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Supplement of

UK Global Ocean GO6 and GO7: a traceable hierarchy of model resolutions

David Storkey et al.

Correspondence to: David Storkey (dave.storkey@metoffice.gov.uk)

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1 FPP keys used in GO6 and GSI8.1

These tables contain the NEMO and CICE preprocessing keys required to build GO6-GSI8.1.

keys for building NEMO

key_cice	couple to CICE sea ice model
key_dynspg_ft	filtered free surface solver
key_vvl	z* vertical coordinate
key_ldfslp	rotate tracer diffusion operators
key_traldf_c2d	geographically varying lateral tracer diffusion
key_dynldf_c2d	geographically varying lateral momentum diffusion
key_zdftke	TKE scheme for vertical mixing
key_zdftmx	include tidal mixing scheme
key_trabbl	include bottom boundary layer scheme
key_zdfddm	include double diffusive mixing parametrisation
key_mpp_mpi	use MPI library
key_mpp_rep	global sums bit compare for parallel model runs with different grid decompositions
key_nosignedzero	overwrite f95 behaviour of intrinsic sign function
key_iomput	use XIOS I/O library
key_xios2	use version 2 of XIOS I/O library
key_nemocice_decomp	use identical parallel decomposition for NEMO and CICE
key_traldf_eiv	1° model only : include eddy-induced advection

keys for building CICE

LINUX	Building CICE for the Linux environment
CICE_IN_NEMO, key_nemocice_decomp	CICE is run within the NEMO model on the same processor decomposition
ncdf	NetCDF format options available for input and output files
coupled, key_iomput	CICE coupled to NEMO and passing variables through NEMO
gather_scatter_barrier	Use MPI barrier for safer gather and scatter communications
ORCA_GRID	use the ORCA family of grids
NICECAT=5, NICELYR=4, NSNWLYR=1	5 thickness categories, 4 ice layers, 1 snow layer
TRAGE=1, TRPND=1	Using single ice age and melt-pond tracers
REPRODUCIBLE	Ensures global sums bit compare for parallel model runs with different grid decompositions
NXGLOB=360, NYGLOB=330	1° model : size of grid in x and y directions
NXGLOB=1440, NYGLOB=1205	1/4° model : size of grid in x and y directions
NXGLOB=4320, NYGLOB=3604	1/12° model : size of grid in x and y directions

2 NEMO namelists

This section contains the scientifically relevant namelists for the NEMO ocean model for GO6. This file should be included as the *namelist_cfg* file in the working directory and other namelists will be set to default values by the *namelist_ref* file. The full scientific definition is give for the 1/4° model, but for the 1° and 1/12° models only those namelist parameters that are changed compared to the 1/4° model.

2.1 Namelists for 1/4° model

```
!=====
10 &namrun
!=====
nn_no = 0
cn_exp = 'go6x2o'
nn_it000 = 1
15 nn_itend = 1984
nn_date0 = 19760101
nn_leapy = 0
ln_rstart = .false.
nn_euler = 1
20 nn_rstctl = 0
cn_ocerst_in = 'restart'
cn_ocerst_indir = './'
cn_ocerst_out = 'restart'
cn_ocerst_outdir = '/home/d00/frsy/cylc-run/u-ah494-make-namelist/share/data/History_Data/'
25 nn_istate = 1
ln_rst_list = .false.
nn_stock = 10000
nn_stocklist = 10*0
nn_write = 640
30 ln_dimgnnn = .false.
ln_mskland = .true.
ln_cfmeta = .true.
ln_clobber = .true.
nn_chunksz = 2097152
35 ln_rstdate = .true.
/

!=====
&namcfg
40 !=====
cp_cfg = 'orca'
cp_cfz = 'no zoom'
jp_cfg = 25
jpidta = 1442
45 jpjdtat = 1207
jpkdta = 75
jpiglo = 1442
jjpglo = 1207
```

```

jpizoom = 1
50  jpjzoom = 1
    jperio = 4
    ln_use_jattr = .false.
    /

55  !=====
    &namzgr
    !=====
    ln_zco = .false.
    ln_zps = .true.
60  ln_sco = .false.
    ln_isfcav = .false.
    /

    !=====
65  &namdom
    !=====
    nn_bathy = 1
    rn_bathy = 0.0
    nn_closea = 1
70  nn_msh = 0
    rn_hmin = -8.0
    rn_e3zps_min = 25.0
    rn_e3zps_rat = 0.2
    rn_rdt = 1350.0
75  rn_atfp = 0.1
    nn_acc = 0
    rn_rdtmin = 28800.0
    rn_rdtmax = 28800.0
    rn_rdth = 800.0
80  ln_crs = .false.
    jphgr_msh = 0
    pp glam0 = 0.0
    pp gphi0 = -35.0
    pp e1_deg = 1.0
85  pp e2_deg = 0.5
    pp e1_m = 5000.0
    pp e2_m = 5000.0
    ppsur = -3958.951371276829
    ppa0 = 103.9530096000000
90  ppa1 = 2.415951269000000
    ppkth = 15.351013700000000
    ppacr = 7.0
    ppdzmin = 999999.0
    pphmax = 999999.0
95  ldbletanh = .true.
    ppa2 = 100.7609285000000
    ppkth2 = 48.029893720000000

```

```

ppacr2 = 13.0
/
100 !=====
&namtsd
!=====
sn_tem = 'EN4_climatologies.nc',-1,'temperature',.true.,.true.,'yearly',' ',' '
105 sn_sal = 'EN4_climatologies.nc',-1,'salinity',.true.,.true.,'yearly',' ',' '
cn_dir = '/projects/ocean/hadgem3/initial/ocean/eORCA025/'
ln_tsd_init = .true.
ln_tsd_tradmp = .false.
/
110 !=====
&namsbc
!=====
nn_fsbc = 1
115 ln_ana = .false.
ln_flx = .false.
ln_blk_clio = .false.
ln_blk_core = .true.
ln_blk_mfs = .false.
120 ln_cpl = .false.
ln_mixcpl = .false.
nn_components = 0
ln_apr_dyn = .false.
nn_ice = 4
125 nn_ice_embd = 1
ln_dm2dc = .true.
ln_rnf = .true.
nn_isf = 3
ln_ssr = .true.
130 nn_fwb = 0
ln_wave = .false.
ln_cdgw = .false.
ln_sdw = .false.
nn_lsm = 0
135 nn_limflx = -1
/

!=====
&namsbc_core
140 !=====
sn_wndi = 'u10_core',6,'U_10_MOD',.true.,.false.,'yearly','weights_grid03_bicubic_eorca025
sn_wndj = 'v10_core',6,'V_10_MOD',.true.,.false.,'yearly','weights_grid03_bicubic_eorca025
sn_qsr = 'qsw_core',24,'SWDN_MOD',.false.,.false.,'yearly','weights_grid03_bilinear_eorca0
sn_qlw = 'qlw_core',24,'LWDN_MOD',.false.,.false.,'yearly','weights_grid03_bilinear_eorca0
145 sn_tair = 't10_core',6,'T_10_MOD',.true.,.false.,'yearly','weights_grid03_bilinear_eorca02
sn_humi = 'q10_core',6,'Q_10_MOD',.true.,.false.,'yearly','weights_grid03_bilinear_eorca02

```

```

sn_prec = 'precip_core',-1,'TPRECIP',.true.,.false.,'yearly','weights_grid03_bilinear_eorca
sn_snow = 'snow_core',-1,'SNOW',.true.,.false.,'yearly','weights_grid03_bilinear_eorca025.
sn_tdif = 'taudif_core',24,'TAUDIF',.true.,.false.,'yearly','weights_grid03_bilinear_eorca
150 cn_dir = '/projects/ocean/hadgem3/forcing/ocean/CORE2/'
ln_taudif = .false.
rn_zqt = 10.0
rn_zu = 10.0
rn_pfac = 1.0
155 rn_efac = 1.0
rn_vfac = 1.0
/

!=====
160 &namtra_qsr
!=====
sn_chl = 'chlorophyll',-1,'CHLA',.true.,.true.,'yearly','','''
cn_dir = './'
ln_traqsr = .true.
165 ln_qsr_rgb = .true.
ln_qsr_2bd = .false.
ln_qsr_bio = .false.
nn_chldta = 0
rn_abs = 0.58
170 rn_si0 = 0.35
rn_sil = 23.0
ln_qsr_ice = .true.
/

175 !=====
&namsbc_rnf
!=====
sn_rnf = 'runoff_lm_nomask',-1,'sornficb',.true.,.true.,'yearly','','''
sn_cnf = 'runoff_lm_nomask',0,'socoefr',.false.,.true.,'yearly','','''
180 sn_s_rnf = 'runoffs',24,'rosaline',.true.,.true.,'yearly','','''
sn_t_rnf = 'runoffs',24,'rotemper',.true.,.true.,'yearly','','''
sn_dep_rnf = 'runoffs',0,'rodepth',.false.,.true.,'yearly','','''
cn_dir = './'
ln_rnf_mouth = .true.
185 rn_hrnf = 10.0
rn_avt_rnf = 2.0e-3
rn_rfact = 1.0
ln_rnf_depth = .false.
ln_rnf_tem = .false.
190 ln_rnf_sal = .false.
ln_rnf_depth_ini = .false.
rn_rnf_max = 5.735e-4
rn_dep_max = 150.0
nn_rnf_depth_file = 0
195 /

```

```

!=====
&namsbc_isf
!=====
200 sn_qisf = 'rnfisf',-12,'sohflisf',.false.,.true.,'yearly','','''
sn_fwfisf = 'rnfisf',-12,'sowflisf',.false.,.true.,'yearly','','''
sn_rnfisf = 'runoff_lm_nomask',-1,'sofwfisf',.true.,.true.,'yearly','','''
sn_depmax_isf = 'runoff_lm_nomask',-1,'sozisfmax',.false.,.true.,'yearly','','''
sn_depmin_isf = 'runoff_lm_nomask',-1,'sozisfmin',.false.,.true.,'yearly','','''
205 sn_Leff_isf = 'rnfisf',0,'Leff',.false.,.true.,'yearly','','''
ln_divisf = .true.
rn_gammat0 = 1.0e-4
rn_gammas0 = 1.0e-4
nn_isfblk = 1
210 rn_hisf_tbl = 30.0
ln_conserve = .true.
nn_gammablck = 1
/

215 !=====
&namsbc_apr
!=====
sn_apr = 'patm',-1,'soms_lpre',.true.,.true.,'yearly','','''
cn_dir = './'
220 rn_pref = 101000.0
ln_ref_apr = .false.
ln_apr_obc = .false.
/

225 !=====
&namsbc_ssr
!=====
sn_sst = 'sst_data',24,'sst',.false.,.false.,'yearly','','''
sn_sss = 'sss_lm.nc',-1,'vosaline',.true.,.true.,'yearly','','''
230 cn_dir = './'
nn_sstr = 0
nn_sssr = 2
rn_dqdt = -40.0
rn_deds = -33.333333
235 ln_sssr_bnd = .true.
rn_sssr_bnd = 4.0
/

!=====
240 &namsbc_alb
!=====
nn_ice_alb = 0
rn_albice = 0.53
rn_alphc = 0.65

```

```

245 rn_alphd = 0.80
    rn_alphdi = 0.72
    rn_cloud = 0.06
    /

250 !=====
    &namberg
    !=====
    ln_icebergs = .true.
    ln_bergdia = .true.
255 nn_verbose_level = 1
    nn_verbose_write = 15
    nn_sample_rate = 64
    rn_initial_mass = 8.8e7,4.1e8,3.3e9,1.8e10,3.8e10,7.5e10,1.2e11,2.2e11,3.9e11,7.4e11
    rn_distribution = 0.24,0.12,0.15,0.18,0.12,0.07,0.03,0.03,0.03,0.02
260 rn_mass_scaling = 2000,200,50,20,10,5,2,1,1,1
    rn_initial_thickness = 40.0,67.0,133.0,175.0,6*250.0
    rn_rho_bergs = 850.0
    rn_LoW_ratio = 1.5
    ln_operator_splitting = .true.
265 rn_bits_erosion_fraction = 0
    rn_sicn_shift = 0
    ln_passive_mode = .false.
    nn_test_icebergs = -1
    rn_test_box = 108.0,116.0,-66.0,-58.0
270 rn_speed_limit = 0.0
    sn_icb = 'calving',-1,'calvingmask',.true.,.true.,'yearly','',''
    cn_dir = './'
    rn_low_ratio = 1.5
    /

275 !=====
    &namlbc
    !=====
    rn_shlat = 0.0
280 ln_vorlat = .false.
    /

    !=====
    &namcla
285 !=====
    nn_cla = 0
    /

    !=====
290 &nambfr
    !=====
    nn_bfr = 2
    rn_bfril = 4.0e-4

```



```

rn_bfri2 = 1.0e-3
295 rn_bfri2_max = 1.0e-1
rn_bfeb2 = 2.5e-3
rn_bfrz0 = 3.0e-3
ln_bfr2d = .true.
rn_bfrien = 50.0
300 rn_tfri1 = 4.0e-4
rn_tfri2 = 2.5e-3
rn_tfri2_max = 1.0e-1
rn_tfeb2 = 0.0
rn_tfrz0 = 3.0e-3
305 ln_tfr2d = .false.
rn_tfrien = 50.0
ln_bfrimp = .false.
ln_loglayer = .false.
/
310 !=====
&nambbc
!=====
sn_qgh = 'geothermal_heating',-12,'heatflow'
315 cn_dir = './'
ln_trabbc = .true.
nn_geoflx = 2
rn_geoflx_cst = 86.4e-3
/
320 !=====
&namdbl
!=====
nn_bbl_ldf = 1
325 nn_bbl_adv = 1
rn_ahtbbl = 1000.0
rn_gambbl = 10.0
/
330 !=====
&nameos
!=====
nn_eos = 0
ln_useCT = .true.
335 rn_a0 = 1.6550e-1
rn_b0 = 7.6554e-1
rn_lambda1 = 5.9520e-2
rn_lambda2 = 7.4914e-4
rn_mu1 = 1.4970e-4
340 rn_mu2 = 1.1090e-5
rn_nu = 2.4341e-3
ln_usect = .false.

```

```

/
345 !=====
    &namtra_adv
    !=====
    ln_traadv_cen2 = .false.
    ln_traadv_tvd = .true.
350 ln_traadv_muscl = .false.
    ln_traadv_muscl2 = .false.
    ln_traadv_ubs = .false.
    ln_traadv_qck = .false.
    ln_traadv_msc_ups = .false.
355 ln_traadv_tvd_zts = .false.
/

```

```

!=====
&namtra_adv_mle
360 !=====
    ln_mle = .false.
    rn_ce = 0.06
    nn_mle = 1
    rn_lf = 5.0e+3
365 rn_time = 172800.0
    rn_lat = 20.0
    nn_mld_uv = 0
    nn_conv = 0
    rn_rho_c_mle = 0.01
370 /

```

```

!=====
&namtra_ldf
!=====
375 ln_traldf_lap = .true.
    ln_traldf_bilap = .false.
    ln_traldf_level = .false.
    ln_traldf_hor = .false.
    ln_traldf_iso = .true.
380 ln_traldf_grif = .false.
    ln_traldf_gdia = .false.
    ln_triad_iso = .false.
    ln_botmix_grif = .false.
    rn_aeiv_0 = 0.0
385 rn_aht_0 = 150.0
    rn_ahtb_0 = 0.0
    rn_slpmax = 0.01
    rn_chsmag = 1.0
    rn_smsb = 1.0
390 rn_aht_m = 2000.0
/

```

```

!=====
&namtra_dmp
395 !=====
ln_tradmp = .false.
nn_zdmp = 0
cn_resto = 'resto.nc'
/
400 !=====
&namdyn_adv
!=====
ln_dynadv_vec = .true.
405 nn_dynkeg = 1
ln_dynadv_cen2 = .false.
ln_dynadv_ubs = .false.
ln_dynzad_zts = .false.
/
410 !=====
&nam_vvl
!=====
ln_vvl_zstar = .true.
415 ln_vvl_ztilde = .false.
ln_vvl_layer = .false.
ln_vvl_ztilde_as_zstar = .false.
ln_vvl_zstar_at_eqtor = .false.
rn_ahe3 = 0.0
420 rn_rst_e3t = 30.0
rn_lf_cutoff = 5.0
rn_zdef_max = 0.9
ln_vvl_dbg = .false.
/
425 !=====
&namdyn_vor
!=====
ln_dynvor_ene = .false.
430 ln_dynvor_ens = .false.
ln_dynvor_mix = .false.
ln_dynvor_een = .false.
ln_dynvor_een_old = .true.
/
435 !=====
&namdyn_hpg
!=====
ln_hpg_zco = .false.
440 ln_hpg_zps = .false.

```

```

ln_hpg_sco = .true.
ln_hpg_isf = .false.
ln_hpg_djc = .false.
ln_hpg_prj = .false.
445 ln_dynhpg_imp = .true.
/

!=====
&namdyn_ldf
450 !=====
ln_dynldf_lap = .false.
ln_dynldf_bilap = .true.
ln_dynldf_level = .false.
ln_dynldf_hor = .true.
455 ln_dynldf_iso = .false.
rn_ahm_0_lap = 40000.0
rn_ahmb_0 = 0.0
rn_ahm_0_blp = -1.5e11
rn_cmsmag_1 = 3.0
460 rn_cmsmag_2 = 3
rn_cmsh = 1.0
rn_ahm_m_blp = -1.0e12
rn_ahm_m_lap = 40000.0
/
465 !=====
&namzdf
!=====
rn_avm0 = 1.2e-4
470 rn_avt0 = 1.2e-5
nn_avb = 0
nn_havtb = 1
ln_zdfevd = .true.
nn_evdm = 1
475 rn_avevd = 10.0
ln_zdfnpc = .false.
nn_npc = 1
nn_npcp = 365
ln_zdfexp = .false.
480 nn_zdfexp = 3
/

!=====
&namzdf_tke
485 !=====
rn_ediff = 0.1
rn_ediss = 0.7
rn_ebb = 67.83
rn_emin = 1.0e-6

```

```

490 rn_emin0 = 1.0e-4
    rn_bshear = 1.0e-20
    nn_mx1 = 3
    nn_pdl = 1
    ln_mx10 = .true.
495 rn_mx10 = 0.04
    ln_lc = .true.
    rn_lc = 0.15
    nn_etau = 1
    rn_efr = 0.05
500 nn_htau = 4
    /

    !=====
    &namzdf_ddm
505 !=====
    rn_avts = 1.0e-4
    rn_hsbfr = 1.6
    /

510 !=====
    &namzdf_tmx
    !=====
    rn_htmx = 500.0
    rn_n2min = 1.0e-8
515 rn_tfe = 0.333
    rn_me = 0.2
    ln_tmx_itf = .true.
    rn_tfe_itf = 1.0
    /

520 !=====
    &namzdf_mldzint
    !=====
    nn_mld_diag = 2
525 sn_mld1 = 1,10.0,0.2,0.1
    sn_mld2 = 1,10.0,-0.2,0
    sn_mld3 = 0,0.0,0.0,0.0
    sn_mld4 = 0,0.0,0.0,0.0
    sn_mld5 = 0,0.0,0.0,0.0
530 /

    !=====
    &nammpp
    !=====
535 cn_mpi_send = 'I'
    nn_buffer = 0
    ln_nnogather = .true.
    jpni = 20

```

```

jpnj = 24
540 jpnij = 480
/

!=====
&namctl
545 !=====
ln_ctl = .false.
nn_print = 0
nn_ictls = 0
nn_ictle = 0
550 nn_jctls = 0
nn_jctle = 0
nn_isplt = 1
nn_jsplt = 1
nn_bench = 0
555 nn_timing = 1
/

!=====
&namnc4
560 !=====
nn_nchunks_i = 4
nn_nchunks_j = 4
nn_nchunks_k = 31
ln_nc4zip = .true.
565 /

!=====
&namtrd
!=====
570 ln_glo_trd = .false.
ln_dyn_trd = .false.
ln_dyn_mxl = .false.
ln_vor_trd = .false.
ln_KE_trd = .false.
575 ln_PE_trd = .false.
ln_tra_trd = .true.
ln_tra_mxl = .false.
nn_trd = 365
ln_ke_trd = .false.
580 ln_pe_trd = .false.
/

!=====
&namptr
585 !=====
ln_diaptr = .false.
ln_subbas = .false.

```

```

/
590 !=====
    &namhsb
    !=====
    ln_diahsb = .false.
/
595 !=====
    &namdct
    !=====
    nn_dct = 15
600 nn_dctwri = 15
    nn_secdebug = 112
/

```

2.2 Changed namelist parameters for 1° model

These are the namelist parameters that are changed compared to the list give for the 1/4° model.

```

605 !=====
    &namcfg
    !=====
    cp_cfg = 'orca'
    jp_cfg = 1
610 jpidta = 362
    jpidta = 332
    jpkdta = 75
    jpiglo = 362
    jpjglo = 332
615 /

    !=====
    &namdom
    !=====
620 rn_rdt = 2700.0
/

    !=====
    &namberg
625 !=====
    nn_sample_rate = 32
/

    !=====
630 &namtra_ldf
    !=====
    rn_aeiv_0 = 1000.0
    rn_aht_0 = 1000.0
/

```

```

635 !=====
    &namdyn_ldf
    !=====
    ln_dynldf_lap = .true.
640 ln_dynldf_bilap = .false.
    rn_ahm_0_lap = 20000.0
    rn_ahm_0_blp = 0.0
    /

645 !=====
    &nammpp
    !=====
    cn_mpi_send = 'I'
    nn_buffer = 0
650 ln_nnogather = .true.
    jpni = 22
    jpnj = 21
    jpnij = 462
    /

```

655 2.3 Changed namelist parameters for 1/12° model

These are the namelist parameters that are changed compared to the list give for the 1/4° model.

```

    !=====
    &namcfg
    !=====
660 cp_cfg = 'orca'
    jp_cfg = 12
    jpidta = 4322
    jpjdtta = 3606
    jpkdta = 75
665 jpiglo = 4322
    jpjglo = 3606
    /

    !=====
670 &namdom
    !=====
    rn_rdt = 360.0
    /

675 !=====
    &namberg
    !=====
    nn_verbose_write = 1200
    nn_sample_rate = 1200
680 /

```



```

!=====
&namlbc
!=====
685 sn_shlat2d = 'shlat_coef.nc',-12,'shlat2d',.false.,.true.,'yearly','',''
ln_shlat2d = .true.
/

!=====
690 &namtra_ldf
!=====
rn_aht_0 = 125.0
/

695 !=====
&namdyn_ldf
!=====
rn_ahm_0_blp = -1.25e10
/

700 !=====
&nammpp
!=====
cn_mpi_send = 'I'
705 nn_buffer = 0
ln_nnogather = .true.
jpnj = 111
jpnj = 6165
jpnij = 93
710 /

```

3 CICE namelists

This section contains the CICE namelists. The full namelists are given for the $1/4^\circ$ model and then for the 1° and $1/12^\circ$ models only those namelist parameters that are changed compared to the $1/4^\circ$ model.

3.1 Namelists for $1/4^\circ$ model

```

715 &setup_nml
days_per_year=365,
debug=.false.,
diag_file='cice_standard_output',
diag_type='file',
720 diagfreq=320,
dt=1350.0,
dump_last=.true.,
dumpfreq='m',
dumpfreq_n=1,
725 hist_avg=.true.,
histfreq='m','d','x','x','x',

```

```

histfreq_n=5*1,
history_dir='./',
history_file='go6x2i.lm',
730 ice_ic='/projects/ocean/hadgem3/initial/seaice/eORCA025//aoksv.01.12.2019.2038.multilayer.ex
incond_dir='./',
incond_file='go6x2i_ic',
istep0=0,
latpnt(1)=90.0,
735 latpnt(2)=-65.0,
lnetcdf4=.true.,
lonpnt(1)=0.0,
lonpnt(2)=-45.0,
ndtd=1,
740 npt=1984,
pointer_file='/home/d00/frsy/cylc-run/u-ah494-make-namelist/share/data/History_Data/CICEhist
print_global=.true.,
print_points=.true.,
restart=.true.,
745 restart_dir='/home/d00/frsy/cylc-run/u-ah494-make-namelist/share/data/History_Data/CICEhist/
restart_ext=.true.,
restart_file='go6x2i.restart',
restart_format='nc',
runtype='initial',
750 use_leap_years=.false.,
use_restart_time=.false.,
write_ic=.true.,
year_init=1976,
/
755 &grid_nml
grid_file='/projects/ocean/hadgem3/grids/seaice/eORCA025/CICE_grid_orca025ext_nemo_dist.nc',
grid_format='nc',
grid_type='tripole',
kcatbound=1,
760 kmt_file='/projects/ocean/hadgem3/grids/seaice/eORCA025/CICE_kmt_eorca025_v2.2_nemo_dist.nc'
/
&domain_nml
distribution_type='nemo',
distribution_wght='block',
765 ew_boundary_type='cyclic',
maskhalo_bound=.false.,
maskhalo_dyn=.false.,
maskhalo_remap=.false.,
nprocs=480,
770 ns_boundary_type='tripoleT',
processor_shape='square-pop',
/
&tracer_nml
restart_aero=.false.,
775 restart_age=.false.,

```

```

restart_fy=.false.,
restart_lvl=.false.,
restart_pond_cesm=.false.,
restart_pond_lvl=.false.,
780 restart_pond_topo=.false.,
tr_aero=.false.,
tr_fy=.false.,
tr_iage=.true.,
tr_lvl=.false.,
785 tr_pond_cesm=.false.,
tr_pond_lvl=.false.,
tr_pond_topo=.true.,
/
&thermo_nml
790 a_rapid_mode=0.5e-3,
aspect_rapid_mode=1.0,
conduct='MU71',
dsdt_slow_mode=-1.5e-7,
kitd=1,
795 ktherm=1,
phi_c_slow_mode=0.05,
phi_i_mushy=0.85,
rac_rapid_mode=10.0,
saltmax=9.6,
800 /
&dynamics_nml
advection='remap',
kdyn=1,
krdg_partic=1,
805 krdg_redist=1,
kstrength=1,
mu_rdg=3.0,
ndte=120,
revised_evp=.false.,
810 /
&shortwave_nml
ahmax=0.5,
albedo_type='default',
albice_i=0.36,
815 albice_v=0.833,
albsnow_i=0.70,
albsnow_v=0.98,
r_ice=0.0,
r_pnd=0.0,
820 r_snw=1.5,
rsnw_mlt=1500.0,
shortwave='default',
/
&ponds_nml

```

```

825 dpscale=1.0e-3,
    frzpcnd='cesm',
    hp1=0.01,
    hs0=0.03,
    hs1=0.03,
830 pndaspect=0.8,
    rfracmax=0.85,
    rfracmin=0.15,
    /
    &zbkgc_nml
835 bgc_data_dir='unknown_bgc_data_dir',
    bgc_flux_type='Jin2006',
    nit_data_type='default',
    phi_snow=0.5,
    restart_bgc=.false.,
840 restart_hbrine=.false.,
    restore_bgc=.false.,
    sil_data_type='default',
    skl_bgc=.false.,
    tr_bgc_am_sk=.false.,
845 tr_bgc_c_sk=.false.,
    tr_bgc_chl_sk=.false.,
    tr_bgc_dms_sk=.false.,
    tr_bgc_dmspd_sk=.false.,
    tr_bgc_dmspp_sk=.false.,
850 tr_bgc_sil_sk=.false.,
    tr_brine=.false.,
    /
    &forcing_nml
    atm_data_dir='unknown_atm_data_dir:',
855 atm_data_format='nc',
    atm_data_type='default',
    atmbndy='default',
    calc_strair=.true.,
    calc_tsfc=.true.,
860 cap_fluxes=.true.,
    formdrag=.false.,
    fyear_init=1997,
    oceanmixed_file='unknown_oceanmixed_file',
    oceanmixed_ice=.false.,
865 ocn_data_dir='unknown_ocn_data_dir:',
    ocn_data_format='nc',
    precip_units='mks',
    restore_ice=.false.,
    restore_sst=.false.,
870 sss_data_type='default',
    sst_data_type='default',
    trestore=0,
    update_ocn_f=.true.,

```

```

ustar_min=5.0e-4,
875 ycycle=1,
/
&icefields_nml
f_aice='m',
f_aicen='m',
880 f_aisnap='x',
f_albice='x',
f_albpnd='x',
f_albsni='m',
f_albsno='x',
885 f_alidr='x',
f_alvdr='x',
f_angle=.true.,
f_anglet=.true.,
f_bounds=.true.,
890 f_congel='m',
f_coszen='x',
f_daidtd='m',
f_daidtt='m',
f_divu='m',
895 f_dsnow='x',
f_dvidtd='m',
f_dvidtt='m',
f_dxt=.false.,
f_dxu=.false.,
900 f_dyt=.false.,
f_dyu=.false.,
f_evap='x',
f_evap_ai='m',
f_fcondtop_ai='x',
905 f_fcondtopn_ai='x',
f_fhocn='x',
f_fhocn_ai='m',
f_flat='x',
f_flat_ai='m',
910 f_flatn_ai='x',
f_flwdn='m',
f_flwup='x',
f_flwup_ai='m',
f_fmeltt_ai='x',
915 f_fmelttn_ai='x',
f_frazil='m',
f_fresh='x',
f_fresh_ai='m',
f_frz_onset='m',
920 f_frzmlt='m',
f_fsalt='x',
f_fsalt_ai='m',

```

```

f_fsens='x',
f_fsens_ai='m',
925 f_fsurf_ai='x',
f_fsurfn_ai='x',
f_fswabs='x',
f_fswabs_ai='m',
f_fswdn='m',
930 f_fswfac='m',
f_fswthru='x',
f_fswthru_ai='m',
f_fy='x',
f_hi='m',
935 f_hisnap='x',
f_hs='m',
f_hte=.false.,
f_htn=.false.,
f_iage='x',
940 f_icepresent='m',
f_meltb='m',
f_melttl='m',
f_melts='m',
f_meltt='m',
945 f_mlt_onset='m',
f_ncat=.true.,
f_qref='x',
f_rain='x',
f_rain_ai='m',
950 f_shear='m',
f_sig1='m',
f_sig2='m',
f_sinz='m',
f_snoice='m',
955 f_snow='x',
f_snow_ai='m',
f_sss='m',
f_sst='m',
f_strairx='m',
960 f_strairy='m',
f_strcorx='x',
f_strcory='x',
f_strength='m',
f_strintx='x',
965 f_strinty='x',
f_strocnx='x',
f_strocny='x',
f_strtltx='x',
f_strtlty='x',
970 f_tair='m',
f_tarea=.true.,

```

```

f_tinz='m',
f_tmask=.true.,
f_tref='x',
975 f_trsig='m',
f_tsfc='m',
f_tsnz='m',
f_uarea=.true.,
f_uocn='m',
980 f_uvel='m',
f_vgrdb=.false.,
f_vgrdi=.false.,
f_vgrds=.false.,
f_vicen='m',
985 f_vocn='m',
f_vvel='m',
/
&icefields_mechred_nml
f_alvl='x',
990 f_aparticn='x',
f_araftn='x',
f_ardg='x',
f_ardgn='x',
f_aredistn='x',
995 f_dardgldt='m',
f_dardglndt='x',
f_dardg2dt='m',
f_dardg2ndt='x',
f_dvirdgdt='m',
1000 f_dvirdgndt='x',
f_krdgn='x',
f_opening='m',
f_vlvl='x',
f_vraftn='x',
1005 f_vrdg='x',
f_vrdgn='x',
f_vredistn='x',
/
&icefields_pond_nml
1010 f_apeff='m',
f_apeff_ai='m',
f_apeffn='m',
f_aponnd='m',
f_aponnd_ai='m',
1015 f_aponndn='m',
f_hpond='m',
f_hpond_ai='m',
f_hpondn='m',
f_ipond='m',
1020 f_ipond_ai='m',

```

/

3.2 Changed namelist parameters for 1° model

These are the namelist parameters that are changed compared to the list give for the 1/4° model.

```
1025 &setup_nml  
dt=2700.0,  
/  
&domain_nml  
ns_boundary_type='tripole',  
/
```

1030 3.3 Changed namelist parameters for 1/12° model

These are the namelist parameters that are changed compared to the list give for the 1/4° model.

```
&setup_nml  
dt=360.0,  
/
```