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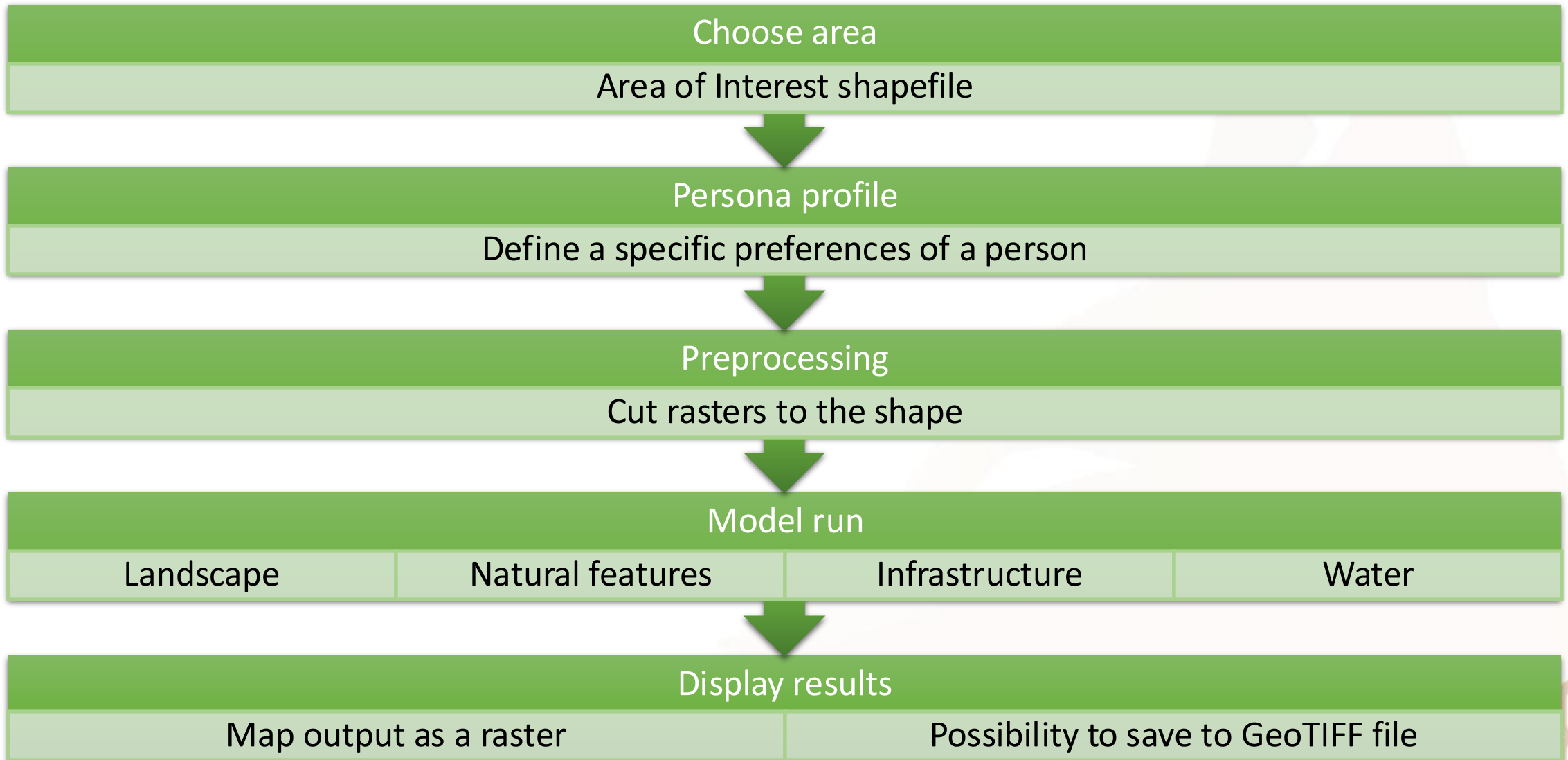
March 3rd – March 7th
Officine Cantelmo, Lecce IT

Model Optimisation with Cultural Ecosystem Services pDT

presented by Tomáš Martinovič
experiments by Maddalenna Tigli, Christopher Andrews, Joe Marsh Rossney, Simon Rolph, Dylan Carbone
supervised by Jan Dick



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Site name	Area (km2)	Run-time (H:M:S)
Bush	31.01	00:00:30.64
Inshriach_NNR	37.31	00:00:30.11
Dalncardoch1	75.1	00:00:48.22
Clackmann	140.52	00:01:44.41
Ben Vorlich	159.64	00:01:9.16
Stirlingshire	2254.82	02:19:34.88

Process	Info	Run-time (s)
Sourcing the functions	opening all the function scripts to run the shiny web app	0.035
Process the area of interest	open the Scotland-wide raster files and cut them to the match the uploaded shapefile	0.74
Component 1: Landscape	For each of the component's variables the rasters are reclassified (based on the persona profile of the run), normalized, masked and written temporarily in folder. For "Infrastructure" and "Water" the Euclidean distance is also calculated before reclassifying it.	19.026
Component 2: Natural Features		3.51
Component 3: Infrastructure		9.28
Component 4: Water		9.23
Compute and normalise final RP Model	Adding all the 4 components rasters up and normalise it to make the output raster file.	0.60

Preprocessing such as projection and cropping was done multiple times on the whole Scotland raster.

- This was eliminated by preparing the file beforehand and cropping the file once for the given area.

Originally, raster objects were stored as separate objects.

- Terra package provides SpatRaster object which can handle multiple rasters more efficiently.

Site name	Area (km2)	Original Run-time (H:M:S)	Optimised Run-time (H:M:S)
Bush	31.01	00:00:30.64	00:00:03.62
Inshriach_NNR	37.31	00:00:30.11	N/A
Dalncardoch1	75.1	00:00:48.22	00:00:06.97
Clackmann	140.52	00:01:44.41	00:00:11.53
Ben Vorlich	159.64	00:01:9.16	00:00:09.75
Stirlingshire	2254.82	02:19:34.88	00:02:37.18

- 💧 The model computation was optimised.
- 💧 Steps were taken to further decrease computation times by leveraging parallelisation.
 - 💧 First attempts resulted into longer execution times.
 - 💧 This is mainly due need to use less efficient data formats for parallelisation.
 - 💧 Some possible causes:
 - 💧 Not enough RAM on the testing system.
 - 💧 Process forking memory copy too expensive compared to computation time.
 - 💧 Small problem, benefits of parallelisation would be seen on larger area.
- 💧 Creation of user interface



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