Hydrol. Earth Syst. Sci. Discuss.,
https://doi.org/10.5194/hess-2018-488-RC2, 2018


Hydrology and Earth System Sciences
Discussions

# *Interactive comment on* "Impact of climate forecasts on the microbial quality of a drinking water source in Norway using hydrodynamic modelling" *by* Hadi Mohammed et al.

**Anonymous Referee #2**

Received and published: 22 November 2018

The authors used a hydrodynamic and water quality modelling approach to predict the potential impact of climate change projections on water temperature and E. coli concentrations in a raw water source in a lake in Norway. Although the forecast was good for the years 2045 and 2075, compared with the year 2017, there are some revisions that should be made.

The major concerns are with the validation/calibration of the model. For instance:

1. Line 233-234, How was the water sampling performed for E. coli counts? How could the authors simulate the E. coli profile just using the surface and raw water intake point? Did the authors perform any sampling at different depths for E. coli counting,



besides surface and intake point? If the authors measured temperature profiles why did they not performed the same approach for the E. coli counting? I suggest a sentence explaining how it was done because it is not very clear how the model was calibrated only with these two sampling points.

2. What was the technique to measure the E. coli counting, was it membrane filtration? If so, how could the authors get concentrations of 45524 CFU/100 ml, it had to be a huge dilution. Although this was not part of the objective of the experiment, these questions, in my opinion, should be considered for a better understanding and calibration of the model.

Other minor revisions should be considered:

Abstract, line 17, the sentence "The results is expected to…" should be corrected for "The results are expected to…".

Section 2.1 – In the description of the lake, I would suggest including a sentence saying the classification of the lake concerning the type of mixing. Is it a dimictic lake?

Section 2.2.2 Microbial discharge into the lake, line 146, the method and units used to determine the E. coli concentration in water samples should be referred to in the text in this section.

Line 157, at the end of the sentence I would suggest including the reference of Table 1.

Line 215, please, explain better the terms of this equation.

Line 158, units of E. coli concentrations is missing

Line 277, Figure 4 shows the distribution of temperature and concentration of E. coli in the Lake in 2017 during the four major seasons or cross-sections from the model output? Do the numbers 15 after the month corresponds to the year of 2015? Shouldn't it be the year 2017? I suggest a clarification of the legend and figure.

One thing that is not very clear is that, although the authors say that the major streams are the key source of E. coli load on the Lake (line 331-332), “Under the current climate forecast for the catchment area of the Lake, the concentrations of E. coli in the Lake... is expected to marginally increase by 2075” (line 395-397) but table 2 shows that average concentrations of E. coli in the tributaries tend to decrease by the year 2075. Also, in table 2, the Arsetelva and Vasstrandelva streams, although they are the “key sources” they exhibit the lower average concentrations. So maybe it should be clear that, perhaps, the “key source” of bacterial contaminations are not the major streams but the populated areas surrounding the north-western part of the Lake.

---

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2018-488, 2018.