Tutorial

Applications of Spatial Data: Ecological Niche Modeling

EVALUATION SUMMARY REPORT

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Erica Echols

Evaluation Specialist, NISER

Dr. Pamela Bishop

Associate Director for STEM Evaluation

Figure 1. Please check the appropriate box to indicate your level of agreement with the following statements about this tutorial:
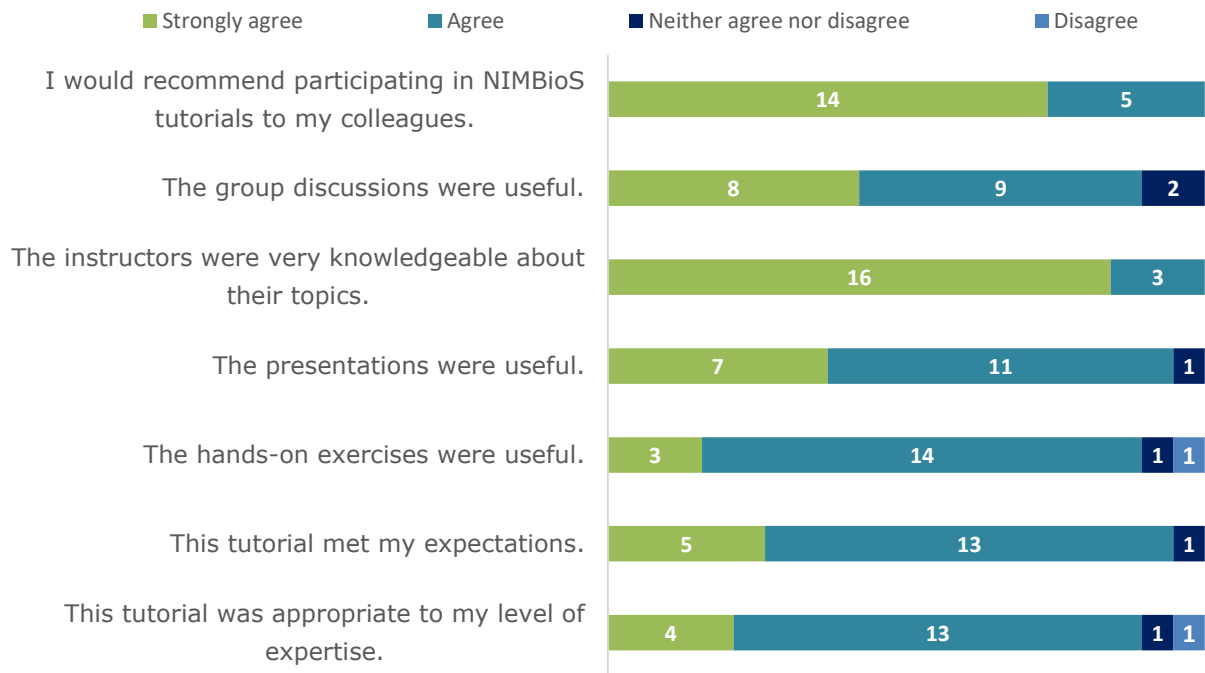
Legend: Strongly agree, Agree, Neither agree nor disagree, Disagree

Statement	Strongly agree	Agree	Neither agree nor disagree	Disagree
I would recommend participating in NIMBioS tutorials to my colleagues.	14	5		
The group discussions were useful.	8	9	2	
The instructors were very knowledgeable about their topics.	16	3		
The presentations were useful.	7	11	1	
The hands-on exercises were useful.	3	14	1	1
This tutorial met my expectations.	5	13	1	
This tutorial was appropriate to my level of expertise.	4	13	1	1

Figure 2. As a result of participating in this tutorial, I have a better understanding of:

Legend: Strongly agree, Agree, Neither agree nor disagree, Disagree

Understanding of	Strongly agree	Agree	Neither agree nor disagree	Disagree
Online spatial data resources	5	11	3	
How to interpret and apply spatial analyses	4	10	4	1
Running Maximum Entropy (MaxEnt) models	12	6	1	
Formatting data in GIS	4	10	5	
Concepts of ecological niche modeling	11	7	1	
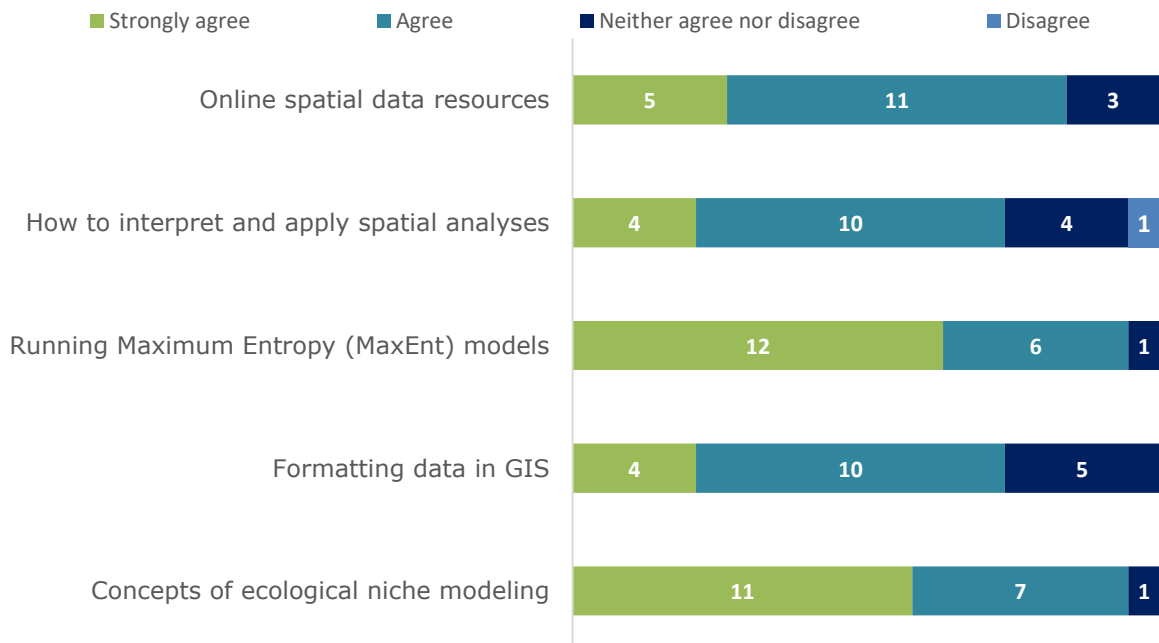
Figure 3. Please indicate your level of satisfaction with the tutorial accommodations:

Legend: ■ Very satisfied ■ Satisfied ■ Neutral ■ Dissatisfied ■ Very dissatisfied

- Resources of the facility in which the tutorial took place: 16 | 2 | 1 | 1
- Comfort of the facility in which the tutorial took place: 15 | 4 | 1 | 1
- Housing arranged by NIMBioS: 15 | 2 | 2 | 1
- Travel arranged by NIMBioS: 6 | 1 | 3 | 1
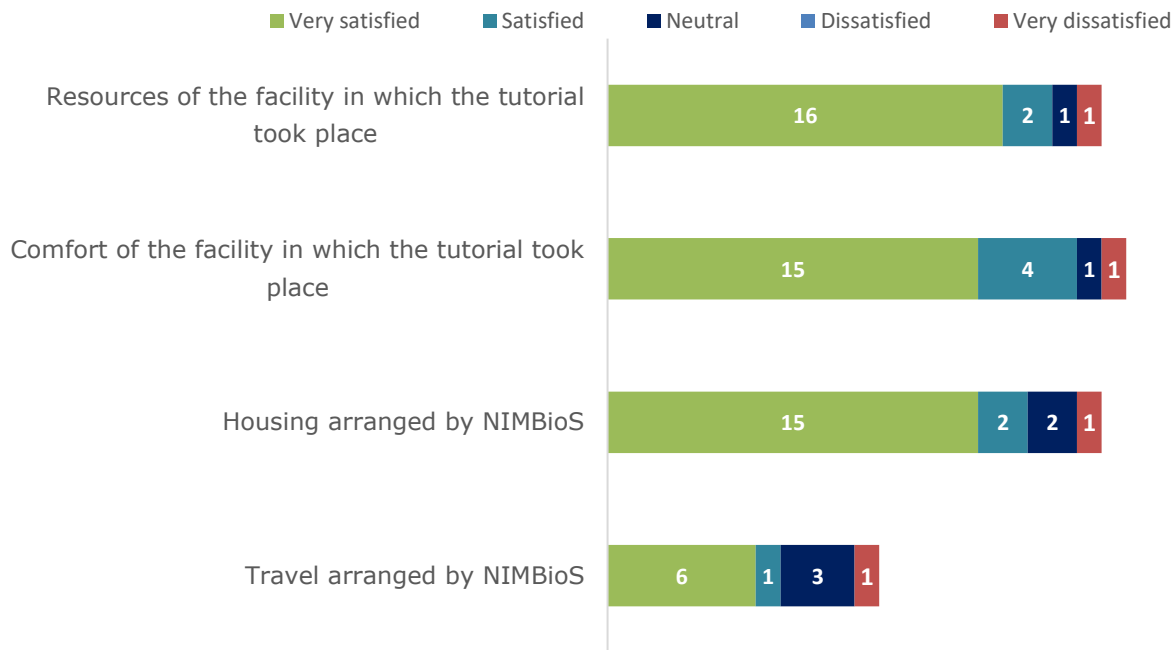
Comments:

Just to add info that the hotel will require a credit card to charge incidentals. I do not own a credit card and this was a bit of an issue when I arrived.

Food was not great.

I was surprised the NIMBIOS covered all expenses! Absolutely no complaints.

They were fine.

They were great!

The final day, we were moved to a smaller room adjacent to the "break" room. This room was too small and had a few individuals not had to leave early, we would not have all fit. Furthermore (and more importantly), the noise coming out of the break room while the other group was in there was extremely loud and distracting. This last day was effectively useless and I wish I had departed the night before.

Great - thank you so much for providing the accommodations! It was very generous of you!

20 out of **22**

attendees felt this was a very effective
format for achieving their goals.

11 out of 22 attendees were satisfied or very satisfied with the opportunities provided during the tutorial presentations and discussions to ask questions and/or make comments.

The tutorial format would have been more effective if:

No comments.

Figure 4. How do you feel about the amount of content offered during the tutorial?

Amount of content was just right	13
Too much for the allotted time	5
Too little for the allotted time	2
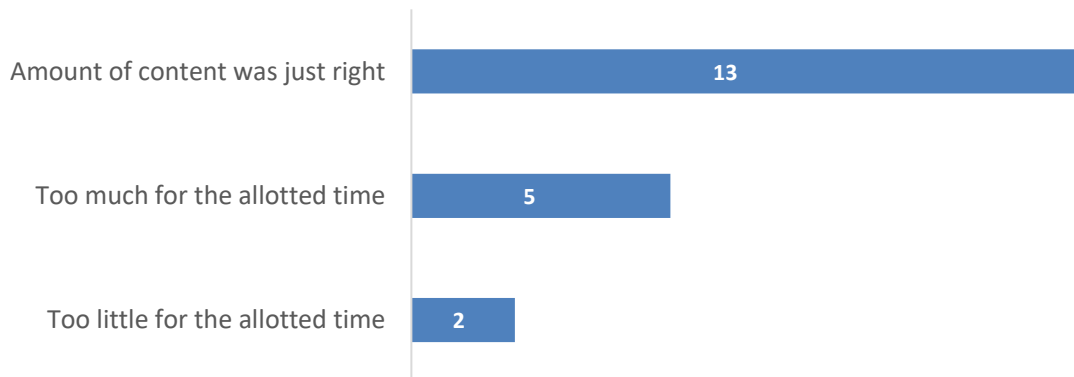
What topics would you have liked to have covered in this tutorial if given more time?

More hands-on examples, and more on interpretation of results and best practices

ENMeval and Wallace part

More on how to quantitatively analyze spatial data.

Other types of algorithms used for niche modeling

If given extra time, it would have been nice to cover other methods/algorithms of ENM such as GARP, boosted regression trees, ENFA, etc.

More of the mathematical theory behind the methods.

It was a great intro on how to execute basic SDMs and the common pitfalls. It would have been interesting to discuss the state of the field more--how some of the major limitations are being addressed and what aspects need more development.

Other methods besides Maxent (e.g., using GAM, GLM, etc). How they differ or are similar, when to use different approaches, benefits/cons of different methods.

Perhaps other modelling methods

More ocean-related scenarios

More practice time with R and other software

Advanced topics about MaxEnt models for niches changing over time, model comparisons with different data sources

I definitely would have liked to go over kuenm more if we had time. It also would have been nice to go over more papers to give us an idea of best and worst practices of niche modeling.

A review on other SDM techniques like random forest

More information on basics of R before delving right in or more information on how a portion of the analysis could be done in ArcGIS and then the rest in R.

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

Meeting people, having a dedicated time and space to focus on the topic.

Best practices in ENM

The software - in particular, how to access and visualize data from online databases.

Access to the code for running Maxent and the one on one time on Wednesday

Besides covering best practices, having many people who were proficient in R so that they could demonstrate how to run Maxent and Wallace in R.

The code and resources shared.

It was all very useful. Having the R-code provided to us was a great way to allow everyone to keep up, even if they are not familiar with how to execute the analyses. (It would have been nice to have some similarly detailed instructions for the GIS portion). What was most helpful to me, though, was the opportunity to discuss the field on the last day.

R code for Maxent, links to data sources, discussion sections.

The classroom discussions

Hearing from each participant about their work and their application of using niche modeling. Also being exposed to certain questions asked and hearing the responses. I gained a lot of exposure to a topic I knew very little of. Lots of absorbing on new content.

Talking about all the topics, and the time we had discussing them point by point.

The R workflow for running a MaxEnt model

The first day was the most helpful where we went over the concepts of niche modeling. It allowed me to get a grasp of the flow of the process and how we need to think about each species before actually getting to the modeling.

The concept of the niche

The group and one-on-one discussions.

What, if anything, would you change about the tutorial?

Watching the recommended/suggested videos was a bit redundant. It would be great to have more hands-on examples to apply the concepts covered.

Nothing.

An extra day would have been useful - there wasn't enough time to really try using our own data, with help from the instructors. Also, some of the practical demonstrations were very rushed, and it would be easy to miss things.

Add an extra day, instead of ending at midday finish at the end of the day and we can leave the next morning

I should be longer than 3 days

Spreading out the coding part over all three days instead of the last day and a half would be helpful.

I learn from R by playing around with it for a few hours instead of in 20 minute patches. I feel I would have understood the code a little better if a little code was introduced during the first day, and then we set aside an hour or two at the end of the first day to go over it.

More written instructions on GIS procedures. More discussion of recent developments in the field. It would be good to have the sense that, after the workshop, you know what the latest issues are.

It felt like much of the time we were told that SDMs are all bad and that no method is good, and that the outcomes aren't reliable. That seems like an odd message to send when offering a tutorial on how to do SDMs. In the future, it might be useful to explain how to make them better and more reliable (or at least defensible).

Perhaps a comparison and contrast with other methods.

For discussion time split into three smaller groups based on experience and expertise so that those with questions that may be very basic for the whole group but within the smaller group of beginners may be wondering the same question.

With more time, it would be great that they could talk about all the content previous to the course, so we can watch videos and read to prepare for more discussion.

Maybe more of an intentional networking aspect

Break up the lectures with more hands on work. Split day 2 lectures up, putting model evaluation/selection into Day 3. Then we have time to practice running the models.

I would not bank on having the people show up having watched the presentations. Because of this it also makes the later discussion a little less useful.

Adding one more day!

If there is any way that it could be longer, this would be incredibly helpful. Then more details could be included on everything - locating and prepping spatial data, running the model, discussions, etc. It was a lot of information in just 2.5 days and I felt it would be extremely helpful to include more detailed info if at all possible but of course this might mean that the tutorial would have to be longer. It would be great to also have some background reading sent prior to the tutorial (not just the videos - which were incredibly helpful!).

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

An organized dinner on one night could allow for more discussion.

It was a great group of people so interactions was easy even during meals and evenings.

As stated before, I think breaking the group into smaller groups based on previous knowledge or experience on the topic can facilitate better conversation suited to the needs/ understanding of the smaller groups.

The WordPress site could be used in a more effective way, especially if the instructors proposed topics in advance, so the students could interact more before the course.

Slack or Whatsapp discussion thread/forum

Additional comments:

It was great that compostable items were used during the provided meals, but this needs to be made known to participants in a better way (bigger more clear signs) so that disposal is done properly. Disposal containers need to be bigger to better accommodate all the waste.

Thank you for the tutorial.

I was very impressed with this tutorial. The material was of a very high content, and all of the instructors were knowledgeable and approachable. I would say that putting the utility of the modelling into some kind of context could have been useful - it wasn't fully clear for which situations ecological niche modelling is best suited.

Really great workshop, I understand more now about what I hope to do with my research on niche models than any university course would have helped. Thank you so much!

I thought this was a wonderful workshop. NIMBioS should offer more ENM workshops in the future.

Great job to all! Thank you!

More practice and interaction on niche model application might be needed, which might take more than 3 days.

Thank you so much for accepting me into the tutorial. It was a lot to absorb and was very pleased to attend along with so many impressive scientists.

I would like to thank Jennifer Spar for the accommodations during the time I was over there.

Thanks for a great tutorial! Thanks for the opportunity.

Thank you so much again for offering the tutorial! I really appreciate that you were able to provide so much support. I learned a lot and I am so grateful for the experience. Thank you for all of your hard work!