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The Map of Tlacotalpa by Francisco Gali, 1580: An Early Example of a Local Coastal Chart in Spanish America

P. 3-15

Manuel Morato-Moreno

Abstract

In the last third of the sixteenth century, the Spanish Crown launched a project to create a map of the New World. Regional maps would be obtained, which, referenced through a system of meridians and parallel arcs, would comprise a complete map of the continent. The mechanism devised for this purpose was that of surveys, known as the Relaciones Geográficas (*Geographic Relations*). Each town would be sent a questionnaire with more than 50 questions that should also be completed with a map of the region. The majority of these maps, known as pinturas, lacked field measurements, and therefore also lacked both scale and geographical coordinates. Only a few cases were created following the standards of European cartography. Among these are the maps made by Francisco Gali. In this paper, we study the map of Tlacotalpa, one of the first examples of local nautical charting in Latin America.

A Study of the Local Geometric Accuracy of Count de Ferraris's *Carte de cabinet* (1770s) Using Differential Distortion Analysis

P. 16-35

Soetkin Vervust, Manuel Claeys Bouûaert, Bernard De Baets, Nico Van de Weghe & Philippe De Maeyer

Abstract

The eighteenth century *Carte de cabinet* of count de Ferraris is the first large-scale (1:11 520) topographic map of the entire Belgian territory, making it a valuable source of historical information. In the past, a number of studies have tried to assess the geometric accuracy of this map, but they all suffer from restricted technical capabilities for computing and visualizing the distortions, and most of them only focus on a limited number of the 275 map sheets. This paper therefore seeks to provide the first systematic and in-depth investigation of the map's local geometric accuracy. Recently, two Belgian government agencies georeferenced the Flemish and Walloon part of the *Carte de cabinet* with a high level of detail, using some 30,000 ground control points to link the old map to the modern topographic map of Belgium. These data sets represent a new and unprecedented potential source of accuracy information. However, the high number of control points and our desire to compute distortions in an exact, local, quantitative and continuous way meant prominent techniques for studying the geometric accuracy of old maps, such as displacement vectors, distortion grids, triangular nets and the popular MapAnalyst software, were unsuited for this task. To meet all our requirements a new technique called Differential Distortion Analysis, which is influenced by the treatment of distortions in map projection theory, was used instead. Its advantages, structure and application to the *Carte de cabinet* are discussed in detail. The new technique allows calculating and displaying the map's local angular and surface distortions with a very high spatial resolution. Consequently, it was possible to identify trends in the obtained levels of accuracy and to relate these to historical facts about the *Carte de cabinet's* production process. This has resulted in important new insights into the map's geometric accuracy.

Maps Telling Stories?

P. 36-57

Franz-Benjamin Mocnik & David Fairbairn

Abstract

Maps are good at representing geographic space, but texts have a stronger affordance of telling a story than maps. Telling stories is, however, important to make information more personal and to arrest the map user's attention. This paper contrasts the map and the text media in order to understand why texts are good at telling a story but conventional maps are not. We demonstrate that, by a modification of maps, appropriate structural features of the text media can be transferred to maps, which makes them more suitable for telling stories. This new concept for map design can lead to new interaction possibilities and provide insights into how maps can be used more effectively.

The First Depiction of Two Superimposed Geographical Surfaces in One Autostereoscopic Map: Antarctica's Topography and the Southern Ocean Seafloor

P. 58-67

Manfred F. Buchroithner & Lars Radig

Abstract

Within the past 10–15 years true-3D lenticular cartography has experienced a remarkable boost. In the course of this development, besides studies into its potential for thematic-cartographic representations, the synoptic depiction of physical surfaces ('geo[graphical] surfaces') has been playing a significant role. In this context the innovative holistic display of complex morphological and topographical conditions is of particular interest. The simultaneous representation of various cartographic parameters at different depths will deliver an enormous surplus of information transfer in the field of thematic cartography as well as in physical/topographic cartography. This paper describes the methodological development and generation of an autostereoscopic hardcopy display of Antarctic topography. The purpose was the simultaneous depiction of the two superimposed surfaces of both the ice-sheet and the rock-bed and, in addition, of the surrounding seafloor, thus displaying a vertical drop of more than 12,000 m.

Labelling Hierarchy for Street Maps Using Centrality Measures

P. 68-84

Wasim Shoman & Fatih Gülgen

Abstract

This paper proposes a compound hierarchy to be used in cartographic labelling of streets. The main purposes of this hierarchy are to ease navigation of street maps and to provide more understandability and legibility of street features for map users. The hierarchy uses centrality measures along with functional classes of the streets to order features according to their spatial importance in each used zoom level. The calculation of a proper radius, to be employed in the calculations of centrality measures, is based on extracting proper field of view in the map user's focus status. The used measures are integrated using fuzzy-analytic hierarchy process, yielding proper coefficients to create the hierarchy. The hierarchy is applied for the thinning process and later for using the styled layer descriptor to label street features. Quality constraints are implemented to make the street labels more understandable and readable.

Communicating Climate Change: Reinforcing Comprehension and Personal Ties to Climate Change Through Maps

P. 85-100

Irene M. Johannsen, Karla A. Lassonde, Forrest Wilkerson & Gertrud Schaab

Abstract

Although climate change is highly prevalent in the media, people in Europe and the United States are often unsure about climate change terms, processes, and its personal consequences. In other words, climate change communication seems to be largely failing so far. Among other communication tools, maps are widely used for explanatory purposes by scientists and the media. Here two questions arise: first, whether high map complexity may be too intricate to be understood and discourage people from deciphering the map; and second, whether personal interest in climate change can be influenced by the phenomenon depicted or the map's scale. In a survey conducted among 109 students in the USA, 63% of respondents preferred a simple map, but a substantial subset, 37%, asked for complexity to receive more information.

Regional phenomena evoked more concern than far-off phenomena (concern level index difference of 0.93 on a 5-ranked Likert scale). The advantage of maps showing local areas could not be statistically confirmed.
