

Atmospheric Isoprene in the NOAA/INSTAAR Global Greenhouse Gas Reference Network

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Two different methods of isoprene monitoring were evaluated from co-collected measurements at the Deutscher Wetterdienst Global Atmospheric Watch (GAW) site, Hohenpeissenberg, Germany. *In situ* sampling followed by gas chromatography analysis performed at the site was compared with whole air sampling within ESRL/GMD's Global Greenhouse Gas Reference Network (GGGRN). For the whole air sampling, air was collected in 2.5-liter glass flasks that were filled within 15 minutes of the *in situ* measurements, and later analyzed by gas chromatography at INSTAAR in Boulder, Colorado. Influences from sample storage time of the flasks, as well as ozone concentration, and humidity during sampling were investigated. None of these appear to have an influence on the isoprene recovery from the flasks. A ~10% systematic disagreement was seen between flask and *in situ* methods in calibration scales. A polynomial fit of the compared data was used to correct for this error, scaling flask measurements to the *in situ* observations. The detection limit for the flask analysis was determined to be 8 pmol mol⁻¹. This allowed quantification of isoprene in GGGRN network flasks at ~50% of the 44 sites included in the network. We present the global and seasonal distribution of isoprene from these data, where sites were classified as being subjected to year-round, seasonal, occasional, or no isoprene occurrence in the network samples.

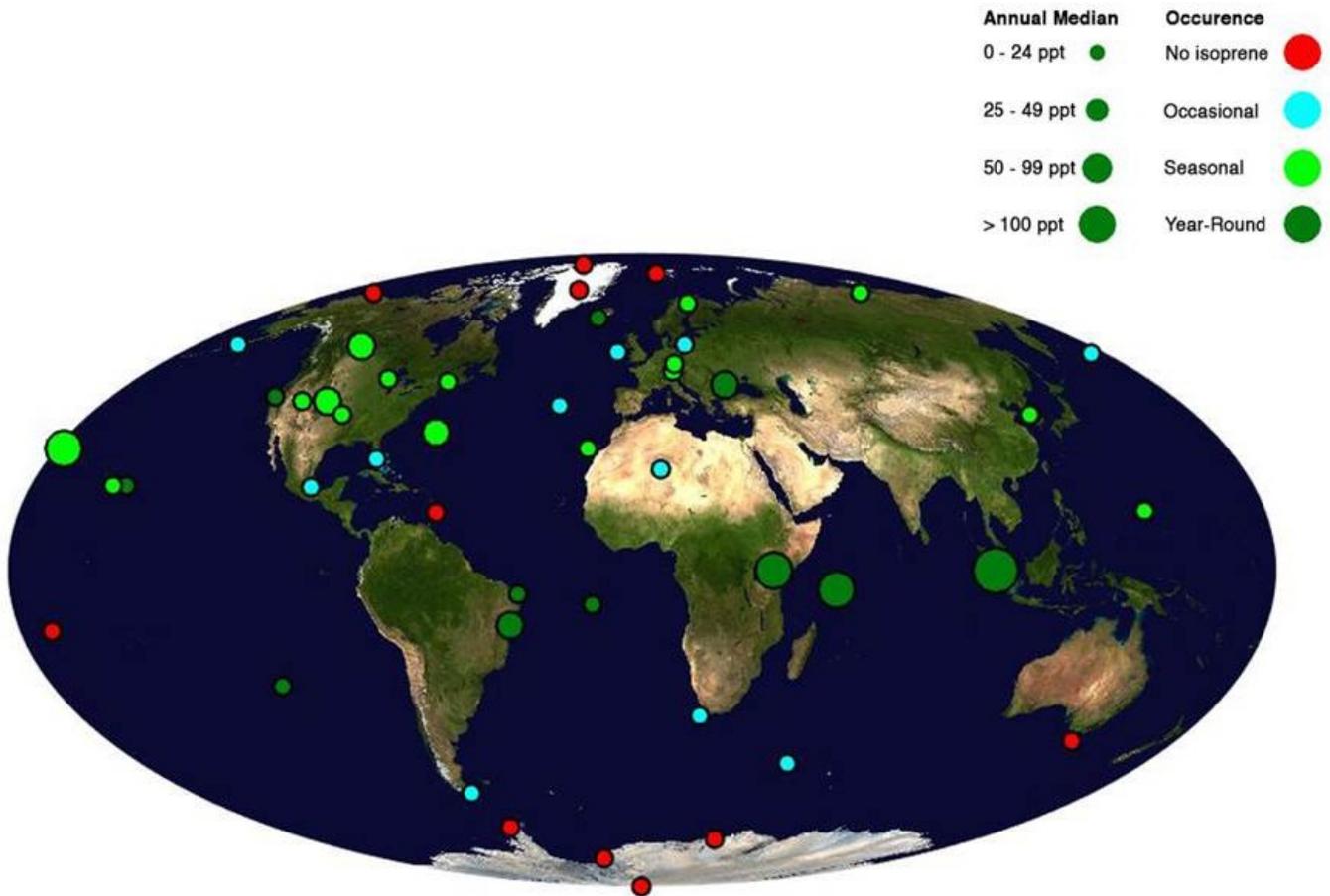


Figure 1. Map showing the global distribution of isoprene at GGGRN network sites. Sites were classified as having no, occasional, seasonal, or year-round isoprene. Point size corresponds to median mixing ratio and categorization (color) to the frequency of isoprene detection at each site.