Data Management Plan for the PhD project: Development and Application of a Monitoring System to Assess the Impacts of Climate and Land Cover Changes on Eco-Hydrological Processes in an Eastern Andes Catchment Area

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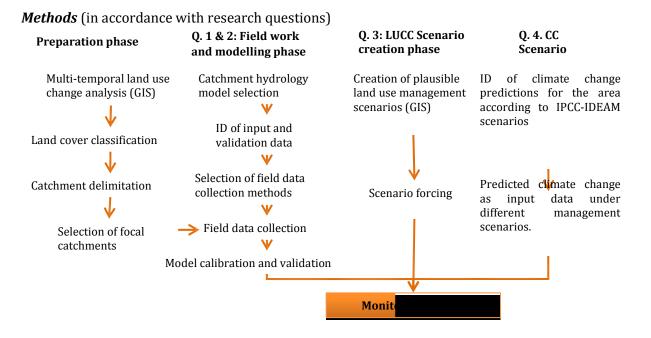
Research description

Context

Tropical montane cloud forests (TMCF) may be crucial for sustaining water yields, but studies indicate a high variability of the underlying processes depending on site specific conditions. The impact of land cover-, land use- and climate change on TMCF, in terms of hydrological processes, is currently unknown. Land use management decisions for the highlands of the Orinoco river basin lack scientific support, despite actual agricultural and oil industry development.

Research questions

- 1. To what extent are ecohydrological processes affected by the transformation of TMCF to grasslands?
- 2. To which extent do ecohydrological processes of secondary TMCF differ from those of mature TMCF?
- 3. How would different local land use management scenarios affect local water yield?
- 4. How does future climate change affect the ecohydrological processes and the TMFC restoration potential?



Data management roles

Involved parties

Involved parties are shown in Table 1. ESS-WUR and ABC will play a role in data management. Colciencias and Equión are exclusively funding parties and their conditions are only related to acknowledging their support on the PhD studies and the project.

Name	Description	Role
Earth System Science Research group (ESS-WUR)	Research group	Academic support
Asociación de Becarios de Casanare (ABC)	Local NGO	Administration and logistics support.
Colciencias/Colfuturo	Public Colombian Institute	Academic funder
Equión Energía Limited	Oil company	Project funder

Individual roles

Short term

Main researcher (Beatriz Ramírez): Responsible for the data management of the project. This includes generating and distributing files according to the backup plan (Table 2).

Daily supervisor (Laurens Ganzeveld): He will store a copy of data according to the backup plan, received by email or through internet file sharing. As soon as ESS has its data management plan established he will be responsible for instructing the main researcher on the guidelines to adapt this management plan.

Asociación de Becarios de Casanare-ABC: They will store a copy of data according to the backup plan in their server, as well as keep the physical folders.

Long term

Once the project is finished, the main researcher will extract the files with the final and relevant trials and/or versions, necessary to replicate the study. Two copies of the depurated folder will be kept; one, at the ESS group (group data management plan under elaboration) in the Netherlands, and one at ABC in Colombia.

Sharing and ownership

This project will contribute to the knowledge of natural resources' dynamics in the Orinoquia region. None of the involved parties restrict the use of data. On the contrary, ABC will create a project summary webpage (in Spanish) in its domain. Access to raw data will be granted after: a) providing information about intended use, and b) agreeing on citation and acknowledgement terms.

Data categorization and backup plan

Table 2. Data categorization includes the corresponding phase of data acquisition, total data size expected (in GB), software choices and file extensions. The back-up plan includes location of copies and periodicity of actualization.

Data categories	Corresponding phase	Software choices	File extension	Back-up plan				
1.	Academic data (Total da	ta size: 215 GB)		Laptop	ED	ESS comp	ABC	D. sup
1.1. Digital maps (Total data size: 150 GB)			X	X	X			
Original imagery	Preparation phase	ArcGIS	.TIFF					
Processed imagery	Preparation phase	ArcGIS	.MXD* & ASCII	monthly	weekly			
Data collection points maps	Field work sub-phase	ArcGIS	.MXD* & ASCII					
Modelling outcome maps	Modelling sub-phase	R or ArcGIS	.MXD* & ASCII	mo				
Scenario maps	LUCC & CC Scenario creation phases	R or ArcGIS	.MXD* & ASCII					
1.2. Field data (Tota	l data size: 50 GB)			X	X		X	Х
Measured data	Field work sub-phase	Excel	.xls & .txt	daily		w	weekly	
1.3. Modelling script	ts, matrices and graph out	comes (Total data s	ize: 10 GB)	X	X	X		Х
Model original scripts	Modelling sub-phase	R & Np	.R & .txt					l .
Adapted model scripts	Modelling sub-phase	R & Np	.R & .txt		daily			
Input matrices	Modelling sub-phase	Excel & Np	.txt					ekly
Output matrices	Modelling sub-phase	Excel & Np	.txt	weekly				weekly
Output graphs	Modelling sub-phase	R & PDF	.R & .pdf					F
Output tests	Modelling sub-phase	R, Excel, Np, Ar	.R, .txt & .pdf					
1.4. Text documents	(Total data size: 5 GB)			X	X	X	X	Х
Research proposal process	Preparation phase	Word	.doc	– weekly				
Literature review summaries	Transversal	Word	.doc		daily		monthly	
Method description	Transversal	Word	.doc					
Paper drafts	Transversal	Word	.doc					

Data categories	Corresponding phase	Software choices	File extension	Back-up plan				
2.	Administration data (Tota	al data size: 1 GB)		Laptop ED ESS comp			ABC	D. sup
2.1. Budget related (Total data size: 0.5 GB)				X	X		Х	
Price lists for required equipment	Preparation phase	Ar/word & Excel	.pdf & .xls					
Equipment invoices and warranties	Preparation phase	Ar & paper	.pdf & pf	weekly			dy	
Field work budget planned and executed	Preparation phase/transversal	Excel	.xls				biweekly	
Field expenses payment receipts (rent, field assistance salaries, etc.)	Field sub-phase	Ar & paper	.pdf & pf					
2.2. Administration	(Total data size: 0.5 GB)			Х	X		Х	
Contracts	Field sub-phase	Ar & paper	.pdf & pf	month	ly		mon.	
Software: ArcGIS file types (.mxd); pf: Physical folders; Ar: Acrobat reader; Np: Notepad Backup system: ED: external drive; comp: computer desktop, D. sup: Daily supervisor; ABC: ABC's server								

Data documentation and file organization

Figure 1 presents a diagram of folder organization and file naming strategy according to data categories (Table 1). In each folder, a metadata a text file (.txt) will contain relevant information of its files. For example, in the folder Orig_image, it is important to know for each image its acquisition date, satellite employed, source of the image and pre-processing procedures (if any). This diagram can also be used as a data index of the project, and can facilitate communication with other users interested in using/viewing this project's information.

	Name	Example	
	Month_year_type	01_1989_landsat	
- Proc_image>	Month_year_type_process	01_1989_landsat_orthor ect	
Digital_maps Field_points	Field_points_date of actualization	Field_points_11_09_13	
Mod_outcome_maps	Month_year_outcome type	01_1989_wateryield	
Scenario_maps>	Year_parameter	2050_wateryield	
- Field_data — (Parameter name) ————————————————————————————————————	Parameter_date of actualization	Rainfall_11_09_2013	
A Orig_scripts>	Model_script_version	Shetran_script_v2.5	
c a – Modified_scripts —>	Model_script_modification_trial#	Shetran_script_cloudwat er_t1	
e Input_data >	Parameter_col#_row#_trial#	Rainfall_4_250_t1	
i Output_matrices	Est. parameter_col#_row#_trial#	ET_4_250_t1	
C Output_graphs>	Graph_x_y_trial#	Scatterplot_rainf_ET_t1	
Output_tests >	Test_parameter_trial#	Senstest_rainfall_t1	
P Research_prop	RP_trial# & _revised by	RP_t1_revLG	
D Lit_rev	Topic_subtopic	Modelling_wateryields	
B Text_docs - Method_desc ->	Topic_method	Soil inf_infiltrometer	
R Paper drafts Paper 1 Paper #	Paper code_date & revised by	TMCFvsPas_11_09_2014 _LG	
Price_lists>	Company_date	Eijkelkamp_11_09_2013	
- Equipment_inv>	Equipment list	Equipment_list	
A Budget Plan_budget >	Budget_date	Budget_11_09_2013	
m Receipts_dig>	Item_rec_date (month_year)	Mercado_rec01_2014	
n administration — Contracts_dig	Item_con_date	Houserent_con_01_2014	

Figure 1. Proposed folder arrangement and file naming strategy.