

## GSL Director's Directed Research Fund (DDRF) Call for Proposals

Title: Interactive Scorecards to Accelerate RRFs Development

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### **Division Chief Sign-off:**

1. Summary of Request: We are asking for \$75K to develop a scorecard that can be used to get a quick, high-level, overview of the relative performance of two modeling systems (e.g., the operational HRRR vs. the experimental RRFs). The unique feature is that the scorecard is interactive, allowing the user to select the variable/statistic of interest and then the system will open a new window showing the underlying data in MATS, which allows the data to be explored using different plot options.
2. Project Description: This project would begin the design and development of an interactive scorecard. We envision two components. The first is an interface that would allow the user to define the two models to be compared, the time-range of the comparison, and fields of the scorecard (e.g., domains, forecast hours, variables, statistics). The second is a visualization application that would display the results in the scorecard, allowing the user to click on any of the fields; when clicked, the data that was used to generate the score would be opened in the appropriate MATS application, thereby allowing the user to interactively plot the data using the range of MATS plot types to understand the characteristics of the data. The figure illustrates this visualization component, wherein the user clicks on the circled symbol, which opens up the MATS surface app displaying the underlying data as a time-series. The user would then be able to change the plot type (in this case to a time-of-day figure) to view the data in new ways. We envision that this interactive capability to visualize verification statistics in a number of different variables, forecast hours, and regions simultaneously will greatly speed up our understanding of model behavior and biases, which will improve the speed of model development.
3. Partners Involved (collaboration): This project would be entirely done by AVID verification and assessment branch (VAB) staff, with input from AVID and EPAD model developers.
4. Schedule / Time frame for project completion: There are multiple activities in this project

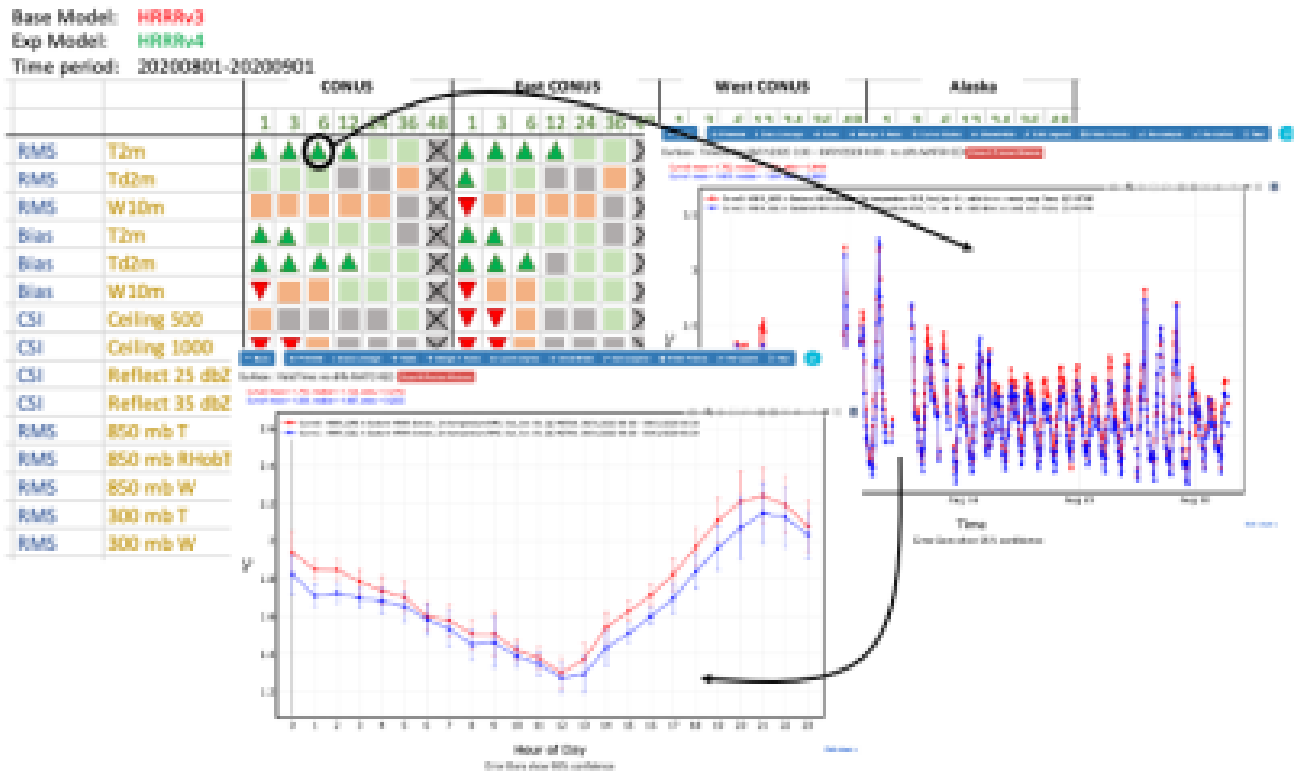
Activity	Time period (months)
Present scope of project to AVID/EPAD staff, collect input	0.0 – 0.5
Design overall logic and data flow	0.5 –2.0

Develop prototype to specify scorecard inputs (models, timeframe, refresh period, regions, fields, statistics, thresholds), store these parameters, design database to store results	2.0 – 9.0
Build batch mode script to execute pre-specified database queries in an automated manner	2.0 – 6.0
Develop prototype to display the scorecard results, and open	7.0 – 11.0

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appropriate MATS app with proper database query when user selects a symbol	
Test coupled application	11.0 – 12.0
Demonstration of application and final presentation	12.0

5. Budget / Leverage/ Availability of other funding: The automatic generation of static images using a “batch mode” process has been desired, and would be conducted under separate funding within AVID’s VAB. This project would leverage this batch mode application for this purpose.
  
6. Positive impact on GSL & NOAA mission: GSL uses a hypothesis-driven approach to improve its short-range and medium-range forecast modeling systems. This requires that the model developers be able to evaluate how well the experimental model, which could be run in a retrospective mode, compares against a baseline modeling system. A scorecard presents the improvements in numerous variables / forecast lengths / domains / etc simultaneously with a simple-to-understand graphical chart. However, the ability to easily perform more in depth surveys of the results with an interactive interface will greatly increase the ability for the model developers to understand the impact of the changes in the experimental model, and thus improve the efficiency of the model development process.
  
7. Deliverables: Prototype of a functional interactive scorecard, and presentation of results to the Director in April 2023



An illustration of the interactive scorecard comparing two versions of the HRRR over a specified time period. The user can click on any of the symbols, which opens up the appropriate MATS app in a different browser window, allowing the data to be plotted in multiple ways (illustrated by the black arrows).