RESEARCH DEPARTMENT MEMORANDUM

ECMWF

To:	RD Scientific Staff and Consultants
Copy:	HR, HO, HMD, HMAS, HMOS, J.Hodkinson Jean Pailleux, **François Bouttier,** Claude Fischer
From:	Mats Hamrud et al.
Date:	April 29, 2008 — File: R48.3/MH/0834
Subject:	**IFS Memorandum Cycle CY33R1**

Cycle 33r1 was created in April 2008. It is currently running in E-suite. Cycle 33r1 is not a common cycle with Meteo France.

Modified libraries: ifs ifsaux trans scripts prepdata satrad odb surf scat bl obstat wam

Contributors: S.Abdalla, G.Balsamo, P.Bechtold, A.Beljaars, J.Berner, J.Bidlot, N.Bormann, R.Buizza, A.Collard, M.Dahoui, R.Dragani, M.Dragosavac, M.Drusch, M.Fisher, R.Forbes, A.Geer, ,M.Hamrud, S.Healy, H.Hersbach, J.Haseler, L.Isaksen, M.Janiskova, M.Koehler, B.Krzeminski, M.Leutbecher, P.Lopez, J.-J.Morcrette, G.Mozdzynski, G.Radnoti, S.Saarinen, D.Salmond, A.Tomkins, F.Vitart, N.Wedi

Jan Haseler

At request of MetOps, do less type=an post-processing.

Files modified(SCRIPTS):

`gen/fast_sgint ifstraj vardata`

Rossana Dragani

GOME2 tco added for passive monitoring in IFS

Files modified(IFS):

`var/surad.F90`

Files modified(OBSTAT):

`module/mod_sat_monitor.F90`

`satmon/sat_add_geo.F90`

Files modified(SATRAD):

`pre_screen/reo3_prescreen.F90`

Files modified(SCRIPTS):

`gen/fetchobs prereo3 smon_def`

Philippe Lopez

(1) Full revision of the simplified moist physics to make it closer to Tiedtke's scheme (incl. Peter Bechtold's new formulation of convective entrainment/detrainment). Changes in the convection scheme also include the new option for activating the implicit treatment of temperature and moisture (RMFSOLTQ2), momentum (RMFSOLUV2) and tracers (RMFSOLCT2), which becomes the new default (RMFSOLxx2 = 1.0). To activate the (old) explicit formulation, RMFSOLxx2 should be set to 0. The new mass-flux limiter scaling factor for temperature and specific humidity (RMFCFL2) used in the simplified physics is always set to 1.0 to avoid instabilities in tangent-linear computations.

Files modified(IFS):

```
phys_ec/cloudst.F90 cloudstad.F90 cloudsttl.F90 cuascn2.F90 cuascn2ad.F90
cuascn2tl.F90 cuctracer.F90 cuctracertl.F90 cuctracerad.F90 cuddrafn2.F90
cuddrafn2ad.F90 cuddrafn2tl.F90 cudtdqn2.F90 cudtdqn2ad.F90 cudtdqn2tl.F90
cududv2.F90 cududv2ad.F90 cududv2tl.F90 cuflx2.F90 cuflx2ad.F90 cuflx2tl.F90
cumastrn2.F90 cumastrn2ad.F90 cumastrn2tl.F90 cupdra.F90 cupdraad.F90
cupdratl.F90 sucumf2.F90
module/yoecumf2.F90
namelist/namcumfs.h
```

Files modified(SCRIPTS):

`gen/modelsv`

(2) Slight reduction of autoconversion coefficient in the simplified cloud scheme.

Files modified(IFS):

phys_ec/cloudst.F90 cloudsttl.F90 cloudstad.F90

Martin Koehler, Marta Janiskov, Philippe Lopez

The computation of the vertical diffusion coefficients, K, in the simplified physics has been modified to make it more consistent with the full nonlinear parameterization. The original K from Louis is kept near the surface to leave stable boundary layer untouched. At higher levels (above 300 m), K now approaches asymptotically the Monin-Obukov formulation. The mixed layer parameterization has also been added in the simplified physics.

A new regularization has been introduced to partially retain perturbations of the exchange coefficients used in vertical diffusion between the upper model levels, and between the surface and the lowest model level. This can be activated by setting logical switch LEKPERT to true in namelist NAMTRAJP (which becomes the new default).

New files (IFS):

phys_ec/vdfdpbls.F90

Files modified(IFS):

phys_ec/vdfexcu.F90 vdfdpbl.F90 callpar.F90 callpartl.F90 callparad.F90 vdfmains.F90 vdfmainstl.F90 vdfmainsad.F90 vdfexcus.F90 vdfexcustl.F90 vdfexcusad.F90

Files modified(SURF):

external/surfexcdrivers.F90 surfexcdriverstl.F90

interface/surfexcdrivers.h surfexcdriverstl.h

module/surfexcdrivers_ctl_mod.F90 surfexcdriverstl_ctl_mod.F90 vsurfstl_mod.F90 vsurfsad_-mod.F90 vexcsstl_mod.F90 vexcssad_mod.F90

Martin Koehler

The diffusion coefficient depends strongly on shear representing the fluxes due to shear instability. Yet the ECMWF model has been shown to be deficient in shear particularly in the small scales and near the PBL top. Therefore the shear going into the diffusion coefficient was increased by an empirical profile representing a background shear term. The code were also cleaned.

Files modified (IFS):

phys_ec/vdfexcu.F90 vdfexcus.F90

Martin Koehler and Anton Beljaars

Increased turbulent orographic form drag. The effect of orography between 10m and 5km on drag in and above the PBL is quite uncertain. A tuning technique was therefore used to get the most realistic winds.

Files modified (IFS):

phys_ec/vdftofdc.F90 vdftofdcs.F90

Peter Bechtold

o Re-tuned entrainment in convection scheme. Add a constant to organized entrainment, avoids too small entrainment when relative humidity close to 100 %. This also required different scaling factor for organized entrainment. A slight improvement in tropical 500-100 hPa winds is expected.

o Exclude convection for KTYPE=2 and KCBOT=KCTOP=KLEV-1.

o Bug correction in callpar.F90 when diagnostic cloud scheme is used.

o Bug fix to scaling of freezing term in convection scheme.

o CFL mass flux limit=1 for tracers

Files modified (IFS):

```
phys_ec/callpar.F90 cuascn.F90 cuascntl.F90 cuascnad.F90 cuentr.F90 cubasen.F90 cubasentl.F9
cubasenad.F90 cumastrn.F90 cumastrntl.F90 cumastrnad.F90 sucumf.F90
```

Richard Forbes

The cloud cover diagnostics (total, high, medium, low) have been made consistent with the assumptions in the radiation scheme, also correcting long-standing bugs in the medium and low level cloud diagnostics. The formulation of the cloud cover diagnostic calculations now follow the cloud generator approach with generalised cloud overlap assumption, as used in the McRad radiation scheme introduced in Cycle 32r2. There has been a bug in the medium and low level cloud diagnostics for many years which resulted in areas of missing cloud. This is now corrected and the occurrence of medium and low level cloud will increase.

Files modified(IFS):

```
phys_ec/sucld.F90 radpar.F90 radlswr.F90 cldpp.F90 callparad.F90 callpar.F90
module/yoecld.F90
```

Gianpaolo Balsamo

- Refinement of land surface runoff (removal of texture upscale)

- Inclusion of a 7th texture class for tropical organic soils.

- Use of aggregated roughness length (instead of dominant tile)

- Tile aggregated roughness instead of dominant tile roughness for momentum, and change in post-processing of 2m T and q (use of dominant low tile instead of specified WMO value).

- Fix for soil temperature analysis in areas with 100% snow cover (Iceland warm drift problem).

- Activation of ERA-40 SST daily climatology tendency (persisted SST anomaly) in the 10-day forecasts

Files modified(IFS):

```
phys_ec/vdfmain.F90 vdfmains.F90 vdfmainsad.F90 vdfmainstl.F90 vdfouter.F90
```

Files modified(PREPDATA):

```
module/yomcons_si.F90
```

```
programs/soilinc.F90
```

Files modified(SCRIPTS):

```
def/an.def
gen/fast_sgint getgrbd getini inter_fp obstat odbcomp smrescale soilana getpersSST
```

Files modified(SURF):

```
external/surfbc.F90 surfexcdriver.F90 surfexcdrivers.F90 surfexcdriversad.F90
surfexcdriverstl.F90 surfrad.F90 surftstp.F90
module/srfene_mod.F90 srfrcg_mod.F90 srft_mod.F90 srfwexc_vg_mod.F90
srfwng_mod.F90 surfbc_ctl_mod.F90 surfexcdriver_ctl_mod.F90
surfexcdrivers_ctl_mod.F90 surfexcdriversad_ctl_mod.F90
surfexcdriverstl_ctl_mod.F90 surfrad_ctl_mod.F90 surftstp_ctl_mod.F90
sussoil_mod.F90 susveg_mod.F90 vsurf_mod.F90 vsurfs_mod.F90 vsurfstl_mod.F90
yos_soil.F90
offline/driver/cpedials.F90 rdcoorgrb.F90 rdfvargrb.F90 sudimls.F90 sufgrb.F90 wrtdcdf.F90
```

Sean Healy and Deborah Salmond

Remove function call to improve efficiency.

Files modified(IFS):

```
pp_obs/gpscalc_alpha.F90 gpscalc_alphaad.F90 gpscalc_alphatl.F90
```

Andrew Collard

Update to IASI RTTOV coefficient file rtcoef_metop_2_iasi.dat. The ISEM sea-surface emissivity model is now used rather than a constant value of 0.98. This results is more consistent first-guess departures in the window region and improved data usage. The impact on the analysis and forecasts is neutral.

Alan Geer

Active assimilation of rain- and cloud-affected TMI and AMSR-E observations in 1D+4D-Var

TMI and AMSR-E were already passively monitored in rainy and cloudy areas in cycle 32r3. The following changes were needed to allow active assimilation:

- Clear sky (4D-Var) and cloud/rainy (1D-4D-Var) microwave imager assimilation streams now share functionality for identifying cloud and rain in observed radiances.
- 1D+4D-Var microwave imager observations are now pre-screened at the BUFR stage to eliminate observations that would otherwise be rejected later during the first guess trajectory. This has the effect of substantially reducing the size of the relevant ECMA files, thus saving enough processing time to allow the new observations to be assimilated.
- BUFR pre-screening functions for the microwave imagers have been speeded up substantially
- Observation error and bias files have been defined for ASMR-E and TMI.

A scientific validation of the new observations can be found in RD internal memorandum (satellite section), no. 816: "Assimilation of rain and cloud affected microwave radiances from additional sensors: AMSR-E and TMI" by A. Geer, P. Bauer and C. O'Dell, March 2008

Files created(IFS):

`module/yommwimager.F90`

`pp_obs/mwimager_cloud.F90 mwimager_lwp.F90`

Files created(SATRAD):

`module/bufr_grid_screen_keep.F90 gaussgrid.F90 mod_grid_screen.F90`

`pre_screen/bufr_grid_screen.F90 distance_between.F90`

Files modified(IFS):

`module/yomonedvar.F90`

`namelist/namonedvar.h`

`onedvar/onedvar_fstscrn.F90 onedvar_raintb.F90 onedvar_read_sat_bias.F90 onedvar_read_sat_error.F90 onedvar_screen.F90 onedvar_setup.F90`

`pp_obs/rad1cemis.F90`

`var/gp_nearest.F90`

Files modified(SATRAD):

`pre_screen/bufr_screen_amsre_1d.F90 bufr_screen_ssmi_1d.F90 bufr_screen_ssmis.F90 bufr_screen_ssmis_1d.F90 bufr_screen_tmi_1d.F90`

Files modified(SCRIPTS):

`gen/ifstraj mkabs_satrad mklinks preobs`

Files deleted(IFS):

`onedvar/onedvar_cloudtest.F90`

Fix for onedvar when no satellite data are available for assimilation.

Files modified(IFS):

`control/gp_model.F90`

Files modified(SCRIPTS):

`gen/pre1crad_screen`

Hans Hersbach

- Choice of QuikSCAT wind in minimization out of all 4 wind solutions, rather than only 2 previously. In practise, now all 4 solutions will occur in CCMA, rather than 2.

- Introduce switches:
to vary observation error for QuikSCAT with wave-vector cell (scan angle),
to switch off quality control on wind-direction diversity,
to choose between different schemes for quality control on rain.
Default values of these switches leave the system as it was before.

- Set proper limits for quality control on wind inversion residual for ASCAT data, reflecting the degree of internal consistency.

- Fix a thinning bug for ERS-2 data, which was introduced in IFS cycle 32r2. Independence of 4D-Var on the number of processors used is now restored.

- Set flags for scatterometer solutions that are not closest to the first guess (event1.fg2big@body), respectively analysis (event1.depar2big@body and status.rejected@body). The solutions that are not closest to the analysis are now both active and rejected, i.e., similar to the practice in variational quality control.

Files modified(IFS):

```
module/yomcosjo.F90 yomscc.F90
namelist/namjo.h namscc.h
pp_obs/hjo.F90
obs_preproc/scaqc.F90 sufglim.F90 defrun.F90 qscatin.F9 new_thinn.F90
setup/suevents.F90
```

Files modified(ODB):

```
ddl/new_thinn_robhdr_6.sql post_thinn_robhdr_6.sql post_thinn_robody_6.sql pre_thinn_-
robhdr_6.sql pre_thinn_robody_6.sql thinn_robhdr_6.sql thinn_robody_6.sql
```

Files modified(SCAT):

```
module/qrain.F
qretrieve/qscat25to50km.F regroup.F
```

Jean Bidlot

IFS changes

Sea ice fraction has been added to the list of fields passed to the wabe model. The array data structures for input and output the wave model interface have been cleaned up.

SCRIPTS:

Use of a new version of the ETOPO2 data set for the derivation of the model mean bathymetry and unresolved bathymetry coefficients. New limited area configurations (medite10, medite15, gm20 and standrewbay) New global configuration (global25)

Bias correction for altimeter data is now specified in input files. The operational version of it is cycle depend, whereas there is one version for reanalysis.

In stand alone runs, the data retrieval has been split into separate task for atmospheric model and surface current data, satellite data and wave model data.

Collocation tasks for in-situ and altimeter data activated in stand alone runs.

In coupled runs, the wave model time step is determined by the IFS via the calling interface, an upper bound on the allowed wave model time steps is still necessary. All wave model time informations are now centralised in wave_set_tstep. WAM:

The new operational limited area wave model (medite10) will now extend from 5N to cover the whole North Atlantic, the Gulf of Mexico, and all seas around Europe, including the newly added Caspian Sea. The horizontal resolution of this model has also been increased to 10km. The spectral resolution has been kept the same (24 directions and 30 frequencies), however, the starting frequency has been shifted to 0.0418HZ (from 0.0345Hz).

An updated version of the high resolution bathymetry data file (ETOPO2) was used to derive the model mean bathymetry and the sub-grid blocking factors in all configurations. The new ETOPO2 contains a proper data set for the Caspian Sea and the US great Lakes. It also iliminates a 1-cell westward bias that was present in the original ETOPO2. (more details at http://www.ngdc.noaa.gov/mgg/fliers/01mgg04.html) A bug in the program using this high resolution data (create_wam_bathymetry) was removed. It was shifted the data set by one cell northwards. A grid point is now declared as a model sea point if 40% or more of the high resolution data cells are sea, as before, the mean bathymetry is computed by averaging over all the cells that are sea. A new global high resolution configuration (global25, 28km) was set up and should be used with the high resolution atmospheric model.

Introduction of more shallow water physics in the form a new shallow water non-linear source term (controlled by ISNONLIN in the input namlist) and bottom induced wave breaking source term (LBIWBK=T in input namelist) and a modified wave propagation scheme (inclusion of corner points in upwind scheme) (IPROPAGS=2). A better discretisation of the depth arrays allows for runs in very shallow waters.

The sea ice fraction field that is used to determine the wave model ice mask is now provided as often as the wind forcing. In coupled mode, it means that it is passed by the IFS to WAM as often as the other fields are exchanged. In stand alone mode, it is input along side the wind fields (set LICERUN to false if no ice field is needed).

The wave model time step can be as small as 1 second and the source term time step be can larger than the advection time step. Furthermore, in coupled mode, the time step is determined by the coupling time step, provided it is not larger than the maximum allowed time step (set by the CFL criteria). In that case, a sub-multiple of the coupling time step will be calculated that satisfy the CFL criteria. Therefore, the time steps that are given in the wave model namelist are the maximum values allowed. In coupled mode, it is therefore recommended to have a coupling time step that is set to the IFS time step as the wave model will adapt its time steps accordingly. All date variables are handled to the seconds.

A bug fix in spectral update following SAR data assimilation was introduced leading to more consistent analysed wave periods.

A better use of altimeter data was put in place by revising the quality control for altimeter wave height. The altimeter data can be feed passively into the assimilation system (see LALTPAS in input namelist).

Improved calculation of the kurtosis parameter, which now includes effects of directional spread, while two new parameters are introduced, namely maximum wave height and the corresponding wave period. The peak period calculation has been revised in such a way that the peak of the 1d-spectrum is fitted with a parabolic curve, the maximum of which is used to determine the peak frequency.

WAM can run again with specified surface currents. It is controlled by input variable IREFRA (see userin). Input current fields are interpolated onto the wave model grid from within WAM.

ECLIB and NAG libraries are no longer needed. Their respective routines have been replaced by equivalent ones.

Bufrex calls were adapted to the latest change to the bufr libraries (emos cycle 251 and above).

New in-situ wave/wind and altimeter data collocation software for stand alone runs.

WAM can be run in pure advection only configuration (LLSOURCE=false).

Minor compiler issues were also solved.

Files modified(IFS):
`control/cprep1.F90`

dia/wrmlppadm.F90
module/surface_fields.F90 yoewcou.F90
phys_ec/ec_phys.F90 ec_phys_drv.F90 ec_physg.F90 suwcou.F90 wvcouple.F90 wvxf2gb.F90
pp_obs/hpos.F90
setup/su0phy.F90 su_surf_flds.F90 sudiml.F90 sugridadm.F90 sugridf.F90 sugridg.F90

Files created(SCRIPTS):

sms/wamobs.sms wamwave.sms wamwind.sms

wav/biascorrection_era.swh biascorrection_ops.swh correction_to_wam_grid_0025 input_to_wam_bathymetry_global25 input_to_wam_bathymetry_medite10 input_to_wam_bathymetry_medite15 preproc_input_global25 preproc_input_gm20 preproc_input_medite10 preproc_input_medite15 preproc_input_standrewbay wam_reference_levels_medite10 wam_reference_levels_medite15 wave_altcol wave_bsdcol wave_data_dates wave_getobs wave_getwave wave_getwind wave_set_tstep

Files modified(SCRIPTS):

build/Makefile.root.wam
def/an.def wam.def
gen/fetchobs getini getmars matchup mkabs_black mkabs_wam obstat odb_compress odbcomp odbprune preobs revmatchup save_out
oce/stage_wave
sms/getfcdata.sms wambuoycol.sms wamdata.sms wamuracol.sms wavini.sms wcold.sms wconst.sms
sms_an/clean_an.sms satrad.sms
sms_oc/iniatmos.sms

wav/archive_wave input_to_wam_bathymetry_medite25 prep_wave preproc_input_global100 preproc_input_global150 preproc_input_global300 preproc_input_global36 preproc_input_global50 preproc_input_global511 preproc_input_medite25 preproc_input_onegrdpt preproc_input_swamp preset_input wam_input wam_reference_levels_global wam_reference_levels_medite25 wave_cldsta wave_const wave_cpini wave_create_bathymetry wave_getalt wave_getgrb wave_getrst wave_getsar wave_getsda wave_run wave_runcold wave_setgflag wave_setup wave_setup_3v wave_setup_4v wave_setup_an

Files deleted(SCRIPTS):

wav/biascorrection.swh

Files created(WAM):

Alt/altcol.F
Sar/dcfftf.F dcffti.F dcftfl.F dcftil.F dnfftf.F dpssf.F dpssf2.F dpssf3.F dpssf4.F dpssf5.F
Wam_oper/bsdcol.F checkcfl.F ctuw.F current2wam.F h_max.F mswell.F out_onegrdpt.F out_onegrdpt_sp.F peak_freq.F propagsl.F propags2.F transf.F transf2.F unsetice.F wamoi.F write_currents.F
Wam_setup/create_wam_library extract_WAM_code readme run_preproc run_preset run_wamodel

Files modified(WAM):

Alt/debac.F debfl.F debu.F enrac.F enrfl.F expoint.F i_get_unit.F readpreb.F

urabu5.F uraplt2.F urapre.F uraqrd.F
Sar/fftsub.F inersl.F
Wam_oper/abort1.F aki.F altas.F blspcon.F bouinpt.F buildstress.F check.F chief.F closend.F confile.F convert_grbspec.F convert_irishgrb.F convert_to_1dspec.F create_wam_bathymetry.F crewfn.F decode_integrated_parameter.F decode_point_spectra.F difdate.F dotdc.F dummy_eclib.F dummy_fdb.F ersfile.F femean.F femeanws.F file_transfer.F fkmean.F fld2fdb.F fldinter.F fwsea.F getinptb.F getrest.F getspec.F getstress.F getwnd.F gradi.F grb2wgrd.F grdata.F grfield.F gribpac.F gribpacs.F grstname.F gsfile_new.F implsch.F incdate.F initmdl.F iniwcst.F inmars.F inmarss.F inmarssi.F intgrs.F intmars.F intpol.F intsgs.F intwaminput.F kurtosis.F makeblos.F mblock.F mgrid.F micep.F mpabort.F mpbcastgrid.F mpclose_unit.F mpdecomp.F mpexchng.F mpuserin.F mstart.F mtabs.F mubuf.F newwind.F nlweigt.F notim.F oifield.F outbc.F outbs.F outcom.F outers.F outgrid.F outint.F outpp.F outspp.F outubuf.F outwaminput.F outwnorm.F phys.F preproc.F preset.F prewind.F propags.F propdot.F prspp.F prspps.F readcur.F readfl.F readgrs.F readice.F readpre.F readsat.F readsta.F readstress.F readt.F readwgrib.F readwind.F rfl4wam.F saras.F savrest.F savspec.F savstress.F sbottom.F sdissip.F sepwisw.F setice.F setwgribhd.F sinput.F snonlin.F spec2fdb.F splitgrs.F stress.F tauhf.F timin.F topoar.F transpart.F tustreas.F uiprep.F upwspec.F userin.F wamassi.F wamodel.F wamwnd.F wavemdl.F write_grid_description.F write_mpdecomp.F writefl.F writestress.F writsta.F wstream_strg.F wvalloc.F wvdealloc.F
module/yowaltas.F yowcoer.F yowcout.F yowcurr.F yowfred.F yowgribhd.F yowgrid.F yowice.F yowindn.F yowintp.F yowmap.F yowmean.F yowmpp.F yowparam.F yowpcons.F yowrefd.F yowshal.F yowstat.F yowtabl.F yowtemp.F yowubuf.F yowwami.F yowwind.F

George Mozdzynski

IBM benchmark optimisations (that we decided to adapt) and a few additional changes Testing was completed by running the following cases,

T799L91 model 8 nodes (64Tx4t)
8.9% faster than 32r3 control (10 day run)

T799L91 model 32 nodes (256Tx4t)
8.3% faster than 32r3 control (10 day run)

T799L91 (95,159,255) incremental 4D-Var
32 nodes (128Tx8t)
fixed minimisation iters to match control
2.6% faster than 32r3 control
note some other 'comparable' modifications are already in IFS
- in cycles 32r2 and 32r3

Files modified(IFS):
adiab/larche.F90 larche5.F90
mwave/mwave_nearest.F90
namelist/nampar0.h
obs_preproc/screen.F90
parallel/pe2set.F90 set2pe.F90

phys_ec/callpar.F90 cloudsc.F90 cuadjtq.F90 cuancape2.F90 cuascn.F90 cubasen.F90 cubasen2ad.F90 cubasenad.F90 cubasentl.F90 cubasmcn.F90 lwprnuage.F90 radlswr.F90 rrtm_ecrt_140gp_mcica.F90 rrtm_rrtm_140gp_mcica.F90 rrtm_rtrn1a_140gp_mcica.F90 satur.F90 sltend.F90 srtm_reftra.F90 srtm_spcvrt_mcica.F90 srtm_srtm_224gp_mcica.F90 srtm_vrtqdr.F90 swclrad.F90 swde.F90 swdead.F90 swdetl.F90 swniad.F90 swnitl.F90 swuvo3.F90 uvde.F90 vdfexcu.F90 vdfincr.F90 vdfmain.F90

setup/suct0.F90 sumpini.F90

var/gp_nearest.F90

Files modified(IFSAUX):

module/mpl_allreduce_mod.F90 yomgstats.F90

support/gstats_print.F90 gstats_setup.F90

Files modified(SCRIPTS):

gen/mkabs_an mkabs_fc mkabs_wam

Files modified(WAM):

Wam_oper/implsch.F sinput.F stresso.F

Fix a severe MPI performance problem seen in the message passing for grid-point norms when using 512 MPI tasks.

At 256 tasks (T799L91 model), the message passing for grid-point norms at every time-step (NFRGDI=1) costs 1 percent of the total wall time.

At 512 tasks this cost explodes to 38% of the total wall time.

The dominant message-passing for gp-norms is a gather of a single field by the master task, ngptot contributions being communicated from each task using non blocking sends. It couldn't be simpler than that.

By recoding this to a MPL_GATHERV, the performance problem disappears, i.e. at 512 tasks the cost is back to ¡ 1 percent.

Of course we COULD reduced this further in the future by doing gp-norms less frequently (e.g. first day every time-step, day2-n every hour).

Files modified(IFS):

parallel/gpnorm1.F90

Subscript violation fixes

Files modified(IFS):

onedvar/onedvar_raintb_snd.F90

pp_obs/hretr.F90 statpred.F90

Files modified(ODB):

odb/bufr2odb/bufr2odb_satob.F90

Files modified(SATRAD):

satrad/pre_screen/bufr_screen_ssmi.F90

Files modified(SCAT):

scat/qretrieve/invert50.F

Clean up all routines containing LIMP_NOOLAP such that the blocks of code for LIMP_NOOLAP=F are now deleted. All references to LIMP_NOOLAP and LIMP are also removed

In this cleanup,
- NSLMPBUFSZ (and variants thereof) are removed from the dummy/calling arguements to the SLCOMM*/*CSET/*RSET routines (as we no longer need to concern ourselves with use of the system/user mailbox)
- mpl_barrier's in TRSTOM, TRMTOS, MPOBSEQ and MPOBSEQAD are now unnecessary and are also removed

Results are identical to control experiments : T159 + T799 incremental 4D-Var and T159 + T799 forecasts have been tested.

Files modified(IFS):

```
adiab/call_sl.F90 call_sl_ad.F90 call_sl_tl.F90 pre_sladrep.F90
control/gp_model.F90 gp_model_ad.F90 scan2mdm.F90
module/yom_phys_grid.F90 yommp.F90
namelist/nampar0.h
obs_preproc/mkglobstab.F90
parallel/phcset.F90 phrset.F90 rdcset.F90 rdrset.F90 slcomm.F90 slcomm1.F90
slcomm2.F90 slcomm2a.F90 slcset.F90 slrset.F90 trmtos.F90 trstom.F90
phys_ec/ec_physg.F90 radintg.F90 suecrad.F90
pp_obs/cpclimi.F90 fpmodprec.F90 mpobseq.F90 mpobseqad.F90 slint.F90
setup/suct0.F90 suephypo.F90 sufpwide.F90 sumpini.F90 susc2b.F90 suslad2.F90 sutrans.F90
```

Files modified(TRANS):

```
external/setup_trans0.F90
interface/setup_trans0.h
module/tpm_gen.F90 trgtol_mod.F90 trltog_mod.F90 trltom_mod.F90 trmtol_mod.F90
```

Provide a workaround for a compiler problem seen on the Linux Cluster when using pgf90 version 7.1-4.

Files modified(IFS):

```
control/spcm.F90 spcmad.F90
```

1) Introduction of a new nampar0 namelist variable NSPECRESMIN (default NPROC). The purpose of NSPECRESMIN is to allow IFS jobs to determine optimal values for NPRTRW and NPRTRV, where NPROC=NPRTRW*NPRTRV. This is now done for both scalar and vector systems (LOPT_SCALAR=T/F).

For model and ifstraj jobs NSPECRESMIN is set to the model / traj resolution plus 1, i.e. $RESOL+1 .

For ifsmin jobs NSPECRESMIN is set to the minimum of the ifsmin resolution and nsmin_wavelet, plus 1. i.e. min($resjob,42)+1, where 42 is the current default for nsmin_wavelet as set in var/sujb.F90 .

For all other jobs NSPECRESMIN takes the default of NPROC (i.e. NPRTRW cannot exceed NPROC).

2) Fix problem in gath_spec_control_mod.F90 that resulted in the abort,

"GATH_SPEC_CONTROL:INVALID RECEIVE MESSAGE LENGTH"

This problem only occurs with large numbers of tasks, and was due to a missing check for zero length messages being sent in traj0 (T159) for spectral resolutions being gathered at T42 and T95.

Files modified(IFS):
module/yomct0.F90
mwave/mwave_nearest.F90
namelist/nampar0.h
setup/sumpini.F90
var/sujb.F90

Files modified(SCRIPTS):
gen/fetchobs ifsmin ifstraj model

Files modified(TRANS):
module/gath_spec_control_mod.F90

Blazej Krzeminski

Space background temperature used to calculate AMSU-A and MHS space background radiances had no band correction applied. This has been fixed.

Files modified(SATRAD):
pre_screen/antenna_read.F90

Milan Dragosavac

Changes needed for new BUFR software.

Files modified(OBSTAT):
bias_sat/biasprep_fbcrack_geos.F90 cycle_biasprep_1c.F90 cycle_biasprep_ssmi.F90
module/bufrvar.F90 mod_sat_monitor.F90
satmon/fbcrack_dmsp.F90
src/buread.F90

Files modified(ODB):
bufr2odb/bufr2odb_atovs.F90 bufr2odb_satob.F90 bufr2odb_temp.F90
get_templateidx.F90 odb2bufr_dep_001.F90 odb2bufr_dep_021.F90
odb2bufr_dep_049.F90 odb2bufr_dep_054.F90 odb2bufr_dep_057.F90
odb2bufr_dep_059.F90 odb2bufr_dep_065.F90 odb2bufr_dep_082.F90
odb2bufr_dep_089.F90 odb2bufr_dep_091.F90 odb2bufr_dep_101.F90
odb2bufr_dep_110.F90 odb2bufr_dep_122.F90 odb2bufr_dep_127.F90
odb2bufr_dep_129.F90 odb2bufr_dep_137.F90 odb2bufr_dep_139.F90
odb2bufr_dep_142.F90 odb2bufr_dep_164.F90 odb2bufr_dep_189.F90
odb2bufr_dep_206.F90 odb2bufr_dep_240.F90 odb2bufr_dep_250.F90
odb2bufr_fos_001.F90 odb2bufr_fos_021.F90 odb2bufr_fos_049.F90
odb2bufr_fos_054.F90 odb2bufr_fos_057.F90 odb2bufr_fos_059.F90
odb2bufr_fos_065.F90 odb2bufr_fos_082.F90 odb2bufr_fos_089.F90
odb2bufr_fos_091.F90 odb2bufr_fos_101.F90 odb2bufr_fos_110.F90
odb2bufr_fos_122.F90 odb2bufr_fos_127.F90 odb2bufr_fos_129.F90
odb2bufr_fos_137.F90 odb2bufr_fos_139.F90 odb2bufr_fos_142.F90
odb2bufr_fos_164.F90 odb2bufr_fos_189.F90 odb2bufr_fos_206.F90
odb2bufr_fos_240.F90 odb2bufr_fos_250.F90 odb2bufr_qc_001.F90
odb2bufr_qc_021.F90 odb2bufr_qc_049.F90 odb2bufr_qc_054.F90 odb2bufr_qc_057.F90

odb2bufr_qc_059.F90 odb2bufr_qc_065.F90 odb2bufr_qc_082.F90 odb2bufr_qc_089.F90
odb2bufr_qc_091.F90 odb2bufr_qc_101.F90 odb2bufr_qc_110.F90 odb2bufr_qc_122.F90
odb2bufr_qc_127.F90 odb2bufr_qc_129.F90 odb2bufr_qc_137.F90 odb2bufr_qc_139.F90
odb2bufr_qc_142.F90 odb2bufr_qc_164.F90 odb2bufr_qc_189.F90 odb2bufr_qc_206.F90
odb2bufr_qc_240.F90 odb2bufr_qc_250.F90

module/bufr_module.F90 bufr_module1.F90

tools/bufr_merge_tovs.F

Files modified(SATRAD):

pre_screen/bufr_screen_amsre.F90 bufr_screen_iasi.F90 bufr_screen_ssmi.F90 bufr_-screen_ssmi_1d.F90 bufr_screen_ssmis.F90 bufr_screen_tmi.F90 geos_prescreen.F90 reo3_-prescreen.F90 screen_1c.F90

Files modified(SCAT):

dcone_qc/scan_bufr.F

etimesort/timesort.F

qbukey/bufr_qscat.F

qretrieve/read_qscat25kmbufr.F write_50kmbufr.F

qsca_split/process_bufr.F

Files modified(SCRIPTS):

gen/sat_crack_fb

Files modified(WAM):

Alt/debac.F debfl.F debu.F urabu5.F urapre.F

Buoy/debuoy.F

Sar/debnv.F decouwa.F decowvs.F

Sami Saarinen

The codb_versions_() function got one additional argument that checks (optionally) the IFS_CYCLE environment variable.

This was needed for blacklisting to enable to check from within blacklist which IFS_CYCLE is in concern and whether the blacklist is applicable to this cycle at all.

In this context it was decided to add another blacklisting failure code (abort_func) to trigger call abort from within Fortran-code (the caller of the blacklist code) with traceback code (this was previously not possible).

Files modified(BL):

compiler/funcs.c generate.c tree.c

include/defs.h fail.h funcs_bla.h

library/blackbox_init.F90

Files modified(IFS):

obs_preproc/black.F90 blinit.F90

Files modified(ODB):

aux/codb_netcdf.c md5sub.c newio.c odbi_client.c

compiler/genc.c odb98.c

include/magicwords.h

lib/codb.c version.c
module/odb.F90
tools/odb_version.c

Fixes to drhook.c that enables the triggering of core-file generation from within Dr.Hook even if the core-file creation was switched off (e.g. with ulimit -c 0). Furthermore, signal catching code was made more robust w.r.t. race-conditions due to OpenMP-threads (thanks to Oliver Treiber).

The need for this was get a some sort of traceback when a process is stuck (deadlock, hang etc.).

When implementing this option, it did not compile properly for linux cluster, so a patch for drhook.h was added later.

To activate this new core-file generation feature, set export DR_HOOK_GENCORE=1

and decide which signal triggers core file creation, e.g. SIGWINCH = 28 : export DR_HOOK_GENCORE_-SIGNAL=28

With these settings on, the hanging process of a batch job could be "killed" via command kill -28 ¡process-id¿ and a traceback should be produced as well as a core, which is usually huge. The core-file could then be hacked with a debugger.

Files modified(IFSAUX):
include/drhook.h
support/drhook.c

Judith Berner and Lars Isaksen

Passive changes for the stochastic backscatter scheme.

The changes consist of:
1. The ability to generate perturbations in T, D and p in balance with the streamfunction perturbations from the stochastic backscatter scheme.
2. A fix, so that the backscatter scheme can be run in model configurations, where Rayleigh friction is switched on.
3. Parameter settings adjusted to the model physics in cycle CY32R3.

Files modified(IFS):
adiab/spchor.F90
module/yomct0.F90 yomdyn.F90 yomstoph.F90
namelist/namct0.h namstoph.h
phys_ec/callpar.F90
setup/su0yomb.F90 suct0.F90 sumpini.F90 surand1.F90 surand2.F90 surfric.F90
var/balvert.F90 cvar3in.F90 sualges.F90

Files modified(SCRIPTS):
gen/fetchobs model modeleps

Niels Bormann

Various changes related to satellite radiances and AMVs:

1) Correction to HOPAD:

A bug has been fixed that affected microwave radiances in coastal areas. This means the gradient test gives 6 or more digits again; the bug was introduced in 28r3 and since then we achieved only 4 digits for standard 4DVAR runs.

2) Alternative AMSU-A window channel departure for blacklisting:

For AMSU-A data the channel 3 window channel departure can now be used in the blacklisting through the keyword WINCHAN_DEP2.

3) Passive monitoring of AVHRR AMVs:

AVHRR winds can now be monitored.

4) Passive monitoring of direct broadcast MODIS AMVs and AMSU-A/B/MHS data from the Pacific-RARS; tidying of the handling of EARS data

Direct broadcast MODIS AMVs, Pacific-RARS ATOVS, and EARS ATOVS data provide similar data as their global counterparts, but they have supposedly better timeliness over a limited area. EARS data are already used operationally, and they have so far been distinguished from the global data through the scanline being set to values larger than 8000.

Now, there are new ODB variables in the sat table to distinguish the generating centre and sub-centre, and to group data together in a "datastream". The datastream variable is filled at the bufr2odb stage, using the function datastream in odb/lib. The three ODB variables are available in the blacklist for rad1c and satob data, and the datastream variable is used in SatMon to separate the global and the regional data. The changes in SatMon introduce the new modes dbamv... and pacrars, for the direct broadcast AMVs and the Pacific-RARS data respectively. Pacific-RARS data and DB MODIS AMVs will only be monitored.

Files created(ODB):

```
lib/datastream.F90
```

Files modified(IFS):

```
common/yomdb_defs.h yomdb_vars.h
module/yomtvrad.F90
obs_preproc/black.F90 blinit.F90
pp_obs/hopad.F90
var/suamv.F90 suvarbc.F90
```

Files modified(OBSTAT):

```
bias_sat/cycle_biasprep_1c.F90
module/mod_sat_create_netcdf.F90 mod_sat_monitor.F90
satmon/get_amv_odb.F90 sat_324_hist_plot.F90 sat_add_geo.F90 sat_geo_plot.F90 sat_-
hist_plot.F90 sat_hov_plot.F90 sat_monitor.F90 sat_overview_hist_plot.F90
```

Files modified(ODB):

```
bufr2odb/bufr2odb_atovs.F90 bufr2odb_satob.F90 get_varindex.F90
cma2odb/initmdb.F90
ddl/amv2.sql black_atovs.sql black_satob.sql cma.h
```

module/varindex_module.F90

Files modified(SATRAD):

pre_screen/screen_1c.F90

Files modified(SCRIPTS):

gen/fetchobs getsmon ifsmin mkabs_obstat obstat odbcomp pregeos sat_crack_fb satmon_-getdat satmon_monitor smon smon_clean smon_def smon_funcs

Saleh Abdalla

Wave monitoring changes.

Files modified(WAM):

Alt/esf_prep2.F textbox.F urabu5.F uraqcm.F uraqml.F urascat.F

Nils Wedi

Allow the postprocessing of etadot (gribcode 77)

Files modified(IFS):

module/yomafn.F90 yomgrb.F90
pp_obs/pos.F90 ppvvel.F90
setup/suafn1.F90 suafn2.F90 suafn3.F90

Extra diagnostic prints in case of Semi-Lagrangian trajectory under ground.

Files modified(IFS):

adiab/larmes.F90
control/gp_model.F90

Bugfix/work-around, model can get stuck with high postprocessing frequency.

dia/wrmlfp.F90

Gabor Radnoti

In recent cycles single outer loop 4dvar exps does not work because of two independent bugs. This branch fixes these bugs.

an.def: ifstsave is called also at update=0 if MXUP_TRAJ ¡ 2
xformev.F90 : fix related to LWRIEVEC=false (which is the case when single outer loop 4DVAR)

Files modified(IFS):

var/xformev.F90

Files modified(SCRIPTS):

def/an.def

Deborah Salmond

Bugfix.

Files modified(IFS):

phys_ec/swniad.F90

Mohamed Dahoui

Allow the monitoring of GPSRO data from METOP/GRAS.

Files modified(OBSTAT):

module/mod_sat_monitor.F90

Mike Fisher

The format of the statistics files for wavelet Jb has been changed. Formerly, the files contained eigenvalues and eigenvectors of a large number of vertical covariance matrices. The new format takes advantage of the fact that most of the vertical covariances are significantly different from zero only in a narrow band around the diagonal of the matrix. A sparse representation is used. In addition, the files are now written and read using the IFS I/O package, instead of Fortran I/O.

Bugfix for write_wavelet_initcv_grib.F90

Files modified(IFS):

module/iostream.F90

parallel/gatherspa.F90

utility/sualspajb.F90 write_wavelet_initcv_grib.F90

var/bgvecs.F90 sujb.F90 sujbwavallo.F90 sujbwavalls.F90 sujbwavelet.F90 sujbwavelet0.F90 sujbwavgen.F90 sujbwavwri.F90 suvar.F90 taskob.F90

Lars Isaksen

Update and improve obstat software.

Files created(OBSTAT):

src/iniitemloc.F90 uv2sd.F90

Files modified(OBSTAT):

module/bufrcodes.F90 globvar.F90 obsdata.F90 statsoft.F90

src/allocsoft.F90 bucoord.F90 buread.F90 buxtract.F90 calcairspop.F90 defaxis.F90 inibufr.F90 inigene.F90 iniglob.F90 inihard.F90 inisoft.F90 inisoftdef.F90 inisoftstat.F90 mergesoft.F90 obstat.F90 odbread.F90 odbscaling.F90 odbscatamb.F90 plotcov.F90 plothis.F90 plotime.F90 plotrms.F90 plotrmsbias.F90 plotsoft.F90 plotusage.F90 updhard.F90 updsoft.F90 winditem.F90 writesoft.F90 wrsoftdef.F90

Files modified(ODB):

ddl/obstat.sql obstat_gpsro.sql obstat_reo3.sql obstat_tovs.sql

Avoid producing webplots for single observation experiments.

Files modified(SCRIPTS):

def/an.def

gen/obstat

Make wsjobs task more resilient and work when wsjobs is delayed by more than a day.

Files modified(SCRIPTS):

def/an.def

gen/obstat

sms_era/get_obtime.sms

Jean-Jacques Morcrette

Modifications to the prognostic aerosol model.

Files created(IFS):

module/yoeaermap.F90

phys_ec/aer_loss.F90 aer_loss_ad.F90 aer_loss_tl.F90 aer_ssalt_ms.F90

Files modified(IFS):

adiab/cpg.F90

climate/updclie.F90

control/reresf.F90 restart_cnt3.F90

dia/sucddh.F90 wrmlfp.F90

module/yoeaeratm.F90 yoeaerop.F90 yoeaersnk.F90 yoeaersrc.F90 yom_ygfl.F90 yomradf.F90

namelist/naeaer.h

phys_ec/aer_bdgtmss.F90 aer_phy1.F90 aer_phy3.F90 aer_src.F90 callpar.F90 ec_phys.F90 ec_phys_drv.F90 ec_physg.F90 raddrv.F90 radint.F90 radintg.F90 radlswr.F90 su_aerop.F90 su_aerp.F90 su_aerw.F90 su_uvrad.F90 suecrad.F90

setup/suafn1.F90 suafn2.F90 suafn3.F90

utility/deallo.F90 dealmod.F90 wrresf.F90

Bugfixes.

Files modified(IFS):

module/yoeaeratm.F90

namelist/naeaer.h

phys_ec/radintg.F90 su_aerw.F90

utility/updtim.F90

Matthias Drusch

Minor modifications to iceanalysis.

Files modified(SCRIPTS):

```
gen/soilana
```

Files modified(SSA):

```
sub/ice_analysis.F90
```

Adrian Tomkins

Fix some switches and makes callpar a bit safer.

Files modified(IFS):

```
phys_ec/callpar.F90
```

Frederic Vitart

Fix a problem with the generation of the parameters 175/176 and 177 used in monthly forecasts.

Files modified(IFS):

```
module/yomvareps.F90
setup/suvareps.F90
```

Martin Leutbecher

Description

Modifications in scripts:

1. minor bugfixes in mkidta_eps and getsvs.sms
2. activation of perturbed vertical exchange coefficient in singular vector computation (LEKPERT=true)

Modifications in prepdata:

1. Adaptation of BUFR decoding programs decode_track.F90 and epsrdbufr.F to EMOSCYCLE=351 (i.e. REAL variables defined with KIND=JPRB, increased length of header section 2).
2. Obsolete files deleted in prepdata.
3. Preparatory steps for generalising the filename convention used for singular vectors in the operational EPS.

Modifications in ifs:

Introduced option LSMSSIG_SVINI. It permist to send an SMS-signal in the singular vector computation when initial singular vectors are available. This will permit to merge the computation of initial and evolved singular vectors in a single task without delaying the operational suite.

Files modified(SCRIPTS):
`gen/mkabs_mctools mkidta_eps modelsv`
`sms/getsvs.sms`

Files modified(PREPDATA):
`mc_tools/aev_norm.F90 decode_track.F90 epsrdbufr.F gen_sv_coeff.F90 te_norm.F90`

Files deleted(PREPDATA):
`mc_tools/comp_rotmat.F comp_rotpert.F90`

Files modified(IFS):
`module/yomlcz.F90`
`namelist/namlcz.h`
`sinvect/cun2.F90 sulcz.F90`

Mats Hamrud

IO optimization (on top of contribution from Mike Fisher).

Files modified(IFS):
`var/sujbvawallo.F90`

Roberto Buizza

Fix for problem with re-start when hor-diff changes in VAREPS legA forecasts.

Files modified(IFS):
`control/cnt4.F90`
`setup/suhdfvareps.F90`

Jan Haseler et al.

Script changes.

Satellites:
`def/an.def gen/ansfc, cleanodb, fetchobs, getgrbe, getsmon, ifstraj, mkabs_obstat, mkabs_satrad, mklinks, obstat_init, pregeos, preobs, prereo3, sat_crack_fb, satmon_-getdat, satmon_monitor, smon, smon_clean, smon_def, smon_funcs, varconsts`

Separate task for pre-processing micro-wave imagery:
`def/an.def gen/prelcrad_screen, premwimg, preobs sms_an/premwimg.sms`

Simplified physics:
`gen/ifsmin, model, modelsv`

Surface analysis:
`gen/soilana`

Wave:

build/Makefile.root.wam def/wam.def gen/fetchobs, mkabs_black, mkabs_wam, preobs, save_out oce/stage_wave sms/getfcdata.sms, wambuoycol.sms, wamdata.sms, wamobs.sms, wamuracol.sms, wamwave.sms, wamwind.sms, wavini.sms, wcold.sms, wconst.sms sms_an/clean_-an.sms sms_oc/iniatmos.sms wav/archive_wave, biascorrection_era.swh, biascorrection_-ops.swh, correction_to_wam_grid_0025, input_to_wam_bathymetry_global25, input_to_-wam_bathymetry_medite10, input_to_wam_bathymetry_medite15, input_to_wam_bathymetry_-medite25, prep_wave, preproc_input_global100, preproc_input_global150, preproc_input_-global25, preproc_input_global300, preproc_input_global36, preproc_input_global50, preproc_input_global511, preproc_input_gm20, preproc_input_medite10, preproc_input_-medite15, preproc_input_onegrdpt, preproc_input_standrewbay, preproc_input_swamp, preset_input, wam_input, wam_reference_levels_global, wam_reference_levels_medite10, wam_reference_levels_medite15, wam_reference_levels_medite25, wave_altcol, wave_-bsdcol, wave_cldsta, wave_const, wave_cpini, wave_create_bathymetry, wave_data_dates, wave_getalt, wave_getgrb, wave_getobs, wave_getrst, wave_getsar, wave_getsda, wave_-getwave, wave_getwind, wave_run, wave_runcold, wave_set_tstep, wave_setgflag, wave_-setup, wave_setup_4v, wave_setup_an

Aeolus:

def/an.def gen/p4_mklib

Persistent SST anomalies:

def/an.def, fc.def gen/fast_sgint, getgrbe, getini, getpersSST, inter_fp, imodel, smsrescale, soilana sms/getpersSST.sms

Monthly VarEPS

def/eps_varfc.def gen/getgrb_vareps, getpersSST, ifsmin, mkabs_mctools, mkidta_eps, model, modeleps, modelsv oce/chunk.h, em_create_veps, extrafields_veps_create, ninosst, reord_create_veps, storm, wm_archive_veps_sfc, wm_archive_veps_ua, wm_create_veps_-sfc, wm_create_veps_ua sms/getiniLeg.sms, getpersSST.sms, getsvs.sms, intHtoL.sms, model.sms, modeleps.sms sms_oc/ensm.sms, extra_arc.sms, mofc_tools.sms, prob_archive.sms, prob_perc.sms, prob_thr.sms, reord.sms, signi.sms, signi_archive.sms, tcyc.sms, wm_-sfc.sms, wm_sfc_arc.sms, wm_ua.sms, wmanom.sms, wmanom_archive.sms, wmem.sms, wmem_-archive.sms, wmem_veps.sms

Post-processing:

gen/anml, ifstraj

Compilation and building:

build/arch/Makefile.in.ibm_power5 gen/mkabs_an, mkabs_fc, mkabs_wam

ODB:

gen/odbcomp

Monitor_only:

def/an.def gen/vardata sms_era/get_obtime.sms

Single observation experiments:

def/an.def

New EMOS_CYCLE problems:

sms/verify.sms, wamverify.sms

Observation plotting:

gen/obstat

climplot:

metview/climate_obs.met, climplot_batch, compvar_ens.met, wind_maps_clim.met, Z500_-bias_era_mm.met, izondia-seas_def_title, zondia_seas_icon_batch.met sms/check_periods.sms, climplot.sms, climplot_save.sms

Cleaning:

def/an.def gen/biassave, fdbksave sms_an/biassave.sms

New BUFR version:

gen/sat_crack_fb

From MetApps:

gen/model oce/wm_archive_veps_sfc, wm_archive_veps_ua, wm_create_veps_sfc sms/modeleps.sms

Back-fixes to operations (CY32R2) incorporated in CY33R1.

4/3/08: Mods from Mohamed Dahoui for GRAS:
obstat/module/mod_sat_monitor.F90

15/2/08: Separate task for pre-processing microwave imagery
scripts/def/an.def
scripts/gen/pre1crad_screen, premwimg, preobs
scripts/sms_an/premwimg.sms

21/1/08: fix from Jean Bidlot for missing rain flag in altimeter data:
wam/Alt/uraqrd.F

16/1/08: Mods from Rossana Draganifor sbuv_2 ozone data:
scripts/gen/prereo3, smon_def

15/1/08: don't write wave model initial conditions to FDB on restart:
wam/Wam_oper/wamodel.F

13/12/07: Put GOES10 back into pregeos
scripts/gen/pregeos

7/11/07: ifsmin for 48 nodes:
scripts/gen/ifsmin

17/10/07: Merge with Peter Bechtold's pae_CY32R3_CAPEsecure
ifs/phys_ec/cuancape2.F90

Files created(SCRIPTS):

gen/premwimg

sms_an/premwimg.sms

Files modified(IFS):

phys_ec/cuancape2.F90

Files modified(OBSTAT):

module/mod_sat_monitor.F90

Files modified(SCRIPTS):

def/an.def

gen/ifsmin obstat prelcrad_screen pregeos preobs prereo3 smon_def

Files modified(WAM):

Alt/uraqrd.F

Wam_oper/wamodel.F