Q1
What are the 2 possible "fertilizer_type(s)" in column 5, which has a domain of [0, 1]?
Thank you. Column 5 refers to the type of fertilizer being utilized in the field experiments. Fertilizer type '0' indicates the experiment used synthetic fertilizer, whereas type '1' is for organic fertilizer or manure.

Q2
Please provide a file with the full citations to the references listed in column 9 of the data file so future users can find and use them. The references from the data file are listed below.

Thank you. Here is the list of references cited in column 9. A separate .docx file listing these references is also provided. The ALFAM paper is listed as Hafner et al. (2018).

Badagliacca, G., Benítez, E., Amato, G., Badalucco, L., Giambalvo, D., Laudicina, V. A., & Ruisi, P. (2018). Long-term effects of contrasting tillage on soil organic carbon, nitrous oxide and ammonia emissions in a Mediterranean Vertisol under different crop sequences. *Science of the Total Environment*, *619–620*, 18–27. https://doi.org/10.1016/j.scitotenv.2017.11.116

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Ferrara, R. M., Loubet, B., Decuq, C., Palumbo, A. D., Di Tommasi, P., Magliulo, V., et al. (2014). Ammonia volatilisation following urea fertilisation in an irrigated sorghum crop in Italy. *Agricultural and Forest Meteorology*, *195–196*, 179–191. https://doi.org/10.1016/j.agrformet.2014.05.010

Gericke, D., Pacholski, A., & Kage, H. (2011). Measurement of ammonia emissions in multi-plot field experiments. *Biosystems Engineering*, *108*, 164–173. https://doi.org/10.1016/j.biosystemseng.2010.11.009

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Martínez-Lagos, J., Salazar, F., Alfaro, M., & Misselbrook, T. (2013). Ammonia volatilization following dairy slurry application to a permanent grassland on a volcanic soil. *Atmospheric Environment*, *80*, 226–231. https://doi.org/10.1016/j.atmosenv.2013.08.005

Meade, G., Pierce, K., O'Doherty, J. V., Mueller, C., Lanigan, G., & Mc Cabe, T. (2011). Ammonia and nitrous oxide emissions following land application of high and low nitrogen pig manures to winter wheat at three growth stages. *Agriculture, Ecosystems and Environment*, *140*, 208–217. https://doi.org/10.1016/j.agee.2010.12.007

Ni, K., Köster, J. R., Seidel, A., & Pacholski, A. (2015). Field measurement of ammonia emissions after nitrogen fertilization-A comparison between micrometeorological and chamber methods. *European Journal of Agronomy*, *71*, 115–122. https://doi.org/10.1016/j.eja.2015.09.004

Rodhe, L., Pell, M., & Yamulki, S. (2006). Nitrous oxide, methane and ammonia emissions following slurry spreading on grassland. *Soil Use and Management*, *22*, 229–237. https://doi.org/10.1111/j.1475-2743.2006.00043.x

Roelcke, M., Li, S. X., Tian, X. H., Gao, Y. J., & Richter, J. (2002). In situ comparisons of ammonia volatilization from N fertilizers in Chinese loess soils. *Nutrient Cycling in Agroecosystems*, *62*, 73–88. https://doi.org/10.1023/A:1015186605419

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Yang, W., Zhu, A., Zhang, J., Xin, X., & Zhang, X. (2017). Evaluation of a backward Lagrangian stochastic model for determining surface ammonia emissions. *Agricultural and Forest Meteorology*, *234–235*, 196–202. https://doi.org/10.1016/j.agrformet.2017.01.001

Yang, Y., Zhou, C., Li, N., Han, K., Meng, Y., Tian, X., & Wang, L. (2015). Effects of conservation tillage practices on ammonia emissions from Loess Plateau rain-fed winter wheat fields. *Atmospheric Environment*, *104*, 59–68. https://doi.org/10.1016/j.atmosenv.2015.01.007

Q3

The abstract refers to the US, India and China and then goes on to say that the "The statistical model captures the spatial distribution of global NH3."

Are there any more specific coordinates for the data than global?

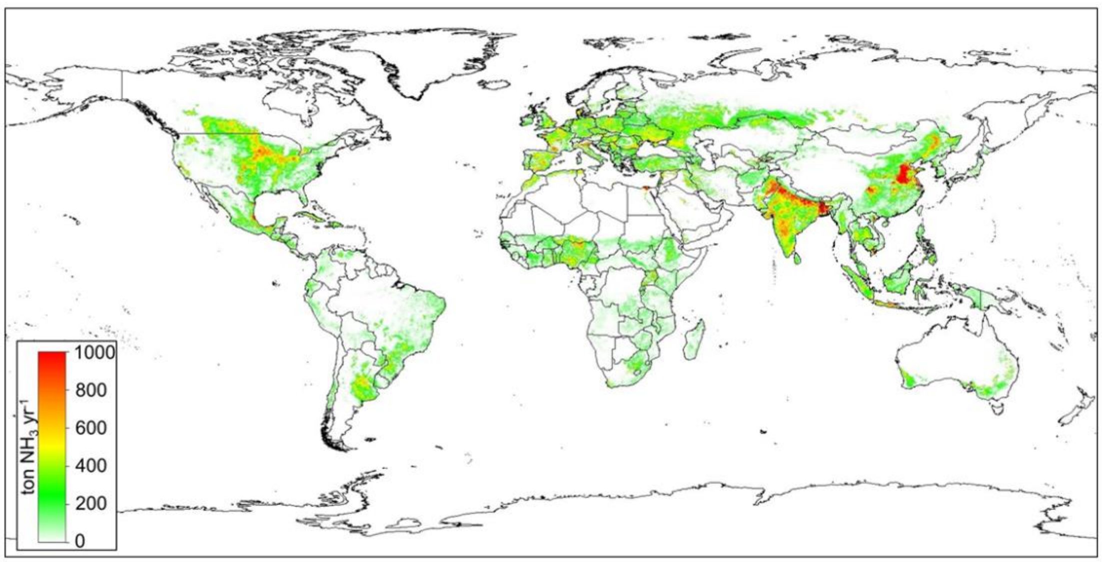
Thank you. The regional analyses for the US, India, and China are all extracted from the global analysis. This is because our calculation for the emission estimate came from an empirical formula that is applicable for a world-wide NH_3 emissions. Therefore, we only included the coordinates that encompass the global distribution of NH_3 emissions.

Q4
A preview graphic is included with all Archival Information Packages (AIP). Sampling locations are typically used but since you are indicating there is world-wide distribution, a map is not that useful but a map will be used if you can not provide an image.

Can you provide an image that would be useful for a future user to decide whether these data suite there purpose. It could be a graph, plot, image in PNGor JPG formats?

Thank you. Here is an image that shows our global NH_3 emission estimate. We also provide this image as a .png file for your record.

Global NH_3 emission from agricultural soils using NH_3_STAT



Q5
We think the title can be improved to help future users find and use your data. There are a couple of options below, please change or modify,if they can be improved or made more accurate. Or you can create a completely new title.

We would like to change the title from:
AIR TEMPERATURE, pH, and others from 1990-01-01 to 2019-01-01

To:
Soil temperature, soil moisture, pH, ammonia and others from the NH3_STAT statistical model from 1990-01-01 to 2019-01-01

or
Ammonia (NH3) emissions characterization from agricultural soil sources from the NH3_STAT statistical model from 1990-01-01 to 2019-01-01

or other?

Thank you. We concur that the title change would be a better fit for the data. We would like to use: “Ammonia (NH3) emissions characterization from agricultural soil sources from the NH3_STAT statistical model from 1990-01-01 to 2019-01-01” for the new title.

Q6
We would like to make a minor change to the abstract to clarify exactly what is in the AIP. Basically adding an introductory sentence.

From:
Global ammonia (NH3) emissions into the atmosphere are projected to increase in the coming years with the increased use of synthetic nitrogen fertilizers and cultivation of nitrogen-fixing crops. A statistical model (NH3_STAT) is developed for characterizing atmospheric NH3 emissions from agricultural soil sources, and compared to the performance of other global and regional NH3 models (e.g., EDGAR, MASAGE, MIX and U.S. EPA). The statistical model was developed by expressing a multiple linear regression equation between NH3 emission and the physicochemical variables. The model was evaluated for 2012 NH3 emissions. The results indicate that, in comparison to other data sets, the model provides a lower global NH3 estimate by 57%, (NH3_STAT: 13.9 Tg N yr-1; EDGAR: 33.0 Tg N yr-1). We also performed a region-based analysis (U.S., India, and China) using the NH3_STAT model. For the U.S., our model produces an estimate that is 143% higher in comparison to EPA. Meanwhile, the NH3_STAT model estimate for India shows NH3 emissions between -0.8 and 1.4 times lower when compared to other data sets. A lower estimate is also seen for China, where the model estimates NH3 emissions 0.4-5 times lower than other datasets. The difference in the global estimates is attributed to the lower estimates in major agricultural countries like China and India. The statistical model captures the spatial distribution of global NH3 emissions by utilizing a simplified approach compared to other readily available datasets. Moreover, the NH3_STAT model provides an opportunity to predict future NH3 emissions in a changing world.

To:
The NCEI accessions contains statistical model (NH3_STAT) data. Global ammonia (NH3) emissions into the atmosphere are projected to increase in the coming years with the increased use of synthetic nitrogen fertilizers and cultivation of nitrogen-fixing crops. A statistical model (NH3_STAT) is developed for characterizing atmospheric NH3 emissions from agricultural soil sources, and compared to the performance of other global and regional NH3 models (e.g., EDGAR, MASAGE, MIX and U.S. EPA). The statistical model was developed by expressing a multiple linear regression equation between NH3 emission and the physicochemical variables. The model was evaluated for 2012 NH3 emissions. The results indicate that, in comparison to other data sets, the model provides a lower global NH3 estimate by 57%, (NH3_STAT: 13.9 Tg N yr-1; EDGAR: 33.0 Tg N yr-1). We also performed a region-based analysis (U.S., India, and China) using the NH3_STAT model. For the U.S., our model produces an estimate that is 143% higher in comparison to EPA. Meanwhile, the NH3_STAT model estimate for India shows NH3 emissions between -0.8 and 1.4 times lower when compared to other data sets. A lower estimate is also seen for China, where the model estimates NH3 emissions 0.4-5 times lower than other datasets. The difference in the global estimates is attributed to the lower estimates in major

agricultural countries like China and India. The statistical model captures the spatial distribution of global NH3 emissions by utilizing a simplified approach compared to other readily available datasets. Moreover, the NH3_STAT model provides an opportunity to predict future NH3 emissions in a changing world.

Thank you. The suggested minor change in the abstract fits with our data submission.