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

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

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Loïc BOLLACHE

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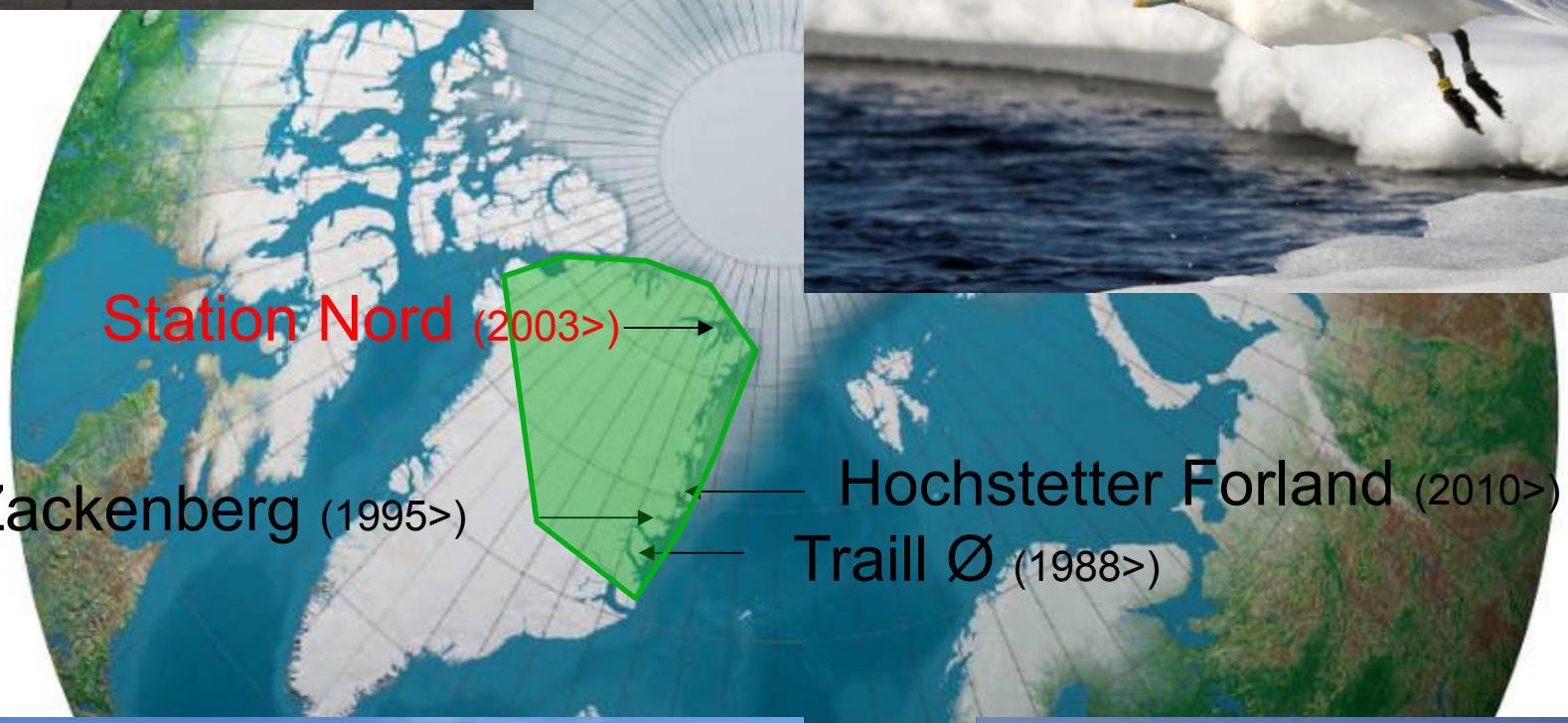
Groupe de Recherche en Écologie Arctique | http://grearctique.free.fr

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>)
Zackenberg (1995>)
Hochstetter Forland (2010>)
Traill Ø (1988>)

B-536

FLUGFELAG ÍSLANDS

YAMAHA
GORE-TEX
CA

ROYAL ARCTIC LINE
ARWA ARCTICA
UNI-FLY
OY-HJN

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

Chouette harfang

Labbe à longue queue

Renard polaire

Hermine

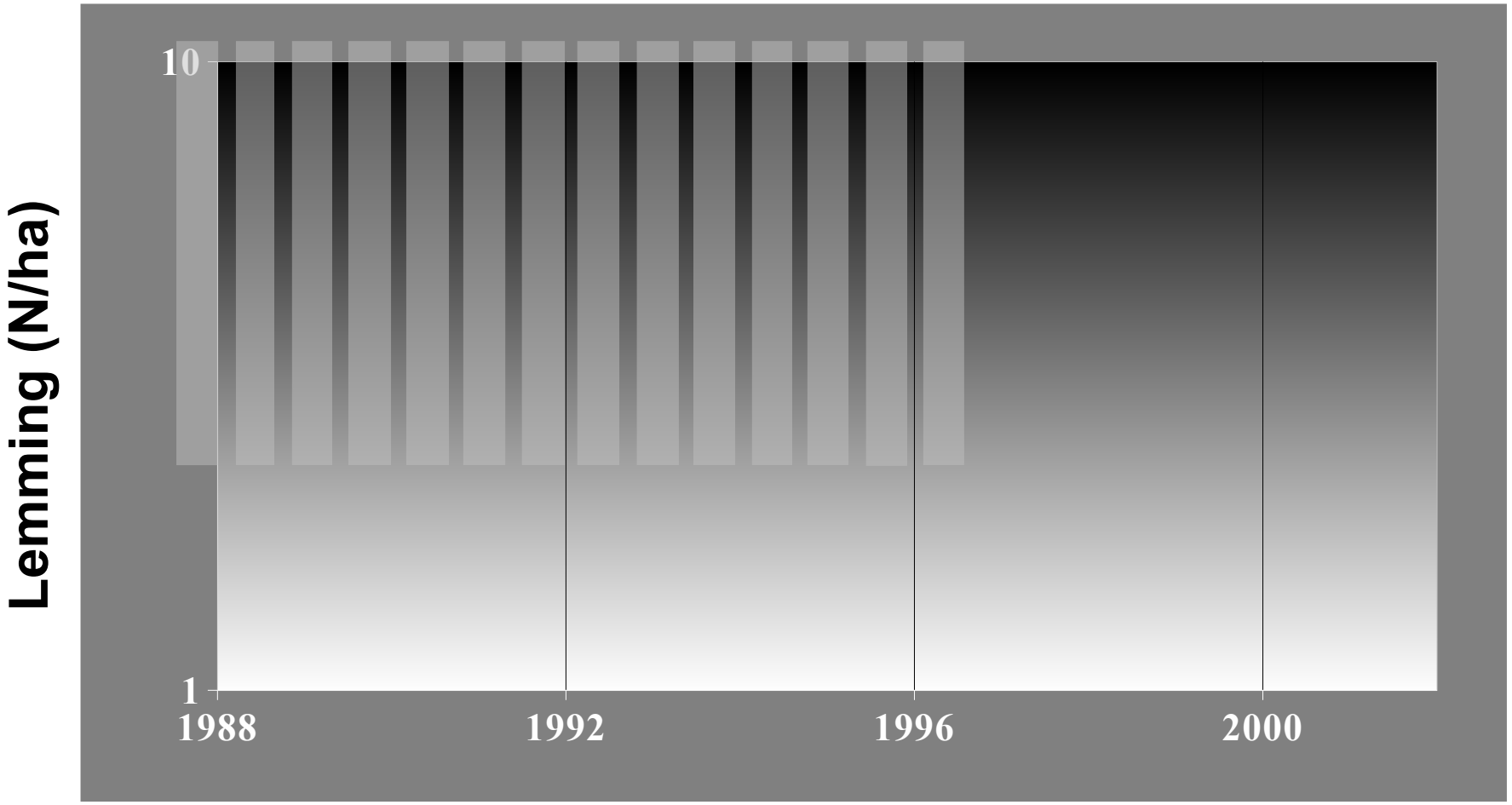
lier

UNIVERSITY OF HELSINKI

ALBERT-LUDWIGS-UNIVERSITÄT FREIBURG

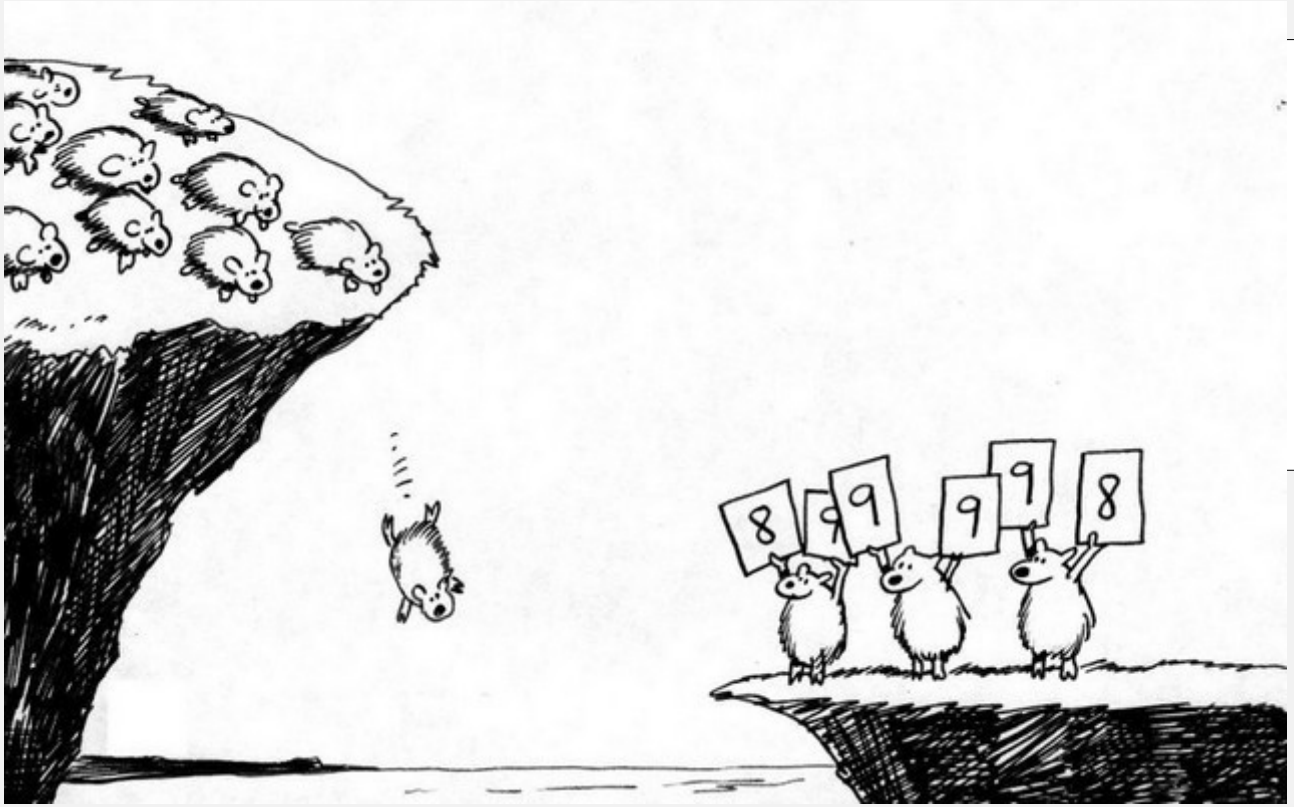
Recherches antérieures

Cycles pluriannuels des lemmings



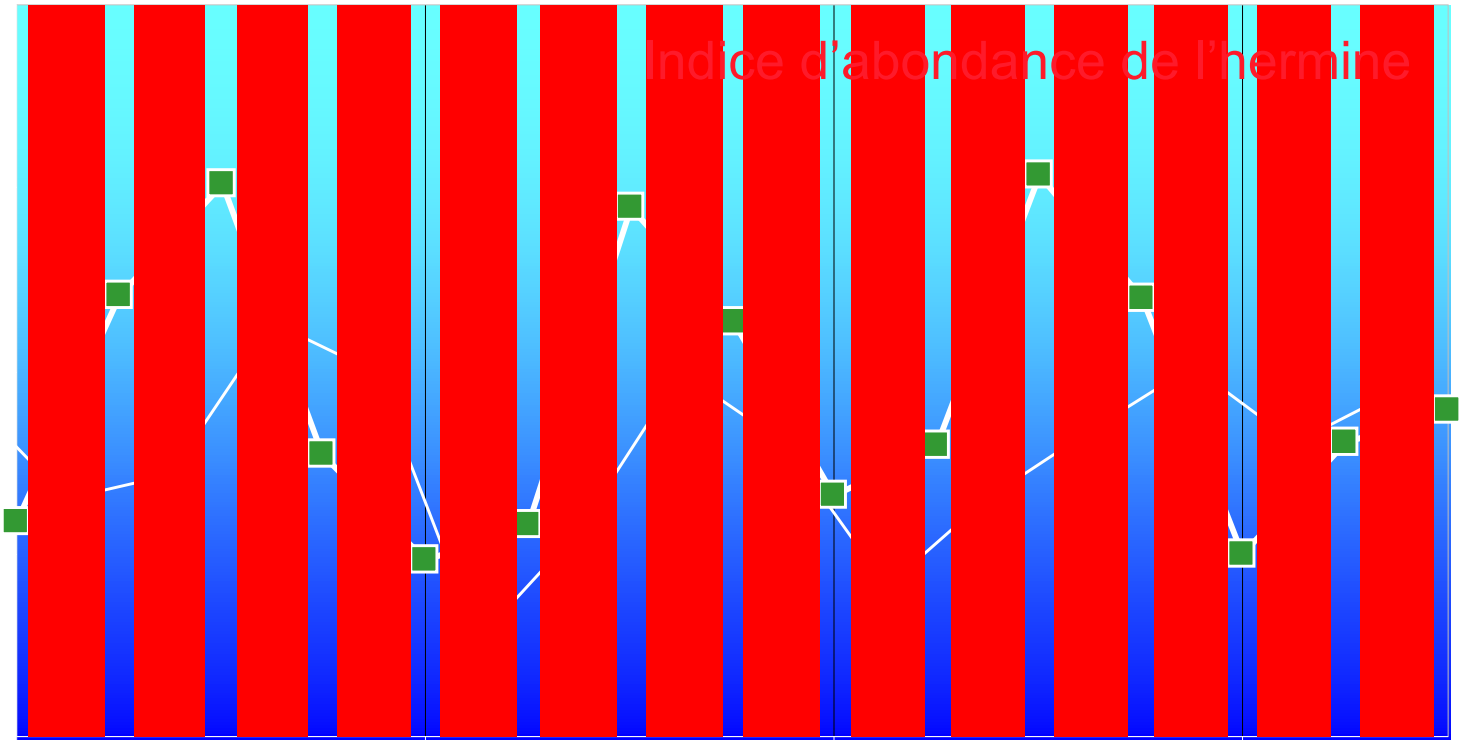
Ann. Zool. Fenn. 1995 (Sittler)
Oikos 2002 (Gilg)
Oikos 2006 (Gilg et al)

Recherches antérieures



Recherches antérieures

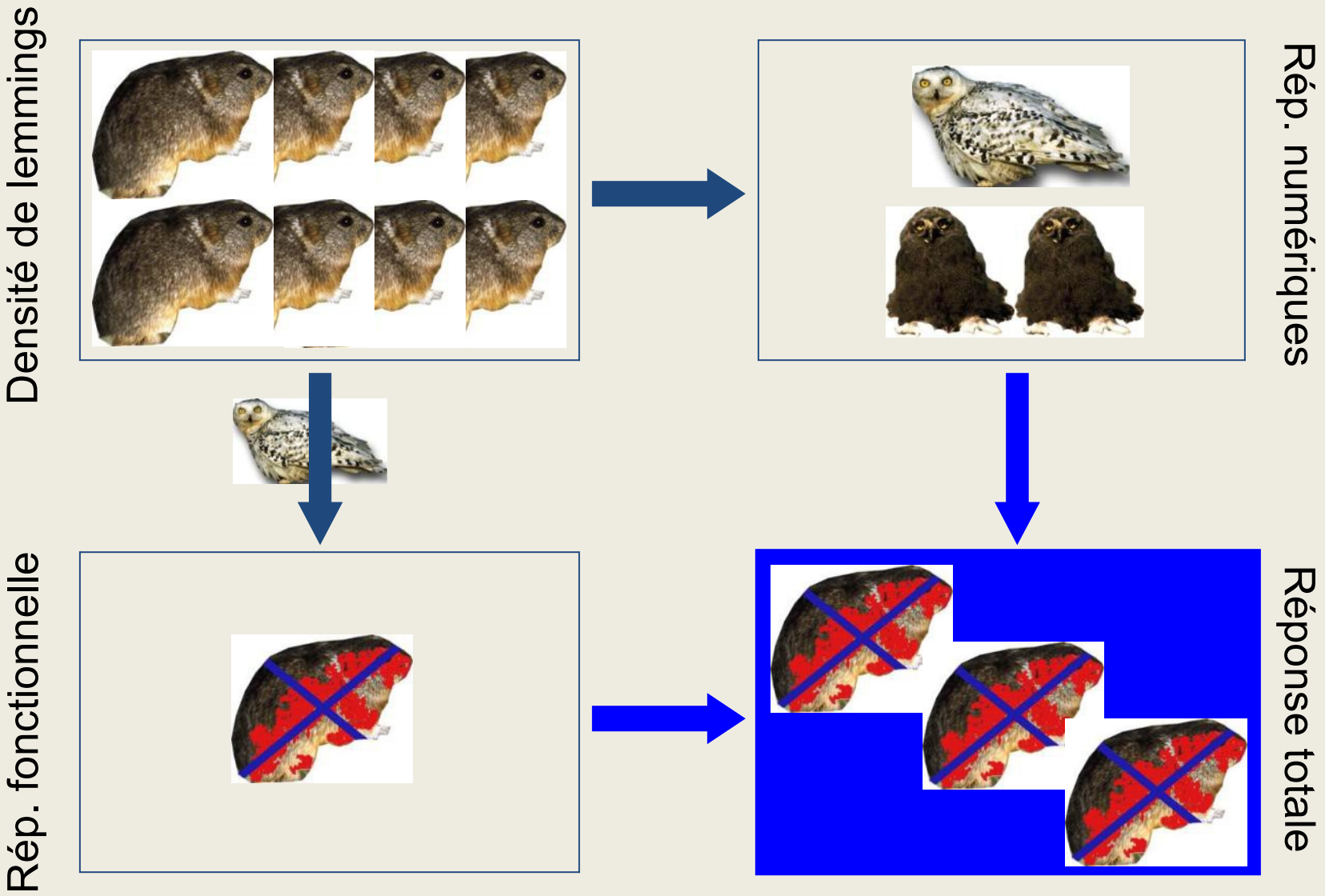
Densité dépendance différée (DDD) de l'hermine



Oikos 2006 (Gilg et al)

Recherches antérieures

Réponses des prédateurs



Recherches antérieures

Réponses des prédateurs

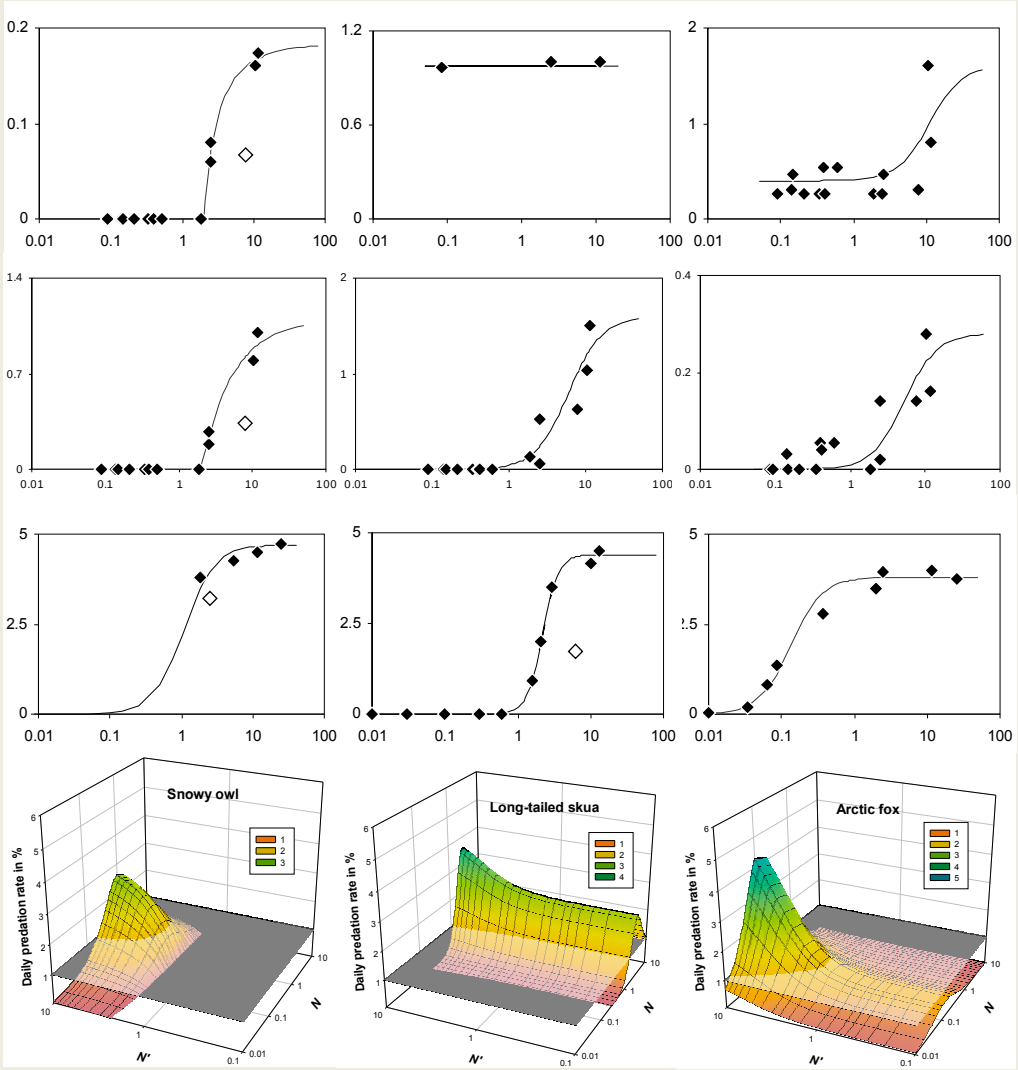
Chouette harfang | Labbe à longue queue | Renard polaire

Réponses numériques (adultes)

Réponses numériques (jeunes)

Réponses fonctionnelles

Réponses totales

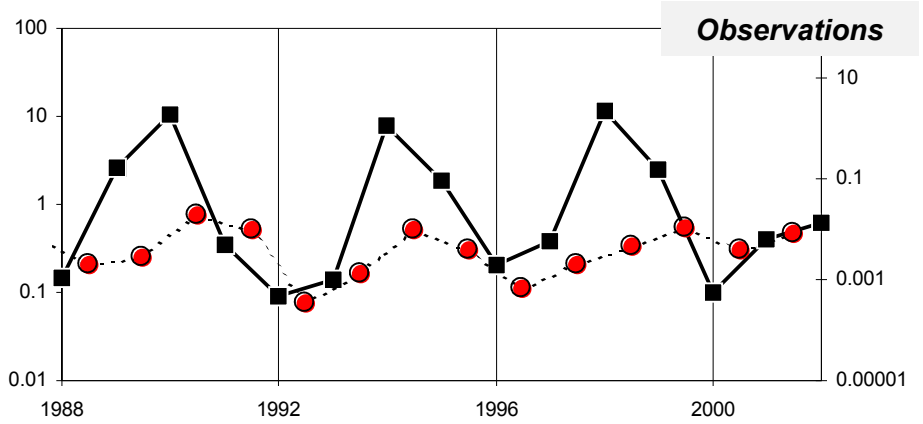


Densités de lemmings

Science 2003 (Gilg, Hanski, Sittler)
Oikos 2006 (Gilg et al)

Recherches antérieures

Validation de l'hypothèse prédation



Simulations

Lemming

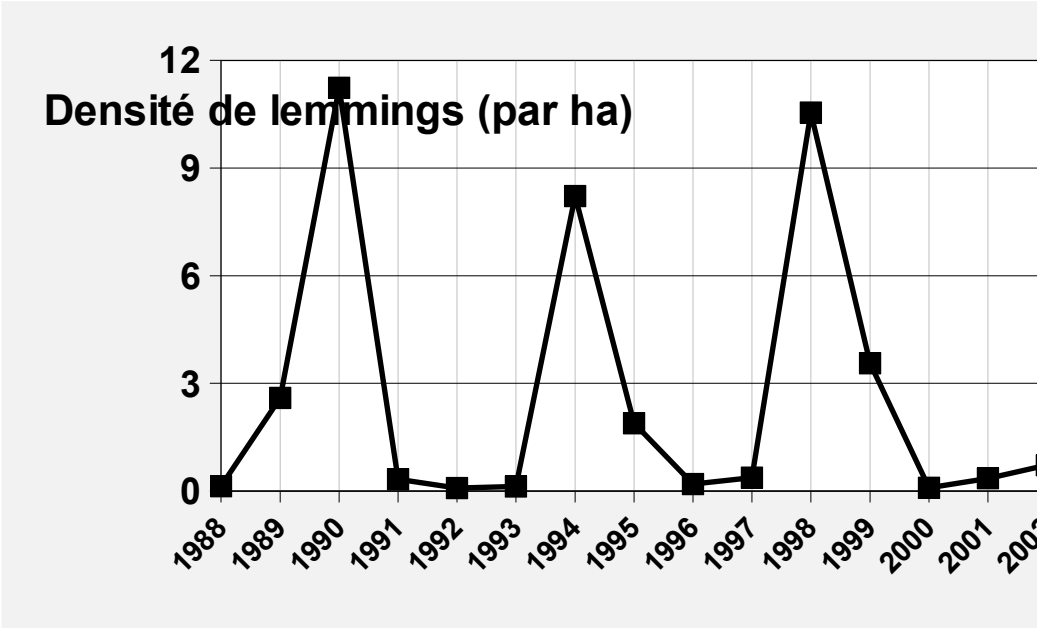
N
(lemmings / hermines)

Hermine

Science 2003 (Gilg, Hanski, Sittler)
Oikos 2006 (Gilg et al)

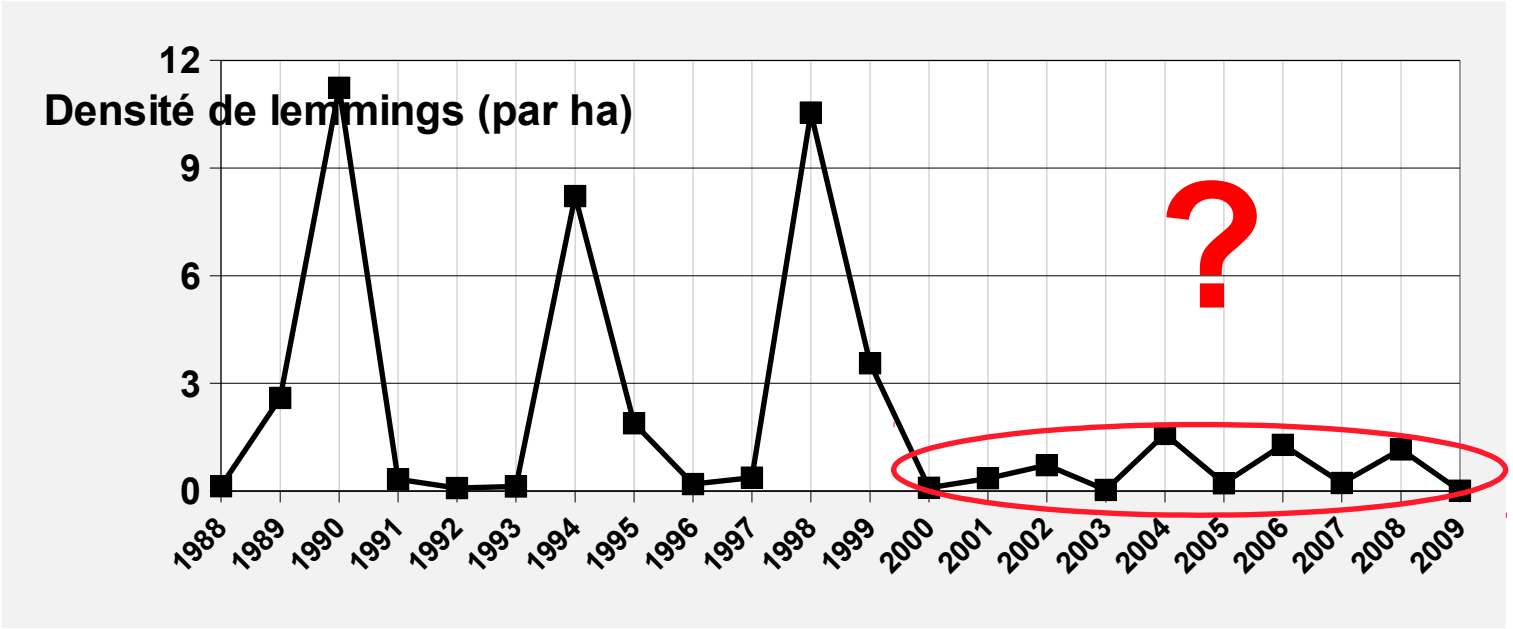
Recherches antérieures

Après 14 années de cyclicité...



Recherches antérieures

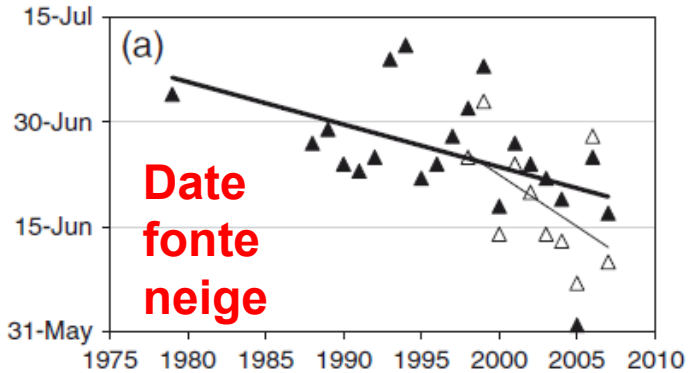
... la dynamique est perturbée

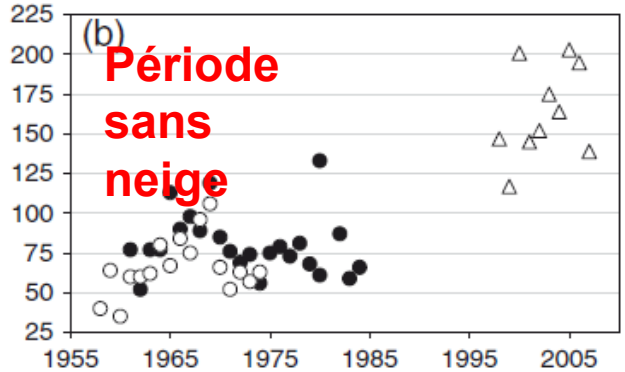


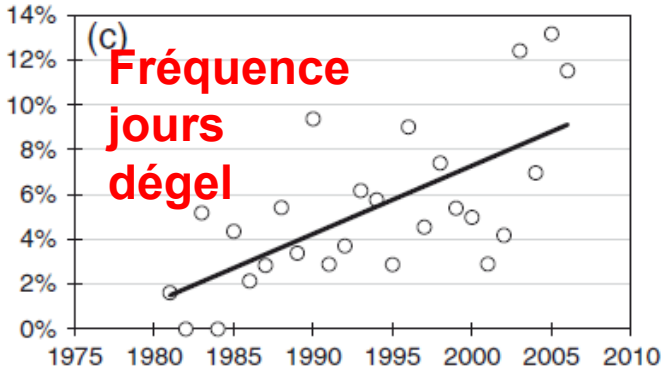
Global Change Biol 2009 (Gilg, Siitler, Hanski)

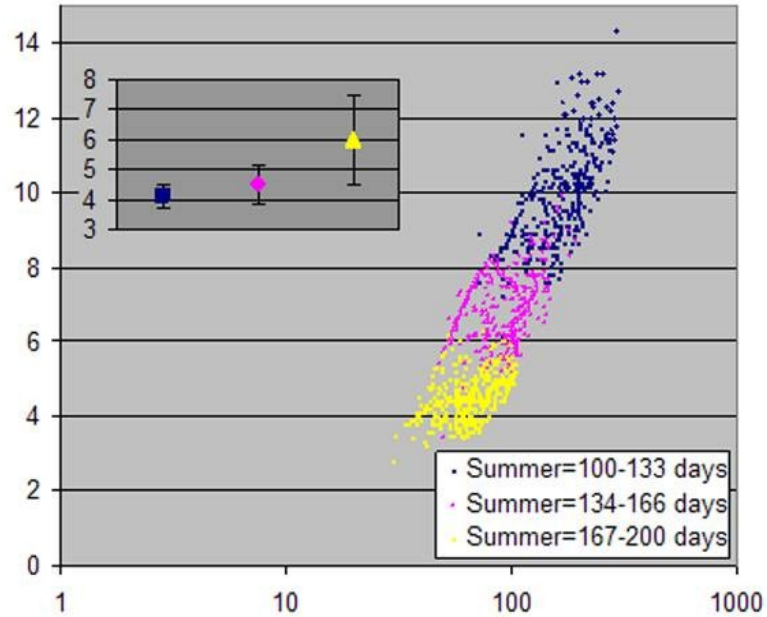
Recherches antérieures

Impact des changements climatiques sur la dynamique de la communauté ?





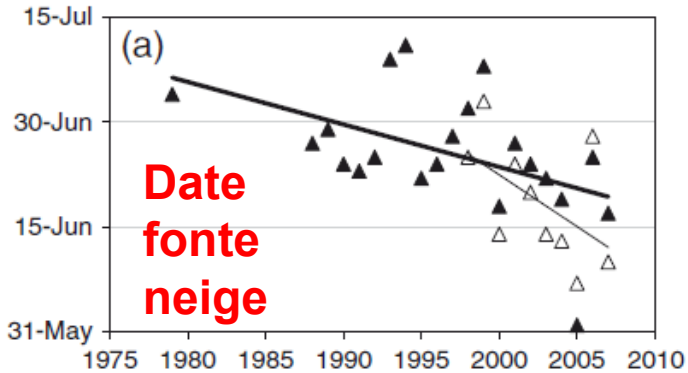


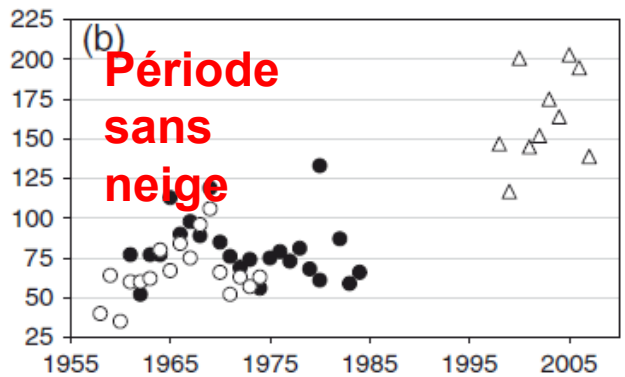


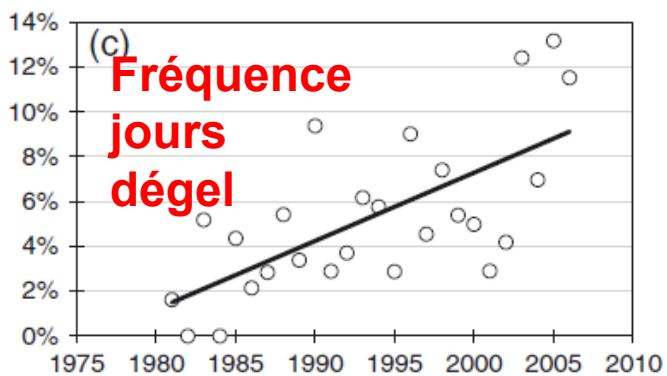
Global Change Biol 2009 (Gilg, Siitler, Hanski)
Ann NY Acad Sc 2012 (Gilg et al)
Proc Roy Soc B 20012 (Schmidt et al)

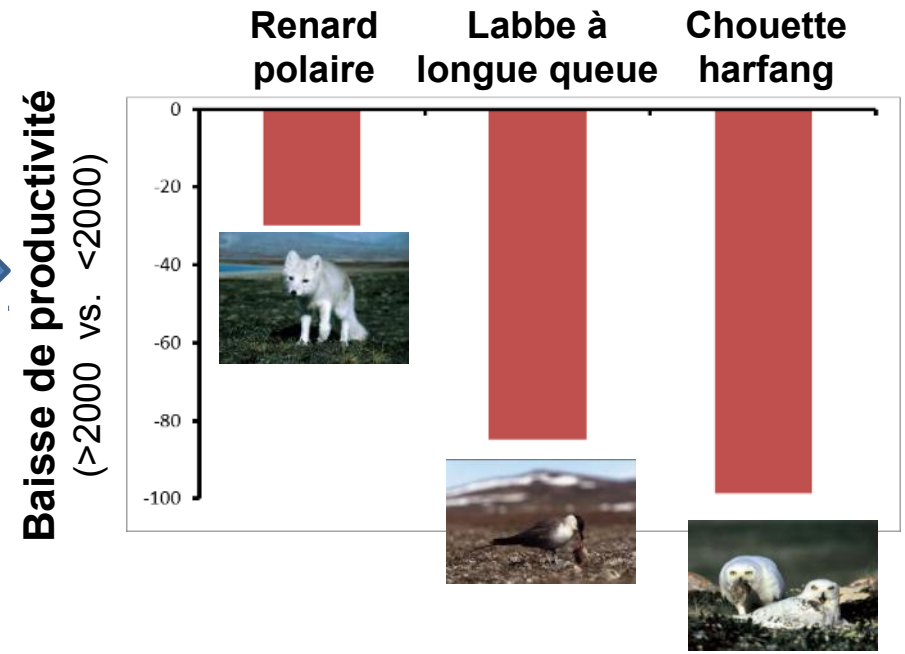
Recherches antérieures

Impact des changements climatiques sur la dynamique de la communauté ?



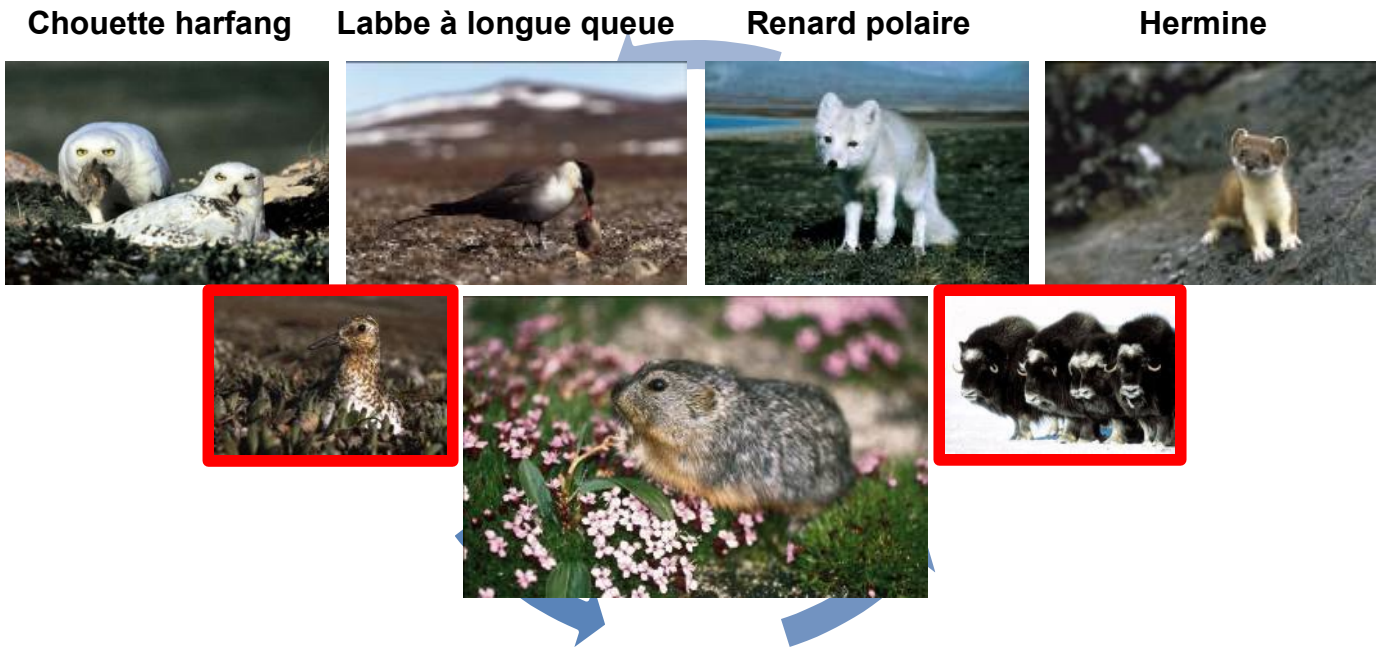


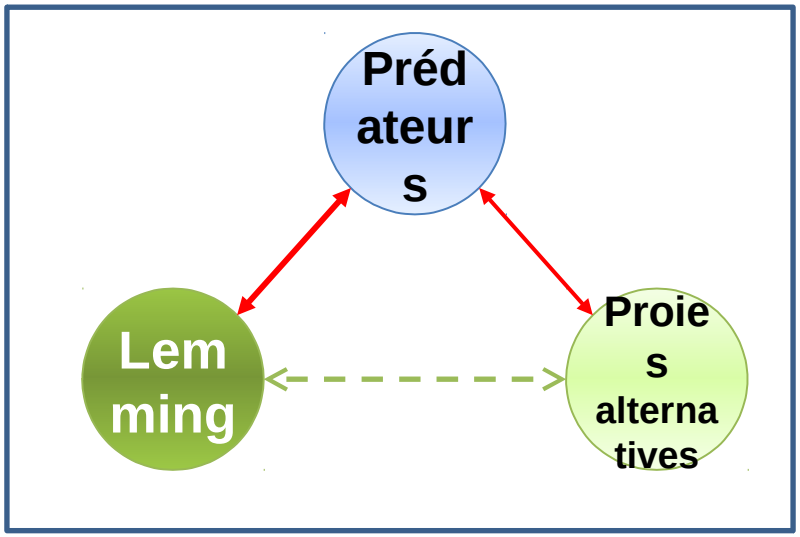


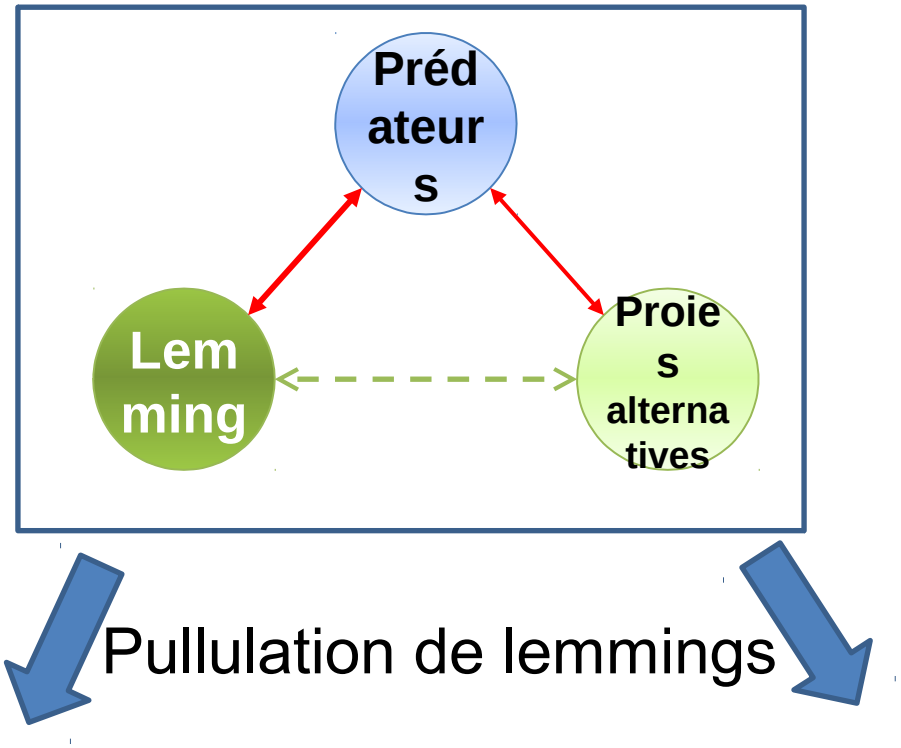


Global Change Biol 2009 (Gilg, Siitler, Hanski)
Ann NY Acad Sc 2012 (Gilg et al)
Proc Roy Soc B 20012 (Schmidt et al)

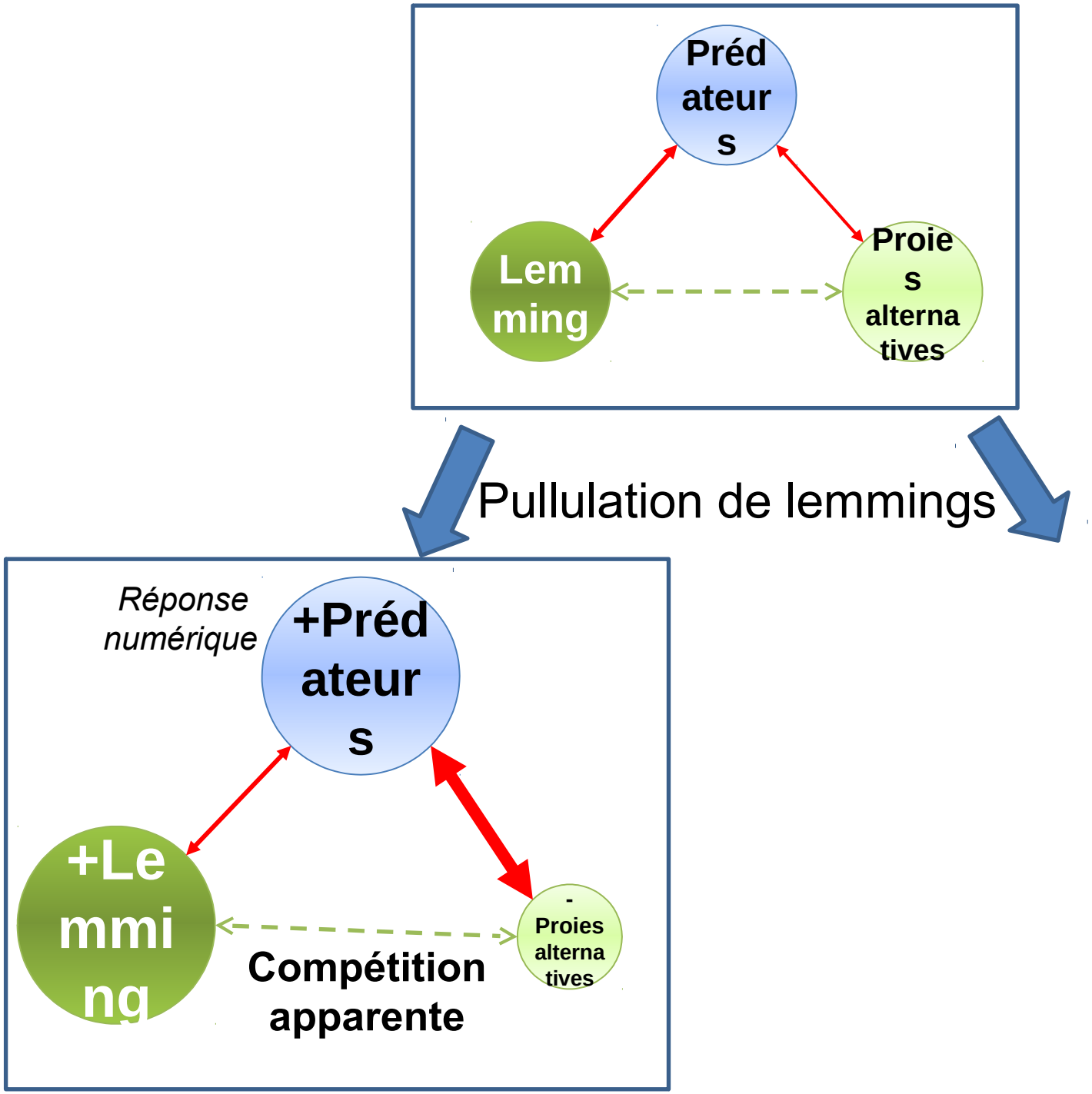
3. Proies alternatives, interactions indirectes et changements climatiques




Prédateurs
Lemming
Proies alternatives



Pullulation de lemmings


Préd
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Lem
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Pullulation de lemmings
Réponse
numérique
+Préd
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+Le
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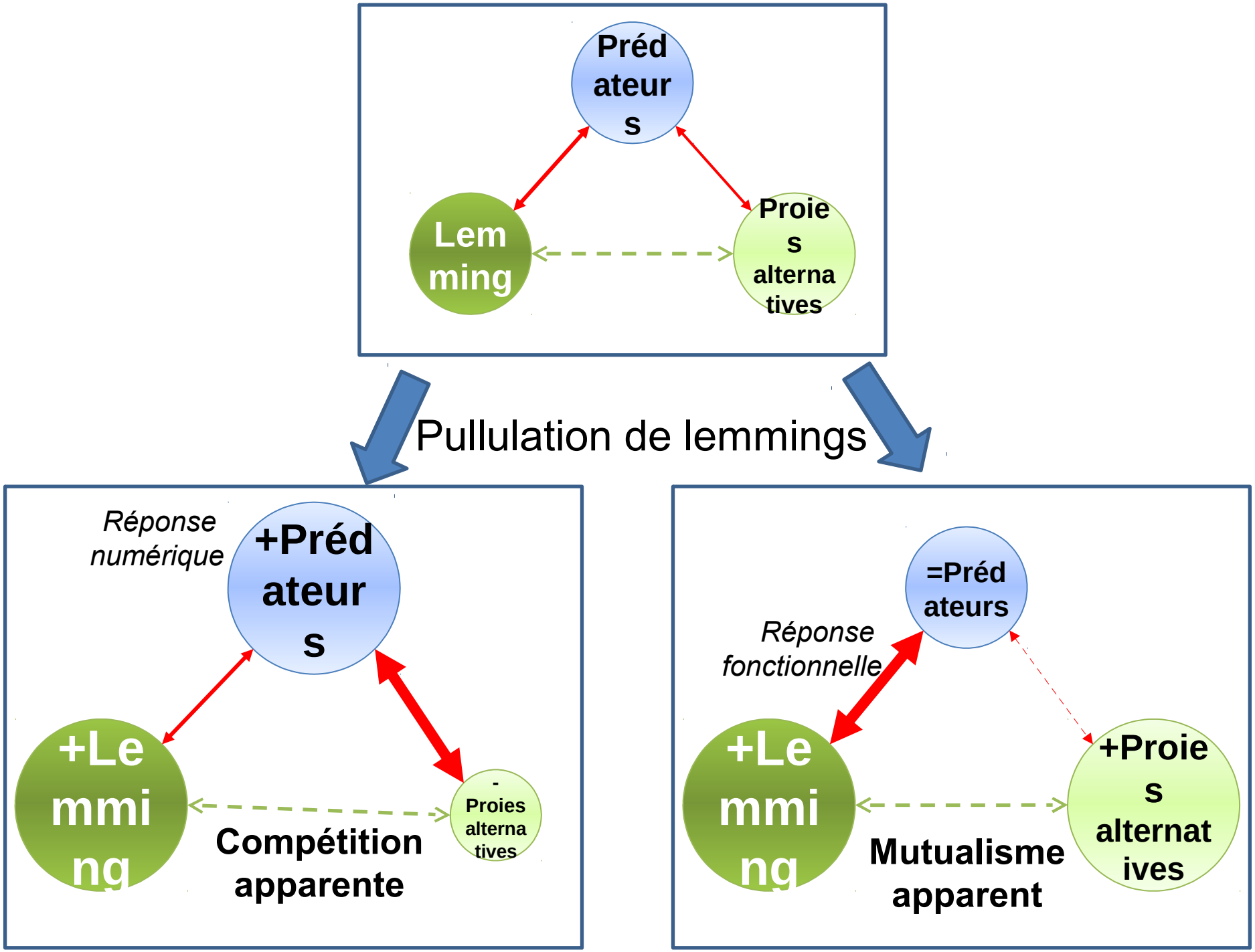
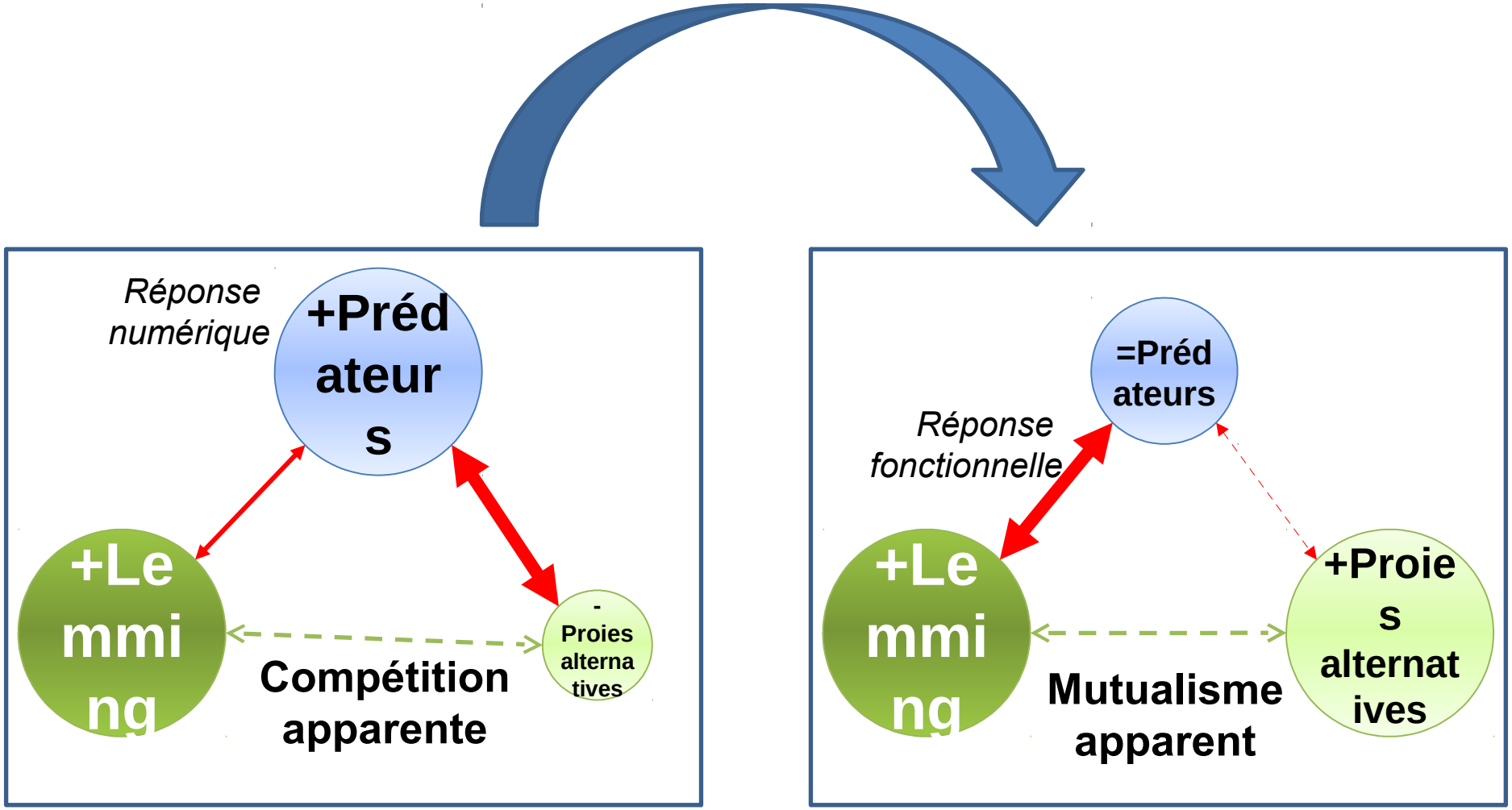
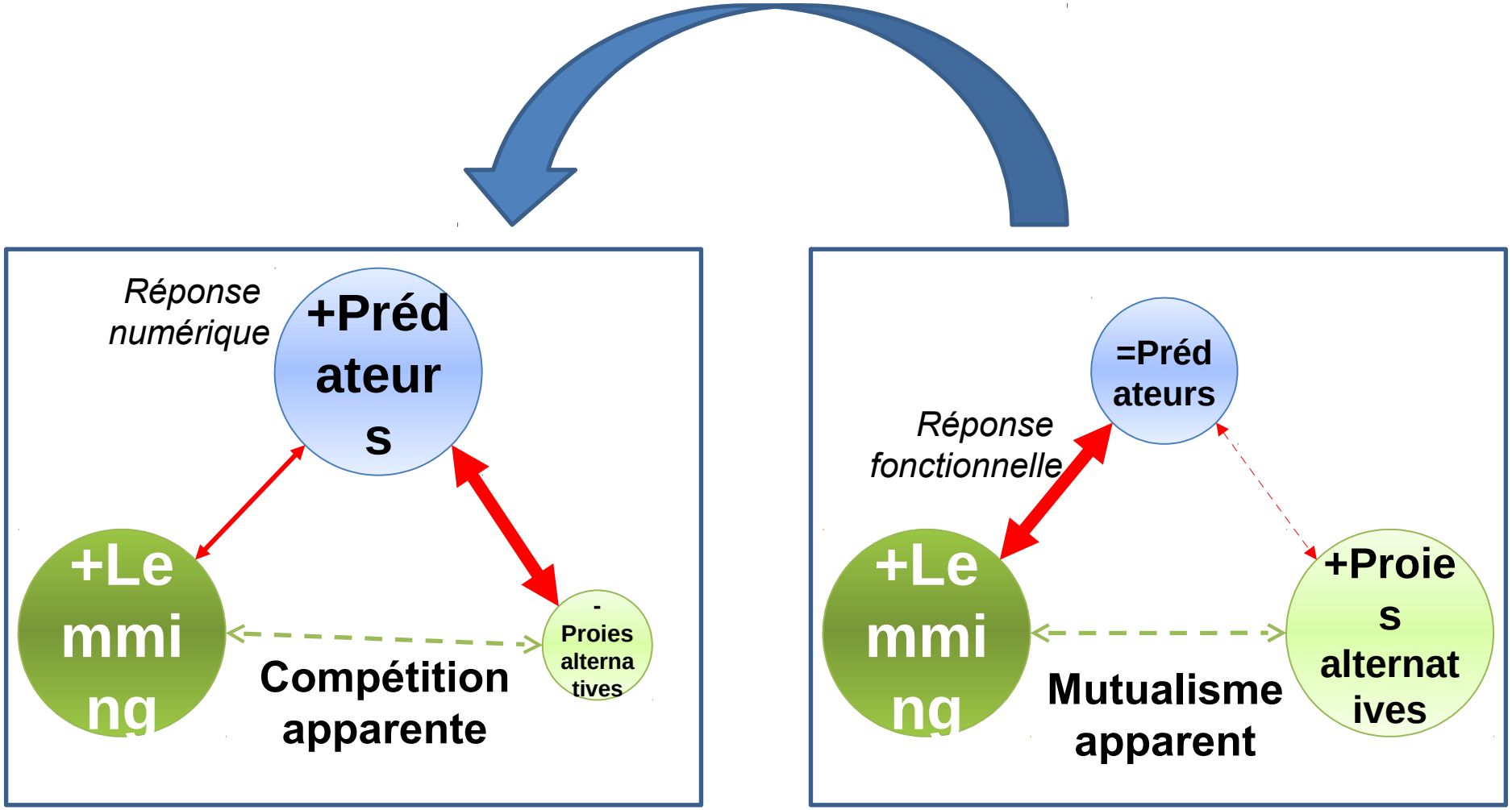
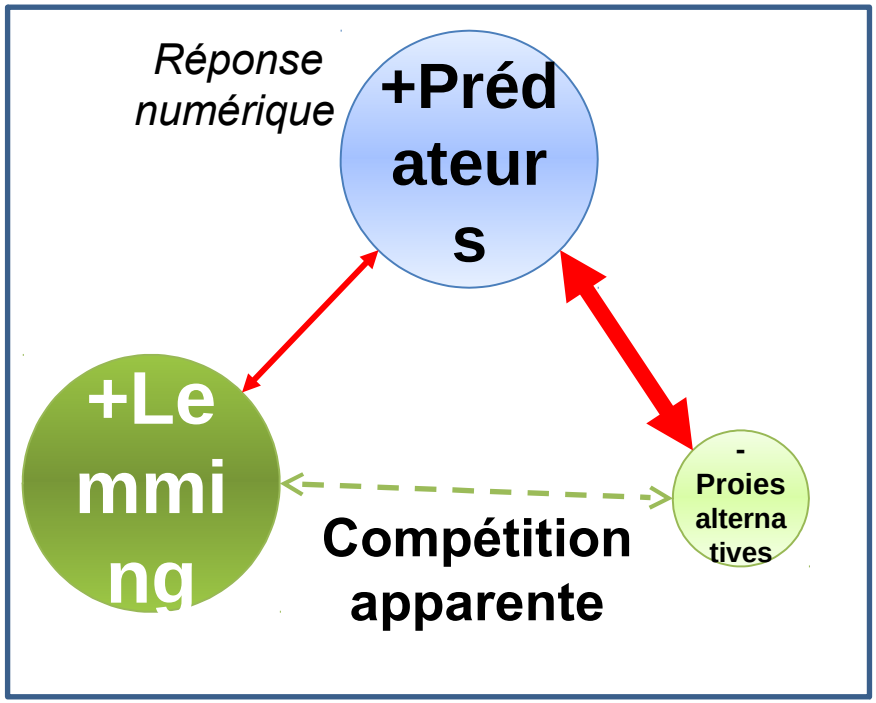
-
Proies
alterna
tives
Compétition
apparente

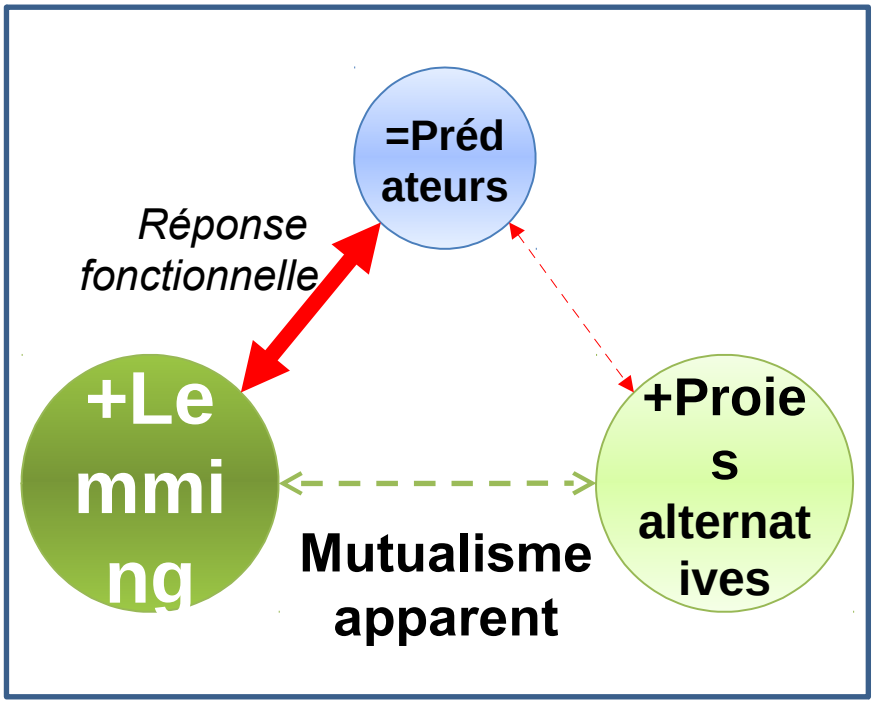

Prédateurs
Lemming
Proies alternatives
Pullulation de lemmings
Réponse numérique
+Prédateurs
+Lemming
- Proies alternatives
Compétition apparente
=Prédateurs
Réponse fonctionnelle
+Lemming
+Proies alternatives
Mutualisme apparent


Réponse numérique
+Prédateurs
+Lemming
-Proies alternatives
Compétition apparente
=Prédateurs
Réponse fonctionnelle
+Lemming
+Proies alternatives
Mutualisme apparent

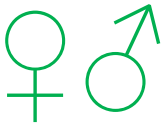

Réponse numérique
+Prédateurs
+Lemming
-Proies alternatives
Compétition apparente
=Prédateurs
Réponse fonctionnelle
+Lemming
+Proies alternatives
Mutualisme apparent

?

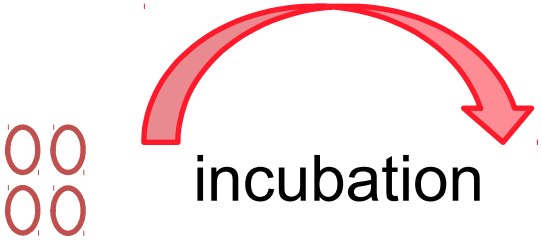

Réponse numérique
+Prédateurs
+Lemming
-Proies alternatives
Compétition apparente


=Prédateurs
Réponse fonctionnelle
+Lemming
+Proies alternatives
Mutualisme apparent

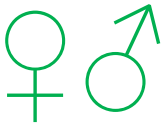
Stratégies de soins parentaux



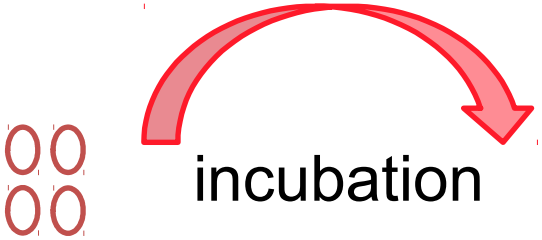
Stratégie biparentale
(↑ productivité)



Stratégies de soins parentaux



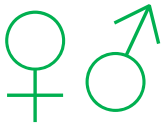
Stratégie biparentale
(↑ productivité)



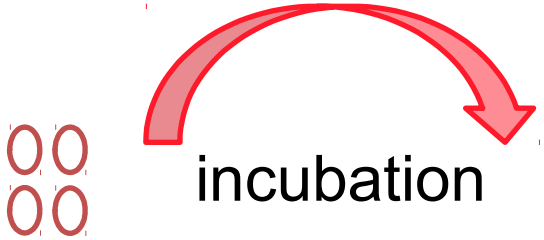
Stratégie monoparentale
(↑ survie des adultes)

Stratégies de soins parentaux

Pression Prédation +



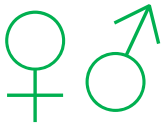
Stratégie biparentale
(↑ productivité)



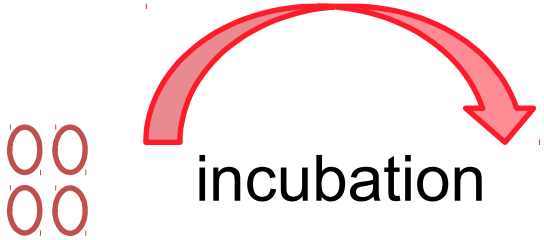
Stratégie monoparentale
(↑ survie des adultes)

Stratégies de soins parentaux

Pression Prédation +



Stratégie biparentale
(↑ productivité)

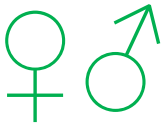


Pression Prédation -

Stratégie monoparentale
(↑ survie des adultes)

Stratégies de soins parentaux

Pression Prédation +



Stratégie biparentale
(↑ productivité)

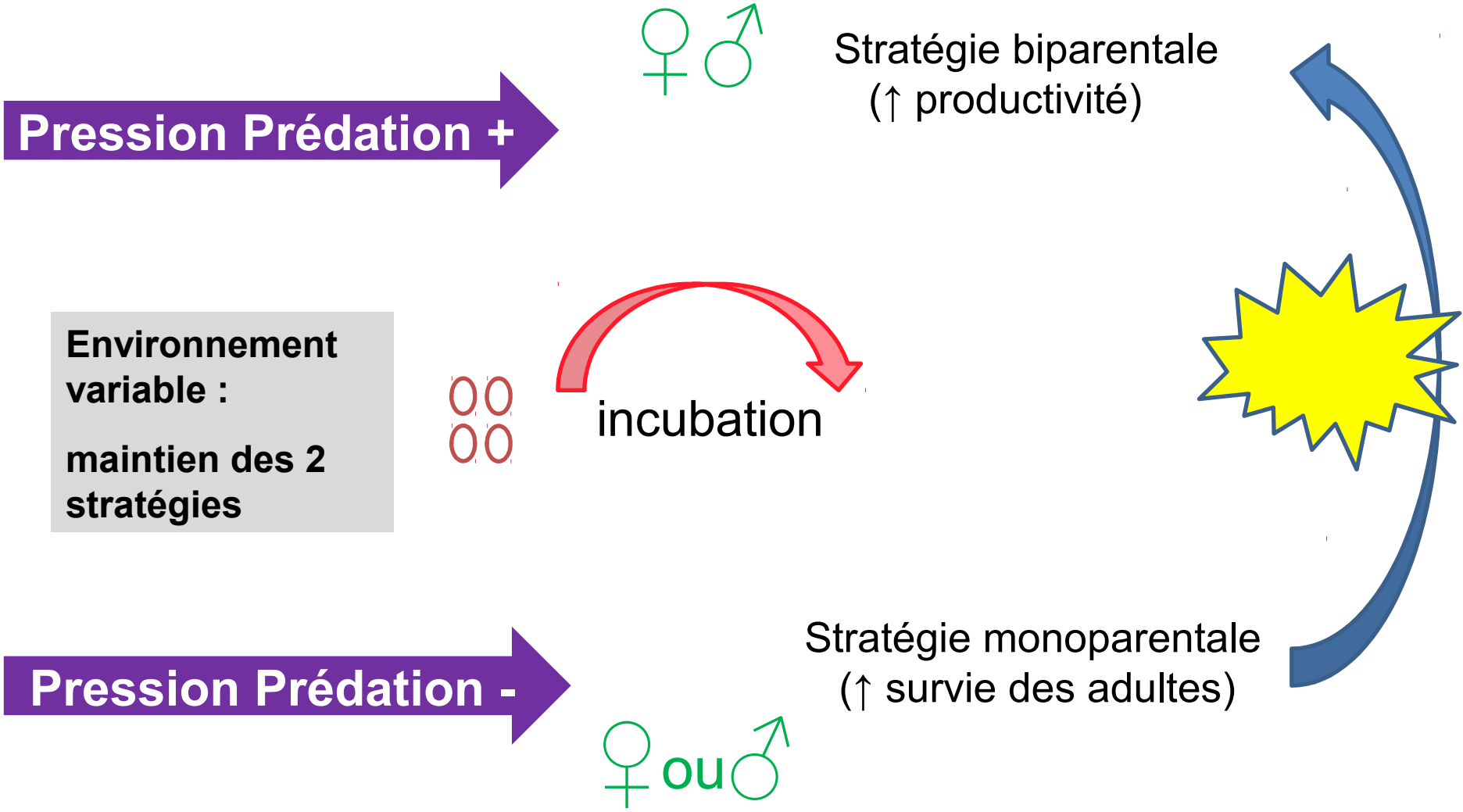
Environnement variable :

maintien des 2 stratégies

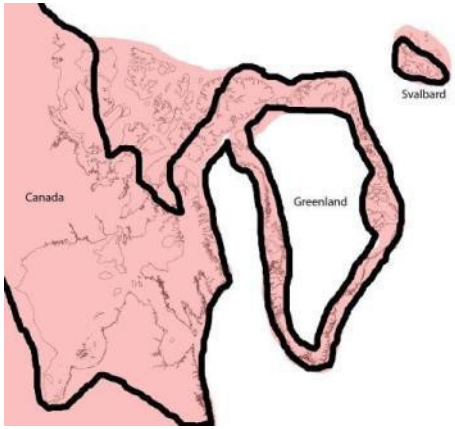
Pression Prédation -

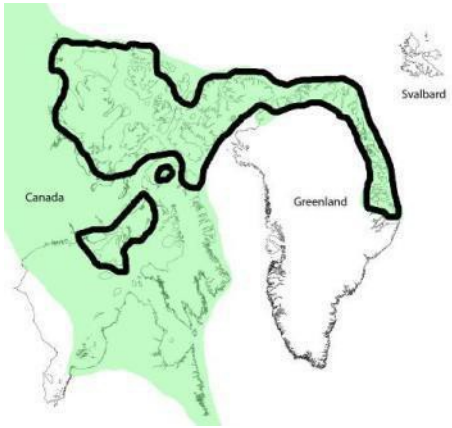
Stratégie monoparentale
(↑ survie des adultes)

Stratégies de soins parentaux



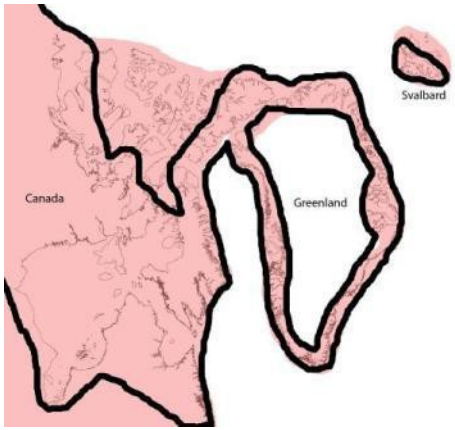
Biogéographie « prédation – dépendante »

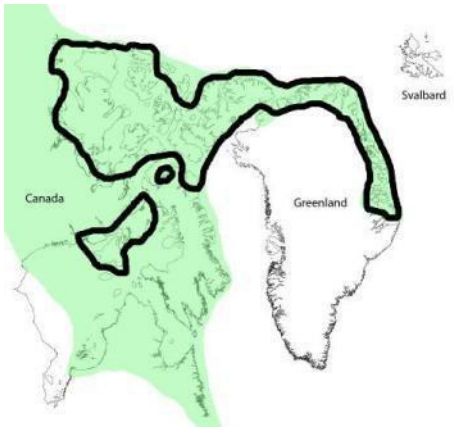




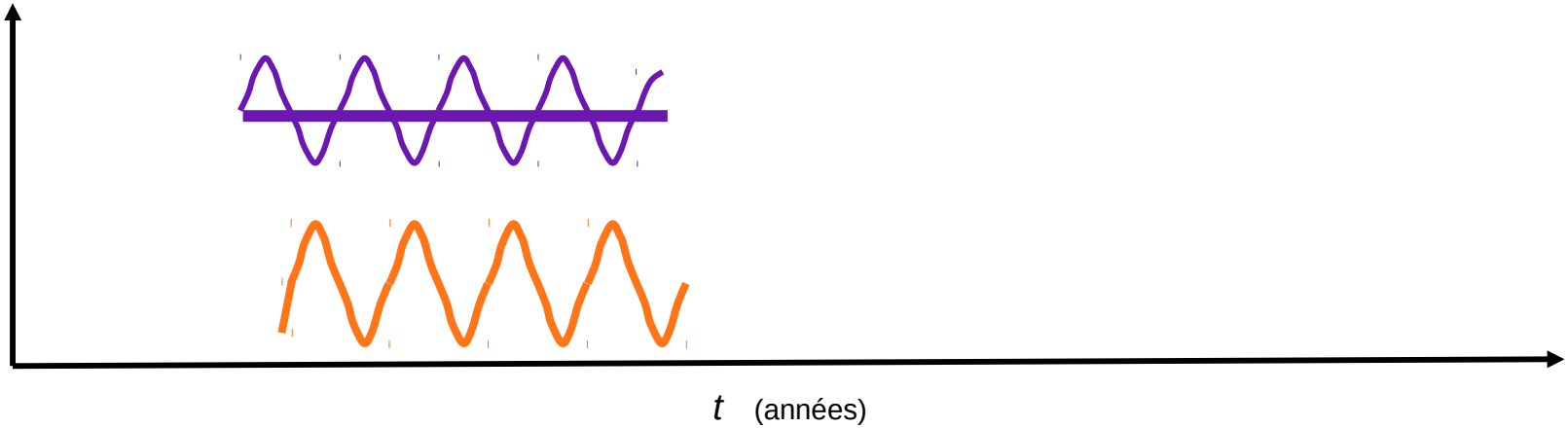
Science 2010 (Gilg et Yoccoz)

Biogéographie « prédation – dépendante »





Relâchement périodique croissant de la pression de prédation

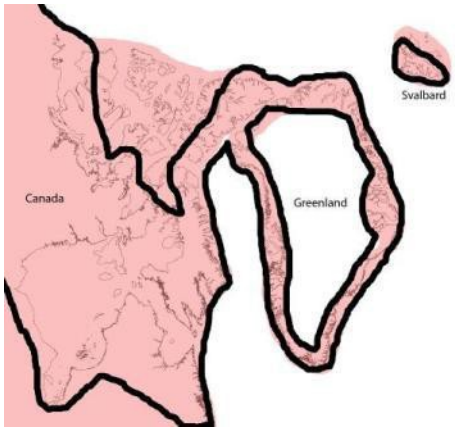


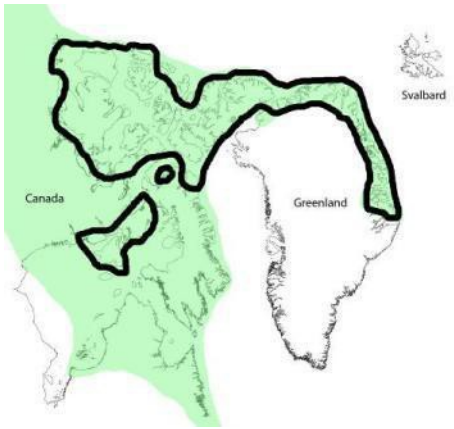
Pression de prédation moyenne des prédateurs généralistes

Densités des lemmings

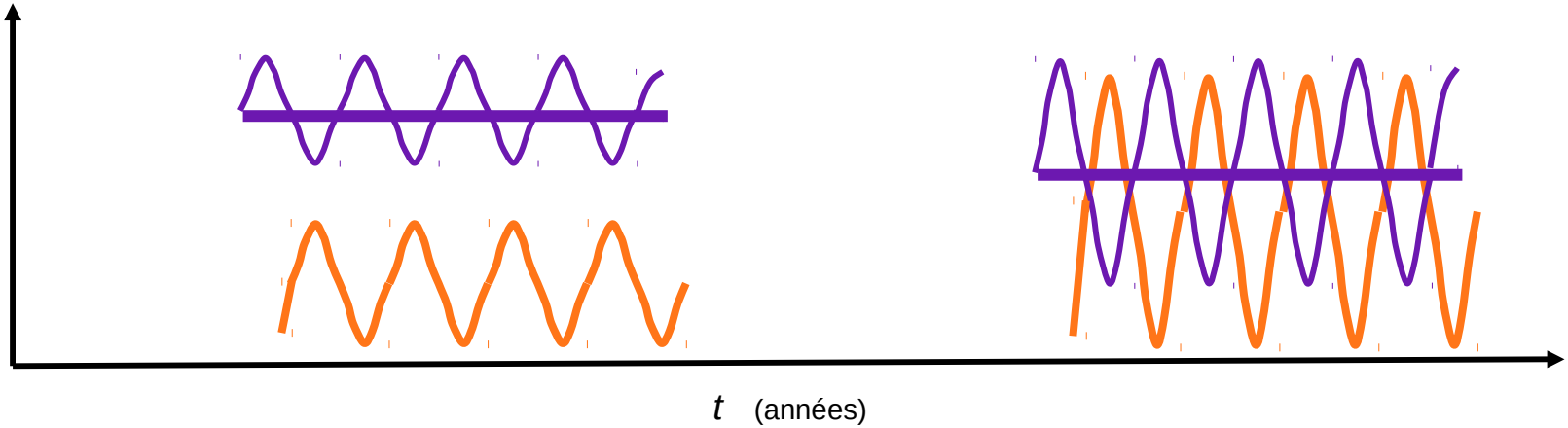
Science 2010 (Gilg et Yoccoz)

Biogéographie « prédation – dépendante »





Relâchement périodique croissant de la pression de prédation

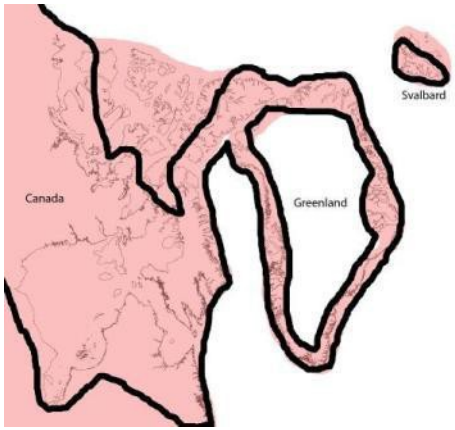


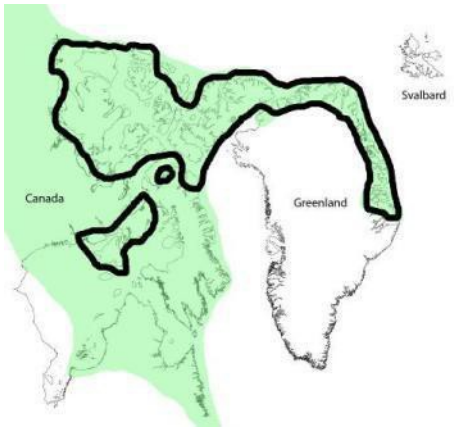
Pression de prédation

Densités des lemmings

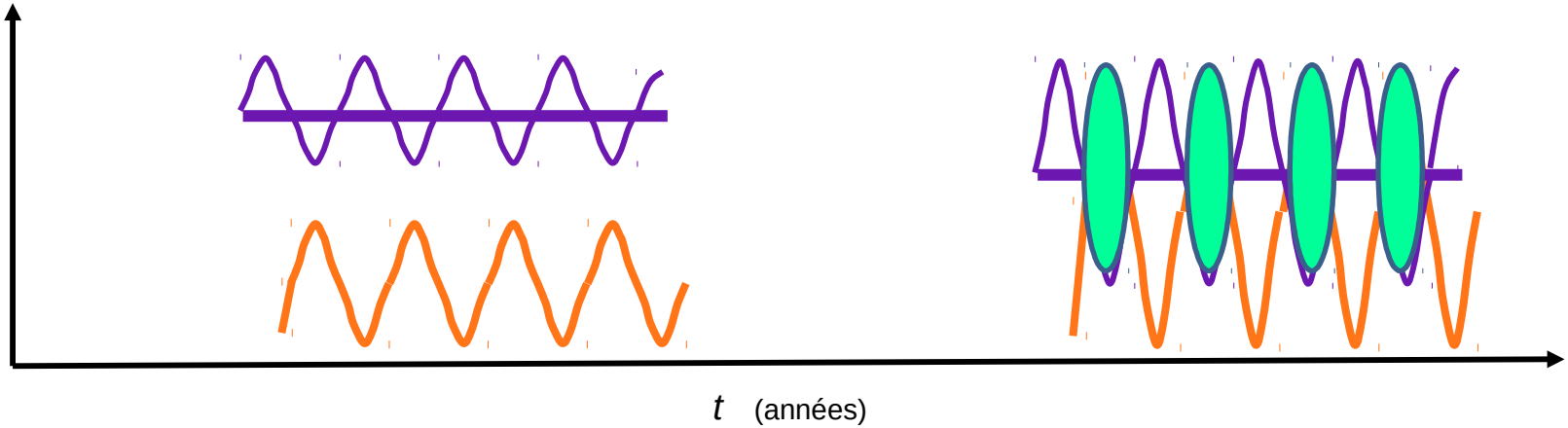
Science 2010 (Gilg et Yoccoz)

Biogéographie « prédation – dépendante »





Relâchement périodique croissant de la pression de prédation



Pression de prédation

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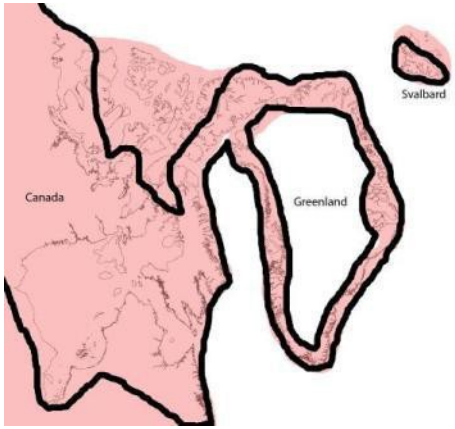
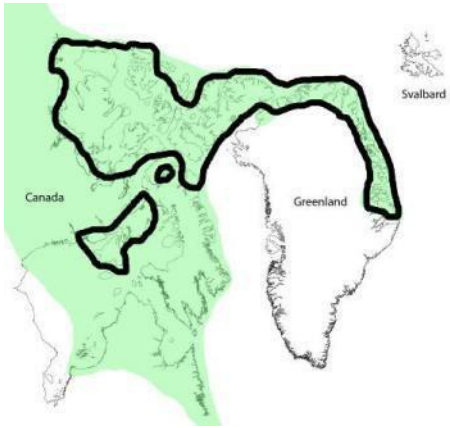
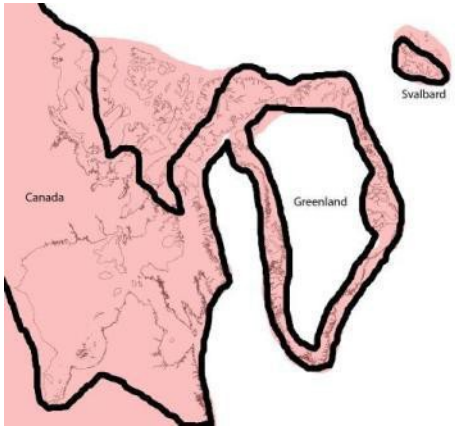
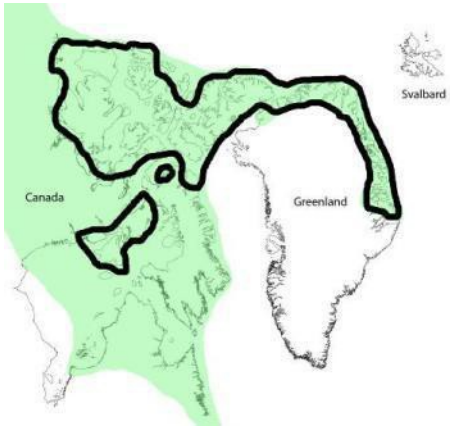


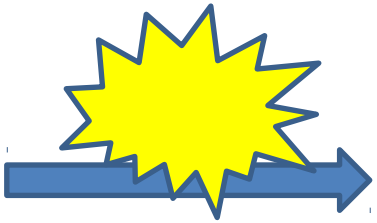


Science 2010 (Gilg et Yoccoz)

Biogéographie « prédation – dépendante »







Science 2010 (Gilg et Yoccoz)

Merci !