

Appendix H: Glossary

- Advection** Transport by large scale motion (of the ocean in the context of this report).
- Airborne fraction** The proportion of CO₂ emissions remaining in the atmosphere.
- Anthropogenic CO₂ flux** Defined as being the net carbon input to the atmosphere due to human influence but excluding natural responses to such input. The precise distinctions are somewhat arbitrary: we include all the fossil (industrial) source, plus the net carbon flux associated with current and past changes in land-use.
- Bomb-¹⁴C** Excess ¹⁴C due to atmospheric testing of nuclear weapons.
- Buffer factor** (Revelle factor) Specification of the relation between CO₂ partial pressure and total inorganic carbon in the ocean surface.
- Eddy diffusion** Mathematical representation of large-scale mixing.
- ENSO** El-Nino/Southern Oscillation. Combined interannual fluctuation in atmosphere/ocean properties. The atmospheric component (Southern Oscillation) is characterised by abnormal east-west pressure gradients across the Pacific. The ocean component (El Nino) is characterised by abnormally warm waters in the eastern Pacific. There is a small-scale variation in atmospheric CO₂ correlated with ENSO events.
- Feedback** Process where a response to some forcing acts to change the amount of forcing: ‘positive feedback’ if the response adds to the forcing and ‘negative feedback’ if the response counteracts the forcing.
- CO₂-Fertilisation** The effect of higher CO₂ levels in producing greater plant growth. The direct effect on growth is well established by laboratory studies on many species. However the key issue for the problems discussed in this report is the extent to which such enhanced growth leads to a sustained increase terrestrial carbon.
- Fossil CO₂ source** The earlier IPCC (1990, 1992) reports denoted this component as ‘industrial’, referring to the production rather than the end-use. This component includes use of fossil fuel (and ideally losses such as leakage and gas flaring) non-fuel uses of fossil carbon (to the extent that such products are oxidised to CO₂) and production of cement.
- Forward** Calculation where the chain of inference follows the direction of cause and effect. In the present context, deducing atmospheric CO₂ concentrations from specified emissions. (c.f. *inverse*).
- GCM** General Circulation Model. Computer model of the atmosphere (AGCM) or ocean (OGCM) that solves (approximately) the dynamical equations which determine the atmospheric (or oceanic) motion.
- GEOSECS** Geochemical Ocean Sections. An observational program conducted during 1973–74. The most important data for carbon cycle studies are the ¹⁴C profiles.
- GtC** Gigatons of carbon. 1 Gt = 10¹⁵ g. Carbon is exchanged between reservoirs, taking a range of chemical forms and so, for uniformity, the amounts are characterised in terms of the mass of carbon. 1 GtC corresponds to $\frac{44}{12}$ Gt of CO₂. One of the few contexts in which the mass of CO₂ is used is in GWPs defined per unit mass.
- GWP** Global Warming Potential. Numerical index designed to facilitate comparisons between radiatively active gases.

Industrial CO₂ See fossil.

Inverse Calculation where the chain of inference reverses the direction of cause and effect. In the present context, using specified atmospheric CO₂ concentrations to deduce the emission histories that would produce these concentrations. (c.f. *forward*).

IPCC Intergovernmental Panel on Climate Change. A body established by the World Meteorological Organisation and the United Nations Environment Program.

KOALA Key Ocean/Atmosphere/Land Assessments. Working title of this document.

Koala Australian marsupial with a six-foot long appendix.

Land-use change flux This is defined as the net carbon flux to the atmosphere from current and past changes in land-use, e.g. deforestation, regrowth, conversions between cropland and pasture, etc. The changes in soil carbon associated with such changes can continue for many decades after the original change in land-use.

Mixed layer Surface layer of the ocean with relatively little variation in the vertical direction due to the action of surface wind stress.

ppmv Parts per million by volume. Measure of trace gas content. The unit ppmv is a measure of atmospheric mixing ratio, although common usage is to apply the term concentration (incorrectly) as equivalent. CO₂ mixing ratios are generally expressed relative to dry air.

Pre-industrial Period prior to the large increase in fossil carbon emissions, i.e. before about 1800 or 1750.

Profile Specification of future variation expressed as a function of time without reference to specific societal actions. (c.f. *scenario*).

Radiative Forcing Influence perturbing the radiative balance of the earth.

Reservoir A part of the earth/ocean/atmosphere system treated as a single entity in terms of its carbon content for purposes of description or modelling.

Response Function Mathematical function of time, specifying the proportion of a unit perturbation remaining after time t .

Scenario Specification of future variation (particularly with reference to CO₂ emissions in this report) derived from specific assumptions about societal behaviour. (c.f. *profile*).

Sink Process leading to net removal of carbon from the atmosphere.

Source Process giving a net input of carbon to the atmosphere.

STUGE An integrated assessment model for greenhouse change studies.

TTO Transient Tracers in the Ocean. An ocean measurement program.

WOCE World Ocean Circulation Experiment. An ongoing (1994) program measuring physical and chemical properties of the oceans.

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