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GeoHAB, a Data Sharing, Spatial Web 2.0 Application for Habitat Types and Land Cover

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ABSTRACT

This article, which is based on the science of informatics and environmental technologies, deals with the implementation of informatics in environmental science and practice. It focuses on web-based GIS spatial data sharing application system design and its development, which records and represents specific environmental information with emphasis on habitats and land cover. The system development was made by using JavaScript, PHP as programming languages and Google Maps API. The application provides centralized environmental information with habitats and land cover. It addresses ordinary users and scientists, that not only have the willing to expand their knowledge in the field but also they have the privilege to explore the research area over the map. The users can render the overlay information of spatial habitat and land cover data layers, execute zooming, panning, and information querying functions. Its aim is to offer, to any interested citizen, scientist or organization, direct and reliable environmental information.

KEYWORDS

Ecology, Google Maps, Habitat Types, Land Cover, Spatial Data

INTRODUCTION

Nowadays, our society is characterized as "information age" where science evolution, global economy, information and new technologies depend on information (Beekman, 2014; Bozinis, 2006). Green Informatics is recently established as a brand-new term and field in the science of information because of the need to bridge the gap between informatics and the natural environment and natural resources regarding sustainability and sustainable development (Andreopoulou, 2013; Panitsidis et al., 2013; Pritchard, 2007). Therefore, environmental technologies are a key foundation in the effort of scientists to solve environmental issues (Andreopoulou, 2013; Panitsidis, 2010). Over the last decade the amount of geospatial data has grown rapidly because of the increasing number of satellites which are used to assist in the analysis and visualization of the data and as a consequence, scientists have developed several spatial data geographic information systems (Steiniger & Hunter, 2013). Environmental sciences are having an increasing trend in the amount of relevant information

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published on the internet. Due to environmental observation and examination, either by onsite research or via remote sensing applications, large amount of sharing data has occurred (Kogan et al., 2011; Tsou et al., 2002) and they are accessible to the public via government institutions, private companies and citizen scientists (Buytaert et al., 2012; Vitolo et al., 2015).

There is a continuous ''pressure'' on today's enterprises to be creative and innovative, so they can tackle multiple challenges such as political, economic, and societal activities. Enterprises take advantage of the use of Information and Communication Technologies (ICTs) to guarantee competitiveness, responsiveness, and effectiveness against all these challenges that suspend their growth and put their survival at risk. The World Wide Web (WWW)illustrates perfectly the ICT support to enterprises that would like to have an efficient online presence on the Internet (Faciet al., 2017; Lee et al., 2013).

Recently new high-speed internet connections give the opportunity to anyone interested in having access to sophisticated information to a computer independently of its geographical location, as the information can be retrieved directly. This advantage can be a crucial factor for every researcher, scientist, student and any other individual that search information. Internet has opened new chances in the field of information, as huge amount of interactive multimedia content is moving around the world. Over the last decade, the WWW has become the primary platform, which can support all views of organizational work. Consequently, the profits of this platform provided increasingly important information systems efforts, leading to the development of information systems based on web technology (DeLone & Mclean, 2003).

This paper presents a web 2.0-based spatial data application for supporting preservation of land cover and habitat types using Google Maps API. In addition, this application has the capability of visualizing those datasets and it offers useful functionalities for quick identification. Furthermore, spatial data access at different spatial scales is possible thanks to multi scale functionality. The value of spatial data in various applications has been recognized and as a consequence of this recognition spatial data plays an important role in management of environmental resources, not only in distributing the primary data, but also in diffusing information and providing valuable services to relevant users (Yang et al., 2005). By using the web 2.0 applications and Google Maps API, those data are accessible for the user needs across any platform (Akanbi & Agunbiade, 2013). The term "Web 2.0" was defined by Tim O'Reilly in 2005, amongst other definitions, as web sites and web services that rely upon the generation of content by their users, as opposed to editors or dedicated content creators (O'Reilly, 2005).

Google maps is a tool that uses Internet and gives access to free layouts, offers a choice between maps and satellite images. The coverage is global, the image resolution varies from region to region, and it can reach up to 15m in some areas. Moreover, Google provides an Application Program Interface (API) as a tool to produce tailor-made new applications according to the needs of the programmer. Using Google Maps API, website could insert dynamic maps to their web sites and overlay line and polygon data on the maps. Such data can be reproduced by using the JavaScript through external XML or KML files. It is also possible to connect a database and overlay data from the database based on a query (API Google, 2017; De Lange & Plass, 2008).

Definition of Corine Land Cover and Habitat Types

Land-cover is the observed biophysical cover of the Earth's surface, describing both vegetation and anthropogenic features. The monitoring of land surface can nowadays be done with a spatial resolution of less than one meter, but interpretation of the captured images remains a challenge (Bastin et al., 2013).

The CORINE Land Cover (CLC) inventory was initiated in 1985 (reference year 1990), it is a European land cover map produced by photo interpretation of Landsat ETM+ images. Updates have been produced in 2000, 2006, and 2012. It consists of an inventory of land cover in 44 classes