

MODÉLISER LA DISTRIBUTION DES OISEAUX MARINS POUR INFORMER LES POLITIQUES ÉOLIENNES

LOUIS SCHROLL

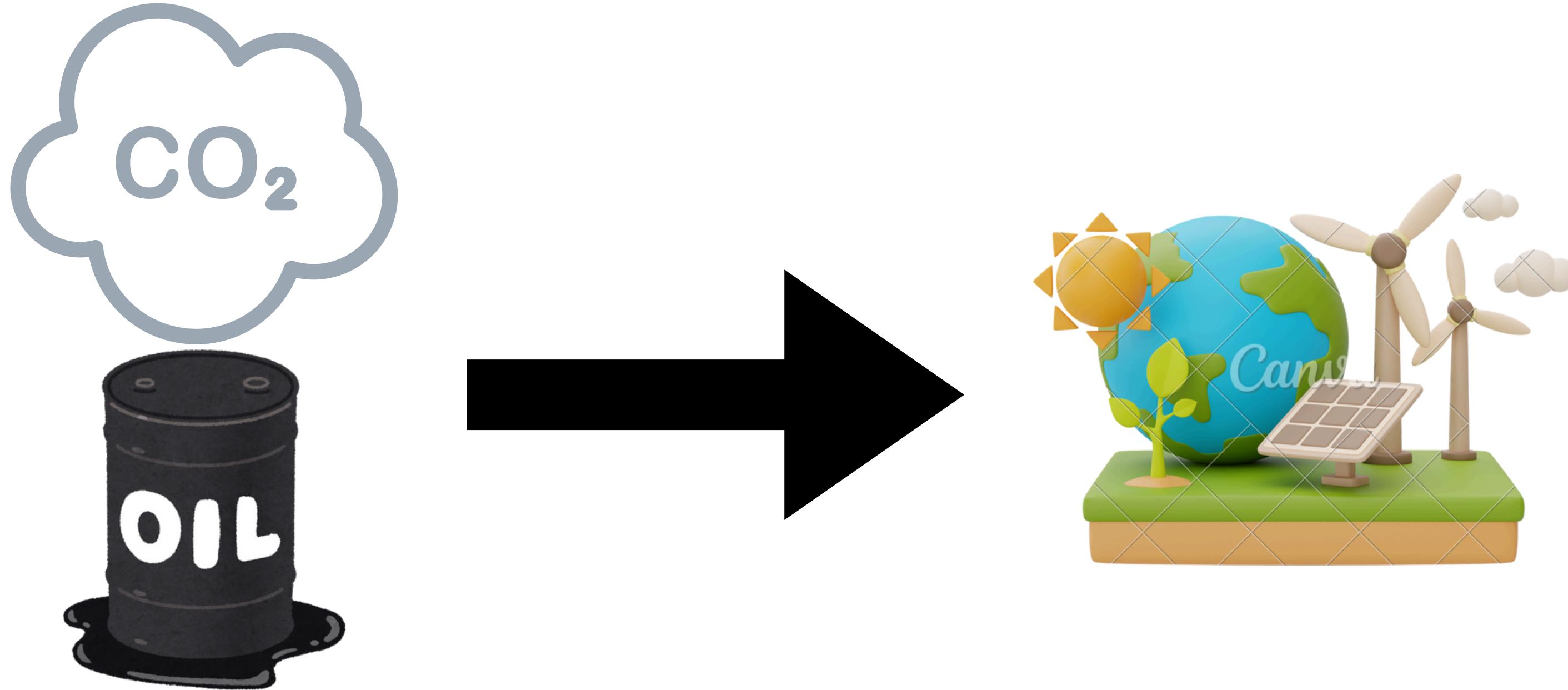
SUPERVISION : COLINE CANNONE, VALENTIN LAURET,
AURELIEN BESNARD



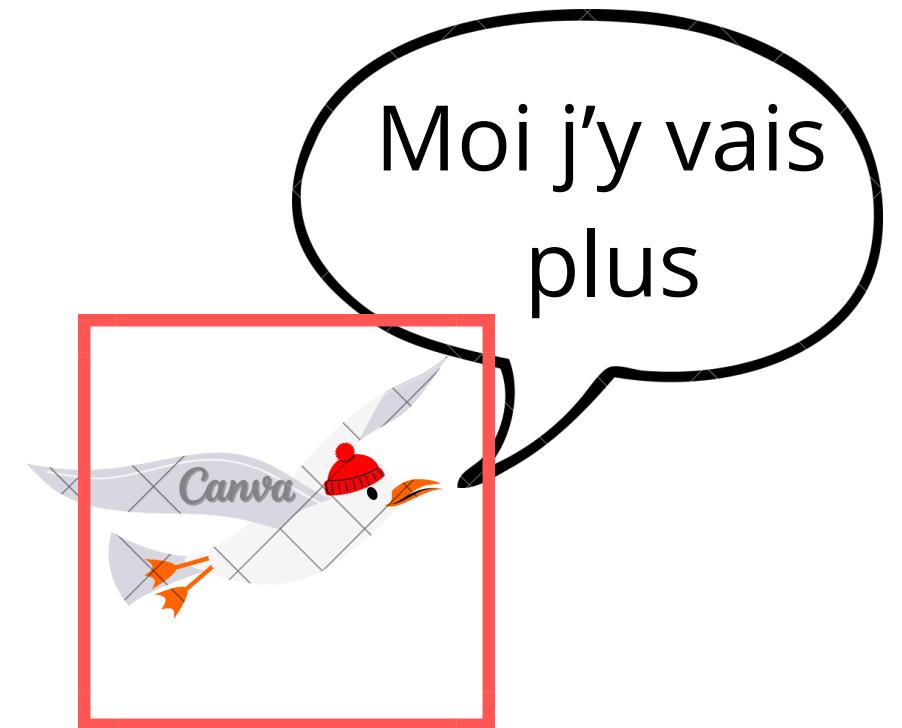
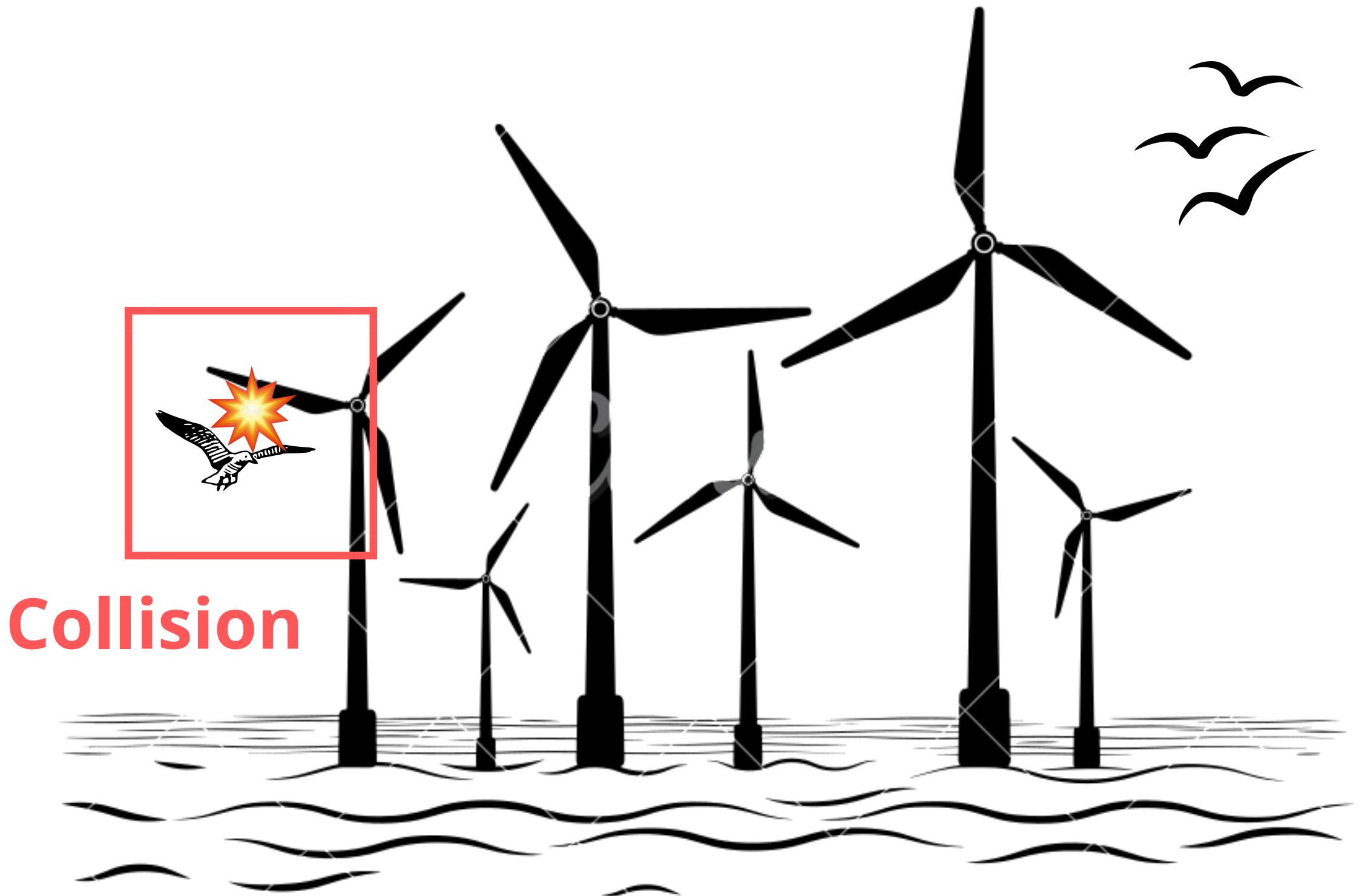
CENTRE D'ECOLOGIE
FONCTIONNELLE
& EVOLUTIVE



INTRODUCTION

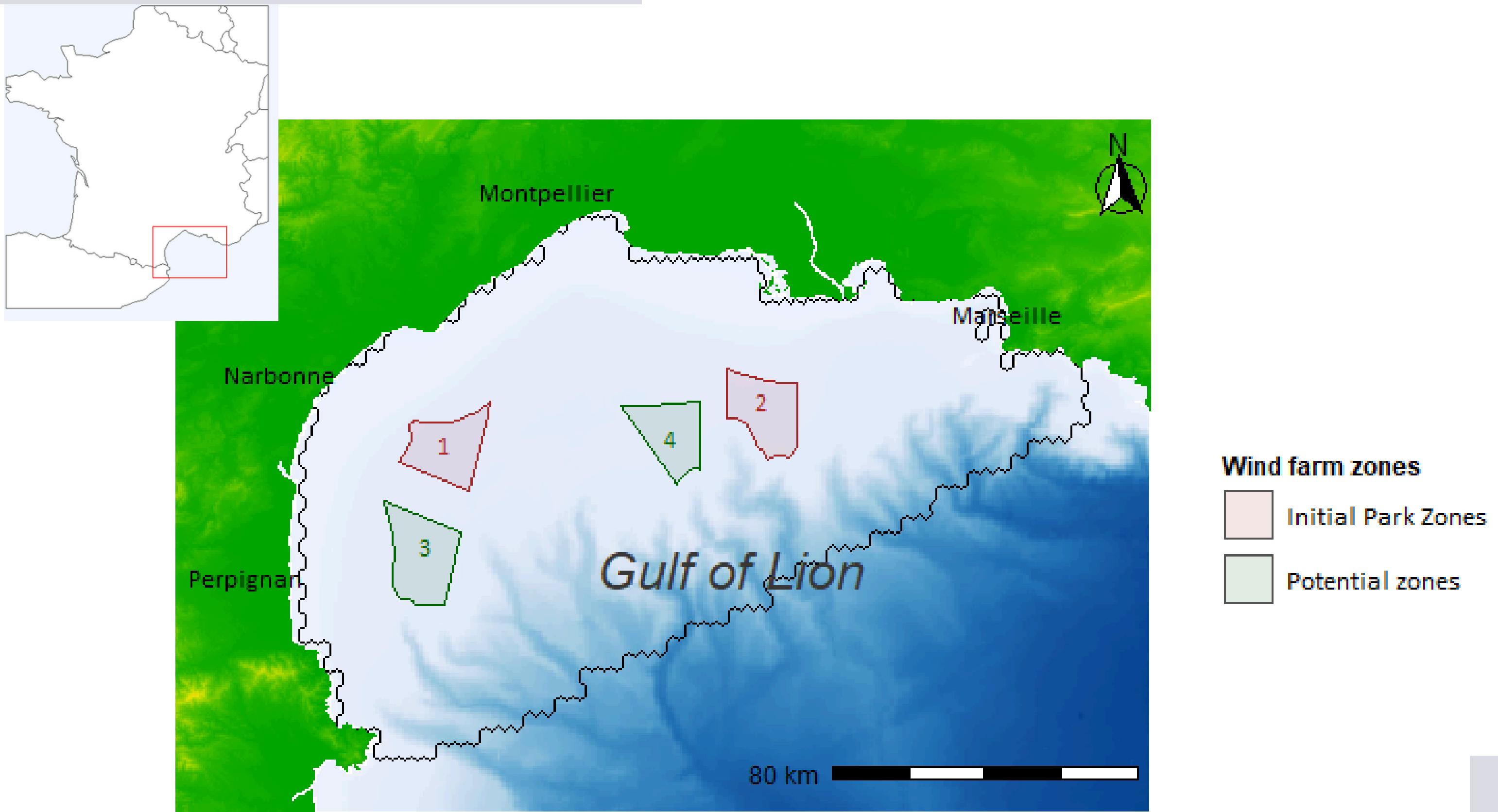


INTRODUCTION



Perte d'habitat

INTRODUCTION



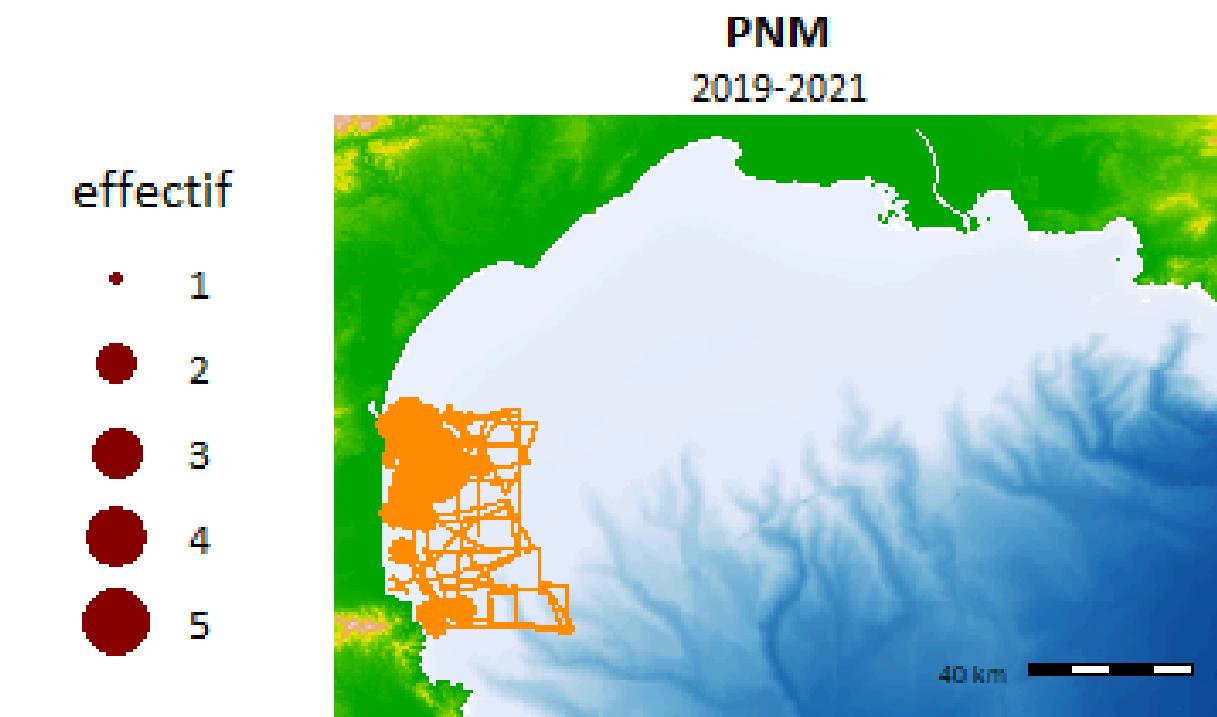
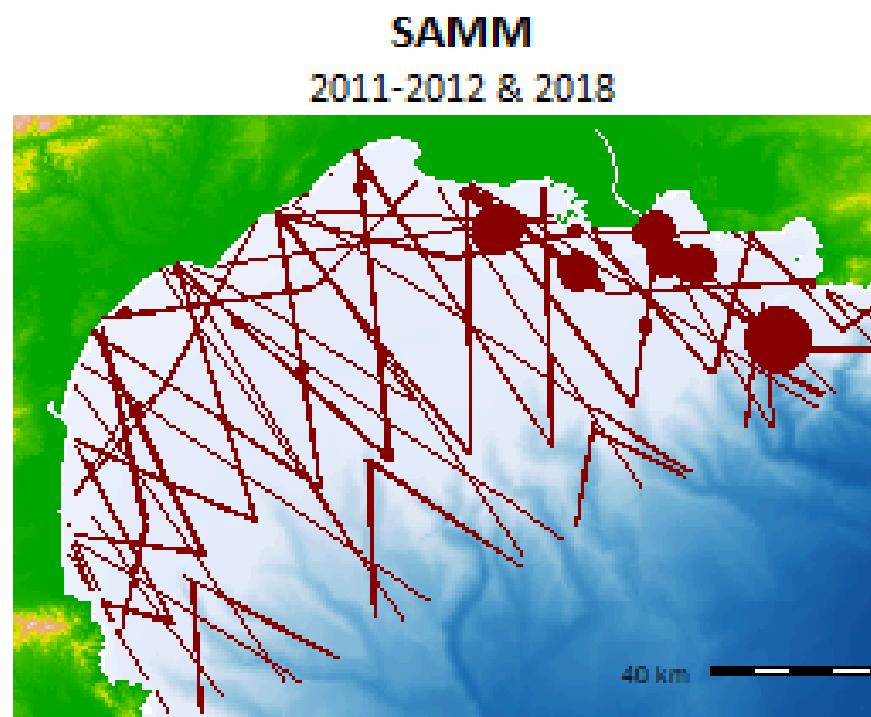
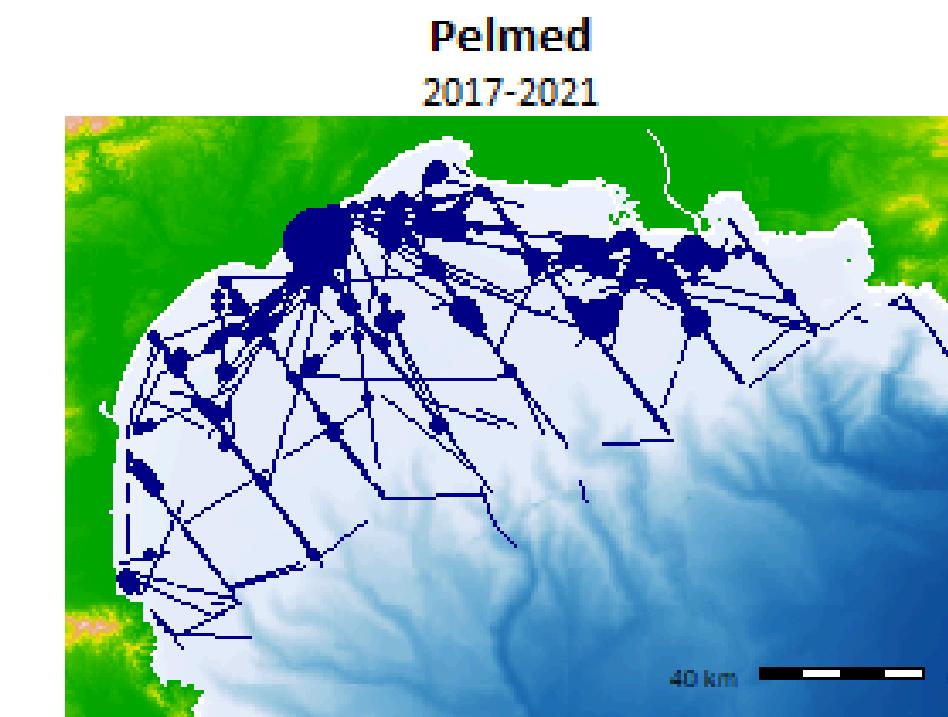
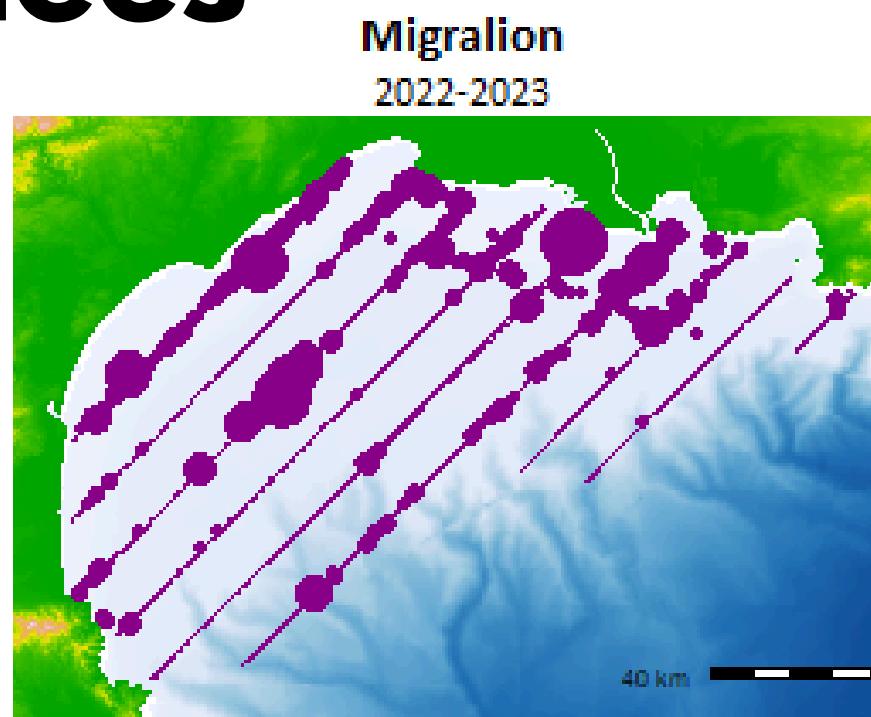
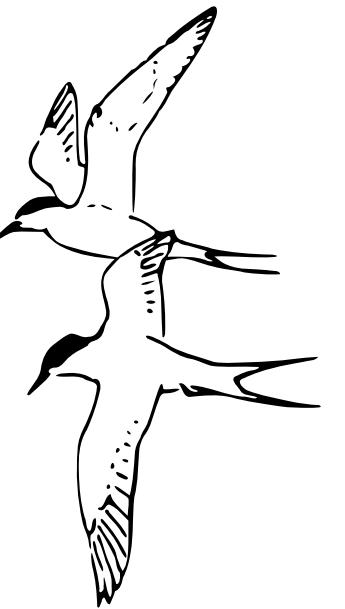


COMMENT LIMITER L'IMPACT SUR LES OISEAUX MARINS ?

**QUELLES SONT LES ZONES LES
PLUS FRÉQUENTÉES PAR CHAQUE
ESPECE D'OISEAU DE MER ?**

METHODE

Les données



effectif

- 10
- 20
- 30
- 40
- 50

effectif

- 5
- 10
- 15
- 20

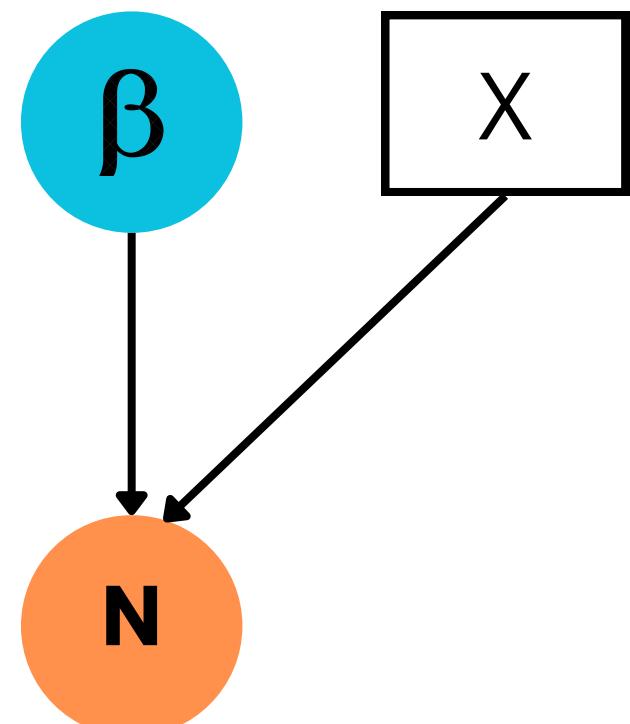
METHODE

N-mixture

Poisson GLM :

$$N \sim \text{Poisson}(\lambda)$$

$$\log(\lambda) = \beta_0 + \beta^T X$$



METHODE

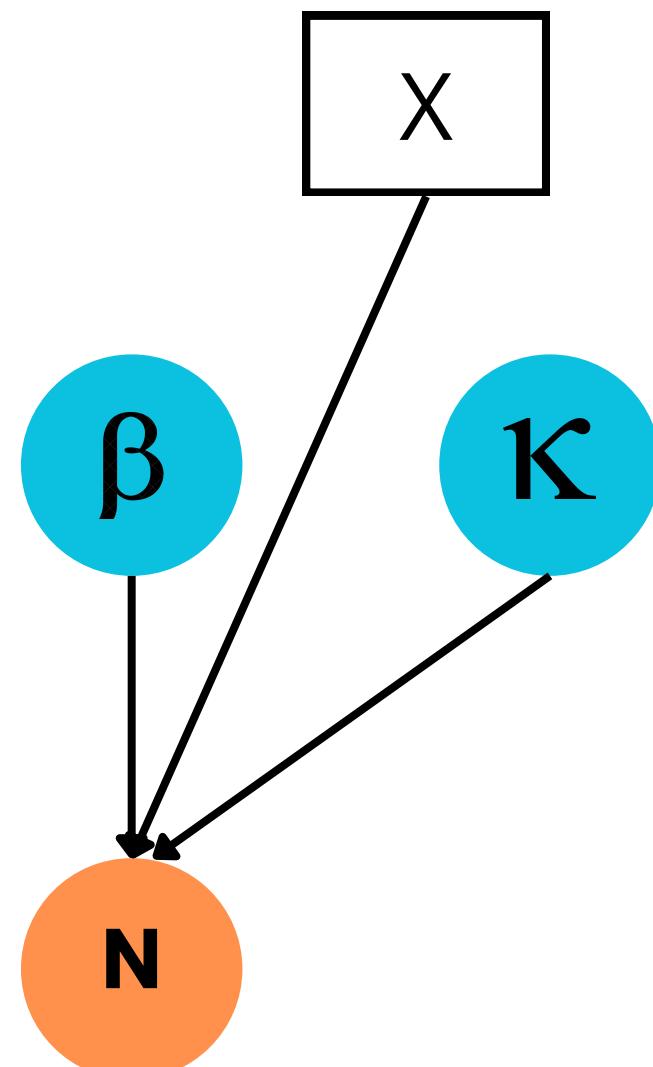
N-mixture

Site j

Negative Binomial GLM :

$$N_j \sim NegBin(\lambda_j, \kappa)$$

$$\log(\lambda_j) = X_j^T \beta$$

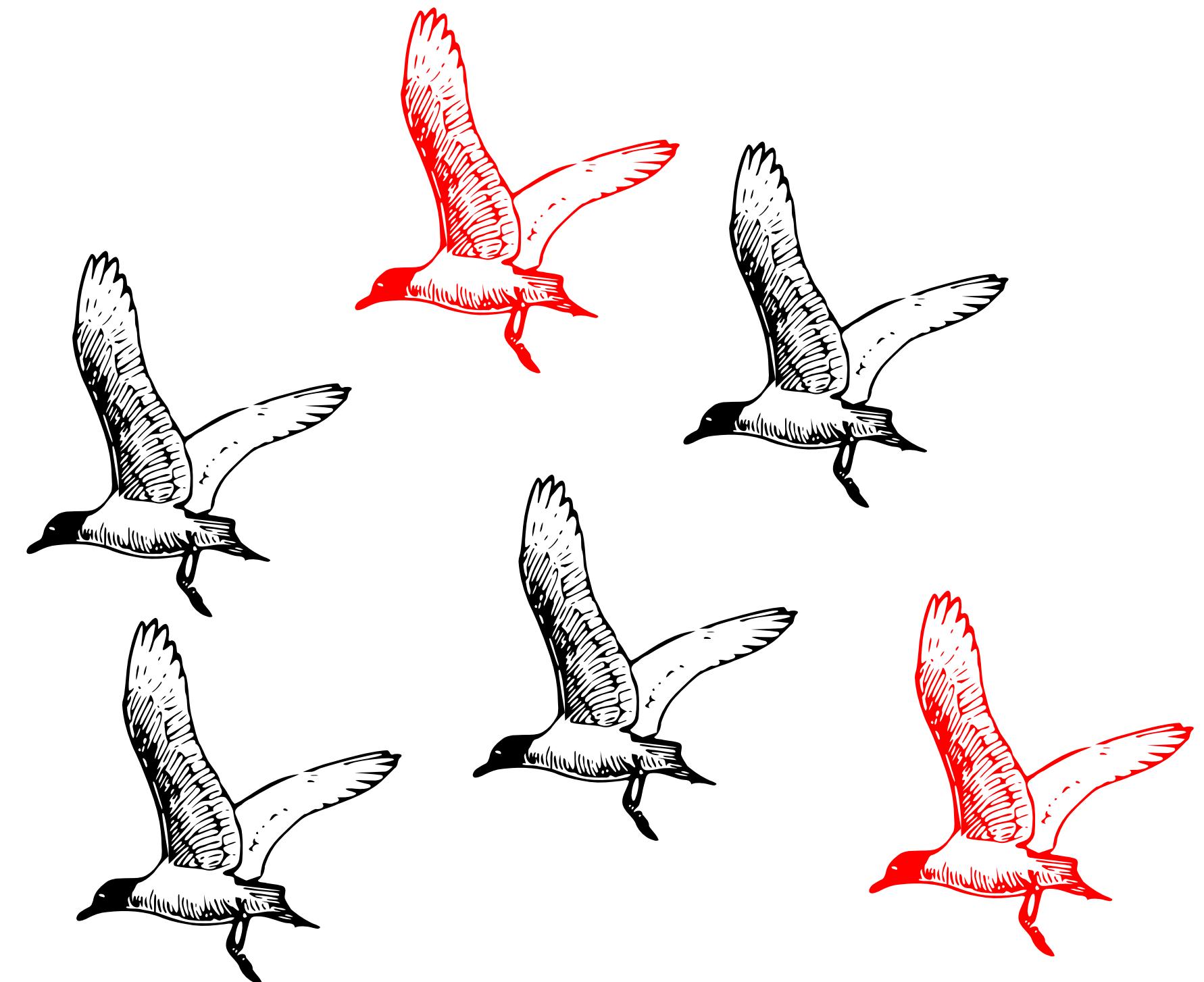


METHODE

N-mixture

Probabilité de
détexion = 4 / 6

$$N^{obs} \sim Binomial(N, p)$$



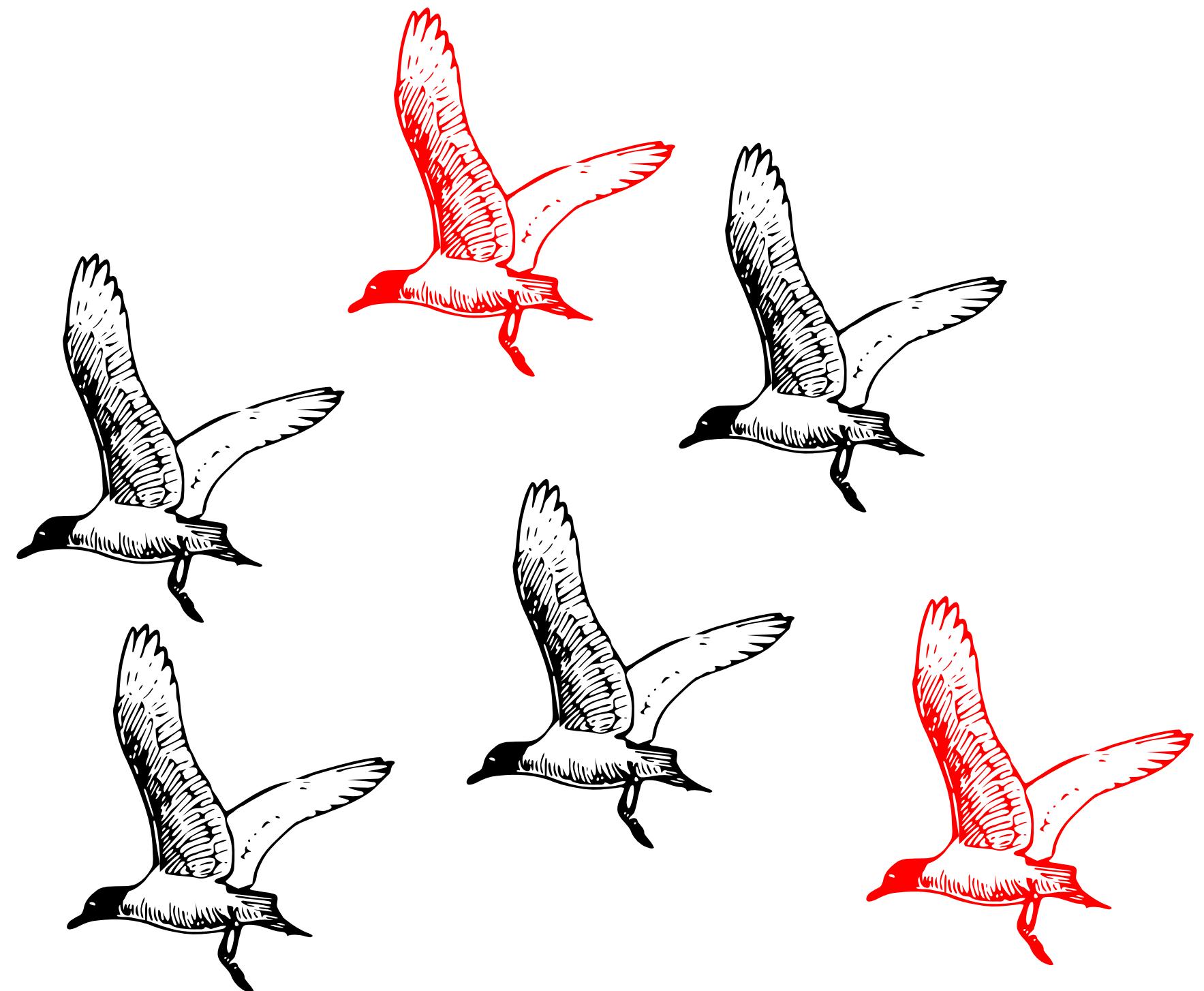
METHODE

N-mixture

Site j

Visite k

$$N_{j,k}^{obs} \sim Binomial(p_{j,k}, N_j)$$



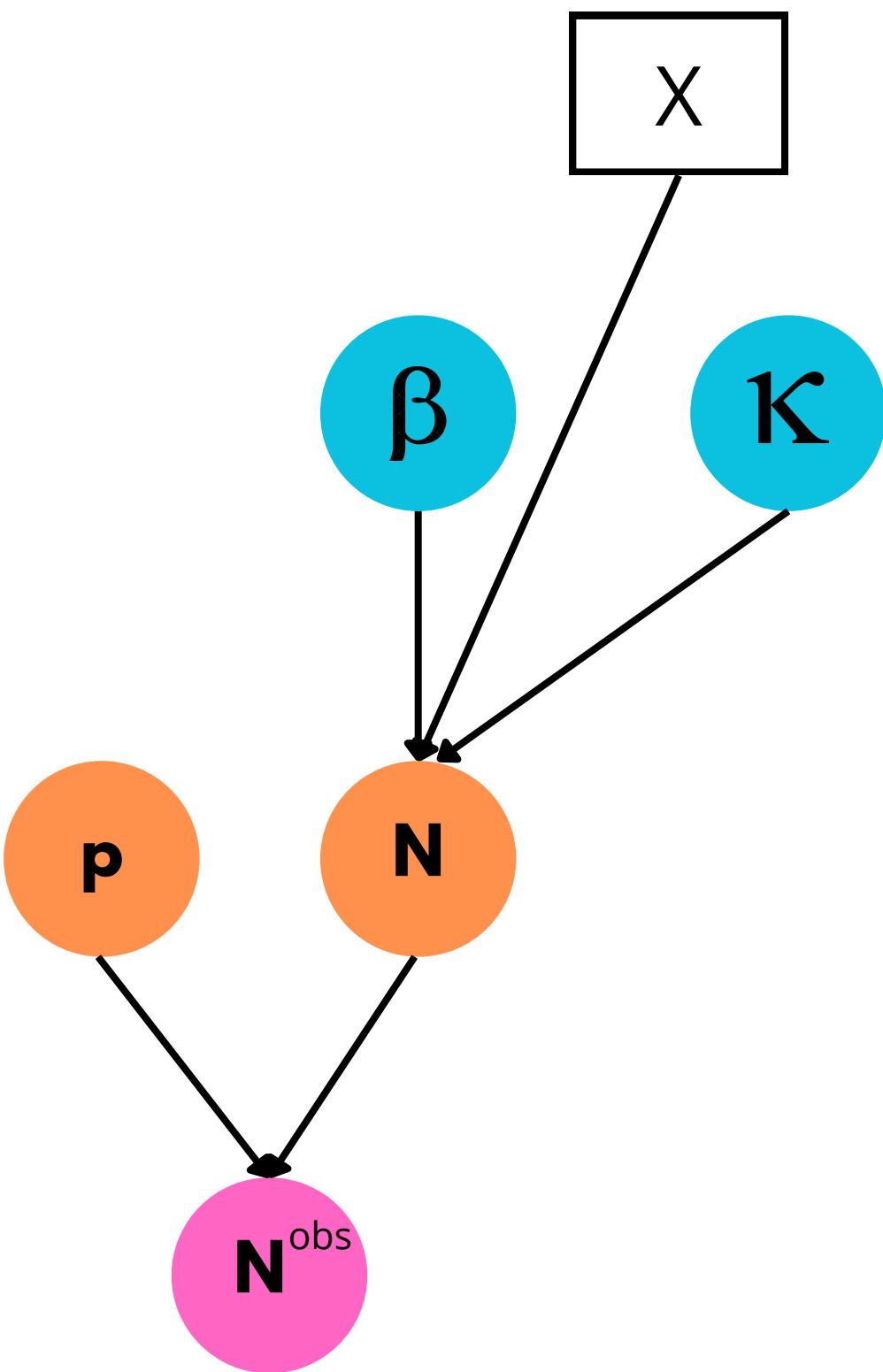
METHODE

N-mixture

Site j

Visite k

$$N_{j,k}^{obs} \sim Binomial(p_{j,k}, N_j)$$



METHODE

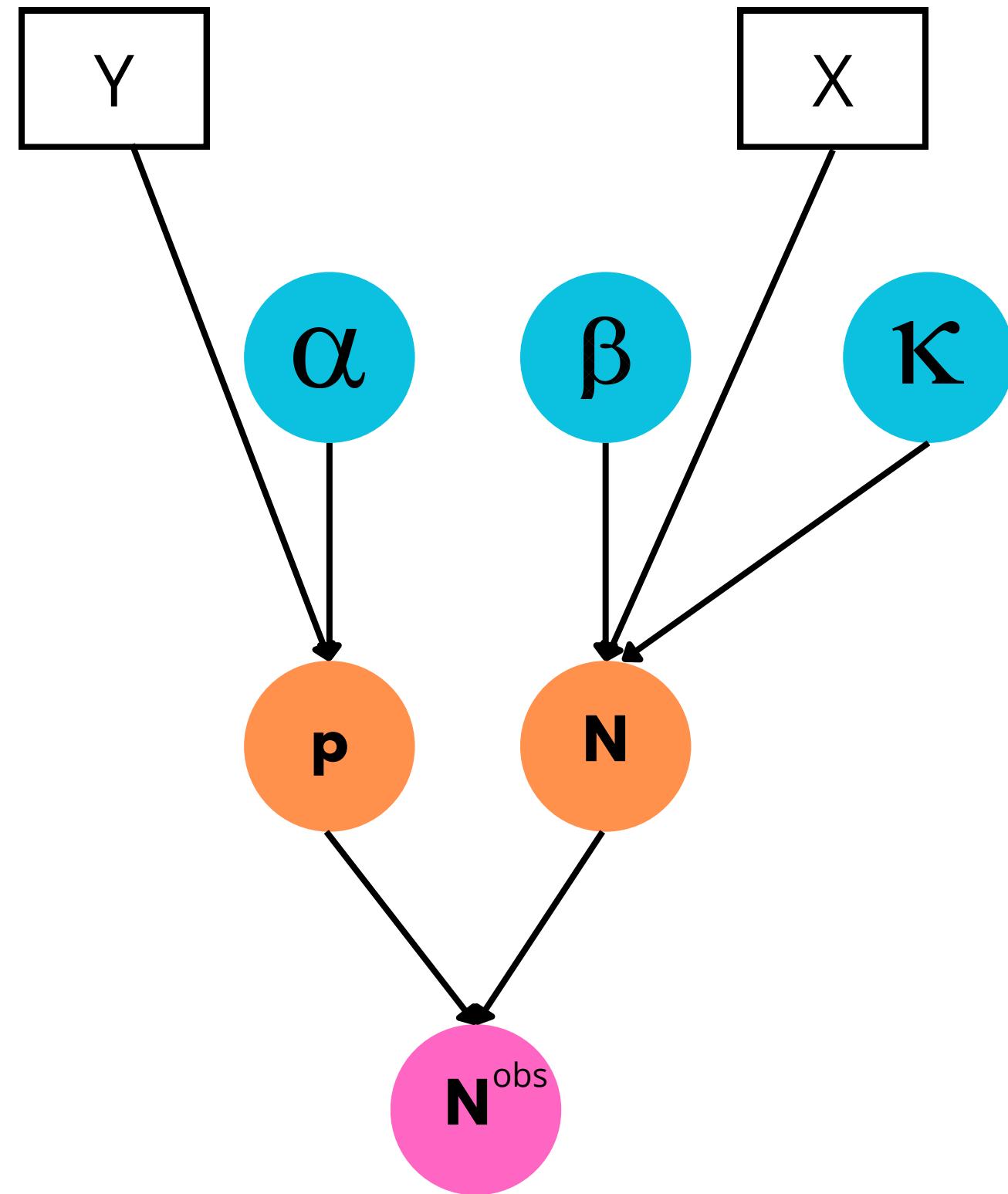
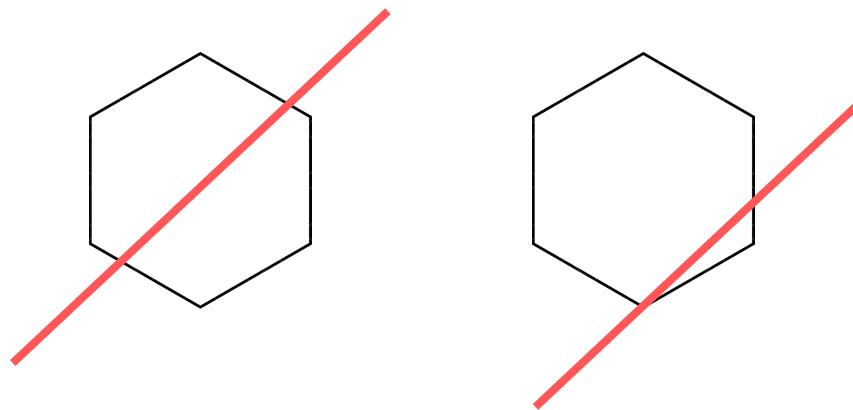
N-mixture

Site j

Visite k

$$N_{j,k}^{obs} \sim Binomial(p_{j,k}, N_j)$$

$$\text{logit}(p_{j,k}) = \alpha^0 + \alpha^1 \text{transect length}_{j,k}$$



METHODE N-mixture

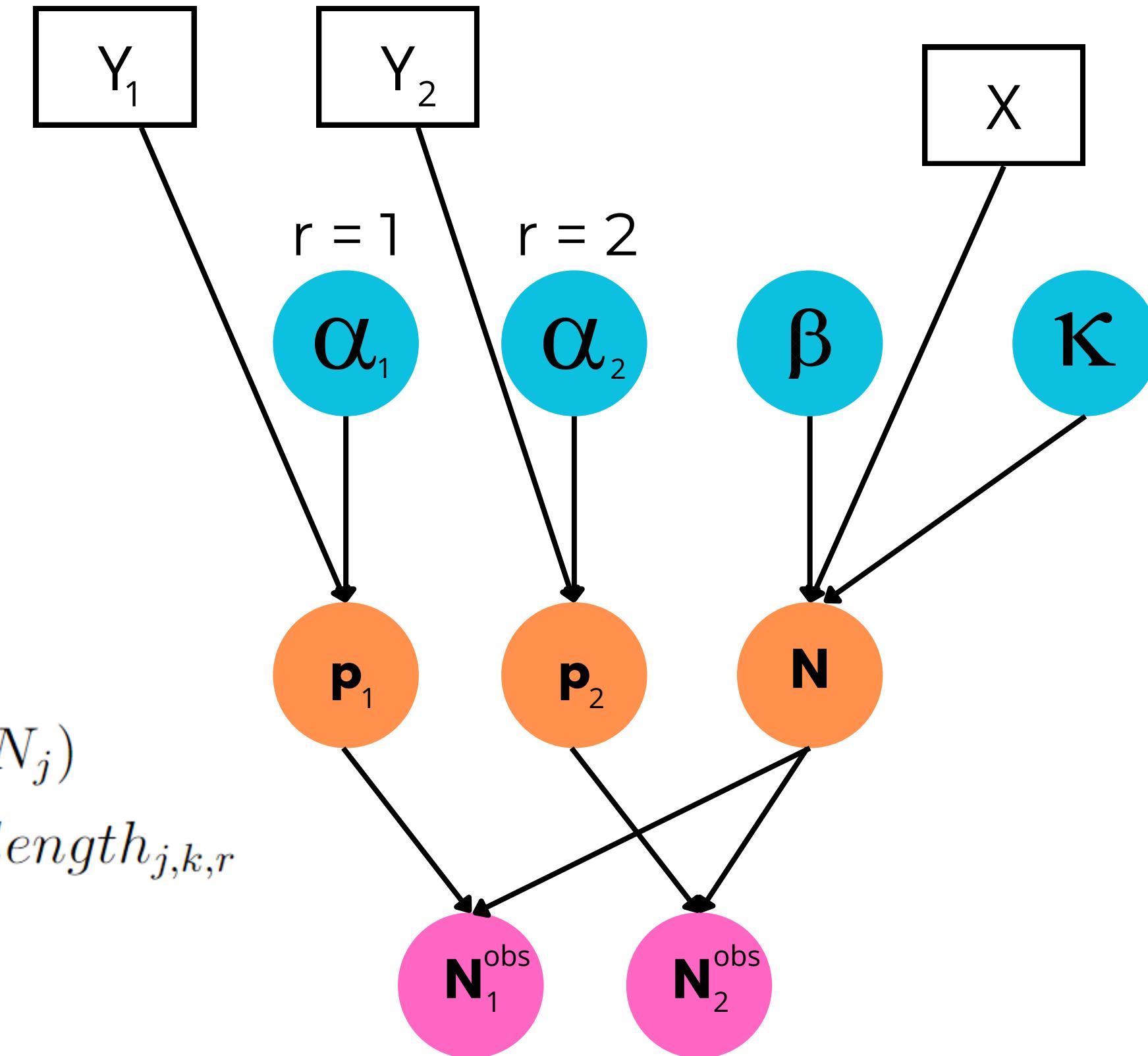
Site j

Visite k

Jeu de donnée r

$$N_{j,k,r}^{obs} \sim Binomial(p_{j,k,r}, N_j)$$

$$\text{logit}(p_{j,k,r}) = \alpha_r^0 + \alpha_r^1 \text{transect length}_{j,k,r}$$



METHODE

N-mixture

Site j

Visite k

Jeu de donnée r

Processus écologique latent

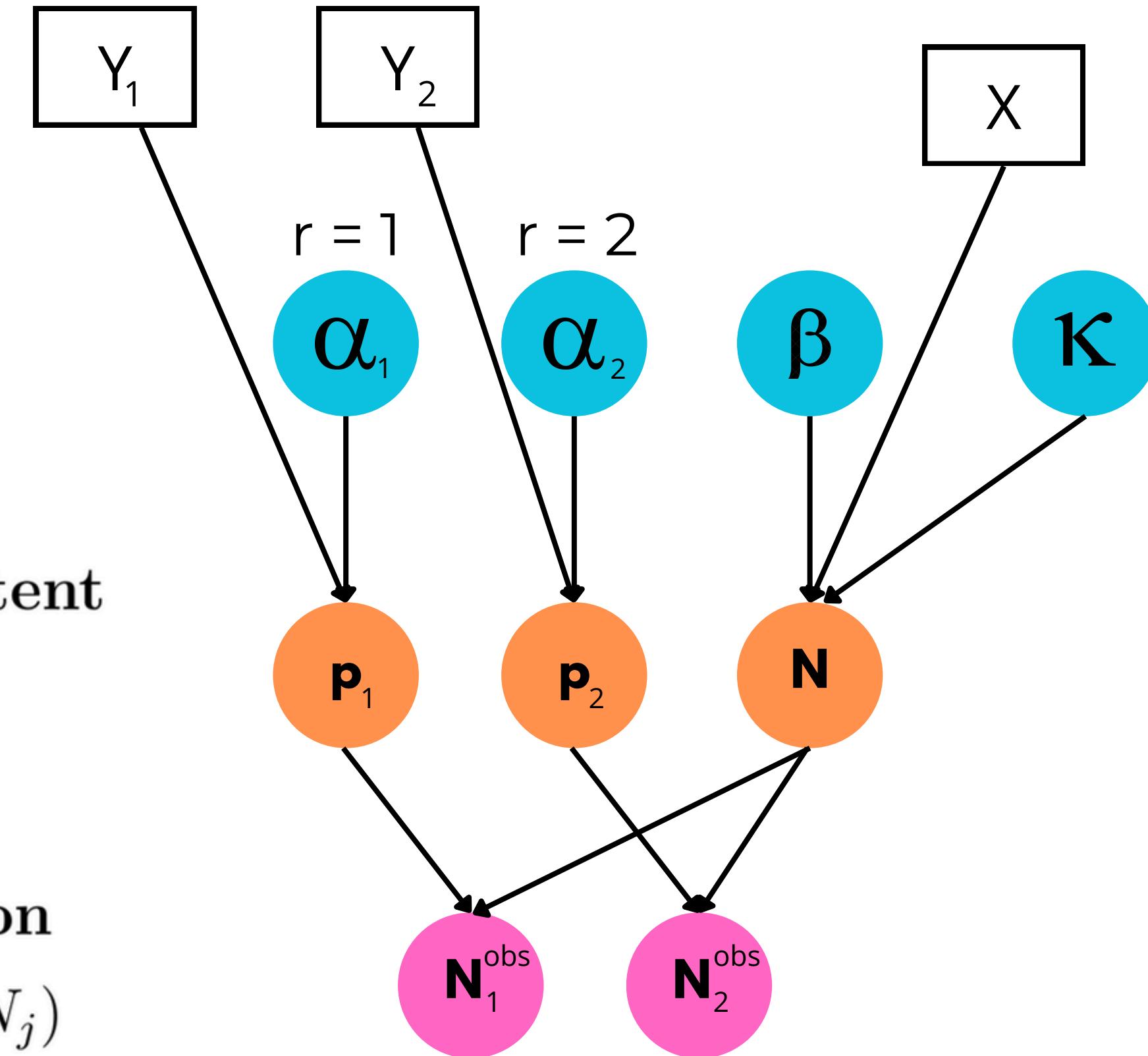
$$N_j \sim \text{NegBin}(\lambda_j, \kappa)$$

$$\log(\lambda_j) = \beta_0 + \beta^T X$$

Processus d'observation

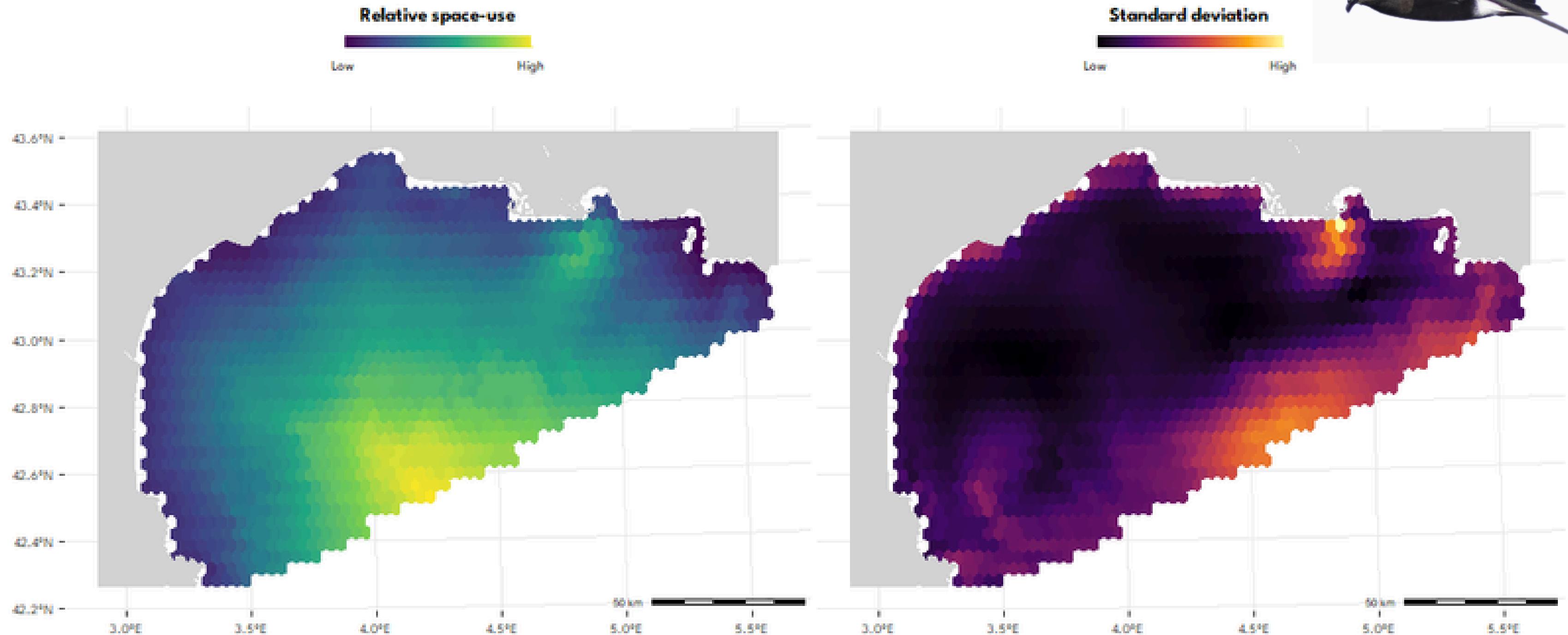
$$N_{j,k,r}^{obs} \sim \text{Binomial}(p_{j,k,r}, N_j)$$

$$\text{logit}(p_{j,k,r}) = \alpha_r^0 + \alpha_r^1 \text{transect length}_{j,k,r}$$



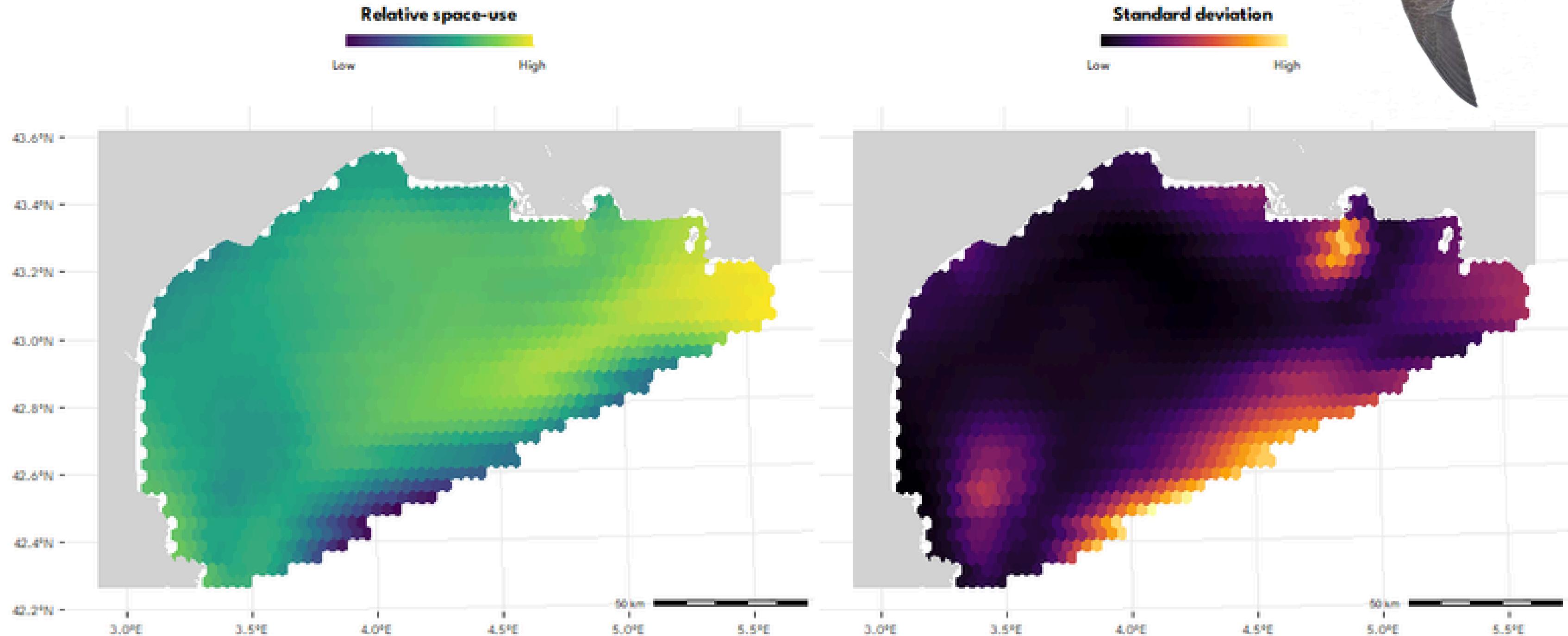
RESULTATS

Océanite tempête (été)



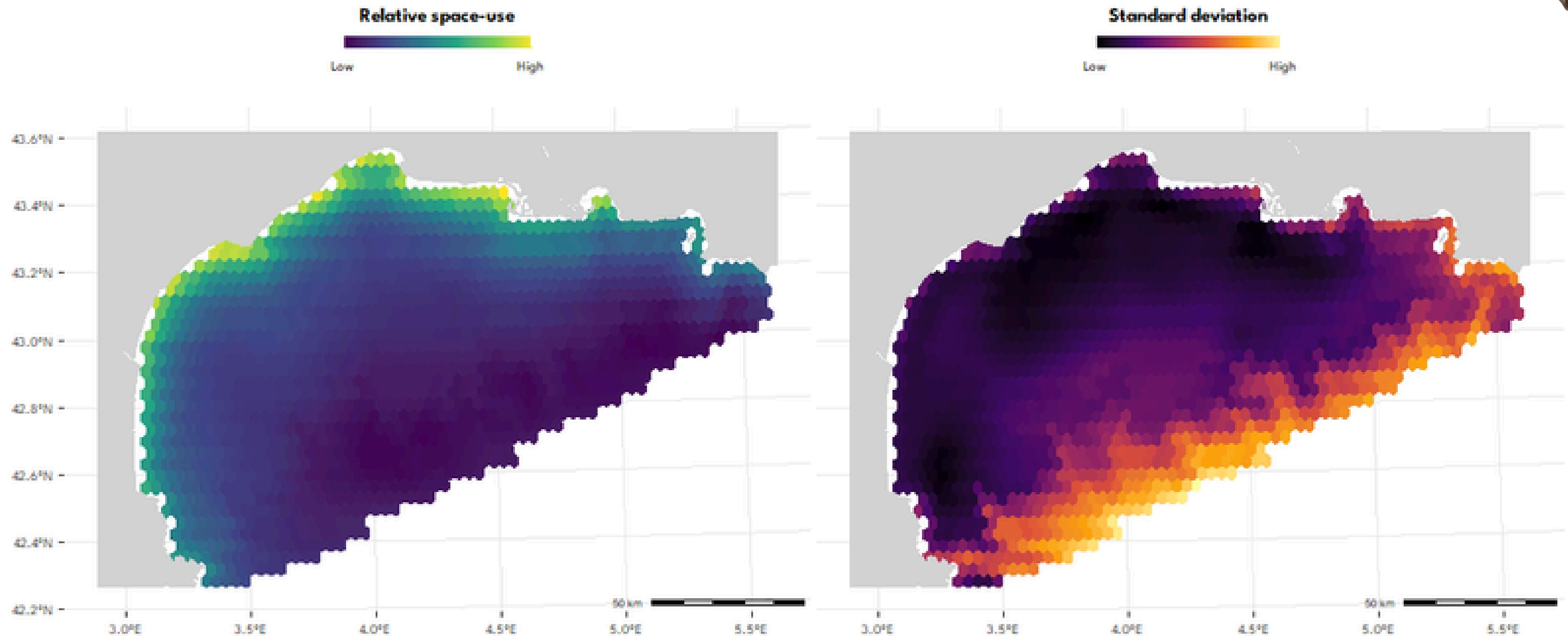
RESULTATS

Puffin de Scopoli (été)

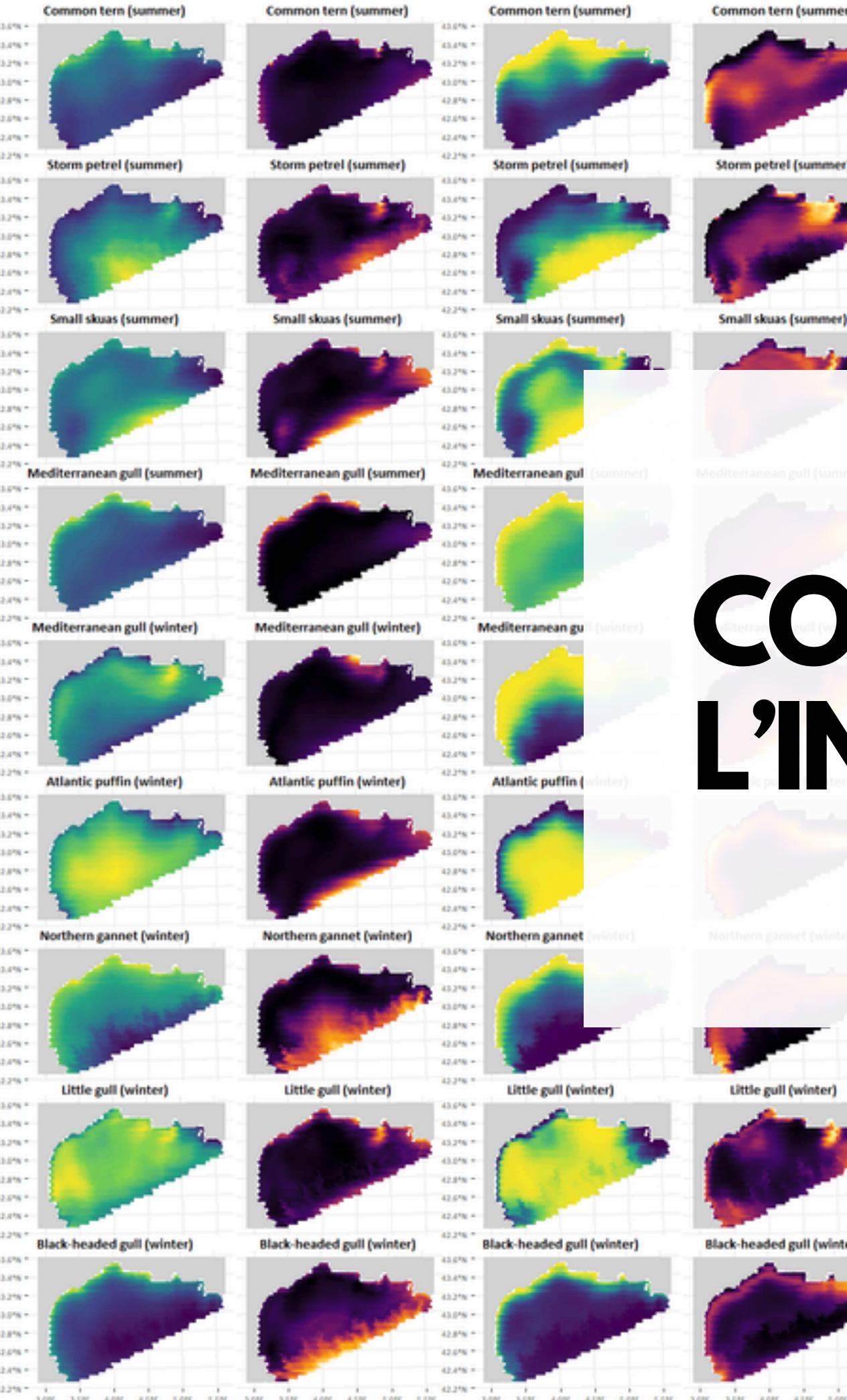


RESULTATS

Mouette rieuse (hiver)



Seabirds distribution in the Gulf of Lion



COMMENT SYNTHETISER L'INFORMATION ?

METHODE

Synthèse du risque

Vulnérabilité =

Risque de
collision

x

Risque de
déplacement

x

Score de
conservation

METHODE

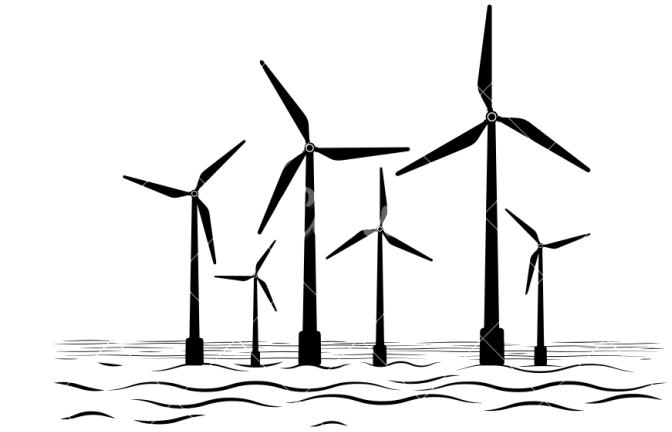
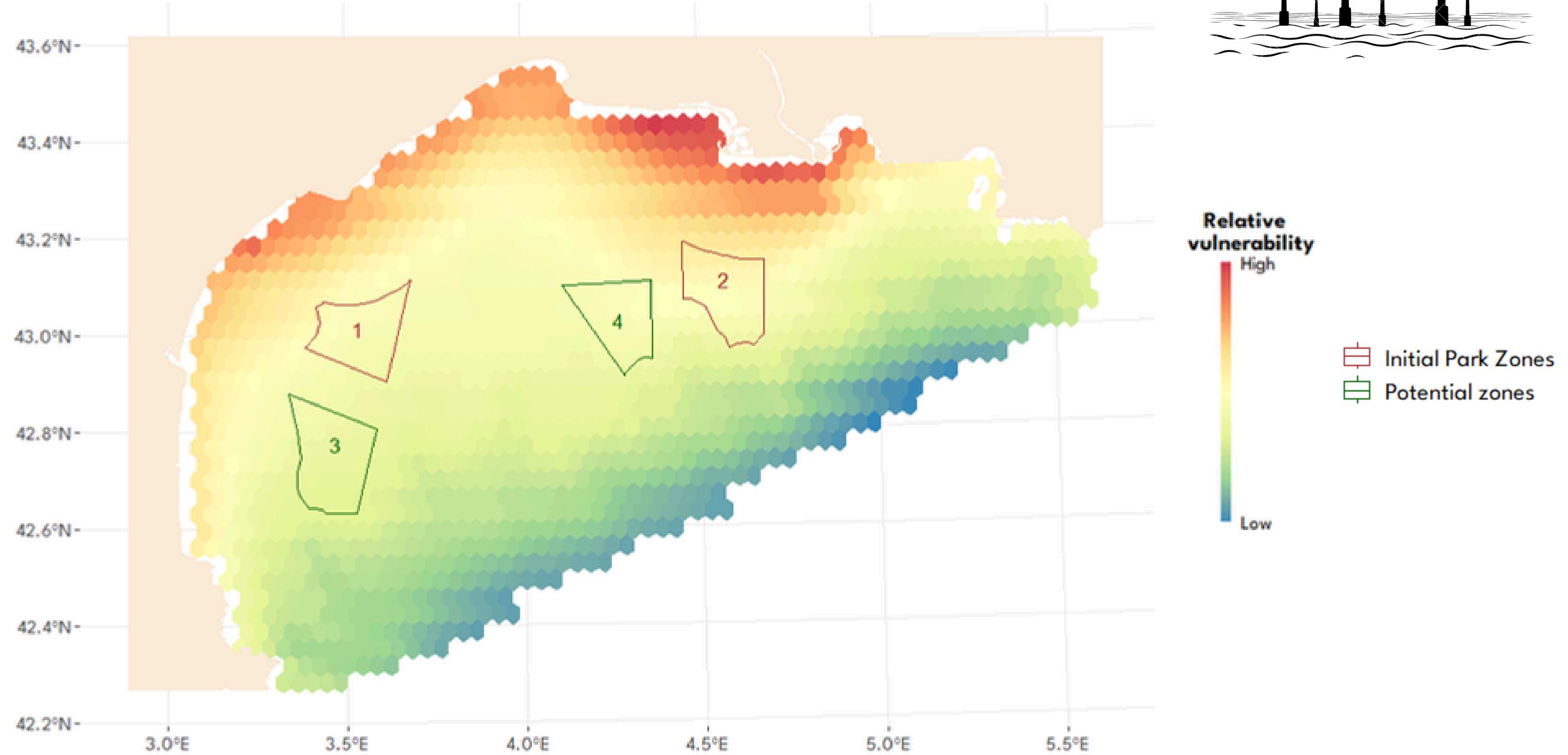
Synthèse du risque

The diagram shows a sequence of maps representing the weighted sum of species' VS maps. It starts with 'espèce 1' (species 1) followed by a multiplication sign and a map showing a green-to-yellow gradient. This is followed by '+ VS₂ x' and another map showing a green-to-blue gradient. The sequence continues with '+ ... + VS_n x' and a final map showing a blue-to-yellow gradient. An equals sign follows, leading to a final map where specific regions are highlighted with numbered green triangles (1, 2, 3, 4) against a background of yellow and orange.

VS = Vulnerability Score

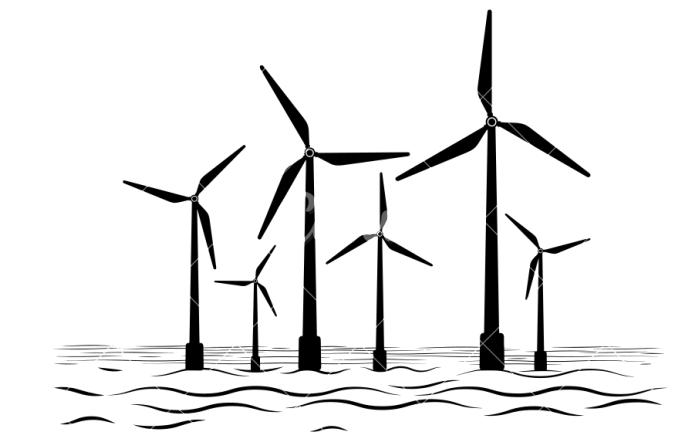
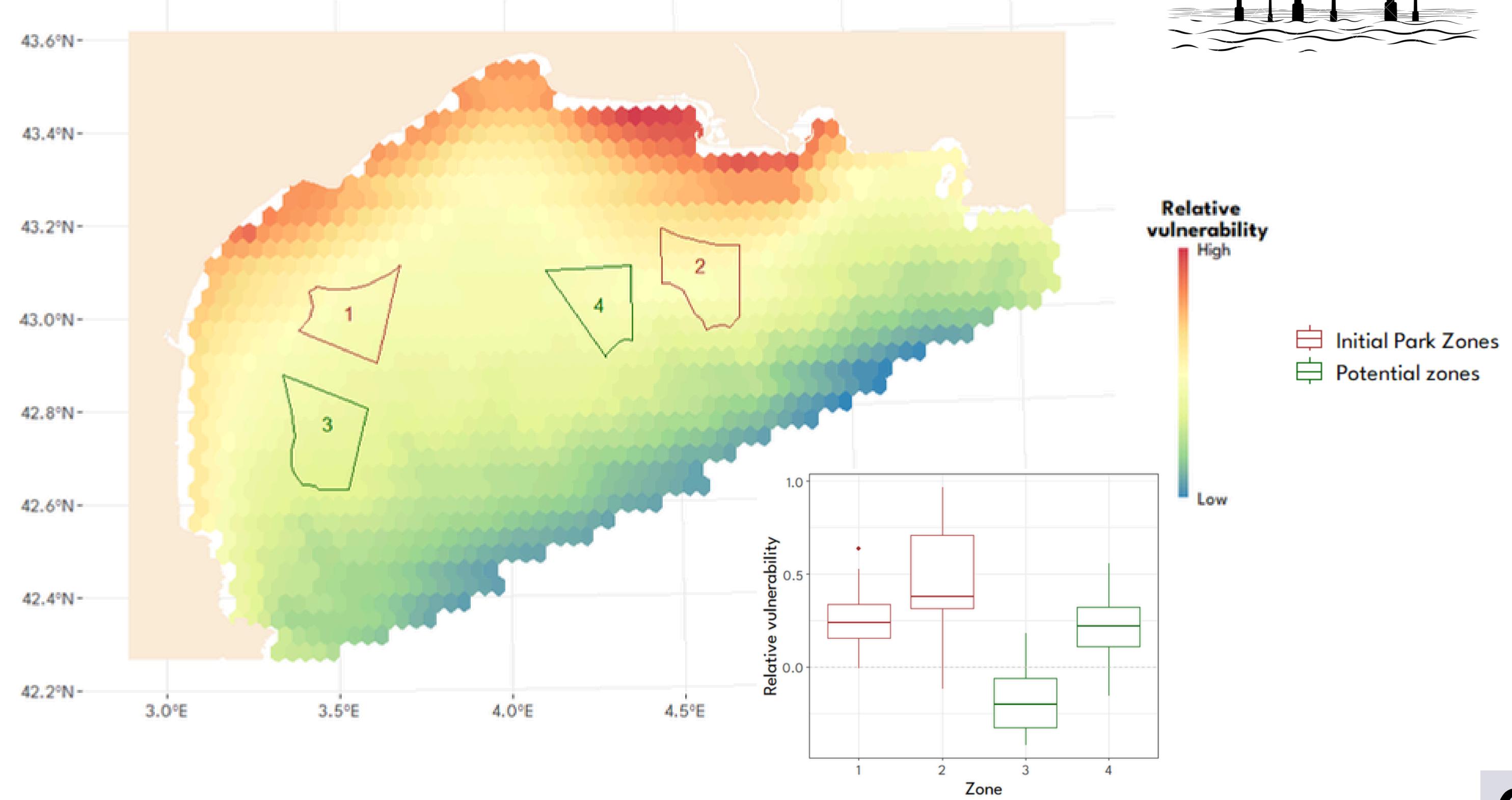
RESULTATS

Seabird vulnerability in the Gulf of Lion



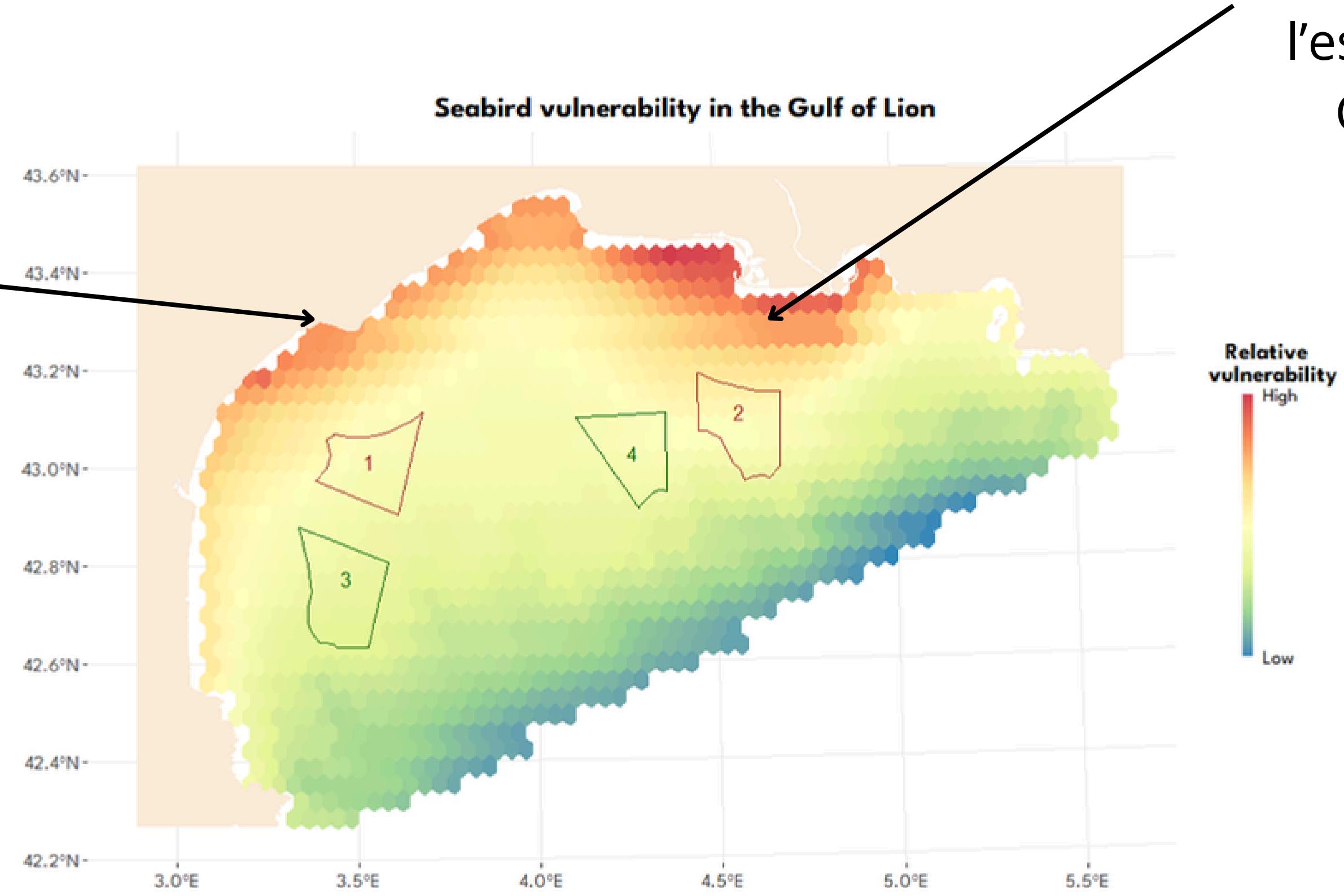
RESULTS

Seabird vulnerability in the Gulf of Lion



DISCUSSION

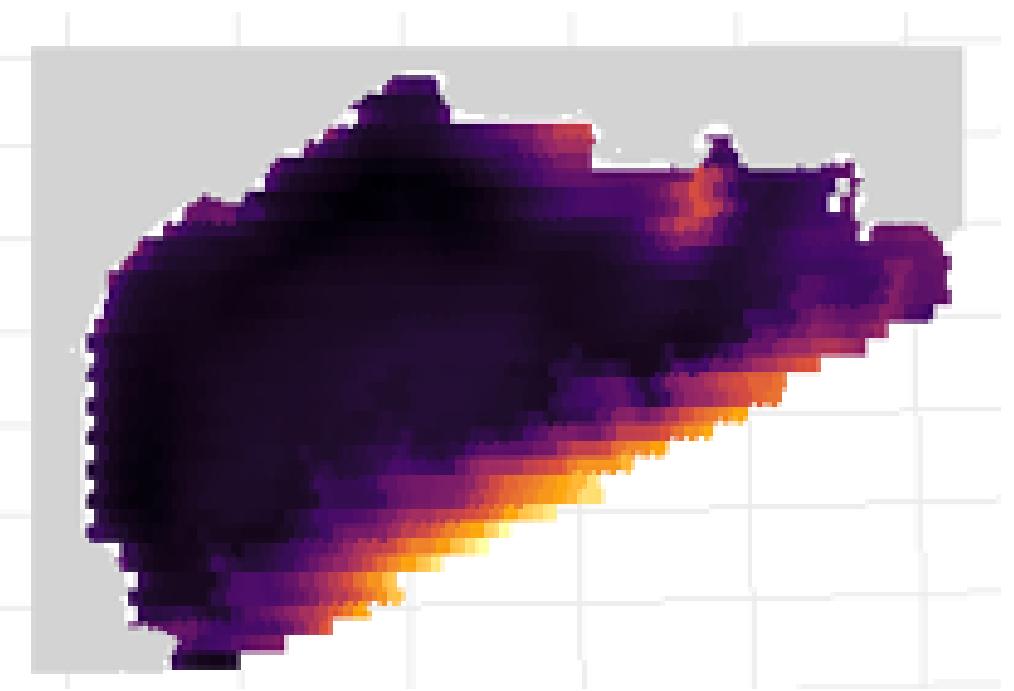
distance à la côte
vulnérabilité



Haute vulnérabilité dans l'estuaire de la Camargue

DISCUSSION

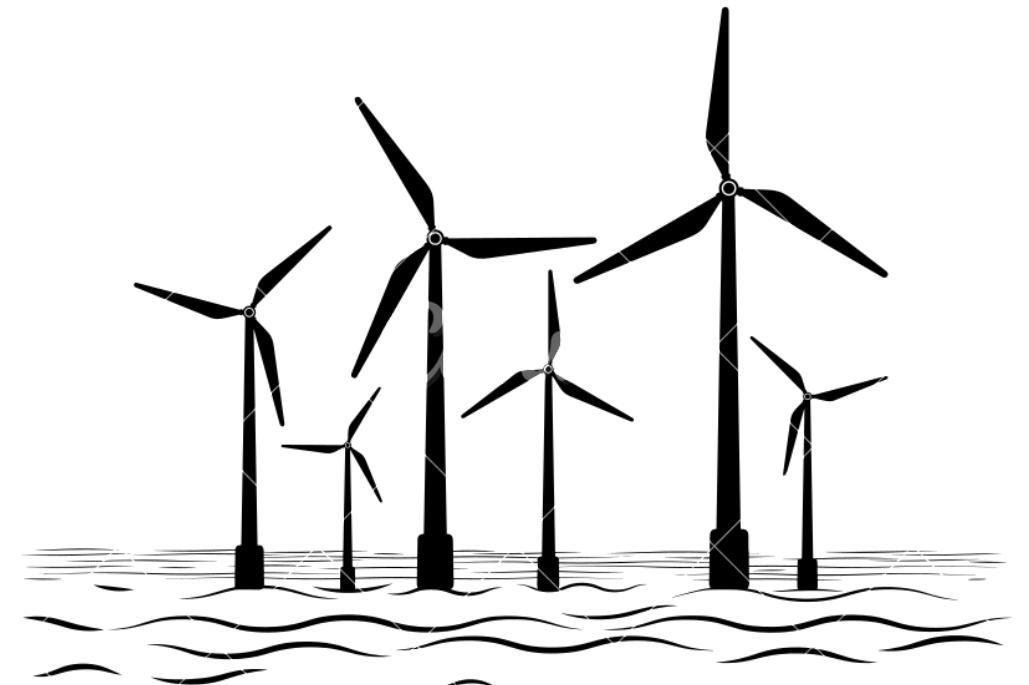
Incertitude



Distribution



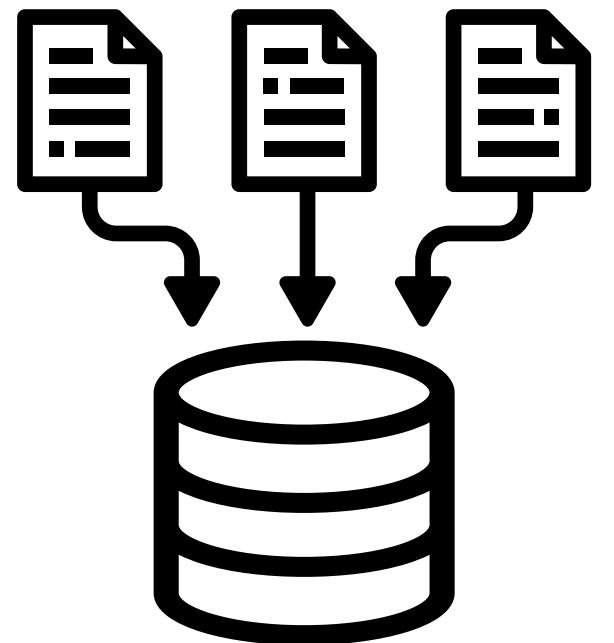
Score de vulnérabilité



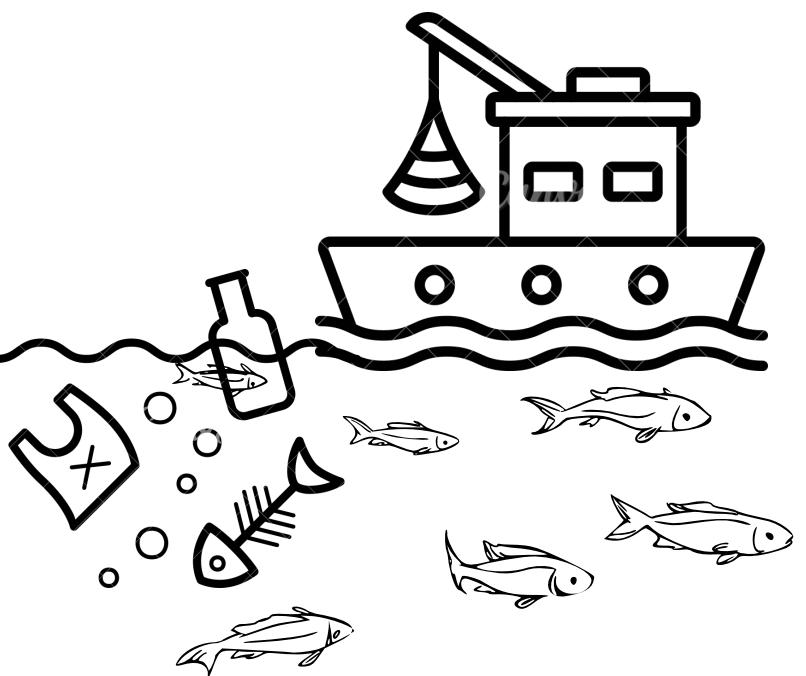
Effets des éoliennes

DISCUSSION

Perpectives



Nouvelles données



Accumulation des
impacts



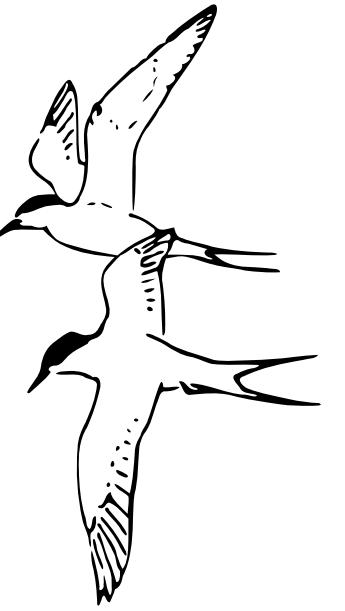
Autres espèces



MERCI POUR VOTRE
ATTENTION

METHODE

Les données



METHODE

RSF

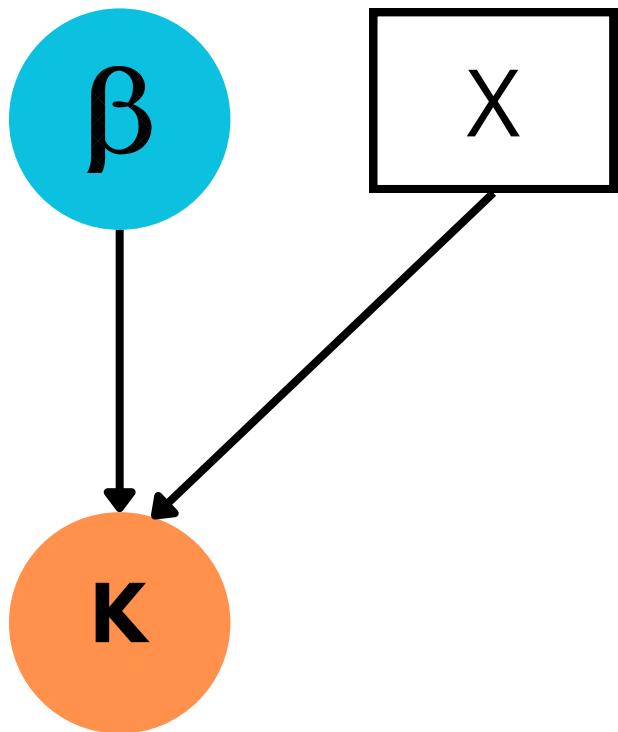
METHODE

RSF

Site j

$$K_j \sim Bernoulli(\lambda_j)$$

$$\text{logit}(\lambda_j) = \beta_0 + X_j^T \beta$$



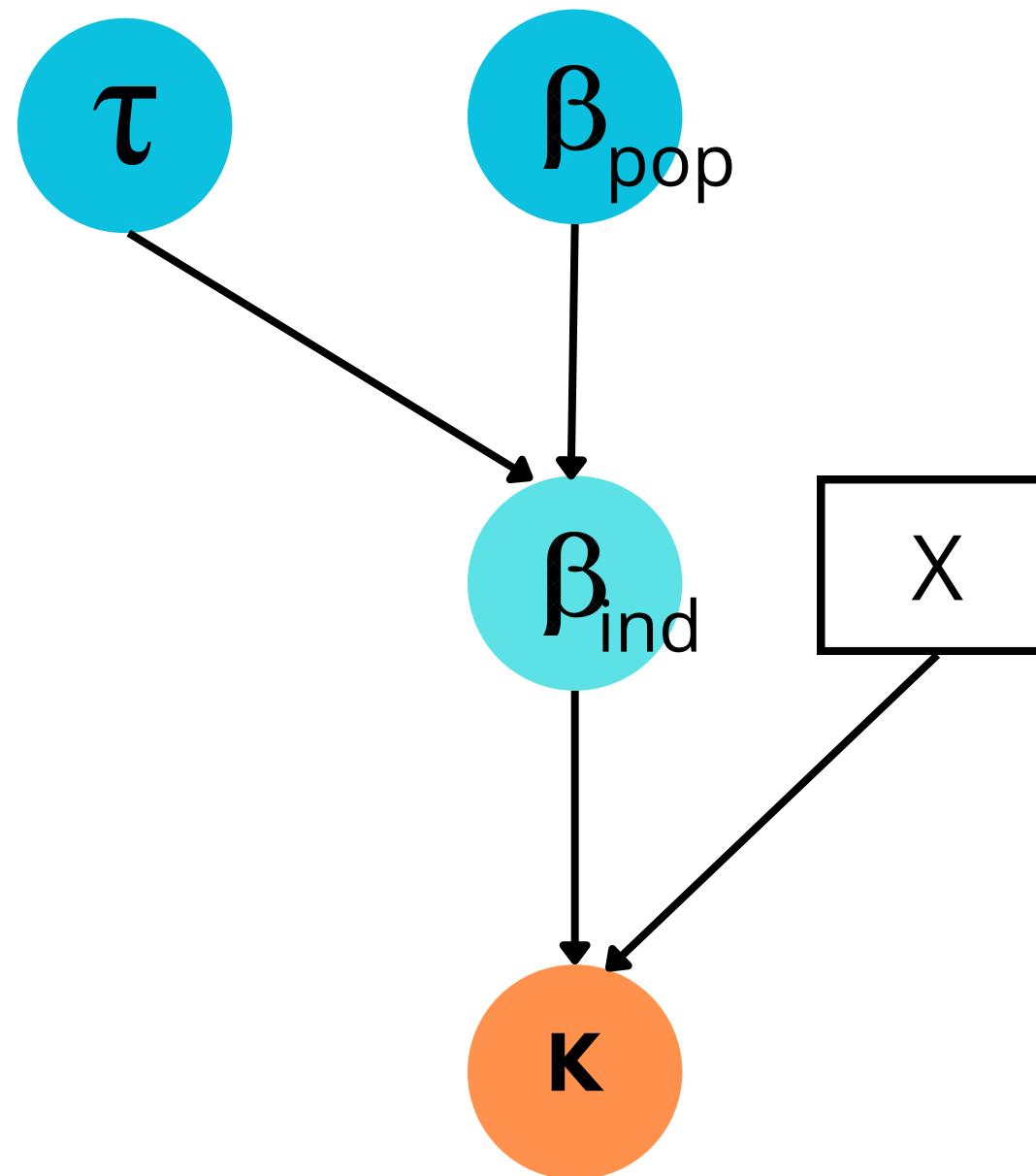
METHODE

RSF

Site j

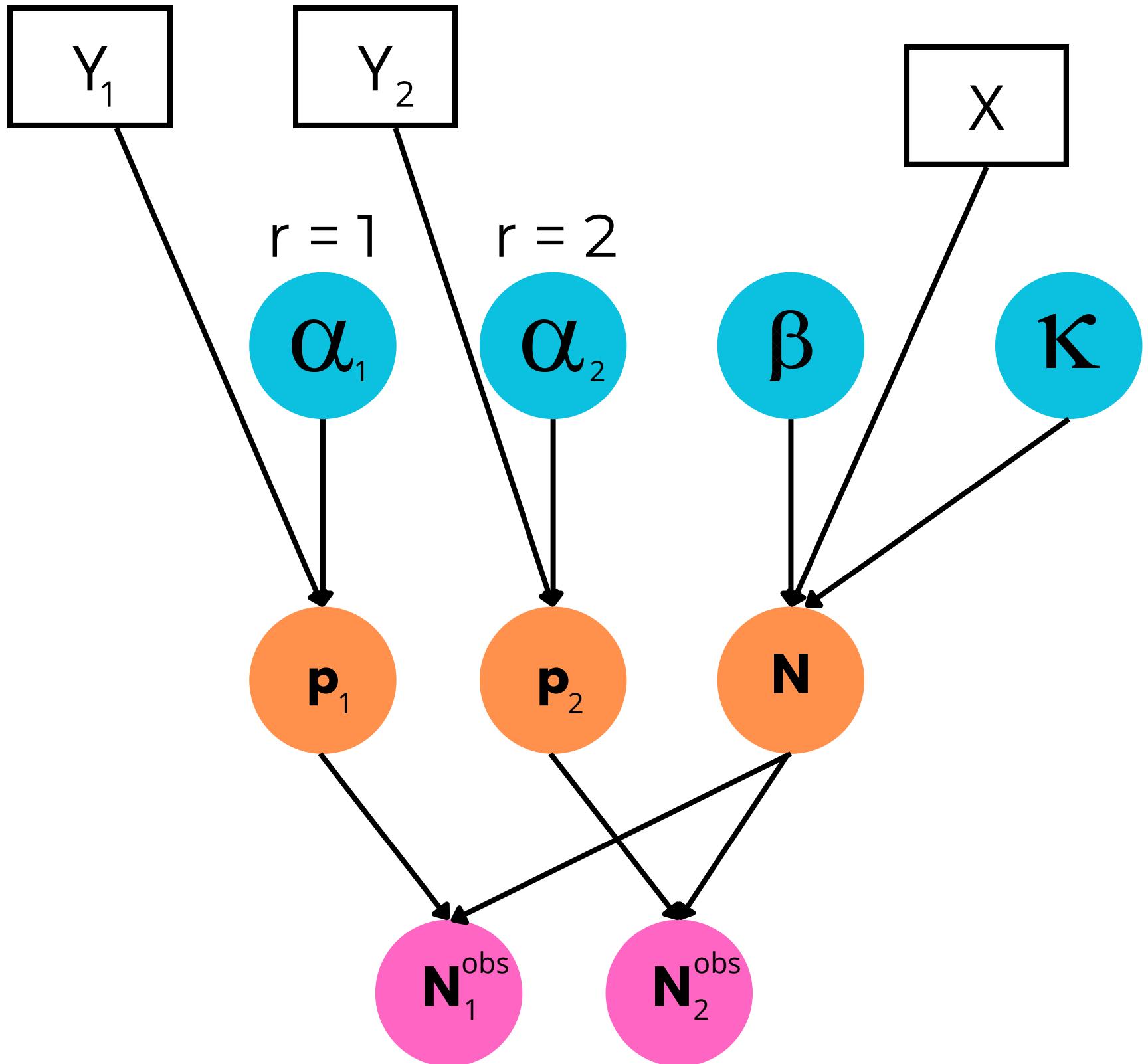
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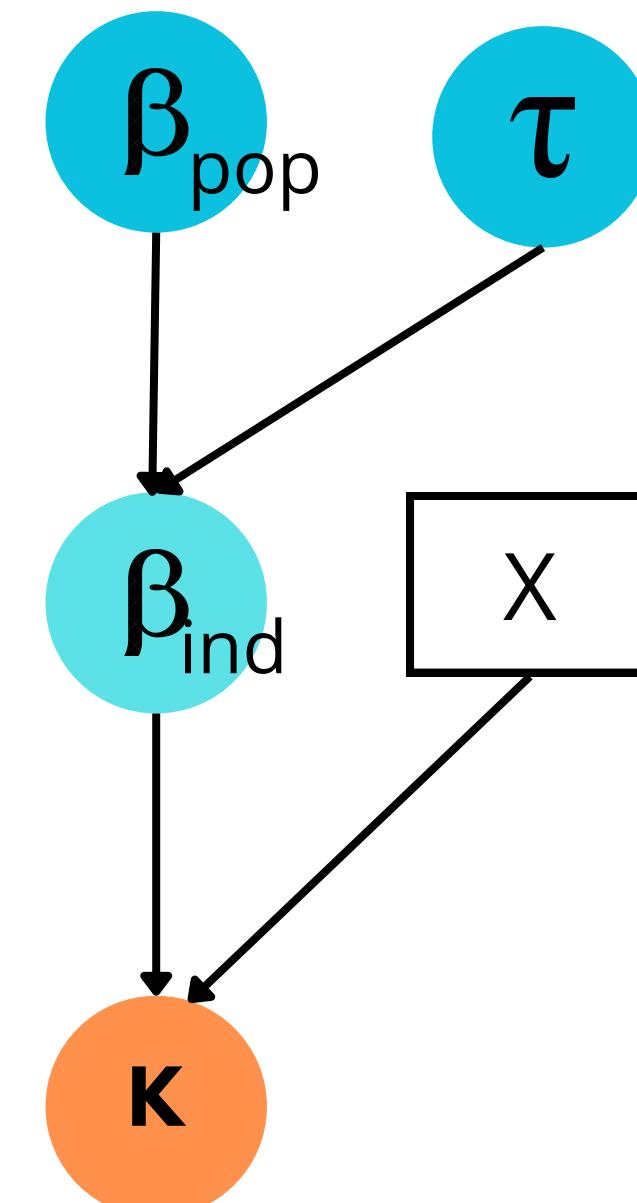


METHODE

N-mixture



RSF



METHODE

RSF + N-mixture

