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A New Swiss Map Generation for Mobile Use

Mark Wigley [a*], Karsten Pippig [b*], Olaf Forte [b], Sebastian Denier [b], Roman Geisthövel [b]

[a] *Swiss Society of Cartography, Mark Wigley – m.wigley@esri.ch;*
[b] *Federal Office of Topography swisstopo, Karsten Pippig – karsten.pippig@swisstopo.ch, Olaf Forte – olaf.forte@swisstopo.ch, Sebastian Denier – sebastian.denier@swisstopo.ch, Roman Geisthövel – roman.geisthoevel@swisstopo.ch*

** Corresponding authors*

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Abstract:

In 1848, 175 years ago, the Swiss Confederation became a modern federal state and the first democracy in Europe. At the same time, Guillaume-Henri Dufour drafted the first official map of Switzerland, which covered the entire country and thus played a decisive role in shaping the image of national entity. The Dufour map represented the first geometrically correct and aesthetically beautiful image of the young federal state and established the world reputation of Swiss cartography.

Since then, not only Switzerland but also map technology and society have undergone fundamental changes. In the digital society, mobile devices and mobile map applications are ubiquitous. The trend is globally emerging that the focus of official cartography is increasingly on the flexible and mobile web representation of data and shifting away from the production of printed maps (Seifert 2021). This inevitably leads to a rethinking and reorientation in official cartography. For its 175-year anniversary, modern Switzerland is receiving a new generation of maps in the form of a "NextGenerationMap", which aims to meet the changing demands of a mobile society.

The new map generation is consistently oriented towards users and their needs in the context of their mobile use. One of the key elements for this is the new interpretation of a dynamic, national map-like visualization based on vector tiles. The design deliberately abandons previous principles of the classic national map in favour of performance and legibility. While the national map is designed and optimized for different scales in its design and generalization, the approach of vector tiles follows a more consistent design logic with less hard breaks between the individual zoom levels. The density of content is oriented to the display size of smartphones (cf. figure 1).

In addition, the characteristic terrain representation of the National Map of Switzerland, one of the reasons for its worldwide reputation, is transferred to vector form while maintaining the same aesthetic and content quality. In the future, the manual creation of the terrain representation - as an intermediate step for the derivation of vector data - will be eliminated. For this purpose, the terrain representations will be derived using artificial intelligence approaches. In initial pilot tests, hand-drawn hill shadings were successfully replicated by using U-net neural networks (cf. Jenny et al. 2020). This approach is expected to be transferred to other terrain representations, including rock depictions, thus enabling a complete automated derivation of vector terrain representation not only for the territory of Switzerland - but also for a worldwide Swiss-style terrain representation.

The "NextGenerationMap" is intended to help generate geo-knowledge from geoinformation. To this end, the map application is to become more interactive and enable the user to call up additional information. An innovative UX concept contributes to this. Points-of-Interest are an essential building block for this. They function as a bridge between static and dynamic information and thus enable the dynamic integration of real-time information (cf. figure 2).

First surveys and tests of the developed prototype show high acceptance of a "NextGenerationMap" by the users.

This presentation will give an insight into the status of this project.

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Figure 1 (left): Example of the map representation. Figure 2 (right): Example of user interface design.

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