Introduction

for data of multiple species

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Welcome! 😄

Who-is-who

Figure 1: Bert

Figure 2: Audun

Who are you, what do you study, and what do you hope to learn?

Schedule

Time	Subject
8:30 - 9:00	Introduction
9:00 - 10:00	Multispecies (Vector) GLM(Ms)
10:00 - 10:15	Break
10:15 - 11:00	Exercise 1
11:00 - 11:45	Joint Species Distribution Models
11:45 - 12:45	Lunch
12:45 - 13:30	Exercise 2
13:30 - 14:15	Model-based ordination
14:15 - 14:30	Break
14:30 - 15:15	Exercise 3
15:15 - 16:00	Multivariate analysis A-Z
16:00 - 17:00	Buffer time/Questions/Discussion/Own analysis

Workshop material

See github for all material:
https://github.com/BertvanderVeen/Nof2025GLLVMworkshop

How we will do it

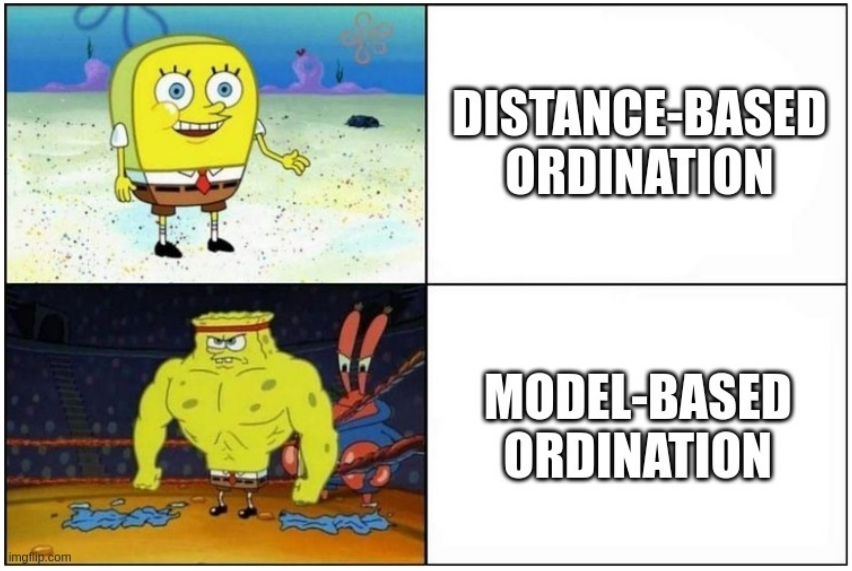
Lectures of about 45 minutes
Practicals of about 45 minutes: datasets and R

Practical sandwich:

- Small practical task
- Discuss together
- Another practical task

What I hope you take away

1. The `gllvm` R-package is great!
2. Performing multivariate analysis well is hard work
3. Contemporary methods are much more flexible than classical methods
4. One framework for all multivariate analysis



Some resources: classical analysis

- David Zeneley's website
- Michael Palmer's website
- Numerical ecology
- Numerical ecology with R
- Data analysis in Community and Landscape ecology
- Analysis of ecological communities

Some resources: model-based analysis

- Some of my other workshop repositories
- gllvm vignette website
- Oxford libraries article
- Warton 2022
- Fahrmeir and Tutz 2001
- Ovaskainen and Abrego
- Bartholomew et al. 2011
- Skrondal and Rabe-Hesketh 2004
- Zuur and Ieno 2025

Some recommended reading

- Halvorsen (2012)
- Wang et al. (2012)
- Warton et al. (2012)
- Clark et al. (2014)
- Warton et al. (2015)
- Warton et al. (2015)
- Hui et al. (2015)
- Pollock et al. (2015)
- ter Braak and Smilauer (2015)
- Hui et al. (2017)
- Niku et al. (2017)
- Ovaskainen et al. (2017)
- Roberts (2017)
- Warton et al. (2017)
- Niku et al. (2019)
- Niku et al. (2019)
- Roberts (2019)
- Paul (2020)
- Zurell et al. (2020)
- van der Veen et al. (2021)
- Popovic et al. (2022)
- Blanchet et al. (2022)
- van der Veen (2022)
- van der Veen et al. (2023)
- Korhonen et al. (2024)
- van der Veen and O'Hara (2025)

Resources that cover all kinds of multivariate methods

(none)

Disclaimer

- There will be some equations
- `gllvm` is in active development (some bugs expected, feature requests are very welcome)
- Report issues at https://github.com/JenniNiku/gllvm

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If you can, update your package version

Questions?


IF YOU HAVE
A QUESTION... ASK
YOU WON'T BE
MAULED, PROMISE
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