

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)

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_zdfcke | TKE scheme for vertical mixing |
| key_zdfcmx | 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
5 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

```
!=====
5 &namrun
!=====
nn_no   =  0
cn_exp  =  'go6x2o'
nn_it000 =  1
10 nn_itend =  1984
nn_date0 =  19760101
nn_leapy =  0
ln_rstart =  .false.
nn_euler =  1
15 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/'
20 nn_istate = 1
   ln_rst_list = .false.
   nn_stock   = 10000
   nn_stocklist = 10*0
   nn_write   = 640
5   ln_dimgnnn = .false.
   ln_mskland = .true.
   ln_cfmeta  = .true.
   ln_clobber = .true.
   nn_chunksz = 2097152
10 ln_rstdate = .true.
   /

   !=====
   &namcfg
15 !=====
   cp_cfg = 'orca'
   cp_cfz = 'no zoom'
   jp_cfg = 25
   jpidta = 1442
20 jpdta = 1207
   jpkdta = 75
   jpiglo = 1442
   jjpglo = 1207
   jpizoom = 1
25 jpjzoom = 1
   jperio = 4
   ln_use_jattr = .false.
   /

30 !=====
   &namzgr

```

```

!=====
ln_zco = .false.
ln_zps = .true.
35 ln_sco = .false.
ln_isfcav = .false.
/

!=====
5 &namdom
!=====
nn_bathy = 1
rn_bathy = 0.0
nn_closea = 1
10 nn_msh = 0
rn_hmin = -8.0
rn_e3zps_min = 25.0
rn_e3zps_rat = 0.2
rn_rdt = 1350.0
15 rn_atfp = 0.1
nn_acc = 0
rn_rdtmin = 28800.0
rn_rdtmax = 28800.0
rn_rdth = 800.0
20 ln_crs = .false.
jphgr_msh = 0
ppglam0 = 0.0
ppgphi0 = -35.0
ppe1_deg = 1.0
25 ppe2_deg = 0.5
ppe1_m = 5000.0
ppe2_m = 5000.0
ppsur = -3958.951371276829
ppa0 = 103.9530096000000
30 ppa1 = 2.415951269000000
ppkth = 15.351013700000000

```

```

ppacr = 7.0
ppdzmin = 999999.0
pphmax = 999999.0
35 ldbletanh = .true.
ppa2 = 100.7609285000000
ppkth2 = 48.02989372000000
ppacr2 = 13.0
/
5
!=====
&namtsd
!=====
sn_tem = 'EN4_climatologies.nc',-1,'temperature',.true.,.true.,'yearly',' ',' '
10 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.
/
15
!=====
&namsbc
!=====
nn_fsbc = 1
20 ln_ana = .false.
ln_flx = .false.
ln_blk_clio = .false.
ln_blk_core = .true.
ln_blk_mfs = .false.
25 ln_cpl = .false.
ln_mixcpl = .false.
nn_components = 0
ln_apr_dyn = .false.
nn_ice = 4
30 nn_ice_embd = 1
ln_dm2dc = .true.

```

```

ln_rnf = .true.
nn_isf = 3
ln_ssr = .true.
35 nn_fwb = 0
ln_wave = .false.
ln_cdgw = .false.
ln_sdw = .false.
nn_lsm = 0
5 nn_limflx = -1
/

!=====
&namsbc_core
10 !=====
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
15 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
20 cn_dir = '/projects/ocean/hadgem3/forcing/ocean/CORE2/'
ln_taudif = .false.
rn_zqt = 10.0
rn_zu = 10.0
rn_pfac = 1.0
25 rn_efac = 1.0
rn_vfac = 1.0
/

!=====
30 &namtra_qsr
!=====

```

```

sn_chl = 'chlorophyll',-1,'CHLA',.true.,.true.,'yearly','','''
cn_dir = './'
ln_traqsr = .true.
35 ln_qsr_rgb = .true.
ln_qsr_2bd = .false.
ln_qsr_bio = .false.
nn_chldta = 0
rn_abs = 0.58
5 rn_si0 = 0.35
rn_si1 = 23.0
ln_qsr_ice = .true.
/

10 !=====
&namsbc_rnf
!=====
sn_rnf = 'runoff_lm_nomask',-1,'sornficb',.true.,.true.,'yearly','','''
sn_cnf = 'runoff_lm_nomask',0,'socoefr',.false.,.true.,'yearly','','''
15 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.
20 rn_hrnf = 10.0
rn_avt_rnf = 2.0e-3
rn_rfact = 1.0
ln_rnf_depth = .false.
ln_rnf_tem = .false.
25 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
30 /

```

```

!=====
&namsbc_isf
!=====
35 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','','''
5 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
10 rn_hisf_tbl = 30.0
ln_conserve = .true.
nn_gammablck = 1
/

15 !=====
&namsbc_apr
!=====
sn_apr = 'patm',-1,'somsplpre',.true.,.true.,'yearly','','''
cn_dir = './'
20 rn_pref = 101000.0
ln_ref_apr = .false.
ln_apr_obc = .false.
/

25 !=====
&namsbc_ssr
!=====
sn_sst = 'sst_data',24,'sst',.false.,.false.,'yearly','','''
sn_sss = 'sss_lm.nc',-1,'vosaline',.true.,.true.,'yearly','','''
30 cn_dir = './'
nn_sstr = 0

```



```

nn_sssr = 2
rn_dqdt = -40.0
rn_deds = -33.333333
35 ln_sssr_bnd = .true.
   rn_sssr_bnd = 4.0
   /

   !=====
5 &namsbc_alb
   !=====
   nn_ice_alb = 0
   rn_albice = 0.53
   rn_alphc = 0.65
10 rn_alphd = 0.80
   rn_alphdi = 0.72
   rn_cloud = 0.06
   /

15 !=====
   &namberg
   !=====
   ln_icebergs = .true.
   ln_bergdia = .true.
20 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
25 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.
30 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
35 rn_speed_limit = 0.0
sn_icb = 'calving',-1,'calvingmask',.true.,.true.,'yearly','',''
cn_dir = './'
rn_low_ratio = 1.5
/

5
!=====
&namlbc
!=====
rn_shlat = 0.0
10 ln_vorlat = .false.
/

!=====
&namcla
15 !=====
nn_cla = 0
/

!=====
20 &nambfr
!=====
nn_bfr = 2
rn_bfri1 = 4.0e-4
rn_bfri2 = 1.0e-3
25 rn_bfri2_max = 1.0e-1
rn_bfeb2 = 2.5e-3
rn_bfrz0 = 3.0e-3
ln_bfr2d = .true.
rn_bfrien = 50.0
30 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
35 ln_tfr2d = .false.
rn_tfrien = 50.0
ln_bfrimp = .false.
ln_loglayer = .false.
/
5
!=====
&nambbc
!=====
sn_qgh = 'geothermal_heating',-12,'heatflow'
10 cn_dir = './'
ln_trabbc = .true.
nn_geoflx = 2
rn_geoflx_cst = 86.4e-3
/
15
!=====
&namdbl
!=====
nn_bbl_ldf = 1
20 nn_bbl_adv = 1
rn_ahtbbl = 1000.0
rn_gambbl = 10.0
/
25 !=====
&nameos
!=====
nn_eos = 0
ln_useCT = .true.
30 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
35 rn_mu2 = 1.1090e-5
rn_nu = 2.4341e-3
ln_usect = .false.
/

5 !=====
&namtra_adv
!=====
ln_traadv_cen2 = .false.
ln_traadv_tvd = .true.
10 ln_traadv_muscl = .false.
ln_traadv_muscl2 = .false.
ln_traadv_ubs = .false.
ln_traadv_qck = .false.
ln_traadv_msc_ups = .false.
15 ln_traadv_tvd_zts = .false.
/

!=====
&namtra_adv_mle
20 !=====
ln_mle = .false.
rn_ce = 0.06
nn_mle = 1
rn_lf = 5.0e+3
25 rn_time = 172800.0
rn_lat = 20.0
nn_mld_uv = 0
nn_conv = 0
rn_rho_c_mle = 0.01
30 /

```

```

!=====
&namtra_ldf
!=====
35 ln_traldf_lap = .true.
   ln_traldf_bilap = .false.
   ln_traldf_level = .false.
   ln_traldf_hor = .false.
   ln_traldf_iso = .true.
5   ln_traldf_grif = .false.
   ln_traldf_gdia = .false.
   ln_triad_iso = .false.
   ln_botmix_grif = .false.
   rn_aeiv_0 = 0.0
10  rn_aht_0 = 150.0
   rn_ahtb_0 = 0.0
   rn_slpmax = 0.01
   rn_chsmag = 1.0
   rn_smsb = 1.0
15  rn_aht_m = 2000.0
   /

!=====
&namtra_dmp
20 !=====
   ln_tradmp = .false.
   nn_zdmp = 0
   cn_resto = 'resto.nc'
   /
25

!=====
&namdyn_adv
!=====
   ln_dynadv_vec = .true.
30  nn_dynkeg = 1
   ln_dynadv_cen2 = .false.

```

```

ln_dynadv_ubs = .false.
ln_dynzad_zts = .false.
/
35
!=====
&nam_vvl
!=====
ln_vvl_zstar = .true.
5 ln_vvl_ztilde = .false.
ln_vvl_layer = .false.
ln_vvl_ztilde_as_zstar = .false.
ln_vvl_zstar_at_eqtor = .false.
rn_ahe3 = 0.0
10 rn_rst_e3t = 30.0
rn_lf_cutoff = 5.0
rn_zdef_max = 0.9
ln_vvl_dbg = .false.
/
15
!=====
&namdyn_vor
!=====
ln_dynvor_ene = .false.
20 ln_dynvor_ens = .false.
ln_dynvor_mix = .false.
ln_dynvor_een = .false.
ln_dynvor_een_old = .true.
/
25
!=====
&namdyn_hpg
!=====
ln_hpg_zco = .false.
30 ln_hpg_zps = .false.
ln_hpg_sco = .true.

```

```

ln_hpg_isf = .false.
ln_hpg_djc = .false.
ln_hpg_prj = .false.
35 ln_dynhpg_imp = .true.
/

!=====
&namdyn_ldf
5 !=====
ln_dynldf_lap = .false.
ln_dynldf_bilap = .true.
ln_dynldf_level = .false.
ln_dynldf_hor = .true.
10 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
15 rn_cmsmag_2 = 3
rn_cmsh = 1.0
rn_ahm_m_blp = -1.0e12
rn_ahm_m_lap = 40000.0
/
20
!=====
&namzdf
!=====
rn_avm0 = 1.2e-4
25 rn_avt0 = 1.2e-5
nn_avb = 0
nn_havtb = 1
ln_zdfevd = .true.
nn_evdm = 1
30 rn_avevd = 10.0
ln_zdfnpc = .false.

```

```

nn_npc = 1
nn_npcp = 365
ln_zdfexp = .false.
35 nn_zdfexp = 3
/

!=====
&namzdf_tke
5 !=====
rn_ediff = 0.1
rn_ediss = 0.7
rn_ebb = 67.83
rn_emin = 1.0e-6
10 rn_emin0 = 1.0e-4
rn_bshear = 1.0e-20
nn_mxl = 3
nn_pdl = 1
ln_mxl0 = .true.
15 rn_mxl0 = 0.04
ln_lc = .true.
rn_lc = 0.15
nn_etau = 1
rnEFR = 0.05
20 nn_htau = 4
/

!=====
&namzdf_ddm
25 !=====
rn_avts = 1.0e-4
rn_hsbfr = 1.6
/

30 !=====
&namzdf_tmx

```



```

!=====
rn_htmx = 500.0
rn_n2min = 1.0e-8
35 rn_tfe = 0.333
rn_me = 0.2
ln_tmx_itf = .true.
rn_tfe_itf = 1.0
/

5
!=====
&namzdf_mldzint
!=====
nn_mld_diag = 2
10 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
15 /

!=====
&nammpp
!=====
20 cn_mpi_send = 'I'
nn_buffer = 0
ln_nnogather = .true.
jpni = 20
jpnj = 24
25 jpnij = 480
/

!=====
&namctl
30 !=====
ln_ctl = .false.

```

```

nn_print = 0
nn_ictls = 0
nn_ictle = 0
35 nn_jctls = 0
nn_jctle = 0
nn_isplt = 1
nn_jsplt = 1
nn_bench = 0
5 nn_timing = 1
/

!=====
&namnc4
10 !=====
nn_nchunks_i = 4
nn_nchunks_j = 4
nn_nchunks_k = 31
ln_nc4zip = .true.
15 /

!=====
&namtrd
!=====
20 ln_glo_trd = .false.
ln_dyn_trd = .false.
ln_dyn_mxl = .false.
ln_vor_trd = .false.
ln_KE_trd = .false.
25 ln_PE_trd = .false.
ln_tra_trd = .true.
ln_tra_mxl = .false.
nn_trd = 365
ln_ke_trd = .false.
30 ln_pe_trd = .false.
/

```

```
!=====  
&namptr  
35 !=====  
ln_diaptr = .false.  
ln_subbas = .false.  
/
```

```
5 !=====  
&namhsb  
!=====  
ln_diahsb = .false.  
/
```

```
10 !=====  
&namdct  
!=====  
nn_dct = 15  
15 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.

```
20 !=====  
&namcfg  
!=====  
cp_cfg = 'orca'  
jp_cfg = 1  
25 jpidta = 362  
jpidta = 332  
jpkdta = 75  
jpiglo = 362  
jjpglo = 332  
30 /
```

```

=====
&namdom
=====
rn_rdt = 2700.0
/

=====
5 &namberg
=====
nn_sample_rate = 32
/

10 !=====
&namtra_ldf
=====
rn_aeiv_0 = 1000.0
rn_aht_0 = 1000.0
15 /

=====
&namdyn_ldf
=====
20 ln_dynldf_lap = .true.
ln_dynldf_bilap = .false.
rn_ahm_0_lap = 20000.0
rn_ahm_0_blp = 0.0
/

25
=====
&nammpp
=====
cn_mpi_send = 'I'
30 nn_buffer = 0
ln_nnogather = .true.

```

```
jpni = 22
jpnj = 21
jpnij = 462
```

35 /

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
5 !=====
cp_cfg = 'orca'
jp_cfg = 12
jpidta = 4322
jpidta = 3606
10 jpkdta = 75
jpiglo = 4322
jjpglo = 3606
/

15 !=====
&namdom
!=====
rn_rdt = 360.0
/

20 !=====
&namberg
!=====
nn_verbose_write = 1200
25 nn_sample_rate = 1200
/

!=====
&namlbc
30 !=====
```

```

sn_shlat2d = 'shlat_coef.nc',-12,'shlat2d',.false.,.true.,'yearly','',''
ln_shlat2d = .true.
/

!=====
&namtra_ldf
!=====
rn_aht_0 = 125.0
5 /

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

!=====
&nammpp
15 !=====
cn_mpi_send = 'I'
nn_buffer = 0
ln_nnogather = .true.
jpnj = 111
20 jpnj = 6165
jpnij = 93
/

```

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

```

&setup_nml
days_per_year=365,

```

```

debug=.false.,
30 diag_file='cice_standard_output',
diag_type='file',
diagfreq=320,
dt=1350.0,
dump_last=.true.,
dumpfreq='m',
dumpfreq_n=1,
5 hist_avg=.true.,
histfreq='m','d','x','x','x',
histfreq_n=5*1,
history_dir='./',
history_file='go6x2i.lm',
10 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,
15 latpnt(2)=-65.0,
lnetcdf4=.true.,
lonpnt(1)=0.0,
lonpnt(2)=-45.0,
ndtd=1,
20 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.,
25 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',
30 use_leap_years=.false.,
use_restart_time=.false.,

```

```

write_ic=.true.,
year_init=1976,
/
35 &grid_nml
grid_file='/projects/ocean/hadgem3/grids/seaice/eORCA025/CICE_grid_orca025ext_nemo_dist.nc',
grid_format='nc',
grid_type='tripole',
kcatbound=1,
5 kmt_file='/projects/ocean/hadgem3/grids/seaice/eORCA025/CICE_kmt_eorca025_v2.2_nemo_dist.nc'
/
&domain_nml
distribution_type='nemo',
distribution_wght='block',
10 ew_boundary_type='cyclic',
maskhalo_bound=.false.,
maskhalo_dyn=.false.,
maskhalo_remap=.false.,
nprocs=480,
15 ns_boundary_type='tripoleT',
processor_shape='square-pop',
/
&tracer_nml
restart_aero=.false.,
20 restart_age=.false.,
restart_fy=.false.,
restart_lvl=.false.,
restart_pond_cesm=.false.,
restart_pond_lvl=.false.,
25 restart_pond_topo=.false.,
tr_aero=.false.,
tr_fy=.false.,
tr_iage=.true.,
tr_lvl=.false.,
30 tr_pond_cesm=.false.,
tr_pond_lvl=.false.,

```



```

tr_pond_topo=.true.,
/
&thermo_nml
35 a_rapid_mode=0.5e-3,
aspect_rapid_mode=1.0,
conduct='MU71',
dsdt_slow_mode=-1.5e-7,
kitd=1,
5 ktherm=1,
phi_c_slow_mode=0.05,
phi_i_mushy=0.85,
rac_rapid_mode=10.0,
saltmax=9.6,
10 /
&dynamics_nml
advection='remap',
kdyn=1,
krdg_partic=1,
15 krdg_redist=1,
kstrength=1,
mu_rdg=3.0,
ndte=120,
revised_evp=.false.,
20 /
&shortwave_nml
ahmax=0.5,
albedo_type='default',
albicev=0.833,
25 albsnowi=0.70,
albsnowv=0.98,
r_ice=0.0,
r_pnd=0.0,
30 r_snw=1.5,
rsnw_mlt=1500.0,

```

```

shortwave='default',
/
&ponds_nml
35 dpscale=1.0e-3,
   frzpond='cesm',
   hp1=0.01,
   hs0=0.03,
   hs1=0.03,
5  pndaspect=0.8,
   rfracmax=0.85,
   rfracmin=0.15,
/
&zbgc_nml
10 bgc_data_dir='unknown_bgc_data_dir',
   bgc_flux_type='Jin2006',
   nit_data_type='default',
   phi_snow=0.5,
   restart_bgc=.false.,
15 restart_hbrine=.false.,
   restore_bgc=.false.,
   sil_data_type='default',
   skl_bgc=.false.,
   tr_bgc_am_sk=.false.,
20 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.,
25 tr_bgc_sil_sk=.false.,
   tr_brine=.false.,
/
&forcing_nml
   atm_data_dir='unknown_atm_data_dir:',
30 atm_data_format='nc',
   atm_data_type='default',

```

```

atmbndy='default',
calc_strair=.true.,
calc_tsfc=.true.,
35 cap_fluxes=.true.,
formdrag=.false.,
fyear_init=1997,
oceanmixed_file='unknown_oceanmixed_file',
oceanmixed_ice=.false.,
5 ocn_data_dir='unknown_ocn_data_dir:',
ocn_data_format='nc',
precip_units='mks',
restore_ice=.false.,
restore_sst=.false.,
10 sss_data_type='default',
sst_data_type='default',
trestore=0,
update_ocn_f=.true.,
ustar_min=5.0e-4,
15 ycycle=1,
/
&icefields_nml
f_aice='m',
f_aicen='m',
20 f_aisnap='x',
f_albice='x',
f_albpnd='x',
f_albsni='m',
f_albsno='x',
25 f_alidr='x',
f_alvdr='x',
f_angle=.true.,
f_anglet=.true.,
f_bounds=.true.,
30 f_congel='m',
f_coszen='x',

```

```
f_daidtd='m',
f_daidtt='m',
f_divu='m',
35 f_dsnow='x',
f_dvidtd='m',
f_dvidtt='m',
f_dxt=.false.,
f_dxu=.false.,
5 f_dyt=.false.,
f_dyu=.false.,
f_evap='x',
f_evap_ai='m',
f_fcondtop_ai='x',
10 f_fcondtopn_ai='x',
f_fhocn='x',
f_fhocn_ai='m',
f_flat='x',
f_flat_ai='m',
15 f_flatn_ai='x',
f_flwdn='m',
f_flwup='x',
f_flwup_ai='m',
f_fmeltt_ai='x',
20 f_fmelttn_ai='x',
f_frazil='m',
f_fresh='x',
f_fresh_ai='m',
f_frz_onset='m',
25 f_frzmlt='m',
f_fsalt='x',
f_fsalt_ai='m',
f_fsens='x',
f_fsens_ai='m',
30 f_fsurf_ai='x',
f_fsurfn_ai='x',
```

```
f_fswabs='x',
f_fswabs_ai='m',
f_fswdn='m',
35 f_fswfac='m',
f_fswthru='x',
f_fswthru_ai='m',
f_fy='x',
f_hi='m',
5 f_hisnap='x',
f_hs='m',
f_hte=.false.,
f_htn=.false.,
f_iage='x',
10 f_icepresent='m',
f_meltb='m',
f_meltl='m',
f_melts='m',
f_meltt='m',
15 f_mlt_onset='m',
f_ncat=.true.,
f_qref='x',
f_rain='x',
f_rain_ai='m',
20 f_shear='m',
f_sig1='m',
f_sig2='m',
f_sinz='m',
f_snoice='m',
25 f_snow='x',
f_snow_ai='m',
f_sss='m',
f_sst='m',
f_strairx='m',
30 f_strairy='m',
f_strcorx='x',
```

```

f_strcory=' x' ,
f_strength=' m' ,
f_strintx=' x' ,
35 f_strinty=' x' ,
f_strocnx=' x' ,
f_strocny=' x' ,
f_strtltx=' x' ,
f_strtltly=' x' ,
5 f_tair=' m' ,
f_tarea=.true.,
f_tinz=' m' ,
f_tmask=.true.,
f_tref=' x' ,
10 f_trsig=' m' ,
f_tsfc=' m' ,
f_tsnz=' m' ,
f_uarea=.true.,
f_uocn=' m' ,
15 f_uvel=' m' ,
f_vgrdb=.false.,
f_vgrdi=.false.,
f_vgrds=.false.,
f_vicen=' m' ,
20 f_vocn=' m' ,
f_vvel=' m' ,
/
&icefields_mechred_nml
f_alvl=' x' ,
25 f_aparticn=' x' ,
f_araftn=' x' ,
f_ardg=' x' ,
f_ardgn=' x' ,
f_aredistn=' x' ,
30 f_dardgldt=' m' ,
f_dardglndt=' x' ,

```

```

f_dardg2dt='m' ,
f_dardg2ndt='x' ,
f_dvirdgdt='m' ,
35 f_dvirdgndt='x' ,
f_krdgn='x' ,
f_opening='m' ,
f_vlvl='x' ,
f_vraftn='x' ,
5 f_vrdg='x' ,
f_vrdgn='x' ,
f_vredistn='x' ,
/
&icefields_pond_nml
10 f_apeff='m' ,
f_apeff_ai='m' ,
f_apeffn='m' ,
f_apond='m' ,
f_apond_ai='m' ,
15 f_apondn='m' ,
f_hpond='m' ,
f_hpond_ai='m' ,
f_hpondn='m' ,
f_ipond='m' ,
20 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.

```

&setup_nml
25 dt=2700.0,
/
&domain_nml
ns_boundary_type='tripole' ,
/

```

30 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,  
/  

```