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ESSD:
Real World Issues and Challenges of High-Quality Data Publication

Hans Pfeiffenberger and David Carlson

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Helmholtz Association – Bremerhaven, Germany
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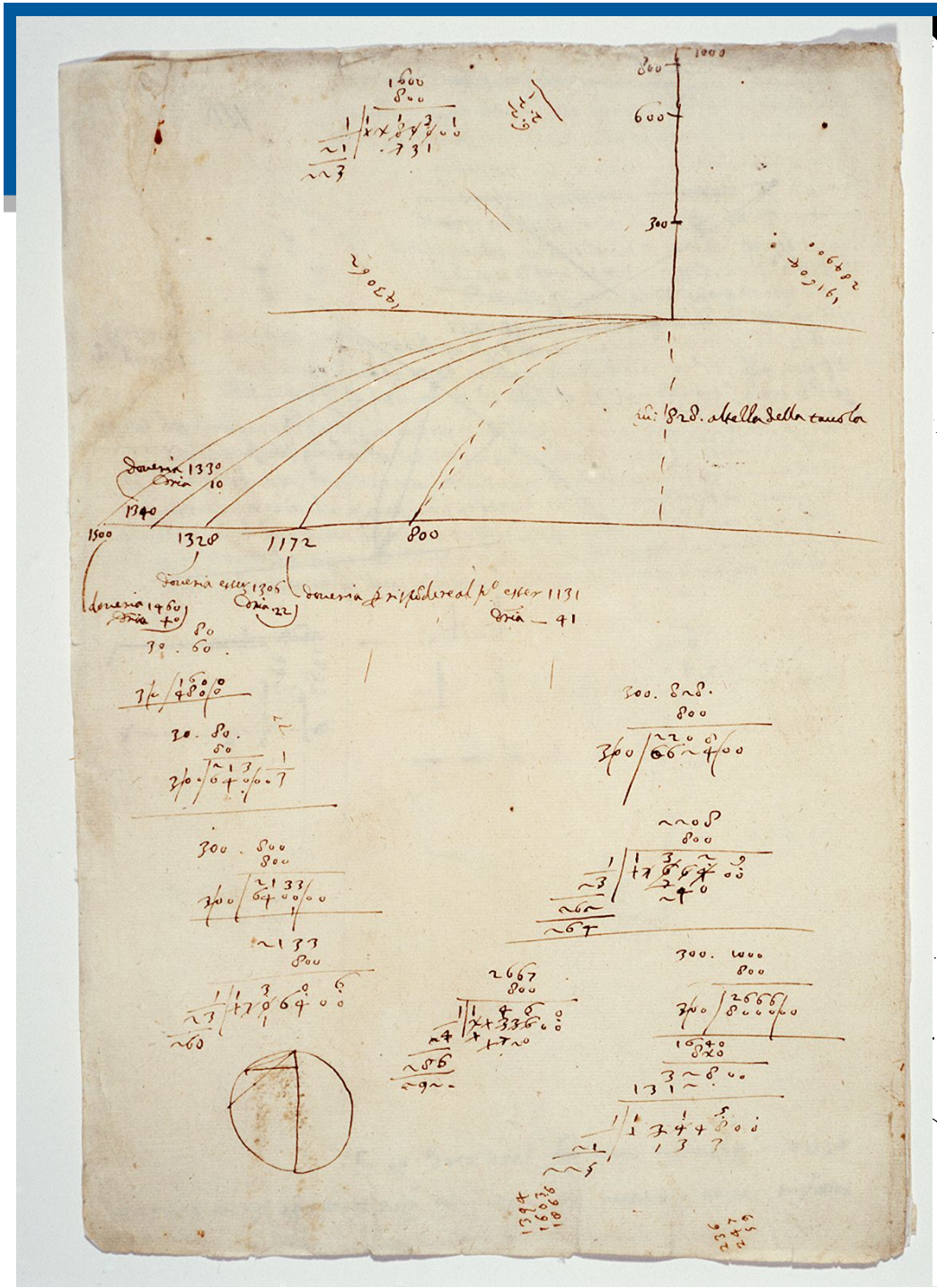
EGU2013, 2013-04-12, Vienna

AWI



PHILOSOPHICAL

TRANSACTIONS:

GIVING SOME

ACCOMPT

OF THE PRESENT

Undertakings, Studies, and Labours

OF THE

INGENIOUS

IN MANY

CONSIDERABLE PARTS

OF THE

WORLD.

Vol I.

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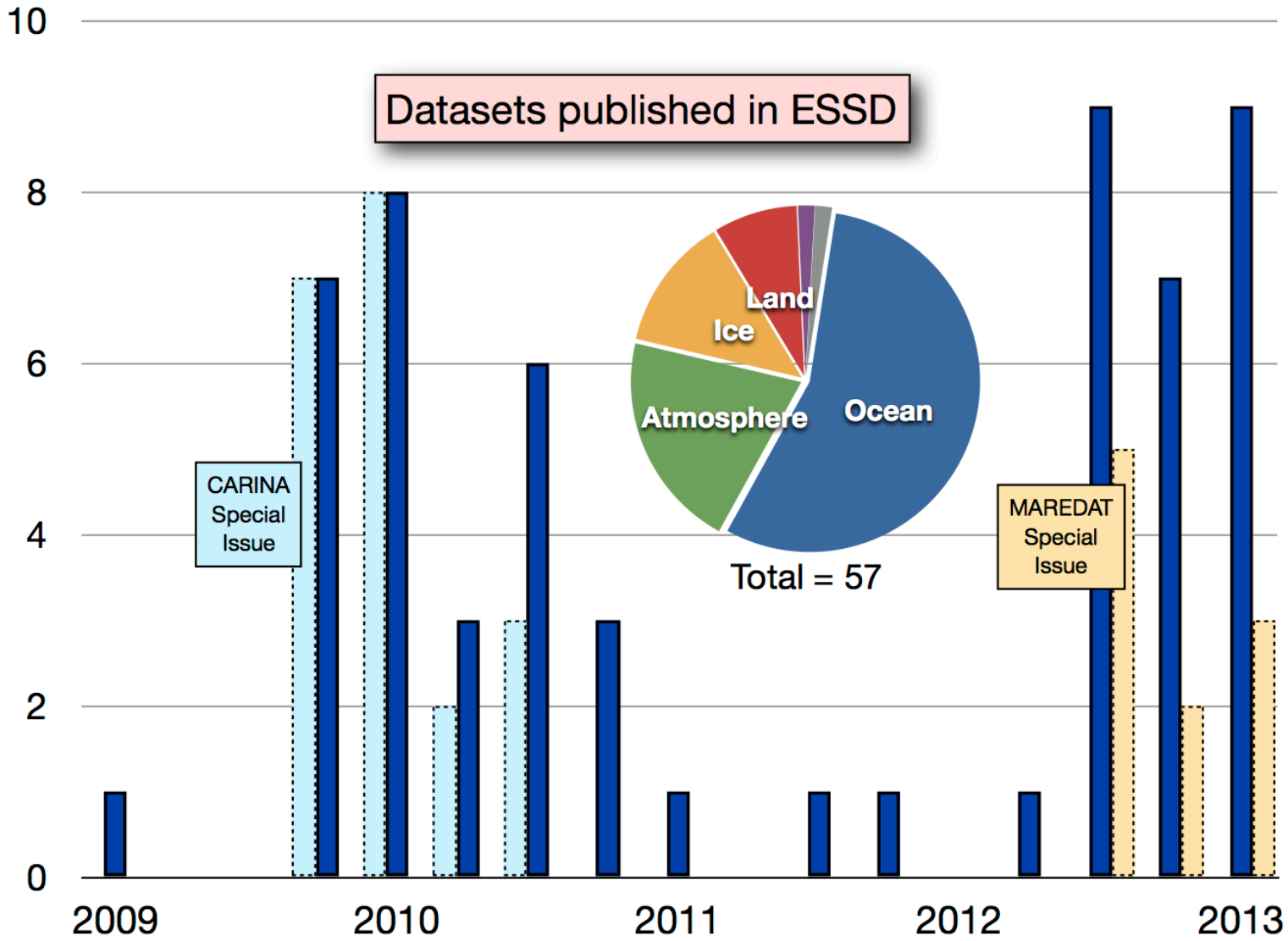

Tuesday, 26 March 2013

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2013: CO above Troll Station, Original Data

Earth System Science Data
The Data Publishing Journal

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Earth Syst. Sci. Data Discuss., 6, 1-26, 2013
www.earth-syst-sci-data-discuss.net/6/1/2013/
doi:10.5194/essdd-6-1-2013

Mesospheric CO above Troll station, Antarctica observed by a ground based microwave radiometer

C. Straub[1], P. J. Espy[1], R. E. Hibbins[1], and D. A. Newnham[2]
[1]Norwegian University of Science and Technology (NTNU), Trondheim, Norway
[2]British Antarctic Survey, Cambridge, UK

Abstract. This paper presents mesospheric carbon monoxide (CO) data acquired by the ground-based microwave radiometer of the British Antarctic Survey (BAS radiometer) stationed at Troll station in Antarctica (72° S, 2.5° E, 1270 a.m.s.l.). The data set covers the period from February 2008 to January 2010, however, due to very low CO

2013: CO above Troll Station, Original Data

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Middle atmospheric carbon monoxide above Troll station, Antarctica from February 2008 - January 2010

GB/NERC/BAS/PDC/00789

Summary

Abstract:
This data set contains mesospheric carbon monoxide (CO) data acquired by the ground-based microwave radiometer of the British Antarctic Survey (BAS radiometer) stationed at Troll station in Antarctica (72 deg S, 2.5 deg E, 1270 amsl). The BAS radiometer has been designed in order to study the effects of energetic particle precipitation on the middle and upper atmosphere, using nitric oxide and ozone measurements. This data set contains the CO measurements carried out in order to study the dynamical context.
The data set covers the period from February 2008 to January 2010, however, due to very low CO concentrations

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Jump To:

- Basic Information
- Additional Information
- Locality
- Instrumentation
- Storage
- Contraints

General Information
Submission
Review

Abstract. This paper presents mesospheric carbon monoxide (CO) data acquired by the ground-based microwave radiometer of the British Antarctic Survey (BAS radiometer) stationed at Troll station in Antarctica (72° S, 2.5° E, 1270 a.m.s.l.). The data set covers the period from February 2008 to January 2010, however, due to very low CO

2013: CO above Troll Station, Original Data

```
BAS microwave radiometerCO profiles acquired at Troll station, Antarctica between Feb 2008 and Jan 2010
Contact: Patrick Espy, tel:  +47 73 55 10 95, email: patrick.espy@ntnu.no
-------------------------------------------------------------------------------
date [UT]:                          2009-10-19 10:44:06
apriori contribution: The profile is most reliable where the contribution from the a priori profile is less than approx.
                      Negative values are a scaling artifact and should be regarded as close to 0.

The 2-sigma systematic errors provided have been determined using perturbation calculations:

temperature error:    error induced by the temperature profile (estimated error = 5K) needed as
                      additional information for the retrieval, mainly random
calibration error:    error induced by the calibration of the measured spectrum (estimated error = 10 percent), can be sys
spectroscopy error: we used lineintensity from HITRAN 2004 with an estimated error of 2 percent, systematic
channel shape error: uncertainty due to the use of a modified channel response function in the retrieval in order to cor
                      for an instability in one of the radiometers local oscillators after 2008-08-09, systematic
Error from measurement noise [K]:  0.1510, random
Smoothing error:      This error only needs to be considered if the profiles of the BAS radiometer are compared to
                      profiles with a significantly larger vertical resolution. For such a comparison the
                      better way would be to convolve the high-resolution profile with the AVK of the retrievals.

Sum of errors:        To build the sum of certain errors they are added up as follows sqrt(error1^2 + error2^2)
-------------------------------------------------------------------------------
```

pressure [hPa]	altitude [km]	vmr [ppmv]	apriori contribution [percent]	temperature error [ppmv]		calibration error [ppmv]		spectroscopy error [ppmv]
0.749894	50.679	0.060	-5.939	0.003	0.048	0.010	0.234	0.011
0.562341	53.021	0.065	-20.151	0.002	0.056	0.011	0.319	0.012
0.421697	55.337	0.072	-27.600	0.002	0.061	0.012	0.349	0.013
0.316228	57.609	0.080	-29.442	0.004	0.067	0.013	0.298	0.015

Sun-earth Interactions

on the middle and upper atmosphere, using nitric oxide and ozone measurements. This data set contains the CO measurements carried out in order to study the dynamical context.
The data set covers the period from February 2008 to January 2010, however, due to very low CO concentrations

- Storage
- Contraints

General Information

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Review

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2012: Nature CC & ESSD; Carbon data aggregation at global scale

nature climate change

NATURE CLIMATE CHANGE | COMMENTARY

The challenge to keep global warming below 2 °C

Glen P. Peters, Robbie M. Andrew, Tom Boden, Josep G. Canadell, Philippe Ciais, Corinne Le Quéré, Gregg Marland, Michael R. Raupach & Charlie Wilson

Affiliations | Contributions | Corresponding author

Nature Climate Change (2012) | doi:10.1038/nclimate1783
Published online 02 December 2012

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2012: Nature CC & ESSD; Carbon data aggregation at global scale

Earth Syst. Sci. Data Discuss., 5, 1107–1157, 2012
www.earth-syst-sci-data-discuss.net/5/1107/2012/
doi:10.5194/essdd-5-1107-2012

Open Access Earth System Science Data Discussions

The global carbon budget 1959–2011

C. Le Quéré[1], R. J. Andres[2], T. Boden[2], T. Conway[3], R. A. Houghton[4], J. I. House[5], G. Marland[6], G. P. Peters[7], G. van der Werf[8], A. Ahlström[9], R. M. Andrew[7], L. Bopp[10], J. G. Canadell[11], P. Ciais[10], S. C. Doney[12], C. Enright[1], P. Friedlingstein[13], C. Huntingford[14], A. K. Jain[15], C. Jourdain[1,*], E. Kato[16], R. F. Keeling[17], K. Klein Goldewijk[25], S. Levis[18], P. Levy[14], M. Lomas[19], B. Poulter[10], M. R. Raupach[11], J. Schwinger[20], S. Sitch[21], B. D. Stocker[22], N. Viovy[10], S. Zaehle[23], and N. Zeng[24]

[1]Tyndall Centre for Climate Change Research, University of East Anglia, Norwich Research Park, Norwich, NR4 7TJ, UK
[2]Carbon Dioxide Information Analysis Center (CDIAC), Oak Ridge National Laboratory, Oak Ridge, Tennessee, USA
[3]National Oceanic & Atmosphere Administration, Earth System Research Laboratory (NOAA/ESRL), Boulder, Colorado 80305, USA
[4]Woods Hole Research Centre (WHRC), Falmouth, Massachusetts 02540, USA
[5]Cabot Institute, Dept of Geography, University of Bristol, UK

2012: Nature CC & ESSD; Carbon data aggregation at global scale

	A	B	C	D	E	F	G
1		**Terrestrial CO_2 sink (positive values represent a flux from the atmosphere to the land)**					
2		All values in petagrams of carbon per year (PgC/yr), for the globe. For values in carbon dioxide (CO_2), multi					
3		1PgC = 1 petagram of carbon = 1 billion tonnes C = 1 gigatonne C = 3.67 billion tonnes of CO_2					
4		**Cite as:**					
5		CLM4CN	Lawrence, D. M., Oleson, K. W., Flanner, M. G., Thornton, P. E., Swenson, S. C., Lawrence,				
6		HYLAND	Levy, P. E., M. G. R. Cannell, et al. (2004). "Modelling the impact of future changes in clim				
7		LPJ-GUESS	Smith, B., I. C. Prentice, et al. (2001). "Representation of vegetation dynamics in the mod				
8		LPJ	Sitch, S., B. Smith, et al. (2003). "Evaluation of ecosystem dynamics, plant geography and				
9		O-CN	Zaehle, S., P. Ciais, et al. (2011). "Carbon benefits of anthropogenic reactive nitrogen offs				
10		ORCHIDEE	Krinner, G., N. Viovy, et al. (2005). "A dynamic global vegetation model for studies of the				
11		SDGVM	Woodward, F. I. and M. R. Lomas (2004). "Vegetation dynamics - simulating responses to				
12		JULES	Clark, D. B., L. M. Mercado, et al. (2011). "The Joint UK Land Environment Simulator (JULE				
13		VEGAS	Zeng, N., A. Mariotti, et al. (2005). "Terrestrial mechanisms of interannual CO2 variability.				
14							
15			Terrestrial CO2 sink as a residual	**Models**			
16	Year		of the global carbon budget	CLM4CN	HYLAND	LPJ-GUESS	LPJ
17	1959	0,42		0,79	2,02	0,42	-0,83
18	1960	1,14		0,75	1,53	1,16	0,81
19	1961	1,20		0,30	1,71	-0,07	-0,55
20	1962	1,76		0,79	2,37	1,25	0,57
21	1963	1,72		-1,20	1,81	0,26	-0,37

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Nature Cli
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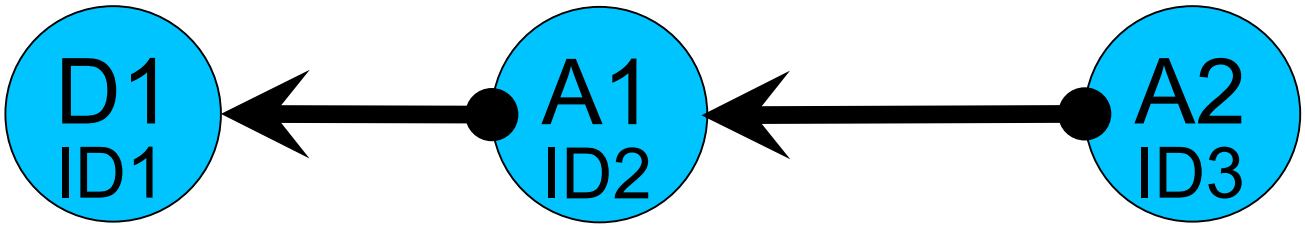
A Naive Theory of Digital Objects and Identifiers



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Interpretation Article

A Naive Theory of Digital Objects and Identifiers

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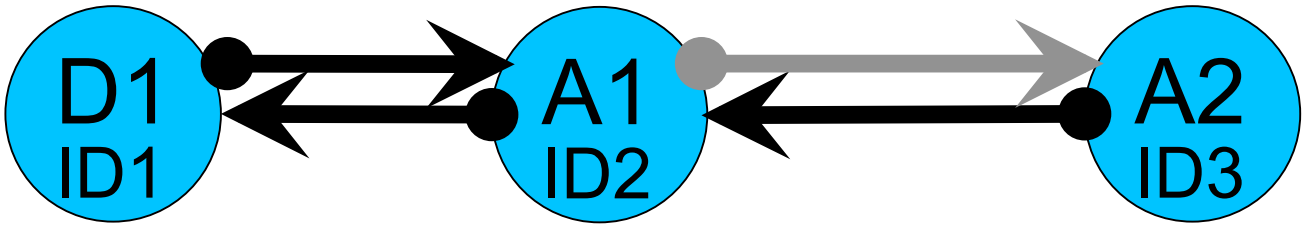
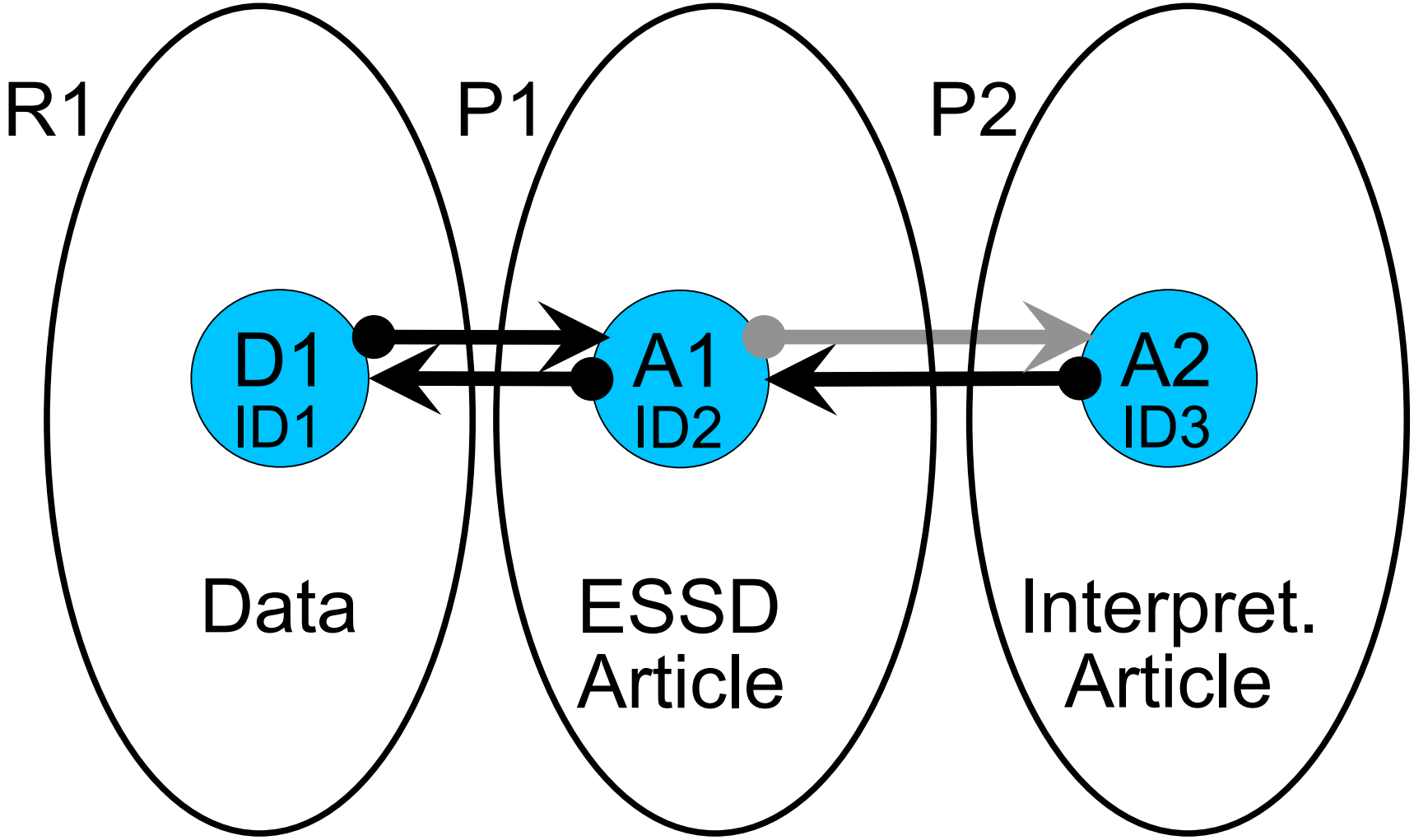


Data

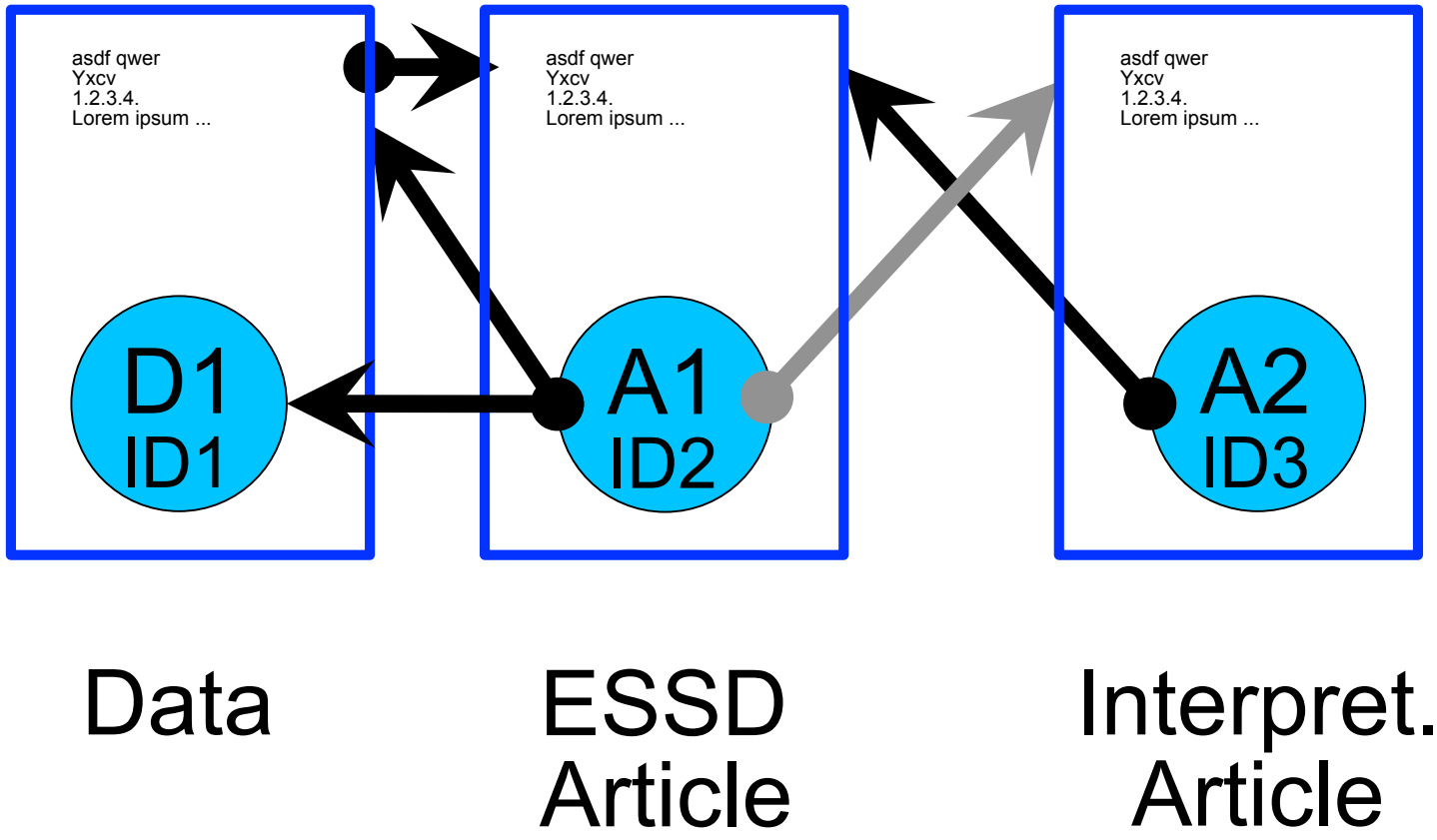
ESSD Article

Interpretation Article

Meanwhile in The Real World ™ : Production Environments



In The Real World ™ : Landing Pages, a Level of Indirection

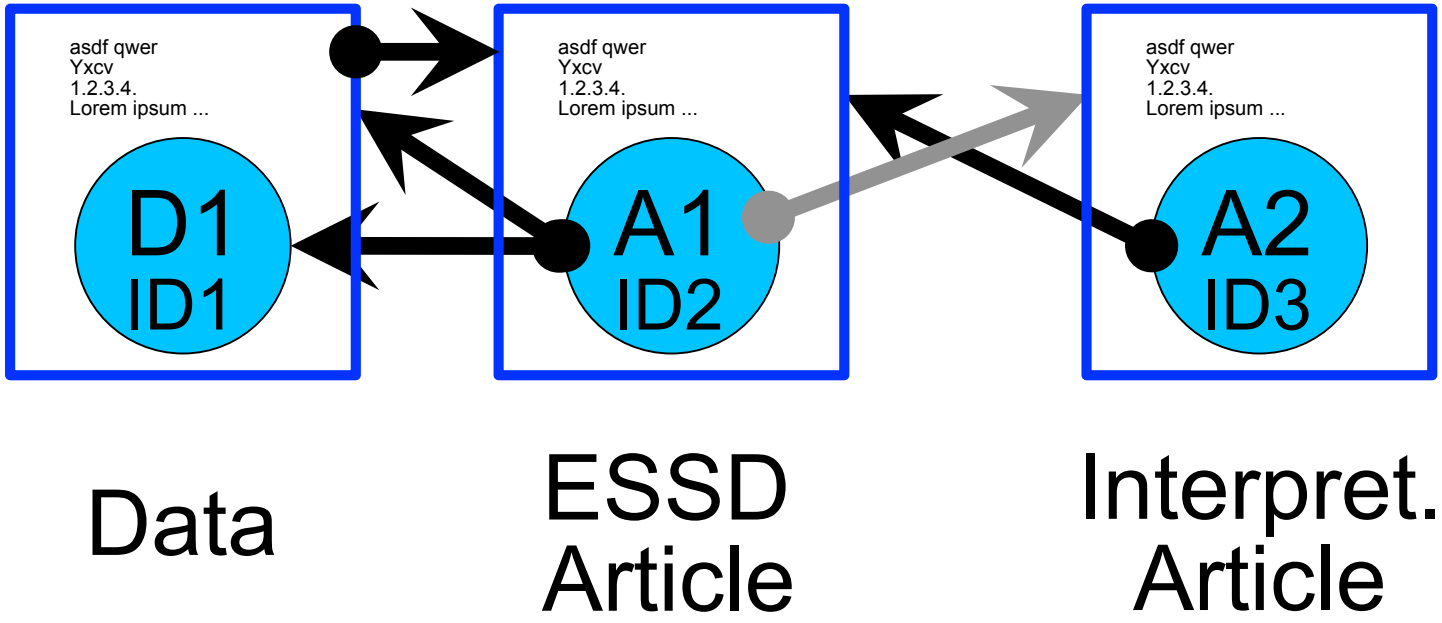


Versioning of Data

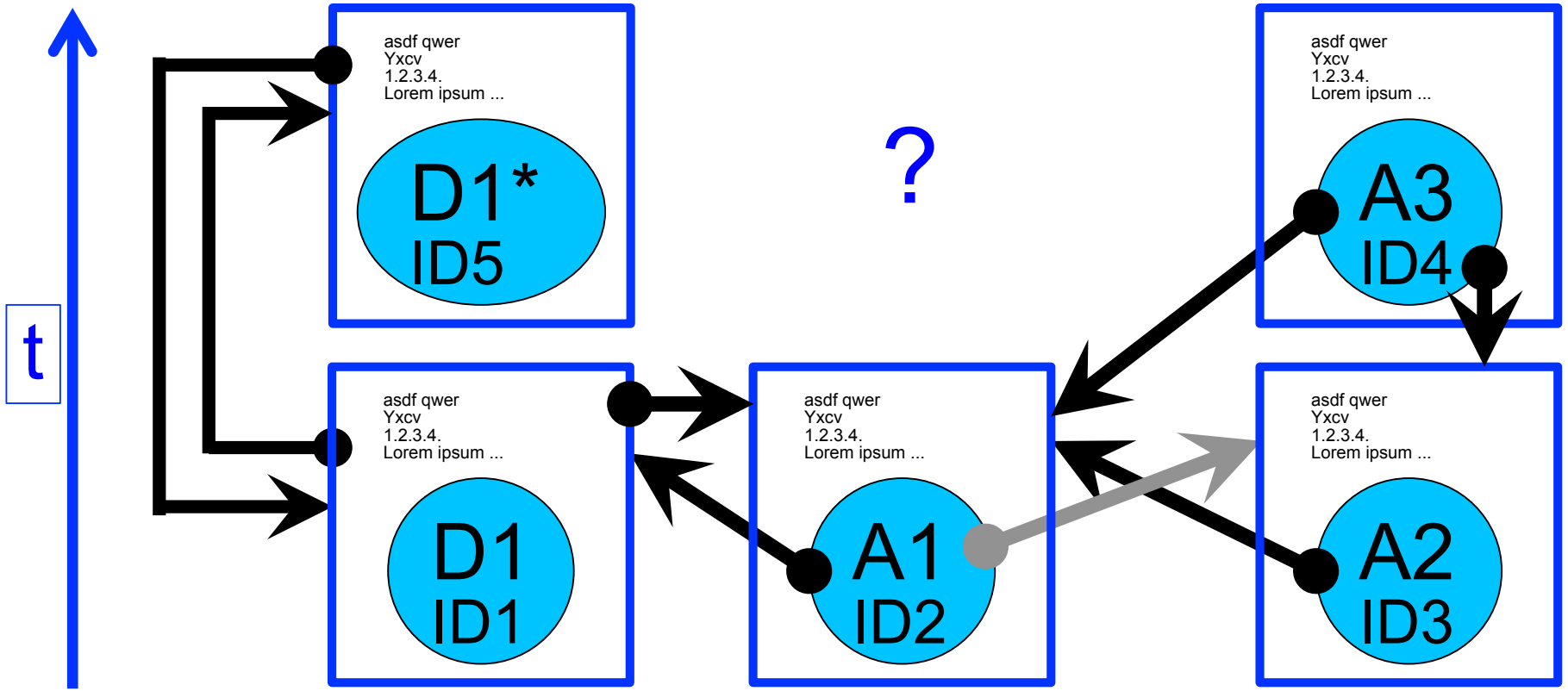
- Very good reasons for versions:

- Corrections (firmware bug in sensor found late)
- Improvements (better calibration function found)
- Extensions (in time or space)

In The Real World ™ : How to Find the Original / Improved Version



In The Real World ™ : How to Find the Original / Improved Version



Conclusion

- Include Real World™ as well as Good Scientific Practise considerations in the Research Data Infrastructure architecture
- One issue is timing:
  - Short timescale : Synchronous production of data & article
  - Longer timescale : „Better“ vs. cited/used versions
- We suggest to resolve the issues under the umbrella of the Research Data Alliance

Thank you!

www.earth-syst-sci-data.net/