Universität Stuttgart

IWS Lehrstuhl für Wasserbau und Wassermengenwirtschaft
Prof. Dr.-Ing. Silke Wieprecht

IRME
Student Project

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–
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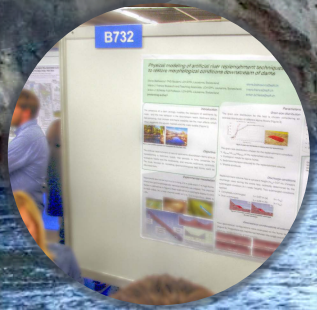
Introduction, tasks and goals

Freshly starting as an engineer or young researcher, your task is to develop and present a flood protection scheme.



Overview

“Develop an integrated flood protection concept”

Option 1: Use our case study

Option 2: Build your own project

Team up: 3 students per group

Extended Project Abstract (3 Pages / Person)

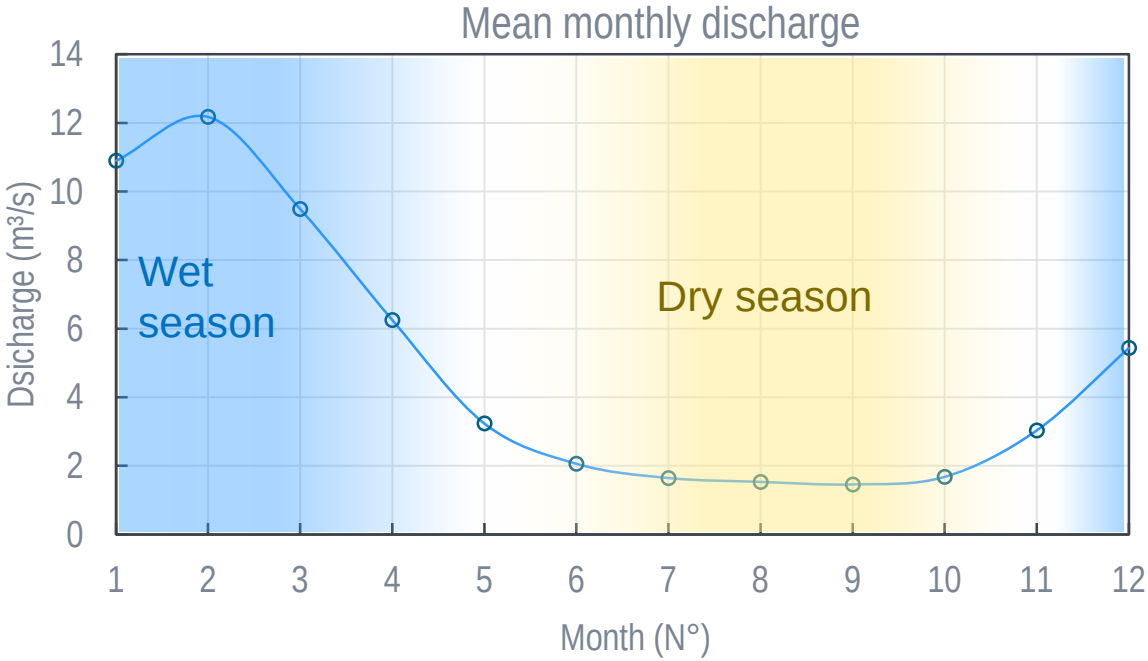
Project Presentation (5 Minutes / Person)

Project Option 1

Romina’s case

Project Option 1

Romina’s case

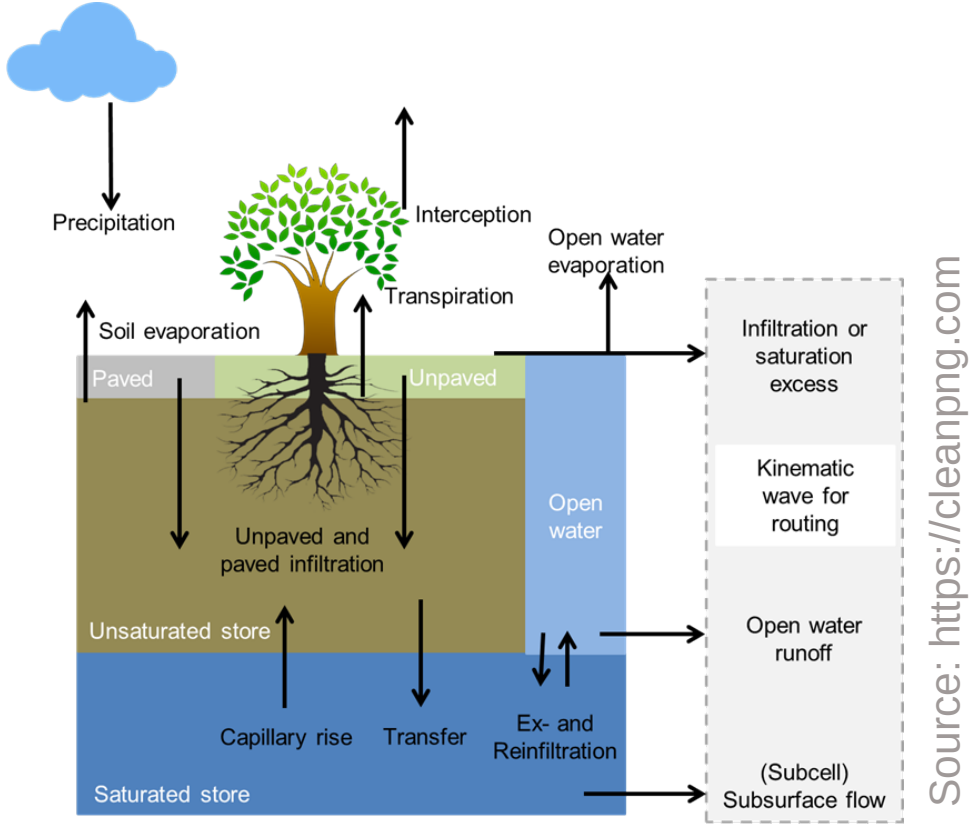


- VIDEO: Gastona River (Tucumán, Argentina)

Project Option 1

Romina's case

- Groundwater recharge and root infiltration



Project Option 1

Romina's case

- Law enforcement: No low-infiltration crops in high altitudes (> 800m asl.)
  - High infiltration crops: Citrus
  - Low infiltration crops: Soy beans, potatoes
  - More information on crop water needs:
    - FAO - crop yield response to water: http://www.fao.org/3/i2800e/i2800e.pdf
      - chapters on crop evapotranspiration
      http://www.fao.org/3/u3160e/u3160e04.htm
      http://www.fao.org/3/X0490e/x0490e0e.htm

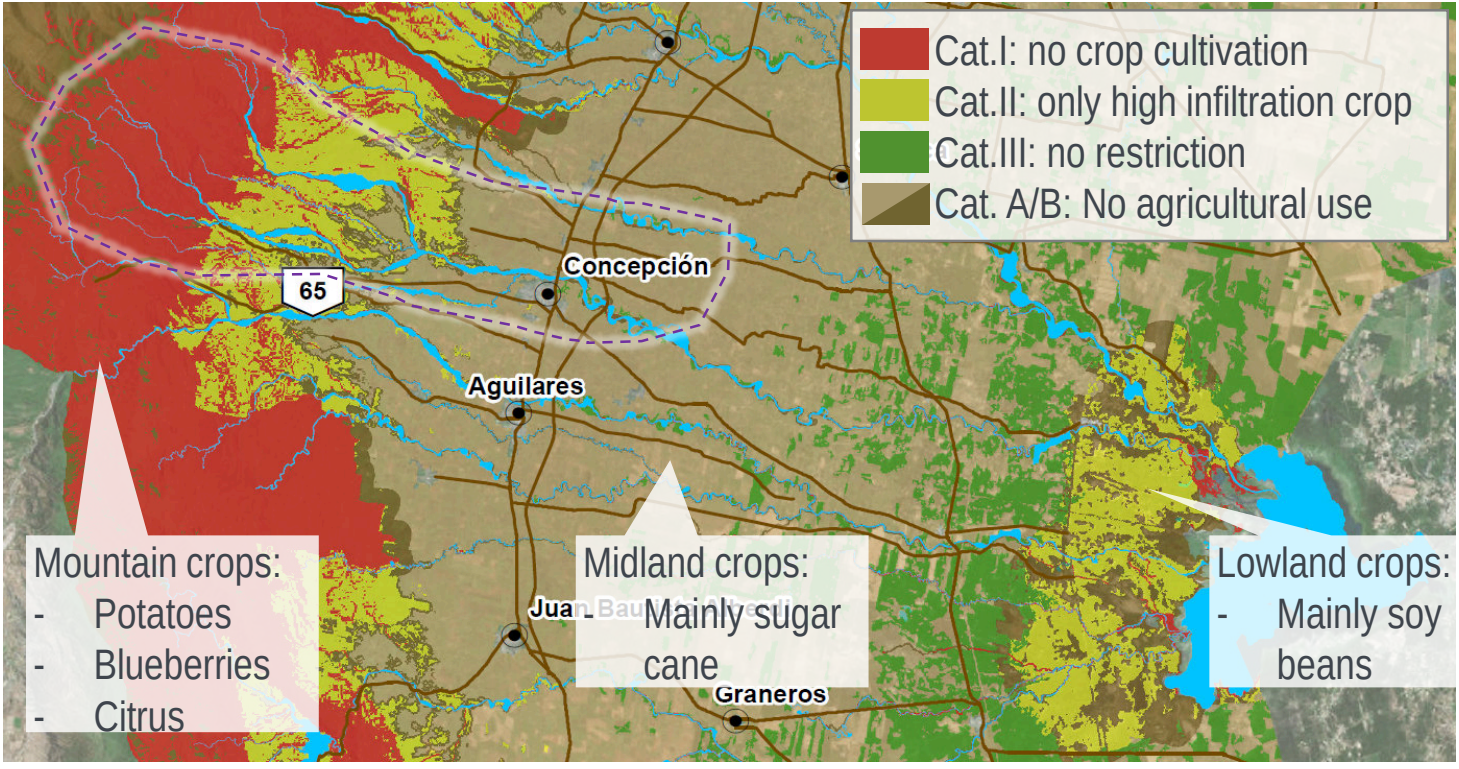
Problems

- Low penalties
- Arbitrary controls

Project Option 1

Romina's case

- Law enforcement: No low-infiltration crops in high altitudes (> 800m asl.)

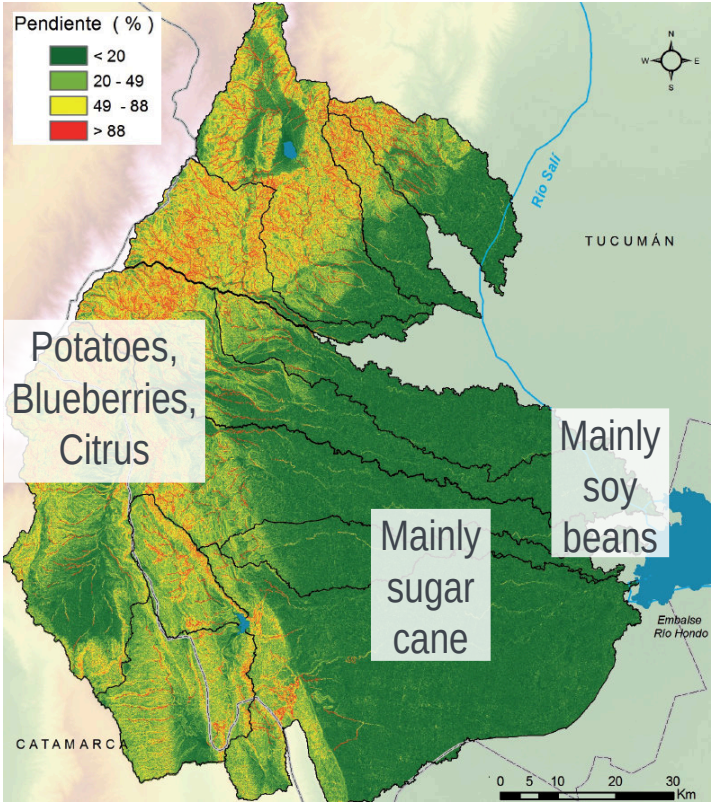


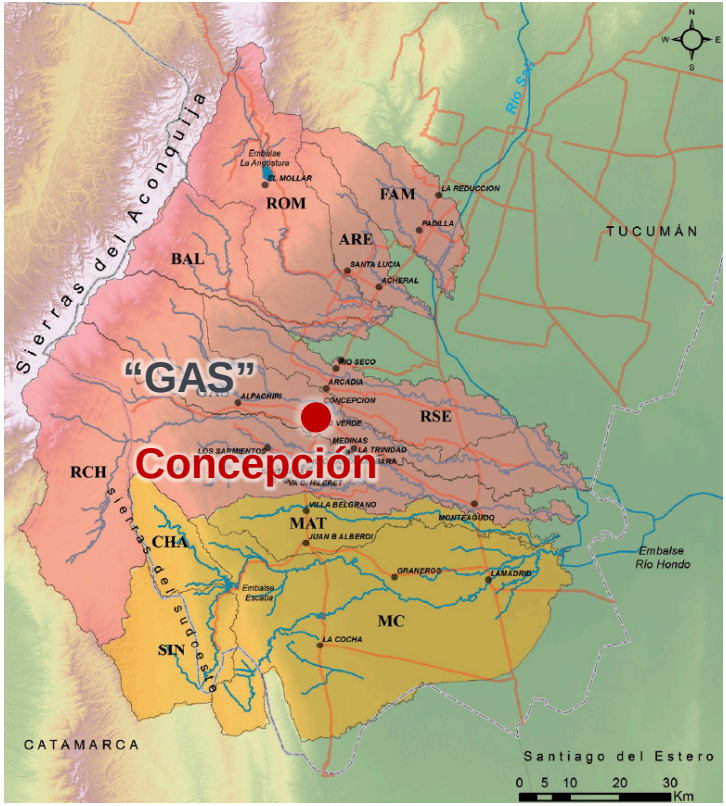
More information: http://rides.produccionTucuman.gov.ar/areas-otbn-provincia-de-tucuman/

Project Option 1

Romina's case

- The watershed





Source: Díaz-Gomez et al. (2017)

Project Option 1

Romina's case

Available data at https://github.com/sschwindt/rominas-case/archive/master.zip

- Geodata
  - DEM (m asl.) – geodata/dem.zip/dem.tif
  - Land use & cover – geodata/landuse_cover.zip/landuse_cover.shp
  - Rivers (Strahler ordered) – geodata/rivers_strahler.zip/rivers_strahler.shp
  - Annual soil loss rates – geodata/soil_loss.zip/soil_loss_m_per_year.tif
  - Watershed sub-zones – geodata/watershed.zip/watershed.shp
- Metadata and hydrological data
  - ROMI – please upload Land use & cover description
  - ROMI – please upload Hydrological data
- Other data: Refer to literature cited above

Project Option 2

Your case

- Use available data (see lecture slides)
- Anywhere in the world
- Generate a river management plan

Project Goals

Criteria

- Investigate and describe available data
- Analyze fluvial landscape: land use, risks, ecological assets, river characteristics
- Generate a risk management plan
  - Consider structural measures (classic and nature-based)
  - Imply non-structural measures

Evaluation scheme (Extended Abstract)

				WEIGHT (GRADE)
INTRODUCTION				55%
Watershed	Landuse	Landscape pattern (topography, vegetation, sediment)	Hydro-climate	15%
River characteristics	Legacies (traces of human activity incl. structures)	Morphodynamic features	Data sources (hydrology)	15%
Flood characteristics	"Flushiness" (peak height / length)	Hysteresis	Sediment deposits?	10%
Protection needs	Infrastructure at risk	Economic aspects	Legal frame (protection goals)	15%
METHODS				20%
Technical measures	→ River engineering			15%
Non-technical measures	→ Governance			5%
ANTICIPATED RESULTS & DISCUSSION				20%
Preferable measures?				5%
Remaining Risk?				5%
Ecological integrity?				10%
CONCLUSIONS				5%
Take-home message of the project				5%

Evaluation scheme (Presentation)

			WEIGHT (GRADE)
INTRODUCTION			30%
Watershed River characteristics	Integral view of the fluvial landscape, vegetation, hydrology (climate) (max. 3 slides)		15%
Flood characteristics	Typical hydrograph (with flood wave migration) + Sediment transport (max. 1-2 slides)		10%
Protection needs	Protection goals of relevant infrastructure incl. legal frame (1 slide)		5%
METHODS - RESULTS			30%
Non-technical measures	Governance issues & risk strategy (1 slide)		5%
Technical measures	Preferable river engineering (2 slides)		15%
Ecological integrity	Link with engineering, effects of vegetation, fish (2 slides)		10%
CONCLUSIONS			25%
Take-home message	Make your case on 1 slide!		25%
DISCUSSION			15%
In Plenum	max. 5 minutes	1 Question for each student	15%

Three presenters = three roles

Presenter 1: Anchorman
First & last slide, section switches

Presenter 2: Introduction

Presenter 3: Methods – Results

Evaluation scheme

Final

- 2/3 = Extended Abstract
- 1/3 = Presentation
- Passed if:

[%] Extended Abstract x 2/3 +[%] Presentation x 1/3 > 50%

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Thank you

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