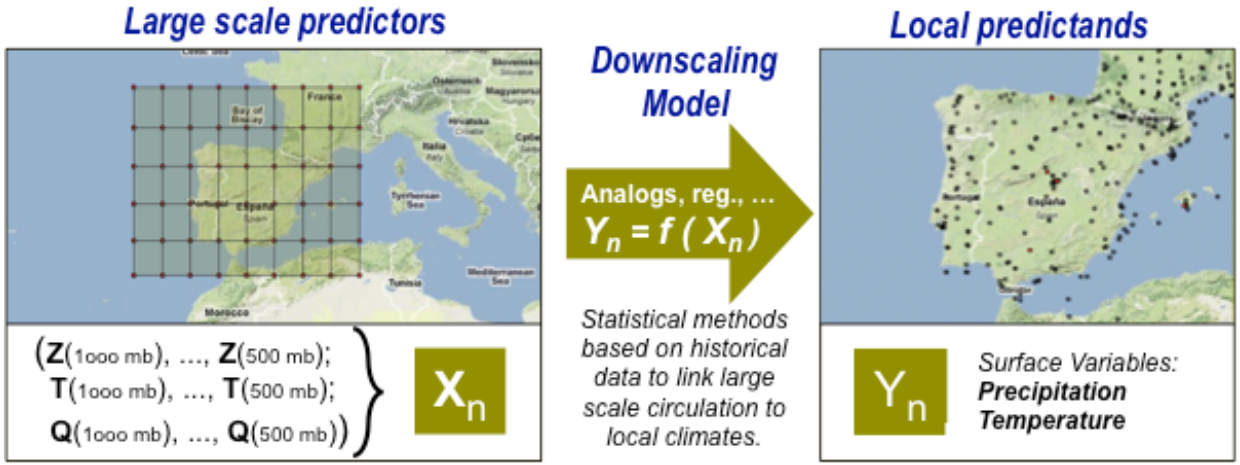
María Dolores Frías
friasmd@unican.es
http://www.meteo.unican.es

Statistical Downscaling:
A user friendly portal



Thanks to: Ana Casanueva
Jose Manuel Gutiérrez
Sixto Herrera
Daniel San Martín
Max Tuni

Santander Meteorology Group:
UNIVERSIDAD DE CANTABRIA
CSIC
Dpto. Matemática Aplicada y Ciencias de la Computación
IFCA Instituto de Física de Cantabria

Santander Meteorology Group

A multidisciplinary approach for weather & climate

ENSEMBLES Downscaling Portal (version 2)

http://ensembles-eu.metoffice.com

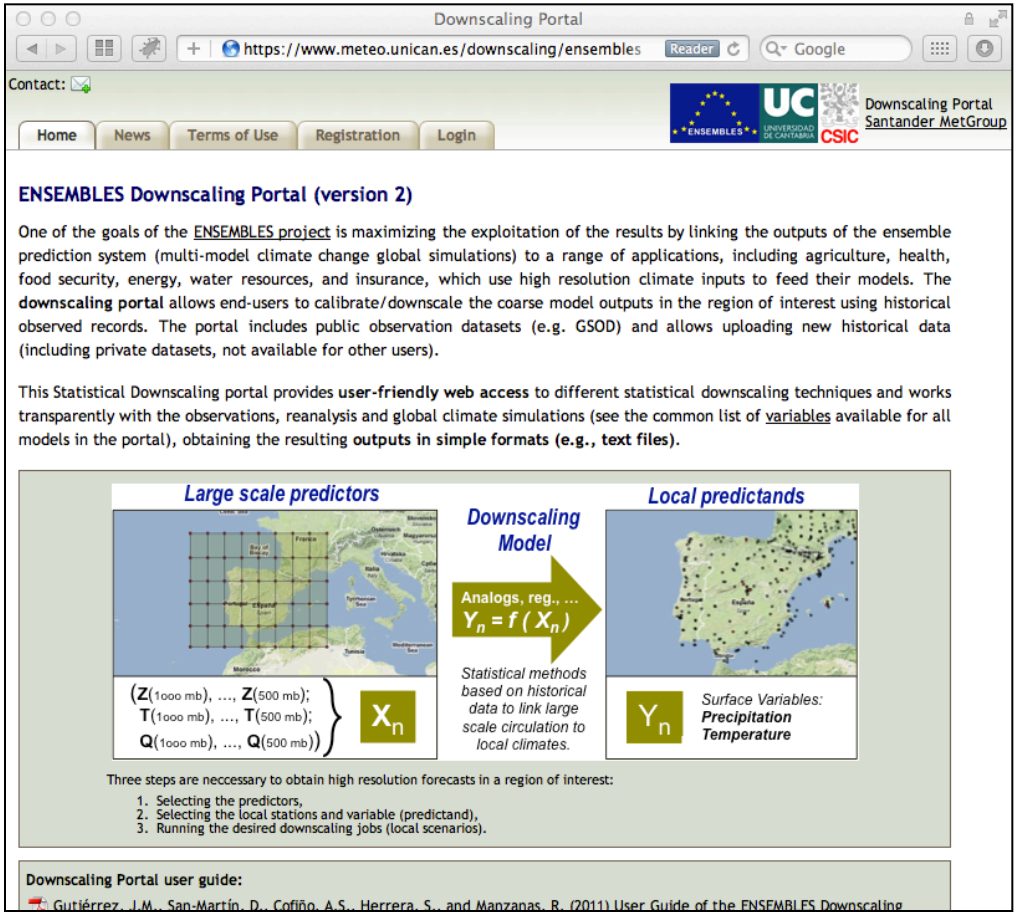
ENSEMBLES Project (2004-2009)

Develop an ensemble prediction system for climate change and linking the outputs to a range of applications.

- **RCM simulations.**
- **Statistical Downscaling.**
- **Gridded observations: E-OBS**

The statistical downscaling portal is a free tool for user-friendly downscaling.

http://www.meteo.unican.es/ensembles



Meteolab: an open-source Matlab toolbox

http://www.meteo.unican.es/en/software/meteolab

Downscaling Portal: Datasets

Currently, the ENSEMBLES datasets included in the portal contain only Climate Change Scenarios data. Data from seasonal experiments (multi-model simulations) will be included soon.

Observations:

- ECA stations + GSOD
- E-OBS 50km + Spain02
- E-OBS 25km

Reanalysis (global coverage):

- ERA40
- NCEP

GCM scenarios (global coverage):

- ENSEMBLES Stream1 (CMIP3):
  - BCM2.0, CNRM-CM3, ECHAM5, ECHO-G, HADGEM, IPCM4
- ENSEMBLES Stream2:
  - CNRM-CM33, ECHAM5c, HADCM3C, HADGEM2, IPCMv2

Downscaling Portal: Follow-on Activities

The activities started in ENSEMBLES have a follow on in several EU-funded and international projects, involving different impact communities, and dealing with different CORDEX-related activities.

FUME

Impacts in forest **fires**

QWeCI

Impacts in **health**

CLIM-RUN

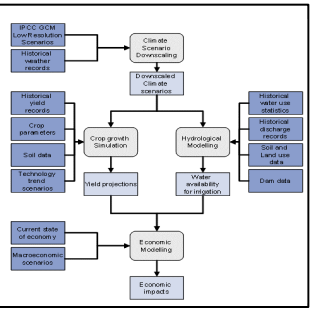
Impacts in tourism, energy, and natural hazards

metafor

Appropriate **metadata** for GCMs and downscaling.

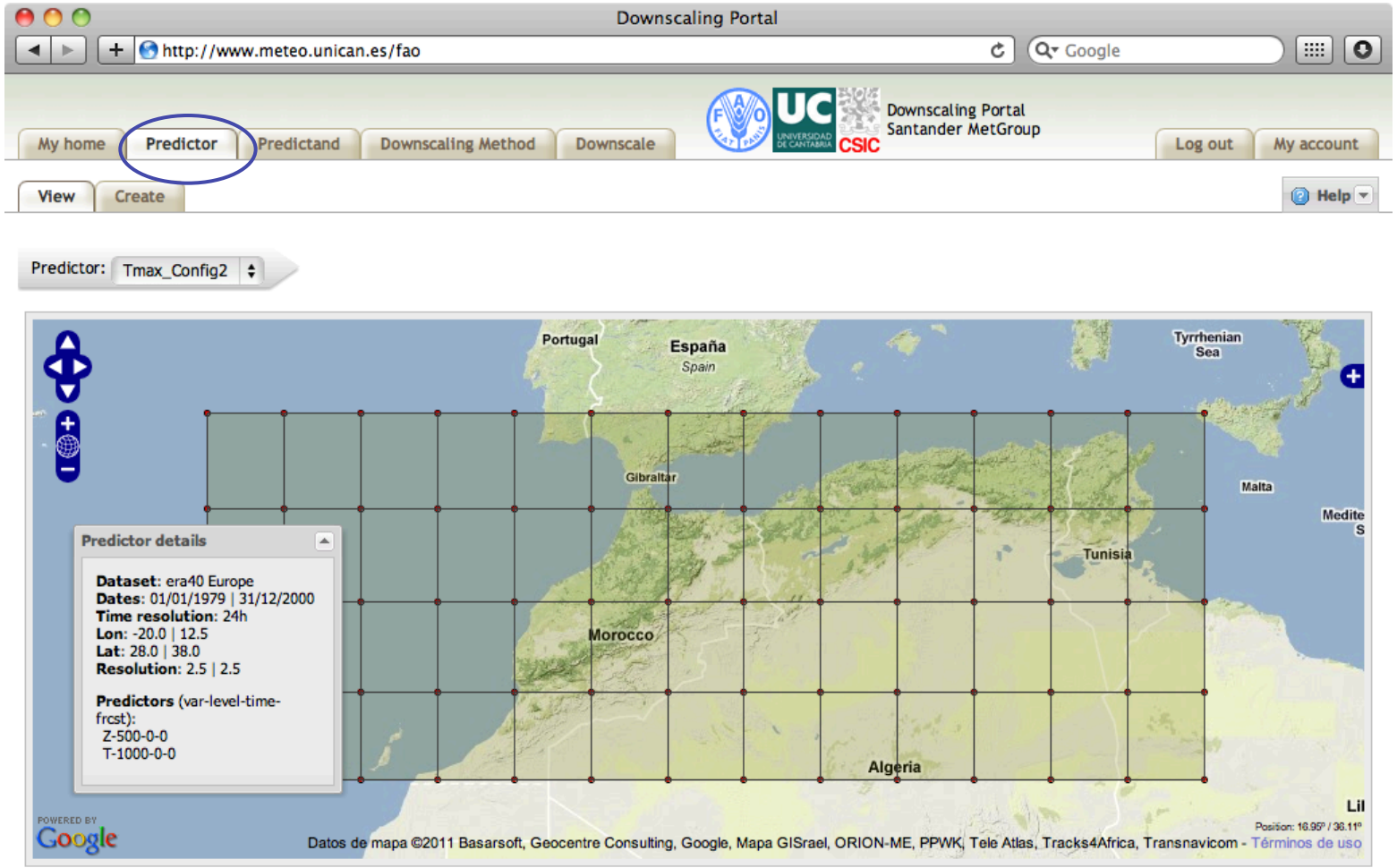
MOSAICC

Integration with impact tools: crop + hydrology + economy



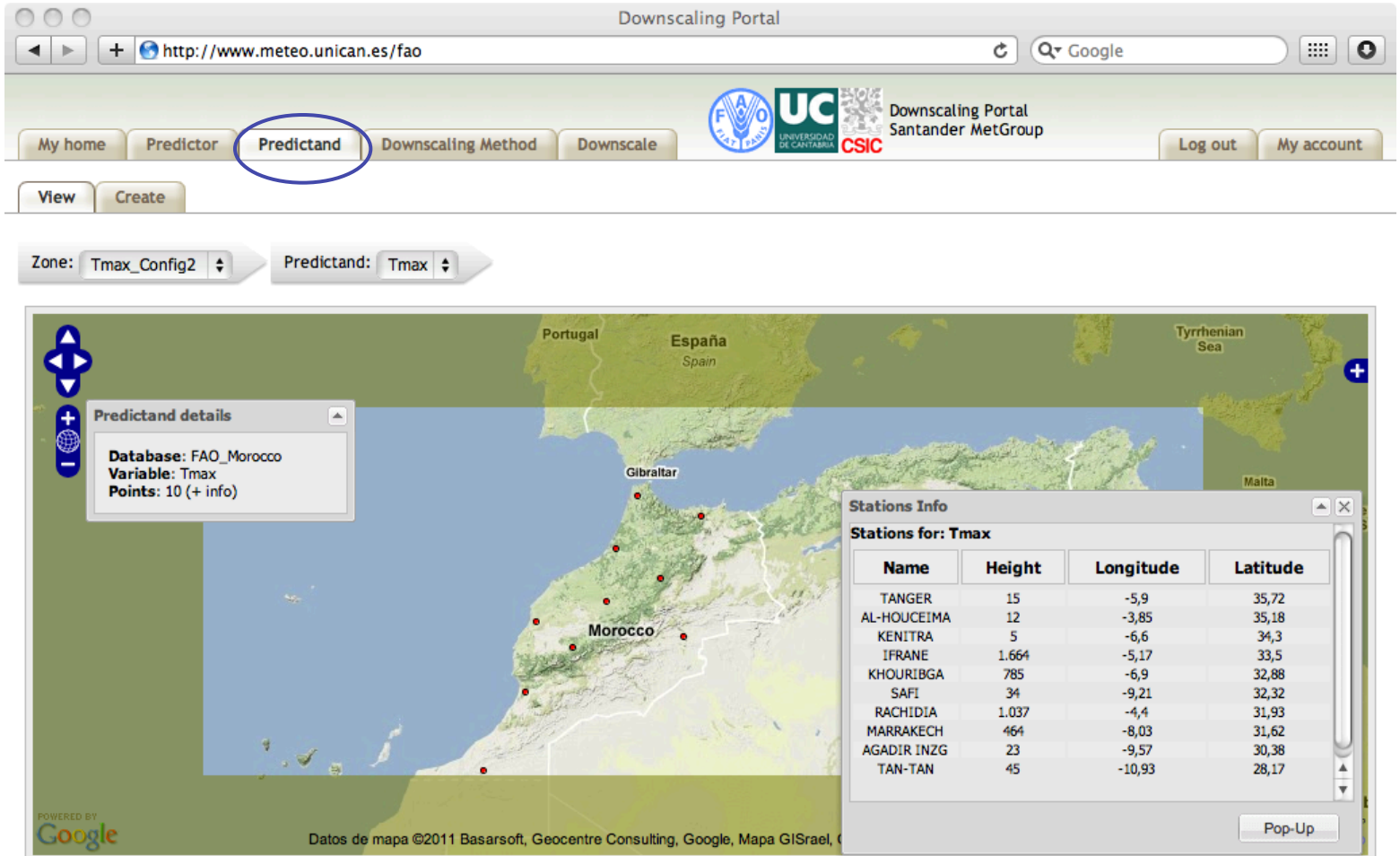
SD Portal: Predictors

The SDS Portal allows creating downscaling experiments selecting a region of interest and the predictors to be used (Z500 and T1000 in this example).



SD Portal: Local predictands

It also allows selecting a local variable of interest (e.g. max. Temp.) in a number of stations from any of the available historical datasets (in this case a dataset developed for the project *FAO_Marocco*).



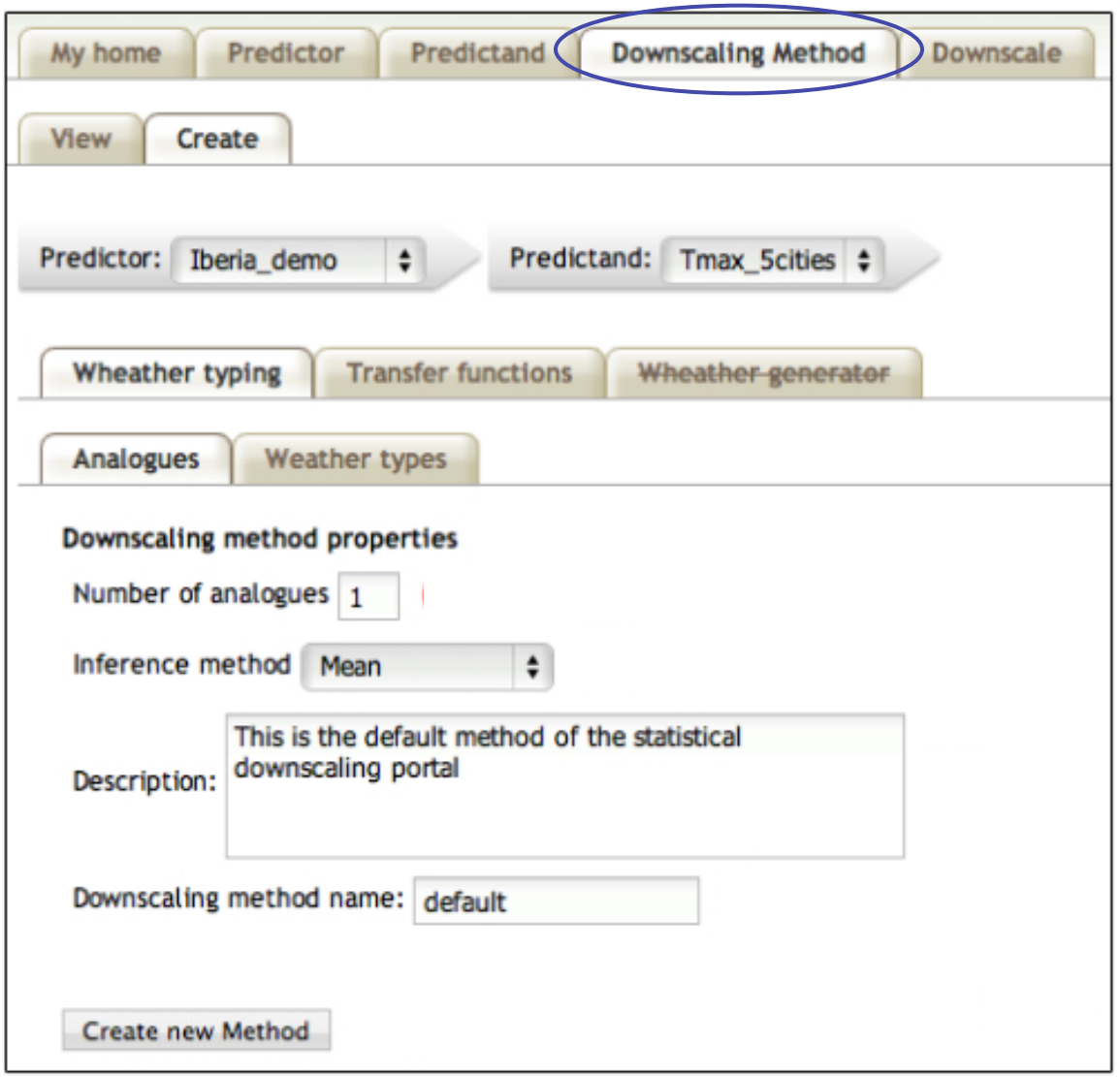
SD Portal: Downscaling Method

It also allows selecting a particular downscaling algorithm from the different families of methods:

- **Analogs**
- **Regression + GLMs**
  - From CPs
  - From grid-points
- **Neural Network**
- **K-means weather types**
- Weather generators

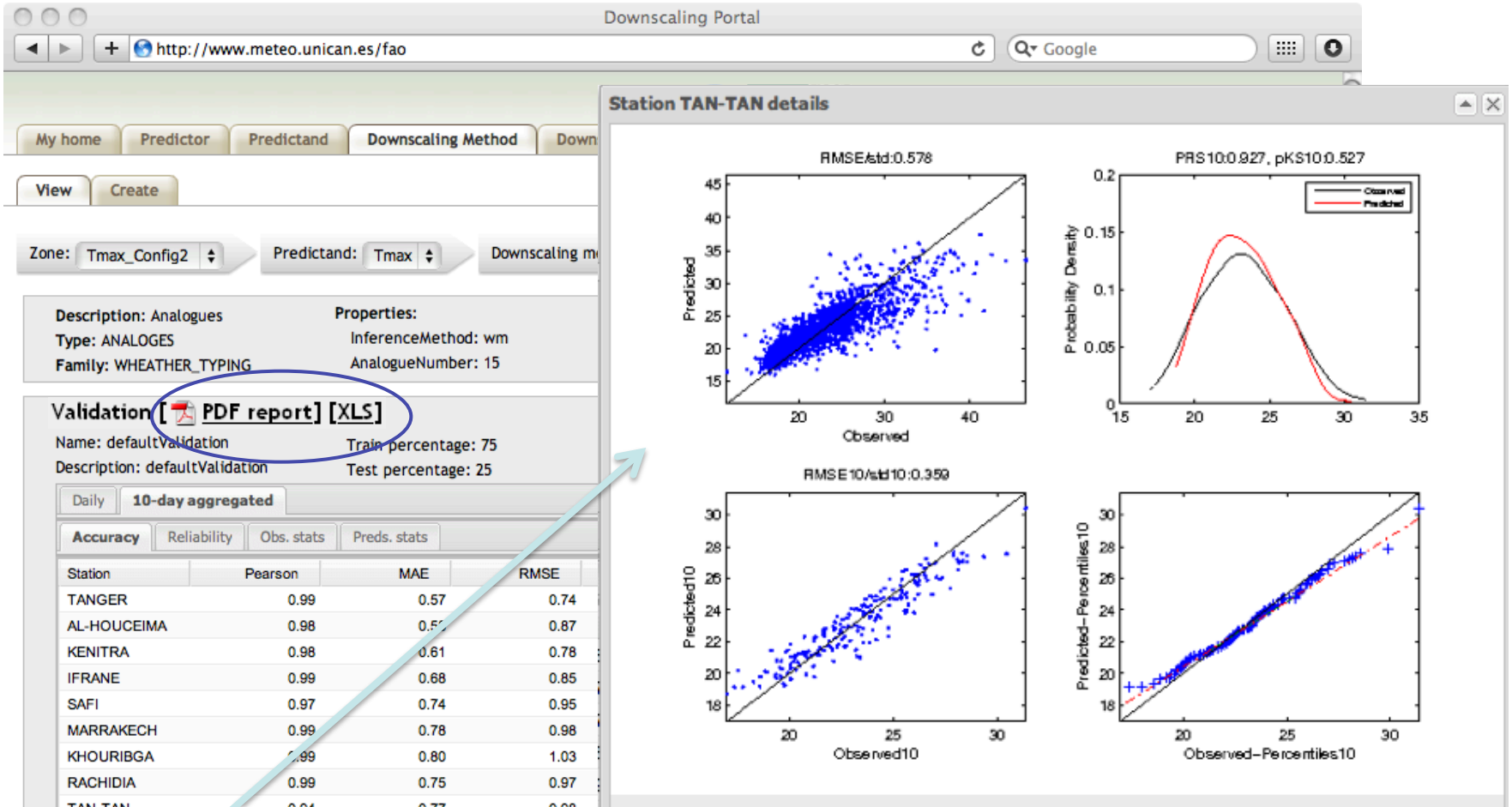
and defining a particular configuration:

- Number of analogs
- Number of CPs.
- etc.



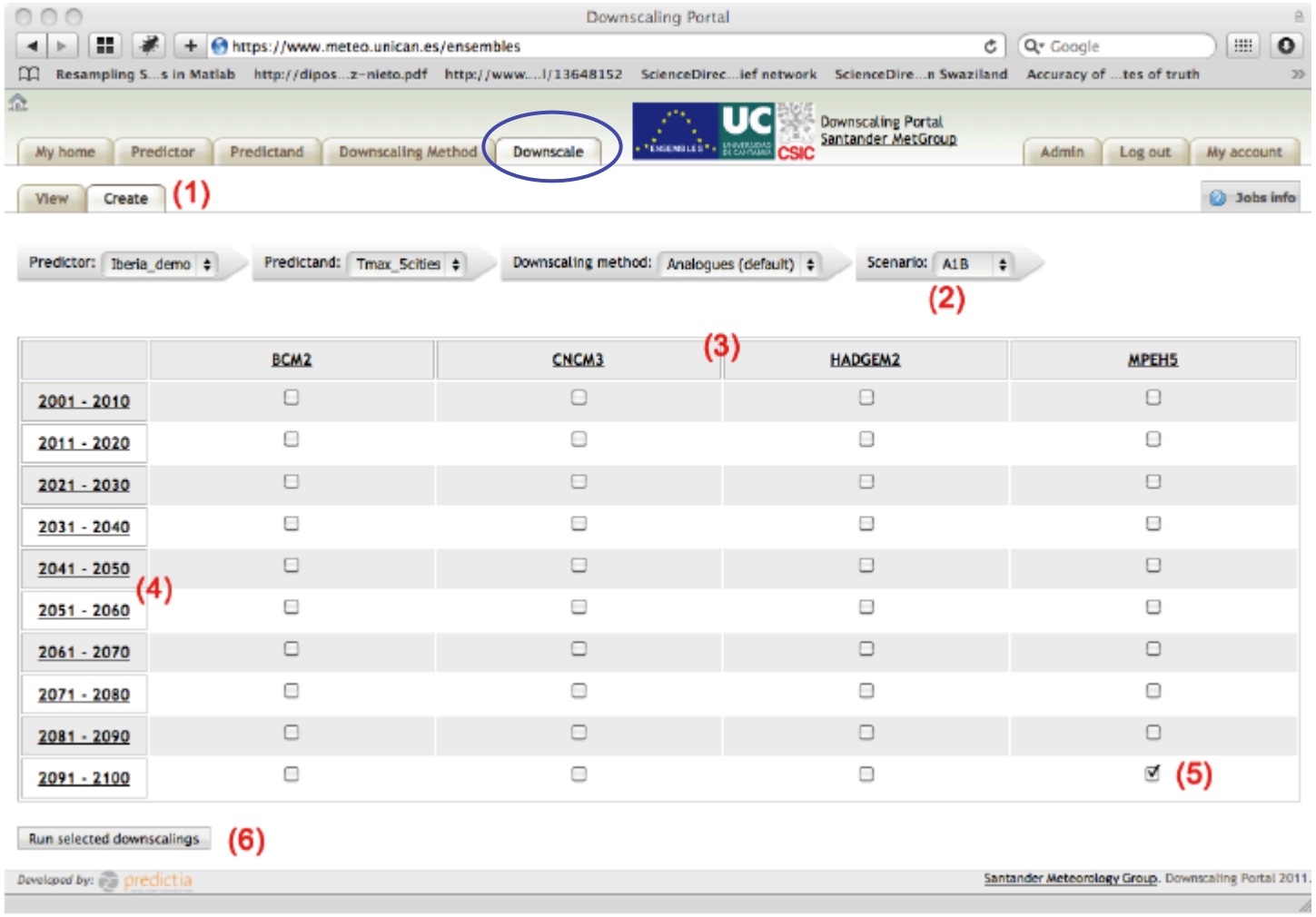
SD Portal: Calibration & validation

Finally, it allows selecting a downscaling method (from the list of available ones, including regression, analogs, weather typing, etc.) and obtaining a cross-validation in present climate using renalysis data.



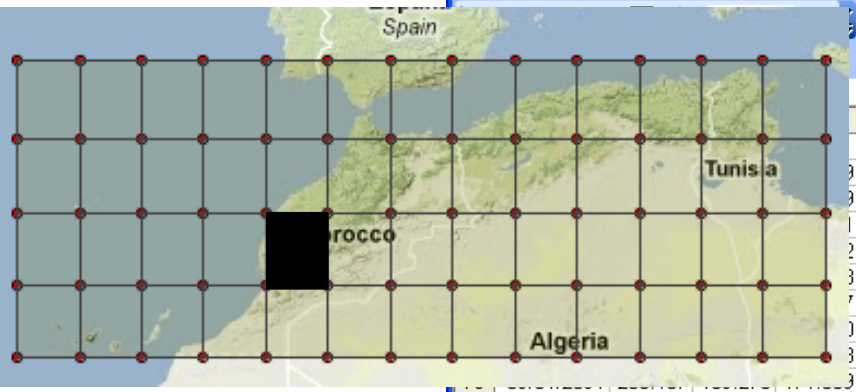
SD Portal: PRODUCTION

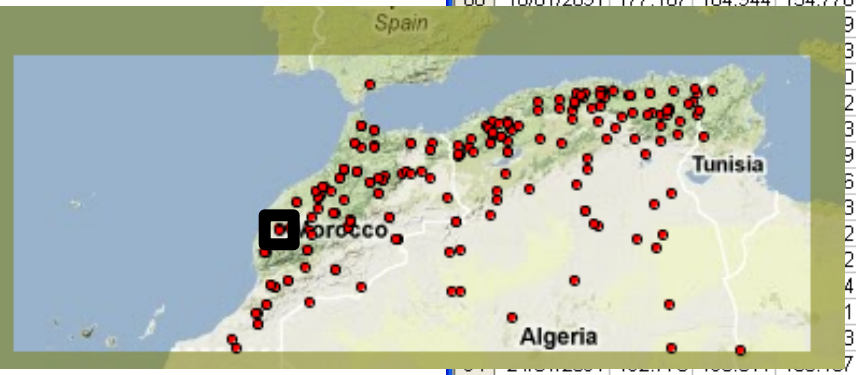
Once the method is defined and validated it can be used to downscale GCM models for future scenarios decade by decade.



SD Portal: Friendly Output

The resulting daily locally projected simulations can be downloaded as Excel (or ascii) files.





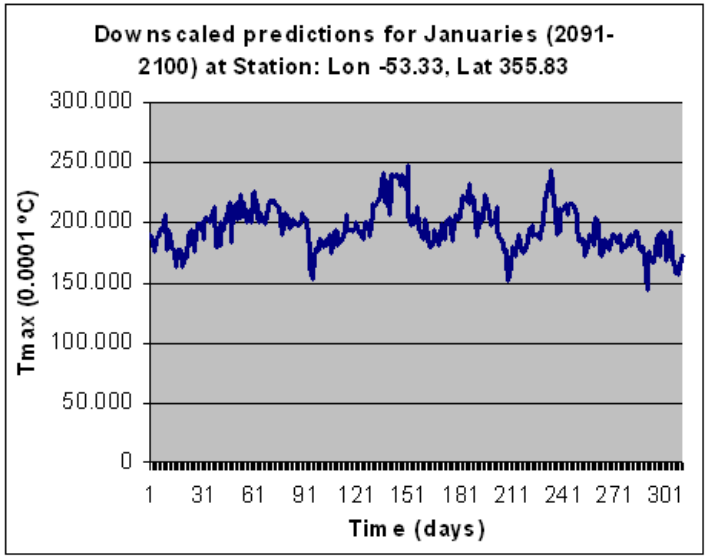
Microsoft Excel - Libro1.xls

Archivo Edición Ver Insertar Formato Herramientas Datos Ventana ? Adobe PDF

Escriba una pregunta

Arial 10

	E	F	G	H	I	J	K	L	M	N	O	P
	c4	c5	c6	c7	c8	c9	c10	c11	c12	c13	c14	c15
	163.611	188.444	148.111	179.778	193.722	159.889	132.778	166.611	197.222	214.000	225.722	226.200
	156.222	196.278	142.000	181.056	183.333	146.667	144.333	171.722	214.389	241.056	228.889	195.100
	115.611	171.389	103.944	165.500	171.000	122.611	103.167	139.500	183.111	218.000	231.056	181.100
	111.000	166.833	96.500	166.111	165.278	104.722	77.444	121.889	171.389	193.778	200.111	185.100
	123.500	184.167	123.389	175.833	181.167	128.778	107.944	151.778	193.500	208.889	206.444	197.700
	131.667	189.111	117.778	182.111	191.889	126.500	103.167	155.278	190.222	197.056	196.667	221.400
	136.444	193.500	123.500	186.111	194.167	134.778	109.556	161.667	195.278	196.278	201.778	216.200
	139.556	194.333	122.222	188.222	201.222	137.833	114.056	167.111	203.500	215.611	211.889	203.400
	125.833	185.111	109.333	17								
80	10/01/2091	177.167	184.944	154.778	121.444	172.889	123.667	16				
	131.167	186.833	117.056	17								
	147.333	185.778	137.611	17								
	120.333	170.111	115.222	17								
	98.444	158.000	84.444	15								
	114.278	165.889	105.333	15								
	127.444	159.056	99.111	15								
	130.500	168.278	110.444	16								
	123.111	165.778	110.444	16								
	103.222	162.833	91.333	15								
	101.778	156.722	91.222	15								
	122.944	168.333	89.667	16								
	135.611	171.389	117.833	17								
	128.778	182.778	112.222	17								
	141.444	195.500	128.611	19								
95	25/01/2091	186.167	188.833	190.389	158.500	183.889	146.611	16				
96	26/01/2091	176.556	191.944	168.278	139.722	181.833	143.556	17				
97	27/01/2091	179.611	190.944	196.833	158.333	200.444	154.500	19				
98	28/01/2091	198.500	214.611	217.056	184.167	219.444	163.056	21				
99	29/01/2091	199.444	217.722	217.167	181.278	215.333	164.611	21				
100	30/01/2091	199.167	224.889	245.000	208.333	244.722	183.111	22				



Hoja1 Hoja2 Hoja3

Listo NUM

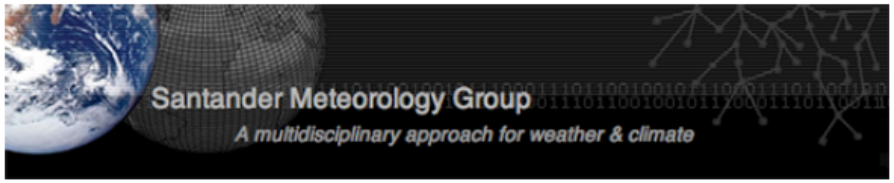
Recommendations and Support for End-Users

These portals **should not be used as a black-box tool (particularly the downscaling portal)** to avoid wrong applications and errors. Some background knowledge is required and the limitations should be known (e.g. the different assumptions of the statistical downscaling methodology). **The users are requested to collaborate with downscaling experts. In some cases of mutual interest we provide support and/or training.**

User tutorials, indications and **recommendations for downscaling** are provided and referred to, e.g. in the ENSEMBLES web site.

User Guide of the ENSEMBLES Downscaling Portal (version 2)

Technical Notes
Santander Meteorology Group (CSIC-UC)
SMG:2.2011



User Guide of the ENSEMBLES Downscaling Portal (version 2)

J.M. Gutiérrez[1], D. San Martín[1,2], A.S. Cofiño[3], S. Herrera[1,2], R. Manzanas[1]
[1] *Instituto de Física de Cantabria, CSIC-Universidad de Cantabria, Santander, Spain.*
[2] *Predictia Intelligent Data Solutions, Santander, Spain.*
[3] *Dpto. Matemática Aplicada y C.C. Universidad de Cantabria. Santander, Spain*
correspondence: gutierjm@ifca.unican.es, daniel@predictia.es, cofinoa@unican.es

version: v3–*October 2012*