Ice sheet model development for CESM1.1.0 and beyond

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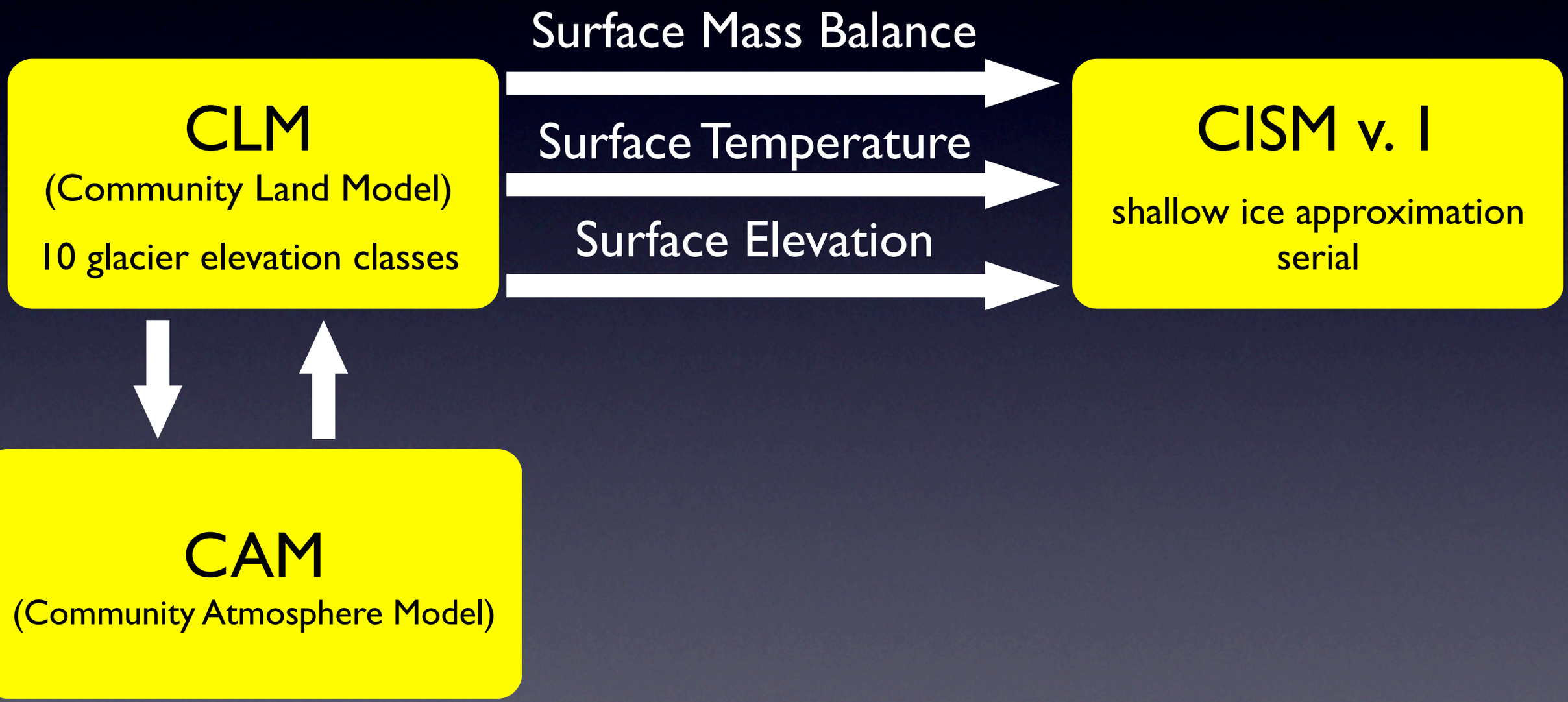
CISM in CESM


Surface Mass Balance
Surface Temperature
Surface Elevation
CLM
(Community Land Model)
10 glacier elevation classes
CISM v. 1
shallow ice approximation
serial
CAM
(Community Atmosphere Model)

CESM1.1 Release

Target release date: Nov 1

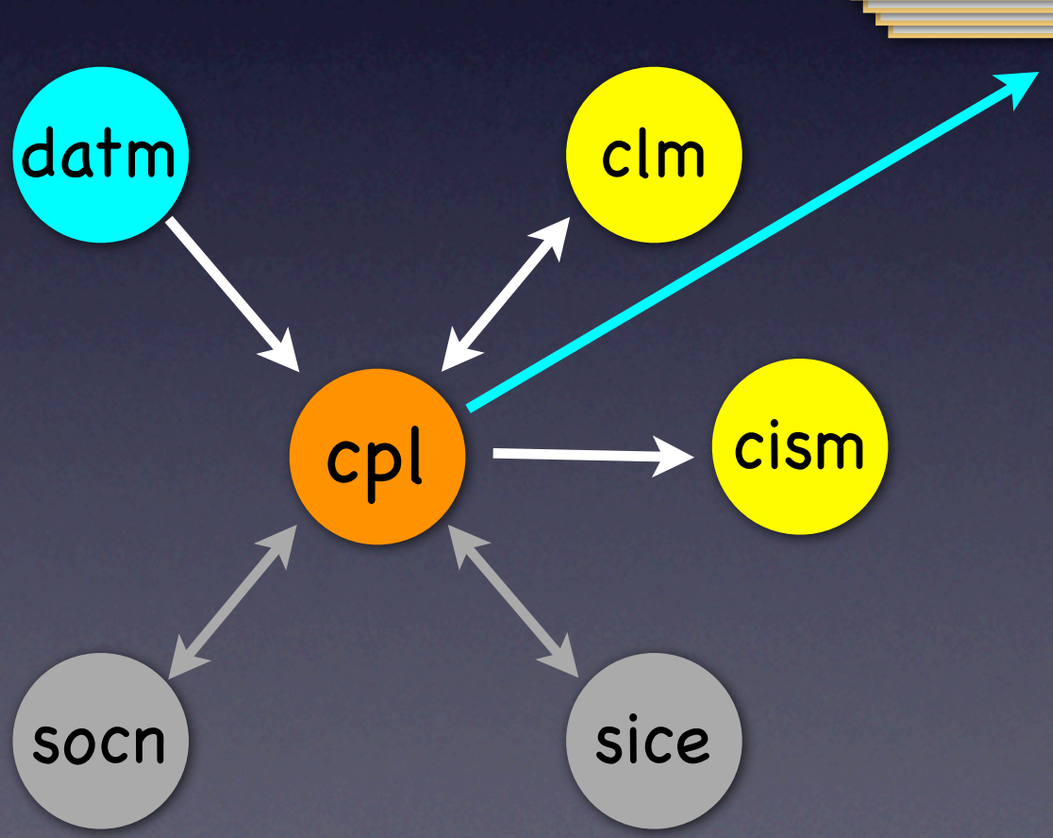
- Ensemble capabilities
- New grid support
  - e.g., CAM-SE (HOMME grid): unstructured grid
  - Better support for user-created grids
- High-resolution land datasets
- Standardized namelist generation

New TG Compset

Key: active / data / stub model

First: Run IG
(or FG or BG)

cpl history
(tsrf, topo,
qice)



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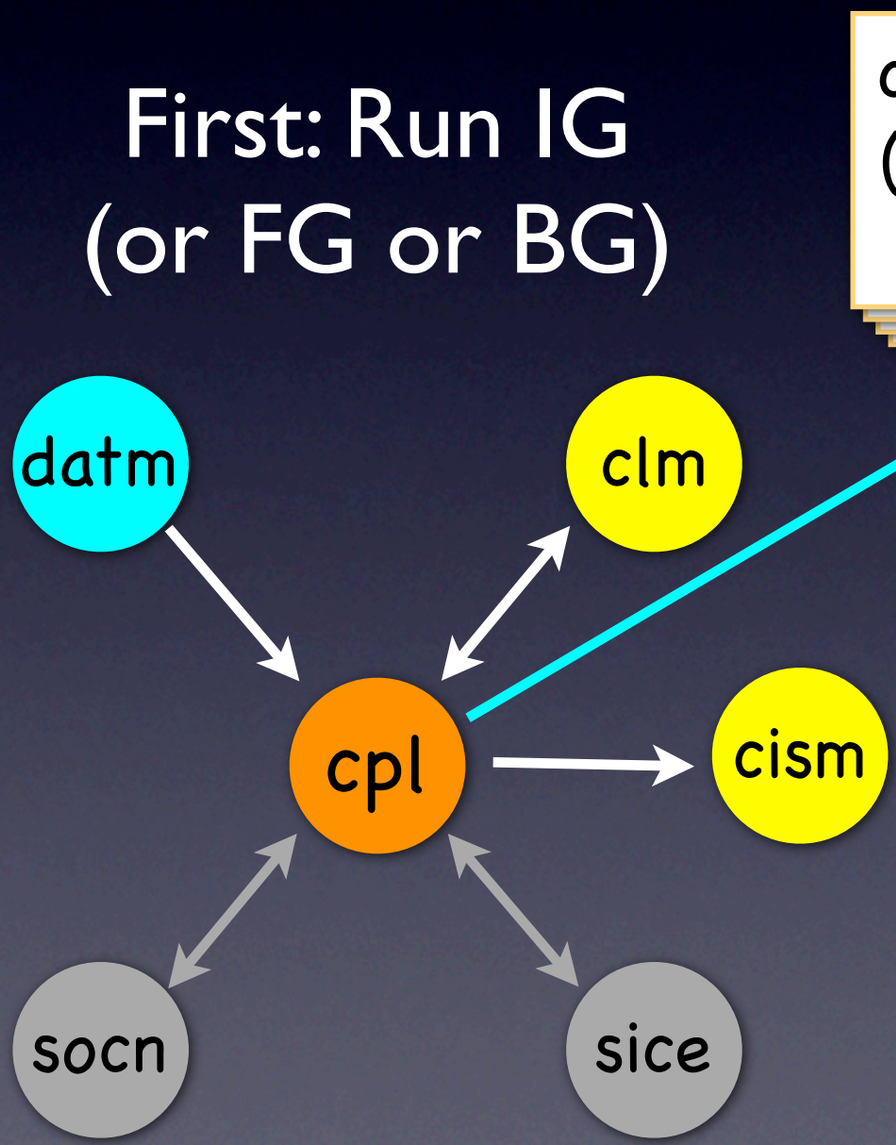

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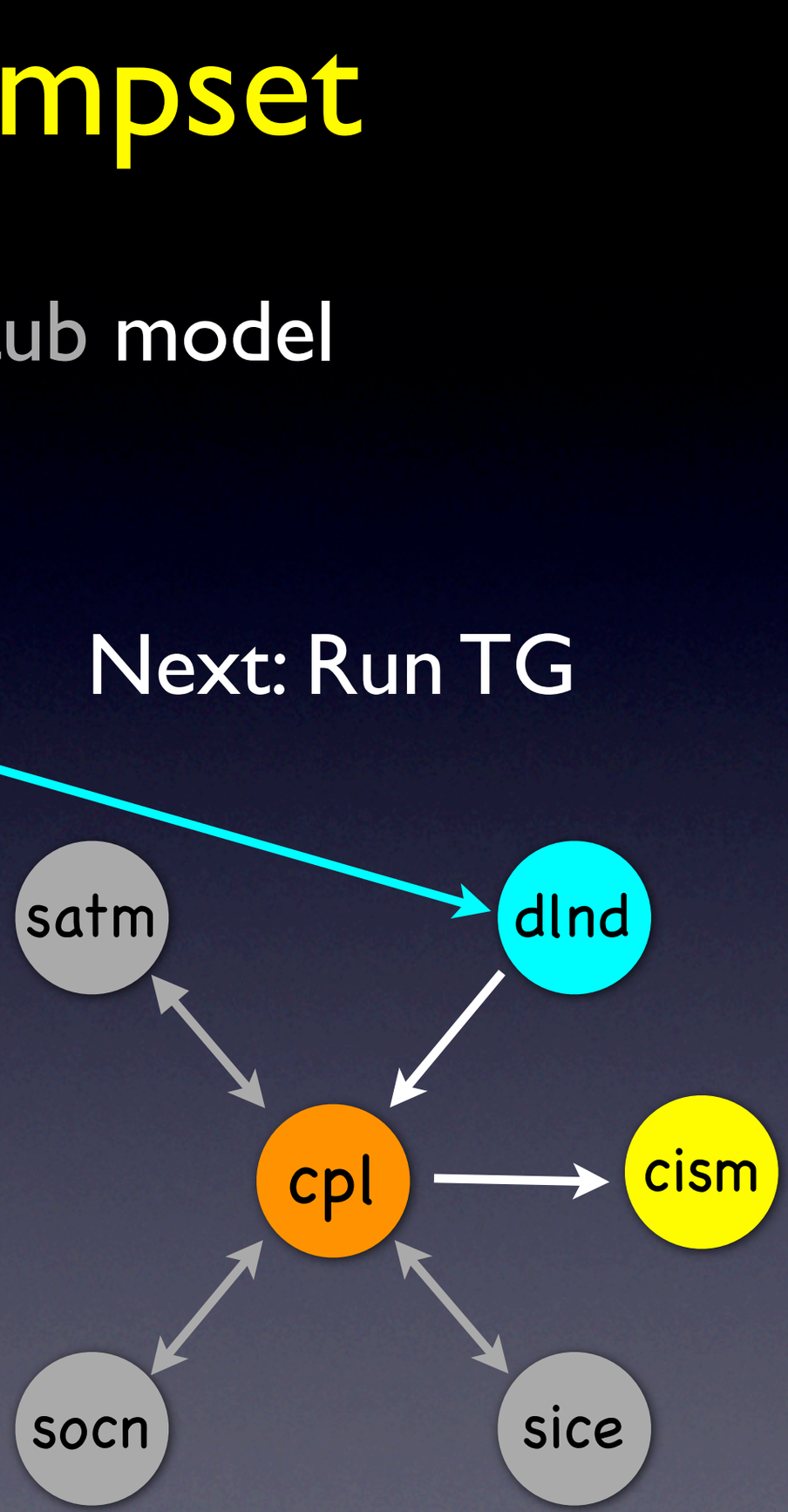

New CISM Features

- CISM2!
  - SEACISM dynamical core, parallel solvers, etc.
  - BICICLES coming soon
- Support for longer time steps in CISM and CESM scripts
  - e.g., 1-year time step
- New default Greenland grid: 5 km

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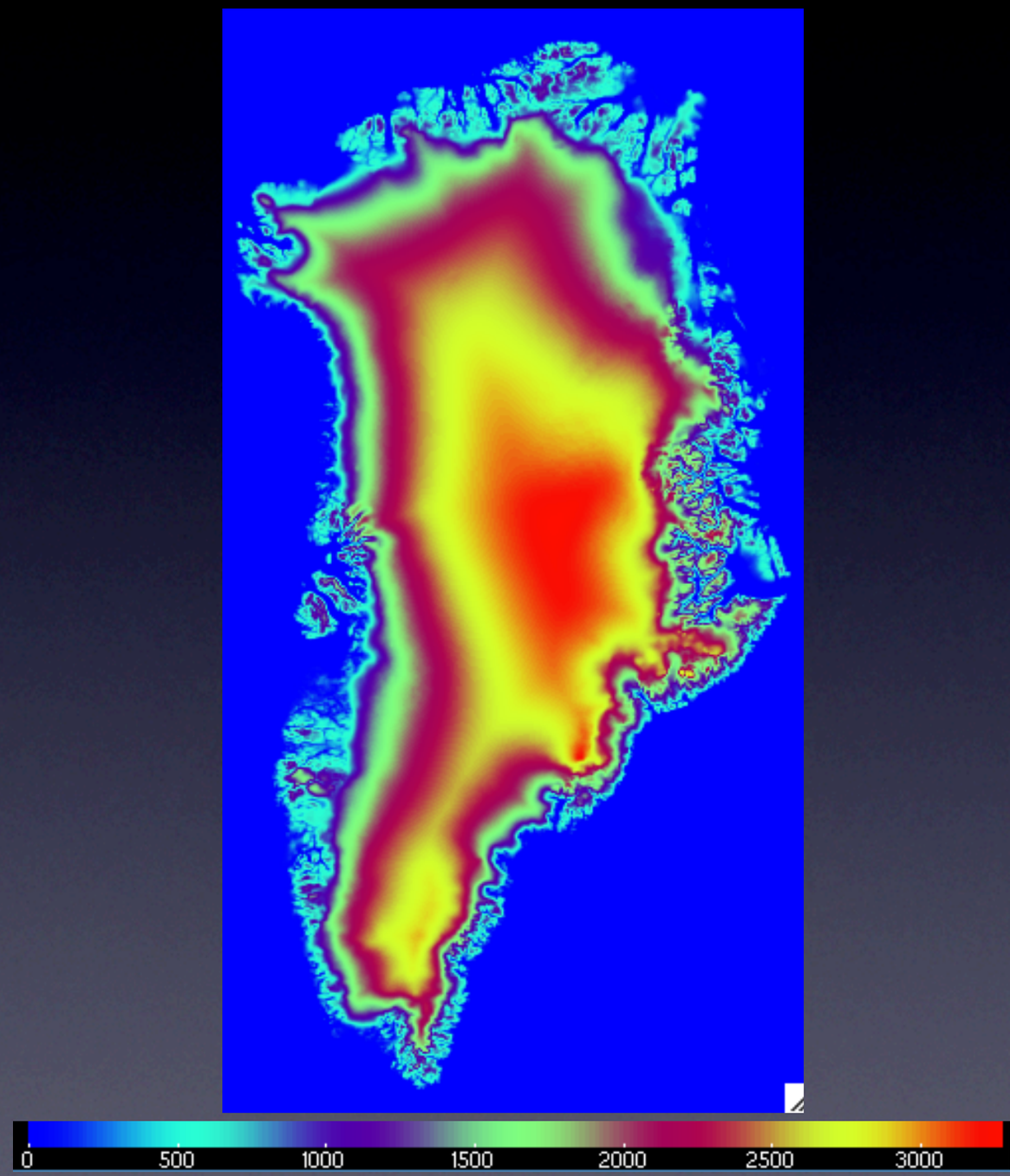

Greenland ice surface upper elevation (m)

Bamber et al. (2001); data set created by Jesse Johnson, Brian Hand, Tim Bocek - University of Montana

New namelist features

Namelist modifications go in $CASEROOT/user_nl_cism

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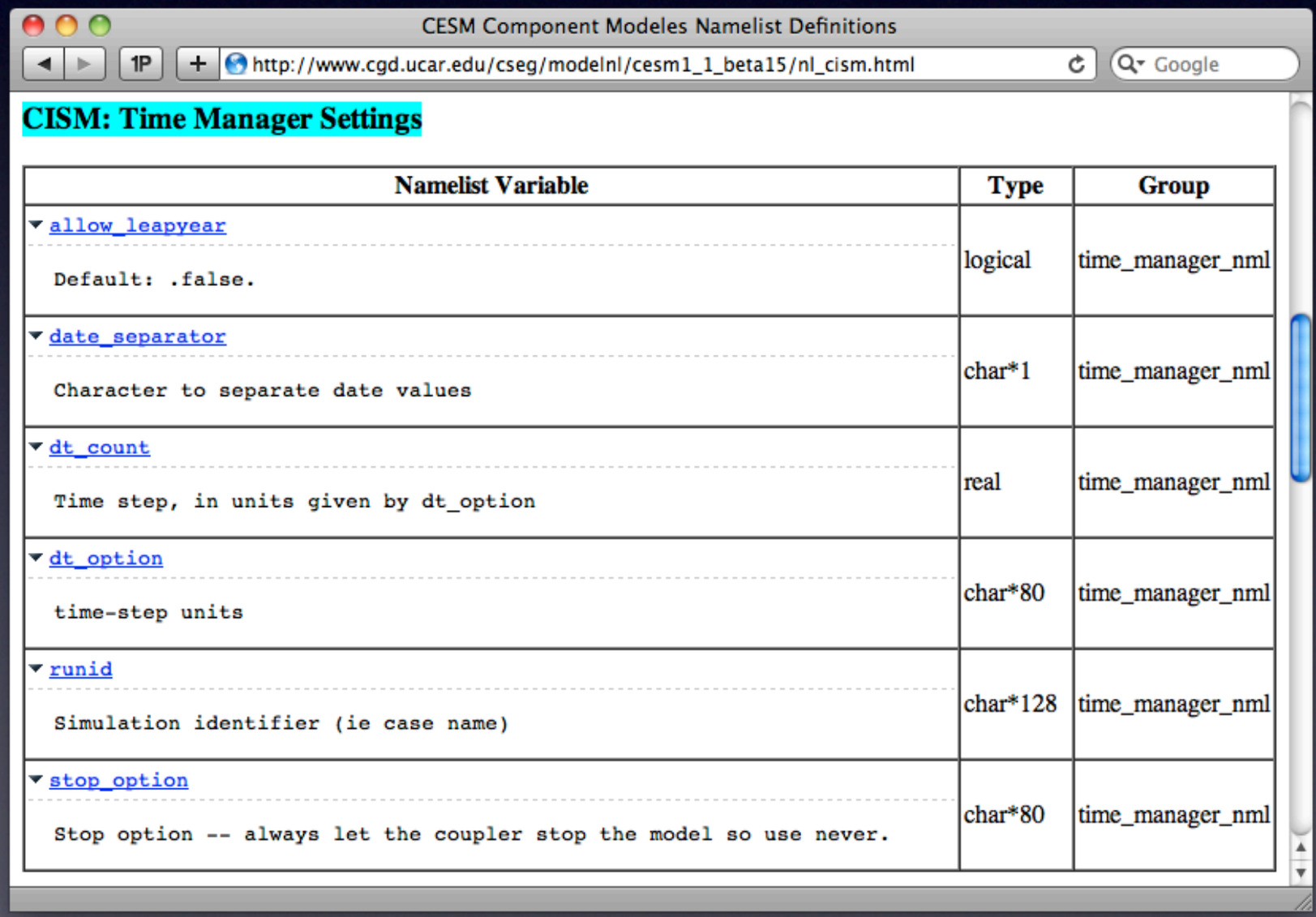
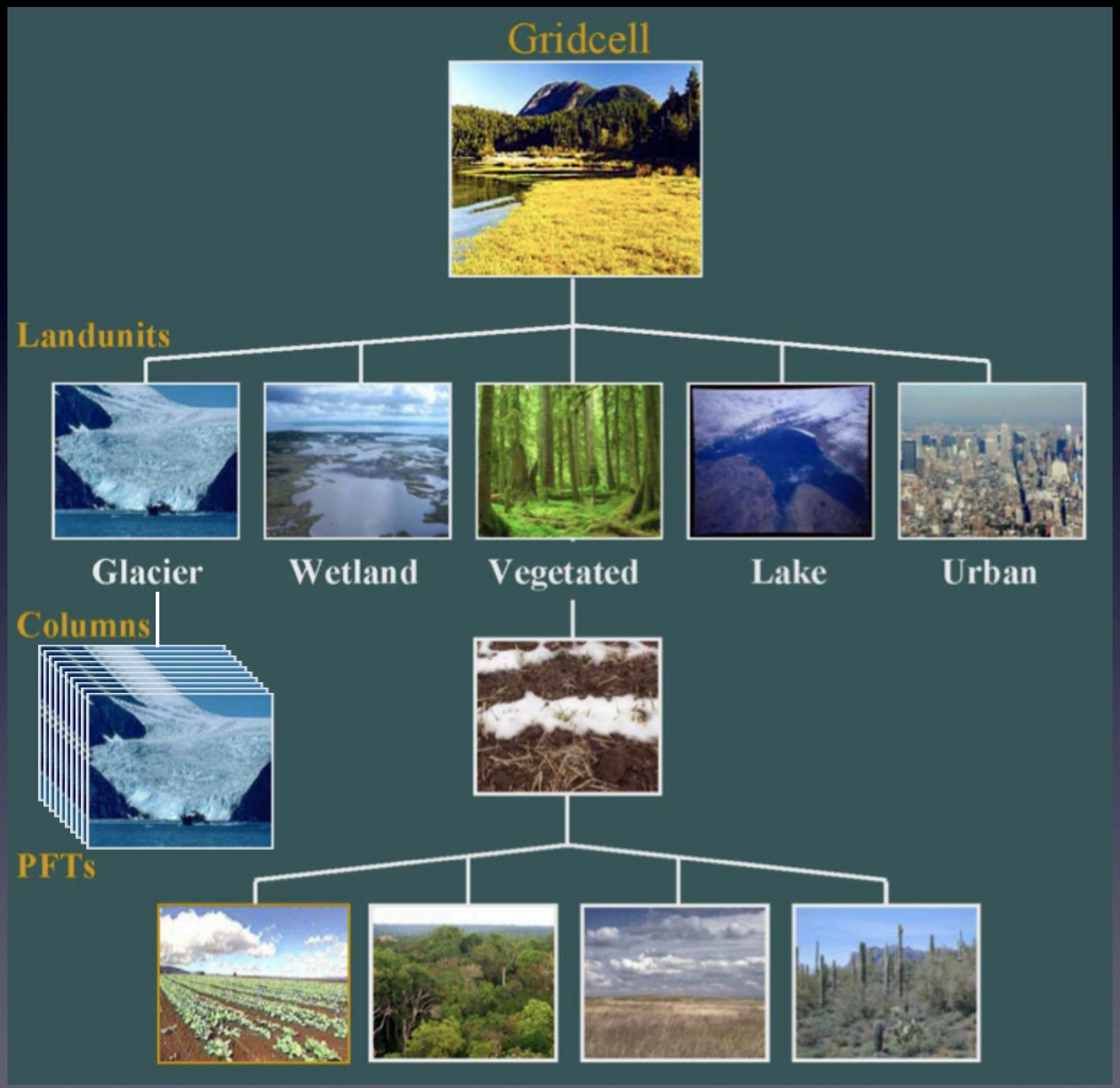


New CLM Features

- Improved glacier cover, consistent with CISM over Greenland
  - Global glacier mask from Alex Gardner
- Ability to output fields averaged only over glacier portion of each grid cell
- Glacier-related bug fixes

Dynamic Landunits in CLM

One column for each elevation class



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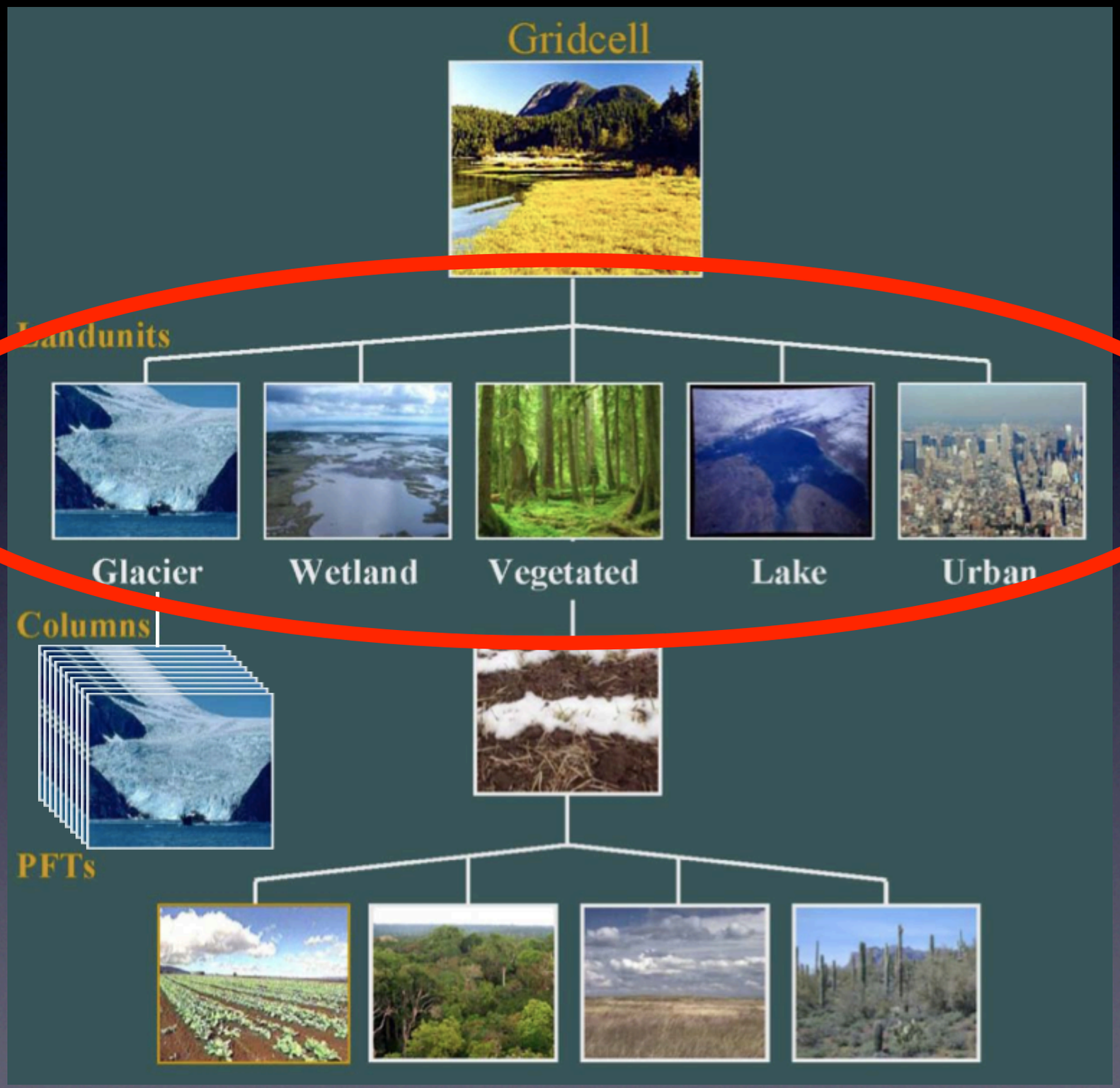

Currently: fixed fractions

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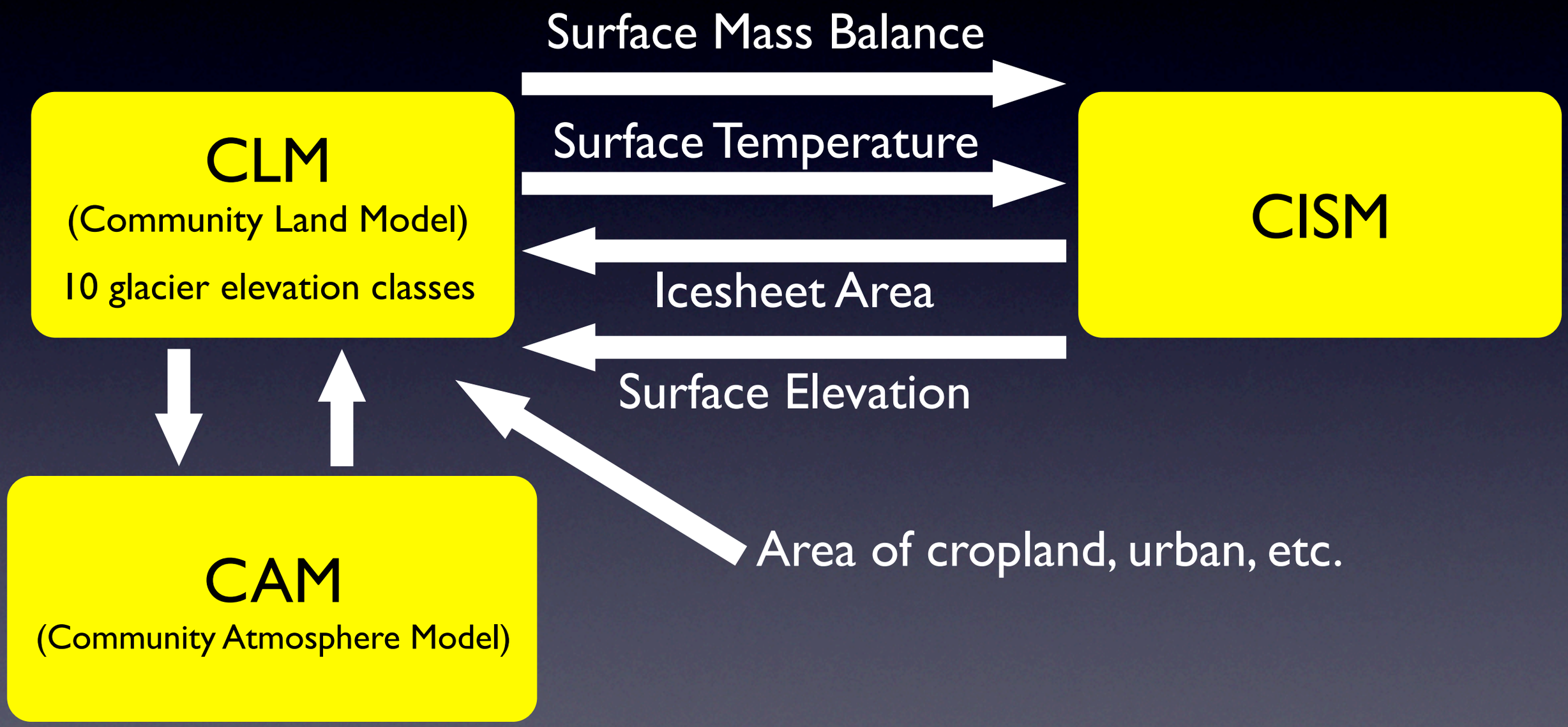

Summary: Major changes

- TG compset
- CISM2
- Improved namelist functionality
- Improved glacier cover in CLM
- Dynamic landunits in CLM (in progress)