



WATERBOUWKUNDIG LABORATORIUM

# **Freshwater management in the Scheldt basin and consequences for the discharges in the Zeeschelde**

**K. Van Eerdenbrugh, F. Mostaert, J. Baetens, J. Balduck**



MINISTERIE VAN DE VLAAMSE GEMEENSCHAP



## THE FLEMISH REGION

WATERBOUWKUNDIG LABORATORIUM



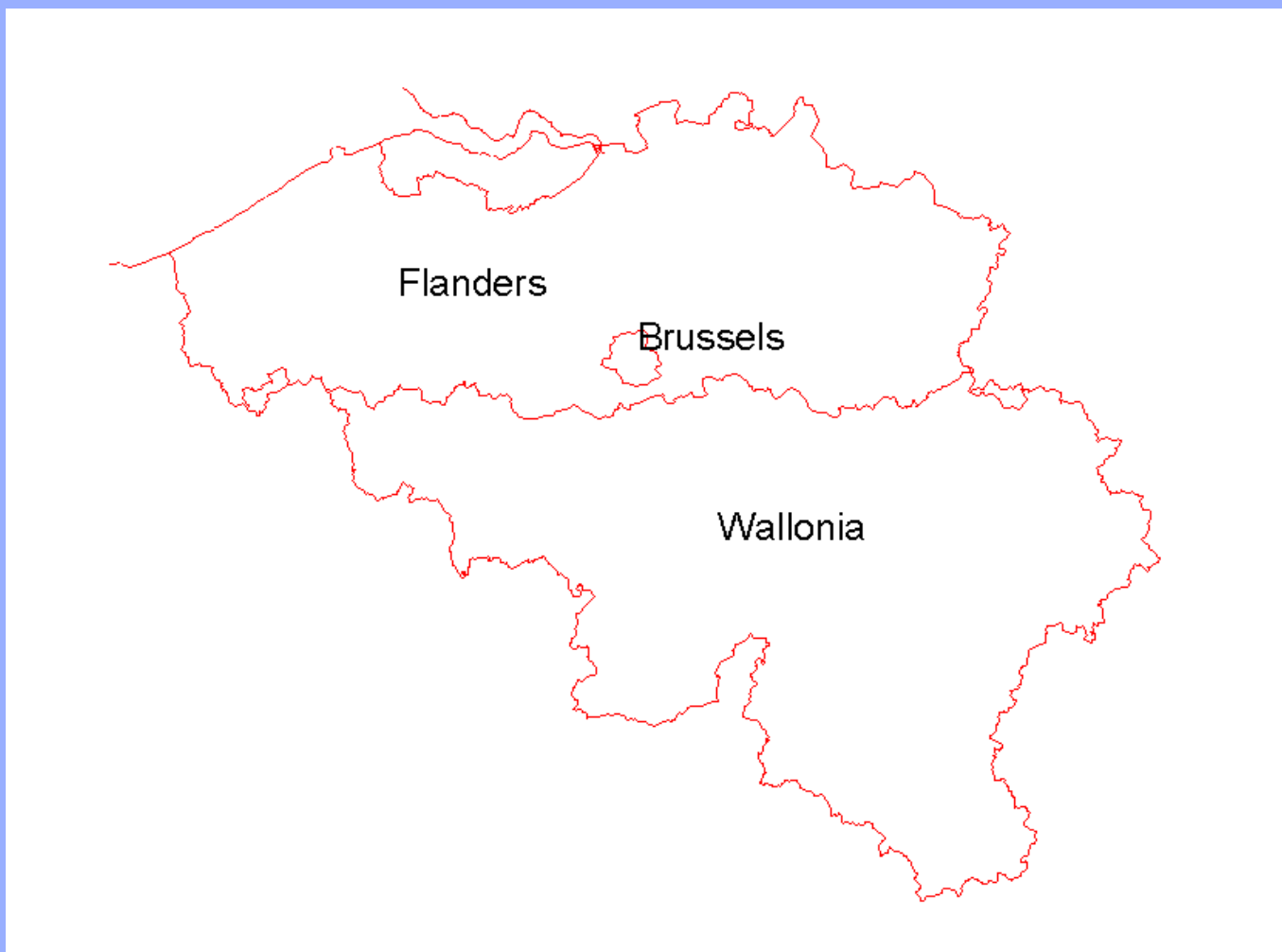
**The whole world is like the human body with its various members. Pain in one member is felt in the whole body.**





# THE FLEMISH REGION

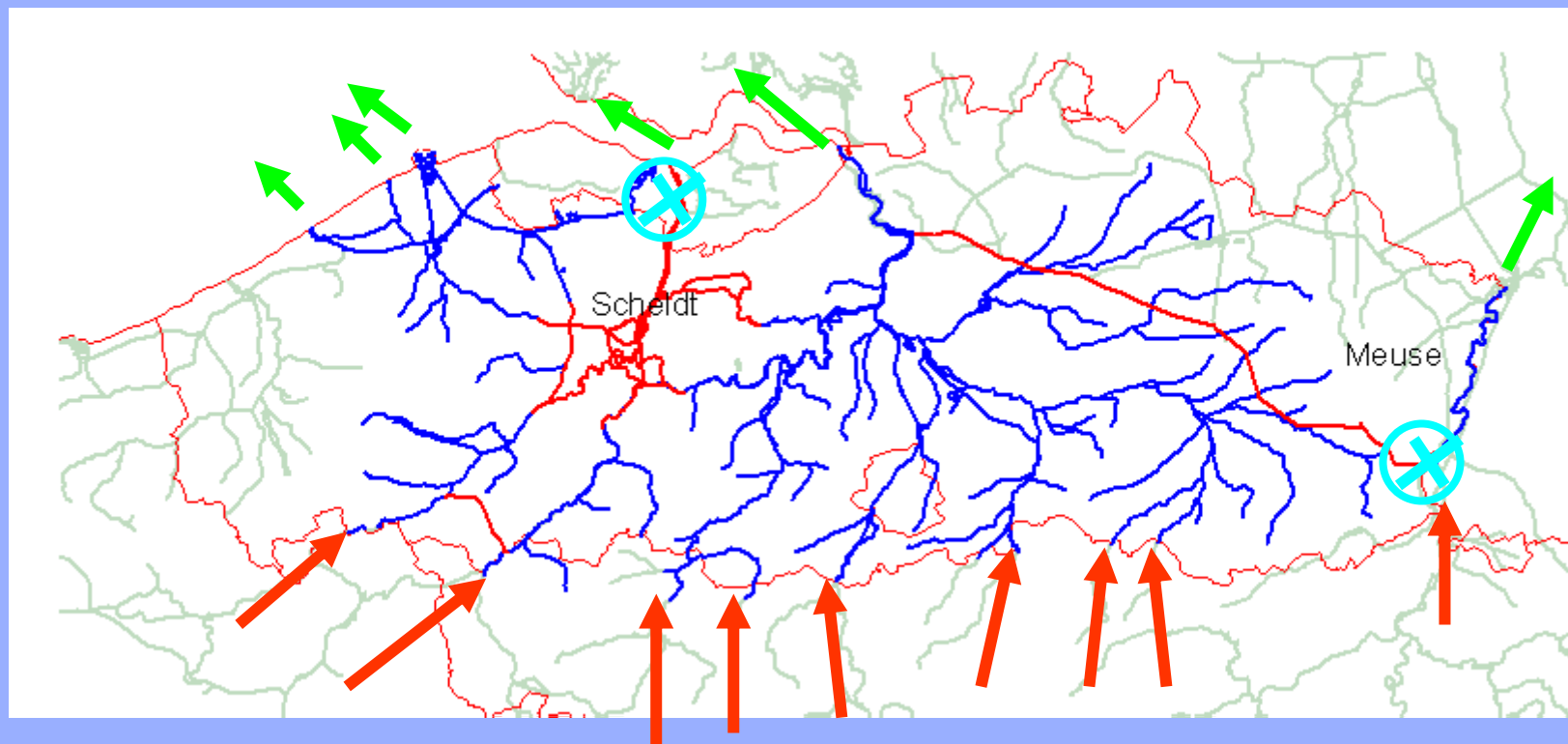
WATERBOUWKUNDIG LABORATORIUM





# THE MAIN FLEMISH CATCHMENTS

WATERBOUWKUNDIG LABORATORIUM



MINISTERIE VAN DE VLAAMSE GEMEENSCHAP



# FRESHWATER MANAGEMENT

WATERBOUWKUNDIG LABORATORIUM



MINISTERIE VAN DE VLAAMSE GEMEENSCHAP



## **LOW FLOW STRATEGY:**

**The choice of an effective set of measures (permanent and operational) for dry periods in order to use the available amount of water as efficiently as possible**

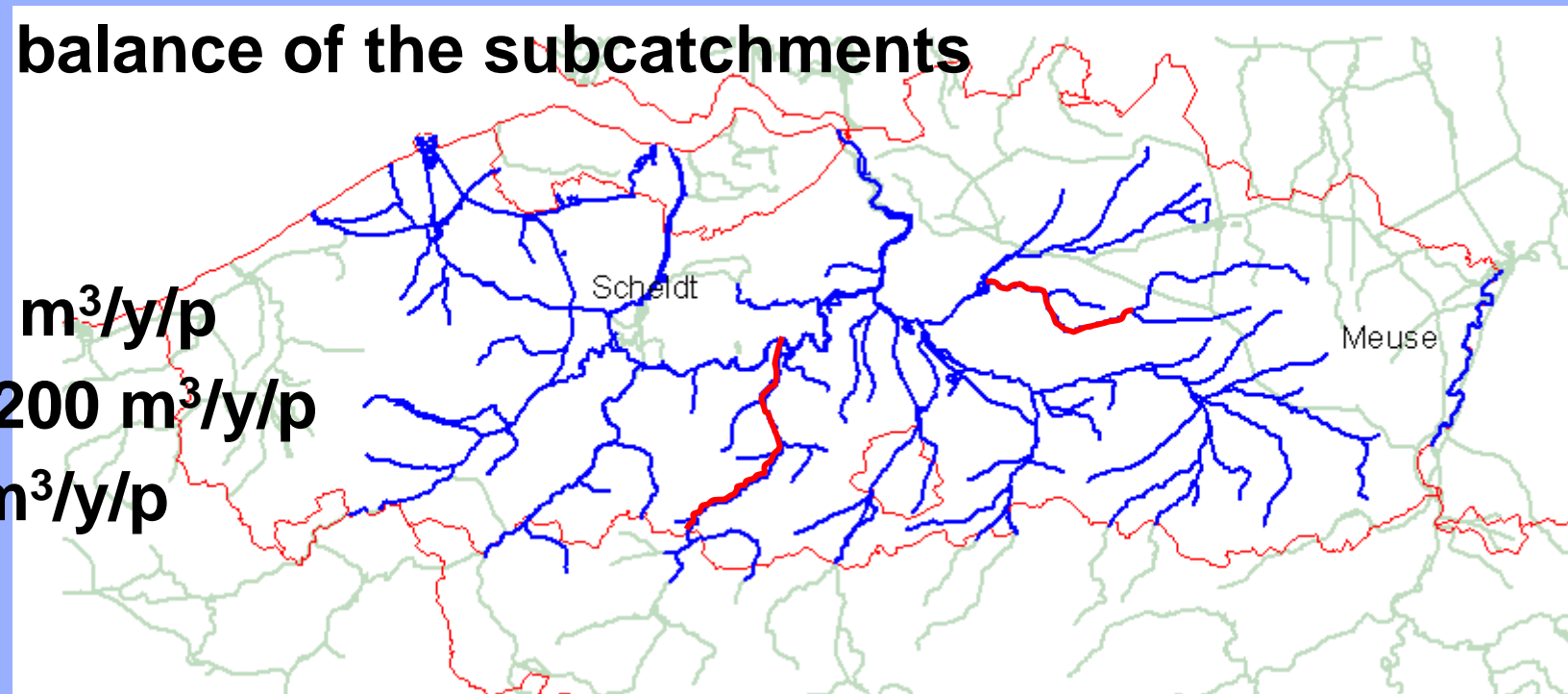




## QUANTITATIVE ASPECTS

- Statistical analysis of low flows and water levels
- Water balance of the subcatchments

**Flanders: 540 m<sup>3</sup>/y/p**  
**Grote Nete: 1200 m<sup>3</sup>/y/p**  
**Dender: 680 m<sup>3</sup>/y/p**



*Bron: Soresma*

## DEMANDS (USERS AND CONSUMERS)

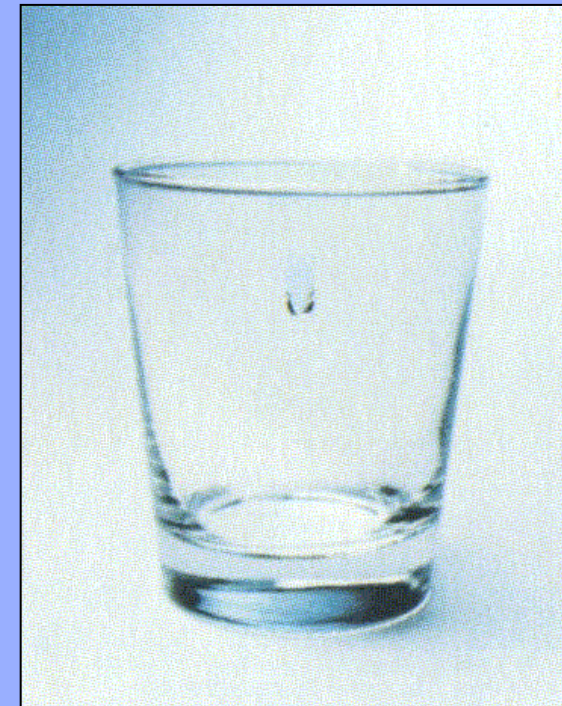
- Navigation
- Salt intrusion
- Water intakes
- Treaties and protocols
- ...





## DEMANDS (USERS AND CONSUMERS)

- minimum discharge or water level
- necessary intakes for production
- consequences in case of shortage (as a function of time)
- possibility to use other resources (temporary)
- ...





# INVENTORY

WATERBOUWKUNDIG LABORATORIUM

## POSSIBLE MEASURES

	Bevaarbare waterlopen	Onbevaarbare waterlopen	Industrie - VEV	Industrie - Electrabel	Industrie - drinkwater-productie	Landbouw	Natuur - land	Natuur - water	Visserij	Watersport	Frankrijk, Wallonië, Nederland
communicatie	x	x	x	x	x	x	x	x	x	x	x
lozingen beperken			x								x
monitoring	x	x									
onderhoud	x	x				x					x
onderzoek					x						
opvang water	x	x	x	x	x	x	x	x	x		
rationeel watergebruik			x	x	x	x					
remediërende maatregelen									x		
scheepvaart	x										
waterbeheersing	x										x
watercaptaties		x	x	x	x	x	x	x	x		

*Bron: Resource Analysis*

## Opinion of the different water users





# METHODOLOGY

WATERBOUWKUNDIG LABORATORIUM

**Necessary efforts**



**Effects of measure**

**Possibilities of common use**

**Translation of shortage into costs**

**Communication**





# METHODOLOGY

WATERBOUWKUNDIG LABORATORIUM

## TECHNICAL BACKGROUND

- Direct effects of measures
- Indirect effects
- Long term consequences



## INTERACTION

- Acceptance of measures by users
- Possibilities of common use
- Necessary efforts
- (in)direct users
- Communication



## COSTS

- Translation of shortage into cost
- Indirect costs

Legal context  
History

Priorities???





# METHODOLOGY

WATERBOUWKUNDIG LABORATORIUM

## TECHNICAL BACKGROUND

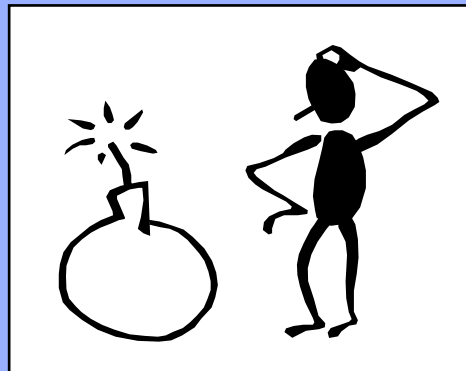
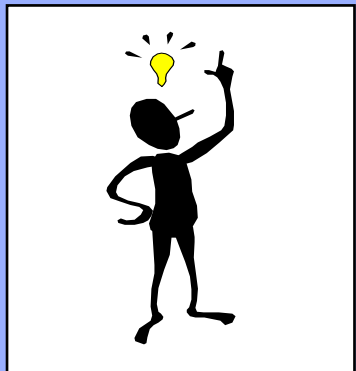
Statistical analysis  
Frequency - duration curves  
Simplified models

## INTERACTION

- Interviews with users and consumers
- Workshop
- Communication strategy

## COSTS

- Costs - benefits
- Multi-criteria



Legal context  
History

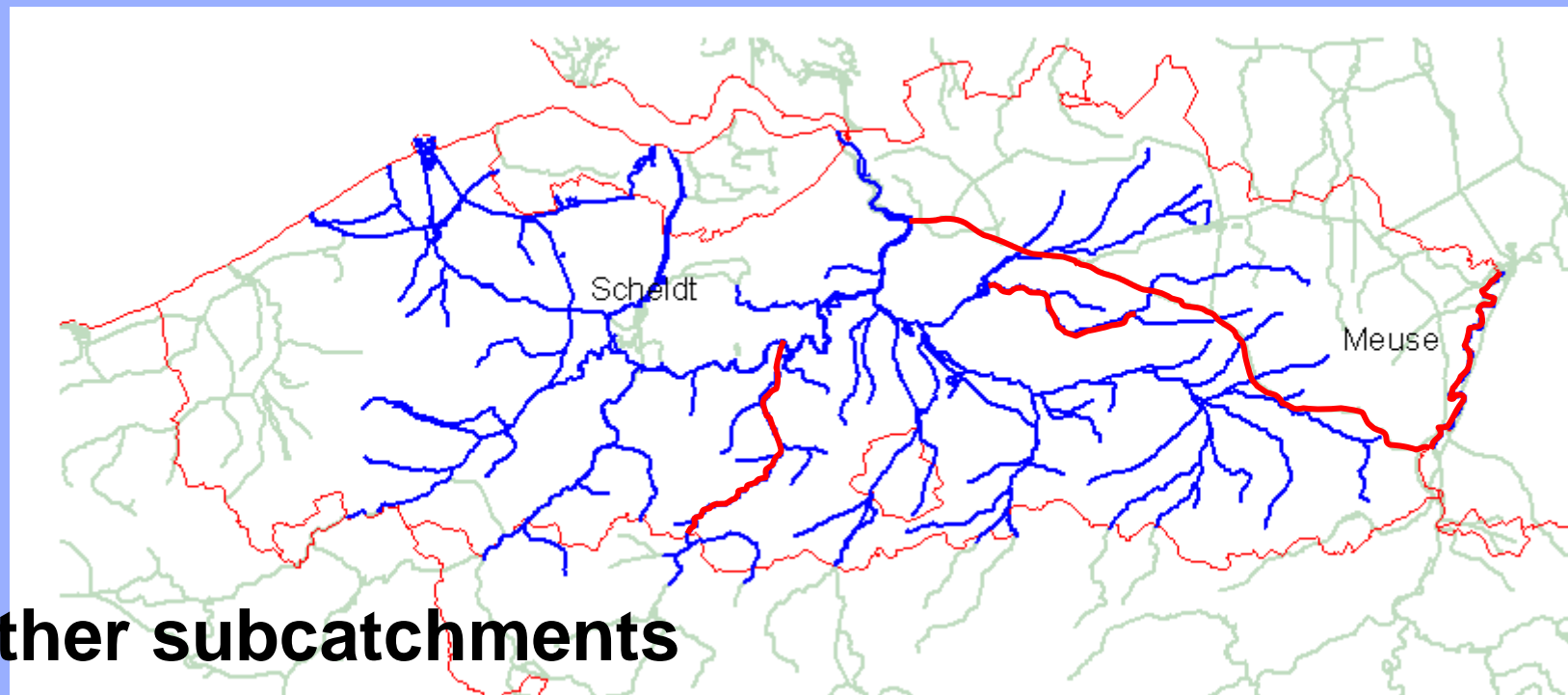




# THEORY => PRACTICE

WATERBOUWKUNDIG LABORATORIUM

- Meuse
- Dender
- Grote Nete
- Inventory other subcatchments







# FRESHWATER MANAGEMENT

WATERBOUWKUNDIG LABORATORIUM



**We may utilise the gifts of nature just as we choose but in her books the debits are always equal to the credits.**

