•**Question:**

Can recent advances in monitoring technology ease Water Framework Directive Monitoring tasks?

Water Framework Directive (WFD) Requirements

1. WFD established on 23 Oct. 2000 (the Directive 2000/60/EC of the European Parliament and the council of Ministers)
2. Requires the EU member states to bring (and maintain) their surface water bodies to a 'good ecological status' (GES) and 'good chemical status' (GCS), leading to 'good surface water status' (GSS).
3. GSS to be achieved by 2015 (but possible derogations may extend the deadline up to 2027).
4. Basic unit considered for the implementation of WFD is the 'River Basin'. The integrated RBM concept encompass all water contained in the basin, thus it extends to all groundwaters, rivers, estuaries and coasts.

Monitoring

1 Monitoring is an important aspect of any procedure that needs clarification whether it has worked effectively or not. However, it is not undertaken due to constrain of time and resources.

2. ‘good chemical status’ (GCS), (Regulatory compliance with WFD), needs regular monitoring of water bodies. The ‘chemical status’ encompasses both synthetic (man made) and non-synthetic (from natural sources/or natural processes) pollutants.

3. WFD monitoring requirements: (i) surveillance monitoring (for generic and risk assessment processes), (ii) operational monitoring (for water bodies ‘at risk’ to achieve GCS), (iii) investigative monitoring (intensive form of monitoring to find out the reasons for failure to achieve GCS).

4. Under WFD, there is also a responsibility to ensure that the good status is maintained once it is achieved, **hence the need for further monitoring.**

New monitoring technology – what it can offer?

1. Development of better instrumentation: the impact of the advancement of the micro-electronic development during last two decades contributed much to the advancement of the sensor technology, data collection and transmission.
2. Grab sampling vs. continuous monitoring: high quality data, possibility for event monitoring, warning and alarm alerting (Accident Emergency Warning Systems –AEWS).
3. Real-time, high frequency data is useful to estimate nutrient dynamics, primary and secondary production as well as to assess C,N,P fluxes; can be effectively employed for quantification of diffuse pollution (e.g., agricultural runoff)
4. More and better water quality data is needed for to calculate Maximum Permissible Loading (or Total Maximum Daily Loads), assess trends, to determine current status of waters (trophic state) and their impairments, and to test water quality models.
5. Laboratory automation: the instruments developed can be adopted (with minor modifications) to speed up laboratory analysis (ideal for busy laboratories with a large number of WFD routine analysis). Could save money on expensive instrumentation (e.g. AAS, ICP/MS), and personnel.