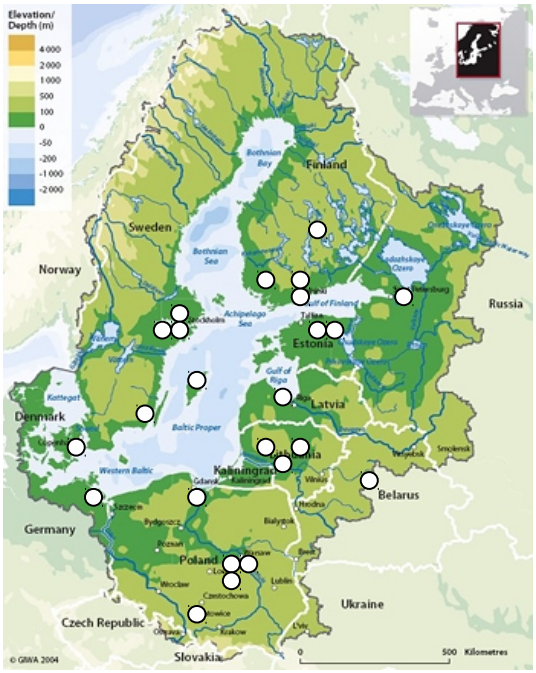
BERAS

Baltic Ecological Recycling Agriculture and Society
2003-2006

Baltic Sea
Drainage Basin



BERAS
Implementation
2010-2013

www.beras.eu

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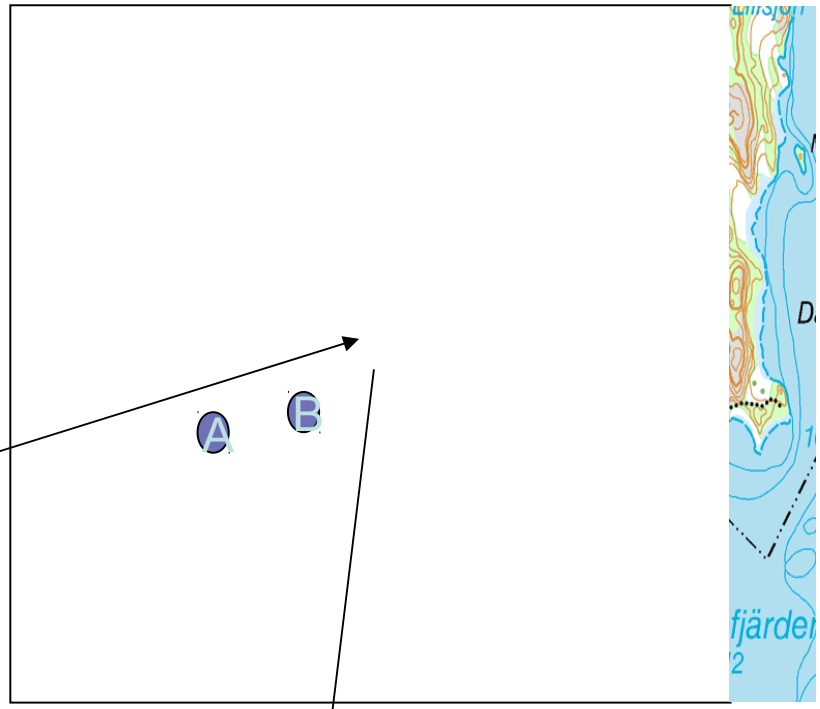
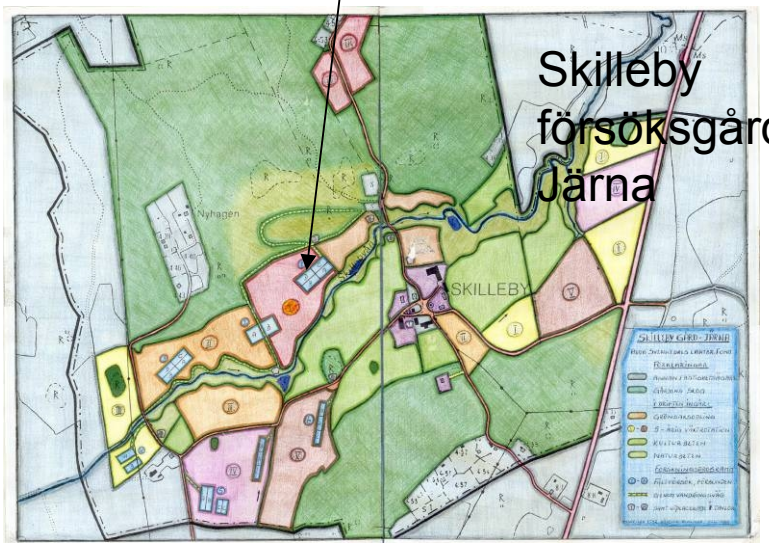
Artur.Granstedt@beras.eu



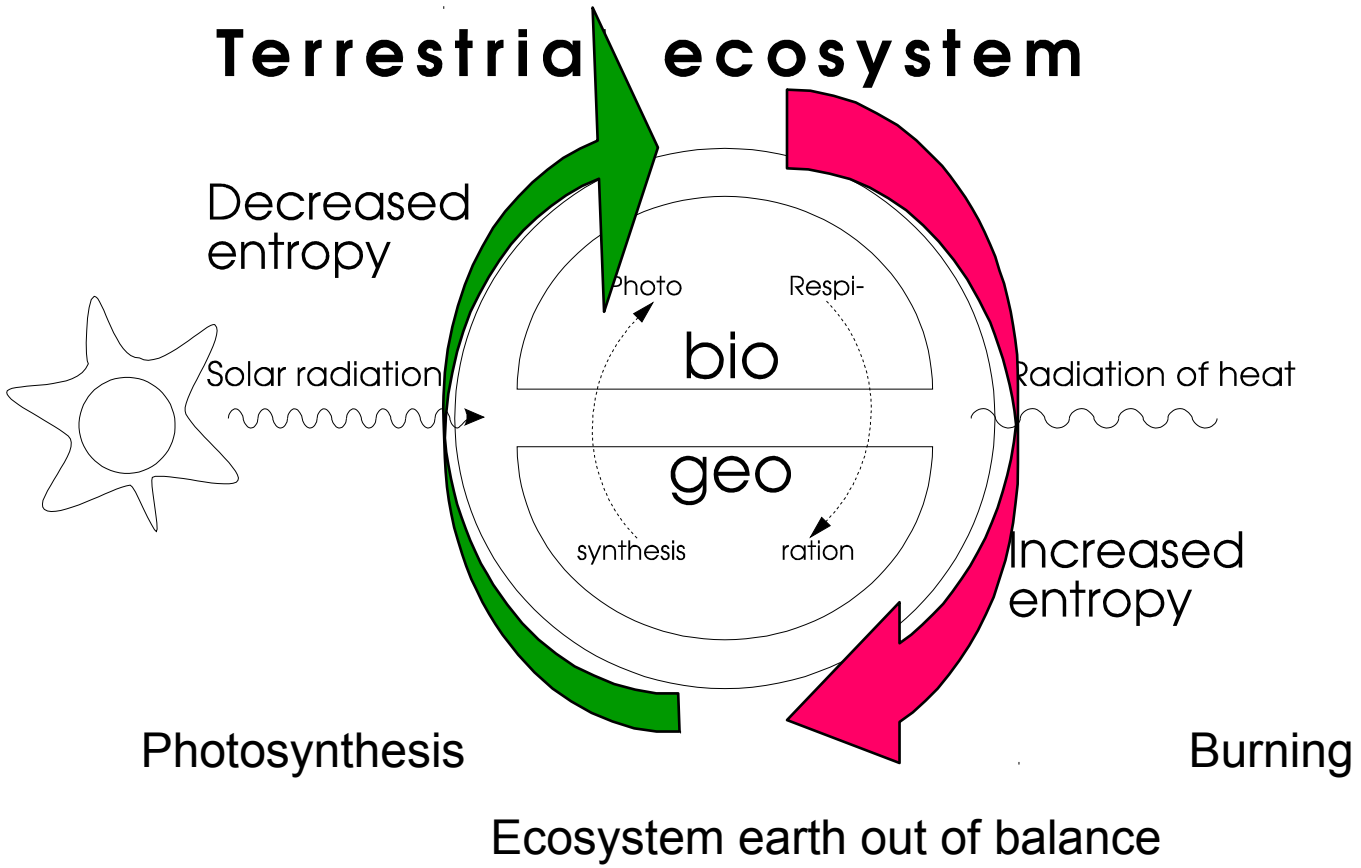


Skilleby försöksgård Järna

Localisation prototype farms BERAS

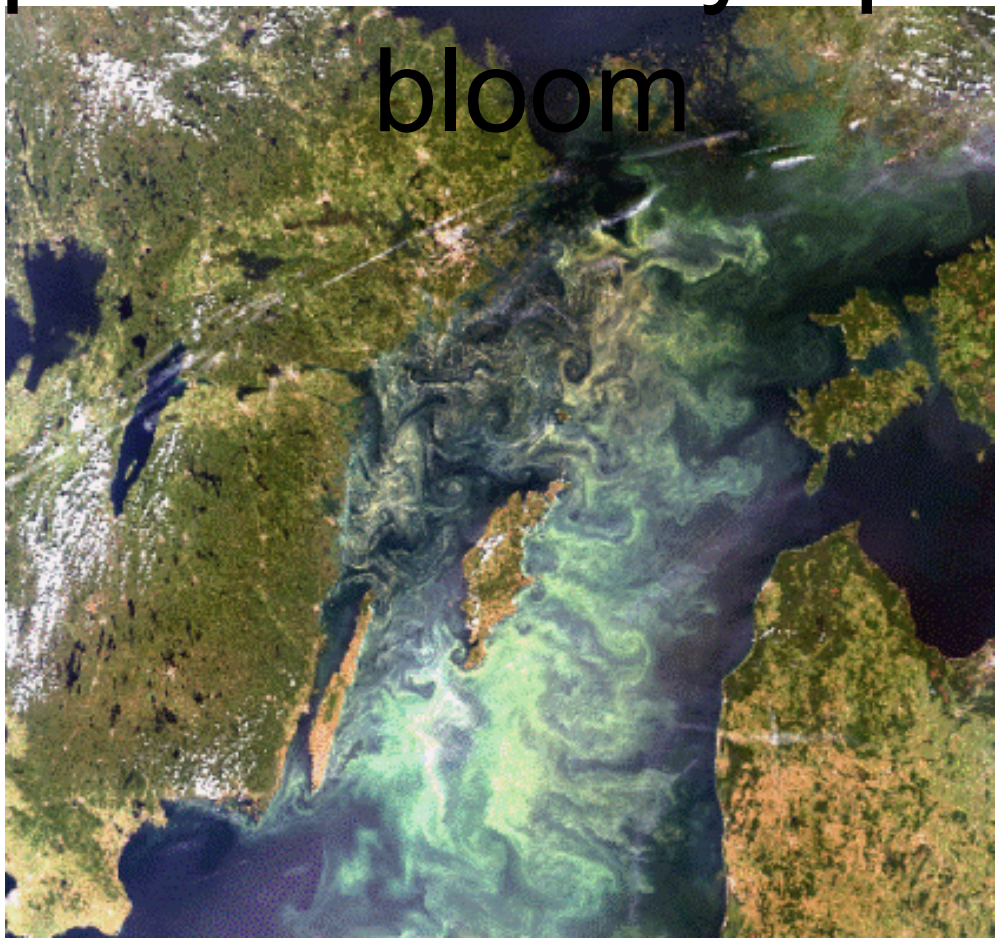
Basic ecological conditions

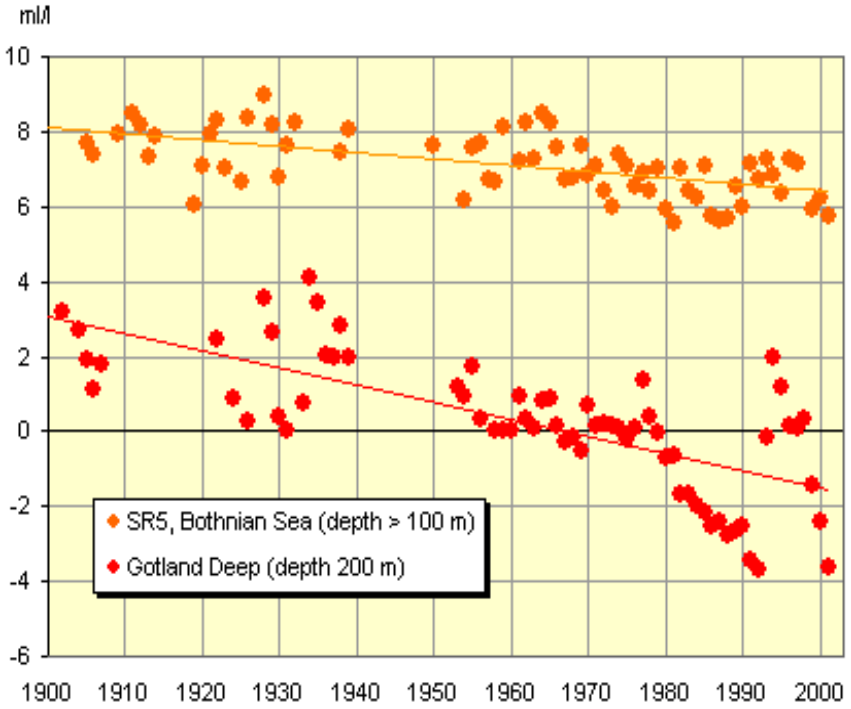
energy flow, recycling and biological diversity

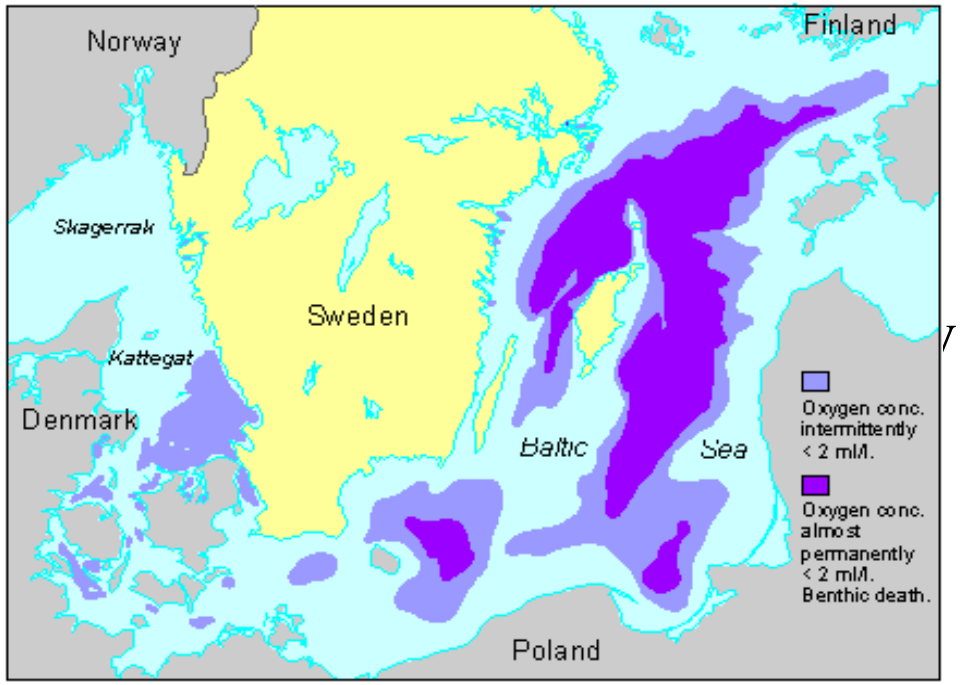


Waterborne inputs of nitrogen and phosphorus

The problem – Phytoplankton bloom

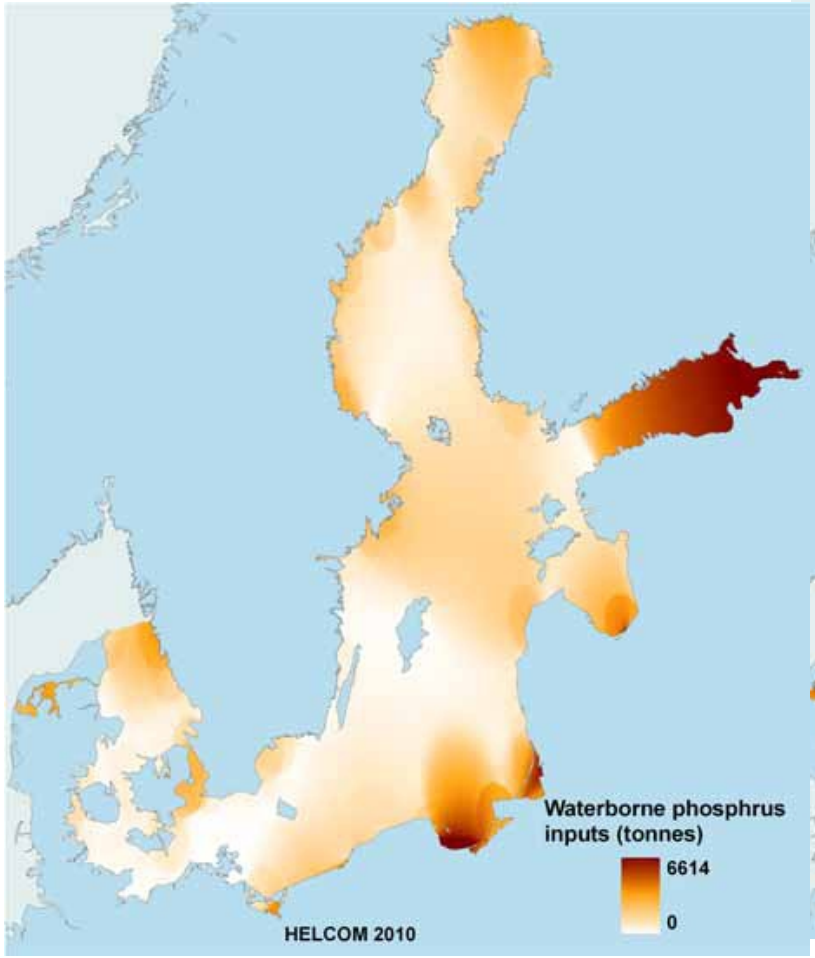


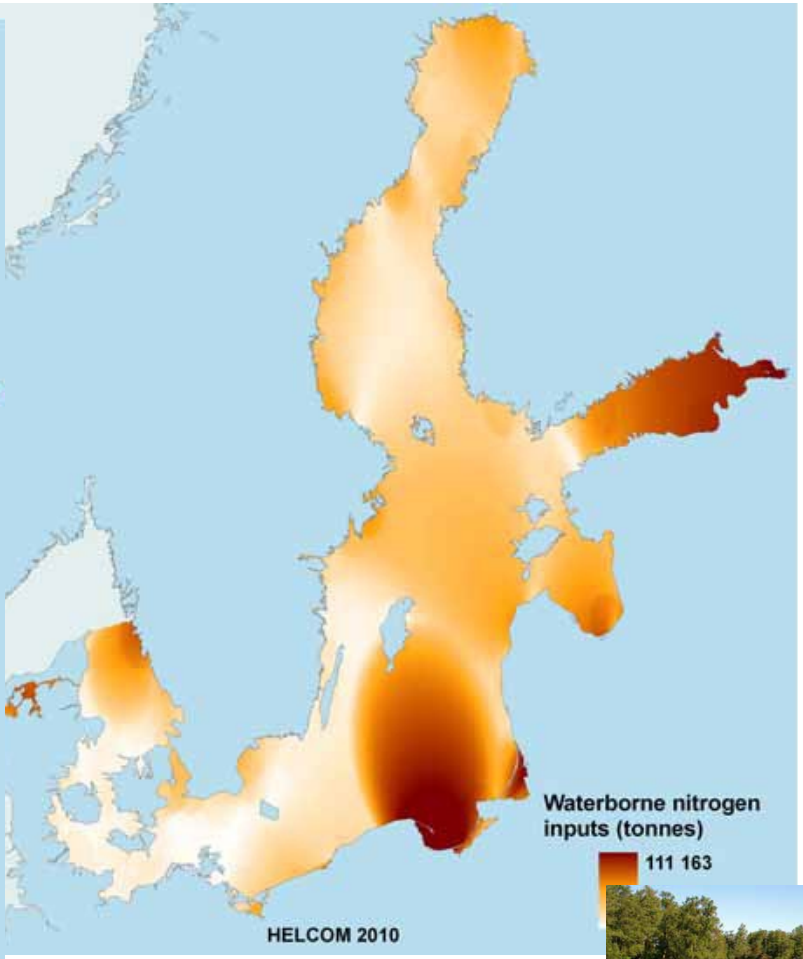


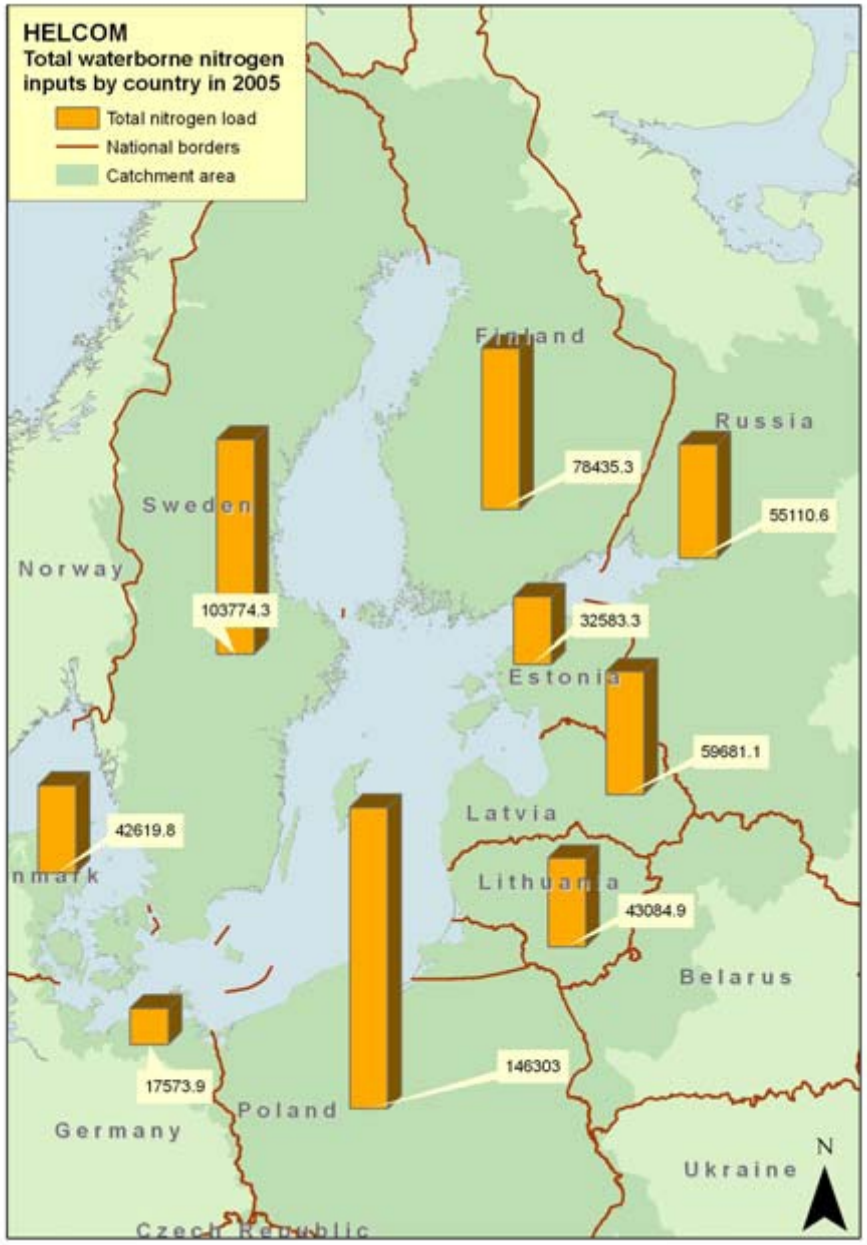


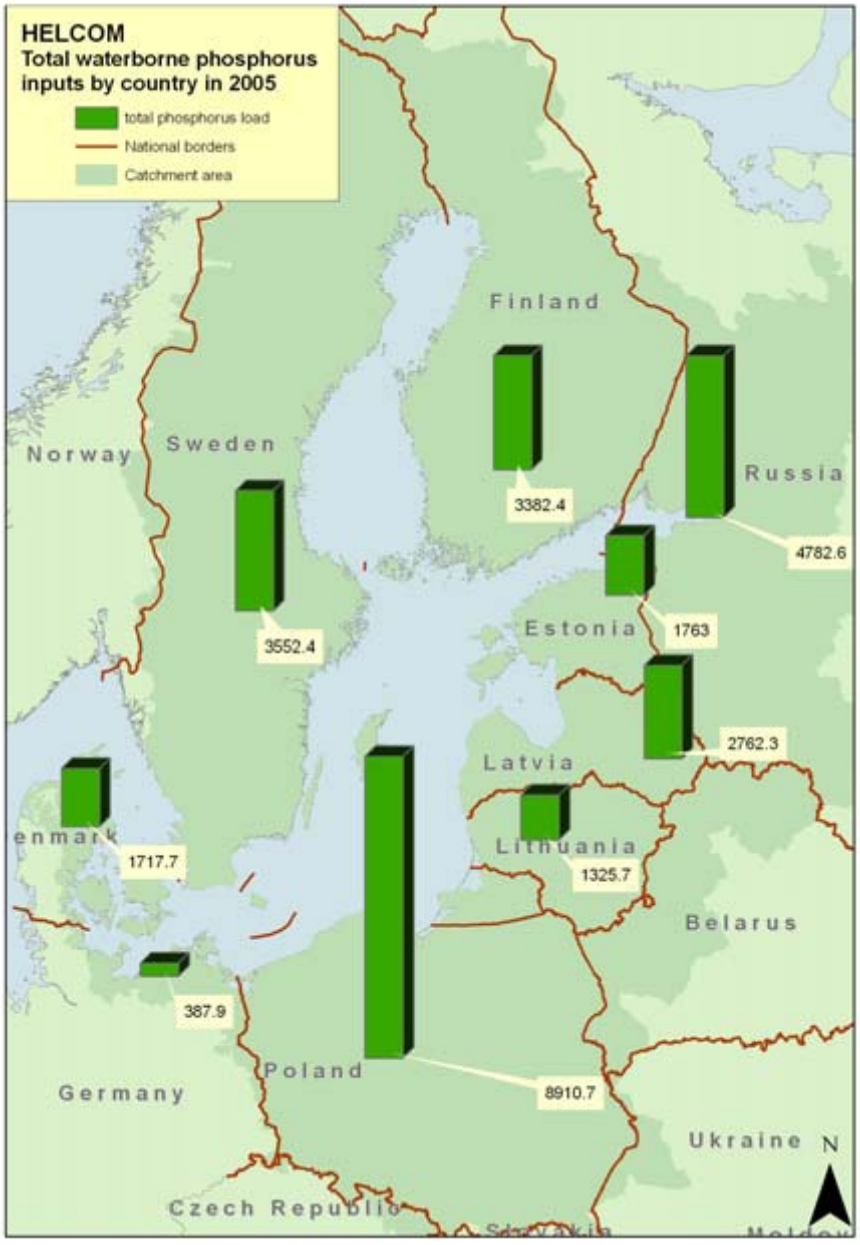
Source: Swedish Environmental Protection Agency.
www.internat.naturvardsverket.se/documents/pollutants/overgod/eutro/havsyree.html

Average annual waterborne inputs of nitrogen and phosphorus from rivers and coastal point sources in 2006. The visualization of the distribution
122 PLC 5 2010





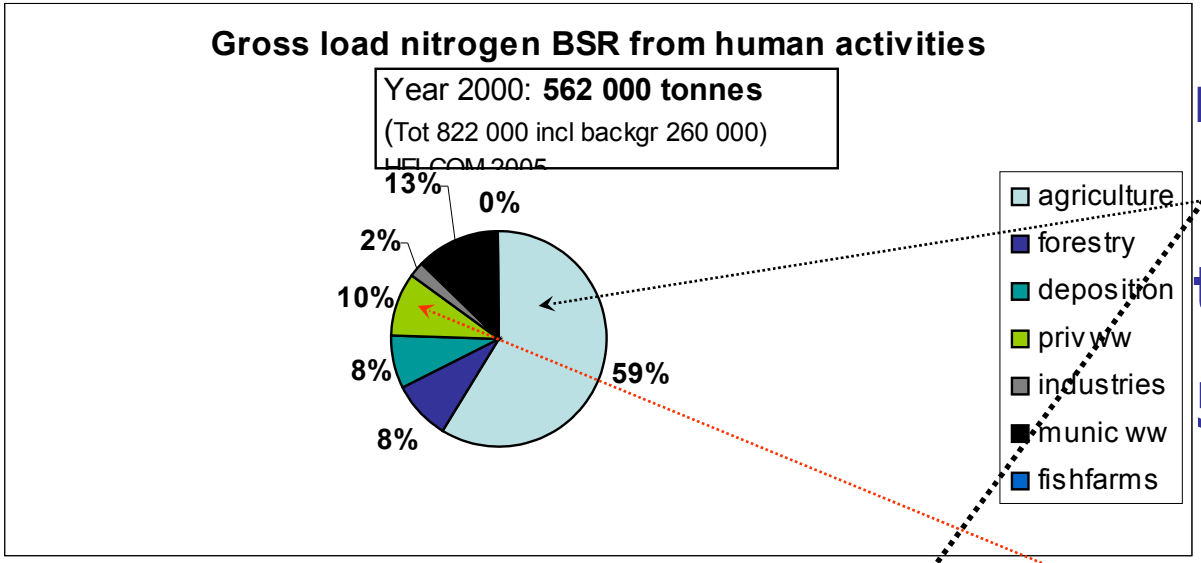

HELCOM
Total waterborne nitrogen inputs by country in 2005
Total nitrogen load
National borders
Catchment area
Finland
Russia
Sweden
Norway
78435.3
55110.6
103774.3
32583.3
Estonia
59681.1
Latvia
42619.8
Lithuania
43084.9
Belarus
146303
17573.9
Poland
Germany
Ukraine
Czech Republic
N


HELCOM
Total waterborne phosphorus inputs by country in 2005
total phosphorus load
National borders
Catchment area
Finland
Norway
Sweden
3382.4
Russia
4782.6
3552.4
Estonia
1763
2762.3
Latvia
1717.7
Lithuania
1325.7
Belarus
387.9
Poland
8910.7
Germany
Ukraine
Czech Republic
N

2001-2006

Aver. annual

641 000 tonnes



N%/P%

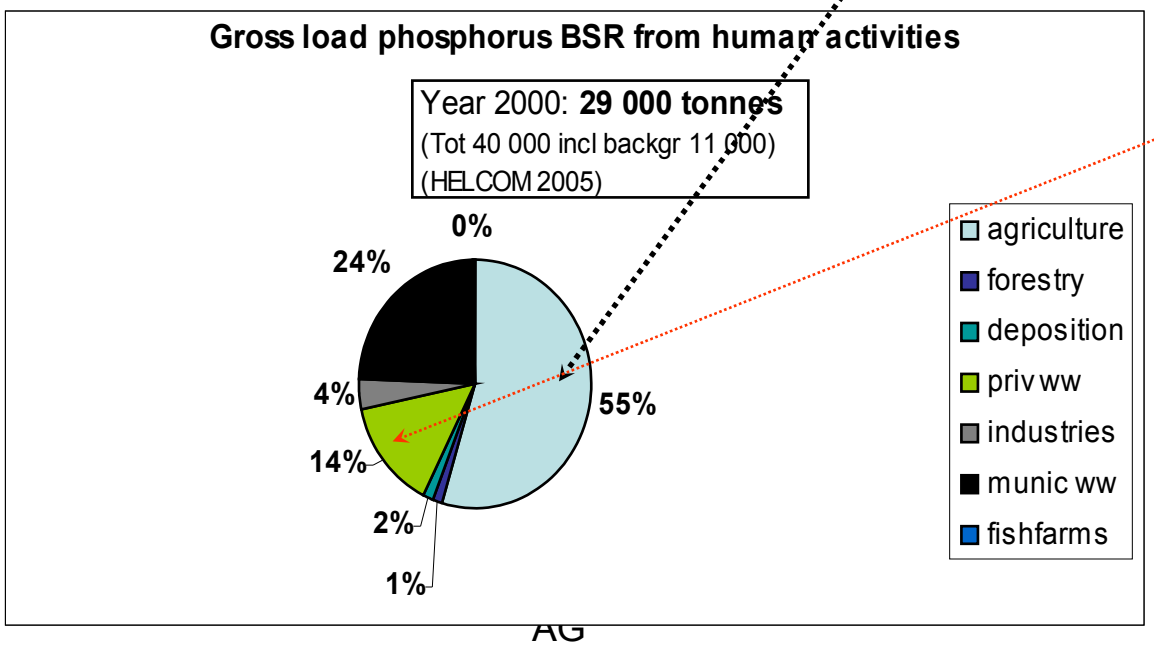
- **Agricult. 59/55**

- **Privat waste 10/14**

2001-2006

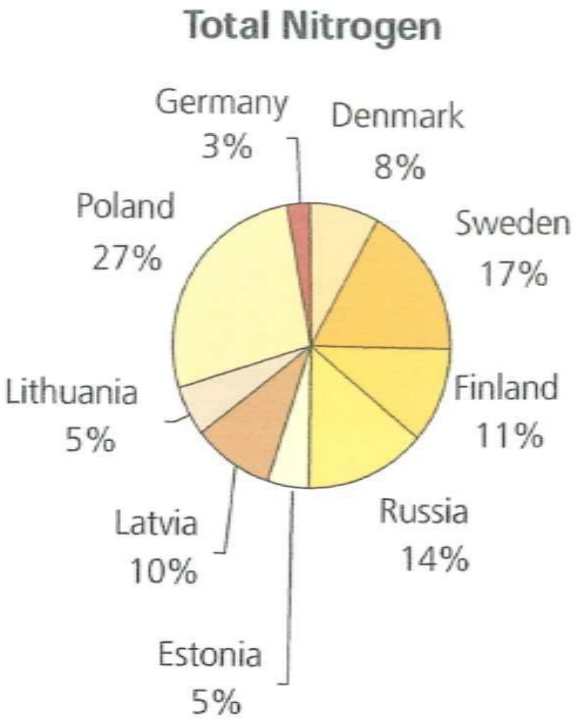
Aver. annual

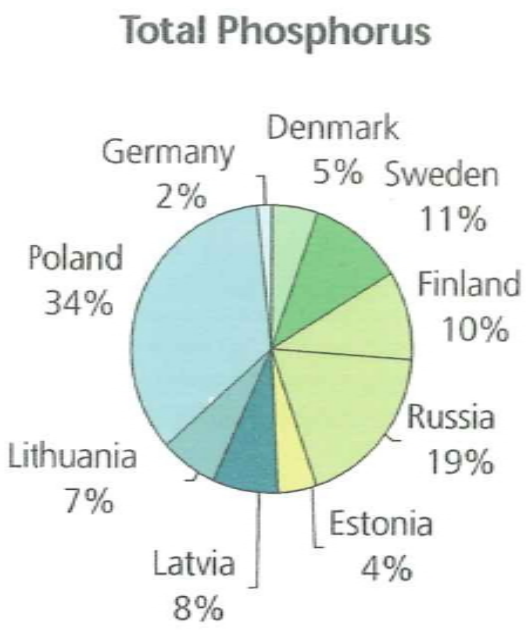
30 200 tonnes



- **Municipal waste 13/24**

Share N and P to Baltic Sea (HELCOM 2010)





We agree on the following country-wise provisional nutrient reduction requirements

2021

Minister meeting

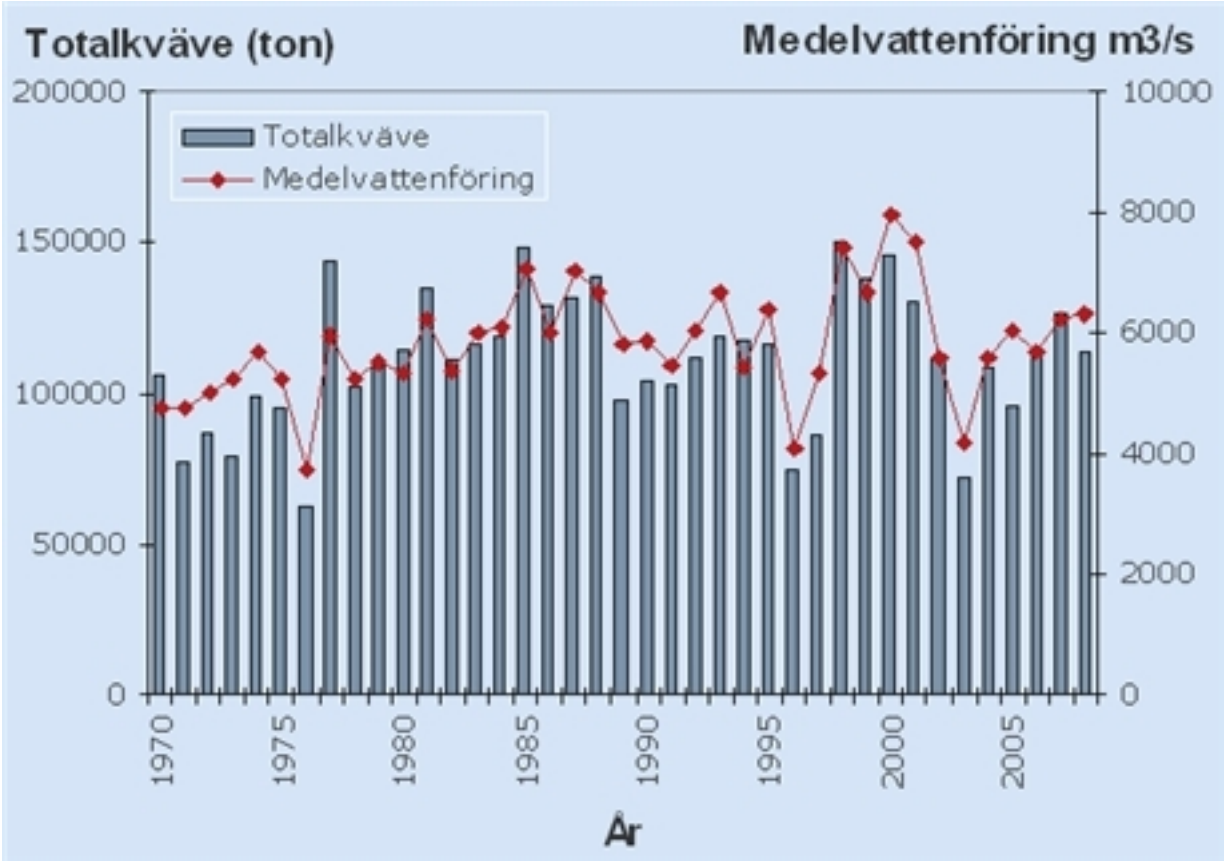
Krakow 15 november 2007

P: 15 260

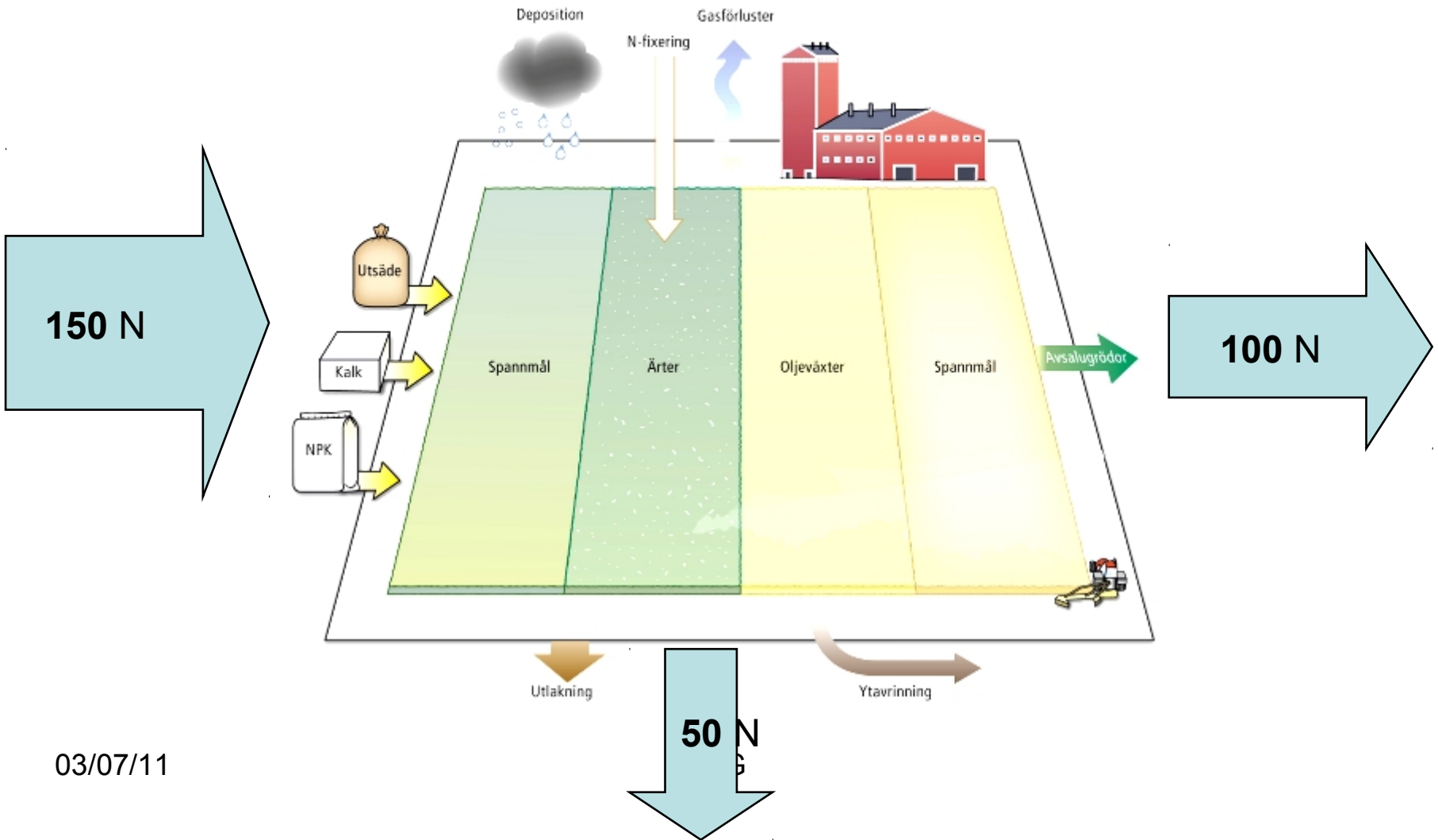
N: 135 000

BEP, BAP

	Phosphorus (tonnes)	Nitrogen (tonnes)
Denmark	16	17,210
Estonia	220	900
Finland	150	1,200
Germany	240	5,620
Latvia	300	2,560
Lithuania	880	11,750
Poland	8,760	62,400
Russia	2,500	6,970
Sweden	290	20,780
Transboundary Commol,poo*	1,660	3,780


Totalkväve (ton)
Medelvattenföring m3/s
200000
150000
100000
50000
0
10000
8000
6000
4000
2000
0
Totalkväve
Medelvattenföring
1970
1975
1980
1985
1990
1995
2000
2005
År

Specialized crop farm

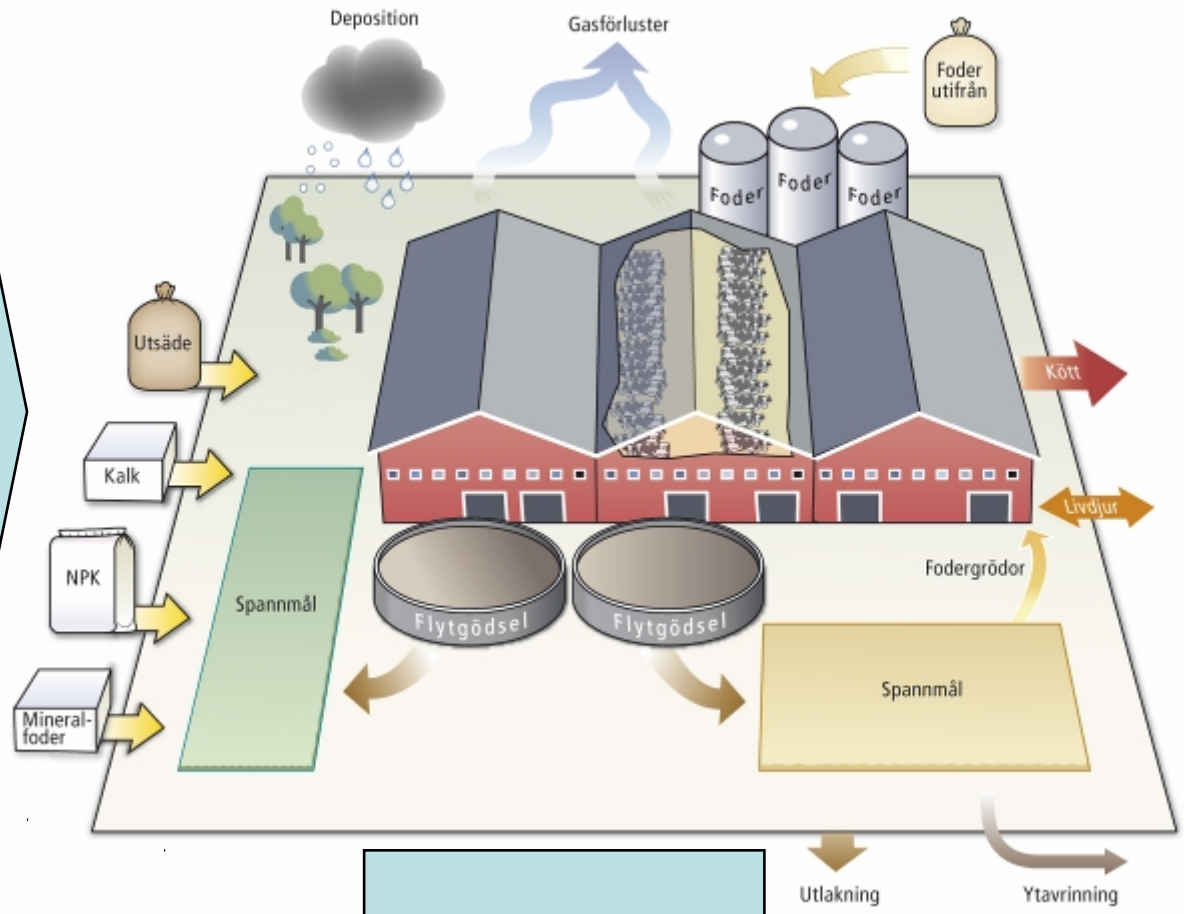


Specialized animal production

200 N

Fodder

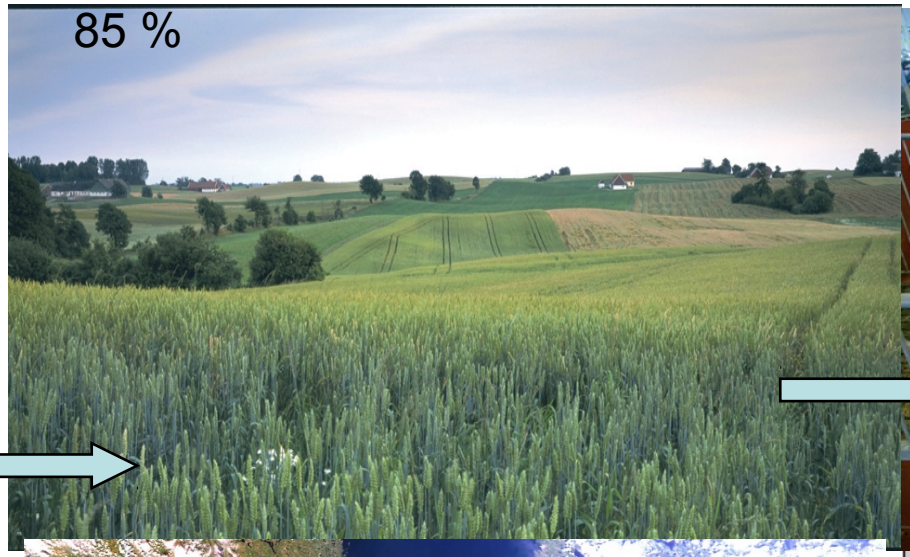
Fertilizers

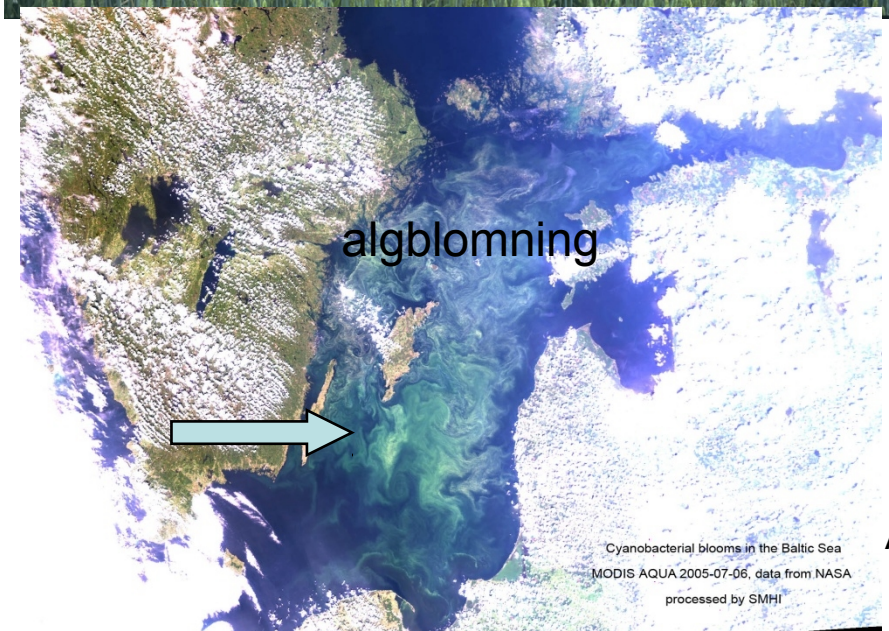


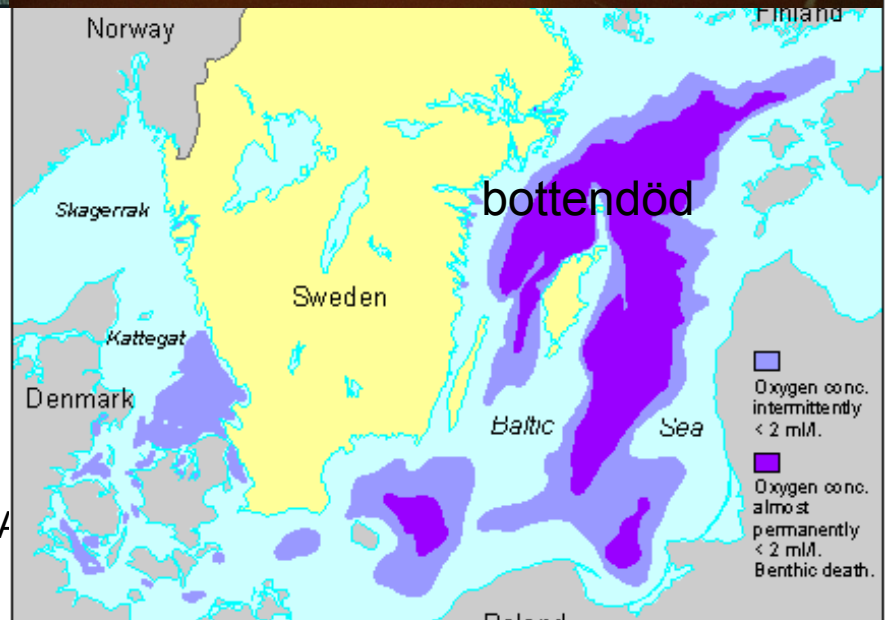
50 N

150 N

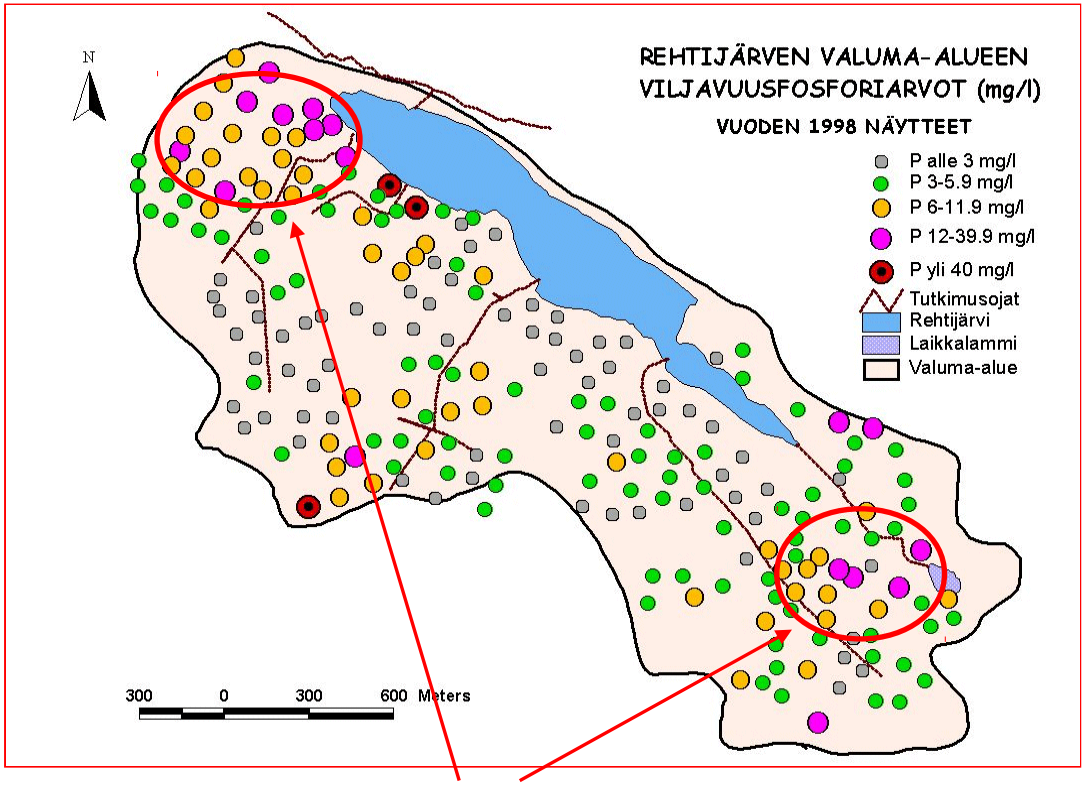
Depleted arable fields, eutrophicated sea and climate warming





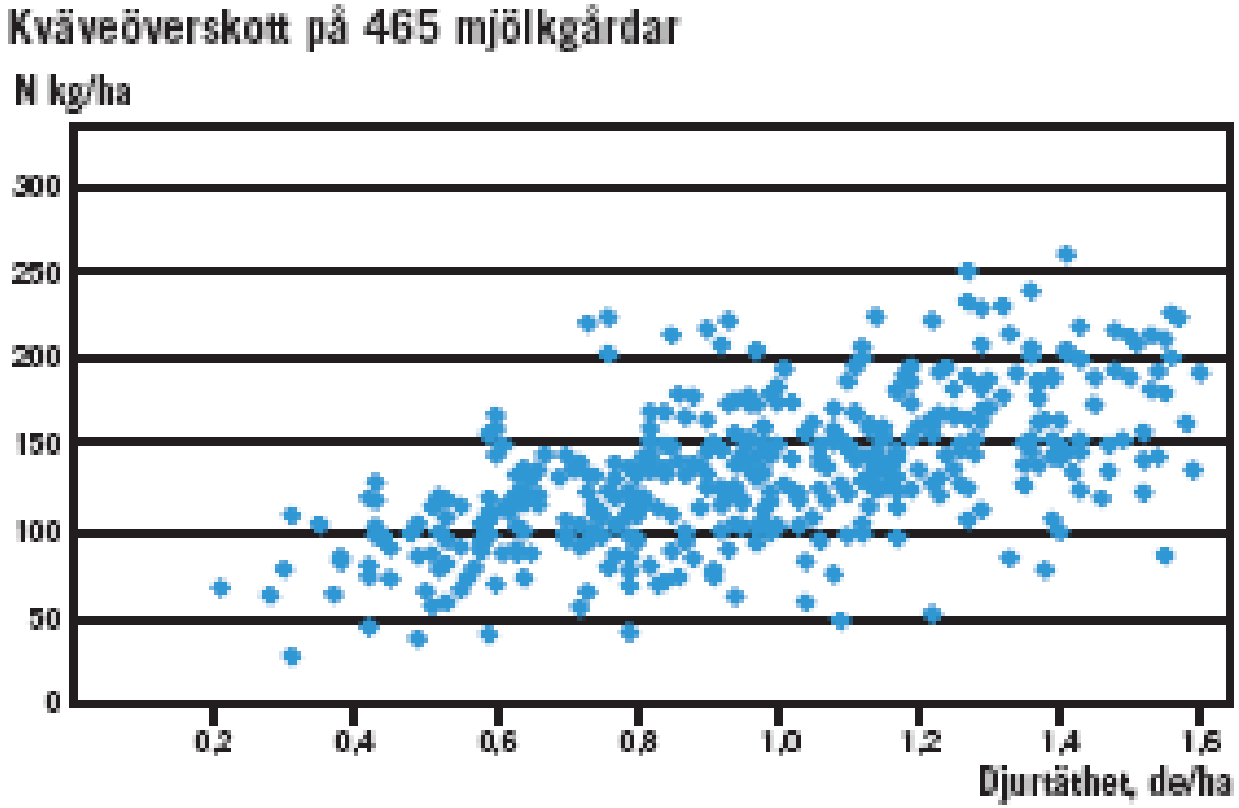


We know that in a catchment scale, a major part of P losses often come from a relatively small part of the catchment.

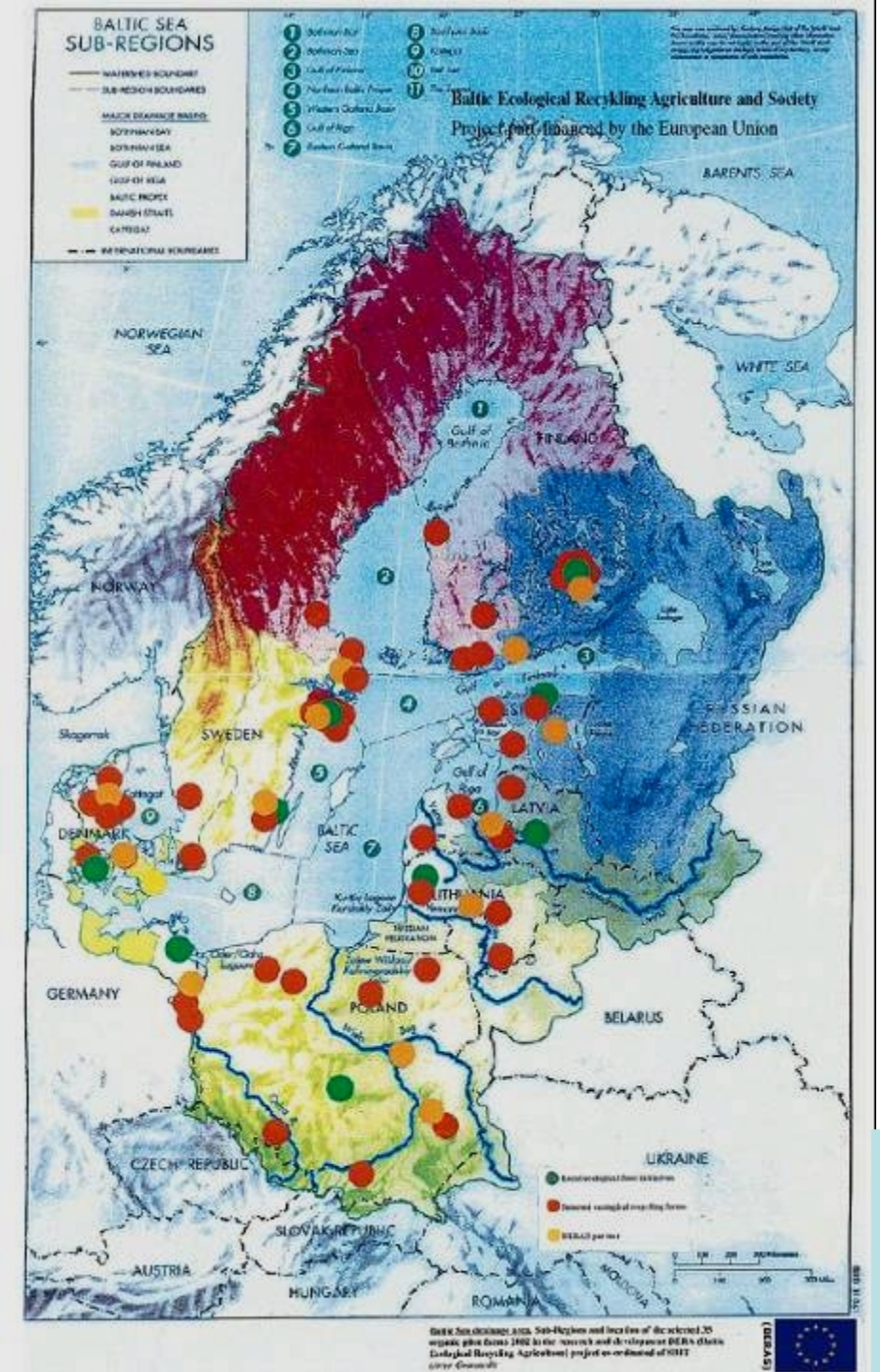


The hot-spots of P losses are typically areas where nutrients in manure is in surplus.

In the lake Rehtijärvi case, these two areas make up a half of the dissolved P losses to the lake, even through their share is less than 20% of the cathment land area.



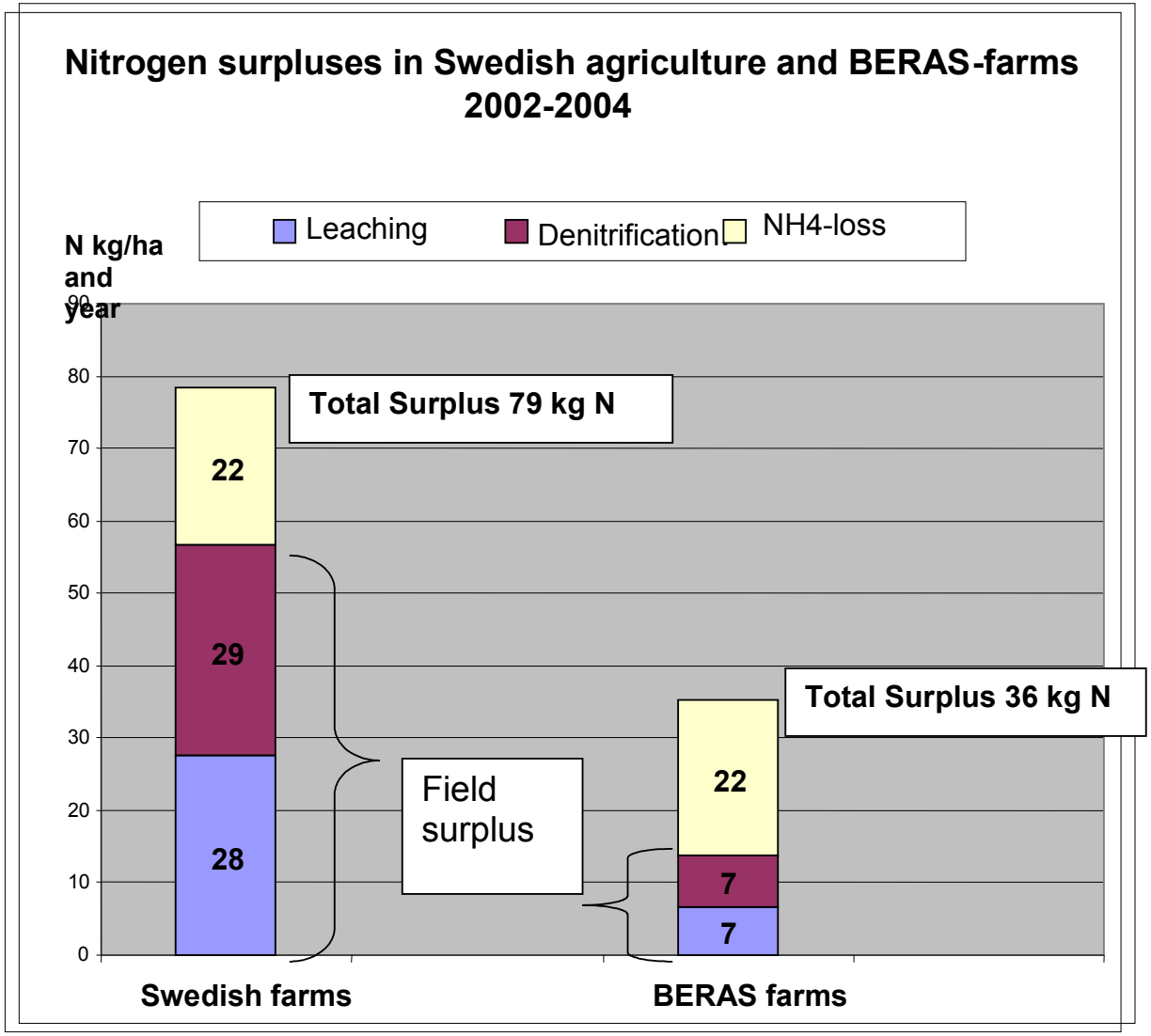
Nitrogen surplus N kg/ha in relation to animal units (de)/ha on 465 dairy farms in Sweden



BERAS project 2003- 2006

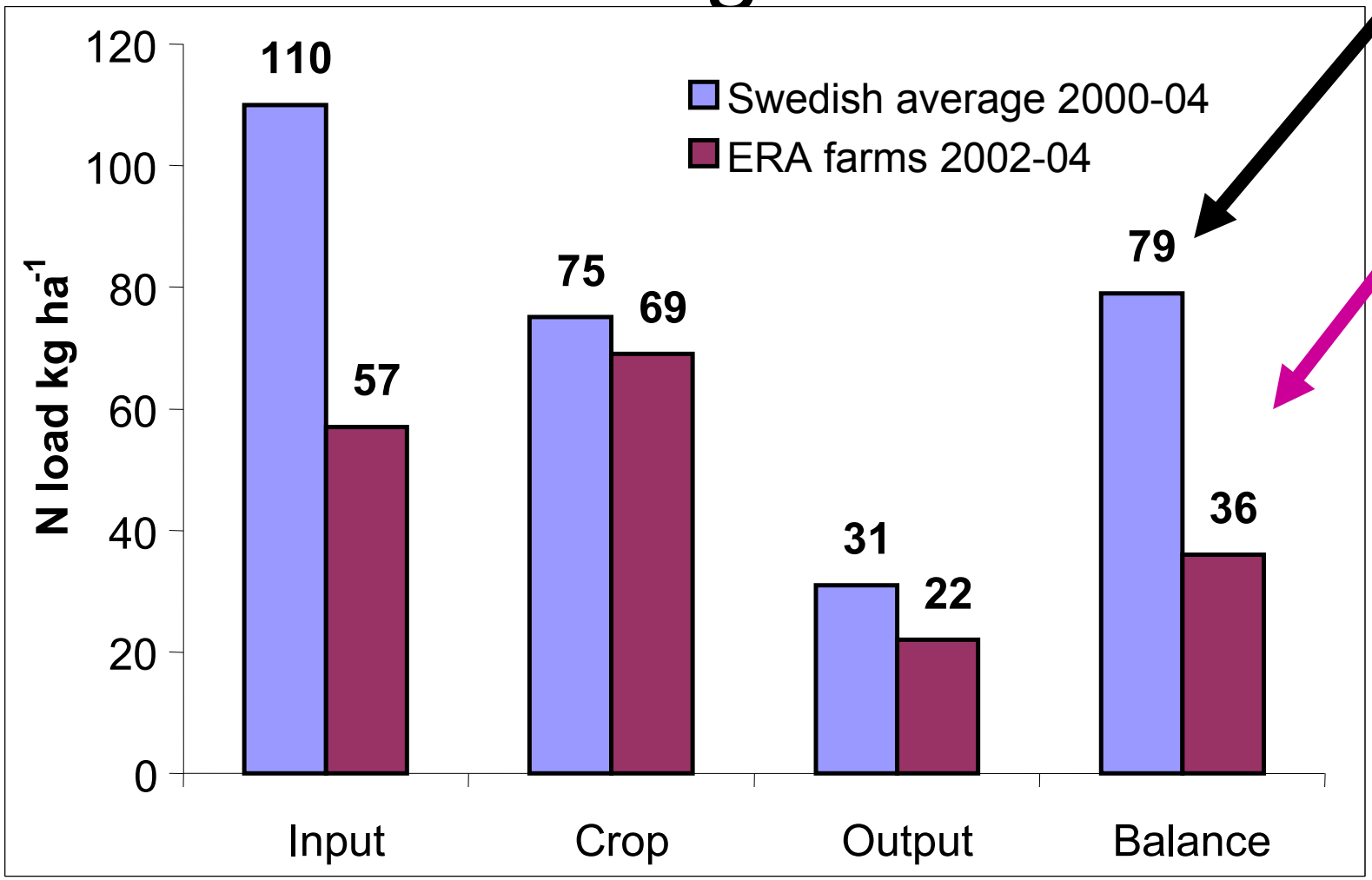
- 20 partners from 8 countries
- Pilot studies on 48 farms
  - Nutrient balances
  - Leakage measurements
  - Energy and global warming potential
  - Biological diversity

BERAS Implementation 2009 -2013



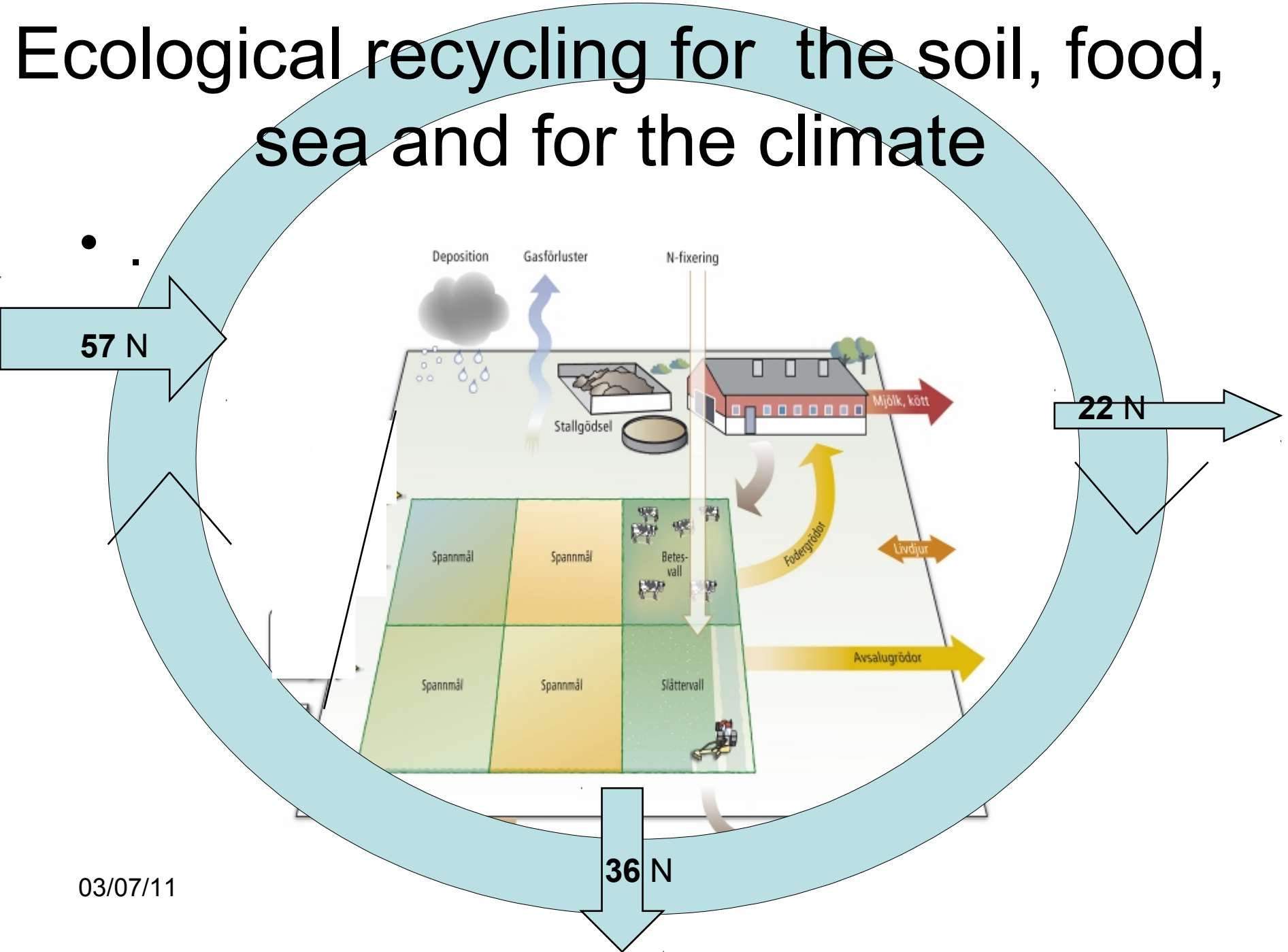
The results indicate 70 – 75 % lower leakage of nitrogen from BERAS-farms compared to the conventional agriculture.

Results – Nitrogen in Sweden



Ecological recycling for the soil, food, sea and for the climate

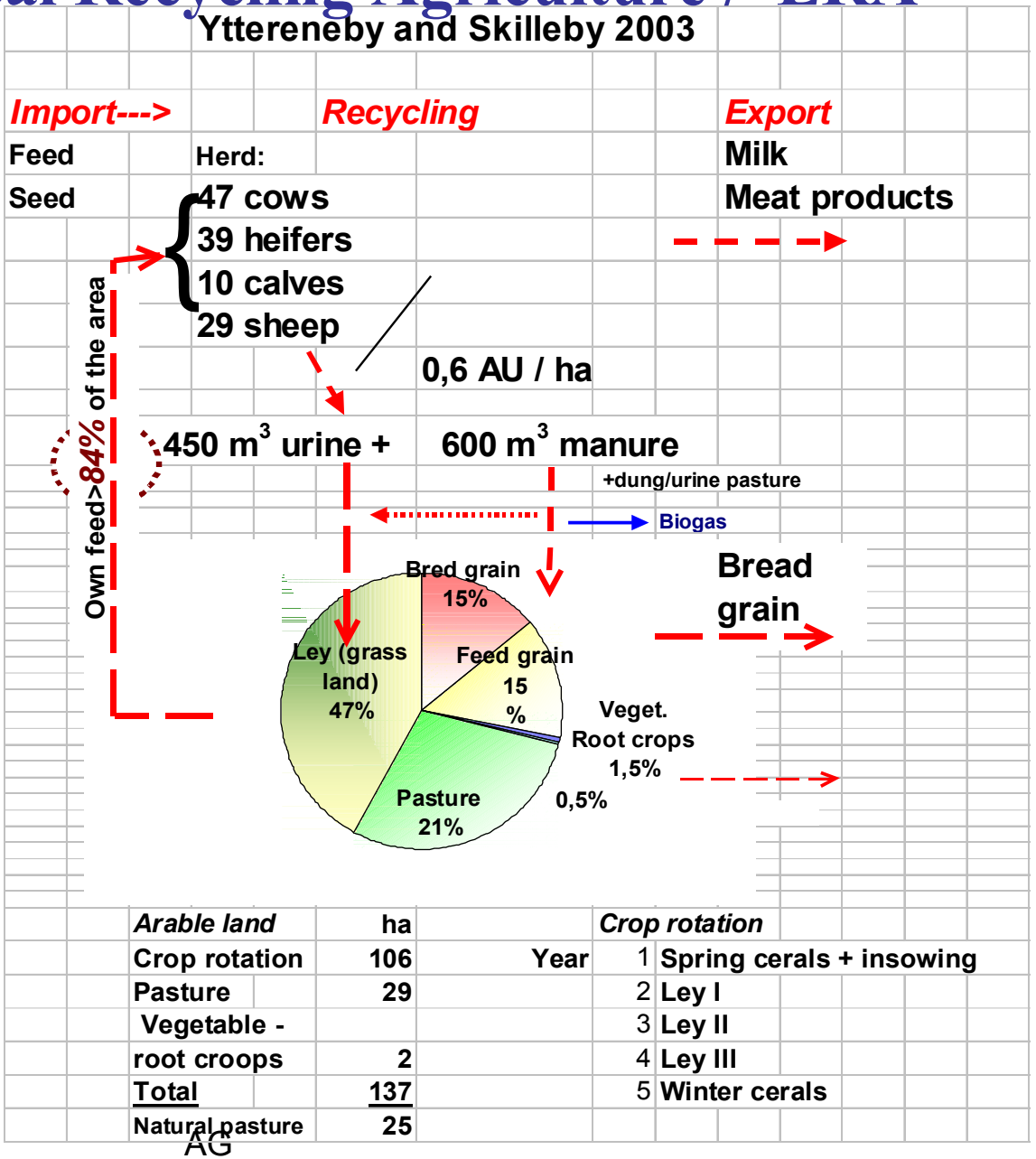
- .



Example of Ecological Recycling Agriculture / ERA

The prototype farm Yttereneby – Skilleby in Järna)

- The animal density is adjusted to the farm's feed production capacity. In this case fodder crops on 84 % and crops for sale on 16 % of the farm area and with a animal density of 0,6 AU/ha (= average for Sweden and European food consumption)



Arable land	ha		*Crop rotation*	
Crop rotation	106	Year	1	Spring cerals + insowing
Pasture	29		2	Ley I
Vegetable -			3	Ley II
root croops	2		4	Ley III
Total	137		5	Winter cerals
Natural pasture	25			

Granstedt, A., L-Baeckström, G.(2000): Studies of the preceding crop effect of ley in ecological agriculture**.** American Journal of Alternative Agriculture, vol. 15, no. 2, pages 68–78. Washington University.

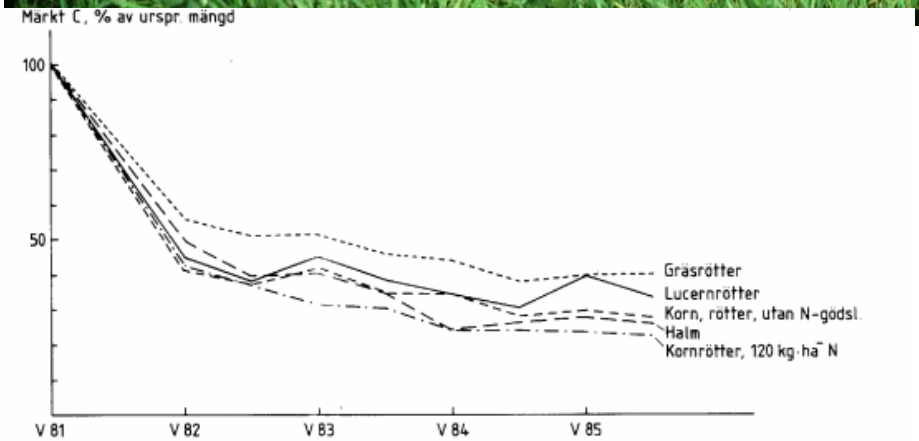
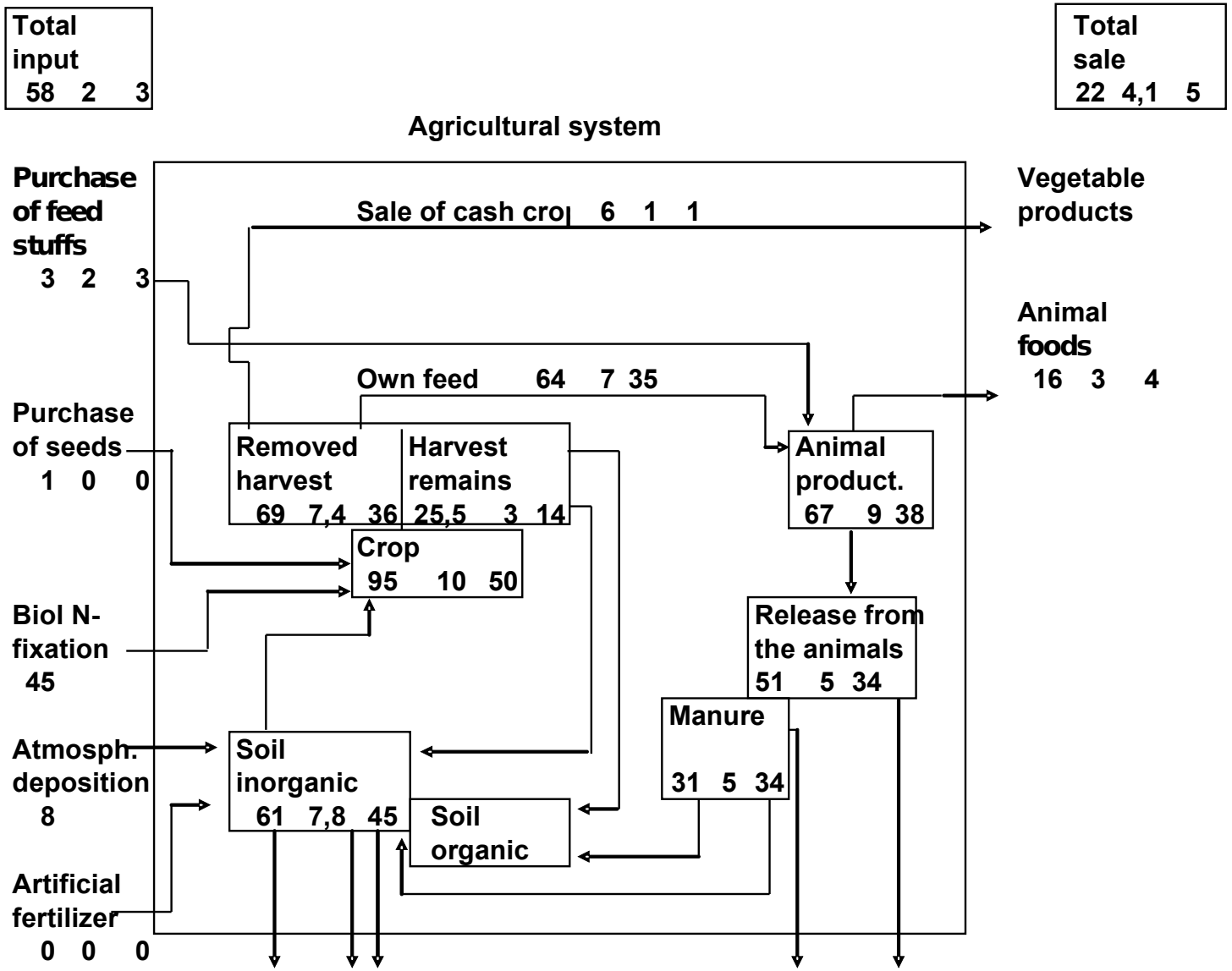


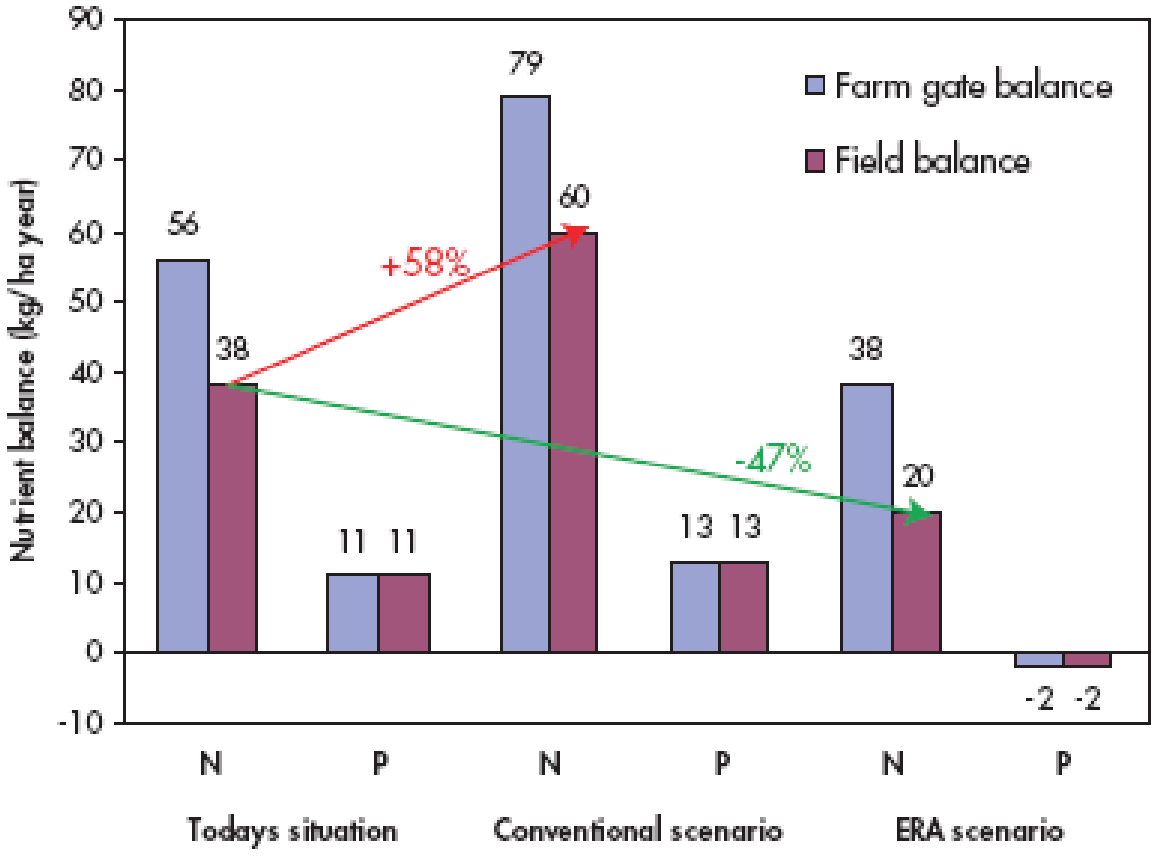
Fig. 4. Mineralisering av isotopmärkt organisk material. – *Mineralization of isotope-labeled organic material.*

Flow of N/P/K kg ha^{-1} in the agricultural-ecosystem Yttereneby-Skilleby
Dagfinn Reder (0,6 animal unit/ha) farm 2002-2003



Three scenarios for the EU – countries around the baltic Sea

Nitrogen- and phosphurus surplus kg/ha and year



BERAS Implementation The objectives

- **Conversion to Ecological Recycling Agriculture (ERA) without use of artificial fertilizers, imported fodder and no use of pesticides and thereby achieve a good environmental status in the Baltic Sea.**

- **Reduce green house emissions from agriculture and food sector through low input of external resources, regional food supply and soil improvement**

- **Protect the Biological diversity trough agriculture without pesticides**

- **Enhance rural development in the region.**

The actions

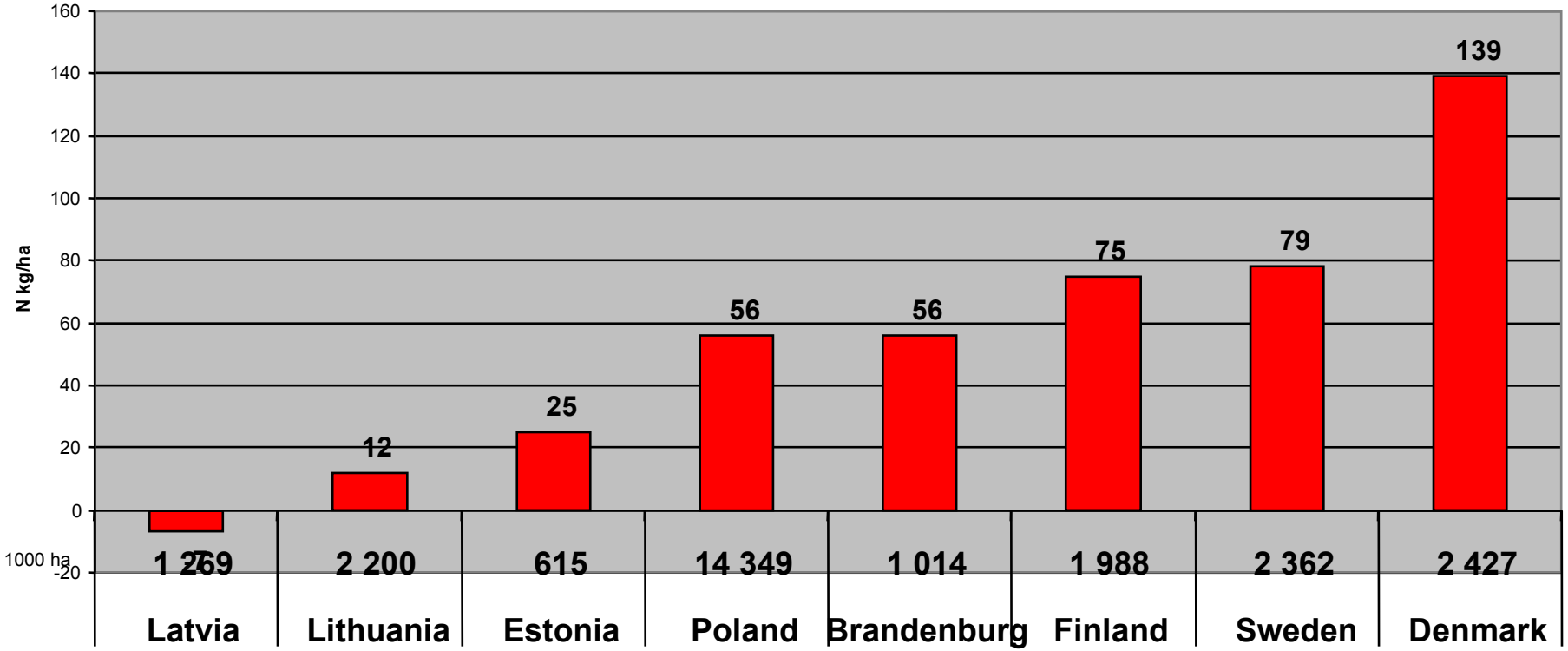
- **Increasing market demand and introduce ecological food throug initiatives “Diet for a clean Baltic” for public and private sector**

- **Introducing techniques and increasing competence among farmers conversion to ERA farming system.**

- **Introducing techniques and knowledge about ERA to agriculture advisory services, authorities etc.**

- **Developing agricultural policy instruments to overcome econom barriers for conversion and provide long term economic incentives for low input recycling agriculture in line with Pollute Pay Principle.**

Agricultural surplus of N kg / ha and year 00-03



New EU states

- Partly nutrient extensive agriculture today
- Small-scale diversified farms (Poland)
- Large unused areas (Latvia)

➢ Risk for separation, specialisation and intensification

➢ Higher nutrient leakage

Work packages and coordination

- **WP1 Management & Adminstration**
- Lead: Södertörn University and SBFI, Sweden
- Contact: Artur Granstedt; .
- **WP2 Communication & Information**
- Lead: Helsinki University, Finland.
- Contact: Sampsa Heinonen, Juha Helenius;
- **WP3 Conversion of farms & Practical guidelines**
- Lead: Leibnitz-Centre for Agricultural Landscape Research
- Contact: Karin Stein-Bachinger;
- **WP4 Environmental, Economical & Sociological, Assessment and Scenarious**
- Lead: MTT Agrifood Research, Finland.
- Contact: Pentti Seuri;
- **WP5 BERAS Implementation Centres and Networks**
- Lead: Polish Ecological Club, Poland
- Contact: Maria Staniszewska;

- **The involvement**

- **The project has 25 partners from 9 countries and is supported by ministries, financial institutions, NGOs and other key stakeholders representing the whole food chain from farmer to consumer from 11 cuntries**

BERAS implementation Partners

- **Belarus** -International Public Association of Animal Breeders "East-West"
- **Denmark** -The Ecological Council
- **Estonia** -Estonian University of Life Science
- -Estonian Organic Farming Foundation (EOFF)
- **Finland** -MTT Agrifood Research Finland
- -Centre for Economic Development,Transport and the Environment
- -Institute of Finnish Environment
- Association of ProAgria Centres
- -University of Helsinki, Department of Agriculture Science
- **Germany** -Leibniz-Centre for Agricultural Landscape Research
- **Latvia** -Latvian Rural Advisory and Training Centre
- **Lithuania** -Lithuanian University of Agriculture,
- -Baltic Foundation HPI
- -Municipal Council of Kaunas District
- **Poland** -Institute of Soil Science and Plant Cultivation
- -Advisory Branch in Minikowo
- -Polish Ecological Club
- -Independent Autonomous Association of Individual Farmers"Solidarity"
- -Pomeranian Agricultural Advisory Centre, Gdansk
- **Sweden** -Södertörn University, Costal Management Research Centre
- -The Biodynamic Research Institute
- - -Södertälje Municipality
- -Swedish Rural Economy and Agricultural societies, Kalmar
- -Swedish Rural Network
- -Swedish Rural Economy and Agricultural societies, Gotland

BERAS-reports CUL Swedish University of Agriculture Sciences

- Available on **http://www.jdb.se/beras/ www.beras.eu**

- **Baltic Ecological Recycling Agriculture and Society (BERAS)**
  Executive Summary (not in printed version)
  BERAS executive summary, Granstedt. A. 2007.
- **Beras report nr 1**
  Local and organic food and farming around the Baltic Sea
  Ekologiskt lantbruk nr 40. Sepännen, L (ed.). Juli 2004.
- **Beras report nr 2**
  Effective recycling agriculture around the Baltic Sea
  Ekologiskt lantbruk nr 41. Granstedt, A., Seuri, P. and Thomsson, O.. December 2004.
- **Beras report nr 3**
  Economical studies within WP3
  Ekologiskt lantbruk nr 43. Possibilities for and Economic Consequences of Switching to Local Ecological Recycling Agriculture, Sumelius, J. (Ed). 2005
- **Beras report nr 4**
  Obstacles and solutions in Use of Local and Organic Food
  Ekologiskt lantbruk nr 44. Kakriainen, S., von Essen H. (ed.). Augusti 2005.
- **Beras report nr 5**
  Environmental impacts of ecological food systems - final report from BERAS
  Ekologiskt lantbruk nr 46. Granstedt, A., Thomsson, O. and Schneider, T. January 2006.
- **Beras report nr 6**
  Approaches to Social Sustainability in Alternative Food Systems
  Ekologiskt lantbruk nr 47**.** Sumelius, J. & Vesala, K.M. (eds.). December 2005.
- **Beras report nr 7**
  The Power of Local - Sustainable Food Systems around the Baltic Sea
  Ekologiskt lantbruk Eds: Kahiluoto, H., Berg, P.G. , Granstedt, A., Fisher, H. & Thomsson, O June 2006

BERAS peer reviewed publications:

- Granstedt, A., Seuri, P and Thomsson, O. 2008. Ecological Recycling Agriculture to Reduce Nutrient Pollution to the Baltic Sea. Journal Biological Agriculture and Horticulture, 2008.

- Granstedt, A. & Kjellenberg, L. 2008. Organic and biodynamic cultivation – a possible way of increasing humus capital, improving soil fertility and be a significant carbon sink in Nordic conditions. Second Scientific ISOFAR Conference in Modena 18-20 June 2008.

- Granstedt, A., Tyburskij, J., Stalenga J. 2007. Nutrient Balances in Organic Farms. Baltic Sea project BERAS (Baltic Ecological Recycling Agriculture and Society), results from Poland. In: Scientific Agricultural conference Poznan August, 2007.

- Granstedt, A. 2000. Increasing the efficiency of plant nutrient recycling within the agricultural system as a way of reducing nutrient pollution to the Baltic Sea. Agriculture, Ecosystems & Environment 1570 (2000) 1–17. Elsevier Science B.V. Amsterdam

- Helmfried, H., Haden, A. and Ljung M. 2007. The Role of Action Research (AR) in Environmental Research: Learning from a Local Organic Food and Farming Research Project. Journal Systemic Practice and Action Research.

- Larsson, M. and Granstedt, A. 2010. Sustainable governance of the agriculture and the Baltic Sea – Agricultural reforms, food production and curbed eutrophication. Ecological Economics 69 (2010) 1943-1951.