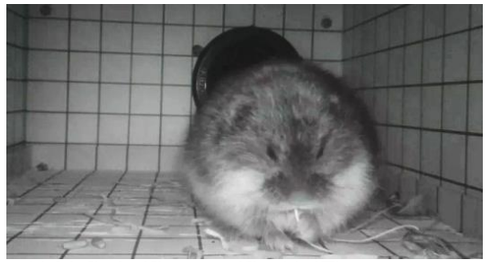
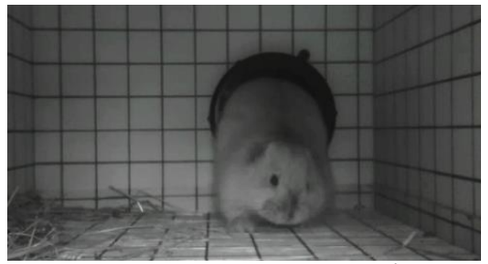
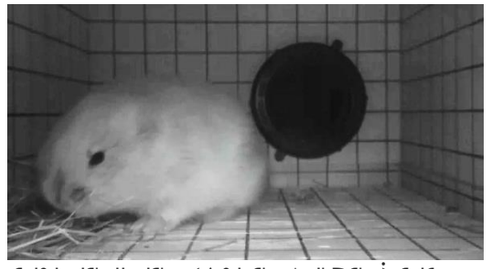






ᐃᓅᓯᖃᕐᕕᖓ ᐊᕕᖓᐃᑦ ᐃᓗᐊᓂ ᐊᐳᑎᑦ

The secret life of

lemmings inside the snowpack
Rain-on-snow
events

Hard melt-freeze
snow layers

Energy spent digging
by lemmings

Lemming numbers

ᓯᓚᐅᑉ ᐅᖂᓂᖓ ᐊᓯᑦᔨᕐᓂᖓᓄ ᐅᓗᕆᐊᓇᖅᑐᒦᓕᖅᑐᑦ ᐊᕕᖓᐃᑦ

Climate change is a threat

for lemmings

ᓲᕐᓗ: ᐊᓯᖓᐃᑦ ᓄᖑᑉᐸᓪᓕᐊᔪᑦ ᐊᑯᑭᑦᑐᓂ
ᐱᔾᔪᑎᒋᓪᓗᒍ ᓯᓚᐅᑉ ᐅᖂᓯᕙᓪᓕᖓᓂᖓ
ᐊᒃᓲᓗᐊᖅᑐᓂᒃ ᐊᒃᑐᖅᑕᐅᑎᓪᓗᒋᑦ ᓂᕐᔪᑎᑦ

E.g.: lemming cycles are collapsing in
Greenland because of climate change
dramatic impacts on wildlife

ᒪᖁᒃᑕᐅᕙᒡᖢᓂ ᐊᐳᑦ
ᑕᐃᒪᓐᓇᐅᔭᕌᖓᑦ

ᑎᓯᒃᑎᓪᖢᓂ ᐊᐅᓂᑯ
ᖁᐊᑲᓐᓂᕋᒥ ᐊᐱᑎ
ᖄᖏᓐᓂ

ᓄᒃᑭᓴᓇᖅᑐᖅ ᐊᑯᓂ
ᐊᒡᒐᒃᐸᒃᑐᑦ ᐊᕕᖓᐃᑦ

ᐊᕕᖓᐃᑦ ᐅᓄᕐᓂᖏᑦ

ᐃᓕᑦᑎᓇᓱᒡᖢᓂ ᐊᕕᖓᕐᓂᒃ
ᐅᑭᐅᒃᑯᑦ ᐱᔭᕐᓂᓐᖏᑦᑐᖅ

Studying lemmings in winter

is challenging

• ᑕᐃᒪᖓᓂ 2017, ᐊᔾᔨᓕᐅᕈᑎᓂᒃ ᐋᕿᒃᓯᓯᒪᕗᒍᑦ
ᓴᓐᓂᕈᑦ ᒥᑦᑎᒪᑕᓕᐅᑉ ᐊᑭᐊᓂ ᓂᐱᓕᐅᕆᔪᖅ
ᐊᕕᖓᓂᒃ ᐊᑖᓂ ᐊᐳᑎᑦ.
Since 2017, there are cameras on Bylot Island
recording lemming activities under the snowpack.

ᐊᕕᖓᖅ ᑲᔪᖅ ᓂᕆᔪᖅ ᐃᔾᔪᒥᒃ.

ᖁᖓᓯᖅᓯᒪᔪᖅ ᐊᕕᖓᖅ ᐃᓯᖅᑐᖅ ᐴᕐᒧᑦ.

A collared lemming walking in the box.

A brown lemming eating grass.

A collared lemming entering the box.

ᖁᖓᓯᖅᓯᒪᔪᖅ ᐊᕕᖓᖅ ᐱᓱᒃᑐᖅ ᐴᕐᒧᑦ.

• ᑎᑎᕋᐅᓯᐱᓗᒋᑦ ᐊᒥᖓᐃᑦ ᑕᑯᔭᑎᑦ ᑕᒡᕘᓇ ᓯᑯ.

• ᐱᓕᕆᖃᑕᐅᔪᒪᒍᕕᑦ ᑕᑯᓇᓱᖃᑦᑕᕐᓗᑎᒃ

ᐅᑭᐅᖑᓂᖓᓂ (ᓲᕐᓗ ᐊᕕᖓᐃᑦ
ᐱᓱᒃᑐᖅᓯᐊᕈᕕᑦ, ᖃᐅᔨᒪᓇᖅᑐᖃᖅᐸᑦ
ᐊᕕᖓᖃᕐᓂᐊᖅᑐᓂᒃ), ᑎᑎᕋᕐᓗᑎᒃ ᐅᕙᑦᑎᓐᓄᑦ
(ᐊᑎᖏᑦ ᑎᑎᕋᖅᓯᒪᔪᑦ ᖃᕆᓴᐅᔭᖃᕐᕕᑦᑎᓐᓂ).

ᖃᓄᖅ ᐃᑲᔪᕈᓐᓇᖅᐱᓯ ᐅᕙᑦᑎᓐᓂᒃ

How can you participate?

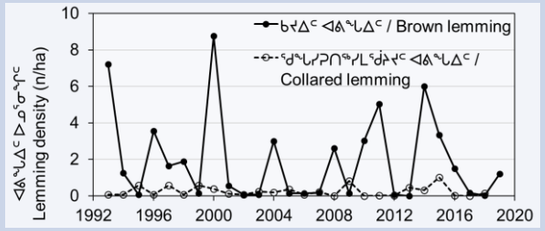
www.cen.ulaval.ca/Bylot

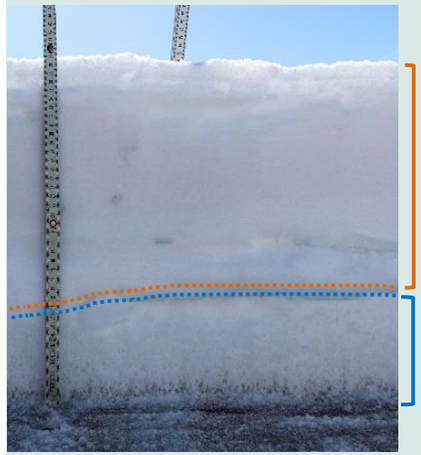
ᐅᖃᕐᕕᐅᔪᓐᓇᖅᑐᑦ ᐅᑯᐊ / Contact information :

Created by: Mathilde Poirier

Report your lemming observations on the
SIKU app.

If interesting observations are made during
winter (ex: lemmings walking on snow, signs
of lemming reproduction), you can write to
us (contact information on our website).





ᖃᓄᐃᒻᒪᑦ ᐊᕕᖓᐃᑦ ᐱᒻᒪᕆᐅᕙᑦ

ᐅᑭᐅᖅᑕᖅᑐᒥ?

Why are lemmings so important in
the Arctic?

• ᐊᕕᖓᐃᒃ = ᓂᕿᒋᔭᐅᔪᑦ ᑎᕆᒐᓂᐊᕐᓂᒃ,
ᑎᕆᐊᕐᓂᒃ, ᐅᒃᐱᖕᓂᑦ ᐊᒻᒪᓗ ᐊᓯᖏᓐᓂᑦ ᑎᖕᒥᐊᓂᒃ.
Lemmings = prey for foxes, ermines, snowy owls
and other predatory birds.

ᐊᕕᖓᐃᑦ ᓄᖃᖓᔪᓐᓇᓐᖏᑦᑐᑦ

ᐊᐳᔾᔭᕆᒃᑐᓂ ᐅᑭᐅᓕᒫᖅ

Lemmings stay active in the

snowpack during all winter

• ᐃᑲᔫᑎᔪᖅ ᐃᓅᔾᔪᑎᒃᓴᖃᕐᒪᑕ ᐊᑖᓂ ᐊᐳᔾᔭᕆᒃᑐᑦ:
‒ ᓴᐳᒻᒥᕗᑦ ᑐᖁᑕᐅᓂᐊᓐᖏᓇᒥᒃ ᓂᕿᖃᖅᑐᓂᑦ
ᑖᒃᑯᓂᖓ
‒ ᐃᑭᐊᕐᒥᒋᓪᓗᒍ ᐅᖂᔾᔪᑎᒋᓪᓗᒍ ᓂᒡᓚᓱᒃᑎᓪᓗᒍ

• Benefits of living under the snowpack:
‒ Protection against predators
‒ Insulation against the cold

Winter nests keep lemmings warm and cozy,
offering the perfect setting for reproduction.

Lemmings dig tunnels in the snowpack to
access the vegetation on which they feed.

ᐊᕕᖓᐃᑦ ᐊᒡᖓᓲᑦ ᓄᓇᐅᑉ ᐃᑭᐊᖓᒍᑦ
ᓱᓪᓗᖃᐅᖅᑐᑦ ᐊᐱᑎᖃᖅᑐᓂ ᐱᔪᓐᓇᕐᓂᐊᕋᒥᒃ
ᐱᕈᖅᑐᓂᒃ ᓂᕿᒋᒐᒥᔾᔪᒃ.

ᐅᑭᐅᒥ ᐃᕙᓲᑦ
ᐅᖂᑎᑕᐅᓲᑦ ᐊᕕᖓᐃᑦ
ᐊᒻᒪᓗ ᑲᑎᓯᒪᕕᖓᑦ,
ᐋᕿᒃᓯᒪᔪᖅ
ᓈᒻᒪᑦᑎᐊᖅᖢᓂ
ᑭᑐᕐᖏᐅᕐᕕᐅᔪᓐᓇᖅᓂᖓ.

ᐊᐳᔾᔭᕆᖕᓂᖓ ᐊᐳᑖ ᖃᓕᕇᓂᖓᖕᒪᑦ

ᐊᔾᔨᒌᓐᖏᑦᑐᓂᑦ ᑎᓯᓂᖃᐅᖅᖢᓂ ᐃᓗᐊ

The snowpack is composed of layers
of different hardnesses

ᐊᑖ ᖃᓂᕇᓕᑦ:
ᐊᐳᑦ ᐃᓗᐊ
ᐊᕿᓂᖓ
(ᐊᕿᑦᑐᖅ)
Bottom layer:
depth hoar (soft)

ᖄᖓ ᖃᓪᓕᐹᖅ:
ᐅᖁᐊᖅ (ᑎᓯᔪᖅ)
Top layer:
windslab (hard)

ᐃᓛᓐᓂᒃᑯᑦ ᐊᕐᕌᒍᓂ, ᑎᓯᒃᑎᓯᒪᔪᖅ
ᐊᐅᓚᐅᖅᖢᓂ-ᓯᑯᕈᕐᓂᑯ ᖄᖓ ᑕᐃᒪᓐᓇᐃᓕᓲᖅ
ᐱᔾᔪᑎᒋᓪᓗᒍ ᒪᖁᖕᓂᕋᒥ-ᑳᖓᒍᑦ-ᐊᐱᓪᓗᓂ
Some years, a hard melt-freeze layer can form
because of rain-on-snow events

ᓇᐅᒃᑯᑦ ᐊᐳᒻᒥ ᐊᕕᖓᐃᑦ

ᑎᓯᓕᐅᖃᑦᑕᖅᐸᑦ?

Where in the snowpack are

lemmings digging their tunnels?

ᐅᖁᐊᖅ
Wind slab

ᐊᐅᓚᐅᖅᖢᓂ-
ᓯᑯᕈᕐᓂᑯ
Melt-freeze

ᐊᐳᑦ ᐃᓗᐊ
ᐊᕿᓂᖓ
Depth hoar

ᐊᕕᖓᓄᑦ ᐋᕿᒃᓯᒪᔾᔪᑎᒃᓴᐃᑦ
ᐊᒃᓱᕈᖅᑎᓗᐊᕐᓂᓐᖏᓇᒥᒃ ᓄᒃᑕᕐᓗᒋᑦ ᐊᐳᔾᔭᕆᒃᑐᒥ:

1) ᐊᒡᒐᒃᑐᑦ ᐊᕿᓐᓂᖓᒍᑦ (ᐊᐳᑦ ᐃᓗᐊ ᐊᕿᓂᖓ).

2) ᐊᓯᐊᒐᑦ ᐊᒡᒐᒃᖢᑎᒃ ᑎᓯᒃᑎᓯᒪᓂᖓᑕ

ᖄᖏᓐᓂᒃ (ᐊᐅᓚᐅᖅᖢᓂ-ᓯᑯᕈᕐᓂᑯ).

Lemming strategies to limit energy expenditure
while moving in the snowpack:

1) Digging in the softest layer (depth hoar).

2) Avoid digging in hard layers (melt-freeze).

Reproduction of foxes and
predatory birds

ᕿᑐᖏᐅᖅᑐᓄᑦ ᑎᕆᒐᓂᐊᕐᓄᑦ
ᐊᒻᒪᓗ ᑎᖕᒥᐊᑦ ᓂᕿᒋᔭᖏᑦ

ᐊᕕᖓᐃᑦ
Lemmings

Predation on geese

ᑖᒃᑯᐊ ᓂᕿᖃᓲᑦ ᓂᕐᓕᕐᓂᒃ

ᐅᓄᖅᓯᕙᖕᓂᖏᑦ
ᐅᓄᕈᓐᓃᖅᐸᖕᓂᖏᑦ ᐊᕕᖓᐃᑦ

• ᒪᕐᕉᔪᒃ (2) ᐊᔾᔨᒌᓐᖏᑦᑐᑦ ᑕᐃᒪᓐᓇᐃᑦᑐᑦ ᓴᓐᓂᕈᑦ
ᒥᑦᑎᒪᑕᓕᐅᑉ ᐊᑭᐊ: ᑲᔪᐃᑦ ᐊᕕᖓᐃᑦ ᐊᒻᒪᓗ
ᖁᖓᓯᕈᑎᖅᓯᒪᖂᔨᔪᑦ ᐊᕕᖓᐃᑦ.

• ᐊᐳᑎ ᖃᓄᕆᑑᓂᖓ ᐅᓄᓐᖏᑉᐹᓕᕐᑎᑦᑎᔪᓐᓇᖅᑐᖅ
ᐊᒃᓱᕈᕐᓇᓲᖑᖕᒪᑕ ᓇᒧᑐᐃᓐᓇᖅ ᓇᕈᑦᑕᕆᐊᒃᓴᖅ
ᐊᕕᖓᐃᑦ ᐅᑭᐅᒃᑯᑦ.

• ᓂᕿᒋᕙᒃᑕᖏᑦ ᓇᓗᓇᐃᕈᑎᒋᓯᒪᔪᑦ ᐊᕕᖓᐃᑦ

ᑐᖁᕙᒡᖢᑎᒃ ᐅᓄᖅᓯᕚᓪᓕᖅᐸᒡᖢᑎᒃ ᓴᓐᓂᖁᑎᓂ.

2 species co-occur on Bylot: brown lemmings and

collared lemmings. ᐅᖁᐊᖅ (ᑎᓯᔪᖅ)

Windslab (hard)

ᐊᐳᑦ ᐃᓗᐊ
ᐊᕿᓂᖓ
(ᐊᕿᑦᑐᖅ)
Depth hoar (soft)
ᐊᐅᓚᐅᖅᖢᓂ-
ᓯᑯᕈᕐᓂᑯ
(ᑎᓯᔪᖅ)
Melt-freeze (hard)

Predation explains lemming cycles on Bylot.

Snow quality modulates population fluctuations
through energy expenditure of lemmings in winter.

Cyclicity of lemming populations