Update on Coupling

The Community Mediator for Earth Prediction Systems (CMEPS) went through preliminary validation for the UFS S2S configuration (FV3GFS-MOM6-CICE5), documented here:
https://github.com/ESCOMP/UFSCOMP/wiki/Milestone:-CMEPS-0.3
In testing, a difference between the CMEPS and NEMS mediator S2S configuration is that the version of the CICE5 model is slightly different in each. In four 35 day runs tested against EMC S2S benchmark 1, there were some differences observed in the ice behavior.

CMEPS is written in a more general fashion than the NEMS mediator, and will be shared with CESM as part of the NCAR-NOAA MOA. It has been validated in the CESM system:
https://github.com/ESCOMP/UFSCOMP/wiki/Milestone:-CMEPS-0.2

The next step is to run CMEPS within the NEMS environment, using the same version of the ice model, and confirm that it replicates the NEMS coupler behavior. This is expected within the next couple of months, with a sprint anticipated for July 2019. There are major challenges in the developer hired for this not being able to get a theia account.

The goal is to enable any significant HAFS work to be implemented in the CMEPS mediator. A first goal will be running the regional atmosphere in it.

Example of CMEPS 0.2 Configurations (Compsets) for CESM

- BMOM (2000_CAM40_CLM45%SP_CICE_MOM6_SROF_SGLC_SWAV): A fully coupled system with four active components: the Community Atmosphere Model (CAM) with version 4 physics, the Community Land Model (CLM) version 4.5, Los Alamos Sea Ice Model (CICE), and the Modular Ocean Model version 6 (MOM6).
- CMOM (2000_DATM%NYF_SLND_DICE%SSMI_MOM6_DROF%NYF_SGLC_SWAV): Active ocean (MOM6) forced by a data atmosphere with Coordinated Ocean-ice Reference Experiments version 2 (COREv2) Normal Year Forcings (NYF). The data ice component reads sea ice extent from Special Sensor Microwave Imager (SSMI) climatological data and computes a surface flux which is sent to the Mediator. The data river provides climatological normal year forcings.
- CMOM_IAF (2000_DATM%IAF_SLND_DICE%IAF_MOM6_DROF%IAF_SGLC_SWAV): Same as CMOM compset, but uses the COREv2 Interannual Forcings (IAF) instead of Normal Year Forcings.
- GMOM (2000_DATM%NYF_SLND_CICE_MOM6_DROF%NYF_SGLC_SWAV): Active ocean (MOM6) and ice (CICE) components forced by a data atmosphere and data river with COREv2 Normal Year Forcings.
- GMOM_IAF (2000_DATM%IAF_SLND_CICE_MOM6_DROF%IAF_SGLC_SWAV): Same as GMOM, but forcings are COREv2 Interannual Forcings.
- F2000Nuopc (2000_CAM40_CLM50%SP_CICE%PRES_DOCN%DOM_SROF_SGLC_SWAV): Active atmosphere (CAM with version 4.0 physics), active land (CLM version 5.0), prescribed sea ice (CICE), and a data ocean model with prescribed climatological SST and ice-coverage.
- I2000Clm50SpNuopc (2000_DATM%GSWP3v1_CLM50%SP_SICE_SOCN_SROF_SGLC_SWAV): Active land (CLM version 5.0) forced by a data atmosphere using Global Soil Wetness Project Phase 3 (GSWP3v1) forcings.
- DTEST (2000_DATM%NYF_SLND_CICE_DOCN%SOM_DROF%NYF_SGLC_SWAV_TEST): A compset with a data ocean in the slab ocean model mode (SOM), which computes a prognostic sea surface temperature and a freeze/melt potential (surface Q-flux) used by the sea ice model. This is used to test the ocean-ice interaction with the ice model in relative isolation and to test regridding in the Mediator.
- X (2000_XATM_XLND_XICE_XOCN_XROF_XGLC_XWAV): All dead components. This configuration is used for testing data flow through the Mediator.
- A (2000_DATM%NYF_SLND_DICE%SSMI_DOCN%DOM_DROF%NYF_SGLC_SWAV): A compset with all data models. This is used to test the CIME infrastructure, especially when porting to new platforms.