

## PCBs in Rain Water, Streams and a Reservoir in a Small Catchment of NW Spain

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Polychlorinated biphenyls (PCBs) constitute a significant environmental concern due to its persistence, tendency to bio-accumulate, acknowledged toxicity and ubiquity. In the present study, a small water catchment ( $\sim 100 \text{ km}^2$ ) inclusive of a two-tailed water supply reservoir (Abegondo-Cecebre) has been monitored between 2009 and 2014. Sampling stations include: a) one precipitation gauge used to collect monthly-integrated bulk precipitation (25 samples); b) seven streams (95 samples); c) five surface and one bottom points within the reservoir (104 samples); d) five points for sediment sampling in two surveys (spring and summer; 10 samples). All the water samples as well as the leachates of sediment washing have been analyzed for their concentration in 6 marker PCB (congeners 28, 52, 101, 138, 153 and 180) and 12 dioxin-like PCB (congeners 77, 81, 105, 114, 118, 123, 126, 156, 157, 167, 169 and 189) compounds. The average concentration of PCB<sub>tot</sub> in the bulk precipitation during the sampling period is  $\sim 406 \text{ pg/L}$  although a very significant decrease has occurred since the end of 2011 ( $\sim 800 \text{ pg/L}$ ) to the end of 2014 ( $\sim 60 \text{ pg/L}$ ). Likewise, the mean concentration of PCB<sub>tot</sub> in the stream water samples is 174 pg/L and a similar reduction in the concentration of PCB<sub>tot</sub> is also acknowledged for the same period of time ( $\sim 250 \text{ pg/L}$  before the end of 2011 and  $\sim 30 \text{ pg/L}$  after then). Reservoir surface water has a PCB<sub>tot</sub> concentration of  $\sim 234 \text{ pg/L}$  which, according to its sampling time (2010-2011) is consistent with the measured stream waters. However, deep reservoir water reveals an average concentration which is higher than the corresponding top water ( $\sim 330 \text{ pg/L}$ ) but significantly smaller than the water-leached sediments ( $\sim 860 \text{ pg/L}$ ). The available data suggest that up to a 30% of PCBs associated with precipitation becomes sequestered by the soil/sediment system while no significant change takes place during the transfer of water from the stream to the reservoir system, at least in surface. However, deep reservoir water is enriched in PCBs what is likely due to exchange reactions with the already enriched reservoir sediments. Significant differences are also observed between the PCB<sub>tot</sub> concentrations of the sediment samples taken in spring (lower) and summer (higher) as well as in connection with the different organic carbon and metal content present in the two tails of the reservoir.