DAPA TOOLBOX GUIDE

Common tools for spatial data processing in python

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CONTENTS

1) About This Guide

This general guide will enable you to:

- Import the DAPA Toolbox into ArcGIS
- Identify which script you need
- Run scripts successfully through the correct use of syntax

All the codes are in Python language, Windows Operating System and require ArcGis Workstation and ArcGis 9.1, 9.2, 9.3, 10 or 10.1.

2) How To Import The DAPA-Toolbox In ArcGis

1) Decompress the DAPA-Toolbox.zip
2) Copy the DAPA-Toolbox folder to the ArcToolbox folder of ArcGIS.

   C:\Program Files (x86)\ArcGIS\Desktop10.0\ArcToolbox\Toolboxes

   Note: The toolbox path changes depending on the version of the installed ArcGIS.

3) Open **ArcMap**, in the **ArcToolbox** window, **right-click** on the toolbox and click **Add > Toolbox** (See Figure 1), then navigate to the location of the toolbox, select the tool and then click Open (See Figure 2).

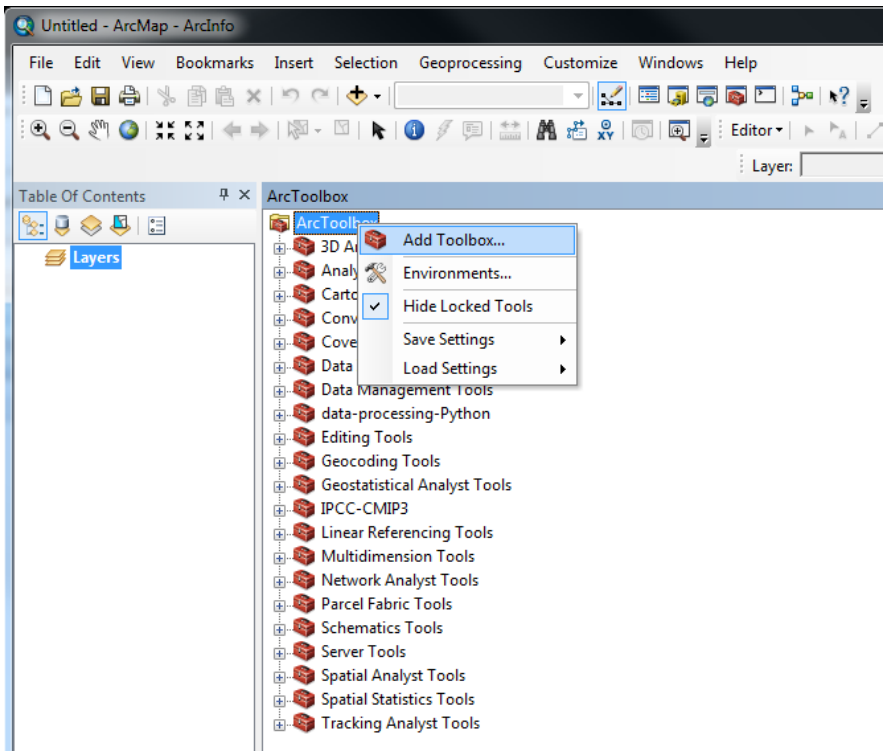

Figure 1. Adding the toolbox

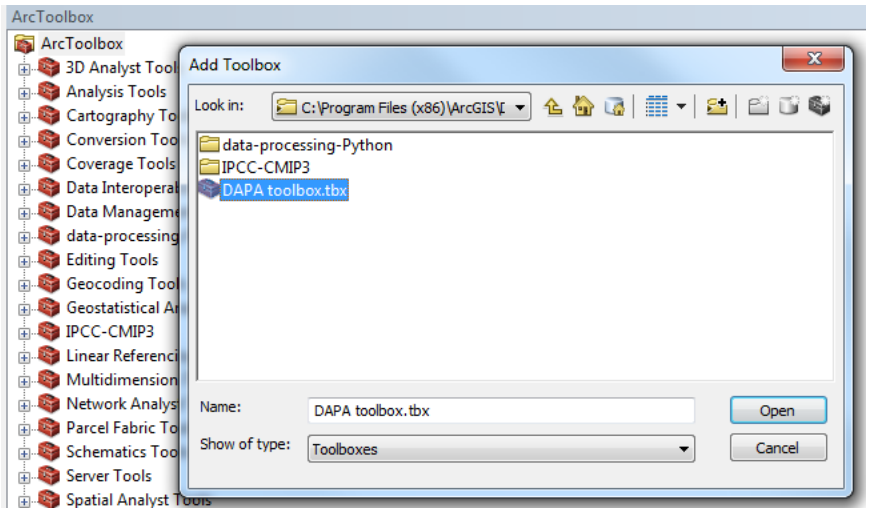

Figure 2. Selecting the toolbox

4) After adding the toolbox, you will need to add the relative path of the script file. To do this, **right-click** on the toolbox, click **Properties > Source**, and then navigate to the location of the script file (See Figure 3).

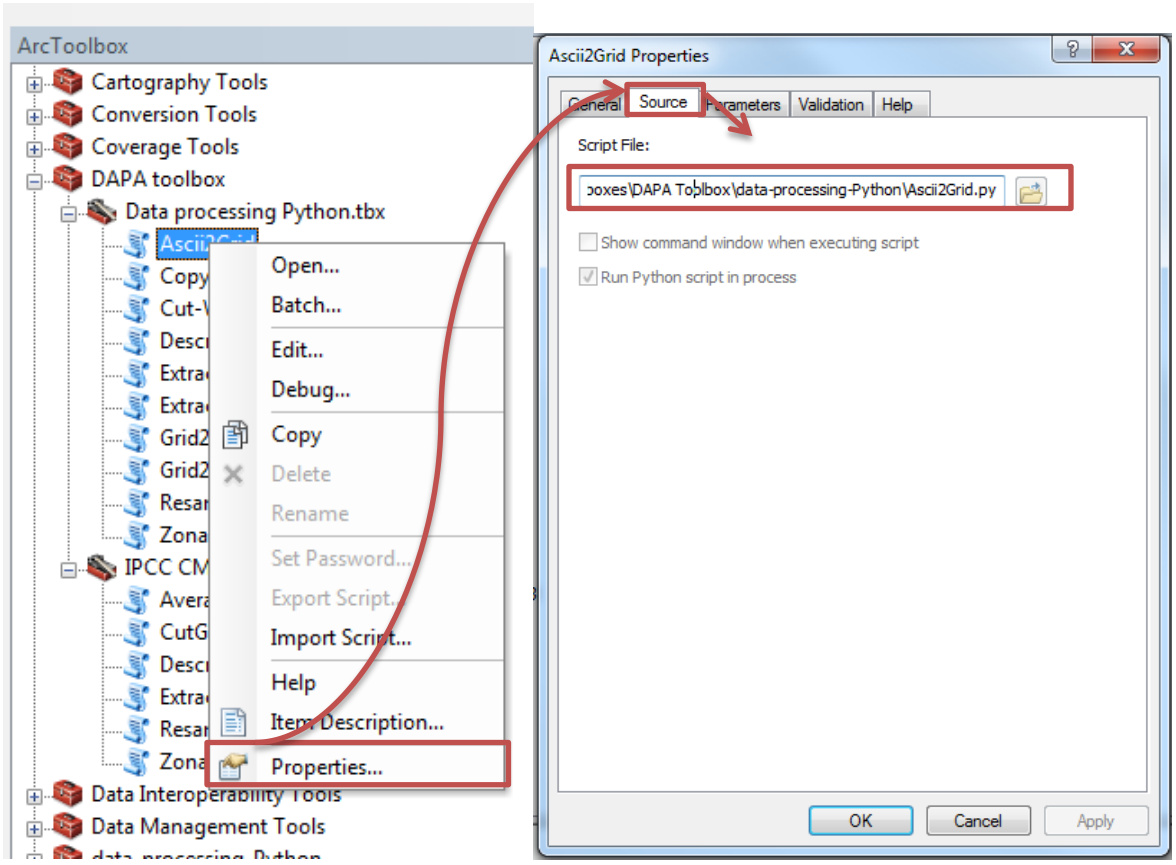

Figure 3. Add script file path

3) How To Run A Script In Cmd

To run a script you must first set the working directory, this establishes where the script is located. The next step is to copy the line of code (syntax scripts) to a **CMD** (in this case Windows), before finally running the script. For example, to run the script "***DescribeGCM_CMIP3.py***" you must first open the *CMD* window and enter the address of the folder where the script is located (see Figure 4), the second step is to copy the syntax of the code with the parameters set (see Figure 5), finally, press the ENTER key to run the script.

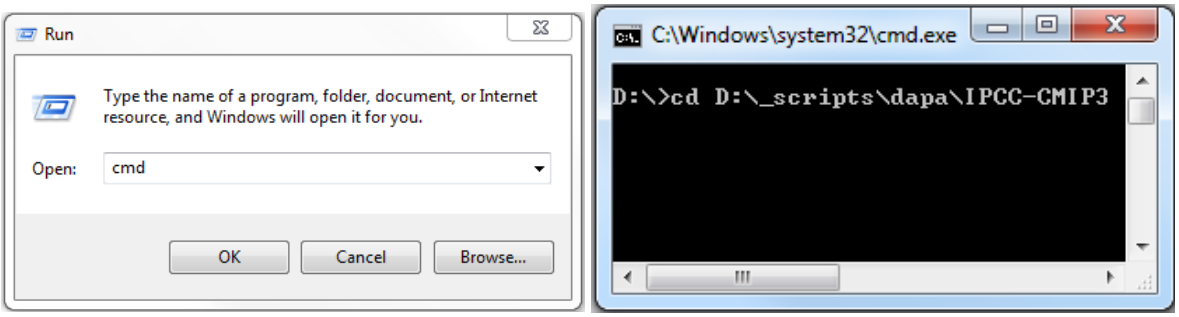

Figure 4. Accessing the CMD and entering the folder of Scripts

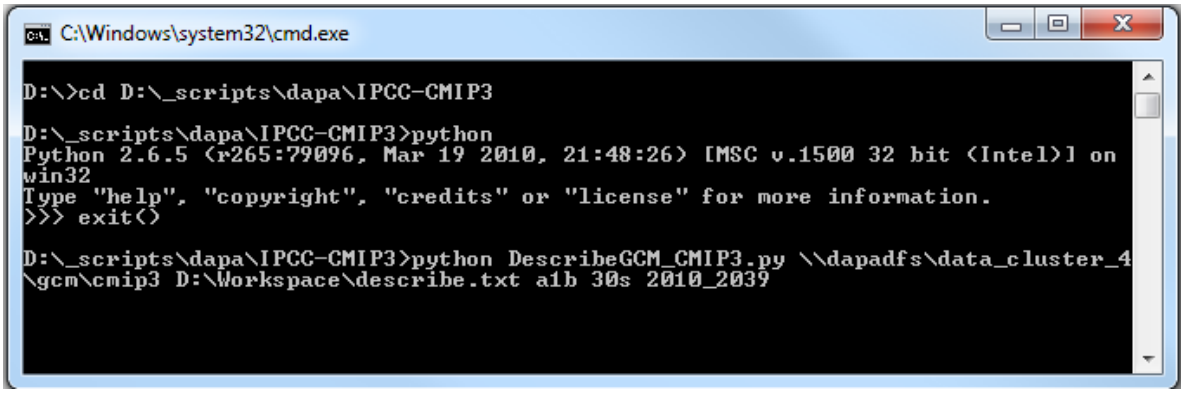

Figure 5. Syntax of the script to run

4) Code Documentation For General Functions

4.1) Ascii2Grid

Ascii2Grid		
Summary	Convert asciis to grids in a workspace	
Syntax	python Ascii2Grid.py <dirbase> <dirout> <wildcard> <type> <remove>	
Example	python Ascii2Grid.py D:\Workspace D:\Workspace prec INTEGER NO	
Parameter	**Explanation**	**Data Type**
dirbase	Is the folder where your ESRI-Asciis files are located	Folder
dirout	Is the folder where the ESRI-grids files are created	Folder
wildcard	Search files with matching key name; e.g. if you want all precipitation data *(prec_1, prec_2, ..., prec_n)*, you must write *"prec"*. Use *"ALL"* to convert all data in the workspace.	String
type	The data type of the output raster dataset. INTEGER — An integer raster dataset will be created. FLOAT — A floating-point raster dataset will be created.	String
remove	Remove ESRI-Ascii files of base directory after converted	String

4.2) Copy Rasters

CopyRasters		
Summary	Copy grids files to another location	
Syntax	python CopyRasters.py <dirbase> <dirout> <wildcard> <switch>	
Example	python CopyRasters.py D:\Workspace D:\Workspace ALL NO	
Parameter	**Explanation**	**Data Type**
dirbase	Is the folder where your ESRI-Grid files are located	Folder
dirout	Is the folder where the ESRI-grids files are created	Folder
wildcard	Search files with matching key name; e.g. if you want all precipitation data *(prec_1, prec_2, ..., prec_n)*, you must write *"prec"*. Use *"ALL"* to convert all data in the workspace.	String
switch	Remove ESRI-Grid files of base directory after copied	String

4.3) DescribeGrid

DescribeGrids		
Summary	Returns the properties of a raster dataset	
Syntax	python DescribeGrids.py <dirbase> <diroutfile> <wildcard>	
Example	python DescribeGrids.py D:\Workspace D:\Workspace\describe.txt prec	
Parameter	**Explanation**	**Data Type**
dirbase	Is the folder where your ESRI-Grid files are located	Folder
diroutfile	Is the folder where you want to create description file to outputs Rasters	Folder
wildcard	Search files with matching key name; e.g. if you want all precipitation data *(prec_1, prec_2, ..., prec_n)*, you must write *"prec"*. Use *"ALL"* to convert all data in the workspace.	String

4.4) ExtractByMask

ExtractByMask		
Summary	Extracts the cells of a raster that correspond to the areas defined by a mask	
Syntax	python ExtractByMask.py <dirbase> <dirout> <mask> <wildcard>	
Example	python ExtractByMask.py D:\Workspace D:\Workspace_cut D:\Workspace \mask ALL	
Parameter	**Explanation**	**Data Type**
dirbase	Is the folder where your ESRI-Grid files are located	Folder
dirout	Is the folder where the cut ESRI-Grid files are created	Folder
mask	Input mask data defining areas to extract (ESRI-grid file or shapefile).	Dataset
wildcard	Search files with matching key name; e.g. if you want all precipitation data *(prec_1, prec_2, ..., prec_n)*, you must write *"prec"*. Use *"ALL"* to convert all data in the workspace.	String

4.5) ExtractCRU_v3_1

ExtractCRU_v3_1		
Summary	Extract data by points or by mask from CRU-TS3.1 grids.	
Syntax	python ExtractCRU_v3_1.py <dirbase> <dirout> <mask> <startyear> <endyear> <variable> <mode>	
Example	python ExtractCRU_v3_1.py \\dapadfs\data_cluster_4\observed\gridded_products\cru-ts-v3-1\monthly_grids D:\Workspace\Output D:\Workspace\mask 2005 2009 ALL 1	
Parameter	**Explanation**	**Data Type**
dirbase	Is the folder where your ESRI-Grid CRU data are located	Folder
mask	Input mask data defining areas to extract (ESRI-grid file or shapefile).	Dataset
dirout	Is the folder where the output files are created (ESRI-Grid files or DBF files)	Folder
startyear	Start year of extraction (1901-2009)	String
endyear	End year of extraction (1901-2009)	String
variable	Search files with matching key name; e.g. if you want all precipitation data (pre_1, pre_2, ..., pre_n), you must write 'pre'. Use 'ALL' to convert all data in the workspace. The possibilities are: tmn(daily minimun temperature), tmx(daily maxmium temperature), pre(precipitation) and tmp(daily mean temperature)	String
Mode	Modes: 1. Extract by points and groups by variables 2. Extract by mask 3. Extract by points and group for MarkSim	Integer

4.6) Grid2Ascii

Grid2Ascii		
Summary	Convert ESRI-Grid to ESRI-Ascii files in a workspace	
Syntax	python Grid2Ascii.py <dirbase> <dirout> <wildcard> <switch>	
Example	python Grid2Ascii.py D:\Workspace D:\Workspace_grids ALL YES	
Parameter	**Explanation**	**Data Type**
dirbase	Is the folder where your ESRI-Grid files are located	Folder

dirout	Is the folder where the ESRI-Asciis files are created	Folder
wildcard	Search files with matching key name; e.g. if you want all precipitation data *(prec_1, prec_2, ..., prec_n)*, you must write *"prec"*. Use *"ALL"* to convert all data in the workspace.	Dataset
switch	Remove ESRI-Grid files of base directory after converted	String

4.7) Grid2OtherFormat

Grid2OtherFormat		
Summary	Convert ESRI-Grid files to other format in a workspace	
Syntax	python Grid2OtherFormat.py <dirbase> <dirout> <wildcard> <format> <switch>	
Example	python Grid2OtherFormat.py D:\Workspace D:\Workspace ALL TIFF YES	
Parameter	**Explanation**	**Data Type**
dirbase	Is the folder where your ESRI-Grid files are located	Folder
dirout	Is the folder where the output rasters are created	Folder
wildcard	Search files with matching key name; e.g. if you want all precipitation data *(prec_1, prec_2, ..., prec_n)*, you must write *"prec"*. Use *"ALL"* to convert all data in the workspace.	Dataset
format	The format of the output raster dataset. BIL—ESRI Band Interleaved by Line file. BIP—ESRI Band Interleaved by Pixel file. BMP—Bitmap graphic raster dataset format. BSQ—ESRI Band Sequential file. DAT—ENVI DAT file GIF—Graphic Interchange Format for raster datasets GRID—ESRI's GRID raster dataset format IMAGINE Image—ERDAS IMAGINE raster data format JP2000—JPEG 2000 raster dataset format JPEG—Joint Photographic Experts Group raster dataset format PNG—Portable Network Graphic raster dataset format TIFF—Tag Image File Format for raster datasets	
switch	Remove ESRI-Grid files of base directory after converted	String

4.8) Resample

Resample		
Summary	Resample ESRI-Grid files in a workspace	
Syntax	python Resample.py <dirbase> <dirout> <resolution> <method> <wildcard>	
Example	python Resample.py D:\Workspace D:\Workspace_resampled 0.5 NEAREST ALL	
Parameter	**Explanation**	**Data Type**
dirbase	Is the folder where your ESRI-Grid files are located	Folder
dirout	Is the folder where the resampled ESRI-Grid files are created	Folder
resolution	Is a numeric value indicating the resolution of the output files in arc-minutes.	Float
method	The resampling algorithm to be used. The default is NEAREST. NEAREST—Nearest neighbor assignment BILINEAR—Bilinear interpolation CUBIC—Cubic convolution MAJORITY—Majority resampling	String
wildcard	Search files with matching key name; e.g. if you want all precipitation data *(prec_1, prec_2, ..., prec_n)*, you must write *"prec"*. Use *"ALL"* to convert all data in the workspace.	Dataset

4.9) ZonalStatisticsAsTable

ZonalStatisticsAsTable		
Summary	Calculate Zonal Statistics as Table of ESRI-Grid files in a workspace	
Syntax	python ZonalStatisticsAsTable.py <dirbase> <dirout> <mask> <wildcard>	
Example	python ZonalStatisticsAsTable.py D:\Workspace D:\Workspace D:\Workspace\mask\shapefile.shp ALL	
Parameter	**Explanation**	**Data Type**
dirbase	Is the folder where your ESRI-Grid files are located	Folder
dirout	Is the folder where the zonal statistics tables are created	Folder
Mask	Polygon shapefile with full path and extension	Folder

wildcard	Search files with matching key name; e.g. if you want all precipitation data *(prec_1, prec_2, ..., prec_n)*, you must write *"prec"*. Use *"ALL"* to convert all data in the workspace.	Dataset

4.10) Cut_WordClim

Cut_WordClim		
Summary	Cut by mask worldclim data and Extraction by mask of points	
Syntax	<Extract_MaskGCM.py> <dirbase> <mask> <dirout> <resolution> <variable> <ascii> <describe>	
Example	python Cut_WordClim.py \\dapadfs\data_cluster_4\observed\gridded_products\worldclim D:\mask D:\Workspace\Output 30s prec NO NO	
Parameter	**Explanation**	**Data Type**
dirbase	Is the folder where your ESRI-Grid files are located	Folder
dirout	Is the folder where the ESRI-Grid files are created	Folder
Mask	Input mask data defining area to extract (ESRI-grid file or shapefile).	Dataset
Resolution	Is a numeric value indicating the resolution of the input files in arc-minutes. The possibilities are 30s, 2_5 min, 5min, 10min	String
variable	The possibilities are: bio(bioclimatic), prec(precipitation), tmax(maximum temperature), tmin(minimum temperature), tmean(average temperature). If you want to choose some variables, only separated with commas without spaces; e.g. "*prec,tmax,tmin*". Use "AL" to use all data in the workspace.	Dataset
ascii	Convert outputs ESRI-Grid files to Ascii	String
describe	Create description file to outputs Rasters	String

5) CODE DOCUMENTATION FOR CMIP3 DATA PROCESSING

5.1) AverageGCM_CMIP3

AverageGCM_CMIP3		
Summary	Calculates the mean (average) and the standard deviation of models from downscaled, disaggregated, anomalies or interpolated GCM data.	
Syntax	<AverageGCM_CMIP3.py> <dirbase> <dirout> <mask> <sres> <resolution> <period> <wildcard>	
Example	python AverageGCM_CMIP3.py \\dapadfs\data_cluster_4\gcm\cmip3\downscaled D:\Workspace\output D:\Workspace\mask a1b 30s 2010_2039 ALL	
Parameter	**Explanation**	**Data Type**
dirbase	Is the folder where are located GCM data	Folder
dirout	Is the folder where the output files are created	Folder
mask	Input mask data defining areas to extract (ESRI-grid file or shapefile).	Dataset
sres	IPCC Emission Escenario. The possibilities are a1b, a2, b1.	String
resolution	Is a numeric value indicating the input resolution in arc-minutes. The possibilities are 30s, 2_5min, 5min, 10min	String
periods	Future 30yr periods The possibilities are: 2010_2039, 2020_2049, 2030_2059, 2040_2069, 2050_2079, 2060_2089, 2070_2099 If you want to choose some periods, enter them separated by commas without spaces; e.g. "2010_2039,2020_2049,2030_2059". Use *"ALL"* to process all the periods.	String
wildcard	Search files with matching key name; e.g. if you want all precipitation data *(prec_1, prec_2, ..., prec_n)*, you must write *"prec"*. Use *"ALL"* to convert all data in the workspace. The possibilities are: bio, prec, tmin, tmax, tmean	String

5.2) CutGCM_CMIP3

CutGCM_CMIP3		
Summary	Extract by mask downscaled, disaggregated, anomalies or interpolated GCM data.	
Syntax	<Extract_MaskGCM.py> <dirbase> <dirout> <mask> <dataset> <sres> <resolution> <models> <periods> <variable> <ascii> <descfile>	
Example	python CutGCM_CMIP3.py \\dapadfs\data_cluster_4\gcm\cmip3 D:\Workspace\output D:\Workspace\mask downscaled A2 30s cnrm_cm3,bccr_bcm2_0 2010_2039 prec YES YES	
Parameter	**Explanation**	**Data Type**
dirbase	Is the folder where are located GCM data	Folder
dirout	Is the folder where the output files are created	Folder
mask	Input mask data defining areas to extract (ESRI-grid file or shapefile).	Dataset
dataset	The possibilities are: Downscaled, Disaggregated, interpolations, and anomalies dataset.	String
sres	IPCC Emission Escenario. The possibilities are a1b, a2, b1.	String
resolution	Is a numeric value indicating the input resolution in arc-minutes. The possibilities are 30s, 2_5min, 5min, 10min	String
models	The possibilities of Global Climate Models are: A1B Scenario: bccr_bcm2_0,cccma_cgcm3_1_t47,cccma_cgcm3_1_t63,cnrm_cm3,csiro_mk3_0,csiro_mk3_5,gfdl_cm2_0,gfdl_cm2_1,giss_aom,giss_model_eh,giss_model_er,iap_fgoals1_0_g,ingv_echam4,inm_cm3_0,ipsl_cm4,miroc3_2_hires,miroc3_2_medres,ncar_ccsm3_0,miub_echo_g,mpi_echam5,mri_cgcm2_3_2a,ncar_pcm1,ukmo_hadcm3,ukmo_hadgem1 A2 Scenario: bccr_bcm2_0,cccma_cgcm3_1_t47,cnrm_cm3,csiro_mk3_0,csiro_mk3_5,gfdl_cm2_0,gfdl_cm2_1,giss_model_er,ingv_echam4,inm_cm3_0,ipsl_cm4,miroc3_2_medres,miub_echo_g,mpi_echam5,mri_cgcm2_3_2a,ncar_ccsm3_0,ncar_pcm1,ukmo_hadcm3,ukmo_hadgem1 B1 Scenario: bccr_bcm2_0,cccma_cgcm3_1_t47,cccma_cgcm3_1_t63,cnrm_cm3,csiro_mk3_0,csiro_mk3_5,gfdl_cm2_0,gfdl_cm2_1,giss_aom,giss_model_er,iap_fgoals1_0_g,inm_cm3_0,ipsl_cm4,miroc3_2_hires,miroc3_2_medres,miub_echo_g,mpi_echam5,mri_cgcm2_3_2a,ncar_ccsm3_0,ukmo_hadcm3 Note: If you want to choose some models, only separated with commas without spaces. Use *"ALL"* to choose all available models.	String
periods	Future 30yr periods	String

	The possibilities are: 2010_2039, 2020_2049, 2030_2059, 2040_2069, 2050_2079, 2060_2089, 2070_2099 If you want to choose some periods, enter them separated by commas without spaces; e.g. "2010_2039, 2020_2049, 2030_2059". Use *"ALL"* to process all the periods.	
variable	The possibilities are: bio(bioclimatic), prec(precipitation), tmax(maximum temperature), tmin(minimum temperature), tmean(average temperature). If you want to choose some variables, only separated with commas without spaces; e.g. *"prec,tmax,tmin"*. Use *"ALL"* to use all data in the workspace.	String
ascii	Convert outputs ESRI-Grid files to Ascii	String
descfile	Describe properties of outputs ESRI-Grid files	String

5.3) ExtractValuesGCM_CMIP3

ExtractValuesGCM_CMIP3		
Summary	Extraction by mask of points, downscaled, diseggregated or interpolated GCM data.	
Syntax	<Extract_MaskGCM.py> <dirbase> <dirout> <mask> <dataset> <sres> <resolution> <models> <periods> <variable>	
Example	python ExtractValuesGCM_CMIP3.py \\dapadfs\data_cluster_4\gcm\cmip3 D:\Workspace\output D:\Workspace\Pluviometros.shp downscaled A2 5min bccr_bcm2_0,cccma_cgcm3_1_t47 2020_2049,2040_2069 prec	
Parameter	**Explanation**	**Data Type**
dirbase	Is the root GCM folder	Folder
dirout	Is the folder where the tables (Dbf) are created	Folder
mask	Input mask data defining points to extract (ShapeFile file).	Dataset
dataset	The possibilities are: Downscaled, Disaggregated, interpolations, and anomalies dataset.	String
sres	IPCC Emission Escenario. The possibilities are a1b, a2, b1.	String
resolution	Is a numeric value indicating the input resolution in arc-minutes. The possibilities are 30s, 2_5min, 5min, 10min	String

models	The possibilities of Global Climate Models are: A1B Scenario: bccr_bcm2_0,cccma_cgcm3_1_t47,cccma_cgcm3_1_t63,cnrm_cm3,csiro_mk3_0,csiro_mk3_5,gfdl_cm2_0,gfdl_cm2_1,giss_aom,giss_model_eh,giss_model_er,iap_fgoals1_0_g,ingv_echam4,inm_cm3_0,ipsl_cm4,miroc3_2_hires,miroc3_2_medres,ncar_ccsm3_0,miub_echo_g,mpi_echam5,mri_cgcm2_3_2a,ncar_pcm1,ukmo_hadcm3,ukmo_hadgem1 A2 Scenario: bccr_bcm2_0,cccma_cgcm3_1_t47,cnrm_cm3,csiro_mk3_0,csiro_mk3_5,gfdl_cm2_0,gfdl_cm2_1,giss_model_er,ingv_echam4,inm_cm3_0,ipsl_cm4,miroc3_2_medres,miub_echo_g,mpi_echam5,mri_cgcm2_3_2a,ncar_ccsm3_0,ncar_pcm1,ukmo_hadcm3,ukmo_hadgem1 B1 Scenario: bccr_bcm2_0,cccma_cgcm3_1_t47,cccma_cgcm3_1_t63,cnrm_cm3,csiro_mk3_0,csiro_mk3_5,gfdl_cm2_0,gfdl_cm2_1,giss_aom,giss_model_er,iap_fgoals1_0_g,inm_cm3_0,ipsl_cm4,miroc3_2_hires,miroc3_2_medres,miub_echo_g,mpi_echam5,mri_cgcm2_3_2a,ncar_ccsm3_0,ukmo_hadcm3 Note: If you want to choose some models, only separated with commas without spaces. Use *"ALL"* to choose all available models.	String
periods	Future 30yr interval The possibilities are: 2010_2039, 2020_2049, 2030_2059, 2040_2069, 2050_2079, 2060_2089, 2070_2099 if you want to choose some periods, enter them separated by commas without spaces; e.g. "2010_2039,2020_2049, 2030_2059". If you want to choose all the periods, you can input only "ALL"	String
variable	The possibilities are: bio(bioclimatic), prec(precipitation), tmax(maximum temperature), tmin(minimum temperature), tmean(average temperature). If you want to choose some variables, only separated with commas without spaces; e.g. *"prec,tmax,tmin"*. Use *"ALL"* to use all data in the workspace.	String

5.4) DescribeGCM_CMIP3

DescribeGCM_CMIP3		
Summary	Describe properties of ESRI-Grid Downscaled, Disaggregated, anomalies or Interpolated datasets	
Syntax	<DescribeGCM_CMIP3.py> <dirbase> <descfile> <sres> <resolution> <models> <periods> <variable>	
Example	python DescribeGCM_CMIP3.py \\dapadfs\data_cluster_4\gcm\cmip3\downscaled D:\Workspace\output a1b 30s cnrm_cm3,bccr_bcm2_0 2010_2039 ALL	
Parameter	**Explanation**	**Data Type**
dirbase	Is the root GCM folder	Folder
Output_file	Is the folder where you want to create description file to outputs Rasters	Folder
sres	IPCC Emission Escenario. The possibilities are a1b, a2, b1.	String
Resolution	Is a numeric value indicating the input resolution in arc-minutes. The possibilities are 30s, 2_5min, 5min, 10min	String
models	The possibilities of Global Climate Models are: A1B Scenario: bccr_bcm2_0,cccma_cgcm3_1_t47,cccma_cgcm3_1_t63,cnrm_cm3,csiro_mk3_0,csiro_mk3_5,gfdl_cm2_0,gfdl_cm2_1,giss_aom,giss_model_eh,giss_model_er,iap_fgoals1_0_g,ingv_echam4,inm_cm3_0,ipsl_cm4,miroc3_2_hires,miroc3_2_medres,ncar_ccsm3_0, miub_echo_g,mpi_echam5,mri_cgcm2_3_2a,ncar_pcm1,ukmo_hadcm3,ukmo_hadgem1 A2 Scenario: bccr_bcm2_0,cccma_cgcm3_1_t47,cnrm_cm3,csiro_mk3_0,csiro_mk3_5,gfdl_cm2_0,gfdl_cm2_1,giss_model_er,ingv_echam4,inm_cm3_0,ipsl_cm4,miroc3_2_medres,miub_echo_g,mpi_echam5,mri_cgcm2_3_2a,ncar_ccsm3_0,ncar_pcm1,ukmo_hadcm3,ukmo_hadgem1 B1 Scenario: bccr_bcm2_0,cccma_cgcm3_1_t47,cccma_cgcm3_1_t63,cnrm_cm3,csiro_mk3_0,csiro_mk3_5,gfdl_cm2_0,gfdl_cm2_1,giss_aom,giss_model_er,iap_fgoals1_0_g,inm_cm3_0,ipsl_cm4,miroc3_2_hires,miroc3_2_medres,miub_echo_g,mpi_echam5,mri_cgcm2_3_2a,ncar_ccsm3_0,ukmo_hadcm3 Note: If you want to choose some models, only separated with commas without spaces. Use *"ALL"* to choose all available models.	String

Periods	Future 30yr periods The possibilities are: 2010_2039,2020_2049,2030_2059,2040_2069, 2050_2079,2060_2089,2070_2099 If you want to choose some periods, enter them separated by commas without spaces; e.g."2010_2039,2020_2049,2030_2059". Use *"ALL"* to process all the periods.	String
variable	Search files with matching key name; e.g. if you want all precipitation data *(prec_1, prec_2, ..., prec_n)*, you must write *"prec"*. Use *"ALL"* to convert all data in the workspace. The possibilities are: bio, prec, tmin, tmax, tmean	String

5.5) ResampleGCM_CMIP3

ResampleGCM_CMIP3		
Summary	Resample ESRI-Grid files anomalies, disaggregated, interpolated or downscaled GCM data	
Syntax	<ResampleGCM_CMIP3.py> <dirbase> <dirout> <sres> <resolution> <resol_resample> <models> <periods> <wildcard> <method>	
Example	python ResampleGCM_CMIP3.py \\dapadfs\data_cluster_4\gcm\cmip3\downscaled D:\Workspace\output B1 5min 10min ALL ALL prec NEAREST	
Parameter	**Explanation**	**Data Type**
dirbase	Is the root GCM folder	Folder
dirout	Is the folder where the output files are created	Folder
sres	IPCC Emission Escenario. The possibilities are a1b, a2, b1.	String
resolution	Is a numeric value indicating the input resolution in arc-minutes. The possibilities are 30s, 2_5min, 5min y 10min	String
resol_resample	Is a numeric value indicating the output resolution in arc-minutes. The possibilities are 30s, 2_5min, 5min y 10min	String

models	The possibilities of Global Climate Models are: A1B Scenario: bccr_bcm2_0,cccma_cgcm3_1_t47,cccma_cgcm3_1_t63,cnrm_cm3,csiro_mk3_0,csiro_mk3_5,gfdl_cm2_0,gfdl_cm2_1,giss_aom,giss_model_eh,giss_model_er,iap_fgoals1_0_g,ingv_echam4,inm_cm3_0,ipsl_cm4,miroc3_2_hires,miroc3_2_medres,ncar_ccsm3_0,miub_echo_g,mpi_echam5,mri_cgcm2_3_2a,ncar_pcm1,ukmo_hadcm3,ukmo_hadgem1 A2 Scenario: bccr_bcm2_0,cccma_cgcm3_1_t47,cnrm_cm3,csiro_mk3_0,csiro_mk3_5,gfdl_cm2_0,gfdl_cm2_1,giss_model_er,ingv_echam4,inm_cm3_0,ipsl_cm4,miroc3_2_medres,miub_echo_g,mpi_echam5,mri_cgcm2_3_2a,ncar_ccsm3_0,ncar_pcm1,ukmo_hadcm3,ukmo_hadgem1 B1 Scenario: bccr_bcm2_0,cccma_cgcm3_1_t47,cccma_cgcm3_1_t63,cnrm_cm3,csiro_mk3_0,csiro_mk3_5,gfdl_cm2_0,gfdl_cm2_1,giss_aom,giss_model_er,iap_fgoals1_0_g,inm_cm3_0,ipsl_cm4,miroc3_2_hires,miroc3_2_medres,miub_echo_g,mpi_echam5,mri_cgcm2_3_2a,ncar_ccsm3_0,ukmo_hadcm3 Note: If you want to choose some models, only separated with commas without spaces. Use *"ALL"* to choose all available models.	String
periods	Future 30yr periods The possibilities are: 2010_2039, 2020_2049, 2030_2059, 2040_2069, 2050_2079, 2060_2089, 2070_2099 If you want to choose some periods, enter them separated by commas without spaces; e.g. "2010_2039,2020_2049, 2030_2059". Use *"ALL"* to process all the periods.	String
wildcard	Search files with matching key name. E.g. if you want all precipitation data *(prec_1, prec_2, ..., prec_n)*, you must write *"prec"*. Use *"ALL"* to convert all data in the workspace. The possibilities are: prec, tmin, tmax, tmean	String
method	The resampling algorithm to be used. The default is NEAREST. NEAREST—Nearest neighbor assignment BILINEAR—Bilinear interpolation CUBIC—Cubic convolution MAJORITY—Majority resampling	String

5.6) ZonalStatisticsGCM_CMIP3

ZonalStatisticsGCM_CMIP3		
Summary	Calculate Zonal Statistics as table of ESRI-Grid files in a workspace	
Syntax	<ZonalStatisticsGCM_CMIP3.py> <dirbase> <dirout> <mask> <dataset> <sres> <resolution> <models> periods> <wildcard>	
Example	python ZonalStatisticsGCM_CMIP3.py \\dapadfs\data_cluster_4\gcm\cmip3 D:\Workspace\output D:\Workspace\polygon.shp downscaled b1 10min bccr_bcm2_0 2020_2049 prec	
Parameter	**Explanation**	**Data Type**
dirbase	Is the root GCM folder	Folder
dirout	Is the folder where the output files are created	Folder
mask	Polygon shapefile with full path and extension	Dataset
dataset	The possibilities are: Downscaled, Disaggregated, interpolations, and anomalies dataset.	String
sres	IPCC Emission Escenario. The possibilities are a1b, a2, b1.	String
resolution	Is a numeric value indicating the input resolution in arc-minutes. The possibilities are 30s, 2_5min, 5min, 10min	String
models	The possibilities of Global Climate Models are: A1B Scenario: bccr_bcm2_0,cccma_cgcm3_1_t47,cccma_cgcm3_1_t63,cnrm_cm3,csiro_mk3_0,csiro_mk3_5,gfdl_cm2_0,gfdl_cm2_1,giss_aom,giss_model_eh,giss_model_er,iap_fgoals1_0_g,ingv_echam4,inm_cm3_0,ipsl_cm4,miroc3_2_hires,miroc3_2_medres,ncar_ccsm3_0,miub_echo_g,mpi_echam5,mri_cgcm2_3_2a,ncar_pcm1,ukmo_hadcm3,ukmo_hadgem1 A2 Scenario: bccr_bcm2_0,cccma_cgcm3_1_t47,cnrm_cm3,csiro_mk3_0,csiro_mk3_5,gfdl_cm2_0,gfdl_cm2_1,giss_model_er,ingv_echam4,inm_cm3_0,ipsl_cm4,miroc3_2_medres,miub_echo_g,mpi_echam5,mri_cgcm2_3_2a,ncar_ccsm3_0,ncar_pcm1,ukmo_hadcm3,ukmo_hadgem1 B1 Scenario: bccr_bcm2_0,cccma_cgcm3_1_t47,cccma_cgcm3_1_t63,cnrm_cm3,csiro_mk3_0,csiro_mk3_5,gfdl_cm2_0,gfdl_cm2_1,giss_aom,giss_model_er,iap_fgoals1_0_g,inm_cm3_0,ipsl_cm4,miroc3_2_hires,miroc3_2_medres,miub_echo_g,mpi_echam5,mri_cgcm2_3_2a,ncar_ccsm3_0,ukmo_hadcm3	String

	Note: If you want to choose some models, only separated with commas without spaces. Use *"ALL"* to choose all available models.	
periods	Future 30yr periods The possibilities are: 2010_2039, 2020_2049, 2030_2059, 2040_2069, 2050_2079, 2060_2089, 2070_2099 If you want to choose some periods, enter them separated by commas without spaces; e.g. "2010_2039,2020_2049,2030_2059". Use *"ALL"* to process all the periods.	String
wildcard	The possibilities are: bio(bioclimatic), prec(precipitation), tmax(maximum temperature), tmin(minimum temperature), tmean(average temperature). If you want to choose some variables, only separated with commas without spaces; e.g. *"prec,tmax,tmin"*. Use *"ALL"* to use all data in the workspace.	Dataset