

# CWD surveillance and cases in Sweden

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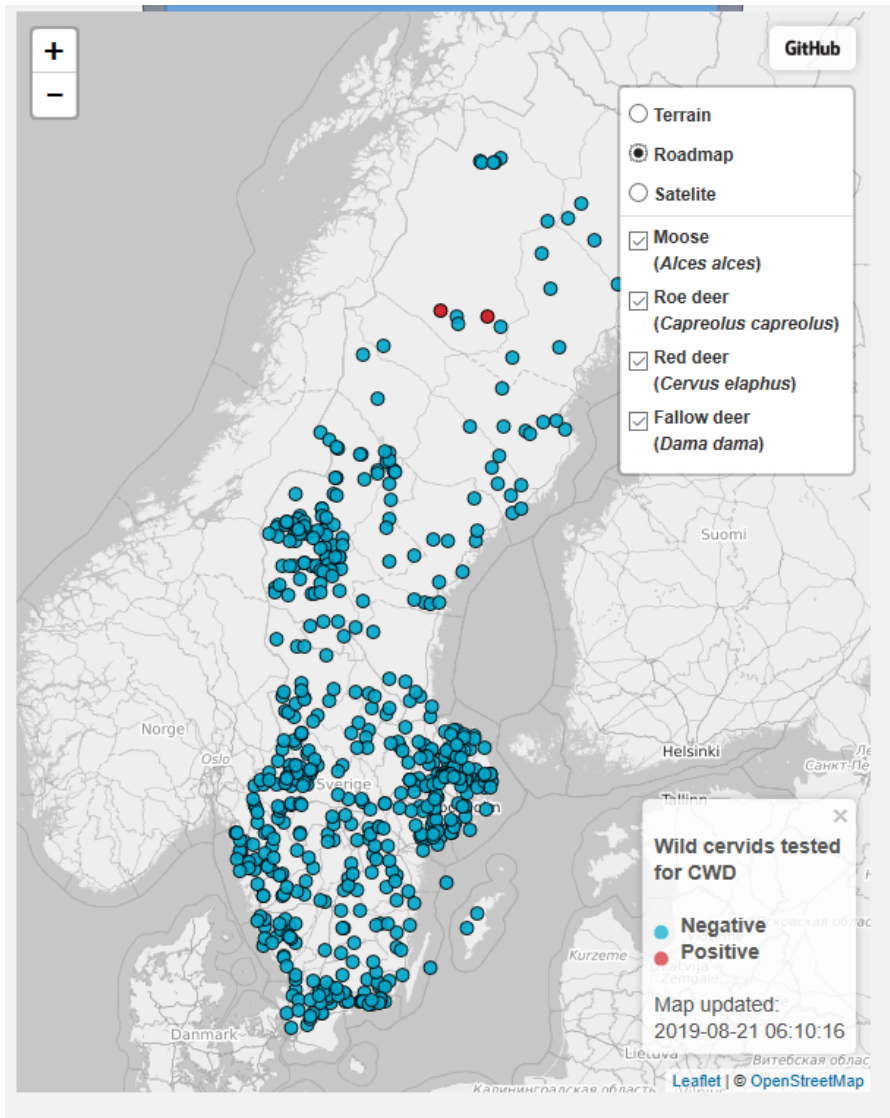
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Veterinærinstituttet  
Norwegian Veterinary Institute

Sweden has now  
joined the club.



Risk-animals	
Eu-surveillance	
Moose	407
Roe-deer	51
Red-deer (wild)	9
Red-deer (farmed)	31
Reindeer	170
	668

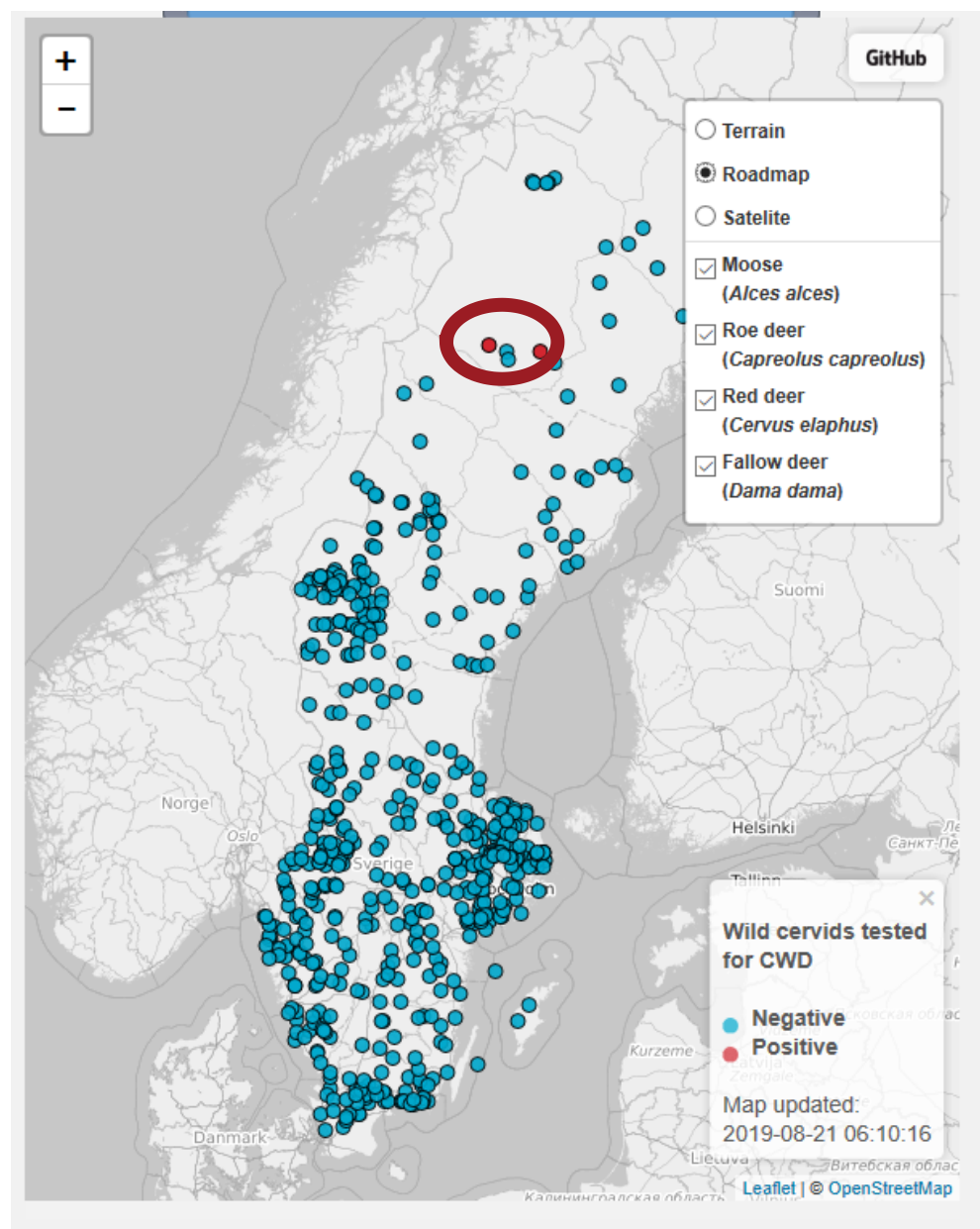


# Ongoing surveillance

## - summary of challenges and choices

- The responsible authority had a late start
- Sweden has not allocated as much resources as our neighbourous country to the west
- Still focus on risk animals –do not include healthy animals in the general surveillance
- An agreement with the Police to use hunters dealing with road-kills was the backbone in our plan – but this did not work out
- The postal services do not want to send samples
- Details at [www.cwd.se](http://www.cwd.se)





# Moose (*Alces alces*)



Photo: Erika Chenais

## First case:

- 16 years old (yearly layering in teeth)
- Female
- Euthanised after being observed emaciated, staggering, walking in circles and apparently blind.
- Sampled within ongoing surveillance programme.
- Confirmed positive March 25th 2019



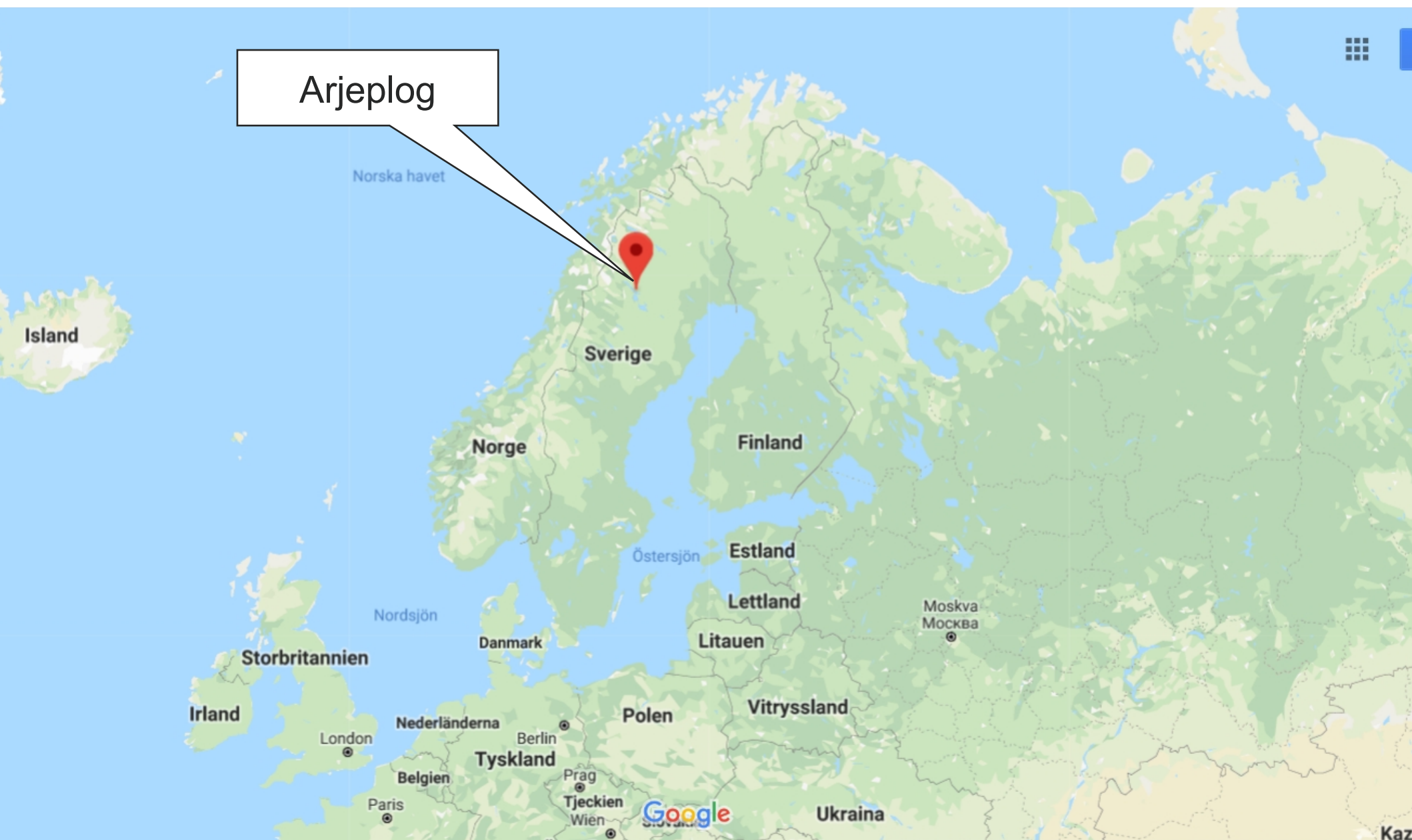


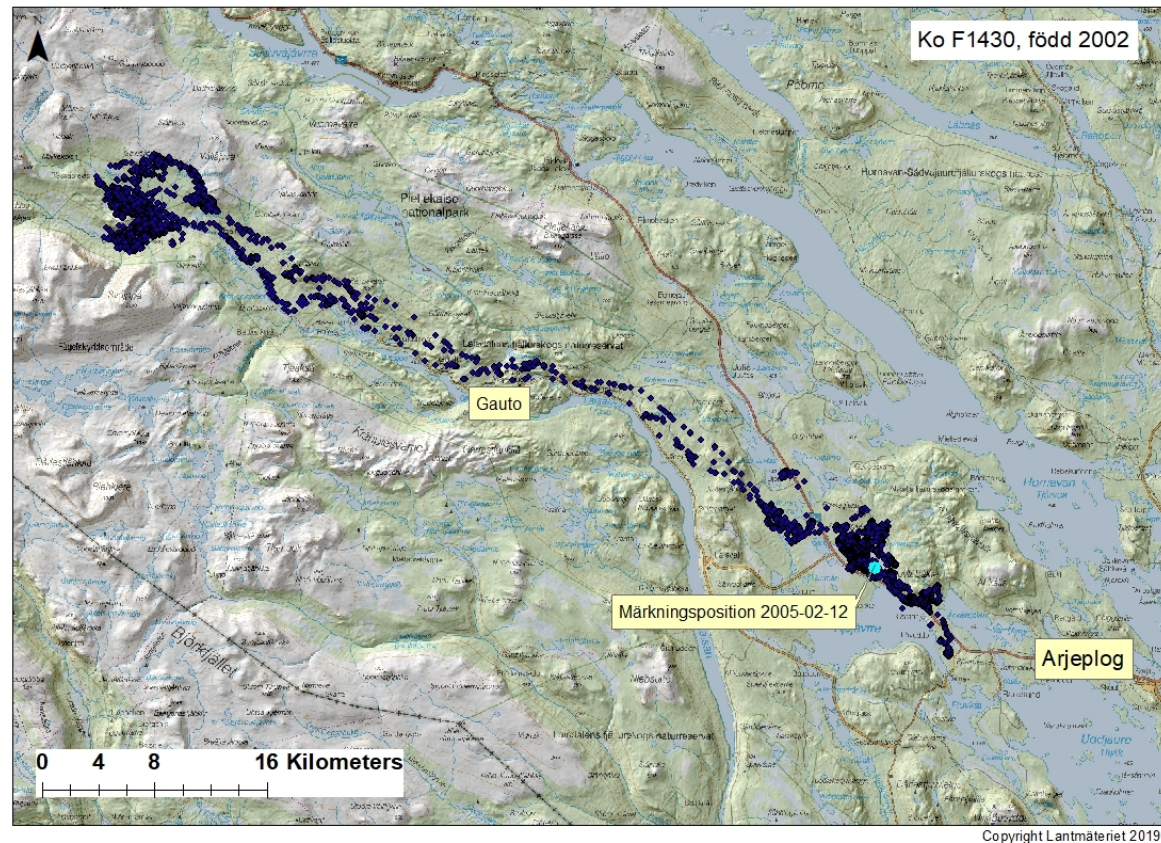




Photo: Elisabeth Lestander



# GPS 2005-2007, seasonal migration studied



SLU, Umeå Center for Wireless Remote Animal Monitoring (UC-WRAM)



- Reproduction in the area is low due to harsh conditions
- Hunters want calves to be born, and therefore prefer to shoot male moose

→ Relatively high proportion of old female moose in this region

# Results so far, moose 1

Method	Material		
	Brainstem	Brain	Retropharyngeal lymph node
Biorad TeSeE Elisa	pos	pos	neg
Biorad TeSeE Western Blot	pos		
IDEXX ELISA	pos	pos	
Immunohistochemistry	pos	pos	neg



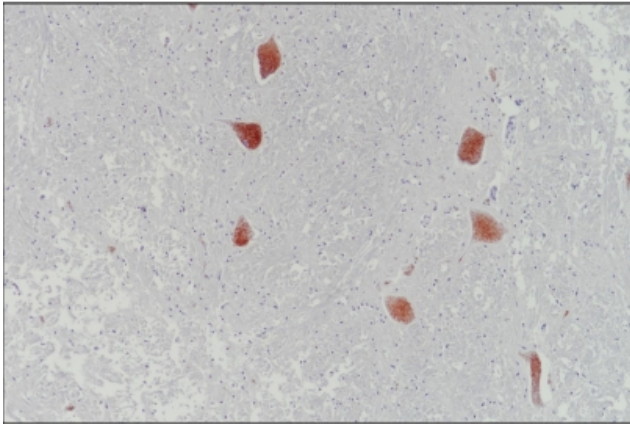
Romolo has more Western blot info

# IHC with antibody L42

Intraneuronal staining in the whole brain,  
especially in the cortical layers

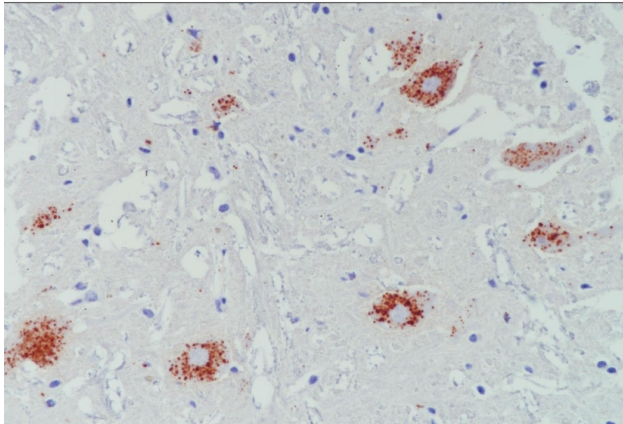
Cerebellum

V541 21 (Cerebellum pedunculi) x40



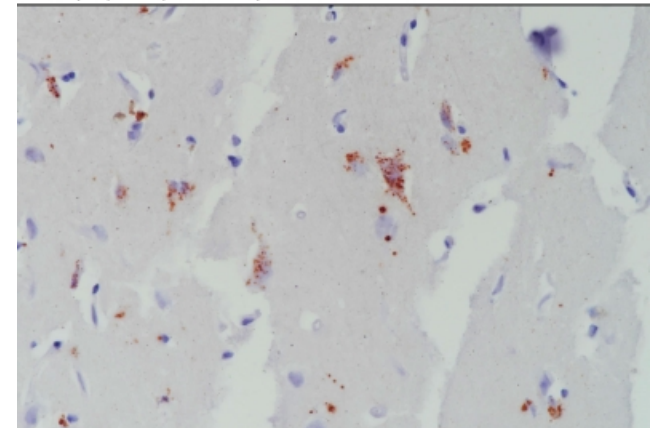
Thalamus (?)

V541 20 (Thalamus?) x40



Temporal or parietal cortex

V541 22 (temporal or parietal cortex) x40

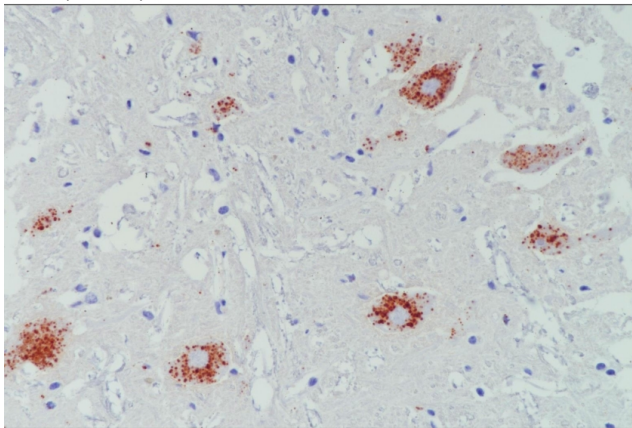


Sylvie Benestad and Linh Tran,  Veterinærinstituttet  
Norwegian Veterinary Institute

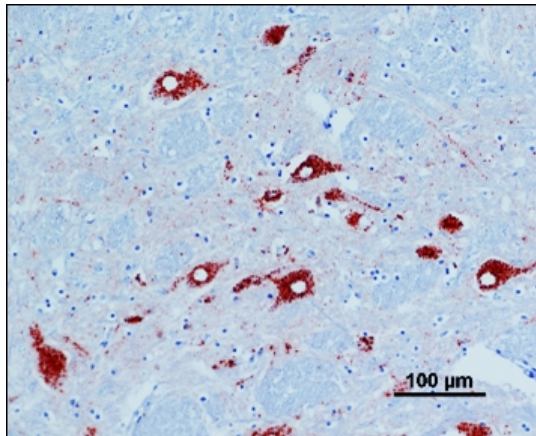


# Comparison with Norwegian moose and Norwegian reindeer

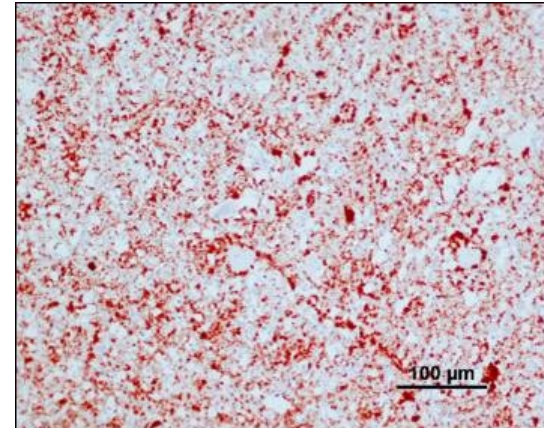
V541 20 (Thalamus?) x40



Swedish moose



Norwegian moose



Norwegian reindeer

Sylvie Benestad

# Retropharyngeal lymph node

V541 26 (Retropharyngeal Ln) x4

Swedish moose,  
no staining

Norwegian  
reindeer

Pos Reindeer Ln

Sylvie Benestad and Linh Tran

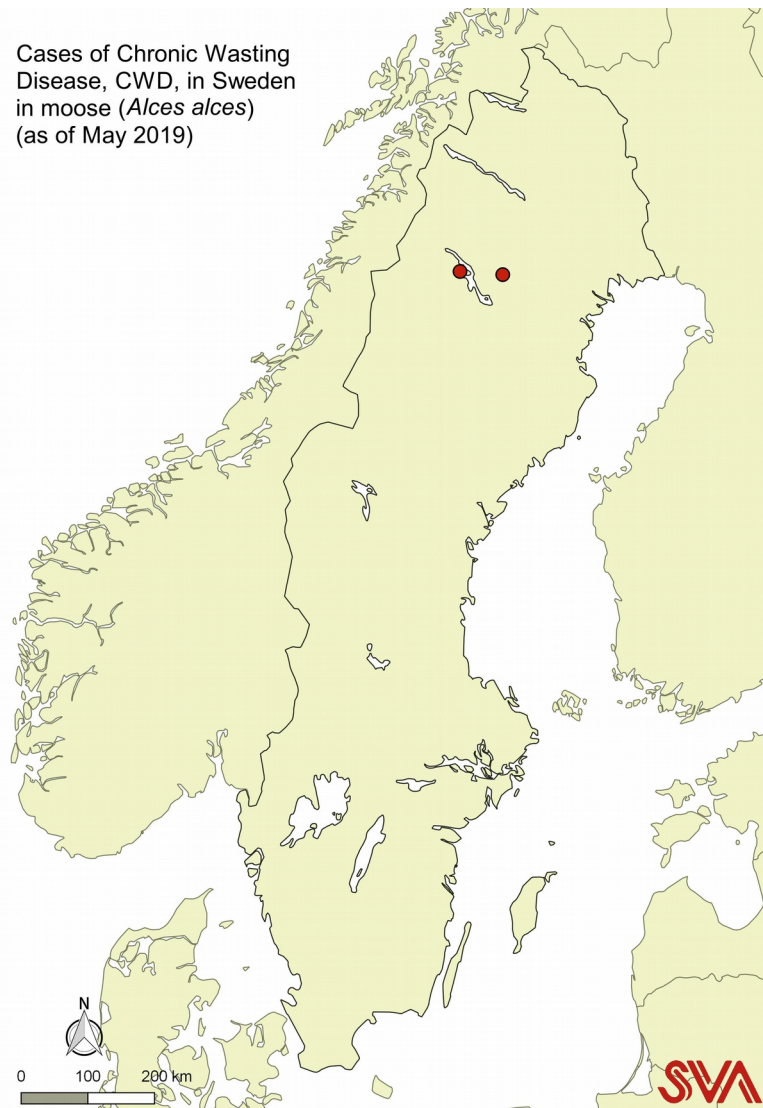
## Second case:

- 16 years old (yearly layering in teeth)
- Female
- Euthanised due to emaciation and behavioural changes.
- Sampled within ongoing surveillance programme.
- Confirmed positive May 22<sup>nd</sup> 2019

Arvidsjaur



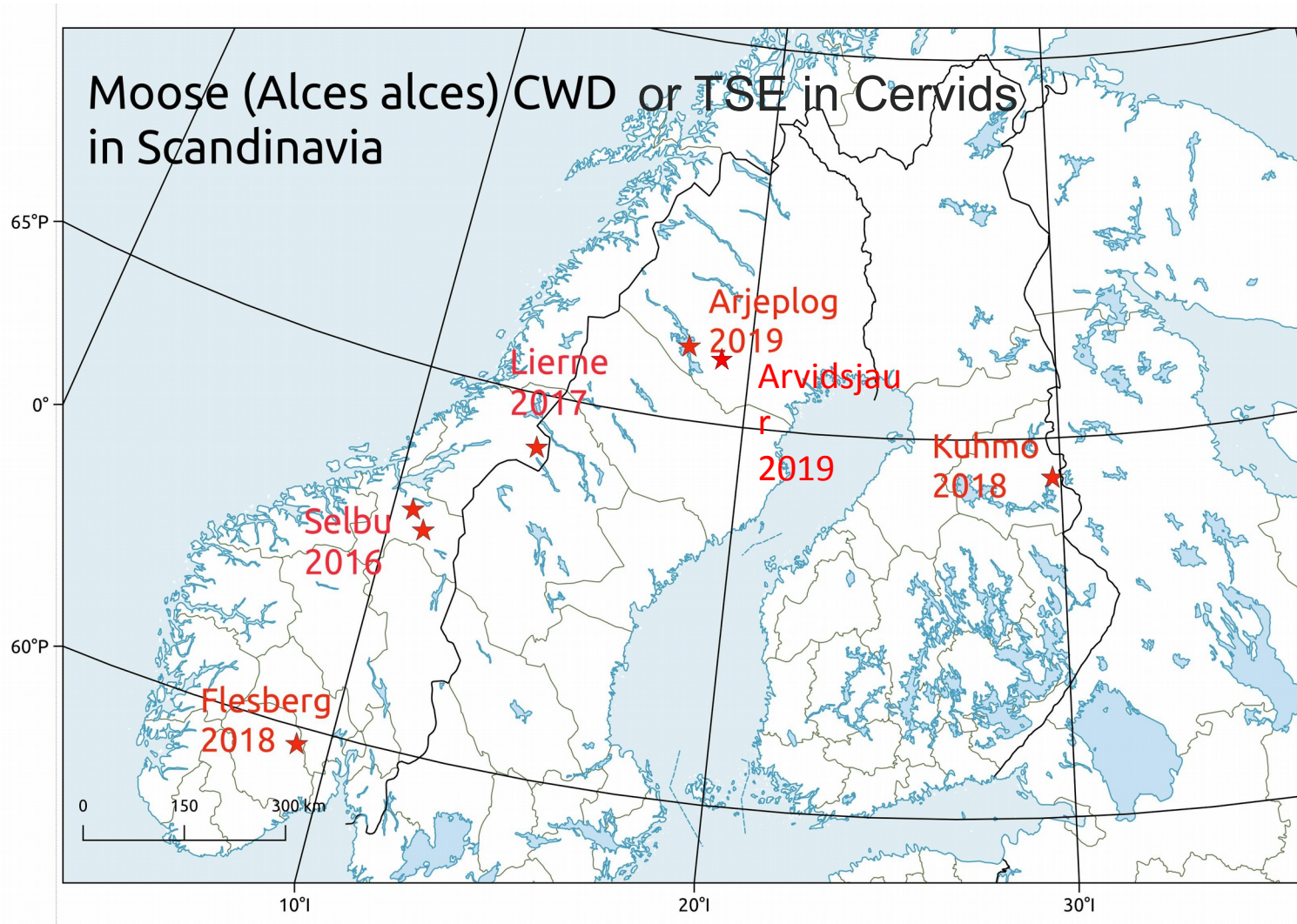




# Results so far, moose 2

Method	Material		
	Brainstem	Brain	Retropharyngeal lymph node
Biorad TeSeE Elisa	pos	pos	neg
Biorad TeSeE Western Blot	pos	pos	
IDEXX ELISA		pos	

- These two moose are similar to the 4 cases in Norway and 1 in Finland:
  - Old females
  - Positive in brainstem/brain and no detectable PrPSc in lymph node
- Prisinu et al 2018, Novel Type of Chronic Wasting Disease Detected in Moose (*Alces alces*), Norway, Emerg Infect Dis. 2018 Dec;24(12):2210-2218.
- Hypothesis has been raised that this may be a spontaneous variant in moose.



Map by Lasse Nuotio

# Swedish cases: What happens now, diagnostics?

Further analyses of the material,  
in collaboration with:

- OIE reference laboratory for CWD in Oslo, Norway
- EU reference laboratory for TSE in Italy
- Bioassays, Glenn Telling laboratory, Colorado
- Bioassays, Romolo Nonno laboratory, Rome, Italy
- Bioassays, Olivier Andreoletti laboratory, Toulouse, France



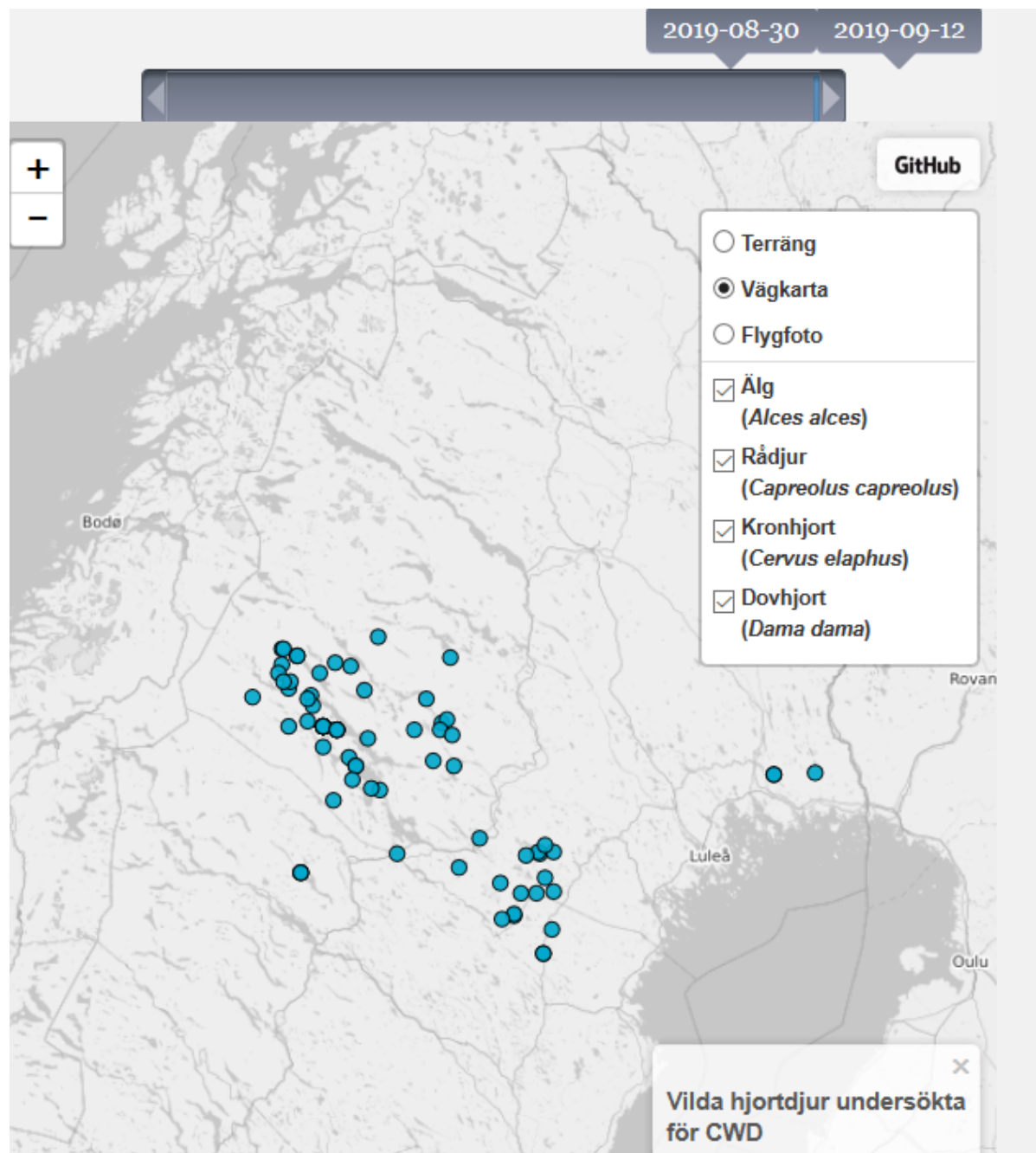
# Swedish cases: What happens now, surveillance?

With available info – chosen to wait for hunt and slaughter for sampling (no culling).

Increased surveillance in the area;

- moose – all hunted above 1 year of age in the area
- reindeer –slaughter, sampling from all semidomestic reindeer populations in the area (minimum 1480 reindeer the coming season)

As many jaws/teeth as possible collected to estimate age of sampled animals.



- The variant found in reindeer in Norway is contagious and thus threat to European cervides
- For the moose variant - we dont know yet...
- Many animals need to be sampled to support or reject hypothesis of spontaneous origin in older animals (compare atypical BSE and atypical scrapie)
- Sampling free ranging wild animals is a logistic challenge – and reindeer slaughter highly dependent on the weather
- If spontaneously occuring – likely to be present in other regions
- Zoonotic potential?

# Thanks to:

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Caroline Bröjer

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Erik Ågren

Gustav Averhed

Eva Emmoth

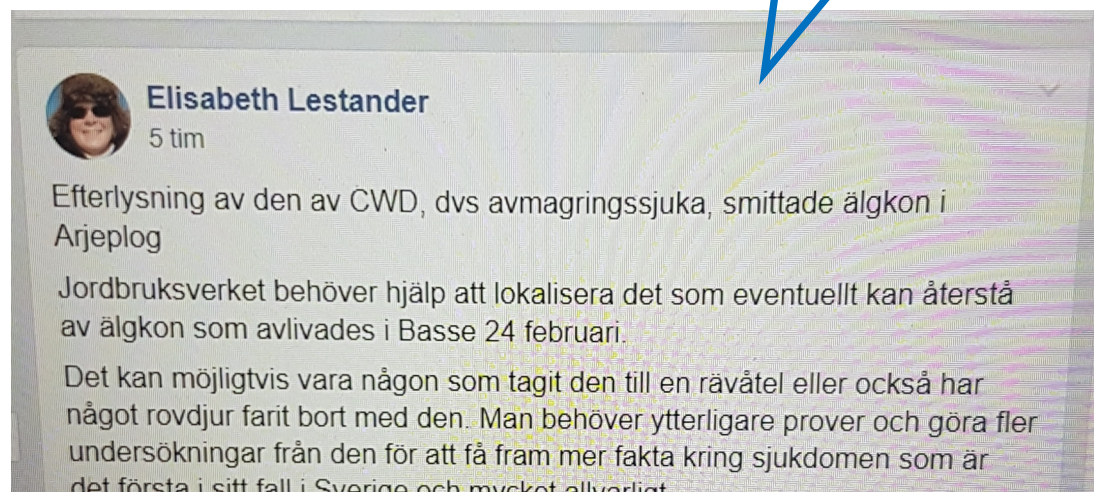
Elisabeth Lestander

In search for the moose on Facebook!



Veterinærinstituttet  
Sylvie Benestad

Linh Tran



# "We only found red snow"

