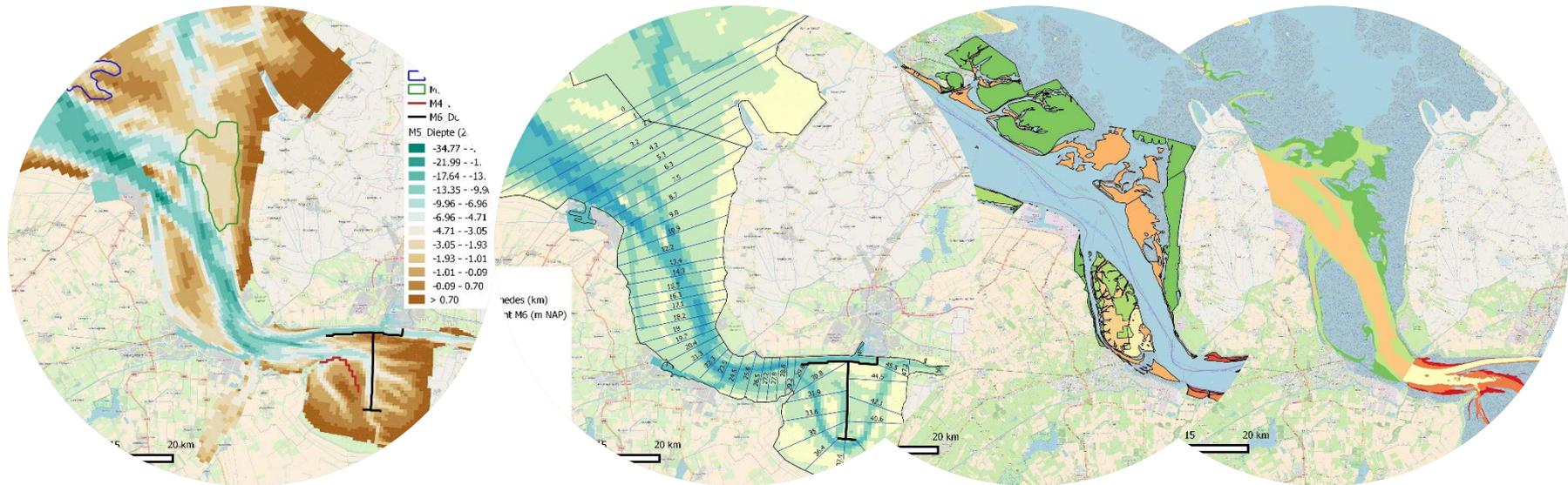


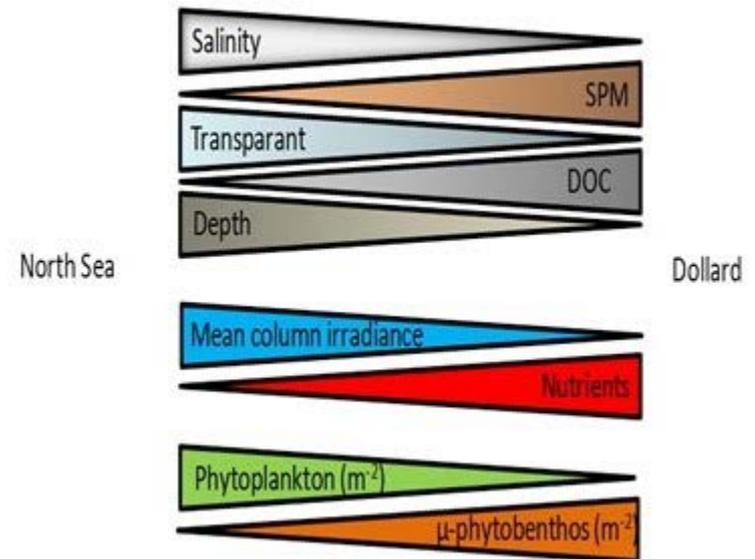
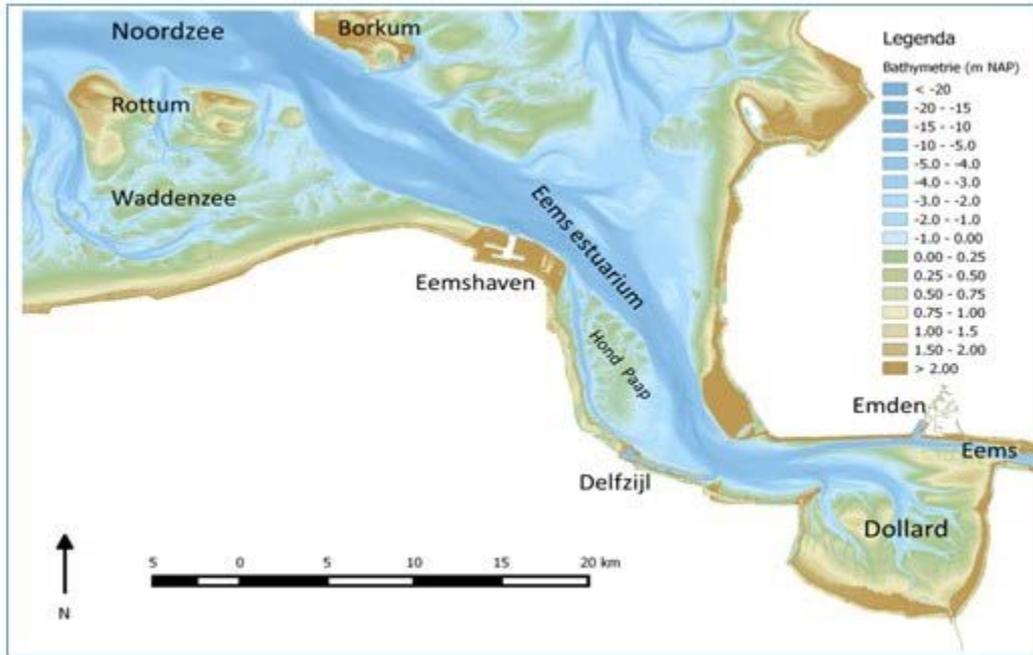
Ecological Perspective Ems-Dollard 2050

Assessment of the ecological targets for the Ems-Dollard for six hydromorphological 'measure-directions'

18 januari 2018, Martin Baptist

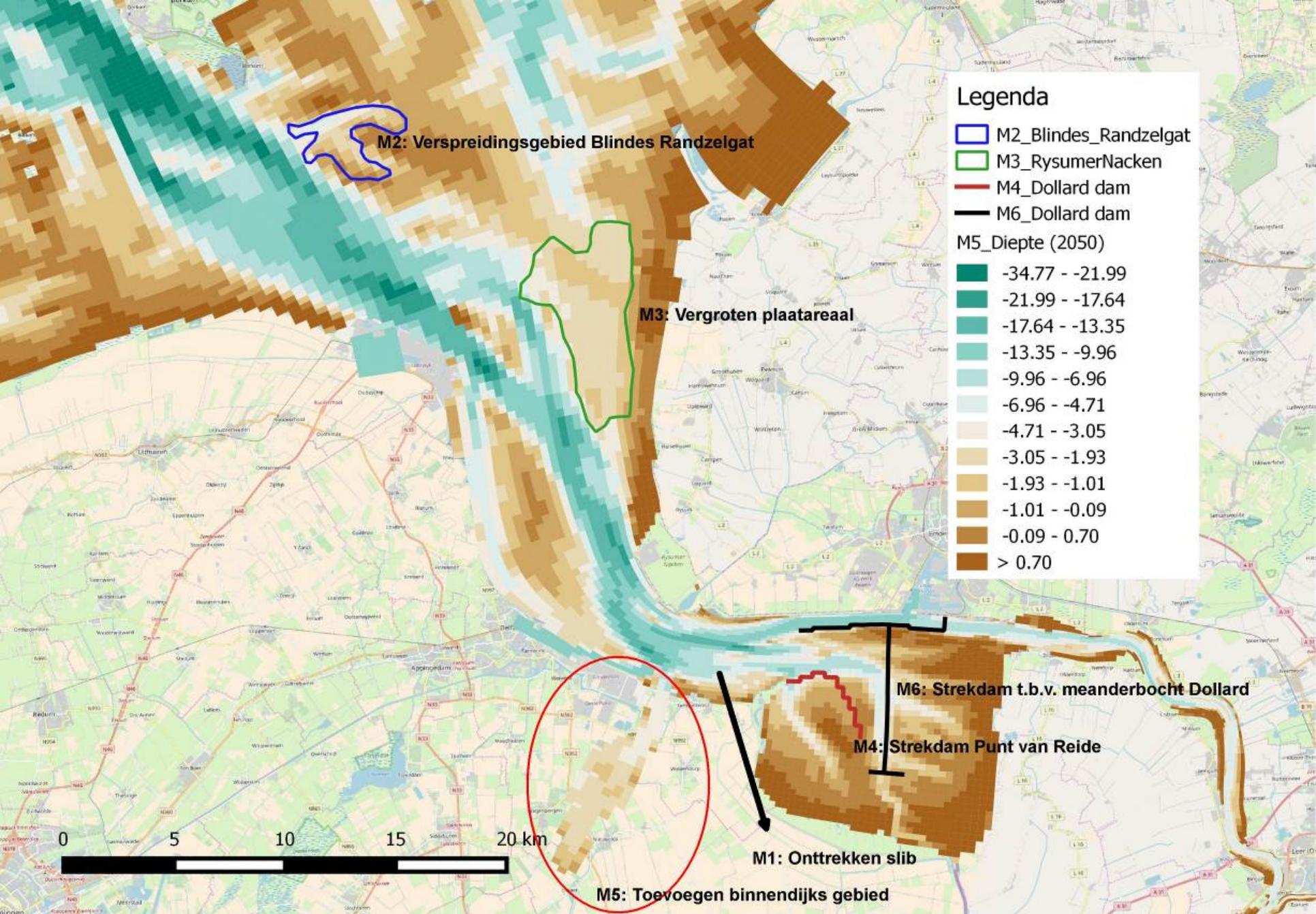


The Ems-Dollard



Dutch Multiannual Adaptive Programme Ems-Dollard 2050

- Framework programme Hydromorfological Improvement:
 - *reduce the suspended sediment concentration and improve a natural hydromorfological state.*
- Deltares did a model study into six 'measure directions':
 - M0: Autonomous development with sea level rise, in 2050
 - M1: *Remove mud and bring outside estuary*
 - M2: *Dispose mud at Blindes Randzelgat*
 - M3: *Increase tidal area at Rysumer Nacken*
 - M4: *Build a dam at Punt van Reide*
 - M5: *Create a new intertidal area*
 - M6: *Make a meander in the Dollard*



Legenda

- M2_Blindes_Randzelgat
- M3_RysumerNacken
- M4_Dollard dam
- M6_Dollard dam

M5_Diepte (2050)

- -34.77 - -21.99
- -21.99 - -17.64
- -17.64 - -13.35
- -13.35 - -9.96
- -9.96 - -6.96
- -6.96 - -4.71
- -4.71 - -3.05
- -3.05 - -1.93
- -1.93 - -1.01
- -1.01 - -0.09
- -0.09 - 0.70
- > 0.70

M2: Verspreidingsgebied Blindes Randzelgat

M3: Vergroten plaatareaal

M6: Strekdam t.b.v. meanderbocht Dollard

M4: Strekdam Punt van Reide

M1: Onttrekken slib

M5: Toevoegen binnendijks gebied



Ecological targets for the Ems-Dollard

1. Appropriate dimensions and natural dynamics;

Sufficient habitats of good quality for birds and fish
Appropriate morphological dimensions in the estuary
Gradual transitions between land and sea

2. Healthy habitats;

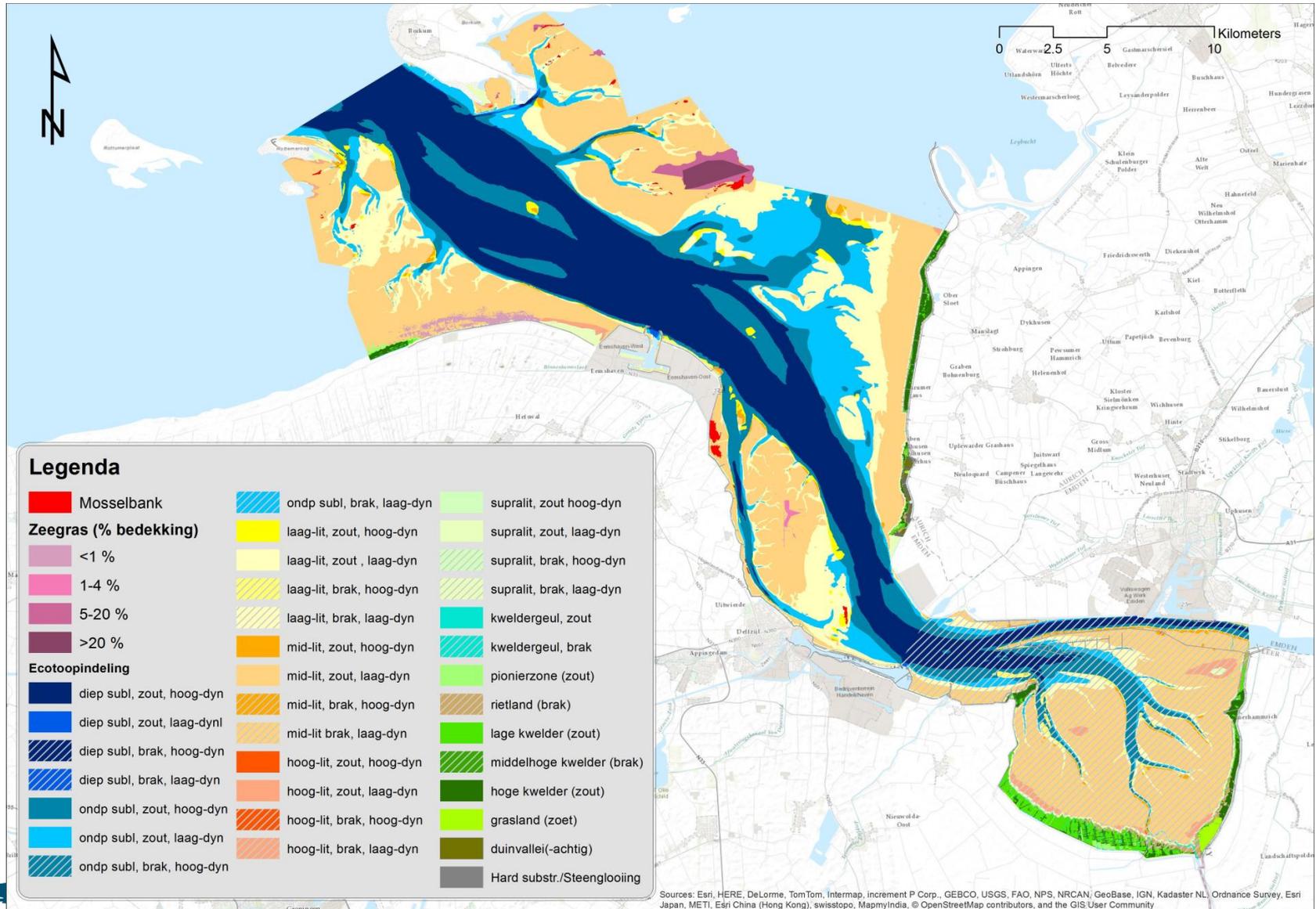
Total area of Ems-Dollard does not decrease
Doubling of the salt marsh area

3. Gradual salinity gradients;

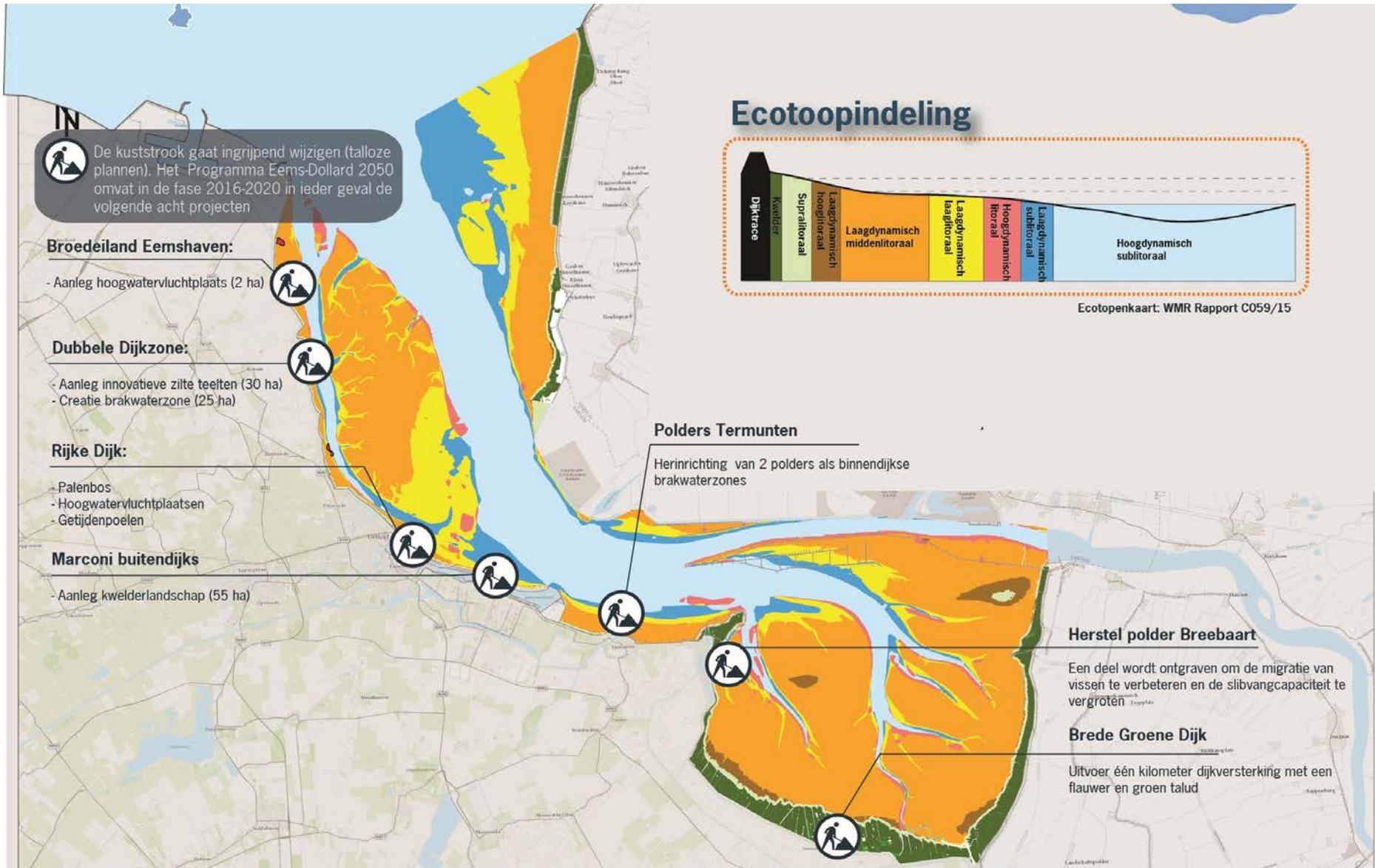
4. Natural turbidity;

5. Sufficient food at the base of the system.

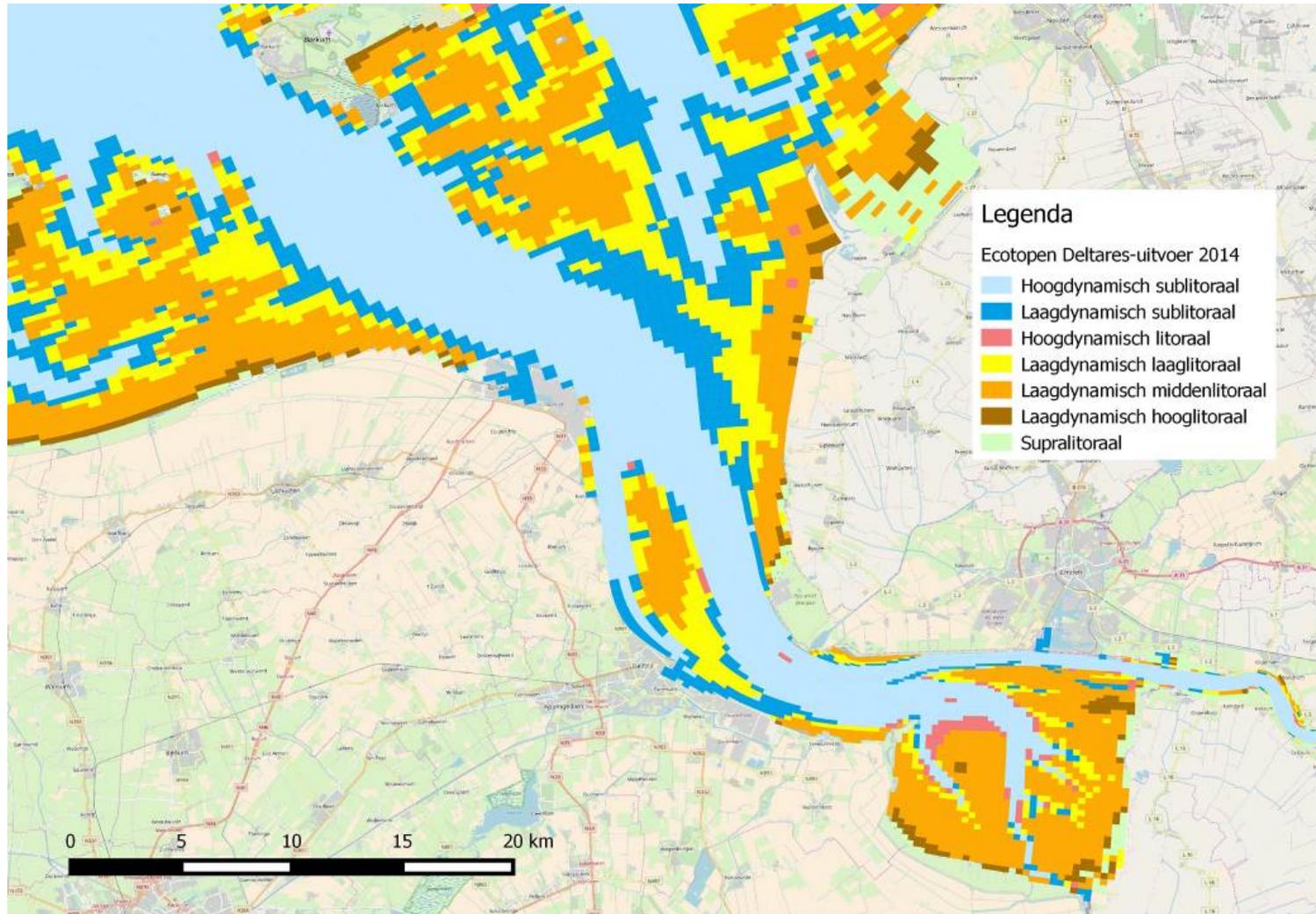
Zoute Wateren Ecotopen Stelsel (ZES.1)



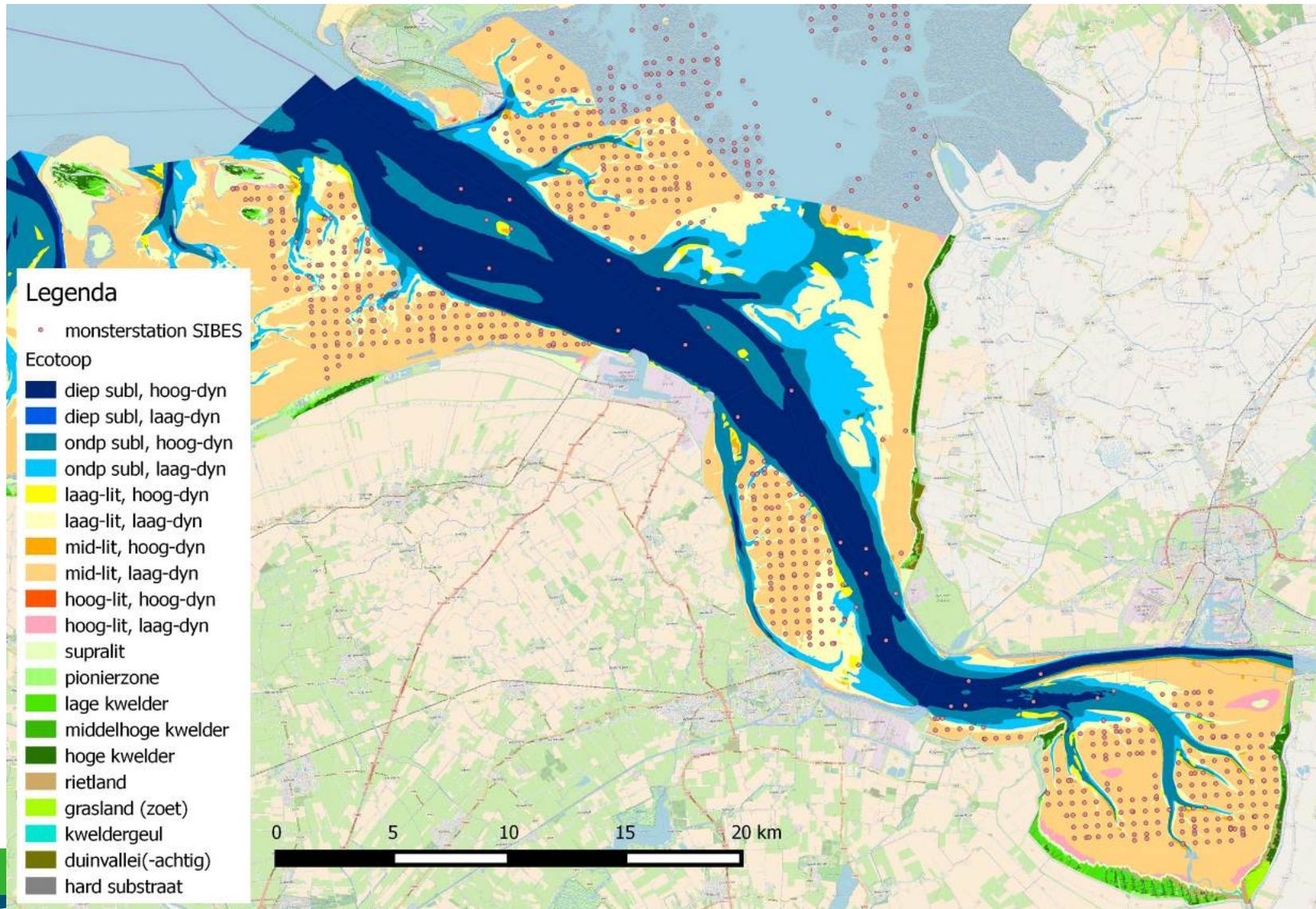
Projecten in de Eems-Dollard



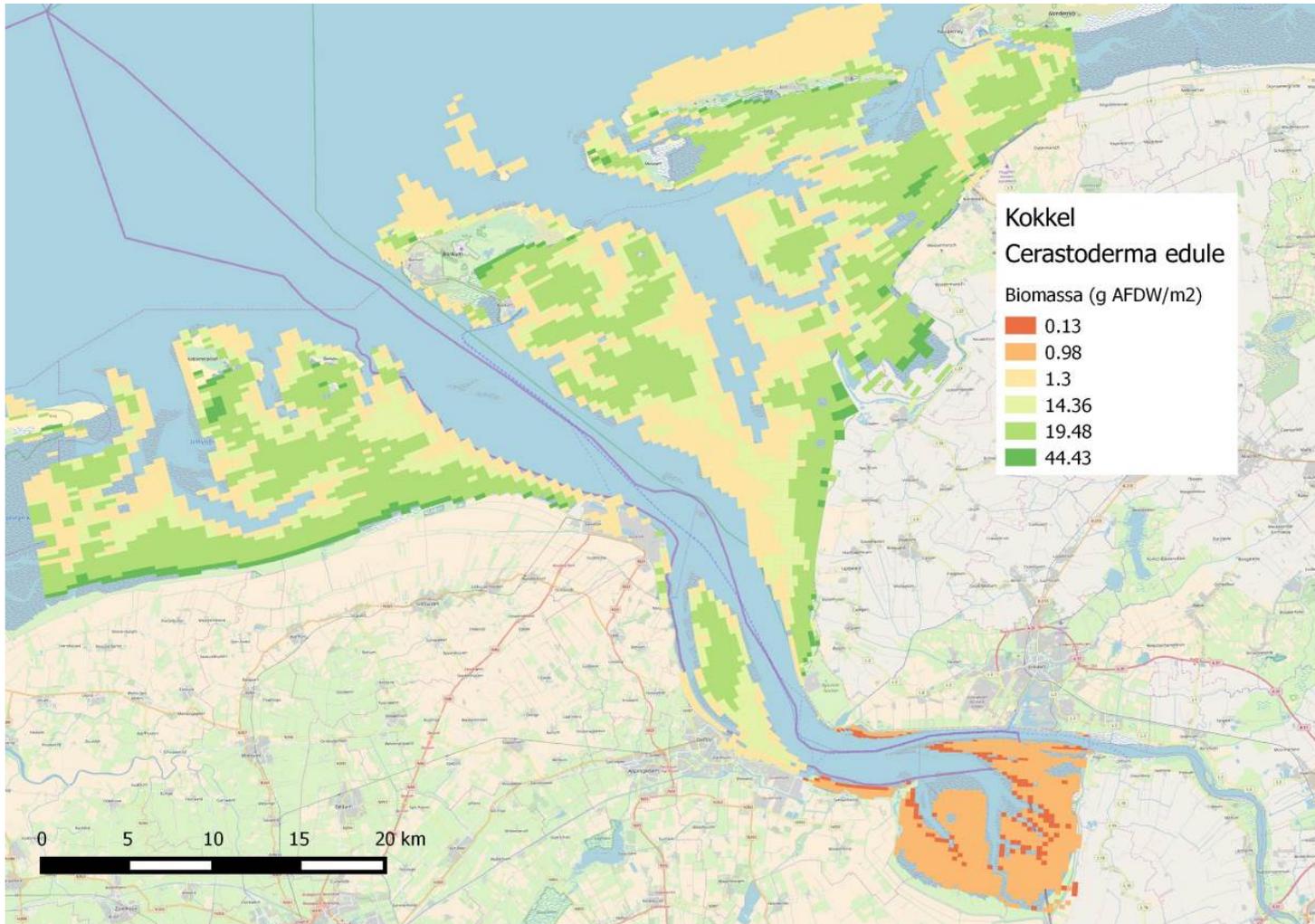
Ecotope model output



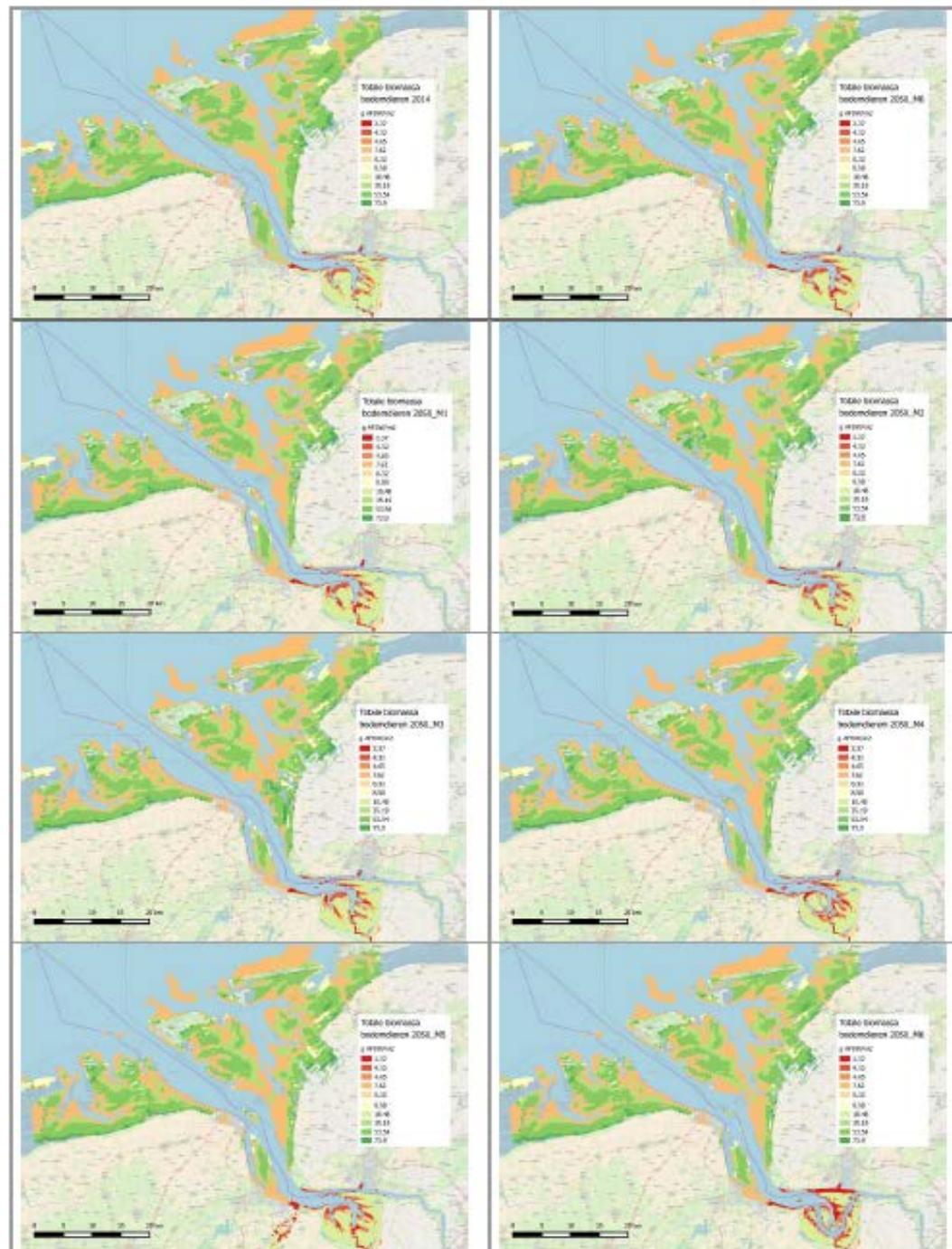
Benthos – SIBES data



Benthos in ecotopes

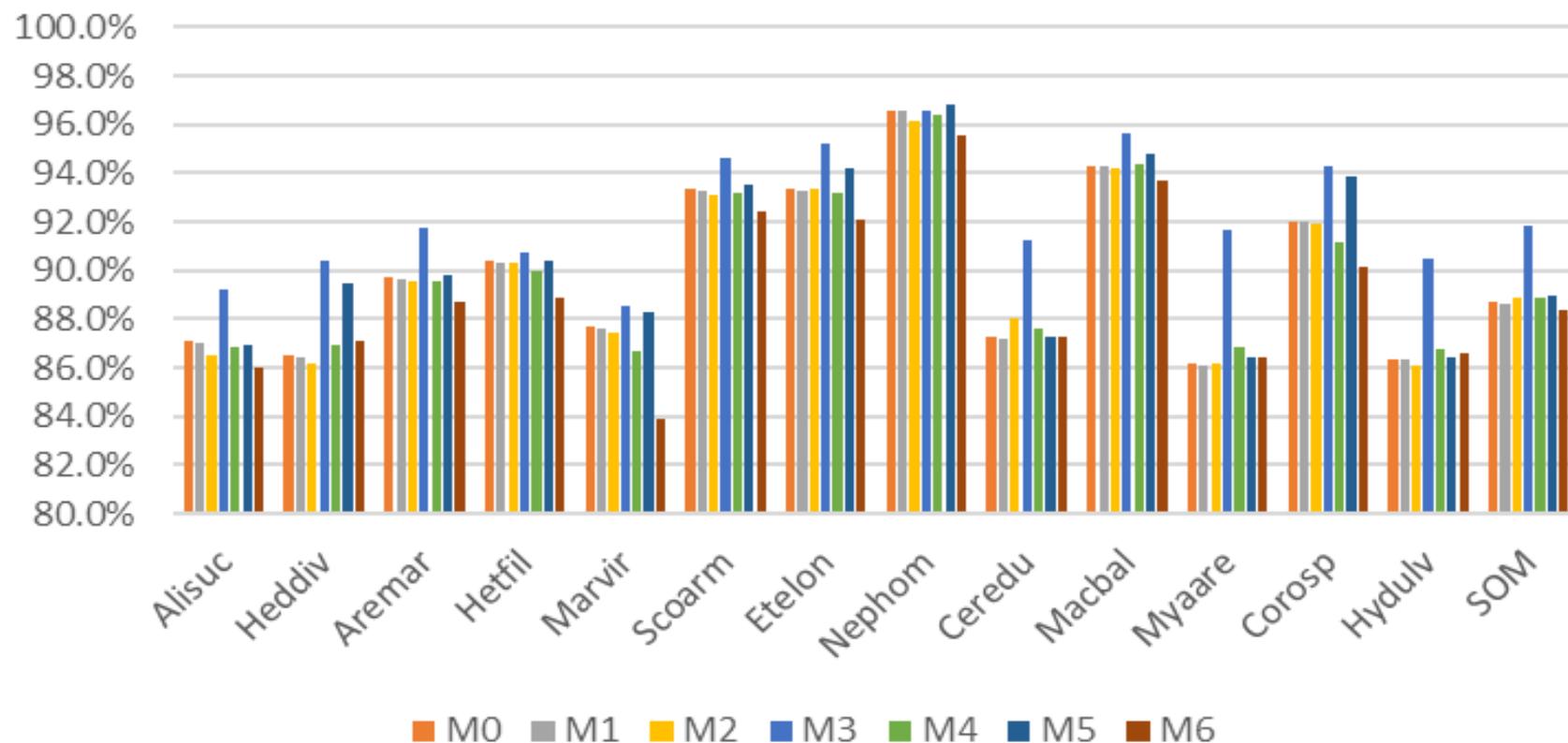


Total biomass benthos

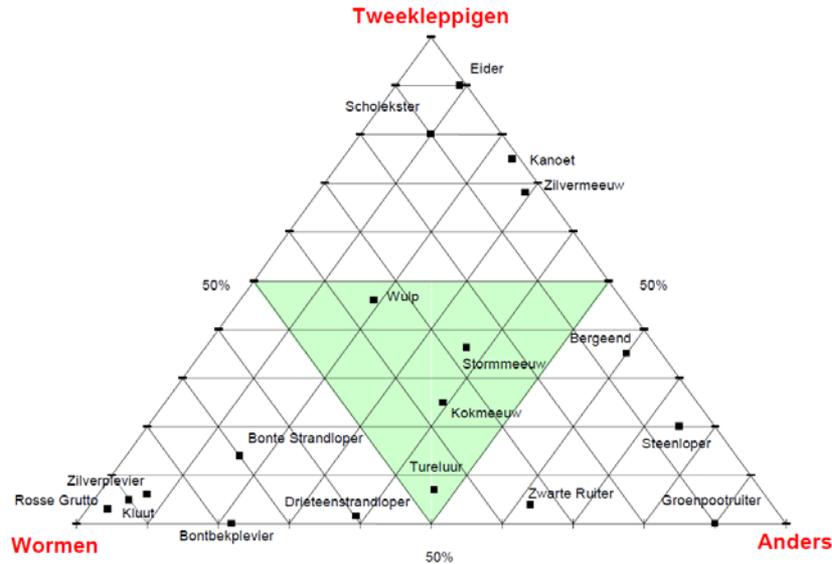


Result benthos

Procentuele verandering t.o.v. 2014

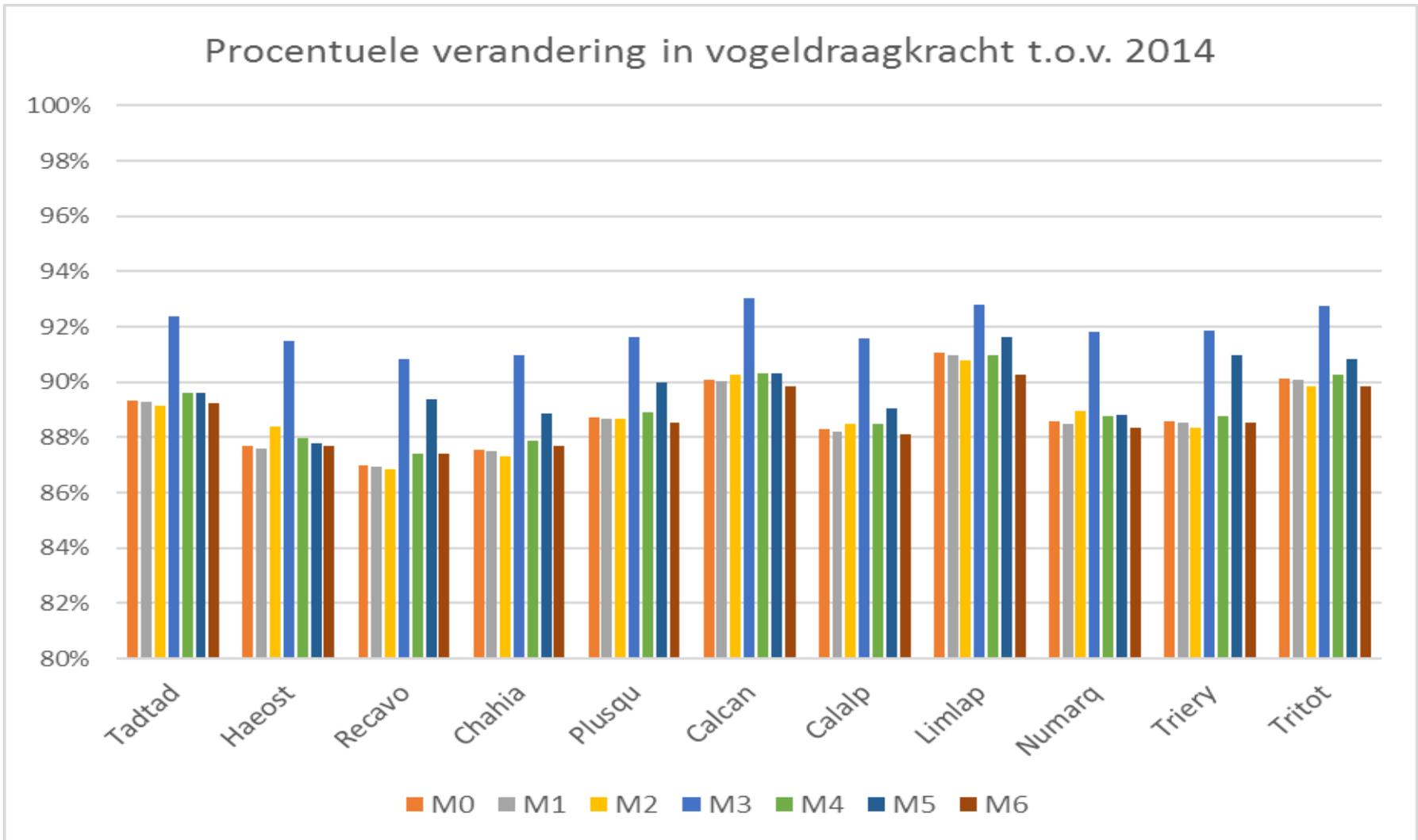


From benthos to birds

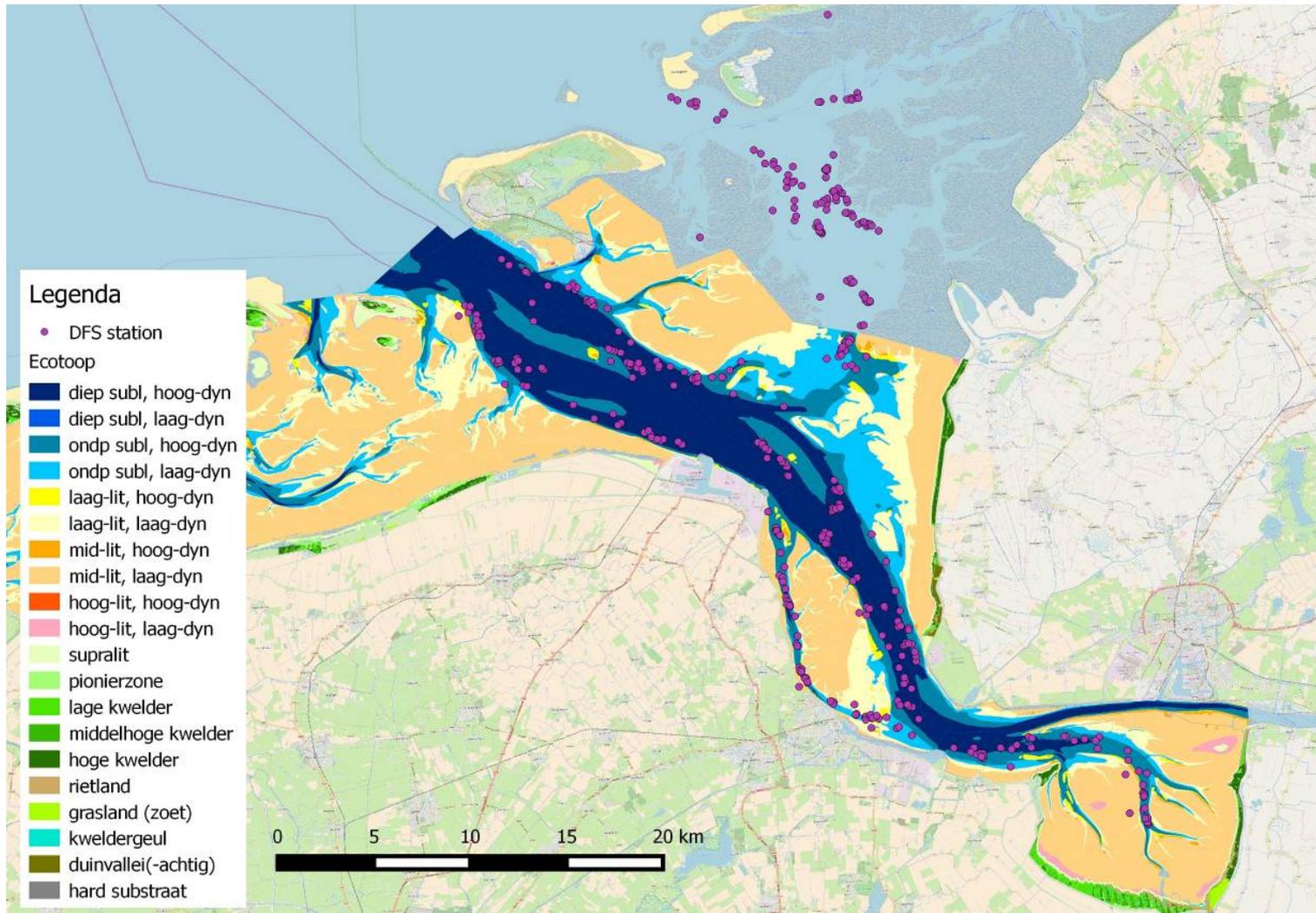


Vogelsoort	Alisuc	Heddiv	Areamar	Hetfil	Marvir	Scoarm	Etelon	Nephom	Ceredu	Macbal	Myaare	Corosp	Hydulv	ANDERS
Bergeend (<i>Tadorna tadorna</i>)		5%								35%			60%	
Scholekster (<i>Haematopus ostralegus</i>)		10%							60%	20%				10%
Kluut (<i>Recurvirostra avosetta</i>)		90%							2%	3%		5%		
Bontbekplevier (<i>Charadrius hiaticula</i>)		38%		20%		20%							22%	
Zilverplevier (<i>Pluvialis squatarola</i>)		57%	10%	10%				10%	3%	3%		7%		
Kanoet (<i>Calidris canutus</i>)									10%	60%	5%		25%	
Bonte strandloper (<i>Calidris alpina</i>)		30%		5%	25%	5%		5%	7%	7%		8%	8%	
Rosse grutto (<i>Limosa lapponica</i>)		20%	14%	20%		20%		20%		3%		3%		
Wulp (<i>Numenius arquata</i>)		20%	15%						23%	23%				19%
Zwarte ruiter (<i>Tringa erythropus</i>)		34%								4%		62%		
Tureluur (<i>Tringa totanus</i>)		16%				15%		15%		7%		24%	23%	

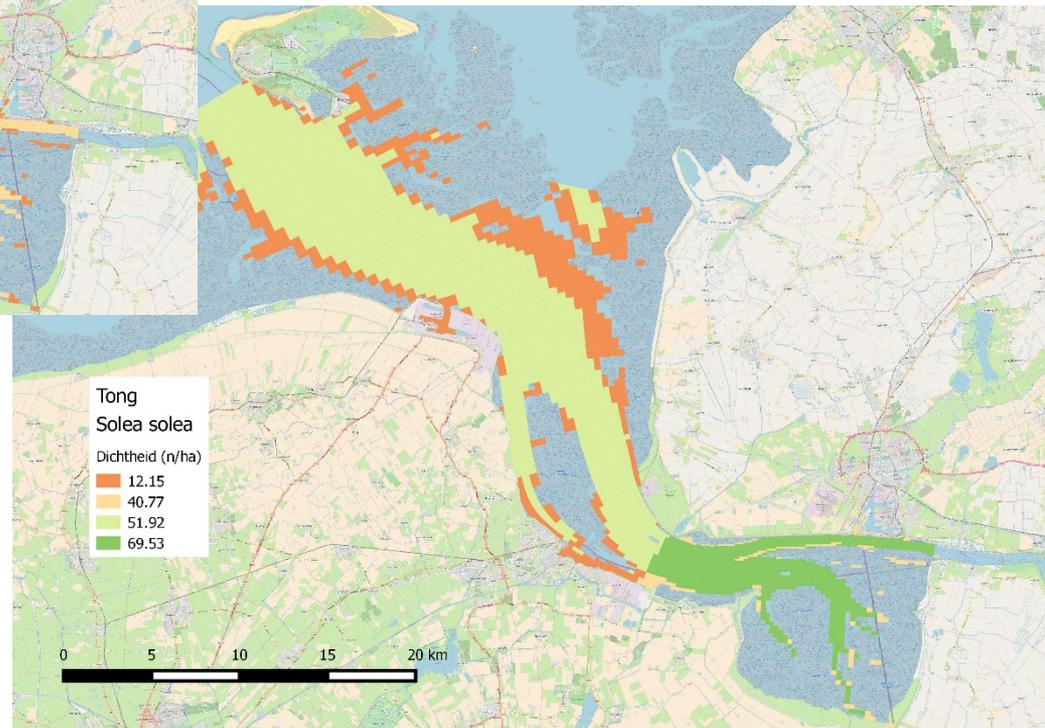
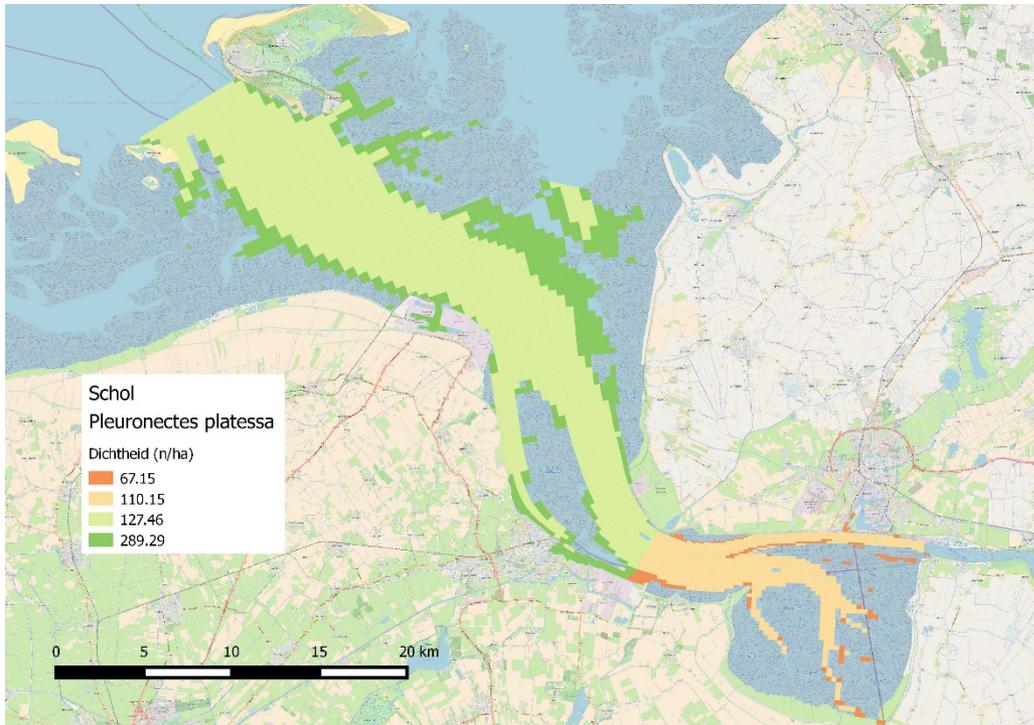
Result birds



Fish – DFS data

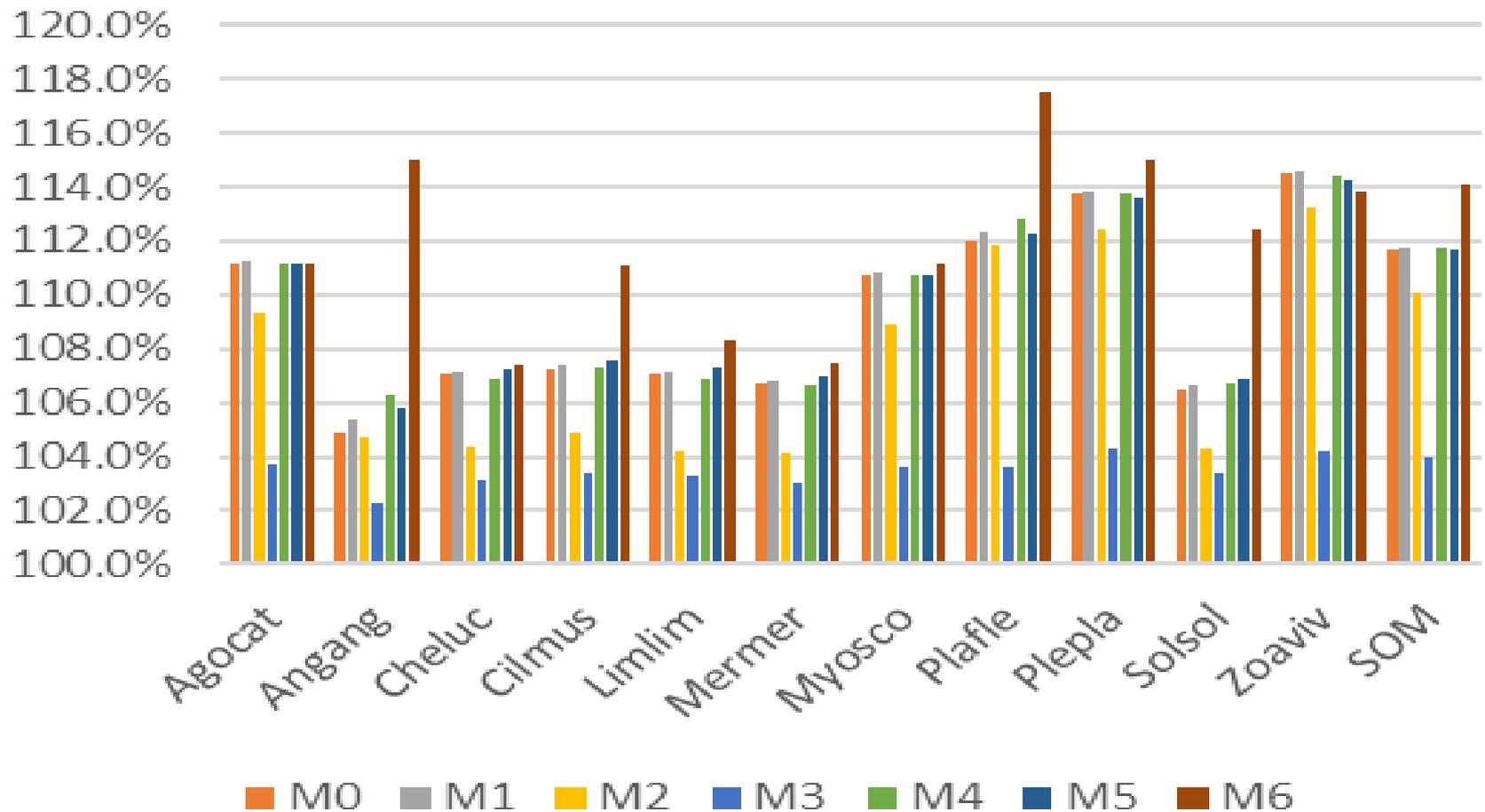


Fish



Result fish

Procentuele verandering t.o.v. 2014



Conclusions

- Sea level rise is a major ecological problem for the Ems-Dollard.
- The ecological targets as described in the Adaptive Programme Ems-Dollard 2050 need further elaboration.