

NIMBioS

Evaluation Report

**SUMMER RESEARCH EXPERIENCES
FOR UNDERGRADUATES AND TEACHERS**

MAY 29 – JULY 20, 2018

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About the NIMBioS SRE

The 2018 NIMBioS Summer Research Experiences (SRE) for Undergraduates was held May 29 – July 20, 2018 at NIMBioS on the campus of the University of Tennessee, Knoxville. Participants from all over the country worked in teams with NIMBioS postdocs and UT faculty on research at the interface of mathematics and biology. Participants received free university apartment-style housing, a stipend of \$4,100, and up to \$650 of support for travel to/from Knoxville.



NISER sent pre and post evaluation surveys to all student participants and post surveys to all mentors. A total of 14 students and 9 mentors responded to the surveys. Additionally, NISER also held a focus group with the students.

2018 Projects and Participants

Ecological Niche Modeling and Risk Assessment of Thousand Cankers Disease



Participants: Benjamin Schenck (College of William and Mary); Brianna Alred (Univ. of Tennessee); Ben Reber (Houghton College)

Mentors: Mona Papeş, Ecology & Evolutionary Biology; Director, Spatial Analysis Lab at NIMBioS, Univ. of Tennessee
Greg Wiggins, NIMBioS Education & Outreach Coordinator

Widespread mortality of black walnut, *Juglans nigra*, in the western U.S. has been attributed to an insect-mediated disease known as thousand cankers disease (TCD). This disease manifests when the vector, *Pityophthorus juglandis* (walnut twig beetle), inoculates trees with a fungus, *Geosmithia morbida*. TCD was documented from black walnut in its native range in the eastern U.S. in 2010. However, the symptomology of the disease has not been as acute as in the western U.S. Greater environmental stress in the western U.S. may account for greater disease severity. Thus, under what scenarios would symptomology be more acute and mortality more widespread in the eastern U.S.? Ecological niche modeling was combined with climate change models to characterize conditions that may contribute to greater infection and mortality in the eastern U.S. The resulting models allowed scientists and resource managers to consider management strategies for future forests.

Mosquito Population Response to Environmental Variables



Participants: Anastashia Blesi (Univ. of Tennessee); Hanna Reed (Univ. of Central Florida); Samantha Brozak (Arizona State Univ.)

Mentors: Dr. Rebecca Trout Fryxell, Medical and Veterinary Entomology, University of Tennessee & Dr. Suzanne Lenhart, NIMBioS Assoc. Director for Education & Outreach; Mathematics, Univ. of Tennessee

In East Tennessee, human acquired mosquito-borne viruses include La Crosse virus, which has bird and small mammal reservoirs. Knowing mosquitoes are dependent on their environment, mosquito populations can be predicted if environmental variables are understood and the reasons for vector and pathogen presence and absence can be described. Knowing how infected and uninfected mosquito populations respond to environmental variables will lead to better understanding of the ecological relationships, quantifying disease and nuisance impacts, and integrating management options. Using data on mosquitoes collected in Trout Fryxell's lab in 2017, with details on the life stages and virus load status, the student team formulated an epidemiological model to predict mosquito abundance levels across their life stages, including the impact of environmental variables. Connecting with human La Crosse cases in this area, the project was seeking to understand the role of *Aedes* mosquitoes in La Crosse virus transmission to children.

Modeling the Management of Feral Cats with Economic Impacts



Participants: Brielle Kwartta (Houghton College); Sarah Brock (Univ. of Tennessee); Yi Dai (The Ohio State Univ.)

Mentors: Dr. Charles Sims, Howard H. Baker Jr. Center for Public Policy; Economics, Univ. of Tennessee; Dr. Suzanne Lenhart, NIMBioS Assoc. Director for Education & Outreach; Mathematics, Univ. of Tennessee; Dr. Teresa Fisher, College of Veterinary Medicine, Institute of Agriculture, Univ. of Tennessee

Feral cats are recognized as a problem globally due to their negative impact on wildlife and potential to spread infectious disease to people and other animals. Trap-neuter-return (TNR) programs are employed in many areas to control feral cat populations, but the economic impact of such programs needs investigation. This project would build a feral cat population model based on some data from colonies in Knox County, TN. The economic costs associated with possible management strategies would be coupled with the model to give guidance about policy decisions. Marcy Souza and Teresa Fisher from the University of Tennessee, College of Veterinary Medicine, will assist with this project.

The Spatial Interactions between Hunting and Plant Gathering in Tropical Forests

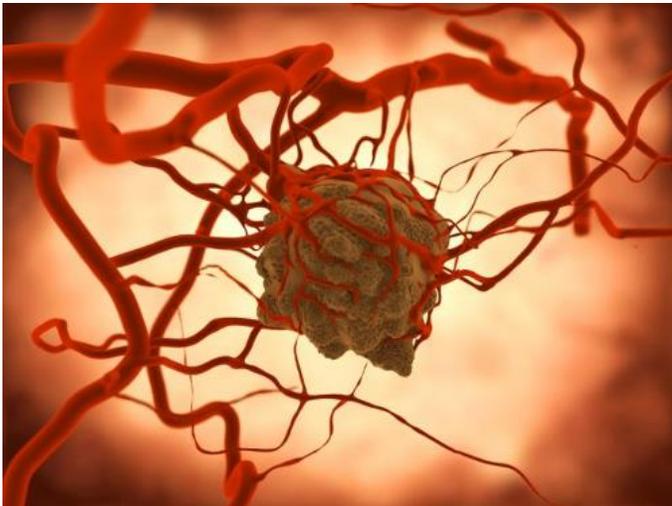


Globally, wildlife is overharvested for bushmeat and the pet trade in biodiverse tropical forests, which presents a major conservation challenge. How harvesters decide which patches of habitat to target is a major knowledge gap that limits the design of wildlife protection policies. The distribution of harvesting pressure across space may be dictated not only by animals but also by plant products, such as medicinal herbs, rattan, and other important goods. Using modeling, this project sought to explore how exploitation pressure would change across a landscape under different conditions, such as the spatial and temporal distribution of plant and animal resources, as well as travel costs for hunters.

Participants: Eeman Abbasi (Mount Holyoke College); Kevin De Angeli (Texas A&M Univ. Kingsville); Alan Gan (Mathematics, Univ. of Tennessee, Knoxville)

Mentors: Dr. Charlotte Chang, NIMBioS Postdoctoral Fellow; Dr. Xingli Giam, Ecology & Evolutionary Biology, Univ. of Tennessee

Using Phylogenetics to Understand Cancer Tumor Evolution

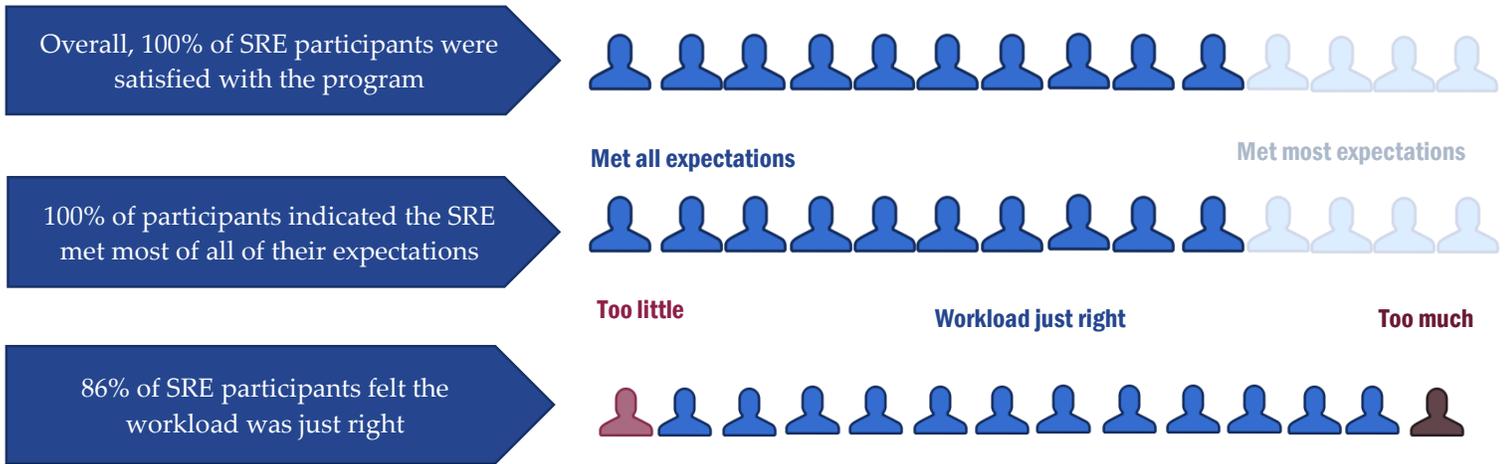


The transition from normal cells to cancer is an example of a within-patient evolutionary process. With advancements in sequencing technology, it has recently become possible to begin applying models of protein evolution to cancer genomes. The aim of this project was to apply a mechanistic model of protein evolution developed in the Gilchrist and O'Meara labs to publicly available cancer genome datasets. Our goal was to deepen our understanding of cancer by quantifying the nature and strength of natural selection on tumor related proteins using an explicit and well defined evolutionary framework.

Participants: Amelia Berle (Lewis & Clark College); Diego Castedo Pena (North Carolina State Univ.); Sadhana Chidambaran (Rutgers Univ., New Brunswick/Piscataway)

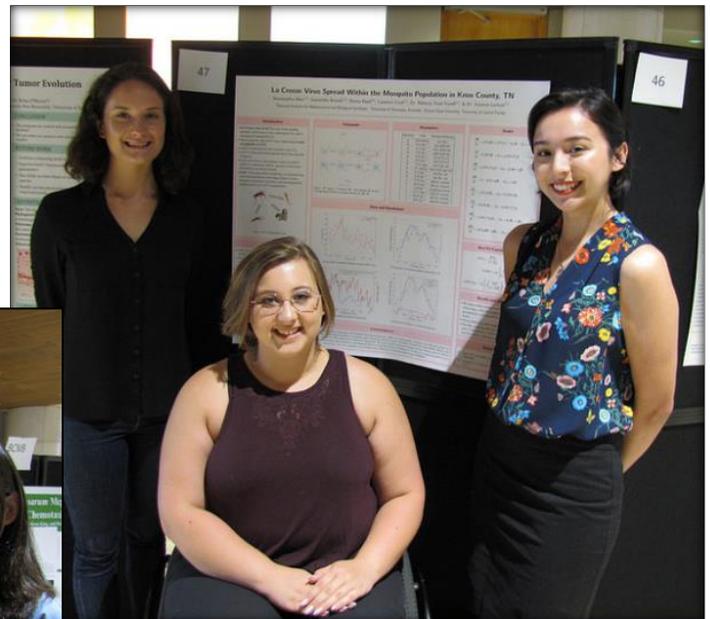
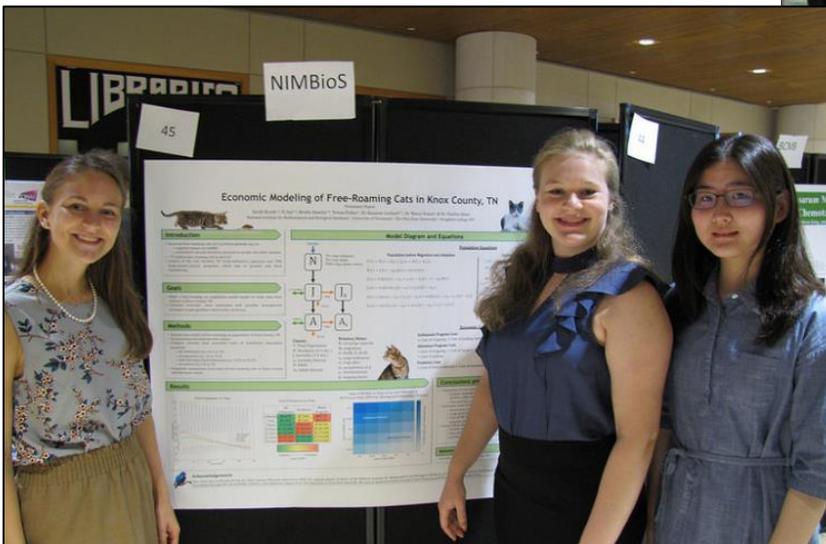
Mentors: Dr. Brian O'Meara, Ecology & Evolutionary Biology, Univ. of Tennessee; Dr. Mike Gilchrist, Ecology & Evolutionary Biology, Univ. of Tennessee

Participant Satisfaction (93% response rate)



SRE Participant comment:

“ I think the mentors were one of the greatest part of this program. They were the best mentors I could have asked for. They did not just introduce me to research, but they also advise me on future graduate school opportunities. It has been really inspiring to work with them, and I can't wait to see them again in October during the Undergraduate Conference.



100% of 2018 SRE Participants would recommend the program to others.

Reasons for recommending the program to others:



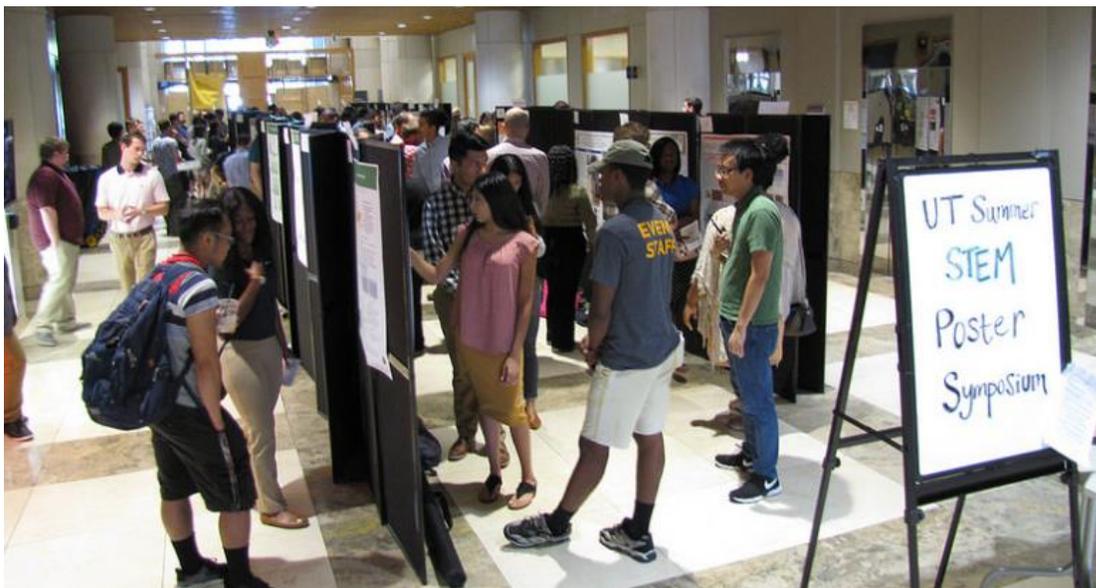
“ Interdisciplinary work is the future. Plus, we always had support and resources. The mentors were great. We were able to do several very fun and unique outdoor experiences as well such as our trips to the Smokies.

“ Wonderful faculty, variety of fun experiences, flexible schedule, wonderful peers

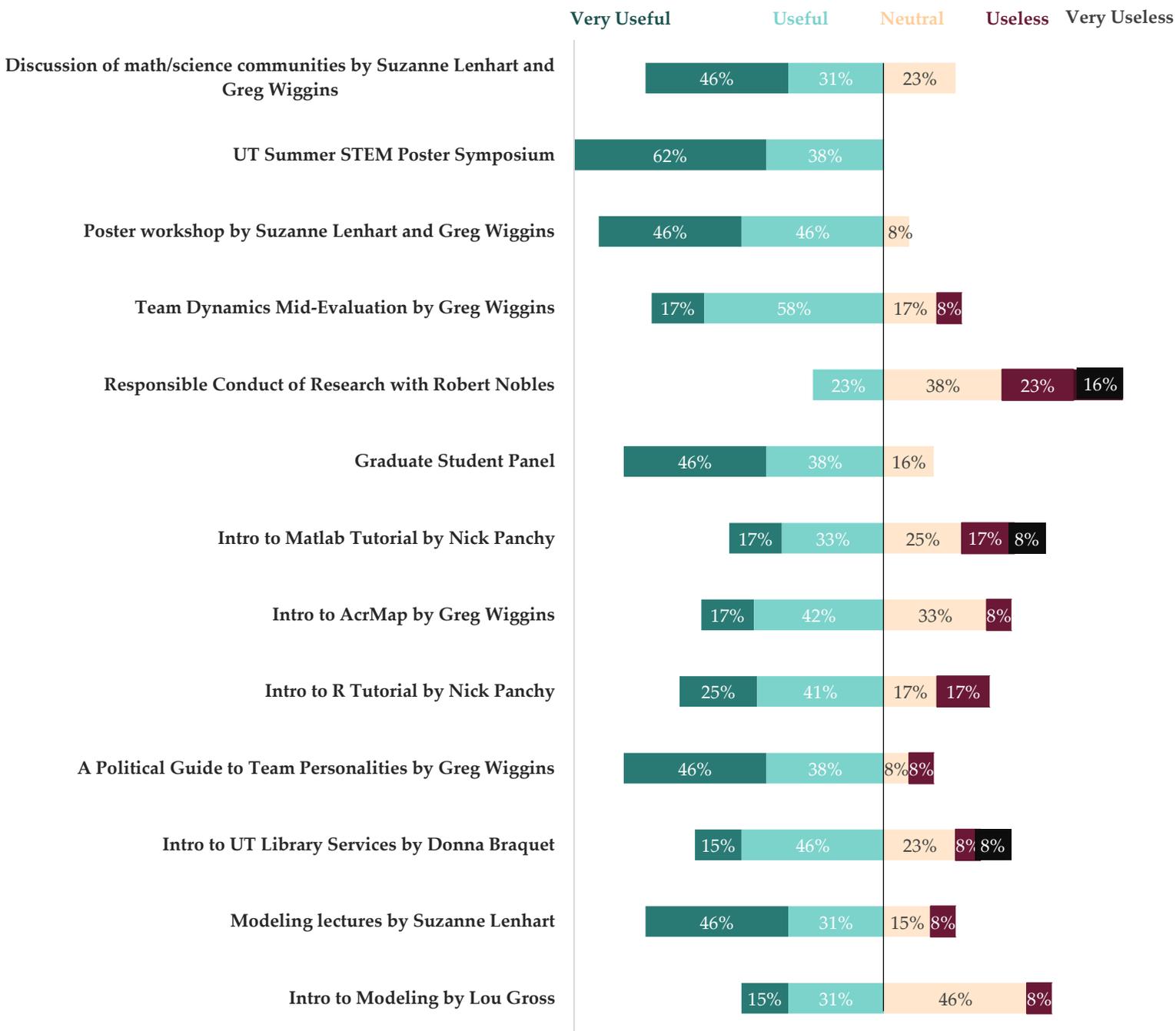
“ Very practical and hands off, allows students to explore and grow as researchers and provides understanding and connections for the grad school application process

“ This program is an excellent introduction to a collaborative, interdisciplinary research environment.

“ Definitely! This has been one of the most interesting summers of my life. I had the chance to work in the field I am passionate about while working with other highly motivated students and prestigious mentors. In addition, I forged great relationships with other SRE students and I explored Knoxville and the Smokey Mountains during the weekends.



Usefulness of lectures and sessions



Other lectures participants found valuable:

The git tutorial session was very informative, even though the information was not used for this summer.

Meeting with Dr. Paul Armsworth about grad school

Talking with the grad students

Comments about lectures or sessions:

Some of the intro lectures (Intro to R, Intro to Matlab, etc.) were not very helpful, because I was already familiar with the material. I would've liked an "advanced" tutorial, as that would have been more useful to me personally.

Satisfaction with accommodations



83% satisfied with housing.



83% satisfied with computing resources.



100% satisfied with extracurricular activities.



83% satisfied with mail service.

Additional accommodations/supports needed:

☞ Vacuum for the dorms (Vol Hall did not have one), and the dorms weren't cleaned before our move in. Old food, underwear, and other stuff was found. Because we were conference guests, we couldn't use the lounge or theatre or gym, but we were there for two months (and it wasn't an issue until the end)

☞ Some sort of orientation would have been helpful

Graduate School Plans

11 out of 14 SRE Participants indicated the experience impacted their plans for graduate school.

12 out of 14 SRE Participants hope to complete a **doctoral degree**. (Aspirations for a doctoral degree increased from 10 to 12 SRE participants. In the pre survey, 4 SRE participants indicated that they hoped to complete a Master's degree. In the post survey, the numbers decreased to 1 SRE participant)

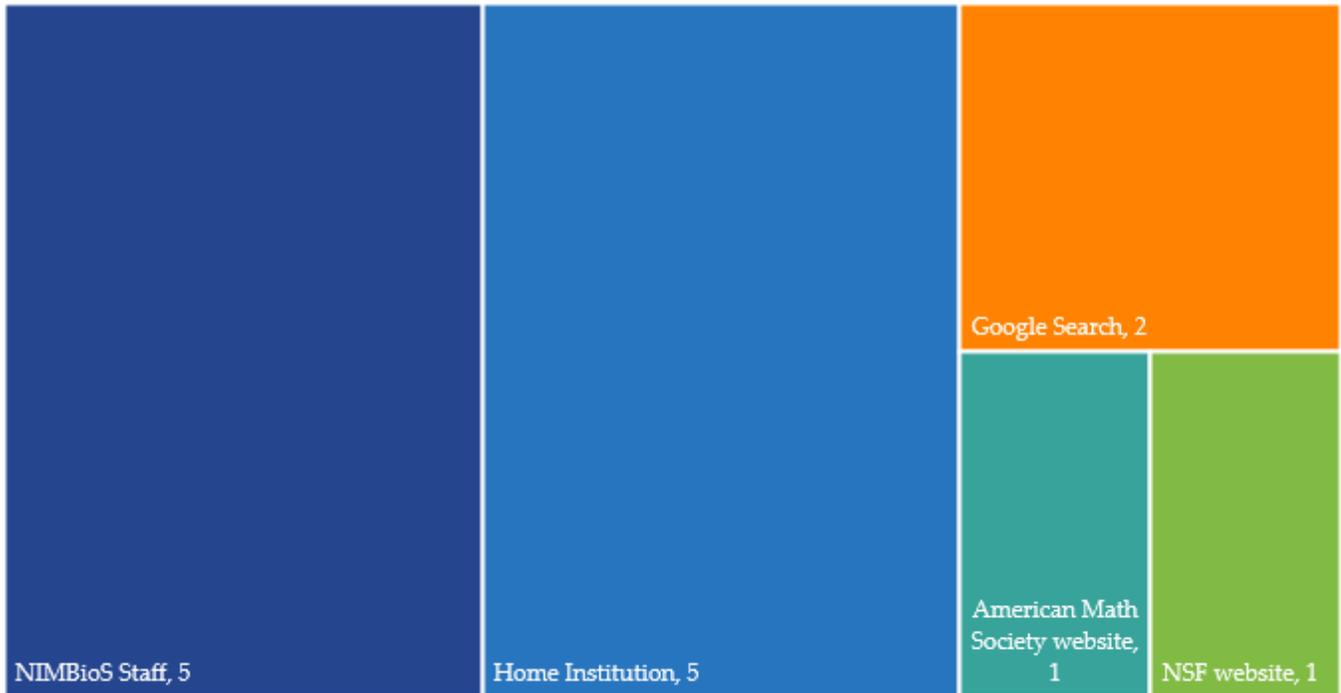
1 out of 14 SRE Participants hope to complete a **Bachelor's degree**.

Ways in which the research experience impacted plans to go to graduate school:

- ☞ Made me decide more clearly on what field I'm interested in.
- ☞ My confidence in my ability to do good research has increased and I feel like I could actually be qualified to go to graduate school.

- “ I am much more confident now about my ability to get into a decent grad school program and feel much more equipped to begin searching and applying
- “ I already planned on going to graduate school; this experience helped narrow down the field I want to work in and gave me a feel for the work environment.

Ways in which participants learned about the Program



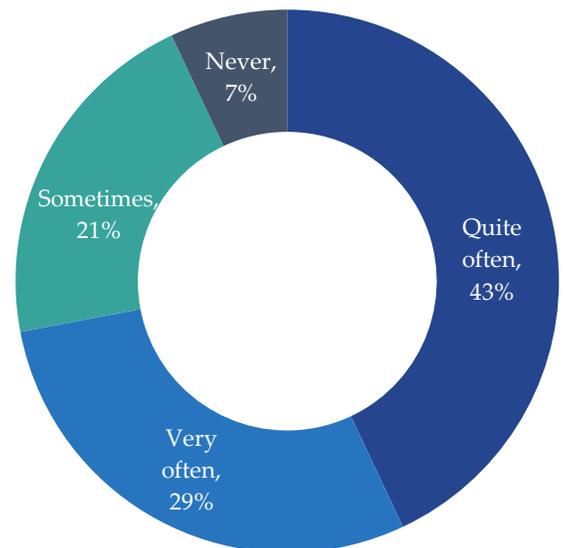
How often participants felt their groups worked well together



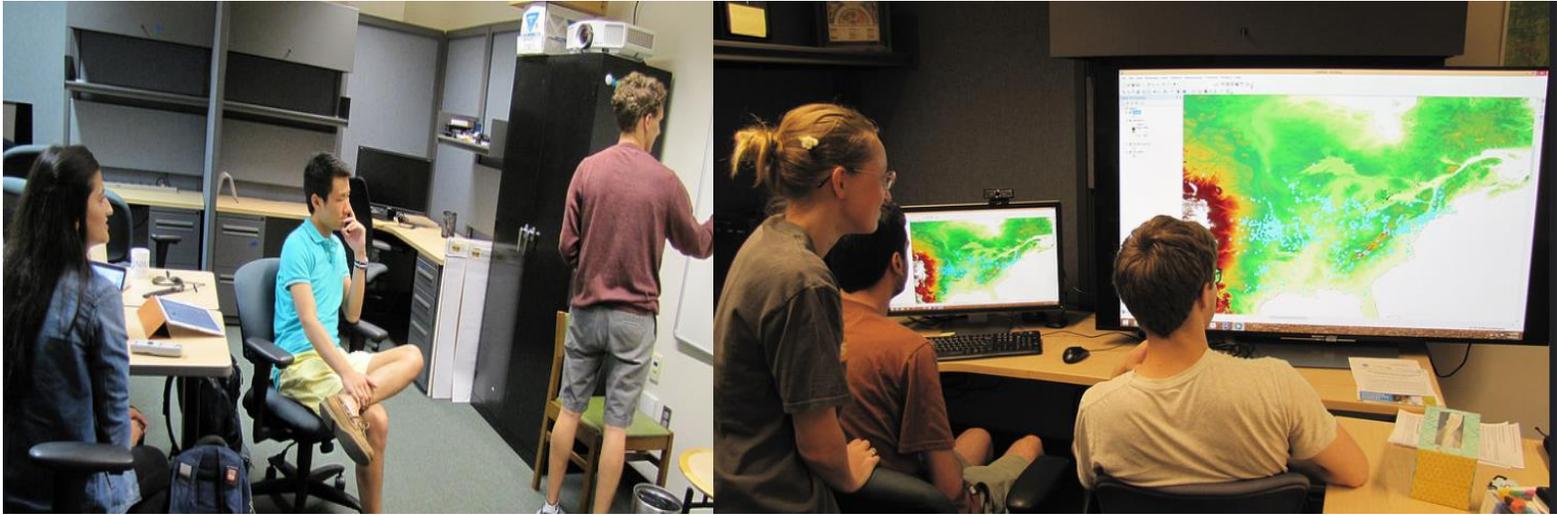
11 SRE students felt Basecamp was a useful means of communicating within the SRE group.

1 SRE student did not feel it was useful.

2 SRE students did not answer the question.



Facilitators of group success



“ We worked best when we were all working on separate tasks, instead of all trying to accomplish the same thing.

“ I think the fact that we worked all together in the same room was key. We were able to consult with each other constantly which helped clarify concerns and continue working quickly. I also think the mentors were key. They were wonderful professors.

Barriers to group success

“ We lived together in the same apartment and had no time away from each other. If we tried to take time away it was seen as personal.

“ Some barriers that prevented our group from working well is when we didn't know what to do next. To remedy this we should have emailed our mentors more.

“ I think people in my group have different programming habits and that slowed us down a little bit. I wish NIMBioS designed a talk on group programming practices so we can use our time more efficiently when it comes to programming.

Participant Satisfaction with Mentors

Aggregated assessment of mentors by research group

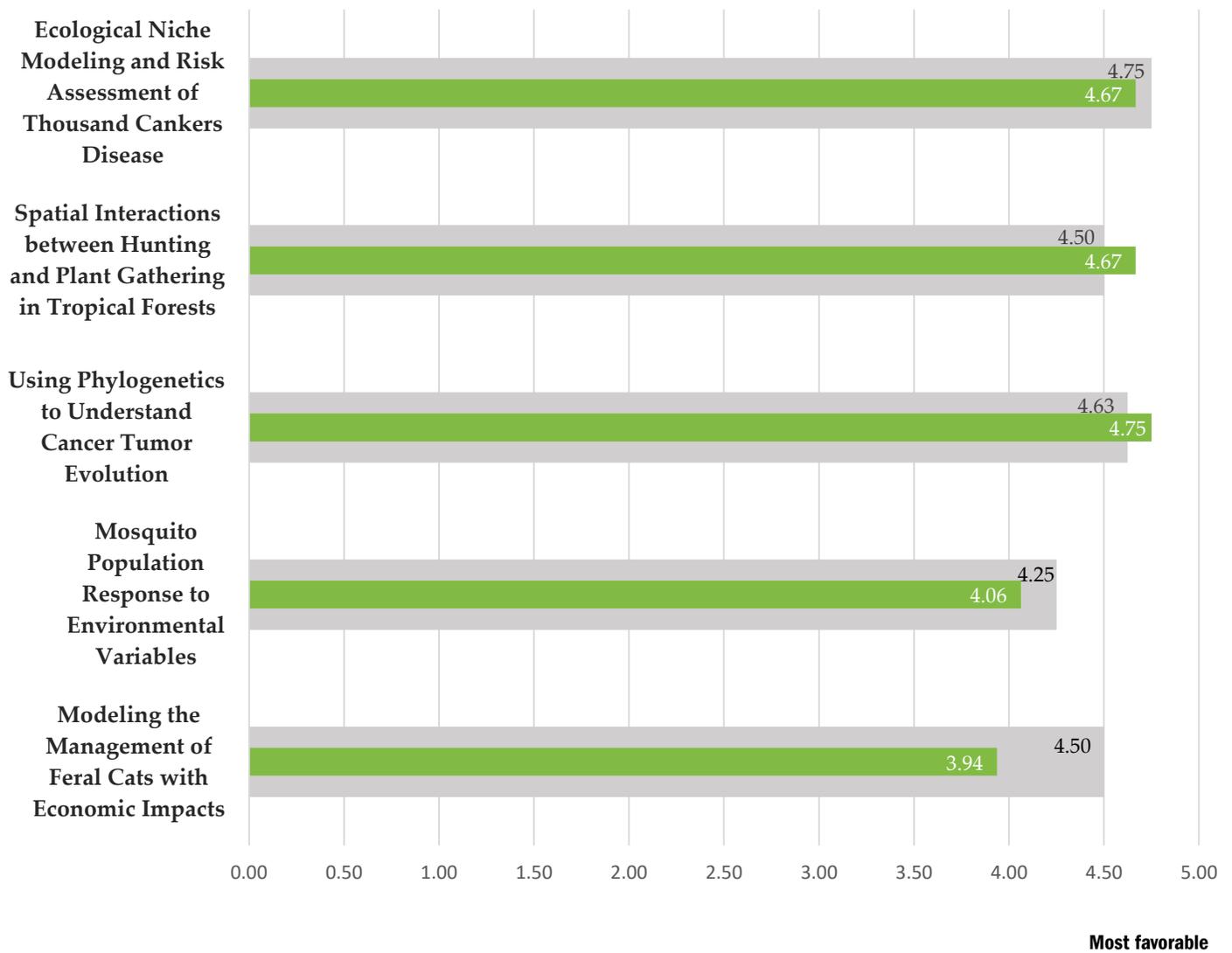
- Modeling the Management of Feral Cats with Economic Impacts
- Mosquito Population Response to Environmental Variables
- Using Phylogenetics to Understand Cancer Tumor Evolution
- Ecological Niche Modeling and Risk Assessment of Thousand Cankers Disease
- Spatial Interactions between Hunting and Plant Gathering in Tropical Forests



“Charlotte is, without hyperbole, the greatest mentor in the entire world.”

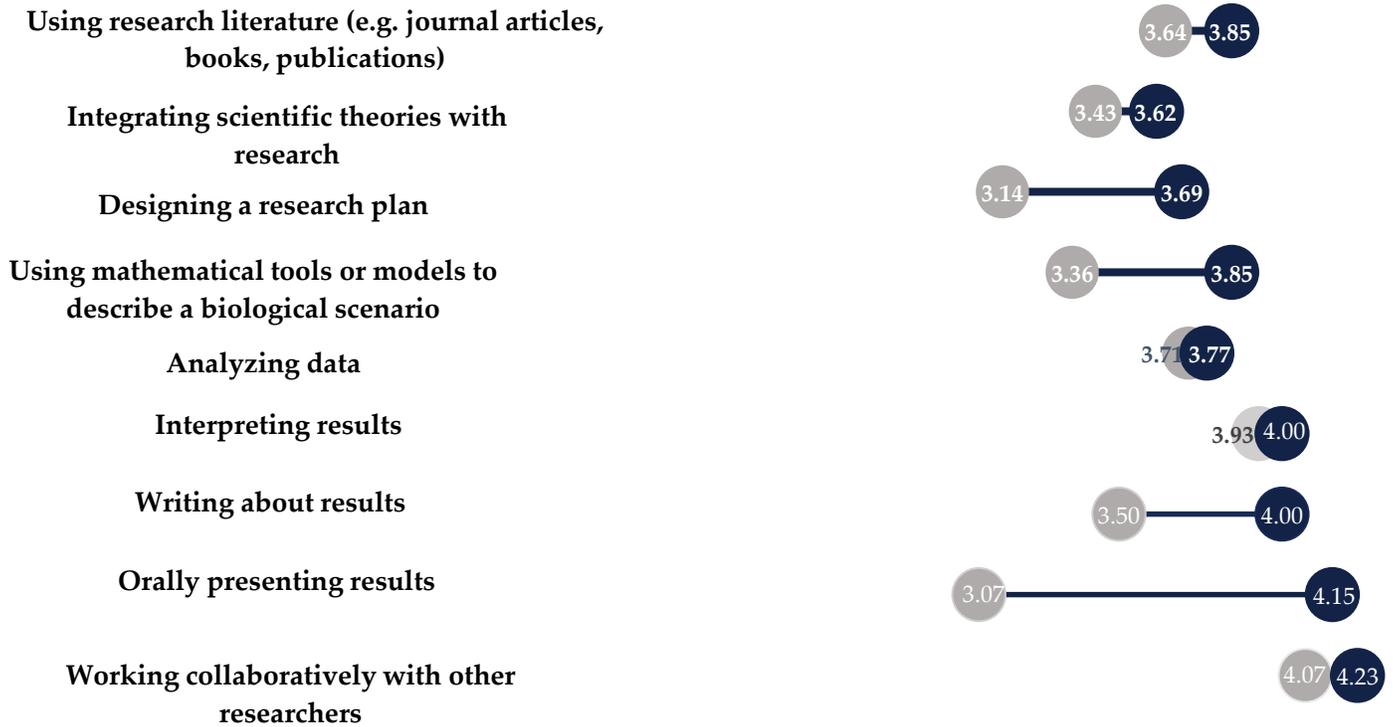
“Mentors were incredible, were always either available in person or by email. Took us to see the town, the Smokies, as well as to see work in the field. They were very prepared and gave us tasks that were challenging, yet very accessible.”

Comparison of mentor composite scores within projects. The Green bar is for mentor 1 and the gray bar is for mentor 2.

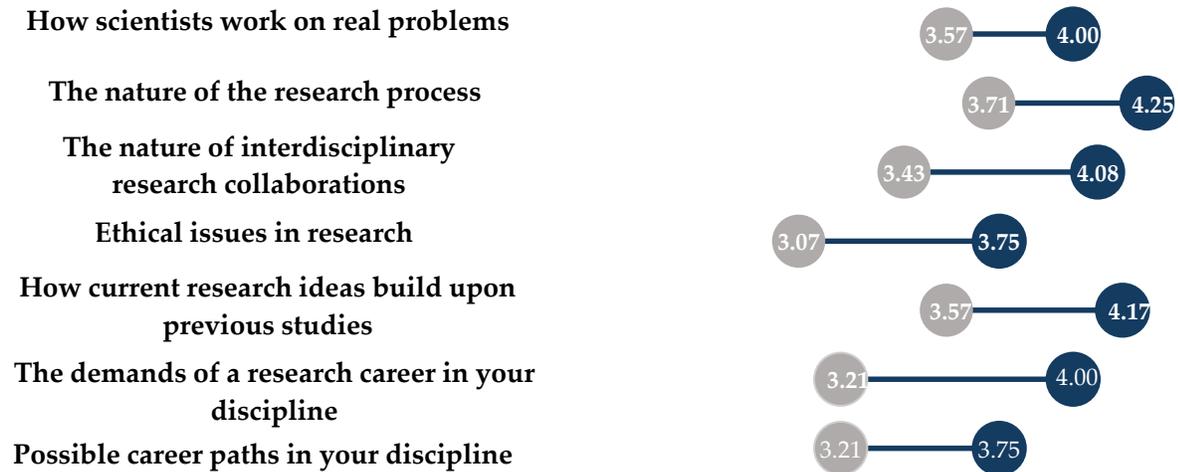


Program Impact

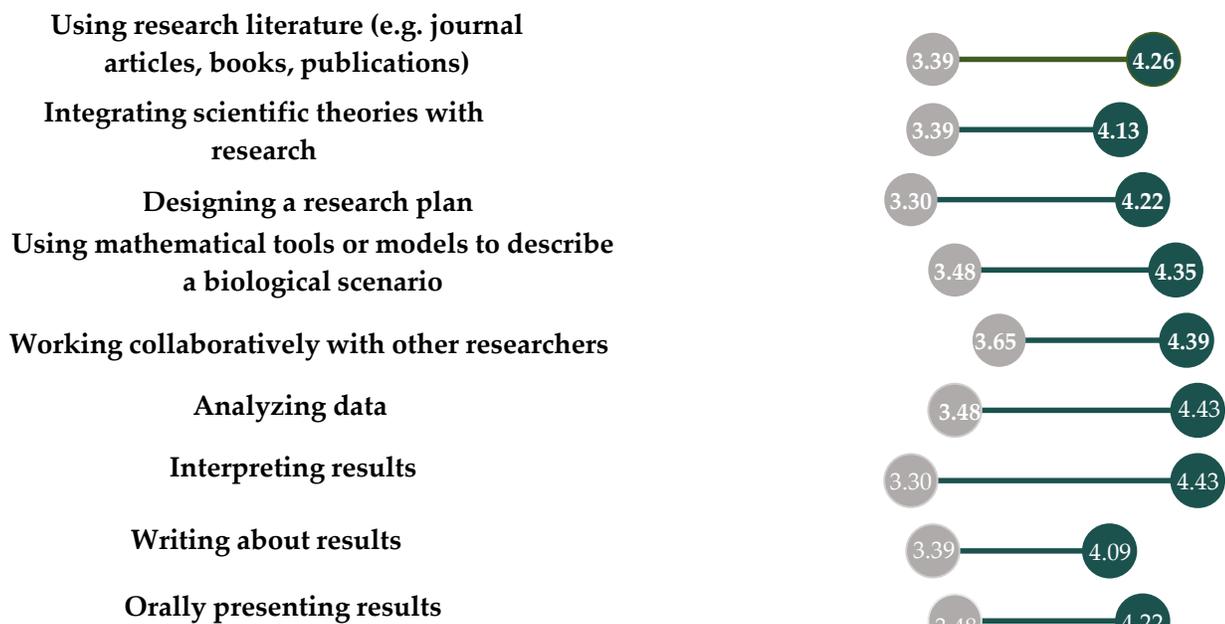
SRE participants rated their research skills at the **beginning** and **end** of the program. Overall increases were evident across research skills. There were small increases for the Analyzing data, Interpreting results and Working collaboratively with other researchers. However, there was a large increase in the category Orally presenting results.



SRE participants rated their understanding of the nature of working as a scientist at the **beginning and end of the program**. There were larger gains when SRE participants reported on their understanding of the nature working as a scientific researcher. All categories showed an increase in before and after scores.



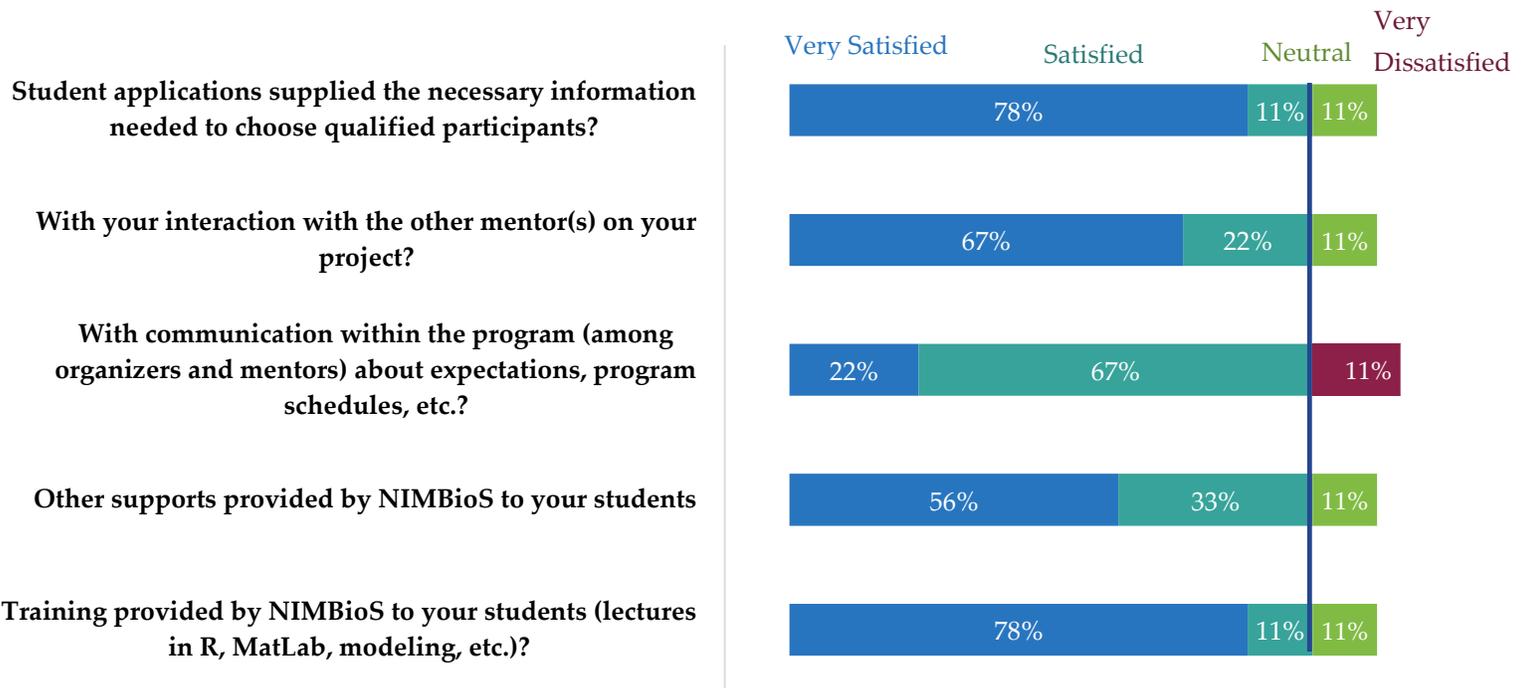
Mentors rated their SRE participants' knowledge about scientific careers and the research process at the **beginning and end of the program**. Overall increases were evident across all knowledge areas.





Mentor Satisfaction (90% response rate)

Mentors responded to several questions regarding satisfaction with various program activities. On the whole, the mentors were satisfied to very satisfied with the majority of the supports offered to them and the SRE participants. One person indicated that they were very dissatisfied with the communication within the program.



90% of 2018 SRE Mentors were satisfied with the NIMBioS SRE program (one mentor was neutral)



Focus group Comments

- ☞ Like that interdisciplinary like in our group we had like a mathematician and then we had a biologist, because we could see both sides versus. It was nice because where we had questions about the biology of something or we were just confused or needed clarification we didn't have to go on like a resource scavenger hunt like we had a professor there to help us and to give feedback on our model and if it's realistic and if any stuff that worked
- ☞ Something really awesome about, I think, everyone's topics here is how applicable it is to like the real world like some people are doing like cancer and diseases and invasive species and it's just it's really cool to see how we can incorporate biology, math, economics, and just all of that together in a project it's pretty cool.
- ☞ To add off onto, to add onto that, so at like bigger universities, I'm like talking to my friends that have done research there, usually you're a part of a lab and you are just kind of a you're just added on there to do research on like little things or just some busy work or but with this program you actually have your own individual like topic which is really cool instead of just being a worker in someone's lab so I thought that was a lot more cool.

Appendix I

SRE Post Survey 2018

Thank you for taking a moment to fill out this survey. Your results will be used to improve the SRE programs for future cohorts, and to track your progress during the program. We hope you had an interesting and exciting experience!

1. Overall, how satisfied were you with your research experience?
 - Very Satisfied
 - Satisfied
 - Neutral
 - Dissatisfied
 - Very Dissatisfied

2. To what extent did this research experience meet your expectations?
 - All expectations met or exceeded
 - Most expectations met
 - Some expectations met
 - No expectations met

3. How did you feel about your workload overall?
 - Way too little
 - Too little
 - Just about right
 - Too much
 - Way too much

4. How often did you feel your research group worked well together?
 - Never
 - Rarely
 - Sometimes
 - Quite often
 - Very often

5. When your group worked well together, what factors do you feel contributed to the group's success?

6. If/when your group was not functioning well, what were some barriers that prevented your group from working well together? How were these barriers overcome (or how do you feel they could have been overcome)?
7. Did this research experience impact your plans to go to graduate school?
 - Yes
 - No
8. Please explain how the research experience impacted your plans for graduate school.
9. What is the highest level of education you hope to complete?
 - High school diploma
 - Associate's degree
 - Bachelor's degree
 - Master's degree
 - Doctoral degree
 - Other degree planned, specify

Please indicate how useful you found the following lectures or sessions.

10. Intro to Modeling by Lou Gross
 - Very useless
 - Useless
 - Neutral
 - Useful
 - Very useful
 - Not applicable
11. Modeling Lectures by Suzanne Lenhart
 - Very useless
 - Useless
 - Neutral
 - Useful
 - Very useful
 - Not applicable
12. Intro to UT Library Services by Donna Braquet
 - Very useless
 - Useless

- Neutral
- Useful
- Very useful
- Not applicable

13. A Political Guide to Team Personalities by Greg Wiggins

- Very useless
- Useless
- Neutral
- Useful
- Very useful
- Not applicable

14. Intro to R Tutorial by Nick Panchy

- Very useless
- Useless
- Neutral
- Useful
- Very useful
- Not applicable

15. Intro to Matlab Tutorial by Nick Panchy

- Very useless
- Useless
- Neutral
- Useful
- Very useful
- Not applicable

16. Graduate Student Panel

- Very useless
- Useless
- Neutral
- Useful
- Very useful
- Not applicable

17. Responsible Conduct of Research with Robert Nobles

- Very useless
- Useless
- Neutral
- Useful
- Very useful
- Not applicable

18. Team Dynamics Mid-Evaluation by Greg Wiggins

- Very useless
- Useless
- Neutral
- Useful
- Very useful
- Not applicable

19. Poster Workshop by Suzanne Lenhart and Greg Wiggins

- Very useless
- Useless
- Neutral
- Useful
- Very useful
- Not applicable

20. UT Summer STEM Poster Symposium

- Very useless
- Useless
- Neutral
- Useful
- Very useful
- Not applicable

21. Discussion of math/science communities by Lenhart and Wiggins

- Very useless
- Useless
- Neutral
- Useful
- Very useful

- Not applicable

22. Please list any other sessions or lectures you found valuable:

23. Comments about lectures or sessions:

The questions on this page will be compared with your pre-survey answers to track your progress as a researcher during the program. How would you rate your ability regarding the following research skills?

24. Using research literature (e.g. journal articles, books, publications)

- Extremely poor
- Below Average
- Average
- Above Average
- Excellent

25. Integrating scientific theories with research

- Extremely poor
- Below Average
- Average
- Above Average
- Excellent

26. Designing a research plan

- Extremely poor
- Below Average
- Average
- Above Average
- Excellent

27. Using mathematical tools or models to describe a biological scenario

- Extremely poor
- Below Average
- Average
- Above Average
- Excellent

28. Working collaboratively with other researchers

- Extremely poor

- Below Average
- Average
- Above Average
- Excellent

29. Analyzing data

- Extremely poor
- Below Average
- Average
- Above Average
- Excellent

30. Interpreting results

- Extremely poor
- Below Average
- Average
- Above Average
- Excellent

31. Writing about results

- Extremely poor
- Below Average
- Average
- Above Average
- Excellent

32. Orally presenting results

- Extremely poor
- Below Average
- Average
- Above Average
- Excellent

The questions on this page will be compared with your pre-survey answers to track your progress as a researcher during the program. How would you rate your level of understanding in the following areas?

33. How scientists work on real problems

- Extremely poor
- Below Average
- Average
- Above Average
- Excellent

34. The nature of the research process

- Extremely poor
- Below Average
- Average
- Above Average
- Excellent

35. The nature of interdisciplinary research collaborations

- Extremely poor
- Below Average
- Average
- Above Average
- Excellent

36. Ethical issues in research

- Extremely poor
- Below Average
- Average
- Above Average
- Excellent

37. How current research ideas build upon previous studies

- Extremely poor
- Below Average
- Average
- Above Average
- Excellent

38. The demands of a research career in your discipline

- Extremely poor
- Below Average
- Average
- Above Average
- Excellent

39. Possible career paths in your discipline

- Extremely poor
- Below Average
- Average
- Above Average
- Excellent

40. Would you recommend the NIMBioS SRE program to others?

- Yes
- No

41. Why or why not?

How satisfied are you with the following resources?

42. Computing resources

- Very Dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

43. Housing

- Very Dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

44. Mail service (postal)

- Very Dissatisfied

- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

45. Extracurricular activities

- Very Dissatisfied
- Dissatisfied
- Neutral
- Satisfied
- Very Satisfied

46. Did you find Basecamp was a useful means of communicating within the SRE group?

- Yes
- No
- I did not use Basecamp
- I did not know about Basecamp

47. Please describe any accommodations/supports you needed that were not supplied (if any).

Mentor Evaluation Your responses to the following questions will be kept confidential. Your name will not be associated with any of your responses regarding your mentors during reporting.

48. To begin the mentor evaluation, please select your SRE Project from the list below:

- Spatial Interactions between Hunting and Plant Gathering in Tropical Forests
- Ecological Niche Modeling and Risk Assessment of Thousand Cankers Disease
- Using Phylogenetics to Understand Cancer Tumor Evolution
- Mosquito Population Response to Environmental Variables
- Modeling the Management of Feral Cats with Economic Impacts

49. My Mentor Was accessible

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

50. My Mentor Was interested in enhancing my research experience

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

51. My Mentor Communicated on an appropriate level

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

52. My Mentor Encouraged independence

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

53. My Mentor Offered constructive ideas for improvement

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

54. My Mentor Was organized

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

55. My Mentor Had the necessary skills to mentor

- Strongly disagree

- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

56. My Mentor Positively impacted my research experience

- Strongly disagree
- Disagree
- Neither agree nor disagree
- Agree
- Strongly agree

57. Please use this space for any additional comments:

Appendix II

SRE Mentor Survey 2018

Thank you for taking a moment to complete this survey. Your responses will be used to evaluate and improve the SRE programs hosted by the National Institute for Mathematical and Biological Synthesis, and will be kept confidential to NIMBioS staff. Information you supply about your program participants will not be shared with them.

1. How satisfied were you that the student applications supplied the necessary information needed to choose qualified participants?
 - Very satisfied
 - Satisfied
 - Neutral
 - Dissatisfied
 - Very dissatisfied

2. Please provide any suggestions regarding questions or content that might be helpful to include in future applications:

3. Did your students attend all research group meetings?
 - Yes
 - No

4. If you answered "No" above, what were the reasons for not attending provided by your students?

5. How satisfied were you with the training provided by NIMBioS to your students (lectures in R, MatLab, modeling, etc.)?
 - Very satisfied
 - Satisfied
 - Neutral
 - Dissatisfied
 - Very dissatisfied

6. Please let us know if there are any additional training that you feel would have benefitted your students:
7. How satisfied were you with the other supports provided by NIMBioS to your students (computer resources, social activities, etc.)?
 - Very satisfied
 - Satisfied
 - Neutral
 - Dissatisfied
 - Very dissatisfied
8. Please let us know if there are any additional supports that you feel would have benefitted your students:
9. How satisfied were you with communication within the program (among organizers and mentors) about expectations, program schedules, etc.?
 - Very dissatisfied
 - Dissatisfied
 - Neutral
 - Satisfied
 - Very satisfied
10. Comments about communications within the program in general:
11. NIMBioS would like your input about providing opportunities to help our SRE mentors increase their undergraduate mentoring skills next year. Please check the box next to each statement below that applies to you regarding your mentoring experience:
 - I do not feel that any additional mentoring training or discussion is necessary.
 - I would have liked to have attended a formal session on mentoring best practices prior to the program.
 - I would have liked to have met with other mentors at least once during the program informally to discuss the mentoring process.
 - I would have liked to have met with mentors after the program informally to discuss lessons learned in mentoring and reflect on the experience.
12. Comments or suggestions about mentor training:

13. How satisfied were you with your interaction with the other mentor(s) on your project?

- Very satisfied
- Satisfied
- Neutral
- Dissatisfied
- Very dissatisfied

14. If you were not satisfied with your interactions with the other mentor(s), please explain: (NOTE: your response will be kept confidential to NIMBioS staff)

The next few pages contain questions about the changes in knowledge and skills that you saw in your program participants from the beginning to the end of the program. Your ratings will be used as one measure of program effectiveness and will not be shared with your participants. You will have to opportunity to rate each of your participants separately on a number of skills and knowledge areas.

15. Please begin by selecting your project from the list below:

- Ecological Niche Modeling and Risk Assessment of Thousand Cankers Disease
- Modeling the Management of Feral Cats with Economic Impacts
- Mosquito Population Response to Environmental Variables
- Spatial Interactions between Hunting and Plant Gathering in Tropical Forests
- Using Phylogenetics to Understand Cancer Tumor Evolution

Based upon your interactions with the participant below, please rate his/her research skills in the following areas at the beginning of the program and again at the end of the program using the drop-down selections:

16. Using research literature (e.g. journal articles, books, publications)

- Extremely Poor
- Below Average
- Average
- Above Average
- Excellent

17. Integrating scientific theories with research

- Extremely Poor
- Below Average
- Average
- Above Average
- Excellent

18. Designing a research plan

- Extremely Poor
- Below Average
- Average
- Above Average
- Excellent

19. Using mathematical tools or models to describe a biological scenario

- Extremely Poor
- Below Average
- Average
- Above Average
- Excellent

20. Working collaboratively with other researchers

- Extremely Poor
- Below Average
- Average
- Above Average
- Excellent

21. Analyzing data

- Extremely Poor
- Below Average
- Average
- Above Average
- Excellent

22. Interpreting results

- Extremely Poor
- Below Average
- Average
- Above Average
- Excellent

23. Writing about results

- Extremely Poor
- Below Average

- Average
- Above Average
- Excellent

24. Orally presenting results

- Extremely Poor
- Below Average
- Average
- Above Average
- Excellent

25. How scientists work on real problems

- Extremely Poor
- Below Average
- Average
- Above Average
- Excellent

26. The nature of the research process

- Extremely Poor
- Below Average
- Average
- Above Average
- Excellent

27. The nature of interdisciplinary research collaborations

- Extremely Poor
- Below Average
- Average
- Above Average
- Excellent

28. Ethical issues in research

- Extremely Poor
- Below Average
- Average
- Above Average
- Excellent

29. How current research ideas build upon previous studies

- Extremely Poor
- Below Average
- Average
- Above Average
- Excellent

30. The demands of a research career in your discipline

- Extremely Poor
- Below Average
- Average
- Above Average
- Excellent

31. Possible career paths in your discipline

- Extremely Poor
- Below Average
- Average
- Above Average
- Excellent

32. Overall, how satisfied were you with the NIMBioS SRE program?

- Very satisfied
- Satisfied
- Neutral
- Dissatisfied
- Very dissatisfied

33. Please use this space for any additional comments or suggestions for improving the program next year:

Appendix III

Focus Group with 2018 NIMBios SRE Students

7/18/18 3:00-4:00 PM

Claxton 105

1. How did you learn about this opportunity to participate?
2. How did the amount of the stipend and travel support compare with other programs or opportunities?
3. Please tell me about your housing this summer. What was your dorm and what has been your experience like living in that place?
4. What do you consider to be the greatest strengths of the program?
5. In what ways have you engaged in social activities, workshops or field experiences?
6. How would you describe this program to others? What would you tell them about this program?
7. Tell me about a time you may have felt challenged or unprepared to accomplish a task? How did you handle that challenge or obstacle?
8. Did you have the resources and support that you needed- computationally, mentoring, supplies, tutorials, etc. to do your work?
9. What improvements can we make to the program?
10. Do you have any other comments about the program you would like to share?