

Strategic Implementation Plan (SIP) for a Community-based Unified Modeling System



Global Modeling Test Bed (GMTB)

Presented by

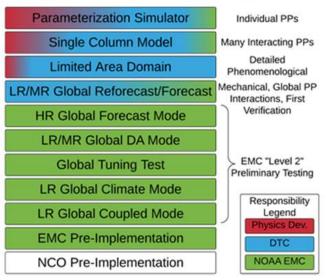
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Presented at NOAA Community Modeling Workshop April 18-19, 2017; College Park, MD

GMTB activities

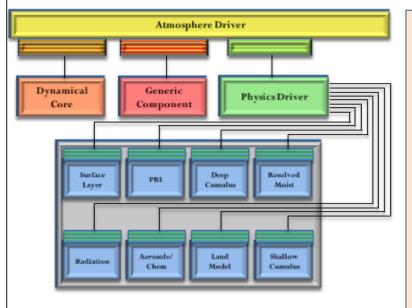
- Development and maintenance of testing infrastructure
 - Single column model, global workflow, verification, diagnostics
- Testing and evaluation
- Common Community Physics Package
 - A collection of physical parameterizations, grouped in suites, that can be used with multiple dynamic cores
 - A framework that enables collaborative development and R2O

GMTB/EMC Testing Hierarchy



What is the Common Community Physics Package (CCPP)?

The nucleus of an R20 community



- CCPP is a collection of dycore-agnostic, vetted, physical parameterizations. There can be multiple of each type (PBL, cumulus etc.) to support various applications (high-res, climate etc.) and maturity level (operational, developmental)
- Dycore agnostic means that the parameterizations can be used with any dycore
- Vetted means that there is a process to determine what is included in CCPP at each layer

CCPP will be distributed in a community-accessible repository (GitHub)



Why have a CCPP?

- To support the implementation of the best physics suite for NCEP operations
- To tap into intellectual capability outside of NOAA by creating a system that allows scientists in multiple institutions to develop a common set of physics
- To a system that supports both operations and R&D with community involvement, and stimulate development of the priorities listed in the <u>NGGPS Physics Team Plan</u>, with initial focus on recommendations from <u>NGGPS Physics Workshop</u>



Workflow for Physics Development

Action

Scheme Status

Call for developments

Developer answers call; connects scheme to IPD interface: introduction to code/doc standards

Physics Testbed

Complexity Tier 1 Tier N

Regression + Comp. Perf. Testing

Initial Review

Physics Evidence of improvement?

Oper./Res. demand?

Technical · Passed regression test?

Comp. performance?

Code/doc standards met?

Test Plan

More Physics Testbed runs + external testing (i.e. EMC pre-implementation, parallels, friendly "Beta")

Final Review

Developer's initial code

Code resides in CCPP repo branch

Improved code through iteration

Standards-compliant + passed initial review

Code admitted to CCPP trunk

Responsibility Legend Physics Dev. DTC

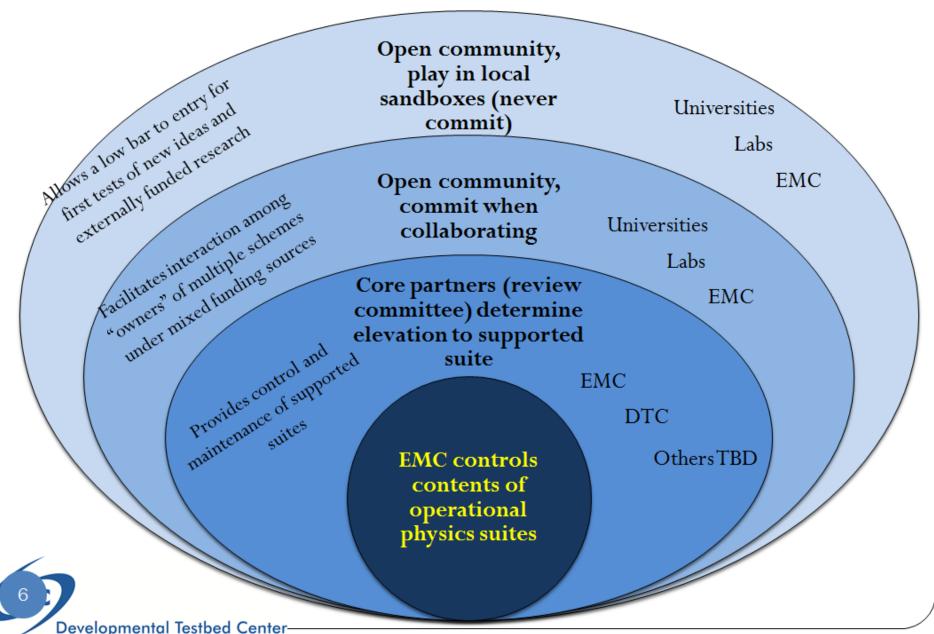
Time

Physics Rev.

Technical Rev.



CCPP Ecosystem



Summary

- GMTB will maintain and support CCPP
- GMTB will maintain a physics testbed for GMTB staff and community scientists to conduct experiments
 - This is on Theia (NOAA R&D) since currently we do not have a more open platform to use
- Additional community support for other components of NGGPS need to be considered:
 - Other component models (land, ocean, ice)
 - Other atmospheric sub-components (i.e., FV3 dycore)
 - DA, ensemble, ... etc.

