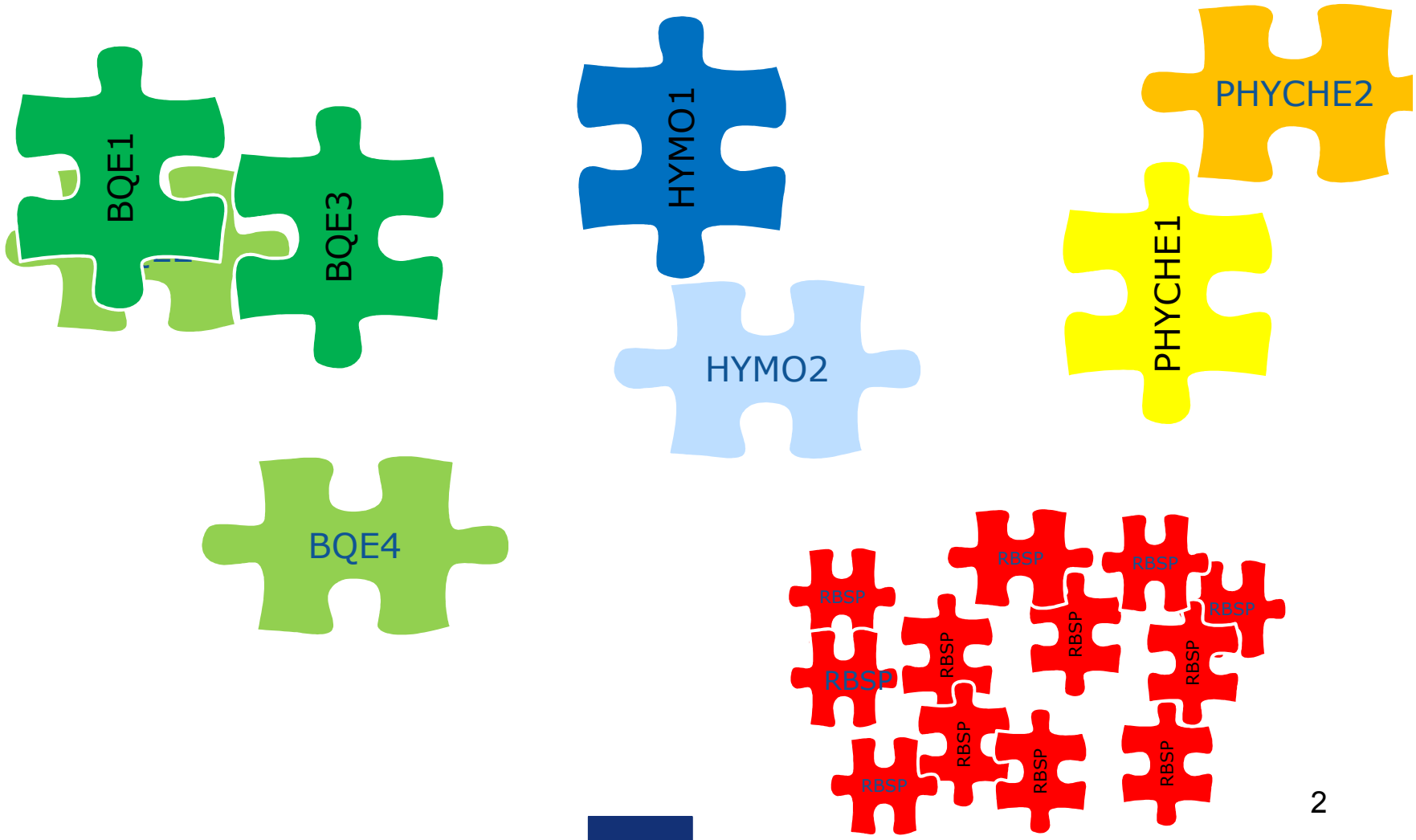
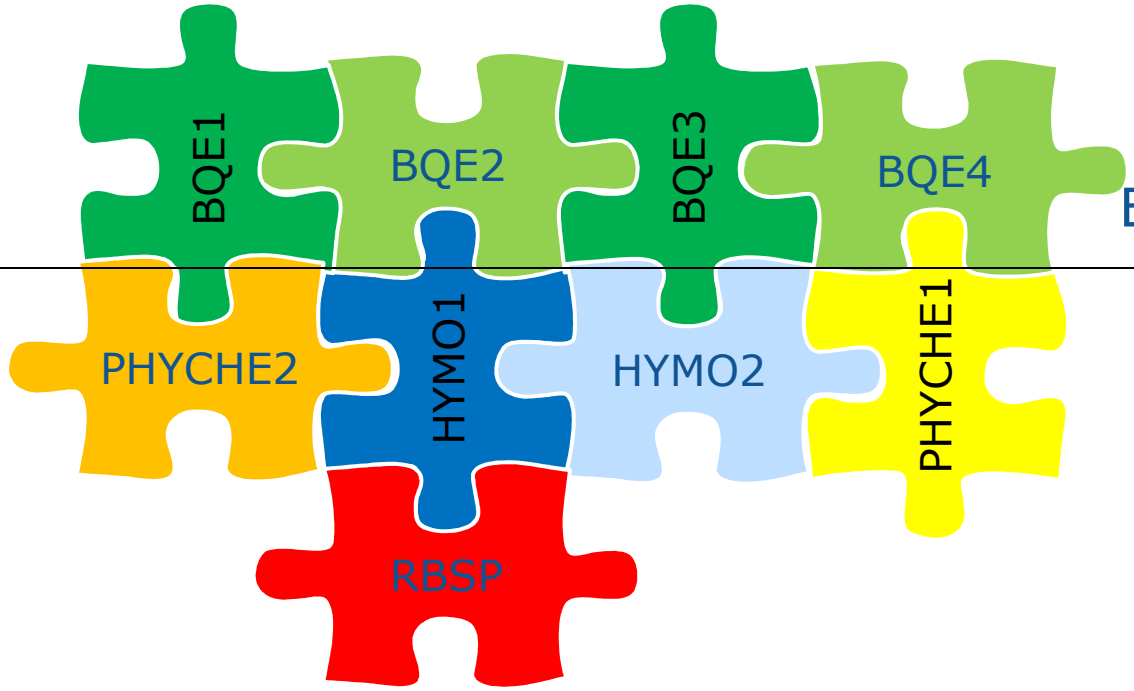
WFD ecological status assessment methods: sensitivity to different pressures and applicability to temporary rivers

Wouter van de Bund European Commission, DG JRC

Ecological status: many elements



Water body classification



BQEs (5 classes)

Supporting elements (2-3 classes)

"one out – all out"

CIS work on classification - State of play

- *BQE methods are intercalibrated*
  - **technical reports**
- *Key principles for classification in 2003 guidance*
- *Best Practice Guide and Toolkit for Nutrients*
- *Hymo assessment methods overview*
- *RBSP: EQS values, link with BQEs unclear*
  - **Work on effect based tools**
- *Reporting from 2nd RBMPs*

Methods and Pressures - questions

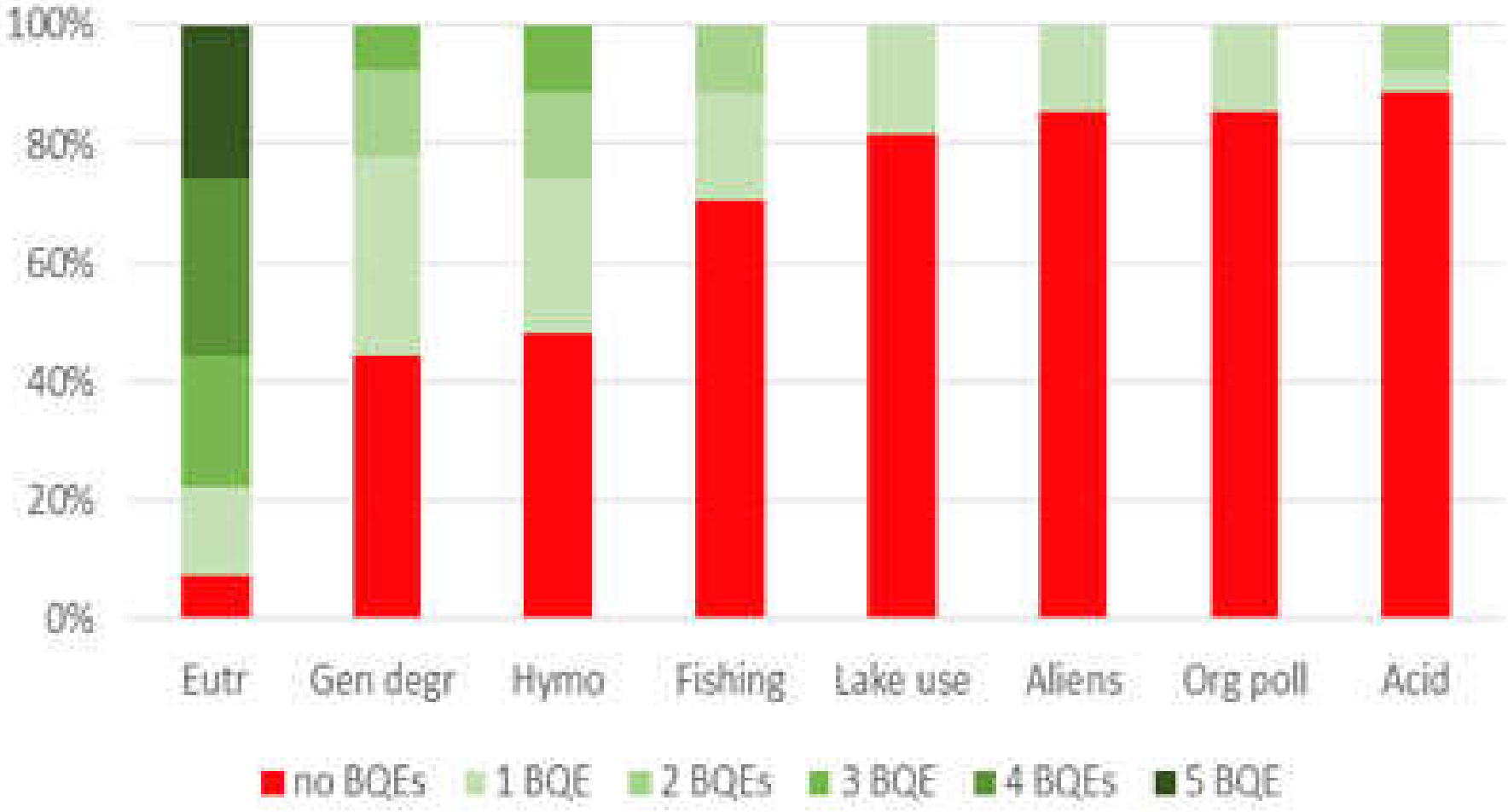
- *Which pressures are assessed / by ecological assessment systems currently in use in Europe?*
- *Which BQEs are used for detecting those pressures?*
- *Are there some pressures missing?*
- *How strong is the evidence provided to demonstrate pressure-response relationships for the different pressures and BQEs?*
- *Can we expect the classification for the different supporting elements to be in agreement with BQE classification?*

Methodology

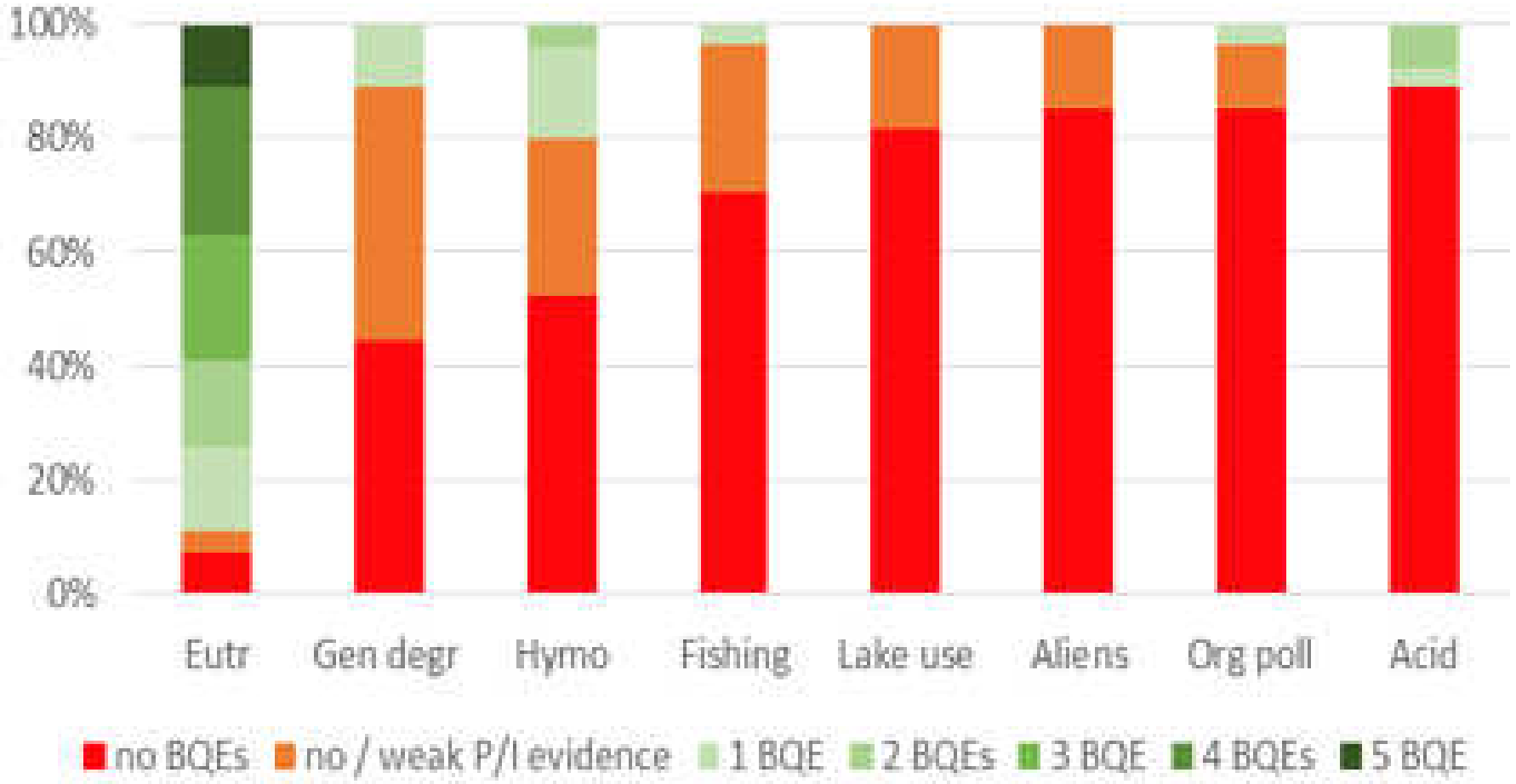
For each of the methods included in the latest round of the intercalibration the following information was extracted from the IC technical report:

- *Pressures to which the method responds according the MS (using the pressure categorization as they are reported)*
- *Checked for evidence documenting pressure-impact relationships in the IC technical reports*
- *Results for all MS and specifically for MED countries*

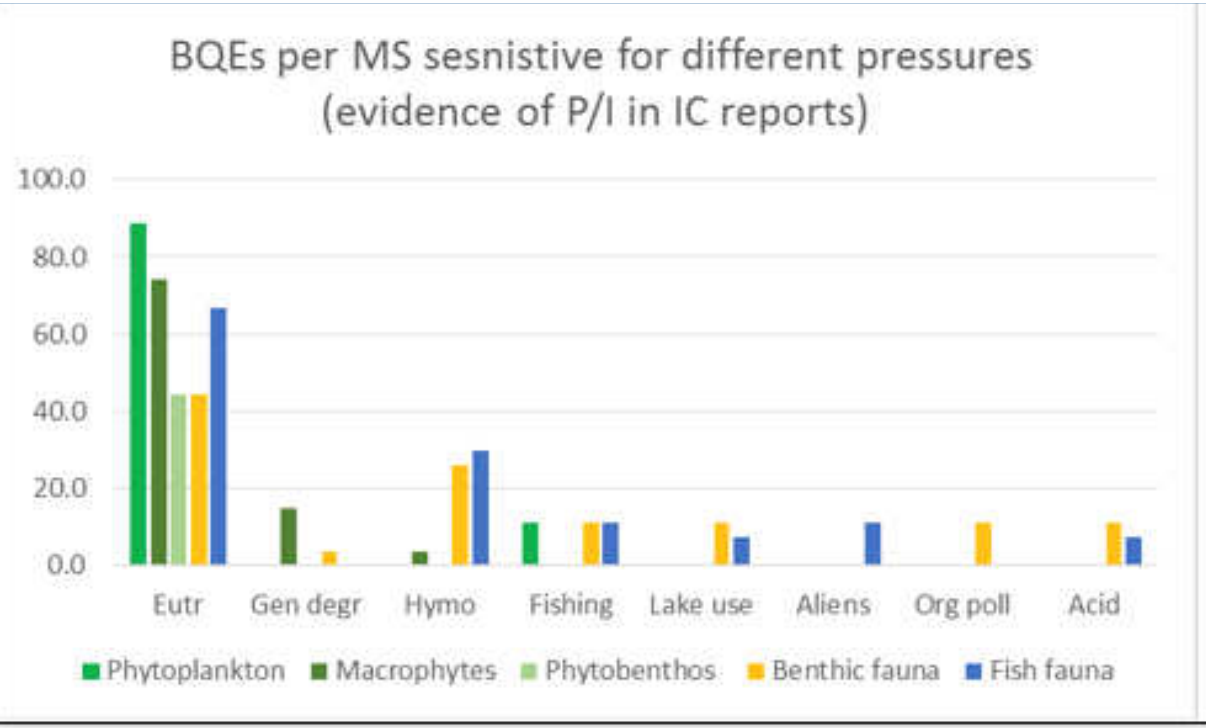
Lakes - # BQEs per MS sensitive for different pressres (according to MS)



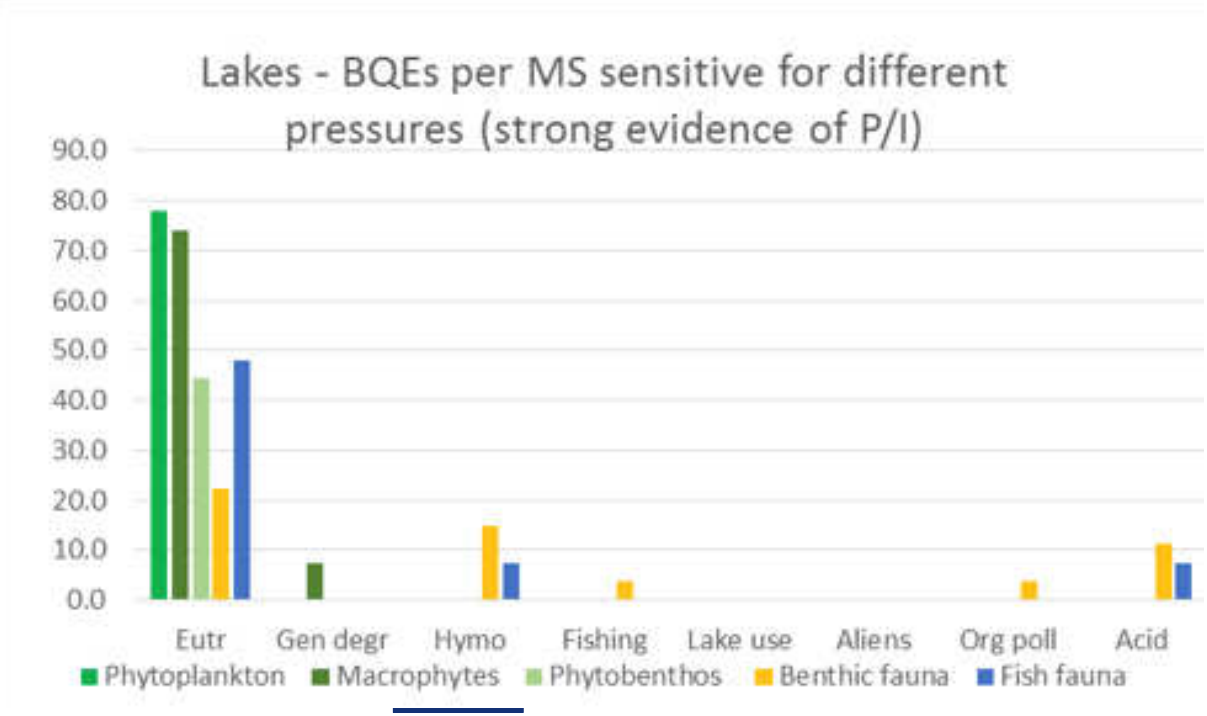
Lakes # BQEs per MS sensitive for different pressures (strong evidence of P/I in IC reports)



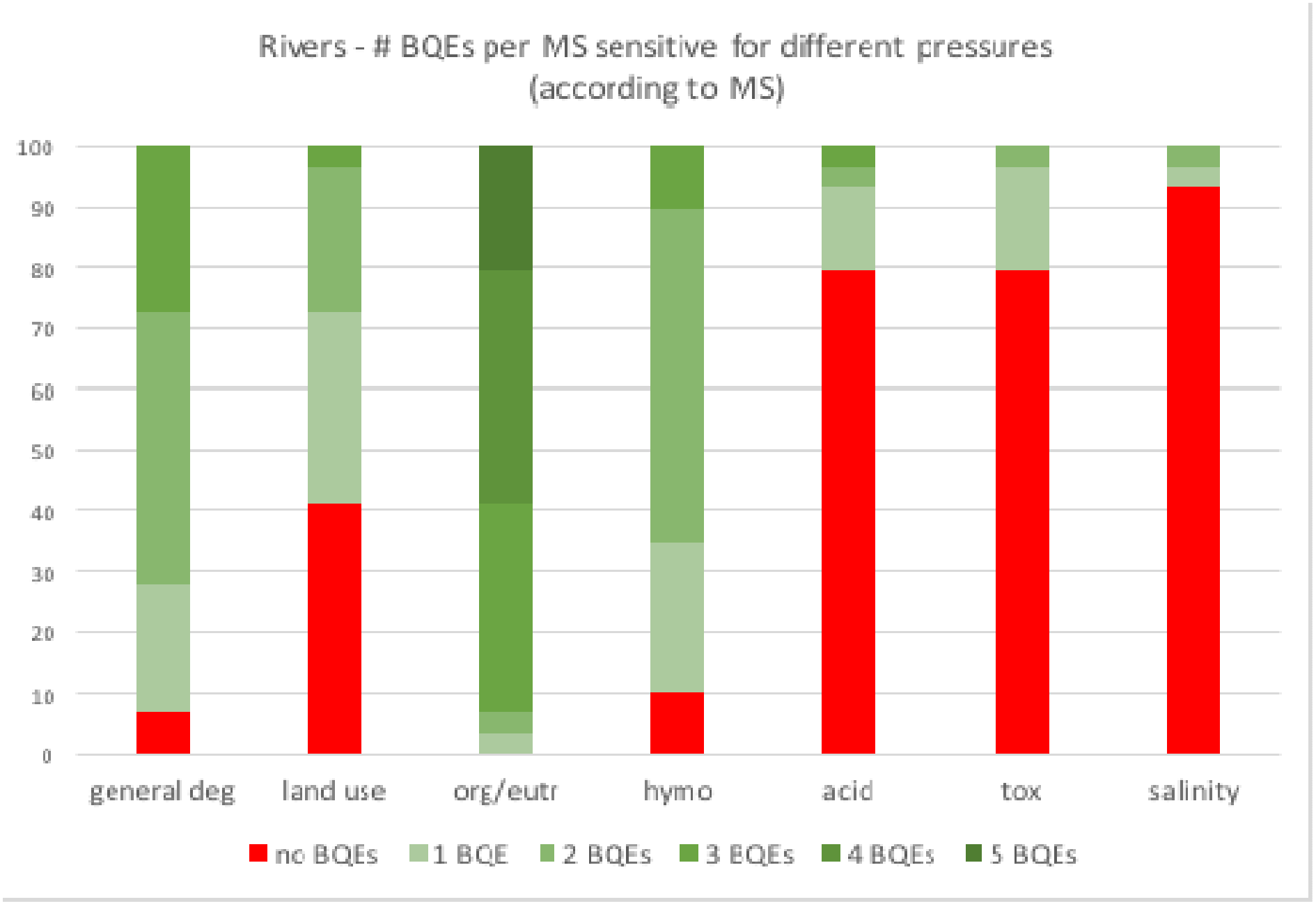
Lakes



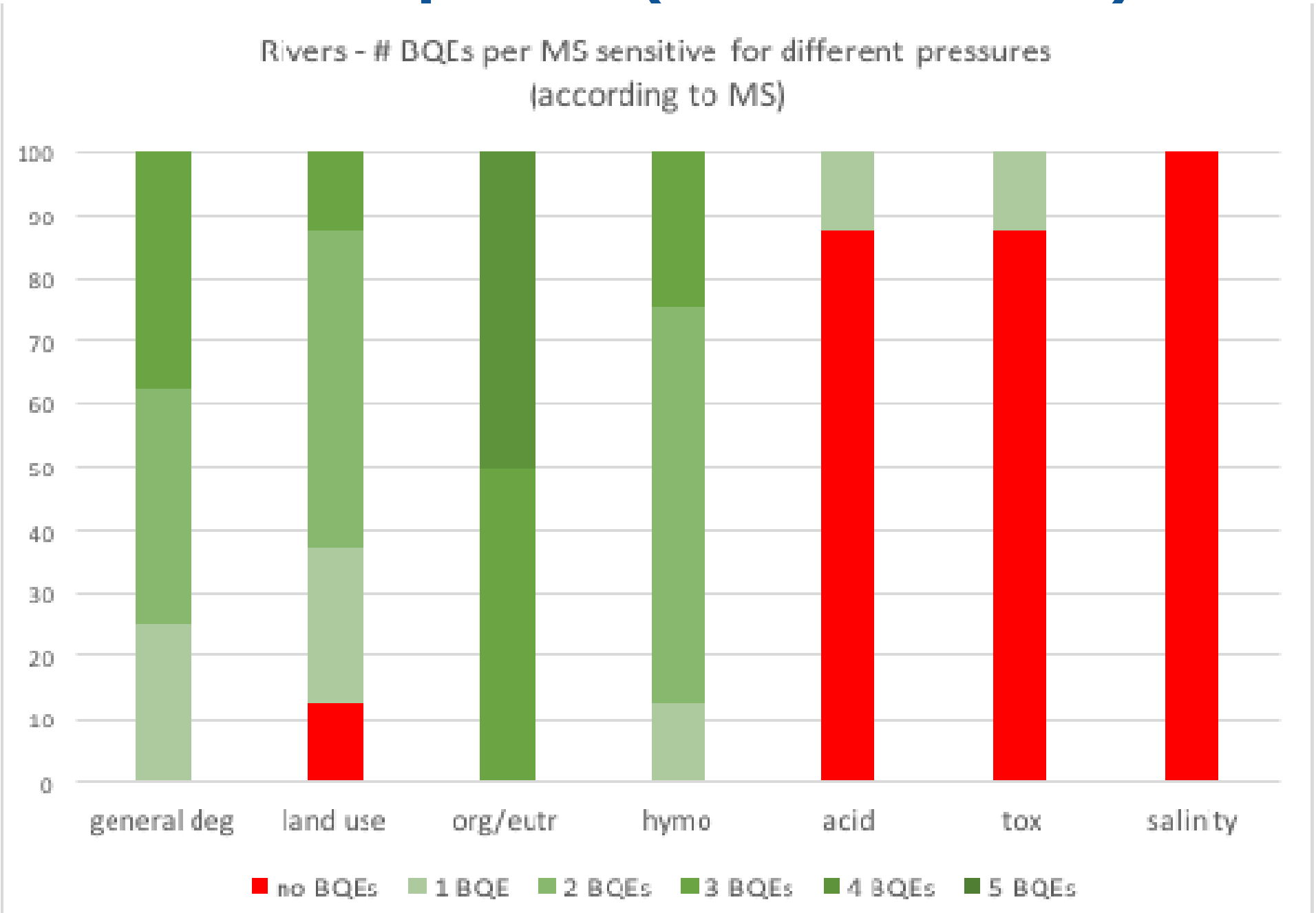
Lakes - strong evidence



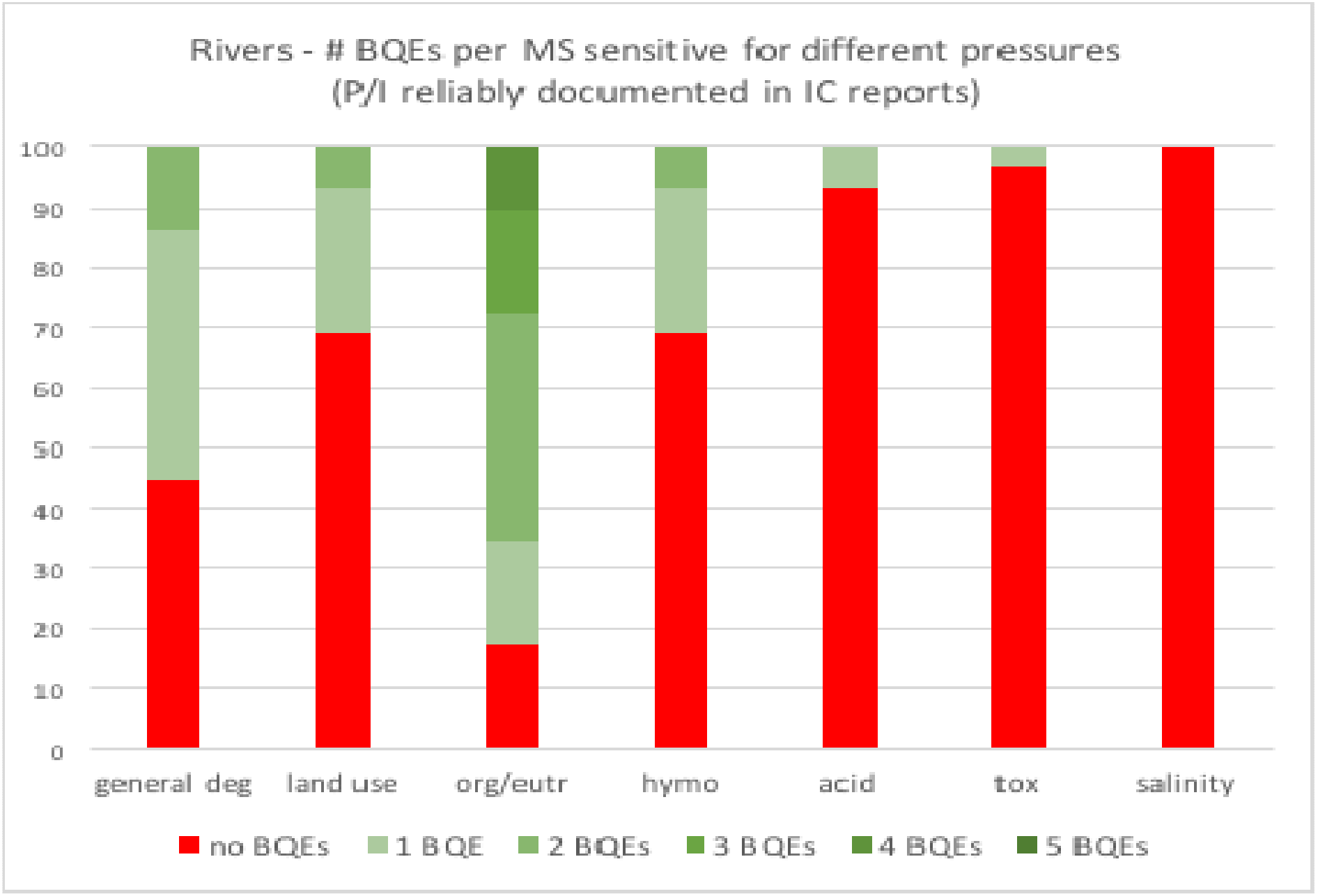
Rivers: reported (all MS)



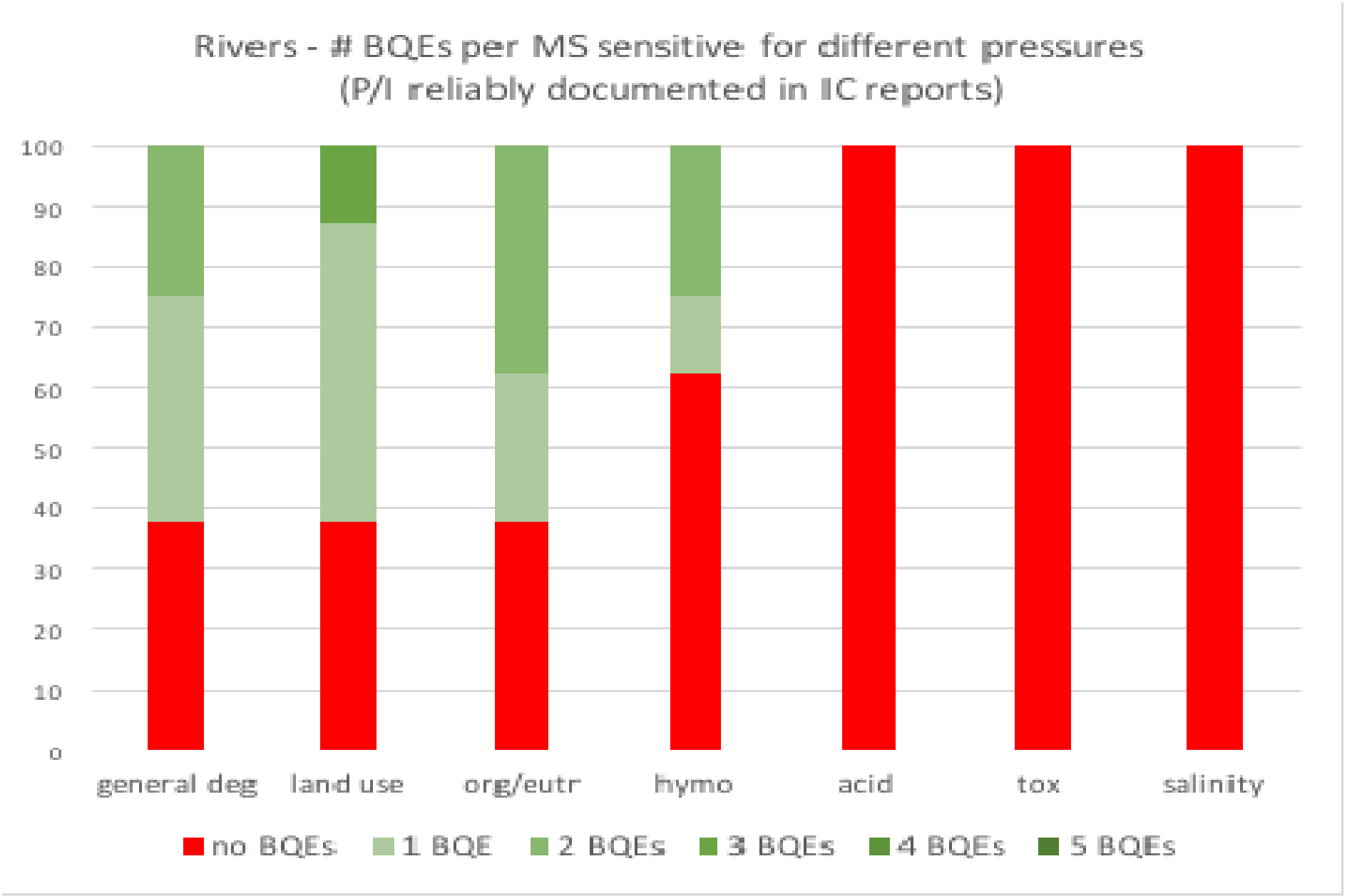
Rivers: reported (Med countries)



Rivers – strong evidence (all MS)

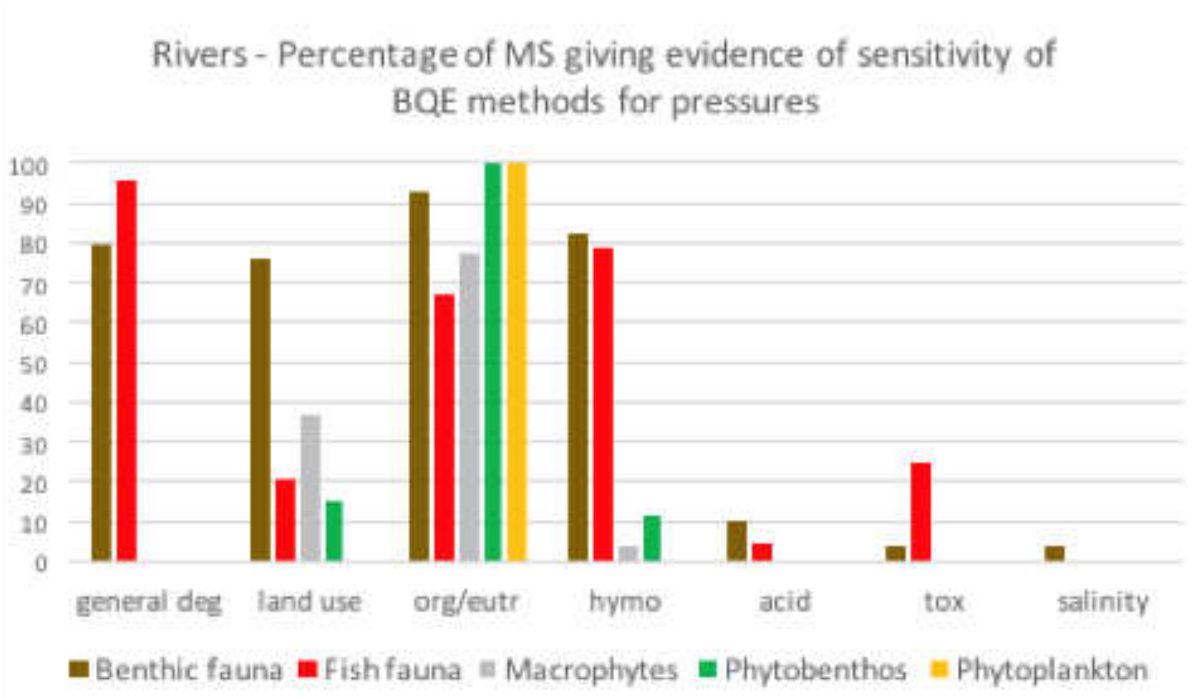


Rivers – strong evidence (MED countries)

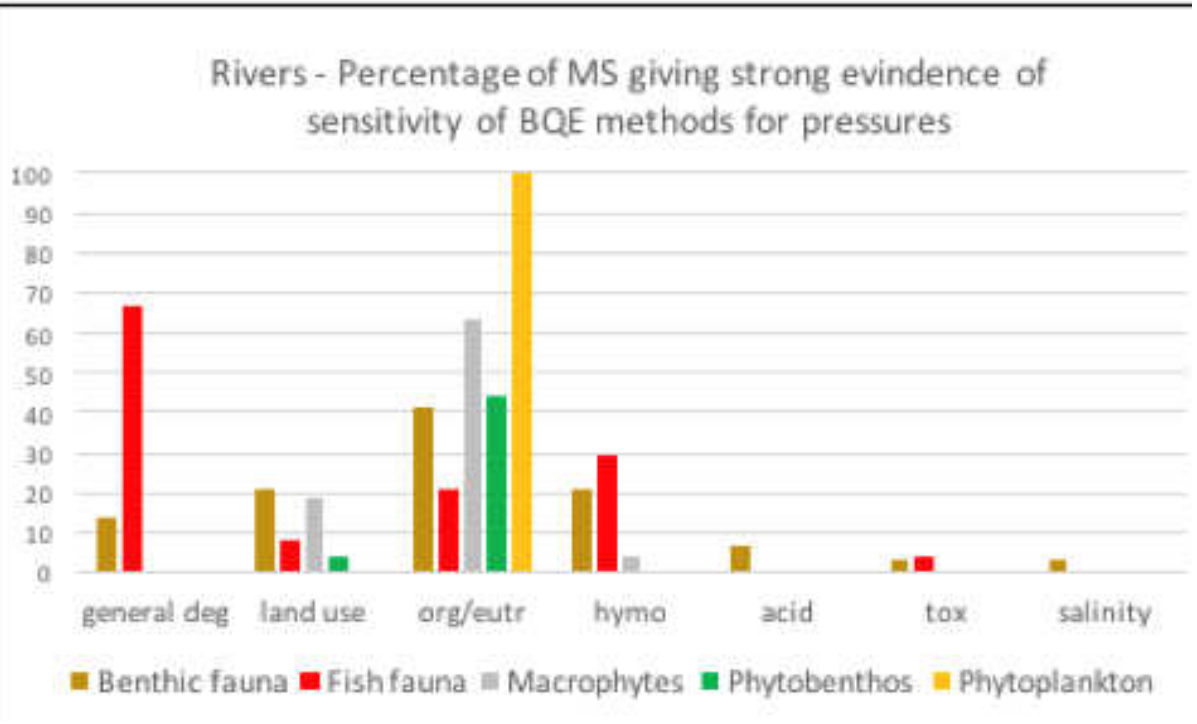


All MS

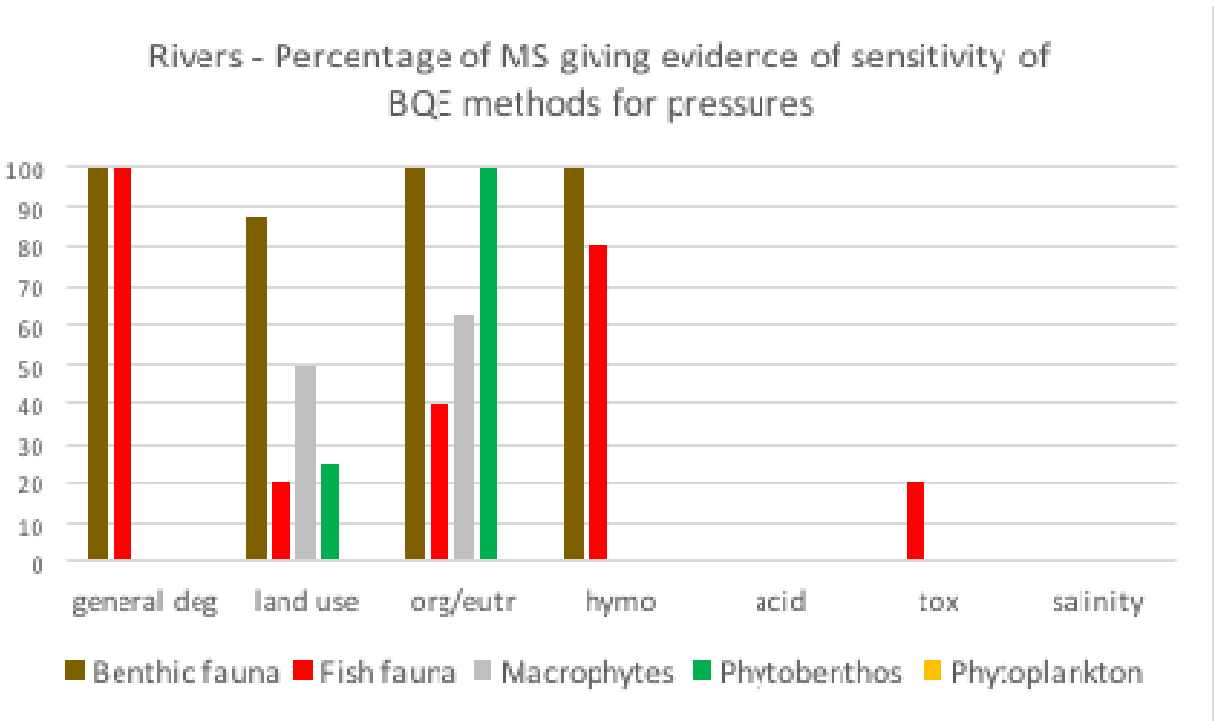
Rivers



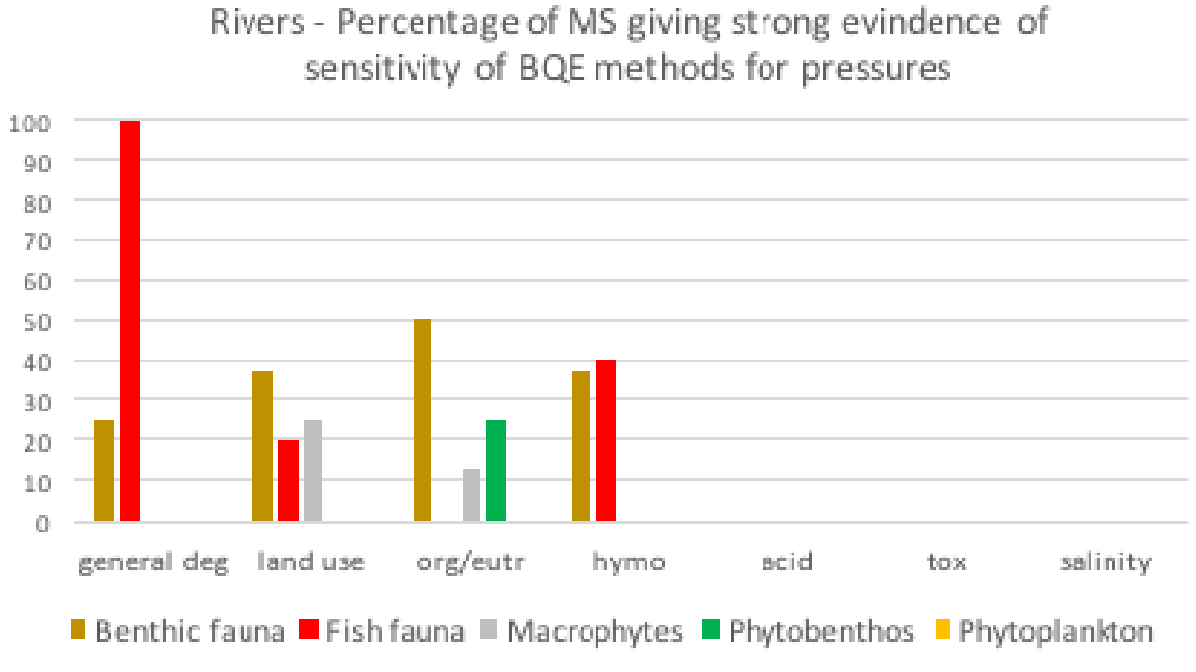
Rivers - strong evidence



Rivers



Rivers - strong evidence



MED countries

Eutrophication and organic pollution

- dominant pressures that are well covered by the BQE methods
- Strong evidence for pressure-impact relationships is reported in the intercalibration technical reports for most BQEs (slightly less so for MED countries
- Phytoplankton not used in MED countries
- High level of redundancy in the classification systems
- Supporting physicochemical elements linked with these pressures can be expected to be in agreement with the BQEs

Hydromorphological pressures (1)

- 90% of MS claim that hymo pressures are addressed by at least 1 BQE for Rivers
- Most sensitive BQEs are fish and benthic fauna
- Hymo evidence much weaker than for nutrients/organic matter
- Hymo evidence slightly stronger for the Mediterranean countries
- Pressure characterization often based on proxy indicators or expert judgment.

- Uncertainty in the effectiveness of BQE assessment methods to detect hymo pressures; hymo classification necessary for diagnosis of problems

Hydromorphological pressures (2)

- MS have hymo classification methods (see ATG hymo activity) but little evidence for P/I relationships using these methods in intercalibration reports
- BQE methods specifically responding to hymo pressures are rare (some notable exceptions where hymo specific modules are in use)
- Lack of emphasis on hydrological pressures

Toxicants

- Few BQEs reported to be sensitive for toxic substances (neither PS nor RBSP)
- Existing BQE classification methods can not be relied on to detect problems with toxicants
- Targeted methods (e.g. effect-based tools) could be developed to better integrate effects of all toxicants in the environment

Acidification

- Targeted BQE methods in place in MS where acidification is a problem (mosty benthic fauna)
- Strong pressure-impact relationships, methods separately intercalibrated
- Conclusion: acidification is well covered by the BQE assessment systems

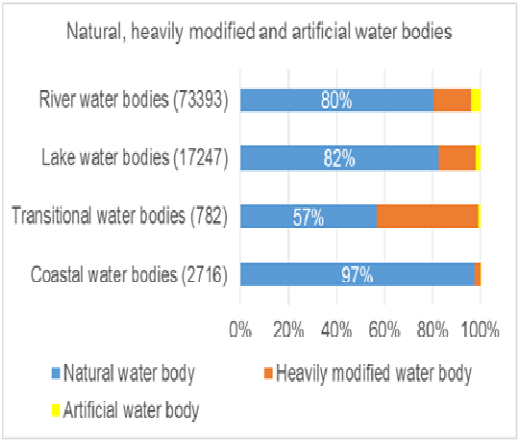
Use of BQEs and supporting elements – overview from WISE reporting of 2nd RBMPs

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Inland, coastal, marine waters

Data:

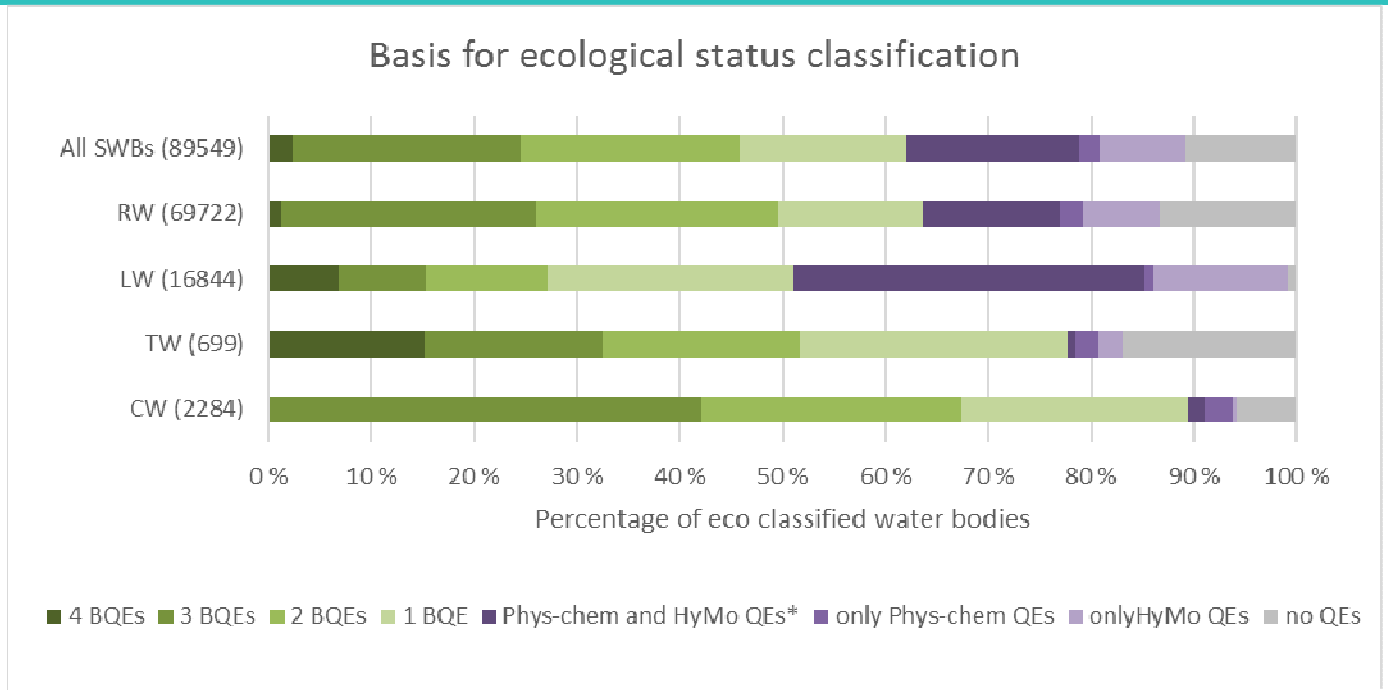
- Data reporting follow the CIS Guidance No. 21; EC, 2009; and 2016 see http://cdr.eionet.europa.eu/help/WFD/WFD_521_2016
- Data for this presentation was available in June 2017 and include 22 countries
  - (AT, DK, IE, MT, NO not available in June)



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Use of BQEs and supporting QEs in ecostatus classification



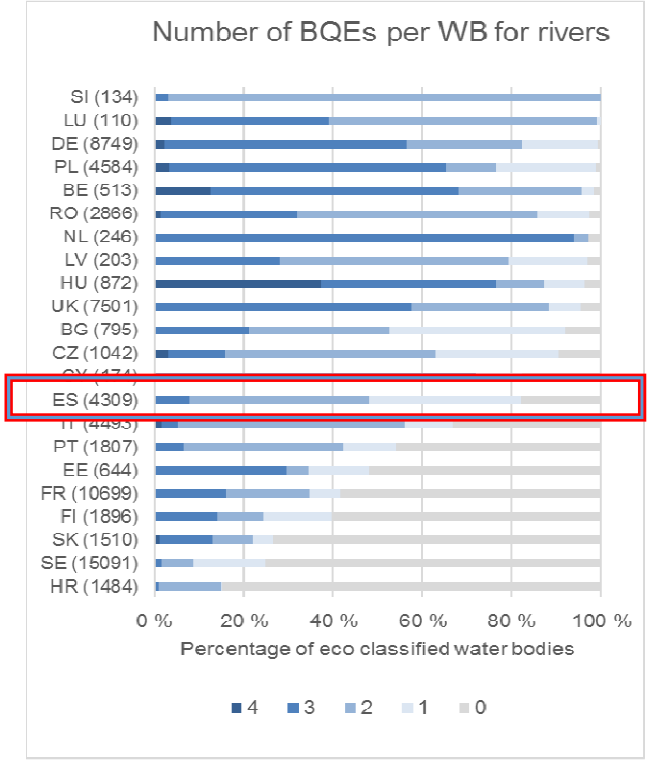
European Environment Agency

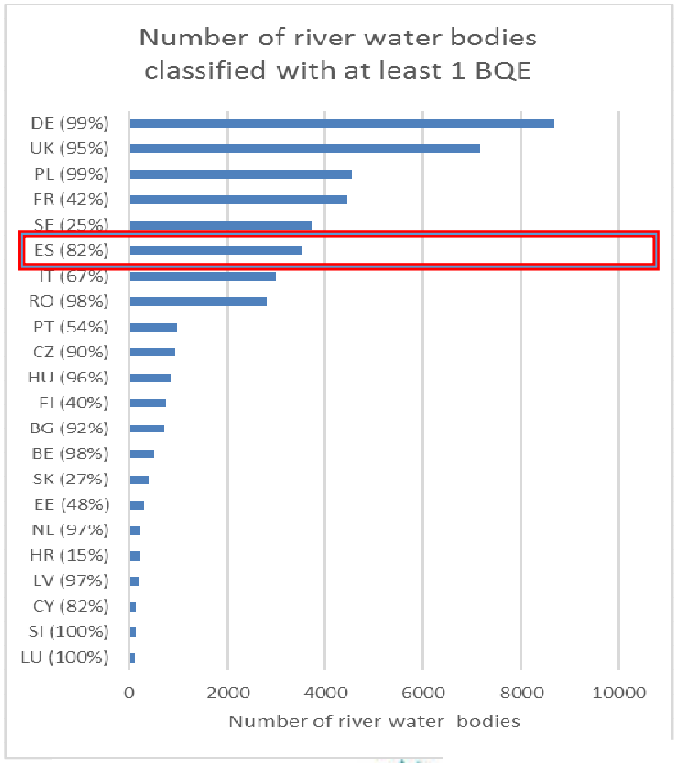
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Classification approach used for different BQEs

Biological quality element (BQE)	# of BQE classified water bodies	Monitoring	Grouping	Expert judgement
Phytoplankton	12242	83 %	6 %	11 %
Phytobenthos	28273	69 %	19 %	12 %
Macrophytes	16328	75 %	19 %	6 %
Other aquatic flora	13176	71 %	23 %	7 %
Macroalgae	1267	76 %	15 %	9 %
Angiosperms	294	88 %	0 %	12 %
Benthic invertebrates	42848	72 %	17 %	11 %
Fish	25258	71 %	14 %	16 %

Use of BQEs in rivers – country level

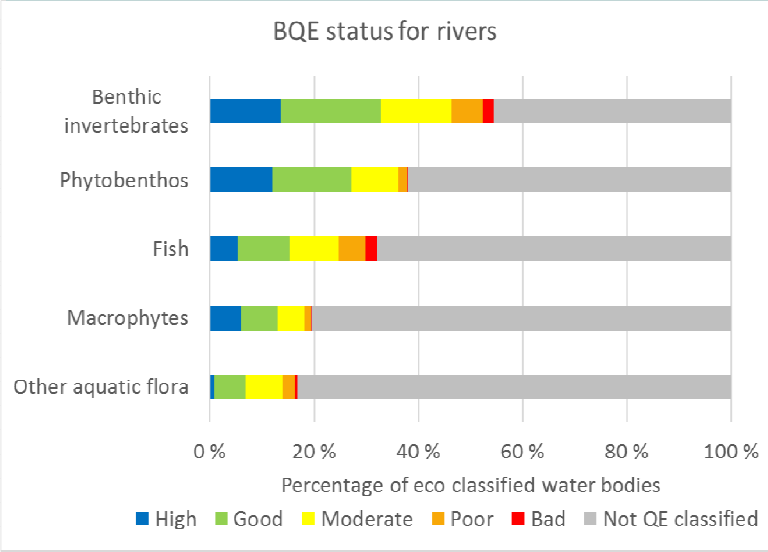


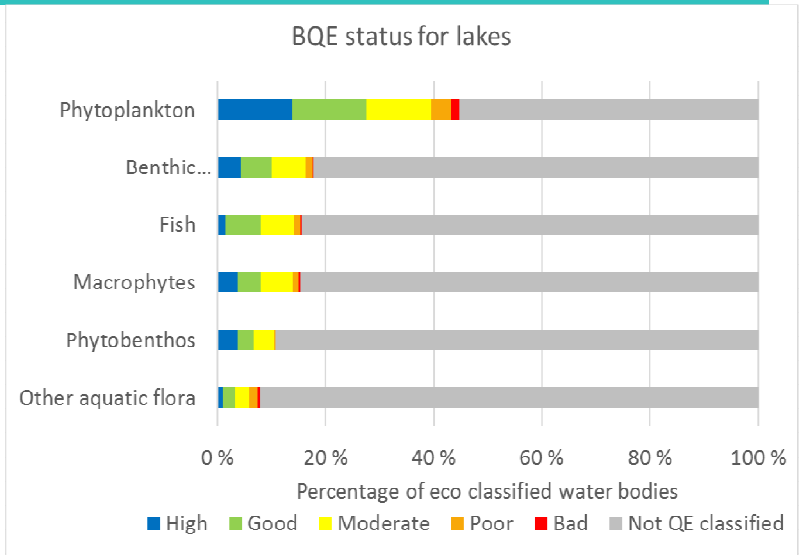


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Status class distribution for single BQEs in rivers & lakes

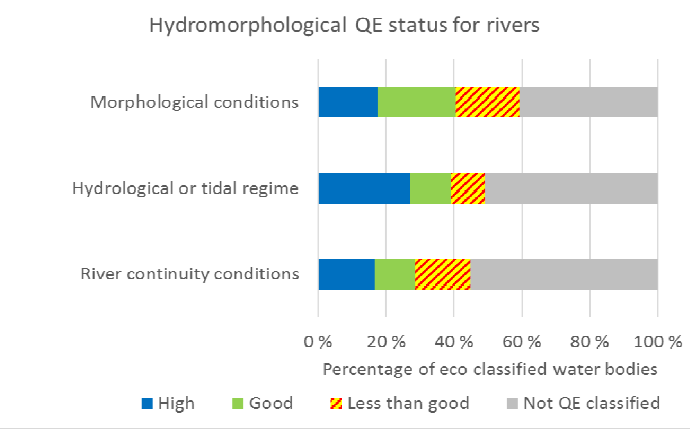


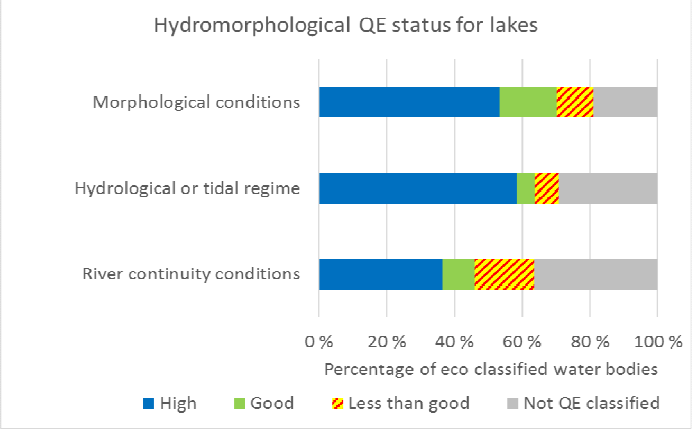


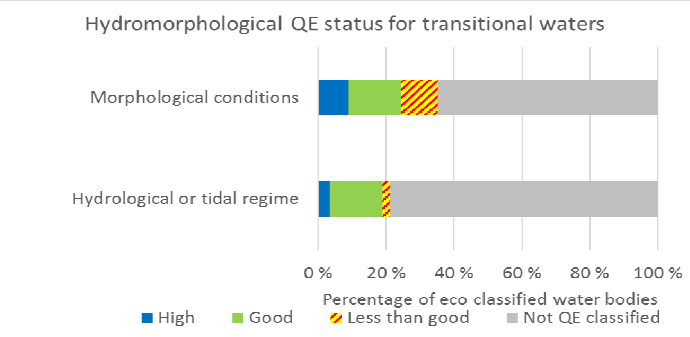
European Environment Agency

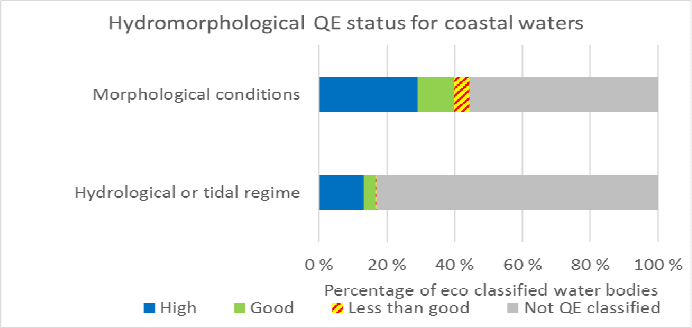
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Status class distribution for HyMo QEs

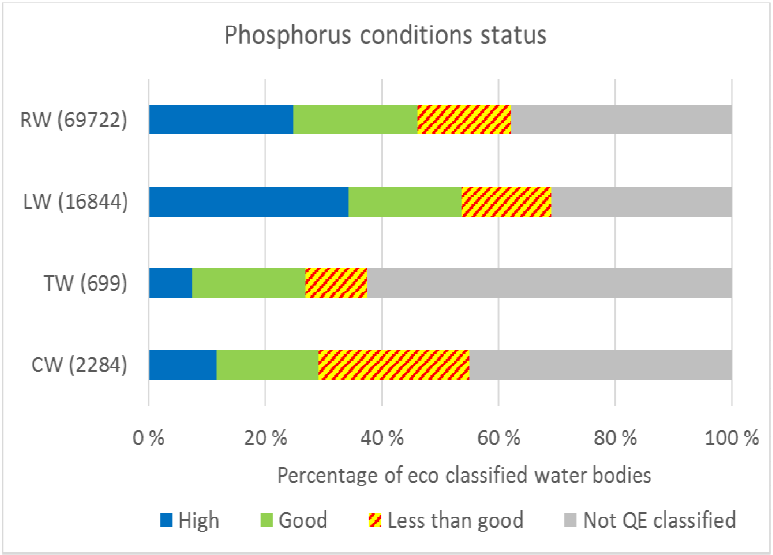


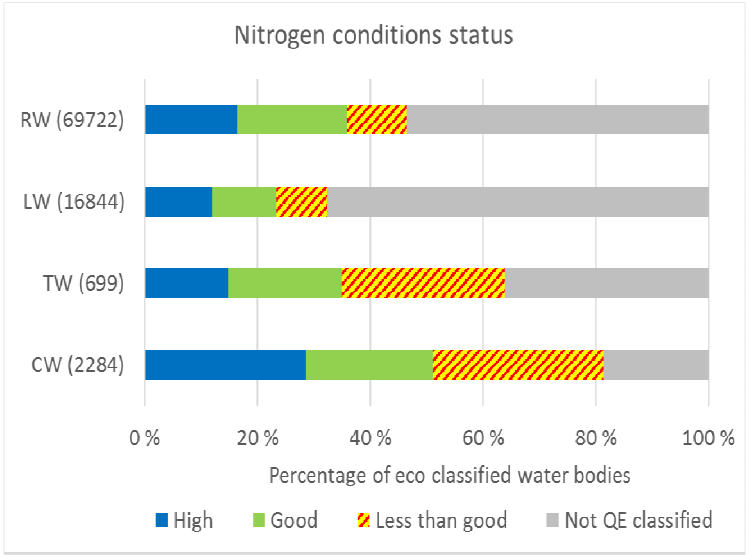






Status class distribution for Phys-chem QEs: Nutrients





Data not available at parameter level

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Key messages on BQE status: EU level

- Phytoplankton and benthic invertebrates and supporting QEs are classified in the majority of water bodies
- Other BQEs are less used for classification
- BQE status is good or better in the majority of water bodies where BQEs have been classified (in all water categories)
- Diffuse pollution is the most dominant pressure where BQE status is < Good, but point source pollution and HyMo pressures are also important in RW and TW
- Change from 1st to 2nd RBMPs show some improvement in river BQEs, but comparisons are difficult due to limited reporting of reasons for change (real or methodological)

Temporary rivers in the WFD intercalibration exercise…

Water category	Rivers
Geographical Intercalibration Group	Mediterranean rivers

Description of types that have been intercalibrated

Type	River characterisation	Catchment (km^2)	Geology	Flow regime
R-M1	Small Mediterranean streams	< 100	Mixed (except silicious)	Highly seasonal
R-M2	Medium Mediterranean streams	100 — 1 000	Mixed (except silicious)	Highly seasonal
R-M4	Mediterranean mountain streams		Non-silicious	Highly seasonal
R-M5	Temporary streams			Temporary

Countries sharing types that have been intercalibrated:

R-M1: Bulgaria, France, Greece, Italy, Portugal, Slovenia, Spain

R-M2: Bulgaria, France, Greece, Italy, Portugal, Slovenia, Spain

R-M4: Cyprus, France, Greece, Italy, Spain

R-M5: Cyprus, Italy, Portugal, Slovenia, Spain

Intercalibration COM Decision 2018/229

Intercalibrated methods for R-M5

Benthic invertebrates

- Cyprus – STAR_ICMi

- Greece – HESY-2

- Italy – MacrOper

- Portugal – IPtIN, IPtIS

- Slovenia - …….

- Spain – IBMWP; IMMi-T

Fish fauna – no results specific for R-M5

Intercalibrated methods for R-M5

Macrophytes – no methods

Phytobenthos

- *Cyprus – IPS*
- *Italy – ICMi*
- *Portugal – IPS*
- *Slovenia - ….*
- *Spain – IPS*

For discussion....

- *Are temporary rivers properly included in national typologies?*
- *Are BQE methods "fit for purpose" for temporary rivers?*
- *What can be done to improve the way temporary rivers are dealt with in the WFD?*
  - **WFD review and fitness check**
  - **CIS work programme 2019-2022**

ECOSTAT classification workshop 29-30 May 2018


Thank you for your attention