

INTRODUCING A DIGITAL HANDBOOK FOR SNOW AND AVALANCHE OBSERVATIONS IN NORWAY

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ABSTRACT: The Norwegian Avalanche Warning Service (NAWS) and its portal Varsom are heavily dependent on observations made in the field. To ensure that observations are comparable and maintain the expected standard, work has been undertaken to publish an openly available digital handbook for snow observations. By compiling a reference consisting of existing internal routines as well as evolving international best practices the contribution may help educating new observers, keeping seasoned avalanche technicians up to date and provide a Norwegian language source of information for the public. By publishing the handbook as a website, we hope to simplify the process of keeping the content up to date, as well as enabling the use of multimedia instructions. The publication complements existing publications published in Norwegian by NAWS and others.

Keywords: handbook, field observation, guidelines

1. INTRODUCTION

The group of observers working for NAWS comprises professionals at the service as well as guides or other members of the public volunteering relevant information. The observers organized by the service have over the years established routines for how to conduct field observations in Norway. However, a lot of these best practices have been communicated bit by bit at courses and meetings, making the existing documentation distributed over several documents, fact sheets and powerpoint presentations. Furthermore, the Varsom platform ([Norwegian Water Resources and Energy Directorate \(b\)](#)) and its system for observation ([Norwegian Water Resources and Energy Directorate \(a\)](#)) define the de facto standard for observations related to snow avalanches, landslide, flooding and lake ice danger in Norway.

By compiling a publicly available resource consisting of national best practices, translations of relevant international standards and background information regarding the regional forecasting operation we seek to establish a common reference for organized avalanche observers as well as making it possible for external observers to make observations aligned with the forecasting service's best practices. We call it the *Guide for field observations and assessment of avalanche hazard*.

2. CONTENTS

The handbook is being published in sections as they become ready, but will when completed contain instructions regarding:

- planning and execution of snowpack observations, including systematic snow cover analysis, route choice, as well as routines for snow profiles and instability tests;
- field weather observation;
- avalanche observation and accident reporting;
- avalanche danger assessments;
- regional avalanche forecasting in Norway; and
- additional information about weather, ATES and software used by the forecasting service.

The chapters regarding snowpack observations and field observations are currently in the process of being published, while the other chapters are yet to be finalized. NAWS already publishes a range of information on avalanches available to the wider public on the Varsom platform, as well as a field handbook for observers, [Norwegian Water Resources and Energy Directorate \(2022\)](#). While these resources are important communication tools, the avalanche theory published on Varsom targets an interested but not professional public, and the field handbook is brief out of necessity. In contrast, the new handbook tries to cover its subjects in more detail and answer both the how and why of field observations.

The handbook complements an existing observing guidelines handbook for local forecasting by NGI,

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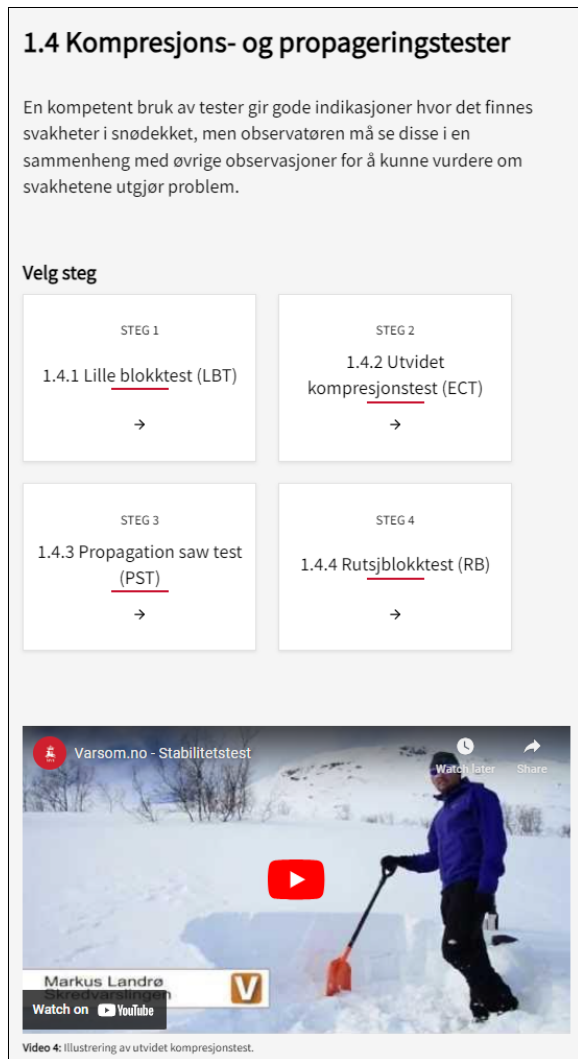


Figure 1: A web page format allows for a non-linear structure, continuous updates and multimedia content.

Kristensen (2007), and has been updated to reflect the latest international standards and practices.

3. FORMAT

To make the handbook accessible in as many settings as possible it is made available as a subpage on the platform <https://veiledere.nve.no/>. This makes it possible to continually update the contents, as we recognize that the subjects covered are ever evolving, making it important to be able to continually update the contents.

In addition, the format allows us to supplement text and diagrams with video (see Figure 1). This makes it easier to describe the snow processes as well as the procedure of snow profiles and tests.

4. TARGET GROUP

The publication is primarily written for those working with field observations for regional avalanche forecasting, but we hope that the information will be useful for other groups as well. In addition, NAWS work with an open data policy, making it possible for anyone to submit observations via the Varsom platform. By making our routines and reasoning public we make it easier for external contributors to make meaningful contributions to the forecasting service.

Parts of the handbook may also be useful for a wider community outside of the realm of regional avalanche forecasting, e.g. the instructions regarding snow profiles, instability tests and fracture line profiles

5. CONCLUSION

This work complements existing information available to the public in Norwegian. Today, general information about avalanches and avalanche bulletins are available on the Varsom platform, and summarized information about snow observation is published in the observer's field handbook. The new digital handbook fills a hole by covering information that does not fit in a field handbook while also being more relevant for observers than bulletin users

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