Canada and ‘Towards INMS’

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Canada, a large country with relatively small population; it is mostly flat with thousands of lakes frozen for half the year.

(therefore lots of great hockey players and figure skaters but not so many Alpine skiers)

A very large and important agriculture sector produces more food than we can eat (despite world class doughnut consumption) - so a lot of grain, beef and pigs are exported (not dairy or chicken as they are protected).

There is no national Nitrogen policy as agricultural regulation is provincial according to the constitution; the federal government can only influence policies by funding provinces.

Most interest in N has been on agronomic efficiency of crops

Great NUE successes:

- N placement technology
- Reduced tillage including stubble management conserve moistures and improves NUE
- Genetics for yield and pest resistance improves NUE
- Extending crop rotations including legumes improves NUE (N inputs are from biological N fixation= fertilizer at ~1,500 kt N each)

Pollution concerns

- Regional concern about N leaching into vulnerable aquifers. Some concern about acid rain in mixed hardwood forests. No policy about gaseous N emissions.
- Great concern about P pollution and eutrophication of large and small lakes. This has direct and indirect bearing on N management (e.g. manure use and interaction between N and P for maximum efficiencies).

Opportunities for improving N efficiency:

- Current research is weighted for scales of field-year (i.e. agronomic plot) and national/ global-annual (i.e. inventories) There are opportunities at other scales
  - micro (day or part day time step and variable rates within fields)
  - farm scale optimizing farm/field as a whole (this includes more detailed information on farm practices)
  - regional scale
- N /water interactions

Idea for T-INMS?

- Twinning T-INMS sites with countries and institutes – sharing funds/ services/ scientists/ students. Perhaps can fit into existing programs rather than new $$