

# 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

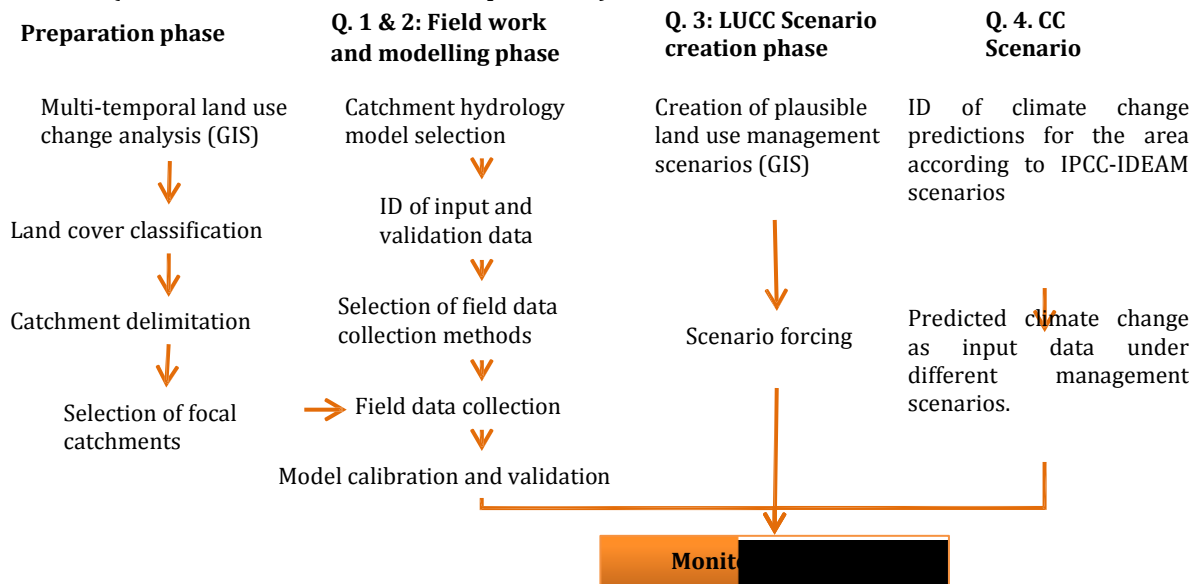
### Context

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?

### Methods (in accordance with research questions)



## 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.

**Table 1. Parties involved in the project**

Name	Description	Role
<b>Earth System Science Research group (ESS-WUR)</b>	Research group	Academic support
<b>Asociación de Becarios de Casanare (ABC)</b>	Local NGO	Administration and logistics support.
<b>Colciencias/Colfuturo</b>	Public Colombian Institute	Academic funder
<b>Equión Energía Limited</b>	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 deputed 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				
<b>1. Academic data (Total data size: 215 GB)</b>				<b>Laptop</b>	<b>ED</b>	<b>ESS comp</b>	<b>ABC</b>	<b>D. sup</b>
<b>1.1. Digital maps (Total data size: 150 GB)</b>				<b>X</b>	<b>X</b>	<b>X</b>		
Original imagery	Preparation phase	ArcGIS	.TIFF	monthly	weekly			
Processed imagery	Preparation phase	ArcGIS	.MXD* & ASCII					
Data collection points maps	Field work sub-phase	ArcGIS	.MXD* & ASCII					
Modelling outcome maps	Modelling sub-phase	R or ArcGIS	.MXD* & ASCII					
Scenario maps	LUCC & CC Scenario creation phases	R or ArcGIS	.MXD* & ASCII					
<b>1.2. Field data (Total data size: 50 GB)</b>				<b>X</b>	<b>X</b>		<b>X</b>	<b>X</b>
Measured data	Field work sub-phase	Excel	.xls & .txt	daily			weekly	
<b>1.3. Modelling scripts, matrices and graph outcomes (Total data size: 10 GB)</b>				<b>X</b>	<b>X</b>	<b>X</b>		<b>X</b>
Model original scripts	Modelling sub-phase	R & Np	.R & .txt	weekly	daily			weekly
Adapted model scripts	Modelling sub-phase	R & Np	.R & .txt					
Input matrices	Modelling sub-phase	Excel & Np	.txt					
Output matrices	Modelling sub-phase	Excel & Np	.txt					
Output graphs	Modelling sub-phase	R & PDF	.R & .pdf					
Output tests	Modelling sub-phase	R, Excel, Np, Ar	.R, .txt & .pdf					
<b>1.4. Text documents (Total data size: 5 GB)</b>				<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>
Research proposal process	Preparation phase	Word	.doc	weekly	daily		monthly	
Literature review summaries	Transversal	Word	.doc					
Method description	Transversal	Word	.doc					
Paper drafts	Transversal	Word	.doc					

Data categories	Corresponding phase	Software choices	File extension	Back-up plan				
2. Administration data (Total data size: 1 GB)				Laptop	ED	ESS comp	ABC	D. sup
2.1. Budget related (Total data size: 0.5 GB)				X	X		X	
Price lists for required equipment	Preparation phase	Ar/word & Excel	.pdf & .xls	weekly			biweekly	
Equipment invoices and warranties	Preparation phase	Ar & paper	.pdf & pf					
Field work budget planned and executed	Preparation phase/transversal	Excel	.xls					
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)				X	X		X	
Contracts	Field sub-phase	Ar & paper	.pdf & pf	monthly			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 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.

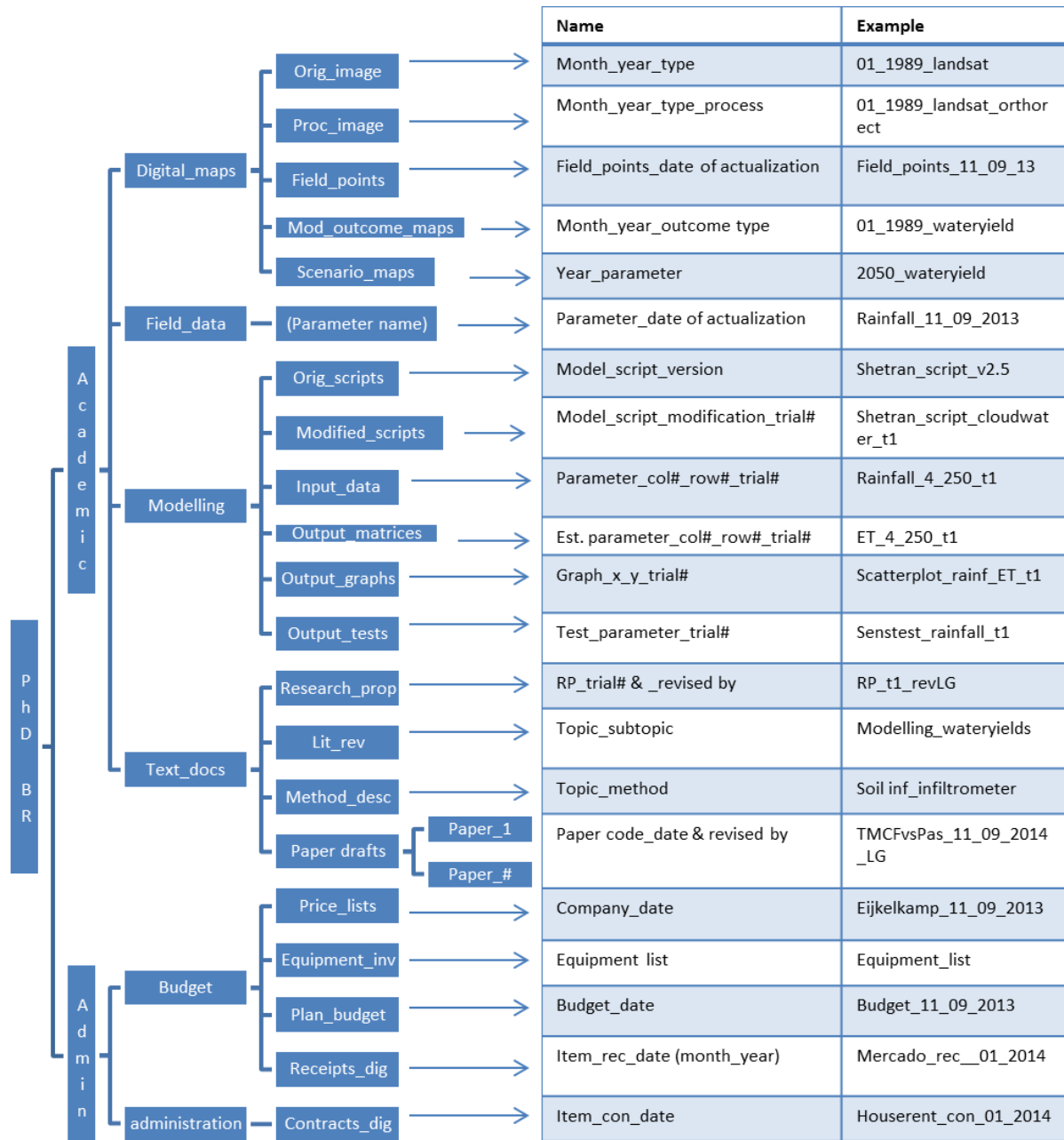


Figure 1. Proposed folder arrangement and file naming strategy.