ANALYSIS OF UNCERTAINTY IN THE STANDARIZATION OF CPUE INDEXES

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1. INTRODUCTION

Catch per unit effort (CPUE) indices are considered as one of the main information sources used in fish stock assessment models (Zou *et al.*, 2019). There are many ways for the standardization of these indices:
- Generalized lineal models (GLMs)
- Generalized additive models (GAMs)
- Geostatistical models.

2. OBJECTIVE

- To evaluate the accuracy and uncertainty associated with CPUE indices derived from datasets with different spatial information.
- How? With the standardization of CPUE indices using geostatistical models in different sampling scenarios, comparing them with GLMs and GAMs models.

3. PLANNING

This poster is part of an ongoing project and in order to achieve the objective (step 5), there will be five steps. Here, we present the results of the step 1 and some hints of step 2.
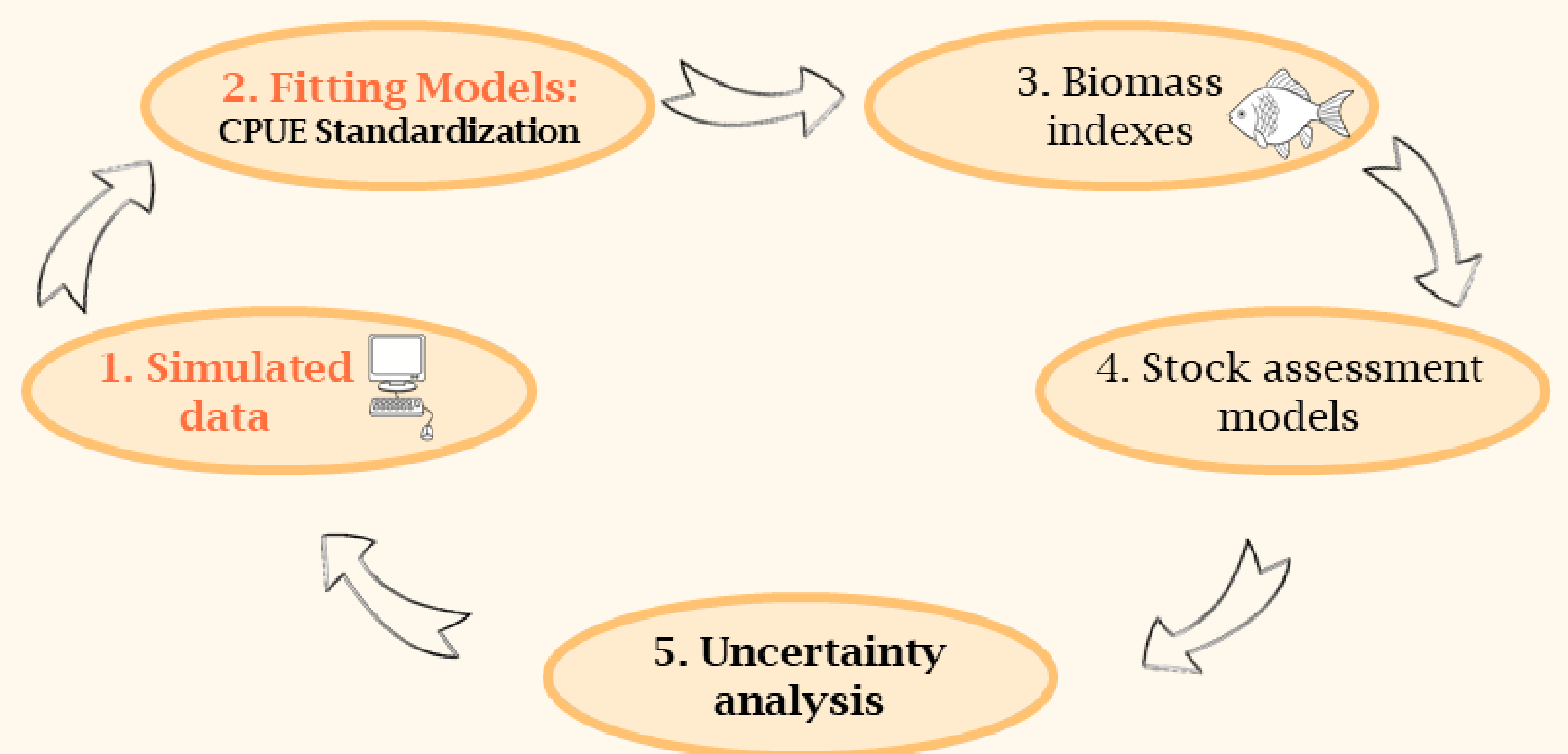

4. SIMULATED DATA

We have performed the simulation of three different sampling scenarios for model fitting using R statistical software. Scenario 1 represents a georeferenced **oceanographic survey**, while scenarios 2 and 3 represent **trawl fisheries**, with georeferenced and lattice data, respectively.
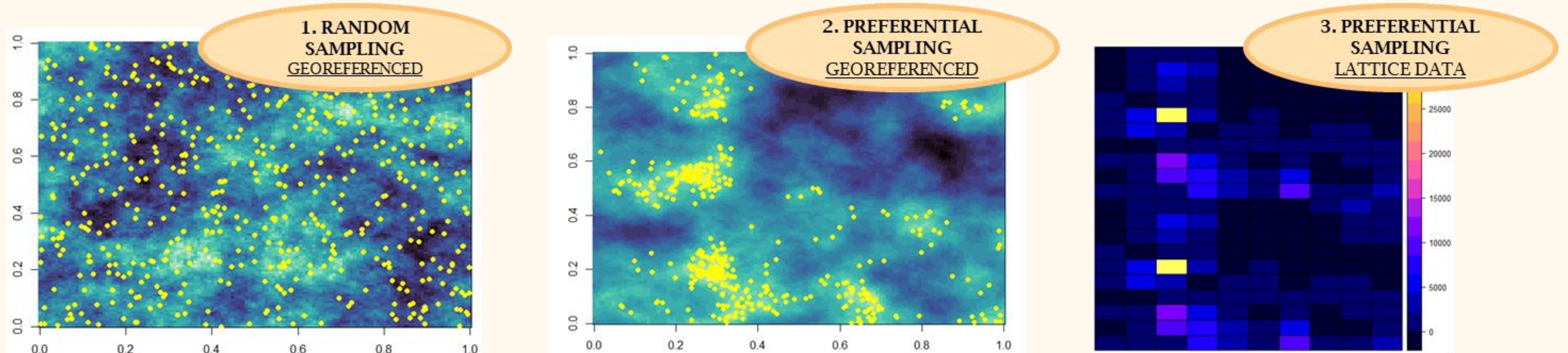
5. FITTING MODELS

We propose the use of R-INLA package (https://www.r-inla.org/), in order to run several **Bayesian** models: GLM, GAM and spatio-temporal models for each of the different simulated scenarios. The GLM and GAM do not consider the spatial term. The results of the model fitting will provide us the standardization of CPUE.
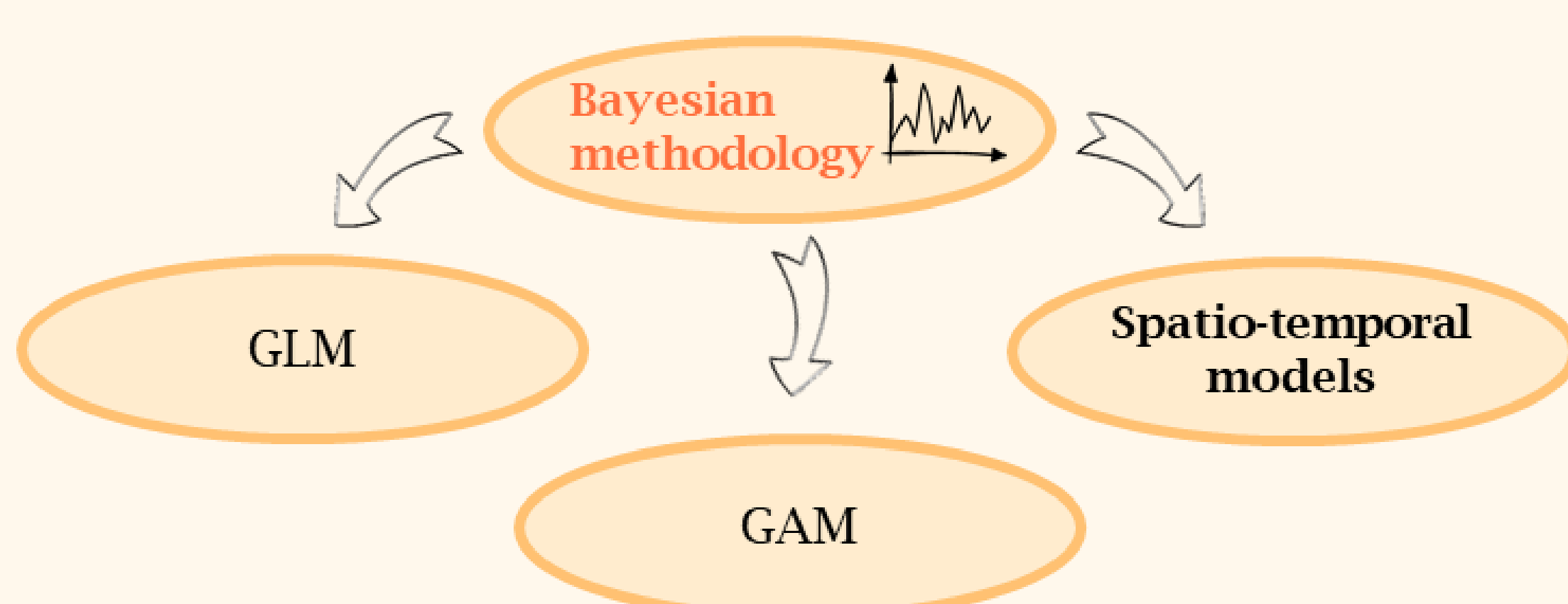
6. CONCLUSIONS

- In this work, we have introduced a methodology to assess the accuracy of the relative biomass indexes.
- We have developed three simulations of different sampling scenarios.
- We propose different Bayesian statistical models for the different scenarios.
- It is important to review which models provide a more precise estimate of the relative biomass indices.
- Our future research will continue with the planning until step 5 is achieved.

7. REFERENCES

- Zhou, S., Campbell, R. A. and Hoyle, S. D. (2019). Catch per unit effort standardization using spatio-temporal models for Australia's Eastern Tuna and Billfish Fishery. ICES Journal of Marine Science, 76(6), 1489-1504.
- Github repositoy: https://github.com/AlbaFuster/Spatial-simulation-and-models-in-R-INLA.git