

Mountain Ski Maps of North America

A Preliminary Survey and Analysis of Style

Alex Tait

International Mapping, Ellicott City, USA

Abstract

This paper examines mountain ski resort trail maps in North America. It starts with a survey of the complete set of maps in use today. For each map, the survey catalogs the point of view, creation method, style and artist where known. The main types of view used are: panoramas, profiles, and planimetric maps. Creation methods include: paintings, illustrating, and computer modeling/rendering. A brief history of the artists involved in creating North American ski maps follows along with discussion of samples of work by several key artists and a brief analysis of map style.

1. Mapping Ski Mountains in North America

Trails maps for ski areas are iconic images of the nature of the sport and its relation to the terrain on which resorts are built. Canada and the United States have well over 400 ski areas that are large enough to merit a trail map. The development of the maps has paralleled the development of the sport of lift-served skiing. As skiing in North America has grown and more money has flowed to building bigger resorts and marketing the resorts to skiers, more attention has been paid to marketing materials (Frye 2007). The combination of bigger areas to map and an increase in money in the sport led to a shift from simpler wayfinding maps to more elaborate mountain portrayals.

This study looks at the total number of ski maps in use and categorizes them by angle of view, method of creation, size, and artist if known. An evaluation of these factors is provided in the context of how they affect the style of the ski map. In addition, an examination of the artists involved in the maps' creation yields information about the history of mapping ski resorts.

2. Survey of Ski Maps in Current Use

A mountain ski map as defined for this paper is a map of the trails and ski facilities of a lift-served ski area. Maps are included for any ski area that has a vertical drop (top to bottom elevation change) of at least 200 feet (60 meters). In addition, due to the limit on time and expenses for gathering materials, the study includes only ski areas and resorts

with established websites, indicating that they are both currently operating and that they are marketing to the public to entice skiers.

The resulting survey of ski maps does not include private ski areas, very small areas or many of the non-commercial (community) ski areas. These areas may have trail maps but are outside the main ski area focus of the industry and this paper. In addition, many resorts have maps in their marketing materials and on their websites that display Nordic or cross-country skiing trails, base lodge areas, resort towns, and lodging. These maps are not included in this study.

The survey of ski maps was conducted during January 2008 by a thorough internet search for ski resorts and then for ski maps used by each resort. Compiled lists of resorts data were accessed at www.skitown.com and www.skireport.com. Each ski map was obtained directly from the individual ski resort website. The visit to the individual websites confirmed that each resort was currently operating and allowed viewing of the trail maps provided by the resort. Where there were multiple trail maps, for example different maps for print and web use, the map designated for print and on-slope use was used. An electronic file was available for 428 out of 429 resorts researched (the only exception was Apple Mountain in Michigan, not included as part of the survey).

For each trail map the following information was catalogued: view type, creation method, artist, existence and type of interactive web map, and size of resort (vertical drop, number of lifts, number of slopes). In addition, subjective style notes were made to assist in categorizing maps and assigning authorship. View type describes the general nature of the view of the mountain: the camera or optical view used. Creation method describes the general technique used to construct the final image.

In order to isolate some of the more important trends in the creation of ski maps, a distinction was made between major resorts and minor resorts. The major resorts are the top 100 ski areas as defined by an index calculated by multiplying the vertical drop (top to bottom elevation difference) by the number of lifts and by the number of trails. The use of the vertical drop in the index aided in putting the larger mountains (in terms of terrain covered) toward the top of

	All Resorts	%	Major Resorts	%
View type				
panoramic	368	86%	100	100%
profile	36	8%	0	0%
planimetric	24	6%	0	0%
Creation method				
painted	307	72%	89	89%
illustrated	85	20%	7	7%
annotated photo	24	6%	1	1%
computer rendered	12	3%	3	3%
Total	428	100%	100	100%

Fig. 1: Survey of North American mountain ski maps, counts and percentages by view type and creation method.

the list. Most smaller mountains did not make it into the top 100 resorts.

The initial results of the survey are summarized in Fig. 1. Some immediate patterns emerge such as the preponderance of ski maps using the panoramic view, indeed for the major resorts it is the only type of view used. Also, the painted technique, originally using traditional tools and now often using the computer, is the dominant method used to create the trail maps. Painted panoramic views have a strong tradition in ski mapping and much of this dominance in the current survey can be attributed to just a few artists.

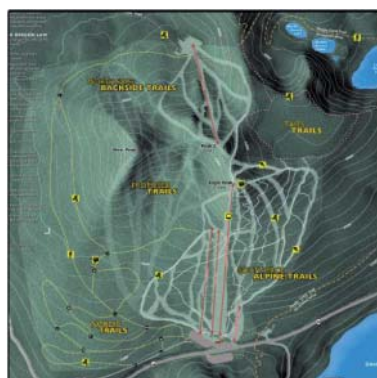
3. Types of Views

Three general view types exist in the set of maps evaluated in the survey (see Fig. 2). Planimetric views are mostly or entirely map like, viewed from directly above over all portions of the image. Panoramic views are oblique perspective views of any angle – there are a great variety of angles used, from very low to very high. A third category is profile views. These are generally very simple elevational views of the mountain from a very low oblique angle or ground level that have little or no three dimensional character and look into the mountain with little or no perspective. Assignment of low oblique views to either panorama or profile groups was a difficult task. Views with little or no attempt at shading or perspective were labeled as profile.

Panoramic views dominate ski trail maps, they comprise 86% of all maps and 100% of maps for the top 100 resorts. There are several probable reasons for this. As Patterson (2000) notes in discussing the panoramic work of Heinrich Berann, one of the earliest panoramic mountain ski map painters, that with a panorama, “Something truly magical happens. Readers feel drawn into the panorama as if they were flying high above the land.” The panoramic ski map may be particularly evocative of the mountain terrain for skiers and potential skiers for whom the feel of the image may replicate the feel of flying down the mountain on skis.

Planimetric views are relatively rare in the survey of current ski trail maps, only 6% of the total. In a brief view of cross-country (Nordic) ski trail maps associated with ski resorts, the planimetric map is much more prevalent. Given the exceptional accuracy of trail and feature placement it may at first seem surprising that true maps are not used more. They are better wayfinding instruments for experienced map users. Wayfinding, however, is only one reason for creating the map and can be minor compared to the need for the map to market the ski area and entice new skiers to visit.

The marketing of ski areas is a consistent factor in creating informational materials, including maps, for resorts. The demands of the marketing department can be at odds with an accurate portrayal of the mountain (Phillips 2007, Powers 2008). Ski areas often ask for the mountain to “look



Planimetric view



Panorama



Profile

Fig. 2: General types of views utilized in mountain ski maps (left to right: Willamette Pass, Oregon; Crested Butte, Colorado; Spirit Mountain, Minnesota).

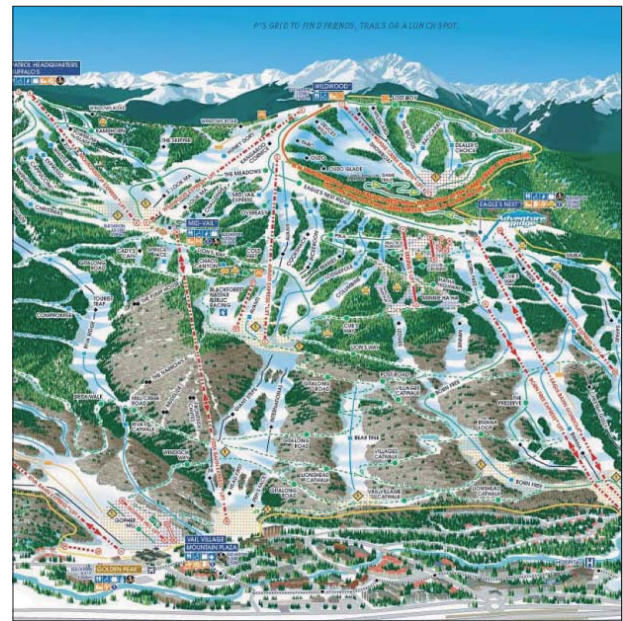


Fig. 3: Left: Peter Powers (Terragraphics) painted view of Mt. Bachelor ski resort in Oregon. Right: Gary Milliken illustrated view (portion) of Vail ski resort in Colorado.

bigger” and for the trails to appear more clearly delineated and map-like. Two requests that are often at odds with each other.

Profile maps constitute about 8% of the total ski maps in this survey. While in some ways a subset of panoramic maps they generally lack some of the key features of panoramas such as depiction of a true depth of field. The profile maps are more in use for smaller mountains, and can make them look larger than they would in an oblique view. The flatter profiles provide an image more amenable to schematic illustration of trails.

4. Methods of Creation and Graphic Styles

The basic methods of creation used by artists creating ski trail maps are painting, illustration, and computer rendering. An initial distinction was made for both painting and illustrating between use of the computer and traditional techniques but the end result is often similar and in many cases difficult to distinguish.

Painted maps are by far the largest group of maps in the survey, 72% of all maps and 89% of maps for the top 100 ski areas. For examples of maps created with traditional painting techniques, see below images of Whistler Blackcomb by James Niehues, Arizona Snowbowl ski resort by Bill Brown,

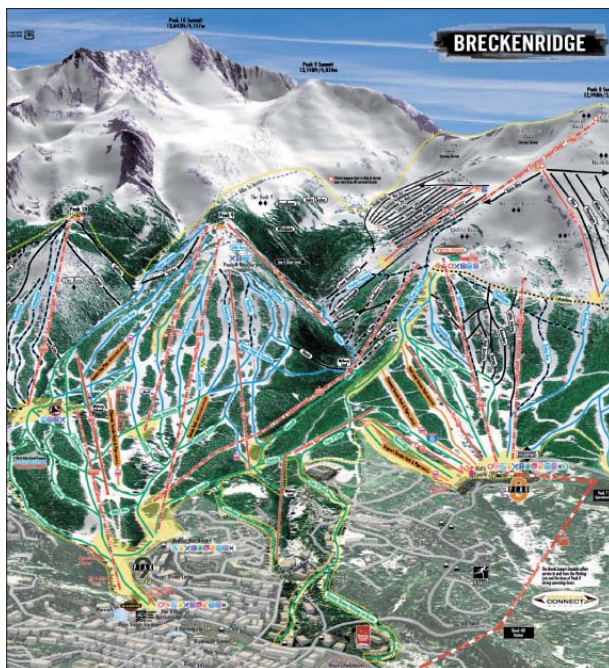


Fig. 4: Left: computer rendered view of Breckenridge resort, Colorado. Right: the author's computer rendered view of Northstar-at-Tahoe, California.

and Mammoth Mountain ski resort by Hal Shelton. For an example painted on the computer see Mount Bachelor by Peter Powers and Terragraphics (see Fig. 3, left side). Painted maps allow the greatest flexibility in terrain depiction and control of all aspects of the image but also require the greatest artistic skill. Despite the fine work by artists such as Hal Shelton and James Niehues, examples abound of unconvincing painted maps.

Illustrated maps are more prevalent in use for smaller ski areas (20% of all areas) than for larger areas (7% of top 100 areas). They are characterized by hard lines and sharp edges. The illustrated maps of Gary Milliken (VistaMaps) are the most prevalent in the major ski areas and the largest and most extensive vector art images (see Fig. 3, right side, showing Vail, Colorado ski resort). These maps usually rely on vector software programs – though some are illustrated with traditional tools – and have a mechanical, less natural feel than the other techniques.

In the survey of ski trail maps, a surprisingly small number of computer rendered images was found, only 3% of all resorts and 3% of top 100 resorts. The author has created two such views for major ski areas, see the example below (Fig. 4) for Northstar-at-Tahoe. This view uses procedural textures and modeled trees to mimic the patterns of slope and forest on the mountain. Breckenridge is another resort that recently converted from painted trail map to computer rendered map (Niehues 2008). The Breckenridge map is a standard satellite photograph draped over a digital elevation model. It includes rendered three-dimensional buildings for the town of Breckenridge.

Annotated aerial photographs are used in 6% of all resorts but only one of the top 100 resorts. They are the simplest of trail maps to create and can be effective for more compact areas but often suffer from the inability to control

generalization, selection and emphasis of features, all advantages of maps and rendered views. For an nice example, see the website for Whitewater resort, British Columbia: www.skiwhitewater.com.

5. Individual Artists and Ski Trail Maps

The array of ski maps in use today reflects the history of artists involved in the business. Maps by Hal Shelton, Bill Brown, and Don Moss, are still in use though some were created 30-40 years ago. Hal Shelton was the first prominent ski trail map artist and he came to the work from both landscape painting and cartographic backgrounds. Shelton had a distinguished career as an innovative map designer with the U.S. Geological Survey and with the Jeppeson Map Company (Patterson and Kelso 2004). Painting ski maps was a bridge for him between his work as a cartographer and his later work as a fine artist painting landscapes (Masia 2005).

Shelton was most active in the 1960s and 1970s. Later in the 1970s and into the 1980s the bulk of the work passed to Bill Brown and then in the 1980s to James Niehues, forming a progression of Colorado based artists (Phillips 2007). Niehues (2008) describes this passing of the baton and notes that the business of ski trail mapping is a niche market that has been dominated by a single artist at most times. Other important artists include Don Moss working out of the northeastern United States in the 1960s and 1970s (Masia, 2005) and Murray Hay working out of Alberta, Canada.

Recent entrants into the business have included Peter Powers and his company Terragraphics, Gary Milliken and this author. These new artists all create ski trail maps with digital tools but not in a single style or creation method. Their variety of styles and creation methods include vector graphics, digital painting and 3d modeling/rendering.



Fig. 5: Hal Shelton painted view of Mammoth Mountain ski resort in California.

The total count by artists with at least two views is as follows. James Niehues tops the list with by far the highest number of trail maps, 112 total maps and 57 out of the top 100. Peter Powers' company Terragraphics counts 25 total, Gary Milliken 8, Don Moss 4, Murray Hay 3, Bill Brown 2, K.M. Mastin 2, Hal Shelton 2, and the author 2. Note that only about one-third of maps had clear attributions, additional research will be needed to identify more artists and obtain a more accurate count.

5.1. Hal Shelton

Hal Shelton's painted view of Mammoth Mountain ski area in the Sierra Nevada Mountains of California is truly a masterpiece (Fig. 5). Its natural coloring, panoramic view, trees textures and depth of field combine to produce a pleasing and easy to read trail map for skiers. A second painting of the mountain in summer appears to also have been painted by Shelton and uses a different view (higher oblique) but is no less effective. Shelton was the first major ski trail map artist and he set the bar very high for all those who have followed.

Of particular note in this view is the effective depth of field. Shelton used a slightly blurred effect for the background ranges, a light haze intensifying toward the horizon and careful placement of the mountain in relation to the background and sky. Though the summit does not break into the sky, it is the focus of the view and gives the impression of a big mountain, always high on the list for any ski resort.

5.2. Bill Brown

Bill Brown's views of Ski Santa Fe in New Mexico and the Arizona Snowbowl (see Fig. 8, below) show a continuation of the classic panoramic trail map style initiated by Hal Shelton. The individually painted trees, the use of haze to bring depth of field and the overall naturalistic look are key elements to this style. Brown's positioning of the subject mountains against the sky without multiple background ranges brings an intimacy to the view and also makes the mountain taller in the mind's eye.

5.3. James Niehues

The distinctive signature of James Niehues appears on more ski trail maps in North America than any other. Indeed, he has painted mountain ski maps around the world, over 120 by his count, and he sits firmly in the classic school of painted panoramas. Niehues credits Hal Shelton and Bill Brown as his mentors but also the panoramic views from Europe, such as those created by Heinrich Berann (Niehues 2008).

Perhaps the most distinctive element of Niehues' work is the rendering of trees. His painstaking painting of each tree, its form, its highlight and its shadow give his work a forested texture unlike most others. The difference between evergreen and deciduous trees in areas such as Vermont is a tribute to the care he takes in preparing each map view. Other distinguishing characteristics are his buildings and cars parked at ski area bases. See Niehues' view of Whistler Blackcomb (Fig. 7).

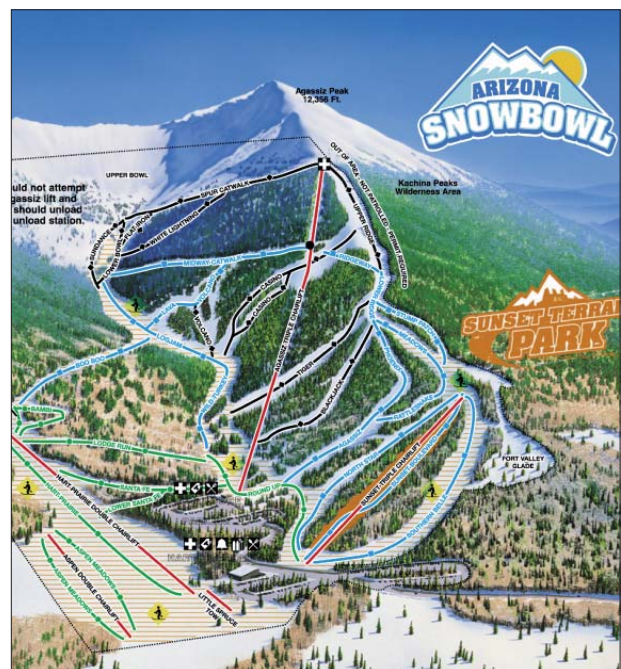


Fig. 6: Bill Brown painted views of Ski Santa Fe, New Mexico and Arizona Snowbowl.



Fig. 7: James Niehues painted view of Whistler Blackcomb in British Columbia.

Niehues does not use computer elevation models for visualizing. He uses topographic maps and reference air photos, often taking the photos himself. He then prepares rough sketches for approval and completes the work with traditional brushes and paints (Phillips 2007). Because of the variety in Niehues work it is hard to describe a single technique for positioning and distortion of terrain and camera for his panoramas. His view of Whistler Blackcomb uses the classic technique of a progressive projection (as described by Jenny 2004) that renders the foreground with a steeper angle than the background.

6. Conclusions and Future Research

This survey of mountain ski trail maps shows that the painted panorama style is preeminent. It shows that several artists have been key in the development of a classic style of North American ski maps and also that new and different techniques by a new set of artists has brought changes around the edges of the old school style. Much work remains to provide a complete picture of the history and stylistic character of ski maps.

One area of research will need to look at the relationship of maps to marketing and how the needs of the resort for advertising the mountain affect the look of the map. Are there times when the marketing needs outweigh the way-finding purpose of the map? Related to this are the influence of the U.S. Forest Service in promoting ski areas and in providing the land on which many areas in the western United States are built (Frye 2007). In addition, one could take a more extensive look at historical trends in ski mapping and gather samples of maps from different periods for individual ski areas.

An analysis of the new techniques being used and developed and how they attempt to mimic or differ from the old styles would be fertile ground for more research as would an analysis of panoramic view construction in the painted maps. One final area for exploration is interactive maps. In the survey of ski trails maps, a note was made during the visit to each resort website of the existence of an interactive web map. For all ski areas 76 out of 428 (or 17.8%) websites had such an interactive map, for the top 100 areas 52 (52%) had them. This may be the future of ski mapping for the next generation of skiers.

References

- Fry, J. (2007): The Story of modern skiing. University Press of New England, Hanover and London, 380 p.
- Jenny, B. (2004): Bringing traditional panorama projections from the painter's canvas to the digital realm. Proceedings of the 4th ICA Mountain Cartography Workshop, Nuria, Spain, 151–157.
- Masia, S. (2005): The trail map artists. *Skiing Heritage*, 17 (4), 14–18.
- Niehues, J. (2008): Personal communication with author.
- Patterson, T. (2000): A view from on high: Heinrich Berann's panoramas and landscape visualization techniques for the US National Park Service. *Cartographic Perspectives*, 36, 38–65.
- Patterson, T. and Kelso, N. (2004): Hal Shelton revisited: Designing and producing natural-color maps with satellite land cover data. *Cartographic Perspectives*, 47, 28–55.
- Phillips, D. (2007): Peak painter. *Colorado Springs Gazette*. 2 November 2007, 31–33.
- Powers, P. (2008): Personal communication with author.

URLs, all accessed January 2008.

- Skireport, <http://www.skireport.com/>
- Skitown, <http://www.skitown.com/>
- Whitewater Ski Resort, <http://www.skiwhitewater.com>