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## **How well do we know global long-term tropospheric ozone changes?**

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The Tropospheric Ozone Assessment Report (TOAR) has among its goals to provide the research community with an up-to-date global assessment of the distribution and trends of tropospheric ozone from the surface to the tropopause. This task requires that we evaluate the quality and consistency of modern and older records. From the earliest measurements in the 19th century, both measurement methods and the portion of the globe observed by them have evolved. These methods have different uncertainties and biases, and the data records differ with respect to coverage (space and time), information content, and representativeness. These are reviewed and compared. From validation and intercomparison experiments, considerable information exists to evaluate different measurement records. Here we attempt to consolidate and reconcile these results, from both surface monitoring (early methods, potassium iodide and UV photometric monitors), and free tropospheric measurements (lidar, ozonesonde, FTIR, aircraft and satellite instruments) to produce a comprehensive description of the uncertainties in our measurement-derived knowledge of the global tropospheric ozone distribution and its changes with time.