2020-03-19

Yannick opened the meeting by welcoming everyone, and in light of the telework situation, asked for suggestions on how to make communications of this kind effective.

This is a general communication week so we went around and collected updates from everyone.

Rahul is working toward being able to compare JEDI forecasts with stand-alone forecasts using the FV3-GFS model. He is currently building a CMake configuration for the GFS model code repository so that this repository can be easily integrated with JEDI bundles.

Rahul is assisting with the integration of FV3-GFS applications into the jedi-rapids workflow. He is testing H(x) first and will follow with cycling runs. Rahul is helping with the management of the storage and access to model configuration and setup files, and with regression testing.

Rahul asked for help with his work on MAGIC (Model Agnostic Grid Interface Construct). MAGIC should allow for a generic interface to Geometry, State and Increment, but there are practical issues surfacing when implementing this feature. A short discussion ensued, and it was noted that MAGIC should facilitate: switching grids, integrating a new model with an exotic grid, and developing coupled DA.

Anna has a PR in under review that will allow/facilitate running H(x) and MakeObs without having to use a model. Later in the meeting it was clarified that this PR will replace a 3D H(x) app with a "NoModel H(x)" app. The NoModel H(x) app will be able to read the state from a file thus eliminating the need for a model to supply these data. The PR is expected to be merged in within the next couple of days.

Steve H has published a set of ioda obs test data on S3 of which all netcdf files are in compliance with IODA conventions (that is, all the netcdf files pass the ioda file checker). There are no necessary code updates as all related tests (UFO, IODA and FV3 were tested) continue to pass. The next step in this work is to add a ctest that runs the file checker on the ioda test data so that we can catch files out of compliance when they are introduced in subsequent updates.

Steve H is working on ObsSpace refactoring. This work has expanded into a joint effort by Ryan, Anna and Steve H to introduce a unified interface and obs storage container for a number of classes in UFO including ObsSpace, ObsVector, GeoVaLs, and IodaIO. An outcome of this work will be the introduction of dimensionality on observation variables. For example, this will allow the existence of a single 2D brightness temperature variable that is dimensioned as (Locations X Channels).

Xin will soon be submitting a series of 3 PRs related to obs bias correction. The first will organize the bias correction terms, the second will add a function to write out bias correction data, and the third will be a refactoring of the ObsBias classes in JEDI. Discussion ensued and it was noted that options for the bias correction output are YAML or netcdf. YAML provides an advantage of being able to feed the results into a subsequent DA run, while netcdf is more amenable to diagnostics (plotting). Another discussion point was how to get access to the number of obs that were kept or rejected after QC steps. It was noted that this information is available in the log files, which may be a good place to start (but might not be the best long term solution). Xin is open to suggestions anyone may have concerning these discussion points.

Guillaume gave an update on SOCA activity. Jong is developing a "freeboard" obs operator for UFO (PR under review). Hamideh is updating UFO obs operators for GMI, SMAP and surface obs. Work is underway to replace the marine obs operators in UFO with all C++ implementations, and Guillaume noted that the refactoring that Ryan, Steve H and Anna are working on may be helpful. There is general cleanup of the SOCA repo, and some variable transform work to fix issues that have surfaced with monthly cycling experiments.

Travis noted that recent PRs, containing fixes for handling S3 test data, have broken SOCA. He asked if there is a way to tell the system not to download unnecessary data. Maryam responded mentioning that a PR that got merged very recently contained a fix for this. Now, no downloads will occur until a related "download" test is run. For example, if you run only the SOCA tests then the IODA and SABER test data won't be downloaded (since the IODA and SABER "download" tests were not run).

Clementine is running EDA with 80 members using low resolution. She is working with Benjamin to resolve some issues that came up in regard to the B-Matrix. Clementine is also making progress in verifying an ensemble O minus B calculation.

Mark O is working toward running a real-time H(x) application in jedi-rapids. He is starting with the FV3-GEOS model running on Discover (since the required GEOS backgrounds are currently available on Discover).

Mark O is integrating different models into jedi-rapids including FV3-GFS, FV3-GEOS, WRF and SOCA. He is also working on EDA integration. Various people (eg, Rahul) are helping Mark organize all of the different model configuration and setup files. This work should help smooth out future model integration. Mark noted that two people, Nan and Clementine, are contributing to the development of jedi-rapids, which is helping smooth out the path for future contributors.

Mark M is working toward a container solution for HPC systems that works across multi-nodes and multi-stages. He has started with a Singularity container on S4 and expects to have H(x) working soon. Once working on S4, he will move to Discover next. Mark noted that the Singularity container is based on Intel compilers since these are the primary supported compilers on S4 and Discover.

Nan is working on the real time H(x) application. It is close to running to completion, and he will work on validating the results next.

Ryan is helping develop the new IODA interface and obs storage scheme that Steve H reported on. Ryan is creating a skeleton interface of which he will hand off to Steve tomorrow. Yannick noted that this work will help resolve some problematic aspects of the current GeoVaLs implementation.

Chris H reported progress with the shallow water model. He has caught up with recent OOPS changes (such as the Variables refactoring), and is compliant with Anna's new PR that introduces the NoModel H(x) application. Chris noted that H(x) with the shallow water model is working properly.

Steve S (UKMO) reported on the development of the UM JEDI integration. Marek is making good progress on the interface. Steve expressed interest in MAGIC explaining that it should fit in well with what they are doing with UM. Rahul added that he will put MAGIC into a JCSDA repo so that others can see it. Rahul noted that MAGIC is all C++, and that it can read netcdf files (using the netcdf C++ API).

Wojciech has two PRs under review. The first contains a buddy check QC filter, and the second introduces nesting capability for the OOPS Parameters class. Wojciech introduced a new team member, August, who will be working on the obs processing side at the Met Office.

Sarah L reported on a meeting with EMC and Goddard where it was decided to move a module in CRTM, that builds lookup tables, to an external stand-alone tool. With the development/enhancement of aerosol aware radiance simulation, moving the table generator to a stand-alone tool will facilitate the creation and maintenance of the lookup tables.

Iliana is making good progress with satellite observation QC filters. She mentioned that she has added new output variables written by some of the ioda-converters, and Ryan will help with getting these changes merged in.

Cory reported that he and Rahul presented an overview of JEDI to the EMC DA team, and he announced that EMC will start using JEDI for development.

Chris S announced that NCAR is looking at RTTOV, and that Jake is working on a C++ interface to RTTOV. Mark M mentioned that David Rundle may create a JCSDA repo for RTTOV, but this is contingent on being able to adequately enforce the license agreement. David is working on a CMake configuration for RTTOV in preparation for the JCSDA repo. Both Yannick and Tom agreed that this should work since we already have a couple of examples of licensed code in JEDI (such as ROPP).

Mark M volunteered to be the point person for RTTOV. Later in the meeting Mark announced that he would create the RTTOV repository today and to send him email if you want access to the repo. You will need a license agreement to get access. If you don't have an agreement email Mark and he will help you get started. Steve S asked if a site can have a blanket license (giving everyone from that site access), and this will have to be researched before answering.

Steve V is creating a CMake configuration for the MPAS model code with the goal to eliminate the need for a build script.

A discussion started up about addressing the issue where changes in the core JEDI system can sometimes break the models (such as the issue with SOCA that Travis mentioned today). The general idea is to have containers for each model that run "build and test" on a periodic (nightly for example) basis. The devil is in the details however, and there are hurdles to overcome such as access from within the container to all the pieces needed for building the models, container bloat and extended test runtimes. Suggestions are welcome!

Yannick closed the updates at this point. He asked for feedback about how well the meeting worked given the many connections due to the telework situation. As a note, roughly 30 connections were made during the meeting, and the technology seemed to handle that load sufficiently. Several people gave a thumbs up so for now we will continue with how we did the meeting today.

Yannick reminded people to use other means of fostering communication such as email and github during the telework period.

Next week is a special topics discussion. Please forward any topic suggestions to the core team.

Thanks everyone and stay healthy!