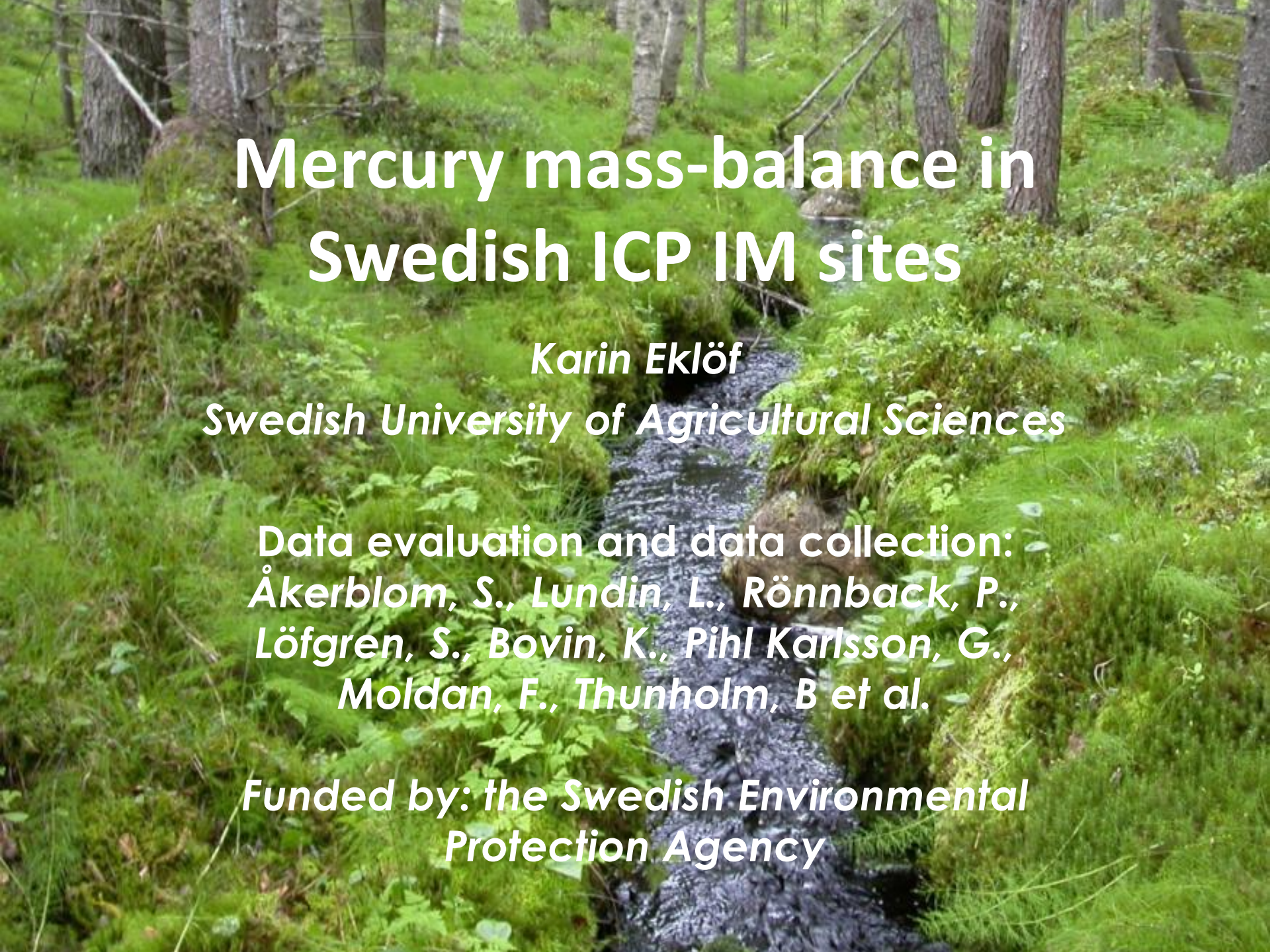


Mercury mass-balance in Swedish ICP IM sites

Karin Eklöf

Swedish University of Agricultural Sciences

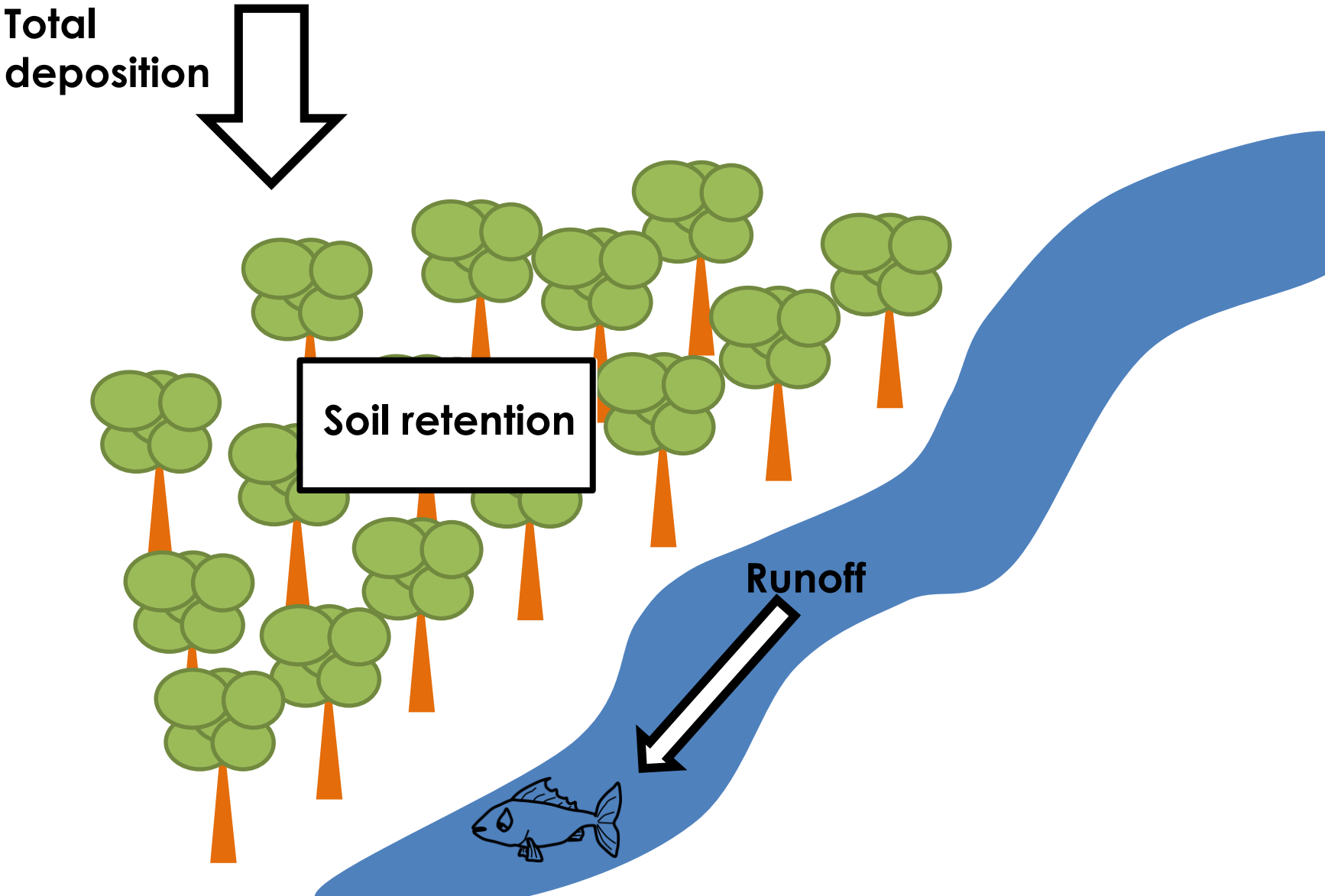
Data evaluation and data collection:
Åkerblom, S., Lundin, L., Rönnback, P., Löfgren, S., Bovin, K., Pihl Karlsson, G., Moldan, F., Thunholm, B et al.

Funded by: the Swedish Environmental Protection Agency

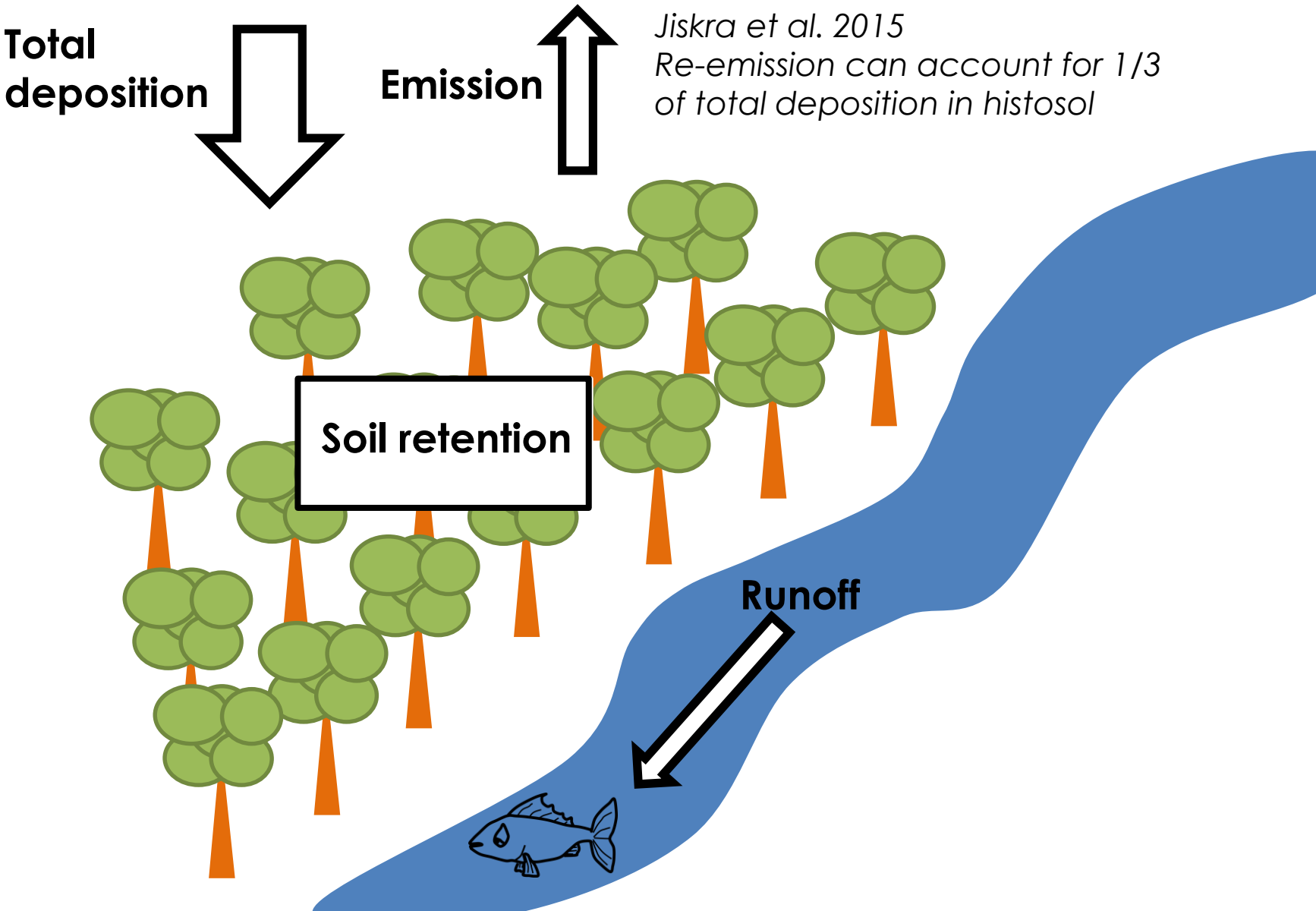
My research interests

Effects of perturbations on mercury biogeochemistry

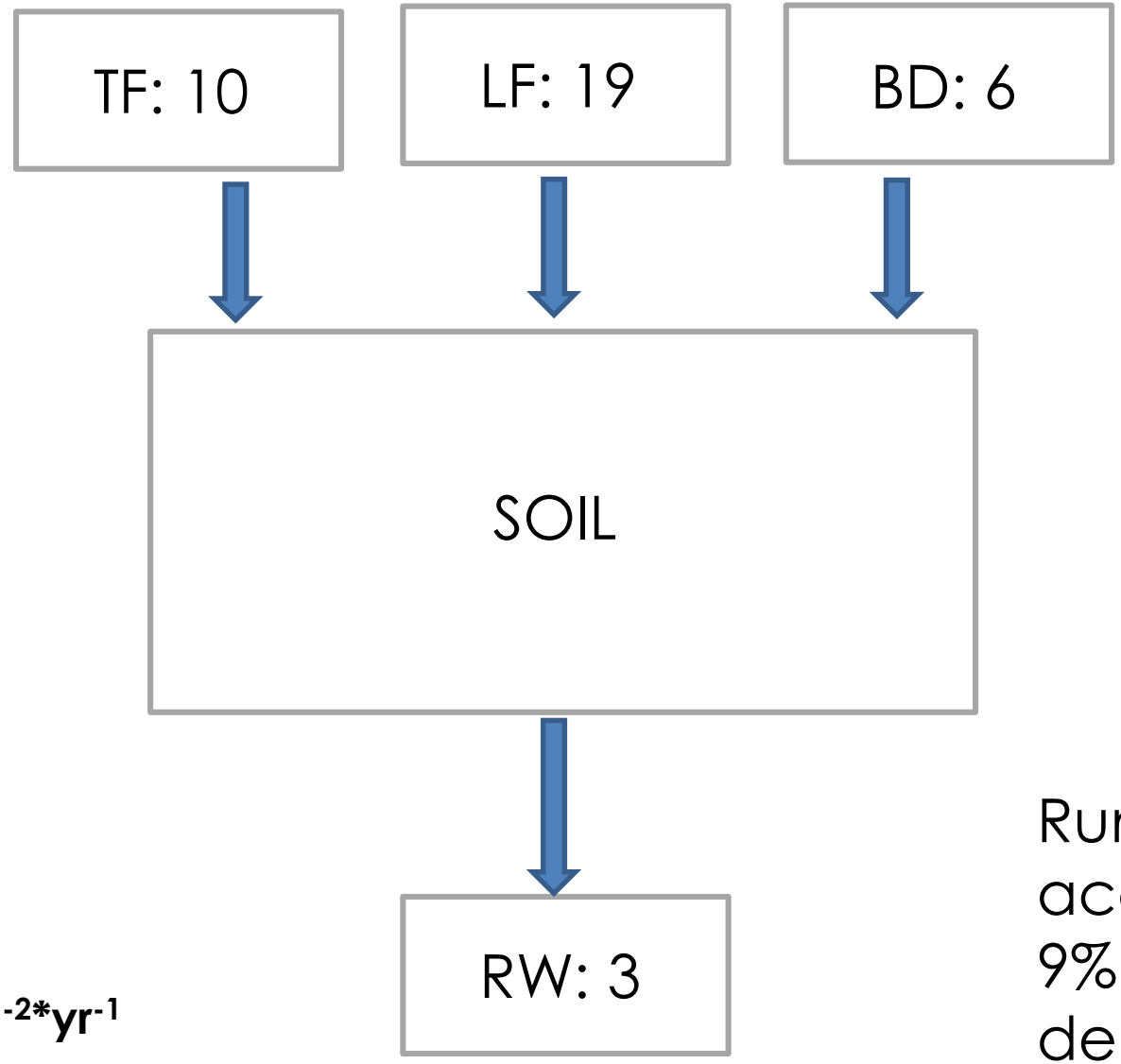
Hg budget of Swedish ICP IM sites



Hg budget of Swedish ICP IM sites



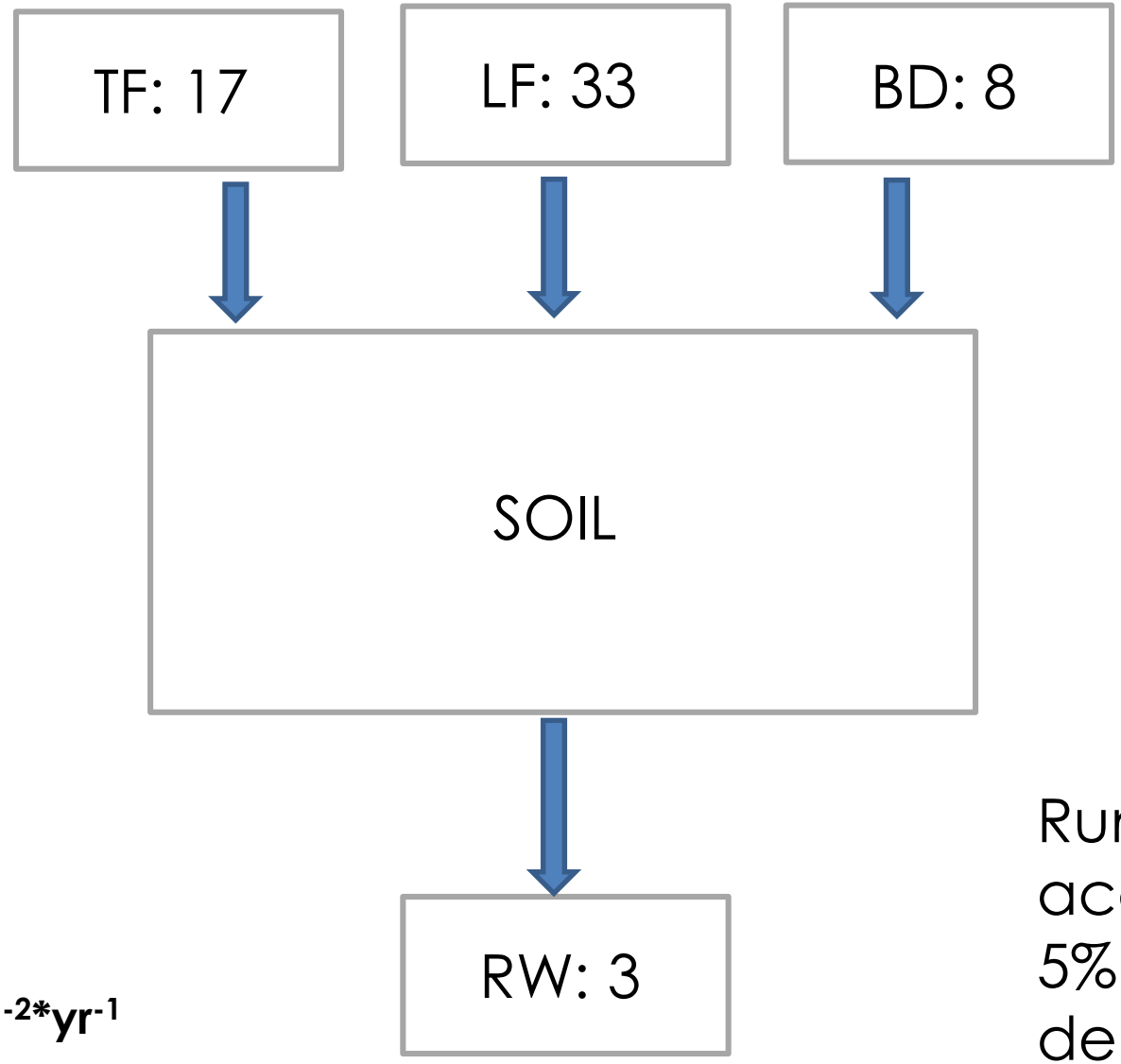
Hg budget of Swedish ICP IM sites 1997-2016



Aneboda
Unit: µg*m^{-2}*yr^{-1}

Runoff accounted for 9% of annual deposition

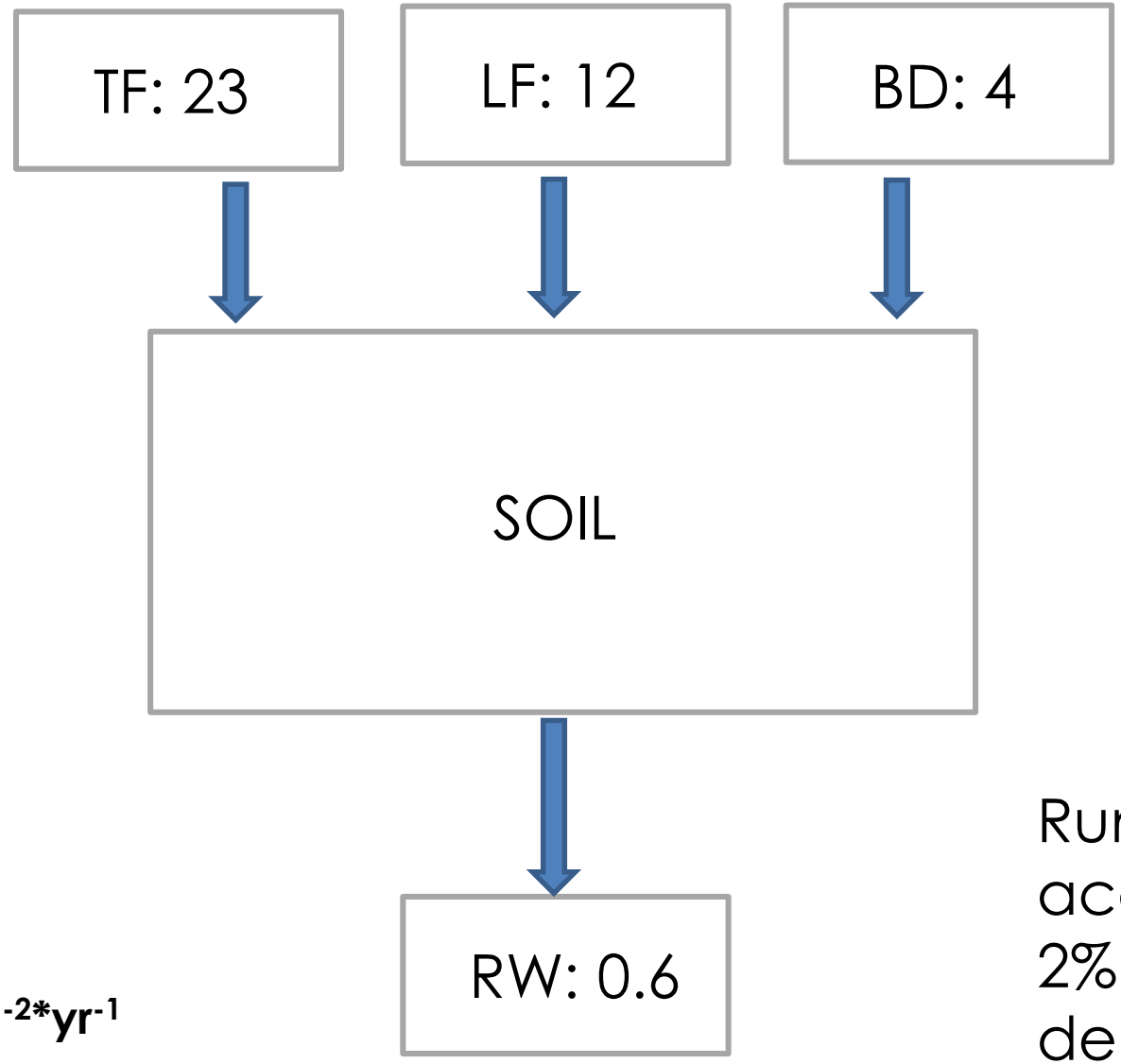
Hg budget of Swedish ICP IM sites 1997-2016



Gårdsjön
Unit: µg*m^{-2}*yr^{-1}

Runoff accounted for 5% of annual deposition

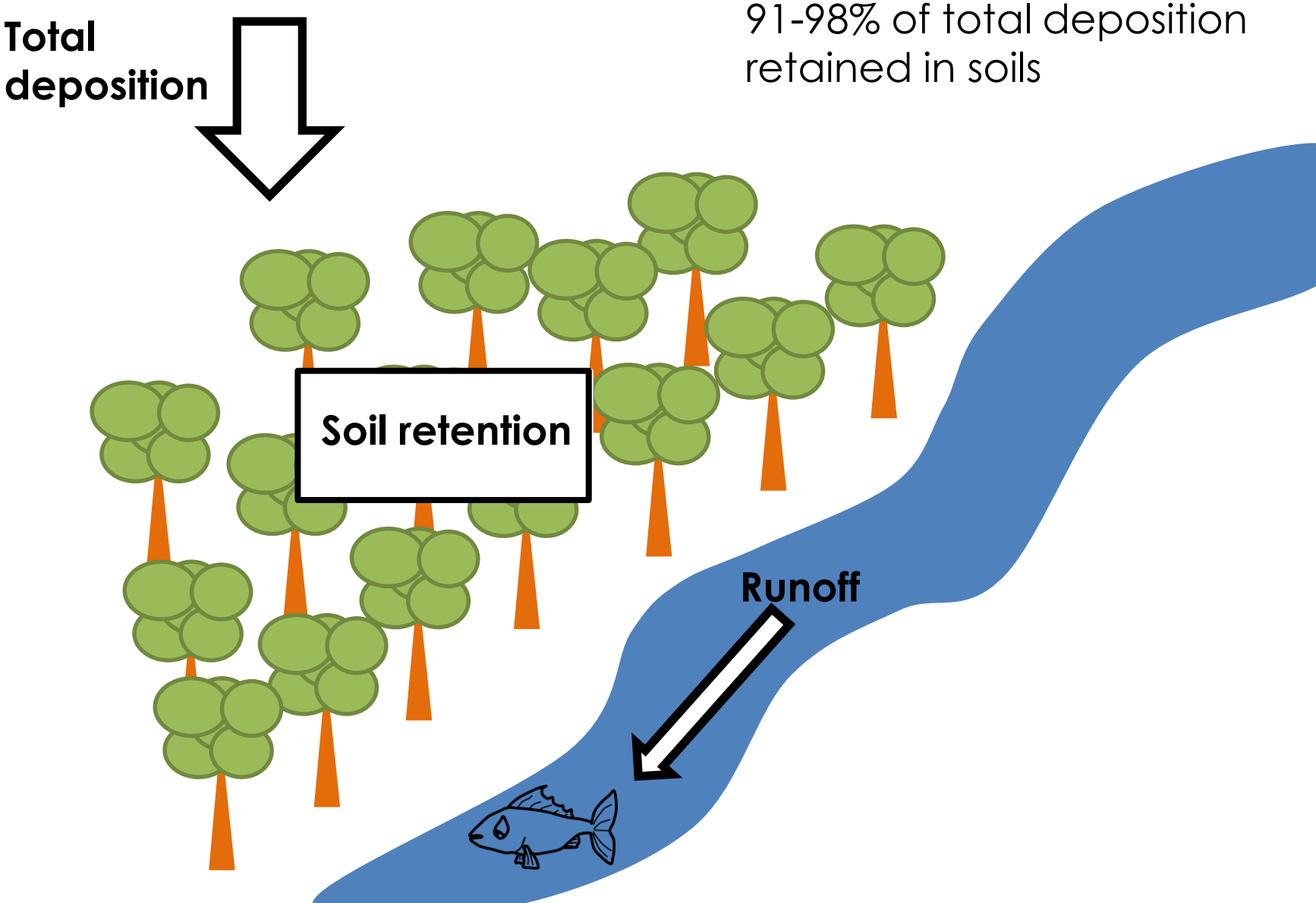
Hg budget of Swedish ICP IM sites 1997-2016



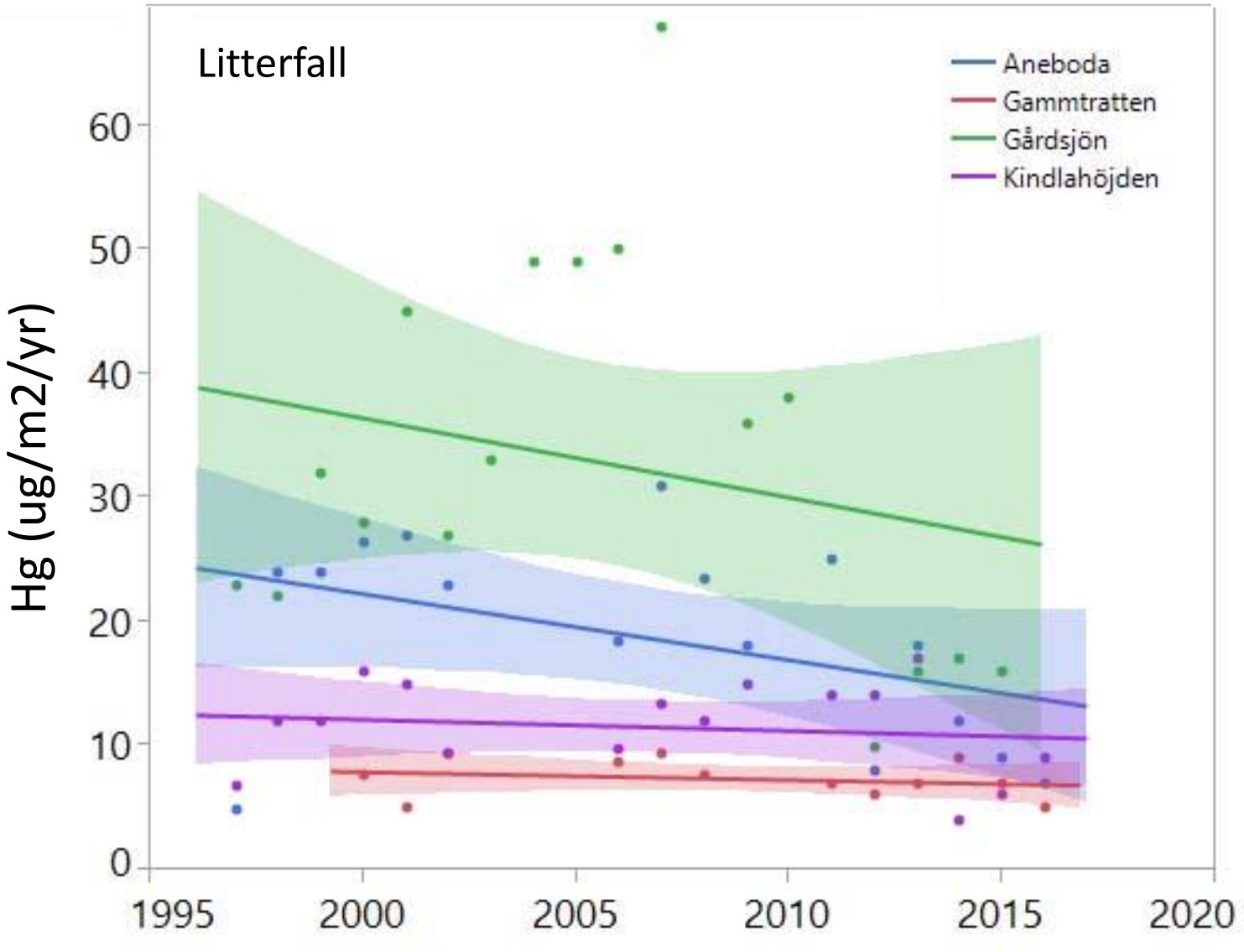
Kindla
Unit: µg*m^{-2}*yr^{-1}

Runoff accounted for 2% of annual deposition

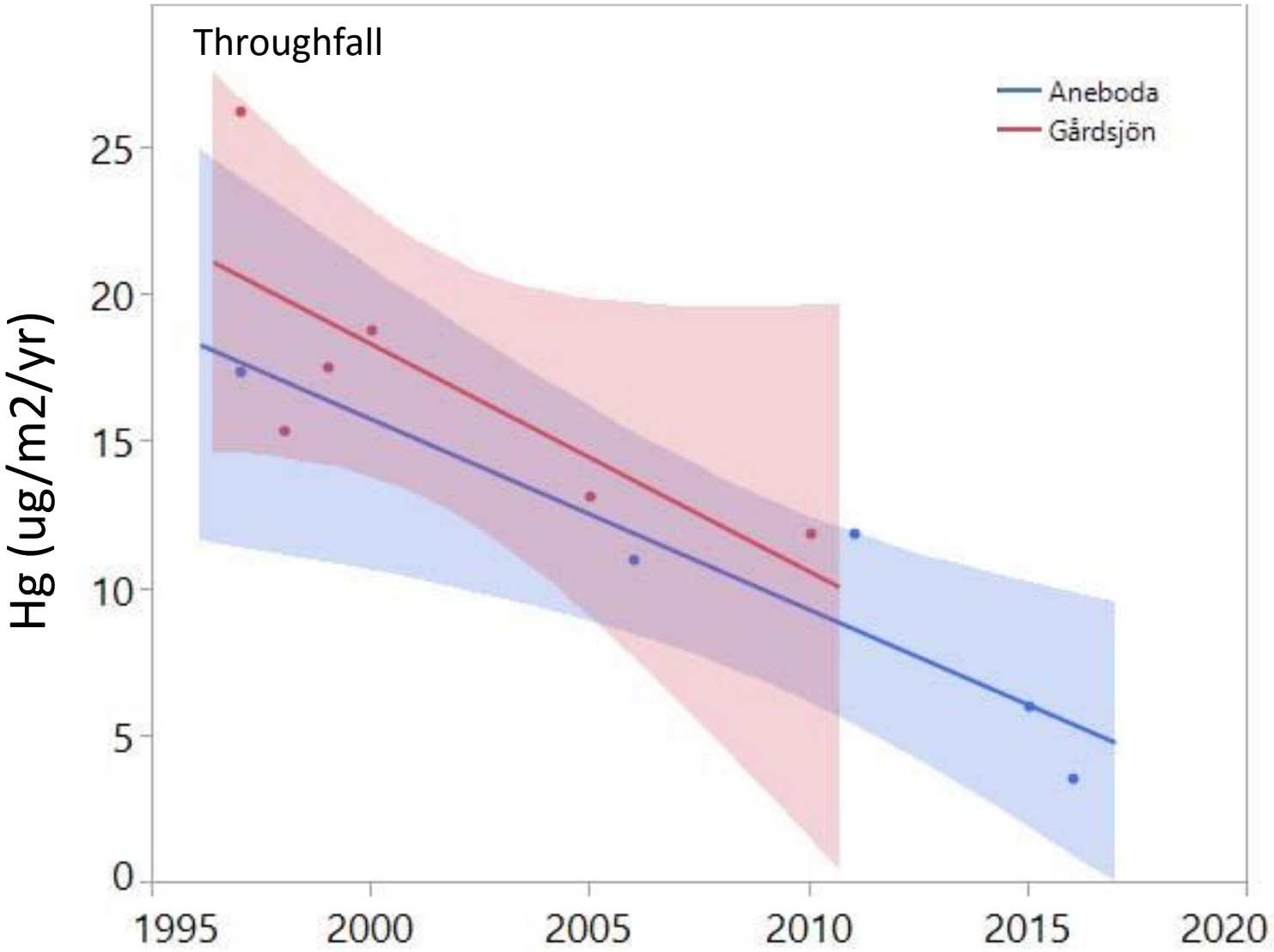
Hg budget of Swedish ICP IM sites



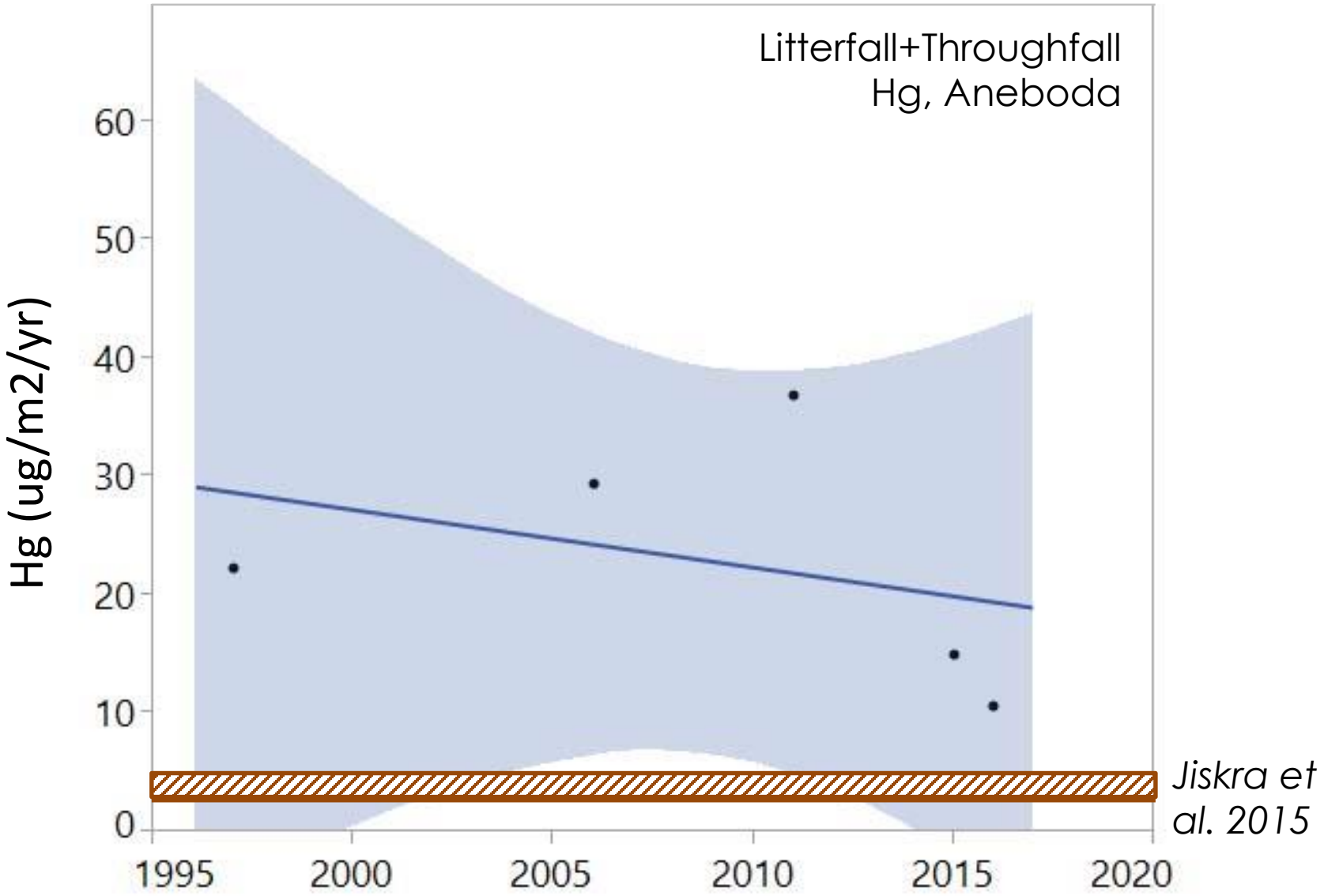
Trends of Hg in Swedish ICP IM sites 1997-2016



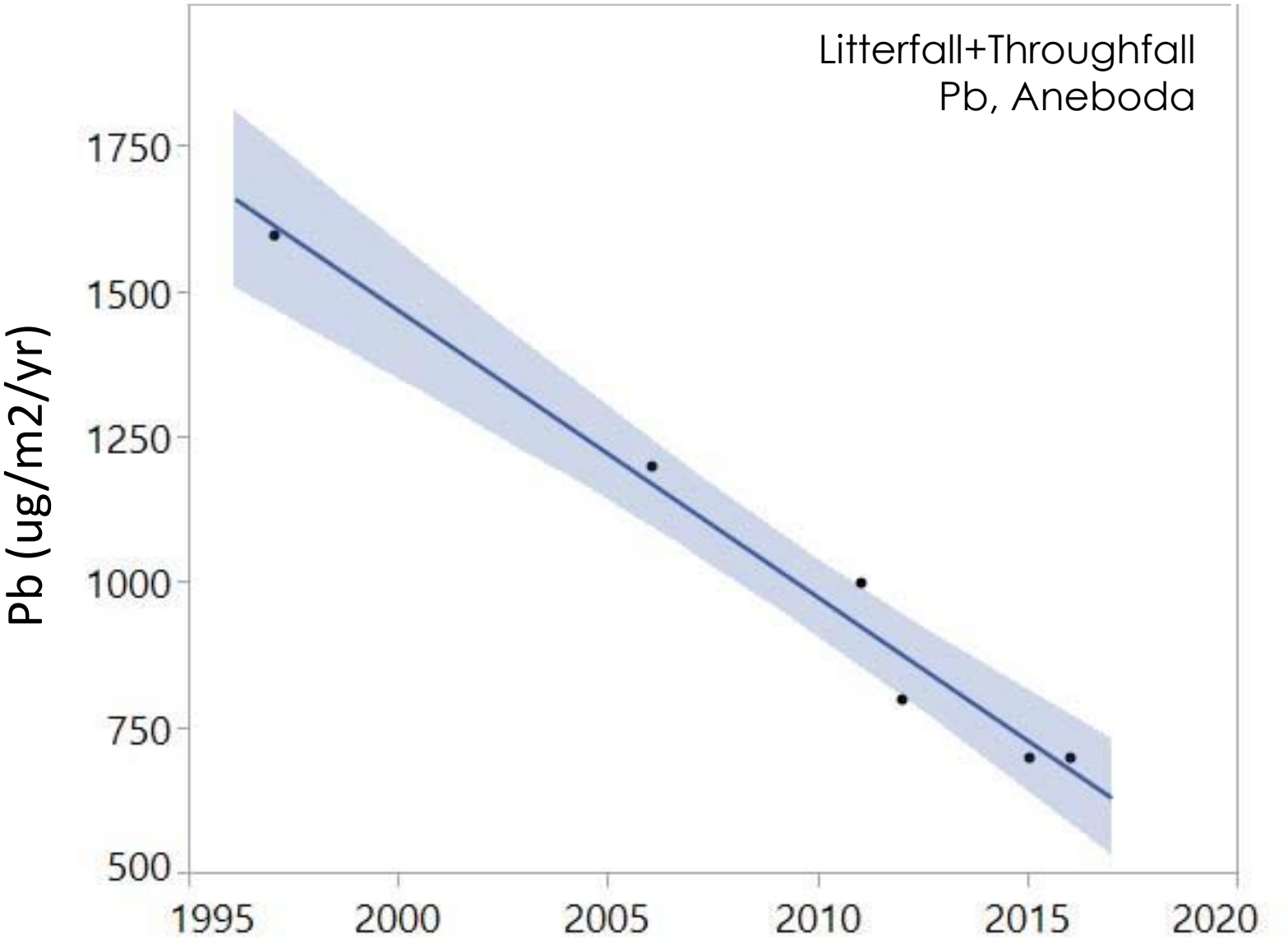
Trends of Hg in Swedish ICP IM sites 1997-2016



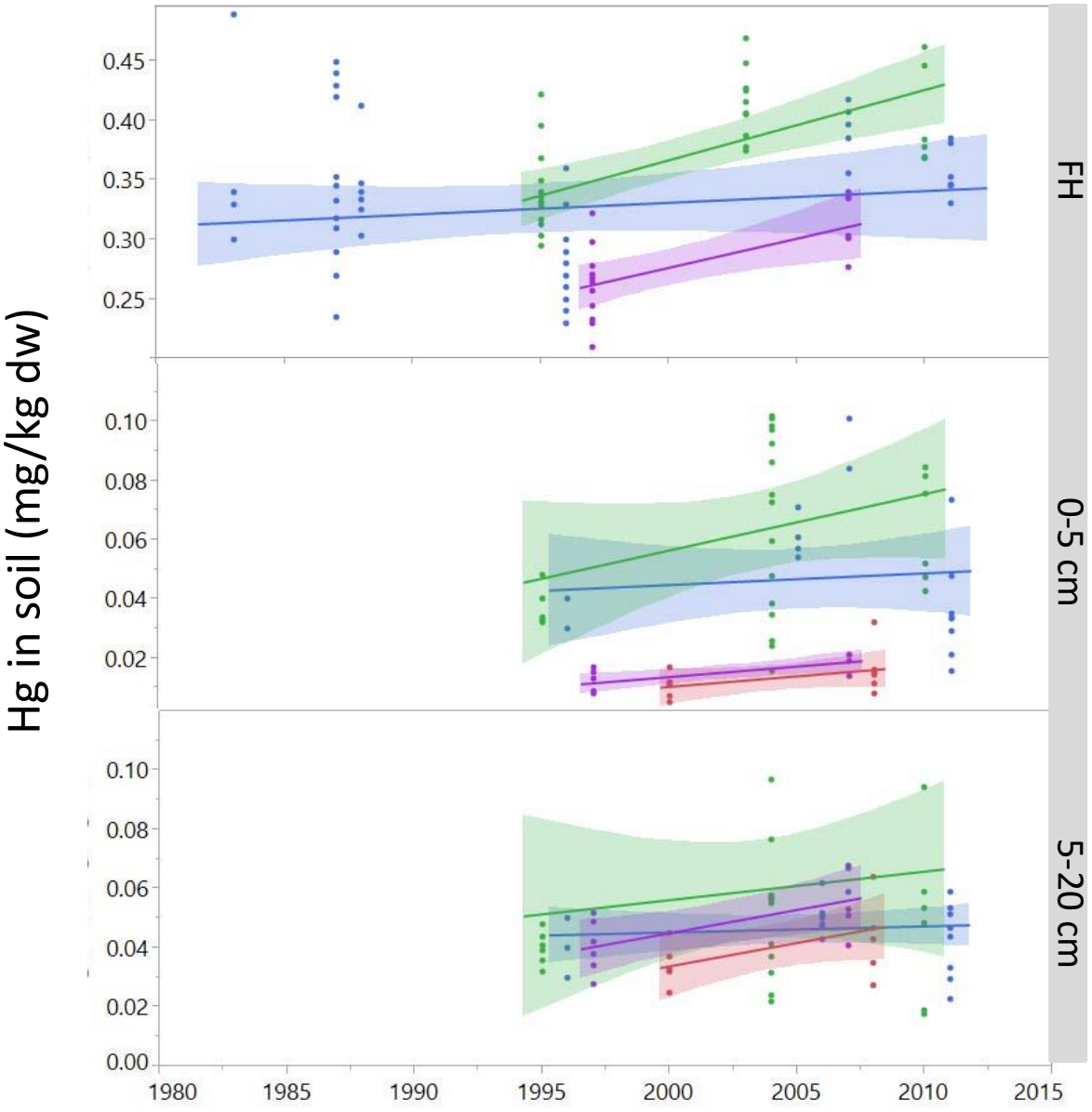
Trends of Hg in Swedish ICP IM sites 1997-2016



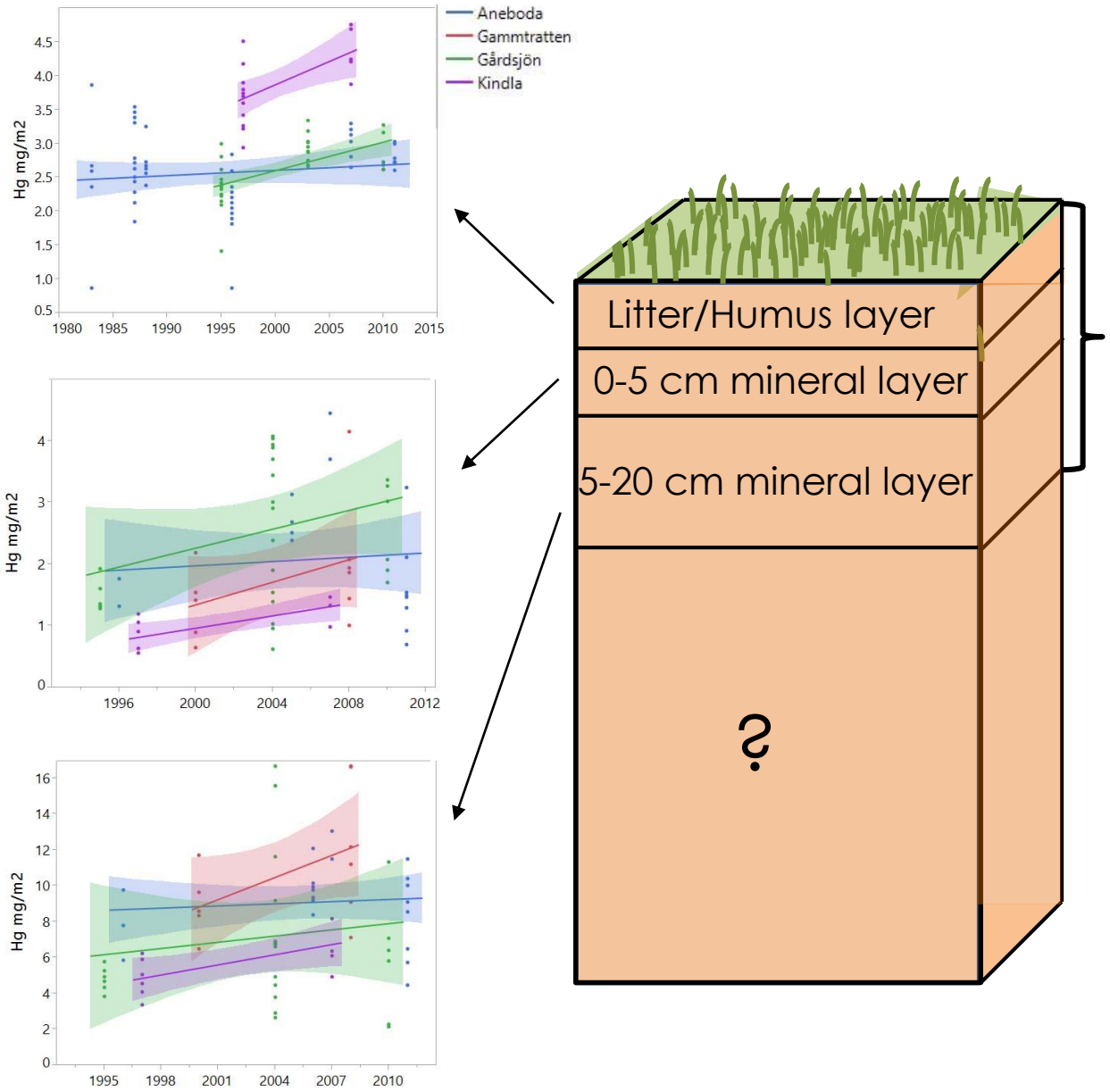
Trends of Hg in Swedish ICP IM sites 1997-2016



Trends of Hg in Swedish ICP IM sites



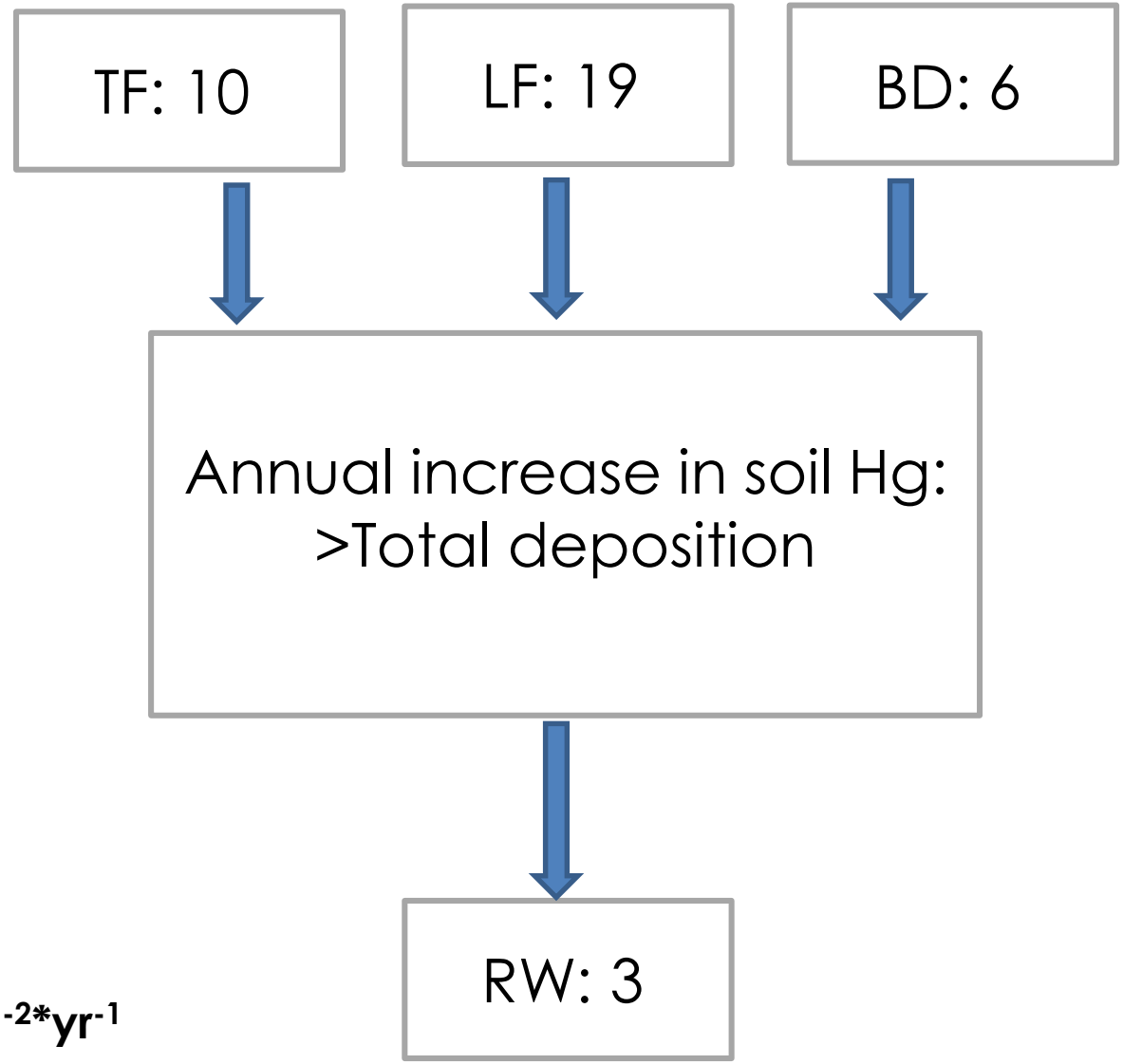
Hg budget of Swedish ICP IM sites



Soil retention

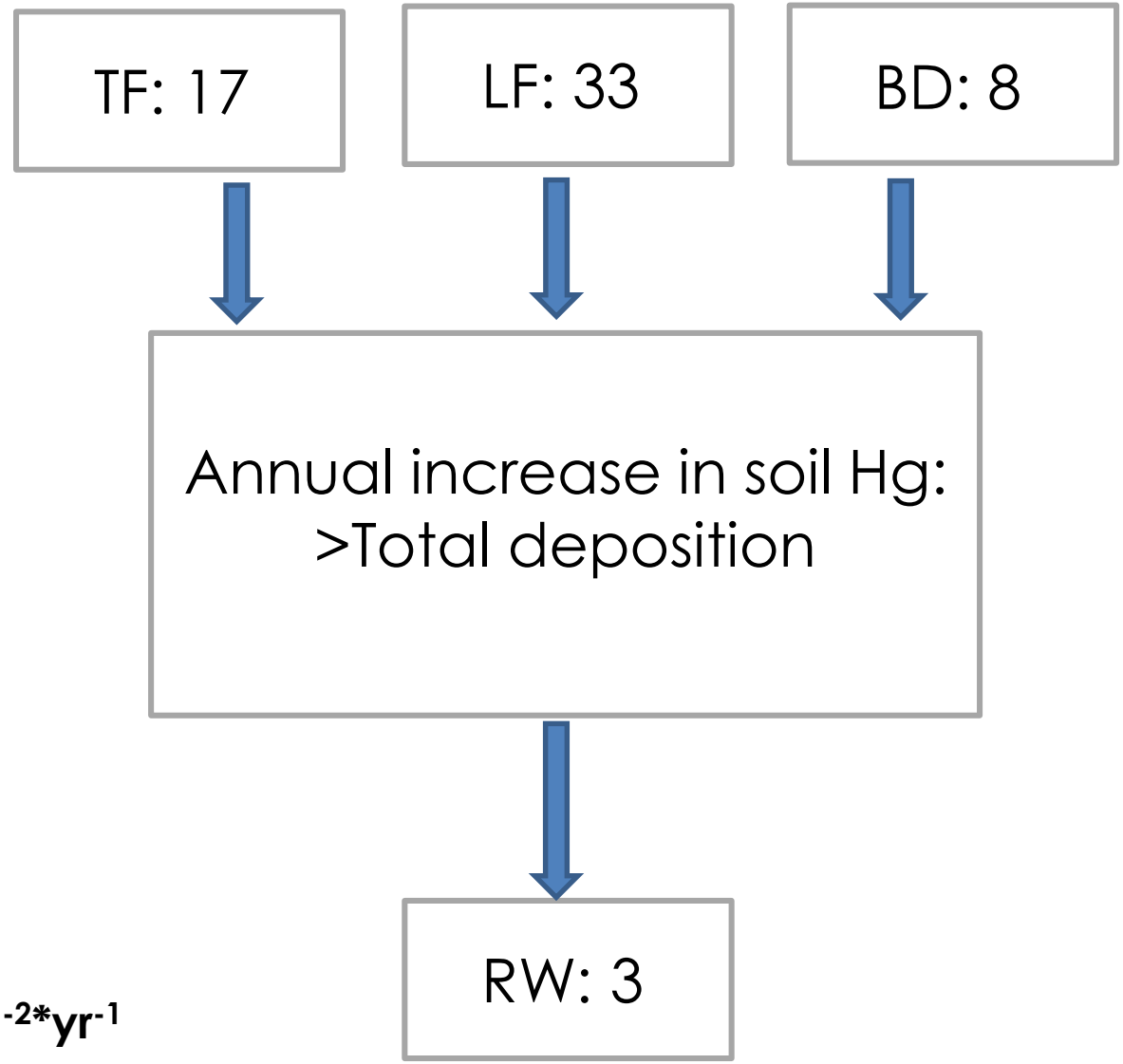
- Annual increase in soil Hg for each m^2 and soil layer
- Values predicted from linear relation between Hg and time
- Predicted annual Hg were combined for the three soil layers to calculate annual increase in the whole (known) soil profile

Hg budget of Swedish ICP IM sites 1997-2016



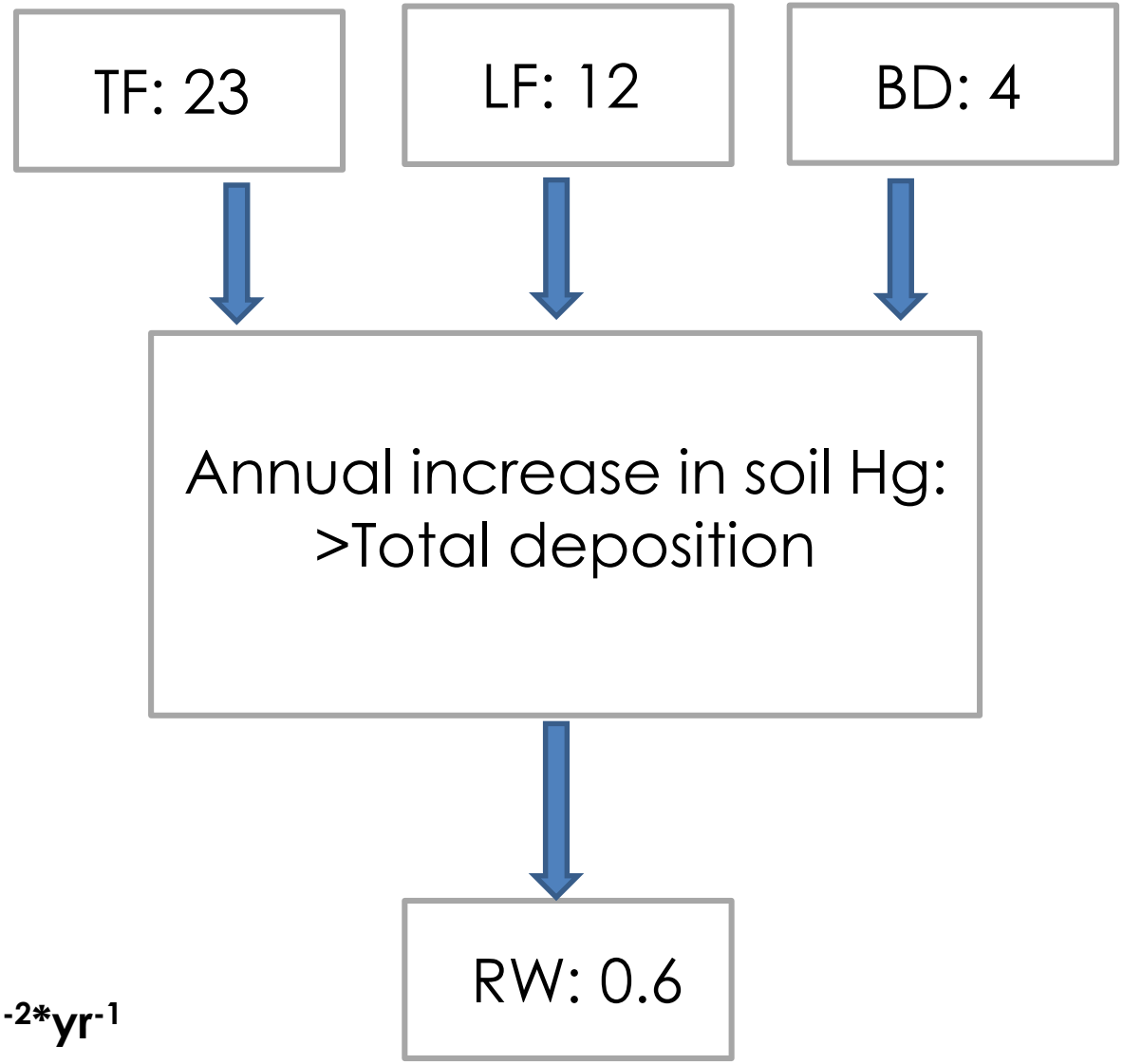
Aneboda
Unit: µg*m^{-2}*yr^{-1}

Hg budget of Swedish ICP IM sites 1997-2016



Gårdsjön
Unit: µg*m^{-2}*yr^{-1}

Hg budget of Swedish ICP IM sites 1997-2016



Kindla
Unit: µg*m^{-2}*yr^{-1}

Hg budget of Swedish ICP IM sites 1997-2016

Annual soil retention exceeds annual total deposition

- Uncertainty in linear fit of Hg in soil over time
- Underestimation of LF?
- Uncertainty in soil depth of FH layer
- Uncertainty in soil density
- Soil Hg data only until 2012
- Stone content (up to 50%) and gravel (up to 30%) may have caused overestimation of Hg in soil

Conclusion

- Annual runoff loads of Hg accounted for 2-9% of annual total Hg deposition
- ICP IM data of Hg in soils are increasing in all measured soil layers between 1995 (1980) and 2012
- Increasing trends of Hg in soils over time may be used to calculate soil Hg retention


Thank you!
Questions?