

SNOWPILOT: ONLINE, UPDATED AND FREE

Doug Chabot^{1*}, Mark Kahrl² and James Earl³

¹ Gallatin National Forest Avalanche Center, Bozeman, Montana

² Kahrl Consulting, Bishop, California

³ Earl Consulting, Livingston, Montana

ABSTRACT: *SnowPilot* (www.snowpilot.org) is open-source, free software that allows users to graph, record and database snowpit information. New for this year is an online version of *SnowPilot*.

KEYWORDS: SnowPilot, snowpit, graphing, database

1. HISTORY

In 2002 Karl Birkeland was researching a new stability test, the Stuffblock, and needed willing participants to try it and record their data. Since Karl sits in the cubicle next to me, I was an easy recruit. All that season I filled a stuff sack with ten pounds of snow and dropped it from ever increasing heights, dutifully recording the results in my yellow Rite-in-the-Rain book along with other pit information. It was a relatively easy task. The real work came at the end of season when Karl sent me a spreadsheet to fill in every detail of the pit and test: score, quality, hardness and grain type of the weak layer and adjacent ones, signs of instability and stability rating. Filling in every column and row of the Excel file opened my eyes to a significant hurdle in advancing snow science amongst practitioners: the valuable data in all our pit books was lost to researchers. Instead of being shared, pencil drawn pits throughout the world were sitting in drawers and on shelves collecting dust, likely never to be looked at again. Scientists ask a question and then collect data to get an answer. What if we collected the data first--all the data in our collective pit books? This would amount to thousands of pits from different snow climates all over the globe populating a database ready for a

question. Out of this idea, *SnowPilot* was born. Software developer Mark Kahrl wrote the program and Conrad Anker found a donor so it could be free for anyone to use.

SnowPilot (www.snowpilot.org) is open-source, free software that allows users to graph, record, share and database snowpit information. Initially developed during the winter of 2003-2004, *SnowPilot* was originally created as a way to enter snowpit data into a handheld Personal Digital Assistant (aka. PDA, Palm Pilot), a precursor to the iPhone, that would be stored and graphically viewed on a PC. As technology changed, *SnowPilot* left the PDA platform and became a standalone program for PC and Mac, while still populating the central database with snowpit data for use by avalanche researchers. Currently the database holds over 7200 snowpits from fifteen countries.

At the 2002 ISSW in Penticton, BC, I sat in the audience and listened to some researchers explain the importance of their study relying on a woefully small number of snowpits. It was not compelling. Contrast this to 2016 when Colorado avalanche forecaster, Ian Hoyer, had a simple question: Are ECTs effective only in a small depth band of 30-70cm as taught in his Level 3? He found his answer in the *SnowPilot* database which revealed 5013 ECTs submitted over nine years by 386, primarily professional, users worldwide. *ISSW 2016 Spoiler Alert:* Ian's analysis of the *SnowPilot* data shows that the ECT is effective over a wide range of weak layer depths. If you have a question, *SnowPilot* may have the answer.

Corresponding author address:

*Doug Chabot, Gallatin National Forest Avalanche Center, 10 E. Babcock St., Bozeman, MT 59715; +1-406-581-1110; dchabot@fs.fed.us; skype: doug.chabot

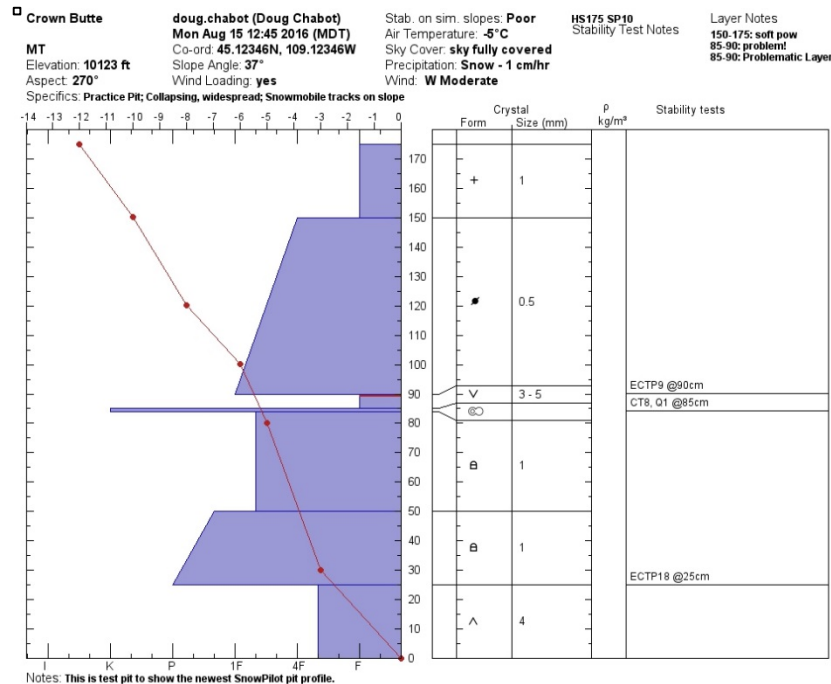


Fig. 1: A SnowPilot graph saved as a .jpg.

2. NEW VERSION: FOR PROFESSIONALS, BY PROFESSIONALS

This winter we are excited to unveil an online version of *SnowPilot* in addition to the software version. It follows the US Snow, Weather and Avalanche Guidelines (SWAG) and the Canadian Observational Guidelines and Recording Standards for Snow (OGRS). After data is entered an image is created that can be downloaded, shared and printed. All data entered is controlled by the user and error-checked to ensure a clean, robust database. As a user you get to decide who can view your snowpits: everyone, just people in your work group or no one. Regardless of your viewing choices, pits automatically populate the database for future research.

2.1 Preferences

Users set their preferences: feet or meters, inches or cm, quality or fracture character, measure zero at the top or the bottom, Degrees C or F, lat/long or UTM, density units and hardness scale, time zone and country/state/mountain range.

2.2 Making the pit

The creation of the pit has all the fields found in SWAG and OGRS. Many fields are drop down menus, plus there is a generous "Notes" box.

The biggest change with the online version is the choice to create layers with a drag and drop feature or by manually entering depths and hardness. The graph populates after adding layers, crystal types and size and stability tests.

2.3 Saving the pit

Once the pit is created and saved as a final version, the data is sent to and stored in the SnowPilot database. Users can search for publicly viewable pits and download their images from the database in various formats including jpg, png and PDF (Fig. 1). An individual's personal SnowPilot data can be exported as SnowPilot.xml, text, and CAAML.

2.4 *Database*

The SnowPilot database is a relational database that resides on our own private and secure server. The data is both protected and routinely backed up. The database can be leveraged by researchers to do advanced and complex queries. Searches are supported via SQL as well as our own search engine and interface. Scripting of various types can also be supported for advanced users.

3. SUMMARY:

SnowPilot does not charge a fee or collect any personal data other than what gets entered, nor do we advertise or sell anything. We respect privacy. In exchange for providing a free platform to enter, view and share snowpit data, *SnowPilot* gets an expanding database that is readily shared with researchers to advance the field of snow science. SnowPilot snowpits have been in presentations at every ISSW since 2004. To ensure *your* pits are helping to expand our knowledge about snow and avalanches, join the data collection effort by checking out www.snowpilot.org.

ACKNOWLEDGEMENTS

We would like to acknowledge Karl Birkeland for his advice and technical support, Conrad Anker for his vision, and our very generous anonymous donor who made this work possible. Additionally, Joseph DeBrucycker lent his coding expertise and Walt Haas shared his knowledge and Drupal snow_profile module.