



STOR-SKALA SPREDNIGSMODELLER

[AV MIKROPLAST I NORDLIGE
HAVOMRÅDER]

Mats Huserbråten FGOK HI

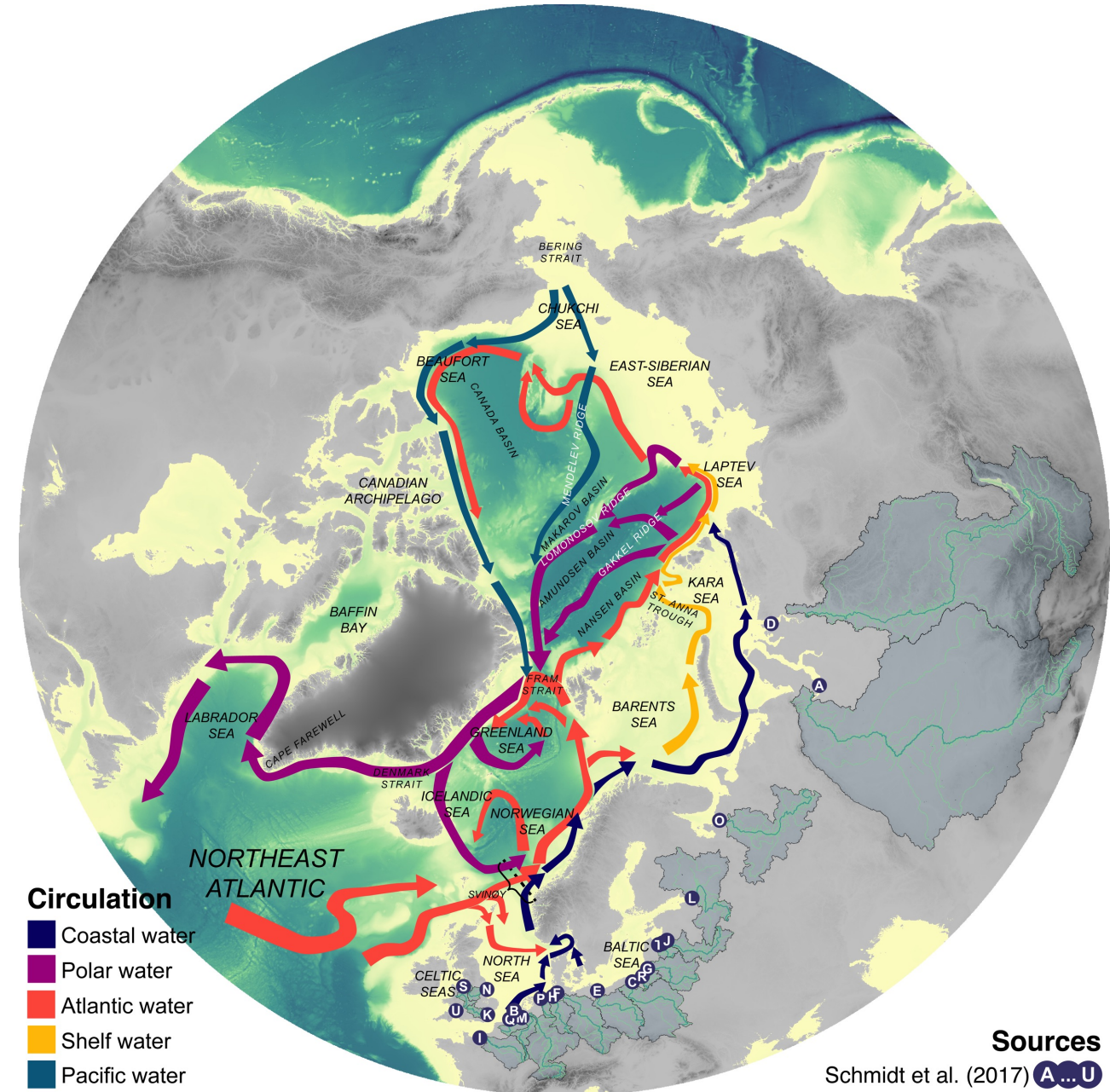
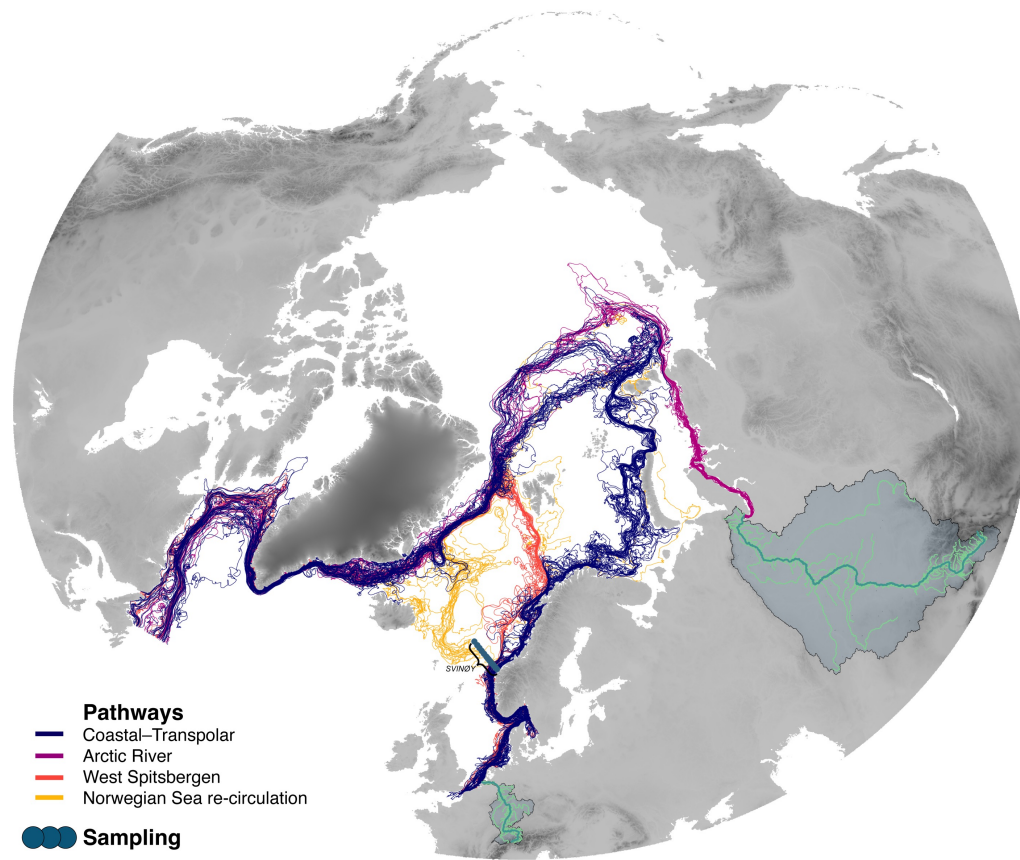


OPEN

Trans-polar drift-pathways of riverine European microplastic

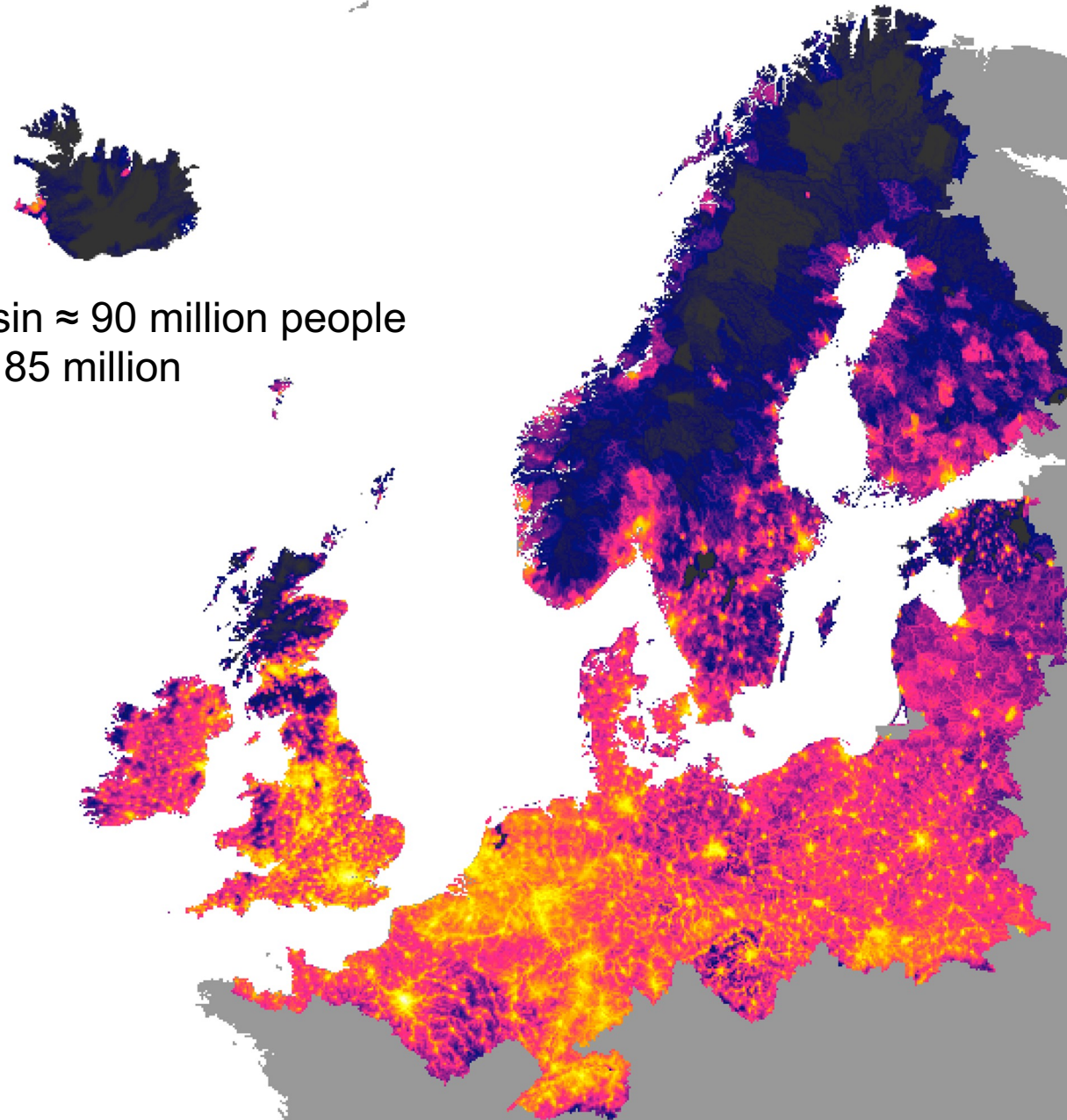
Mats B. O. Huserbråten^{1✉}, Tore Hattermann^{2,3}, Cecilie Broms¹ & Jon Albretsen¹

 Check for updates

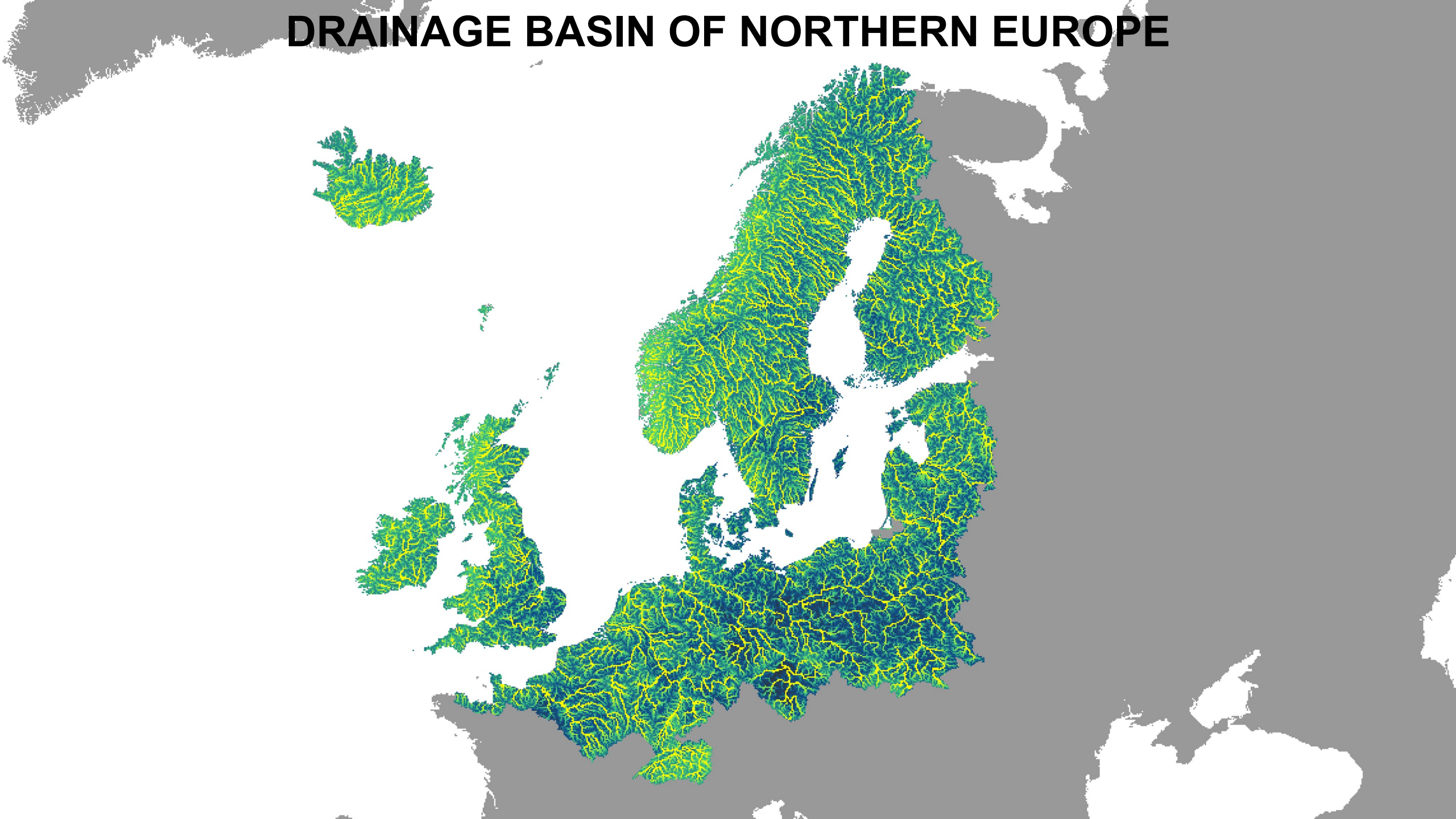


POPULATION DENSITY IN NORTHERN EUROPE

North Sea drainage basin $\approx$ 90 million people
Baltic drainage basin $\approx$ 85 million
Total $\approx$ 175 million

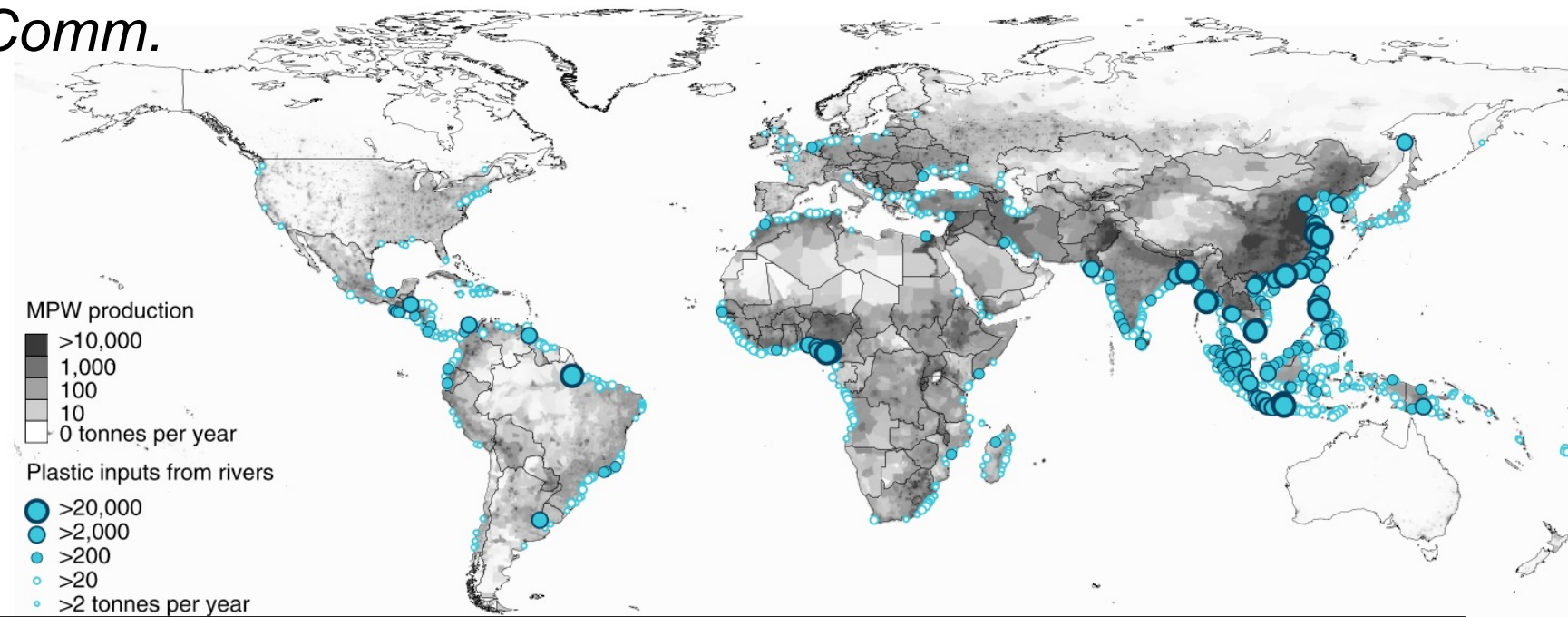


DRAINAGE BASIN OF NORTHERN EUROPE



Lebreton et al. (2017) *Nat. Comm.*

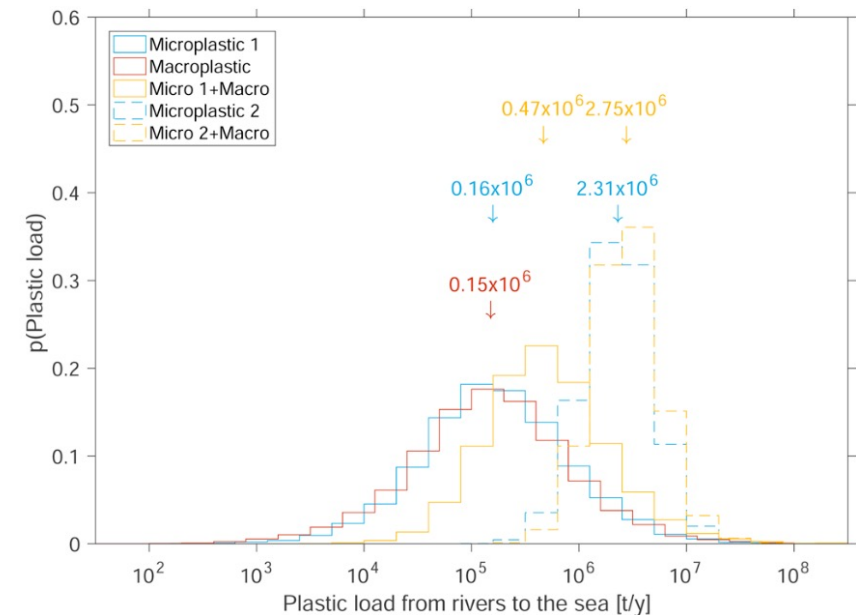
$1.15\text{--}2.41 \times 10^6 \text{ T/YEAR}$



DISCHARGE OF MICROPLASTIC FROM WORLDS RIVERS

$0.41\text{--}4 \times 10^6 \text{ T/YEAR}$

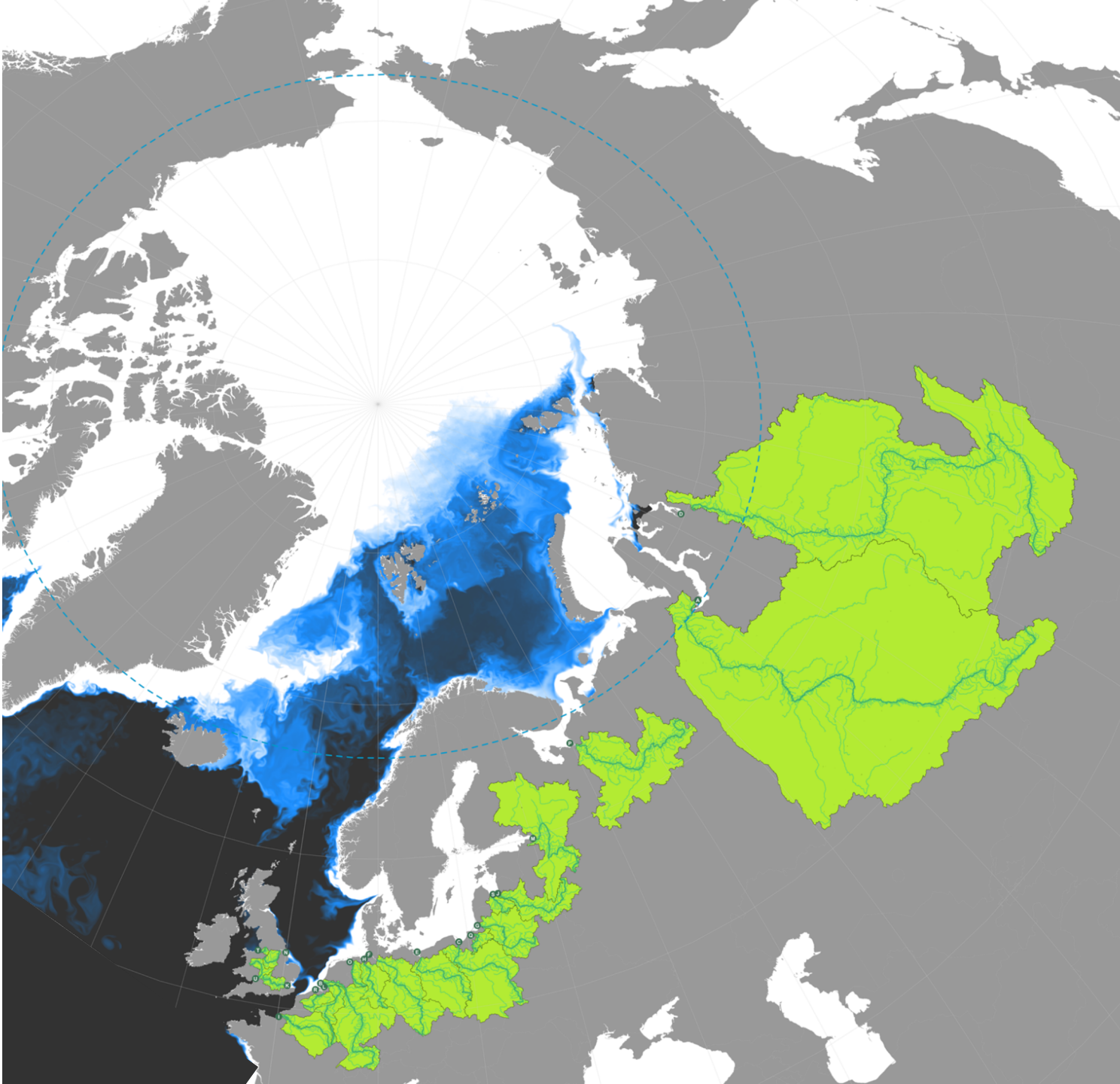
>50% = MP

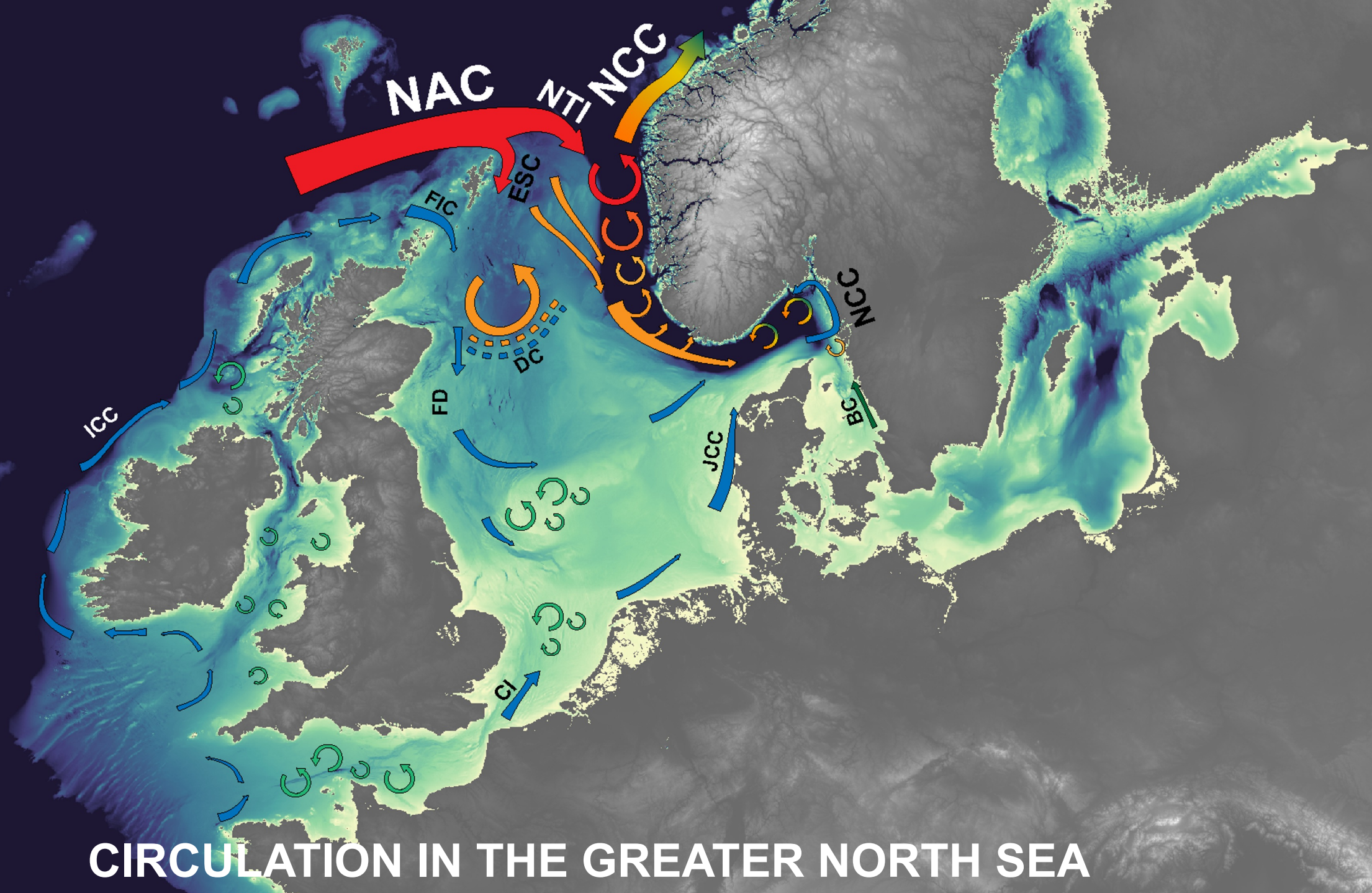


Schmidt et al. (2017) *Env. Sci. & Techn.*

“RIVER-BORNE” MICROPLASTIC IN NORTHERN EUROPE

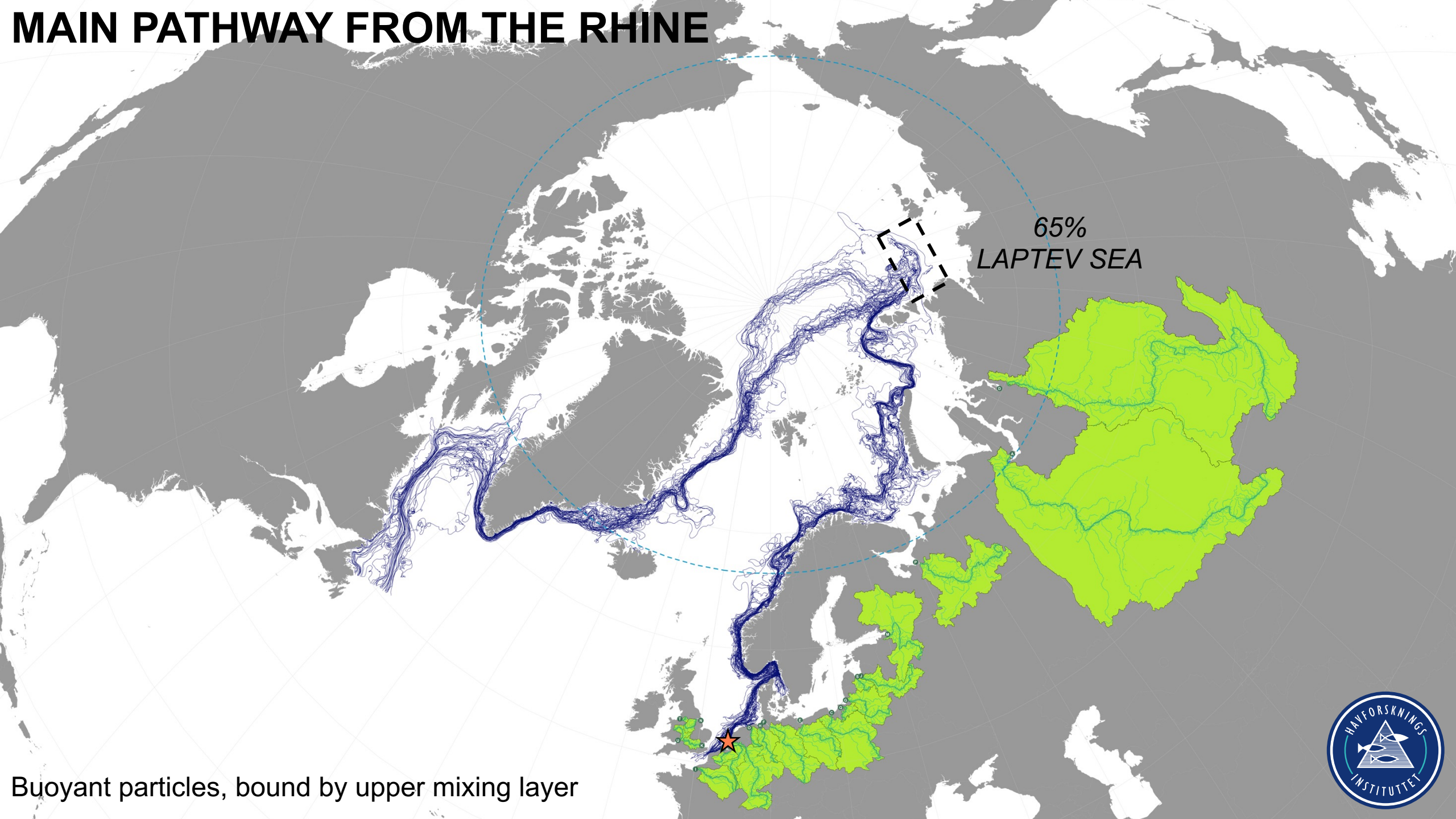
Letter	River	Sea	Area	Model 1	Model 2	Macro	Rank
A	Ob	Kara Sea	2463489	796	113	166	42
B	Rhine	North Sea	162207	473	71	109	53
C	Vistula	Baltic Sea	192237	317	50	79	67
D	Yenisey	Kara Sea	2451512	118	21	36	99
E	Oder	Baltic Sea	118445	98	18	31	111
F	Elbe	North Sea	137991	77	14	25	124
G	Neman	Baltic Sea	92196	41	8	15	157
H	Weser	North Sea	44881	25	5	10	190
I	Seine	North Sea	73378	14	3	6	228
J	Daugava	Baltic Sea	84374	12	3	6	238
K	Thames	North Sea	13347	12	3	6	245
L	Neva	Baltic Sea	238902	11	3	6	246
M	Meuse	North Sea	32784	11	3	5	247
N	Trent	North Sea	11751	4	1	2	337
O	Dvina	Kara Sea	347484	3	1	2	357
P	Ems	North Sea	12146	3	1	2	365
Q	Pregolya	Baltic Sea	13897	2	0	1	427
R	Scheldt	North Sea	19069	2	1	1	399
S	Lielupe	Baltic Sea	17529	1	0	1	486
T	Mersey	North Sea	2387	1	0	1	485
U	Severn	North Sea	11008	1	0	1	498
Total				2022 t	319 t	511 t	t/year





CIRCULATION IN THE GREATER NORTH SEA

MAIN PATHWAY FROM THE RHINE



Buoyant particles, bound by upper mixing layer

MAIN PATHWAY + "SHORTCUT"

30%
FRAM STRAIT RE-
CIRCULATION

Buoyant particles, bound by upper mixing layer

HAVFORSKNINGS
INSTITUTTET

MAIN PATHWAY + "SHORTCUT"

30%
FRAM STRAIT RE-
CIRCULATION

Buoyant particles, bound by upper mixing layer

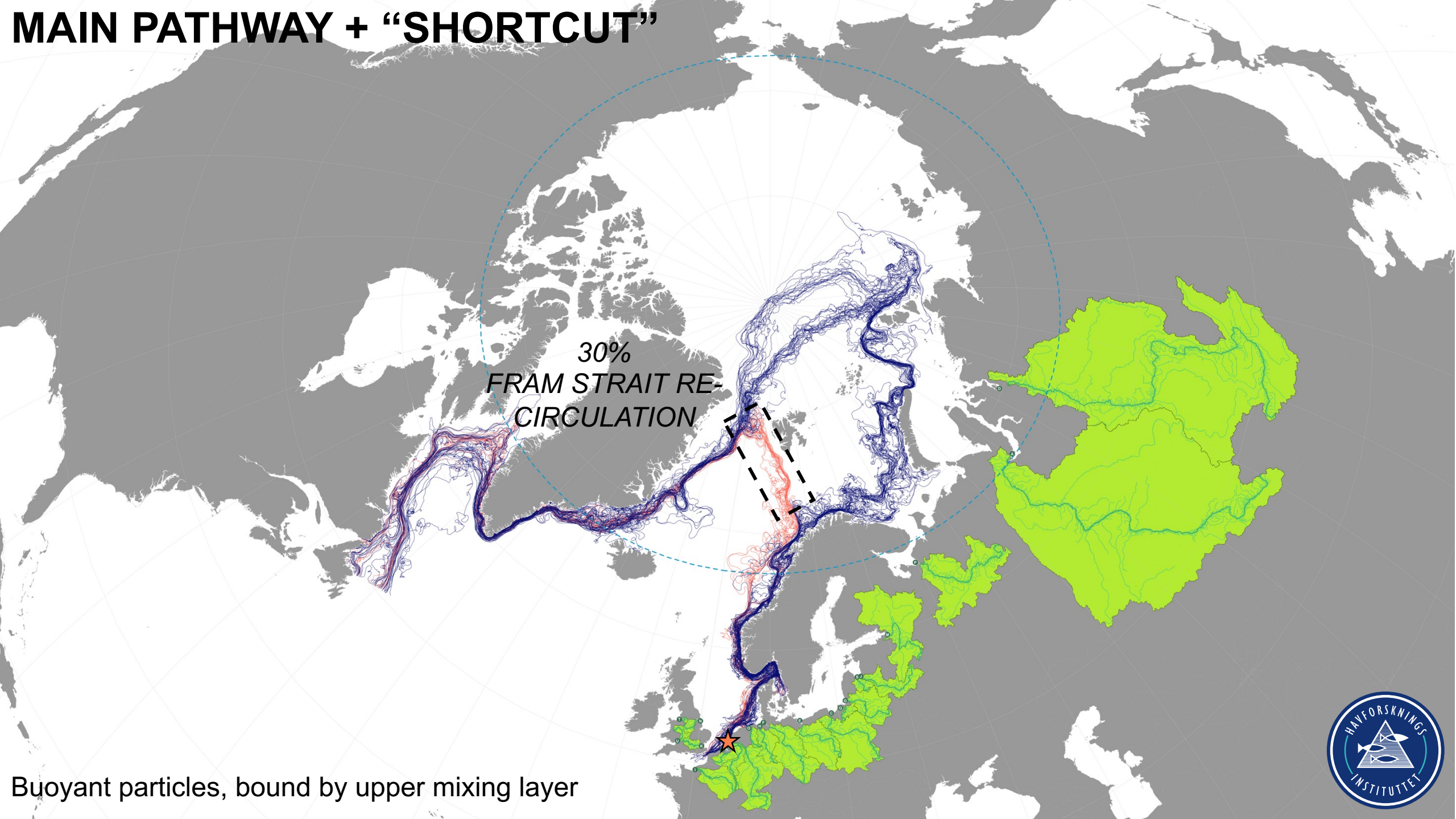
HAVFORSKNINGS
INSTITUTTET

MAIN PATHWAY + "SHORTCUT"

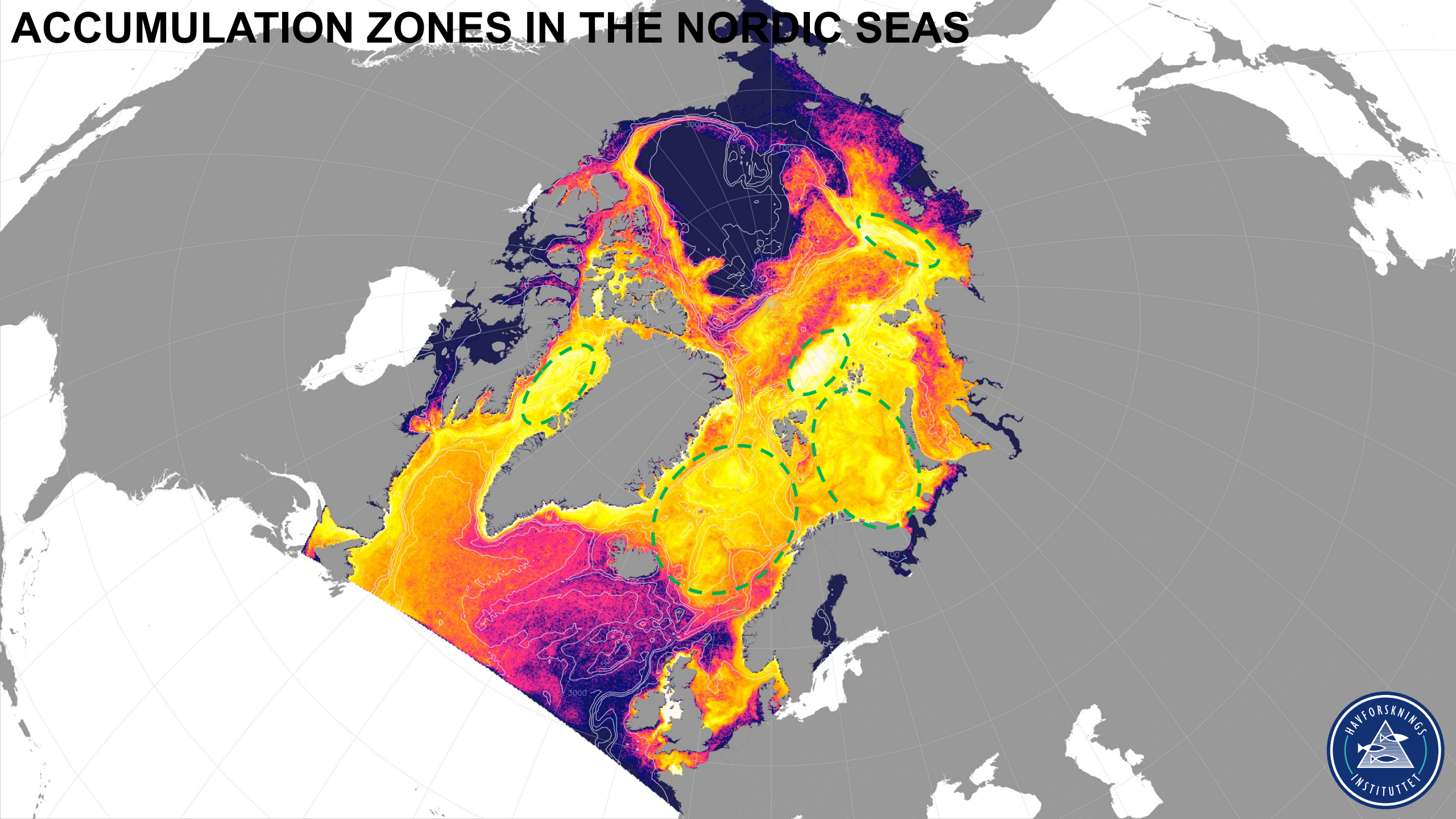
30%
FRAM STRAIT RE-
CIRCULATION

Buoyant particles, bound by upper mixing layer

HAVFORSKNINGS
INSTITUTTET



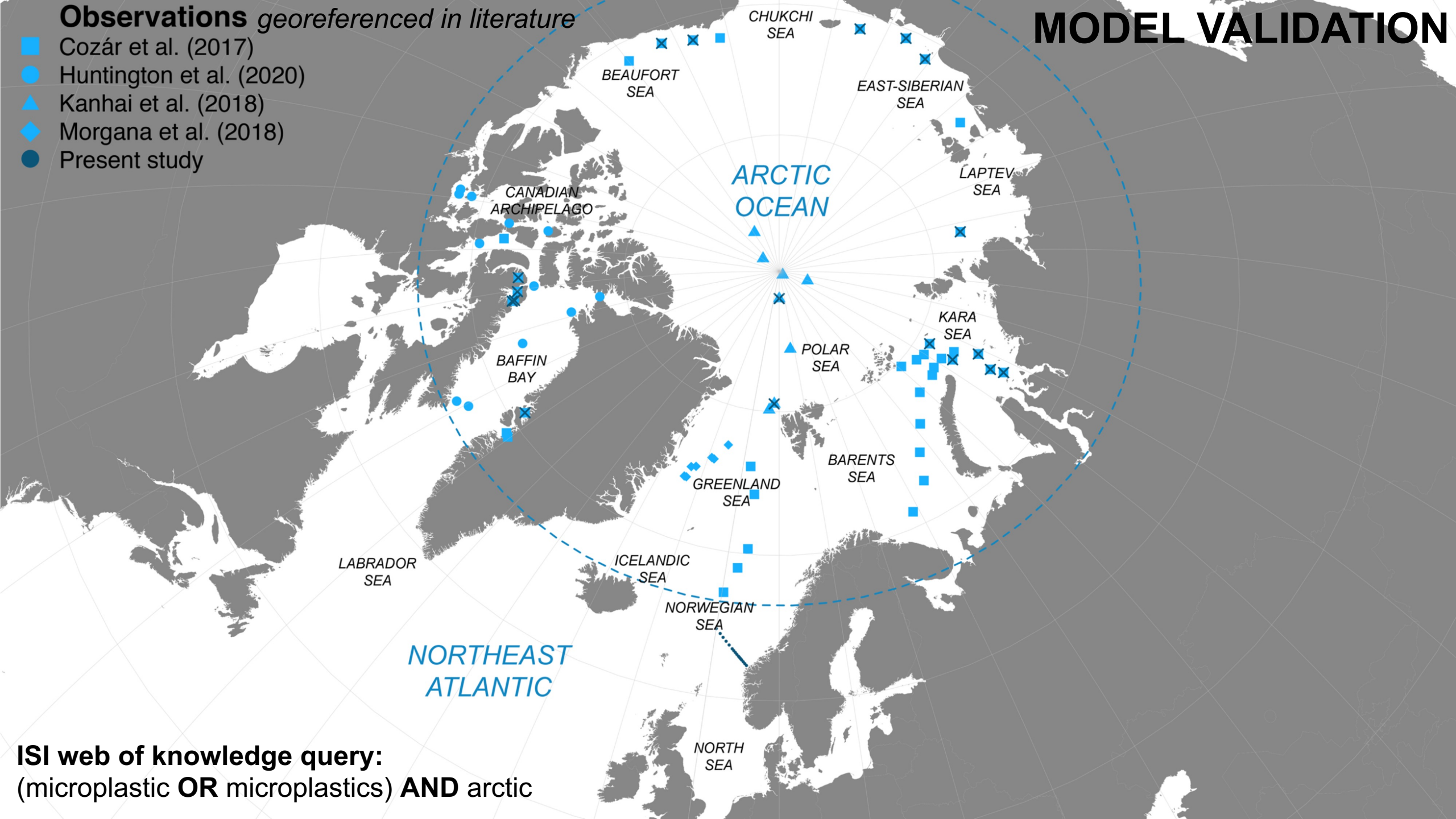
ACCUMULATION ZONES IN THE NORDIC SEAS



Observations *georeferenced in literature*

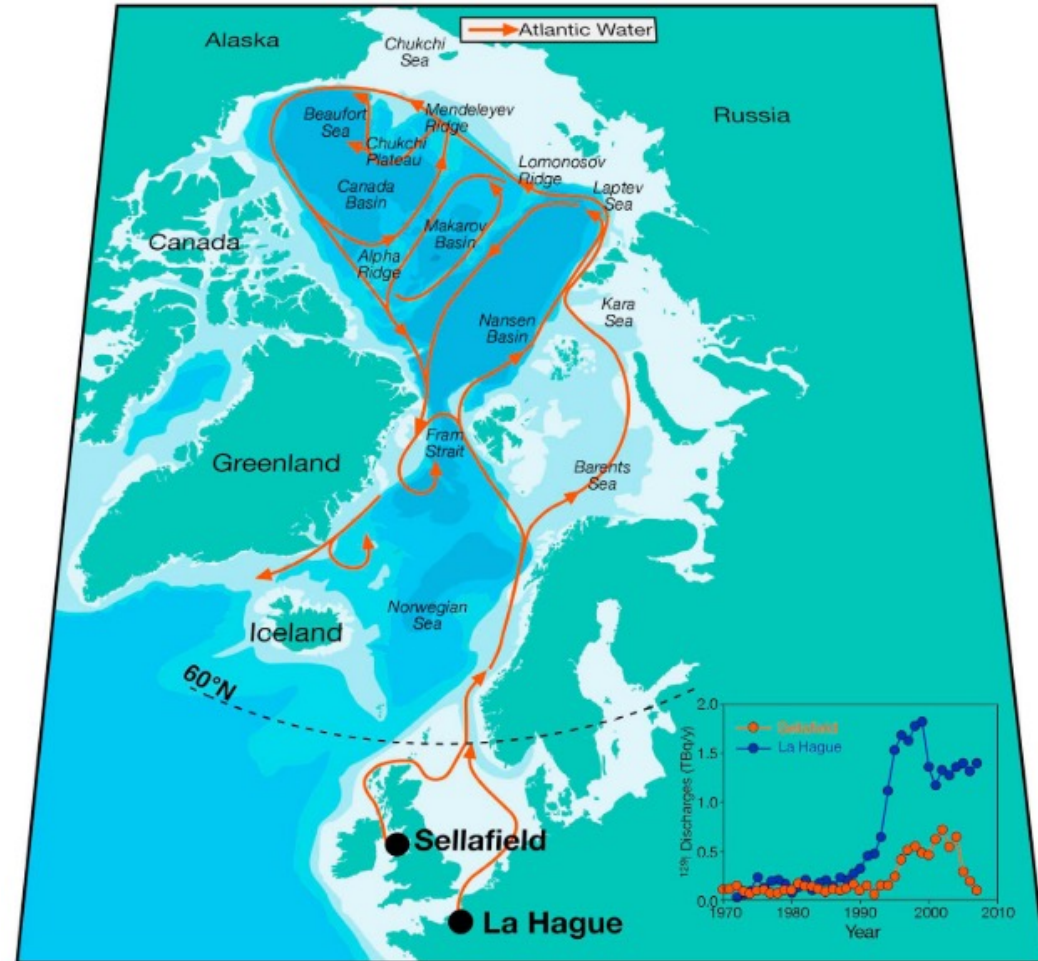
- Cozár et al. (2017)
- Huntington et al. (2020)
- ▲ Kanhai et al. (2018)
- ◆ Morgana et al. (2018)
- Present study

MODEL VALIDATION



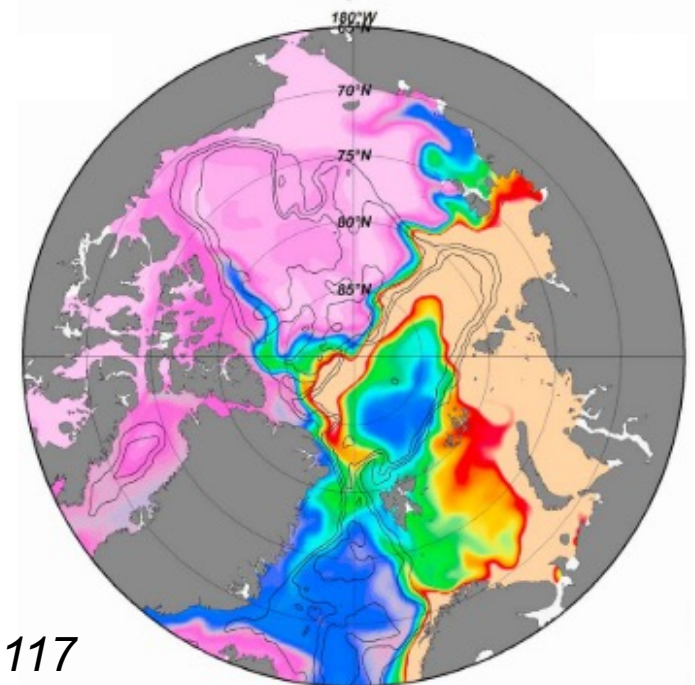
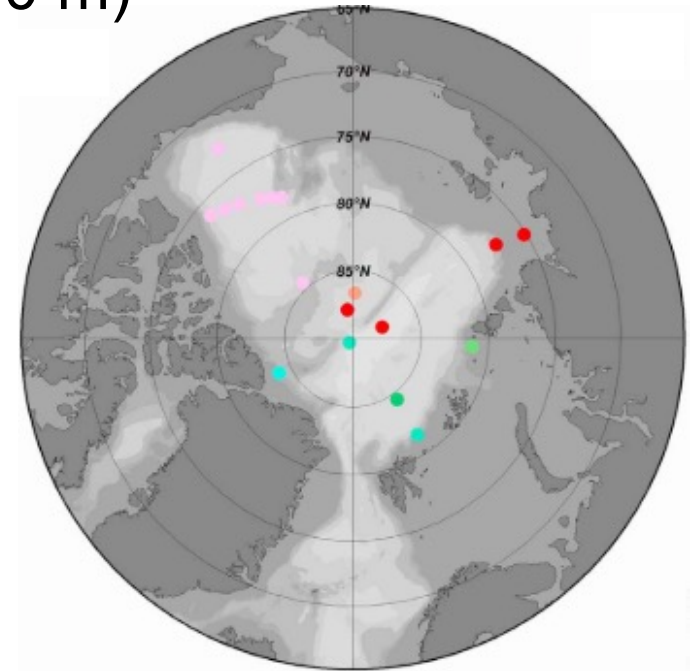
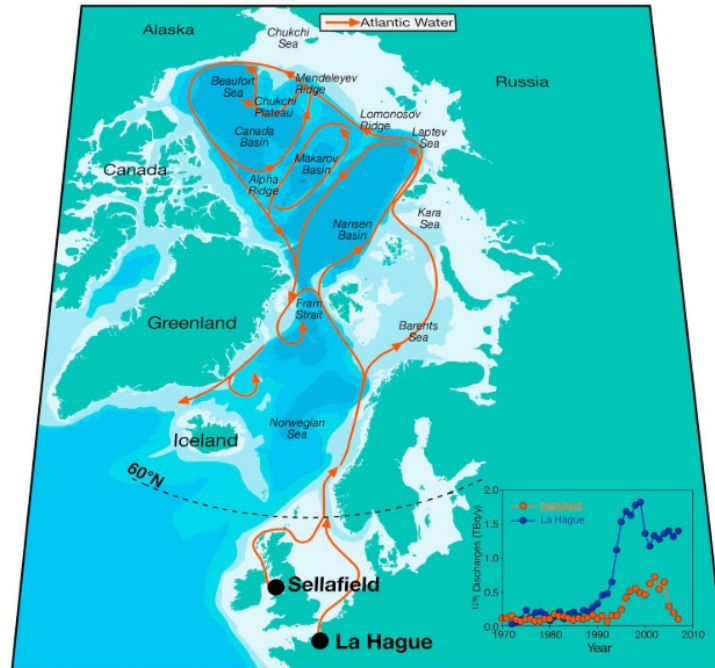
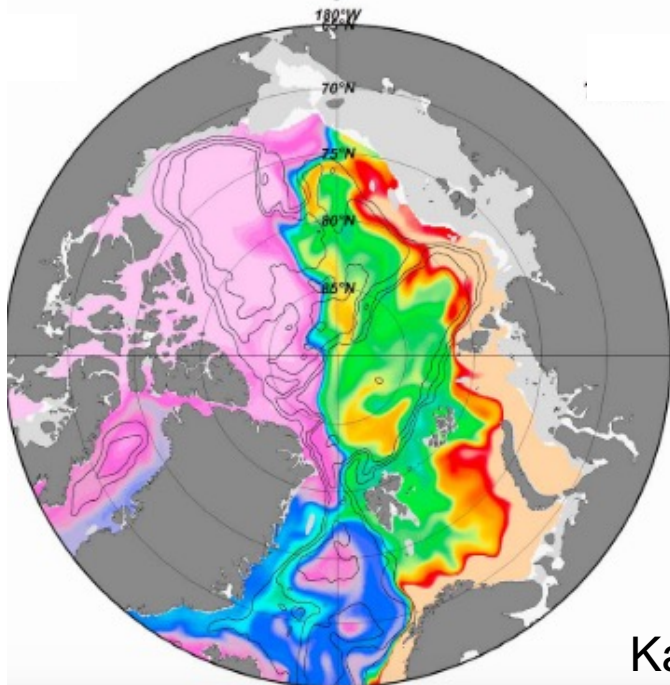
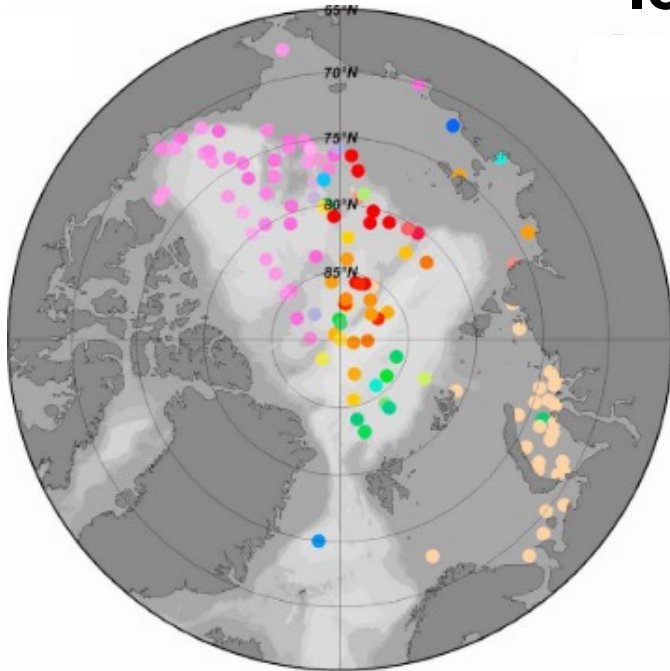
ISI web of knowledge query:
(microplastic **OR** microplastics) **AND** arctic

MODEL VALIDATION



Iodine₁₂₉ from waste water of European nuclear powerplants

Iodine₁₂₉ in surface layer (0-60 m)





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