SAB Priority Study Topics

22 July 2021

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1. **Leadership for Coastal Resilience (In Progress)**

   Identify the challenges of future decades and how NOAA can work across line offices, with other Federal agencies, and with the private sector to ensure coastal infrastructures, and those who rely on it, are resilient to both acute and chronic threats.

   Lead – Denise Reed

2. **Earth System Prediction and Predictability (Combine with Priority Topic 4)**

   How can NOAA best respond to the demand for broader forecasting services (from fisheries to space weather) by advancing geophysical observations, modeling systems, and computational resources and architectures, and transferring improvements to operations and services?

   Lead – Joellen Russell & CWG / Zhaoxia Pu / Ilene Carpenter / Jason Hickey

3. **Integrating Social and Behavioral Sciences Into Every NOAA Mission Area (Adjusting)**

   In what ways and in what areas can the social and behavioral sciences be better integrated into NOAA missions to optimize the impact of information and services? What are organizational and structural barriers within NOAA that might limit the use of social and behavioral sciences and what organizational infrastructure is needed to overcome these barriers?

   Lead – Martin Storksdieck / Bonnie McKay / Jon Allan

4. **Technology, Data, and Observations to Improve Understanding and Prediction of Earth Systems at S2S2D Time Scales (Combine with Priority Topic 2)**

   Assess approaches NOAA can use to apply technology, data, and observations to improve understanding and prediction of earth systems at S2S2D time scales. Observations are essential for improved understanding and model validation/verification so that NOAA can better predict future extreme events.

   Lead – Joellen Russell & CWG / Zhaoxia Pu / Ilene Carpenter /Jason Hickey

5. **Application of Emerging S&T and Public-Private Partnerships To Monitor and Predict Changes in the United States Living Marine Resources (Adjusting)**

   Build on ESMWG Report to look at improved methods to monitor and predict changes in living marine resources.

   Lead – Molly McCammon & ESMWG / Bonnie McKay

6. ~~**Assessment of NOAA's Capability to Understand Regional Sources of Environmental Impacts**~~ **(Removed)**

   ~~1) Identify current capabilities across NOAA's portfolio used to identify regional sources and agents of environmental impact; and 2) recommend strategies and tactics which NOAA can use to better detect and communicate regional sources and agents.~~

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5. **Application of Emerging S&T and Public-Private Partnerships To Monitor and Predict Changes in the United States Living Marine Resources (Adjusting)**
Build on ESMWG Report to look at improved methods to monitor and predict changes in living marine resources.
Lead – Molly McCammon & ESMWG / Bonnie McKay

5. **Developing Resilience in the Face of a Rapidly Changing Marine Environment**
Build on ESMWG Reports to look at improved methods to monitor, predict, and respond to changes in living marine resources in the face of a rapidly changing marine environment.
Lead – Molly McCammon & ESMWG / Bonnie McKay

Description – The rate of change in the marine environment in the next 10-20 years is going to be greater than the last 10-20 years. The changes are largely due to climate change and are having cascading impacts within the ecosystem, manifesting themselves as marine heat waves, reduced sea ice, increases in ocean acidification and harmful algal blooms. **How will NOAA's practices and products and services need to evolve over the next decade to keep up with, and predict, possible future ocean states and the impact on its resources? Are current programs, and those under development, sufficient to enable resilient coastal communities and residents?**

Developing Resilience in the Face of a Rapidly Changing Marine Environment

Justification – Rapid changes are occurring in fundamental ocean hydrographic structures, as well as biogeochemical properties. We have observed changes at the base of the food web up, their impacts on upper trophic levels, and on the overall health and productivity of the oceans. In addition, rapidly changing conditions are creating more frequent severe events. Questions we now face include (among others):

(i)   how will physical structures (e.g., oceanic fronts, location of ice-edge) transform and at what rate?

(ii)   how will variables/resources of interest, e.g., fisheries, be affected/redistributed and coastal resilience be impacted?

(iii) will rates of physical change in the environment be too fast to allow biological adaptation? Economic and social adaption?

(iv) will current explanatory capabilities change?