

A Community Workflow for the Limited Area Model (LAM) Configuration of the FV3

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Abstract

In this poster, we present various aspects of the community workflow being developed by the DTC (Developmental Testbed Center, a collaboration between GSL and NCAR) and others for running the limited area model (LAM) configuration of GFDL's FV3 (Finite-Volume-Cubed) global atmosphere model (also known as the regional FV3). This work is part of a multi-center/NOAA lab effort (GSL, EMC, NSSL, and NCAR) to develop an FV3-LAM that will be accessible to and usable by the wider research community (e.g. NCAR, university researchers). The set of experiment and workflow generation scripts are easily configurable and include extensive error and compatibility checks to inform the user of inconsistent configurations before any forecast experiments are launched.

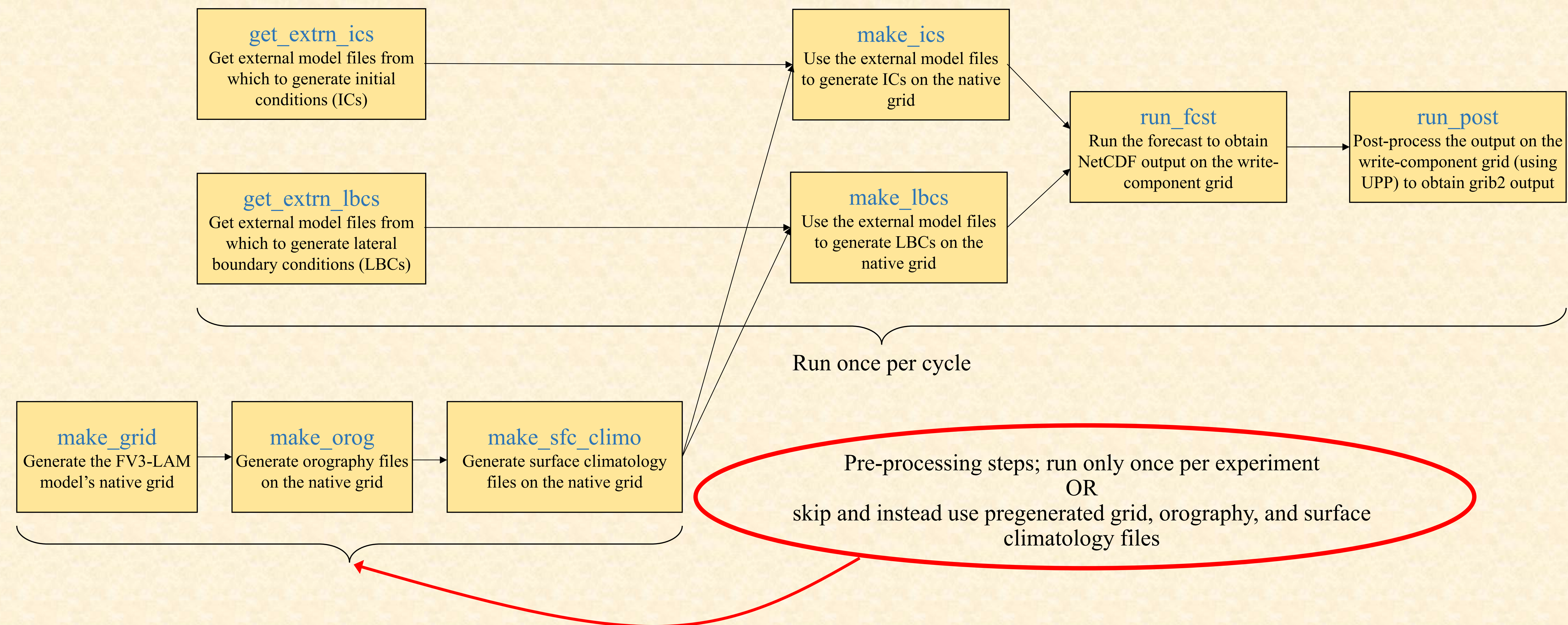
Current capabilities of the FV3-LAM community workflow include:

- Generation of arbitrary regional grids. For convenience, several pre-defined grids are available in workflow.
- Generation of filtered topography and climatological fields on regional grids.
- Automated fetching of external NWP model files from which to generate initial and lateral boundary conditions (ICs and LBCs) from various sources. External model can be FV3GFS, GSMGFS, RAP, HRRR, and/or NAM.
- Remapping of fields from the external model grid(s) to the native grid to generate ICs, surface fields, and LBCs.
- Use of various Common Community Physics Package (CCPP) physics suites.
- Running with multiple cycle dates (no DA capability yet).
- Running of ensemble forecasts with stochastic physics.
- Output on either the native grid or on grids supported by EMC's write-component regridding utility.
- Post-processing of output using the Unified Post Processor (UPP).
- Python plotting scripts for grib2 output from UPP.
- Script and directory structure that complies with operational (NCO) standards.
- Running of experiments in either operational (NCO) or research (community) mode.
- Running of experiments with or without the rocoto workflow manager and/or a job scheduler (e.g. slurm).
- Support for multiple computing platforms.
- Testing infrastructure to ensure that new workflow features behave as expected and do not break existing functionality.
- Detailed documentation

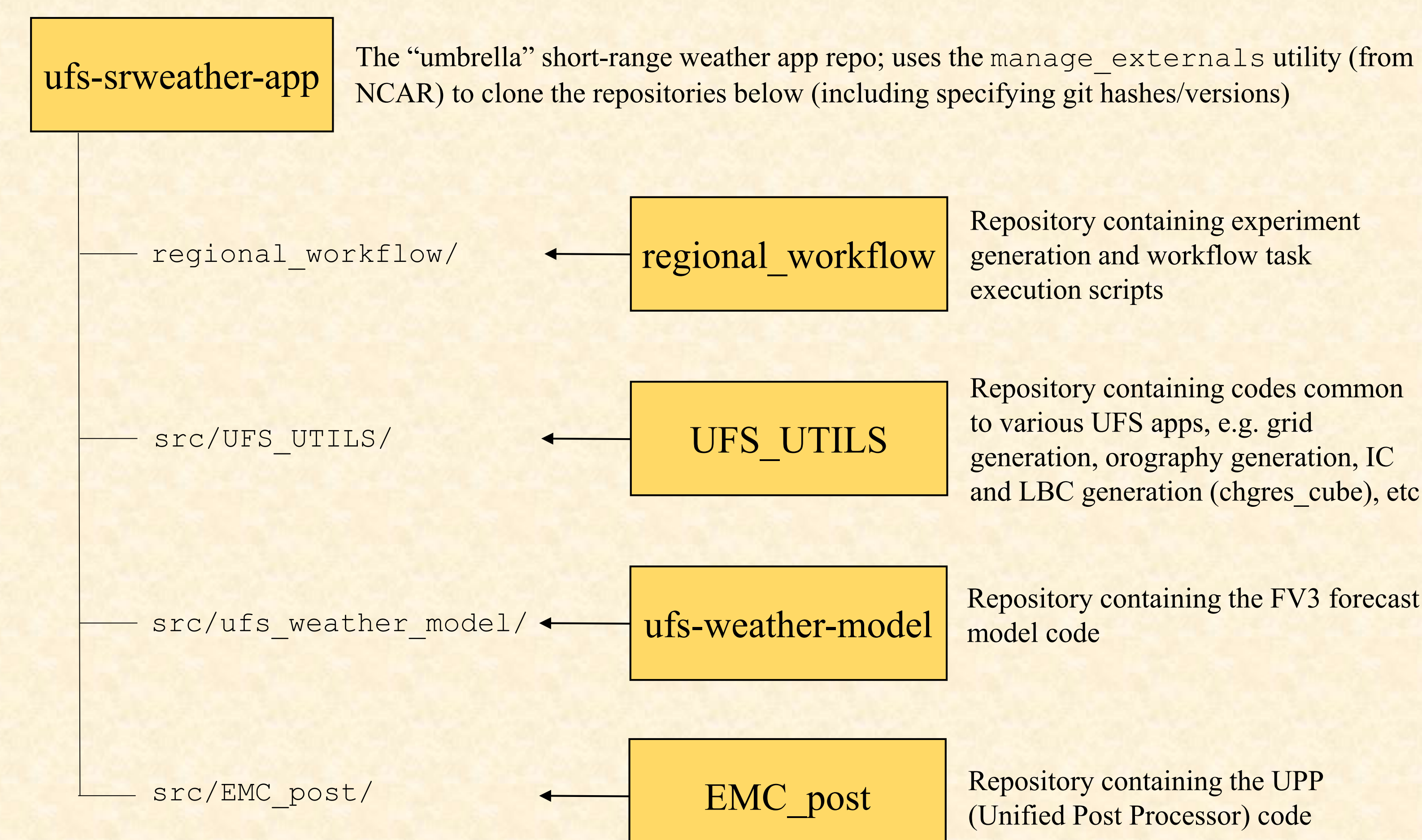
How to Obtain the Workflow

- Visit homepage of the UFS Short-Range Weather App's repository:
<https://github.com/ufs-community/ufs-srweather-app>
- In the description section towards the bottom, click the link to the Getting Started page and follow the instructions!

FV3LAM Workflow Tasks



Repository Structure



Ongoing Work

- First public release (version 1.0) of the `ufs-srweather-app` happened on March 4, 2021:
 - Can be found on the `release/public-v1` branch of the `ufs-srweather-app` repository.
- Features currently slated to be added to the workflow:
 - Real-time and DA (data assimilation) capabilities:
 - New workflow task for GSI
 - Ability to start model from restart files
 - User-configurable vertical coordinate (currently fixed at 64 levels):
 - Number of levels
 - Distribution of levels
 - Model top pressure
 - Transition level from sigma to isobaric coordinates
 - New workflow task for METplus verification
- Workshop/tutorial planned for 2021

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