

# Model Development Activities at NOAA Targeting Exascale

*Thursday, 27 September 2018 11:30 (30 minutes)*

Effective utilization of fine-grain chips with thousands of compute cores, and systems with millions of compute cores will require adapting and rewriting applications to prepare them for exascale. For the last two years, significant efforts have been made to adapt the National Weather Service's Finite Volume-cubed (FV3) model in order to run efficiently on GPUs without degrading performance on CPU hardware. The work to adapt the FV3 code has proven to be both challenging and disappointing as code changes were more invasive and performance gains were elusive. Some detail of this work will be presented.

Disappointment with FV3 led to formation of a project to explore how to design and develop future assimilation and NWP models for Exascale. Modeled after the ESCAPE project in Europe, the focus has been to develop dwarfs to evaluate key areas of the weather prediction system. Initial work is focused in four areas: transport, 4DVAR, I/O, and machine learning. Prototype development is from scratch and is not constrained by legacy codes, approaches, software or languages. This presentation will give an overview of the work, with additional details in follow-on presentations by Harrop (Software Design), and Flynt (I/O).

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