Upgrade of the JMA's Seasonal Ensemble Prediction System

JMA's Seasonal Ensemble Prediction System will be upgraded from JMA/MRI-CPS3(CPS3) to JMA/MRI-CPS4(CPS4) on January 22, 2026. After this date, CPS4 will be used for 1-month prediction products as well as 6-month prediction products. Therefore, 1-month prediction products published on this webpage will be updated from Global Ensemble Prediction System (GEPS) to CPS4, and the 6-month prediction products published on this webpage will be updated from CPS3 to CPS4.

(1) Upgrade from CPS3 to CPS4

CPS4 improves both the atmospheric and ocean models and increases the number of atmospheric vertical layers from 100 to 128. CPS4 incorporates a linear ozone scheme, which contributes to a realistic representation of ozone variation compared to the monthly climatology used in CPS3. See the table below for the comparison of CPS4 and CPS3.

Model	CPS4[1]	CPS3[2]
Horizontal Resolution	Atmosphere:TL319 (approx. 55km) Ocean:0.25° (lon)×0,25° (lat)	Atmosphere:TL319 (approx. 55km) Ocean:0.25° (lon)×0,25° (lat)
Vertical Layers	Atmosphere:**128 levels** (up to 0.01hPa) Ocean:60 levels	Atmosphere:100 levels (up to 0.01hPa) Ocean:60 levels
Initial Condition	Atmosphere: Global Analysis (GA) **+ Ozone Analysis** (Re-forecast: JRA-3Q **+ Ozone Analysis**) Land: Offline Land Analysis (*) Ocean: 4DVAR(coarse res) + IAU(eddy permitting res), daily (*)	Atmosphere: GA (Re-forecast: JRA-3Q) Land: Offline Land Analysis (*) Ocean: 4DVAR(coarse res) + IAU(eddy permitting res), daily (*)

[1] CPS4:Research activities in Earth System Modelling. Report No. 55 WCRP Report No. 08/2025 https://doi.org/10.5281/zenodo.17531926

[2] CPS3:Japan Meteorological Agency/Meteorological Research Institute Coupled Prediction System Version3(JMA/MRI-CPS3) https://doi.org/10.2151/jmsj.2023-009

	Sea Ice: 3DVAR, daily (*) * Forcing is given from GA (Re-forecast: JRA-3Q)	Sea Ice: 3DVAR, daily (*) * Forcing is given from GA (Re-forecast: JRA-3Q)
Initial Perturbation	Atmosphere: **Singular Vectors + Local Ensemble Transform Kalman Filter** Ocean: Analysis uncertainty pattern	Atmosphere: Breeding of Growing Modes Ocean: Analysis uncertainty pattern
Model Perturbation	Atmosphere: Stochastic Perturbation of Physics Tendency (SPPT) **+ Stochastic Humidity Profile for Convective parametrization**	Atmosphere: SPPT
Forecast Range	240 days (daily) 34 days (Tuesday and Wednesday)	240 days (daily)
Ensemble Size	6-month prediction: 5 members per day (**85 members** are used for statistical forecasts by a Lagged Average Forecast (LAF) method) **1-month prediction: 50 members per week**	6-month prediction: 5 members per day (51 members are used for statistical forecasts by a LAF method)

(2) Changing the format, the file name and the directory of the products

- GRIB2 format
  - ✓ Background Generating Process Identifier number
    13 --> 132
  - ✓ Initial time
    12 UTC --> 00 UTC
  - ✓ Ensemble size (ensemble statistical 6-month prediction products)
    51 --> 85
- File name
  For the 1-month prediction products, “GEPS” of the file name will be changed to “CPS” and added “FD00-34” which means prediction period.
  For example:
  JMA**GEPS**_1p25deg_yyyymmdd_surf_Ppp_fcst_em.grb2
  --> JMA**CPS**_1p25deg_yyyymmdd_surf_Ppp_fcst_em_**FD00-34**.grb2

- Directory

  (current) - January 21, 2026 (The data will not be deleted for some time.)

  --> January 22, 2026 -

  ✓ 1-month prediction products

  (a) Ensemble Statistics

  https://ds.data.jma.go.jp/wmc/gpv/model/**1mE.Grib2**/GPV_1DAY_125/

  --> https://ds.data.jma.go.jp/wmc/gpv/model/**CPS4/1-mon**/GPV_1DAY_125/

  (b) Individual ensemble members

  https://ds.data.jma.go.jp/wmc/gpv/model/**1mE.Grib2**/MGPV_125/

  -->https://ds.data.jma.go.jp/wmc/gpv/model/**CPS4/1-mon**/MGPV_125/

  (c) Systematic Error

  https://ds.data.jma.go.jp/wmc/data/gpv/model/**1mE_Hind_125.GEPS2503**/Syserr/

  -->https://ds.data.jma.go.jp/wmc/data/gpv/model/**1mE_Hind_125.CPS4**/Syserr/

  (d) Hindcast

  https://ds.data.jma.go.jp/wmc/data/gpv/model/**1mE_Hind_125.GEPS2503**/Daily/

  -->https://ds.data.jma.go.jp/wmc/data/gpv/model/**1mE_Hind_125.CPS4**/Daily/

  ✓ 6-month prediction products

  (a) Ensemble Statistics

  https://ds.data.jma.go.jp/wmc/gpv/model/**CPS3**/6-mon/GPV/

  --> https://ds.data.jma.go.jp/wmc/gpv/model/**CPS4**/6-mon/GPV/

  (b) Individual ensemble members

  https://ds.data.jma.go.jp/wmc/gpv/model/**CPS3**/6-mon/MGPV/

  --> https://ds.data.jma.go.jp/wmc/gpv/model/**CPS4**/6-mon/MGPV/

  (c) Systematic Error

  https://ds.data.jma.go.jp/wmc/gpv/model/**CPS3**/syserr/

  --> https://ds.data.jma.go.jp/wmc/gpv/model/**CPS4**/syserr/

  (d) Hindcast

  https://ds.data.jma.go.jp/wmc/data/gpv/model/**CPS3_Hind**/monthly/

  --> https://ds.data.jma.go.jp/wmc/data/gpv/model/**CPS4_Hind**/monthly/