# Supplementary Information

## Bioaccumulation of fluorotelomer sulfonates and perfluoroalkyl acids in marine organisms living in aqueous film-forming foam (AFFF) impacted waters

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## Sampling, sample preparation, and analysis

***Sampling***

Sediments and small crabs were sampled from a radius of 20 m from the emission point. Sediments were sampled using a plexiglas tube (7.5 cm diameter) which was pushed into the sea floor to a depth of approximately 10 cm. Water depth varied between stations. Approximate water depths at the different stations were: A - 3 m, B – 1 m, C – 1 m, D – 1 m, E – 5 m, F – 5 m, H – 3 m.

Fish traps used for catching edible crab and fish were placed approximately 200 m from shore, in deeper water compared to sampling of small crabs and sediment, to enable sampling (as it was not possible to catch fish within 20 m from the emission points). Approximate water depths at the different stations were: A - 15 m, B – 5 m, C – 7 m, D – 7 m, E – 20 m, F – 20 m, H – 30 m.

***Analysis***

The list of target PFAS analysed varied between media (see table S4). Sediments were analysed for 30 PFAS compounds, water was analysed for 19 PFAS compounds, passive samplers were analysed for 15 PFAS compounds and biota were analysed for 22 PFAS compounds.

Analysis of PFAS were carried out at the accredited laboratory Eurofins GfA Lab Service GmbH (in Germany), according to DIN EN ISO/IEC 17025:2005. All extracts were analysed using high performance liquid chromatography and mass spectrometric detection (HPLC/MS-MS).

***SorbiCell conceptual basis and deployment***

Passive samplers were used to measure total concentrations in the fjord water (sea water) at all stations. The conceptual basis of the passive sampler, the SorbiCell, is previously described[1] and summarized here. Passive samplers can be used to determine time integrated average concentrations without the need for high resolution water sampling. The SorbiCell sampler is an advective passive flow through sampler with an entrance filter, a tailored sorbent material for the compounds of interest, and a tracer salt for the calculation of the volume of water which has passed through the sampler. The entrance filter allows both freely dissolved and the small particle bound pollutant fraction (< 100 µm) to be adsorbed by the sorbent material. Containers for collecting the water which has flown through the sampler were used as a control for the calculated water volumes (based on the tracer salt).

The tailored sorbent for PFAS analysis was purchased from Eurofins Environment Testing Norway AS. SorbiCell cartridges were pre-wetted with Millipore water prior to deployment, using a syringe. This was done in order to expel all air from the tracer salt and resin matrices, thereby establishing good capillary contact with the surrounding water. Passive samplers were deployed in the fjord, as close as

possible to the emission point, 0.5 meters below the water surface. Passive samplers were collected 3 weeks after deployment, the cartridges were placed in sealed tubes which were put in cooled insulated containers, and sent for chemical analysis.

***Extraction of water samples***

Water was extracted for PFAS following method DIN 38407-F42, involving solid-phase extraction (SPE) followed by basic methanol elution, evaporation, and re-dissolving in methanol. Thirteen internal standards were used ($^{13}C_2$-$H_4$PFOS, $^{13}C_4$-PFOS, $^{13}C_2$-PFDoA, $^{18}O_2$-PFHxS, $^{13}C_8$-PFOSA, $^{13}$C2-$M_2$PFTeDA, $^{13}C_3$-$M_3$PFBS, $^{13}C_4$-PFBA, $^{13}C_2$-PFHxA, $^{13}C_8$-PFOA, $^{13}C_5$-PFNA, 13$C_2$-PFDA, and $^{13}C_2$-PFUnA).

***Extraction of sediments***

PFAS concentrations in sediments were quantified using method DIN 38414-S14, involving methanol or acetonitrile, ultrasonic extraction with a multi-step solvent clean-up, using SPE.

***Extraction of passive samplers (SorbiCell)***

SorbiCell were analysed for PFAS by extracting the sorbent using methanol.

***Extraction of biotic tissue***

Approximately 1.5 g material (0.92 g – 1.64 g tissue from crabs, snails and fish muscle, and 0.18 g-0.91 g fish liver) were extracted for PFAS analysis. Samples were freeze dried and 18 surrogate standards ($^{13}$C-PFOS, $^{13}C_2$-PFDoA, $^{18}0_2$-PFHxS, $^{18}0_2$-PFHxS, $^{13}C_8$-PFOSA, $^{13}C_2$-PFTeDA, $^{13}$C-PFBS, $^{13}$C-PFBS, $^{13}C_4$-PFHpA, $^{13}C_5$-PFPeA, $^{13}C_2$-6:2FTS, $^{13}C_2$-6:2FTS, $^{13}C_4$-PFBA, $^{13}C_2$-PFHxA, $^{13}C_8$-PFOA, $^{13}C_5$-PFNA, $^{13}C_2$-PFDA, and $^{13}C_2$-PFUnA) were added before extraction with methanol in an ultrasonic bath. After vaporization, acetonitrile and hexane were added for solvent exchange, and the acetonitrile phase was isolated and cleaned up. Following this the acetonitrile was vaporized and dissolved in methanol. $^{13}C_4$-PFOA was used as internal (injection) standard. The LOQ was calculated based on sample intake weight. For results below the LOQ, the method LOQ was divided by the weight of sample intake in order to get the sample specific LOQ (raw data, see table S5). For data treatment of results below the LOQ, half the LOQ was used.

## Data treatment and statistics

***Biological parameters***

Concentrations (C) in whole fish (µg/kg) were calculated using the weight of the whole fish (kg), the liver weight (kg), and the concentrations in liver and remaining tissue (µg/kg):

$$C\ whole\ fish\ (\mu g/kg) = \frac{(C\ remaining\ tissue\ (\mu g/kg)\ x\ weight\ remaining\ tissue\ (kg))\ +\ (C\ liver\ (\mu g/kg)\ x\ weight\ liver\ (kg))}{weight\ whole\ fish\ (kg)}$$

Fulton's condition factor (K):

$$K\ =\ \frac{Whole\ body\ weight\ (g)}{Length\ (cm)^3} \times 100$$

Liver Somatic Index (LSI):

$$LSI\ =\ \frac{Liver\ weight\ (g)}{Total\ body\ weight\ (g)} \times 100$$

***Statistical methods***

Data handling was performed in Microsoft Excel 2013. Statistical analysis was carried out using R version 3.4.2.[2] Concentrations below the LOQ are treated as half the LOQ. The significance level (p) was set to 0.05 ($p \leq 0.05$).

PFOS concentrations in cod liver and whole fish were not normally distributed according to the Shapiro-Wilk w-test (function: shapiro.test). Some individuals had a considerably higher PFAS body burden compared to the general level, causing a positive skew in the dataset. Therefore, the non-parametric unpaired Wilcoxon Test/Mann–Whitney U test (function: wilcox.test) was used to test differences between PFOS concentrations in cod caught near the Air Station and cod caught at the Reference Station. Similarly, several groups in the dataset for the proportional levels of 6:2 FTS were positively skewed, hence significance testing was performed using the non-parametric Kruskal-Wallis test and Bonferroni correction (package: agricolae[4], functions: shapiro.test, kruskal.test, kruskal).

Potential trends between length, weight, Fulton's condition factor (K), or liver somatic index and $\Sigma_{22}$ PFAS were evaluated using Spearman's rank correlation coefficient (Spearman's rho) (function: cor.test).

Differences in PFAS profiles between different organisms and tissues were evaluated using Principal Components analysis (PCA) (packages factoextra[5] and FactoMineR[6], functions: prcomp, fviz_pca) in combination with the multivariate PERMANOVA tool followed by Bonferroni correction (package vegan[3], functions: adonis, pairwise.adonis).

# Supplementary tables

*Table S1 Sampling time for storm water at the different stations.*

| Station | June 2015 | January 2016 | February 2016 | Mars 2016 | April 2016 | May 2016 | September 2016 |
|---|---|---|---|---|---|---|---|
| A | | | | X | X | X | |
| B | X | X | X | | X | X | |
| C | | | | X | X | X | |
| D | X | X | X | | X | X | |
| E | X | X | X | | X | X | |
| F | | | | | | X[1] | X[1] |
| G | | | | X | X | X | |
| H | X | X | X | | X | X | |
| Ref. | | | | | | | |

[1] *Sampled soil leachate water*

*Table S2 Total number of analysed samples of snails, crabs and fish at each station*

| Station | A | B | C | D | E | F | G | H | Ref. |
|---|---|---|---|---|---|---|---|---|---|
| *Carcinus maenas (whole organisms)* | Mixed sample (n = 8) | 1 | Mixed sample (n = 4) | Mixed sample (n = 11) | n.f. | Mixed sample (n = 2) | n.f. | Mixed sample (n = 4) | Mixed sample (n = 4) |
| *Hyas araneus (whole organisms)* | Mixed sample (n = 2) | Mixed sample (n = 1) | Mixed sample (n = 5) | n.f. | Mixed sample (n = 7) | Mixed sample (n = 6) | n.f. | Mixed sample (n = 1) | Mixed sample (n = 4) |
| *Cancer pagurus* (hepatopancreas) | n.f. | n.f. | n.f. | 2 | 1 | 1 | 3 | n.f. | 2 |
| *Gadus morhua* (liver) | 4 | 3 | 1 | 5 | 2 | 2 | 5 | 3 | 6 |
| *Gadus morhua* (whole fish[1]) | 4 | 3 | 1 | 5 | 2 | 2 | 5 | 3 | 6 |
| *Pleuronectes platessa* (liver) | 2 | n.f. | n.f. | 2 | 1 | n.f. | n.f. | n.f. | n.f. |
| *Pleuronectes platessa* (whole fish[1]) | 2 | n.f. | n.f. | 2 | 1 | n.f. | n.f. | n.f. | n.f. |
| *Microstomus kitt* (liver) | n.f. | 1 | n.f. | n.f. | n.f. | n.f. | n.f. | n.f. | n.f. |
| *Microstomus kitt* (whole fish[1]) | n.f. | 1 | n.f. | n.f. | n.f. | n.f. | n.f. | n.f. | n.f. |

[1] *Calculated concentration from concentration in remaining tissue after removal of liver and stomach content combined with liver concentration. n.f. = not found at the specific station*

*Table S3.1 Fish weight, fork length, Fulton's condition factor (K), liver weight, and liver somatic index*

| Organism | Sampling station | Sample name | Weight (g) | Length (cm) | Fulton's K | Weight liver (g) | Liver somatic index |
|---|---|---|---|---|---|---|---|
| Atlantic cod | A | A-T-1 | 1670 | 59.2 | 0.80 | - [1] | - [1] |
| | | A-T-3 | 570 | 40.6 | 0.85 | 1.50 | 0.27 |
| | | A-T-4 | 1520 | 50.3 | 1.19 | 15.21 | 1.03 |
| | | A-T-5 | 1630 | 57.3 | 0.87 | - [1] | - [1] |
| | | A-T-6 | 720 | 43.3 | 0.89 | 3.01 | 0.44 |
| | B | B-T-1 | 130 | 26.8 | 0.68 | 0.24 | 0.20 |
| | | B-T-2 | 260 | 31 | 0.87 | 0.32 | 0.14 |
| | | B-T-3 | 250 | 31.2 | 0.82 | 0.76 | 0.36 |
| | C | C-T-1 | 1120 | 54.7 | 0.68 | 3.03 | 0.31 |
| | D | D-T-2 | 1230 | 51 | 0.93 | 8.06 | 0.79 |
| | | D-T-3 | 700 | 43.9 | 0.83 | 1.71 | 0.26 |
| | | D-T-4 | 450 | 37.7 | 0.84 | 0.81 | 0.19 |
| | | D-T-5 | 1030 | 49 | 0.88 | 1.26 | 0.14 |
| | | D-T-6 | 320 | 35.4 | 0.72 | 1.17 | 0.40 |
| | E | E-T-1 | 2800 | 66.2 | 0.97 | 10.26 | 0.42 |
| | | E-T-2 | 350 | 34.4 | 0.86 | 0.19 | 0.05 |
| | | E-T-3 | 80 | 24.9 | 0.52 | - [1] | - [1] |
| | F | F-T-1 | 190 | 29.5 | 0.74 | 1.62 | 0.96 |
| | | F-T-2 | 210 | 30.1 | 0.77 | 0.18 | 0.09 |
| | G | G-T-1 | 2020 | 63.6 | 0.79 | 17.72 | 0.89 |
| | | G-T-2 | 1770 | 61.3 | 0.77 | 14.74 | 0.83 |
| | | G-T-3 | 1970 | 61.7 | 0.84 | 60.50 | 3.17 |
| | | G-T-4 | 1190 | - | - | 8.93 | 0.76 |
| | | G-T-5 | 1500 | 57.5 | 0.79 | 3.85 | 0.31 |
| | H | H-T-1 | 8340 | 92.2 | 1.06 | 242.49 | 3.27 |
| | | H-T-2 | 990 | 45 | 1.09 | 8.82 | 0.93 |
| | | H-T-3 | 1130 | 49.8 | 0.91 | 8.66 | 0.81 |
| | Reference station | Ref-T-1 | 1620 | 56.7 | 0.89 | 17.03 | 1.11 |
| | | Ref-T-2 | 1470 | 54.3 | 0.92 | 18.95 | 1.33 |
| | | Ref-T-3 | 2420 | 63.8 | 0.93 | 18.26 | 0.83 |
| | | Ref-T-4 | 2120 | 63.1 | 0.84 | 18.81 | 0.92 |
| | | Ref-T-5 | 1810 | 55.6 | 1.05 | 14.32 | 0.83 |
| | | Ref-T-6 | 3210 | 71.5 | 0.88 | 79.77 | 3.02 |
| European plaice | A | A-R-1 | 530 | 36.8 | 1.06 | 1.09 | 0.21 |
| | | A-R-2 | 360 | 33 | 1.00 | 2.21 | 0.68 |
| | D | D-R-1 | 760 | 39.8 | 1.21 | 2.05 | 0.31 |
| | | D-R-2 | 430 | 35.2 | 0.99 | 1.55 | 0.40 |
| | E | E-R-1 | 420 | 33.9 | 1.08 | 2.71 | 0.70 |
| Lemon sole | B | B-L-1 | 340 | 34.5 | 0.83 | 0.42 | 0.13 |

[1] Liver was lost and liver weight could not be measured

*Table S3.2 Crab weight, carapace length and sex*

| Organism | Sampling station | Sample type | Sample name | Male | Female | Weight (g) [1] | Length (cm) [1] |
|---|---|---|---|---|---|---|---|
| Great spider crab | A | Mixed sample | A-PK | 1 | 1 | - | - |
| Green shore crab | | | A-SK | 5 | 2 | - | - |
| Great spider crab | B | | B-PK | 1 | 0 | - | - |
| Green shore crab | | | B-SK | 0 | 1 | - | - |
| Great spider crab | C | | C-PK | 3 | 1 | - | - |
| Green shore crab | | | C-SK | 2 | 2 | - | - |
| Green shore crab | D | | D-SK | 7 | 4 | - | - |
| Great spider crab | E | | E-PK | 3 | 4 | - | - |
| Great spider crab | F | | F-PK | 3 | 3 | - | - |
| Green shore crab | | | F-SK | 2 | 0 | - | - |
| Great spider crab | H | | H-PK | 1 | 0 | - | - |
| Green shore crab | | | H-SK | 2 | 2 | - | - |
| Great spider crab | Reference station | | Ref-PK | 3 | 1 | - | - |
| Green shore crab | | | Ref-SK | 2 | 2 | - | - |
| Edible crab | D | Individual | D-TK-1 | Male | | 526 | 15.1 |
| | | | D-TK-2 | Male | | 350 | 14.1 |
| | E | | E-TK-1 | Male | | - | - |
| | F | | F-TK-1 | Male | | 912 | 17.7 |
| | G | | G-TK-1 | Female | | 329 | 13.4 |
| | | | G-TK-2 | Female | | 384 | 13.4 |
| | | | G-TK-3 | Male | | 232 | 11.2 |
| | Reference station | | Ref-TK-1 | Male | | 371 | 13.5 |
| | | | Ref-TK-2 | Male | | 452 | 14.9 |

[1] Small crabs (Great spider crab and Green shore crab) were analysed as mixed samples of whole organisms, and individual length and weight were not measured.

*Table S4. Analysed PFAS compounds. Compounds are grouped according to chemical structure. Abbreviations are given in round brackets ( ). SED = sediment, WAT = water, PAS = passive sampler, BIO = biota*

| **Compound** | SED | WAT | PAS | BIO |
|---|---|---|---|---|
| 4:2 Fluorotelomer sulfonate (4:2 FTS) | X | | | X |
| 6:2 Fluorotelomer sulfonate (6:2 FTS) | X | X | X | X |
| 8:2 Fluorotelomer sulfonate (8:2 FTS) | X | X | X | X |
| Perfluorobutanoic acid (PFBA) | X | X | X | X |
| Perfluoropentanoic acid (PFPeA) | X | X | X | X |
| Perfluorohexanoic acid (PFHxA) | X | X | X | X |
| Perfluoroheptanoic acid (PFHpA) | X | X | X | X |
| Perfluorooctanoic acid (PFOA) | X | X | X | X |
| Perfluorononanoic acid (PFNA) | X | X | X | X |
| Perfluorodecanoic acid (PFDeA) | X | X | X | X |
| Perfluoroundecanoic acid (PFUnA) | X | X | X | X |
| Perfluorododecanoic acid (PFDoA) | X | X | | X |
| Perfluorotridecanoic acid (PFTrDA) | X | X | | X |
| Perfluorotetradecanoic acid (PFTA) | X | X | | X |
| Perfluorohexadecanoic acid (PFHxDA) | X | | | |
| Perfluorobutane sulfonic acid (PFBS) | X | X | X | X |
| Perfluorohexane sulfonic acid (PFHxS) | X | X | X | X |
| Perfluoroheptane sulfonic acid (PFHpS) | X | X | | X |
| Perfluorooctane sulfonic acid (PFOS) | X | X | X | X |
| Perfluorodecane sulfonic acid (PFDS) | X | X | X | X |
| N-ethylperfluorooctane sulfonamide (EtFOSA) | X | | | |
| N-ethylperfluorooctane sulfonamide acetic acid (EtFOSAA) | X | | | |
| N-ethylperfluorooctane sulfonamide ethanol (EtFOSE) | X | | | |
| N-methylperfluorooctane sulfonamide acetic acid (MeFOSAA) | X | | | |
| N-methylperfluorooctane sulfonamide ethanol (MeFOSE) | X | | | |
| N-methylperfluorooctane sulfonamide (MeFOSA) | X | | | |
| Perfluorooctane sulfonamide acetic acid (FOSAA) | X | | | |
| Perfluoro-3,7-dimethyl-octanoic acid (PF-3,7-DMOA) | X | | | X |
| Perfluorooctane sulfonamide (PFOSA) | X | X | X | X |
| 7H dodecane fluoroheptanoic acid (HPFHpA) | X | | | X |
| Total number of PFAS | 30 | 19 | 15 | 22 |

*Table S5. Ratio of liver to whole fish (including liver) concentrations. Of the 22-PFAS analysed only compounds detected in both liver and in remaining whole fish are included. Numbers in brackets indicate the total number of individuals with concentrations above detection limit for each compound.*

| **Species/compound** | | **Median** | **Average** | **Standard error of mean (SEM)** | **Max** | **Min** |
|---|---|---|---|---|---|---|
| **Atlantic cod (*Gadus morhua*)** | | | | | | |
| FTS | 8:2 FTS [2] | 3.87 | 3.87 | 0.76 | 4.63 | 3.10 |
| Short chained PFCA | PFBA [2] | 1.50 | 1.50 | 0.09 | 1.58 | 1.41 |
| Long chained PFCA | PFNA [19] | 2.04 | 2.87 | 0.40 | 7.25 | 1.16 |
| | PFDeA [19] | 2.56 | 2.80 | 0.32 | 6.23 | 0.99 |
| | PFUnA [26] | 2.19 | 2.81 | 0.33 | 7.97 | 1.24 |
| | PFDoA [4] | 3.31 | 3.43 | 0.33 | 4.32 | 2.78 |
| | PFTrA [21] | 2.72 | 3.46 | 0.57 | 10.79 | 0.75 |
| Long chained PFSA | PFHxS [1] | 3.40 | 3.40 | - | 3.40 | 3.40 |
| | PFOS [30] | 2.91 | 3.54 | 0.35 | 9.95 | 1.52 |
| | PFOSA [12] | 3.47 | 4.88 | 1.19 | 14.65 | 0.80 |
| **European place (*Pleuronectes platessa*)** | | | | | | |
| Long chained PFCA | PFNA [4] | 3.54 | 3.05 | 0.58 | 3.78 | 1.33 |
| | PFDeA [4] | 2.80 | 2.43 | 0.42 | 2.94 | 1.19 |
| | PFUnA [5] | 3.16 | 2.68 | 0.51 | 3.86 | 1.28 |
| | PFTrA [4] | 2.54 | 2.57 | 0.51 | 3.64 | 1.55 |
| Long chained PFSA | PFOS [5] | 3.02 | 2.46 | 0.45 | 3.38 | 0.96 |
| **Lemon sole (*Microstomus kitt*)** | | | | | | |
| Long chained PFCA | PFOA [1] | 1.93 | 1.93 | - | 1.93 | 1.93 |
| | PFNA [1] | 1.95 | 1.95 | - | 1.95 | 1.95 |
| Long chained PFSA | PFOS [1] | 2.40 | 2.40 | - | 2.40 | 2.40 |

*Table S6. Relative fraction of analysed PFAS compounds in biota from the Air Station (stations A-H) given as a % of sum 22-PFAS (in bold). Concentrations below the LOQ are treated as half the LOQ. Standard error of means (SEM) are given in the row below (not for Lemon sole where n=1) .*

| | **Atlantic cod** *remaining tissue* | **Atlantic cod** *liver* | **European place** *remaining tissue* | **European place** *liver* | **Lemon sole** *remaining tissue* | **Lemon sole** *liver* | **Snail (Patellidae)** *Soft tissue* | **Green shore crab** *whole organisms* | **Great spider crab** *whole organisms* | **Edible crab** *hepatopancreas* |
|---|---|---|---|---|---|---|---|---|---|---|
| **4:2 FTS** | **1.81** | **2.71** | **1.69** | **2.04** | **4.53** | **4.97** | **1.80** | **1.58** | **1.81** | **0.74** |
| | 0.16 | 0.22 | 0.38 | 0.33 | | | 0.42 | 0.66 | 0.51 | 0.16 |
| **6:2 FTS** | **1.48** | **2.03** | **1.26** | **6.92** | **3.40** | **3.73** | **12.84** | **21.81** | **25.14** | **24.34** |
| | 0.13 | 0.17 | 0.29 | 5.43 | | | 5.15 | 10.05 | 10.98 | 10.32 |
| **8:2 FTS** | **2.37** | **3.95** | **1.69** | **6.49** | **4.53** | **4.97** | **6.58** | **1.75** | **1.86** | **4.40** |
| | 0.26 | 0.53 | 0.38 | 3.43 | | | 1.50 | 0.62 | 0.49 | 2.20 |
| **PFBA** | **2.39** | **1.78** | **0.84** | **3.09** | **2.27** | **2.48** | **0.91** | **0.79** | **0.90** | **1.36** |
| | 0.86 | 0.30 | 0.19 | 1.47 | | | 0.21 | 0.33 | 0.26 | 0.48 |
| **PFPeA** | **0.91** | **1.43** | **1.12** | **1.02** | **2.27** | **2.48** | **0.93** | **0.79** | **0.90** | **0.48** |
| | 0.08 | 0.12 | 0.42 | 0.17 | | | 0.20 | 0.33 | 0.26 | 0.10 |
| **PFHxA** | **0.91** | **1.35** | **0.84** | **1.02** | **2.27** | **2.48** | **0.91** | **0.79** | **0.90** | **0.37** |
| | 0.08 | 0.11 | 0.19 | 0.17 | | | 0.21 | 0.33 | 0.26 | 0.08 |
| **PFHpA** | **0.91** | **1.35** | **0.84** | **1.02** | **2.27** | **2.48** | **0.90** | **0.79** | **0.90** | **0.37** |
| | 0.08 | 0.11 | 0.19 | 0.17 | | | 0.21 | 0.33 | 0.26 | 0.08 |
| **PFOA** | **1.30** | **1.48** | **0.98** | **1.02** | **6.91** | **5.27** | **0.93** | **0.82** | **0.91** | **6.92** |
| | 0.18 | 0.14 | 0.19 | 0.17 | | | 0.20 | 0.32 | 0.25 | 2.72 |
| **PFNA** | **5.14** | **3.85** | **12.76** | **12.40** | **11.96** | **9.24** | **0.96** | **0.83** | **1.31** | **5.47** |
| | 0.44 | 0.46 | 3.07 | 3.76 | | | 0.20 | 0.32 | 0.38 | 1.33 |
| **PFDeA** | **4.57** | **3.57** | **8.65** | **6.54** | **2.27** | **2.48** | **0.92** | **1.04** | **1.53** | **2.65** |
| | 0.40 | 0.46 | 1.53 | 1.74 | | | 0.21 | 0.28 | 0.43 | 0.67 |
| **PFUnA** | **8.09** | **6.13** | **7.90** | **6.74** | **2.27** | **2.48** | **0.90** | **1.61** | **2.11** | **4.65** |
| | 0.84 | 0.63 | 0.58 | 1.26 | | | 0.21 | 0.36 | 0.62 | 1.42 |
| **PFDoA** | **1.58** | **1.50** | **1.05** | **1.02** | **2.27** | **2.48** | **0.90** | **1.25** | **0.90** | **1.18** |
| | 0.20 | 0.11 | 0.20 | 0.17 | | | 0.21 | 0.26 | 0.26 | 0.43 |
| **PFTrA** | **6.14** | **5.36** | **3.59** | **2.51** | **2.27** | **2.48** | **1.17** | **3.38** | **2.65** | **3.86** |
| | 0.66 | 0.95 | 0.75 | 0.32 | | | 0.24 | 0.73 | 1.02 | 1.04 |
| **PFTA** | **0.99** | **1.35** | **0.84** | **1.02** | **2.27** | **2.48** | **0.90** | **0.98** | **0.90** | **1.11** |
| | 0.09 | 0.11 | 0.19 | 0.17 | | | 0.21 | 0.29 | 0.26 | 0.34 |
| **PFBS** | **1.36** | **2.03** | **1.26** | **1.53** | **3.40** | **3.73** | **1.35** | **1.19** | **1.35** | **0.80** |
| | 0.12 | 0.17 | 0.29 | 0.25 | | | 0.32 | 0.50 | 0.38 | 0.19 |
| **PFHxS** | **1.51** | **2.08** | **1.72** | **1.53** | **3.40** | **3.73** | **1.36** | **2.28** | **1.53** | **3.22** |
| | 0.10 | 0.15 | 0.66 | 0.25 | | | 0.31 | 0.44 | 0.31 | 0.58 |
| **PFHpS** | **1.39** | **2.03** | **1.26** | **1.53** | **3.40** | **3.73** | **1.35** | **1.26** | **1.45** | **0.56** |
| | 0.11 | 0.17 | 0.29 | 0.25 | | | 0.32 | 0.47 | 0.34 | 0.12 |
| **PFOS** | **36.91** | **37.56** | **45.61** | **34.59** | **23.30** | **22.13** | **52.16** | **47.29** | **38.75** | **33.70** |
| | 2.72 | 2.88 | 1.59 | 5.32 | | | 6.51 | 9.40 | 4.50 | 4.61 |
| **PFDS** | **1.36** | **2.03** | **1.26** | **1.53** | **3.40** | **3.73** | **1.35** | **1.19** | **1.35** | **0.56** |
| | 0.12 | 0.17 | 0.29 | 0.25 | | | 0.32 | 0.50 | 0.38 | 0.12 |
| **PF-3,7-DMOA** | **1.81** | **2.97** | **1.69** | **2.04** | **4.53** | **4.97** | **1.80** | **1.58** | **1.81** | **0.81** |
| | 0.16 | 0.33 | 0.38 | 0.33 | | | 0.42 | 0.66 | 0.51 | 0.13 |
| **PFOSA** | **15.25** | **10.74** | **1.44** | **2.38** | **2.27** | **2.48** | **7.27** | **5.41** | **9.22** | **1.71** |
| | 2.94 | 3.01 | 0.53 | 1.40 | | | 1.87 | 1.29 | 2.81 | 0.78 |
| **HPFHpA** | **1.81** | **2.71** | **1.69** | **2.04** | **4.53** | **4.97** | **1.80** | **1.59** | **1.81** | **0.74** |
| | 0.16 | 0.22 | 0.38 | 0.33 | | | 0.42 | 0.67 | 0.51 | 0.16 |

*Table S7. Concentrations of 22-PFAS detected in biota. Concentrations below LOQ are denoted as < followed by the sample specific LOQ*

| **Tissue** | | **Snail (*Patellidae*)** | **Snail (*Patellidae*)** | **Snail (*Patellidae*)** | **Snail (*Patellidae*)** | **Snail (*Patellidae*)** | **Snail (*Patellidae*)** |
|---|---|---|---|---|---|---|---|
| **Sample name** | | **Snail A** | **Snail B** | **Snail B - 2** | **Snail C** | **Snail C - 2** | **Snail D** |
| Comment | | Station A | Station B | Station B: 30 - 100 m from emission source[1] | Station C | Station C: 20 - 100 m from emission source[1] | Station D |
| 4:2 FTS | µg/kg | < 0.0858 | < 0.0849 | < 0.0811 | < 0.0848 | < 0.0794 | < 0.0977 |
| 6:2 FTS | µg/kg | < 0.0643 | 0.13 | < 0.0608 | < 0.0636 | 0.142 | < 0.0733 |
| 8:2 FTS | µg/kg | 0.0874 | 0.449 | 0.245 | < 0.0848 | < 0.0794 | < 0.0977 |
| PFBA | µg/kg | < 0.0429 | < 0.0425 | < 0.0406 | < 0.0424 | < 0.0397 | < 0.0488 |
| PFPeA | µg/kg | < 0.0429 | < 0.0425 | < 0.0406 | < 0.0424 | < 0.0397 | < 0.0488 |
| PFHxA | µg/kg | < 0.0429 | < 0.0425 | < 0.0406 | < 0.0424 | < 0.0397 | < 0.0488 |
| PFHpA | µg/kg | < 0.0429 | < 0.0425 | < 0.0406 | < 0.0424 | < 0.0397 | < 0.0488 |
| PFOA | µg/kg | < 0.0429 | < 0.0425 | < 0.0406 | < 0.0424 | < 0.0397 | < 0.0488 |
| PFNA | µg/kg | < 0.0429 | < 0.0425 | < 0.0406 | < 0.0424 | < 0.0397 | < 0.0488 |
| PFDeA | µg/kg | < 0.0429 | < 0.0425 | < 0.0406 | < 0.0424 | < 0.0397 | < 0.0488 |
| PFUnA | µg/kg | < 0.0429 | < 0.0425 | < 0.0406 | < 0.0424 | < 0.0397 | < 0.0488 |
| PFDoA | µg/kg | < 0.0429 | < 0.0425 | < 0.0406 | < 0.0424 | < 0.0397 | < 0.0488 |
| PFTrA | µg/kg | < 0.0429 | 0.0666 | < 0.0406 | < 0.0424 | < 0.0397 | < 0.0488 |
| PFTA | µg/kg | < 0.0429 | < 0.0425 | < 0.0406 | < 0.0424 | < 0.0397 | < 0.0488 |
| PFBS | µg/kg | < 0.0643 | < 0.0637 | < 0.0608 | < 0.0636 | < 0.0595 | < 0.0733 |
| PFHxS | µg/kg | < 0.0643 | < 0.0637 | < 0.0608 | < 0.0636 | < 0.0595 | < 0.0733 |
| PFHpS | µg/kg | < 0.0643 | < 0.0637 | < 0.0608 | < 0.0636 | < 0.0595 | < 0.0733 |
| PFOS | µg/kg | 7.37 | 1.23 | 0.361 | 0.635 | 0.476 | 2.57 |
| PFDS | µg/kg | < 0.0643 | < 0.0637 | < 0.0608 | < 0.0636 | < 0.0595 | < 0.0733 |
| PF-3.7-DMOA | µg/kg | < 0.0858 | < 0.0849 | < 0.0811 | < 0.0848 | < 0.0794 | < 0.0977 |
| PFOSA | µg/kg | 0.636 | 0.274 | 0.438 | 0.0698 | 0.0735 | 0.129 |
| HPFHpA | µg/kg | < 0.0858 | < 0.0849 | < 0.0811 | < 0.0848 | < 0.0794 | < 0.0977 |
| Sum PFAS excl. LOQ | µg/kg | 8.1 | 2.15 | 1.04 | 0.705 | 0.692 | 2.7 |

[1] In four stations (B, C, E, and F), an additional sample of snails was collected approximately 100 m from the emission source

| **Tissue** | | **Snail (*Patellidae*)** | **Snail (*Patellidae*)** | **Snail (*Patellidae*)** | **Snail (*Patellidae*)** | **Snail (*Patellidae*)** | **Snail (*Patellidae*)** |
|---|---|---|---|---|---|---|---|
| **Sample name** | | **Snail E** | **Snail E - 2** | **Snail F** | **Snail F – 2** | **Snail G** | **Snail H** |
| Comment | | Station E: Stream outlet | Station E: 140 m from emission source[1] | Station F: soil leachate | Station F: 90 m east of emission source[1] | Station G | Station H: south side |
| 4:2 FTS | µg/kg | < 0.0816 | < 0.0905 | < 0.0896 | < 0.0988 | < 0.0727 | < 0.0909 |
| 6:2 FTS | µg/kg | 3.68 | 0.926 | 56.3 | 1.11 | 0.146 | < 0.0682 |
| 8:2 FTS | µg/kg | 0.634 | 0.352 | 8.29 | 0.447 | < 0.0727 | < 0.0909 |
| PFBA | µg/kg | < 0.0408 | < 0.0452 | 0.136 | < 0.0494 | < 0.0364 | < 0.0455 |
| PFPeA | µg/kg | 0.0632 | < 0.0452 | 0.177 | < 0.0494 | < 0.0364 | < 0.0455 |
| PFHxA | µg/kg | < 0.0408 | < 0.0452 | 0.0832 | < 0.0494 | < 0.0364 | < 0.0455 |
| PFHpA | µg/kg | < 0.0408 | < 0.0452 | 0.0562 | < 0.0494 | < 0.0364 | < 0.0455 |
| PFOA | µg/kg | 0.0475 | < 0.0452 | 0.234 | < 0.0494 | < 0.0364 | < 0.0455 |
| PFNA | µg/kg | 0.0647 | < 0.0452 | 0.434 | < 0.0494 | < 0.0364 | < 0.0455 |
| PFDeA | µg/kg | 0.0429 | < 0.0452 | 0.135 | < 0.0494 | < 0.0364 | < 0.0455 |
| PFUnA | µg/kg | < 0.0408 | < 0.0452 | 0.0571 | < 0.0494 | < 0.0364 | < 0.0455 |
| PFDoA | µg/kg | < 0.0408 | < 0.0452 | < 0.0448 | < 0.0494 | < 0.0364 | < 0.0455 |
| PFTrA | µg/kg | < 0.0408 | 0.0479 | 0.094 | 0.0827 | < 0.0364 | < 0.0455 |
| PFTA | µg/kg | < 0.0408 | < 0.0452 | < 0.0448 | < 0.0494 | < 0.0364 | < 0.0455 |
| PFBS | µg/kg | < 0.0612 | < 0.0679 | < 0.0672 | < 0.0741 | < 0.0545 | < 0.0682 |
| PFHxS | µg/kg | < 0.0612 | < 0.0679 | 0.196 | < 0.0741 | < 0.0545 | < 0.0682 |
| PFHpS | µg/kg | < 0.0612 | < 0.0679 | < 0.0672 | < 0.0741 | < 0.0545 | < 0.0682 |
| PFOS | µg/kg | 14.3 | 3.37 | 12.6 | 2.04 | 4.21 | 0.19 |
| PFDS | µg/kg | < 0.0612 | < 0.0679 | < 0.0672 | < 0.0741 | < 0.0545 | < 0.0682 |
| PF-3.7-DMOA | µg/kg | < 0.0816 | < 0.0905 | < 0.0896 | < 0.0988 | < 0.0727 | < 0.0909 |
| PFOSA | µg/kg | 0.878 | 0.311 | 2.32 | 0.253 | 0.073 | 0.0683 |
| HPFHpA | µg/kg | < 0.0816 | < 0.0905 | < 0.0896 | < 0.0988 | < 0.0727 | < 0.0909 |
| Sum PFAS excl. LOQ | µg/kg | 19.7 | 5.01 | 81.1 | 3.94 | 4.43 | 0.258 |

[1] In four stations (B, C, E, and F), an additional sample of snails were sampled approximately 100 m from the emission source

| **Tissue** | | **Snail (*Patellidae*)** | **Snail (*Patellidae*)** | **Green shore crab (whole)** | **Green shore crab (whole)** | **Green shore crab (whole)** | **Green shore crab (whole)** | **Green shore crab (whole)** |
|---|---|---|---|---|---|---|---|---|
| **Sample name** | | **Snail H - 2** | **Snail Ref.** | **A-SK** | **B-SK** | **C-SK** | **D-SK** | **F-SK** |
| Comment | | Station H: north side | Reference station | Station A | Station B | Station C | Station D | Station F |
| 4:2 FTS | µg/kg | < 0.0684 | < 0.0734 | < 0.219 | < 0.108 | < 0.124 | < 0.153 | < 0.220 |
| 6:2 FTS | µg/kg | 0.121 | < 0.0551 | 0.18 | 3.35 | 1.46 | 0.397 | 12.3 |
| 8:2 FTS | µg/kg | 0.115 | < 0.0734 | < 0.219 | 0.273 | < 0.124 | < 0.153 | < 0.220 |
| PFBA | µg/kg | < 0.0342 | < 0.0367 | < 0.109 | < 0.0538 | < 0.0621 | < 0.0766 | < 0.110 |
| PFPeA | µg/kg | < 0.0342 | < 0.0367 | < 0.109 | < 0.0538 | < 0.0621 | < 0.0766 | < 0.110 |
| PFHxA | µg/kg | < 0.0342 | < 0.0367 | < 0.109 | < 0.0538 | < 0.0621 | < 0.0766 | < 0.110 |
| PFHpA | µg/kg | < 0.0342 | < 0.0367 | < 0.109 | < 0.0538 | < 0.0621 | < 0.0766 | < 0.110 |
| PFOA | µg/kg | < 0.0342 | < 0.0367 | < 0.109 | 0.071 | < 0.0621 | < 0.0766 | < 0.110 |
| PFNA | µg/kg | < 0.0342 | < 0.0367 | < 0.109 | 0.0739 | < 0.0621 | < 0.0766 | < 0.110 |
| PFDeA | µg/kg | < 0.0342 | < 0.0367 | < 0.109 | 0.106 | 0.0737 | 0.114 | < 0.110 |
| PFUnA | µg/kg | < 0.0342 | < 0.0367 | < 0.109 | 0.298 | 0.151 | 0.292 | < 0.110 |
| PFDoA | µg/kg | < 0.0342 | < 0.0367 | < 0.109 | 0.289 | 0.0752 | 0.152 | < 0.110 |
| PFTrA | µg/kg | < 0.0342 | 0.055 | 0.152 | 0.628 | 0.224 | 0.577 | 0.148 |
| PFTA | µg/kg | < 0.0342 | < 0.0367 | < 0.109 | 0.188 | < 0.0621 | 0.078 | < 0.110 |
| PFBS | µg/kg | < 0.0513 | < 0.0551 | < 0.164 | < 0.0807 | < 0.0931 | < 0.115 | < 0.165 |
| PFHxS | µg/kg | < 0.0513 | < 0.0551 | < 0.164 | 0.709 | 0.307 | 0.162 | < 0.165 |
| PFHpS | µg/kg | < 0.0513 | < 0.0551 | < 0.164 | 0.137 | < 0.0931 | < 0.115 | < 0.165 |
| PFOS | µg/kg | 0.805 | 0.0754 | 1.6 | 13.6 | 7.49 | 6.55 | 3.26 |
| PFDS | µg/kg | < 0.0513 | < 0.0551 | < 0.164 | < 0.0807 | < 0.0931 | < 0.115 | < 0.165 |
| PF-3.7-DMOA | µg/kg | < 0.0684 | < 0.0734 | < 0.219 | < 0.108 | < 0.124 | < 0.153 | < 0.220 |
| PFOSA | µg/kg | 0.0717 | < 0.0367 | 0.309 | 1.59 | 0.28 | 0.863 | 0.529 |
| HPFHpA | µg/kg | < 0.0684 | < 0.0734 | < 0.219 | < 0.108 | < 0.124 | < 0.153 | < 0.231 |
| Sum PFAS excl. LOQ | µg/kg | 1.11 | 0.13 | 2.24 | 21.3 | 10.1 | 9.19 | 16.2 |

| **Tissue** | | **Green shore crab (whole)** | **Green shore crab (whole)** | **Great spider crab (whole)** | **Great spider crab (whole)** | **Great spider crab (whole)** | **Great spider crab (whole)** | **Great spider crab (whole)** |
|---|---|---|---|---|---|---|---|---|
| **Sample name** | | **H-SK** | **Ref-SK** | **A-PK** | **B-PK-1** | **C-PK** | **C-PK-2** | **E-PK** |
| Comment | | Station H | Reference station | Station A | Station B | Station C | Station C: fish trap | Station E: 140 m from emission source |
| 4:2 FTS | µg/kg | < 0.190 | < 0.0994 | < 0.199 | < 0.107 | < 0.141 | < 0.112 | < 0.142 |
| 6:2 FTS | µg/kg | 0.515 | < 0.0745 | < 0.149 | 0.128 | 0.121 | 0.211 | 5.57 |
| 8:2 FTS | µg/kg | < 0.190 | < 0.0994 | < 0.199 | < 0.107 | < 0.141 | < 0.112 | < 0.142 |
| PFBA | µg/kg | < 0.0952 | < 0.0497 | < 0.0996 | < 0.0535 | < 0.0703 | < 0.0559 | < 0.0711 |
| PFPeA | µg/kg | < 0.0952 | < 0.0497 | < 0.0996 | < 0.0535 | < 0.0703 | < 0.0559 | < 0.0711 |
| PFHxA | µg/kg | < 0.0952 | < 0.0497 | < 0.0996 | < 0.0535 | < 0.0703 | < 0.0559 | < 0.0711 |
| PFHpA | µg/kg | < 0.0952 | < 0.0497 | < 0.0996 | < 0.0535 | < 0.0703 | < 0.0559 | < 0.0711 |
| PFOA | µg/kg | < 0.0952 | 0.0525 | < 0.0996 | < 0.0535 | < 0.0703 | < 0.0559 | < 0.0711 |
| PFNA | µg/kg | < 0.0952 | 0.0552 | < 0.0996 | < 0.0535 | < 0.0703 | 0.201 | < 0.0711 |
| PFDeA | µg/kg | < 0.0952 | 0.0728 | < 0.0996 | 0.0612 | < 0.0703 | 0.222 | < 0.0711 |
| PFUnA | µg/kg | < 0.0952 | 0.177 | < 0.0996 | 0.137 | < 0.0703 | 0.211 | 0.0717 |
| PFDoA | µg/kg | < 0.0952 | 0.0814 | < 0.0996 | < 0.0535 | < 0.0703 | < 0.0559 | < 0.0711 |
| PFTrA | µg/kg | 0.0989 | 0.28 | < 0.0996 | 0.225 | < 0.0703 | 0.224 | 0.0903 |
| PFTA | µg/kg | < 0.0952 | < 0.0497 | < 0.0996 | < 0.0535 | < 0.0703 | < 0.0559 | < 0.0711 |
| PFBS | µg/kg | < 0.143 | < 0.0745 | < 0.149 | < 0.0803 | < 0.105 | < 0.0839 | < 0.107 |
| PFHxS | µg/kg | < 0.143 | < 0.0745 | < 0.149 | < 0.0803 | < 0.105 | < 0.0839 | 0.124 |
| PFHpS | µg/kg | < 0.143 | < 0.0745 | < 0.149 | < 0.0803 | < 0.105 | < 0.0839 | < 0.107 |
| PFOS | µg/kg | 0.478 | 0.399 | 1.26 | 0.964 | 0.905 | 3.79 | 3.21 |
| PFDS | µg/kg | < 0.143 | < 0.0745 | < 0.149 | < 0.0803 | < 0.105 | < 0.0839 | < 0.107 |
| PF-3.7-DMOA | µg/kg | < 0.190 | < 0.0994 | < 0.199 | < 0.107 | < 0.141 | < 0.112 | < 0.142 |
| PFOSA | µg/kg | < 0.0952 | < 0.0497 | 0.249 | 0.607 | 0.114 | 1.03 | 0.668 |
| HPFHpA | µg/kg | < 0.192 | < 0.0994 | < 0.199 | < 0.107 | < 0.141 | < 0.112 | < 0.142 |
| Sum PFAS excl. LOQ | µg/kg | 1.09 | 1.12 | 1.51 | 2.12 | 1.14 | 5.89 | 9.73 |

| **Tissue** | | **Great spider crab (whole)** | **Great spider crab (whole)** | **Great spider crab (whole)** | **Edible crab (Hepatopancreas)** | **Edible crab (Hepatopancreas)** | **Edible crab (Hepatopancreas)** | **Edible crab (Hepatopancreas)** |
|---|---|---|---|---|---|---|---|---|
| **Samplename** | | **F-PK** | **H-PK** | **Ref-PK** | **D-TK-1** | **D-TK-2** | **E-TK-1** | **F-TK-1** |
| Comment | | Station F | Station H | Reference station | Station D:fish trap | Station D: fish trap | Station E: fish trap | Station F: fish trap |
| 4:2 FTS | µg/kg | < 0.100 | < 0.130 | < 0.217 | < 0.144 | < 0.178 | < 0.203 | < 0.252 |
| 6:2 FTS | µg/kg | 56.8 | 0.991 | < 0.163 | 0.423 | 0.859 | 26.4 | 1.53 |
| 8:2 FTS | µg/kg | 0.333 | < 0.130 | < 0.217 | 0.221 | 0.508 | 0.551 | < 0.252 |
| PFBA | µg/kg | < 0.0502 | < 0.0650 | < 0.108 | 0.0857 | 0.108 | 0.115 | 0.165 |
| PFPeA | µg/kg | < 0.0502 | < 0.0650 | < 0.108 | 0.0726 | < 0.0892 | < 0.101 | < 0.126 |
| PFHxA | µg/kg | < 0.0502 | < 0.0650 | < 0.108 | < 0.0718 | < 0.0892 | < 0.101 | < 0.126 |
| PFHpA | µg/kg | < 0.0502 | < 0.0650 | < 0.108 | < 0.0718 | < 0.0892 | < 0.101 | < 0.126 |
| PFOA | µg/kg | 0.0715 | < 0.0650 | < 0.108 | 0.298 | 0.243 | 0.791 | 1.76 |
| PFNA | µg/kg | 0.143 | < 0.0650 | < 0.108 | 0.571 | 0.502 | 0.344 | 1.05 |
| PFDeA | µg/kg | 0.103 | < 0.0650 | < 0.108 | 0.382 | 0.446 | 0.203 | 0.33 |
| PFUnA | µg/kg | 0.1 | 0.067 | < 0.108 | 0.593 | 1.03 | 0.284 | 0.496 |
| PFDoA | µg/kg | < 0.0502 | < 0.0650 | < 0.108 | 0.128 | 0.305 | < 0.101 | 0.144 |
| PFTrA | µg/kg | 0.129 | 0.0716 | 0.159 | 0.436 | 0.734 | 0.213 | 0.435 |
| PFTA | µg/kg | < 0.0502 | < 0.0650 | < 0.108 | 0.178 | 0.207 | 0.112 | 0.141 |
| PFBS | µg/kg | < 0.0753 | < 0.0975 | < 0.163 | < 0.108 | < 0.134 | < 0.152 | < 0.189 |
| PFHxS | µg/kg | 0.452 | < 0.0975 | < 0.163 | 0.218 | 0.475 | 0.434 | 0.465 |
| PFHpS | µg/kg | 0.543 | < 0.0975 | < 0.163 | < 0.108 | < 0.134 | < 0.152 | < 0.189 |
| PFOS | µg/kg | 16.2 | 1.13 | 0.344 | 4.04 | 3.84 | 5.45 | 3.52 |
| PFDS | µg/kg | < 0.0753 | < 0.0975 | < 0.163 | < 0.108 | < 0.134 | < 0.152 | < 0.189 |
| PF-3.7-DMOA | µg/kg | < 0.100 | < 0.130 | < 0.217 | < 0.144 | < 0.178 | < 0.203 | < 0.252 |
| PFOSA | µg/kg | 0.588 | 0.147 | 0.26 | 0.474 | 0.117 | 0.228 | < 0.126 |
| HPFHpA | µg/kg | < 0.100 | < 0.130 | < 0.217 | < 0.144 | < 0.178 | < 0.203 | < 0.252 |
| Sum PFAS excl. LOQ | µg/kg | 75.5 | 2.4 | 0.764 | 8.12 | 9.37 | 35.1 | 10 |

| **Tissue** | | **Edible crab (Hepatopancreas)** | **Edible crab (Hepatopancreas)** | **Edible crab (Hepatopancreas)** | **Edible crab (Hepatopancreas)** | **Remaining tissue** | **Liver** | **Remaining tissue** |
|---|---|---|---|---|---|---|---|---|
| **Sample name** | | **G-TK-2** | **G-TK-3** | **Ref-TK-1** | **Ref-TK-2** | **A-T-1** | **A-T-1** | **A-T-3** |
| Comment | | Station G: fish trap | Station G: fish trap | Reference station fish trap | Reference station fish trap | Station A Atlantic cod | Station A Atlantic cod | Station A Atlantic cod |
| 4:2 FTS | µg/kg | < 0.237 | < 0.173 | < 0.0947 | < 0.121 | < 0.110 | < 0.279 | < 0.0990 |
| 6:2 FTS | µg/kg | 2.06 | 10.7 | 0.308 | < 0.0956 | < 0.0821 | < 0.209 | < 0.0742 |
| 8:2 FTS | µg/kg | < 0.237 | 6.15 | 0.386 | < 0.121 | < 0.110 | < 0.279 | < 0.0990 |
| PFBA | µg/kg | 0.388 | 0.266 | 0.338 | < 0.0778 | < 0.0548 | < 0.140 | 0.287 |
| PFPeA | µg/kg | < 0.118 | 0.139 | < 0.0474 | < 0.0604 | < 0.0548 | < 0.140 | < 0.0495 |
| PFHxA | µg/kg | < 0.118 | < 0.0864 | < 0.0474 | < 0.0604 | < 0.0548 | < 0.140 | < 0.0495 |
| PFHpA | µg/kg | < 0.118 | < 0.0864 | 0.0998 | < 0.0604 | < 0.0548 | < 0.140 | < 0.0495 |
| PFOA | µg/kg | 1.63 | 1 | 0.648 | 0.623 | < 0.0548 | < 0.140 | < 0.0495 |
| PFNA | µg/kg | 0.873 | 1.08 | 0.733 | 0.819 | 0.109 | 0.279 | 0.0521 |
| PFDeA | µg/kg | 0.242 | 0.484 | 0.416 | 0.29 | 0.0736 | 0.179 | < 0.0495 |
| PFUnA | µg/kg | 0.356 | 0.851 | 0.507 | 0.42 | 0.155 | 0.342 | 0.0643 |
| PFDoA | µg/kg | < 0.118 | 0.23 | 0.129 | 0.0979 | < 0.0548 | < 0.140 | < 0.0495 |
| PFTrA | µg/kg | 0.532 | 0.511 | 0.97 | 0.442 | 0.161 | 1.08 | 0.082 |
| PFTA | µg/kg | < 0.118 | 0.152 | 0.173 | 0.0799 | < 0.0548 | < 0.140 | < 0.0495 |
| PFBS | µg/kg | < 0.178 | 0.67 | < 0.0711 | < 0.0906 | < 0.0821 | < 0.209 | < 0.0742 |
| PFHxS | µg/kg | 0.469 | 0.924 | 0.416 | 0.569 | < 0.0821 | < 0.209 | < 0.0742 |
| PFHpS | µg/kg | < 0.178 | < 0.130 | < 0.0711 | < 0.0906 | < 0.0821 | < 0.209 | < 0.0742 |
| PFOS | µg/kg | 3.05 | 17 | 4.38 | 5.91 | 0.483 | 1.56 | 0.28 |
| PFDS | µg/kg | < 0.178 | < 0.130 | < 0.0711 | < 0.0906 | < 0.0821 | < 0.209 | < 0.0742 |
| PF-3.7-DMOA | µg/kg | < 0.237 | 0.249 | 0.188 | < 0.121 | < 0.110 | < 0.279 | < 0.0990 |
| PFOSA | µg/kg | 0.16 | 0.357 | 0.356 | 0.197 | 0.132 | < 0.140 | 0.517 |
| HPFHpA | µg/kg | < 0.237 | < 0.173 | < 0.0947 | < 0.121 | < 0.110 | < 0.279 | < 0.0990 |
| Sum PFAS excl. LOQ | µg/kg | 9.75 | 40.7 | 10.1 | 9.45 | 1.11 | 3.44 | 1.28 |

| **Tissue** | | **Liver** | **Remaining tissue** | **Liver** | **Remaining tissue** | **Liver** | **Remaining tissue** | **Liver** |
|---|---|---|---|---|---|---|---|---|
| **Sample name** | | **A-T-3** | **A-T-4** | **A-T-4** | **A-T-5** | **A-T-5** | **A-T-6** | **A-T-6** |
| Comment | | Station A Atlantic cod | Station A Atlantic cod | Station A Atlantic cod | Station A Atlantic cod | Station A Atlantic cod | Station A Atlantic cod | Station A Atlantic cod |
| 4:2 FTS | µg/kg | < 0.476 | < 0.0876 | < 0.411 | < 0.0997 | < 0.426 | < 0.102 | < 0.411 |
| 6:2 FTS | µg/kg | < 0.357 | < 0.0657 | < 0.308 | < 0.0748 | < 0.319 | < 0.0768 | < 0.308 |
| 8:2 FTS | µg/kg | < 0.476 | < 0.0876 | < 0.411 | < 0.0997 | < 0.426 | < 0.102 | < 0.411 |
| PFBA | µg/kg | < 0.238 | < 0.0438 | < 0.205 | < 0.0499 | < 0.213 | 0.131 | 0.208 |
| PFPeA | µg/kg | < 0.238 | < 0.0438 | < 0.205 | < 0.0499 | < 0.213 | < 0.0512 | < 0.205 |
| PFHxA | µg/kg | < 0.238 | < 0.0438 | < 0.205 | < 0.0499 | < 0.213 | < 0.0512 | < 0.205 |
| PFHpA | µg/kg | < 0.238 | < 0.0438 | < 0.205 | < 0.0499 | < 0.213 | < 0.0512 | < 0.205 |
| PFOA | µg/kg | < 0.238 | < 0.0438 | < 0.205 | < 0.0499 | < 0.213 | < 0.0512 | < 0.205 |
| PFNA | µg/kg | < 0.238 | 0.0652 | < 0.205 | 0.101 | < 0.213 | 0.0769 | 0.308 |
| PFDeA | µg/kg | < 0.238 | 0.0705 | 0.217 | 0.119 | < 0.213 | 0.0777 | 0.353 |
| PFUnA | µg/kg | 0.335 | 0.156 | 0.457 | 0.246 | 0.253 | 0.176 | 0.874 |
| PFDoA | µg/kg | < 0.238 | < 0.0438 | < 0.205 | 0.0646 | < 0.213 | < 0.0512 | < 0.205 |
| PFTrA | µg/kg | 0.559 | 0.133 | 0.267 | 0.209 | 0.221 | 0.137 | 0.61 |
| PFTA | µg/kg | < 0.238 | < 0.0438 | < 0.205 | < 0.0499 | < 0.213 | < 0.0512 | < 0.205 |
| PFBS | µg/kg | < 0.357 | < 0.0657 | < 0.308 | < 0.0748 | < 0.319 | < 0.0768 | < 0.308 |
| PFHxS | µg/kg | < 0.357 | < 0.0657 | < 0.308 | < 0.0748 | < 0.319 | < 0.0768 | < 0.308 |
| PFHpS | µg/kg | < 0.357 | < 0.0657 | < 0.308 | < 0.0748 | < 0.319 | < 0.0768 | < 0.308 |
| PFOS | µg/kg | 1.85 | 0.53 | 2.13 | 0.383 | 0.56 | 0.413 | 2.5 |
| PFDS | µg/kg | < 0.357 | < 0.0657 | < 0.308 | < 0.0748 | < 0.319 | < 0.0768 | < 0.308 |
| PF-3.7-DMOA | µg/kg | < 0.476 | < 0.0876 | < 0.411 | < 0.0997 | < 0.426 | < 0.102 | 0.7 |
| PFOSA | µg/kg | 1.56 | 0.207 | < 0.205 | 0.149 | < 0.213 | 0.27 | < 0.205 |
| HPFHpA | µg/kg | < 0.476 | < 0.0876 | < 0.411 | < 0.0997 | < 0.426 | < 0.102 | < 0.411 |
| Sum PFAS excl. LOQ | µg/kg | 4.31 | 1.16 | 3.07 | 1.27 | 1.03 | 1.28 | 5.55 |

| **Tissue** | | **Remaining tissue** | **Liver** | **Remaining tissue** | **Liver** | **Remaining tissue** | **Liver** | **Remaining tissue** |
|---|---|---|---|---|---|---|---|---|
| **Sample name** | | **B-T-1** | **B-T-1** | **B-T-2** | **B-T-2** | **B-T-3** | **B-T-3** | **C-T-1** |
| Comment | | Station B Atlantic cod | Station B Atlantic cod | Station B Atlantic cod | Station B Atlantic cod | Station B Atlantic cod | Station B Atlantic cod | Station C Atlantic cod |
| 4:2 FTS | µg/kg | < 0.0887 | < 0.628 | < 0.106 | < 0.422 | < 0.0962 | < 0.352 | < 0.0897 |
| 6:2 FTS | µg/kg | < 0.0665 | < 0.471 | < 0.0796 | < 0.317 | < 0.0722 | < 0.264 | < 0.0673 |
| 8:2 FTS | µg/kg | < 0.0887 | < 0.628 | < 0.106 | < 0.422 | < 0.0962 | 0.366 | < 0.0897 |
| PFBA | µg/kg | < 0.0444 | < 0.314 | 0.426 | 0.6 | < 0.0481 | < 0.176 | < 0.0449 |
| PFPeA | µg/kg | < 0.0444 | < 0.314 | < 0.0531 | < 0.211 | < 0.0481 | < 0.176 | < 0.0449 |
| PFHxA | µg/kg | < 0.0444 | < 0.314 | < 0.0531 | < 0.211 | < 0.0481 | < 0.176 | < 0.0449 |
| PFHpA | µg/kg | < 0.0444 | < 0.314 | < 0.0531 | < 0.211 | < 0.0481 | < 0.176 | < 0.0449 |
| PFOA | µg/kg | < 0.0444 | < 0.314 | 0.0727 | < 0.211 | 0.051 | < 0.176 | 0.0472 |
| PFNA | µg/kg | 0.0815 | 0.315 | 0.218 | 0.253 | 0.131 | 0.219 | 0.129 |
| PFDeA | µg/kg | 0.0833 | < 0.314 | 0.12 | 0.308 | 0.126 | 0.206 | 0.0957 |
| PFUnA | µg/kg | 0.196 | 0.883 | 0.169 | 0.604 | 0.184 | 0.415 | 0.168 |
| PFDoA | µg/kg | 0.0734 | 0.319 | < 0.0531 | < 0.211 | < 0.0481 | < 0.176 | < 0.0449 |
| PFTrA | µg/kg | 0.408 | 1.16 | 0.146 | 0.58 | 0.144 | 0.502 | 0.177 |
| PFTA | µg/kg | 0.0607 | < 0.314 | < 0.0531 | < 0.211 | < 0.0481 | < 0.176 | < 0.0449 |
| PFBS | µg/kg | < 0.0665 | < 0.471 | < 0.0796 | < 0.317 | < 0.0722 | < 0.264 | < 0.0673 |
| PFHxS | µg/kg | < 0.0665 | < 0.471 | < 0.0796 | < 0.317 | < 0.0722 | < 0.264 | < 0.0673 |
| PFHpS | µg/kg | < 0.0665 | < 0.471 | < 0.0796 | < 0.317 | < 0.0722 | < 0.264 | < 0.0673 |
| PFOS | µg/kg | 1.44 | 7 | 0.677 | 1.49 | 1.15 | 2.59 | 0.422 |
| PFDS | µg/kg | < 0.0665 | < 0.471 | < 0.0796 | < 0.317 | < 0.0722 | < 0.264 | < 0.0673 |
| PF-3.7-DMOA | µg/kg | < 0.0887 | < 0.628 | < 0.106 | < 0.422 | < 0.0962 | < 0.352 | < 0.0897 |
| PFOSA | µg/kg | 0.908 | 3.2 | < 0.0531 | 1.65 | 2 | < 0.176 | < 0.0449 |
| HPFHpA | µg/kg | < 0.0887 | < 0.628 | < 0.106 | < 0.422 | < 0.0962 | < 0.352 | < 0.0897 |
| Sum PFAS excl. LOQ | µg/kg | 3.25 | 12.9 | 1.83 | 5.49 | 3.78 | 4.3 | 1.04 |

| **Tissue** | | **Liver** | **Remaining tissue** | **Liver** | **Remaining tissue** | **Liver** | **Remaining tissue** | **Liver** |
|---|---|---|---|---|---|---|---|---|
| **Sample name** | | **C-T-1** | **D-T-2** | **D-T-2** | **D-T-3** | **D-T-3** | **D-T-4** | **D-T-4** |
| Comment | | Station C Atlantic cod | Station D Atlantic cod | Station D Atlantic cod | Station D Atlantic cod | Station D Atlantic cod | Station D Atlantic cod | Station D Atlantic cod |
| 4:2 FTS | µg/kg | < 0.480 | < 0.107 | < 0.459 | < 0.0944 | < 0.481 | < 0.0922 | < 0.476 |
| 6:2 FTS | µg/kg | < 0.360 | < 0.0801 | < 0.344 | < 0.0708 | < 0.361 | < 0.0692 | < 0.357 |
| 8:2 FTS | µg/kg | < 0.480 | < 0.107 | 0.57 | < 0.0944 | < 0.481 | 0.0966 | < 0.476 |
| PFBA | µg/kg | < 0.240 | < 0.0534 | < 0.229 | < 0.0472 | < 0.241 | < 0.0461 | < 0.238 |
| PFPeA | µg/kg | < 0.240 | < 0.0534 | < 0.229 | < 0.0472 | < 0.241 | < 0.0461 | < 0.238 |
| PFHxA | µg/kg | < 0.240 | < 0.0534 | < 0.229 | < 0.0472 | < 0.241 | < 0.0461 | < 0.238 |
| PFHpA | µg/kg | < 0.240 | < 0.0534 | < 0.229 | < 0.0472 | < 0.241 | < 0.0461 | < 0.238 |
| PFOA | µg/kg | < 0.240 | < 0.0534 | < 0.229 | < 0.0472 | < 0.241 | < 0.0461 | < 0.238 |
| PFNA | µg/kg | 0.78 | 0.0921 | < 0.229 | 0.0841 | < 0.241 | 0.258 | 0.597 |
| PFDeA | µg/kg | 0.534 | 0.109 | < 0.229 | 0.104 | < 0.241 | 0.202 | 0.594 |
| PFUnA | µg/kg | 1.12 | 0.224 | 0.377 | 0.195 | 0.353 | 0.268 | 0.659 |
| PFDoA | µg/kg | < 0.240 | < 0.0534 | < 0.229 | < 0.0472 | < 0.241 | < 0.0461 | < 0.238 |
| PFTrA | µg/kg | 1.97 | 0.129 | 0.257 | 0.153 | < 0.241 | 0.18 | 0.364 |
| PFTA | µg/kg | < 0.240 | < 0.0534 | < 0.229 | < 0.0472 | < 0.241 | < 0.0461 | < 0.238 |
| PFBS | µg/kg | < 0.360 | < 0.0801 | < 0.344 | < 0.0708 | < 0.361 | < 0.0692 | < 0.357 |
| PFHxS | µg/kg | < 0.360 | < 0.0801 | < 0.344 | < 0.0708 | < 0.361 | 0.0841 | < 0.357 |
| PFHpS | µg/kg | < 0.360 | < 0.0801 | < 0.344 | < 0.0708 | < 0.361 | < 0.0692 | < 0.357 |
| PFOS | µg/kg | 3.46 | 0.66 | 2.47 | 0.933 | 2.82 | 1.78 | 5.1 |
| PFDS | µg/kg | < 0.360 | < 0.0801 | < 0.344 | < 0.0708 | < 0.361 | < 0.0692 | < 0.357 |
| PF-3.7-DMOA | µg/kg | < 0.480 | < 0.107 | < 0.459 | < 0.0944 | < 0.481 | < 0.0922 | < 0.476 |
| PFOSA | µg/kg | < 0.240 | < 0.0534 | < 0.229 | 2.54 | 8.78 | 0.293 | < 0.238 |
| HPFHpA | µg/kg | < 0.480 | < 0.107 | < 0.459 | < 0.0944 | < 0.481 | < 0.0922 | < 0.476 |
| Sum PFAS excl. LOQ | µg/kg | 7.87 | 1.21 | 3.67 | 4.01 | 12 | 3.16 | 7.32 |

| **Tissue** | | **Remaining tissue** | **Liver** | **Remaining tissue** | **Liver** | **Remaining tissue** | **Liver** | **Remaining tissue** |
|---|---|---|---|---|---|---|---|---|
| **Sample name** | | **D-T-5** | **D-T-5** | **D-T-6** | **D-T-6** | **E-T-1** | **E-T-1** | **E-T-2** |
| Comment | | Station D Atlantic cod | Station D Atlantic cod | Station D Atlantic cod | Station D Atlantic cod | Station E Atlantic cod | Station E Atlantic cod | Station E Atlantic cod |
| 4:2 FTS | µg/kg | < 0.0893 | < 0.408 | < 0.0973 | < 0.493 | < 0.103 | < 0.494 | < 0.109 |
| 6:2 FTS | µg/kg | < 0.0670 | < 0.306 | < 0.0729 | < 0.369 | < 0.0770 | < 0.370 | 0.157 |
| 8:2 FTS | µg/kg | < 0.0893 | < 0.408 | < 0.0973 | 1.14 | < 0.103 | < 0.494 | 0.215 |
| PFBA | µg/kg | < 0.0446 | < 0.204 | < 0.0486 | < 0.246 | < 0.0514 | < 0.247 | 0.102 |
| PFPeA | µg/kg | < 0.0446 | < 0.204 | < 0.0486 | < 0.246 | < 0.0514 | < 0.247 | < 0.0547 |
| PFHxA | µg/kg | < 0.0446 | < 0.204 | < 0.0486 | < 0.246 | < 0.0514 | < 0.247 | < 0.0547 |
| PFHpA | µg/kg | < 0.0446 | < 0.204 | < 0.0486 | < 0.246 | < 0.0514 | < 0.247 | < 0.0547 |
| PFOA | µg/kg | < 0.0446 | < 0.204 | < 0.0486 | < 0.246 | < 0.0514 | < 0.247 | 0.0727 |
| PFNA | µg/kg | 0.118 | 0.236 | 0.195 | 1.45 | 1.06 | 3.03 | 0.266 |
| PFDeA | µg/kg | 0.0971 | 0.278 | 0.165 | 1.05 | 0.284 | 0.825 | 0.15 |
| PFUnA | µg/kg | 0.167 | 0.349 | 0.206 | 1.69 | 0.259 | 0.774 | 0.207 |
| PFDoA | µg/kg | < 0.0446 | < 0.204 | < 0.0486 | 0.309 | 0.195 | 0.547 | 0.0728 |
| PFTrA | µg/kg | 0.134 | 0.231 | 0.0892 | 0.895 | 0.598 | 1.5 | 0.195 |
| PFTA | µg/kg | < 0.0446 | < 0.204 | < 0.0486 | < 0.246 | 0.0811 | < 0.247 | < 0.0547 |
| PFBS | µg/kg | < 0.0670 | < 0.306 | < 0.0729 | < 0.369 | < 0.0770 | < 0.370 | < 0.0820 |
| PFHxS | µg/kg | < 0.0670 | < 0.306 | < 0.0729 | 0.389 | 0.265 | 0.91 | < 0.0820 |
| PFHpS | µg/kg | < 0.0670 | < 0.306 | < 0.0729 | < 0.369 | 0.109 | < 0.370 | < 0.0820 |
| PFOS | µg/kg | 1.31 | 4.57 | 1.56 | 16.1 | 18 | 70.4 | 2.77 |
| PFDS | µg/kg | < 0.0670 | < 0.306 | < 0.0729 | < 0.369 | < 0.0770 | < 0.370 | < 0.0820 |
| PF-3.7-DMOA | µg/kg | < 0.0893 | < 0.443 | < 0.0973 | < 0.493 | < 0.103 | < 0.494 | < 0.109 |
| PFOSA | µg/kg | 1.35 | 1.08 | 0.487 | 1.58 | 13.4 | 56.4 | 0.61 |
| HPFHpA | µg/kg | < 0.0893 | < 0.408 | < 0.0973 | < 0.493 | < 0.103 | < 0.494 | < 0.109 |
| Sum PFAS excl. LOQ | µg/kg | 3.18 | 6.73 | 2.7 | 24.6 | 34.2 | 134 | 4.82 |

| **Tissue** | | **Liver** | **Remaining tissue** | **Remaining tissue** | **Liver** | **Remaining tissue** | **Liver** | **Remaining tissue** |
|---|---|---|---|---|---|---|---|---|
| **Sample name** | | **E-T-2** | **E-T-3** | **F-T-1** | **F-T-1** | **F-T-2** | **F-T-2** | **G-T-1** |
| Comment | | Station E Atlantic cod | Station E Atlantic cod | Station F Atlantic cod | Station F Atlantic cod | Station F Atlantic cod | Station F Atlantic cod | Station G Atlantic cod |
| 4:2 FTS | µg/kg | < 1.45 | < 0.0928 | < 0.0773 | < 0.391 | < 0.0989 | < 1.48 | < 0.0833 |
| 6:2 FTS | µg/kg | < 1.09 | < 0.0696 | < 0.0580 | < 0.293 | < 0.0742 | < 1.11 | < 0.0625 |
| 8:2 FTS | µg/kg | < 1.45 | < 0.0928 | < 0.0773 | < 0.391 | < 0.0989 | < 1.48 | < 0.0833 |
| PFBA | µg/kg | < 0.726 | < 0.0464 | < 0.0387 | 0.271 | < 0.0494 | < 0.739 | < 0.0416 |
| PFPeA | µg/kg | < 0.726 | < 0.0464 | < 0.0387 | < 0.195 | < 0.0494 | < 0.739 | < 0.0416 |
| PFHxA | µg/kg | < 0.726 | < 0.0464 | < 0.0387 | < 0.195 | < 0.0494 | < 0.739 | < 0.0416 |
| PFHpA | µg/kg | < 0.726 | < 0.0464 | < 0.0387 | < 0.195 | < 0.0494 | < 0.739 | < 0.0416 |
| PFOA | µg/kg | < 0.726 | 0.122 | < 0.0387 | < 0.195 | 0.0822 | < 0.739 | < 0.0416 |
| PFNA | µg/kg | < 0.726 | 0.172 | 0.158 | 0.327 | 0.146 | < 0.739 | 0.102 |
| PFDeA | µg/kg | < 0.726 | 0.106 | 0.142 | 0.246 | 0.114 | < 0.739 | 0.17 |
| PFUnA | µg/kg | < 0.726 | 0.194 | 0.301 | 0.422 | 0.297 | 0.775 | 0.389 |
| PFDoA | µg/kg | < 0.726 | < 0.0464 | 0.0711 | < 0.195 | 0.0602 | < 0.739 | 0.0812 |
| PFTrA | µg/kg | < 0.726 | 0.216 | 0.31 | 0.233 | 0.182 | < 0.739 | 0.221 |
| PFTA | µg/kg | < 0.726 | < 0.0464 | 0.0416 | < 0.195 | < 0.0494 | < 0.739 | < 0.0416 |
| PFBS | µg/kg | < 1.09 | < 0.0696 | < 0.0580 | < 0.293 | < 0.0742 | < 1.11 | < 0.0625 |
| PFHxS | µg/kg | < 1.09 | < 0.0696 | < 0.0580 | < 0.293 | < 0.0742 | < 1.11 | < 0.0625 |
| PFHpS | µg/kg | < 1.09 | < 0.0696 | < 0.0580 | < 0.293 | < 0.0742 | < 1.11 | < 0.0625 |
| PFOS | µg/kg | 4.21 | 1.12 | 0.642 | 1.41 | 0.916 | 2.93 | 0.758 |
| PFDS | µg/kg | < 1.09 | < 0.0696 | < 0.0580 | < 0.293 | < 0.0742 | < 1.11 | < 0.0625 |
| PF-3.7-DMOA | µg/kg | < 1.45 | < 0.0928 | < 0.0773 | < 0.391 | < 0.0989 | < 1.48 | < 0.0833 |
| PFOSA | µg/kg | 9 | 0.747 | 0.29 | 0.371 | 0.584 | 5.56 | < 0.0416 |
| HPFHpA | µg/kg | < 1.45 | < 0.0928 | < 0.0773 | < 0.391 | < 0.0989 | < 1.48 | < 0.0833 |
| Sum PFAS excl. LOQ | µg/kg | 13.2 | 2.68 | 1.96 | 3.28 | 2.38 | 9.27 | 1.72 |

| **Tissue** | | **Liver** | **Remaining tissue** | **Liver** | **Remaining tissue** | **Liver** | **Remaining tissue** | **Liver** |
|---|---|---|---|---|---|---|---|---|
| **Sample name** | | **G-T-1** | **G-T-2** | **G-T-2** | **G-T-3** | **G-T-3** | **G-T-4** | **G-T-4** |
| Comment | | Station G Atlantic cod | Station G Atlantic cod | Station G Atlantic cod | Station G Atlantic cod | Station G Atlantic cod | Station G Atlantic cod | Station G Atlantic cod |
| 4:2 FTS | µg/kg | < 0.268 | < 0.0587 | < 0.551 | < 0.0833 | < 0.280 | < 0.0938 | < 0.338 |
| 6:2 FTS | µg/kg | < 0.201 | < 0.0440 | < 0.413 | < 0.0625 | < 0.210 | < 0.0703 | < 0.253 |
| 8:2 FTS | µg/kg | < 0.268 | < 0.0587 | < 0.551 | < 0.0833 | < 0.280 | < 0.0938 | 0.438 |
| PFBA | µg/kg | < 0.134 | < 0.0293 | < 0.275 | < 0.0417 | < 0.140 | < 0.0469 | < 0.169 |
| PFPeA | µg/kg | < 0.134 | < 0.0293 | < 0.275 | < 0.0417 | 0.205 | < 0.0469 | < 0.169 |
| PFHxA | µg/kg | < 0.134 | < 0.0293 | < 0.275 | < 0.0417 | < 0.140 | < 0.0469 | < 0.169 |
| PFHpA | µg/kg | < 0.134 | < 0.0293 | < 0.275 | < 0.0417 | < 0.140 | < 0.0469 | < 0.169 |
| PFOA | µg/kg | 0.144 | < 0.0293 | < 0.275 | < 0.0417 | < 0.140 | < 0.0469 | 0.171 |
| PFNA | µg/kg | 0.16 | 0.0772 | < 0.275 | 0.0694 | 0.466 | 0.0774 | 0.277 |
| PFDeA | µg/kg | 0.169 | 0.0885 | < 0.275 | 0.124 | 0.578 | 0.129 | 0.237 |
| PFUnA | µg/kg | 0.565 | 0.117 | 0.316 | 0.251 | 0.833 | 0.187 | 0.234 |
| PFDoA | µg/kg | < 0.134 | 0.0322 | < 0.275 | 0.0501 | 0.188 | 0.048 | < 0.169 |
| PFTrA | µg/kg | 0.352 | 0.0691 | < 0.275 | 0.0992 | 0.438 | 0.0969 | < 0.169 |
| PFTA | µg/kg | < 0.134 | < 0.0293 | < 0.275 | < 0.0417 | < 0.140 | < 0.0469 | < 0.169 |
| PFBS | µg/kg | < 0.201 | < 0.0440 | < 0.413 | < 0.0625 | < 0.210 | < 0.0703 | < 0.253 |
| PFHxS | µg/kg | < 0.201 | < 0.0440 | < 0.413 | < 0.0625 | < 0.210 | < 0.0703 | < 0.253 |
| PFHpS | µg/kg | < 0.201 | < 0.0440 | < 0.413 | < 0.0625 | < 0.210 | < 0.0703 | < 0.253 |
| PFOS | µg/kg | 1.41 | 0.616 | 1.92 | 0.547 | 2.72 | 1.05 | 2.95 |
| PFDS | µg/kg | < 0.201 | < 0.0440 | < 0.413 | < 0.0625 | < 0.210 | < 0.0703 | < 0.253 |
| PF-3.7-DMOA | µg/kg | < 0.268 | < 0.0587 | < 0.551 | < 0.0833 | < 0.280 | < 0.0938 | < 0.338 |
| PFOSA | µg/kg | < 0.134 | 0.132 | < 0.275 | < 0.0417 | < 0.140 | 0.105 | < 0.169 |
| HPFHpA | µg/kg | < 0.268 | < 0.0587 | < 0.551 | < 0.0833 | < 0.280 | < 0.0938 | < 0.338 |
| Sum PFAS excl. LOQ | µg/kg | 2.8 | 1.13 | 2.24 | 1.14 | 5.42 | 1.69 | 4.31 |

| **Tissue** | | **Remaining tissue** | **Liver** | **Remaining tissue** | **Liver** | **Remaining tissue** | **Liver** | **Remaining tissue** |
|---|---|---|---|---|---|---|---|---|
| **Sample name** | | **G-T-5** | **G-T-5** | **H-T-1** | **H-T-1** | **H-T-2** | **H-T-2** | **H-T-3** |
| Comment | | Station G Atlantic cod | Station G Atlantic cod | Station H Atlantic cod | Station H Atlantic cod | Station H Atlantic cod | Station H Atlantic cod | Station H Atlantic cod |
| 4:2 FTS | µg/kg | < 0.106 | < 0.491 | < 0.109 | < 0.258 | < 0.0989 | < 0.352 | < 0.0610 |
| 6:2 FTS | µg/kg | < 0.0792 | < 0.369 | < 0.0816 | < 0.194 | < 0.0741 | < 0.264 | 0.0828 |
| 8:2 FTS | µg/kg | 0.397 | 1.24 | < 0.109 | < 0.258 | 0.164 | 0.786 | 0.101 |
| PFBA | µg/kg | < 0.0528 | < 0.246 | < 0.0544 | < 0.129 | < 0.0494 | < 0.176 | 0.13 |
| PFPeA | µg/kg | < 0.0528 | < 0.246 | < 0.0544 | < 0.129 | < 0.0494 | < 0.176 | < 0.0305 |
| PFHxA | µg/kg | < 0.0528 | < 0.246 | < 0.0544 | < 0.129 | < 0.0494 | < 0.176 | < 0.0305 |
| PFHpA | µg/kg | < 0.0528 | < 0.246 | < 0.0544 | < 0.129 | < 0.0494 | < 0.176 | < 0.0305 |
| PFOA | µg/kg | < 0.0528 | < 0.246 | < 0.0544 | < 0.129 | < 0.0494 | < 0.176 | 0.0489 |
| PFNA | µg/kg | 0.333 | 0.52 | 0.371 | 0.785 | 0.151 | 0.311 | 0.23 |
| PFDeA | µg/kg | 0.23 | 0.425 | 0.272 | 0.746 | 0.146 | 0.352 | 0.156 |
| PFUnA | µg/kg | 0.21 | 0.428 | 0.361 | 0.561 | 0.285 | 0.355 | 0.125 |
| PFDoA | µg/kg | < 0.0528 | < 0.246 | 0.0773 | < 0.129 | 0.0603 | < 0.176 | < 0.0305 |
| PFTrA | µg/kg | 0.13 | 0.389 | 0.225 | 0.298 | 0.0988 | < 0.176 | 0.0739 |
| PFTA | µg/kg | < 0.0528 | < 0.246 | < 0.0544 | < 0.129 | < 0.0494 | < 0.176 | < 0.0305 |
| PFBS | µg/kg | < 0.0792 | < 0.369 | < 0.0816 | < 0.194 | < 0.0741 | < 0.264 | < 0.0457 |
| PFHxS | µg/kg | 0.0838 | < 0.369 | < 0.0816 | < 0.194 | < 0.0741 | < 0.264 | 0.0921 |
| PFHpS | µg/kg | < 0.0792 | < 0.369 | < 0.0816 | < 0.194 | < 0.0741 | < 0.264 | 0.0609 |
| PFOS | µg/kg | 4.26 | 11.7 | 0.901 | 2.83 | 1.16 | 2.16 | 4.05 |
| PFDS | µg/kg | < 0.0792 | < 0.369 | < 0.0816 | < 0.194 | < 0.0741 | < 0.264 | < 0.0457 |
| PF-3.7-DMOA | µg/kg | < 0.106 | < 0.491 | < 0.109 | < 0.258 | < 0.0989 | < 0.352 | < 0.0610 |
| PFOSA | µg/kg | 0.282 | < 0.246 | 0.271 | < 0.129 | 0.287 | < 0.176 | 0.219 |
| HPFHpA | µg/kg | < 0.106 | < 0.491 | < 0.109 | < 0.258 | < 0.0989 | < 0.352 | < 0.0610 |
| Sum PFAS excl. LOQ | µg/kg | 5.93 | 14.7 | 2.48 | 5.22 | 2.35 | 3.96 | 5.37 |

| **Tissue** | | **Liver** | **Remaining tissue** | **Liver** | **Remaining tissue** | **Liver** | **Remaining tissue** | **Liver** |
|---|---|---|---|---|---|---|---|---|
| **Sample name** | | **H-T-3** | **Ref-T-1** | **Ref-T-1** | **Ref-T-2** | **Ref-T-2** | **Ref-T-3** | **Ref-T-3** |
| Comment | | Station H Atlantic cod | Ref. station Atlantic cod | Ref. station Atlantic cod | Ref. station Atlantic cod | Ref. station Atlantic cod | Ref. station Atlantic cod | Ref. station Atlantic cod |
| 4:2 FTS | µg/kg | < 0.571 | < 0.0967 | < 0.347 | < 0.105 | < 0.468 | < 0.0738 | < 0.541 |
| 6:2 FTS | µg/kg | < 0.428 | < 0.0725 | < 0.261 | < 0.0785 | < 0.351 | < 0.0553 | < 0.406 |
| 8:2 FTS | µg/kg | < 0.571 | < 0.0967 | < 0.347 | < 0.105 | < 0.468 | < 0.0738 | < 0.541 |
| PFBA | µg/kg | < 0.286 | < 0.0483 | < 0.174 | < 0.0523 | < 0.234 | < 0.0369 | 0.689 |
| PFPeA | µg/kg | < 0.286 | < 0.0483 | < 0.174 | < 0.0523 | < 0.234 | < 0.0369 | < 0.271 |
| PFHxA | µg/kg | < 0.286 | < 0.0483 | < 0.174 | < 0.0523 | < 0.234 | < 0.0369 | < 0.271 |
| PFHpA | µg/kg | < 0.286 | < 0.0483 | < 0.174 | < 0.0523 | < 0.234 | < 0.0369 | < 0.271 |
| PFOA | µg/kg | < 0.286 | < 0.0483 | < 0.174 | < 0.0523 | < 0.234 | < 0.0369 | < 0.271 |
| PFNA | µg/kg | 0.374 | < 0.0483 | < 0.174 | 0.108 | < 0.234 | 0.0902 | < 0.271 |
| PFDeA | µg/kg | < 0.286 | < 0.0483 | < 0.174 | 0.117 | < 0.234 | 0.162 | 0.339 |
| PFUnA | µg/kg | < 0.286 | 0.0768 | < 0.174 | 0.217 | 0.315 | 0.47 | 1.01 |
| PFDoA | µg/kg | < 0.286 | < 0.0483 | < 0.174 | < 0.0523 | < 0.234 | 0.0941 | 0.304 |
| PFTrA | µg/kg | < 0.286 | < 0.0483 | < 0.174 | 0.116 | 0.323 | 0.298 | 1.06 |
| PFTA | µg/kg | < 0.286 | < 0.0483 | < 0.174 | < 0.0523 | < 0.234 | < 0.0369 | < 0.271 |
| PFBS | µg/kg | < 0.428 | < 0.0725 | < 0.261 | < 0.0785 | < 0.351 | < 0.0553 | < 0.406 |
| PFHxS | µg/kg | < 0.428 | < 0.0725 | < 0.261 | < 0.0785 | < 0.351 | < 0.0553 | < 0.406 |
| PFHpS | µg/kg | < 0.428 | < 0.0725 | < 0.261 | < 0.0785 | < 0.351 | < 0.0553 | < 0.406 |
| PFOS | µg/kg | 9.53 | 0.304 | 1.4 | 0.555 | 1.61 | 0.441 | 1.29 |
| PFDS | µg/kg | < 0.428 | < 0.0725 | < 0.261 | < 0.0785 | < 0.351 | < 0.0553 | < 0.406 |
| PF-3.7-DMOA | µg/kg | < 0.571 | < 0.0967 | < 0.347 | < 0.105 | < 0.468 | < 0.0738 | < 0.541 |
| PFOSA | µg/kg | < 0.286 | < 0.0483 | < 0.174 | 0.142 | < 0.234 | 0.214 | 0.986 |
| HPFHpA | µg/kg | < 0.571 | < 0.0967 | < 0.347 | < 0.105 | < 0.468 | < 0.0738 | < 0.541 |
| Sum PFAS excl. LOQ | µg/kg | 9.91 | 0.38 | 1.4 | 1.25 | 2.25 | 1.77 | 5.68 |

| **Tissue** | | **Remaining tissue** | **Liver** | **Remaining tissue** | **Liver** | **Remaining tissue** | **Liver** | **Remaining tissue** |
|---|---|---|---|---|---|---|---|---|
| **Sample name** | | **Ref-T-4** | **Ref-T-4** | **Ref-T-5** | **Ref-T-5** | **Ref-T-6** | **Ref-T-6** | **A-R-1** |
| Comment | | Ref. station Atlantic cod | Ref. station Atlantic cod | Ref. station Atlantic cod | Ref. station Atlantic cod | Ref. station Atlantic cod | Ref. station Atlantic cod | Station A European plaice |
| 4:2 FTS | µg/kg | < 0.0823 | < 0.390 | < 0.108 | < 0.414 | < 0.0903 | < 0.485 | < 0.116 |
| 6:2 FTS | µg/kg | < 0.0617 | < 0.292 | < 0.0810 | < 0.310 | < 0.0677 | < 0.364 | < 0.0873 |
| 8:2 FTS | µg/kg | < 0.0823 | < 0.390 | < 0.108 | < 0.414 | < 0.0903 | < 0.485 | < 0.116 |
| PFBA | µg/kg | < 0.0412 | < 0.195 | < 0.0540 | < 0.207 | < 0.0452 | 0.555 | < 0.0582 |
| PFPeA | µg/kg | < 0.0412 | < 0.195 | < 0.0540 | < 0.207 | < 0.0452 | < 0.242 | < 0.0582 |
| PFHxA | µg/kg | < 0.0412 | < 0.200 | < 0.0540 | < 0.207 | < 0.0452 | < 0.242 | < 0.0582 |
| PFHpA | µg/kg | < 0.0412 | < 0.195 | < 0.0540 | < 0.207 | < 0.0452 | < 0.242 | < 0.0582 |
| PFOA | µg/kg | < 0.0412 | < 0.195 | < 0.0540 | < 0.207 | < 0.0452 | < 0.242 | < 0.0582 |
| PFNA | µg/kg | 0.216 | 0.395 | 0.113 | < 0.207 | 0.15 | 0.257 | 0.101 |
| PFDeA | µg/kg | 0.143 | 0.271 | 0.0992 | < 0.207 | 0.21 | 0.365 | 0.115 |
| PFUnA | µg/kg | 0.213 | 0.379 | 0.18 | < 0.207 | 0.38 | 0.663 | 0.17 |
| PFDoA | µg/kg | < 0.0412 | < 0.195 | < 0.0540 | < 0.207 | 0.103 | < 0.242 | < 0.0582 |
| PFTrA | µg/kg | 0.166 | 0.322 | 0.158 | < 0.207 | 0.395 | 0.825 | 0.141 |
| PFTA | µg/kg | < 0.0412 | < 0.195 | < 0.0540 | < 0.207 | < 0.0452 | < 0.242 | < 0.0582 |
| PFBS | µg/kg | < 0.0617 | < 0.292 | < 0.0810 | < 0.310 | < 0.0677 | < 0.364 | < 0.0873 |
| PFHxS | µg/kg | < 0.0617 | < 0.292 | < 0.0810 | < 0.310 | < 0.0677 | < 0.364 | < 0.0873 |
| PFHpS | µg/kg | < 0.0617 | < 0.292 | < 0.0810 | < 0.310 | < 0.0677 | < 0.364 | < 0.0873 |
| PFOS | µg/kg | 0.964 | 2.82 | 0.569 | 1.02 | 0.709 | 1.66 | 0.939 |
| PFDS | µg/kg | < 0.0617 | < 0.292 | < 0.0810 | < 0.310 | < 0.0677 | < 0.364 | < 0.0873 |
| PF-3.7-DMOA | µg/kg | < 0.0823 | < 0.390 | < 0.108 | < 3.55 | < 0.0903 | < 0.485 | < 0.116 |
| PFOSA | µg/kg | 0.192 | 0.274 | < 0.0540 | < 0.207 | 0.0744 | 0.917 | < 0.0582 |
| HPFHpA | µg/kg | < 0.0823 | < 0.390 | < 0.108 | < 0.414 | < 0.0903 | < 0.485 | < 0.116 |
| Sum PFAS excl. LOQ | µg/kg | 1.9 | 4.46 | 1.12 | 1.02 | 2.02 | 5.24 | 1.47 |

| **Tissue** | | **Liver** | **Remaining tissue** | **Liver** | **Remaining tissue** | **Liver** | **Remaining tissue** | **Liver** |
|---|---|---|---|---|---|---|---|---|
| **Sample name** | | **A-R-1** | **A-R-2** | **A-R-2** | **D-R-1** | **D-R-1** | **D-R-2** | **D-R-2** |
| Comment | | Station A European plaice | Station A European plaice | Station A European plaice | Station D European plaice | Station D European plaice | Station D European plaice | Station D European plaice |
| 4:2 FTS | µg/kg | < 0.501 | < 0.103 | < 0.438 | < 0.101 | < 0.476 | < 0.107 | < 0.340 |
| 6:2 FTS | µg/kg | 3.25 | < 0.0770 | < 0.329 | < 0.0754 | < 0.357 | < 0.0801 | < 0.255 |
| 8:2 FTS | µg/kg | 2.25 | < 0.103 | < 0.438 | < 0.101 | 0.965 | < 0.107 | < 0.340 |
| PFBA | µg/kg | < 0.250 | < 0.0514 | 0.663 | < 0.0503 | < 0.238 | < 0.0534 | < 0.170 |
| PFPeA | µg/kg | < 0.250 | 0.0537 | < 0.219 | < 0.0503 | < 0.238 | < 0.0534 | < 0.170 |
| PFHxA | µg/kg | < 0.250 | < 0.0514 | < 0.219 | < 0.0503 | < 0.238 | < 0.0534 | < 0.170 |
| PFHpA | µg/kg | < 0.250 | < 0.0514 | < 0.219 | < 0.0503 | < 0.238 | < 0.0534 | < 0.170 |
| PFOA | µg/kg | < 0.250 | < 0.0514 | < 0.219 | 0.0543 | < 0.238 | < 0.0534 | < 0.170 |
| PFNA | µg/kg | < 0.250 | 0.144 | 0.535 | 0.917 | 3.5 | 0.858 | 1.14 |
| PFDeA | µg/kg | < 0.250 | 0.0978 | 0.29 | 0.56 | 1.5 | 0.475 | 0.567 |
| PFUnA | µg/kg | 0.28 | 0.119 | 0.468 | 0.383 | 1.22 | 0.37 | 0.476 |
| PFDoA | µg/kg | < 0.250 | < 0.0514 | < 0.219 | < 0.0503 | < 0.238 | < 0.0534 | < 0.170 |
| PFTrA | µg/kg | 0.26 | 0.0618 | < 0.219 | 0.132 | 0.485 | 0.137 | 0.213 |
| PFTA | µg/kg | < 0.250 | < 0.0514 | < 0.219 | < 0.0503 | < 0.238 | < 0.0534 | < 0.170 |
| PFBS | µg/kg | < 0.375 | < 0.0770 | < 0.329 | < 0.0754 | < 0.357 | < 0.0801 | < 0.255 |
| PFHxS | µg/kg | < 0.375 | 0.0842 | < 0.329 | < 0.0754 | < 0.357 | < 0.0801 | < 0.255 |
| PFHpS | µg/kg | < 0.375 | < 0.0770 | < 0.329 | < 0.0754 | < 0.357 | < 0.0801 | < 0.255 |
| PFOS | µg/kg | 1.79 | 0.922 | 3.17 | 1.8 | 5.47 | 2.32 | 2.23 |
| PFDS | µg/kg | < 0.375 | < 0.0770 | < 0.329 | < 0.0754 | < 0.357 | < 0.0801 | < 0.255 |
| PF-3.7-DMOA | µg/kg | < 0.501 | < 0.103 | < 0.438 | < 0.101 | < 0.476 | < 0.107 | < 0.340 |
| PFOSA | µg/kg | 0.901 | < 0.0514 | < 0.219 | < 0.0503 | < 0.238 | < 0.0534 | < 0.170 |
| HPFHpA | µg/kg | < 0.501 | < 0.103 | < 0.438 | < 0.101 | < 0.476 | < 0.107 | < 0.340 |
| Sum PFAS excl. LOQ | µg/kg | 8.74 | 1.48 | 5.12 | 3.84 | 13.1 | 4.16 | 4.63 |

| **Tissue** | | **Remaining tissue** | **Liver** | **Remaining tissue** | **Liver** |
|---|---|---|---|---|---|
| **Sample name** | | **E-R-1** | **E-R-1** | **B-L-1** | **B-L-1** |
| Comment | | Station E European plaice | Station E European plaice | Station B Lemon sole | Station B Lemon sole |
| 4:2 FTS | µg/kg | < 0.104 | < 0.381 | < 0.119 | < 0.330 |
| 6:2 FTS | µg/kg | < 0.0783 | < 0.286 | < 0.0894 | < 0.248 |
| 8:2 FTS | µg/kg | < 0.104 | < 0.381 | < 0.119 | < 0.330 |
| PFBA | µg/kg | < 0.0522 | 0.662 | < 0.0596 | < 0.165 |
| PFPeA | µg/kg | < 0.0522 | < 0.190 | < 0.0596 | < 0.165 |
| PFHxA | µg/kg | < 0.0522 | < 0.190 | < 0.0596 | < 0.165 |
| PFHpA | µg/kg | < 0.0522 | < 0.190 | < 0.0596 | < 0.165 |
| PFOA | µg/kg | < 0.0522 | < 0.190 | 0.0907 | 0.175 |
| PFNA | µg/kg | 0.746 | 2.6 | 0.157 | 0.307 |
| PFDeA | µg/kg | 0.587 | 1.75 | < 0.0596 | < 0.165 |
| PFUnA | µg/kg | 0.522 | 1.83 | < 0.0596 | < 0.165 |
| PFDoA | µg/kg | 0.0848 | < 0.190 | < 0.0596 | < 0.165 |
| PFTrA | µg/kg | 0.139 | 0.458 | < 0.0596 | < 0.165 |
| PFTA | µg/kg | < 0.0522 | < 0.190 | < 0.0596 | < 0.165 |
| PFBS | µg/kg | < 0.0783 | < 0.286 | < 0.0894 | < 0.248 |
| PFHxS | µg/kg | < 0.0783 | < 0.286 | < 0.0894 | < 0.248 |
| PFHpS | µg/kg | < 0.0783 | < 0.286 | < 0.0894 | < 0.248 |
| PFOS | µg/kg | 2.78 | 8.54 | 0.306 | 0.735 |
| PFDS | µg/kg | < 0.0783 | < 0.286 | < 0.0894 | < 0.248 |
| PF-3.7-DMOA | µg/kg | < 0.104 | < 0.381 | < 0.119 | < 0.330 |
| PFOSA | µg/kg | 0.194 | < 0.190 | < 0.0596 | < 0.165 |
| HPFHpA | µg/kg | < 0.104 | < 0.381 | < 0.119 | < 0.330 |
| Sum PFAS excl. LOQ | µg/kg | 5.06 | 15.8 | 0.554 | 1.22 |

## Supplementary figures

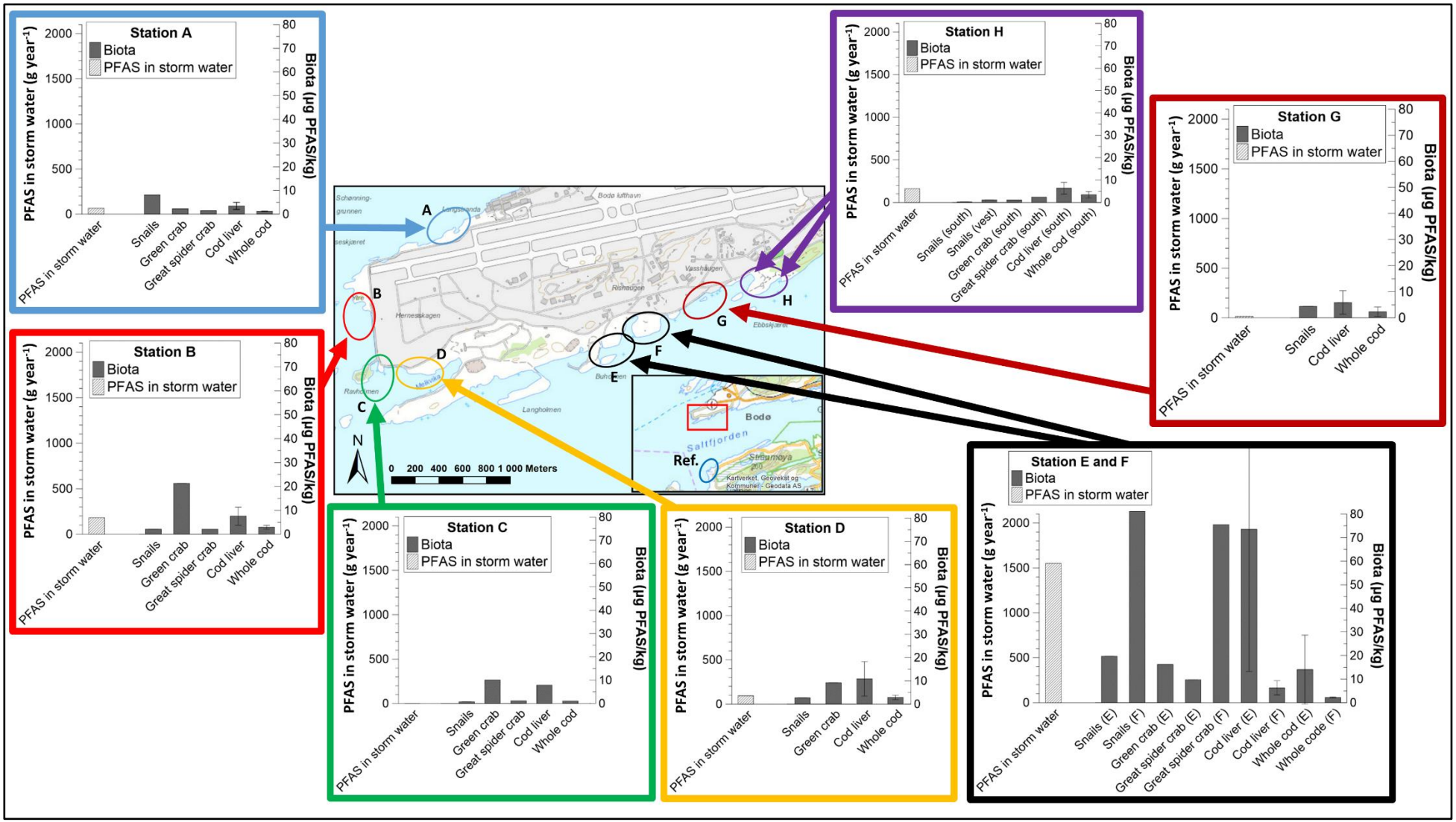


*Figure S1. Map of the Air Station, including sampling stations, calculated amount of PFAS release with storm water, and concentrations in biota.*

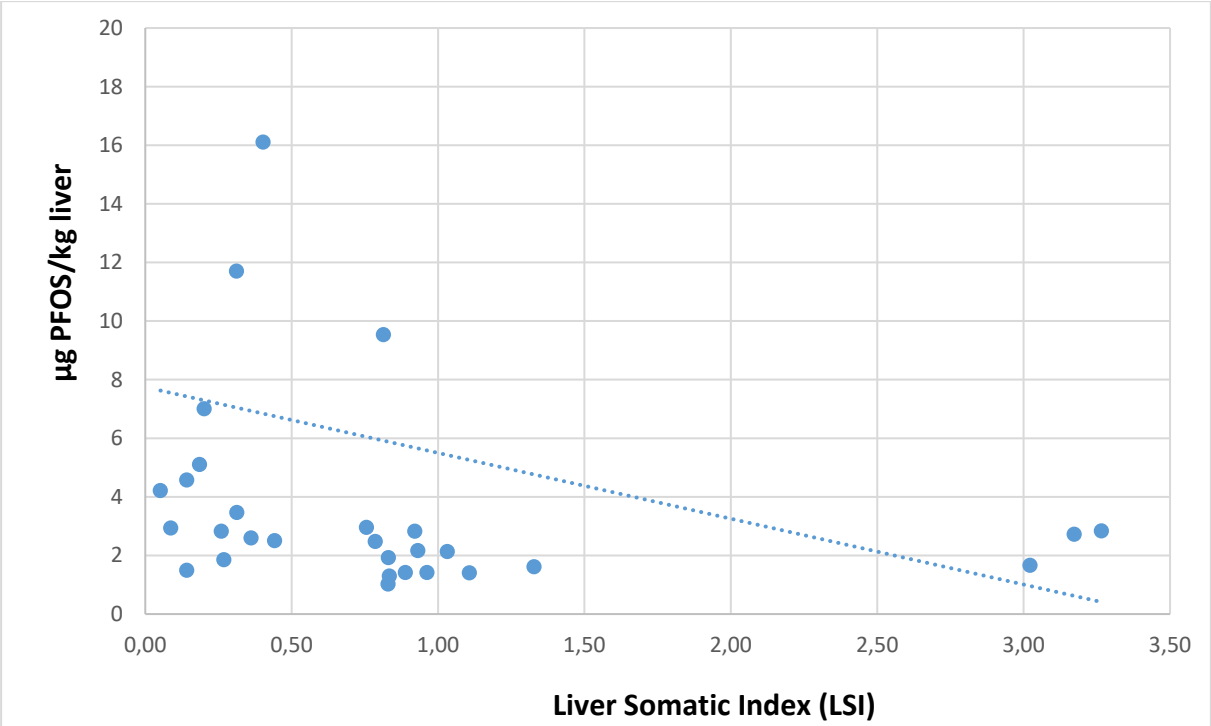


*Figure S2. PFOS concentrations in liver of Atlantic cod vs. Liver Somatic Index (LSI)*

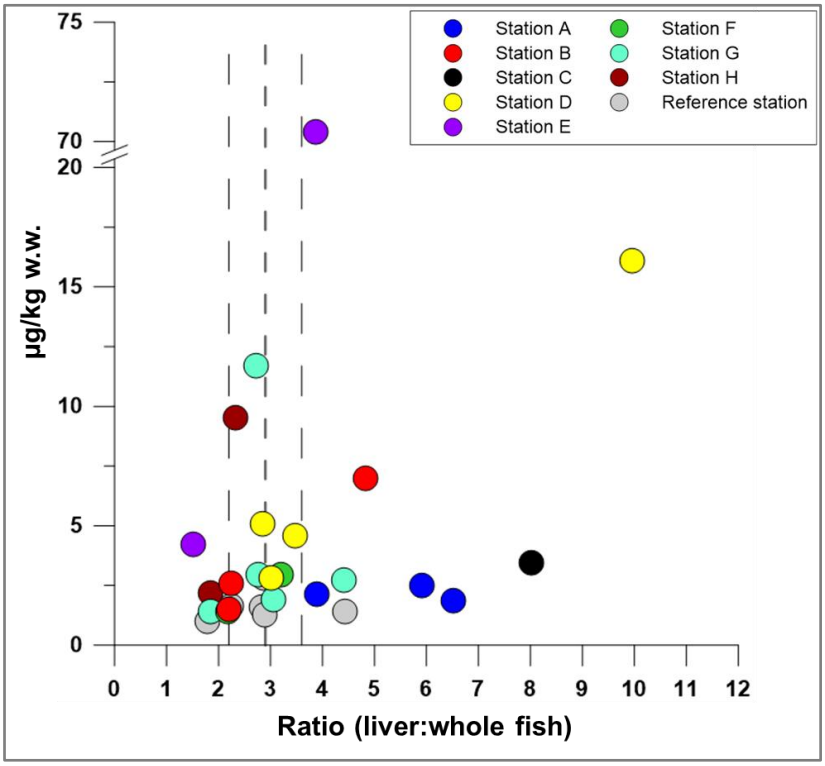


*Figure S3. PFOS liver concentrations in Atlantic cod plotted against the ratio of PFOS concentrations liver to whole fish. Each circle represent one individual, caught at the respective station. Dashed lines show median ratio ± the median absolute deviation (MAD).*

# References


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