Soil Survey in Canada: Lessons from the Past, Ideas for the Future

Scott Smith
Soil Scientist, Pacific Agri-Food Research Centre
Summerland, BC V0H 1Z0

Presentation to Soil Science Society of America, Annual Meeting, Minneapolis, Minnesota, November 16, 2015

Outline

• Lessons from the Past
  – Decline and fall of soil survey in Canada
  – How and Why
  – The evolving reality
• Ideas for the Future
  – Administrative challenge: collaboration among a community of users
  – Emerging technological solutions

Acknowledgements

• Robert MacMillan
  LandMapR Environmental Solutions, Edmonton, AB

• Angela Bedard-Haughn
  Dept of Soil Science, University of Saskatchewan, Saskatoon, SK

• Peter Schut
  Agriculture and Agri-Food Canada, Ottawa, ON

• Members of the Canadian Digital Soil Data Consortium

‘About 150 Canadian pedologists and student assistants were in the field in the summer of 1975 mapping soils. A similar number were busy with correlation, cartography, data management, research and administration directly related to soil survey.’ And so goes the introduction to the report History of Soil Survey in Canada, 1914-1975 (McKeague and Stobbe 1978)

Change in staffing levels past 35 years

Why?

• Use of soil survey information never legally mandated into government legislation and policy

• Concept of simple inventory as a scientific investment faded

• General purpose surveys no longer satisfied users, specific purpose surveys increasingly costly and slow to produce

• Importance not sold, case not made within government

• As programs shrank, survey re-trenched rather than reached out
Result of retrenchment: Soil Landscapes of Canada map extents

SLC Version 2  1996
National coverage, limited attributes

SLC Version 3 2011
Limited extent, many attributes

The Evolving Reality

The demise of large government soil institutions
Predominance of private-sector over government inventories
Total number of soil scientists has not diminished, and there still exists a robust user community,
The resultant decentralization of expertise and of information
The emergence of new technologies to share information, so........

“If we want soil inventory to survive in Canada and find a new normal, we need to start with finding ways to collate and share our primary field and lab observation data widely and openly”. Bob MacMillan

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Evolution

The Evolving Reality

The demise of large government soil institutions
Predominance of private-sector over government inventories
Total number of soil scientists has not diminished, and there still exists a robust user community,
The resultant decentralization of expertise and of information
The emergence of new technologies to share information, so........

“If we want soil inventory to survive in Canada and find a new normal, we need to start with finding ways to collate and share our primary field and lab observation data widely and openly”. Bob MacMillan

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium

The Future

Community of users: the Canadian Digital Soil Data Consortium
Supporting a broader community

The CDSDC will achieve this via three infrastructure components:

1) **Platform**: interoperable framework for new and diverse soil and environmental data.

2) **Repository**: A secure, sustainable national repository

3) **Applications**: Links to research tools, mobile apps, and digital soil mapping functions like

---

Collecting and managing new data: the early focus

A key objective of the CDSDC is to develop and maintain an openly accessible platform for contributing, archiving, and retrieving geo-referenced soil profile descriptions and laboratory analytical data for Canada.

- Represents enormous public good
- Reduces costs and improves quality and efficiency
- Key to future ability to generate predictive maps
- Help us to meet international objectives (Global Soil Partnership, GlobalSoilMap.net) in a way that we can't right now

Concluding thought....

No matter how much technology you have, you still need to dig a hole

Thank you for your attention