

Martin et al. (2004) finds that the ratio of formaldehyde columns to tropospheric NO<sub>2</sub> columns is an indicator of the relative sensitivity of surface ozone to emissions of nitrogen oxides (NOx) and volatile organic compounds (VOCs). The attached figure shows monthly mean tropospheric HCHO/NO<sub>2</sub> column ratio retrieved from GOME for North America, Europe, and East Asia. Ratios greater than 1 tend to be NOx-limited. Ratios below 1 tend to be NOx-saturated. White areas indicate remote regions (observed tropospheric NO<sub>2</sub> columns less than 2.5x10<sup>15</sup> molecules cm<sup>2</sup>) and regions below the HCHO detection limit of 4x10<sup>15</sup> molecules cm<sup>2</sup>. The satellite-derived ratios indicate that surface ozone is more sensitive to emissions of NOx than of VOCs throughout most continental regions of the Northern Hemisphere during summer. Exceptions include Los Angeles and industrial areas of Germany. A seasonal transition occurs in the fall when surface ozone becomes less sensitive to NOx and more sensitive to VOCs.