ICP Integrated Monitoring of Air Pollution Effects on Ecosystems – ICP IM

Current issues, achievements & priorities 2018-2019

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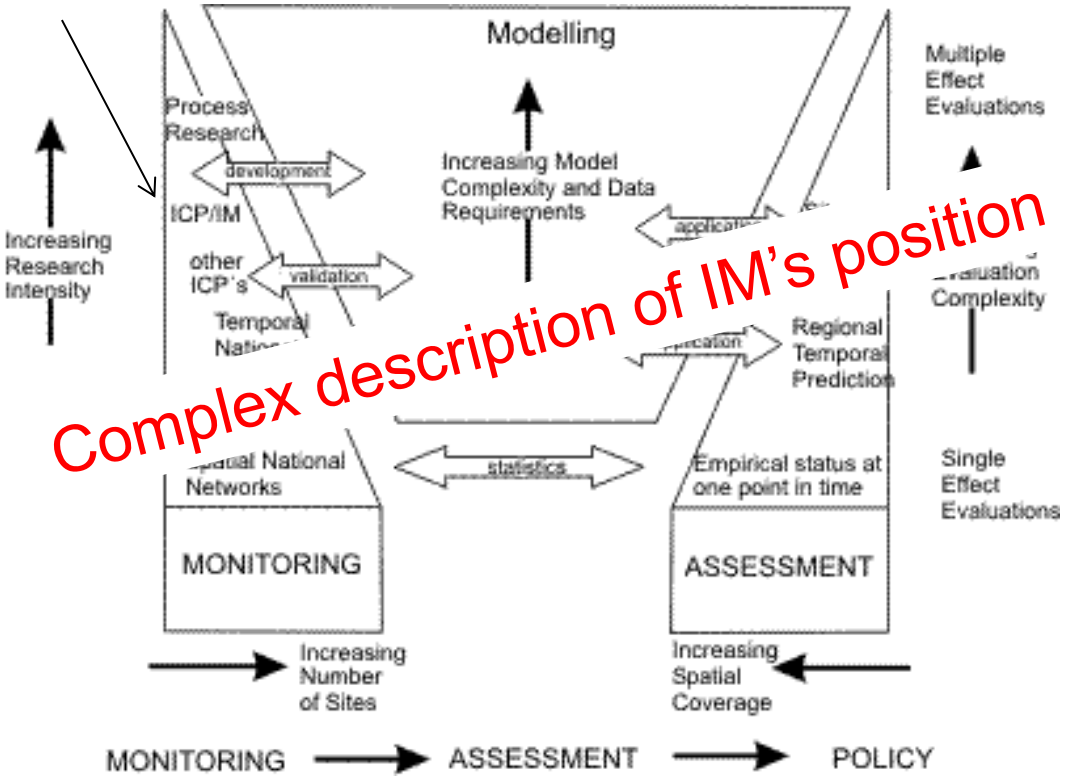


- Conceptual model on how rational environmental policy is developed through a sequence of monitoring and assessment.
- The position of ICP IM in the hierarchy of monitoring programmes is indicated.

Policy

Modelling

Complexity

Validation

Application

Global m
policy rel

Catchment scale

pecific

Data requirement

Monitoring

Statistics

Assessment

Research intensity

IM

Other ICP:s

Regional monitoring

(Inter-) National monitoring

Number of sites

Complexity

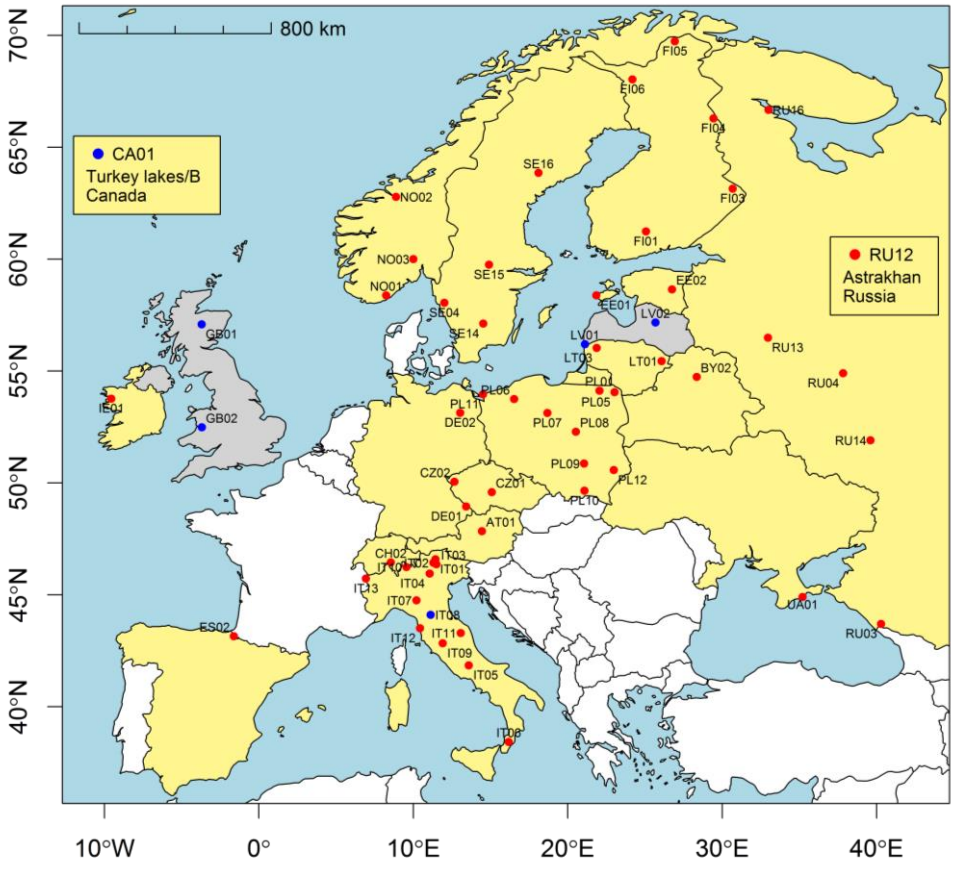
Process under-standing

Regional Temporal predictions

Momentary empirical status

Spatial coverage

Integrated monitoring sites, Jan 2018



16 active countries

2 inactive

44 active sites

5 inactive sites

Increase from 41 active sites in 2017!

Room for further enlargement in Europe

Integrated Monitoring: Key tasks

- Assessment of concentrations, pools and fluxes of sulphur and nitrogen compounds and heavy metals
- Trend analysis of bulk and throughfall deposition and runoff water chemistry
- Assessment of ecosystem responses using biological data
- Dynamic modelling and assessment of the effects of emission/deposition scenarios, including confounding effects of climate change processes
- Calculation of (site-specific) critical loads for sulphur, nitrogen and heavy metals
- Links between critical load exceedance and empirical impact indicators

Examples from recent studies

- Analysis of long-term trends
- Dynamic modelling

Scientific paper on mass balances and indicators for sulphur and nitrogen in IM catchments

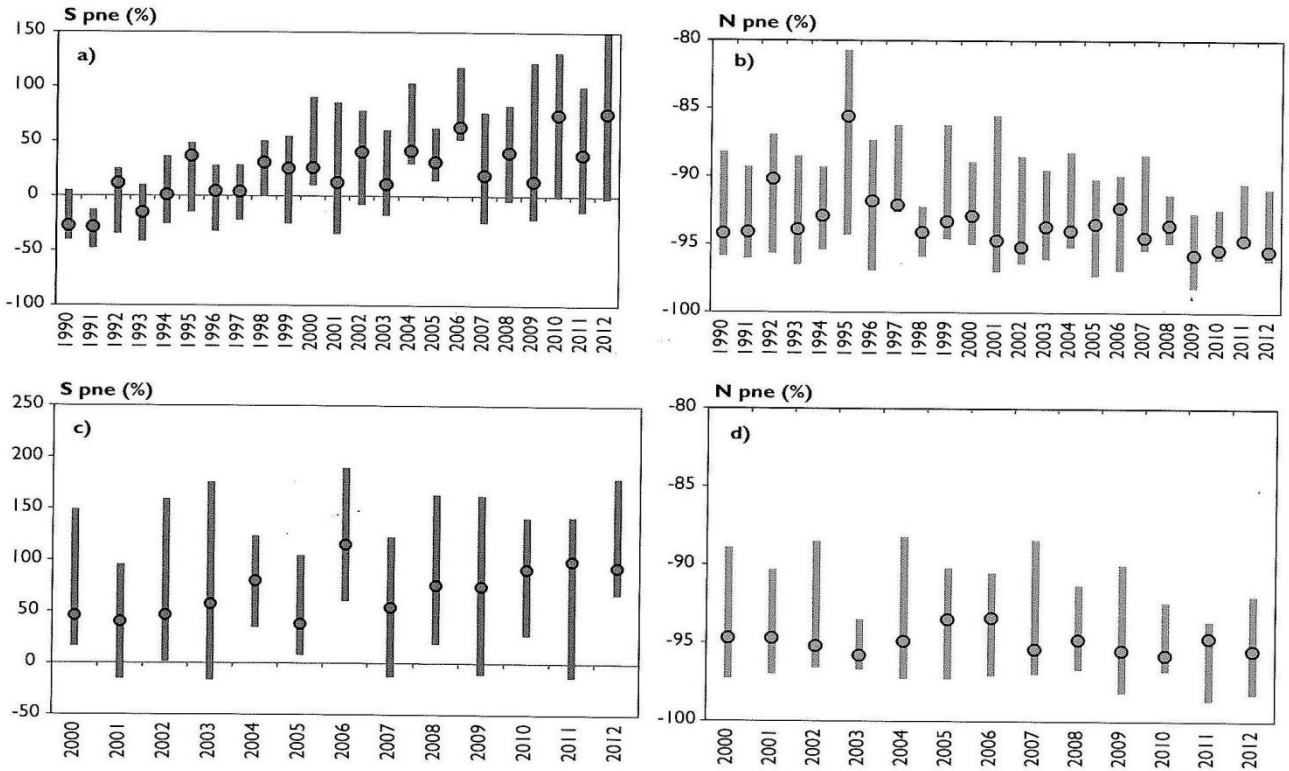
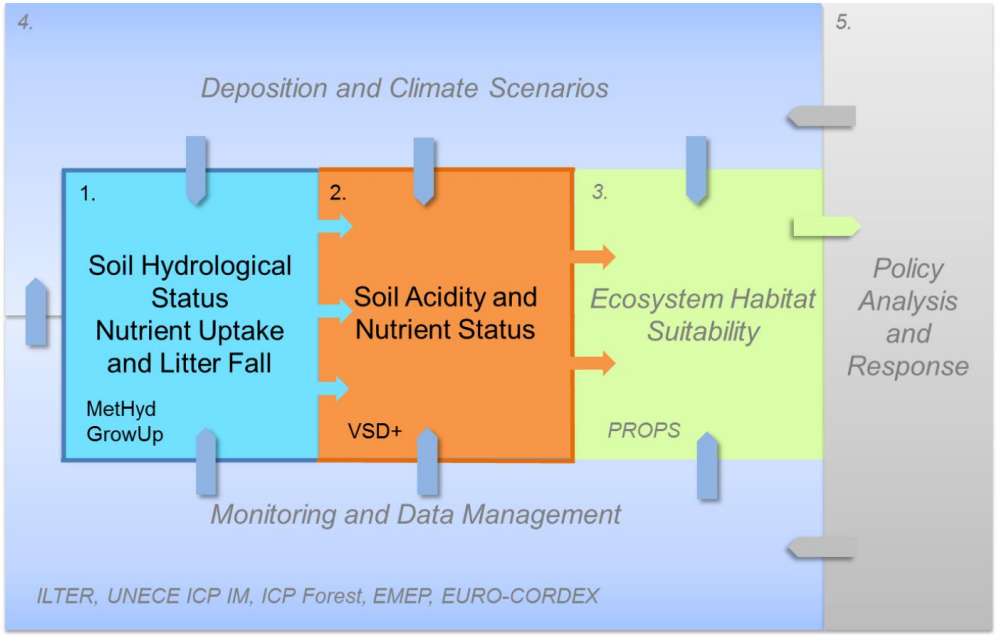
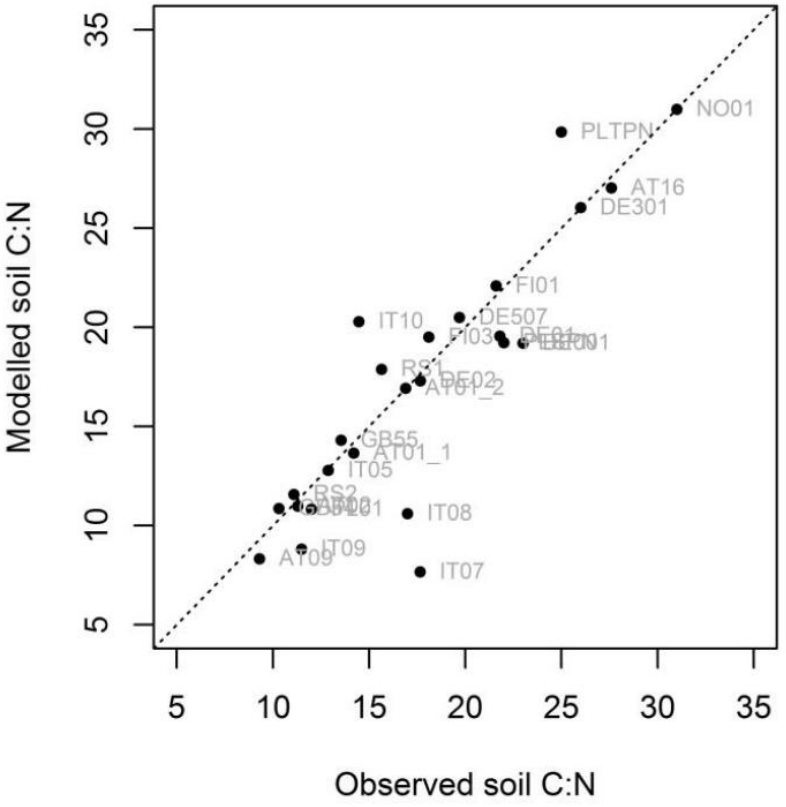


Figure 3.2 Percentiles (25%, median 50%, 75%) of percent net export (pne, %) of sulphate (SO_4) and total inorganic nitrogen (TIN) for the IM sites CZ01, CZ02, DE01, FI01, FI03, NO01, NO02, SE04 in 1990–2012 (a and b, respectively) and for the sites CZ01, CZ02, DE01, EE02, FI01, FI03, IT01, LT01, LT03, LV01, LV02, NO01, NO02, SE04, SE14, SE15, SE16 in 2000–2010 (c and d, respectively). DE01 and SE14 were omitted from the calculation of pne for TIN due to excess N mineralization after Norway spruce (*Picea abies*) dieback due to a bark beetle attack in 1996–1997 and storm logging / bark beetle attack in 2005–2009, respectively.

(Vuorenmaa *et al.* 2017, *Ecological Indicators* 76: 15–29)

Work in progress: Modelling of ecosystem habitat suitability





(Holmberg et al, submitted)

ICP IM draft work plan 2018-19

1. Reoccurring standard activities

Activity	Time frame	Responsible
ICP IM Task Force meeting 2018, Warsaw	9-11 May 2018	IM chair and programme centre, NFP contributions
ICP IM Task Force meeting 2019	tbd	IM chair and programme centre, NFP contributions
Submission of quality controlled results for year 2017	December 2018	National Focal Points
Submission of quality controlled results for year 2018	December 2019	National Focal Points
ICP IM Annual Report 2018	2018	Programme Centre in collaboration with NFPs
ICP IM Annual Report 2019	2019	Programme Centre in collaboration with NFPs
Reporting of ICP IM activities to WGE	2018 and 2019	Programme Centre and Chair

ICP IM draft work plan 2018-19

2. Cooperations and reports

Activity	Time frame	Responsible
Cooperation with other ICPs, particularly regarding dynamic modelling (all ICPs), cause-effect relationships in terrestrial systems (ICP Forests, ICP Vegetation), and surface waters (ICP Waters).	Tbd. TF meeting	According to decisions at the TF meeting
Cooperation with external organisations (International Long Term Ecological Research Network ILTER, LifeWatch, GEO BON). Progress reports.	2018	Programme Centre and NFPs, eLTER EU-project activities
Develop concepts for multi pollutant – multi effect relationships (NOx, O3, acidity, heavy metals, POPs, etc). Progress reports/contributions to Annual Report OR presentations in Workshop	2018	Voluntary activities at National Focal Points
Report on dynamic modelling on the impacts of deposition and climate change scenarios on ground vegetation	2019	Programme Centre and NFPs of Austria and Sweden

ICP IM draft work plan 2018-19

3. Scientific papers

Activity	Time frame	Responsible
Scientific paper on long-term trends in atmospheric deposition and runoff water chemistry of S and N compounds at ICP IM catchments in relation to changes in emissions and hydrometeorological conditions	2018	Programme Centre, in cooperation with NFPs
Scientific paper on dynamic modelling on the impacts of future deposition scenarios on soil and water conditions in ICP IM catchments	2018	Programme Centre and NFPs
Scientific paper on the relationship between critical load exceedances and empirical ecosystem impact indicators	2019	Programme Centre and NFPs of Austria and Sweden
Scientific paper on HM trends in concentrations and fluxes across ICP IM sites in Europe, cooperation with ICP Waters	2019	Programme Centre and individual researchers

ICP IM threats and areas for improvement

Presented at the WGE Extended Bureaux, Feb 2018

- Comprehensive monitoring expensive to carry out
- Long-term funding not guaranteed for many sites
- Site data not available from many countries → gaps in coverage
- Complete data sets not available from many sites → limits possibilities for comprehensive analysis
- Standardisation of methods and data collection incomplete → challenge for data quality
- How can ICP IM monitoring sites be used for future policy development

Revised mandate for ICP IM

Mainly linguistic revisions

Most important change:
The mandatory yearly activities moved from Work Plan to the mandate

Current issues ICP IM

More detailed, and discussions at the IM Task Force