Challenge Proposal:
[Assessing the evolution of the Green Urban Structure of Lisbon through remote sensing]

Context / Description

The Green Urban Structure is a system for promoting natural elements in urban landscapes, aiming at sustainability and quality of life. Considered a fundamental urban planning strategy, its implementation has been going on for a long time, having accompanied the development of cities, in response to the constant challenges brought about by the evolution of societies and cultures. The development of Green Urban Structure models took place in parallel with the evolution of cities, helping to understand the history of man's relationship with nature, but also inspiring new strategies for articulating natural elements with human needs, in the face of new and constant emerging sustainability challenges.

On June 21, 2018, Lisbon was distinguished with the European Green Capital 2020 award, a distinction that results from the evaluation of a set of international experts on 12 indicators that aim to assess sustainability in the city. This recent evolution, as well as the complexity of Lisbon's urban fabric, brings the need for an assessment of the historical evolution of Lisbon's green urban structure using very high resolution remote sensing images (VHR) for the longest possible historical period (subject to the availability of the corresponding remote sensing data).

Goals

Analyse the historical evolution of green spaces in the city of Lisbon over the past 20 years, with regard to their location, configuration, quality, and area quantification, with the greatest possible accuracy and precision.

Challenges/Questions

C1: Evolution of the location of green spaces in the city of Lisbon

Q1: How have green space perimeters evolved within the city of Lisbon since 2000? Have their areas increased or decreased? Have they changed their geometric configuration?

C2: Quantification of the evolution of the total area of green space in the city of Lisbon.

Q2: What is the total annual sum of green space area (m2) in the city of Lisbon, for the period considered?

C3: Evaluation of the quality of green spaces in the city of Lisbon.

Q3: Using metrics proposed by current models of Green Urban Structure, has the quality of urban green spaces in the city of Lisbon increased or decreased? And in what locations have these situations occurred?

Outcome

For each challenge, answer the questions and identify a methodology or approach to solve the challenge using data provided and/or available.

The questions mentioned are guidelines and examples. We also encourage candidates to formulate and answer their own questions related to the challenge.

Data sources

The data sets for each challenge will be presented in depth prior the start of the challenge and comprise essentially the following major topics:

- Temporal series of remote sensing (VHR) images
- Ancillary data regarding the urban structure of the city of Lisbon, such as major circulation axes, building location and urban plans, amongst many others.