Economic assessment of basin scale strategies to achieve quality goals (good status)

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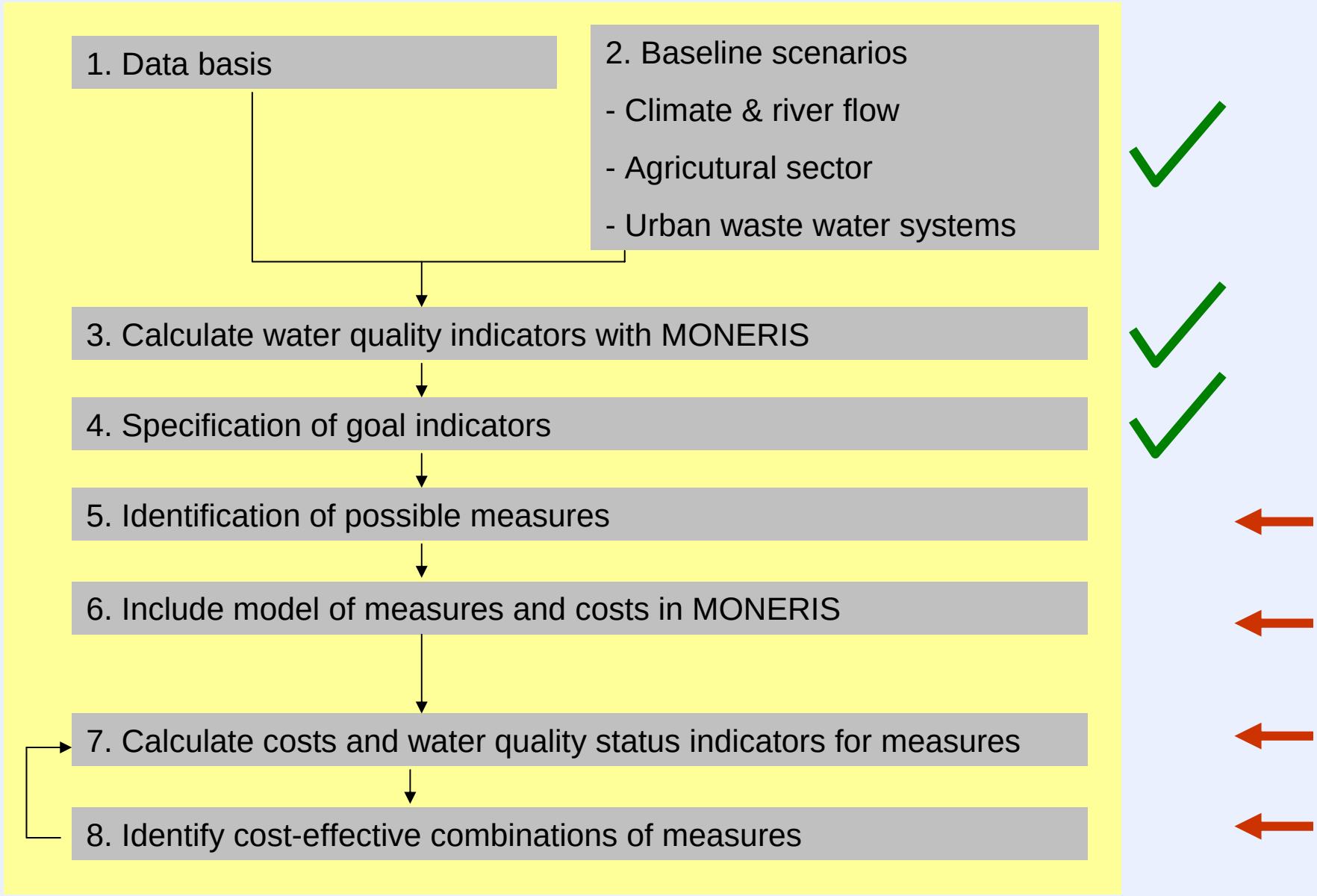
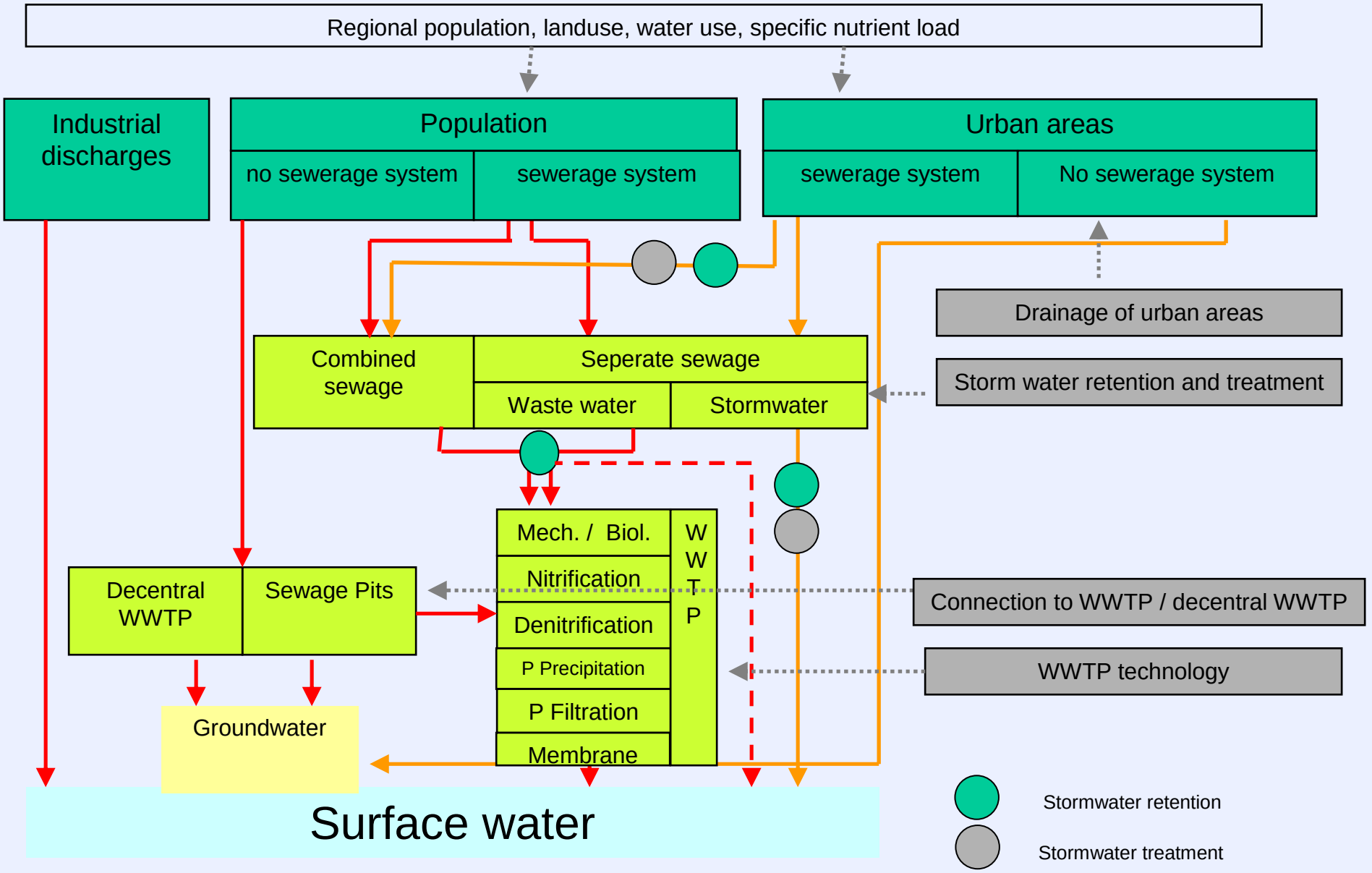
Content: Steps in cost-effectivness analysis with MONERIS



Step 5: integration of measures in MONERIS pathways – urban sources



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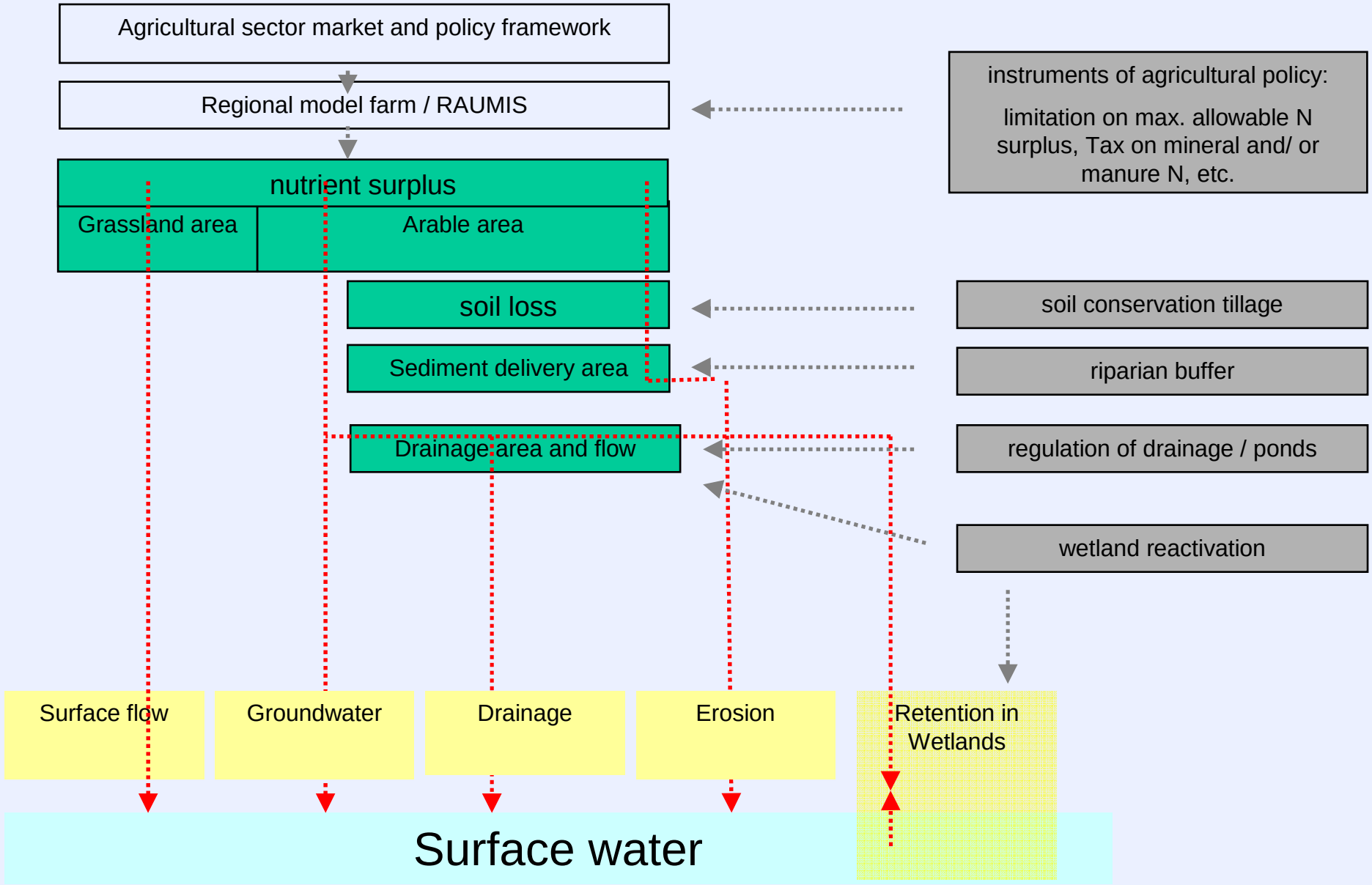
Step 5: integration of measures in MONERIS pathways – agricultural sources

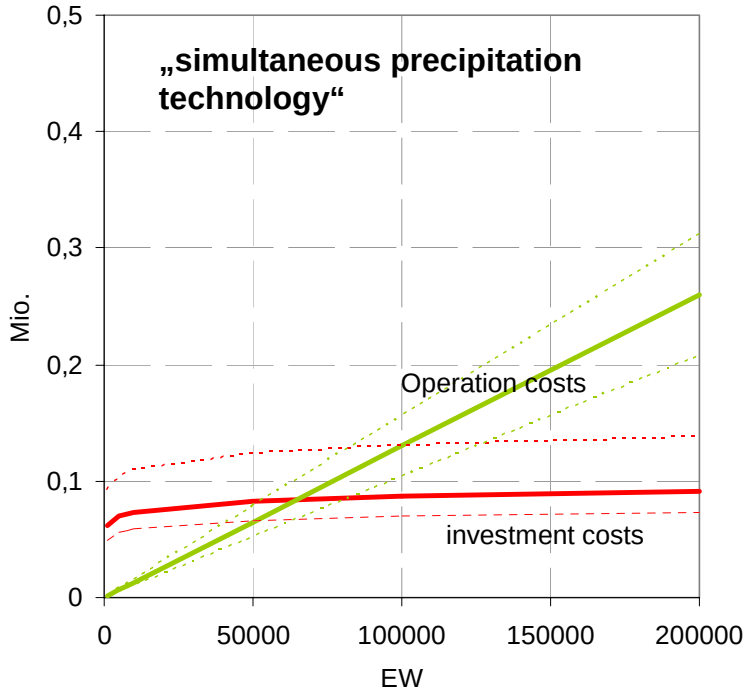


Step 6: Cost model => cost functions and annual costs

-standardised cost-functions adapted to available data => „cost bands“

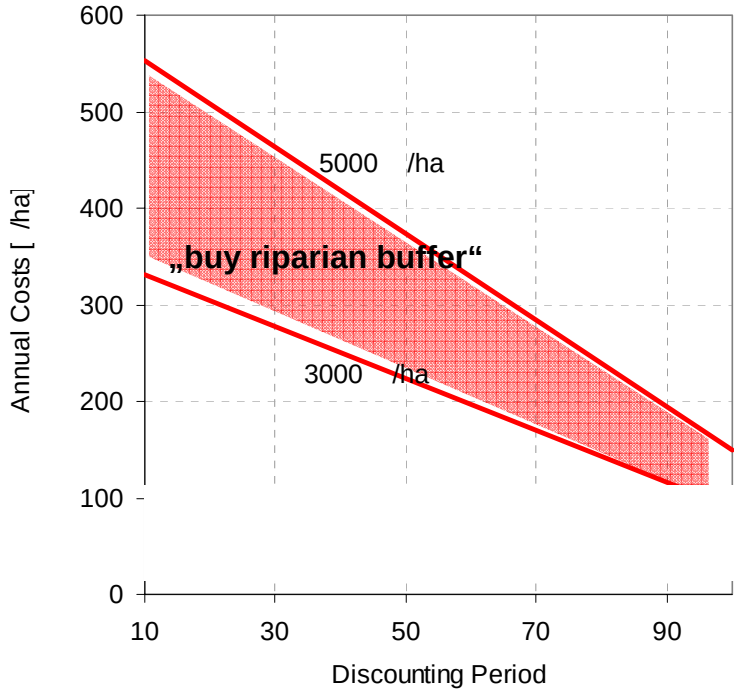
- comparison on the basis of discounted annual values

Example: P Elimination in WWTP



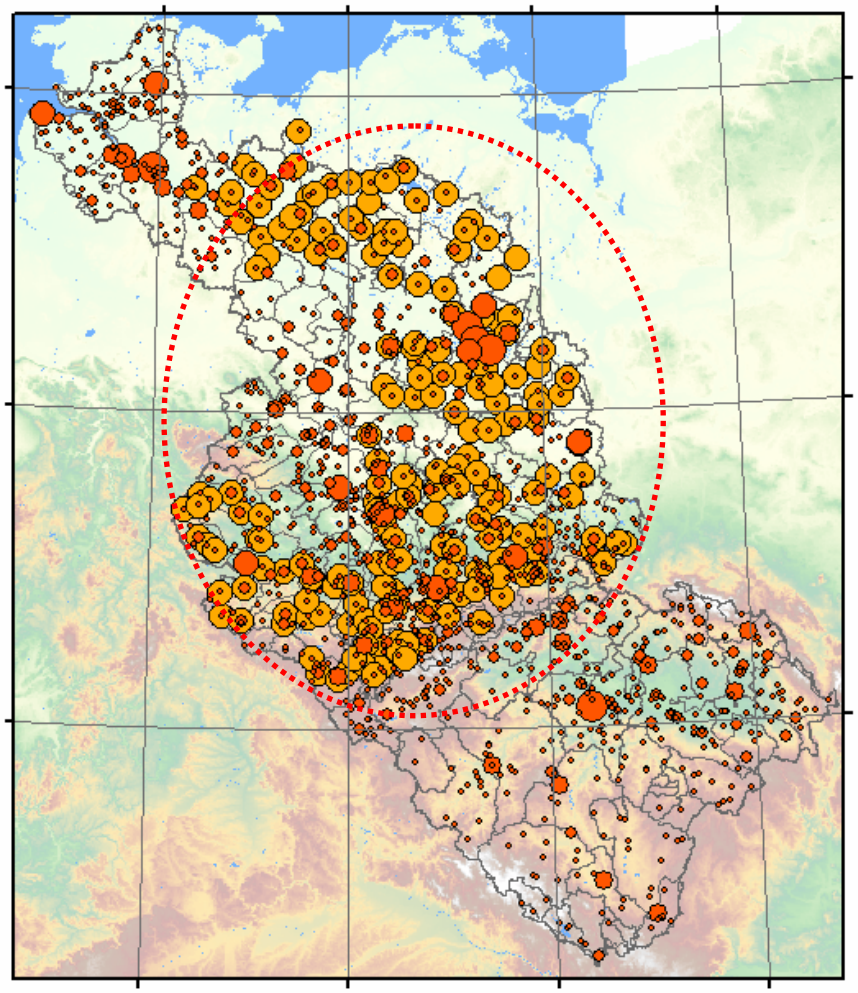
=> scale effects, investment and operation costs

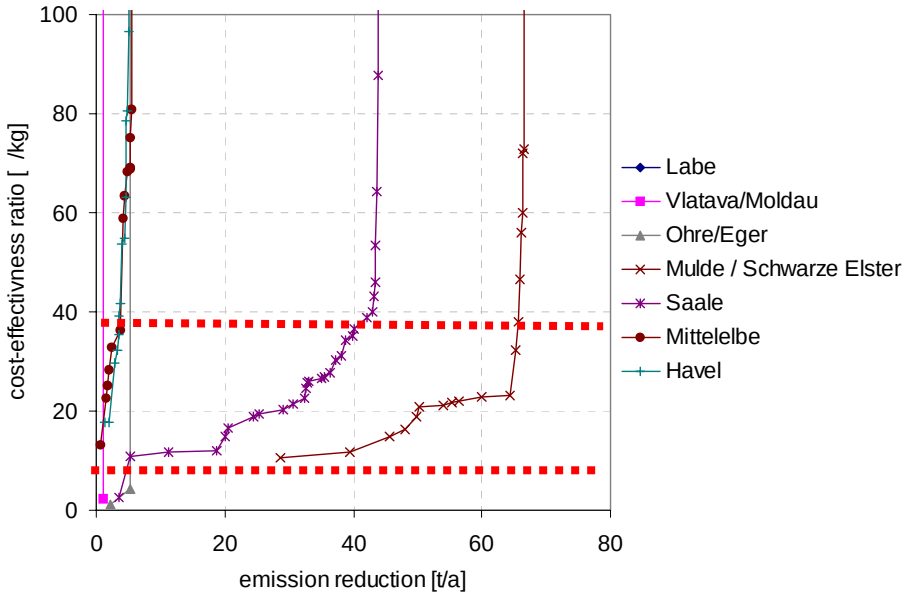
Example: Erosion control

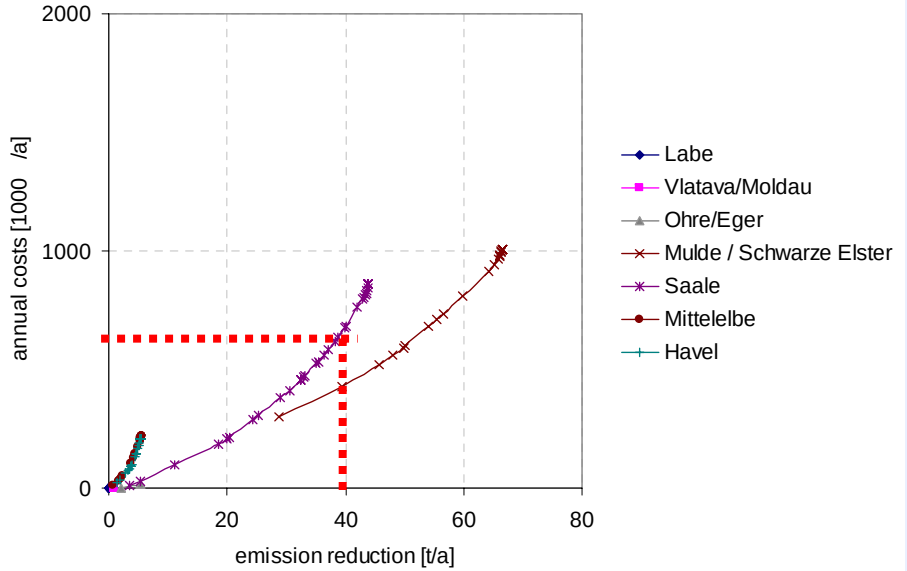


⇒effect of discounting on annual costs

Step 7: Analysing basin specific costs and effects







Example: P Elimination in WWTP

All WWTP > 1000 EW with chemical treatment => 1 - 0,8 mg/l P konz., 3% discount, 60 year discount period, only german subbasin

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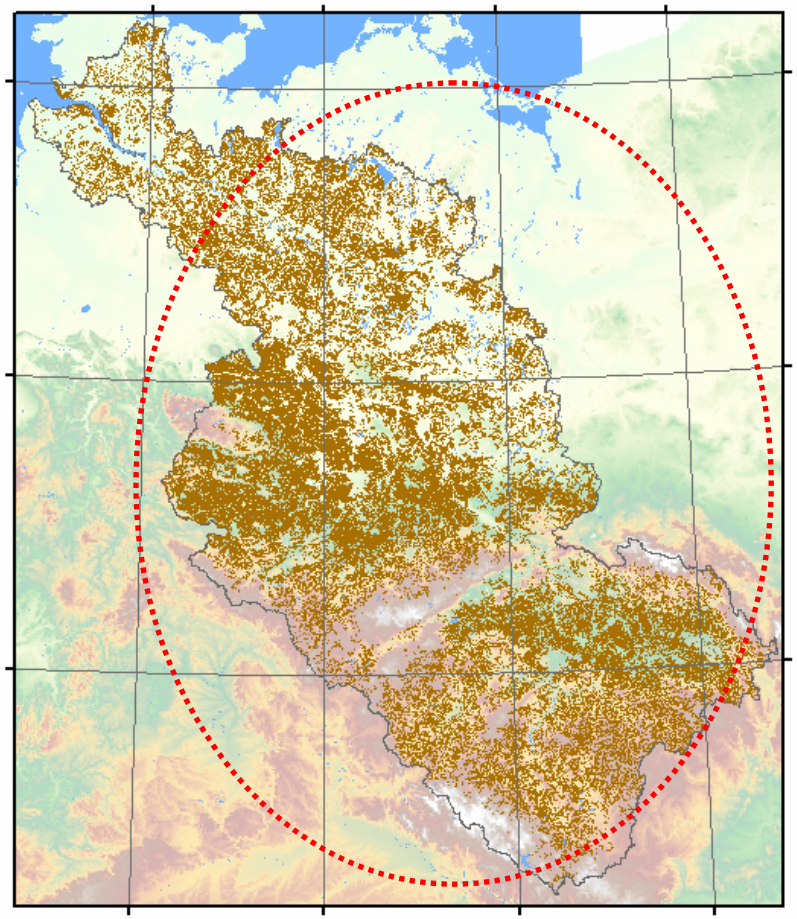
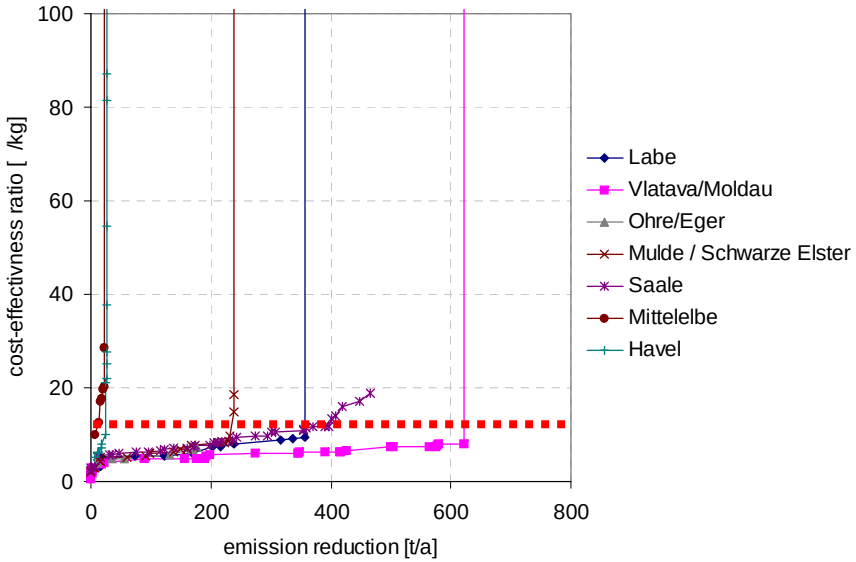
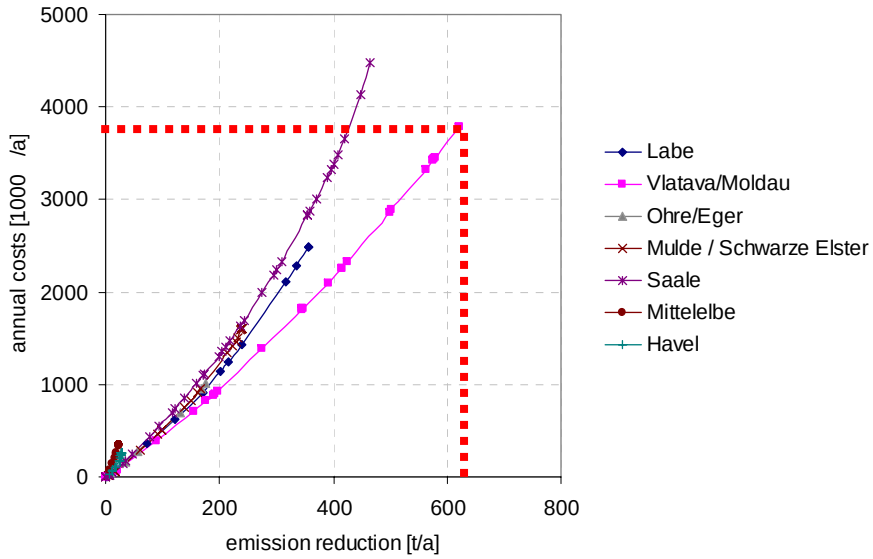
Step 7: Analysing basin specific costs and effects







Example: P reduction by erosion control

Soil erosion on all of arable land contributing to sediment delivery is reduced by 80% through soil cultivation practice, costs 50 /ha, 3% discount, 60 year discount period

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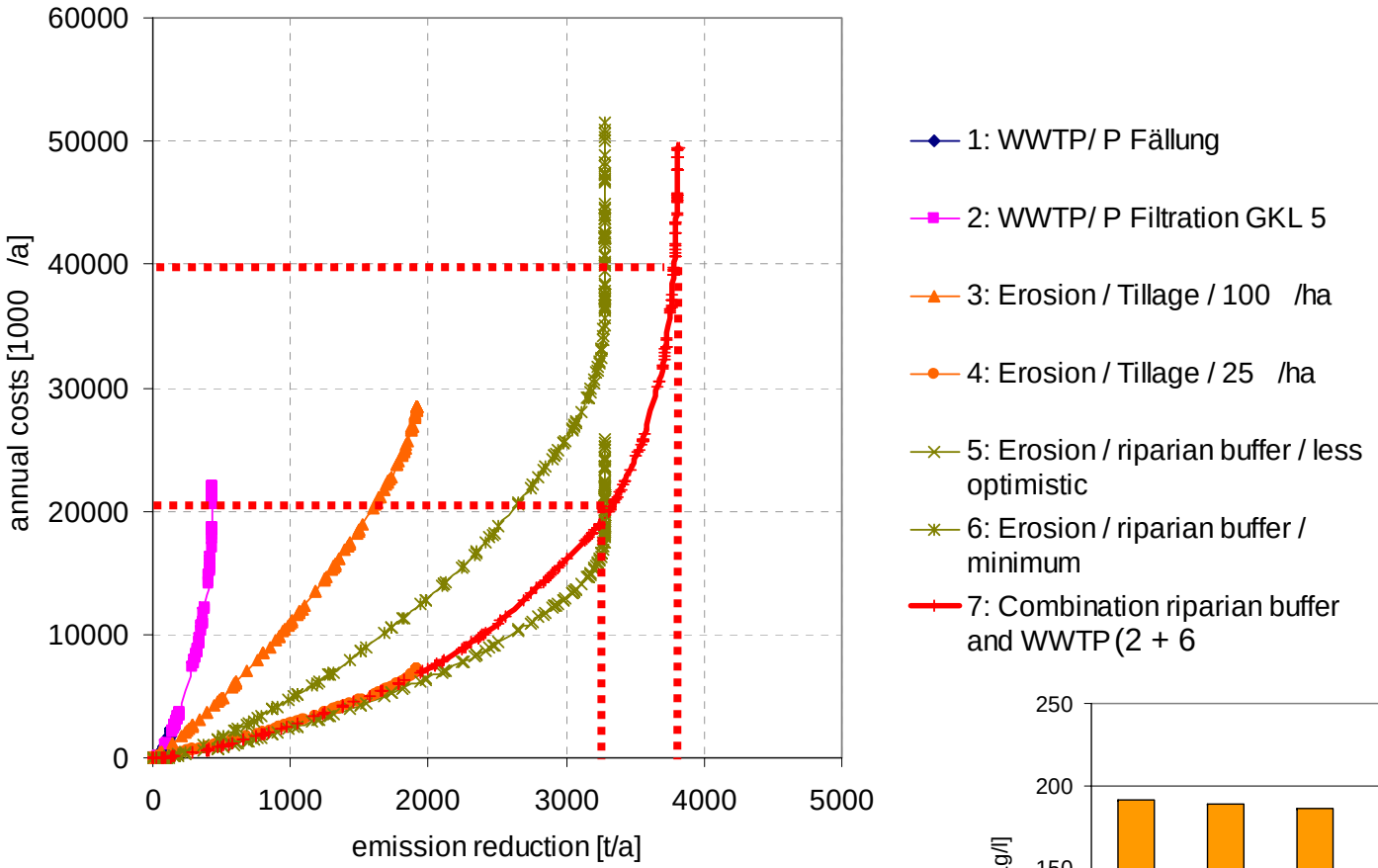
Step 8: Comparison of measures / assessment of combinations

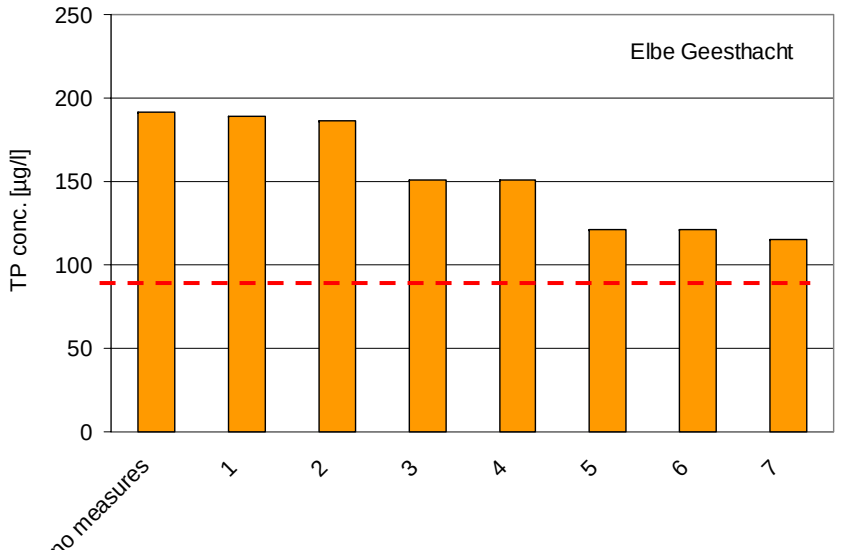


Comparison: P reduction measures

⇒ *ca. 20 - 40 Mio. annual costs for coming close to „good status“ in P conc., discount period 60 years.*

⇒ *25 Mio Inhabitants: 0,8 – 1 / EW or 0,03 – 0,05 /m³*

=> WWTP CZ not yet included



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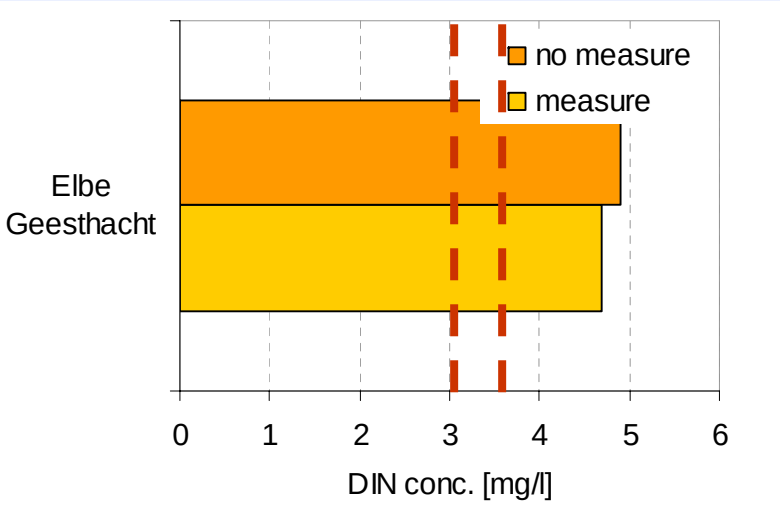
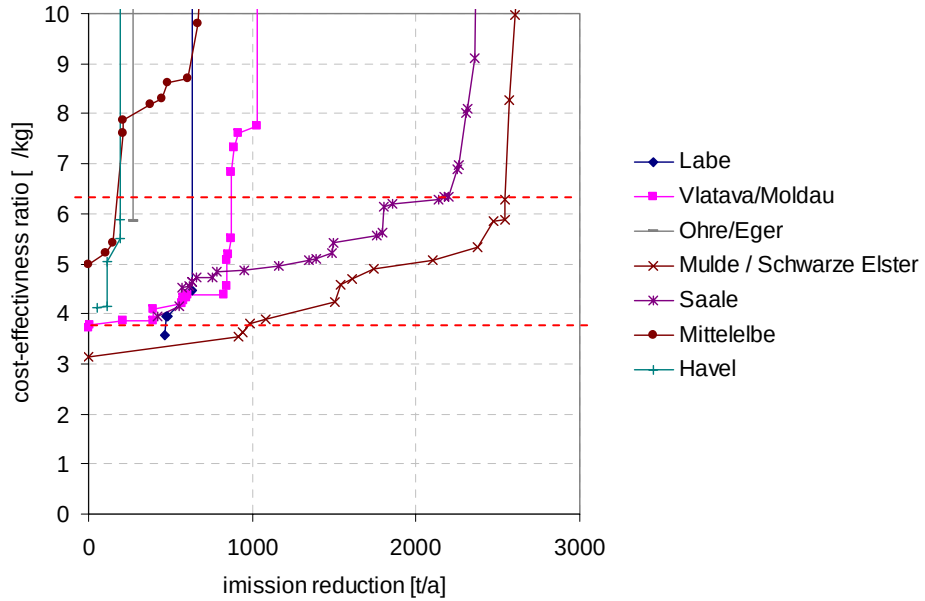
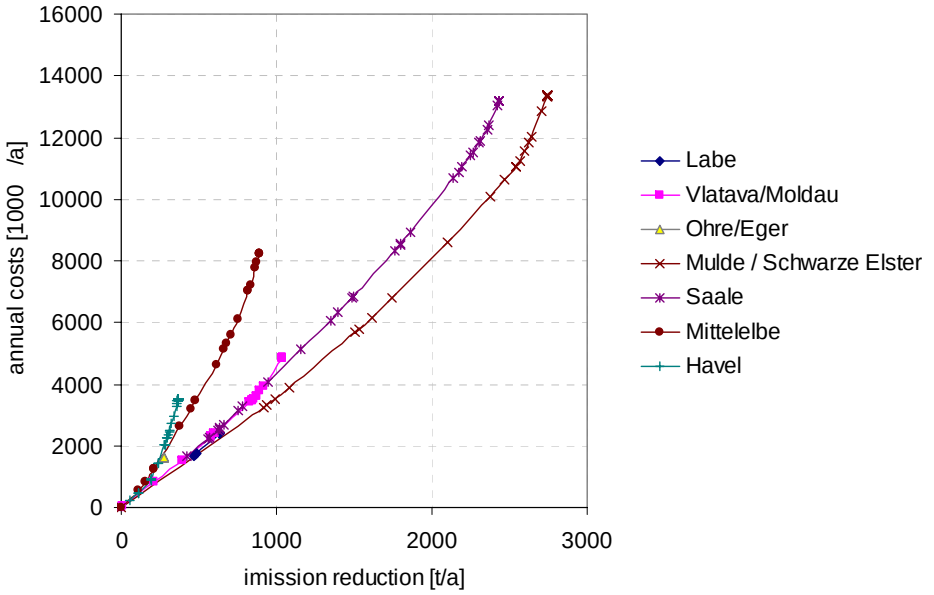






Example: N surplus in agriculture

*⇒ reduction of allowable maximum to 50 kg N / ha surplus, costs of surplus reduction assumed 1 / kg N / ha*a*

=> here only effect of groundwater pathway, RAUMIS will calculate regional different costs

Conclusion

Results so far:

- Integrated analysis of measures, outcomes and cost-effectiveness with MONERIS made possible
- It seems possible to achieve good status, as far as the nutrient concentrations are concerend
- This will require to activate almost all P reduction potentials, especially a reduction in sediment transport (Czech WWTP potential not fully included yet).
- large differentials in cost effectiveness and potential for measures between basins, implies that some will need to do more than others to reach a good status of the Elbe.

Thank You !

Introduction

Lead Questions:

Which strategies to achieve quality goals (good status) are promising

=> from a basinwide perspective?

=> and under the conditions of regional change?

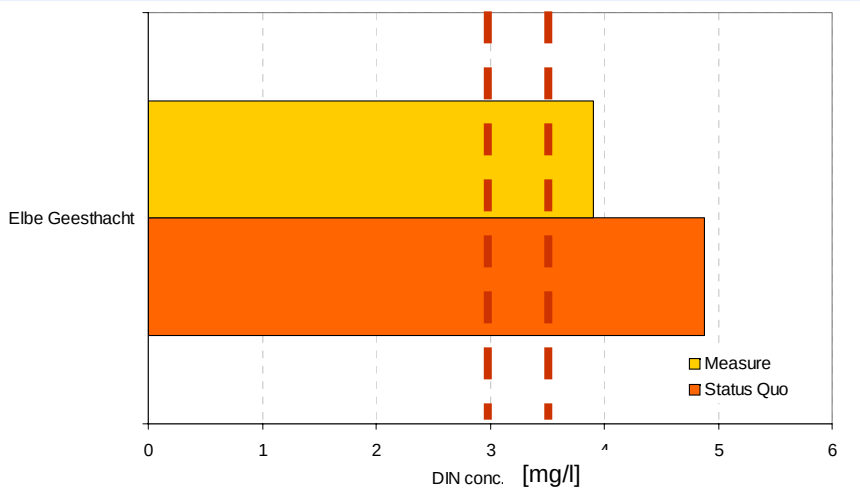
Economic assessement method:

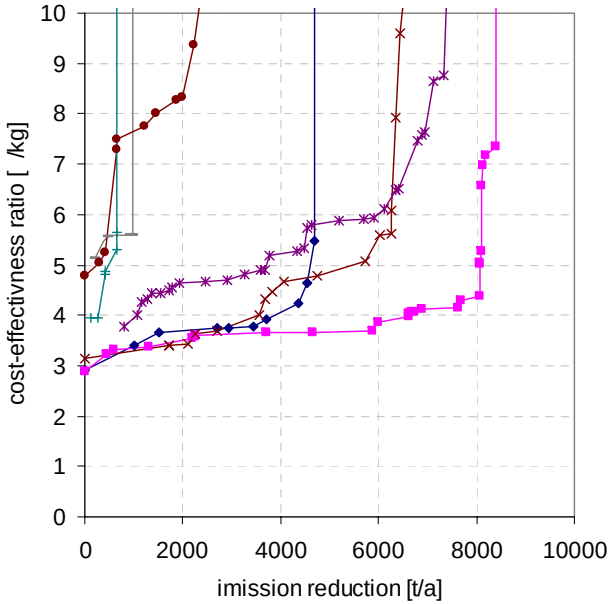
Cost-effectiveness analysis

But:

⇒ before we can asses effects of global change on management options, we first have to operationalise the „cost-effectiveness“ challenge of the WFD for large scale basins like the Elbe.

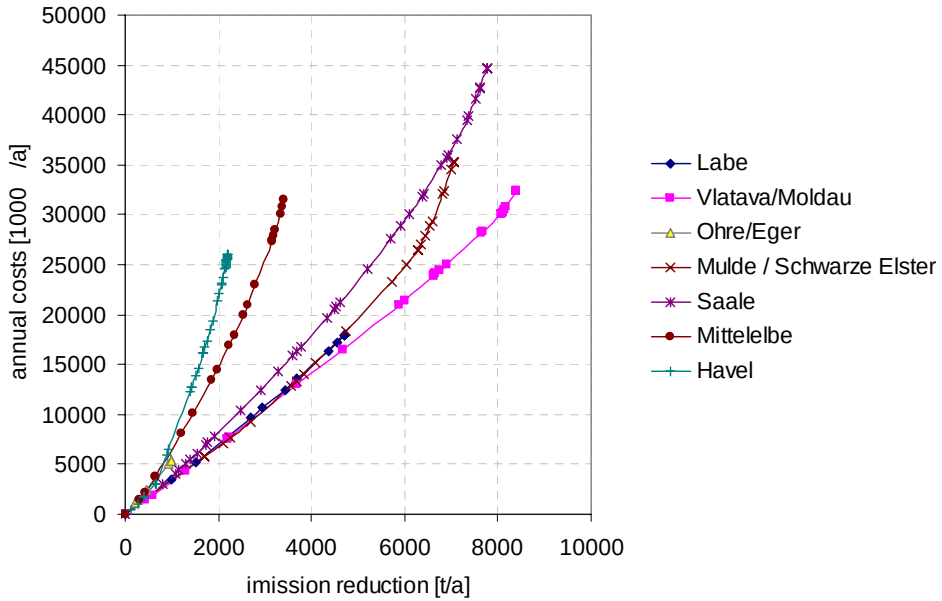
Step 8: Comparison of measures / assessment of combinations



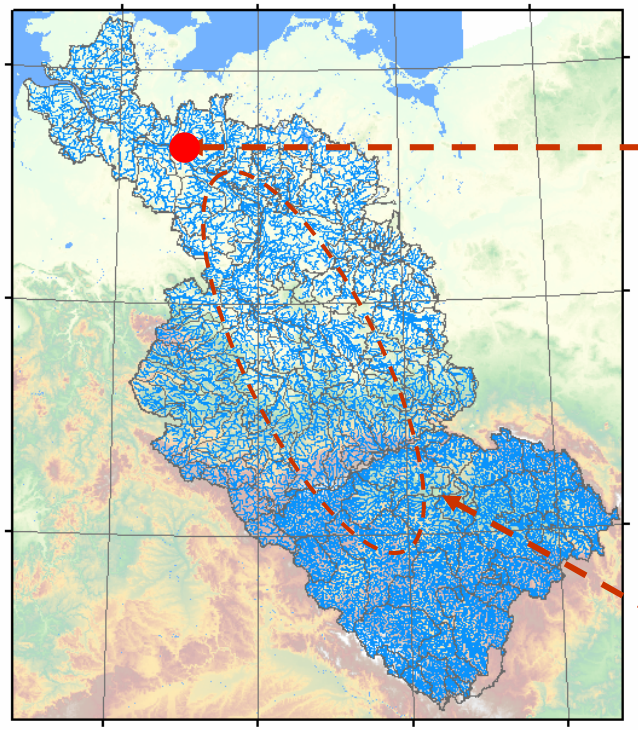


Example: N surplus in agriculture

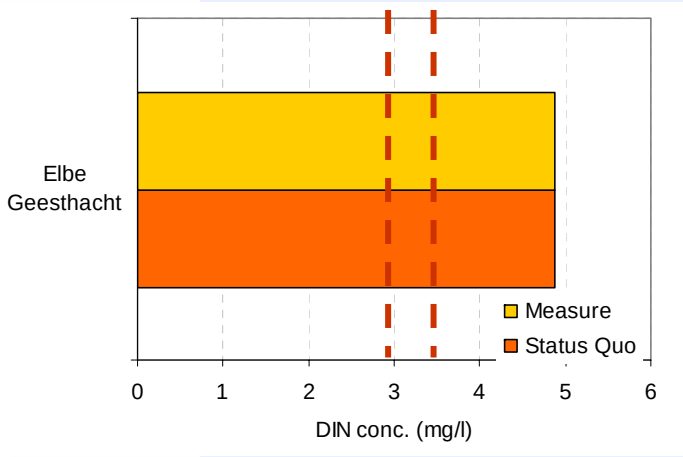
*⇒ maximum of 30 kg N / ha surplus allowed, costs of surplus reduction assumed with 1 / kg N / ha*a*
=> ca. 250 Mio. annual costs for coming close to „good status“ in DIN conc.,
=> 25 Mio Inhabitants: ca. 10 / EW or 0,35 /m³
=> RAUMIS will calculate „true“ cost of measure, other effective measures not included

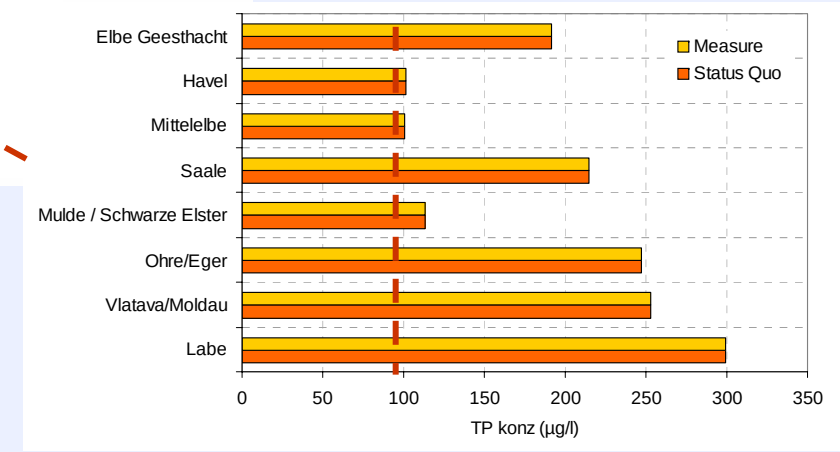


Step 4: Definition of goal indicators

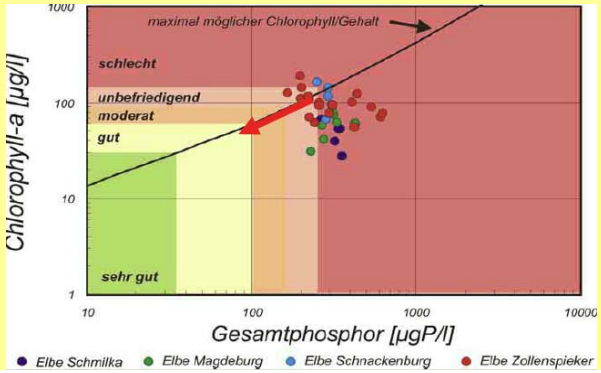


Goal: reduction of nutrient load to North Sea





P concentration => quality status



Goal: good quality status of Elbe River

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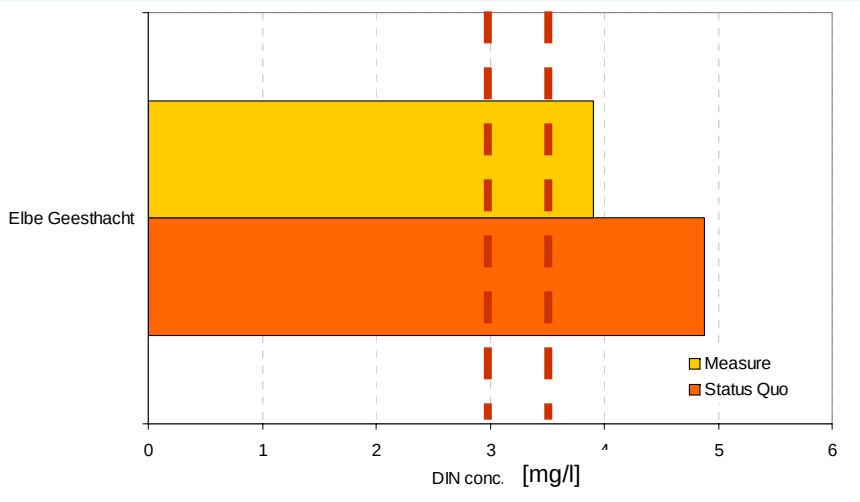
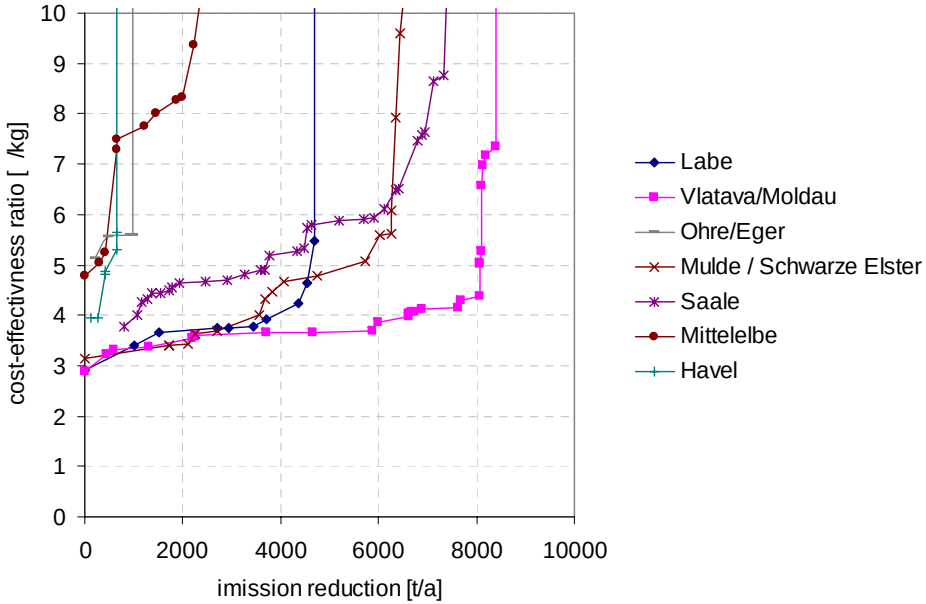
Outlook

Tasks:

- intensive sensitivity analysis
- identify „least cost solutions“, cost-effective combinations of measures
- improve on Czech Basin
- Commence dialog with IKSE, FGG, Länder to reach some level on agreement concerning specification of measures and cost assumptions
- systematic comparison of potential strategies under conditions of different baseline scenarios

Step 8: Comparison of measures / assessment of combinations





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