AARHUS UNIVERSITY
DCE – DANISH CENTRE FOR ENVIRONMENT AND ENERGY

DHI

Application of the Danish EPA's Marine Model Complex and Development of a Method Applicable for the River Basin Management Plans 2021-2027

Management Scenario 2c – Land-based nutrient scenarios (loadings from neighbouring countries unchanged)

Miljø- og Fødevareministeriet
Miljøstyrelsen

Technical Note
October 2021

The expert in **WATER ENVIRONMENTS**

Application of the Danish EPA's Marine Model Complex and Development of a Method Applicable for the River Basin Management Plans 2021-2027

Management Scenario 2c –Land-based nutrient scenarios (loadings from neighbouring countries unchanged)

Prepared for	Danish EPA (Miljøstyrelsen, Fyn)
Represented by	Mr Harley Bundgaard Madsen, Head of Section

Eelgrass in Kertinge Nor
Photo: Peter Bondo Christensen

Authors	Anders Chr. Erichsen (DHI), Karen Timmermann (DTU), Trine Cecilie Larsen (DHI), Jesper Christensen (AU), Sophia Elisabeth Bardram Nielsen (DHI) & Stiig Markager (AU)
Quality supervisor	Mads Birkeland (DHI), Nikolaj Reducha Andersen (AU) & Signe Jung-Madsen (DCE)

Project number	11822953
Approval date	29-10-2021
Classification	Open

Preface

This report is commissioned and funded by the Danish Environmental Protection Agency (EPA). The data, methods and results included in the report are intended to be an integrated part of the material behind the Danish River Basin Management Plans (RBMP) 2021-2027.

The work reported was managed and performed by DHI and AU/DCE. During the project, a steering committee followed the development, and was involved through dialogue and follow-up on progress, etc. The steering committee consisted of members from the Danish Ministry of Environment and Food (MFVM), the Danish EPA (MST), DHI and AU.

In addition, a follow-up group consisting of members from The Danish Agriculture & Food Council, SEGES, Sustainable Agriculture (BL), the Danish Society for Nature Conservation, the Danish Sports Fishing Association, Danish Fishermen PO (DFPO), the Danish Ports, and KL/municipalities was affiliated with the project. The follow-up group has been continuously informed about the progress of the project at meetings convened by the MFVM.

Choice of methods, data processing, description and presentation of results have been solely AU's and DHI's decision and responsibility. A draft version of this report has been reviewed by MST and the follow-up group.

CONTENTS

Preface

1 Introduction 1

2 Preconditions for MAI Calculations 2
2.1 Management Scenario Definitions 2
2.1.1 Management Scenario 2 2
2.1.2 Scenario Loadings 3
2.2 Method for Calculating Danish N-MAI 4
2.3 Results 4
2.4 Closing Remarks 14

3 References 15

FIGURES

Figure 2-1 Atmospheric N depositions summarised at overall water body level. 3

TABLES

Table 2-1 Overview of input data used to construct management scenario 2c. 4
Table 2-2 Maximum Allowable Nitrogen Inputs (N-MAIs) for Danish water bodies giving present-day loadings from neighbouring countries and reductions in atmospheric N deposition according to the NEC directive. 6

Table A- 1 Water body specific MAIs based on the two individual indicators chlorophyll-a (Chl-a) and light (light) estimated from statistical models (STAT) respectively mechanistical models (MEK). 17

Table B- 1 Water body specific MAIs based on the two individual indicators chlorophyll-a (Chl-a) and light (light) estimated from statistical models (STAT) respectively mechanistical models (MEK). 25

Table C- 1 Water body specific MAIs based on the two individual indicators chlorophyll-a (Chl-a) and light (light) estimated from statistical models (STAT) respectively mechanistical models (MEK). 33

Table D- 1 Water body specific MAIs based on the two individual indicators chlorophyll-a (Chl-a) and light (light) estimated from statistical models (STAT) respectively mechanistical models (MEK). 41

Table E- 1 Water body specific MAIs based on the two individual indicators chlorophyll-a (Chl-a) and light (light) estimated from statistical models (STAT) respectively mechanistical models (MEK). 49

APPENDICES

Appendix A Maximum Allowable Nitrogen Inputs (MAIs) based on management scenario 2c and assuming 0% reduction in Danish land-based P-loads 16
Appendix B Maximum Allowable Nitrogen Inputs (MAIs) based on management scenario 2c and assuming 10% reduction in Danish land-based P-loads 24
Appendix C Maximum Allowable Nitrogen Inputs (MAIs) based on management scenario 2c and assuming 20% reduction in Danish land-based P-loads 32
Appendix D Maximum Allowable Nitrogen Inputs (MAIs) based on management scenario 2c and assuming 30% reduction in Danish land-based P-loads 40
Appendix E Maximum Allowable Nitrogen Inputs (MAIs) based on management scenario 2c and assuming 50% reduction in Danish land-based P-loads 48

1 Introduction

When preparing the Danish River Basin Management Plans 2015-2021 (RMBP 2015-2021), DHI and Aarhus University (AU) developed a number of mechanistic (DHI) and statistical (AU) models that were used for calculating chlorophyll-a target values defining the threshold (GM) between 'Good Ecological Status' (GES) and 'Moderate Ecological Status'. The models were also used for calculating Maximum Allowable Inputs (MAIs) of total nitrogen (N) from Danish catchments based on the GM threshold value and a proxy for eelgrass depth limit. Hence, the development aimed at both the model development and the development of a method for calculating the MAIs.

As part of the political, regulatory package 'The Food and Agriculture Agreement from 2015' an international evaluation of the procedures used in the RBMP 2015-2021 was conducted. The evaluation was finalised autumn 2017 with a report (Herman *et al.* 2017) including a number of recommendations for improving the scientific background behind the RBMP 2021-2027.

To follow up on the international evaluation, the Danish EPA facilitated a range of research and development projects (R&D) projects with the overall aim of developing methods to calculate robust, transparent and differentiated chlorophyll-a reference values (and corresponding GM values) and MAIs in as many water bodies as possible for implementation into the RBMP 2021-2027.

Two central R&D projects relate to the continued model development in the assessment of reference chlorophyll-a values (and corresponding target values) and final MAI calculations. Other projects support different aspects of the final MAI calculations, but here we focus on the following two central R&D projects:

- 'Recommendations for the continued development of models and methods for use in the River Basin Management Plan 2021-2027. Follow-up on the international evaluation of marine models behind the River Basin Management Plan 2015-2021' (Erichsen & Timmermann 2018)
- 'Application of the Danish EPA's Marine Model Complex and Development of a Method Applicable for the River Basin Management Plans 2021-2027'.

The outcome of the above research projects is a set of MAIs based on a range of scenarios reflecting different assumptions regarding future developments in nutrient loading from neighbouring countries and the atmosphere as described in Erichsen *et al.* 2020. In the present technical note, the assumptions and input data behind management scenario 2c and corresponding results are described. In management scenario 2c it is assumed that land based nutrient loadings from neighbouring countries are unchanged compared to present day (2014-2018) loadings, and the potential impact for MAI is assessed.

2 Preconditions for MAI Calculations

The Danish MAIs will, among other things, also depend on future loadings from neighbouring countries and atmospheric N-depositions as described in more detail in Erichsen *et al.* 2020. In addition, some water bodies may also respond to Danish land-based P loadings, which is why one set of Danish land-based N-MAIs corresponds to a set of Danish land-based P-MAIs.

In order to calculate a set of Danish land-based N-MAIs with the developed models, we need to make assumptions on future loadings and management strategies from neighbouring countries (management scenarios), and Danish land-based P loadings.

With respect to reductions in neighbouring countries, the Danish EPA has defined a set of preconditions to be used for constructing management scenarios defining potential developments in future non-Danish land-based loadings and atmospheric deposition. For each scenario, Danish land-based N-MAIs are calculated based on 0%, 10%, 20%, 30% and 50% Danish land-based P reductions, respectively.

In this technical note, we have not assessed the feasibility of the scenarios defined by the Danish EPA, but solely provided N-MAIs that will ensure that the targets are reached given that the preconditions related to nutrient loading from other countries, atmospheric N deposition and P loading from Danish catchments are fulfilled.

2.1 Management Scenario Definitions

As mentioned above, the Danish EPA has defined a set of assumptions regarding nutrient inputs from other countries and the atmosphere to be used as preconditions for the Danish land-based N-MAI calculations. The preconditions are grouped into three management scenarios and one scenario related to the interpretation of the Water Framework Directive (WFD-scenario). The different assumptions are described in general terms in Erichsen *et al.* 2020, whereas the present technical note describes management scenario 2c in more detail (also see 'bold' description below).

2.1.1 Management Scenario 2 – Regional Treaties and RBMP 2015-2021

The second group of scenarios encompasses assumptions for the land-based loadings from neighbouring countries that are not based on adopted treaties. The assumptions include:

a) Neighbouring countries are assumed to have had the same percentage of nutrient reduction as Denmark when Danish land-based N-MAIs are reached. The reduction percentage is relative to the basis period 1997-2001

b) Neighbouring countries are assumed to have the same area-specific anthropogenic loadings (kg/ha) as Denmark when Danish N-MAIs are reached

c) Loadings from neighbouring countries are unchanged compared to the present-day loadings (2014-2018)

d) Danish land-based N-MAIs assuming updated BSAP targets. A new set of targets is being developed in HELCOM and will be adopted by the end of 2021.

e) Additional Wadden Sea P-reductions[1]

[1] This scenario is in addition to what has been reported in previous technical notes (e.g. Erichsen *et al.* 2020) and is a supplement to the series of management scenarios.

For the above five sub-scenarios, the atmospheric deposition will be kept as described in management scenario 1, i.e. full implementation of the NEC-directive with respect to atmospheric N-deposition (see Erichsen *et al.* (2020) for details).

2.1.2 Scenario Loadings

The full overview of the scenario reductions applied for management scenario 2c in other countries than Denmark, and atmospheric depositions are summarised in Table 2-1, and explained briefly in the following sections.

Present-Day Loadings

In management scenario 2c, the present-day loadings to the Baltic Sea and the North Sea from all other countries than Denmark are applied.

These loadings correspond to the loadings included in the calibration and validation of the mechanistic models and are described in more detail in Erichsen & Birkeland (2020).

NEC-Directive

According to Blicher-Mathiesen & Sørensen (2020), the reductions in atmospheric N deposition after full implementation of the NEC-directive altogether amount to 16% or a 10% reduction in 2027, if the different countries' predictions are implemented. The full reduction of 16% is used for management scenarios 1 and 2, whereas the prediction of 10% reduction is used for management scenario 3a (see Erichsen *et al.* 2020 for details).

Data are delivered by AU, and the reductions are resolved on an overall water body scale and implemented in the Danish land-based N-MAIs calculations, see Figure 2-1 for data.

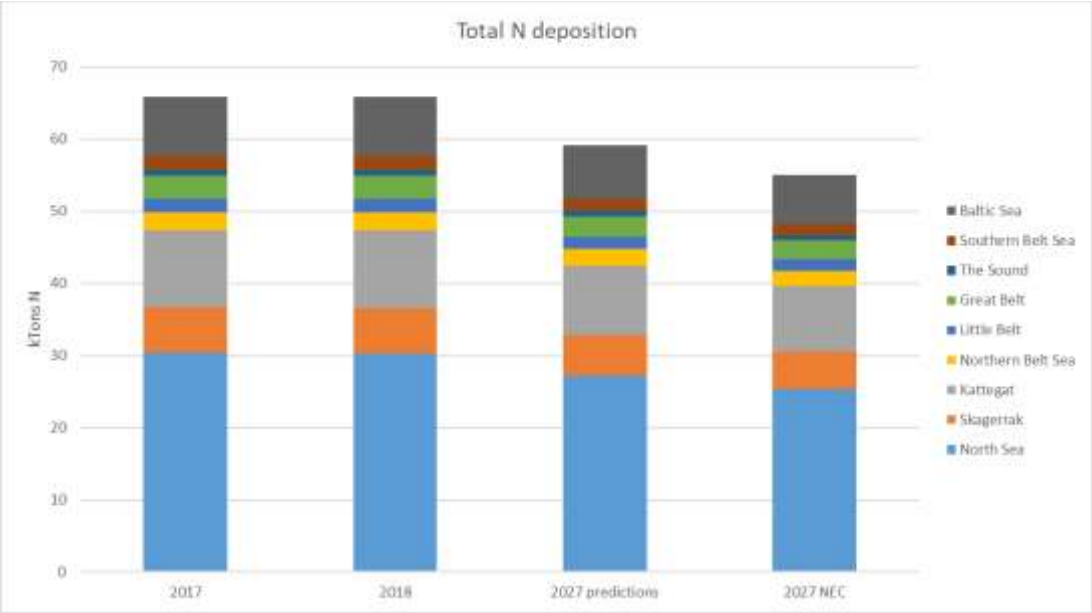

Figure 2-1 Atmospheric N depositions summarised at overall water body level. '2017' and '2018' represents present-day atmospheric N-depositions, whereas '2027 NEC' represents agreement behind the directive, and '2027 predictions' represents the different country prognosis.

Table 2-1 Overview of input data used to construct management scenario 2c.

Danish water areas affected	N load reduction in management scenario 2c. Reductions are in % of current (2014-2018) load	P load reduction applied in management scenario 2c. Reductions are in % of current (2014-2018) load	Adopted treaties
Wester Baltic Sea	0%	0%	-
Great Belt and Kattegat	0%	0%	-
Southern Little Belt	0%	0%	-
North Sea water bodies and Limfjorden	0%	0%	-
Atmospheric deposition, all Danish water bodies	16%	0%	NEC directive

2.2 Method for Calculating Danish N-MAI

Based on the assumed future load reductions from neighbouring countries and atmospheric deposition as described above, N-MAIs from Danish catchments to each of the 109 water bodies is calculated. This is based on the status value of the indicators in each water body, as well as a defined target value (*Erichsen & Birkeland 2020b*). The status values for the two indicators are based on measurements. Target values are defined as a “slight deviation from reference conditions”, where reference conditions refer to a state with minimal human influence. Based on the method described in Erichsen *et al*. (2020), each target value will have a MAI which will support the system to achieve GES.

Since all Danish water bodies are connected to a higher or lesser degree, the reduction needed for a single water body cannot be assessed in isolation. In addition, it is necessary to consider the load reduction requirement estimated for nearby water bodies. To account for connected water bodies, the following scheme was applied:

1) Catchments are assigned to each water body. Local catchments are assigned to the inner part (sub-catchments) of estuaries (upstream water bodies), whereas two or more local catchments (main-catchments) are assigned for downstream water bodies (e.g. the outer part of estuaries) and more open water bodies.

2) Load reductions (in %) for each individual water body are calculated as described in Erichsen *et al.* (2020) and transformed into a N-reduction requirement in tons using the load of the assigned catchment.

3) For up-stream water bodies (with local catchments) the calculated reduction is a minimum requirement that should be obtained independently of downstream waterbody requirements.

4) Reduction requirements for downstream water bodies are corrected, considering any minimum reduction handled by up-stream water bodies.

5) Reduction requirements are transformed into MAIs by subtracting the required load reduction from the average annual load and aggregated to the corresponding local and/or regional catchment.

2.3 Results

Based on the above-described assumption (implementation of the Baltic Sea Action Plan, German nutrient reductions according to RBMP 2015-2021, additional Wadden Sea P-reduction

and reductions in atmospheric N deposition according to the NEC directive) the different reduction requirements and corresponding MAIs are calculated.

The different reduction requirements (%-wise and in actual tons) based on the different indicators and different models are included in Appendices A-E (20% P-reductions) and Appendices F-J (30% P-reductions), whereas the aggregated MAIs are reported in Table 2-2.

Table 2-2 Maximum Allowable Nitrogen Inputs (N-MAIs) for Danish water bodies giving present-day loadings from neighbouring countries and reductions in atmospheric N deposition according to the NEC directive.
The table shows N-MAIs in tons N per year, where 'main' denotes main-catchment, and 'sub' indicates sub-catchments being part of a main-catchment. The table shows average annual loads as well as N-MAIs calculated for 5 different phosphorus reduction scenarios designated P0, P10, P20, P30 and P50, where phosphorus loadings from Danish catchments are reduced by 0%, 10%, 20%, 30% and 50%, respectively. The column 'aggregated' denotes sub-catchments included in specific MAIs.

No.	Name	Aggregation	Average annual (main)	Average annual (sub)	P0 (main)	P0 (sub)	P10 (main)	P10 (sub)	P20 (main)	P20 (sub)	P30 (main)	P30 (sub)	P50 (main)	P50 (sub)
1	Roskilde Fjord, ydre	1,2		764		521		523		525		527		531
2	Roskilde Fjord, indre	2		388		372		373		374		375		377
6	Nordlige Øresund	6	1,098		925		930		936		941		951	
16	Korsør Nor	16		40		24[a]		24[a]		25		25		26
17	Basnæs Nor	17		69		40[a]		40[a]		40[a]		40[a]		40[a]
18	Holsteinborg Nor [c)]	18		22		22		22		22		22		22
24	Isefjord, ydre	24,165		899		486		495		504		514		533
25	Skælskør Fjord og Nor	25		44		32		33		33		34		36
28	Sejerø Bugt	28	164		108[a]		108[a]		108[a]		108[a]		108[a]	
29	Kalundborg Fjord	29	69		16[a]		18[a]		19[a]		21[a]		23[a]	
34	Smålandsfarvandet, syd [c)]	34	523		523		523		523		523		523	
35	Karrebæk Fjord	35		1,272		975		1,006		1,034		1,062		1,115
36	Dybsø Fjord	36		61		59		60		61		61		61
37	Avnø Fjord	37		238		154		157		159		162		167
38	Guldborgsund [c)]	38	419		419		419		419		419		419	

No.	Name	Aggregation	Average annual (main)	Average annual (sub)	P0 (main)	P0 (sub)	P10 (main)	P10 (sub)	P20 (main)	P20 (sub)	P30 (main)	P30 (sub)	P50 (main)	P50 (sub)
44	Hjelm Bugt	44	91		20[b]		20[b]		20[b]		20[b]		20[b]	
45	Grønsund	45	278		157[a]		157[a]		157[a]		157[a]		157[a]	
46	Fakse Bugt	46,47	509		308[a]		308[a]		308[a]		308[a]		308[a]	
47	Præstø Fjord	47		208		119		122		126		129		136
48	Stege Bugt [c)]	48,49	259		245		245		245		245		245	
49	Stege Nor	49		24		10[a]		10[a]		10[a]		10[a]		10[a]
56	Østersøen, Bornholm	56	860		184[b]		184[b]		184[b]		184[b]		184[b]	
57	Østersøen, Christiansø	57	3		2[a]		2[a]		2[a]		2[a]		2[a]	
59	Nærå Strand	59		98		22[b]		24[a]		30		39		59
62	Lillestrand	62		11		5[a]		5[a]		5[a]		5[a]		5[a]
68	Lindelse Nor	68		50		30[a]		30[a]		30[a]		30		30
72	Kløven	72		43		19[a]		19[a]		19[a]		19[a]		19[a]
74	Bredningen	74		128		43[a]		45		50		56		67
80	Gamborg Fjord	80		80		49[a]		49[a]		49[a]		49[a]		49[a]
82	Aborg Minde Nor	82		152		34[b]		34[b]		34[b]		34[b]		41[a]
83	Holckenhavn Fjord	83		290		95[a]		103		114		126		149
84	Kerteminde Fjord	84,85		50		33		33		33		33		33
85	Kertinge Nor	85		24		13[a]		13[a]		14[a]		14[a]		15
86	Nyborg Fjord	83,86		308		114[a]		122		133		144		168

No.	Name	Aggregation	Average annual (main)	Average annual (sub)	P0 (main)	P0 (sub)	P10 (main)	P10 (sub)	P20 (main)	P20 (sub)	P30 (main)	P30 (sub)	P50 (main)	P50 (sub)
87	Helnæs Bugt	87		216		72[a]		72[a]		72[a]		72[a]		72[a]
89	Lunkebugten	89		16		5[b]		5[b]		5[b]		5[b]		5[b]
90	Langelandssund	83,86,89,90	768		208[b]		208[b]		208[b]		208[b]		208[b]	
92	Odense Fjord, ydre	92,93		1,358		803		814		832		850		885
93	Odense Fjord, Seden Strand	93		1,288		733[a]		744		762		779		815
95	Storebælt SV	95	188		115[a]		115[a]		115[a]		115[a]		115[a]	
96	Storebælt NV	96, 84, 85	227		132[a]		132[a]		132[a]		132[a]		132[a]	
101	Genner Bugt	101		35		13[b]		13[b]		13[b]		13[b]		13[a]
102	Åbenrå Fjord	102		130		59[b]		59[b]		59[b]		59[b]		59[b]
103	Als Fjord	103,104,105		269		78[b]		78[b]		78[b]		78[b]		78[b]
104	Als Sund	104		68		48		48		48		48		48
105	Augustenborg Fjord	105		62		29[a]		29[a]		29[a]		29[a]		29[a]
106	Haderslev Fjord	106		239		129[a]		130[a]		130[a]		131		133
107	Juvre Dyb	107		349		119[a]		119[a]		119[a]		119[a]		119[a]
108	Avnø Vig	108		60		23[a]		24[a]		25		27		32
109	Hejlsminde Nor	109		138		89[a]		95		104		108		118
110	Nybøl Nor	110		66		29[b]		29[b]		30[a]		30[a]		31[a]
111	Lister Dyb	111		2,155		714[a]		714[a]		714[a]		714[a]		714[a]
113	Flensborg Fjord, indre	113		51		19[b]		19[b]		19[b]		19[b]		19[b]

No.	Name	Aggregation	Average annual (main)	Average annual (sub)	P0 (main)	P0 (sub)	P10 (main)	P10 (sub)	P20 (main)	P20 (sub)	P30 (main)	P30 (sub)	P50 (main)	P50 (sub)
114	Flensborg Fjord, ydre	110,113,114		219		79[b]		79[b]		79[b]		79[b]		79[b]
119	Vesterhavet, syd	119, 107, 111, 121, 120	8,538		2,720[a]		2,720[a]		2,720[a]		2,720[a]		2,720[a]	
120	Knudedyb	120		2,910		841[a]		841[a]		841[a]		841[a]		841[a]
121	Grådyb	121		2,920		842[a]		842[a]		842[a]		842[a]		842[a]
122	Vejle Fjord, ydre	122,123		968		457[a]		457[a]		457[a]		457[a]		457[a]
123	Vejle Fjord, indre	123		561		394[a]		398		405		413		428
124	Kolding Fjord, indre	124		493		215[a]		219[a]		233		249		288
125	Kolding Fjord, ydre	124,125		528		250[a]		254[a]		268[a]		284[a]		300[a]
127	Horsens Fjord, ydre	127,128		833		251[a]		256[a]		260[a]		264[a]		272[a]
128	Horsens Fjord, indre	128		782		377		379		382		385		391
129	Nissum Fjord, Ydre	129,130, 131		2,412		1,073		1,191		1,336		1,465		1,905
130	Nissum Fjord, mellem	130,131		2,083		743		861		1,006		1,216		1,676
131	Nissum Fjord, Felsted Kog	131		1,938		1,300[b]		1,309[a]		1,361[a]		1,474		1,727
132	Ringkøbing Fjord	132		4,748		2,446[a]		2,543[a]		2,662[a]		2,782[a]		3,019[a]
133	Vesterhavet, nord	133, 129,130,131 , 132	7,237		2,485[a]		2,485[a]		2,485[a]		2,485[a]		2,485[a]	
136	Randers Fjord, indre	136		2,925		2,201[a]		2,201[a]		2,256		2,346		2,525

No.	Name	Aggregation	Average annual (main)	Average annual (sub)	P0 (main)	P0 (sub)	P10 (main)	P10 (sub)	P20 (main)	P20 (sub)	P30 (main)	P30 (sub)	P50 (main)	P50 (sub)
137	Randers Fjord, ydre	136,137		3,078		2,137		2,235		2,332		2,429		2,619
138	Hevring Bugt	138, 137, 136	3,235		2,294		2,392		2,490		2,586		2,776	
139	Anholt [c)]	139	9		9		9		9		9		9	
140	Djursland Øst	140	856		538[a]		538[a]		538[a]		538[a]		538[a]	
141	Ebeltoft Vig [c)]	141	14		14		14		14		14		14	
142	Stavns Fjord	142		5		3[a]		3[a]		3[a]		3[a]		3[a]
144	Knebel Vig	144		18		6[a]		6[a]		6[a]		6[a]		6[a]
145	Kalø Vig	144,145		190		136		139		142		144		147
146	Norsminde Fjord	146		140		75[a]		91[a]		98		105		121
147	Århus Bugt og Begtrup Vig	144,145,147	656		453[a]		453[a]		453[a]		453[a]		453[a]	
154	Kattegat Læsø [c)]	154	78		78		78		78		78		78	
157	Bjørnholms Bugt, Riisgårde Bredning, Skive Fjord og Lovns Bredning	157,158		3,632		1,174[a]		1,290[a]		1,402[a]		1,509[a]		1,770
158	Hjarbæk Fjord	158		1,795		522		595		669		744		900
159	Mariager Fjord, indre	159		516		132		153		172		192		232
160	Mariager Fjord, ydre	159,160		963		579		600		619		639		679
165	Isefjord, indre	165		812		463		463		463		463		463
200	Kattegat Nordsjælland	1,2,24,165,200	1,857		1,201[a]		1,212[a]		1,223[a]		1,235[a]		1,243a	

No.	Name	Aggregation	Average annual (main)	Average annual (sub)	P0 (main)	P0 (sub)	P10 (main)	P10 (sub)	P20 (main)	P20 (sub)	P30 (main)	P30 (sub)	P50 (main)	P50 (sub)
201	Køge Bugt	201	1,109		481[a]		489[a]		497[a]		506[a]		523[a]	
204	Jammerland Bugt og Musholm Bugt	204	1,327		568[a]		568[a]		569[a]		569[a]		570[a]	
206	Smålandsfarvandet, åbne del	16,17,18,25,35,36,37,206	2,014		870		870		870		870		870	
207	Nakskov Fjord	207		454		172		174		177		179		184
208	Femerbælt	207,208,209	1,530		891[a]		891[a]		891[a]		891[a]		891[a]	
209	Rødsand og Bredningen	209		521		237		237		237		237		237
212	Fåborg Fjord	212		30		10[b]		10[b]		10[b]		10[b]		10[b]
214	Det sydfynske Øhav	68,72,212,214	633		176[b]		176[b]		176[b]		176[b]		176[b]	
216	Lillebælt, syd	87,101,102,103,104,105,110,113,114,216	1,309		718[a]		718[a]		718[a]		718[a]		718[a]	
217	Lillebælt Bredningen	74,82,106,108,109,217	956		327[b]		327[b]		327[b]		327[b]		327[b]	
219	Århus Bugt, syd, Samsø og Nordlige Bælthav	59,62,92,93,127,128,142,146,219	2,810		794[b]		794[b]		794[b]		794[b]		794[b]	
221	Skagerrak	221	1,423		1,423		1,423		1,423		1,423		1,423	
222	Kattegat Ålborg Bugt [c)]	222, 159,160	2,026		1,642		1,663		1,682		1,702		1,742	

No.	Name	Aggregation	Average annual (main)	Average annual (sub)	P0 (main)	P0 (sub)	P10 (main)	P10 (sub)	P20 (main)	P20 (sub)	P30 (main)	P30 (sub)	P50 (main)	P50 (sub)
224	Nordlige Lillebælt	122,123,224	1,588		988[a]		988[a]		988[a]		988[a]		988[a]	
225	Nordlige Kattegat ÅlbækBugt	225	706		450[a]		450[a]		450[a]		450[a]		450[a]	
231	Lillebælt Snævringen	231,124,125,80	789		259[b]		259[b]		259[b]		259[b]		259[b]	
232	Nissum Bredning	232	880		363[a]		372[a]		380[a]		389[a]		406[a]	
233	Kaas Bredning og Venø Bugt	232,233		1,955		890		997		1,105		1,213		1,435
234	Løgstør Bredning	157,158,234		4,336		2,391[a]		2,504[a]		2,616[a]		2,728[a]		2,952[a]
235	Nibe Bredning og Langerak	238,236,235,233,232,157,158,234	11,064		6,447		6,560		6,713		6,870		7,277	
236	Thisted Bredning	236		1,091		333[a]		343[a]		353[a]		363[a]		382[a]
238	Halkær Bredning	238		620		114[b]		114[b]		154[a]		199[a]		383
	Danish N-load (National MAI)		58,100		29,553		29,820		30,125		30,433		31,127	

a) Truncated at land-based reference N-load for one indicator

b) Truncated at land-based reference N-load for two indicators

c) Chlorophyll-a and light 'Good-Moderate' target obtained based on measurement (and not dependent on reductions from neighbouring countries or atmospheric depositions

2.4 Closing Remarks

The estimated Maximum Allowable Nitrogen Input (N-MAI) to Danish water bodies presented in this report is based on the preconditions that the BSAP, the RBMP 2015-2021, additional Wadden Sea P-reductions (20% and 30%), and the NEC directive will be fully implemented. These treaties have been adopted but not yet fully implemented. These assumptions, which have not been assessed as part of this study, are accepted as preconditions.

If the preconditions are fulfilled, and the MAI for Danish water bodies is reached by the end of 2027, all Danish water bodies will most likely not have reached Good Ecological Status (GES) as defined in the WFD. This is because:

- The MAI estimation is based on the depth of light as a proxy for the indicator eelgrass depth limit. Hence, even if light has reached the target value, recovery of eelgrass after light improvements may take years to decades. In addition, other factors, such as sediment suitability, lack of seedlings, etc., may delay or prevent eelgrass recovery.

- With the given preconditions in management scenario 1, one or both of the indicators (chlorophyll-a and light) may not reach the target value despite reductions from Danish catchments. In these situations, the reduction requirement for that indicator is cut off/truncated at the reference loading. A cut-off at reference loading indicates that due to the scenario and associated preconditions, a specific MAI for that water body that ensures GES cannot be obtained, and administrative choices have to be made, like applying an average reduction from neighbouring water bodies, reductions to down-stream water bodies or a general MAI (kg/ha) for those water bodies. However, the implication is that GES for both indicators cannot be expected in these water bodies, even if MAI is obtained.

- The method is not based on the one-out-all-out principle as required in the WFD, but on an average of two indicators. Hence, it is expected that both indicators will be as close to the target value as possible, but one will theoretically be above and one below the target value.

- In this management scenario, we are using the boundary between good and moderate status as the target value for each of the indicators. Due to uncertainties, there is a 50% chance that the indicator value will end in good status and a 50% chance that the indicator value will end in moderate status, if MAI for that indicator is reached, assuming the measured indicator follows a symmetrical distribution.

- As some ecosystems respond with significant time-lags to changes in loadings, it will take years before the full environmental effects of nutrient reductions can be observed. Hence, reaching MAI will provide the conditions for obtaining GES but the achievement of GES will likely be delayed.

3 References

/1/ Blicher-Mathiesen G & Sørensen P (red) (2020). Baseline 2027 for udvalgte elementer. Aarhus Universitet, DCE – Nationalt Center for Miljø og Energi, 120 s. - Teknisk rapport nr. 184 http://dce2.au.dk/pub/TR184.pdf

/2/ COWI (2018). Nabotjek af EU-landes fremgangsmåder ved planlægning for marine vandområder i henhold til Vandrammedirektivet. Komparativ rapport. COWI rapport.

/3/ Erichsen AC (Ed.), Timmermann K (Ed.), Birkeland M, Christensen JPA, Markager S, Møhlenberg F. (2018) Recommendations for continued development of models and methods for use in the River Basin Management Plan 2021-2027. Follow-up on the international evaluation of marine models behind the River Basin Management Plan 2015-2021. Technical report. DHI.

/4/ Erichsen AC, Birkeland M, Timmermann K, Christensen J & Markager S (2020). Application of the Danish EPA's Marine Model Complex and Development of a Method Applicable for the River Basin Management Plans 2021-2027. Conceptual Method for Estimating Maximum Allowable Inputs. Technical report. DHI.

/5/ Erichsen AC, Birkeland M (2020a). Development of Mechanistic Models – Short Technical Description of Biogeochemical Model Input Data. Technical report. DHI.

/6/ Erichsen AC, Birkeland M (2020b). Methods for establishing Chlorophyll-a references and target values applicable for the River Basin Managements Plan 2021-2027. Technical report. DHI.

/7/ Gadegast M & Venohr M (2015). Modellierung Historischer Nährstoffeinträge und -Frachten zur Ableitung von Nährstoffreferenz – und Orientierungswerten für Mitteleuropäische Flussgebiete. Technical Report

/8/ Herman P, Newton A, Schernewski G, Gustafsson B, Malve O (2017) International Evaluation of the Danish Marine Models, Danish EPA.

Appendix A – Maximum Allowable Nitrogen Inputs (N-MAIs) based on management scenario 2c and assuming 0% reduction in Danish land-based P loads

Table A- 1 Water body specific MAIs based on the two individual indicators chlorophyll-a (Chl-a) and light penetration depth (light) estimated from statistical models (STAT) respectively mechanistical models (MEK).
The table shows both the individual calculations as well as the averaged water specific MAIs (without any aggregation) and corresponding need for reduction in %. The data in this table are based on management scenario 2c and Danish land-based P-reductions set at 0%.

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
1	Roskilde Fjord,ydre	1,2	764			632	410		521	521	32
2	Roskilde Fjord, indre	2	388	376		386	350	376	368	372	4
6	Nordlige Øresund	6	1,098			1,098	752		925	925	16
16	Korsør Nor	16	40			40	9		24	24	39
17	Basnæs Nor	17	69			69	10		40	40	42
18	Holsteinborg Nor	18	22			22	22		22	22	0
24	Isefjord, ydre	24,165	899	413	522	455	553	467	504	486	46
25	Skælskør Fjord og Nor	25	44			33	31		32	32	28
28	Sejerø Bugt	28	164			164	53		108	108	34
29	Kalundborg Fjord	29	69	13	25	13	13	19	13	16	77
34	Smålandsfarvandet, syd	34	523			523	523		523	523	0
35	Karrebæk Fjord	35	1,272			1,272	679		975	975	23
36	Dybsø Fjord	36	61			56	61		59	59	4
37	Avnø Fjord	37	238			238	71		154	154	35
38	Guldborgsund	38	419			419	419		419	419	0
44	Hjelm Bugt	44	91			20	20		20	20	78
45	Grønsund	45	278			270	44		157	157	43

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
46	Fakse Bugt	46,47	509			107	509		308	308	40
47	Præstø Fjord	47	208			136	102		119	119	43
48	Stege Bugt	48,49	259			259	259		259	259	0
49	Stege Nor	49	24			15	4		10	10	59
56	Østersøen, Bornholm	56	860			184	184		184	184	79
57	Østersøen, Christiansø	57	3			0	3		2	2	48
59	Nærå Strand	59	98			22	22		22	22	77
62	Lillestrand	62	11			7	3		5	5	58
68	Lindelse Nor	68	50			50	11		30	30	39
72	Kløven	72	43			28	11		19	19	55
74	Bredningen	74	128			44	42		43	43	67
80	Gamborg Fjord	80	80			22	75		49	49	39
82	Aborg Minde Nor	82	152			34	34		34	34	78
83	Holckenhavn Fjord	83	289			81	110		95	95	67
84	Kerteminde Fjord	84,85	50			15	50		33	33	35
85	Kertinge Nor	85	24	15		18	5	15	11	13	45
86	Nyborg Fjord	83,86	308			130	185		158	158	49
87	Helnæs Bugt	87	216			67	77		72	72	67
89	Lunkebugten	89	16			5	5		5	5	68

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
90	Langelandssund	83,86,89,90	767			197	197		197	197	74
92	Odense Fjord, ydre	92,93	1,358	661	996	934	965	828	950	889	35
93	Odense Fjord, Seden Strand	93	1,288		626	1,288	390	626	839	733	43
95	Storebælt SV	95	188			41	188		115	115	39
96	Storebælt NV	96, 84, 85	227			38	227		132	132	42
101	Genner Bugt	101	35			13	13		13	13	62
102	Åbenrå Fjord	102	130	59		59	59	59	59	59	55
103	Als Fjord	103,104,105	269			67	67		67	67	75
104	Als Sund	104	68			28	68		48	48	29
105	Augustenborg Fjord	105	62	29		29	30	29	29	29	53
106	Haderslev Fjord	106	239			104	154		129	129	46
107	Juvre Dyb	107	349			119			119	119	66
108	Avnø Vig	108	60			26	20		23	23	62
109	Hejlsminde Nor	109	138			120	58		89	89	36
110	Nybøl Nor	110	66			29	29		29	29	55
111	Lister Dyb	111	2,155			714			714	714	67
113	Flensborg Fjord, indre	113	51	19		19	19	19	19	19	63
114	Flensborg Fjord, ydre	110,113,114	219	66		66	66	66	66	66	70

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
119	Vesterhavet, syd	119, 107, 111, 121, 120	8,538			3,934			3,934	3,934	54
120	Knudedyb	120	2,910	841		841		841	841	841	71
121	Grådyb	121	2,920			842			842	842	71
122	Vejle Fjord, ydre	122,123	968			403	473		438	438	55
123	Vejle Fjord, indre	123	561	470	288	464	354	379	409	394	30
124	Kolding Fjord, indre	124	493	188		237	247	188	242	215	56
125	Kolding Fjord, ydre	124,125	528			278	287		282	282	47
127	Horsens Fjord, ydre	127,128	833			399	104		251	251	70
128	Horsens Fjord, indre	128	782			386	368		377	377	52
129	Nissum Fjord, Ydre	129,130, 131	2,413			1,335	977		1,156	1,156	52
130	Nissum Fjord, mellem	130,131	2,083			897	589		743	743	64
131	Nissum Fjord, Felsted Kog	131	1,938	1,938		662	662	1,938	662	1,300	33
132	Ringkøbing Fjord	132	4,747		1,679	4,748	1,679	1,679	3,213	2,446	48
133	Vesterhavet, nord	133, 129,130,131 , 132	7,239			1,176			1,176	1,176	84
136	Randers Fjord, indre	136	2,925	2,925	1,477	2,925	1,477	2,201	2,201	2,201	25
137	Randers Fjord, ydre	136,137	3,078	3,078	1,196	3,078	1,196	2,137	2,137	2,137	31

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
138	Hevring Bugt	138, 137, 136	2,714		3,235	1,439	3,235		2,337	2,337	14
139	Anholt	139	9			9	9		9	9	0
140	Djursland Øst	140	856			219	856		538	538	37
141	Ebeltoft Vig	141	14			14	14		14	14	0
142	Stavns Fjord	142	5			5	1		3	3	37
144	Knebel Vig	144	18			5	7		6	6	68
145	Kalø Vig	144,145	190	123	175	95	149	149	122	135	29
146	Norsminde Fjord	146	140			103	47		75	75	47
147	Århus Bugt og Begtrup Vig	144,145,147	656	250	656	250	656	453	453	453	31
154	Kattegat Læsø	154	78			78	78		78	78	0
157	Bjørnholms Bugt, Riisgårde Bredning, Skive Fjord og Lovns Bredning	157,158	3,633			992	1,356		1,174	1,174	68
158	Hjarbæk Fjord	158	1,795			417	627		522	522	71
159	Mariager Fjord, indre	159	516			81	184		132	132	74
160	Mariager Fjord, ydre	159,160	963			768	487		627	627	35
165	Isefjord, indre	165	812	339		364	812	339	588	463	43
200	Kattegat Nordsjælland	1,2,24,165,200	1,857			1,857	629		1,243	1,243	33
201	Køge Bugt	201	1,109	712		249	249	712	249	481	57

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
204	Jammerland Bugt og Musholm Bugt	204	1,327			828	308		568	568	57
206	Smålandsfarvandet, åbne del	16,17,18,25,35,36,37,206	2,014			1,471	270		870	870	57
207	Nakskov Fjord	207	454			265	79		172	172	62
208	Femerbælt	207,208,209	1,530			252	1,530		891	891	42
209	Rødsand og Bredningen	209	521			247	227		237	237	54
212	Fåborg Fjord	212	30			10	10		10	10	67
214	Det sydfynske Øhav	68,72,212,214	633	176	176	176	176	176	176	176	72
216	Lillebælt, syd	87,101,102,103,104,105,110,113,114,216	1,309			462	1,309		885	885	32
217	Lillebælt Bredningen	74,82,106,108,109,217	956	276		276	276	276	276	276	71
219	Århus Bugt, syd, Samsø og Nordlige Bælthav	59,62,92,93,127,128,142,146,219	2,810			626	626		626	626	78
221	Skagerrak	221	1,423			1,423			1,423	1,423	0
222	Kattegat Ålborg Bugt	222,159,160	2,026			2,026	2,026		2,026	2,026	0
224	Nordlige Lillebælt	122,123,224	1,588			389	1,588		988	988	38

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
225	Nordlige Kattegat ÅlbækBugt	225	706			195	706		450	450	36
231	Lillebælt Snævringen	231,124,125,80	789		134	134	134	134	134	134	83
232	Nissum Bredning	232	880	297	560	297	297	429	297	363	59
233	Kaas Bredning og Venø Bugt	232,233	1,955			1,108	672		890	890	54
234	Løgstør Bredning	157,158,234	6,501			1,980	2,802		2,391	2,391	63
235	Nibe Bredning og Langerak	238,236,235,233,232,157,158,234	11,064		9,108	2,647	8,396	9,108	5,522	7,315	34
236	Thisted Bredning	236	1,091			269	397		333	333	69
238	Halkær Bredning	238	620			114	114		114	114	82

Appendix B – Maximum Allowable Nitrogen Inputs (N-MAIs) based on management scenario 2c and assuming 10% reduction in Danish land-based P loads

Table B- 1 Water body specific MAIs based on the two individual indicators chlorophyll-a (Chl-a) and light penetration depth (light) estimated from statistical models (STAT) respectively mechanistical models (MEK).
The table shows both the individual calculations as well as the averaged water specific MAIs (without any aggregation) and corresponding need for reduction in %. The data in this table are based on management scenario 2c and Danish land-based P-reductions set at 10%.

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
1	Roskilde Fjord,ydre	1,2	764			632	414		523	523	32
2	Roskilde Fjord, indre	2	388	376		388	354	376	371	373	4
6	Nordlige Øresund	6	1,098			1,098	762		930	930	15
16	Korsør Nor	16	40			40	9		24	24	39
17	Basnæs Nor	17	69			69	10		40	40	42
18	Holsteinborg Nor	18	22			22	22		22	22	0
24	Isefjord, ydre	24,165	899	434	537	455	553	486	504	495	45
25	Skælskør Fjord og Nor	25	44			33	32		33	33	26
28	Sejerø Bugt	28	164			164	53		108	108	34
29	Kalundborg Fjord	29	69	13	31	13	13	22	13	18	74
34	Smålandsfarvandet, syd	34	523			523	523		523	523	0
35	Karrebæk Fjord	35	1,272			1,272	739		1,006	1,006	21
36	Dybsø Fjord	36	61			58	61		60	60	2
37	Avnø Fjord	37	238			238	76		157	157	34
38	Guldborgsund	38	419			419	419		419	419	0
44	Hjelm Bugt	44	91			20	20		20	20	78
45	Grønsund	45	278			270	44		157	157	43

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
46	Fakse Bugt	46,47	509			107	509		308	308	40
47	Præstø Fjord	47	208			138	107		122	122	41
48	Stege Bugt	48,49	259			259	259		259	259	0
49	Stege Nor	49	24			15	4		10	10	59
56	Østersøen, Bornholm	56	860			184	184		184	184	79
57	Østersøen, Christiansø	57	3			0	3		2	2	48
59	Nærå Strand	59	98			25	22		24	24	76
62	Lillestrand	62	11			7	3		5	5	57
68	Lindelse Nor	68	50			50	11		30	30	39
72	Kløven	72	43			28	11		19	19	55
74	Bredningen	74	128			47	42		45	45	65
80	Gamborg Fjord	80	80			22	75		49	49	39
82	Aborg Minde Nor	82	152			34	34		34	34	78
83	Holckenhavn Fjord	83	290			85	121		103	103	64
84	Kerteminde Fjord	84,85	50			15	50		33	33	35
85	Kertinge Nor	85	24	15		18	5	15	11	13	44
86	Nyborg Fjord	83,86	308			134	190		162	162	47
87	Helnæs Bugt	87	216			67	77		72	72	67
89	Lunkebugten	89	16			5	5		5	5	68

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
90	Langelandssund	83,86,89,90	767			197	197		197	197	74
92	Odense Fjord, ydre	92,93	1,358	661	996	944	1,002	828	973	901	34
93	Odense Fjord, Seden Strand	93	1,288		626	1,288	434	626	861	744	42
95	Storebælt SV	95	188			41	188		115	115	39
96	Storebælt NV	96, 84, 85	227			38	227		132	132	42
101	Genner Bugt	101	35			13	13		13	13	62
102	Åbenrå Fjord	102	130	59		59	59	59	59	59	55
103	Als Fjord	103,104,105	269			67	67		67	67	75
104	Als Sund	104	68			28	68		48	48	29
105	Augustenborg Fjord	105	62	29		29	30	29	29	29	53
106	Haderslev Fjord	106	239			104	155		130	130	46
107	Juvre Dyb	107	349			119			119	119	66
108	Avnø Vig	108	60			27	20		24	24	60
109	Hejlsminde Nor	109	138			131	60		95	95	31
110	Nybøl Nor	110	66			29	29		29	29	55
111	Lister Dyb	111	2,155			714			714	714	67
113	Flensborg Fjord, indre	113	51	19		19	19	19	19	19	63
114	Flensborg Fjord, ydre	110,113,114	219	66		66	66	66	66	66	70

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
119	Vesterhavet, syd	119, 107, 111, 121, 120	8,538			3,934			3,934	3,934	54
120	Knudedyb	120	2,910	841		841		841	841	841	71
121	Grådyb	121	2,920			842			842	842	71
122	Vejle Fjord, ydre	122,123	968			403	476		440	440	55
123	Vejle Fjord, indre	123	561	483	289	465	355	386	410	398	29
124	Kolding Fjord, indre	124	493	188		241	258	188	249	219	56
125	Kolding Fjord, ydre	124,125	528			278	294		286	286	46
127	Horsens Fjord, ydre	127,128	833			407	104		256	256	69
128	Horsens Fjord, indre	128	782			388	372		380	380	51
129	Nissum Fjord, Ydre	129,130, 131	2,412			1,419	1,063		1,241	1,241	49
130	Nissum Fjord, mellem	130,131	2,083			991	732		861	861	59
131	Nissum Fjord, Felsted Kog	131	1,938	1,938		662	696	1,938	679	1,308	32
132	Ringkøbing Fjord	132	4,747		1,679	4,748	2,065	1,679	3,406	2,543	46
133	Vesterhavet, nord	133, 129,130,131 , 132	7,239			1,176			1,176	1,176	84
136	Randers Fjord, indre	136	2,925	2,925	1,477	2,925	1,477	2,201	2,201	2,201	25
137	Randers Fjord, ydre	136,137	3,078	3,078	1,392	3,078	1,392	2,235	2,235	2,235	27

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
138	Hevring Bugt	138, 137, 136	2,715		3,235	1,441	3,235		2,338	2,338	14
139	Anholt	139	9			9	9		9	9	0
140	Djursland Øst	140	856			219	856		538	538	37
141	Ebeltoft Vig	141	14			14	14		14	14	0
142	Stavns Fjord	142	5			5	1		3	3	37
144	Knebel Vig	144	18			5	7		6	6	68
145	Kalø Vig	144,145	190	129	181	95	149	155	122	139	27
146	Norsminde Fjord	146	140			136	47		91	91	35
147	Århus Bugt og Begtrup Vig	144,145,147	656	250	656	250	656	453	453	453	31
154	Kattegat Læsø	154	78			78	78		78	78	0
157	Bjørnholms Bugt, Riisgårde Bredning, Skive Fjord og Lovns Bredning	157,158	3,632			992	1,589		1,290	1,290	64
158	Hjarbæk Fjord	158	1,795			455	735		595	595	67
159	Mariager Fjord, indre	159	516			85	220		153	153	70
160	Mariager Fjord, ydre	159,160	963			806	569		688	688	29
165	Isefjord, indre	165	812	339		364	812	339	588	463	43
200	Kattegat Nordsjælland	1,2,24,165,200	1,857			1,857	629		1,243	1,243	33
201	Køge Bugt	201	1,109	729		249	249	729	249	489	56

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
204	Jammerland Bugt og Musholm Bugt	204	1,327			828	308		568	568	57
206	Smålandsfarvandet, åbne del	16,17,18,25,35,36,37,206	2,014			1,471	270		870	870	57
207	Nakskov Fjord	207	454			266	82		174	174	62
208	Femerbælt	207,208,209	1,530			252	1,530		891	891	42
209	Rødsand og Bredningen	209	521			247	227		237	237	54
212	Fåborg Fjord	212	30			10	10		10	10	67
214	Det sydfynske Øhav	68,72,212,214	633	176	176	176	176	176	176	176	72
216	Lillebælt, syd	87,101,102,103,104,105,110,113,114,216	1,309			462	1,309		885	885	32
217	Lillebælt Bredningen	74,82,106,108,109,217	956	276		276	276	276	276	276	71
219	Århus Bugt, syd, Samsø og Nordlige Bælthav	59,62,92,93,127,128,142,146,219	2,810			626	626		626	626	78
221	Skagerrak	221	1,423			1,423			1,423	1,423	0
222	Kattegat Ålborg Bugt	222,159,160	2,026			2,026	2,026		2,026	2,026	0
224	Nordlige Lillebælt	122,123,224	1,588			389	1,588		988	988	38

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
225	Nordlige Kattegat ÅlbækBugt	225	706			195	706		450	450	36
231	Lillebælt Snævringen	231,124,125,80	789		134	134	134	134	134	134	83
232	Nissum Bredning	232	880	297	595	297	297	446	297	372	58
233	Kaas Bredning og Venø Bugt	232,233	1,955			1,164	830		997	997	49
234	Løgstør Bredning	157,158,234	6,502			1,980	3,028		2,504	2,504	61
235	Nibe Bredning og Langerak	238,236,235,233,232,157,158,234	11,064		9,324	3,226	9,069	9,324	6,147	7,736	30
236	Thisted Bredning	236	1,091			269	417		343	343	69
238	Halkær Bredning	238	620			114	114		114	114	82

Appendix C – Maximum Allowable Nitrogen Inputs (N-MAIs) based on management scenario 2c and assuming 20% reduction in Danish land-based P loads

Table C- 1 Water body specific MAIs based on the two individual indicators chlorophyll-a (Chl-a) and light penetration depth (light) estimated from statistical models (STAT) respectively mechanistical models (MEK).
The table shows both the individual calculations as well as the averaged water specific MAIs (without any aggregation) and corresponding need for reduction in %. The data in this table are based on management scenario 2c and Danish land-based P-reductions set at 20%.

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
1	Roskilde Fjord,ydre	1,2	764			632	418		525	525	31
2	Roskilde Fjord, indre	2	388	376		388	357	376	373	374	4
6	Nordlige Øresund	6	1,098			1,098	773		936	936	15
16	Korsør Nor	16	40			40	9		25	25	38
17	Basnæs Nor	17	69			69	10		40	40	42
18	Holsteinborg Nor	18	22			22	22		22	22	0
24	Isefjord, ydre	24,165	899	455	554	455	554	504	504	504	44
25	Skælskør Fjord og Nor	25	44			34	33		33	33	24
28	Sejerø Bugt	28	164			164	53		108	108	34
29	Kalundborg Fjord	29	69	13	36	13	13	25	13	19	72
34	Smålandsfarvandet, syd	34	523			523	523		523	523	0
35	Karrebæk Fjord	35	1,272			1,272	797		1,034	1,034	19
36	Dybsø Fjord	36	61			61	61		61	61	0
37	Avnø Fjord	37	238			238	81		159	159	33
38	Guldborgsund	38	419			419	419		419	419	0
44	Hjelm Bugt	44	91			20	20		20	20	78
45	Grønsund	45	278			270	44		157	157	43

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
46	Fakse Bugt	46,47	509			107	509		308	308	40
47	Præstø Fjord	47	208			140	111		126	126	40
48	Stege Bugt	48,49	259			259	259		259	259	0
49	Stege Nor	49	24			15	4		10	10	59
56	Østersøen, Bornholm	56	860			184	184		184	184	79
57	Østersøen, Christiansø	57	3			0	3		2	2	48
59	Nærå Strand	59	98			31	29		30	30	69
62	Lillestrand	62	11			7	3		5	5	57
68	Lindelse Nor	68	50			50	11		30	30	39
72	Kløven	72	43			28	11		19	19	55
74	Bredningen	74	128			51	49		50	50	61
80	Gamborg Fjord	80	80			22	75		49	49	39
82	Aborg Minde Nor	82	152			34	34		34	34	78
83	Holckenhavn Fjord	83	290			96	133		114	114	61
84	Kerteminde Fjord	84,85	50			15	50		33	33	35
85	Kertinge Nor	85	24	16		18	5	16	11	14	43
86	Nyborg Fjord	83,86	308			139	193		166	166	46
87	Helnæs Bugt	87	216			67	77		72	72	67
89	Lunkebugten	89	16			5	5		5	5	68

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
90	Langelandssund	83,86,89,90	767			197	197		197	197	74
92	Odense Fjord, ydre	92,93	1,358	661	996	954	1,036	828	995	912	33
93	Odense Fjord, Seden Strand	93	1,288		626	1,288	506	626	897	762	41
95	Storebælt SV	95	188			41	188		115	115	39
96	Storebælt NV	96, 84, 85	227			38	227		132	132	42
101	Genner Bugt	101	35			13	13		13	13	62
102	Åbenrå Fjord	102	130	59		59	59	59	59	59	55
103	Als Fjord	103,104,105	269			67	67		67	67	75
104	Als Sund	104	68			28	68		48	48	29
105	Augustenborg Fjord	105	62	29		29	30	29	29	29	53
106	Haderslev Fjord	106	239			104	156		130	130	46
107	Juvre Dyb	107	349			119			119	119	66
108	Avnø Vig	108	60			29	21		25	25	58
109	Hejlsminde Nor	109	138			138	69		104	104	25
110	Nybøl Nor	110	66			30	29		30	30	55
111	Lister Dyb	111	2,155			714			714	714	67
113	Flensborg Fjord, indre	113	51	19		19	19	19	19	19	63
114	Flensborg Fjord, ydre	110,113,114	219	66		66	66	66	66	66	70

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
119	Vesterhavet, syd	119, 107, 111, 121, 120	8,538			3,934			3,934	3,934	54
120	Knudedyb	120	2,910	841		841		841	841	841	71
121	Grådyb	121	2,920			842			842	842	71
122	Vejle Fjord, ydre	122,123	968			403	480		441	441	54
123	Vejle Fjord, indre	123	561	496	303	466	355	400	411	405	28
124	Kolding Fjord, indre	124	493	208		246	268	208	257	233	53
125	Kolding Fjord, ydre	124,125	528			278	302		290	290	45
127	Horsens Fjord, ydre	127,128	833			415	104		260	260	69
128	Horsens Fjord, indre	128	782			389	375		382	382	51
129	Nissum Fjord, Ydre	129,130, 131	2,413			1,533	1,148		1,340	1,340	44
130	Nissum Fjord, mellem	130,131	2,083			1,141	871		1,006	1,006	52
131	Nissum Fjord, Felsted Kog	131	1,938	1,938		662	907	1,938	784	1,361	30
132	Ringkøbing Fjord	132	4,748		1,679	4,748	2,544	1,679	3,646	2,663	44
133	Vesterhavet, nord	133, 129,130,131 , 132	7,239			1,176			1,176	1,176	84
136	Randers Fjord, indre	136	2,925	2,925	1,588	2,925	1,588	2,256	2,256	2,256	23
137	Randers Fjord, ydre	136,137	3,078	3,078	1,587	3,078	1,587	2,332	2,332	2,332	24

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
138	Hevring Bugt	138, 137, 136	2,715		3,235	1,441	3,235		2,338	2,338	14
139	Anholt	139	9			9	9		9	9	0
140	Djursland Øst	140	856			219	856		538	538	37
141	Ebeltoft Vig	141	14			14	14		14	14	0
142	Stavns Fjord	142	5			5	1		3	3	37
144	Knebel Vig	144	18			5	7		6	6	68
145	Kalø Vig	144,145	190	136	188	95	149	162	122	142	25
146	Norsminde Fjord	146	140			140	56		98	98	30
147	Århus Bugt og Begtrup Vig	144,145,147	656	250	656	250	656	453	453	453	31
154	Kattegat Læsø	154	78			78	78		78	78	0
157	Bjørnholms Bugt, Riisgårde Bredning, Skive Fjord og Lovns Bredning	157,158	3,632			992	1,812		1,402	1,402	61
158	Hjarbæk Fjord	158	1,795			497	840		669	669	63
159	Mariager Fjord, indre	159	516			90	255		173	173	67
160	Mariager Fjord, ydre	159,160	963			852	645		748	748	22
165	Isefjord, indre	165	812	339		364	812	339	588	463	43
200	Kattegat Nordsjælland	1,2,24,165,200	1,857			1,857	629		1,243	1,243	33
201	Køge Bugt	201	1,109	746		249	249	746	249	497	55

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
204	Jammerland Bugt og Musholm Bugt	204	1,327			829	308		569	569	57
206	Smålandsfarvandet, åbne del	16,17,18,25,35,36,37,206	2,014			1,471	270		870	870	57
207	Nakskov Fjord	207	454			268	86		177	177	61
208	Femerbælt	207,208,209	1,530			252	1,530		891	891	42
209	Rødsand og Bredningen	209	521			247	227		237	237	54
212	Fåborg Fjord	212	30			10	10		10	10	67
214	Det sydfynske Øhav	68,72,212,214	633	176	176	176	176	176	176	176	72
216	Lillebælt, syd	87,101,102,103,104,105,110,113,114,216	1,309			462	1,309		885	885	32
217	Lillebælt Bredningen	74,82,106,108,109,217	956	276		276	276	276	276	276	71
219	Århus Bugt, syd, Samsø og Nordlige Bælthav	59,62,92,93,127,128,142,146,219	2,810			626	626		626	626	78
221	Skagerrak	221	1,423			1,423			1,423	1,423	0
222	Kattegat Ålborg Bugt	222,159,160	2,026			2,026	2,026		2,026	2,026	0
224	Nordlige Lillebælt	122,123,224	1,588			389	1,588		988	988	38

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
225	Nordlige Kattegat ÅlbækBugt	225	706			195	706		450	450	36
231	Lillebælt Snævringen	231,124,125,80	789		134	134	134	134	134	134	83
232	Nissum Bredning	232	880	297	629	297	297	463	297	380	57
233	Kaas Bredning og Venø Bugt	232,233	1,955			1,221	988		1,104	1,104	44
234	Løgstør Bredning	157,158,234	6,501			1,980	3,253		2,616	2,616	60
235	Nibe Bredning og Langerak	238,236,235,233,232,157,158,234	11,064		9,539	3,841	9,737	9,539	6,789	8,164	26
236	Thisted Bredning	236	1,091			269	437		353	353	68
238	Halkær Bredning	238	620			114	195		154	154	75

Appendix D – Maximum Allowable Nitrogen Inputs (N-MAIs) based on management scenario 2c and assuming 30% reduction in Danish land-based P loads

Table D- 1 Water body specific MAIs based on the two individual indicators chlorophyll-a (Chl-a) and light penetration depth (light) estimated from statistical models (STAT) respectively mechanistical models (MEK).
The table shows both the individual calculations as well as the averaged water specific MAIs (without any aggregation) and corresponding need for reduction in %. The data in this table are based on management scenario 2c and Danish land-based P-reductions set at 30%.

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
1	Roskilde Fjord,ydre	1,2	764			632	421		527	527	31
2	Roskilde Fjord, indre	2	388	376		388	361	376	375	375	3
6	Nordlige Øresund	6	1,098			1,098	783		941	941	14
16	Korsør Nor	16	40			40	10		25	25	37
17	Basnæs Nor	17	69			69	10		40	40	42
18	Holsteinborg Nor	18	22			22	22		22	22	0
24	Isefjord, ydre	24,165	899	476	569	455	555	523	505	514	43
25	Skælskør Fjord og Nor	25	44			34	35		34	34	22
28	Sejerø Bugt	28	164			164	53		108	108	34
29	Kalundborg Fjord	29	69	13	42	13	13	28	13	21	70
34	Smålandsfarvandet, syd	34	523			523	523		523	523	0
35	Karrebæk Fjord	35	1,272			1,272	852		1,062	1,062	17
36	Dybsø Fjord	36	61			61	61		61	61	0
37	Avnø Fjord	37	238			238	86		162	162	32
38	Guldborgsund	38	419			419	419		419	419	0
44	Hjelm Bugt	44	91			20	20		20	20	78
45	Grønsund	45	278			270	44		157	157	43

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
46	Fakse Bugt	46,47	509			107	509		308	308	40
47	Præstø Fjord	47	208			143	116		129	129	38
48	Stege Bugt	48,49	259			259	259		259	259	0
49	Stege Nor	49	24			16	4		10	10	59
56	Østersøen, Bornholm	56	860			184	184		184	184	79
57	Østersøen, Christiansø	57	3			0	3		2	2	48
59	Nærå Strand	59	98			38	41		39	39	60
62	Lillestrand	62	11			7	3		5	5	57
68	Lindelse Nor	68	50			50	11		30	30	39
72	Kløven	72	43			28	11		19	19	55
74	Bredningen	74	128			55	56		56	56	57
80	Gamborg Fjord	80	80			22	75		49	49	39
82	Aborg Minde Nor	82	152			34	34		34	34	78
83	Holckenhavn Fjord	83	289			107	144		126	126	57
84	Kerteminde Fjord	84,85	50			15	50		33	33	35
85	Kertinge Nor	85	24	16		18	5	16	11	14	41
86	Nyborg Fjord	83,86	308			144	197		170	170	45
87	Helnæs Bugt	87	216			67	77		72	72	67
89	Lunkebugten	89	16			5	5		5	5	68

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
90	Langelandssund	83,86,89,90	767			197	197		197	197	74
92	Odense Fjord, ydre	92,93	1,358	661	996	963	1,071	828	1,017	923	32
93	Odense Fjord, Seden Strand	93	1,288		626	1,288	577	626	932	779	39
95	Storebælt SV	95	188			41	188		115	115	39
96	Storebælt NV	96, 84, 85	227			38	227		132	132	42
101	Genner Bugt	101	35			13	13		13	13	62
102	Åbenrå Fjord	102	130	59		59	59	59	59	59	55
103	Als Fjord	103,104,105	269			67	67		67	67	75
104	Als Sund	104	68			28	68		48	48	29
105	Augustenborg Fjord	105	62	29		29	30	29	29	29	53
106	Haderslev Fjord	106	239			105	157		131	131	45
107	Juvre Dyb	107	349			119			119	119	66
108	Avnø Vig	108	60			31	24		27	27	54
109	Hejlsminde Nor	109	138			138	78		108	108	22
110	Nybøl Nor	110	66			31	29		30	30	54
111	Lister Dyb	111	2,155			714			714	714	67
113	Flensborg Fjord, indre	113	51	19		19	19	19	19	19	63
114	Flensborg Fjord, ydre	110,113,114	219	66		66	66	66	66	66	70

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
119	Vesterhavet, syd	119, 107, 111, 121, 120	8,538			3,934			3,934	3,934	54
120	Knudedyb	120	2,910	841		841		841	841	841	71
121	Grådyb	121	2,920			842			842	842	71
122	Vejle Fjord, ydre	122,123	968			403	483		443	443	54
123	Vejle Fjord, indre	123	561	511	317	467	356	414	411	413	27
124	Kolding Fjord, indre	124	493	233		251	279	233	265	249	50
125	Kolding Fjord, ydre	124,125	528			278	308		293	293	45
127	Horsens Fjord, ydre	127,128	833			423	104		264	264	68
128	Horsens Fjord, indre	128	782			391	379		385	385	51
129	Nissum Fjord, Ydre	129,130, 131	2,412			1,699	1,231		1,465	1,465	39
130	Nissum Fjord, mellem	130,131	2,083			1,425	1,008		1,216	1,216	42
131	Nissum Fjord, Felsted Kog	131	1,938	1,938		905	1,113	1,938	1,009	1,474	24
132	Ringkøbing Fjord	132	4,748		1,679	4,748	3,021	1,679	3,884	2,782	41
133	Vesterhavet, nord	133, 129,130,131 , 132	7,239			1,176			1,176	1,176	84
136	Randers Fjord, indre	136	2,925	2,925	1,768	2,925	1,768	2,346	2,346	2,346	20
137	Randers Fjord, ydre	136,137	3,078	3,078	1,779	3,078	1,779	2,429	2,429	2,429	21

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
138	Hevring Bugt	138, 137, 136	2,715		3,235	1,443	3,235		2,339	2,339	14
139	Anholt	139	9			9	9		9	9	0
140	Djursland Øst	140	856			219	856		538	538	37
141	Ebeltoft Vig	141	14			14	14		14	14	0
142	Stavns Fjord	142	5			5	1		3	3	37
144	Knebel Vig	144	18			5	7		6	6	68
145	Kalø Vig	144,145	190	143	190	95	149	166	122	144	24
146	Norsminde Fjord	146	140			140	71		105	105	25
147	Århus Bugt og Begtrup Vig	144,145,147	656	250	656	250	656	453	453	453	31
154	Kattegat Læsø	154	78			78	78		78	78	0
157	Bjørnholms Bugt, Riisgårde Bredning, Skive Fjord og Lovns Bredning	157,158	3,632			992	2,026		1,509	1,509	58
158	Hjarbæk Fjord	158	1,795			544	944		744	744	59
159	Mariager Fjord, indre	159	516			96	288		192	192	63
160	Mariager Fjord, ydre	159,160	963			906	715		810	810	16
165	Isefjord, indre	165	812	339		364	812	339	588	463	43
200	Kattegat Nordsjælland	1,2,24,165,200	1,857			1,857	629		1,243	1,243	33
201	Køge Bugt	201	1,109	763		249	249	763	249	506	54

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
204	Jammerland Bugt og Musholm Bugt	204	1,327			830	308		569	569	57
206	Smålandsfarvandet, åbne del	16,17,18,25,35,36,37,206	2,014			1,471	270		870	870	57
207	Nakskov Fjord	207	454			270	89		179	179	61
208	Femerbælt	207,208,209	1,530			252	1,530		891	891	42
209	Rødsand og Bredningen	209	521			247	227		237	237	54
212	Fåborg Fjord	212	30			10	10		10	10	67
214	Det sydfynske Øhav	68,72,212,214	633	176	176	176	176	176	176	176	72
216	Lillebælt, syd	87,101,102,103,104,105,110,113,114,216	1,309			462	1,309		885	885	32
217	Lillebælt Bredningen	74,82,106,108,109,217	956	276		276	276	276	276	276	71
219	Århus Bugt, syd, Samsø og Nordlige Bælthav	59,62,92,93,127,128,142,146,219	2,810			626	626		626	626	78
221	Skagerrak	221	1,423			1,423			1,423	1,423	0
222	Kattegat Ålborg Bugt	222,159,160	2,026			2,026	2,026		2,026	2,026	0
224	Nordlige Lillebælt	122,123,224	1,588			389	1,588		988	988	38

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
225	Nordlige Kattegat ÅlbækBugt	225	706			195	706		450	450	36
231	Lillebælt Snævringen	231,124,125,80	789		134	134	134	134	134	134	83
232	Nissum Bredning	232	880	297	663	297	297	480	297	389	56
233	Kaas Bredning og Venø Bugt	232,233	1,955			1,281	1,146		1,213	1,213	38
234	Løgstør Bredning	157,158,234	6,502			1,980	3,477		2,728	2,728	58
235	Nibe Bredning og Langerak	238,236,235,233,232,157,158,234	11,064		9,752	4,495	10,400	9,752	7,447	8,600	22
236	Thisted Bredning	236	1,091			269	457		363	363	67
238	Halkær Bredning	238	620			114	284		199	199	68

Appendix E – Maximum Allowable Nitrogen Inputs (N-MAIs) based on management scenario 2c and assuming 50% reduction in Danish land-based P loads

Table E- 1 Water body specific MAIs based on the two individual indicators chlorophyll-a (Chl-a) and light penetration depth (light) estimated from statistical models (STAT) respectively mechanistical models (MEK).
The table shows both the individual calculations as well as the averaged water specific MAIs (without any aggregation) and corresponding need for reduction in %. The data in this table are based on management scenario 2c and Danish land-based P-reductions set at 50%.

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
1	Roskilde Fjord,ydre	1,2	764			632	429		531	531	31
2	Roskilde Fjord, indre	2	388	376		388	369	376	378	377	3
6	Nordlige Øresund	6	1,098			1,098	804		951	951	13
16	Korsør Nor	16	40			40	12		26	26	35
17	Basnæs Nor	17	69			69	10		40	40	42
18	Holsteinborg Nor	18	22			22	22		22	22	0
24	Isefjord, ydre	24,165	899	520	600	455	556	560	505	533	41
25	Skælskør Fjord og Nor	25	44			35	37		36	36	18
28	Sejerø Bugt	28	164			164	53		108	108	34
29	Kalundborg Fjord	29	69	13	53	13	13	33	13	23	66
34	Smålandsfarvandet, syd	34	523			523	523		523	523	0
35	Karrebæk Fjord	35	1,272			1,272	958		1,115	1,115	12
36	Dybsø Fjord	36	61			61	61		61	61	0
37	Avnø Fjord	37	238			238	96		167	167	30
38	Guldborgsund	38	419			419	419		419	419	0
44	Hjelm Bugt	44	91			20	20		20	20	78
45	Grønsund	45	278			270	44		157	157	43

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
46	Fakse Bugt	46,47	509			107	509		308	308	40
47	Præstø Fjord	47	208			148	124		136	136	35
48	Stege Bugt	48,49	259			259	259		259	259	0
49	Stege Nor	49	24			16	4		10	10	58
56	Østersøen, Bornholm	56	860			184	184		184	184	79
57	Østersøen, Christiansø	57	3			0	3		2	2	48
59	Nærå Strand	59	98			54	65		59	59	40
62	Lillestrand	62	11			7	3		5	5	57
68	Lindelse Nor	68	50			50	11		30	30	39
72	Kløven	72	43			28	11		19	19	55
74	Bredningen	74	128			64	69		67	67	48
80	Gamborg Fjord	80	80			22	75		49	49	39
82	Aborg Minde Nor	82	152			48	34		41	41	73
83	Holckenhavn Fjord	83	290			131	167		149	149	49
84	Kerteminde Fjord	84,85	50			15	50		33	33	35
85	Kertinge Nor	85	24	18		18	5	18	12	15	38
86	Nyborg Fjord	83,86	308			154	205		179	179	42
87	Helnæs Bugt	87	216			67	77		72	72	67
89	Lunkebugten	89	16			5	5		5	5	68

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
90	Langelandssund	83,86,89,90	767			197	197		197	197	74
92	Odense Fjord, ydre	92,93	1,358	661	996	982	1,142	828	1,062	945	30
93	Odense Fjord, Seden Strand	93	1,288		626	1,288	718	626	1,003	815	37
95	Storebælt SV	95	188			41	188		115	115	39
96	Storebælt NV	96, 84, 85	227			38	227		132	132	42
101	Genner Bugt	101	35			13	13		13	13	62
102	Åbenrå Fjord	102	130	59		59	59	59	59	59	55
103	Als Fjord	103,104,105	269			67	67		67	67	75
104	Als Sund	104	68			28	68		48	48	29
105	Augustenborg Fjord	105	62	29		29	30	29	29	29	53
106	Haderslev Fjord	106	239			107	160		133	133	44
107	Juvre Dyb	107	349			119			119	119	66
108	Avnø Vig	108	60			36	29		32	32	46
109	Hejlsminde Nor	109	138			138	97		118	118	15
110	Nybøl Nor	110	66			33	29		31	31	53
111	Lister Dyb	111	2,155			714			714	714	67
113	Flensborg Fjord, indre	113	51	19		19	19	19	19	19	63
114	Flensborg Fjord, ydre	110,113,114	219	66		66	66	66	66	66	70

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
119	Vesterhavet, syd	119, 107, 111, 121, 120	8,538			3,934			3,934	3,934	54
120	Knudedyb	120	2,910	841		841		841	841	841	71
121	Grådyb	121	2,920			842			842	842	71
122	Vejle Fjord, ydre	122,123	968			403	489		446	446	54
123	Vejle Fjord, indre	123	561	543	344	468	357	444	413	428	24
124	Kolding Fjord, indre	124	493	296		261	300	296	280	288	42
125	Kolding Fjord, ydre	124,125	528			278	321		300	300	43
127	Horsens Fjord, ydre	127,128	833			439	104		272	272	67
128	Horsens Fjord, indre	128	782			394	387		391	391	50
129	Nissum Fjord, Ydre	129,130, 131	2,413			2,412	1,398		1,905	1,905	21
130	Nissum Fjord, mellem	130,131	2,083			2,083	1,268		1,675	1,675	20
131	Nissum Fjord, Felsted Kog	131	1,938	1,938			1,515	1,938	1,515	1,727	11
132	Ringkøbing Fjord	132	4,747		1,679	4,748	3,967	1,679	4,357	3,018	36
133	Vesterhavet, nord	133, 129,130,131 , 132	7,239			1,176			1,176	1,176	84
136	Randers Fjord, indre	136	2,925	2,925	2,126	2,925	2,126	2,525	2,525	2,525	14
137	Randers Fjord, ydre	136,137	3,078	3,078	2,160	3,078	2,160	2,619	2,619	2,619	15

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
138	Hevring Bugt	138, 137, 136	2,715		3,235	1,443	3,235		2,339	2,339	14
139	Anholt	139	9			9	9		9	9	0
140	Djursland Øst	140	856			219	856		538	538	37
141	Ebeltoft Vig	141	14			14	14		14	14	0
142	Stavns Fjord	142	5			5	1		3	3	37
144	Knebel Vig	144	18			5	7		6	6	68
145	Kalø Vig	144,145	190	156	190	95	149	173	122	147	22
146	Norsminde Fjord	146	140			140	101		121	121	14
147	Århus Bugt og Begtrup Vig	144,145,147	656	250	656	250	656	453	453	453	31
154	Kattegat Læsø	154	78			78	78		78	78	0
157	Bjørnholms Bugt, Riisgårde Bredning, Skive Fjord og Lovns Bredning	157,158	3,633			1,112	2,429		1,771	1,771	51
158	Hjarbæk Fjord	158	1,795			653	1,147		900	900	50
159	Mariager Fjord, indre	159	516			110	353		232	232	55
160	Mariager Fjord, ydre	159,160	963			963	841		902	902	6
165	Isefjord, indre	165	812	339		364	812	339	588	463	43
200	Kattegat Nordsjælland	1,2,24,165,200	1,857			1,857	629		1,243	1,243	33
201	Køge Bugt	201	1,109	797		249	249	797	249	523	53

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
204	Jammerland Bugt og Musholm Bugt	204	1,327			831	308		570	570	57
206	Smålandsfarvandet, åbne del	16,17,18,25,35,36,37,206	2,014			1,471	270		870	870	57
207	Nakskov Fjord	207	454			273	95		184	184	59
208	Femerbælt	207,208,209	1,530			252	1,530		891	891	42
209	Rødsand og Bredningen	209	521			247	227		237	237	54
212	Fåborg Fjord	212	30			10	10		10	10	67
214	Det sydfynske Øhav	68,72,212,214	633	176	176	176	176	176	176	176	72
216	Lillebælt, syd	87,101,102,103,104,105,110,113,114,216	1,309			462	1,309		885	885	32
217	Lillebælt Bredningen	74,82,106,108,109,217	956	276		276	276	276	276	276	71
219	Århus Bugt, syd, Samsø og Nordlige Bælthav	59,62,92,93,127,128,142,146,219	2,810			626	626		626	626	78
221	Skagerrak	221	1,423			1,423			1,423	1,423	0
222	Kattegat Ålborg Bugt	222,159,160	2,026			2,026	2,026		2,026	2,026	0
224	Nordlige Lillebælt	122,123,224	1,588			389	1,588		988	988	38

No.	Name	Aggregation	Average annual N-load	Chl-a (STAT)	Light (STAT)	Chl-a (MEK)	Light (MEK)	N-MAI (STAT)	N-MAI (MEK)	Avg. MAI	Avg. reduction [%]
225	Nordlige Kattegat ÅlbækBugt	225	706			195	706		450	450	36
231	Lillebælt Snævringen	231,124,125,80	789		134	134	134	134	134	134	83
232	Nissum Bredning	232	880	297	731	297	297	514	297	406	54
233	Kaas Bredning og Venø Bugt	232,233	1,955			1,408	1,461		1,435	1,435	27
234	Løgstør Bredning	157,158,234	6,502			1,980	3,925		2,952	2,952	55
235	Nibe Bredning og Langerak	238,236,235,233,232,157,158,234	11,064		10,174	5,936	11,064	10,174	8,500	9,337	16
236	Thisted Bredning	236	1,091			269	496		383	383	65
238	Halkær Bredning	238	620			305	461		383	383	38