Tutorial

Applications of Spatial Data: Ecological Niche Modeling

EVALUATION SUMMARY REPORT

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Figure 1. Please check the appropriate box to indicate your level of agreement with the following statements about this tutorial:

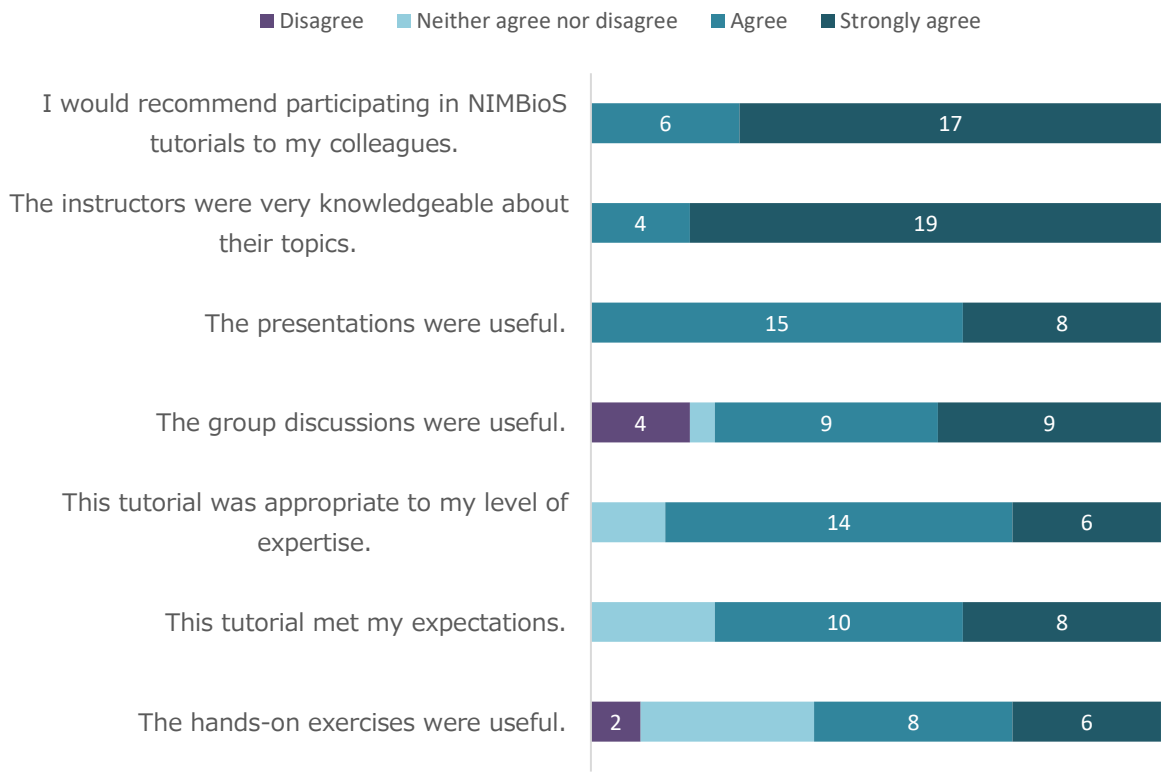


Figure 2. As a result of participating in this tutorial, I have a better understanding of:

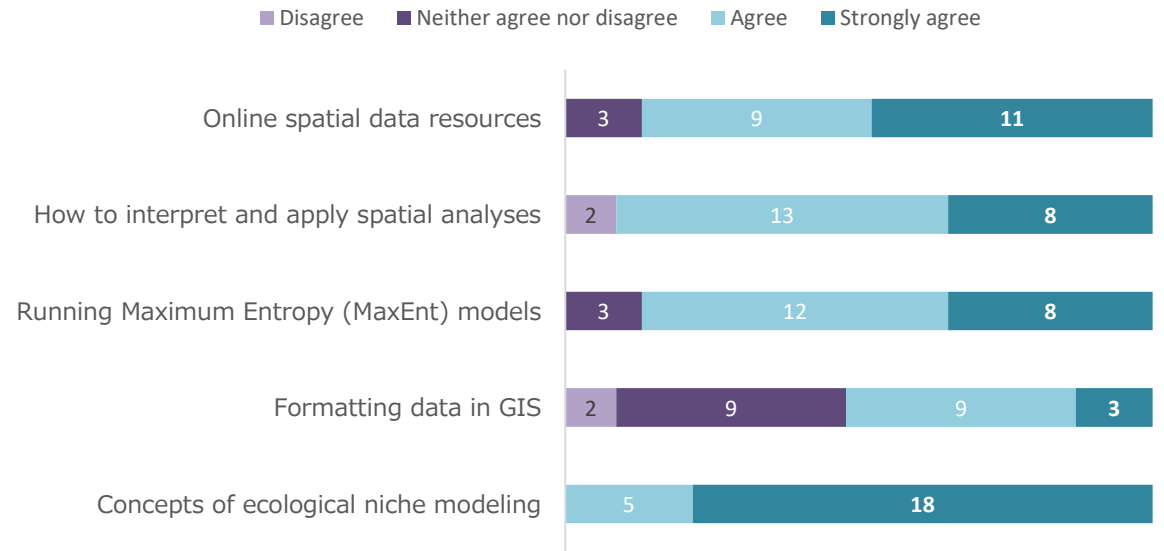
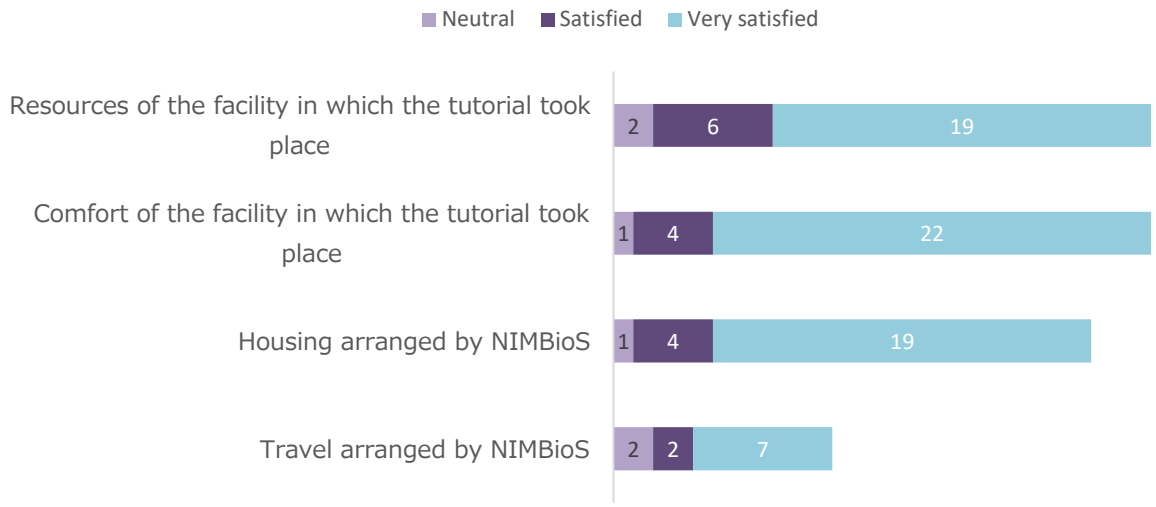


Figure 3. Please indicate your level of satisfaction with the tutorial accommodations:



Comments:

Everything was great. I felt welcomed by the organizers and travel/accommodations was top notch.

A computer lab would have made a big difference to making the course run smoothly

The accommodation was so nice and conducive.

Accommodations were great!

Way above my expectations from food to lodging to the work area.

This is not about accommodations but about the facilities. Maybe working in a computer room with all PCs having the right versions of GIS and R so that all would run smoothly could help prevent some of the time troubleshooting problems with personal laptops. Again, being so short time is very precious!!!

Accommodations were great and I liked having breakfast and lunch on site.

They were appropriate for the event.

17 out of **24**

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

20 out of 23

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:

There was more time to practice working with content and lessons

More information was available in advance of the tutorial (e.g., the schedule had been posted, and the very useful list of resources under "Tutorial Data" had been made available, if we had known we would need Arc GIS, and if the functioning of R on our laptops had been confirmed before that lecture began).

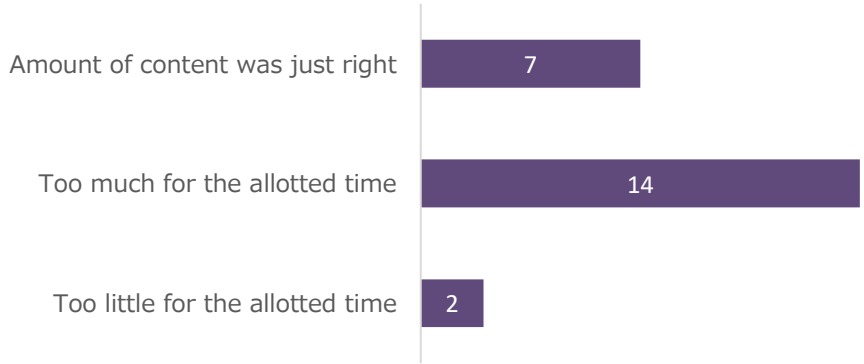
Time wasn't spent on teaching people how to use R/ArcGIS.

Many of the attendees didn't have knowledge of GIS or of R. We could have maybe split up to perform steps in either program of choice. I also think the tutorial would be more effective with more time - 2.5 days was nowhere near long enough

There was more time to do practical work and more advanced students could work together with less advanced ones.

Had more time to work through tutorials

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



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

The selection of background points and deciding the extent to project the model.

Coverage was adequate and comprehensive.

More in depth discussion of when this analysis is appropriate and when it is not; likewise, more discussion about pitfalls to avoid and how to make sure the analysis being done correctly.

Although we went through some examples together, I don't feel as though much time was allotted to model calibration or model performance. As such, the KUENM tutorial was a bit esoteric for me, personally.

I would have liked more time to work with the data given to us and practice the concepts and methods we were learning; I didn't feel that I got enough of a substantial understanding of how to operate the given programs/software

The concept of niche modeling and the comparison for different algorithms

Environmental layers and resources; how to apply the BAM diagram for a species; more on understanding the statistical aspects of ENM, and more about applications of ENM.

More R code, new developments in Spatial modeling, more hands-on activities

More hands on using a specific example

I would have liked to have spent more time on the topics that were covered, especially the hands-on parts. Also, based on communications prior to the start of the course I thought we would be working in QGIS and not ArcGIS, so I would have liked to have used that program.

If the tutorial could have gone on for a full week, that would have been amazing! I would have loved more time for model evaluation and more time for working on our own data with time to get help/feedback from other participants and the instructors.

Other ecological niche models outside of Maxent, frontiers in ecological niche modeling

I would have like to go over how to download and format various data (as we only used Bioclim) and the assumptions of each re sampling method (and what is recommended).

Modelling using biomod2 through ensemble modelling

I expected having more time to actually run more models for different taxa and systems and questions to get a better understanding of model outputs, how to interpret and identify artifacts vs. good signals in different situations.

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

The presentations and discussions that followed. The hands-on time and demonstrations were not long enough to make them very useful.

Hands on experience using the R version of Maxent modeling. The linear workflow provided a good overview that was comprehensively worked and tested. Because it was fully worked example, I found it useful for attempting my own analyses.

Experience and knowledge of the instructors, class discussion of examples

Overall the first day and the overview of theory was very useful. That said, I benefited most from the hands-on tutorial session, i.e. actually going through some example data.

Understanding the complexity of all the factors and considerations that go into niche modeling.

Concept of ecological niche modeling

I was given a substantial level of information about ecological niche modeling and how to make use of data effectively to develop and properly analyze models to come to meaningful conclusions. I think these resources and lessons will play a large role in helping to guide me when I use ecological niche modeling for my own research

The concept of niche modeling, the maxent R code and ArcGIS illustration

The resources and R code provided to us; the overview of ENM theory; the publication methods troubleshooting.

Hands-on activities and R code

Conceptual lectures

The topics covered on the first part of the first day were very clear and useful: concepts and basics of niche modeling, species occurrence records, and some of the lectures presented by X. Feng on the second day. The calibration and validation review (esp. the "General Methodological Summary" schematic diagram) was especially helpful.

All of it was great - I loved the overview of ArcGIS, the presentations on the theory behind niche modeling (BAM), and the work time.

Learning how to use Maxent and going through all of the parameters, running Maxent models in R

The background information on maximum entropy, how to avoid pitfalls when writing methods for publications, and introducing the R package/tutorial that will run all candidate models at one time.

Evaluation of the models and the definition of the M

Through all talks and discussion I gained a more comprehensive understanding of the field and where the frontier of the field is, but I could not really make a jump on practical aspects which was really what I was hoping to gain. However, it all was very useful and I would no doubt take it again!

The whole tutorial was useful, but this topic area is so vast that it's hard to do much more than a brief overview. I found the networking to be very useful and wished I had more time to discuss what others were doing in their modelling

It showed us a general view of the most relevant tools for running ENM

Conceptual idea of the niche and thinking about how to model it

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

Structure the tutorial so that the first day is the reviewing of concepts, second day demonstrations, and third day hands on. It would be even better if the tutorial was four days with two days of reviewing concepts. If you wanted to go really crazy, it would be fun to make it five days with one day being a field day to explore the area and Smokey mountains.

Jumping around between ArcGIS and Maxent was a bit too much for me (but probably fine for others). There were some technical glitches and if the workshop could have been held in a computer lab, I think it would have been better for both the workshop participants and the organizers/instructors.

Less time spent having students try to figure out to use R code.

Overall, the course was very useful for me. If I were to make one change, it would be to split ArcGIS/Qgis and R users into separate groups. I feel that this would allow for more time and instructor-student interaction during the hands-on portion of the workshop, which could also provide more time to be spent going over model calibration and model selection. Additionally, to improve our ability to evaluate ENMs, it would be good to repeat the exercise with an example of "good" and "bad" models/data.

I would have love to extend the time allotted for the workshop in other to cover the whole topics very well.

There needed to be more time, perhaps 5 days instead of 3, in order to learn and practice

Make it at least a day longer to cover all of the necessary topics. More preparation ahead of the workshop in terms of us getting all of the necessary R packages and other applications downloaded. During practice time, it would have been helpful if the instructors had been actively looking to answer questions around the room. Better anticipate how long a lecture will take (30 min. vs. an hour, etc.) when making the schedule. Otherwise a great workshop!

Would make it longer and add more hands-on activities - perhaps as group projects. I would do a more structured ice breaker.

I would have liked for the tutorial to have been longer (5 days), and it would have been great to have had the lecture notes in advance of the lectures. It felt like parts of the tutorial were fairly disorganized and rushed.

Give it another 3 days!

I would not include information on how to use ArcGIS or other GIS skills in this tutorial. This tutorial should be meant for people who already have familiarity with those topics, and should know how to format data for input into SDMs.

Reduce the amount of material, so that instructors had enough time to communicate the most important concepts. / Either eliminate the R-focused material, provide non R-users pre-tutorial resources, or create a separate R-focused tutorial for those with R experience.

Length! I was burnt out, the days were long and the topics covered were deep, it was hard to know if I should have networked during the evening or go over what was taught in the workshop earlier that day.

I would make some adjustments to make sure participants are on same (or more similar) level of understanding of GIS tools and R platform so that those steps are not slowing too much the progression to what is really important. As for R you could maybe ask participants to use the "swirl" package of R and fill in mandatory questionnaire that could emerge for the swirl progression itself. I am taking another workshop soon and that is how they are trying to bring participants to a basic understanding of R before the class and I think is a good idea. Else I feel the tutorial should be a little longer for people catching up with the tools. Also, I think sessions should go into later in the day, specially being so short. We could all sleep more when we are at home :)

I would make the length of training longer, there was a ton of material that we just skimmed over and it would be nice to have a least a day or two of hands on trial and error.

More time to practice with the different tools explored during the tutorial

It would be good to have some more hands-on exercises so that we can practice

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

We always seemed to run out of time for questions! Don't know how to fix this other than offer more time or maybe less students in the tutorial.

Could have used a little more time to talk with the instructors one-on-one.

Break into groups to work on something.

A chat box on the website would have been handy.

It was perfect. The only think I could think of that would have been more helpful would have been some identifiers of the comforts of participants in R and Arc....I would have liked to have a working group with some R folks to complement my expertise in Arc, but asking around worked too.

Instead of trying to pass around microphones to question-askers, have the instructors repeat the questions.

I feel that we did not utilize the word press discussion board to its full capacity, a potential missed opportunity to communicate better. It would have also been nice to be subdivided into groups based off what we are studying, as plant models and animals models will look a little different.

Hum. I think the hands on part and really having time to face a question and apply the methods was really lacking, so more time for that and maybe get teams working together on different things and maybe later review all problems and interpretations in common could help interacting more with participants.

A few more breaks would have been nice to help foster communication among attendees and instructors

A short profile of each participant could be share between the group before the event takes place, so we could make connections more easily with other participants working in topics related with our work

Additional comments:

Overall an awesome tutorial that I was glad to be a part of. Well done!

Thank you for the opportunity to participate. I learned a lot and gained a lot of confidence with using Maxent.

Overall a really great tutorial!

Overall, a very nice experience. For the next iteration, I would love to have fewer trainees who are chosen based on a single set of criteria, which would make for a richer experience for everyone. Also, a couple more "trainers" would help ... perhaps advanced students from Mona's lab or mine.

I am satisfied with the workshop. I will just wish there can be more time to cover the plans for each events.

Despite criticisms, I really enjoyed the course and found it to be highly valuable. It gave me the basics I need to apply MaxEnt to future research, appreciated the expertise of the instructors, and found all of them to be highly accessible and kind. Many thanks to NIMBioS and the instructors!

This was one of the best uses of my time in my professional career. It was an extremely helpful tutorial, both for deepening my knowledge and for stimulating new ideas and making professional connections. As a professor at a primarily undergraduate institution, I feel a little intellectually isolated. This was an invigorating and inspirational tutorial, and I left full of ideas that will kickstart my productivity during my sabbatical next year.

All instructors should always use a microphone. It's a matter of accessibility, not merely recording capability.

Thanks for hosting a great workshop, I feel like a lot was accomplished in a very short amount of time! I look forward to using what I learned in the workshop for research!

Globally increase the number of days

"I wish the tutorial was longer! I wanted to stay there learning from instructors for a week! Now seriously, I know it's a huge effort and more time really exponentiate things. However I think an extra day is needed and there was some discussion about having students watch videos in advance for theory and make the session more focused in practice and discussion results in the light of the concepts. Instructors also talked about having sequential tasks to complete but "solutions"" available should students cannot get them to work so that all can continue, say in subsequent days.

Also, I really tried to be constructive so that things can be improved, but I need to stress that I learnt a huge deal and I am very grateful for the opportunity. It was amazing and I would certainly go there again!

THANK YOU!!!

This was a great topic and I would love to be involved in more courses like this. It was just a ton of material to cover in such a brief amount of time.

The tutorial needs a better balance between theory and practice