

# Data Infrastructure for water remote sensing

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# Modelling compound activity in water

## Requirements

Two dimensions are:

- ▶ *a spatial one*: concurrent presence of different EDCs in a complex mixture, related toxicity strictly related to the mutual interaction between different compounds
- ▶ *a temporal one*: related to the time temporal misfit between institutions and biophysical systems, related to the time mismatches about the communication of scientific knowledge on EDCs distribution

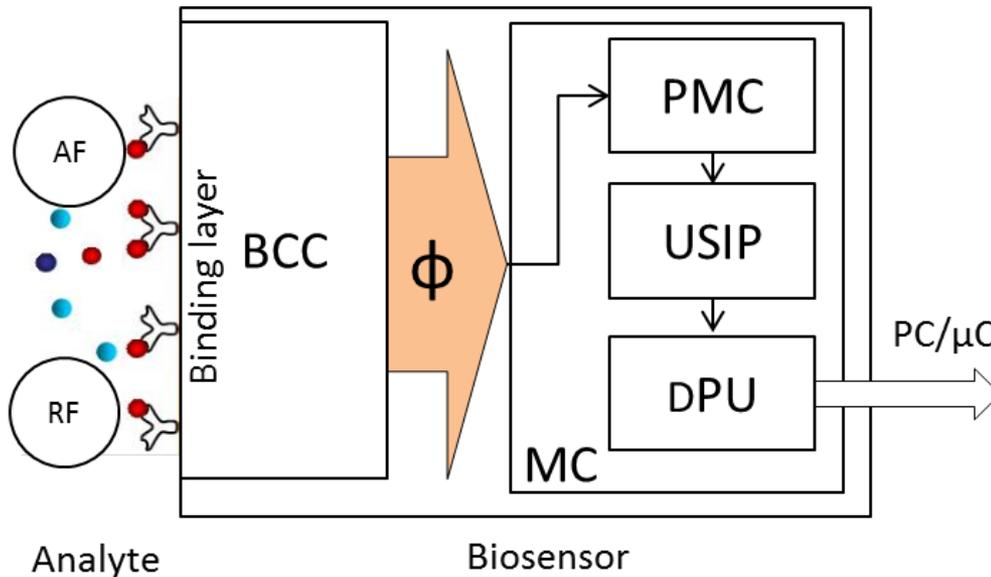
To face this goals is important to implement:

- ▶ **a robust and timely system** of on line and real time revelation systems
- ▶ **a robust data management system** connected to a mathematical model to predict EDCs activity and assess toxicity.

# Biosensors, general structure

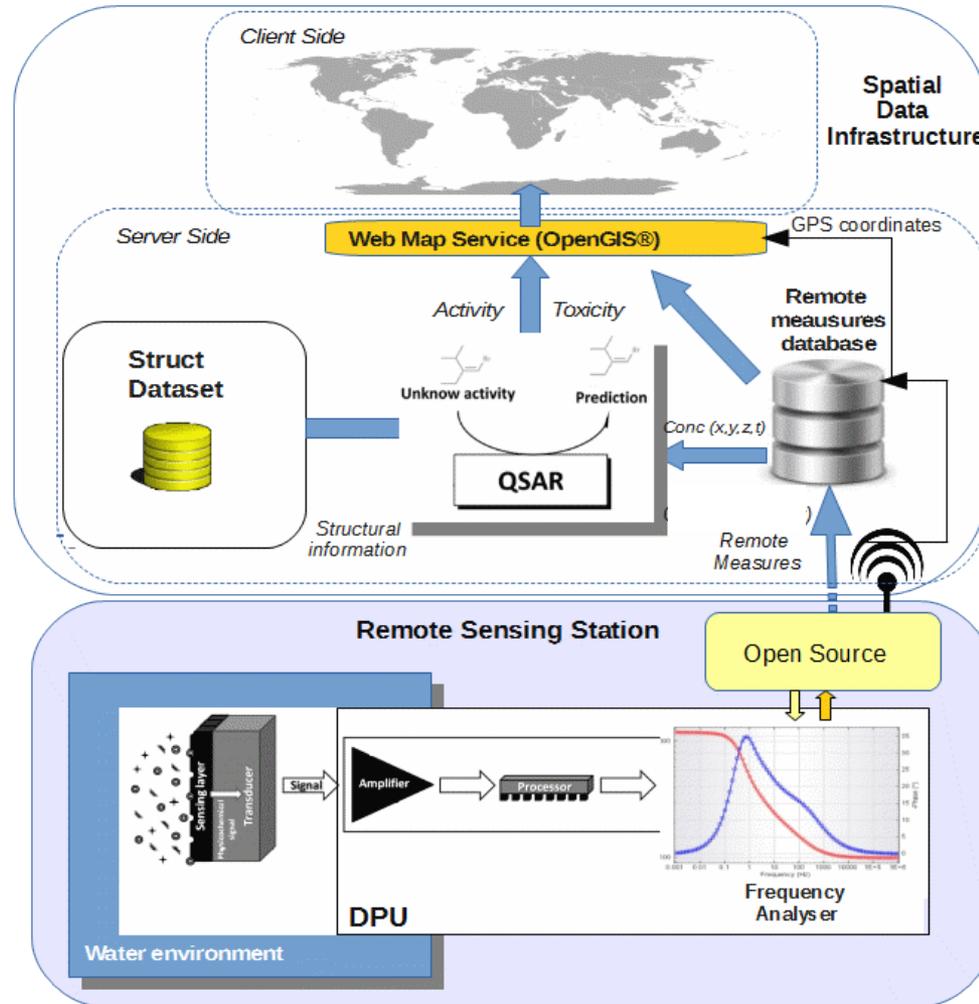
*“self-contained integrated device that is capable of providing specific quantitative or semi-quantitative analytical information using a biological recognition element (biochemical receptor) which is retained in direct spatial contact with the transduction element”*

IUPAC, 1997



- ▶ **AF**: the action factor
- ▶ **RF**: random factors
- ▶ **BCC**: biochemical converter
- ▶ **PMC**: primary measuring converter
- ▶ **USIP**: unit for separating information
- ▶ **DPU**: Data Processing Unit

# General Structure



3. Once generated, the outputs on activity and toxicity from the **QSAR model** together with the data gathered from the on-field measurement about the type of **EDCs and its on-situ concentration**, can be available to be **georeferenced on a map**

1. Multiple remote sensing stations equipped with gold immunobiosensor coated with **ER- $\alpha$**  receptor, to sense different classes of **EDCs compounds**,

2. **DPU unit**, is be composed by an amplification stage and a frequency analyser: this stage will be implemented on an embedded **Arduino® board**,