

A Post-2013 Drop-off in Total Ozone at a Third of Global Ozonesonde Stations: ECC Instrument Artifacts?

Ryan M. Stauffer^{1,2}, Anne M. Thompson², Debra E. Kollonige^{3,2}, Jacquelyn C. Witte^{2*}, David W. Tarasick⁴, Jonathan Davies⁴, Holger Vömel⁵, Gary A. Morris⁶, Roeland Van Malderen⁷, Bryan J. Johnson⁸, Richard R. Querel⁹, Henry B. Selkirk^{10,2}, Rene Stübi¹¹, and Herman G. J. Smit¹²

¹Earth System Science Interdisciplinary Center, University of Maryland, College Park, MD, USA

²Atmospheric Chemistry and Dynamics Lab, NASA/GSFC, Greenbelt, MD, USA

*Now at National Center for Atmospheric Research Earth Observations Laboratory, Boulder, CO, USA

³Science Systems and Applications, Inc., Lanham, MD, USA

⁴Environment and Climate Change Canada, Downsview, ON, CA

⁵National Center for Atmospheric Research Earth Observations Laboratory, Boulder, CO, USA

⁶St. Edwards University, Austin, TX, USA

⁷Royal Meteorological Institute of Belgium, Uccle (Brussels), Belgium

⁸Global Monitoring Division, NOAA Earth System Research Laboratory, Boulder, CO, USA

⁹National Institute of Water & Atmospheric Research (NIWA), Lauder, NZ

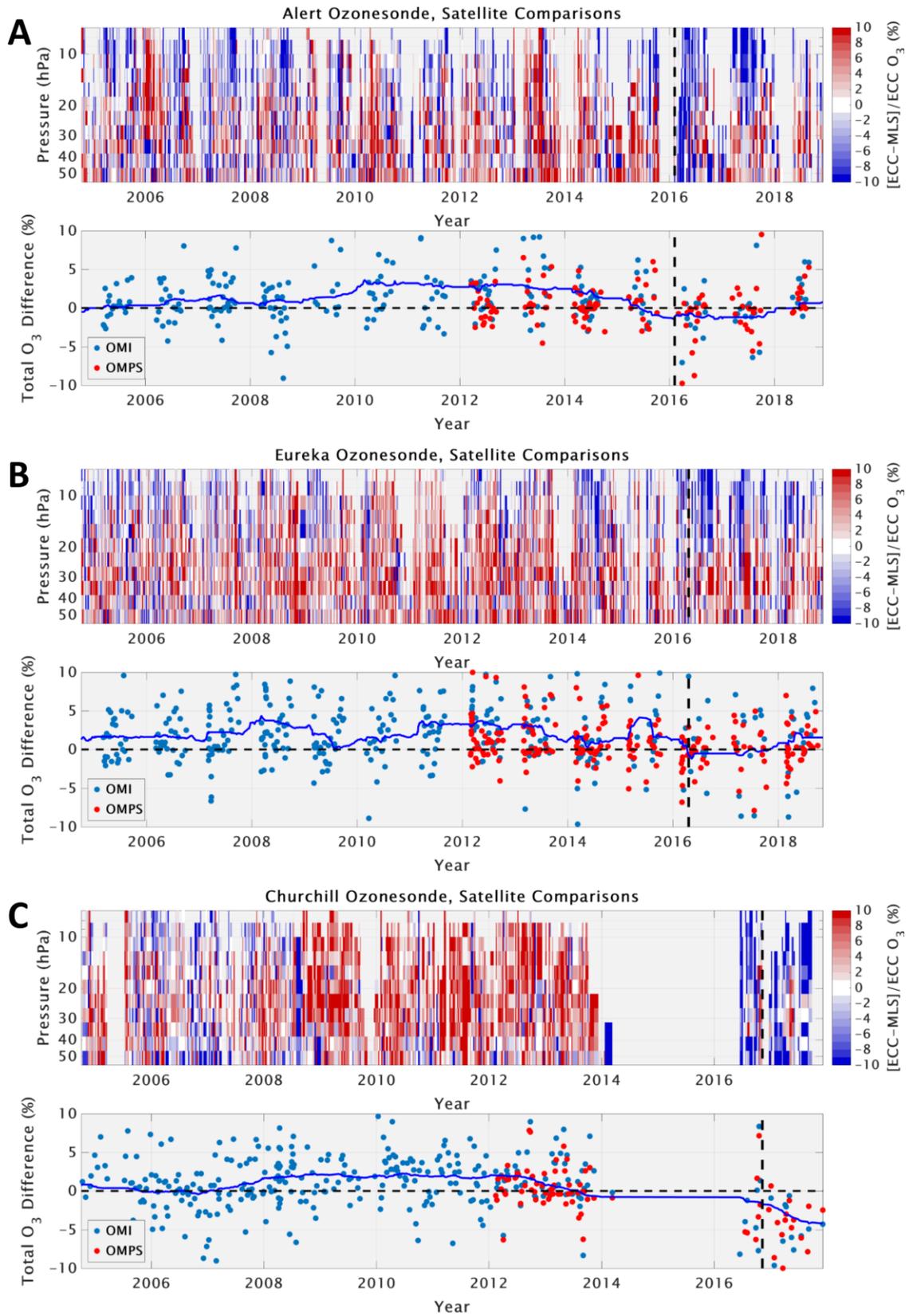
¹⁰Universities Space Research Association, Columbia, MD, USA

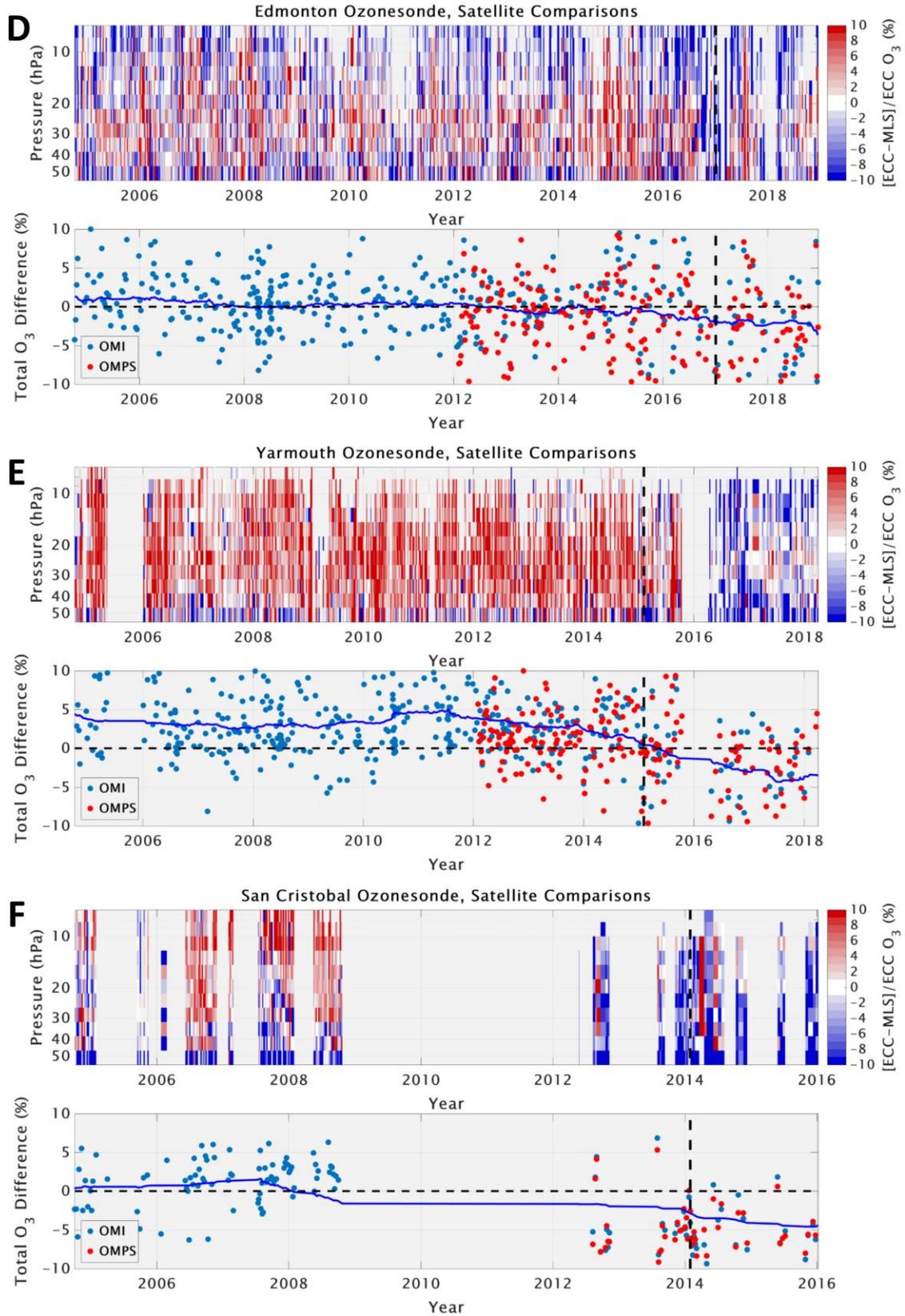
¹¹Federal Office of Meteorology and Climatology, MeteoSwiss, Aerological Station, Payerne, Switzerland

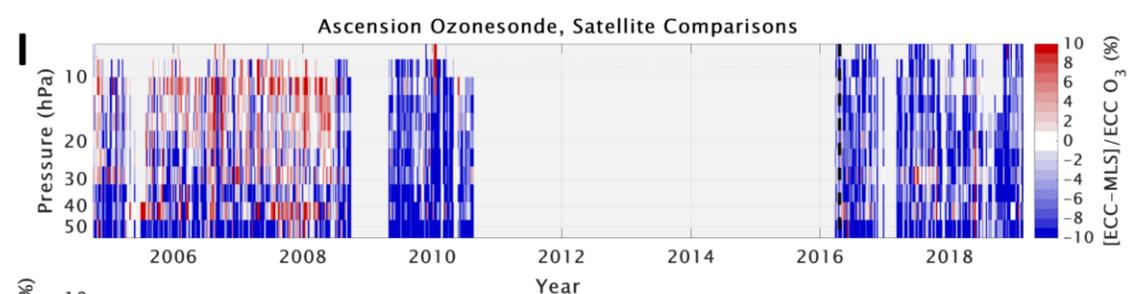
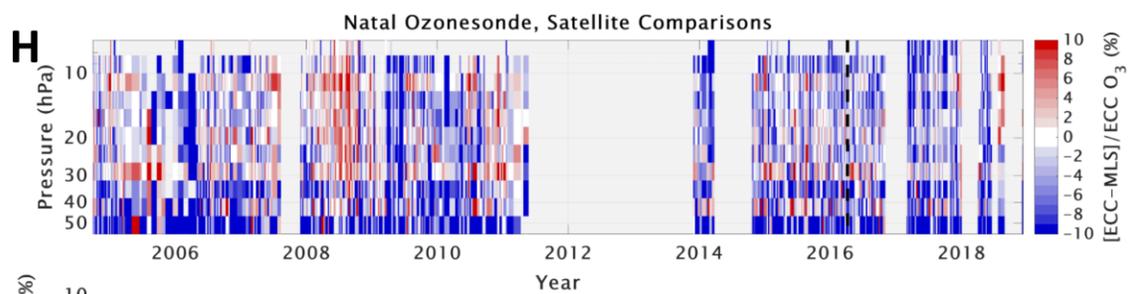
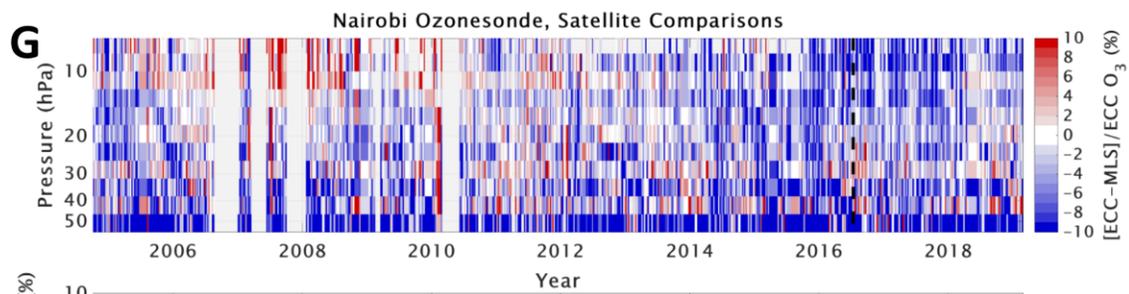
¹²Institute of Chemistry and Dynamics of the Geosphere: Troposphere, Jülich Research Centre, Jülich, Germany

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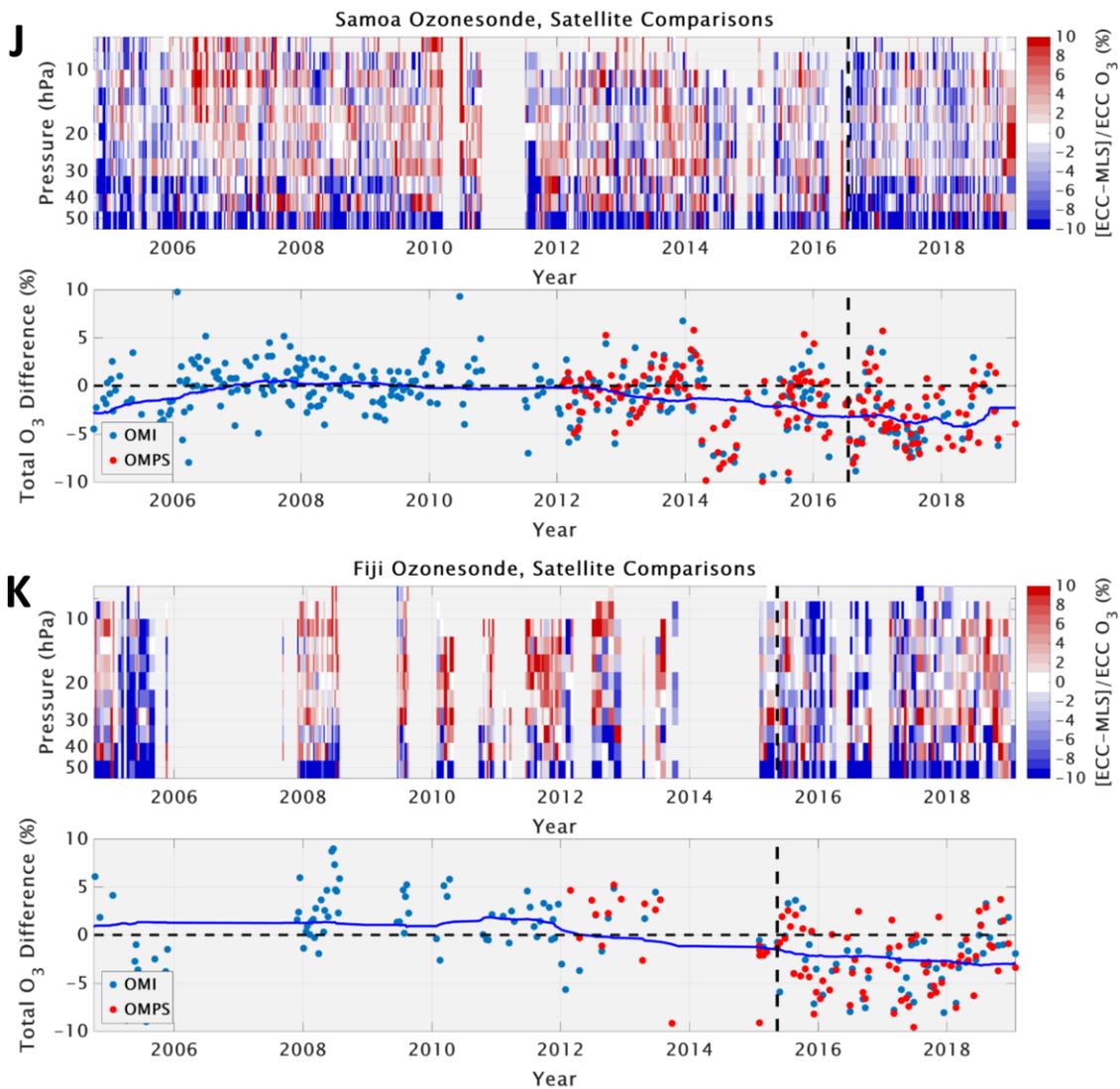
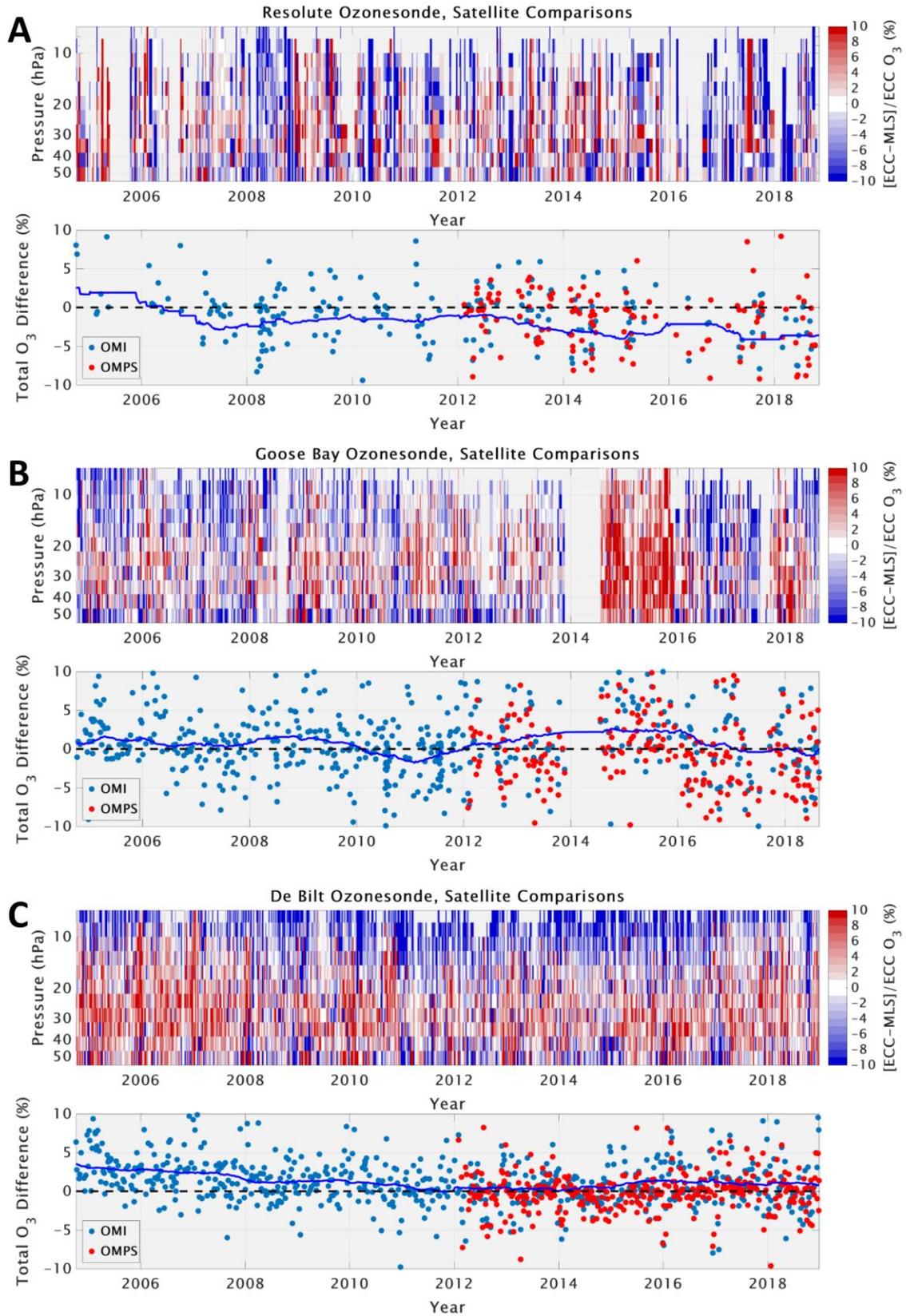
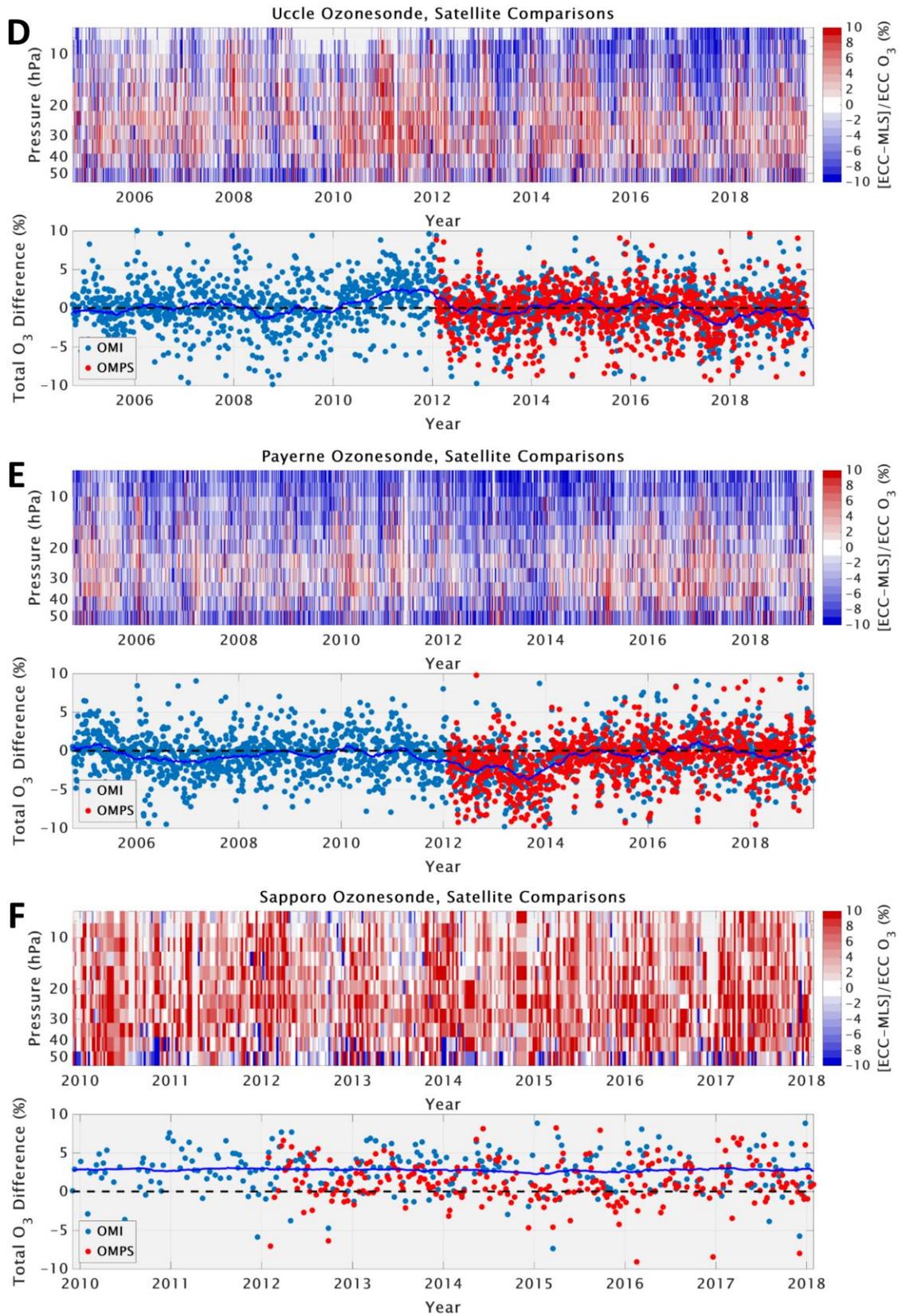
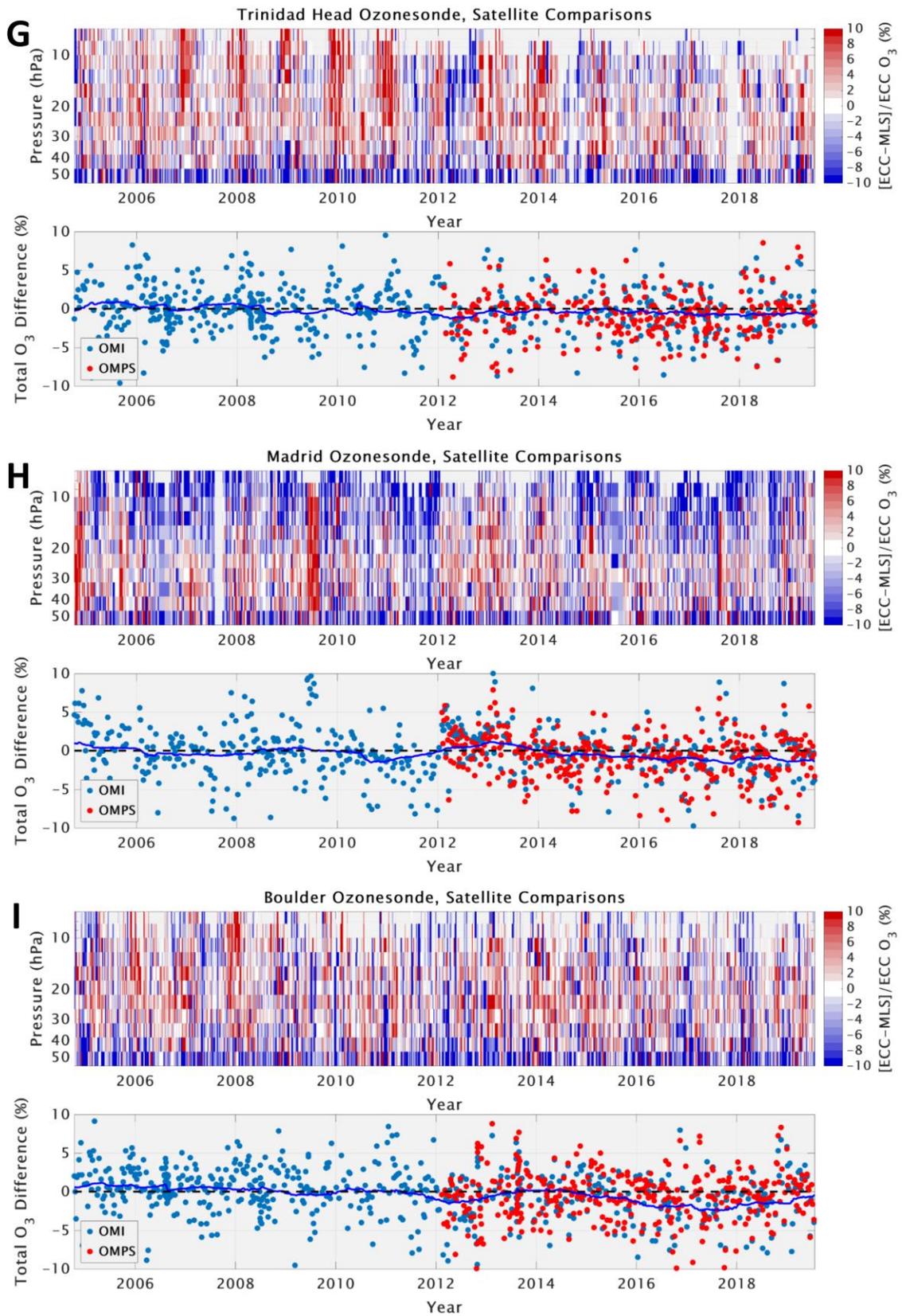
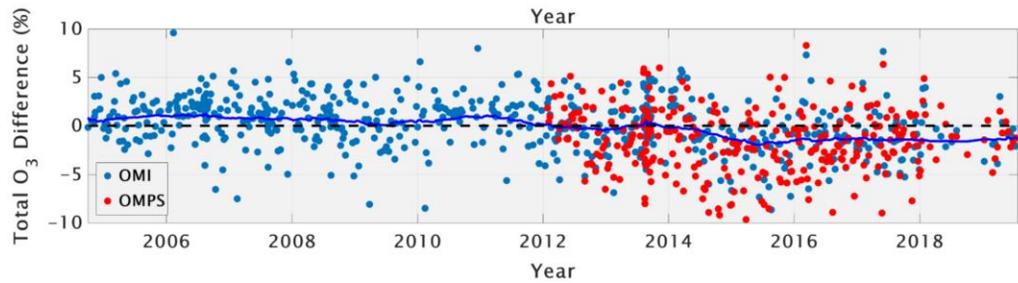
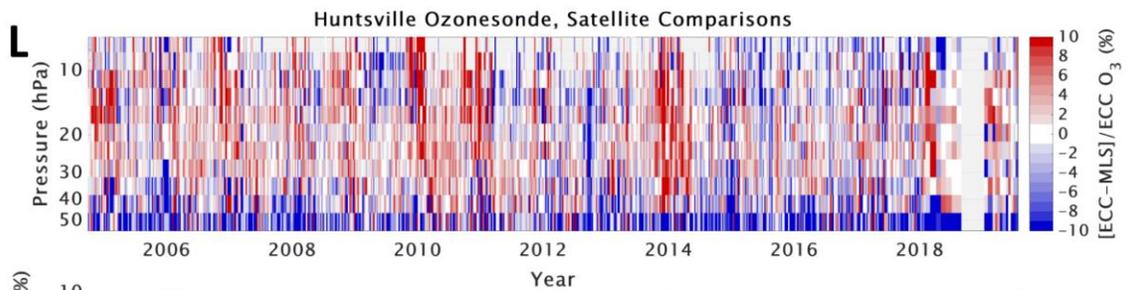
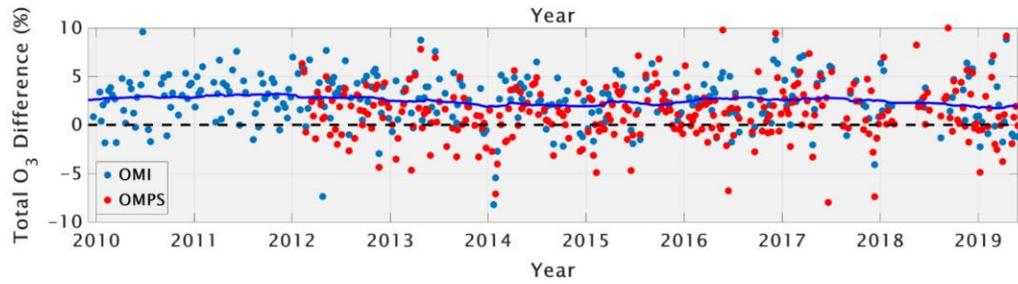
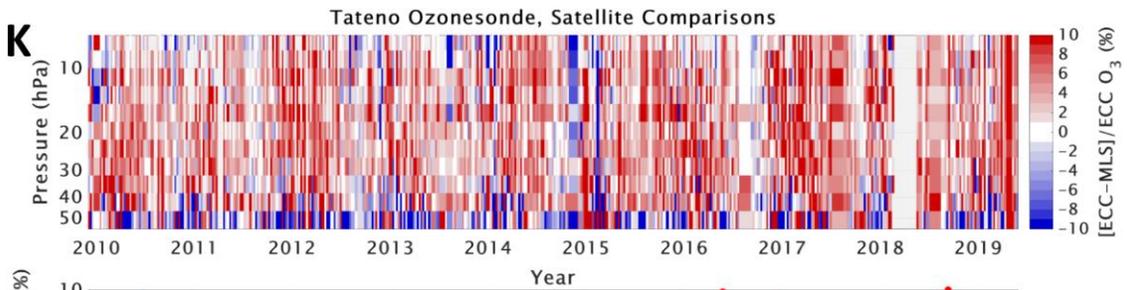
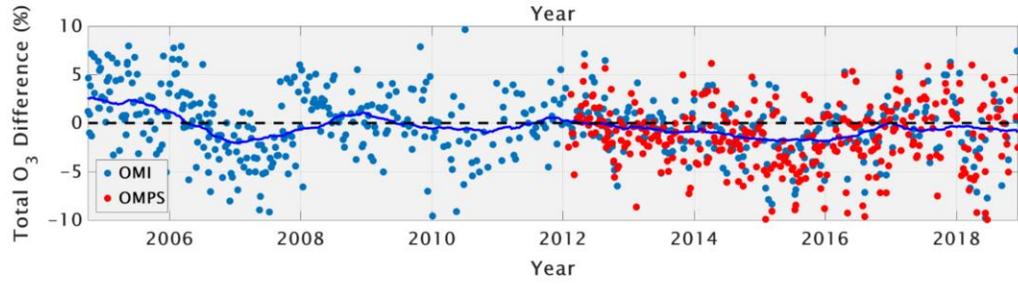
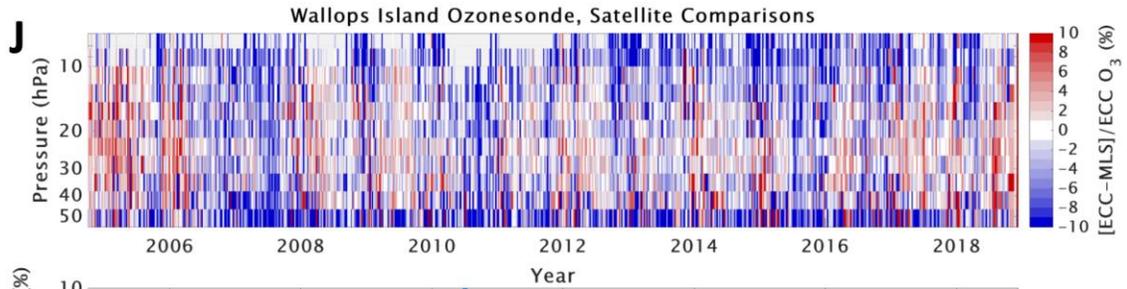


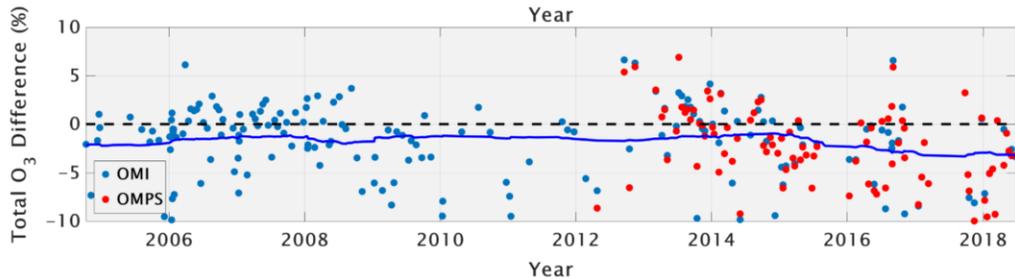
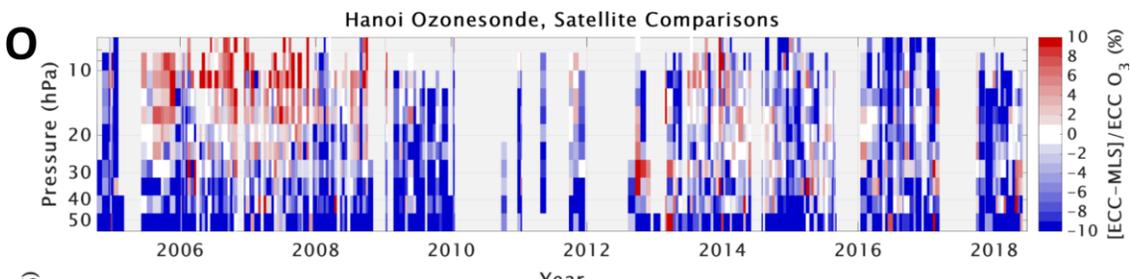
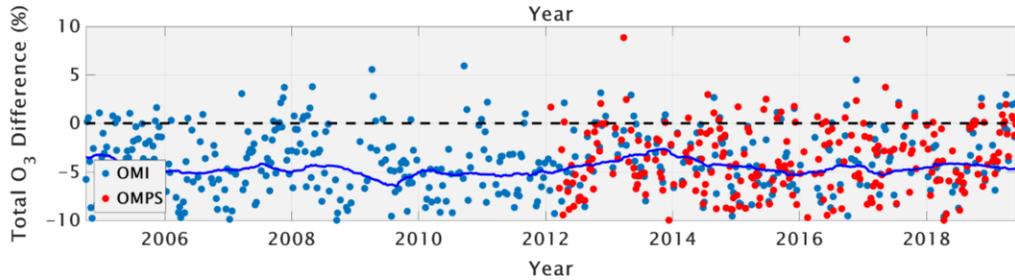
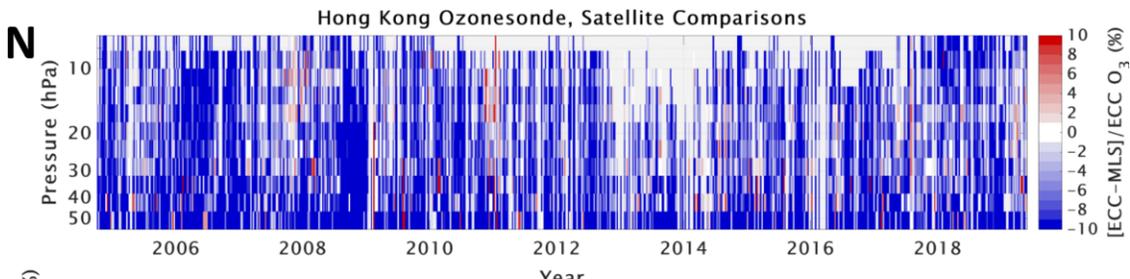
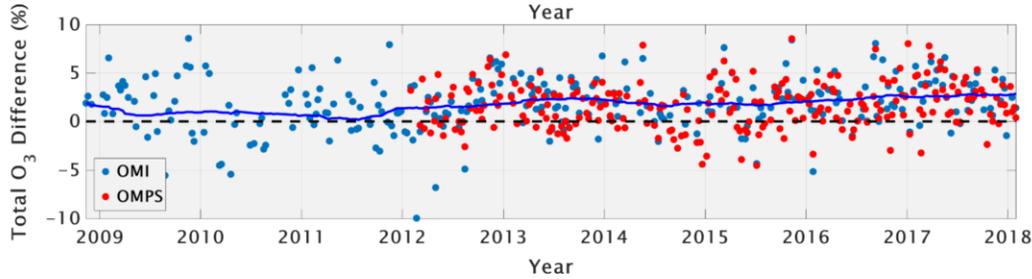
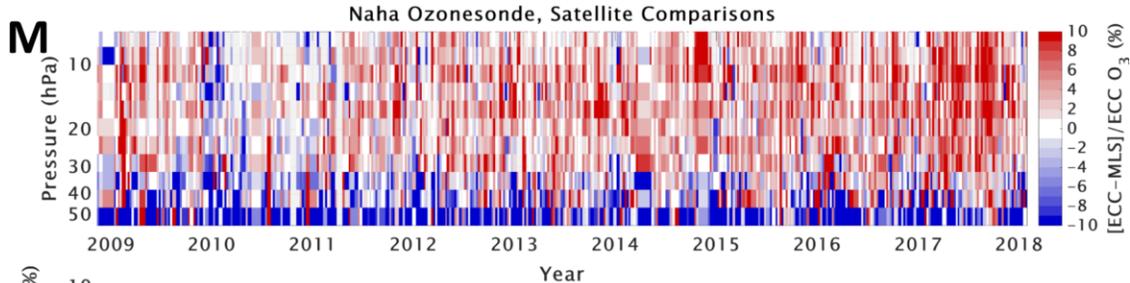
Figure S1. As in Figure 1, but for the 11 remaining affected ECC ozonesonde sites that exhibit a > 3 % drop-off in TCO relative to OMI. Note that the only affected Type2 station is Natal, Brazil (h). See Table 1 for more metadata on each site.

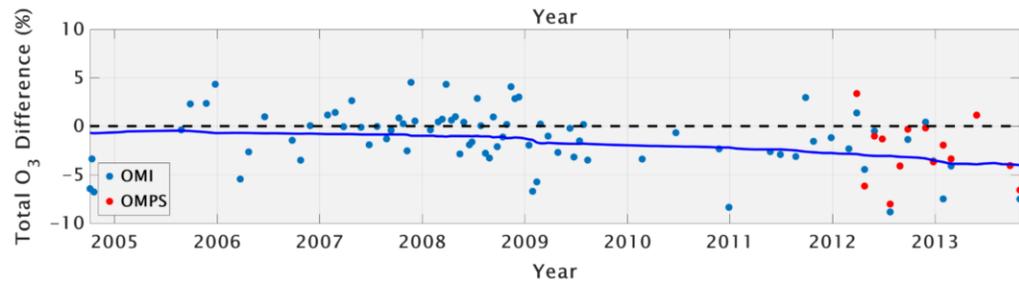
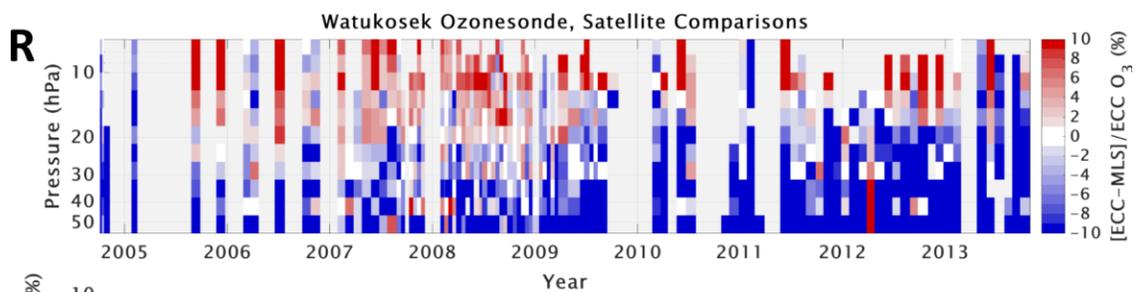
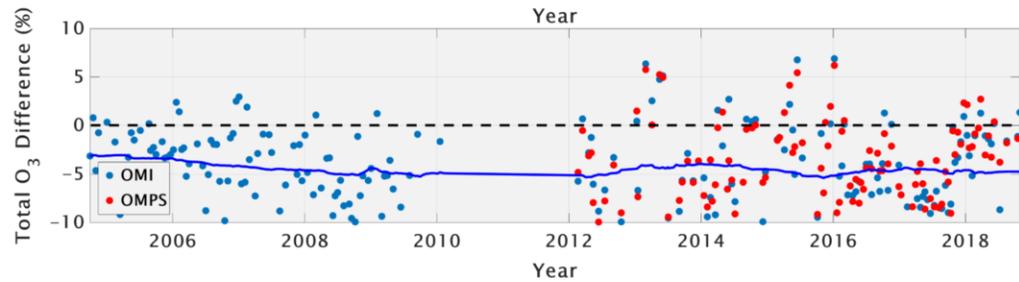
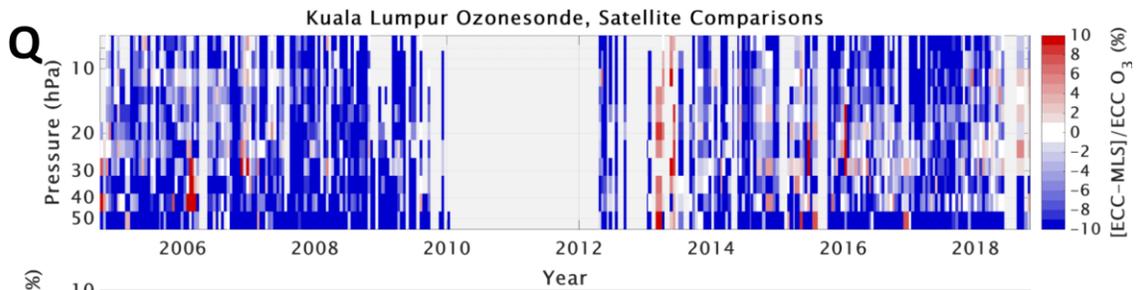
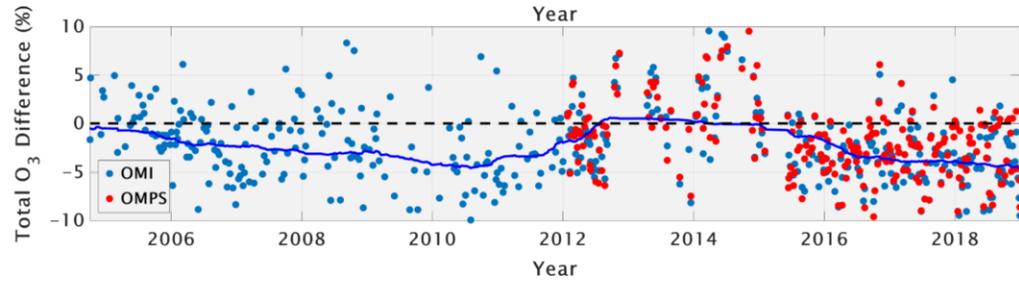
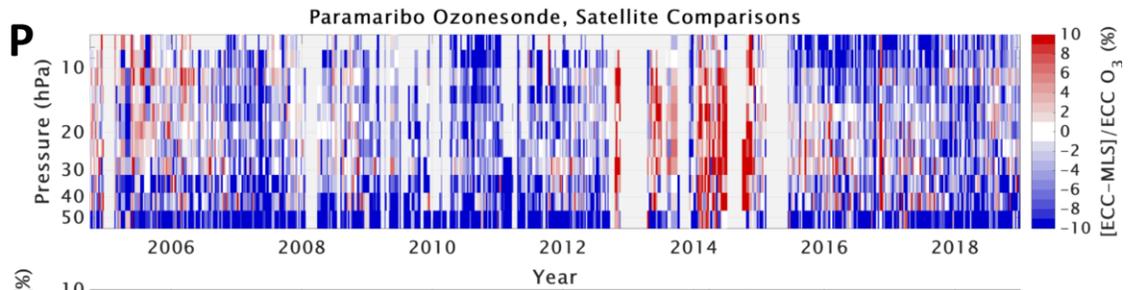


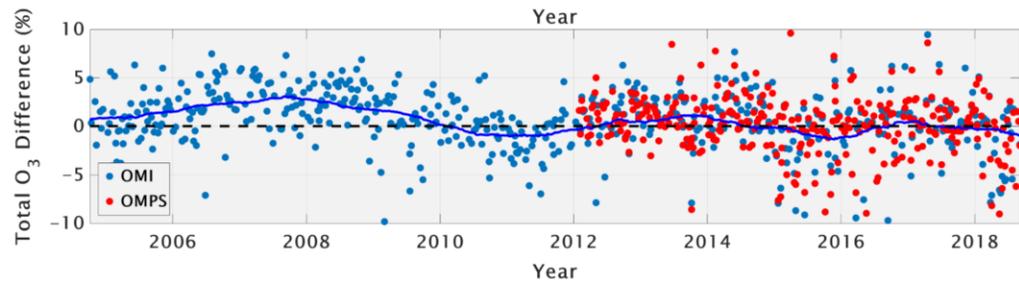
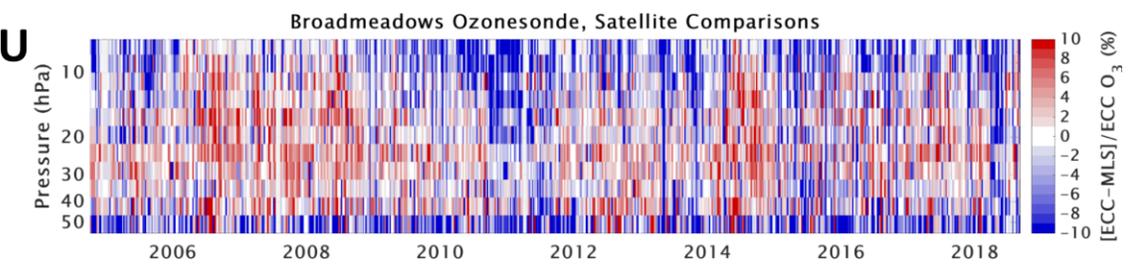
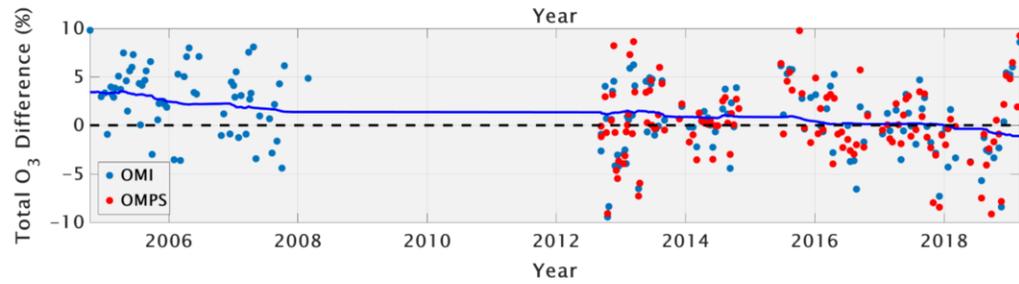
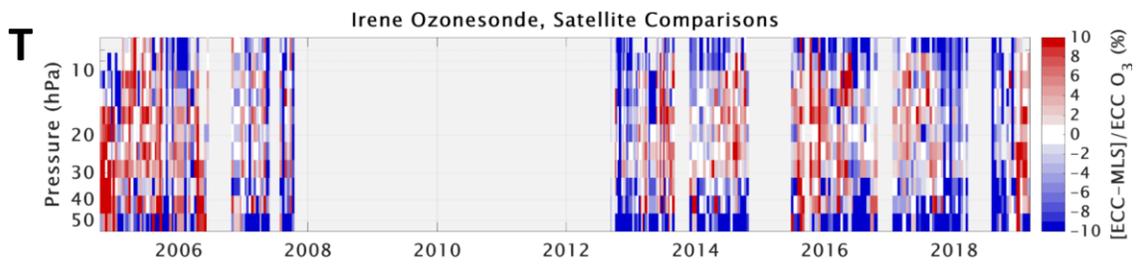
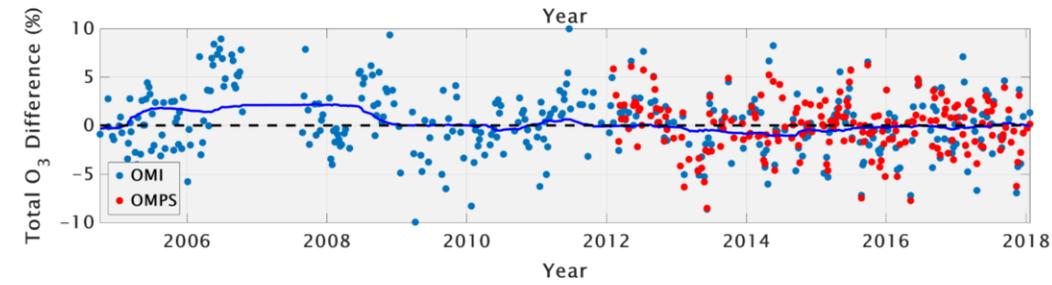
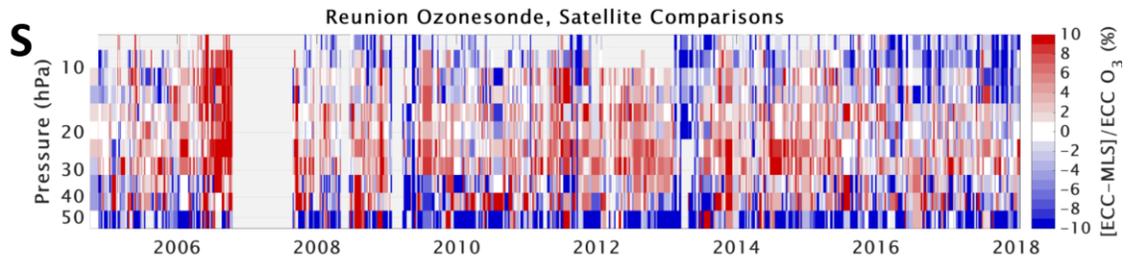












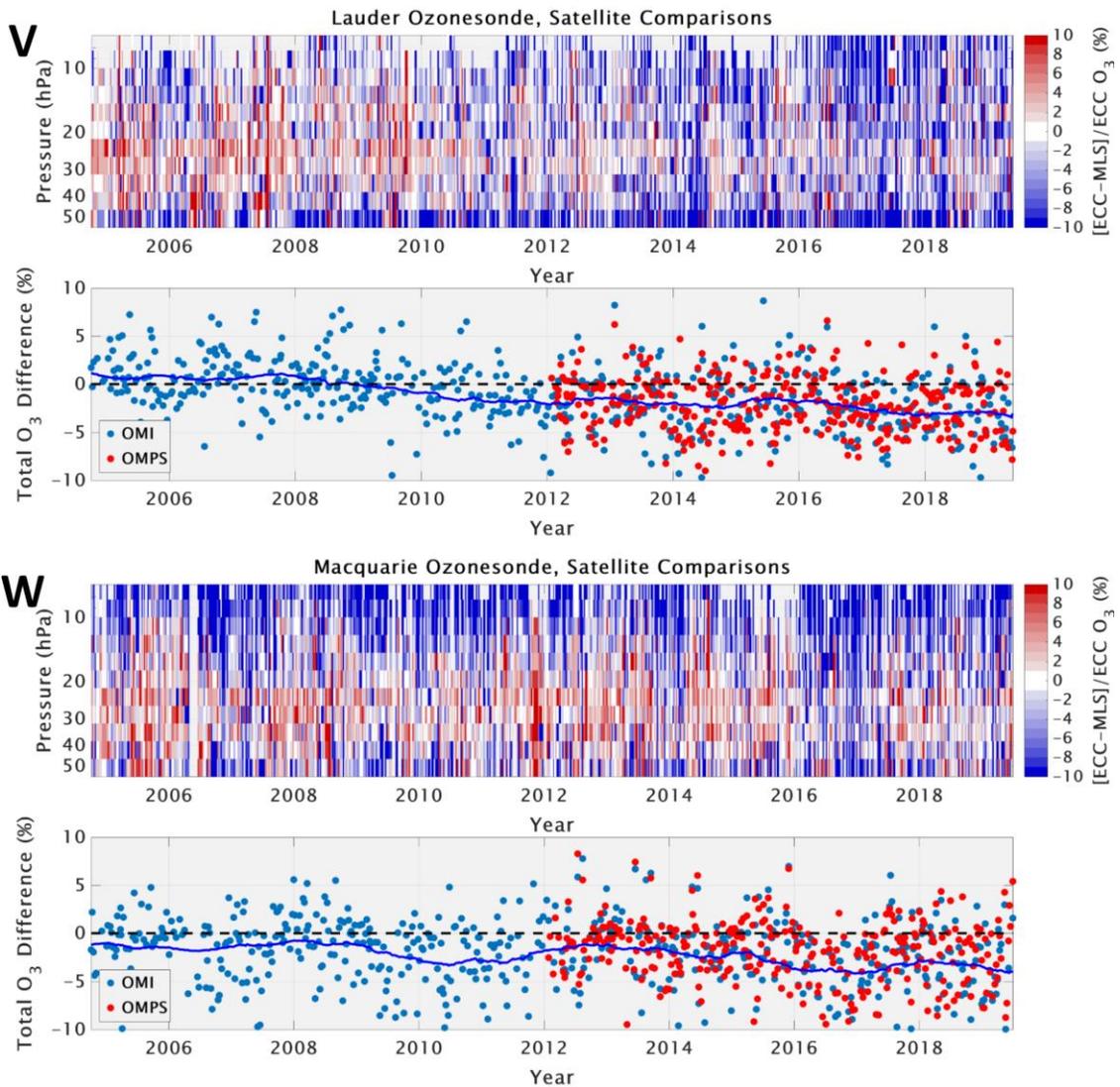


Figure S2. As in Figure 1, but for the 23 reference ECC ozonesonde sites (i.e. those that do not exhibit a > 3 % drop-off in TCO relative to OMI). See Table 1 for more metadata on each site.

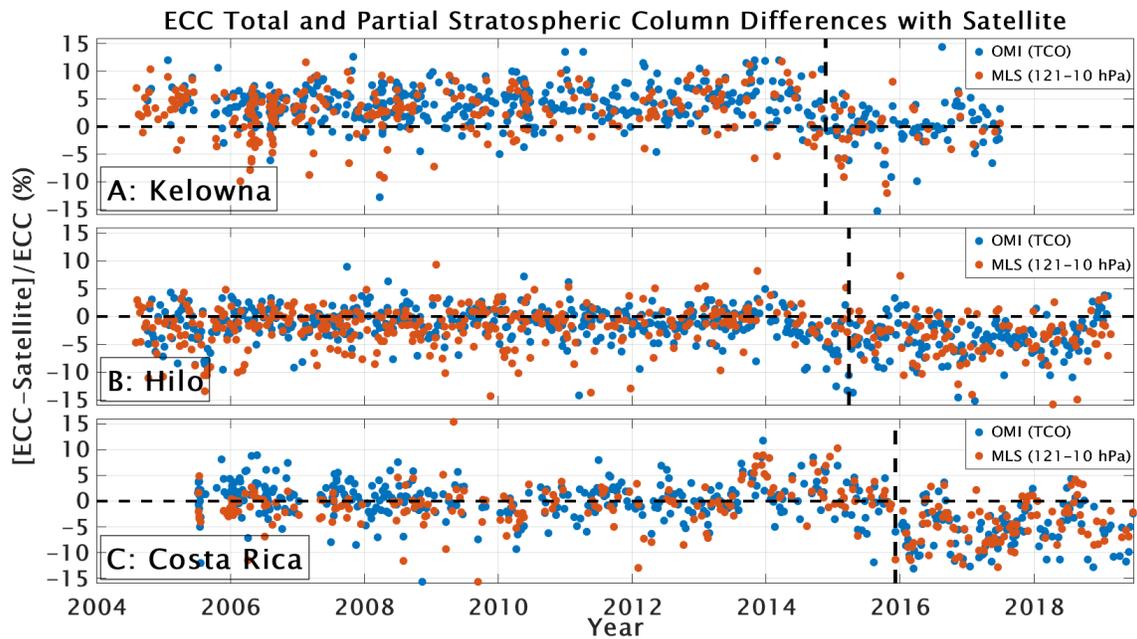


Figure S3. Time series of percent differences between ECC and OMI TCO (blue dots) and ECC and MLS partial stratospheric column O_3 integrated from 121 to 10 hPa (orange dots) for Kelowna (A), Hilo (B), and Costa Rica (C; the same sites as Figure 1). This shows the coincidence in the ECC stratospheric column drop vs. MLS with the TCO drop vs. OMI. The horizontal black dashed lines indicate the 0 % line and the vertical dashed lines indicate the date of ECC TCO drop-off (see Table 1).

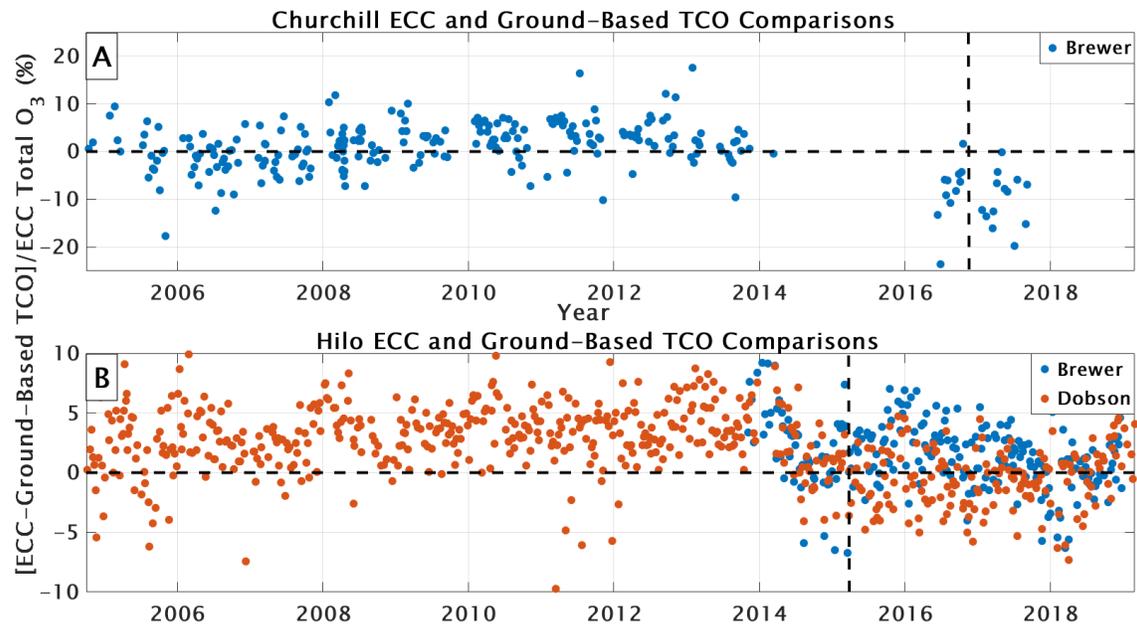


Figure S4. Time series of comparisons between ECC and ground-based TCO measurements at Churchill, Canada (A), and Hilo, HI (B). Horizontal dashed lines indicate the 0 % line for TCO comparisons, and the vertical black dashed lines indicate the date of ECC drop-off (see Table 1). Note the different y-scales for each panel.

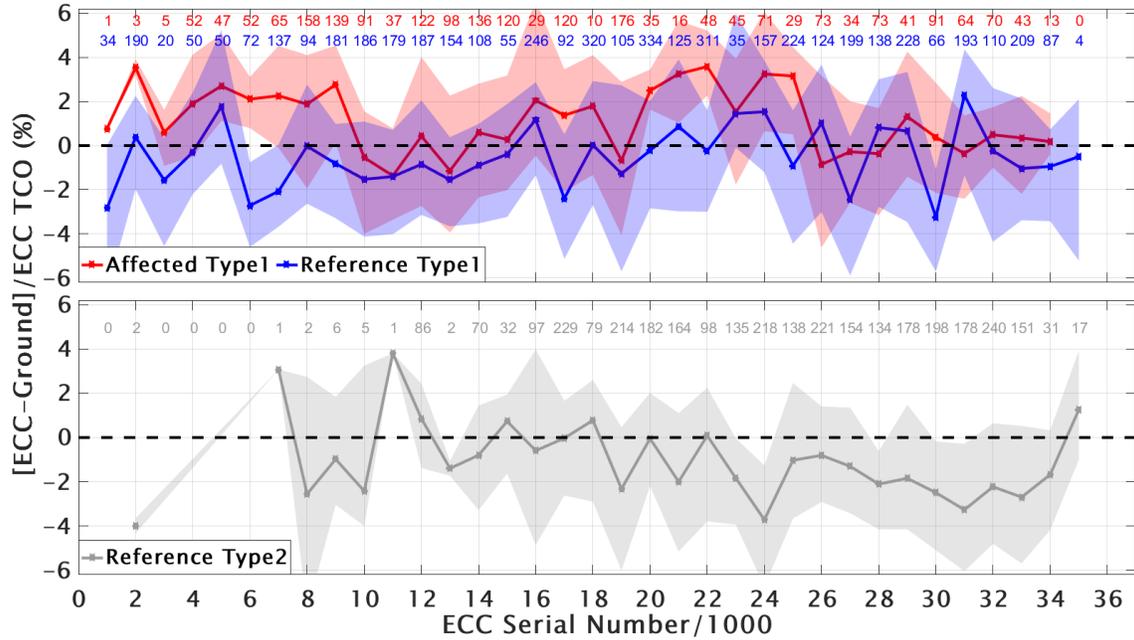


Figure S5. Median (lines) and 25th to 75th (shading) percentiles of comparisons between ECC and ground-based TCO. The comparisons are separated by every 1000 serial numbers for Type1 (top) and Type2 (bottom) ECCs. The Type1 ECCs are separated into affected (red; six available sites) and reference (blue; nine sites) stations. Natal, the only affected Type2 site, is not included in this figure, leaving seven Type2 sites that have available ground-based data for this comparison (Hong Kong does not have ground-based TCO data available). The number of samples for each serial number bin are shown at the top of each panel.

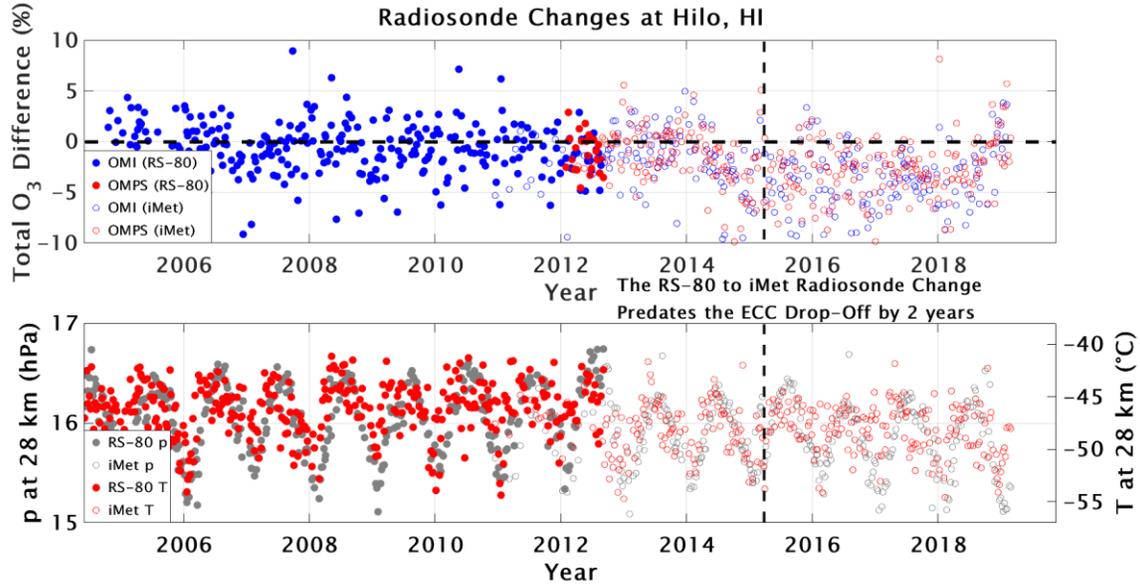


Figure S6. Top panel: Time series of TCO percent differences between Hilo ECC, and OMI (blue) and OMPS (red) TCO. Bottom panel: Pressure (grey) and temperature (red) values at 28 km altitude (representative of the mid-stratosphere). The solid dots show when the ECC ozonesonde was paired with a Vaisala RS-80 radiosonde, and the open dots show when the ECC was paired with an InterMet iMet radiosonde. The vertical dashed lines indicate the date of the ECC TCO drop-off at Hilo (see Table 1), and the horizontal line on the top panel indicates the 0 % line for TCO comparisons.