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Deriving cropland N_2O emissions from space-based NO_2 observations

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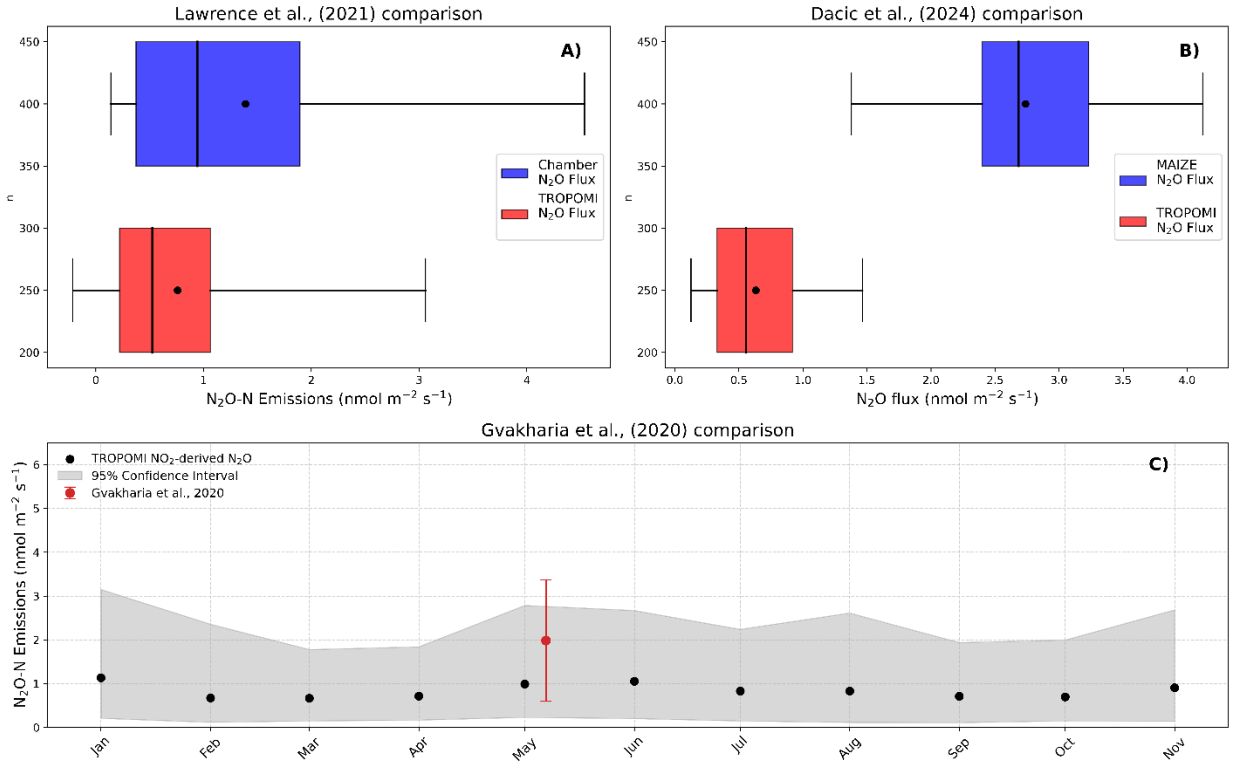

Figure S1: Variation of Figure 3, with a slow (7 hour) NOx lifetime. Satellite derived estimates concurrence with independent studies. (A, top left) Box plots of the distribution of daily average N_2O flux derived from chamber observations detailed in Lawrence et al., 2021 and TROPOMI observations from that period. (B, top right) Box plots of N_2O flux observed by TROPOMI across the MAIZE campaign domain, and ensemble averages for coincident days of the MAIZE (2021-2022) campaign. (C, Bottom) TROPOMI-NO_2 derived N_2O flux (gray distribution) compared against the N_2O flux estimate from Gvakharia et al., (2020) (red band).

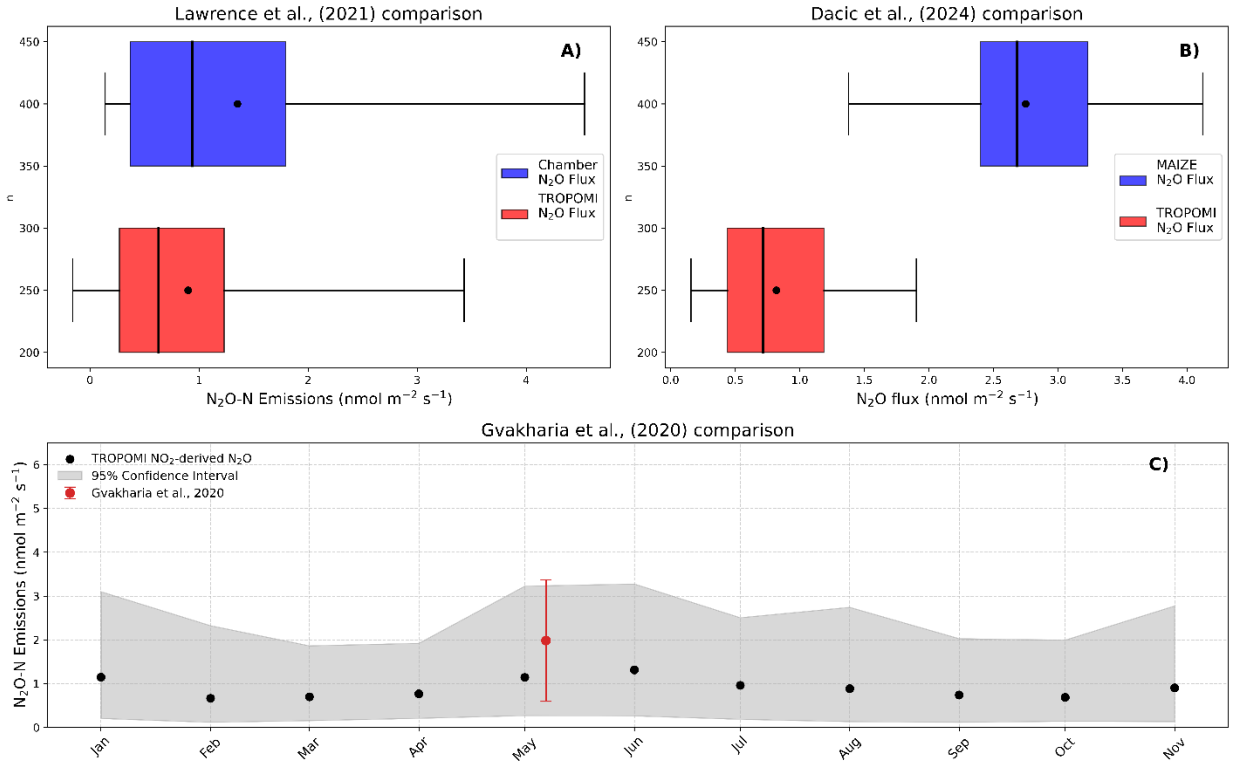

Figure S2: Variation of Figure 3, with a moderate (5 hour) NOx lifetime. Satellite derived estimates concurrence with independent studies. (A, top left) Box plots of the distribution of daily average N_2O flux derived from chamber observations detailed in Lawrence et al., 2021 and TROPOMI observations from that period. (B, top right) Box plots of N_2O flux observed by TROPOMI across the MAIZE campaign domain, and ensemble averages for coincident days of the MAIZE (2021-2022) campaign. (C, Bottom) TROPOMI-NO_2 derived N_2O flux (gray distribution) compared against the N_2O flux estimate from Gvakharia et al., (2020) (red band).

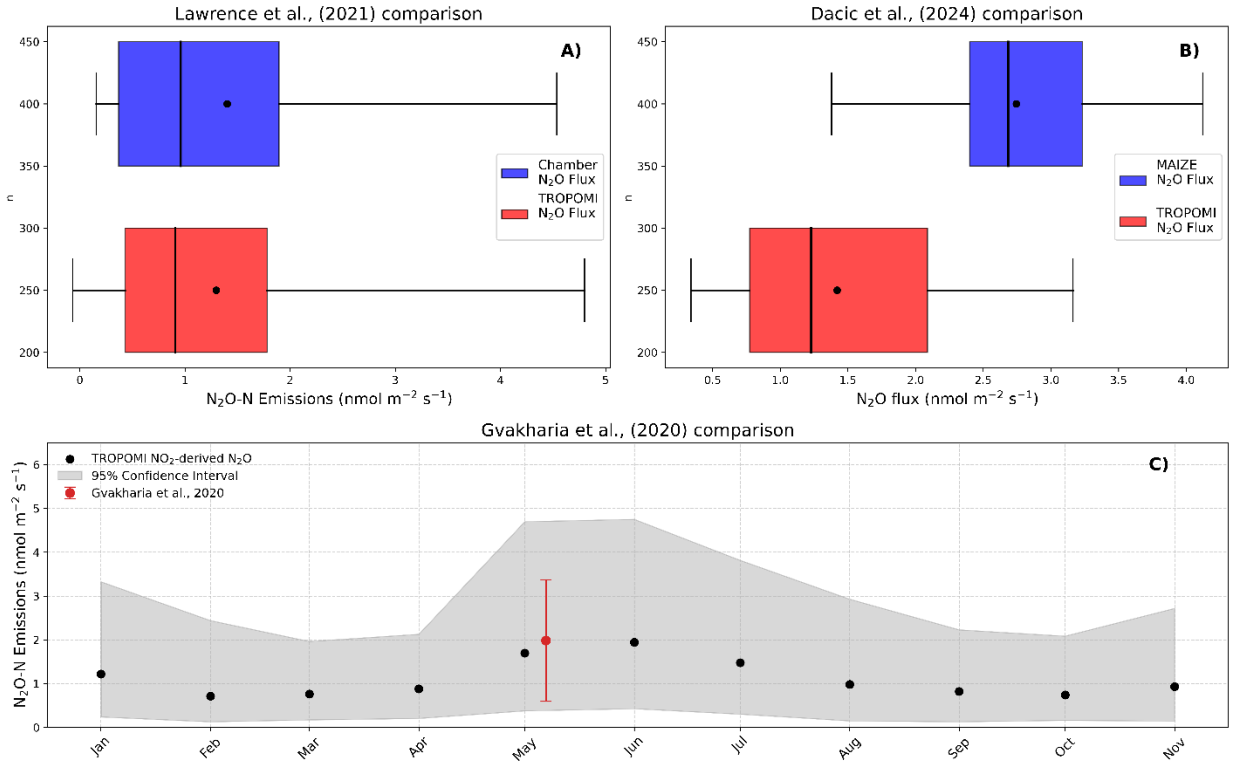

Figure S3: Variation of Figure 3, with a slow (half of main text) deposition rates. Satellite derived estimates concurrence with independent studies. (A, top left) Box plots of the distribution of daily average N_2O flux derived from chamber observations detailed in Lawrence et al., 2021 and TROPOMI observations from that period. (B, top right) Box plots of N_2O flux observed by TROPOMI across the MAIZE campaign domain, and ensemble averages for coincident days of the MAIZE (2021-2022) campaign. (C, Bottom) TROPOMI-NO_2 derived N_2O flux (gray distribution) compared against the N_2O flux estimate from Gvakharia et al., (2020) (red band).

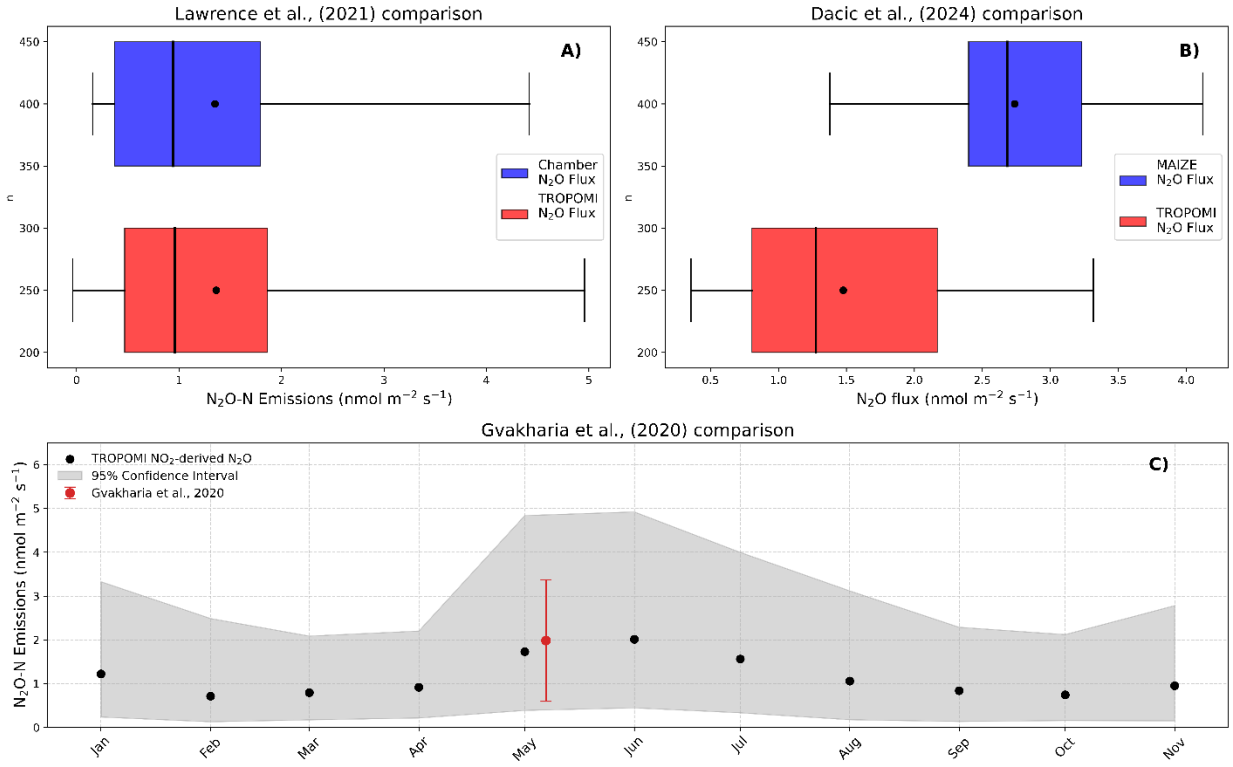

Figure S4: Variation of Figure 3, with a fast (double of main text) deposition rates. Satellite derived estimates concurrence with independent studies. (A, top left) Box plots of the distribution of daily average N_2O flux derived from chamber observations detailed in Lawrence et al., 2021 and TROPOMI observations from that period. (B, top right) Box plots of N_2O flux observed by TROPOMI across the MAIZE campaign domain, and ensemble averages for coincident days of the MAIZE (2021-2022) campaign. (C, Bottom) TROPOMI-NO_2 derived N_2O flux (gray distribution) compared against the N_2O flux estimate from Gvakharia et al., (2020) (red band).