

Welcome!

AIM-UP! Hands On Meeting 2012



Degrees Conferred, Spring 2010

- 66 occupational endorsements
- 34 recommendations for education licensure
- 840 certificates and associate or baccalaureate degrees
- 263 master's and doctoral degrees



Currently ca. 140 graduate students in Biology & Wildlife and ca. 500 undergraduate students in Biology & Wildlife

Student Profile, Fall 2010

ENROLLMENT

Fairbanks Campus	5,787
Community and Technical College	3,681
Bristol Bay Campus	717
Chukchi Campus	343
Interior-Aleutians Campus	487
Kuskokwim Campus	387
Northwest Campus	602
Center for Distance Education	1,872
University of Alaska Fairbanks (total*)	11,034



* Some students attend more than one campus and are not counted twice in the total.

Female	59%
Male	41%
Alaska Native/American Indian	21%
Undergraduate	89%
Graduate	11%
Median age	25

Progress since the last meeting



Santa Fe, Oct. 2010

Meeting attendance:

SPHNC, ASM, BSA, Evolution

- RCN UBE: Ethnobiology (Kayce)
- STEM AK

Course Evaluations (UAF, UNM, Berkeley)

New Co-Evolution Course this semester UNM

RCN-UBE: Advancing Integration of Museums into Undergraduate Programs (AIM-UP!) 2010-2015

WWW.AIM-UP!.ORG

"At this point, I wish to emphasize what I believe will ultimately prove to be the greatest value to our museum and that is that the student of the future will have access to the original record of faunal conditions Right now are probably beginning changes to be wrought in the next few years vastly more complex than those that have occurred in ten times that length of time preceding."

J. Grinnell (1912)



Pressing questions

- Climate change
- Ecosystem integrity
- Habitat conversion
- Pollinants
- Emerging diseases
- Invasive species
- Declining diversity

will require the critical scientific infrastructure of museum collections and scientists trained to use them.

What do collections-based approaches offer undergraduate education?

- Scale—time and space
- Integration
 - biotic and abiotic
 - genomic and organismal
- Complexity
- Web-based Discovery
- Scientific Process
- Experiential vs passive

Goals of the network

- Make natural history collections more accessible to educators and to the public.
- Consider novel ways of educating based on collections and associated data
- Develop instructional tools, guidelines, and generally more usable "front-end" entry into museum databases that will facilitate on-line use by educators
- Develop evaluation tools.

Museums are essential archive observations, themes, practices and other datasets that allow scientists to use the powerful new tools of molecular biology to explore diversity and evolutionary processes in integrate across disciplines.



Activities of the network:

- 1) annual 3-day all-hands meeting (rotating) for all participants,
- 2) annual grad/undergrad seminar (multi-institutional) focused on theme development,
- 3) short-term exchanges of museum educators for intensive content development,
- 4) frequent interaction via interactive internet services (e.g., weekly video conferencing, AIM-UP! on-line discussion, ARCTOS blog),
- 5) short course (two weeks) for 8 undergraduate students



Fall semester workshop seminar. Participants shared a variety of museum collections in undergraduate, high, business, and interdisciplinary courses.

"...collections are the foundation for research on some of the fundamental phenomena of biological science: ecology, climate change, biogeography, behavior, agriculture, and culture. Natural history collections together form a huge library of scientific data... provide clues to patterns of the past and present and to predictions of future change....." *essay by Tom Koel & Thomas (2005), "Natural History Museum Collections in the 21st Century."*

2010



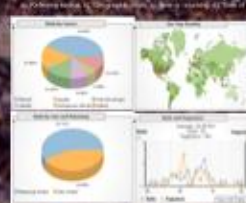
Museums are essentially archival observatories that provide our best window on historic conditions and establish the baselines necessary for assessing change and predicting future prospects. BUT their value will depend on our ability to train the next generation of scientists to creatively explore and integrate these vast resources across disciplines and into critical science initiatives.

SCIENTIFIC PERSPECTIVES

• In the world's increasingly dynamic and globalized, the importance of developing and providing high quality, peer-reviewed, open access, and freely available scientific data and information is increasing.

• Many such projects need to make the most of the rich and varied data sets that are available in museum collections, and making the most of these data sets is the goal of the network. The network will also provide a forum for the development of a shared infrastructure for data sharing, discovery, and education.

RCN-UBE: Advancing Integration of Museums into Undergraduate Programs (AIM-UP!) 2010-2015



Network Participants: University-based museums (U. Alaska, Harvard, UCB Berkeley, New Mexico U, U. Michigan) and free-standing museums (New York State Museum, Denver Museum), Federal agencies (USDA, NPS, USGS), International Partners (ROM, D. Canada, PEI/CICBA/Vegreville), Libraries (U. Arizona), Textbook Authors, 3 new participants annually, & 6 "Local" undergraduate educators annually.

AIM-UP! A Research Coordinating Network to Increase the Use of Museum Collections in Undergraduate Education

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Why collections?

Natural history collections are invaluable resources for undergraduate education. Such collections allow students to explore organismal diversity directly through examination of specimens and associated data. With the increasing availability of online specimen and ancillary data, natural history specimens can also serve as the foundation for instructional exercises at institutions lacking physical collections.

The challenge

Few people outside of museums are aware of the educational value of collections. This includes students and instructors at our home institutions: a recent survey of ~100 beginning undergraduates at UC Berkeley revealed that >70% were unaware that Berkeley has a natural history museum and that <10% had visited that museum. Clearly, a significant challenge is to inform students and instructors about the potential role of collections in undergraduate research.



AIM-UP! mission

We are an NSF-funded research coordinating network (RCN) developed to increase the use of natural history collections in undergraduate research. Specific goals of the network include:

1. Training undergraduates in museum-based research.
2. Developing instructional tools based on freely-accessible online museum data bases.
3. Introducing educators at non-museum institutions to the instructional power of museum collections.
4. Increasing public awareness of the educational importance of natural history collections.

AIM-UP! activities

The RCN is engaged in multiple activities aimed at increasing the use of natural history collections in undergrad education. These include:

1. Annual interactive online seminar
2. Development of educational modules
3. Annual all-participants workshop
4. Summer student "demo" workshop

AIM-UP! themes

Each year, the RCN focuses on a specific conceptual theme that can be explored through the use of natural history collections. These themes are (1) integrated inventories, (2) decoding diversity, (3) generating genotypes, (4) fast forward (climate change) and (5) coevolving communities.



1st annual RCN workshop, Santa Fe, NM
15-17 October 2011



"...collections are the foundation for research on some of the fundamental phenomena of biological science: ecology, climate change, biogeography, behavior, agriculture, and culture. Natural history collections together form a huge library of scientific data... provide clues to patterns of the past and present and to predictions of future change..."

Excerpted from Keith S. Thomson (2005) "Natural History Museum Collections in the 21st Century."

For more information, please visit www.aim-up.org

March 2011:

SPHNC
meeting in
San Francisco, CA

June 2011:

Botanical Society
of America
meeting in
St. Louis, MO



"At this point, I wish to emphasize what I believe will ultimately prove to be the greatest value to our museum and that is that the student of the future will have access to the original record of faunal conditions Right now are probably beginning changes to be wrought in the next few years vastly more conspicuous than those that have occurred in ten times that length of time preceding."
-J. Grinnell (1912)



June 2011

1. Evolution Meeting,

Norman, OK

2. American Society of Mammalogists

Portland, OR

aim-up@aim-up.org

www.aim-up.org

AIM-UP!

We are an NSF-funded research coordinating network (RCN) that aims to increase the integration of natural history collections into undergraduate education. Our goals are to:

1. Train undergraduates in museum-based research
2. Develop instructional tools that utilize museum specimens or databases
3. Introduce educators to the instructional power of museum collections and databases
4. Increase public awareness of the importance of natural history collections.



The Challenge

Few educators that are not affiliated with museums are aware of the educational potential of collections and associated databases. But this unfamiliarity also includes students and instructors at institutions with large museums: a recent survey of ~ 100 beginning undergraduates at UC Berkeley revealed that > 70% were unaware of the Museum of Vertebrate Zoology and that < 10% had visited it. The same survey of ~100 undergraduates at UNM revealed that about 50% were unaware of UNM's Museum of Southwestern Biology and only about 15% had visited. Clearly, a significant challenge is to inform students and instructors about the potential role of collections in undergraduate teaching and research at all universities.



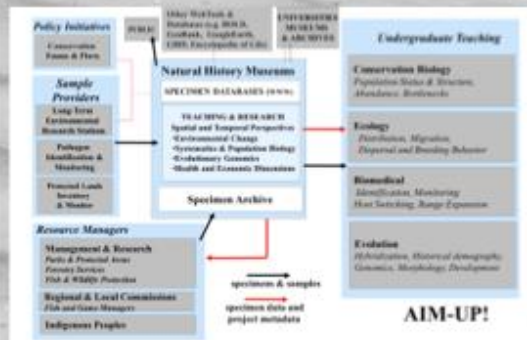
Target Audiences

- Natural history collections (academic and free-standing)
- Educators with or without collections

Interested?

We are recruiting people to join the network and participate in one of our working groups.

- Bioinformatics and Web Presence
- Outreach, Development and Design
- Education
- Network Evaluation



What do collections-based approaches offer undergraduate education?

- Scale
 - time and space
- Integration of Data
 - biotic and abiotic
 - genomic and organismal
- Complexity
- Web-based Discovery
- Educational Process
 - Experiential versus passive
 - Actual data



Museums are essentially archival observatories that provide one of our best windows on historic conditions by establishing the baselines necessary to assess change and predict future impacts, BUT their value depends on our ability to train the next generation of scientists to creatively explore and integrate these vast resources across disciplines and into critical science initiatives.



Annual Themes

- Year 1 – Integrative Inventories
- Year 2 – Geographic Variation
- Year 3 – Evolutionary Dynamics of Genomes
- Year 4 – Biotic Response to Climate Change
- Year 5 – Co-evolving Communities of Pathogens & Hosts, relating to Emerging Disease

This Research Coordinating Network is partially supported by the National Science Foundation under Grant NSF 0956129. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.



Web page development (Thanks to Kayce!!!)


<http://www.aim-up.org/>

AIM-UP

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[AIM-UP! Blog](#)



Advancing Integration of Museums into Undergraduate Programs

Natural history collections form a crucial physical basis for understanding the diversity and history of life. Often these collections are associated with universities, yet their depth and significance is accessible almost exclusively to practicing researchers. AIM-UP! is an NSF-funded [Research Coordination Network](#) exploring the use of natural history collections in undergraduate education.

Five themes are proposed for the five years of the project:



- [Integrative Inventories](#): Complex Biotic Associations Across Space and Time
- Geographic Variation
- Evolutionary Dynamics of Genomes
- Biotic Response to Climate Change
- Co-evolving Communities of Pathogens and Hosts as Related to Emerging Disease

AIM-UP! is refining existing efforts and developing new integrated approaches to collections-based training in large-scale questions using the expertise of educators, curators, collection managers, database managers, and scientists whose work spans disciplines and relates topics covering a spectrum of time and space.

The network is:

- developing teaching and analytic tools for training students in the emerging fields of climate change, evolutionary genomics and molecular ecology
- developing instructional tools for museum databases, such as ARCTOS, that are freely available to the public
- developing an integrated network of educators working on specimen-based questions
- including minority and female scientists, agency biologists, academics, international participants, and museums with large public audiences
- training undergraduate students in museum-based field and laboratory research
- conducting outreach targeted to underrepresented students with an emphasis on issues relevant to their communities.

Network participants communicate through 1) an annual three-day all-hands working meeting at field stations and participating institutions; 2) workshops at scientific meetings, such as the [Natural Science Collections Alliance](#); 3) frequent interaction via interactive internet services (e.g., video conferencing, AIM-UP! blog, ARCTOS blog); 4) short-term exchanges of museum educators for intensive content development; 5) a short course (two weeks) for undergraduate students at 1 host institution to beta-test new approaches, and 6) a fall semester seminar course at the University of New Mexico (available via webcasting to all network participants). While AIM-UP! began as a collaboration between the University of Alaska, Harvard University, the University of California at Berkeley, and the University of New Mexico as a way to integrate expertise and data across these institutions, it is already expanded to other universities, federal agencies, and a large museum-based genetic consortium in Canada.



Monday 20 Feb.

9:45	Bus leaves Pikes Lodge to UAF
10:00-10:15	Pre-Evaluation (also assign 2 to summarize each day's findings)
10:15-11:00	Welcome and introductions (Steffi, Joe)
11:00 – 12:00	Update RCN (Steffi, Eileen, Joe), Discussion of Goals for meeting
12:00-13:30	Lunch
13:30 -14:00	Discussion of AIM-UP! And AAAS Vision and Change
14:00-14:30	Introduce Modules/Themes/Groups (Eileen)
14:30-15:00	An Example of Digitization--VertNet (John, Rob)
15:00-15:30	New Initiatives at Texas Advanced Computing Center (TACC-Tomislav)
15:30-16:00	Brainstorm Opportunities Related to Collections-based Digitization & Undergraduate Education
16:00-16:15	Coffee Break
16:15-16:30	Museums and the Web (Miriam Langer)
16:30-16:45	Wrap up for the Day
17:00-19:00	Reception at UAM and Interactive Tour (including 2 headed caribou)
19:15-21:15	Dinner at <i>Asiana Sushi</i> (2001 Airport Way)
Return to Pikes at 21:15	



Tuesday, 21 Feb.

- 7:45 Bus leaves from Pikes to UAF (light breakfast will be provided)
- 8:00-9:00 Summary of Day 1 and Outline for today's meeting
- 9:00-9:15 Brainstorming: Ideas for New Teaching Modules Geographic variation using museum collections/databases
- 9:15-9:45 Three Subgroups to develop lesson plans
- 9:45:10:30 Subgroup reports (10 minutes each)
- 10:30-11:00 Coffee break**
- 11:00-11:30 International Perspective I: Evolucion via the web-(Enrique)
- 11:30-12:00 Intl. Perspective II: Partnerships with Science Teachers (MP)
- 12:00-13:30 Lunch**
- 13:30-14:30 Designing evaluation plans - Phil (and Tricia via Skype)
Student Surveys—(Eileen)
Network Evaluation
- 14:30-15:00 Breakout: Round II of 3 Subgroups on Education Modules
- 15:00-15:30 Coffee break**
- 15:30-16:30 Wrap up for the Day
- 16:30-18:30 Field Trip (Musk Ox Farm, IAB, Morris Thompson Center)
- Return to Pikes at 18:30
- 19:30-20:30 Leave Pikes Hotel for Dinner at *LemonGrass* (388 Chena Pump Plaza, Old Chena Pump Rd)
<http://lemongrassalaska.com/menus/dinner-menu>

Wednesday, 22 Feb

8:15	Bus leaves from Pikes to UAF (light breakfast will be provided)
8:30-9:45	Summary of Day 2 (set New Directions) and Outline for today
9:45-10:00	Coffee Break
10:00-11:00	STE(A)M: Intro to ART & BIOLOGY Workshops—(Szu-Han)
11-12:00	Brandon Balengeé conference via Skype
12-13:30	Lunch
13:30-14:00	Discussion of Breakout Objectives
14:00-15:30	Breakout—Round III, Three Module Working Groups
15:30-16:30	20 minute Summaries from 3 Working Groups
16:30-17:30	Identify Next Steps, Time Lines, Wrap-up
19:30	Dinner Pike's Landing

Buses depart Pikes for airport at 11:00?