

Calculation of net inputs Actual and Normalized

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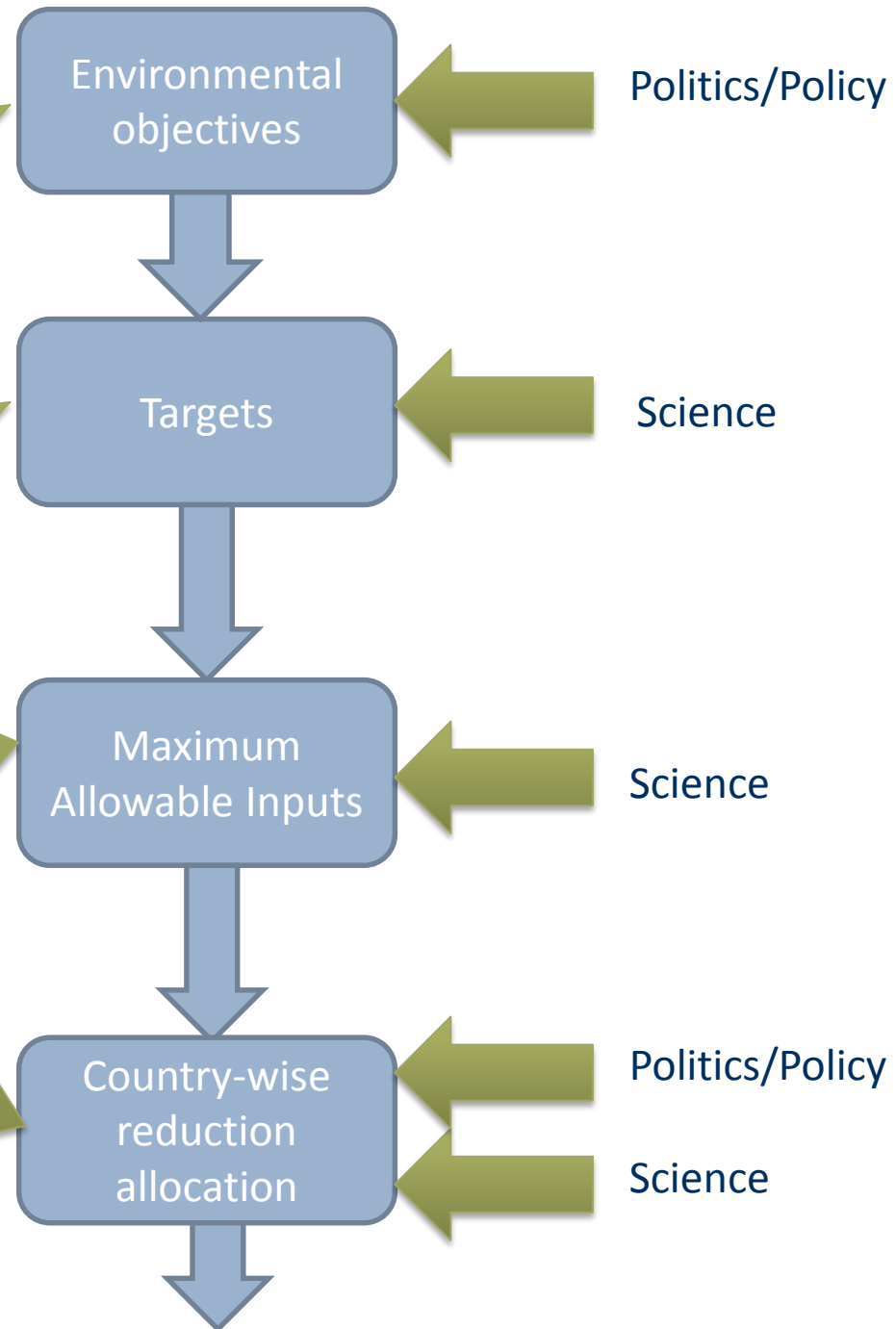
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What is it about?

- ✓ Clear water
- ✓ Nutrient concentrations close to natural levels
- ✓ Natural occurrences of algae

Basin	Winter	Summer

Country	Phosphorus
DK	38
EE	320
FI	360 (330+30)
DE	170 (110+60)
LV	220
LT	1470
PL	7480
RU	3790
SE	530

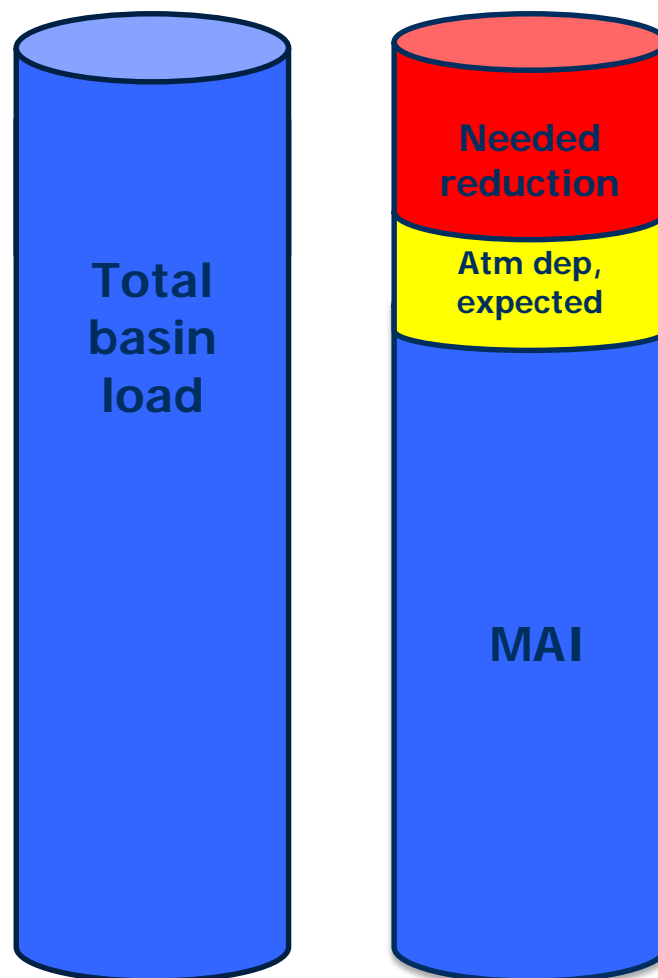


Maximum allowable inputs and needed reductions

Baltic Sea Sub-basin	Maximum Allowable Inputs		Reference inputs		Needed reductions	
	TN tons	TP tons	TN tons	TP tons	TN tons	TP tons
Kattegat	74,000	1,687	78,761	1,687	4,761	0
Danish Straits	65,998	1,601	65,998	1,601	0	0
Baltic Proper	325,000	7,360	423,921	18,320	98,921	10,960
Bothnian Sea	79,372	2,773	79,372	2,773	0	0
Bothnian Bay	57,622	2,675	57,622	2,675	0	0
Gulf of Riga	88,417	2,020	88,417	2,328	0	308
Gulf of Finland	101,800	3,600	116,252	7,509	14,452	3,909
Baltic Sea	792,209	21,716	910,343	36,893	118,134	15,177

Needed reduction
given by the
difference
between the **total
loads** to the basin
and the **MAI** plus
**expected
reductions** from
non-HELCOM

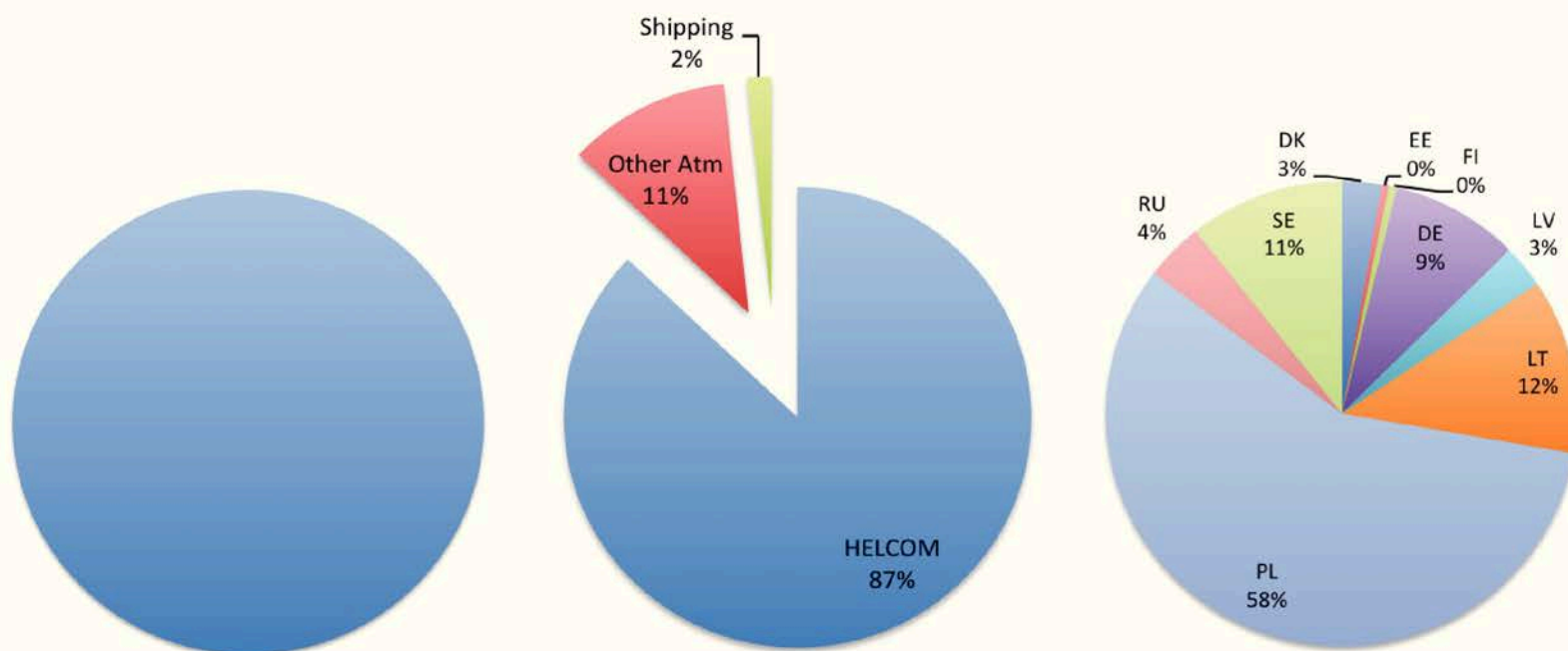
With expected reductions



Allocation principles

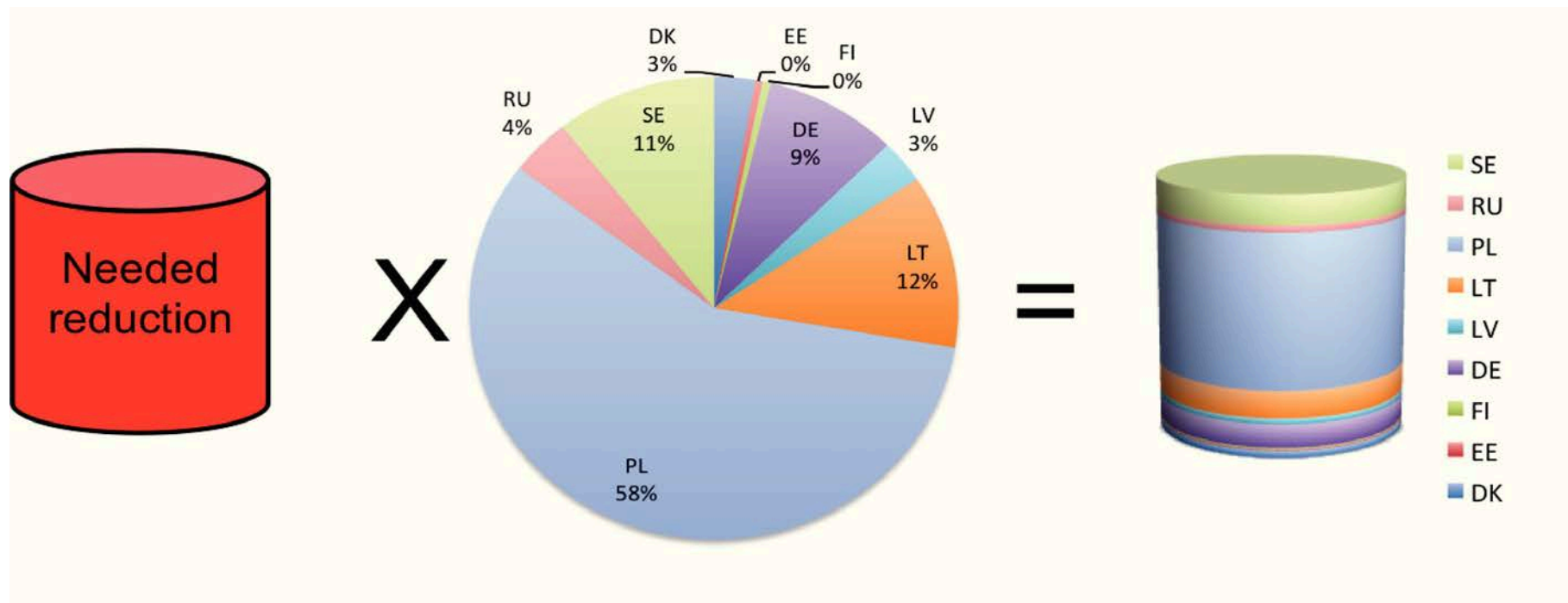
How the shares on inputs from different Contracting Parties to a Baltic Sea sub-basin are determined

Example Nitrogen Baltic proper



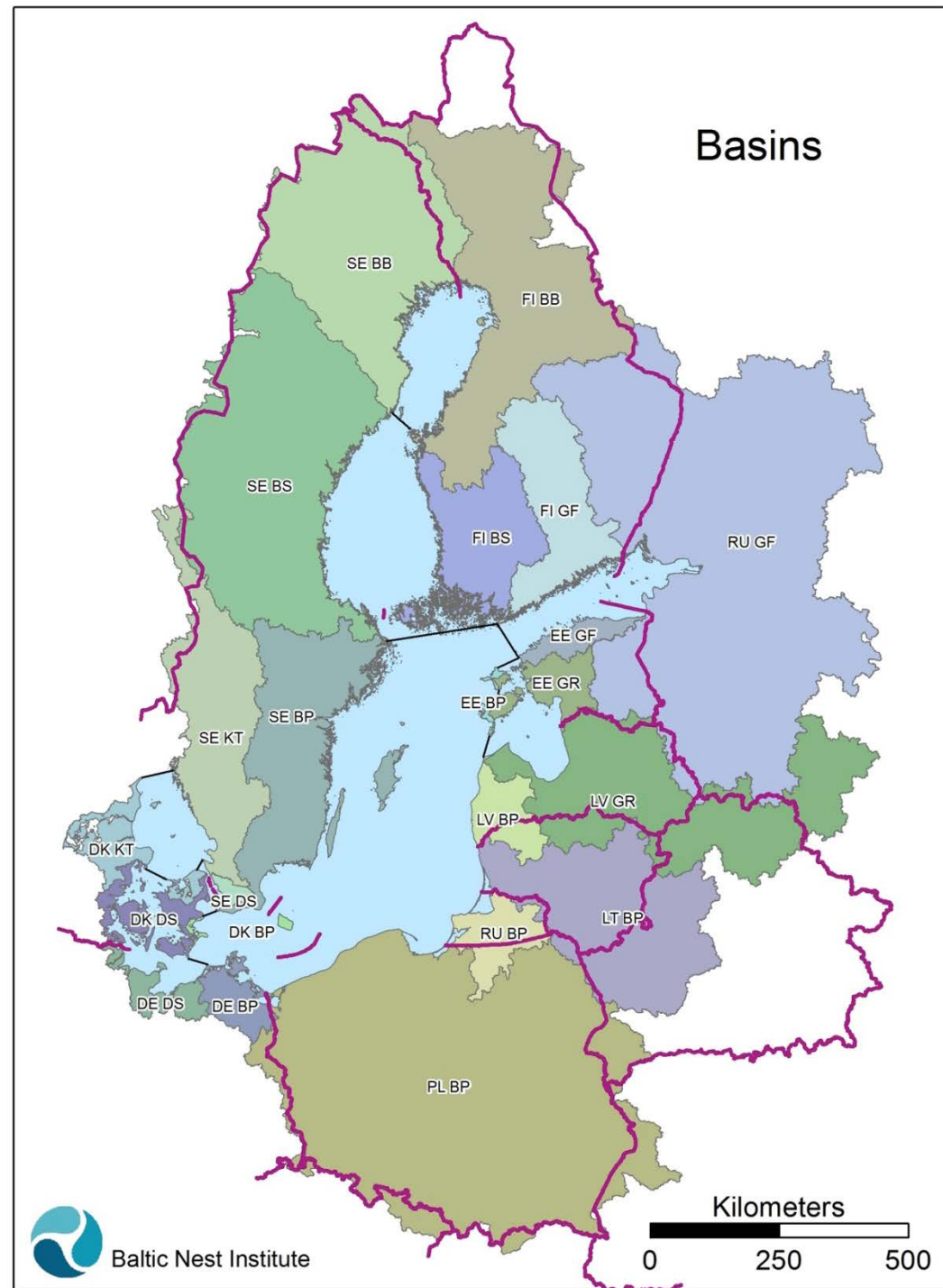
Allocation principles

The CART is determined by multiplying the need reduction with the shares



The “Country-basin” catchments

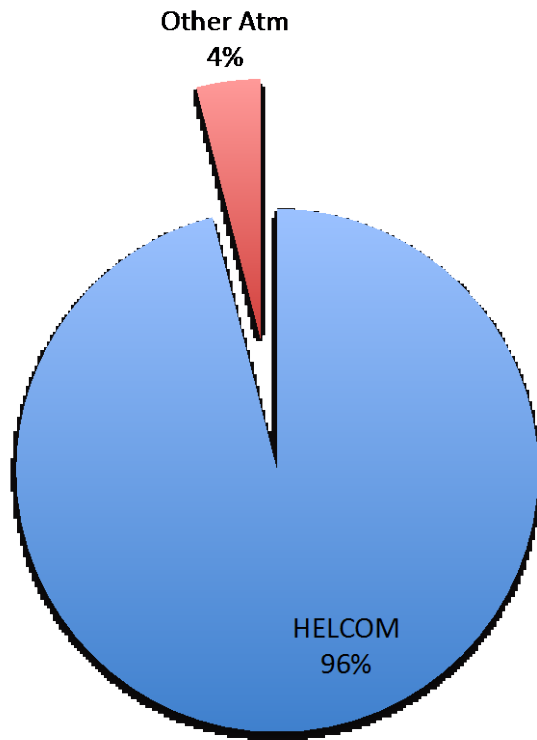
- Inputs are primarily assigned to the country doing the monitoring (owning the river mouth)
- Major rivers carry nutrients from upstream countries (transboundary inputs)



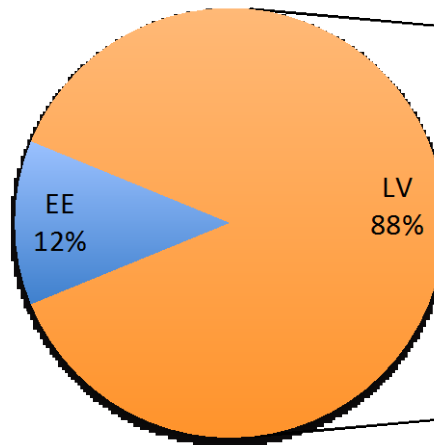
Allocation also on non-HELCOM countries

Example GUR Phosphorus

Before allocation only atmospheric P load is subtracted.

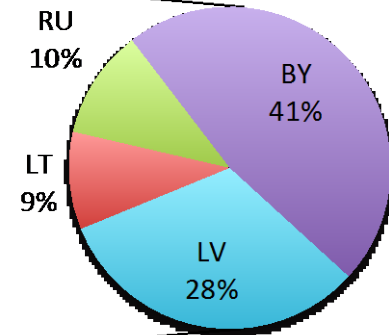


CART: The reduction is shared between the coastal states, EE and LV



Needed reduction
308 ton
LV = 270 (88%)
EE = 38 (12%)

Transboundary sharing among both CPs and BY of LV's reduction requirement



The 270 on LV is shared
LV = 86 (28%)
LT = 26 (9%)
RU = 30 (10%)
BY = 128 (41%)

Nitrogen	BP	GF	KT	ALL
DK	2136	42	708	2886
EE	382	1419	0	1801
FI	424	2603	2	3029
DE	7419	165	79	7663
LV	1645	23	1	1669
LT	8935	33	1	8969
PL	43436	147	27	43610
RU	2498	7879	4	10381
SE	8356	63	826	9245
<i>Gothenburg Protocol expected reduction in non Contracting parties</i>	14725	1486	2511	18722
<i>Expected reduction shipping</i>	5735	592	602	6929
BY	1977			1977
CZ	727			727
UA	526			526
Sum	98921	14452	4761	118134

CART



Phosphorus	BP	GF	GR	Sum
DK	38	0	0	38
EE	15	268	38	321
FI	0	364	0	364
DE	175	0	0	175
LV	129	0	86	215
LT	1441	0	26	1467
PL	7477	0	0	7477
RU	481	3277	30	3788
SE	535	0	0	535
BY	424		128	552
CZ	187			187
UA	58			58
Sum	10960	3909	308	15177

External nutrient sources to the Baltic Sea

- Waterborne sources
 - Rivers and Streams
 - Direct point sources
- Airborne sources
 - Atmospheric deposition

How data is defined

- Waterborne inputs
 - Reported by the country "owning" the coastline were the input occur to the PLC
- Airborne inputs
 - EMEP calculates how much nitrogen deposition different emissions cause
 - Emissions causing phosphorus deposition are not know so the deposition is not attributed to a particular source

Net inputs

Net inputs =
Waterborne inputs +
Transboundary through other countries -
Transboundary from other countries +
Atmospheric inputs

Definition of nutrient input ceiling

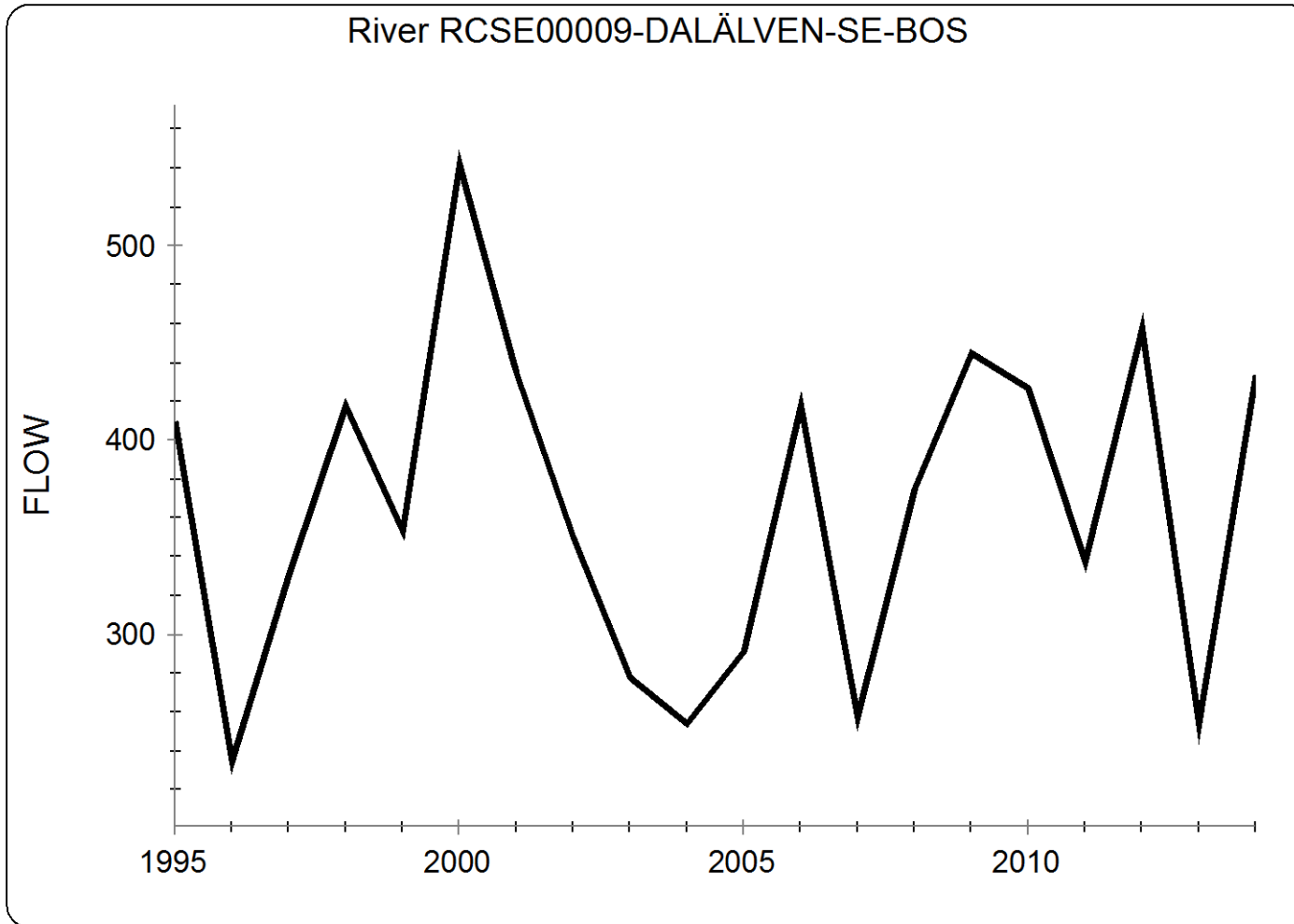
Ceiling = Net reference inputs (1997-2003) –
CART

For basins with $CART = 0$, Ceiling = Net reference
inputs

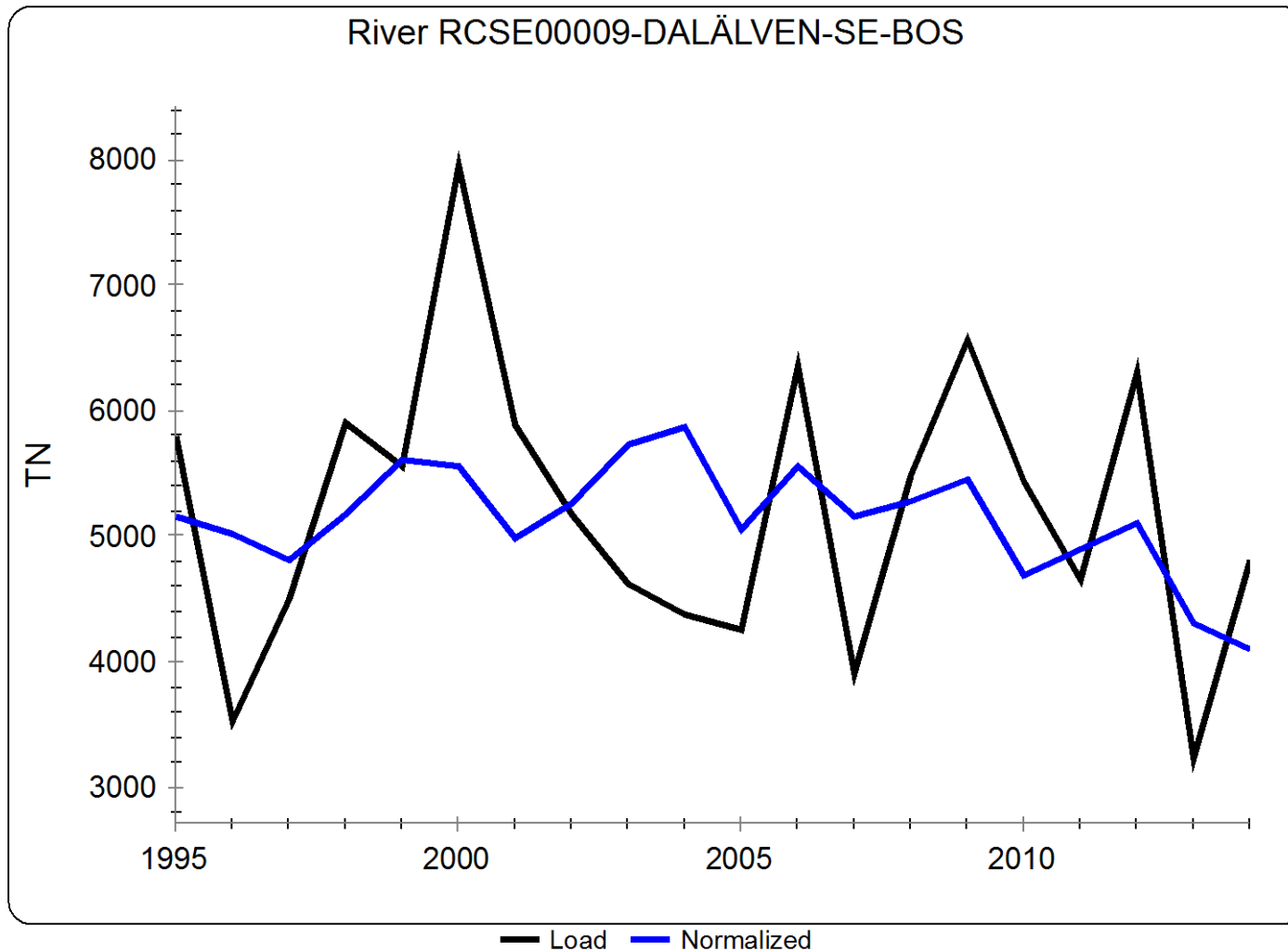
Flow normalization

- Remove variations (as far as possible) due to variations between years in runoff
- Done for each catchment individually (In PLC5.5 normalization was done on Country-basin aggregations)
- River catchments with incomplete time-series added to unmonitored area before normalization

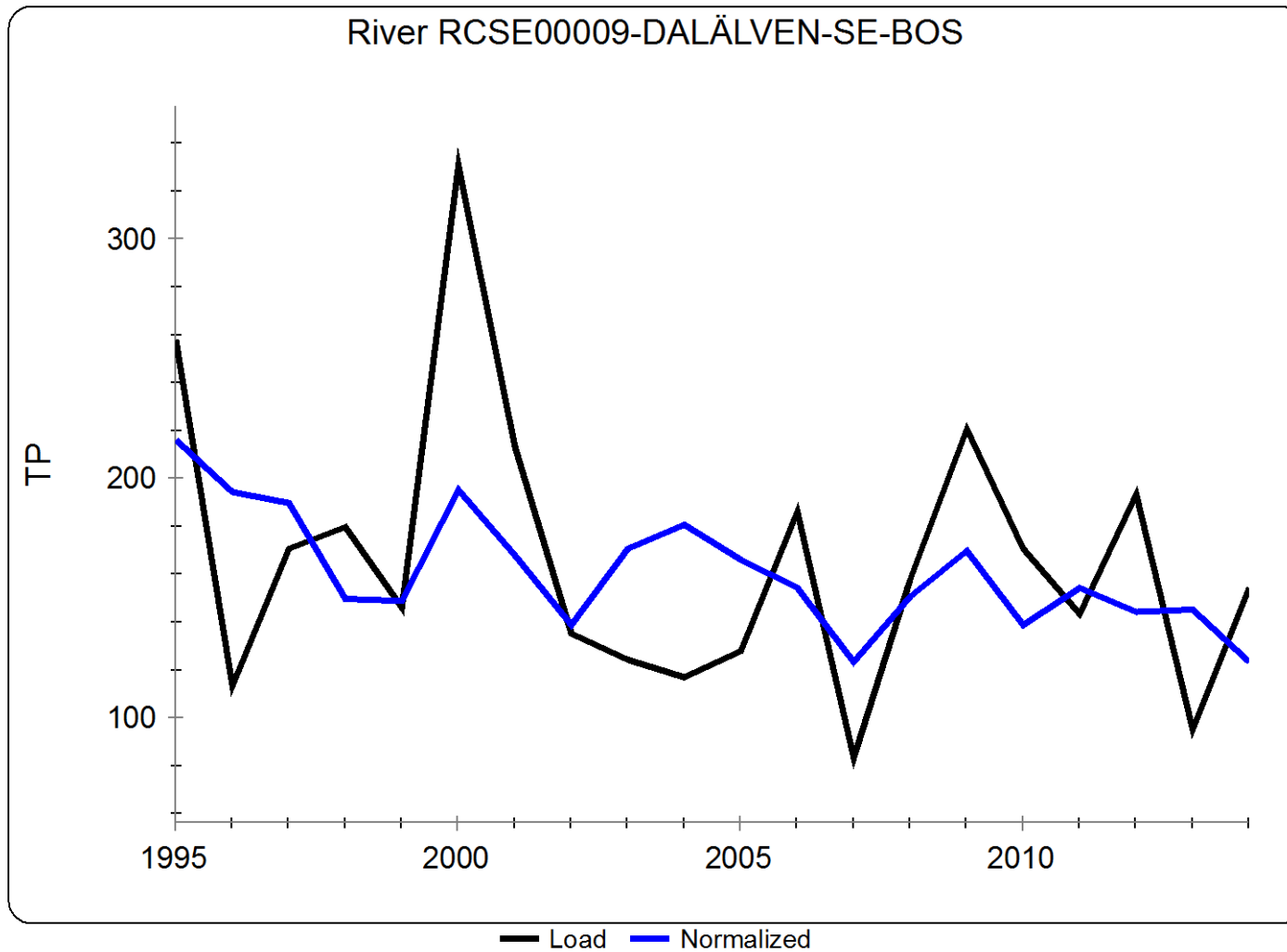
Example: Dalälven



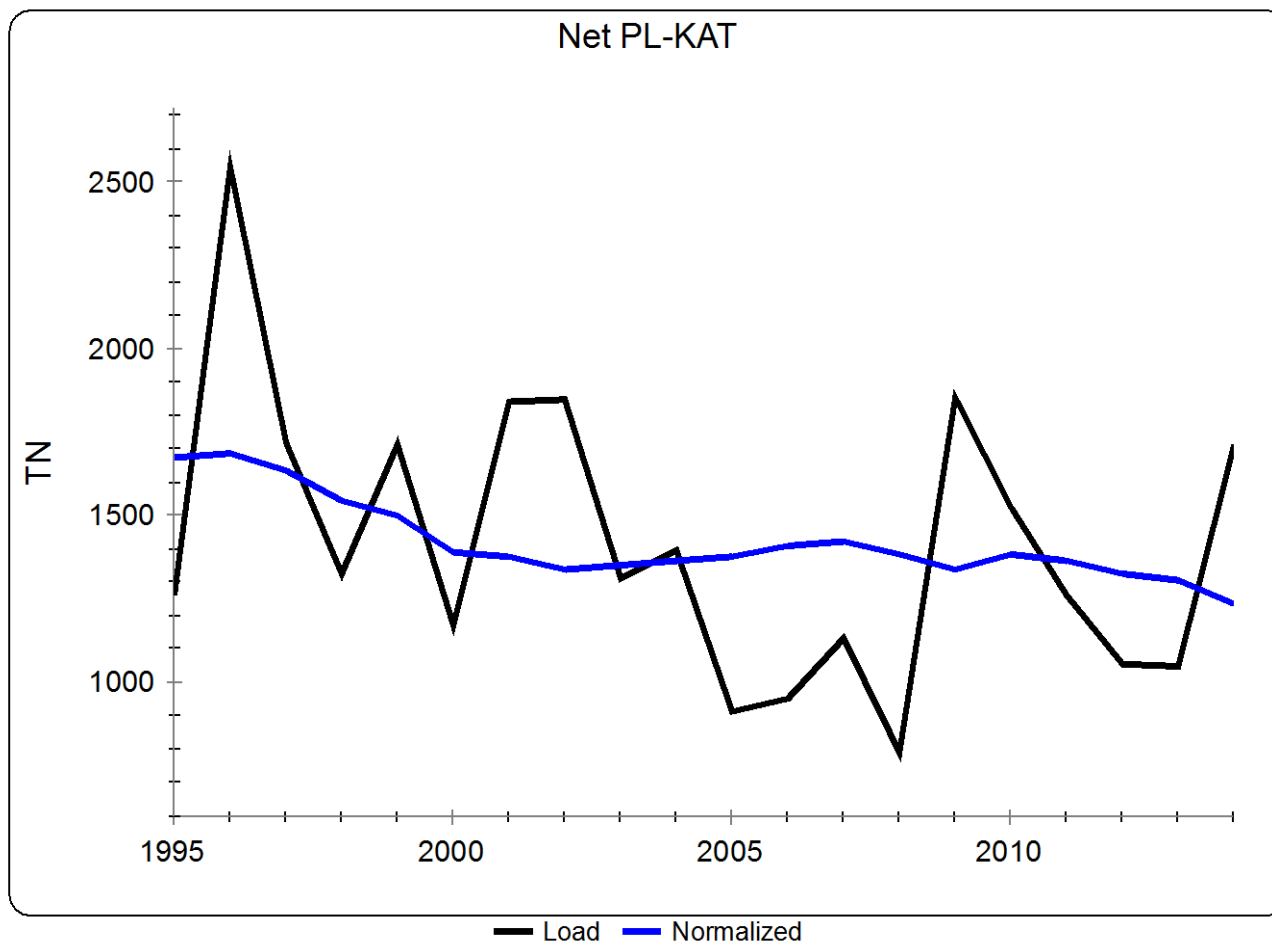
Example: Dalälven



Example: Dalälven



Normalized atmospheric deposition: removes natural inter annual variability



Transboundary rivers

- Oder
 - Poland, Germany and **Czech Rep**
- Vistula
 - Poland, **Belarus** and **Ukraine**
- Neva
 - Russia and Finland
- Pregolya
 - Russia and Poland
- Nemunas
 - Lithuania and **Belarus**
- Barta, Venta and Lielupe
 - Latvia and Lithuania
- Daugava
 - Latvia, Lithuania, **Belarus** and Russia

Border rivers

- Torne älv
 - Finland and Sweden
- Narva
 - Russia and Estonia