



Climate health impacts, Norway

Preben Ottesen (ed.)
Dept. director
Dept. of pest control
Norwegian inst. of Public Health



Health and climate

- Extreme temperatures
 - Heat waves / milder winters
- Extreme weather events
 - Land slides, floods, storms
- Air quality and allergies
- Water quality
- Infections and toxins transmitted through foods
- Vectors and vector borne infections

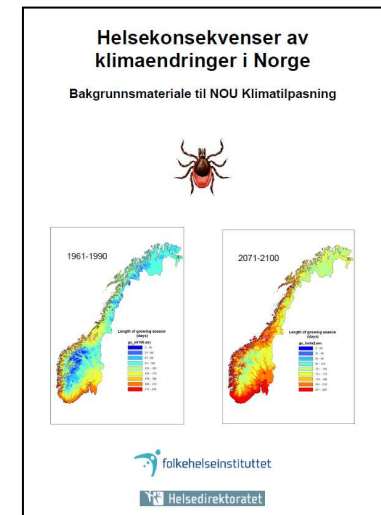
European Centre for Disease Prevention and control (ECDC)

Effects are most severe in tropical and sub-tropical areas, and in low income countries

Background report for NOU adaptation to climate change

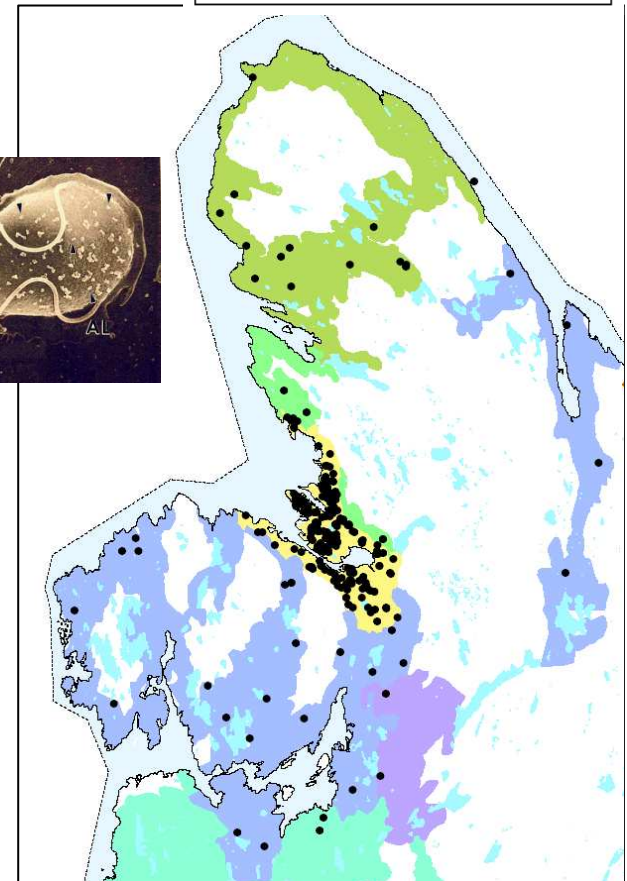
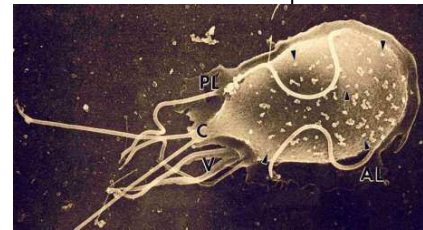
- **Employers and finance**
 - NOU Adaptation to Climate change
 - Norwegian Ministry of Health and Care Services
- **Authors, all Norw. Inst. of Public Health**
 - Jan Alexander (mould toxins in food)
 - Truls Krogh (water quality)
 - Jørgen Lassen (infections in food and vector borne infections)
 - Vidar Lund (water quality)
 - Per Nafstad (extreme temperatures and mortality)
 - Unni Cecilie Nygaard (air quality and allergy)
 - Preben Ottesen (vectors)
 - Per Schwarze (air quality and allergy)
 - Hans Utkilen (water quality)
 - Geir Aamodt (land slides, storms, floods)

See the report at www.fhi.no/dokumenter/80c514cad4.pdf



First Norwegian case of water borne giardia, Bergen 2004

- After a period of much rain, flooding of sewage.
- Svartediket was the source
- Map of giardiasis cases in Bergen 1/9 to 1/12 and water sources (colored)

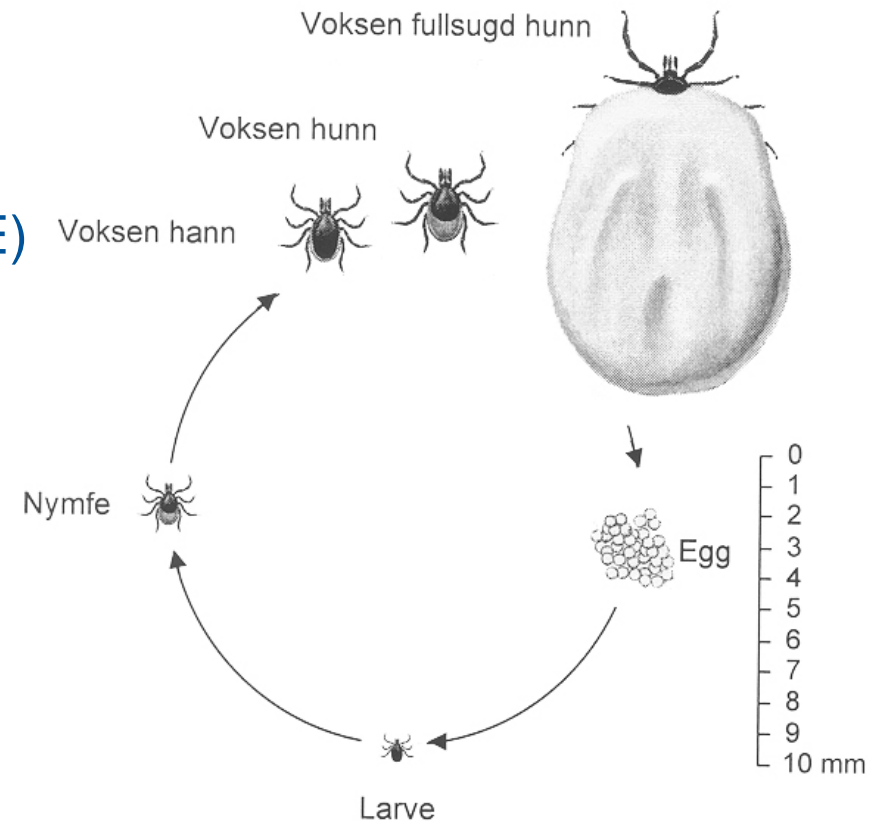


Infections and toxins through food

- Salmonellosis is a "summer disease"
- Campylobacter and extended summer season
- Mould toxins in food
- Probably a small increase in
 - Shigella
 - Salmonella – typhoid group
 - E. coli
 - Listeria
 - Acute viral intestinal infections

The Sheep tick *Ixodes ricinus*

- Diseases:
 - Borreliosis
 - Tick borne encephalitis (TBE)
 - Anaplasmosis
 - Tularemia
 - Babesiosis
 - Rickettsia
 - More animal diseases



Distribution of the Sheep Tick

Correlated with 170 – 180 days > 5 °C

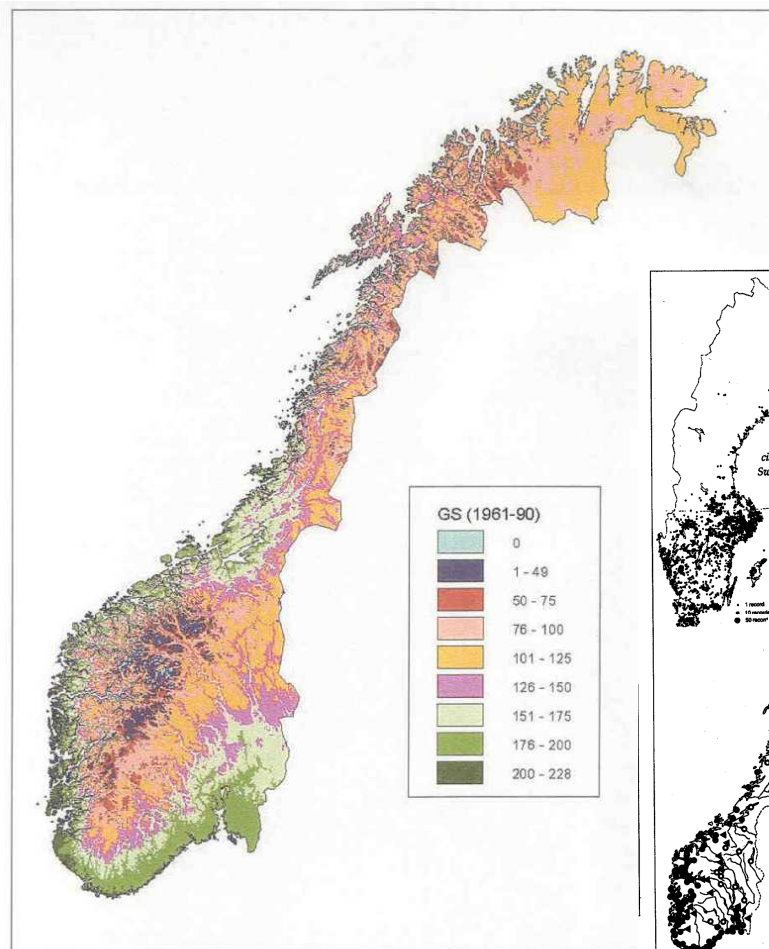
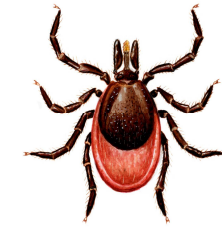
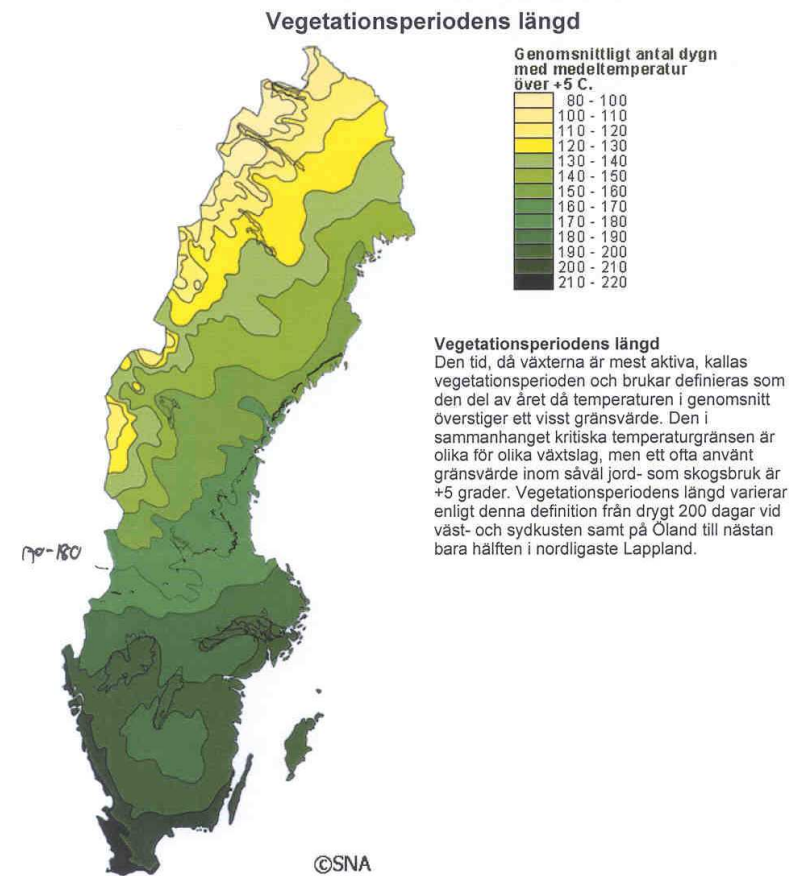
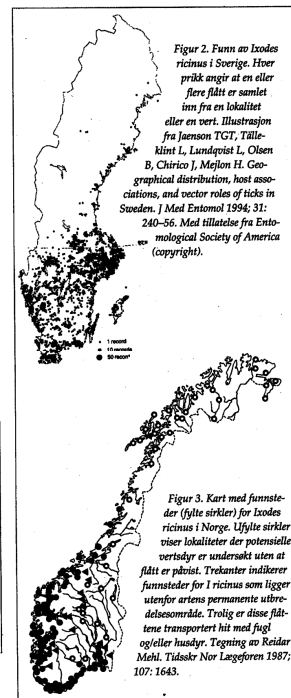


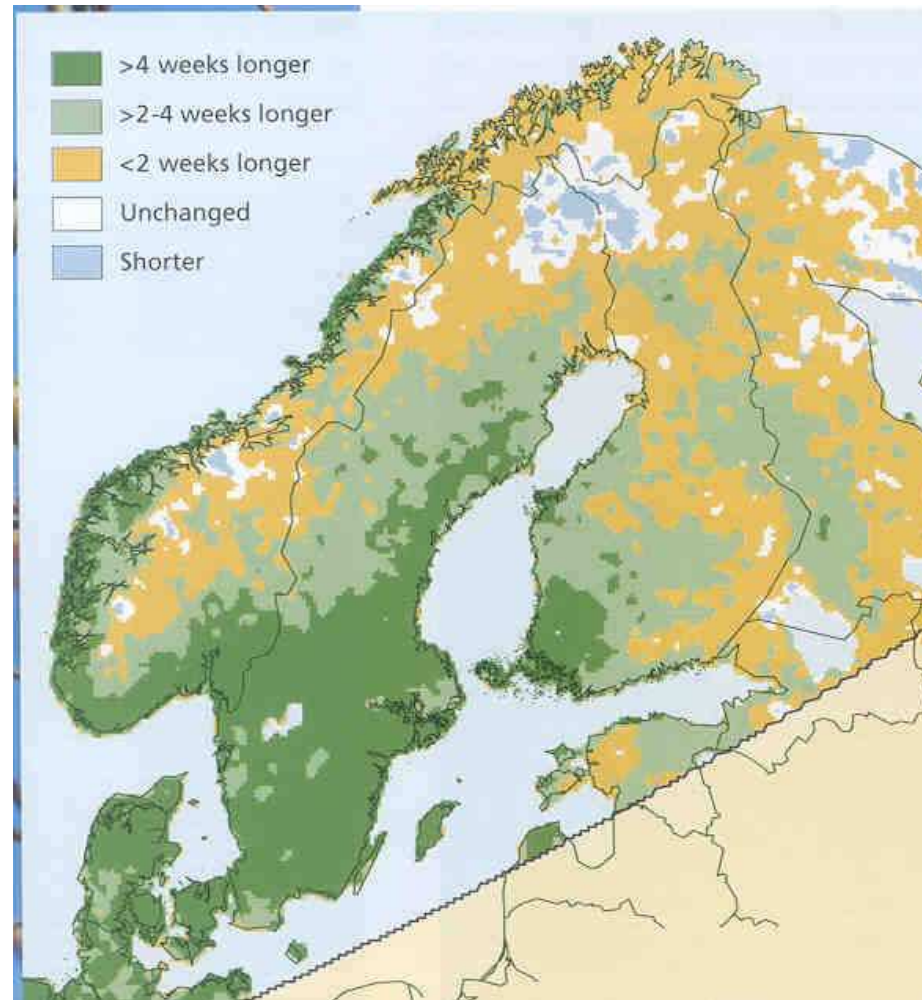
Figure 4.1 The length of the growing season for the normal period 1961-1990.



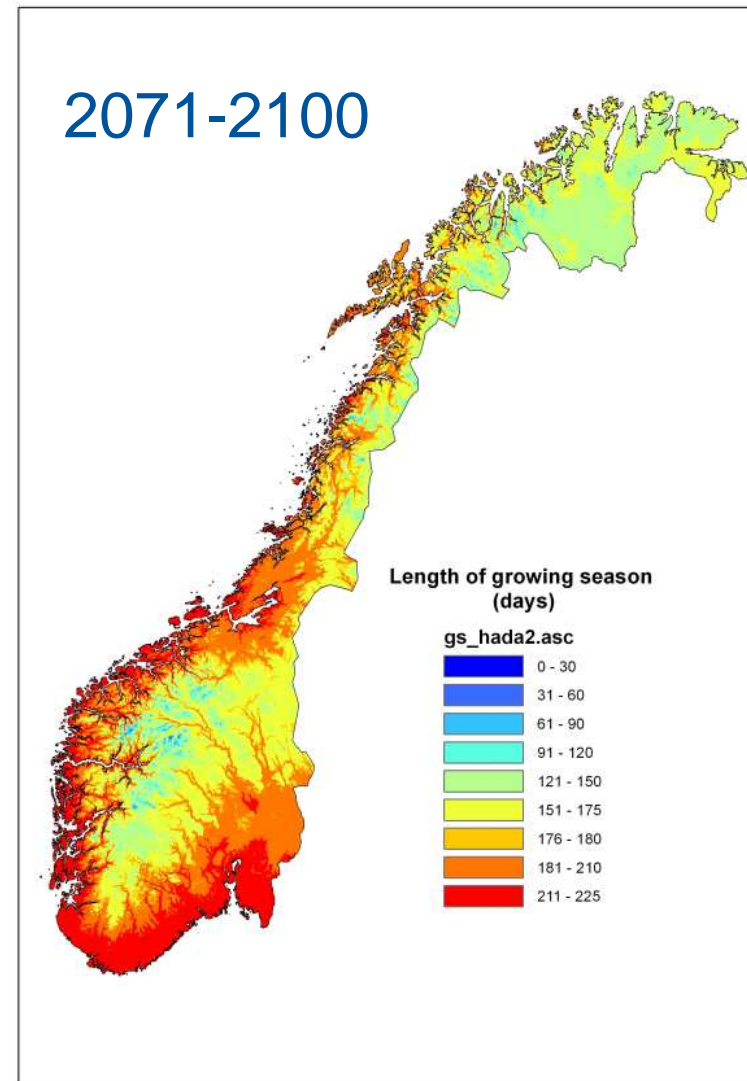
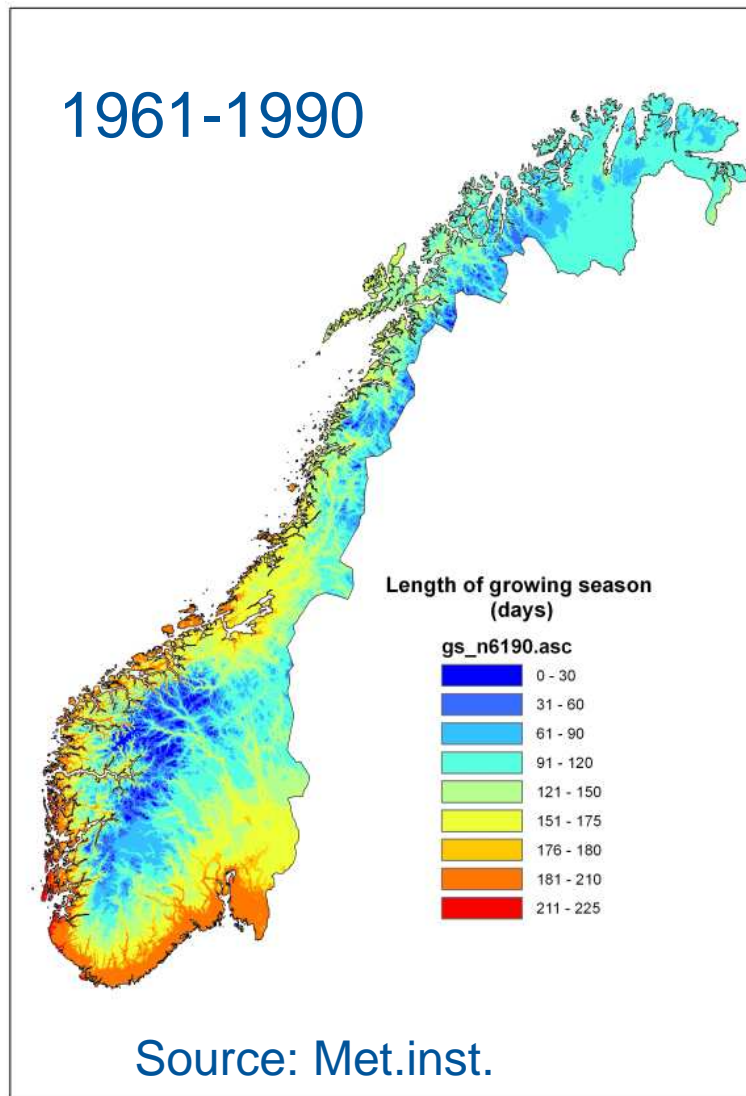
Change in growing season 1982 - 1999

- Vegetation index, satellite data
- Measure photosynthetic activity

(Source: Norut, Høgda et al. 2001)

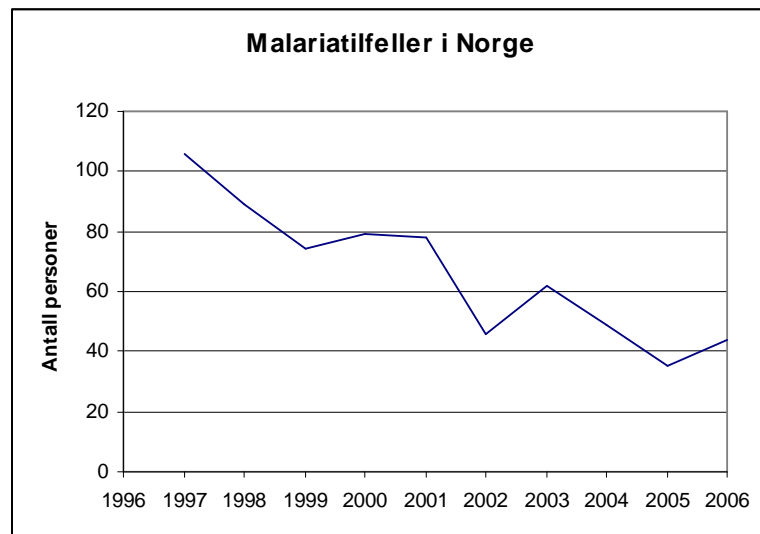


Change in growing season, daily average $> 5^{\circ}\text{C}$

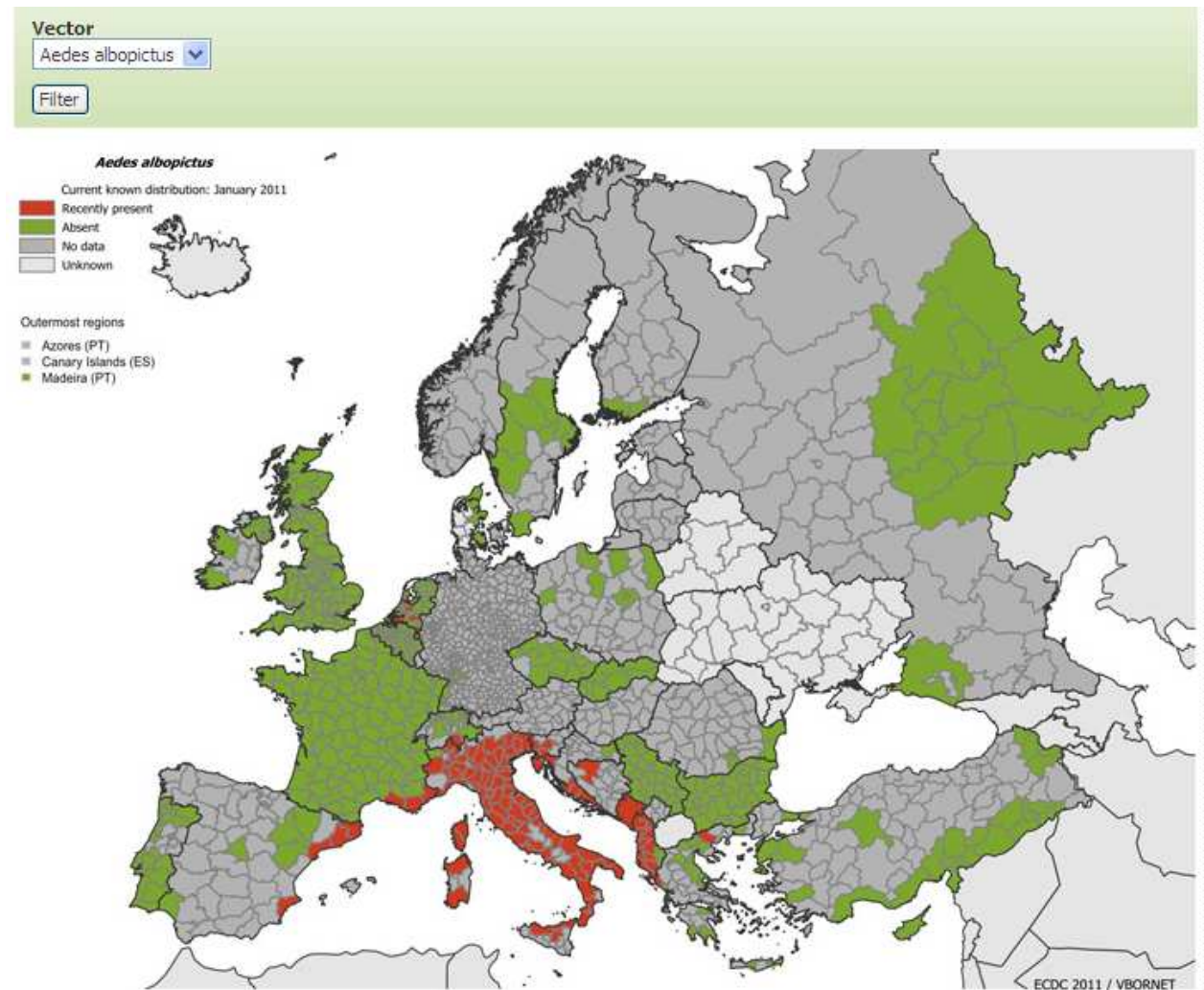


Mosquito borne diseases

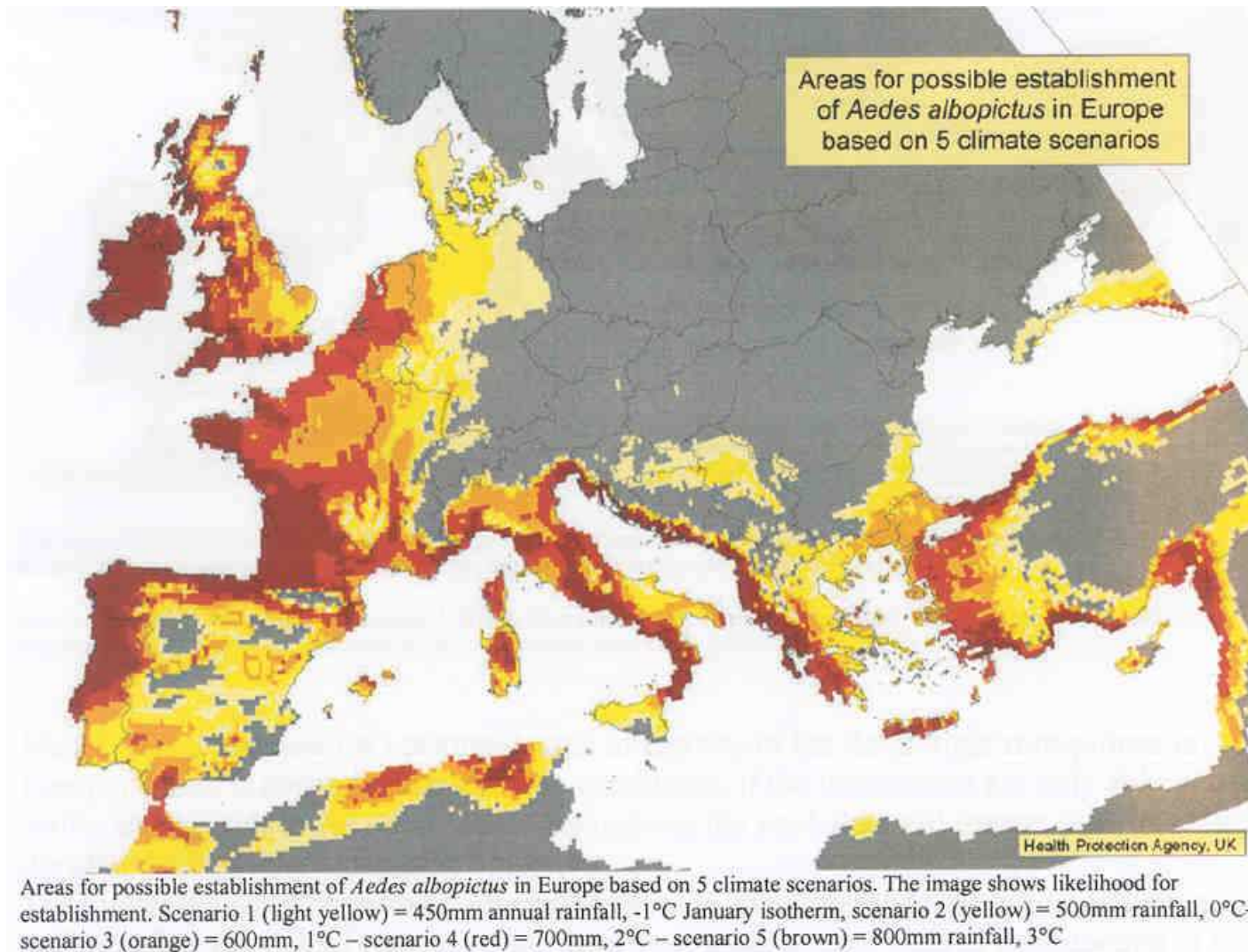
- Malaria (*Anopheles* spp.)
- West Nile fever (*Culex* spp.)
- Various virus diseases (*Aedes albopictus*)



Asian tiger mosquito – distribution January 2011 (VBORNET)

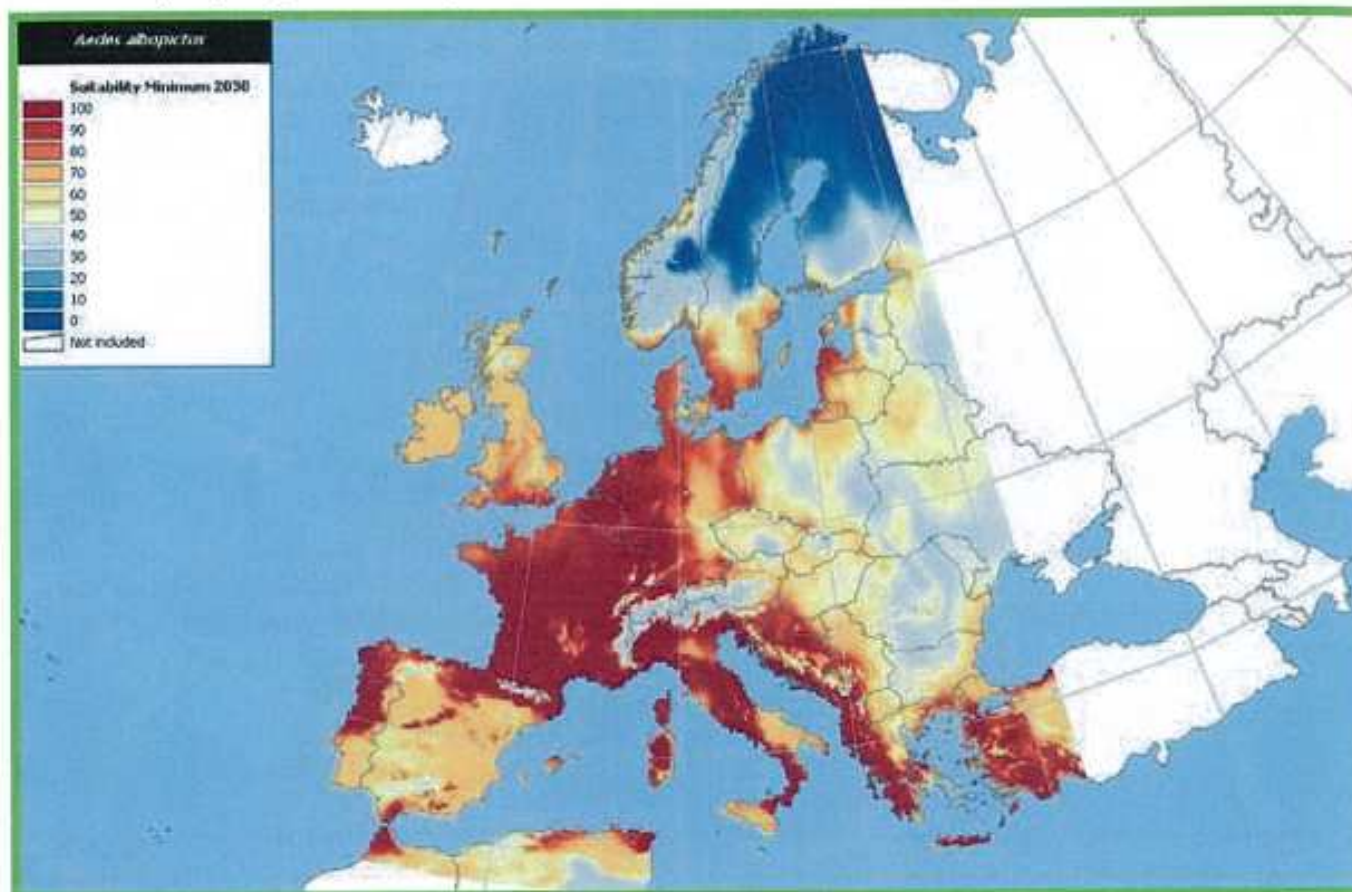


Potential distribution, five climate scenarios

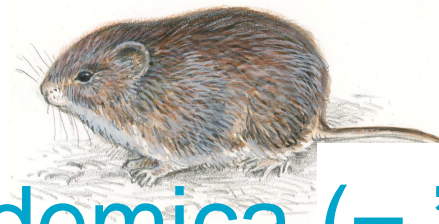


Minimal impact: long-term change scenario

Figure 7b (i). Prospective impact of climate change on *Aedes albopictus* distribution in Europe: minimal impact, long-term change scenario

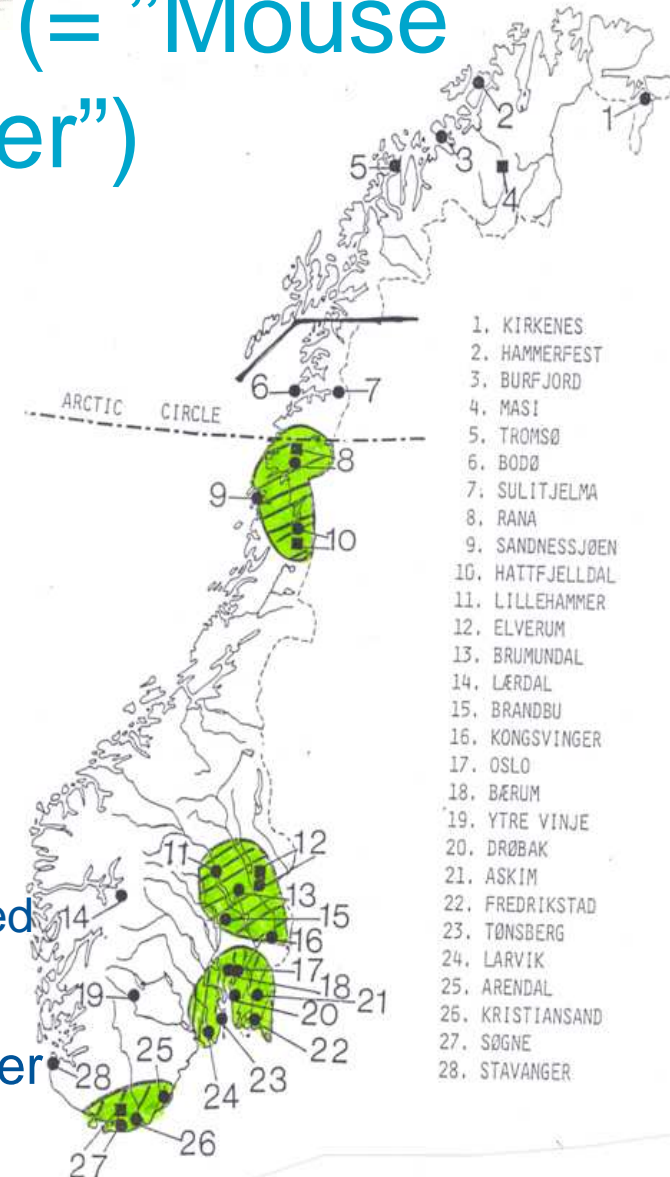


The minimal impact long-term projections for 2030 show a shift. While the central European zone (as described above) clearly extends in all directions and reaches as far as the Baltic states and even encompasses large parts of southern Sweden, the Balkan zone shrinks, with parts of Romania and Bulgaria now becoming unsuitable.



Nephropathia epidemica (= "Mouse plague", "vole fever")

- A type of viral haemorrhagic fever with renal syndrome (HFRS)
- Caused by the Puumala virus.
- The incubation period is three weeks
- Vector is bank vole (*Myodes glareolus*; formerly *Clethrionomys glareolus*)
- Red-backed vole, *M. rutilus*?
- Mostly in peak years of small rodents
- Mostly in the period September to April
 - When voles are inside, or fire wood is used
- Infects through secrets or excretes
- Probably no infections from drinking water



Swimmers itch, Cercarial dermatitis

- A digenetic fluke (Trematoda)
- Related to *Schistosoma* (Bilharzia)
- Spread across all Europe during the last decades
- All Norway north to Troms
- Main host in birds
- Snails are intermediate hosts
- The cercaria needs $> 20\text{ }^{\circ}\text{C}$ to attack

