

5th ICA Mountain Cartography Workshop

Bohinj, Slovenia, 29th March – 1st April, 2006

The 5th Workshop of International Cartographic Association, Commission on Mountain Cartography took place in Slovenia this spring. Previous mountain cartography workshops took place in the Austrian Alps (Silvretta 1988, Rudolfshütte 2000), North America's Cascade Range (Mount Hood 2002) and the Catalan Pyrenees (Val de Nuria 2004). This year the mountain cartographers returned again to the Alps, but this time to the southern limestone region. The workshop venue was "Gozdnasola" (forest school), which is the National Training Centre of the Scout Association of Slovenia. The centre is located near Lake Bohinj, 533 m above sea level, in Triglav National Park, a protected area of forests and mountains, including Triglav (2.864 m), the highest peak in Slovenia and the Slovenian national symbol.

The workshop was organized by the Section for Cartography, Association of Surveyors of Slovenia. Other contributors included The Faculty of Civil and Geodetic Engineering, University of Ljubljana; Surveying and Mapping Authority, Republic of Slovenia; Geodetic Institute of Slovenia; Local Tourist Organization Bohinj; Slovenia's Government Public Relations and Media Office; Triglav National Park Authority; and, the Scout Association of Slovenia.

Fifty people attended the workshop, making it the largest mountain cartography gathering to date. Attendees came from Austria, Croatia, Germany, Poland, Slovenia, Switzerland and the USA. Staying at a small facility in the mountains for three days fostered professional interaction among the group. It was a requirement that almost everyone give a presentation. The presentations covered a range of research and production topics relating to the broad theme of mountain cartography. Specific topics included topographic mapping, relief representation, hillshading, cliff drawing, cartography of glacial phenomena, risk and natural hazard mapping, snow avalanches and landslide hazards,

geomorphological mapping, mountain tourist mapping, remote sensing applications, data models, data integration, digital elevation models, data capture, classification and representation, cartography and GIS tools applied to mountain data, visualization, rendering, animation, multimedia and Internet applications, LBS services.

The workshop started on the evening of Wednesday, March 29th with welcoming presentations by the local organizer, Dusan Petrovi and the Commission president, Lorenz Hurni. Next on the agenda was a keynote presentation by MSc. Martin Solar, head of management and planning for the Triglav National Park Authority. Martin Solar gave a slide show and discussed projects underway in the park and environmental and management problems that the park is facing.

On Thursday, participants gave 18 presentations in three sessions. The first session started off with presentations on mountain maps of North America. Tom Patterson, Andreas Neumann and Martin Gamache presented papers on developing a new visitor map of Glacier Bay National Park, Alaska; an interactive hiking map of Yosemite National Park; and the mountain cartography work by the Alpine Mapping Guild, respectively. Following this, Christian Häberling discussed conceptual aspects of 3D map integration in interactive school atlases. Bernhard Jenny spoke about the design of a panorama map with parallel and spherical projection. Brane Padjen and Damijan Jeric discussed how they made panoramic maps of Slovenia. Martin Gurtner concluded the session with a historical overview about compiling information on Swiss national topographic maps, from traditional field sheets to recent digital workflows.

The second session combined presentations on glacier mapping and remote sensing. Manfred Buchroithner presented on the development of three new types of glacier dynamic maps. Viktor Kaufmann and Richard Ladstädter described the monitoring of the Doesen rock glacier (Ankogel group, Austria) from 1995-2005. Mihaela Triglav Cekada explained photogrammetrical monitoring of the disappearing Triglav glacier in Slovenia. Wolfgang Sulzer discussed the challenges of mapping Mt. Aconcagua in the Andes with remote sensing techniques. The last presenter, Jacek Drachal, analyzed the appearance of mountain chains on satellite images provided by Google EARTH.

Session three, on GPS terrain applications / Risk and natural hazard mapping, consisted of six presentations. Gasper Mahnic showed a special GPS based device that enables users to locate points in the mountains and helps to interpret views. Kristof Ostir described the application of satellite remote sensing in natural hazard management relating to the Mount Mangart landslide. Michaela Kinberger discussed the importance of geo-communications and daily avalanche awareness. Vladimir Prebilic and Uros Svete examined the problems and challenges for Mountain Rescue Service (GRS) in Slovenia. Miha Pavsek spoke about avalanche cadastre for the Slovenian Alps and its meaning for avalanche prevention. The sixth and final presentation by Stefan Räber discussed the manual renovation of a 3D relief model of the Valis Alps made decades ago by Eduard Imhof. Toni Mair of Switzerland did the renovations. Stefan Räber and Bernhard Jenny followed this after dinner that evening with a movie titled "Construction of 3D-reliefs", which they directed. The movie provided an overview of the 3D relief work of Toni Mair, whose work was on exhibit at the workshop. Meeting Toni Mair and seeing his exceptional work was a great experience for every participant. The representatives of ETH Zürich used this opportunity to thank Toni for renovating the Imhof model.

Friday offered another 15 presentations, divided into three sessions. The first two sessions covered relief presentation and GIS analysis of mountainous areas. Jürg Gilgen showed the new topographic map series of Switzerland with a focus on rock, scree and glacier representation on them. David Theler spoke about an integrated GIS application dealing with geomorphological mapping and risk assessment in the western Swiss Alps. Drasen Tutic presented his experiences with analytical relief shading of Mount Medvednica above Zagreb. Methods to create rock drawing analytically were prepared by Tobias Dahinden and also by Simon Premoze. Mr. Premoze gave a second presentation about the processing of terrain data to preserve features in a DEM. Aileen Buckley and Charlie Frye described a data model for named features of the natural landscape. Michael Heuberger discussed terrain representation for small-scaled maps. Lorenz Hurni gave a presentation on integrated cartographic mountain information systems, which are important for the future presentation of mountain cartographic products. The next paper



Conference Reports

discussed a new DEM of Slovenia, made from various data sources and featuring enhanced geomorphological details by Tomas Podobnikar, including a description of Triglav national park historical maps analysis, where Ziga Kokalj joined Tomaz. In the final presentation, Blaz Barboric spoke about coordinate homogenization in Triglav National Park and the problem of cross border data compatibility.

The last session, Visualizations and animations, consisted of three presentations. Katja Londerhausen and Nikolas Prechtel prepared an animated presentation of the Dresden "Altai-GIS". Lojze Miklavcic explained procedures for making a map of Lake Bohinj in natural looking manner. Dusan Petrovic examined the results of a user questionnaire on different types of 3D presentations. The session concluded with a discussion panel on design issues in mountain cartography today, led by Karel Kriz. The panel prompted an active debate. In the evening, Manfred Buchroithner demonstrated an interactive over fly above Gesäuse National Park in Austria. For entertainment afterwards, Dusan Petrovic presented videos that introduced the arduous sport of adventure racing.

On Saturday, the participants pursued different outdoor activities. A dozen participants climbed Mount Rodica (1966 m) and skied down to the valley in excellent snow conditions. Others spent the day alpine skiing at Vogel (the local ski area) and mountain biking. And others went sightseeing, including Savica Waterfall, Mostnica Gorge, the railway station and railroad tunnel at Bohinjska Bistrica, hay-racks in Studor, churches, or taking the cable car to Vogel for a view of Bohinj Lake far below. The workshop wrapped up with a farewell diner featuring Slovenian dishes.

During the workshop, Commission on Mountain Cartography members met to discuss Commission business and announce the next workshop. The 6th workshop of ICA Commission on Mountain Cartography will take place in Lenk, Switzerland, in February 2008.

All papers will be published in the publication series of ICC. Abstracts can be accessed on the commission's web-site www.karto.ethz.ch/ica-cmc.

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