NEW EFFORTS TO UPDATE NASA'S GLOBAL REFERENCE ATMOSPHERIC MODELS (GRAM). H. L. Justh[1], A. M. Dwyer Cianciolo[2], K. L. Burns[3], J. Hoffman[4], R. W. Powell[5], and P. W. White[6]. [1]NASA, Marshall Space Flight Center, Mail Code EV44, Marshall Space Flight Center, AL, 35812, hilary.l.justh@nasa.gov, [2]NASA, Langley Research Center, Mail Stop 489, Hampton, VA 23681, alicia.m.dwyercianciolo@nasa.gov, [3]Jacobs Space Exploration Group, 1500 Perimeter Pkwy., Suite 400, Huntsville, AL 35806, kerry.l.burns@nasa.gov, [4]Analytical Mechanics Associates, 21 Enterprise Pkwy., Suite 300, Hampton, VA 23666, james.hoffman-1@nasa.gov, [5]Analytical Mechanics Associates, 21 Enterprise Pkwy., Suite 300, Hampton, VA 23666, richard.w.powell@nasa.gov and [6]NASA, Marshall Space Flight Center, Mail Code EV44, Marshall Space Flight Center, AL, 35812, patrick.w.white@nasa.gov.

Introduction: NASA is at the forefront of planetary exploration. The inability to test planetary spacecraft in the flight environment prior to a mission requires engineers to rely on ground-based testing and models of the vehicle and expected environments. One of the most widely used engineering models of the atmosphere for many NASA projects is the Global Reference Atmospheric Model (GRAM) developed by the NASA Marshall Space Flight Center (MSFC). Over the past decade GRAM upgrades and maintenance have depended on inconsistent and waning project-specific support. Recently, the NASA Science Mission Directorate (SMD) has agreed to provide funding support in Fiscal Year 2018 and 2019 to upgrade the GRAMs. This poster summarizes the objectives, tasks and milestones of this effort.

GRAM Upgrade Objectives, Tasks, and Milestones:

Objectives. The GRAM upgrade effort will focus on three primary objectives: upgrade atmosphere models within the GRAMs, modernize the GRAM code, and socialize plans and status to improve communication between GRAM users, modelers and GRAM developers.

Tasks. The priority of this effort is to update the atmosphere models in the GRAMs and to establish a foundation for developing GRAMs for additional destinations. This includes determining which atmosphere models have upgrades currently available and incorporating them into the GRAMs. Planetary mission atmospheric data will be used as the basis for comparison studies of the GRAM models. Another key element of this effort is modernizing the GRAM code. This task involves creating a new framework that transitions the original Fortran code to C++. This effort will take advantage of object-oriented capabilities of C++. In addition to the model and code upgrades, socializing the status of the upgrades and advocating and promoting its continued use in proposals and projects will be conducted by the study coordinators and leads.

Milestones. Project milestones for fiscal year 2018/2019 and beyond have been determined and include: surveying users to prioritize investments, meeting with key modeling groups, identifying, obtaining and implementing atmosphere model upgrades for GRAMs as well as observational and mission data sets for GRAM comparisons, upgrading the GRAM code framework, and releasing updated and new GRAMs that will include programming and user guides.

Conclusions: The GRAMs are a critical tool set that influences mission selection and decisions. The funding provided by the NASA SMD is vital to address current limitations and accomplish GRAM developmental goals.

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