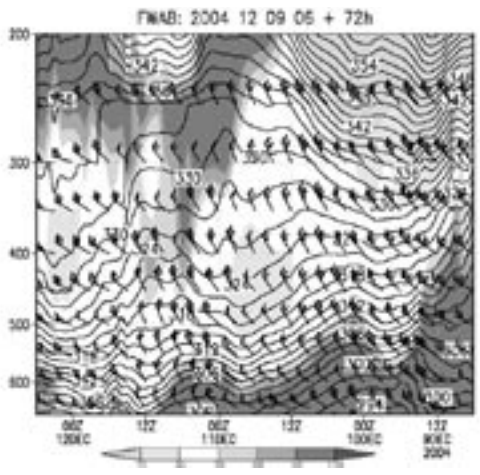

Figure 3. A black and white (actual images are in color) time-height cross-section of forecast potential temperature (contours), relative humidity (shaded image), and wind. Forecast time increases from right to left so that the right side of the plot is the 0-hour forecast and the left side is the 72-hour forecast. The vertical scale of the plot is in pressure (mb) so that the bottom is at ground level and the top is at 200 mb (about 38,500').

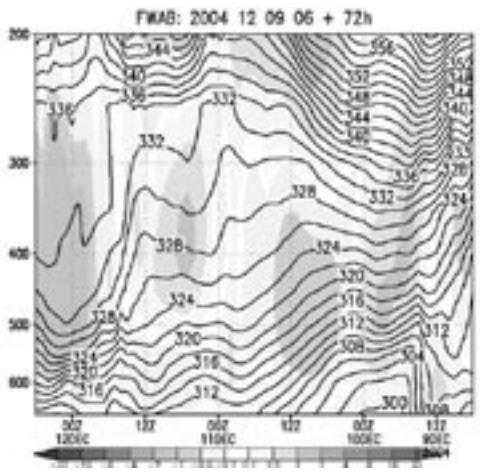

Figure 4. A time-height cross-section of forecast equivalent potential temperature (contours) and vertical motion (shaded image). Positive vertical motion indicates rising air that is typically associated with moist conditions while negative vertical motion suggests sinking air that is typically associated with dry conditions. For more details on how to interpret these cross-section forecasts, see Steenburgh and Greene (2004).

Another set of specialized products are the point forecasts. These are predictions for a specific location and are displayed in text format (Figure 2). Forecasts for the first 48 hours are typically available at 7:00 (morning and evening). These forecasts are continually updated and extend to 72 hours by about 10:00. Users can add locations (by latitude and longitude) to the list of point forecasts generated. Each time a forecast point is added, a forecast is generated during the next model cycle.

Two types of time-height cross sections are also generated at each point-forecast location. These images depict the vertical structure of the atmosphere through time (Figures 3 & 4). Time-height analysis can be used to determine the depth of moisture in the atmosphere as well as vertical wind and stability profiles (see Steenburgh and Greene, 2004).

Summary

Although some of the RMC products available at http://fireweather.info are created for fire weather applications, most of them are useful to any group that is interested in forecasting the weather. In addition to providing weather support to avalanche programs, the RMC is also interested in improving the accuracy of their forecasts. This high-resolution weather information is provided with the hope that observers will compare the point-forecast products to the daily observations they record. With your help, we can build a mutually beneficial relationship and maybe improve weather forecasts in mountainous regions.

References

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John Snook has spent over 20 years working with atmospheric models for the National Oceanic and Atmospheric Administration, the Forest Service and private consulting firms. He has a Ph.D. in Atmospheric Science from Colorado State University. John has also spent many years as a member of the volunteer ski patrol at Arapahoe Basin in Colorado and spends nearly every weekend working in the snow.

Ethan Greene is a Ph.D. candidate in Geosciences at Colorado State University. He has worked as a meteorologist, ski patroller, regional avalanche forecaster and avalanche educator. When Ethan is not digging long troughs in the snow on Rabbit Ears Pass or standing in a walk-in freezer, he likes to ride in the Never Summer range of northern Colorado.

Ned Nikolov has spent most of the past 14 years modeling the exchange of water vapor, energy, and trace gases between terrestrial ecosystems and the atmosphere. He has also done some original work in vegetation remote-sensing developing and implementing physics-based algorithms for retrieval of canopy leaf area index from multispectral satellite images. In 1997, he received a Ph.D. in ecological modeling from Colorado State University. As a member of the RMC team, he has recently specialized in Web design and Web application development. Ned enjoys switching between various research topics and work areas that stimulate different parts of his holographic brain.

Michael Fajardo has spent much of the past six years modeling systems on a molecular scale. In 2004 he received an M.S. in Biochemistry/ Biophyics from Washington State University. His thesis centered on evolutionary studies of reduction potentials in iron-sulfur proteins. After joining the RMC, Michael shifted his research focus from molecular-level protein systems to more macroscopic atmospheric science systems. Additionally, Michael has extensive knowledge of web & graphic design and serves as the primary system administrator for the RMC team.

Karl Zeller is the Rocky Mountain Center's Chief Wizard and has spent about 40 years working in the field of meteorology for the Environmental Protection Agency, the National Oceanic and Atmospheric Administration, The Bureau of Land Management, the Forest Service and for private consulting fir ms. He was a part-time Air Force Reservist Weather Forecaster for 26 years. He has a Ph.D. in Boundary Layer Fluid Mechanics from Colorado State University. Karl is also an American Meteorological Society Certified Consulting Meteorologist. His hobby is undisciplined meteorology. ❄

Manuel (center) passes out the briefcase-sized radio-controlled targets."

Easy Searcher 3 control unit

An Avalanche Rescue Seminar with Manuel Genswein

Story & Photos by John Brennan

A stint in the military is mandatory in Switzerland. When his time came, Manuel Genswein enlisted in the mountain division. Part of his training involved beacon searches. After completing the primary and secondary search, if his first probe attempt wasn't a direct hit, then he was cordially invited to conduct another search. This experience got Manuel thinking about search strategies and associated instructing methods. Manuel has training in electrical engineering and extensive ski mountaineering experience in the Swiss Alps, a background which makes him well suited to understanding beacon technology and beacon use in avalanche rescue. He also has a gift for passing along this information in an easy-to-understand format. Snowmass and Aspen Highlands recently had the opportunity to host an avalanche rescue seminar taught by Manuel. Since he was traveling to the States for several other engagements, it was possible for us to share his travel expenses among the different organizations. Although Manuel was teaching a bargain-priced two-day seminar for the Summit County Rescue Group several hours from our resort, we felt that a separate course for a smaller group of like-minded professionals would best serve our needs.

The course was broken down into three days, the first being a set-up day for the field session as well as an opportunity to "train the trainers" who would be assisting. The second day was in the classroom, and the final day was held in the field. The field day consisted of four unique scenarios, and by having four assistant trainers, Manuel could spend his time where he was most needed.

One of the focuses of the field day was the multiple-beacon training site. Manuel has developed the "Easy Searcher 3" for this purpose. Up to 16 of these radio-controlled units, each the size of a small briefcase, can be run by a control unit. Beacon signals from each buried target can be toggled on either manually or automatically, depending on the search scenarios you want. The targets alert the control unit when they have been struck by a probe. Additionally, a target's transmit signal can be turned off while the strike indicator feature continues to operate—useful for probe-line exercises. The "Easy Searcher" can be permanently installed and toggled for automatic use by rescue groups or the public.

Multiple burial exercises can be difficult at best. Manuel has taught his search strategies for these events in over 14 countries as well as presenting them at the International Snow Science Workshop in 2000 and 2002 and in *The Avalanche Review* (See *Pinpointing in a Circle*, Vol. 19, No. 3, pp. 8-9, and *Statistical Analyses on Multiple Burial Situations and Search Strategies for Multiple Burials*, Vol. 21, No. 3, pp. 9-11 – ED.). While some of our patrollers were scratching their heads a bit over Manuel's strategies during the classroom session, in the field it became crystal clear that these systematic systems were the best way to find an unknown number of buried beacons. The field day also provided a chance to learn Manuel's strategy for pinpointing deeply buried victims—another potential exercise in futility given the number of false maximum readings that can be produced in these events. Once again, when theory and practice united, it became clear that we were learning and honing life-saving skills. His Web site www.genswein.com contains specific information on rescue courses as well as downloadable copies of all his papers.

John Brennan has recently taken on the responsibilities of Rocky Mountain Section Representative for the AAA. In the rest of his life, he is an avalanche and explosives specialist who works at Snowmass, Colorado, and Las Leñas, Argentina. He has published several previous articles in ***The Avalanche Review****. He can be reached at jbrennan@aspensnowmass.com* ❄

Manuel (in sweater) describes the control unit to Snowmass and Highland patrollers.