



Observational support for the NOAA Annual Greenhouse Gas Index (AGGI)

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Data used to calculate the U.S. National Oceanic and Atmospheric Administration (NOAA) Annual Greenhouse Gas Index (AGGI - <http://www.cmdl.noaa.gov/aggi>) derives from a globally extensive, long-term, atmospheric monitoring network that involves both frequent flask sampling and in situ measurements of all major and many minor greenhouse gases. The AGGI is designed to enhance the connection between scientists and society by providing a normalized standard that can be easily understood and followed. The contribution of long-lived greenhouse gases to climate forcing is well understood by scientists and has been reported through international assessments. Nevertheless, the language of scientists (for example, watts per square meter per year) often eludes policy makers, educators, and the general public. This index is designed to help bridge that gap.

Measurements of the long-lived greenhouse gases, carbon dioxide, methane, nitrous oxide and the halocarbons (mainly CFCs) have minimal scientific uncertainty, being independent of climate models, and thus provide a climate benchmark free of controversy. All of these gases have been monitored around the world since the 1970's mainly by NOAA's Earth System Research Laboratory (ESRL), Global Monitoring Division (formerly CMDL), in Boulder, Colorado. To provide the data required for the AGGI, continuous measurements from five baseline climate observatories at Pt. Barrow, Alaska; Mauna Loa, Hawaii; Trinidad Head, California; American Samoa; and at the South Pole are maintained. In addition, flask air samples are collected through several global networks, including a cooperative program for carbon-containing and other greenhouse gases that provides samples from globally widespread clean air sites. All measurements are reported on World Calibration Scales, produced and maintained by NOAA/ESRL in Boulder. These data are used to calculate annual global average

concentrations from which changes in radiative forcing of the global climate since the pre-industrial era (1750) for the 26-year period encompassing 1979 through 2004 are determined. This includes all major greenhouse gases and 10 minor halogenated gases. Results are normalized to radiative forcing in 1990 to produce the AGGI.