

Making changes in NEMS/GSM:

- 1) Create a nems ticket and a gsm ticket; document all the changes along your work
- 2) Create a NEMSlegacy branch

%svn copy <https://svnemoc.ncep.noaa.gov/projects/nems/apps/NEMSLegacy/trunk>

https://svnemoc.ncep.noaa.gov/projects/nems/apps/NEMSLegacy/branches/your_nemslegacy_branch -m"your message"

- 3) Create a nems branch

%svn copy <https://svnemoc.ncep.noaa.gov/projects/nems/trunk>

https://svnemoc.ncep.noaa.gov/projects/nems/branches/your_nems_branch -m"your message"

- 4) Create a gsm branch

%svn copy <https://svnemoc.ncep.noaa.gov/projects/gsm/trunk>

https://svnemoc.ncep.noaa.gov/projects/gsm/branches/your_gsm_branch -m"your_message"

- 5) Make changes to a working copy of your NEMSLegacy/nems/gsm branches

a) get a NEMSlegacy working copy from your branch:

%svn co

https://svnemoc.ncep.noaa.gov/projects/nems/apps/NEMSLegacy/branches/your_nemslegacy_branch

You will see a directory named your_nemslegacy_branch under your local directory

b) change svn external links to your branches

%cd your_nemslegacy_branch

%svn propedit svn:externals .(dot)

Change the trunks (along with the revision number) to your nems/gsm branches:

NEMS <https://svnemoc.ncep.noaa.gov/projects/nems/trunk>

NEMS/src/atmos/gsm -rRevision_number <https://svnemoc.ncep.noaa.gov/projects/gsm/trunk>

NEMS/src/atmos/nmm -rRevision_number <https://svnemoc.ncep.noaa.gov/projects/nmmb/trunk>

Change to:

NEMS https://svnemoc.ncep.noaa.gov/projects/nems/branches/your_nems_branch

NEMS/src/atmos/gsm https://svnemoc.ncep.noaa.gov/projects/gsm/branches/your_gsm_branch

NEMS/src/atmos/nmm <https://svnemoc.ncep.noaa.gov/projects/nmmb/trunk>

Save the file, then do

```
%svn update
```

Now the working copy has your nems/gsm branches. You can start to make changes.

6) Compile and run jobs using regression test script:

The easiest way to compile and run a test is through nems/gsm regression test. Currently there are 9 tests for gsm including Eulerian dycore, WAM, GSM semi-Lagrangian (SLG), and ngac. You can find general setting for all gsm regression tests at:

Your_nemslegacy_branch/your_nems_branch/tests/gsm_config

Detailed setting information for each test is at the files under your_nems_branch/tests/tests. For example, your_nems_branch/tests/tests/gfs_slg contains the setting for gsm SLG T62 regression test.

Here is how to run a single regression test, you may use this example to test your code:

```
%cd your_nemslegacy_branch/your_nems_branch/tests
```

```
% cp rt.conf rt.conf1
```

Edit the rt.conf1 file, keep the tests you want to run and remove the rest. Below is an example file rt.conf1 to run gsm SLG at T62 on wcoss:

```
COMPILE | gsm | standard | wcoss | gsm_intel |
```

```
RUN | gfs_slg | standard | | gfs |
```

To compile and run the test, do:

```
% ./rt.sh -l rt.conf1
```

If there are compiling errors, please check file: Compile_wcoss.log on wcoss and Compile_theia.log on theia under your_nems_branch/tests. If the code is successfully compiled, but the job failed, please go to the run directory (on phase1: /ptmpp1/\$USER/rt_\$jobid, on phase2: /ptmpp2//\$USER/rt_\$jobid, on theia: /scratch4/NCEPDEV/stmp3/\$USER/rt_\$jobid). On

wcoss look for fcst.\$CDATE.out.\$job_id for the run output prints; on theia: files out and err in the run directory have all the run output prints.

Currently the GSM SLG regression test history files (sigf and flxf) are in nemsio grib format. You can use grib2ctl.pl to create the GrADS control file, to create index file, please use:

```
Gribmap -s12800000 -i your_grads_ctl.ctl
```

The -s option is to skip nemsio header. The sfc history files are in nemsio binary format, to generate grads ctl file:

```
/global/save/emc.glopara/bin/mkgfsnemsioctl your_sfcfile
```

You will see a Grads control file: your_sfcfile.ctl.

To see the impact of your changes on the forecast, you can compare the forecasts made from your branch and those from baseline (results created from trunk). On wcoss, the baseline results are at:

```
/meso/noscrub/Ratko.Vasic/REGRESSION_TEST
```

On Theia:

```
/scratch4/NCEPDEV/meso/noscrub/Ratko.Vasic/REGRESSION_TEST
```

7) Run regression tests on wcoss and theia

If the tests run well and you would like to commit your code changes into trunk, please finish following steps:

a) commit all the changes to your gsm branch and nems branch.

b) update your branch with the latest nems/gsm trunk change through svn merge. For example, to merge changes from gsm trunk:

i) dry run merge to show all the possible conflicts:

```
%cd your_nemslegacy_branch/your_nems_branch/src/atmos/gsm
```

```
%svn merge -dry-run https://svnenc.ncep.noaa.gov/projects/gsm/trunk
```

ii) merge changes from gsm trunk

```
%svn merge https://svnenc.ncep.noaa.gov/projects/gsm/trunk
```

Please resolve all the conflicts shown up.

c) run regression test on both wcss and theia (we usually do a full regression test before the commit)

```
%cd your_nemslegacy_branch/your_nems_branch/tests
```

```
%./rt.sh -f
```

You can run as a background job:

```
on wcss: %nohup ./rt.sh -f >xx 2>&1 &
```

```
on theia: %nohup ./rt.sh -f > & xx &
```

When regression test is done, please review RegressionTests_wcss.log on wcss and RegressionTests_theia.log on theia, and fix all the failed tests if any. All regression tests should be passed before you commit the changes to trunk.

8) Commit changes to trunk

Please follow the steps below to commit your changes:

a) Committing to gsm trunk

finish documenting all the changes in your gsm ticket, and reassign your ticket to someone to review, make changes if the reviewer suggests any. If the reviewer recommends the changes to be committed, reassign the ticket to gsm code manager (jun.wang@noaa.gov) for gsm trunk commit. A new revision number will be available once the code is committed.

b) Committing to nems trunk

finish documenting all NEMS changes in NEMS ticket, now you yourself will commit to nems trunk.

- i) Send out an “intent to commit” email to NEMS announcement group at: ncep.list.nems.announce@lstrv.ncep.noaa.gov. If you are not in the email list, please send email to nicole.mckee@noaa.gov or mark.iredell@noaa.gov. Current policy is to wait for 24 hours after you send the announcement to give people time reviewing your changes. If you receive any feedbacks from nems developers, please resolve all the issues before you commit to nems trunk. For details, please read the “code development Guidelines” section at <https://svnemc.ncep.noaa.gov/trac/nems>
- ii) To commit your branch to nems trunk:

- 1)check out a working copy of nems trunk

```
%svn co https://svnemc.ncep.noaa.gov/projects/nems/trunk
```

```
%cd trunk
```

You can run a dry run merge first to view the list of files that are going to be changed, then do actual merge. Resolve all the conflicts

```
%svn merge --dry-run --reintegrate  
https://svnemc.ncep.noaa.gov/projects/nems/branches/your\_nems\_branch
```

```
%svn merge --reintegrate  
https://svnemc.ncep.noaa.gov/projects/nems/branches/your\_nems\_branch
```

2) Then commit to nems trunk

```
%svn ci -m"your message for commit" or
```

```
%svn ci -F log_file (log file has your message for commit)
```

c) Committing to NEMSLegacy trunk

Update NEMSLegacy to point to the head of nems/gsm trunks

i) Check out an NEMSLegacy trunk working copy:

```
%svn co https://svnemc.ncep.noaa.gov/projects/nems/apps/NEMSLegacy/trunk
```

```
%cd trunk
```

```
%svn propedit svn:externals .(dot)
```

ii) Change following links to gsm/nems head of trunk with revision number:

```
NEMS https://svnemc.ncep.noaa.gov/projects/nems/trunk
```

```
NEMS/src/atmos/gsm -rGSM_trunk_revision_number_from_7a)  
https://svnemc.ncep.noaa.gov/projects/gsm/trunk
```

```
NEMS/src/atmos/nmm -rRevision_number  
https://svnemc.ncep.noaa.gov/projects/nmm/trunk
```

iii) Commit the changes from your NEMSLegacy trunk working copy:

```
%cd trunk
```

```
%svn ci -m"your message for commit" or
```

%svn ci -F log_file (log file has your message for commit)

If you have question with this documentation, please contact: Jun.Wang@noaa.gov