 FTS	Cabo Dos Bahías 2023–San Lorenzo 2023	NA
Detection 6:2 FTS	Cabo Dos Bahías 2024–San Lorenzo 2023	0.1509
Detection 6:2 FTS	Cabo Dos Bahías 2025–San Lorenzo 2023	<0.0001
Detection 6:2 FTS	Deployment period (df = 2)	<0.0001
Detection 6:2 FTS	Long deployment–Medium deployment	0.0089
Detection 6:2 FTS	Long deployment–Short deployment	<0.0001
Detection 6:2 FTS	Medium deployment–Short deployment	1.0000
Detection NMeFOSAA	Colony-season cohort (df = 3)	0.1447
Detection NMeFOSAA	Cabo Dos Bahías 2023–Cabo Dos Bahías 2024	NA
Detection NMeFOSAA	Cabo Dos Bahías 2023–Cabo Dos Bahías 2025	NA
Detection NMeFOSAA	Cabo Dos Bahías 2024–Cabo Dos Bahías 2025	NA
Detection NMeFOSAA	Cabo Dos Bahías 2023–San Lorenzo 2023	NA
Detection NMeFOSAA	Cabo Dos Bahías 2024–San Lorenzo 2023	NA
Detection NMeFOSAA	Cabo Dos Bahías 2025–San Lorenzo 2023	NA
Detection NMeFOSAA	Deployment period (df = 2)	0.0096
Detection NMeFOSAA	Long deployment–Medium deployment	0.1087
Detection NMeFOSAA	Long deployment–Short deployment	1.0000
Detection NMeFOSAA	Medium deployment–Short deployment	0.2667
Detection NEtFOSAA	Colony-season cohort (df = 3)	0.5069
Detection NEtFOSAA	Cabo Dos Bahías 2023–Cabo Dos Bahías 2024	NA
Detection NEtFOSAA	Cabo Dos Bahías 2023–Cabo Dos Bahías 2025	NA
Detection NEtFOSAA	Cabo Dos Bahías 2024–Cabo Dos Bahías 2025	NA
Detection NEtFOSAA	Cabo Dos Bahías 2023–San Lorenzo 2023	NA
Detection NEtFOSAA	Cabo Dos Bahías 2024–San Lorenzo 2023	NA
Detection NEtFOSAA	Cabo Dos Bahías 2025–San Lorenzo 2023	NA
Detection NEtFOSAA	Deployment period (df = 2)	0.3208
Detection NEtFOSAA	Long deployment–Medium deployment	NA
Detection NEtFOSAA	Long deployment–Short deployment	NA
Detection NEtFOSAA	Medium deployment–Short deployment	NA
Concentration PFPeA	Colony-season cohort (df = 3)	0.0271
Concentration PFPeA	Cabo Dos Bahías 2023–Cabo Dos Bahías 2024	0.0009
Concentration PFPeA	Cabo Dos Bahías 2023–Cabo Dos Bahías 2025	1.0000
Concentration PFPeA	Cabo Dos Bahías 2024–Cabo Dos Bahías 2025	0.0195
Concentration PFPeA	Cabo Dos Bahías 2023–San Lorenzo 2023	1.0000
Concentration PFPeA	Cabo Dos Bahías 2024–San Lorenzo 2023	0.0002
Concentration PFPeA	Cabo Dos Bahías 2025–San Lorenzo 2023	1.0000
Concentration PFPeA	Deployment period (df = 2)	0.2018
Concentration PFPeA	Long deployment–Medium deployment	0.2393
Concentration PFPeA	Long deployment–Short deployment	1.0000
Concentration PFPeA	Medium deployment–Short deployment	0.6475
Concentration PFHxA	Colony-season cohort (df = 3)	<0.0001

Concentration PFHxA	Cabo Dos Bahías 2023–Cabo Dos Bahías 2024	<0.0001
Concentration PFHxA	Cabo Dos Bahías 2023–Cabo Dos Bahías 2025	0.5415
Concentration PFHxA	Cabo Dos Bahías 2024–Cabo Dos Bahías 2025	0.0059
Concentration PFHxA	Cabo Dos Bahías 2023–San Lorenzo 2023	1.0000
Concentration PFHxA	Cabo Dos Bahías 2024–San Lorenzo 2023	<0.0001
Concentration PFHxA	Cabo Dos Bahías 2025–San Lorenzo 2023	0.9583
Concentration PFHxA	Deployment period (df = 2)	0.0570
Concentration PFHxA	Long deployment–Medium deployment	0.0838
Concentration PFHxA	Long deployment–Short deployment	0.2852
Concentration PFHxA	Medium deployment–Short deployment	0.6077
Concentration PFHxS	Colony-season cohort (df = 3)	0.2853
Concentration PFHxS	Cabo Dos Bahías 2023–Cabo Dos Bahías 2024	0.5587
Concentration PFHxS	Cabo Dos Bahías 2023–Cabo Dos Bahías 2025	0.8350
Concentration PFHxS	Cabo Dos Bahías 2024–Cabo Dos Bahías 2025	1.0000
Concentration PFHxS	Cabo Dos Bahías 2023–San Lorenzo 2023	1.0000
Concentration PFHxS	Cabo Dos Bahías 2024–San Lorenzo 2023	1.0000
Concentration PFHxS	Cabo Dos Bahías 2025–San Lorenzo 2023	1.0000
Concentration PFHxS	Deployment period (df = 2)	0.2107
Concentration PFHxS	Long deployment–Medium deployment	0.2562
Concentration PFHxS	Long deployment–Short deployment	0.9769
Concentration PFHxS	Medium deployment–Short deployment	0.6983
Concentration PFHpA	Colony-season cohort (df = 3)	0.0003
Concentration PFHpA	Cabo Dos Bahías 2023–Cabo Dos Bahías 2024	0.0028
Concentration PFHpA	Cabo Dos Bahías 2023–Cabo Dos Bahías 2025	1.0000
Concentration PFHpA	Cabo Dos Bahías 2024–Cabo Dos Bahías 2025	0.0025
Concentration PFHpA	Cabo Dos Bahías 2023–San Lorenzo 2023	1.0000
Concentration PFHpA	Cabo Dos Bahías 2024–San Lorenzo 2023	0.0240
Concentration PFHpA	Cabo Dos Bahías 2025–San Lorenzo 2023	1.0000
Concentration PFHpA	Deployment period (df = 2)	0.4307
Concentration PFHpA	Long deployment–Medium deployment	0.9495
Concentration PFHpA	Long deployment–Short deployment	1.0000
Concentration PFHpA	Medium deployment–Short deployment	0.5879
Concentration PFOS	Colony-season cohort (df = 3)	0.2134
Concentration PFOS	Cabo Dos Bahías 2023–Cabo Dos Bahías 2024	0.9911
Concentration PFOS	Cabo Dos Bahías 2023–Cabo Dos Bahías 2025	0.2541
Concentration PFOS	Cabo Dos Bahías 2024–Cabo Dos Bahías 2025	1.0000
Concentration PFOS	Cabo Dos Bahías 2023–San Lorenzo 2023	1.0000
Concentration PFOS	Cabo Dos Bahías 2024–San Lorenzo 2023	1.0000
Concentration PFOS	Cabo Dos Bahías 2025–San Lorenzo 2023	1.0000
Concentration PFOS	Deployment period (df = 2)	0.5012
Concentration PFOS	Long deployment–Medium deployment	1.0000
Concentration PFOS	Long deployment–Short deployment	0.8244
Concentration PFOS	Medium deployment–Short deployment	1.0000
Concentration HFPO-DA	Colony-season cohort (df = 3)	0.0767
Concentration HFPO-DA	Cabo Dos Bahías 2023–Cabo Dos Bahías 2024	0.4831
Concentration HFPO-DA	Cabo Dos Bahías 2023–Cabo Dos Bahías 2025	1.0000
Concentration HFPO-DA	Cabo Dos Bahías 2024–Cabo Dos Bahías 2025	0.8271
Concentration HFPO-DA	Cabo Dos Bahías 2023–San Lorenzo 2023	0.1890
Concentration HFPO-DA	Cabo Dos Bahías 2024–San Lorenzo 2023	1.0000
Concentration HFPO-DA	Cabo Dos Bahías 2025–San Lorenzo 2023	0.3362
Concentration HFPO-DA	Deployment period (df = 2)	0.6480
Concentration HFPO-DA	Long deployment–Medium deployment	1.0000
Concentration HFPO-DA	Long deployment–Short deployment	1.0000
Concentration HFPO-DA	Medium deployment–Short deployment	1.0000
Concentration 6:2 FTS	Colony-season cohort (df = 3)	<0.0001
Concentration 6:2 FTS	Cabo Dos Bahías 2023–Cabo Dos Bahías 2024	0.0609
Concentration 6:2 FTS	Cabo Dos Bahías 2023–Cabo Dos Bahías 2025	<0.0001
Concentration 6:2 FTS	Cabo Dos Bahías 2024–Cabo Dos Bahías 2025	0.0635
Concentration 6:2 FTS	Cabo Dos Bahías 2023–San Lorenzo 2023	1.0000
Concentration 6:2 FTS	Cabo Dos Bahías 2024–San Lorenzo 2023	0.1361
Concentration 6:2 FTS	Cabo Dos Bahías 2025–San Lorenzo 2023	0.0001
Concentration 6:2 FTS	Deployment period (df = 2)	<0.0001
Concentration 6:2 FTS	Long deployment–Medium deployment	0.0040

Concentration 6:2 FTS	Long deployment–Short deployment	<0.0001
Concentration 6:2 FTS	Medium deployment–Short deployment	1.0000
Concentration NMeFOSAA	Colony-season cohort (df = 3)	0.1470
Concentration NMeFOSAA	Cabo Dos Bahías 2023–Cabo Dos Bahías 2024	0.9429
Concentration NMeFOSAA	Cabo Dos Bahías 2023–Cabo Dos Bahías 2025	1.0000
Concentration NMeFOSAA	Cabo Dos Bahías 2024–Cabo Dos Bahías 2025	1.0000
Concentration NMeFOSAA	Cabo Dos Bahías 2023–San Lorenzo 2023	1.0000
Concentration NMeFOSAA	Cabo Dos Bahías 2024–San Lorenzo 2023	0.3056
Concentration NMeFOSAA	Cabo Dos Bahías 2025–San Lorenzo 2023	0.4684
Concentration NMeFOSAA	Deployment period (df = 2)	0.0126
Concentration NMeFOSAA	Long deployment–Medium deployment	0.0095
Concentration NMeFOSAA	Long deployment–Short deployment	1.0000
Concentration NMeFOSAA	Medium deployment–Short deployment	0.0332
Concentration NMeFOSAA	Colony-season cohort (df = 3)	0.5269
Concentration NMeFOSAA	Cabo Dos Bahías 2023–Cabo Dos Bahías 2024	1.0000
Concentration NMeFOSAA	Cabo Dos Bahías 2023–Cabo Dos Bahías 2025	1.0000
Concentration NMeFOSAA	Cabo Dos Bahías 2024–Cabo Dos Bahías 2025	1.0000
Concentration NMeFOSAA	Cabo Dos Bahías 2023–San Lorenzo 2023	1.0000
Concentration NMeFOSAA	Cabo Dos Bahías 2024–San Lorenzo 2023	1.0000
Concentration NMeFOSAA	Cabo Dos Bahías 2025–San Lorenzo 2023	1.0000
Concentration NMeFOSAA	Deployment period (df = 2)	0.2914
Concentration NMeFOSAA	Long deployment–Medium deployment	0.5494
Concentration NMeFOSAA	Long deployment–Short deployment	1.0000
Concentration NMeFOSAA	Medium deployment–Short deployment	0.3500



**Figure S1.** LC-MS/MS mobile phase gradient. The gradient starts at 50% mobile phase A (5 mM ammonium acetate in water: acetonitrile (19:1)) and 50% mobile phase B (acetonitrile: methanol (1:1 v/v)). Mobile phase B increases to 95% (0–8 min) and is held constant for 3.5 min. Then, the mobile phase B is returned to its starting condition of 50% (11.5–18 min). The phases were held constant for 5 min to allow for column equilibration.