LGM POP-CISM coupling

Testing and set up of the new POP-CISM coupling
Information on the shelf melt scheme
https://docs.google.com/document/d/1scLtUcu5P77DSQ--01tCXt0hyG9eMgl8w8zG0bBClv4/edit
Information on the related NHIS/LGM runs
https://docs.google.com/document/d/10AZfMxN9e1Wa07LgU7DiE0sxu-S9zEK83VhA4_pYGf0/edit

CESM modifications.

The modifications to the code for the coupler can be found here:
for cism_wrapper: https://github.com/ESCOMP/cism-wrapper/tree/CISM_wrapper_CISMPOP
for cism: https://github.com/ESCOMP/cism/tree/cism_pop_coupling
for cime: https://github.com/alperaltuntas/cime/tree/altuntas/pop2_cism_coupling

Revised CIME branch: 21 may
https://github.com/alperaltuntas/cime.git
Pop2_cism_cpl_bp_cime5.6.16

Note that the cism_wrapper includes all the changes comprised in the tag cism2_1_67.

Code directory
/glade/u/home/sbradley/cesm_tags/cesm2.1.0-pop

(see Externals.cfg) for the revisions)
ALSO: need to copy the revised config_machines.xml for the changes to the mpt
/glade/u/home/sbradley/cesm_tags/CHECK_OUT/config_machines.xml

In the CESM directory, modify the file Externals.config to include the new links for checking out codes and any other modification for component version. All components are checked out as 'default' apart from what is described below.
##
[cime]
branch = **pop2_cism_cpl_bp_cime5.6.16**
protocol = git
repo_url = https://github.com/alperaltuntas/cime

local_path = cime
required = True

[pop]
branch = cesm_pop_2_1_20190115_cpl_cism
protocol = svn
repo_url = https://svn-ccsm-models.cgd.ucar.edu/pop2/branches
local_path = components/pop
externals = Externals.cfg
required = True

[cism]
branch = CISM_wrapper_CISMPOP
protocol = git
repo_url = https://github.com/ESCOMP/cism-wrapper
local_path = components/cism
externals = Externals_CISM.cfg
required = True

[CLM]
tag = ismip6.n01_release-clm5.0.15
protocol = git
repo_url = https://github.com/ESCOMP/ctsm
local_path = components/clm
externals = Externals_CLM.cfg
required = True

Extra information on running with the POP-CISM coupling (beyond mapping files)

To turn on the coupling:
./xmlchange OCN_C2_GLC=TRUE

Coupling interval
Note that ocn will pass its export fields at every coupling interval (every hour, I think), but glc will receive the averages once every year.
 For testing purposes, you can set: ./xmlchange GLC_AVG_PERIOD=glc_coupling_period

This will make glc receive at every glc coupling interval, which I think is once a day.
? if may need to adjust: After changing GLC_AVG_PERIOD, you may have to turn off glc restart files, or you may need to adjust the dynamic timestep of glc to be the same as glc_coupling_period. Otherwise the case raises an error at the end of the run when glc tries to write a restart file.

To run with the new code: user_nl_cism:
nzocn = 7
bmlt_float = 7

###

<mark>**21 May: latest set of code:**</mark>
LGM test RUNS
/gpfs/u/home/sbradley/cesm_tags/cesm2.1.0-pop

Create case script:
> *gpfs/u/home/sbradley/cases_LGM/create_LGM_BG-pop-restartCESM1.csh*
<mark>New case script:</mark>
Use restart files from a 16 yr B run (ran on cartesius)- not with cism-pop code

*gpfs/u/home/sbradley/cases_LGM/*create_LGM_BG-pop-restartLGM.csh

<mark>9 June:</mark>
All recent updates includes

Aiming to run 5 years BG run: test the coupling between CESM-CISM
Start with 1 year BG run:

Test1: /glade/u/home/sbradley/cases_LGM/**BG-pop-LGMrestart-190608**
Need to add restart=0: prevent CFL violations
*/gpfs/fs1/scratch/sbradley/**BG-pop-LGMrestart-190608**/run/cesm.log.6576457.chadmin1.190609-083723*
Current error
MPT ERROR: Rank 216(g:216) received signal SIGSEGV(11)
When look at output restart files are produced '1year': yr-0017 for cam/cice/clm/pop/rtm:
problem is with CISM, but nothing in glc.log*

Test2: /glade/u/home/sbradley/cases_LGM/**BG-pop-LGMrestart-bm3-190610**
-BG 1 year run, but with bmlt_float =3

On cartesius: ran a successful BG-1year run using the cesm2.1.0-ismip code

12 June: updated cime branch from Alper: run again NOEVOLVE
BG-pop-LGM-CISMNOEVOLVE-190612
Runs - no issues.: 5 day
Repeat 1 year - runs
BG-pop-LGM-190612:
1 year run with CESM1 restart and EVOLVE - runs: this was with bmlt_float=3

Now repeat with no restart files, bmlt_float=7
BG-pop-190614
Run fails with same MPT error as restart run below

BG-pop-LGMrestart-190612 * using the revised glissade_bmlt_float (GL)
1 year run with B-LGM *16yr* restart
Fails when using the LGM restart files
/glade/scratch/sbradley/BG-pop-LGMrestart-190612/run/cesm.log.6685376.chadmin1.190613-0
15355
Update lithospheric load: tstep_count, nlith =   1   4000
402:MPT ERROR: Rank 402(g:402) received signal SIGSEGV(11).

##
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receive the averages once every year.
 For testing purposes, you can set: ./xmlchange GLC_AVG_PERIOD=glc_coupling_period

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restart files, or you may need to adjust the dynamic timestep of glc to be the same as
glc_coupling_period. Otherwise the case raises an error at the end of the run when glc tries to
write a restart file.

To run with the new code: user_nl_cism:
nzocn = 7
bmlt_float = 7

Create_case scripts

Reference script for a 'B' run: with the changes for OCN-GLC coupling
/gpfs/u/home/sbradley/cases_LGM/create_LGM_BG-pop-restartCESM1.csh

Reference script for a TG run
/gpfs/u/home/sbradley/cases_LGM/create_LGM_TG-restartCESM1.csh

information on the mapping files:

The new mapping files are in
/gpfs/fs1/work/sbradley/CESM2.0_SETUP/CPL/OCN-CISM/code
See README for the code to run and any other information

Example netcdf of the output from these mapping files /results/