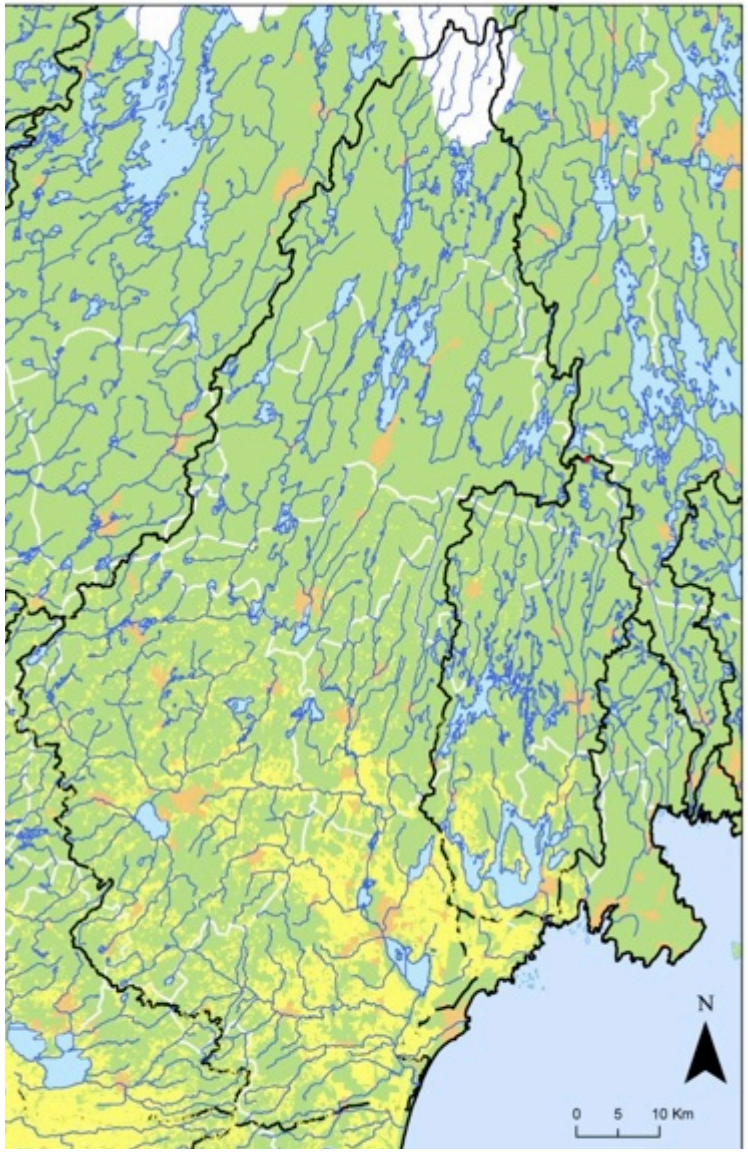
BRUNARE VATTEN

– i Möckeln, Helge å och i världen

Emma Kritzberg
Enheten för Akvatisk Ekologi
Biologiska institutionen

LUNDS UNIVERSITET

Brunt vatten
– en naturlig del av landskapet



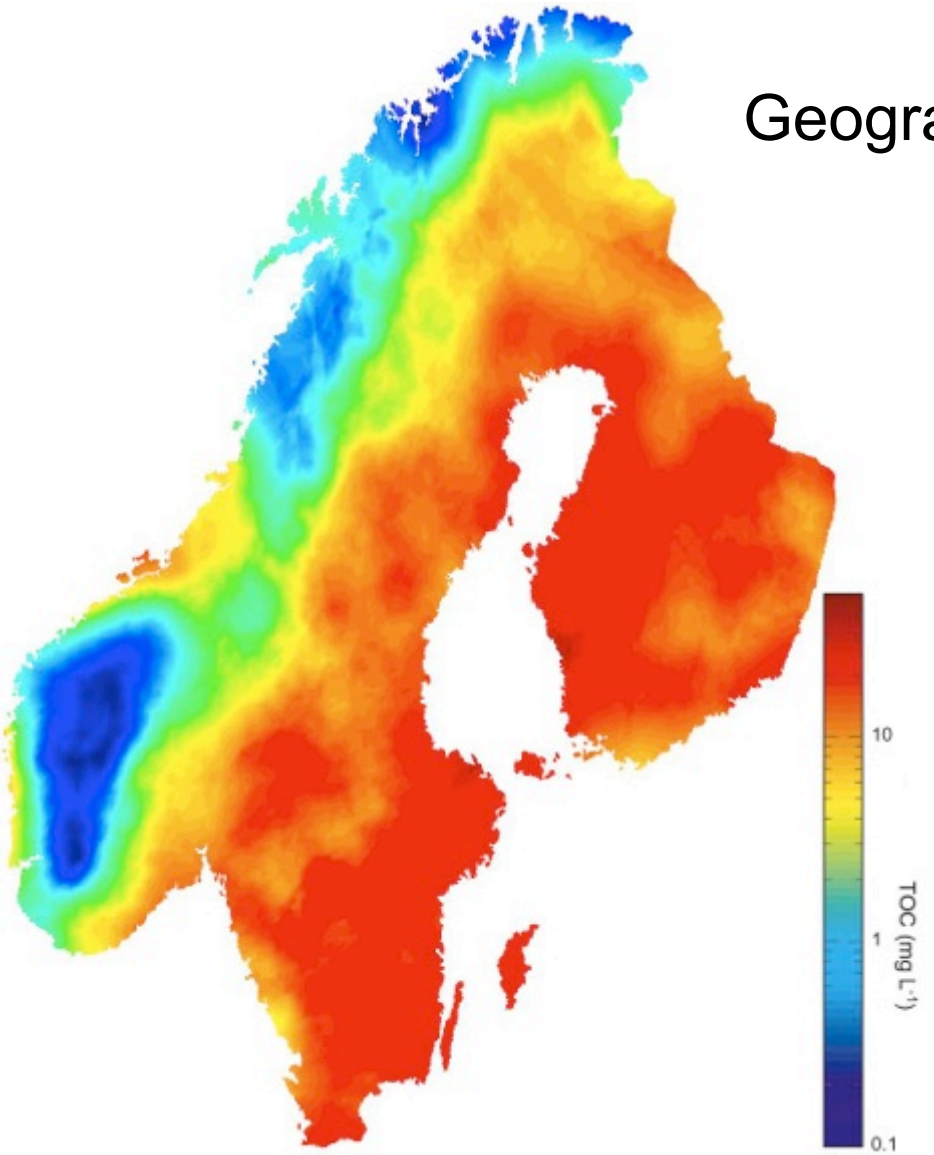
Myrmark

Skogsbygd

Brunt vatten
– en naturlig del av landskapet

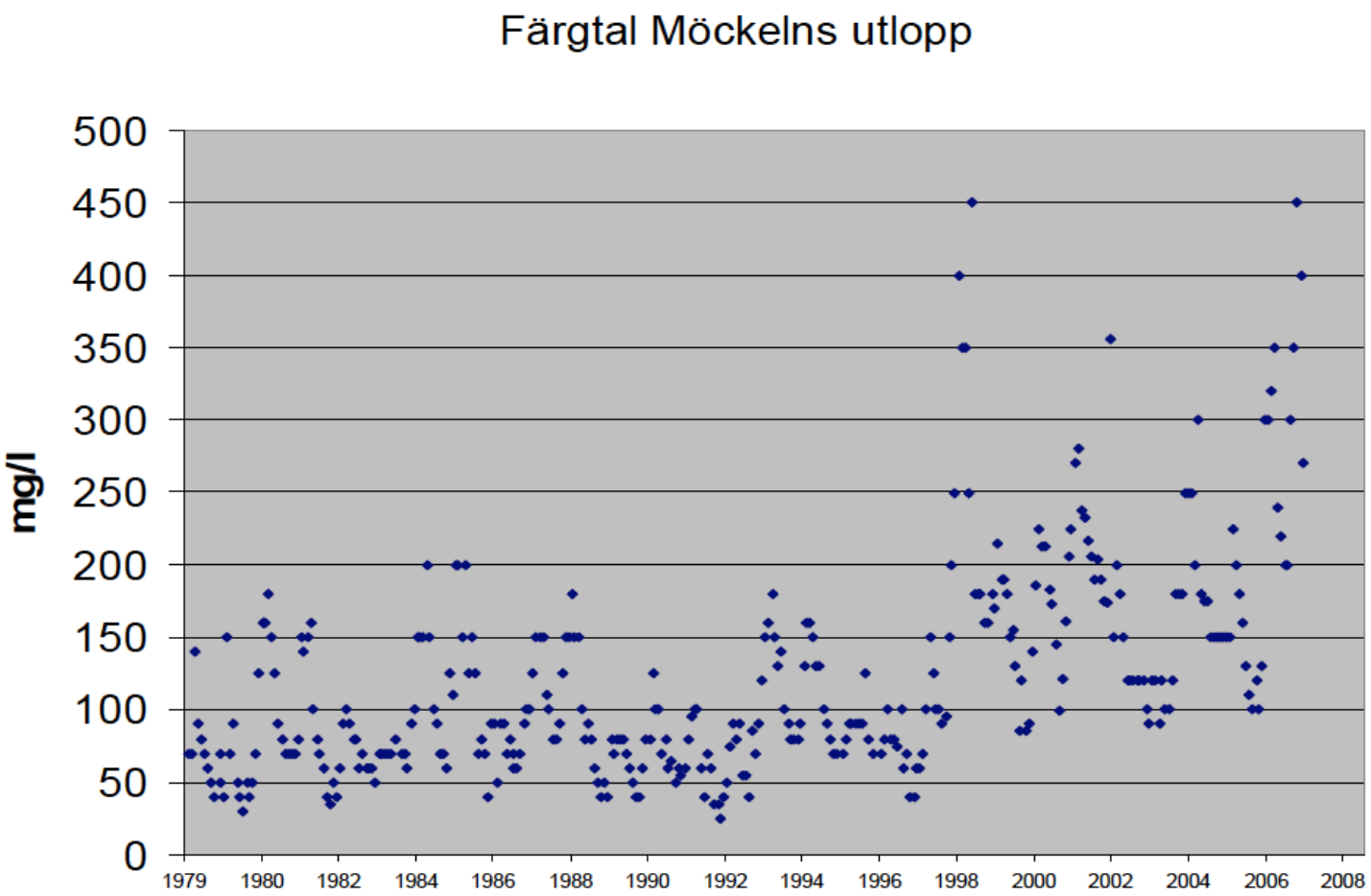
→ Organiskt material
– humus

→ Järn

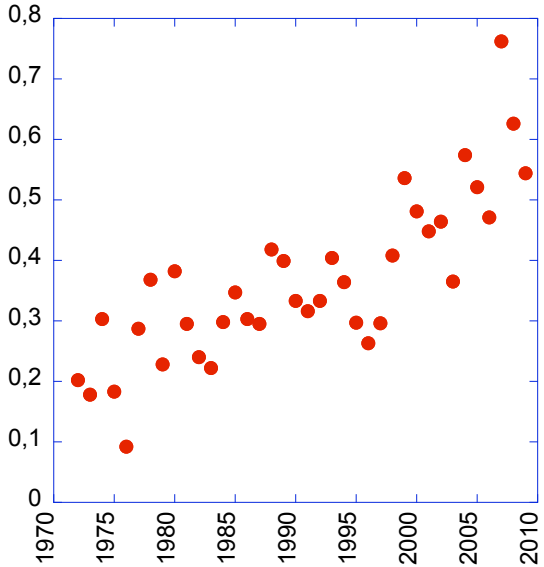


Geografiska skillnader i mängden organiskt material

Möckeln

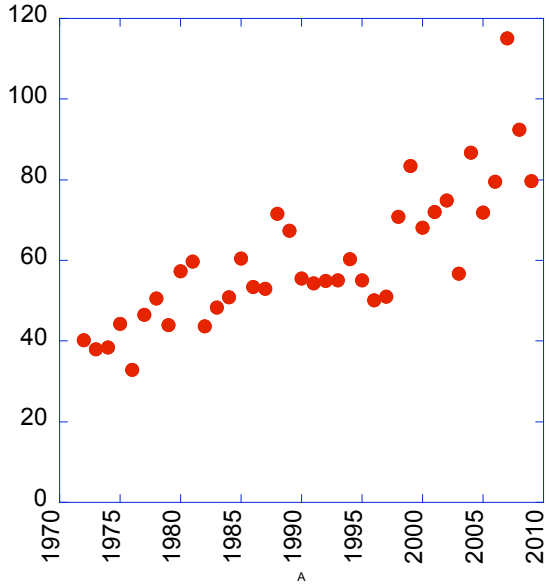

Färgtal Möckelns utlopp
mg/l
500
450
400
350
300
250
200
150
100
50
0
1979
1980
1982
1984
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008

Vattenfärg



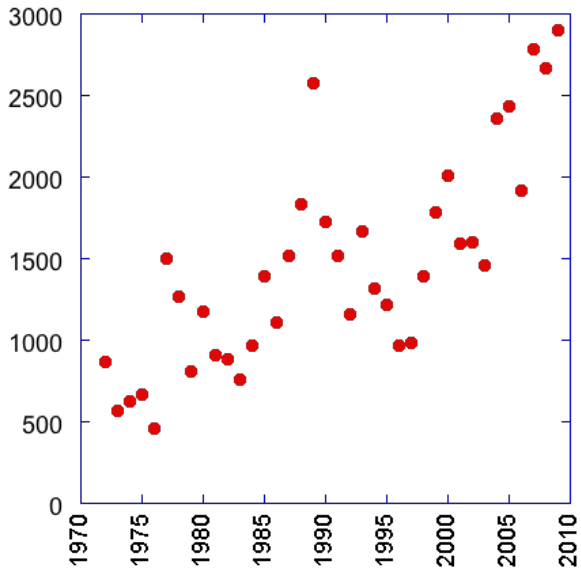
200 %

Organiskt material

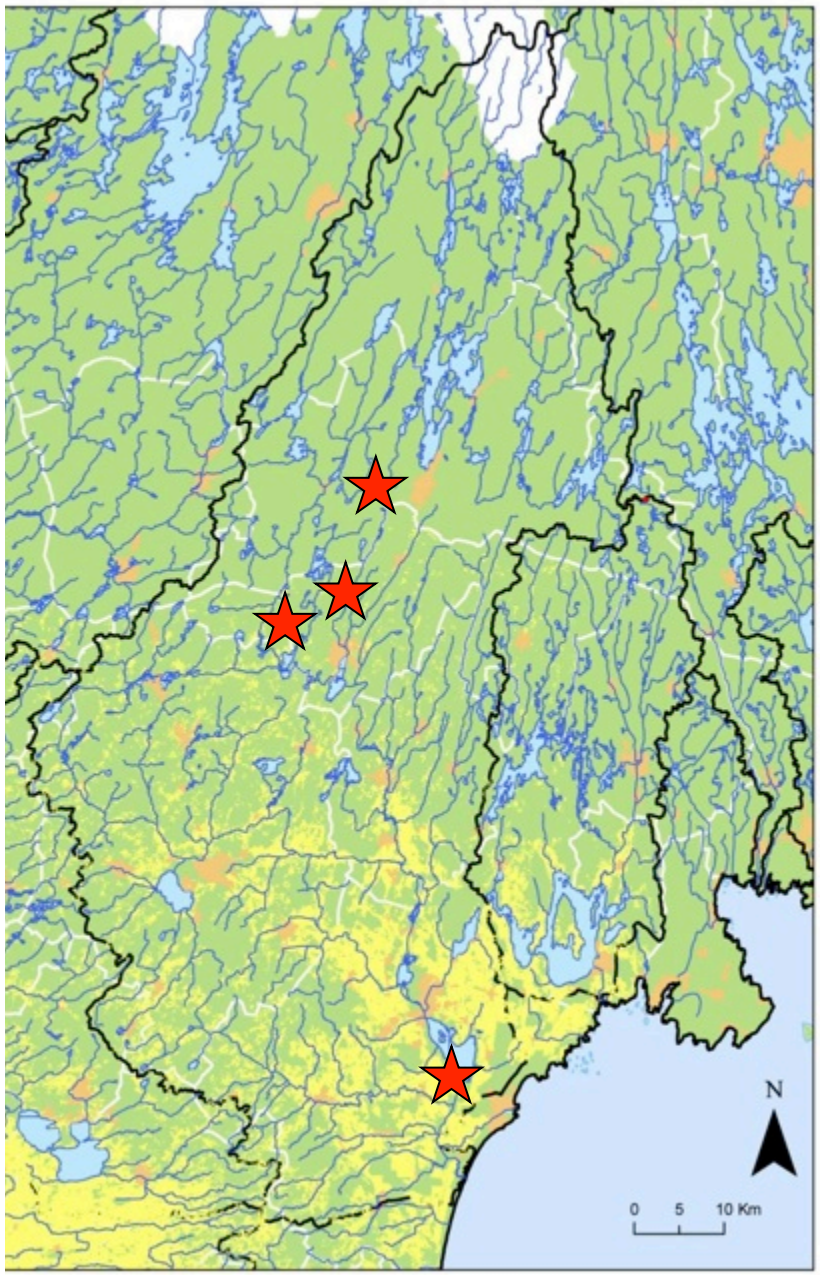


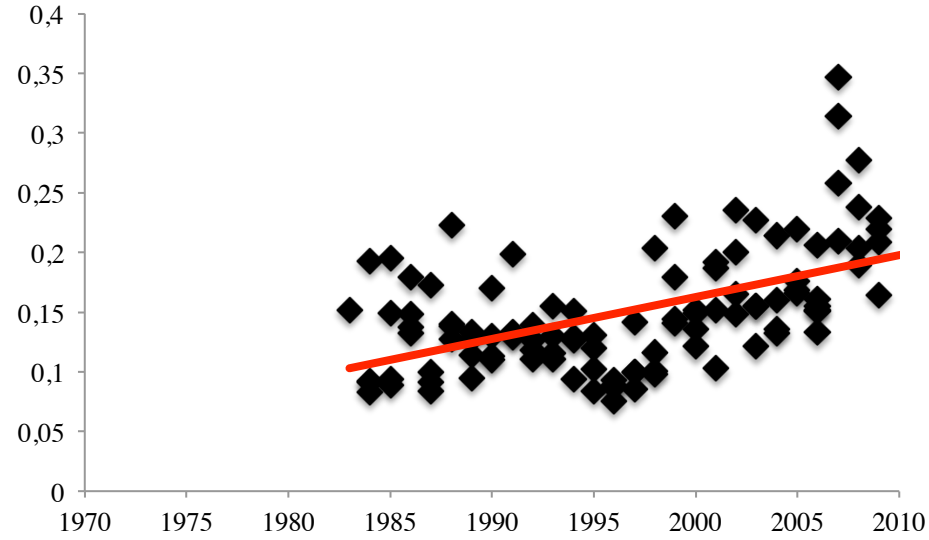
120 %

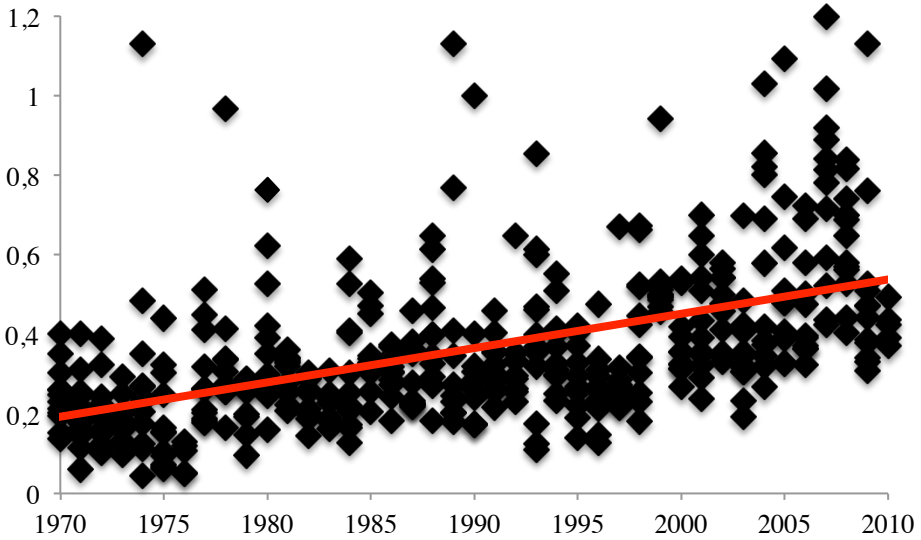
Järn



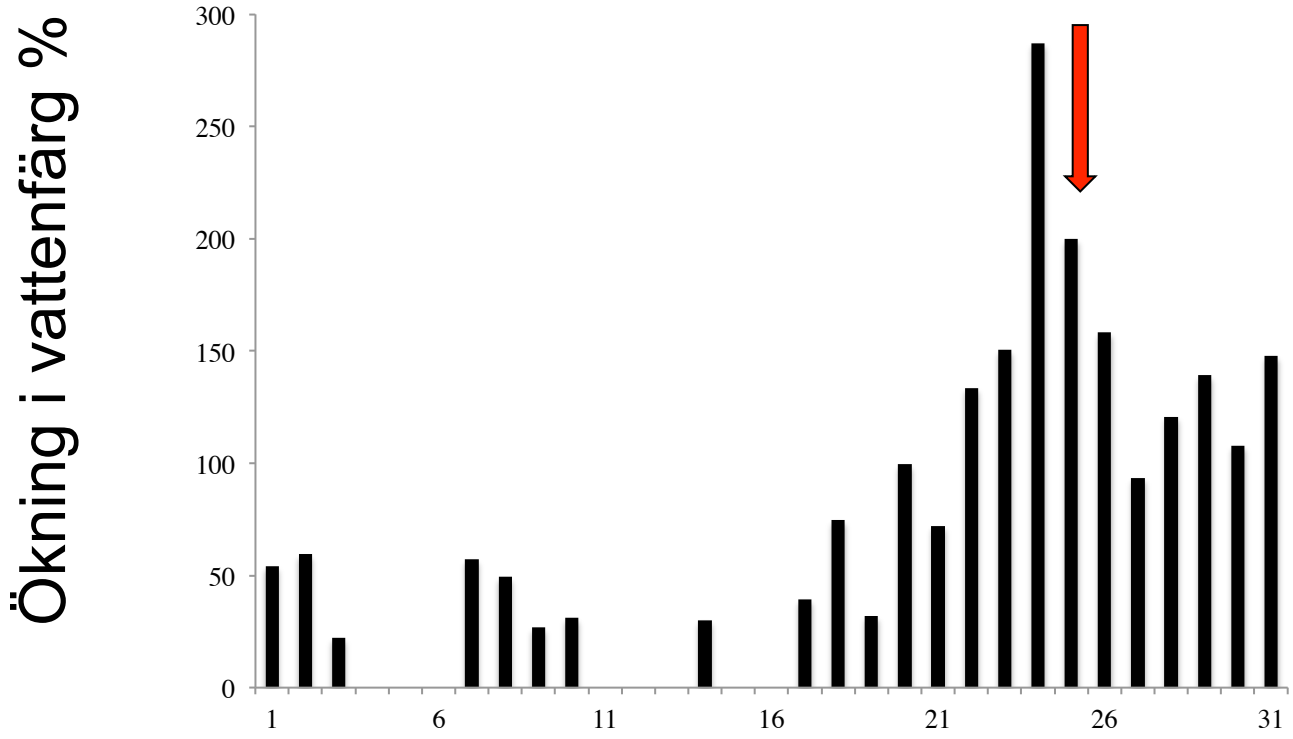
230 %


N
0 5 10 Km


0,4
0,35
0,3
0,25
0,2
0,15
0,1
0,05
0
1970
1975
1980
1985
1990
1995
2000
2005
2010


1,2
1
0,8
0,6
0,4
0,2
0
1970
1975
1980
1985
1990
1995
2000
2005
2010

Brunifiering i Sverige
1972 - 2009



Kritzberg & Ekström 2012 Biogeosciences

Brunifiering på norra halvklotet

Norge (Hongve et al. 2004; De Wit et al. 2007; Haaland et al. 2010)

Finland (Vuorenmaa et al. 2006; Lepisto et al. 2008)

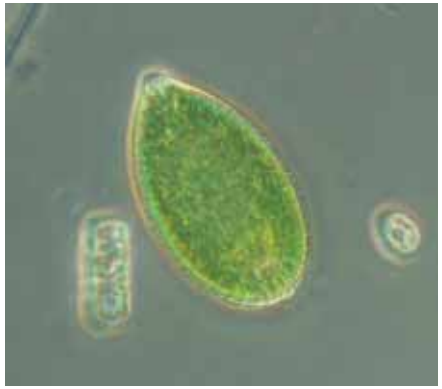
Storbritannien (Davies et al. 2005; Evans et al. 2006; Worrall et al. 2007)

Centraleuropa (Hejzlar et al. 2003; Skjelskvåle et al. 2005)

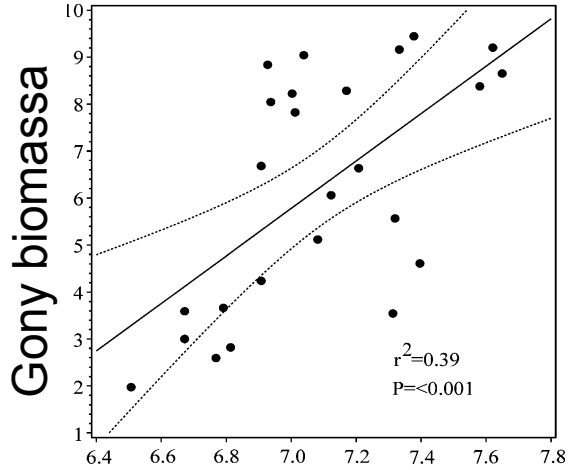
Nordamerika (Driscoll et al. 2003; Findlay 2003; Skjelskvåle et al. 2005)

KONSEKVENSER?

Rekreationsvärdet sjunker

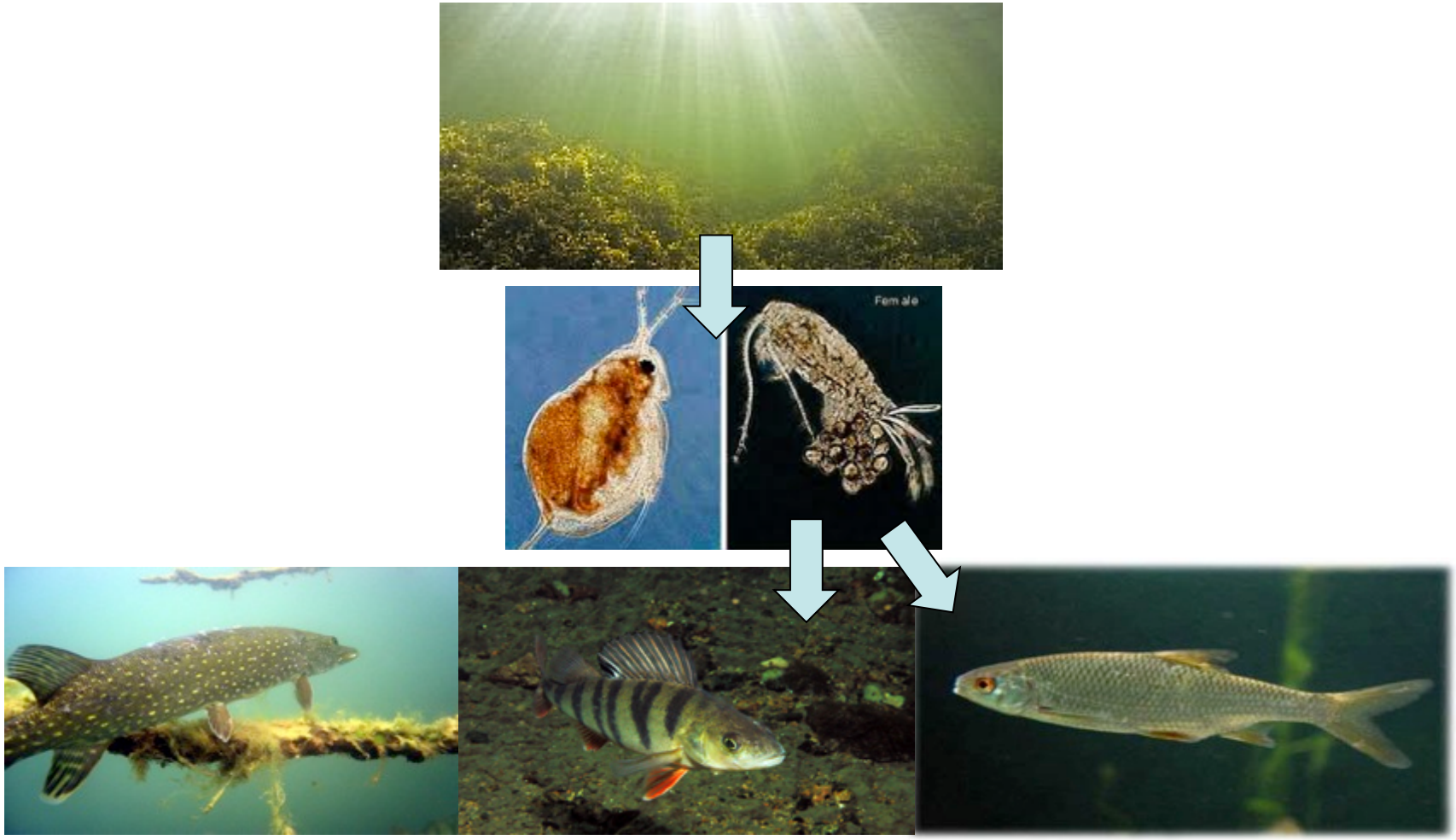


Gonyostomum semen - gubbslem



Effekter på ekosystemet

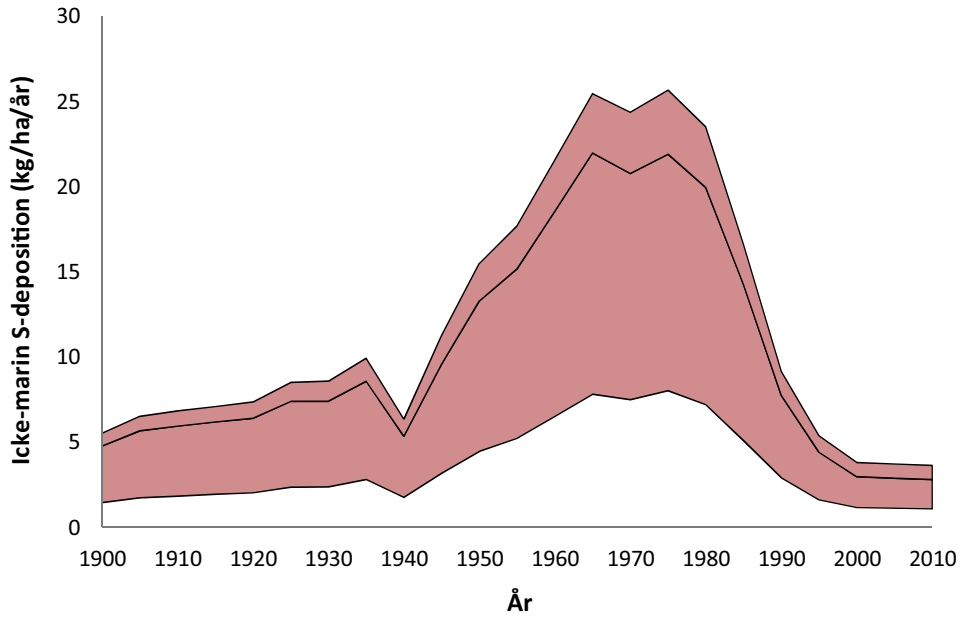
Ljusklimatet → växtplankton och undervattensvegetation
→ födosöksframgång



ORSAKER?

REGIONALA/GLOBALA

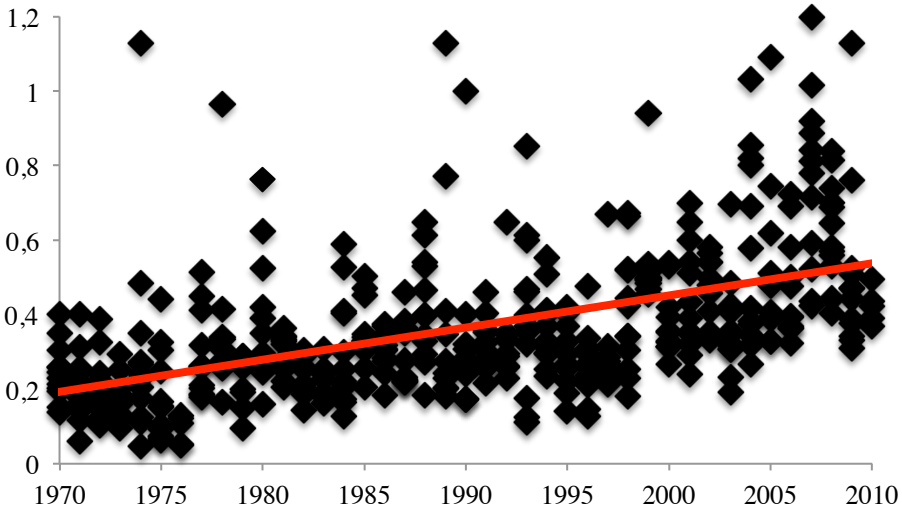
MINSKANDE FÖRSURNING



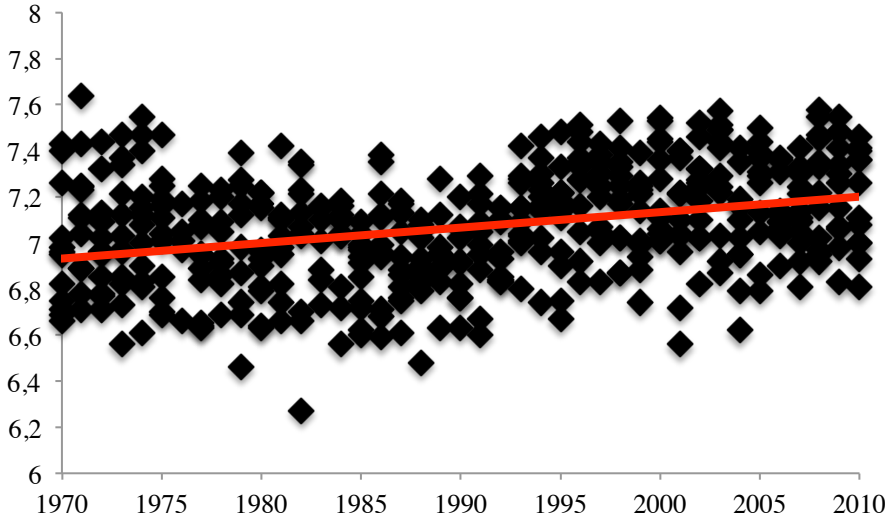
Fölster m fl. (2011) NV

HELGE Å

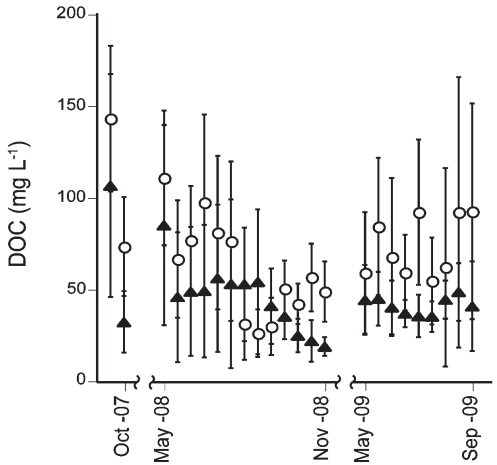
VATTENFÄRG



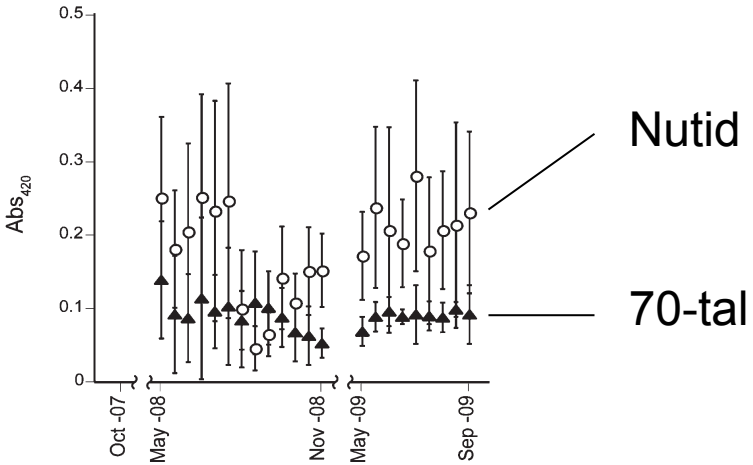
pH



ORGANISKT MATERIAL



VATTENFÄRG

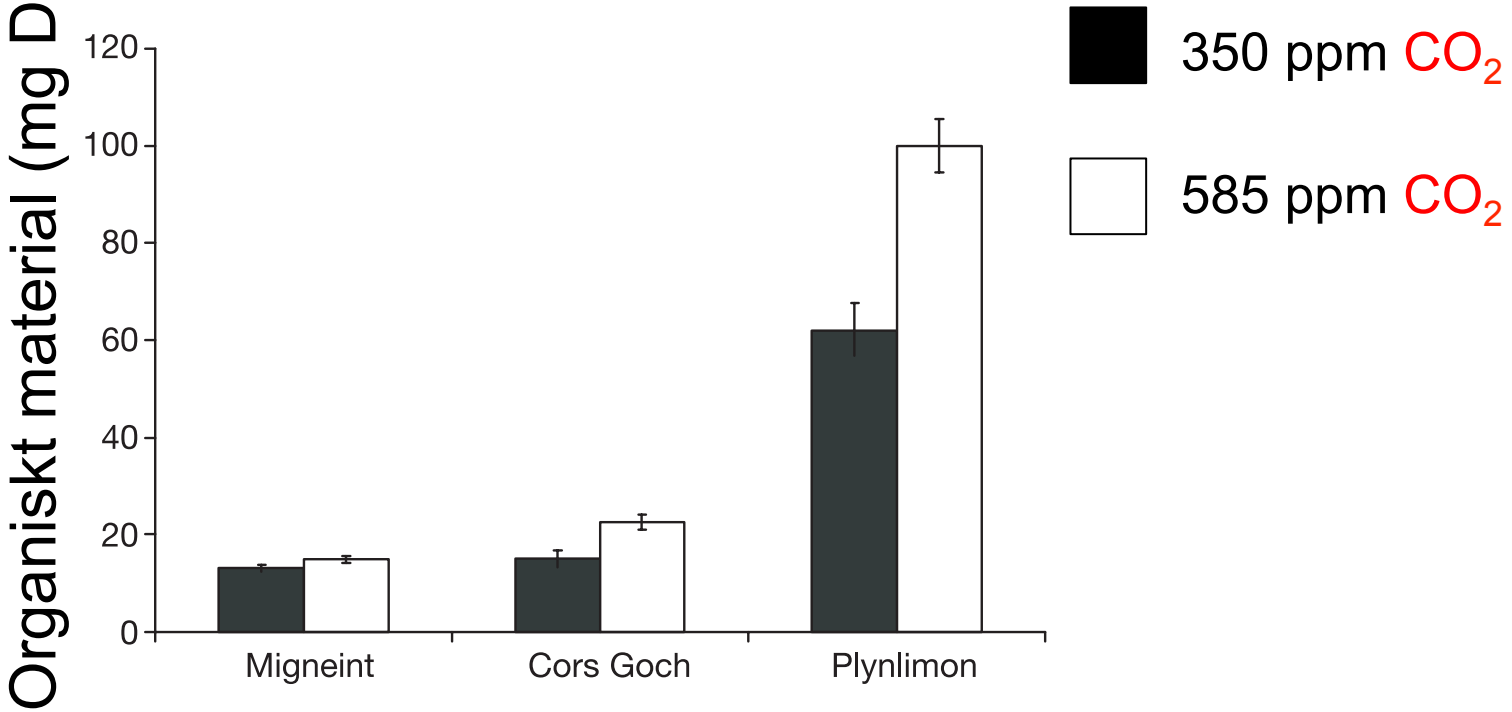


Ekström et al. 2011

ORSAKER?

REGIONALA

KLIMAT

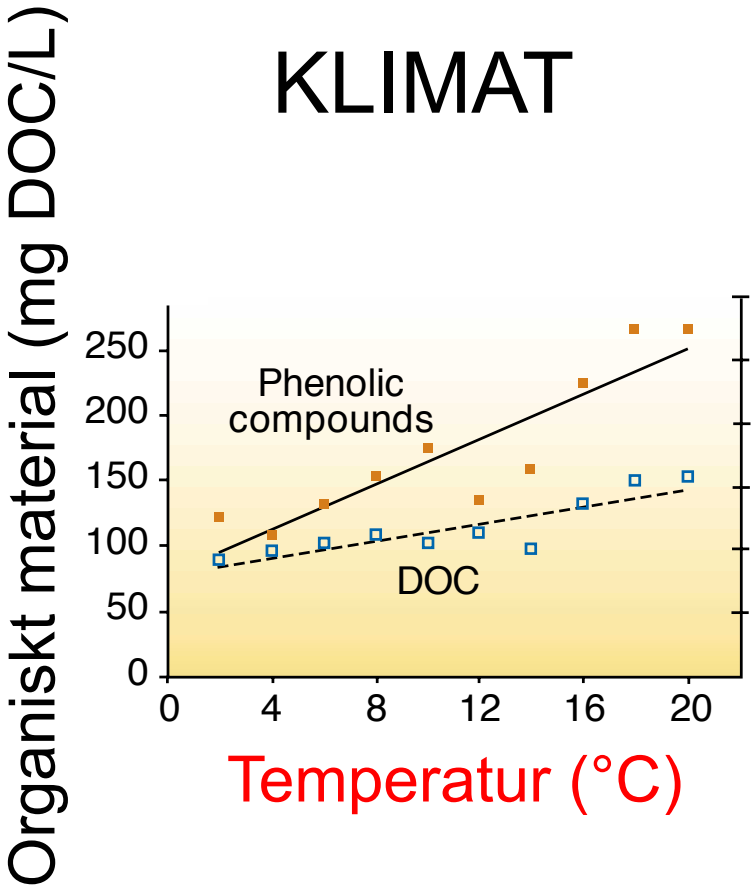


Freeman et al. 2004

ORSAKER?

REGIONALA

KLIMAT

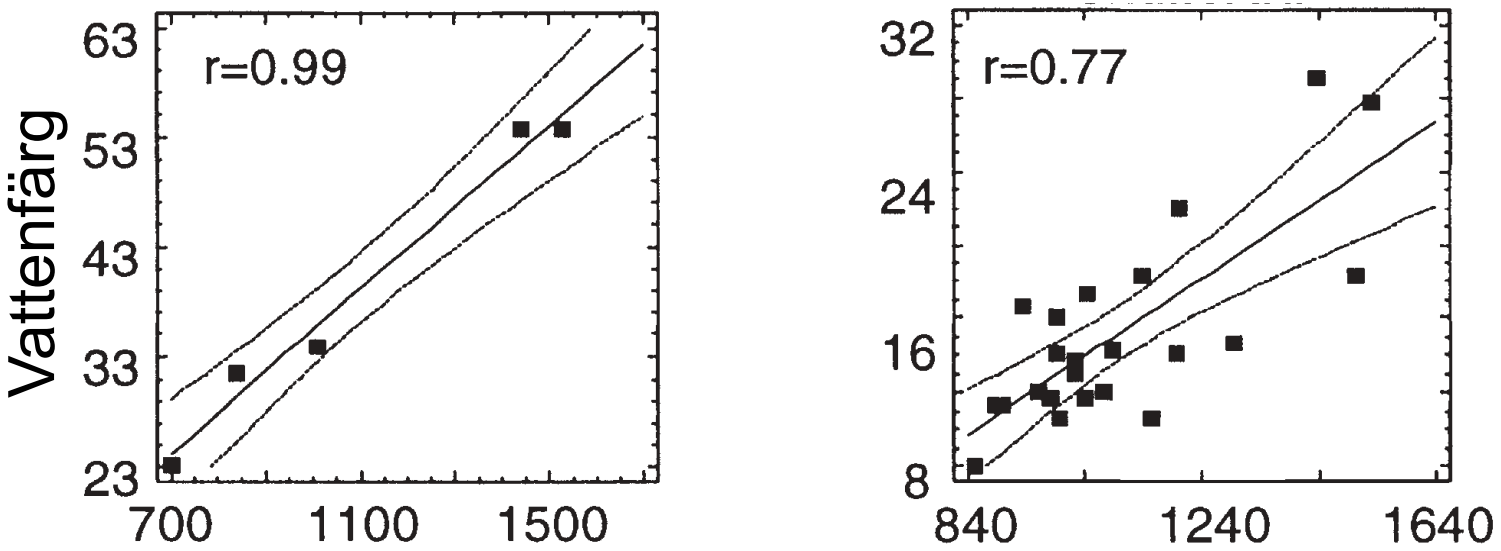


Freeman et al. 2001

ORSAKER?

REGIONALA

KLIMAT



Nederbörd mm/år

Hongve et al. 2004

ORSAKER?

LOKALA

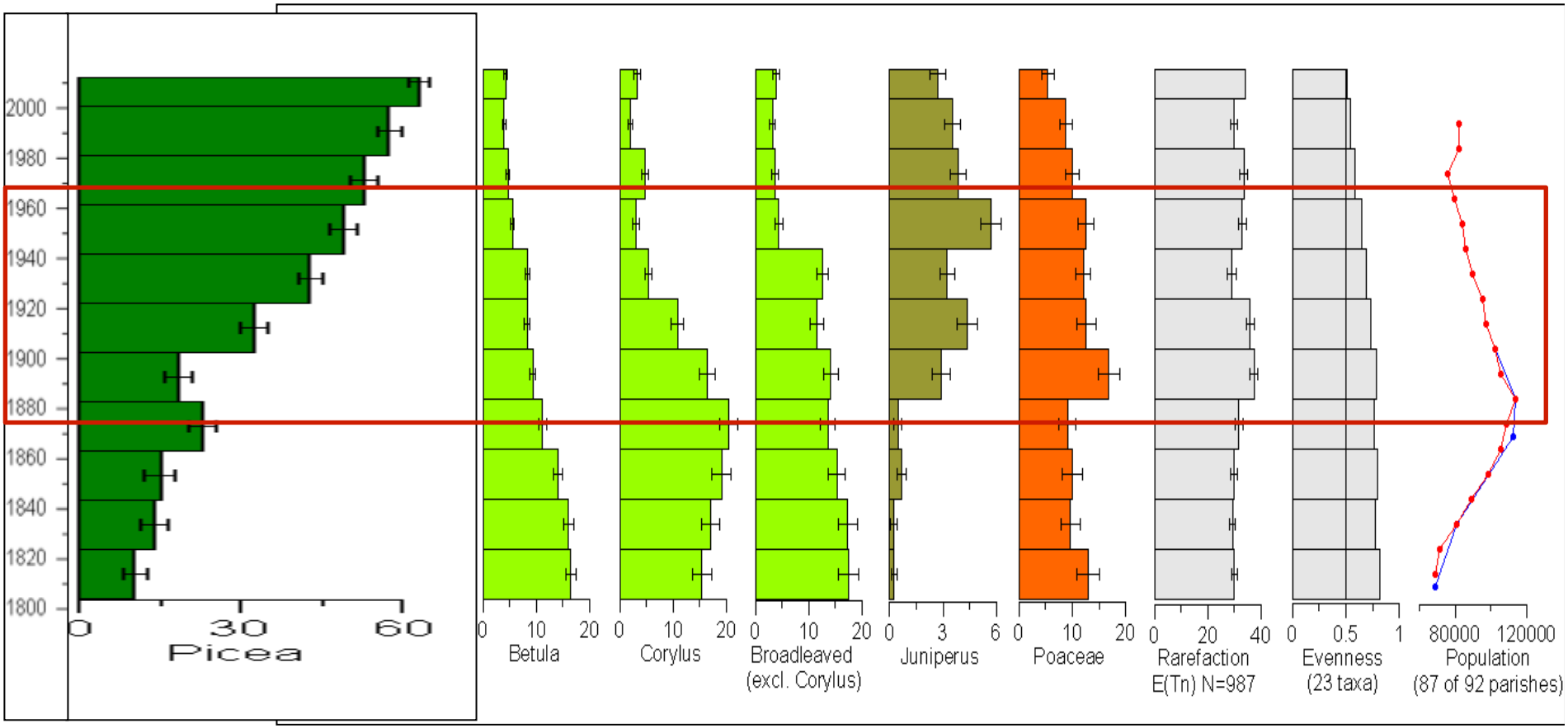
MARKANVÄNDNING

MOSSE BARRSKOG LÖVSKOG JORDBRUKSMARK




Bragée et al. manuskript

Förändringar i markanvändning



Fredh, Broström et al. under revision

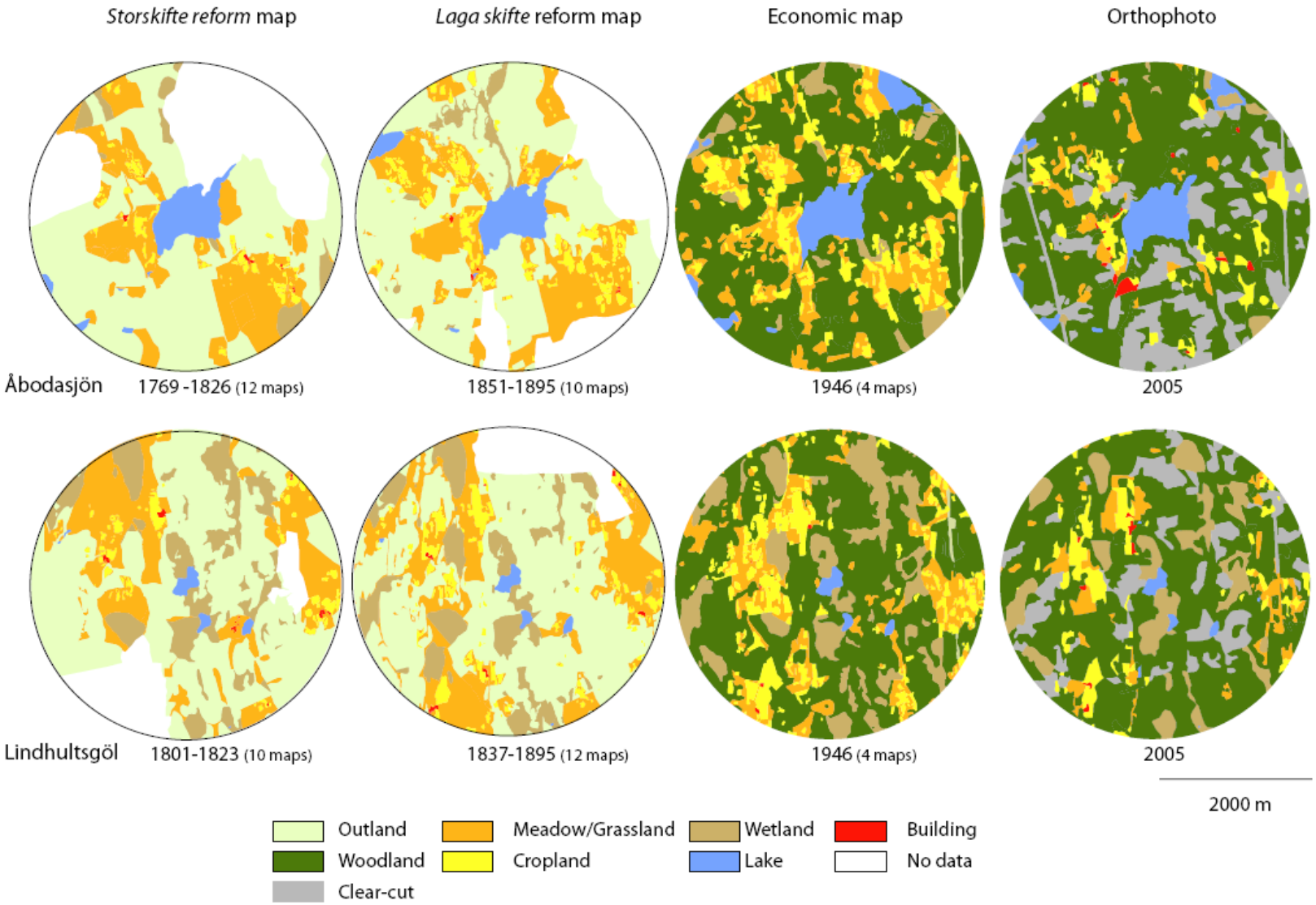
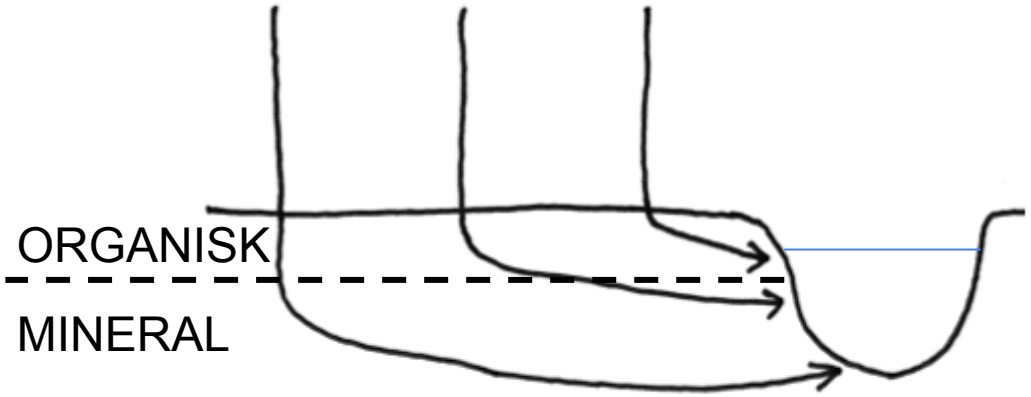


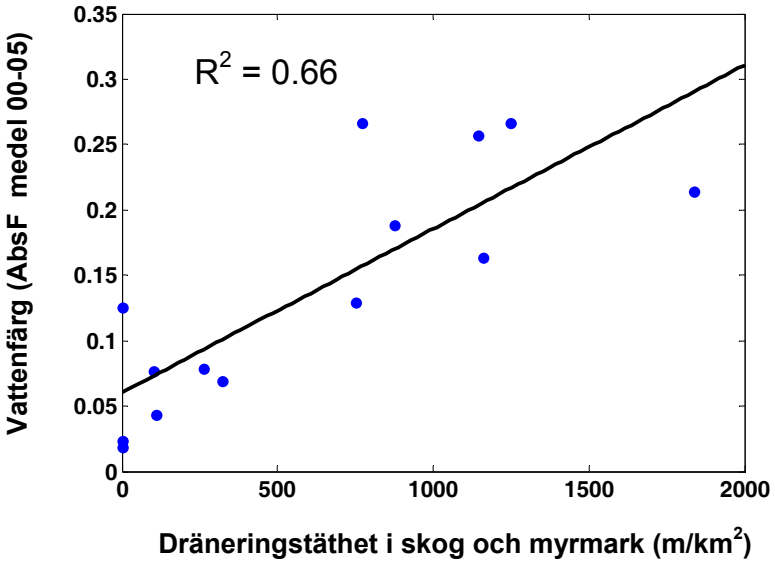
Figure 9. Documented categories of land use derived from historical maps and available orthophotos within 2-km radii around Åbodasjön and Lindhultsgöl.

ORSAKER?

LOKALA

DIKNING





Kalén 2007

SAMMANFATTNING

- Vattenfärgen ökar i Möckeln, Helge å, Sverige, norra halvklotet

- Regionala orsaker
  - CO2
  - temperatur
  - nederbörd/vattenflöden
  - minskad försurning

- Lokala faktorer
  - markanvändning
  - dikning

- Framtiden?

- Åtgärder?