

## ATMOSPHERIC CONCENTRATION OF CARBON DIOXIDE, 1958–2004

The data in this table were taken at the Mauna Loa Observatory in Hawaii and represent averages adjusted to the 15th of each month. The last column gives the average over the year. The concentration of CO<sub>2</sub> is given in parts per million by volume. Data from other measurement sites may be found in Reference 1.

The first graph illustrates the seasonal variation of CO<sub>2</sub> concentration and the steady increase over the last 45 years. The second graph summarizes the growth in the emissions of CO<sub>2</sub> into the atmosphere as a result of burning of fossil fuels (Reference 2).

### References

1. Keeling, C.D., and Whorf, T.P., Atmospheric carbon dioxide record from Mauna Loa, Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, U.S. Department of Energy, Oak Ridge, TN, 2005; <[cdiac.esd.ornl.gov/trends/co2/sio-mlo.htm](http://cdiac.esd.ornl.gov/trends/co2/sio-mlo.htm)>.
2. Marland, G., Boden, T. A., and Andres, R. J., Global, Regional, and National CO<sub>2</sub> Emissions. In *Trends: A Compendium of Data on Global Change, 2001*. Carbon Dioxide Information Analysis Center, Oak Ridge National Laboratory, U.S. Department of Energy, Oak Ridge, TN; <[cdiac.esd.ornl.gov/trends/emis/tre\\_glob.htm](http://cdiac.esd.ornl.gov/trends/emis/tre_glob.htm)>.

### CO<sub>2</sub> Concentration in ppm at Mauna Loa

| Year | Jan.   | Feb.   | March  | April  | May    | June   | July   | Aug.   | Sept.  | Oct.   | Nov.   | Dec.   | Annual |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 1958 |        |        | 315.71 | 317.45 | 317.50 |        | 315.85 | 314.93 | 313.19 |        | 313.34 | 314.67 |        |
| 1959 | 315.58 | 316.47 | 316.65 | 317.72 | 318.29 | 318.16 | 316.55 | 314.80 | 313.84 | 313.34 | 314.82 | 315.59 | 315.98 |
| 1960 | 316.43 | 316.97 | 317.58 | 319.03 | 320.03 | 319.59 | 318.18 | 315.91 | 314.16 | 313.84 | 315.00 | 316.19 | 316.91 |
| 1961 | 316.89 | 317.70 | 318.54 | 319.48 | 320.58 | 319.77 | 318.58 | 316.79 | 314.99 | 315.31 | 316.10 | 317.01 | 317.65 |
| 1962 | 317.94 | 318.56 | 319.69 | 320.58 | 321.01 | 320.61 | 319.61 | 317.40 | 316.26 | 315.42 | 316.69 | 317.69 | 318.45 |
| 1963 | 318.74 | 319.08 | 319.86 | 321.39 | 322.24 | 321.47 | 319.74 | 317.77 | 316.21 | 315.99 | 317.06 | 318.36 | 318.99 |
| 1964 | 319.57 |        |        |        | 322.24 | 321.89 | 320.44 | 318.70 | 316.70 | 316.87 | 317.68 | 318.71 |        |
| 1965 | 319.44 | 320.44 | 320.89 | 322.13 | 322.16 | 321.87 | 321.21 | 318.87 | 317.81 | 317.30 | 318.87 | 319.42 | 320.03 |
| 1966 | 320.62 | 321.59 | 322.39 | 323.70 | 324.07 | 323.75 | 322.41 | 320.37 | 318.64 | 318.10 | 319.79 | 321.03 | 321.37 |
| 1967 | 322.33 | 322.50 | 323.04 | 324.42 | 325.00 | 324.09 | 322.55 | 320.92 | 319.26 | 319.39 | 320.72 | 321.96 | 322.18 |
| 1968 | 322.57 | 323.15 | 323.89 | 325.03 | 325.57 | 325.36 | 324.14 | 322.11 | 320.33 | 320.25 | 321.33 | 322.90 | 323.05 |
| 1969 | 324.00 | 324.42 | 325.64 | 326.66 | 327.38 | 326.70 | 325.89 | 323.67 | 322.38 | 321.78 | 322.85 | 324.12 | 324.62 |
| 1970 | 325.06 | 325.98 | 326.93 | 328.14 | 328.07 | 327.66 | 326.35 | 324.69 | 323.10 | 323.07 | 324.01 | 325.13 | 325.68 |
| 1971 | 326.17 | 326.68 | 327.18 | 327.78 | 328.92 | 328.57 | 327.37 | 325.43 | 323.36 | 323.57 | 324.80 | 326.01 | 326.32 |
| 1972 | 326.77 | 327.63 | 327.75 | 329.72 | 330.07 | 329.09 | 328.05 | 326.32 | 324.84 | 325.20 | 326.50 | 327.55 | 327.46 |
| 1973 | 328.54 | 329.56 | 330.30 | 331.50 | 332.48 | 332.07 | 330.87 | 329.31 | 327.51 | 327.18 | 328.16 | 328.64 | 329.68 |
| 1974 | 329.35 | 330.71 | 331.48 | 332.65 | 333.08 | 332.25 | 331.18 | 329.40 | 327.44 | 327.37 | 328.46 | 329.58 | 330.25 |
| 1975 | 330.40 | 331.41 | 332.04 | 333.31 | 333.96 | 333.59 | 331.91 | 330.06 | 328.56 | 328.34 | 329.49 | 330.76 | 331.15 |
| 1976 | 331.74 | 332.56 | 333.50 | 334.58 | 334.87 | 334.34 | 333.05 | 330.94 | 329.30 | 328.94 | 330.31 | 331.68 | 332.15 |
| 1977 | 332.92 | 333.41 | 334.70 | 336.07 | 336.74 | 336.27 | 334.93 | 332.75 | 331.58 | 331.16 | 332.40 | 333.85 | 333.90 |
| 1978 | 334.97 | 335.39 | 336.64 | 337.76 | 338.01 | 337.89 | 336.54 | 334.68 | 332.76 | 332.54 | 333.92 | 334.95 | 335.50 |
| 1979 | 336.23 | 336.76 | 337.96 | 338.89 | 339.47 | 339.29 | 337.73 | 336.09 | 333.91 | 333.86 | 335.29 | 336.73 | 336.85 |
| 1980 | 338.01 | 338.36 | 340.08 | 340.77 | 341.46 | 341.17 | 339.56 | 337.60 | 335.88 | 336.02 | 337.10 | 338.21 | 338.69 |
| 1981 | 339.23 | 340.47 | 341.38 | 342.51 | 342.91 | 342.25 | 340.49 | 338.43 | 336.69 | 336.85 | 338.36 | 339.61 | 339.93 |
| 1982 | 340.75 | 341.61 | 342.70 | 343.57 | 344.13 | 343.35 | 342.06 | 339.82 | 337.97 | 337.86 | 339.26 | 340.49 | 341.13 |
| 1983 | 341.37 | 342.52 | 343.10 | 344.94 | 345.75 | 345.32 | 343.99 | 342.39 | 339.86 | 339.99 | 341.16 | 342.99 | 342.78 |
| 1984 | 343.70 | 344.50 | 345.29 | 347.08 | 347.43 | 346.79 | 345.40 | 343.28 | 341.07 | 341.35 | 342.98 | 344.22 | 344.42 |
| 1985 | 344.97 | 346.00 | 347.43 | 348.35 | 348.93 | 348.25 | 346.56 | 344.69 | 343.09 | 342.80 | 344.24 | 345.56 | 345.91 |
| 1986 | 346.29 | 346.96 | 347.86 | 349.55 | 350.21 | 349.54 | 347.94 | 345.91 | 344.86 | 344.17 | 345.66 | 346.90 | 347.15 |
| 1987 | 348.02 | 348.47 | 349.42 | 350.99 | 351.84 | 351.25 | 349.52 | 348.11 | 346.44 | 346.36 | 347.81 | 348.96 | 348.93 |
| 1988 | 350.43 | 351.72 | 352.22 | 353.59 | 354.22 | 353.79 | 352.39 | 350.44 | 348.72 | 348.88 | 350.07 | 351.34 | 351.48 |
| 1989 | 352.76 | 353.07 | 353.68 | 355.42 | 355.67 | 355.13 | 353.90 | 351.67 | 349.80 | 349.99 | 351.30 | 352.53 | 352.91 |
| 1990 | 353.66 | 354.70 | 355.39 | 356.20 | 357.16 | 356.22 | 354.82 | 352.91 | 350.96 | 351.18 | 352.83 | 354.21 | 354.19 |
| 1991 | 354.72 | 355.75 | 357.16 | 358.60 | 359.33 | 358.24 | 356.18 | 354.03 | 352.16 | 352.21 | 353.75 | 354.99 | 355.59 |
| 1992 | 355.98 | 356.72 | 357.81 | 359.15 | 359.66 | 359.25 | 357.03 | 355.00 | 353.01 | 353.31 | 354.16 | 355.40 | 356.37 |
| 1993 | 356.70 | 357.16 | 358.38 | 359.46 | 360.28 | 359.59 | 357.58 | 355.52 | 353.70 | 353.98 | 355.33 | 356.80 | 357.04 |
| 1994 | 358.36 | 358.91 | 359.97 | 361.27 | 361.68 | 360.94 | 359.55 | 357.49 | 355.84 | 355.99 | 357.58 | 359.04 | 358.89 |
| 1995 | 359.96 | 361.00 | 361.64 | 363.45 | 363.79 | 363.26 | 361.90 | 359.46 | 358.06 | 357.75 | 359.56 | 360.70 | 360.88 |
| 1996 | 362.05 | 363.25 | 364.03 | 364.72 | 365.41 | 364.97 | 363.65 | 361.49 | 359.46 | 359.60 | 360.76 | 362.33 | 362.64 |
| 1997 | 363.18 | 364.00 | 364.57 | 366.35 | 366.80 | 365.62 | 364.47 | 362.51 | 360.19 | 360.77 | 362.43 | 364.28 | 363.76 |
| 1998 | 365.32 | 366.15 | 367.31 | 368.61 | 369.29 | 368.87 | 367.64 | 365.77 | 363.90 | 364.23 | 365.46 | 366.97 | 366.63 |
| 1999 | 368.15 | 368.87 | 369.59 | 371.14 | 371.00 | 370.35 | 369.27 | 366.94 | 364.63 | 365.12 | 366.67 | 368.01 | 368.31 |
| 2000 | 369.14 | 369.46 | 370.52 | 371.66 | 371.82 | 371.70 | 370.12 | 368.12 | 366.62 | 366.73 | 368.29 | 369.53 | 369.48 |
| 2001 | 370.28 | 371.50 | 372.12 | 372.87 | 374.02 | 373.30 | 371.62 | 369.55 | 367.96 | 368.09 | 369.68 | 371.24 | 371.02 |

Atmospheric Concentration of Carbon Dioxide, 1958–2004

| Year | Jan.   | Feb.   | March  | April  | May    | June   | July   | Aug.   | Sept.  | Oct.   | Nov.   | Dec.   | Annual |
|------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| 2002 | 372.43 | 373.09 | 373.52 | 374.86 | 375.55 | 375.40 | 374.02 | 371.49 | 370.71 | 370.24 | 372.08 | 373.78 | 373.10 |
| 2003 | 374.68 | 375.63 | 376.11 | 377.65 | 378.35 | 378.13 | 376.62 | 374.50 | 372.99 | 373.00 | 374.35 | 375.70 | 375.64 |
| 2004 | 376.79 | 377.37 | 378.41 | 380.52 | 380.63 | 379.57 | 377.79 | 375.86 | 374.06 | 374.24 | 375.86 | 377.48 | 377.38 |

