

# „International Generic Sample Number“

Eine Schnittstelle am Übergang zwischen realer Welt und „Linked Data“  
für wissenschaftliche Interoperabilität

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# Was erwartet Sie

Im Designprozess  
für PetDB fällt  
Kerstin Lehnert und  
ihr Team etwas in  
der Literatur auf !



2004

2008



Jens Klump  
reserviert einen  
Handle Namespace

Während der AGU  
San Francisco wird  
die IGSN (IGSN e.V.)  
Organisation mit  
Internationalen  
Partnern gegründet



2011

2021



IGSN und DataCite  
schließen eine  
strategische  
Partnerschaft

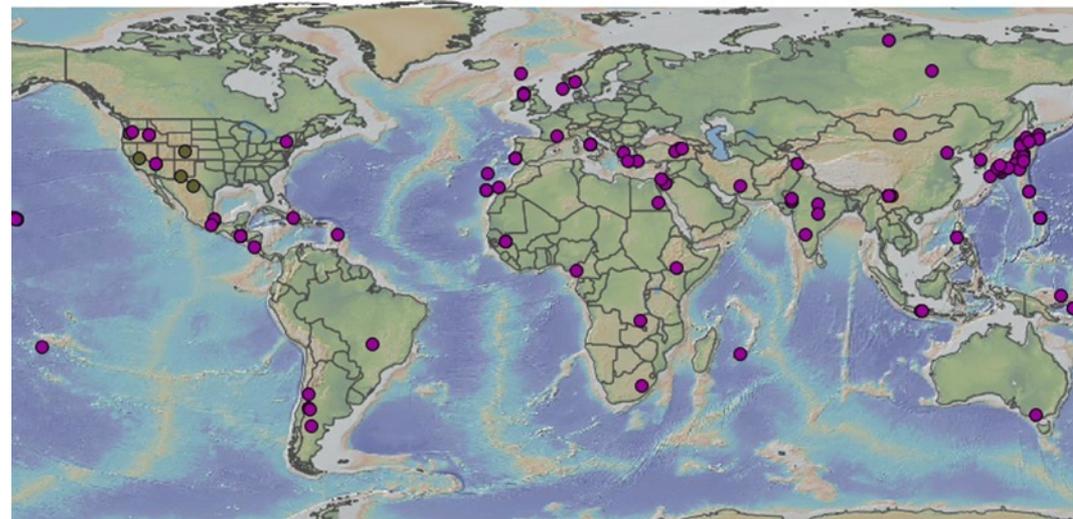


# Wissenschaftliche Proben in der Literatur

2004 Kerstin Lehnert und ihr Team am LDEO der Columbia führen mehrere Datenquellen zu einer „PetDB“ und später „EarthChem“ zusammen

<b>PetDB Identifier:</b>	ARGAMPH-003
<b>IGSN:</b>	N/A
	AMPH D-3(SUN, 1980) D3(ENGEL, 1964) PD3(TATSUMOTO, 1965) PD3(TATSUMOTO, 1966) AMPH-D3(MACDOUGALL, 1986) AMPH D-3(SCHILLING, 1975) S-10(SUBBARAO, 1972)
<b>Other Names:</b>	PV D-3(ENGEL, 1965) AMPH-3D(PINEAU, 1983) AMPH 3-PD3(HART, 1971) PD-3(HEDGE, 1970) PD-3(MUEHLENBACH, 1972) AMPH3D(PINEAU, 1976) D-3(SCHILLING, 1971) D-3(SCHEIDEGGER, 1981)

Eine Proben hatte in der Literatur viele Bezeichnungen



Eine Bezeichnung gehörte zu verschiedene Proben (Probe „M1“ kommt überall her)

# Wissenschaftliche Proben identifizieren?

**Handle**

**ARK**

**2004**

**URN**

**URI**

Gespräche mit dem prä-DataCite Projekt zu diesem Zeitpunkt ergaben, dass DOI nicht für physische Objekte geeignet wäre.

Kerstin Lehnert entwickelte das Konzept der IGSN „International GeoSample Number“ und baute einen Registrierungservice am LDEO auf, da Ihre Fallbeispiele in keines der Systeme so richtig passten.



Geochimica et Cosmochimica Acta  
Volume 124, 1 January 2014, Pages 283-308



## Tracing river chemistry in space and time: Dissolved inorganic constituents of the Fraser River, Canada

Britta M. Voss<sup>a, b</sup>, Bernhard Peucker-Ehrenbrink<sup>a</sup>, Timothy I. Eglinton<sup>a, c</sup>, Gregory Fiske<sup>d</sup>, Zhaohui Aleck Wang<sup>a</sup>, Katherine A. Hoering<sup>a</sup>, Daniel B. Montluçon<sup>a, c</sup>, Chase LeCroy<sup>a</sup>, Sharmila Pal<sup>a</sup>, Steven Marsh<sup>a</sup>, Sharon L. Gillies<sup>a</sup>, Alida Janmaat<sup>a</sup>, Michelle Bennett<sup>a</sup>, Bryce Downey<sup>a</sup>, Jenna Fanslau<sup>a</sup>, Helena Fraser<sup>a</sup>, Garrett Macklam-Harron<sup>a</sup>, Michelle Martinec<sup>a</sup>, Brayden Wiebe<sup>a</sup>

Show more

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<https://doi.org/10.1016/j.gca.2013.09.006>

Get rights and content

### Abstract

The Fraser River basin in southwestern Canada bears unique geologic and climatic features which make it an ideal setting for investigating the origins, transformations and delivery to the coast of dissolved riverine loads under relatively pristine conditions. We present results from sampling campaigns over three years which demonstrate the lithologic and hydrologic controls on fluxes and isotope compositions of major dissolved inorganic runoff constituents (dissolved nutrients, major and trace elements, <sup>87</sup>Sr/<sup>86</sup>Sr,



Geochimica et Cosmochimica Acta  
Volume 75, Issue 12, 15 June 2011, Pages 3335-3357



## Seasonal variability of element fluxes in two Central Siberian rivers draining high latitude permafrost dominated areas

Marie-Laure Bagard<sup>a</sup>, François Chabaux<sup>a</sup>, Oleg S. Pokrovsky<sup>b</sup>, Jérôme Viers<sup>b</sup>, Anatoly S. Prokushkin<sup>c</sup>, Peter Stille<sup>a</sup>, Sophie Rihs<sup>a</sup>, Anne-Désirée Schmitt<sup>d</sup>, Bernard Dupré<sup>b</sup>

Show more

+ Add to Mendeley Share Cite

<https://doi.org/10.1016/j.gca.2011.03.024>

Get rights and content

### Abstract

In order to constrain the origin and fluxes of elements carried by rivers of high latitude permafrost-dominated areas, major and trace element concentrations as well as Sr and U isotopic ratios were analyzed in the dissolved load of two Siberian rivers (Kochechum and Nizhnyaya Tunguska) regularly sampled over two hydrological cycles (2005–2007). Large water volumes of both rivers were also collected in spring 2008 in order to perform size separation through dialysis experiments. This study was completed by spatial sampling of the Kochechum watershed carried out during summer and by a detailed analysis of the main hydrological compartments of a small watershed. From element concentration variations along the hydrological cycle, different periods can be marked out, matching hydrological periods. During winter baseflow period (October to May)

Referenzen  
DOI

zentrum

# Was bedeuten Proben in der Literatur

IGSN: 10.58052/GRO00009



Fraser, Fitzwilliam.jpg  
(primary image)

IGSN: 10.58052/GRO00009  
Sample Name: 09FRA09  
Other Name(s): L.L.HDPE  
Sample Type: Individual Sample  
Parent IGSN: Not Provided

**Description**  
Material: Liquid-suspension  
Classification: Not Provided  
Field Name: Not Provided  
Description: Not Provided  
Age (min): Not Provided  
Age (max): Not Provided  
Collection Method: Not Provided  
Collection Method Description: Not Provided  
Size: Not Provided  
Geological Age: Not Provided  
Geological Unit: Not Provided  
Comment: Not Provided  
Purpose: Not Provided

**Collection**  
Field Program/Cruise: Not Provided  
Platform Name: Not Provided  
Platform Type: Not Provided  
Platform Description: Not Provided  
Launch Type: Not Provided  
Launch ID: Not Provided  
Launch Platform Name: Not Provided  
Collector/Chief Scientist: Not Provided  
Collector/Chief Scientist Detail: Bernard Pucker-Ehrenholz  
USA  
A 02543-1541,  
Woods Hole, MA 02543-1541,  
USA

**Geolocation**  
Latitude (WGS84): 52.85258  
Longitude (WGS84): -118.60632  
Northing (m) (UTM NAD83): Not Provided  
Easting (m) (UTM NAD83): Not Provided  
Zone: Not Provided  
Vertical Datum: Not Provided  
Elevation Start: Not Provided  
Elevation End: Not Provided  
Nav Type: Not Provided  
Physiographic Feature: Not Provided  
Name Of Physiographic Feature: Not Provided  
Location Description: Fraser River at F  
Locality: under Hwy 16 F  
Country: Canada  
State/Province: British Columbia  
County: Not Provided  
City: Jasper

**Related Samples**  
Parents: No Parents  
Siblings: No Siblings  
Children:  

- 10.58052/GRO000423 09FRA09
- 10.58052/GRO000496 09FRA09
- 10.58052/GRO000621 09FRA09
- 10.58052/GRO000622 09FRA09
- 10.58052/GRO001033 09FRA09 - Bank sed
- 10.58052/GRO001092 09FRA09 - D14C sed
- 10.58052/GRO001156 09FRA09 - D14C
- 10.58052/GRO001177 09FRA09 - DO14C

Relevant Documents:  
Fraser, Fitzwilliam.jpg (primary image)

Relevant Links:  
<http://dx.doi.org/10.1016/j.gca.2013.09.006>: Cited by

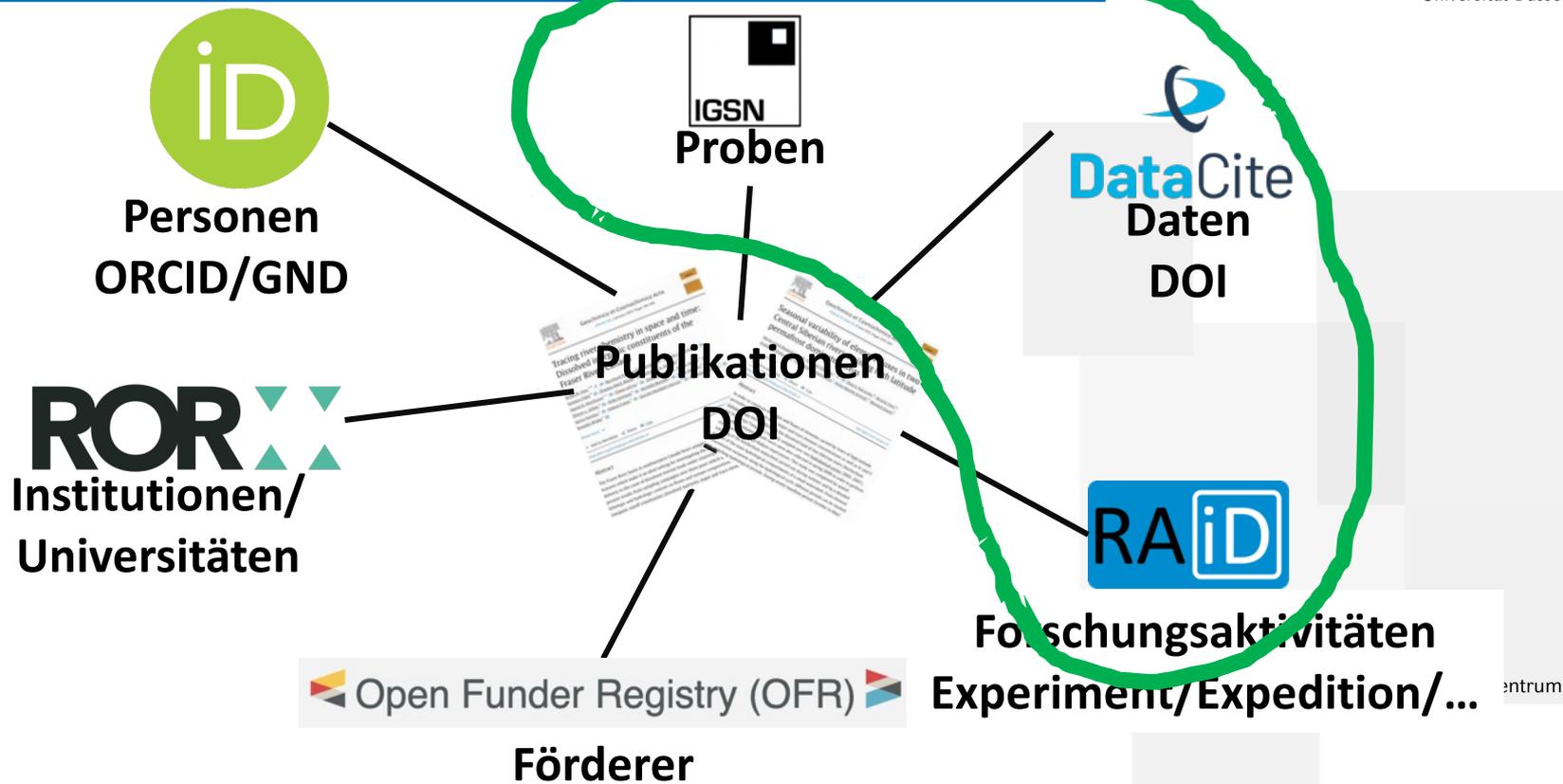
Site	IGSN	Date (yyyy-mm-dd)	Lat (°N)	Lon (°W)
Fraser at Fitzwilliam	GRO000009	2009-08-03	52.8526	118.6063
	GRO000027	2010-10-14		
Fraser at McBride	GRO000073	2011-06-03		
	GRO000011	2009-08-04	53.3023	120.1411
Fraser at Hansard	GRO000030	2010-10-14		
	GRO000070	2011-06-02		
Fraser at Stoner	GRO000012	2009-08-04	54.0817	121.8462
	GRO000038	2010-10-16		
Fraser at Lilloet	GRO000066	2011-06-01		
	GRO000018	2009-08-08	53.6384	122.6652
Fraser at Lytton	GRO000058	2010-10-19		
	GRO000022	2009-08-10	50.7080	121.9132
Fraser at Hope	GRO000045	2010-10-21		
	GRO000058	2011-05-28		
Fraser at Fort Langley	GRO000008	2009-08-01	50.2479	121.5910
	GRO000047	2010-10-22		
Fraser at Fort Langley	GRO000048	2010-10-24	49.3893	121.4557
	GRO000055	2011-05-27	49.3817	121.4486
Fraser at Fort Langley	GRO000001	2009-07-30	49.1801	122.5672
	GRO000025	2009-08-13		
Fraser at Fort Langley	GRO000051	2010-10-25		
	GRO000076	2011-06-07		
Fraser at Fort Langley	GRO000002	2009-07-28	49.2145	122.7829

DOI

bioRxiv preprint doi: <https://doi.org/10.1101/011111>; this version posted February 20, 2014. The copyright holder for this preprint (which was not certified by peer review) is the author/funder, who has granted bioRxiv a license to display the preprint in perpetuity. It is made available under aCC-BY-NC-ND 4.0 International license.

Date (yyyy-mm-dd)	Lat (°N)	Lon (°W)	Distance from source (km)	Elevation (masl)	Average precipitation (mm a <sup>-1</sup> )	Upstream drainage area (km <sup>2</sup> )	Average bedrock age (Ma)	Average discharge (km <sup>3</sup> a <sup>-1</sup> )
2009-08-03	52.8526	118.6063	50	1,085	594	672	764	1.4
2010-10-14								
2011-06-03								
2009-08-04	53.3023	120.1411	230	713	679	6,907	738	6.2
2010-10-14								
2011-06-02								
2009-08-04	54.0817	121.8462	480	604	644	18,088	700	14.5
2010-10-16								
2011-06-01								
2009-08-08	53.6384	122.6652	615	550	641	80,731	345	
2010-10-19								
2009-08-10	50.7080	121.9132	1050	200	330	152,364	254	54.7
2010-10-21								
2011-05-28								
2009-08-01	50.2479	121.5910	1110	145	433	156,342	251	
2010-10-22								
2010-10-24	49.3893	121.4557	1210	34	2,008	216,561	281	85.6
2011-05-27	49.3817	121.4486						
2009-07-30	49.1801	122.5672	1315	3	1,789	228,776	274	
2009-08-13								
2010-10-25								
2011-06-07								
2009-07-28	49.2145	122.7829	1336	1	1,708	228,993	274	99.6
2010-10-27								
2011-06-06								
2010-10-14	52.8515	118.6027	49	1,086	594	132	768	
2009-08-03	53.0506	119.2138	125	835	594	181	556	
2010-10-14								
2011-06-03								
2010-10-15	53.0602	119.6139	185	756	631	252	732	
2011-06-02								
2010-10-15	53.2518	120.0289	223	725	631	803	752	
2011-06-02								
2010-10-15	53.3221	120.2251	235	725	679	412	770	0.4
2011-06-02								

# Da ist er der PID Graph



# Aber zurück aus der Zukunft

Dezember 2011

AGU Annual Fall Meeting SF  
IGSN e.V. Gründungsveranstaltung

Frühjahr 2011

Meeting San Diego SCC

# 2008-2011

Technische  
Meetings

Erster Handle Präfix wurde  
Lizenziert „10273“



HOME MEMBERSHIP RESOURCES CONTACT

## IGSN e.V.

The IGSN e.V. is the Implementing Organization of the International Geo Sample Number IGSN, a unique identifier for samples and specimens collected from our natural environment.

The objective of the IGSN e.V. is to implement and promote standard methods to locate, identify, and cite physical samples with confidence by operating an international IGSN registration service with a distributed infrastructure for use by and benefit to its members.



Members of the IGSN e.V. at the founding event in December 2011.

The IGSN was developed by the System for Earth Sample Registration SESAR, with funding from the US National Science Foundation. SESAR currently operates all registration services for the IGSN. A new architecture for the IGSN that will advance broad and international implementation is under development and will be completed in 2012.

The IGSN e.V. is incorporated under German law as a not-for-profit society (gemeinnütziger eingetragener Verein) with a registered office at the GeoForschungsZentrum (GFZ) Potsdam.

The founding assembly of the IGSN e.V. was held on December 7, 2011, in San Francisco, California. The following founding members signed the statutes

### Recent News

**Linking between the literature and SESAR through IGSNs**  
Sept 2012. SESAR (System for Earth Sample Registration) is working with publishers to the citation of samples in digital journals...  
Post date:

**Important Presentations at the 34th International Geological Congress**  
Two talks in session 5.2 "Information management interoperability and standards: Data" on Wednesday August 8, 2012, will...  
Post date:

**34th International Geological Congress Workshop**  
The System for Earth Sample Registration and the IGSN e.V. will hold a workshop at the upcoming 34th International Geological...  
Post date:

**IGSN e.V. at EGU General Assembly 2012**  
Join the IGSN e.V. at Splinter Meeting SP... April 23, 2012, 19:00-20:00h, at the EGU General Assembly 2012 in Vienna, Austria...  
Post date:

[More News ...](#)

# Was brauchte es?



IGSN

Metadaten

DOI

Lokale  
Metadaten  
LandingPage

Metadaten

Doppelte  
Flexibilität

IDs

Wir haben schon eindeutige IDs???

URN-Syntax

```

namestring = assigned-name
             [ rq-components ]
             [ f-component ]
assigned-name = "urn" ":" NID ":" NSS
NID           = (alphanum) @x30(ldh) (alphanum)
ldh           = alphanum / "-"
NSS           = pchar *(pchar / "/" )
rq-components = [ "?"* r-component ]
               [ "?"* q-component ]
r-component   = pchar *( pchar / "/" / "?" )
q-component   = pchar *( pchar / "/" / "?" )
f-component   = fragment

; general URI syntax rules (RFC3986)
fragment      = *( pchar / "/" / "?" )
pchar         = unreserved / pct-encoded / sub-delims / ":" / "@"
pct-encoded   = "%" HEXDIG HEXDIG
unreserved    = ALPHA / DIGIT / "-" / "." / "_" / "~"
sub-delims    = "!" / "$" / "&" / "'" / "(" / ")" / "*" / "+" / "," / ";" / "="
alphanum      = ALPHA / DIGIT ; obsolete, usage is deprecated
    
```



Geomar



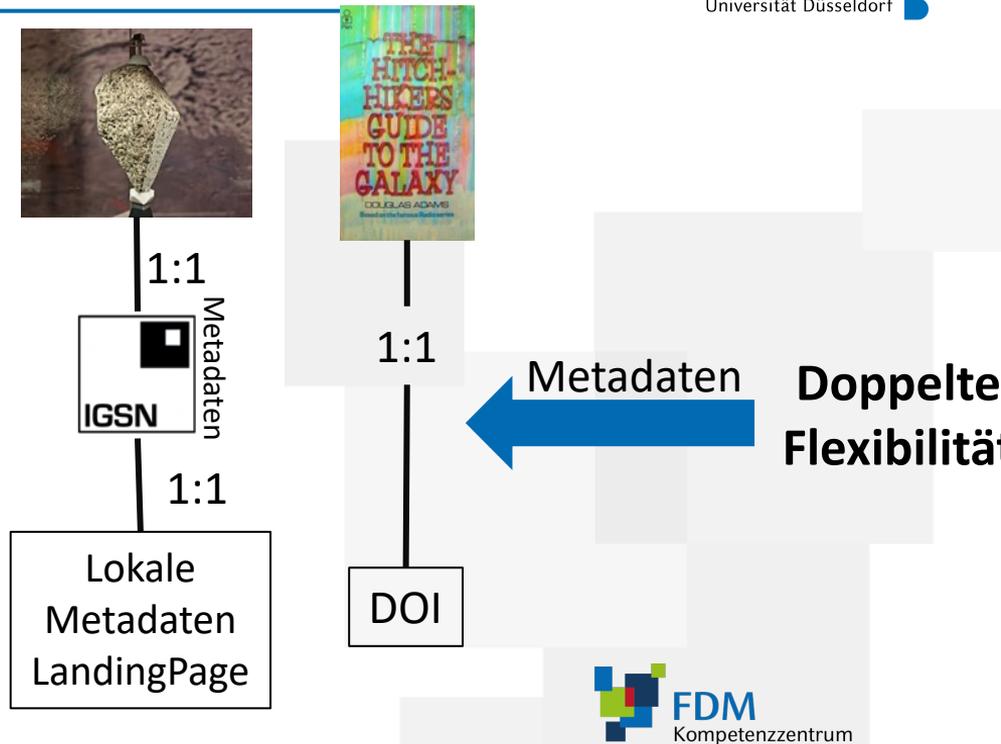
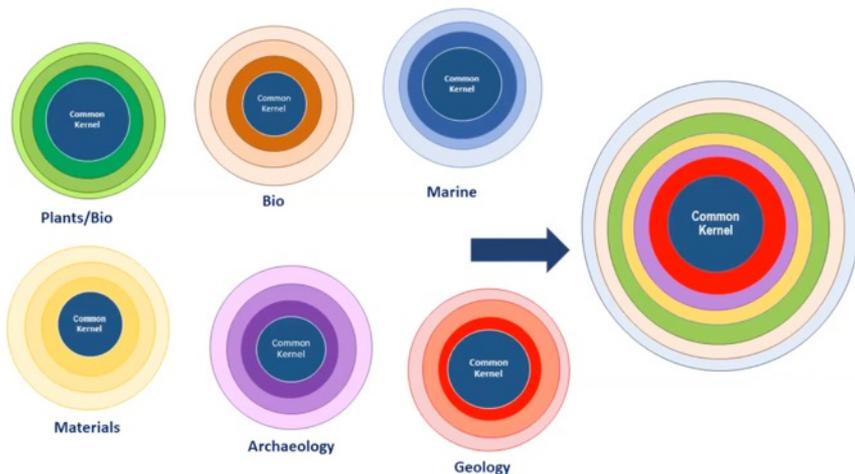
NK-Bi



HB-Ki

# Was brauchte es?

## IGSN Community of Communities



<https://blogs.loc.gov/law/2014/09/return-of-the-card-catalog/>

# Was brauchte es?

URN-Syntax

```
namestring = assigned-name  
            [ rq-components ]  
            [ "a" f-component ]  
assigned-name = "urn:" NID ":" NSS  
NID = (alphanum) &#x30;(ldh) (alphanum)  
ldh = alphanum / "-"  
NSS = pchar *(pchar / "/" )  
rq-components = [ "?"* r-component ]  
                [ "?"* q-component ]  
r-component = pchar *( pchar / "/" / "?" )  
q-component = pchar *( pchar / "/" / "?" )  
f-component = fragment  
  
; general URI syntax rules (RFC3986)  
fragment = *( pchar / "/" / "?" )  
pchar = unreserved / pct-encoded / sub-delims / ":" / "@"  
pct-encoded = "%" HEXDIG HEXDIG  
unreserved = ALPHA / DIGIT / "-" / "." / "_" / "~"  
sub-delims = "!" / "$" / "&" / "'" / "(" / ")" / "*" / "+" / "," / ";" / "="  
  
alphanum = ALPHA / DIGIT ; obsolete, usage is deprecated
```

SESAR

GRO000009

SSH000SUA

International Continental Drilling

ICDP5054ESYI201

Geoscience Australia

AU6114973

AU1

Doppelte  
Flexibilität

IDs



Wir haben schon eindeutige IDs????



Geomar



NK-Bi



HB-Ki

## 2018

Der Betrieb der Infrastruktur auf Basis von „in kind contribution“ & „freiwilligen Einsatz“ hatte zwar 10 Jahre ohne Ausfälle funktioniert, allerdings wurde bei über 20 Organisationen und >10 Mio IGSNs das Ende der Fahnenstange sichtbar

IGSN konnte durch eine Finanzierung der Alfred P. Sloan Foundation ein Projekt zur Modernisierung durchführen: IGSN 2040.

# Skaliert das? Warum ist das wichtig?



1000 km  
Bohrkerne



1m wird ca. 50  
mal beprobt



50 Mio Proben  
für viele verschiedene  
Messungen



Ca. 3 Mrd Proben  
in Museen



Isotopenmessungen  
und Analysen  
für einzelne mm<sup>2</sup>

# Skaliert das? Warum ist das wichtig?

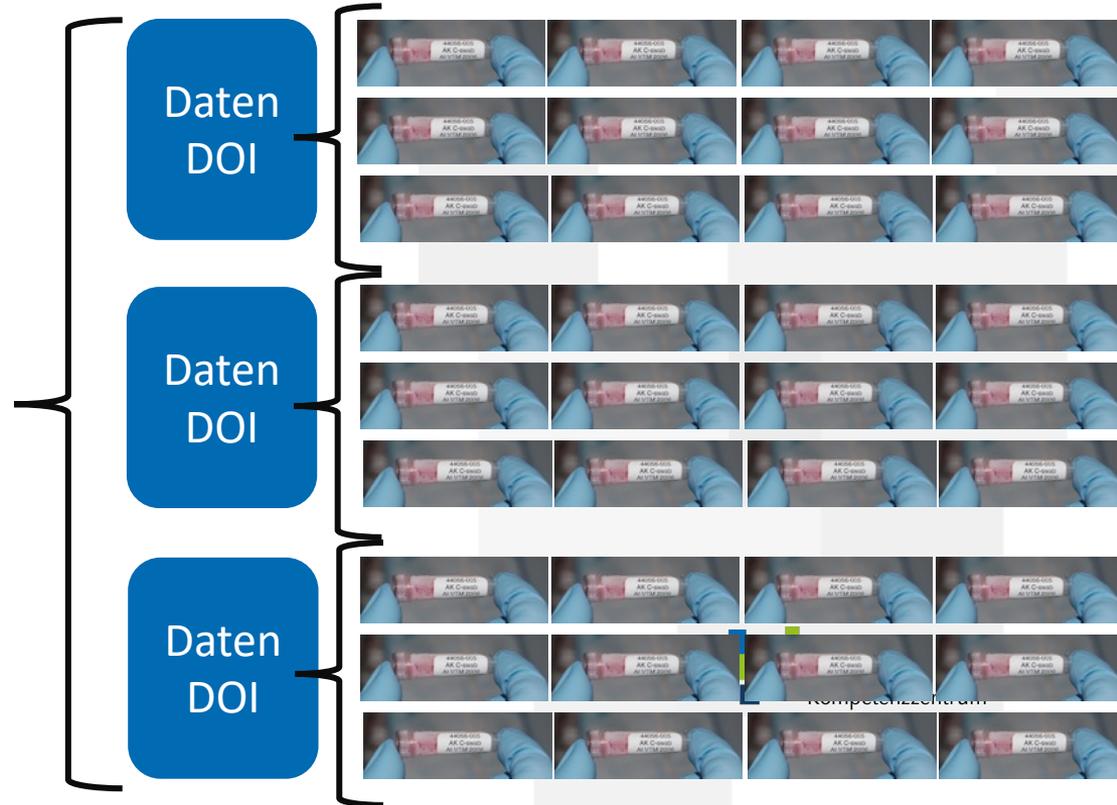
ca. 50  
Mio  
Proben  
erhalten

50 Mio Proben  
für viele verschiedene  
Messungen



1:m:n

Isotopenmessungen  
und Analysen  
für einzelne mm<sup>2</sup>



## 2018

Der Betrieb der Infrastruktur auf Basis von „in kind contribution“ & „freiwilligen Einsatz“ hatte zwar 10 Jahre ohne Ausfälle funktioniert, allerdings wurde bei über 20 Organisationen und >10 Mio IGSNs das Ende der Fahnenstange sichtbar

IGSN konnte durch die Alfred P. Sloan Foundation finanziert ein Projekt zur Modernisierung möglich machen: IGSN 2040.

## 2021

Es war notwendig einen Partner zu finden, der entweder die gleiche Zielgruppe hatte oder technische Unterstützung leisten konnte



# DataCite und IGSN - 2021

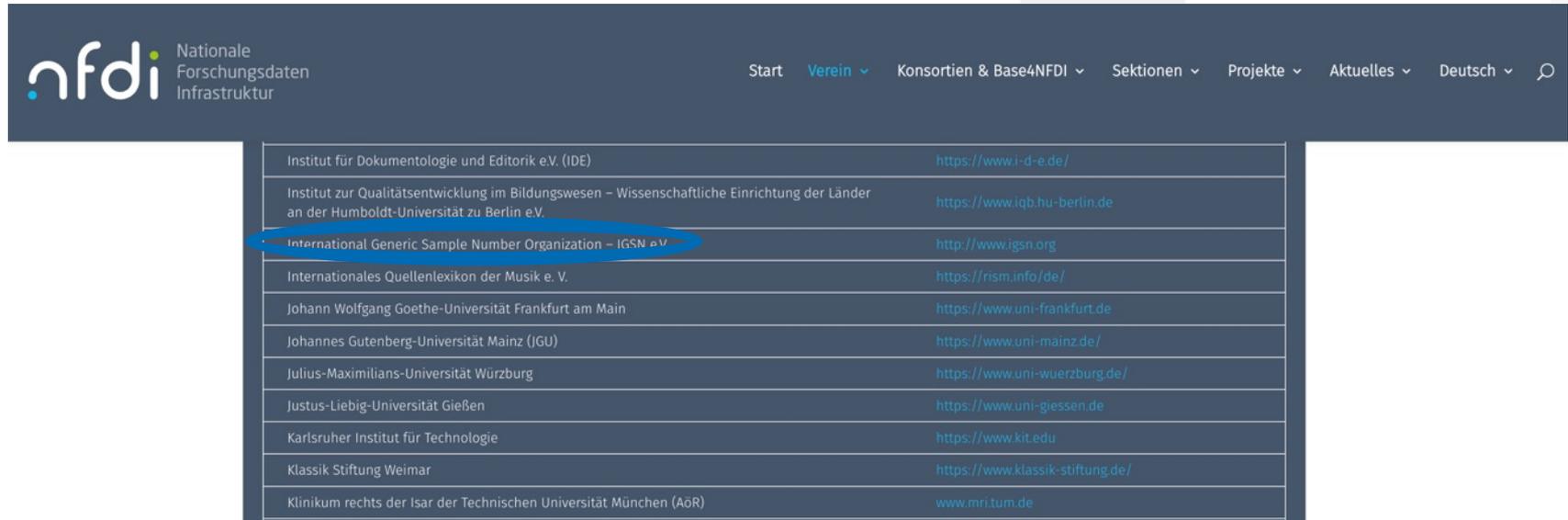
SESAR 10.58052/  
GRO000009  
SSH000SUA

International Continental Drilling 10.60510/  
ICDP5054ESYI201

ID	Name	DOI Registrations				DOI Metadata	
		Total	2023	2022	This month	Findable	Registered
VVHA	Geoscience Australia	7,012,692	7,004,694	320	234	5,952,282	1,060,410
CERN	CERN - European Organization for Nuclear Research	5,820,642	903,016	1,412,095	114,060	4,945,572	875,070
XAQP	Interdisciplinary Earth Data Alliance (IEDA)	4,932,140	4,932,140	0	7,961	4,926,046	6,094
OTJM	Figshare Internal	2,934,036	286,169	394,572	18,122	2,794,536	139,500
TAWJ	University of Tartu	2,864,795	475,658	274	44	2,864,779	16
STDP	ETH Zurich	2,630,398	344,773	265,438	38,073	2,624,430	5,968
ARXIV	arXiv	2,370,684	186,358	2,184,326	14,514	2,370,684	0
GBIF	Global Biodiversity Information Facility	2,338,428	595,361	538,250	36,863	2,337,876	552
SAGE	SAGE Publishing	2,148,882	77,648	83,664	5,535	650,539	1,498,343
RG	ResearchGate	1,457,805	122,753	104,304	11,375	1,157,248	300,557
FAO	FAO	1,356,256	184,377	121,236	3,124	1,356,256	0
ZYPI	Leibniz Institute DSMZ – German Collection of Micro...	1,142,071	383,360	269,336	0	1,142,071	0

# International Generic Sample Number

## NFDI Mitglied



The screenshot shows the NFDI website with a list of member organizations. The entry for 'International Generic Sample Number Organization - IGSN e.V.' is highlighted with a blue circle. The website header includes the NFDI logo and navigation links: Start, Verein, Konsortien & Base4NFDI, Sektionen, Projekte, Aktuelles, and Deutsch.

Organization Name	Website URL
Institut für Dokumentologie und Editorik e.V. (IDE)	<a href="https://www.i-d-e.de/">https://www.i-d-e.de/</a>
Institut zur Qualitätsentwicklung im Bildungswesen – Wissenschaftliche Einrichtung der Länder an der Humboldt-Universität zu Berlin e.V.	<a href="https://www.iqb.hu-berlin.de">https://www.iqb.hu-berlin.de</a>
International Generic Sample Number Organization – IGSN e.V.	<a href="http://www.igsn.org">http://www.igsn.org</a>
Internationales Quellenlexikon der Musik e. V.	<a href="https://rism.info/de/">https://rism.info/de/</a>
Johann Wolfgang Goethe-Universität Frankfurt am Main	<a href="https://www.uni-frankfurt.de">https://www.uni-frankfurt.de</a>
Johannes Gutenberg-Universität Mainz (JGU)	<a href="https://www.uni-mainz.de/">https://www.uni-mainz.de/</a>
Julius-Maximilians-Universität Würzburg	<a href="https://www.uni-wuerzburg.de/">https://www.uni-wuerzburg.de/</a>
Justus-Liebig-Universität Gießen	<a href="https://www.uni-giessen.de">https://www.uni-giessen.de</a>
Karlsruher Institut für Technologie	<a href="https://www.kit.edu">https://www.kit.edu</a>
Klassik Stiftung Weimar	<a href="https://www.klassik-stiftung.de/">https://www.klassik-stiftung.de/</a>
Klinikum rechts der Isar der Technischen Universität München (AöR)	<a href="www.mri.tum.de">www.mri.tum.de</a>

# International Generic Sample Number

## Take Home Message: IGSN

- ist ein PID für die Nachvollziehbarkeit von Proben über Instituts- und Systemgrenzen hinweg und zur Verknüpfung mit Publikationen
- Stellt einen PID für physische Proben auf der Basis eines global eindeutigen und auflösbaren Identifiers
- PIDs werden bereits von hochkarätigen Forschungseinrichtungen, Universitäten und Regierungsbehörden genutzt und von Wissenschaftsverlagen akzeptiert
- PIDs sind jetzt über DataCite und seine Mitglieder erhältlich – ein Service, eine Mitgliedschaft

Danke ans  
Team



Fragen?