**Bringing Earth Sciences to K-12 and the Community**

**via Outreach Opportunities**

*On the Cutting Edge: Early Career Geoscience Faculty Workshop – June 2011*

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*University of Arizona*

*(Much of this material was drawn from a previous handout by Katryn Weise, City College of San Francisco)*

WHY OUTREACH?

Why are we in this session today?

Why does outreach matter to us?

What are the benefits of outreach to ourselves and our departments?

PERHAPS I DO OUTREACH BECAUSE …

- it makes me feel a useful and contributing part of my community. It meets my own personal mission on this planet.

- It was strongly suggested by my Dean that it would be good for the College and for my tenure.

- I see a need in the community that isn’t being addressed.

- I wish to engage the community in the College (improve relations etc…).

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THINK-PAIR-SHARE EXERCISE …

On your own - On a piece of paper, answer:

Why am I interested?

What am I hoping to achieve through outreach, for myself, my students, and my department?

Partner Share **-** Share your answers to both questions with a partner.

Group Share - Share one or two of your answers with the group.

SOME IDEAS FROM PREVIOUS WORKSHOPS:

· Makes us feel like good humans / citizens by giving us an opportunity to share our skills

· Gives us a chance to enjoy other pleasures: I think kids are awesome!

· Groundwater issues in the community need input

· I have a funded student who is required to do ½ outreach

· Increases science education of community

· Satisfies my desire for service

· Is part of my professional responsibility

· I enjoy it!

· Increases recruitment! (Especially for brand-new campuses)

· My Dean is keen on outreach

· Will give me a better public profile (I get my name in the paper!)

· Ensures research is known to and benefits the public

· Creates networks that will facilitate research projects and internships / jobs for students

· Expands my views beyond my limited institutional environment

· Connects me and my department with our town (improves relations!)

· Exposes underrepresented groups to Earth Science

· Increases visibility of the institution within the community

· Satisfies the Broader Impacts section on NSF grants

· Invigorates your own studies with community-related issues

· Can involve our students (give them hands-on experience and help them gain confidence).

· Educates the community on local environmental issues, especially policy makers

· Strengthens relationship between college and leaders

· Encourages more interest in teaching in the community

· It’s a requirement (service learning) for program or class

· Attracts money from private and public donors

· Builds better relationships with local landowners (facilitates field work)

· Advertises expertise of your department as a future resource

· Changes institution’s image of outreach to partnering for mutual benefit

· Provides resources and professional development to K-12.

· Improves your own education / teaching (observe how others do it for different audiences)

· Like Richard Feynman said: if you can’t explain it to a 2nd grader, you don’t understand it!

SOME OUTREACH OPPORTUNITIES:-

Teaching teachers and enhancing classroom education (K-12)

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| SOME OPPORTUNITIES…• Placement of student interns• Recruitment of majors• Recruitment of teachers• Teacher training• Loaning or donation of materials• Basic skills and preparation• Making field trips more accessible• Enhancing/Teaching curriculum• Community building• Public education | SOUTHERN ARIZONA EXAMPLES…• UA College of Science (CoS) outreach program to K-12• CATTS – Collaboration to Advance Teaching Technology and Science• CoS Flandrau Center Science Outreach Open Houses• Adopt-A-School (AAS) - putting Professors and graduate students into the classroom• UA field trips (bring classes to science labs/centers)• UA - Teachers at UA for a Day event• MESA (Math Eng. Science Achievement) Program• Arizona Center for STEM teachers• Arizona teachers initiative• teacher training lectures / courses / workshops  |

Working with High School students

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| SOME OPPORTUNITIES…• Placement of student interns• Recruitment of majors• Public education• Community building | SOUTHERN ARIZONA EXAMPLES…• NASA Space Grant Program Science Speakers into the classroom to answer science questions• Service-Learning and Science Clubs (outreach from ourstudents to theirs)• Physics Factory• Tree Ring Lab School Presentations• AP calculus class visits to local High Schools |

Collaborating with Federal/State/Private research groups

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| SOME OPPORTUNITIES…• Placement of student interns• Recruitment of Majors• Education in local issues• Incorporation of research data into classroom• Funding for classroom data collection• Research and job experience | SOUTHERN ARIZONA EXAMPLES…• NOAA/NWS• USGS geologic/hydrologic/natural resources survey |

Collaborating with other 2-year and 4-year college departments

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| SOME OPPORTUNITIES…• Research and job experience• Recruitment of Majors• Opportunity for multi/interdisciplinary collaboration• Sharing resources (seminars, materials, etc.) | SOUTHERN ARIZONA EXAMPLES…• Pima Community College• University of Arizona |

Assisting in community workshops

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| SOME OPPORTUNITIES…• Development of curricula• Loaning or donation of materials• Recruitment of majors• Training workshop leaders• Public education• Community building | SOUTHERN ARIZONA EXAMPLES…• College of Science Public Lecture Series• Steward Observatory Public Evenings• UA – hosted community Book Fair• Flandrau Science Center’s “Science Café” – a casual public forum to discuss science topics of general interest  |

Providing resources to local museums and aquariums

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| SOME OPPORTUNITIES…• Placement of student interns• Loaning of display materials• Public education• Community building• Development and leading of localfield trips• Assistance with display design• Assistance with curricula• Brown-bag lectures | SOUTHERN ARIZONA EXAMPLES…• UA Museum of Natural History• Flandrau Science Center• Biosphere 2• Tucson Children’s Museum• Arizona-Sonoran Desert Museum• Arizona State Museum• International Wildlife Museum |

Collaborating with local, state, or national park programs

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| SOME OPPORTUNITIES…• Leading field trips• Teaching community classes• Providing resources• Producing curriculum | SOUTHERN ARIZONA EXAMPLES…• Grand Canyon trail guides, exhibits• Tucson Water (Citizens Water Advisory Committee)• Saguaro Nat’l Park; Sabino Canyon (NFS) |

Assisting the Media

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| SOME OPPORTUNITIES…• Hosting / presenting on programs or blogs• Writing articles• Providing expert advice or interviews for writers on natural hazards, natural resources, pollution or environmental issues, etc. | SOUTHERN ARIZONA EXAMPLES…• Local TV news stations• Local news – KUAT, campus, newspapers, etc.• BLOGS and the internet• Radio |

Getting involved with local political groups

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| SOME OPPORTUNITIES…• Providing expert advice• Recruiting resources• Calculating statistics | SOUTHERN ARIZONA EXAMPLES…• Green Jobs• Environmental Issues• Energy Issues• Natural resource issues• Land management agencies, like water resource, and reclamation projects. |

TIPS FOR OUTREACH

· Make the outreach opportunity a partnership. Share the work!

· When approaching organizations and people to be involved, be sure your project is one that will save them time or make their job easier or better.

· Look to good models of outreach within your own department, other departments, other colleges, or the organizations that interest you.

· Get your feet wet by getting involved with an existing program (such as GLOBE – global learning and observation for the betterment of the environment – worldwide protocol for how K-12 students can collect data)

· Network. Network. Network.

· Match your outreach interest with departmental/college goals.

· Be realistic about how much time you can commit.

· Look to private companies and local foundations for funds. Look everywhere; Admissions; Deans; Public Utilities.

· Have booths at local fairs. Participate in local Earth Day events.

· Have a department open house.

· Provide public science talks to the community (hosted at sites throughout the city, including bars, e.g., “Science Café”).

· Working with teachers multiplies the benefits through their students.

· Look to the public outreach arm of AGU for more resources.

HOW?

1. Pick the outreach opportunity that most appeals to you, and on a piece of paper, answer the following:

What are some steps I can take to pursue this outreach opportunity? (include as many steps as you think of – but start small and work to larger and larger ones)

2. Share - Discuss your steps with a partner – exchange ideas.

FINAL THOUGHTS

“A journey of a thousand miles begins with a single step.”

- Studies show that when you get the ball rolling and keep it moving, even if imperceptibly slow, things are more likely to happen for you.

- It may help to get involved in someone else’s outreach program first, to build your experience and confidence.

· You’ve already begun the first step – you’ve opened your mind to the idea of doing something non-traditional.

· Step two was writing down some ideas on how to proceed.

· Step three was sharing those ideas with someone else. Hopefully the sharing gave you new ideas and if nothing else, it cemented the ideas more firmly in your mind.