

ECOSTAT nutrient meeting (18.-19.11.2015)

**Session 1: Comparison of European
freshwater and saline water nutrient
boundaries**



Background

Why?

- Previous work showed a large degree of discrepancy between the nutrient standard values set in the Member States.
- Too large differences in the methods used to determine the standards and in the way the values were used by MS;
- Correspondence between nutrient standards and thresholds for good ecological status in related biological methods is missing / unclear.

How?

- Two questionnaires, one for freshwater and one for saline waters were sent to the Member States covering three aspects:
 1. High/good and good/moderate boundaries for nutrients
 2. Methods used to derive reference conditions and good/moderate boundaries for nutrients
 3. Use of nutrient classification in the assessment of ecological status / eutrophication status

Challenges

- Gaps in reported data
- Comparisons difficult
 - No common parameters, metrics and seasons of the year when they assess nutrients.
 - **Comparisons were only carried out when the same parameters, metrics and seasons were used since comparability cannot be assumed if these differ.**
- Lack of information related to common types of waters.
- Values provided without units or other units than indicated in the template.
- Salinity lacking or the boundary values provided by MS are not based on the same salinity values/ranges.

Data submitted by the MS

Regional Sea	Country	Transitional	Coastal	Marine
Baltic Sea	Denmark	Not defined	No data submitted	No data submitted
	Estonia	Not defined	G/M and reference values submitted	No data submitted
	Finland	Not defined	G/M and reference values	G/M and reference values
	Germany	Not defined	G/M and reference values submitted	G/M and reference values submitted
	Latvia	G/M and reference values submitted	G/M and reference values submitted	Only G/M values submitted
	Lithuania	G/M and reference values submitted	G/M and reference values submitted	Only G/M values submitted
	Poland	G/M and reference values submitted	G/M and reference values submitted	G/M and reference values submitted
	Sweden	G/M and reference values submitted	G/M and reference values submitted	Only G/M values submitted
	Black Sea	Bulgaria	G/M and reference values submitted	Only G/M values submitted
	Romania	G/M and reference values submitted	G/M and reference values submitted	G/M and reference values submitted

Regional Sea	Country	Transitional	Coastal	Marine
Mediterranean	Croatia	G/M and reference values submitted	G/M and reference values submitted	G/M and reference values submitted
	Cyprus	Not applied	G/M and reference values submitted	No data submitted
	France	Only G/M values submitted	No data submitted	No data submitted
	Greece	G/M and reference values submitted	G/M and reference values submitted	Only reference values submitted
	Italy	Only G/M values submitted	G/M and reference values submitted	No data submitted
	Malta	Not applied	No data submitted	No data submitted
	Slovenia	Not applied	G/M and reference values submitted	G/M and reference values submitted
	Spain	Only G/M values submitted	Only G/M values submitted	Only G/M values submitted
	North East Atlantic	Belgium	Only G/M values submitted	G/M and reference values submitted
France		Only G/M values submitted	Only G/M values submitted	No data submitted
Germany		G/M and reference values submitted	G/M and reference values submitted	G/M and reference values submitted
Ireland		G/M and reference values submitted	G/M and reference values submitted	G/M and reference values submitted
Netherlands		Only G/M values submitted	Only G/M values submitted	No data submitted
Norway		Not applied	Only G/M values submitted	No data submitted
Portugal		Only G/M values submitted	Only G/M values submitted	No data submitted
Spain		Only G/M values submitted	Only G/M values submitted	Only G/M values submitted
Sweden		G/M and reference values submitted	G/M and reference values submitted	Only G/M values submitted
UK		G/M and reference values submitted	G/M and reference values submitted	G/M and reference values submitted

Key findings

Large heterogeneity in:

- the nutrient parameters assessed by MS
 - DIN, phosphate, total nitrogen, total phosphorus
- the assessment time
 - summer, winter or all year round
- the statistic used for the assessment
 - mean, median or 90th percentile

Table 1 Metrics used and time of year measured for G/M conditions in transitional waters in the Baltic Sea

Country	National Type	TN in mg/l			TP in microg/l			Phosphate			Nitrate			DIN		
		Mean	Median	90% percentile	Mean	Median	90% percentile	Mean	Median	90% percentile	Mean	Median	90% percentile	Mean	Median	90% percentile
Lithuania	Northern part of the Curonian Lagoon	S			S											
Lithuania	Central part of the Curonian Lagoon	S			S											
Lithuania	Plume of the Curonian lagoon in the Baltic sea	S			S											
Latvia	LVT							W							W	
Poland	Internal Gulf of Gdańsk	S			S			Y		Y				Y		
Poland	External (Outer) Puck Bay	S			S			Y		Y				Y		
Poland	Vistula Outlet	S			S			Y		Y				Y		
Poland	Świna - Outlet	S			S			Y		Y				Y		
Poland	Dziwna - Outlet	S			S			Y		Y				Y		
Poland	Vistula Lagoon	Y			Y			Y		Y				Y		
Poland	Szczecin Lagoon	Y			Y			Y		Y				Y		
Poland	Puck Lagoon	Y			Y			Y		Y				Y		
Sweden	Stockholms inre skärgård och Hallsfjärden	S/W			S/W			W						W		

Legend: S=summer, W=winter, Y=year-round, ?=unclear

Table 1 Metrics used and time of year measured for G/M conditions in transitional waters in the Black Sea

Country	National Type	TN in mg/l			TP in microg/l			Phosphate			Nitrate			DIN			Comments
		Mean	Median	90% percentile	Mean	Median	90% percentil	Mean	Median	90% percentile	Mean	Median	90% percentile	Mean	Median	90% percentile	
Bulgaria	R16 Black sea firths	Y			Y												
Bulgaria	L7 Black sea freshwater lakes	Y			Y												
Bulgaria	L8 Black sea oligohaline lakes	Y			Y												
Bulgaria	L9 Black sea mesohaline/polyhalie lakes	Y			Y												
Bulgaria	L10 Black sea euhaline and hyperhaline coastal lakes	Y			Y												
Romania	RO_TT03																Assess phosphate and DIN biannually (2004-2012)

Legend: S=summer, W=winter, Y=year-round, ?=unclear

Table 1 Metrics used and time of year measured for G/M conditions in transitional waters in the North East Atlantic

Country	National Type	TN in mg/l			TP in microg/l			Phosphate			Nitrate			DIN			
		Mean	Median	90% percentile	Mean	Median	90% percentile	Mean	Median	90% percentile	Mean	Median	90% percentile	Mean	Median	90% percentile	
Belgium	O1o	S			S									Y			Y
Belgium	O1b							S									
Belgium	O2zout							S									
France	N1	Y															
France	all																W
France	all																W
Germany	T1, T2	Y			Y												W
Ireland	TW2												W/S				
Ireland	TW2												W/S				
Ireland	TW2												W/S				
Netherlands																	W
Portugal	A1												Y				Y
Portugal	A1												Y				Y
Portugal	A1												Y				Y
Portugal	A1												Y				Y
Spain	AT-T07												Y				Y
Spain	AT-T08												Y				Y
Spain	AT-T09												Y				Y
Spain	AT-T10												Y				Y
Spain	AT-T11												Y				Y
Spain	AT-T12												Y				Y
Spain	AT-T13												Y				Y
Sweden	Stockholms inre skärgård och Hallsfjärden	W/S			W/S								W				W
Sweden	Göta Älvs och Norde Älvs estuarie	W/S			W/S								W				W
UK	TW1																W
UK	TW2																W
UK	TW3																W
UK	TW4																W
UK	TW5																W

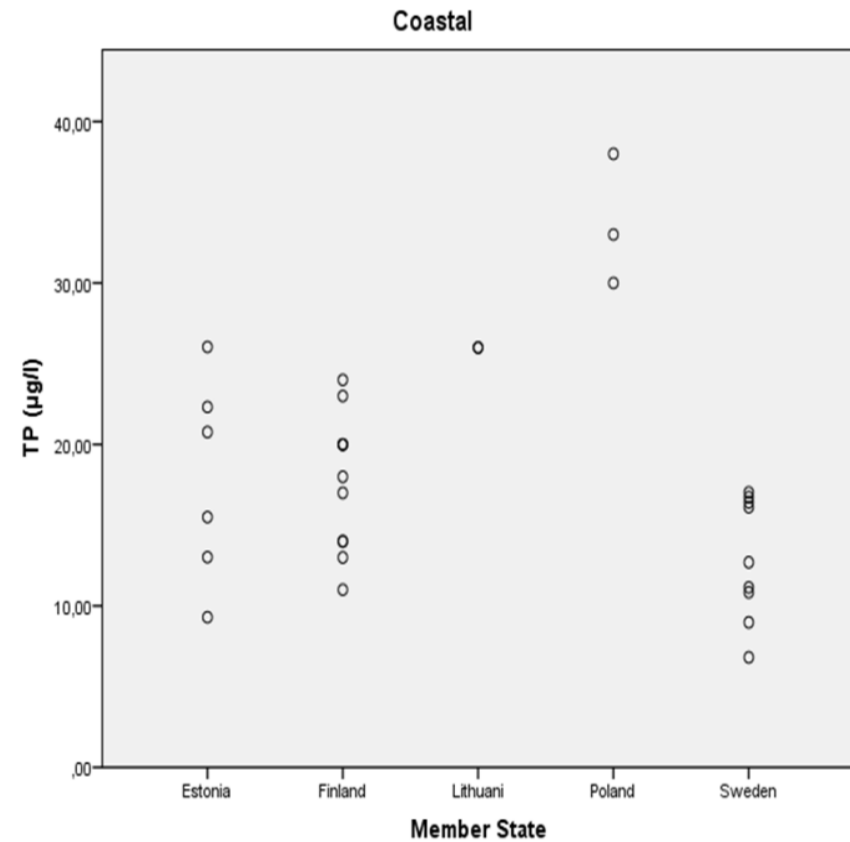
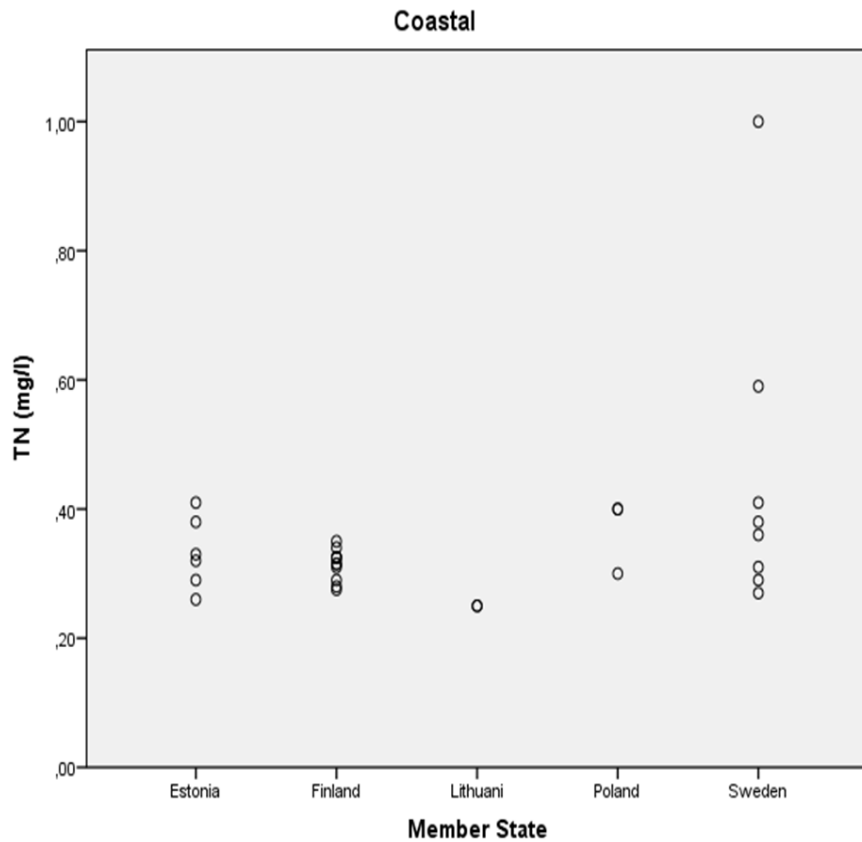
Legend: S=summer, W=winter, Y=year-round, ?=unclear

Table 1 Metrics used and time of year measured for G/M conditions in transitional waters in the Baltic Sea

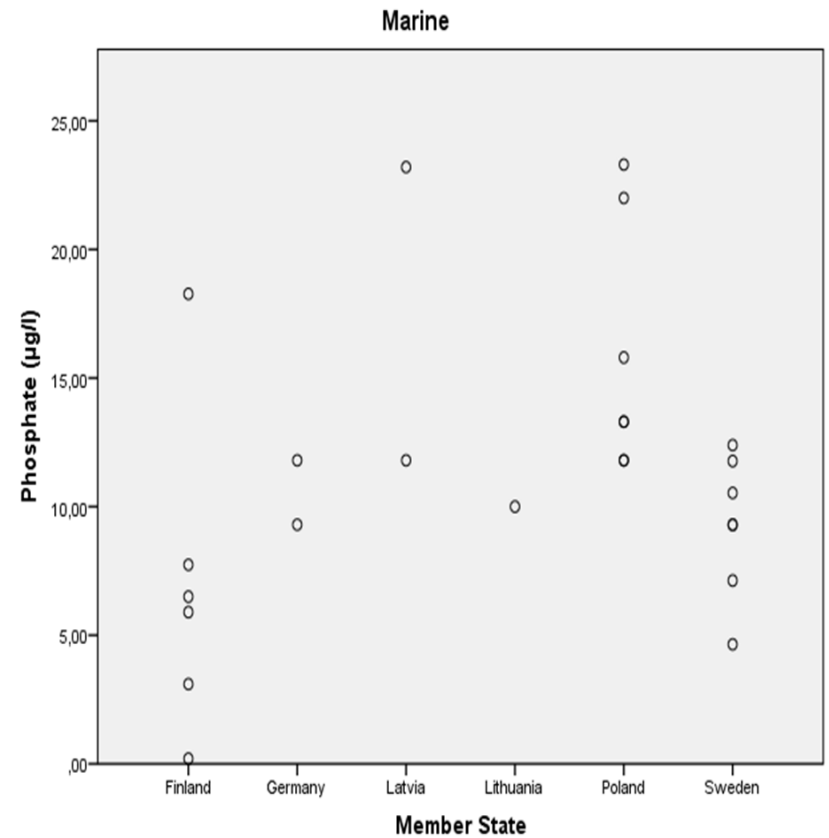
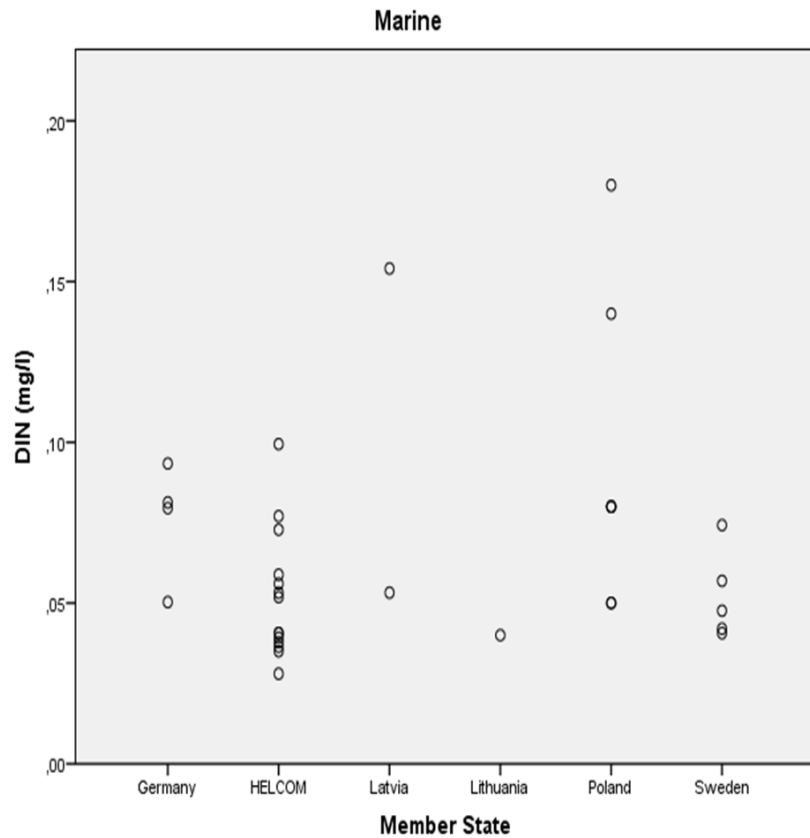
Country	National Type	TN in mg/l			TP in microg/l			Phosphate			Nitrate			DIN		
		Mean	Median	90% percentile	Mean	Median	90% percentile	Mean	Median	90% percentile	Mean	Median	90% percentile	Mean	Median	90% percentile
Lithuania	Northern part of the Curonian Lagoon	S			S											
Lithuania	Central part of the Curonian Lagoon	S			S											
Lithuania	Plume of the Curonian lagoon in the Baltic sea	S			S											
Latvia	LVT							W						W		
Poland	Internal Gulf of Gdańsk	S			S			Y			Y			Y		
Poland	External (Outer) Puck Bay	S			S			Y			Y			Y		
Poland	Vistula Outlet	S			S			Y			Y			Y		
Poland	Świna - Outlet	S			S			Y			Y			Y		
Poland	Dziwna - Outlet	S			S			Y			Y			Y		
Poland	Vistula Lagoon	Y			Y			Y			Y			Y		
Poland	Szczecin Lagoon	Y			Y			Y			Y			Y		
Poland	Puck Lagoon	Y			Y			Y			Y			Y		
Sweden	Stockholms inre skärgård och Hallsfjärden	S/W			S/W			W						W		

Legend: S=summer, W=winter, Y=year-round, ?=unclear

Baltic Sea – G/M boundaries for coastal waters



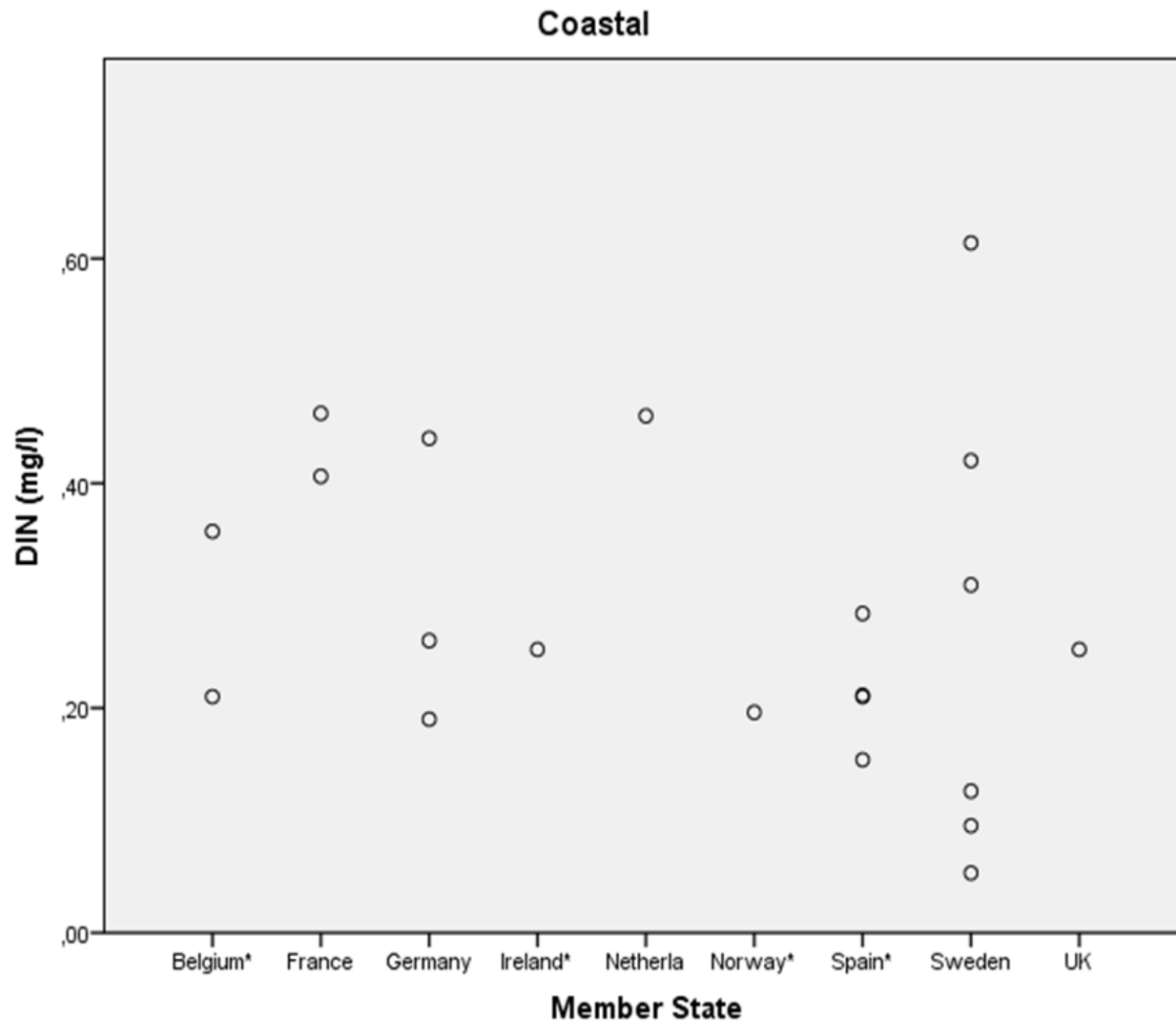
Baltic Sea – G/M boundaries for marine waters



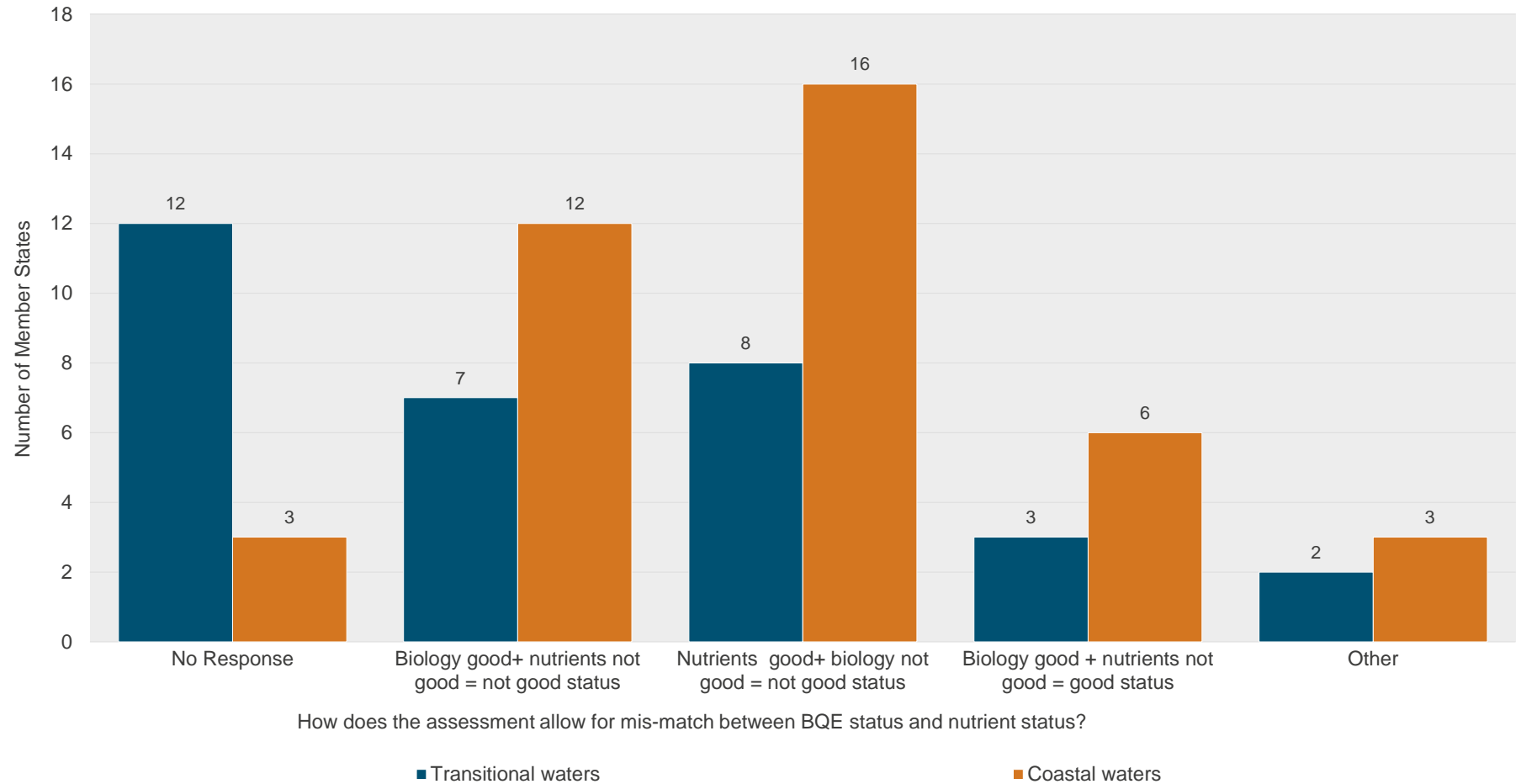
OSPAR, Helcom, not used

North East Atlantic

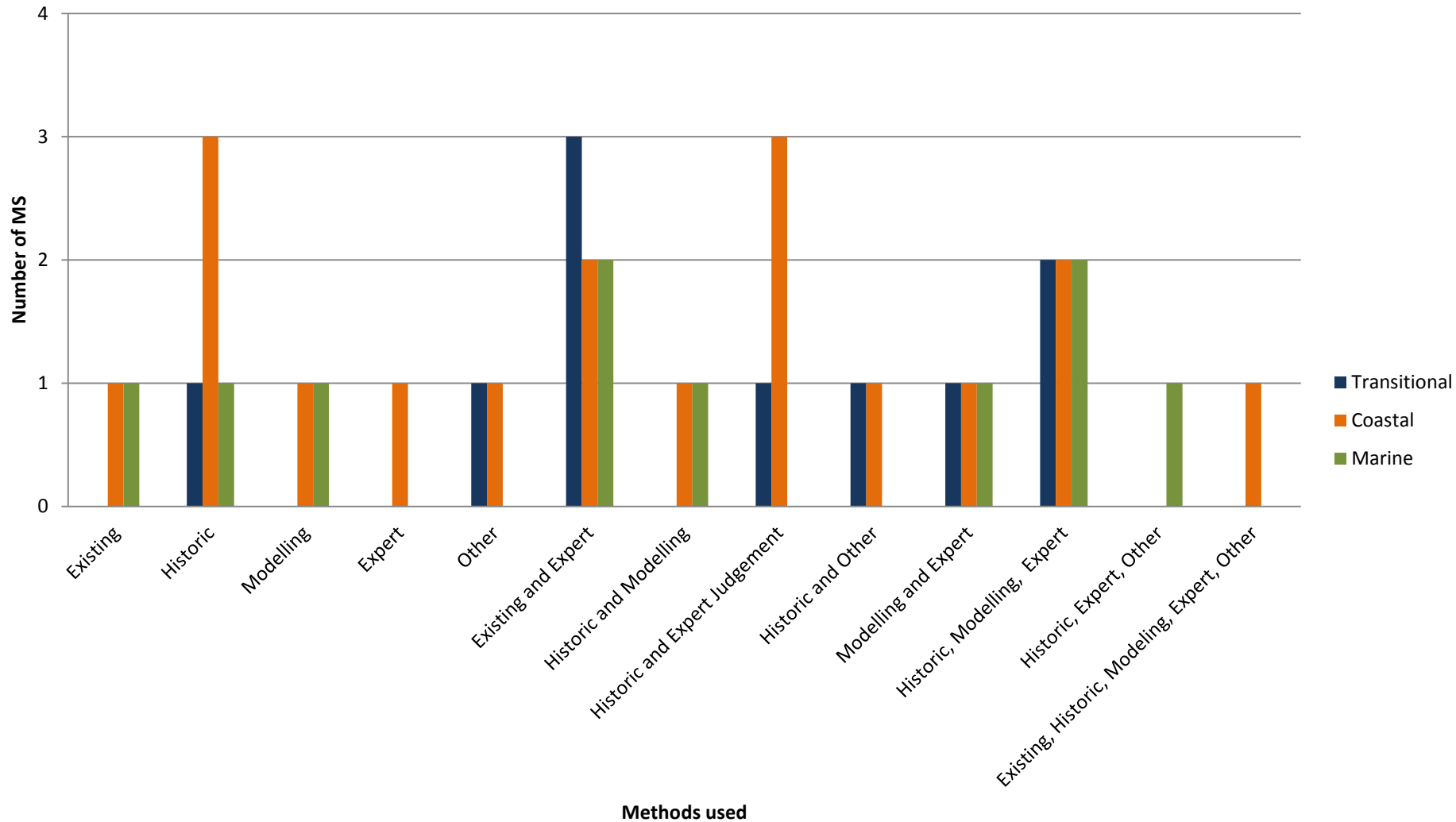
G/M boundaries for marine waters



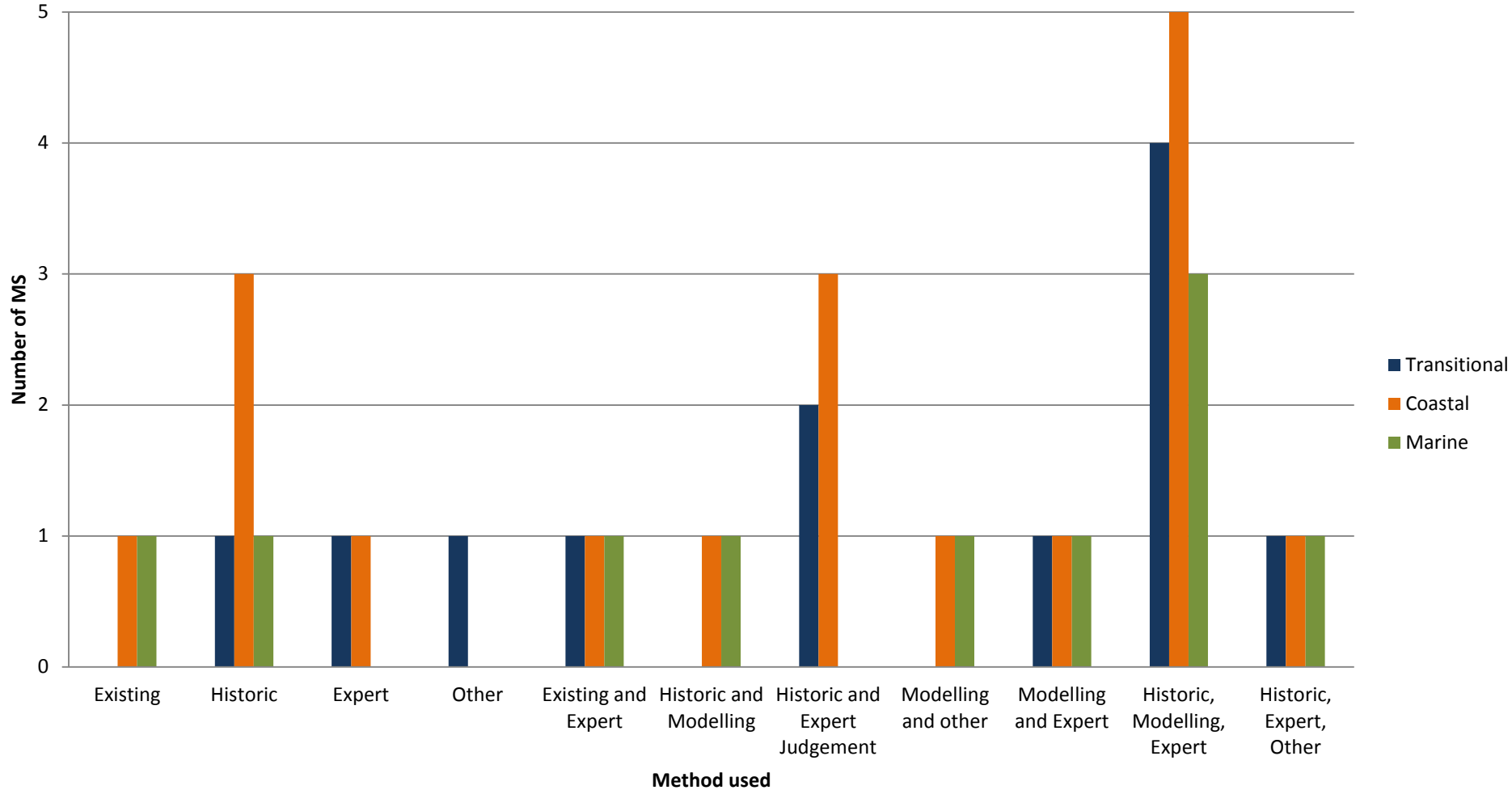
Application rules for boundary values



Methods to define RC- Phosphorus



Methods to define RC- Nitrogen



Methods used to set Nutrient boundaries G/M conditions

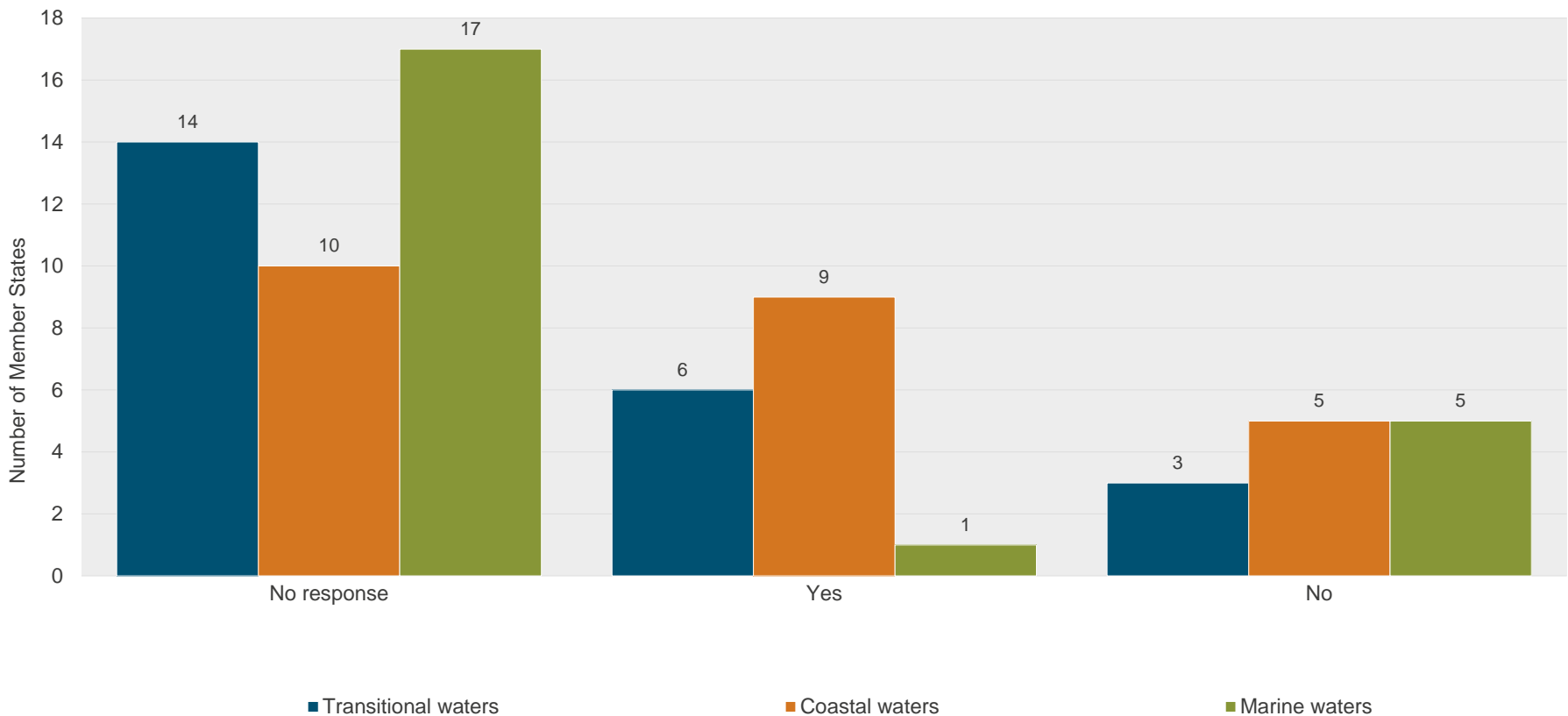
- The information provided is not always detailed and makes a comparison difficult to impossible.
- For the Baltic Sea DE, FI, EE refer to the HECLOM approach.
- For the North Sea DE, SE, UK refer to the OSPAR approach
- In the Mediterranean Sea and Black Sea no common approach was found.
- Several MS reported work in progress (ES, F, PT).

Comparison of the methods used to set nutrient boundary values

- To derive reference conditions predominantly use of historic nutrient inputs/nutrient concentrations and extrapolation into the sea along salinity gradients
- Use of different historic years – DE 1880, DK 1900, NL 1930s, BE 1950s/2, PL 1950s?, RO 1960s, HR 1972-2010, EE 1993-2008 sites with low impact, F 2006-2011, FI 1900 & recent, IE – unimpacted sites; SE – historical data ?, not further specified:?, LV 60s and 1973, NO-recent data?, PT – not yet defined, RO-1959-2011, SI – recent, UK?
- Sometimes use of pressure-response relationships (e.g. IT- chla, BG, LT-chla) mainly based on chlorophyll-a (sometimes macrophytes) but it remains unclear how the boundaries for the BQEs were derived
- To derive G/M boundaries an acceptable deviation was added to the reference conditions.
- It shows that setting reference conditions is the main anchor point for deriving G/M boundaries

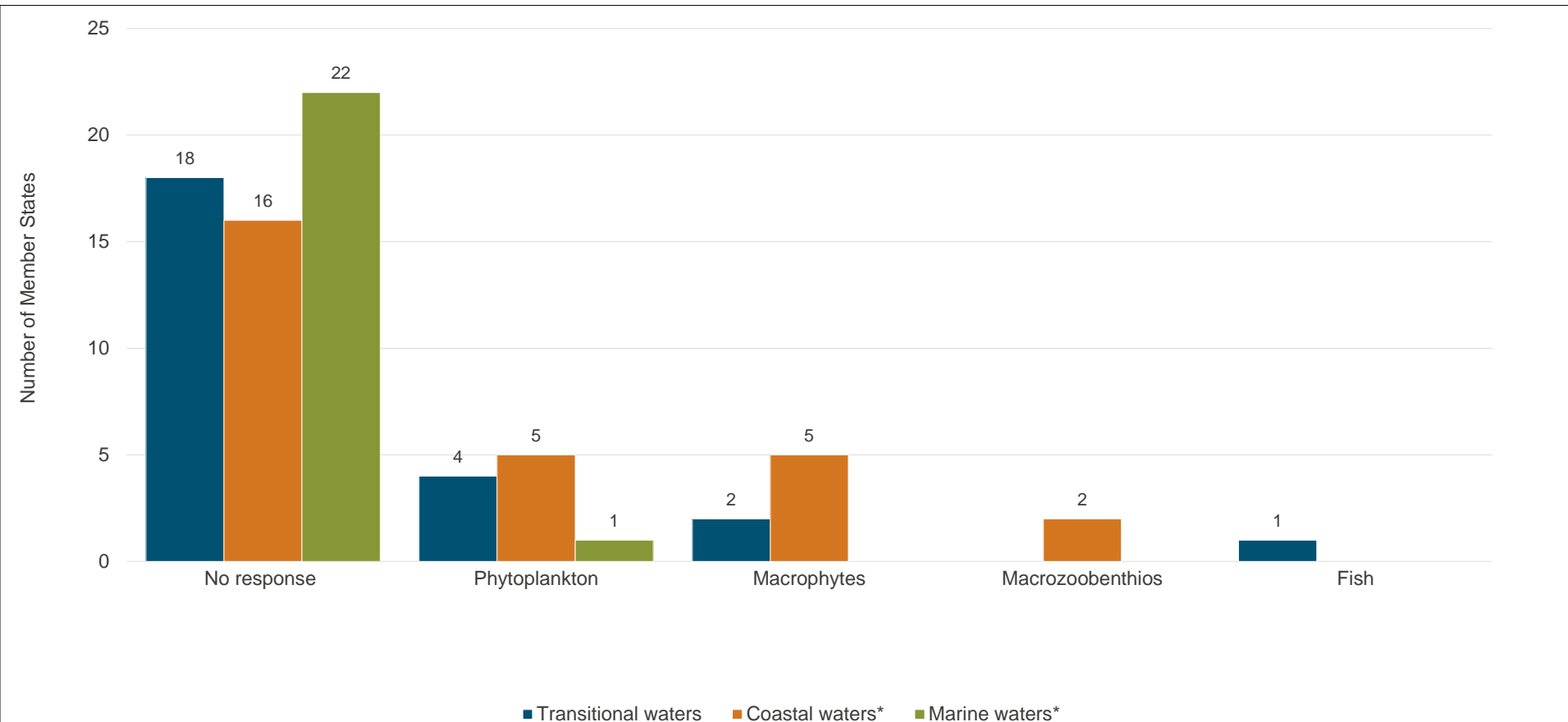
Mis-match between classes I

Does a mis-match occur between WFD class derived from nutrient sensitive biological methods and the class derived from nutrient concentrations?



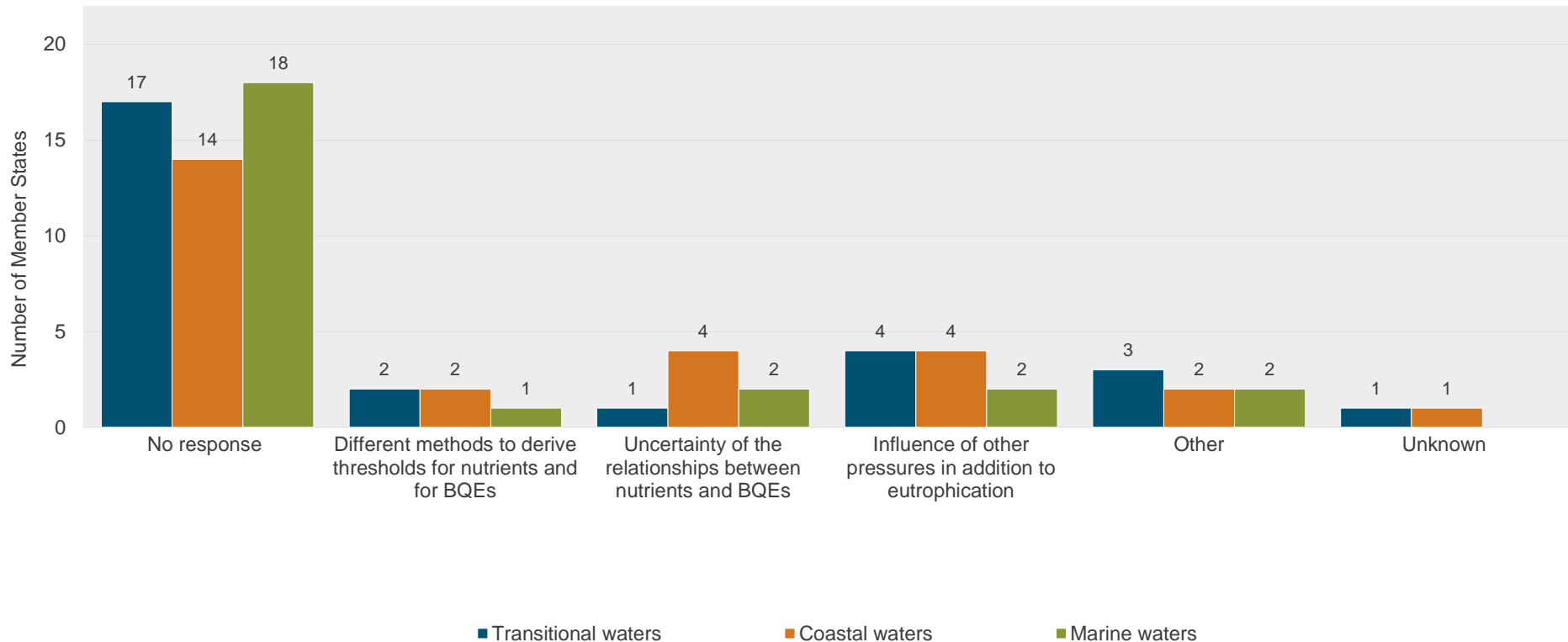
Mis-match between classes II

For those Member States where mis-match occurs, for which BQE is this mis-match predominantly observed?



Mis-match between classes III

If there is a consistent mis-match between WFD/MSFD class derived from nutrient sensitive biological methods/effect indicators and the class derived from nutrient concentrations, please indicate possible reasons



THANK YOU