WELCOME!

Hierarchical Modelling of Species Communities with the R-package Hmsc

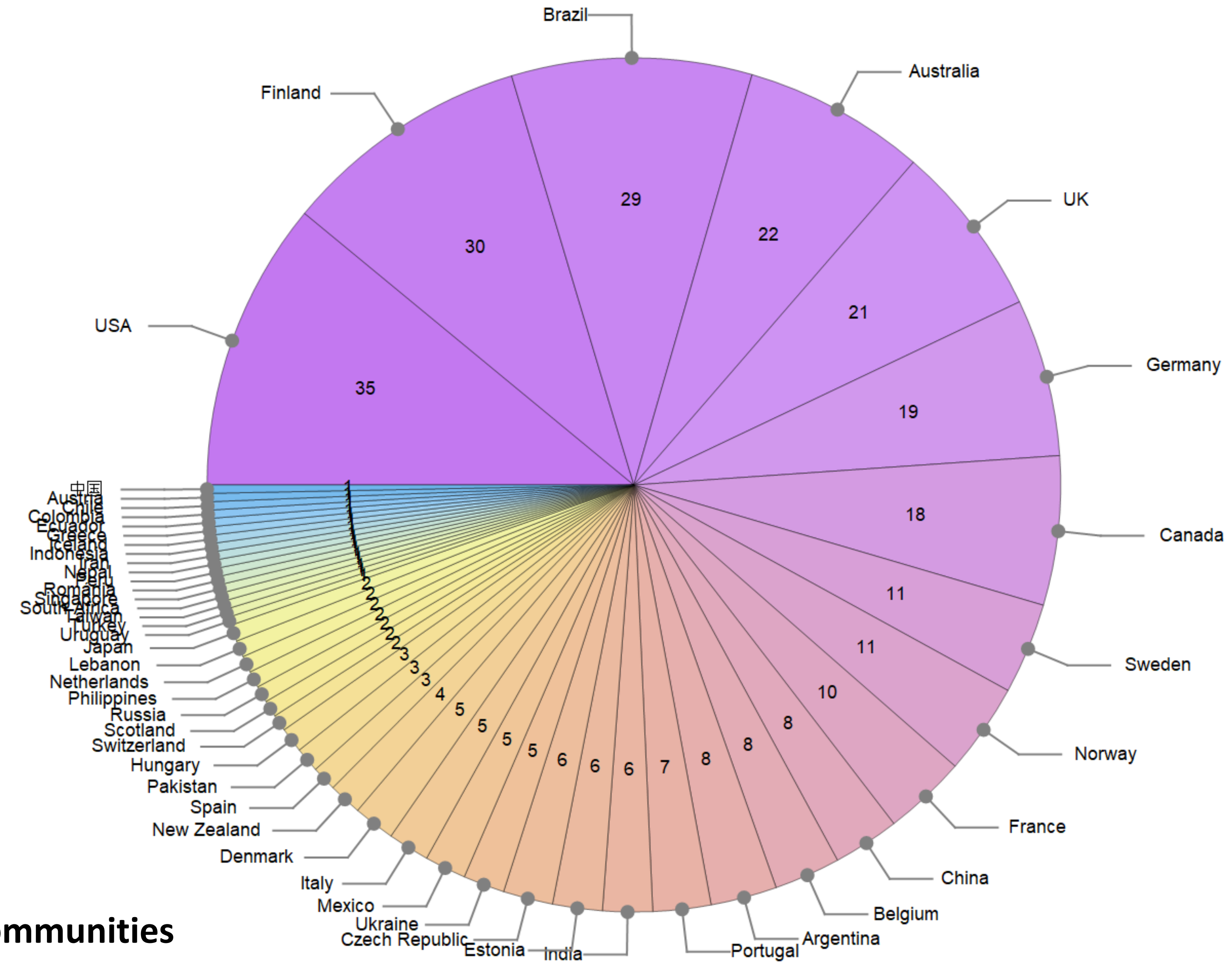
Teachers:

- Prof. **Otso Ovaskainen** (Universities of Jyväskylä, University of Helsinki & Norwegian University of Science and Technology)
- Dr. **Nerea Abrego** (University of Jyväskylä & University of Helsinki)
- Dr. **Gleb Tikhonov** (Aalto University)
- Prof. Emeritus **Jari Oksanen** (University of Helsinki)
- Dr. **Øystein Opedal** (Lund University)
- Dr. **Mirkka Jones** (University of Helsinki)
- Project planner **Bess Hardwick** (University of Helsinki)

ANY QUESTIONS? PLACE THEM IN CHAT!

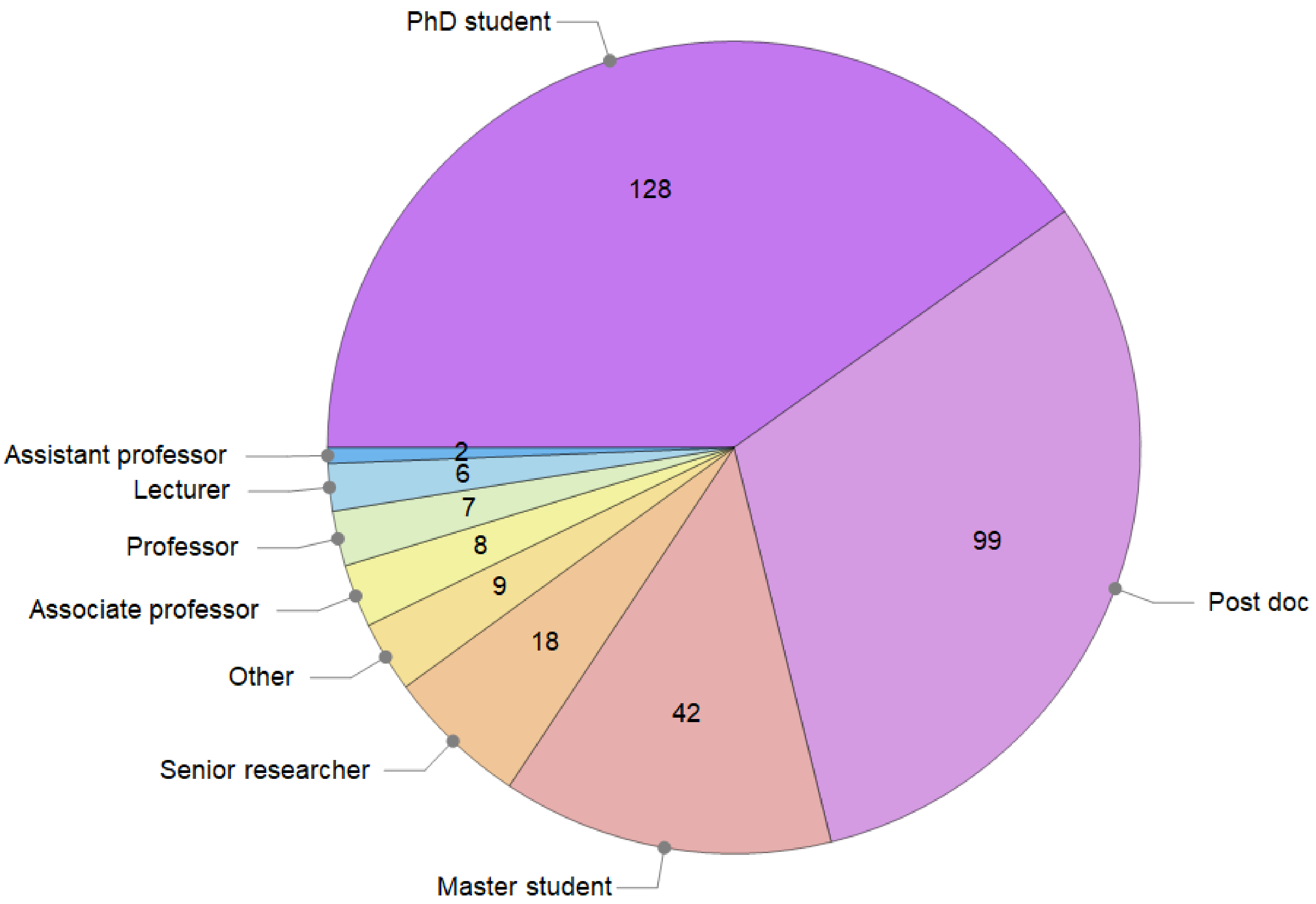
319 participants
from 49 countries!

#HMSCmarathon



HMSC = Hierarchical Modelling of Species Communities

Majority of the participants are PhD students, post docs & master students



Need study credits (2 ECTS)?

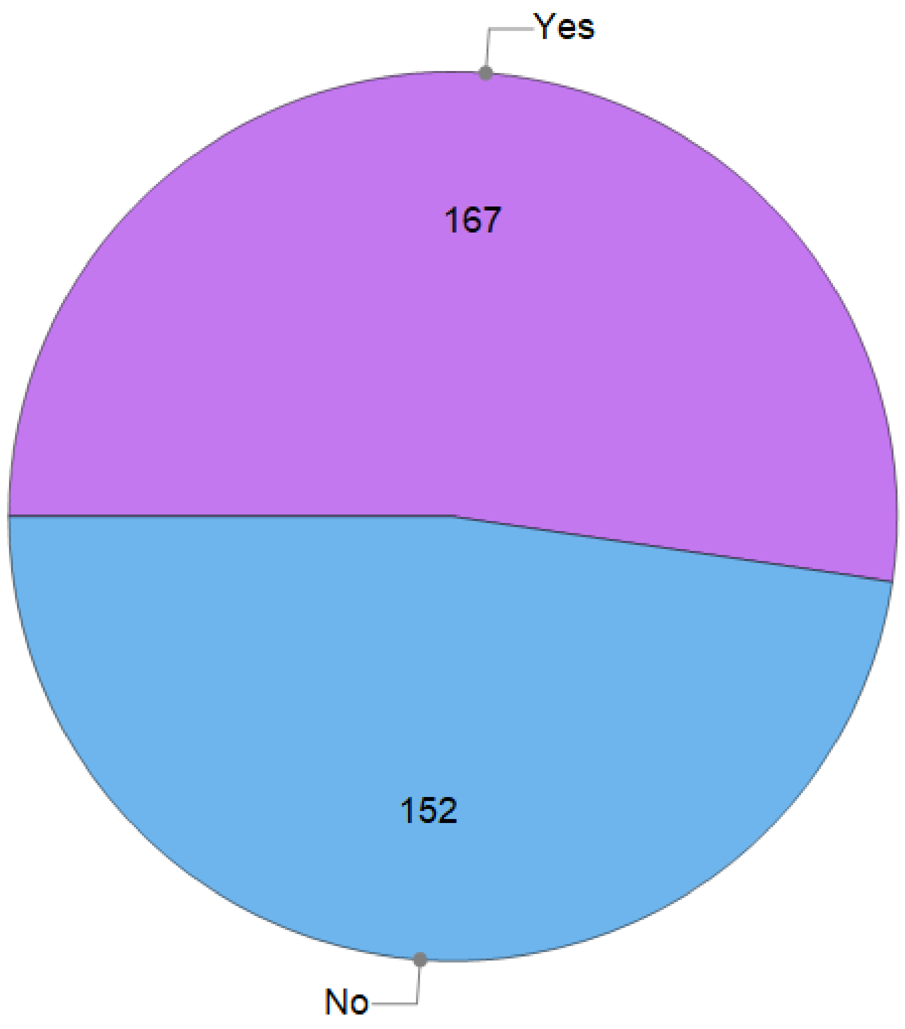
- You can receive a signed certificate stating that you have successfully completed this 2ECTS course – hopefully your university will then accept to register the credits.

- To achieve the study credits, you should turn in a learning diary at the end of the course (2-5 pages in total, pdf-file), where you summarize in your own words what you learned during each of the course days. Send the pdf file to hmsc-course@helsinki.fi, with email subject learning_diary_surname_firstname, e.g. learning_diary_ovaskainen_otso.

- If you are a student at Helsinki, we can register your credits directly.

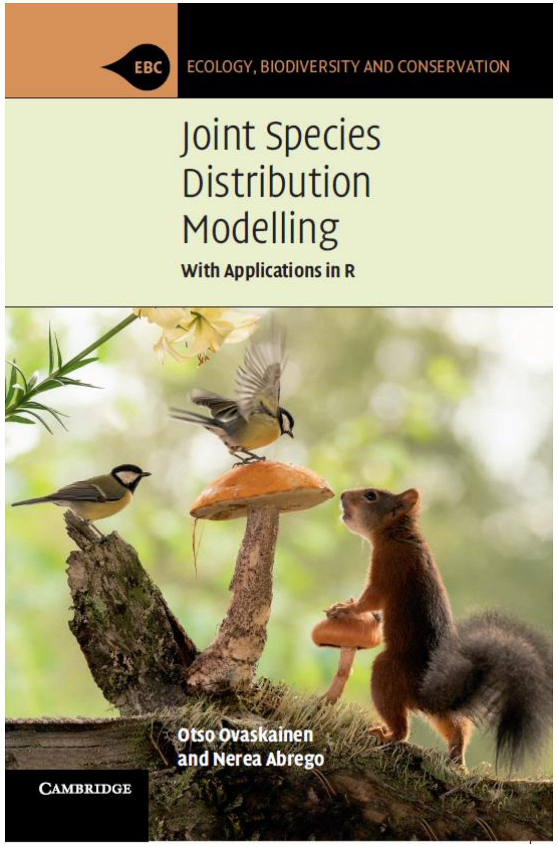
More than half planned to come with their own data

- >60 datasets received
- Pilot models fitted for 39 datasets
- We aim to set up pilot models for everybody – latest after the course!



Course material

1. Book



Cambridge University Press (2020)

2. R-package Hmsc (in CRAN)

APPLICATION

Methods in Ecology and Evolution

Joint species distribution modelling with the R-package Hmsc

Gleb Tikhonov[1,2] | Øystein H. Opedal[2,3] | Nerea Abrego[4] | Aleksi Lehikoinen[5] | Melinda M. J. de Jonge[6] | Jari Oksanen[7] | Otso Ovaskainen[2,3]

Methods in Ecology & Evolution (2020)

3. R-scripts (at the www-page)

Additional recommended reading

ECOLOGY LETTERS

Ecology Letters, (2017) doi: 10.1111/ele.12757

IDEA AND PERSPECTIVE

How to make more out of community data? A conceptual framework and its implementation as models and software

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Computationally efficient joint species distribution modeling of big spatial data

Gleb Tikhonov[1,2,8], Li Duan,[3] Nerea Abrego,[4] Graeme Newell,[5] Matt White,[5] David Dunson,[6] and Otso Ovaskainen[1,7]

Modeling species co-occurrence by multivariate logistic regression generates new hypotheses on fungal interactions

Otso Ovaskainen,[1,3] Jenni Hottola,[1,2] and Juha Siitonen[2]

Testing the heterospecific attraction hypothesis with time-series data on species co-occurrence

Esther Sebastián-González[1,2,*], José Antonio Sánchez-Zapata[2], Francisco Botella[2] and Otso Ovaskainen[3]

Making more out of sparse data: hierarchical modeling of species communities

Otso Ovaskainen[1,3] and Janne Soininen[2]

Bryophyte Species Richness on Retention Aspens Recovers in Time but Community Structure Does Not

Anna Oldén[1*], Otso Ovaskainen[2], Janne S. Kotiaho[1], Sanna Laaka-Lindberg[3], Panu Halme[1]

Using joint species distribution models for evaluating how species-to-species associations depend on the environmental context

Gleb Tikhonov[*,1], Nerea Abrego[2], David Dunson[3] and Otso Ovaskainen[1,2]

Wood-inhabiting fungi with tight associations with other species have declined as a response to forest management

Nerea Abrego, David Dunson, Panu Halme, Isabel Salcedo and Otso Ovaskainen

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So Many Variables: Joint Modeling in Community Ecology

David I. Warton,[1,*] F. Guillaume Blanchet,[2] Robert B. O'Hara,[3] Otso Ovaskainen,[4,5] Sara Taskinen,[6] Steven C. Walker,[2] and Francis K.C. Hui[7]

How are species interactions structured in species-rich communities? A new method for analysing time-series data

Otso Ovaskainen[1,2], Gleb Tikhonov[1], David Dunson[3], Vidar Grøtan[2], Steinar Engen[4], Bernt-Erik Sæther[2] and Nerea Abrego[2,5]

Uncovering hidden spatial structure in species communities with spatially explicit joint species distribution models

Otso Ovaskainen[1,2*], David B. Roy[3], Richard Fox[4] and Barbara J. Anderson[5]

Measuring and predicting the influence of traits on the assembly processes of wood-inhabiting fungi

Nerea Abrego[*,†,1,2], Anna Norberg[†,3] and Otso Ovaskainen[1,3]

Using latent variable models to identify large networks of species-to-species associations at different spatial scales

Otso Ovaskainen[1,2*], Nerea Abrego[2,3,4], Panu Halme[3,5] and David Dunson[6]

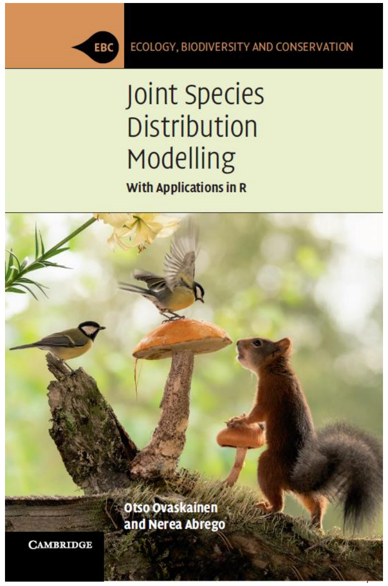
Course programme

https://www.helsinki.fi/en/researchgroups/statistical-ecology/hmsc

How the course relates to the book?

Contents

The colour plates appear between pages 336 and 337



How the course relates to the book?

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LECTURE 2

LECTURE 3

LECTURE 4

LECTURE 5

R-demonstration 1

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R-demonstration 2

LECTURE 7

LECTURE 7

All R-demonstrations

R-demonstration 3

LECTURE 10

LECTURE 1: Welcome!
LECTURE 11: Closing words

LECTURE 8: how to write materials and methods?

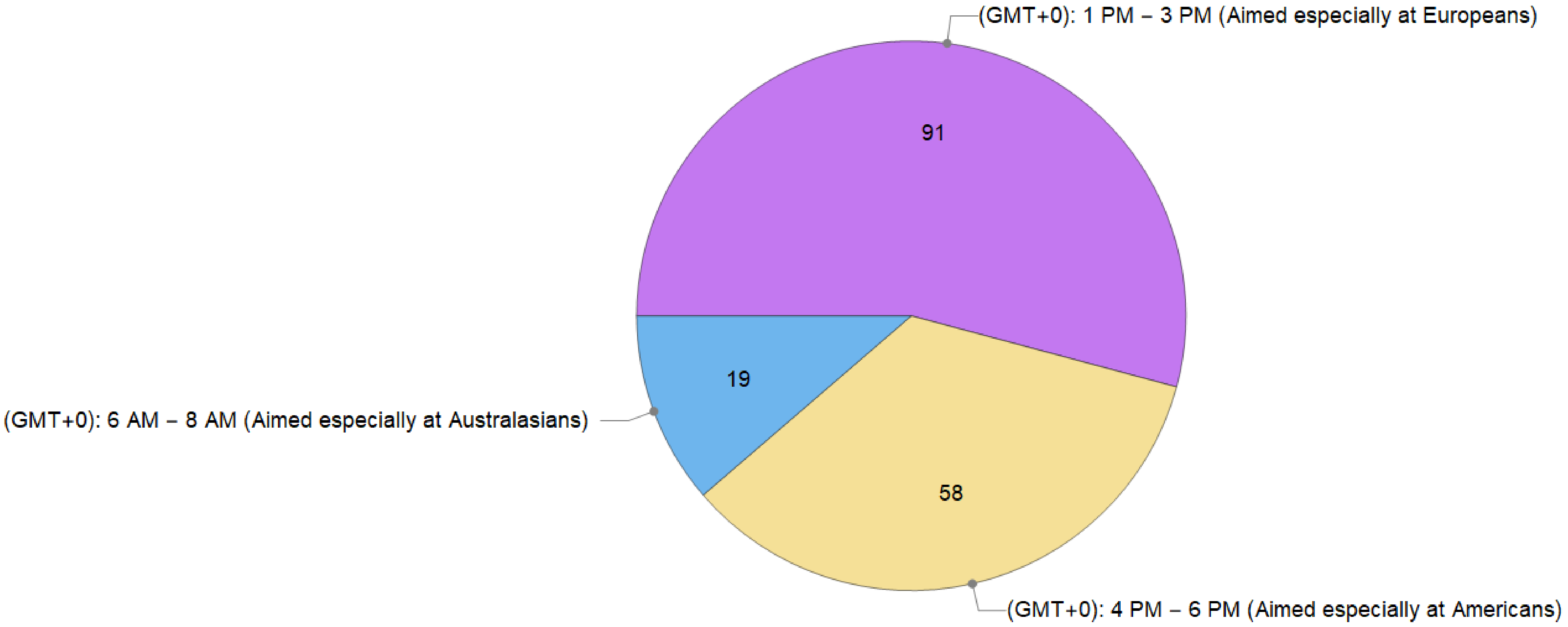
LECTURE 9: how to write results?

R-demonstrations 4 & 5: your own case studies!

Break-out groups 1 & 2

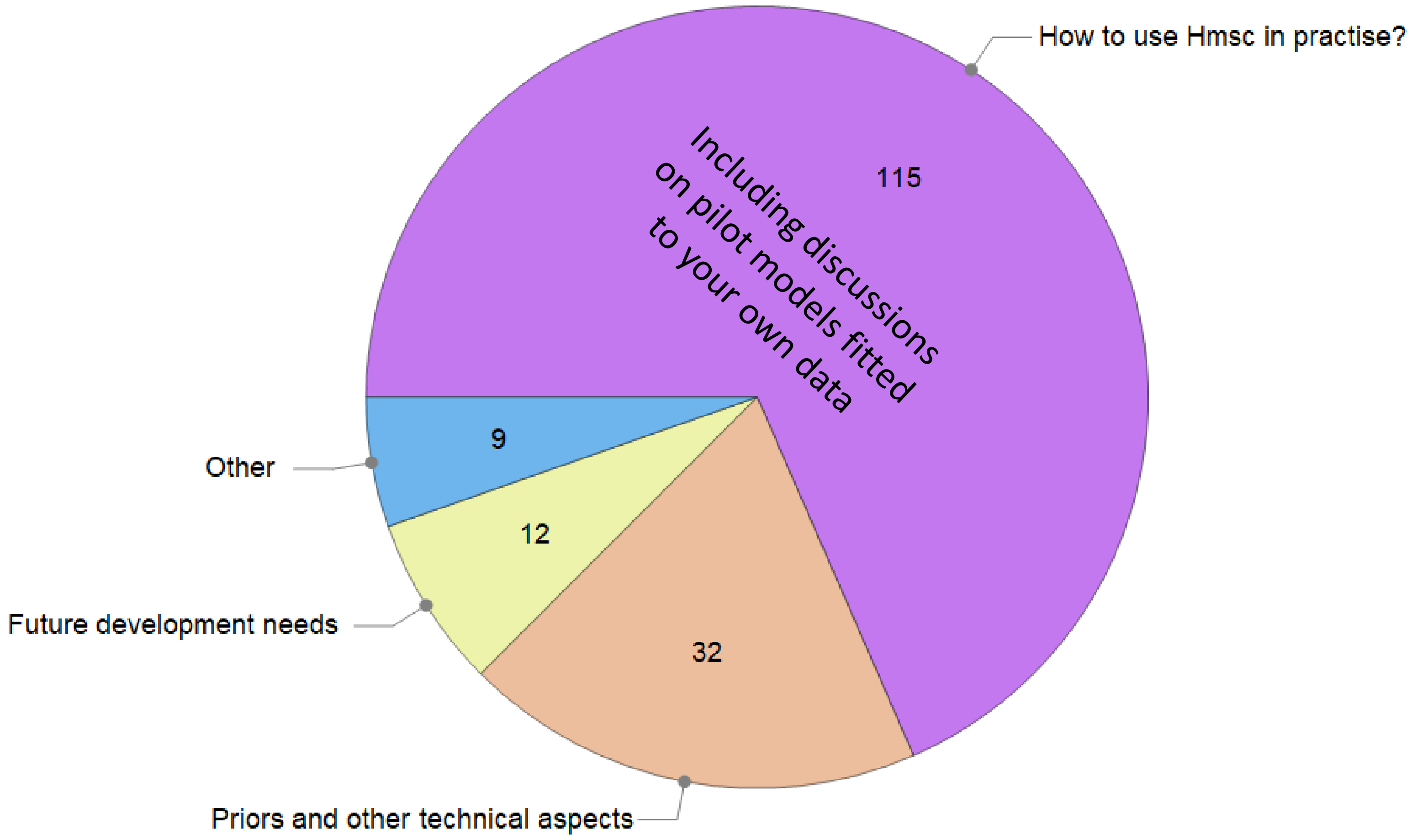
What happens in the break-out groups?

There are two break-out groups
Both of them have three time options



What happens in the break-out groups?

What do you want to talk about in the break-out groups?



Thank you for listening, and welcome again to this course!

ANY QUESTIONS ABOUT THE COURSE ARRANGEMENTS?

ASK IN CHAT!