2011 Annual Report
National Institute for Mathematical and Biological Synthesis

Reporting Period, September 2010 – August 2011
Submitted to the National Science Foundation, April 2011

Attachment to NIMBioS Annual Report

Section A. Year 3 Reporting Period (Sep 1, 2010 – Aug 31, 2011)

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Section A. Year 3 Reporting Period (Sep 1, 2010 – Aug 31, 2011)

A-1. NIMBioS Board of Advisors Meeting Summary

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Summary Report of NIMBioS Advisory Board Meeting held October 11-12, 2010

Submitted by Louis Gross, November 11, 2010

This is a brief summary of the discussions and recommendations made by the Advisory Board during the meetings held from 0830 October 11 to noon on October 12. The agenda for the meeting is included below. One month prior to the meeting information on all requests for support submitted by the September 1, 2010 deadline was provided to the Board via a password-protected link off the NIMBioS website. This included links to original requests, and board members were each assigned 3-5 requests to review for the various activities, with the assignments made based upon Board member expertise and the topic of the application. An online review form allowed all Board members to report their comments and overall rating for the variety of requests and have them downloaded directly for summary prior to the meeting. These reviews were open to all Board members at the time of the meeting, and served as the starting point for discussions during the meeting. In addition NIMBioS leadership provided access to a variety of documents produced for the Sponsoring Agencies Site Review held in June 2010, as well as the Annual Report to NSF, the report of the site review and the NIMBioS Leadership Team response to the review.

The meeting, led by Board Chair Alan Hastings, was attended by fourteen members of the Board with an additional member calling in via teleconference. Also in attendance were the NIMBioS Leadership Team and the NSF Program Officer (Sam Scheiner).

Following the call to order by Alan Hastings and approval of the agenda, the meeting began with a brief Director's Report by Lou Gross thanking those who have rotated off the Board, welcoming new members , thanking Alan Hastings for his efforts as the initial Chair of the Advisory Board and thanking Susan Holmes for her willingness to serve as Board Chair for the next two years. Personnel changes were described including a new Education and Outreach Coordinator, four new Postdoctoral Fellows and two newly-hired faculty members. Activities held since the June site review were mentioned, including two Investigative Workshops, Two Tutorials, three Working Group meetings and eighteen short-term visitors. The variety of collaborative activities ongoing were described, including the newly developed set of workshops in collaboration with a supplement provided through the National Center for Medical Intelligence, a variety of activities in collaboration with other NSF Bio and Math Centers, and plans to host the 2012 Annual Conference and Meeting of the Society for Mathematical Biology. Some projects in development were also mentioned including a collaboration with an HHMI quantitative biology group proposing a NSF Biology Education Center, a collaboration with the new Teragrid visualization project, and a potential collaboration with the James S. McDonnell Foundation.

There followed a brief discussion of the procedures for Board input to the evaluation of the NIMBioS Leadership Team. It was noted that the original plan of a yearly evaluation by the Board's Leadership Evaluation Committee did not take into account the external NSF reviews which occur every two years. Since a site review was held in June 2010, the Leadership Team prior to the Board Meeting asked the current and incoming Board Chairs if they considered it necessary to carry out an additional leadership review. They did not consider it necessary and, after discussion, the Board concurred that in the future a formal evaluation by the Board would be conducted in years in which there was no site review conducted by the NSF.

The bulk of the remainder of the first day focused on review of requests for support, a discussion of the efforts to enhance diversity of participants, and suggestions on how to deal with high-demand activities. The 2nd half day of the meeting was devoted to discussion of other issues raised in the site

review report, plans for partnership activities, the NIMBioS strategic plan, NIMBioS policies (primarily the diversity plan), and new or continuing initiatives.

Requests for Support

Discussion of the various support requests proceeded following the order in the agenda. Any individual who had a conflict of interest regarding any request did not participate in the discussion of that request and left the room so as not to hear the comments. The Board discussion led to the following recommendations:

1. Sabbatical visitors – the Board left the decision concerning the single applicant up to the Leadership Team.
2. Investigative Workshops – the Board recommended that the two workshop requests be approved, one be rejected and three others be considered by the Leadership Team following further responses by the proposed organizers.
3. Working Groups – the Board recommended that three of the requests be approved, and one be denied.
4. Postdoctoral Fellowships –The NIMBioS Leadership Team submitted 13 post-doc requests for review by the Board, with one applicant withdrawing just prior to the meeting. Of the 12 applicants reviewed and discussed in detail during the meeting, the Board recommended that one be accepted, that two others should be considered further by the Leadership team although one or more board members had reservations, and the remainder of applicants should be denied.

Site Review Comments Regarding Diversity

The Board devoted considerable discussion to the first four recommendations of the site review regarding gender, ethnicity, race, geographic area, and disciplinary focus for NIMBioS participants. Following display of the most recent summary of participant demographics, the Board made a number of suggestions:

1. The Board was very concerned about the skewed gender distribution of the organizers of activities and the participants in Working Groups. The Board strongly urged NIMBioS to find some mechanism to encourage the attendance of females who have parenting responsibilities at our gatherings and very particularly suggested that a mechanism be established, described on the website, for providing childcare for children of attendees. A suggestion was made to pursue with the University the possibility of an extended per diem to ensure those attendees with parenting responsibilities would not be forced to accept a hardship in attending NIMBioS activities.
2. Make it very clear on the website that the Leadership Team will assist potential organizers to identify potential participants who will enhance diversity of an activity.
3. Experiment a bit by holding back a couple of slots in Working Groups for the Leadership Team to possibly suggest individuals who would enhance diversity to organizers, including the possibility of a graduate student or additional postdoc.
4. Use the Advisory Board to enhance the range of biological fields represented by NIMBioS activities. The Board should be expected to generate at least one Working Group or Workshop request for each of the two evaluations a year. Encourage potential applicants to consider a liaison from the Board.
5. Add to the rating form used by the Board a specific rating on diversity for all requests.

Benchmarks

Regarding the recommendation from the site review that some benchmarks be established with regard to various aspects of NIMBioS activities, the Board made the following suggestions:

1. Across all Working Groups and Workshops we should aim for at least 30% of participants and

30% or organizers be female. Make it clear on the website that this is a factor in evaluation of requests and that Working Groups are strongly encouraged to include females and minorities as organizers.
2. An objective should be that 75% of Working Group and Workshop requests submitted should not have a UT faculty member as one of its organizers.
3. Increase by at least 10% per year the number of submissions of requests for NIMBioS support, including pre-submission requests that are discussed with the Leadership Team but perhaps not submitted to the Board for evaluation.

Partnership Activities

Partnership activities to date were discussed, noting that it has emphasized collaborations with other NSF BIO Centers (particularly NCEAS, NESCent and iPlant), NSF and Canadian Math Institutes, Great Smoky Mountains National Park and various Teragrid activities headquartered at Oak Ridge National Laboratory. The Board discussed whether it was advisable for NIMBioS to extend its partnerships to developing new relations with its current sponsoring agency partners, with other industrial partners, or with other universities. While the Board did not provide explicit recommendations to the Leadership Team, it was made clear that NIMBioS cannot be expected to do it all, and that the Leadership Team should prioritize its choice of emphasis particularly based on what is most effective in ensuring a highly positive review prior to the next renewal cycle. The Board noted that it was not clear how an emphasis on industry partners or new university partners was appropriate to this goal.

Additional Comments

Following discussion of issues surrounding high demand activities for which the applicant pool is strong and much larger than can be accommodated, the Board noted that this is a sign of success. Following discussion of the methods currently in place to evaluate and accept applicants, the Board thought these procedures were appropriate. However the Board encouraged the NIMBioS staff to consider ways to provide via the web, when feasible, more presentations and information developed through Workshops and Tutorials.

Other suggestions were:

1. Change the deadline for Spring postdoc submissions or add another evaluation period in order to match up with those applying for Math faculty and postdocs. In particular, consider a Dec. 17 deadline with a response by February 1 to applicants. The Board suggested that they would be willing to carry out evaluations for this deadline and we should evaluate its effectiveness before removing the March 1 deadline for postdocs.
2. Allow postdocs to consider having one of their mentors at another institution and have mostly virtual interactions with occasional visits.
3. Develop a Workshop for Assistant Professors that brings in program officers from funding agencies to discuss opportunities, and use this as a mechanism to build communities across different areas.
4. Consider using some of the 3 FTE commitment of UTK to provide additional release time for members of the Leadership Team, especially Dr. Lenhart, who have taken on extensive new roles for NIMBioS.
5. Consider changing the REU/REV dates to allow those from schools on quarter system to participate.
6. For the Virtual Board meeting in the Spring, have two discussions – one for postdocs and one for other requests, with each handled separately by about ½ of the Board so that Board members have a better basis of comparison across the requests they evaluate.

BENCHMARKS FOR DIVERSITY OF PARTICIPANTS AND ORGANIZERS AT NIMBIOS ACTIVITIES

As per the suggestion of the Site Review carried out at NIMBioS in June 2010, the NIMBioS Leadership Team has consulted with the NIMBioS Advisory Board to establish a variety of benchmarks for our programs. The Site Review particularly recommended that benchmarks be developed on participation in Working Groups and Investigative Workshops relative to gender and under-represented groups, on geographical diversity of participants, and on the breadth of topic coverage for our activities.

We have chosen these benchmarks to be evaluated across the breadth of our types of activities, rather than applied to constrain any single activity. From discussions with the Site Review team, we believe that the intent of their recommendations was in no way to establish any type of "quotas" for particular activities but to encourage broadening our activities and participants across the range of our programs. A list and description of the benchmarks are provided in the Special Requirements section of this annual report.

Figure 1 (below) documents the range of subject areas associated with NIMBioS Working Groups and Investigative Workshops by year. Note that the first activities began in April of Year 1, and the values for Year 3 include only activities through April of Year 3. Metrics that characterize our major research-support activities (Working Groups and Investigative Workshops) as well as our entire range of activities relative to these benchmarks are presented by year in Table 1.

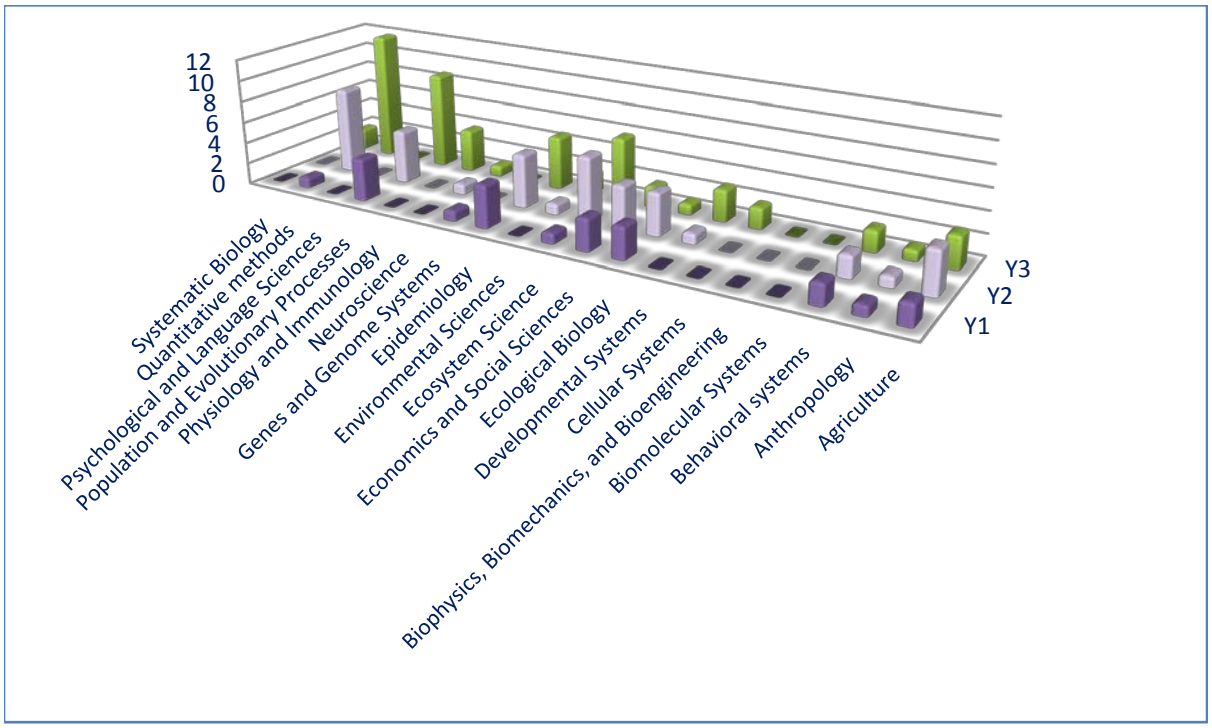


Figure 1. Breadth of subject areas for NIMBioS Working Groups and Investigative Workshops by year (March 2009 – April 2011). Year 1 includes activities from March-August 2009. Year 3 includes activities from September 2010 – April 2011.

Table 1. Diversity measures for NIMBioS Working Groups, Investigative Workshops, and All Events (including tutorials and outreach and education activities in addition to working groups and workshops) by year.

Participant diversity:		**Year 1***	**Year 2**	**Year 3****	**Overall**
Gender	Working groups	19%	22%	28%	23%
	Workshops	40%	40%	39%	39%
	All events	37%	42%	38%	40%
(Benchmark: approximately 30% female)					
International	Working groups	20%	19%	22%	20%
	Workshops	10%	22%	17%	18%
	All events	7%	12%	13%	11%
(Benchmark: approximately 10% outside USA)					
URG	Working groups	9%	10%	5%	8%
	Workshops	7%	10%	9%	9%
	All events	9%	11%	11%	11%
(Benchmark: increase proportion approximately 10% per year)					
Local	Working groups	14%	15%	14%	15%
	Workshops	22%	23%	15%	20%
	All events	35%	20%	14%	22%
(Benchmark: No more than 15% from UT/ORNL)					
Organizer diversity		**Year 1***	**Year 2**	**Year 3****	**Overall**
Gender	Working groups	11%	13%	13%	12%
	Workshops	25%	29%	36%	31%
	All events	23%	28%	19%	24%
(Benchmark: approximately 30% female)					
Local	Working groups	28%	22%	16%	21%
	Workshops	75%	36%	9%	31%
	All events	57%	42%	24%	39%
(Benchmark: No more than 25% UT Faculty/Staff)					

**Year 1 includes activities from March-August 2009.*

***Year 3 includes activities from September 2010-April 2011.*

Participant Diversity Report

Year Three

September 2010-April 2011

National Institute for Mathematical and Biological Synthesis
April, 2011

NIMBioS Participant Diversity Report, Year Three

Introduction

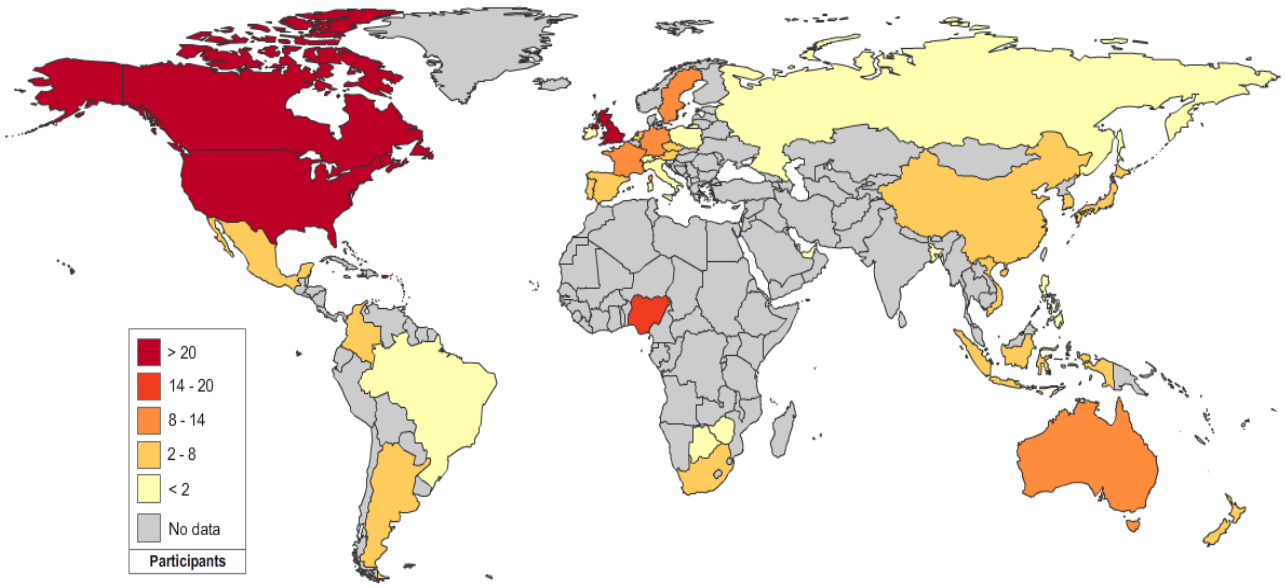
This is a report of the diversity represented by NIMBioS participants during its third annual reporting period (RP 3) to the National Science Foundation. The report covers the period of September 2010-April 2011. An electronic demographic survey aligned to the reporting requirements of the National Science Foundation was sent to all participants before their arrival at NIMBioS. A link to the survey was sent to each of the participants who had not previously visited NIMBioS three weeks before the date of his or her event. Reminder emails were sent to non-responding participants at one and two weeks beyond the initial contact date. The overall response rate for the demographic survey during RP 3 was 88%. Demographic questions regarding gender, race, ethnicity, and disability status were optional. When feasible, the Evaluation Coordinator supplied missing demographic data from other sources (e.g. institution, primary field of study). The evaluator did not assume race, ethnicity, or disability status for any participant who did not report this information. All demographic information is confidential, and results are reported only in the aggregate.

Participant Demographics

Geographic Diversity

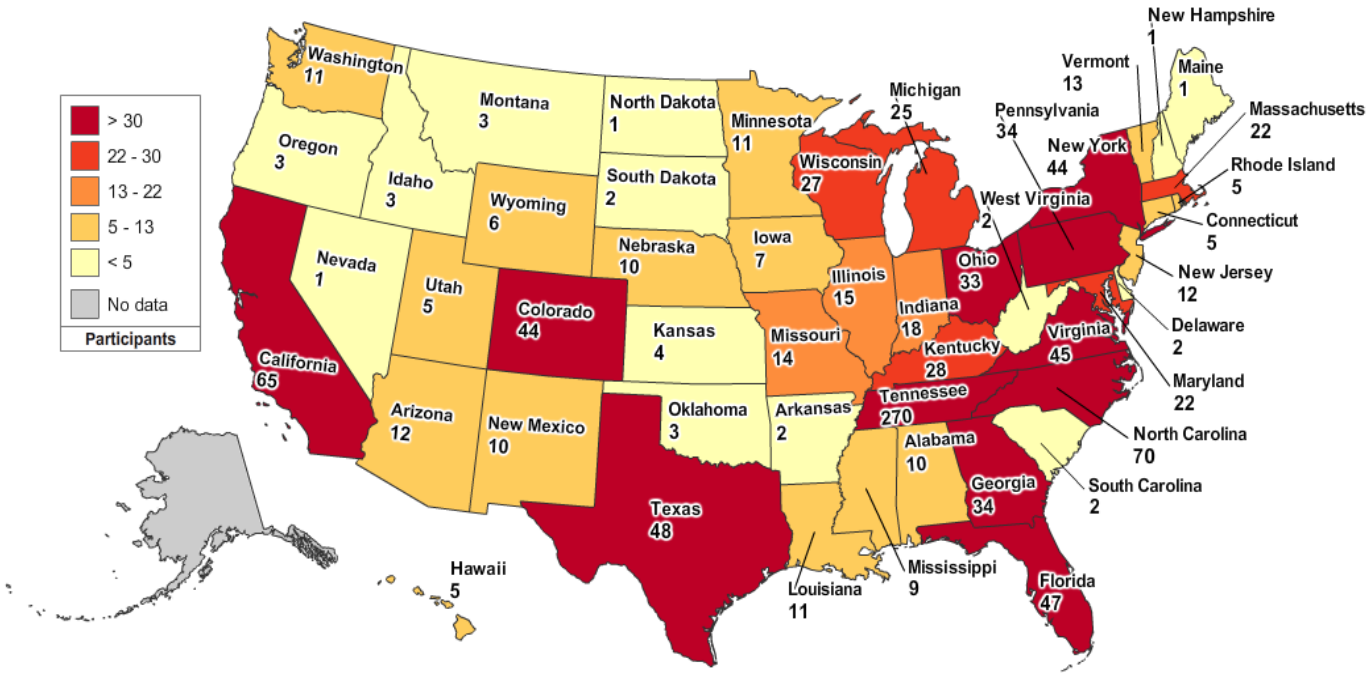
During RP 3, a total of 567 participants (500 different people) from 20 countries participated in NIMBioS events. Most participants came from the United States (89%), Canada (3%), and the United Kingdom (2%) (Figure 1).

Figure 1. NIMBioS RP 3 Participants by Country



Within the U.S., 49 different states were represented, as well as the District of Columbia and Puerto Rico. While the greatest number of participants came from within Tennessee (270), several other states were represented by relatively large numbers of participants, including North Carolina (70), California (65),Texas (48), and Florida (47) (Figure 2).

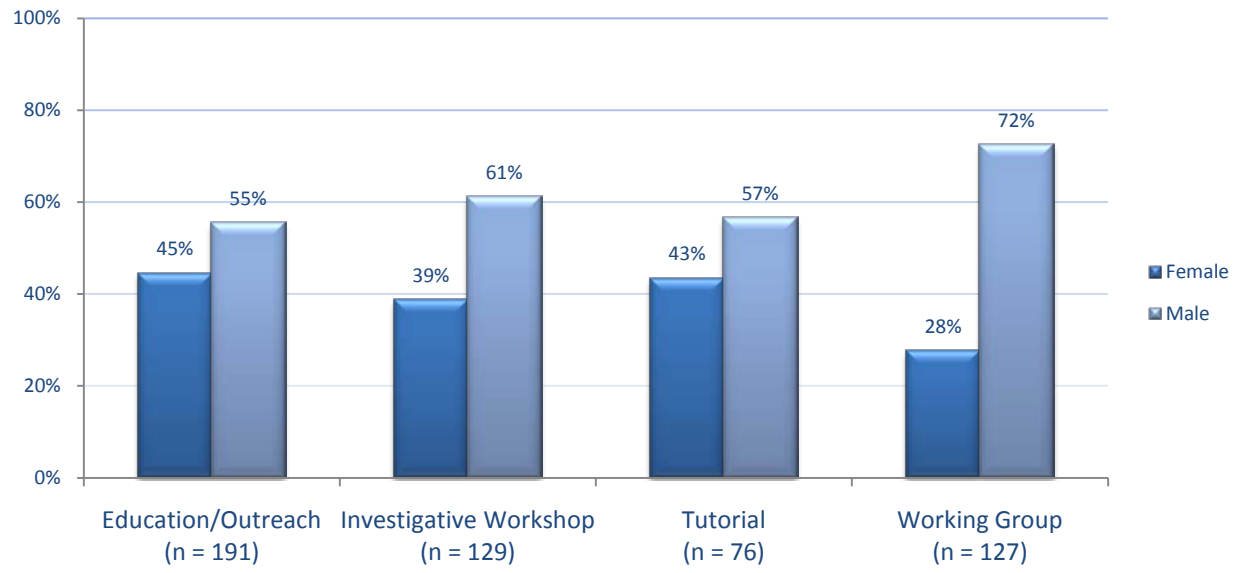
Figure 2. NIMBioS RP 3 Participants by U.S. State



Gender, Racial, and Ethnic Diversity

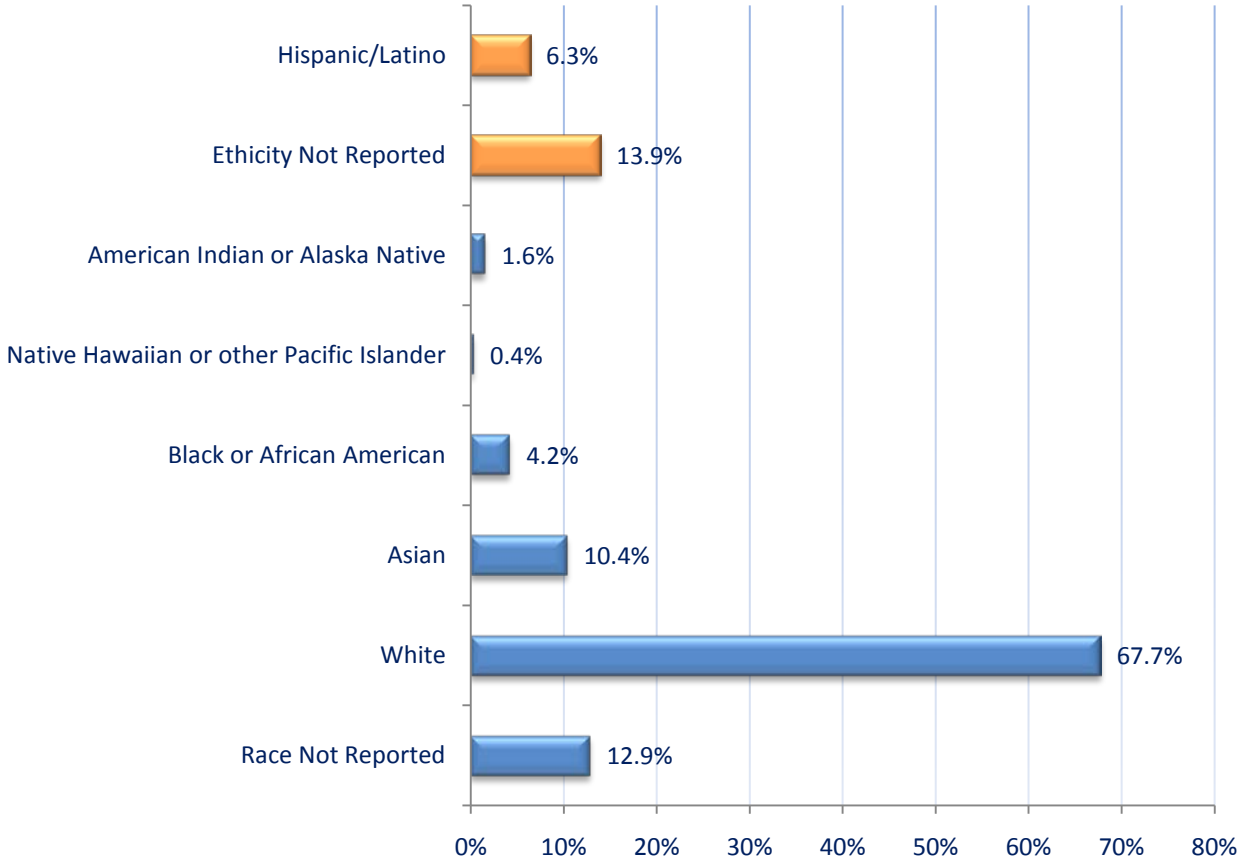
Across all events during RP 3, the ratio of gender was 62% male to 38% female. Within specific activity types, this gender ratio varied. (Note: Although tutorials are considered part of the Education and Outreach (EO) Program at NIMBioS, the NIMBioS leadership team is interested in analyzing the gender, ethnic, and racial composition of these events separately from the rest of the EO activities.) Most major events have an approximate 60/40 ratio of males to females, with the exception of Working Groups (Figure 3).

Figure 3. Gender composition of participants by event type



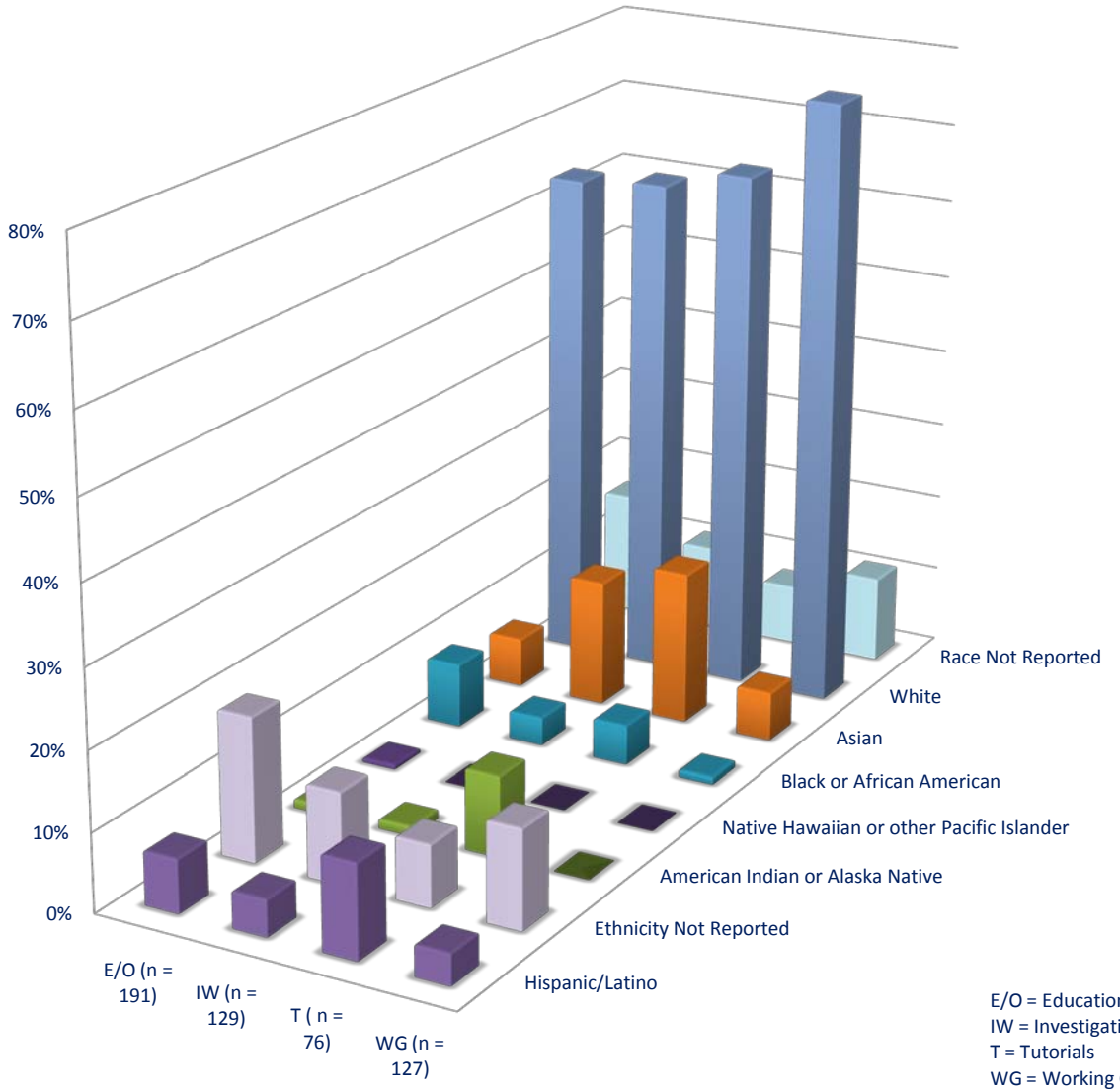
Of the 488 participants who opted to report their ethnicity status, 6.4% indicated they were Hispanic/Latino. Of the 494 who reported their racial status, the majority (67.7%) indicated they were white; however, Asian, black or African American, native Hawaiian/Pacific islander, and Native American races were also represented (Figure 4).

Figure 4. Ethnic and racial composition of participants (n = 567)



By event, Tutorials showed the greatest percentage of Hispanic/Latino participants (11.9%), followed by Education and Outreach (6.8%). Among the different event types, participants self-identifying racially as white were always in the majority, followed by Asian and Black or African American (Figure 5).

Figure 5. Ethnic and racial composition of participants, by event type



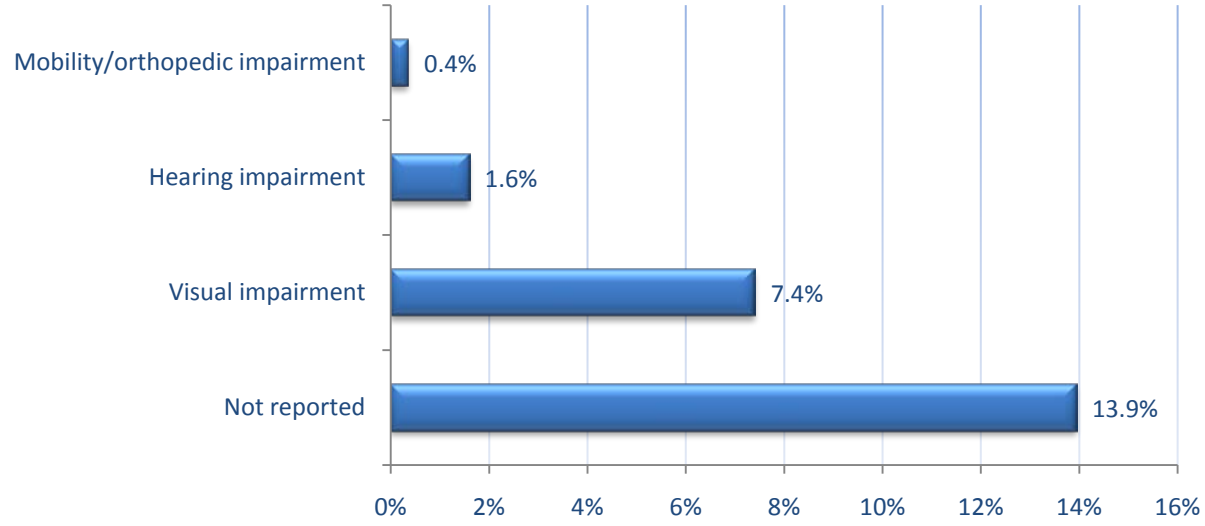
E/O = Education and Outreach Activities
IW = Investigative Workshops
T = Tutorials
WG = Working Groups

	E/O (n = 191)	IW (n = 129)	T (n = 76)	WG (n = 127)
Hispanic/Latino	6.8%	4.7%	11.9%	3.9%
Ethnicity Not Reported	18.3%	11.6%	7.9%	12.6%
American Indian or Alaska Native	1.1%	1.2%	10.3%	0.0%
Native Hawaiian or other Pacific Islander	0.6%	0.0%	0.0%	0.0%
Black or African American	8.2%	3.6%	5.1%	0.9%
Asian	6.3%	16.3%	19.7%	6.3%
White	63.4%	64.3%	67.1%	78.0%
Race Not Reported	15.9%	10.8%	7.7%	11.1%

Disability Status

Of the 488 participants indicating disability status, 7% indicated having some sort of visual impairment, while nearly 1.6% indicated having a hearing impairment. A smaller percentage indicated having mobility impairment (Figure 6).

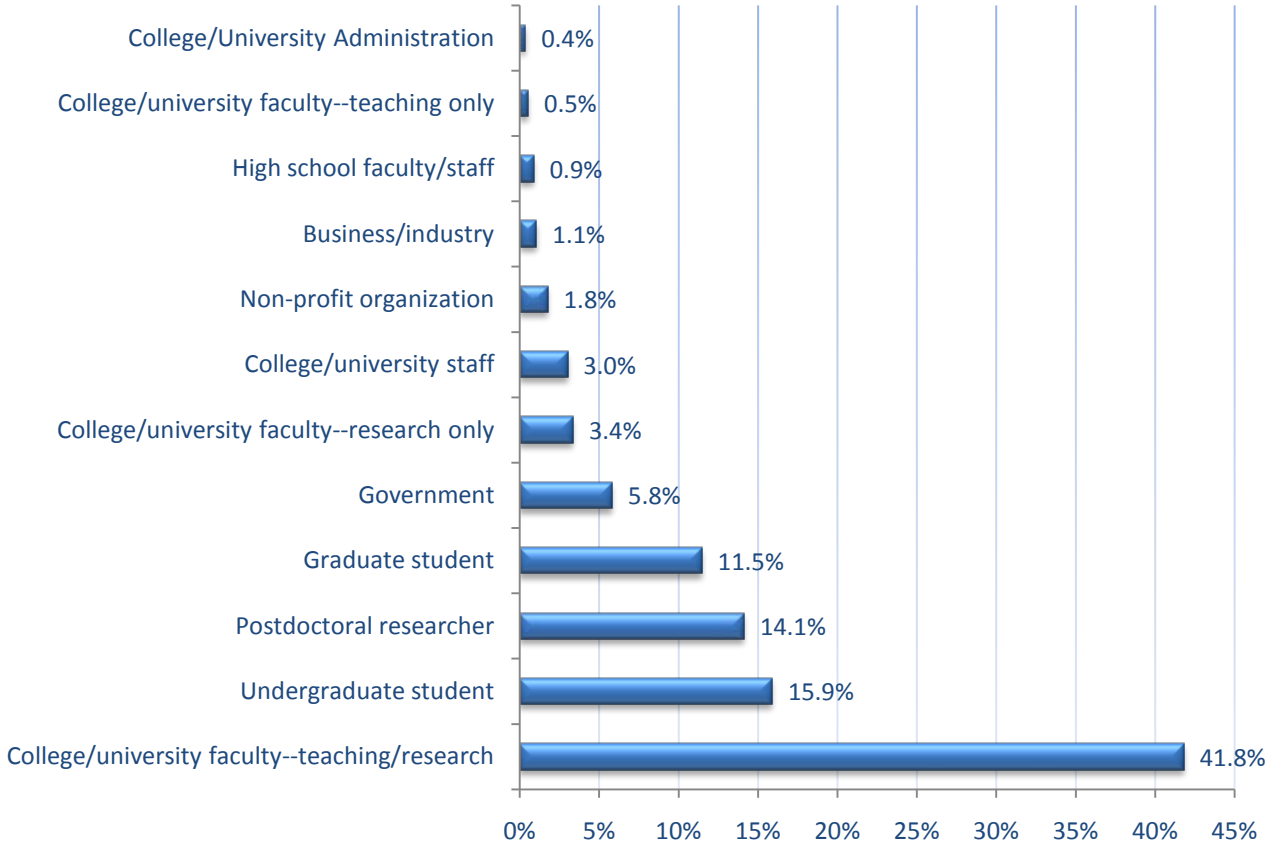
Figure 6. Disability status of participants (n = 567)



Institutional and Disciplinary Diversity

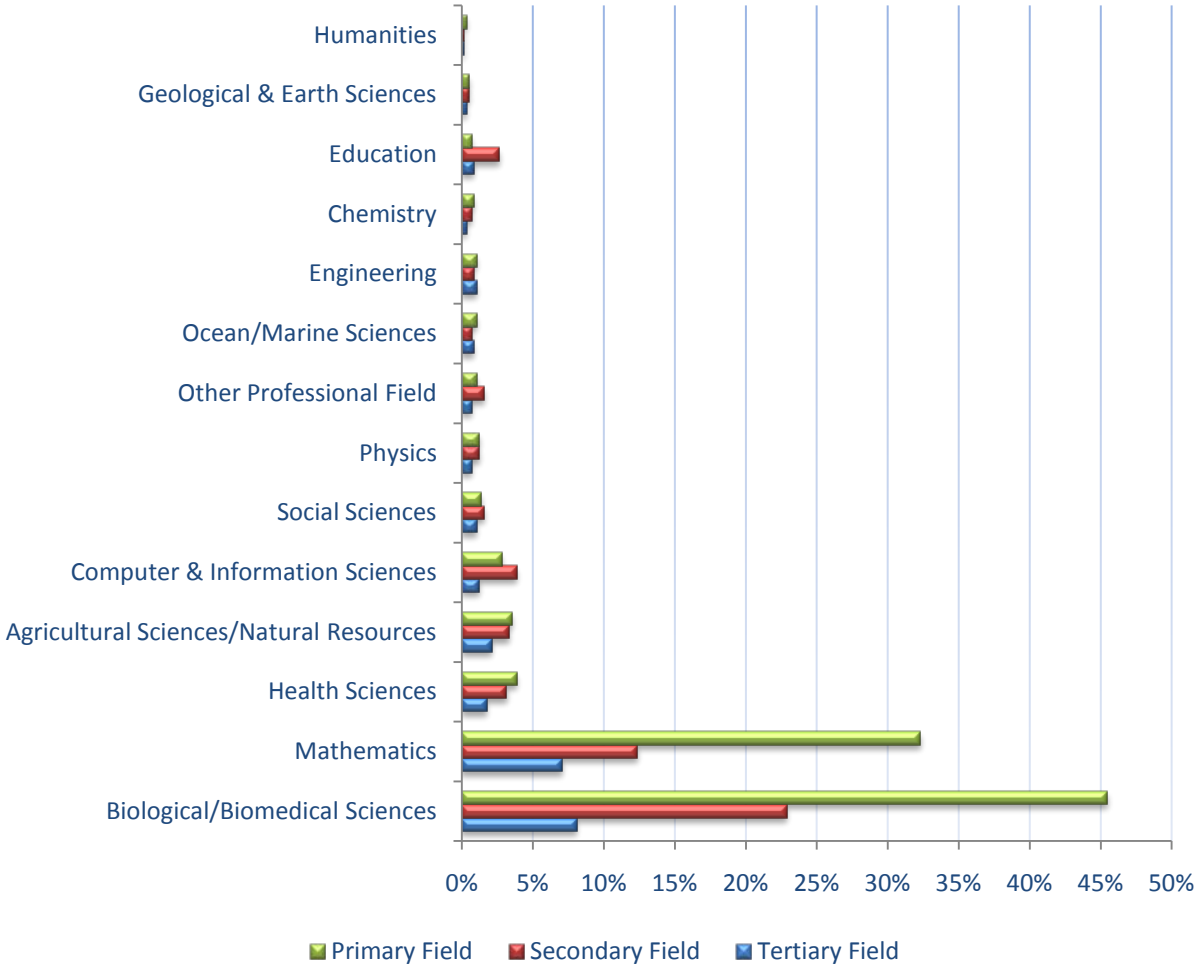
The majority of NIMBioS participants were college/university faculty or staff, undergraduate students, or postdoctoral researchers; however, many participants came from government, business/industry, non-profit, or other positions (Figure 7).

Figure 7. Status of participants (n = 567)



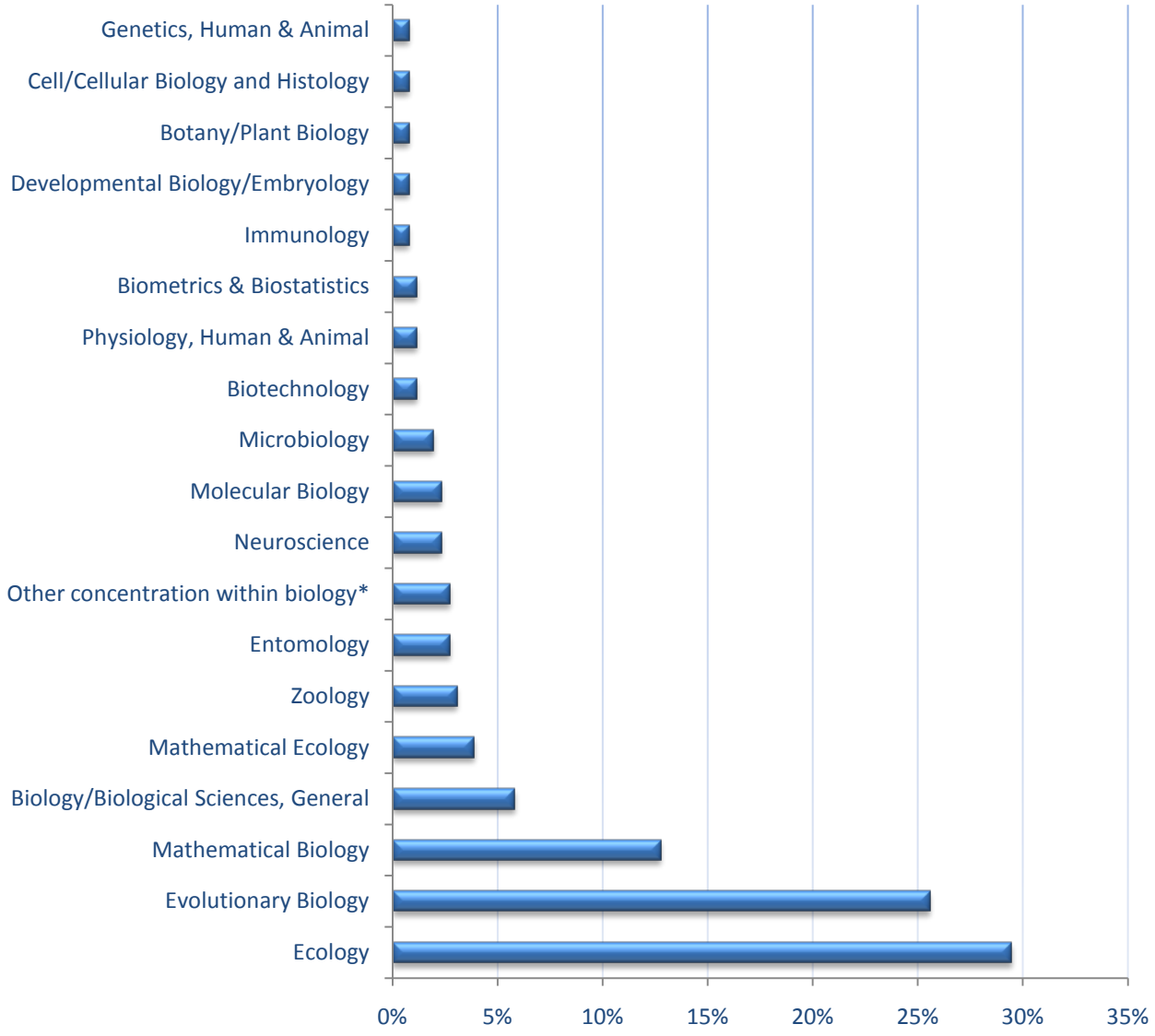
Participants at NIMBioS indicated primary, secondary, and tertiary fields of study, as well as areas of concentration within those fields. The most commonly reported fields of study included biological/biomedical sciences, mathematics, and health sciences, although many other disciplines were represented (Figure 8).

Figure 8. Primary, secondary, and tertiary discipline areas of participants (n = 567)



The 258 participants naming Biological/Biomedical Sciences as their primary field of study indicated 26 different areas of concentration within which they would classify their primary areas of research/expertise. The most commonly indicated area of concentration was ecology (29%), followed by evolutionary biology (26%) and mathematical biology (13%) (Figure 9).

Figure 9. Participant research/expertise area concentrations within biological/biomedical sciences field of study (n = 258)



* Other concentrations having only one participant: Molecular ecology, Wildlife/range management, Plant physiology, Biochemistry, Biomedical Sciences, Parasitology, Biophysics

Participants during RP 3 represented 262 different institutions, including colleges and universities, government institutions, private businesses, non-profits, and high schools (Figure 10). Of the colleges/universities represented, most were classified as comprehensive (having undergraduate and graduate programs) (Figure 11).

Figure 10. Types of institutions represented

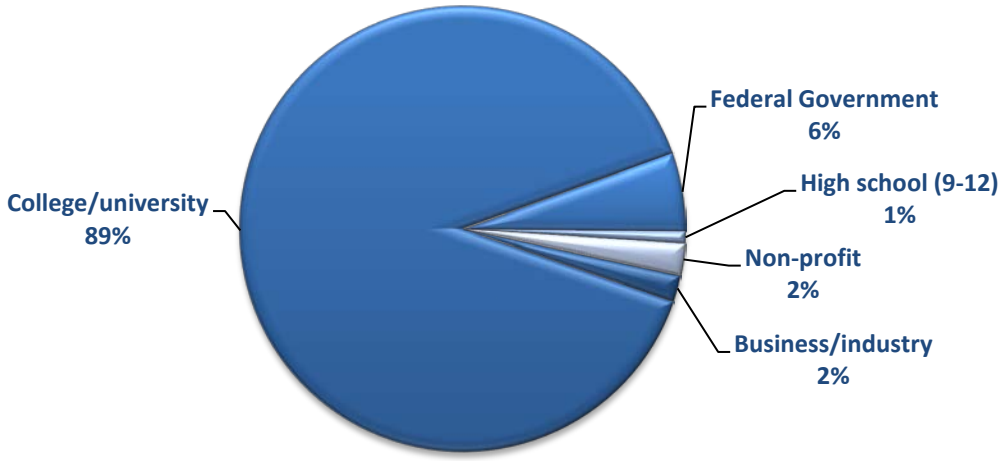
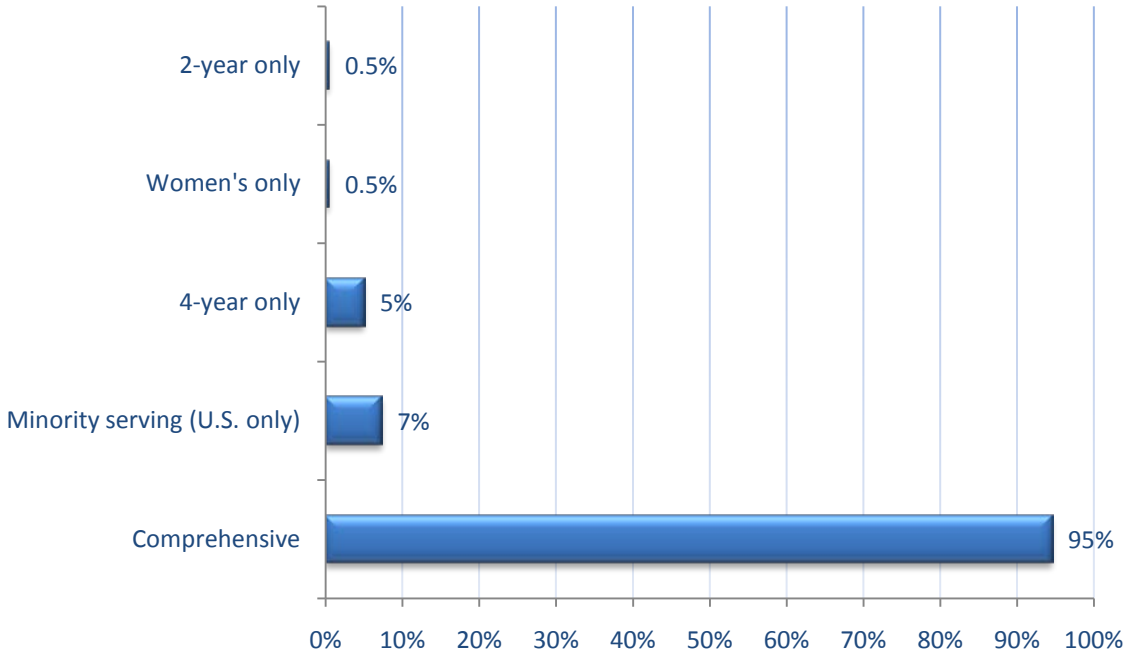


Figure 11. Characteristics of participants' colleges/universities



Evaluation Summary Report of NIMBioS Activities Year Three

September 2010-April 2011

National Institute for Mathematical and Biological Synthesis
April 2011

Evaluation Summary of Major NIMBioS Activities

Executive Summary

This is a report of NIMBioS evaluated activities during the third annual reporting period (RP 3) to the National Science Foundation. The report covers the period of September 2010-April 2011. During RP 3, 567 participants (500 different people) from 262 institutions participated in NIMBioS sponsored activities (see Diversity Report for details on participants). Research program activities during RP 3 included:

- 11 Working Groups (with a total of 12 meetings)
- 4 Investigative Workshops
- 20 Short-term visitors
- 10 Postdoctoral Fellows
- 2 Sabbatical Fellows

Education and outreach program activities during RP 3 included (see Annual Report for more details on these events):

- 2 Tutorials
- 3 Biology in a Box Teacher Workshops
- A NIMBioS Seminar Series
- Tennessee Junior Science and Humanities Symposium
- Research Experiences for Undergraduates/Veterinary Students Program
- Sharing Adventures in Engineering and Science Program (SHADES)
- Undergraduate Research Conference at the Interface of Biology and Mathematics
- EcoED Webinar-- Math, Computing, Undergraduate Ecology Education and Large Datasets: An example from a Citizen Science Program
- Gadget Girls: Adventures in STEM
- Teacher Collaboration Program

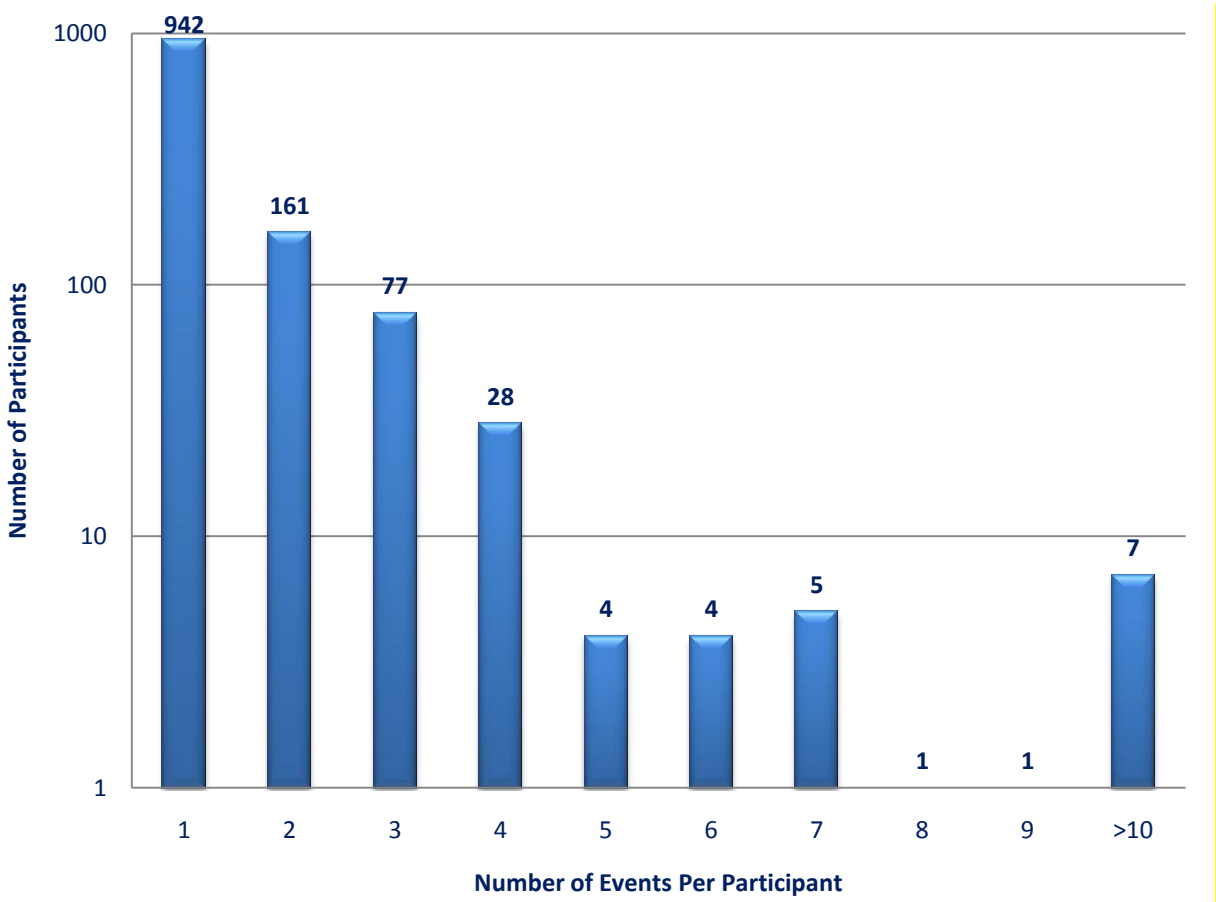
Other events included:

- 2 Advisory Board Meetings

By the end of August 2011 NIMBioS will have hosted 17 working group meetings, 9 Investigative Workshops, 4 Tutorials, 26 Short-term Visitors, and 3 Sabbatical Fellows.

Of the 1,230 different participants **to date**, 288 have visited NIMBioS for more than one event (Figure 1).

Figure 1. Number of events per participant



NIMBioS conducted evaluations of its 12 working group meetings,4 workshops, 2 tutorials, Undergraduate Research Conference at the Interface of Biology and Mathematics, EcoED Webinar, and Research Experiences for Undergraduates/Veterinary Students programs. An evaluation of the pilot Teacher Collaboration program is ongoing as well. Evaluations were carried out via electronic surveys sent to all participants either after participation in a NIMBioS event, or both before and after participation if a pre/post comparison of responses was warranted. Evaluation findings, along with suggestions for improvement, were shared with event organizers, as well as NIMBioS staff as needed. Improvements to program content and format, as well as NIMBioS' overall operations, are made accordingly. Following is a brief synopsis of the evaluations of NIMBioS' major activities during RP 3.

Research Activities

Working Group and investigative workshop evaluation highlights are aggregated across all events in their respective categories. Evaluations of working groups and workshops sought to answer the following common questions:

1. Were participants satisfied with the event overall?
2. Did the event meet participant expectations?
3. Do participants feel the group made adequate progress toward their stated goals?
4. Do participants feel they gained knowledge about the main issues related to the research problem?
5. Do participants feel they gained a better understanding of the research across disciplines related to the group's research problem?
6. What impact do participants feel participating in the event will have on their future research?
7. Were participants satisfied with the accommodations offered by NIMBioS?
8. What changes in accommodations, group format, and/or content would participants like to see at future meetings?

Working Groups

NIMBioS Working Groups are chosen to focus on major scientific questions at the interface between biology and mathematics that require insights from diverse researchers. The questions to be addressed may be either fundamental, applied or both, and may be focused around a particular biological topic, or one from mathematics that is driven by biological insight. NIMBioS is particularly interested in questions that integrate diverse fields, require synthesis at multiple scales, and/or make use of or require development of new mathematical/computational approaches.

Working Groups are relatively small (10-12 participants, with a maximum of 15), focus on a well-defined topic and have well-defined goals and metrics of success (e.g., publications, database, software). Selection of Working Groups is based upon the potential scientific impact and inclusion of participants with a diversity of backgrounds and expertise that match the scientific needs of the effort. Organizers are responsible for identifying and confirming participants with demonstrated accomplishments and skills to contribute to the Working Group. Given this emphasis, working group activities rarely involve recently-trained researchers such as postdocs and graduate students. Participation by international

researchers is encouraged; though generally there will not be more than 2-3 individuals from outside North America in a Working Group. Working Groups typically meet 2-4 times over a two year period, with each meeting lasting 3-5 days; however the number of participants, number of meetings, and duration of each meeting is flexible, depending on the needs and goals of the Group. Plans can include visits to NIMBioS for subsets of Working Group members to collaborate with NIMBioS IT staff and researchers on Working Group needs.

First Meetings

During RP 3, NIMBioS hosted the first meetings of three working groups, with a total of 35 participants (Table 1) (See http://www.nimbios.org/workinggroups/ for more details about specific working groups). Evaluation surveys were sent to all participants, with the exception of working group organizers and NIMBioS employees who were participating in the working groups. A total of 14 participants took part in the evaluation of the first meetings of their working groups (the evaluation form for the Optimal Control for Agent-based Models group was still open at the time of this report, and is not included in the total or summary).

Table 1. *Working Group First Meetings Hosted by NIMBioS*

Title of Working Group	Dates	# Participants
Species Delimitation	12/2-4/10	12
Gene Tree Reconciliation	12/16-18/10	12
Optimal Control for Agent-based Models	4/26-28/11	11

Synopsis of First Meeting Evaluation Results

- Overall satisfaction with first meetings was relatively high among survey respondents, the majority of whom (86%) indicated they either agreed or strongly agreed that their respective meetings were very productive and met their expectations.
- 75% of respondents thought the presentations were useful and 83% thought the presenters were very knowledgeable about their topics.
- The majority of respondents (93%) agreed that they had a better understanding of the main issues related to their group's research problem as a result of participation.

- A large majority (93%) said they planned to take the knowledge they gained during the working group and apply it to their own research.
- 64% of respondents reported they developed *unanticipate*d plans for collaborative research with other working group participants.
- 93% of respondents either agreed or strongly agreed that they would recommend participating in NIMBioS working groups to their colleagues.
- 86% of respondents agreed that the format of their working group was very effective for achieving the group's goals.
- 88% of respondents felt their working group made adequate progress toward its stated goals for the first meeting.
- 67% of respondents said they left their respective meetings with a good idea of what their contribution will be at the next meeting.
- Overall, respondents reported being satisfied with the travel, housing, and other amenities provided by NIMBioS.

Second Meetings

During the reporting period, NIMBioS hosted the second meetings of four working groups, with a total of 47 participants (Table 2). Evaluation surveys were sent to all participants, with the exception of working group organizers and NIMBioS employees who were participating in the working groups. A total of 18 participants took part in the evaluation of the second meetings of their working groups.

Table 2. *Working Group Second Meetings Hosted by NIMBioS*

Title of Working Group	Dates	# Participants
Synthesizing Predictive Modeling of Forest Insect Dynamics Across Spatial and Temporal Scales	10/18-21/10	14
Cross-Topology Registration	1/8-10/11	11
Food Web Dynamics	1/11-15/11	8
Modeling Bovine Tuberculosis	1/31-2/1/11	14

Synopsis of Second Meeting Evaluation Results

- Overall satisfaction with the working group meetings was high among survey respondents, 100% of whom indicated they either agreed or strongly agreed that their meeting was very productive and met their expectations.
- 100% of respondents thought the presentations were useful and that the presenters were very knowledgeable about their presentation topics.
- 100% of respondents agreed that participating in the meeting increased their understanding of the work being done in by others in the group, and that it increased their understanding of how everyone's work would come together to achieve the goals of the group.
- All respondents said that participating in their working group had influenced their research agendas. Several participants noted that the group had lead to collaborations that otherwise may not have occurred.
- 100% of respondents agreed that the format of their working group was very effective for achieving its goals.
- Most respondents (85%) felt that their working group made adequate progress toward reaching its intended goals.
- Most (85%) respondents said they left their second meeting with a good idea of what their contribution would be at the next meeting.
- Overall, respondents reported being satisfied with the travel, housing, and other amenities provided by NIMBioS.

Third Meetings

During the reporting period, NIMBioS hosted the third meetings of four working groups, with a total of 40 participants (Table 3). Evaluation surveys were sent to all participants, with the exception of working group organizers and NIMBioS employees who were participating in the working groups. A total of 21 participants took part in the evaluation of the second meetings of their working groups (the evaluation form for the Synthesizing Predictive Modeling of Forest Insect Dynamics Across Spatial and Temporal Scales group was still open at the time of this report, and is not included in the total or summary). .

Table 3. *Working Group Third Meetings Hosted by NIMBioS*

Title of Working Group	Dates	# Participants
Integrating Functional and Evolutionary Dynamics at Multiple Scales	9/13-17/10	9
Coalitions and Alliances	11/4-6/10	9
Population and Community Ecology Consequences of Intraspecific Niche Variation	2/10-12/11	14
Synthesizing Predictive Modeling of Forest Insect Dynamics Across Spatial and Temporal Scales	4/14-20/11	8

Synopsis of Third Meeting Evaluation Results

- All respondents indicated they were very satisfied with their working groups overall.
- 95% of respondents indicated being satisfied with the diversity of disciplinary expertise of their working group's participants.
- All respondents felt their groups were making adequate progress toward their goals.
- 85% of respondents agreed that participating in the working group meeting increased their understanding of the work being done in by others in the group, and that they had a better understanding of how everyone's work would come together to achieve the goals of the group.
- All respondents said they felt the expectations for the next working group meeting were clear, in the sense that they were leaving this meeting with a good idea of what they needed to accomplish before the next meeting.
- Respondents indicated the greatest differences between their collaborations within the working group and their other research collaborations were in the disciplinary topics involved, research methods used, and scientific questions addressed.

Fourth Meetings

During the reporting period, NIMBioS hosted the fourth meeting of one working group, with a total of 5 participants (Table 4). Evaluation surveys were sent to all participants, with the exception of working group organizers and NIMBioS employees who were participating in the working groups. A total of 3 participants took part in the evaluation of the second meetings of their working groups. Because of the small number of respondents in this group, a summary of results will not be provided.

Table 4. *Working Group Fourth Meetings Hosted by NIMBioS*

Title of Working Group	Dates	# Participants
Biological Problems using Binary Matrices	12/14-17/10	5

Investigative Workshops

NIMBioS Investigative Workshops differ from working groups in that they focus on a broader topic or set of related topics at the interface of biology and mathematics and have relatively large size (30-40 participants). Workshops attempt to summarize/synthesize the state of the art and identify future directions, and they have potential for leading to one or more future working groups. Organizers invite 15-20 key participants, and the remaining 15-20 participants are filled through open application from the scientific community.

NIMBioS hosted four investigative workshops during RP 3, with a total of 129 participants (Table 5). Evaluation surveys were sent to participants of all workshops, with the exception of workshop organizers and NIMBioS employees who were participating in the workshops. A total of 75 participants took part in the evaluation of the workshops (the evaluation form for the Synchrony in Biological Systems Across Scales was still open at the time of this report, and is not included in the total or summary).

Table 5. *Investigative Workshops Hosted at NIMBioS*

Title of Workshop	Dates	# Participants
Modeling Wildlife Zoonoses	11/8-10/10	45
Solid Tumor Modeling	1/19-21/11	38
Modeling Infectious Disease	1/23-25/11	12
Synchrony in Biological Systems Across Scales	4/11-13/11	34

Synopsis of Workshop Evaluation Results

- Overall satisfaction was high among survey respondents, the majority of whom (93%) indicated they either agreed or strongly agreed that their workshop was very productive. Most (92%) also agreed it met their expectations.

- Almost all respondents thought the presentations were useful (97%,) and all felt that the presenters were very knowledgeable about their topics.
- 99% of respondents either agreed or strongly agreed that they would recommend participating in NIMBioS workshops to their colleagues.
- Most respondents (98%) felt that participating in their workshops helped them to better understand the research going on in other disciplines regarding the research problems.
- Many (62%) said the exchange of ideas that took place during their workshop would influence their future research, while 31% said it would "possibly" influence their research.
- 31% of respondents said they developed plans for collaborative research with other workshop participants, while 30% said they would "possibly" collaborate with other participants.
- The majority of respondents (90%) agreed that they had a better understanding of the main issues related to their workshop's research problem as a result of participation.
- 90% of respondents agreed that the format of their workshop was very effective for achieving its goals.
- 85% of respondents felt the workshop made adequate progress toward finding a common language across disciplines for research on their workshop's topic.
- A large majority (92%) said they were satisfied with the opportunities provided during the workshop presentations and discussions to ask questions and/or make comments.
- Overall, respondents reported being satisfied with the travel, housing, and other amenities provided by NIMBioS.

Education and Outreach Program Activities

Tutorials

NIMBioS hosted two tutorials during RP 3, with a total of 76 participants (Table 6). Evaluation surveys were sent to all participants, with the exception of tutorial organizers and NIMBioS affiliates who were participating in the tutorials. A total of 56 participants took part in the evaluation of the tutorials.

Table 6. *Tutorials Hosted at NIMBioS*

Title of Tutorial	Dates	# Participants
Phylogenetics Tutorial	10/13-15/10	39
Stochastic Tutorial	3/15-18/11	37

The evaluation of the tutoriasl sought to answer the following questions:

1. Were participants satisfied with the tutorial overall?
2. Did the tutorial meet participant expectations?
3. Was the tutorial appropriate to the participants' levels of expertise?
4. Did participants feel they learned an appropriate amount of information?
5. How did participants feel about the amount of content and format of the tutorial?
6. Were participants satisfied with the accommodations offered by NIMBioS?
7. What changes in accommodations, group format, and/or content would participants like to see at future similar meetings?

Synopsis of Tutorial Evaluation Results

- 95% of respondents either agreed or strongly agreed that they would recommend participating in NIMBioS tutorials to their colleagues.
- 78% of respondents agreed the tutorials met their expectations and 76% agreed they were appropriate to their level of expertise.
- 98% of respondents thought the instructors were knowledgeable about their topics, and 91% thought the presentations were useful.
- 78% of participants thought the hands-on exercises were useful, while a smaller majority felt the group discussions were useful (73%).
- 89% of respondents agreed that the formats of the tutorials were very effective for achieving its goals.
- 49% of participants indicated they felt the amount of content offered during the tutorial was "just right," while 38% felt there was too much material presented for the allotted time.
- All participants indicated having a better understanding of tutorial content result of attending the tutorials.
- A large majority (95%) said they were satisfied with the opportunities provided during the tutorial to ask questions and/or make comments.
- Overall, respondents reported being satisfied with the travel, housing, and other amenities provided by NIMBioS.

Research Experiences for Undergraduates/Veterinary Students

The NIMBioS Research Experiences for Undergraduates (REU) and Research Experiences for Veterinary Students (REV) programs took place simultaneously on the University of Tennessee, Knoxville (UT) campus June 7-July 30, 2010. Thirteen undergraduates, three veterinary students and two high school teachers from 15 different institutions across the United States were chosen to participate in the program.

During the eight-week long program, participants lived on campus at the University of Tennessee, Knoxville, (UT) and worked in teams with UT faculty to conduct research at the interface of mathematics and biology. The award included a stipend, housing and some funding to support travel.

Research topics for the 2010 program were modeling the effects of climate change on ant foraging behavior in the Great Smoky Mountains National Park; predicting the park's biodiversity; modeling Johne's disease in cattle; modeling the growth and development of plant pathogens; and modeling the dynamics of cat populations in the community. Mentors in the program included UT professors Suzanne Lenhart (Professor in Applied Mathematics, Associate Director of NIMBioS), Shigetoshi Eda (Center for Wildlife Health, Department of Forestry, Wildlife and Fisheries), Paul Armsworth (Assistant Professor, Department of Ecology and Evolutionary Biology), Steven Wise, (Assistant Professor, Department of Mathematics), Kim Gwinn (Associate Professor, Entomology and Plant Pathology), and John New (Professor, Department Head, Comparative Medicine). NIMBioS postdoctoral fellows William Godsoe, and Sharon Bewick also served as mentors. Evaluation surveys were sent to all participants in the program, with the exception of mentors. All 18 participants took part in the evaluation.

The evaluation of the REU/REV sought to answer the following questions:

1. Were participants satisfied with the program overall?
2. Did the research experience meet participant expectations?
3. Did the research experience impact participant plans to go to graduate school?
4. To what extent did participants increase their research skills during the program?
5. To what extent do participants feel they gained knowledge about the research process?
6. How satisfied were participants with their mentors?
7. How satisfied were participants with the accommodations offered by NIMBioS?
8. What changes do participants feel NIMBioS should make in the program for next year?

Synopsis of REU/REV Evaluation Results

- Overall satisfaction with the program was high among participants, 94% of whom said they were "satisfied" or "very satisfied" with their experiences and would recommend the program to others.
- Fifteen of the eighteen participants said most or all of their expectations were met or exceeded during the program, while three participants said only "some" of their expectations were met.
- The majority of participants (89%) thought the overall workload during the program was "just about right," while 11% thought either "too much" or "too little" work was assigned.
- Overall, participants were highly satisfied with their mentors, indicating that they were very helpful and supportive during the research experience. Participants rated their mentors highly, with the average mentor rating at 1.71 (on a scale of -2 to 2, with 2 being the most favorable).
- Participants rated the usefulness of the BCMB information sessions highly as well. Ratings ranged from an average of 0.11 for the "Diversity in Science" session, to an average of 0.44 for the "Speaking to a Professional Audience" session (on a scale of -1=not useful to 1=very useful).
- Gains in several research-related skills were reported by participants, with an average rating for all skills of 0.75 on the pre-survey and 1.07 on the post-survey (on a 5-point Likert scale from -2=extremely poor at the skill to 2=excellent at the skill).
- Participants reported gains in knowledge regarding several research-related topics. Before the program, participants on average rated themselves 0.55 on a 5-point Likert scale from -2=extremely poor understanding to 2=excellent understanding of the topics. After participation, the average rating was 1.28.
- Sixty-seven percent of participants said that participating in the program impacted their plans to go to graduate school in some way. Some participants said that the experience reinforced their previous decisions to attend graduate school, while others said that the experience made them more interested in integrating math and biology into their graduate school plans.

Undergraduate Research Conference at the Interface of Biology and Mathematics (URC)

The NIMBioS second annual Undergraduate Research Conference at the Interface of Biology and Mathematics took place at the University of Tennessee's Conference Center in downtown Knoxville November 19-20, 2010. The event was organized by the NIMBioS Education and Outreach Associate

Director for Education, Outreach, and Diversity, Suzanne Lenhart, and the Education and Outreach Coordinator Kelly Moran.

Nearly 130 undergraduate students and faculty mentors participated from more than 30 institutions throughout the United States. Dr. Abdul-Aziz Yakubu, Professor and Chair of the Department of Mathematics from Howard University, kicked off the conference with a plenary talk on fish population dynamics. Students contributed more than 60 oral and poster presentations to the program on topics in ecology, evolution, disease, biomedical applications and genetics. Participants learned about educational and professional opportunities at NIMBioS and also at NESCent, the National Evolutionary Synthesis Center, located in Durham, NC. A panel discussion featuring professionals in mathematical ecology and biology, bioinformatics and computational biology fielded questions on graduate school and career advice. Evaluation surveys were sent to all participants in the program, with the exception of NIMBioS affiliates and event organizers. A total of 102 participants took part in the evaluation.

The evaluations for the conference sought to answer the following questions:

1. Were participants satisfied with the conference overall?
2. Did the conference meet participant expectations?
3. Do participants feel the conference allowed them to make new connections with others in math and biology?
4. Do participants feel they gained a better understanding of undergraduate research happening at the interface of mathematics and biology?
5. What impact do undergraduate participants feel the conference will have on their future career plans?
6. Were participants satisfied with the accommodations offered by NIMBioS?
7. What changes in accommodations, group format, and/or content would participants like to see at future similar meetings?

Synopsis of URC Conference Evaluation Results

- Overall satisfaction with the conference was high among respondents, the majority of whom indicated they either agreed or strongly agreed that the conference was productive (89%) and met their expectations (85%).
- Most respondents thought the presentations were useful (81%), while a slightly smaller majority felt the panel discussion was useful (79%).

- Ninety-two percent of respondents either agreed or strongly agreed that they would recommend participating in NIMBioS conferences to their colleagues.
- Overall, respondents reported being satisfied with the conference accommodations provided by NIMBioS.
- Respondents reported high levels of learning about how to present scientific research and career opportunities available at the interface of mathematics and biology.
- Most respondents felt the most useful aspect of the conference was the career panel, followed by the poster session and networking opportunities.
- Ninety-eight percent of undergraduate respondents said they felt that participating in the conference helped them become more knowledgeable about undergraduate research going on at the interface of biology and math.
- The majority of respondents (89%) agreed that the conference was successful in achieving its goal of creating a forum through which undergraduates could present research and make new connections at the interface of math and biology.
- Twenty-five percent of undergraduate respondents said they felt that the exchange of ideas that took place during the conference would (or potentially would) influence their career plans, while 44% said it "possibly" would influence their career plans.
- The majority of respondents (99%) said they felt that participating in the conference helped them make connections with others within the interdisciplinary field of math and biology.

EcoEd Webinar-- Math, Computing, Undergraduate Ecology Education and Large Datasets: An example from a Citizen Science Program

A 45-minute webinar entitled "Math, Computing, Undergraduate Ecology Education and Large Datasets: An Example from a Citizen Science Program" was presented by NIMBioS Director Louis Gross and Postdoctoral Fellow William Godsoe on September 8, 2010. The webinar, hosted via LiveOnline@UT, was offered as one of several events prior to the Oct. 14-15 2010 Ecology and Education Summit, sponsored by ESA and the National Education Association in Washington, D.C.

The webinar focused on math and computational education for ecology undergrads and illustrated how a large field dataset can be used to motivate hypothesis formulation and assessment by undergraduates. This included a discussion of NIMBioS' Research Experience for Undergraduates (REU) program linking biology and math undergrads; discussion of a large citizen science project based in the Great Smoky Mountains National Park (Discover Life in America's All Taxa Biodiversity Inventory – ATBI);

description of one ATBI large biodiversity dataset and how a small group of undergrads chose what to analyze and how to do so; and interview comments from the REU students about their learning process. The presenters emphasized how the data and analysis involved a multiplicity of concepts of biodiversity, the variety of questions raised by the students and the constraints on addressing them using the available data.

The evaluation of the webinar sought to answer the following questions:

1. Did participants find the information presented in the webinar useful?
2. Did the webinar meet participants' expectations?
3. Did participants felt they learned about the central topics of the webinar?
4. Did participants feel the presenter adequately addressed audience questions?
5. Were there any technical problems with the format of the webinar?
6. What topics would participants have liked to cover if given more time?
7. What topics would participants like to cover at future webinars?

Synopsis of Webinar Evaluation Results

- Participant expectations for the webinar included learning how to use large datasets in undergraduate ecology classes and how to incorporate citizen science projects into the classroom.
- 64% of respondents felt as though the webinar met their expectations.
- The majority of respondents (52%) said they felt that participating in the webinar helped them better understand the importance of mathematics in undergraduate biology education.
- 97% of respondents indicated they felt sufficient opportunity was given for questions and comments from the audience, and that the questions from the audience were answered well.
- 40% of respondents indicated having some sort of technical experience while accessing the webinar. The most common complaint dealt with audio problems.
- If given more time, participants would have liked to have gotten more specific information about how to translate the REU example into a project for a large undergraduate ecology classroom.
- Other suggestions for future webinar topics included information about other available datasets available for classroom use, statistics for undergrad teaching, and how to overcome differences in mathematics skills of undergrad biology students.

NIMBioS Participants by Event/Activity

NIMBioS Board Meetings

BOA Event	Start Date	End Date
BoA Virtual Meeting March 2009	24-Mar-09	24-Mar-09

Cheryl Briggs (Not reported)
Carlos Castillo-Chavez (Mathematics)
Iain Couzin (Biological/Biomedical Sciences)
Sergey Gavrilets (Biological/Biomedical Sciences)
James Glazier (Biological/Biomedical Sciences)
Gregory Goins (Biological/Biomedical Sciences)
Louis Gross (Biological/Biomedical Sciences)
Alan Hastings (Mathematics)
Christine Heitsch (Mathematics)
Graham Hickling (Biological/Biomedical Sciences)
Susan Holmes (Not reported)
Peter Hudson (Health Sciences)
Trachette Jackson (Mathematics)
Overtoun Jenda (Mathematics)
John Jungck (Biological/Biomedical Sciences)
Matthew Keeling (Mathematics)
Nancy Kopell (Not reported)
Donna Koslowsky (Biological/Biomedical Sciences)
David Krakauer (Not reported)
Suzanne Lenhart (Mathematics)
Jonathan Mattingly (Mathematics)
George Middendorf (Biological/Biomedical Sciences)
Cynthia Peterson (Biological/Biomedical Sciences)
Gary Smith (Biological/Biomedical Sciences)
De Witt Sumners (Mathematics)
John Tyson (Biological/Biomedical Sciences)
Mariel Vazquez (Mathematics)
Chris Welsh (Biological/Biomedical Sciences)

BOA Event	Start Date	End Date
BoA Meeting Oct. 2009	22-Oct-09	23-Oct-09

Paul Armsworth (Biological/Biomedical Sciences)
Sharon Bewick (Biological/Biomedical Sciences)
Carlos Castillo-Chavez (Mathematics)
Michelle Colby (Agricultural Sciences/Natural Resources)
Iain Couzin (Biological/Biomedical Sciences)
Lisa Fauci (Mathematics)
Sergey Gavrilets (Biological/Biomedical Sciences)
James Glazier (Biological/Biomedical Sciences)
William Godsoe (Biological/Biomedical Sciences)
Gregory Goins (Biological/Biomedical Sciences)
Louis Gross (Biological/Biomedical Sciences)
Alan Hastings (Mathematics)
Christine Heitsch (Mathematics)
Graham Hickling (Biological/Biomedical Sciences)
Mary Ann Horn (Mathematics)

Overtoun Jenda (Mathematics)
John Jungck (Biological/Biomedical Sciences)
Donna Koslowsky (Biological/Biomedical Sciences)
Suzanne Lenhart (Mathematics)
Yi Mao (Chemistry)
Jonathan Mattingly (Mathematics)
Brian O'Meara (Biological/Biomedical Sciences)
Cynthia Peterson (Biological/Biomedical Sciences)
Jane Rooney (Health Sciences)
Gary Smith (Biological/Biomedical Sciences)
De Witt Sumners (Mathematics)
John Tyson (Biological/Biomedical Sciences)
Mariel Vazquez (Mathematics)
Chris Welsh (Biological/Biomedical Sciences)

BOA Event	Start Date	End Date
BoA Virtual Meeting March 2010	31-Mar-10	31-Mar-10

Cheryl Briggs (Not reported)
Iain Couzin (Biological/Biomedical Sciences)
Sergey Gavrilets (Biological/Biomedical Sciences)
James Glazier (Biological/Biomedical Sciences)
Gregory Goins (Biological/Biomedical Sciences)
Louis Gross (Biological/Biomedical Sciences)
Alan Hastings (Mathematics)
Graham Hickling (Biological/Biomedical Sciences)
Susan Holmes (Not reported)
Trachette Jackson (Mathematics)
John Jungck (Biological/Biomedical Sciences)
Nancy Kopell (Not reported)
Donna Koslowsky (Biological/Biomedical Sciences)
Suzanne Lenhart (Mathematics)
Jonathan Mattingly (Mathematics)
George Middendorf (Biological/Biomedical Sciences)
Sam Scheiner (Biological/Biomedical Sciences)
Gary Smith (Biological/Biomedical Sciences)
John Tyson (Biological/Biomedical Sciences)
Mariel Vazquez (Mathematics)
Chris Welsh (Biological/Biomedical Sciences)

BOA Event	Start Date	End Date
BoA Meeting Oct. 2010	11-Oct-10	12-Oct-10

Carlos Castillo-Chavez (Mathematics)
Leland Ellis (Biological/Biomedical Sciences)
Sergey Gavrilets (Biological/Biomedical Sciences)
Louis Gross (Biological/Biomedical Sciences)
Alan Hastings (Mathematics)
Christine Heitsch (Mathematics)
Graham Hickling (Biological/Biomedical Sciences)
Susan Holmes (Not reported)
Trachette Jackson (Mathematics)
John Jungck (Biological/Biomedical Sciences)
Suzanne Lenhart (Mathematics)
Jonathan Mattingly (Mathematics)
Ellis McKenzie (Health Sciences)
George Middendorf (Biological/Biomedical Sciences)

Kiona Ogle (Biological/Biomedical Sciences)
Lisa Sattenspiel (Social Sciences)
Sam Scheiner (Biological/Biomedical Sciences)
Ynte Schukken (Health Sciences)
De Witt Sumners (Mathematics)
Mariel Vazquez (Mathematics)
Chris Welsh (Biological/Biomedical Sciences)

Education and Outreach

E&O Event	Start Date	End Date
R Seminar	02-Feb-09	02-Mar-09

Emily Austin (Biological/Biomedical Sciences)
Maria Barrios Garcia (Biological/Biomedical Sciences)
Noelia Barrios (Biological/Biomedical Sciences)
Arijana Barun (Biological/Biomedical Sciences)
Nicholas Buckley (Biological/Biomedical Sciences)
Romina Dimarco (Biological/Biomedical Sciences)
Emmi Felker-Quinn (Biological/Biomedical Sciences)
Sumit Goswami (Biological/Biomedical Sciences)
Patrik Hudson (Biological/Biomedical Sciences)
Tim Hunkapiller (Biological/Biomedical Sciences)
Hae-Ryong Kwon (Biological/Biomedical Sciences)
JP Lessard (Biological/Biomedical Sciences)
Marco Martinez (Not reported)
Brandon Matheny (Biological/Biomedical Sciences)
Rachael Miller Neilan (Mathematics)
Martin Nunez (Biological/Biomedical Sciences)
Mariano Rodriguez-Cabal (Biological/Biomedical Sciences)
Mijun Shakya (Biological/Biomedical Sciences)
Katie Stuble (Biological/Biomedical Sciences)
Megan Todd-Thompson (Biological/Biomedical Sciences)
Justin Vaughn (Biological/Biomedical Sciences)
Fei Xing (Mathematics)

E&O Event	Start Date	End Date
Faculty presentations Spring 2009	18-Feb-09	25-Mar-09

Vitaly Ganusov (Health Sciences)
Linda Highfield (Health Sciences)
Jaewook Joo (Computer & Information Sciences)
David Liberles (Biological/Biomedical Sciences)
Jian Liu (Biological/Biomedical Sciences)
Liang Liu (Mathematics)
Rongsong Liu (Mathematics)
Jian Ma (Biological/Biomedical Sciences)
Seyed Moghadas (Biological/Biomedical Sciences)
Brian O'Meara (Biological/Biomedical Sciences)
Hong Qin (Biological/Biomedical Sciences)
Shigui Ruan (Mathematics)
Paul Torgerson (Health Sciences)
Degui Zhi (Agricultural Sciences/Natural Resources)

E&O Event	Start Date	End Date
NIMBioS Seminar Series 2009	Jan-09	Apr-09

21-Jan-09 David Banks (Not reported)
18-Feb-09 Debra Knisley (Not reported)
25-Feb-09 Xuhui Huang (Not reported)
04-Mar-09 Jingzhi Pu (Chemistry)
11-Mar-09 Tongye Shen (Biological/Biomedical Sciences)
25-Mar-09 Jerome Baudry (Not reported)
01-Apr-09 Leonard McMillan (Computer & Information Sciences)
08-Apr-09 Mark Welch (Biological/Biomedical Sciences)
22-Apr-09 Judith Blake (Biological/Biomedical Sciences)
04-Feb-09 Karunesh Arora (Chemistry)
11-Feb-09 Shachi Gosavi (Not reported)

E&O Event	Start Date	End Date
PKAL Webinar: Mathematics and Life Science Education	23-Apr-09	23-Apr-09

David Brakke (Not reported)
Joanne Chu (Biological/Biomedical Sciences)
Veronique Delesalle (Biological/Biomedical Sciences)
Judith Dilts (Biological/Biomedical Sciences)
Jeanne Duffy (Other Professional Field)
Susan Elrod (Other Professional Field)
Louis Gross (Biological/Biomedical Sciences)
Mark Huibregtse (Not reported)
Mike Kerchner (Social Sciences)
Frank Kuserk (Biological/Biomedical Sciences)
Stephen Matheson (Biological/Biomedical Sciences)
Kelly McConnaughay (Other Professional Field)
Maria Pellegrini (Not reported)
John Pilger (Biological/Biomedical Sciences)
Muriel Poston (Other Professional Field)
Randy Pruim (Mathematics)
Judy Ridgway (Education)
Srebrenka Robic (Biological/Biomedical Sciences)
Martha Smith (Not reported)
Jim Swartz (Chemistry)
Bill Tomlinson (Other Professional Field)
Brenda Tooley (Humanities)
Brian (David) Walton (Mathematics)
Michelle Withers (Biological/Biomedical Sciences)
Grace Wyngaard (Biological/Biomedical Sciences)
Brian Yurk (Mathematics)
John Zobitz (Mathematics)
Rosemary Zumwalt (Other Professional Field)

E&O Event	Start Date	End Date
Vision and Change Meeting	01-May-09	01-May-09

John Anderson (Biological/Biomedical Sciences)
Kathryn Dabbs (Mathematics)
Deepa Dave (Biological/Biomedical Sciences)
Sarah Duncan (Biological/Biomedical Sciences)
Steven Fassino (Mathematics)
Jordan Grubbs (Biological/Biomedical Sciences)
Andrew Johns (Biological/Biomedical Sciences)
Michael Jungwirth (Biological/Biomedical Sciences)
Jonathon Lockhart (Biological/Biomedical Sciences)
Nathan Stebbins (Biological/Biomedical Sciences)

Heather Tran (Biological/Biomedical Sciences)

E&O Event	Start Date	End Date
Numbers Count Workshop	29-May-09	31-May-09

Mary Ball (Not reported)
Eungchun Cho (Mathematics)
Anna Decker (Biological/Biomedical Sciences)
Elif Demirci (Mathematics)
Wandi Ding (Mathematics)
Orland Fernandes (Chemistry)
Gregory Goins (Biological/Biomedical Sciences)
Linda Grisham (Biological/Biomedical Sciences)
Kristin Jenkins (Education)
Patricia Mulhall (Biological/Biomedical Sciences)
Claudia Neuhauser (Mathematics)
Tom Purucker (Biological/Biomedical Sciences)
Hong Qin (Biological/Biomedical Sciences)
Sue Risseeuw (Not reported)
Srebrenka Robic (Biological/Biomedical Sciences)
Fred Singer (Biological/Biomedical Sciences)
Ethel Stanley (Education)
Bonnie Stevenson (Not reported)
Stephen Wright (Biological/Biomedical Sciences)

E&O Event	Start Date	End Date
REU/REV 2009	01-Jun-09	24-Jul-09

Taylor Atchley (Biological/Biomedical Sciences)
Cameron Auker (Mathematics)
Laura Bahorich (Health Sciences)
Twyla Benally (Health Sciences)
Crystal Bennett (Mathematics)
Kimberly Briggs-Dunn (Biological/Biomedical Sciences)
Julie Paige Brown (Health Sciences)
Kerri Coon (Biological/Biomedical Sciences)
Crystal DeGroot (Health Sciences)
Sarah Duncan (Biological/Biomedical Sciences)
Steven Fassino (Mathematics)
Revorn Ferguson (Biological/Biomedical Sciences)
Michael Gilchrist (Biological/Biomedical Sciences)
Kimberly Gwinn (Agricultural Sciences/Natural Resources)
Graham Hickling (Biological/Biomedical Sciences)
Wen Huang (Mathematics)
Vishnupriya Khatri (Biological/Biomedical Sciences)
Suzanne Lenhart (Mathematics)
James Nance (Mathematics)
Agricola Odoi (Health Sciences)
Katie Schiermeyer (Mathematics)
Ginger Sills (Mathematics)
Steven (Steve) Wise (Mathematics)

E&O Event	Start Date	End Date
Curriculum Development Workshop	22-Jun-09	26-Jun-09

Errol Archibold (Education)
Stephen Everse (Biological/Biomedical Sciences)

Gregory Goins (Biological/Biomedical Sciences)
Meda Higa (Biological/Biomedical Sciences)
Sanjukta Hota (Mathematics)
Semen Koksal (Mathematics)
Mark Maloney (Biological/Biomedical Sciences)
Joseph McCray (Biological/Biomedical Sciences)
HanChuan Ong (Biological/Biomedical Sciences)
Mark Pauley (Biological/Biomedical Sciences)
Tom Purucker (Biological/Biomedical Sciences)
Hong Qin (Biological/Biomedical Sciences)
Alexandrine Randriamahefa (Biological/Biomedical Sciences)
Kathy Takayama (Biological/Biomedical Sciences)
Arlin Toro (Biological/Biomedical Sciences)
Rafael Tosado-Acevedo (Biological/Biomedical Sciences)
Paula Vasquez (Mathematics)
Jossie Vega de Varona (Mathematics)

E&O Event	Start Date	End Date
PEER Skills for Success Workshop	02-Aug-09	12-Aug-09

Paul Abraham (Biological/Biomedical Sciences)
Rachel Adams (Biological/Biomedical Sciences)
Cheryl Barksdale (Social Sciences)
Amber Bible (Biological/Biomedical Sciences)
Walter (Skip) Bollenbacher (Biological/Biomedical Sciences)
Joel Bucci (Not reported)
Claire Campbell (Ocean/Marine Sciences)
Patricia Carey (Not reported)
Dan Close (Biological/Biomedical Sciences)
Sam Donovan (Education)
Sally Ellingson (Computer & Information Sciences)
Alison Erickson (Biological/Biomedical Sciences)
Joseph (Ben) Ernest (Biological/Biomedical Sciences)
Susan (Michelle) Everett (Engineering)
Stephen Everse (Biological/Biomedical Sciences)
Jason Harris (Biological/Biomedical Sciences)
Joe Hughes (Biological/Biomedical Sciences)
Jerreme Jackson (Biological/Biomedical Sciences)
Jeremy Jay (Computer & Information Sciences)
Yao Jianzhuang (Not reported)
Xiaomin Jing (Not reported)
Elizabeth Johnson (Mathematics)
Randy Lacey (Not reported)
Monique LeMieux (Not reported)
Xiaoxin Liu (Not reported)
Zhou Li (Not reported)
Brittany McDaniel (Biological/Biomedical Sciences)
Ellen Messenger (Engineering)
Avik Mukherjee (Biological/Biomedical Sciences)
Ayla Norris (Not reported)
Letitia Olson (Biological/Biomedical Sciences)
Stephen Perritt (Biological/Biomedical Sciences)
Cynthia Peterson (Biological/Biomedical Sciences)
Lenora Pluchino (Not reported)
Harry Richards (Biological/Biomedical Sciences)
Alison Russell (Not reported)
Jennifer Ryan (Biological/Biomedical Sciences)

Keat Schwab (Not reported)
Dmitriy Smolensky (Not reported)
Ethel Stanley (Education)
Dylan Storey (Not reported)
Caroline Szymeczek (Other Professional Field)
Rick Weber (Not reported)
Xuejuan Zhang (Not reported)
Yijia Zhang (Biological/Biomedical Sciences)

E&O Event	Start Date	End Date
BioSongs	14-Oct-09	14-Oct-09

Folashade Agusto (Mathematics)
Erol Akcay (Biological/Biomedical Sciences)
Sharon Bewick (Biological/Biomedical Sciences)
Jay Clark (Agricultural Sciences/Natural Resources)
Aimee Classen (Biological/Biomedical Sciences)
Virginia Dale (Biological/Biomedical Sciences)
Van Eaton (Other Professional Field)
Arthur Echternacht (Biological/Biomedical Sciences)
Louis Gross (Biological/Biomedical Sciences)
Kimberly Gwinn (Agricultural Sciences/Natural Resources)
Suzanne Lenhart (Mathematics)
Maggie Longmire (Social Sciences)
Yi Mao (Chemistry)
Sean McCollough (Other Professional Field)
Richard (R.B.) Morris (Other Professional Field)
Brian O'Meara (Biological/Biomedical Sciences)
Thandi Onami (Biological/Biomedical Sciences)
Susan Riechert (Not reported)
Rhonda Rucker (Humanities)
Sparky Rucker (Humanities)
Premal Shah (Biological/Biomedical Sciences)
Todd Steed (Other Professional Field)
Joe Williams (Biological/Biomedical Sciences)

E&O Event	Start Date	End Date
Undergraduate Research Conference 2009	23-Oct-09	24-Oct-09

Azmy Ackleh (Mathematics)
Folashade Agusto (Mathematics)
Jasmin Alexander (Not reported)
Deborah Allen (Not reported)
Laura Allen (Not reported)
Michael Antolin (Biological/Biomedical Sciences)
Kierstin Arnold (Not reported)
Tyler Aten (Biological/Biomedical Sciences)
Quintana Baker (Not reported)
Roshonda Barner (Mathematics)
Andrew Bean (Mathematics)
Crystal Bennett (Mathematics)
Sharon Bewick (Biological/Biomedical Sciences)
Erin Bodine (Mathematics)
Mike Bokosha (Biological/Biomedical Sciences)
Madison Brandon (Mathematics)
John Branigan (Mathematics)
Chad Brassil (Biological/Biomedical Sciences)

Jeremy Brooks (Mathematics)
Noah Brostoff (Mathematics)
David Brown (Mathematics)
Emily Brown (Biological/Biomedical Sciences)
Janeise Burks (Mathematics)
Sharon Cameron (Mathematics)
Malcolm Campbell (Biological/Biomedical Sciences)
David Carroll (Biological/Biomedical Sciences)
Lydia Carten (Biological/Biomedical Sciences)
Maya Chhetri (Mathematics)
Chichia Chiu (Mathematics)
Jenna Comes (Not reported)
Edward Connor (Biological/Biomedical Sciences)
Robert Cool (Biological/Biomedical Sciences)
Derek Crouthers (Not reported)
Mary Crowe (Biological/Biomedical Sciences)
Lisa Curll (Not reported)
Kathryn Dabbs (Mathematics)
Ryan Deeds (Biological/Biomedical Sciences)
Michael Derocher (Biological/Biomedical Sciences)
Suma Desu (Mathematics)
Wandi Ding (Mathematics)
Sarah Duncan (Biological/Biomedical Sciences)
Moriah Echlin (Biological/Biomedical Sciences)
Todd Eckdahl (Biological/Biomedical Sciences)
Christina Emanuel (Biological/Biomedical Sciences)
Steven Fassino (Mathematics)
Revorn Ferguson (Biological/Biomedical Sciences)
Renee Fister (Mathematics)
Alice Ford (Not reported)
Jeffrey Forrester (Mathematics)
Rachel Fovargue (Not reported)
Holly Gaff (Health Sciences)
Michael Gilchrist (Biological/Biomedical Sciences)
Gregory Goins (Biological/Biomedical Sciences)
Richard Gomulkiewicz (Biological/Biomedical Sciences)
Ava Gooding (Biological/Biomedical Sciences)
Garrett Graham (Physics)
Richard Grosberg (Biological/Biomedical Sciences)
Jessica Gulbranson (Biological/Biomedical Sciences)
Ian Hamilton (Biological/Biomedical Sciences)
Paul Harris (Biological/Biomedical Sciences)
David Hayes (Biological/Biomedical Sciences)
Sekeenia Haynes (Agricultural Sciences/Natural Resources)
Mandira Hegde (Biological/Biomedical Sciences)
Raymond Hendon (Mathematics)
Laurie Heyer (Mathematics)
Kelsi Hirai (Not reported)
Julia Hobson (Biological/Biomedical Sciences)
Carole Hom (Biological/Biomedical Sciences)
Alexander Hoover (Mathematics)
David Hopkins (Mathematics)
Mary Ann Horn (Mathematics)
Sanjukta Hota (Mathematics)
Hillary Howard (Biological/Biomedical Sciences)
Michael Howard (Biological/Biomedical Sciences)
Nancy Huntly (Biological/Biomedical Sciences)

Jozsi Jalics (Mathematics)
Tess Jeffers (Biological/Biomedical Sciences)
Corey Johnson (Not reported)
McKayla Johnson (Biological/Biomedical Sciences)
John Jungck (Biological/Biomedical Sciences)
Zane Kalik (Not reported)
Eric Kamta (Mathematics)
David Kasofsky (Not reported)
Lindsay Keegan (Mathematics)
Russell Kendrick (Not reported)
Andrew Kerkhoff (Biological/Biomedical Sciences)
Shazia Khattack (Biological/Biomedical Sciences)
Brionna Knighten (Mathematics)
Jeff Knisley (Mathematics)
Hristo Kojouharov (Mathematics)
Semen Koksal (Mathematics)
Hannah Korbach (Mathematics)
Boryana Koseva (Biological/Biomedical Sciences)
Donna Koslowsky (Biological/Biomedical Sciences)
Bala Krishnamoorthy (Mathematics)
Tor Kwembe (Mathematics)
Evan Lancaster (Mathematics)
Alicia Langarica (Mathematics)
Kin Lau (Biological/Biomedical Sciences)
Chris Leary (Mathematics)
Glenn Ledder (Mathematics)
Namyong Lee (Mathematics)
Suzanne Lenhart (Mathematics)
Rebecca Leonard (Not reported)
Ovidiu Lipan (Biological/Biomedical Sciences)
Marsida Lisi (Mathematics)
Kristie Llera (Mathematics)
Svetlana Lockwood (Computer & Information Sciences)
Andrew Long (Mathematics)
Robert Long (Mathematics)
Amanda Lorusso (Mathematics)
Kyle Lyman (Not reported)
Anthony Mai (Not reported)
Carly Manning (Biological/Biomedical Sciences)
Marco Martinez (Not reported)
Martin Maxey (Mathematics)
Joshua Mike (Not reported)
Jason Miller (Mathematics)
Susan Mopper (Biological/Biomedical Sciences)
Raymond Ng (Mathematics)
Brittany Ann Niccum (Not reported)
Natalie Omattage (Biological/Biomedical Sciences)
Robert Parise (Biological/Biomedical Sciences)
Miran Park (Biological/Biomedical Sciences)
Kendell Pawelec (Engineering)
Alex Perkins (Biological/Biomedical Sciences)
Miranda Phan (Mathematics)
Tina Pilaroscia (Not reported)
Gabriella Pinter (Mathematics)
Jeff Poet (Mathematics)
Lei Qian (Computer & Information Sciences)
Tabatha Rainwater (Mathematics)

Mousa Rebouh (Mathematics)
Harry Richards (Biological/Biomedical Sciences)
Marissa Rivera (Not reported)
Michael Roberts (Biological/Biomedical Sciences)
Rebecca Rodger (Mathematics)
Grayson Rodriguez (Not reported)
Ben Rogers (Not reported)
Lindsay Rogerson (Not reported)
Casey Rommel (Mathematics)
Chelsea Ross (Not reported)
Valery Ross (Biological/Biomedical Sciences)
Shunda Rushing (Mathematics)
Philip (Phil) Ryan (Mathematics)
Jan Rychtar (Mathematics)
Rene Salinas (Mathematics)
Elizabeth Sanders (Biological/Biomedical Sciences)
Elsa Schaefer (Mathematics)
Joshua Schraiber (Biological/Biomedical Sciences)
Richard Schugart (Mathematics)
James Schulte (Biological/Biomedical Science)
Emily Signor (Biological/Biomedical Sciences)
Jammal Simmons (Mathematics)
Richard Sinden (Biological/Biomedical Sciences)
Caitlin Smith (Biological/Biomedical Sciences)
Robin Snyder (Biological/Biomedical Sciences)
Adnan Solaiman (Biological/Biomedical Sciences)
Lori Stevens (Biological/Biomedical Sciences)
Jasmin Sutton (Not reported)
Julia Svoboda (Education)
John Swaddle (Biological/Biomedical Sciences)
Simon Tavener (Mathematics)
Leland Taylor (Biological/Biomedical Sciences)
Edwin Tecarro (Mathematics)
Ana-Maria Tenekedjieva (Mathematics)
Samantha Tracht (Mathematics)
Mariel Vazquez (Mathematics)
Dgruv Vig (Not reported)
Ato Wallace (Mathematics)
Brian (David) Walton (Mathematics)
Jin Wang (Mathematics)
Marvin Washington (Not reported)
Brenton Willoughby (Not reported)
Leslie Wilson (Mathematics)
Moriah Wright (Mathematics)
Lev Yampolsky (Biological/Biomedical Sciences)
George Yates (Mathematics)
Xiao Zhu (Biological/Biomedical Sciences)
Erin Zingarelli (Biological/Biomedical Sciences)
Landon Zink (Biological/Biomedical Sciences)

E&O Event	Start Date	End Date
NIMBioS Seminar Series 2010	Feb-10	Nov-10

9-Feb-10 Folashade Agusto (Mathematics)
23-Feb-10 Vitaly Ganusov (Health Sciences)
26-Feb-10 Mark Lewis (Mathematics)
03-Mar-10 Paul Armsworth (Biological/Biomedical Sciences)

23-Mar-10 Qing Nie (Mathematics)
30-Mar-10 Jeremy Van Cleve (Biological/Biomedical Sciences)
06-Apr-10 Yi Mao (Chemistry)
28-Apr-10 Ayesugal Birand (Biological/Biomedical Sciences)
30-Apr-10 Brian Beckage (Biological/Biomedical Sciences)
31-Aug-10 Vlastimil Krivan (Mathematics)
14-Sep-10 Xavier Thibert-Plante (Biological/Biomedical Sciences)
28-Sep-10 Ross Cressman (Mathematics)
12-Oct-10 Thomas Ingersoll (Mathematics)
26-Oct-10 David (Dave) McCandlish (Biological/Biomedical Sciences)
26-Oct-10 Jeanne Narum (Other Professional Field)
16-Nov-10 ToewsCaLenn Turchin (Biological/Biomedical Sciences)
18-Nov-10 Abdul-Aziz Yakubu (Mathematics)
23-Nov-10 Tucker Gilman (Not reported)
30-Nov-10 Philip Crowley (Biology)

E&O Event	Start Date	End Date
Evaluation Meeting	22-Apr-10	23-Apr-10

Philip Crowley (Biological/Biomedical Sciences)
Audrey Aronowsky (Biological/Biomedical Sciences)
Pamela Bishop (Education)
Debbie Donahue (Computer & Information Sciences)
Wendy Gram (Education)
Barbara Heath (Social Sciences)
Mary Ann Horn (Mathematics)
Peter McCartney (Computer & Information Sciences)
Craig McClain (Ocean/Marine Sciences)
Tony Nance (Mathematics)

E&O Event	Start Date	End Date
REU/REV 2010	07-Jun-10	30-Jul-10

Chris Shields (Social Sciences)
Samrachana Adhikari (Mathematics)
Paul Armsworth (Biological/Biomedical Sciences)
Sharon Bewick (Biological/Biomedical Sciences)
Dubravka Bodiroga (Mathematics)
David Bulger (Chemistry)
John Collins (Mathematics)
Crystal Drakes (Health Sciences)
Sarah Duncan (Biological/Biomedical Sciences)
Shigetoshi Eda (Agricultural Sciences/Natural Resources)
Kelly Geyer (Mathematics)
William Godsoe (Biological/Biomedical Sciences)
Kimberly Gwinn (Agricultural Sciences/Natural Resources)
Ashley Jackson (Biological/Biomedical Sciences)
Jaewook Joo (Computer & Information Sciences)
Reka Kelemen (Biological/Biomedical Sciences)
Evan Lancaster (Mathematics)
Suzanne Lenhart (Mathematics)
Tyler Massaro (Mathematics)
John New (Health Sciences)
Luong Nguyen (Mathematics)
Ejebagom Ojogbo (Computer & Information Sciences)
Steven Rekant (Health Sciences)
Janelle Scott (Health Sciences)

Meredith Spence (Biological/Biomedical Sciences)
Ngoc Thai (Mathematics)
Jillian Trask (Mathematics)
Heidi Weimer (Health Sciences)
Steven (Steve) Wise (Mathematics)

E&O Event	Start Date	End Date
Biology in a Box Workshop	17-Jun-10	18-Jun-10

Guang Yang (Mathematics)
Paula Davis (Education)
Kim Day (Mathematics)
Sarah Duncan (Biological/Biomedical Sciences)
Christina Foran (Education)
Lynette Fowler (Education)
Janice Fox (Education)
Stephanie Geouge (Education)
Robin Grove (Biological/Biomedical Sciences)
Susan Hawkins (Education)
Jennifer Jensen (Education)
Tammy Knipp (Education)
Suzanne Lenhart (Mathematics)
Latrelle McFarlane (Education)
Zack Nolan (Mathematics)
William Powell (Biological/Biomedical Sciences)
Kathe Rainwater (Education)
Susan Riechert (Not reported)
Angela Rogers (Mathematics)
Penny Russell (Education)
Alicia Scott (Mathematics)
Liesel Watkins (Mathematics)
Ralph Wheeler (Biological/Biomedical Sciences)

E&O Event	Start Date	End Date
EcoEd Webinar: Undergrad Education	08-Sep-10	08-Sep-10

Neva Winters (Chemistry)
Vasilios Alexiades (Mathematics)
Barbara Blonder (Biological/Biomedical Sciences)
Sarah Boyle (Biological/Biomedical Sciences)
David Bulger (Chemistry)
Amy Downing (Biological/Biomedical Sciences)
Nicole Evans (Ocean/Marine Sciences)
Wendy Fink (Not reported)
Urmi Ghosh-Dastidar (Mathematics)
William Godsoe (Biological/Biomedical Sciences)
Wendy Gram (Education)
Louis Gross (Biological/Biomedical Sciences)
George Hammond (Biological/Biomedical Sciences)
Tomas Hook (Biological/Biomedical Sciences)
Martha Hoopes (Biological/Biomedical Sciences)
David Howe (Agricultural Sciences/Natural Resources)
Kristin Jackson (Not reported)
Alan Johnson (Agricultural Sciences/Natural Resources)
Daniel Johnson (Biological/Biomedical Sciences)
Cherie Keller (Biological/Biomedical Sciences)
Andrew Kerkhoff (Biological/Biomedical Sciences)

Katherine Kovach (Biological/Biomedical Sciences)
Gavin Leighton (Biological/Biomedical Sciences)
Benjamin Levy (Mathematics)
Andrea Litt (Agricultural Sciences/Natural Resources)
Kathleen LoGiudice (Biological/Biomedical Sciences)
Jose-Luis Machado (Biological/Biomedical Sciences)
Krisztian Magori (Biological/Biomedical Sciences)
Melissa McCartney (Biological/Biomedical Sciences)
Barbara McGuinness (Agricultural Sciences/Natural Resources)
Colleen McLinn (Education)
Rachael Miller Neilan (Mathematics)
Jennifer Momsen (Education)
Christa Partlow (Engineering)
Diane Pavek (Biological/Biomedical Sciences)
Denise Piechnik (Biological/Biomedical Sciences)
Kathleen Shea (Biological/Biomedical Sciences)
Jeffrey Simmons (Biological/Biomedical Sciences)
Wendy Smith (Agricultural Sciences/Natural Resources)
Shannon Trimboli (Agricultural Sciences/Natural Resources)
Judith Visty (Biological/Biomedical Sciences)
Amity Wilczek (Biological/Biomedical Sciences)

E&O Event	Start Date	End Date
Undergraduate Research Conference 2010	19-Nov-10	20-Nov-10

Long Yu (Computer & Information Sciences)
Gloria Abarca (Agricultural Sciences/Natural Resources)
Sara Abdelmageed (Mathematics)
Folashade Agusto (Mathematics)
Amie Albanese (Mathematics)
Ann Marie Alcocer (Mathematics)
Michael Antolin (Biological/Biomedical Sciences)
Paul Armsworth (Biological/Biomedical Sciences)
Curtis Atkisson (Social Sciences)
Anthony Bates (Not reported)
Audrey Bechette (Biological/Biomedical Sciences)
John Berges (Ocean/Marine Sciences)
Timkhite-Kulu Berhane (Biological/Biomedical Sciences)
Lindsay Blazsek (Biological/Biomedical Sciences)
Elizabeth Boeckmann (Geological & Earth Sciences)
Sarah Brnich (Biological/Biomedical Sciences)
David Brown (Mathematics)
David Bulger (Chemistry)
Shannon Burke (Mathematics)
Alan Joseph Caceres (Computer & Information Sciences)
Dana Callaway (Mathematics)
Jenna Cantrell (Mathematics)
Ricardo Chavez (Mathematics)
Kevin Chodnicki (Biological/Biomedical Sciences)
John Collins (Mathematics)
Bryan Conner (Biological/Biomedical Sciences)
Timothy Crisci (Biological/Biomedical Sciences)
Alexandria Croom (Mathematics)
Lisa Curll (Not reported)
Virginia Dale (Biological/Biomedical Sciences)
Alexandra Decarlo (Not reported)
John DeJesus (Mathematics)

Jesse Drendel (Mathematics)
Shigetoshi Eda (Agricultural Sciences/Natural Resources)
Timothy Elston (Biological/Biomedical Sciences)
Markus Ernst (Not reported)
Samantha Erwin (Mathematics)
Adam Eury (Physics)
Steven Fassino (Mathematics)
John Feldmann (Mathematics)
Julia Filiberti (Mathematics)
Renee Fister (Mathematics)
Jeffrey Forrester (Mathematics)
Sergey Gavrilets (Biological/Biomedical Sciences)
Morgan Geile (Biological/Biomedical Sciences)
Kelly Geyer (Mathematics)
Carl Giuffre (Mathematics)
Audrey Gonzalez (Not reported)
Garrett Graham (Physics)
Michael Grant (Mathematics)
Louis Gross (Biological/Biomedical Sciences)
Zie Haque (Mathematics)
Alexander Hare (Mathematics)
Sekeenia Haynes (Agricultural Sciences/Natural Resources)
Elise Hellwig (Mathematics)
Michael Hintze (Mathematics)
Benjamin Howard (Mathematics)
Volodymyr Hrynkiv (Mathematics)
Aron Huckaba (Not reported)
Ashley Hughes (Mathematics)
Daniele Ippolito (Mathematics)
Ashley Jackson (Biological/Biomedical Sciences)
Jerreme Jackson (Biological/Biomedical Sciences)
Jozsi Jalics (Mathematics)
Avis James (Biological/Biomedical Sciences)
Lauren Jeffers (Mathematics)
Tennesse Joyce (Mathematics)
Zane Kalik (Not reported)
Erin Keeney (Biological/Biomedical Sciences)
Reka Kelemen (Biological/Biomedical Sciences)
Tara Kemfort (Biological/Biomedical Sciences)
Sepideh Khavari (Mathematics)
Boryana Koseva (Biological/Biomedical Sciences)
Evan Lancaster (Mathematics)
Istvan Lauko (Mathematics)
Suzanne Lenhart (Mathematics)
Ling Li (Mathematics)
Ovidiu Lipan (Biological/Biomedical Sciences)
Kyla Lutz (Biological/Biomedical Sciences)
Aaron Marcus (Mathematics)
Tyler Massaro (Mathematics)
Oliver Mendez (Computer & Information Sciences)
Joshua Mike (Not reported)
Diquan Moore (Not reported)
Kelly Moran (Education)
Elizabeth Moses (Biological/Biomedical Sciences)
Charles Murphy (Biological/Biomedical Sciences)
Drew Neavin (Biological/Biomedical Sciences)
John New (Health Sciences)

Tuan (Ahn) Nguyen (Mathematics)
Duc-Trung Nguyen (Biological/Biomedical Sciences)
Bolutife Ogunjobi (Computer & Information Sciences)
Robert Parise (Biological/Biomedical Sciences)
Gerneiva Parkinson (Not reported)
Herman Pittman (Physics)
Greg Pullen (Not reported)
Lei Qian (Computer & Information Sciences)
Stephen Quinn (Mathematics)
Harry Richards (Biological/Biomedical Sciences)
Nneka Richards (Physics)
Shunda Rushing (Mathematics)
Philip (Phil) Ryan (Mathematics)
Jan Rychtar (Mathematics)
Rene Salinas (Mathematics)
David Schuchart (Computer & Information Sciences)
Richard Schugart (Mathematics)
Timothy Smart-Dumouchel II (Mathematics)
Janay Smith (Mathematics)
Katherine St. John (Computer & Information Sciences)
Leslie Stewart (Not reported)
Thomas Stojsavljevic (Mathematics)
Kyle Strand (Mathematics)
James Tanner (Computer & Information Sciences)
Maxx Tessmer (Biological/Biomedical Sciences)
Ngoc Thai (Mathematics)
Hannah Thompson (Mathematics)
Jillian Trask (Mathematics)
Ashutosh Wadhwa (Health Sciences)
Brian (David) Walton (Mathematics)
Jory Weintraub (Biological/Biomedical Sciences)
Jessica Whitaker (Biological/Biomedical Sciences)
Sara Wilder (Mathematics)
Brendan Wray (Biological/Biomedical Sciences)
Joshua Wright (Mathematics)
Abdul-Aziz Yakubu (Mathematics)
Mayra Yanez (Biological/Biomedical Sciences)
Guang Yang (Mathematics)
George Yates (Mathematics)
Jeong-Mi Yoon (Mathematics)

E&O Event	Start Date	End Date
NIMBioS Seminar Series 2011	Jan-11	Apr-11

12-Jan-11 Mark Kirkpatrick (Biological/Biomedical Sciences)
25-Jan-11 Tony Jhwueng (Mathematics)
08-Feb-11 Cristina Lanzas (Health Sciences)
22-Feb-11 Emily Moran (Biological/Biomedical Sciences)
01-Mar-11 Peter Hammerstein (Biological/Biomedical Sciences)
08-Mar-11 Mark McPeek (Biological/Biomedical Sciences)
22-Mar-11 Fred Adler (Mathematics)
05-Apr-11 Karen Page (Mathematics)

Songwriter-in-Residence

Nov-10 Richard (RB) Morris (Other Professional Field)
Jan-11 Jay Clark (Agricultural Sciences/Natural Resources)

Apr-11 Timothy Sellers (Humanities)

Graduate Research Assistants 2008

01-Aug-08 -- 30-Apr-09 Ivan Juric (Biological/Biomedical Sciences)

Graduate Research Assistants 2009

01-Aug-09 -- 30-Apr-10 Erin Bodine (Mathematics)
Rachel Leander (Mathematics)
Premal Shah (Biological/Biomedical Sciences)
01-Jan-09 -- 32-Dec-09 Edgar Duenez-Guzman (Computer & Information Sciences)

Graduate Research Assistants 2010

01-Aug-10 -- 30-Apr-11 Mauricio Gonzalez-Forero (Not reported)
01-Aug-10 -- 30-Apr-11 Xia Henian (Not reported
01-Aug-10 -- 30-Apr-11 Premal Shah (Biological/Biomedical Sciences)
01-Aug-09 -- 01-Sep-09 Chu Yuzhuo (Not reported)

Undergraduate Workers

01-Oct-09 -- 01-Oct-10 Ana Richters (Not reported)
01-Oct-09 -- 31-Dec-09 Christal Thomas (Biological/Biomedical Sciences)
01-Jan-11 -- 30-May-11 Ellen Ford (Not reported)

Investigative Workshops

Investigative Workshop Event	Start Date	End Date
Modeling White Nose Syndrome in Bats	29-Jun-09	01-Jul-09

Anne Ballmann (Biological/Biomedical Sciences)
Mylea Bayless (Agricultural Sciences/Natural Resources)
David Blehert (Biological/Biomedical Sciences)
Elizabeth Buckles (Health Sciences)
Jeremy Coleman (Biological/Biomedical Sciences)
Paul Cryan (Biological/Biomedical Sciences)
Paula Federico (Biological/Biomedical Sciences)
Wyatt Frampton (Health Sciences)
Winifred Frick (Biological/Biomedical Sciences)
Jessie Glaeser (Biological/Biomedical Sciences)
Thomas Hallam (Biological/Biomedical Sciences)
Alan Hicks (Biological/Biomedical Sciences)
Cory Holliday (Agricultural Sciences/Natural Resources)
Thomas Ingersoll (Mathematics)
Henriette Jager (Agricultural Sciences/Natural Resources)
Guy Knudsen (Biological/Biomedical Sciences)
Thomas Kunz (Biological/Biomedical Sciences)
Brandon Matheny (Biological/Biomedical Sciences)
Gary McCracken (Biological/Biomedical Sciences)
Jeff Nichols (Mathematics)
Daniel Nolfi (Agricultural Sciences/Natural Resources)
Evan Pannkuk (Biological/Biomedical Sciences)
James Peirce (Mathematics)
Wilfred (Mac) Post (Biological/Biomedical Sciences)
DeeAnn Reeder (Biological/Biomedical Sciences)

Alison Robbins (Biological/Biomedical Sciences)
Emi Saito (Biological/Biomedical Sciences)
Marcy Souza (Health Sciences)
Bill Stiver (Agricultural Sciences/Natural Resources)
Amy Turmelle (Biological/Biomedical Sciences)
Kevina Vulinec (Agricultural Sciences/Natural Resources)
Richard Weinstein (Biological/Biomedical Sciences)
LeAnn White (Health Sciences)

Investigative Workshop Event	Start Date	End Date
Modeling Bovine Tuberculosis	07-Jul-09	09-Jul-09

Peter Youngbaer (Other Professional Field)
Erika Asano (Mathematics)
Lisa Benjamin (Health Sciences)
Ellen Brooks Pollock (Mathematics)
Victoria Brown (Mathematics)
Michael Buhnerkempe (Biological/Biomedical Sciences)
Xiongwen Chen (Biological/Biomedical Sciences)
Andrew Conlan (Biological/Biomedical Sciences)
Fernanda Dorea (Biological/Biomedical Sciences)
Todd Duenckel (Health Sciences)
Matt Farnsworth (Agricultural Sciences/Natural Resources)
Eli Fenichel (Agricultural Sciences/Natural Resources)
Yrjo Grohn (Health Sciences)
Graham Hickling (Biological/Biomedical Sciences)
Susan Jones (Health Sciences)
John Kaneene (Biological/Biomedical Sciences)
Cristina Lanzas (Health Sciences)
Tom Lindstrom (Biological/Biomedical Sciences)
Jason Lombard (Health Sciences)
Robert Meyer (Health Sciences)
Ryan Miller (Agricultural Sciences/Natural Resources)
Alvaro Moraes (Mathematics)
John New (Health Sciences)
Agricola Odoi (Health Sciences)
Francisco Olea Popelka (Health Sciences)
Kathy Orloski (Health Sciences)
Richard Orton (Computer & Information Sciences)
Susan Pala (Health Sciences)
Janet Payeur (Biological/Biomedical Sciences)
Katie Quatrano (Agricultural Sciences/Natural Resources)
Emmit Rawls (Agricultural Sciences/Natural Resources)
Suelee Robbe Austerman (Health Sciences)
Sadie Ryan (Simonovich) (Biological/Biomedical Sciences)
Samuel Scarpino (Biological/Biomedical Sciences)
Shih-Lung Shaw (Social Sciences)
Michael (Mike) Tildesley (Mathematics)
Matthew Vernon (Biological/Biomedical Sciences)
Colleen Webb (Biological/Biomedical Sciences)

Investigative Workshop Event	Start Date	End Date
New Soil Black Box Math Strategies	15-Oct-09	17-Oct-09

Uno Wennergren (Biological/Biomedical Sciences)
Karen Abbott (Biological/Biomedical Sciences)
Kent Apostol (Agricultural Sciences/Natural Resources)

Alison Bennett (Biological/Biomedical Sciences)
James Bever (Biological/Biomedical Sciences)
Lori Biederman (Agricultural Sciences/Natural Resources)
Stuart Borrett (Biological/Biomedical Sciences)
Loren Byrne (Biological/Biomedical Sciences)
Aimee Classen (Biological/Biomedical Sciences)
Kim Cuddington (Biological/Biomedical Sciences)
Marie-anne de Graaff (Agricultural Sciences/Natural Resources)
Karen Garrett (Agricultural Sciences/Natural Resources)
Antonio (Tony) Golubski (Biological/Biomedical Sciences)
Louis Gross (Biological/Biomedical Sciences)
Alan Hastings (Mathematics)
Erik Hobbie (Agricultural Sciences/Natural Resources)
Jason Hoeksema (Biological/Biomedical Sciences)
Volodymyr Hrynkiv (Mathematics)
Justine Karst (Biological/Biomedical Sciences)
Miroslav Kummel (Biological/Biomedical Sciences)
Charlotte Lee (Biological/Biomedical Sciences)
Kun (Justine) Leng (Mathematics)
Chao Liang (Agricultural Sciences/Natural Resources)
Wei (Joy Key Rose) Liao (Biological/Biomedical Sciences)
Keenan Mack (Biological/Biomedical Sciences)
Laura Miller (Mathematics)
Bonnie Ownley (Agricultural Sciences/Natural Resources)
Sarah Richardson (Biological/Biomedical Sciences)
Claudia Rojas Alvarado (Agricultural Sciences/Natural Resources)
Ellen Simms (Biological/Biomedical Sciences)
James Umbanhowar (Biological/Biomedical Sciences)
Vonda Walsh (Mathematics)
Matthew Warren (Biological/Biomedical Sciences)

Investigative Workshop Event	**Start Date**	**End Date**
Optimal Control and Optimization for Individual-based and Agent-based Models	01-Dec-09	03-Dec-09

Jun Zhu (Mathematics)
Folashade Agusto (Mathematics)
Gary An (Biological/Biomedical Sciences)
Sharon Bewick (Biological/Biomedical Sciences)
Sudin Bhattacharya (Engineering)
Filippo Castiglione (Computer & Information Sciences)
Stephen Eubank (Mathematics)
Eli Fenichel (Agricultural Sciences/Natural Resources)
Ben Fitzpatrick (Mathematics)
Weihao Ge (Physics)
Shana Gillette (Social Sciences)
Volker Grimm (Biological/Biomedical Sciences)
Louis Gross (Biological/Biomedical Sciences)
Franziska Hinkelmann (Mathematics)
Joe Hughes (Biological/Biomedical Sciences)
Ayaz Hyder (Biological/Biomedical Sciences)
Abdul Jarrah (Mathematics)
Jaewook Joo (Computer & Information Sciences)
Hee-Dae Kwon (Mathematics)
Reinhard Laubenbacher (Mathematics)
Rachel Leander (Mathematics)
Dongjun Lee (Engineering)

Jeehyun Lee (Mathematics)
Suzanne Lenhart (Mathematics)
Zhao Lu (Mathematics)
Brian Mac Participante (Computer & Information Sciences)
Charles Macal (Computer & Information Sciences)
Richard Medina (Social Sciences)
Rachael Miller Neilan (Mathematics)
David Murrugarra Tomairo (Mathematics)
Michael North (Computer & Information Sciences)
Virginia Pasour (Mathematics)
Andrew Penland (Mathematics)
Valeriy Perminov (Mathematics)
Vladimir Protopopescu (Mathematics)
Ami Radunskaya (Mathematics)
Steven Railsback (Agricultural Sciences/Natural Resources)
Katarzyna (Kasia) Rejniak (Mathematics)
Rene Salinas (Mathematics)
Suresh Sethi (Other Professional Field)
Diglio Simoni (Computer & Information Sciences)
Abdessamad Tridane (Mathematics)
Alan Veliz-Cuba (Mathematics)
Jie Xiong (Mathematics)
Jiongmin Yong (Mathematics)

Investigative Workshop Event	Start Date	End Date
Modeling Toxoplasma gondii	12-May-10	15-May-10

Xiaopeng Zhao (Engineering)
Folashade Agusto (Mathematics)
Diego Fernando Aranda Lozano (Mathematics)
Gustavo Arrizabalaga (Biological/Biomedical Sciences)
Jheelam Banerjee (Biological/Biomedical Sciences)
John Baroch (Biological/Biomedical Sciences)
Sharon Bewick (Biological/Biomedical Sciences)
Hema Casala (Biological/Biomedical Sciences)
Jitender Dubey (Health Sciences)
Zhilan Feng (Mathematics)
Vitaly Ganusov (Health Sciences)
Solange Gennari (Agricultural Sciences/Natural Resources)
Luca Gerardo Giorda (Mathematics)
Michael Gilchrist (Biological/Biomedical Sciences)
Emmanuelle Gilot-Fromont (Health Sciences)
Sandra Halonen (Biological/Biomedical Sciences)
William Harris (Mathematics)
James Haven (Biological/Biomedical Sciences)
Rachel Hill (Microbiology)
Jaewook Joo (Computer & Information Sciences)
Asis Khan (Health Sciences)
Michel Langlais (Mathematics)
Suzanne Lenhart (Mathematics)
Kerrie Anne Loyd (Agricultural Sciences/Natural Resources)
Debashree Majumdar (Biological/Biomedical Sciences)
Aurelien Mazurie (Biological/Biomedical Sciences)
Natalie Miller (Biological/Biomedical Sciences)
Dana Mordue (Biological/Biomedical Sciences)
Lina Ocampo (Mathematics)
Agricola Odoi (Health Sciences)

Peter Plechac (Mathematics)
Daofeng Qu (Agricultural Sciences/Natural Resources)
Jay Radke (Biological/Biomedical Sciences)
Benjamin Rosenthal (Biological/Biomedical Sciences)
Elliot Shwab (Biological/Biomedical Sciences)
Chunlei Su (Biological/Biomedical Sciences)
Adam Sullivan (Engineering)
Yasuhiro Suzuki (Biological/Biomedical Sciences)
Paul (Jianjun) Tian (Mathematics)
Elizabeth VanWormer (Health Sciences)
Jorge Velasco-Hernandez (Biological/Biomedical Sciences)
Isabelle Villena (Biological/Biomedical Sciences)
Kwai Lam Wong (Computer & Information Sciences)
Yiding Yang (Mathematics)
Xiaopeng Zhao (Engineering)

Investigative Workshop Event	Start Date	End Date
Modeling Reef Ecosystems	21-Jul-10	23-Jul-10

Huaiyu Zhou (Health Sciences)
Luis Alberto Acosta Moreno (Ocean/Marine Sciences)
Paul Armsworth (Biological/Biomedical Sciences)
Jerald Ault (Ocean/Marine Sciences)
Stephen Ban (Ocean/Marine Sciences)
David Bernard (Biological/Biomedical Sciences)
Sharon Bewick (Biological/Biomedical Sciences)
Michael Bode (Mathematics)
Robert Stephen Cantrell (Mathematics)
Megan Donahue (Biological/Biomedical Sciences)
Erik Franklin (Ocean/Marine Sciences)
Tak Fung (Mathematics)
Felimon Gayanilo (Computer & Information Sciences)
Alan Hastings (Mathematics)
Clifford Hearn (Ocean/Marine Sciences)
Eric Hochberg (Ocean/Marine Sciences)
Ali Hudon (Ocean/Marine Sciences)
Craig Johnson (Ocean/Marine Sciences)
Cheryl Knowland (Ocean/Marine Sciences)
Semen Koksal (Mathematics)
Suzanne Lenhart (Mathematics)
Joseph Maina (Biological/Biomedical Sciences)
Steven McMurray (Biological/Biomedical Sciences)
Jessica Melbourne-Thomas (Ocean/Marine Sciences)
Rachael Miller Neilan (Mathematics)
Erinn Muller (Biological/Biomedical Sciences)
Jennifer O'Leary (Ocean/Marine Sciences)
Carlos Ruiz (Ocean/Marine Sciences)
James (Jim) Sanchirico (Social Sciences)
Matthew Spencer (Biological/Biomedical Sciences)
Carl Toews (Mathematics)
Howie Weiss (Mathematics)
Elizabeth Widman (Ocean/Marine Sciences)
Laith Yakob (Biological/Biomedical Sciences)
Susan Yee (Biological/Biomedical Sciences)
Aletta Yniguez (Ocean/Marine Sciences)

Investigative Workshop Event	Start Date	End Date

Modeling Wildlife Zoonoses	08-Nov-10	10-Nov-10

Tracy Ziegler (Ocean/Marine Sciences)
Folashade Agusto (Mathematics)
Linda Allen (Mathematics)
Jacques Belair (Mathematics)
Seth Blumberg (Biological/Biomedical Sciences)
Vrushali Bokil (Mathematics)
Vicki Brown (Biological/Biomedical Sciences)
Dong Hoon Chung (Biological/Biomedical Sciences)
Yong-Kyu Chu (Biological/Biomedical Sciences)
Sara Del Valle (Mathematics)
Esteban Domingo (Biological/Biomedical Sciences)
Matt Farnsworth (Agricultural Sciences/Natural Resources)
Timothy Flietstra (Mathematics)
Sebastian Funk (Mathematics)
Hans Heesterbeek (Biological/Biomedical Sciences)
Parviez Hosseini (Biological/Biomedical Sciences)
James (Mac) Hyman (Mathematics)
Thomas Ingersoll (Mathematics)
Renata Ivanek-Miojevic (Health Sciences)
Colleen Jonsson (Biological/Biomedical Sciences)
Hem Joshi (Mathematics)
Melissa Kennedy (Biological/Biomedical Sciences)
Sabra Klein (Biological/Biomedical Sciences)
Michel Langlais (Mathematics)
Sean Laverty (Mathematics)
Suzanne Lenhart (Mathematics)
Chelsea Lewis (Mathematics)
James Lloyd-Smith (Biological/Biomedical Sciences)
Krisztian Magori (Biological/Biomedical Sciences)
Kudakwashe Magwedere (Agricultural Sciences/Natural Resources)
Joel Miller (Mathematics)
James Mills (Health Sciences)
Sean Moore (Biological/Biomedical Sciences)
John New (Health Sciences)
Erik Osnas (Biological/Biomedical Sciences)
Jennifer Owen (Biological/Biomedical Sciences)
Celia Perales (Biological/Biomedical Sciences)
Juliet Pulliam (Biological/Biomedical Sciences)
Naveen Ramunigari (Engineering)
Susan Shriner (Biological/Biomedical Sciences)
Marcy Souza (Health Sciences)
Samantha Tracht (Mathematics)
Pauline van den Driessche (Mathematics)
Jorge Velasco-Hernandez (Biological/Biomedical Sciences)
Sukhitha Vidurupola (Mathematics)

Investigative Workshop Event	**Start Date**	**End Date**
Solid Tumor Modeling	19-Jan-11	21-Jan-11

Jane White (Biological/Biomedical Sciences)
Alexander Anderson (Other Professional Field)
Andreas Aristotelous (Mathematics)
David Axelrod (Biological/Biomedical Sciences)
Jheelam Banerjee (Biological/Biomedical Sciences)
Jyoti Champanerkar (Mathematics)

Yaming Chen (Mathematics)
Raluca Craciun (Chemistry)
Donghai Dai (Health Sciences)
Amina Eladdadi (Mathematics)
Ardith El-Kareh (Biological/Biomedical Sciences)
Heiko Enderling (Biological/Biomedical Sciences)
James Glazier (Biological/Biomedical Sciences)
Haijun Gong (Biological/Biomedical Sciences)
Yi Jiang (Biological/Biomedical Sciences)
Jaewook Joo (Computer & Information Sciences)
Joyner Michele (Mathematics)
Kimberly Kanigel-Winner (Biological/Biomedical Sciences)
Yangjin Kim (Mathematics)
John Lowengrub (Mathematics)
Sharon Lubkin (Mathematics)
Nicholas Marko (Other Professional Field)
Susan Massey (Mathematics)
Michael McEntee (Health Sciences)
Maxwell Neal (Biological/Biomedical Sciences)
Bonsu Osei (Biological/Biomedical Sciences)
Judith Perez-Velazquez (Mathematics)
Aleksander Popel (Engineering)
Ami Radunskaya (Mathematics)
Katarzyna (Kasia) Rejniak (Mathematics)
Russell Rockne (Health Sciences)
Zachariah Sinkala (Mathematics)
Dwayne Stupack (Biological/Biomedical Sciences)
Javier Torres-Roca (Biological/Biomedical Sciences)
Hwa-Chain Wang (Health Sciences)
Zhihui (Bill) Wang (Biological/Biomedical Sciences)
Ann Wells (Biological/Biomedical Sciences)
Steven (Steve) Wise (Mathematics)

Investigative Workshop Event	Start Date	End Date
Modeling Infectious Disease	23-Jan-11	25-Jan-11

Tarynn Witten (Health Sciences)
Dylan George (Not reported)
Peter Gething (Health Sciences)
Boloye Gomero (Not reported)
Louis Gross (Biological/Biomedical Sciences)
Simon Hay (Biological/Biomedical Sciences)
Suzanne Lenhart (Mathematics)
Justin Lessler (Biological/Biomedical Sciences)
Virginia (Ginny) Pitzer (Health Sciences)
Juliet Pulliam (Biological/Biomedical Sciences)
Steven Riley (Biological/Biomedical Sciences)
David Smith (Biological/Biomedical Sciences)
Cecile Viboud (Biological/Biomedical Sciences)

Investigative Workshop Event	Start Date	End Date
Synchrony in Biological Systems Across Scales	11-Apr-11	13-Apr-11

Karen Abbott (Biological/Biomedical Sciences)
Bharath Ananthasubramaniam (Engineering)
Catherine Aubee (Biological/Biomedical Sciences)
Michael Bonsall (Biological/Biomedical Sciences)

Carmen Canavier (Biological/Biomedical Sciences)
Xiongwen Chen (Biological/Biomedical Sciences)
Karl Cottenie (Biological/Biomedical Sciences)
Noel Cressie (Mathematics)
Cori D'Ausilio (Biological/Biomedical Sciences)
Martin Golubitsky (Mathematics)
Alan Hastings (Mathematics)
Jaewook Joo (Computer & Information Sciences)
Timothy Keitt (Biological/Biomedical Sciences)
Peter Kramer (Mathematics)
Rachel Leander (Mathematics)
Maria Leite (Mathematics)
Todd Levine (Biological/Biomedical Sciences)
Timothy (Tim) Lewis (Mathematics)
Andrew (Sandy) Liebhold (Biological/Biomedical Sciences)
Frida Logdberg (Biological/Biomedical Sciences)
Yi Mao (Chemistry)
Thomas Massie (Biological/Biomedical Sciences)
Theoden (Tay) Netoff (Biological/Biomedical Sciences)
Katherine Newhall (Mathematics)
Calistus Ngonghala (Mathematics)
Andrew Noble (Biological/Biomedical Sciences)
Shubha Pandit (Biological/Biomedical Sciences)
Vito Quaranta (Biological/Biomedical Sciences)
Ravi Rao (Computer & Information Sciences)
Leonid Rubchinsky (Mathematics)
Natalia Toporikova (Biological/Biomedical Sciences)
Jaimie Van Norman (Biological/Biomedical Sciences)
Uno Wennergren (Biological/Biomedical Sciences)
Xiaopeng Zhao (Engineering)

Postdoctoral Fellows

Start Date	Name	Primary Field of Study

08-Sep-09 Folashade Agusto (Mathematics)
01-Aug-09 Erol Akcay (Biological/Biomedical Sciences)
01-Aug-09 Sharon Bewick (Biological/Biomedical Sciences)
10-Sep-10 Tucker Gilman (Not reported)
10-Sep-09 William Godsoe (Biological/Biomedical Sciences)
01-Jun-10 Thomas Ingersoll (Mathematics)
01-Oct-10 Tony Jhwueng (Mathematics)
17-Aug-09 Yi Mao (Chemistry)
31-Aug-10 Emily Moran (Biological/Biomedical Sciences)
01-May-10 Xavier Thibert-Plante (Biological/Biomedical Sciences)

Sabbatical Fellows

Start Date	End Date	Name	Primary Field of Study

01-Jan-10 -- 27-Aug-10 Brian Beckage (Biological/Biomedical Sciences)
15-Jul-10 -- 15-Dec-10 Vlastimil Krivan (Mathematics)
18-Jan-11 -- 30-Aug-11 Karen Page (Mathematics)

Short-term Visitors

Start Date	End Date	Name	Primary Field of Study

07-Jul-10 -- 10-Jul-10 Redwan Al Faori (Biological/Biomedical Sciences)
13-Dec-09 -- 19-Jul-10 Brian Beckage (Biological/Biomedical Sciences)
09-Apr-11 -- 16-Apr-11 Ludek Berec (Biological/Biomedical Sciences)
04-Jul-10 -- 27-Jul-10 Michael Bode (Mathematics)
07-Jul-10 -- 10-Jul-10 Luis Cabrales (Agricultural Sciences/Natural Resources)
14-Mar-10 -- 19-Mar-10 Judith Canner (Mathematics)
04-Apr-11 -- 05-Apr-11 Juanjuan Chai (Mathematics)
10-Jun-10 -- 11-Jun-10 Dong Chen (Other Professional Field)
02-Apr-11 -- 10-Apr-11 Ryan Chisholm (Biological/Biomedical Sciences)
22-Oct-10 -- 31-Oct-10 Ryan Chisholm (Biological/Biomedical Sciences)
23-May-11 -- 24-May-11 Joseph (Joe) Corn (Agricultural Sciences/Natural Resources)
27-Sep-10 -- 02-Oct-10 Ross Cressman (Mathematics)
30-Nov-10 -- 02-Dec-10 Philip Crowley (Biological/Biomedical Sciences)
15-Oct-09 -- 13-Nov-09 Celine Devaux (Biological/Biomedical Sciences)
10-May-10 -- 14-May-10 Scott Duke-Sylvester (Not reported)
10-May-10 -- 14-May-10 Christopher Ellingwood (Computer & Information Sciences)
14-Jul-09 -- 24-Jul-09 Zhilan Feng (Mathematics)
01-May-09 -- 29-May-09 Renee Fister (Mathematics)
11-Apr-11 -- 15-Apr-11 Kevin Flores (Mathematics)
29-Sep-10 -- 03-Oct-10 Urban Friberg (Biological/Biomedical Sciences)
01-May-09 -- 29-May-09 Holly Gaff (Health Sciences)
14-Feb-11 -- 16-Feb-11 Urmi Ghosh-Dastidar (Mathematics)
19-Feb-10 -- 21-Feb-10 Antonio (Tony) Golubski (Biological/Biomedical Sciences)
12-Jul-10 -- 23-Jul-10 Richard Hall (Biological/Biomedical Sciences)
19-Feb-10 -- 21-Feb-10 Jason Hoeksema (Biological/Biomedical Sciences)
23-May-11 -- 24-May-11 Lindsey Holmstrom (Health Sciences)
28-Nov-10 -- 29-Nov-10 Robert Holt (Biological/Biomedical Sciences)
15-May-10 -- 20-May-10 Sanjukta Hota (Mathematics)
07-Jul-10 -- 10-Jul-10 Marjorie Hubbard (Engineering)
18-Jan-11 -- 22-Jan-11 Istvan Karsai (Biological/Biomedical Sciences)
03-Aug-09 -- 05-Aug-09 Ilki Kim (Engineering)
19-Feb-10 -- 21-Feb-10 Miroslav Kummel (Biological/Biomedical Sciences)
12-Jul-10 -- 23-Jul-10 John Lambrinos (Biological/Biomedical Sciences)
14-Jul-09 -- 24-Jul-09 Maria Leite (Mathematics)
04-Jul-10 -- 27-Jul-10 Gareth Lennox (Biological/Biomedical Sciences)
22-Jul-10 -- 17-Aug-10 Yoram Louzoun (Mathematics)
10-May-10 -- 14-May-10 Kerrie Anne Loyd (Agricultural Sciences/Natural Resources)
23-May-11 -- 24-May-11 Marguerite Madden (Agricultural Sciences/Natural Resources)
10-Jun-10 -- 11-Jun-10 Marguerite Madden (Agricultural Sciences/Natural Resources)
01-Jun-11 -- 02-Jun-11 Krisztian Magori (Biological/Biomedical Sciences)
09-Apr-11 -- 16-Apr-11 Daniel Maxin (Mathematics)
25-Oct-10 -- 30-Oct-10 David (Dave) McCandlish (Biological/Biomedical Sciences)
13-Dec-09 -- 19-Dec-09 Jason Miller (Mathematics)
24-Apr-10 -- 27-Apr-10 Emily Moran (Biological/Biomedical Sciences)
25-Oct-10 -- 26-Oct-10 Jeanne Narum (Other Professional Field)
21-Jun-10 -- 25-Jun-10 William Platt (Biological/Biomedical Sciences)
29-Sep-10 -- 03-Oct-10 William (Bill) Rice (Biological/Biomedical Sciences)
19-Feb-10 -- 21-Feb-10 Sarah Richardson (Biological/Biomedical Sciences)
01-Nov-10 -- 12-Nov-10 Philip (Phil) Ryan (Mathematics)
28-Jun-10 -- 02-Jul-10 Rene Salinas (Mathematics)
07-Mar-11 -- 08-Mar-11 Rene Salinas (Mathematics)
18-Jul-10 -- 20-Jul-10 Rene Salinas (Mathematics)
18-May-10 -- 21-May-10 Rene Salinas (Mathematics)
09-Aug-09 -- 14-Aug-09 Rene Salinas (Mathematics)
01-May-09 -- 29-May-09 Elsa Schaefer (Mathematics)

12-Jul-10 -- 23-Jul-10 Gregory Schrott (Biological/Biomedical Sciences)
18-Jan-11 -- 22-Jan-11 Jonathan Shik (Biological/Biomedical Sciences)
19-Feb-10 -- 21-Feb-10 Ellen Simms (Biological/Biomedical Sciences)
27-Jan-10 -- 31-Jan-10 Ellen Simms (Biological/Biomedical Sciences)
12-Dec-09 -- 20-Dec-09 Jean Tchuenche (Mathematics)
28-Jun-10 -- 02-Jul-10 Michael (Mike) Tildesley (Mathematics)
04-Jul-10 -- 27-Jul-10 Carl Toews (Mathematics)
14-Nov-10 -- 19-Nov-10 ToewsCaLenn Turchin (Biological/Biomedical Sciences)
19-Feb-10 -- 21-Feb-10 James Umbanhowar (Biological/Biomedical Sciences)
24-Mar-10 -- 31-Mar-10 Jeremy Van Cleve (Biological/Biomedical Sciences)
14-Jul-09 -- 24-Jul-09 Jorge Velasco-Hernandez (Biological/Biomedical Sciences)
08-Nov-09 -- 06-Feb-10 Eti Dwi Wiraningsih (Mathematics)
14-May-11 -- 22-May-11 Mae Woods (Mathematics)
03-Oct-10 -- 09-Oct-10 Mohammed Yahdi (Mathematics)
12-Jul-10 -- 23-Jul-10 Hiroyuki Yokomizo (Biological/Biomedical Sciences)

Informal Visitors

Start Date	End Date	Name	Primary Field of Study

25-Aug-10 -- 25-Aug-10 William Chambers (Health Sciences)

Tutorials

Tutorial Event	Start Date	End Date
Training the Trainers: High-Performance Computing Tutorial for Computational Science Professionals Collaborating with Biologists	16-Mar-09	18-Mar-09

Andreas Aristotelous (Mathematics)
David Banks (Not reported)
Michael Berry (Computer & Information Sciences)
Stephanie Bryant (Not reported)
Eric Carr (Geological & Earth Sciences)
Scott Duke-Sylvester (Not reported)
John Eblen (Not reported)
Jim Ferguson (Not reported)
Laxminarayana Ganapathi (Computer & Information Sciences)
Vladimir Gapeyev (Not reported)
Nicholas Gewecke (Mathematics)
Christian Halloy (Computer & Information Sciences)
Jeff Krause (Not reported)
Michael Langston (Computer & Information Sciences)
Hilmar Lapp (Computer & Information Sciences)
Yaohang Li (Computer & Information Sciences)
Bruce Loftis (Computer & Information Sciences)
Zhao Lu (Mathematics)
Michael McLennan (Engineering)
Sudhir Naswa (Not reported)
Davi Ortega (Not reported)
Rick Reeves (Not reported)
Douglas Roberts (Not reported)
Gary Rogers (Computer & Information Sciences)
Tabitha Samuel (Computer & Information Sciences)
Michael Saum (Mathematics)
Mikhail A Sekachev (Not reported)

Diglio Simoni (Computer & Information Sciences)
Edwin Skidmore (Not reported)
Eric Solano (Engineering)
Stanimire Tomov (Computer & Information Sciences)
Yaxing Wei (Not reported)
Kwai Lam Wong (Computer & Information Sciences)

Tutorial Event	Start Date	End Date
Optimal Control and Optimization for Biologists	15-Dec-09	17-Dec-09

Christal Yost (Computer & Information Sciences)
Folashade Agusto (Mathematics)
Paul Armsworth (Biological/Biomedical Sciences)
Brian Beckage (Biological/Biomedical Sciences)
Barbara Benitez-Gucciardi (Mathematics)
Michael (Guy) Bevers (Agricultural Sciences/Natural Resources)
Sharon Bewick (Biological/Biomedical Sciences)
Erin Bodine (Mathematics)
Lydia Bourouiba (Mathematics)
Eungchun Cho (Mathematics)
Swati Debroy (Mathematics)
Renee Fister (Mathematics)
Joe Hughes (Biological/Biomedical Sciences)
Mohammad Safayet Khan (Biological/Biomedical Sciences)
Cristina Lanzas (Health Sciences)
Darunee Lawson (Not reported)
Rachel Leander (Mathematics)
Namyong Lee (Mathematics)
Maria Leite (Mathematics)
Kun (Justine) Leng (Mathematics)
Suzanne Lenhart (Mathematics)
Zhao Lu (Mathematics)
Yi Mao (Chemistry)
Alex Masarie (Agricultural Sciences/Natural Resources)
Erin McCowen (Agricultural Sciences/Natural Resources)
Curtis Miller (Mathematics)
Holly Moeller (Ocean/Marine Sciences)
Olivia Prosper (Mathematics)
Karen Rios-Soto (Mathematics)
Michael Robert (Mathematics)
Jean Tchuenche (Mathematics)
Miranda Teboh-Ewungkem (Mathematics)
Carl Toews (Mathematics)
Jiafeng Wang (Health Sciences)
Eti Dwi Wiraningsih (Mathematics)
Mohammed Yahdi (Mathematics)

Tutorial Event	Start Date	End Date
Computational Biology Curriculum Development	06-Jul-10	09-Jul-10

Xiaopeng Zhao (Engineering)
Folashade Agusto (Mathematics)
Edilberto Arteaga (Education)
Dorjsuren Badamdorj (Mathematics)
Juliet Bailey-Penrod (Biological/Biomedical Sciences)
Sam Donovan (Education)
Robin Dowell-Deen (Biological/Biomedical Sciences)

Stephen Everse (Biological/Biomedical Sciences)
Debra Goldberg (Computer & Information Sciences)
Louis Gross (Biological/Biomedical Sciences)
Stan Guffey (Biological/Biomedical Sciences)
Kristin Jenkins (Education)
Roger Lui (Mathematics)
Karla Marriott (Chemistry)
Vilma Martinez (Biological/Biomedical Sciences)
Gaolin Milledge (Computer & Information Sciences)
Andrei Olifer (Biological/Biomedical Sciences)
Mark Pauley (Biological/Biomedical Sciences)
Cynthia Peterson (Biological/Biomedical Sciences)
Lei Qian (Computer & Information Sciences)
Harry Richards (Biological/Biomedical Sciences)
Srebrenka Robic (Biological/Biomedical Sciences)
Rebecca Seipelt (Biological/Biomedical Sciences)
Ethel Stanley (Education)
Patty Stinger-Barnes (Education)
Arlin Toro (Biological/Biomedical Sciences)
Rafael Tosado-Acevedo (Biological/Biomedical Sciences)
Jossie Vega de Varona (Mathematics)

Tutorial Event	**Start Date**	**End Date**
Graph Theory and Biological Networks	16-Aug-10	18-Aug-10

Xiaofei Wang (Biological/Biomedical Sciences)
Folashade Agusto (Mathematics)
Hawthorne Beyer (Biological/Biomedical Sciences)
Xiongwen Chen (Biological/Biomedical Sciences)
Eungchun Cho (Mathematics)
Margaret Cozzens (Mathematics)
Roy Dar (Physics)
Justin Dunmyre (Mathematics)
Joanna Ellis-Monaghan (Mathematics)
Joseph Ferrari (Agricultural Sciences/Natural Resources)
Marie-Josee Fortin (Biological/Biomedical Sciences)
Urmi Ghosh-Dastidar (Mathematics)
Shana Gillette (Social Sciences)
Sara Gudmundson (Biological/Biomedical Sciences)
Gregg Hartvigsen (Biological/Biomedical Sciences)
Troy Hegel (Agricultural Sciences/Natural Resources)
Genie Hsieh (Computer & Information Sciences)
Joe Hughes (Biological/Biomedical Sciences)
Tony (Dwueng-Chwuan) Jhwueng (Mathematics)
Jaewook Joo (Computer & Information Sciences)
John Jungck (Biological/Biomedical Sciences)
Michael LaMar (Mathematics)
Simone Linz (Mathematics)
Matthew Macauley (Mathematics)
Jacob Malcom (Biological/Biomedical Sciences)
Yi Mao (Chemistry)
Julia Michalak (Agricultural Sciences/Natural Resources)
Elizabeth Miller (Biological/Biomedical Sciences)
Jennifer Mokos (Social Sciences)
Erik Osnas (Biological/Biomedical Sciences)
Sharmila Pathikonda (Biological/Biomedical Sciences)
Michael Pelsmajer (Mathematics)

Brandon Puckett (Ocean/Marine Sciences)
Radhika Ramamurthi (Mathematics)
Srebrenka Robic (Biological/Biomedical Sciences)
Alissa Rockney (Mathematics)
Christine Schwab (Biological/Biomedical Sciences)
Maria Siopsis (Mathematics)
Xavier Thibert-Plante (Biological/Biomedical Sciences)
Christopher Wright (Biological/Biomedical Sciences)

Tutorial Event	Start Date	End Date
High Performance Computing for Phylogenetics	13-Oct-10	15-Oct-10

Xiaoya Zha (Mathematics)
Jason Bond (Biological/Biomedical Sciences)
Gustavo Bravo (Biological/Biomedical Sciences)
Johanna Cannon (Biological/Biomedical Sciences)
Eric Carr (Geological & Earth Sciences)
Kyong-Sook Chung (Biological/Biomedical Sciences)
Karen Cranston (Biological/Biomedical Sciences)
Jim Ferguson (Not reported)
Phillip Harris (Biological/Biomedical Sciences)
Heather Heinz (Biological/Biomedical Sciences)
Brendan Hodkinson (Biological/Biomedical Sciences)
Tony (Dwueng-Chwuan) Jhwueng (Mathematics)
Elizabeth Long (Biological/Biomedical Sciences)
Patrick Matheny (Biological/Biomedical Sciences)
Nicholas Matzke (Biological/Biomedical Sciences)
Camila Mazzoni (Biological/Biomedical Sciences)
Sheldon McKay (Biological/Biomedical Sciences)
Daniel Miranda-Esquivel (Biological/Biomedical Sciences)
Michael Moore (Biological/Biomedical Sciences)
James Munro (Biological/Biomedical Sciences)
Stuart Nielsen (Biological/Biomedical Sciences)
Brian O'Meara (Biological/Biomedical Sciences)
Eric O'Neill (Biological/Biomedical Sciences)
Susanne Renner (Biological/Biomedical Sciences)
Josephine Rodriguez (Biological/Biomedical Sciences)
Catalina Salgado (Biological/Biomedical Sciences)
Millicent Sanciangco (Biological/Biomedical Sciences)
Andrea Schwarzbach (Biological/Biomedical Sciences)
Chengli Shen (Biological/Biomedical Sciences)
Michelle Smith (Biological/Biomedical Sciences)
Alexandros Stamatakis (Computer & Information Sciences)
Dan Stanzione (Engineering)
Robert Thomson (Biological/Biomedical Sciences)
Robin van Velzen (Biological/Biomedical Sciences)
Ximena Velez Zuazo (Ocean/Marine Sciences)
James Wilgenbusch (Computer & Information Sciences)
Grace Wyngaard (Biological/Biomedical Sciences)
Xi Yang (Social Sciences)
Ya Yang (Biological/Biomedical Sciences)

Tutorial Event	Start Date	End Date
Stochastic Modeling in biology	16-Mar-11	18-Mar-11

Kowiyou Yessoufou (Biological/Biomedical Sciences)
Folashade Agusto (Mathematics)

Edward Allen (Mathematics)
Linda Allen (Mathematics)
Rea Antoniou Kourounioti (Biological/Biomedical Sciences)
Vrushali Bokil (Mathematics)
Farida Chamchod (Mathematics)
Raluca Craciun (Chemistry)
Richard Erickson (Biological/Biomedical Sciences)
Raju Gautam (Health Sciences)
Iris Gray (Other Professional Field)
Yan Hao (Mathematics)
Jorge Hernan Jacome Reyes (Biological/Biomedical Sciences)
Joyner Michele (Mathematics)
Cristina Lanzas (Health Sciences)
Suzanne Lenhart (Mathematics)
Nianpeng Li (Mathematics)
Romuald Lipcius (Ocean/Marine Sciences)
Sarah Lukens (Mathematics)
Rebecca Mitchell (Biological/Biomedical Sciences)
Francesc Montane (Agricultural Sciences/Natural Resources)
Doumbia Moussa (Mathematics)
Anuj Mubayi (Mathematics)
Judith Perez-Velazquez (Mathematics)
Jose Ponciano (Biological/Biomedical Sciences)
Alicia Prieto Langarica (Mathematics)
Sotiris Prokopiou (Mathematics)
Philip (Phil) Ryan (Mathematics)
Rob Salguero-Gomez (Biological/Biomedical Sciences)
Ynte Schukken (Health Sciences)
Abbas Shirinifard (Physics)
Si Tang (Biological/Biomedical Sciences)
Sergio Vallina (Ocean/Marine Sciences)
Xiao Wang (Biological/Biomedical Sciences)
Paul Williams (Biological/Biomedical Sciences)
Stephen Wright (Biological/Biomedical Sciences)
Jie Xiong (Mathematics)
Jorge Zanudo (Physics)

Working Groups

Working Group Event	Start Date	End Date
Coalitions and Alliances M1	16-Apr-09	18-Apr-09

Louise Barrett (Biological/Biomedical Sciences)
Frans de Waal (Biological/Biomedical Sciences)
Edgar Duenez-Guzman (Computer & Information Sciences)
Sergey Gavrilets (Biological/Biomedical Sciences)
Janko Gravner (Mathematics)
Mike Mesterton-Gibbons (Mathematics)
John Mitani (Biological/Biomedical Sciences)
Jorge Pacheco (Physics)
John Patton (Social Sciences)
Susan Perry (Social Sciences)

Working Group Event	Start Date	End Date
Intragenomic Conflict M1	20-Apr-09	22-Apr-09

Brian Skyrms (Social Sciences)
Troy Day (Biological/Biomedical Sciences)
Kelly Dyer (Biological/Biomedical Sciences)
Andy Gardner (Biological/Biomedical Sciences)
Sergey Gavrilets (Biological/Biomedical Sciences)
David Haig (Biological/Biomedical Sciences)
Ichizo Kobayashi (Biological/Biomedical Sciences)
David Queller (Biological/Biomedical Sciences)
Sean Rice (Biological/Biomedical Sciences)
William (Bill) Rice (Biological/Biomedical Sciences)
Francisco Ubeda de Torres (Biological/Biomedical Sciences)
Marcy Uyenoyama (Biological/Biomedical Sciences)
John (Jack) Werren (Biological/Biomedical Sciences)
Geoff Wild (Mathematics)

Working Group Event	Start Date	End Date
Feral Swine and Pseudorabies M1	27-Apr-09	29-Apr-09

Jon Wilkins (Biological/Biomedical Sciences)
Charles Collins (Mathematics)
Joseph (Joe) Corn (Agricultural Sciences/Natural Resources)
Kim DeLozier (Biological/Biomedical Sciences)
Daniel Haydon (Biological/Biomedical Sciences)
Graham Hickling (Biological/Biomedical Sciences)
Ellen Kasari (Health Sciences)
Suzanne Lenhart (Mathematics)
Edward Lungu (Mathematics)
Hamish McCallum (Biological/Biomedical Sciences)
April McMillan (Engineering)
Agricola Odoi (Health Sciences)
Leslie Real (Biological/Biomedical Sciences)
Rene Salinas (Mathematics)
Bill Stiver (Agricultural Sciences/Natural Resources)

Working Group Event	Start Date	End Date
Binary Matrices M1	26-May-09	29-May-09

Kurt VerCauteren (Biological/Biomedical Sciences)
Stefano Allesina (Biological/Biomedical Sciences)
Richard Barker (Mathematics)
Robert Dorazio (Biological/Biomedical Sciences)
Nicholas Gotelli (Biological/Biomedical Sciences)
Stephen Kembel (Biological/Biomedical Sciences)
Joshua Ladau (Biological/Biomedical Sciences)
Steven Schwager (Mathematics)
Dan Simberloff (Biological/Biomedical Sciences)
Dan Stouffer (Biological/Biomedical Sciences)

Working Group Event	Start Date	End Date
SPIDER M1	07-Jun-09	09-Jun-09

Diego Vazquez (Biological/Biomedical Sciences)
Graziano Ceddia (Agricultural Sciences/Natural Resources)
Gerardo Chowell-Puente (Biological/Biomedical Sciences)
Peter Daszak (Health Sciences)
Eli Fenichel (Agricultural Sciences/Natural Resources)
David Finnoff (Social Sciences)

Lynn Garrett (Agricultural Sciences/Natural Resources)
Graham Hickling (Biological/Biomedical Sciences)
Garth Holloway (Social Sciences)
Richard Horan (Social Sciences)
Christopher Jerde (Biological/Biomedical Sciences)
Charles Perrings (Social Sciences)
Michael Springborn (Social Sciences)
Leticia Velazquez (Mathematics)

Working Group Event	Start Date	End Date
Function & Evolution M1	10-Jun-09	12-Jun-09

Christina Villalobos (Mathematics)
Erol Akcay (Biological/Biomedical Sciences)
Joel Brown (Biological/Biomedical Sciences)
Herbert Gintis (Social Sciences)
Louis Gross (Biological/Biomedical Sciences)
Priya Iyer (Biological/Biomedical Sciences)
Brian Mcgill (Biological/Biomedical Sciences)
Angela Potochnik (Humanities)
Joan Roughgarden (Biological/Biomedical Sciences)
Eric Vanden-Eijnden (Mathematics)
Thomas Vincent (Engineering)

Working Group Event	Start Date	End Date
Ecology of Niche Variation M1	27-Jul-09	29-Jul-09

Lee Worden (Mathematics)
Priyanga Amarasekare (Biological/Biomedical Sciences)
Marcio Araujo (Ocean/Marine Sciences)
Daniel Bolnick (Biological/Biomedical Sciences)
Reinhard Buerger (Mathematics)
Donald DeAngelis (Biological/Biomedical Sciences)
Yuexin Jiang (Biological/Biomedical Sciences)
Yuan Lou (Mathematics)
Kevin McCann (Biological/Biomedical Sciences)
Mark Novak (Biological/Biomedical Sciences)
Volker Rudolf (Biological/Biomedical Sciences)
Sebastian Schreiber (Biological/Biomedical Sciences)
Richard Svanback (Biological/Biomedical Sciences)
Mark Urban (Biological/Biomedical Sciences)
Benjamin Van Allen (Biological/Biomedical Sciences)

Working Group Event	Start Date	End Date
SPIDER M2	09-Nov-09	11-Nov-09

Gail Wolkowicz (Mathematics)
Carlos Castillo-Chavez (Mathematics)
Graziano Ceddia (Agricultural Sciences/Natural Resources)
Peter Daszak (Health Sciences)
Eli Fenichel (Agricultural Sciences/Natural Resources)
Paula Gonzalez (Mathematics)
Graham Hickling (Biological/Biomedical Sciences)
Christopher Jerde (Biological/Biomedical Sciences)
Charles Perrings (Social Sciences)
Michael Springborn (Social Sciences)
Leticia Velazquez (Mathematics)

Working Group Event	Start Date	End Date
Binary Matrices M2	10-Dec-09	13-Dec-09

Christina Villalobos (Mathematics)
Stefano Allesina (Biological/Biomedical Sciences)
Richard Barker (Mathematics)
Edward Connor (Biological/Biomedical Sciences)
Robert Dorazio (Biological/Biomedical Sciences)
William Godsoe (Biological/Biomedical Sciences)
Nicholas Gotelli (Biological/Biomedical Sciences)
Joshua Ladau (Biological/Biomedical Sciences)
Steven Schwager (Mathematics)
Dan Simberloff (Biological/Biomedical Sciences)
Dan Stouffer (Biological/Biomedical Sciences)

Working Group Event	Start Date	End Date
Darwinian Morphometrics M1	10-Jan-10	12-Jan-10

Diego Vazquez (Biological/Biomedical Sciences)
Jay Beder (Mathematics)
Patrick Carter (Biological/Biomedical Sciences)
Daniel Gervini (Mathematics)
Richard Gomulkiewicz (Biological/Biomedical Sciences)
Benedikt Hallgrimsson (Biological/Biomedical Sciences)
Nancy Heckman (Mathematics)
David Houle (Biological/Biomedical Sciences)
Sarang Joshi (Engineering)
Joel Kingsolver (Biological/Biomedical Sciences)
Mark Kirkpatrick (Biological/Biomedical Sciences)
Eladio Marquez (Biological/Biomedical Sciences)
James Stephen Marron (Mathematics)
Karin Meyer (Agricultural Sciences/Natural Resources)
Washington Mio (Mathematics)
John Stinchcombe (Biological/Biomedical Sciences)

Working Group Event	Start Date	End Date
Feral Swine and Pseudorabies M2	25-Jan-10	26-Jan-10

Fang Yao (Mathematics)
Eric Carr (Geological & Earth Sciences)
Charles Collins (Mathematics)
Joseph (Joe) Corn (Agricultural Sciences/Natural Resources)
Graham Hickling (Biological/Biomedical Sciences)
Ellen Kasari (Health Sciences)
Suzanne Lenhart (Mathematics)
Marguerite Madden (Agricultural Sciences/Natural Resources)
Hamish McCallum (Biological/Biomedical Sciences)
April McMillan (Engineering)
Agricola Odoi (Health Sciences)
Rene Salinas (Mathematics)
Gary Smith (Biological/Biomedical Sciences)
Bill Stiver (Agricultural Sciences/Natural Resources)
Seth Swafford (Agricultural Sciences/Natural Resources)

Working Group Event	Start Date	End Date
Coalitions and Alliances M2	04-Feb-10	06-Feb-10

Kurt VerCauteren (Biological/Biomedical Sciences)
Erol Akcay (Biological/Biomedical Sciences)
Mark Flinn (Social Sciences)
Sergey Gavrilets (Biological/Biomedical Sciences)
Janko Gravner (Mathematics)
John Mitani (Biological/Biomedical Sciences)
Jorge Pacheco (Physics)
Susan Perry (Social Sciences)
Brian Skyrms (Social Sciences)

Working Group Event	Start Date	End Date
Modeling Bovine Tuberculosis M1	17-Feb-10	18-Feb-10

Malini Suchak (Biological/Biomedical Sciences)
Folashade Agusto (Mathematics)
Shweta Bansal (Biological/Biomedical Sciences)
Michael Buhnerkempe (Biological/Biomedical Sciences)
Matt Farnsworth (Agricultural Sciences/Natural Resources)
Graham Hickling (Biological/Biomedical Sciences)
John Kaneene (Biological/Biomedical Sciences)
Jason Lombard (Health Sciences)
Ryan Miller (Agricultural Sciences/Natural Resources)
Agricola Odoi (Health Sciences)
Katie Quatrano (Agricultural Sciences/Natural Resources)
Matthew Vernon (Biological/Biomedical Sciences)
Colleen Webb (Biological/Biomedical Sciences)

Working Group Event	Start Date	End Date
Forest Insects M1	22-Feb-10	26-Feb-10

Uno Wennergren (Biological/Biomedical Sciences)
Barbara Bentz (Agricultural Sciences/Natural Resources)
Sharon Bewick (Biological/Biomedical Sciences)
Christina Cobbold (Mathematics)
Barry Cooke (Agricultural Sciences/Natural Resources)
Gregory Dwyer (Biological/Biomedical Sciences)
William Godsoe (Biological/Biomedical Sciences)
Kyle Haynes (Biological/Biomedical Sciences)
Josie Hughes (Biological/Biomedical Sciences)
Patrick James (Biological/Biomedical Sciences)
Mark Lewis (Mathematics)
Andrew (Sandy) Liebhold (Biological/Biomedical Sciences)
Mario Pineda-Krch (Biological/Biomedical Sciences)
Tom Swetnam (Biological/Biomedical Sciences)

Working Group Event	Start Date	End Date
Function & Evolution M2	01-Mar-10	03-Mar-10

Xi Yang (Social Sciences)
Erol Akcay (Biological/Biomedical Sciences)
Joel Brown (Biological/Biomedical Sciences)
Louis Gross (Biological/Biomedical Sciences)
Priya Iyer (Biological/Biomedical Sciences)
Brian Mcgill (Biological/Biomedical Sciences)
Angela Potochnik (Humanities)
Joan Roughgarden (Biological/Biomedical Sciences)

Working Group Event	Start Date	End Date
Food Web M1	27-Apr-10	30-Apr-10

Lee Worden (Mathematics)
Tanguy Daufresne (Biological/Biomedical Sciences)
Dominique Gravel (Biological/Biomedical Sciences)
Laura Jones (Biological/Biomedical Sciences)
Christopher Klausmeier (Biological/Biomedical Sciences)
Yang Kuang (Mathematics)
Mathew Leibold (Biological/Biomedical Sciences)
Irakli Loladze (Biological/Biomedical Sciences)
Francois Massol (Biological/Biomedical Sciences)

Working Group Event	Start Date	End Date
Binary Matrices M3	04-May-10	07-May-10

Robert Sterner (Geological & Earth Sciences)
Stefano Allesina (Biological/Biomedical Sciences)
Edward Connor (Biological/Biomedical Sciences)
Robert Dorazio (Biological/Biomedical Sciences)
William Godsoe (Biological/Biomedical Sciences)
Joshua Ladau (Biological/Biomedical Sciences)
Steven Schwager (Mathematics)

Working Group Event	Start Date	End Date
Cortical Networks M1	19-May-10	21-May-10

Dan Stouffer (Biological/Biomedical Sciences)
John Beggs (Biological/Biomedical Sciences)
Guillermo Cecchi (Physics)
Jack Gallant (Biological/Biomedical Sciences)
Judith Hirsch (Biological/Biomedical Sciences)
Ehud Kaplan (Biological/Biomedical Sciences)
Marcelo Magnasco (Biological/Biomedical Sciences)
Maria Neimark-Geffen (Biological/Biomedical Sciences)
Sheila Nirenberg (Biological/Biomedical Sciences)
Ravi Rao (Computer & Information Sciences)

Working Group Event	Start Date	End Date
Ecology of Niche Variation M2	21-Jun-10	23-Jun-10

Dario Ringach (Biological/Biomedical Sciences)
Priyanga Amarasekare (Biological/Biomedical Sciences)
Marcio Araujo (Ocean/Marine Sciences)
Daniel Bolnick (Biological/Biomedical Sciences)
Reinhard Buerger (Mathematics)
Donald DeAngelis (Biological/Biomedical Sciences)
Yuexin Jiang (Biological/Biomedical Sciences)
Jonathan Levine (Biological/Biomedical Sciences)
Yuan Lou (Mathematics)
Mark Novak (Biological/Biomedical Sciences)
Volker Rudolf (Biological/Biomedical Sciences)
Sebastian Schreiber (Biological/Biomedical Sciences)
Richard Svanback (Biological/Biomedical Sciences)
Mark Urban (Biological/Biomedical Sciences)
David Vasseur (Biological/Biomedical Sciences)

Working Group Event	Start Date	End Date
Feral Swine and Pseudorabies M3	10-Aug-10	12-Aug-10

Gail Wolkowicz (Mathematics)
Charles Collins (Mathematics)
Joseph (Joe) Corn (Agricultural Sciences/Natural Resources)
Graham Hickling (Biological/Biomedical Sciences)
Ellen Kasari (Health Sciences)
Suzanne Lenhart (Mathematics)
Hamish McCallum (Biological/Biomedical Sciences)
Rene Salinas (Mathematics)
Brandon Schmit (Biological/Biomedical Sciences)

Working Group Event	Start Date	End Date
Function & Evolution M3	13-Sep-10	17-Sep-10

Kurt VerCauteren (Biological/Biomedical Sciences)
Erol Akcay (Biological/Biomedical Sciences)
Joel Brown (Biological/Biomedical Sciences)
James Fearon (Social Sciences)
Louis Gross (Biological/Biomedical Sciences)
Priya Iyer (Biological/Biomedical Sciences)
Adam Meirowitz (Social Sciences)
Angela Potochnik (Humanities)
Joan Roughgarden (Biological/Biomedical Sciences)

Working Group Event	Start Date	End Date
Forest Insects M2	18-Oct-10	21-Oct-10

Lee Worden (Mathematics)
Barbara Bentz (Agricultural Sciences/Natural Resources)
Sharon Bewick (Biological/Biomedical Sciences)
Christina Cobbold (Mathematics)
Barry Cooke (Agricultural Sciences/Natural Resources)
Gregory Dwyer (Biological/Biomedical Sciences)
William Godsoe (Biological/Biomedical Sciences)
Kyle Haynes (Biological/Biomedical Sciences)
Josie Hughes (Biological/Biomedical Sciences)
Anthony (Tony) Ives (Biological/Biomedical Sciences)
Patrick James (Biological/Biomedical Sciences)
Subhash Lele (Mathematics)
Mark Lewis (Mathematics)
Andrew (Sandy) Liebhold (Biological/Biomedical Sciences)

Working Group Event	Start Date	End Date
Coalitions and Alliances M3	04-Nov-10	06-Nov-10

Mario Pineda-Krch (Biological/Biomedical Sciences)
Louise Barrett (Biological/Biomedical Sciences)
Annie Bissonnette (Biological/Biomedical Sciences)
Napoleon Chagnon (Social Sciences)
Frans de Waal (Biological/Biomedical Sciences)
Mark Flinn (Social Sciences)
Sergey Gavrilets (Biological/Biomedical Sciences)
Janko Gravner (Mathematics)
Mike Mesterton-Gibbons (Mathematics)

Working Group Event	Start Date	End Date
Species Delimitation M1	02-Dec-10	04-Dec-10

Susan Perry (Social Sciences)
Cecile Ane (Mathematics)
Bryan Carstens (Biological/Biomedical Sciences)
Julia Chifman (Mathematics)
Tony (Dwueng-Chwuan) Jhwueng (Mathematics)
Laura Knowles (Biological/Biomedical Sciences)
Laura Kubatko (Mathematics)
Adam Leache (Biological/Biomedical Sciences)
Brian O'Meara (Biological/Biomedical Sciences)
H. Bradley Shaffer (Biological/Biomedical Sciences)
Stacey Smith (Biological/Biomedical Sciences)
David Weisrock (Biological/Biomedical Sciences)

Working Group Event	Start Date	End Date
Binary Matrices M4	14-Dec-10	17-Dec-10

Ruriko Yoshida (Mathematics)
Edward Connor (Biological/Biomedical Sciences)
Robert Dorazio (Biological/Biomedical Sciences)
William Godsoe (Biological/Biomedical Sciences)
Joshua Ladau (Biological/Biomedical Sciences)

Working Group Event	Start Date	End Date
Gene Tree Reconciliation M1	16-Dec-10	18-Dec-10

Steven Schwager (Mathematics)
Cecile Ane (Mathematics)
Gordon Burleigh (Biological/Biomedical Sciences)
Oliver Eulenstein (Computer & Information Sciences)
Pawel Gorecki (Computer & Information Sciences)
Snehalata Huzurbazar (Mathematics)
Tony (Dwueng-Chwuan) Jhwueng (Mathematics)
Anke Konrad (Biological/Biomedical Sciences)
Jim Leebens-Mack (Not reported)
David Liberles (Biological/Biomedical Sciences)
Liang Liu (Mathematics)
Brian O'Meara (Biological/Biomedical Sciences)

Working Group Event	Start Date	End Date
Darwinian Morphometrics M2	08-Jan-11	10-Jan-11

Matthew Rasmussen (Computer & Information Sciences)
Patrick Carter (Biological/Biomedical Sciences)
George Gilchrist (Biological/Biomedical Sciences)
Richard Gomulkiewicz (Biological/Biomedical Sciences)
Benedikt Hallgrimsson (Biological/Biomedical Sciences)
David Houle (Biological/Biomedical Sciences)
Mark Kirkpatrick (Biological/Biomedical Sciences)
Eladio Marquez (Biological/Biomedical Sciences)
Stephen (Steve) Marron (Mathematics)
Karin Meyer (Agricultural Sciences/Natural Resources)
Washington Mio (Mathematics)

Working Group Event	Start Date	End Date

Food Web M2	11-Jan-11	15-Jan-11

John Stinchcombe (Biological/Biomedical Sciences)
Tanguy Daufresne (Biological/Biomedical Sciences)
Dominique Gravel (Biological/Biomedical Sciences)
Christopher Klausmeier (Biological/Biomedical Sciences)
Mathew Leibold (Biological/Biomedical Sciences)
Irakli Loladze (Biological/Biomedical Sciences)
Francois Massol (Biological/Biomedical Sciences)
Kimberly Schulz (Biological/Biomedical Sciences)

Working Group Event	Start Date	End Date
Modeling Bovine Tuberculosis M2	31-Jan-11	01-Feb-11

Robert Sterner (Geological & Earth Sciences)
Folashade Agusto (Mathematics)
Michael Buhnerkempe (Biological/Biomedical Sciences)
Matt Farnsworth (Agricultural Sciences/Natural Resources)
Maureen (Carolyn) Gates (Health Sciences)
Graham Hickling (Biological/Biomedical Sciences)
John Kaneene (Biological/Biomedical Sciences)
Jason Lombard (Health Sciences)
Ryan Miller (Agricultural Sciences/Natural Resources)
Agricola Odoi (Health Sciences)
Katie Quatrano (Agricultural Sciences/Natural Resources)
Michael (Mike) Tildesley (Mathematics)
Matthew Vernon (Biological/Biomedical Sciences)
Colleen Webb (Biological/Biomedical Sciences)

Working Group Event	Start Date	End Date
Ecology of Niche Variation M3	10-Feb-11	12-Feb-11

Uno Wennergren (Biological/Biomedical Sciences)
Priyanga Amarasekare (Biological/Biomedical Sciences)
Marcio Araujo (Ocean/Marine Sciences)
Daniel Bolnick (Biological/Biomedical Sciences)
Reinhard Buerger (Mathematics)
Donald DeAngelis (Biological/Biomedical Sciences)
Yuexin Jiang (Biological/Biomedical Sciences)
Jonathan Levine (Biological/Biomedical Sciences)
Kevin McCann (Biological/Biomedical Sciences)
Mark Novak (Biological/Biomedical Sciences)
Sebastian Schreiber (Biological/Biomedical Sciences)
Richard Svanback (Biological/Biomedical Sciences)
Mark Urban (Biological/Biomedical Sciences)
David Vasseur (Biological/Biomedical Sciences)

Working Group Event	Start Date	End Date
Forest Insects M3	14-Apr-11	20-Apr-11

Gail Wolkowicz (Mathematics)
Sharon Bewick (Biological/Biomedical Sciences)
Christina Cobbold (Mathematics)
Gregory Dwyer (Biological/Biomedical Sciences)
William Godsoe (Biological/Biomedical Sciences)
Josie Hughes (Biological/Biomedical Sciences)
Vlastimil Krivan (Mathematics)
Suzanne Lenhart (Mathematics)

Working Group Event	Start Date	End Date
Optimal Control M1	26-Apr-11	28-Apr-11

Andrew (Sandy) Liebhold (Biological/Biomedical Sciences)
Gary An (Biological/Biomedical Sciences)
Michael (Guy) Bevers (Agricultural Sciences/Natural Resources)
Paula Federico (Biological/Biomedical Sciences)
Ben Fitzpatrick (Mathematics)
Reinhard Laubenbacher (Mathematics)
Suzanne Lenhart (Mathematics)
Rachael Miller Neilan (Mathematics)
Rene Salinas (Mathematics)
Abdessamad Tridane (Mathematics)
Jie Xiong (Mathematics)
Jiongmin Yong (Mathematics)

Attachment to NIMBioS Annual Report

Section B. Year 2 Reporting Period (Sep 1, 2009 – Aug 31, 2010)

B-1. NIMBioS Board of Advisors Meeting Summary

B-2. Participant Diversity Report, Year 2

B-3. Evaluation Summary Report, Year 2

Summary Report of NIMBioS Advisory Board Meeting held October 22-23, 2009

This is a brief summary of the discussions and recommendations made by the Advisory Board during this meeting. The meeting, led by Board Chair Alan Hastings, was attended by fifteen members of the Board with an additional three members calling in via teleconference. Also in attendance were the NIMBioS Leadership Team and representatives from NSF (Mary Ann Horn), USDA (Jane Rooney), and DHS (Michelle Colby).

One month prior to the meeting, information on all requests for support submitted by the September 1, 2009 deadline was provided to the Board via a password-protected website. This included links to original requests, and Board members were each assigned 3-5 requests to review for the various activities, with the assignments made based upon Board member expertise and the topic of the application. An online review form allowed all Board members to report their comments and overall rating for the variety of requests and have them downloaded directly for summary prior to the meeting. These reviews were open to all Board members prior to the meeting, and served as the starting point for discussions during the meeting. In addition NIMBioS leadership provided access to the draft strategic plan, NIMBioS policies, evaluation procedures, NIMBioS annual report to NSF (Year 1), and information on the REV program via the same website.

Following the call to order by Alan Hastings and approval of the agenda, Director Louis Gross summarized Year 1, Associate Director for Scientific Activities Sergey Gavrilets summarized these activities, and Associate Director for Education, Outreach, and Diversity Suzanne Lenhart summarized activities in these areas. Mary Ann Horn then commented on Year 1 from the NSF perspective. The remainder of the first day mostly focused on review of requests for support, but there was time for the Board Leadership Evaluation committee to report to the full board (without NIMBioS present) and for the Board to discuss performance with the NIMBioS Leadership Team and procedures for selecting board members and electing a new Chair. The 2nd half day of the meeting was devoted to discussion of the NIMBioS strategic plan, NIMBioS policies (primarily the diversity plan), and new or continuing initiatives.

Discussion of the various support requests proceeded following the order in the agenda. Any individual who had a conflict of interest regarding any request did not participate in the discussion of that request and left the room so as not to hear the comments. The Board discussion led to the following recommendations:

1. Sabbatical visitors – the Board recommended that one of the two applicants be accepted and the other be denied.
2. Investigative Workshops – the Board recommended that the one workshop request be approved following clarification of diversity and expertise of proposed participants.

3. Working Groups – the Board recommended that one of the requests be approved, two be approved if the applicants modified the request appropriately to address diversity issues, and two be denied. One of the denied working groups was recommended to be approved if it was modified and resubmitted as a workshop request.
4. Postdoctoral Fellowships –The NIMBioS Leadership Team submitted 11 post-doc requests for review by the Board. Of the 11 applicants reviewed and discussed in detail during the meeting, the Board recommended that 3 be accepted, 5 should be considered further by the Leadership team although one or more board members had reservations, and 3 should be denied.

Leadership Evaluation – The Board reported being impressed with what NIMBioS has accomplished to date, but noted two challenges:

1. Freeing up key NIMBioS Leadership to focus on science vs. administration
2. Broadening the community of those requesting support for activities

Comments on Leadership mirrored comments on the Strategic Plan with the key being successfully defining the NIMBioS goals and mission and attracting the range of researchers needed to meet them. Some suggestions to expand participation from areas of biology not well represented to date include targeting young researchers as activity organizers, actively recruiting people with different interests, or hosting a conference to bring people from different disciplines to NIMBioS.

Strategic Plan – Discussion of the NIMBioS strategic plan centered on whether the plan clearly describes the goals and mission of NIMBioS. There was some perceived conflict possibly due to NIMBioS having multiple objectives related to multiple sponsors. There was discussion of the NIMBioS model that relies on a community-driven approach, and general feedback from the Board suggested the community-driven approach is a good one, appropriate, but maybe not sufficient by itself for a new Center interested in attracting the best from a broad spectrum of biology and mathematics. In order to reach a wider community, NIMBioS should consider selecting new areas and actively soliciting requests for support in those areas, in addition to maintaining the current community-driven approach. Discussion also covered what criteria might be used to determine whether activities are appropriate for NIMBioS. Director Louis Gross suggested three potential criteria:

1. Do we learn something new about biology from the mathematics and modeling involved, or does it generate new mathematics?
2. Are the models possible to parameterize and compare to observations?
3. If the exercise is focused on theory, are there broadly applicable new biological insights which arise?

It was agreed that the NIMBioS Leadership Team would revise the Strategic Plan and allow the Board to review it again.

Diversity Plan - The NIMBioS diversity plan was generally considered adequate, but Board members commented that the calls for requests for support needed more explicit statements requiring potential organizers to document diversity within

their proposed groups, a direct link to the Diversity Plan, and a NIMBioS contact for those with questions about how to account for diversity. Additionally the scientific breadth aspect of diversity needs to be made clear as well as more traditional social diversity issues. There was considerable discussion of diversity issues with a consensus that diversity considerations need to be incorporated from the beginning of an activity (beginning with development of the initial request for support). NIMBioS needs to be proactive and invite input from the Committee to Promote Diversity when appropriate. NIMBioS needs to make a significant effort to reach out to many institutions to attract minorities. It was pointed out that faculty at many minority-serving institutions may need release time to be able to participate in NIMBioS activities.

REV Program – NIMBioS conducted a pilot Research Experience for Veterinary students (REV) in conjunction with the Research Experience for Undergraduate program (REU). For the pilot, the Board and NSF had agreed that funds from the REU budget would be used for the REV component. Looking ahead, the Leadership Team asked for input from the Board, NSF, and USDA about continuing the REV program and possibly expanding it. Based on very positive feedback for the pilot program, the Board was in favor of continuing the REV at the first year level, and expanding it if new funds are made available.

Procedures for Board Membership Selection – Suggested procedures for selection of new members of the Board of Advisors as existing members rotate off were provided to the Board. Following discussion the suggested procedures were approved in their entirety.

Requests for Support for Scientific Gatherings – NIMBioS is fairly regularly approached about sponsoring or co-sponsoring scientific gatherings, to the point that NIMBioS leadership requested confirmation from the Board of a general policy on what should reasonably be supported and what should not. It was agreed that NIMBioS should generally only support scientific gatherings at its location in Knoxville. Support of activities in other locations is acceptable when they involve collaboration with other NSF-funded Centers for a common purpose or, occasionally, when the activity is in conjunction with major professional societies directly connected to the NIMBioS mission. For external activities, the Board noted that NIMBioS should be selective, taking into account how closely an activity fits within the NIMBioS mission and whether NIMBioS would benefit enough to justify the expense.

Sponsor Comments
NSF – Mary Ann Horn reported that NSF is generally quite happy with NIMBioS performance so far. She noted that NIMBioS needs to target a wide community, including international involvement and addressing a broad spectrum of biology. Model assessment and undergraduate education were two areas she suggested NIMBioS might consider becoming more involved in. She encouraged more interaction with USDA and DHS so long as NSF is kept in the communication loop.

USDA – Jane Rooney reported on her role as interagency coordinator of activities related to veterinary science. She encouraged further discussion on problem areas including those arising due to lack of data on certain animal disease and the need for coordination of modeling activities between groups to reduce the likelihood that conflicting recommendations about government response arise from consideration of the same disease scenario.

DHS – Michelle Colby pointed out how DHS support for NIMBioS arose through a five-year R&D plan which includes the RAPIDD project activities. She noted that the NIMBioS role is considered the basic research component as well as workforce development. She encouraged cooperation as appropriate with RAPIDD.

New Initiatives – A general discussion led to several suggestions for activities that NIMBioS could "prime the pump" to initiate including

- a workshop on model assessment
- a workshop to facilitate interactions with USDA
- reaching out to new areas by soliciting small short-term visitor groups to come to NIMBioS and develop a request for support in a selected area
- a workshop on undergraduate education
- Board provided authority for NIMBioS to organize a young researcher workshop
- Board approved reallocating some participant support funds for purpose of developing targeted activities with caveat that these activities should include leaders outside of the University of Tennessee.

Participant Diversity Report

Year Two

April 1, 2009-March 31, 2010

National Institute for Mathematical and Biological Synthesis
March, 2010

NIMBioS Participant Diversity Report, Year Two

Introduction

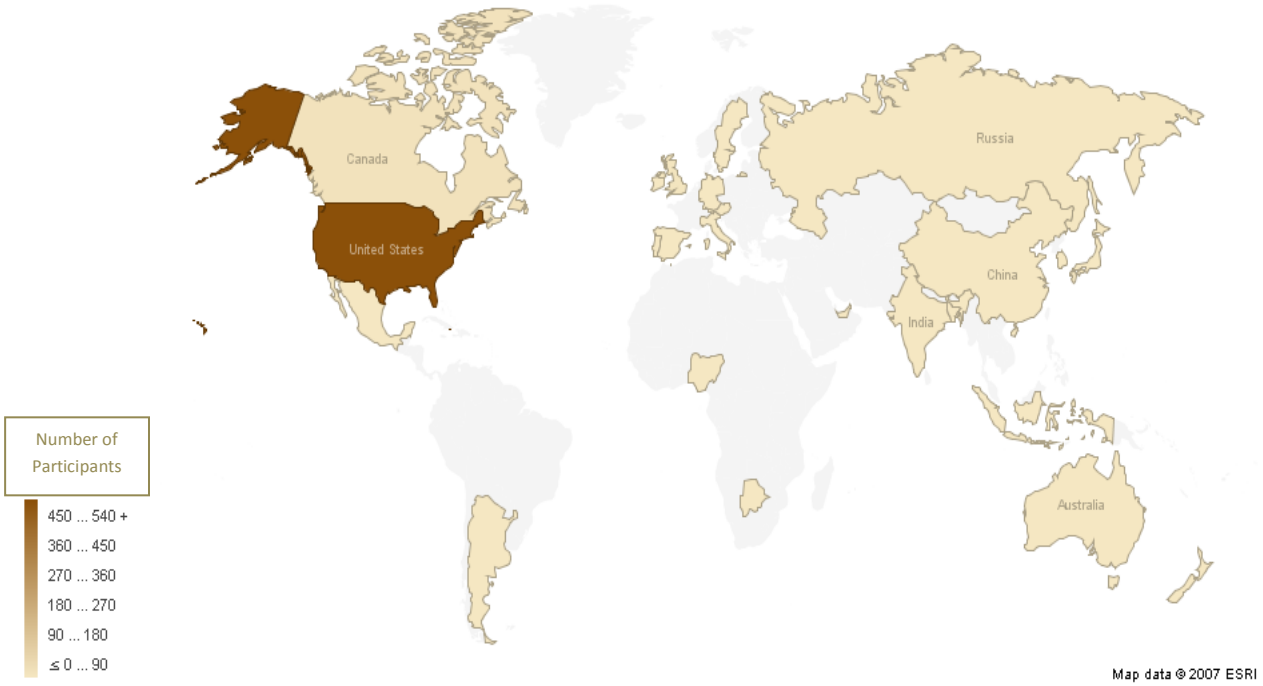
This is a report of the diversity represented by NIMBioS' participants during its second annual reporting period (RP 2) to the National Science Foundation. The report covers the period of April 1, 2009-March 31, 2010. An electronic demographics survey aligned to the reporting requirements of the National Science Foundation was sent to all participants before their arrival at NIMBioS. A link to the survey was sent to each of the 618 participants during RP 2 three weeks before the date of his or her event. Reminder emails were sent to non-responding participants at one and two weeks beyond the initial contact date. The overall response rate for the demographic survey during RP 2 was 77%. Demographic questions regarding gender, race, ethnicity, and disability status were optional. When feasible, the Evaluation Coordinator supplied missing demographic data from other sources (e.g. institution, primary field of study). The evaluator did not assume race, ethnicity, or disability status for any participant who did not report this information. All demographic information is confidential, and results are reported only in the aggregate.

Participant Demographics

Geographic Diversity

During RP 2, a total of 618 people from 25 countries participated in NIMBioS events (109 of these people visited NIMBioS more than once during the reporting period). Most participants came from the United States (90.5%), Canada (3.4%), and the United Kingdom (1.8%) (Figure 1).

Figure 1. NIMBioS RP 2 Participants by Country



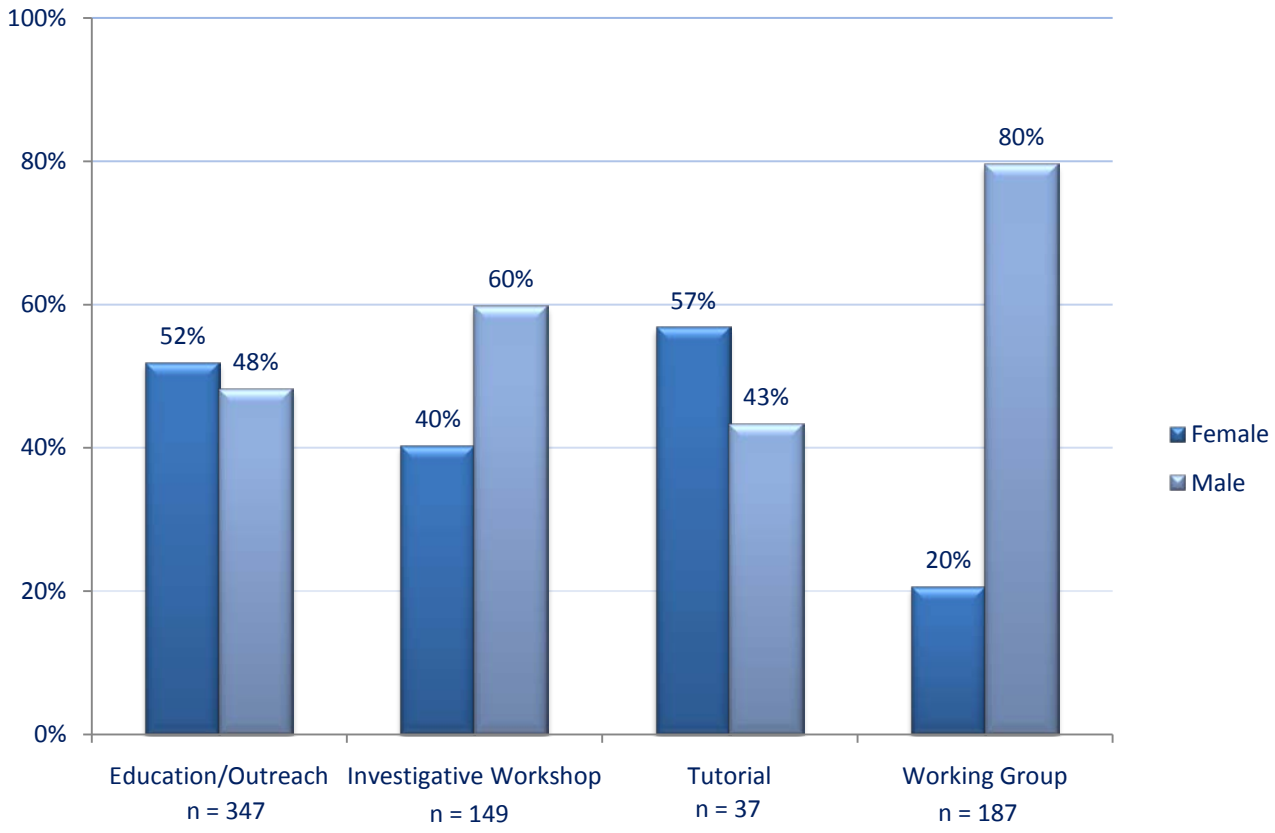
Within the U.S., 43 different states were represented, as well as Puerto Rico. While the greatest number of participants came from within Tennessee (151), several other states were represented by relatively large numbers of participants, including North Carolina (34), California (33),Virginia (30), and Colorado (28) (Figure 2).

Figure 2. NIMBioS RP 2 Participants by U.S. State

Gender, Racial, and Ethnic Diversity

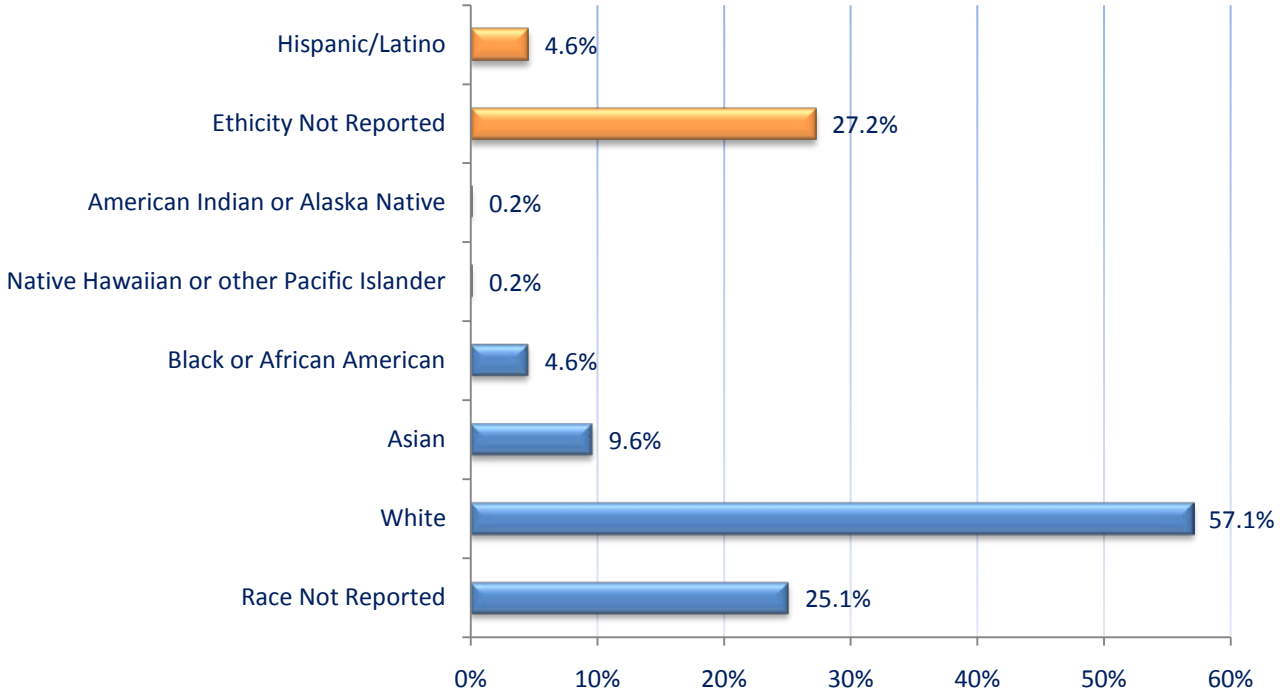
Across all 33 events during RP 2, the ratio of gender was 57% male to 43% female. Within specific activity types, this gender ratio varied. (Note: Although tutorials are considered part of the Education and Outreach (EO) Program at NIMBioS, the NIMBioS leadership team is interested in analyzing the gender, ethnic, and racial composition of these events separately from the rest of the EO activities.) While EO activities and the Tutorial have a similar gender ratio, relatively fewer women have participated in Investigative Workshops. Working Groups show a larger imbalance with regard to gender, with 80% of participants being male (Figure 3).

Figure 3. Gender composition of participants by event type



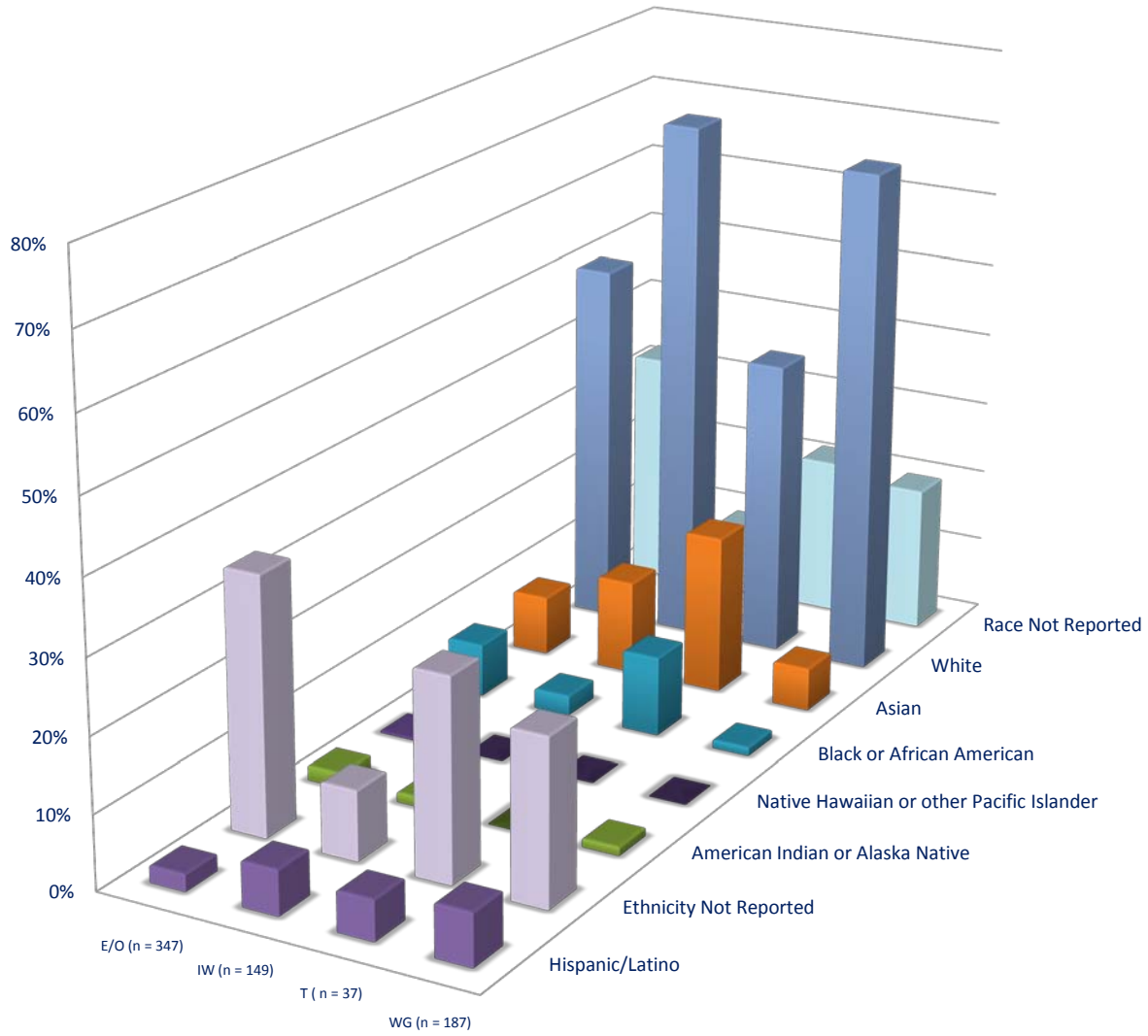
Of the 447 participants who opted to report their ethnicity status, 4.6% indicated they were Hispanic/Latino. Of the 459 who reported their racial status, the majority (57.1%) indicated they were white; however, Asian, black or African American, native Hawaiian/Pacific islander, and Native American races were also represented (Figure 4).

Figure 4. Ethnic and racial composition of participants (n = 618)



By event, Working Groups showed the greatest percentage of Hispanic/Latino participants (7%), followed by Investigative Workshops (6%). Among the different event types, participants self-identifying racially as white were always in the majority, followed by Asian and Black or African American (Figure 5).

Figure 5. Ethnic and racial composition of participants, by event type



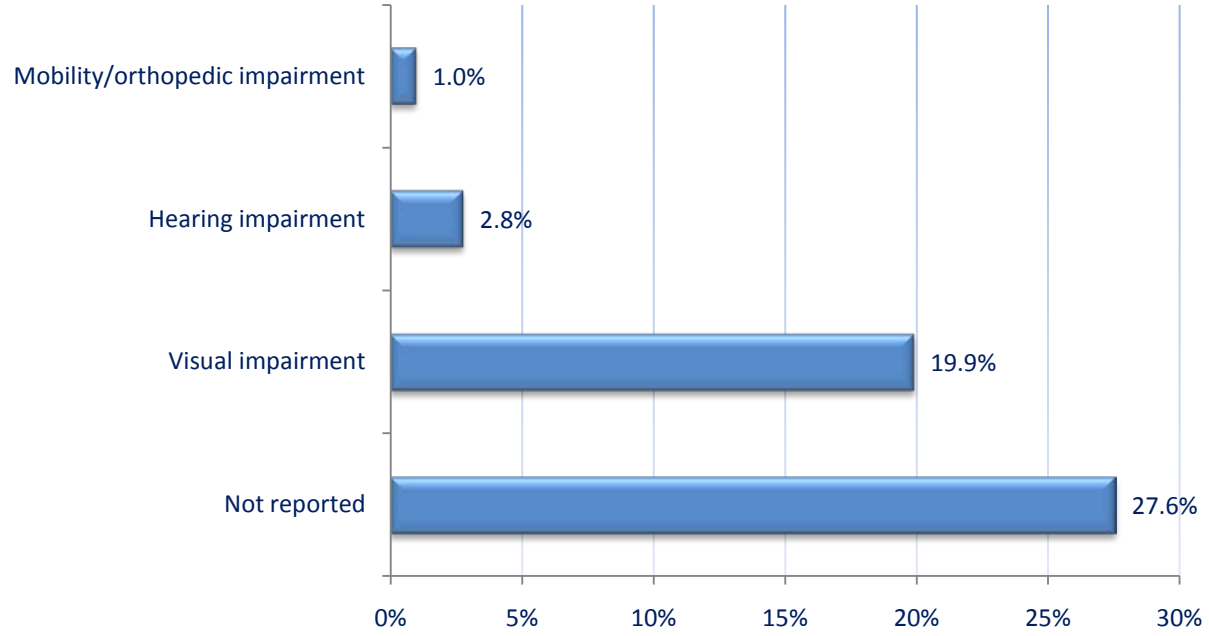
	E/O (n = 347)	IW (n = 149)	T (n = 37)	WG (n = 187)
Hispanic/Latino	2.3%	6.0%	5.4%	7.0%
Ethnicity Not Reported	34.6%	9.4%	27.0%	22.2%
American Indian or Alaska Native	2.0%	1.3%	0.0%	1.2%
Native Hawaiian or other Pacific Islander	0.3%	0.0%	0.0%	0.0%
Black or African American	7.2%	2.7%	10.8%	1.2%
Asian	8.1%	12.8%	21.6%	5.8%
White	49.9%	71.8%	40.5%	69.0%
Race Not Reported	32.3%	9.4%	21.6%	19.9%

E/O = Education and Outreach Activities
IW = Investigative Workshops
T = Tutorial
WG = Working Groups

Disability Status

Of the 444 participants indicating disability status, nearly 20% indicated having some sort of visual impairment, while nearly 3% indicated having a hearing impairment. A smaller percentage indicated having mobility impairment (Figure 6).

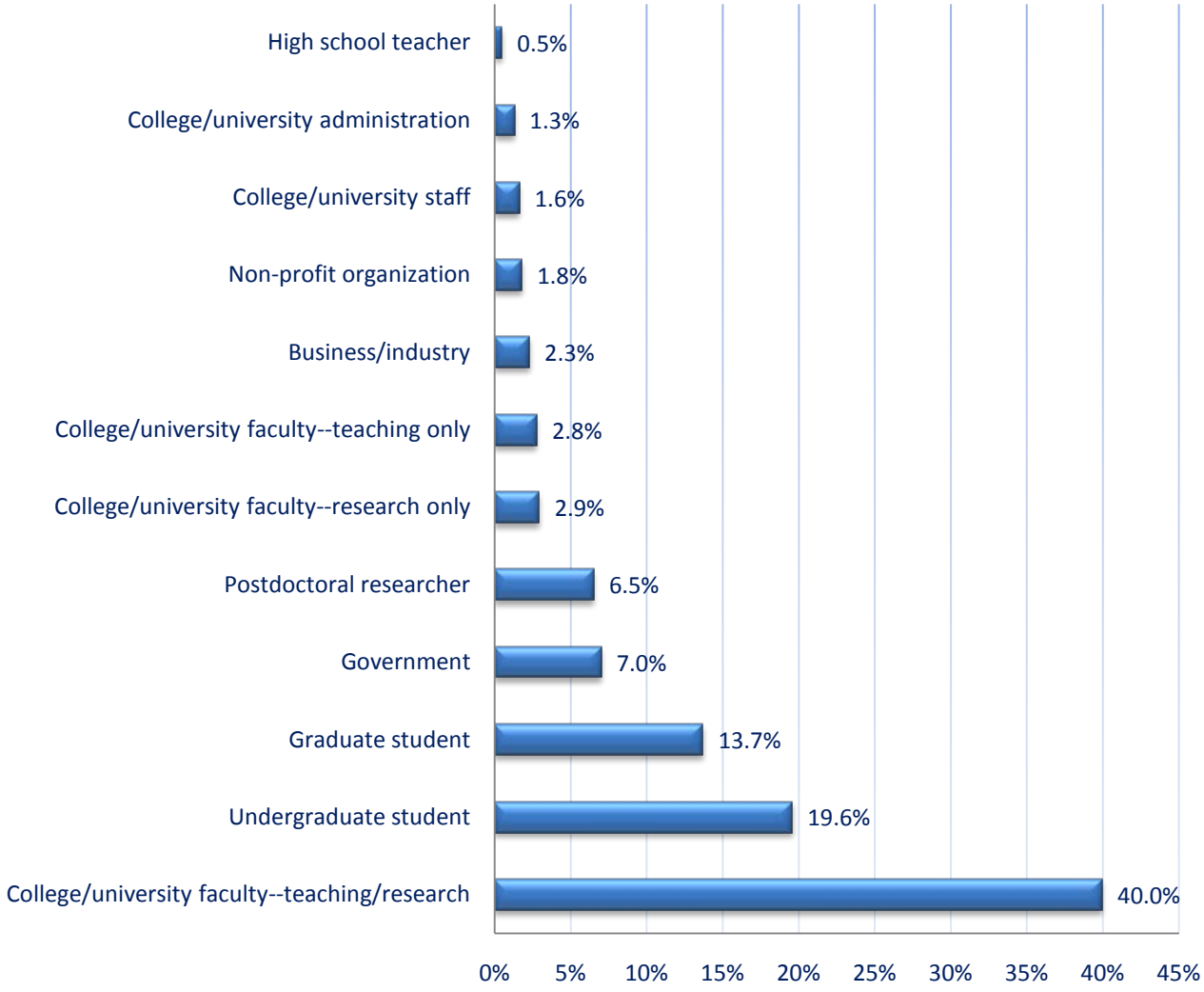
Figure 6. Disability status of participants (n = 618)



Institutional and Disciplinary Diversity

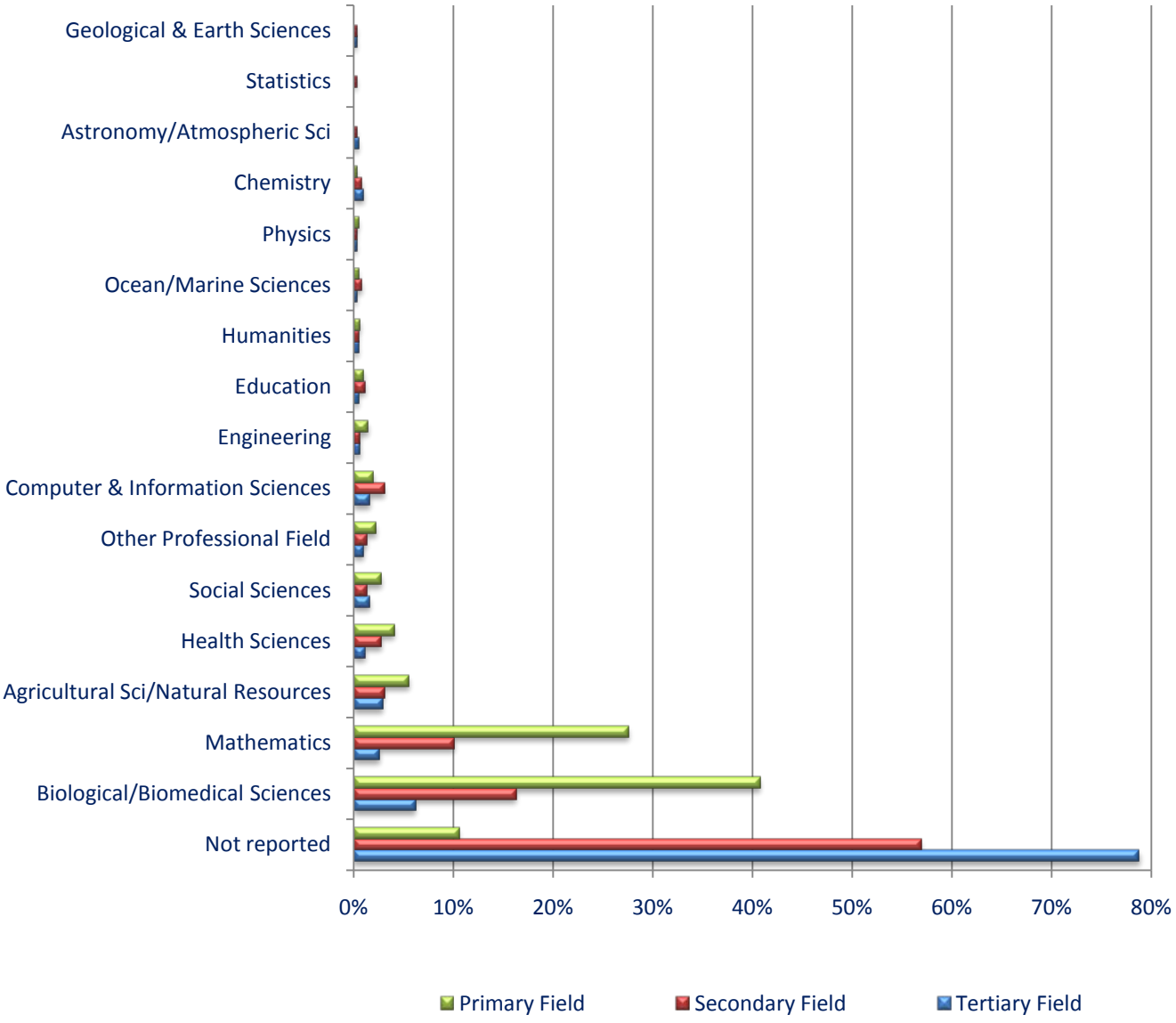
The majority of NIMBioS participants were college/university faculty or staff, undergraduate, or graduate students; however, many participants came from government, business/industry, non-profit, or other positions (Figure 7).

Figure 7. Status of participants (n = 618)



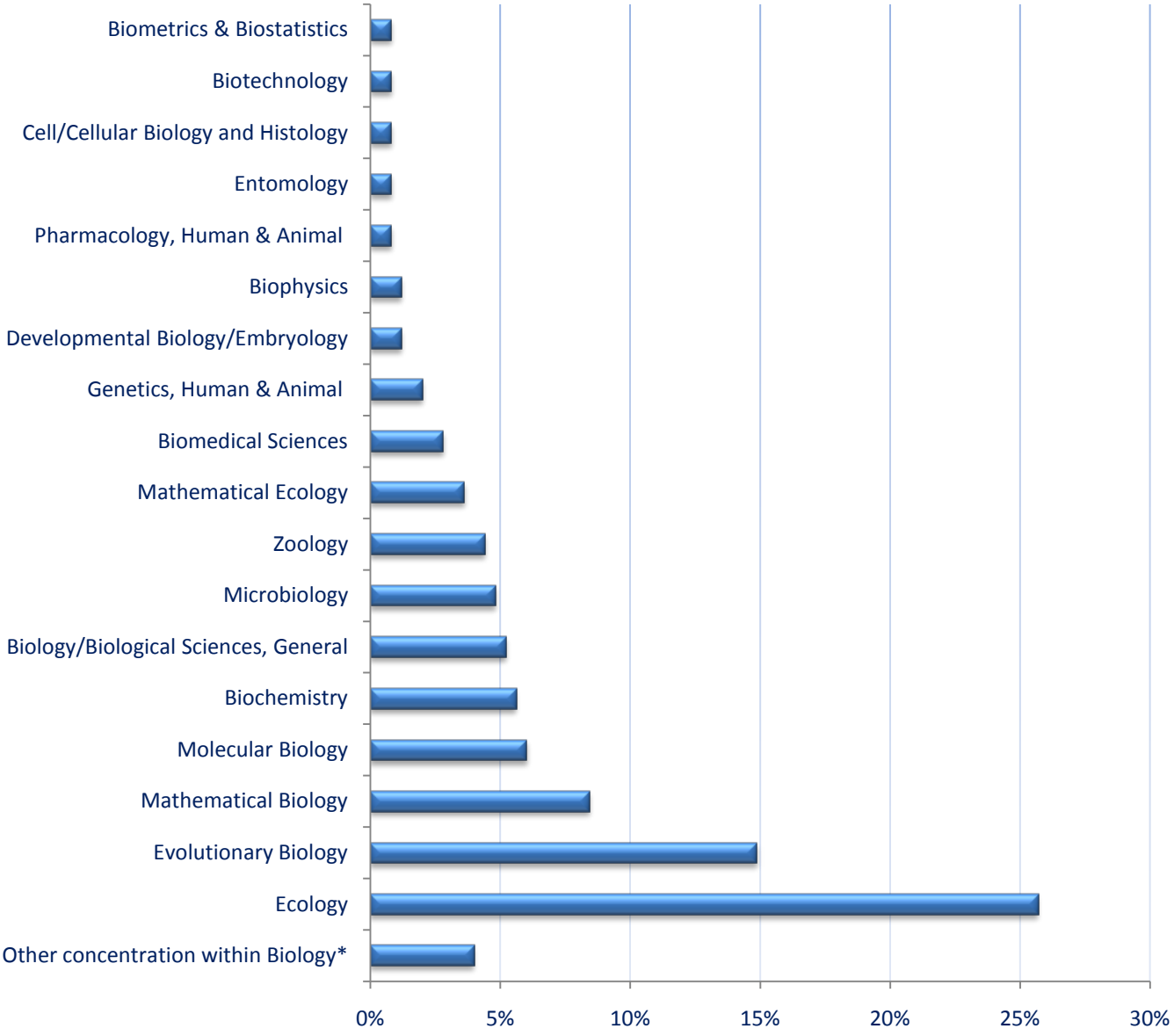
Participants at NIMBioS indicated primary, secondary, and tertiary fields of study, as well as areas of concentration within those fields. The most commonly reported fields of study included biological/biomedical sciences, mathematics, and agricultural sciences/natural resources, although many other disciplines were represented (Figure 8).

Figure 8. Primary, secondary, and tertiary discipline areas of participants (n = 618)



The 249 participants naming Biological/Biomedical Sciences as their primary field of study indicated 27 different areas of concentration within which they would classify their primary areas of research/expertise. The most commonly indicated area of concentration was ecology (26%), followed by evolutionary biology (15%) and mathematical biology (8%) (Figure 9).

Figure 9. Participant research/expertise area concentrations within biological/biomedical sciences field of study (n = 249)



* Other concentrations having only one participant: Wildlife/Range management, Veterinary Medicine, Plant pathology/phytopathology, Physiology, Human & Animal, Pathology, Human & Animal, Neuroscience, Immunology, Endocrinology, Botany/Plant Biology

Participants during RP 2 represented 249 different institutions, including colleges and universities, government institutions, private businesses, non-profits, and high schools (Figure 10). Of the 207 *different* colleges/universities represented, most were classified as comprehensive (having undergraduate and graduate programs) (Figure 11).

Figure 10. Types of institutions represented

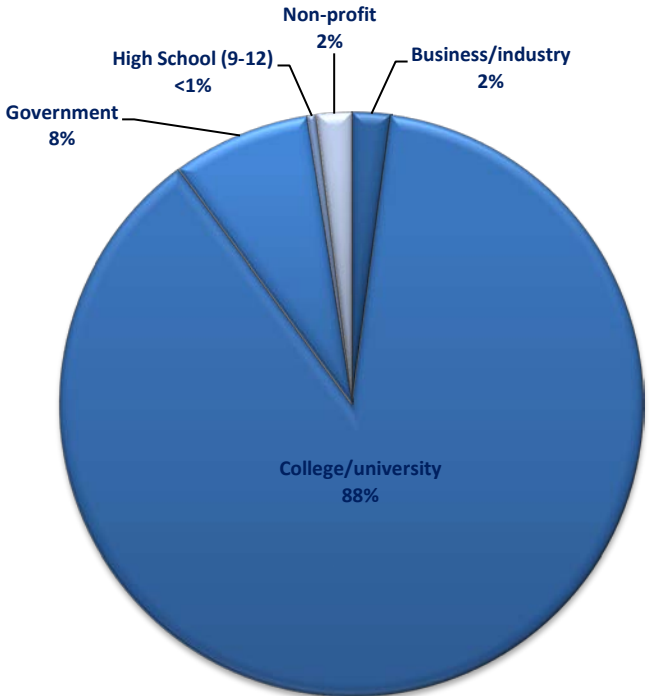
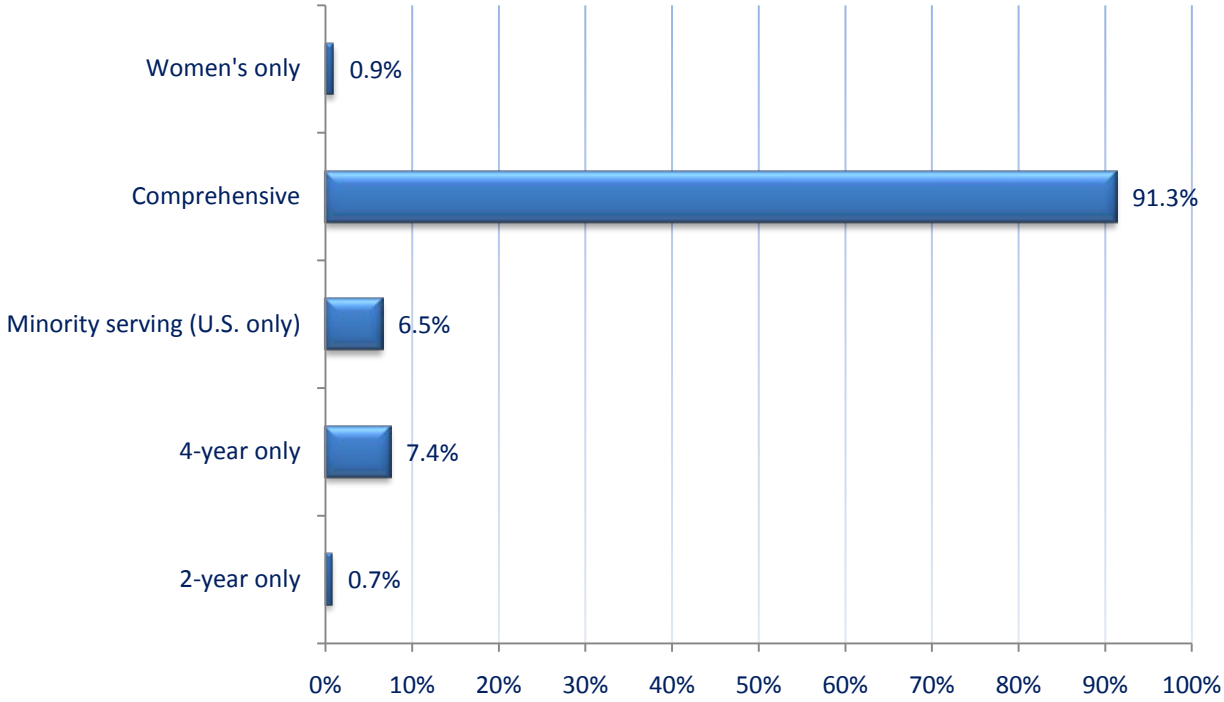


Figure 11. Characteristics of participants' colleges/universities



Evaluation Summary Report of NIMBioS Activities Year Two

April 1, 2009-March 31, 2010

National Institute for Mathematical and Biological Synthesis
March, 2010

Evaluation Summary of Major NIMBioS Activities

Executive Summary

This is a report of NIMBioS evaluated activities during the second annual reporting period (RP 2) to the National Science Foundation. The report covers the period of April 1, 2009-March 31, 2010. During RP 2, 618 different people from 249 institutions participated in NIMBioS sponsored activities. Research program activities during RP 2 included:

- 10 Working Groups (with a total of 15 meetings)
- 4 Investigative Workshops
- 20 Short-term visitors
- 6 Postdoctoral Fellows
- 1 Sabbatical Fellow
- 6 Graduate Research Assistantships

Education and outreach program activities during RP 2 included:

- 1 Tutorial
- 3 Education/Outreach Workshops
- A NIMBioS Seminar Series
- Biology by Numbers (Kids U at the University of Tennessee)
- Research Experiences for Undergraduates/Veterinary Students Program
- Mu Alpha Theta 2009 National Convention
- Vision and Change Undergraduate Education Reform Meeting
- Undergraduate Conference at the Interface between Mathematics and Biology
- Project Kaleidoscope Webinar
- Teacher Collaboration Program Pilot

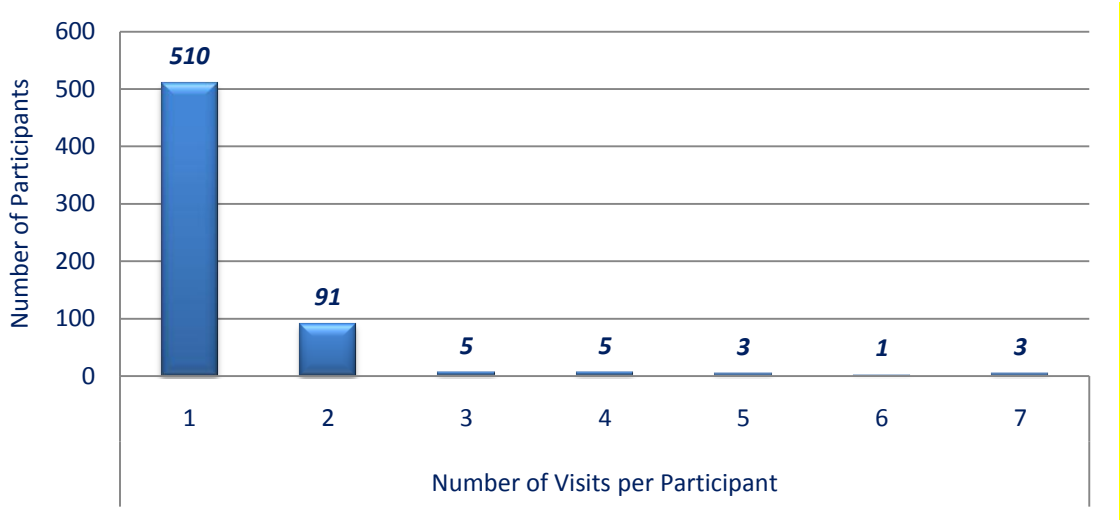
Other events included:

- 2 Advisory Board Meetings
- BioSongs Meeting

Participants came from colleges/ universities, government institutions, non-profit organizations, business organizations, and high schools (See Participant Diversity Report for complete demographic details).

Of the 618 participants, 108 visited NIMBioS more than once (Figure 1). Most participants making return visits to NIMBioS during RP 2 were participating in subsequent meetings of a Working Group; however, 49 participants took part in two different types of events (e.g. a Working Group and a Workshop), while five participated in three different types of events.

Figure 1. Number of events per participant



NIMBioS conducted evaluations of its Working Groups, Workshops, Tutorial, Undergraduate Conference at the Interface between Mathematics and Biology, and Research Experiences for Undergraduates/Veterinary Students programs. An evaluation of the pilot Teacher Collaboration program is ongoing as well. Evaluations were carried out via electronic surveys sent to all participants either after participation in a NIMBioS event, or both before and after participation if a pre/post comparison of responses was warranted. Evaluation findings, along with suggestions for improvement, were shared with event organizers, as well as NIMBioS staff as needed. Improvements to program content and format, as well as NIMBioS' overall operations, are made accordingly. Following is a brief synopsis of the evaluations of NIMBioS' major activities during RP 2.

Research Program Activities

Working Group and Investigative Workshop evaluation highlights are aggregated across all events in their respective categories. Evaluations of Working Groups and Workshops sought to answer the following common questions:

1. Were participants satisfied with the event overall?
2. Did the event meet participant expectations?

3. Do participants feel the group made adequate progress toward their stated goals?
4. Do participants feel they gained knowledge about the main issues related to the research problem?
5. Do participants feel they gained a better understanding of the research across disciplines related to the group's research problem?
6. What impact do participants feel participating in the event will have on their future research?
7. Were participants satisfied with the accommodations offered by NIMBioS?
8. What changes in accommodations, group format, and/or content would participants like to see at future meetings?

Working Groups

First Meetings

NIMBioS Working Groups are chosen to focus on major scientific questions at the interface between biology and mathematics. NIMBioS Working Groups are relatively small (10-15 participants), focus on a well-defined topic, and have well-defined goals and metrics of success. Working Groups typically meet 2-3 times over a two-year period, with each meeting lasting 3-5 days; however, the number of participants, number of meetings, and duration of each meeting is flexible, depending on the needs and goals of the group. During RP 2, NIMBioS hosted the first meetings of ten Working Groups, with a total of 130 participants (Table 1) (See http://www.nimbios.org/workinggroups/ for more details about specific Working Groups). Evaluation surveys were sent to all participants, with the exception of Working Group organizers and NIMBioS employees who were participating in the Working Groups. A total of 82 participants took part in the evaluation of the first meetings of their Working Groups.

Table 1. *Working Group First Meetings Hosted by NIMBioS*

Title of Working Group	Dates	# Participants
Coalitions and Alliances	4/16-18/09	10
Intragenomic Conflict	4/20-22/09	14
Feral Swine/Pseudo-rabies in Great Smoky Mountains National Park	4/27-29/09	13
Biological Problems Using Binary Matrices	5/ 26-29/09	10
Synthesizing and Predicting Infectious Disease while Accounting for Endogenous Risk (SPIDER)	6/7-9/09	14
Integrating Functional and Evolutionary Dynamics at Multiple Scales	6/10-12/09	10
Population and Community Ecology Consequences of Intraspecific Niche Variation	7/27-29/09	15
Darwinian Morphometrics: Cross-Topology Registration of Shape	1/10-12/10	16
Modeling Bovine Tuberculosis	2/17-18/10	14
Modeling Forest Insects	2/22-26/10	14

Synopsis of First Meeting Evaluation Results

- Overall satisfaction with first meetings was high among survey respondents, the majority of whom (97%) indicated they either agreed or strongly agreed that their respective meetings were very productive and met their expectations (95%).
- Almost all respondents (95%) thought the presentations were useful and the presenters were very knowledgeable about their topics (99%).
- The majority of respondents (83%) agreed that they had a better understanding of the main issues related to their group's research problem as a result of participation.
- A large majority (98%) said they planned to take the knowledge they gained during the Working Group and apply it to their own research.
- Forty-two percent of respondents reported they developed *unanticipate*d plans for collaborative research with other Working Group participants.
- Ninety-nine percent of respondents either agreed or strongly agreed that they would recommend participating in NIMBioS Working Groups to their colleagues.
- Almost all respondents said that the most useful aspect of their Working Groups was its multidisciplinary composition.

- Ninety-nine percent of respondents agreed that the format of their Working Group was very effective for achieving the group's goals.
- Ninety-two percent of respondents felt their Working Group made adequate progress toward its stated goals for the first meeting.
- Ninety-two percent of respondents said they left their respective meetings with a good idea of what their contribution will be at the next meeting.
- Overall, respondents reported being satisfied with the travel, housing, and other amenities provided by NIMBioS.

Second Meetings

During the reporting period, NIMBioS hosted the second meetings of five Working Groups, with a total of 53 participants (Table 2). Evaluation surveys were sent to all participants, with the exception of Working Group organizers and NIMBioS employees who were participating in the Working Groups. A total of 29 participants took part in the evaluation of the second meetings of their Working Groups.

Table 2. *Working Group Second Meetings Hosted by NIMBioS*

Title of Working Group	Dates	# Participants
Synthesizing and Predicting Infectious Disease while Accounting for Endogenous Risk (SPIDER)	11/9-11/09	11
Biological Problems Using Binary Matrices	12/10-13/09	11
Feral Swine/Pseudo-rabies in Great Smoky Mountains National Park	1/25-26-10	14
Coalitions and Alliances	2/4-6/10	9
Integrating Functional and Evolutionary Dynamics at Multiple Scales	3/1-3/10	8

Synopsis of Second Meeting Evaluation Results

- Overall satisfaction with the Working Group meetings was high among survey respondents, 97% of whom indicated they either agreed or strongly agreed that their meeting was very productive, while 93% indicated it met their expectations.
- One-hundred percent of respondents thought the presentations were useful and that the presenters were very knowledgeable about their presentation topics.
- Ninety-seven of respondents agreed that participating in the meeting increased their understanding of the work being done in by others in the group, while 83% agreed that it

increased their understanding of how everyone's work would come together to achieve the goals of the group.

- Many (79%) of respondents said that participating in the Working Group had influenced their research agendas. Several participants noted that the group had lead to collaborations that otherwise may not have occurred.
- Most respondents (86%) agreed that the format of the Working Group was very effective for achieving its goals.
- Almost all respondents (97%) felt that their Working Group made adequate progress toward reaching its intended goals.
- Most (86%) respondents said they left the second meeting with a good idea of what their contribution would be at the next meeting.
- Overall, respondents reported being satisfied with the travel, housing, and other amenities provided by NIMBioS.

Workshops

NIMBioS Investigative Workshops involve 30-40 participants, focus on a broad topic or a set of related topics, attempt to summarize/synthesize the state of the art and identify future directions, and have potential for leading to one or more future Working Groups. NIMBioS hosted four Investigative Workshops during RP 2, with a total of 149 participants (Table 3). Evaluation surveys were sent to all participants, with the exception of Workshop organizers and NIMBioS employees who were participating in the Workshops. A total of 124 participants took part in the evaluation of the Workshops.

Table 3. *Investigative Workshops Hosted at NIMBioS*

Title of Workshop	Dates	# Participants
Modeling White Nose Syndrome (WNS) in Bats at the Individual,	6/29-7/1/09	35
Modeling Bovine Tuberculosis	7/7-9/09	38
New Soil Black Box Strategies	10/15-17/09	33
Optimal Control and Optimization for Individual-based and Agent-based Models	12/1-3/09	43

Synopsis of Workshop Evaluation Results

- Overall satisfaction was high among survey respondents, the majority of whom (93%) indicated they either agreed or strongly agreed that their Workshop was very productive. Most (89%) also agreed it met their expectations.
- Almost all respondents thought the presentations were useful (98%) and that the presenters were very knowledgeable about their topics (92%).
- Ninety-eight percent of respondents either agreed or strongly agreed that they would recommend participating in NIMBioS Workshops to their colleagues.
- Most respondents (94%) felt that participating in their Workshops helped them to better understand the research going on in other disciplines regarding the research problems.
- Most (86%) said the exchange of ideas that took place during the Workshop would influence their future research.
- The majority of respondents agreed that they had a better understanding of the main issues related to their Workshop's research problem as a result of participation.
- Ninety-five percent of respondents agreed that the format of their Workshop was very effective for achieving its goals.
- Ninety percent of respondents felt the participants of their Workshops, overall, made adequate progress toward the Workshop's stated goals.
- A large majority (97%) said they were satisfied with the opportunities provided during the Workshop presentations and discussions to ask questions and/or make comments.
- Overall, respondents reported being satisfied with the travel, housing, and other amenities provided by NIMBioS.

Education and Outreach Program Activities

Tutorial: Optimal Control and Optimization for Individual-based and Agent-based Models

NIMBioS hosted one Tutorial during RP 2. The Optimal Control and Optimization for Biologists Tutorial was conducted at NIMBioS December 15-17, 2009. The Tutorial comprised 37 participants, including co-organizers Suzanne Lenhart (University of Tennessee, Department of Mathematics and NIMBioS Associate Director for Education, Outreach and Diversity) and Michael Bevers (USDA Forest Service, Fort Collins, Colorado). Participants included a diverse collection agricultural scientists, biologists, engineers, and mathematicians.

The Tutorial was designed to introduce selected topics in optimal control and optimization with an emphasis on biological applications. Introductory material on optimal control of ordinary differential equations and difference equations, and some interactive computer labs were included in sessions led by Dr. Lenhart. Mathematical programming and spatial optimization techniques were demonstrated for managing natural resources under conditions of risk. Lectures and computer lab exercises, led by Dr. Bevers, introduced linear, integer, nonlinear, stochastic and chance-constrained programming methods. Renee Fister of Murray State University gave a lecture on optimal control techniques applied to cancer modeling. Paul Armsworth of the University of Tennessee lectured on applications in conservation and natural resource management.

Evaluation surveys were sent to all participants, with the exception of Tutorial organizers and NIMBioS employees who were participating in the Tutorial. A total of 26 participants took part in the evaluation of the Tutorial.

The evaluation of the Tutorial sought to answer the following questions:

1. Were participants satisfied with the Tutorial overall?
2. Did the Tutorial meet participant expectations?
3. Was the Tutorial appropriate to the participants' levels of expertise?
4. Did participants feel they learned an appropriate amount of information?
5. How did participants feel about the amount of content and format of the Tutorial?
6. Were participants satisfied with the accommodations offered by NIMBioS?
7. What changes in accommodations, group format, and/or content would participants like to see at future similar meetings?

Synopsis of Tutorial Evaluation Results

- One-hundred percent of respondents either agreed or strongly agreed that they would recommend participating in NIMBioS Tutorials to their colleagues.
- Almost all respondents agreed the Tutorial met their expectations (96%) and was appropriate to their level of expertise (92%).
- All respondents thought the instructors were knowledgeable about their topics, and 92% thought the presentations were useful.
- The majority of participants thought the hands-on exercises were useful (96%), while a smaller majority felt the group discussions were useful (89%).

- Ninety-two percent of respondents agreed that the format of the Tutorial was very effective for achieving its goals.
- The majority of respondents (69%) indicated they felt the amount of content offered during the Tutorial was "just right," while 31% felt there was too much material presented for the allotted time.
- One-hundred percent of participants agreed that they had a better understanding of optimal control of ordinary differential equations and difference equations as a result of attending the Tutorial.
- A smaller majority of participants (58%) agreed that they had a better understanding of linear, integer, nonlinear, stochastic and chance-constrained programming methods as a result of attending the Tutorial.
- A large majority (92%) said they were satisfied with the opportunities provided during the Tutorial to ask questions and/or make comments.
- Overall, respondents reported being satisfied with the travel, housing, and other amenities provided by NIMBioS.

Research Experiences for Undergraduates/Veterinary Students

The NIMBioS *Research Experience for Undergraduates* (REU) and *Research Experience for Veterinary Students* (REV) programs took place simultaneously on the UT campus June 1-July 24, 2009. During the program, veterinary students and undergraduate students majoring in math, biology, and related fields lived on campus and worked in four-person research teams mentored by UT professors. The teams worked on state-of-the-art research projects at the interface of math and biology both in the lab and in the field. Participants learned how to write computer programs to model their research findings mathematically. Besides the research projects, program activities included lectures on modeling and background on the projects, lab work, tutorials on Matlab and R, an ethics session, a career advice session, progress and finale presentations, a written report, and social activities. The program was designed to give participants the opportunity to actively participate in the various components of the scientific research process. Each project group had a math/computational mentor and a biology/vet mentor.

The REU/REV program comprised 16 participants who came from a diverse array of backgrounds, including agricultural sciences/natural resources, biological/biomedical sciences, engineering, veterinary medicine, and mathematics. A high school math teacher and biology teacher were also included in the

16. Four veterinary students and four undergraduate math majors participated in the REV program projects, while the remaining six undergraduates and two teachers participated in the REU program projects.

Evaluation surveys were sent to all student and high school teacher participants in the program. All 16 participants took part in the evaluation.

The evaluation of the REU/REV sought to answer the following questions:

1. Were participants satisfied with the program overall?
2. Did the research experience meet participant expectations?
3. Did the research experience impact participant plans to go to graduate school?
4. To what extent did participants increase their research skills during the program?
5. To what extent do participants feel they gained knowledge about the research process?
6. How satisfied were participants with their mentors?
7. How satisfied were participants with the accommodations offered by NIMBioS?
8. What changes do participants feel NIMBioS should make in the program for next year?

Synopsis of REU/REV Evaluation Results

- Overall satisfaction with the program was high among participants, 100% of whom said they were “satisfied” or “very satisfied” with their experience and would recommend the program to others.
- Fourteen of the sixteen participants said most or all of their expectations were met or exceeded during the program.
- Participants rated their mentors highly, with the average biology mentor rating at 4.8 and the average math mentor rating at 4.3 (on a scale of 1-5, with 5 being the most favorable).
- Participants reported gains in several research-related skills, with an average rating of 3.4 for all skill levels on the pre survey and 3.9 on the post survey (on a scale of 1 = extremely poor at the skill and 5 = excellent at the skill).
- Participants reported gains in knowledge regarding several research related topics. Before the program, participants on average rated themselves 3.2 on a 5-point scale (1 = extremely poor understanding of the topic, 5 = excellent understanding). After participation, the average rating was 4.0.

- While most participants' plans to go to graduate school remained unchanged as a result of participating in the program, one student said the experience encouraged him/her to attain a doctoral degree when he/she previously planned to attain only a bachelor's degree.
- Overall, respondents reported being satisfied with the travel, housing, and other amenities provided by NIMBioS.

Undergraduate Conference on the Interface between Mathematics and Biology

The NIMBioS first annual Undergraduate Research Conference at the Interface Between Biology and Mathematics took place at the University of Tennessee's Conference Center in downtown Knoxville October 23-24, 2009. The event was organized by the NIMBioS Education and Outreach Associate Director for Education, Outreach, and Diversity, Suzanne Lenhart, and the Education and Outreach Coordinator Sarah Duncan.

The conference comprised nearly 200 participants, including college/university undergraduates, college/university faculty and staff, government employees, graduate students, and postdoctoral researchers. Undergraduates in biology, mathematics, computer science and related fields gave talks and presented posters on topics ranging from modeling diseases to using mathematics to understand population dynamics and biological phenomena. The conference featured 40 student talks and 40 student posters.

Keynote speakers at the conference included Lisa J. Fauci, professor of mathematics at Tulane University, who discussed the dynamics of cilia and flagella, and Paul E. Super, Science Coordinator at the Great Smoky Mountains National Park (GSMNP), who talked about research, inventories, and monitoring used in protection efforts at GSMNP. The conference also included a panel discussion with university faculty on career opportunities at the interface of mathematics and biology.

The evaluations for the conference sought to answer the following questions:

1. Were participants satisfied with the conference overall?
2. Did the conference meet participant expectations?
3. Do participants feel the conference allowed them to make new connections with others in math and biology?
4. Do participants feel they gained a better understanding of undergraduate research happening at the interface of mathematics and biology?

5. What impact do undergraduate participants feel the conference will have on their future career plans?
6. Were participants satisfied with the accommodations offered by NIMBioS?
7. What changes in accommodations, group format, and/or content would participants like to see at future similar meetings?

Synopsis of UBM Conference Evaluation Results

- Overall satisfaction with the conference was high among respondents, the majority of whom indicated they either agreed or strongly agreed that the conference was productive (86%) and met their expectations (88%).
- Most respondents thought the presentations were useful (87%), while a smaller majority felt the panel discussion was useful (73%).
- Ninety-one percent of respondents either agreed or strongly agreed that they would recommend participating in NIMBioS conferences to their colleagues.
- Overall, respondents reported being satisfied with the conference accommodations provided by NIMBioS.
- Respondents reported relatively high levels of learning on how to present scientific research. Learning gains, however, were slightly lower regarding career opportunities at the interface of mathematics and biology.
- Most respondents felt the most useful aspect of the conference was the student presentations followed by the good atmosphere for student interaction and the career panel.
- Ninety-five percent of undergraduate respondents said they felt that participating in the conference helped them become more knowledgeable about undergraduate research going on at the interface of biology and math.
- Ninety-two percent of respondents felt the conference format was effective.
- The majority of respondents (97%) agreed that the conference made adequate progress toward its goal of creating a forum through which undergraduates could present research and make new connections at the interface of math and biology.
- Eighty-one percent of undergraduate respondents said they felt that the exchange of ideas that took place during the conference would (or potentially would) influence their career plans.
- The majority of respondents (86%) said they felt that participating in the conference helped them make connections with others within the interdisciplinary field of math and biology.

Educational Workshops

NIMBioS hosted three educational workshops organized and co-sponsored by outside organizations during the reporting period (Table 4). Organizers conducted their own evaluations of these workshops, thus no evaluation summary is provided in this report.

Table 4. *Educational Workshops Hosted at NIMBioS*

Title of Workshop	Dates	# Participants	Outside Sponsors*
NUMB3R5 Count	5/26-31/2009	19	1,2
SCALE-IT Biology Curriculum Workshop	6/22-26/2009	18	1,3,5
PEER Skills for Success	8/2-12/2009	45	1,4

* 1 = BioQUEST Curriculum Consortium

2 = Howard Hughes Medical Institute (HHMI)

3 = Oak Ridge National Laboratory (ORNL)

4 = Program for Excellence & Equity in Research (PEER)

5 = Scalable Computing and Leading Edge Innovative Technologies (SCALE-IT)

NUMB3R5 Count

This workshop was for faculty interested in addressing the gap between mathematics and its application in biological problem solving to support the observation, experimentation and modeling of data. The NUMB3R5 Count workshop provided an introduction to data, tools and curricular materials for use with undergraduates.

SCALE-IT Biology Curriculum Workshop

This undergraduate biology curriculum workshop provided college faculty information about bioinformatics and visualization, which are rapidly developing research approaches throughout the biological, physical, and mathematical sciences curricula.

PEER Skills for Success

PEER aims to create a “program of excellence” that implements innovations and leverages existing resources across the UTK campus to generate more accomplished, competitive and determined underrepresented minority PhDs.

The Skills for Success workshop was a five day session offered to first year PEER graduate students as well as other first year UTK graduate students from other programs. The workshop emphasized interactive group work focusing on current biological problems with bioinformatics and visual tools.

Attachment to NIMBioS Annual Report

Section C. Year 1 Reporting Period (Sep 1, 2008 – Aug 31, 2009)

C-1. NIMBioS Board of Advisors Meeting Summary

C-2. Evaluation Reports of NIMBioS Activities (Nov 2008 - Mar 2009)

NIMBioS Board of Advisors Meeting
20-21 November 2008 – University of Tennessee Conference Center, Knoxville

Summary of Actions/Recommendations regarding NIMBioS Operating Procedures:

1. **Board of Advisors (BOA) Meetings:** It is expected that the BOA will meet twice a year to review requests for support and provide guidance for NIMBioS leadership. At least one meeting should be face-to-face, but the second meeting could be virtual. Whether the second meeting scheduled for March 2009 is face-to-face or virtual will be determined by the Director. Virtual meetings will have visualization teleconference capability. The October 2009 meeting of the BOA will be planned for Oct. 21-22, just before the Undergraduate Biology/Math Conference, planned for October 23-24.

2. **BOA Structure:** The structure for the Board is modified from that in the original UTK proposal so that the Committee to Promote Diversity (CPD) is a formal committee of the Board of Advisors (BOA), with all members of the CPD also serving on the BOA but maintaining their responsibility for recommendations for NIMBioS with regard to encouraging diverse participation in all activities.

3. **Role of the BOA:** While it was originally envisioned that the BOA would review all requests for support and provide recommendations to the NIMBioS leadership team, discussions led to a decision that the BOA would act mostly in an advisory capacity. Thus it is expected that the Leadership Team of NIMBioS shall make final decisions on all activities while taking into account the recommendations from the BOA. The BOA will provide review and recommendations specifically for all Working Group, Investigative Workshop, Postdoctoral Fellow and Sabbatical Fellow applications. The NIMBioS Leadership Team will preview requests for support, categorize them, and present them to the BOA. The BOA would then react with agreement, disagreement, or further recommendations. As part of its advisory role, the BOA recommends areas of emphasis and ensures NIMBioS works towards its synthesis and diversity goals. The advisory capacity is not meant to limit opportunities for BOA input into the workings of NIMBioS. The BOA has a wide range of expertise and should participate in strategic planning and new directions discussions for NIMBioS.

4. **Evaluation of Requests for Support**: Requests for support will be assigned to groups of 4-5 BOA members with appropriate expertise. These BOA members will examine those requests in detail and be prepared to summarize them for the rest of the BOA prior to discussion. Ideally these evaluations for each request will be carried out by two BOA members with math backgrounds, two members with biology backgrounds, and include at least one representative from the CPD.

5. **Advisory Board Membership:** It is expected that BOA and CPD members will serve at least two year terms, and that a system be established for staggering of terms so that not all members will rotate at the same time. The NIMBioS leadership team will bring a recommendation for staggered terms to the next BOA meeting after having discussed it with the Chairs of the BOA and CPD.

6. **Leadership Evaluation Committee:** The Leadership Evaluation Committee's purpose is to evaluate the NIMBioS leadership team in collaboration with the University of Tennessee administration. This Committee will meet once a year. Discussion was held as to whether members of this committee might receive any compensation for their time. This depends upon the plans of the UTK administration as to whether a broader review by external individuals to UTK beyond those on the BOA will be involved and compensated, and if so we will consult NSF as to whether compensation for BOA members is acceptable. This Committee shall be made up of at least three people: one with a mathematical emphasis, one with a biological emphasis, and one representing the CPD. The initial Committee will be DeWitt Sumners, Gary Smith, and George Middendorf.

7. **BOA Leadership:** Alan Hastings was selected to be the Chair of the BOA and Overtoun Jenda was selected to be the Chair of the CPD. The time period of service in these positions is one year, with the possibility that someone might serve more than one term. Selection of new chairs will be made at the Fall meeting of the BOA.

8. **Assessment:** An important role of the BOA and CPD is assisting in defining metrics for determining success of NIMBioS. Assessment will be a key feature for NIMBioS success, and one area that must be documented is how NIMBioS succeeds in being unique from other similar centers. As a synthesis center, NIMBioS must stay focused on bringing mathematical and biological expertise together to address new problems (or old problems in innovative ways). NIMBioS's mathematical focus should separate it from other similar centers. As part of the strategic planning process, a draft set of metrics for NIMBioS will be constructed with assistance from the BOA and CPD.

9. **Conflicts of Interest (COI):** A member of the BOA or Leadership Team (LT) has a COI if they have had any meaningful intellectual collaboration with an applicant for support in the last 48 months. If there was no real collaboration, there is no COI. Professors are forever conflicted with their PhD students (and vice-versa). Post-docs fall into the 48 month window. Members are also in COI with anyone from the same financial unit at their institution. Any BOA or LT member with a COI must declare it and refrain from involvement in review of that applicant/request. If an individual changes institutions, they are still in conflict with colleagues from the old institution for one year. The draft COI policy submitted to the BOA was approved by vote of the BOA with agreement that this draft policy may be modified in the future to reflect discussion leading up to the vote (e.g. adding specific details of the time periods for conflicts) and taking account of policies in place at other NSF-Centers. The COI Policy will be posted on the NIMBioS website.

10. **IP & Data Policy:** NIMBioS has drafted an Intellectual Property and Data Policy, but details of the policy are still being working out with the University of Tennessee legal department. As draft policies are approved by the UT legal office, they will be submitted to the BOA for approval/modification.

11. **Diversity Plan:** The initial draft points presented as part of a NIMBioS diversity plan must be elaborated and formally approved by the BOA. The Leadership Team is encouraged to obtain similar plans from other recent Centers as potential guidance. The Diversity Plan should include methods to broadly advertise and reach out to minority communities, should include methods for how requests for support will be evaluated regarding diversity commitments, and methods for how NIMBioS might seek requests

and applications for support dealing specifically with minority issues at the math/biology interface. The Plan should also specify the definition of diversity of participation.

12. **Strategic Plan:** The BOA approved the draft procedure for developing a strategic plan as presented. The goal is to have a strategic plan to be formally approved by the BOA in Fall 2009 that will cover the first five years of NIMBioS. The strategic plan should highlight how NIMBioS will distinguish itself from other similar centers, how progress will be measured and how the data will be collected to assess these metrics for progress. These metrics should quantify NIMBioS impact on the broader scientific community and on the non-scientific community, with specific outreach/education goals.

13. **Post-doctoral Fellowships:** An effort must be made to advertise these widely, including diverse venues. Many mathematicians do not read Science and would not have seen NIMBioS announcements there. Timing is also an issue, with differences arising among fields. NSF post-docs in Mathematics are announced in February, so mathematics applicants are unlikely to commit before then. NIMBioS post-docs are meant to be independent researchers with the role of NIMBioS mentors to assist them more than to direct them. While there was some concern expressed that independent post-docs may not interact with others enough, it was generally believed that a good group of post-docs will learn alot from each other. We should encourage a mix of post-doc types including those focused on their own projects and others with broader perspective. Regarding post-doc applications, the leadership team will provide recommendations to the BOA, which will approve/disapprove. In cases where a conflict of interest exists for members of the leadership team, the team may defer a final decision on that case to the BOA.

14. **Facilities:** NIMBioS must ensure as spaces are renovated that the renovations facilitate discussion and interaction wherever and whenever possible. One means toward this end is to provide white-boards wherever people may congregate, and to provide as many nooks and interaction areas in the office layout as possible.

15. **Working Groups:** Working groups will be recommended by the NIMBioS Leadership Team and approved by the BOA after evaluating all applicants. Membership in a working group is set by the working group organizers with input from the NIMBioS leadership team and taking into account comments from the BOA and CPD. Working group organizers should entertain requests from post-docs to be involved, but they are under no obligation to include researchers based upon level of experience. Working group organizers will provide formal written progress reports to the Leadership Team as well as informal progress reports on a more frequent basis (at least quarterly). A similar selection process will be used for Investigative Workshops, with a formal written summary report provided by the organizers to the Leadership Team within a reasonable time following the workshop.

16. **Emphasis Areas:** The areas/types of activities NIMBioS support is up to the BOA and the suggestions from the community. If the BOA determines a particular need in an area, the NIMBioS Leadership Team will announce that we are particularly interested in providing support in that area, but will maintain an open-door attitude to applications in all areas. Discussion of what areas NIMBioS should support with regard to human health issues suggested that any clinical or other issues better suited to NIH or agencies with a medical focus should be less attractive to NIMBioS, unless the requests were focused on developing new mathematical relationships.

Additional Discussions:

The meeting included an array of discussion of various aspects of NIMBioS, along with detailed discussion of the various requests for support obtained. The BOA made numerous suggestions with regard to the applications for support, and charged the Leadership Team to pass on these suggestions to the applicants and to proceed as the Team deems appropriate to support activities. Some of the general topics of discussion included:

Working Groups –
Size - Is the size of 10-15 people appropriate? This was based on NCEAS model and experience and we will have to evaluate whether this is still reasonable for NIMBioS, but as an initial size range we will use NCEAS results as guidance.

Student and post-doc involvment - It was suggested that it would be good to have graduate students and post-docs involved in working groups. They have time and energy and may get more actual work done than more advanced scientists with more demands on their time. Post-doc involvement in working groups will be determined by working group organizers, but organizers could be encouraged to involve qualified post-docs. Requests for support should identify their support needs and could include a request for a post-doc to be assigned to the project. Coordinating timing of working group selections and post-doc selections might be beneficial; once working groups are set, it might be useful to be able to inform post-doc applicants.

Working Group Membership - Regarding a mechanism for involving additional people in working groups, there is no intention to put out an open call for attendance at a working group. It is up to the organizers, with recommendations from the BOA and NIMBioS Leadership Team, to put together a group with an appropriate mix of fields/expertise. A midpoint review of working group success might consider whether additional expertise is needed. Working group organizers need to be encouraged to bring together people who are not already collaborating; an objective is new collaborations, new synergies, innovative approaches and results. We want to allow flexibility in how working groups are put together, and adding people when it will benefit the group is clearly an option. While the organizers set the initial membership of a working group, the BOA and LT can recommend changes. Generally changes would come in the form of recommendations to include people from additional areas of expertise or for enhancing diversity of the group rather than listing specific individuals.

Duration and other Working Group Models - At NCEAS small groups may work intensively for up to 2 weeks. This has the advantage of focusing on the problem and making progress rather than having shorter meetings and relying on most of the work to be completed individually. NIMBioS does not have to be constrained to one format for working groups. Organizers of working group can propose the format they think will work best. This flexibility for the structure of a working group should be added to the guidelines for organizers.

Evaluation – General discussion about how to evaluate working groups led to agreement on the questions: Does the request represent sound science? Is it potentially transformative (new and innovative)? What will mathematics do for the problem that has not been done before? Regarding ranking evaluations, criteria for working groups does not specify special consideration for local involvement by UT/ORNL faculty or staff. A request that is competitive for support could be given higher priority if it was of particular interest to NIMBioS sponsors DHS and USDA. How well a request addresses diversity is an explicit criteria for support. Working group requests should identify whether participant interest is confirmed. Another evaluation criteria

concerns the level of risk for a request, and the BOA will be requested to evaluate whether projects with a high risk of failure (inability to achieve goal), has sufficient potentially large benefit to make it worthy of support.

Other discussions -

Regarding the relationship between NIMBioS and DHS it was noted that all results of activities at NIMBioS are public, and thus we will not engage in any classified activities. It was also noted that NIMBioS does not interact directly with DHS sponsors but that both DHS and USDA sponsors are involved in an NSF-led team that provides coordination between the sponsoring agencies.
NIMBioS should consider having a setup for video at NIMBioS activities and making videos widely available via the web. No concordance was reached as to whether this was worth a major investment (e.g. as was done at MBI), but it was noted that there are a variety of less-costly mechanisms that might be beneficial to pursue.

There was a request that NIMBioS involve Veterinary Medicine students including those working on a MPH to be involved in the summer REU program. A program that encourages use of mathematics and infectious disease modeling for veterinary students could have considerable impact on the field.

Data Collection - It is important to keep in mind that NIMBioS is a synthesis center; it was not created to conduct experimental/observational work. Synthesis of existing data is expected, but new data development is not. NIMBioS needs to use mathematical approaches to gain new insights from existing data. Being data poor does not necessarily prevent developing models, and developing models can lead to better focused data collection. There was discussion that not allowing collection of new data may be somewhat short-sighted, but it was noted that there may be other mechanisms to fund data collection deemed essential to success of a working group.

NIMBioS uniqueness - Discussion was held on how NIMBIoS activities relate to those at the other Centers including NCEAS and NESCent. General discussion during the course of the meeting made clear that NIMBioS needs to separate itself from the other centers in terms of what and how we address areas of interest. The primary difference is the NIMBioS focus on bringing mathematical and biological expertise together to address problems/issues. In addition, NIMBioS is not restricted to researching a single level of organization so the breadth of potential projects also separates NIMBioS from these other centers. While we want to be unique, we also want to pursue opportunities for joint interaction when possible. The High Performance Computing training-the-trainers workshop planned for March is an example of working together with the other Centers.

Advertising/Announcements - We need innovative ways to get the word out and invite collaborative types of projects and reach out beyond our usual contacts. As an initial step we requested all BOA members to submit a list of 10 contacts to be notified of NIMBioS opportunities.

Evaluation Report of NIMBioS Activities

Completed evaluation reports to date:

R Seminar

Board of Advisors Meeting

High Performance Computing Tutorial

May 29, 2009

Evaluation Report

R Seminar

February 2-March 2, 2009

Pamela Bishop
Program Evaluation Coordinator
National Institute for Mathematical and Biological Synthesis
March 16, 2009

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R Seminar Evaluation

Introduction

The R Seminar for statistical computing was conducted on the University of Tennessee campus and sponsored jointly by NIMBioS and the Department of Ecology and Evolutionary Biology. The purpose of the seminar was to help students learn to use the R statistics package in biological research. The format of the seminar was one hour a week for six weeks, beginning on February 2, 2009. The seminar was limited to 20 participants who were selected from an applicant pool. Due to participant attrition during the six week duration, a total of 15 participants remained at the end of the seminar.

Evaluation Design

A participant survey was distributed online to seminar participants during the last meeting on March 9, 2009. A total of 15 participants responded to the survey, for a 100% response rate. The following report summarizes their responses.

Findings

Overall satisfaction

Participants responded favorably to overall questions about the seminar, including satisfaction level, level at which content was presented, and knowledge of the instructor. All but one of the respondents agreed they would recommend the seminar to others (Figure 1, Table 1).

Figure 1. Overall participant satisfaction

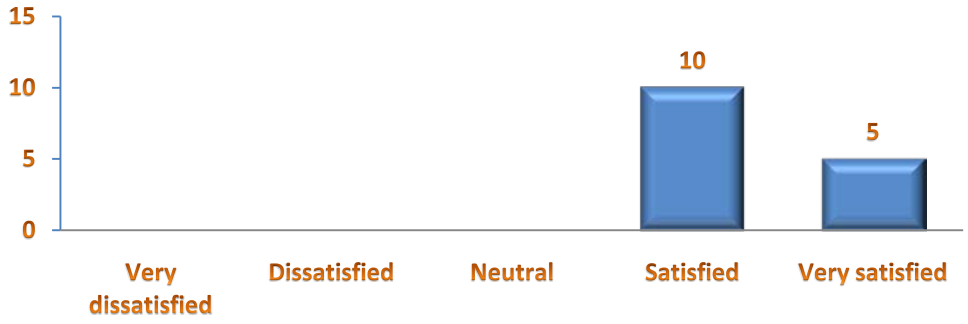


Table 1. *Number of responses to general rating questions, by response category*

	Strongly Disagree	Disagree	Neutral	Agree	Strongly agree
The seminar was appropriate to my level of expertise.			2	5	8
The instructor seemed very knowledgeable about the topic.			1	3	11
I would recommend this seminar to others.			1	4	10

Seminar Content and Format

Participants answered several questions about the seminar content and format. Most participants felt the amount of content offered was just right, and the majority of participants felt the format was effective (Figures 2 & 3).

Figure 2. Amount of content offered during seminar

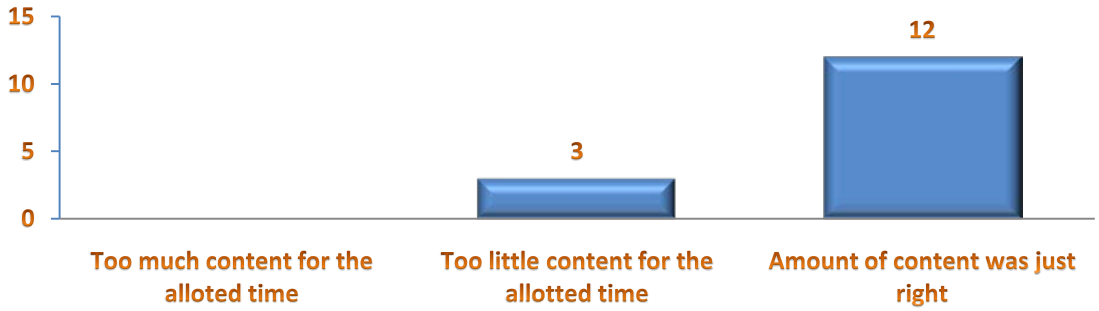
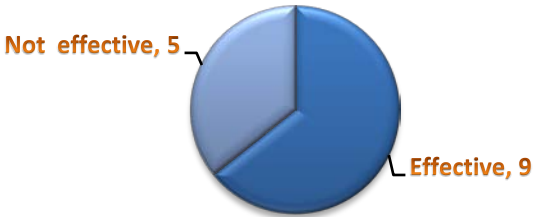


Figure 3. Effectiveness of seminar format



All participants indicating the format was not effective said they would have liked for the seminar to last longer. One participant's comment about how to make the seminar more effective (See Appendix B for a full listing of responses):

"More time each week. One hour is not long enough. I feel like I have learned a bit, but maybe not enough to be an independent R learner. This class needs to be thought over a longer period of time, and more time devoted to it each week."

In response to a question regarding the most useful aspect of the seminar, the majority of participants (n = 12) responded that the exercises that forced them to figure things out on their own were extremely useful learning tools (See Appendix B for a full listing of responses):

"Being told what we wanted to accomplish with a data set and having to look up and implement the commands."

"How to use R resources. Because the class is so short, it is very important that we learn how to get the information we need by our own means. So everything about searching R for formula, finding and uploading packages, etc, was very useful."

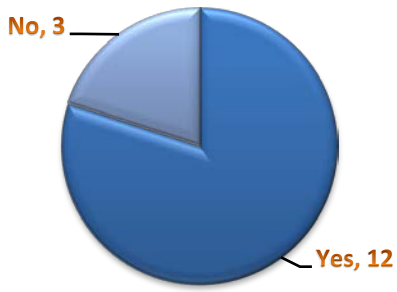
"Learning how to upload packages and doing an entire exercise by myself."

In response to a question about the least useful aspect of the seminar, 5 of the 10 respondents indicated they thought everything was useful. Other responses indicated that the handouts about data and hypotheses, having to look everything up rather than being provided the code, and the time devoted to teaching stats rather than how to use R were the least useful aspects. One participant suggested that introductory level and follow-up seminars would be useful:

"The least useful thing is that the seminar was only 6 classes, I think with the turn over of participants and the interest we really need a follow up, and an introductory class of R for new students."

When asked if attending the seminar would enable them to use R in their research, the majority of participants answered "yes" (Figure 4).

Figure 4. Ability to use R in research as a result of attending the seminar



Of the three participants indicating they did not feel they could use R after the seminar, one two felt that a longer course would allow them to learn enough content to be able to effectively use R, while one indicated he/she needed more statistical background courses. Some participant comments (See Appendix B for a full listing of responses):

> *"It just needs to be thought for a longer period of time so that we can get to a point where we can do more than a T-test and a Regression. I want to use R to for Monte-Carlo simulations and design my own null models. I am not saying that we should be taught how to do this on R, but I feel that I would need a full semester of learning about R to get to a point where I can learn how to do permutation tests by myself."*

> *"More info, perhaps a semester long course would be helpful."*

Suggestions for Future Seminars

The overwhelming consensus by survey respondents was that the best way to improve the R seminar would be to make it longer. Participants found the content of the seminar very useful, but felt as thought they did not have enough time to learn everything they were interested in knowing. Some participant comments (See Appendix B for a full listing of responses):

> *"If a complete semester (or even 2) were used. I feel like the course was much too short to actually cover enough. Again, what we did cover was a fantastic base for me to go ahead and get into R. I just wish it was much longer."*

> *"More time each week. One hour is not long enough. I feel like I have learned a bit, but maybe not enough to be an independent R learner. This class needs to be thought over a longer period of time, and more time devoted to it each week."*

Respondents indicated a number of topics they would to have covered if given more time, including how to make graphs and how to perform specific statistical functions such as ANOVAs, t-tests, and logistic regression. Additionally, respondents indicated they would be interested in attending seminars on other topics, including Bayesian modeling for biology and math ecology for "non-math people" (See Appendix B for full listing of comments):

> *"A much more detailed R seminar (perhaps even a class). But also, perhaps more general math ecology for graduate students that have a strong ecology background but little math especially as it relates to ecology. As it is now, anything that has to do with math ecology seems to assume an extremely high knowledge of math and less ecology. I think things that for people coming from the ecology side, it is much harder to get into the math ecology than for students coming from the math side."*

Respondents had a few suggestions for making the written seminar materials more useful for someone learning how to use R in a biological context as well. Two respondents indicated it would be useful to

have a book or manual to follow while learning the content, while another suggested including the command in the problems on the handouts:

> *"We could follow a book like the Gotelli and Ellison stats book, and go from chapter to chapter and learn how to do the basic tests in each chapter using R."*

> *"I think that it would be nice to have kind of a manual instead of having copies of a book for the exercise."*

Conclusion and Recommendations

Overall, the seminar was well-received by the participants and appears to be a useful activity for students interested in using R in biological research. The recommendations (if feasible) from analysis of the survey data are as follows:

- Continue to offer the R seminar, but change the format so that participants have more time. A full semester course meeting several times a week would be ideal.
- Consider a written text to use with the course that students can use as a reference
- Continue and expand the current inquiry-based format for learning to use R
- Offer a seminar in math ecology for students with a limited math background

Appendix A

R Seminar Participant Survey

Please check the appropriate box to indicate your level of agreement with the following statements about this seminar:

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	No Answer
The seminar was appropriate to my level of expertise.	❍	❍	❍	❍	❍	❍
The instructor seemed very knowledgeable about the topic.	❍	❍	❍	❍	❍	❍
I would recommend this seminar to others.	❍	❍	❍	❍	❍	❍

How do you feel about the amount of content offered during the seminar?

❍ Too little content for the allotted time
❍ Too much content for the allotted time
❍ Amount of content was just right
❍ No Answer

What topics would you have liked to have covered in this seminar if given more time?

How do you feel about the format of the workshop (one hour a week for six weeks)?

❍ This was a very effective format for learning the material
❍ This was not a very effective format for learning the material
❍ No Answer

The seminar format would have been more effective if:

What was the single most useful activity/concept offered during the seminar?

What was the single least useful activity/concept offered during the seminar?

Do you feel this seminar will enable you to use R in your research?

❍ Yes
❍ No
❍ No Answer

Please indicate any suggestions you have for making the written seminar materials you received more useful to someone learning how to use R in a biological context:

Indicate your overall level of satisfaction with the seminar:

❍ Very dissatisfied
❍ Dissatisfied
❍ Neutral
❍ Satisfied
❍ Very satisfied
❍ No Answer

What topics (besides R) would you like to see covered at future NIMBioS/EEB seminars?

Additional comments:

Demographic Information

Your participation in answering the following questions is completely voluntary. Answer only those questions with which you feel comfortable.

I am a(n):
Undergraduate student
Graduate student **(14)**

Gender
Male **(8)**
Female **(7)**

Are you Hispanic or Latino?
Yes **(4)**
No **(10)**

What is your racial background?
American Indian or Alaska Native
Native Hawaiian or other Pacific Islander
Asian **(4)**
Black or African-American
White **(11)**

Appendix B

Open-ended Responses

What topics would you have liked to have covered in this seminar if given more time? (n=11)

Miscellaneous (6)

Writing and executing programs in R

I think we need to try more project-like missions.

I would like to have a little bit of more emphasis on data manipulation. , The content on statistics was covered fine. , I don't know if it would be possible but little bit of exposure on repetitive (I mean looping) activity would have been very good!

I would have liked to have gone in more detailed analysis and learned better how to read help manuals.

More time to practice the given problems. It was great to learn the basics and to learn how to work with r.

A more detailed instruction on how to work with data in R. Naturally, this course was too short to also cover general programming, but a bit of info on how to create your own functions and the like would be nice if we had more time. , For the amount of time we had, I am pleased with the topics we did cover.

Regression (4)

Logistic regression, more about ANOVAs (block, factorial)

More on graphing, more linear examples... multiple regression selection, more types of ANOVA

How to make the most common forms of graphs used to present results. How to run stepwise regressions., Pairwise T-Test

Topics for the next seminar, because I would like to have a follow up; how to make graphs, logistic regression, multivariate stats

Graphs (3)

Making graphs, more statistical tests

How to make the most common forms of graphs used to present results. How to run stepwise regressions., Pairwise T-Test

Topics for the next seminar, because I would like to have a follow up; how to make graphs, logistic regression, multivariate stats

ANOVA (2)

Logistic regression, more about ANOVAs (block, factorial)

More on graphing, more linear examples... multiple regression selection, more types of ANOVA

The seminar format would have been more effective if: (n=5)

More time (5)

More classes through out the semester

We met twice a week for three weeks

Three times in a week and about four weeks, like general classes.

If a complete semester (or even 2) were used. I feel like the course was much too short to actually cover enough. Again, what we did cover was a fantastic base for me to go ahead and get into R. I just wish it was much longer.

More time each week. One hour is not long enough. I feel like I have learned a bit, but maybe not enough to be an independent R learner. This class needs to be thought over a longer period of time, and more time devoted to it each week.

What was the single most useful activity/concept offered during the seminar? (n=15)

Learning how to figure things out on our own (12)

Teaching us how to ask questions from the program

Look up how to do thing on our own.

Being told what we wanted to accomplish with a data set and having to look up and implement the commands ourselves

working on our own-- being given an activity and being let loose to figure things out on our own., It might be useful to send out the code commands we're using that day before hand-- that way we can try it on our own and use class time for troubleshooting, asking questions about our own datasets, etc.

How to do search things in R was really good. But there were other useful things too!

Just myself soaked in the R tool was good enough...and instructor was very helpful on directing us to right places for further help

Learning the code for basic operations

Learning how to do full tests. Like ANOVAs

Finding help in R. RSiteSearch("") and ? function

How to use R resources. Because the class is so short, it is very important that we learn how to get the information we need by our own means. So everything about searching R for formula, finding and uploading packages, etc, was very useful.

The two last classes in which we only get the data and we need to figure out how to analyzed data, trying to find the answers and comments for our own.

Learning how to upload packages and doing an entire exercise by myself.

Miscellaneous (4)

Method and example to use R program

Just myself soaked in the R tool was good enough...and instructor was very helpful on directing us to right places for further help

Step by step how to do the analysis

I learn some of the R commands which enlarge my horizons so that it is very helpful for my future research.

What was the single least useful activity/concept offered during the seminar? (n=10)

Everything was useful (5)

None

I can't find anything that was lest useful

None

None.

I have never used R, either SAS so everything in this seminar was useful for me

Miscellaneous (5)

Handouts about data and hypotheses

Looking up how to do everything.. just provide the code

I can't think of anything that was not useful. The least useful thing was probably attaching data (but only because I always used $ instead, it will likely be useful in the future).

Most of us have a basic knowledge of statistics, so I felt there was too much time devoted to teaching stats concepts that we already knew. The emphasis should be on how to use R, not how to do stats.

The least useful thing is that the seminar was only 6 classes, I think with the turn over of participants and the interest we really need a follow up, and an introductory class of R for new students

Please indicate any suggestions you have for making the written seminar materials you received more useful to someone learning how to use R in a biological context: (n=10)

Use a book or manual (2)

We could follow a book like the Gotelli and Ellison stats book, and go from chapter to chapter and learn how to do the basic tests in each chapter using R.

I think that it would be nice to have kind of a manual instead of having copies of a book for the exercise

Include handouts with codes (3)

Handouts about code and their input arguments

Being given written code before class would have been helpful

I will give handouts with the basics of R (i.e. the code for an ANOVAs, or how to enter data) that will help people to use it after they forgot the details of the course (i.e. 6 months after the course)

Miscellaneous (2)

None

I don't think they could have been. Pretty clear and straightforward handouts.

What topics (besides R) would you like to see covered at future NIMBioS/EEB seminars? (n=11)

Bayesian modeling

Understanding what parameter values can be accurately extracted from a data set

Systems biology markup language (SBML)

Working with Genomic datas

SAS

Permutation-based tests.

Multivariate stat using R

Math ecology (3)

Basics of math ecology. Or modeling for people that are not math people.

A much more detailed R seminar (perhaps even a class). But also, perhaps more general math ecology for graduate students that have a strong ecology background but little math especially as it relates to ecology. As it is now, anything that has to do with math ecology seems to assume an extremely high knowledge of math and less ecology. I think things that for people coming from the ecology side, it is much harder to get into the math ecology than for students coming from the math side.

I would also like to take a seminar about SAS and Math Ecology

More about R (2)

More on R, Basic modeling for biology

A much more detailed R seminar (perhaps even a class). But also, perhaps more general math ecology for graduate students that have a strong ecology background but little math especially as it relates to ecology. As it is now, anything that has to do with math ecology seems to assume an extremely high knowledge of math and less ecology. I think things that for people coming from the ecology side, it is much harder to get into the math ecology than for students coming from the math side.

Additional comments: (n=4)

The instructor made a great job teaching this seminar

None

Great stuff. I learned a lot, and think this R seminar should be expanded on in the future.

Good job Marco!

Appendix C

List of Participants

Last name	First name	Department	Institution
Austin	Emily	Ecology and Evolutionary Biology	University of Tennessee
Barrios	Noelia	Ecology and Evolutionary Biology	University of Tennessee
Barun	Arijana	Ecology and Evolutionary Biology	University of Tennessee
Buckley	Nicholas	Ecology and Evolutionary Biology	University of Tennessee
Dimarco	Romina	Ecology and Evolutionary Biology	University of Tennessee
Felker-Quinn	Emmi	Ecology and Evolutionary Biology	University of Tennessee
Goswami	Sumit	Biochemistry Molecular Biology	University of Tennessee
Hudson	Patrik	Ecology and Evolutionary Biology	University of Tennessee
Hunkapiller	Tim	Ecology and Evolutionary Biology	University of Tennessee
Kwon	Hae-Ryong	Genome Science & Technology	University of Tennessee
Lessard	JP	Ecology and Evolutionary Biology	University of Tennessee
Matheny	Brandon	Ecology and Evolutionary Biology	University of Tennessee
Neilan	Rachael	Math	University of Tennessee
Nunez	Martin	Ecology and Evolutionary Biology	University of Tennessee
Rodriguez-Cabal	Mariano	Ecology and Evolutionary Biology	University of Tennessee
Shakya	Mijun	Genome Science & Technology	University of Tennessee
Stuble	Katie	Ecology and Evolutionary Biology	University of Tennessee
Todd-Thompson	Megan	Ecology and Evolutionary Biology	University of Tennessee
Vaughn	Justin	Biochemistry Molecular Biology	University of Tennessee
Xing	Fei	Math	University of Tennessee

Evaluation Report

High Performance Computing Tutorial

March 16-18, 2009

Pamela Bishop
Program Evaluation Coordinator
National Institute for Mathematical and Biological Synthesis
April 15, 2009

Table of Contents

Summary of Results

Brief Synopsis

The High Performance Computing (HPC) Tutorial was conducted on the University of Tennessee (UT) campus March 16-18, 2009. The purpose of the tutorial was to disseminate the information necessary for organizations and individuals to leverage HPC resources for research at the interface of biological/computational/mathematical research. The tutorial consisted of a series of short (30 -90 minute) presentations by invited speakers, with hands-on sessions as well.

The majority of the HPC Tutorial participants found the information presented useful and relevant, but indicated they would like a more hands-on format for future tutorials. While the workshop appeared to meet its main goal of enhancing participant capabilities to leverage HPC resources for biological/computational/mathematical research, participant responses indicated a need for more tutorial offerings on a variety of HPC subjects.

Highlights of Results

- The HPC Tutorial participants comprised a diverse array of backgrounds, including graduate students, postdoctoral researchers, university faculty and staff, and those from the non-profit sector.

- Participants came from a diverse array of business/education/research backgrounds, including ecology, biology, engineering, mathematics, and biophysics.

- Most participants (95%) indicated they were either ”very satisfied” or “satisfied” with the tutorial overall.

- Ninety percent of participants indicated they would recommend this tutorial to others.

- Most participants (75%) indicated they felt the amount of content offered during the tutorial was just right, 15% thought there was too much content for the allotted time, and 10% thought there was too little content offered.

- On the whole, most participants (90%) indicated that participating in the tutorial enhanced their capabilities to leverage HPC resources for research at the interface of math and biology.

- While most participants (85%) indicated the format of the tutorial was effective, the most common suggestion for improvement was to include more hands-on activities.

- Overall, participants were satisfied with the housing, travel, and tutorial facilities.

- Participants expressed interest in learning about a variety of HPC topics at possible future tutorials.

Conclusion and Recommendations

The majority of the HPC Tutorial participants found the information presented useful and relevant, but indicated they would like a more hands-on format for future tutorials. While the workshop appeared to meet its main goal of enhancing participant capabilities to leverage HPC resources for biological/computational/mathematical research, participant responses indicated a need for more tutorial offerings on a variety of HPC subjects. The recommendations from analysis of participant survey data are as follows:

- Offer more HPC tutorials on topics specified by participants Appendix B
- Consider offering a "networking" workshop where participants can present on their current HPC research/interests and discuss collaboration opportunities with other researchers
- Consider offering an online HPC tutorial
- Change the tutorial format to include more hands-on activities and demonstrations
- To better understand and meet participant needs, include a question on the tutorial application where applicants can indicate the top three topics they are interested in learning about during the tutorial

High Performance Computing Tutorial Evaluation

Background

Introduction

The High Performance Computing (HPC) Tutorial was conducted on the University of Tennessee (UT) campus March 16-18, 2009. The leadership team for the tutorial included staff from NIMBioS, UT's department of Electrical Engineering and Computer Science, and UT's National Institute for Computational Sciences. The purpose of the tutorial was to disseminate the information necessary for organizations and individuals to leverage HPC resources for research at the interface of biological/computational/mathematical research. The tutorial consisted of a series of short (30 -90 minute) presentations by invited speakers, with hands-on sessions included at the end of the first two days. The third day concluded at noon and had no hands-on session scheduled. Speakers at the tutorial presented on topics in the following areas:

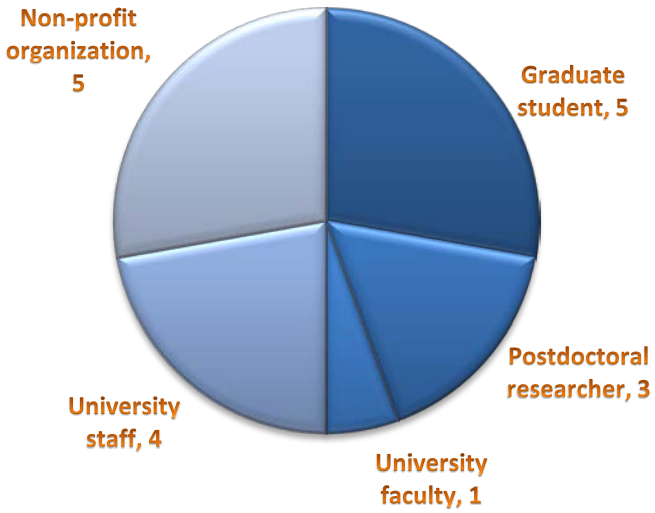
- TeraGrid resources,
- visualization and storage,
- queue and submission management,
- storage and data management,
- constraints and benefits of different parallelization approaches,
- computational biology resources,
- MATLAB distributed computing toolbox; and
- case studies in use of HPC in computational/integrative biology.

Respondent Demographics

A survey, which included optional demographic questions, was disseminated to all participants to gather information about their perception of the tutorial. Eighteen of the twenty tutorial participants responded to optional demographic survey questions about themselves. Of the 17 males and one female responding to these questions, 11 self-identified as white, 5 as Asian, and 1 as black or African American. One respondent did not indicate a racial identification.

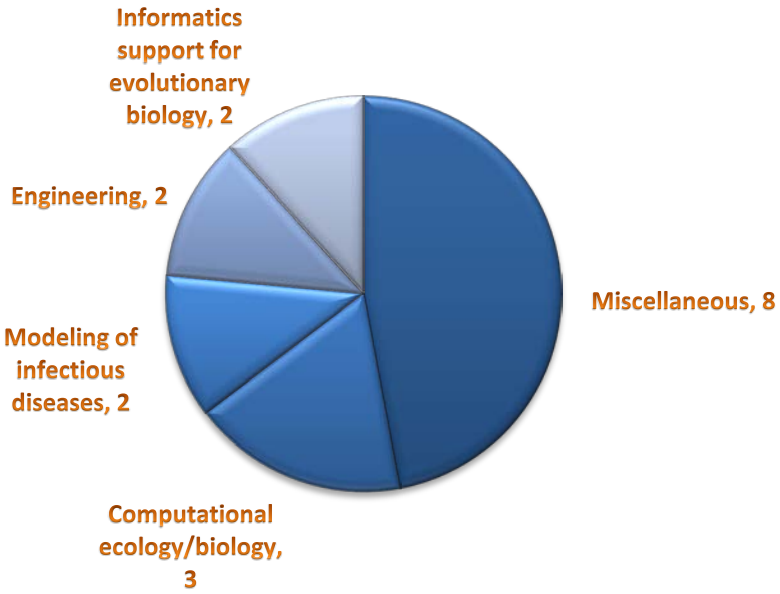
Respondents indicated they came from a variety of backgrounds, including graduate students, postdoctoral researchers, university faculty and staff, and non-profit organizations (Figure 1). Of the 13 respondents from institutes for higher education, 11 indicated they were from 4-year colleges/universities, two of which were classified as minority-serving.

Figure 1. Status of tutorial survey respondents



Respondents indicated came from diverse areas of business/education/research as well (See Appendix B for a full listing). The majority of business/education/research areas listed in response to this question did not fit into a particular theme; however, some themes did emerge during analysis of these responses, including computational ecology/biology, modeling of infectious diseases, engineering, and informatics support for evolutionary biology (Figure 2).

Figure 2. Survey respondents' main area of business/education/research



Six respondents indicated their education/research activities were currently supported through NSF awards, including the iPlant Collaborative and the National Center for Ecological Analysis and Synthesis (See Appendix B for a full listing of NSF award titles).

Evaluation Design

Evaluation Questions

Because this was the first tutorial hosted by NIMBioS, the focus of the evaluation was formative for the purpose of improving the content and format of future tutorials. The evaluation framework was guided by Kirkpatrick's Four Levels of Evaluation model for training and learning programs (Kirkpatrick, 1994[1]). The evaluation questions were developed according to level one of the model, participants' reactions, in order to gather information about how participants felt about the content and format of the tutorial. Several questions constituted the foundation for the evaluation:

1. Did participants find the tutorial useful?
2. Were participants satisfied with the tutorial content?
3. Was the format of the tutorial appropriate?
4. Was the tutorial appropriate to participants' level of expertise?
5. What would participants change about the tutorial to make it better?
6. What topics would participants like to cover at future tutorials?
7. Will participants be able to use the information and resources presented in order to leverage HPC resources?
8. Were participants satisfied with the tutorial facilities?
9. Were participants satisfied with the housing and travel accommodations?

Evaluation Procedures

An electronic survey covering the evaluation questions was designed by the Evaluation Coordinator and sent to the Director and Deputy Director of NIMBioS for review and approval. The final instrument was hosted online via UT's secure survey web host mrInterview. Links to the survey were sent to all 20 participants in the tutorial on the morning of the last day of the tutorial, March 18, 2009. The Evaluation Coordinator spoke briefly during the concluding remarks presentation to let the participants know that they should have received the survey link, and also to convey the importance of getting their feedback about the tutorial for the purpose of improving future offerings. Reminder emails were sent to non-responding participants on March 23 and 25, 2009. By April 1, 20 participants had given their feedback, for a response rate of 100%.

Data analysis

Data from the electronic survey included both forced-response and supply-item questions. All data were downloaded from the online survey host into the statistical analysis software SPSS for analysis. Quantitative data were summarized descriptively using SPSS, while qualitative data were transferred to SPSS Text Analysis for Surveys. Qualitative responses were categorized by question and analyzed for trends.

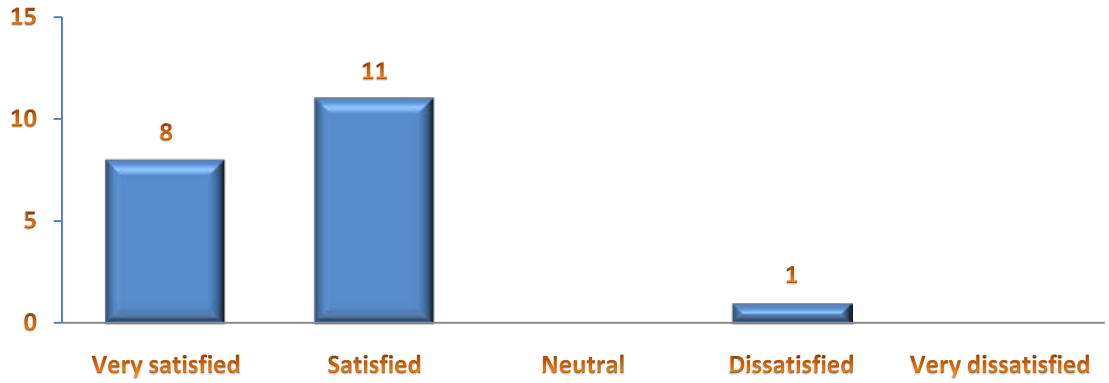
[1] From Kirkpatrick, D.L. (1994). *Evaluating Training Programs: The Four Levels*. San Francisco, CA: Berrett-Koehler

Findings

Overall Satisfaction

Most respondents responded favorably to a question about overall satisfaction with the tutorial (Figure 3). The single respondent who indicated dissatisfaction with the tutorial overall was unhappy with the format of the tutorial, indicating that more hands-on time would have been more appropriate. The dissatisfied respondent also indicated he/she felt the tutorial offered to much content for the allotted time.

Figure 3. Overall respondent satisfaction with the tutorial



The majority of respondents responded favorably to overall questions about the tutorial, including level at which content was presented, usefulness of the hands-on exercises, and knowledge of the instructors. All but one of the respondents agreed they would recommend the seminar to others (Table 1).

Table 1. *Number of responses to general tutorial rating questions, by response category*

	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
The tutorial was appropriate to my level of expertise.	6	12	2		
The tutorial met my expectations.	8	9	1	2	
The hands-on exercises were useful.	9	6	5		
The presentations were useful.	9	9		2	
The instructors were very knowledgeable about their topics.	14	5	1		
I would recommend this tutorial to others.	10	8	1	1	

Tutorial Content and Format

Respondents answered several questions about the tutorial content and format. Most respondents (75%) felt the amount of content offered was just right, and the majority of respondents (85%) felt the format was effective (Figures 4 & 5).

Figure 4. Amount of content offered during tutorial

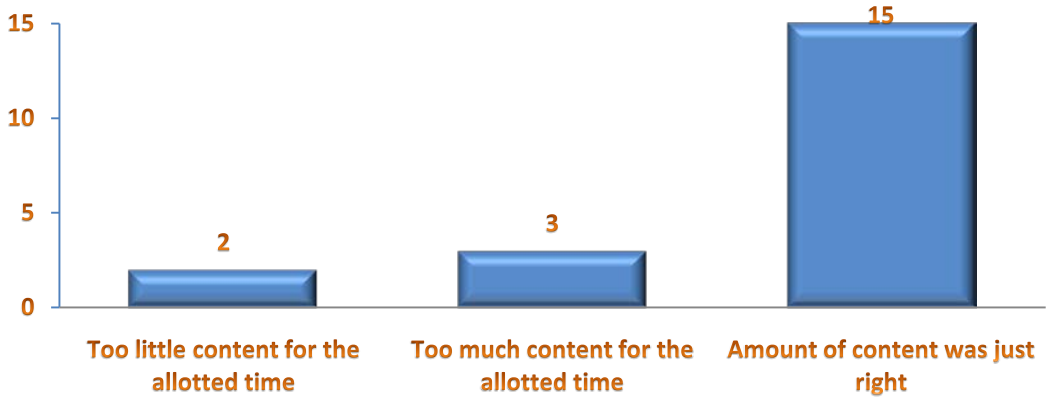
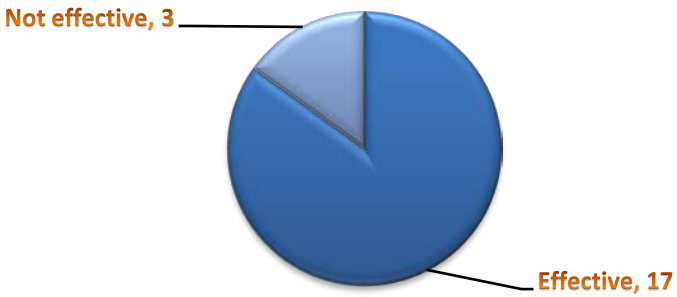


Figure 5. Effectiveness of tutorial format



Two of the respondents indicating they felt the format was not effective said they would have liked to have seen more hands-on activities and less time devoted to lecture (See Appendix B for a full listing of responses to all open-ended questions):

> *"There needs to be *much* more time for hands-on sessions. Programming knowledge and know-how is best learned and most effectively retained by doing it, not by hearing about it. My suggestions would be to give the hands-on sessions in fact the majority of the time - lectures in between can introduce the learning goals, give an overview and hints, and then respondents can work through the material in a hands-on way through exercises."*

> *"MPI and other parallel programming lectures (should be) allotted less time and concentrated on explaining concepts (with minimal, if at all, use of code examples), while hands-on sessions (should be) given more time and (be) more structured (interspersed with 5min mini-lectures based on the code examples)."*

Participants were asked to comment on the most useful aspect of the tutorial. Analysis of responses to this question revealed the most commonly mentioned aspect was the hands-on exercises (n=8). Specifically, the MPI hands-on exercises were mentioned by several respondents. Other aspects mentioned by more than one respondent were the HUB and profiling presentations. Some respondent comments about the most useful aspects of the tutorial:

> *"The MPI programming exercise AND the 'from the trenches' perspectives, of Christian Halloy and others on how to port existing applications, into the MPI environment".*

> *"For me it was the presentation on Science Gateways, and Nano Hub in particular. The Rappture toolkit."*

> *"I found the analysis and profiling session very interesting."*

In addition to the most useful aspect of the tutorial, respondents were asked their opinions of the least useful aspect. Only six participants responded to this question, and no particular themes emerged during analysis of these responses. One of these participants responded that the whole tutorial was useful:

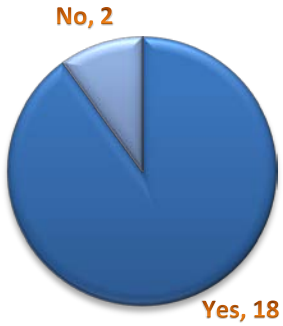
> *"I could not pick one: all presented material was appropriate for this tutorial."*

Responses from the remaining five respondents indicated they felt the MATLAB programming, science portal, and graduate student presentations were the least useful aspects of the presentation. One respondent's comment:

> *"CS grad student presentations on clique/graph processing. The topics appeared disjointed and very narrowly focused. While interesting theoretically, perhaps using "real world" problems to illustrate these concepts would have been more helpful."*

When asked if they felt the tutorial would enhance their capabilities to leverage HPC resources for research at the interface of math and biology, the majority of respondents (90%) answered "yes" (Figure 6).

Figure 6. Enhanced participant capabilities to leverage HPC resources



One of the two respondents who answered "no" to this question indicated that they did not have sufficient background knowledge to understand all of the information presented:

> *"Well... I think this tutorial was above my level and therefore I think it would be nicer if it was longer and about more basic topics. However, I am delighted about the possibilities that I was exposed during this tutorial."*

Accommodations

Housing and Travel

Of the six respondents indicating their housing arrangements during the tutorial were handled by NIMBioS, four reported being "very satisfied" with the housing, while two reported feeling "neutral" about it. One respondent indicated that the hotel was nice, but the "wireless Internet did not work all the time."

Of the four respondents indicating their travel arrangements were handled by NIMBioS, all reported being either "satisfied" or "very satisfied" with this aspect.

Tutorial Accommodations

The six participants who answered questions about the tutorial accommodations all responded favorably about facility comfort and resources, as well as food and drinks supplied by NIMBioS (Table 2).

Table 2. *Number of responses to general tutorial accommodations questions, by response category*

	Very satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
Comfort of the facility in which the tutorial took place	5	1			
Resources of the facility in which the tutorial took place	5	1			
Quality of meals	4	2			
Quality of drinks and snacks provided	4	2			

Suggestions for Future Tutorials

Participants were asked several questions about what they would like to see at future NIMBioS tutorials. Analysis of open-ended responses indicated that a common request was to make future tutorials more hands-on in nature. One respondent indicated he/she felt that programming knowledge is best learned by doing it rather than hearing about it, and thus suggested that hands-on activities constitute the majority of the program during future tutorials, with presentations interspersed to support the hands-on exercises.

When asked what topics they would have liked to have covered in this tutorial if given more time, the most common response included more information about MPI (See Appendix B for a complete listing of responses). One participant's comments about what he/she would like to have covered:

"High-level overview of the MPI interface (think pictures rather than code examples and breadth of coverage of available features rather than syntactic differences of C vs. Fortran)….Programming biological problems with tools or languages that are higher-level than MPI. Parallel features (like Map/Reduce) in R and Matlab are steps in the right direction, but are not sufficient. There are research and upcoming industrial languages for parallel programming (e.g. X10 from IBM, Fortress from Sun) that promise to be better for a practitioner who needs to solve a problem rather than create a distributable software package. Such tools may be still in their infancy, but NIMBioS is well-positioned to be the center of expertise in applying them."

Other themes found in participant responses to this question included parallelization and individual/agent based modeling:

"Parallel bio-applications"

"HPC for hierarchical data. This is a real challenge as subsets of the data aren't independent of each other and so partitioning the problem for parallelization is a real problem. The data clustering example was a nice start in this regard, though what would have been good is to actually go through the strategies in a maybe simplified example and see hands-on what the pitfalls are and how one might go about surmounting the challenge. The authors of BEAST (A. Rambaut, A. Drummon, M. Suchard) and RAxML (A. Stamatakis) should be able to provide excellent material to this - they are actively working on parallelizing ML calculations for trees, for example."

"A section on distributed individual-based agent-based modeling might have been useful."

In response to a question about topics participants would like to see at future tutorials, respondents offered up several suggestions. Although most of the suggestions were singular, two respondents indicated they would be interested in a tutorial focused on discussing how to collaborate and share data, and two others indicated they would like a tutorial focused on ideas and resources for using HPC in specific research settings. Some participant comments:

"A venue to discuss collaboration opportunities might be useful."

"It might be useful to solicit a list of problems that individuals/organizations face which they feel would benefit from use of HPC resources. These people could then be brought together for a workshop or working group, along with HPC specialists, to scope out design/specification documents which could provide a road map for the participants to convert existing applications to HPC ready applications. These case studies could then be used as tutorials later on."

"I really enjoyed the presentations covering HPC applications -- I would like to see more resources for researchers to get ideas about how to incorporate HPC into their own applications."

In addition to suggestions for future tutorials, all 20 respondents indicated they would participate in online tutorials to learn more about HPC topics.

Conclusion and Recommendations

The majority of the HPC Tutorial participants found the information presented useful and relevant, but indicated they would like a more hands-on format for future tutorials. While the workshop appeared to meet its main goal of enhancing participant capabilities to leverage HPC resources for biological/computational/mathematical research, participant responses indicated a need for more tutorial offerings on a variety of HPC subjects. The recommendations from analysis of participant survey data are as follows:

- Offer more HPC tutorials on topics specified by participants Appendix B
- Consider offering a "networking" workshop where participants can present on their current HPC research/interests and discuss collaboration opportunities with other researchers
- Consider offering an online HPC tutorial
- Change the tutorial format to include more hands-on activities and demonstrations
- To better understand and meet participant needs, include a question on the tutorial application where applicants can indicate the top three topics they are interested in learning about during the tutorial

Appendix A

HPC Tutorial Respondent Survey

HPC Tutorial Survey

Thank you for taking a moment to complete this survey. Your responses will be used to improve the tutorials offered by the National Institute for Mathematical and Biological Research. Information supplied on the survey will be confidential, and results will be reported only in the aggregate.

NIMBioS will send two reminder emails to tutorial respondents who have not responded to this survey. If you would like to be excluded form these reminder emails, please enter your name below. Your survey results will still remain confidential and your name will not be associated with any of your responses in reporting of survey results.

Name:

Please check the appropriate box to indicate your level of agreement with the following statements about this tutorial:

	Strongly agree	*Agree*	*Neutral*	*Disagree*	*Strongly disagree*
This tutorial was appropriate to my level of expertise.					
This tutorial met my expectations.					
The hands-on exercises were useful.					
The presentations were useful.					
The instructors were very knowledgeable about their topics.					
I would recommend this tutorial to others.					

How do you feel about the format of the tutorial?
This was a very effective format for learning the material
This was not a very effective format for learning the material *(branch to open-ended response)*

The tutorial format would have been more effective if: _____

How do you feel about the amount of content offered during the tutorial? (check one)
Too little content for the allotted time
Too much content for the allotted time
Amount of content was just right

What topics would you have liked to have covered in this tutorial if given more time?

What was the single *most* useful activity/concept offered during the tutorial?

What was the single *least* useful activity/concept offered during the tutorial?

Do you feel this tutorial will enhance your capabilities to leverage HPC resources for research at the interface of math and biology?
Yes
No *(branch to Please indicate)*

Please indicate how you think the tutorial could be improved to help you leverage HPC resources for your research:

Indicate your overall level of satisfaction with the tutorial:
Very satisfied
Satisfied
Neutral
Dissatisfied
Very dissatisfied

Would you participate in online tutorials to learn more about HPC topics?
Yes
No

What topics would you like to see covered at future NIMBioS tutorials?

Do you currently work under an NSF supported grant?
No
Yes *(branch to Name of grant)*

Name of grant:

Were your housing arrangements during the tutorial arranged by NIMBioS?
Yes (branch to satisfaction with housing)
No

Overall, how satisfied were you with your housing arrangements?

Comments about housing arrangements:

Was your transportation to Knoxville arranged by NIMBioS?
Yes (branch to satisfaction with transportation)
No

Overall, how satisfied were you with your travel arrangements?

What could NIMBioS have done to make your stay in Knoxville more enjoyable (e.g. better information about nearby attractions, public transportation, etc.)?

Other comments about travel arrangements:

Please indicate your level of satisfaction with the HPC Tutorial accommodations:	*Very satisfied*	*Satisfied*	*Neutral*	*Dissatisfied*	*Very Dissatisfied*
Comfort of the facility in which the tutorial took place					
Resources of the facility in which the tutorial took place					
Quality of meals					
Quality of drinks and snacks provided					

Comments about HPC Tutorial accommodations:

Please provide any additional comments about your experience with the HPC Tutorial:

Demographics

I am a(n): (check one that best describes you)
Undergraduate student
Graduate student
Postdoctoral researcher
University faculty—teaching/research
University faculty—teaching only
University faculty—research only
University staff *(all university/student answers branch to Describe your institution:)*
Business/industry employee
Non-profit organization employee

Describe your institution: (check all that apply)
2-year college/university
4-year college/university
Minority serving institution
Women's only institution

Please give a 2-5 word description of your main area of business/education/research (e.g. mathematical immunology, high school science teacher, etc.):

Gender: (check one)
Male
Female

Are you Hispanic or Latino? (check one)
Yes
No

What is your racial background? (check all that apply)
American Indian or Alaska Native
Native Hawaiian or other Pacific Islander
Asian
Black or African American
White

Appendix B

Open-ended Responses

The tutorial format would have been more effective if: (n=2)

There need to be *much* more time for hands-on sessions. Programming knowledge and know-how is best learned and most effectively retained by doing it, not by hearing about it. My suggestions would be to give the hands-on sessions in fact the majority of the time - lectures in between can introduce the learning goals, give an overview and hints, and then participants can work through the material in a hands-on way through exercises.

MPI and other parallel programming lectures were allotted less time and concentrated on explaining concepts (with minimal, if at all, use of code examples), while hands-on sessions were given more time and were more structured (interspersed with 5min mini-lectures based on the code examples).

What topics would you have liked to have covered in this tutorial if given more time? (n=13)

Miscellaneous (6)

This is difficult to say, as codes and application areas can be so drastically distinct. If the participants were from a more focused application area, then taking an real example code through the profiling and scaling process seems like it would be quite useful. This would provide opportunities to see different algorithms, approaches and libraries that may be of use to coders in that application domain.

Perhaps three more hours of dedicated lab time to complete , the examples. , Also, a session on COTS cluster solutions such as ROCKS.

Perhaps a more in-depth discussion on small cluster computing, which can be used as a "stepping stone" to the HPC arena.

Identifying the roles of a software architect in exploiting the HPC for biological and other scientist who may be new to HPC.

- Current projects utilizing Kraken/TeraGrid, - NanoHub

* a little more information about obtaining accessing to HPC resources, * a little more information about the differences between related technologies, such as grid, * a little more information about educational or instructional resources about HPC

MPI (3)

MPI and OpenMP hybrid techniques

More MPI

- High-level overview of the MPI interface (think pictures rather than code examples and breadth of

coverage of available features rather than syntactic differences of C vs. Fortran.) - This is provided MPI will still remain a major topic, see next. , - Programming biological problems with tools or languages that are higher-level than MPI. Parallel features (like Map/Reduce) in R and Matlab are steps in the right direction, but are not sufficient. There are research and upcoming industrial languages for parallel programming (e.g. X10 from IBM, Fortress from Sun) that promise to be better for a practitioner who needs to solve a problem rather than create a distributable software package. Such tools may be still in their infancy, but NIMBioS is well-positioned to be the center of expertise in applying them.

Parallelization (2)

parallel bio-applications

HPC for hierarchical data. This is a real challenge as subsets of the data aren't independent of each other and so partitioning the problem for parallelization is a real problem. The data clustering example was a nice start in this regard, though what would have been good is to actually go through the strategies in a maybe simplified example and see hands-on what the pitfalls are and how one might go about surmounting the challenge. The authors of BEAST (A. Rambaut, A. Drummon, M. Suchard) and RAxML (A. Stamatakis) should be able to provide excellent material to this - they are actively working on parallelizing ML calculations for trees, for example.

Modeling (2)

Optimal control and individual/agent-based modeling using HPC.

A section on distributed individual-based agent-based modeling might have been useful.

What was the single *most* useful activity/concept offered during the tutorial? (n=14)

Hands-on exercises (8)

The hands-on session on Monday afternoon.

Real time experience on kraken.

Hands-on Tutorial

Hands on working on Kraken with sample MPI code

Basics of HPC and machine architecture and hands-on exercises

The MPI programming exercise AND the 'from the trenches' perspectives, of Christian Halloy and others on how to port existing applications , into the MPI environment.

The MPI exercises to build on the MPI overview.

MPI tutorial

Miscellaneous (2)

Among NIMBioS presentations, Eric Carr's and Tabitha Samuel's

overview of parallel features in MATLAB and R.
* exposure to teragrid and freely available resources

HUBs (3)

The guest lecture on HUBzero.

HUBs, GPUs and the discussions

For me it was the presentation on Science Gateways, and Nano Hub in particular. The Rappture toolkit described at that site will be quite useful.

Profiling (2)

I found the analysis and profiling session very interesting.

High Performance profiling

What was the single *least* useful activity/concept offered during the tutorial? (n=6)

They were all pretty good, but if I HAD to select one, , it would be the discussion on MATLAB programming.

the science portal or hub presentation (it was vague as to why this was important as it related to HPC, except that it utilized HPC resources on the backend).

The lectures that went into excruciating details on the API calls.

Some background and introductory material would have been sufficient if supplied in print. The presenters probably could have jumped to advanced topics much quicker.

I could not pick one: all presented material was appropriate for this tutorial.

CS grad student presentations on clique/graph processing. The topics appeared disjointed and very narrowly focused. While interesting theoretically, perhaps using "real world" problems to illustrate these concepts would have been more helpful.

Please indicate how you think the tutorial could be improved to help you leverage HPC resources for your research: (n=1)

Well... I think this tutorial was above my level and therefore I think it would be nicer if it was longer and about more basic topics. However, I am delighted about the possibilities that I was exposed during this tutorial

What topics would you like to see covered at future NIMBioS tutorials? (n=13)

Miscellaneous (9)

MPI, Dense Lin Algebra

More of basics.

More in-depth MATLAB PCT topics.

Infectious disease modeling

How about a session focusing on simulation models used in Ecology, (such as the Optimal Control talk)? Many Ecologists would be interested, in this.

Effective and authentic use of HPC in the classroom.

Detailed HPC topics that will be modular in nature and will help the learning process. For eg: Understanding MPIs is a major topic. In a similar way one could start with LINUX/CLI/UNIX concepts keeping biologist in mind.

Parallelizing calculations over hierarchical data structures, such as trees. Loop parallelization.

Bioinformatics

Collaboration (2)

A venue to discuss collaboration opportunities might be useful.

Data Sharing, Collaboration Computing

Using HPC in research (2)

It might be useful to solicit a list of problems that individuals/organizations face which they feel would benefit from use of HPC resources. These people could then be brought together for a workshop or working group, along with HPC specialists, to scope out design/specification documents which could

provide a road map for the participants to convert existing applications to HPC ready applications. These case studies could then be used as tutorials later on.

I really enjoyed the presentations covering HPC applications -- I would like to see more resources for researchers to get ideas about how to incorporate HPC into their own applications.

Award title: (n=4)

SGER: A Novel Multi-Scoring Functions Sampling Approach to Improve Protein Modeling Resolution and It's Applications in Protein Loop Structure Prediction (CCF-0829382)

NSDL Pathways.

National Center for Ecological Analysis and Synthesis

iPlant Collaborative

Institution at which award is held: (n=4)

University of Arizona

UC Santa Barbara

Shodor

North Carolina A&T State University

Comments about housing arrangements: (n=1)

Hotel is nice, but wireless Internet did not work all of the time.

What could NIMBioS have done to make your stay in Knoxville more enjoyable (e.g. better information about nearby attractions, public transportation, etc.)? (n=3)

Not much. All my needs were met!, Oh, ONE thing: I did not receive the emails that told everyone (else) when , the Monday session was to begin. Despite calls and emails to Eric Carr. So , I was late to the first session, something I don't like to have happen. , So, a bit more attention to getting the word out!

None

Everything was fine.

Other comments about travel arrangements: (n=0)

Comments about HPC Tutorial accommodations: (n=1)

Overall, a good tutorial

Please provide any additional comments about your experience with the HPC Tutorial: (n=0)

Please give a 2-5 word description of your main area of business/education/research (e.g. mathematical immunology, high school science teacher, etc.): (n=17)

Miscellaneous (8)

Computational Protein Structure Modeling

HPC solutions in the area of large-scale social network agent-based simulations.

applied and computational mathematics

Adaptive Finite Element, Non conforming Methods

geospatial information system

Computational Biophysics

systems manager for iPlant Collaborative

mathematical study of phase transitions

Computational ecology/biology (3)

Computational Ecology
computational biology
computational biology education k-college

Modeling of infectious diseases (2)

I am interested in modeling infectious disease transmission on managed dairy herds and evaluating the effectiveness of control measures such as culling intervention and vaccination.

Agent based modeling of infectious diseases

Engineering (2)

Math Models and Simulations in Environmental/civil engineering.

Mechanical Engineering, particularly Computational Fluid Dynamics(CFD)

Informatics support for evolutionary biology (2)

Informatics support and cyber infrastructure for evolutionary biology

informatics support for evolutionary biology

Appendix C

List of Participants

Participants

Last name	First name	Institution
Aristotelous	Andreas	University of Tennessee
Banks	David	University of Tennessee
Bryant	Stephanie	RTI International
Diglio	Simoni	RTI International
Ganapathi	Laxminarayana	RTI International
Gapeyev	Vladimir	National Evolutionary Synthesis Center (NESCent)
Gewecke	Nicholas	University of Tennessee
Krause	Jeff	Shodor
Lapp	Hilmar	National Evolutionary Synthesis Center (NESCent)
Li	Yaohang	North Carolina A&T State University
Lu	Zhao	National Evolutionary Synthesis Center (NESCent)
Naswa	Sudhir	University of Tennessee
Ortega	Davi	University of Tennessee
Reeves	Rick	NCEAS
Roberts	Douglas	RTI International
Saum	Michael	University of Tennessee
Sekachev	Mikhail A	University of Tennessee
Skidmore	Edwin	IPLANT COLLABORATIVE
Solano	Eric	RTI International
Wei	Yaxing	ORNL

Presenters

Last name	First name	Institution
*Berry	Michael W	University of Tennessee
*Carr	Eric	University of Tennessee
Duke-Sylvester	Scott	Emory University
Eblen	John	University of Tennessee
*Ferguson	Jim	NICS
Halloy	Christian	NICS
*Langston	Mike	University of Tennessee
Loftis	Bruce	NICS
McLennan	Michael	Purdue University
Rogers	Gary	University of Tennessee
Tomov	Stan	University of Tennessee
Wong	Kwai Lam	NICS
Yost	Christal	NICS

*Organizer of event

Evaluation Report

Board of Advisors Virtual Meeting

March 24, 2009

Pamela Bishop
Program Evaluation Coordinator
National Institute for Mathematical and Biological Synthesis
May 7, 2009

Table of Contents

Summary of Evaluation Findings

Brief synopsis

Overall, the Board of Advisors members felt that the entirely virtual format for the meeting went relatively well for a first run, with several respondents indicating they preferred the virtual format over an in-person one. An overall issue raised by several respondents was lack of organization with the evaluation process during the meeting.

In general, respondents thought using WebEx as a web conferencing tool was fine, but were split on their opinions about using Google Docs to evaluate applications for funding requests. Most of the issues with Google Docs cited by respondents revolved around the clarity of the instructions, and the format of the spreadsheet that contained all of the applicants' materials.

Highlights of Results

- Ninety-one percent of respondents also felt that participating in the virtual meeting was worth their time.
- Although reactions were mixed about the completely virtual format of the meeting, the majority of participants indicated they felt it was better than meeting face-to-face.
- The majority (91%) of respondents felt that the entirely virtual meeting was an interesting experience in that they learned something about virtual meeting technology.
- Almost all (91%) of the respondents felt well-prepared for the virtual meeting.
- An overall issue raised by several respondents was lack of organization with the evaluation process during the meeting.
- Respondents were split on their opinions of Google Docs, with the main complaints being that the instructions were confusing and the spreadsheet format was unintuitive and difficult to navigate.
- In general, respondents thought using WebEx as a web conferencing tool was fine, with the main complaints revolving around reading and interpreting the instructions.
- Only one respondent reported having any serious difficulty using WebEx.

Conclusion and Recommendations

Overall, the BoA members responding to the survey felt that the entirely virtual format for the meeting went relatively well for a first run, with several respondents indicating they preferred the virtual format over an in-person one. An overall issue raised by several respondents was lack of organization with the evaluation process during the meeting.

In general, respondents thought using WebEx as a web conferencing tool was fine, but were split on their opinions about using Google Docs to evaluate applications for funding requests. Most of the issues with Google Docs cited by respondents revolved around the clarity of the instructions, and the format of the spreadsheet that contained all of the applicants' materials. The recommendations from analysis of participant survey data are as follows:

- Continue to offer virtual meetings to the BoA using WebEx.
- If using WebEx for future virtual meetings, disable the voice callout when participants leave or enter the meeting.
- Reconsider the instructions to participants regarding the use of WebEx, especially regarding installation and testing of the software.
- Make the WebEx instructions shorter, if possible.
- If possible, consider imposing a deadline several days before the meeting for all members to have applications reviewed and rated, and send reminders to those who have not done so by the deadline.
- Consider researching other web sharing services besides Google Docs for sharing funding applications.
- If use of Google Docs for this purpose is continued for future meetings, reconsider the instructions to applicants to make them more succinct.

Board of Advisors Virtual Meeting Evaluation

Background

The first NIMBioS Board of Advisors (BoA) Virtual Meeting was held from 12:00 PM to 2:00 PM EST on March 24, 2009 via WebEx, a web conferencing service. The main purpose of the meeting was to evaluate requests for NIMBioS support for sabbatical visitors, investigative workshops, working groups, and postdoctoral fellows. Other items on the agenda included discussion of NIMBioS activities, structure of the Board, and NIMBioS' strategic plan (See Appendix A for the complete agenda).

Participants in the virtual meeting included 16 BoA members, as well as the Director, Deputy Director, and Associate Directors of NIMBioS. All application materials for support requests were available to meeting participants online at Google Docs. Scoring sheets, along with instructions for evaluating the applications, were available on Google Docs as well. Instructions to participants for using Google Docs and WebEx were sent to all participants in advance of the meeting.

Evaluation Design

Evaluation Questions

Because this was the first entirely virtual BoA meeting hosted by NIMBioS, the focus of the evaluation was formative for the purpose of improving the format and procedures of similar meetings in the future. Several questions guided the evaluation:

1. Did participants feel they were adequately prepared by NIMBioS staff for the meeting?
2. Were the instructions clear for:
    a. How the meeting would proceed?
    b. How to access the necessary documents on Google Docs?
    c. How to use WebEx?
3. Was Google Docs an effective document sharing service?
4. What problems did participants have using Google Docs?
5. What (if any) other document sharing tools do participants feel would be more effective?
6. Was WebEx an effective virtual conferencing service?
7. What problems did participants have using WebEx?
8. What (if any) other virtual conferencing services do participants feel would be more effective?
9. How did participants feel about the entirely virtual format of the meeting?
10. What suggestions do participants have for making future virtual meetings more productive?

Evaluation Procedures

An electronic survey covering the evaluation questions was designed by the Evaluation Coordinator with input from NIMBioS staff involved in organizing the meeting. The instrument was sent to the Director and Deputy Director of NIMBioS for review and approval. The final instrument was hosted online via the University of Tennessee's secure web survey host mrInterview (See appendix B for a copy of the final instrument). Links to the survey were sent to all 16 BoA participants on March 30, 2009. Reminder emails were sent to non-responding participants on April 2 and 9, 2009. By April 15, 12 participants had given their feedback, for a response rate of 75%.

In addition to the survey sent to all BoA meeting attendees, another survey was sent to five BoA members who did not attend the virtual meeting, but who participated in the rating of funding requests using Google Docs. The survey for these BoA members contained only the questions regarding the use of Google Docs. The Google Docs survey was administered in the same manner as the full survey. By April 15, four of the five survey recipients had responded to the survey, for a response rate of 80%. The data from these respondents is reported along with data from the virtual meeting participants regarding use of Google Docs.

Data Analysis

Data from the electronic survey included both forced-response and supply-item questions. All data were downloaded from the online survey host into the statistical analysis software SPSS for analysis. Quantitative data were summarized descriptively using SPSS, while qualitative data were transferred to SPSS Text Analysis for Surveys. Qualitative responses were categorized by question and analyzed for trends.

Findings

Preparation for the Meeting

Overall, participants in the virtual meeting felt that they had been adequately prepared by the information they received before the meeting. The single participant who indicated feeling inadequately prepared said he/she had to invest too much time learning how to use the technology:

> *"Emails should be more succinct with clear but brief itemized instructions. Board members should not have to invest substantial amounts of time in learning new online systems (notably Google Docs)."*

Ten of 12 respondents indicated the instructions for accessing the necessary materials needed before the meeting were clearly conveyed. One of the participants who indicated the instructions were not clear said he/she had problems with the password, but that the problems was resolved very quickly after bringing it to the attention of NIMBioS staff. Another participant indicated that the instructions would have been better if they were somehow condensed into a shorter format.

Using Google Docs

Information in this section combines responses from the 12 respondents who attended the virtual meeting and the four who did not attend the meeting, but did access Google Docs to participate in the rating of funding requests.

Participant opinions were mixed regarding the use of Google Docs. While most agreed that the instructions for using Google Docs needed more clarity, participants were roughly split down the middle about the effectiveness of the service.

Of the 16 respondents, only six indicated they found the instructions for accessing Google Docs were clear. Of the 10 who did not find the instructions clear, six indicated they had used Google Docs previously, and four had not. When asked how NIMBioS could have made the instructions more clear,

two participants indicated they felt the instructions should be shorter (See Appendix C for a full listing of participant responses to open-ended questions):

> *"Instructions were lengthy, and made using the systems seem prohibitively complicated. Why not adopt more of a Fastlane approach?"*

> *"It's not really possible to make the instructions clear for such an inherently complex spreadsheet. It took a while to fiddle with it and get familiar. Also the instructions were dauntingly long and it was hard to remember what was most important and what not, in terms of working with the format. However I did work at it and put my comments in the Google doc format as requested. Now I have done it once I feel confident I won't need to put in nearly as much time just to get things working next time."*

Other participants indicated they felt the instructions needed more clarity on how to access the material:

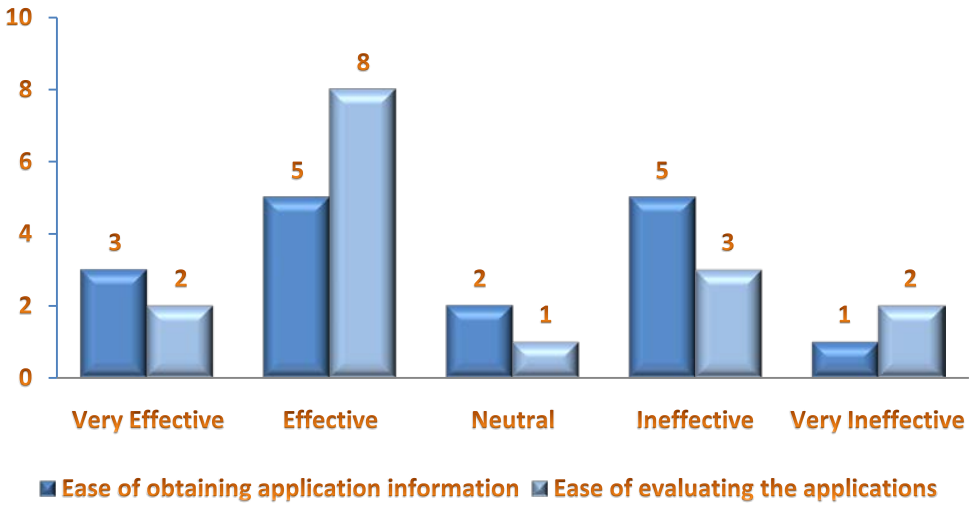
> *"Greater clarity regarding the mechanisms for assessing the material and posting evaluations would have been useful. I mostly managed by clicking on items to see what happened. Kind of a primitive approach for a supposedly and reasonably sophisticated group."*

> *"… I was only able to see the spreadsheet in my google docs., [the instructions stated] 'Once signed-in, all documents shared with you will be visible in your personal Google account, and the link provided in the email from Google, Docs will remain active to provide direct access to the review, materials.'…Accessing applicant files (PDFs): for someone not familiar with google docs, understanding how to find the link to the pdf was difficult. Also clicking on the link in the applicants tab led to editing the cell and produced an error…The use of the comment field was not smooth as the format kept changing as I typed."*

Another respondent indicated that the problem may not have been with the instructions, but that Google Docs itself was "unintuitive."

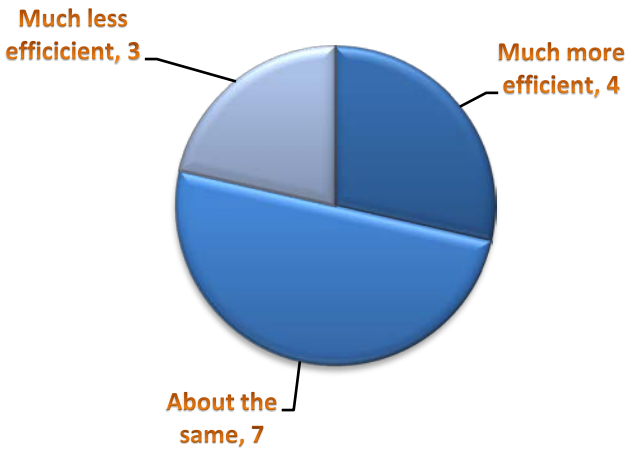
When asked to rate the effectiveness of Google Docs regarding ease of obtaining information about the applications and ease of evaluating the applications, respondents had mixed opinions. Half of the respondents rated Google Docs as an effective format for accessing the applications. A higher number of respondents (10) felt Google Docs was an effective format for rating and commenting on the application; however, five indicated they felt it was not effective (See Figure 1).

Figure 1. Number of responses to Google Docs effectiveness questions, by response category



Although several respondents indicated they felt Google Docs was ineffective for obtaining and evaluating funding applications, only three indicated they felt Google Docs was "much less efficient": than other document sharing services they had used. Four respondents indicated Google Docs was "much more efficient" (See Figure 1). One participant suggested using the National Science Foundation's Fastlane approach for sharing and evaluating funding application for NIMBioS.

Figure 1. *Efficiency of Google Docs compared to other document sharing services.*



Using WebEx

Of the 12 BoA members responding to the survey, only two indicated they had used WebEx prior to the virtual meeting. Of the 12 respondents, eight said they thought the instructions for using WebEx were clear. Of the four who did not think the instructions were clear, two indicated they had used WebEx

previously, and two had not. When asked how NIMBioS could have made the instructions more understandable, two participants said clearing up the installation requirement would be helpful:

> *"The instructions said: If you have not used WebEx before, please install it and try the test, meeting beforehand., However, there was no way of 'installing it' and trying it beforehand. So I just hoped that it would work when the time came."*

> *"It wasn't clear if we needed to download WebEx software prior to the meeting. The message from Lou suggested that we needed to download something, but it turns out we didn't."*

Most participants indicated they did not have any problems connecting to the meeting. One participant had trouble connecting online, but was able to successfully connect to the meeting by phone through support from NIMBioS staff. One participant, however, indicated he/she thought "WebEx was a mess" that damaged his/her browser, which he/she said had to be reinstalled.

None of the respondents indicated having trouble hearing other participants during the meeting, and most (83%) felt that all participants were given equivalent opportunities to contribute to the discussion during the meeting. One participant who felt the discussion was not equal for all participants noted:

> *"We are a close community and we know each other. It is difficult to participate when there is so much cheerleading ... Conflict of interests are difficult to handle ... I can't think of good ways to fix this ..."*

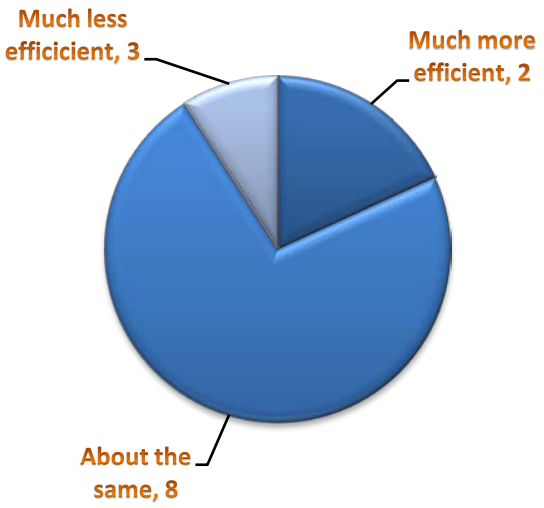
Respondents were asked to rate several features of WebEx used during the virtual meeting. The majority of respondents rated the features of WebEx positively, with 64% of the total responses in the "excellent" to "good" range. Participants rated the readability of documents in the display window highest, and web browser sharing ability lowest (See Table 1).

Table 1. *Number of responses to WebEx feature rating questions, by response category*

	Excellent	Good	Neutral	Fair	Poor
Readability of documents in display window	5	7			
Transitioning between documents in the document window	4	5	1	1	
Web browser sharing	2	5	3	1	1
Activated phone icons for speaking participants	4	5	2	1	
Polling	4	5	3		
Notes window	1	2	7	2	
Chat window	2	2	7	1	

Most respondents said they thought the efficiency of WebEx for web conferencing was about the same as other services they had used. Three respondents indicated they felt WebEx was "much less efficient" than other web conferencing services they had used, while two respondents indicated WebEx was "much more efficient" (See Figure 2). One participant suggested looking into using either Marratech or Skype for future NIMBioS virtual meetings.

Figure 2. *Efficiency of WebEx compared to other web conferencing services.*



Suggestions for Future Meetings

The majority (91%) of respondents felt that the entirely virtual meeting was an interesting experience in that they learned something other than how to technically deal with the tools used, and that participating in the virtual meeting was worth their time. Although reactions were mixed about the completely virtual format of the meeting, several participants indicated they felt it was better than meeting face-to-face:

> *"I thought it was a much more efficient use of my time than real meetings."*

> *"Please keep [the virtual format], This was a great time saver, efficient and effective, I love the way you keep the paperwork to a minimum I much appreciate it."*

> *"I really liked the virtual meeting option. Attending an in-person meeting takes about 3 days of my time, while this took less than 3 hours. It saved resources and money."*

Fewer respondents (2) indicated that they did not like the entirely virtual format of the meeting. One respondent said he/she was concerned that communicating solely by email could cause some of the process to get lost in the daily influx of email most people experience:

"The problem with moving to an exclusively electronic evaluation without paper or phone notification is that the procedure can come across as "automatic" and is lost in a mass of similar requests."

Another respondent just didn't like having to do everything online:

"Once I got the files, it was easy to rate them and send back the info. I hated having to do it on the web with this system."

Other respondents pointed out that, although there were issues with the entirely virtual format, they felt that the next time around would be easier since everyone had experience with the system:

"… I think the whole thing was new to many of us and we needed to get up the learning curve. Most people really did not try that hard but a little effort was worth it and rewarding ~ next time use the same approach

"Once the system has been used once, I presume that the next times will be much easier."

"I suspect that increased frequency of use will increase our ability to effectively use WebEx or decreased frequency will increase level of frustration."

Several respondents offered suggestions to enhance the meeting experience in the future, including better organization and communicated expectations for BoA member participation:

"…We need sharp organization and know when we are really needed."

"The Board must do their homework is the truth, i thought I was lax until i saw that the others had failed to fill out their charts, We need to work through everything in a simple straightforward way and not go back and forth or return to previous reviews , We are getting there ..."

"Sharper processes ... summaries ... expected participation ..."

"Collect more structured, written feedback prior to the meeting."

One respondent felt that BoA members were not paying enough attention to diversity during the evaluation of applications, and that members should also try harder to set aside personal relationships when discussing the scholarly merit of applicants:

"Diversity is an issue where the board has to be educated. Merging both groups is a good start but when it is noted that for "canadians ... diversity is including foreigners ... well ..." or when the issue of having no women in a program is not even observed ... What blind us from providing POSITIVE and CONSTRUCTIVE (possibly passionate) criticism is that we all know each other ... when the proposer is a well known and well like person or group ... the level of scrutiny seemed to have gone down ..."

Most respondents (75%) said they would prefer not to add video feed to the meeting in the future, although three indicated they would like to be able to see all participants. Other participants indicated they would like to disable the announcement when someone enters or leaves the meeting:

> *"Disable vocal announcements of entering/leaving meeting, and use chat window instead. Make polling numbers available to all. Recognize that with this many people very little real discussion can occur."*

> *"1. Don't have the names read out over the phone when people come and go, 2. I think there was a list of people signed in on the web page (I cant recall) but if there want make sure this is available so we can read it."*

Conclusion and Recommendations

Overall, the BoA members responding to the survey felt that the entirely virtual format for the meeting went relatively well for a first run, with several respondents indicating they preferred the virtual format over an in-person one. An overall issue raised by several respondents was lack of organization with the evaluation process during the meeting.

In general, respondents thought using WebEx as a web conferencing tool was fine, but were split on their opinions about using Google Docs to evaluate applications for funding requests. Most of the issues with Google Docs cited by respondents revolved around the clarity of the instructions, and the format of the spreadsheet that contained all of the applicants' materials. The recommendations from analysis of participant survey data are as follows:

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- If possible, consider imposing a deadline several days before the meeting for all members to have applications reviewed and rated, and send reminders to those who have not done so by the deadline.
- Consider researching other web sharing services besides Google Docs for sharing funding applications.
- If use of Google Docs for this purpose is continued for future meetings, reconsider the instructions to applicants to make them more succinct.

Appendix A

Virtual Board of Advisors Meting Agenda

Agenda for the NIMBioS Advisory Board Virtual Meeting - March 24, 2009

0. Approval of the Agenda

1. Discussion of evaluations of requests for NIMBioS support (as distributed via Google Docs):

a. Sabbatical visitors

b. Investigative Workshops

c. Working Groups

d. Postdoctoral Fellows

2. Discussion of NIMBioS Activities (summarized in the Report to the Board of March 20, 2009):

a. Scientific activities

b. Education, Outreach and Diversity activities

c. Publicity and Evaluation activities

d. Infrastructure activities (hiring, building, etc.)

3. Discussion of Other Planning Issues:

a. Next Board Meeting (October 21-22)

b. NIMBioS Leadership Evaluation

c. Board Structure (new member selection, rotations off of founding members, selection of Chair)

d. Strategic Plan

4. Other business

Appendix B

Board of Advisors Virtual Meeting Survey

NIMBioS Board of Advisors Virtual Meeting Follow-up Survey

Thank you for your participation in the NIMBioS Board of Advisors virtual meeting. Your input regarding our activities at the Institute is very important to us. The information you provide in the following survey will help our staff improve future virtual meetings hosted by NIMBioS. Your answers to the survey will remain confidential, and results will only be reported in aggregate.

NIMBioS will send two reminder emails to those who have not responded to this survey. If you would like to be excluded form these reminder emails, please enter your name below. Your survey results will still remain confidential and your name will not be associated with any of your responses in reporting of survey results.

Name:

Instructions before the meeting

Do you feel the information you received before the meeting allowed you to be adequately prepared?
Yes
No → What could NIMBioS have done differently to better prepare you for the meeting?

Overall, were the instructions clear for accessing the necessary materials you needed to review before the conference?
Yes
No → How could NIMBioS have made the instructions more clear?

Using Google Docs

The following questions are to gather your opinions on the use of Google Docs as a document sharing tool.

Had you used Google Docs prior to using it to rate the NIMBioS applications?
Yes
No

Were the instructions from NIMBioS for accessing the documents in Google Docs clear?
Yes
No → How could NIMBioS have made the instructions more clear?

Rate the effectiveness of Google Docs in the following areas:
(Very Effective, Effective, Neutral, Ineffective, Very Ineffective)
Ease of obtaining information about the applications
Ease of evaluating the applications (ratings and adding comments)

How does Google Docs compare to other document sharing services you have used?
Much more efficient
About the same
Much less efficient → Please list any other document sharing service(s) that you feel would be more efficient:

Using WebEx

Had you used WebEx prior to using it for the NIMBioS virtual meeting?
Yes
No

Were the instructions from NIMBioS for using WebEx clear?
Yes
No → How could NIMBioS have made the instructions more clear?

Rate the following WebEx features:
(*Excellent , Good, Neutral, Fair, Poor*)
Readability of documents in display window
Transitioning between documents in the document display window
Web browser sharing (used to display Google Docs spreadsheet)
Participant list window that displayed activated phone icons when a participant spoke
Polling
Notes window
Chat window

Would you prefer to have a video feed associated with the virtual meeting (e.g. WebEx has this capability)?
Yes → Would you prefer to see: (check one) only the host; all participants
No

Did you feel that that all participants were given equivalent opportunities to contribute to the discussion portion?
Yes
No → Please explain:

Describe any problems you had connecting online to the meeting:

Describe any problems you had connecting by phone to the meeting:

Did you have any trouble hearing the other participants during the meeting?
Yes → Please explain:
No

How does WebEx compare to other web conferencing services you have used?
Much more efficient
About the same
Much less efficient → Please list any other web conferencing services you feel would be more efficient:

If NIMBioS continues to use WebEx for its virtual meetings, what modifications should we make to enhance the meeting experience?

Overall Opinion

These final few questions are to gauge your overall opinion of the NIMBioS Virtual Board of Advisors meeting, and to solicit your suggestions for improvement.

Overall, was this an interesting experience in that you learned something other than how to technically deal with the tools we were using?
Yes
No

Did you feel that participating in the virtual meeting was worth your time?
Yes
No

What could NIMBioS do in the future to make its virtual meetings more productive?

Please provide any additional comments about the NIMBioS Virtual Board of Advisors meeting:

Appendix C

Open-ended Responses

What could NIMBioS have done differently to better prepare you for the meeting? (n=1)

Emails should be more succinct with clear but brief itemized instructions., Board members should not have to invest substantial amounts of time in , learning new online systems (notably GoogleDocs).

How could NIMBioS have made the instructions (for the virtual meeting) more clear? (n=2)

I had problems with the password given, but it was resolved quickly (within hours) or asking about it.

Brevity.

How could NIMBioS have made the (Google docs) instructions more clear? (n=6)

Shorter instructions (2)

Instructions were lengthy, and made using the systems seem prohibitively complicated. Why not adopt more of a Fastlane approach?

It's not really possible to make the instructions clear for such an inherently complex spreadsheet. It took a while to fiddle with it and get familiar. Also the instructions were dauntingly long and it was hard to remember what was most important and what not, in terms of working with the format. However I did work at it and put my comments in the google doc format as requested. Now I have done it once I feel confident I won't need to put in nearly as much time just to get things working next time.

More clarity on how to access material (2)

Greater clarity regarding the mechanisms for assessing the material and posting evaluations would have been useful. I mostly managed by clicking on items to see what happened. Kind of a primitive approach for a supposedly and reasonably sophisticated group.

1. In the following the number of documents that we should expect to see was unclear. I was only able to see the spreadsheet in my google docs., "Once signed-in, all documents shared with you will be visible in your, personal Google account, and the link provided in the email from Google, Docs will remain active to provide direct access to the review, materials.", 2. Accessing applicant files (PDFs): for someone not familiar with google docs, understanding how to find the link to the pdf was difficult. Also clicking on the link in the applicants tab led to editing the cell and produced an error., 3. "Comment" field. , The use of the comment field was not smooth as the format kept changing as I typed.

Miscellaneous (2)

I don't know if the problem was with the instructions or with Googledocs itself. After many tries, I finally gave up and asked to have the relevant files sent to me, thus bypassing Googledocs entirely. It may be that if I had had followed the directions minutely, i wouldn't have gotten into trouble, but found the system very unintuitive.

I think we need a printed letter in addition to emails with which we are swamped.

Please list any other document sharing service(s) that you feel would be more efficient: (n=4)

None, I found the system really easy to use.

I use google docs for my own work but for some reason in this case I had difficulties with access.

I have done some ratings for other organization on the web, and it was straightforward. But I don't remember the name of the service. And I recall being told it was expensive.

Fastlane

How could NIMBioS have made the (WebEx) instructions more clear? (n=4)

Clear up installation requirement (2)

The instructions said: If you have not used WebEx before, please install it and try the test, meeting beforehand., However, there was no way of 'installing it' and trying it beforehand. So I just hoped that it would work when the time came.

It wasn't clear if we needed to download WebEx software prior to the meeting. The message from Lou suggested that we needed to download something, but it turns out we didn't.

Miscellaneous (2)

The audio didn't work for me - I could see the icon appearing beside those talking but no sound. I had to call tech support twice. First time they gave me an out of service phone number and then a number that allowed me to use my phone for the audio channel. It was less convenient than had the audio worked. Oh - I use audio on my PC all the time and checked sound levels worked OK with other software.

Don't know. It seemed very complicated to set up, so I forwarded the email to departmental computer support so they could deal with the issue.

Did you feel that that all participants were given equivalent opportunities to contribute to the discussion portion? Please explain: (n=2)

We are a close community and we know each other. It is difficult to participate when there is so much cheerleading ... Conflict of interests are difficult to handle ... I can't think of good ways to fix this ...

Some people are used to talking more than others.

Describe any problems you had connecting online to the meeting: (n=9)

No problems (6)

None.

None, the systems worked well.

I thought it went very smoothly.

No connection problems, there were typos in the documents that were a source, of confusion.

None , I think the whole thing was new to many of us and we needed to get up the learning curve. Most people really did not try that hard but a little effort was worth it and rewarding ~ next time use the same approach

None

Miscellaneous (3)

My secretary learned how to do it and we had an expert come and try the day before ... Downloading documents and looking at all the documents was not always easy ... , Finally, some of us play NO role (as we had no assignment) on some topics and we had to seat and wait ... Postdoctoral recommendations (if our participation is wanted) should be sent to the rest and a summary if possible by NimBios staff.

WebEx was a mess. Except for voting option it's a crummy system. It also damaged my browser. Had to uninstall it and then reinstall my browser.

As previously mentioned I had major problems getting the audio feed and ended up having to use my phone (and had problems there too).

Describe any problems you had connecting by phone to the meeting: (n=9)

No problems (8)

none

None.

None, the system worked well.

Again, no problems.

No problem ... once we got the right number

None

None... by the way it is very annoying when someone leaves that their name is read out since this interrupts the discussion

None

Number out of service (1)

see previous - number given was out of service. Second number worked fine. Was delayed by this by approx 10 mins.

Did you have any trouble hearing the other participants during the meeting?
Please explain: (n=0)

Please list any other web conferencing services you feel would be more efficient: (n=1)

marratech, Skype

If NIMBioS continues to use WebEx for its virtual meetings, what modifications should we make to enhance the meeting experience? (n=5)

Miscellaneous (3)

I thought it went well.

I think I addressed this issue in other responses. We need sharp organization and know when we are really needed.

I would love to know how to get audio working on WebEx.

Disable name callout (2)

Disable vocal announcements of entering/leaving meeting, and use chat window instead. Make polling numbers available to all. Recognize that with this many people very little real discussion can occur.

1. Dont have the names read out over the phone when people come and go, 2. I think there was a list of people signed in on the web page (I cant recall) but if there want make sure this is available so we can read it

What could NIMBioS do in the future to make its virtual meetings more productive? (n=7)

Miscellaneous (4)

The documents should be combined in a better way.

I thought it was a much more efficient use of my time than real meetings.

I suspect that increased frequency of use will increase our ability to effectively use WebEx or decreased frequency will increase level of frustration.

better applicant pool

More structured feedback process (3)

The Board must do their homework is the truth, i thought I was lax until i saw that the others had failed to fill out their charts , We need to work through everything in a simple straightforward way and not go back and forth or return to previous reviews , We are getting there ...

Sharper processes ... summaries ... expected participation ...

Collect more structured, written feedback prior to the meeting.

Please provide any additional comments about the NIMBioS Virtual Board of Advisors meeting: (n=8)

Keep the entirely virtual format (3)

Please keep them, This was a great time saver , efficient and effective, I love the way you keep the paperwork to a minimum I much appreciate it

once the system has been used once, I presume that the next times will be much easier.

I really liked the virtual meeting option. Attending an in-person meeting takes about 3 days of my time, while this took less than 3 hours. It saved resources and money.

Lose the entirely virtual format (2)

The problem with moving to an exclusively electronic evaluation without paper or phone notification is that the procedure can come across as "automatic" and is lost in a mass of similar requests.

Once I got the files, it was easy to rate them and send back the info. I hated having to do it on the web with this system.

Miscellaneous (3)

Please carefully check the documents as the titles and postdoctoral fellows had mistakes that made it very confusing to follow.

Diversity is an issue where the board has to be educated. Merging both groups is a good start but when it is noted that for "canadians ... diversity is including foreigners ... well ..." or when the issue of having no women in a program is not even observed ... What blind us from providing POSITIVE and

CONSTRUCTIVE (possibly passionate) criticism is that we all know each other ... when the proposer is a well known and well like person or group ... the level of scrutiny seemed to have gone down ...

While I like the idea of a 1-5 scoring system, it will take a few iterations for everyone to converge to a unified understanding of these values -- eg. what exactly is the difference between a 4 and 5?

Appendix D

List of Participants

BoA member meeting attendees

Last	First	Institution
Briggs	Cheryl	UC-SantaBarbara
Castillo-Chavez	Carlos	Arizona State Univ.
Couzin	Iain	Princeton Univ.
Fauci	Lisa	Tulane Univ.
Goins	Gregory	North Carolina A&T State Univ.
Hastings	Alan	UC-Davis
Heitsch	Christine	Georgia Institute of Technology
Holmes	Susan	Stanford Univ.
Hudson	Peter	Penn. State Univ.
Jackson	Trachette	Univ. Michigan
James	Glazier	Indiana Univ.
Jungck	John	Beloit College
Koslowski	Donna	Michigan State Univ.
Mattingly	Jonathan	Duke Univ.
Middendorf	George	Howard Univ.
Smith	Gary	Univ. Pennsylvania

BoA members who did not attend the meeting, but rated applications

Last	First	Institution
Jenda	Overtoun	Auburn Univ.
Keeling	Matthew	Univ. of Warwick
Krakauer	David	Santa Fe Institute
Tyson	John	VPI and State Univ.
Vazquez	Mariel	San Francisco State Univ.