

HAFS Telecon
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HAFS activities within GMTB: Physics and Workflow

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Global Model Test Bed (GMTB)

Developmental Testbed Center (DTC)



Projects in GMTB

	Org	Funding	Area
CCPP Hierarchical testing framework (HTF) Single-column model (SCM) Diagnostics Release/support Testing and evaluation	NCAR/GSD	NGGPS	Various
HTF: SCM enhancements	NCAR	HSUP	Physics
HTF: Case studies for testing UFS	GSD	HSUP	Physics
CCPP regression test	NCAR	HSUP	Infrastructure
HWRF physics in HAFS	NCAR/GSD	HSUP	HAFS
HAFS workflow	GSD	HSUP	Infrastructure

} This talk

All projects are collaborative. Worth mentioning that the HAFS Workflow project has close interdependencies with NCAR CGD (CESM group)

HWRF Physics for HAFS

Presented by Ligia Bernardet

Parameterizations in CCPP

Current						Planned	
	FV3GFS (released)	FV3GFS v1.1	CPT	GSD	Others	HWRF	Others
Microp	GFDL	GFDL	M-G	Thompson	Zhao-Carr	F-A	
PBL	GFS/EDMF	TKE EDMF	GFS/EDMF	MYNN	SHOC,YSU, saYSU	GFS/EDMF*	
Sfc layer	GFS	GFS	GFS	GFS	MYNN	GFDL	
Deep cu	saSAS	saSAS	CS	Grell-Freitas	Tiedtke	saSAS*	
Shallow cu	saSAS	saSAS	saSAS	MYNN	SHOC	saSAS*	
Radiation	RRTMG	RRTMG	RRTMG	RRTMG		RRTMG*	RRTMGP
GWD	GFS	GFS	GFS	GFS			uGWD, RAP
Land	Noah	Noah	Noah	RUC		Noah*	
Ozone	NRL 2006	NRL 2015	NRL 2015	NRL 2015			
H2O		NRL	NRL	NRL			

*HWRF parameterizations may have the same name of their GFS counterparts but the code is different

HAFS Physics project

- Add HWRF physics to CAPP
- Test in HAFS
 - Configurations: global and stand-alone regional
 - Sample: a few storms identified in consultation with EMC
 - Workflow: use what is available when tests start (coupled? DA?)
 - Compare results using HWRF, FV3GFS, and FV3-SAR suites

Deliverables	
Project Starts	Q3FY19
HWRF parameterizations in CAPP	Q1FY20
Successful HAFS v0 runs using the HWRF suite	Q2FY20
Test plan	Q2FY20
Report on test results	Q3FY20
Communication of results at conference	Q3FY21

Improving HAFS Workflow Usability, Portability, and Testing Capabilities

Presented by Evan Kalina

Motivation

- How should the community interact with the HAFS workflow?
Where is it housed, and what is its governance?
- Many tools (UFS Utilities, NCEP Libraries, CROW) not publicly available.
- There are a variety of potential starting points for developing a HAFS workflow.
 - FV3 Global, FV3 SAR, HWRF, HFIP summer demo, CROW, CIME
- Limited clarity on whether/how HWRF scripts and CROW should be used in the HAFS workflow.
- Current ability to perform hierarchical testing within the HWRF workflow is limited.

Desired project outcomes

- Foster a community development environment for the HAFS workflow that is publicly accessible
- Develop a prototype flexible HAFS workflow that is easy to configure, build, run, and port
- Enable hierarchical testing (using canned datasets to run components of the coupled modeling system)
- Enable transition to operations by providing researchers with a system that is similar in capabilities to the operational workflow

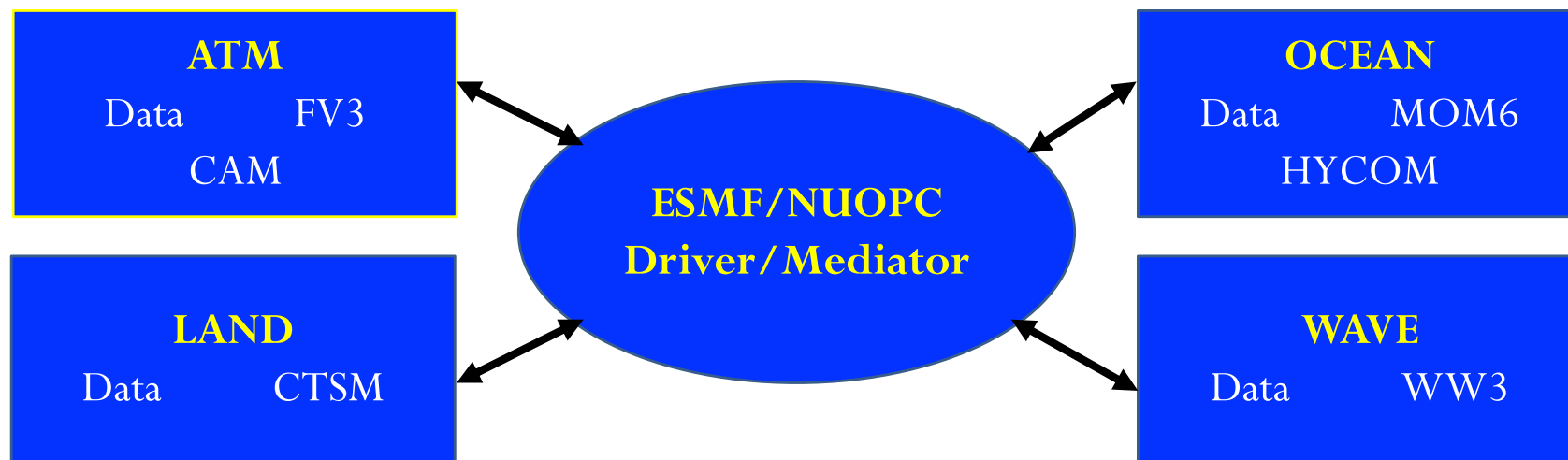
What is CROW?

- The Community, Research, and Operational Workflows
- Envisioned as an end-to-end common workflow for all NCEP models
- In present form, it is a front-end only
 - Defines which jobs to run based on user-provided configuration (i.e., create XML for Rocoto/ecFlow)
 - Similar in functionality to Python's ConfigParser in HWRF



What is CIME?

- The Common Infrastructure for Modeling the Earth
- Contains a Case Control System for configuring, compiling, and running earth system models
- Runs CIME-compliant model components (and data components) through ESMF coupler

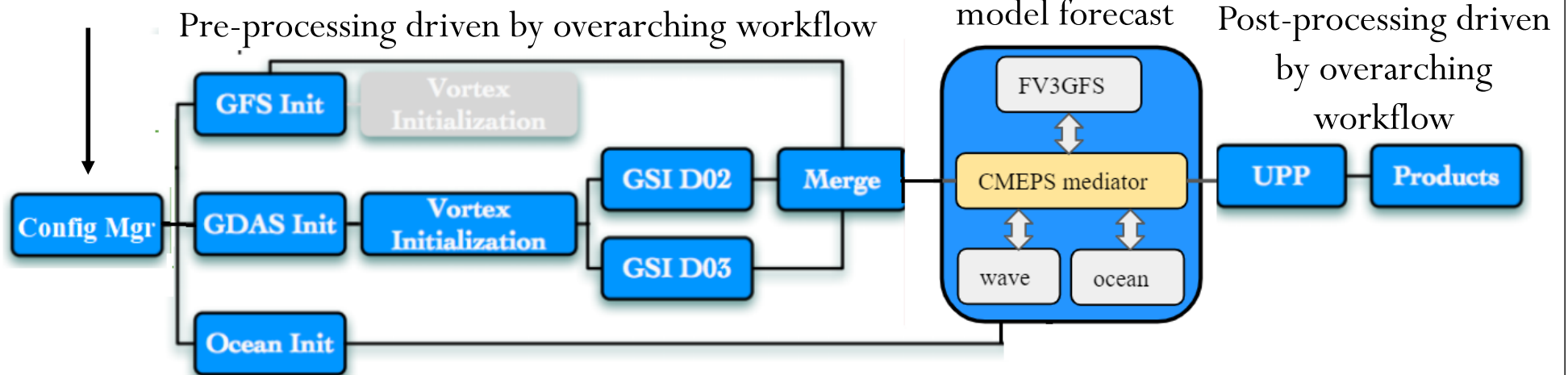


Moving forward

- Create and decide on governance for UFS Workflows repository
- Conduct community review to determine how to use CROW
 - Will CROW be developed further?
 - Is it being considered for use in other UFS applications?
 - Does it provide functionality that we need?
- Determine how best to configure HAFS and how to drive workflow
 - CROW, CIME, and the HWRF scripts are all possible options
- Make model components CIME compliant and generalize CIME data components to UFS (NCAR/CGD work)
- Assemble a prototype workflow

High-level HAFS T20 workflow design

Leverage CROW,
CIME, and/or
HWRF



*Actual scripts used to run each component would come from current HAFS development effort.

Project milestones and timeline

Deliverables	
Project Starts	Q3FY19
Create and establish governance for UFS Workflows repository	Q1FY20
Community review of CROW	Q2FY20
Demonstrate that CROW or alternative can interact with CIME	Q3FY20
Plan/document design of the HAFS transition-to-operations workflow	Q4FY20
Demonstrate a HAFS workflow prototype	Q3FY21

GSD FTE: 0.40 (Year 1), 0.36 (Year 2)