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Long-Term Environmental Monitoring Program

PREPARED FOR

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ACRONYMS AND ABBREVIATIONS

°C	Degrees Celsius
AMT	Alyeska Marine Terminal [officially known as the Valdez Marine Terminal]
ANS	Alaska North Slope [Crude Oil]
cm	Centimeter
CV	Calibration Verification
DQO	Data Quality Objective
EPA	U.S. Environmental Protection Agency
ESBs	Equilibrium Partitioning Sediment Benchmarks
FSES	Food Safety and Environmental Stewardship [Oregon State University lab]
GC/MS	Gas Chromatography/Mass Spectrometry
GOC	Gold Creek
HMW	High Molecular Weight [PAH]
JAC	Jackson Point
LMW	Low Molecular Weight [PAH]
LTEMP	Long-Term Environmental Monitoring Program
m	meters
mL	Milliliter
MDL	Method Detection Limit
ng/g	Nanogram per Gram (parts per billion)
ng/L	Nanogram/ Liter (parts per trillion)
OSU	Oregon State University
PAH	Polycyclic Aromatic Hydrocarbons
pg/µL	Picogram per Microliter
PSD	Passive Sampling Device
PWSRCAC	Prince William Sound Regional Citizens' Advisory Council
QC	Quality Control
RED	Positive control Site - Valdez Small Boat Harbor Entrance [red light]
RPD%	Relative Percent Difference
SAW	Saw Island
SHC	Saturated Hydrocarbons
SIM	Specific Ion Monitoring
SOP	Standard Operating Procedure

Executive Summary

This technical supplement contains information on field sampling and analytical and data analysis methods used to monitor and assess environmental hydrocarbons and their potential environmental risk in Prince William Sound Regional Citizens' Advisory Council's (PWSRCAC) Long-Term Environmental Monitoring Program (LTEMP). Here, we have plotted and summarized all sediment, Pacific blue mussel tissue (*Mytilus trossulus*), and passive samples collected in the 2025 campaign in Port Valdez. This document should aid in the assertions made in the 2025 Long-Term Environmental Monitoring Program Summary Report (fjord & fish sciences, 2025).

1. Methods

1.1. Field Methods

1.1.1. Sediments and Mussel Tissue

In 2025, sediment sampling at Valdez Marine Terminal (Alyeska Marine Terminal (AMT)) and Gold Creek (GOC) took place on May 28 (Figure 1; Table 1). Samples were collected using a modified Van Veen grab and deployed to a depth of 65–67 meters (m) at AMT and 26–27 m at GOC from the salmon seining/fishing vessel, Equinox, contracted as a research vessel and fitted with an aluminum davit. For each replicate, a ~250 milliliter (mL) sample of the surface 1–5 centimeters (cm) was collected at each site, placed in three hydrocarbon-free jars, and frozen for hydrocarbons, total organic carbon, and particle grain size analysis. Three replicates were taken at each site. Samples were frozen at the end of the sampling day and sent to the lab for analysis within a week of sampling.

The 2025 Port Valdez Pacific blue mussel (*Mytilus trossulus*) sampling was performed at Jackson Point (JAC) and Saw Island (AMT/SAW) on May 28 and at the positive control reference station at the Valdez Small Boat Harbor – RED (RED) and LTEMP reference site at GOC on May 29. Three replicates of ~30 large mussels were collected by hand at each site. Sample replicates are usually taken from multiple locations spaced along 30 m of shoreline. Mussel samples were wrapped in aluminum foil and double bagged in plastic zip-locks, frozen, and shipped to the laboratory, where they remained frozen until analysis. The analytical lab performed dissections of a whole mussel, including all internal organs.

1.1.2. Passive Sampling Devices

In 2025, the passive sampling devices (PSDs) were collected on May 28 at sites JAC and AMT/SAW, and on May 29 from GOC after an April 26 deployment. The PSDs are low-density polyethylene membranes submerged in shallow water to absorb passing hydrocarbons. The PSD is intended to sample only a fraction of the total hydrocarbon analytes present, namely, freely dissolved compounds and labile complexes that diffuse into the membrane that are the most bioavailable hydrocarbons for aquatic organisms. As a critical part of the method, various deuterated surrogate compounds are pre-infused into the membrane before deployment. This known starting concentration allows the time-integrated back calculation of dissolved chemical concentrations specific to the environmental conditions experienced by the PSDs. The PSDs were deployed in 4–7 m of water, attached to new polypropylene rope with hydrocarbon-free steel cables and shackles, anchored to a concrete cinder block at each location. At each site, three replicates of 5 PSDs were deployed such that they floated approximately 1 m above the seafloor. The PSDs were collected from stations, transferred to hydrocarbon-free Teflon bags, sealed, and stored at room temperature following LTEMP field protocols (2019 LTEMP PSD standard operating procedure (SOP)). A deployment field blank and a retrieval field blank were included in each annual analysis. Samples were sent to the Oregon State University

(OSU) Food Safety and Environmental Stewardship (FSES) lab in Corvallis, Oregon, for analysis and frozen at -20°C upon arrival.

1.2. Analytical Methods

1.2.1. Sediments and Mussel Tissue

Tissue and sediment samples were analyzed for semi-volatiles, biomarkers, and saturated hydrocarbon analytes at Pace Analytical Services (previously Alpha Analytical and NewFields) lab in Mansfield, Massachusetts. Extractions used the ALPHA OP-018 method for tissues and the ALPHA OP-013 method for sediments. Polycyclic aromatic hydrocarbons (PAH), sterane/triterpene petro-geochemical markers, and saturated hydrocarbons (SHC) are quantified as concentrations in the extracted sediments and mussel tissues. Parent PAHs, alkylated PAHs, and petrochemical markers are analyzed using selected ion monitoring gas chromatography/mass spectrometry (SIM GC/MS) via a modified U.S. Environmental Protection Agency (EPA) Method 8270 (aka 8270M). This analysis provides the concentration of 1) approximately 80 PAH, alkylated PAH homologs, individual PAH isomers, and sulfur-containing aromatics, and 2) approximately 78 tricyclic and pentacyclic triterpenes, regular and rearranged steranes, and tri-aromatic and monoaromatic steroids. Using a modified EPA 8015D(M), 37 SHC in sediments are quantified as total extractable materials (C9-C44) and as concentrations of n-alkanes (C9-C40) and selected (C15-C20) acyclic isoprenoids (e.g., pristane and phytane). The complete lists of PAH, SHC, and petro-geochemical markers are presented in Tables 2-4.

Surrogates are novel or deuterated compounds added in known amounts to each raw sample to assess the efficiency of extraction and analysis by their final percent recovery. Surrogate recoveries are considered acceptable if they are between 50% and 130%. Surrogate percent recovery concentrations are acceptable across all but one analyses performed in 2025 with a range of 62%-99% recovery. In the instance of this one sample (biomarkers in GOC-S-25-3-DUP), additional integrations and calculations were reviewed and verified to be due to the native sample heterogeneity. Another lab-performance quality control (QC) measure is the EPA-formulated, statistically derived, analyte-specific Method Detection Limit (MDL) that EPA defines as “the minimum measured concentration of a substance that can be reported with 99 percent confidence that the measured concentration is distinguishable from method blank results.” Pace Analytics Laboratory’s method detection limits (MDLs) for hydrocarbons exceed the performance of most commercial labs and are within the lower detection limits needed for forensic purposes. Duplicate sediment and tissue samples were run for method QC and precision assessment. Several samples have analytes that are reported as estimated values below the reporting limit and as such “J” flagged in the dataset. Some sample results are "B" qualified if the concentrations are less than 10x the concentrations in the blank. Both J and B flagged samples are plotted in the figures and included in the calculation; flags are retained in the LTEMP Master dataset. A diluted Alaska North Slope (ANS) crude standard sample, collected in 2020, was run in parallel to sediment samples.

1.2.2. Seawater Sampled by Passive Sampling Device

To remove any biofouling (e.g., periphyton or particulates), the PSD strips were cleaned in the laboratory by light scrubbing and sequential washing in 1 N HCl, 18 MΩ*cm water, and twice with isopropanol, then dried. PSDs were extracted twice at room temperature with 200 mL n-hexane before the volume was reduced. 82 PAHs were quantified on a modified Agilent 7890 gas chromatograph (GC) and Agilent 7000 triple quadrupole mass spectrometer. The internal standard, Perylene-D12, was added to each sample or parallel aliquots of bioassay samples immediately before analyses. Calculating freely dissolved water concentration of organic compounds was done following the lab-specific SOP. Continuing calibration verification (CV) analysis was performed at the start and end of every analytical batch (maximum of 15 samples). CVs met FSES data quality objectives (DQOs) with an average of 83% of the target analytes within 30% of the known value. Instrument blanks were analyzed after each CV, and in all cases, FSES DQOs were met for all target analytes. To demonstrate instrument precision, a duplicate analysis was performed. Average relative percent difference (RPD %) was 9%, meeting FSES DQO's.Perylene-D12, the method internal standard, had less than 11% variation across the entire project.

1.3. Data Analysis

Data analysis and management were done using the R statistical program (R Core Team 2021). Briefly, data were reformatted to allow for individual locations and analytes to be accessed, and analysis nomenclature was reconciled against the historical dataset. All data with concentrations reported as "non-detect" by Pace Analytical were removed for summary purposes. However, detected values under the method detection concentration were retained if no other issues were reported with the value. Any sample with matrix interference (i.e., "G" lab flag) was removed from the analysis for matrix interference. For sediment analysis, samples with negative detection and matrix interference were plotted for forensic determination. A select group of commonly used analytes was plotted to ease interpretation at the author's discretion and ordered using previously used LTEMP standards when possible. Method detection limits were plotted for sediment (Figures 2-7) and tissue samples (Figures 8-15). Corrections for dry weight, total organic carbon, and lipid content are reported in the tables and text when appropriate. Data from multiple labs were merged to compare historical data (Auke Bay Lab, NewFields/Alpha Analytical, and GERG).

Passive sampling device data were extracted and merged into a single dataset. Common lab flags were "B" for background correction applied broadly to Naphthalene and Fluorene and "J", which is close to the detection level and therefore estimated. For summary purposes, all data with concentrations reported as "non-detect" by FSES were not included in summary calculations and figures, though the qualitative data was included in tables for transparency purposes. PAH profiles were plotted for individual replicates for all sites (Figures 16-18).

1.4. Toxicological Interpretations

Multiple avenues were used to investigate the possibility of toxicological effects as no single standard exists, and development in the field of ecotoxicology is rapid. The most commonly accepted method is summing a select group of PAHs. This includes 53, 44, 42, 16, and other specific sum calculations PAHs. Calculations were made of the relative proportion on low (2–3 ring) and high (4–6 ring) molecular weight PAHs as well as sum totals of known carcinogenic PAHs (i.e., benzo(a)pyrene, benz(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, and indeno(1,2,3-c,d)pyrene).

Furthermore, these values were adjusted for dry and lipid weights for mussel tissues to aid in cross-study comparisons. Sediment values were compared to *Equilibrium Partitioning Sediment Benchmarks (ESBs) for PAH Mixtures* (EPA-2003) using 34 PAHs, including some alkylated compounds (Table 6). Tissue concentrations were compared against the most recently available published literature and concentration-of-concern guidelines, as appropriate (Table 7). Seawater samples are treated similarly using a comparison for water column based water quality benchmarks for individual PAHs used to calculate toxicity quotients (Table 8, Baldwin et al 2024). Concentrations were compared to other field measurements across similar environments (sub-arctic, temperate fjord systems), areas with moderate human activity converted for wet or dry weight in tissues as appropriate, other lab studies with analogous aims as LTEMP (e.g., monitoring of ongoing petroleum operations, sublethal effects, chronic exposure) as explained in the 2025 summary report (fjord & fish 2025).

Saturated hydrocarbons and petro-geochemical biomarkers were not a focus of toxicological interpretations as they are not known to have specific modes of toxic action.

1.5. Source Identification, Petroleum Fingerprinting, and Biomarker Analysis

Source identification through petroleum fingerprinting and petro-geochemical markers analysis was performed using ANS whole crude oil collected in 2020, and was run as laboratory standard with 2025 samples. For accurate comparisons, the ANS chemical profile is displayed petro-geochemical biomarkers for each replicate sediment sample (Figure 4 and 5). Profiles were scaled to T19-hopane for petro-geochemical markers to aid in interpretation. Profiles were qualitatively evaluated for the best match between individual replicates and potential ANS source using practices outlined in previous LTEMP reports (Payne and Driskell 2020; Stout and Wang 2016). Biomarkers in tissues were displayed in tabular form as few analytes were detected (Table 9). Common hydrocarbon diagnostic ratios of low- and high-molecular weight PAHs and petro-geochemical biomarkers were calculated for sediments, tissue samples, and seawater for quantitative source identification (Table 10).

1.6. References

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2. TABLES

Table 1. Long-Term Monitoring Program sites sampled in 2025 for subtidal marine sediments, Pacific blue mussels and deployment/retrieval of the passive sampling devices. Coordinates are displayed in the WGS84 datum.

Site	Latitude	Longitude	Matrix
AMT-S	61.0906	-146.3928	Sediment
GOC-S	61.1242	-146.4906	Sediment
AMT-B	61.0903	-146.4092	Pacific Blue Mussel Tissue
JAC-B	61.0901	-146.3757	Pacific Blue Mussel Tissue
GOC-B	61.1244	-146.4961	Pacific Blue Mussel Tissue
RED-B	61.1237	-146.3532	Pacific Blue Mussel Tissue
GOC-PSD	61.1243	-146.4947	Water via Passive Sampler Device
JAC-PSD	61.0907	-146.3757	Water via Passive Sampler Device
AMT-PSD	61.0914	-146.4092	Water via Passive Sampler Device

Table 2. Analytes quantified in marine subtidal sediments of the 2025 Long-Term Environmental Monitoring Program.

	EPA 8015D(M)		EPA 8015D(M)		8270E-SIM(M) cont.
1	Nonane (C9)	40	o-terphenyl	78	3-Methylphenanthrene
2	Decane (C10)	41	d50-Tetracosane	79	2-Methylphenanthrene (2MP)
3	Undecane		**8270E-SIM(M)**	80	2-Methylanthracene (2MA)
4	Dodecane (C12)	42	cis/trans-Decalin	81	9/4-Methylphenanthrene (9MP)
5	Tridecane	43	C1-Decalins	82	1-Methylphenanthrene
6	2,6,10 Trimethyldodecane (1380)	44	C2-Decalins	83	C1-Phenanthrenes/Anthracenes
7	n-Tetradecane (C14)	45	C3-Decalins	84	C2-Phenanthrenes/Anthracenes
8	2,6,10-Trimethyltridecane (1470)	46	C4-Decalins	85	C3-Phenanthrenes/Anthracenes
9	n-Pentadecane (C15)	47	Naphthalene	86	C4-Phenanthrenes/Anthracenes
10	n-Hexadecane (C16)	48	C1-Naphthalenes	87	Retene
11	Norpristane (1650)	49	C2-Naphthalenes	88	Anthracene
12	n-Heptadecane (C17)	50	C3-Naphthalenes	89	Carbazole
13	Pristane	51	C4-Naphthalenes	90	Fluoranthene
14	n-Octadecane (C18)	52	2-Methylnaphthalene	91	Benzo[b]fluorene
15	Phytane	53	1-Methylnaphthalene	92	Pyrene
16	n-Nonadecane (C19)	54	Benzothiophene	93	C1-Fluoranthenes/Pyrenes
17	n-Eicosane (C20)	55	C1-Benzo(b)thiophenes	94	C2-Fluoranthenes/Pyrenes
18	n-Heneicosane (C21)	56	C2-Benzo(b)thiophenes	95	C3-Fluoranthenes/Pyrenes
19	n-Docosane (C22)	57	C3-Benzo(b)thiophenes	96	C4-Fluoranthenes/Pyrenes
20	n-Tricosane (C23)	58	C4-Benzo(b)thiophenes	97	Naphthobenzothiophenes
21	n-Tetracosane (C24)	59	Biphenyl	98	C1-Naphthobenzothiophenes
22	n-Pentacosane (C25)	60	2,6-Dimethylnaphthalene	99	C2-Naphthobenzothiophenes
23	n-Hexacosane (C26)	61	Dibenzofuran	100	C3-Naphthobenzothiophenes
24	n-Heptacosane (C27)	62	Acenaphthylene	101	C4-Naphthobenzothiophenes
25	n-Octacosane (C28)	63	Acenaphthene	102	Benz[a]anthracene
26	n-Nonacosane (C29)	64	2,3,5-Trimethylnaphthalene	103	Chrysene/Triphenylene
27	n-Triacontane (C30)	65	Fluorene	104	C1-Chrysenes
28	n-Hentriacontane (C31)	66	C1-Fluorenes	105	C2-Chrysenes
29	n-Dotriacontane (C32)	67	C2-Fluorenes	106	C3-Chrysenes
30	n-Tritriacontane (C33)	68	C3-Fluorenes	107	C4-Chrysenes
31	n-Tetratriacontane (C34)	69	Dibenzothiophene	108	Benzo[b]fluoranthene
32	n-Pentatriacontane (C35)	70	4-Methyldibenzothiophene(4MDT)	109	Benzo[j]fluoranthene/Benzo[k]fluoranthene
33	n-Hexatriacontane (C36)	71	2/3-Methyldibenzothiophene(2MDT)	110	Benzo[a]fluoranthene
34	n-Heptatriacontane (C37)	72	1-Methyldibenzothiophene(1MDT)	111	Benzo[e]pyrene
35	n-Octatriacontane (C38)	73	C1-Dibenzothiophenes	112	Benzo[a]pyrene
36	n-Nonatriacontane (C39)	74	C2-Dibenzothiophenes	113	Perylene
37	n-Tetracontane (C40)	75	C3-Dibenzothiophenes	114	Indeno[1,2,3-cd]pyrene
38	Total Petroleum Hydrocarbons (C9-C44)	76	C4-Dibenzothiophenes	115	Dibenz[a,h]anthracene/Dibenz[a,c]anthracene
39	Total Saturated Hydrocarbons	77	Phenanthrene	116	Benzo[g,h,i]perylene

Table 2. Analytes quantified in marine subtidal sediments of the 2025 Long-Term Environmental Monitoring Program.

	8270E-SIM(M) contin.		**8270E-SIM(M) contin.**
117	Hopane (T19)	**156**	Unknown Sterane (S18)
118	C23 Tricyclic Terpane (T4)	**157**	13a,17b-20S-Ethyldiacholestane (S19)
119	C24 Tricyclic Terpane (T5)	**158**	14a,17a-20S-Methylcholestane (S20)
120	C25 Tricyclic Terpane (T6)	**159**	14a,17a-20R-Methylcholestane (S24)
121	C24 Tetracyclic Terpane (T6a)	**160**	14a(H),17a(H)-20S-Ethylcholestane (S25)
122	C26 Tricyclic Terpane-22S (T6b)	**161**	14a(H),17a(H)-20R-Ethylcholestane (S28)
123	C26 Tricyclic Terpane-22R (T6c)	**162**	14b(H),17b(H)-20R-Cholestane (S14)
124	C28 Tricyclic Terpane-22S (T7)	**163**	14b(H),17b(H)-20S-Cholestane (S15)
125	C28 Tricyclic Terpane-22R (T8)	**164**	14b,17b-20R-Methylcholestane (S22)
126	C29 Tricyclic Terpane-22S (T9)	**165**	14b,17b-20S-Methylcholestane (S23)
127	C29 Tricyclic Terpane-22R (T10)	**166**	14b(H),17b(H)-20R-Ethylcholestane (S26)
128	18a-22,29,30-Trisnorneohopane-TS (T11)	**167**	14b(H),17b(H)-20S-Ethylcholestane (S27)
129	C30 Tricyclic Terpane-22S	**168**	C26,20R+C27,20S TAS
130	C30 Tricyclic Terpane-22R	**169**	C28,20S TAS
131	17a(H)-22,29,30-Trisnorhopane-TM	**170**	C27,20R TAS
132	17a/b,21b/a 28,30-Bisnorhopane (T14a)	**171**	C28,20R TAS
133	17a(H),21b(H)-25-Norhopane (T14b)	**172**	Naphthalene-d8
134	30-Norhopane (T15)	**173**	Phenanthrene-d10
135	18a(H)-30-Norneohopane-C29Ts (T16)	**174**	Benzo[a]pyrene-d12
136	17a(H)-Diahopane (X)	**175**	5B(H)Cholane
137	30-Normoretane (T17)		
138	18a(H)&18b(H)-Oleananes (T18)		**D6913/D7928**
139	Moretane (T20)	176	Cobbles
140	30-Homohopane-22S (T21)	177	% Coarse Gravel
141	30-Homohopane-22R (T22)	178	% Fine Gravel
142	Gammacerane/C32-Diahopane	179	Gravel
143	30,31-Bishomohopane-22S (T26)	180	% Coarse Sand
144	30,31-Bishomohopane-22R (T27)	181	% Medium Sand
145	30,31-Trishomohopane-22S (T30)	182	% Fine Sand
146	30,31-Trishomohopane-22R (T31)	183	Sand
147	Tetrakishomohopane-22S (T32)	184	% Silt Fine
148	Tetrakishomohopane-22R (T33)	185	% Clay Fine
149	Pentakishomohopane-22S (T34)	186	Fines
150	Pentakishomohopane-22R (T35)		**9060A(M)**
151	13b(H),17a(H)-20S-Diacholestane (S4)	187	Total Organic Carbon (Rep1)
152	13b(H),17a(H)-20R-Diacholestane (S5)	188	Total Organic Carbon (Rep2)
153	13b,17a-20S-Methyldiacholestane (S8)	189	Total Organic Carbon (Average)
154	17a(H)20SC27/C29dia		
155	17a(H)20rc27/C29dia		

Table 3. Analytes quantified in intertidal mussels of the 2025 Long-Term Environmental Monitoring Program.

	EPA 8015D(M)		8270E-SIM(M)		
1	Nonane (C9)	**41**	Hopane (T19)	**83**	14a,17a-20R-Methylcholestane (S24)
2	Decane (C10)	**42**	C23 Tricyclic Terpane (T4)	**84**	14a(H),17a(H)-20S-Ethylcholestane (S25)
3	Undecane	**43**	C24 Tricyclic Terpane (T5)	**85**	14a(H),17a(H)-20R-Ethylcholestane (S28)
4	Dodecane (C12)	**44**	C25 Tricyclic Terpane (T6)	**86**	14b(H),17b(H)-20R-Cholestane (S14)
5	Tridecane	**45**	C24 Tetracyclic Terpane (T6a)	**87**	14b(H),17b(H)-20S-Cholestane (S15)
6	2,6,10 Trimethyldodecane (1380)	**46**	C26 Tricyclic Terpane-22S (T6b)	**88**	14b,17b-20R-Methylcholestane (S22)
7	n-Tetradecane (C14)	**47**	C26 Tricyclic Terpane-22R (T6c)	**89**	14b,17b-20S-Methylcholestane (S23)
8	2,6,10-Trimethyltridecane (1470)	**48**	C28 Tricyclic Terpane-22S (T7)	**90**	14b(H),17b(H)-20R-Ethylcholestane (S26)
9	n-Pentadecane (C15)	**49**	C28 Tricyclic Terpane-22R (T8)	**91**	14b(H),17b(H)-20S-Ethylcholestane (S27)
10	n-Hexadecane (C16)	**50**	C29 Tricyclic Terpane-22S (T9)	**92**	5B(H)Cholane
11	Norpristane (1650)	**51**	C29 Tricyclic Terpane-22R (T10)	**93**	cis/trans-Decalin
12	n-Heptadecane (C17)	**52**	18a-22,29,30-Trisnorneohopane-TS (T11)	**94**	C1-Decalins
13	Pristane	**53**	C30 Tricyclic Terpane-22S	**95**	C2-Decalins
14	n-Octadecane (C18)	**54**	C30 Tricyclic Terpane-22R	**96**	C3-Decalins
15	Phytane	**55**	17a(H)-22,29,30-Trisnorhopane-TM	**97**	C4-Decalins
16	n-Nonadecane (C19)	**56**	17a/b,21b/a 28,30-Bisnorhopane (T14a)	**98**	Naphthalene
17	n-Eicosane (C20)	**57**	17a(H),21b(H)-25-Norhopane (T14b)	**99**	C1-Naphthalenes
18	n-Heneicosane (C21)	**58**	30-Norhopane (T15)	**100**	C2-Naphthalenes
19	n-Docosane (C22)	**59**	18a(H)-30-Norneohopane-C29Ts (T16)	**101**	C3-Naphthalenes
20	n-Tricosane (C23)	**60**	17a(H)-Diahopane (X)	**102**	C4-Naphthalenes
21	n-Tetracosane (C24)	**61**	30-Normoretane (T17)	**103**	2-Methylnaphthalene
22	n-Pentacosane (C25)	**62**	18a(H)&18b(H)-Oleananes (T18)	**104**	1-Methylnaphthalene
23	n-Hexacosane (C26)	**63**	Moretane (T20)	**105**	Benzothiophene
24	n-Heptacosane (C27)	**64**	30-Homohopane-22S (T21)	**106**	C1-Benzo(b)thiophenes
25	n-Octacosane (C28)	**65**	30-Homohopane-22R (T22)	**107**	C2-Benzo(b)thiophenes
26	n-Nonacosane (C29)	**66**	Gammacerane/C32-Diahopane	**108**	C3-Benzo(b)thiophenes
27	n-Triacontane (C30)	**67**	30,31-Bishomohopane-22S (T26)	**109**	C4-Benzo(b)thiophenes
28	n-Hentriacontane (C31)	**68**	30,31-Bishomohopane-22R (T27)	**110**	Biphenyl
29	n-Dotriacontane (C32)	**69**	30,31-Trishomohopane-22S (T30)	**111**	2,6-Dimethylnaphthalene
30	n-Tritriacontane (C33)	**70**	30,31-Trishomohopane-22R (T31)	**112**	Dibenzofuran
31	n-Tetratriacontane (C34)	**71**	Tetrakishomohopane-22S (T32)	**113**	Acenaphthylene
32	n-Pentatriacontane (C35)	**72**	Tetrakishomohopane-22R (T33)	**114**	Acenaphthene
33	n-Hexatriacontane (C36)	**73**	Pentakishomohopane-22S (T34)	**115**	2,3,5-Trimethylnaphthalene
34	n-Heptatriacontane (C37)	**74**	Pentakishomohopane-22R (T35)	**116**	Fluorene
35	n-Octatriacontane (C38)	**75**	13b(H),17a(H)-20S-Diacholestane (S4)	**117**	C1-Fluorenes
36	n-Nonatriacontane (C39)	**76**	13b(H),17a(H)-20R-Diacholestane (S5)	**118**	C2-Fluorenes
37	n-Tetracontane (C40)	**77**	13b,17a-20S-Methyldiacholestane (S8)	**119**	C3-Fluorenes
38	Total Petroleum Hydrocarbons (C9-C44)	**78**	17a(H)20SC27/C29dia	**120**	Dibenzothiophene
39	Total Saturated Hydrocarbons	**79**	17a(H)20rc27/C29dia	**121**	4-Methyldibenzothiophene(4MDT)
40	d50-Tetracosane	**80**	Unknown Sterane (S18)	**122**	2/3-Methyldibenzothiophene(2MDT)
		81	13a,17b-20S-Ethyldiacholestane (S19)	**123**	1-Methyldibenzothiophene(1MDT)
		82	14a,17a-20S-Methylcholestane (S20)	**124**	C1-Dibenzothiophenes

Table 3. Analytes quantified in intertidal mussels of the 2025 Long-Term Environmental Monitoring Program.

	8270E-SIM(M)
125	C2-Dibenzothiophenes
126	C3-Dibenzothiophenes
127	C4-Dibenzothiophenes
128	Phenanthrene
129	3-Methylphenanthrene
130	2-Methylphenanthrene (2MP)
131	2-Methylanthracene (2MA)
132	9/4-Methylphenanthrene (9MP)
133	1-Methylphenanthrene
134	C1-Phenanthrenes/Anthracenes
135	C2-Phenanthrenes/Anthracenes
136	C3-Phenanthrenes/Anthracenes
137	C4-Phenanthrenes/Anthracenes
138	Retene
139	Anthracene
140	Carbazole
141	Fluoranthene
142	Benzo[b]fluorene
143	Pyrene
144	C1-Fluoranthenes/Pyrenes
145	C2-Fluoranthenes/Pyrenes
146	C3-Fluoranthenes/Pyrenes
147	C4-Fluoranthenes/Pyrenes
148	Naphthobenzothiophenes
149	C1-Naphthobenzothiophenes
150	C2-Naphthobenzothiophenes
151	C3-Naphthobenzothiophenes
152	C4-Naphthobenzothiophenes
153	Benz[a]anthracene
154	Chrysene/Triphenylene
155	C1-Chrysenes
156	C2-Chrysenes
157	C3-Chrysenes
158	C4-Chrysenes
159	Benzo[b]fluoranthene
160	Benzo[j]fluoranthene/Benzo[k]fluoranthene
161	Benzo[a]fluoranthene
162	Benzo[e]pyrene
163	Benzo[a]pyrene
164	Perylene
165	Indeno[1,2,3-cd]pyrene
166	Dibenz[a,h]anthracene/Dibenz[a,c]anthracene
167	Benzo[g,h,i]perylene
168	Naphthalene-d8
169	Phenanthrene-d10
170	Benzo[a]pyrene-d12
	NOAA NOS ORCA 130
171	Percent Lipids
	2540G
172	Moisture

Table 4. Analytes quantified in seawater by passive sampling device in the 2025 Long-Term Environmental Monitoring Program.

Parent and Alkyl Substituted PAHs by GC-MS/MS (ng/L)				Determination of Forensic Alkyl PAHs using GC-QQQ (ng/L)	
Count	**Analytes**	**Count.**	**Analytes.**	**Count..**	**Analytes..**
1	1,2-dimethylnaphthalene	34	benzo[b]fluoranthene	65	C1-benz[a]anthracenes & chrysenes & triphenylenes
2	1,4-dimethylnaphthalene	35	benzo[b]fluorene	66	C1-dibenzothiophenes
3	1,5-dimethylnaphthalene	36	benzo[b]perylene	67	C1-fluoranthenes & pyrenes
4	1,6 and 1,3-Dimethylnaphthalene	37	benzo[c]fluorene	68	C1-fluorenes
5	1,8-dimethylnaphthalene	38	benzo[e]pyrene	69	C1-naphthalenes
6	1-methylnaphthalene	39	benzo[ghi]perylene	70	C1-phenanthrenes & anthracenes
7	1-methylphenanthrene	40	benzo[j]fluoranthene	71	C2-benz[a]anthracenes & chrysenes & triphenylenes
8	1-methylpyrene	41	benzo[k]fluoranthene	72	C2-dibenzothiophenes
9	2,3-dimethylanthracene	42	chrysene	73	C2-fluoranthenes & pyrenes
10	2,6-diethylnaphthalene	43	coronene	74	C2-fluorenes
11	2,6-dimethylnaphthalene	44	cyclopenta[cd]pyrene	75	C2-naphthalenes
12	2-ethylnaphthalene	45	dibenzo[a,e]fluoranthene	76	C2-phenanthrenes & C2-anthracenes
13	2-methylanthracene	46	dibenzo[a,e]pyrene	77	C3-dibenzothiophenes
14	2-methylnaphthalene	47	dibenzo[a,h]anthracene	78	C3-fluorenes
15	2-methylphenanthrene	48	dibenzo[a,h]pyrene	79	C3-naphthalenes
16	3,6-dimethylphenanthrene	49	dibenzo[a,i]pyrene	80	C3-phenanthrenes & anthracenes
17	5-methylchrysene	50	dibenzo[a,l]pyrene	81	C4-naphthalenes
18	6-methylchrysene	51	dibenzo[e,l]pyrene	82	C4-phenanthrenes & C4-anthracenes
19	7,12-dimethylbenz[a]anthracene	52	dibenzothiophene		
20	9,10-dimethylanthracene	53	fluoranthene		
21	9-methylanthracene	54	fluorene		
22	Naphtho[2,3-b]fluoranthene	55	indeno[1,2,3-cd]pyrene		
23	Naphtho[2,3-j] and [1,2-k]fluoranthene	56	naphthalene		
24	Pyrene	57	naphtho[1,2-b]fluoranthene		
25	acenaphthene	58	naphtho[2,3-a]pyrene		
26	acenaphthylene	59	naphtho[2,3-e]pyrene		
27	anthanthrene	60	naphtho[2,3-k]fluoranthene		
28	anthracene	61	perylene		
29	benz[a]anthracene	62	phenanthrene		
30	benz[j] and [e]aceanthrylene	63	retene		
31	benzo[a]chrysene	64	triphenylene		
32	benzo[a]fluorene				
33	benzo[a]pyrene				

Table 5. Sediment PAH loads from 2025 samples.

Count	Analyte (ng/g dry weight)	AMT-S-25-1	AMT-S-25-2	AMT-S-25-3	GOC-S-25-1	GOC-S-25-2	GOC-S-25-3	GOC-S-25-3-DUP
1	Naphthalene	2.140	3.170	2.010	2.720	1.620	0.791	0.826
2	C1-Naphthalenes	6.180	2.120	2.410	2.170	1.750	0.587	0.602
3	C2-Naphthalenes	19.600	3.550	3.700	3.120	2.040	1.280	1.230
4	C3-Naphthalenes	20.100	2.980	2.820	2.080	1.460	0.886	0.823
5	C4-Naphthalenes	11.200	2.530	2.480	1.510	1.860	-	-
6	Biphenyl	2.640	2.210	2.150	3.040	1.330	1.280	1.560
7	Dibenzofuran	1.870	1.190	0.978	1.080	0.808	0.493	0.469
8	Acenaphthylene	0.459	0.207	0.188	0.304	0.119	0.046	0.068
9	Acenaphthene	3.250	0.402	0.380	0.698	0.467	0.255	0.325
10	Fluorene	4.130	1.160	1.090	1.160	0.722	0.549	0.507
11	C1-Fluorenes	8.900	2.900	1.920	1.710	0.940	0.773	0.797
12	C2-Fluorenes	12.700	4.460	2.400	1.590	0.804	0.675	0.663
13	C3-Fluorenes	13.600	4.950	5.160	-	-	-	-
14	Dibenzothiophene	7.040	0.589	0.463	0.385	0.278	0.200	0.204
15	C1-Dibenzothiophenes	24.200	1.120	0.697	0.339	0.214	0.210	0.223
16	C2-Dibenzothiophenes	29.100	3.090	2.440	0.792	0.535	-	0.440
17	C3-Dibenzothiophenes	18.000	4.780	3.460	-	0.524	-	-
18	C4-Dibenzothiophenes	7.200	4.080	3.120	-	-	-	-
19	Phenanthrene	30.000	5.510	4.530	4.200	2.420	2.000	2.220
20	C1-Phenanthrenes/Anthracenes	52.600	3.960	3.040	1.770	0.920	0.650	0.973
21	C2-Phenanthrenes/Anthracenes	39.600	5.640	3.250	1.420	0.742	0.541	0.633
22	C3-Phenanthrenes/Anthracenes	16.800	4.920	3.700	0.966	0.430	0.478	0.557
23	C4-Phenanthrenes/Anthracenes	6.110	2.910	2.650	-	0.469	-	-
24	Retene	2.030	1.220	0.523	-	0.119	-	0.150
25	Anthracene	4.120	0.546	0.447	0.400	0.269	0.334	0.323
26	Carbazole	1.570	0.625	0.662	0.374	0.499	2.020	2.020
27	Fluoranthene	8.380	3.210	2.150	3.130	1.830	0.923	1.680
28	Benzo[b]fluorene	2.330	0.466	0.322	0.275	0.145	0.158	0.145
29	Pyrene	11.400	2.520	1.560	2.060	1.010	0.688	1.350
30	C1-Fluoranthenes/Pyrenes	16.700	2.760	2.460	1.500	0.693	0.797	0.840
31	C2-Fluoranthenes/Pyrenes	10.300	2.940	2.680	0.996	0.480	0.594	0.756
32	C3-Fluoranthenes/Pyrenes	7.350	4.710	3.790	-	-	-	-
33	C4-Fluoranthenes/Pyrenes	5.680	4.280	3.760	-	-	-	-
34	Naphthobenzothiophenes	4.090	1.110	0.928	0.443	0.196	0.127	0.161
35	C1-Naphthobenzothiophenes	6.370	3.210	2.720	0.633	0.485	-	-
36	C2-Naphthobenzothiophenes	8.760	8.240	6.830	-	-	-	-
37	C3-Naphthobenzothiophenes	6.550	6.750	5.090	-	-	-	-
38	C4-Naphthobenzothiophenes	5.850	4.750	4.500	-	-	-	-
39	Benz[a]anthracene	5.320	1.290	0.556	0.633	0.255	0.367	0.471
40	Chrysene/Triphenylene	7.580	2.960	1.900	1.280	0.414	0.457	0.594
41	C1-Chrysenes	7.860	3.110	2.620	0.769	0.364	0.465	0.651
42	C2-Chrysenes	6.000	4.650	4.720	-	-	-	1.100
43	C3-Chrysenes	9.030	8.580	9.660	-	-	-	-
44	C4-Chrysenes	9.600	-	-	-	-	-	-
45	Benzo[b]fluoranthene	3.340	1.570	0.774	0.950	0.271	0.214	0.445
46	Benzo[j]fluoranthene/Benzo[k]fluoranthene	2.690	0.916	0.485	0.796	0.164	0.222	0.354
47	Benzo[a]fluoranthene	0.516	0.193	-	-	-	-	-
48	Benzo[e]pyrene	2.840	1.440	1.030	0.658	0.246	0.235	0.406
49	Benzo[a]pyrene	2.240	1.060	0.520	0.505	0.127	0.135	0.385
50	Perylene	2.080	1.610	1.160	0.626	0.304	0.268	0.352
51	Indeno[1,2,3-cd]pyrene	1.020	0.637	0.401	0.338	0.103	0.144	0.284

Table 5. Sediment PAH loads from 2025 samples.

Count	Analyte (ng/g dry weight)	AMT-S-25-1	AMT-S-25-2	AMT-S-25-3	GOC-S-25-1	GOC-S-25-2	GOC-S-25-3	GOC-S-25-3-DUP
52	Dibenz[a,h]anthracene/Dibenz[a,c]anthracene	0.417	0.197	0.178	0.174	0.079	0.074	0.240
53	Benzo[g,h,i]perylene	1.570	1.140	0.823	0.479	0.171	0.151	0.287
	Total Organic Carbon (Average)	0.549	0.623	0.528	0.544	0.48	0.474	0.551
	Sum 53 PAH (ng/g dry weight)	501.00	145.12	118.29	48.07	28.68	20.07	26.11
	Sum 53 PAH (ng/g TOC corrected)	912.57	232.93	224.02	88.37	59.74	42.34	47.39
	Sum 16 PAH[1] (ng/g dry weight)	88.06	26.50	17.99	19.83	10.04	7.35	10.36
	Sum low molecular weight PAH[2]	343.57	70.19	56.01	31.45	20.84	12.03	13.59
	Sum high molecular weight PAH[3]	155.86	74.30	61.62	16.25	7.34	6.02	10.50
	% low molecular weight PAH	69%	49%	48%	66%	74%	67%	56%
	% high molecular weight PAH	31%	51%	52%	34%	26%	33%	44%
	Sum of Carcinogenic PAH[4]	22.607	8.630	4.814	4.676	1.413	1.613	2.773

1- 16 EPA Priority PAHs - naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, benzo[a]anthracene, chrysene, benzo[b]fluoranthene, benzo[k]fluoranthene , benzo[a]pyrene, benzo[g,h,i]perylene, indeno[1,2,3-c,d]pyrene,

2- Low molecular weight PAHs : napthalenes - phenanthrenes (2-3-ring PAH)

3- High molecular weight PAHs: fluoranthene - benzo (g,h,i)perylene (3-6 ring PAH)

4 - Carcinogenic PAHs: benzo[a]pyrene, benz[a]anthracene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenz[a,h]anthracene, indeno[1,2,3-cd]pyrene

Table 6. Sediment PAH toxicity comparisons from 2025 samples.

	EPA 2003	Sample Organic carbon corrected levels (ng/g)						Sample Equlibrium Partioning concentration-of-concern values					
PAH Analyte	Sediment Benchmarks (ng/goc)	AMT-S-25-1	AMT-S-25-2	AMT-S-25-3	GOC-S-25-1	GOC-S-25-2	GOC-S-25-3	AMT-S-25-1	AMT-S-25-2	AMT-S-25-3	GOC-S-25-1	GOC-S-25-2	GOC-S-25-3
Naphthalene	385000	389.80	508.83	380.68	500.00	337.50	166.88	1.01E-03	1.32E-03	9.89E-04	1.30E-03	8.77E-04	4.33E-04
C1-Naphthalenes	444000	1125.68	340.29	456.44	398.90	364.58	123.84	2.54E-03	7.66E-04	1.03E-03	8.98E-04	8.21E-04	2.79E-04
Acenaphthylene	452000	83.61	33.23	35.61	55.88	24.79	9.70	1.85E-04	7.35E-05	7.88E-05	1.24E-04	5.48E-05	2.15E-05
Acenaphthene	491000	591.99	64.53	71.97	128.31	97.29	53.80	1.21E-03	1.31E-04	1.47E-04	2.61E-04	1.98E-04	1.10E-04
C2-Naphthalenes	510000	3570.13	569.82	700.76	573.53	425.00	270.04	7.00E-03	1.12E-03	1.37E-03	1.12E-03	8.33E-04	5.29E-04
Fluorene	538000	752.28	186.20	206.44	213.24	150.42	115.82	1.40E-03	3.46E-04	3.84E-04	3.96E-04	2.80E-04	2.15E-04
C3-Naphthalenes	581000	3661.20	478.33	534.09	382.35	304.17	186.92	6.30E-03	8.23E-04	9.19E-04	6.58E-04	5.24E-04	3.22E-04
Anthracene	594000	750.46	87.64	84.66	73.53	56.04	70.46	1.26E-03	1.48E-04	1.43E-04	1.24E-04	9.43E-05	1.19E-04
Phenanthrene	596000	5464.48	884.43	857.95	772.06	504.17	421.94	9.17E-03	1.48E-03	1.44E-03	1.30E-03	8.46E-04	7.08E-04
C1-Fluorenes	611000	1621.13	465.49	363.64	314.34	195.83	163.08	2.65E-03	7.62E-04	5.95E-04	5.14E-04	3.21E-04	2.67E-04
C4-Naphthalenes	657000	2040.07	406.10	469.70	277.57	387.50	ND	3.11E-03	6.18E-04	7.15E-04	4.22E-04	5.90E-04	0.00E+00
C1-Phenanthrenes/Anthracenes	670000	9581.06	635.63	575.76	325.37	191.67	137.13	1.43E-02	9.49E-04	8.59E-04	4.86E-04	2.86E-04	2.05E-04
C2-Fluorenes	686000	2313.30	715.89	454.55	292.28	167.50	142.41	3.37E-03	1.04E-03	6.63E-04	4.26E-04	2.44E-04	2.08E-04
Pyrene	697000	2076.50	404.49	295.45	378.68	210.42	145.15	2.98E-03	5.80E-04	4.24E-04	5.43E-04	3.02E-04	2.08E-04
Fluoranthene	707000	1526.41	515.25	407.20	575.37	381.25	194.73	2.16E-03	7.29E-04	5.76E-04	8.14E-04	5.39E-04	2.75E-04
C2-Phenanthrenes/Anthracenes	746000	7213.11	905.30	615.53	261.03	154.58	114.14	9.67E-03	1.21E-03	8.25E-04	3.50E-04	2.07E-04	1.53E-04
C3-Fluorenes	769000	2477.23	794.54	977.27	ND	ND	ND	3.22E-03	1.03E-03	1.27E-03	0.00E+00	0.00E+00	0.00E+00
C1-Fluoranthenes/Pyrenes	770000	3041.89	443.02	465.91	275.74	144.38	168.14	3.95E-03	5.75E-04	6.05E-04	3.58E-04	1.88E-04	2.18E-04
C3-Phenanthrenes/Anthracenes	829000	3060.11	789.73	700.76	177.57	89.58	100.84	3.69E-03	9.53E-04	8.45E-04	2.14E-04	1.08E-04	1.22E-04
Benz[a]anthracene	841000	969.03	207.06	105.30	116.36	53.13	77.43	1.15E-03	2.46E-04	1.25E-04	1.38E-04	6.32E-05	9.21E-05
Chrysene/Triphenylene	844000	1380.69	475.12	359.85	235.29	86.25	96.41	1.64E-03	5.63E-04	4.26E-04	2.79E-04	1.02E-04	1.14E-04
C4-Phenanthrenes/Anthracenes	913000	1112.93	467.09	501.89	ND	97.71	ND	1.22E-03	5.12E-04	5.50E-04	0.00E+00	1.07E-04	0.00E+00
C1-Chrysenes	929000	1431.69	499.20	496.21	141.36	75.83	98.10	1.54E-03	5.37E-04	5.34E-04	1.52E-04	8.16E-05	1.06E-04
Benzo[a]pyrene	965000	408.01	170.14	98.48	92.83	26.46	28.48	4.23E-04	1.76E-04	1.02E-04	9.62E-05	2.74E-05	2.95E-05
Perylene	967000	378.87	258.43	219.70	115.07	63.33	56.54	3.92E-04	2.67E-04	2.27E-04	1.19E-04	6.55E-05	5.85E-05
Benzo[e]pyrene	967000	517.30	231.14	195.08	120.96	51.25	49.58	5.35E-04	2.39E-04	2.02E-04	1.25E-04	5.30E-05	5.13E-05
Benzo[b]fluoranthene	979000	608.38	252.01	146.59	174.63	56.46	45.15	6.21E-04	2.57E-04	1.50E-04	1.78E-04	5.77E-05	4.61E-05
Benzo[j]fluoranthene/Benzo[k]fluoranthene	981000	489.98	147.03	91.86	146.32	34.17	46.84	4.99E-04	1.50E-04	9.36E-05	1.49E-04	3.48E-05	4.77E-05
C2-Chrysenes	1008000	1092.90	746.39	893.94	ND	ND	ND	1.08E-03	7.40E-04	8.87E-04	0.00E+00	0.00E+00	0.00E+00
Benzo[g,h,i]perylene	1095000	285.97	182.99	155.87	88.05	35.63	31.86	2.61E-04	1.67E-04	1.42E-04	8.04E-05	3.25E-05	2.91E-05
C3-Chrysenes	1112000	1644.81	1377.21	1829.55	ND	ND	ND	1.48E-03	1.24E-03	1.65E-03	0.00E+00	0.00E+00	0.00E+00
Indeno[1,2,3-cd]pyrene	1115000	185.79	102.25	75.95	62.13	21.46	30.38	1.67E-04	9.17E-05	6.81E-05	5.57E-05	1.92E-05	2.72E-05
Dibenz[a,h]anthracene/Dibenz[a,c]ant	1123000	75.96	31.62	33.71	31.99	16.46	15.61	6.76E-05	2.82E-05	3.00E-05	2.85E-05	1.47E-05	1.39E-05
C4-Chrysenes	1214000	1748.63	ND	ND	ND	ND	ND	1.44E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sample Equlibrium Partioning concentration-of-concern values for PAH Mixtures (% of benchmark)								**0.091689**	**0.019881**	**0.019062**	**0.01171**	**0.0079708**	**0.0050076**

Table 7. Mussel Tissue PAH loads from 2025 LTEMP samples.

Count	ANALYTE	JAC-B-25-1	JAC-B-25-2	JAC-B-25-3	AMT-B-25-1	AMT-B-25-2	AMT-B-25-3	RED-B-25-1	RED-B-25-2	RED-B-25-3	GOC-B-25-1	GOC-B-25-2	GOC-B-25-3
1	Naphthalene	0.653	0.65	0.585	0.472	0.527	0.572	0.679	0.644	0.55	0.457	0.855	0.724
2	C1-Naphthalenes	0.463	0.49	0.377	0.435	0.373	0.414	0.611	0.574	0.441	0.402	0.633	0.511
3	C2-Naphthalenes	0.738	0.772	0.897	0.658	0.665	0.79	0.988	0.887	0.777	0.64	0.926	0.797
4	C3-Naphthalenes	0.757	0.727	0.827	0.715	0.705	0.686	0.931	0.929	0.674	-	0.784	0.731
5	Biphenyl	0.221	0.185	0.17	0.212	0.21	0.228	0.292	0.298	0.208	0.331	0.206	0.214
6	Dibenzofuran	0.313	0.212	0.235	0.22	0.204	0.204	0.622	0.721	0.57	0.211	0.258	0.259
7	Acenaphthylene	0.085	0.062	0.062	0.048	0.058	0.036	0.125	0.134	0.121	-	0.08	0.07
8	Acenaphthene	0.116	0.098	0.096	0.1	0.085	0.102	0.458	0.531	0.354	0.123	0.155	0.108
9	Fluorene	0.321	0.328	0.312	0.303	0.259	0.279	0.701	0.808	0.645	0.262	0.329	0.302
10	Dibenzothiophene	0.136	0.11	0.099	0.107	0.108	0.091	0.3	0.369	0.292	0.088	0.105	0.107
11	C1-Dibenzothiophenes	0.156	0.267	0.193	0.183	0.234	0.13	0.294	0.23	0.282	-	-	-
12	C2-Dibenzothiophenes	0.5	-	0.594	0.592	0.578	0.5	0.917	0.712	0.91	-	-	-
13	Phenanthrene	1.18	1.4	1.25	1.3	1.28	1.24	5.58	6.42	5.55	1.41	1.7	1.69
14	C1-Phenanthrenes/Anthracenes	0.57	0.478	0.539	0.552	0.497	0.47	1.46	1.66	1.27	0.468	0.58	0.5
15	Anthracene	0.072	0.068	0.059	0.063	-	0.041	0.375	0.389	0.315	0.065	0.056	0.084
16	Carbazole	0.087	0.112	0.075	0.072	0.118	0.079	0.164	0.128	0.108	0.084	0.106	0.1
17	Fluoranthene	0.699	0.727	0.633	0.638	0.771	0.636	6.8	7.54	5.82	0.81	0.78	0.889
18	Pyrene	0.222	0.281	0.197	0.207	0.251	0.205	2.74	3.22	2.48	0.249	0.297	0.259
19	Naphthobenzothiophenes	0.07	0.054	0.038	0.042	-	0.05	0.992	0.721	0.726	0.045	0.055	0.057
20	Benz[a]anthracene	0.082	0.061	0.056	0.04	-	0.03	1.7	1.2	1.22	0.057	0.064	0.061
21	Chrysene/Triphenylene	0.167	0.195	0.168	0.132	0.167	0.132	3.68	2.86	2.86	0.218	0.207	0.271
22	Benzo[b]fluoranthene	0.104	-	-	-	-	-	1.39	1.01	0.938	-	-	-
23	Benzo[j]fluoranthene/Benzo[k]fluoranthene	0.079	-	-	-	-	-	1.32	1.01	0.962	-	-	-
24	Indeno[1,2,3-cd]pyrene	0.139	0.097	-	0.063	-	0.053	0.243	0.212	0.212	0.079	-	-
25	Benzo[g,h,i]perylene	0.309	0.25	0.114	0.13	0.168	0.15	0.396	0.412	0.385	0.164	0.16	0.098
26	C1-Fluorenes	-	0.29	-	0.267	-	0.242	0.454	0.536	0.529	-	0.276	0.32
27	C1-Fluoranthenes/Pyrenes	-	-	-	-	-	0.261	2	1.97	1.57	0.356	0.492	0.38
28	C1-Naphthobenzothiophenes	-	-	-	-	-	0.347	0.508	0.371	0.587	-	-	-
29	C2-Naphthobenzothiophenes	-	-	-	-	-	0.637	-	-	0.607	-	-	-
30	C3-Naphthobenzothiophenes	-	-	-	-	-	0.678	-	-	-	-	-	-
31	C2-Phenanthrenes/Anthracenes	-	-	-	-	-	-	1.2	0.958	1.17	-	-	-
32	C3-Phenanthrenes/Anthracenes	-	-	-	-	-	-	1.01	0.824	0.805	-	-	-
33	Benzo[b]fluorene	-	-	-	-	-	-	0.542	0.54	0.414	-	-	-

Table 7. Mussel Tissue PAH loads from 2025 LTEMP samples.

Count	ANALYTE	JAC-B-25-1	JAC-B-25-2	JAC-B-25-3	AMT-B-25-1	AMT-B-25-2	AMT-B-25-3	RED-B-25-1	RED-B-25-2	RED-B-25-3	GOC-B-25-1	GOC-B-25-2	GOC-B-25-3
34	C2-Fluoranthenes/Pyrenes	-	-	-	-	-	-	0.826	0.78	0.66	-	-	-
35	C1-Chrysenes	-	-	-	-	-	-	0.838	0.682	0.554	-	-	-
36	Benzo[a]fluoranthene	-	-	-	-	-	-	0.093	-	-	-	-	-
37	Benzo[e]pyrene	-	-	-	-	-	-	0.797	0.755	0.636	-	-	-
38	Benzo[a]pyrene	-	-	-	-	-	-	0.379	0.242	0.205	-	-	-
39	Perylene	-	-	-	-	-	-	0.119	0.134	0.098	-	-	-
	Percent Lipids	1.56	1.43	1.44	1.6	1.42	1.28	1.51	1.62	1.12	1.9	1.69	2.13
	Moisture	85.9	85.7	87.2	87.6	87.9	88.3	87.7	84.7	88.5	86	86.9	85
Total PAH (ng/g wet weight)		8.24	7.91	7.58	7.55	7.26	9.28	42.52	41.41	36.51	6.52	9.10	8.53
Total PAH (ng/g dry weight)		58.43	55.34	59.19	60.90	59.98	79.34	345.72	270.66	317.43	46.56	69.50	56.88
Total PAH (ng/g lipid corrected)		528.14	553.43	526.11	471.94	511.13	725.23	2816.16	2556.23	3259.38	343.11	538.70	400.56
Sum 16 PAH[1] (ng/g wet weight)		4.23	4.22	3.53	3.50	3.57	3.48	26.57	26.63	22.62	3.89	4.68	4.56
Sum 16 PAH[1] (ng/g dry weight)		0.60	0.60	0.45	0.43	0.43	0.41	3.27	4.07	2.60	0.55	0.61	0.68
Sum low molecular weight PAH[2] (ng/g wet weight)		6.28	5.85	6.30	5.96	5.78	5.78	14.33	15.31	12.96	4.46	6.67	6.10
Sum high molecular weight PAH[3] (ng/g wet weight)		1.87	1.96	1.21	1.52	1.36	3.42	28.03	25.98	23.44	1.98	2.33	2.34
% low molecular weight PAH		77%	75%	84%	80%	81%	63%	34%	37%	36%	69%	74%	72%
% high molecular weight PAH		23%	25%	16%	20%	19%	37%	66%	63%	64%	31%	26%	28%
Sum of Carcinogenic PAH[4] (ng/g wet weight)		0.571	0.353	0.224	0.235	0.167	0.215	8.712	6.534	6.397	0.354	0.271	0.332

1 16 EPA Priority PAHs - See Table 5

2 Low molecular weight PAHs : napthalenes - phenanthrenes (2-3-ring PAH)

3 High molecular weight PAHs: fluoranthene - benzo (g,h,i)perylene (3-6 ring PAH)

4 Carcinogenic PAHs: benzo[a]pyrene, benz[a]anthracene, benzo[b]fluoranthene, benzo[k]fluoranthene, chrysene, dibenz[a,h]anthracene, indeno[1,2,3-cd]pyrene

Table 8. 2025 Water PAH concentrations quantified via passive sampling device (ng/L C free).

.	Analyte	JAC-PSD-25-1	JAC-PSD-25-2	JAC-PSD-25-3	AMT-PSD-25-1	AMT-PSD-25-2	AMT-PSD-25-3	GOC-PSD-25-1	GOC-PSD-25-2	GOC-PSD-25-3
1	naphthalene	0.842	4.58	0.905	3.12	1.58	3.47	0.471	0.591	0.456
2	C1-naphthalenes	0.312	0.543	0.408	0.809	0.34	0.44	0.256	0.312	0.276
3	C2-naphthalenes	0.391	1.03	0.866	2.53	0.861	1.07	0.39	0.456	0.37
4	C3-naphthalenes	1.55	1.14	1.44	6.24	2.1	2.4	0.761	1.17	0.801
5	C4-naphthalenes	2.7	1.67	2.27	11.6	3.29	3.28	1.01	1.68	1.16
6	acenaphthylene	< 0.00955	< 0.00945	< 0.00947	< 0.00993	< 0.0104	< 0.0104	< 0.00940	< 0.00961	< 0.00945
7	acenaphthene	0.159	0.106	0.171	0.306	9.69E-02	0.156	0.161	0.209	0.17
8	fluorene	8.60E-02	0.127	9.24E-02	0.185	7.19E-02	0.124	8.58E-02	0.105	9.06E-02
9	C1-fluorenes	0.129	0.178	0.156	0.232	0.28	0.283	0.148	0.14	9.89E-02
10	C2-fluorenes	0.597	0.528	0.586	0.688	0.915	1.06	0.342	0.448	0.384
11	C3-fluorenes	0.514	0.376	0.389	0.701	0.738	0.8	0.316	0.456	0.327
12	anthracene	2.74E-02	5.42E-02	5.10E-02	2.42E-02	3.91E-02	3.74E-02	2.92E-02	2.60E-02	2.04E-02
13	phenanthrene	0.166	0.161	0.158	0.181	0.219	0.233	0.201	0.239	0.214
14	C1-phenanthrenes & anthracenes	0.141	0.106	0.121	0.173	0.181	0.218	0.101	0.128	0.11
15	C3-phenanthrenes & anthracenes	0.831	0.683	0.746	0.853	1.16	1.17	0.349	0.725	0.557
16	dibenzothiophene	9.75E-03	8.88E-03	9.10E-03	9.90E-03	1.19E-02	1.66E-02	1.02E-02	1.21E-02	1.02E-02
17	C1-dibenzothiophenes	0.123	8.90E-02	0.117	0.115	0.113	0.212	6.97E-02	8.75E-02	7.56E-02
18	C2-dibenzothiophenes	0.191	0.16	0.185	0.159	0.223	0.343	0.105	0.126	0.109
19	C3-dibenzothiophenes	< 0.0324	< 0.0294	< 0.0303	< 0.0388	< 0.0440	< 0.0440	< 0.0311	< 0.0352	< 0.0324
20	fluoranthene	9.06E-02	7.11E-02	7.72E-02	8.24E-02	9.72E-02	9.38E-02	0.113	0.14	0.121
21	Pyrene	1.17E-02	7.81E-03	9.56E-03	1.65E-02	1.39E-02	1.24E-02	2.45E-02	3.03E-02	2.75E-02
22	C1-fluoranthenes & pyrenes	3.44E-02	3.94E-02	3.33E-02	2.87E-02	3.56E-02	8.22E-02	3.86E-02	4.67E-02	4.21E-02
23	C2-fluoranthenes & pyrenes	< 0.00193	< 0.00148	< 0.00163	< 0.00277	< 0.00338	< 0.00338	< 0.00178	< 0.00233	< 0.00195
24	chrysene	3.63E-03	2.72E-03	3.51E-03	3.26E-03	3.84E-03	3.21E-03	4.50E-03	5.13E-03	4.79E-03
25	triphenylene	4.96E-03	4.19E-03	4.32E-03	5.13E-03	6.72E-03	6.08E-03	5.41E-03	6.52E-03	6.02E-03
26	C1-benz[a]anthracenes & chrysenes & triphenylenes	0.026	0.030	0.028	0.033	0.031	0.031	0.025	0.035	1.77E-02
27	perylene	< 0.000750	< 0.000555	< 0.000621	< 0.00112	< 0.00138	< 0.00138	< 0.000686	< 0.000929	< 0.000759
28	benzo[b]fluoranthene	1.47E-03	1.51E-03	1.10E-03	2.84E-03	3.82E-03	3.88E-03	1.98E-03	2.42E-03	2.25E-03
29	benzo[j]fluoranthene	< 0.000396	< 0.000293	< 0.000328	< 0.000590	< 0.000728	< 0.000729	< 0.000363	< 0.000490	< 0.000401
30	benzo[k]fluoranthene	< 0.000375	< 0.000278	< 0.000310	< 0.000558	< 0.000689	< 0.000690	< 0.000343	< 0.000464	< 0.000379
31	benzo[e]pyrene	< 0.000584	< 0.000431	< 0.000483	< 0.000869	< 0.00107	< 0.00107	< 0.000534	< 0.000723	< 0.000590
32	benzo[a]pyrene	< 0.000842	< 0.000623	< 0.000697	< 0.00125	< 0.00155	< 0.00155	< 0.000770	< 0.00104	< 0.000851
33	indeno[1,2,3-cd]pyrene	< 0.000247	< 0.000182	< 0.000204	< 0.000368	< 0.000454	< 0.000454	< 0.000226	< 0.000306	< 0.000249
34	benzo[ghi]perylene	< 0.000310	< 0.000229	< 0.000256	< 0.000462	< 0.000570	< 0.000571	< 0.000283	< 0.000384	< 0.000313
	Total PAHs	8.94201	11.69701	8.82749	28.09793	12.41178	15.54527	5.01879	7.17687	5.45106
	Total PAH w/o Naphthalene	3.147	2.734	2.938	3.799	4.241	4.885	2.131	2.968	2.388
	Sum 16 PAHs[1]	1.419	5.146	1.501	3.959	2.163	4.170	1.122	1.390	1.130
	Sum low molecular weight PAH[2]	8.769	11.540	8.671	27.926	12.220	15.313	4.806	6.911	5.230
	Sum high molecular weight PAH[3]	0.173	0.157	0.157	0.172	0.192	0.232	0.213	0.266	0.221
	Percent low molecular weight PAH	98%	99%	98%	99%	98%	99%	96%	96%	96%
	Sum of Carcinogenic PAHs[4]	0.004	0.003	0.004	0.003	0.004	0.003	0.005	0.005	0.005
	Percent Naphthalene	65%	77%	67%	86%	66%	69%	58%	59%	56%

[1]-[4]: See Tables 5 6

Table 9. Mussel tissue biomarkers from 2025 LTEMP samples. All positive analyte detections are reported for every sample with positive detections (i.e., not all samples had positive detections).

Count	ANALYTE	JAC-B-25-1	JAC-B-25-2	JAC-B-25-3	AMT-B-25-1	AMT-B-25-2	AMT-B-25-3	RED-B-25-1	RED-B-25-2	RED-B-25-3	GOC-B-25-1	GOC-B-25-2	GOC-B-25-3
1	Hopane (T19)	0.706	0.957	1.080	0.612	3.460	0.652	2.470	1.710	2.030	0.944	0.420	0.745
2	30-Norhopane (T15)	0.930	0.772	0.573	0.686	0.652	0.862	1.610	1.400	1.530	0.702	0.633	0.565
3	30,31-Bishomohopane-22S (T26)	5.130	5.190	4.760	4.770	5.190	5.420	5.950	4.990	4.870	4.220	3.690	4.100
4	13b(H),17a(H)-20S-Diacholestane (S4)	0.176	0.191	0.181	-	-	0.132	0.378	0.293	0.309	-	-	0.134
5	17a(H)20SC27/C29dia	0.517	0.689	0.299	0.452	0.437	0.554	0.914	0.541	0.583	0.470	0.469	0.453
6	17a(H)20rc27/C29dia	0.508	1.040	0.400	0.698	0.593	0.676	1.360	0.914	0.750	0.773	0.725	0.699
7	14b(H),17b(H)-20R-Cholestane (S14)	0.199	0.212	0.160	0.228	0.171	0.172	0.434	0.377	0.368	0.204	0.139	0.190
8	14b(H),17b(H)-20S-Cholestane (S15)	0.180	0.208	0.185	0.198	0.221	0.220	0.439	0.373	0.392	0.166	0.181	0.235
9	14b,17b-20S-Methylcholestane (S23)	0.180	0.247	0.270	0.220	0.226	0.230	0.562	0.586	0.470	0.249	-	-
10	14b(H),17b(H)-20R-Ethylcholestane (S26)	0.361	0.325	0.253	0.237	0.332	0.289	0.434	0.448	0.691	0.243	0.224	0.313
11	14b(H),17b(H)-20S-Ethylcholestane (S27)	0.218	0.260	0.249	0.353	0.166	0.186	0.720	0.635	0.416	0.260	0.176	0.145
12	30-Homohopane-22S (T21)	-	0.599	0.582	-	-	-	1.050	0.862	1.020	-	-	-
13	14a,17a-20R-Methylcholestane (S24)	-	0.559	0.257	0.284	0.286	0.245	0.557	0.532	0.368	0.315	0.240	0.397
14	14a(H),17a(H)-20R-Ethylcholestane (S28)	-	0.347	0.219	0.272	0.271	0.377	0.643	0.524	0.510	0.271	0.245	0.296
15	14b,17b-20R-Methylcholestane (S22)	-	0.234	0.160	0.177	0.171	0.142	0.439	0.501	0.343	0.166	-	-
16	14a(H),17a(H)-20S-Ethylcholestane (S25)	-	-	-	-	-	0.172	0.322	0.257	0.245	-	-	-
17	C23 Tricyclic Terpane (T4)	-	-	-	-	-	-	1.020	1.450	1.100	-	-	-
18	C24 Tricyclic Terpane (T5)	-	-	-	-	-	-	0.377	0.322	0.332	-	-	-
19	C24 Tetracyclic Terpane (T6a)	-	-	-	-	-	-	0.547	0.310	0.348	-	-	-
20	C26 Tricyclic Terpane-22S (T6b)	-	-	-	-	-	-	0.184	-	-	-	-	-
21	C28 Tricyclic Terpane-22R (T8)	-	-	-	-	-	-	0.227	-	-	-	-	-
22	18a-22,29,30-Trisnorneohopane-TS (T11)	-	-	-	-	-	-	0.552	0.638	0.702	-	-	-
23	17a(H)-22,29,30-Trisnorhopane-TM	-	-	-	-	-	-	0.533	0.431	0.547	-	-	-
24	18a(H)-30-Norneohopane-C29Ts (T16)	-	-	-	-	-	-	0.360	0.416	-	-	-	-
25	30-Homohopane-22R (T22)	-	-	-	-	-	-	0.728	0.803	0.889	-	-	-
26	13b(H),17a(H)-20R-Diacholestane (S5)	-	-	-	-	-	-	0.194	0.204	0.181	-	-	-
27	13b,17a-20S-Methyldiacholestane (S8)	-	-	-	-	-	-	0.260	0.248	0.240	-	-	-
28	14a,17a-20S-Methylcholestane (S20)	-	-	-	-	-	-	0.296	-	0.382	-	-	-
29	C25 Tricyclic Terpane (T6)	-	-	-	-	-	-	-	0.350	-	-	-	-
Count		11	15	15	13	13	15	28	26	25	13	11	12

Table 10. Diagonistic Ratios for petroleum fingerprinting in marine sediment, intertidal mussel tissue, and seawater sampled by PSD for all replicates of the 2025 LTEMP campaign.

n	SAMPID	Matrix	Total Petroleum Hydrocarbons (C9-C44 ng/g)	Total Saturated Hydrocarbons (μg/g)	Ratio of T15/T19[1]	Ratio of Pristane/ Phytane[2]	Ratio of Pristane/ C17[3]	Ratio of Phytane/ C18[4]	ANT/(ANT+PHE)[5]	ΣLMW/ΣHMW[6]	FL/(FL + PYR)[7]	FLA/(FLA + PYR)[8]
Whole ANS Crude Oil			563000	77351.80	0.557	1.729	0.863	0.578	0.000	-	0.848	0.213
Cutoff Value (s)									0.100	1.00	0.500	0.400
1	AMT-S-25-1	Sediment	37.10	1.70	0.600	3.495	0.645	0.371	0.121	2.204	0.266	0.424
2	AMT-S-25-2	Sediment	38.70	2.02	0.600	1.407	0.415	0.072	0.090	0.945	0.320	0.560
3	AMT-S-25-3	Sediment	33.00	2.12	0.687	1.526	0.484	0.365	0.090	0.909	0.410	0.580
4	GOC-S-25-1	Sediment	28.60	2.35	1.076	0.043	0.507	11.616	0.100	1.936	0.360	0.600
5	GOC-S-25-2	Sediment	13.20	0.99	0.790	3.645	0.886	0.199	0.100	2.840	0.417	0.640
6	GOC-S-25-3	Sediment	10.60	0.88	0.611	1.683	0.411	0.289	0.143	1.998	0.444	0.573
7	JAC-B-25-1	Tissue	1.35	2.70	1.317	0.175	0.315	12.308	0.058	3.357	0.591	0.759
8	JAC-B-25-2	Tissue	5.04	1.76	0.807	0.196	0.380	7.650	0.046	2.991	0.539	0.721
9	JAC-B-25-3	Tissue	1.25	1.84	0.531	0.169	0.433	9.625	0.045	5.220	0.613	0.763
10	AMT-B-25-1	Tissue	4.79	2.18	1.121	0.317	0.657	11.154	0.046	3.924	0.594	0.755
11	AMT-B-25-2	Tissue	4.74	2.01	0.188	0.167	0.308	12.000	0.584	4.262	0.508	0.754
12	AMT-B-25-3	Tissue	4.47	2.17	1.322	0.244	0.423	9.643	0.032	1.690	0.576	0.756
13	RED-B-25-1	Tissue	7.86	3.42	0.650	2.000	0.420	1.235	0.063	0.511	0.204	0.713
14	RED-B-25-2	Tissue	14.30	2.06	0.819	2.267	0.453	1.250	0.057	0.589	0.201	0.700
15	RED-B-25-3	Tissue	15.70	3.01	0.750	2.000	0.400	1.600	0.054	0.553	0.206	0.700
16	GOC-B-25-1	Tissue	8.40	3.03	0.744	0.197	0.449	15.700	0.044	2.253	0.513	0.765
17	GOC-B-25-2	Tissue	6.89	1.84	1.507	0.222	0.593	12.154	0.032	2.860	0.526	0.724
18	GOC-B-25-3	Tissue	7.75	2.63	0.758	0.224	0.455	12.000	0.047	2.611	0.538	0.774
19	JAC-PSD-25-1	Seawater	8.92	-	-	-	-	-	0.142	59.752	0.880	0.886
20	JAC-PSD-25-2	Seawater	11.67	-	-	-	-	-	0.252	91.060	0.942	0.901
21	JAC-PSD-25-3	Seawater	8.80	-	-	-	-	-	0.244	67.218	0.906	0.890
22	AMT-PSD-25-1	Seawater	28.06	-	-	-	-	-	0.118	201.153	0.918	0.833
23	AMT-PSD-25-2	Seawater	12.38	-	-	-	-	-	0.151	75.862	0.838	0.875
24	AMT-PSD-25-3	Seawater	15.51	-	-	-	-	-	0.138	75.969	0.909	0.883
25	GOC-PSD-25-1	Seawater	4.99	-	-	-	-	-	0.127	25.565	0.778	0.822
26	GOC-PSD-25-2	Seawater	7.14	-	-	-	-	-	0.098	29.907	0.776	0.822
27	GOC-PSD-25-3	Seawater	5.43	-	-	-	-	-	0.087	25.679	0.767	0.815

[1] T15-Norhopane to T19-Hopane is a diagnostic ratio that identifies crude oil presence

[2] Higher values are indicative of greater marine biogenic sources over oil

[3] Higher values are indicative of greater weathering for oil and biogenic mixtures

[4] Higher values are indicative of oil-derived material and microbial degradation of the straight-chain alkanes

[5] Ratio of Anthracene to Anthracene+ Phenanthrene is indicative of petrogenic sources with values <0.1 and pyrogenic with values > 0.1 (Pies et al 2008)

[6] ΣLMW/ΣHMW; A higher prevelance of low molecular weight PAHs compared to high molecular weight PAHs (e.g., values >1) indicates petrogenic sources (Zang et al 2008)

[7] FL/(FL + PYR); Flourene and pyrene ratios indicate types of emissions with values <0.5 suggesting petrol while values >0.5 diesel (Ravindra et al. 2008b)

[8] FLA/(FLA + PYR); Flouranthene and Pyrene ratios indicate types of combustion with values >0.4 indicating wood and coal combustion (De La Torre-Roche et al., 2009)

3. FIGURES

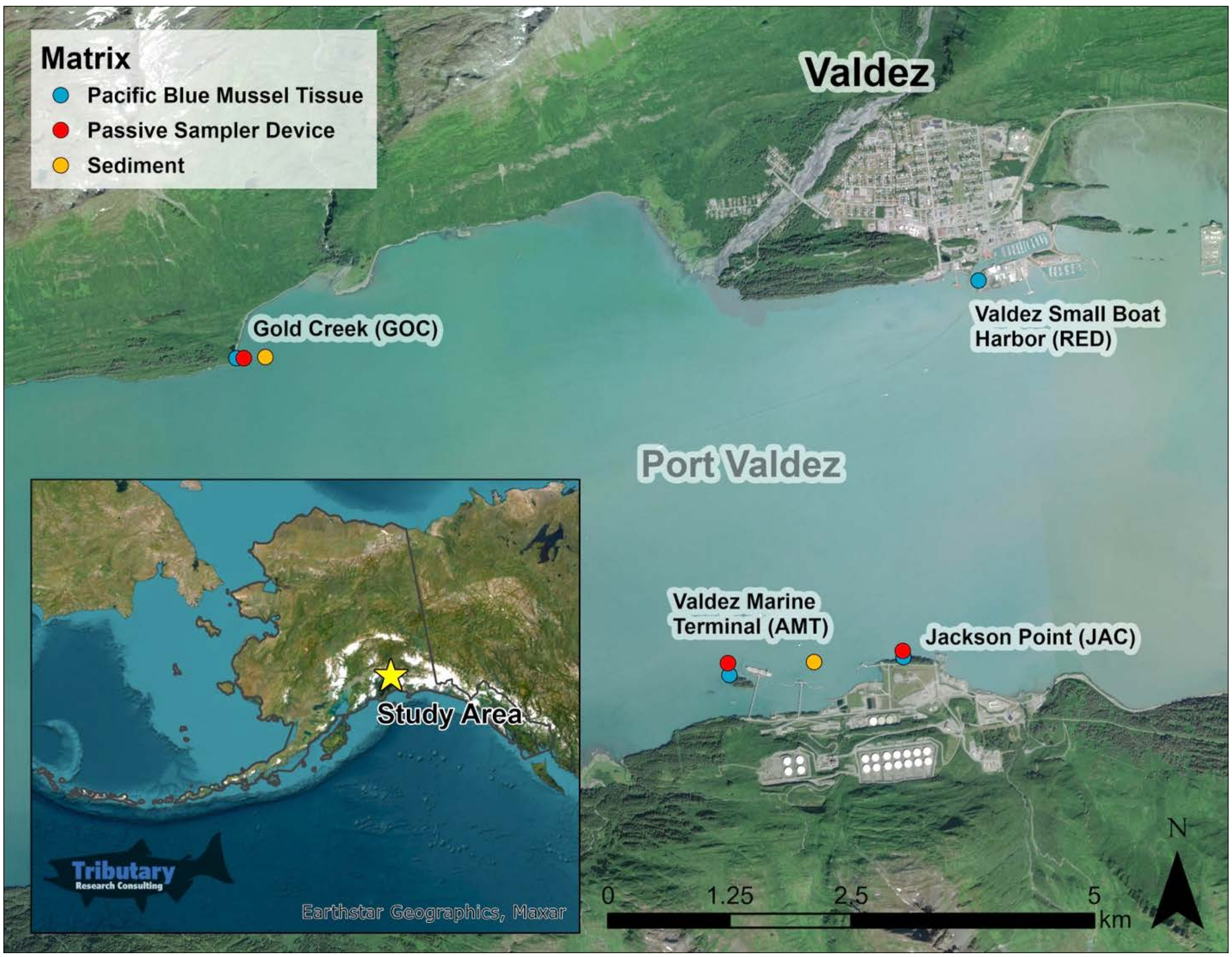

Figure 1. Long-Term Environmental Monitoring Program sites from the 2025 campaign. Mapping by Tributary Research Consulting.

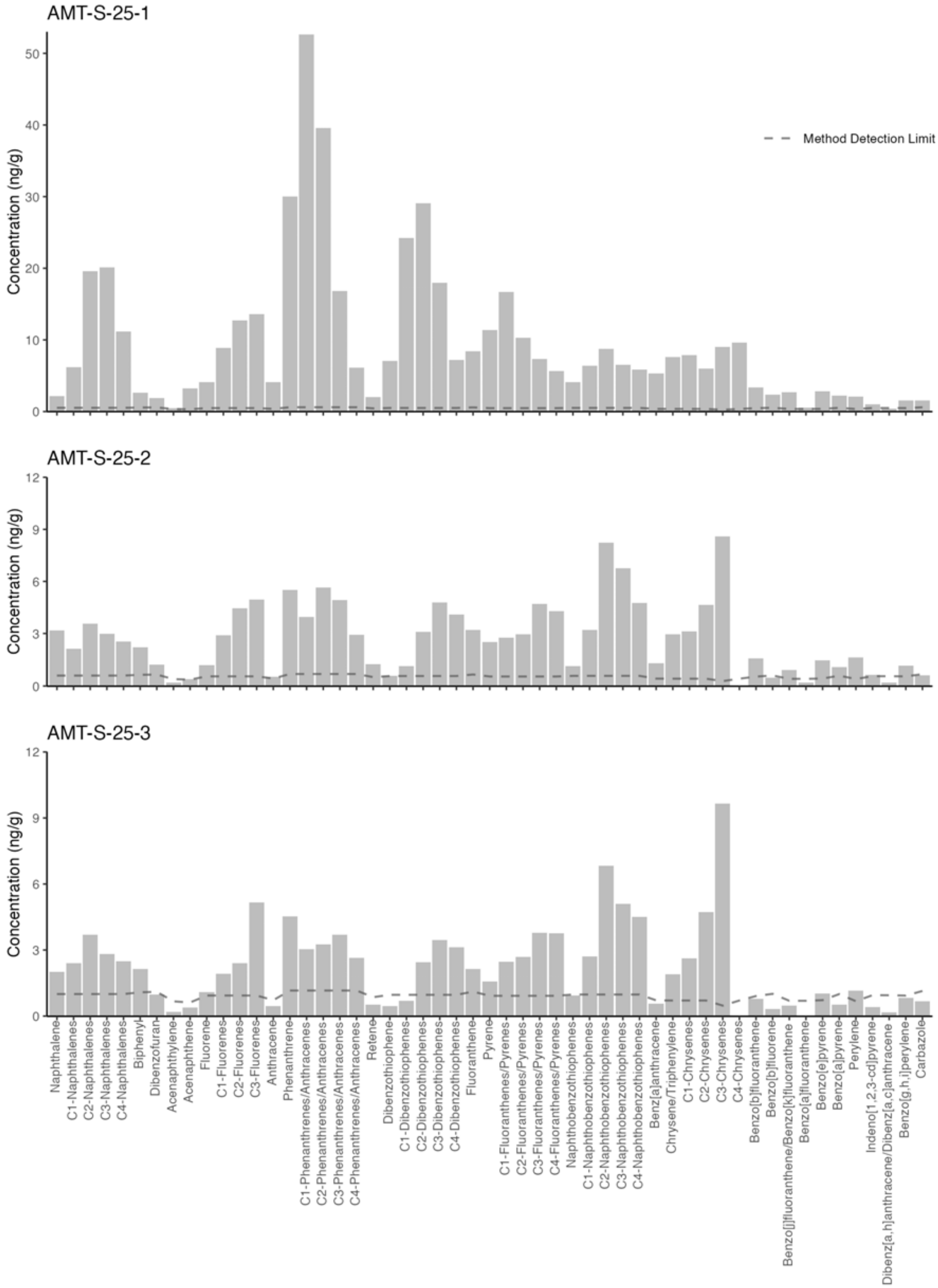

Figure 2. 2025 PAH profiles from individual sediment samples at the Valdez Marine Terminal (AMT) with the analyte-specific method detection limit superimposed as dashed lines. Note that the top panel has a different y-axis compared to the other two plots.

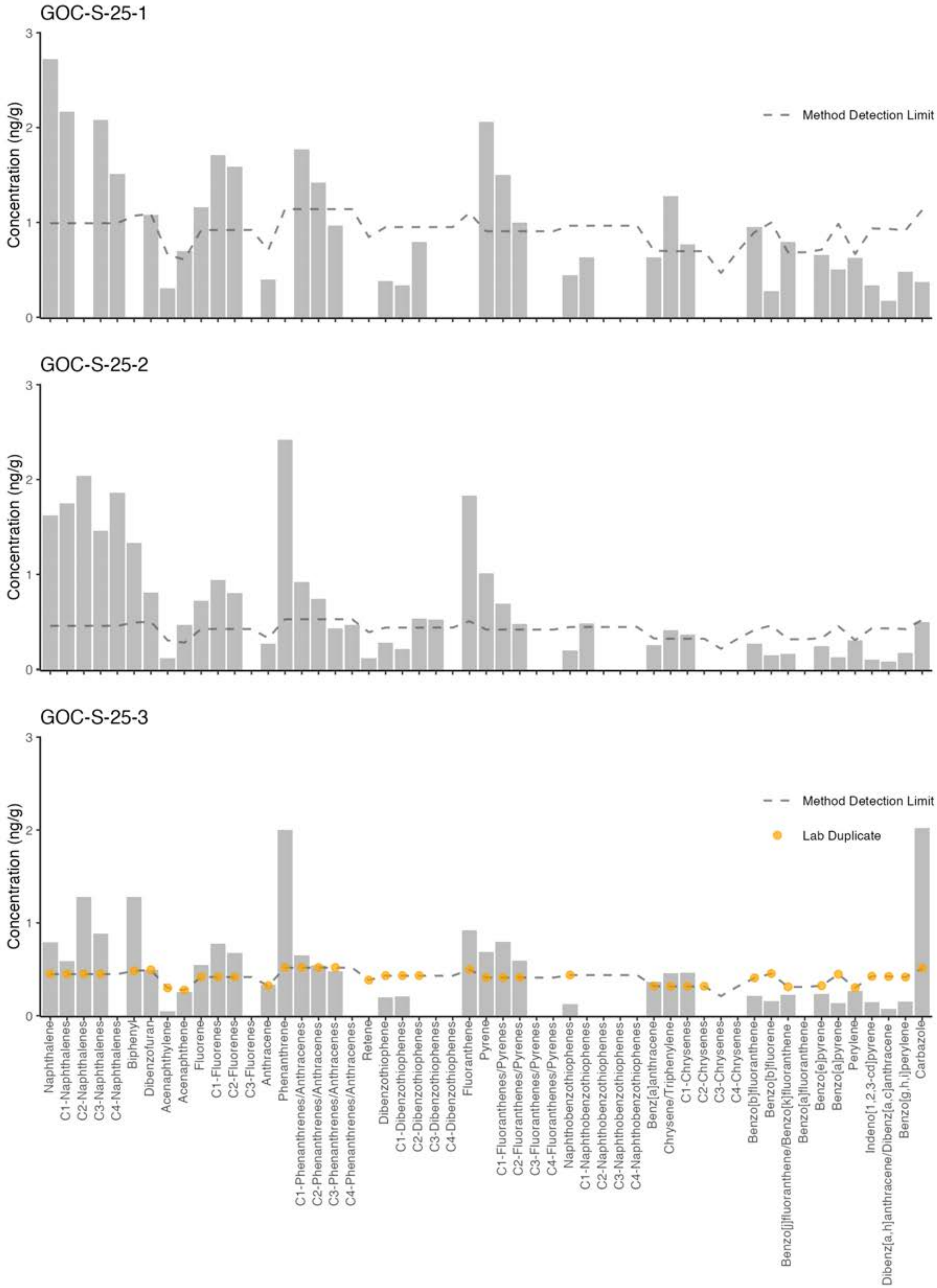

Figure 3. 2025 PAH profiles from individual sediment samples at the Gold Creek (GOC) reference site with the sample duplicate overlaid as orange points and the analyte-specific method detection limit superimposed as a dashed line.

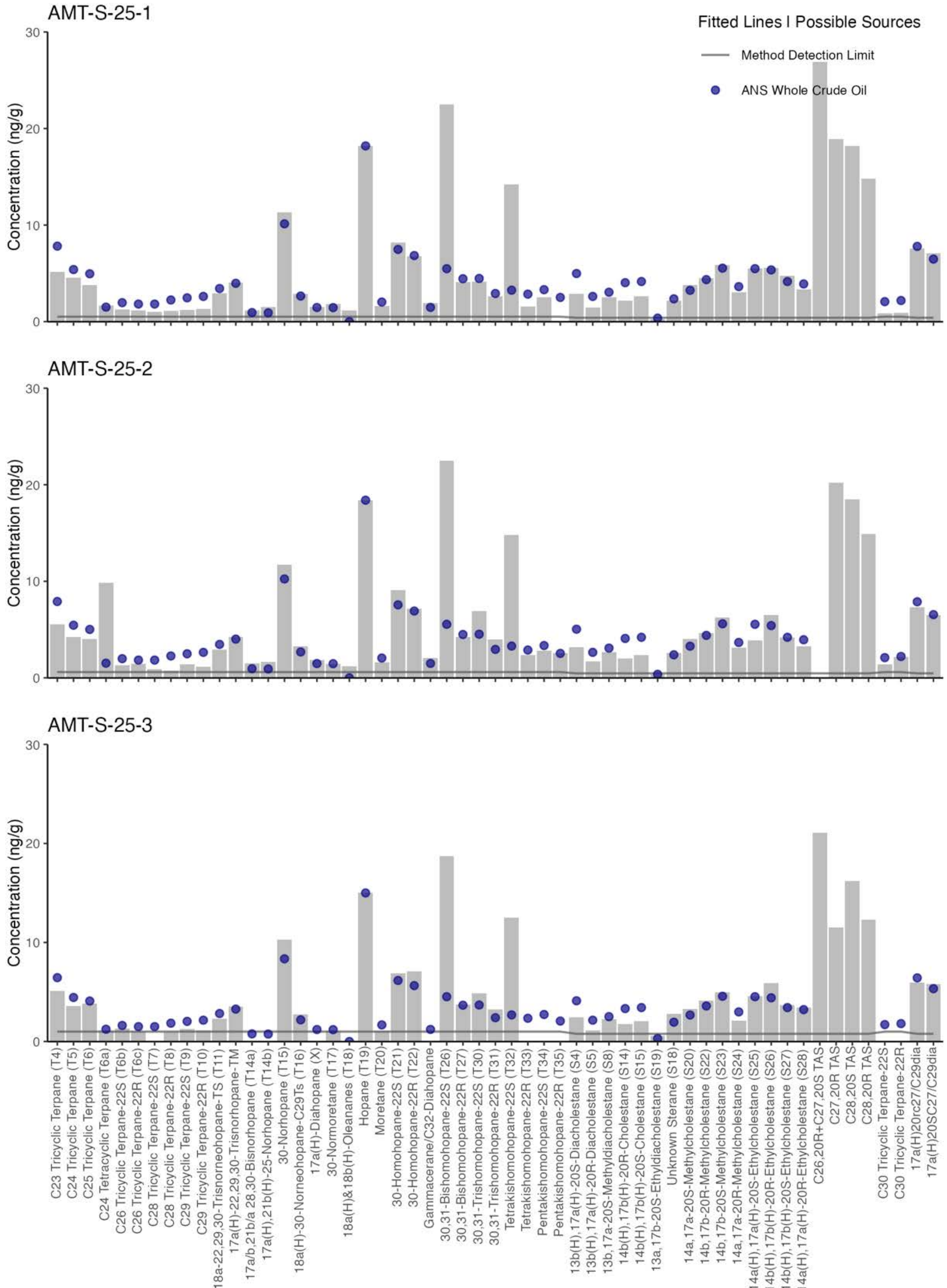

Figure 4. 2025 petro-geochemical profiles from individual sediment samples at the Valdez Marine Terminal (AMT) with the ANS potential source profile superimposed as blue points and the analyte-specific method detection limit superimposed as a line. ANS profile lines are scaled to Hopane (T19) and represent data only where points are present.

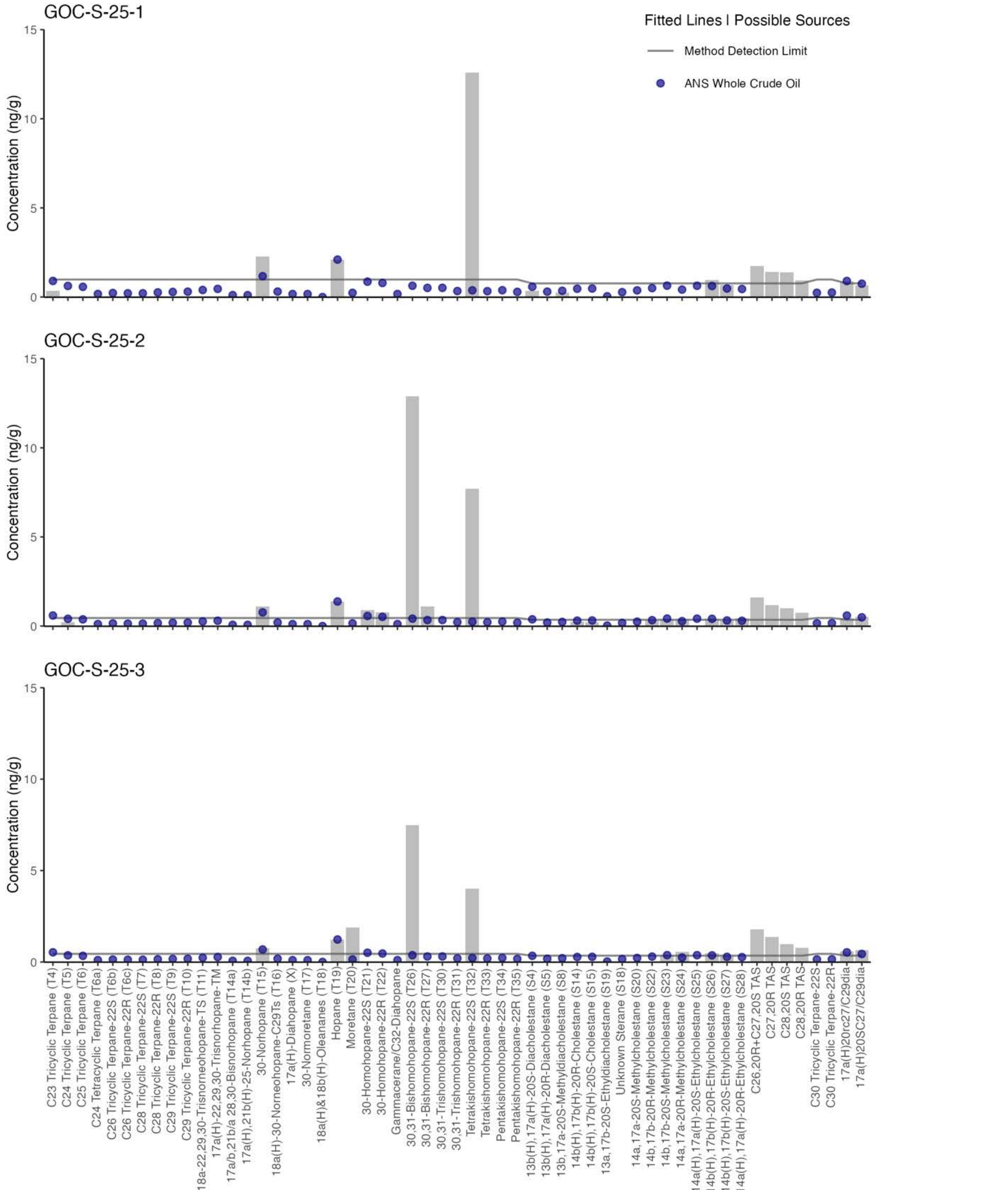

Figure 5. 2025 petro-geochemical biomarker profiles from individual sediment samples at the Gold Creek (GOC) reference site with the ANS potential source profile superimposed as blue points and the analyte-specific method detection limit superimposed as a line. ANS profile lines are scaled to Hopane (T19) and represent data only where points are present.

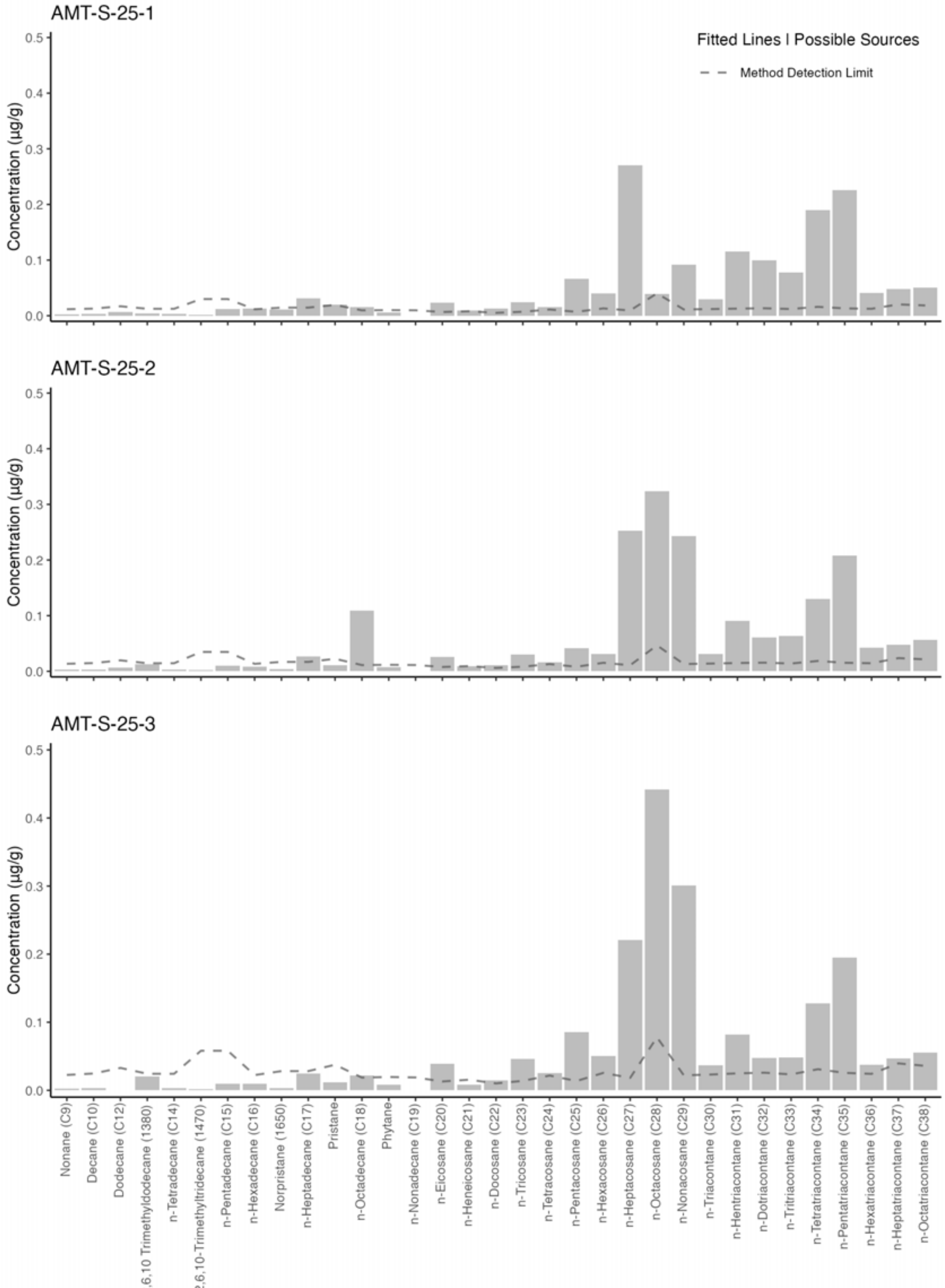

Figure 6. 2025 saturated hydrocarbon profiles from individual sediment samples at the Valdez Marine Terminal (AMT) with the analyte-specific method detection limit superimposed as a dashed line.

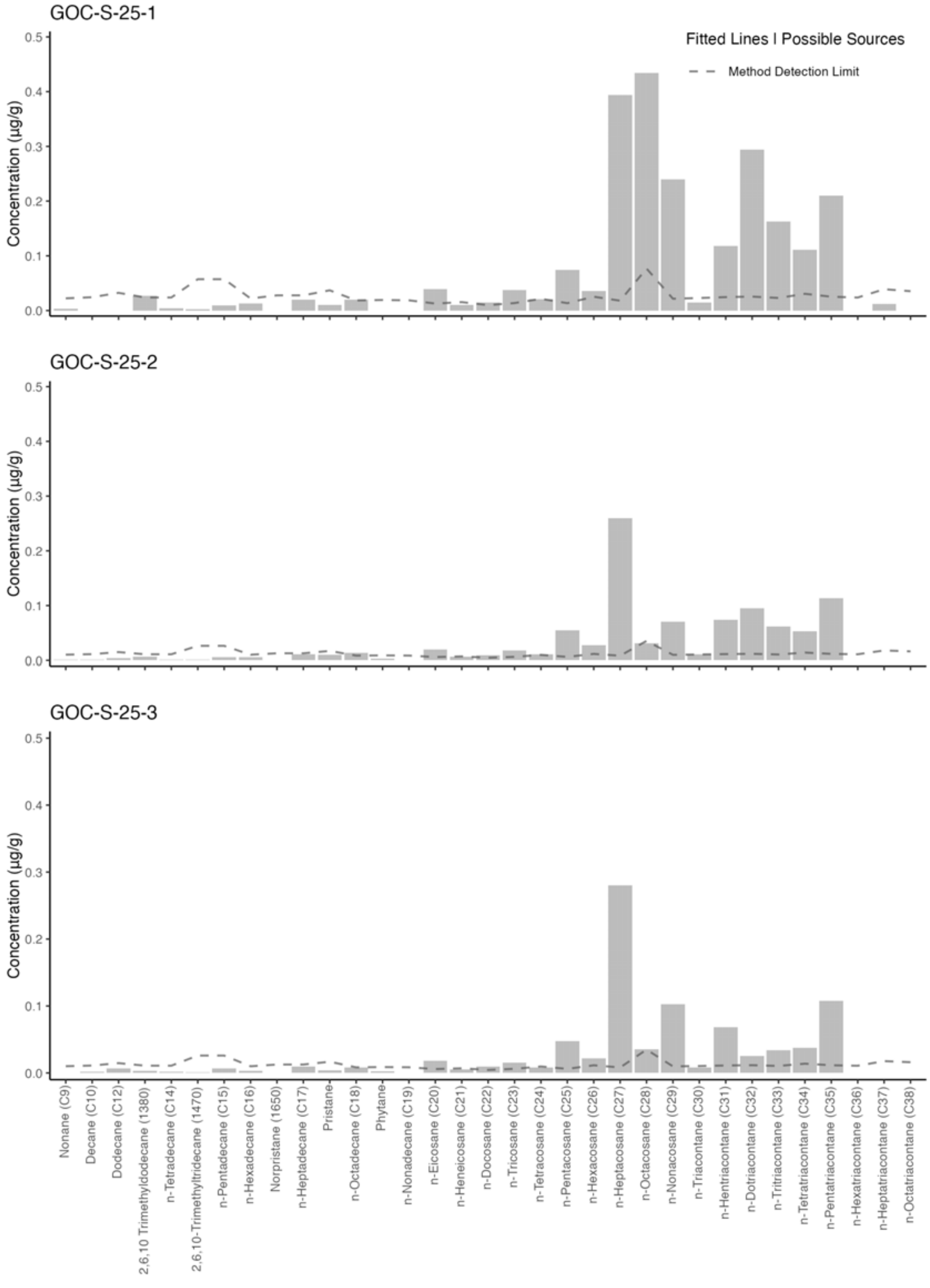

Figure 7. 2025 saturated hydrocarbon profiles from individual sediment samples at the Gold Creek (GOC) reference site with the analyte-specific method detection limit superimposed as a dashed line.

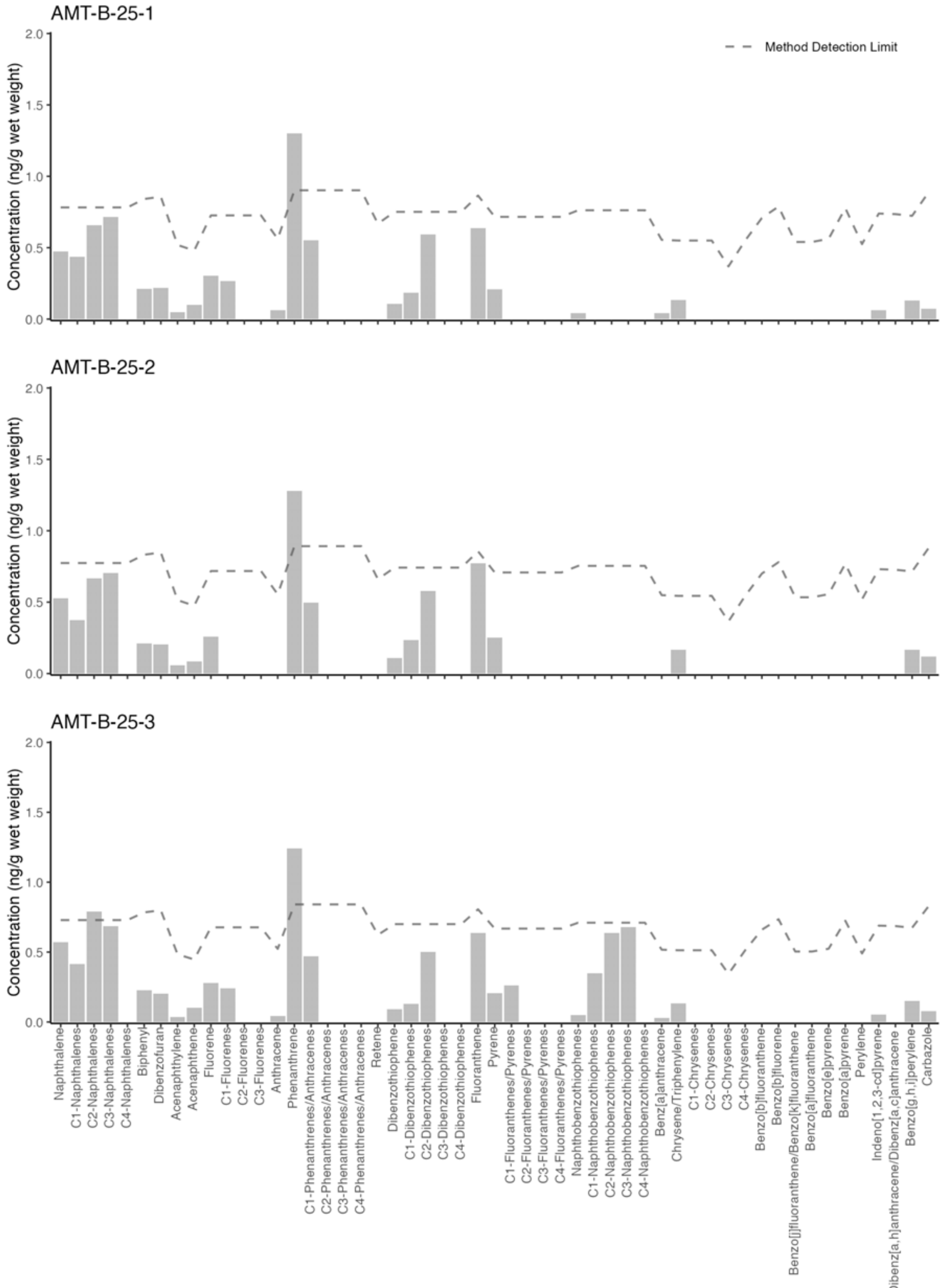

Figure 8. 2025 PAH profiles from individual tissue samples at the Valdez Marine Terminal (AMT) site with the analyte-specific method detection limit superimposed as a dashed line.

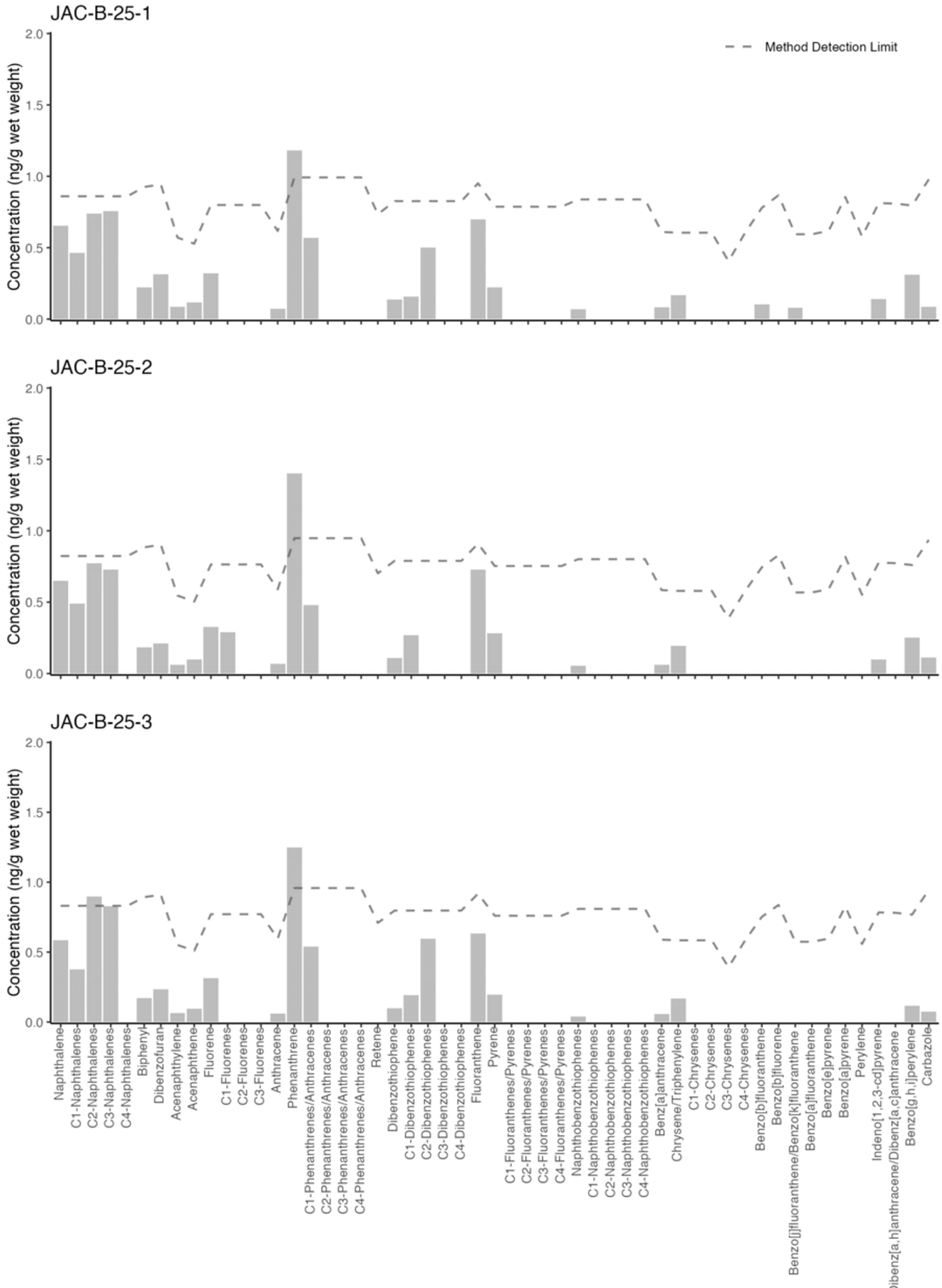

Figure 9. 2025 PAH profiles from individual tissue samples at the Jackson Point (JAC) site, near the Valdez Marine Terminal, with the analyte-specific method detection limit superimposed as a dashed line.

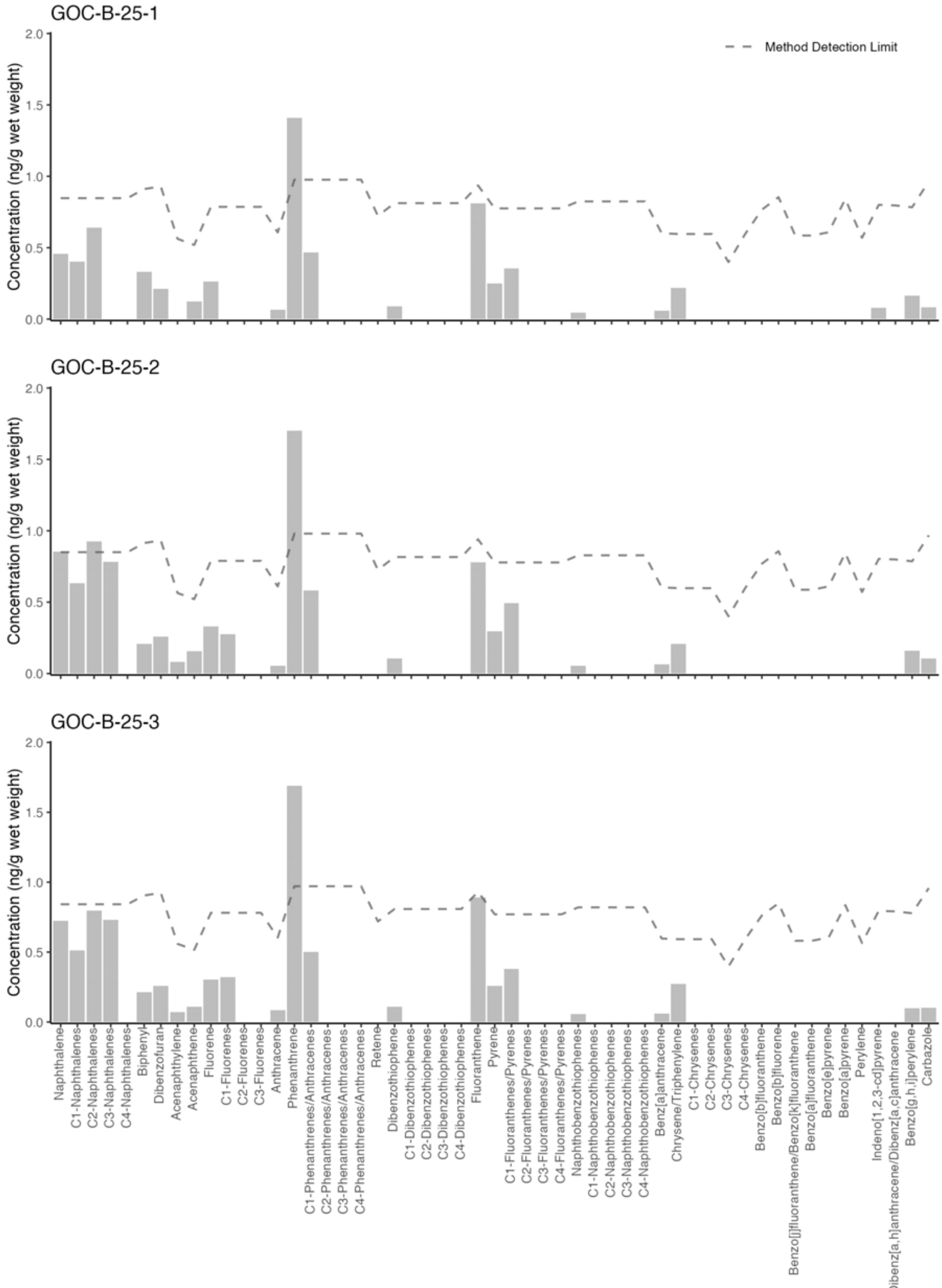

Figure 10. 2025 PAH profiles from individual tissue samples at the Gold Creek (GOC) reference site in Port Valdez with the analyte-specific method detection limit superimposed as a dashed line.

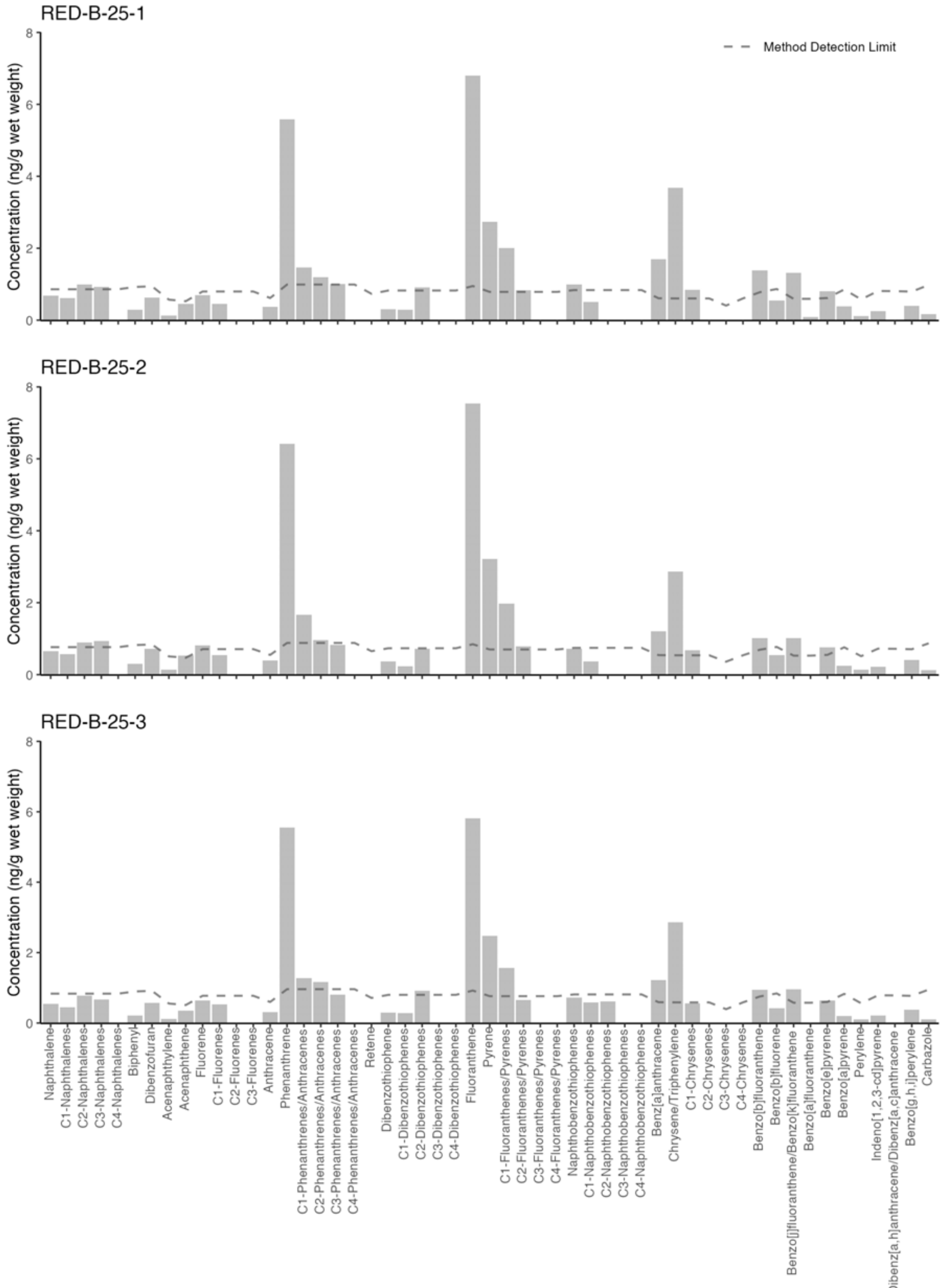

Figure 11. 2025 PAH profiles from individual tissue samples at positive control site at the entrance of the Valdez Small boat harbor (RED) site with the analyte specific method detection limit superimposed as a dashed line.

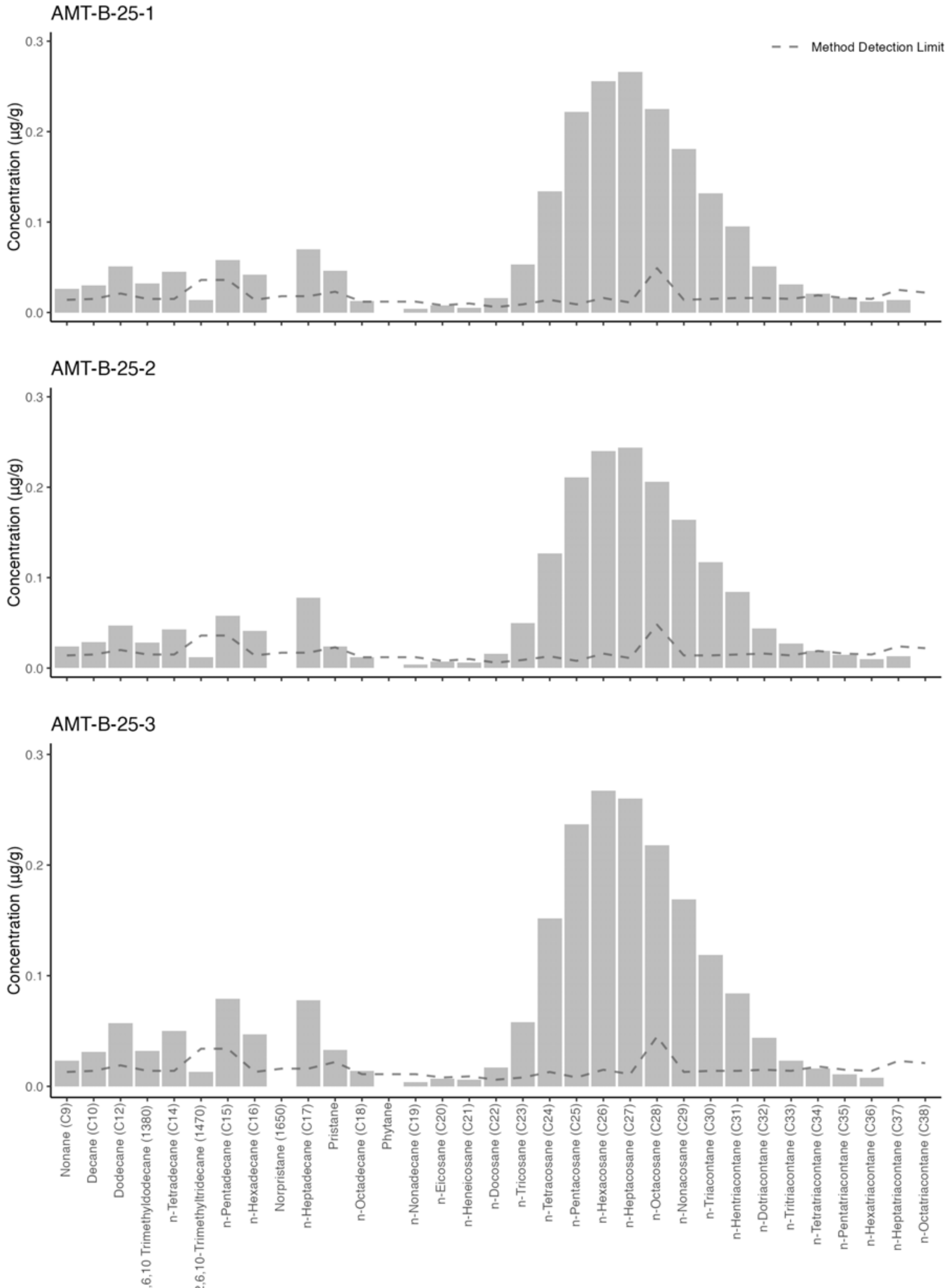

Figure 12. 2025 saturated hydrocarbon profiles from individual tissue samples at the Valdez Marine Terminal (AMT) site with the analyte-specific method detection limit superimposed as a dashed line.

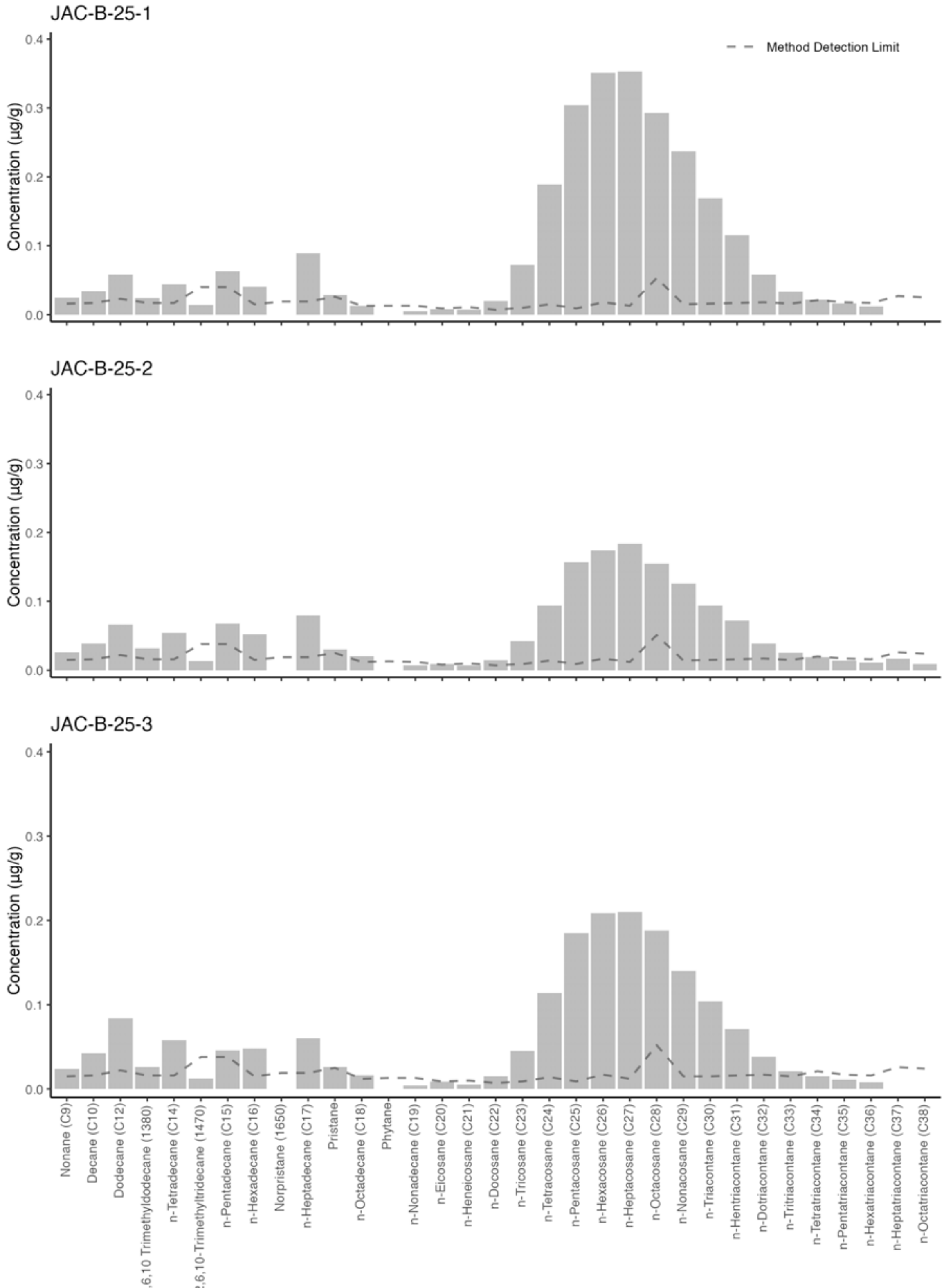

Figure 13. 2025 saturated hydrocarbon profiles from individual tissue samples at the Jackson Point (JAC) site with the analyte-specific method detection limit superimposed as a dashed line.

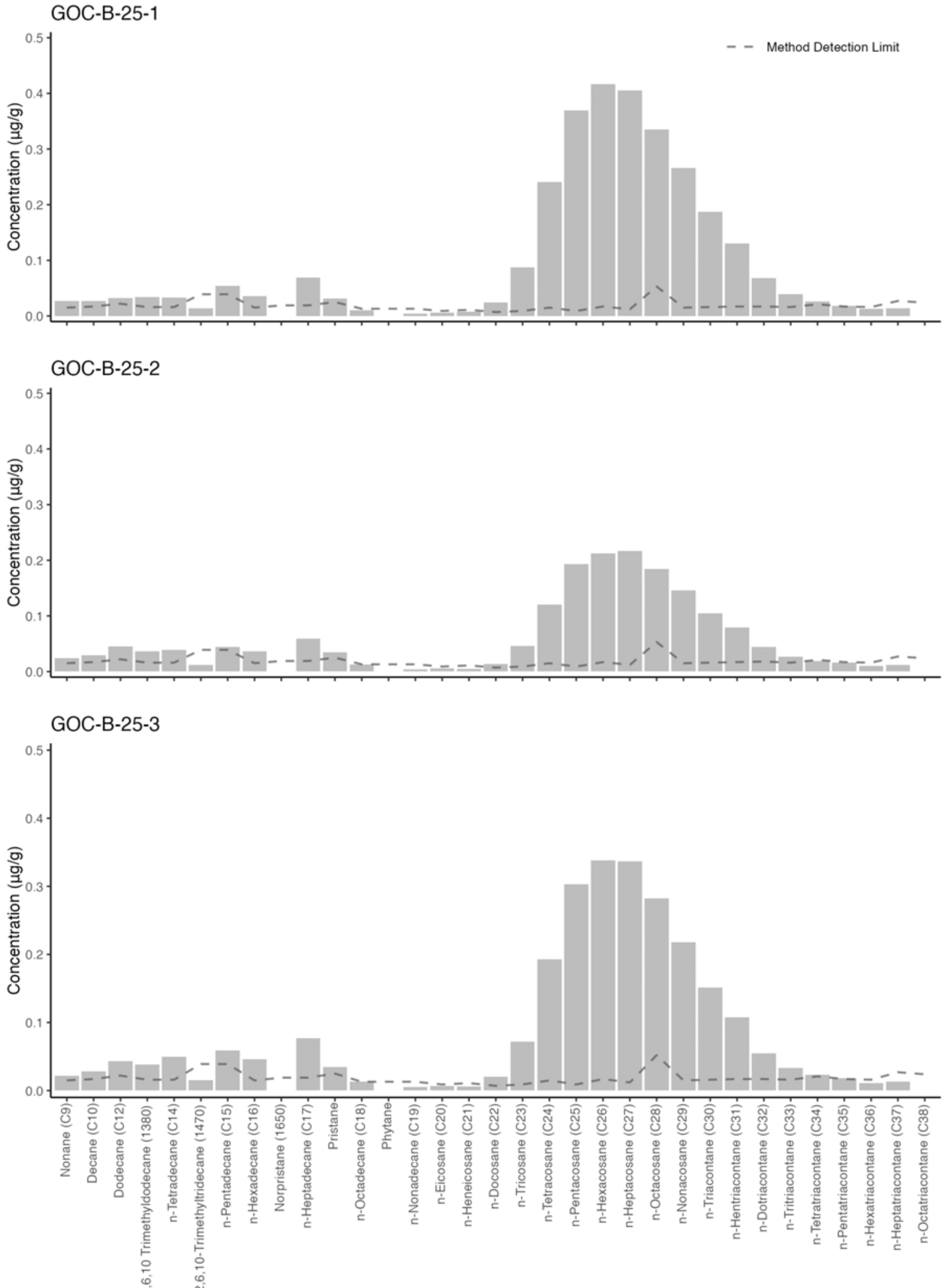

Figure 14. 2025 saturated hydrocarbon profiles from individual tissue samples at the Gold Creek (GOC) site with the analyte-specific method detection limit superimposed as a dashed line.

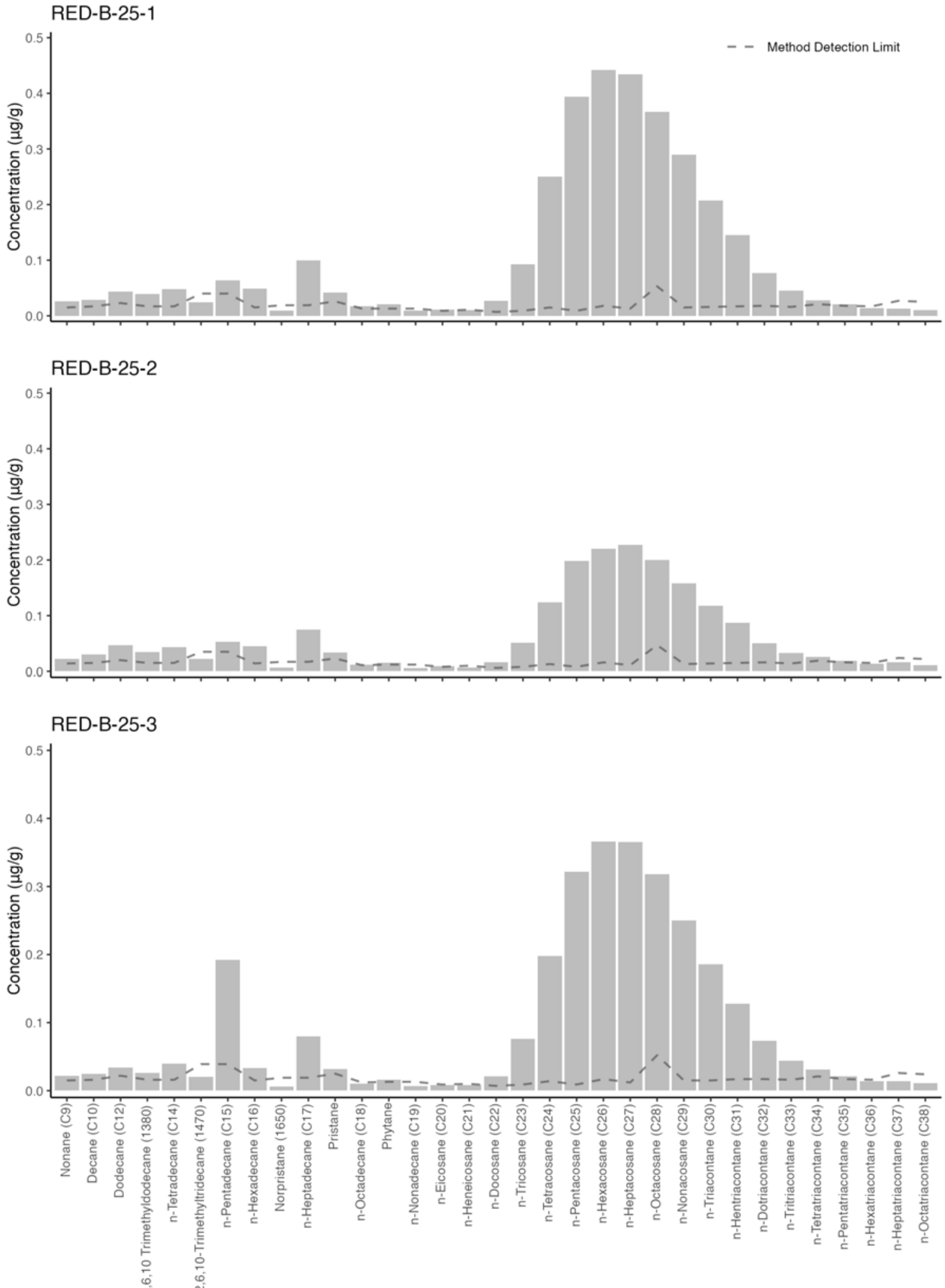

Figure 15. 2025 saturated hydrocarbon profiles from individual tissue samples at the positive control site at the entrance of the Valdez Small Boat Harbor (RED) site with the analyte-specific method detection limit superimposed as a dashed line.

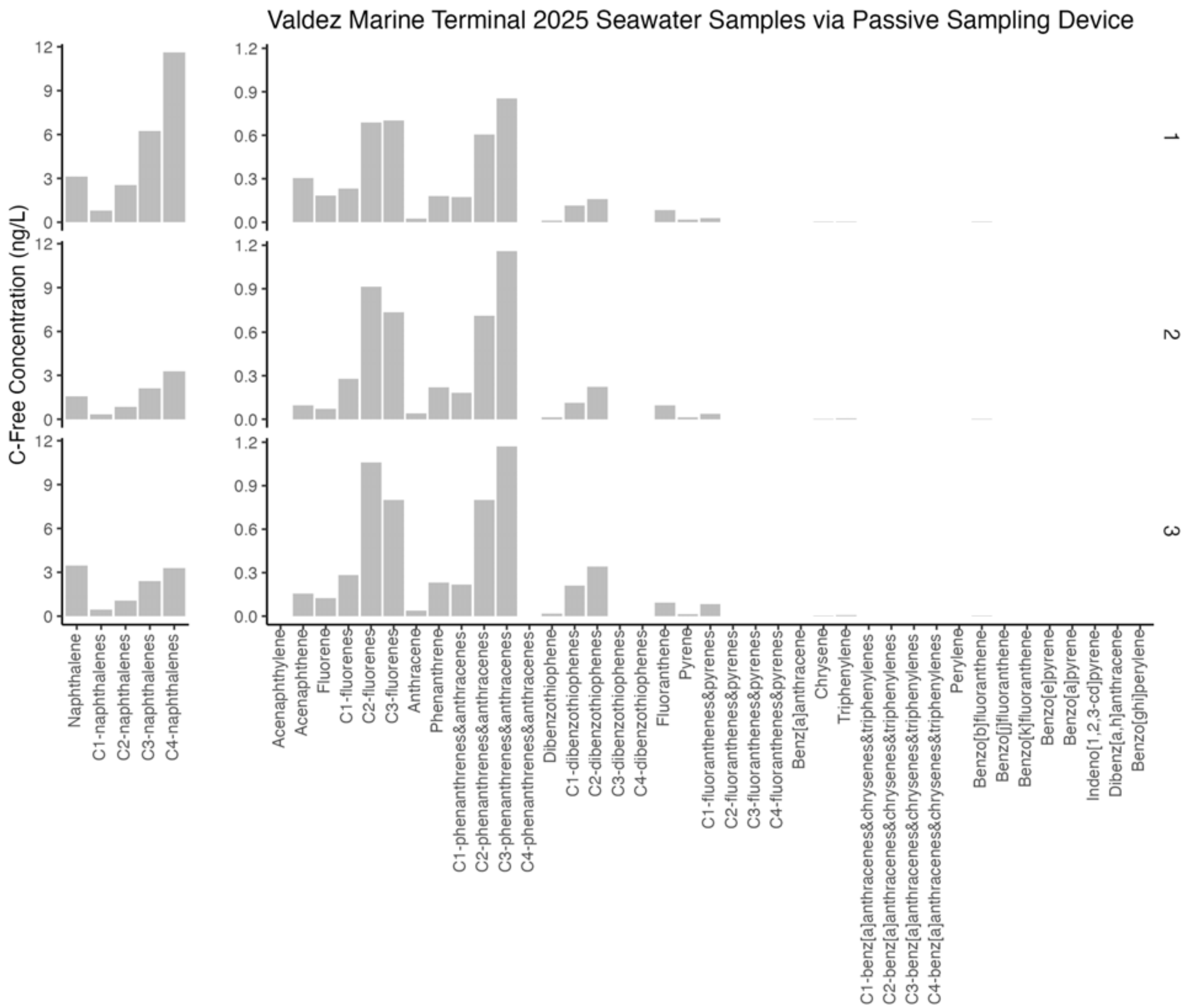

Figure 16. PAH profiles in seawater sampled via passive sampling devices placed at Valdez Marine Terminal in 2025. Values represent the reported values for the three replicates stacked vertically. Note the changes in scale between the Naphthalenes on the left and the other PAHs.

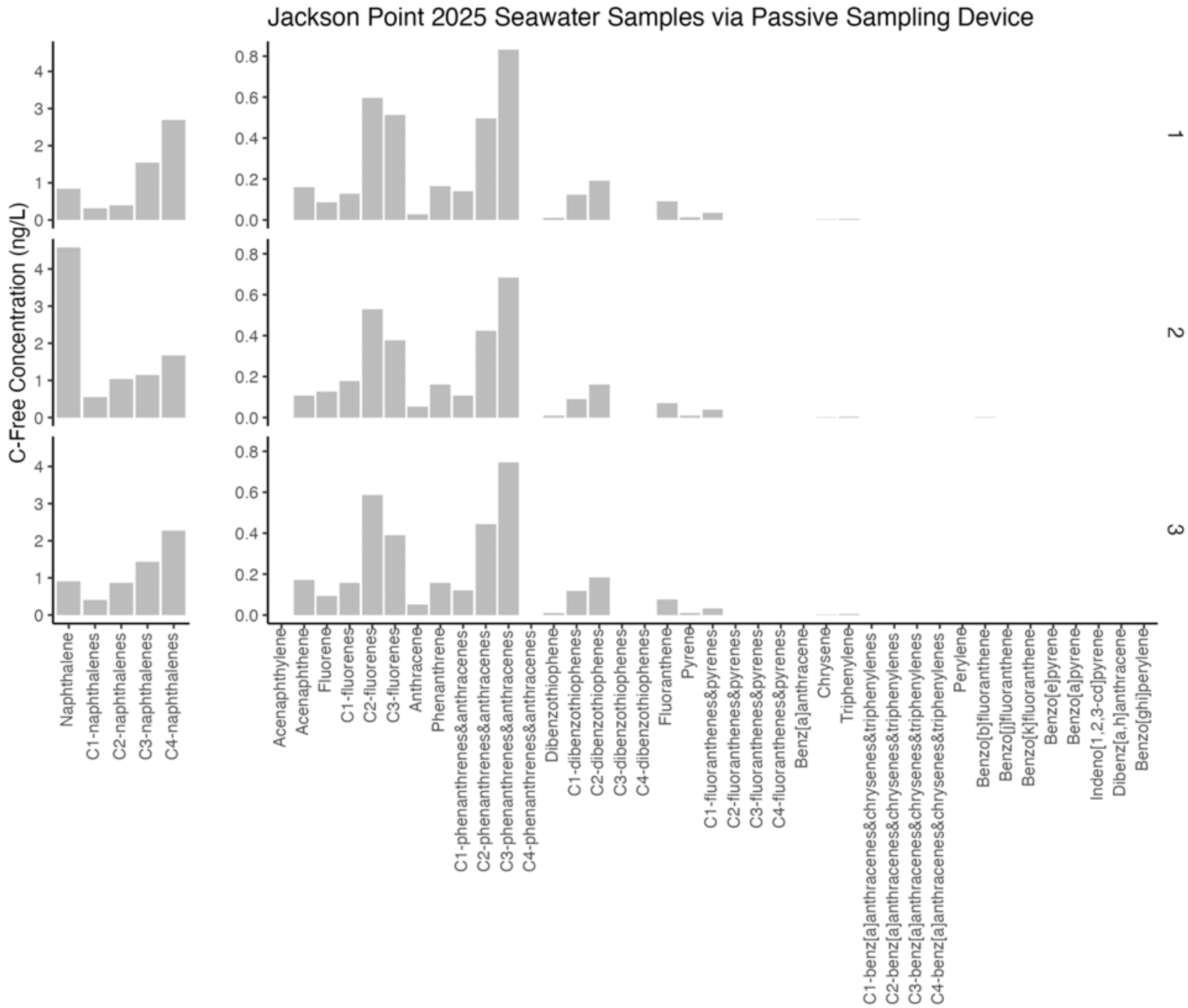

Figure 17. PAH profiles in seawater sampled via passive sampling devices placed at Jackson Point in 2025. Values represent the reported values for the three replicates stacked vertically. Note the changes in scale between the Naphthalenes on the left and the other PAHs.

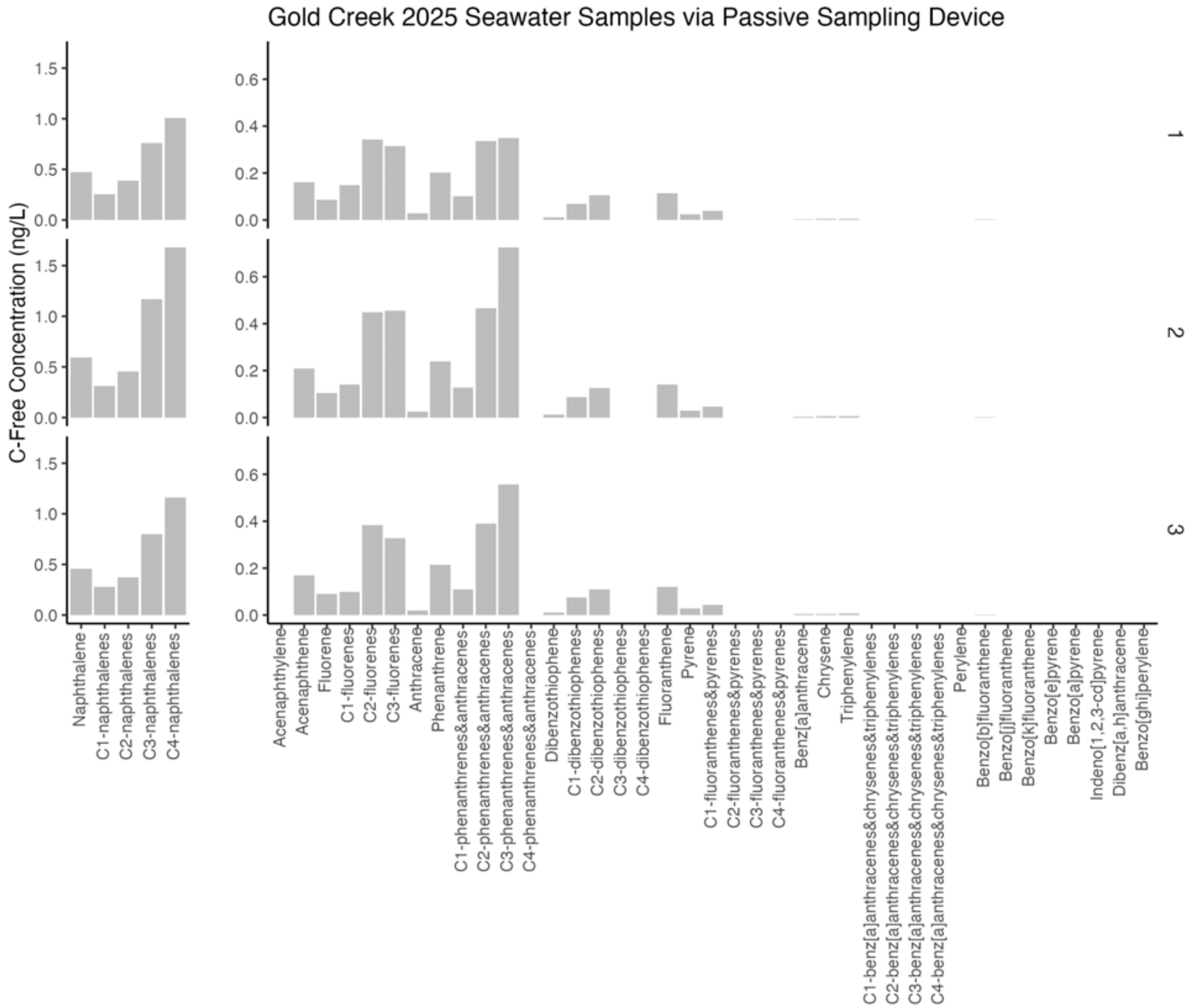

Figure 18. PAH profiles in seawater sampled via passive sampling devices placed at Gold Creek in 2025. Values represent the reported values for the three replicates stacked vertically. Note the changes in scale between the Naphthalenes on the left and the other PAHs.