

CAM developments towards CESM2

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**U.S. DEPARTMENT OF
ENERGY**

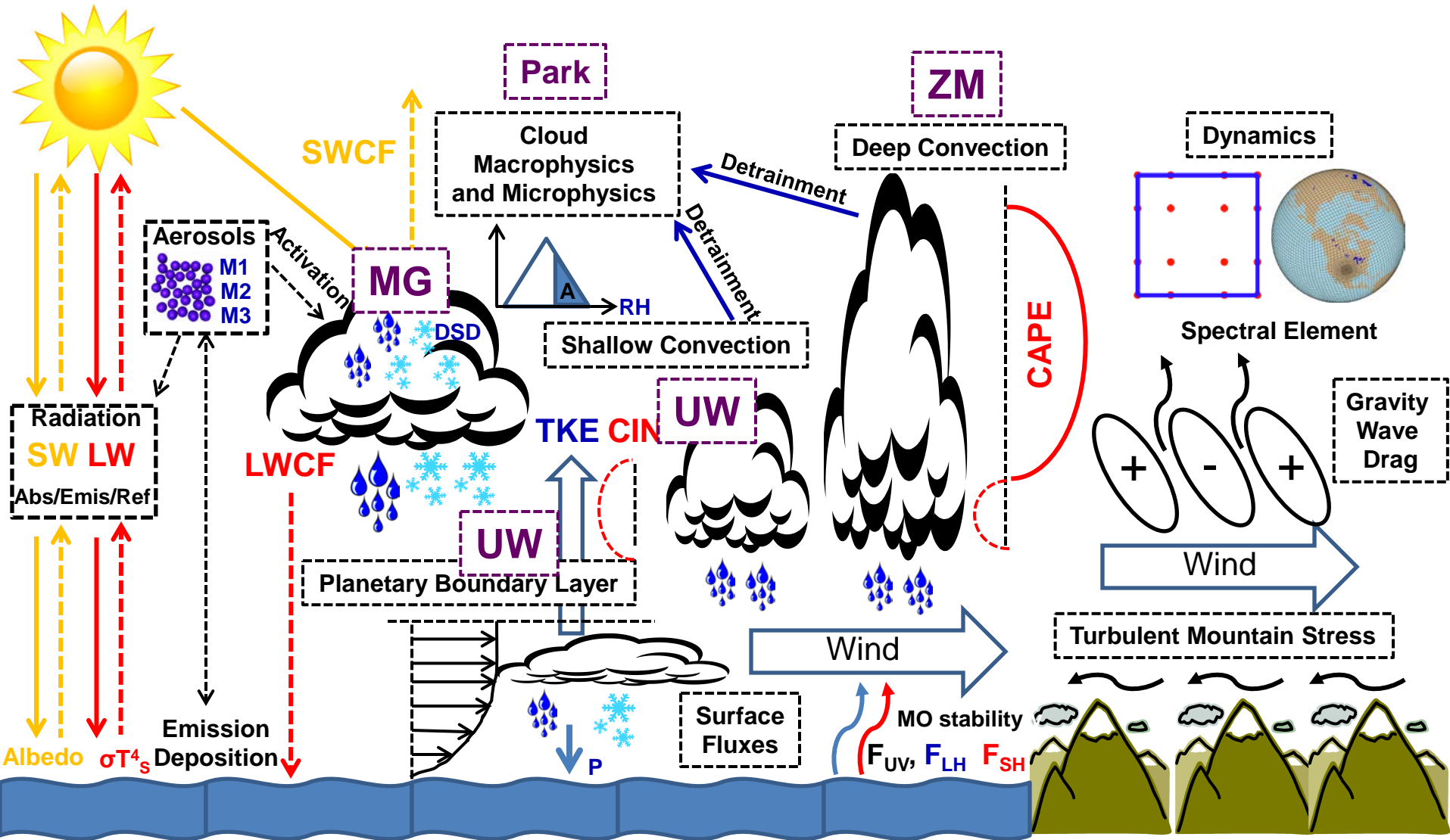


Model Changes from CAM5 to CAM5.5

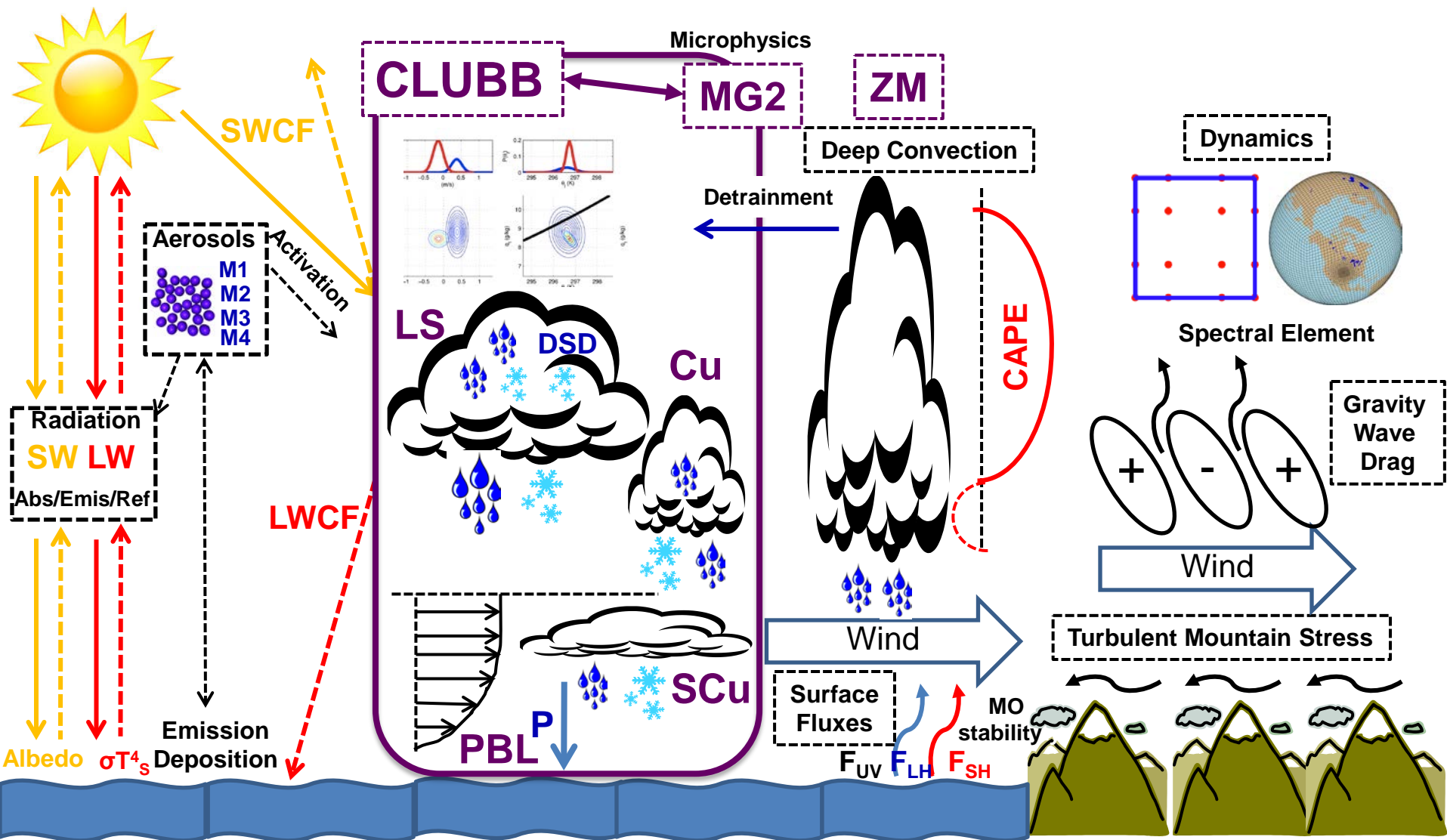
Running CAM5 from the trunk is no longer CMIP5 CAM5.

- **CAM5.1/5.2/5.3**
 - Bug fixes
 - SE climate testing (switch from Eulerian to Lagrangian vertical advection)
 - Large-ensemble (LENS) configuration
- **CAM5.4 (L32)**
 - Morrison-Gottelman (MG2) microphysics (Gottelman)
 - Modal Aerosol Model (MAM3->MAM4, Ma)
 - Mixed phase cloud ice nucleation dependence on aerosols (Liu)
- **Pre CAM5.5:** Panel recommendation: Move forward with CLUBB+CAM5.4
- **CAM5.5 (CESM1.5 testing)**
 - CLUBB (Bogenschutz/Larson/Gottelman)
 - Dust retune/erodibility
 - New orography specification (GTOPO30 (1996)->GMTED2010, Lauritzen)
- **CAM6 (CESM2)**

Community Atmosphere Model, version 5 (CAM5)

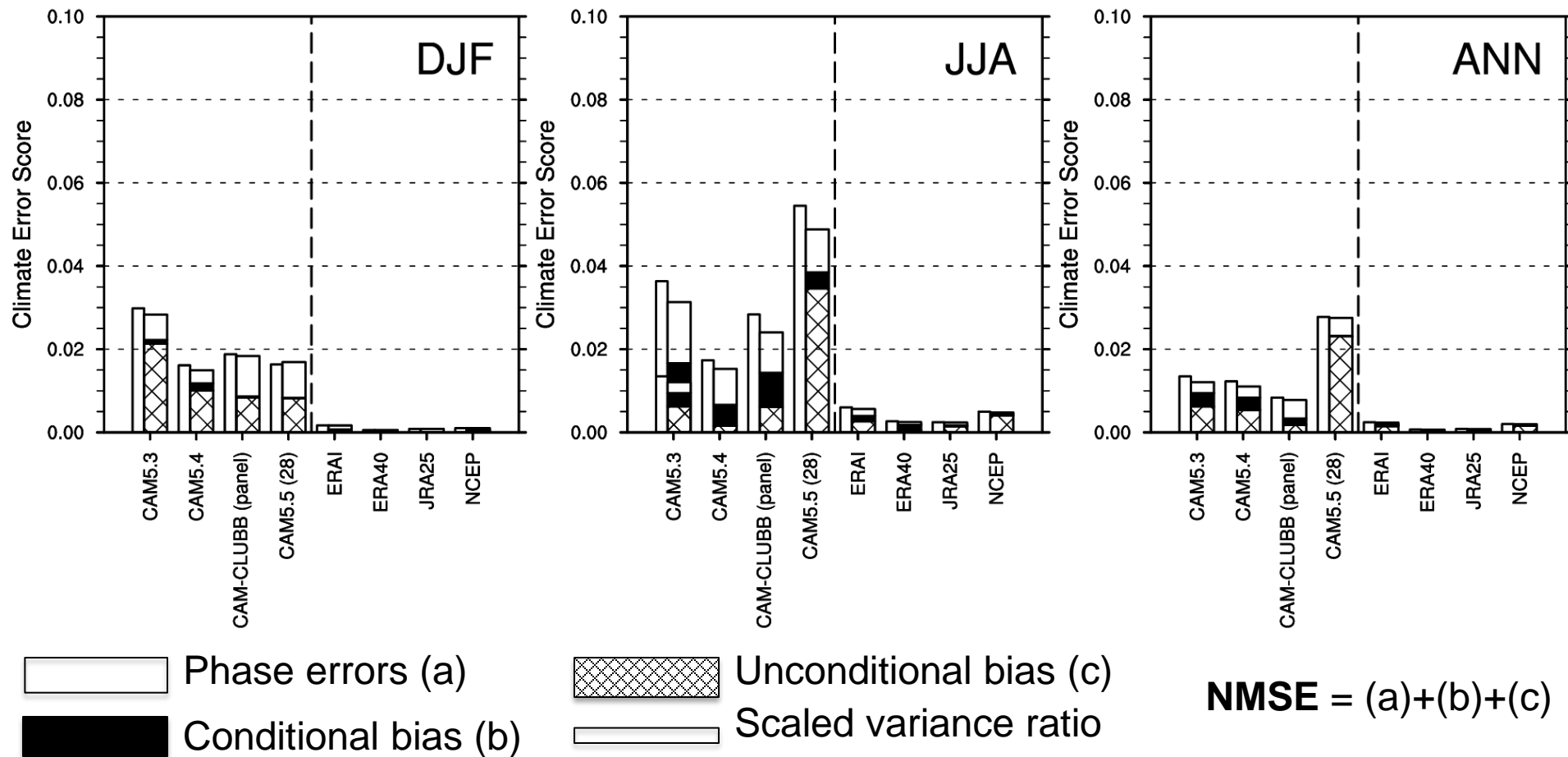


Community Atmosphere Model, version 5.5 (CAM5.5)



CAM5.5 summary performance

Mean 500-mb height based skill metric (CCSM3/4 J. Climate papers)



CAM Development Timelines

The path towards CESM2 and beyond (as of February 2016)

2015 (CAM5.5)

- CAM5.4
- CLUBB
- New orography

CAM5.5

CESM1.5

CICE5

CLM5

POP2

- Focus on 1850/20th C simulations
- Simulation concerns

Building Coupled System

2016 (->CAM6)

- Coupled system tuning
1. CLUBB tuning (radiation distributions)
 2. Auto-conversion (indirect effects)
 3. Ridging/drag/momentum (surface impacts)
 4. Deep convection ZM modifications (tropical variability)
- Integration with WACCM (ice clouds)

CAM6 model in CESM2 for CMIP6

Release

2017 (CAM6+)

- Scale-aware physics
- CLUBB-SIHLS
- UNICON
- Convective microphysics
- Stochastic physics
- SE at low resolution
- CSLAM
- MPAS
- Increased vertical resolution
- Regionally-refined cases

0.25 deg SE

CMIP6 High-res MIP

1 deg FV

CMIP6 Deck

2 deg FV

Paleo+Small resource users?

Mar: CAM6 outline

Jul: Define CESM2

Sep: Code freeze

2015 (CESM1.5)

2016 (CESM2)

2017 (CESM2+)

AMWG Web page

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Atmosphere Model

AMWG

Welcome to the AMWG webpage.

The Atmosphere Model Working Group (AMWG) is a broad collection of researchers across university and federal institutions engaged in atmospheric science research using the [Community Earth System Model \(CESM\)](#). The overarching goal is to continually develop the [Community Atmosphere Model \(CAM\)](#) in order to periodically provide new versions for use by the wider CESM community.

The AMWG sets short and long term [development](#) targets to guide community research. Development focuses on research into new and existing physical parameterizations, dynamical cores and added functionality for CAM. To this end close interactions exist with the [Chemistry–Climate Working Group \(Chem–ClimWG\)](#) and the [Whole Atmosphere Working Group \(WAWG\)](#). Ultimately, we aim to deliver the best representation of the atmosphere to be used in multiple applications for climate, climate variability and climate change research.

COMMUNITY ATMOSPHERE MODEL (CAM)

The Community Atmosphere Model (CAM) is the latest in a series of global atmosphere models developed at NCAR for

Community Earth System Model
Community Atmosphere Model
Representing the key atmospheric processes in CAM5

AMWG INFORMATION

- AMWG Priorities
- AMWG Metrics and Diagnostics
- CAM development
- CAM simulations
- Developers' Guidelines
- AMWG News
- Upcoming Meetings
- Past Meetings
- Research Highlights
- AMWG Diagnostics Package

http://www.cesm.ucar.edu/working_groups/Atmosphere

- Developments
- Control simulations
- Diagnostics
- Meetings + presentations

Questions?

