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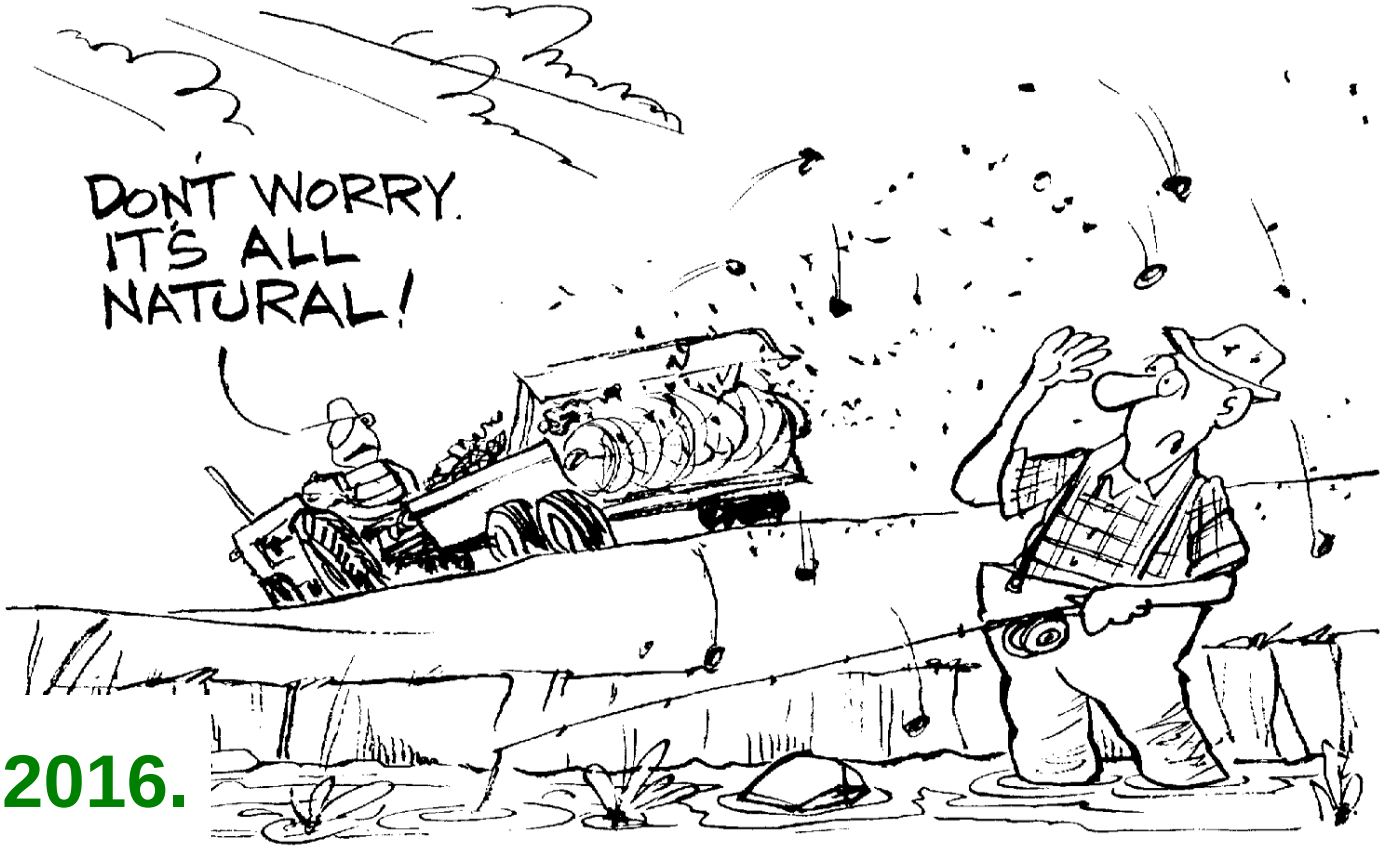
European Union
European Regional Development Fund

Accumulated Experience in Various Projects About Manure Management Practices and Technologies In Latvia



Jelgava 16.02.2016.

The REAL BaltiC Sea

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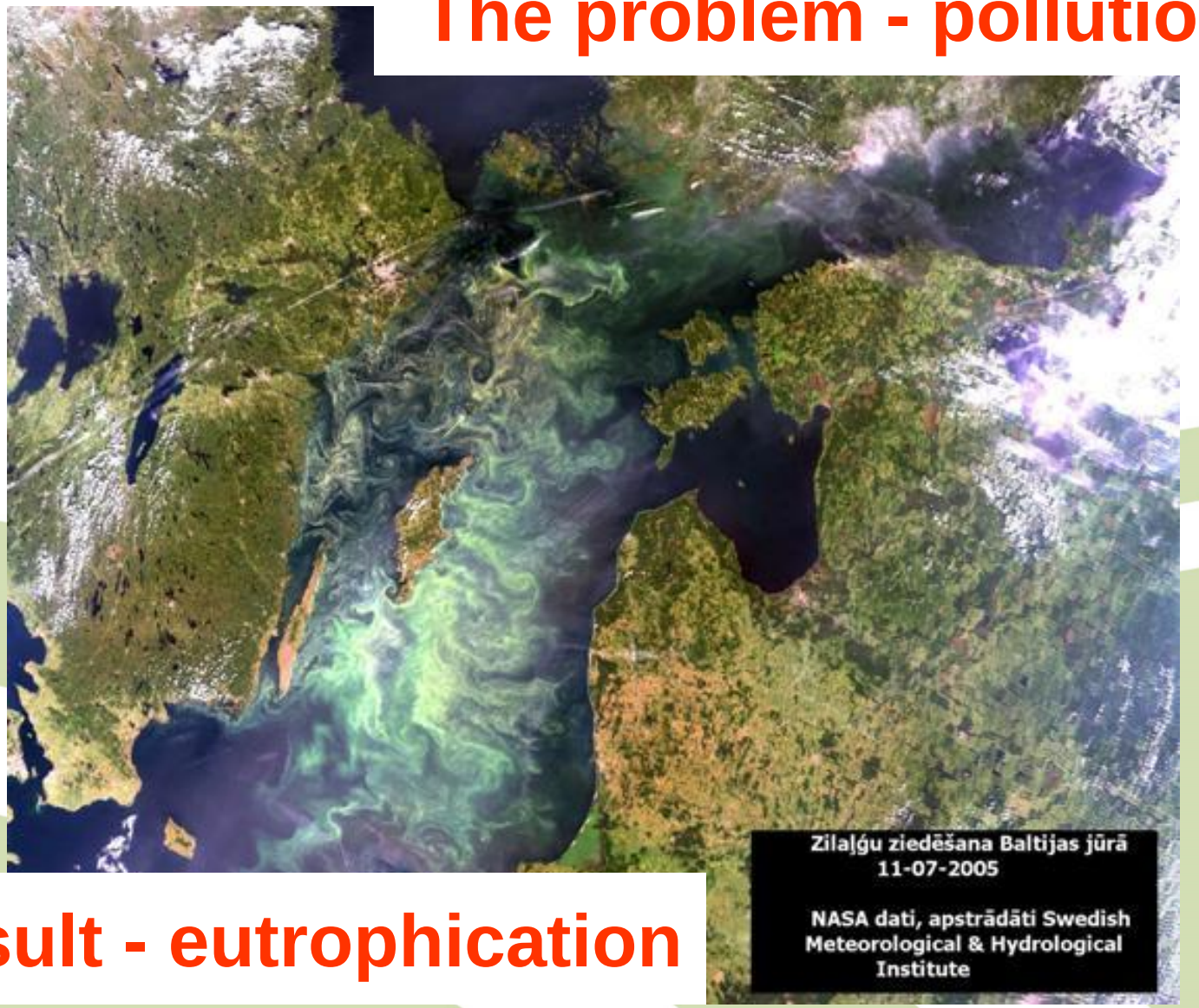
The problem - pollution...



...the result - eutrophication

N and P runoff to Baltic Sea

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Algae in full bloom

Oxygen content in Baltic Sea bottom earlier

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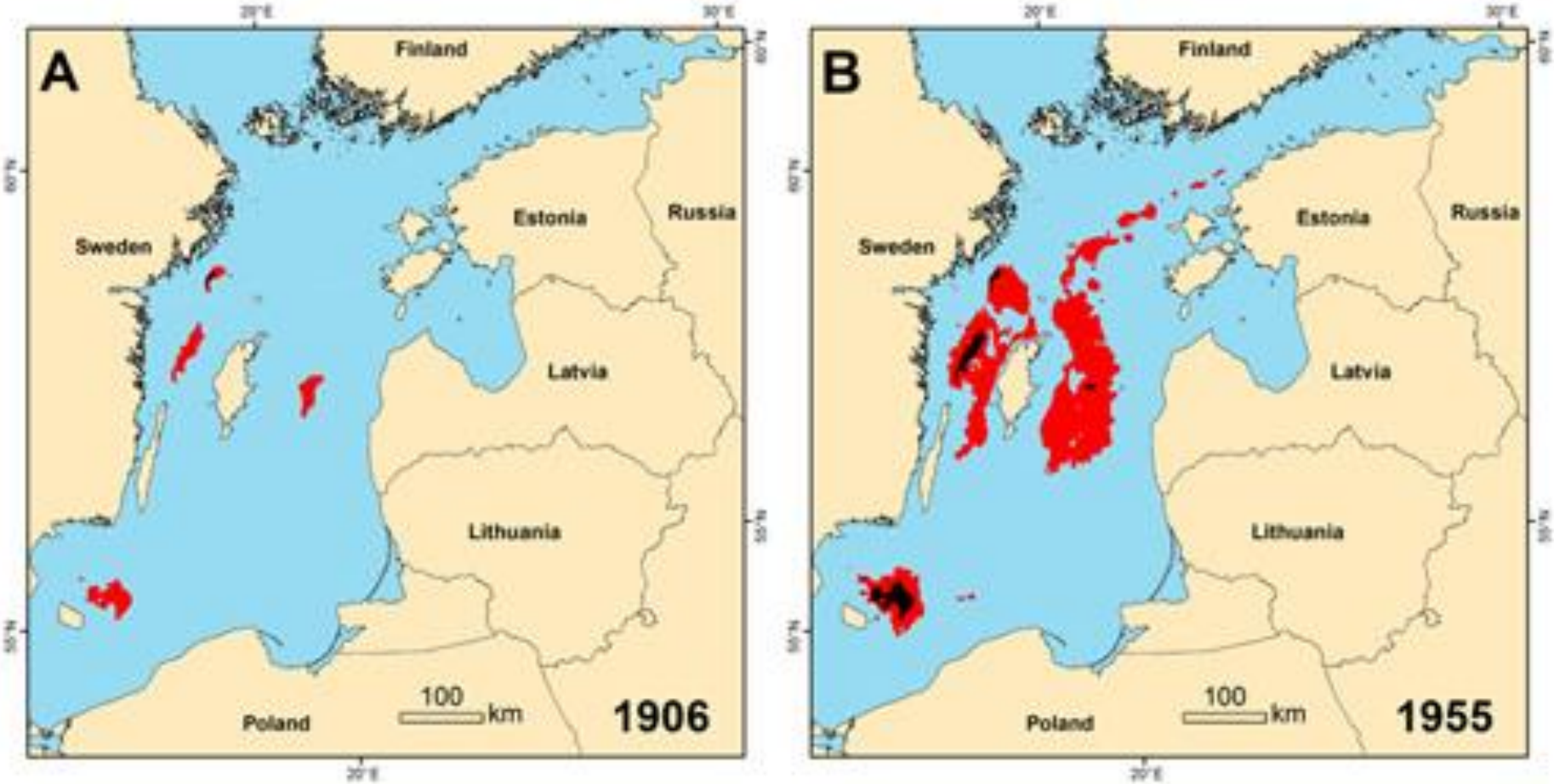

The youngest sea on Planet, one of the largest water body with less salinity

7 of 10 world's largest dead bottom zones are located in Baltic Sea

Source: Jacob Carstensen, Jesper H. Andersen, Bo G. Gustafsson, and Daniel J. Conley. "Deoxygenation of the Baltic Sea during the last century." PNAS. Published online before print: 31-March-2014. doi: 10.1073/pnas.1323156111

Oxygen content in Baltic Sea bottom nowadays

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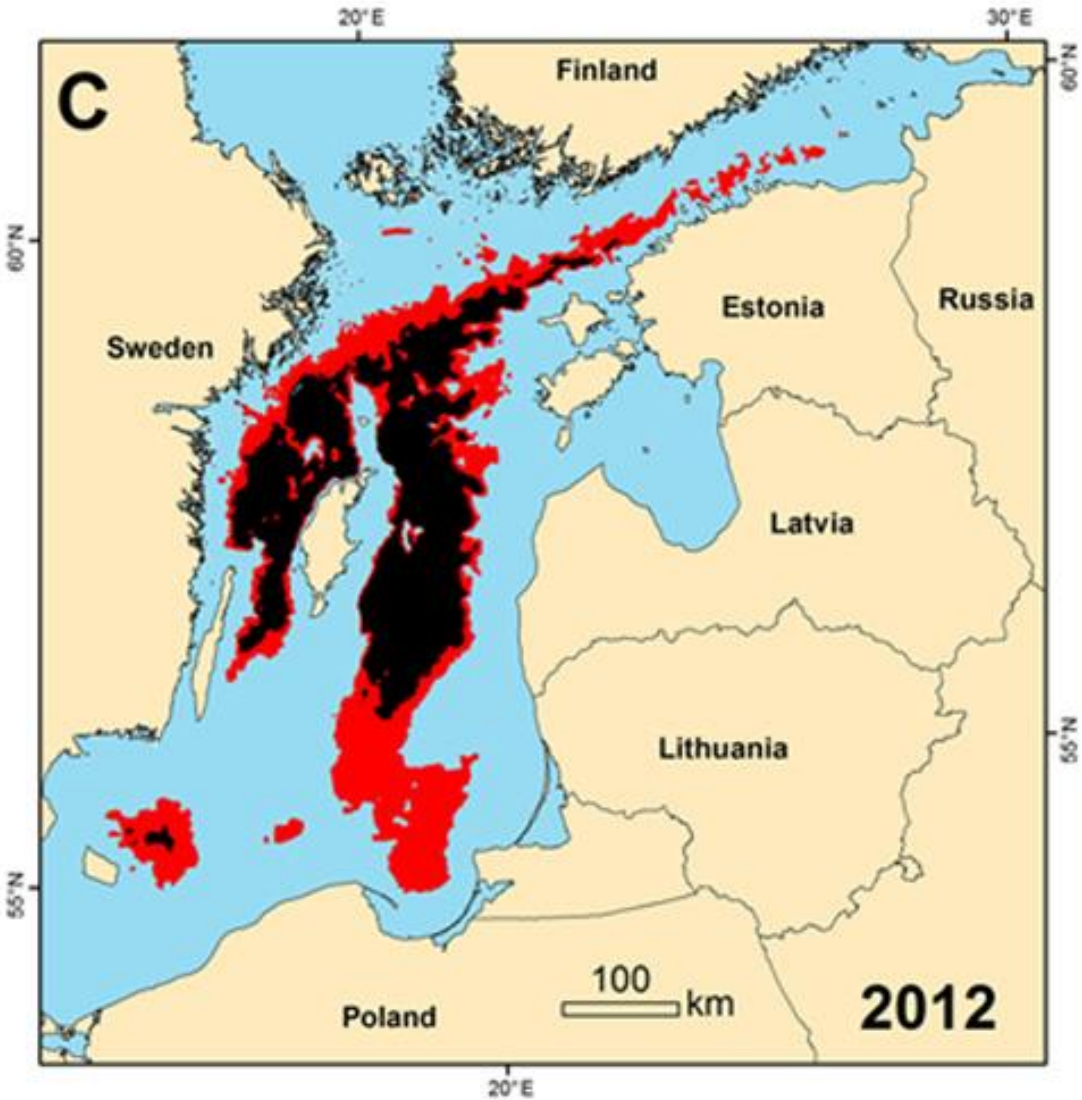
During the last 100 years water temperature at the bottom of the sea has raised by 2 degrees Celsius.

Two problems:

- **oxygen disolves in water less intense;**
- **higher temperature stimulates the activity of bacteria and their qxygen consumption .**



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Baltic Sea catchment area

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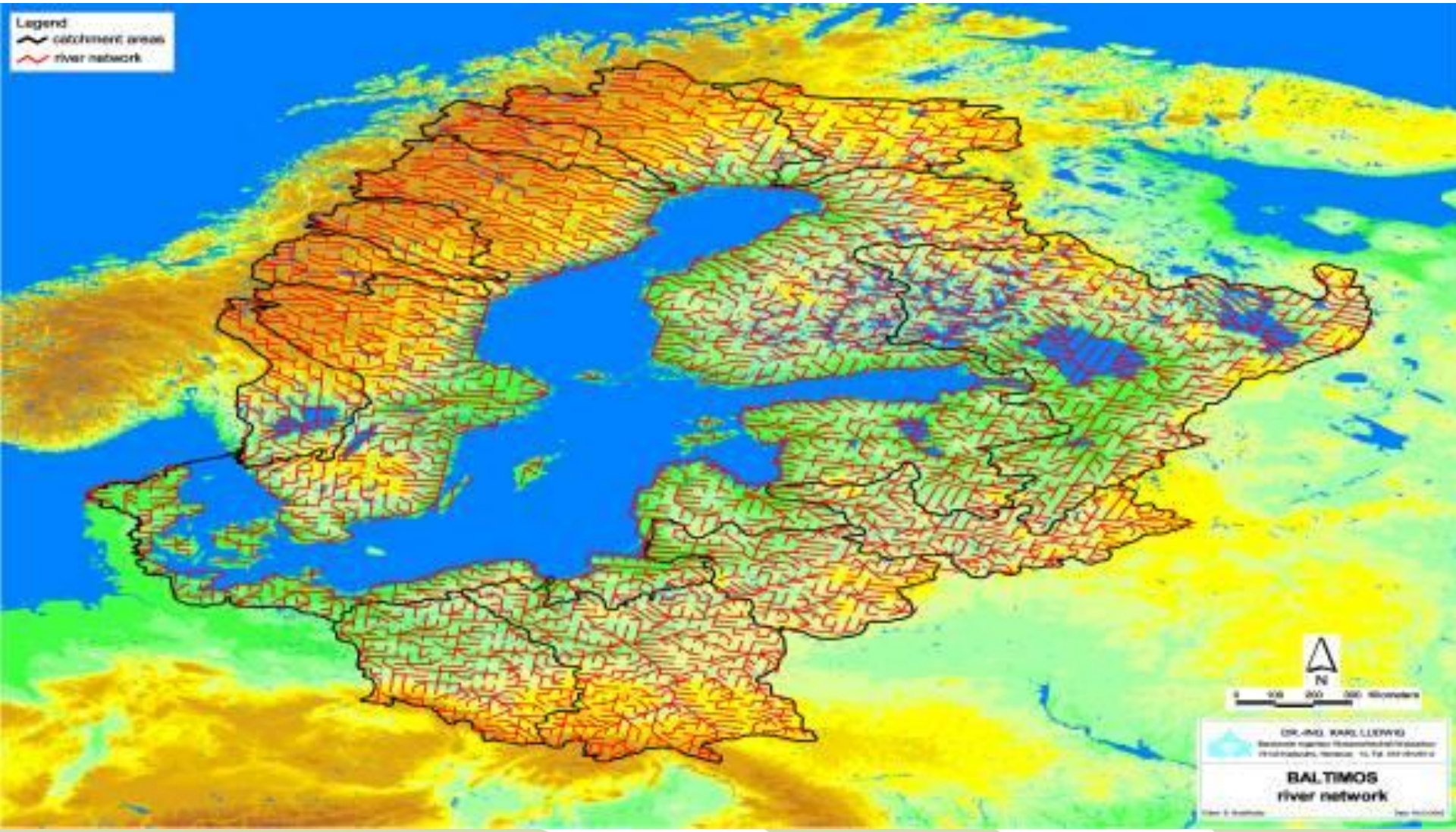

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Intensity of N and P pollution, 2010

Pollution of N

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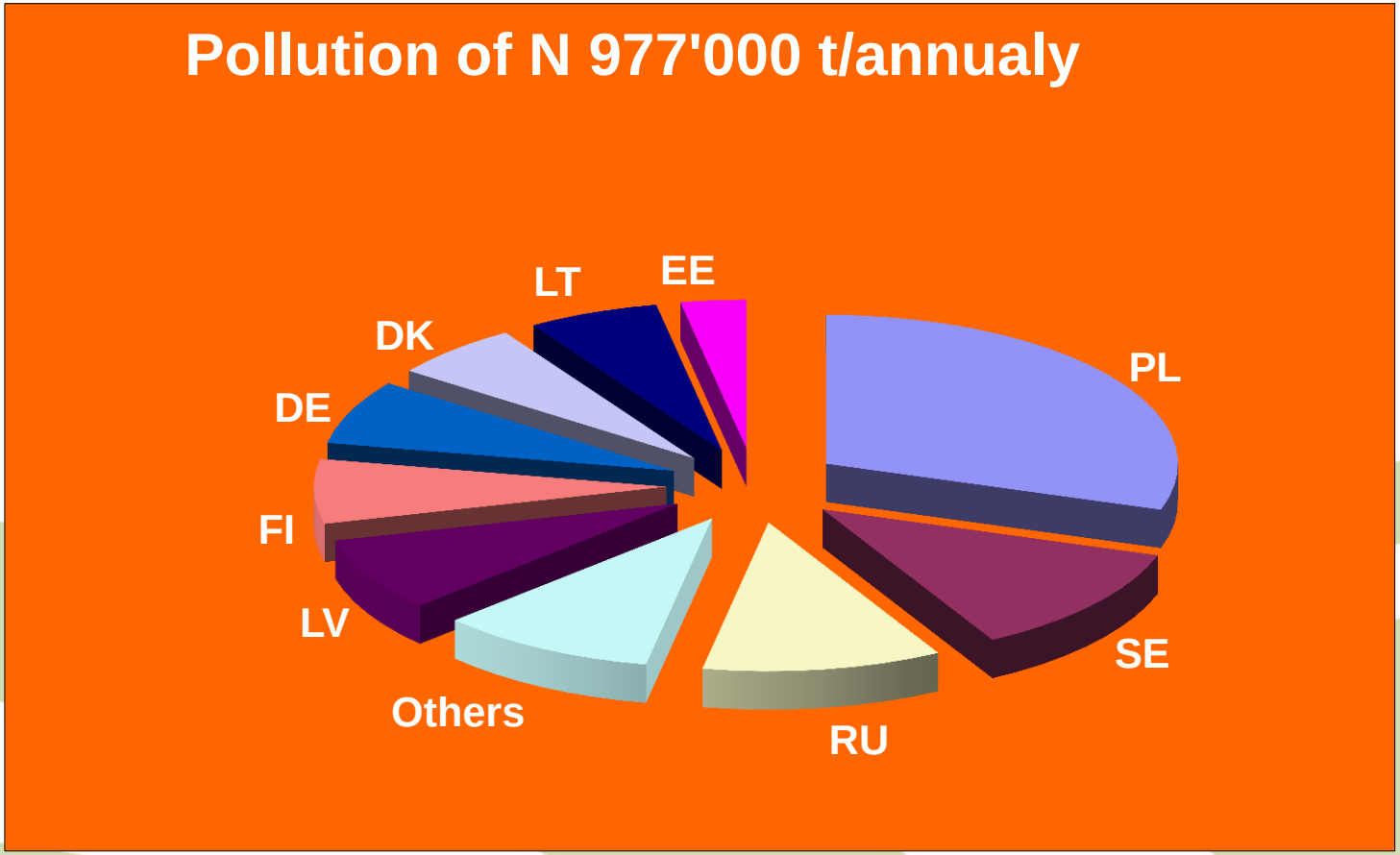

Source: Baltic Sea Environment Proceedings No. 141. Review of the Fifth Baltic Sea Pollution Load Compilation for the 2013 HELCOM Ministerial Meeting

Pollution of P

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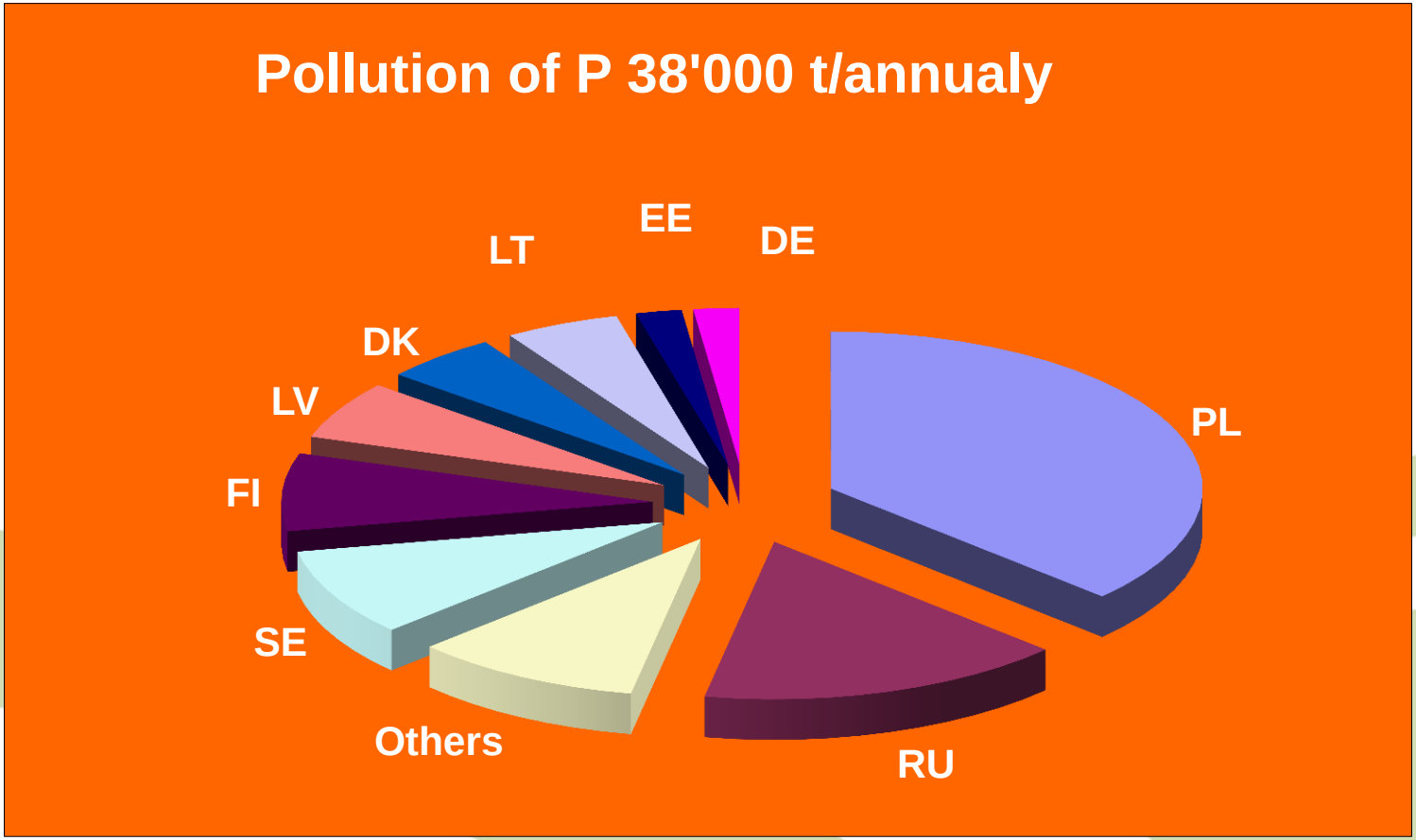

Source: Baltic Sea Environment Proceedings No. 141. Review of the Fifth Baltic Sea Pollution Load Compilation for the 2013 HELCOM Ministerial Meeting

Photo: Andreas Gursky "Rhine II"

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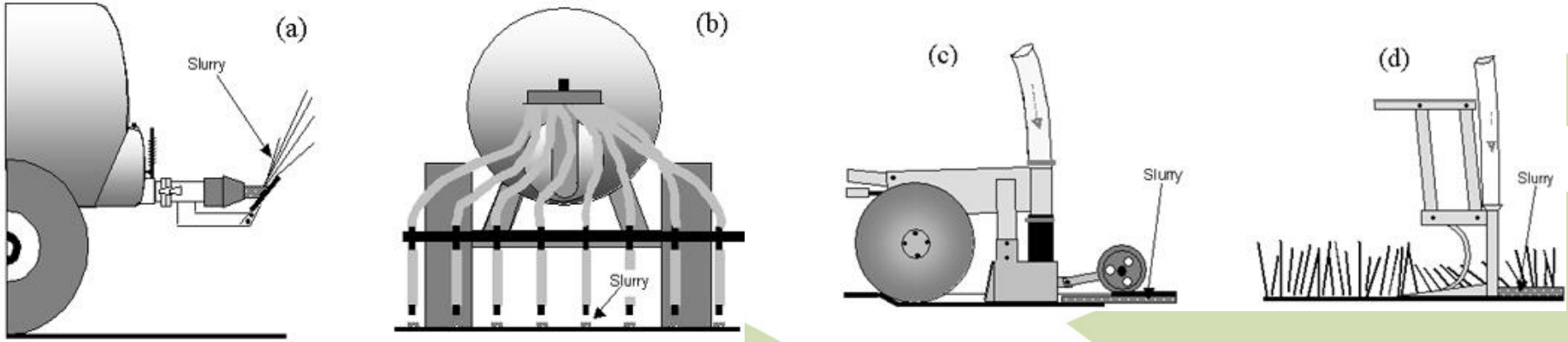
Slurry ???

- Different N losses (in house/ storage/ application)
- Transportation to the field – heavy tanker or pipes
- Different methods of application (deflector plate, trailing hoses, heavy duty injector)



- Acidification/ P separation/ mixed
- Bacteria (liquid/ solid)

Ready for the plants, of course!

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From storage to field

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- Very heavy tanker and five axles?
- On public roads – damage and safety?

- What about soil compaction on the field?
- And capacity? Not very fast ☹

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The second possibility – umbillical system

- Not habmful for the road and field
- More effective - faster
- No need for heavy tanker, just pump and pipes
- Limit of 2,5km... Or extra pumps and storages

System No.3, well... not manure hopefully...

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Manure spreading

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- The new ones chop the stuff and give almost perfect distribution
- The old... bacteria will definetely help
- Ploughing in after spreading – no doubt

Complete misery – deflector plate...

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- In spite of all – the most popular in Latvia
- Enormous N loss (up to 60%), uneven and inaccurate distribution
- Smell !!!
- Problems with use of grass (at least 6 weeks)
- But cheap hardware...

Not really better ☹

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- Swing arm principle
- Distribution is even worse

We can do better!

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- Here we go – trailing hoses
- Distributor and chopper inside
- Excellent distribution and exact dosage, no blockages
- Perfect in growing crop
- Minimal N loss
- Comparably expensive

Coming closer...

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- Trailing hoses with coulters
- Ideal distribution and exact dosage, no blockages
- Less N emissions than ordinaru trailing hoses
- Need for little more power
- We have wearing parts on this one

And the winner is...

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- Injector mounted on a cultivation tool
- Excellent distribution and exact dosage, no blockages
- Almost no N loss during application

- Need for more power to cut the soil
- More wearing parts, the most expensive
- More difficult to manoeuvre

Alternatives to save N

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- Acidification using sulphuric acid (0,5...3 litres per ton)
- 50% reduction of ammonia emissions (comparing to untreated slurry)
- Possibility to add different components into application
- Possibility to use the system more efficient – separation of P from slurry (crystallisation)

Treating slurry/ manure

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- Less risk of N runoff and emissions
- Better plant uptake
- Easier to spread – more homogeneous
- Almost no smell
- Reduction of volume by third (manure), faster process

If we take, we have to give back

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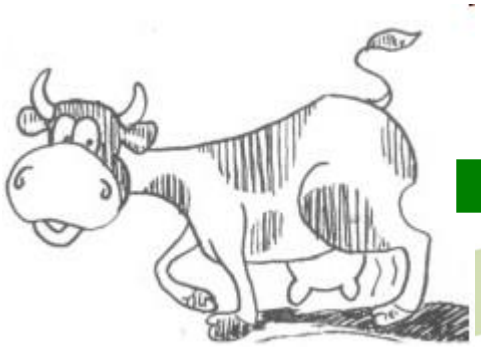
!



Input ~ Output

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To roll up

The state of our Sea is bad, but:

- We have the knowledge to treat it back
- 60% reduction of ammonia emissions is realistic during the spreading
- The choice of proper application system is not the only solution to reduce N loss during application
- There is a room for improvement to use manure more efficient and plant/environment friendly
- Cheaper machinery doesn't equal more sustainable farming

There’s always sun behaind the clouds ☺

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Was great to have you here, thanks!

Jānis Kažotnieks

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