Witteveen Bos

Ecosystem benefits of acidification abatement

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Questions

(1) What are ecosystem benefits?

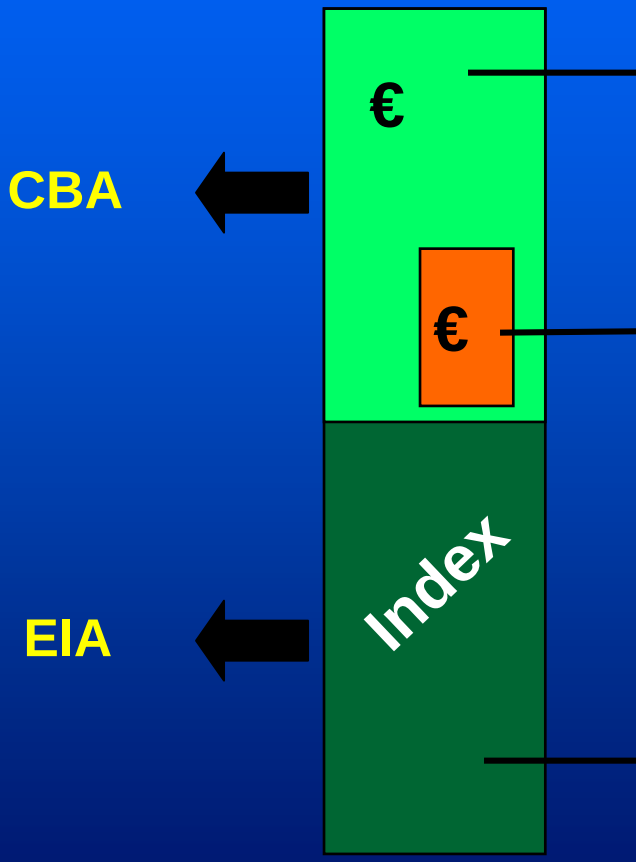
(2) How to determine ecosystem benefits of acidification abatement?

(3) Can we learn from benefits of Water Framework Directive?

(4) What information is already available?

What are ecosystem benefits?

The three values of nature



Socio-economic value:
Nature produces welfare for humans through functions

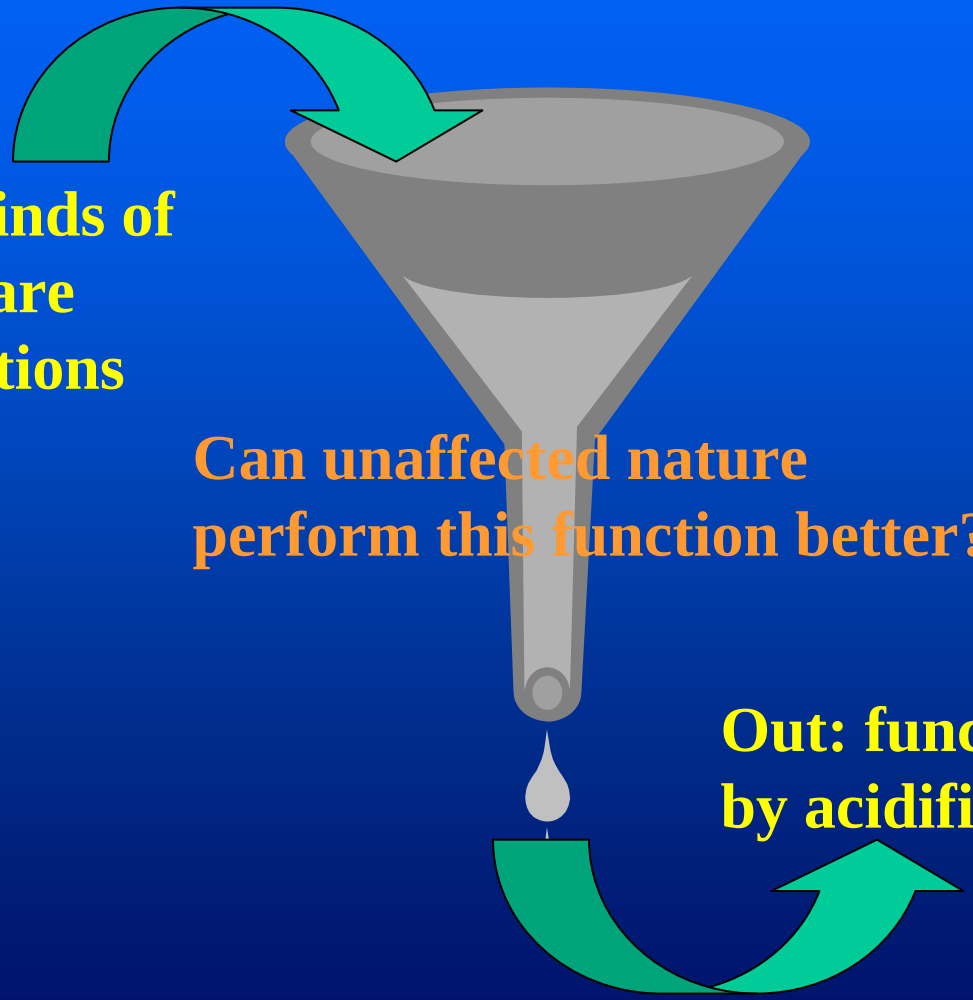
Financial value:
income for humans

The financial value of not exploited areas is often zero, since nobody makes money on them

Ecological value:
Nature has an intrinsic value; welfare plants and animals

How to determine the ecosystem benefits of acidification abatement?

In:
all kinds of welfare functions



Can unaffected nature perform this function better?

- *CO2 fixation*
- *Nitrogen storage*
- *Aluminium binding*
- *Binding heavy metals*
- *Recreational perception*
- *Non-use*

Out: functions affected by acidification

The steps of benefit determination

(1) Determine how many hectares of nature are affected

(2) Determine which welfare functions forests, heathlands, meadows and fens perform

(3) Determine which of these functions are affected by acidification (deposition levels)

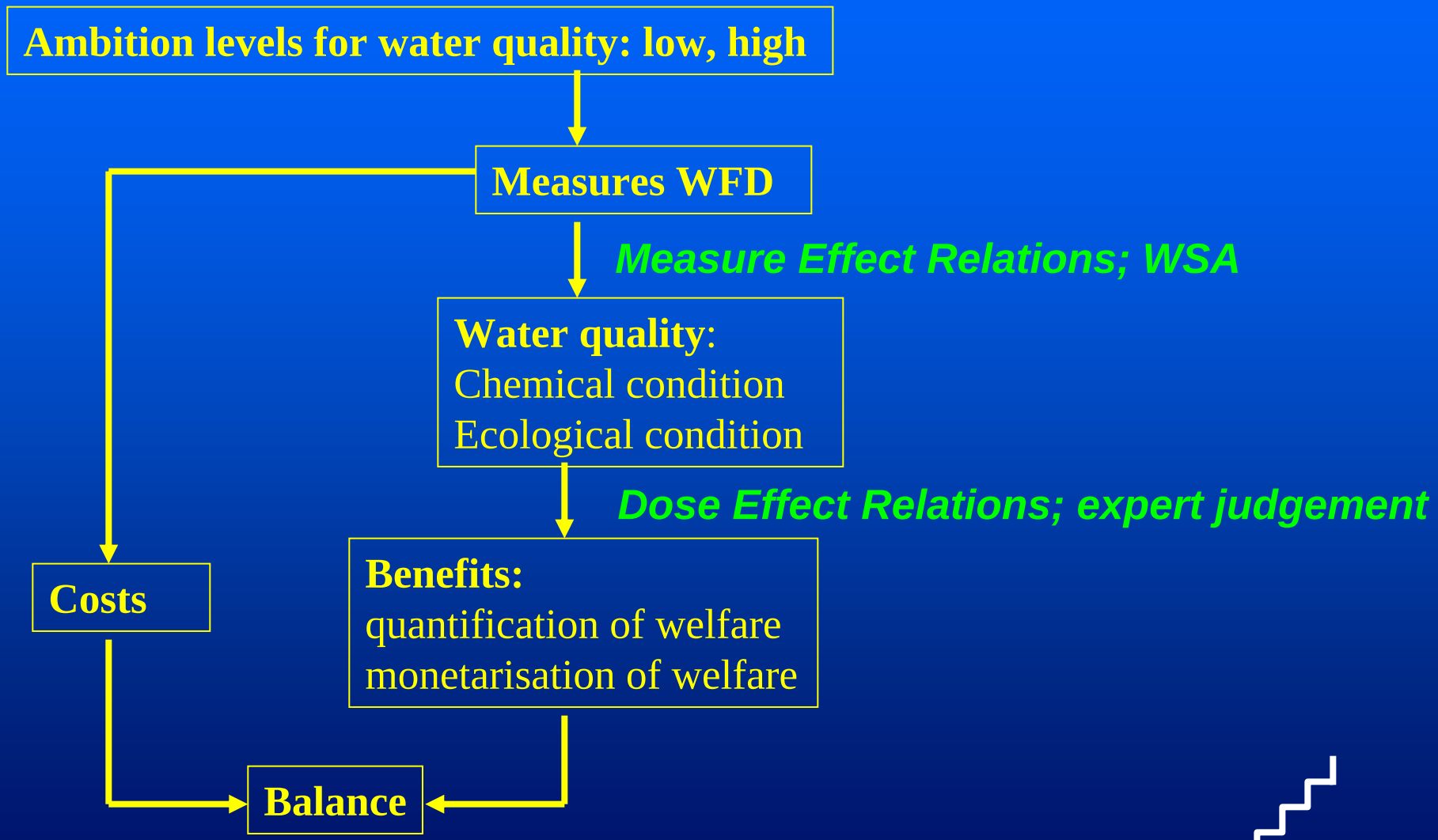
(4) Quantify the change in function performance

(5) Find a price tag for the function

Use available authorized numbers?

Learn from WFD?

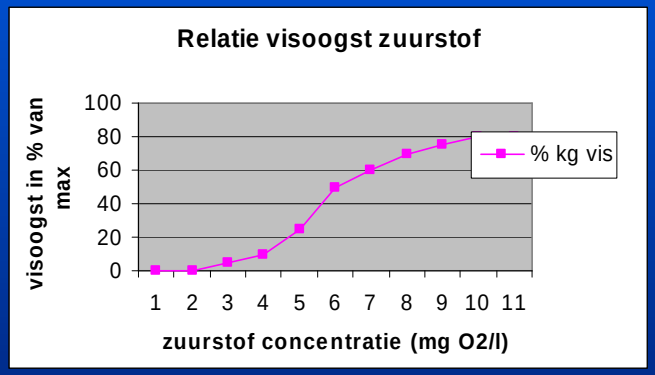
How are water quality benefits determined?



Calculation of benefits

Benefit = % change * maximum quantity * price

From:

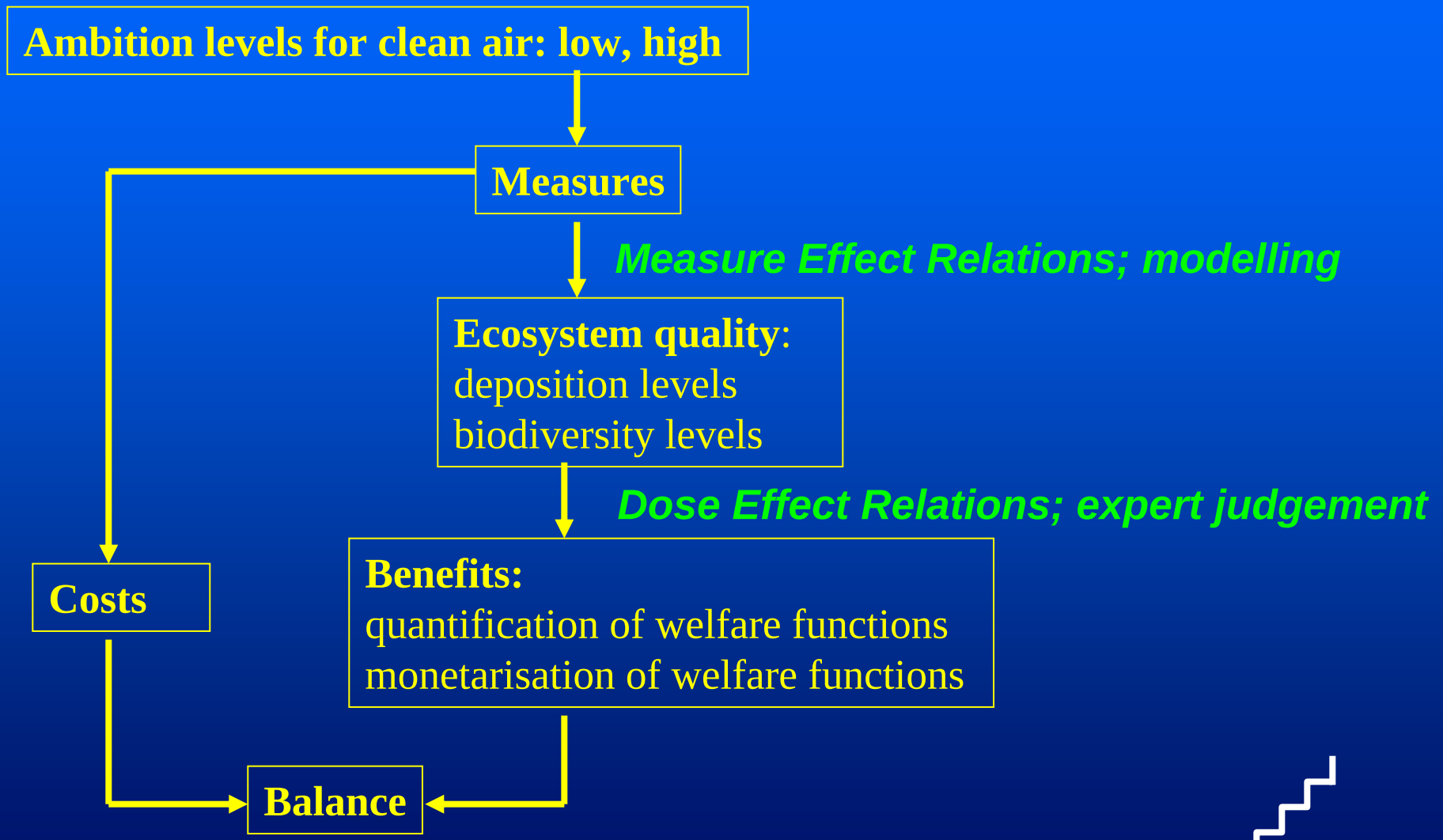


e.g. max. kg of fish yields per catchment area

euro per kg fish

Starting point determines benefit!

Applied on air pollution



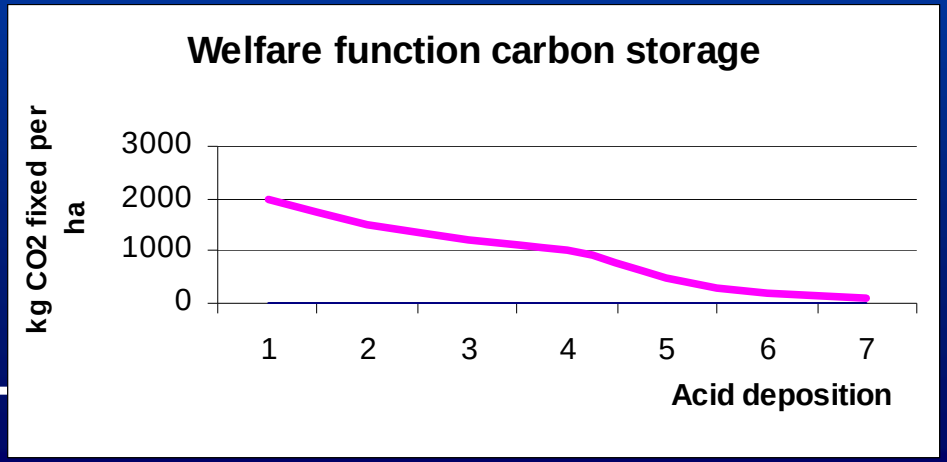
Calculation of ecosystem benefits

Benefit = number of ha affected * change in quantity per ha * price

modelled on the basis of critical loads e.g. ha of forests affected

e.g. change in kg of CO2 fixed per ha per year

euro per kg CO2



Available numbers

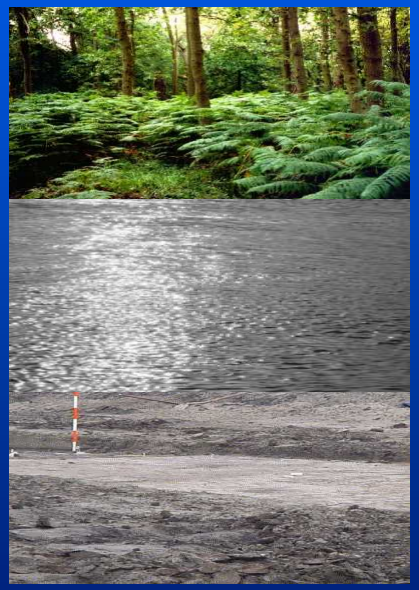
The Netherlands

2000: National Guideline for SE CBA

2004: Supplement for the valuation of ´Nature, Water and Soil´

2006: Authorized numbers book

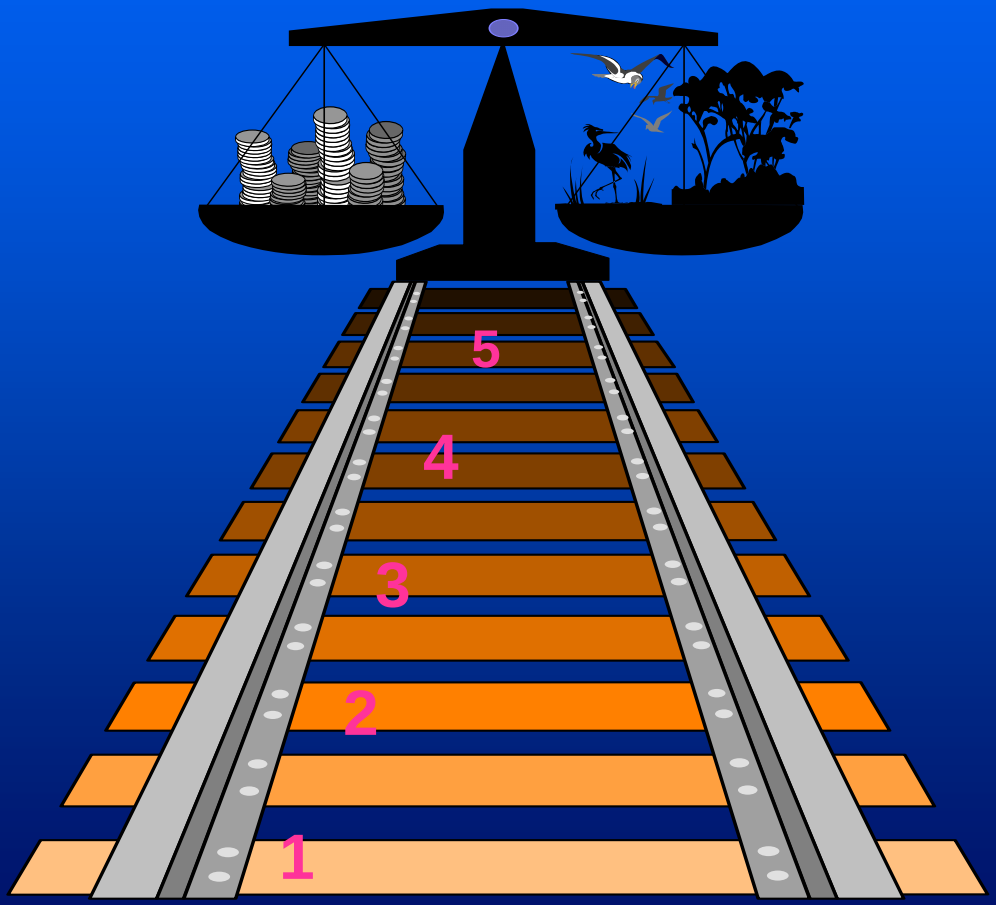
Experience numbers for
quantification and monetarisation
of ecosystem functions
for different types of ecosystems



Experience numbers for nature

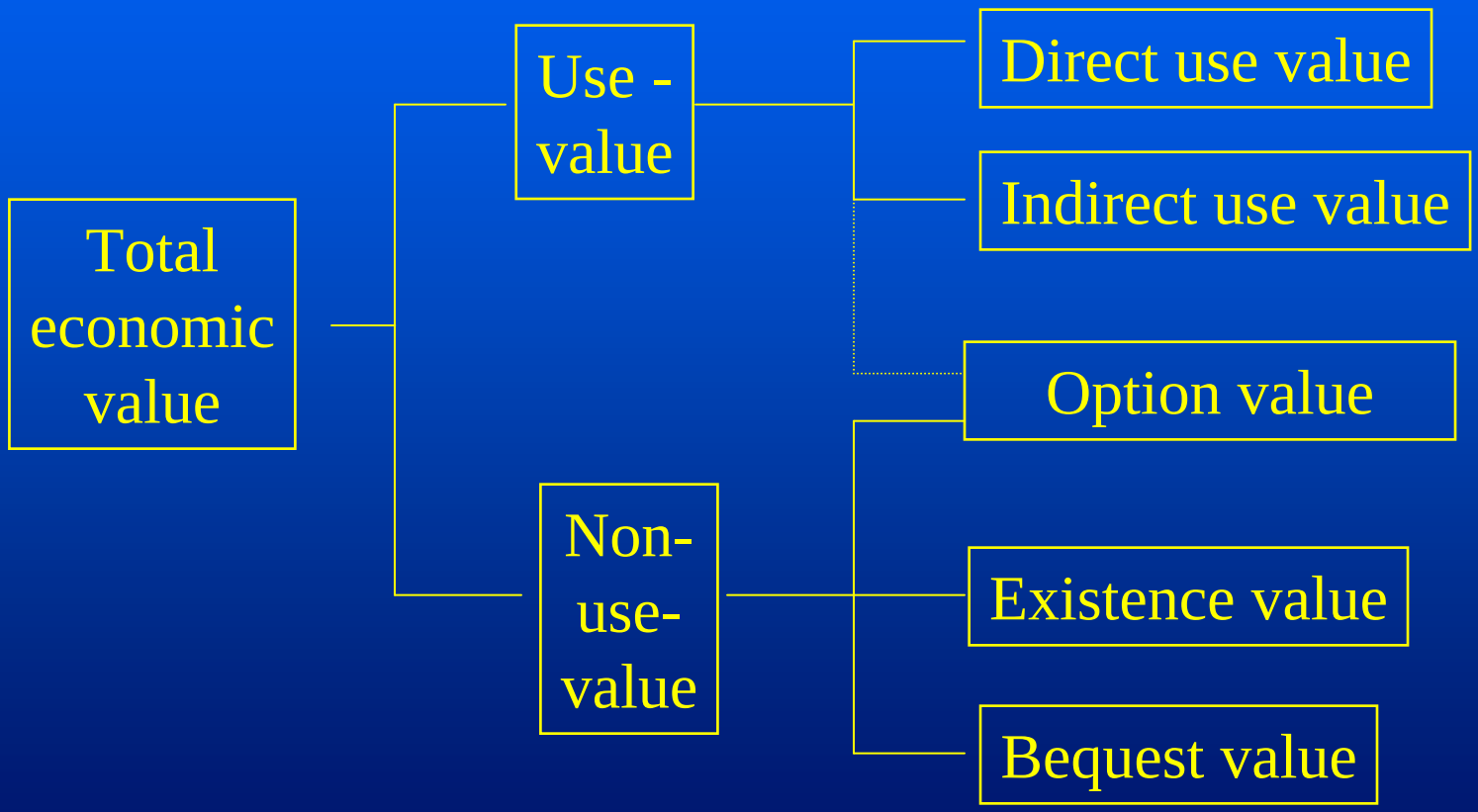
Nature type	Forest		Reedland		Etc.
	quantity	price	quantity	price	
Benefits:					
Wood production					
N-purification:	*kg N/ha/y*	*€ 2,2/kg*			
P-purification					
Binding of metals					
Carbon fixation		*6,8 ton C/ha/y*		*€183/ton C*	
Erosion prevention					
Recreation					
Housing amenity					
Dust retention:		*€ 70/kg PM10*			
NO2 uptake					
Non-use					

Let´s simply determine ecosystem benefits!



What is economic valuation?

-measuring welfare generation



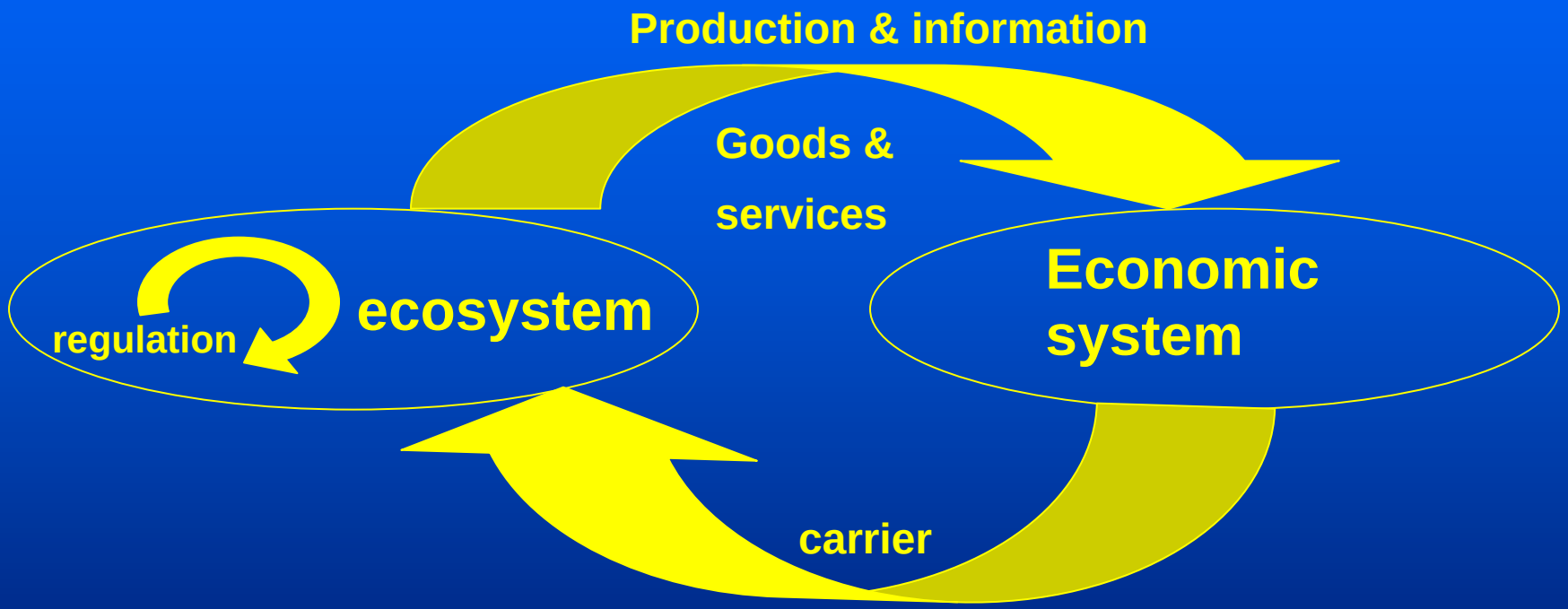
How to determine economic values?

- Find out which functions the natural environment fulfils for human welfare

- Be ware of omissions and overlap

- Choose appropriate valuation method

The functions of nature approach



No omissions, no overlap

- Economic school: goods and services
- Ecological school: conditional processes
- Combination: value either G&S or condition

Example

- value either the good ´clean water´ or the condition ´nitrogen purification´

- value either the service ´shipping possibilities`or the condition ´sediment control´ etc.