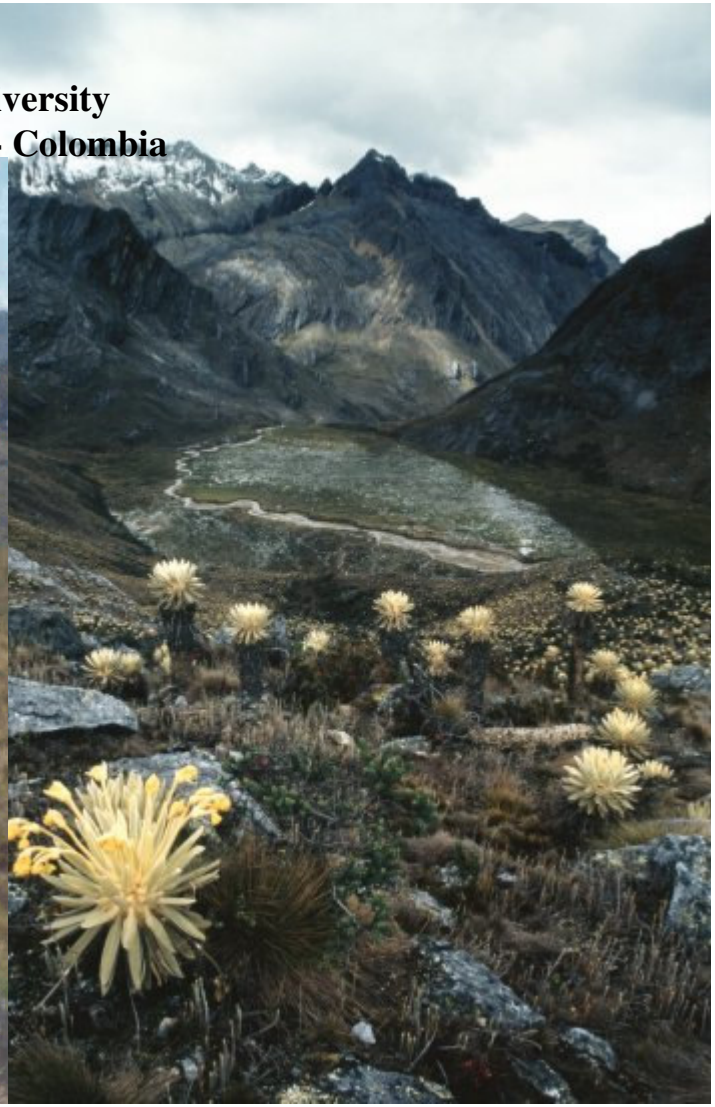
Evolutionary Objects for Glacial Landforms Recognition: GRASS Possibilities

José Lubín Torres Orozco –with ALBAN Program Scholarship support
Prof. Dr. Rer. Nat. Ekkehard Jordan - Geography Institute Düsseldorf University
Prof. Dr. Norberto Parra – Lab. Sistemas Complejos – UNAL – Medellín - Colombia



Sequence

- **Introduction**
- **Motivation**
- **Project: Goal, Model Explanation, area, initial Results and Future Work.**
- **Discussion**

Introduction

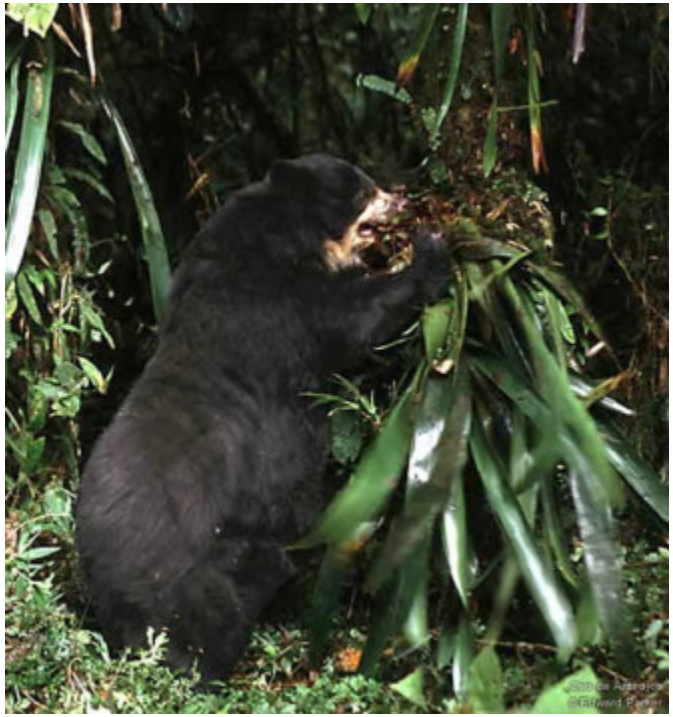
-Geography Institute – Düsseldorf University:

Photogrammetry, GIS, DTM, etc

- Laboratorio de Sistemas Complejos – UNAL - Colombia:

Climate Change, soils, geomorphology, biodiversity, dynamic flows, geostatistics, image analysis, informatics, etc.

Introduction



1) **Geomorphology:**

   GIS possibilities, DTM accurate, Modeling and Simulation.

2) **Tools:**

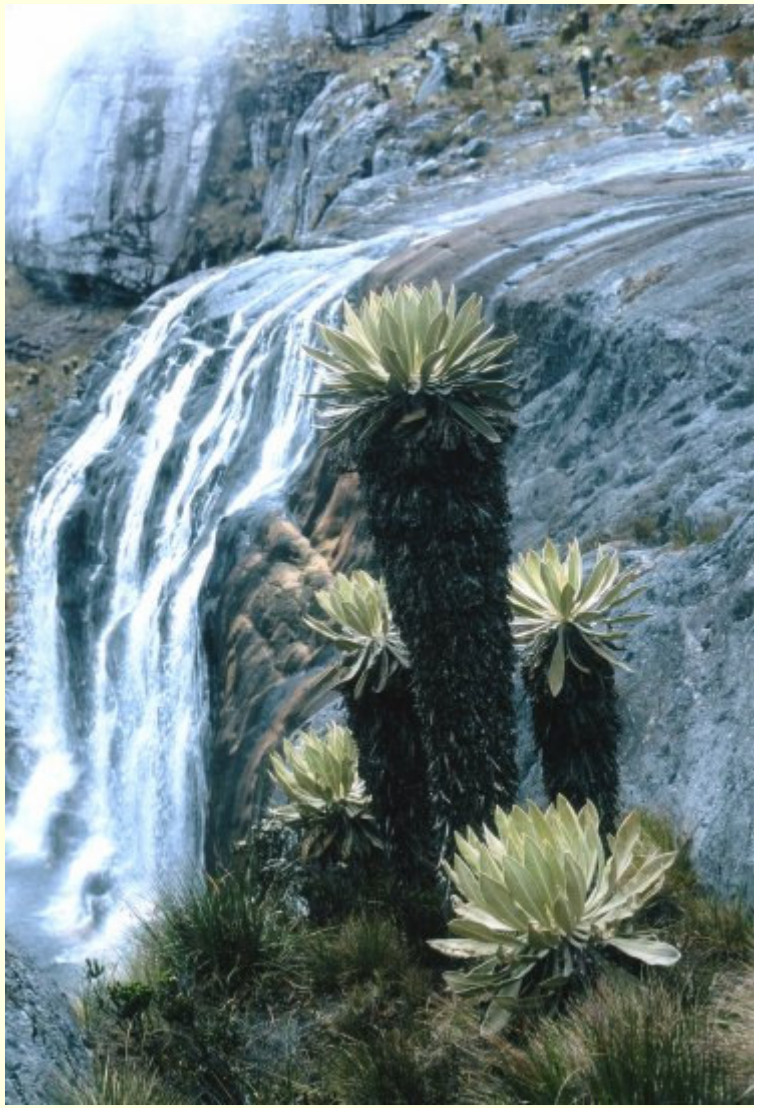
   Image Analysis,, Wavelets, Texture Analysis, Artificial Intelligence.

BUT: ***LITTLE MONEY for research***
Colombia – only 0.3% Nat. Budget for research

THEN:
Software GNU: OpenGIS, Grass, R, Linux, etc

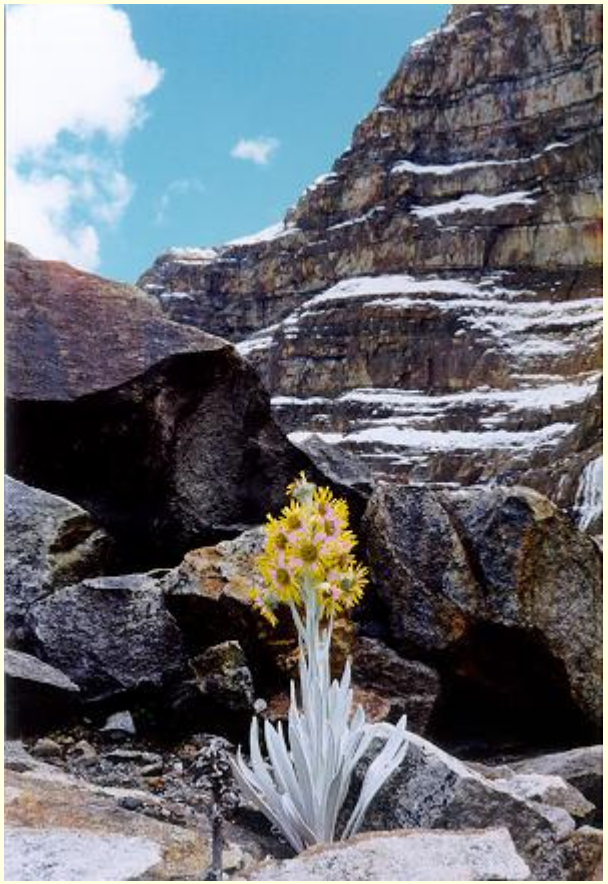
Motivation

The development of new tools to understand better our ecosystems behavior and to preserve our natural resources



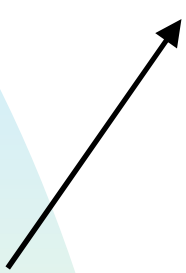
Motivation

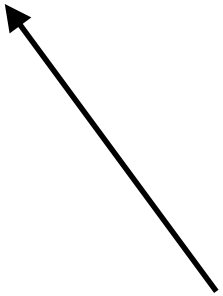
Landforms Recognition in Glaciers and later the Modeling of their Evolution.



Project

Model for glacial landforms recognition in La Sierra Nevada del Cocuy - Colombia

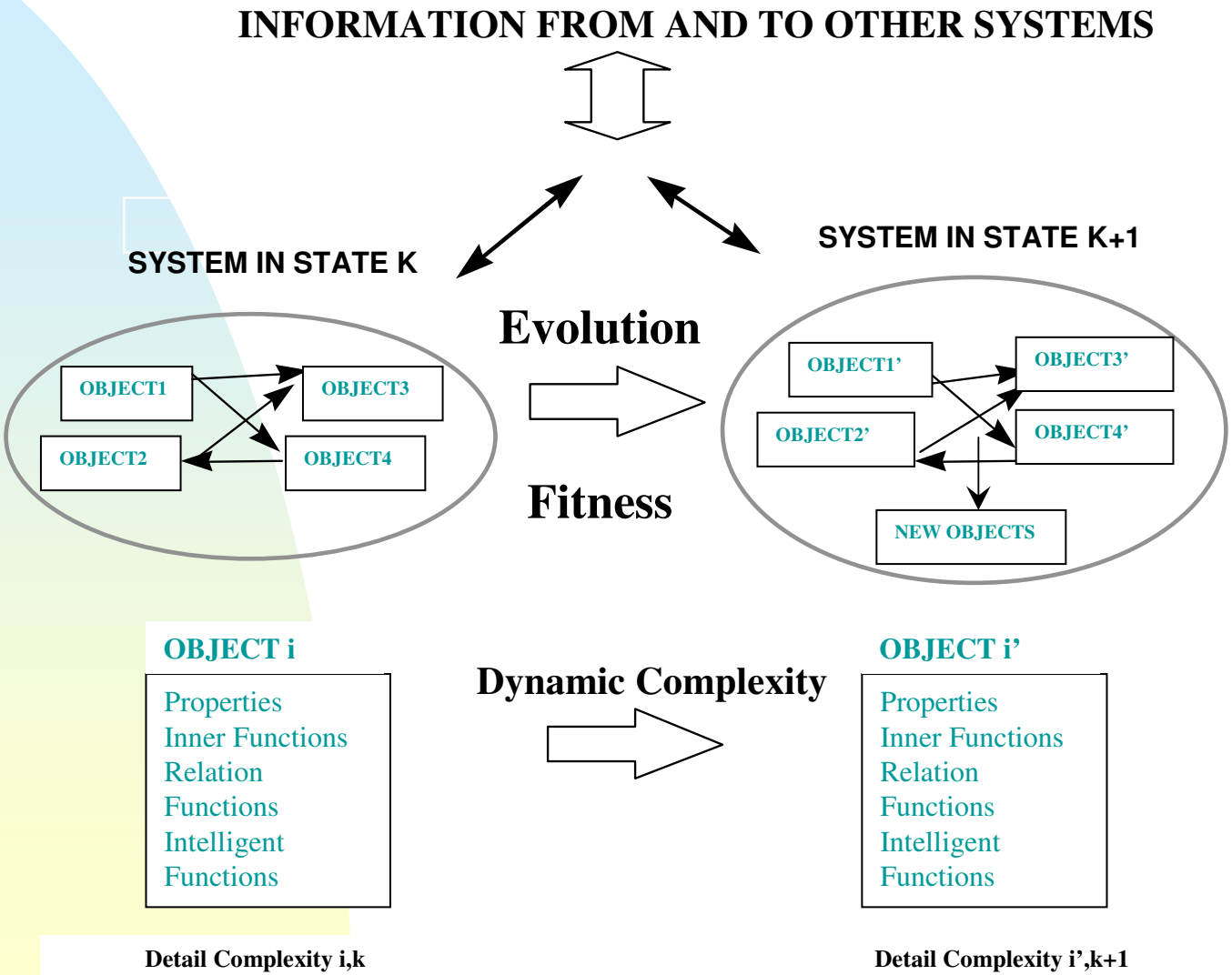




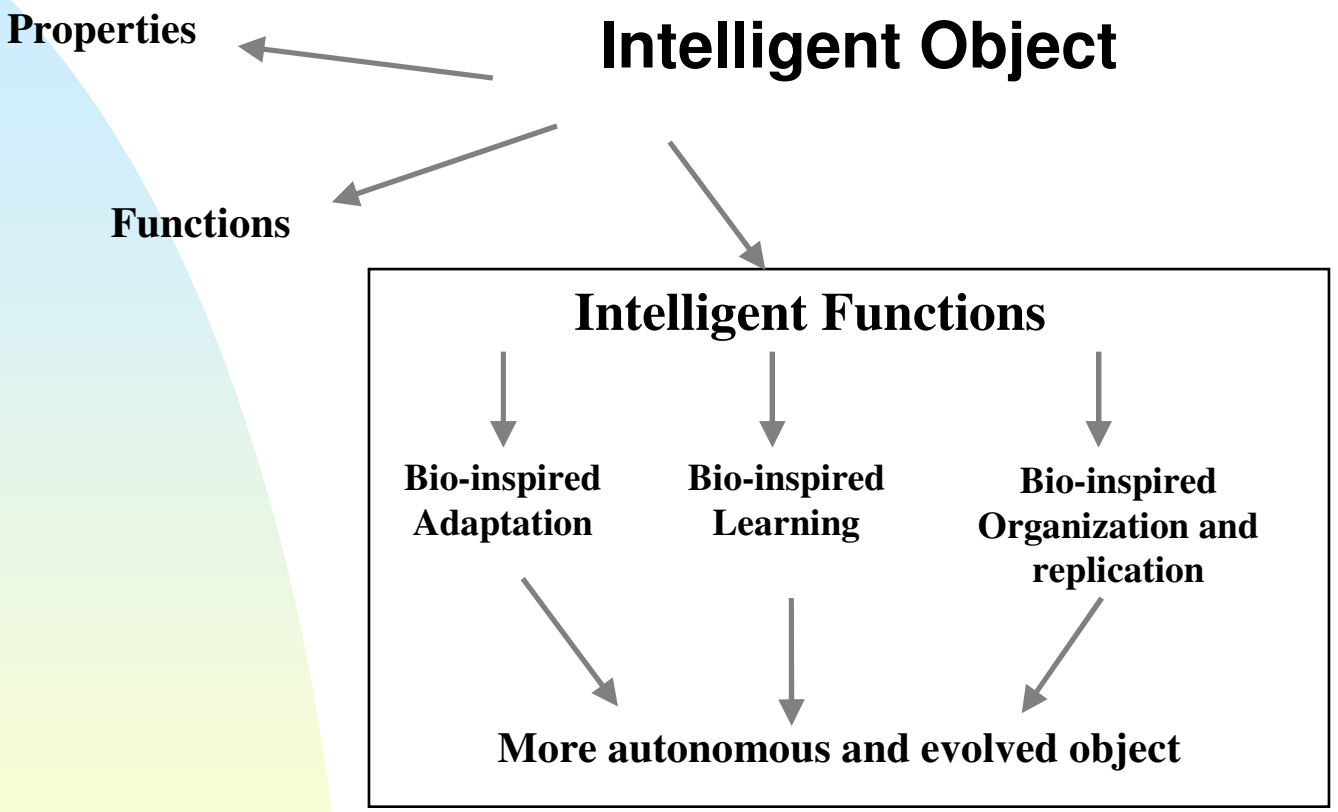
MDT and Basic Analysis Support with GIS and photogrammetric Software

New Algorithms creation in GRASS with OOGM model

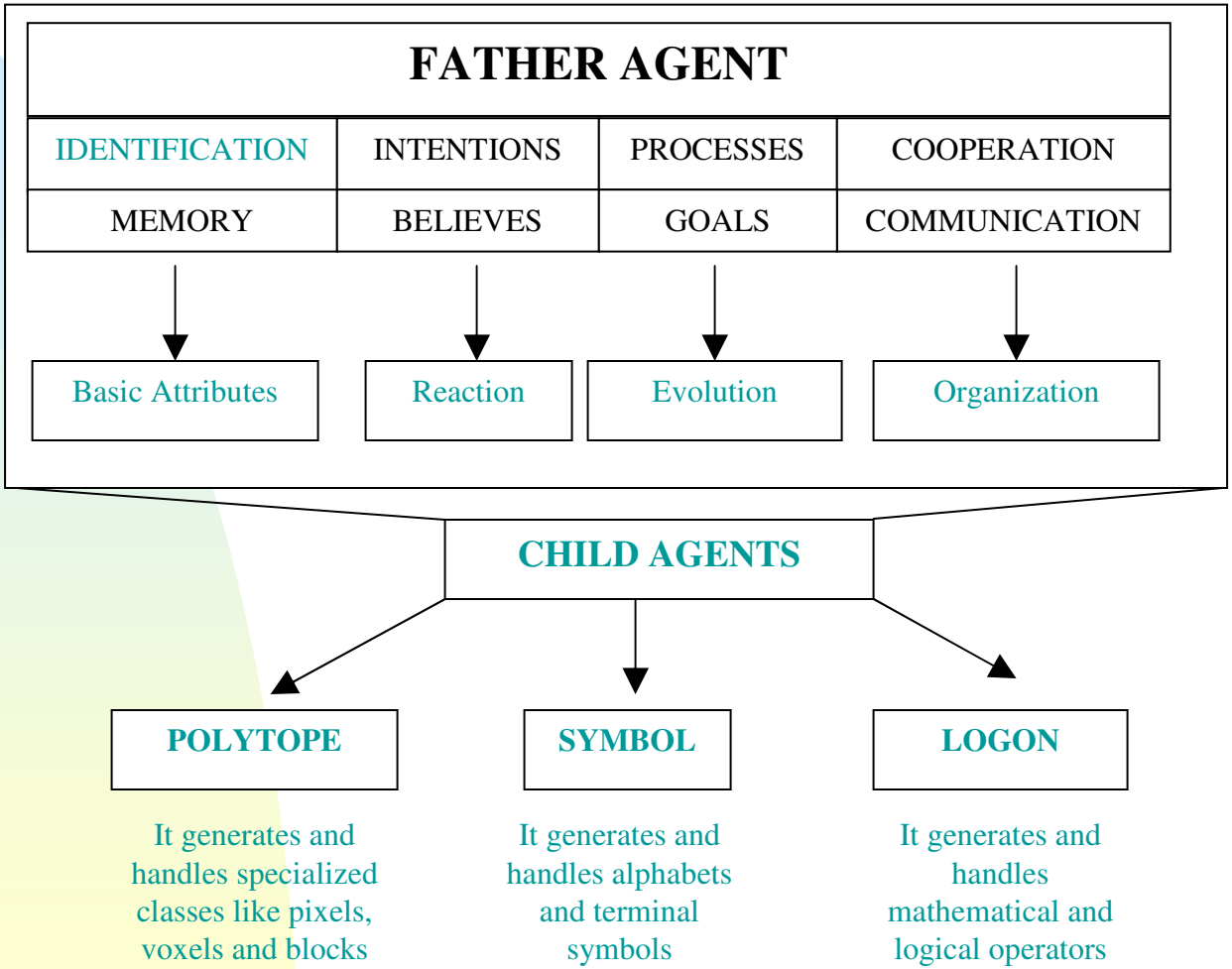
Project – OO Genetic Model



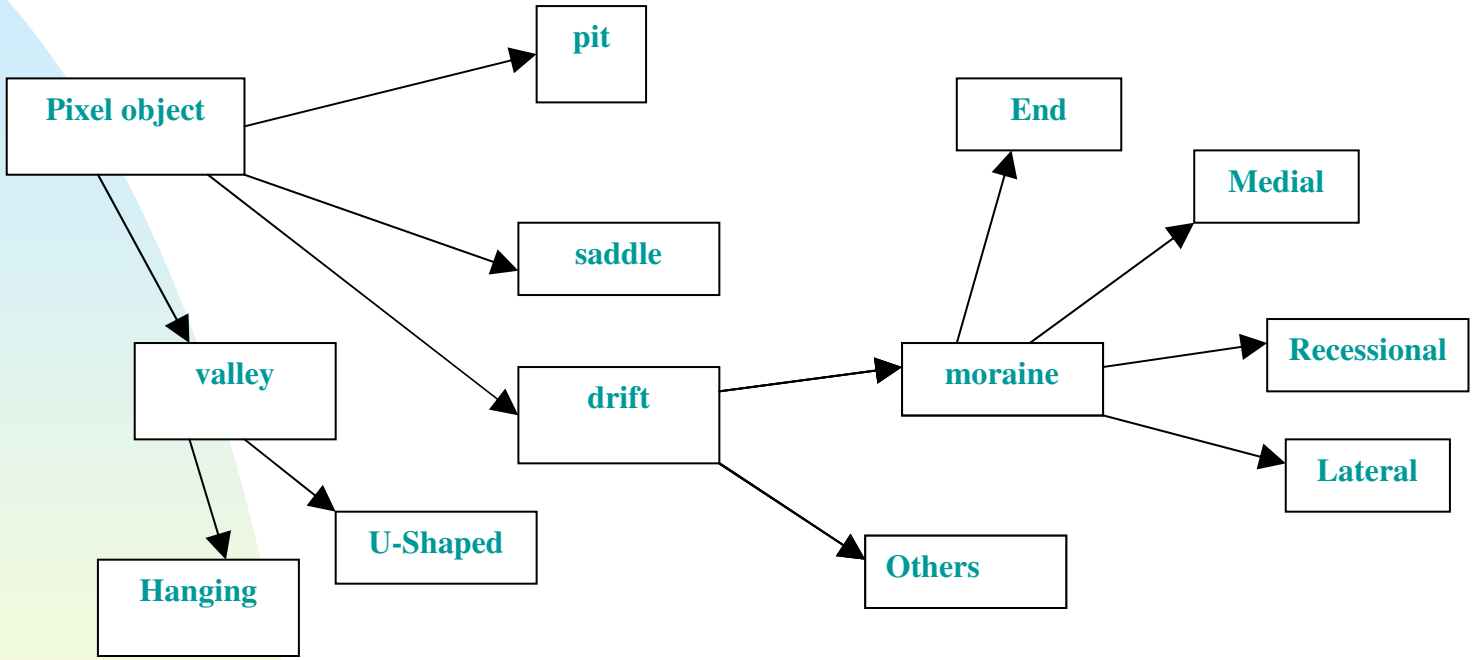
Project – OOGM Model



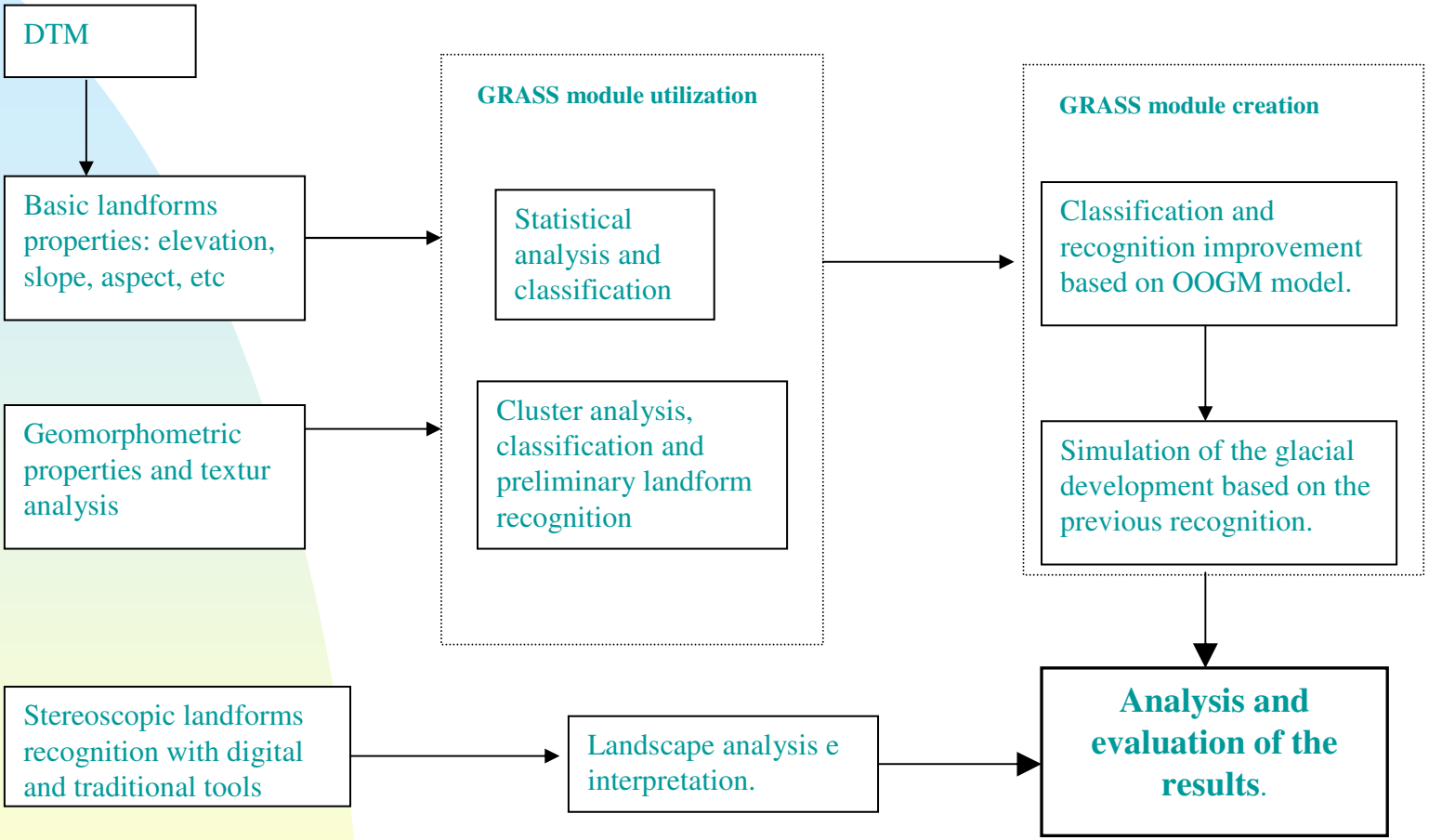
Project – New Model on OOGM



Project – Glacial Landforms

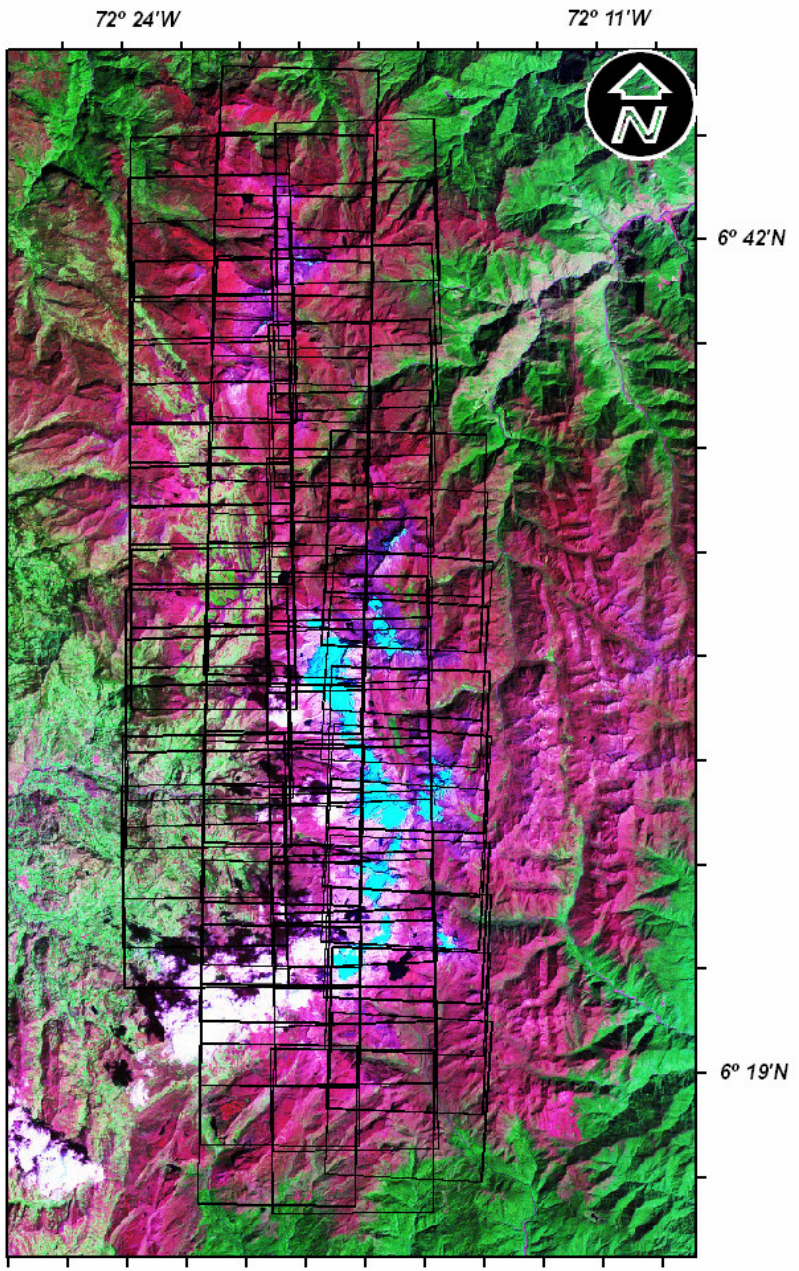


Project – Methodology

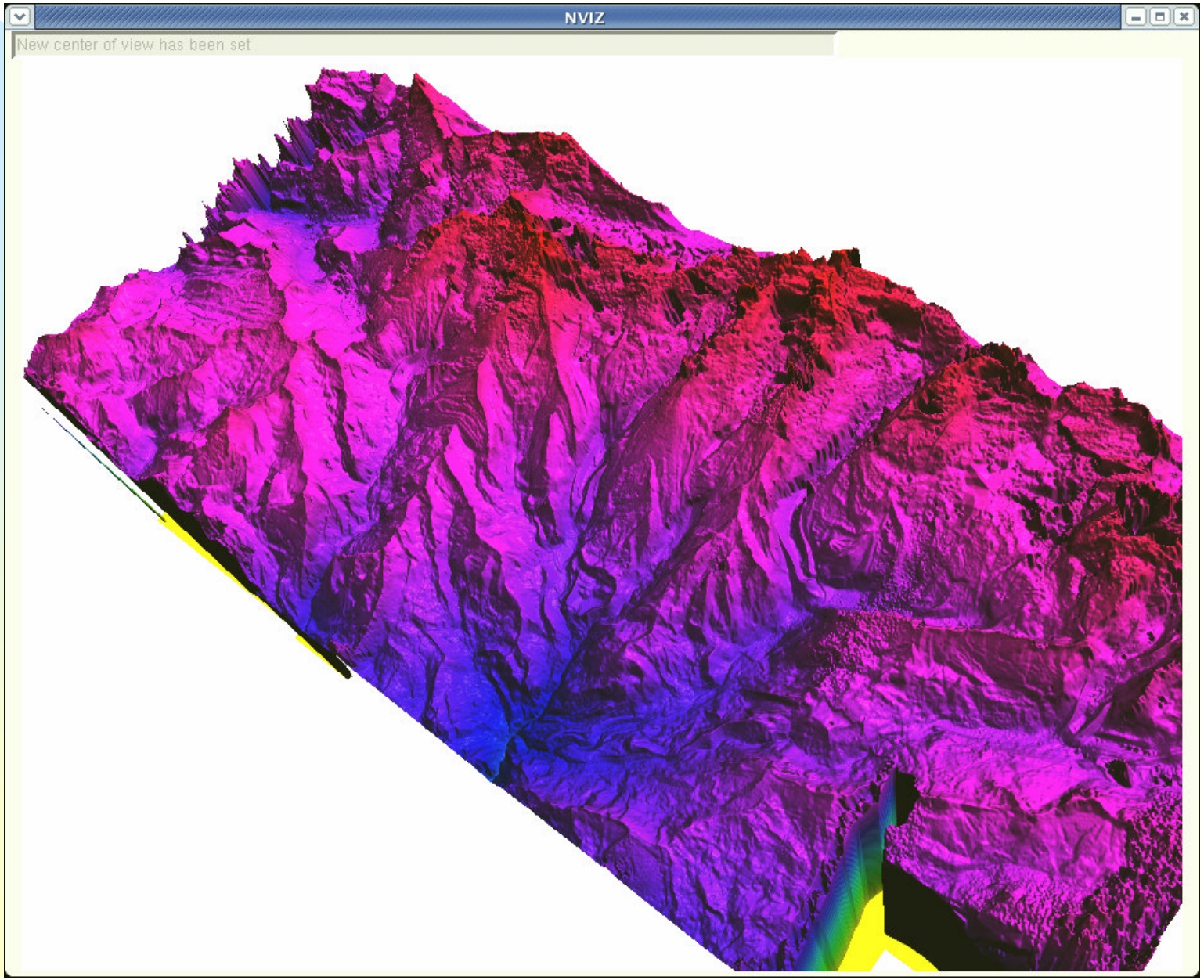


Wood 96, Bonk 02, Schmidt 03 and 04 and Vélez 06 – Preliminar Work

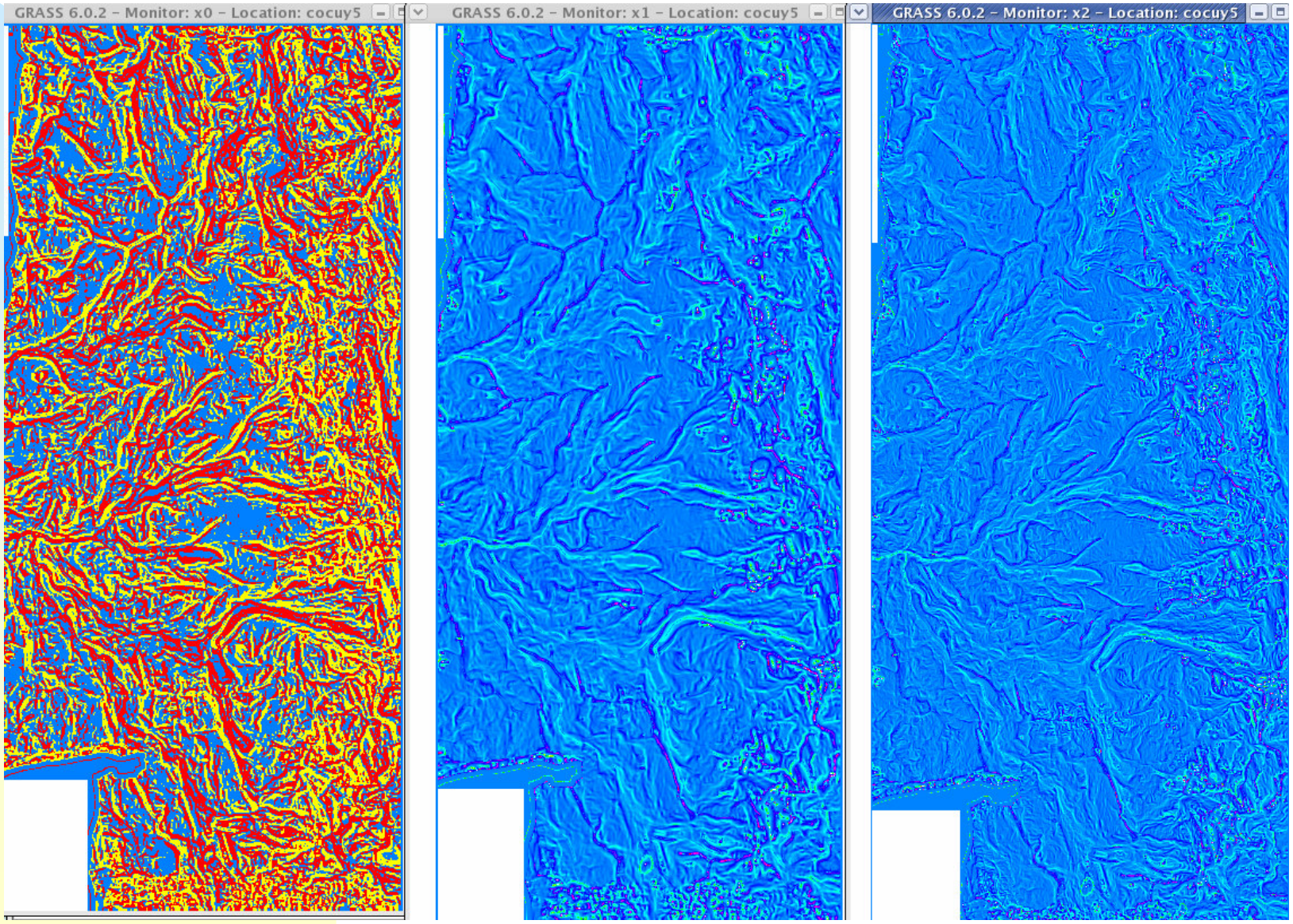
Research area



DTM

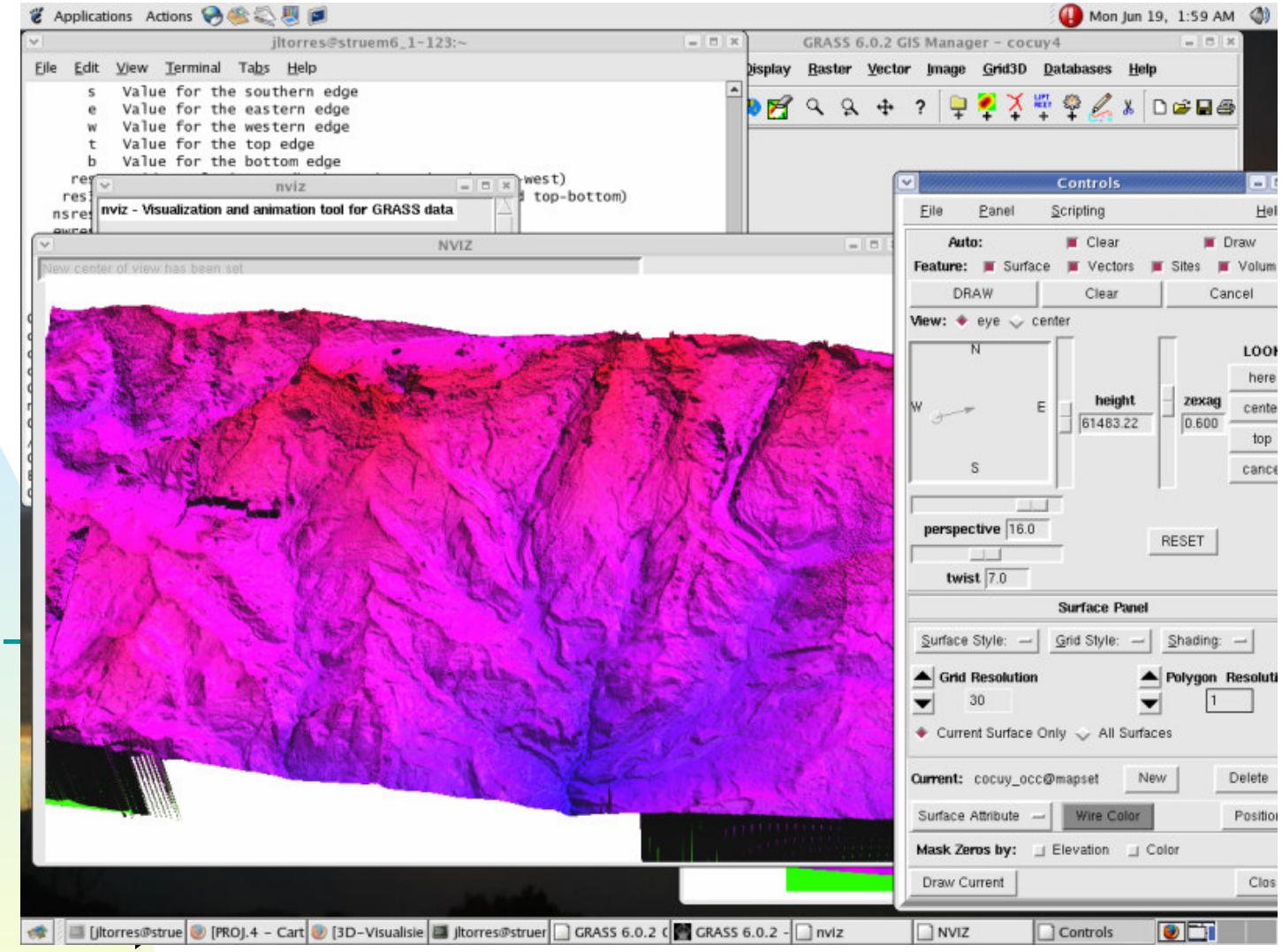


Initial Results



Future Work

Gdal, Mesa 3D – OpenGL



Posgress

R

Code in C, C++, Python, Scripts, etc

GRASS

Conclusions

- There are promising tools still expecting to be evaluated: evolutionary computing is only a case, into geomorphological analysis algorithms. Open and GNU Programs can be good testing laboratories.

- Problems like selection of the window, scale dependency, uncertainty of the model or applied methodology, semantic of the geomorphometric models and neighborhood rules (Bonk 02; Schmidt 03-04; Vélez 06), are waiting for more intelligent solution tools or better models.

- The tropical glaciers in the Anden are disappearing rapidly generating big problems with the nature resources availability for many communities and besides destroying ecosystems with unique biodiversity.

Special Thanks for:

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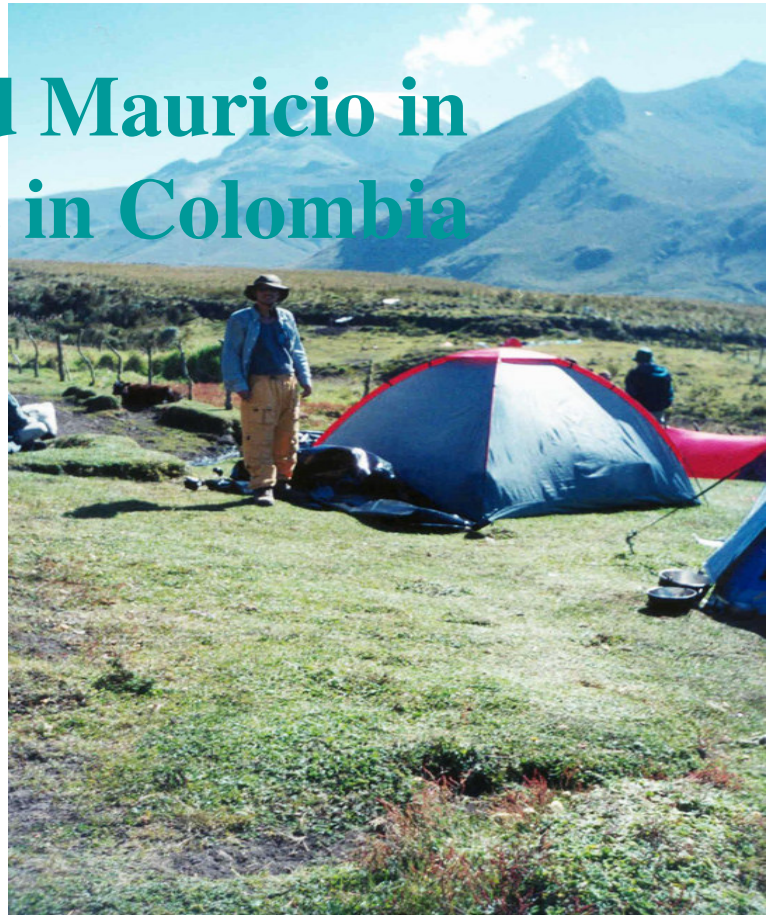
Prof. Norberto, Kenneth and Mauricio in Lab. De Sistemas Complejos in Colombia

All GRASS Programmers, Congress Organizers

and you



Beiträge ist mir sehr willkommen!!!