Miljøkonsekvensvurdering af kabelprojekt over Storstrøm

Background report: Hazardous substances - Spill

Energinet Eltransmission A/S

Date: 16.03.26

Contents

Appendix

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1.0	25.06.2025	Final Report	AIRN	KLBU	KAED
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NOMENCLATURE

Abbreviation	Description
CF	Coming From
DDM	Denmark's Depth Model
DEM	Digital Elevation Model
DMI	Danish Meteorological Institute
DTM	Digital Terrain Model
ECMWF	European Centre for Medium-Range Forecasts
EEA	European Environmental Agency
EHS	Environmental hazardous substances
EQS	Environmental Quality Standards
ERA5	ECMWF ReAnalysis v5
GT	Going Towards
HD	Hydrodynamic
HD2D	Hydrodynamic 2-Dimensional (depth-averaged)
HD3D	Hydrodynamic 3-Dimensional
HSWL	Highest Still Water Level
LAT	Lowest Astronomical Tide
LSWL	Lowest Still Water Level
ME	Mean Error
MEA	Mean Absolute Error
MSL	Mean Sea Level
MSLP	Mean Sea Level Pressure
MT	Mud Transport (DHI MIKE module)
RMSE	Root Mean Squared Error
SMHI	Swedish Meteorological and Hydrological Institute
SoW	Scope of Work
SSC	Suspended Sediment Concentration
SSE	Sea Surface Elevation
STD	Standard Deviation
UTM	Universal Transverse Mercator
VD	Vertical Datum
WGS84	World Geodetic System 1984
WSxx (W_s xx)	Wind Speed at xx mMSL
WL	(Total) Water Level
WD_{xx}, (W_D xx)	Wind direction at xx mMSL

1. Introduction

Scheduled for 2025, the planning for the installation of two power cables that will connect the Zealand municipalities of Vordingborg and Guldborgsund via StorStrømmen is currently being assessed by ***Energinet Eltransmission A/S*** ('The Client').

The release and subsequently resuspension of sediment that occure during cable burial/spooling can release hazardous pollutants and nutrients that may already be present in the sediment. Thus, one concern regarding both the environmental impact and construction works is the release and spreading of environmental hazardous substances (***EHS***).

Figure 1.1 shows a map of the Vordingborg, Guldborgsund and Storstrømmen areas along with the currently proposed layout of the two power cables to be installed. Storstrømmen is approx. 10 km long with varying depths of 5 to 36 m and 1 to 2 km wide.

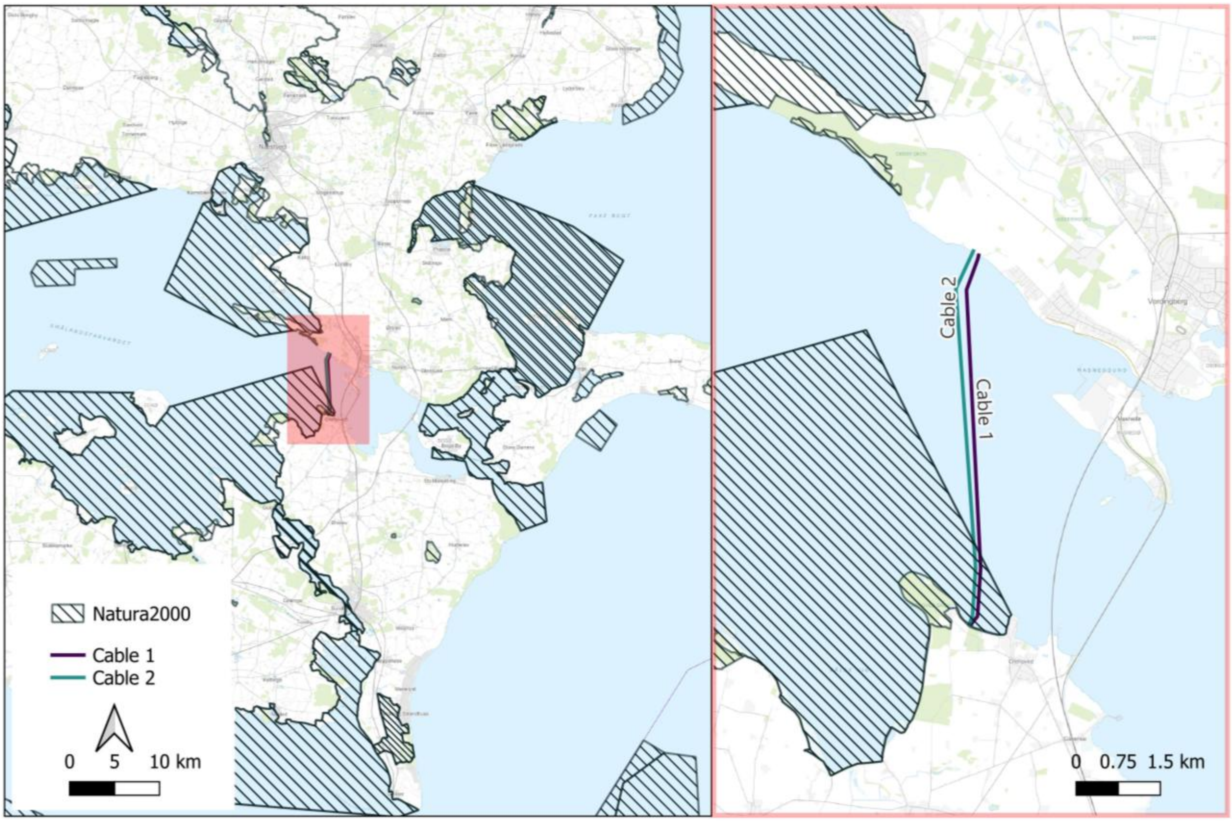

Figure 1.1: Overview of the planned power cables routes accross Storstrømmen.

This report builds upon NIRAS' report "Miljøkonsekvensvurdering af kabelprojekt over Storstrøm, Background report: Sediment spill, 2025" [1], which provides a detailed description of the numerical models (hydrodynamic and sediment spill models) and their potential impacts on the physical environment, including sediment concentrations, sedimentation heights, and light attenuation. The present report focuses on documenting the expected concentrations of hazardous substances in both the water and the settled sediment.

1.1. Scope of work

The purpose of the present study is to present the potential exceedance durations and extent of increased environmental hazardous substances and thus, the impact due to dredging works during the installation period of the two power cables between Ore and Orehoved within the Storstømmen region.

When cables are dug, flushed or plowed into the seabed, sediment is dispersed and distributed in the water column. The coarser sediments such as sand, quickly settle again, while the finer particles such as silt and clay stay in suspension in the water phase for a longer time period.

In connection with the sediment spill, environmentally hazardous substances that are in the sediment can also be released. In the present report, it is assumed that environmentally hazardous substances are dispersed in two forms,

- as dissolved matter originating from the sediment pore water, which is mixed in ('discharged to') the relevant part of the water column, and
- as particle-bound matter in the relevant particle fraction, which settles out over time according to the sediment dispersion model.

In addition, the impact of suspended particle sedimentation on EHS concentration of seafloor sediments is analysed.

1.2. Coordinate system

Unless stated otherwise, the Vertical Datum (***VD***) throughout the report is Mean Sea Level (***MSL***), while the geographic coordinate system is WGS84 EPSG:7416 ETRS89 UTM32N.

1.3. Project modifications

According to the project description for the coastal Horizontal Directional Drilling (***HDD***) presented in Section 3.4.2 of the EIA report, drilling will be carried out from the coast towards the sea over minimum distances of 450 m and 550 m in the southern area due to archaeological findings. Consequently, along the final 450 m approaching the southern coastline, no sediment—and thus no environmentally hazardous substances—will be released.

The results presented in this report reflect a scenario in which dredging is assumed along the entire cable route. Accordingly, the results for the southern coastal section are conservative. The area where no sediment spill occurs, and therefore no release of environmentally hazardous substances is expected, is (if deemed necessary) indicated as a black-dashed zone labelled *HDD*.

2. Summary

In the scope of the present study, concentrations of environmentally hazardous substances (***EHS***) are calculated for both the water phase (including dissolved and particle-bound fractions) and the settled sediment. Potential background concentrations of EHS are also considered.

Due to the significant temporal variability in sediment and EHS concentrations within the water column, simple metrics such as maximum values or temporal averages are insufficient to accurately describe either the underlying processes or the potential ecological impacts. Therefore, exceedance durations—both cumulative and consecutive—are calculated and assessed to provide a more comprehensive understanding.

Key Findings:

- **Background Concentrations:** Background levels of EHS are generally elevated. In the water column, the background concentrations of 5 out of 11 PAHs and arsenic exceed the applicable marine Environmental Quality Standards (***EQS***). For the seabed sediment, EQS values are exceeded for 4 out of 11 PAHs and 2 out of 6 heavy metals.

- **EHS in the Water Phase:** While no additional exceedance of EQS is observed for heavy metals, exceedances are found for PAHs with respect to both the standard EQS marine and the EQS marine max thresholds. However, the exceedance of EQS marine by time-averaged EHS concentrations and of EQS max marine by maximum EHS concentrations are restricted to a mixing zone of 350 m.

- **EHS in the Settled Sediment:** Based on the modelling results, the EHS values for Nickel and Di-n-butyl phthalate are exceeded due to construction activities, with affected areas of maximum 3.3 ha (considering background concentrations). For all other substances considered, no exceedances of the environmental quality standards in the deposited sediments can be attributed to construction activities.

These results represent the best available estimate of EHS concentrations in both the water column and the sediment. However, it must be emphasized that EHS dispersion is a highly complex process. In this study, it has been simplified through a series of necessary assumptions.

Efforts have been made to provide a representative overview of the environmental situation without placing undue emphasis on isolated peak values. Nonetheless, due to the inherent complexity of EHS behaviour, limitations in data availability, and constraints within the applied modelling framework, the derived concentrations are subject to uncertainty. These uncertainties should be acknowledged and carefully considered in the interpretation of results and in the broader context of the environmental impact assessment.

3. Scenarios to be assessed

Two different scenarios were initially considered for the construction phase:

1) **Scenario 1**
   - Jetting in waters deeper than 6 m and where no moraine clay (till) is present
   - Pre-excavation and backfilling in water depths less than 6 m and where moraine clay is present

2) **Scenario 2**
   - Dredging: Pre-excavation and backfilling along the entire route

In both cases, a spill rate of 5% is assumed (Box 3.1 in [2]). In Scenario 1, 3,638 m^3 of sediment is released compared to 5,360 m^3 in Scenario 2.

Because significantly more sediment is released in scenario 2, only the second scenario is analysed in the numerical simulations (see Table 3.2).

A potential installation program is described in Table 3.1.

Table 3.1: Installation program (copied from [1])

Setup, Activity	Cable No.	Amount	Unit	Capacity	Unit	Days	Start	End
Excavating (North, shallower than 6 m) - Cable 1	1	657	m	300	m/day	2.2	01.05.2027	03.05.2027
Excavating (deeper than 6 m) - Cable 1	1	4'642	m	300	m/day	15.5	03.05.2027	18.05.2027
Excavating (South, shallower than 6 m) - Cable 1	1	1'366	m	300	m/day	4.6	18.05.2027	23.05.2027
Excavating (North, shallower than 6 m) - Cabe 2	1	648	m	300	m/day	2.2	23.05.2027	25.05.2027
Excavating (deeper than 6 m) - Cabe 2	1	4'676	m	300	m/day	15.6	25.05.2027	09.06.2027
Excavating (South, shallower than 6 m) - Cabe 2	1	1'412	m	300	m/day	4.7	09.06.2027	14.06.2027
Laying out the cable in July								
Backfilling (North, shallower than 6 m) - Cable 1	1	657	m	300	m/day	2.2	01.08.2027	03.08.2027
Backfilling (deeper than 6 m) - Cable 1	1	4'642	m	300	m/day	15.5	03.08.2027	18.08.2027
Backfilling (South, shallower than 6 m) - Cable 1	1	1'366	m	300	m/day	4.6	18.08.2027	23.08.2027
Backfilling (North, shallower than 6 m) - Cabe 2	1	648	m	300	m/day	2.2	23.08.2027	25.08.2027
Backfilling (deeper than 6 m) - Cabe 2	1	4'676	m	300	m/day	15.6	25.08.2027	09.09.2027
Backfilling (South, shallower than 6 m) - Cabe 2	1	1'412	m	300	m/day	4.7	09.09.2027	14.09.2027

As described in section 1.3, drilling will be carried out from the coast towards the sea over minimum distances of 450 m and 550 m in the southern area due to archaeological findings. Since this is not considered in the results presented in the following sections, results for the southern coastal section are conservative.

Table 3.2: Sediment sources, spill percentage and gross spill (copied from [1])

Case specification		Excavating along entire cable length		
Excavating (North, shallower than 6 m)		**Total**	**Cable 1**	**Cabe 2**
Total length	m	1,305	657	648
Vol. to be removed (2 x 2 m^2)	m^3	5,220	2,628	2,592
Capacity	m/day	300	300	300
Spill percentage, bottom	%	0%	0%	0%
Spill percentage - entire water column	%	5%	5%	5%
Spill gross	m^3	261	131	130
Backfilling (North, shallower than 6 m)		**Total**	**Cable 1**	**Cabe 2**
Total length	m	1,305	657	648
Vol. to be removed (2 x 2 m^2)	m^3	5,220	2,628	2,592
Capacity	m/day	300	300	300
Spill percentage, bottom	%	0%	0%	0%
Spill percentage - entire water column	%	5%	5%	5%
Spill gross	m^3	261	131	130
Excavating (South, shallower than 6 m)		**Total**	**Cable 1**	**Cabe 2**
Total length	m	2,778	1,366	1,412
Vol. to be removed (2 x 2 m^2)	m^3	11,112	5,464	5,648
Capacity	m/day	300	300	300
Spill percentage, bottom	%	0%	0%	0%
Spill percentage, top	%	5%	5%	5%
Spill gross	m^3	556	273	282
Backfilling (South, shallower than 6 m)		**Total**	**Cable 1**	**Cabe 2**
Total length	m	2,778	1,366	1,412
Vol. to be removed (2 x 2 m^2)	m^3	11,112	5,464	5,648
Capacity	m/day	300	300	300
Spill percentage, bottom	%	0%	0%	0%
Spill percentage - entire water column	%	5%	5%	5%
Spill gross	m^3	556	273	282
Excavating (deeper than 6 m)		**Total**	**Cable 1**	**Cabe 2**
Total length	m	9,318	4,642	4,676
Vol. to be removed (2 x 2 m^2)	m^3	37,272	18,568	18,704
Capacity	m/day	300	300	300
Spill percentage, bottom	%	5%	5%	5%
Spill percentage, top	%	0%	0%	0%
Spill gross	m^3	1,864	928	935
Backfilling (deeper than 6 m)		**Total**	**Cable 1**	**Cabe 2**
Total length	m	9,318	4,642	4,676
Vol. to be removed (2 x 2 m^2)	m^3	37,272	18,568	18,704
Capacity	m/day	300	300	300
Spill percentage, bottom	%	5%	5%	5%
Spill percentage - entire water column	%	0%	0%	0%
Spill gross	m^3	1,864	928	935
Volume to be moved, total	m^3	107,208	53,320	53,888
Spill gross, total	m^3	5,360	2,666	2,694
Spill percentage overall	%	5%		

4. Data basis

This section presents the sources of data considered in the study of the spreading of environmental substances. While detailed overview of bathymetry, metocean hindcast databases and measurements/observations for validation is provided in [1], relevant findings of the sediment spill study [1] are summarized in section 4.1. Information of the environmental hazardous substances are presented in chapter 4.2.

4.1. Sediment [1]

In this chapter, the sediment characteristics and the underlying assumptions for sediment spread modelling are described.

4.1.1. Local sediment samples [1]

Figure 4.1 provides an overview of the locations along the proposed cable layout at which sediment samples were acquired during the geological survey conducted by Rambøll, as detailed in [3].

4.1.2. Seabed sediment [1]

In relation to the properties of the sediment in the Storstrømmen area, and in addition to the local sediment samples survey by Rambøll, a geological map of the seabed was obtained from the online source GEUS [4]. The map was enhanced through the knowledge gained from the geotechnical and geophysical investigations [3].

The final results are depicted in Figure 4.1 the alongside the geological map retrieved from GEUS.

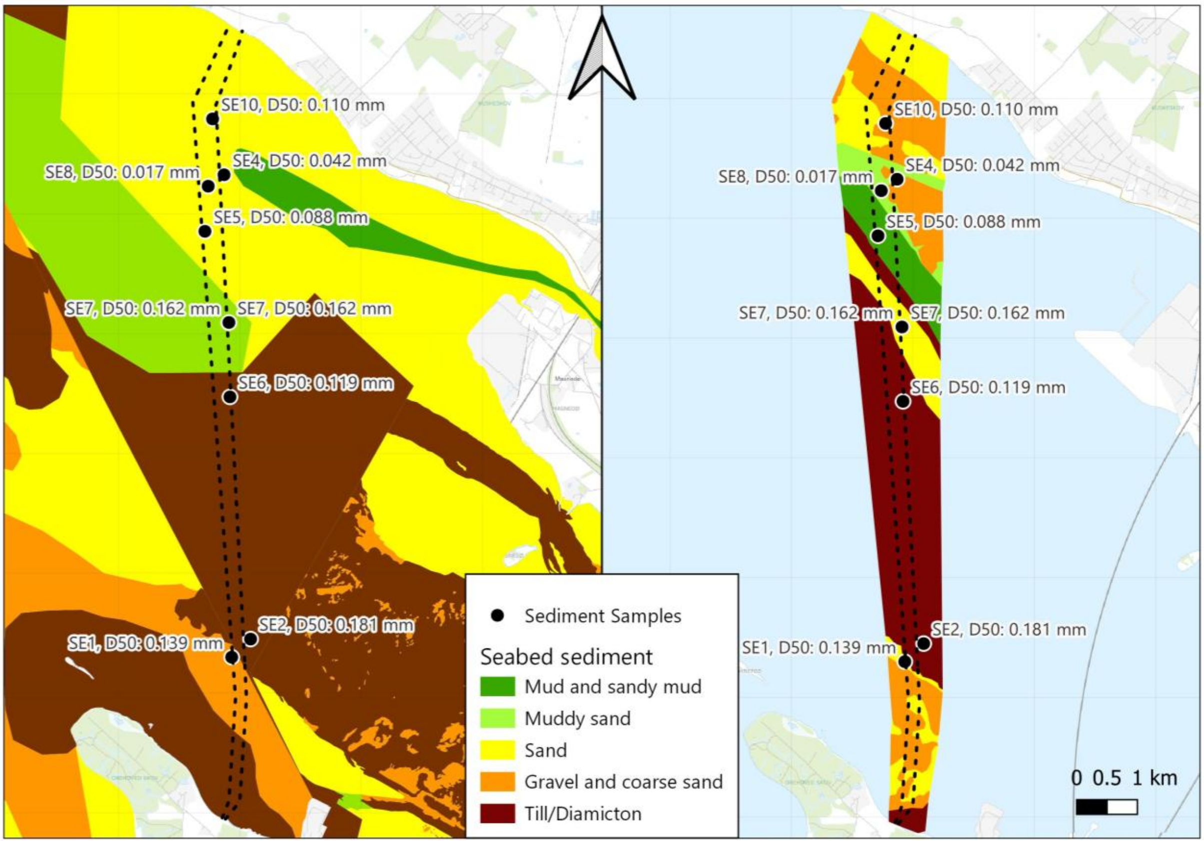

Figure 4.1: Geological map retrieved from GUES [4] on the left and higher resolution sediment distribution in the area along the cables's route on the right [3] along with grab samples locations.

4.1.3. Sediment type and characteristics [1]

For the purpose of characterizing the sediment type, the average granulometric curves of the five categories of seabed interpreted geologically by Rambøll (see Figure 4.1, [3]) are derived by averaging the grab samples within the different geological categories.

The sediment is described by six categories based on grain sizes and settling velocities, as shown in Table 4.1.

- **Coarse** sand larger than d=0.25 mm is assumed to settle next to the source and is therefore not included in the modelling, while the finer sediments are available for dispersion and transport.
- **Cohesive** fractions are considered as chemically active fraction (accumulation pollutants (EHS)) and refer to fine-grained particles, typically <63 µm (fractions: coarse silt, medium silt, fine silt and Clay, in Table 4.1).

Fine sand is not considered a cohesive fraction to which environmental substances typically bind; however, it is included in the sediment spill model, so its effect on the sedimentation processes can be considered.

Table 4.1: Sediment categories and settling velocities [5] used for the modelling of the sediment dispersion. The cohesive fractions, to which environmental substances can be bound, are highlighted in light-brown.

	coarse	fine sand	coarse silt	medium silt	fine silt	Clay
Settling velocity	-	15.0 mm/s	2.90 mm/s	0.560 mm/s	0.070 mm/s	0.030 mm/s
d, mean	-	0.1565 mm	0.0425 mm	0.0141 mm	0.0044 mm	0.0013 mm
d, minimum	-	0.0630 mm	0.0219 mm	0.0062 mm	0.0025 mm	0.0000 mm
d, maximum	-	0.2500 mm	0.0630 mm	0.0219 mm	0.0062 mm	0.0025 mm
Mud and sandy mud	21.8%	36.5%	10.8%	8.9%	6.5%	15.5%
Muddy sand	1.9%	28.0%	22.6%	20.0%	9.4%	18.1%
Sand	8.2%	89.8%	0.5%	0.5%	0.5%	0.5%
Gravel and coarse sand	2.1%	85.1%	5.8%	2.3%	1.9%	2.8%
Till/Diamicton	14.5%	63.6%	8.0%	5.3%	3.2%	5.4%

4.1.4. Estimated sediment spill

Based on the program (Table 3.1) developed in consultation with the client, sediment is spilled between 1 May and 15 September, characterized by two main phases (see program Table 3.1), namely excavation and backfilling.

In order to describe the different activities and the depth of the spill, 12 different sources were included in the MT model of [1] (Table 3.2). Assuming a spill rate of 5% (Table 3.2, [2]), a total of 5,365 m^3 of sediment is spilled,

- 13% of which is coarse material not modelled and assumed to settle next to the source.
- 20% of which corresponds to the cohesive fractions, to which EHS can be bound (temporal variation, see Figure 4.2).

It is assumed that the non-spilled sediment remains in its original physical state.

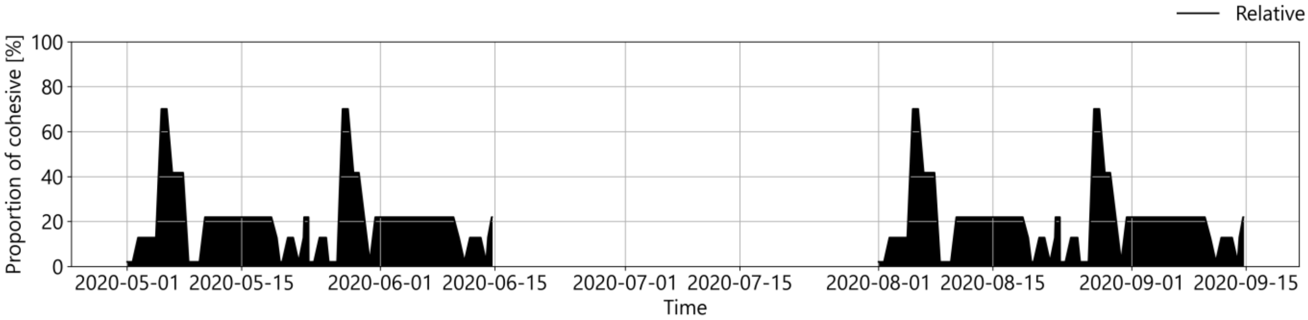

Figure 4.2: Timeseries of modelled proportion of cohesive sediment spilled due to the construction work.

Table 4.2: Total expected spill along cables [1]

Sediment →	coarse	fine sand	coarse silt	medium silt	fine silt	Clay	Sum
Activity ↓	**m^3**	**m^3**	**m^3**	**m^3**	**m^3**	**m^3**	**m^3**
Excavating (North, shallower than 6 m) - Cable 1	5	114	6	2	2	3	**132**
Excavating (deeper than 6 m) - Cable 1	116	578	79	57	34	64	**929**
Excavating (South, shallower than 6 m) - Cable 1	15	229	12	6	5	7	**274**
Excavating (North, shallower than 6 m) - Cable 2	5	113	5	2	2	3	**130**
Excavating (deeper than 6 m) - Cable 2	124	576	80	58	34	63	**936**
Excavating (South, shallower than 6 m) - Cable 2	15	238	13	6	5	7	**283**
Backfilling (North, shallower than 6 m) - Cable 1	5	114	6	2	2	3	**132**
Backfilling (deeper than 6 m) - Cable 1	116	578	79	57	34	64	**929**
Backfilling (South, shallower than 6 m) - Cable 1	15	229	12	6	5	7	**274**
Backfilling (North, shallower than 6 m) - Cable 2	5	113	5	2	2	3	**130**
Backfilling (deeper than 6 m) - Cable 2	124	576	80	58	34	63	**936**
Backfilling (South, shallower than 6 m) - Cable 2	15	238	13	6	5	7	**283**
Sum	**560**	**3,696**	**389**	**264**	**163**	**293**	**5,365**
Proportion	**10%**	**69%**	**7%**	**5%**	**3%**	**5%**	**100%**

4.1.5. Background concentration

As described in detail in [1], based on the information from the Fehmarn Belt, the background concentration is generally very low, therefore the sediment spill study [1] focused solely on modelling the excess concentration resulting from the spill caused by the construction work.

4.2. Environmental hazardous substances

A detailed description of the EHS is provided in [6]. Hereafter, only the key findings are presented. Along the cable route, 12 surface sediment samples (top 1-2 cm) were taken with a Van Veen grab (250 cm^2/0.025 m^2) in the water depth range of 5.1 to 13.1 metres and analysed for all relevant environmentally hazardous substances.

Although the samples were taken in varying sediment types, as the seabed conditions vary overall in accordance with the GEUS marine sediment map along the route (Figure 4.1), no significant differences could be found between the measurements. Therefore, mean values were used for all 12 sediment samples. There was no indication of higher level of EHS in the sediment of the dumpsite in the proximity of the cable corridor, why these samples were included.

4.2.1. EHS concentrations in the pore water and the sediment

The EHS concentration in the spilled sediment based on 12 measurements in the sediment along the cable corridor [6]is described in Table 4.3. The porewater concentration were calculated based on the average sediment concentrations and partition coefficients between sediment and water (K_d = concentration in sediment / concentration in water) and under the assumption of equilibrium between sediment and water. The partition coefficients have been collected from registrations dossiers from the European Chemicals Agency (ECHA) [7]. Where partition coefficients were not available from ECHA values were estimated using EPISuite and the organic carbon content of the sediment samples.

*Table 4.3: EHS concentration of the spilled sediment (pore water and dry matter). * indicates that the Sediment EQS OC corr. (see Table 4.5) is reached or exceeded.*

Parameter	Calculated porewater conc. (µg/l)	Average sediment conc (mg/kgTS)
Benzo(a)anthracene	0.0034	0.0073*
Benzo(a)pyrene	0.0012	0.0087*
Benzo(b+j+k)Fluoranthene	0.0031	0.0218
Benzo(g,h,i)perylene	0.0004	0.0089
Chrysene / Triphenylene	0.0053	0.0115*
Di-n-butyl phthalate (DBP)	1.1369	0.0160
Fluoranthene	0.0302	0.0203
Indeno(1,2,3-cd)pyrene	0.0004	0.0083
Pyrene	0.0223	0.0160
4-t-octylphenol	0.1063	0.0129
Arsenic (As)	1.4412	1.9442*
Lead (Pb)	0.0212	9.7083
Cadmium (Cd)	0.2343	0.1446
Chromium (Cr)	0.0819	9.8333*
Mercury (Hg)	0.0001	0.0129
Nickel (Ni)	0.3023	4.7042
Methylnaphthalenes, total	0.0674	0.0123*

4.2.2. Background concentrations

The background concentrations of EHS in the water body and the seabed based on NOVANA and the EIA of Lynetteholmen is described in Table 4.4. The background concentrations are estimated based on measured values in the water phase in Danish marine waters [8]. For substances where no measurements were above the detection limit, half of the lowest detection limit is used as an estimate of the water background concentration. The background concentration of EHS in both the sediment and the spill is assumed to be identical, meaning the values presented in Table 4.3 and Table 4.4 are the same.

*Table 4.4: Background EHS concentration of the water and the sediment in the project area, * indicates that the EQS marine water (see Table 4.5) is reached or exceeded.*

Parameter	Water background concentration (µg/l)	Average. sediment conc (mg/kgTS)
Benzo(a)anthracene	0.0003	0.0073*
Benzo(a)pyrene	0.0003*	0.0087*
Benzo(b+j+k)Fluoranthene	0.0050*	0.0218
Benzo(g,h,i)perylene	0.0003*	0.0089
Chrysene / Triphenylene	0.0003	0.0115*
Di-n-butyl phthalate (DBP)	0.0000	0.0160
Fluoranthene	0.0043	0.0203
Indeno(1,2,3-cd)pyrene	0.0050*	0.0083
Pyrene	0.0042*	0.0160
4-t-octylphenol	0.0000	0.0129
Arsenic (As)	1.6335*	1.9442*
Lead (Pb)	0.1891	9.7083
Cadmium (Cd)	0.0320	0.1446
Chromium (Cr)	0.3880	9.8333*
Mercury (Hg)	0.0041	0.0129
Nickel (Ni)	1.3236	4.7042
Methylnaphthalenes, total	0.0083	0.0123*

4.2.3. EQS-Thresholds

Table 4.5 shows the relevant EQS thresholds [9], against which the EHS concentrations are to be compared. While in case of heavy metals, only the dissolved concentration is relevant in respect to the EQS, for PAHs (Polycyclic Aromatic Hydrocarbons) the dissolved and the absorbed EHS to suspended (SS) phases are relevant.

Table 4.5: EQS-Thresholds for the relevant substances in the project areas. While in case of heavy metals, only the dissolved (W) concentration is relevant in respect to the EQS, for PAHs (Polycyclic Aromatic Hydrocarbons) the dissolved and the absorbed EHS to suspended (SS) phases are relevant. 5% EQS is relevant if the background concentration ≥ EQS marine and is calculated $c_{Background} + 0.05 * EQS\ marine$.

Parameter	Relevant for marine	5% EQS marine (µg/l)	EQS marine water (µg/l)	Max EQS marine water (µg/l)	Sediment EQS OC corr. (mg/kg TS)
Benzo(a)anthracene	SS & W	-	0.0005	0.01	0.0073
Benzo(a)pyrene	SS & W	0.0003	0.00017	0.027	0.0017
Benzo(b+j+k)Fluoranthene	SS & W	0.005	0.00017	0.017	0.068
Benzo(g,h,i)perylene	SS & W	0.0003	0.00017	0.00082	0.042
Chrysene / Triphenylene	SS & W	-	0.0014	0.0014	0.0056
Di-n-butyl phthalate (DBP)	SS & W		0.23	35	0.0289
Fluoranthene	SS & W	-	0.0063	0.12	0.8463
Indeno(1,2,3-cd)pyrene	SS & W	0.005	0.00017	-	0.042
Pyrene	SS & W	0.0043	0.0023	0.04	0.102
4-t-octylphenol	SS & W	-	0.01	-	0.048
Arsenic (As)	W	1.7	1.6*	2.1*	0.4
Lead (Pb)	W	-	1.3	14	163
Cadmium (Cd)	W	-	0.25	1.5	3.8
Chromium VI (Cr VI)	W	-	2.5	85	9.2
Mercury (Hg)	W	-	-	0.07	9.3
Nickel (Ni)	W	-	8.6	34	6.8
Methylnaphthalenes, total	SS & W	-	0.12	2	0.0058

*Added the natural background concentration

5. Methodology

Environmentally hazardous substances are dispersed in two forms; On the one hand, as dissolved matter originating from the sediment pore water, which is mixed in ('discharged to') the relevant part of the water column, and on the other hand, as particle-bound matter in the cohesive fractions, which settles out over time according to the sediment dispersion model.

The two forms are treated separately, based on the assumption that dissolved substances originating from pore water mix with the water column and remain in dissolved form, while the particle-bound fraction stays attached to the sediment particles, despite any changes in equilibrium conditions.

To estimate the effect of environmental hazardous substances, two types of numerical models are used:

- An HD3D model describing the hydrodynamics [1]
- A MT model to simulate the dispersal and deposit of the sediments dispersed due to the installation [1].

A detailed description of the HD3D-modell is provided in [1]. The characteristics of the MT model and the corresponding translation to EHS are described hereafter.

5.1. Sediment model (MT)

The sediment spill modelling is conducted using DHI's fine sediment model MIKE3 MT. Since the sediment model is an add-on to the hydrodynamic model, current and water level data are transferred per 30 minute-timestep for the advective transport of the sediment and deposition/resuspension of near-bottom sediments.

5.1.1. Model setup

The MT-model can be described by the following characteristics.

Sediment fractions: The sediment types are split into 6 categories based on the diameter, whereas coarse sediment is not modelled as it is assumed to settle close to the source (Table 4.1).

Porewater : In addition to the simulations described and performed in [1], the spreading of the porewater is modelled as a tracer, with settling velocities set to 0 m/s. This transforms the MT model into a pure transport model (AD), where the movement of dissolved or suspended substances, such as pollutants or tracers, is solely governed by advection and dispersion.

Source implementation: A description of the sediment source in time and space is applied. Sediment is released near the bottom (approx. 2 m above the ground). In areas where the water depth is < 6 m, the spill is evenly distributed over the entire depth (Figure 5.1).

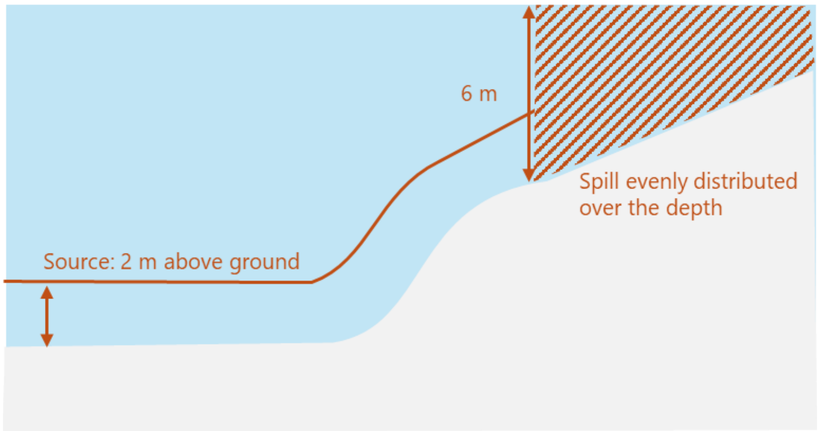

Figure 5.1: Schematic representation of the implemenation of the source in the MT-Model

Excess model: The model is designed as an excess model, focusing solely on the spilled material. The background concentration of sediment is generally low with values around 1- 2 mg/l during the period of activity (May-September, Table 3.1). The background concentration and the interaction with it is not included in this model as the concentrations are considered insignificant for flocculation. Flocculation of suspended material are generally seen at higher concentration above 10 mg/l, where they will impact the settling velocities of the suspended material. This argument holds for the majority of the area. Nearshore background concentrations can become high during storms. However, in these areas the seabed mostly consists of coarser materials like sand and silt which do not interact with the cohesive sediments simulated in this model. Therefore, only one layer of sediment is included at the bottom, assuming that the sediment layer is newly deposited.

Erosion: For erosion a critical shear stress is applied e.g., 0.3 N/m^2 [5].

Dispersion: Vertical and Horizontal dispersion coefficient are set to 0.01

Flocculation: As the fine-grained part of the suspended sediment is transported in the water column, it will flocculate and form larger particles with correspondingly higher settling velocities. The flocculation of sediment depends on various parameters such as size and type of sediment, sediment concentration, turbulence, salinity, and the amount of organic matter [10]. Organic matter acts as a glue between the single particles, and a mixture of organic and non-organic sediment will thus achieve higher settling velocities than purely organic and purely non-organic material [11]. Flocculation is included based on the settling velocities (see Table 4.1) from the field study of Fehmarn Belt [5] The exact increase in particle size as a result of flocculation is not modelled but represented by the settling velocity. Flocculation is included to some degree, but as the data is based on experiments, the simulation exhibits some uncertainty.

Consolidation: Once deposited, the sediment will begin to consolidate due to the weight of the sediment deposited above, leading to a slow compaction of the sediment, an increase in density and strength over time, and thus a decrease in the bottom level if no further sediment is deposited. In the numerical simulation, a consolidation of the sediment is not considered, and the calculated sediment heights are based on a density of 180 kg/m^3 which is considered slightly conservative with regards to bed thickness.

5.1.2. Post-processing

The direct output from the MT model are

- suspended sediment concentration (***SSC***) in kg/m^3 of each modelled sediment fraction in x, y, z (3D) and time and
- sedimented material which determines the thickness of the sedimentation layer in x, y (2D) and time.

Depth averages of suspended sediment concentration are calculated for the entire water column, as well as for the top and bottom of the water column (2 m). Thus, in shallow areas, there is an overlap (Figure 5.2).

The time-variant, depth-averaged SSC and sedimentation information serves as input for the modelling of the environmental hazardous substances.

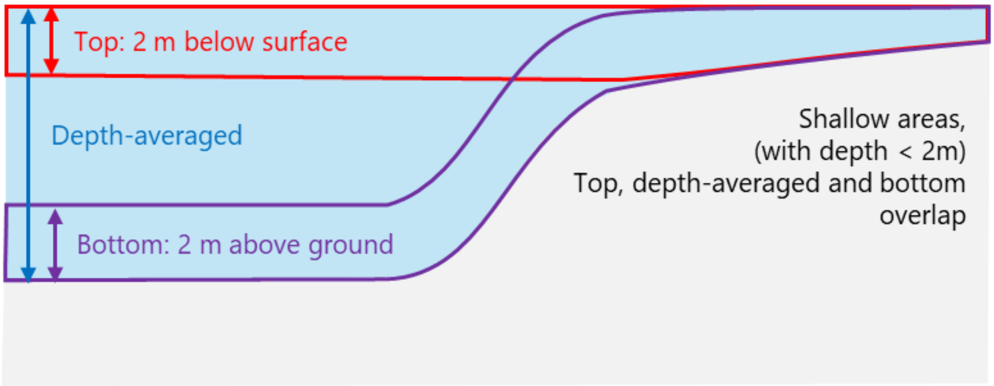

Figure 5.2: Schematic representation of the different types of averaging over depth.

5.2. Modelling of environmental hazardous substances

As described, environmentally hazardous substances within the sediment disturbed during the construction phase are present in two forms: they are partly bound to cohesive particles and partly dissolved in the pore water.

In the scope of the present study, the concentrations of environmentally hazardous substances (EHS) in the water (dissolved and bound to the suspended sediment) and in the deposited sediment are calculated (Table 5.1). The modelling of these hazardous substances is based on the depth-averaged, time-varying concentrations of suspended sediments, as well as the calculated sedimentation rates.

It is assumed that the dispersion of pore water can be represented in the numerical sediment dispersion model as a fraction with no settling velocity. This approach allows for the simulation of both the spatial distribution and dilution of the pore water, and consequently, of the environmentally hazardous substances dissolved within it. The dispersion and dilution of hazardous substances bound to cohesive sediment fractions are modelled similarly. While no background concentration of SSC (= 0 kg/m^3) is considered, EHS background concentrations in the water phase and in the sediment are considered.

The calculations and the underlying assumptions are described in detail in the following chapter.

Table 5.1: Modelling concept for environmental hazardous substances

Medium	Abbreviation	Relevant phase	Origin / Mechanism	Relevant model
EHS in the water $C_{EHS,W}$	$C_{EHS\ from\ Porewater}$	Water phase	Pore water of spilled sediment	AD (MT, fraction without settling velocity)
	$C_{EHS\ absorbed\ to\ SSC_{cohesive}}$	Suspended sediment	Spilled cohesive sediment	MT (cohesive fractions)
EHS in the seabed	$C_{EHS-Sediment}$	Settled sediment	Spilled cohesive sediment	MT (Sedimentation)

5.2.1. General assumptions

To manage the complexity of the system and due to the lack of more detailed data, the following assumptions serve as the foundation for the calculations presented.

Water properties: A constant water density is assumed, independent of temperature variations and suspended solid content.

Sediment properties: It is assumed that the spilled material has constant porosity, and therefore a consistent pore water content (38%, see Appendix 1). Likewise, the dry density of the material is considered uniform, regardless of its specific composition. The proportion of cohesive sediment fractions is also treated as constant, serving as a basis for scaling the EHS concentrations. Furthermore, processes such as consolidation of the settled material are not taken into account and the non-spilled sediment is assumed to remain in its original physical state, meaning the spill rate applied to the sediment is equally applied to the associated pore water. Coarse sand, which is expected to settle rapidly and in close proximity to the source, is excluded from both the modelling and the evaluation. Finally, the organic matter content in the sediment is assumed to be negligible and is therefore not considered in the analysis.

EHS properties: Environmentally hazardous substances in suspension are considered to bind exclusively to cohesive sediment fractions. Variations in EHS concentrations along the cable corridor are not considered, and both temporal and spatial changes in background concentrations are neglected.

Table A 1 in Appendix 1 gives an overview of the relevant parameters for the calculations, which are described hereafter in detail.

5.2.2. EHS Concentration in the water

The concentration of environmentally hazardous substances (EHS) in the water depends on the pre-existing concentration of EHS in the water phase ($C_{EHS-Background}$), the concentration of EHS in the spilled sediment and the pore water, the suspended sediment concentration (SSC) during sediment spreading. The process is in fact very complex, and the consequence of spreading of SSC due to dredging can be assessed based on the following described and recognised conservative progression.

Depending on the EHS to be considered, the relevant concentrations in respect to the marine EQS can be calculated as:

PAHs and phenols and phthalates (relevant for EQS)

$$C_{EHS} = C_{EHS\ from\ Porewater} + C_{EHS-SSC} + C_{EHS-Background}$$

The resulting concentrations will be shown with and without background concentrations (excess concentration of EHS).

Heavy metals (relevant for EQS is only relevant for the dissolved substance)

$$C_{EHS} = C_{EHS\ from\ Porewater} + C_{EHS-Background}$$

The resulting concentrations will be shown with and without background concentrations (excess concentration of EHS).

Hereafter, the calculation of the individual concentrations are described in detail.

5.2.2.1. EHS from spilled pore water

The $C_{EHS\ from\ Porewater}$ due to the dispersion of the porewater from the spill throughout the model domain is modelled via a tracer method. At the spill, a fictive, neutrally buoyant sediment fraction, a so-called passive tracer, is added to the model to represent the porewater of the spilled sediment. The tracer is added at a fixed porewater to tracer ratio. This ratio is used in the postprocessing of the model results to convert the SSC of the tracer to the porewater volume-fraction f_{PW} [m^3PW/m^3Water] at any location and time in the model:

$$f_{PW} = SSC_{Tracer} * \frac{V_{Porewater\ spill}}{M_{Tracer}}$$

The spilled pore water can be described by the product of the spilled sediment volume $V_{Sediment\ spill\ per\ s}$ [m^3MUD/s] and the porosity ϕ, [m^3PW /m^3Mud]).

$$V_{Porewater\ spill} = V_{Sediment\ spill} * \phi$$

By multiplying porewater volume-fraction f_{PW} [m^3PW/m^3Water] with the EHS-concentration in the pore water C_{EHS-PW} [mg/m^3PW], the EHS-concentration in the water due to the pore water results $C_{EHS\ from\ Porewater}$ [mg/m^3Water].

$$C_{EHS\ from\ Porewater} = f_{PW} * C_{EHS-PW}$$

5.2.2.2. EHS-concentration due suspended (cohesive) sediment

While the EHS-concentration in the sediment C_{EHS-S} [mg/kgTS] in Table 4.5 refers to the sediment in the seabed (with all fractions), it is assumed that the hazardous substances are only bound to and are transported with the four cohesive sediment fractions ($SSC_{cohesive}$,< 0.063 mm, see Table 4.1).

Therefore, the concentration must first be scaled. The cohesive fractions of the spilled material account to 20% (spilled cohesive volume $V_{cohesive}$ compared to spilled sediment volume V_{tot}). The scaling factor is assumed to be constant:

$$C_{EHS-S_{cohesive}} = C_{EHS-S} * \frac{V_{tot}}{V_{cohesive}} = C_{EHS-S} * 5.08.$$

As a consequence, the EHS concentration due to the suspended sediment $C_{EHS-SSC}$ [mgEHS/m^3Water = µgEHS/l] can be directly derived with the $SSC_{cohesive}$ [kg/m^3Water] and EHS-concentration of the cohesive sediment $C_{EHS-S_{cohesive}}$ [mg/kgTS]:

$$C_{EHS-SSC} = SSC_{cohesive} * C_{EHS-S_{cohesive}}$$

5.2.3. EHS concentration in the settled sediment

As the EHS is bound to and transported with the cohesive sediment, the EHS concentration in the seabed $C_{EHS-Sediment}$ [mg/kgTS] can change.

- In areas, where mainly coarse sediment (> 0.063 mm) settles, the concentration decreases, as the coarse material does not contain any EHS.
- In areas, where more cohesive sediment settles (< 0.063 mm), the concentration increases.

The calculation of the concentration of EHS in the sediment $C_{EHS-Sediment}$ [mg/kgTS] is conducted for the top 3 cm of the seabed [7], where the sedimentation is > 0.001 m (400 ha, [1]). Complete sediment mixing and dilution of the EHS concentration is assumed and the background concentration is considered.

The concentration of EHS the sediment concentration in the seabed $C_{EHS-Sediment}$ [mg/kgTS] in the top 3 cm (z_{tot} = 3 cm) of the seabed is calculated as

$$C_{EHS-Sediment} = \frac{m_{Background} * C_{EHS-S-Background} + m_{cohesive} * C_{EHS-S-Cohesive}}{m_{Background} + m_{cohesive} + m_{non-cohesive}}$$

where $m_{Background}$ [kgTS/m^2] is the mass contribution from the natural seabed, $m_{cohesive}$ is the mass contribution of the settled cohesive fractions [kgTS/m^2] and $m_{non-cohesive}$ is the mass contribution of the settled non-cohesive modelled fractions[1] [kgTS/m^2]. Since coarse sand is not modelled, as it is assumed to settle in the very close proximity of the source, the $C_{EHS-Sediment}$ can be slightly overestimated along the cable corridor itself.

While the mass contributions of the settled sediment can be extracted from the MT-Simulation, the mass contribution of the background sediment is calculated - if the sedimentation < 0.03 m - as

$$m_{Background} = (z_{tot} - z_{sedimentation})\, \rho_{Background}$$

where z_{tot}= 3 cm comprises the top layer of sediment, $z_{sedimentation}$ represents the sedimentation height of the MT-Simulation and $\rho_{Background}$ is the dry density of the seabed sediment (see Table A 1).

[1] There are two non-cohesive fractions listed in Table 4.1, whereas the coarse material is not modelled and assumed to settle next to the source (within a few meters compared to the element sizes of 1,000 m^2).Thus, the $m_{cohesive}$ corresponds to the fine sand fraction.

5.3. Post-processing

While the applied modelling approach enables the description of EHS concentration in four dimensions (x, y, z, and time), the results must be evaluated in a manner that allows for a meaningful assessment. The relevant considerations for post-processing are presented in the following.

5.3.1. EHS in the water column

EHS concentrations are directly linked to the concentrations of suspended sediment and the porewater. Therefore, for the depth-averaged results of the sediment dispersion model, the EHS concentrations are determined using the approach described above. The evaluation focuses on the time interval from May 1 (start of the activity) to October 15, 2020—one month after the end of the spill.

As described in [1], suspended sediment concentrations exhibit high spatial and temporal fluctuations, caused by the varying currents and – more important - the source moving in space and time (sediment spill along the cables). According to the project schedule (Table 3.1), sediment-releasing activities are divided into two phases, interrupted by a one-month cable installation period in July. Considering the timeseries of suspended sediment concentrations extracted around 1.5 km west of the cable corridor (Point 1, 679881, 6097982, [1], Figure 5.3), the general temporal variation and the effect of the two is evident.

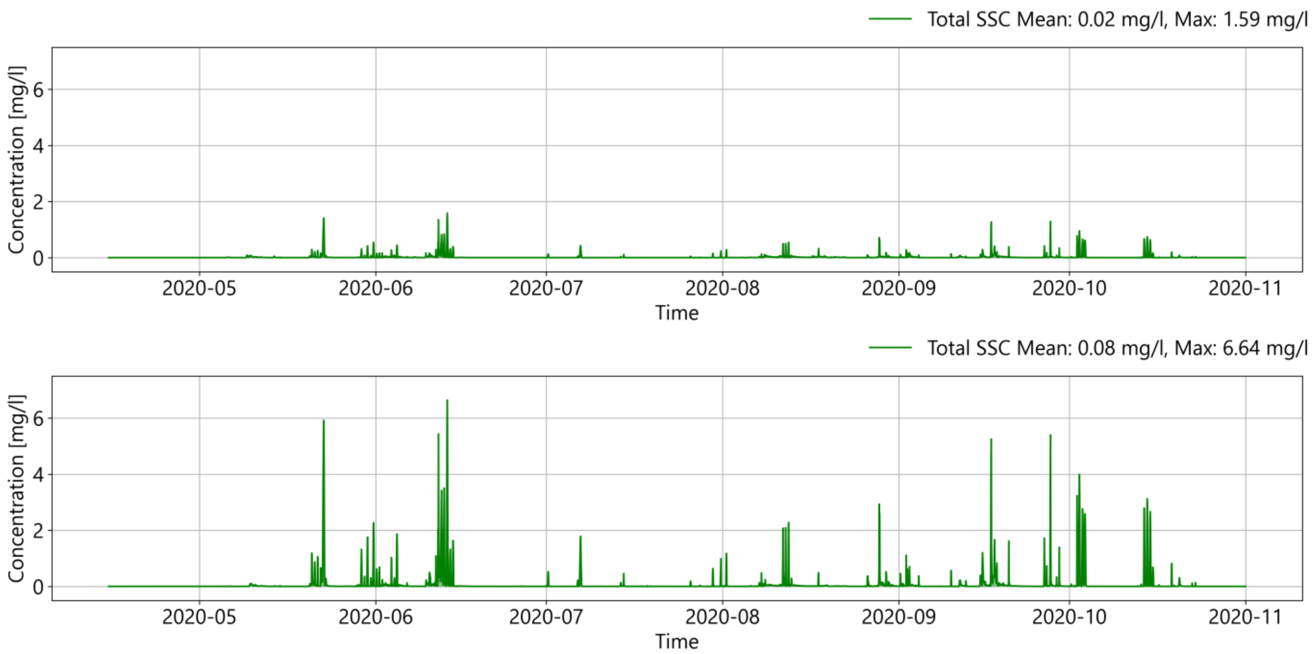

Figure 5.3: Timeseries of concentration averaged over the entire water column (top) and the bottom (averaged between 0 and 2m above ground) at point 1.

Due to the dynamic nature of the concentrations, the modelling results capture temporal fluctuations of EHS concentrations associated with sediments in high detail. To enable a clear and meaningful assessment while preserving the information gained from the modelling, several complementary metrics are applied. Therefore, different aspects of the EHS concentrations are evaluated in the following sections.

5.3.1.1. *Pre-screening based on exceedance durations*

Exceedance durations relative to the EQS values are used to identify substances that exceed the threshold at any point in time and to assess the influence of vertical resolution and background concentrations.

Two exceedance metrics (see visualisation in Figure 5.4 and EQS values see Table 4.5) are analysed:

- **Cumulative exceedance duration**, representing the total time during which the EHS concentration exceeds a defined threshold (i.e., the sum of all exceedance periods).
- **Longest consecutive exceedance duration**, representing the longest uninterrupted period during which the threshold is continuously exceeded.

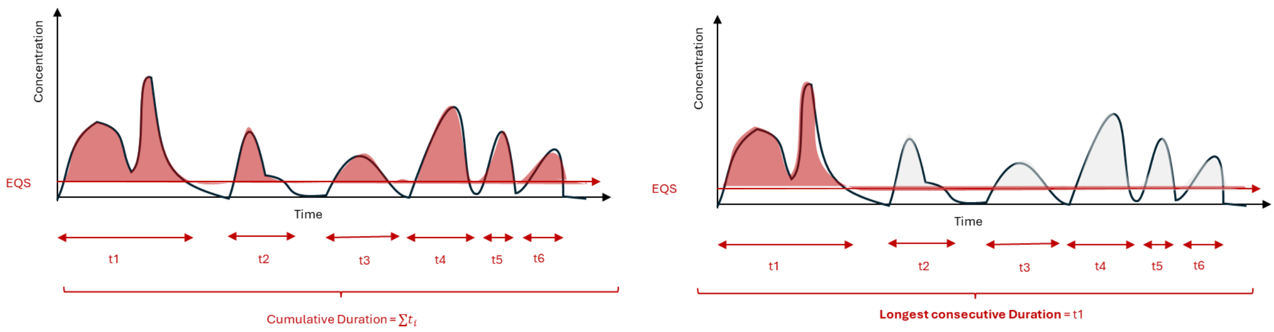

Figure 5.4: Visulation of cumulative (left) vs. consecutive (right) exceedance durations

According to the project schedule (Table 3.1), sediment-releasing activities are divided into two phases, interrupted by a one-month cable installation period in July. For this reason, the longest consecutive exceedance duration is considered the most representative metric and presented in detail. The cumulative exceedance duration is additionally provided for the depth-averaged EHS concentrations as a sensitivity indicator.

Relevant depth interval: Sediment concentrations tend to be highest near the seabed for two main reasons. First, sediment is released 2 meters above the seabed—except in shallow areas (less than 6 meters deep), where the spill is assumed to be evenly distributed throughout the water column (Figure 5.1). Second, gravity causes suspended sediment to sink and accumulate near the bottom before eventual deposition. As this study aims to provide a representative estimate of EHS concentrations, the main report presents exceedance durations based on EHS concentrations averaged over the entire water column. To illustrate the range of outcomes and the sensitivity of the results to the depth-averaging approach, variations are considered using the uppermost 2 meters and the lowermost 2 meters of the water column. These additional results are provided in tabular form only.

Effect of background concentrations: The assumption of spatially and temporally constant EHS background concentrations represents a simplification. It is reasonable to expect that EHS concentrations—particularly for PAHs, where the concentration bound to suspended sediment is relevant for the assessment—may increase during periods of elevated hydrodynamic activity (e.g., during strong wind or wave events) due to the resuspension of sediments containing similar EHS levels as those in the spill. Conversely, lower concentrations are expected during calm sea conditions. At the same time, sediment-releasing activities are typically carried out under favourable weather conditions, meaning that during the period of sediment release—and thus during peak EHS concentrations—background concentrations are likely to be lower. Since a reliable estimation of this variability is not feasible, the results that include background concentrations are considered the primary basis for assessment. However, to illustrate potential variability, the depth-averaged maximum longest consecutive exceedance duration is also presented under the assumption that background concentrations are negligible.

Based on the occurrence of exceedances, the key metrics described below are calculated for the substances identified as critical.

5.3.1.2. Metrics for Assessment

To assess the impact of EHS released from sediments during trenching, a mixing zone extending 350 m on each side of the two cable routes is defined. The extent of this mixing zone follows the guidance provided by the Danish Environmental Protection Agency (FAQ 67). Given the strong hydrodynamic conditions in Storstrømmen, the area is considered representative of open coastal waters, and the mixing zone was defined accordingly.

Depending on the applicable environmental quality standard (EQS marine or Max EQS marine, see Table 4.5), two assessment metrics are applied:

EQS marine (time-averaged standard): Time-averaged EHS concentrations are compared with the EQS marine value. To account for the temporal distribution of trenching activities, three assessment periods are considered:

- Full simulation period: 01/05–31/10
- First activity period: 01/05–15/06
- Second activity period: 01/08–15/09

Max EQS marine (maximum allowable concentration): The maximum EHS concentration occurring at any time and location within the simulation is evaluated. The resulting map shows, for each raster cell, the highest concentration occurring at any point during the simulation period. Consequently, the spatial distribution does not correspond to a single timestep but represents the envelope of maximum concentrations over time.

5.3.2. EHS in the settled sediment

With respect to EHS sedimentation, all time steps where sedimentation exceeds 1 mm are considered. For these time steps, the EHS concentration in the top 3 cm of the sediment layer is calculated, and the maximum value observed over the period is identified and compared against the specified threshold.

6. Assessment of impacts during the construction phase

This chapter, along with **Error! Reference source not found.** to Appendix 4 presents the results of EHS concentrations in both the water column and the sediment.

6.1. EHS Concentration in the water

As the relevant environmental quality standards apply to different phases of the substances, the results for PAHs, phenols, and phthalates are assessed based on total EHS concentrations (including contributions from porewater release, sediment-associated transport, and background concentrations), whereas for heavy metals only the dissolved fraction is relevant for comparison with the EQS. Therefore, the results for organic substances and heavy metals are discussed separately.

6.1.1. PAHs and phenols and phthalates

6.1.1.1. Pre-screening based on exceedance durations

The maximum longest consecutive exceedance durations of EQS-Thresholds of PAHs and phenols and phthalates averaged over the entire water columns is depicted for the individual EQS in Table 6.1. As in case of Benzo(a)pyrene, Benzo(b+j+k)Fluoranthene, Benzo(g,h,i)perylene, Indeno(1,2,3-cd)pyrene and Pyrene, the EQS marine is already exceeded by the background concentrations, the 5% EQS marine is also calculated and the exceedance duration evaluated. The results can be described as follows:

- The EQS (marine and max marine) are not exceeded for Methylnaphthalenes, total and Di-n-butyl phthalate (DBP).
- While the 5% EQS marine of Indeno(1,2,3-cd)pyrene is exceeded during 52 hours, the EQS max marine is not reached or exceeded.
- Maximum longest consecutive exceedance duration of 5% EQS marine accounts to 70 hours (Benzo(b+j+k)Fluoranthene, area around 20,000 ha),
- Maximum longest consecutive exceedance duration of EQS max marine 14 hours (Benzo(g,h,i)perylene, area around 82 ha)

Table 6.1: ***Maximum longest consecutive exceedance durations [h] of the EQS marine of PAHs and phenols and phthalates in the water column, depth-averaged*** *(Always indicates that the background concentration already exceeds the threshold, see (Table 4.5))*

	5% EQS marine[2]	EQS marine	EQS max marine
Benzo(a)anthracene	-	17	4
Benzo(a)pyrene	54	Always	2
Benzo(b+j+k)Fluoranthene	70	Always	6
Benzo(g,h,i)perylene	54	Always	14
Chrysene / Triphenylene	-	12	12
Fluoranthene	-	12	2
Indeno(1,2,3-cd)pyrene	52	Always	0
Pyrene	26	Always	3
Methylnaphthalenes, total	-	0	0
4-t-octylphenol	-	5	Not defined
Di-n-butyl phthalate (DBP)	-	0	0

[2] 5% EQS is calculated by $c_{Background} + 0.05 * \text{EQS marine}$.

6.1.1.1.1. Cumulative exceedance duration

If the cumulative exceedance duration[3] is considered (Table 6.2) instead of the consecutive exceedance durations, the exceedance durations are longer with a maximum exceedance of 5% EQS maximum of Benzo(b+j+k)Fluoranthene of around 2 weeks and of EQS max marine of Benzo(g,h,i)perylene of around 25 hours. The affected area where the EQS max marine is reached or exceeded for more than a day accounts to 0.05 ha.

Table 6.2: ***Maximum cumulative exceedance durations [h] of the EQS marine of PAHs and phenols and phthalates in the water column, depth averaged*** *(Always indicates that the background concentration already exceeds the threshold, see (Table 4.4.))*

	5% EQS marine	EQS marine	EQS max marine	Area [ha], EHS > EQS max over 24 h
Benzo(a)anthracene	-	28	5	0.00
Benzo(a)pyrene	190	Always	3	0.00
Benzo(b+j+k)Fluoranthene	344	Always	10	0.00
Benzo(g,h,i)perylene	192	Always	25	0.04
Chrysene / Triphenylene	-	21	21	0.00
Fluoranthene	-	22	2	0.00
Indeno(1,2,3-cd)pyrene	185	Always	0	0.00
Pyrene	62	Always	4	0.00
Methylnaphthalenes, total	-	0	0	0.00
4-t-octylphenol	-	8	0	Not defined
Di-n-butyl phthalate (DBP)	-	0	0	0.00

6.1.1.1.2. Effect of depth-intervals considered

The comparison of the maximum longest consecutive exceedance durations given different depth averaging-intervals (Table 6.1, Table 6.3 and

Table 6.4) reveals,

- Exceedance durations in the same order of magnitude
- Higher exceedance durations if considering the bottom-layer, with a maximum increase in duration of 4 hours (5% EQS marine, Benzo(b+j+k)Fluoranthene)

Table 6.3: ***Maximum longest consecutive exceedance durations [h] of the EQS marine of PAHs and phenols and phthalates in the water column, 2 m below surface*** *(Always indicates that the background concentration already exceeds the threshold, see (Table 4.4))*

	5% EQS marine	EQS marine	EQS max marine
Benzo(a)anthracene	-	17	4
Benzo(a)pyrene	54	Always	2
Benzo(b+j+k)Fluoranthene	64	Always	6
Benzo(g,h,i)perylene	54	Always	14
Chrysene / Triphenylene	-	12	12

[3] the total time (i.e., the sum of all periods) during which the EHS concentration exceeds a defined threshold

Fluoranthene	-	12	2
Indeno(1,2,3-cd)pyrene	52	Always	0
Pyrene	26	Always	3
Methylnaphthalenes, total	-	0	0
4-t-octylphenol	-	5	Not defined
Di-n-butyl phthalate (DBP)	-	0	0

Table 6.4: ***Maximum longest consecutive exceedance durations [h] of the EQS marine of PAHs and phenols and phthalates in the water column, 2 m above seabed*** *(Always indicates that the background concentration already exceeds the threshold, see (Table 4.4.))*

	5% EQS marine	EQS marine	EQS max marine
Benzo(a)anthracene	-	18	4
Benzo(a)pyrene	54	Always	2
Benzo(b+j+k)Fluoranthene	68	Always	6
Benzo(g,h,i)perylene	54	Always	16
Chrysene / Triphenylene	-	15	15
Fluoranthene	-	15	2
Indeno(1,2,3-cd)pyrene	52	Always	0
Pyrene	26	Always	3
Methylnaphthalenes, total	-	0	0
4-t-octylphenol	-	5	Not defined
Di-n-butyl phthalate (DBP)	-	0	0

6.1.1.1.3. Effect of background concentrations

Without considering the background concentrations (Table 6.5), neither the EQS marine nor the EQS max are reached or exceeded for a duration longer than 1 day[4]. For substances, where the background concentrations do not exceed the EQS marine (Table 4.4), the exceedance durations are reduced by almost a factor 2. Comparing the area, in which the (5%) EQS Marine of Benzo(b+j+k)Fluoranthene is exceeded underlines that the strong exceedance of the EQS is mainly forced by the high background concentration.

Regarding Di-n-butyl phthalate (DBP) and 4-t-octylphenol, no differences can be observed between the values listed in Table 6.1 (with background concentration) and Table 6.5 (without background concentration), as the background concentration is expected to be 0 µg/l (Table 4.4).

[4] 5% EQS marine is not relevant, as the background concentration is assumed to 0 µg/l.

Table 6.5: ***Maximum longest consecutive exceedance durations [h] of the EQS marine of PAHs and phenols and phthalates in the water column, depth-averaged without considering EHS background concentrations*** *(5% EQS marine is not relevant, as the background concentration is assumed to be 0 µg/l.)*

	5% EQS marine	EQS marine	EQS max marine
Benzo(a)anthracene	-	14	4
Benzo(a)pyrene	-	18	2
Benzo(b+j+k)Fluoranthene	-	23	5
Benzo(g,h,i)perylene	-	18	13
Chrysene / Triphenylene	-	10	10
Fluoranthene	-	7	2
Indeno(1,2,3-cd)pyrene	-	18	0
Pyrene	-	10	3
Methylnaphthalenes, total	-	0	0
4-t-octylphenol	-	5	Not defined
Di-n-butyl phthalate (DBP)	-	0	0

6.1.1.1.4. Relevant conclusions

The EQS (marine and max marine) are not exceeded for Methylnaphthalenes, total and Di-n-butyl phthalate (DBP). Therefore, these substances are not investigated in the following sections.

EQS marine is reached or exceeded for ***nine*** substances, with the longest consecutive exceedance duration of 5% EQS marine accounting to ***70 hours*** (Benzo(b+j+k)Fluoranthene).

EQS max marine is reached or exceeded for ***seven*** substances (no exceedance for Indeno(1,2,3-cd)pyrene and no value available for 4-t-octylphenol), with maximum longest consecutive exceedance duration of EQS max marine accounting to ***14 hours*** (Benzo(g,h,i)perylene, area around 82 ha)

6.1.1.2. Metrics for Assessment

To assess the exceedances, the temporally varying concentrations are either time-averaged (EQS marine) or the maximum concentration is determined (EQS max marine) and compared with the respective EQS values. Based on the previous screening, only substances showing an instantaneous exceedance are considered in the subsequent assessment.

6.1.1.2.1. Temporal mean concentrations vs EQS marine

Time-averaged EHS concentrations are compared with the EQS marine value. It should be noted that the temporal average is highly dependent on the period considered: the longer the period without any release, the lower the resulting time-averaged concentration

Based on the pre-screening results (section 6.1.1.1), the most pronounced exceedance is expected for Benzo(b+j+k)fluoranthene. Therefore, the main report focuses on results for this substance (additional results, see Appendix 2).

As depicted in Figure 6.1, exceedances of EQS marine by time-averaged concentrations of Benzo(b+j+k)fluoranthene during the activity periods are largely confined to the 350 m mixing zone. Exceedances outside this zone are limited, observed only for a small area (~1 km from the northern coast) [5] and only when considering the first activity period.

The spatial differences in concentrations can be explained by shallow conditions along the southern coast and variations in soil properties, with higher cohesive sediment content in the northern area where exceedances occur. Whereas it is to be noted that the results at the Southern Coast are not deemed to be representative, as due to project modifications this section will not be dredged but drilled, without any spill of sediments.

Considering the time-averaged concentration over the full simulation period (01 May – 31 October, Figure 6.2, left), concentrations are lower and remain within the mixing zone. To account for uncertainty in background concentrations, results without background contributions are also presented (Figure 6.2, right), showing no relevant exceedances of EQS marine.

Maps for the remaining substances during the first activity period (worst-case scenario) are provided in **Error! Reference source not found.**, where no exceedances beyond the 350 m mixing zone are observed.

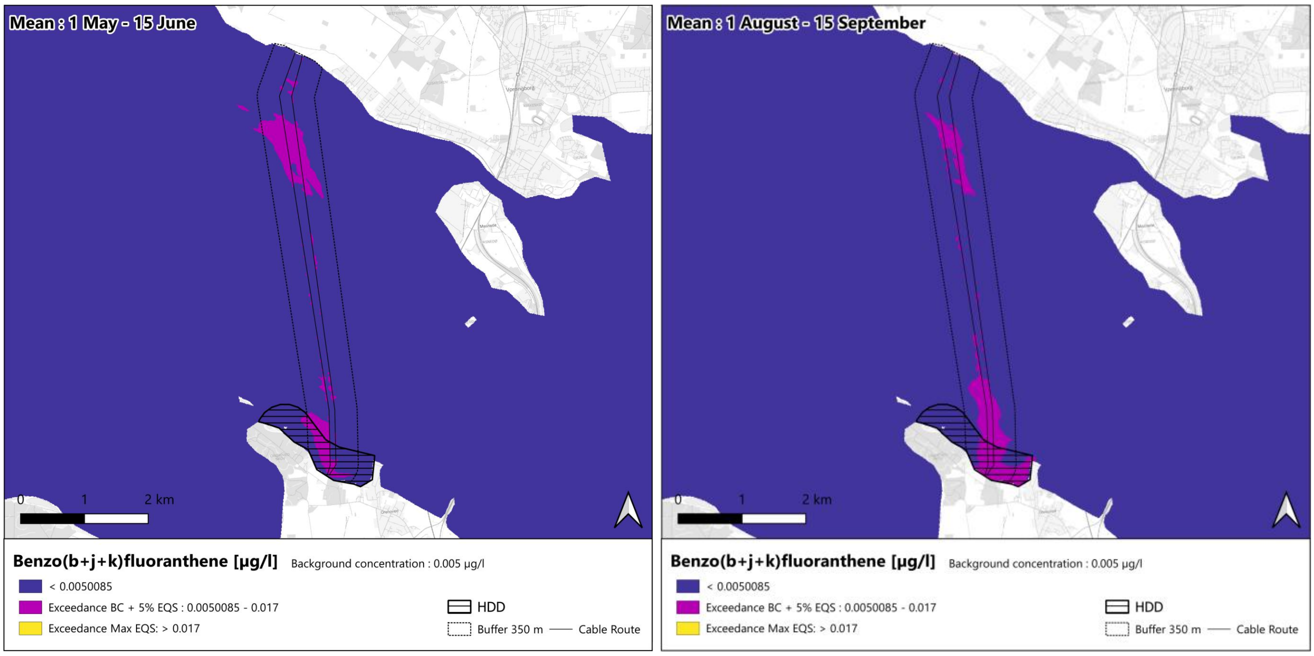

Figure 6.1: Time-averged Benzo(b+j+k)Fluoranthene concentrations; first period of activity (left) and second (right). The black-dashed area indicates the zone where drilling occurs without sediment release; however, in the model it is represented as dredged, thus the shown concentrations are overestimated and should not be considered.

[5] Within the first 450 m from the south coast, the cables will be drilled without any release of the sediment. the black-dashed area indicates this zone. However, in the model it is represented as dredged, thus the shown concentrations are overestimated and should not be considered.

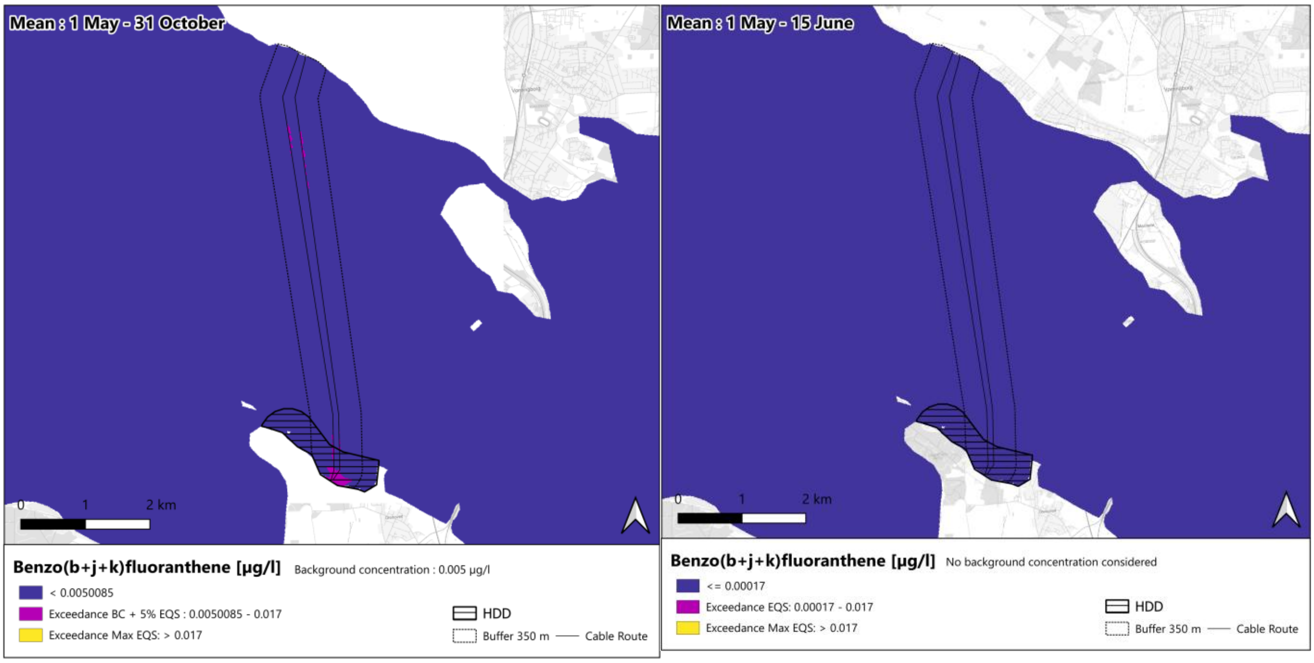

Figure 6.2: Sensitivity of time-averged Benzo(b+j+k)Fluoranthene concentrations depending on the period (left) and the background concentration (no background concentration considered, period 1, right). The black-dashed area indicates the zone where drilling occurs without sediment release; however, in the model it is represented as dredged, thus the shown concentrations are overestimated and should not be considered.

6.1.1.2.2. Maximum concentration vs EQS max marine

Maximum EHS concentrations are compared with the EQS max marine value. Based on the pre-screening results (section 6.1.1.1), the most pronounced exceedance is expected for Benzo(g,h,i)perylene. Therefore, the main report focuses on results for this substance.

As depicted in Figure 6.3, exceedances of EQS max marine by maximum concentrations of Benzo(g,h,i)perylene are confined to the 350 m mixing zone. Concentrations along the southern coast are overestimated because the model represents this area as dredged, whereas the project modification involves drilling without sediment release. Therefore, this area is not relevant for the assessment.

Maps of maximum concentrations of all seven substances, where an exceedance of the EQS max marine is to be expected, are shown in Appendix 3.

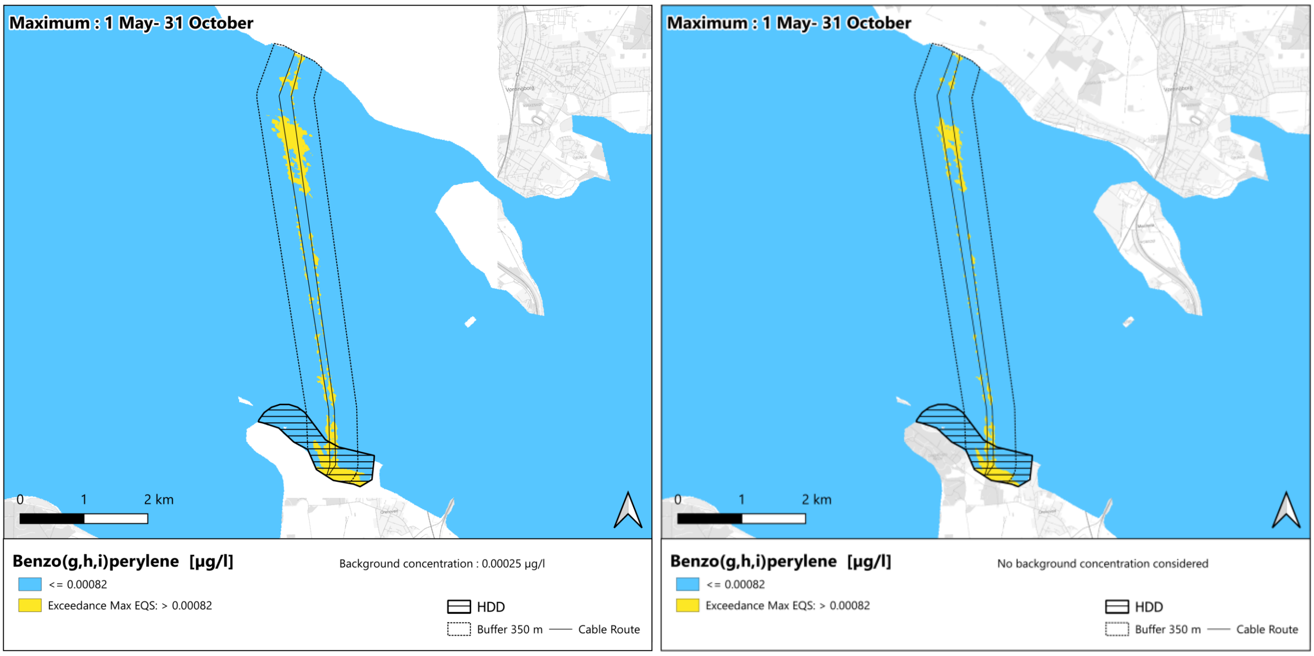

Figure 6.3: Maximum Benzo(g,h,i)perylene concentrations; with (left) and without (right) the consideration of the background concentration The black-dashed area indicates the zone where drilling occurs without sediment release; however, in the model it is represented as dredged, thus the shown concentrations are overestimated and should not be considered.

6.1.2. Heavy metals

The EQS for heavy metals only accounts for dissolved substances, thus the spill and spread of the porewater is the main variable. In the scope of the activities around 0.3 l/s of pore water is released.

6.1.2.1. Pre-screening based on exceedance durations

Since independent of the depth-interval and the exceedance duration considered, neither EQS marine nor EQS marine max are exceeded, the most conservative result (2 m above seabed, cumulative duration) is shown in Table 6.6.

*Table 6.6: **Maximum cumulative exceedance durations [h] of the EQS marine of heavy metals excess concentrations** in the water column, (Always indicates that the background concentration already exceeds the threshold, see (Table 4.5.))*

	5% EQS marine	EQS marine	EQS max marine
Arsenic (As)	0	Always	0
Lead (Pb)	-	0	0
Cadmium (Cd)	-	0	0
Chromium (Cr)	-	0	0
Mercury (Hg)	-	0	0
Nickel (Ni)	-	0	0

6.1.2.2. Metrics for Assessment

Since no exceedances of the threshold values were observed during the pre-screening, a detailed description of the mean and maximum concentrations is omitted.

6.2. EHS Concentration in the settled sediment

As described in chapter 5.2.3, as the EHS is bound to and transported with the cohesive sediment, the EHS concentration in the seabed $C_{EHS-Sediment}$ [mg/kgTS] can change – although the EHS-concentration of the spilled sediment and the background sediment (e.g. the seabed) are the same. Namely,

- in areas, where mainly fine sand (> 0.063 mm) settle (decrease, as the EHS-concentration of fine sand is assumed to be 0 mg/kgTS.
- In areas, where more cohesive sediment (< 0.063 mm) settles (increase).

In the following results, no consolidation is considered (settled sediment density: 180 $kg/m^{3,}$ [12]) and only areas, where the sedimentation height is > 1 mm, are analysed. The resulting EHS concentrations are compared to the *Sediment EQS OC corr.* (see Table 4.5.) and the maximum area, where *Sediment EQS OC corr.* is reached or exceeded, is determined. As the assumption of spatially and temporally constant EHS background concentrations in the seabed represents a simplification, the evaluation is also conducted under the assumption that background concentrations are negligible.

The results are shown in form of tables of areas, where the EQS is reached or exceeded. For the case without considering background concentrations, maps are provided in Appendix 4.

6.2.1. PAHs and phenols and phthalates

Table 6.7 illustrates the maximum areas where the temporal peak concentrations of PAHs in the seabed reach or exceed the sediment EQS (organic carbon-corrected). The data indicate that, due to the project, the EQS for Benzo(b+j+k)Fluoranthene, Benzo(g,h,i)perylene, Fluoranthene, Indeno(1,2,3-cd)pyrene, and Pyrene is neither reached nor exceeded. In contrast, for Benzo(a)anthracene, Benzo(a)pyrene, Chrysene/Triphenylene, and Methylnaphthalenes (sum), the background concentrations already exceed the EQS.

When background concentrations are excluded, the area where EQS values are reached or exceeded ranges from 7 to 24 hectares.

In case of Di-n-butyl phthalate (DBP), based on the results, an exceedance of EQS is to be expected in an area of 0.9 ha to 1.6 (without and with background concentration). As shown in Figure 6.4, the affected area is limited to the immediate vicinity of the cable corridor.

Table 6.7: Areas in ha, where the ***maximum concentration reaches or exceeds the Sediment EQS OC corr. of PAHs and phenols and phthalates*** *in the settled sediment (Everywhere > 400 ha (where sedimentation depth >= 1 mm, see [1], as the background concentration already exceeds the threshold, see (Table 4.4))*

	Sediment EQS OC corr. (excess)	Sediment EQS OC corr. (with background concentration)
Benzo(a)anthracene	3.6	Everywhere
Benzo(a)pyrene	38.0	Everywhere
Benzo(b+j+k)Fluoranthene	0.0	0.0
Benzo(g,h,i)perylene	0.0	0.0
Chrysene / Triphenylene	12.0	Everywhere
Fluoranthene	0.0	0.0
Indeno(1,2,3-cd)pyrene	0.0	0.0
Pyrene	0.0	0.0
Methylnaphthalenes, total	12.6	Everywhere
4-t-octylphenol	0.0	0.0
Di-n-butyl phthalate (DBP)	0.9	1.6

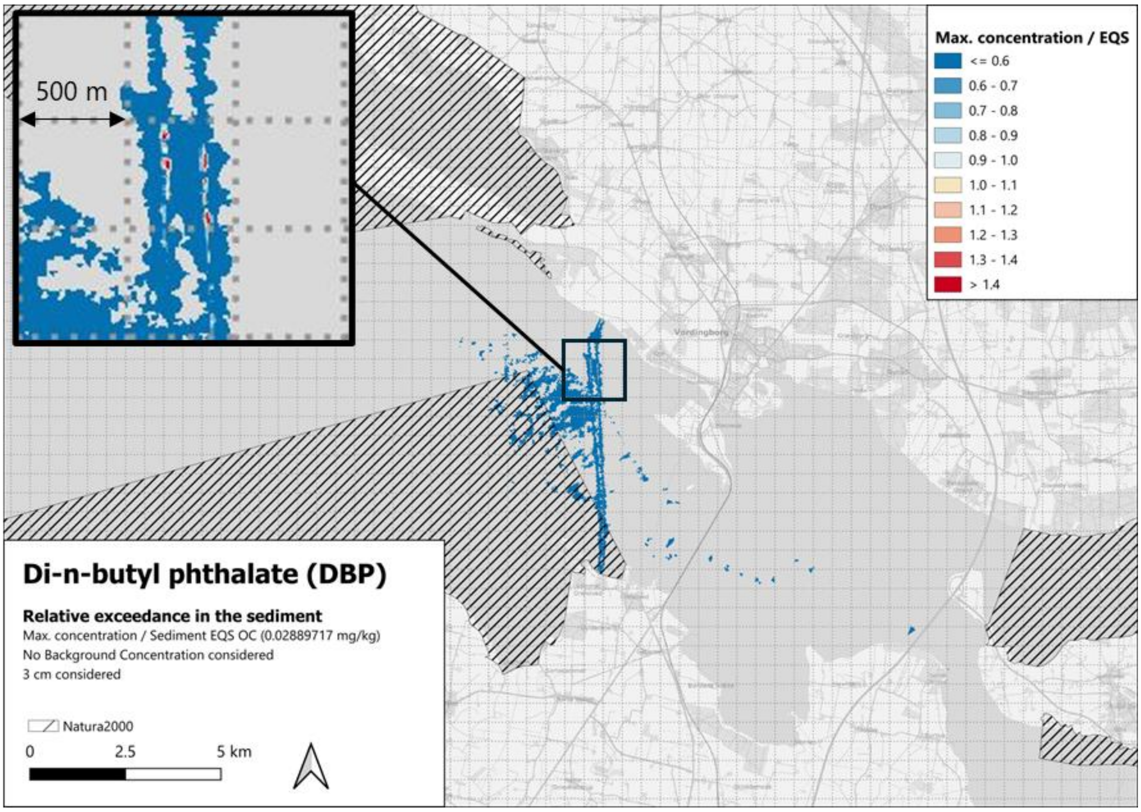

Figure 6.4: Relative exceedance of EQS of Di-n-butyl phthalate (DBP) in the settled sediment, if the background concentration is not considered.

6.2.2. Heavy metals

Table 6.8 illustrates the maximum areas where the temporal peak concentrations of heavy metals in the seabed reach or exceed the sediment EQS (organic carbon-corrected).

The data indicate that, due to the project, the maximum concentration of Nickel reaches or exceeds the EQS over within an area of 1.6 ha to 3.3 ha (with and without background concentration). As shown in Figure 6.5, the affected area is limited to the immediate vicinity of the cable corridor.

In contrast, the EQS for Lead, Cadmium and Mercury are neither reached nor exceeded. Regarding, Arsenic and Chromium the, background concentrations already exceed the EQS.

*Table 6.8: Areas in ha, where the **maximum concentration reaches or exceeds the Sediment EQS OC corr. of heavy metals** in the settled sediment (Everywhere > 400 ha (where sedimentation depth >= 1 mm, see [1], as the background concentration already exceeds the threshold, see (Table 4.4))*

	Sediment EQS OC corr. (excess)	Sediment EQS OC corr. (with background concentration)
Arsenic (As)	36.3	Everywhere
Lead (Pb)	0.0	0.0
Cadmium (Cd)	0.0	0.0
Chromium (Cr)	4.0	Everywhere
Mercury (Hg)	0.0	0.0
Nickel (Ni)	1.6	3.3

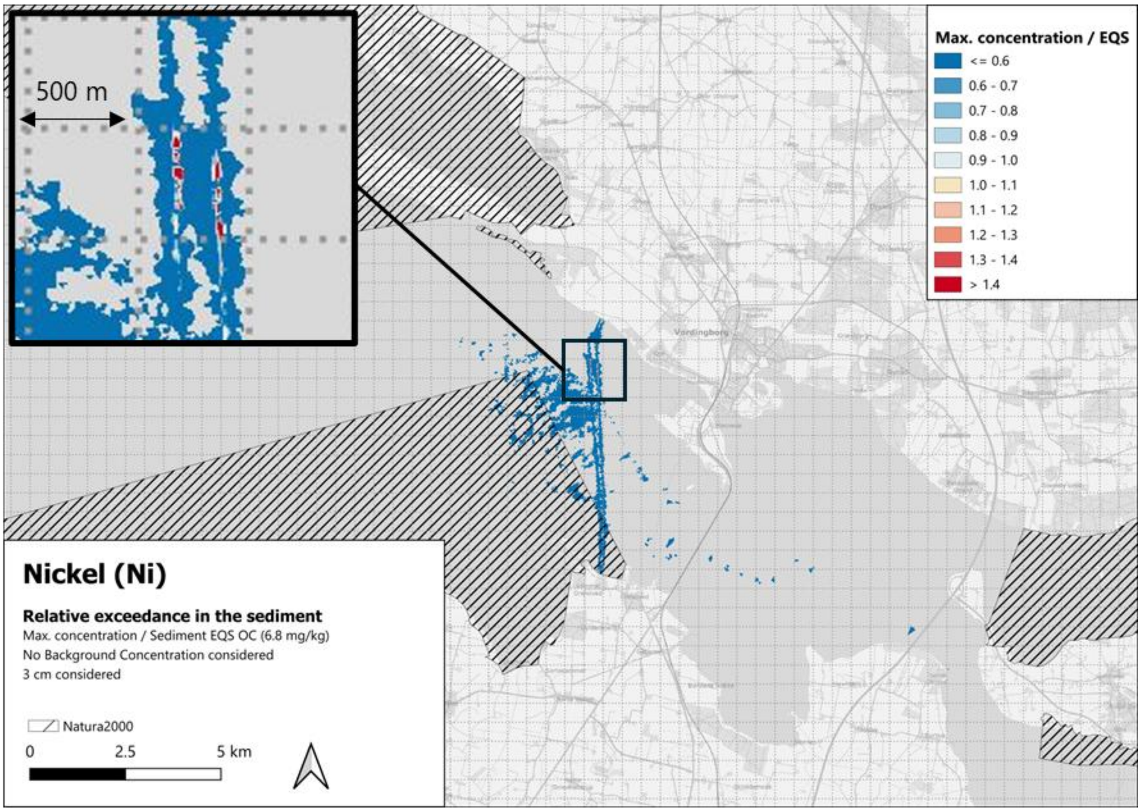

Figure 6.5: Relative exceedance of EQS of Nickel in the settled sediment, if the background concentration is not considered.

7. Discussion

The results discussed above represent the best estimate of EHS concentrations in both the water column and settled sediment. However, it must be emphasized that the dispersion of environmentally hazardous substances (EHS) is a highly complex process, which has been simplified in the present study through the following assumptions:

Sediment Dispersion Modelling Approach: As outlined in [1], the sediment spill model is designed in a way that may overestimate sediment concentrations in the water column, as it does not account for background concentrations. The presence of background sediment can enhance flocculation, increase settling rates, and thereby reduce the amount of suspended sediment. Additionally, the model does not include processes such as consolidation or biological activity, both of which can increase the resistance of settled sediment to erosion and resuspension. As a result, resuspension may be overestimated. Consequently, predicted concentrations of PAHs—bound with cohesive sediment—should be considered conservative. Conversely, the omission of consolidation may underestimate long-term EHS mobility due to unmodeled pore water expulsion and contaminant release.

Neglect of Spatial Variability in EHS Concentrations: The assumption of uniform EHS concentrations, regardless of sediment composition or spatial location, may lead to an overestimation of short-term concentration peaks. At the same time, it could also result in an overestimation of average EHS concentrations over time, as localized variations are not captured.

No Phase Changes of EHS After the Spill: In the applied modelling approach, dissolved and sediment-bound EHS concentrations are treated separately. Post-spill processes such as desorption from sediments or absorption into them are not considered. In reality, the partitioning of EHS between solid and liquid phases depends on several environmental factors, including background dissolved concentrations, pH, redox conditions, organic matter content, and particle size. Because these interactions are excluded, the model does not fully capture the effective dispersion of EHS. The net impact of this omission—whether it leads to under- or overestimation—remains uncertain.

EHS Background Concentrations: As previously discussed, background concentrations of EHS in the water column vary over time and space due to hydrodynamic influences. Assuming a constant background concentration may lead to overestimation under calm conditions and underestimation in turbulent environments. As shown, for PAHs in particular, background levels significantly influence total EHS concentrations and, therefore, the comparison to EQS.

Temporal and Spatial Resolution of Results: As demonstrated by the variations across different water layers and the duration of EQS exceedances, EHS concentrations fluctuate both vertically and over time. The final assessment is therefore highly sensitive to post-processing methods and the way results are presented. In this report, efforts were made to depict a representative overview of the situation without placing undue emphasis on isolated peak values.

Given the complexity of EHS behaviour, the limitations in data availability, and the constraints of the modelling approach, the derived concentrations involve inherent uncertainties. These uncertainties should be carefully considered when interpreting the results and within the broader context of the environmental impact assessment.

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Appendix 1 Parameters considered to calculate the EHS concentrations

Table A 1: Parameters considered to calculate the EHS concentration in water and the settled sediment

Parameter	Value	Unit	Description
Particle Density ρ_p	2,650	kgTS/m³TS	
Dry Bulk Density ρ_b	1,650	kgTS/m³TS	
Background Dry Bulk Density $\rho_{b-Background}$	1,650	kgTS/m³TS	
Dry density of settled sediment ρ_d	180	kgTS/m³TS	See 180 kg/m³
Water Density ρ_W	1000	kgWater/m³Water	
Porosity ϕ	38	%	$1 - \frac{\rho_b}{\rho_p}$
Spill	5	%	See Table 3.2
Spilled Sediment $R_{Sediment\ spill\ per\ s}$	0.00069	m³MUD/s	Trench area : 2 x 2 m Trench volume: 4 m³/m Speed: 300 m/d $R_{tot} = \frac{V_{trench}}{Speed} * \frac{1\ d}{86400s} * Spill$
Spilled volume	5,635	m³MUD	See Table 4.2
Spilled volume of cohesive sediment	1,110	m³MUD	See Table 4.2
Scaling Factor Cohesive	5.08		See Footnote
Spilled Tracer in the model	1	kgTracer/s	Representing pore water (no settling velocity)
Relevant sediment depth to be considered	0.03	m	
EHS concentrations	Variable	C_{EHS-S}: mgEHS/kgTS C_{EHS-W}: mgEHS/m³Porewater	See Table 4.5

Appendix 2 Time-averaged concentrations (1 May to 15 June)

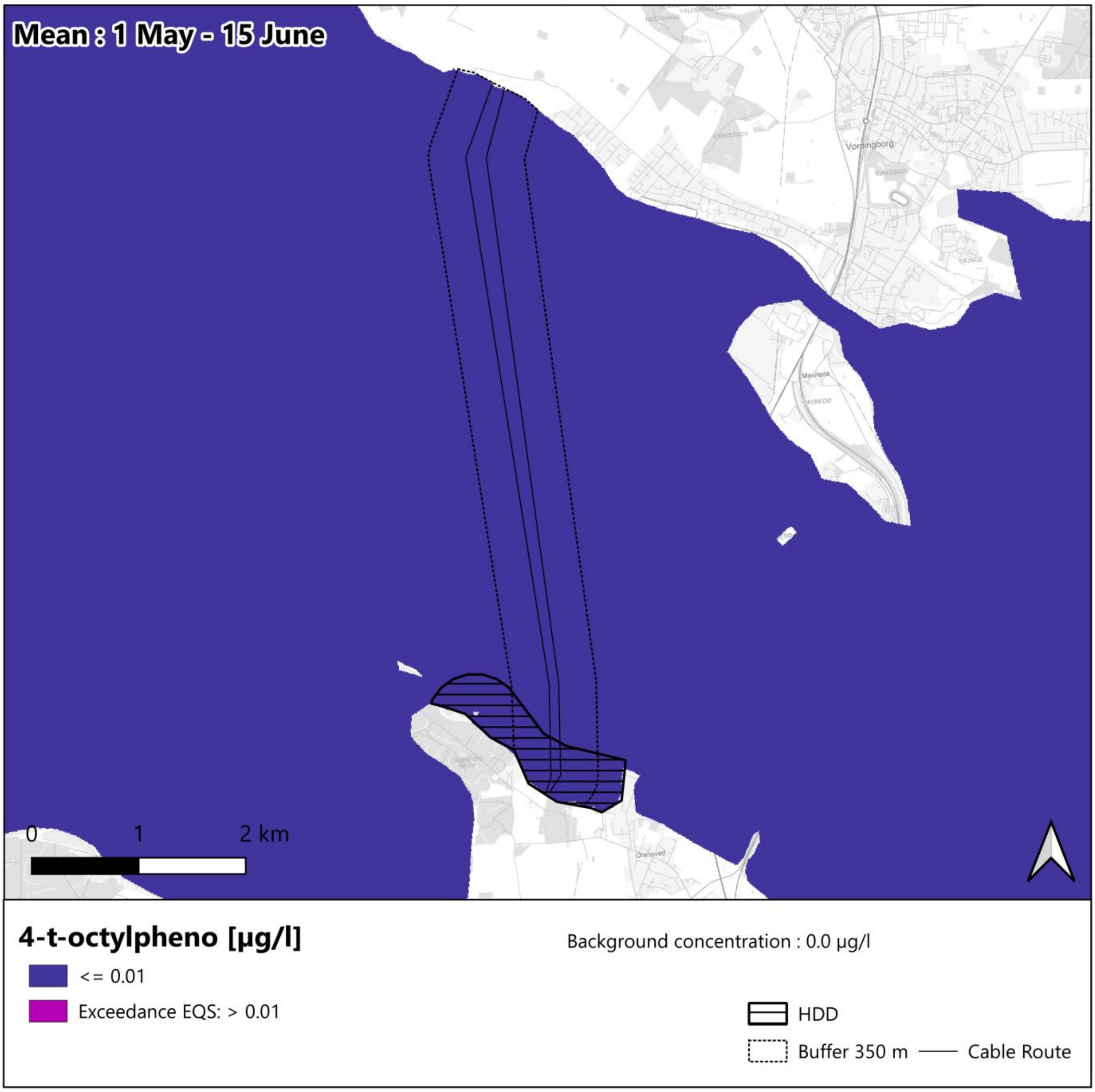


Figure 6: Mean depth-averaged concentration (temporal average) over the 1 period (between 1 May and 15 June) of 4-t-octylphenol

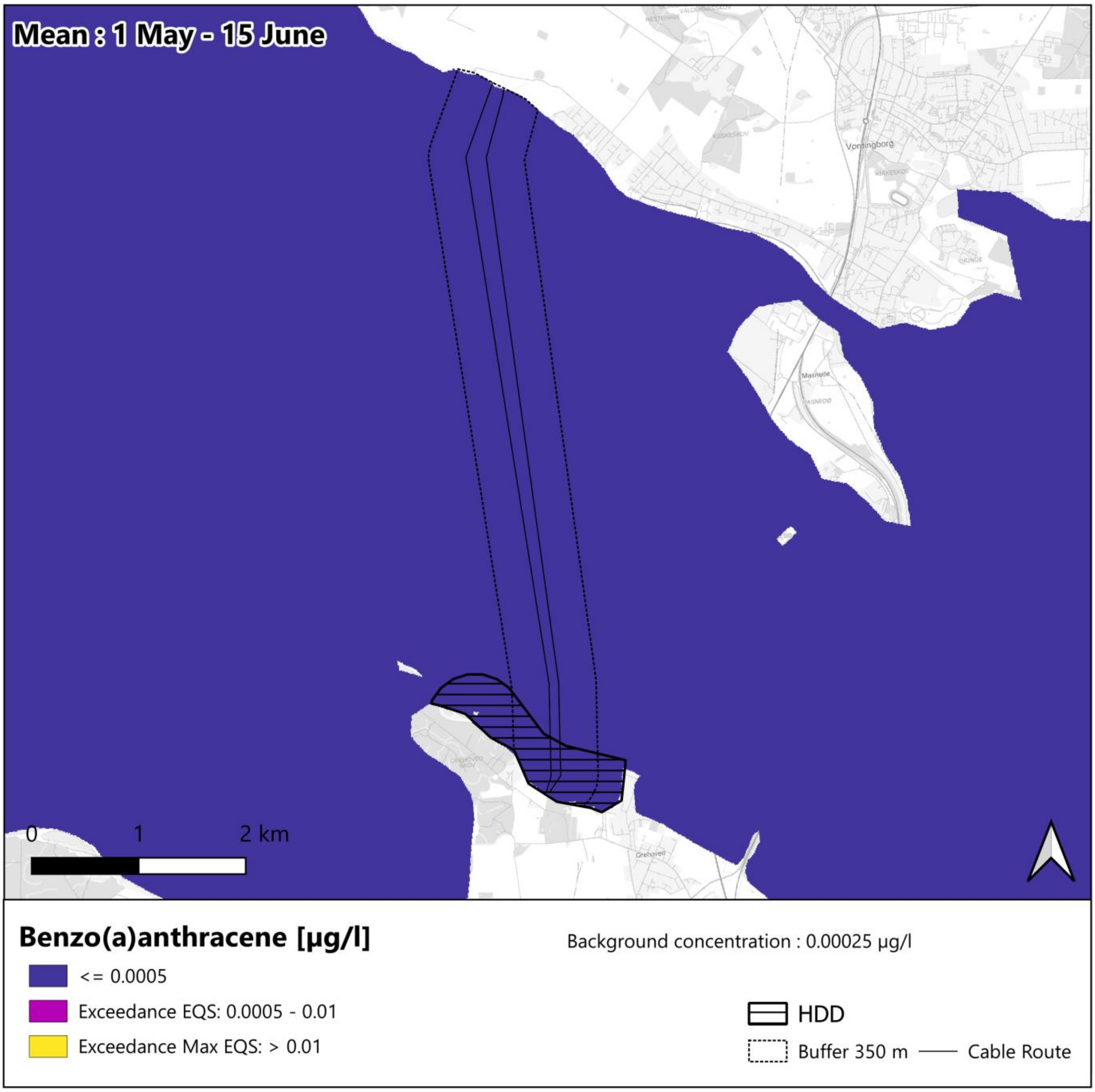


Figure 7: Mean depth-averaged concentration (temporal average) over the 1 period (between 1 May and 15 June) of Benzo(a)anthracene

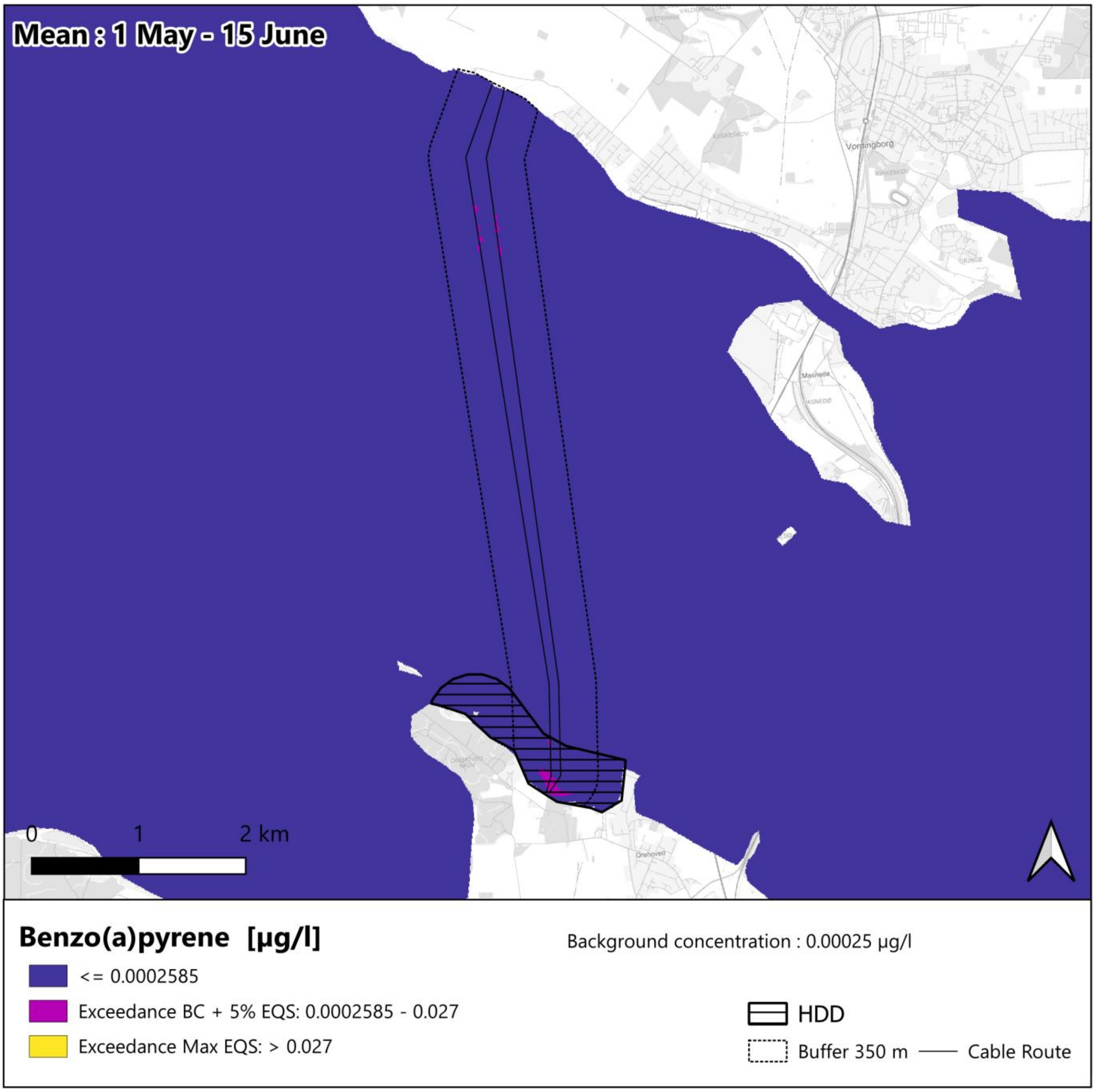


Figure 8: Mean depth-averaged concentration (temporal average) over the 1 period (between 1 May and 15 June) of Benzo(a)pyrene

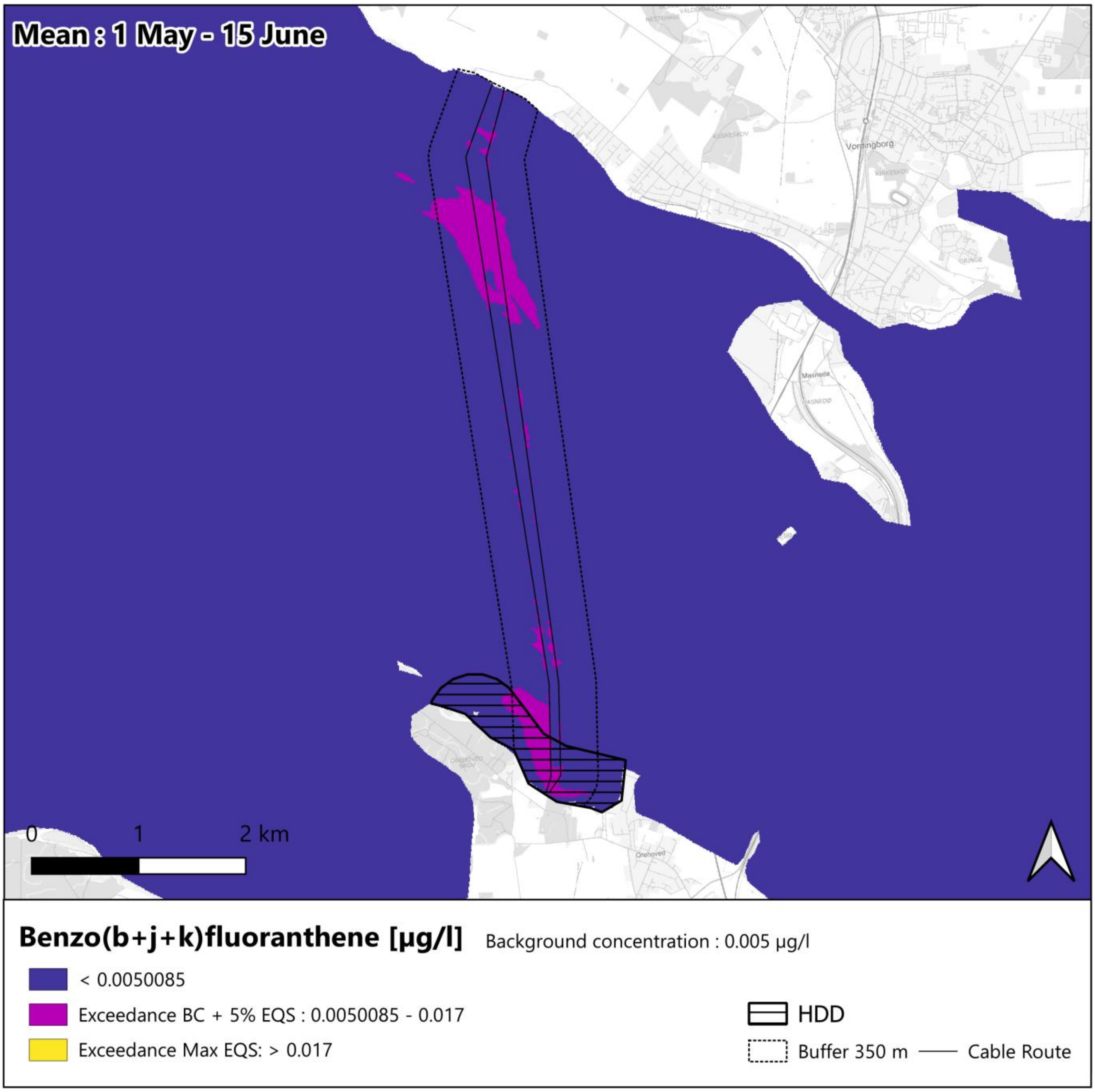


Figure 9: Mean depth-averaged concentration (temporal average) over the 1 period (between 1 May and 15 June) of Benzo(b+j+k)Fluoranthene

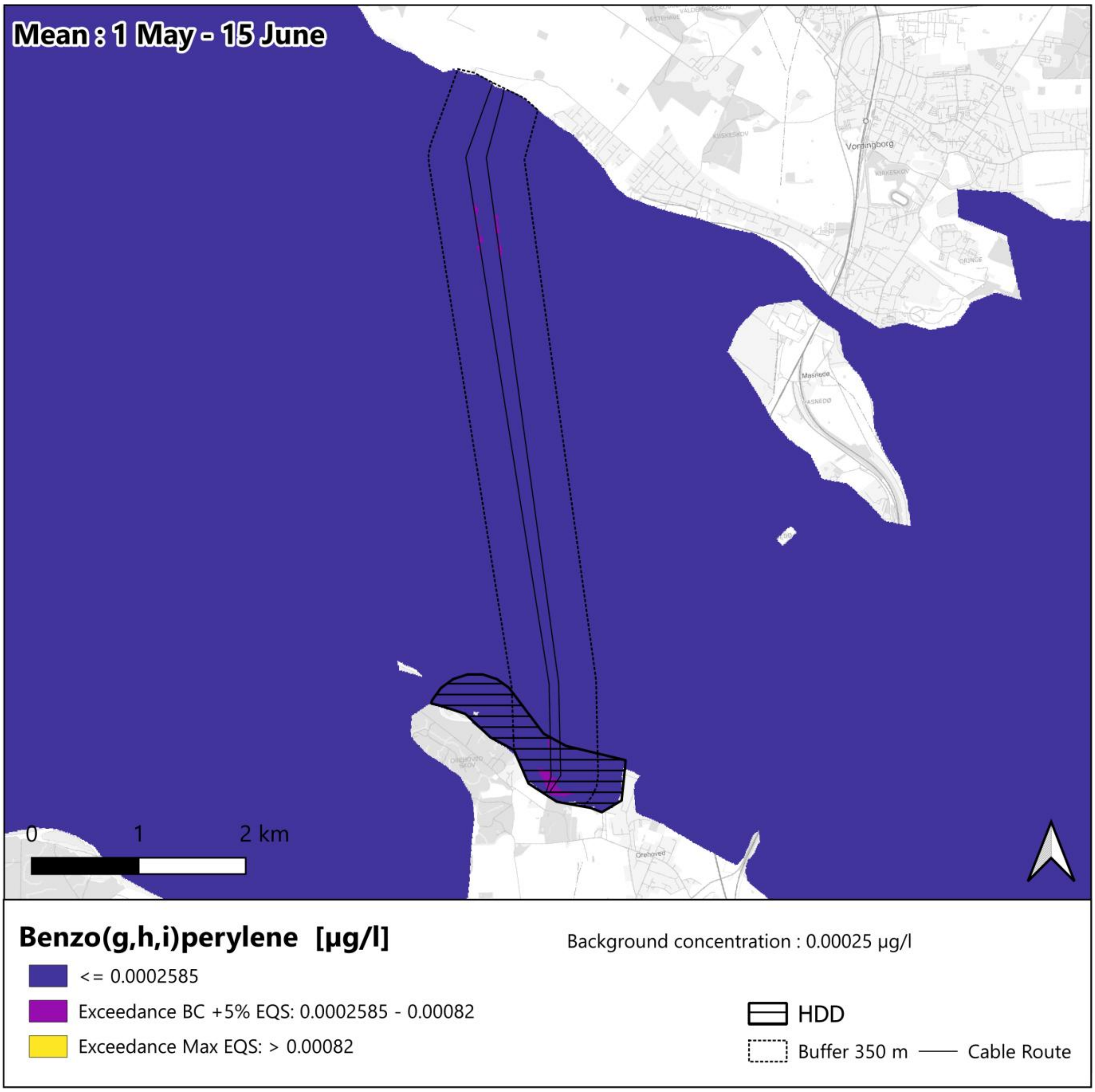


Figure 10: Mean depth-averaged concentration (temporal average) over the 1 period (between 1 May and 15 June) of Benzo(g,h,i)perylene

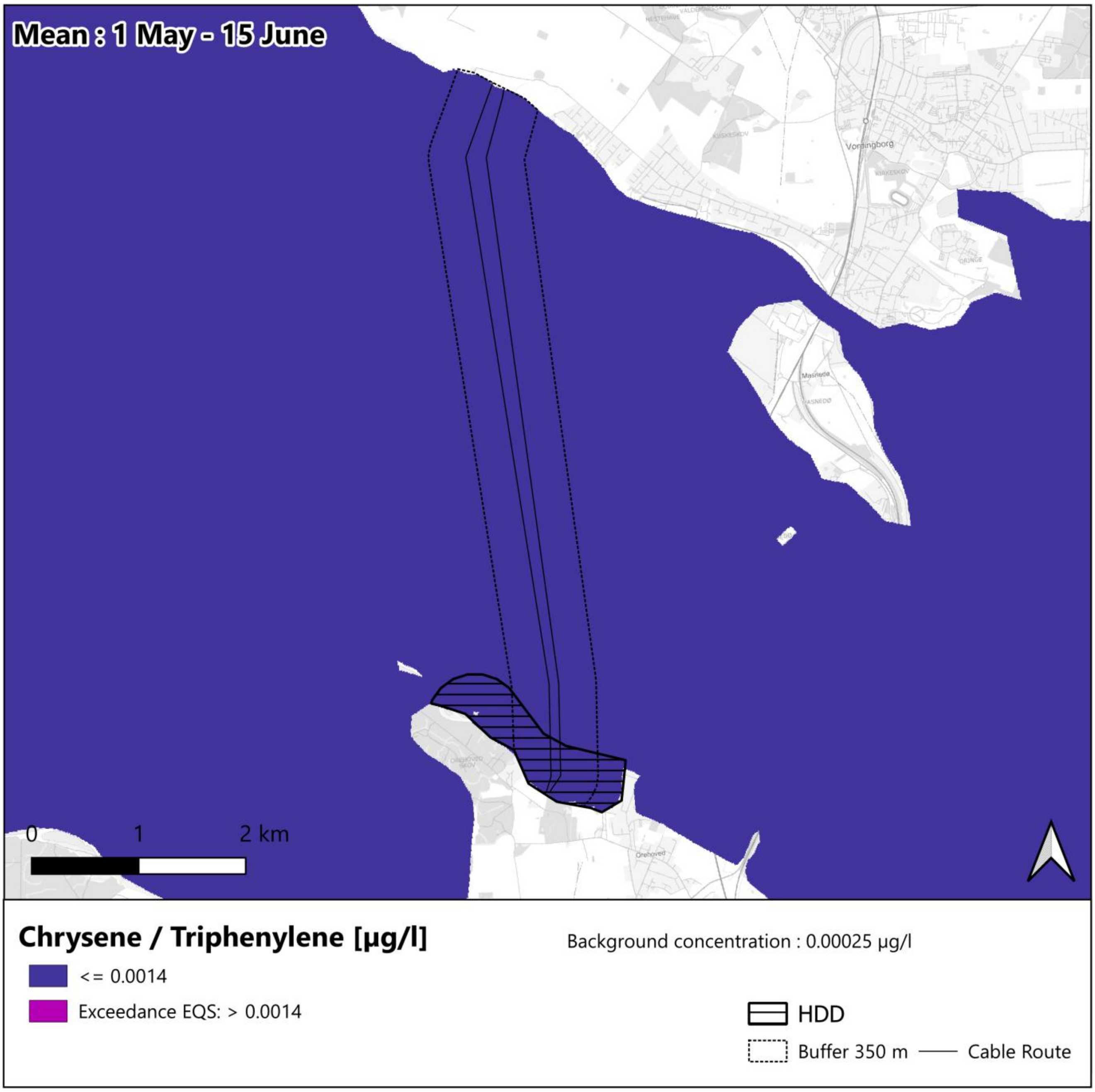


Figure 11: Mean depth-averaged concentration (temporal average) over the 1 period (between 1 May and 15 June) of Chrysene / Triphenylene

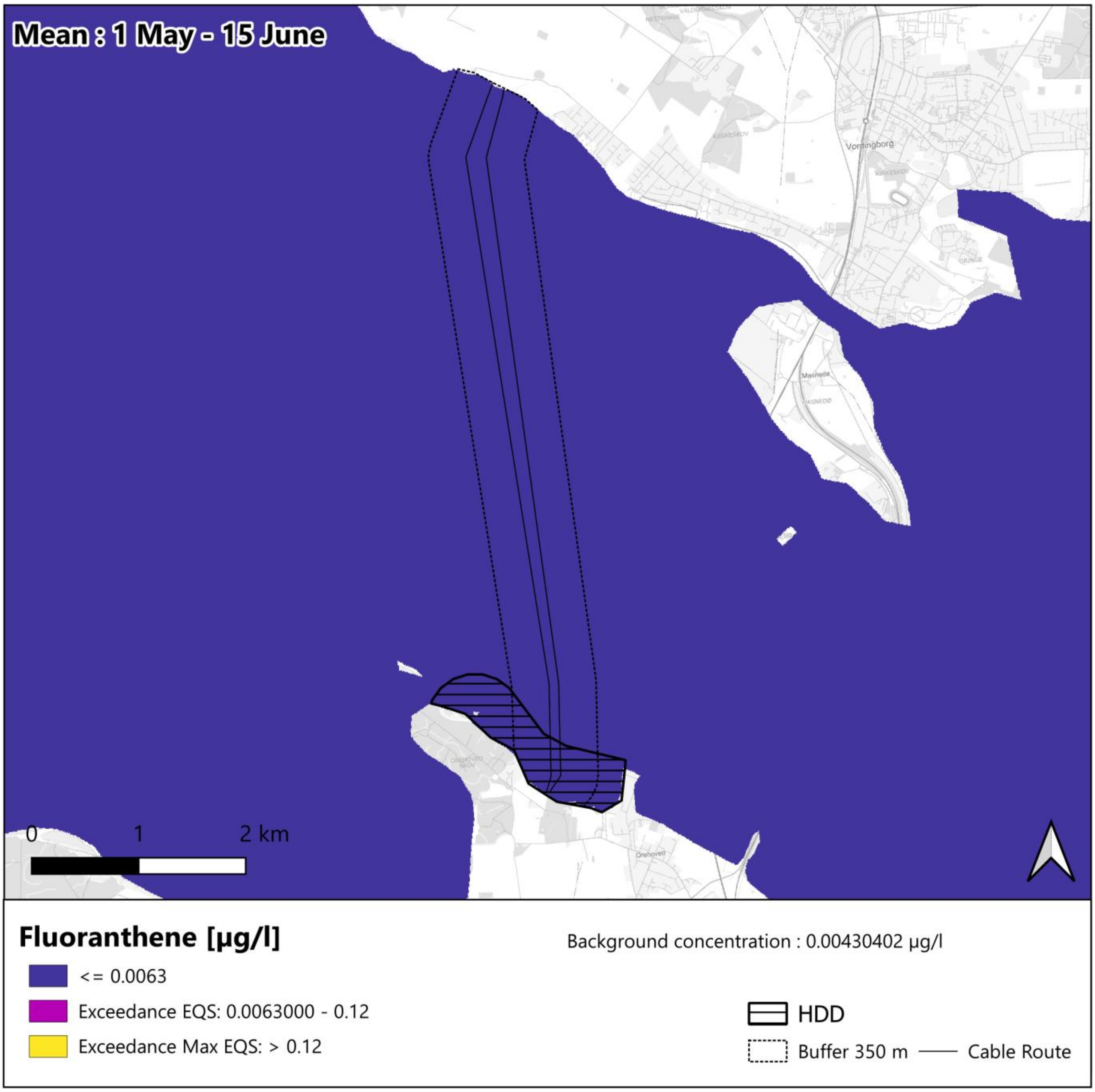


Figure 12: Mean depth-averaged concentration (temporal average) over the 1 period (between 1 May and 15 June) of Fluoranthene

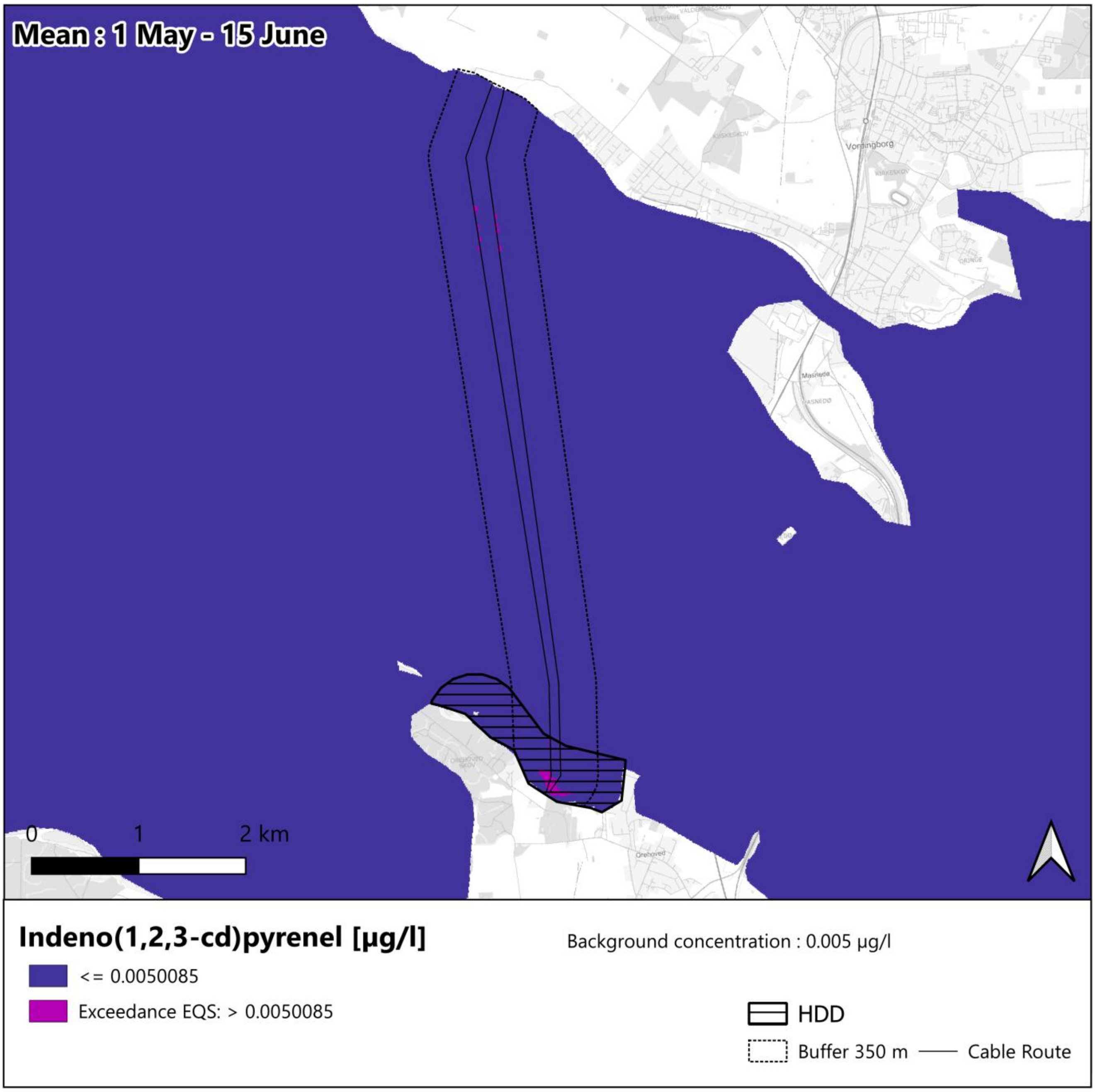


Figure 13: Mean depth-averaged concentration (temporal average) over the 1 period (between 1 May and 15 June) of Indeno(1,2,3-cd)pyrene

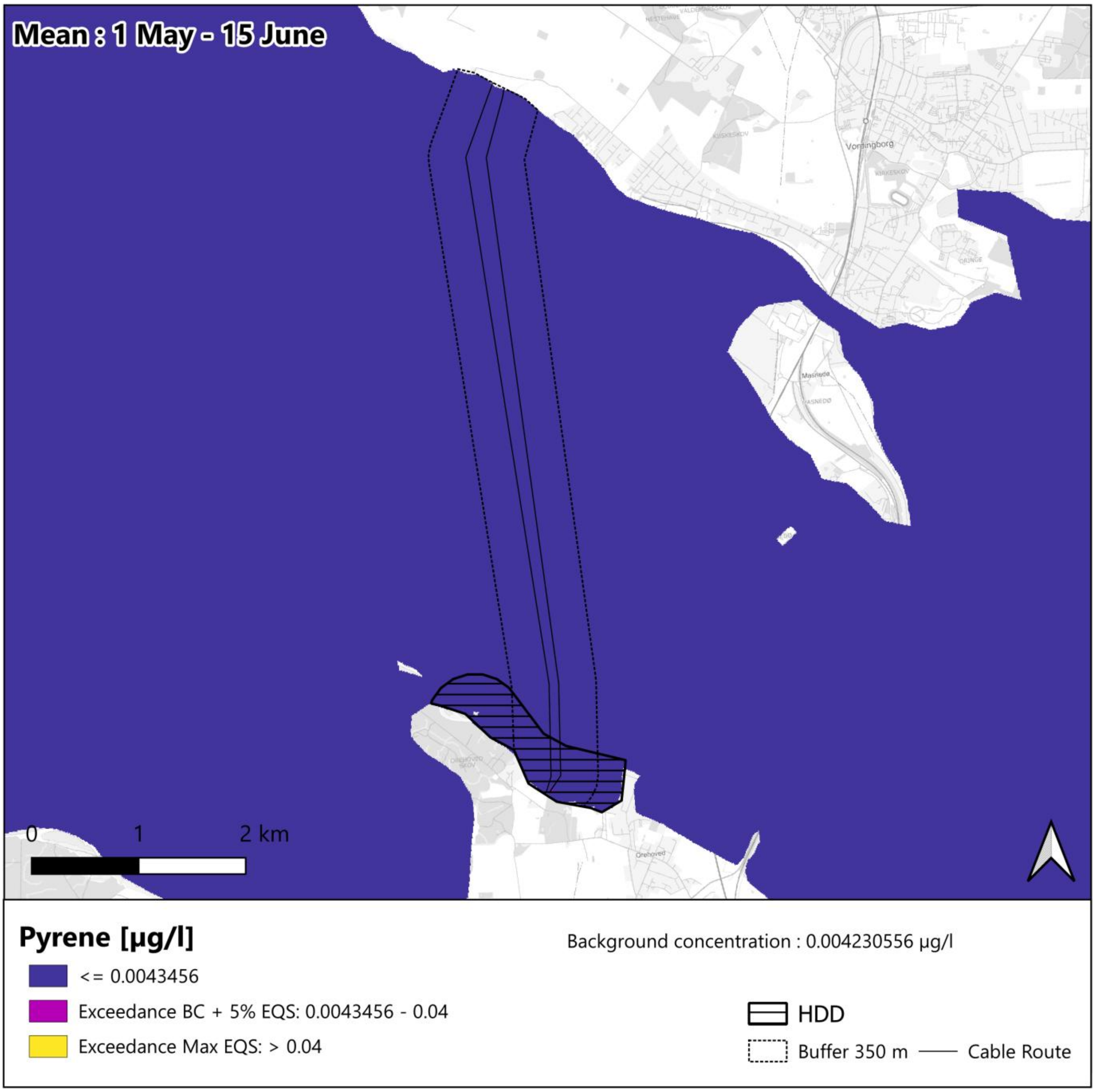


Figure 14: Mean depth-averaged concentration (temporal average) over the 1 period (between 1 May and 15 June) of Pyrene

Appendix 3 Maximum concentrations (full period)

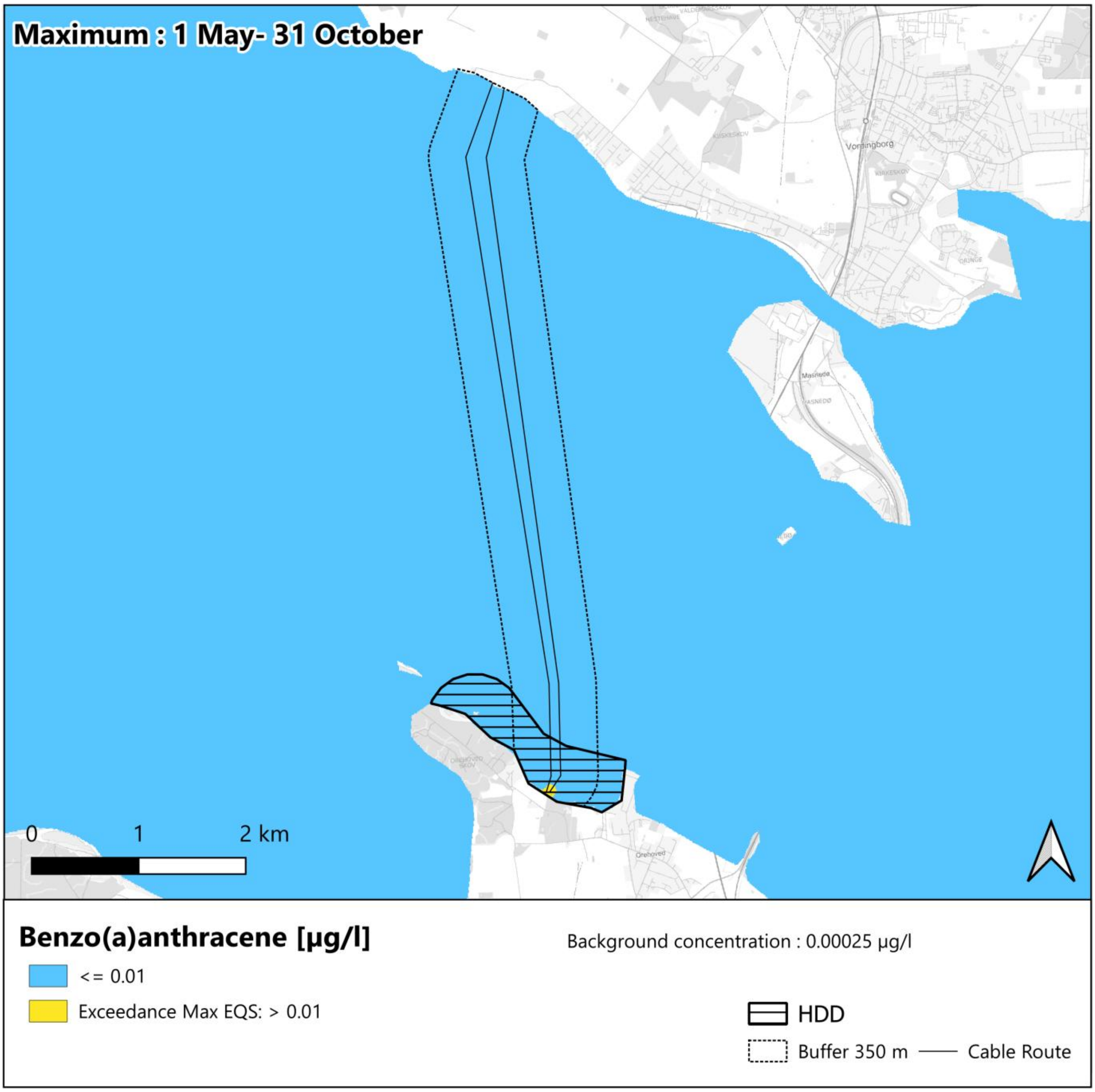


Figure 15: Maximum depth-averaged concentration (temporal average) over the (between 1 May and 15 June) of Benzo(a)anthracene

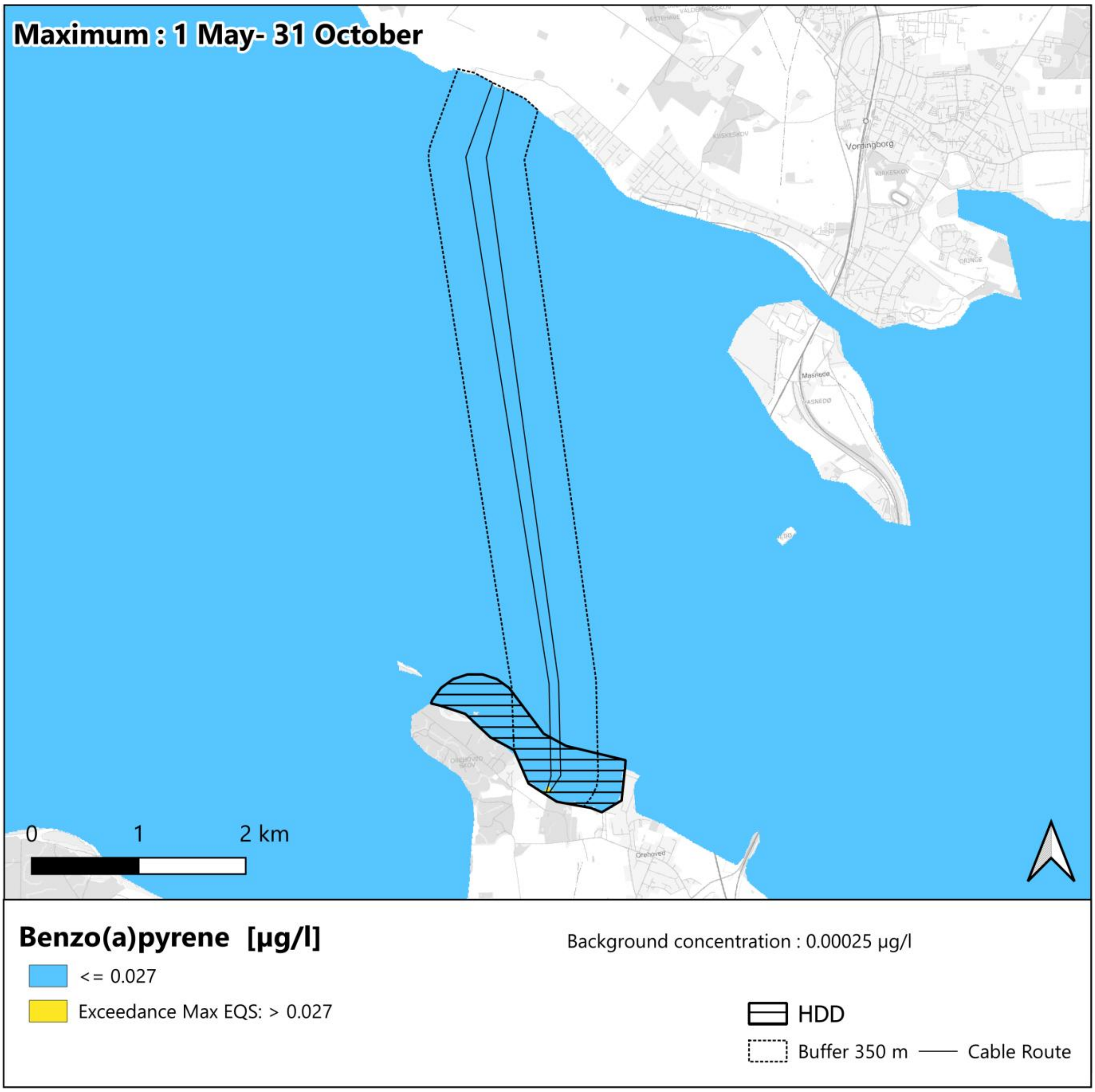


Figure 16: Maximum depth-averaged concentration (temporal average) over the (between 1 May and 15 June) of Benzo(a)pyrene

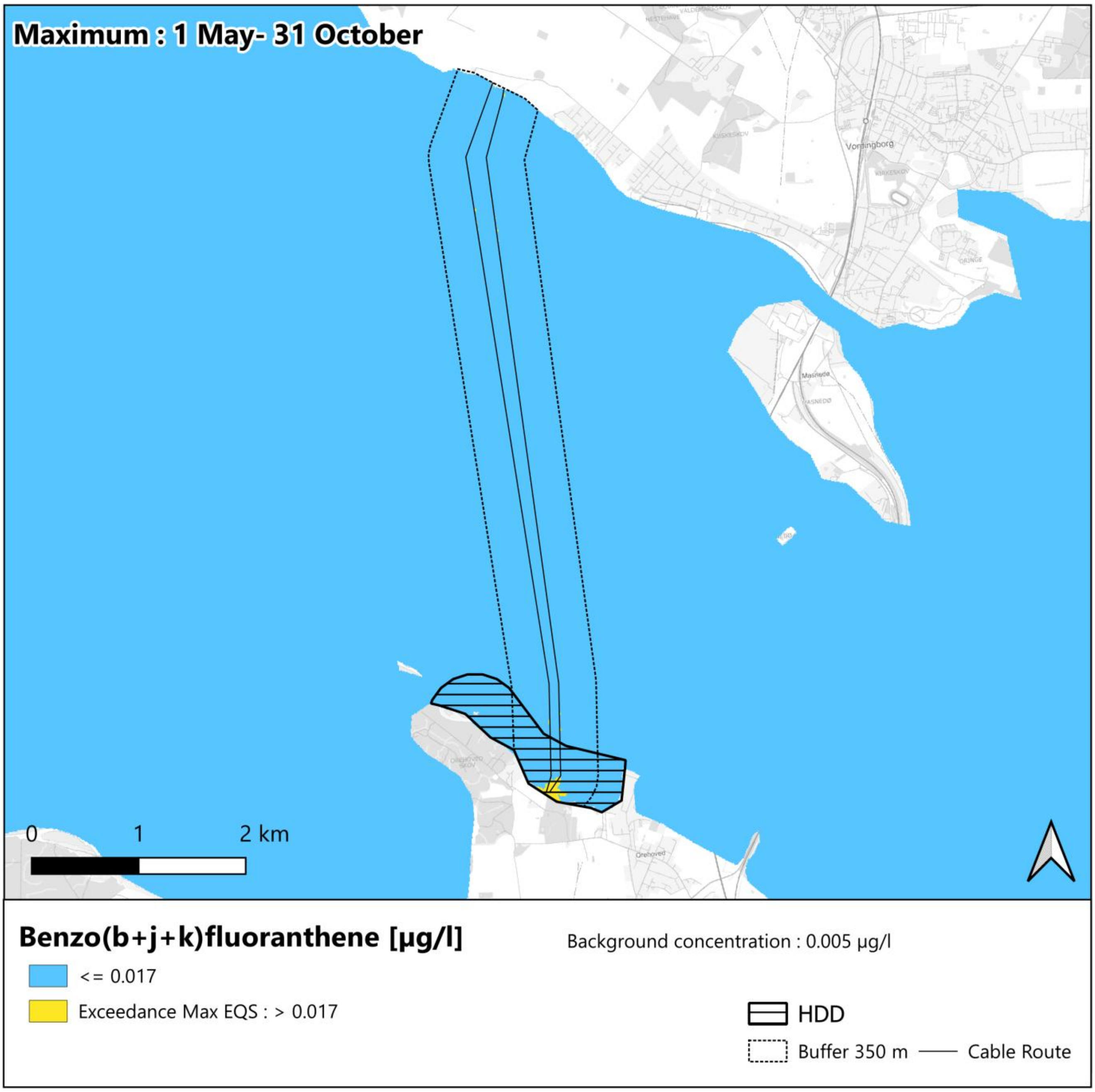


Figure 17: Maximum depth-averaged concentration (temporal average) over the (between 1 May and 15 June) of Benzo(b+j+k)Fluoranthene

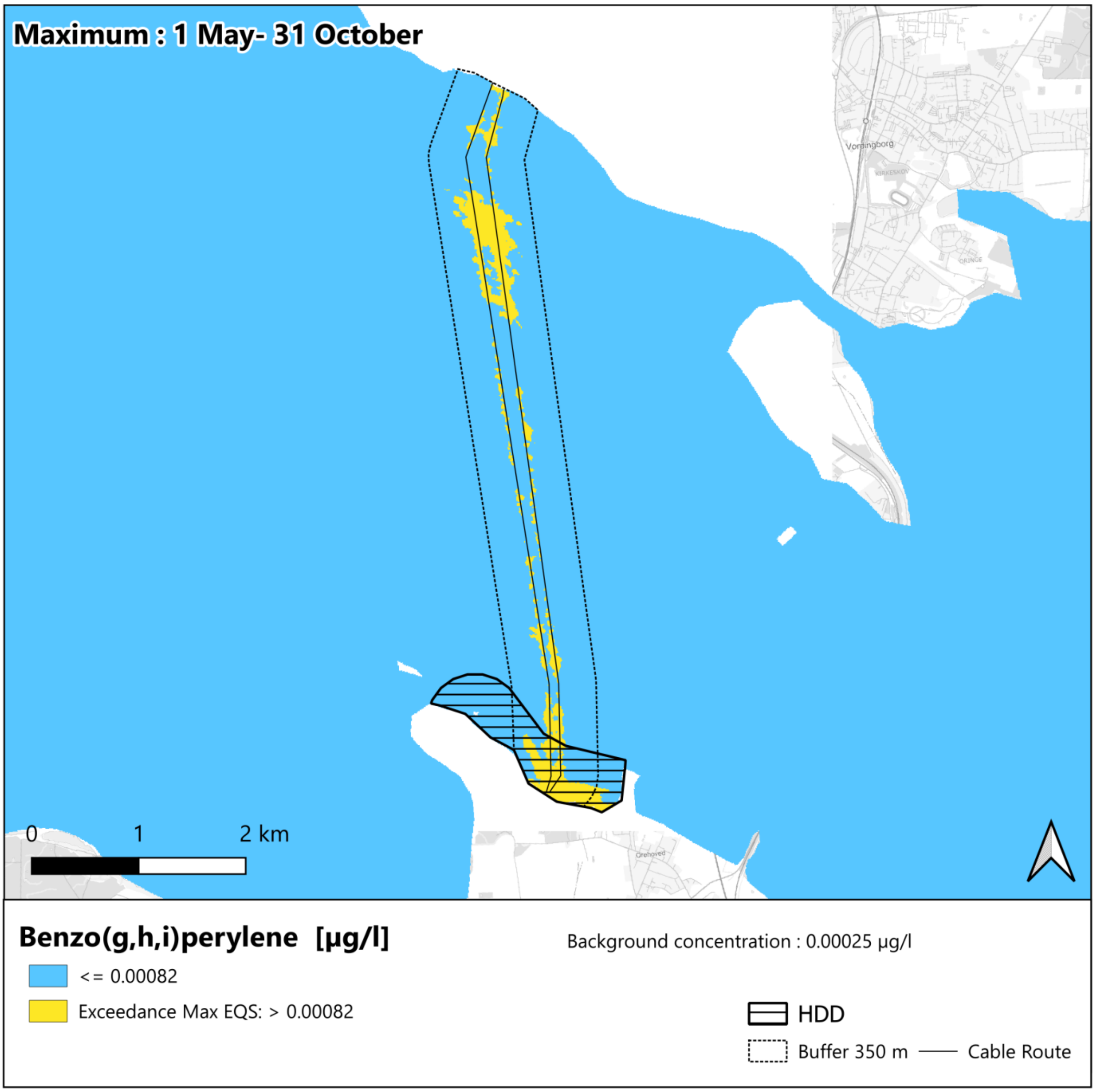


Figure 18: Maximum depth-averaged concentration (temporal average) over the (between 1 May and 15 June) of Benzo(g,h,i)perylene

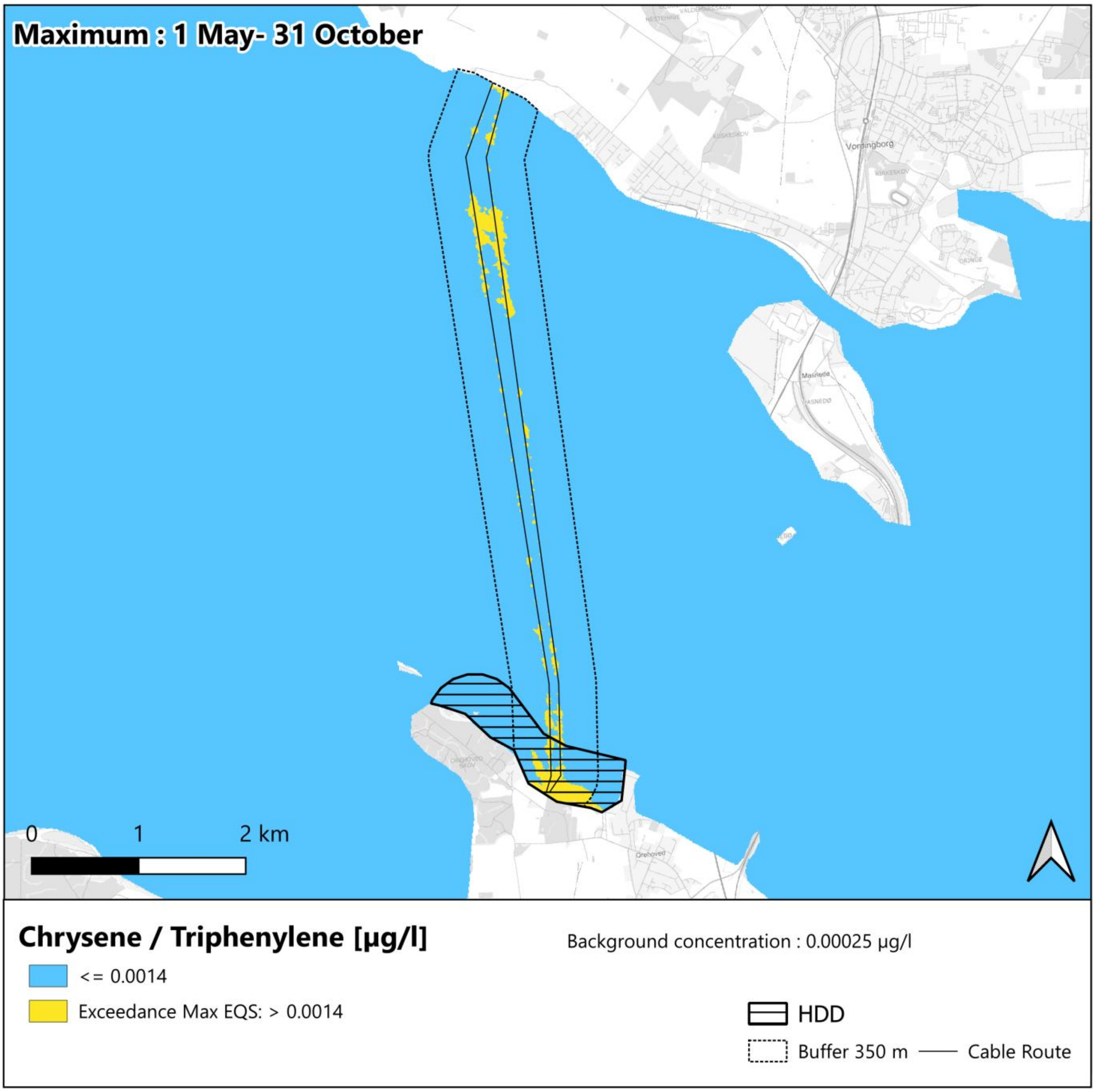


Figure 19: Maximum depth-averaged concentration (temporal average) over the (between 1 May and 15 June) of Chrysene / Triphenylene

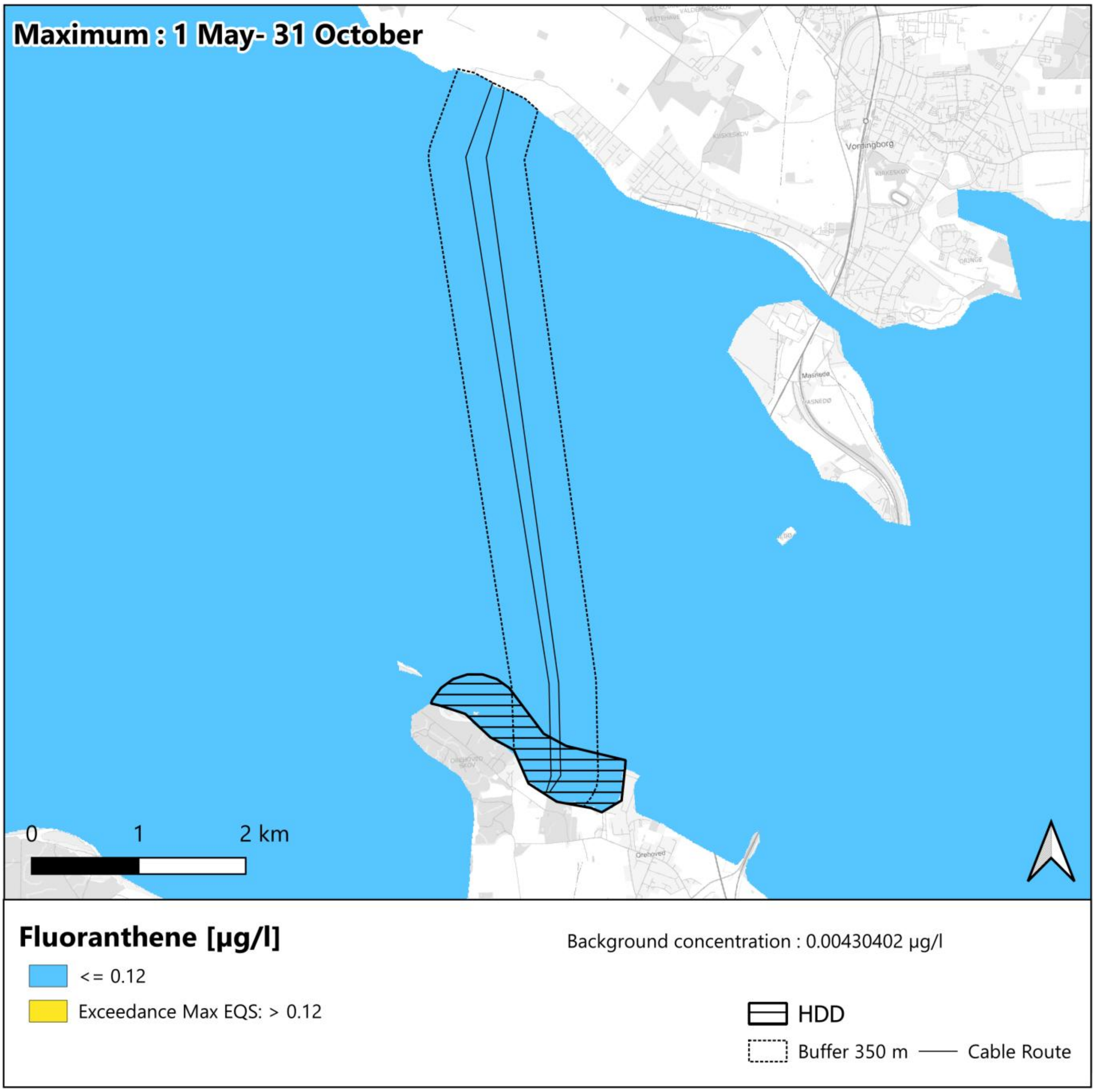


Figure 20: Maximum depth-averaged concentration (temporal average) over the (between 1 May and 15 June) of Fluoranthene

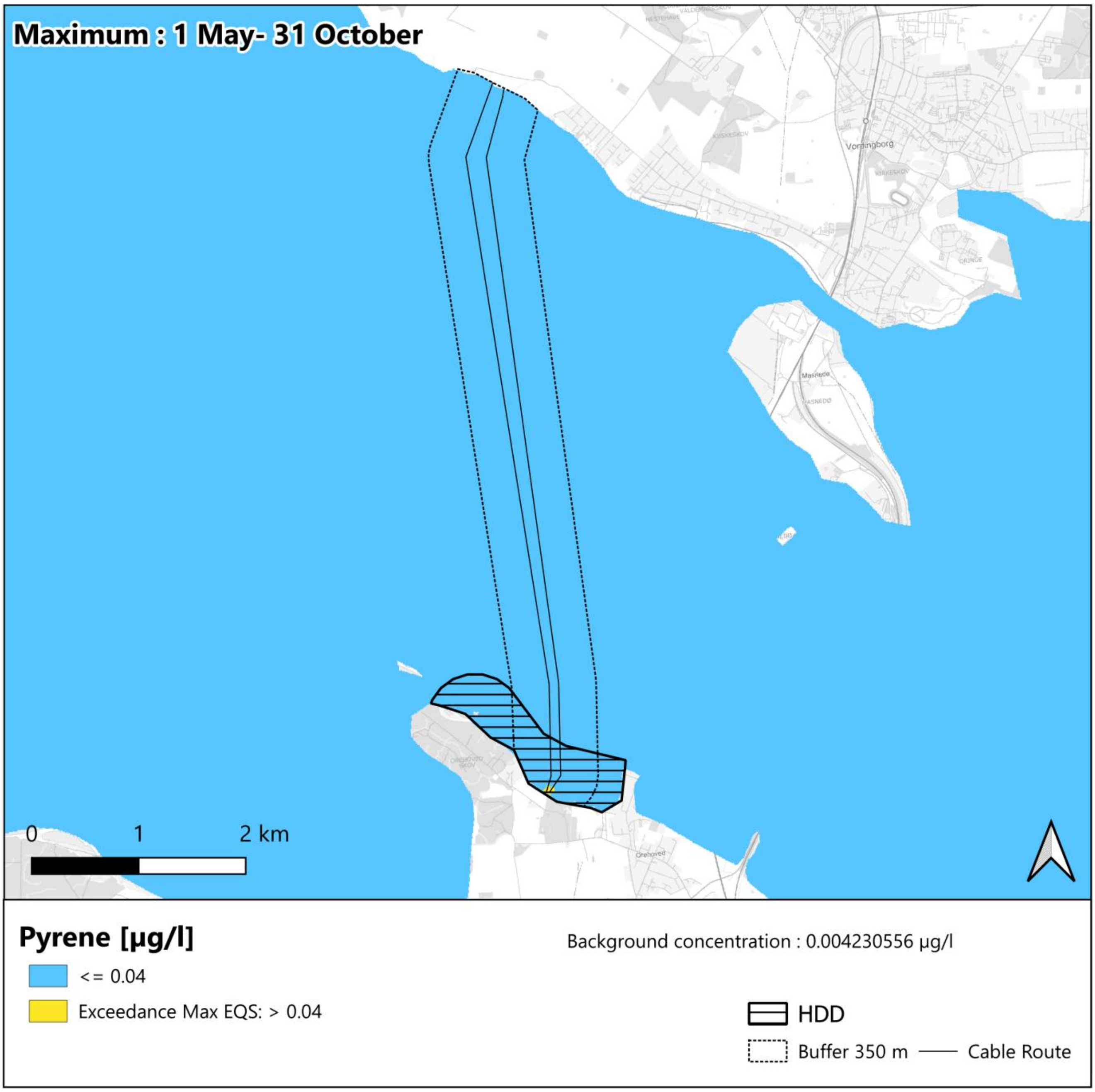
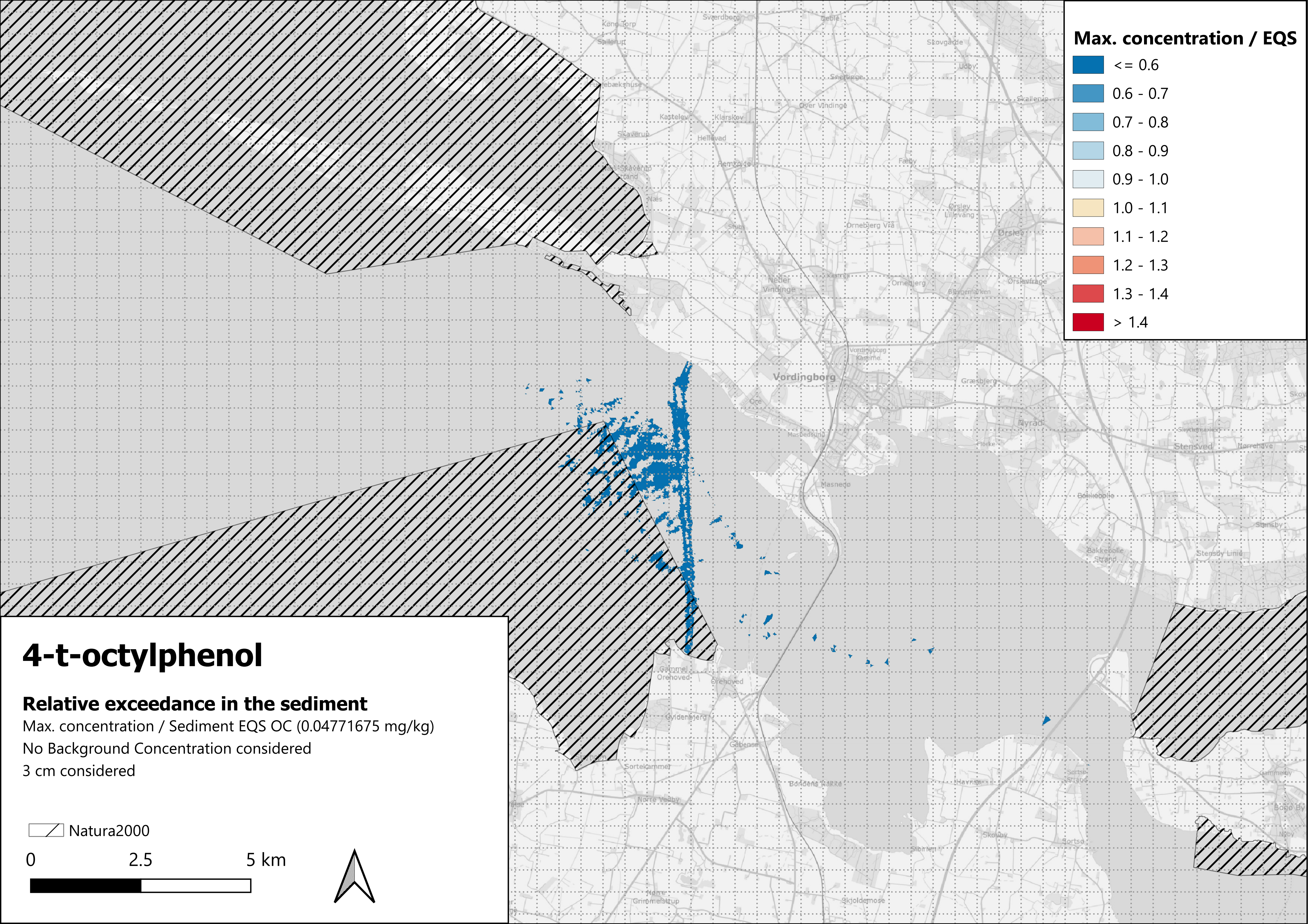
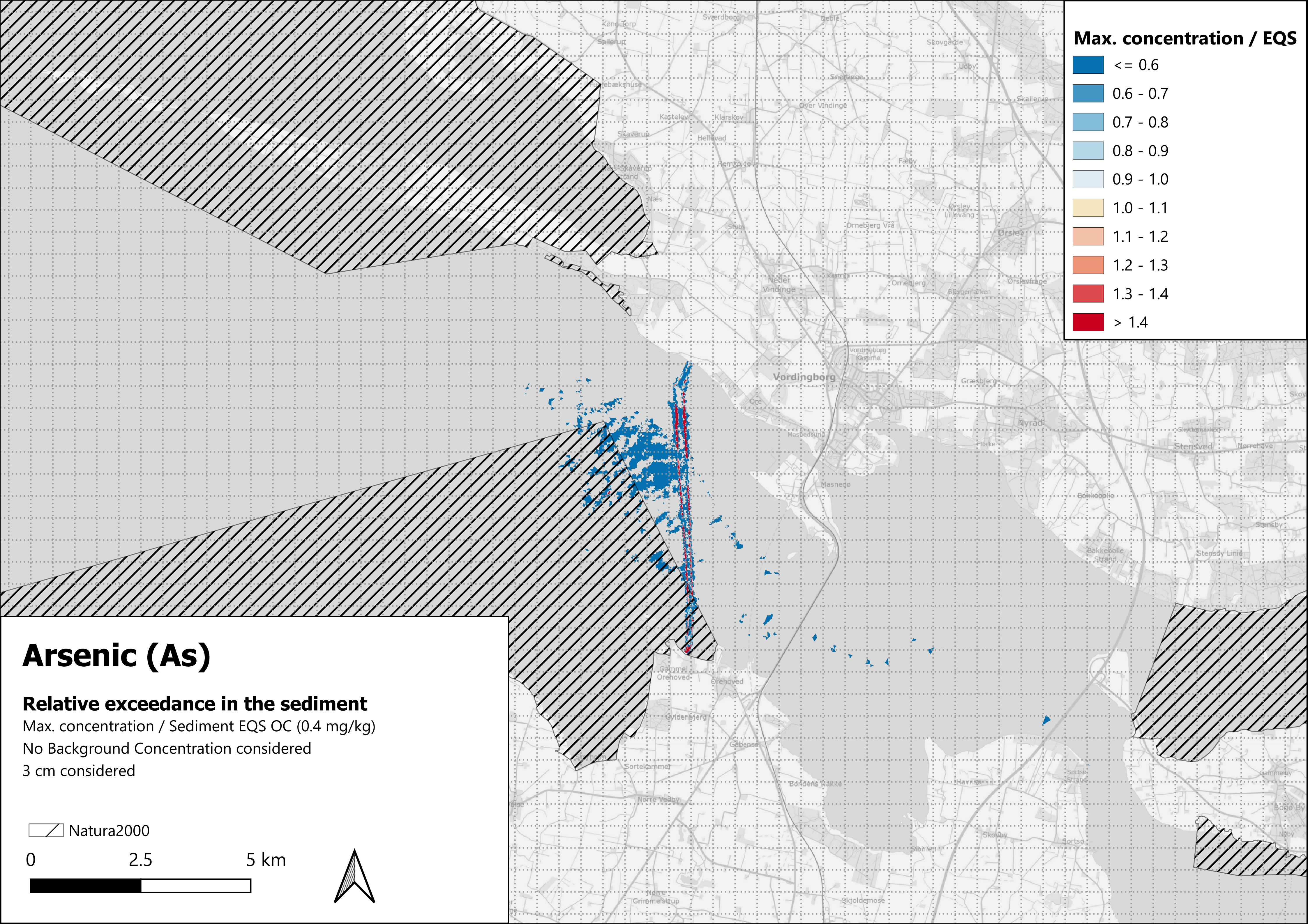
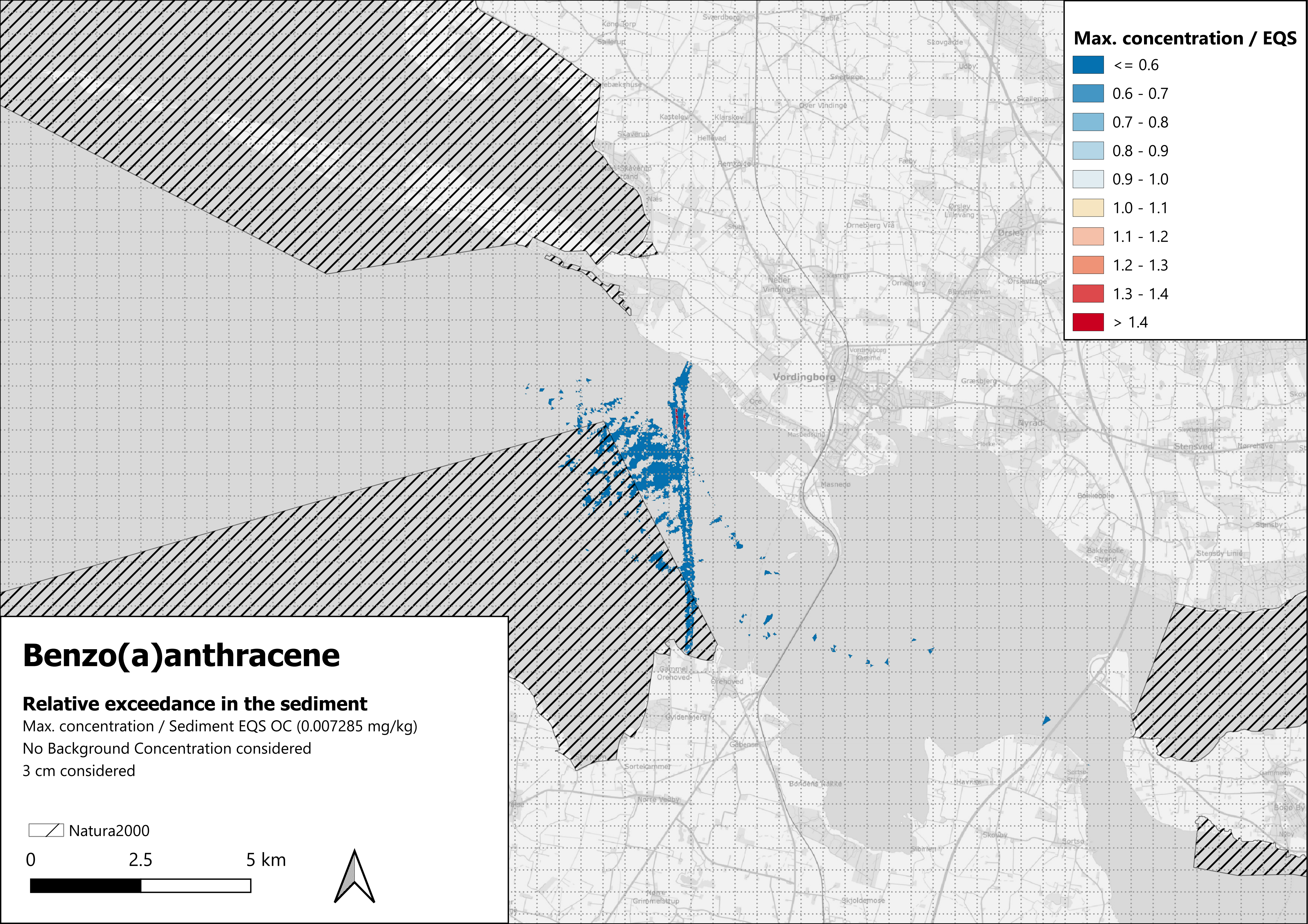


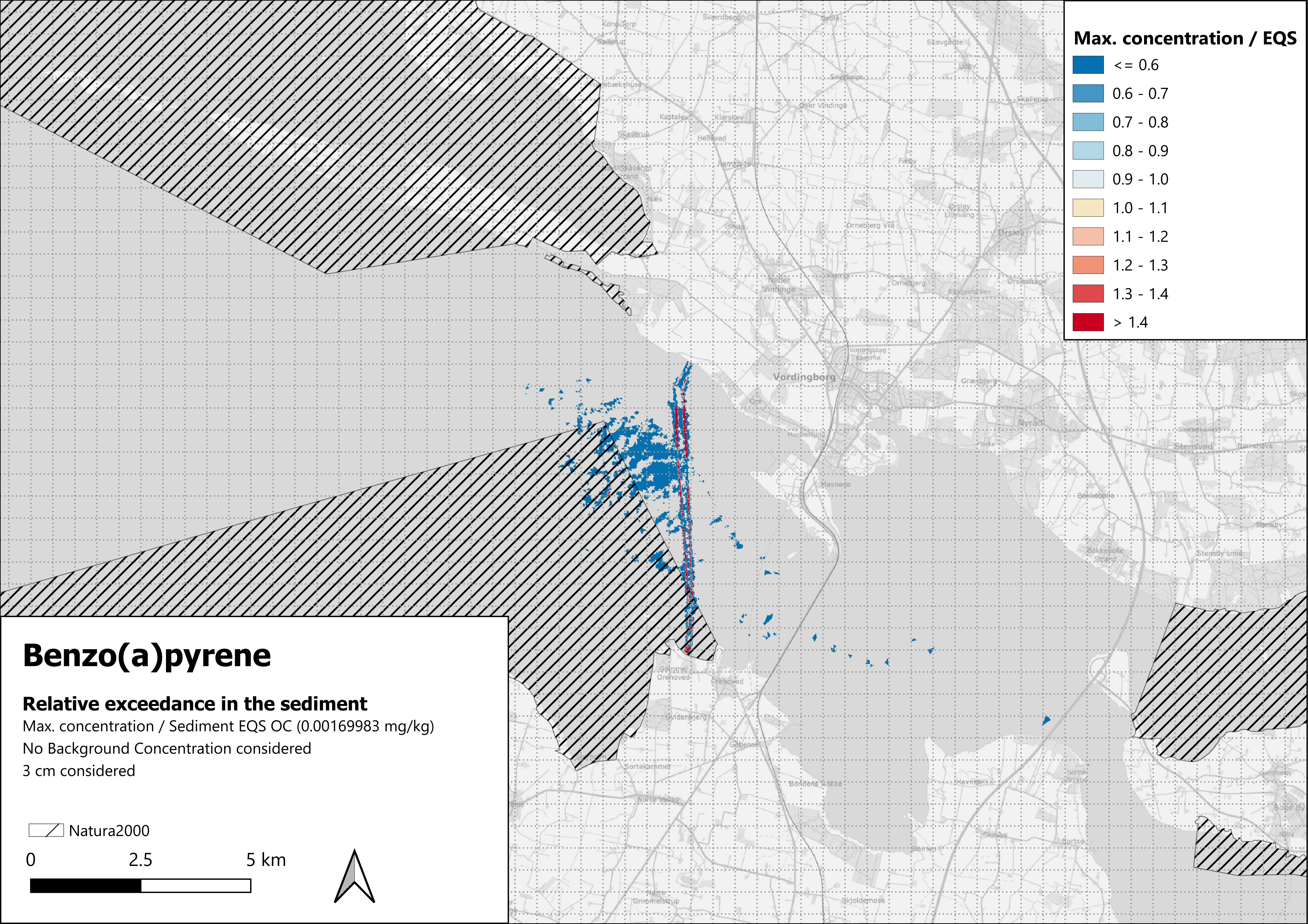
Figure 21: Maximum depth-averaged concentration (temporal average) over the (between 1 May and 15 June) of Pyrene

Appendix 4 EHS-Exceedance in settled sediment (Zoom, Excess EHS)

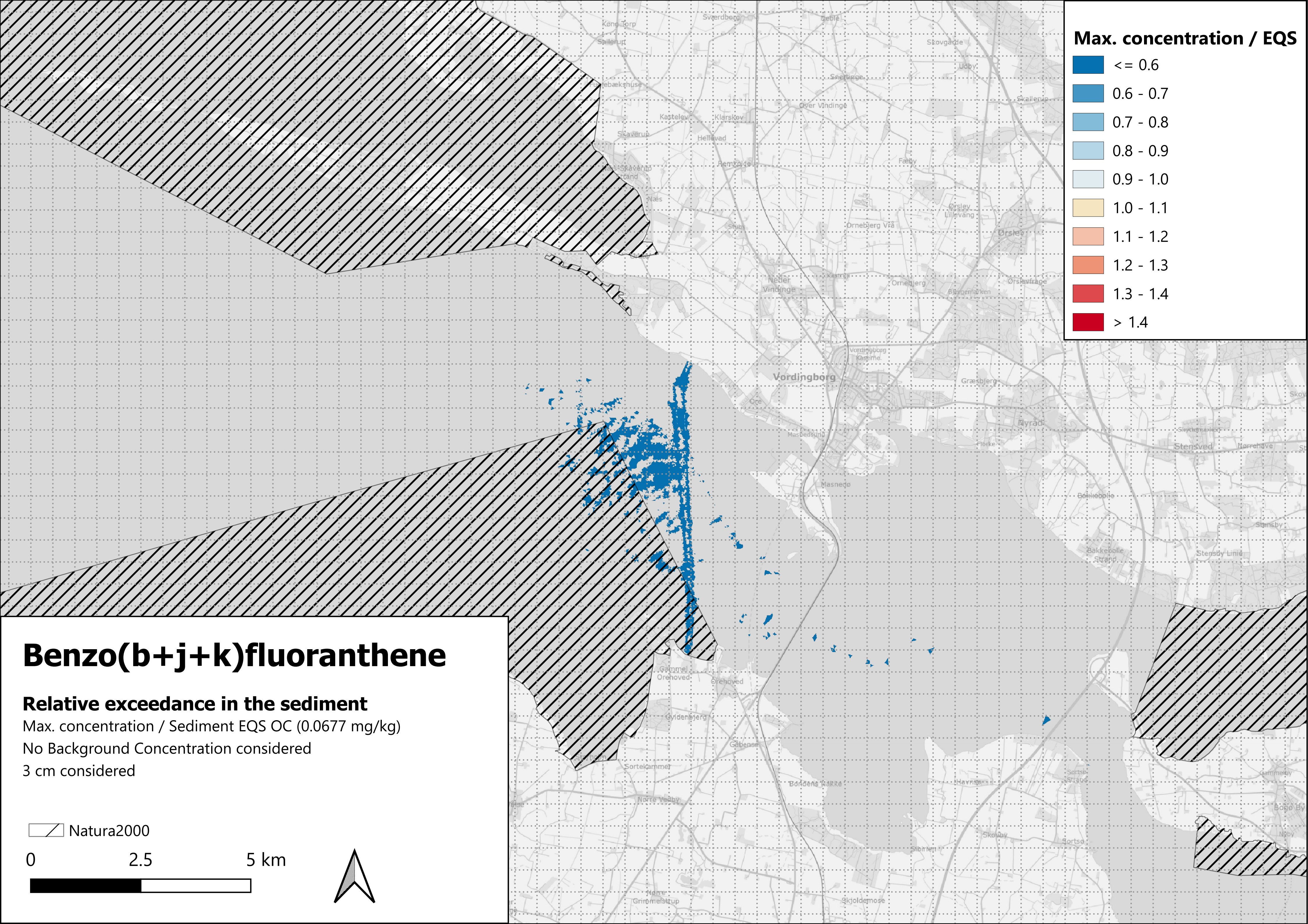

Max. concentration / EQS
<= 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1.0
1.0 - 1.1
1.1 - 1.2
1.2 - 1.3
1.3 - 1.4
> 1.4
Vordingborg
4-t-octylphenol
Relative exceedance in the sediment
Max. concentration / Sediment EQS OC (0.04771675 mg/kg)
No Background Concentration considered
3 cm considered
Natura2000
0
2.5
5 km

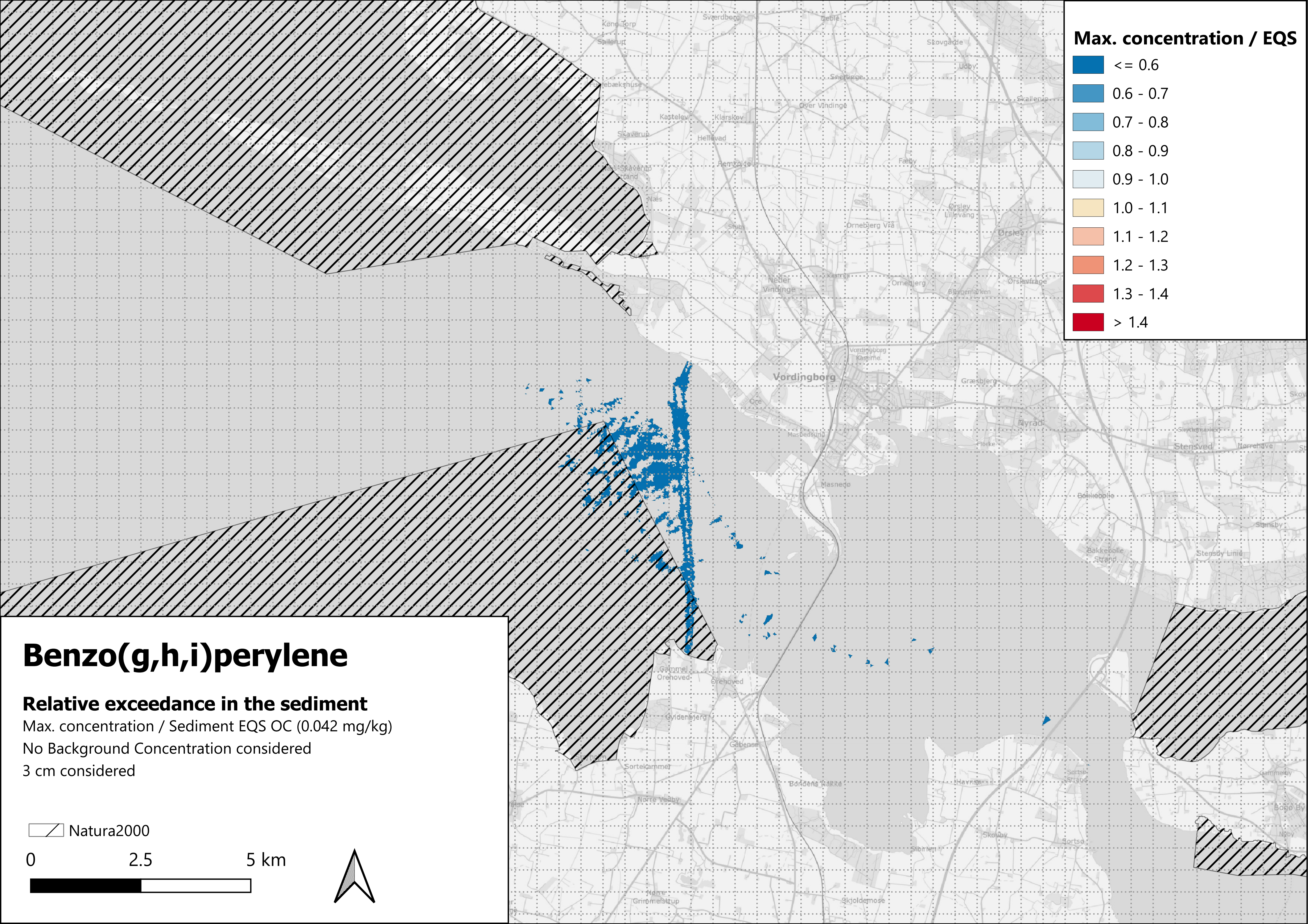

Max. concentration / EQS
<= 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1.0
1.0 - 1.1
1.1 - 1.2
1.2 - 1.3
1.3 - 1.4
> 1.4
Vordingborg
Arsenic (As)
Relative exceedance in the sediment
Max. concentration / Sediment EQS OC (0.4 mg/kg)
No Background Concentration considered
3 cm considered
Natura2000
0
2.5
5 km


Max. concentration / EQS
< = 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1.0
1.0 - 1.1
1.1 - 1.2
1.2 - 1.3
1.3 - 1.4
> 1.4
Vordingborg
Benzo(a)anthracene
Relative exceedance in the sediment
Max. concentration / Sediment EQS OC (0.007285 mg/kg)
No Background Concentration considered
3 cm considered
Natura2000
0
2.5
5 km



Max. concentration / EQS
<= 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1.0
1.0 - 1.1
1.1 - 1.2
1.2 - 1.3
1.3 - 1.4
> 1.4
Vordingborg
Benzo(a)pyrene
Relative exceedance in the sediment
Max. concentration / Sediment EQS OC (0.00169983 mg/kg)
No Background Concentration considered
3 cm considered
Natura2000
0
2.5
5 km


Max. concentration / EQS
<= 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1.0
1.0 - 1.1
1.1 - 1.2
1.2 - 1.3
1.3 - 1.4
> 1.4
Benzo(b+j+k)fluoranthene
Relative exceedance in the sediment
Max. concentration / Sediment EQS OC (0.0677 mg/kg)
No Background Concentration considered
3 cm considered
Natura2000
0
2.5
5 km
Vordingborg



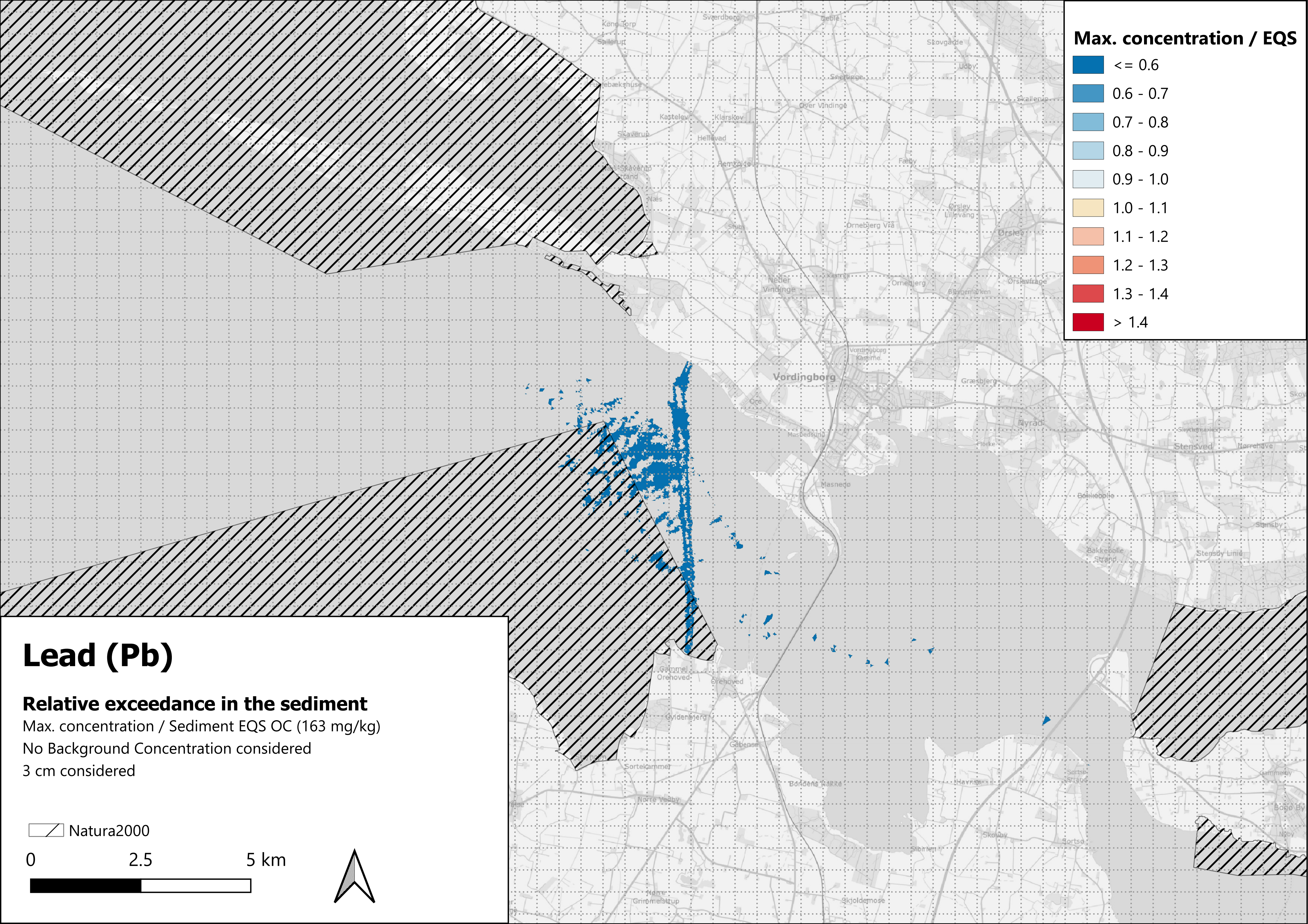
Benzo(g,h,i)perylene

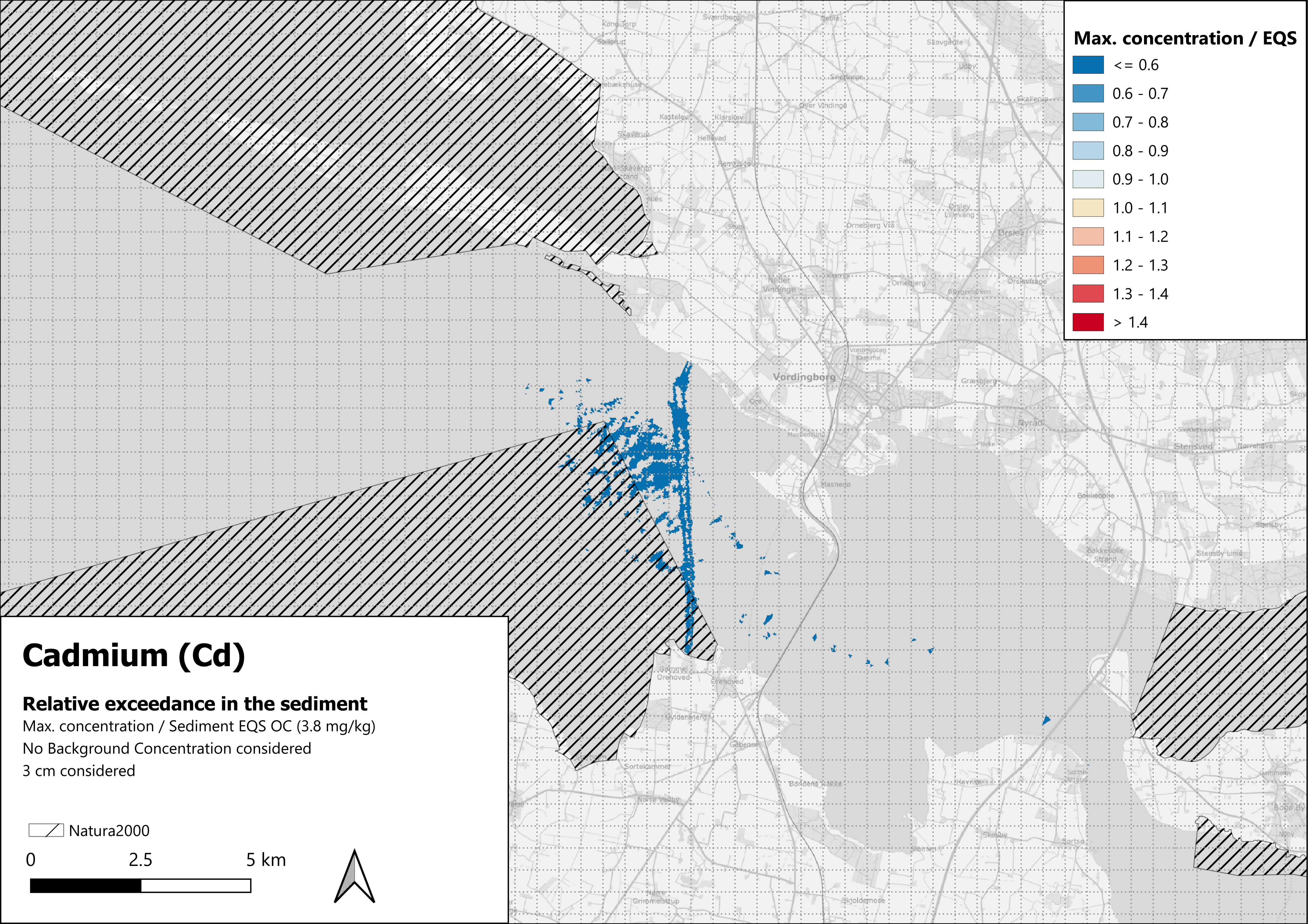
Relative exceedance in the sediment

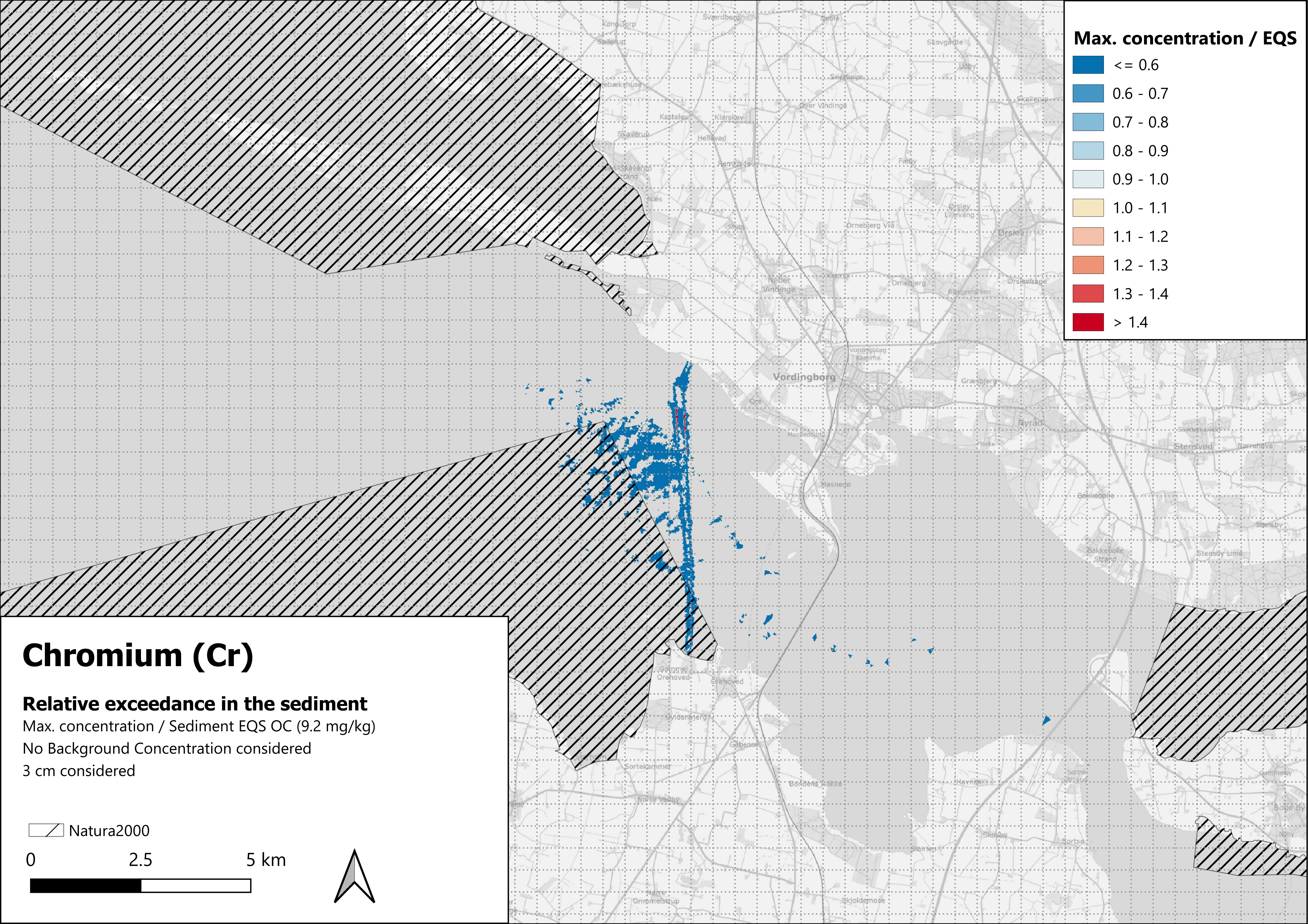
Max. concentration / Sediment EQS OC (0.042 mg/kg)

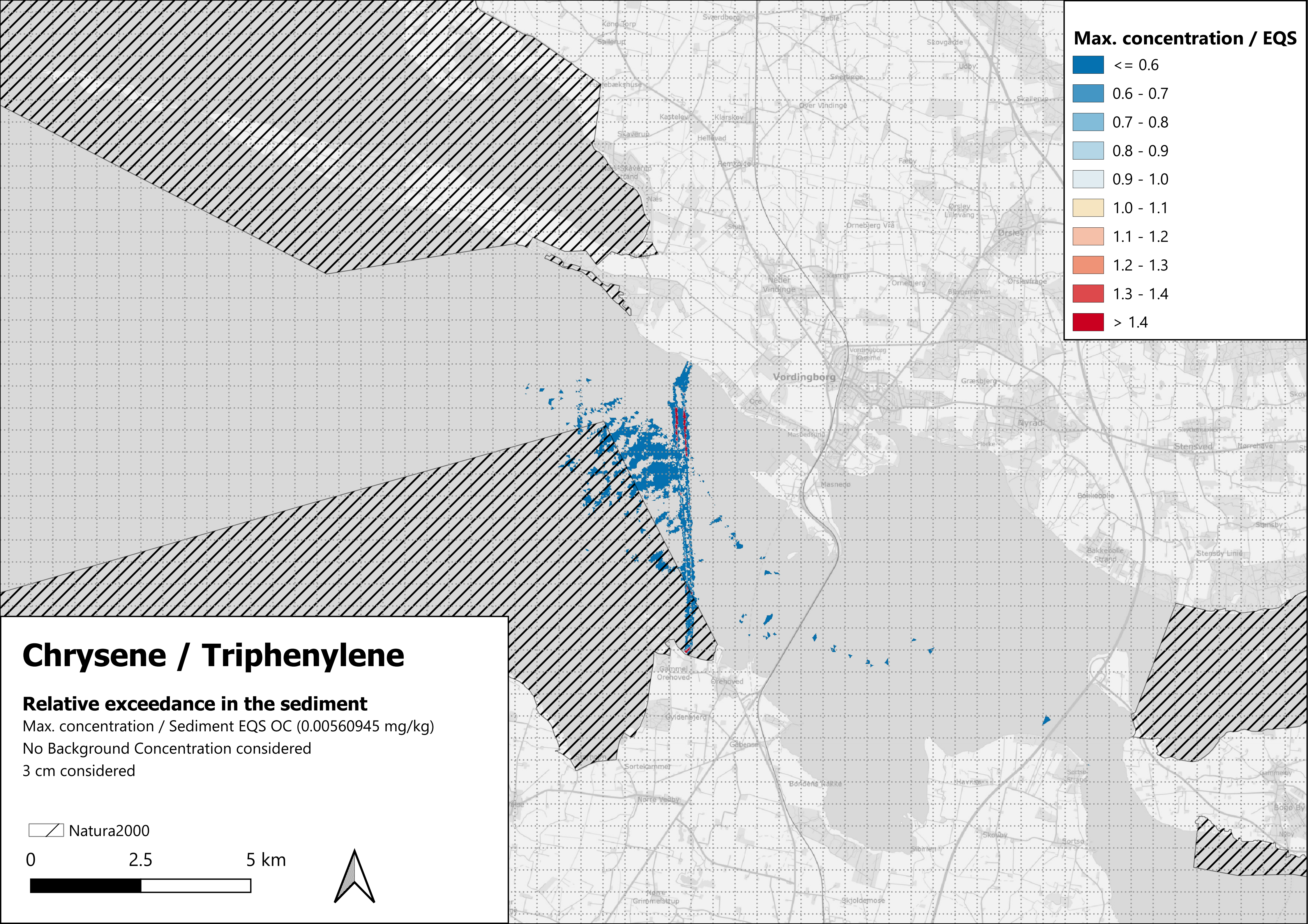
No Background Concentration considered

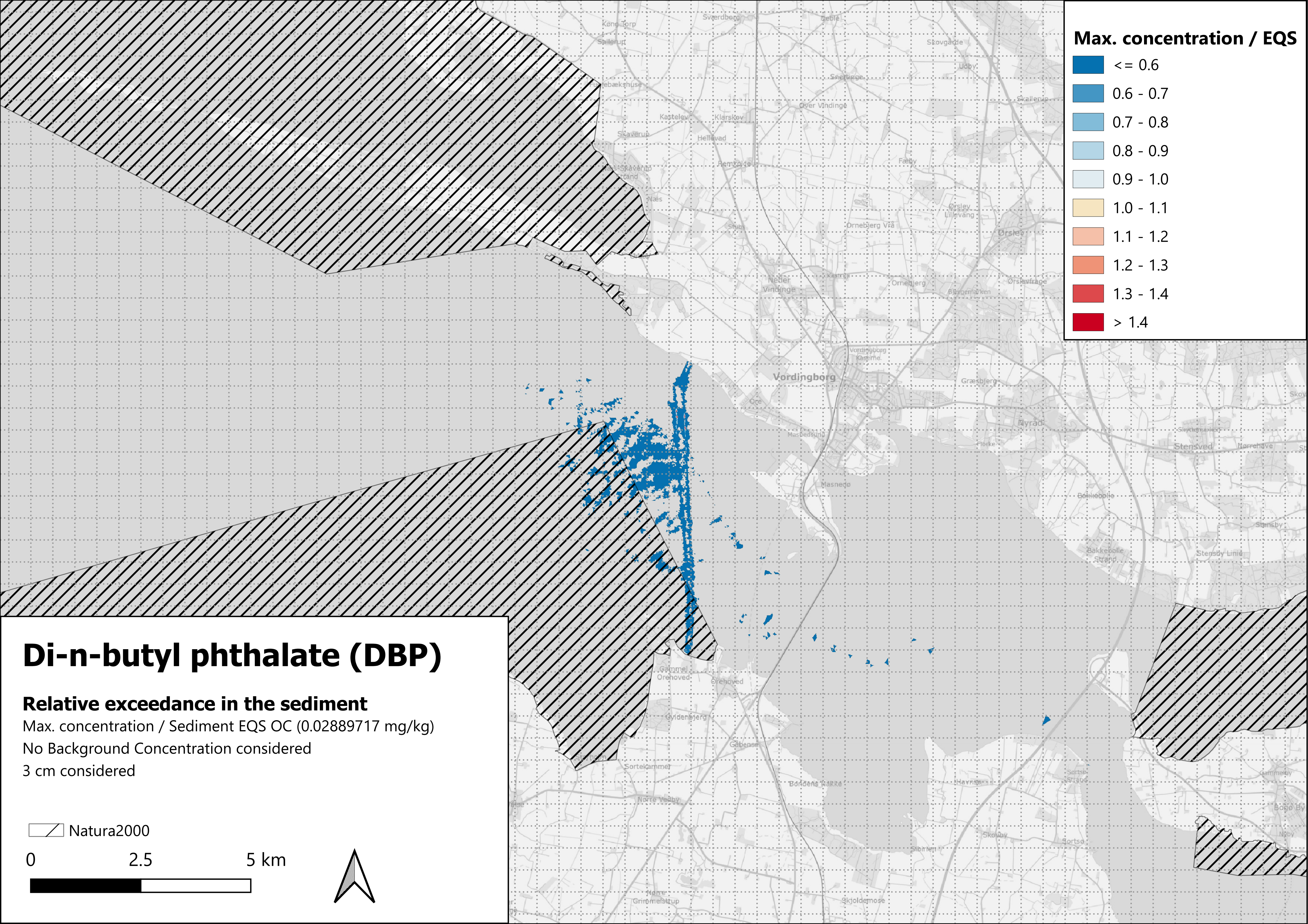
3 cm considered

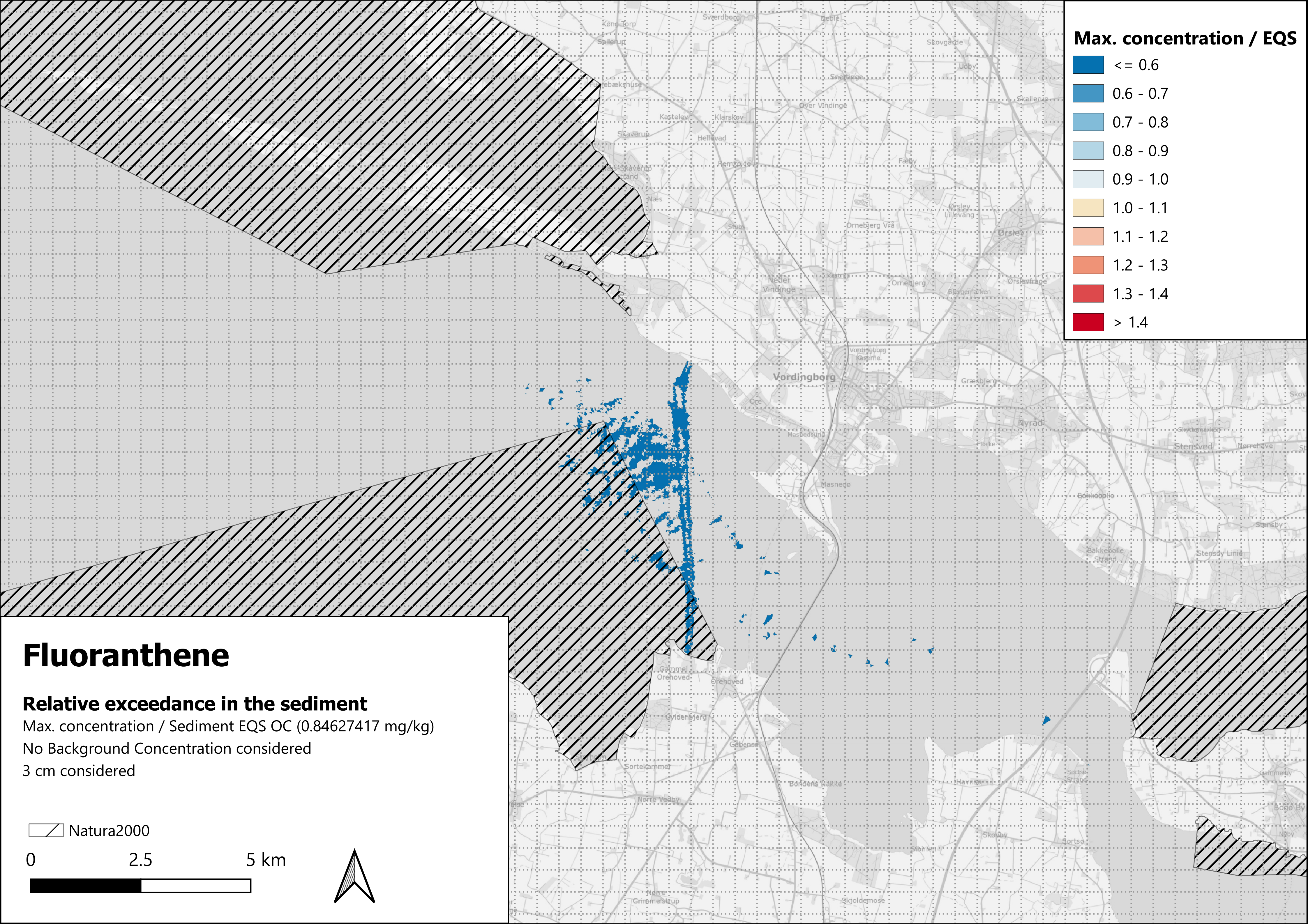

Max. concentration / EQS
<= 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1.0
1.0 - 1.1
1.1 - 1.2
1.2 - 1.3
1.3 - 1.4
> 1.4
Vordingborg
Lead (Pb)
Relative exceedance in the sediment
Max. concentration / Sediment EQS OC (163 mg/kg)
No Background Concentration considered
3 cm considered
Natura2000
0
2.5
5 km

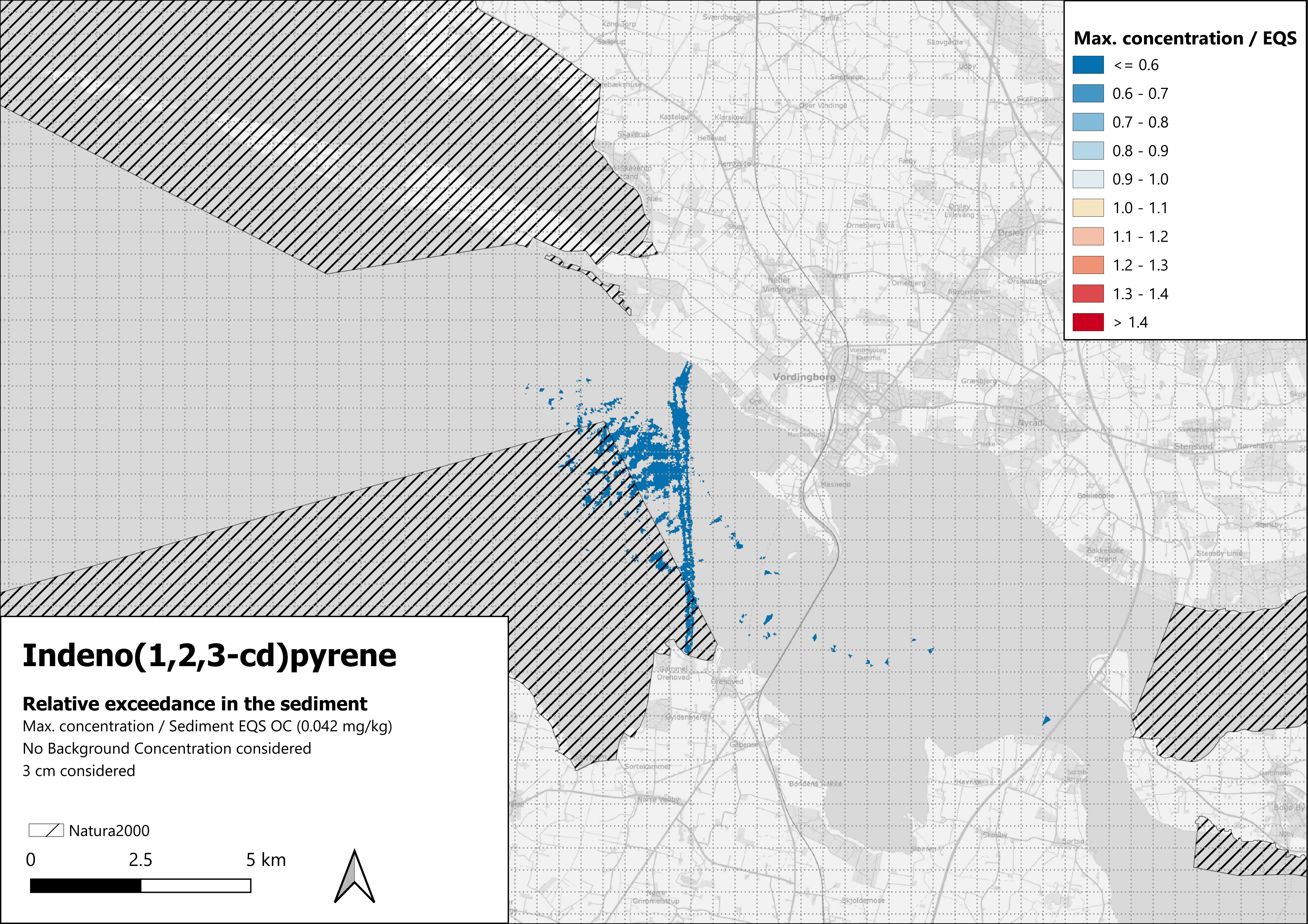

Max. concentration / EQS
<= 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1.0
1.0 - 1.1
1.1 - 1.2
1.2 - 1.3
1.3 - 1.4
> 1.4
Vordingborg
Masnedø
Cadmium (Cd)
Relative exceedance in the sediment
Max. concentration / Sediment EQS OC (3.8 mg/kg)
No Background Concentration considered
3 cm considered
Natura2000
0
2.5
5 km

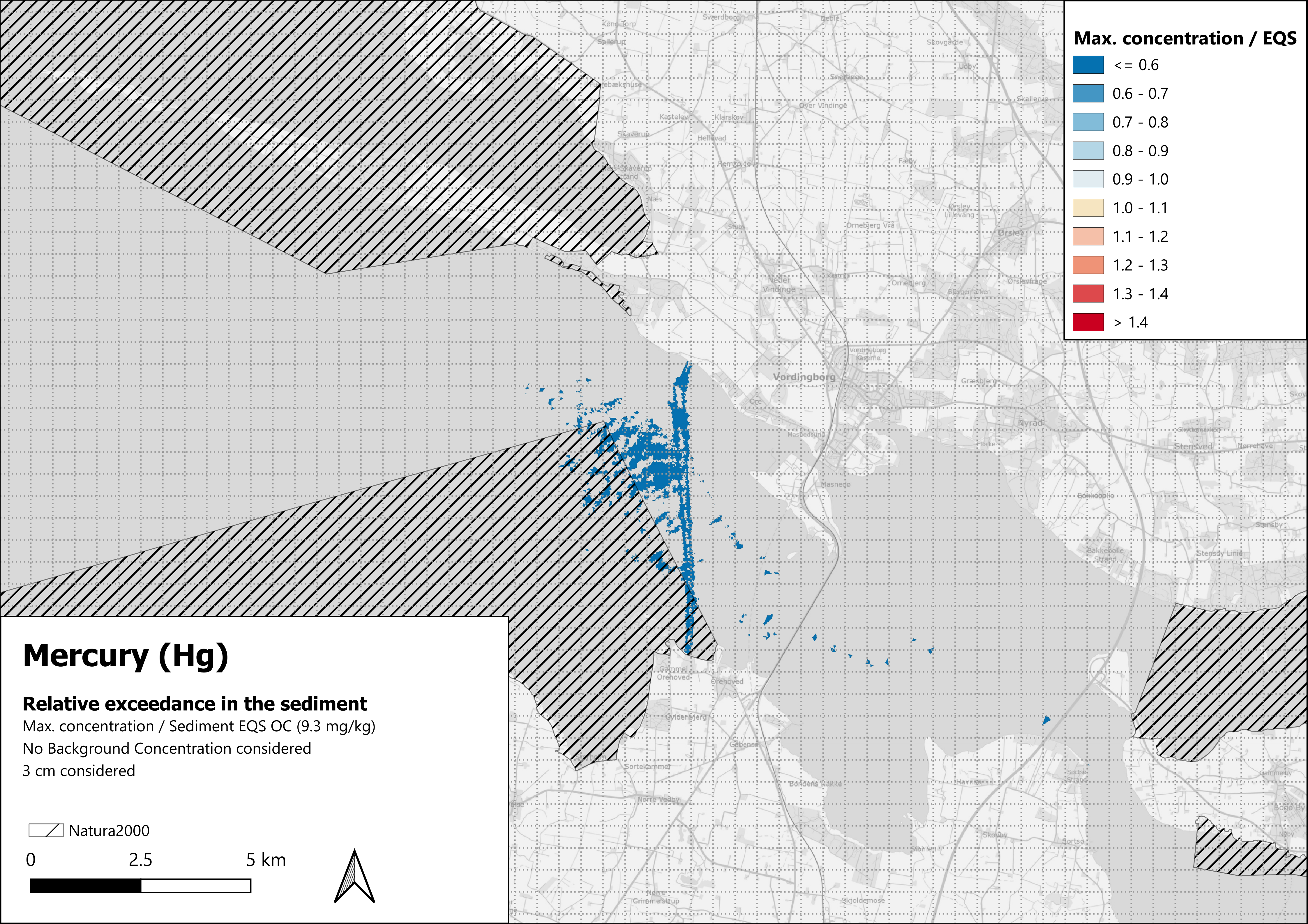

Max. concentration / EQS
<= 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1.0
1.0 - 1.1
1.1 - 1.2
1.2 - 1.3
1.3 - 1.4
> 1.4
Vordingborg
Chromium (Cr)
Relative exceedance in the sediment
Max. concentration / Sediment EQS OC (9.2 mg/kg)
No Background Concentration considered
3 cm considered
Natura2000
0
2.5
5 km

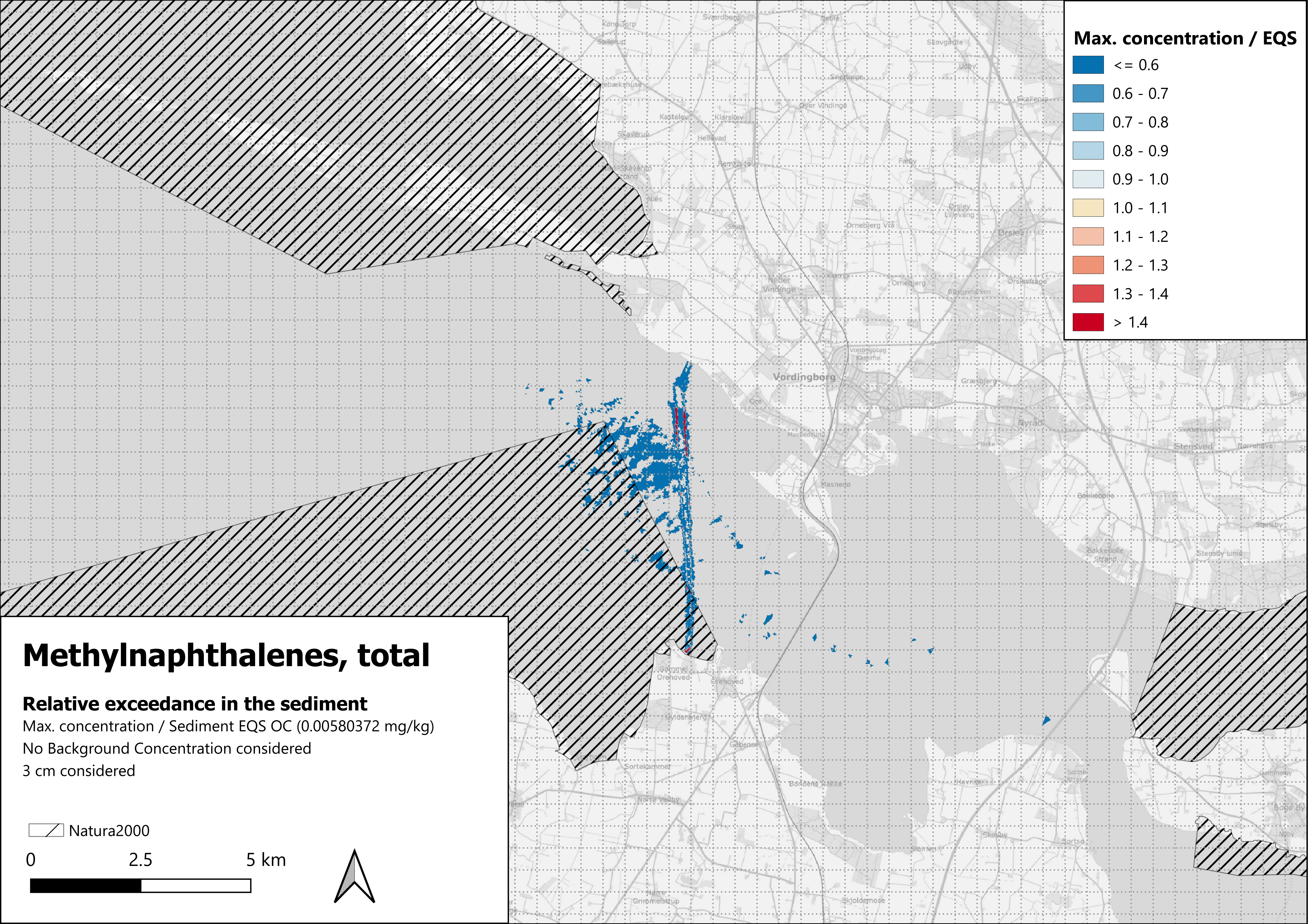

Max. concentration / EQS
<= 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1.0
1.0 - 1.1
1.1 - 1.2
1.2 - 1.3
1.3 - 1.4
> 1.4
Vordingborg
Chrysene / Triphenylene
Relative exceedance in the sediment
Max. concentration / Sediment EQS OC (0.00560945 mg/kg)
No Background Concentration considered
3 cm considered
Natura2000
0
2.5
5 km

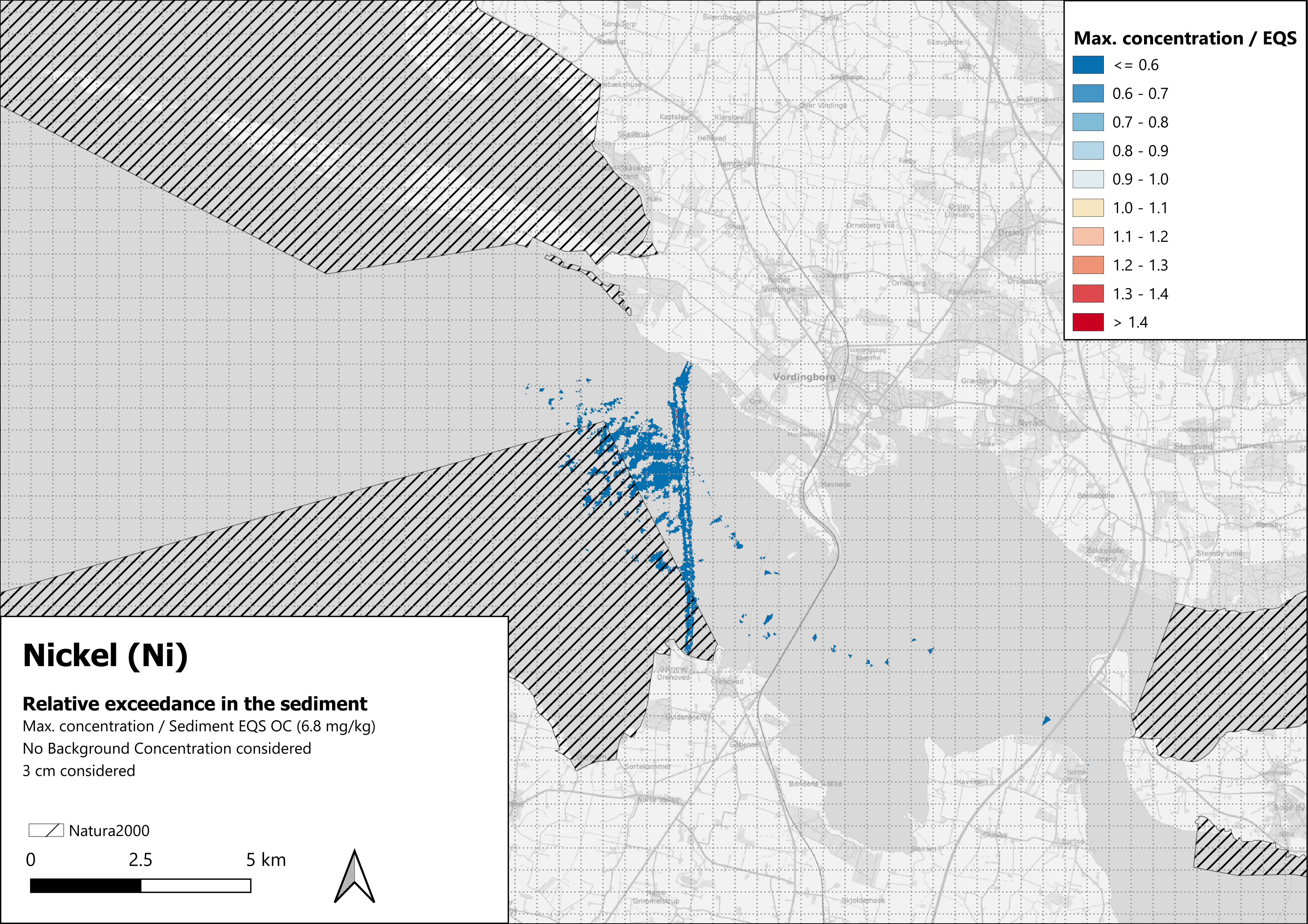

Di-n-butyl phthalate (DBP)
Relative exceedance in the sediment
Max. concentration / Sediment EQS OC (0.02889717 mg/kg)
No Background Concentration considered
3 cm considered
Natura2000
0
2.5
5 km
Max. concentration / EQS
<= 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1.0
1.0 - 1.1
1.1 - 1.2
1.2 - 1.3
1.3 - 1.4
> 1.4
Vordingborg

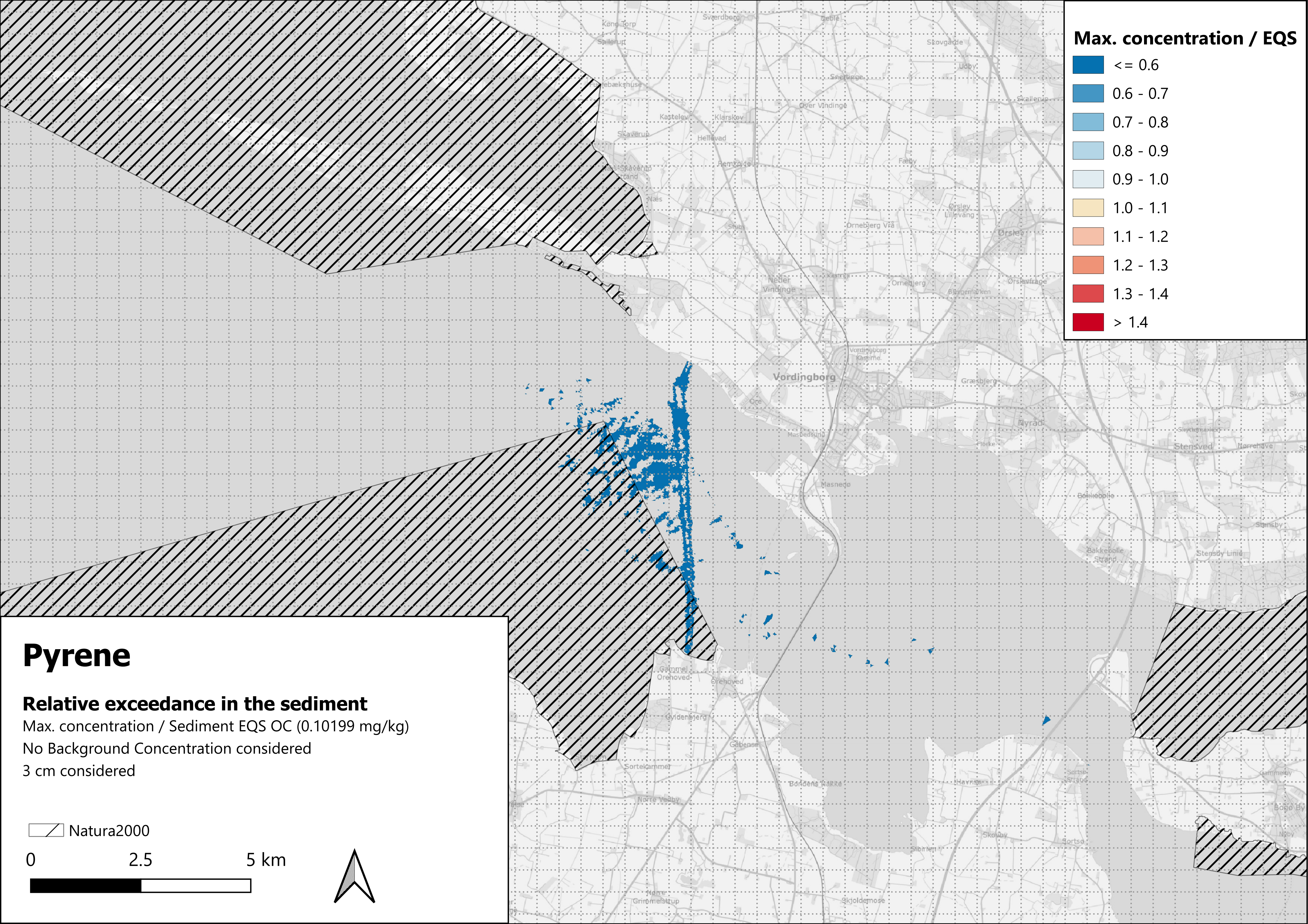

Max. concentration / EQS
<= 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1.0
1.0 - 1.1
1.1 - 1.2
1.2 - 1.3
1.3 - 1.4
> 1.4
Vordingborg
Fluoranthene
Relative exceedance in the sediment
Max. concentration / Sediment EQS OC (0.84627417 mg/kg)
No Background Concentration considered
3 cm considered
Natura2000
0
2.5
5 km


Indeno(1,2,3-cd)pyrene
Relative exceedance in the sediment
Max. concentration / Sediment EQS OC (0.042 mg/kg)
No Background Concentration considered
3 cm considered
Natura2000
0
2.5
5 km
Max. concentration / EQS
<= 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1.0
1.0 - 1.1
1.1 - 1.2
1.2 - 1.3
1.3 - 1.4
> 1.4
Vordingborg
Nyråd
Stensved
Ørslev
Masnedø
Neder Vindinge
Ørnebjerg
Græsbjerg


Max. concentration / EQS
<= 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1.0
1.0 - 1.1
1.1 - 1.2
1.2 - 1.3
1.3 - 1.4
> 1.4
Vordingborg
Mercury (Hg)
Relative exceedance in the sediment
Max. concentration / Sediment EQS OC (9.3 mg/kg)
No Background Concentration considered
3 cm considered
Natura2000
0
2.5
5 km


Max. concentration / EQS
<= 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1.0
1.0 - 1.1
1.1 - 1.2
1.2 - 1.3
1.3 - 1.4
> 1.4
Vordingborg
Methylnaphthalenes, total
Relative exceedance in the sediment
Max. concentration / Sediment EQS OC (0.00580372 mg/kg)
No Background Concentration considered
3 cm considered
Natura2000
0
2.5
5 km


Max. concentration / EQS
<= 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1.0
1.0 - 1.1
1.1 - 1.2
1.2 - 1.3
1.3 - 1.4
> 1.4
Vordingborg
Nickel (Ni)
Relative exceedance in the sediment
Max. concentration / Sediment EQS OC (6.8 mg/kg)
No Background Concentration considered
3 cm considered
Natura2000
0
2.5
5 km


Pyrene
Relative exceedance in the sediment
Max. concentration / Sediment EQS OC (0.10199 mg/kg)
No Background Concentration considered
3 cm considered
Natura2000
0
2.5
5 km
Max. concentration / EQS
<= 0.6
0.6 - 0.7
0.7 - 0.8
0.8 - 0.9
0.9 - 1.0
1.0 - 1.1
1.1 - 1.2
1.2 - 1.3
1.3 - 1.4
> 1.4
Vordingborg