Outsider's view inside NSF: Trends and Tips

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and

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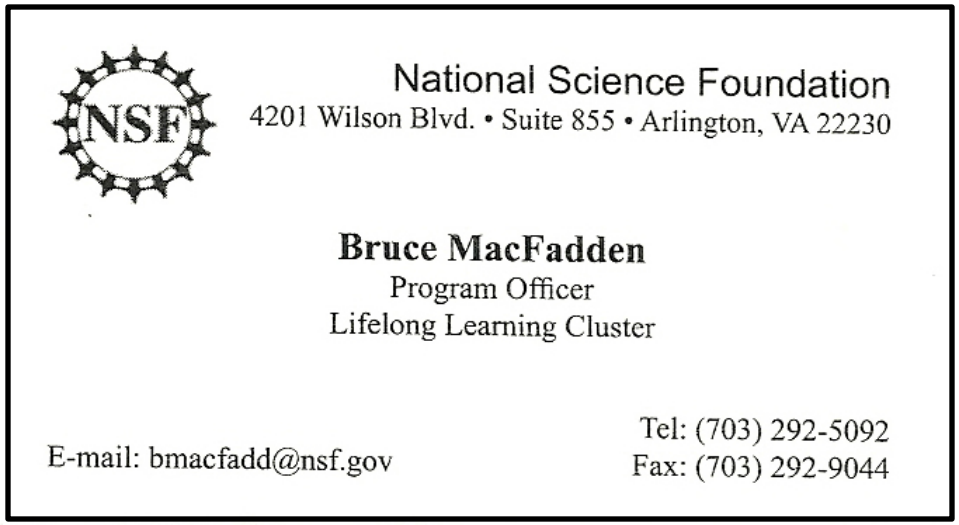
Why this talk?

E&O workshop--Feedback

Are you looking for $ in all the wrong places?

Why me?



July 2009-July 2010

How important is Informal (Lifelong) Learning?

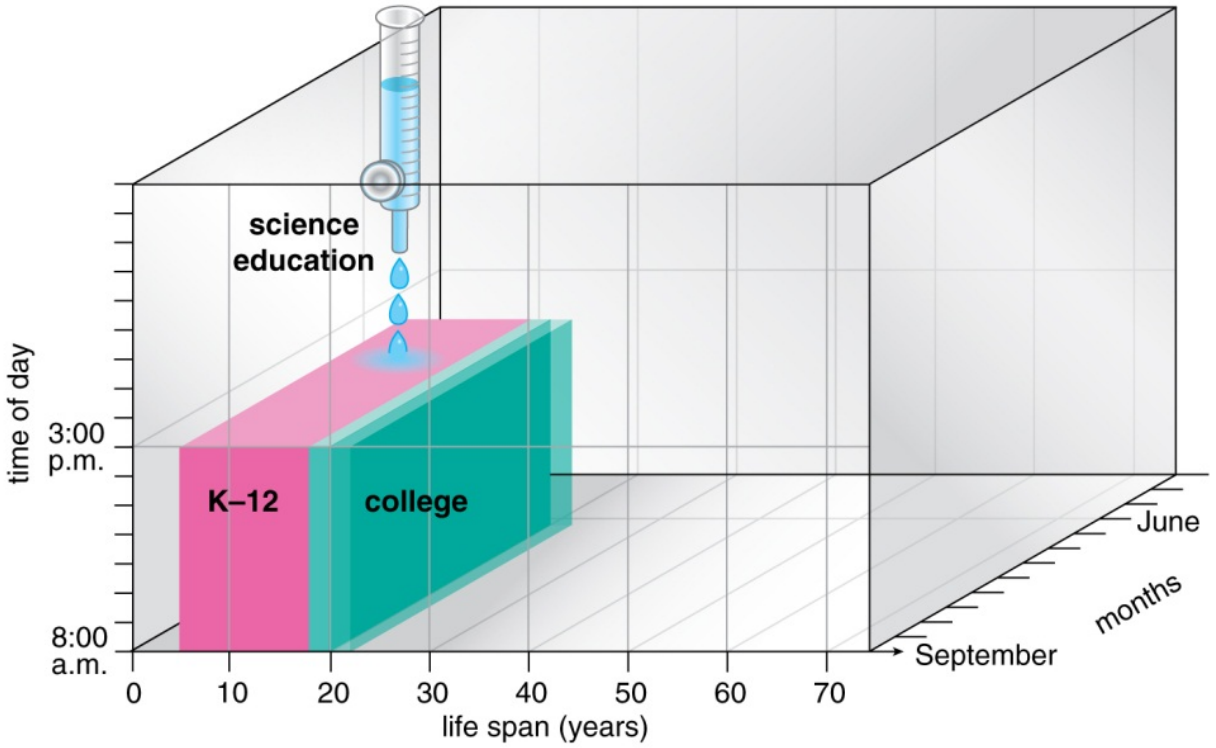
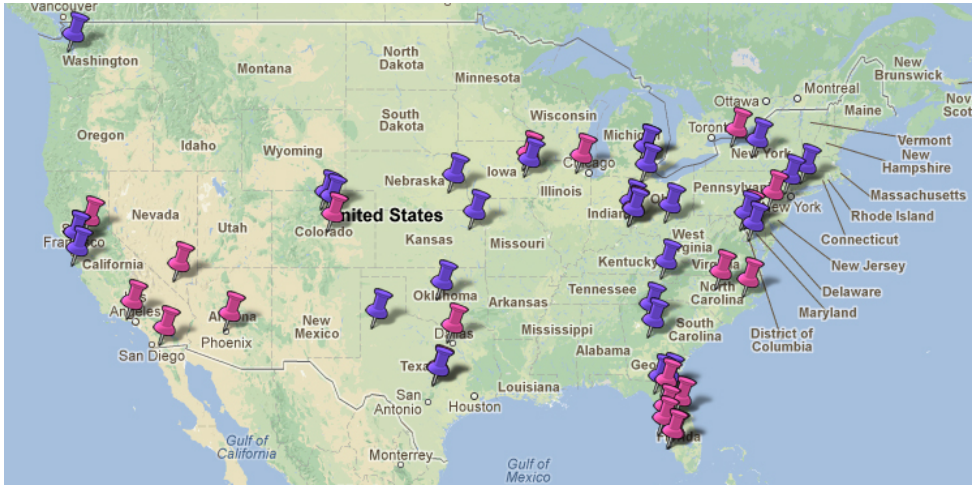


Figure 2. On average, only about 5 percent of an American's lifetime is spent in the classroom, and only a small fraction of that is dedicated to science instruction. Emerging data suggest that the best way to increase the public understanding of science is to reach people during the other 95 percent of their life.

Taken from FALK, J. H., and L. D. DIERKING. 2010. The 95 per-cent solution. American Scientist, 98:486-493.

(Personal) Outcomes of my time at NSF



California STEM Teachers Project

http://www.flmnh.ufl.edu/panama-pire/pcppireteach/default.htm

Gatun, Panama, July 2012

AP Biology
Harbor High,
Santa Cruz CA
December 2012

Black box called NSF

- Part of the Executive branch
- Primary place to fund basic STEM research
- About 2000 employees, ~500 POs
- Budget– about $ 7 Billion
- About 45 to 50 K proposals/year; ?10 K funded
- Directorates (Research & Related Activities)
  - R&RAs the scientists' "comfort zone" BIO, GEO, etc.

Thinking outside the box

Education and Human Resources (EHR)

- $875 million budget (2013)
- Opportunities, but different culture
- DUE (Division of Undergraduate Education)
- DGE (Division of Graduate Education)
- HRD (Human Resource Development)
- DRL (Division of Research on Learning)
  - DRK12 (Discovery Research K12)
  - AISL (Advancing Informal STEM Learning)
    - Lifelong Learning

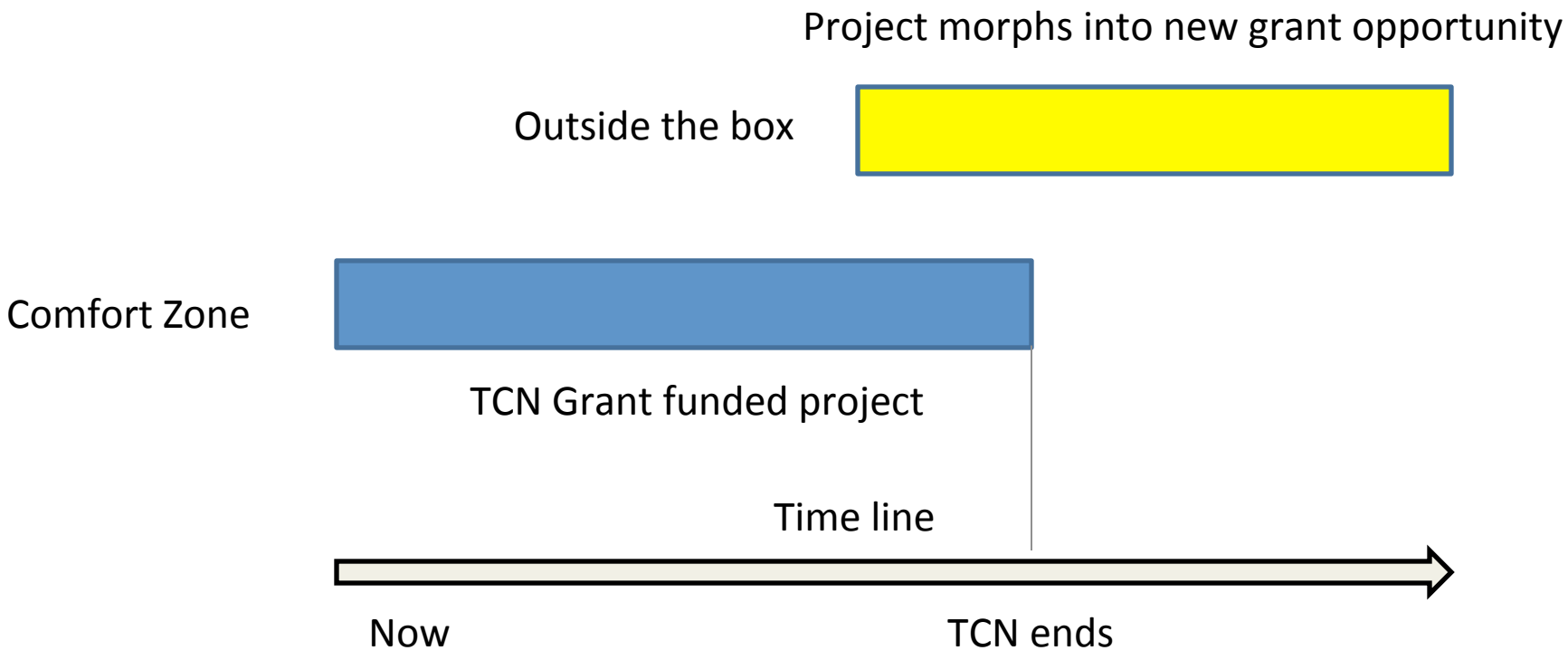
Repackaging what you do

- REU RET
- AISL
- RCNs
- IGERT
- HRD
- CAREER
- Etc.

Trends

- Decline of core single-investigator awards
- Rise of complex, collaborative projects
- Waves of (strategic) buzz words
  - Climate change, Sustainability, now Big Data
  - Tip—"fit" your project into these
- Caveat—don't miss the bandwagon
  - Education programs are in a state of flux
- Collaborative learning network (Community of Practice)

Tip—TCN Longevity



Where's the low-hanging fruit at NSF?

- I've looked, but haven't found any yet.
- But if your go-to program has not been good to you, then look elsewhere.

If you go to EHR!

- Partner with an educator
- Turn up the heat on evaluation/assessment
- Don't warm up (resubmit) your BIO proposal

Think outside the box; Have fun!

Why Reed Beaman?

- Program Director, Division of Biological Infrastructure, BIO Directorate, 2010-2011
  - Advances in Biological Informatics (ABI)
  - Dimensions of Biodiversity (cyberinfrastructure lead)
  - Computing in the Cloud (CiC)
  - Innovations in Biological Imaging and Visualization (IBIV)
  - Cyberinfrastructure Training, Education, Advancement, and Mentoring for Our 21st Century Workforce (CI-TEAM)

- "Expert" appointment, DBI, 2012 – Strategic planning for BIO Centers and biological cyberinfrastructure

Trends

- Collaboration
  - Multidisciplinary
  - International
- Sustainability
  - Planetary, environmental
  - Infrastructure

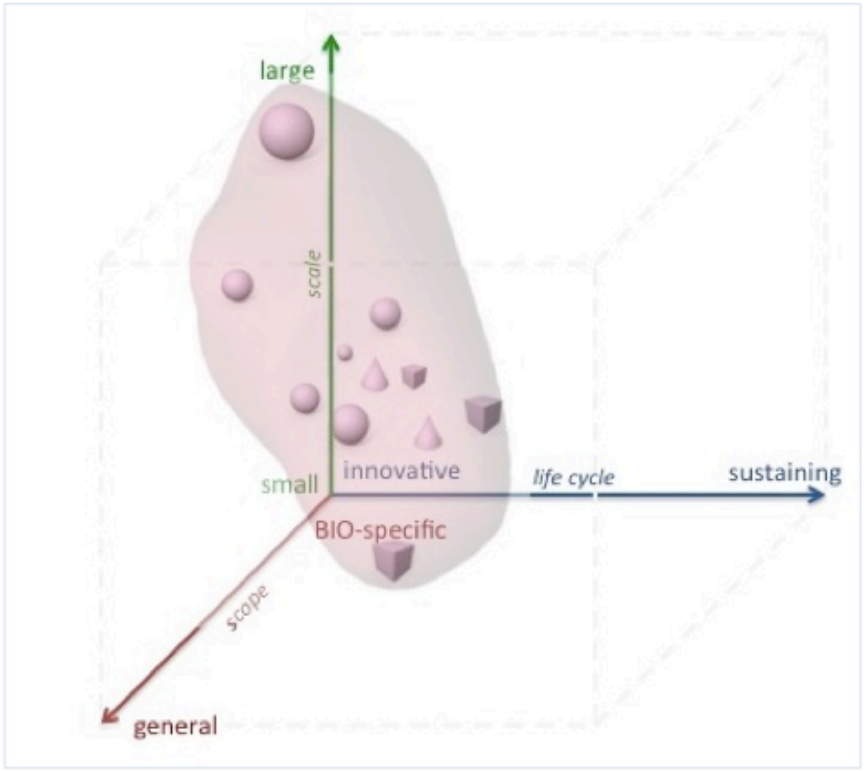
C. CyberSEES Project Requirements

Competitive CyberSEES projects must satisfy the following requirements, which represent defining characteristics of the CyberSEES solicitation. Further information on these requirements can be found in the Review Criteria section of this document.

- The research must be well-grounded in sustainability issues.
- The research objective must advance computing or cyberinfrastructure knowledge, while also advancing knowledge in another discipline.
- The team composition must be synergistic and interdisciplinary, and must consist of at least two investigators from distinct scientific disciplines.
- For Type 2 proposals, the project must address education and workforce development in sustainability science.

Source: http://www.nsf.gov/pubs/2014/nsf14531/nsf14531.htm

A BIO view of CI investments



Dimensions of scope, scale, and point in life cycle

Example: Advanced Digitization of Biodiversity Collections

Enabled through combination of new and existing programs

- HUB – sphere (which supports the TCNs)
- Thematic Collections Networks – smaller spheres
- ABI supported tools – cubes
- Collections in Support of Biological Research - cones

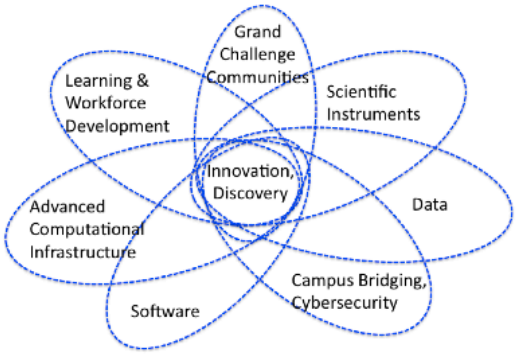
- Source: Anne Maglia, http://www.nsf.gov/attachments/125204/public/Craig_Stewart_Presentation.pdf

NSF's Cyberinfrastructure vision

2. Vision, Goals and Strategies

CIF21 contributes to NSF's overall strategic objectives,[1] by supporting the creation of advanced cyberinfrastructure, including high performance computing systems, data storage systems and repositories, advanced instruments, and visualization systems, enabling researchers to gain new insights and investigate ever broader and more complex research challenges. CIF21's cross-community and multipronged approach will direct those investments along a new path toward a comprehensive, integrated, sustainable, and secure cyberinfrastructure (CI) that will accelerate research and education and new functional capabilities in computational and data-enabled science and engineering (CDS&E). CIF21 also addresses the engagement and education of students from groups traditionally underrepresented in science: African Americans, Hispanics, Native Americans and indigenous people, persons with disabilities, and women.

CIF21: cyberinfrastructure as an ecological system



http://www.nsf.gov/cise/aci/cif21/CIF21Vision2012current.pdf

Final Tips

- Talk to the program officers
- Read the Dear Colleague letters
- Serve as a reviewer
- E & O investments (and requirements from NSF) increase with project, budget size
- Look at the budget

Take a dive into the budget

DIRECTORATE FOR BIOLOGICAL SCIENCES (BIO) **$760,580,000**
+$48,200,000 / 6.8%

BIO Funding
(Dollars in Millions)

	FY 2012 Actual	FY 2012 Enacted/ Annualized FY 2013 CR	FY 2014 Request	Change Over FY 2012 Enacted Amount	Change Over FY 2012 Enacted Percent
Molecular & Cellular Biosciences (MCB)	$125.63	$125.79	$136.39	$10.60	8.4%
Integrative Organismal Systems (IOS)	212.43	212.33	225.37	13.04	6.1%
Environmental Biology (DEB)	142.55	142.56	148.97	6.41	4.5%
Biological Infrastructure (DBI)	126.46	126.18	133.65	7.47	5.9%
Emerging Frontiers (EF)	105.22	105.52	116.20	10.68	10.1%
Total, BIO	**$712.28**	**$712.38**	**$760.58**	**$48.20**	**6.8%**

Totals may not add due to rounding.

- DBI's FY 2014 requested increase of $7.47 million, or 5.9 percent, empowers biological discovery by supporting the development and enhancement of biological research resources, human capital, and centers. It reflects an increase in support of NSF's CIF21 investment, active research participation by undergraduate students through the Research Experiences for Undergraduates Sites (REU Sites) program, and continued investment in research to address BIO's five Grand Challenges. DBI will also partner with DEB to provide increased support for SIBS, an effort that networks the growing legacy of biological knowledge in collections with integrative biological research.

Source: http://www.nsf.gov/bio/budget/FY14/fy14_bio_final.pdf

Cross-cutting and other programs

- Division of Biological Infrastructure (BIO/DBI)
  - Human Resources cluster (e.g., REU)
  - Research Resources cluster (e.g., ABI, CSBR)
  - Centers

- Science, Engineering and Education for Sustainability (SEES)

- Science Across Virtual Institutes (SAVI): A NSF-wide Activity to Accelerate Advances in Science and Engineering Research and Education through International Collaborations

Shared Google Spreadsheet with NSF funding opportunities