NATIONAL ACADEMIES WORKSHOP
MEASURING RESEARCH AND DEVELOPMENT EXPENDITURES IN THE U.S. NONPROFIT SECTOR
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TALKING POINTS
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MOTE MARINE LABORATORY

Mote Marine Laboratory in Context as an independent non-profit research institution

- Mote Marine Laboratory is celebrating nearly 60 years of Innovative Research and Service to the Community, during which time we have expanded from a single basic shark behavior research program initiative by our founding director, Dr. Genie Clark, to our current 24 diverse research programs ranging from ocean technology to marine biomedical and immunology, ocean acidification impacts in coral reef ecosystems to ecotoxicology, fisheries to inorganic and organic chemistry, marine mammals to ocean observation systems, and harmful algal blooms to biomarkers and genetics.
- Mote was originally founded with the support of philanthropy and partnerships with our community, both of which allow a great deal of freedom for Mote researchers to follow their passions for science they conduct.
- Today, Mote has ~ 200 staff, with ~ 90 scientists, 33 of whom hold PhDs and are actively engaged in conducting research in six of the seven continents. Mote scientists have published over 3,250 peer-reviewed manuscripts over our history (Mean ~ 50 per year).
- We have six different Mote research and education/outreach campuses extending from Sarasota, Florida to Key West. Our annual operating budget is ~$21M, with over half coming from research grants, contracts and cooperative agreements.
- Mote is committed to increasing the level of ocean literacy amongst the broader public by translating and transferring marine research discoveries through both structured and informal science education programs. The Aquarium at Mote Marine Laboratory is one of the nation's key centers for informal marine science learning and attracts ~350,000 visitors annually. Our structure education programs at Mote reach 29,000 students and members of the public each year. We also inform key policy discussions about ocean issues by working closely with policy makers and legislators.
- Although Mote is independent of any university, we have numerous partnership agreements with universities in the U.S. and around the world. We maintained our commitment to educating the next generation of ocean scientists through an active under-graduate college intern program, including being a host institution for the NSF-funded REU program for the past 10 years.
- In addition, the Florida State Legislature has just appropriated funds to support Mote implementing an innovative program to provide research experiences for local university undergraduates under mentorship of Mote scientists.

- During the last 5 years, over 100 graduate students have conducted their thesis and dissertation research utilizing Mote facilities and infrastructure with guidance of Mote scientists.
- As part of the Mote 2020 Vision and Strategic Plan, we have developed and implemented the Mote Post-Doctoral Fellowship Program in which Fellows are provided full support and mentorship for two years to develop their own research programs at Mote and launch their careers.
- By the end of 2014, we will have 4 concurrently rotating two-year fellowships and our goal is to increase to a total of 7 concurrently rotating fellowships by 2020. This program is supported entirely through Mote philanthropic efforts.
- As an independent laboratory that is not part of a government agency or university, we have the freedom and flexibility to pursue the emerging issues in the marine environment and focus on the subjects we think are important to oceans and people depending on them – i.e., ocean acidification, toxins in the marine environment, key animals in the ecosystem like sharks/top predators, the health of fisheries underpinning our economy, etc.
- As an independent, nonprofit laboratory, Mote has many advantages, but it also faces challenges to find funding.
- Mote is not automatically funded through any government process or university, so we must work hard to compete for local, state and federal grants and contracts. Roughly half of Mote's funding comes through scientists earning competitive grants from NSF, DOD, NIH, EPA, and other federal and state agencies.
- Another major pillar of our funding has always been philanthropy.
- Paradigms for funding and conducting science in the US have evolved considerably since WWII, the creation of NSF, a growing role for federal funding of research in the intervening decades and now with cuts in federal funding, the growing importance once again of philanthropy and independent non-profit research institutions such as Mote Marine Laboratory.
- Some have said that the practice of science in the 21st century is becoming shaped less by national priorities or by peer-review groups and more by the particular preferences of individuals with huge amounts of money.
- Others believe that setting national priorities by the very peer-review groups who established current paradigms of science will inhibit federal support for proposals for what some call "high risk" and the NSB termed potentially transformative research.
- Independent non-academic nonprofits research institutions, such as Mote Marine Laboratory, are the most nimble and entrepreneurial, and least bureaucratic of any nonprofit including academic institutions.
- Our entrepreneurial culture, and philanthropic support allows the freedom to leverage agency-funded research and pursue "high risk" potentially transformative research.

Status and Trends - NSB SEI 2014

- "Other Nonprofits" (other than academics and FFRDC) R&D budget in 2011 ~ $17.8B; Similar funding level to FFRDCs
- Academic have generally received steadily increasing federal research support over last decade.
- However, "Other Nonprofits" declined in R&D expenditures by 2.6% (2010 to 2011) and the only other institutional category to decline was FFRDCs by 0.8%.

Recommendation

In a book entitled "Science, Money and Politics", Daniel Greenberg has stated that Donald Kennedy once remarked (*paraphrasing here)* that academia is bound by a set of policies and practices that favor the present state of affairs over any possible future, and that it is a portrait of conservatism, perhaps even of senescence.

Perhaps it is past time for NSF and our Nation's federal research programs to reconsider the critical value of independent nonprofit research institutions such as Mote Marine Laboratory and "Other Nonprofits" (other than universities/academics and FFRDCs).

Given the somewhat unique role of independent nonprofit research institutions, such as Mote Marine Laboratory, in terms of, *inter alia*:

- innate entrepreneurial spirit of entirely soft-money research enterprise with a mission of translating and transferring research results,
- minimal bureaucratic challenges and hurdles to the conduct of science,
- the lack of political influences on research conducted and the scientific freedom provided through significant philanthropic support to leverage competitive grants from federal and state agencies and conduct potential transformative research,

NSF should survey and track much more closely the federal research funding trends for such research institutions and the vital niche role they play in enabling the U.S. to stay at the forefront in the global research and innovation enterprise. The R&D model of such institutions like Mote may provide insights on more effective and efficient use of R&D investments.