NATURAL CAPITAL ACCOUNTING AND VALUATION OF ECOSYSTEM SERVICES PROJECT - BRAZIL





Instituto Brasileiro de Geografia e Estatística IBGE



MAIN PURPOSES

> To implement the Ecosystem Experimental Accounting, integrated to the System of Environmental-Economic Accounting, analyzing and producing information about a pilot region and thus contributing to the expansion of knowledge in this specific theme

> Use techniques and tools (SWAT – Soil and Water Assessment Tool) that simulate hydrological and erosive processes using data such as soil characteristics, slope, precipitation, flow, land cover/land use, among others

ECOSYSTEM SERVICES

Soil loss and water regulation

Understanding of the hydrological cycle and associated erosion processes, where anthropogenic interventions on the Earth surface cause changes in the hydrological, physical and socioeconomic processes of a region.



RIO GRANDE BASIN

MBGE

Instituto Brasileiro de Geografia e Estatística IBGE

RIO GRANDE in BRAZIL







Contact to local stakeholders: introduce the Project and listen to their needs

> Land cover Land use verification: points of uncertainty; associate office work with field reality

Verification of data for the SWAT modeling: soil data; pluviometric, fluviometric and telemetric stations

> Landscape dynamics: geology, relief, soils, land cover/land use



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MEETING LOCAL STAKEHOLDERS

Municipal Secretary of Environment – Barreiras, Bahia

> Municipal Secretary of Environment – Santa Rita de Cássia, Bahia

Federal University of western Bahia – Barreiras, Bahia



ON THE ROAD























DATA FOR SWAT MODELING





RIO GRANDE BASIN Physical Account for Land Cover/Use (2000 – 2016 km²)

| CLASSES STOCKS | Artificial Suctace | <u>Copland</u> | Managed Pasture | Mosaic of Occupations in Eor | Silviculture | Loces Iree Cover | Wetland | Savannah, Shrubland, Grass | M osaic of Occupations i Savannah/Shrubland/Grasslar | Juland Water Bodies | Coastal Water Bodies | മെപ്പോളു |
|---|--------------------|----------------|-----------------|------------------------------|--------------|------------------|---------|----------------------------|---|---------------------|----------------------|----------|
| Stock (2000) | 89 | 10488 | 304 | 6294 | 14 | 17290 | 0 | 41764 | 759 | 25 | 0 | 0 |
| Total additions to stock | 23 | 5073 | 584 | 604 | 82 | 16 | 0 | 1 | 388 | 0 | 0 | 0 |
| Total <u>reductions</u> in <u>stock</u> | 0 | 49 | 4 | 313 | 8 | 989 | 0 | 5366 | 42 | 0 | 0 | 0 |
| Stock (2010) | 112 | 15512 | 884 | 6585 | 88 | 16317 | 0 | 36399 | 1105 | 25 | 0 | 0 |
| Total additions to stock | 4 | 2080 | 59 | 107 | 25 | 13 | 0 | 0 | 214 | 0 | 0 | 0 |
| Total reductions in stock | 0 | 9 | 7 | 76 | 4 | 154 | 0 | 2252 | 0 | 0 | 0 | 0 |
| Stock (2012) | 116 | 17583 | 936 | 6616 | 109 | 16176 | 0 | 34147 | 1319 | 25 | 0 | 0 |
| Total additions to stock | 2 | 1074 | 188 | 75 | 101 | 0 | 0 | 0 | 236 | 0 | 0 | 0 |
| Total reductions in stock | 0 | 18 | 17 | 80 | 23 | 306 | 0 | 1214 | 18 | 0 | 0 | 0 |
| Stock (2014) | 118 | 18639 | 1107 | 6611 | 187 | 15870 | 0 | 32933 | 1537 | 25 | 0 | 0 |
| Total additions to stock | 8 | 150 | 63 | 162 | 18 | 11 | 0 | 0 | 119 | 0 | 0 | 0 |
| Total reductions in stock | 0 | 3 | 10 | 21 | 0 | 206 | 0 | 277 | 14 | 0 | 0 | 0 |
| Stock (2016) | 126 | 18786 | 1160 | 6752 | 205 | 15675 | 0 | 32656 | 1642 | 25 | 0 | 0 |

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ELEVATION/SLOPE



| SLOPE (%): | Area (km²) | Watershed Area (%) | | | |
|------------|------------|--------------------|--|--|--|
| 0-15 | 72551,2 | 95,5 | | | |
| 15-30 | 2.363,1 | 3,1 | | | |
| 30-9999 | 1.078,5 | 1,4 | | | |
| TOTAL | 75.992,7 | 100,0 | | | |

SOILS



INCEPTISOL

INCEPTISOL

ULTISOL

OXISOL

Rio Grande Basin

Watershed Area

(%)

0,3

32.3

39,0 0,2

0,3

5,3

3,2

8.4

2,0 3.5

0,1

0,1 2,6

1,4

0.1

1,0

0,2

100.0

1.077,5

100,9 784,7

164,0

75.992,7

METEOROLOGICAL/PLUVIOMETRIC DATA



FIRST RESULTS









Low : 381



THE 18 SUB-BASINS (land use + soil + slope)



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 \rightarrow SECOND FIELDWORK

 \rightarrow HIDROLOGICAL RESPONSE UNITS (HRU)

 \rightarrow IMPLEMENTATION OF SWAT MODEL FOR ACTUAL CONDITIONS

 \rightarrow **MODELING – FUTURE SCENARIOS**



OBRIGADO!