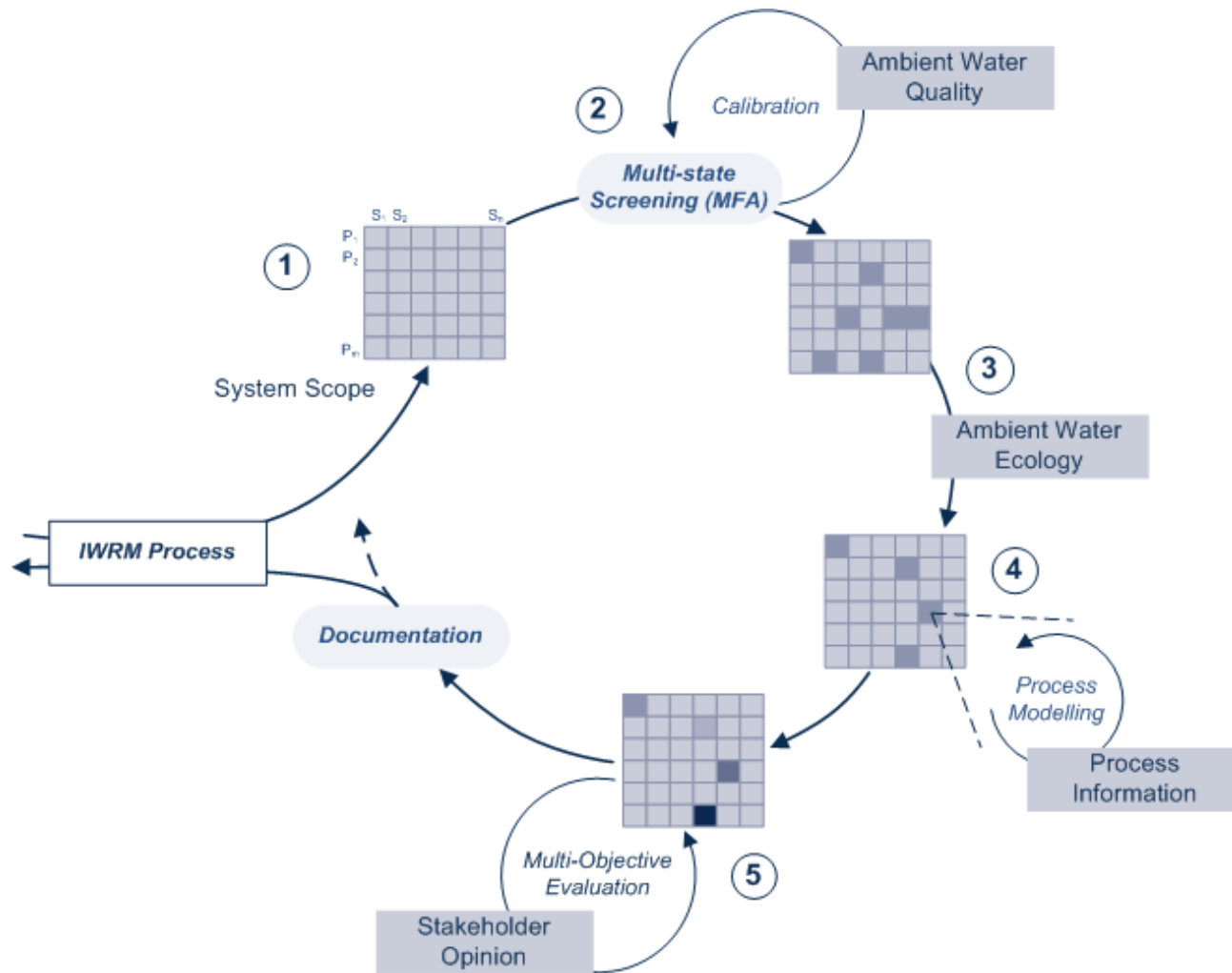


IWRM Decision Support with Material Flow Analysis: Consideration of Urban System Input

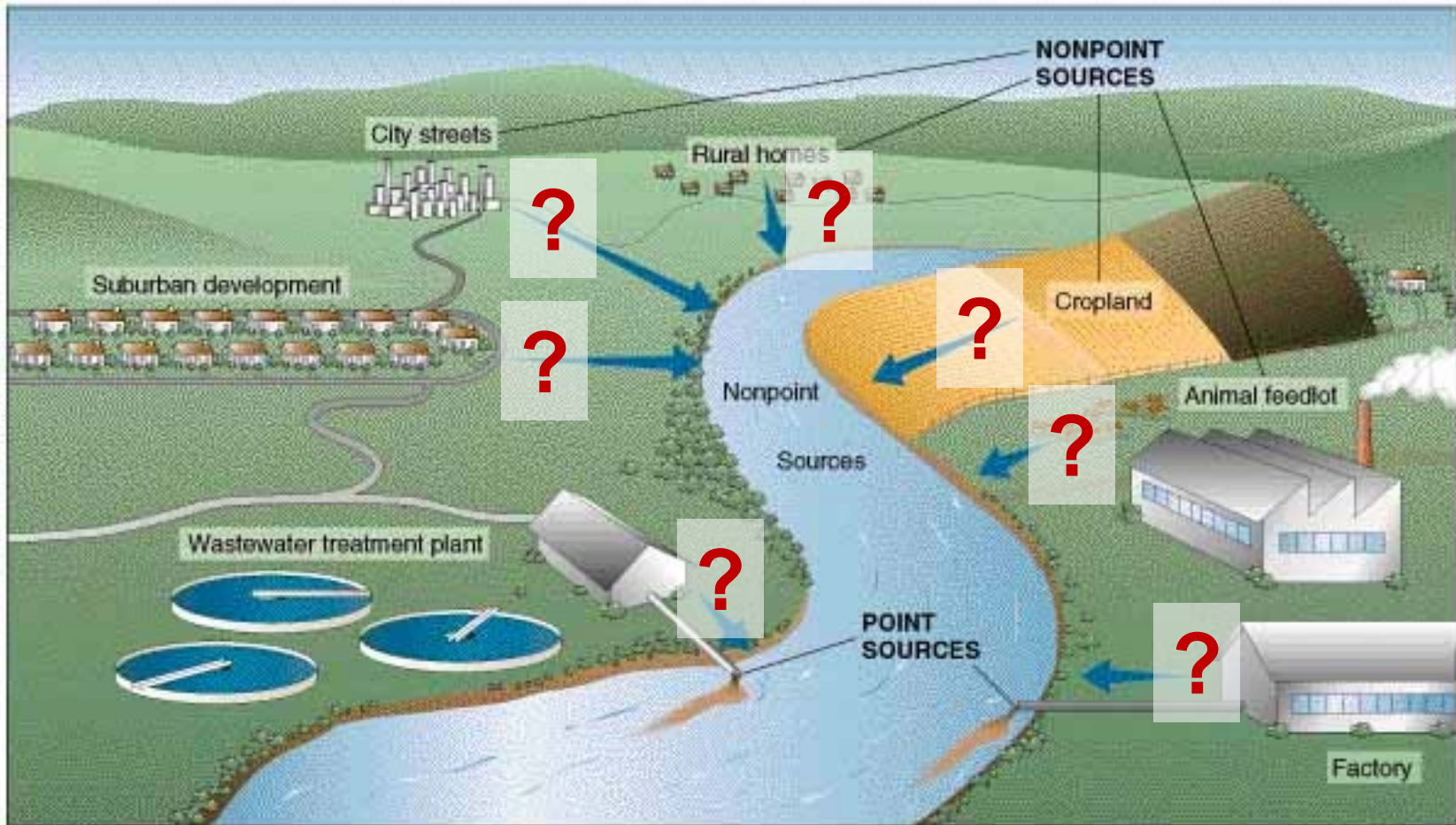
Tatyana Terekhanova, Björn Helm, Jens Tränckner, Peter Krebs

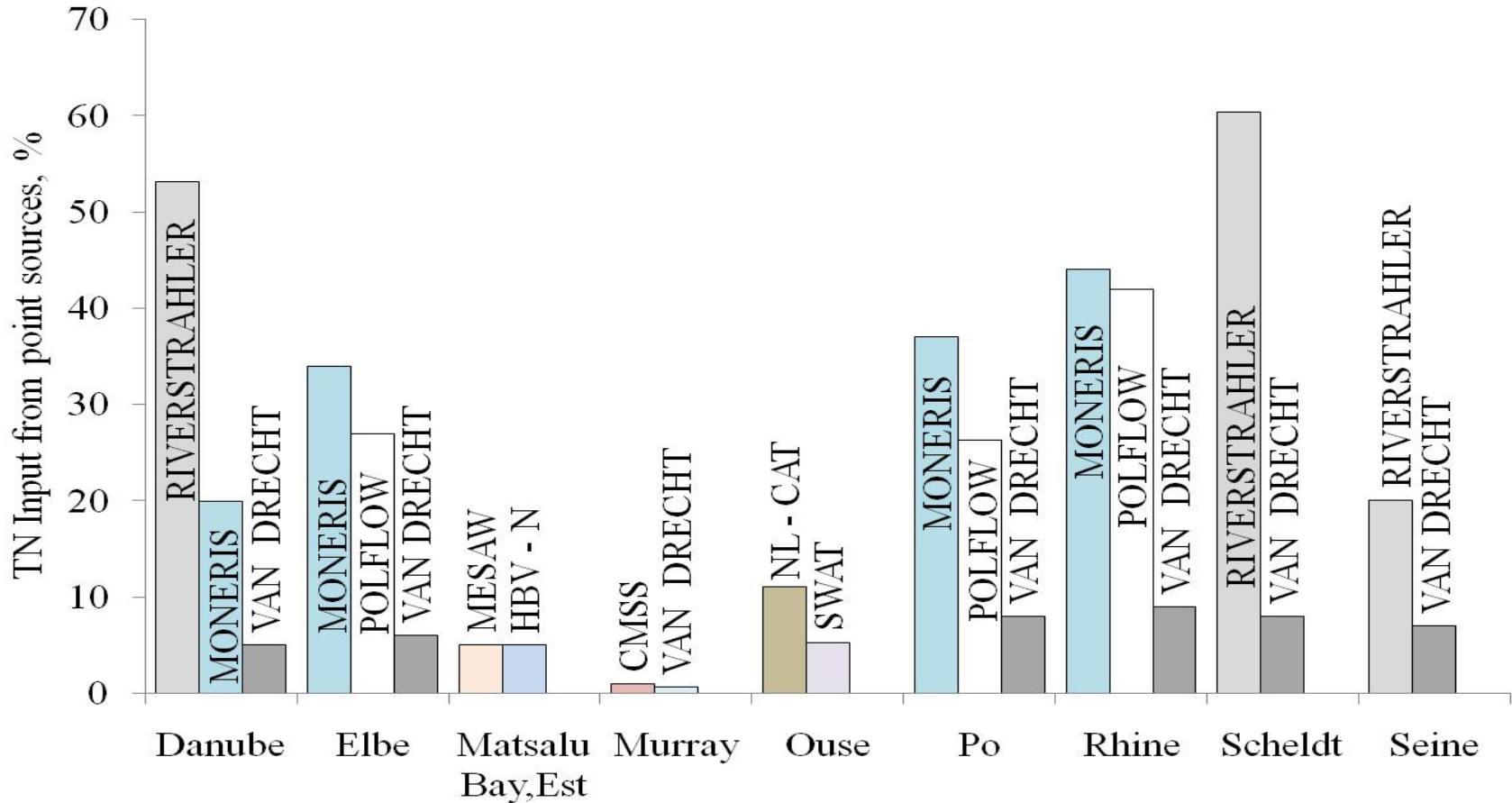
Institute of Urban Water Management, TU Dresden

Dresden, 13th Oktober 2011



Motivation: pressures identification





→ **Tools?**

- Literature survey

- Selection of models for analysis of urban system input quantification
 - Catchment scale modelling
 - Compliance with MFA methodology
 - Urban system
 - Urban system compartments
 - Modelling tool documentation

- Analysis of quantification procedures

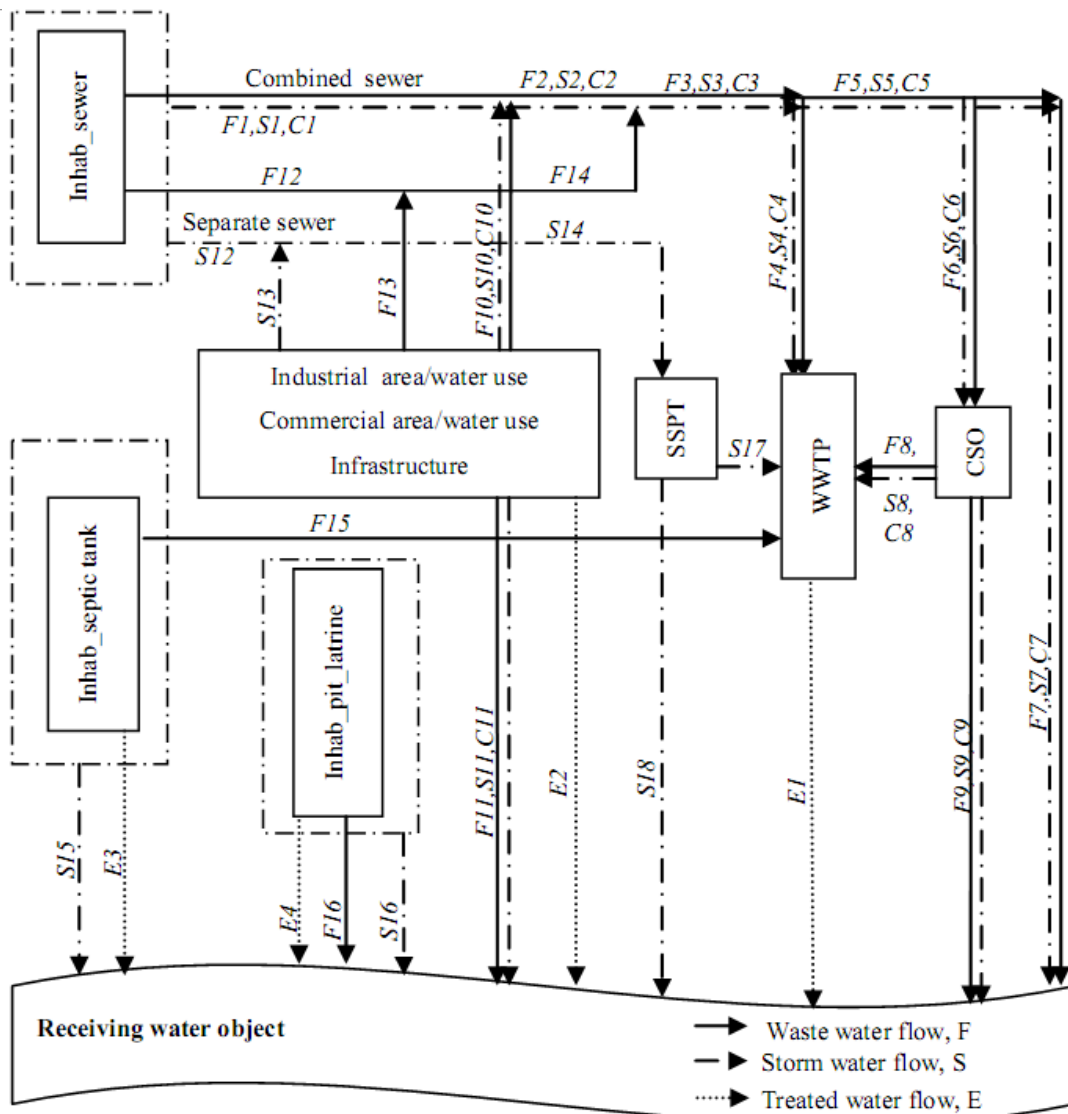
Ranking: 0 = not considered

1 = as pure input

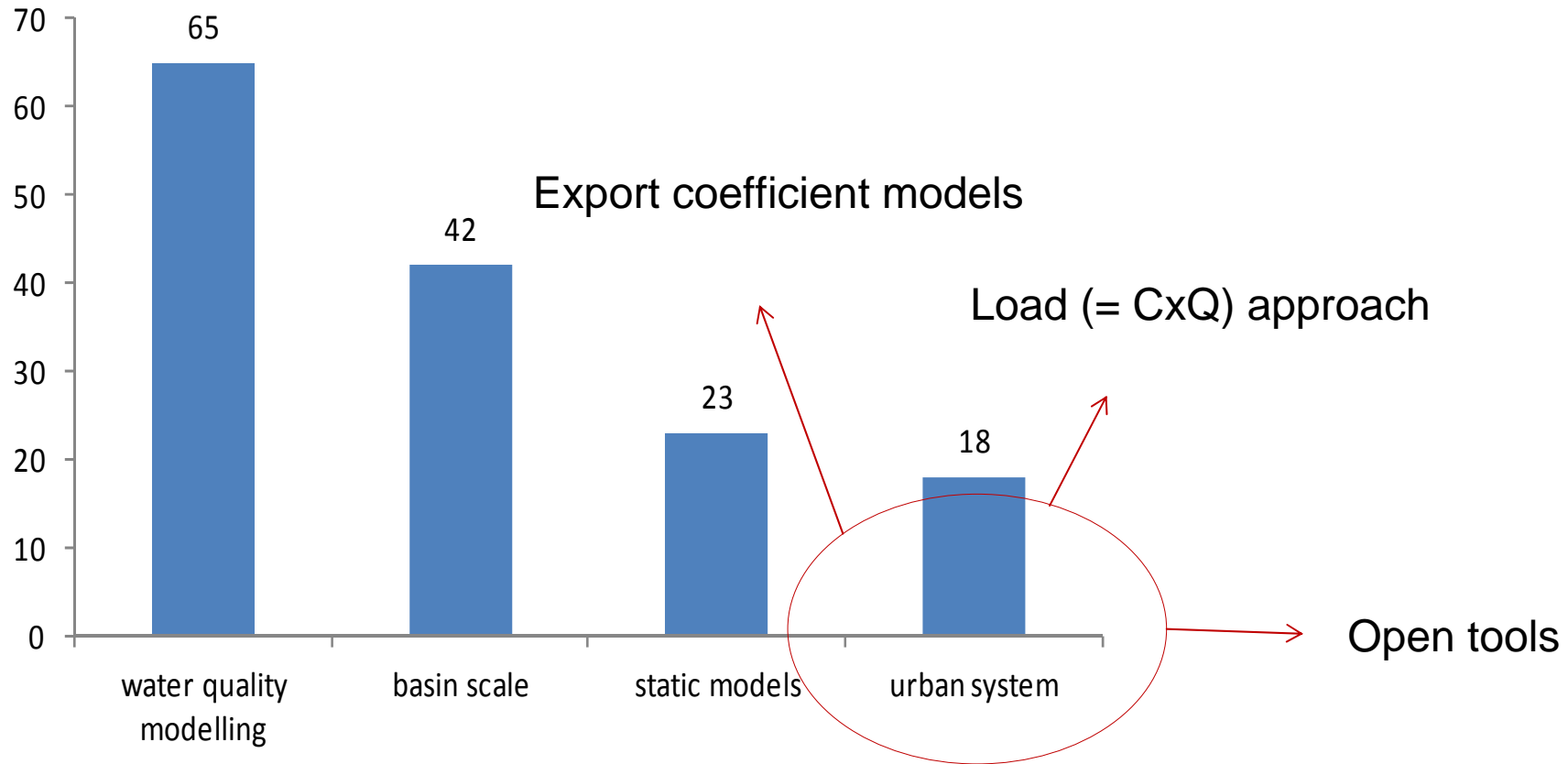
2 = input + simple approach

3 = advanced calculation approach

Methodology: Urban drainage compartments



- C7 Flows from combined sewer system diverted directly into receiving water object
- C9 Overflow volumes from CSO structure into RWO
- C11 Direct mixed water discharge from non-residential users/areas into RWO
- S15 Flows (F,S) from residential areas with septic tanks
- S,F 16 Direct (criteria: distance from RWO) discharge (F,S) from residential areas with pit latrines or similar
- S18 Discharge into RWO from SSPT
- E1 Effluent from municipal WWTP
- E2 Effluent from industrial WWTP
- E3 Effluent from septic tank
- E4 Effluent from pit latrine



Name	type	E1	E2	E3	E4	C7	C9	C11	S11	S15	S16	S18	R
MESAW	EC	1	1	0	0	0	0	0	1	1	1	1	0,18
CMSS	EC	1	1	0	0	0	0	0	2	2	2	2	0,3
WATERSN	EC	3	0	3	0	0	0	0	1	1	1	1	0,3
SPARROW	EC	1	1	1	0	0	0	0	2	2	2	2	0,33
Smith (2005)	EC	2	1	1	0	0	0	0	2	2	2	2	0,36
WBLMER	EC	0	0	3	0	0	0	0	3	3	3	3	0,45
PLOAD	EC/CxD	1	1	0	0	0	0	1	3	3	3	3	0,45
TEOTIL	EC/CxD	1	1	1	1	0	0	0	3	3	3	3	0,48
WMM	EC/CxD	1	1	0	3	0	1	0	3	3	3	3	0,55
STOFFBILANZ	EC**	1	1	0	3	3	0	0	3	3	3	3	0,61

0 = not considered

1 = input data in loads

2 = simplified calculation

3 = comprehensive calculation

Name	type	E1	E2	E3	E4	C7	C9	C11	S11	S15	S16	S18	R
POLFLOW	CxD	1	1	1	1	1	0	1	0	0	0	0	0,18
GISPLM	CxD	1	1	0	0	0	0	0	2	2	2	2	0,30
MOBINEG	CxD	1	1	1	1	1	1	1	2	2	2	2	0,45
HARP-appr	CxD	3	1	0	1	1	1	1	2	2	2	2	0,48
STEPL	CxD	1	1	3	0	3	0	1	2	2	2	2	0,52
MONERIS	CxD	1	1	3	3	3	3	1	3	3	3	3	0,82
WEAP	CxD	-	-	-	-	-	-	-	-	-	-	-	-
SIMBOX	CxD	-	-	-	-	-	-	-	-	-	-	-	-
0 not considered		2 simplified calculation											
1 input data in loads		3 comprehensive calculation											

- Conceptual representation of urban system boundaries and compartments
- Type of pollution source
- deficits in:
 - CSO and storm water quantification
 - Case specific WWTP efficiency
- High requirements on input data, instead of computational approach
- Reference pollutant concentrations/loads

For IWRM decision support:

- Scarce data& a priori known low urban impact
 - Export coefficient models
- Greater urban pressures
 - CxD models, ! Data availability
- Higher population density&comprehensive urban infrastructure
 - Integrated modelling: Urban MFA tool implemented into basin model

Thank you
for
your attention !