Sulphur and nitrogen input-output budgets at ICP Integrated Monitoring sites in Europe in 1990-2012 — *a preparation of manuscript*

12.5.2014

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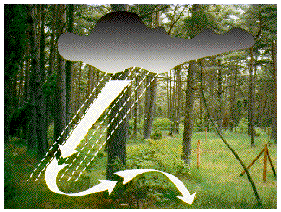


with

National IM Focal Points

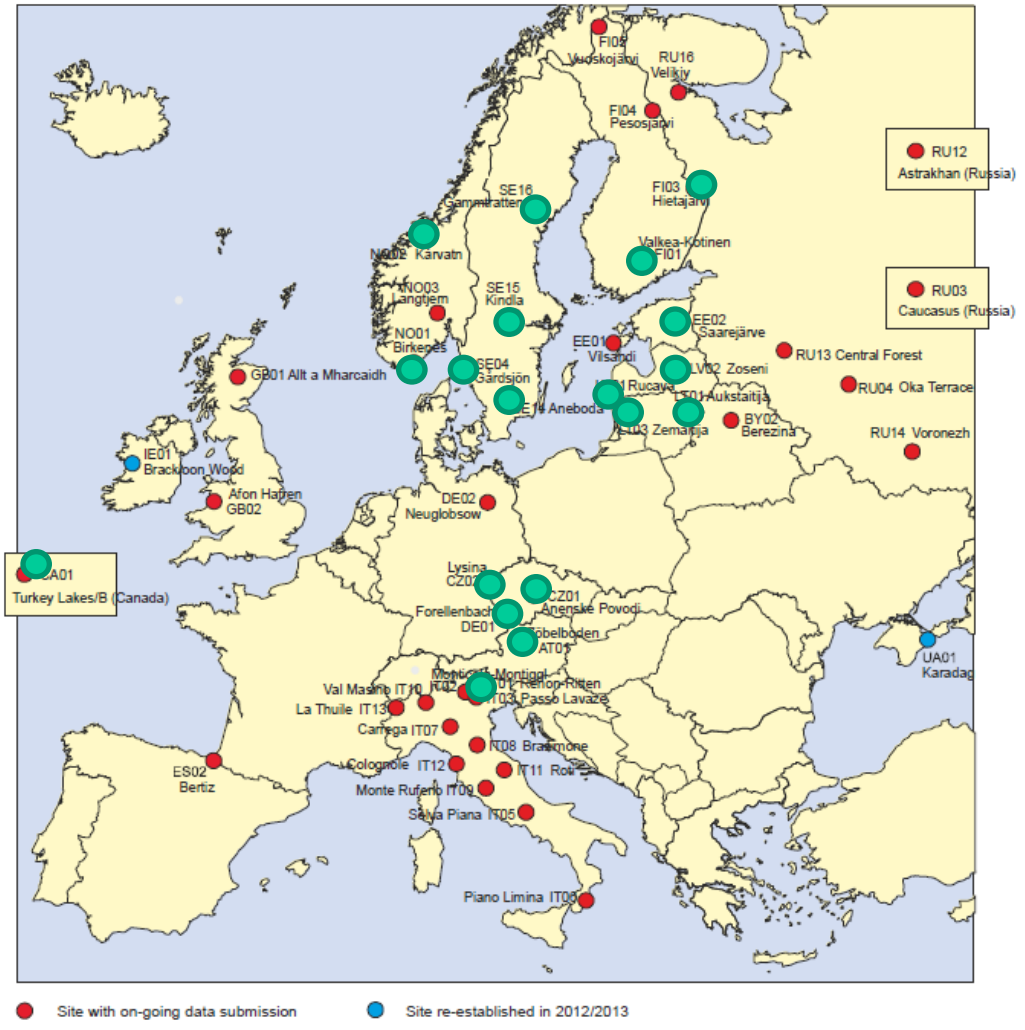
LRTAP Long-range Transboundary Air Pollution

SYKE

ICP IM network /study sites

AIM OF THIS STUDY:

- To calculate annual input-output budgets of sulphur (SO_4) and nitrogen (TIN) for the period 1990-2012
- To assess organic N losses at IM sites in 1995-2012
- 19 IM sites (AT01, CA01, CZ01, CZ02, DE01, EE02, FI01, FI03, IT01, LT01, LT03, LV01, LV02, NO01, NO02, SE04, SE14, SE15, SE16).



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Input & output & retention/release

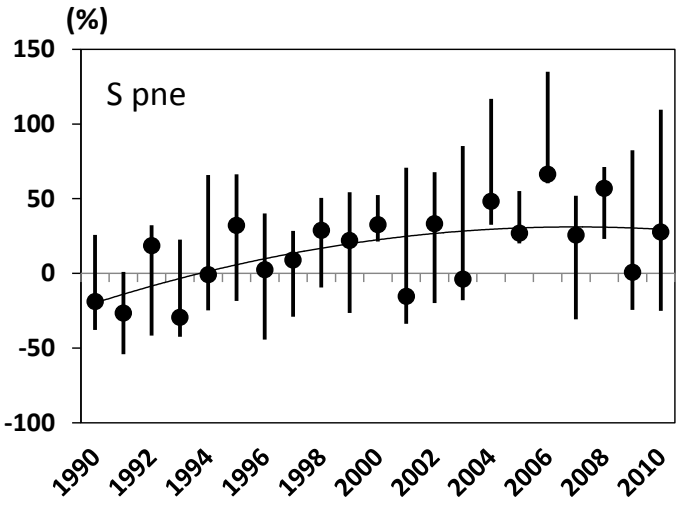
- **Input** total deposition (wet + dry)
  - Sulphur (SO_4) ⬅ Bulk and Throughfall
  - TIN (NO_3 + NH_4) ⬅ Bulk deposition
- **Output** runoff water fluxes: SO_4 , TIN and organic N:
  - Organic N = Total N — TIN
- **Percent net export (pne)** = (output–deposition)100/deposition.

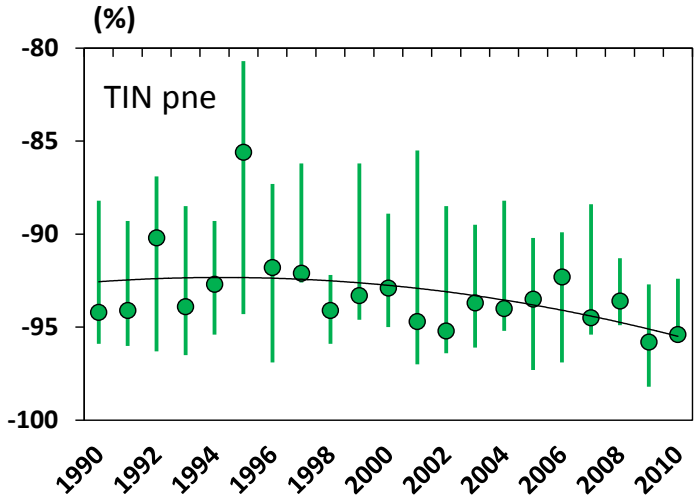
  Positive pne values indicate release and negative pne values indicate retention in the catchment.

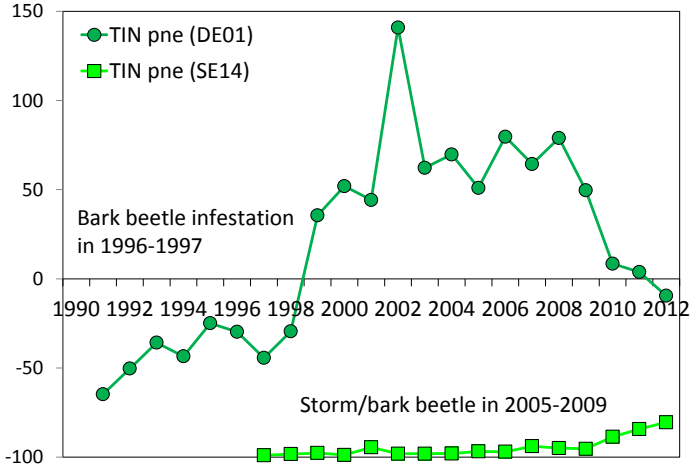
What we know about mass balances at IM sites based on the previous assessment (1990-2010)?

Percent net exports (pne) of SO_4 and TIN

- Forest soils are now releasing S that had accumulated in the past.
- Current N deposition generally exceeds S deposition (on an equivalent basis), mostly strong retention of TIN in the catchment.
- Confounding factors may result in increasing nitrogen export, but reversal can be expected?







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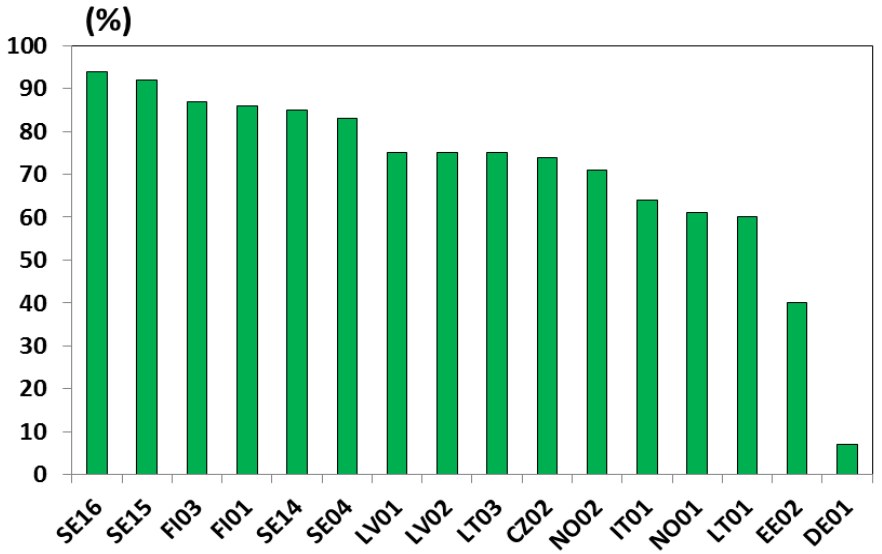
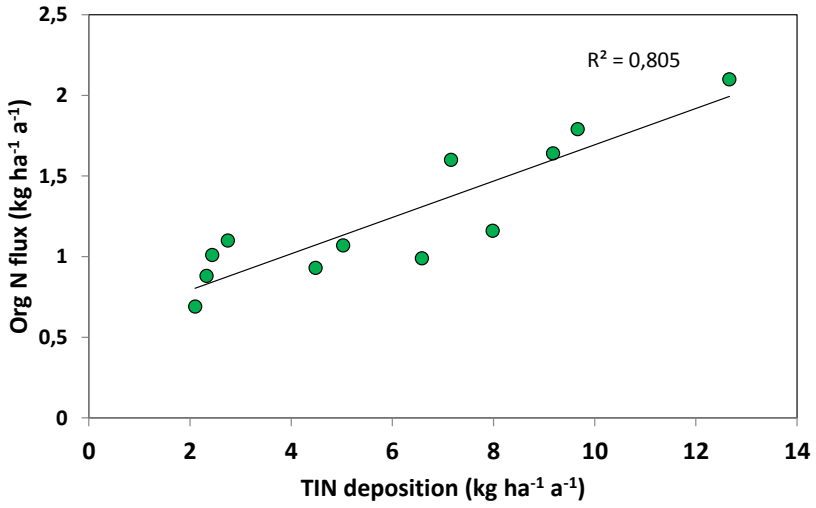
Org N is receiving increasing attention

Organic N may account for significant fraction (60-95%) of total N, N enrichment may increase organic N loss.





Framework of the MB paper

- Mass-balance budgets for S and TIN in 1990-2012
- Trends (SKT, Sen's slope), based on monthly values:
  - input fluxes (tot S, TIN)
  - output fluxes (SO_4, TIN, tot N, Org N, DOC) and pne's
  - C/N, N deposition vs. org N leaching
- Submission of the manuscript by end of 2014
- Journal?

Valkea-Kotinen (FI01) IM catchment (photo: Jorma Keskitalo)

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