

## Evaluation results: Terrestrial Biosphere, part 2 (Sep 2017)

### Course details

The course started with an overview of the "standard statistical toolbox", reviewing basic statistical approaches like correlation, linear regression and analysis of variance. Special emphasis was put on test of assumptions and statistical model selection. This led to situations where standard assumptions were not fulfilled but the same type of questions was to be answered.

The aim of the course was to introduce into basic statistical thinking and to enable to look at data statistically. Each block was accompanied by practicals where example data were analyzed using the software package R.

Detailed information is provided on the following webpage: <http://www.imprs-gbgc.de/index.php/Courses/ASDA2017>

14 out of 14 participants filled in the survey by Sep 26, 2017.

### Survey results

How useful was the course in providing background knowledge on statistics and data analysis? (Answer: 1=not useful at all...5=extremely useful)

1	0%
2	0%
3	14%
4	36%
5	50%

How useful was the course for your individual research projects? (Answer: 1=not useful at all...5=extremely useful)

1	0%
2	14%
3	14%
4	50%
5	22%

## Please remark on the overall structure of the course.

- (4x) good /fine
  - went from easily understandable to complicated
  - clear, structured, good visual aid
  - it has logical and sequential steps.
  - including lectures, examples and practical parts.
- (4x) very good / perfect
  - Clear explanation. Would have preferred to have more time for exercises
  - all (in my eyes) relevant topics have been covered and there was a good balance between lessons and (practical) examples, questions were well answered
- It was quite nice. The lecture first gave us the theoretical knowledge and then applied in R, which induced in a really rational way.
- Dr Schumacher is an excellent teacher who truly wants to convey his knowledge to young scientists. His lectures were well-structured and organized. The fact that right after each theoretical lecture there was a coding part in R was very helpful too.
- It included the topics and methods needed for each project and study. I learned so much.
- Very nicely framed.
- It's better to extend the course for 1 or 2 days

## Which parts of the workshop were especially good (and why)?

- all parts was good because are relevant for my work. The professor did emphasis on the supposed and limits of each statistic technique.
- (5x) day 1:
  - real basic background knowledge was provided
  - because it was well understandable.
  - easy to follow, the topics were well explained and going through the example in R together made it easy to apply and further understand the explained approaches - many examples
  - non-linear regression part
  - The modelling part and how to use non-parametric models.
- (2x) day 2:
  - autocorrelation part. Because it fits my research. I learned a lot from this part.
  - time-spatial autocorrelation
- (2x) day 3:
  - Linear mixed model
  - Linear Mixed Effect model, was very interesting and useful. The LME model are robust and flexible and widely used in the environmental science.
- The different parts were well balanced. I liked Jens' lecturing style!!

- (2x) Exercises / practice, it helps me to get better understanding
- great atmosphere, very sympathetic teacher, speed of teaching was very good
- I was quite impressed by the the course of first and second are closed related to my own data.

**Which parts of the workshop were not so good / not so fitting / not well enough presented?**

- (5x) None.
- practical part of linear mixed models maybe require be more interactive exercises and less demonstration.
- It is not that easy to do the practice and follow examples in R without R skills (though Jens tried to overcome that, by explaining the formula syntax in the beginning) The lecture notes could be a bit more detailed, to make a repetition a bit easier.
- for me some parts were very difficult; for me it would be best to directly write a script together, while the teacher explains, what he was writing and what the results mean etc
- not enough time for exercises on day 2
- I personally assume maybe we could have more examples on linear mixed model
- For the Mixed Effect model I would suggest more hands-on examples in R.
- (3x) 2nd and 3rd day were not so easy to understand/follow.
  - things got complicated very fast and the R presentation/exercise part just does not do anything at all if one is not trained enough in the language.
  - Maybe a more practical approach instead of the concept of "models" would have been better. Besides, the demonstrations with R without having the code were not so helpful because it was too quick to follow.
  - ... as they were only shown in front. it would be helpful to provide the example scripts in advance, so that everyone can make comments directly in the code to still understand why what was done later

**Please suggest components that a future course should include.**

- (2x) no.
- probability, and probability distributions
- (2x) It could be much useful for the lecture share the R script before the course, so that we can follow it quickly during the course.
- It's will be wonderful if we can have more R code exercises on statistics.
- Knowing the following statistical methods would be an asset to the PhD student: 1. Principal Components Analysis (PCA) 2. Redundancy analysis (RDA) 3. Meta-analysis 4. Structural equation modeling
- Some practical information on experimental design and how to treat your data in the first place would be nice. Maybe the participants should be forced more to bring some of their own data (if they have it) at the last day and discuss it.
- maybe how to best deal with outliers