An Introduction to AIM-UP!

Advancing the Integration of Museums into Undergraduate Programs

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Traditional Uses of Museums in Education

1) Undergraduate Experiences in Curation
Traditional Uses of Museums in Education

2) Undergraduate Experiences in Museum Fieldwork
Traditional Uses of Museums in Education

3) Undergraduate Learning Through Exhibits
4) Specimens Used in Classrooms
Traditional Uses of Museums in Education
5) Research Experiences Based on Collections
What do collections-based approaches add to undergraduate education?

- Scale—time and space
- Integration
  - biotic and abiotic
  - genomic to organismal to ecosystems
- Complexity—multiple views
- Web-based Discovery
- Database Exposure
- Scientific Process
  - Experiential vs passive
Challenges to leveraging collections for education (from the perspective of educators)

Few educators (& fewer students) seem to know:

• about natural history collections
  o or their role in development of key concepts
  o or potential contributions to key societal issues
• how to access museum information
• how to incorporate specimen data in teaching
A few more challenges (from the perspective of collections)

• Collections (and databases) have limitations
  – Specimen availability
  – Narrow view of possibilities
    – **Systematics**, now to other disciplines
      – (samples plus time and space stamps)
    – “Unintended Consequences”
  – Collections developed for research,
    – How do we unleash potential for teaching?
      – (formal and informal)
  – Databases developed for **collection management**, not education or outreach.
AIM-UP! NSF-funded RCN

Expanding beyond traditional museum experiences by...

• developing novel ways of using collections and data
• increasing accessibility of natural history collections to educators/public through online resources
• developing tools, guidelines, and “front-end” entry into databases to facilitate on-line use by educators/students
• partnering with other non-traditional museum users (e.g., Behavior, Geography, Art)
• developing international collaborations

www.aim-up.org
AIM-UP!--the network

Universities, Community Colleges and Tribal Colleges:


International: U Guelph, U Nacional de la Republica (Montevideo)

High Schools: Highland High (urban) and Sitka High (rural)

*original network participants
AIM-UP!--the network
AIM-UP! (inspired by the Arctos database)
AIM-UP! (inspired by the Arctos database)

The Arctos network and small collections:

- Minimal up-front investment in technology
- Data security and data servers handled elsewhere by IT professionals
- Database templates for different types of collections (herbarium, vertebrate, invertebrate, etc.)
- Built for data sharing and linking between databases, not only internal collections management
- Website: arctosdb.org
AIM-UP! Educational Modules
- online resources to help educators use museum specimens and/or data to enhance their teaching

Some other modules include:
- Coal Balls
- GIS and Bats
- How to Read a Scientific Paper
- Island Biogeography
- Phylogenetics Activities and Project
- Plant Range and Distribution in Alaska
AIM-UP! Educational Collaborations

Seminar and workshop that brought student artists into the Museum of Southwestern Biology

Julia Anderson
AIM-UP! Products

• Better Understanding of Existing Programs
• Survey of Educators and Students
• Stimulate Interdisciplinary Use of Specimens
• Publications—
  — Perspectives, Surveys, Educational Venues, Texts
• Workshops
• Educational modules centered around themes

Grow the Community of Users
Annual Conceptual Themes:

1) Integrative Inventories: Exploring Complex Biotic Associations Across Space and Time (MSB)
2) Decoding Diversity: Making Sense of Geographic Variation (UAM)
3) Evolutionary Dynamics of Genomes (MCZ)
4) **Biotic Response to Climate Change** (MVZ)
5) Coevolving Communities and the Human Dimension (MSB)
5 Annual All-Hands Meetings

2010-2015

• Exchange Perspectives on Teaching
  – Museums and Climate Change—
  Asilomar, Ca----26 Feb-3 March 2014

• Explore Educational Modules & Dissemination

• Evaluation
MUSEUM COLLECTIONS
AND CLIMATE CHANGE BIOLOGY

Potential Topics for Educational Modules

• Spatial and Temporal Genetic Variation

• Scientific Process (Replication--without vouchers, difficult to impossible)

• Climate change
  – Move
  – Adjust/Adapt
  – Extirpation
Workshops & Seminars--Spring 2012

1) Fluid Taxonomy -- on the dynamic, ever shifting practice of classification

2) Cataloguing Wonder -- collecting through the senses

3) Morphology and Evolution -- investigating change in nature and culture through place and time
More Possibilities
Educational Modules

• With warming conditions individuals/populations
  – Move
    • up in elevation—(Grinnell Project)
    • to higher latitudes (musk-ox parasite)
    • Explore Velocity of Change
  – Species distributions
  – Niche envelops
  – Life history changes
  – Phenology
NSF-RCN
Research Coordinating Network

• Goal: create new directions in research & education by communicating and coordinating activities across disciplinary, organizational, geographic and international boundaries.

• Crossing Taxonomic Borders
• Educators-Museum Staff
• Biologists-Education Specialists
• Informatics--Databases
• Art and Geography
• Others (GenBank)
RCN-UBE

- RCN-Undergraduate Biology Education---focuses on improved participation and learning in undergraduate biology curricula.