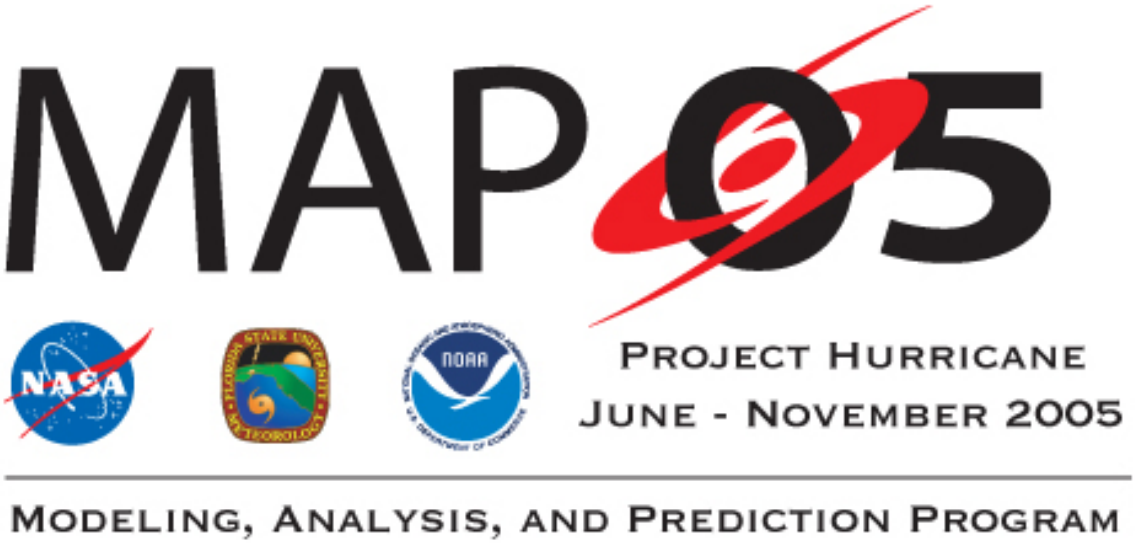




# The MAP '05 Project

*Focusing on the "Greatest Storms on Earth"*

During the summer and fall of 2005 the *MAP '05* team will implement three versions of Goddard's flagship global atmospheric model to enable "real time" prediction of Atlantic tropical cyclones. By executing the research products in an operational environment in

which side-by-side comparisons with other types of models can be analyzed, the strengths and weaknesses of the Goddard models can be better understood, particularly for extraordinary atmospheric conditions. For the first time, Goddard's numerical models will be introduced as a member of the Florida State University (FSU) "Superensemble", a novel approach to forecasting tropical cyclones that combines the output from multiple models and quantifies the biases of each such that an optimal forecast of storm track and intensity can be determined. Results from the Superensemble will be made available to forecasters at the National Hurricane Center.

The modeling suite, known as the Goddard Earth Observing System (GEOS) has been in development at Goddard since the early 1990s under the auspices of the former Data Assimilation Office (DAO) and the current Global Modeling and Assimilation Office (GMAO). The project will test the fourth and fifth generations of GEOS (GEOS4 and GEOS5, respectively), which represent different implementations of the finite-volume general circulation model (fvGCM). While GEOS4 represents a mature product, GEOS5 is a development effort that is nearing completion. GEOS4 will be initialized with input provided by the National Centers for Environmental Prediction (NCEP). Two instances of GEOS5 are planned: a version that is initialized in a similar manner as GEOS4, and a version that is executed in data assimilation mode (the GEOS5 model coupled with NCEP's Gridpoint Statistical Interpolation analysis package). GEOS5 is expected to be made available during the summer of 2005 and will be introduced to the FSU Superensemble in an offline, prototype mode. For more information about the products of the GMAO, please visit http://gmao.gsfc.nasa.gov.

At Goddard, **Dr. Robert Atlas** and **Dr. Michele Rienecker** will serve as co-lead science investigators.

Dr. Atlas and his team will lead the science investigation of hurricane forecasts and will work with scientists at Goddard, FSU, the National Hurricane Center, and NOAA's Hurricane Research Division in the interpretation of forecast results and model performance. He serves as Goddard's Chief Meteorologist, and has a strong background in

operational forecasting. Preliminary results from the 2004 hurricane season were promising, in which Dr. Atlas executed the GEOS4 version of the fvGCM parallel to other operational and research models. Dr. Atlas's work in 2004 led to the collaborations with FSU and the various government research and operational institutions.

Dr. Rienecker, head of the GMAO, and her team will be responsible for the development and implementation of the new GEOS5 model and data assimilation products. They will undertake overall scientific evaluation of the GEOS5 system performance at high resolution, the interplay of NCEP's data analysis product with the atmospheric GCM, forecast skill of other weather extremes, and interact with both the Joint Center for Satellite Data Assimilation and with Dr. Atlas on how new satellite data may improve forecasts.

NOAA's Environmental Modeling Center (EMC) and Tropical Prediction Center (TPC), both managed by NCEP, will be closely evaluating the results of the *MAP '05* research experiments. Their goal is to determine if elements of the GEOS physics and/or dynamics packages should be considered for infusion into future NOAA operational products (NASA's research models and computing platforms are not designed nor are intended to be used for permanent operations).

The Goddard models differ in a variety of ways when compared to those from other research centers and operational agencies. Perhaps the most significant differences are in the model's finite volume dynamical core [ref] and its ability to produce timely forecasts for the entire globe at comparatively high horizontal resolutions (¼ x ¼ degree).

*For more information about the MAP '05 project, please contact the SIVO at 301-286-9804, or send email directly to the MAP '05 Project Manager, Michael Seablom, at Michael.S.Seablom@nasa.gov*.