

## MID-TERM PROGRESS REPORT- January 2004

**Title:** Transition of Revised Dynamical Model Track Prediction Evaluation Expert System (DYMES)

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From mid-July through the remainder of the hurricane season, I operated DYMES every weekday morning on Atlantic and eastern Pacific storms; unlike the previous two years, I did not necessarily construct a selective consensus (SCON) for every case. An increased number of time periods during the 2003 season had high quality and consistent model guidance (e.g., during Hurricane Isabel). Thus, the first objective of DYMES to indicate when the dynamical model consensus was to be accepted as the guidance was exercised and no SCON was required. Consequently, less effort is required when the guidance is so good and consistent. Nevertheless, a number of cases did contain erroneous track guidance that did require construction of an SCON that reduces the error.

The most important conceptual modification to DYMES was the addition of error mechanisms involving midlatitude features that the program objectively suggests to the forecaster. The NHC request during the 2002 season to step through the model fields at a time step of 6 hours rather than 12 hours led to the development of the user-friendly option of stepping through the fields at 6, 12, or 24 hour time steps. This time-step can be changed at any point with the click of a button. At the onset of the 2003 season, this feature, which is rather complicated, was ready; however, I found several bugs during the season that needed to be rectified, and they have been. Another important feature is the track-amending capability that allows a forecaster to manually correct corrupted or missing tracks in real-time, thereby increasing the number of members in the consensus forecast, which should improve the consensus. This feature is also quite complicated, and several bugs were corrected throughout the 2003 season as they were encountered. Another relatively unimportant bug concerning the Track and Fields Display for storms near the prime meridian was corrected. Now the map properly displays the geography east of the prime meridian. Finally, although not a bug with DYMES, the utilization of DYMES led to solving a bug with the GFDN output from FNMOC. While looking at the Fields Display of GFDN with DYMES on a daily basis, I noticed that occasionally the circulation center and reported storm center were displaced by five or ten degrees latitude. Further investigation revealed that the problem was created by a file sent by FNMOC, and FNMOC corrected the problem.

In mid-November, I visited NHC and obtained valuable access to statistics, as well as getting feedback, especially from Richard Knabb, on important cases. Unlike the review by NHC received in November 2002, few items that were needed for operational testing were provided during this visit.

In August 2002, personnel from TPC/NHC and I performed an intensive two-week test in which DYMES was run on every storm for every forecast cycle. During 2003, we did not perform an intensive test. Simply from personal conversations, it was

fairly obvious that manpower at the NHC was stretched thin for such a test. However, I made some basic observations while operating DYMES throughout the season. Notable differences in the structure of the TC (even at analysis) from model to model were seen, and these had important consequences on subsequent motion. Also, a surprisingly high number of cases involved obvious tracker problems in which the tracker jumped to another circulation.

One objective is to demonstrate the potential value of DYMES given the new emphasis on midlatitude-based error mechanisms. After completing the error mechanism assignments for the 2003 cases, I will run a few “retrospective” cases from 2003 before the IHC to show just how well DYMES can perform with the updated model traits knowledge base. Following coordination with NHC, I plan to complete the remainder of the “retrospective” cases during March after the IHC.

Production of training material planned for the January - March time period, and is now scheduled for April-early May. At the IHC, I intend to discuss the outline of the training material with NHC personnel. I still plan on traveling to NHC in mid-May to install and present this training material.

Also planned prior to Mid-May 2004 are the three major projects: incorporating DYMES output SCON into ATCF; displaying height fields; and displaying field differences. Work will begin soon on these projects. Funds are available for the programmers’ efforts. I plan to have all of these capabilities ready for the 2004 season.

Although not in the project timeline, hardware issues need to be addressed in the near term. The SGI machine on which DYMES operates does not currently have a maintenance contract, which means that its security and background software is not up-to-date. Before the IHC, I intend to get a maintenance contract on that machine, make sure its security is up to standard, install a C compiler, install XView software so that the screen capture capability of DYMES can be used, and buy an additional hard drive to house the model fields for the upcoming 2004 season.