

CICE Consortium tutorial - Coupled CICE activity

Learning Goals:

In this activity you will use standalone CICE and the Community Earth System Model (CESM) to understand some of the scientific impacts of coupling CICE.

Background:

We want to explore the impacts of changing CICE parameters and their impacts on the sea ice. Any of these tests are expected to fail the bit-for-bit test. However, we do not know if changing the parameters also impacts the climate. You will test these changes in both coupled and uncoupled experiments to determine whether changing the sea ice parameters has a big impact on the resulting sea ice.

We will focus on two namelist parameters:

- 1) The Cf parameter corresponds to the frictional dissipation that occurs during ridging. The default Cf value is 17, and we will test possible values in the range from 1 to 100.
- 2) The R_snw parameter is a tuning parameter for the Delta Eddington dry snow albedo. The default value is 1.5, and we will test reasonable values ranging from -1.5 to 1.5.

For this activity each student should choose a different value to test in standalone CICE experiments so that we can cover a full range of parameter space. We recommend you use the naming conventions detailed below for consistency among all the runs. We want to make sure all the values below are chosen by at least one person because we will analyze corresponding coupled Community Earth System Model (CESM) experiments this afternoon.

Parameter value	Experiment name	Student Running	QC vs. baseline (Pass or Fail)	QC vs. others (Can expand as needed)
Cf = 1	cice_cf1			
Cf = 2	cice_cf2			
Cf = 5	cice_cf5			
Cf = 17	cice_cf17		(default)	
Cf = 50	cice_cf50			
Cf = 100	cice_cf100			

Parameter value	Experiment name	Student Running	QC vs. baseline (Pass or Fail)	QC vs. others (Can expand as needed)
R_snw = 1.5	cice_rsnw15		(default)	
R_snw = 1.0	cice_rsnw10			
R_snw = 0.5	cice_rsnw05			
R_snw = 0.0	cice_rsnw0			
R_snw = -0.5	cice_rsnwm05			
R_snw = -1.0	cice_rsnwm10			
R_snw = -1.5	cice_rsnwm15			

Part 1 - Standalone CICE namelist changes (~1hr):

Yesterday you ran the QC test on data that already existed. Today you will create your own model output with which to run the QC test. This morning you will set up and start running the experiment with the single namelist change you chose.

1. Choose either a Cf ****or**** R_Snw change to make, but do not make both changes at once. Once you've chosen your parameter and what value you will test, write your name on the table so we can see who is running which experiment.
2. Following the QC test instructions from yesterday, set up a new experimental case with the "testid" name described above (e.g. cice_cf1). Because you are just changing a single namelist parameter, not making a code change, you can create this case from your cice_master directory.
3. Once the case is set up, build it, make your chosen namelist parameter change, and then submit the job.
4. Check that the job is running as expected and producing output. The job will take ~2hrs to run, so you will return to analyze it this afternoon. Once it is complete, please write the path to the output on the board so others can look at the results as well.