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Hydrology and Earth System Sciences
Discussions

Interactive comment on "Using high frequency water quality data to assess sampling strategies for the EU Water Framework Directive" *by* R. A. Skeffington et al.

Anonymous Referee #2

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This paper applies high-frequency datasets (dissolved P, dissolved oxygen, pH, and temperature) from four rivers to assess the optimal (low-frequency) sampling strategy for WFD-related compliance testing (or WFD classification). The paper is in a good shape. It's well written and easy to follow. The message of the high uncertainty in the WFD-classification (and trend detection) is important.

I have 3 general comments or suggestions for the paper:

1: The paper focuses on monitoring for WFD-classification. This is a good focus which enables to quantify uncertainties. However, it may also suggest that WFD-classification

is the only thing that water quality monitoring is aiming at. However, in addition to compliance testing, water quality monitoring also plays a role in the selection and evaluation of mitigation options, which requires system knowledge. These broader monitoring objectives and the reasoning behind the focus on WFD-classification could be added to the introduction.

2: The paper proposes different sampling strategies for different parameters. In practice however, all these parameters are usually coupled; they are analyzed for the same samples. Therefore, a distinct strategy for each solute may not be realistic. This could be mentioned in the discussion.

3: The uncertainty of the WFD-classification for a specific location in a specific year is an important message and conclusion. Can you advise for water quality managers how to deal with this uncertainty? For example: do not base mitigation plans on non-compliance of 1 location in 1 year. The same issue was recently addressed in the discussion of Rozemeijer et al., 2004: Water quality status and trends in agriculture-dominated headwaters; a national monitoring network for assessing the effectiveness of national and European manure legislation in The Netherlands,. Environ. Mon. Assess 186, 8981-8995.

Some minor comments/suggestions: #p1-L26-28: Introduce this sentence with e.g.: Weekly sampling considerably reduces the uncertainties compared to monthly sampling.

#p2, L10-11: 'A more critical approach to sampling. . .' This advice is a bit vague.

p5, L14: The WFD-classification of the River Frome seems to be "poor" (orange) in figure 1.

p8, L24-26: This sentence could be used in the summary/conclusions to support the conclusion of the high uncertainties in the classification. Maybe a table with these percentages for the other rivers/parameters could be added?

#p9-L27-29: Another important message. Maybe also add this statement to the conclusions / abstract?

#p10-L14-17: Can you explain why a 3-hours sampling window improves the precision?

#p12-L14-18: You may add the explanation why a low flow leads to lower DO. Less dilution of STW-effluent? Larger biological DO-consumption?

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 12, 1279, 2015.