

# Broader Impacts, Education & Outreach, and Evaluation

Bruce J. MacFadden

Co-PI & Director of Education and Outreach

Curator of Vertebrate Paleontology

Florida Museum of Natural History

# Outline

- Broader Impacts ➡ Education & Outreach
- Strategies to Broaden representation
- Education and Outreach
  - HUB activities so far
  - Future activities
- Long-term vision for BI and E&O
  - E&O subcommittee
- Evaluation, accountability & quantifying impact

# Changes to BI Criteria, NSF 13-1

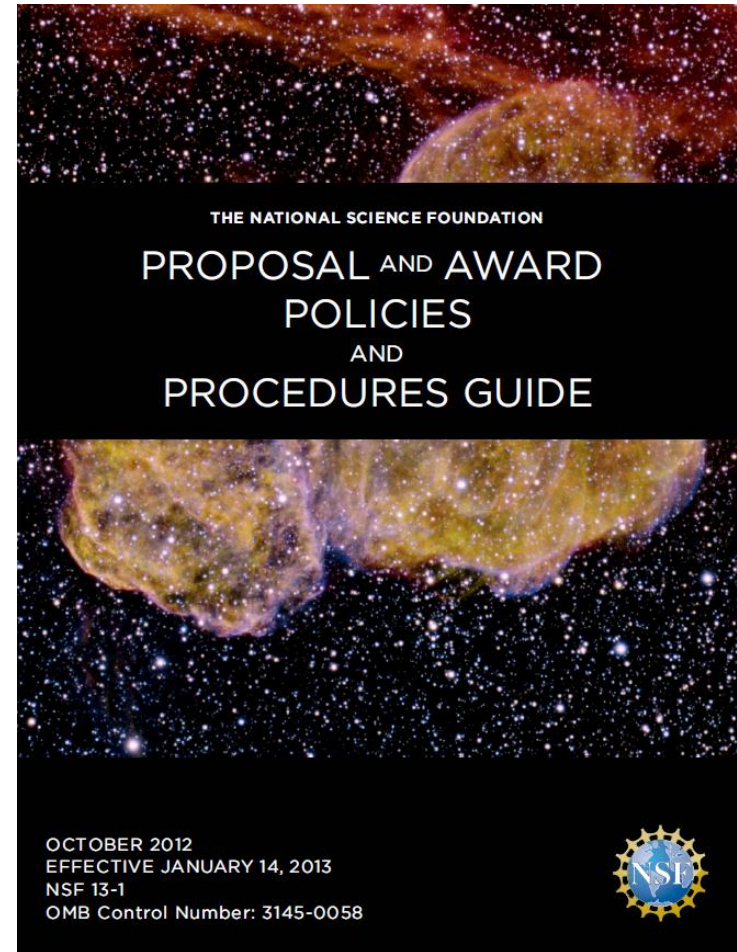
## Significant Changes summary (p. 3)

“**Review Criteria**, has been renamed Merit Review Principles and Criteria and revised to incorporate recommendations from the NSB. New language has been added on merit review principles, and revised merit review criteria language was inserted.

..References to the document containing examples illustrating activities likely to demonstrate broader impacts have been deleted. This was done to eliminate confusion over the document, which was often viewed as a prescriptive list of additional requirements instead of illustrative examples.”

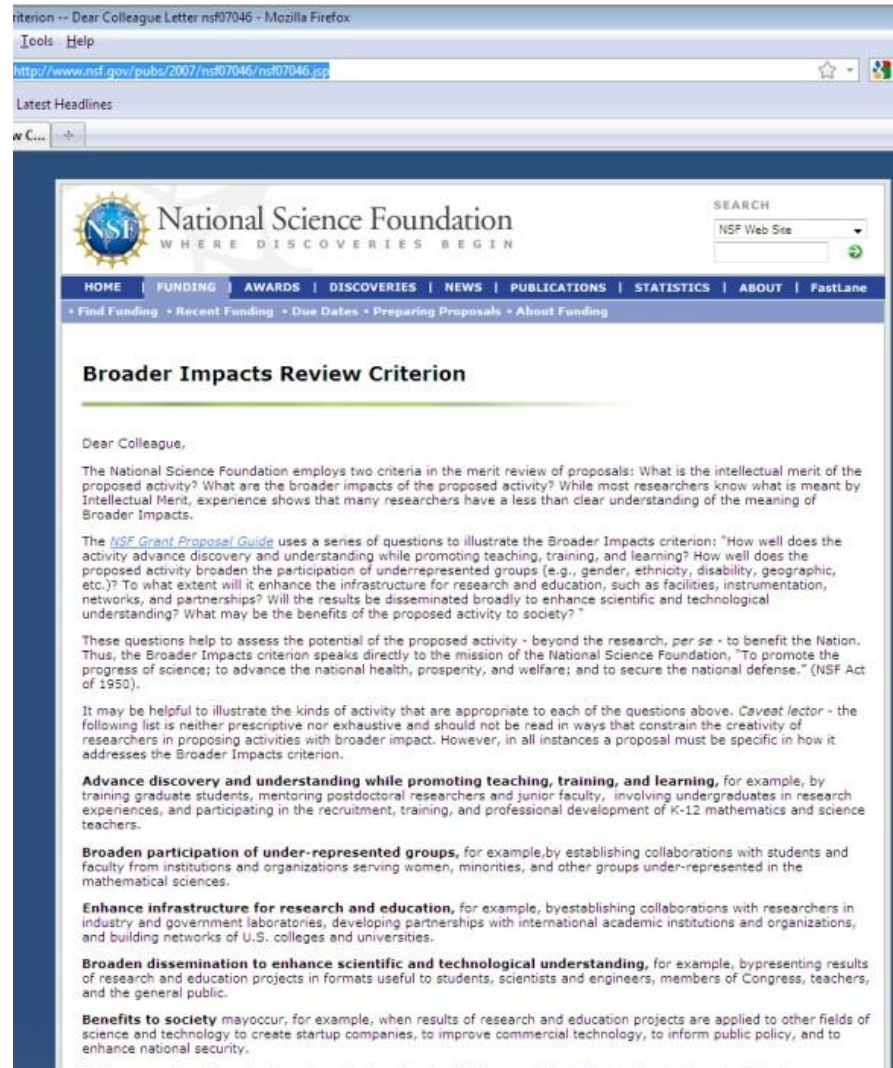
Page III-2. “**Broader Impacts:** The Broader Impacts criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes.”

My take—The 2007 Dear Colleague letter still provides a good framework.



# iDigBio E&O framework follows NSF's Broader Impact criteria\*\*

1. Advance discovery and understanding while promoting teaching, training, and learning
2. Broaden participation of underrepresented groups
3. Enhance infrastructure for research and education
4. Broad dissemination to enhance scientific and technological understanding
5. Benefits to Society



The screenshot shows a web browser window displaying the National Science Foundation (NSF) website. The page title is "Broader Impacts Review Criterion". The content includes a "Dear Colleague" letter from the NSF, explaining the two criteria used in the merit review of proposals: Intellectual Merit and Broader Impacts. The text discusses the NSF's mission and provides examples of activities that can address the Broader Impacts criterion, such as training graduate students, mentoring postdoctoral researchers, and participating in the recruitment, training, and professional development of K-12 mathematics and science teachers. The page also includes a search bar and a navigation menu with links to HOME, FUNDING, AWARDS, DISCOVERIES, NEWS, PUBLICATIONS, STATISTICS, ABOUT, and FastLane.

\*<http://www.nsf.gov/pubs/2007/nsf07046/nsf07046.jsp>

# Teaching, training, and learning

- iDigBio related content is integrated into courses at FSU and UF
- iDigBio has supported and mentored two postdocs, 6 graduate students, and four undergraduates
- We have hosted or facilitated workshops and more are in the planning stages. These have impacted professionals and students from many institutions. David will provide the stats in his talk.

# Broadening representation

## *iDigBio* Visiting Scholars program

- Early career professional development
- 2012, Anna Monfils, Central MI Univ
- 2013 Corey Toler—Franklin, UC-Davis



## Broad dissemination--Professional stakeholders

- We have attended and/or presented talks or posters at ~50 professional meetings (half during this past year)
- We have led the development and implementation of symposia and themed sessions, e.g., Botany, GSA, and more are planned , e.g., SPNHC 2013
- Articles published in peer-reviewed journals, e.g., Zootaxon special issue



## Broad dissemination--Other stakeholders

- Produce iDigBio e-newsletter
- Social media (Facebook, Twitter) on web site
- Talks to civic and interest groups, e.g., fossil clubs in Florida

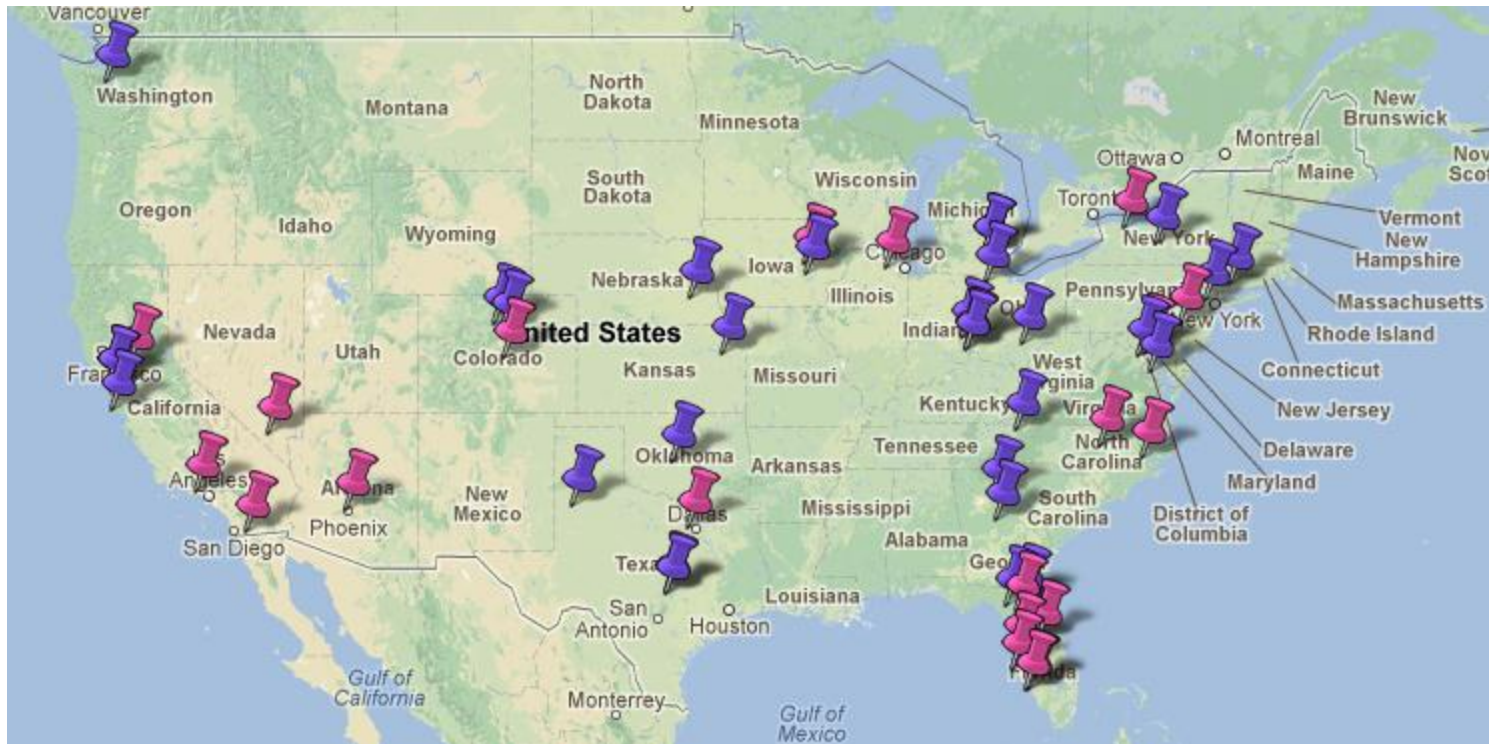


Fossils in the Cloud—SW Florida Fossil Club



# New HUB-focused initiatives

## FOSSIL project



Networked Community of Practice (CoP) between fossil clubs (red) and professional paleontologists

# California STEM Teachers Project

(Funded by NSF RET Supplements to Panama PIRE 0966884)



Gatun,  
Panama,  
July 2012



Canopy Crane, Panama, July 2012



AP Biology  
Harbor High,  
Santa Cruz CA  
December 2012



# USA Science & Engineering Festival Washington DC, 27-29 April 2012 (100,000 visitors over one weekend)



Panama PIRE (0966884) selected by OISE

Goal: To have iDigBio at 2014 Science Festival

## Enhancing infrastructure: E&O subcommittee

- Formed March 2013, with members from iDigBio team
- Charges to:
  - Coordinate E&O activities
  - Communicate with TCNs
  - Develop activities of interest to the HUB and TCNs
- Short-term goals (next six months)
  - Establish regular communication with one E&O point person from each TCN
  - Plan for, and implement, an E&O Workshop
  - Facilitate common goals

# Analysis TCN BI activities (N=7)\* (if explicitly stated)

• Grad training & mentoring	6
• Undergraduate training & mentoring	6
• Postdoc training & mentoring	2
• Fostering professional community use	1
• Museums, etc.	5
• K12 outreach	4
• Underrepresented groups	5
• Amateurs, volunteers & citizen science	5
• Evaluation & Best Practices	2
• EPSCoR	1
• Access & awareness of digitized collections by society	1+

\*Thanks to Joanna McCaffrey for help

# TCNs' BI general overview

- Many proposed BI projects have limited accountability for goals, outcomes, etc.
- Some activities complement *iDigBio* initial goals; e.g., developing an UG course, webinar etc.
- Lots of overlap and possibility for collaborations
  - And possible funding from other NSF programs
- Coordination and communication—via E&O subcommittee and workshop



# Evaluation



- Professional evaluator, Dr. Shari Ellis, FLMN Center for Informal Science Education
  - Develops surveys, interviews, and evaluates workshops and other iDigBio activities
  - Collects and provides data for reports, as needed
- Overall project evaluation
  - Process during early stages
  - Impacts and outcomes during later stages
- Can track goals, milestones, deliverables, outcomes, etc.

# Other evaluation activities

Development of specific front-end evaluations (needs assessments), such as recent initiatives:

Survey to 24 fossil clubs in US to understand needs, knowledge, attitudes, and demographics (MacFadden)

- Survey to >100 to understand the involvement of undergraduates working in collections (Monfils)

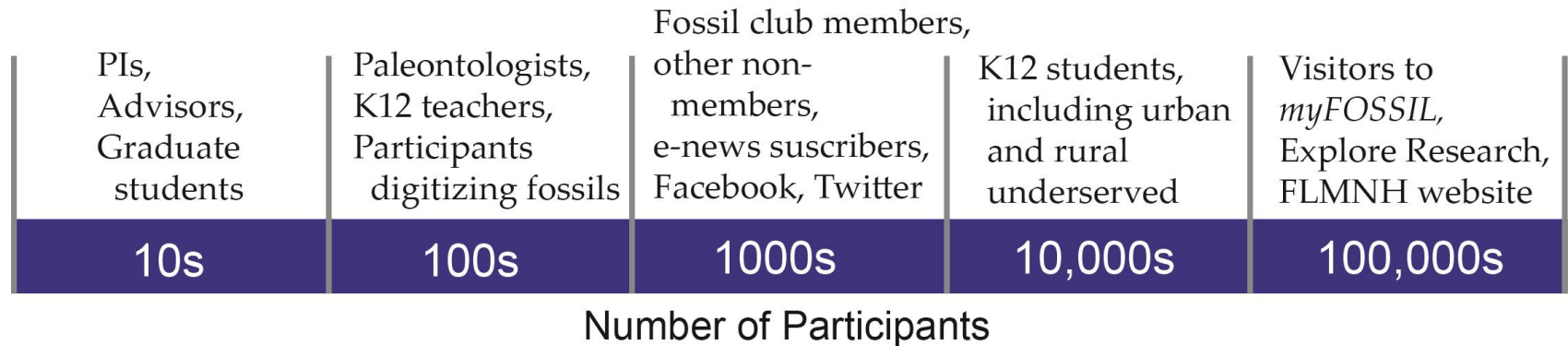
- Assisting grad student with *Explore Research*

# Explore Research\*



\*Funded by seed money from the UF VP for Research

# Quantifying Impact: Example from the FOSSIL project



Deep  
Impact



Broad  
Impact

# Summary

Through our activities so far, or those planned, or pending, iDigBio is fulfilling its E&O mission of the project via all five Broader Impact criteria:

1. Teaching, training, and learning
2. Broadening representation
3. Enhancing infrastructure
4. Broad dissemination
5. Overall benefits to society

And, we have an on-going implementation plan to evaluate outcomes, and quantify impact.