The Paleoclimate Modelling Intercomparison Project Phase 3 …

… and the PMIP3 Database

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Paleoclimate Modelling Intercomparison Project 3

https://pmip3.lsce.ipsl.fr/

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This presentation…

- Will not be given by an experimented showman
- Should give a rough idea of what "paleo" is
  → paleoclimate (i.e. *climate of the past* ☺)
  for software engineers and ESGF members
  - CMIP5 Paleoclimate periods
    0k / pre-industrial
    6k / mid-Holocene
    21k / Last Glacial Maximum
    LM / Last Millennium
  - other (non CMIP5) : PlioMIP AGCM, PlioMIP AOGCM, last interglacial,…
- Remember this presentation when we send you (go-essp-tech) mails about our paleo-related problems

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A super brief history of PMIP

- 3rd phase in 15+ years
- netCDF files from the start
  - PMIP 1 ➔ Atmosphere only models
    AMIP variable names, ftp server
  - PMIP 2 ➔ Atmosphere-Ocean(-Vegetation)
    CMIP3 names and CMOR/CF
    OPeNDAP server
    CMIP3-like file hierarchy
    ➔10650 files, 480 Gb
  - PMIP 3 ➔ *will be* fully CMIP 5 compliant

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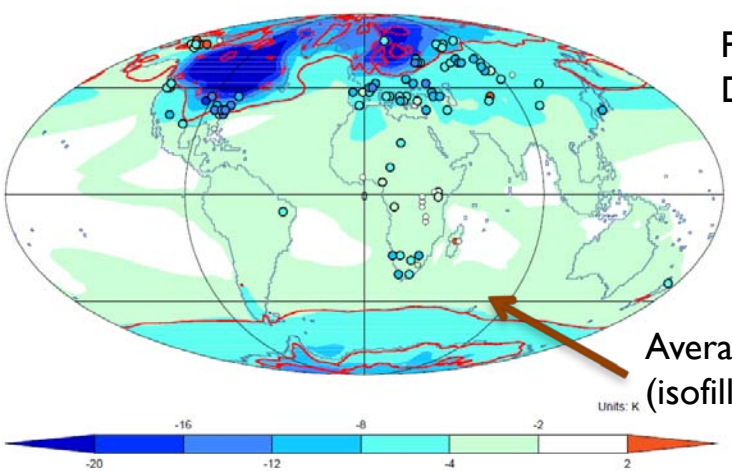
Paleo experiments? Why?

- Do some science ☺
- Check how (well!) the models perform with "unusual" boundary conditions and long-term experiments

Can compare the results with actual field data (aka *proxy* data)!

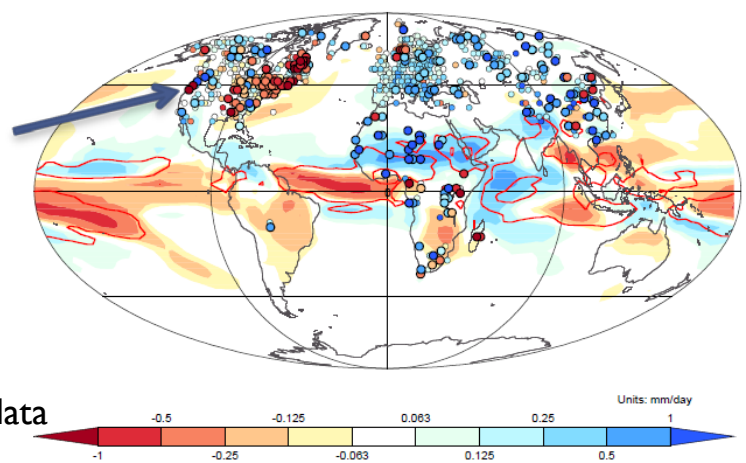
e.g. PMIP2 models vs pollen-based reconstructions (Bartlein et al)

21k-0k surface air temperature (annual mean)



Pollen-based Data (dots)

Averaged model data (isofill)



6k-0k precipitation (annual mean)

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Model Boundary Conditions in a changing world (loooong term changes)

- Depending on the experiment (6k, 21k, LM), change the BC a bit or a lot:

  orbital parameters,

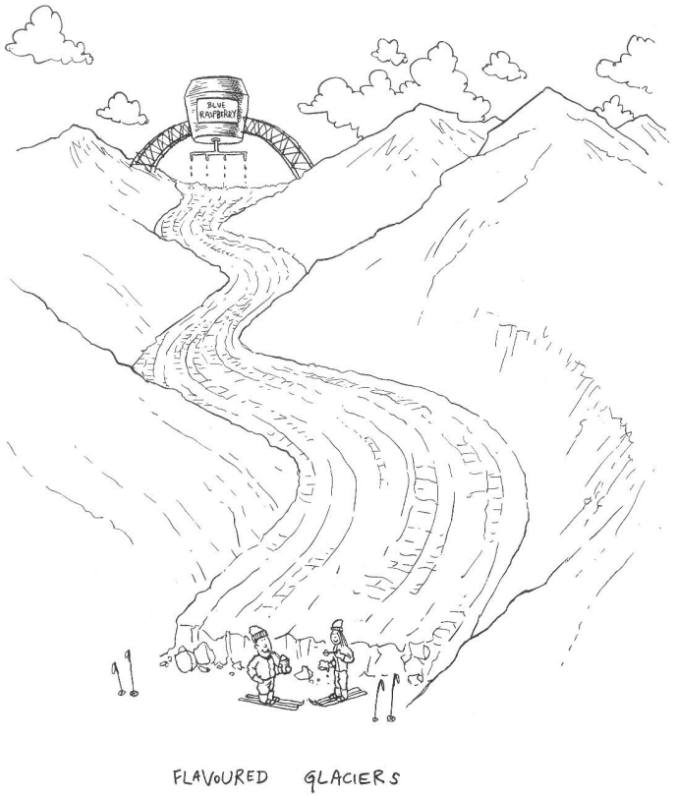
  trace gases,

  aerosols,

  vegetation,

  ice-sheet,

  …



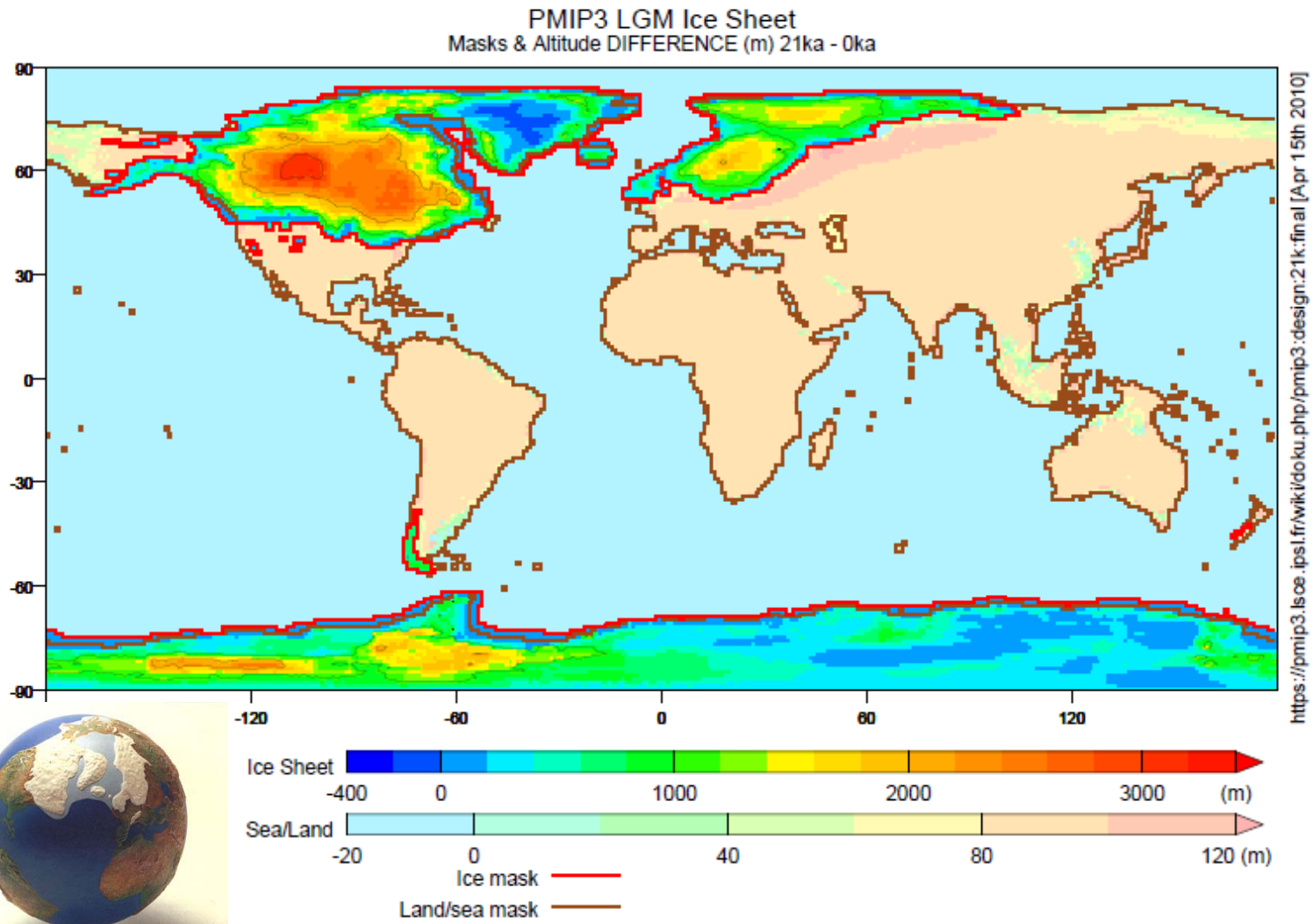
- All the details on the PMIP3 wiki

  https://pmip3.lsce.ipsl.fr/wiki/doku.php/pmip3:design:final

https://pmip3.lsce.ipsl.fr

Example: LGM / 21k ice sheet

BIGGER ice-sheet → see level around 120m lower (than now…)



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The PMIP3 DB (at last!)

- The PMIP3 DB does not exist yet…
- Some paleo model data will be in the distributed CMIP5 DB

  … and a subset will be mirrored at IPSL
- Some paleo model data will only be at IPSL

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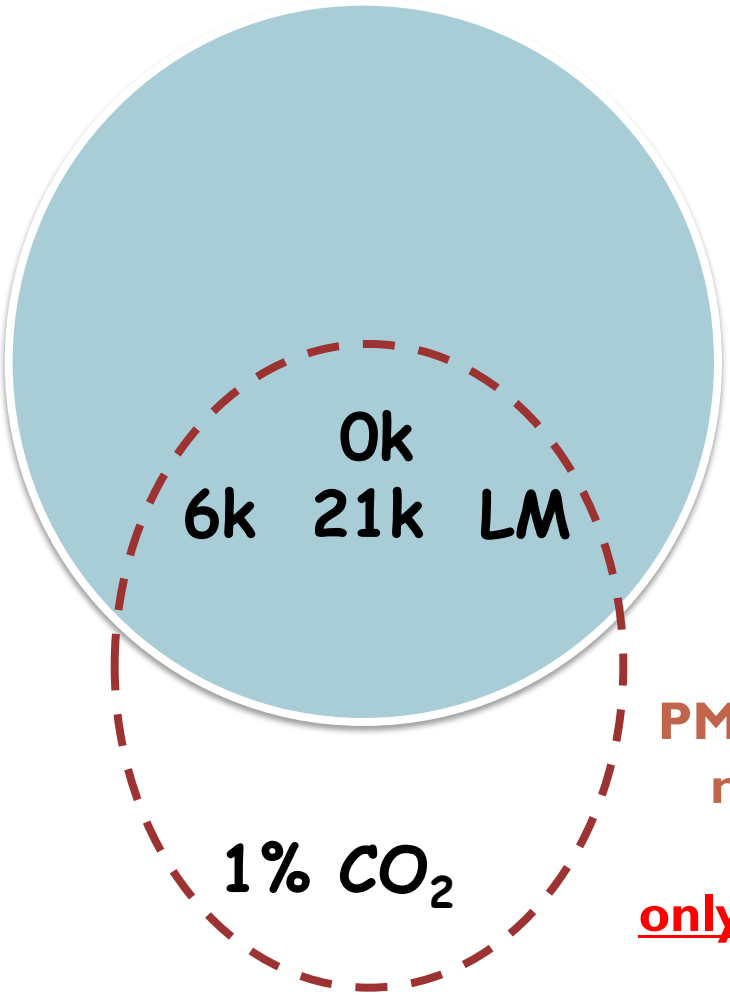
PMIP3 participants and CMIP5 experiments



CMIP5 participants

in the distributed CMIP5 DB

(subset mirrored in PMIP3 DB at IPSL)

(13 groups)

PMIP3-only participants making CMIP5 runs

only in PMIP3 DB at IPSL

(4 groups)

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PMIP3 participants and *non-CMIP5* exps

PlioMIP project

- *AGCM*
- *AOGCM*

PlioMIP participants

only in PMIP3 DB at IPSL

(14 groups)

8.2 ka

Last Interglacial

- 2-8 ka
- 115 ka
- 125 ka
- 128 ka
- 125-130 ka
- 130 ka

Future **☺ PMIP3 experiments**

Other experiments that will be

only in PMIP3 DB at IPSL

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PMIP3 exps completion date

- Most of the data is (theoretically) already available in institutes (not CMORized)
- New data will arrive in the DB till mid-2012

	Experiments available in March 2011	Estimated availability of new experiments later in 2011									*2012*	Total
		April	May	June	July	August	September	October	November	December		
0k	15		2									17
	BCC, CAU/IFM-GEOMAR, CNRM/CERFACS, GFDL, GISS, IPSL, KNMI, LASG/IAP, LOVECLIM, MIROC, MRI, NCAR, QCCCE/CSIRO, UBRIS, UNSW		BCCR MPI									
6k	10		1	2		1		1	1			16
	BCC, CAU/IFM-GEOMAR, IPSL, KNMI, LOVECLIM, MIROC, NCAR, QCCCE/CSIRO, UBRIS, UNSW		CNRM/CERFACS	MPI MRI		GISS		LASG/IAP	BCCR			
21k	0		3	3	2	1		1		2	1	13
			LOVECLIM MIROC? NCAR	IPSL MPI UNSW	CNRM/CERFACS? GISS	UBRIS?		LASG/IAP		BCCR MRI?	GFDL	
LM	4		1	2	1					1	1	10
	LASG/IAP, LOVECLIM, NCAR, UNSW		MIROC?	IPSL MPI	GISS					MRI?	BCCR	

Information as of March 31st 2011

CMIP5 and WG1 milestones

July 18-22: Second Lead Authors Meeting (LA2)

October 24-28: WCRP Open Science Conference will include a CMIP5 session (Denver, Colorado)

December 16 – February 10, 2012: Expert Review of the First Order Draft (FOD)

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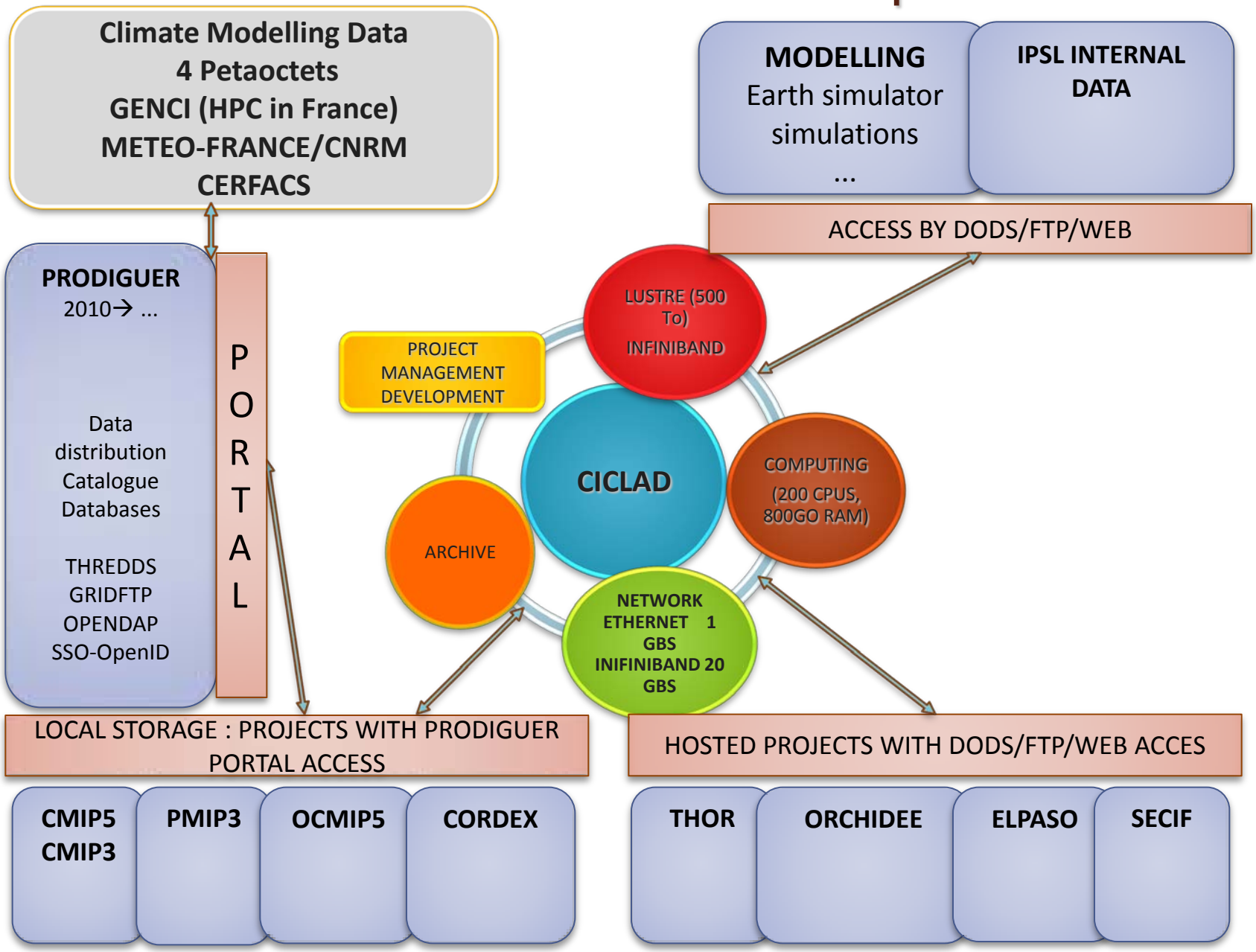
The IPSL data node & PRODIGUER portal



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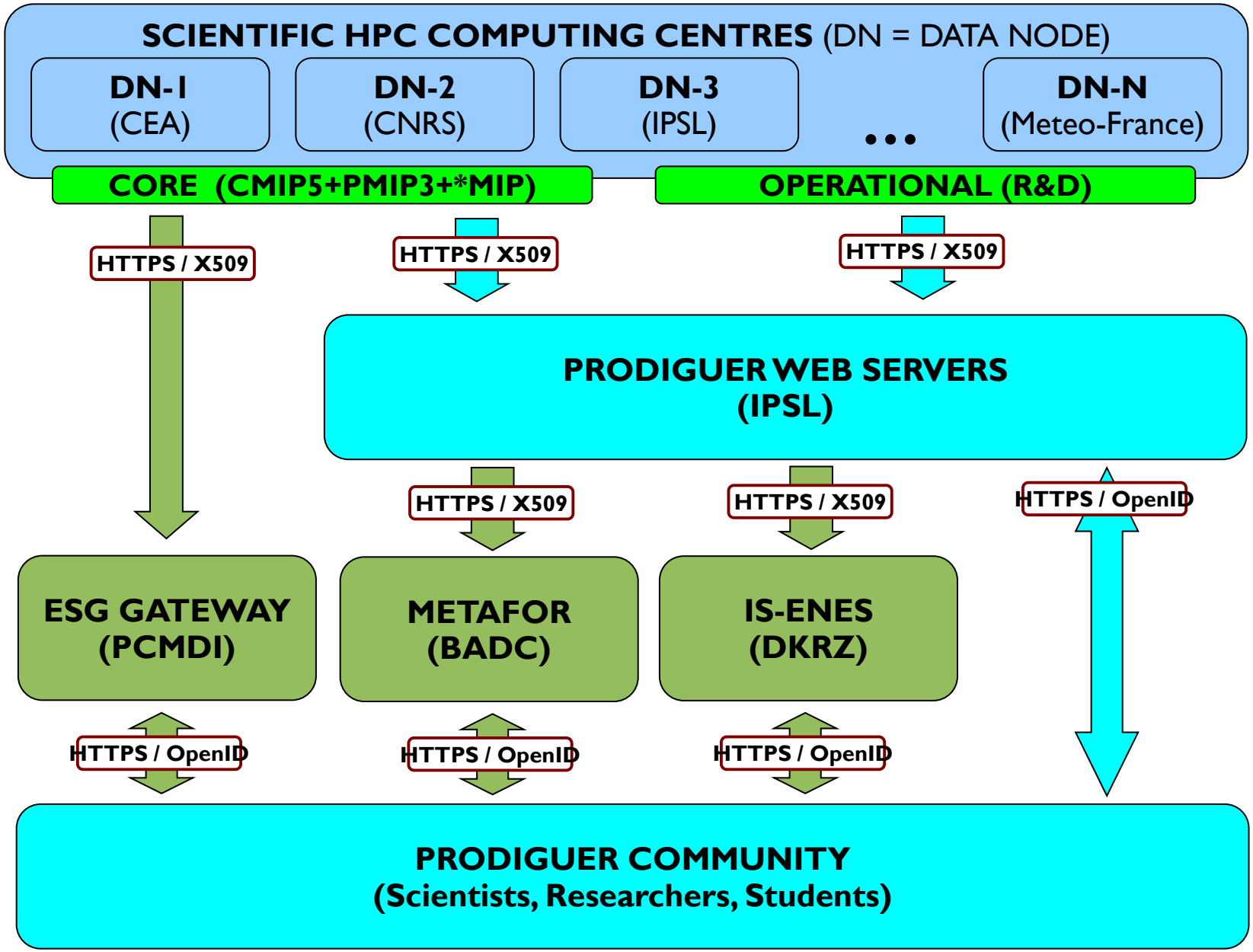

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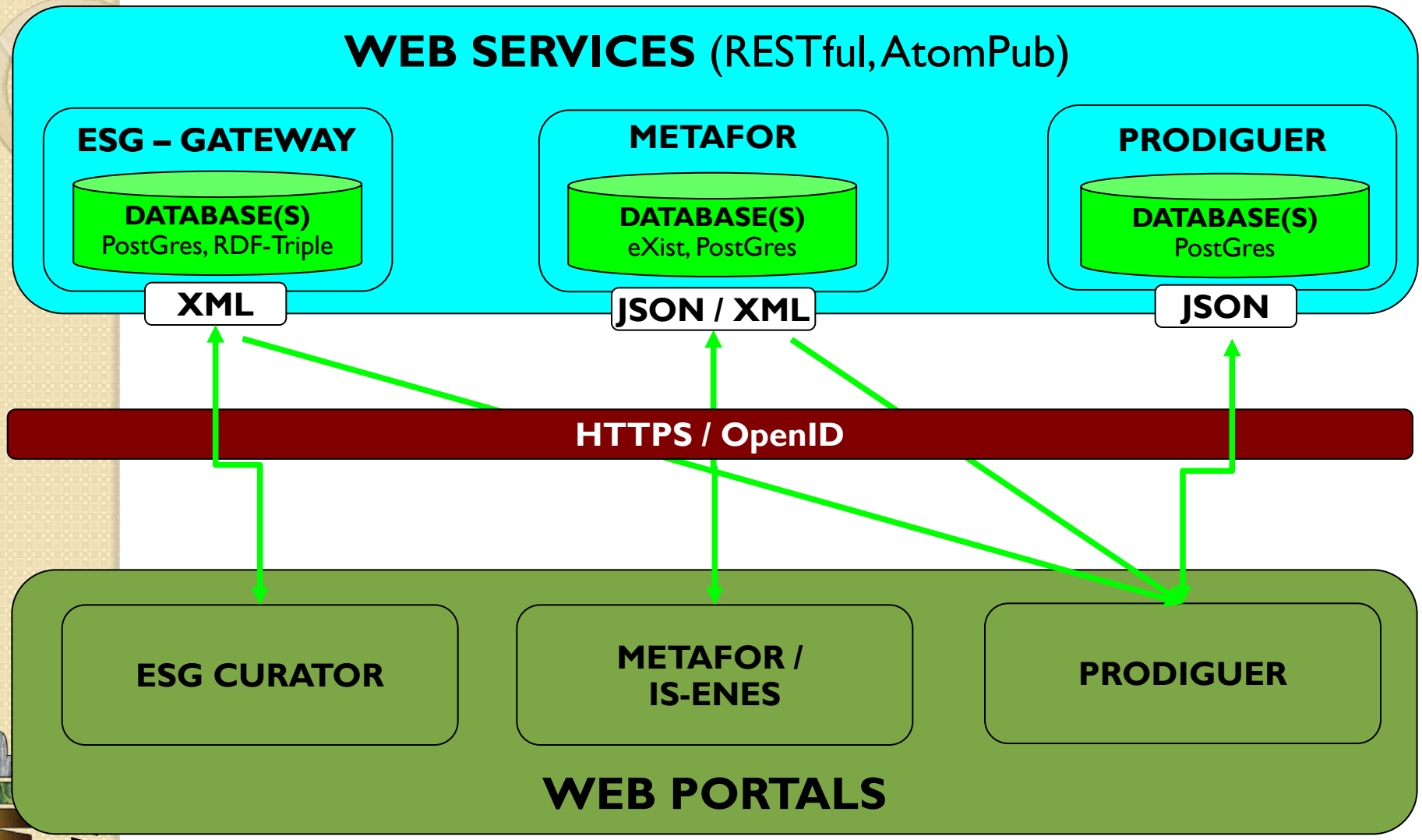
Meta-Data Analysis



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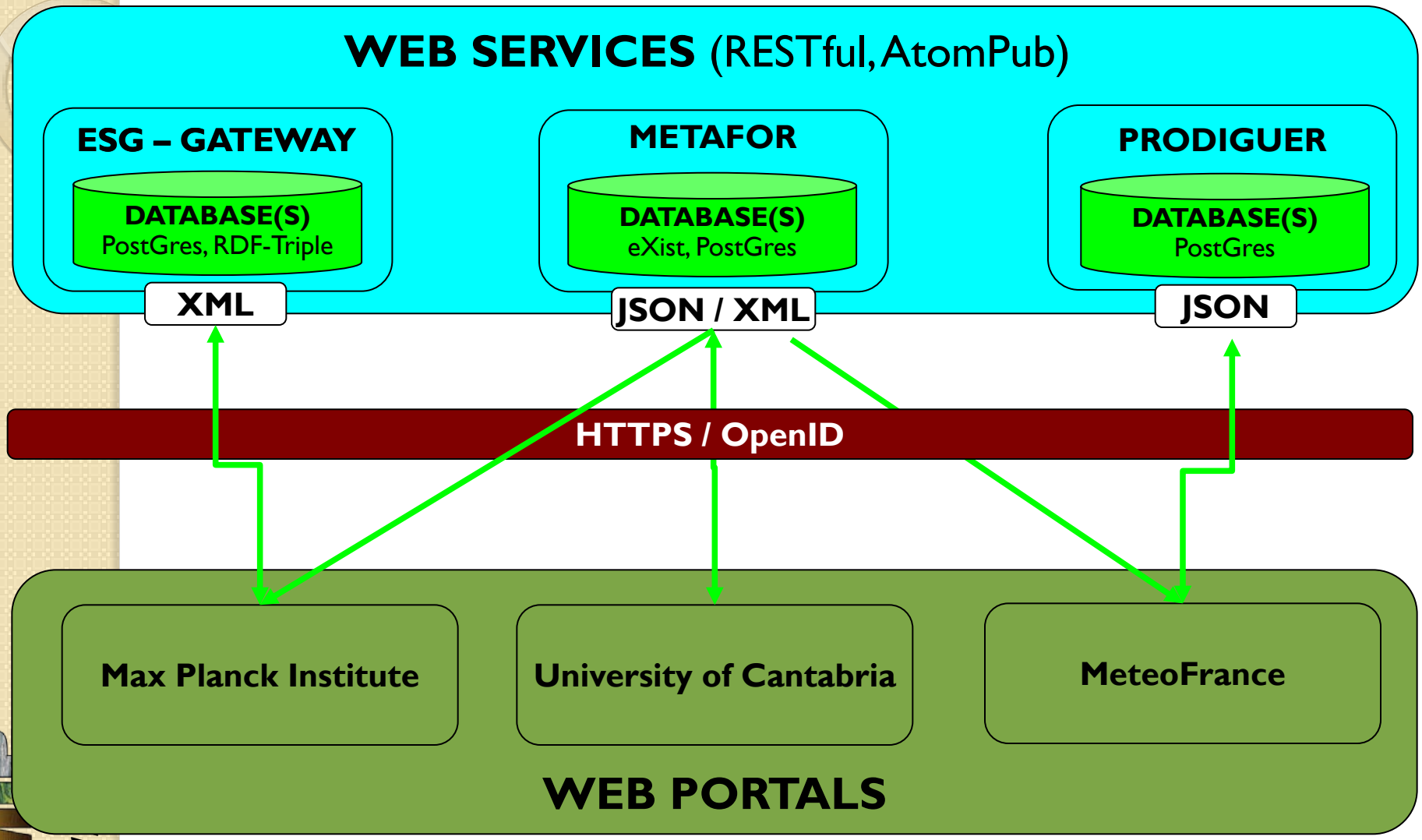
Meta-Data Analysis



Prodiguer Web Portal

Apache	✓	**HTML**	✓
OpenID	✗	**Javascript**	✓
Python	✓	**Jquery**	✓
Pylons	✓	**JSON**	✓

✓ Done

✗ In Progress

Version 1.0 alpha3: April 2011

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Potential contribution to the ESGF software stack

- Mirroring a subset (0k + paleo) of the replicated CMIP5 DB (and staying up-to-date…)
- Access control of replicated data (and unique data at IPSL), new group, new role.
- Non-CMIP5 models/experiments
  - Documenting with METAFOR
  - …
- Customizing LAS for distributing model data to non-programmers (climate proxy data community)
- …

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