CMIP5 tier:

Core
Tier 1
Tier 2

CMIP5 experiment number	*CMIP5 experiment short name*	*CMIP5 experiment long name*	*Experiment Description*	*Years per run*	*Ensemble size*
1.1	**decadalXXXX**	**Ensembles of 10-year hindcasts and predictions**	With ocean initial conditions in some way representative of the observed anomalies or full fields for the start date, simulations should be initialized towards the end of 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000 and 2005. A minimum ensemble size of 3 should be produced for each start date. The atmospheric composition (and other conditions including volcanic aerosols) should be prescribed as in the historical run (expt. 3.2) and the RCP4.5 scenario (expt. 4.1) of the long-term suite of experiments.	10	≥ 3
1.2	**decadalXXXX**	**Ensembles of 30-year hindcasts and predictions**	Extend to 30 years the expt. 1.1 integrations with initial dates near the end of 1960, 1980 and 2005. A minimum ensemble size of 3 should be produced for each start date.	30	≥ 3
1.3	**noVolcXXXX**	**Hindcasts without volcanoes**	Additional runs initialized near end of 1960, 1975, 1980, 1985 and 1990 as in expts. 1.1 and 1.2, but without volcanic eruptions (e.g., without Agung, El Chichon and Pinatubo).	10-30	≥ 3
1.4	**volcIn2010**	**Prediction with 2010 volcano**	Pinatubo-like eruption imposed in year 2010	10-30	≥ 3
1.5		**Initialize with alternative strategies**	Since there is at present no generally accepted "best" way to initialize models, some groups may choose to try different initialization methods.	10-30	≥ 3
1.6		**Run with more complete atmos. chemistry**	The chemistry/aerosol community plans to put together experiments with short-lived species and pollutants (probably two to three years hence).	10-30	≥ 3
2.1	**sst2030**	**Future "time-slice" experiment (2026-2035)**	Simulation of a future decade covering the years 2026- 2035, with prescribed SSTs and sea ice concentration anomalies (relative to expt. 3.3).	10	≥ 1
3.1	**piControl**	**Pre-industrial Control**	Impose non-evolving, pre-industrial conditions, which may include: prescribed atmospheric oncentrations of all well-mixed gases (including CO2), some short-lived (reactive) species, and prescribed non-evolving emissions or concentrations of natural aerosols or their precursors, some short-lived (reactive) species, and unperturbed land use.	≥ 500	1
3.2	**historical**	**Historical (1850- at least 2005)**	Impose changing conditions (consistent with observations), which may include: atmospheric composition (including CO2), due to both anthropogenic and volcanic influences, solar forcing, missions or concentrations of short-lived species and natural and anthropogenic aerosols or their precursors, and land use.	≥ 156	≥ 1
3.3	**amip**	**AMIP (1979- at least 2008)**	Impose SSTs & sea ice (from observations), but with other conditions (including CO2 concentrations and aerosols) as in expt. 3.2. See expt. 6.5 for further recommendations from CFMIP.	≥ 30	≥ 1
3.4	**midHolocene**	**Mid-Holocene**	Consistent with PMIP specifications, impose Mid-Holocene conditions, including: orbital parameters, atmospheric concentrations of well-mixed greenhouse gases.	≥ 100	1
3.5	**lgm**	**Last Glacial Maximum**	Consistent with PMIP requirements, impose Last Glacial Maximum conditions, including: ice sheets, atmospheric concentrations of well-mixed greenhouse gases.	≥ 100	1
3.6	**past1000**	**Last Millennium**	Consistent with PMIP requirements, impose evolving conditions, including: solar variations, volcanic aerosols.	1000	1
4.1	**rcp45**	**Future projection (2006-2300) forced by RCP4.5**	Radiative forcing stabilizes at ~4.5W m-2 after 2100.	95	1
4.2	**rcp85**	**Future projection (2006-2300) forced by RCP8.5**	Radiative forcing reaches ~8.5 W m-2 near ~2100.	95	1
4.3	**rcp26**	**Future projection (2006-2300) forced by RCP2.6**	Radiative forcing peaks at ~2.6 Wm-2 near 2100.	95	1
4.4	**rcp60**	**Future projection (2006-2100) forced by RCP6**	Radiative forcing stabilizes at ~6 W m-2 after ~2100.	95	1
5.1	**esmControl**	**ESM pre-industrial control**	Imposed conditions identical to expt. 3.1, but with CO2 concentration determined by the model itself.	250	1
5.2	**esmHistorical**	**ESM historical (1850- at least 2005)**	As in expt. 3.2, but prescribe anthropogenic CO2 emissions, rather than concentrations.	156	1
5.3	**esmrcp85**	**ESM RCP8.5 (2006-2100)**	Continuation of expt.5.2 into the future as in expt. 4.2, but with prescribed anthropogenic CO2 emissions, rather than concentrations.	95	1
5.4-1	**esmFixClim1**	**ESM fixed climate 1**	This experiment is forced with prescribed atmospheric CO2 concentrations. Spin off from the control (expt. 3.1) at the same point as expt. 6.1 and impose conditions identical to those prescribed in expt. 6.1, but the radiation code is fed the time-invariant CO2 concentration from the control. There is little climate change and the carbon cycle responds only to the increase in CO2 concentration.	140	1
5.4-2	**esmFixClim2**	**ESM fixed climate 2**	This experiment is forced with prescribed atmospheric CO2 concentrations. Spin off from the control (expt. 3.1) at the same point as expt. 3.2 and impose conditions identical to those prescribed in expt. 3.2 (for the historical period) and expt. 4.1 (RCP4.5 for the future), but the radiation code is fed the time-invariant CO2 concentration from the control. The radiation code "sees" all other prescribed conditions evolve as in expts. 3.2 and 4.1. There will be some climate change in this case due the variations in, for example, aerosol forcing, solar variability, and land use change.	251	1
5.5-1	**esmFdbk1**	**ESM feedback 1**	This simulation is forced with prescribed atmospheric CO2 concentration. As in expt. 5.4, but this time only the radiation code "sees" the rising atmospheric CO2 concentration. Forced in this way, the carbon cycle, which "sees" the 3.1 control atmospheric CO2 concentration, responds to climate change alone.	140	1
5.5-2	**esmFdbk2**	**ESM feedback 2**	This simulation is forced with prescribed atmospheric CO2 concentration. As in expt. 5.4, but this time all the other evolving forcings found in expts. 3.2 and 4.1 should also be seen by the radiation code. Forced in this way, the carbon cycle, which "sees" the 3.1 control atmospheric CO2 concentration, responds to climate change alone.	251	1
6.1	**1pctCO2**	**Idealized 1%/yr run to 4x pre- industrial CO2.**	This run is initialized from the pre-industrial control (expt. 3.1) and CO2 concentration is prescribed to increase at 1%/yr.	140	1
6.2a	**sstClim**	**Control prescribed SST experiment**	An atmosphere-only run driven by prescribed SST and sea ice consistent with the climatology of the pre-industrial control run (expt. 3.1)	≥ 30	1
6.2b	**sstClim4xCO2**	**Perturbed run for Hansen-style diagnosis of "fast" climate system responses to 4xCO2.**	As in expt. 6.2a above, but with atmospheric CO2 concentration quadrupled, relative to pre- industrial level.	≥ 30	1
6.3	**abrupt4xCO2**	**Gregory-style diagnosis of "slow" climate system responses.**	Impose an instantaneous quadrupling of atmospheric CO2 concentration (relative to pre- industrial) and then hold it fixed.	150	≥ 1
6.4a	**sstClimAerosol**	**Hansen-style diagnosis of "fast" climate system responses to all anthropogenic aerosols alone for the year 2000.**	As in expt. 6.2a above, but with aerosols consistent with conditions in year 2000 of the historical run (expt. 3.2)	30	≥ 2
6.4b	**sstClimSulfate**	**Hansen-style diagnosis of "fast" climate system responses to all anthropogenic sulfate aerosol alone for the year 2000.**	As in expt. 6.2a above, but with aerosols consistent with conditions in year 2000 of the historical run (expt. 3.2)	30	≥ 2
6.5	**amip4xCO2**	**Cloud response to imposed 4xCO2 (Hansen-style diagnosis of "fast" climate system responses).**	Consistent with CFMIP requirements, the AMIP conditions are imposed (expt. 3.3, which is the control for this run), but the radiation code (only) sees quadrupled CO2, relative to AMIP.	30	1
6.6	**amipFuture**	**Cloud response to an imposed change in SST pattern.**	Consistent with CFMIP requirements, add a patterned SST perturbation to the AMIP SSTs of expt. 3.3 (which is the "control" for this run).	30	1
6.7a	**aquaControl**	**Aqua-planet : control run**	Consistent with CFMIP requirements (with CO2 set to AMIP mean concentration), impose zonally uniform SSTs on a planet without continents.	5	1
6.7b	**aqua4xCO2**	**Aqua-planet: cloud response to imposed 4xCO2 (Hansen-style diagnosis).**	Consistent with CFMIP requirements, impose 4xCO2 (relative to AMIP mean CO2) on the zonally uniform SSTs of expt. 6.7a (which is the control for this run).	5	1
6.7c	**aqua4K**	**Aqua-planet: cloud response to an imposed uniform change in SST.**	Consistent with CFMIP requirements, add a uniform +4K to the zonally uniform SSTs of expt. 6.7a (which is the control for this run).	5	1
6.8	**amip4K**	**Cloud response to an imposed uniform change in SST**	Consistent with CFMIP requirements, add a uniform +4 K SST to the AMIP SSTs of expt. 3.3 (which is the "control" for this run).	30	1
7.1	**historicalNat**	**Natural-only (1850- at least 2005)**	Impose conditions as in the control experiment (3.1), but with natural forcing (e.g., volcanoes and solar variability) evolving as in the historical run (expt. 3.2).	≥ 156	≥ 1
7.2	**historicalGHG**	**GHG-only (1850- at least 2005)**	Impose conditions as in the control experiment (3.1), but with greenhouse gas forcing evolving as in the historical run (expt. 3.2). This can yield an estimate of the contribution of greenhouse gas forcing to recent warming, and when used in combination with the "all forcings" experiment (3.2) and "natural-only forcings experiment (3.1), the response to aerosols can be estimated as a residual.	≥ 156	≥ 1
7.3	**historicalMisc**	**Other individual forcing runs**	Historical simulation considering other individual forcing agents or combinations of forcing, for example, land use changes only, or anthropogenic aerosols only or anthropogenic sulfate aerosols only, or volcanic aerosols only, etc.	≥ 156	≥ 1