**Issues faced while Running WRF and CMAQ on ARGO cluster at GMU**

**Issue 1: CMAQ-DDM & WRF version**

We’ve installed CMAQ v5.3.2 at the beginning on cluster. However, it doesn’t have DDM tools in it. After a discussion with Dr. Yongtao (GA tech), we’ve decided to swtitch CMAQ version to v5.2.1. At the same time in order to use file that are supported by CMAQ, we’ve re installed WRF v3.9.1.1 and MCIP v4.3.

Dr. Yongtao’s group found a bug in the CMAQ 5.2 DDM code which is in SOA\_DEFN.F and can cause crashes in CMAQ-DDM run. In our set up on Argo cluster after rebuilding CMAQ v5.2.1, I’ve updated existing DDM functions with the fixed DDM functions provided by Dr. Yongtao.

Using fixed files: When you compile your CMAQ, you will have a BLD\_XXX folder, in which all the source codes sit there with a Makefile. Replace the original codes with the fixed files, and then recompile (make under the BLD\_XXX folder). Before the replacing, better saving your original code in a different name and compare your original codes and the original codes Dr. Yongtao sent, to make sure the original codes are the same.

**Issue 2: Smaller modeling domain**

Emission files that we’ve got from Professor Dan’s group for testing CMAQ had a modeling domain over the whole continental U.S. However, due to computation and storage limitation we wanted to use a smaller domain.

Initially I’ve randomly chosen a modeling domain over Virginia in MCIP files by modifying following sections in MCIP scripts (wrfout files were for the whole U.S. domain, didn’t change it).

Table

Description automatically generated with medium confidence

After running CCTM, we got following error:

Text

Description automatically generated

Solution: we have to rerun ICON and BCON file to match NCOL, NROW, XORIG and YORIG values like in MCIP files. After that, we need to use M3Tools program m3wndw to window the emissions files to the grid of the (200x120) modeling domain. Same thing I did on land emission files. Point source emission files remained same as before.

Graphical user interface, text, application

Description automatically generated

This will resolve domain issue.

Using IOAPI m3tools

Please see the batch script available at :

/projects/HAQ\_LAB/mrasel/cmaq/Build\_CMAQ/LIBRARIES/ioapi/bin/scripts

More details on m3wndw:

<https://www.cmascenter.org/ioapi/documentation/all_versions/html/M3WNDW.html>

in order to run m3wndw IOAPI tools I need information of LOCOL, LOROW, HICOL and HIROW values. Follow the following procedures:

Graphical user interface, text, application

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A picture containing text

Description automatically generated

**Issue 3: After solving domain issue when I ran CCTM scripts, I faced following errors:**

Text

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Suggestion from CMAQ forum was to reduce advection time step by changing CTM\_MAXSYNC value from 300 to 120 or 60. This will resolve this issue.

**WRF issues**

1. When you’ll run wrf for 1 month or more then add sst update under physics section.

Shape, rectangle, square

Description automatically generated

1. Time step error:

Graphical user interface, text, application

Description automatically generated

1. In order to know num\_metgrid level and num soil levels in namelist.input file:

Text, letter

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