



## **The eHabitat R library: Large scale modelling of habitat uniqueness for the management and assessment of protected areas**

Jon Olav Skøien, Javier Martínez-López, and Gregoire Dubois

European Commission - Joint Research Centre - Institute for Environment and Sustainability, Ispra, Italy  
(javier.martinez-lopez@jrc.ec.europa.eu)

There are over 100,000 protected areas in the world that need to be assessed systematically according to their ecological values in order to support decision making and fund allocation processes. Ecological modelling has become an important tool for conservation and biodiversity studies. Moreover, linking remote sensing with ecological modelling can help overcoming some typical limitations of ecological studies related to conservation, such as sampling effort bias of biodiversity inventories. Habitats offer refuge for species and can be mapped at ecoregion scale by means of remote sensing. Large-scale ecological models are thus needed to make progress on important conservation challenges and the adoption of an open source community approach is crucial for its implementation. R is a Free and Open Source Software (FOSS) which allows the analysis of large amounts of remote sensing data through multivariate statistics and GIS capabilities, offers interoperability with other models and tools, and can be further implemented and used within a web processing service, as well as under a local desktop environment. The eHabitat R library, one of the Web Processing Services (WPS) supporting DOPA, the Digital Observatory for Protected Areas (<http://dopa.jrc.ec.europa.eu/>), computes habitat similarities and proposes a habitat replaceability index (HRI) which can be used for characterizing each protected area worldwide. More exactly, eHabitat computes for each protected area a map of probabilities to find areas presenting ecological characteristics that are similar to those found in the selected protected area. The library is available online for using it and extending it by the research and end users communities. This paper presents the eHabitat library, as an example of a successful development and application of FOSS tools for geoscientific tasks, in particular for delivering critical services in relation the conservation of protected areas. Some methodological aspects, such as parallel computing capabilities, will be further illustrated with a few case studies.