SWAT's hydro-sedimentological simulations for the Brazilian semi-arid

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Nordeste: the northeastern region of Brazil

Nordeste’s semi-arid: Caatinga biome
Nordeste’s semi-arid high variability of rainfall and river discharge
land degradation and desertification risks
social and economic vulnerability

challenge: adaptation – “convivência com a seca”

hydrometeorological and LUCC knowledge is very important for water and agricultural management
the semi-arid extremes
rainfall characteristics and distribution

Marengo et al. (2000)
basis for adaptation
new legal and institutional framework for water management

Brazilian national and state plans
decentralized and participative

Climate Change
Desertification
Water Resources
integrated modelling supporting adaptation

Global atm. model

Regional atm. model

Rainfall

Process models

Hydrologic

Erosion, sediment prod.

Agroclimatic

Management models

Reservoir Management

Soil conservation

Agricultural planning

Decision making

Storage volumes

Collapsing prone areas

Planting date

SWAT
network of semi-arid representative and experimental basins: basis for SWAT parameterization

distributed modelling experience:

- WESP
- CHDM
- WEPP
- KINEROS 2
- AÇUMOD
- SWAT
SWAT: parameterization
representative basin of Sumé
130, 34, 10 km²
SWAT: hydrologically-based LUCC scenarios representative basin of Sumé
SWAT: farmer’s behaviour-based LUCC scenarios
Marias Pretas basin – 11 km²

LEGENDA
- Caatinga arbórea-arbustiva fechada
- Caatinga arbórea-arbustiva aberta
- Pastagem
- Solo exposto

Legenda
- Favoráveis
- Indecisos
- Não favoráveis

0.0 - 0.2
0.3 - 0.4
0.5 - 0.6
0.7 - 1.2
1.3 - 2.0
2.1 - 4.0
4.1 - 6.0
6.1 - 8.0
8.1 - 10.0
10.1 - 12.0

willingness to adopt conservation measures
SWAT: climate change scenarios
sediment yield change
current challenges
ongoing developments

considering phenology of seasonal vegetation

&

using remote sensing-estimated ET (SEBAL)
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Thank you!

Carlos Galvão

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