

Article

Supplementary Materials: Meteorological Drivers of Permian Basin Methane Anomalies Derived From TROPOMI

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Table S1. Description of TROPOMI Sensor Level 2 product version used (transferred from the TROPOMI readme documents available on the TROPOMI website [51] in the processing of Level 3 GEE products (Table 1) available on the GEE cloud computing platform.

Level 2 Processor Version and Times used in Study	Resolution	Product	Noted changes
V01.02.02 (1 Dec 2018–20 March 2019)	12/ 2018-8/ 2019: 7km x 7 km. after 8/2019 – 7 km x 5.5 km	Sentinel-5P OFFL CH ₄	Initial operational version
V01.03.00 (20 March 2019 – 23 April 2019),	7 km x 5.5 km	Sentinel-5P OFFL CH ₄	Added new variables eastward wind and northward wind
V01.03.01 (23 April 2019 – 26 June 2019).	7 km x 5.5 km	Sentinel-5P OFFL CH ₄	No changes with respect to previous version
V01.03.02 (26 June 2019 – 29 November 2020)	7 km x 5.5 km	Sentinel-5P OFFL CH ₄	No changes with respect to the previous version. Since 11/03/2020 Cloud Mask based on VIIRS ECM product (instead for VICMO)
V01.02.02 (1 Dec 2018–20 March 2019)	3.5 km x 7 km	Sentinel-5P OFFL NO ₂	No changes with respect to previous version. Major changes were implemented in the previous version, see TROPOMI NO ₂ readme file [51].
V01.03.00 (20 March 2019 – 23 April 2019)	3.5 km x 7 km	Sentinel-5P OFFL NO ₂	New cloud retrieval (FRESCO-S cloud). Definition of qa_value improved. New variables added
V01.03.01 (23 April 2019 – 26 June 2019)	3.5 km x 7 km	Sentinel-5P OFFL NO ₂	No new changes
V01.03.02 (26 June 2019 – 29 November 2020)	3.5 km x 7 km; after August 2019 3.5 km x 5.5 km	Sentinel-5P OFFL NO ₂	No new changes

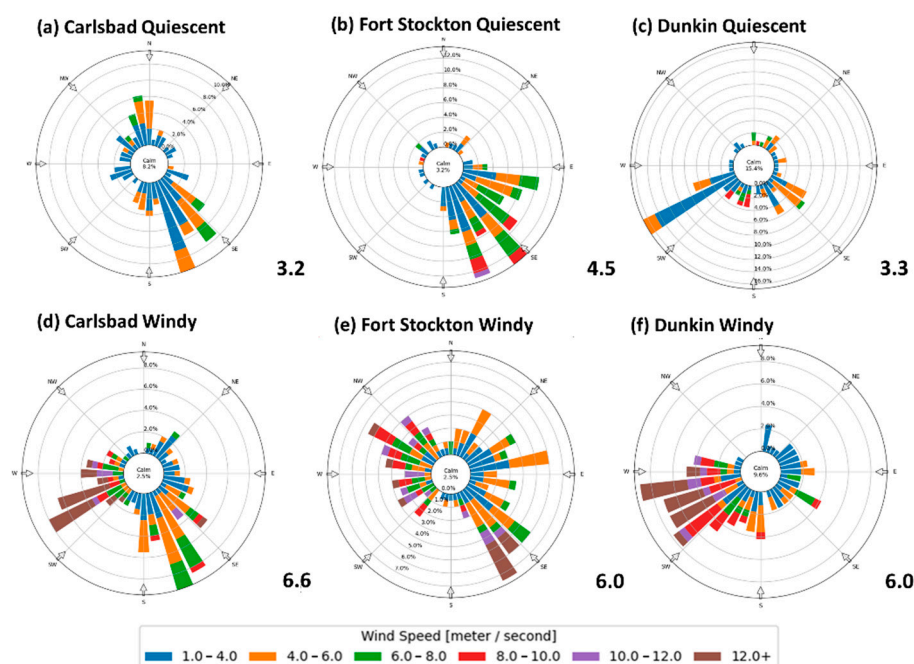


Figure S1. 10-m wind rose plots for short-term quiescent (16–23 March 2019) and windy (8–15 March 2019) cases. Carlsbad a). quiescent and d). windy cases; Fort Stockton b). quiescent and e). windy cases; and Dunkin c). quiescent and f). windy cases. Calm wind observations are noted in the center of the wind rose, and the mean wind speed (in meters per second) at each of the 6 stations is shown in the lower right corner of each plot. The frequency of winds observed from each direction is shown by the location on the wind rose, while the wind speed associated with that direction is shown according to the speed color scale listed above. Wind roses courtesy of the Iowa State University custom wind rose feature [63].

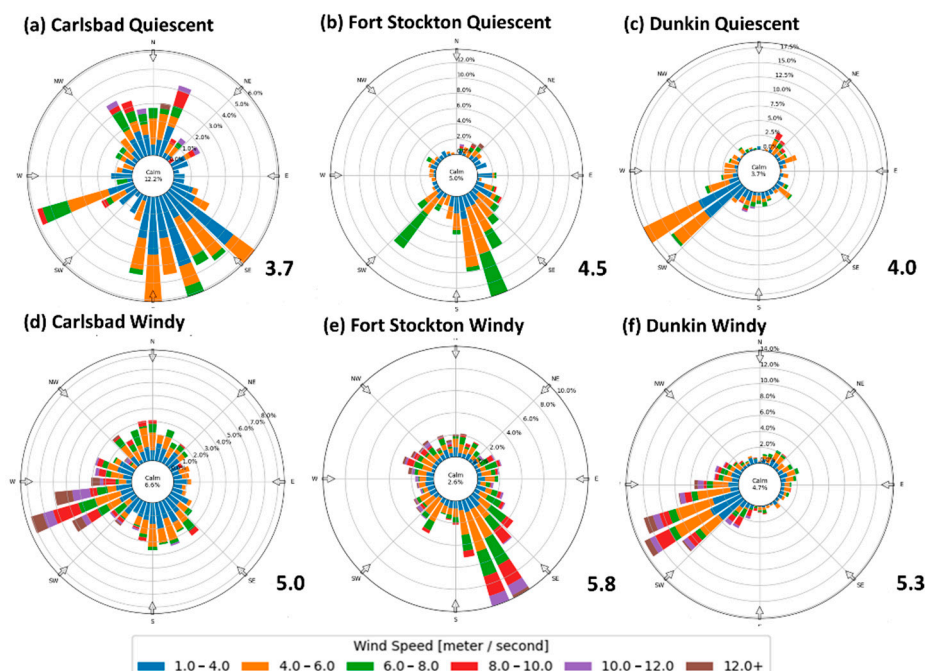


Figure S2. 10-m wind rose plots for longer term quiescent (24 September – 9 October 2020) and windy (1 April – 10 May 2019) cases. Carlsbad a). quiescent and d). windy cases; Fort Stockton b). quiescent and e). windy cases; and Dunkin c). quiescent and f). windy cases. Calm wind observations are noted in the center of the wind rose, and the mean wind speed (in meters per second) at each of the 6 stations is shown in the lower right corner of each plot. The frequency of winds observed from each direction is shown by the location on the wind rose, while the wind speed associated with that direction is shown according to the speed color scale listed above. Wind roses courtesy of the Iowa State University custom wind rose feature [63].