WP 2.3

Archivio dei dati delle carote di ghiaccio non polare e dati biologici di lunga conservazione

Responsabile: **Mattia De Amicis**

Collaboratori: **Ivan Frigerio, Daniele Strigaro, Matteo Mattavelli, Roberto Garzonio, Alice Mayer, Fabio Olivotti, Stefano Roverato**.

Dipartimento di Scienze dell'Ambiente e di Scienze della terra

Università di Milano Bicocca

Attività - obiettivi

- ✓ Costruzione di un sistema informativo territoriale e di un database per l'archiviazione dei dati glaciologici da ghiacciai non polari di alta quota

OBIETTIVI (O)

- ✓ ……
- ✓ O2: Costruzione di un archivio informatico dei dati ottenuti nell'ambito del progetto.
- ✓ …..

MODALITA' DI REALIZZAZIONE DELLE ATTIVITÀ (A)

- ✓ A1: **Costruzione di un archivio dei ghiacciai che possono essere perforati.**

- ✓ A5: **Creazione di un portale di accesso ai dati e ai campioni conservati.**

DELIVERABLES (D)

- ✓ D1 (PM12): **Archivio dei dati di ghiacciai perforabili; trasmissione dati al Portale Generale.**
- ✓ D2 (PM24): **Relazione su archivio di carote di ghiaccio; trasmissione informazioni al Portale Generale.**
- ✓ D4 (PM36): **Archivio informatico dei dati ottenuti; trasmissione informazioni al Portale Generale.**

MILESTONES (M)

- ✓ M1 (PM12): **Completamento dell'archivio dei dati e metadati di ghiacciai.**
- ✓ M3 (PM24): **Predisposizione dell'archivio dei dati ottenuti dalle analisi delle carote di ghiaccio.**
- ✓ M6 (PM48): Definizione delle modalità di accesso agli archivi.

Archivio dei dati di ghiacciai perforabili

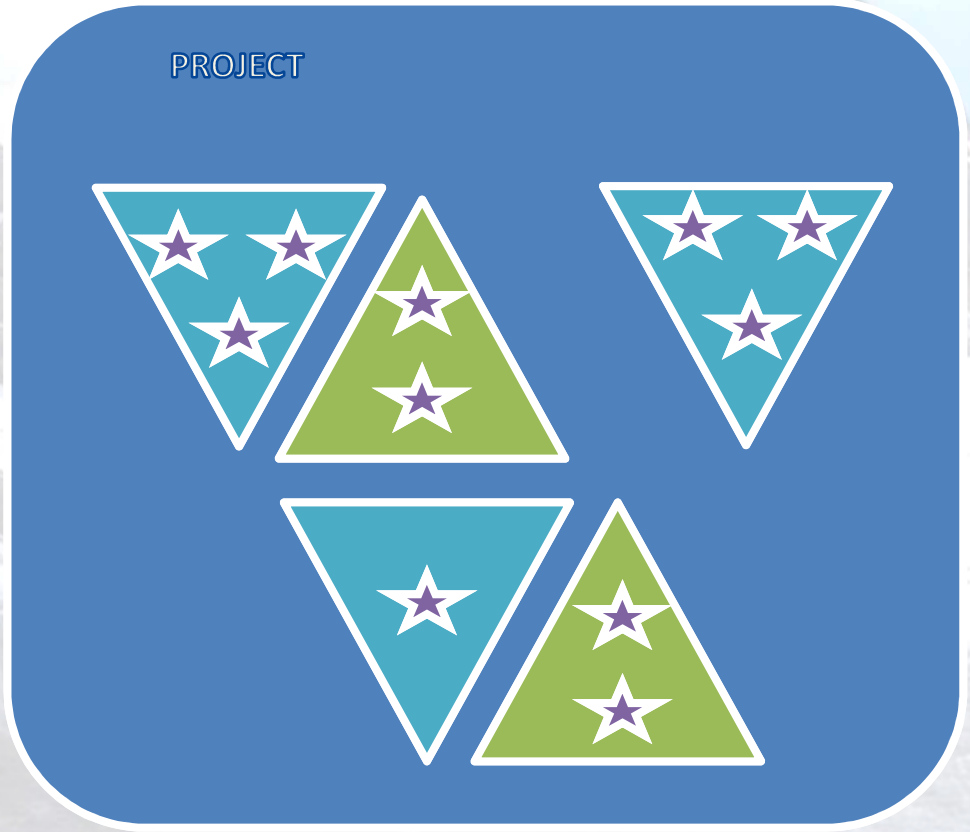
- ✓ Anagrafica ghiacciai
  - ✓ Database pubblici esistenti (GLIMS, WGI, WGMS, RGI)

- ✓ Perforazioni, integrazione di
  - ✓ Dati provenienti da NOA, NICL
  - ✓ Dati di letteratura
  - ✓ Dati UNIMIB - DISAT
- ✓ Analisi carote, integrazione di
  - ✓ Dati provenienti da NOA, NICL
  - ✓ Dati di letteratura
  - ✓ Dati UNIMI - DISAT

DATA STRUCTURE Definition

Project	Union of administrative, financials, technical and scientific components for study one or several sites.
Perforation	Campaign suitable for the collection of one or more cores in the same site in a short period of time (seasonality dependences).
Ice Core	Core sampled, spatial information are ice core referred
Data provider	Principal investigator of the core or principal author of reference paper
Parameter	Name and measurement unit of chemical-physical value stored
Value	Raw numeric value of parameter

DEFINITION



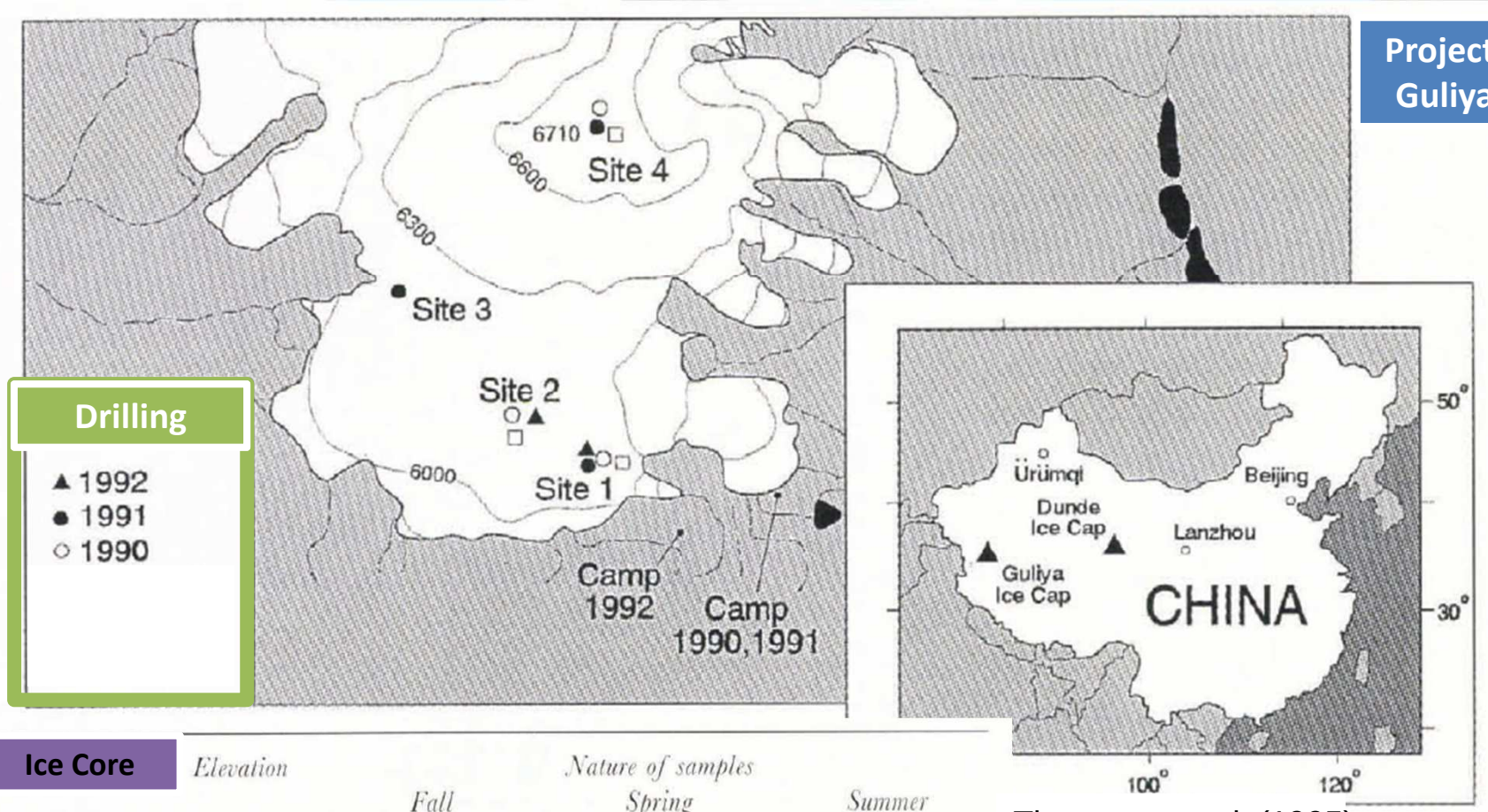
Drilling site A year (xxxx)

Drilling site B year (xxxy)

Ice Core

DEFINITION example

Project: Guliya



Thompson et al. (1995)

Ice Core

	Elevation	*Nature of samples*		
		Fall	*Spring*	*Summer*
	m	*1990*	*1991*	*1992*
1	6040	P(b) SC(b)	SC(i)	DC(b)
2	6200	SC(i)		P(i) DC(i)
3	6200		SC(b)	
Summit	6710	SC(i)	P(b) SC(b)	

DBMS: WDB (Norvegian Meteorological Institute)

- WDB is a NextData deliverable according to **WP2.1**
- Developed by Norvegian Meteorological Institute(met.no)
- Create to store meteorological and oceanograpich data.

High altitude met. station

(Elena Glacier, Uganda)

Geometry → Point

Meteorological Parameters

Reference time → 1400 AC

Non polar Ice core

(Lys glacier, ice core drilling)

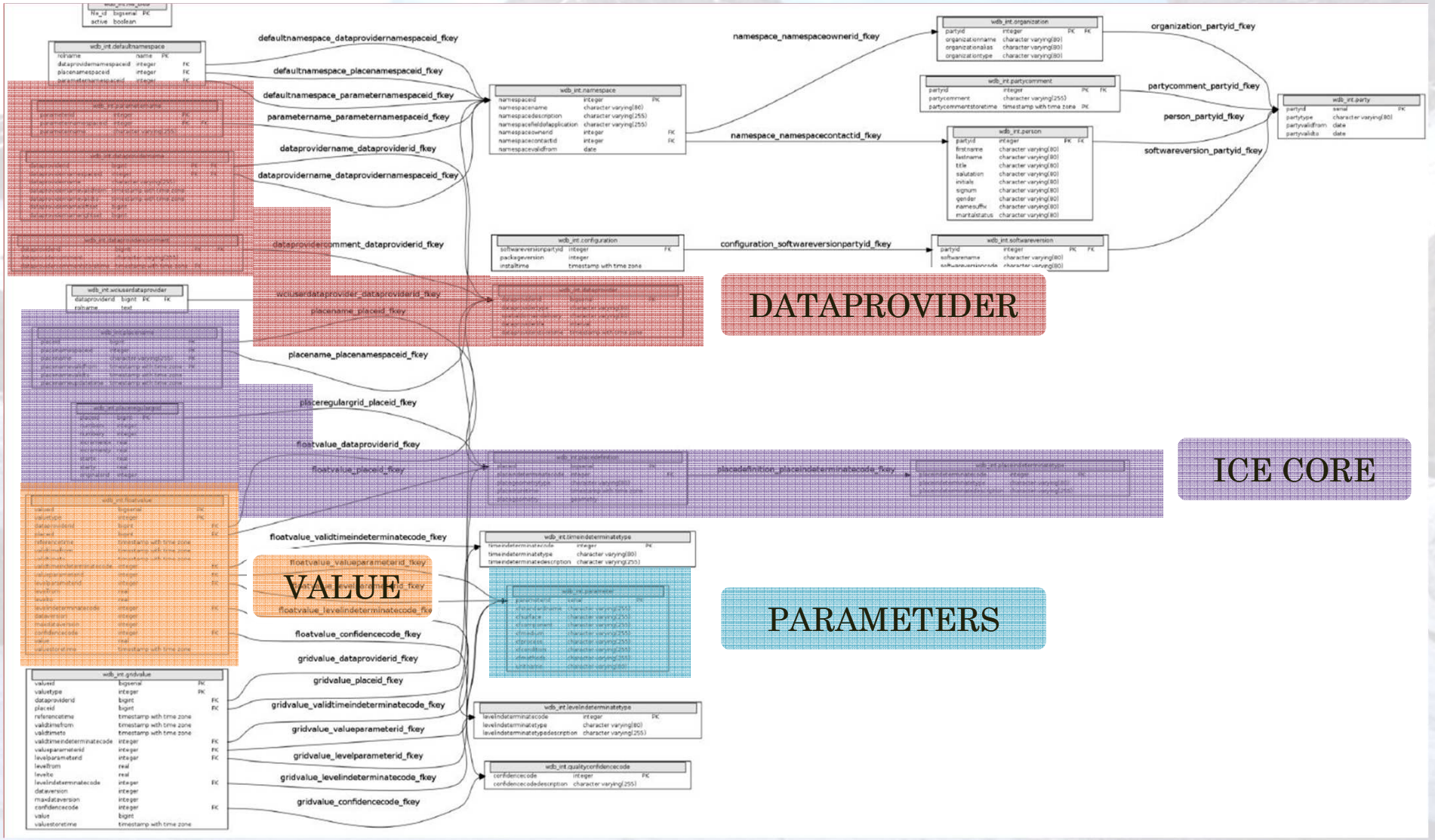
Geometry → Point

Ice core Parameters

Reference time → ?

WDB source code modified in order to fix the RT problem

IDB STRUCTURE



ATTRIBUTES AND PARAMETERS

ATTRIBUTES

ICE CORE	IC ID
	Spatial information
	Name of drilling site
DATA PROVIDER	DP ID
	Name of person

PARAMETERS	Name	Unit	Temp. average
Major Elements	Amonium	ppb, ppq	1 y.a., 10 y.a.,
	Chloride	ppb, ppq	1 y.a., 10 y.a.,
	Fluoride	ppb, ppq	1 y.a., 10 y.a.,
	Magnesium	ppb, ppq	1 y.a., 10 y.a.
	Nitrate	ppb, ppq	1 y.a., 10 y.a.
Trace Elements	Elements of periodic table	ppb, ppq	1 y.a., 10 y.a.
Stable Isotope	d18O	Total of 300 parameters with several units and differents temporal ranges.	
	dD		
Dust	Dimensional class of particells, concentration, etc..		
Gases	d18O atm		
Miscellaneus	Accumulation rate		

NON POLAR ICE CORES UPLOAD IN IDB

122 new ice cores

	Project	Perforations	Ice cores
America	17	24	56 (30)*
Europe	9	30	44 (44)*
Africa	2	2	8 (0)
Asia	24	40	70 (48)*
TOT	**52**	**96**	**178**

122 new ice core were surveyed for the first time.

*Added ice cores

CHARACTERIZED ICE CORES UPLOAD IN IDB

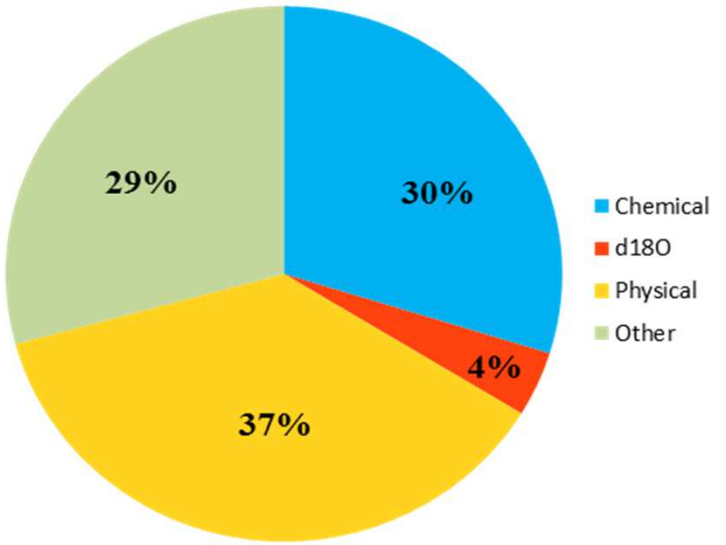
36 ice cores with chemical-physical characterization

32 ice cores from National Climatic Data Center (NOAA_NCDC)
http://www.ncdc.noaa.gov/paleo/icecore/

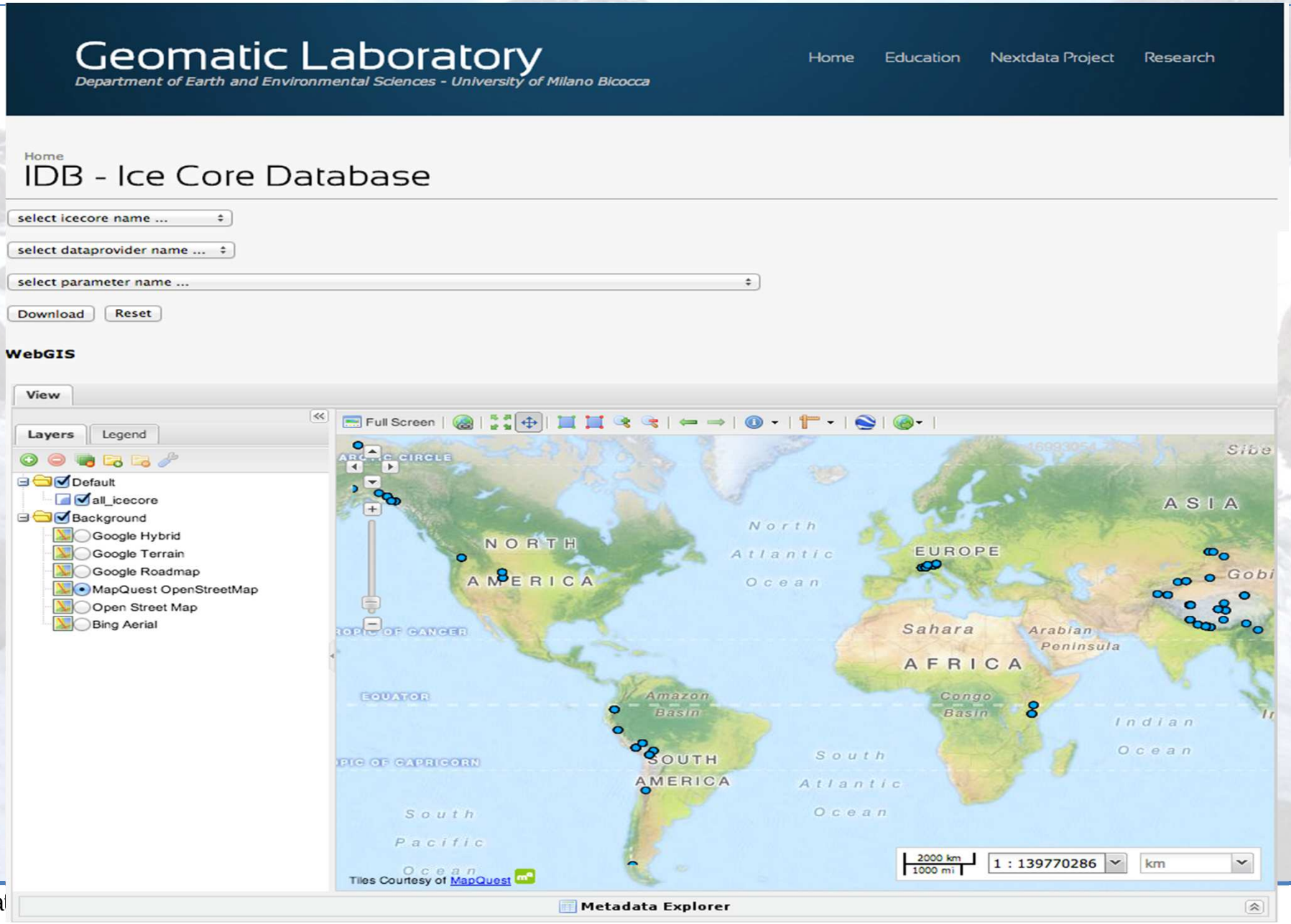
2 ice cores from NICL data base
http://nicl.usgs.gov/

2 ice cores from DISAT (V. Maggi)

- 254 parameters
- ~ 300.000 values



IDB WEBGIS http://geomatic.disat.unimib.it/idb



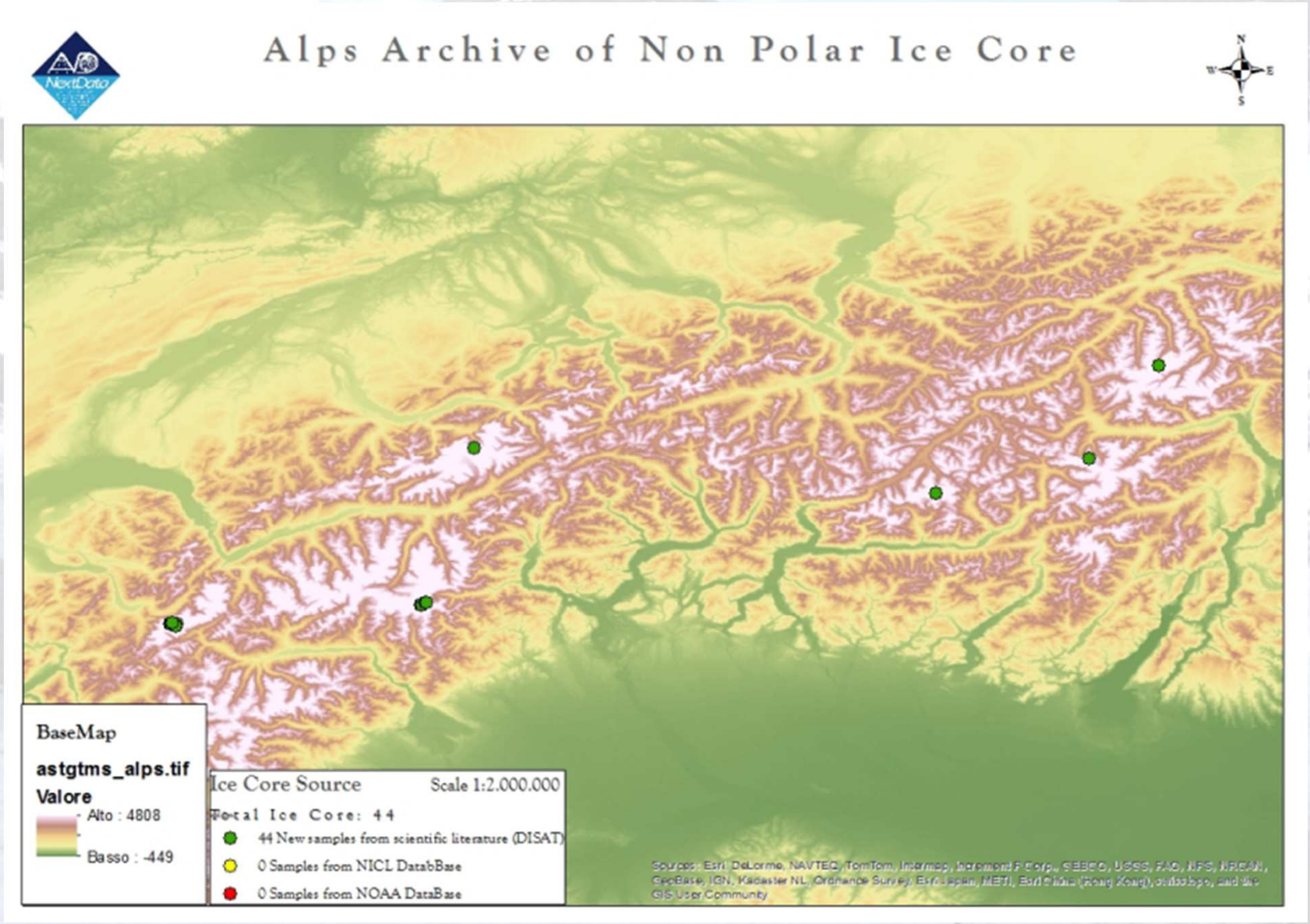
European Ice cores statistics IDB1

	Sites	Perforations	Ice cores
Monte Rosa	2	10	18
Monte Bianco	5	13	14
Ortles-Cevedale	1	2	5
Morteratsch	1	1	2
Grossfiescherhorn	1	2	2
Vernagtferner	1	1	3
Europe	**11**	**29**	**44**

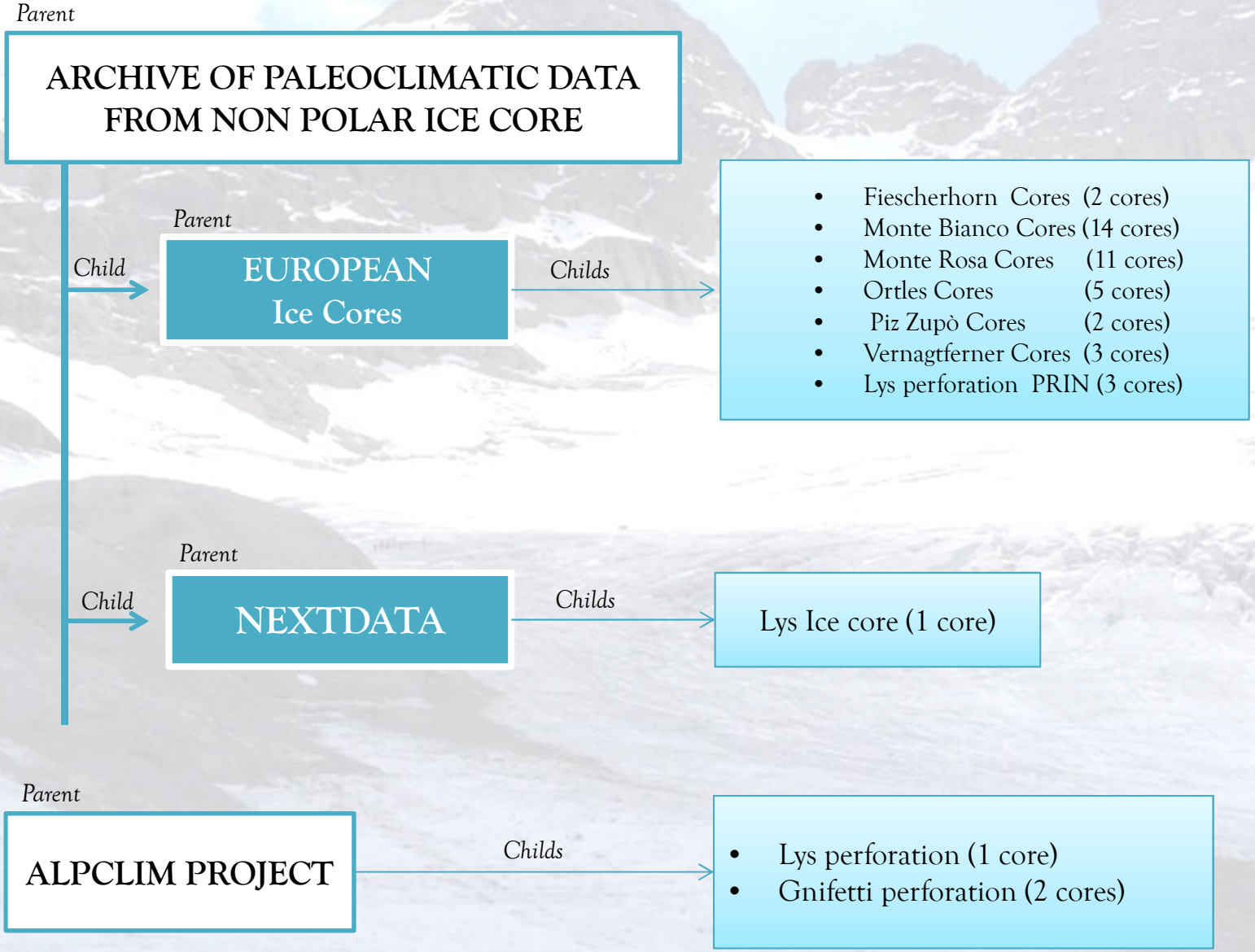
European ice cores had not been surveyed and mapped before.

Number of Europen ice core parameters stored in IDB	2 -CdL96 CdL03-
Parameter	21
Raw Number	7713

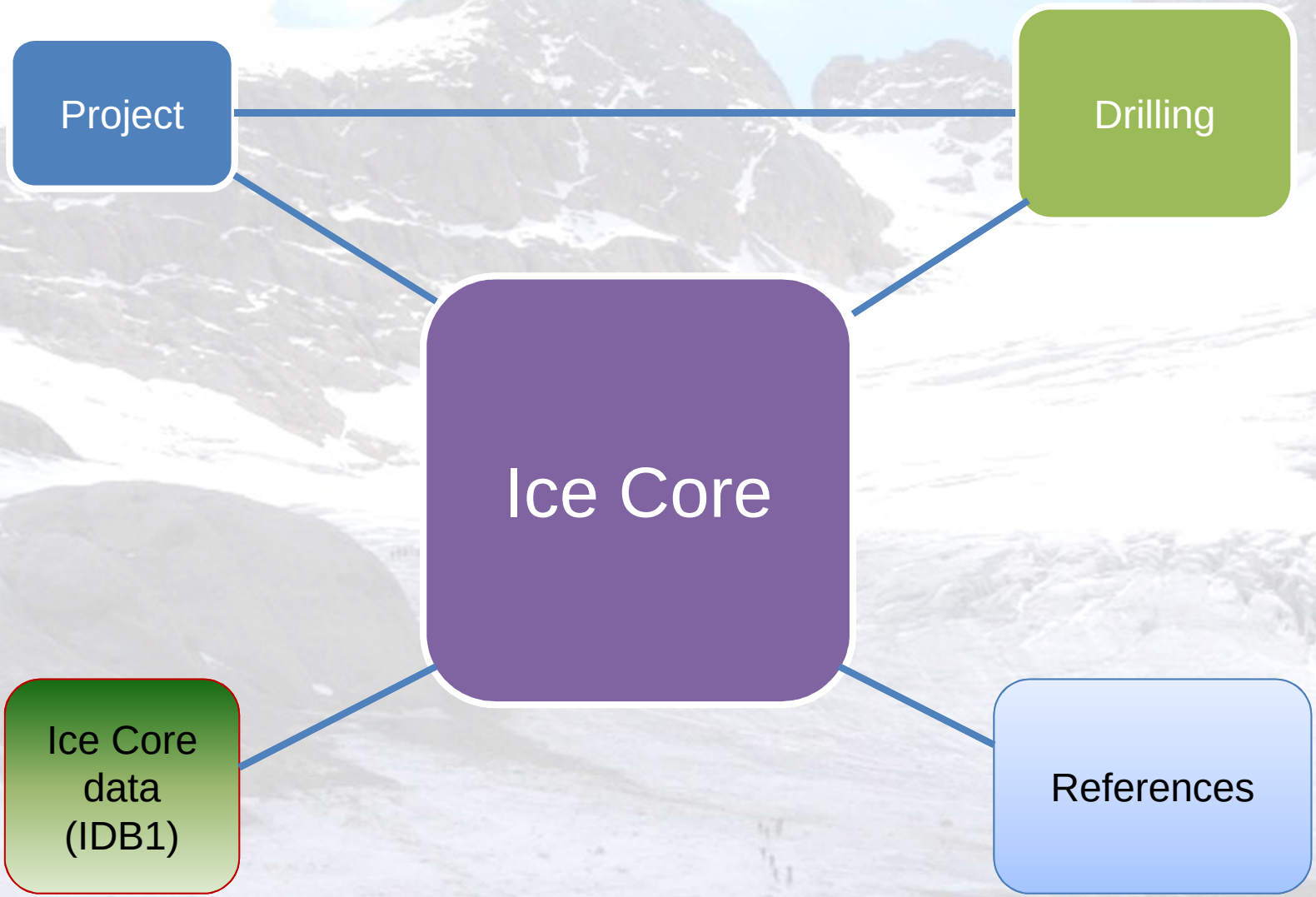
European Ice cores list of data and metadata



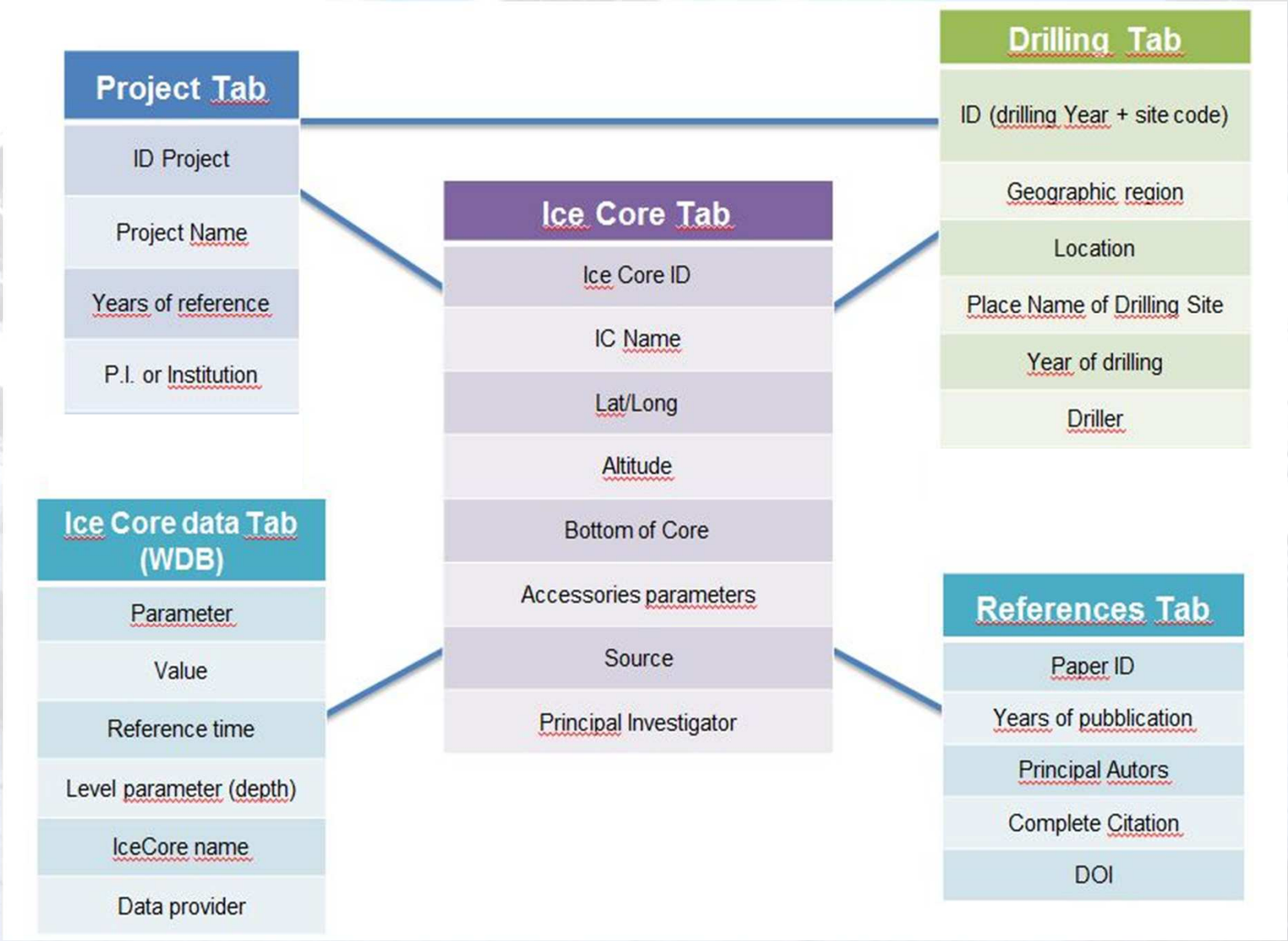
Metatadata European Ice cores - ShareGeonetwork



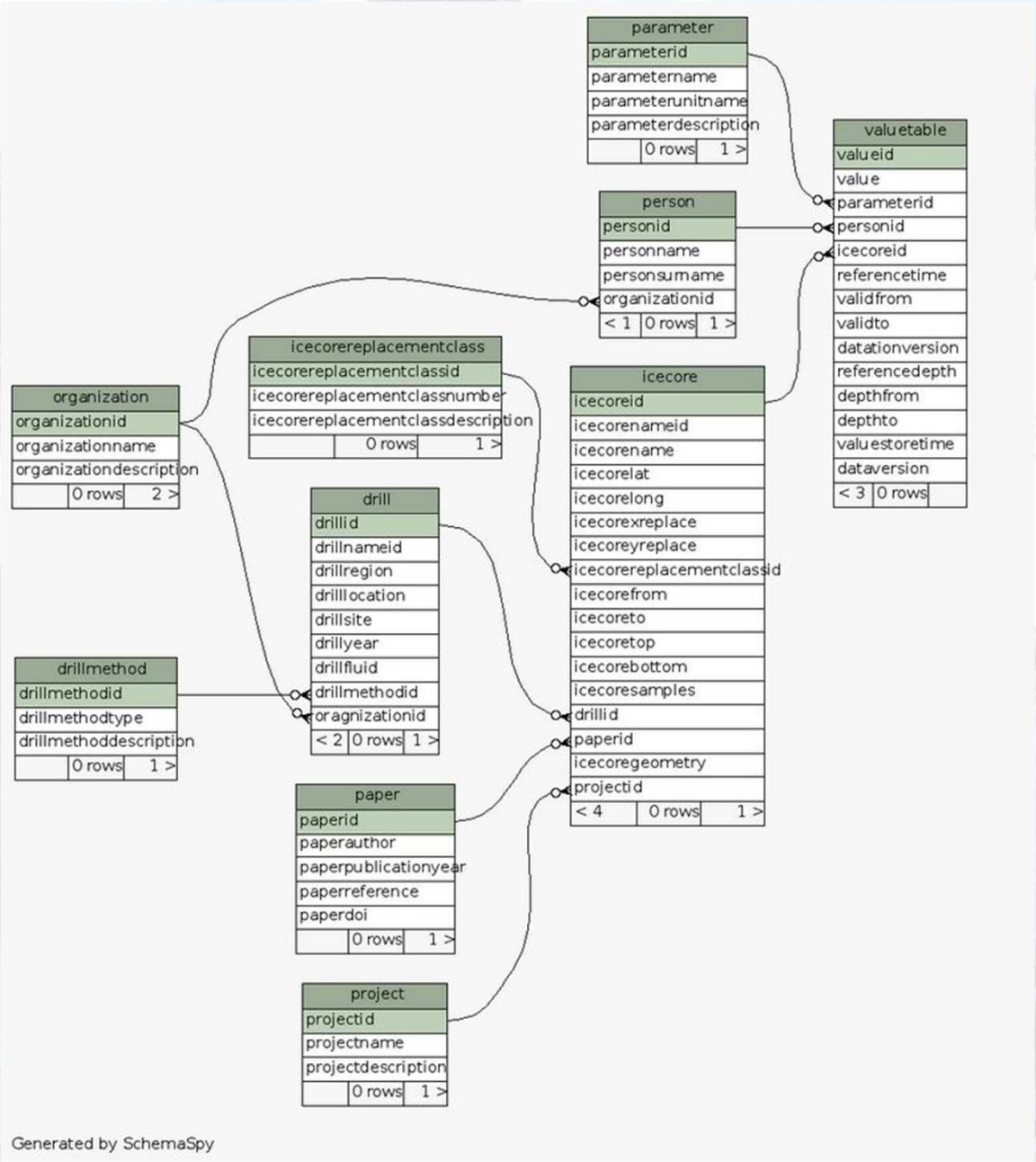
Project Evolution - DATA STRUCTURE IDB2



IDB 2.0 Conceptual scheme



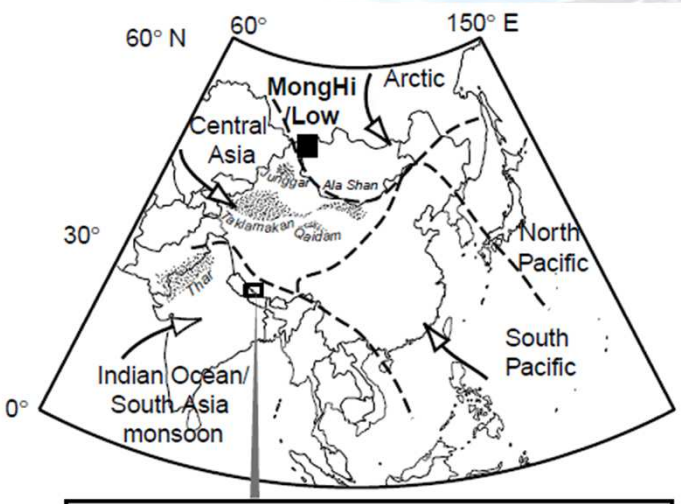
IDB2 - Geodatabase structure

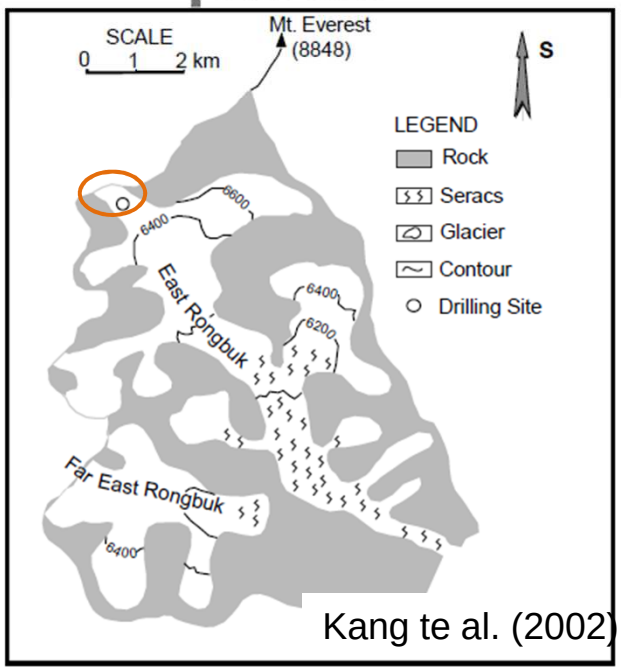


IDB2 and Glacier dbs association

Ic_name	Ic_id	wgi_id	glims_id	wgms_id	rgi_id	rgi_gli_id	local_id	glac_name	geog_area
Piz Zupo PZ02/1	PZ0200956E04622NPZ1	CH4J14322004	G009927E46382N	None	RGI32-11.01946	G009925E46389N	984	MORTERATSCH VADRETDA	Swiss Alps
Piz Zupo PZ02/2	PZ0200956E04622NPZ2	CH4J14322004	G009927E46382N	None	RGI32-11.01946	G009925E46389N	984	MORTERATSCH VADRETDA	Swiss Alps
CG KCH B95/1	CG9500752E04555NB01	CH4N01356009	G007800E45965N	None	RGI32-11.02848	G007803E45950N	536	GORNERGLETSCHER	Swiss Alps
CG B82/1	CG8200752E04555NB01	CH4N01356009	G007800E45965N	None	RGI32-11.02848	G007803E45950N	536	GORNERGLETSCHER	Swiss Alps
CG B82/1b	CG8200752E04555NB1b	CH4N01356009	G007800E45965N	None	RGI32-11.02848	G007803E45950N	536	GORNERGLETSCHER	Swiss Alps
CG CC B82/2	CG8200752E04555NB02	CH4N01356009	G007800E45965N	None	RGI32-11.02848	G007803E45950N	536	GORNERGLETSCHER	Swiss Alps
CG KCS B95/2	CG9500752E04555NB02	CH4N01356009	G007800E45965N	None	RGI32-11.02848	G007803E45950N	536	GORNERGLETSCHER	Swiss Alps
CG 03/2	CG0300752E04555NCG2	IT4L01211009	G007800E45965N	None	RGI32-11.02890	G007898E45941N	536	GORNERGLETSCHER	Swiss Alps
CG 03/1	CG3000752E04555NCG1	IT4L01211009	G007800E45965N	None	RGI32-11.02890	G007898E45941N	536	GORNERGLETSCHER	Swiss Alps
CG B77/1	CG7700752E04555NB71	IT4L01211009	G007800E45965N	None	RGI32-11.02890	G007898E45941N	536	GORNERGLETSCHER	Swiss Alps
CG B77/2	CG7700752E04555NB72	IT4L01211009	G007800E45965N	None	RGI32-11.02890	G007898E45941N	536	GORNERGLETSCHER	Swiss Alps
CG KCI 05	CG0500752E04555NKCI5	IT4L01211009	G007800E45965N	None	RGI32-11.02890	G007898E45941N	536	GORNERGLETSCHER	Swiss Alps
CG KCI sup	CG0500752E04555NKCS	IT4L01211009	G007800E45965N	None	RGI32-11.02890	G007898E45941N	536	GORNERGLETSCHER	Swiss Alps
CG B76	CG7600752E04555NB76	IT4L01211009	G007800E45965N	None	RGI32-11.02890	G007898E45941N	536	GORNERGLETSCHER	Swiss Alps
CdL 96	CL9600751E04555NC96	IT4L01508305	G007800E45965N	None	RGI32-11.02973	G007834E45898N	536	GORNERGLETSCHER	Swiss Alps
CdL 00/1	CL0000751E04555NC01	IT4L01508305	G007800E45965N	None	RGI32-11.02973	G007834E45898N	536	GORNERGLETSCHER	Swiss Alps
CdL 03/1	CL0300751E04555NC31	IT4L01508305	G007800E45965N	None	RGI32-11.02973	G007834E45898N	536	GORNERGLETSCHER	Swiss Alps
CdL 03/2	CL0300751E04555NC32	IT4L01508305	G007800E45965N	None	RGI32-11.02973	G007834E45898N	536	GORNERGLETSCHER	Swiss Alps
CdL 03/3	CL0300751E04555NC33	IT4L01508305	G007800E45965N	None	RGI32-11.02973	G007834E45898N	536	GORNERGLETSCHER	Swiss Alps
CdL 12/1	CL1200751E04555NC12	IT4L01508305	G007800E45965N	None	RGI32-11.02973	G007834E45898N	536	GORNERGLETSCHER	Swiss Alps

ICE CORE REPOSITIONING METHODOLOGY





Kang te al. (2002)

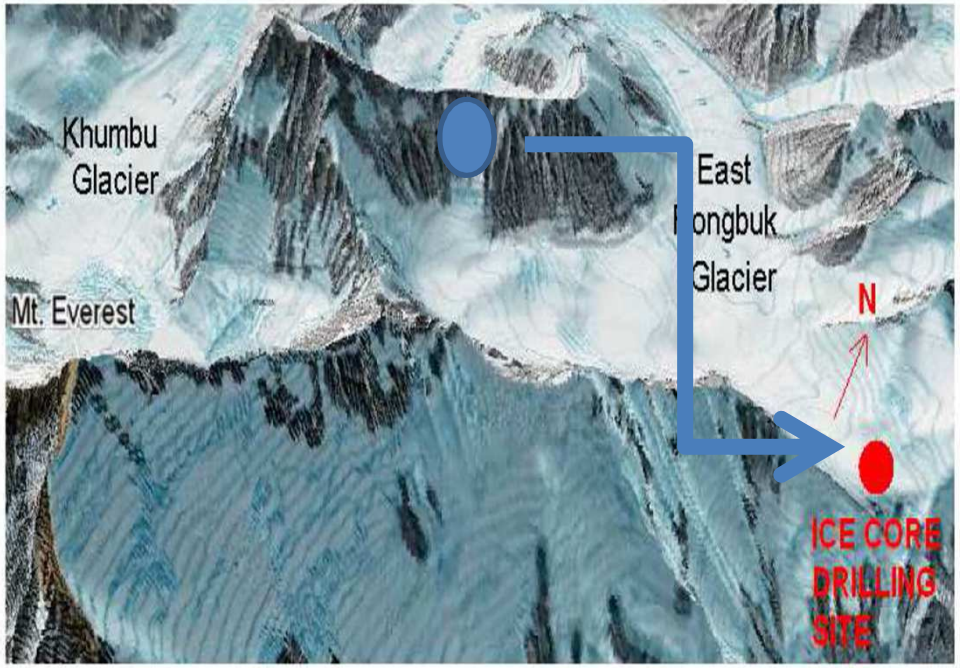
Repositioning class: 2

Project: Everest

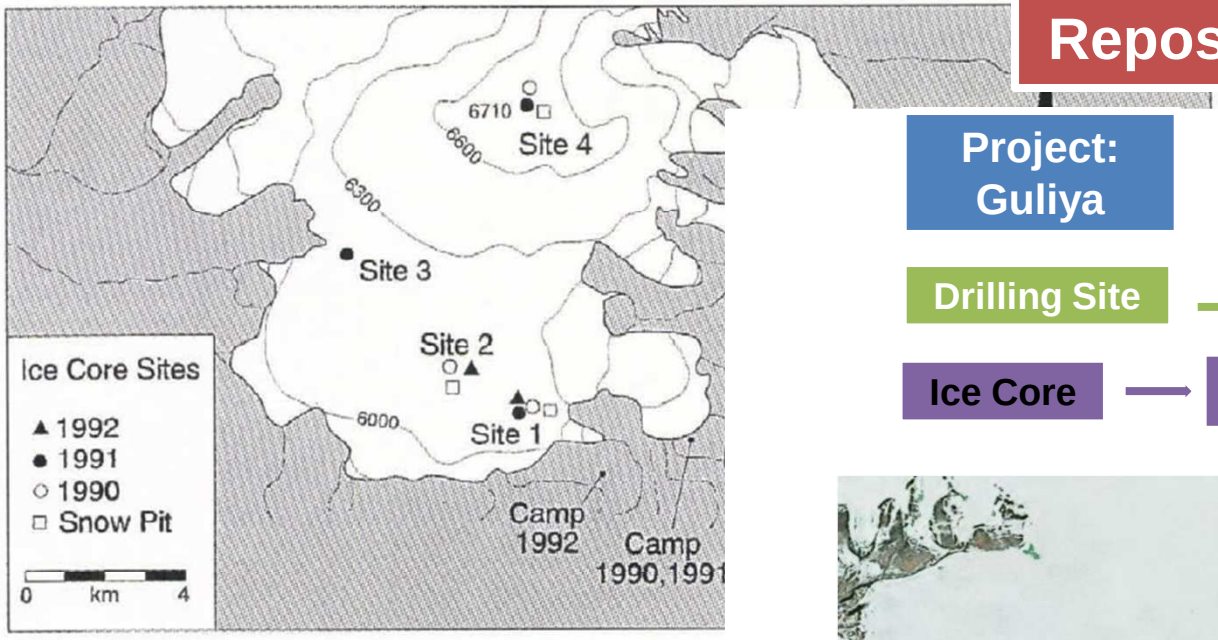
Drilling Site → **1**

Ice Core → **5**

Ice cores shift from the rock to the real perforation point



ICE CORE REPOSITIONING METHODOLOGY



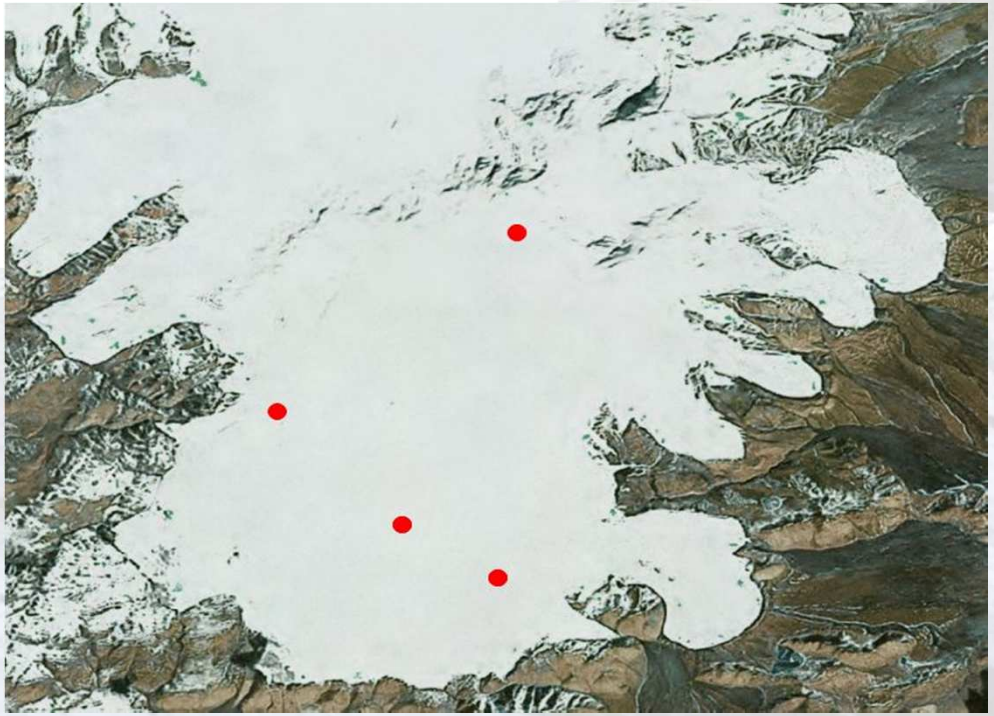
Thompson et al. (1995)

Repositioning class: 3

Project: Guliya

Drilling Site — **4**

Ice Core — 9



Before: one coordinate couple for 9
Ice core: 37°17' N – 81° 29' E

Now: 4 different coordinate couple and possibility to increase untill 9

ICE CORE REPOSITIONING METHODOLOGY

Replacement accuracy class	Point replacement
0	No information for repositioning
1	No map, no topography of the area, repositioning made with altitude or choosing more probably point.
2	Location map in paper, map is not detailed, one point for several ice core
3	Paper map of detailed location of ice cores
4	Accuracy GPS coordinates (more 4 value decimal degrees)

Non Polar Ice cores

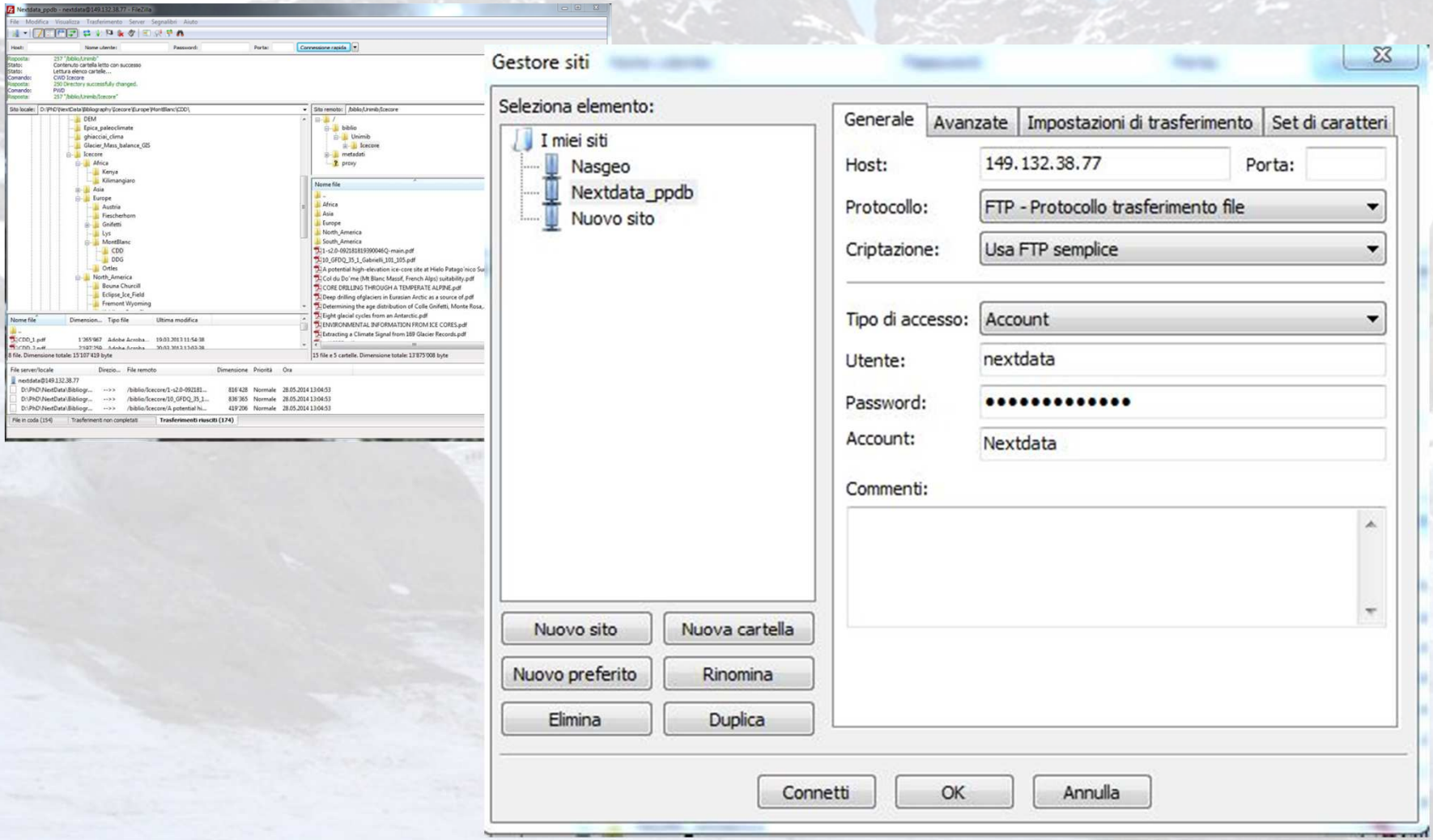
IceCore ID	CL0300751E04555NC33
Ice Core Name	CdL 03/1
Geographic Area	Alps Monte Rosa, Swiss Alps
Place name of Drilling site	Colle del Lys
Reference Long	7°51'32.73"E
Reference Lat	45°55'7.78"N
Altitude (m. a.s.l.)	4248
Lenght	102,38
X repositioned	7.85909167
Y repositioned	45.9187997
Replacement Class	4
Year Drilled	2003
Top of Core (m)	0
Core Diameter (cm)	9,8
Samples Taken to Date	No value
Source	DISAT
Method of drilling	Electromechanical
Drill Fluid	Dry
Original Principal Investigator	V. Maggi
University or Affiliate	DISAT, UNIMIB, Milano
ID paper	CdL03

European Ice cores Reference papers

ID paper	Year of pubblication	Principal Autor	Citation	DOI
CDD1	1999	S.Preunkert	S.PREUNKERT, D.WAGENBACH, M.LEGRAND, C. VINCENT Col du Do^me (Mt Blanc Massif, French Alps) suitability for ice-core studies in relation with past atmospheric chemistry over Europe. T ellus (2000), 52B, 993–1012	
CDD2	2013	S.Preunkert	S. Preunkert and M. Legrand Towards a quasi-complete reconstruction of past atmospheric aerosol load and composition (organic and inorganic) over Europe since 1920 inferred from Alpine ice cores Clim. Past Discuss., 9, 1099–1134, 2013	10.5194/cpd-9-1099-2013
CDD3	2003	S.Preunkert	Preunkert, S., D. Wagenbach, and M. Legrand, A seasonally resolved alpine ice core record of nitrate: Comparison with anthropogenic inventories and estimation of preindustrial emissions of NO in Europe, J. Geophys. Res., 108(D21), 4681.	10.1029/2003JD003475, 2003.
CDD4	2001	S.Preunkert	Preunkert, S., Legrand, M., Wagenbach, D., Sulfate trends in a Col du Dbme (French Alps) ice core: A record of anthropogenic sulfate levels in the European midtroposphere over the twentieth century, JOURNAL OF GEOPHYSICAL RESEARCH, VOL. 106, NO. D23, PAGES 31,991-32,004, DECEMBER 16, 2001	
CDD5	1976	L. LLIBOUTRY	LLIBOUTRY, L., BRIAT, M., CRESEVEUR, M., POURCHET M., 15 m DEEP TEMPERATURES IN THE GLACIERS OF MONT BLANC (FRENCH ALPS), Journal of Glaciology, Vel. 16, No. 74, 1976	
CDD6	1990	M. De Angelis	DeAngelis, M., Gaudichet, A., Saharan dust deposition over Mont Blanc (French Alps) during the last 30 years. Tellus (1991), 43B, 61-75.	
DDG1	2006	G.R. Burton	Burton,G.R., Rosman,K.J.R., Van de Velde, K,P, Boutron, C.F., A two century record of strontium isotopes from an ice core drilled at Mt Blanc, France Earth and Planetary Science Letters 248 (2006) 217–226	10.1016/j.epsl.2006.05.021
DDG2	1997	C. Vincent	VINCENT, C., VALLON, M., PINGLOT, F., FUNK, M., REYNAUD, L., Snow accuDlulation and ice flow at Dome du Gouter (4300 Dl), Mont Blanc, French Alps, Journal rifGlaciology, T70l. 43, No. 145, 1997	

Modalità di distribuzione del dato (M6)

- Italian Open Data License *(www.dati.gov.it)*
  - IODL 1.0 impone all'utente di citare la fonte delle informazioni e di pubblicare e condividere gli eventuali lavori derivati con la stessa licenza o con licenza compatibile (CC-BY-SA o ODbL);
  - IODL 2.0 impone all'utente unicamente di citare la fonte delle informazioni.
- Licenze creative commons - CC (*http://www.creativecommons.it/)*
  - CC:BY
  - CC:BY:SA
  - CC:BY:ND
  - CC:BY:NC
  - CC:BY:NC:SA
  - CC:BY:NC:ND


Gestore siti
Seleziona elemento:
I miei siti
Nasgeo
Nextdata_ppdb
Nuovo sito
Generale
Avanzate
Impostazioni di trasferimento
Set di caratteri
Host:
149.132.38.77
Porta:
Protocollo:
FTP - Protocollo trasferimento file
Criptazione:
Usa FTP semplice
Tipo di accesso:
Account
Utente:
nextdata
Password:
Account:
Nextdata
Commenti:
Nuovo sito
Nuova cartella
Nuovo preferito
Rinomina
Elimina
Duplica
Connetti
OK
Annulla

http://geomatic.disat.unimib.it/idb2