LUCI toolbox for SEEA

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Capital thinking. Globally minded.

TE WHARE WĀNANGA O TE ŪPOKO O TE IKA A MĀUI

VICTORIA
UNIVERSITY OF WELLINGTON

Intent of LUCI for SEEA tool

Supporting countries and other users to bring out "Tier 1 and 2" accounts with global and/or local data sources. Partially funded by the NCAVES project.

Multiple versions for users depending on software access and needs: web tool, associated geoprocessing service, and equivalent ArcMap toolbox

Freely available and accessible, open source code at http://github.com/lucitools/LUCI_SEEA

All tools can be run with freely available global datasets

Have negotiated rights to hold many of these on our server and distribute derived datasets to users.

Functionality of first version:

- Create aggregation grid

- Aggregate habitat metrics (Shannon's index, mean patch size, inverse Simpson's index and habitat richness)

- Land extent accounts tool

- Revised Universal Soil Loss Equation tool (*stand alone* and open/close accounts version)

- Species richness tool for presence/absence data such as the IUCN red list species data

- Alpha versions now live at model.lucitools.org, tutorials and test datasets included

📖 **lucitools** / **LUCI_SEEA**

👁 Unwatch ▾   3   ★ Star   0   ⑂ Fork   0

`<> Code`   ⓘ Issues 0   ⑂ Pull requests 0   ▥ Projects 0   ▤ Wiki   ⛊ Security   ⏸ Insights   ⚙ Settings

LUCI (Land Utilisation Capability Indicator) - freely available version   Edit

Manage topics

ⓟ **43 commits**	⑂ **2 branches**	◌ **0 releases**	👥 **3 contributors**	⚖ **GPL-3.0**

Branch: master ▾   New pull request   Create new file   Upload files   Find File   **Clone or download ▾**

👤 **keeforama** RUSLE tool - minor tidy ups   Latest commit c77abee 6 hours ago

📁 display	Land accounts tool: Changes to output opening maps, closing maps, and...	11 days ago
📁 lib	RULSE tool changes - Removed one of the two checkCoverage functions i...	9 hours ago
📁 solo	RUSLE tool - minor tidy ups	6 hours ago
📁 tables	RUSLE: Added the table for the Harmonized World Soils Database	27 days ago
📁 tool_classes	RUSLE tool - minor tidy ups	6 hours ago
📁 tools	Land Accounts tool - added new 'Land Cover Name Field' parameter. Thi...	4 days ago
📄 .gitignore	Added missing functions to common. Minor changes to aggregate_data - ...	3 months ago
📄 LICENSE	Initial commit	3 months ago

LUCI

Calculate land extent accounts

Shapefiles

○ One shapefile with multiple fields

● Two separate shapefiles

Opening year land cover shapefile

Shapefile showing land cover (zip all the shapefile files up and upload as one zip file)

[Choose file] RioGrande_uso2000.zip

Closing year land cover shapefile

Shapefile showing land cover (zip all the shapefile files up and upload as one zip file)

[Choose file] RioGrande_uso2016.zip

Shapefile column containing opening year land extent data

uso2000

Shapefile column containing closing year land extent data

uso2016

Land cover table with labels

[Choose file] RioGrande_Table.zip

Land cover code column

LCLU_code

Land cover name column

LC_CLASS

LUCI

Gilbues

Pama das
Nascentes do
Rio Parnaiba

Palma

Apa
Ta

860 m

Corrente

TOCANTINS

+

751 m

−

960 m

Dianópolis

Natividade

Barra

Irecê

Ibc

| | Opening year land extent |
| | Closing year land extent |

Opening year land extent

LC_CLASS

Artificial Surfaces

Cropland

Managed Pasture

Forest Mosaic

Silviculture

Hide accounts table
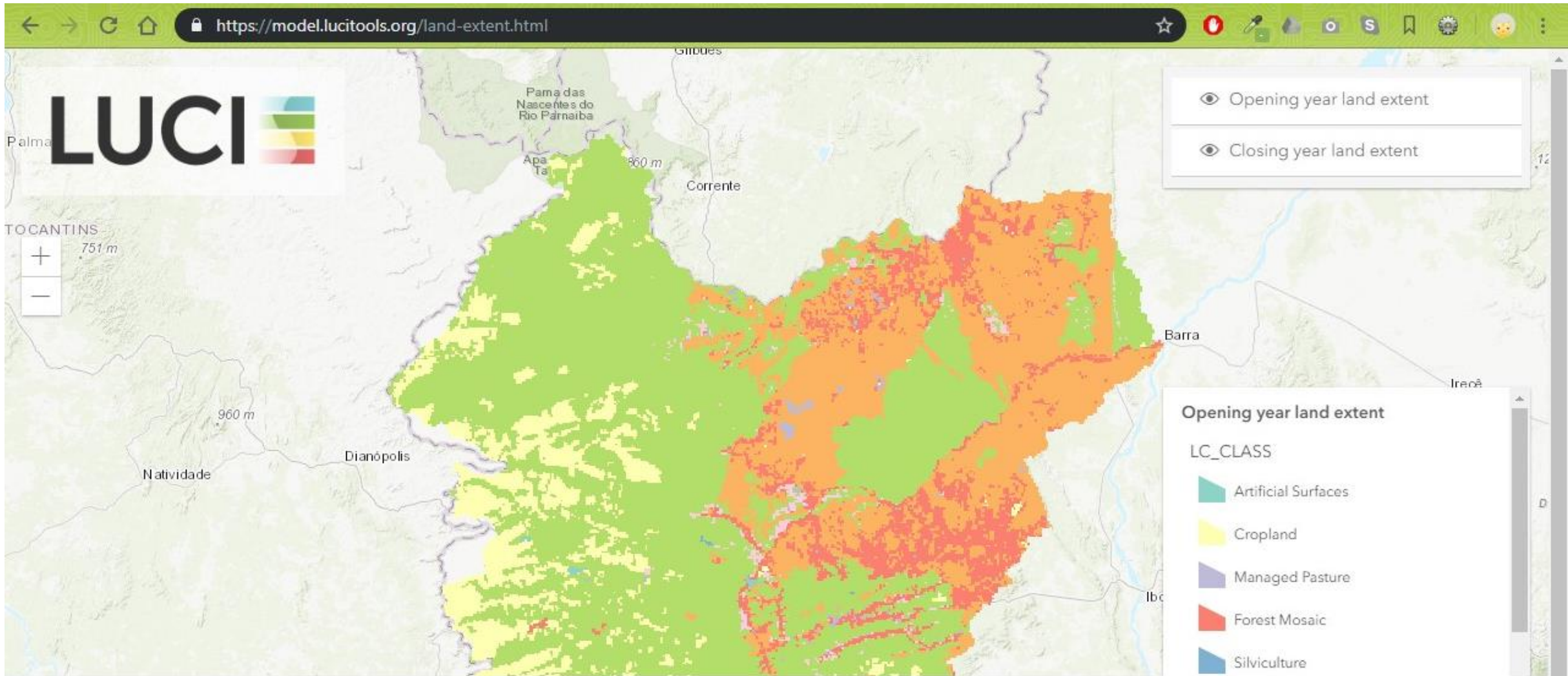
LC_CLASS	area1_km2	area2_km2	AbsDiff	RelDiff	⊕
Artificial Surfaces	89	126	37	29.3651	
Cropland	10488	18786	8298	44.1712	
Managed Pasture	304	1160	856	73.7931	
Forest Mosaic	6294	6752	458	6.78318	
Silviculture	14	205	191	93.1707	

Habitat metrics: Karnataka districts
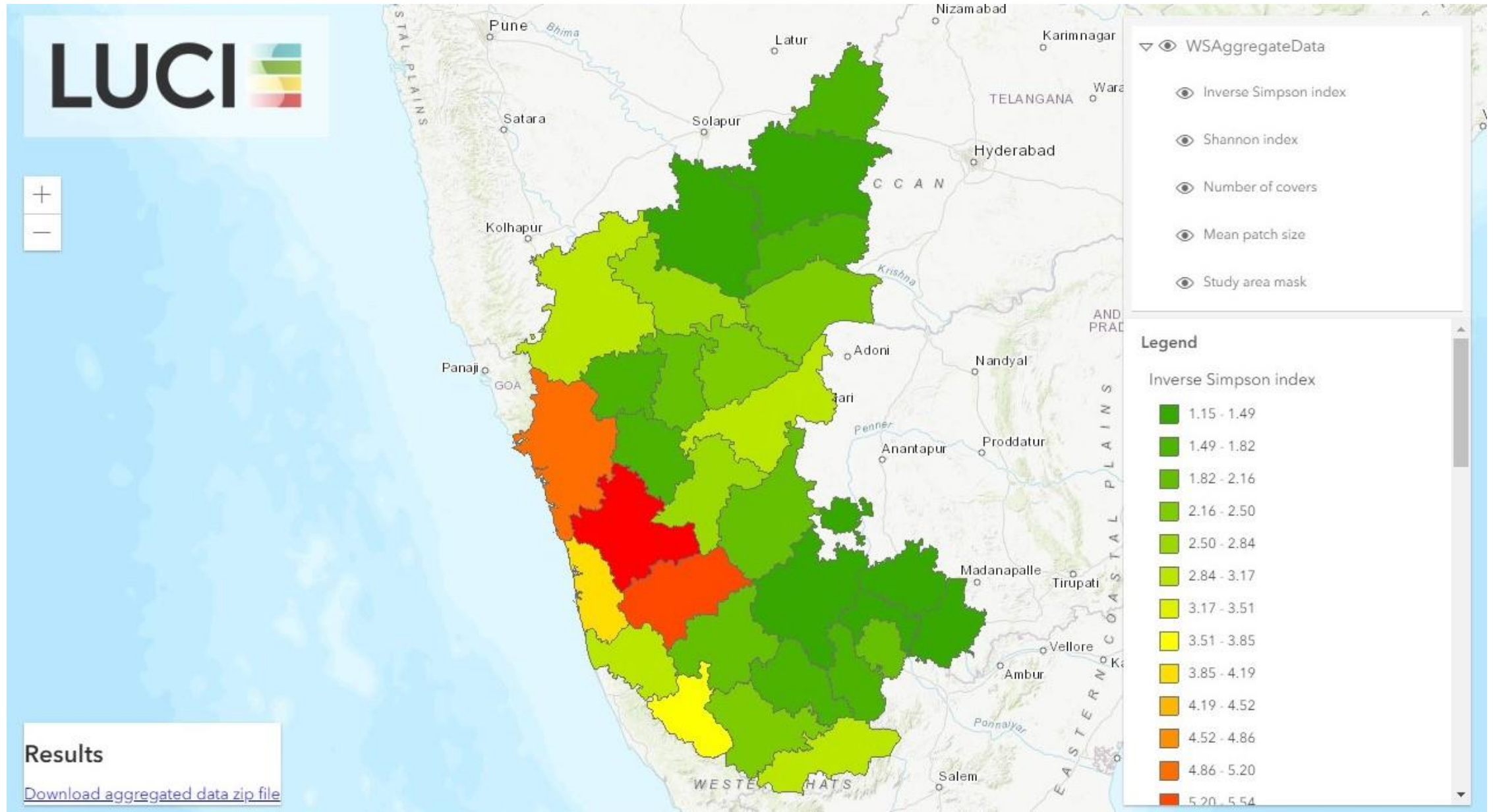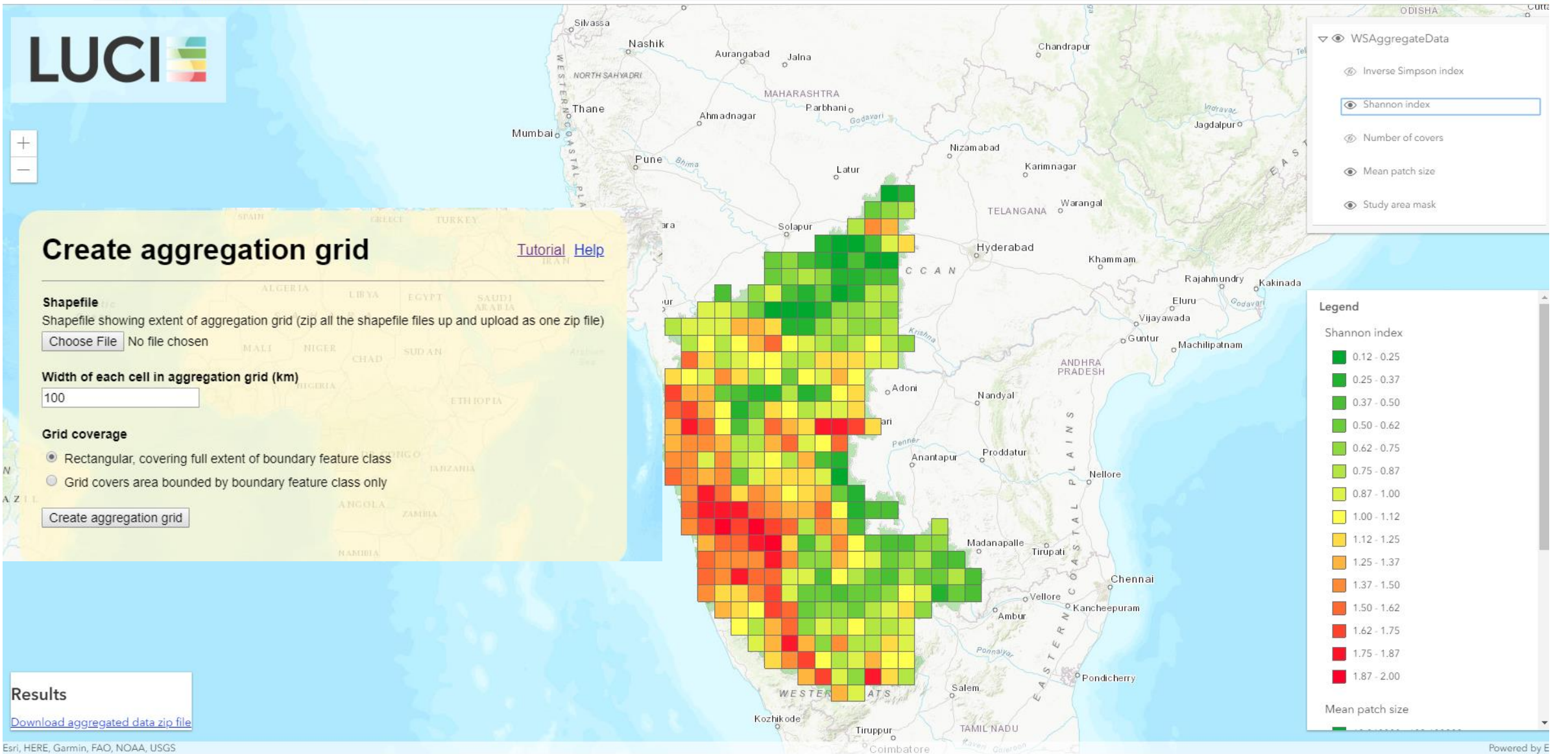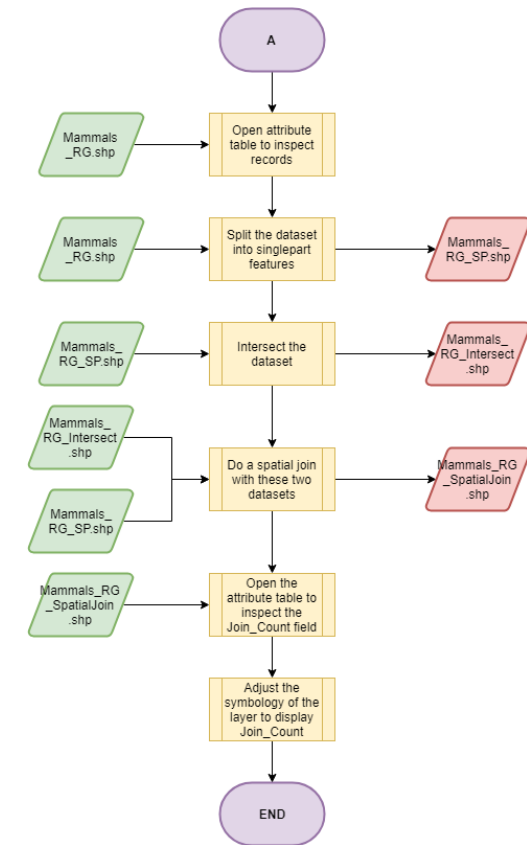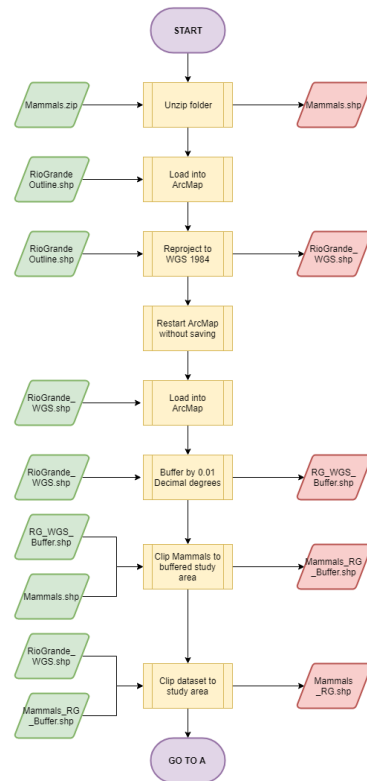
RUSLE and species richness tool example output
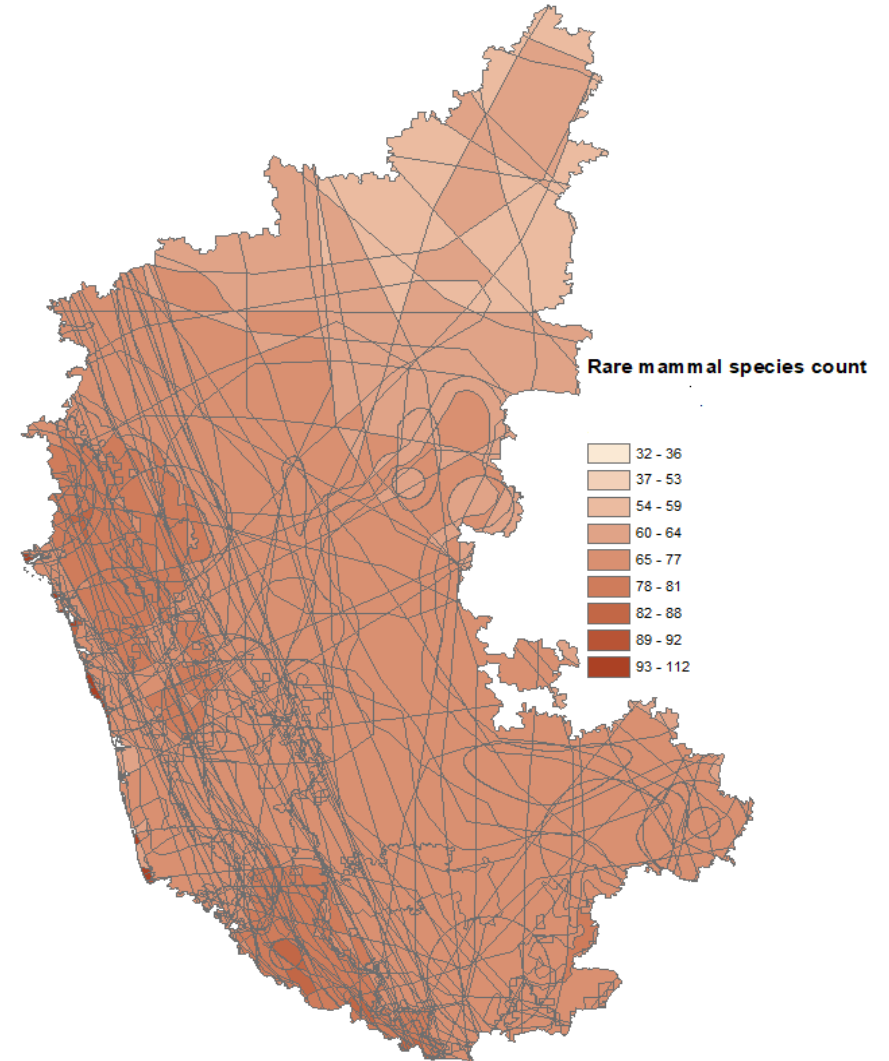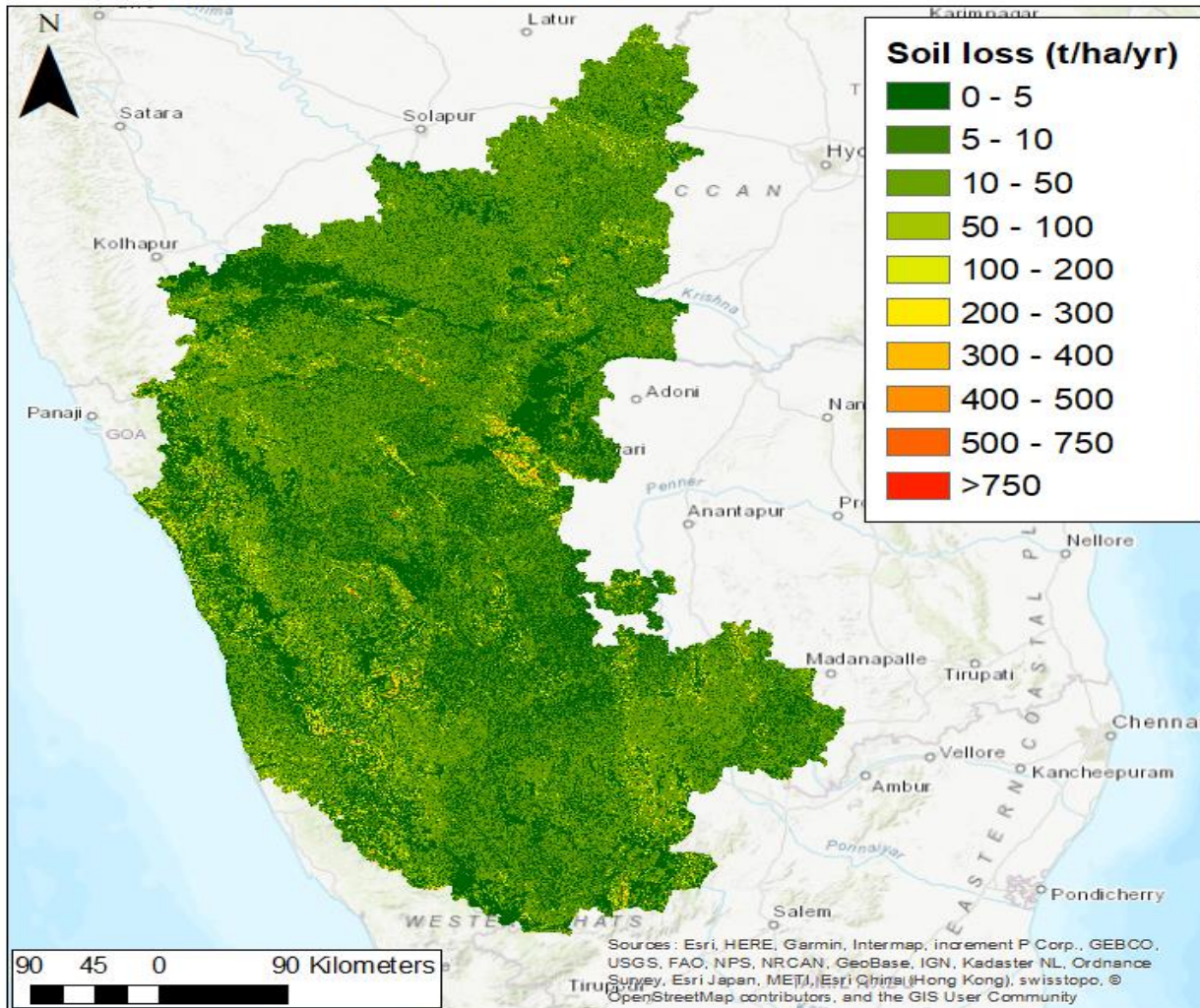
# Guidance provided to process "tricky" datasets as well as replicate functions

Processing the Mammals Dataset of the IUCN Red List Threatened Species

Future plans include more from "standard"

LUCI
LAND UTILISATION & CAPABILITY INDICATOR

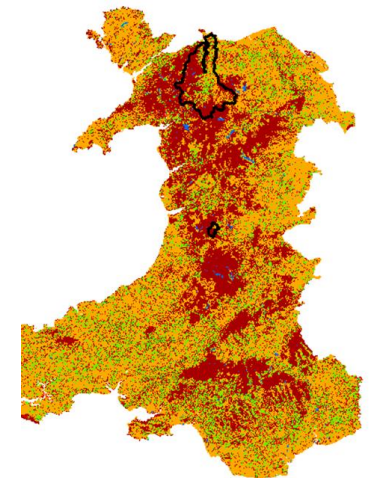| Service	Method
Production	Based on slope, fertility, drainage, aspect, climate
C stock/emissions	IPCC Tier 1 compatible – based on soil & vegetation
CH_4/N_2O emissions	IPCC Tier 1 compatible– soils, veg, stocking rate, fertiliser
Water supply and floods/ droughts	Topographical routing of water accounting for storage and infiltration capacity as function of soil & land use.
Erosion	Slope, curvature, contributing area, land use, soil type
Sediment delivery	Erosion combined with detailed topographical routing
Water quality	Export coefficients (land cover, farm type, regional fertiliser, stocking rate) combined with water and sediment delivery models
Habitat Approaches	1) Cost-distance approach: dispersal, fragmentation, connectivity. 2) Identification of priority habitat by biophysical requirements e.g. wet grassland 3) Measures of habitat richness, evenness, patch size etc
Coast/ floodplain inundation risk	Based on topography and input height of storm surge/long term rise etc: surface and groundwater impacts estimated
Tradeoffs/synergy identification	Various layering options with categorised service maps; e.g. Boolean, conservative, weighted arithmetic, distribution plots

Nitrate in rivers
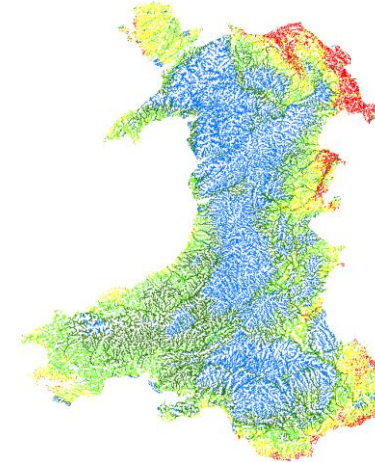
Agricultural use
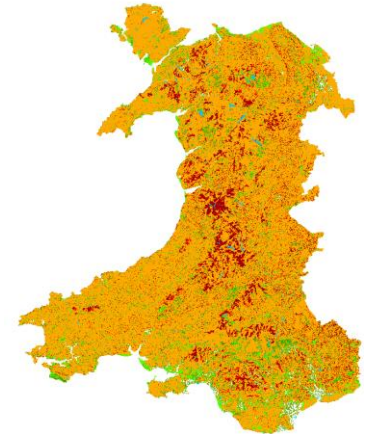
Flood mitigation
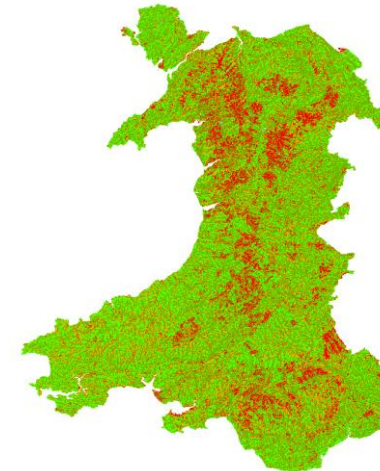
Woodland priorities

Thank you!

- Questions?