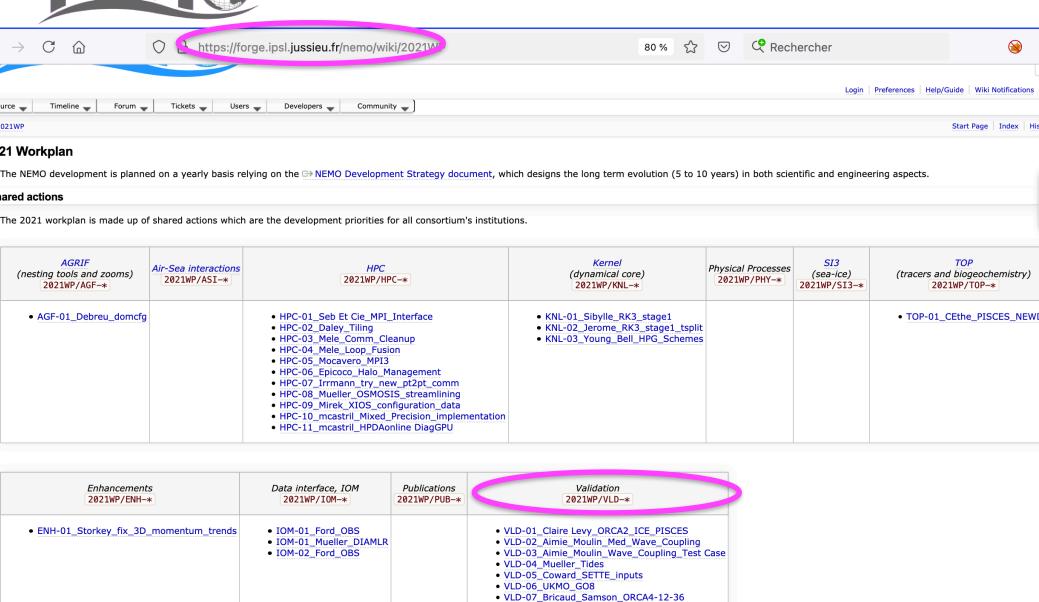# Report on current NEMO Consortium work-plan
Progress with 4.2 Release Candidate and plans for 2nd half of 2021

The 2021 workplan of NEMO Consortium:

80 %

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2021WP

Start Page | Index | His

21 Workplan

The NEMO development is planned on a yearly basis relying on the ➡ NEMO Development Strategy document, which designs the long term evolution (5 to 10 years) in both scientific and engineering aspects.

hared actions

The 2021 workplan is made up of shared actions which are the development priorities for all consortium's institutions.

AGRIF (nesting tools and zooms) 2021WP/AGF–*	Air-Sea interactions 2021WP/ASI–*	HPC 2021WP/HPC–*	Kernel (dynamical core) 2021WP/KNL–*	Physical Processes 2021WP/PHY–*	SI3 (sea-ice) 2021WP/SI3–*	TOP (tracers and biogeochemistry) 2021WP/TOP–*
• AGF-01_Debreu_domcfg		• HPC-01_Seb Et Cie_MPI_Interface • HPC-02_Daley_Tiling • HPC-03_Mele_Comm_Cleanup • HPC-04_Mele_Loop_Fusion • HPC-05_Mocavero_MPI3 • HPC-06_Epicoco_Halo_Management • HPC-07_Irrmann_try_new_pt2pt_comm • HPC-08_Mueller_OSMOSIS_streamlining • HPC-09_Mirek_XIOS_configuration_data • HPC-10_mcastril_Mixed_Precision_implementation • HPC-11_mcastril_HPDAonline DiagGPU	• KNL-01_Sibylle_RK3_stage1 • KNL-02_Jerome_RK3_stage1_tsplit • KNL-03_Young_Bell_HPG_Schemes			• TOP-01_CEthe_PISCES_NEWD

Enhancements 2021WP/ENH–*	Data interface, IOM 2021WP/IOM–*	Publications 2021WP/PUB–*	Validation 2021WP/VLD–*
• ENH-01_Storkey_fix_3D_momentum_trends	• IOM-01_Ford_OBS • IOM-01_Mueller_DIAMLR • IOM-02_Ford_OBS		• VLD-01_Claire_Levy_ORCA2_ICE_PISCES • VLD-02_Aimie_Moulin_Med_Wave_Coupling • VLD-03_Aimie_Moulin_Wave_Coupling_Test Case • VLD-04_Mueller_Tides • VLD-05_Coward_SETTE_inputs • VLD-06_UKMO_GO8 • VLD-07_Bricaud_Samson_ORCA4-12-36 • VLD-08_CEthe_IPSL_Coupled_Model • VLD-0⬚_____Sheet_Fe_Source • VLD-1⬚

Capture d'écran

Main results at mid 2021 (1)

https://nemo-ocean.discourse.group/t/announcing-the-4-2-release-ca... 90%

Announcing the 4.2 Release Candidate and call for beta testers
■ Annoucements

ClaireLevy   1 ✎ 8d

The next NEMO release (4.2) is scheduled for end of 2021. Meanwhile a preliminary version is now available for beta testers. This version includes a number of major developments in terms of sciences and of HPC (see details below).
It has been widely tested by the NEMO System Team (more than any previous NEMO version) but we know some bugs are likely to still be in there.

Those bugs will now be found by using this 4.2 Release candidate on more realistic applications and longer simulations.
It will start with the demonstrators of the H2020 IMMERSE project, but we also would like to call for other beta testers in the NEMO community.

The work proposed to beta testers is to start using this 4.2RC for their application(s), and to compare the results to what they are using now to identify the errors and hopefully the progress gained while using this new version, with or without all the new features.
The benefits for the beta testers is to get some knowledge on the coming 4.2 release, which is very different from 4.0,and moreover to make sure that this 4.2 release will be immediately usable for their projects, including all the new features.
The cost is to spend some time on this validation work: to identify possible bugs and their origins, without any guarantee that possible problems will be solved immediately: this 4.2RC is not a release, and the support will be limited once origin of bugs are identified, to correct them.

If you are willing to be part of this 4.2RC beta testing team, please answer the topic Testing phase for NEMO 4.2 RC 4 .

The NEMO System Team

- 16 June: announcement of 4.2 Release Candidate

- Call for beta testers

- New discourse forums (63 registrations since 7 June)

The 4.2 Release Candidate: improvements since 4.0
~40% lines of NEMO changed…

Kernel
- HPG schemes: new higher order hpg scheme (Shchepetkin and Mc Williams 2003) suitable for use with terrain following coordinates (`ln_hpg_djc=.true.`)
- Quasi Eulerian Coordinates

AGRIF
- Versatile change of vertical coordinates in zooms vs parent
- Support zooms crossing North Fold or East-West periodic boundaries (beta)
- Online initialization of zooms from parent fields
- New pre-processing tool for creating nested models meshes (embedded into DOMAINcfg)

Air sea interactions
- Current feedback
- Integration of Atmospheric Boundary Layer 1D model
- Improvement to wave forcing
- Improvements to bulk formulae
- Wave coupling

Vertical physics
- Improvement to OSMOSIS vertical physics
- Mass-flux convection scheme

Sea-ice SI3, icebergs, ice-shelves:
- New EAP rheology
- Energy and conservation diagnostics
- Ocean column properties in icebergs

Biogeochemistry PISCES and its interface
- Iron cycle in ice sheets
- New Interface with dynamics

HPC
- Enabling different MPI haloes sizes (facilitated by no longer outputing the overlap rows and columns - leading to a change in input files)
- Loop tiling (TRA, DYN and ZDF modules only): the full domain is divided into smaller "tiles" in order to improve performance by keeping data in memory cache for as long as possible
- Use of MPI3
- Improved performances of solar penetration scheme
- Loop fusion

DATA interface and IO management
- Improvement to NEMO OBS operator: refactored OBS code to better enable extension to new observation types
- Restarts read and write using XIOS

VALIDATION
- Tests cases developed with most new developments, available on https://github.com/NEMO-ocean/NEMO-examples 9

Main results at mid 2021 (2)

- Major SETTE validation script improvements

- Elaboration of new NEMO web platform and tools (survey, discussions)

- New Zulip chat tool for developers

- New Discourse tool in place of previous forums for users (63 registrations since 7 June 2021)

Unfinished:

- VP rheology

- New time stepping scheme (ongoing)

- Mixed precision (in discussion for NEMO reference)

From June to December 2021

Validation of 4.2 RC

- By IMMERSE demonstrators
- By the VALIDATION actions of the work plan
- By Beta testers from users Community? (no answer as for today…)

Preparing 4.2 official release

- Validation of 4.2RC
- In principle no new feature to be added until 2022

Changing NEMO web platform and tools

- Terms of Reference to be discussed with MOI and endorsed by NSC

4.2 Official Release available on this new GitLab platform end 2021