SPECS

Seasonal-to-decadal climate Prediction for the improvement of European Climate Services

SPECS NetCDF convention: Dealing with climate predictions on the ESGF

Closing the GRIB/NetCDF gap workshop

Reading – 24/09/2014

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European Commission

SEVENTH FRAMEWORK PROGRAMME

IC3

Plan

I The SPECS conventions

- SPECS general presentation (aim, partners)
- Conventions (format and variables)
- Dealing with the time axis
- CMORisation
- Ongoing experiments (who, what, when, status)

II Sharing the experiments: BADC global repository

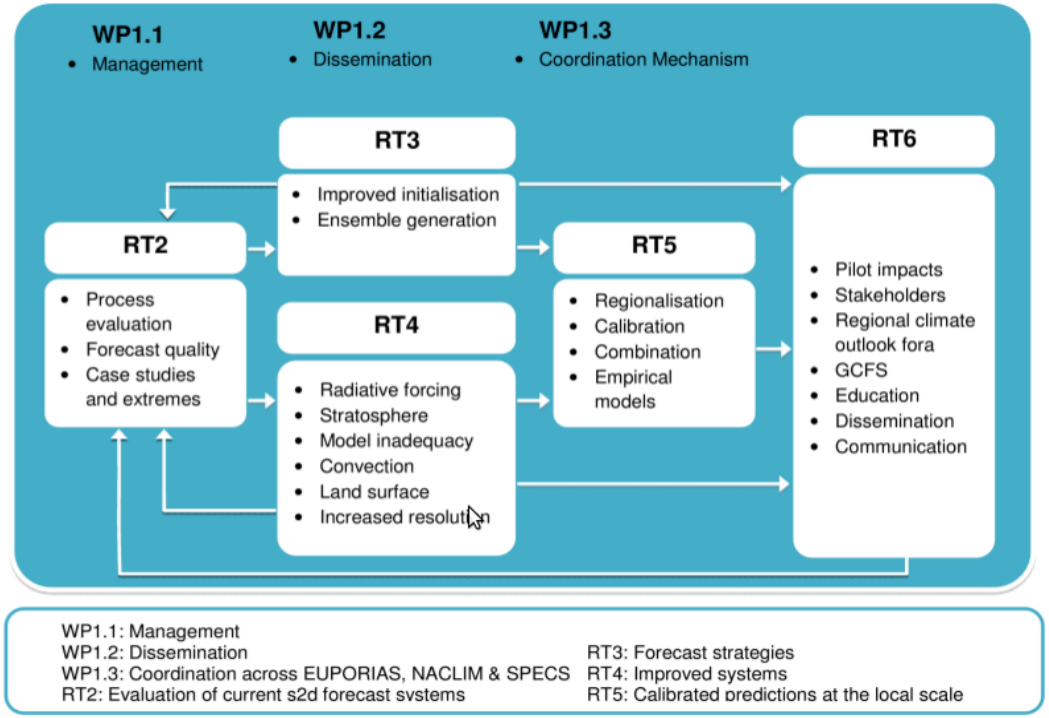
- Access: "command line mode" and ESGF data portal
- Current status: available experiments and models
- Schedule for data availability

SPECS motivation

Seasonal-to-decadal climate Prediction for the improvement of European Climate Services

SPECS will deliver a new generation of European climate forecast systems, including initialised Earth System Models (ESMs) and efficient regionalisation tools to produce quasi-operational and actionable local climate information over land at seasonal-to-decadal time scales with improved forecast quality and a focus on extreme climate events, and provide an enhanced communication protocol and services to satisfy the climate information needs of a wide range of public and private stakeholders.

Forecast System	Project Partners
CNRM-CM5	CNRM, CERFACS
EC-Earth	KNMI, SMHI, IC3, ENEA
IFS/NEMO	ECMWF, UOXF
IPSL-CM5	CNRS
MPI-ESM	MPG, UniHH
UM	UKMET



List of required variables

	Monthly	Daily
Ocean 2D	t20d,tos,msftmyza,msftmyzaba,msftmyz,msftmyzba,hfnorth,hfnorthba,hfnortha,hfnorthaba,sltnorth,sltnortha	t20d
Ocean 3D	Thetao,sos,uo,vo	
Atmosphere 2D	Tas, tasmax,tasmin, uas vas, psl,pr,clt,hfss, hfls,rls,rlds,rsut,snld	Tas, tasmax,tasmin, uas vas, psl,pr,clt,rls,rlds,rsut,snld,rlut
Atmosphere 3D (850, 500, 200 and 50hPa)	Ta,ua,va,hus,zg	Ta850,zg500
Sea ice	Sic,sit,usi,vsi,snld,tsice,hflsi,strairx,strairy	Sic,snld,tsice

(*)Vertical levels: 850, 500, 200 and 50hPa

Set of 3 priorities:

P1 and P2 to be CMORised and published at BADC

P3 to be stored locally

And 3 classes:

Class 1: Monthly means, will be published.

Class 2: Daily, will be published. Six-hourly values for the variables psl, tas, tdps, clt, uas, vas, and 12-hourly values for zg500 (no daily means required for any of those variables); daily averages from 6-hourly values for all other instantaneous fields (like tos, ta, etc) and fluxes from daily accumulated values for all flux variables.

Class 3: Some 3- and 6-hourly data for all other variables not included in class 2, to be stored locally at the modelling centres and made available upon a request

Conventions and format

New global attributes: physics_description, initialization_description, associated_experiment

Introduction of double time axis (handled by CDO from v1.6.4rc8):

double leadtime(time) ;

leadtime:units = "days" ;

leadtime:long_name = "Time elapsed since the start of the forecast" ;

leadtime:standard_name = "forecast_period" ;

double time(time) ;

time:bounds = "time_bnds" ;

time:units = "days since 1850-01-01" ;

time:calendar = "noleap" ;

time:axis = "T" ;

time:long_name = "Verification time of the forecast" ;

time:standard_name = "time" ;

reference_time=time-leadtime

CMORisation

- Integration of the SPECS conventions in the official CMOR release (available on PCMDI CMOR github project)
- Backward compatible with the previous CMOR release, SPECS mode activated if the argument arg_cmor_project = “SPECS” is passed to the cmor_setup function
- Development of multi-support and multi-model programs to handle the library and properly CMORize the data with the SPECS conventions (specs2cmor package)
- Support for ECMWF: from Mars-grib to CMORized Netcdf4 files

Experiments description

Experiment family	Models	Institutes involved
improvedStratVertRes	HadGem3,CNRM-CM6,EC-EARTH3	MeteoF, IPSL
horizlResImpact	CNRMCM5,EC-EARTH2.3,ECHAM/MPIOM	MeteoF, SMHI,MPG, IPSL,CCCMa,IC3
seaIceInit	LIM2,LIM3,ECHAM6/MPIOM,GELATO6, HadCIce,	IC3,MeteoF, MetOffice,SMHI,URead
soilMoistureInit	HTESSEL,EC-Eaerth2.3,Cycle40r1,HadGem3,CNRMCM5,ECHAM/MPIOM	IC3, ECMWF,MetOffice,MeteoF,MPG
decadal	Ec-earth2.3,MPI-ESM,IPSL-CM5A,Can-CM4	KNMI, MPG, SMHI, IPSL CCCMa
snowInit	HTESSEL,Cycle40r1,CNRM-CM5	IC3, ECMWF, MeteoF
phenology	EC-EARTH2.4,Cycle40r1	KNMI, ECMWF, ENEA
aerosols	HadGem3,EC-Earth2.3	ECMWF, MetOffice, IC3
solarIrradiance	HadGem3,Cycle40r	ECMWF, MetOffice
seasonal	CanCM1	NMME

Common repository access

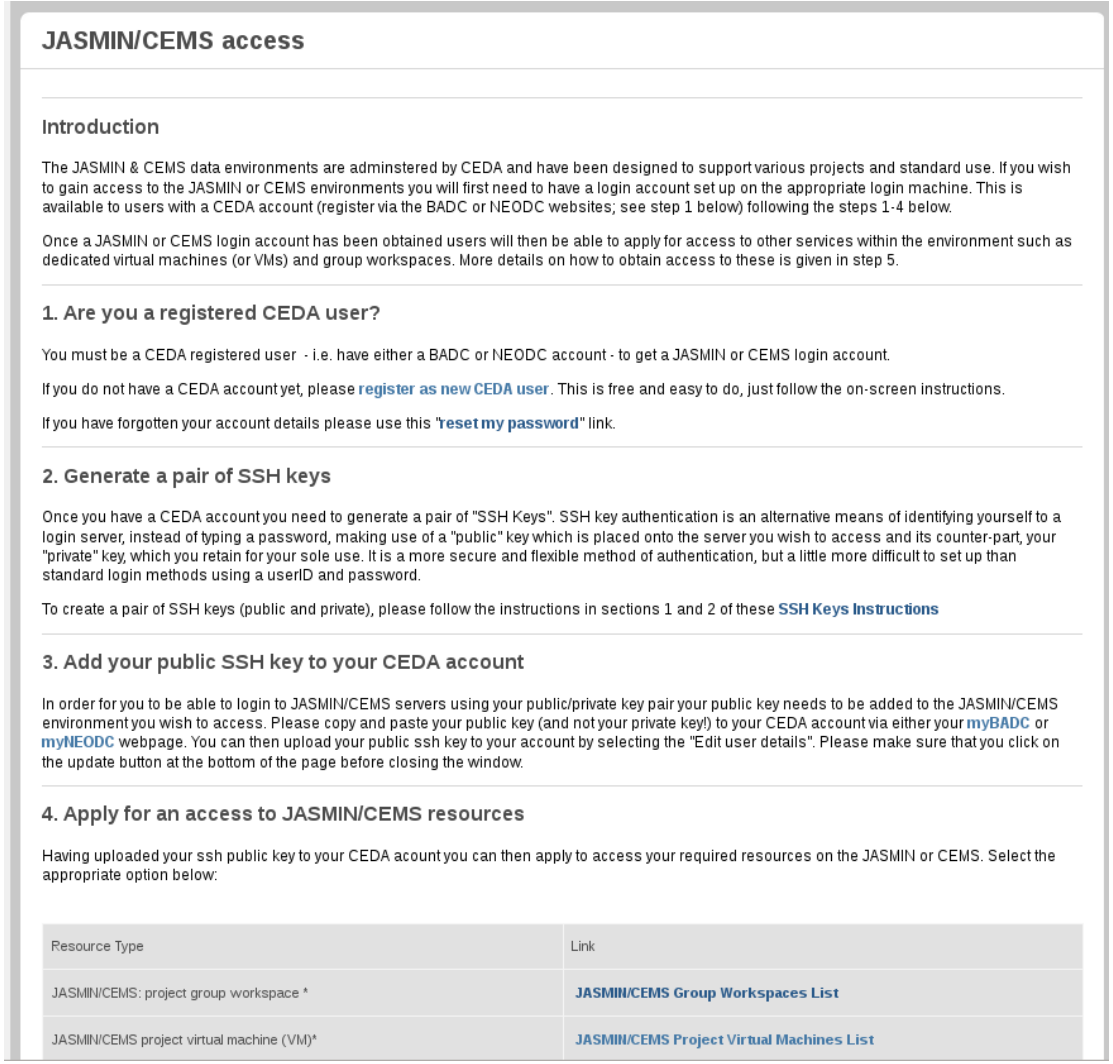
British Atmospheric Data Centre responsible of storing, maintaining the SPECS database and publishing it (estimated total volume of 80TB)

- Login through the Jasmin server at BADC:

  http://www.ceda.ac.uk/help/users-guide/jasmin-cems-access/

- Terms and conditions:

Access is restricted to non-commercial use during the project, but becomes unrestricted after the end of the SPECS project. In this context "restricted" means only available for research, including research by commercial bodies. Access is granted to all users registered with ESGF who indicate their acceptance of the terms of use.



JASMIN/CEMS access

Introduction

The JASMIN & CEMS data environments are adminstered by CEDA and have been designed to support various projects and standard use. If you wish to gain access to the JASMIN or CEMS environments you will first need to have a login account set up on the appropriate login machine. This is available to users with a CEDA account (register via the BADC or NEODC websites; see step 1 below) following the steps 1-4 below.

Once a JASMIN or CEMS login account has been obtained users will then be able to apply for access to other services within the environment such as dedicated virtual machines (or VMs) and group workspaces. More details on how to obtain access to these is given in step 5.

1. Are you a registered CEDA user?

You must be a CEDA registered user - i.e. have either a BADC or NEODC account - to get a JASMIN or CEMS login account.

If you do not have a CEDA account yet, please **register as new CEDA user**. This is free and easy to do, just follow the on-screen instructions.

If you have forgotten your account details please use this "**reset my password**" link.

2. Generate a pair of SSH keys

Once you have a CEDA account you need to generate a pair of "SSH Keys". SSH key authentication is an alternative means of identifying yourself to a login server, instead of typing a password, making use of a "public" key which is placed onto the server you wish to access and its counter-part, your "private" key, which you retain for your sole use. It is a more secure and flexible method of authentication, but a little more difficult to set up than standard login methods using a userID and password.

To create a pair of SSH keys (public and private), please follow the instructions in sections 1 and 2 of these **SSH Keys Instructions**

3. Add your public SSH key to your CEDA account

In order for you to be able to login to JASMIN/CEMS servers using your public/private key pair your public key needs to be added to the JASMIN/CEMS environment you wish to access. Please copy and paste your public key (and not your private key!) to your CEDA account via either your **myBADC** or **myNEODC** webpage. You can then upload your public ssh key to your account by selecting the "Edit user details". Please make sure that you click on the update button at the bottom of the page before closing the window.

4. Apply for an access to JASMIN/CEMS resources

Having uploaded your ssh public key to your CEDA acount you can then apply to access your required resources on the JASMIN or CEMS. Select the appropriate option below:

Resource Type	Link
JASMIN/CEMS: project group workspace *	**JASMIN/CEMS Group Workspaces List**
JASMIN/CEMS project virtual machine (VM)*	**JASMIN/CEMS Project Virtual Machines List**

Getting SPECS data

2 methods:

- “command line” option: connecting to the Jasmin server and get the data with rsync/scp

- Earth System Grid Federation (ESGF) portal:

  CMIP5-like access to a SPECS catalog. Web portal with user-friendly search facilities

Current data availability

Available at this stage of the project:

- Decadal: MPI: 1961-01 → 2012-01
  IPSL: 1961-01 → 2013-01
- Extended decadal : MPI: 1901-01 → 2010-01
- HorizlResImpact: IC3: 1993 → 2000
- SeaIceInit: IC3: 1993
- Seasonal: CMC1-CanCM3: 1981-03 → 2014-07

Soon to come (simulations completed, waiting for the upload):

- soilMoisture (IC3),
- seaIceInit (Uread)
- decadal (SMHI, CCCMa)
- improvedStratVertRes (MF)