

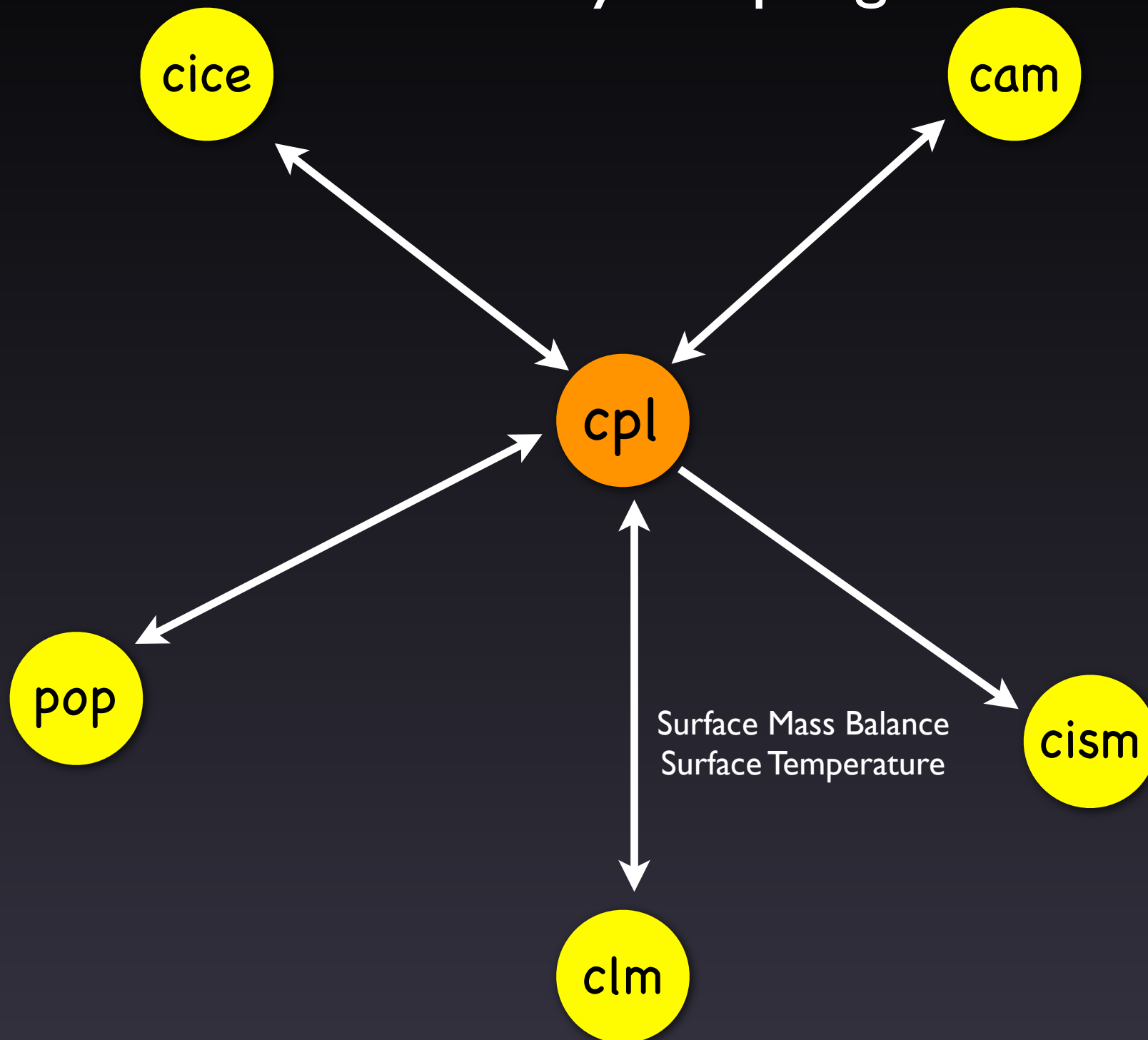
# Tutorial: Ice sheet modeling in CESM

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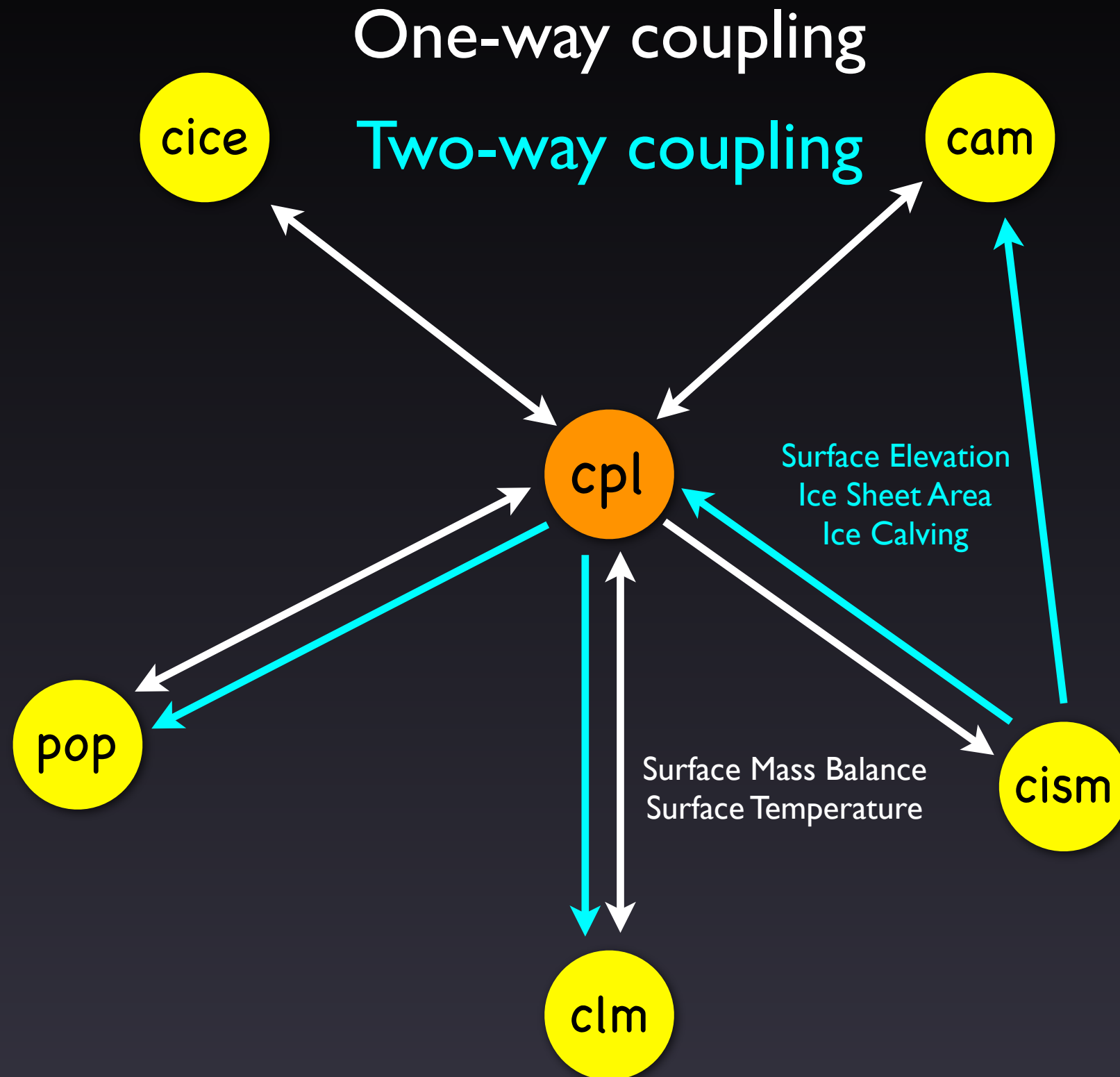
Bill Lipscomb  
Land Ice Working Group Co-chair

# CISM in CESM

One-way coupling



# CISM in CESM



# Land Ice: From CESM1 to CESM2

CESM1.0	CESM2.0
One-way coupling	Two-way coupling
Serial, shallow ice approximation	Parallel, higher-order: CISM2.1
No way to run standalone CISM	TG compset for running standalone CISM
1-m snow pack in CLM	10-m snow pack in CLM, with substantially improved physics
Only 3 land/atm resolutions supported	All land/atm resolutions supported
SMB only computed in runs done by LIWG	SMB computed in all runs

# Compsets with Evolving Greenland Ice Sheet

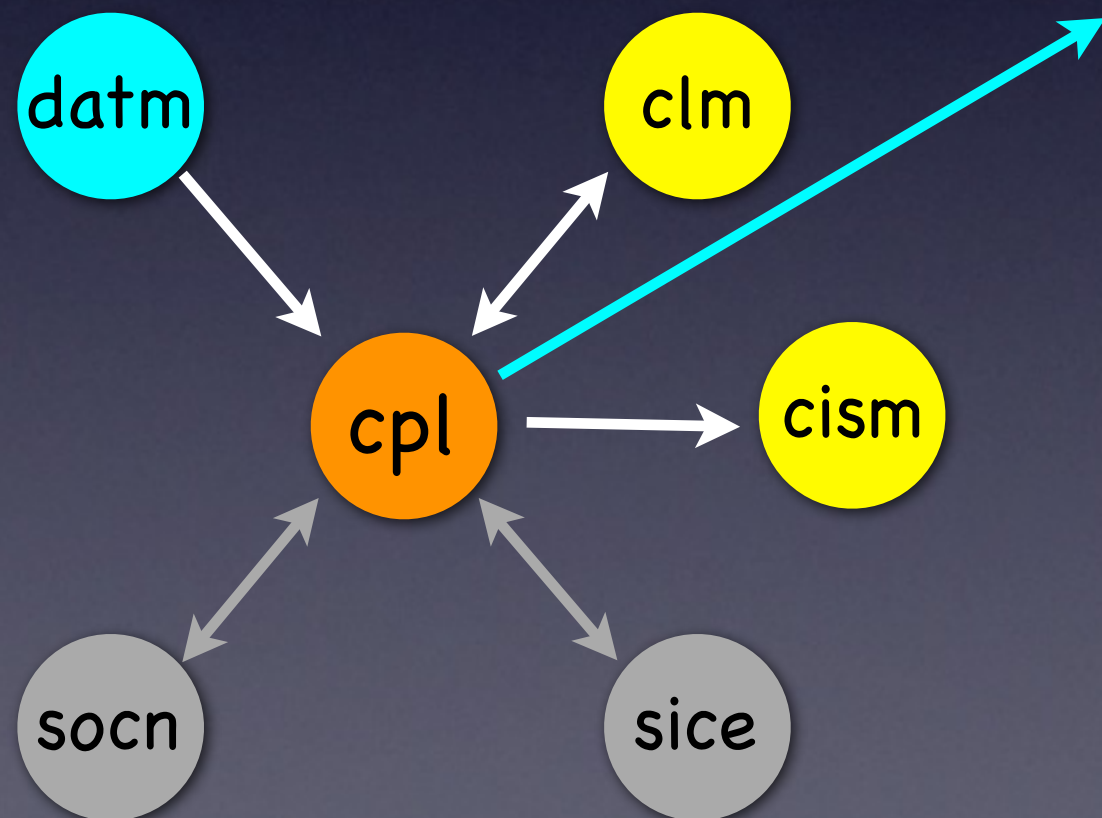
- B1850G and similar: fully coupled
- J1850G: CLM, CISM, POP, CICE, MOSART, all forced by datm
- I...G (e.g., I1850CIm50BgC CropG): CLM, CISM and MOSART
- T1850G: CISM only
- Compsets without active ice sheet still have diagnostic ice sheet for examining surface mass balance

# T Compset

Key: **active** / **data** / stub model

First: Run I compset  
(or F or B)

cpl history  
(tsrf, topo,  
qice)





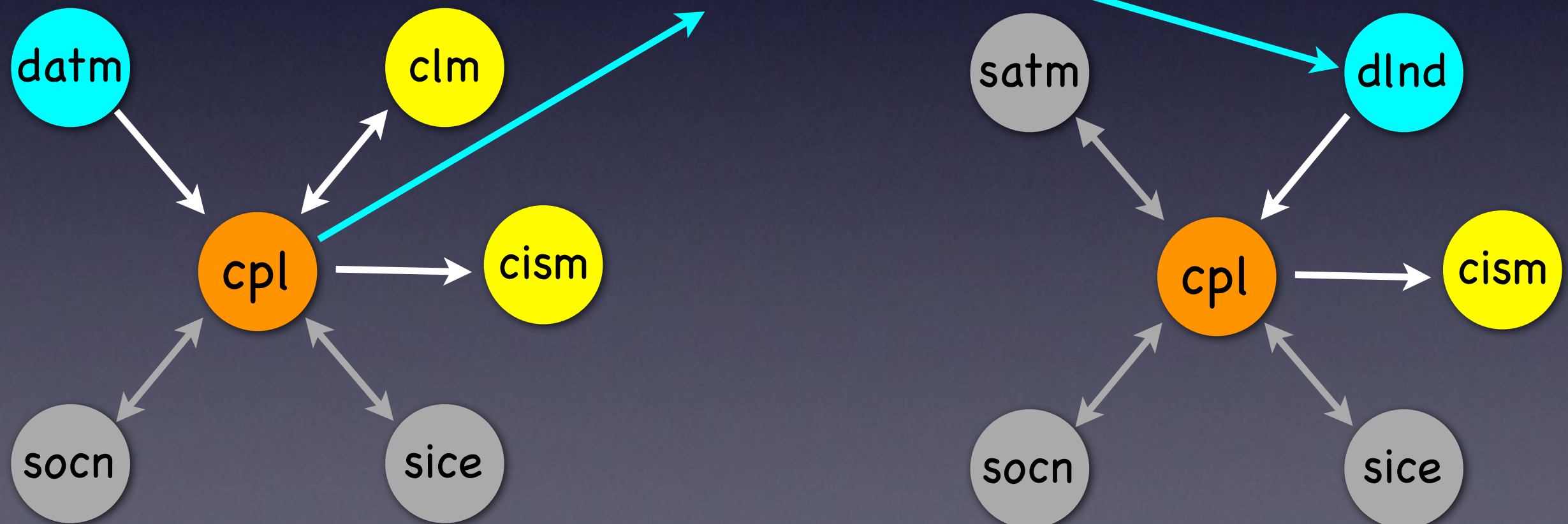
# T Compset

Key: **active** / **data** / stub model

First: Run I compset  
(or F or B)

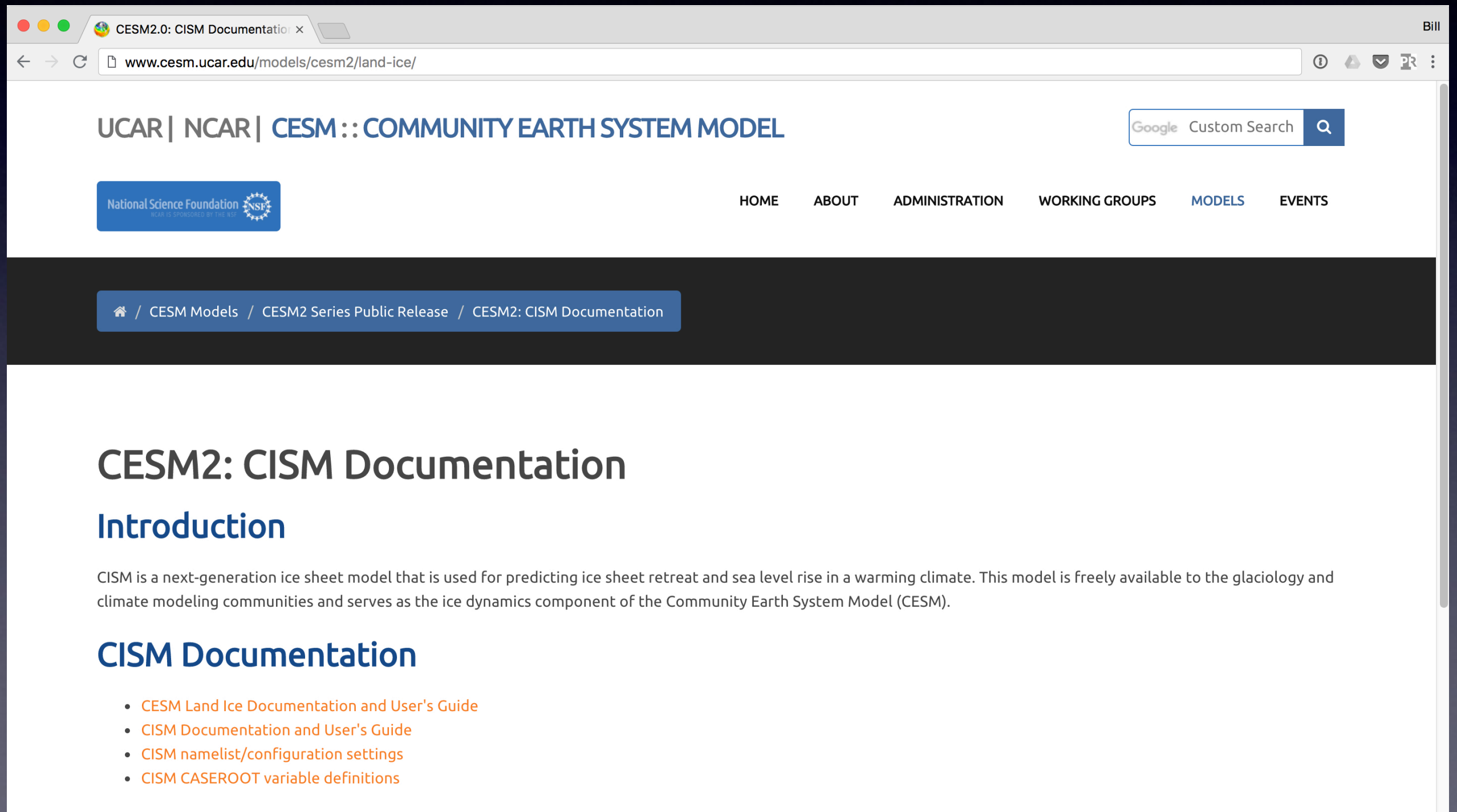
cpl history  
(tsrf, topo,  
qice)

Next: Run T compset



# For more information

<http://www.cesm.ucar.edu/models/cesm2/land-ice/>



The screenshot shows a web browser window with the URL [www.cesm.ucar.edu/models/cesm2/land-ice/](http://www.cesm.ucar.edu/models/cesm2/land-ice/). The page header includes the UCAR | NCAR | CESM :: COMMUNITY EARTH SYSTEM MODEL logo, a Google Custom Search bar, and a navigation menu with links: HOME, ABOUT, ADMINISTRATION, WORKING GROUPS, MODELS, and EVENTS. A blue banner below the header contains the text: / CESM Models / CESM2 Series Public Release / CESM2: CISM Documentation. The main content area features the title "CESM2: CISM Documentation" and a subheading "Introduction". The introduction text states: "CISM is a next-generation ice sheet model that is used for predicting ice sheet retreat and sea level rise in a warming climate. This model is freely available to the glaciology and climate modeling communities and serves as the ice dynamics component of the Community Earth System Model (CESM).". Below this, there is a section titled "CISM Documentation" with a bulleted list of links: CESM Land Ice Documentation and User's Guide, CISM Documentation and User's Guide, CISM namelist/configuration settings, and CISM CASEROOT variable definitions.

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## CESM2: CISM Documentation

### Introduction

CISM is a next-generation ice sheet model that is used for predicting ice sheet retreat and sea level rise in a warming climate. This model is freely available to the glaciology and climate modeling communities and serves as the ice dynamics component of the Community Earth System Model (CESM).

### CISM Documentation

- [CESM Land Ice Documentation and User's Guide](#)
- [CISM Documentation and User's Guide](#)
- [CISM namelist/configuration settings](#)
- [CISM CASEROOT variable definitions](#)