

Data Sciences and Decision Support Presentation

Robert Grossman, University of Chicago and SAB Member
Christopher Lenhardt, RENCI and SAB Member

Proposed Focus: Artificial Intelligence (AI), Data Science and Its Applications to the NOAA Mission

We are considering AI and data science broadly to include AI applications, analytics, machine learning, deep learning and related areas.

These topics include a number of elements relevant to the various themes the SAB is considering at this time, including:

1. Model and data assimilation
2. “Big data” applications
3. Applications of data science and AI to problems of interest to NOAA
4. Decision support
5. Fisheries stock assessment

Recent Discussion

Recently, we had a call with:

- Dr. Ed Kearns, Chief Data Officer, NOAA
- Dr. Chelle Gentemann, DAARWG Chair

We gained some initial high-level insights into some AI activities at NOAA

For example, NOAA has recently formed a working group on AI and is planning an upcoming workshop on AI and its applications

We are also collecting names of additional NOAA personnel to approach for informal information gathering

Proposed Topics of Report

1. Selected applications of AI and data science to the NOAA mission.
2. Enabling technology, including the required data management and cloud computing infrastructure.
3. Issues around preparing NOAA data resources to be AI and data science “friendly.” For example, how to lower the cost and effort required for use with AI and data science applications and services.
4. How might AI and data science accelerate NOAA’s economic impact and contribute to an increase in US competitiveness?

Proposed Information Gathering Framework

Potential impact on mission:

- Seek to learn more about AI capabilities and uses across various NOAA efforts

Technology:

- Look at the technological implications of using and deploying AI at NOAA, such as what cloud computing and data management infrastructure is required?

Enabling / Transformational NOAA-specific capabilities:

- Are there some specific AI and data science activities that might be broadly leveraged by different groups and missions within NOAA?
- Could NOAA share the training and pre-training datasets with the external research community?

Recommendations for SAB consideration:

1. Task DAARWG with preparing a brief report with analysis of key issues and potential recommendations related to the following:
 - a. Recommendations for preparing analysis-ready datasets.
 - b. Recommendation for training researchers to work in this area.
 - c. Recommendations for preparing training data for machine learning.
2. Request a short report from the NOAA AI Working Group on the topic of AI, with a briefing at a future SAB meeting:
 - a. What NOAA missions would AI have the biggest impact, both near term and intermediate term?
 - b. What are some efforts to capture and share knowledge related to AI across NOAA?
 - c. What is the technology readiness within NOAA to use AI and data science?