

# Template to prepare preprints and manuscripts using markdown and github actions

[Michael D. Catchen](#)<sup>1,2</sup>

<sup>1</sup> McGill University   <sup>2</sup> Québec Centre for Biodiversity Sciences

## Correspondance to:

Michael D. Catchen — [michael.catchen@mail.mcgill.ca](mailto:michael.catchen@mail.mcgill.ca)

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**Purpose:** This template provides a series of scripts to render a markdown document into an interactive website and a series of PDFs.

**Motivation:** It makes collaborating on text with GitHub easier, and means that we never need to think about the output.

**Internals:** GitHub actions and a series of python scripts. The markdown is handled with pandoc.

1 Forecasting in ecology.

2 Forecasting in weather, introduce computers.

3 Future is uncertain, how do we best act given a forecast?

4 We have some goal state for the future, and some estimate of what the state of the world will be given a set

5 of actions.

6 Brief summary of decision theory.

7 Transition to theme of optimization given unknown information. In face of uncertainty, decision making

8 is an optimization problem. Frame optimization problem mathematically an introduce concept of

9 solution-space and constraint.

10 Transition to how this is applied in ecology. Introduce idea of monitoring network. Transition to specifics

11 of this thesis.

12 [Figure 1 about here.]

## 13 **CH1 optimizing sampling of species distributions**

- 14 • simulate species distribution and efficacy of detection given a set of observation points where the
- 15 dist from observation site decays.
- 16 • optimize set of repeated sampling locations L for a *known* distribution D.
- 17 • address SDM not being the territory

## 18 **CH2 optimizing sampling of interactions**

- 19 • the missing link paper, turn this into optimizing with two different SDMs

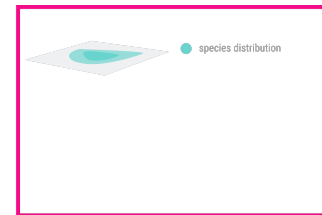
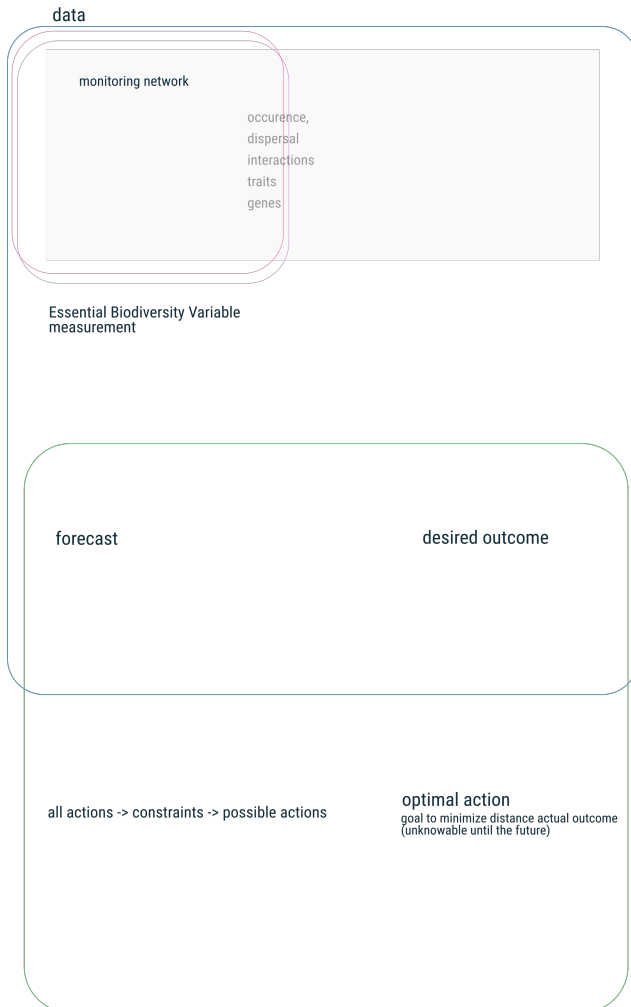
## 20 **CH3 optimizing corridor placement**

- 21 • land cover -> resistance -> extinction time
- 22 • simulated annealing to optimize landscape optimization

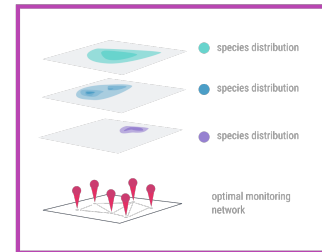
23 **CH4 a software note on the resulting packages.**

24 • Observatories.jl, Corridors.jl, MCD.jl

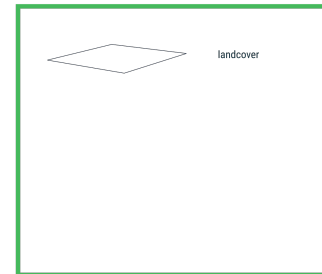
*Mitigating the effects of climate and land-use change as an optimization problem*



chapter one  
how to sample species?



chapter two  
how to sample interactions?



chapter three  
optimizing landscape



chapter four  
metacommunity dynamics

Figure 1: thesis concept