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Progress towards the setting up of a multidisciplinary infrastructure for ecological modeling with eHabitat

Mattia Santoro (1), Gregoire Dubois (2), Jon Olav Skoien (2), Stephen Peedell (2), Cristiano Fugazza (2), Stefano Nativi (1), and Massimo Craglia (2)

(1) CNR - National Research Council of Italy, IMAA {santoro@imaa.cnr.it, stefano.nativi@cnr.it}, (2) European Commission-Joint Research Center, Ispra
{gregoire.dubois,jon.skoien,stephen.peedell,cristiano.fugazza,massimo.craglia@jrc.ec.europa.eu}

The Group on Earth Observations (or GEO) is coordinating international efforts to build a Global Earth Observation System of Systems (GEOSS). This emerging public infrastructure is interconnecting a diverse and growing array of instruments and systems for monitoring and forecasting changes in the global environment. In order to provide the GEOSS Common Infrastructure (GCI) with new functionalities and capacities, the GEO Architecture and Data Committee (ADC) launched the Architecture Implementation Pilot (AIP) Initiative. The third phase of AIP (AIP-3), completed at the end of 2010, increased GEOSS capacity to support 9 strategic Societal Benefit Areas (SBAs): Disaster Management, Health, Energy, Climate, Water, Weather, Ecosystems, Agriculture and Biodiversity. From these SBAs, biodiversity is possibly the one needing the largest efforts in setting up multidisciplinary and cross-disciplinary infrastructures that will allow the research activities required to understand the impact of our environmental policies on the loss of species diversity.

In the AIP-3 context, the EC-funded EuroGEOSS and GENESIS projects have developed a multidisciplinary use scenario called “eHabitat” dealing with Climate Change and Biodiversity SBAs. eHabitat has been developed as a Web Processing Service for the DOPA, the Digital Observatory for Protected Areas (see http://dopa.jrc.ec.europa.eu/). This information system is developed as a set of interoperable web services at the Joint Research Centre of the European Commission in collaboration with other international organizations, including GBIF, UNEP-WCMC, Birdlife International and RSPB. In short, DOPA is designed to assess the state and pressures of Protected Areas (PAs) and to prioritize these accordingly, in order to support decision making and fund allocation processes. The use scenario proposed for AIP-3 was conceived to understand how environmental and climatic factors impact on ecosystems found in a given protected area.

Based on the previous AIP-2 experience, the EuroGEOSS and GENESIS projects enhanced the existing modeling capacity with:

1) a discovery broker service which underpins semantics enabled queries: the EuroGEOSS/GENESIS Discovery Augmentation Component (DAC);

2) environmental modeling components (i.e. OGC WPS instances) implementing algorithms to predict evolution of PAs ecosystems;

3) a workflow engine to: i) browse semantic repositories; ii) retrieve concepts of interest; iii) search for resources (i.e. datasets and models) related to such concepts; iv) execute WPS instances.

This presentation introduces the enhanced infrastructure developed by the EuroGEOSS/GENESIS AIP-3 Pilot to implement the “eHabitat” use scenario and demonstrates how a GEOSS-based interoperability infrastructure can aid decision makers to assess and possibly forecast the irreplaceability of a given protected area, an essential indicator for assessing the criticality of threats this protected area is exposed to.

The infrastructure is accessible through the GEO Portal and was used to demonstrate the “eHabitat” model at the GEO Ministerial Meeting – Beijing, November 2010.