Museum Collections on the Internet and in the Classroom

19 October 2013
Kayce Bell
Museum of Southwestern Biology
University of New Mexico
Education, Training, & Research
Natural History Collections

• Scale—time and space
• Integration
  – biotic and abiotic
  – genomic to organismal to ecosystems
• Database
• Scientific Process
  – experiential vs passive
Collections-based approaches and undergraduate education

- Complexity-multiple views
- Web-based discovery
- Linking genomic data and physical specimens
Natural History Collections Data

• On-line databases
  – Global Biodiversity Information Facility
  – Taxonomic databases: MaNIS, Ornis, HerpNet, FishNet
  – Museum databases: Arctos (MVZ, UAM, MSB, many others), Field Museum, Smithsonian, American Museum of Natural History
Integrating in the Classroom

- Students can access and use databases
- Address questions of local relevance
- Inquiry-based learning
Challenges

• Few educators (& fewer students) seem to know:
  • about natural history collections
    or their role in development of key concepts
  • how to access museum information
  • how to incorporate specimen data in teaching
A Few More Challenges

Collections (and databases) have limitations

Specimen availability
Narrow view of possibilities (systematics)
Collections developed for research
Databases developed for collection management, not education.

How do we unleash potential for teaching?
Undergraduate Learning Through Exhibits
Graduate and Undergraduate Research Experiences Based on Collections
Expand traditional museum experiences

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• Increase accessibility of natural history collections to educators/public through databases.
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• Partner with other non-traditional museum users (e.g., Behavior, Geography, Art)

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Expand traditional museum experiences

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• Implement education modules that use museum collections and data

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Modules should:

- Provide all background material for instructors
- List key concepts and skill sets
- Be easy to incorporate to already established curricula
- Be easy to modify to better fit an instructor’s particular needs.

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Educational Modules

Island Biogeography: Species Richness Across a Northern Archipelago

Key Concepts and Skills:
- Evolution & Ecology
  - Body size on islands
  - Competitive exclusion/release
  - Isolation and Divergence
  - Island biogeography
- Conservation biology
- Scientific process & hypothesis testing
- Statistical methods
- Management & analyses of large-scale databases

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Educational Modules
Reading, Constructing, & Using Phylogenies

Key Concepts and Skills
Learn about scientific process
Gain appreciation for evolutionary connections across the Tree of Life
Interpret a phylogeny
Learn how phylogenetic trees are constructed
Introduce the different ways to study evolutionary relationships
Learn how comparative phylogenetics is used to understand the biology of organisms

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More Educational Modules

Climate change

Adaptable to local flora and fauna

Activities for other disciplines (art, geography, etc.)

Scalable – high school and undergraduate

Develop Spanish-language Modules

Need suggestions for use, modification, and development of new modules
Digital Collections!

Having collections available on-line make these educational opportunities possible.

Emphasize the value of collections to an audience that otherwise may not even know they exist.
Join us!

AIM-UP! is recruiting people to join the network.

The network is looking for people interested in implementing modules and developing new modules.

Contact:
Joe Cook, tucojoe@gmail.com
Kayce Bell, kayce.bell@gmail.com

www.aim-up.org
Funding and Participation

University of New Mexico; University of Alaska, Fairbanks; Harvard University; University of California, Berkeley; Texas A&M University; City University of New York; Occidental University; University of Nevada, Reno; Arizona State University; University of Ohio; Florida Natural History Museum; University of Illinois, Champaign-Urbana; College of Southern Nevada; Northern Michigan University; University of Michigan; Massachusetts College of Liberal Arts; University of Colorado, Boulder; Denver Museum of Nature & Science; United States Geological Survey; United States Department of Agriculture