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**EC-Earth 3.1**

**Release Notes**

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## Overview

EC-Earth 3.1 is a new minor release in the EC-Earth 3 series, which introduces a number of physical changes as well as technical improvements and bugfixes. Most notably, EC-Earth 3.1 includes the results of the collaborative tuning effort over the past months. The component versions (IFS, NEMO, and OASIS) have not changed since the previous release update, EC-Earth 3.0.1.

The EC-Earth 3.1 source code can be downloaded from the Subversion repository at the URL:

**<https://svn.ec-earth.org/ecearth3/tags/3.1>**

For a more detailed description of how to get started with EC-Earth 3, please refer to the EC-Earth 3 Development Portal at

**<https://dev.ec-earth.org>**

Note that access to the Development Portal is based on individual user accounts, which can be generated for EC-Earth partners that have signed the Letter of Intent and an agreement with ECMWF. If you need to sign these documents, please contact [ecearth@ecmwf.int](mailto:ecearth@ecmwf.int). Once this is done, contact the Development Portals administrators ([uwe.fladrich@smhi.se](mailto:uwe.fladrich@smhi.se) for the time being).

The development of EC-Earth 3 will be continued after this release. Bugfixes for version 3.1 will be provided in the Subversion repository at

**<https://svn.ec-earth.org/ecearth3/branches/maintenance/3.1>**

in order to support the sustained utilisation of this version. For bug reporting, please use the issue tracker at the Development Portal.

Please bear in mind that maintaining EC-Earth is a community effort! Help is needed to fix bugs, document, and further develop the model. The most efficient way to contribute is via the Development Portal.

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## List of changes

The following lists provides an overview of the changes included in EC-Earth 3.1 as compared to the previous release, 3.0.1. For reference, the corresponding issue number (**#NNN**, see the issue tracker at the Development Portal) or a Subversion revision number (**rNNN**, see SVN logs) is given along with a short description of the change.

### IFS

- Switching on Rayleigh friction as recommended by ECMWF **#100**
- Updated stratospheric aerosol optical depth from GISS; revision of volcanic aerosols in scenario experiments; allow users to set end date of the known history of volcanic aerosols **#103**
- Disable warm ocean parametrisation in IFS **#123**
- Fix bug when reading pressure levels from CMIP5 aerosol file **#98**
- Introduce advection mass fixer back-ported from cycle 38r1 **#115**

- Change in organized entrainment rate **#120**
- Reducing the ocean diffusive albedo slightly to allow for a slightly warmer ocean **#133**
- Make NCMIP5FIXYR namelist variable configurable through ec-conf **#92**
- Fix minor errors in IFS found by GNU compiler **r1207+1208**

## NEMO

- Reduce freshwater loss and SSH decrease **#118**
- Tuning namelist parameters **#131**
- Add missing contribution (fmmecc) to freshwater exchange in LIM3 coupled mode **#118**
- Fix consistency of ORCA1 bathymetry in Gibraltar Strait **#112**
- Update ORCA025L75 namelist to comply with new MERCATOR bathymetry **#128**
- Fix bugs in LIM3 output **#126**
- Solve leap year problem for NEMO standalone experiments **#119**
- Provide ORCA025 standalone configuration **#99** and set nn\_closea=1 **r1193**
- Add LIM3 documentation
- Fix work array allocation in eosbn3 **r1397**
- Fix allocation and file handling in diaptr **r1397-1399,1411**

## Atmosphere-Ocean Coupling

- Adjust freshwater flux correction, which was too strong **#64**

## Run scripts and data

- Updated initial files on Publisher **#128**
- Create automatic subdirectory structure in run directory **#84**
- Update list of platforms in build and run configurations **#116**
- Clean iodef.xml file **#63**
- Easy porting to ECMWF Power/AIX systems **#49**
- Move runoff\_maps to OASIS initial files directory **#89**
- Avoid unnecessary linking of executable files **#101**
- Link NEMO ahmcoef file only when present in data directory **r1241**

## Other changes

- Fix ec-conf to avoid patching system path **r1190**

- Update MPI configuration for MareNostrum platform **r1191**
- Add EC-Earth Development Guide

## Detailed List of Changes

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r1190 | ufla | 2013-04-08 14:27:52 +0200 (Mon, 08 Apr 2013) | 3 lines
Change access to XML attribute names in ec-conf as suggested by Jost v. Hardenberg. This makes
patching the system path on some machines obsolete!
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r1191 | ufla | 2013-04-09 10:08:26 +0200 (Tue, 09 Apr 2013) | 2 lines
Updating MareNostrum3 run config according to BSC recommendations.
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r1193 | klausred | 2013-04-11 09:09:13 +0200 (Thu, 11 Apr 2013) | 2 lines
RUNTIME: set nn_closea=1 in namelists for ORCA025
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r1207 | ufla | 2013-04-18 10:11:20 +0200 (Thu, 18 Apr 2013) | 3 lines
Bugfix: Prevent type mismatch errors (gfortran) by explicitly converting from INTEGER(4) to
INTEGER(8).
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r1208 | ufla | 2013-04-18 10:11:55 +0200 (Thu, 18 Apr 2013) | 2 lines
Remove obsolete line with SIND intrinsic.
-----
r1229 | klausred | 2013-05-23 16:32:32 +0200 (Thu, 23 May 2013) | 2 lines
RUNTIME: minor bug fix in launch_atm for lindgren
-----
r1241 | ufla | 2013-06-13 13:27:51 +0200 (Thu, 13 Jun 2013) | 2 lines
Link the ahmcoef file (NEMO coefficients) only when present in the inidata directory.
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r1268 | klausred | 2013-08-29 12:46:27 +0200 (Thu, 29 Aug 2013) | 2 lines
IFS: fixed bug when reading monthly surface pressure from CMIP5 aerosol file
-----
r1307 | ufla | 2013-10-03 15:54:39 +0200 (Thu, 03 Oct 2013) | 2 lines
Update krypton platform to use newer modules.
-----
r1309 | ufla | 2013-10-04 10:00:09 +0200 (Fri, 04 Oct 2013) | 2 lines
Updating platform pc-gcc-openmpi (modified GRIB_API directories)
-----
r1310 | ufla | 2013-10-04 10:04:47 +0200 (Fri, 04 Oct 2013) | 3 lines
Making variable NCMIP5FIXYR of the IFS namelist configurable through ec-conf parameter
MOD:IFS:CMIP5_FIXYEAR. This solves issue #92.
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r1348 | ufla | 2013-11-14 14:38:37 +0100 (Thu, 14 Nov 2013) | 3 lines
Adding initial version of the EC-Earth Development Guide. This is at an early stage and work in
progress!
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r1371 | klausred | 2013-11-25 09:33:18 +0100 (Mon, 25 Nov 2013) | 2 lines
Add LIM3 documentation
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r1397 | klausred | 2013-12-05 22:44:03 +0100 (Thu, 05 Dec 2013) | 2 lines
NEMO: change allocation of work arrays in eosbn2
-----
r1398 | klausred | 2013-12-06 09:23:17 +0100 (Fri, 06 Dec 2013) | 2 lines
NEMO: bugfix in diaptr, allocate arrays after reading the namelist
-----
r1399 | klausred | 2013-12-06 15:46:50 +0100 (Fri, 06 Dec 2013) | 3 lines
NEMO: diaptr tried closing too many output files when running on more than 1 processor, close only
files when numptr>0
-----
r1411 | klausred | 2013-12-08 11:29:15 +0100 (Sun, 08 Dec 2013) | 2 lines
NEMO: allocate array btmsk30 in diaptr
-----
r1416 | ufla | 2013-12-11 09:33:37 +0100 (Wed, 11 Dec 2013) | 2 lines
Carry on with Developers Guide
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r1453 | martin.evaldsson | 2013-12-19 08:47:49 +0100 (Thu, 19 Dec 2013) | 1 line
NEMO-standalone bugfix: Turning off leap years in namelist (leap years are not included in the
DFS-data set)
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r1454 | martin.evaldsson | 2013-12-19 08:50:08 +0100 (Thu, 19 Dec 2013) | 1 line  
NEMO-standalone: simplified and generalized linking of forcing files in run-script

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r1526 | ufla | 2014-02-10 10:41:09 +0100 (Mon, 10 Feb 2014) | 2 lines  
Updating triolith configuration (new software versions).

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r1555 | ufla | 2014-02-13 13:08:24 +0100 (Thu, 13 Feb 2014) | 2 lines  
Merging development/2013/r1232-i84-rundir-structure related to issue #84.

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r1556 | ufla | 2014-02-13 13:15:51 +0100 (Thu, 13 Feb 2014) | 2 lines  
Removing gimle platform (NSC, Sweden), which is no longer existing.

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r1568 | ufla | 2014-02-27 13:21:36 +0100 (Thu, 27 Feb 2014) | 5 lines  
Merging /branches/development/advection-mass-fixer, which implements a back-port of the IFS cy38 advection mass fixer. See ECMWF Technical Memorandum no. 713 for details. Backport implemented by J.v.Hardenberg, ISAC-CNR.

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r1570 | ufla | 2014-02-28 13:45:38 +0100 (Fri, 28 Feb 2014) | 3 lines  
Addressing issue #101: The executable files are now copied and additional links (\*.lnk) are created for reference.

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r1571 | ufla | 2014-02-28 13:51:19 +0100 (Fri, 28 Feb 2014) | 2 lines  
Removing platforms ekman-intel-intelmpi, MareNostrum3-intel-openmpi (source), and ekman (runtime). See issue #116.

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r1572 | ufla | 2014-02-28 14:16:15 +0100 (Fri, 28 Feb 2014) | 4 lines  
Fixing part of issue #118 by applying bugfix reported as NEMO ticket 897 (see <https://forge.ipsl.jussieu.fr/nemo/ticket/897>) correcting fresh water flux in LIM3.

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r1573 | ufla | 2014-02-28 14:26:09 +0100 (Fri, 28 Feb 2014) | 3 lines  
Switching on Rayleigh friction in IFS, following advice from ECMWF. Solves issue #100.

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r1577 | ufla | 2014-02-28 14:59:28 +0100 (Fri, 28 Feb 2014) | 2 lines  
Merging branches/development/2014/r1573-ifs-volcano-update (issue #103).

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r1579 | ufla | 2014-02-28 15:35:51 +0100 (Fri, 28 Feb 2014) | 3 lines  
Adding information about the development branch naming convention to the Development Guide.

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r1609 | martin.evaldsson | 2014-03-11 10:01:37 +0100 (Tue, 11 Mar 2014) | 1 line  
Added description of the runoff handling algorithm

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r1616 | ufla | 2014-03-13 12:49:41 +0100 (Thu, 13 Mar 2014) | 2 lines  
Adding function leap\_days() to ocean standalone run script (issue #119)

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r1617 | ufla | 2014-03-13 13:03:46 +0100 (Thu, 13 Mar 2014) | 3 lines  
Add leap day correction to NEMO standalone run script (issue #119)  
De-activate NEMO success test temporarily (doesn't work yet with leap days)

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r1619 | martin.evaldsson | 2014-03-13 16:52:02 +0100 (Thu, 13 Mar 2014) | 1 line  
Bugfix: Array declared too small

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r1631 | martin.evaldsson | 2014-03-18 12:54:45 +0100 (Tue, 18 Mar 2014) | 1 line  
Reintegrating r927-1630 from branches/development/port-to-ecmwf; see issue #49 for details

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r1651 | ufla | 2014-03-27 08:57:45 +0100 (Thu, 27 Mar 2014) | 4 lines  
- Correcting the leap\_days function. See comments 11,12 in issue #119  
- Re-enable success test for NEMO (should work now with leap day handling in place)

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r1656 | ufla | 2014-03-27 14:14:55 +0100 (Thu, 27 Mar 2014) | 2 lines  
Merging branches/development/2014/r1609-lim3\_icemod (see issue #126).

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r1657 | ufla | 2014-03-27 14:48:15 +0100 (Thu, 27 Mar 2014) | 3 lines  
Adding LEOCWA=FALSE to the NAEPHY namelist for IFS, which switches off the so-called warm ocean parametrisation (see issue #123).

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r1659 | martin.evaldsson | 2014-03-27 15:16:43 +0100 (Thu, 27 Mar 2014) | 1 line  
Bugfix: switching on "exit-on-error" when exiting in leap\_days()-routine

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r1663 | martin.evaldsson | 2014-03-28 09:09:20 +0100 (Fri, 28 Mar 2014) | 1 line

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Merging branches/development/2013/r1268-nemo-highres-standalone (see issue #99)
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r1664 | ufla | 2014-03-28 14:33:20 +0100 (Fri, 28 Mar 2014) | 2 lines
Add missing contribution (fmec) to freshwater exchange in coupled mode (LIM3).
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r1666 | ufla | 2014-03-28 14:43:12 +0100 (Fri, 28 Mar 2014) | 3 lines
Merging branch to implement freshwater flux corrector on liquid precipitation over oceans in order
to fix SSH changes (see issue #118).
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r1668 | ufla | 2014-03-28 14:52:54 +0100 (Fri, 28 Mar 2014) | 3 lines
Changing the parameter for organized entrainment for positively buoyant deep convection ENTRORG to
1.5*10^-4. See issue #120.
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r1669 | ufla | 2014-03-28 14:57:57 +0100 (Fri, 28 Mar 2014) | 2 lines
Adjusting namelist parameters (NEMO ORCA1L46) according to issue #131.
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r1673 | ufla | 2014-03-31 10:44:27 +0200 (Mon, 31 Mar 2014) | 2 lines
Add initial version of 3.1 release notes.
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r1674 | ufla | 2014-03-31 10:52:45 +0200 (Mon, 31 Mar 2014) | 2 lines
Modified NEMO grid and mask at Gibraltar strait for ORCA1. This is according to issue #112.
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r1675 | martin.evaldsson | 2014-04-01 08:18:02 +0200 (Tue, 01 Apr 2014) | 1 line
Resolving issue 89 by moving "runoff_maps.txt" to respective oasis configuration folder
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r1677 | ufla | 2014-04-01 10:19:11 +0200 (Tue, 01 Apr 2014) | 2 lines
Complementing 3.1 release notes and providing PDF version.
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r1678 | ufla | 2014-04-01 10:36:24 +0200 (Tue, 01 Apr 2014) | 2 lines
Updating 3.1 release notes.
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r1679 | ufla | 2014-04-01 10:58:51 +0200 (Tue, 01 Apr 2014) | 2 lines
Cleaning iodef.xml (see issue #63)
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r1686 | martin.evaldsson | 2014-04-02 08:25:08 +0200 (Wed, 02 Apr 2014) | 1 line
Updating ORCA025L75 namelist to comply with the switch to the MERCATOR bathymetry file (bullet
point #3 in issue #128)
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r1687 | ufla | 2014-04-02 09:23:37 +0200 (Wed, 02 Apr 2014) | 3 lines
Reducing slightly the ocean diffusive albedo to allow for a slightly warmer ocean. See issue #133.
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