

Interfacing MOM5/CICE

Compiling/testing OOPS on cheyenne:

- git clone https://github.com/JCSDA/OOPS.git
- cd ./OOPS/
- Execute the build_oops_cheyenne.csh script (*temporary solution*)
- cd ./build/oops
- ctest (some test might fail for the QG model)

Adding a model interface: (*temporary solution*)

- cd ./oops/
- If the model is coded in some flavor of fortran (90 or more recent), use the ModelX as a template
 - cp -r ModelX Mom5Cice5
- In ./oops/CMakeLists.txt, add the following line: add_subdirectory(Mom5Cice5)
- Rebuild from scratch (usin the build_oops_cheyenne.csh script)
- Start editing the files under ./Mom5Cice5/model/
- cd ~/OOPS/build/
- make
- if successful:
 - cd ~/OOPS/build/oops/
 - ctest
- Running single test:
 - cd ~/OOPS/build/oops/Mom5Cice5/test
 - Edit CTestTestfile.cmake (write out how the test should be configured)
 - ./test_mom5cice5_geometry -- ./testinput/interfaces.json

Random Notes:

- Adding netcdf:
 - load appropriate netcdf module, add to build script
 - In ~/OOPS/oops/CMakeList.txt, under dependencies, Add:
find_package(NetCDF3 REQUIRED)
include_directories(\${NETCDF_INCLUDE_DIR})
 - Need to add a few env var in build script as well
 - Edit ~/OOPS/oops/Mom5Cice5/model/CMakeLists.txt and add the fortran netcdf libraries

NICAS: Preliminary testing

While the entire state is initialized through OOPS, for the purpose of testing, we only consider a small subset of the Ocean and Sea-ice state:

- Snow or ice surface temperature
- Snow enthalpy (1 level)
- Ice enthalpy (7 levels)
- Upper ocean salinity (For freezing temperature)
- Upper ocean temperature

Test 0: Pass geometry and state to NICAS as column arrays/unstructured grids

Test 1: Applying NICAS to an increment ("single obs test", mostly zeros with a few strategically placed 1's)

- Example of applying NICAS to to the Antarctic region:

Note the the correlation field in the Weddell sea, close to the Antarctic Peninsula does not leak across the peninsula into the Amundsen Sea.

[blocked URL](#)

- Example of applying NICAS to to the Arctic region:

[blocked URL](#)

Test 2: Same single obs test as above but reading an ensemble (currently 4 members).

Technically working, but only 4 members available. NICAS returns XX^T o L dx

To do:

- Balance/transform operators
- Issues with mask?
- MPI decomposition
- Chose a model!
- Long term goal: Proper unstructured grid definition, and remove the need for masking, anisotropic localization ...

