

Comments by Owen R. Cooper (TOAR Scientific Coordinator of the Community Special Issue) on:

### **Reactive nitrogen in and around the northeastern and Mid-Atlantic US: sources, sinks, and connections with ozone**

Authors: Huang, M., Carmichael, G. R., Crawford, J. H., Bowman, K. W., De Smedt, I., Colliander, A., Cosh, M. H., Kumar, S. V., Guenther, A. B., Janz, S. J., Stauffer, R. M., Thompson, A. M., Fedkin, N. M., Swap, R. J., Bolten, J. D., and Joseph, A. T.

EGUsphere [preprint], <https://doi.org/10.5194/egusphere-2024-484>, 2024

Discussion started: 22 Feb 2024; Discussion closes May 1, 2024

This review is by Owen Cooper, TOAR Scientific Coordinator of the TOAR-II Community Special Issue. I, or a member of the TOAR-II Steering Committee, will post comments on all papers submitted to the TOAR-II Community Special Issue, which is an inter-journal special issue accommodating submissions to six Copernicus journals: ACP (lead journal), AMT, GMD, ESSD, ASCMO and BG. The primary purpose of these reviews is to identify any discrepancies across the TOAR-II submissions, and to allow the author teams time to address the discrepancies. Additional comments may be included with the reviews. While O. Cooper and members of the TOAR Steering Committee may post open comments on papers submitted to the TOAR-II Community Special Issue, they are not involved with the decision to accept or reject a paper for publication, which is entirely handled by the journal's editorial team.

#### **General Comments:**

TOAR-II has produced two guidance documents to help authors develop their manuscripts so that results can be consistently compared across the wide range of studies that will be written for the TOAR-II Community Special Issue. Both guidance documents can be found on the TOAR-II webpage: <https://igacproject.org/activities/TOAR/TOAR-II>

*The TOAR-II Community Special Issue Guidelines:* In the spirit of collaboration and to allow TOAR-II findings to be directly comparable across publications, the TOAR-II Steering Committee has issued this set of guidelines regarding style, units, plotting scales, regional and tropospheric column comparisons, tropopause definitions and best statistical practices.

*Guidance note on best statistical for TOAR analyses:* The aim of this guidance note is to provide recommendations on best statistical practices and to ensure consistent communication of statistical analysis and associated uncertainty across TOAR publications. The scope includes approaches for reporting trends, a discussion of strengths and weaknesses of commonly used techniques, and calibrated language for the communication of uncertainty. Table 3 of the TOAR-II statistical guidelines provides calibrated language for describing trends and uncertainty, similar to the approach of IPCC, which allows trends to be discussed without having to use the problematic expression, "statistically significant".

#### **Specific Comments:**

My comments are minor, as follows:

1) When discussing the impact of COVID on ozone it would be helpful to cite a new paper published in the TOAR-II Community Special Issue. Putero et al. (2023) show that ozone decreased in 2020 at high elevation sites across the western USA, and also at four high elevation sites in the eastern USA. Another

paper that is relevant to the COVID period is Steinbrecht et al. (2021) who show that ozone also decreased in the free troposphere of northern mid-latitudes.

2) When discussing long-term ozone trends across the USA, the papers that are currently available in the peer-reviewed literature are out-of-date, as they all seem to end in 2014 or 2015. However, EPA provides regular ozone trend updates on the following webpage:

<https://www.epa.gov/air-trends/ozone-trends>

They focus on the 98<sup>th</sup> percentile, or the annual 4<sup>th</sup> highest MDA8 ozone value.

3) As summarized in the TOAR-II “Guidance note on best statistical for TOAR analyses”, the TOAR community is abandoning the expression “statistically significant” for the reasons described by Wasserstein et al. (2019). Please follow these recommendations and replace “statistically significant” on line 396 by describing your confidence in this result.

### References:

Putero, D., Cristofanelli, P., Chang, K.-L., Dufour, G., Beachley, G., Couret, C., Effertz, P., Jaffe, D. A., Kubistin, D., Lynch, J., Petropavlovskikh, I., Puchalski, M., Sharac, T., Sive, B. C., Steinbacher, M., Torres, C., and Cooper, O. R.: Fingerprints of the COVID-19 economic downturn and recovery on ozone anomalies at high-elevation sites in North America and western Europe, *Atmos. Chem. Phys.*, 23, 15693–15709, <https://doi.org/10.5194/acp-23-15693-2023>, 2023.

Steinbrecht, Wolfgang, Dagmar Kubistin, Christian Plass-Dülmer, Jonathan Davies, David W. Tarasick, Peter von der Gathen, Holger Deckelmann, Nis Jepsen, Rigel Kivi, Norrie Lyall, Matthias Palm, Justus Notholt, Bogumil Kois, Peter Oelsner, Marc Allaart, Ankie Piters, Michael Gill, Roeland Van Malderen, Andy W. Delcloo, Ralf Sussmann, Emmanuel Mahieu, Christian Servais, Gonzague Romanens, Rene Stübi, Gerard Ancellet, Sophie Godin-Beekmann, Shoma Yamanouchi, Kimberly Strong, Bryan Johnson, Patrick Cullis, Irina Petropavlovskikh, James W. Hannigan, Jose-Luis Hernandez, Ana Diaz Rodriguez, Tatsumi Nakano, Fernando Chouza, Thierry Leblanc, Carlos Torres, Omaira Garcia, Amelie N. Röhlings, Matthias Schneider, Thomas Blumenstock, Matt Tully, Clare Paton-Walsh, Nicholas Jones, Richard Querel, Susan Strahan, Ryan M. Stauffer, Anne M. Thompson, Antje Inness, Richard Engelen, Kai-Lan Chang, Owen R. Cooper (2021), COVID-19 Crisis Reduces Free Tropospheric Ozone Across the Northern Hemisphere, *Geophysical Research Letters*, 48, e2020GL091987. <https://doi.org/10.1029/2020GL091987>

Wasserstein, R.L., Schirm, A.L. and Lazar, N.A., 2019. Moving to a world beyond “ $p < 0.05$ ”. *The American Statistician*, 73(sup1), pp.1-19  
<https://www.tandfonline.com/doi/pdf/10.1080/00031305.2019.1583913>