



THE NORTHERNMOST UNIVERSITY
of Technology in Scandinavia

Discharge of phosphorus and bacteria from alkaline and sand filters used for on-site sanitation

Preliminary results from a full-scale study

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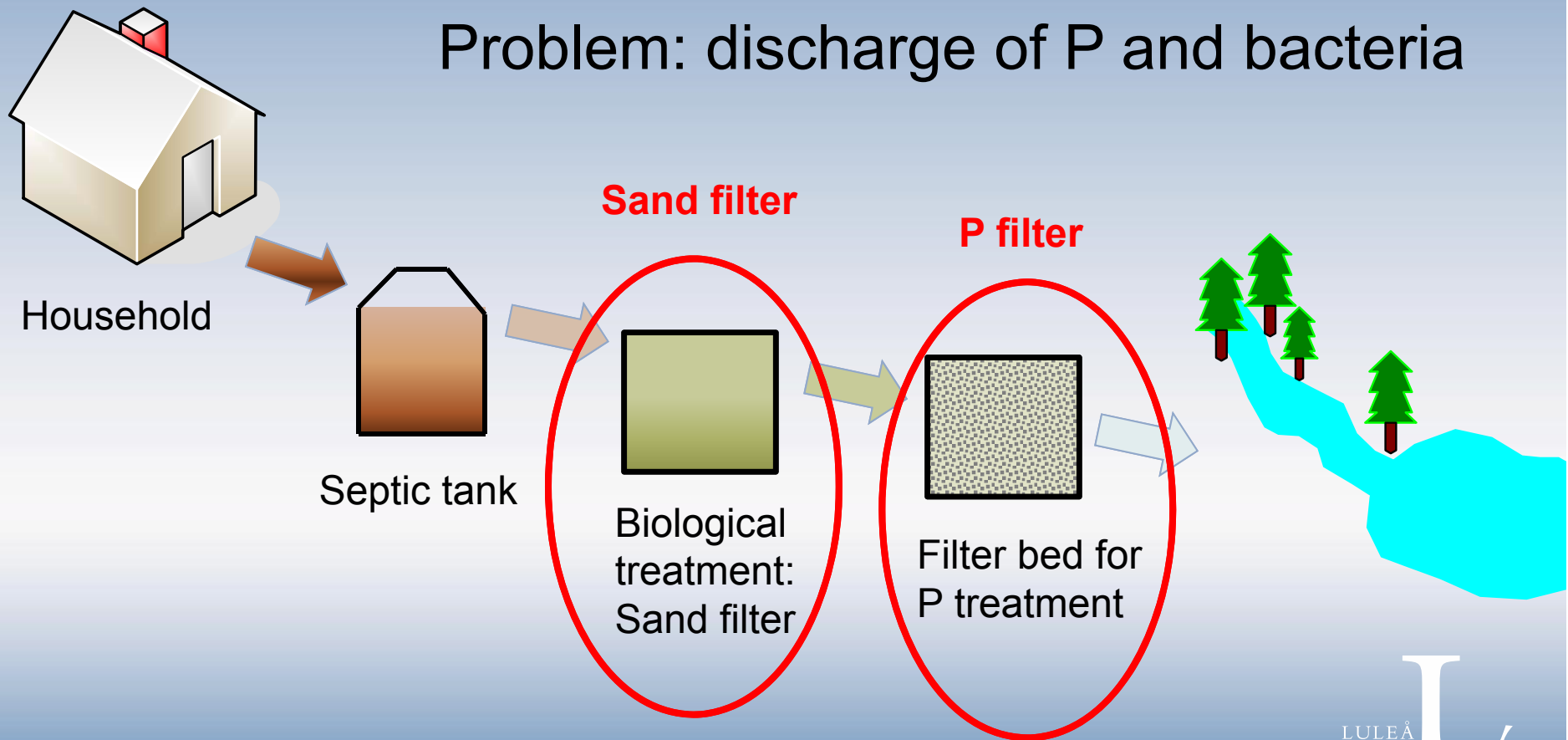






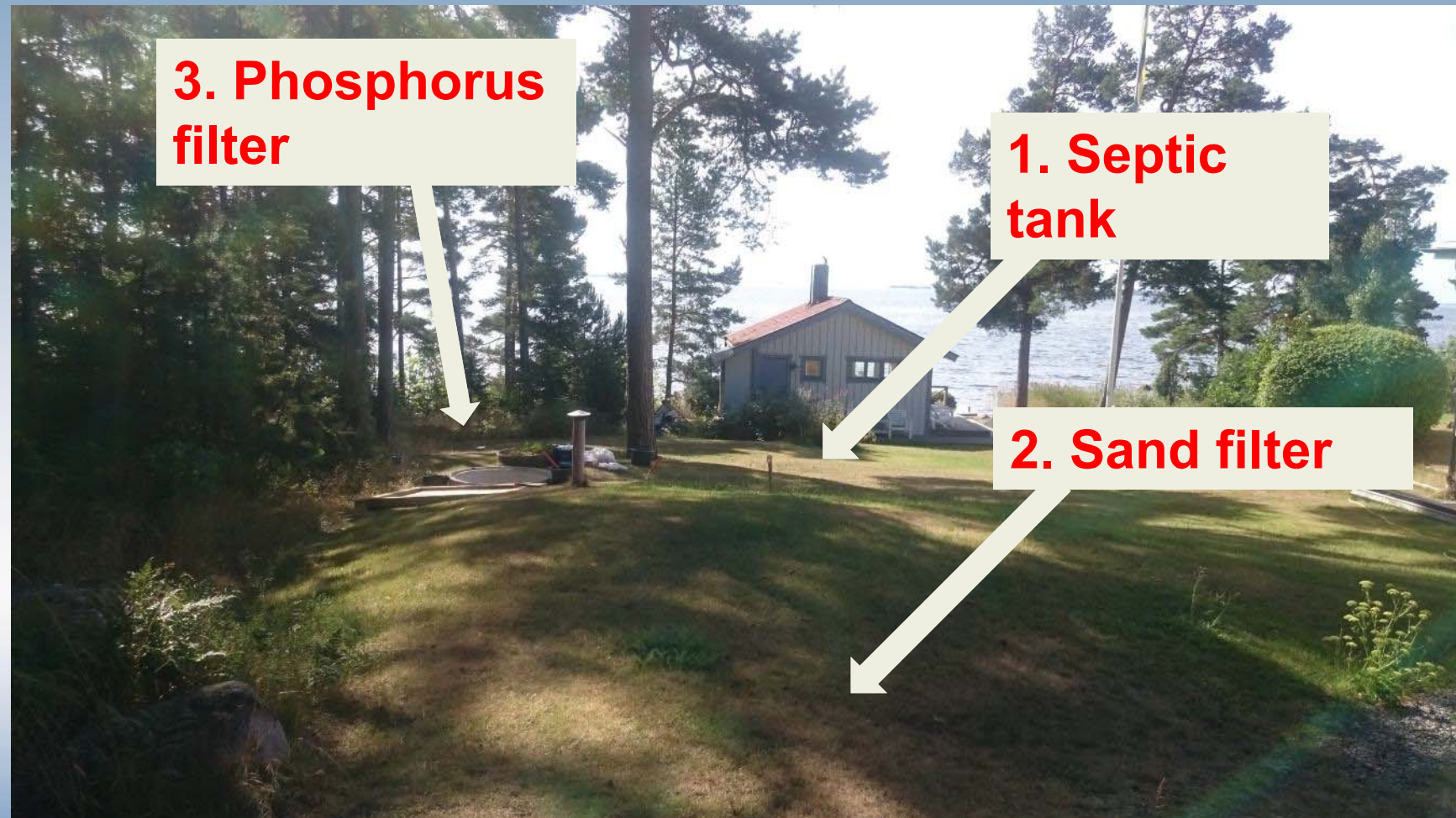
On-site wastewater treatment

Problem: discharge of P and bacteria



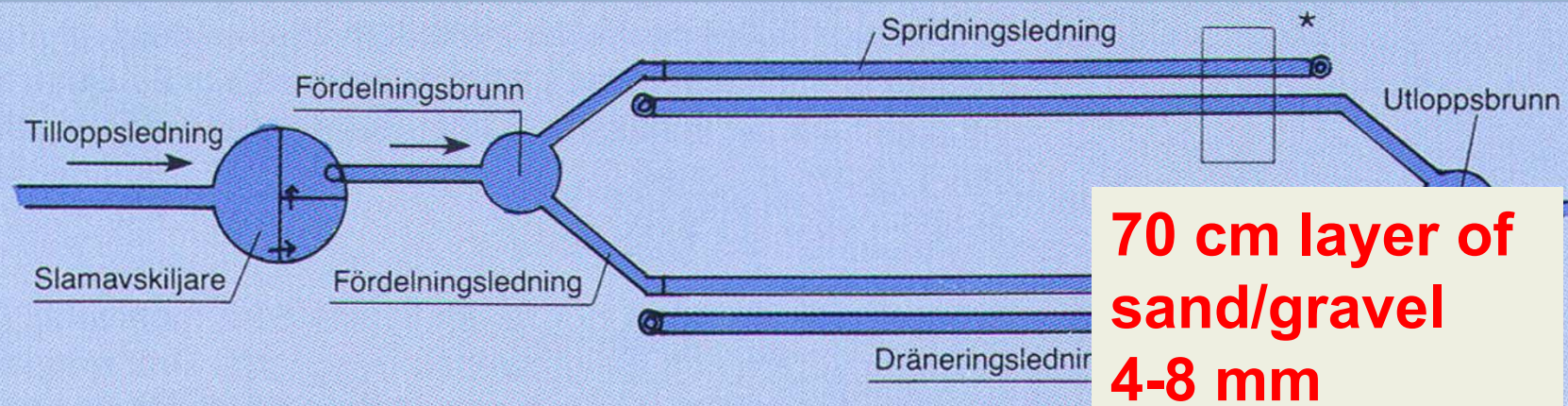


On-site wastewater treatment



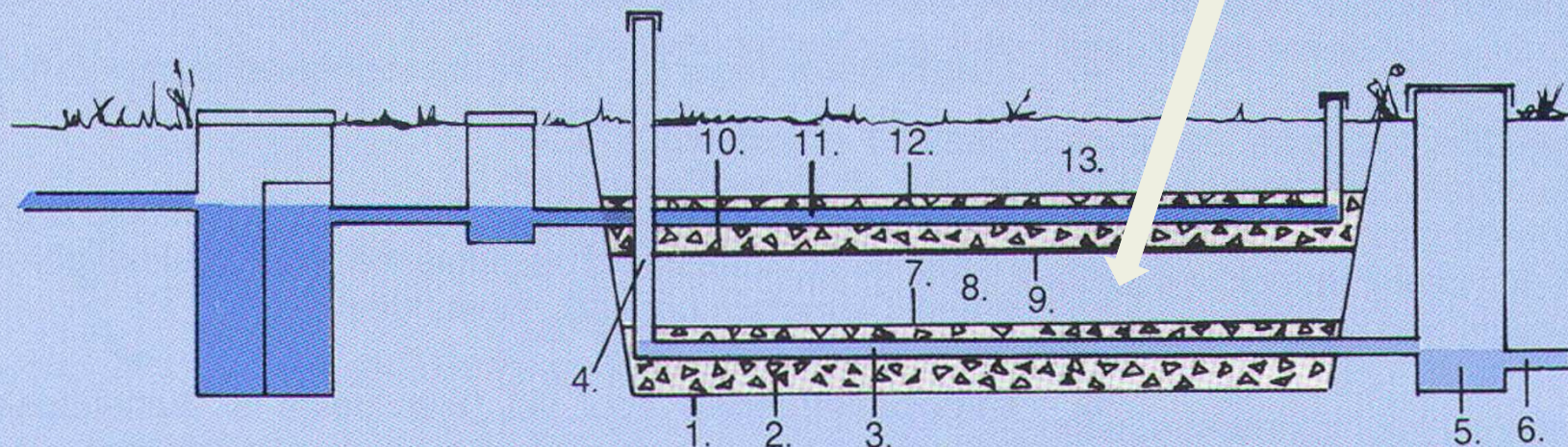


Sand filter design

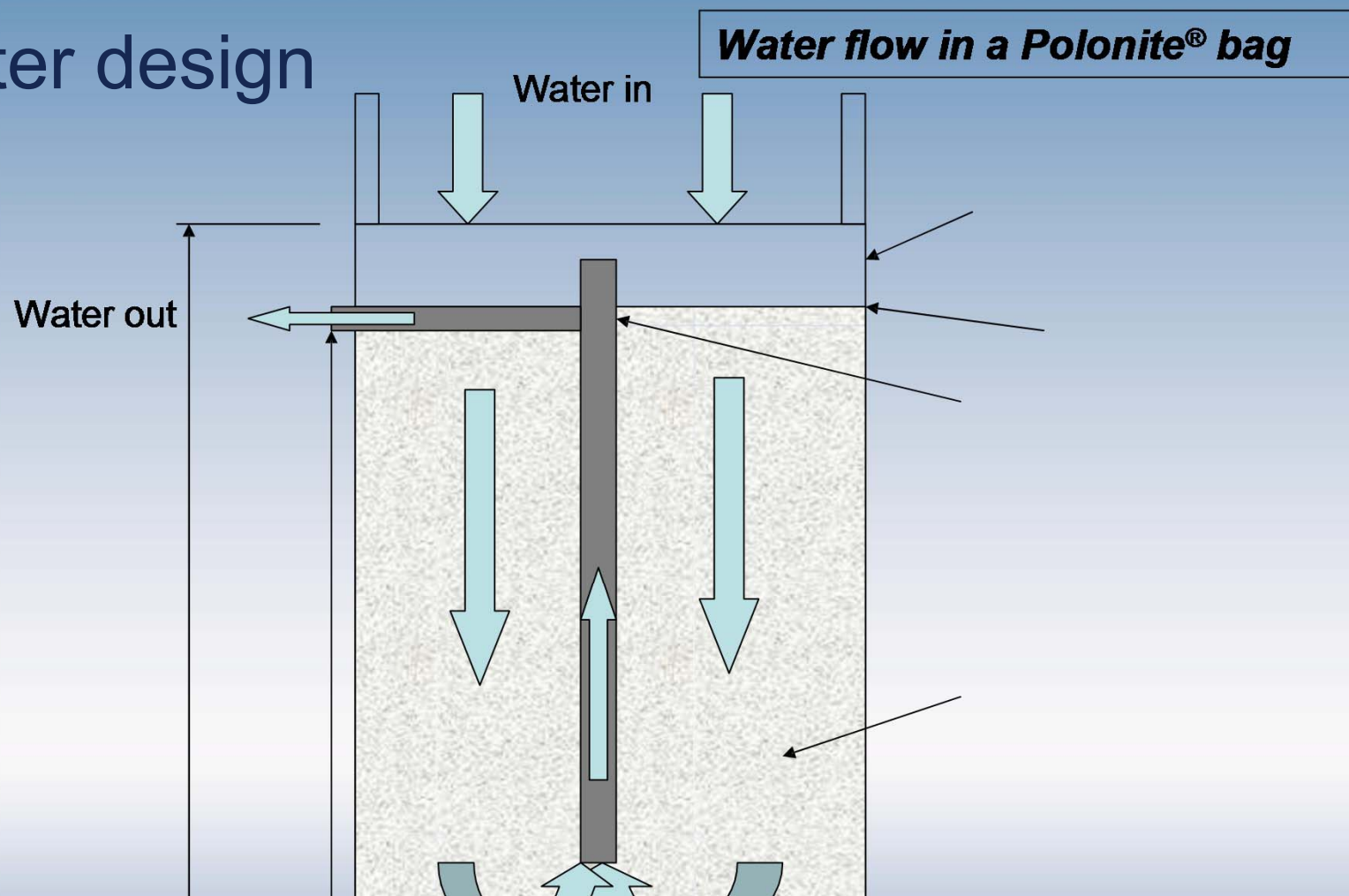


**70 cm layer of
sand/gravel
4-8 mm**

Principskiss med beteckningar



filter design



P filter design



Methods

Identification of suitable on-site facilities

- Co-operation with 4 municipalities
- Contact with 37 property owners
- Inspection of 29 facilities: sampling possible? Flow measurement possible?

5 sand filters and 2 P filters were sampled

Sampling during a few hours in the morning and evening to cover consumption peaks

Methods: Sampling

Samples taken at inlet and outlet of sand filters
and P filters

Flow-proportional sampling, manual flow
measurement

2 composite samples taken at each occasion



Methods: Analysed parameters

Total and dissolved P

Bacteria

- E. Coli
- Intestinal enterococci
- C. perfringens
- Total coliforms

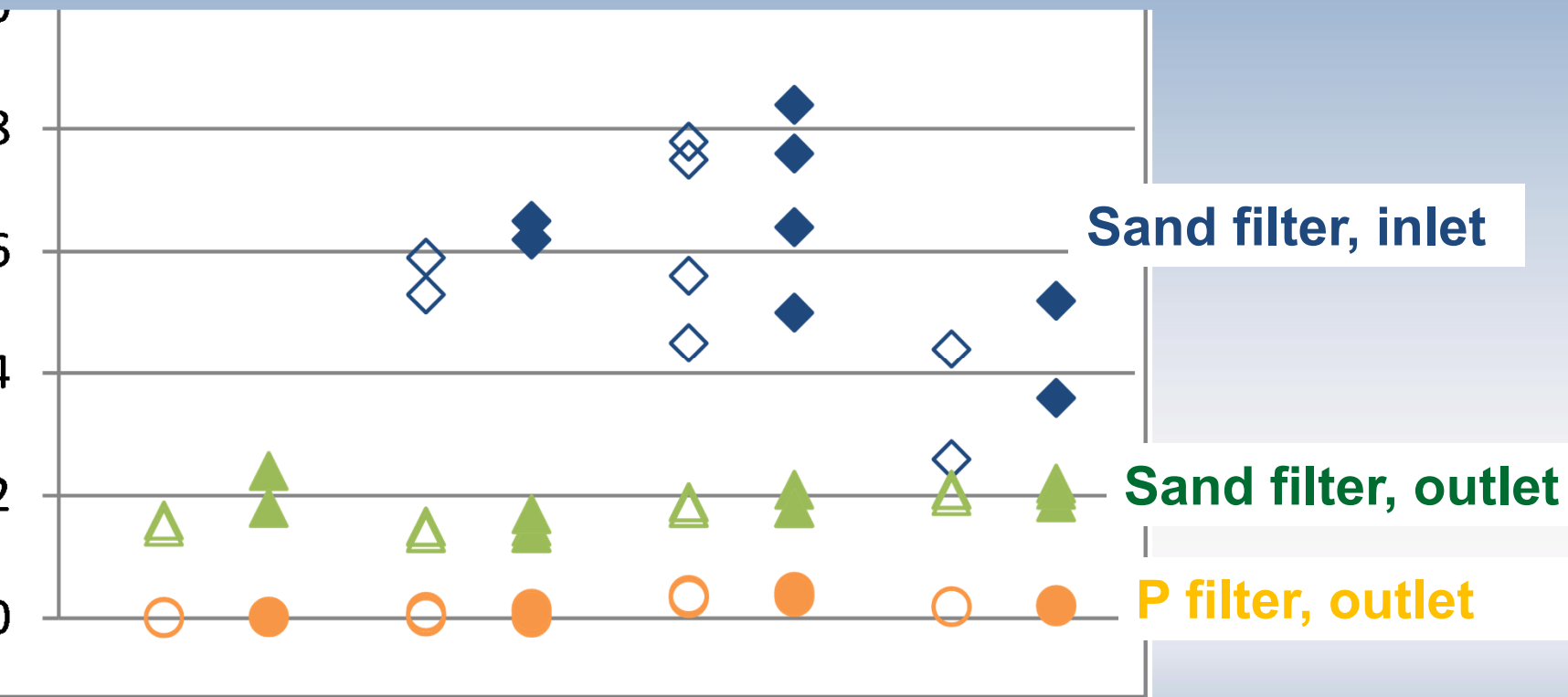
TOC, DOC, BOD

pH

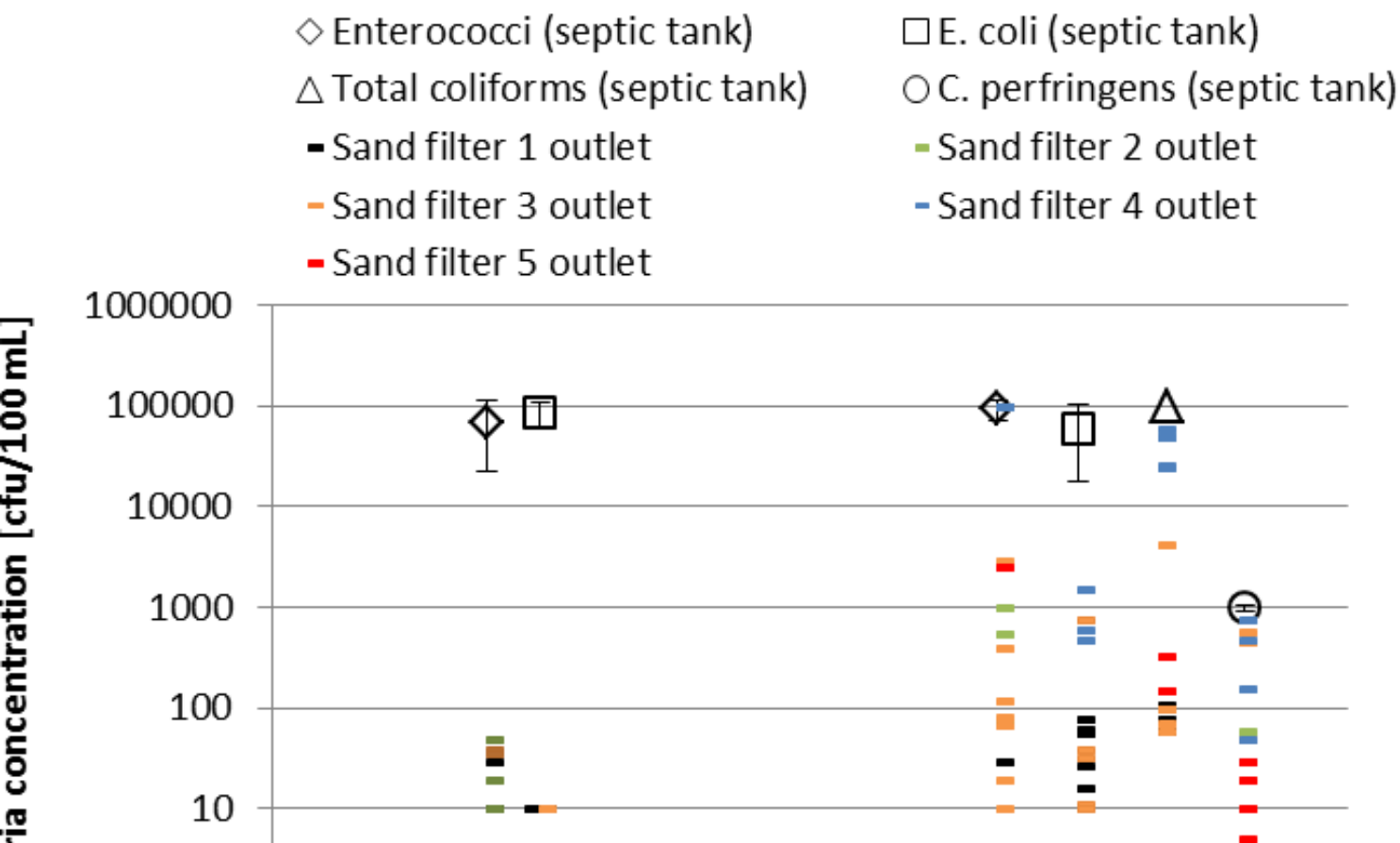
temperature

Results

Discharge of P from sand and P filter 1



Bacteria discharge from sand filters



Conclusions (1)

Flow-proportional sampling of private on-site WW facilities impeded by:

- Un-informative municipal databases
- Owners' good will
- Facility's design, installation, function

Therefore, it is difficult to assess the function of on-site units at full scale.

Generally rather low concentrations of total P in the outlets of the sand filters, possibly also due to dilution with soil water.

Conclusions (2)

The two investigated P filters varied in performance. The low P concentrations measured in the influent to the P filters make it difficult to generally assess the P filters' efficiency.

Concentrations of four indicator bacteria, intestinal enterococci, *E. coli*, total coliforms and *C. perfringens*, were reduced in four of the five investigated sand filters. Varying between seasons.

Thank you for your attention!

