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## Changements climatiques et interactions interspécifiques au sein d'une communauté de vertébrés terrestres arctiques

Olivier Gilg, Jérôme Moreau, Loïc Bollache

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# Changements climatiques et interactions interspécifiques au sein d'une communauté de vertébrés terrestres arctiques



Olivier GILG  
Jérôme MOREAU  
Loïc BOLLACHE



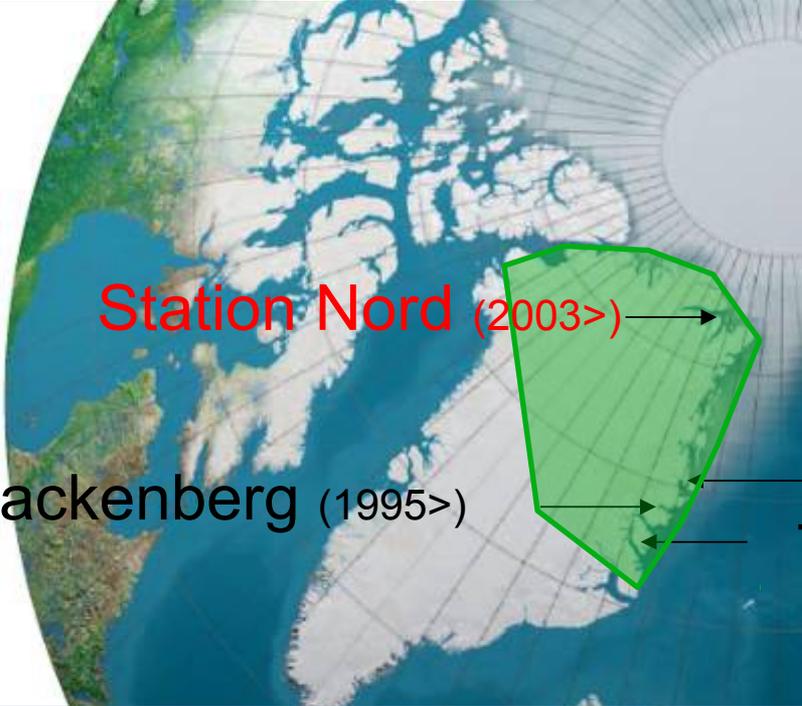
# Changements climatiques et interactions interspécifiques au sein d'une communauté de vertébrés terrestres arctiques



**1. Nord-Est  
Groenland :  
géographie  
logistique**

**2. Cycles du  
lemming :  
interactions  
prédateurs-proie**

**3. Proies  
alternatives et  
interactions  
indirectes**



Station Nord (2003>)

Zackenbergl (1995>)



Hochstetter Forland (2010>)

Trail Ø (1988>)















ROYAL ARCTIC LINE

MINA ARCTICA

UNIFLY

HELICOPTER

OY-HJN







## 2. Interactions prédateurs-proie au sein d'une communauté à dynamique cyclique

Chouette harfang



Labbe à longue queue



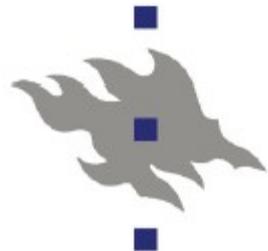
Renard polaire



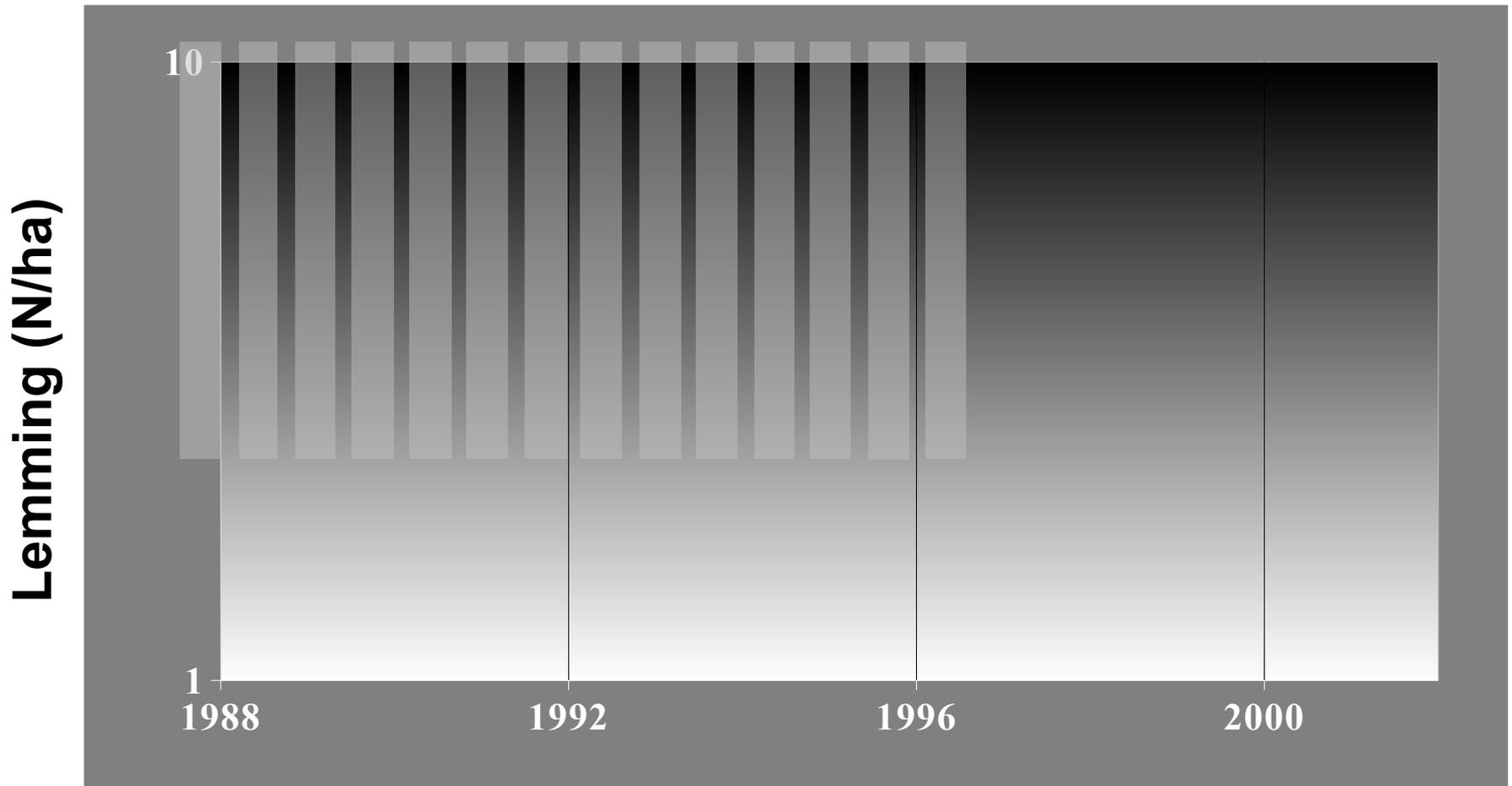
Hermine



lier

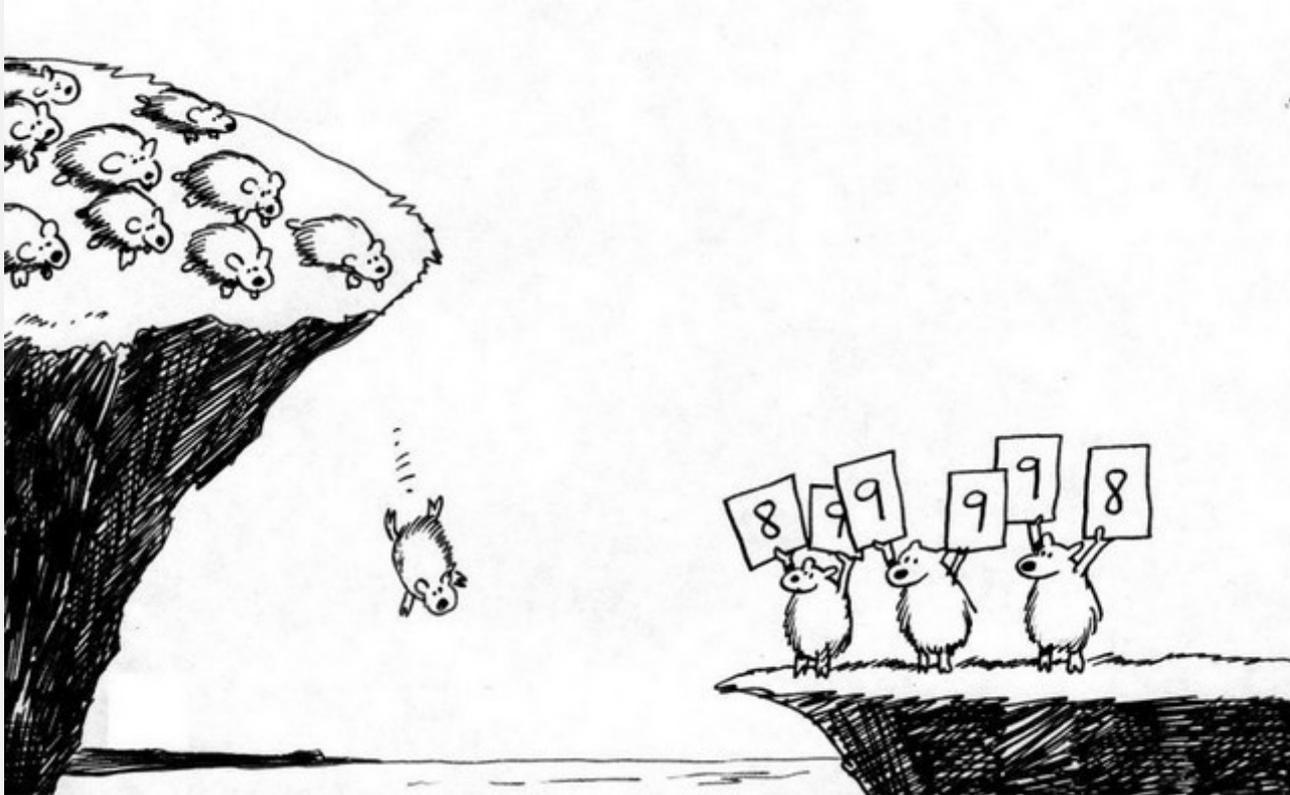


Cycles pluriannuels des lemmings

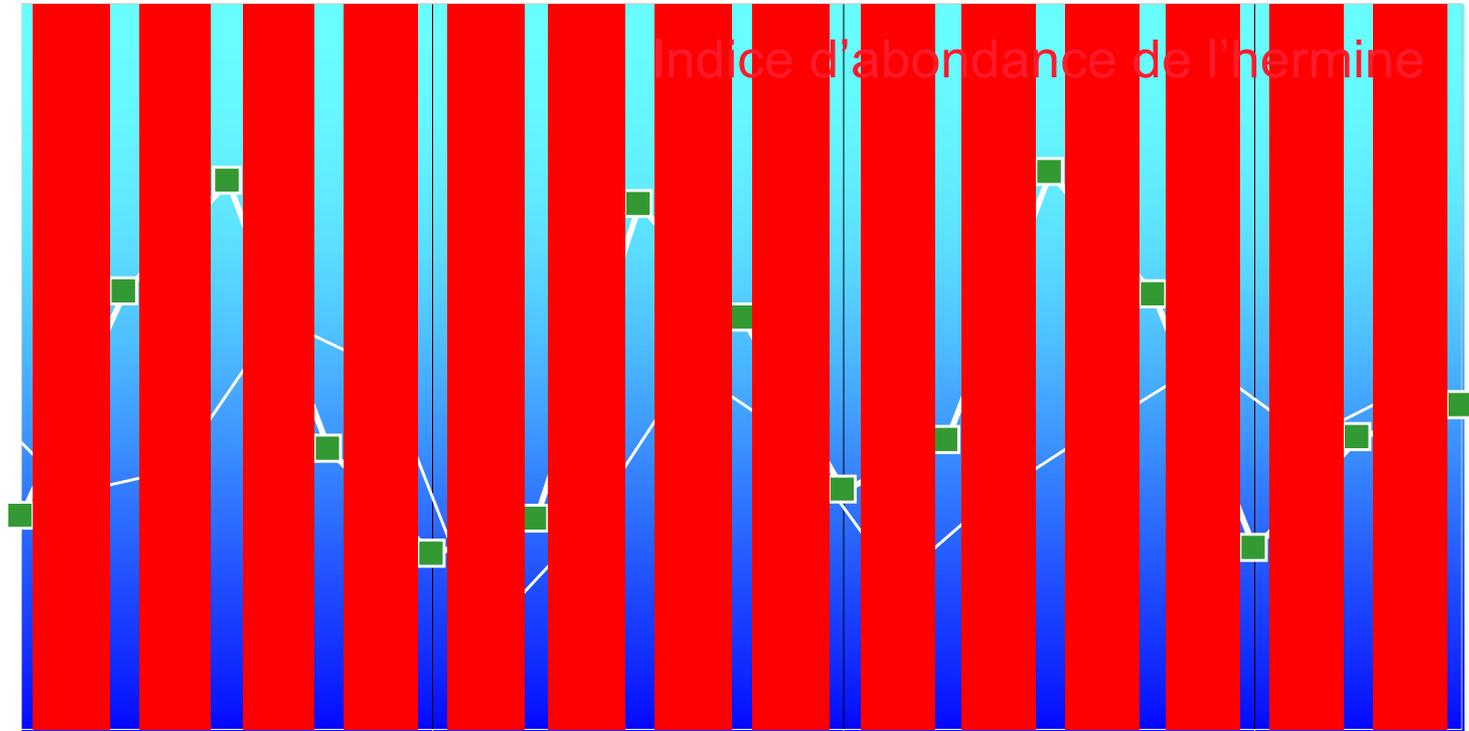


*Ann. Zool. Fenn.* 1995 (Sittler)  
*Oikos* 2002 (Gilg)  
*Oikos* 2006 (Gilg et al)

## Recherches antérieures



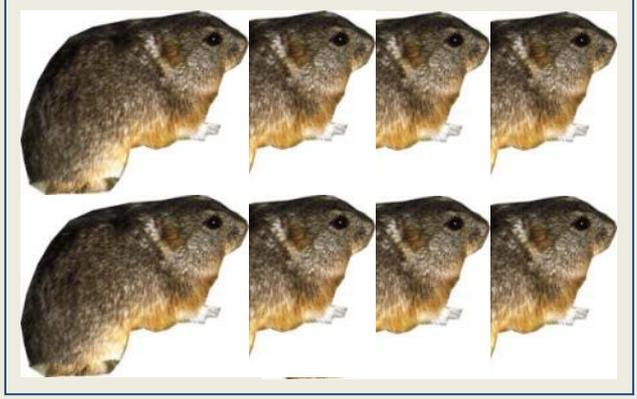
Densité dépendance différée (DDD) de l'hermine



# Recherches antérieures

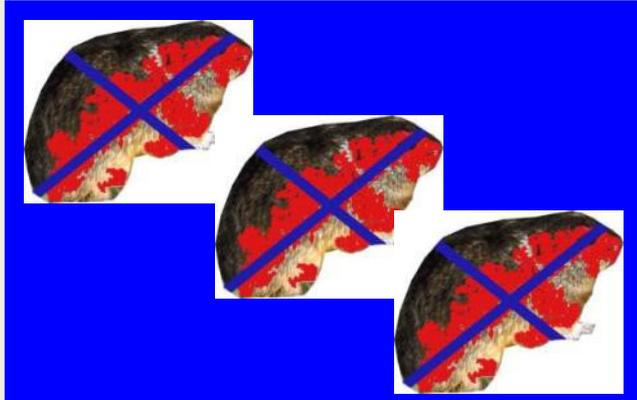
## Réponses des prédateurs

Densité de lemmings



Rép. numériques

Rép. fonctionnelle

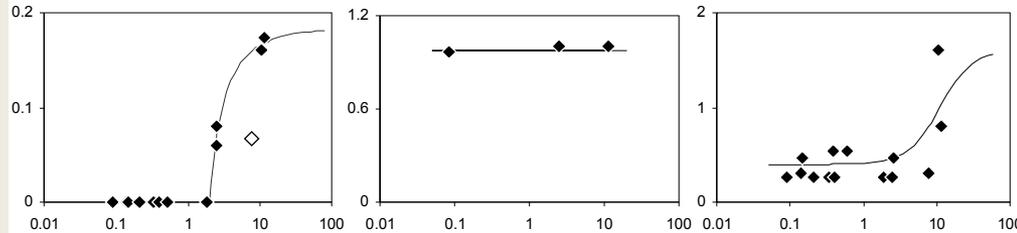


Réponse totale

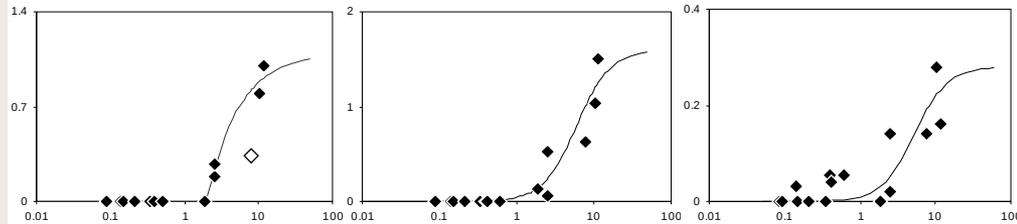


Chouette harfang    Labbe à longue queue    Renard polaire

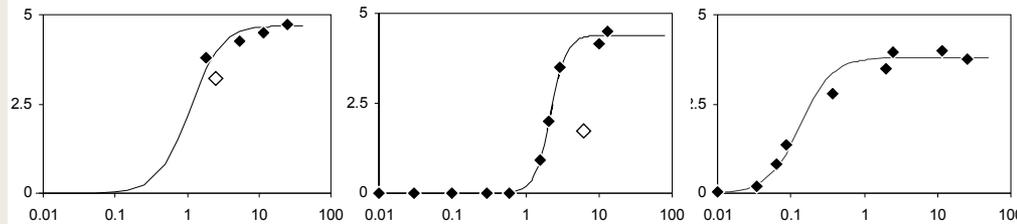
Réponses numériques (adultes)



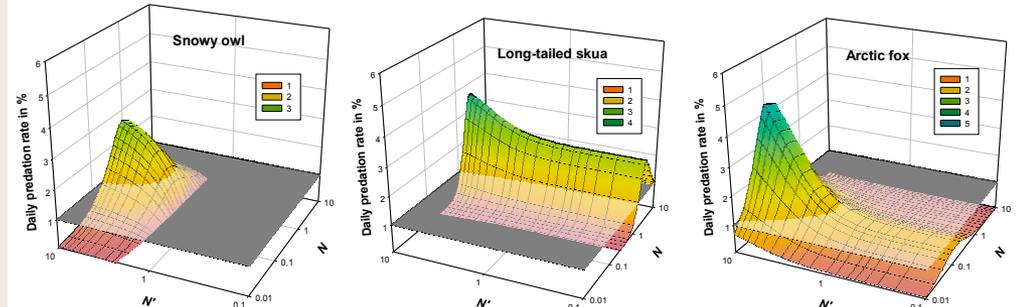
Réponses numériques (jeunes)



Réponses fonctionnelles

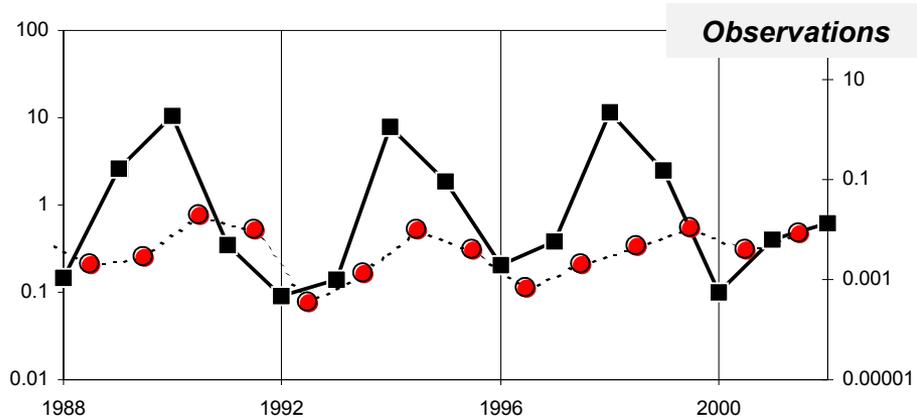


Réponses totales



Densités de lemmings

## Validation de l'hypothèse prédation



Simulations

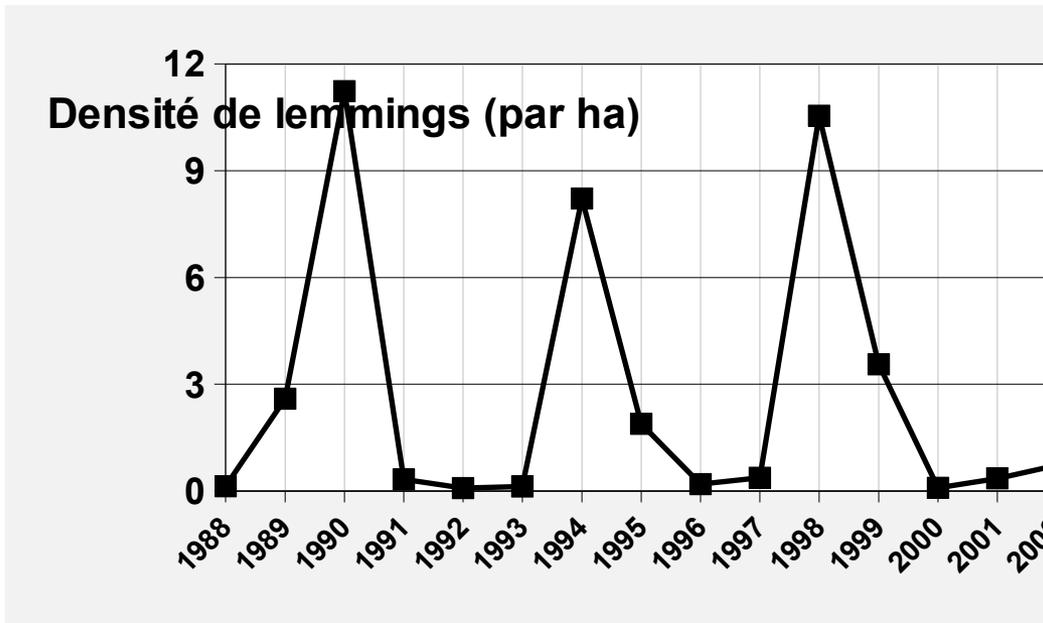
Lemming

$N$   
(lemmings / hermines)

Hermine

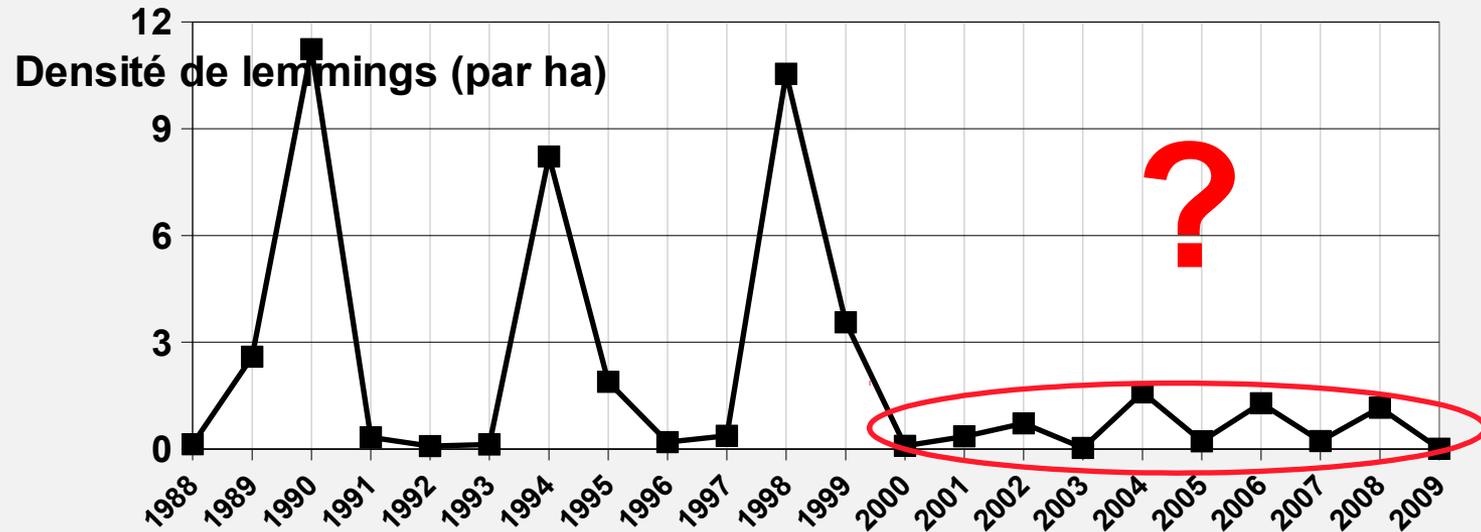
## Recherches antérieures

Après 14 années de cyclicité...



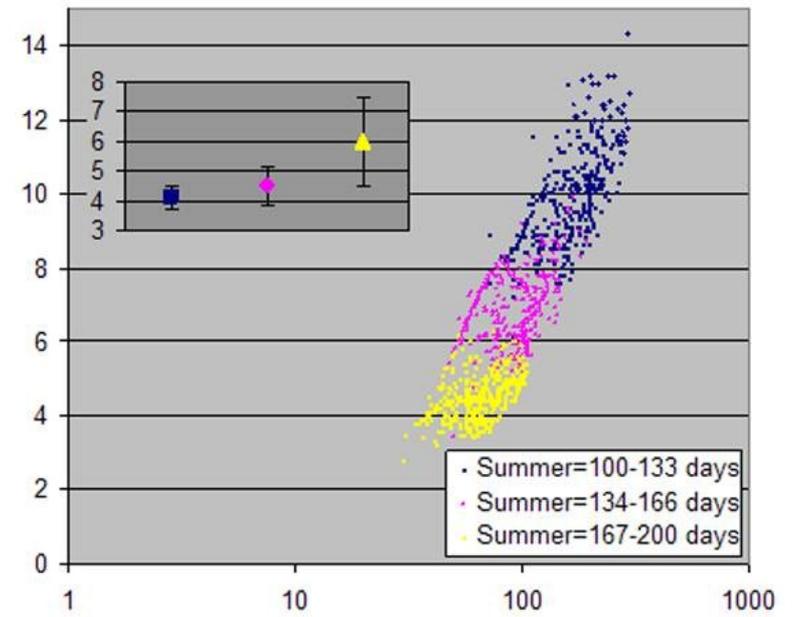
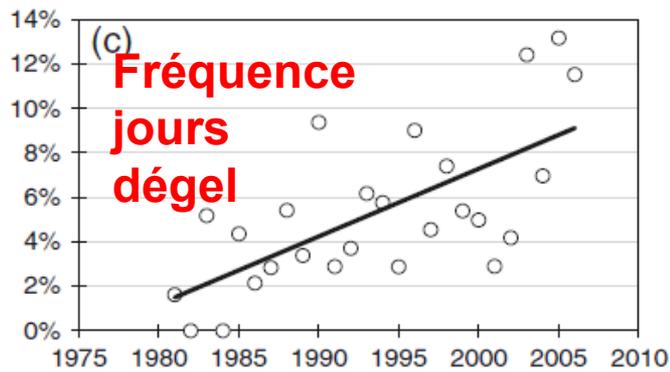
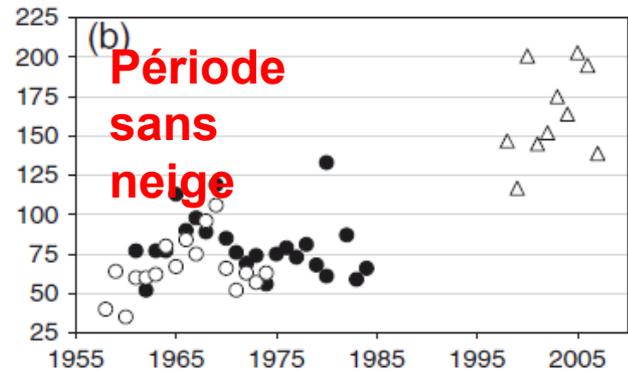
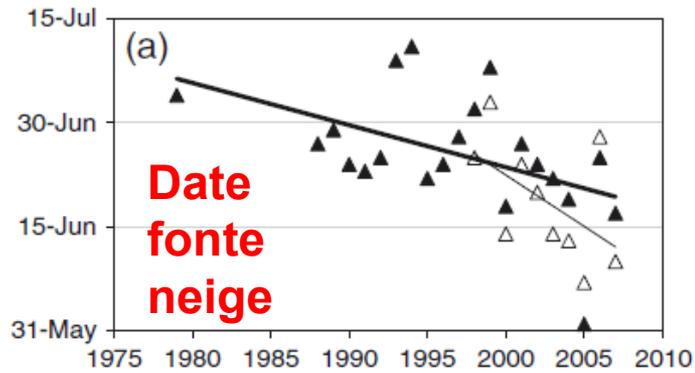
## Recherches antérieures

... la dynamique est perturbée



# Recherches antérieures

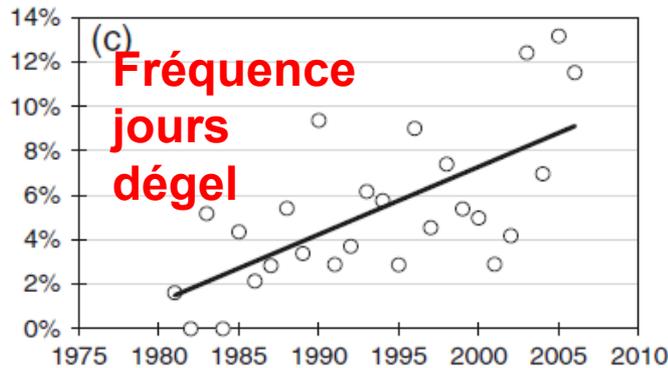
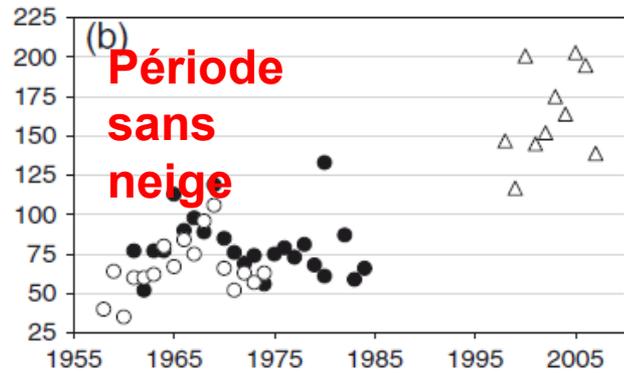
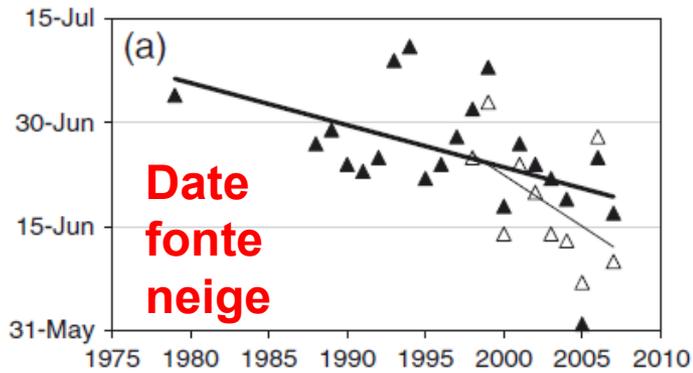
**Impact des changements climatiques sur la dynamique de la communauté ?**



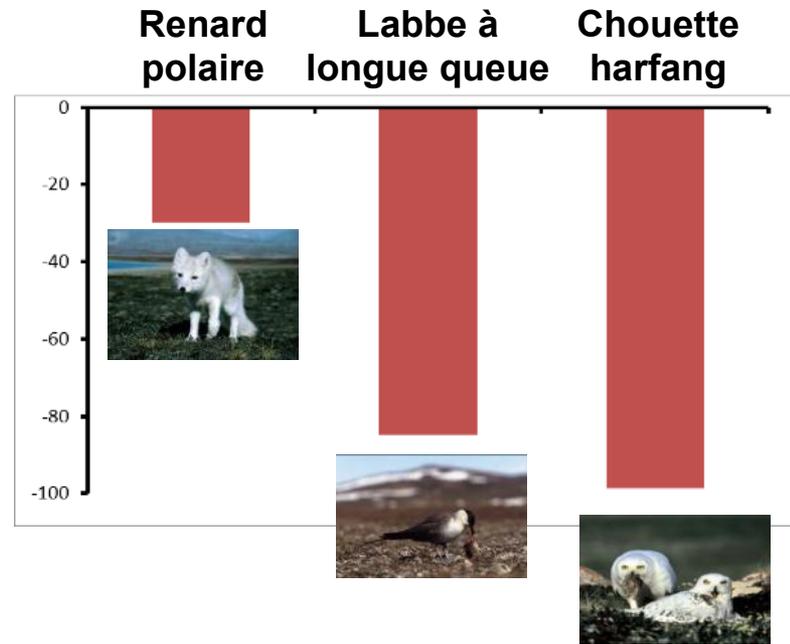
*Global Change Biol 2009 (Gilg, Siittler, Hanski)  
Ann NY Acad Sc 2012 (Gilg et al)  
Proc Roy Soc B 20012 (Schmidt et al)*

# Recherches antérieures

**Impact des changements climatiques sur la dynamique de la communauté ?**



**Baisse de productivité (>2000 vs. <2000)**



Global Change Biol 2009 (Gilg, Siittler, Hanski)  
 Ann NY Acad Sc 2012 (Gilg et al)  
 Proc Roy Soc B 20012 (Schmidt et al)

# 3. Proies alternatives, interactions indirectes et changements climatiques

Chouette harfang



Labbe à longue queue



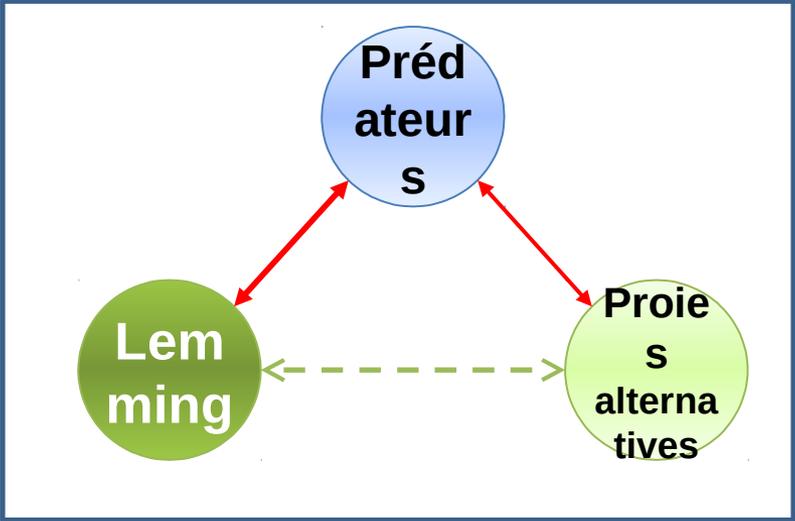
Renard polaire

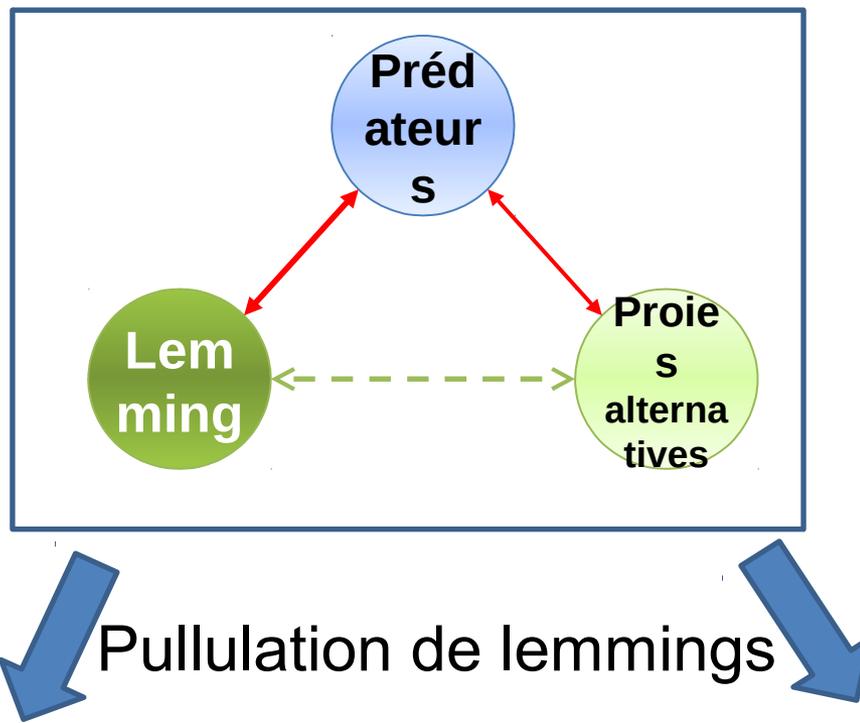


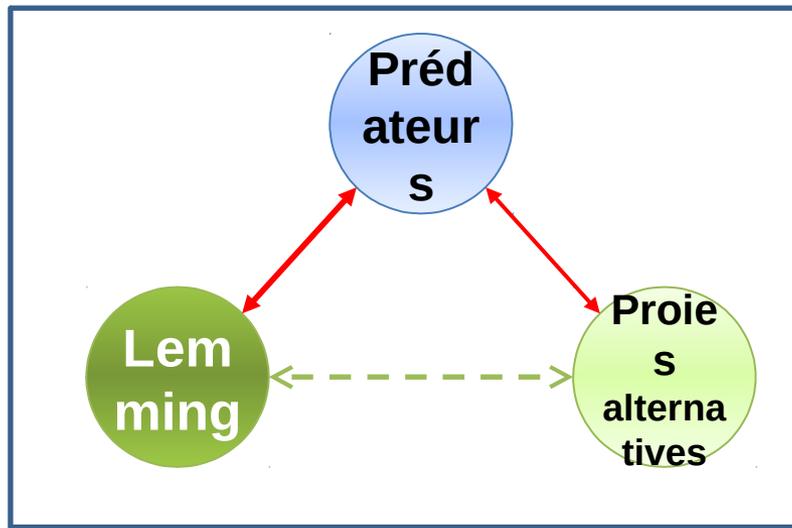
Hermine



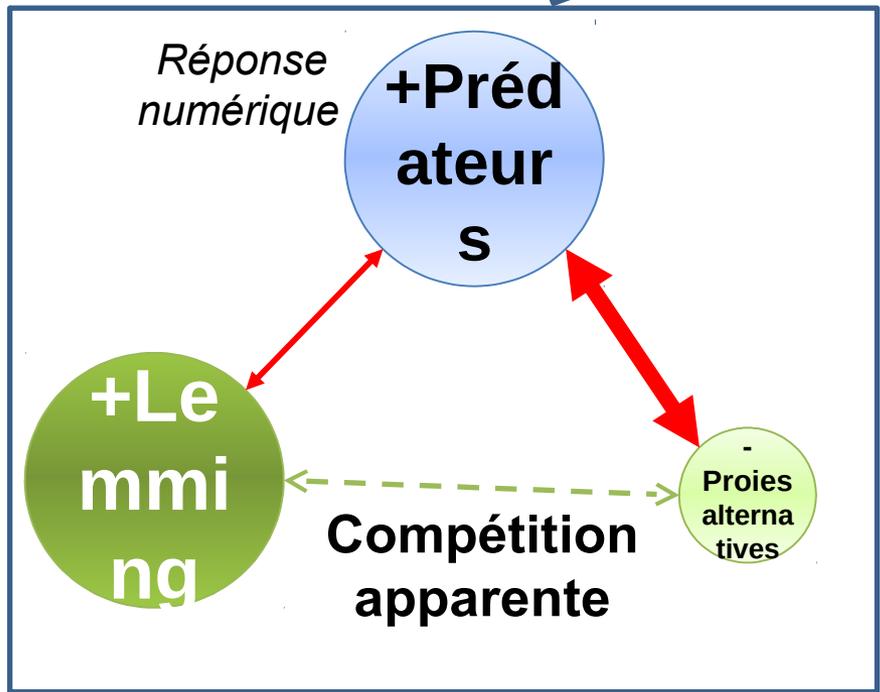
Lemming à collier

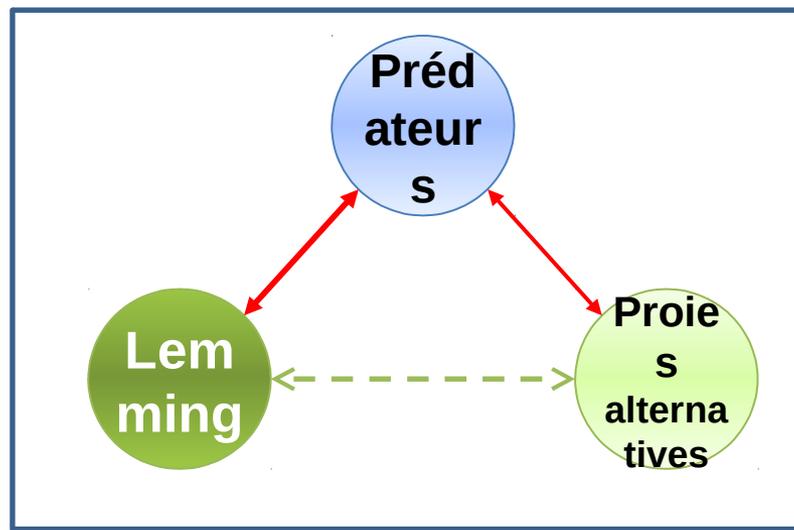




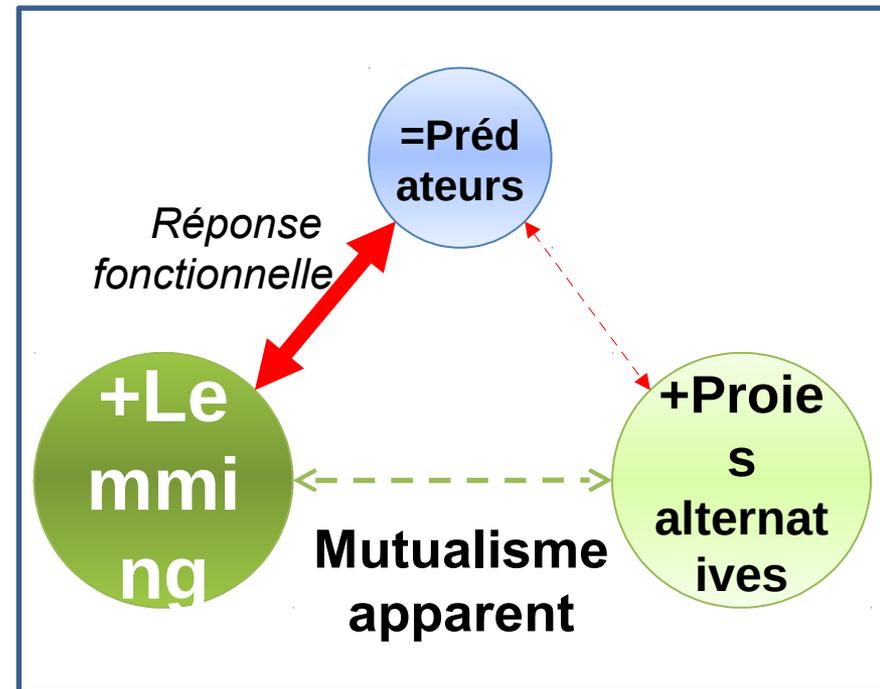
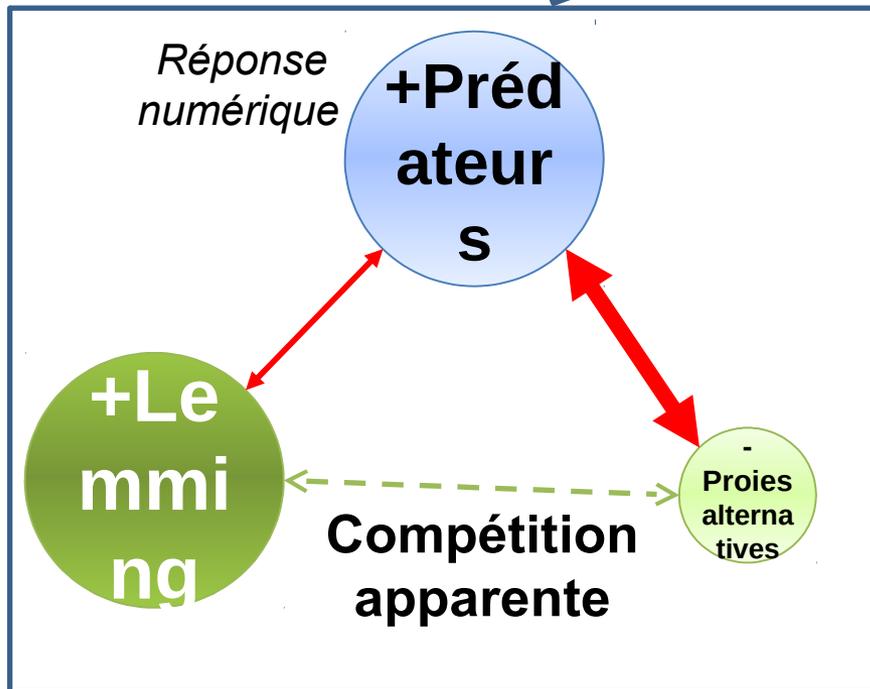


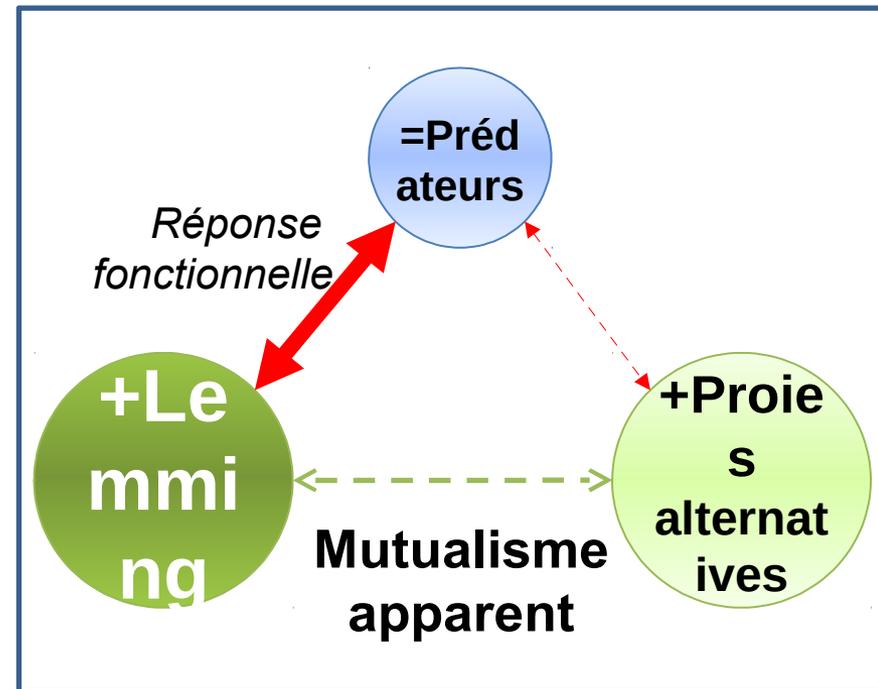
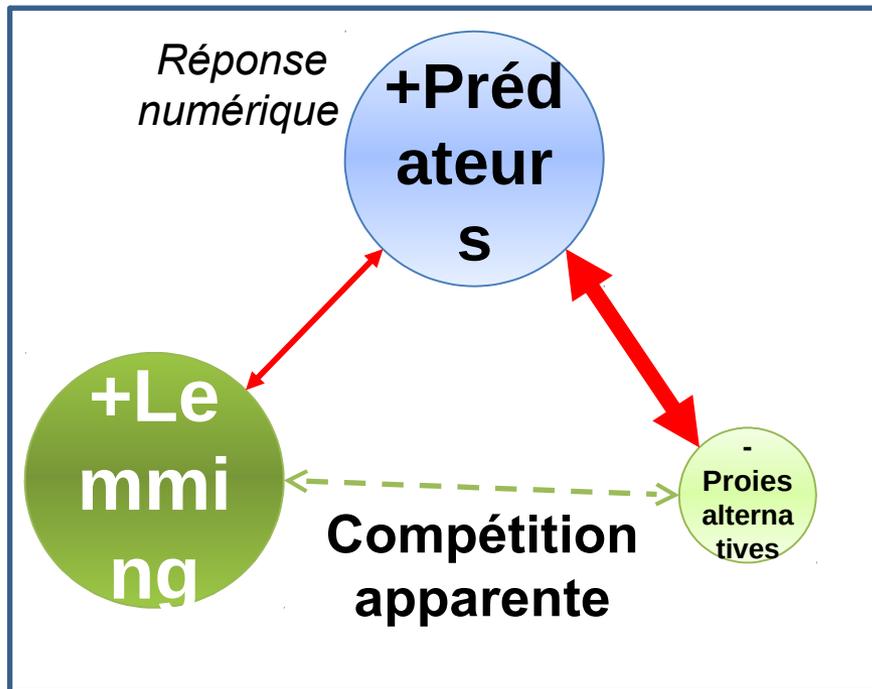
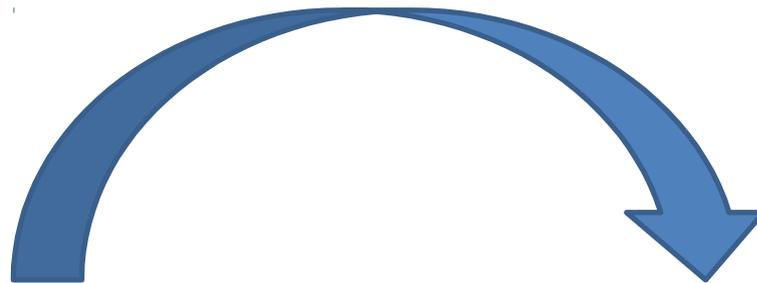
Pullulation de lemmings

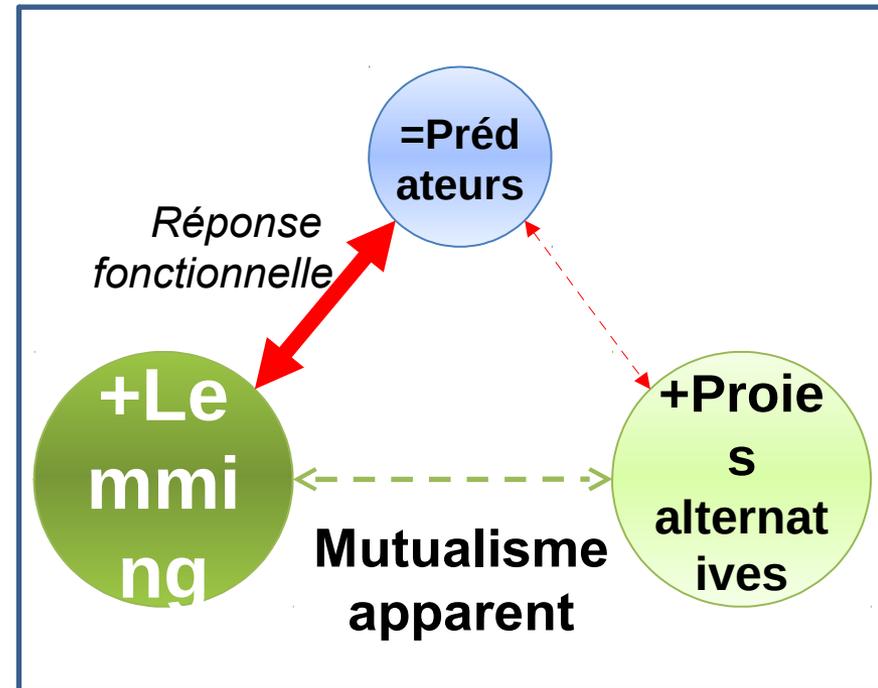
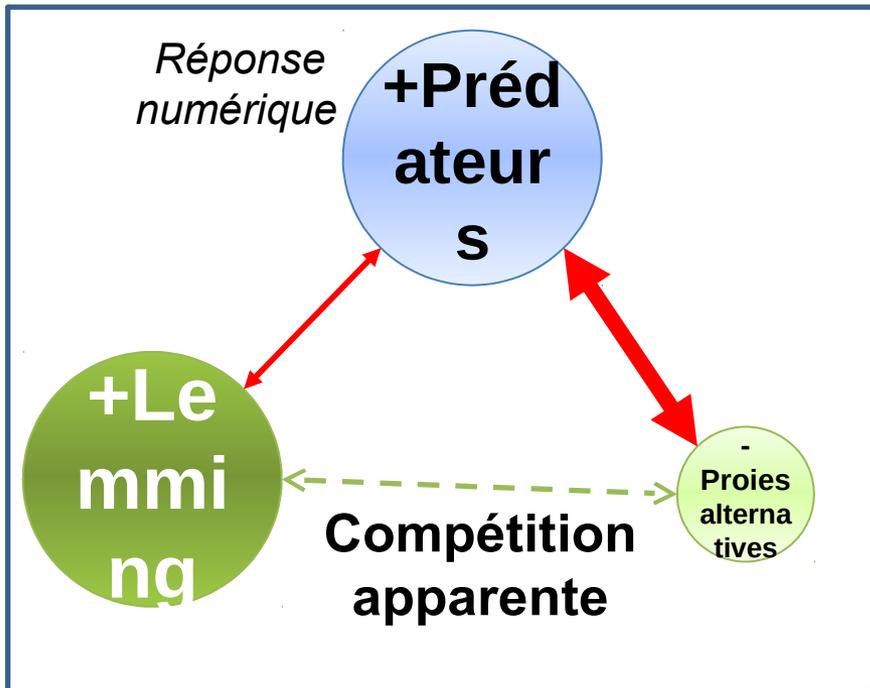
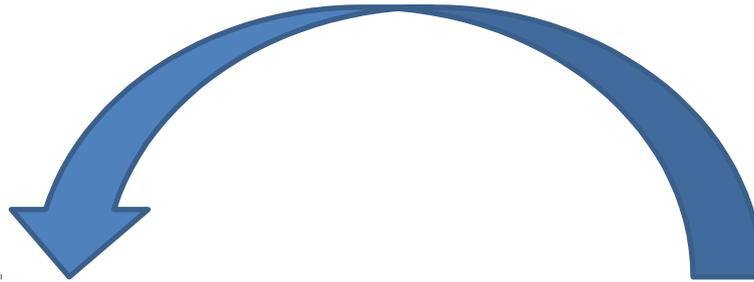


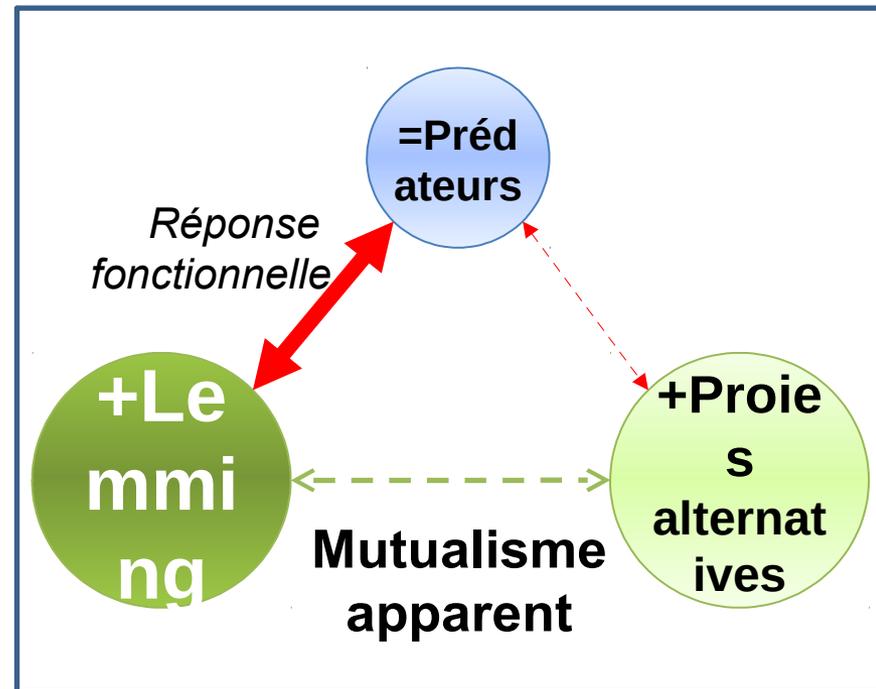
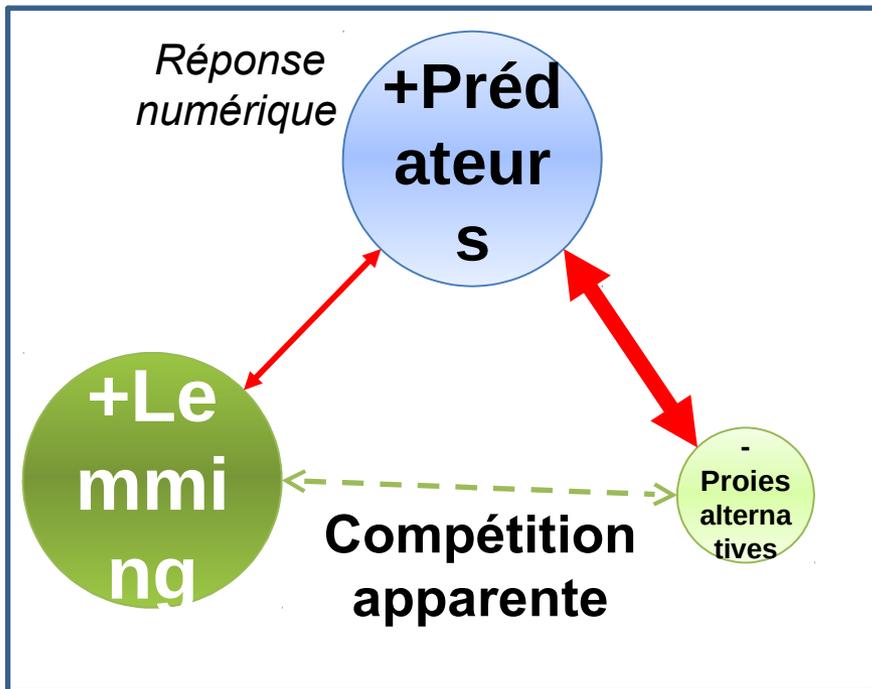


Pullulation de lemmings









## Stratégies de soins parentaux



Stratégie biparentale  
(↑ productivité)



incubation

# Stratégies de soins parentaux



Stratégie biparentale  
(↑ productivité)



incubation

Stratégie monoparentale  
(↑ survie des adultes)



# Stratégies de soins parentaux

**Pression Prédation +**



Stratégie biparentale  
(↑ productivité)

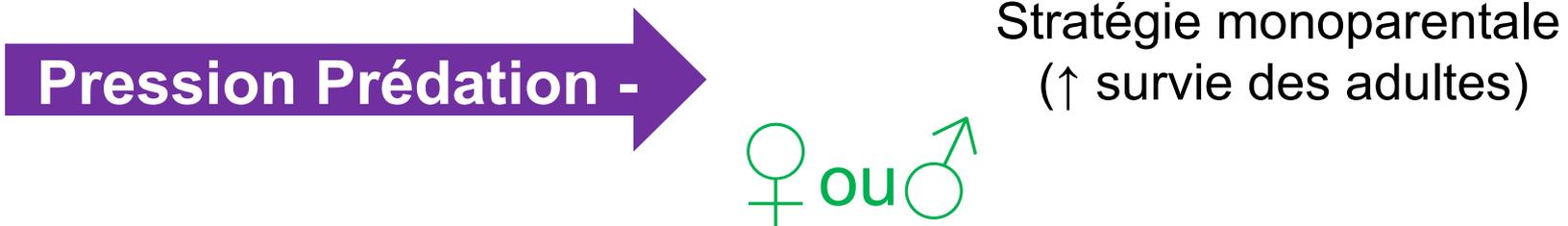
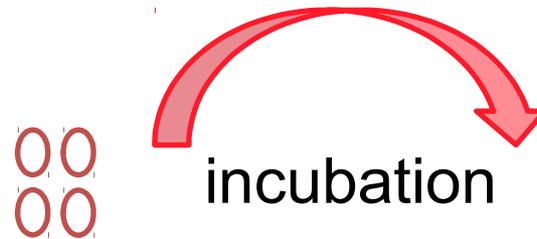
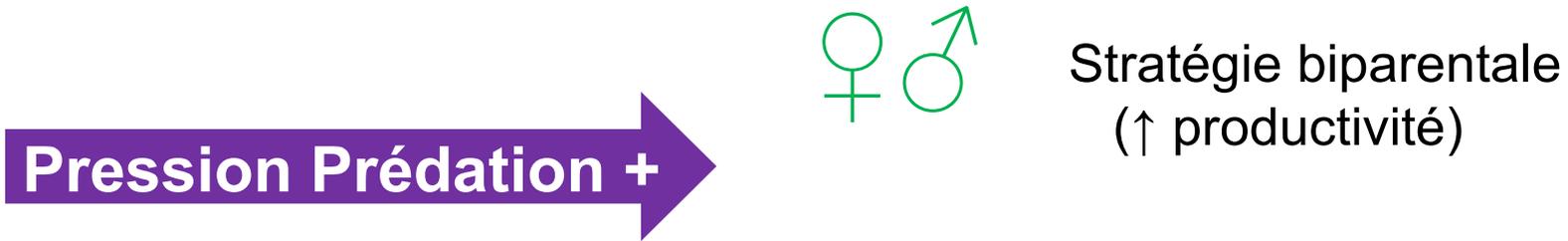


incubation

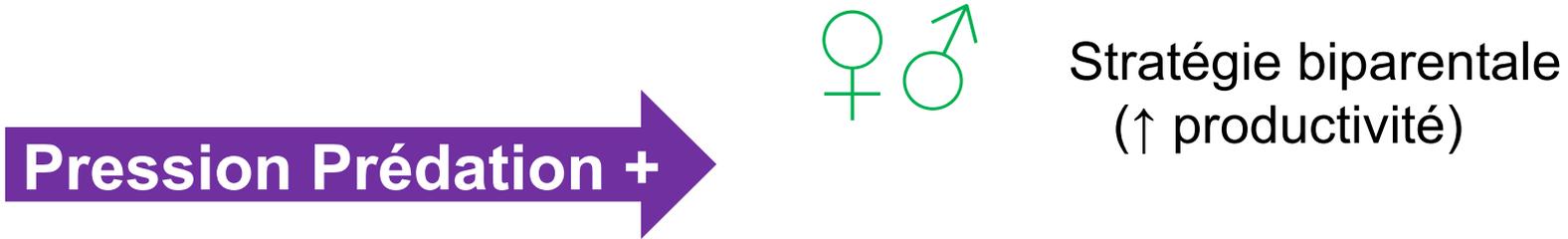
Stratégie monoparentale  
(↑ survie des adultes)



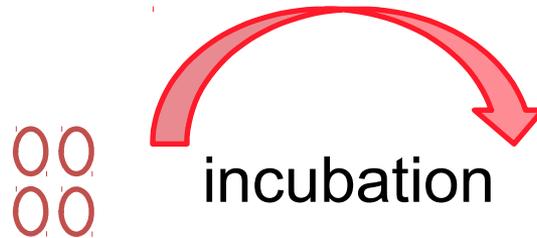
## Stratégies de soins parentaux



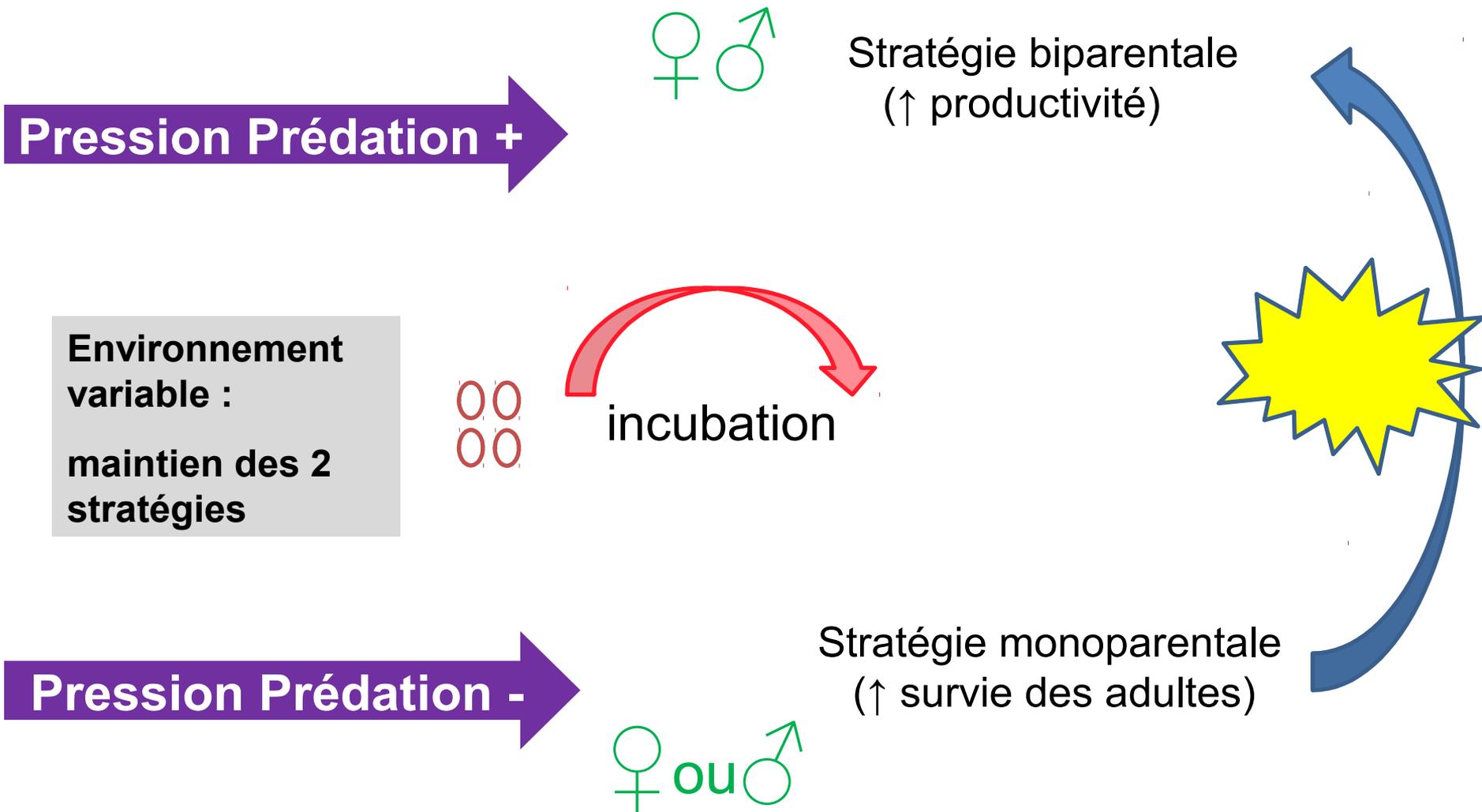
# Stratégies de soins parentaux



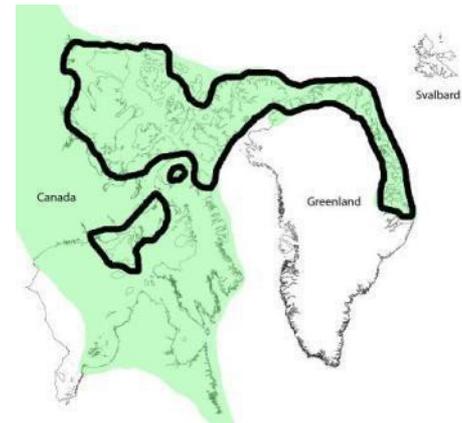
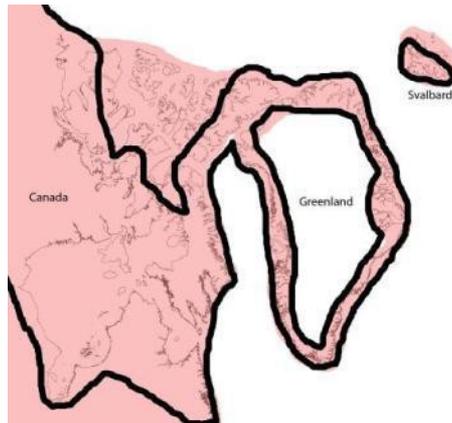
Environnement variable :  
maintien des 2 stratégies



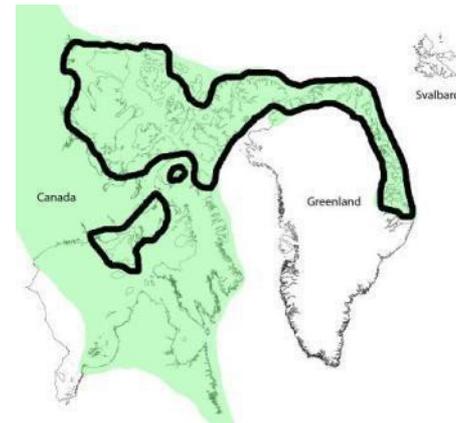
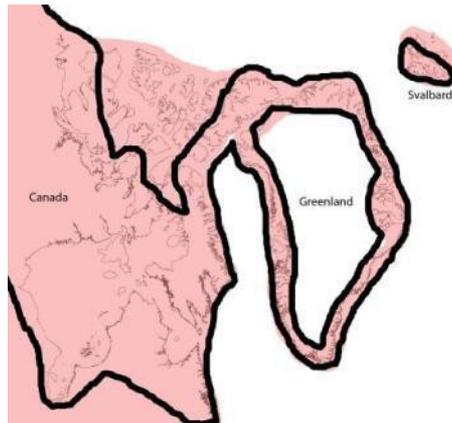
# Stratégies de soins parentaux



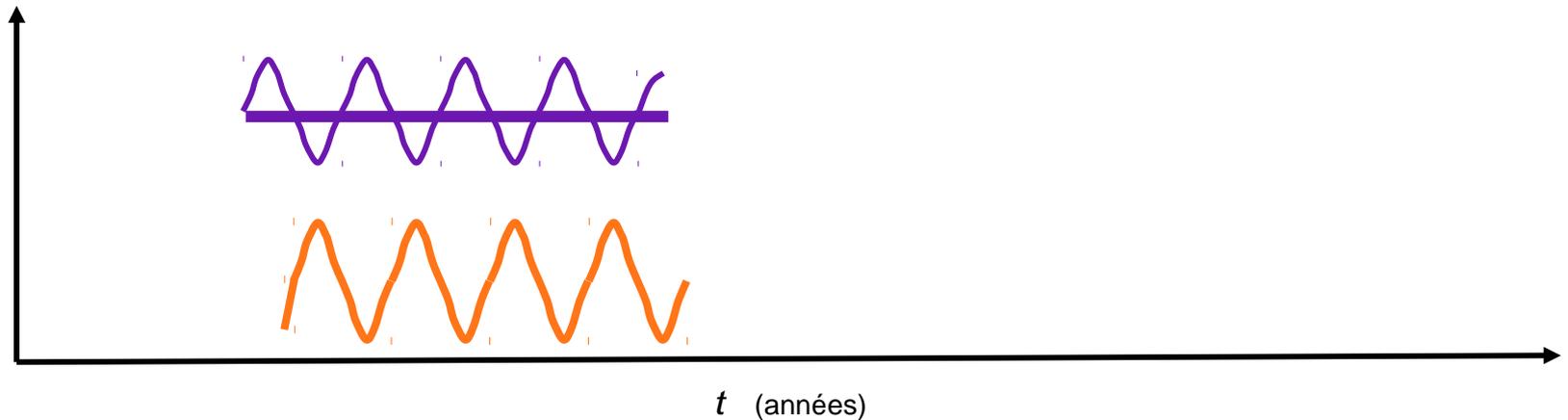
# Biogéographie « prédation – dépendante »



# Biogéographie « prédation – dépendante »



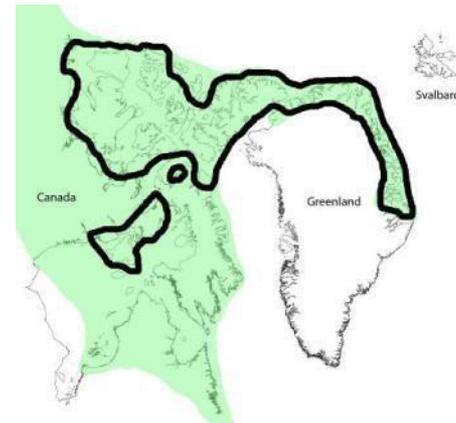
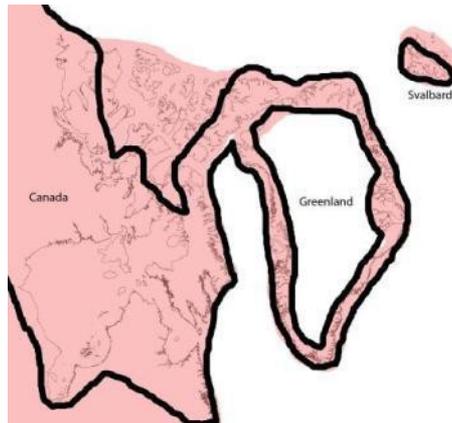
Relâchement périodique croissant de la pression de prédation



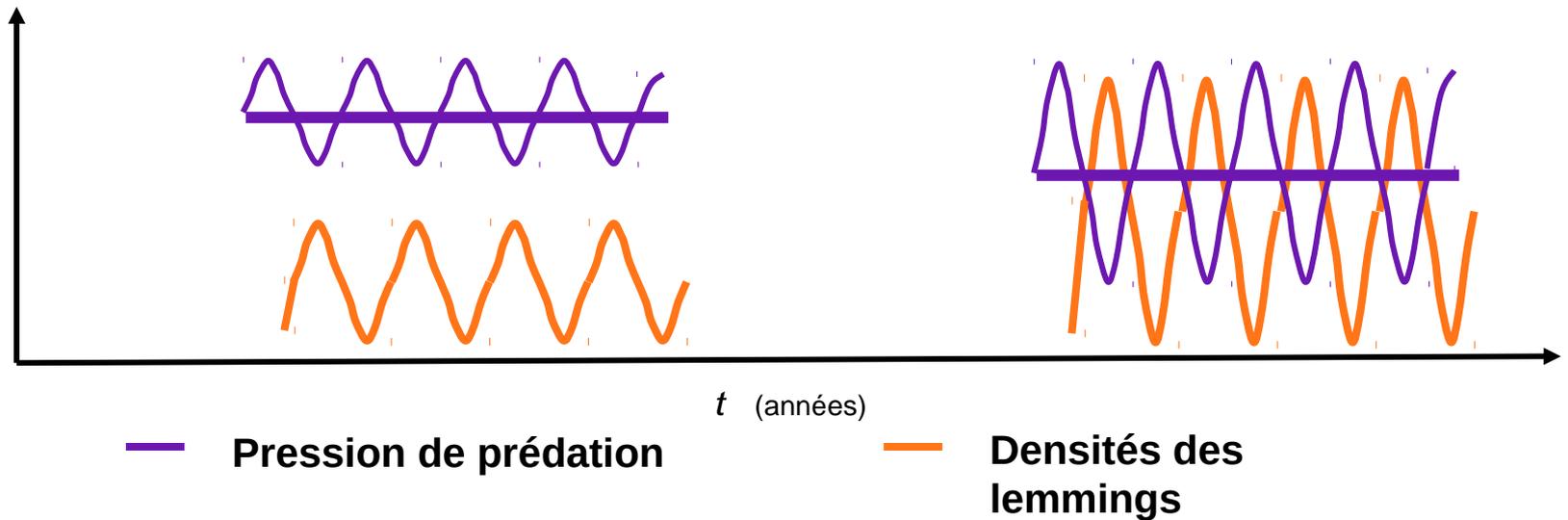
— Pression de prédation  
moyenne des prédateurs  
généralistes

— Densités des  
lemmings

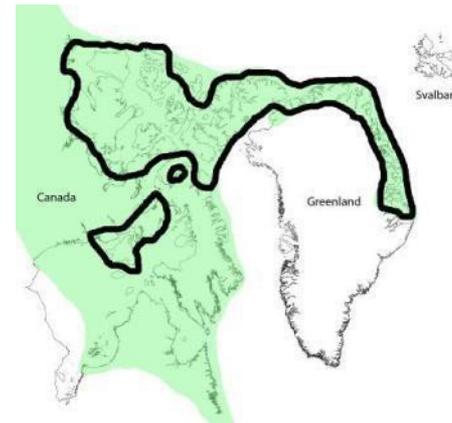
# Biogéographie « prédation – dépendante »



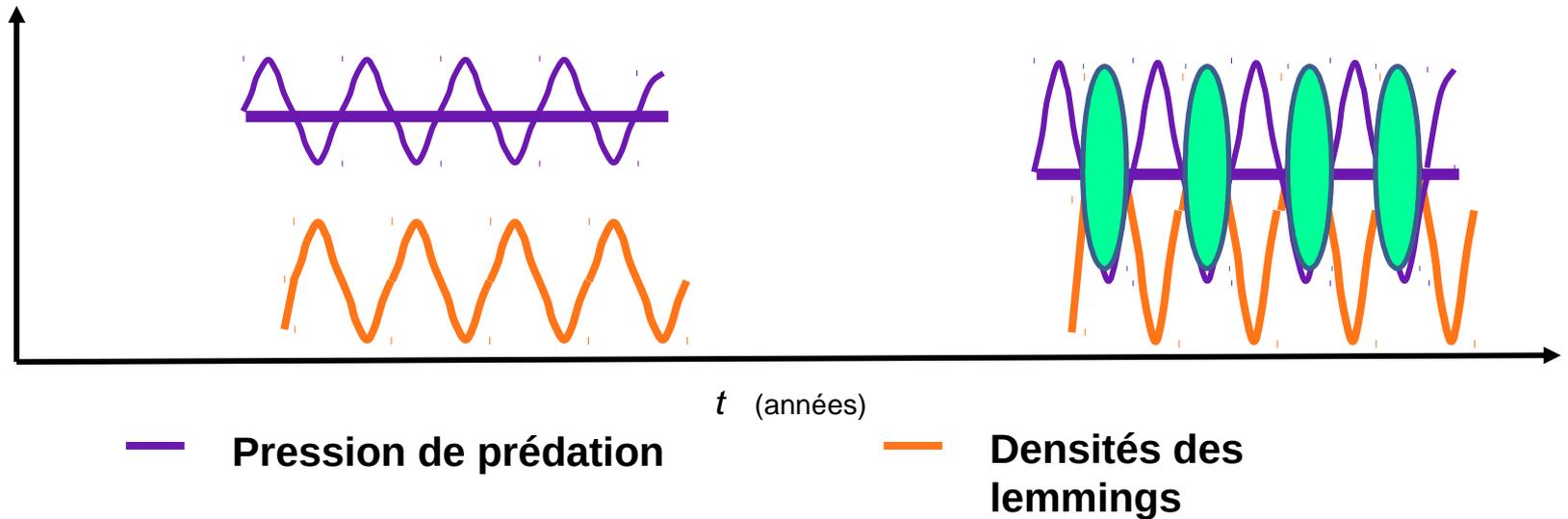
Relâchement périodique croissant de la pression de prédation



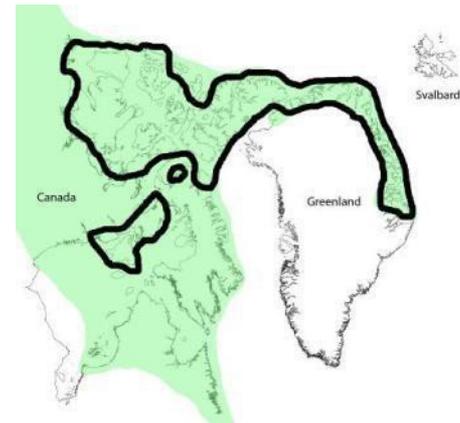
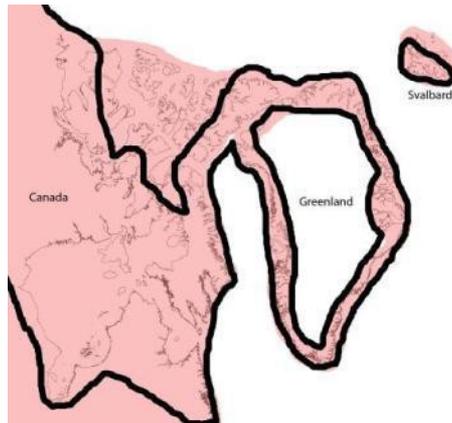
# Biogéographie « prédation – dépendante »



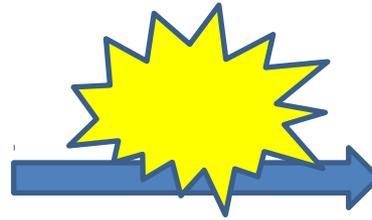
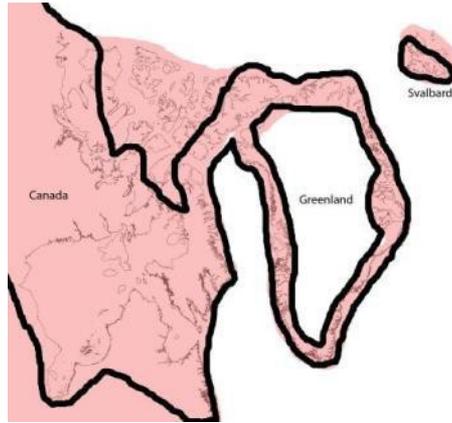
Relâchement périodique croissant de la pression de prédation



# Biogéographie « prédation – dépendante »



# Biogéographie « prédation – dépendante »



Merci !

