

# **BUSHTICK**

## **Changing farming, bush encroachment, and tick-borne disease risk in southern Norway**

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# BUSHTICK

- Shared cost project, 12 months
- Belgian partner:
  - Université catholique de Louvain, Centre de recherche sur la Terre et le climat Georges Lemaître
    - Medical geography, remote sensing and forest transition
    - Sophie Vanwambeke, Patrick Meyfroidt, Jasper Van doninck
- International partners:
  - Norwegian Veterinary Institute (NVI)
    - Zoonotic diseases and epidemiology
    - Solveig Jore, Edgar Brun
  - Northern Research Institute (Norut)
    - Norwegian environment and vegetation types
    - Bernt Johansen



## Context

- Bush encroachment in marginal areas of Europe
    - Decrease in agricultural land use levels and intensity
    - Decrease in grazing livestock
- « Rewilding » of landscapes





# Context

1888-2005  
Bygland, Aust-Agder

1972-2008  
Tokke, Telemark

2001-2011  
Radøy, Hordaland



Source: [www.tilbakeblikk.no](http://www.tilbakeblikk.no)





## Context

- Bush encroachment in marginal areas of Europe
  - Decrease in agricultural land use levels and intensity
  - Decrease in grazing livestock
- « Rewilding » of landscapes
  
- Ticks / tick-borne diseases increasing

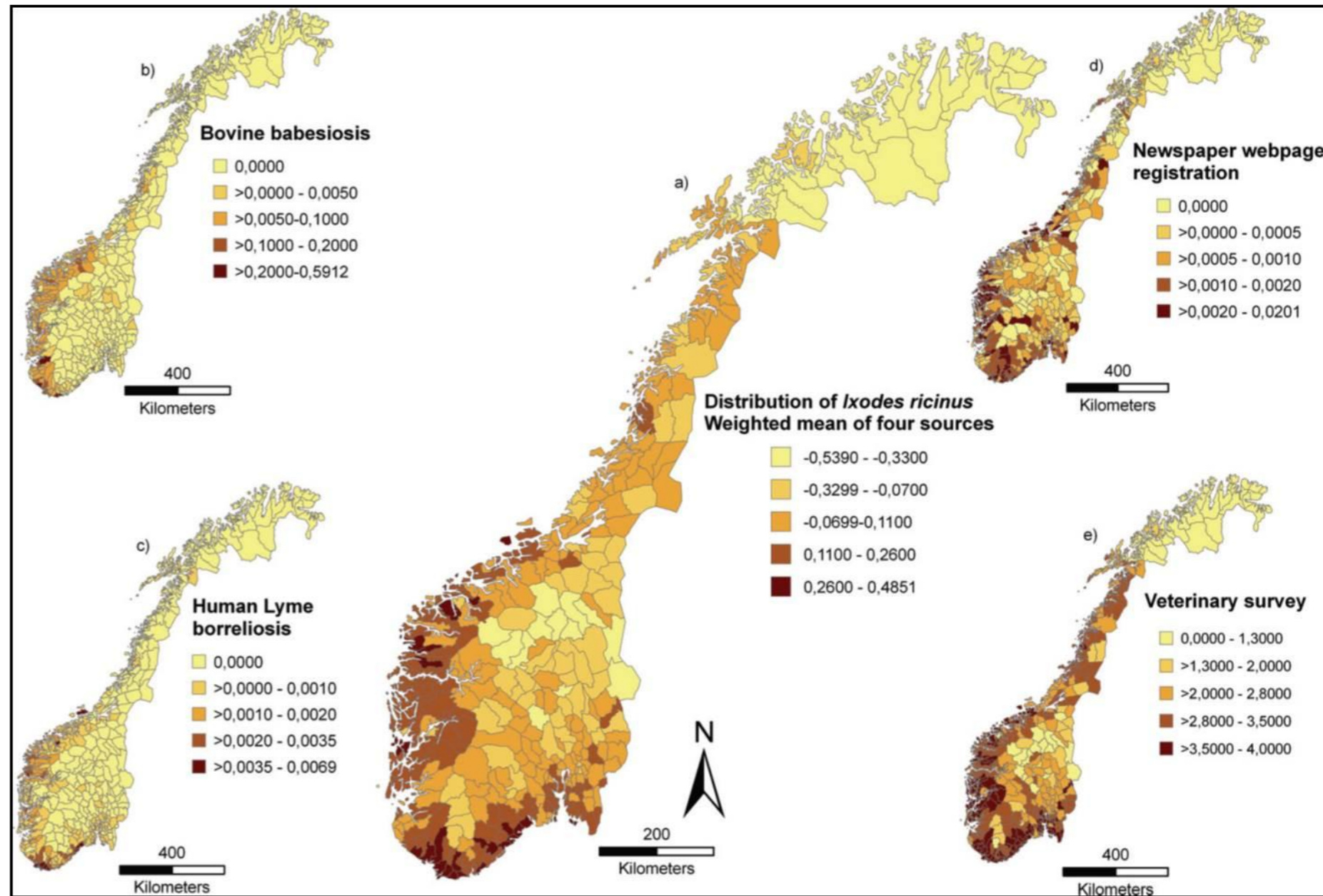


# Context

## 1935-1943



## Present (1991-2008)



Source: Jore *et al.*, *Parasites & Vectors*, 2011, 4:84

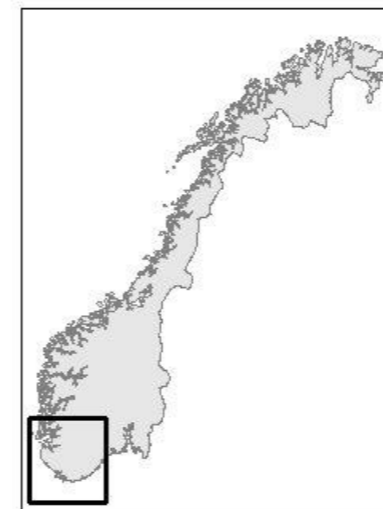


# Objectives

- Investigate the spatio-temporal dynamics of bush encroachment in southern Norway
- Investigate the relation between bush encroachment and ticks (*Ixodes ricinus*) and tick-borne disease risk.

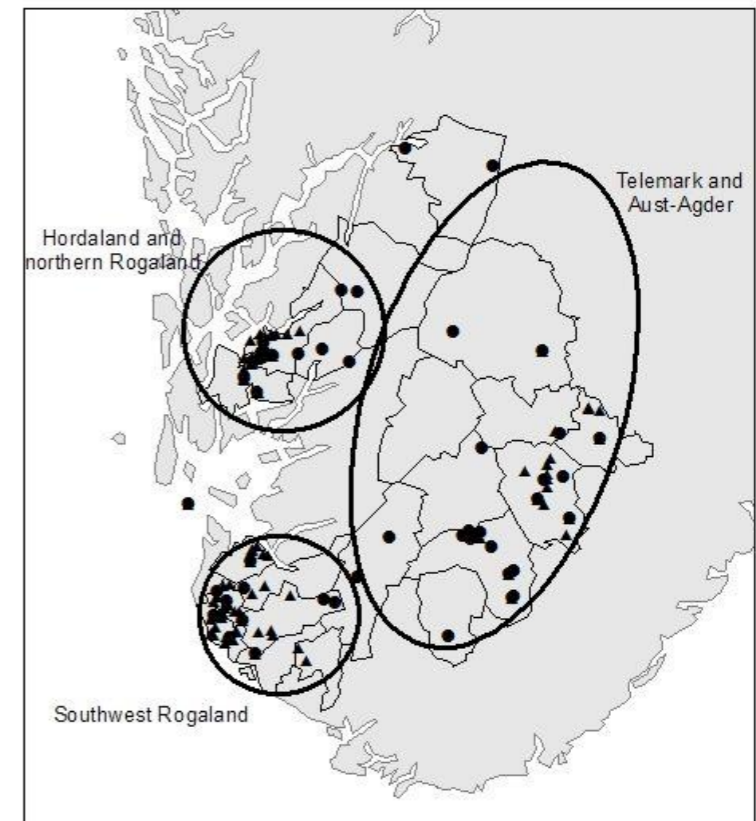
- Study sites

- Aust-Agder & Telemark (Inland)
- Rogaland (Coast)
- North Rogaland & Hordaland (Fjord)



Legend

- ▲ Farm
  - Pasture
  - Study municipalities
  - Norway
- 50 25 0 50 Kilometers

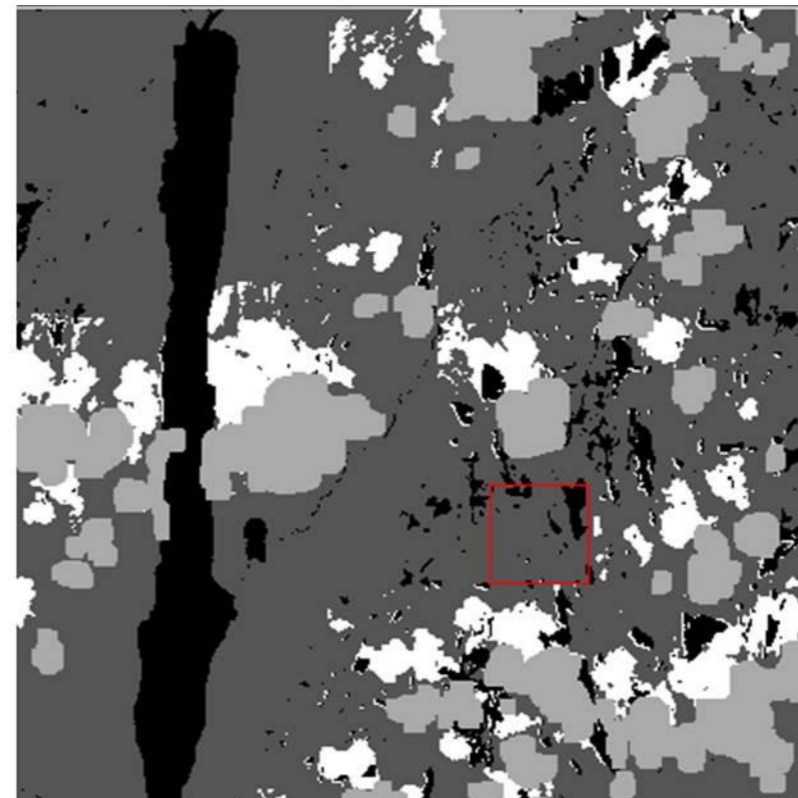
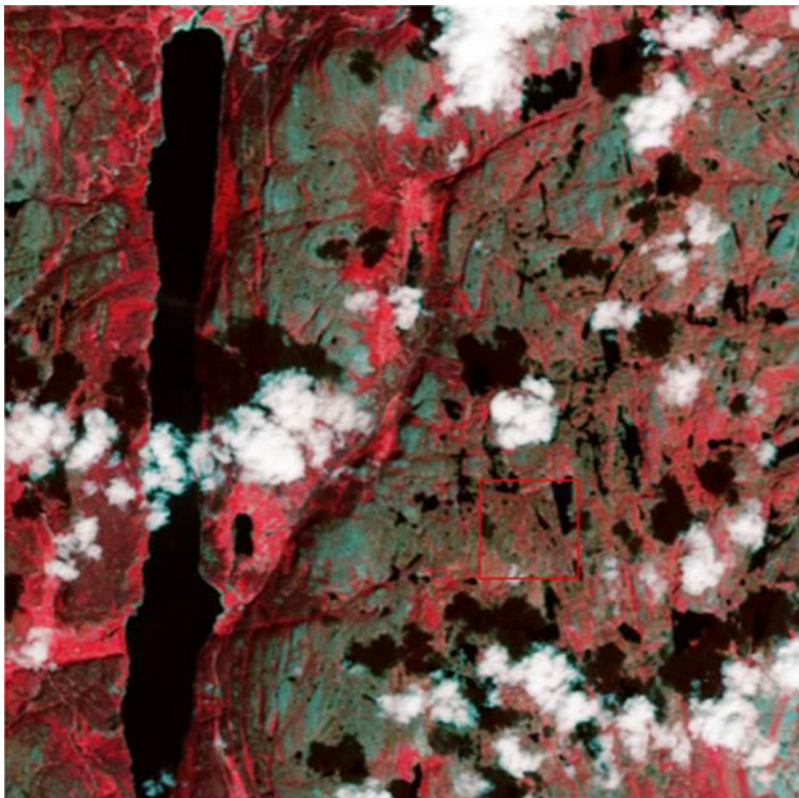






# Datasets

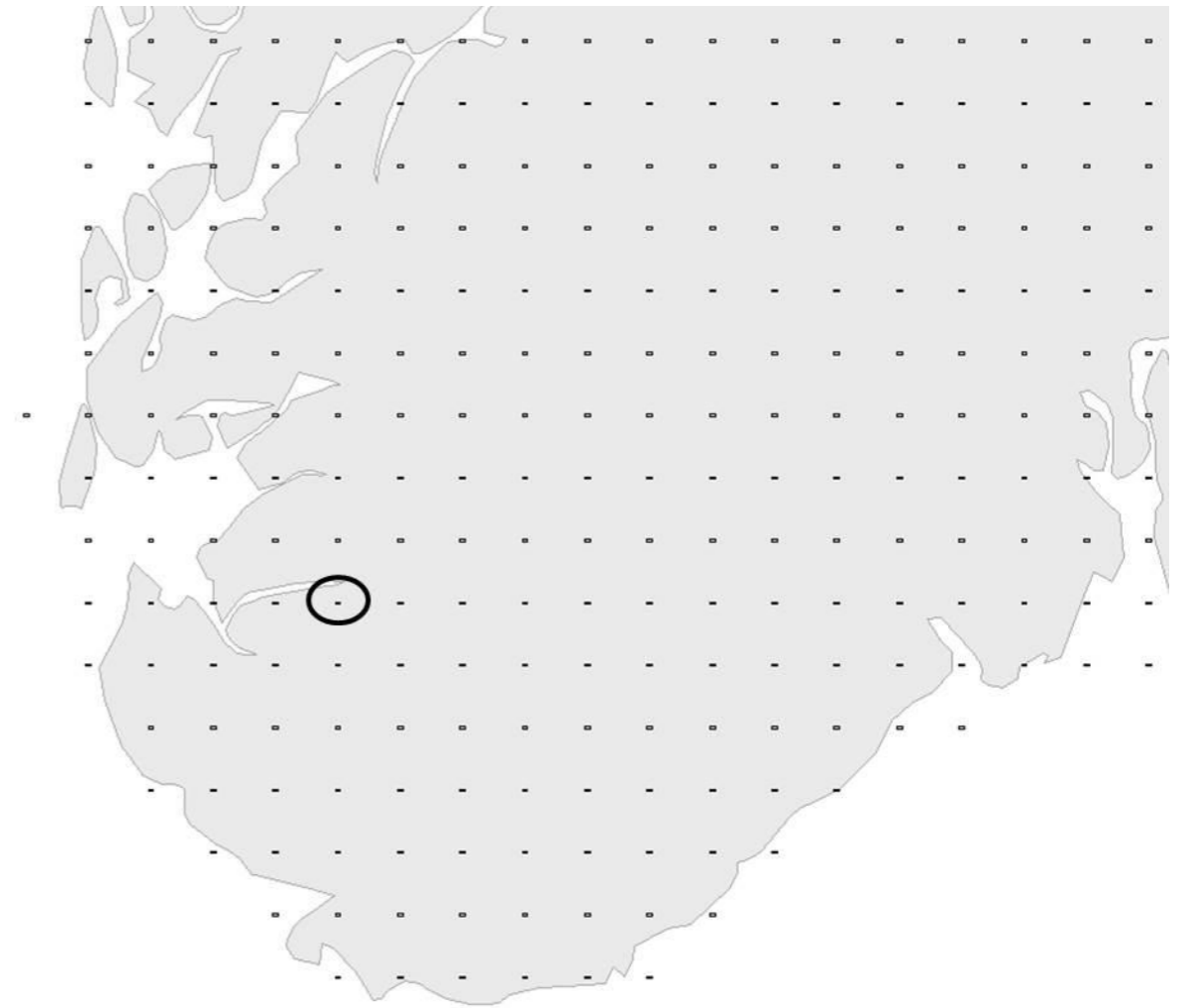
- Remote sensing data
  - Landsat TM/ETM+: 1984, 1994, 2006
    - Cloud/shadow/snow/water masking
    - Radiometric/topographic correction





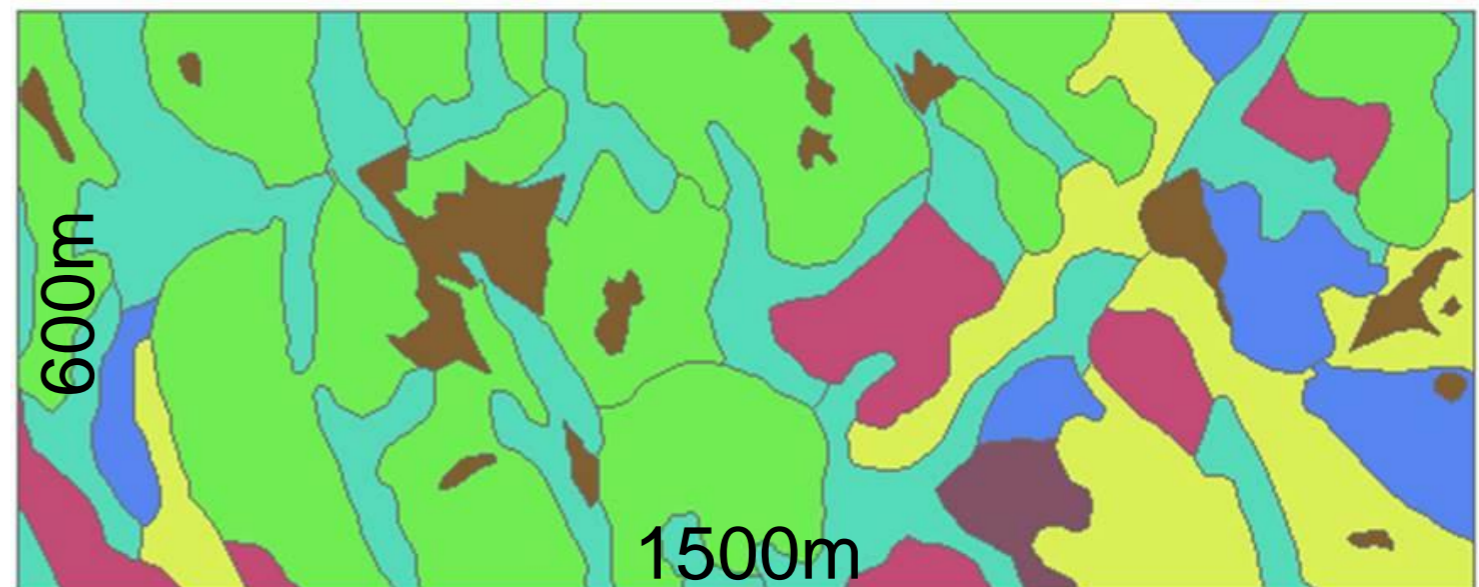


# Datasets



- Landcover data

- 1:50.000 topographic map (Kartverket)
- AR18x18 landcover classification (Skog og Landskap)







# Datasets



- Tick sampling
  - Historical (proxy) datasets
  - Sampling July, September 2013



## Expected results

- Map evolution of vegetation regrowth in southern Norway during past three decades at high spatial resolution
  - Land cover maps (hard/soft classification)
  - Land cover change maps
- Untangle complex web of interactions between environmental variables and ticks and tick-borne disease risk

**Thank you!**