# SCIENCE ADVISORY BOARD

August 28, 2020

Neil A. Jacobs, Ph.D.
Assistant Secretary of Commerce for
Environmental Observation and Prediction
Herbert C. Hoover Building, Room 6811
14th Street & Constitution Avenue, NW
Washington, DC 20230

Dear Dr. Jacobs:

**Subject:**       ***SAB Review of Draft NOAA Precipitation Prediction Grand Challenge Strategic Plan***

On behalf of the NOAA Science Advisory Board (SAB), I am pleased to transmit to you a report on Review of the Draft NOAA Precipitation Prediction Grand Challenge Strategic Plan.  The SAB approved this review report at its August 27, 2020 virtual meeting.  The review was conducted at the request of the NOAA Weather Water Climate Board.  The SAB's Climate Working Group (CWG), in collaboration with the Environmental Information Services Working Group (EISWG), quickly formed a Review Team and assembled the attached report.

The SAB and Review Team note the Draft Strategic Plan is well conceived and establishes an excellent framework for our nation to increase its precipitation prediction skill through the development and application of a fully-coupled Earth system prediction model.  We fully support this important NOAA initiative to improve precipitation prediction.

SAB members considered in detail the Strategic Plan and the CWG/EISWG review at their meeting.  They agreed overall with recommendations and comments of the Review Team (summarized below).  There was, however, a lively discussion of Recommendation 1, which concerns the conceptual structure of the report.  The NOAA Draft Strategic Plan lays out an overall goal and then a set of six Objectives with specific Actions under each one.  The Objectives begin with user engagement and move from there to errors in the prediction, products and applications, systems, observations, models, and predictability.  Discussion of the Review Team's Recommendation 1 was as follows:

- The Review Team recommended reordering the Objectives to put user engagement last. Rationale of the Review Team is that user engagement is not fundamental to increasing forecasting skill. While important, the Review Team was not convinced it should be the first consideration; the emphasis should be first on science needed to improve prediction.

- SAB members noted strong support for NOAA to engage users at the start of any strategic endeavor. Placing it as the first Objective sends the message that the agency values involvement of the user community in meeting this PPG Challenge and recognizes the community has a strong role to play. A NOAA representative noted that they had the same discussion when preparing the draft strategic plan and ultimately decided to keep user engagement as the first Objective for this very reason.

While the SAB members agreed not to request a change to the review report, they believe the ordering of the Objectives should be left to NOAA's discretion.

The report makes the following recommendations and comments:

Grand Recommendation:
Emphasize the **grand** in the plan: What is the biggest push that will make the biggest difference? Consider emphasizing the three top outcomes that NOAA and partners can produce right now to improve, even if they are expensive or difficult.

Additional Recommendations:
**Recommendation 1**: Structure the strategic plan for R2O2R, from the identification of needs in science of prediction and predictability, to the co-development of products to service.

**Recommendation 2**: Explain the specific sources (decisions, observations, processes, etc.) of the substantial improvement (or the lack thereof) in precipitation prediction from the last 20 years, especially lessons learned from observations, modeling, and prediction.

**Recommendation 3**: Explain the specific sources that will lead to substantial improvement in precipitation prediction over the next 20 years.

**Recommendation 4**: Highlight clear, quantitative goals and connect those to the improvements distinguished in Recommendation #3.

**Recommendation 5**: Delineate the role of the community (different NOAA line offices, NOAA Cooperative Institutes, academia, private sector, states, and other federal agencies) and how NOAA and partners will work together to achieve these outcomes.

<u>Comments</u>
**Comment 1**: Highlight the mechanism of integrating precipitation process datasets (including clouds and precipitation rate), seamless approaches to understand and model the processes behind precipitation predictability from weather to decadal scales, and establish traceability of error sources to evaluate improvements in precipitation prediction skill.

**Comment 2:** Clarify the focus of the plan to exclude or include precipitation prediction improvement over the ocean.

The SAB, CWG, and EISWG are happy to provide clarification on any comments and recommendations and to help with any future implementation plans.  Please let me know if you have any questions, comments, or concerns.

Very respectfully,

John Kreider
Chair, NOAA Science Advisory Board

Attachment:  Final Report

CC:     Tim Gallaudet
        Louis Uccellini
        Craig McLean
        Wayne Higgins
        John Murphy
        Tom Graziano
        Cynthia Decker
        Michael Weiss
        Adrian Mahoney
        Joellen Russell
        Kirstin Dow
        Brad Colman
        John Snow
        Allison Matzelle
        Dorian Stiefel
        Caren Madsen
        Courtney Edwards