

# Species distribution models (SDM)

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# About

This is a short tutorial for constructing species distribution models in R. It describes the whole process from downloading OBIS and GBIF data, generating pseudo-absence data, including environmental data, fitting the model, validating the model and generating the resulting maps for visualization.

The code is available in AZTI's github repository repository and the book is readily available here.



# Chapter 1

## Introduction

Some introduction about SDMs





## Chapter 2

# Libraries

Load libraries that will be used



## Chapter 3

# Presence-absence data

Bla bla bla

### 3.1 Download presence data

Download from GBIF OBIS. See code sent by Guillem (LectureAnisakis\_10\_2021.R)

### 3.2 Create pseudo-absence data

See code from ANICHO (maintaining some space around presences) and from BONICHO (randomly)



## Chapter 4

# Environmental data

Bla bla bla

### 4.1 Download from public repositories

Download from Bio-oracle. See code sent by Guillem (LectureAnisakis\_10\_2021.R)

### 4.2 Operations with rasters

We can complete this a bit more later on, though not necessary right now



## Chapter 5

# Prepare final dataset

Bla bla bla

### 5.1 Merge environmental and presence-absence data

### 5.2 Exploratory plots





# Chapter 6

## Model fit

Some introduction about SDMs

### 6.1 Generalised linear models

### 6.2 Generalised additive models

### 6.3 Shape-constrained generalised additive models

One citation is [Citores et al., 2020]

#### 6.3.1 using scam

#### 6.3.2 using mboost



## Chapter 7

# Model selection

Bla bla



## Chapter 8

# Model validation

Bla bla

### 8.1 Optimum threshold

### 8.2 k-fold validation



## Chapter 9

# Prediction and maps

predict from fitted models and produce maps





# Bibliography

L. Citores, L. Ibaibarriaga, D. J. Lee, M. J. Brewer, M. Santos, and G. Chust. Modelling species presence–absence in the ecological niche theory framework using shape-constrained generalized additive models. *Ecological Modelling*, 418:108926, 2020.