



Evaluation Report

Investigative Workshop: Modeling White
Nose Syndrome in Bats

June 29-July , 2009

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August, 2009

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Workshop Evaluation Executive Summary

Brief Synopsis of Event

This report is an evaluation of a NIMBioS Investigative Workshop entitled “Modeling White Nose Syndrome in Bats,” which took place at NIMBioS June 29-July 1, 2009. NIMBioS Investigative Workshops are relatively large (30-40 participants), focus on a broader topic or a set of related topics than Working Groups, 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. Participants may include post-docs and graduate students with less experience in the particular topic than those participating in Working Groups.

The Modeling White Nose Syndrome in Bats (WNS) group comprised 35 participants, including co-organizer Thomas Hallam and Gary McCracken (University of Tennessee, Knoxville). Participants included a diverse collection of theoreticians and biologists, in addition to wildlife managers from NGOs and state and federal government employees.

The focus of the Workshop was to understand and mitigate WNS, which is now recognized as the major threat to bats in North America. The workshop was preceded by a webinar held on June 25 featuring 12 speakers who gave background materials necessary for the workshop. The workshop itself consisted of breakout discussion groups that focused on specialized topics and themes, and plenary discussions that focused on the results of the breakout sessions and mitigation needs. Breakout discussion sessions included modeling and fungi, modeling and bat ecology relevant to WNS, modeling perspectives and utility to WNS, and modeling and management.

Evaluation Design

An electronic survey aligned to the following evaluation questions was designed by NIMBioS' Evaluation Coordinator with input from the NIMBioS Director and Deputy Director:

1. Were participants satisfied with the Workshop (including the webinar) overall?
2. Did the meeting meet participant expectations?
3. Do participants feel the Workshop made adequate progress toward its 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 Workshop's research problem?
6. What impact do participants feel the Workshop 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 similar meetings?

The final instrument was hosted online via the University of Tennessee's secure online survey host mriInterview. Links to the survey were sent to 33 Workshop participants on July 2, 2009 (co-organizers Gary McCracken and Thomas Hallam were not included in the evaluation). Reminder emails were sent to non-responding participants on July 9 and 14, 2009. By July 21, 2009, 29 participants had given their feedback, for a response rate of 88%.

Highlights of Results

- Overall satisfaction with the Workshop was high among respondents, the majority of whom indicated they either agreed or strongly agreed that the Workshop was very productive (97%) and met their expectations (90%).
- All respondents thought the presentations were useful, the presenters were very knowledgeable about their presentation topics, and the group discussions were useful.
- All respondents either agreed or strongly agreed that they would recommend participating in NIMBioS Workshops to their colleagues.
- Overall, respondents reported being satisfied with the travel, housing, and other amenities provided by NIMBioS.
- Respondents reported relatively high levels of learning, with an average of 80% of respondents agreeing that they acquired new knowledge about the central topics of the workshop.
- Most respondents said the multidisciplinary composition of the Workshop was its most useful aspect.
- Ninety-three percent of respondents said they felt that participating in the Workshop helped them understand the research going on in other disciplines regarding WNS.
- Ninety-seven percent of respondents agreed that the format of the Workshop was very effective for achieving its goals
- Eighty-nine percent of respondents agreed that the Workshop made adequate progress toward its goal of developing predictive models to determine the conditions under which the WNS disease may spread, although many voiced concerns that there was not a solid plan in place for who would actually carry out the modeling work that needed to be done.
- Twenty-four respondents said they felt that the exchange of ideas that took place during the Workshop would (or potentially would) initiate and/or influence their future research.
- Twelve respondents reported they developed solid plans for collaborative research with other Workshop participants, while four indicated they saw potential for collaboration in the future.

Conclusions and Recommendations

Overall, the Workshop was successful in making progress toward its goals. Survey respondents were satisfied with the meeting, indicating that it was a productive experience that met their expectations. Several indicated that the workshop organizers did a great job, and that real progress was made towards understanding the research problems at hand. Respondents were also satisfied with the travel, housing, and other amenities offered by NIMBioS.

The workshop had good diversity regarding gender and primary field of study of its participants; however, several participants indicated the inclusion of more mathematical modelers would have been helpful. Little diversity existed in the racial composition of the group.

Respondents reported relatively high levels of learning about the central topics of the workshop. Almost all said they learned more about research happening in disciplines other than their own as well. While the majority of respondents agreed that they had a better understanding of the main issues related to WNS, however, some indicated they either did not learn, or felt “neutral” or about the amount of understanding they gained on certain topics.

The majority of respondents agreed that the Workshop made adequate progress toward its goal of developing predictive models to determine the conditions under which the WNS disease may spread, although many voiced concerns that there was not a solid plan in place for who would actually carry out the modeling work that needed to be done. Several participants indicated that solid plans for follow-up and future research were lacking at the conclusion of the workshop.

Most respondents indicated they planned to take the knowledge they gained during the Workshop and apply it to their own research. Twelve respondents reported they had developed solid plans for collaborative research with other Workshop participants, while four indicated they saw potential for collaboration in the future.

Several suggestions for improvement of future workshops were suggested by participants, including better organization, a more clearly defined agenda with clear objectives and goals, and clarification of small group tasks. Other suggestions from respondents included allowing more interaction among groups, providing some sort of research synopsis of what has already been done in the field to participants before the workshop, and clearly defining research/modeling roles and tasks that should take place after the conclusion of the Workshop.

Based on analysis of participant response data, the recommendations for future workshops are as follows:

- If feasible, consider offering a preconference webinar to Workshop participants to get everyone up to date on the latest research about the Workshop research problems.
- For future preconference webinars, ensure that presenters use land lines instead of cell phones to connect to the meeting, and stick to a format that is two hours or less

- Ensure that a clearly defined agenda with clear objectives and goals is conveyed to workshop participants before the start of the workshop, and discuss the day's objectives at the start of each day of the workshop.
- Clearly define and communicate the goals of each of the breakout group discussion sessions each day.
- Before the conclusion of the workshop, consider designating a specific time slot to address the next steps that should be taken, and assign specific tasks to individuals or groups with tentative timelines for completion.

Modeling Bovine Tuberculosis Workshop Evaluation Report

Background

Introduction

This report is an evaluation of a NIMBioS Investigative Workshop entitled “Modeling White Nose Syndrome in Bats,” which took place at NIMBioS June 29-July 1, 2009. NIMBioS Investigative Workshops are relatively large (30-40 participants), focus on a broader topic or a set of related topics than Working Groups, 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. Participants may include post-docs and graduate students with less experience in the particular topic than those participating in Working Groups.

The Modeling White Nose Syndrome in Bats (WNS) group comprised 35 participants, including co-organizer Thomas Hallam and Gary McCracken (University of Tennessee, Knoxville). Participants included a diverse collection of theoreticians and biologists, in addition to wildlife managers from NGOs and state and federal government employees.

Workshop Background

The epizootiology of WNS in bats is best described as partially understood. There are uncertainties and questions about the pathogenesis of the disease although it is understood that the fungi *Geomyces* sp. play a significant role in the onset and progression of the disease. The focus of the workshop was to understand and mitigate WNS, which is now recognized as the major threat to bats in North America. The workshop was preceded by a webinar held on June 25 featuring 12 speakers who gave background materials necessary for the workshop. The workshop itself consisted of breakout discussion groups that focused on specialized topics and themes, and plenary discussions that focused on the results of the breakout groups and mitigation needs. Breakout discussion sessions included modeling and fungi, modeling and bat ecology relevant to WNS, modeling perspectives and utility to WNS, and modeling and management.

Participant Demographics

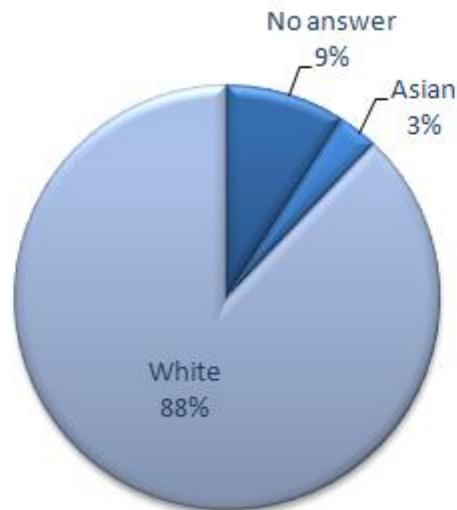
Program participants were government employees (40%), college/university faculty (33%), postdoctoral researchers (9%), graduate students (9%), and non-profit organization employees (9%) who came from 26 institutions across 15 states. Primary fields of study for the 35 participants included agricultural sciences/natural resources, biological/biomedical sciences, health sciences, and mathematics (Table 1).

Table 1. Participant fields of study and areas of concentration

Field of Study	Concentration	# Participants
Agricultural Sciences/Natural Resources	Environmental Science	1
	Forest/Resources Management	1
	Natural Resources/Conservation	1
	Wildlife/Range management	4
Biological/Biomedical Sciences	Biology/Biomedical Sciences, Other	2
	Ecology	8
	Evolutionary Biology	2
	Mathematical Biology	2
	Microbiology	2
	Physiology, Human & Animal	1
	Plant pathology/Phytopathology	1
	Zoology, Other	2
Health Sciences	Veterinary Medicine	4
Mathematics	Applied Mathematics	1
	Mathematical Biology	1
	Mathematical Ecology	1
Other Professional Field	Public Administration	1

The 15 females and 20 males (two of whom self-identified as being of Hispanic/Latino ethnicity) mostly self-identified racially as white (Figure 1).

Figure 1. Racial composition of program participants (n =35)



Three respondents indicated their work is currently supported by a National Science foundation grant. One respondent indicated his/her work is supported by three separate grants, while another indicated receiving support from two separate grants (Table 2).

Table 2. NSF grants supporting participant research

Name of grant	Institution(s) at which grant is held
BESTNet Predicting spatial variation in West Nile virus transmission Human-related factors affecting emerging infectious diseases	Arizona State University
The Ecology, Emergence and Pandemic Potential of Nipah virus in Bangladesh	Wildlife Trust
High-Fidelity Site Characterization by Experimentation, Field observation, and Inversion-Base Modeling	Carnegie Mellon
Cyber-ShARE: Center for Sharing Cyber-Resources to Advance Research and Education	University of Texas, El Paso

Evaluation Design

Evaluation Questions

The evaluation of the Workshop was both formative and summative in nature, in that the data collected from participants was intended to both gain feedback from participants about the quality of the current Workshop and also to inform future meetings. The evaluation framework was guided by Kirkpatrick’s Four Levels of Evaluation model for training and learning programs (Kirkpatrick, 1994¹). 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 Workshop, as well as the accommodations provided by NIMBioS. Several questions constituted the foundation for the evaluation:

Workshop and Webinar

1. Were participants satisfied with the Workshop (including the webinar) overall?

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

2. Did the meeting meet participant expectations?
3. Do participants feel the Workshop made adequate progress toward its 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 Workshop's research problem?
6. What impact do participants feel the Workshop 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?

Evaluation Procedures

An electronic survey aligned to the evaluation questions was designed by NIMBioS' Evaluation Coordinator with input from the NIMBioS Director and Deputy Director. The final instrument was hosted online via the University of Tennessee's secure online survey host mrInterview. Links to the survey were sent to 33 Workshop participants on July 2, 2009 (co-organizers Gary McCracken and Thomas Hallam were not included in the evaluation). Reminder emails were sent to non-responding participants on July 9 and 14, 2009. By July 21, 2009, 29 participants had given their feedback, for a response rate of 88%.

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 software package SPSS for analysis. Quantitative data were analyzed using SPSS, while qualitative data were analyzed in SPSS Text Analysis for Surveys. Qualitative responses were categorized by question and analyzed for trends.

Findings

Pre-workshop Webinar

Of the 23 survey respondents who said they attended the pre-workshop webinar, 22 said they felt the webinar was worth their time. All respondents said their main goal for attending the webinar was to get background information about WNS and to get up to date on the current research in the area. Some participants also were hoping the webinar would clarify the goals of the upcoming workshop. Some overall participant comments:

"It showed me there would be new perspectives and expertise guided by the NIMBioS framework and got me excited about attending. It also influenced me to independently learn more about the backgrounds and work of other participants before arriving."

"...this made it possible to get invited participants informed about what was known and not known [about] White-Nose Syndrome before we actually met."

While participants were pleased with the webinar overall, some suggestions were made for improvement of future webinars, including banning the use of cell phones, and shortening the length of the session. Some participant comments on improving the format:

"... It would have been better to hold it a few days earlier, to give me more time for reading as follow up. Sound quality was frequently poor. Protocols need to be established for eliminating echo, interference and loss of signal if webinars are going to rely on voice. Participants should be prepared to switch to typed text. I was not able to paste text into the webinar's comments box. Spelling and typing challenged participants, such as myself, may be more comfortable typing into their favorite text editor, then pasting into the comments box."

"Need to make sure the presenters are using land lines and not cell phones."

"I think it would have been better to limit the webinar to 1-1.5 hours. Certainly, greater than two hours was too long in my opinion."

Workshop

Overall Satisfaction

Overall satisfaction with the Workshop was high among respondents, the majority of whom indicated they either agreed or strongly agreed that the Workshop was very productive (97%) and met their expectations (90%). Some general participant comments:

"This workshop was one of the most productive and informative programs I have participated in. I hope to build more on what I learned and the contacts I made. The organization and format (and food, accommodations, etc.) were really terrific!"

"I have been a Federal employee for many years, have attended many meetings and workshops - I feel this workshop was one of the most well organized, comfortable, congenial, and useful for addressing an important issue that I have ever been part of. All of those involved with the organization were fantastic, friendly, and helpful. No glitches!!! Tom H. was one of the warmest and best facilitators I have ever been involved with. A meeting of this type has been needed for no less than 18 months -- I truly believe that many good things will transpire from it."

"I have attended several workshops over the past few years aimed at better understanding and finding solutions for white-nose syndrome and other extremely important issues facing wildlife. This workshop stood out from others I have attended in that it involved a wider range of surprisingly appropriate expertise, open and exciting air of discussion, excellent technical and travel support, and most important to me...a total lack of pretense. I think that the workshop will help set important research in motion."

All respondents thought the presentations were useful, the presenters were very knowledgeable about their presentation topics, and the group discussions were useful. Additionally, all of the respondents either agreed or strongly agreed that they would recommend participating in NIMBioS Workshops to their colleagues (Table 2).

Table 2. Participant satisfaction with various aspects of the Workshop, by level of agreement

	<i>n</i>	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
I feel the Workshop was very productive.	29	55%*	41%	0%	3%	0%
The Workshop met my expectations.	29	34%	55%	3%	7%	0%
The presenters were very knowledgeable about their topics.	29	76%	24%	0%	0%	0%
The presentations were useful.	29	59%	41%	0%	0%	0%
The group discussions were useful.	29	72%	28%	0%	0%	0%
I would recommend participating in NIMBioS Workshops to my colleagues.	29	72%	28%	0%	0%	0%

* Note: Percentages in tables may not add to 100% due to rounding

Satisfaction with Accommodations

Overall, respondents reported being satisfied with the travel, housing, and facilities provided by NIMBioS during the Workshop. The only suggestions for improvements involved more attention to unusual dietary needs (such as low-carb and vegetarian). One participant’s comments about the overall accommodations:

“[I] was impressed by the quality travel accommodations and organization; appreciated the social activities scheduled in the evenings”

Twenty-four respondents answered questions regarding satisfaction with travel, 21 of whom said they were satisfied with their accommodations, while three indicated feeling “neutral.” The less satisfied participants did not give reasons for feeling so.

One participant also expressed concern over how the reimbursement process worked for local participants whose accommodations were not arranged by NIMBioS:

“A technical detail would be explaining better for those of us that were local as to what could and couldn't be done with respect to mileage, meals, and similar. We were all sent the reimbursement forms, but it wasn't clear what we were supposed to do with these. I asked in order to get it cleared up, but it would have been nice to not have to ask.”

The majority of participants reported being satisfied with the comfort and resources of the NIMBioS facility, as well as the quality of meals provided (Table 3).

Table 3. *Participant levels of satisfaction with Workshop accommodations*

Please indicate your level of satisfaction with the Workshop accommodations:	<i>n</i>	Very satisfied	Satisfied	Neutral	Dissatisfied	Strongly dissatisfied
Comfort of the facility in which the Workshop took place	29	90%	10%	0%	0%	0%
Resources of the facility in which the Workshop took place	29	83%	14%	3%	0%	0%
Quality of meals	29	83%	14%	3%	0%	0%
Quality of drinks and snacks provided	29	79%	17%	0%	0%	3%

Workshop Content

Participant Learning

Respondents were asked several questions to gauge their levels of learning about the main issues related to the research problem, including learning about research in disciplines other than their own, as well as specific ideas listed as priority topics in the workshop announcement. Ninety-three percent of respondents said they felt that participating in the Workshop helped them understand the research going on in other disciplines regarding WNS.

Respondents reported relatively high levels of learning, with an average of 80% of respondents agreeing that they learned more about the central topics of the workshop. While the majority of respondents agreed that they had a better understanding of the main issues related to WNS, some respondents said they either did not gain understanding, or felt “neutral” or about the amount of understanding they gained on the topics, while one strongly disagreed that he/she learned anything about these topics (Table 3). The respondent who strongly disagreed thought that there needed to be more research done on the main topics of the workshop:

“...much research is just gearing up or in very early stages to answer the very questions you just asked me if I had gotten out of the workshop. ...we all recognized some of the major gaps in knowledge and mentioned some of the basic things that need to be done or can be done based on the little information currently known - now that we recognize these, who is going to do it? Questions/issues brought up during the workshop were not new - these have been asked a number of times already. There remains the problem of resource and personnel availability to do such research.”

Table 3. Participant self-reports of learning about issues related to the Workshop’s research problem

As a result of participating in this Workshop, I have a better understanding of:	<i>n</i>	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
the temporal and spatial scales of bats during WNS stress.	29	41%	38%	17%	0%	3%
the pathology of the infectious agent presumed responsible for WNS.	29	45%	45%	7%	0%	3%
the physiology of bats during WNS stress.	29	31%	41%	24%	0%	3%

Communication

Twenty-eight of the 29 survey respondents said they were either “very satisfied” or “satisfied” with the opportunities provided during workshop presentations and discussions to ask questions and/or make comments. To enhance participant communication, NIMBioS piloted the use of Twitter, an online communication tool, during both the Webinar and the Workshop. Participants were informed of the availability of Twitter before the Webinar and Workshop, and were provided instructions on how to use the technology. All respondents indicated being aware of the availability of Twitter as a communication tool during the Workshop, however, 83% of participants did not use Twitter during the workshop. Four participants indicated they followed the Twitter feed during the Workshop, while only one participant said he/she posted a comment to the feed. When asked if they would be interested in using Twitter or other social networking tools for communications during NIMBioS workshops, 76% of respondents said no. The most commonly cited reason for not using the Twitter communication tool was that it seemed unnecessary when direct contact among participants was so readily available. Some participant comments:

“It was not at all necessary, all the people were in the same room, I could speak to them in person!”

“Didn't see the need since I was sitting in the room. Since we never referred to anything posted on Twitter, it seems no one used it during the workshop.”

Some participants said they did not use Twitter because they were unsure how to use it, while one participant said it could be problematic to go public with the information exchanged at the meeting:

“I find this method of communication useless. Furthermore, opening working group discussion to the general public could cause people to be less willing to have candid open discussion and could cause problems for government participants who have to deal with FOI issues.”

Progress Toward Goals

The majority of respondents said they thought that the workshop helped them better understand the research going on in other disciplines regarding WNS, with both the self-described “empiricists” and “modelers” indicating gains in knowledge. Some general participant comments:

“Nothing beats in-person collaboration and conversation. The most valuable thing about this workshop was the broad collaboration across disciplines. This is something that has been missing from WNS conversations at past meetings.”

“I learned more than I ever expected. The NIMBioS format is an exceptional educational and communicative tool...”

Several respondents who considered themselves “modelers” indicated they learned more about data limitations coming from the empiricists. Almost all respondents who considered themselves “empiricists” mentioned gaining knowledge about mathematical modeling, although one participant said he/she would have liked more information about the data needs of the modelers:

“I would have liked to have had more explicit information on the variables that modelers need to conduct their analyses, and the limitations of the modeling approach--this could help empiricists collect the type of data that [is] most needed by the modelers, and to help improve the reliability of the resultant models.”

Eighty-nine percent of respondents agreed that the Workshop made adequate progress toward its goal of developing predictive models to determine the conditions under which the WNS disease may spread, although many voiced concerns that there was not a solid plan in place for who would actually carry out the modeling work that needed to be done:

“We really did not make plans on where to go next. I am unclear as to how to interact with the modelers at this point in order to add information to the model or to get predictions from the model. “

“...I still don't feel that the identification of the priority questions was made, who is going to really lead any effort in developing the models and who has the data available.”

“...I am concerned that there is no clear plan to accomplish the tasks we identified. If there were an avenue to assign responsibilities or have Follow up "action items" or something it might ensure that there will be action...not just talk.”

Impact on Future Research Plans

Most respondents said the multidisciplinary composition of the Workshop was its most useful aspect, as they were able to learn from those in fields other than their own:

[The most useful part of the Workshop was...]

“The diverse backgrounds of the participants fed fresh perspectives and significant gains (in my opinion) on the surveillance and control of WNS in bats across the landscape. “

“The introduction of new fields of expertise to the “usual suspects” that have been working on WNS. It broadened horizons and provided some tangible hope for progress in a number of areas.”

“Getting to know many of the people involved with the research and management of WNS. Otherwise it would have taken months to come up to speed and to learn who everyone is.”

Other respondents felt the group discussions were the most useful aspect of the workshop:

[The most useful part of the Workshop was...]

“Mixing up the break-out groups, not having a facilitator that controlled the discussions, not filtering input from any participants, and allowing discussions to develop in the plenary sessions. The meals on-site and the cruise were also great for keeping conversations going.”

“[S]plitting into groups to discuss research and management needs and how they could be addressed with models and what data we have and what data we need.”

Twenty-four respondents said they felt that the exchange of ideas that took place during the Workshop would (or potentially would) initiate and/or influence their future research. Some participant comments:

“...one of my colleagues and I had worked up a study plan to look at simply evaluating whether the current protocols for equipment disinfection was adequate. We learned at the workshop, someone was already looking at that. Thus, we can look at other ways to contribute. By knowing what direction other researchers were/are focusing, it helps me determine where I could best serve to contribute to the overall effort.”

“...by having researchers from different areas (bats, immunologists, pathologists, fungal biologists, etc) and managers i have a much better idea of what the needs are for WNS research.”

“...I learned a lot more detailed information on fungal ecology, and the degree of progress on molecular techniques used to define fungal species. This will help direct my research to more collaborative approaches finding solutions to stop WNS spread.”

In addition to new ideas for research, 12 respondents said that they developed unanticipated plans for collaborative research with other Workshop participants, while four said the potential for collaboration was present:

“...I have initiated 2 small studies with other researchers that are not directly in my area of expertise that should be very helpful to the effort.”

“... I have plans to apply for grants and to collaborate with several people in the workshop. I was impressed with the level of cooperation and information exchange that people extended.”

“... several opportunities arose through just getting to meet and greet and talk. Information sources that I'd developed for one application are useful to others for a variety of applications. At least one collaborative paper will come out of the associations I developed during the workshop.”

“...[I] will try to interface my area of interest (mycology, fungal epizootics, modeling) with bat biologists. Some preliminary research [is] already underway.”

Suggestions for Future Workshop Meetings

Respondents were asked several questions soliciting suggestions for future Workshop meetings. Several themes emerged from analysis of participant responses, including better organization. Suggestions for better organization included a more clearly defined agenda with clear objectives and goals, as well as clarification of small group tasks:

“I would perhaps not organize them in advance but rather collaboratively develop a list of questions/hypotheses and then cross link this with modeling tools, then send groups off to address each question.”

“I would have been helped by having a more clearly defined agenda or task that would lead to building a model.”

“Perhaps making sure that there are clear and adequately defined objectives for the breakout groups to tackle. At times, it felt that there was some redundancy in the discussion among breakout groups.”

Several respondents felt that an additional day to discuss modeling would have been beneficial:

“I believe the foundation was certainly built. I wish we had been able to spend an additional day sitting down and playing with heuristic models.”

“I agree that progress was made esp. on the last day but would have like to have reached this stage of model development a day early and actually attempted some basic models while at the meeting; I'm not clear when this next step will occur and who will be responsible for moving this forward.”

Another common suggestion was a more clearly defined plan for what was going to happen after the meeting:

“I would nail down commitments to future collaborations. Who is doing what?”

“[A] plan for who is actually going to follow through with the research ideas, especially the modeling”

“I'm a little concerned that it was unclear if and when the modeling would ever take place on the topics we discussed.”

“The end product of the workshop should not have been a paper detailing the utility of modeling to explore WNS (we know this potential already) but would have rather it been to list priority questions, the data available/still needed, the proposed models to use, and assigned people to work on those specific questions (ie: pair up biologists with the modelers) and set some product deadlines.”

Other suggestions from respondents included allowing more interaction among groups and providing some sort of research synopsis of what has already been done in the field to participants before the workshop:

“Having a thorough synopsis of what research has been conducted, what is in the works and what is planned for future research- this might help people not currently working with the project directly contribute.”

“Perhaps some concise “required” background reading on basic bat biology/ecology, and also fungal biology/ecology. We spent more time than needed on the basics of these (especially fungi)”

Conclusions and Recommendations

Overall, the Workshop was successful in making progress toward its goals. Survey respondents were satisfied with the meeting, indicating that it was a productive experience that met their expectations. Several indicated that the workshop organizers did a great job, and that real progress was made towards understanding the research problems at hand. Respondents were also satisfied with the travel, housing, and other amenities offered by NIMBioS.

The workshop had good diversity regarding gender and primary field of study of its participants; however, several participants indicated the inclusion of more mathematical modelers would have been helpful. Little diversity existed in the racial composition of the group.

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The majority of respondents agreed that the Workshop made adequate progress toward its goal of developing predictive models to determine the conditions under which the WNS disease may spread, although many voiced concerns that there was not a solid plan in place for who would actually carry out the modeling work that needed to be done. Several participants indicated that solid plans for follow-up and future research were lacking at the conclusion of the workshop.

Most respondents indicated they planned to take the knowledge they gained during the Workshop and apply it to their own research. Twelve respondents reported they had developed solid plans for

collaborative research with other Workshop participants, while four indicated they saw potential for collaboration in the future.

Several suggestions for improvement of future workshops were suggested by participants, including better organization, a more clearly defined agenda with clear objectives and goals, and clarification of small group tasks. Other suggestions from respondents included allowing more interaction among groups, providing some sort of research synopsis of what has already been done in the field to participants before the workshop, and clearly defining research/modeling roles and tasks that should take place after the conclusion of the Workshop.

Based on analysis of participant response data, the recommendations for future workshops are as follows:

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- For future preconference webinars, ensure that presenters use land lines instead of cell phones to connect to the meeting, and stick to a format that is two hours or less.
- Ensure that a clearly defined agenda with clear objectives and goals is conveyed to workshop participants before the start of the workshop, and discuss the day's objectives at the start of each day of the workshop.
- Clearly define and communicate the goals of each of the breakout group discussion sessions each day.
- Before the conclusion of the workshop, consider designating a specific time slot to address the next steps that should be taken, and assign specific tasks to individuals or groups with tentative timelines for completion.

Appendix A

List of Participants

Participants

Last name	First name	Institution
Amelon	Sybil	United States Department of Agriculture Forest Service
Ballmann	Anne	United States Geological Survey
Bayless	Mylea	Bat Conservation International
Blehert	David	United States Geological Survey
Buckles	Elizabeth	Cornell University
Coleman	Jeremy	United States Fish and Wildlife Service
Cryan	Paul	United States Geological Survey
Federico	Paula	Mathematical Biology Institute
Frampton	Wyatt	Utah Department of Agriculture and Food
Frick	Winifred	University of California Santa Cruz
Glaeser	Jessie	United States Department of Agriculture Forest Service
*Hallam	Thomas	University of Tennessee Knoxville
Hicks	Alan	NYS Department of Environmental Conservation
Holliday	Cory	The Nature Conservancy
Ingersoll	Thomas	University of California Berkeley
Jager	Henriette	Oak Ridge National Laboratory
Knudsen	Guy	University of Idaho Moscow
Kunz	Thomas	Boston University
Matheny	Brandon	University of Tennessee Knoxville
*McCracken	Gary	University of Tennessee Knoxville
Nichols	Jeff	Oak Ridge National Laboratory
Nolfi	Daniel	Great Smoky Mountains National Park
Pannkuk	Evan	Arkansas State University
Peirce	James	University of Wisconsin LaCrosse

Post	Wilfred (Mac)	Oak Ridge National Laboratory
Reeder	DeeAnn	Bucknell University
Robbins	Alison	Tufts University
Saito	Emi	United States Department of Agriculture APHIS
Souza	Marcy	University of Tennessee Knoxville
Stiver	Bill	Great Smoky Mountains National Park
Turmelle	Amy	Centers for Disease Control and Prevention
Vulinec	Kevina	Delaware State University
Weinstein	Richard	University of Tennessee Knoxville
White	LeAnn	United States Geological Survey
Youngbaer	Peter	National Speleological Society

*** Organizer of Workshop**

Appendix B

Modeling White Nose Syndrome in Bats Workshop Survey

Modeling White Nose Syndrome in Bats Survey

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

NIMBioS will send two reminder emails to Workshop participants who have not responded to this survey. If you would like to be excluded from 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:

Preconference Webinar Evaluation

Did you attend the preconference webinar on June 24?

Yes

No

What were you hoping to learn by attending the webinar?

Do you feel the webinar was worth your time?

Yes

No

Comments about the webinar:

Workshop Evaluation

How did you hear about this Workshop?

Please check the appropriate box to indicate your level of agreement with the following statements about this Workshop: (Very satisfied, Satisfied, Neutral, Dissatisfied, Very dissatisfied)

I feel the Workshop was very productive.

The Workshop met my expectations.

The presenters were very knowledgeable about their topics.

The presentations were useful.

The group discussions were useful.

I would recommend participating in NIMBioS Workshops to my colleagues.

Please check the appropriate box to indicate your level of agreement with the following statements.
As a result of participating in this Workshop, I have a better understanding of:
(Strongly agree, Agree, Neutral, Disagree, Strongly disagree)

the temporal and spatial scales of bats during WNS stress
the pathology of the infectious agent presumed responsible for WNS
the physiology of bats during WNS stress

Do you feel that participating in the Workshop helped you understand the research going on in other disciplines regarding WNS?

Yes

No

Comments:

Do you feel the Workshop made adequate progress toward its goal of developing predictive models to determine the conditions under which the WNS disease may spread?

Yes

No

Comments:

Do you feel that the exchange of ideas that took place during the Workshop will influence your future research? Please explain:

Did you develop unanticipated plans for collaborative research with other Workshop participants? Please explain:

What do you feel was the most useful aspect of the Workshop?

What would you have changed about the Workshop?

How do you feel about the format of the Workshop?

This was a very effective format for achieving our goals

This was not a very effective format for achieving our goals ->

The Workshop format would have been more effective if:

Please indicate your level of satisfaction with the Workshop accommodations:
(Very satisfied, Satisfied, Neutral, Dissatisfied, Very dissatisfied)

Travel arranged by NIMBioS
Housing arranged by NIMBioS
Comfort of the facility in which the Workshop took place
Resources of the facility in which the Workshop took place
Quality of meals
Quality of drinks and snacks provided

Please indicate any changes NIMBioS can make to improve the resources and/or accommodations available to Workshop participants:

Communications Evaluation

NIMBioS is currently exploring innovative avenues for communication among its Workshop participants. Your responses to the following questions will allow us to better understand the communication needs of our scientific communities.

How satisfied were you with the opportunities provided during workshop presentations and discussions to ask questions and/or make comments?

Very satisfied
Satisfied
Neutral
Dissatisfied
Very Dissatisfied

Please indicate any suggestions you have for facilitating communication among participants during the Workshop:

Were you aware of the availability of Twitter as a communication tool during the Workshop?

Yes
No

In what ways did you use the Twitter communication tool?

Followed the twitter feed
Posted a question
Posted a comment
I did not use twitter

If you did not use Twitter during the Workshop, could you please explain why (e.g. didn't know how to use it, didn't have time, wasn't interested)?

Would you be interested in using Twitter or other social networking tools for communications during NIMBioS workshops?

Yes

No

If you maintain a blog about your research and would like a link posted on the NIMBioS website, please provide the URL here, along with a brief description of the blog:

Please provide any additional comments about your overall experience with the Workshop:

Demographic Information

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

If your work is currently supported by an NSF grant, please indicate the name of the grant:

Institution at which NSF grant is held:

I am a(n):

Graduate student--master's level

Graduate student--doctoral level

Postdoctoral researcher

College/University faculty—teaching/research

College/University faculty—teaching only

College/University faculty—research only

College/University staff

College/University administrator

Government employee

Business/industry employee

Non-profit organization employee

If you are from a college/university, please describe your institution: (check all that apply)

2-year institution

4-year institution

Minority serving institution

Women's only institution

Not applicable

Please select response that best describes your general area of expertise/research/study:

Agricultural Sciences/Natural Resources
Astronomy/Atmospheric Sciences/Meteorology
Biological/Biomedical Sciences
Chemistry
Computer & Information Sciences
Education
Engineering
Geological & Earth Sciences
Health Sciences
Humanities
Mathematics
Ocean/Marine Sciences
Physics
Social Sciences
Other Professional Field

Please select the response that best describes your area of concentration within Agricultural Sciences/Natural Resources:

Agricultural Economics
Agricultural Animal Breeding
Agricultural Science, other
Agriculture, General
Agronomy & Crop Science
Animal Nutrition
Animal Science, Other
Environmental Science
Fishing and Fisheries Sciences/Management
Food Science
Food Science and Technology, Other
Forest Sciences and Biology
Forest/Resources Management
Forestry & Related Science, Other
Horticulture Science
Natural Resources/Conservation
Plant Breeding
Plant Pathology/Phytopathology
Plant Sciences, Other
Poultry Science
Soil Chemistry/Microbiology
Soil Sciences, Other
Wildlife/Range management

Wood Science & Pulp/Paper Tech.

Please select the response that best describes your area of concentration within Biological/Biomedical Sciences:

Anatomy
Bacteriology
Biochemistry
Biomedical Sciences
Biometrics & Biostatistics
Biophysics
Biotechnology
Botany/Plant Biology
Cell/Cellular Biology and History
Developmental Biology/Embryology
Ecology
Endocrinology
Entomology
Genetics, Human & Animal
Immunology
Mathematical biology
Microbiology
Molecular Biology
Neuroscience
Nutrition Sciences
Parasitology
Pathology, Human & Animal
Pharmacology, Human & Animal
Physiology, Human & Animal
Plant Genetics
Plant Pathology/Phytopathology
Plant Physiology
Toxicology
Biology/Biological Sciences, General
Biology/Biomedical Sciences, Other
Zoology, Other

Please select the response that best describes your area of concentration within Health Sciences:

Environmental Health
Environmental Toxicology
Epidemiology
Health Systems/Service Administration
Kinesiology/Exercise Science

Nursing Science
Pharmacy
Public Health
Rehabilitation/Therapeutic Services
Speech-Language Pathology & Audiology
Veterinary Medicine
Health Sciences, General
Health Science, Other

Please select the response that best describes your area of concentration within Engineering:

Aerospace, Aeronautical & Astronautical
Agricultural
Bioengineering & Biomedical
Ceramic Sciences
Chemical
Civil
Communications
Computer
Electrical, Electronics and Communications
Engineering
Engineering
Engineering Physics
Engineering Science
Environmental Health
Industrial & Manufacturing
Materials Science
Mechanical
Mechanics
Metallurgical
Mining & Mineral
Nuclear
Ocean
Operations Research
Petroleum
Polymer & Plastics
Systems
Engineering, General
Engineering, Other

Please select the response that best describes your area of concentration within Computer & Information Sciences:

Computer Science

Information Science & Systems
Computer & Information Science, Other

Please select the response that best describes your area of concentration within Mathematics:

Algebra
Analysis & Functional Analysis
Applied Mathematics
Computing Theory & Practice
Geometry/Geometry Analysis
Logic
Mathematical biology
Number Theory
Operations Research
Statistics
Topology/Found.
Math/Statistics, General
Math/Statistics, Other

Please select the response that best describes your area of concentration within
Astronomy/Atmospheric Science/Meteorology:

Astronomy
Astrophysics
Atmospheric Chemistry and Climatology
Atmospheric Physics and Dynamics
Meteorology
Atmospheric Science/Meteorology, General
Atmospheric Science/Meteorology, Other

Please select the response that best describes your area of concentration within Chemistry:

Analytical
Inorganic
Medicinal/Pharmaceutical
Organic
Physical
Polymer
Theoretical
Chemistry, General
Chemistry, Other

Please select the response that best describes your area of concentration within Geological & Earth
Sciences:

Geochemistry

Geology
Geomorphology & Glacial Geology
Geophysics & Seismology
Mineralogy & Petrology
Paleontology
Stratigraphy & Sedimentation
Geological and Earth Sciences, General
Geological and Earth Sciences, Other

Please select the response that best describes your area of concentration within Physics:

Acoustics
Atomic/Molec/Chem
Biophysics
Condensed
Matter/Low Temp
Nuclear Physics
Optics/Phototonics
Particle (Elem)
Plasma/Fusion
Polymer
Applied Physics
Physics, General
Physics, Other

Please select the response that best describes your area of concentration within Ocean/Marine Sciences:

Hydrology & Water Resources
Marine Sciences
Oceanography, Chemical and Physical
Ocean/Marine, Other

Please select the response that best describes your area of concentration within Social Sciences:

Anthropology
Area Studies
Criminology
Demography/Population Studies
Econometrics
Economics
Geography
International Relations/Affairs
Political Science & Government
Public Policy Analysis

Sociology
Statistics
Urban Affairs/Studies
Social Sciences, General
Social Sciences, Other

Please select the response that best describes your area of concentration within Humanities: :

History
Letters
Foreign Languages & Literature
Other Humanities

Please select the response that best describes your area of concentration within Education:

Adult & Continuing Education
Counseling & Guidance
Curriculum & Instruction
Educational Administration & Supervision
Educational Assessment/Testing/Measurement
Educational Leadership
Educational Psychology
Educational Statistics/Research Methods
Educational/Instructional Media Design
Elementary Education
Higher Education/Evaluation & Research
Pre-elementary/Early Childhood Education
School Psychology
Secondary Education
Social/Philosophical Foundations of Educational
Special Education
Education, General
Education, Other

Other Professional Fields: Please select the response that best describes your area of concentration:

Business Management/Administrative
Communications
Family/Consumer/Human Science, General
Law
Library Science
Parks/Sports/Rec./Leisure/Fitness
Public Administration
Social Work
Other field, please specify:

Gender:

Male

Female

Are you Hispanic or Latino?

Yes

No

What is your racial background?

American Indian or Alaska Native

Native Hawaiian or other Pacific Islander

Asian

Black or African-American

White

Disability status

No disability

Hearing impairment

Visual impairment

Mobility impairment

Other disability, please specify below:

Citizenship:

U.S. citizen

Permanent resident

Other non-U.S. Citizen

Appendix C

Open-ended Survey Responses

Do you feel that participating in the Workshop helped you understand the research going on in other disciplines regarding WNS? (n=18)

<i>Response</i>	<i>Code A</i>	<i>Code B</i>
Nothing beats in-person collaboration and conversation. The most valuable thing about this workshop was the broad collaboration across disciplines. This is something that has been missing from WNS conversations at past meetings.	Collaboration	Contacts
I learned more than I ever expected. The NIMBioS format is an exceptional educational and communicative tool. And good food!	Collaboration	New Info
I have been working very hard to keep up on WNS since it was first observed, I have not been actively involved in the direct research; therefore, I found trying to obtain information concerning what researchers were actively involved and in what aspect they were involved EXTREMELY difficult. Having most of those who have been involved together to hear what has been done, by whom, and what are the current findings, was very helpful.	Communication	Research
Excellent opportunity to form contacts with bat biologists and managers	Contacts	
The cross disciplinary aspect of the workshop was, perhaps, its biggest success.	Contacts	
It did make it very clear, but to no surprise, that much research is just gearing up or in very early stages to answer the very questions you just asked me if I had gotten out of the workshop. What I think was missing, although I don't know who would really have the answer to this question is, was the answer to: we all recognized some of the major gaps in knowledge and mentioned some of the basic things that need to be done or can be done based on the little information currently known - now that we recognize these, who is going to do it? Questions/issues brought up during the workshop were not new - these have been asked a number of times already. There remains the problem of resource and personnel availability to do such research.	Follow-Up	
this was one of the most productive workshops I've been to. although I'm a little concerned that it was unclear if and when the modeling would ever take place on the topics we discussed.	Models	Follow-Up
didn't hear much new stuff and would have rather focused more on modeling options with what is known	Models	
From a modeler perspective, I understand better about data limitations.	Models	
The power of modeling, and its potential to contribute to solving the WNS problem are much more clear to me now!	Models	
More specifically, the scope of the problem and the variety of needs and approaches to find a solution. The pursuit of a solution is greatly enhanced by math models.	Models	
It was also a nice introduction to different types of mathematical modeling which I have never been involved with before.	Models	

I would have liked to have had more explicit information on the variables that modelers need to conduct their analyses, and the limitations of the modeling approach--this could help empiricists collect the type of data that most needed by the modelers, and to help improve the reliability of the resultant models.

Models

As a student who does not start his PhD until fall, the workshop was a tremendous advantage to me and I left with a sense of urgency in my work and many ideas for research, some of which I have already started writing grants for.

New Info

Research

I felt that it helped me to form a better gestalt for the problem.

New Info

Definitely. I was very familiar with aspects of WNS related to bats, but learned a tremendous amount about fungal biology, epidemiology, and mathematical modeling.

New Info

As I said, the mathematical was new to me, as was more of the epidemiological. The mycological, biological and speleological were quite familiar.

New Info

although it would be beneficial to know what studies are being conducted so that work is not duplicated by numerous investigators

Research

Do you feel the Workshop made adequate progress toward its goal of developing predictive models to determine the conditions under which the WNS disease may spread? (n=21)

Response

Code A

Code B

I am not sure of where we are going now that the meeting is over. My sense is that work generated at the meeting is proceeding (beyond that of my personal experience) but I am not certain of that.

Follow-Up

Qualified yes: only if momentum can be maintained and communication lines stay open

Follow-Up

Yes, however, I am concerned that there is no clear plan to accomplish the tasks we identified. If there were an avenue to assign responsibilities or have Follow up "action items" or something it might ensure that there will be action...not just talk. I understand this is difficult... and I do believe people will individually take the initiative to drive things forward on their own.

Follow-Up

I wasn't there for the last day and haven't seen final products, so hard to say.

Miscellaneous

It was a good start.

Miscellaneous

This is kind of the wrong question, but related outcomes would be the microenvironment effects and changing the local environment in a hibernaculum were directions pursued.

Miscellaneous

Yes, although I am not convinced that is the first priority of research need.

Miscellaneous

We really did not make plans on where to go next. I am unclear as to how to interact with the modelers at this point in order to add information to the model or to get predictions from the model.

Models

Follow-Up

I think that this question would be best answered by the modelers, because they will be the ones who develop the models--either from available empirical data, or from theory. From my perspective, I felt that we made good progress, but further discussions are needed between a select group of empiricists and modelers to more specifically identify empirical parameters that would be of interest to modelers, and to discuss the limitations and challenges of collecting the kind of empirical data needed to make the resultant models predictively robust.

Models Progress

I believe the foundation was certainly built. I wish we had been able to spend an additional day sitting down and playing with heuristic models.

Models Time

Adequate yes, outstanding progress no. It took the group a while to outline what data was valuable for each model and what information was needed. I think that if we started by focusing on what data we had access to, we could have developed and tested at least an empirical model during the workshop. It was nice to outline what was needed in the future for process-based models.

Models

But - I had thought that we might get a bit farther in the actual modeling process.

Models

However, getting some practical models out there working and validated soon will be the true test.

Models

I agree that progress was made esp. on the last day but would have like to have reached this stage of model development a day early and actually attempted some basic models while at the meeting; I'm not clear when this next step will occur and who will be responsible for moving this forward.

Models

It was a good start - more work needs to done to finalize the models and to test them.

Models

Note that there are many other important modeling tasks that were also considered, such as using modeling to prioritize data collection and resource allocation

Models

since no one there is specifically working on modeling WNS, we just talked about what models should be made, so I'm not sure if the models will really happen.

Models

There was at least an understanding of what needed to be accomplished. In terms of developing a model on the conference, no.

Models

Yes and no. I think it worked well in making non-modelers better aware or comfortable with what we can do with models. However, I still don't feel that the identification of the priority questions was made, who is going to really lead any effort in developing the models and who has the data available.

Models

Once we formed the breakout groups the second day, everyone was very focused to come up with actual models (not just the conceptual kind), and I think we really made good progress in defining the parameters of the disease spread.

Progress

The discussions on day 3 made good progress towards this goal. I think that day 2 discussions could have been better focused towards this goal.

Time

**Do you feel that the exchange of ideas that took place during the Workshop will influence your future research?
Please explain: (n=29)**

<i>Response</i>	<i>Code A</i>	<i>Code B</i>
For me, that depends on opportunities to submit proposals in this research area.	Depends	
No - I am not a research faculty	No	
Unfortunately for me, no. The mission of my group is pretty established. Although I am lucky that my supervisor has had the fortitude to approve my allocating some time to the WNS work, the time allotted is very minimal and would be insufficient to my developing any WNS-related models in the future (on my own). As a collaborator or checker of assumptions, I probably could help. However, to lead a modeling effort just wouldn't be feasible at this time.	No	
Yes, it will influence future meetings (by including broader disciplines) and it will influence collaborative planning. We don't conduct research - but we do fund research and coordinate conservation activities. These actions will definitely be influenced by the workshop.	Yes	
Yes. If nothing else the open exchange of ideas between biologist and modelers. I was not aware of individual energetic models and plan on using them more in my future research.	Yes	
Helping to explain the scientific methodologies to my colleagues is probably the most significant area of influence in my case.	Unclear	
The workshop brought many different types of researchers together that could lead to greater synergistic interdisciplinary efforts that otherwise may not have happened.	Unclear	
absolutely! Concerns raised by the mycologists about identifying G.D. in hibernacula has shifted our approach. the modelers are helping with sample sizes relating to upcoming studies.	Yes	
Absolutely, for example, one of my colleagues and I had worked up a study plan to look at simply evaluating whether the current protocols for equipment disinfection was adequate. We learned at the workshop, someone was already looking at that. Thus, we can look at other ways to contribute. By knowing what direction other researchers were/are focusing, it helps me determine where I could best serve to contribute to the overall effort.	Yes	
Absolutely. I have changed the focus of my research in response to the level of the crisis. We need to have a lot more energy and attention going toward finding a solution. The potential of a similar disease hitting humans needs to be considered.	Yes	
Absolutely. I now believe that the high degree of uncertainty surrounding WNS can most effectively be dealt with through modeling and assessing potential ecological and management outcomes.	Yes	
It has made me revise the type of information that I'm collecting from submitters in hopes of gathering necessary data for the priority model questions	Yes	
It will make me look at things in different ways.	Yes	
Yes	Yes	
Yes	Yes	

Yes - particularly, the exchange of ideas seeded several potential collaborations between myself and other attendees.	Yes
Yes, but further discussion is needed with modelers to understand how best to proceed in developing research plans.	Yes
Yes, I have already begun writing grants and developing experiments for my PhD.	Yes
Yes, I now have research plans related to WNS, and hopefully some collaborations getting started	Yes
Yes, in fact my laboratory in Madison is now collaborating with the Fish and Wildlife Disease unit. We are actively pursuing joking research opportunities and have met several times since the workshop already.	Yes
Yes, these issues apply to my current research on the ecology of infectious disease in bats. I have similarly had to deal with multiple competent reservoir species that interact across the landscape, and control efforts for other bat pathogens appear to be similarly constrained given the vagility of these hosts. The physiological and immunological links were also helpful in thinking about variation in how bats may respond to different pathogens in their environment.	Yes
yes. by having researchers from different areas (bats, immunologists, pathologists, fungal biologists, etc) and managers i have a much better idea of what the needs are for WNS research.	Yes
Yes. I got ideas about models of spread I could work on and what would be important (relevant to biologists and managers) hypothesis to test. I the best part of the workshop was to learn about the relevant research questions and data limitations.	Yes
Yes. I have a better understanding of the information needs related to WNS.	Yes
yes. I have a better understanding of what my lab can do to fill in the large gaps in our knowledge	Yes
Yes. I learned a lot more detailed information on fungal ecology, and the degree of progress on molecular techniques used to define fungal species. This will help direct my research to more collaborative approaches finding solutions to stop WNS spread.	Yes
Yes. I may become involved in researching treatment options for affected bats.	Yes
Yes. I've been looking strongly into agent-based epidemiological models since. Also related is GIS incorporation into research. Even if not applied directly to WNS, these are still valuable to me for future research.	Yes
Yes-good ideas were discussed and we made new contacts	Yes

Did you develop unanticipated plans for collaborative research with other Workshop participants? Please explain: (n=29)

<i>Response</i>	<i>Code A</i>	<i>Code B</i>
Had to leave early.	Miscellaneous	

the afore mentioned sample size issues was an unexpected plus. We have expanded out chemical treatment group	Miscellaneous
no	No
No	No
No	No
i made a lot of contacts that will be used for future questions concerning who is working on what aspect of the disease and what managers are doing so i know who to call in the future.	Not Yet
not yet	Not Yet
Not yet clear, but probably.	Not Yet
We talked about collaborating and now is up to all of us. I see this part a little harder since we did not have that much time to talk about it, and when you get back to your workplace most of us have other obligations.	Not Yet
Possibly- I may be included on a UT grant covering many aspects of modeling and treatment of WNS.	Possibly
Hopefully, but it is yet to be determined. I am interested in working on a process-based model and will be interested to see what data is collected and shared.	Possibly
I did not develop any firm plans during the workshop, but certainly began thinking hard about collaborating with modelers, epidemiologists, and fungus experts to devise a model of WNS spread.	Possibly
I think you have to collaborate with other groups in science these days. I hope to work with some of the participants at the meeting.	Yes
no - not specific plans. But - the door is opened for new collaborations.	No
Somewhat yes. While new plans for collaborative research were not explicitly focused on WNS, I did get the chance to build new collaborations with some of the working group participants. These collaborations are more generally geared towards multiple reservoir epizootiological models.	Yes
We did not have time to develop collaborative research projects during this working group, apart from those that many of the empiricists had already begun before this workshop was organized. However, that being said, it is clear to me that modeling offers great potential for additional research collaborations with modelers--and I would like to be part of this discussion--both from an individual-based modeling perspective, but also from an ecosystem or landscape modeling perspective.	Possibly
Yes, I have initiated 2 small studies with other researchers that are not directly in my area of expertise that should be very helpful to the effort.	Yes
Yes, I have plans to apply for grants and to collaborate with several people in the workshop. I was impressed with the level of cooperation and information exchange that people extended.	Yes

Yes, see previous discussion box.	Yes
Yes, several opportunities arose through just getting to meet and greet and talk. Information sources that I'd developed for one application are useful to others for a variety of applications. At least one collaborative paper will come out of the associations I developed during the workshop.	Yes
Yes, we are now working on a data mining plan to make existing information available to the group. We are also focusing our efforts to assist in answering the key questions identified by this group.	Yes
Yes, we have been able to refine some grants to better target what the group thought needed to be done.	Yes
Yes, will try to interface my area of interest (mycology, fungal epizootics, modeling) with bat biologists. Some preliminary research already underway.	Yes
Yes. Data mining and funding of specific research projects are areas where I will be collaborating to a greater degree than I anticipated going into the workshop.	Yes
Yes. Discussions with a mycologist from the UW Forest Products Lab were fruitful	Yes
Yes. Though I anticipated my collaboration with some of these researchers, I was surprised by a few of the specific researchers who proposed collaboration. I hope collaborate with at least 2 and as many as 6 of the labs in attendance.	Yes

What do you feel was the most useful aspect of the Workshop? (n=29)

<i>Response</i>	<i>Code A</i>	<i>Code B</i>
Day 1 discussions and contacts made	Discussions	Networking
The group discussions on day 1	Discussions	Groups
The group discussions were very helpful.	Discussions	Groups
splitting into groups to discuss research and management needs and how they could be addressed with models and what data we have and what data we need.	Discussions	Groups
Mixing up the break-out groups, not having a facilitator that controlled the discussions, not filtering input from any participants, and allowing discussions to develop in the plenary sessions. The meals on-site and the cruise were also great for keeping conversations going.	Discussions	Unregulated
The sharing of ideas with others who have a common interest in WNS research and the potential impacts of this syndrome on populations and ecosystems.	Discussions	
sharing information and ideas	Discussions	
Exchange of ideas and keeping up to date with what people were working on	Discussions	Learning
Having people from many different disciplines present.	Diversity	
Interfacing with bat biologists/ecologists/managers	Diversity	

Interaction with colleagues from different areas of research related to infectious disease.	Diversity	
bridging in new people from a variety of disciplines	Diversity	
The diverse backgrounds of the participants fed fresh perspectives and significant gains (in my opinion) on the surveillance and control of WNS in bats across the landscape.	Diversity	
The diversity and knowledge of the participants.	Diversity	
The broad diversity of disciplines that were brought to the discussion	Diversity	
The introduction of new fields of expertise to the "usual suspects" that have been working on WNS. It broadened horizons and provided some tangible hope for progress in a number of areas.	Diversity	
Getting to know many of the people involved with the research and management of WNS. Otherwise it would have taken months to come up to speed and to learn who everyone is.	Networking	
smaller groups facilitated productive discussion	Groups	
interdisciplinary group of researchers, interest groups, and research managers	Groups	
The chance to breakaway and work in individual groups. I.e. the modelers group or the epidemiology group.	Groups	
Assembling the group	Groups	
Learn about the relevant questions and hypothesis of the WNS.	Learning	
Meeting other modelers and experts and driving at a big problem with our own experiences and expertise.	Learning	
Since most participants were either modelers or "bat people," I think the most useful aspect had to do with those two groups learning more about the ecology of fungi (I am a mycologist...)	Learning	
Getting all of the people actively involved with current research together with those that could and should contribute; updates and information on who is doing what. I have wondered for sometime why mycologists and epidemiologists had not been tapped to help evaluate WNS. I was very happy these disciplines were represented.	Learning	
developing modeling approaches; increasing the range of researchers working on WNS.	Models	Diversity
Developing contacts and research ideas.	Networking	
Networking with other researchers	Networking	
The breakout sessions followed by summaries. Also the ability to freely exchange information and ask questions.	Learning	Groups
What would you change about the Workshop? (n=25)		
<i>Response</i>	<i>Code A</i>	<i>Code B</i>
I would have been helped by having a more clearly defined agenda or task that would lead	Organization	

to building a model.

better clarification of tasks assigned to each working group and better assurance of less overlap; not clear what each group was supposed to achieve

Organization

Perhaps making sure that there are clear and adequately defined objectives for the breakout groups to tackle. At times, it felt that there was some redundancy in the discussion among breakout groups.

Organization

I would have provided more direction for the day-two discussions

Organization

It's always difficult to know how a meeting is going to go when you throw a bunch of people into a room. However, I think that we could have really focused discussions more on the mathematical modeling stuff on the afternoon of day 1, not until day 2. It seemed that the first day and a half seemed to go in circles, particularly for the groups after the math modelers were pulled into their own group.

Organization

I would perhaps not organize them in advance but rather collaboratively develop a list of questions/hypotheses and then cross link this with modeling tools, then send groups off to address each question.

Organization

Clear direction/path for follow-up and action

Organization Follow-Up

My only suggestions for improvement: demonstration and "play" with actual simple models during the workshop; the break-out groups on Tuesday afternoon and Wednesday morning would have benefitted from a bit more guidance, such as a recommended structure for the reports (e.g., important questions, appropriate modeling approach for getting at each question, data availability and needs, time frame, etc.); one of the coffee pots put out in the morning contained decaf, but was not marked as such ;)

Organization Accomod.

Modeling variety could have been better represented. The modeling group was particularly weak on spatial modeling.

More modelers

I would nail down commitments to future collaborations. Who is doing what?

Follow-Up

More direction on how to work with modelers after the meeting.

Follow-Up

A technical detail would be explaining better for those of us that were local as to what could and couldn't be done with respect to mileage, meals, and similar. We were all sent the reimbursement forms, but it wasn't clear what we were supposed to do with these. I asked in order to get it cleared up, but it would have been nice to not have to ask. The "have to write a group report" aspect was a bit unclear too and I don't know that it helped or hindered. It did add an aspect of "doing something" and arguing out what we need to do to follow up, but was kind of artificial.

Follow-Up Accomod.

a plan for who is actually going to follow through with the research ideas, especially the modeling

Follow-Up

would have like to have seen the modelers interact more, and earlier, with the non-modelers.

Interaction

Although it probably would not have been as productive of a meeting -- to have a little more group interaction with the whole group would have been nice. What I mean here is that I am very interested in at least 2 groups and would liked to have heard discussions in

Interaction

both groups.

Make the group smaller in the future.

Interaction

I think it was very good and productive. I would like more time to discuss further collaboration in situ, but I understand we can do this using email and other communication tools provided.

More Time

Not much. Maybe one-half more day of breakout sessions?

More Time

A day longer!

More Time

I thought it went great.

Nothing

I thought it was a well organized and overall productive workshop.

Nothing

You fed us too much good food!!! :-)

Nothing

Nothing I can think of at the moment.

Nothing

Having a thorough synopsis of what research has been conducted, what is in the works and what is planned for future research- this might help people not currently working with the project directly contribute.

Synopsis

Perhaps some concise "required" background reading on basic bat biology/ecology, and also fungal biology/ecology. We spent more time than needed on the basics of these (especially fungi)

Synopsis

The Workshop format would have been more effective if: (n=1)

Response

Code A

Code B

The end product of the workshop should not have been a paper detailing the utility of modeling to explore WNS (we know this potential already) but would have rather it been to list priority questions, the data available/still needed, the proposed models to use, and assigned people to work on those specific questions (ie: pair up biologists with the modelers) and set some product deadlines

Organization

What could NIMBioS have done to make your stay in Knoxville more enjoyable (e.g. better information about nearby attractions, public transportation, etc.)? (n=0)

Please indicate any changes NIMBioS can make to improve the resources and/or accommodations available to Workshop participants: (n=16)

Response

Code A

Code B

To many sweets and carbohydrates. Need more variety (some people had health issues that make high carbohydrate meals and snacks very bad)

Dietary Needs

The resources and accommodations were absolutely great! Maybe make sure there is more vegetarian fare? The hotel was incredible and I really liked the Volunteer Princess

Dietary Needs

cruise!

Allowance for unusual dietary needs.

Dietary Needs

Accommodations were satisfactory, though there was some trouble meeting my special dietary needs. I do feel one important resource was overlooked. It would have been good to receive a detailed information packet, 10 or so days before the workshop, including links to pdfs of relevant research. Particularly for those of us who are not specialists in this field, it would be good to have a little more time to become conversant with attendees from other fields, by reading some research in preparation for the workshop.

Dietary Needs

Organization

Despite having a net-id, i had trouble getting internet access. Ended up having to install a second virus software and changing my admin account, which is probably not a bad idea but it remains to be seen whether it will cause conflicts with ORNL setup.

Internet

Provide more room for comments in the boxes. The word limitation in some of the boxes in this survey, limited me from fully expressing my thoughts. Below, if there is room, I have expanded on some of my comments above. One of the great challenges that faces researchers who are working on White-Nose Syndrome, is the uncertainties in populations dynamics. From my perspective, this is one area that modelers could help make advances- by varying physiological and population variables that would help predict future changes. The crisis that we are facing is upon us, but we don't even know some of the variable that could inform a model. An initial start would be for someone to assemble assorted environmental variables and put these into a GIS to explore the potential effects of individual variables on reproductive success, but more importantly the assess the synergistic affects of assorted variables on the expected spread of WNS.

Miscellaneous

I am local so didn't need travel arrangements or housing.

Nothing

Well done Tom & Gary & staff, thanks!

Nothing

was impressed by the quality travel accommodations and organization; appreciated the social activities scheduled in the evenings

Nothing

none jump to mind

Nothing

None that were relevant to my group experience, but a group slightly larger than ours may not be as comfortable.

Nothing

NIMBioS did a nice job

Nothing

I appreciated the hard work of the NIMBioS staff. I think the meeting went as smoothly as probably could have been expected.

Nothing

food was awesome..whatever you are doing..keep doing it!

Nothing

Facilities, housing, and meals were all very suitable.

Nothing

NIMBioS did not arrange my travel since I signed up so late for the meeting. I have no recommendations for change - the facilities and the facilitators were excellent.

Travel

Please provide any additional comments about your overall experience with the Workshop: (n=14)

<i>Response</i>	<i>Code A</i>	<i>Code B</i>
It was an excellent opportunity to meet so many people involved with this project and really brought the Forest Service "up to speed." Hopefully many good things will come of it and we can help save the bats!	Contacts	
thanks, I enjoyed it very much! -Guy	Excellent	
Good Job!	Excellent	
excellent workshop.	Excellent	
Excellent - very helpful in moving our WNS investigation forward with a science-based approach.	Excellent	
I was very satisfied with my experience, given my objectives coming into the workshop. For folks who have been addressing this problem for a longer period of time, I hope that this group was able to bring fresh and constructive ideas for advancing knowledge on the topic.	Inspiring	Productive
I have to admit, I arrived at the workshop feeling rather hopeless about WNS. After attending, I believe that if there is a solution, we stand a chance of finding it.	Inspiring	Productive
I was under the misimpression that we would develop a model during the workshop, and answer some of the questions we set out to ask. My other misunderstanding was that the faculty at NIMBioS would take on the task of working on the models, if they were not complete during the workshop. It would be helpful to have an explanation of the process before the workshop, (which you did) my lack of experience shows here	Models	Organization
The modeling aspect - which was supposed to be the emphasis - was vague and the workshop was not structured to provide a clear way for others to participate. The workshop, as a result, had the feeling that "modelers" would take the information and the contacts made there and proceed on their own, rather than developing a concrete collaboration. I think a more pointed tutorial on models and their potential development, use, and would have been more helpful than the widespread notion that somehow the models were at hand to do almost anything that came up, without elaboration of what might be specifically involved.	Models	Organization
This workshop was one of the most productive and informative programs I have participated in. I hope to build more on what I learned and the contacts I made. The organization and format (and food, accommodations, etc.) were really terrific!	Organization	Productive
I have been a Federal employee for many years, have attended many meetings and workshops -- I feel this workshop was one of the most well organized, comfortable, congenial, and useful for addressing an important issue that I have ever been part of. All of those involved with the organization were fantastic, friendly, and helpful. No glitches!!! Tom H. was one of the warmest and best facilitators I have ever been involved with. A meeting of this type has been needed for no less than 18 months -- I truly believe that many good things will transpire from it.	Organization	Productive
Overall, I felt this was a very successful workshop. Compliments to the organizers and all who made this a successful experience.	Organization	Excellent
Very useful and mostly productive workshop. Resources while there were excellent.	Productive	Excellent

Thanks for everything.

I have attended several workshops over the past few years aimed at better understanding and finding solutions for white-nose syndrome and other extremely important issues facing wildlife. This workshop stood out from others I have attended in that it involved a wider range of surprisingly appropriate expertise, open and exciting air of discussion, excellent technical and travel support, and most important to me...a total lack of pretense. I think that the workshop will help set important research in motion.

Productive Contacts

If you maintain a blog about your research and would like a link posted on the NIMBioS website, please provide the URL here, along with a brief description of the blog: (N=3)

<i>Response</i>	<i>Code A</i>	<i>Code B</i>
http://soils.ag.uidaho.edu/gknudsen/ (research program description, not really a blog but periodically updated)	Research	
I maintain a WNS website for the Nss, but it is not a blog. www.caves.org/WNS	Website	
BAT Website: http://www.bu.edu/cecb/BATS BIOLOGY Website: http://www.bu.edu/biology CECB Website: http://www.bu.edu/cecb NSF DISCOVERY Website on Aeroecology: http://www.nsf.gov/discoveries/disc_summ.jsp?cntn_id=112547 NSF DISCOVERY Website on Agroecology: http://www.nsf.gov/discoveries/disc_summ.jsp?cntn_id=112602	Website	

How did you hear about this Workshop? (n=28)

<i>Response</i>	<i>Code A</i>	<i>Code B</i>
A call from Gary McCracken	Call	
Through a conference call about WNS	Call	
ECOLOG list	Ecolog List	
ECOLOG-L Listserve	Ecolog List	
I was contacted by email by the organizers.	Email	
Jason Miller (Truman State) send me an email.	Email	
One of my collaborators, Bill Rainey, forwarded an e-mail he received.	Email	
Through E-mail from Fish and Wildlife Service	Email	
Through several e-mails.	Email	
Forest Service administrator	Organization	
Through the interagency national federal working group for WNS.	Organization	
a co-worker working on WNS	Invited	

From Dr. Tom Hallam.	Invited	
From the communications coordinator at NIMBioS	Invited	
I got a direct invitation to attend the workshop from Gary McCracken during the WNS Science strategy meeting in Austin.	Invited	
I heard about the workshop from both lead organizers, Drs. Hallam and McCracken. Dr. McCracken was my dissertation advisor, and Dr. Hallam was on my committee. I also saw an online post through ECOLOG.	Invited	Web
I was invited	Invited	
I was invited to attend by Tom Kunz & Tom Hallman	Invited	
I was invited to participate	Invited	
I was invited.	Invited	
Invite from Tom	Invited	
Invited	Invited	
Invited by Tom Hallam	Invited	
Through discussions with Tom Hallam and Gary McCracken, colleagues with whom I have previously collaborated on other research projects.	Invited	
Through word of mouth via colleagues, and also through a short presentation by Gary McCracken at the Austin Science Strategy meeting on WNS. re: prev. question - I watched the archived webinar prior to the workshop since i was unable to attend the scheduled webinar. I think having the webinar available via archive for those who could not make the times/dates is VERY valuable. The webinar itself was very valuable to get folks up to speed. I highly recommend this in the future.	Invited	
found it while doing a web search on WNS	Web	
Google alerts.	Web	
Internet announcement	Web	

What were you hoping to learn by attending the webinar? (n=22)

<i>Response</i>	<i>Code A</i>	<i>Code B</i>
Background information on WNS spread, learn more about bat ecology related to WNS	Background	Bat Ecology
I have not been involved in research on WNS in bats until now. Thus, I was hoping that the webinar would provide relevant background information needed to address the objectives of the workshop (for someone in my position).	Background	
Background information on the subjects I was not well acquainted with, mainly modeling. Also, to collect notes before I showed up to the conference so I would have an idea of what was going on.	Background	

Background information on the subject.	Background	
Enough background to be able to be up to date concerning the most current issues associated with WNS for the upcoming workshop.	Background	
Not being an expert on bats or WNS I wanted to get up to speed.	Background	
Background information about the disease.	Background	
Background info and history of WNS as well as background/affiliation of workshop participants.	Colleagues	Background
I expected to learn about the status of the WNS and what kind of research is being done.	Current Research	
background information on the knowns and unknowns concerning WNS and what research is currently in progress	Current Research	Background
I was hoping to learn about current research, most of which does not appear, yet, in literature. I was also hoping that the webinar would clarify workshop goals for me, so that I'd be better prepared.	Current Research	
I was hoping to learn what was presently known about WNS and ideas for possible mathematical models.	Math Modeling	
I hoped to learn more about NIMBioS and how mathematical modeling approaches could be brought to bear on important questions surrounding WNS. I was also hoping to get a feel for the range of expertise that would be present at the meeting.	Math Modeling	
How the application of mathematical modeling could assist us practically in addressing the disease progression of WNS and its geographic progression.	Math Modeling	
To meet new colleagues and to learn the power of modeling to address White-Nose Syndrome. To learn what kind of data modelers need to develop a new way of thinking about White-Nose Syndrome, or how modelers could develop predictive models independent of empirical data.	Math Modeling	Colleagues
Yes it helped put all the current work in context.	Miscellaneous	
Didn't know what to expect. Was kind of surprised by the length and variety of info. I guess it did save time and give opportunity to include some who couldn't attend, but it was long! I did go back and reviewed it in its entirety and did take screenshots and notes. The ability to review and take notes and start off the workshop on the same level is a great idea, but the length made it mind-numbing.	Miscellaneous	
I was hoping to get some updates on the current knowledge of WNS, and an introduction to some of the modeling applications.	Updates	
I was not expecting to learn much. I wanted to bring new people up to speed to that we could not be wasting time in the Knoxville meeting.	Updates	
I was hoping to get up to speed on what was going on with WNS - I had read the reports online but hadn't heard of news since the late Winter update. I had hoped that there would be a bit more discussion of what was concluded at the Austin TX meeting, but it was ok that there wasn't much mentioned about that meeting.	Updates	

More about WNS

Updates

Be brought up to date on current state of knowledge and what aspects of WNS different people are currently working on.

Updates

Comments about the webinar: (n=16)

Response

Code A

Code B

it worked

Liked It

I enjoyed hearing the background of WNS from both the bat biologist and mycologists. The online format and archive was very convenient.

Liked It

it was very helpful

Liked It

Absolutely. It showed me there would be new perspectives and expertise guided by the NIMBioS framework and got me excited about attending. It also influenced me to independently learn more about the backgrounds and work of other participants before arriving.

Liked It

Yes, this made it possible to get invited participants informed about what was known and not known White-Nose Syndrome before we actually met.

Liked It

Well run, thanks. Probably need to remind future speakers not to use cell phones :-)

No cells

I was on the call for 2.5 hours and left when the guy on the cell phone wasn't coming through clearly. I felt that much of what was covered in the webinar on WNS was already out there in summaries and presentations available on the web since this past winter or earlier. Also, it was clear that many of the participants were not up to speed on those materials, so the webinar was probably worth their time. However, this meant that questions that had answers previously were asked and quite honestly, many of the questions really had nothing to do with the purpose of the Investigative workshop, which was mathematical modeling.

No cells

Technological fluidity lacked. Also, some of the talks became repetitive once we were at the conference.

No cells

It was unfortunately that the last speaker was unintelligible due to a bad phone connection.

No cells

Excellent, there were some VERY few technical problems; these did not detract from the exchange.

No cells

The webinar really helped me establish a foundation for my preparation. It would have been better to hold it a few days earlier, to give me more time for reading as follow up. Sound quality was frequently poor. Protocols need to be established for eliminating echo, interference and loss of signal if webinars are going to rely on voice. Participants should be prepared to switch to typed text. I was not able to paste text into the webinar's comments box. Spelling and typing challenged participants, such as myself, may be more comfortable typing into their favorite text editor, then pasting into the comments box.

No cells

Need to make sure the presenters are using land lines and not cell phones.

No cells

I think it was very good idea and saved time during the workshop. We could make references to things said at the webinar.	Time	Liked It
---	------	----------

I found the information presented to be helpful in preparing for the workshop. However, I think it would have been better to limit the webinar to 1-1.5 hours. Certainly, greater than two hours was too long in my opinion.	Time	Liked It
--	------	----------

I hadn't counted on devoting the time for the webinar so had to work on other things during it -- it would have been nice to know prior to the application process for planning purposes. Some sound issues, but the presentations were helpful.	Time	
--	------	--

Not having been exposed to the mathematical side of things previously, the potential was clearly evident. Other than a minor sound problem with one presenter, the format worked very well. My only complaint would be that it didn't stick to the two-hour timeframe, as I had other work commitments.	Time	
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If you did not use Twitter during the Workshop, could you please explain why (e.g. didn't know how to use it, didn't have time, wasn't interested)? (n=21)

<i>Response</i>	<i>Code A</i>	<i>Code B</i>
Ample face-to-face communication was available, and external input seemed unnecessary	Direct Contact	Unnecessary
It was not at all necessary, all the people were in the same room, I could speak to them in person! I did use the tool for asking questions during the webinar, I don't know if that is related to Twitter.	Direct Contact	Unnecessary
don't know how and didn't see the point since I could ask the question directly to the person/group	Direct Contact	Unsure How to Use
I wasn't familiar with it, and particularly what it would offer above face-to-face interaction within the group.	Direct Contact	Unsure How to Use
I thought that good old fashioned hand-raising worked just fine!	Direct Contact	Unnecessary
Didn't see the need since I was sitting in the room. Since we never referred to anything posted on Twitter, it seems no one used it during the workshop.	Direct Contact	Unnecessary
Nothing there that we weren't experiencing as a group anyway.	Direct Contact	Unnecessary
i was in the workshop so i didn't think i needed to see what i was already hearing.	Direct Contact	Unnecessary
wasn't interested - and haven't used it before. It seemed like it would distract me from interacting directly. why would i type my question.. when i could simply ask it and have direct conversation? might be useful for folks who weren't there in person? don't know.	Direct Contact	Unnecessary
Wasn't interested. I'm sort of anti these things - taking away from personal contact. My social networking tends to be personal, face to face, or by telephone, although e-mail is a necessity, and list serves can be.	Direct Contact	Unnecessary

Mostly did not have time. Responses were quicker just by raising a hand. I can see some advantages of Twitter in large groups, but I don't see the advantages in a small group-- unless it provides opportunities to highlight certain points in abbreviated fashion. One of the problems that I see with various types of online communication is that it actually reduces face-to-face social contacts, and unless you know the person who is writing something, the person might just as well be anonymous. I personally like face-to-face contact. One of the criticisms of online communication is that people can actually lose social skills of face-to-face communication. In effect, someone could sit by themselves in a room their entire life, and never meet someone face-to-face. With advances in online communication, other forms of social communication can potentially become diminished or lost.

Direct Contact Time

Wasn't interested and wasn't clear how using Twitter was useful when we were all in a room together

Direct Contact Unsure How to Use

wasn't interested

Unnecessary

there is not enough time in the day to simply answer e-mails. I cannot afford to add another layer of E- communication.

Unnecessary Time

I wasn't interested

Unnecessary

I find this method of communication useless. Furthermore, opening working group discussion to the general public could cause people to be less willing to have candid open discussion and could cause problems for government participants who have to deal with FOI issues.

Unnecessary Privacy

Was not interested at first and when I tried to access it after the conference I could not get on.

Unnecessary Unsure How to Use

Don't really get the purpose of it - do you want parallel communications to be going on at the same time? Can people multitask that way and still be listening to the group?

Unnecessary

Didn't know how to use it; didn't feel a need to use it.

Unnecessary Unsure How to Use

Didn't think it was required to assist the communication that was taking place already.

Unnecessary

I'm new to Twitter. It often takes time to establish a new tool such as this.

Unsure How to Use

Please indicate any suggestions you have for facilitating communication among participants during the Workshop: (n=10)

Response

Code A Code B

More follow-up communication perhaps.

Follow-UP

I was the youngest one there and had the least experience so I really just tried to listen to the main people.

None

Changing the composition of the breakout groups would probably ensure the greatest contact and communication among participants.

Organization

It might be good to provide a printed assessment of workshop progress, like a brief newsletter, daily in the mornings preceding the workshop.

Organization

Send an e-mail to participants noting where the information from the working group meeting can be found on the web. You probably have already done this, but because have been in the field most of the time since the meeting, I could have missed this. Judging from the very limited use of Twitter by the participants at the face-to-face meeting, I don't think this is a very effective way to communicate--except if provides an opportunity for shy participants to ask a question. Perhaps this just reflects the fact that twitter and tweet are relatively new ways of communicating for old guys--over 70--and that this was the first time that some of us were introduced to this mode of communication. Use of twitter on the webinar was very affective.

Twitter

I thought the format worked well, and that twitter was not necessary (in fact we only had it at the very beginning). The post-workshop WIGGIO site looks like it will be very helpful.

WIGGIO

Not Twitter

Getting hit at my email with lots of references that I didn't have a context for was not as effective as a wiki-like environment. I've joined the Wiggio-group, but I've not understood its role yet. Do I have to check one more website weekly, can I do an RSS feed, and similar questions.

WIGGIO

I think I am going to really like Wiggio. I think the twitter didn't add anything to my experience. The webinar was excellent - and archiving it for participants to view prior to the workshop (if they couldn't participate) was very valuable.

WIGGIO

Not Twitter

There were more opportunities for communication during the meeting (e.g., twitter) than I was able to utilize.

WIGGIO

Not Twitter

Patience. Not everyone (myself included) understands/uses/appreciates the potential of Twitter or Wiggio.

WIGGIO

Twitter