

# PLOTGOOGLEMAPS: THE R-BASED WEB-MAPPING TOOL FOR THEMATIC SPATIAL DATA

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*Google Maps are increasingly used for communication throughout many map-based services and maps, embedded on third-party websites via the Google Maps API. The main objective of this paper is to present a solution for an easy creation of an interactive web map, with a base map supplied by Google, where all map elements and additional functionalities are handled by just one line of code. The present solution for the automatic creation of a complete web map, based on the Google Maps API, is the R package plotGoogleMaps. This tool provides a new interactive plot device for handling the geographic data for web browsers. It also offers a complete map in the HTML format, which has become a regular medium for cartographic communication. The tool plotGoogleMaps is developed in the R software language and it is designed for the automatic creation of web maps, as a combination of users' data and Google Maps layers.*

*Google Maps est de plus en plus utilisé pour la communication dans de nombreuses cartes et de nombreux services cartographiques qui sont intégrés à de tiers sites Web par l'entremise de l'API (interface de programmation) Google Maps. Le principal objectif de cet article est de présenter une solution permettant de créer aisément une carte Web interactive grâce à une carte de base fournie par Google où tous les éléments de la carte et toutes les fonctionnalités additionnelles sont traités par une seule ligne de code. La présente solution pour la création automatique d'une carte complète sur le Web fondée sur l'API Google Maps est le progiciel R plotGoogleMaps. Cet outil fournit un nouveau dispositif de représentation graphique interactif permettant aux navigateurs Web de traiter des données géographiques. Il offre également une carte complète en format HTML qui est devenu le média régulier pour la communication cartographique. L'outil plotGoogleMaps est développé dans le langage logiciel R et est conçu pour la création automatique de cartes Web à partir d'une combinaison des données des utilisateurs et des couches de Google Maps.*

## 1. Introduction

Although the Internet has been in existence, at least in some form, since the late 60s, only from the mid-90s, with the widespread use of the World Wide Web (Web), has the Internet become a foremost medium for cartographers [Peterson 2007]. The real breaking point in the usage of geographic information on the Web was in the year 2005. In June 2005, Google released the Google Maps Application Programming Interface (API), which allows a combination of geographic information from a variety of sources and formats. One of the most important capabilities of the API is the generation of mashup maps—the product of the combination of geographic data from one source with a map from another source [Miller 2006; Gartner 2009; Haklay et al. 2008]. The mashup maps are easy to create and implement in any web page, with no cost and without any technical specification and requirements whatsoever, resulting in an increased web mapping popularity. This progress, together with the popularity of web mapping, and its application, is clarified by Haklay [Haklay et al. 2008]:

These rapid developments in web mapping and geographic information use are enabled and facilitated by global trends in the way that individuals and communities use the Internet and new technologies to create, develop, share and use information (including geographic information), through innovative, often collaborative, applications.

This change of direction of the Web philosophy, from communication media to contribution media, is named Web 2.0. The term and the concept, Web 2.0, was first coined and described by Tim O'Reilly [2005].

The collaborative nature of the Web 2.0 environment allows data production to be shared among many individuals [Feick and Deparday. 2010]. Goodchild [2007] described the term 'Web Mapping 2.0' as an important part of the Web 2.0 concept. Integration and visualization of different geographic information on base map (such as Google Maps/Earth, Virtual Earth, or Yahoo Map),



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