

THE INTERNATIONAL SOIL CARBON NETWORK

Data synthesis and community development

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Context

- Soil contains at least two thirds of terrestrial organic carbon
- Soil carbon feedbacks to climate change are still uncertain, but could be large
 - ▣ Rapid- vs decadal-turnover carbon reservoirs
 - ▣ Inputs
 - ▣ Disturbance (fire, erosion, etc)
 - ▣ Land use
- Pressure to *figure it out!*



Community

We have

□ A community?

- Multiple nations, agencies, institutions, groups, individuals
- Similar goals
- Differing...objectives, methods, scales, precision, products, and world views

We need

□ A community.

- Better communication
- More opportunities for collaboration
- Increased leveraging of infrastructure and investment
- Easier ways to share data and ideas



Community Response - ISCN

- **Characterize** the current distribution and stability of soil carbon
- **Forecast** soil carbon vulnerability to loss under changing climate, land use, and other disturbance
- **Organize** and **distribute** this information at resolutions that are useful to land managers, modelers, and policy makers

*No single group can accomplish these goals across these scales
it requires a coherent effort.*

ISCN Science Steering Group

- Chris Swanston (USFS, NACP SSG)
- Rich Birdsey (USFS)
- Felipe García-Oliva (Univ. Mexico)
- Jennifer Harden (USGS)
- Gustaf Hugelius (Stockholm Univ.)
- Julie Jastrow (ANL)
- Mark Johnson (USEPA)
- Ingrid Kögel-Knabner (TUM)
- Randy Kolka (USFS)
- Marc Kramer (U. Florida)
- Greg Lawrence (USGS)
- Johannes Lehmann (Cornell)
- Bob McKane (USEPA)
- Stephen Ogle (CSU NREL)
- Luca Montanarella (EC JRC)
- Rich Pouyat (USFS)
- Dan Richter (Duke)
- Pete Smith (U. Aberdeen)
- Catherine Ste-Marie (NRC-CFS)
- Peter Thornton (ORNL, CCSSG)
- Margaret Torn (LBNL)
- Larry West (USDA-NRCS)

Currently 22 members from several agencies and nations.
Three additional new members are being recruited this year.



Membership

- Easy – you give, you get. (just sign up)
- Data contribution
 - ▣ Fair use governed by data policy
 - ▣ Database- flexible, dynamic, growing
 - ▣ Less work, more exposure – fulfills funding commitments
- Infrastructure and sample sharing
 - ▣ Research sites and equipment
 - ▣ Archived soils
- Synthesis products, perspectives, expertise



Support And Investment

- Database and related activities
 - Agencies- USDA-FS, USGS
 - Competitive funds- USDA-NIFA REE-NET
 - Institutional support- LBNL, Microsoft Research, Northern Institute of Applied Climate Science

- Other major projects
 - Radiocarbon Collaborative- IA between USDA-FS and LLNL Center for Accelerator Mass Spectrometry; Michigan Tech University
 - Soil archiving- preliminary support from USDA-NRCS SSL, USDA-FS, USGS archive facilities



ISCN Carbon Database

Principles

- ❑ Extend the “lifetime” of soil carbon data beyond publication
- ❑ Include **all** associated data
- ❑ Facilitate broad-level synthesis
- ❑ Integrate with other disciplines
- ❑ Remain dynamic
- ❑ Focus on endusers
- ❑ Provide credit





ISCN Carbon Database

Fair Use Policy

- Three Data Phases for providers
 - ▣ Phase 1: Data upload and QC
 - ▣ Phase 2: Meta data viewable, core data not
 - ▣ Phase 3: All data free access
- Providers decide shift to Phase 2 and 3
- Citation agreement – cite data used!
- Providers determine citation for their data



ISCN Carbon Database

www.soilcarb.net

www.fluxdata.org/nscn/SitePages/ISCN.aspx

INTERNATIONAL SOIL CARBON NETWORK

ISCN Home About Data The Community Resources

Search this site...

EXPLORE THE SOIL CARBON DATABASE

- Find and download raw soil carbon data
- Contribute your own research data
- Network and collaborate with other scientists and researchers

GET STARTED NOW

The International Soil Carbon Network (ISCN) is a scientific community devoted to the advancement of soil carbon research.

The Network coordinates independent soil research and monitoring efforts in the United States and internationally. ISCN members contribute to a community-driven soil carbon database and use available data to prepare scientific papers and large-scale syntheses.

Join Today!

www.fluxdata.org/nscn/Data/SitePages/Home.aspx

ISCN Carbon Database

Database overview

- Fair use policy
- Contribution guidelines
- 22 datasets
- Over 250 variables
- 41,000 profiles
- Unlimited growth capacity
- Shared infrastructure with LBNL fluxdata.org



Dataset Information

- [Data Policy and Use](#)
- [Quick Start Guide](#)
- [Data Documentation](#)
- [Variables and Calculations](#)

Access Data

- [Database Reports](#)
- [Map-based Data](#)

Contribute Data

- [Upload Data](#)
- [Soil Archive Survey](#)

Dataset Information

Before using the database, please familiarize yourself with the Data Policy and Use document.

Data Policy and Use - What you need to know about fair use and data management before accessing the database.

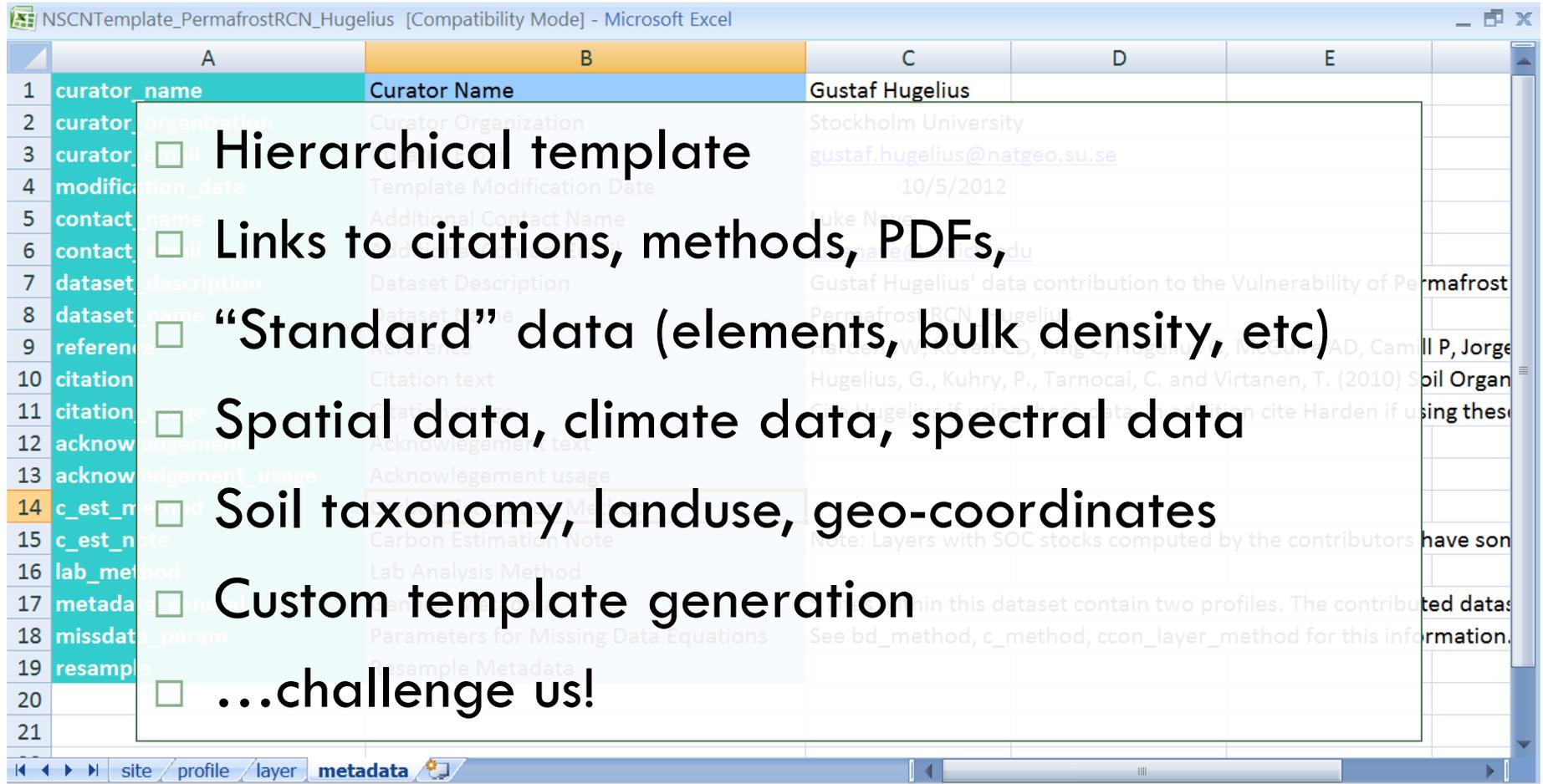
Quick Start Guide - A 'how-to' guide for understanding and interacting with the database.

Data Documentation - Summary information about the contents of the database.

Variables and Calculations - Variables, calculations, and quality assessment information.

ISCN Carbon Database

Data uploads and diversity



The image shows a screenshot of a Microsoft Excel spreadsheet titled "NSCNTemplate_PermafrostRCN_Hugelius [Compatibility Mode] - Microsoft Excel". The spreadsheet has columns labeled A through E. The data in the spreadsheet is as follows:

	A	B	C	D	E
1	curator_name	Curator Name	Gustaf Hugelius		
2	curator_organ	Curator Organization	Stockholm University		
3	curator_email	Curator Email	gustaf.hugelius@natgeo.su.se		
4	modification_date	Template Modification Date	10/5/2012		
5	contact_name	Additional Contact Name	Luke N		
6	contact_email	Additional Contact Email	luke.n@natgeo.su.se		
7	dataset_description	Dataset Description	Gustaf Hugelius' data contribution to the Vulnerability of Permafrost		
8	dataset_name	Dataset Name	PermafrostRCN_Hugelius		
9	reference	Reference	Hugelius, G., Kuhry, P., Tarnocai, C., and Virtanen, T. (2010) Soil Organ		
10	citation_text	Citation text	Hugelius, G., Kuhry, P., Tarnocai, C. and Virtanen, T. (2010) Soil Organ		
11	citation_url	Citation URL	Gustaf Hugelius if using spreadsheet, please cite Harden if using these		
12	acknowledgement_text	Acknowledgement text			
13	acknowledgement_usage	Acknowledgement usage			
14	c_est_method	Carbon Estimation Method			
15	c_est_note	Carbon Estimation Note	Note: Layers with SOC stocks computed by the contributors have son		
16	lab_method	Lab Analysis Method			
17	metadata_note	Metadata Note	in this dataset contain two profiles. The contributed data		
18	missdata_param	Parameters for Missing Data Equations	See bd_method, c_method, ccon_layer_method for this information.		
19	resample	Resample Metadata			
20					
21					

Overlaid on the spreadsheet is a text box with the following content:

- Hierarchical template
- Links to citations, methods, PDFs,
- “Standard” data (elements, bulk density, etc)
- Spatial data, climate data, spectral data
- Soil taxonomy, landuse, geo-coordinates
- Custom template generation
- ...challenge us!

The spreadsheet interface includes a status bar at the bottom with tabs for "site", "profile", "layer", and "metadata".

ISCN Carbon Database

Online data browsing

The screenshot shows a web browser window displaying an Excel spreadsheet titled "Profile Carbon to 1m Depth". The spreadsheet contains data for various sites, including site names, coordinates, regions, profile names, observation dates, and carbon storage values (SOC to 1m Depth, SOC Profile Total, Profile Top, Profile Bot).

Profile Carbon to 1m Depth
[Download latest spreadsheet](#)
Generated: 4/23/2011 12:55:13 PM
Data as of 03/04/2011; Processed 04/20/2011

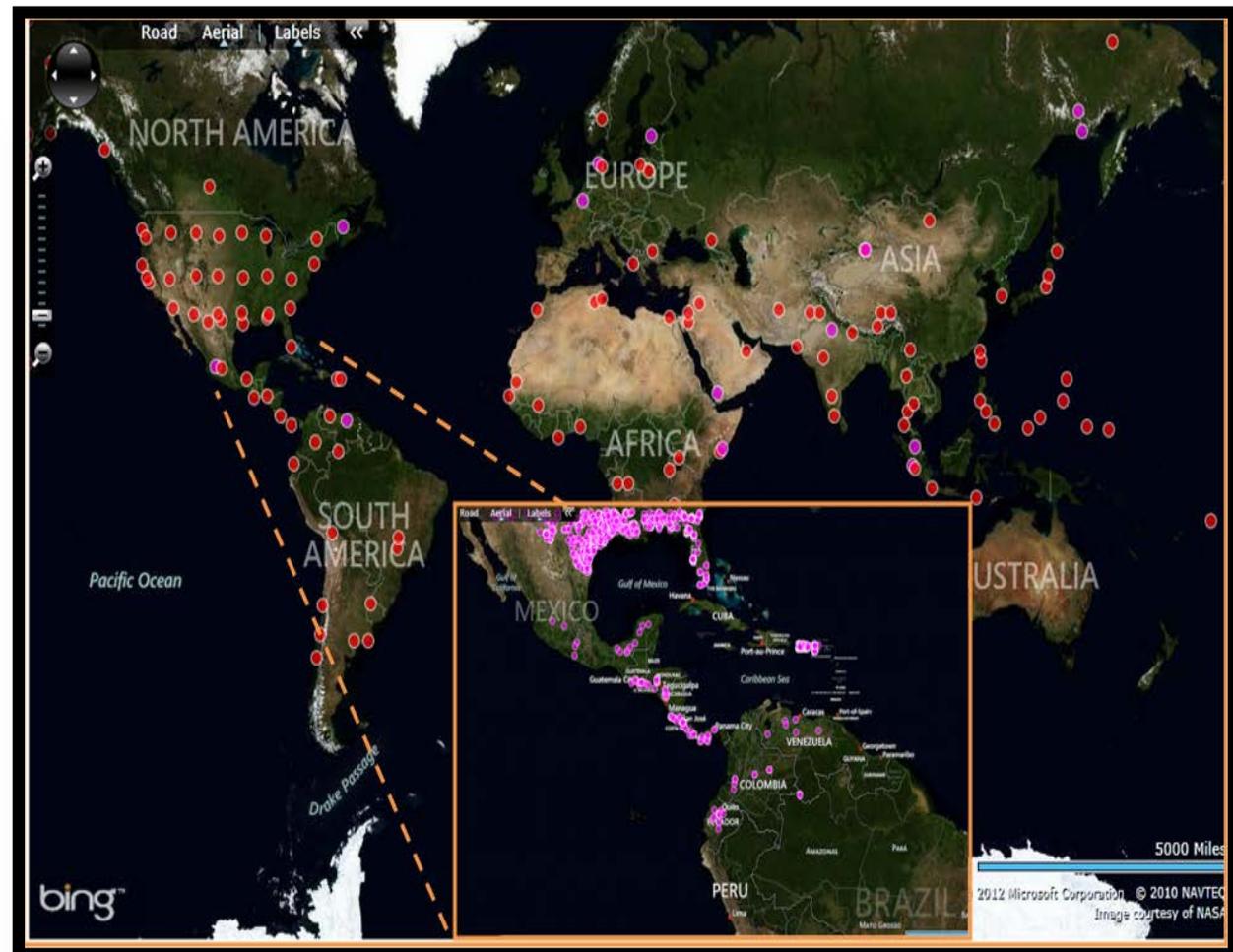
This is a beta release of the NSCN Database products. Several features of the database, data submissions guidelines and quality checks are still under development. Please send any feedback to nscc-support@nscc.gov

Site Name	Latitude	Longitude	Eco-Region	Profile Name	Observation Date	SOC to 1m Depth	SOC Profile Total	Profile Top	Profile Bot
	dec. deg	dec. deg				g cm-2	g cm-2	cm	cm
# 16E1851016	44.78820038	-116.0889969	Idaho Batholith	SOSID-085-001	06/22/2005	1.5458	1.7384	0	152
00AL123001	32.6692009	-85.75810242	Piedmont	00AL123001	04/21/2000	1.1694	1.2889	0	203
00AZ005001	36.18000031	-111.9440002	Arizona/New Mexico Plateau	00AZ005001	08/03/2000	1.0024	1.0024	0	66
00AZ005002	36.25249863	-112.0950012	Arizona/New Mexico Mountains	00AZ005002	10/03/2000	1.2839	1.3529	0	160
00AZ005003	400	400	Unknown	00AZ005003	10/04/2000	0.6773	0.7435	3	152
00AZ005004	36.27610016	-112.0780029	Arizona/New Mexico Mountains	00AZ005004	08/09/2000	0.9286	1.0724	5	119
00AZ005005	36.25970078	-112.0210037	Arizona/New Mexico Mountains	00AZ005005	08/02/2000	1.1957	1.4173	0	155
00AZ005006	36.23469925	-111.9860001	Arizona/New Mexico Mountains	00AZ005006	08/03/2000	1.9366	2.027	15	107
00AZ005008	36.29750061	-112.0849991	Arizona/New Mexico Mountains	00AZ005008	10/04/2000	0.7869	1.1804	5	183
00AZ005009	400	400	Unknown	00AZ005009	04/01/2000	0.1434	0.1434	66	80

ISCN Carbon Database

Map-based access

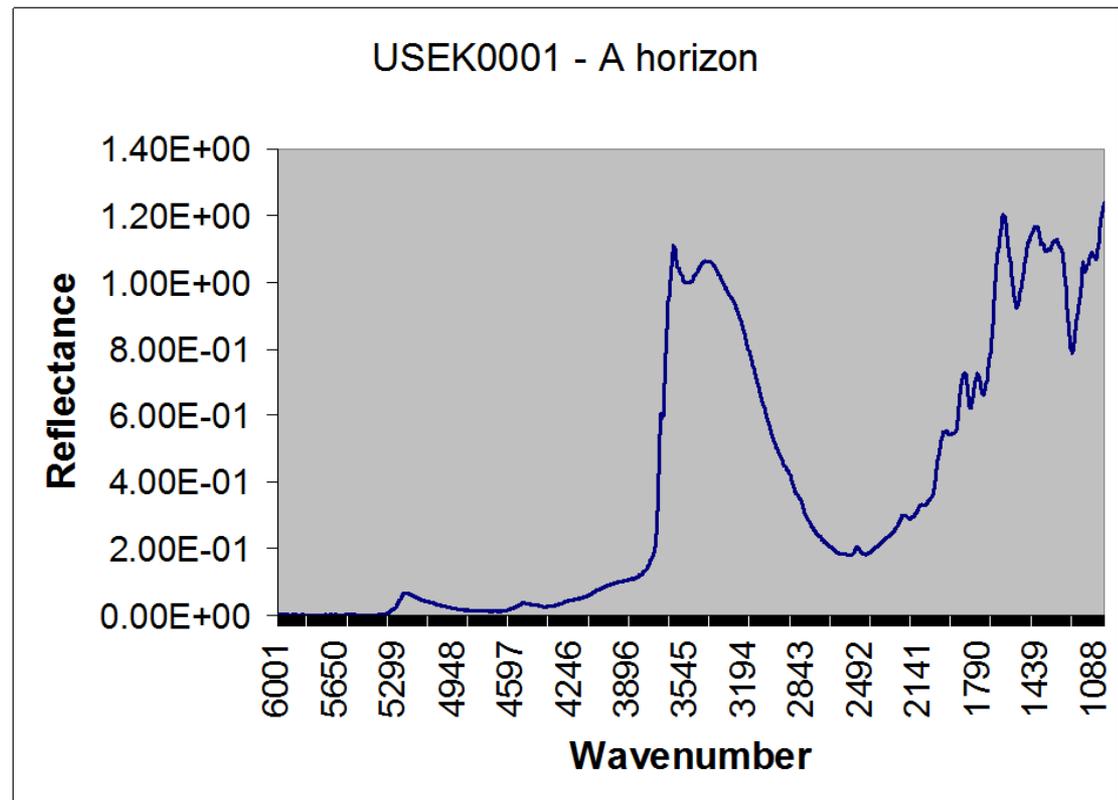
- Select and download custom datasets
- Coverage greatest in US
- Increasing international coverage



ISCN Carbon Database

Technology progress- 2013

- New templates accommodate FTIR and other spectral datasets
- New QA/QC code checks data template integrity and detects duplicated data contributions



Planned Growth Areas

- International Collaborations- more partners
 - Growth of global data coverage
 - Data templates for international approaches, methodologies, classification systems
- Database- greater usability
 - Machine-readable automatic downloads, user-customized downloads
 - Data use and publication tracking, linkages between soil sample archives and data
- Community outreach- more involvement
 - Workshops for data users and contributors
 - More varied Steering Group





Thank you!

Visit the ISCN at www.soilcarb.net to learn more!

A banner image for the International Soil Carbon Network. It features a dark blue background with a faint world map and a grid pattern. On the left side, there is a pile of brown soil. The text "INTERNATIONAL SOIL CARBON NETWORK" is written in large, bold, white capital letters across the middle of the image.

**INTERNATIONAL
SOIL CARBON NETWORK**

ISCN Carbon Database

Data coverage- May 2013

- Low data density in Mexico, Central and South America
- Multiple efforts ongoing to increase international data density

