GFDL Model Glossary

AM2 – Atmospheric component of CM2.1 (IPCC Fourth Assessment Report model) containing a 2-degree resolution atmosphere using the Finite-Volume dynamical core with a latitude-longitude discretization, a 2-degree horizontal resolution and 24 hybrid sigma/pressure vertical layers.

AM3 – Atmospheric model with 2-degree resolution using the Finite-Volume dynamical core on the cubed-sphere (FV3), including comprehensive online atmospheric chemistry and aerosols, aerosol-cloud interactions (aerosol indirect effects), and increased vertical extent to resolve the stratosphere.

AM4 – Prototype atmospheric model under development using the Finite-Volume dynamical core on the cubed-sphere (FV3), including online atmospheric chemistry with a reduced set of constituents and aerosols, aerosol-cloud interactions (aerosol indirect effects). The convection parameterization includes a "double-plume" option that subsumes features from both AM3 and HIRAM models of the previous generation.The target resolution is C192 (~50 km).

C2560 – A global cloud-permitting model at 3.5 km resolution using the FV3 dynamical core with 5 prognostic cloud condensate types and the Zhao modification of the UW shallow convection. A version of this model has been coupled to MOM4.

CM2.1 – IPCC Fourth Assessment Report (AR4) model containing a 2-degree resolution atmosphere (AM2), the Finite-Volume dynamical core with a latitude-longitude discretization, a 1-degree resolution ocean (MOM4) on a tripolar grid, and the LM2 land surface model.

CM2.5 – High resolution climate model loosely based on CM2.1 (AM2 physics, FV3 dynamical core) with 0.5-degree atmosphere and 0.25-degree or finer ocean.

CM2.6 – Similar to CM2.5 but with 0.1-degree or finer ocean.

CM3 – IPCC Fifth Assessment Report (AR5) model containing the AM3 atmospheric component and the LM3 land formulation with dynamic vegetation. The ocean and sea ice components are similar to CM2.1.

CM4 – IPCC Sixth Assessment Report (AR6) model planned for development over the 2013-2016 timeframe. The resolution is expected to be about 0.5-degree in the atmosphere and 0.25-degree or finer in the ocean. The atmospheric component of CM4 is referred to as AM4.The ocean version of CM4 will be MOM6.

COBALT – (Carbon, Ocean Biogeochemistry and Lower Trophics), an extension of TOPAZ to include additional ecosystem comprehensiveness such as higher trophic levels (mesozooplankton).

ESM2M – IPCC Fifth Assessment Report (AR5) earth system model based on CM2.1 physical model but containing dynamic vegetation, new biogeochemical components in the ocean (TOPAZ) and land (LM3) models, and updated ocean physical parameterizations.

ESM2G – IPCC Fifth Assessment Report earth system model, twin to ESM2M but with a GOLD-based ocean model replacing the MOM-based ocean in ESM2M. GOLD is an ocean code that uses an isopycnal vertical coordinate.

ESM2.6 – An Earth System model prototype based on the CM2.6 physical model but including the COBALT ocean biogeochemical model.

FLOR – Forecast-oriented Low Ocean Resolution version of CM2.5, which substitutes the 1-degree ocean for the 0.25-degree. This model is optimized for seasonal-to-decadal predictions, but used across all timescales. (Also referred to as CM2.5_FLOR)

FV3 – Finite volume dynamical core discretized on a cubed-sphere grid. Horizontal resolution of FV3 models is indicated as Cnnn, where each face of the cube contains nnn x nnn grid points. (C48 = 2-degree resolution, C96=1-degree, C192 = 0.5-degree ≈ 50km, C384 = 0.25-degree ≈ 25km, C2560 ≈ 3.5km)

GOLD – (Generalized Ocean Layer Dynamics) Ocean model with generalized vertical coordinate. Configured with an isopycnal vertical coordinate for use as the ocean component of ESM2G.

HFS – GFDL Hurricane Forecast System used operationally by the National Hurricane Center for operational hurricane prediction.

HIRAM – Series of atmospheric model designed for high resolution simulations using the FV3 dynamical core and a non-intrusive convective parameterization. This model has been used extensively, at various horizontal resolutions, for the study of tropical cyclones, as well as mean climate.

LM2 – The land component in CM2.1 (IPCC Fourth Assessment Report model).

LM3 – The land component in ESM2M, ESM2G, CM3 and other follow-on models from CM2.1. Advances from LM2 include the addition of a dynamic vegetation and carbon system component, vertically-resolved temperature, and improved hydrology.

MOM – The GFDL Modular Ocean Model, the most widely used ocean model in the world, for research and also for operational forecasting at NCEP as well as in other countries (Australia, Brazil, Canada, India, Korea). The current public version is MOM5. MOM6, under development, will extend MOM5 to include C-grid discretization and an alternate vertical formulation that includes isopycnal coordinates, within a single Arbitrary-Lagrangian-Eulerian representation.

SIS – (Sea Ice Simulator) The sea ice model used in all of GFDL models including full ice dynamics, three-layer thermodynamics (one snow, two ice), and 5 ice thickness categories all on the ocean tripolar grid.

TOPAZ – (Tracers of Ocean Phytoplankton with Allometric Zooplankton) the ocean biogeochemistry component of the GFDL Earth System Models including cycles of carbon, nitrogen, phosphorus, iron, silicon, alkalinity and lithogenic material with plankton functional groups.

ZETAC - A regional atmospheric model developed at GFDL primarily for use in dynamical downscaling applications. An 18-km grid Atlantic basin version of the model has been used to downscale Atlantic hurricane activity.