Comparison of methods to derive reference conditions and G/M boundaries

- Different approaches in deriving reference conditions
  - Selection of historical years largely based on pragmatism: not go back too far to create unrealistic conditions. Tried to find a time scale where impact was likely to be not too high
  - Difference on trophic level (oligotrophication in Med) so reference conditions are lower
  - In Mediterranean can use existing reference sites for boundary setting using pressure-response relationships.
  - IE and UK use remote, off-shore values as reference. UK also uses existing low-impact sites along the coast and correlates with off-shore values
  - Despite different approaches some MS have similar boundaries (DK and IE)
  - Very few examples of using pressure-response relationships
- Need to discuss the deviation (the % from which G/M can be defined) Decided by experts – pragmatic approach. Deviaton should be max 50% and can go lower than that. OSPAR has range between 25-50%.
  - Ireland mentioned uses two times 50% (50 % reference - H/G + 50 % G/M), but crosschecked with our eutrophication parameters (e.g. oxygen)

Comparison of nutrient boundary values

- As regards the use of different parameters for N and P
  - Reasons for assesssing total nutrients or dissolved depends on the assessment method as result may be unreliable. More costly to assess total nutrients
  - Total nutrients may not be reliable in terms as link to eutrophication
  - In transitional waters/estuaries difficult to assess total nutrients due to suspended matter
  - Some MS have more robust data on Total nutrients
  - In light of CC, Total nutrients might be more robust measurement but more investigation needed
  - Total nutrients are necessary for calculating budgets (used in modelling) and for setting nutrient reduction targets
  - Decision on which parameters to assess for three waters depends on many issues and could be as simple as that different institutions are assessing different water types – no scientific reason
  - In principle would be good to have a consistent approach but in practice dependent on the ecosystems, also on objectives and also on pollution pathways (riverine, atmospheric, transboundary)
  - Within regions should be possible to have a common approach but it‘s not necessary for all regional seas to have the same approach

Comparison of nutrient boundary values

- Use of different seasons
  - In Baltic and North East makes sense to assess dissolved nutrients in winter because biological activity is low
  - In Black Sea and Med variability is very high so measure year-round
  - There should be a regional sea approach
- Use of different statistics
  - If have a lot of outliers use median, if have lots of data use mean
  - Mean and median don‘t given very different values if don‘t have too many outliers
  - Need a strategic approach to set up monitoring framework
    - Choice of statistical method depends on the sampling size and quality
    - Choice depends on what you want to achieve with monitoring

Application of nutrient boundaries

- UK approach: If a mis-match, record whatever is low but then go through a weighted evidence procedure to estimate „confidence“, which impacts decision-making on measure implementation
- IE: classify based on all-out-one out. Biology drives measure implementation more than nutrients
- HR approach: Use operational and investigative monitoring when there is a mis-match to better understand situation

- **All-out-one out principle is legally binding**

Comparison of nutrient boundary values

- Why did some MS not report on reference conditions and G/M?
  - Baltic: SE doesn‘t know why no reference conditions were submitted for marine
  - Med: In France waters are ogliotrophic so there is no eutrophication. Slovenia has set boundary values but not officially part of regulation – they are expert values. Italy has not reported and will once monitoring is revised. Croatia‘s data are also expert values and not set in regulation
  - North East: NL use OSPAR values for reference conditions