BALLOON
Baltic Lagoon Network

ARTWEI

Lagoon indicators and status

A. Razinkovas-Baziukas

South Baltic
PROGRAMME

Typology (spatial dimension)

- Depth
- Residence time
- Salinity
- Bottom sediment type

- ✓ Salinity
- ✓ Tidal range
- ✓ Surface area
- ✓ Degree of confinement
- ✓ Sediment type
- ✓ Vegetation type
- ✓ Depth
- ✓ Oxygen
- ✓ Time (seasonality)

Trends (for all 3 lagoons)

- Nutrient loads
- Chlorophyll A
- Phytoplankton composition
- Benthic communities (biomass & composition)
- Fish catches & community structure

Multi-metric indices (used for macrozoobenthos)

- ✓ BAT
- ✓ BITS
- ✓ M-AMBI
- ✓ ISS

Indicator classification

- Natural processes - and nature conditions (clear , not polluted etc.)
- Socio-economics part of development / layer existing in context of lagoon
- Local or regional government policy or cooperation
- Endangering for habitats (biodiversity, conditions) and human economy influence/ factors - natural and anthropogenic ones

Publication plan

Typology revisited (pee-reviewed publication)

Including residence time maps for 3 lagoons (do we have models ready ?)

Trends (Nutrient loads, ChlA, Phytoplankton structure, Macrozoobenthos)

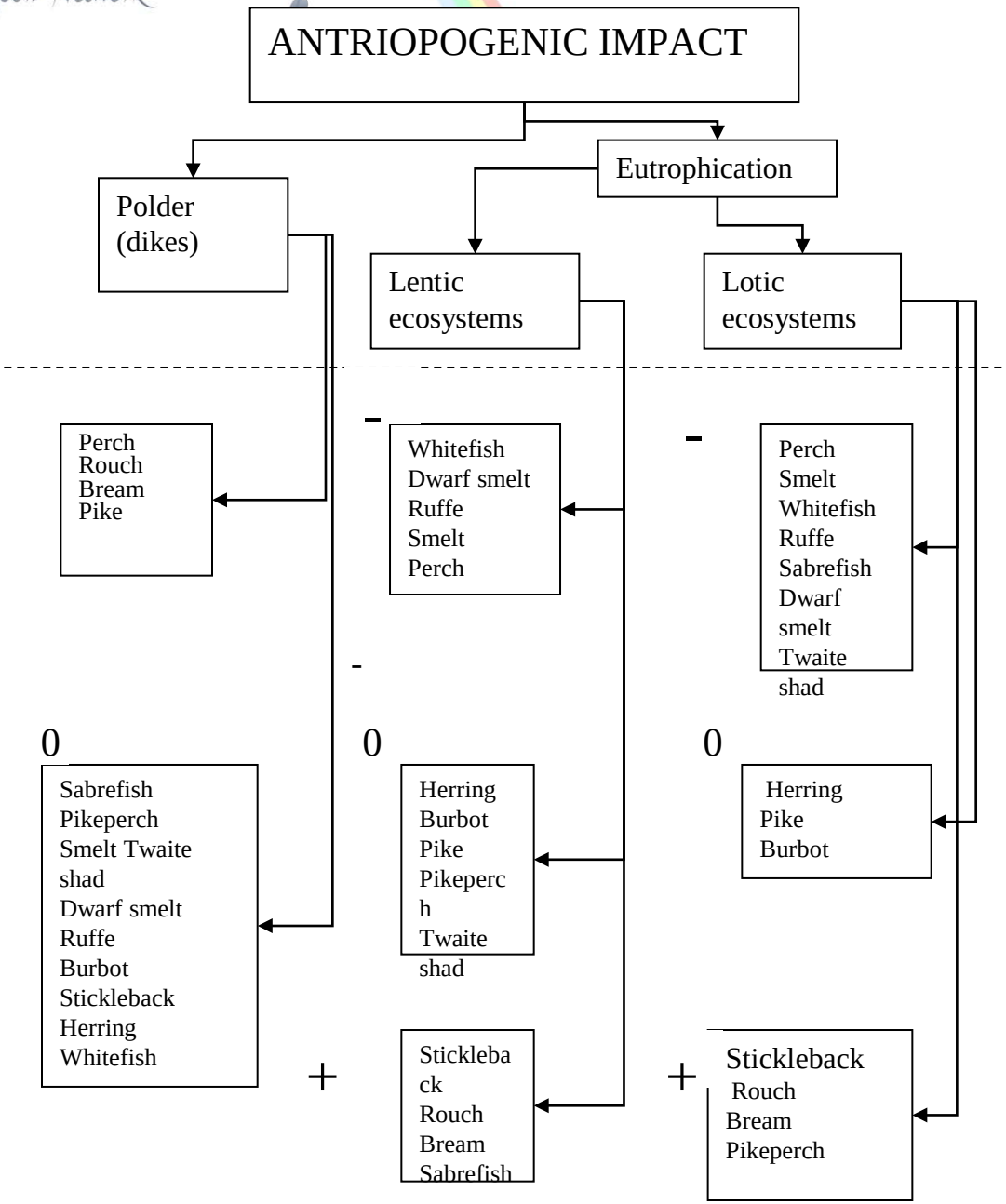
Indices (Macrozoobenthos??)

Changes in fish communities

Changes in anthropogenic pressure

Scio-economical indicators & comparison (Tomasz??)

- Linear habitats as indicators (Ramunas)
- Fish community structure (Arvydas & Arturas, Sergej S.)
- Water quality (sensu WFD):
- A) typology residence time (Boris, Ali)
- B) ChA and index Benthos to CHL A (Sergej A.)
- C) Phytoplonkton community structure (Sergej A.)
- Water and nutrient budgets (Arturas, Ali)
- Sediment budget (Boris, Ali)
- Socio-economics part of development / layer existing in context of lagoon (Tomasz ?)
- Local or regional government policy or cooperation (Tomasz?)
- Nature conservation (Kazimierz)


ANTRIOPOGENIC IMPACT
Eutrophication
Polder (dikes)
Lentic ecosystems
Lotic ecosystems
-
-
-
Perch
Rouch
Bream
Pike
Whitefish
Dwarf smelt
Ruffe
Smelt
Perch
Perch
Smelt
Whitefish
Ruffe
Sabrefish
Dwarf smelt
Twaite shad
0
0
0
Sabrefish
Pikeperch
Smelt Twaite shad
Dwarf smelt
Ruffe
Burbot
Stickleback
Herring
Whitefish
Herring
Burbot
Pike
Pikeperch
Twaite shad
Herring
Pike
Burbot
+
+
Stickleback
Rouch
Bream
Sabrefish
Stickleback
Rouch
Bream
Pikeperch

Background

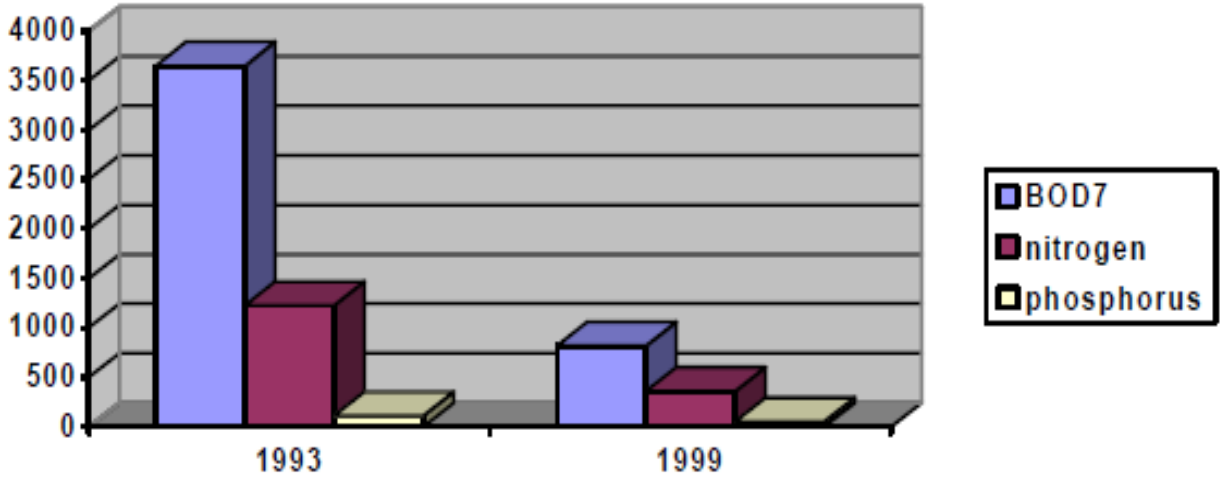
“The first symptom of the eutrophication of the waters in the Lagoon occurred in prewar times. But year by year, the volumes of the agricultural, industrial and municipal waste water increased, especially following the period between 1955 and 1965. This period marked the beginning of the heavy eutrophication of the Curonian Lagoon, due to the poor water quality of the River Nemunas”

HELCOM Thematic report (October 2000)

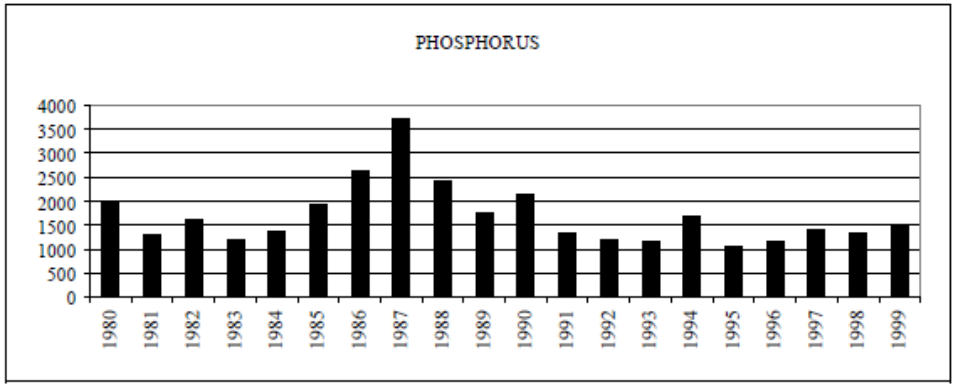
HOTSPOTS WITHIN THE AREA

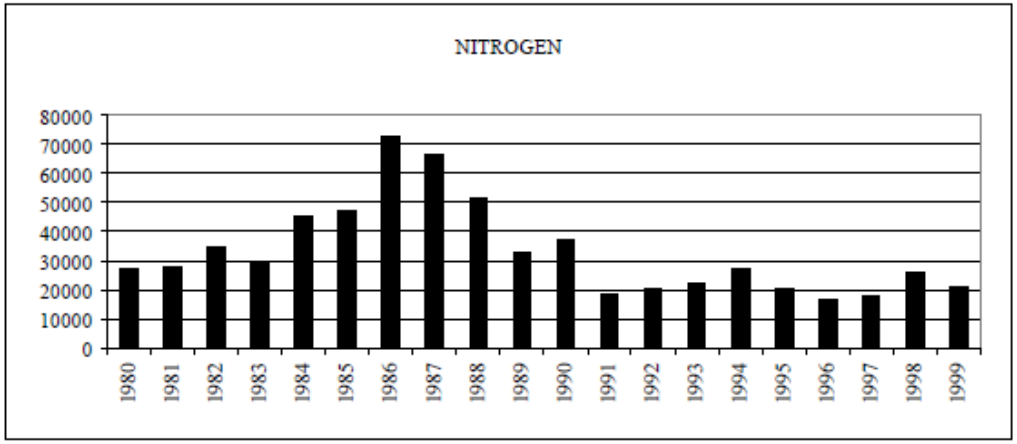
Klaipėda WWTP hot spot (deleted in 2001)

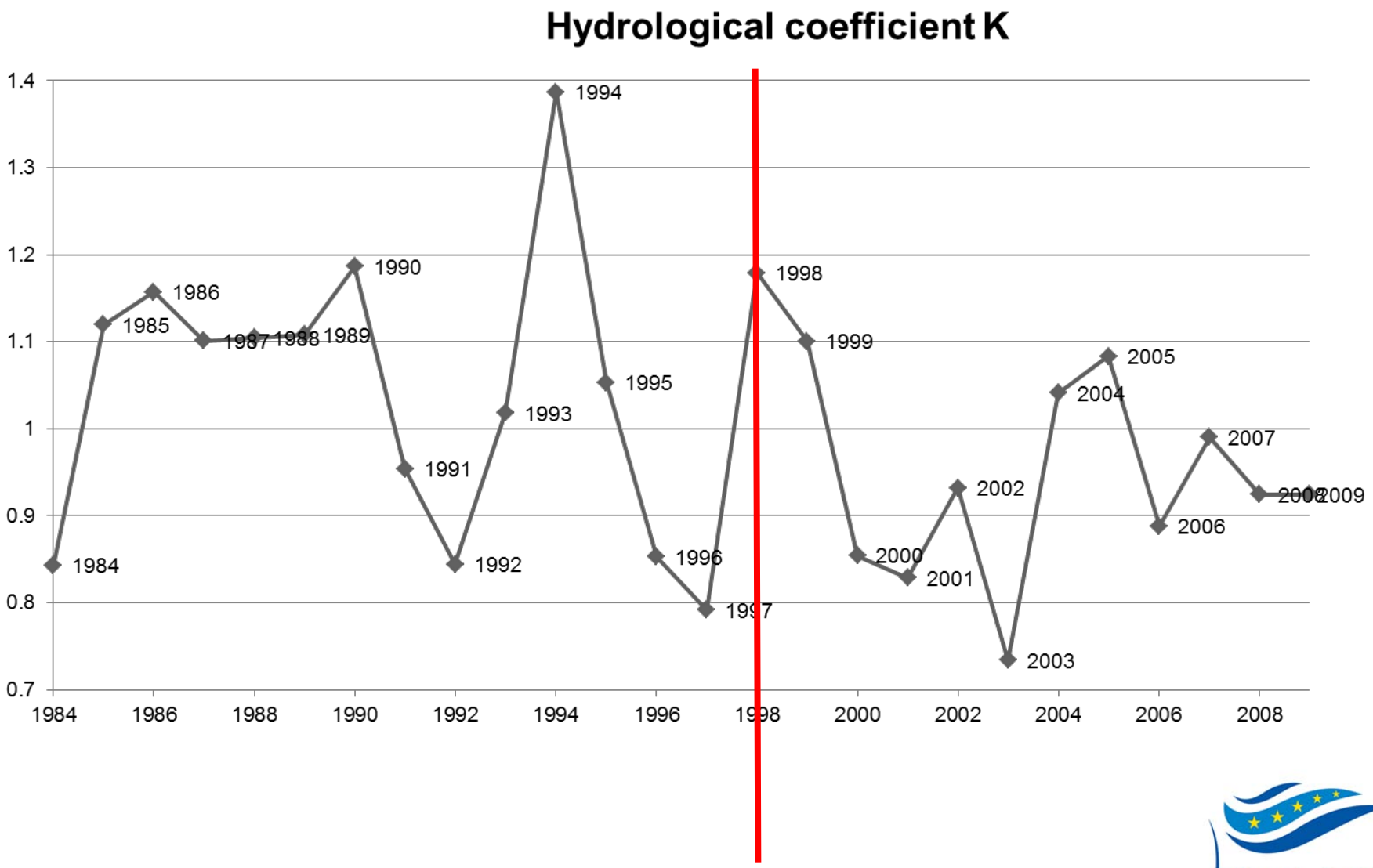
- The secondary and tertiary treatment of waste water introduced in 1998-1999



Nutrient loads (from the above report)






Hydrological coefficient K
1.4
1.3
1.2
1.1
1
0.9
0.8
0.7
1984
1986
1988
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1994
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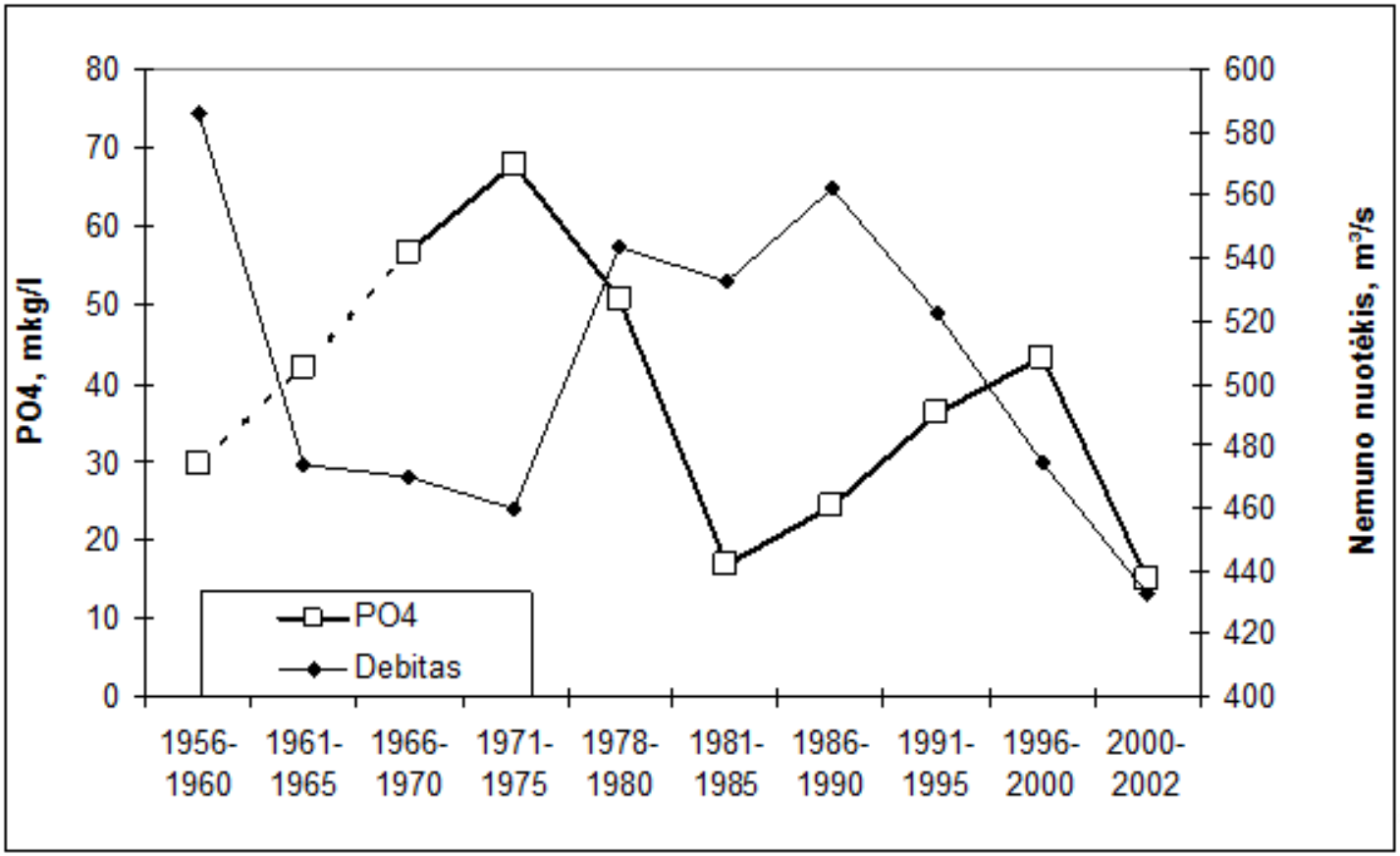
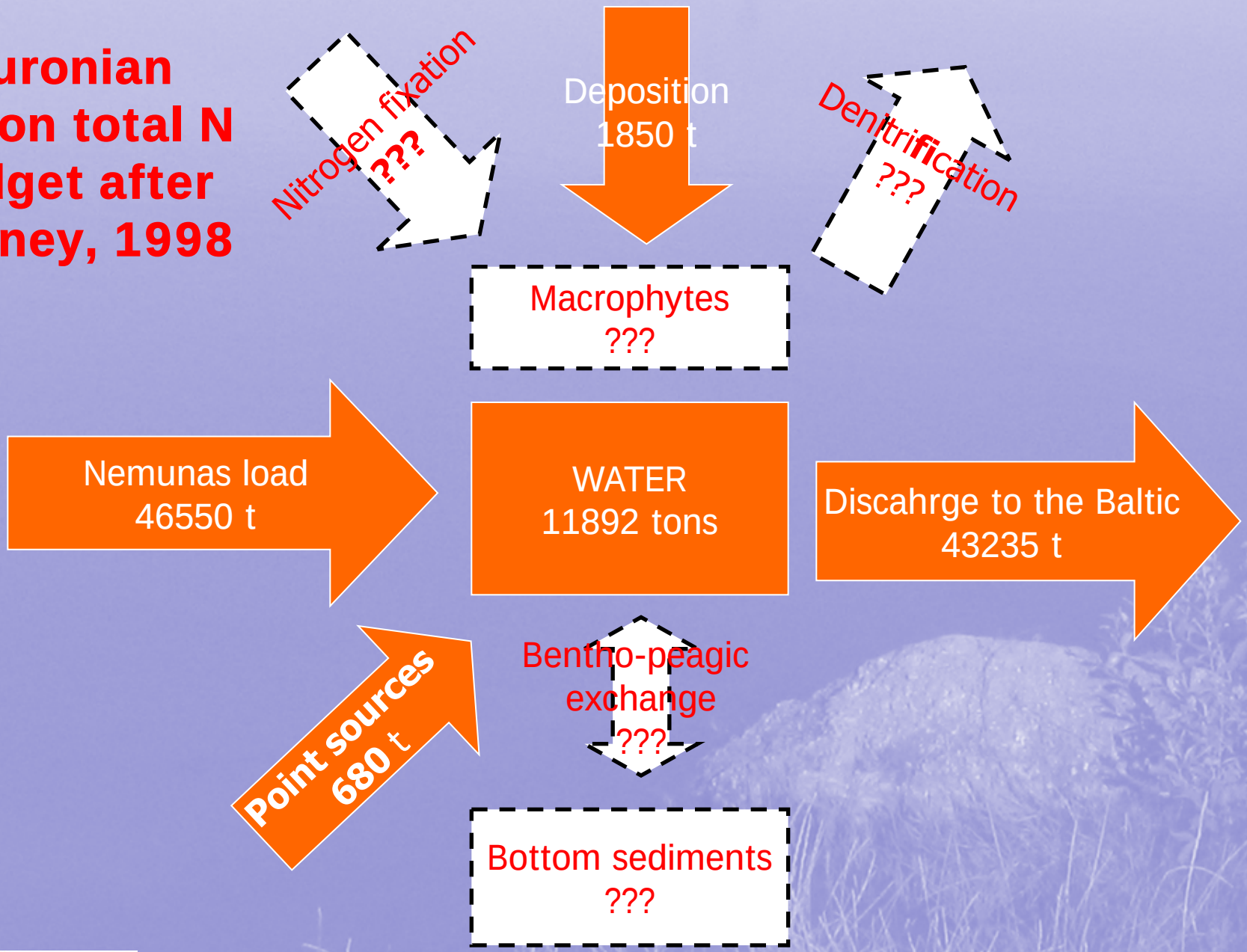
Phosphate concentrations and runoff



Curonian lagoon total N budget after Swaney, 1998



Total N Budget revised

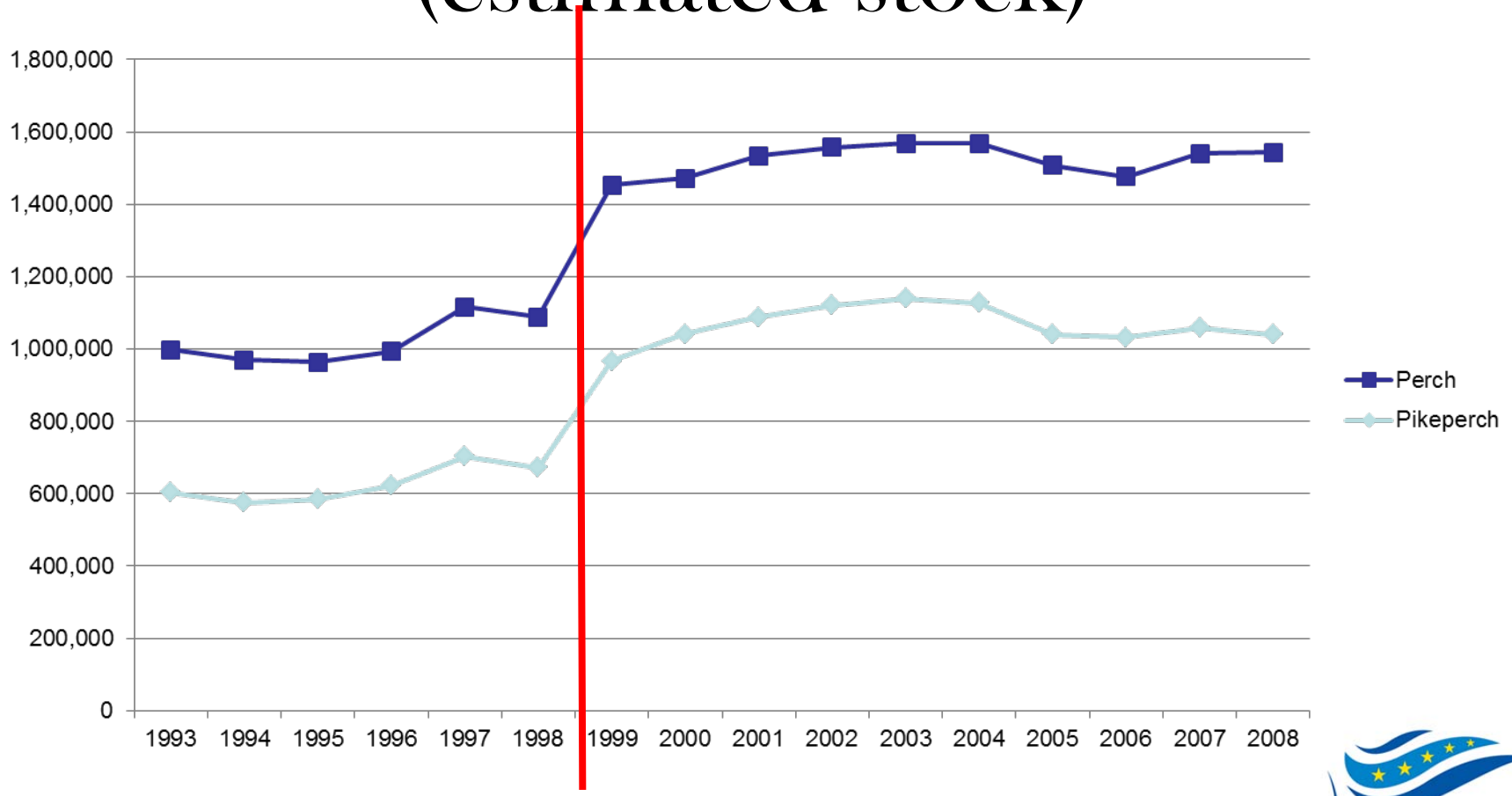
(for 2000-2006)

- Recalculated and corrected N budget for 2000-2006 is significantly lower.
- Not so clear for the P (need additional calculations)

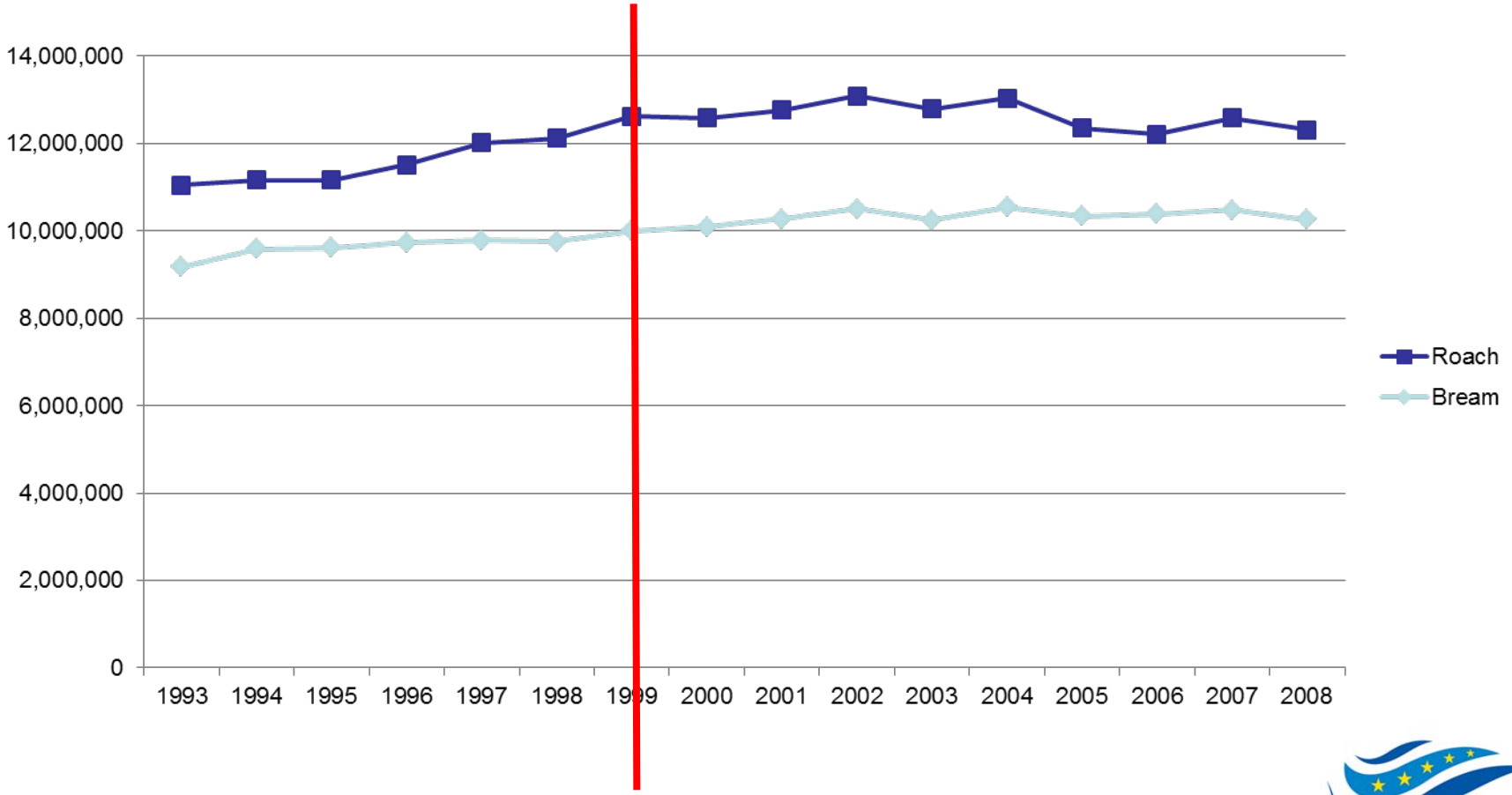
FISHERY

- Reconstruction of stock dynamics based on the population structure (Ložys & Razinkovas, unpublished)

Predatory commercial fish (estimated stock)



Demersal commercial fish stock



Fishery

- Regulation measures improved ?

Conclusions

- Some improvement in mostly N runoff to the lagoon
- Somehow improved stocks of predatory commercial fish

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LAGOON INDICATORS

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WFD parameters

- Classification
- Macrophytes
- Phytoplankton
- Benthos
- Chemistry
- Residence time (modelled)

Potameid (*Potamonogeton pectinatus* & *P. perfoliatus*) distribution

Water quality class	Maximum potameid penetration depth, m	Comments
Very good	≥ 3 m	Maximum depth observed in 50ties (Minkevičius, Pipinis, 1959)
Good	1-3 m	Contrmporary potameid distribution threshold in the most suitable locations.
Average	0,6- 1 m	Average potameid distribution
Bad	0,6 – 0,5 m	Potameid zone in hydraulically active habitats
Very bas	< 0,5 m	Only *P. pectinatus* ocuurs

Fishery & food webs(MFD)

- Pelagic/benthic fish ratio
- Maximum length of fish
- Nutritional status of ke species
- ECOPATH derived parameters