

Thoughts on Collaboration for the next Decadal Survey

Mark R. Abbott
28 October 2025

Collaborations and Partnerships

- Collaborations are relatively straightforward
 - ▣ Short-term, well-defined expectations and outcomes
 - ▣ Generally, need a clear leader
 - The general contractor – or first author
- Partnerships are enduring, open-ended, and much more complicated
 - ▣ Tensions between co-equals
 - ▣ Different cultures and expectations
 - ▣ Each partner operates under different constraints
- Earth science does well at collaboration; partnerships, not so much

International Partnerships

- Successes are generally bi-lateral
 - ▣ NASA and CNES missions on ocean topography from TOPEX/Poseidon to JASON series to SWOT
 - ▣ Japan and ocean vector winds
 - ▣ India and Synthetic Aperture Radar
 - ▣ And many others
- International leadership
 - ▣ International Ocean Color Coordinating Group under CEOS
 - Standards, data sharing, education, etc.
- Manageable, well-defined interfaces
 - ▣ But one-time and not scalable beyond original focus

Interagency Partnerships

- From the Midterm Assessment (2024) ...
 - ▣ “It remains unclear which elements of its future architecture would be funded or implemented directly by NOAA versus other agency, international, or commercial partners.”
- And from Issues in the Integration of Research and Operational Satellite Systems for Climate Research (NAS, 2000) ...
 - ▣ “Climate research and monitoring capabilities should be balanced with the requirements for operational weather observation and forecasting within an overall US strategy for future satellite observing systems”
- And from the KISS Continuity Study Team (2024)
 - ▣ “the US lacks an overarching, systematic plan or framework...”

Why are Interagency Partnerships so hard?

- Differences in values and cultures
 - ▣ NASA places priority on scientific understanding and connections with the academic research community
 - “Performance is the only driver; cost and schedule are features” – MH Freilich
 - ▣ NOAA places priority on short-term environmental prediction and connections with its line offices and labs
- Tempo and costs
 - ▣ Operational agency budgets grow slowly, and technology insertion is slow
 - ▣ Research agencies are more flexible and pursue new opportunities
- Governance
 - ▣ NASA is an independent agency
 - ▣ NOAA is part of the Dept. of Commerce

An Example from Beyond the Remote Sensing World

- Highly-successful international Argo program
 - ▣ About 4000 profilers in operation, deploy about 800/year
 - ▣ NOAA funds about half of the O&M and acquisition costs at \$20M/year
 - ▣ And we have passed “Peak Argo” for the core profilers
- Biogeochemical (BGC) Argo funded by NSF
 - ▣ About 300 BGC Argo profilers in operation
 - ▣ BGC Argo profilers have expensive sensors
 - \$15M/year for O&M/acquisition, including about 100 new profilers/year
 - ▣ No “predictable pathway” for transition
- NOAA looking to rely more on commercial providers for many global observations
 - ▣ Significant fraction of NOAA budget is tied up in observations
 - ▣ NOAA issued RFI last summer for global ocean observations – tide gauges, ocean drifters, and Argo

It's about to get even more complicated...

Partnerships with the Commercial World

- Guard rails and trap doors
 - ▣ Ownership and sharing, transparency, QA/QC, international agreements, etc.
 - ▣ Sustaining and continuity in the face of profit pressures and paying back investors
 - ▣ Risks, rewards, and responsibilities
- Culture and pace
 - ▣ Commercial providers approach risk and the performance/cost/schedule trade space in fundamentally different ways – Steve Battel
 - ▣ Academia (and NASA) are comfortable with customized, expensive, and long development time missions
- If the government and its scientists are just one of many customers...

Partnerships with a Diverse World of Users and Customers

- Andy Rowe and Kai Lee (2013) for the Packard Foundation:
 - ▣ Science pursues reliable knowledge through peer-reviewed publications
 - ▣ Policy decisions are made “under deadlines and amid controversy” with knowledge that is just “good enough”
- Deeper dialog and collaboration between scientists, decision makers, and the public, and not assume that science can set the political and social agendas
- Can the adaptive strategies, needed by society in a world of deep uncertainty, align with the interests of science?

“Saving Science” – Sarewitz (2016)

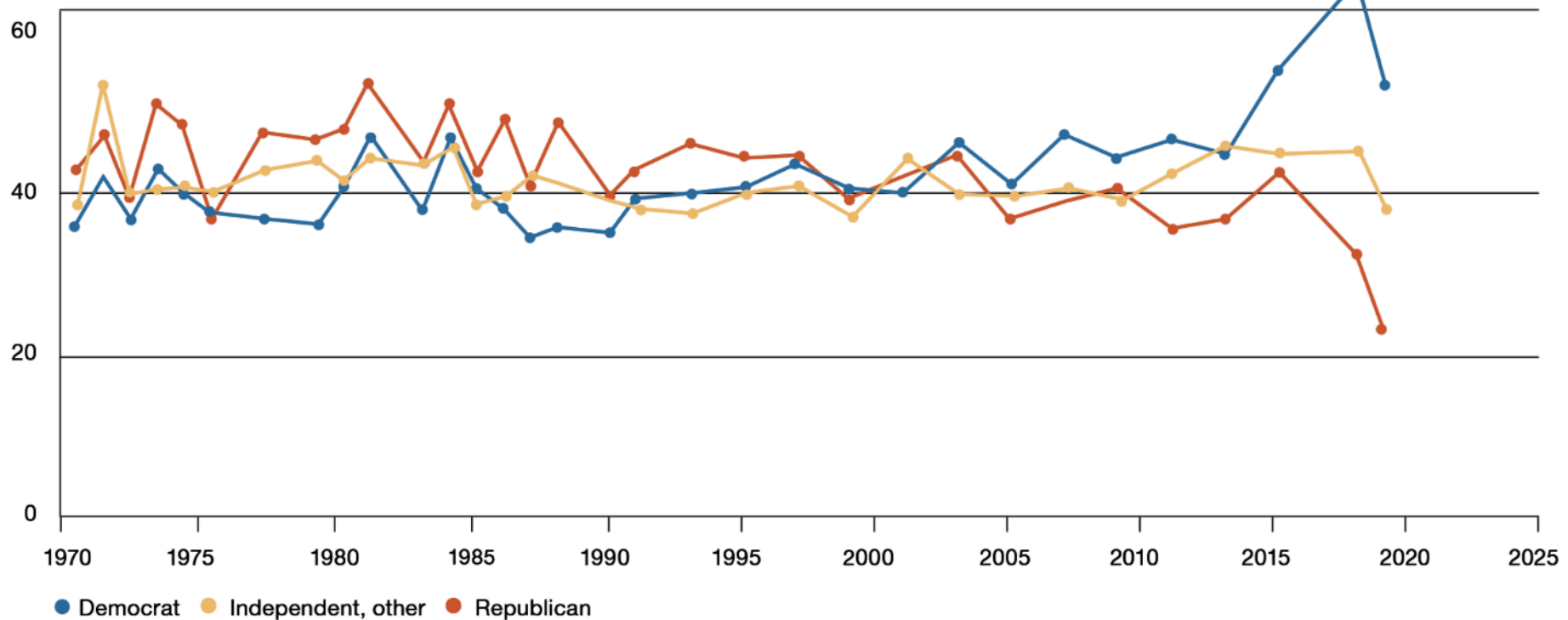
- Weinberg (1972) defined “trans-science” as problems where questions “can be asked of science yet which cannot be answered by science”
- Funtowicz and Ravetz (1993) called this “post-normal” science, characterized by issues where “decisions are urgent, uncertainties and stakes are high, and values are in dispute”
- Moving beyond the “free play of free intellects” and trans-science – why should we care?

“In the future, the most valuable science institutions will be closely linked to the people and places whose urgent problems need to be solved”

Gradually, then Suddenly...

Figure 1. **CONFIDENCE IN SCIENCE BY POLITICAL LEANING**

Percentage expressing "A Great Deal" of confidence in the scientific community.



Source: General Social Survey: Confidence in the Scientific Community. Courtesy American Enterprise Institute.

<https://issues.org/new-politics-science-mills-st-clair/>

The Changing Ecology of United States Science

“... science is adapted to an obsolete environment. Other environmental changes include: (i) a dissatisfied public ready to reduce the federal government's size and reach; (ii) deficit-reduction strains on funding, leading to many program reductions; (iii) increasing public awareness of problems that neither science nor government has resolved, including racism, drug abuse, breakdown of community, and crime; and (iv) ... decades of decay in real wages, leading to politics focused on the grievances of the middle class.”

And the article reference...

Byerly Jr, R. & R. Pielke Jr,.1995. The changing ecology of United States science. *Science*, 269, 1531-1532.

- And the politicization of science since 2000...

A Modest Proposal...

- Rebuilding trust and deepening partnerships
 - ▣ Dialog and understanding between science and public
 - ▣ Identify some key issues that confront those who need to make decisions
- Roadmapping to identify greatest risks and uncertainties
 - ▣ Key metrics and targets
 - ▣ A “managed” process, not just free play or politics
- How will freeze/thaw cycles change in Chicago over the next 20 years?
 - ▣ What are uncertainties?
 - ▣ Where should we make investments?

Some Final Words from Rayner and Sarewitz (2021)

“The focus must be on the design of institutional arrangements that bring the strengths and limits of our always uncertain knowledge of the world’s complexities into better alignment with the cognitive and political pluralism that is the foundation for democratic governance — and the life’s blood of any democratic society”