The paper by Tang et al., with the title: “Variable contribution of wastewater treatment plant effluents to N_2O emission " has greatly improved in clarity and quality with the new changes. Given that there are very few studies worldwide on the impact of WWTPs on N_2O emissions in aquatic systems, as shown in the Supplementary figure 8 and in the Table 1 of the paper, I consider the article to be of great interest and that it will be widely disseminated. However, I have some suggestions:

General comments:

The title of the paper refers to the contribution of WWTPs to N_2O emissions. However, the manuscript hardly discusses water-atmosphere fluxes of N_2O, nor the contribution of WWTPs to water-atmosphere fluxes of N_2O in the Potomac River estuary in detail. So my suggestion is that just as the contribution of WWTPs to N_2O concentration is discussed, there should be more discussion of the effect of WWTPs on N_2O fluxes to the atmosphere in the system. Another option would be to change the title of the paper.

Material and methods:

Ln 158: There is no mention of phosphate in the manuscript, so you should delete it. Were the samples taken in triplicate like the N_2O samples? Please indicate.

Ln 167-168: Were obtained N_2O concentrations in the water from the measurements made in the headspace using the solubility proposed by Weiss and Price (1980)?

Ln 168-170: The text: “Specifically, the monthly atmospheric N_2O concentrations were obtained from the nearby atmospheric station in Brentwood, Maryland (https://gml.noaa.gov/) (Andrews et al., 2023).” should be included in the N_2O flux calculation section, it could go on line 191 after (Weiss and Price, 1980).

Ln 173: It should be included how you have calculated the saturation percentage. This parameter is discussed in the text and presented in figure 2a.

Ln 186: It should be indicated how the total N cited in lines 158-160 has been measured.

Ln 191-194. The three gas transfer velocity (k) equations should be written in the same format:

- - Or write the k proposed by Wanninkhof (2014) as k_{660} as has been done for the other two parameterisations.:

$$k_{660} = 0.251\ x\ U^2$$

- - Or write:

  Raymond and Cole (2001): $k = 1.91\ x\ e^{0.35xU}\ x\ \left(\frac{Sc}{600}\right)^{-0.5}$

  Jiang et al. (2008): $k = 0.314\ x\ U^2 - 0.436\ x\ U + 3.99\ x\ \left(\frac{Sc}{600}\right)^{-0.5}$

  Wanninkhof (2014): $k = 0.251\ x\ U^2\ x\ \left(\frac{Sc}{660}\right)^{-0.5}$

Results and discussion

Ln 219-228. More should be commented on the water-atmosphere N_2O fluxes, practically only their range of variation in the whole system is presented. As with the N_2O concentrations, the water-atmosphere fluxes present seasonal variations (this if is commented in the abstract) and surely present spatial variations (you should comment on this). However, it is mentioned in the paper that the saturation percentage of N_2O is always higher than 100%, so the system behaves as a source of this gas, and that there is seasonal variation, but little is said about the fluxes to the atmosphere (Ln 218-220).

Ln 226-228: I do not believe that a maximum flux of N_2O to the atmosphere of 31.7µmol m^{-2} d^{-1} in the Potomac River Estuary can be considered as an intense source of N_2O to the atmosphere, as there are other estuaries with much more intense emissions. Perhaps it would be more accurate to put: Therefore, tributaries to the Chesapeake Bay (i.e., the Potomac River) are more intense sources of N_2O to the atmosphere than the Bay.

Ln 285-286: For better clarity and interpretation of the text, the values of your observed $\delta^{15}N$ of N_2O downstream of WWTPs and in the urban WWTPs should be included.

Ln 288: Do you know of any work where there is evidence of denitrification in WWTPs, in downstream creeks, or in sediments? If so, could you please cite it.

Ln 343-345: Text in brackets is not in Times New Roman 12. Why is the number of data considered for the predictions so small? Especially for the stations without WWTPs, in the complete study there are 8 sampling x 8 stations (4 stations without WWTPs + 4 stations central channel) = 64 data compared to the 23 considered in the prediction.

Ln 365. In the section: “Impact of wastewater treatment plants on N_2O concentrations and emissions” very little is mentioned about how N_2O fluxes to the atmosphere vary in the stations upstream and downstream of the WWTPs. However, there is much discussion of the effect of the WWTPs on N_2O concentrations. More should be said about these emissions, as the title of the paper says "Variable contribution of wastewater treatment plant effluents to N_2O emission". Furthermore, table 1 could present the N_2O fluxes as well as the concentrations.

Ln 366 - 369: Figure 4a should be mentioned, where the sampling stations considered in this study are shown in detail.

Figures:

Figures 2 and 3 and Supplemetary figures 3 and 5. It is not necessary to write the word "concentration" on the axes of the figures when referring to N_2O concentration (nM), just as you do not write NO_x^- concentration.

References

Ln 604-613: Rosentreter references should be put in chronological order.