Land Utilisation and Capability Indicator (LUCI)

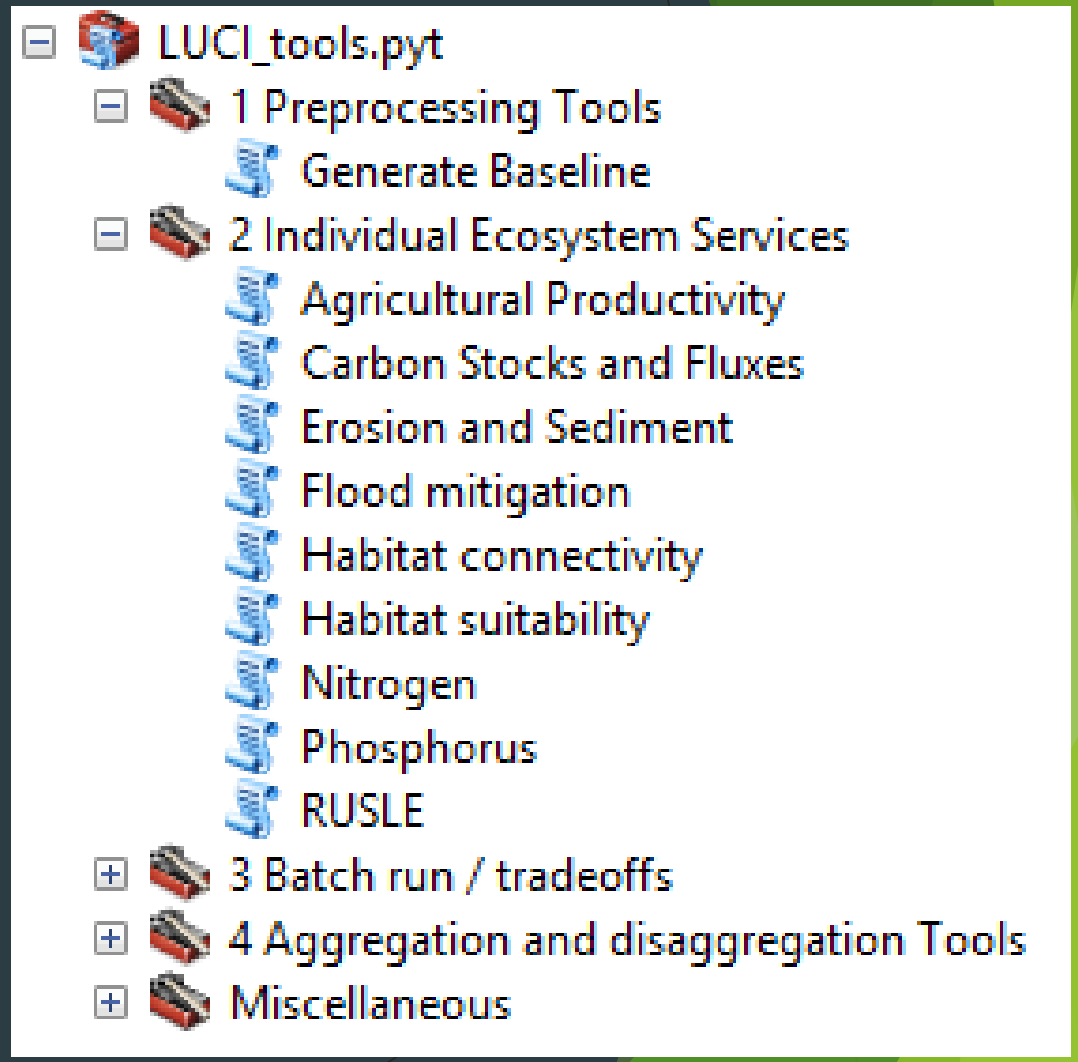
More information: https://lucitools.org/

What is LUCI?

- Originally developed as a land management decision-support tool
  - Required inputs: DEM, land cover, soil
  - Optional inputs: locally-sourced data including more detailed climate, water, geological, and local management data among others
- Highly spatially explicit: sub-field to farm to national scale
- Models spatial distribution of ecosystem services
  - Opportunities, trade-offs, and synergies

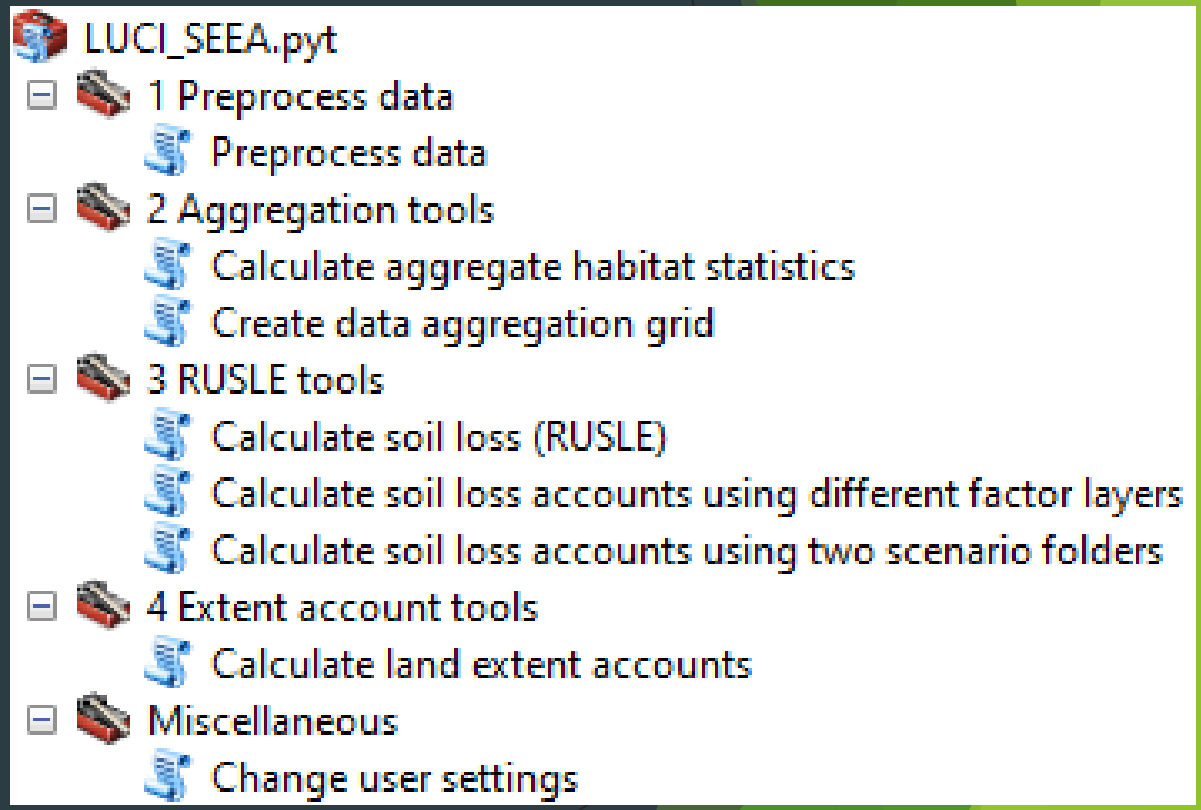
LUCI v0.9 toolbox

- Main LUCI toolbox
  - Preprocessing input data
  - Ecosystem services modelling
  - Batch run and tradeoffs
  - Aggregation tools
- Miscellaneous tools
  - Stream entry/exit
  - Flatwater inundation



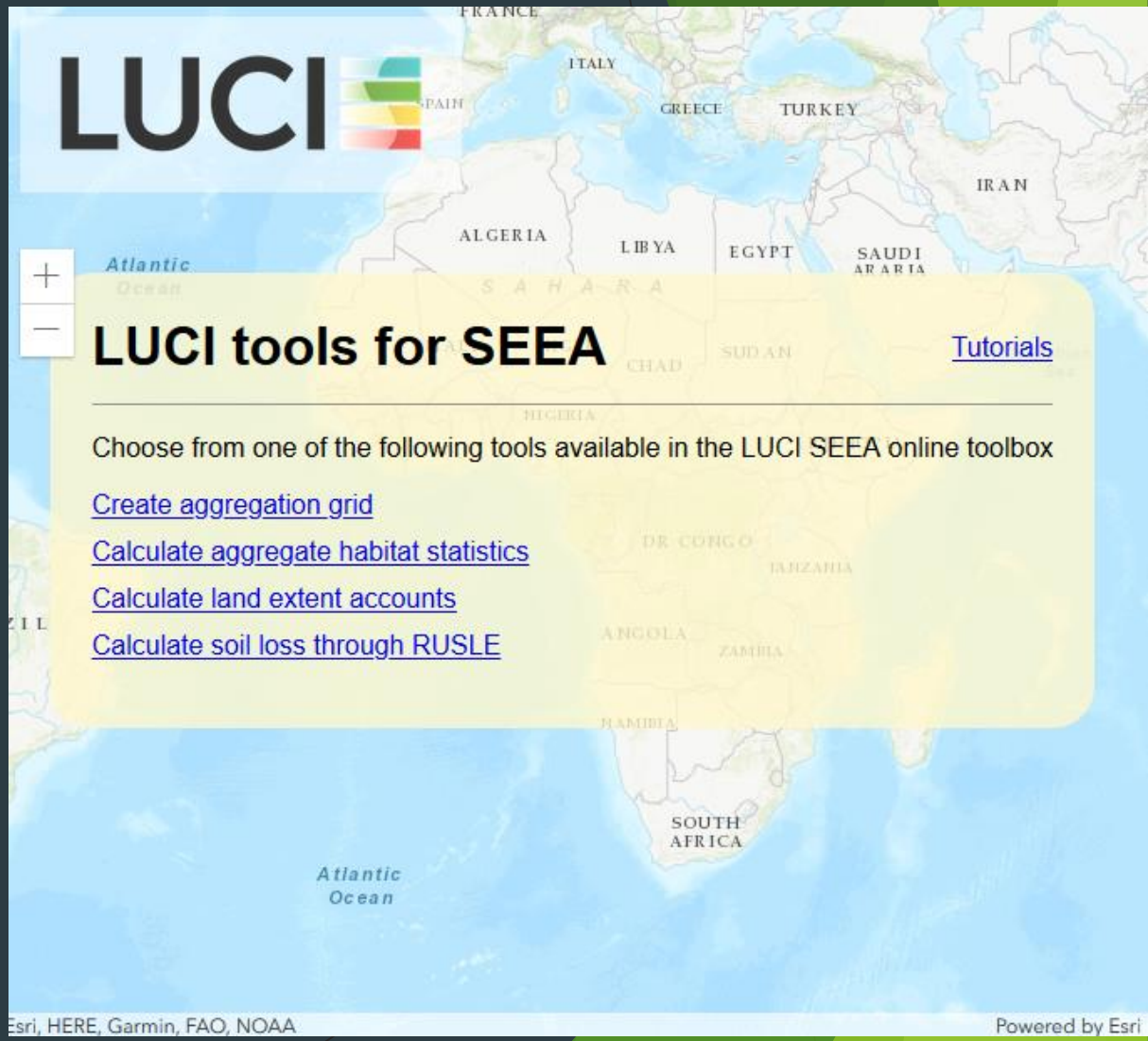
LUCI for SEEA v1.0 toolbox

- Freely accessible and open-source toolbox to support the SEEA work
- Tools should be able to support freely available and global datasets, or have the option for the user to supply their own data
- https://github.com/lucitools/LUCI_SEEA



LUCI for SEEA web toolbox

- Accessible online tools and tutorials with sample data
- Mainly to support the SEEA work
  - Due to data restrictions, users have mostly been using the ArcMap toolbox instead
- https://model.lucitools.org/



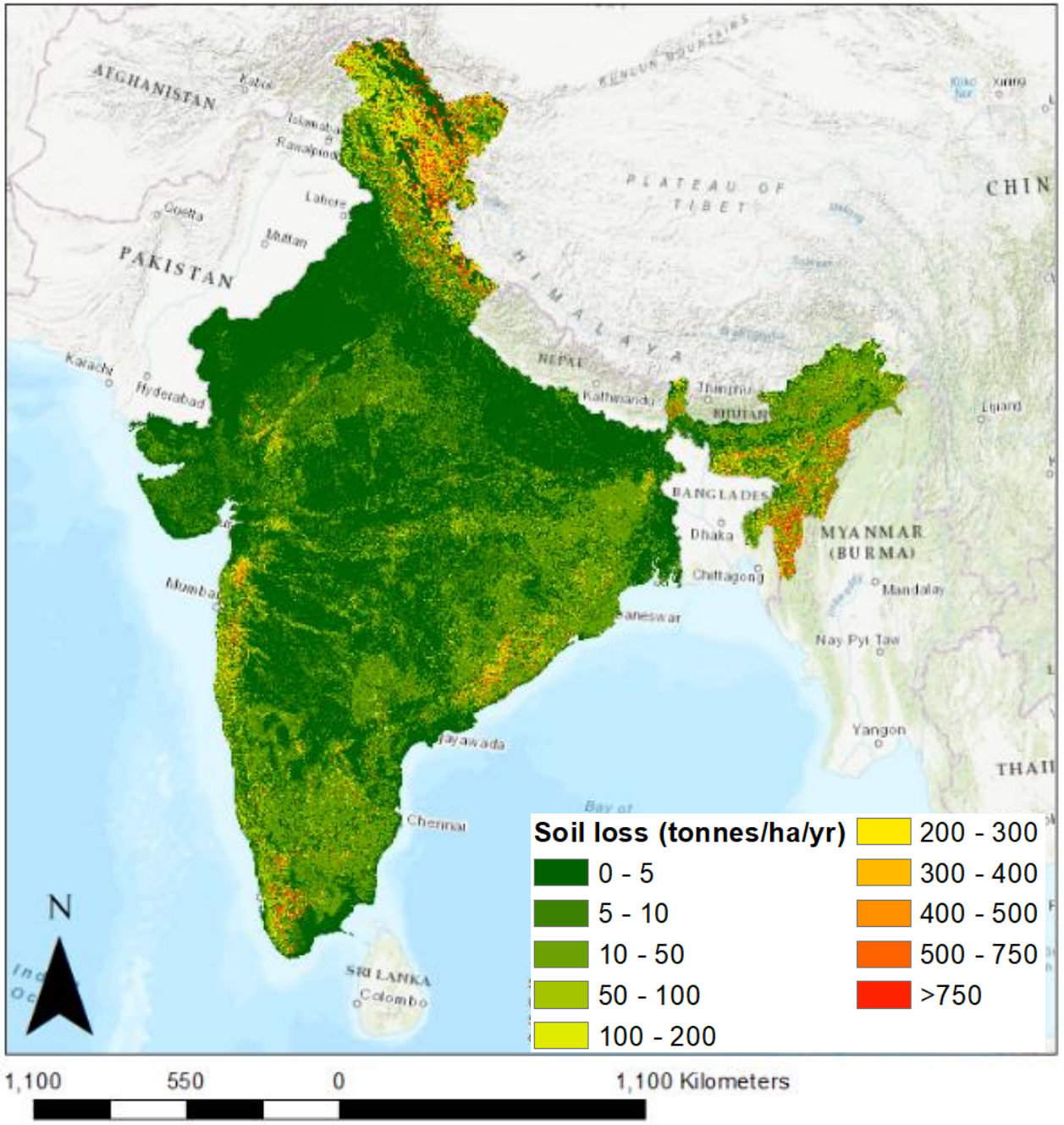
LUCI for SEEA work

- Locations:
  - Rio Grande basin, Brazil
  - Karnataka state, India
  - National-scale RUSLE runs for India and Brazil
- Aim: developing tools and procedures to support the System of Environmental-Economic Accounting (SEEA) in these areas
- Ongoing work with NSO India, supported by NCAVES

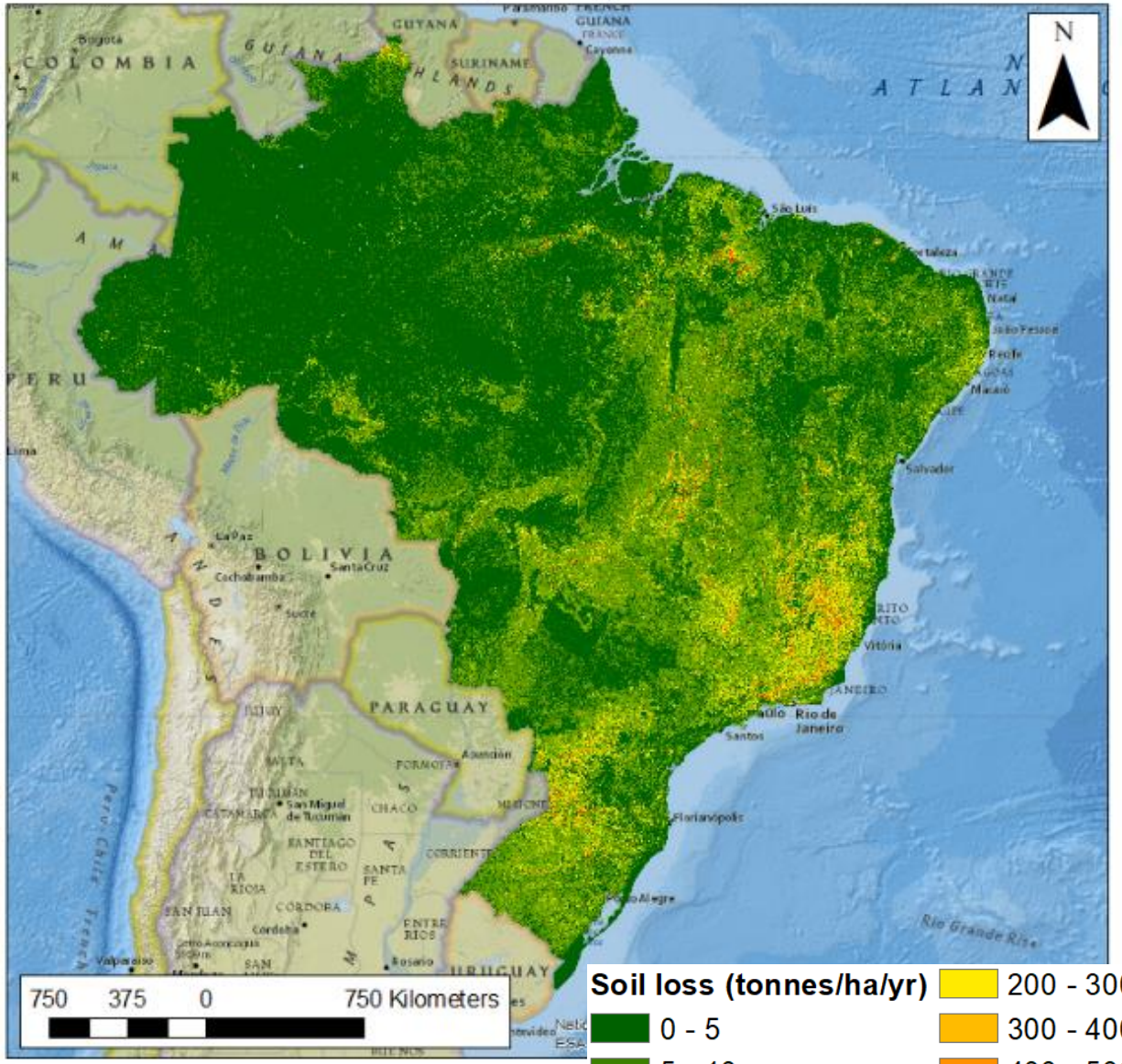
Preliminary RUSLE runs

- Over India and Brazil
- Using global data
- For two different years
  - Identifying areas, states, watersheds vulnerable to soil loss
  - Investigating changes in soil loss due to land cover changes

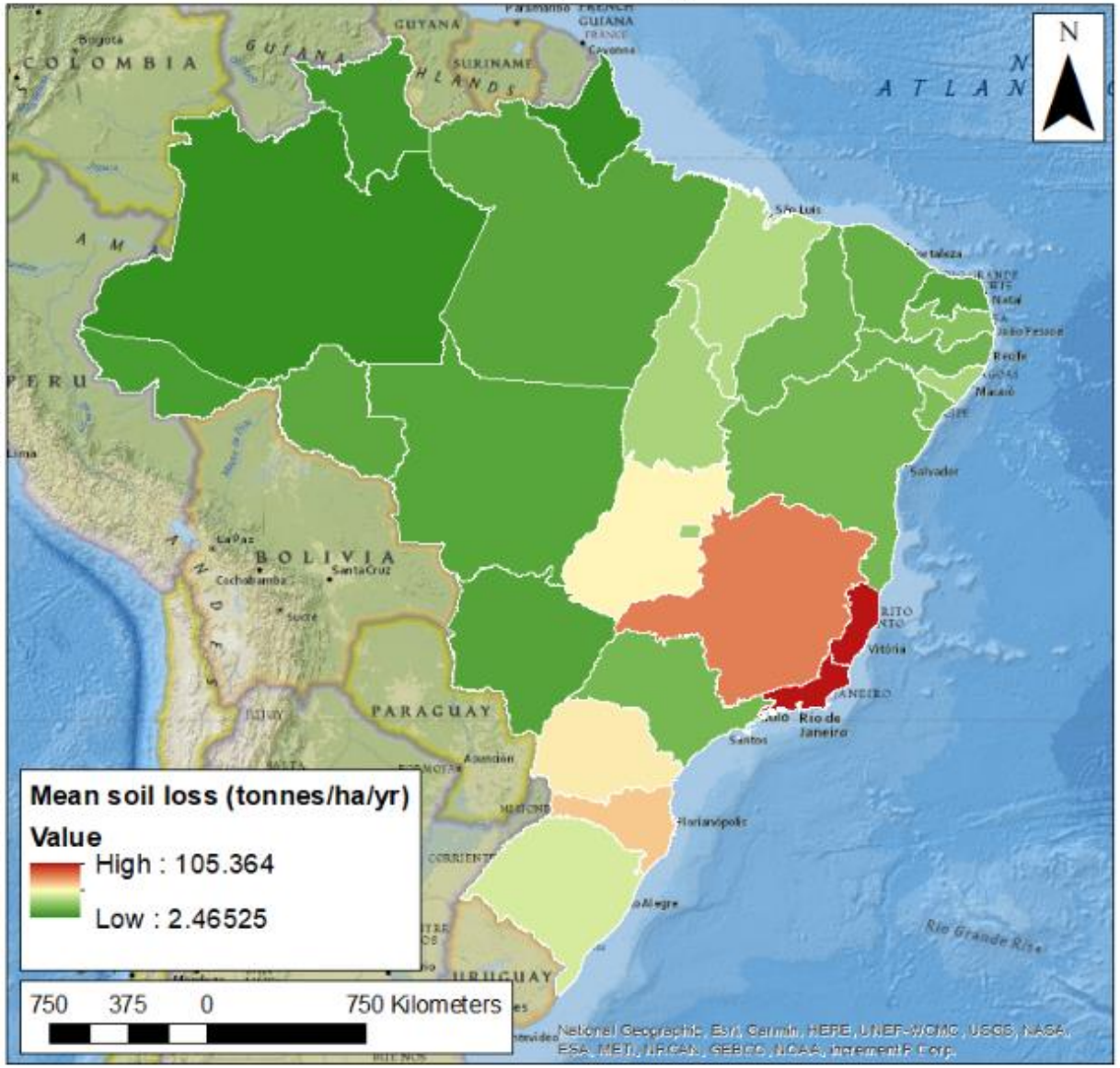
Soil loss over mainland India (2000)



Soil loss over Brazil (2000)



Mean soil loss by state (2000)



Challenges

- Biophysical modellers accounting for people
  - Cultural services and “valuations” (current LUCI emphasis on Maori/Pacifica and South East Asia needs)
  - Governance structures
  - (Ecological) economics
- Data, computers, and third party dependencies
- Licensing issues (cost or time) and privacy issues

Opportunities

- Incredible innovations and increased availability of temporally resolved satellite and other globally available data.
- Enormous progress and uptake of these integrated tools over the past decade, exponential increase.
- Many of the challenges in the previous slide: data, computers, licensing, resolving multidisciplinary jargon issues and third party dependencies are noted and being addressed!
- Bring in indigenous views.