NOAA Research and Development Plan

NOAA Science Advisory Board
February 27, 2019

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NOAA R&D Plan

- The NOAA Research and Development Plan is a cross Line Office initiative that will set the foci for R&D at NOAA for the coming years.
  - Identified drivers for the plan
    - Legislative mandates and authorities
    - Department of Commerce Strategic Plan (2018-2022)
    - NOAA priorities
  - Collected internal and external input
    - Public comment period - December 8 - February 8
    - AGU Town Hall
      - Planned AMS Town Hall precluded due to federal shutdown
    - Input from NOAA Councils

NOAA R&D Plan Public Comments

- Public comment period ended February 8
  - Government shutdown likely impacted the number of comments received

- Solicited comments via the Federal Register Notice, town hall presentation, meetings with NOAA councils, social media posts, and internal and constituents emails
    - 67 comments received
      - 41 internal, 23 external, and 3 unknown affiliations

NOAA R&D Plan Framework

- **Vision Area 1:** Reduced Societal Impacts from Severe Weather and Other Environmental Phenomena
- **Vision Area 2:** Sustainable Use of Ocean and Coastal Resources
- **Vision Area 3:** A Robust and Effective Research, Development, and Transition Enterprise
- Comments grouped and addressed by vision area

Summary of Public Comments

- **Vision Area 1:** ***Reduced Societal Impacts from Severe Weather and Other Environmental Phenomena***
  - Support atmospheric chemistry research
    - Utilize recommendations in the NAS report “The Future of Atmospheric Chemistry Research”
  - Connect weather patterns, air chemistry, and air quality predictions
  - Determine cost to value of high performance computing
  - Use deep learning methods in ocean observation and forecasting
  - Determine ways to maximize the value of warning and dissemination systems for tornadoes and other weather hazards
  - Establish a national capability for high precision monitoring of greenhouse gases using commercial aircrafts
  - Use Artificial Intelligence to improve climate change impact quantifications, weather and climate models, and extreme weather event forecasts
  - Prioritize subseasonal-to-seasonal (S2S) predictions and water predictions

Summary of Public Comments Cont.

- **Vision Area 2:** ***Sustainable Use of Ocean and Coastal Resources***
  - Explore the Northeast Canyons
  - Include 'omics/genomics, eDNA, and unmanned systems as major topics
  - Formalize partnerships with marine-focused ichthyological research collections to support the research and archive of fish specimens and training of students
  - Research in estuarine and coastal regions must address multi-dimensional, multi-variable questions and interactions among variables at different scales
  - Integrate new and evolving capabilities associated with eDNA and ocean sound (measuring changes in ocean soundscapes over time)
  - Enhance aquaculture
    - Develop novel technologies for offshore aquaculture in U.S. waters
    - Use machine learning, flexible fabric, and nano sensors for ocean, fisheries, and aquaculture monitoring systems
    - Invest in aquaculture research to reduce losses from disease, predation, ocean acidification, harmful algal blooms, and market crashes

Summary of Public Comments Cont.

- **Vision Area 3:** ***A Robust and Effective Research, Development, and Transition Enterprise***
  - Engineering components need to be met for transitions
  - Utilize technology and data from outside sources at the research level if not ready for the operation level
  - Better integrate datasets across NOAA and share with stakeholders, invest in data architecture for emerging technologies (such as AI), create communities of practice for data innovations and techniques
  - Include AI, machine learning, Big Data, and cloud computing as major topics
  - Employ physics-based data inference, fuse diverse sources of data
  - Develop new computational methodologies for NOAA models that are forward looking and involve interdisciplinary teams
  - Support for a biogeochemical Argo array
  - Strengthen atmospheric composition R&D with connections to JPSS and GOES satellite data

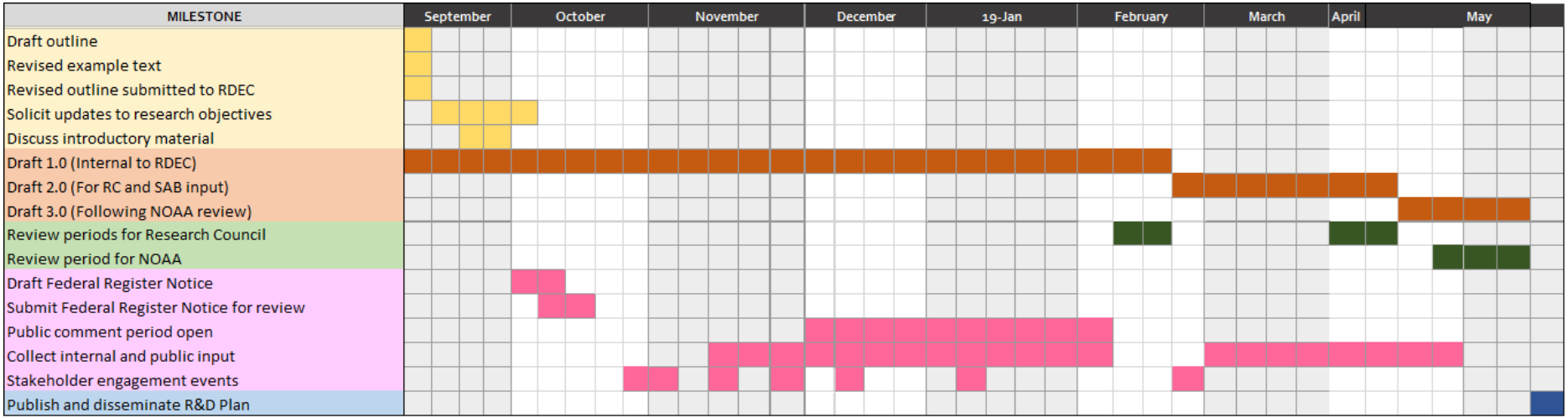
Summary of Public Comments Cont.

- **Other**
  - Bring in more data scientists and social scientists and provide greater job security through federal positions. Train existing workforce to adopt new technologies
  - Share data and expertise. Specific mentions of industry, private-public partnerships, the academic community, and support for NOAA laboratories
  - Seek stronger connections with the emergency management community on the research, development, and strategic use of unmanned aircraft systems (UAS)
  - Create strategy for sustainable funding of long-term records
  - Fund NOAA long-range research projects and encourage innovation
  - Suggestions to change vision areas
    - Include a new vision area regarding societal responses and have the third vision area listed outside the new vision areas
    - Include human activities in the first vision statement
    - Change first vision area to “Reduced societal impacts from severe atmospheric-oceanic events and other environmental phenomena”
    - Change third vision area to “An innovative and effective research, development, and transition enterprise”

Request: Review Outline

- Seeking NOAA SAB consensus feedback at April 23-24 meeting addressing:
  - R&D Plan Outline
  - Comments on framework gaps and areas needing emphasis/de-emphasis
  - Recommended NOAA R&D priorities

Timeline:


MILESTONE
September
October
November
December
19-Jan
February
March
April
May
Draft outline
Revised example text
Revised outline submitted to RDEC
Solicit updates to research objectives
Discuss introductory material
Draft 1.0 (Internal to RDEC)
Draft 2.0 (For RC and SAB input)
Draft 3.0 (Following NOAA review)
Review periods for Research Council
Review period for NOAA
Draft Federal Register Notice
Submit Federal Register Notice for review
Public comment period open
Collect internal and public input
Stakeholder engagement events
Publish and disseminate R&D Plan

NOAA

Oceanic and Atmospheric Research

Questions?