

# Running on New Grids: Remaining Issues

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# Dual Grid

*The “dual grid” is the finite-volume counterpart to the spectral elements used by the atmos model. It is needed by ESMF to generate mapping files between spectral elements and other grids.*

- The best grids are generated by a serial matlab program that would take years to complete at cloud-resolving scales
    - We are currently using a cruder, parallel F90 code with NCL utilities to massage data into the required format
      - This is sufficient for fixed-SST runs because the dual grid is only used for computing surface roughness and boundary forcings (which don't require exact conservation)
      - We should replace the NCL code with NCO commands or python or wait until...
    - Eventually we should rewrite the matlab code in parallel F90 or C
      - This would be a great topic for a Sandia summer student
- \* Since we have a working solution (for fixed-SST runs), this change isn't a high priority

# Atm Initial Condition

- The traditional tool, `interpic_new`, only interpolates from initial conditions *on the FV grid*
- It's trivial to use `TempestRemap` to do *horizontal* regridding of SE initial conditions
  - This is sufficient for now because we're not changing vertical resolution
  - In the next few months, we need to create a standalone tool for vertical regridding
    - Unclear who to task with this... volunteers?

# Testing

- To prevent our workflow from breaking, **nightly tests are needed for each step of our toolchain.**
- Plan: use Noel's script for automating one or more steps. Assign this task to Noel?

# Other Tasks

- We still haven't tackled the Atmosphere dry deposition (atmsrf) file
- Because the land model uses O(15) surface types, it requires a lot of regridding work to run at a new resolution. It would be much easier if the land model lived on its own grid which wasn't updated for each new atm grid ([teaser for Tian's talk](#))
- In addition to land IC and finidat files, the land model needs a land use/land cover change file for transient runs. Nobody on E3SM core staff knows how to make these files ([teaser for Louise's talk](#))
- Post-processing tools will also need fixes for high res ([discussed in yesterday's infrastructure session](#))

Am I missing any other tasks?

Backup slides follow

# Guidance

- Amount of topography smoothing needed and strategy for spinning up the atmosphere will probably change at cloud-resolving scales
  - New strategies are needed
- Strategy: learn as we go.



# Small things

- Smoothtopo.job should accept command-line arguments
- land how-to documentation needs cleanup(?)
- We still need a better strategy for creating land IC files.