



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

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Challenge: good status and cost effectiveness



Elbe River



Coastal Sea

Lead Questions:

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

- ⇒ are cost – effective from the basin perspective
- ⇒ and these also effective under the conditions of global change?

Indicator: Nutrient loads

Choice of economic assesement 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.

IV-6 Integrierte Bewertung mit Kosten – Wirksamkeitsanalyse

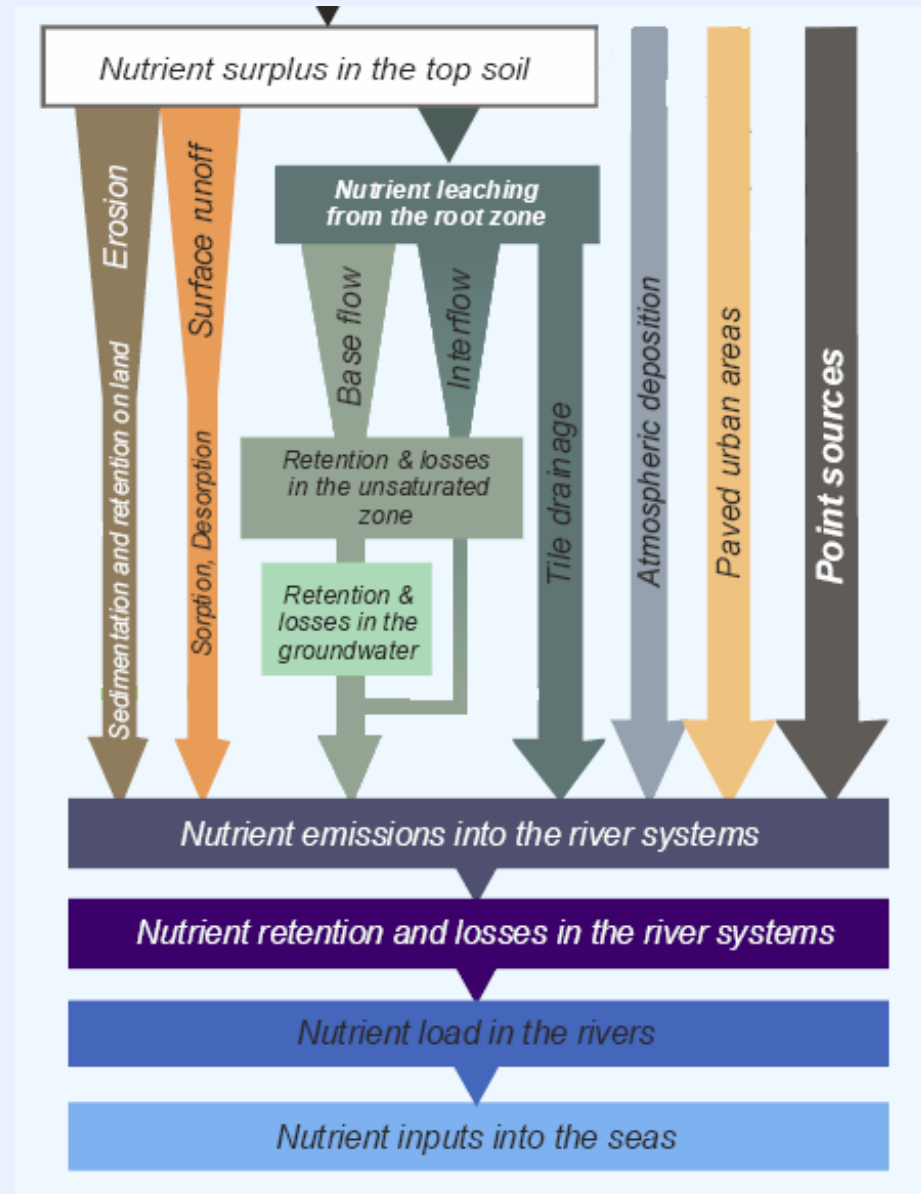
Erstellen eines integrierten Moduls zur Kosten Wirksamkeitsanalyse mit MONERIS

- Entwicklung einer an die verfügbare Datenlage angepassten Konzeption inkl. der Auswahl von darzustellenden Maßnahmen
- Vermeidungskostenfunktionen (TUB, ISI, FAL) liegen vor
- Vermeidungskostenfunktionen sind in MONERIS eingebaut
- Auswertungsroutinen für Kosten-Wirksamkeitsanalyse mit MONERIS sind erstellt.

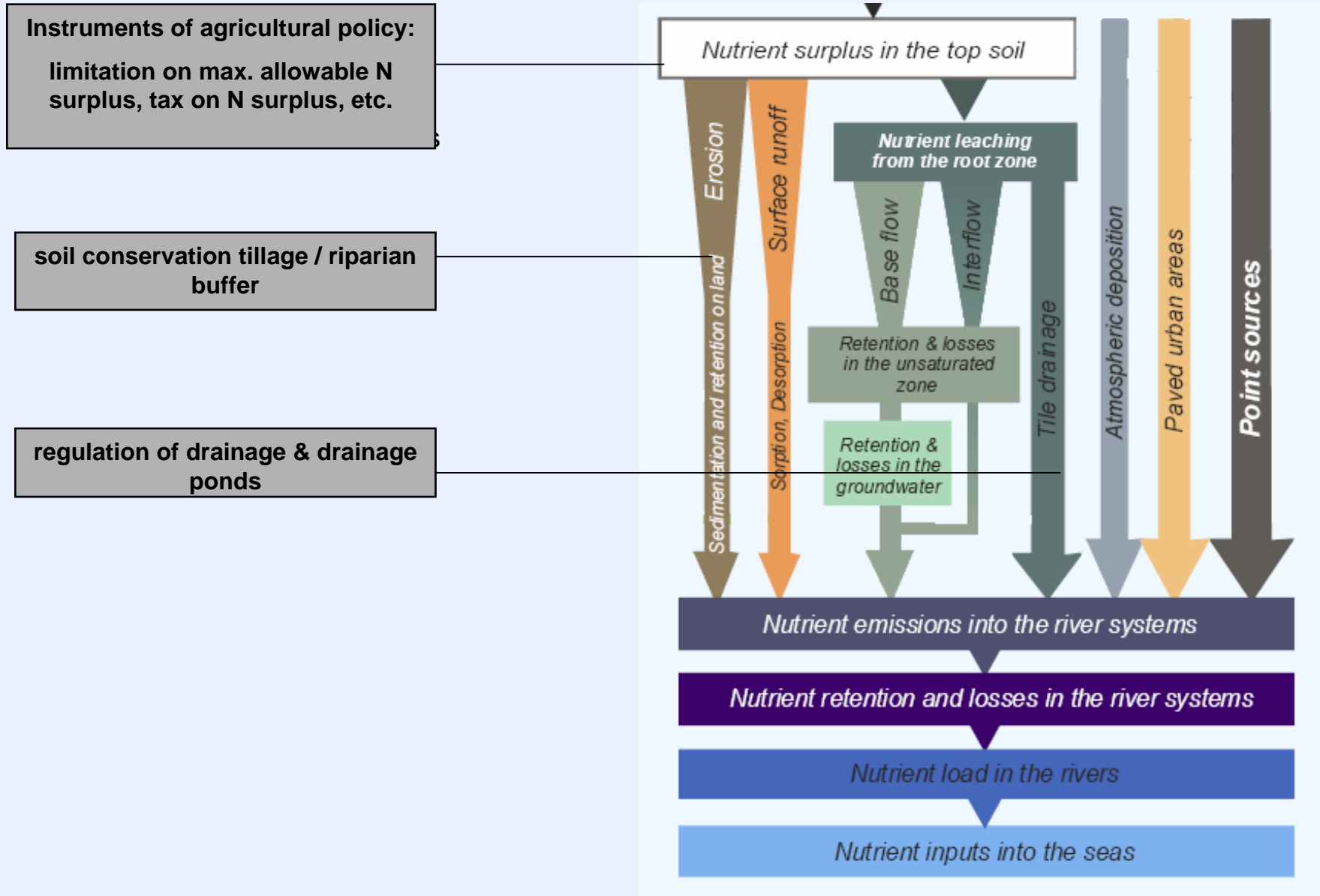
Untersuchung von Handlungsstrategien

- Ergebnisse der Kosten – Wirksamkeitsanalyse von Maßnahmen für status quo Projektion liegen vor
- Einfluss unterschiedlicher Entwicklungsrahmen auf das Ergebnis liegen vor
- Ableitung von Handlungsempfehlung

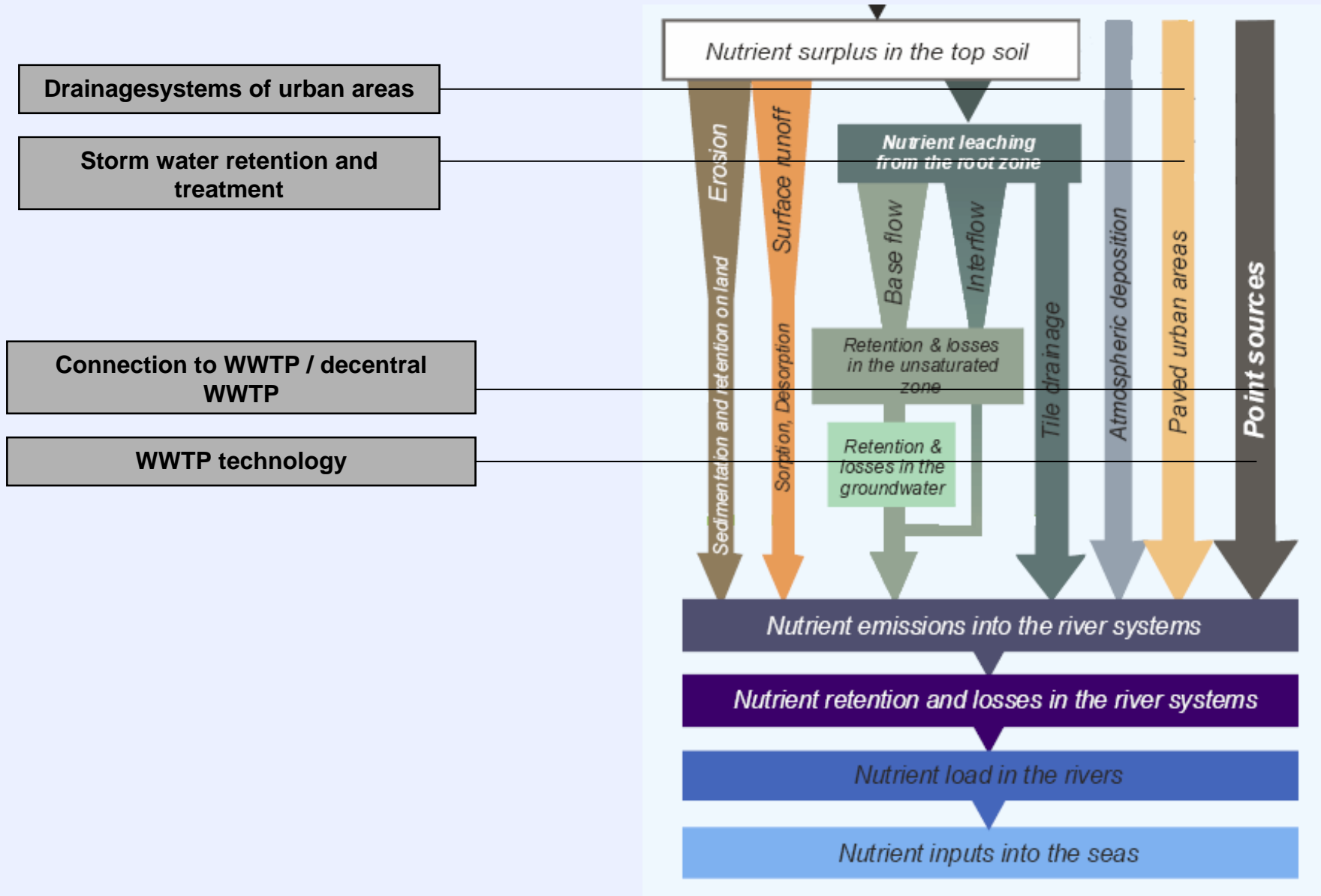
Conceptual approach: integrated economic –ecologic modelling



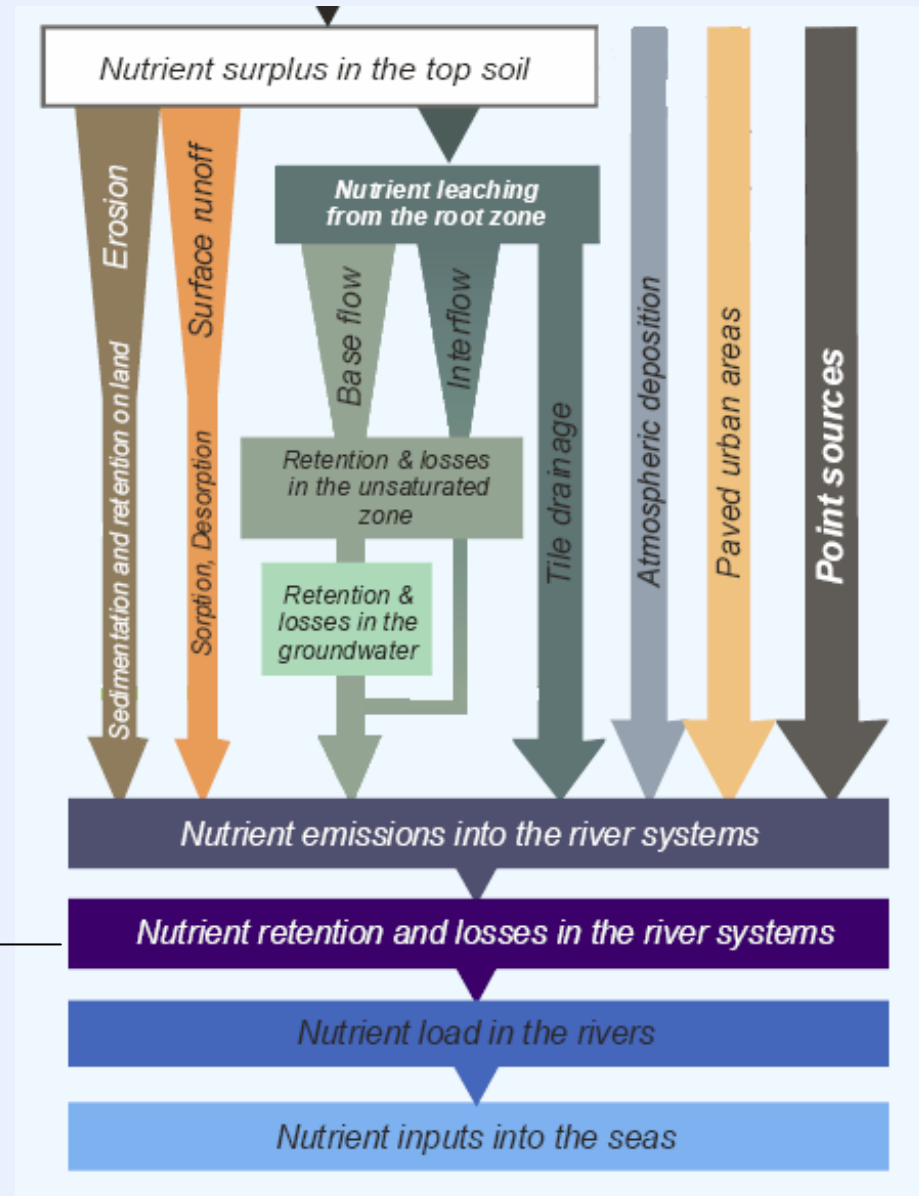
Measures to reduce emissions from agricultural pathways



Measures to reduce emissions from urban pathways



Measures to increase retention capacity



fen wetland & floodplain reactivation

Conceptual approach: integrated economic –ecologic modelling



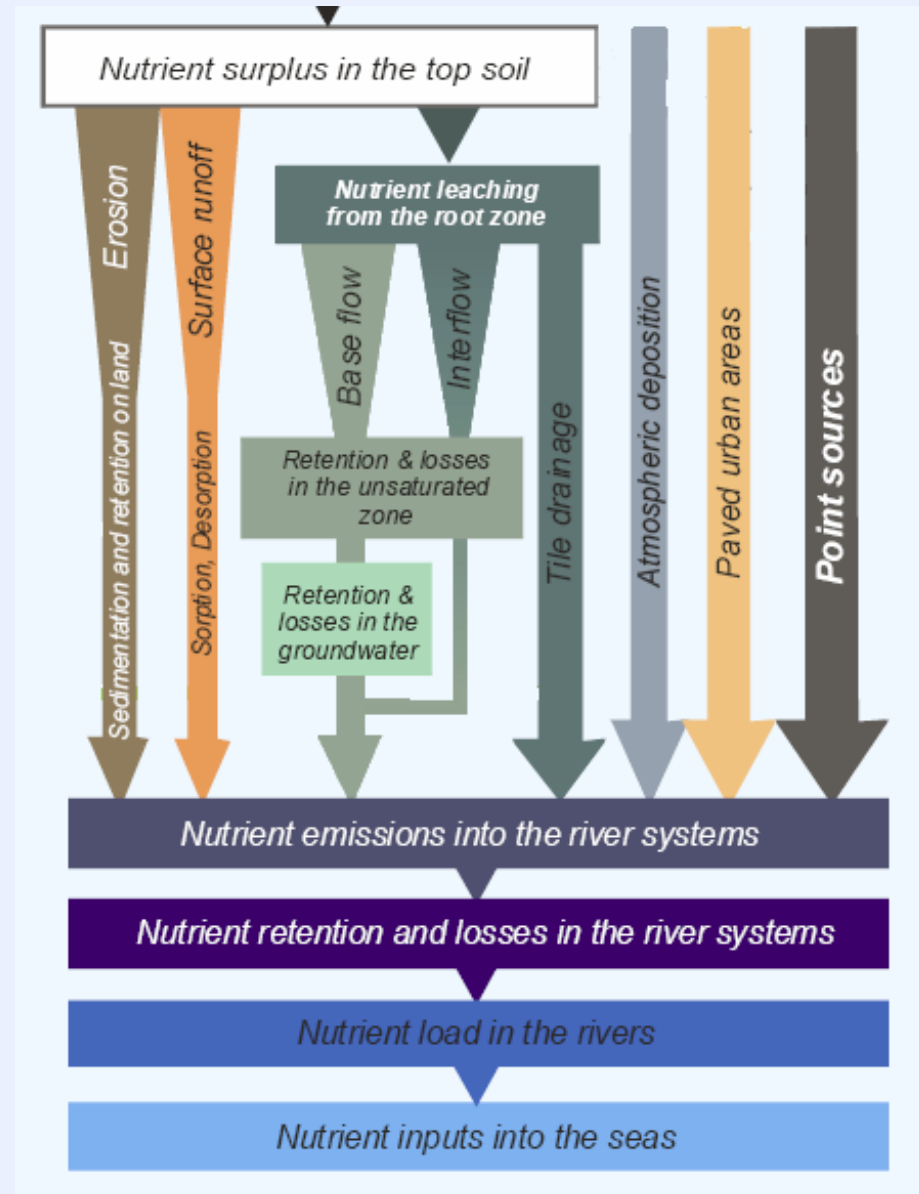
Indicators:

Cost-effectiveness of reduction of

A →

B →

C →

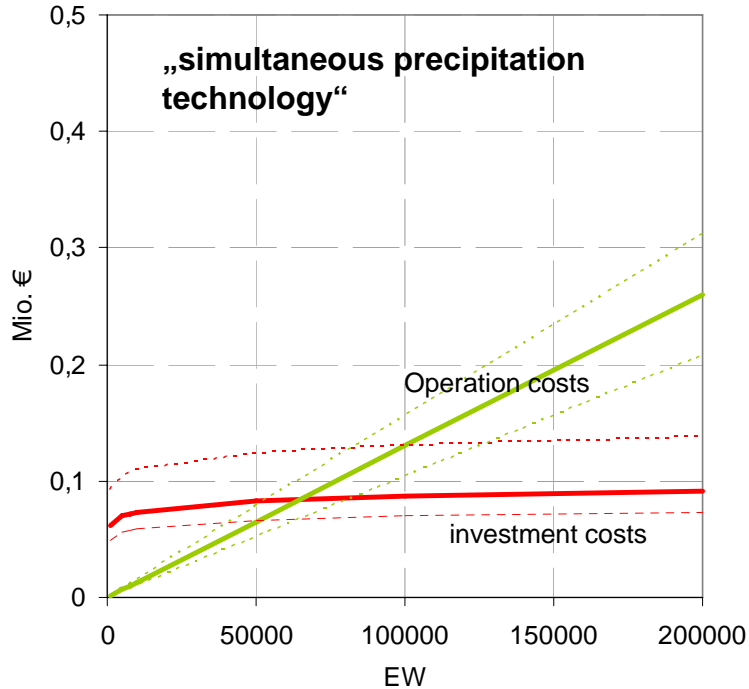


Step 6: Cost model => cost functions



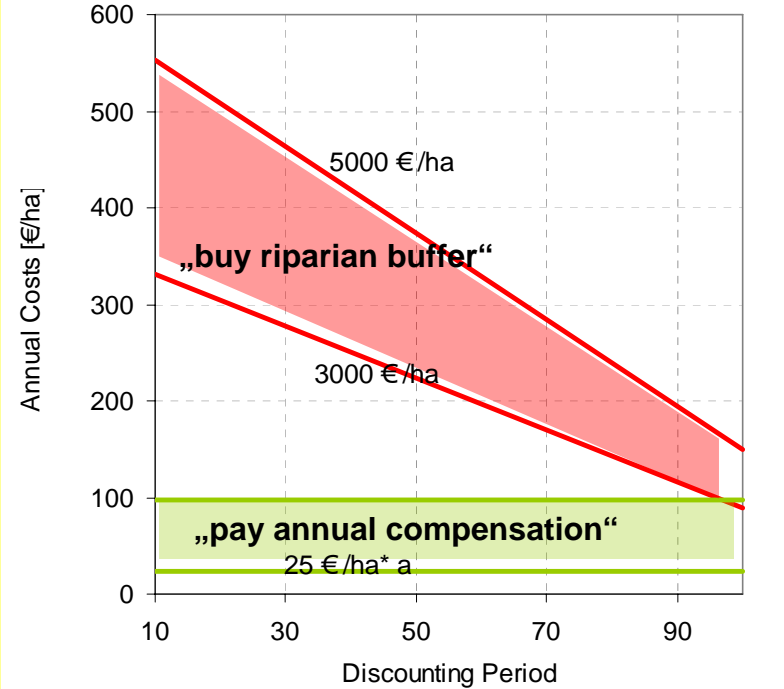
- standardised cost-functions adapted to available data => „cost bands“
- comparison on the basis of discounted annual values

Example: P Elimination in WWTP



=> scale effects, investment and operation costs

Example: Erosion control

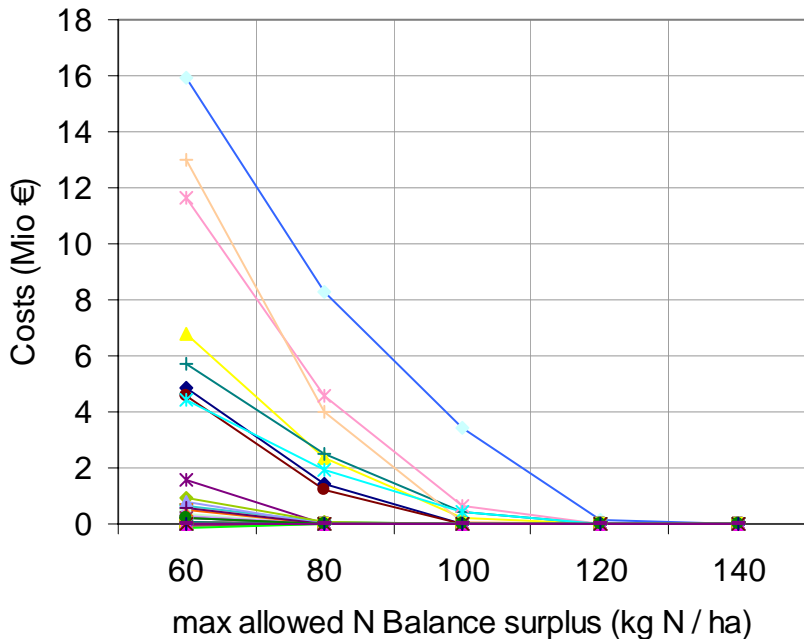


=> effect of discounting on annual costs

Step 6: Cost model => cost functions



Example: Costs of imposing standards for max. allowable nutrient balance surplus in agriculture



=> Regional costs derived from agricultural sector model (RAUMIS) on the basis of „regional model farms“

Spatial disaggregation of measures:

- Individual WWTP
- Municipality: urban sewerage infrastructure
- 100 km² subbasins: wetlands, erosion
- Landkreis (NUTS 3): „model farm“

Step 7: Analysing basin specific costs and effects

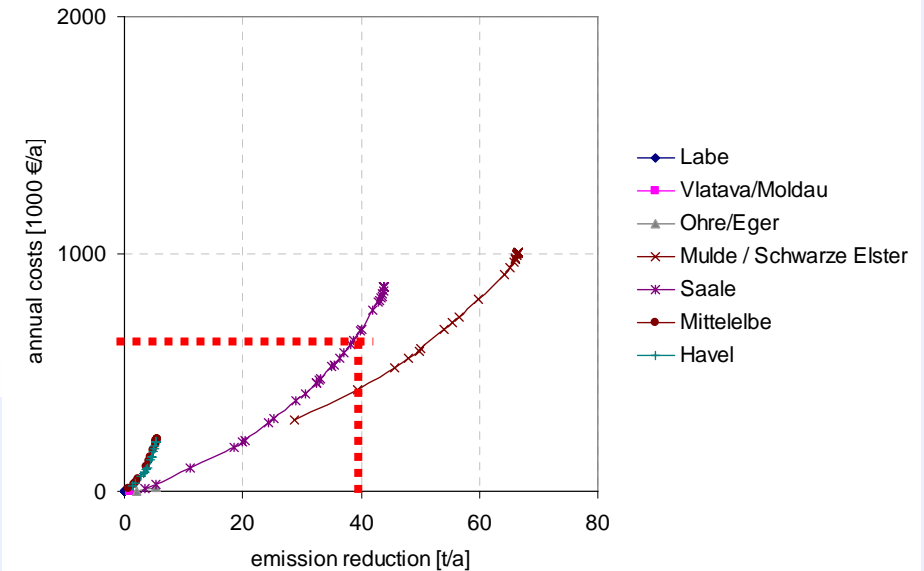
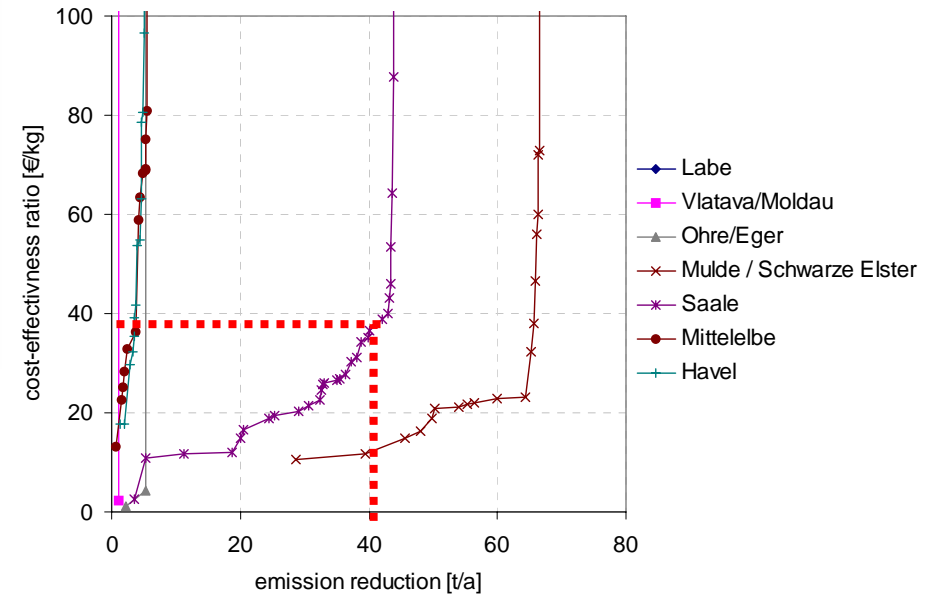
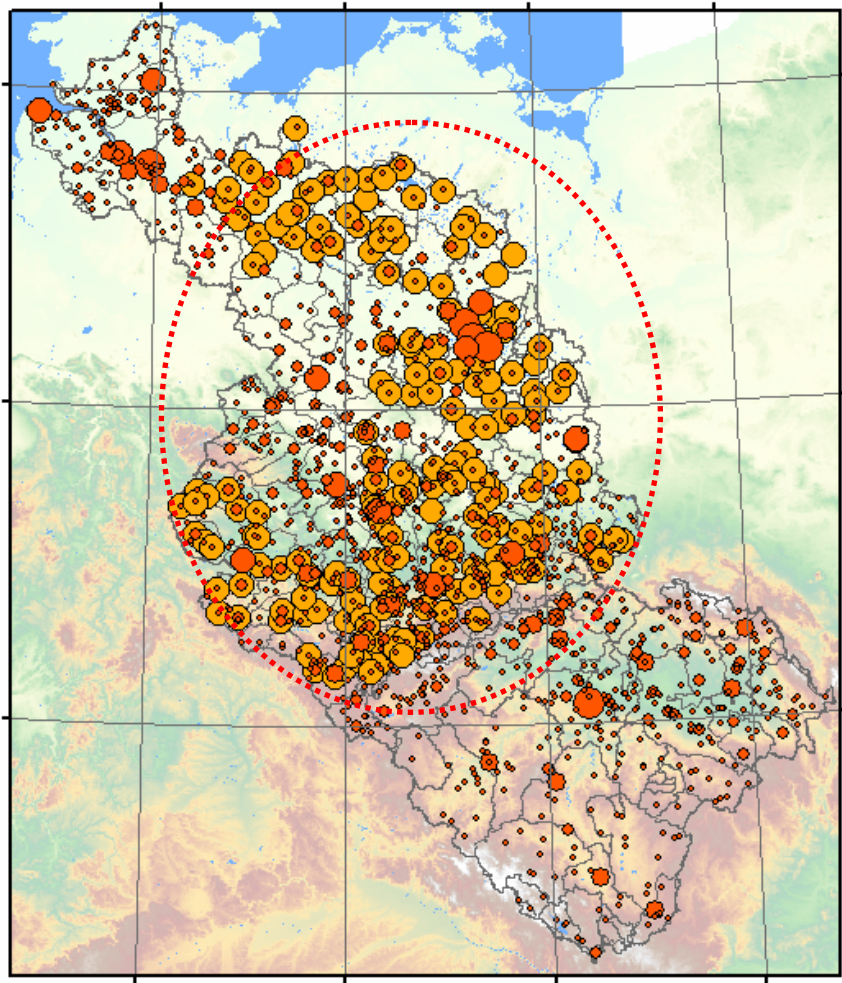


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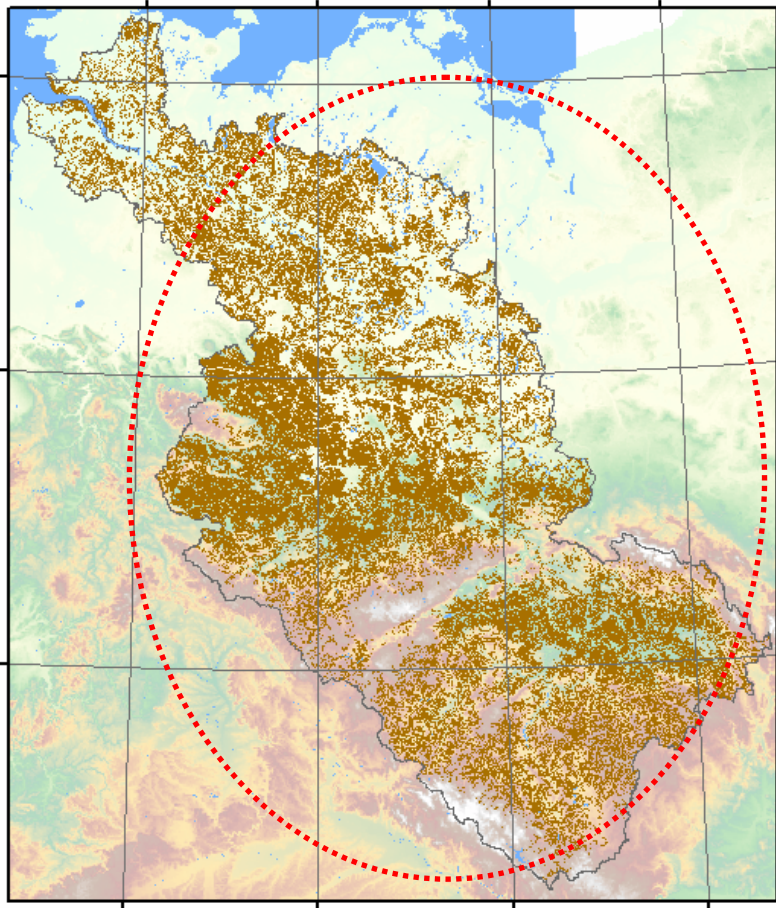
Step 7: Analysing basin specific costs and effects



Example: P Elimination in WWTP

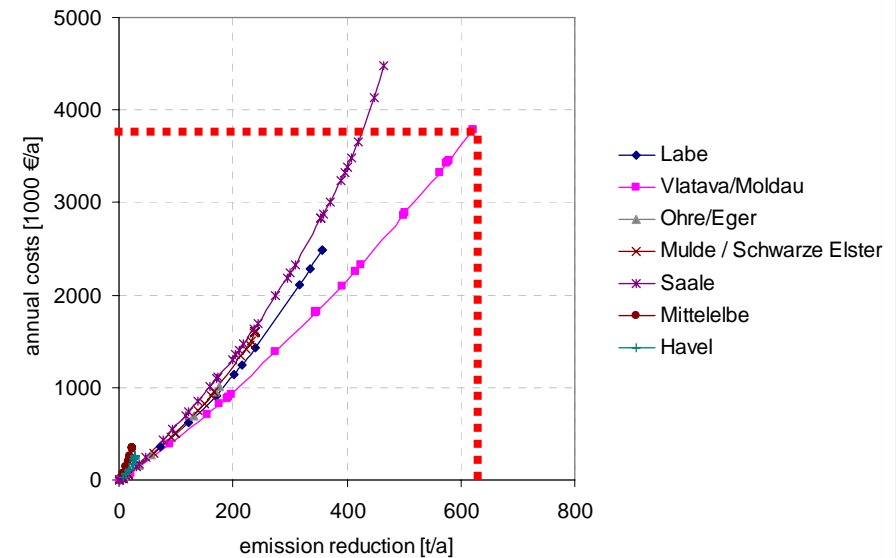
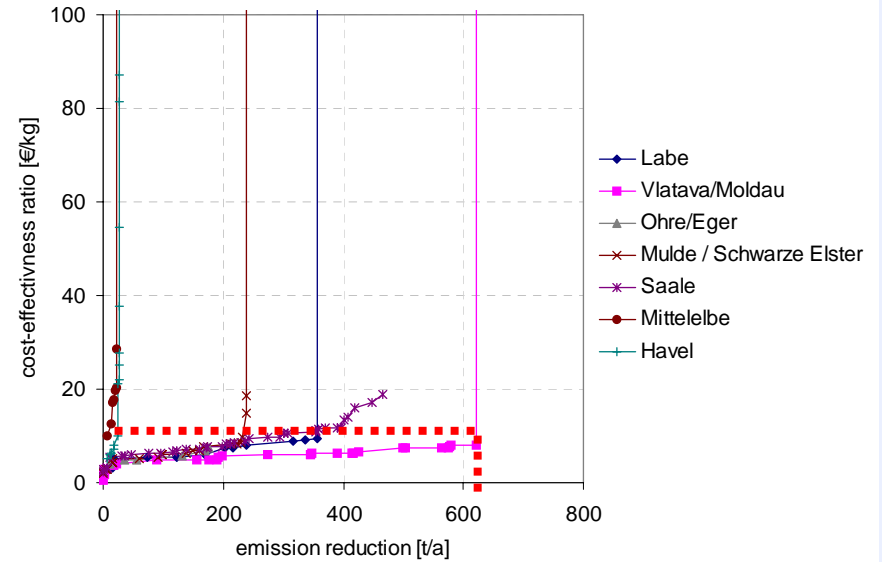
All WWTP > 1000 EW with chemical treatment => 1 - 0,8 mg/l P konz., 3% discount, 60 year discount period, only german subbasin

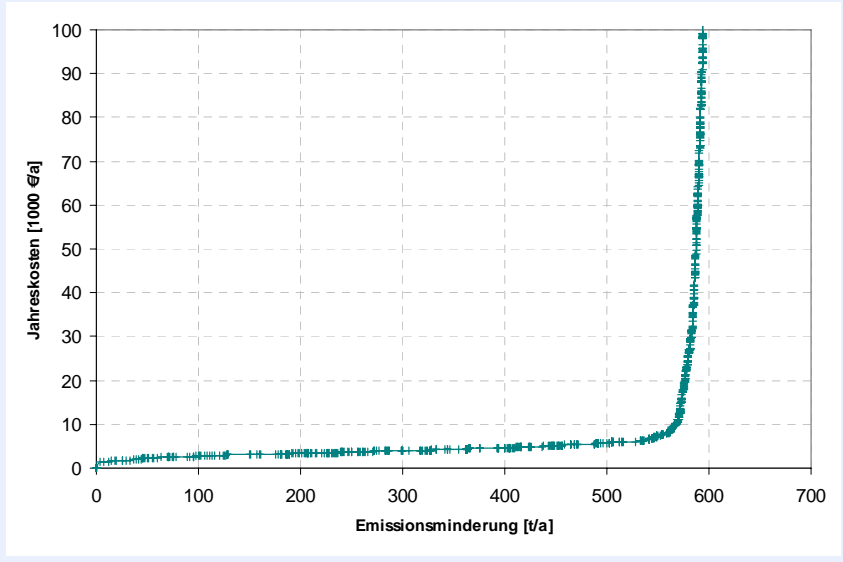
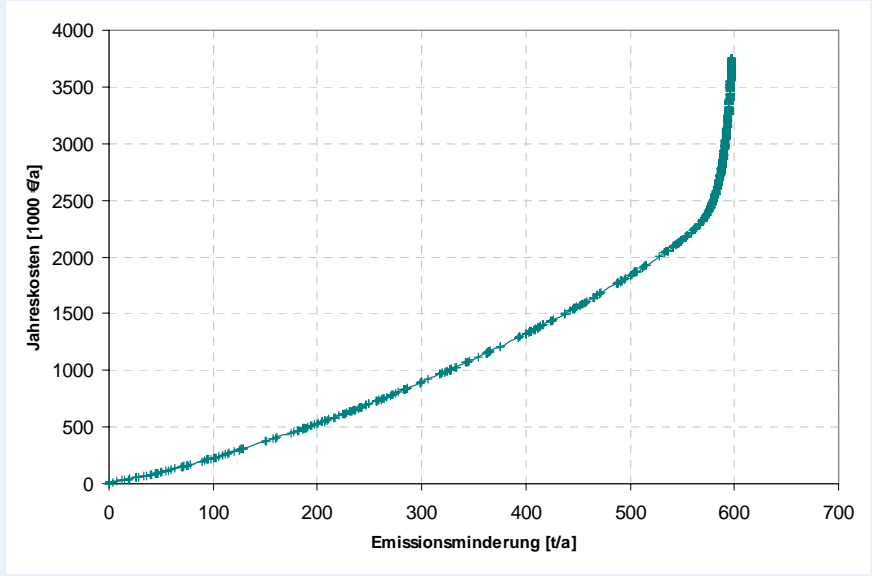
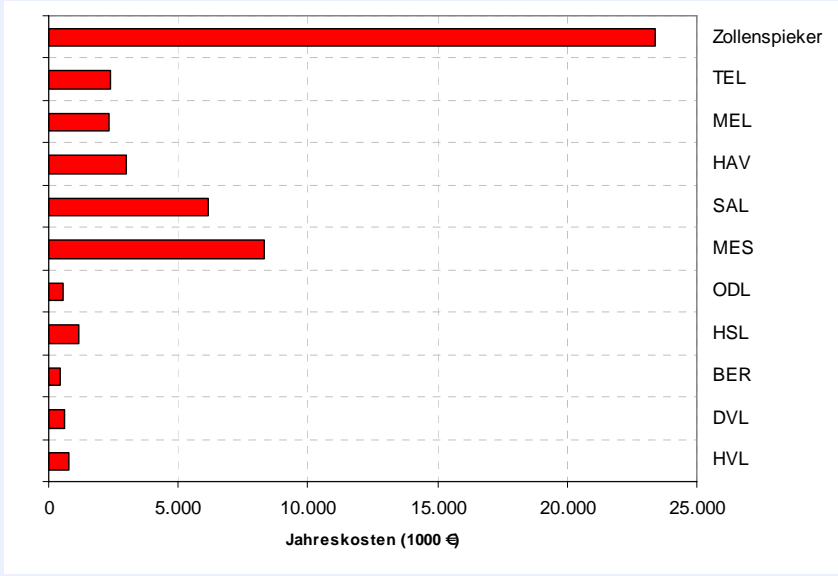
Step 7: Analysing basin specific costs and effects



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

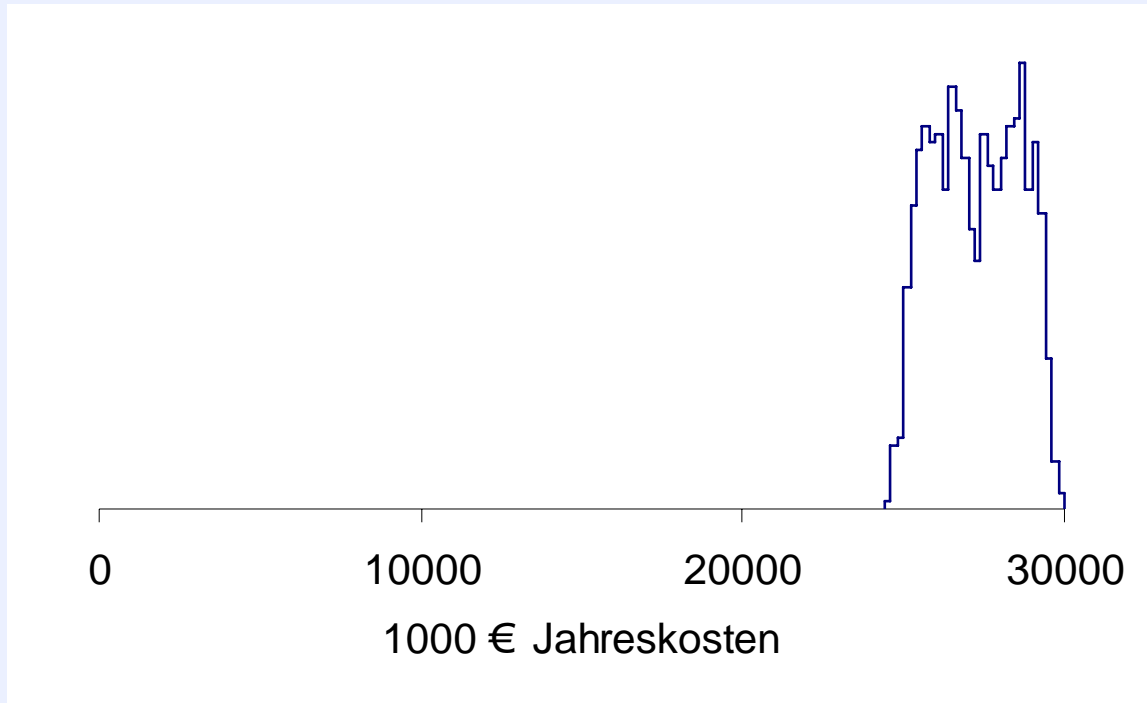




Summary Statistics

Average 27253,306
 SD 1321,4878
 Max 29870,077
 Min 24584,959

rep = 1000
 disk = 3%
 zeitraum = 30%



Step 8: Assessment of combinations



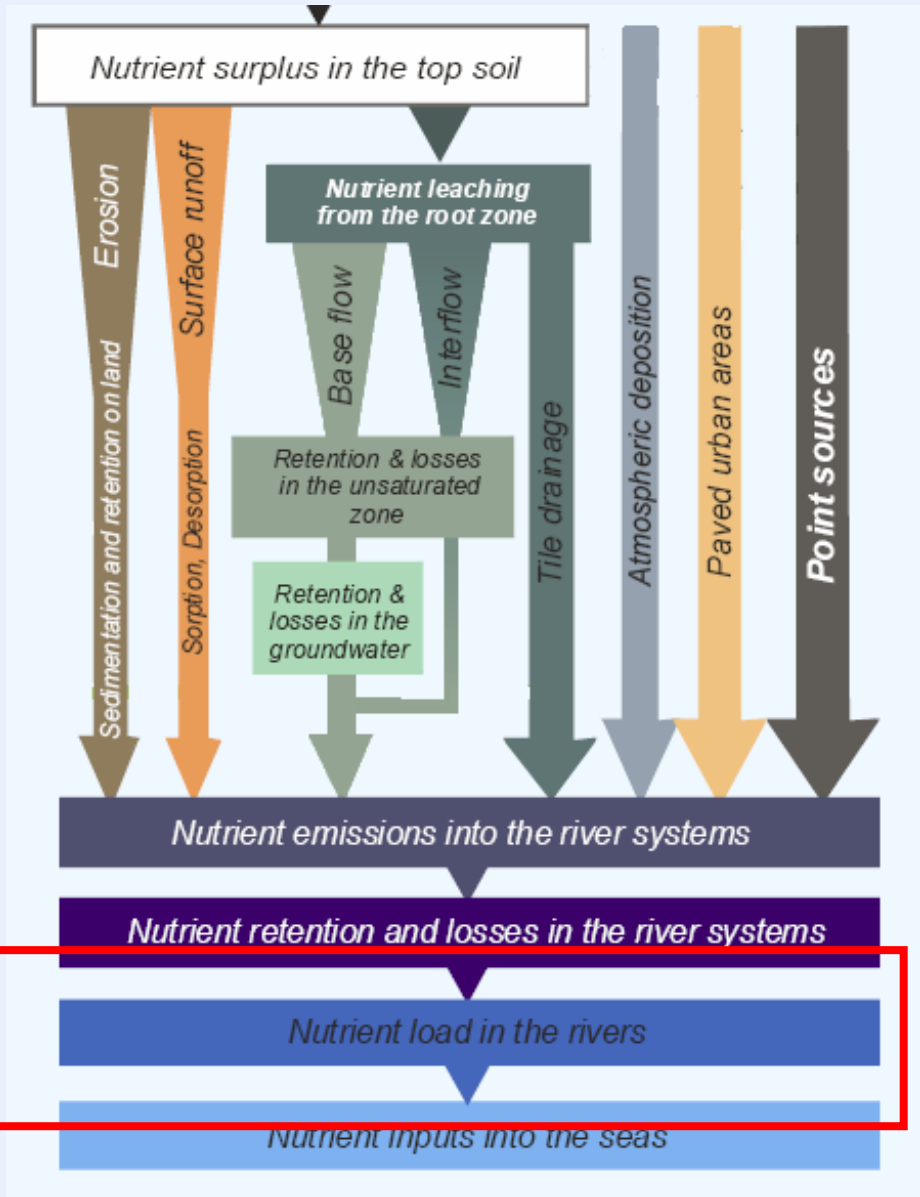
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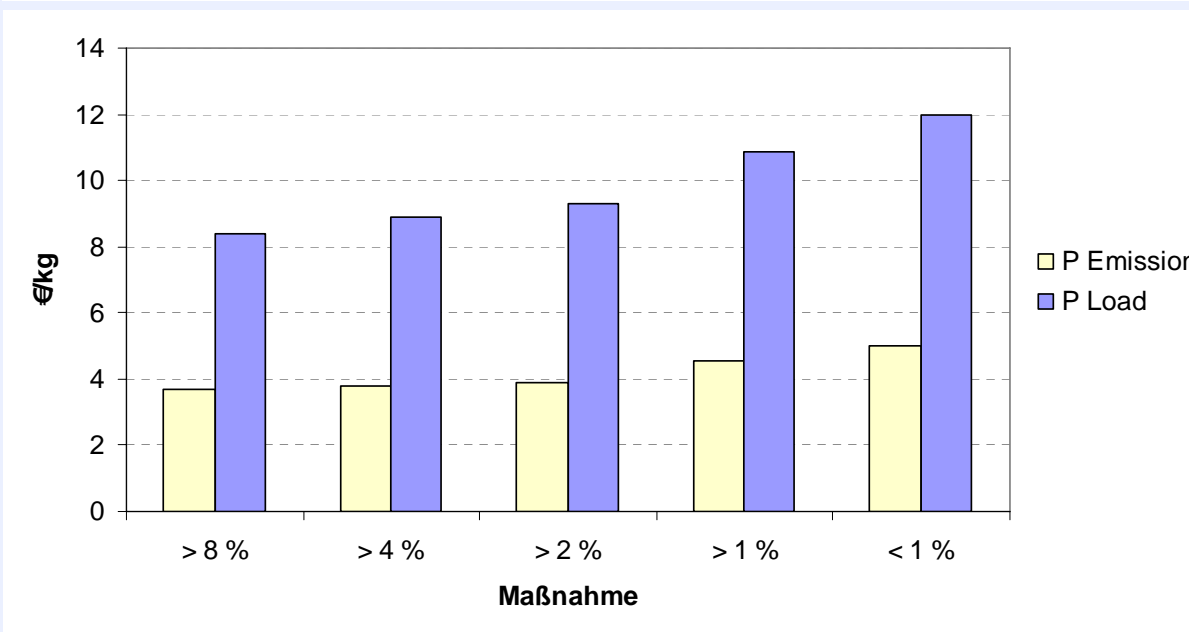
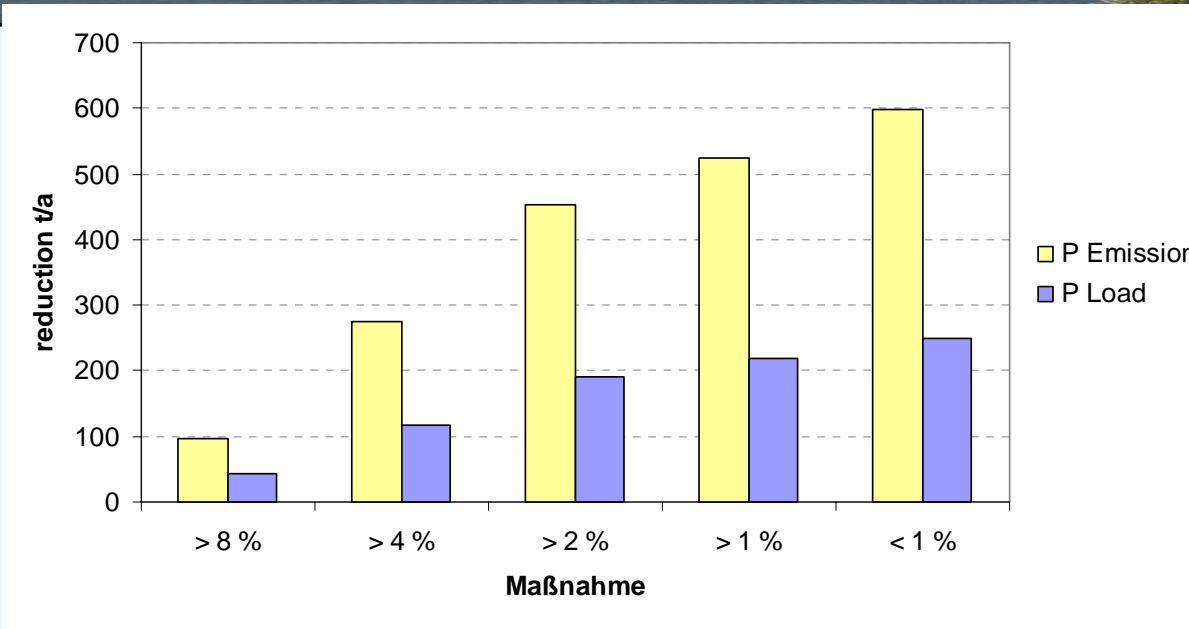
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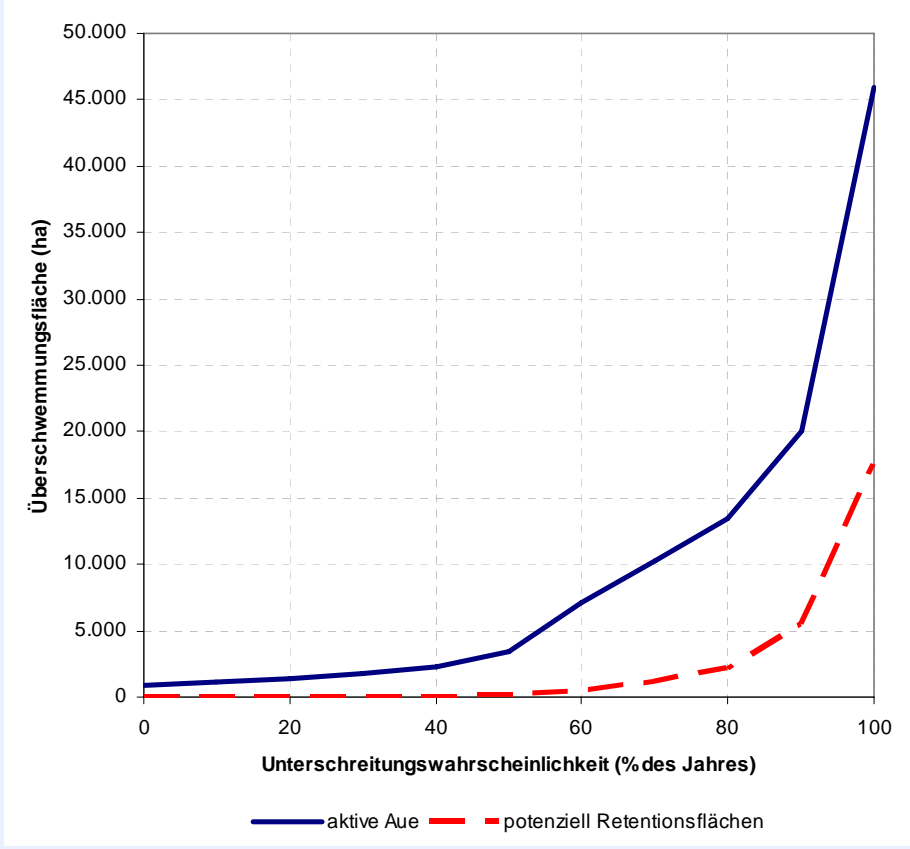
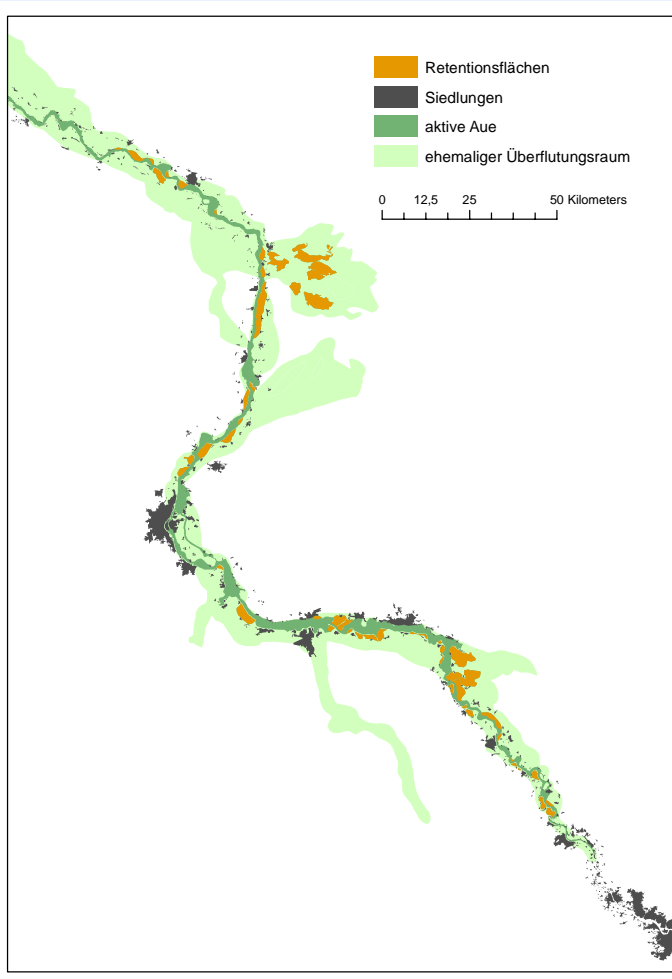
A →

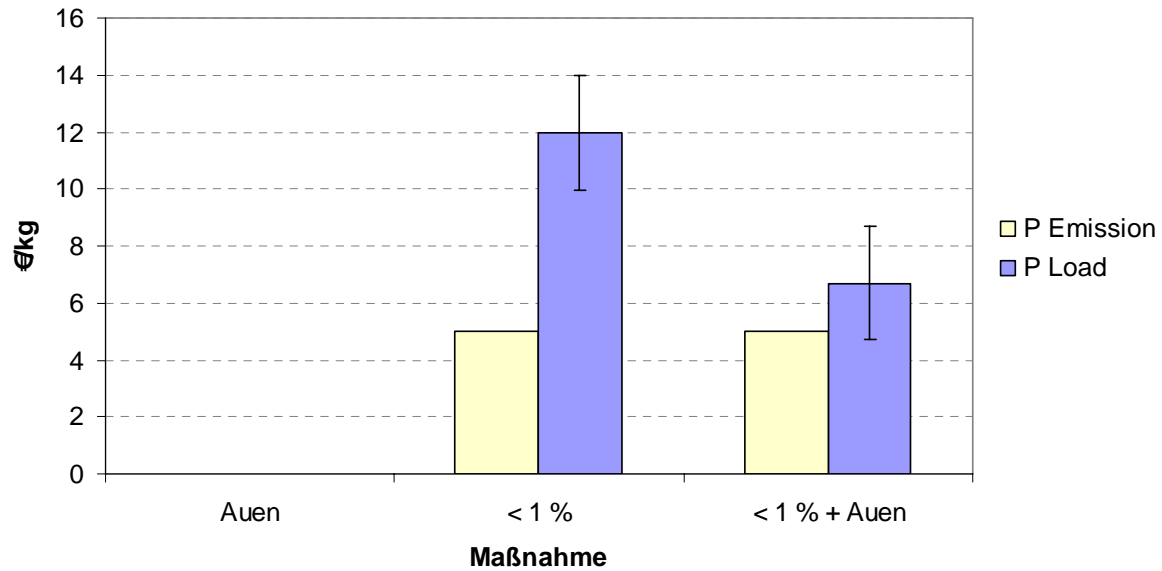
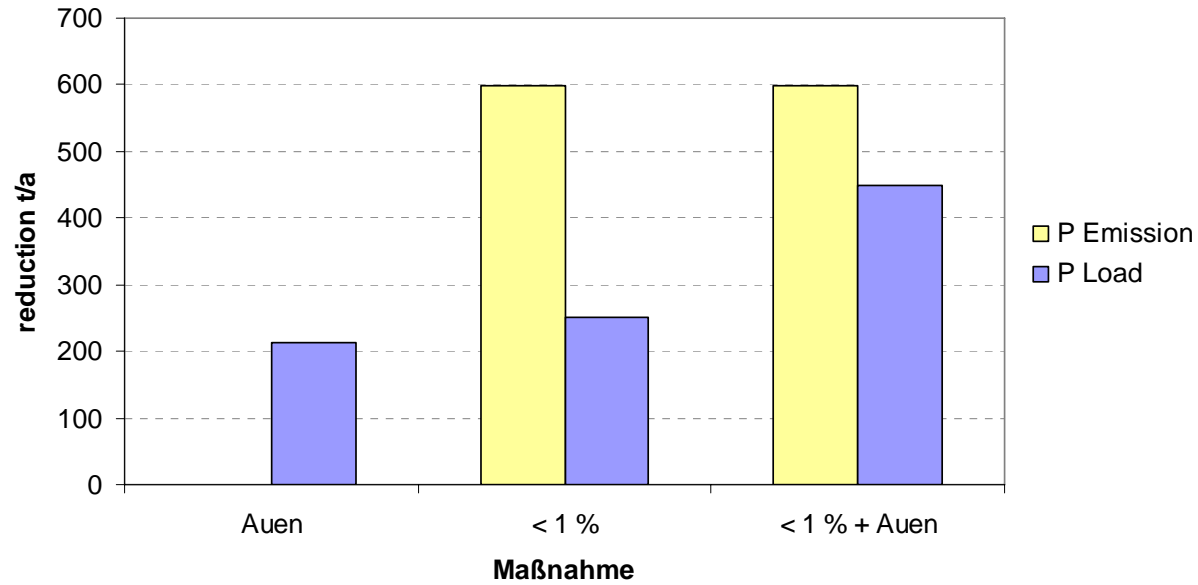
B →

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- Vermeidungskostenfunktionen (TUB, ISI, FAL) liegen vor
 - => RAUMIS fehlt noch
 - => ISI abgleichen noch weitere Ergänzungen?
 - => Feuchtgebietsretention noch einzubauen
- Vermeidungskostenfunktionen sind in MONERIS eingebaut
 - => Anpassung an MONERIS 2.0 abschließen
- Auswertungsroutinen für Kosten-Wirksamkeitsanalyse mit MONERIS sind erstellt.
 - => Minimierungsroutine aus Prototyp in MONERIS 2.0 implementieren

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Thank You !

