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1. INTRODUCTION

In August 2006 the forecast component of the Global Forecast System (GFS) was implemented into NCEP operations as a single gridded component within the Earth System Modeling Framework (ESMF) (<http://www.esmf.ucar.edu>) marking NCEP's first use of the ESMF superstructure. Meanwhile the concurrency ESMF version of the Global Ensemble Forecast System (GEFS) has been completed and is in use for all global ensemble research projects. In order to unify efforts within the Environmental Modeling Center (EMC), the new B-grid version of the Nonhydrostatic Mesoscale Model (NMMB) is also being placed under ESMF and it will be followed by the inclusion of additional parts of the production suite. This will ultimately streamline the interaction of analysis, forecast, and post-processing systems within NCEP and will provide the opportunity to serve the same purpose among different systems within NOAA and the general community. Although this common framework is currently under development and continues to evolve, its basic structure is described below.

2. THE GENERAL DESIGN

ESMF offers considerable freedom in choosing how to use it in any particular

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application. The framework being built is relatively simple so as to facilitate easier and more rapid understanding of it by the users. The fundamental design is depicted in Figure 1. Below the main program lies the so-called atmospheric or ATM gridded component. That component in turn creates separate gridded subcomponents for the model's dynamics and physics as well as a coupler component through which information is passed between the dynamics and physics. In addition there are gridded components coupled to the ATM component for the writing of output. Any number of these output components/couplers may be used depending on how many groups of MPI tasks are assigned to this purpose. Input components/couplers analogous in design to those for output will be added. A general post-processor for the GFS and NMMB is being prepared and will be incorporated into the framework. The coupling to ocean models will then follow to produce a full atmosphere-landsurface-ocean prediction system under the single framework. Direct attachment of the analysis systems is also being considered.

3. SUMMARY

Construction of a common ESMF superstructure for the forecast component of the GFS and for the NMMB is underway. This will simplify the effort of placing the models under a single community framework and streamline subsequent evolution of the application. A general post-processor will be inserted soon. Coupling to ocean models will follow and in the future the analysis systems could also be added.

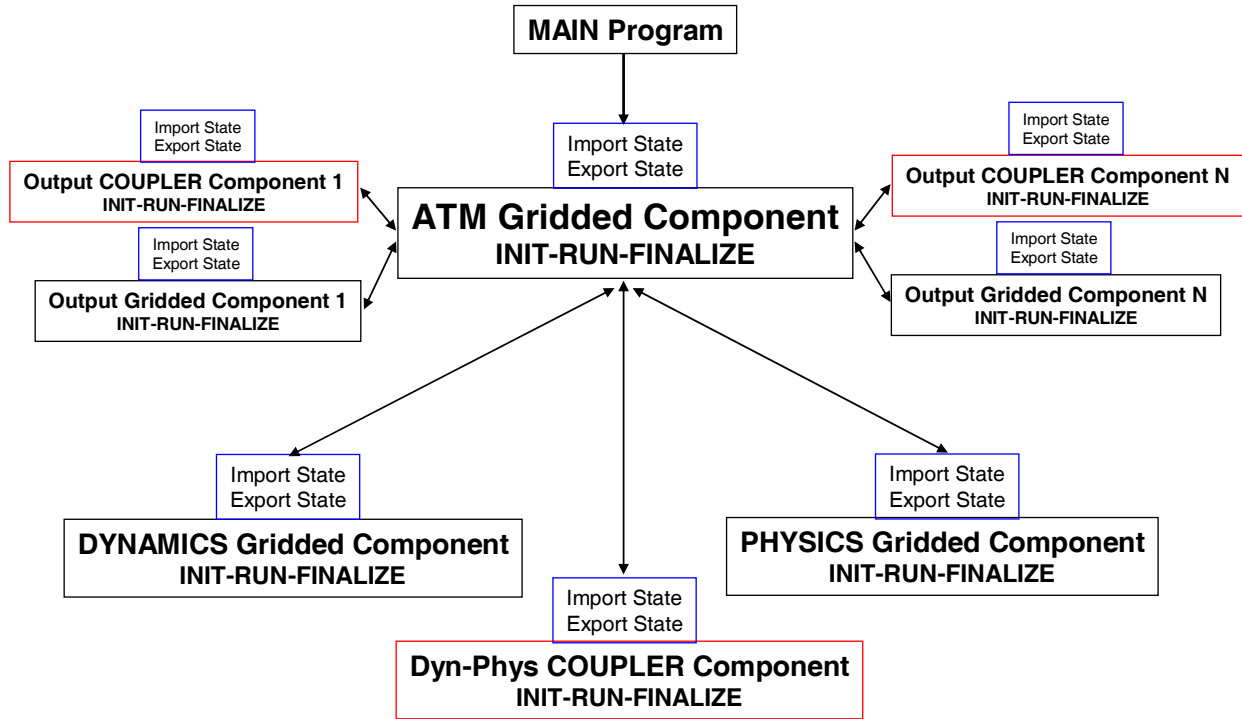


Fig. 1 Fundamental design of ESMF framework for NCEP models.