

An aerial photograph of a vast, snow-covered mountain range. The terrain is rugged with numerous peaks and ridges, all blanketed in white snow. In the distance, more mountain ranges are visible under a clear blue sky. The overall scene is a high-altitude, alpine environment.

Field campaign - SLOVAKIA

Place: Low Tatras mountain – Chopok massif

Time: 15-16 February 2016

- Snow cover measurements on the south and north slopes of Chopok masiff 2023 m a.s.l.
- Excursion to the meteorological station at Chopok
- Internal workshops on snow data use

Programme

February 14 arrival

9-14 snow measurements in selected profiles, south slope of Chopok

February 15

Internal workshop 1

15-19 Hydrological models and the use of snow profile data in hydrological and NWP models

9-14 snow measurements in selected profiles, north slope of Chopok

February 16

15-19 Internal workshop 2

Snow data use in various applications – snow and forest conditions, avalanches, microorganisms...

February 17 Departure

Starting



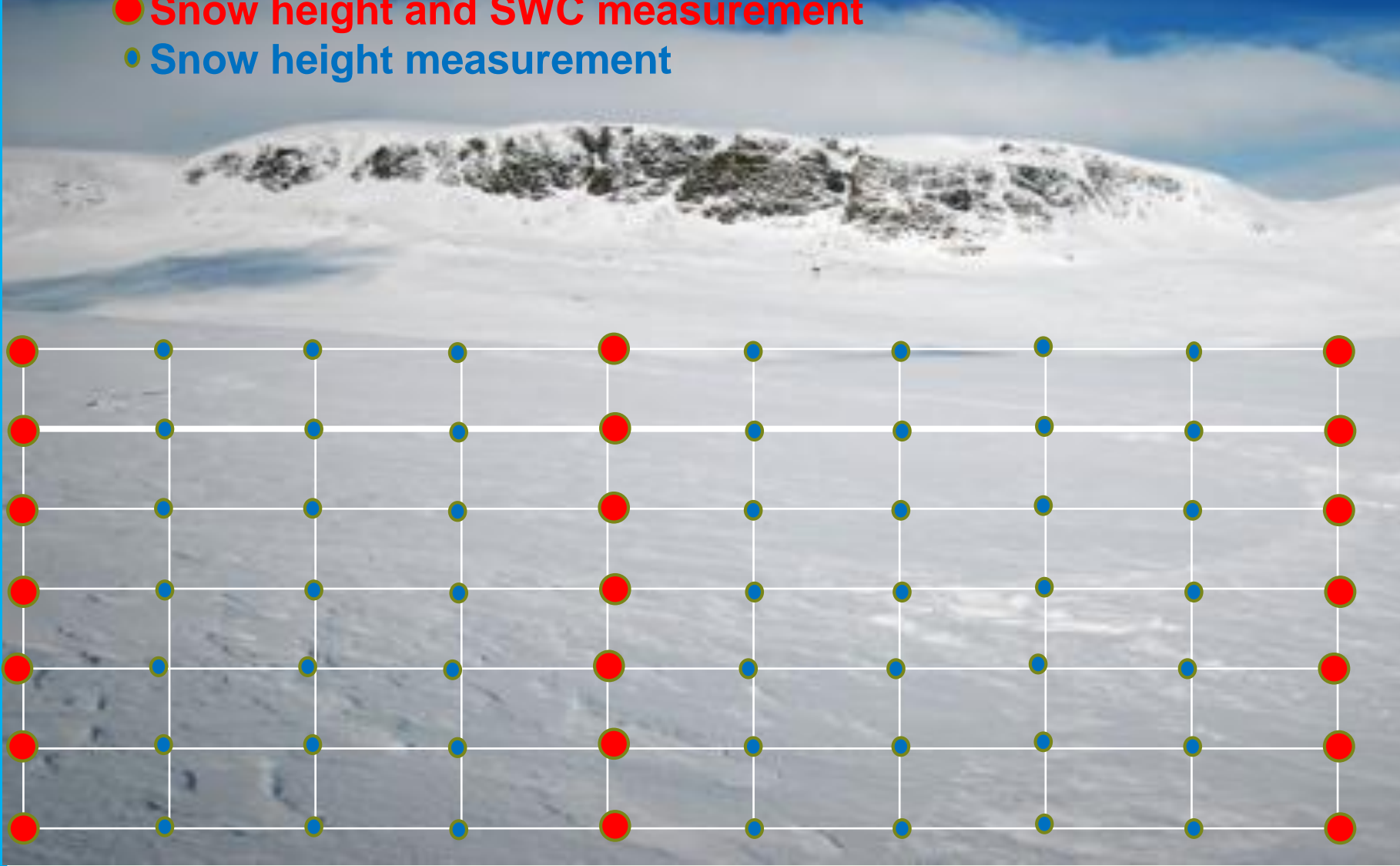
Field snow cover measurements in Slovakia

- done regularly during the winter time, each Monday at selected places (profiles)
- about 35 “profiles” selected in mountain areas in Slovakia
- measurements done by 3 “snow groups” of 6-10 members
- measurement frequency depends on snow cover height
- snow cover measurements at 10 points and snow water content measurements at 3 points in one line
- simple measurements with snow stick and snow tube
- snow cover and water content protocol from each measurement

- further snow data available from about 55 standard precipitation stations
- data used for the calculation of snow water content in the watersheds

Field snow cover measurements in Slovakia

- Snow height and SWC measurement
- Snow height measurement





M E A S U R E M E N T S



Protocol

Snehomerný profil:

Dátum: _____ Hod: _____

Nadm. výška: _____ Expozícia: _____

Teplota: _____ Počasie: _____

Bod	Výška [cm]	Hmotnosť [dg]	Vod. hodn. [mm]	Pomer [mm/cm]
1				
2		Pozn:		
3				
4				
5				
6				
7				
8			Meral:	
9				
10				
∅				

Results

2/15/2016	coordinates		altitude [m a.s.l.]	snow height [cm]	snow water content [mm]	snow density [g.cm-3]
Dead bats cave	48,92527°	19,61184°	1121	45	140	0.311
				49	144	0.294
				42	136	0.324
				55	156	0.284
				49		
				42		
				42		
				46		
				50		
				49		
				49		
				50		
				50		
				48		
				49		
				45		
				42		
				47		
				47	144	0.305
spring Trangoška	48,92446°	19,60566°	1130	33	108	0.327
				43	116	0.270
				48	156	0.325
				43		
				36		
				34		
				35		
				32		

Snow cover data use – water content calculation

Choose a watershed:

Vah river basin



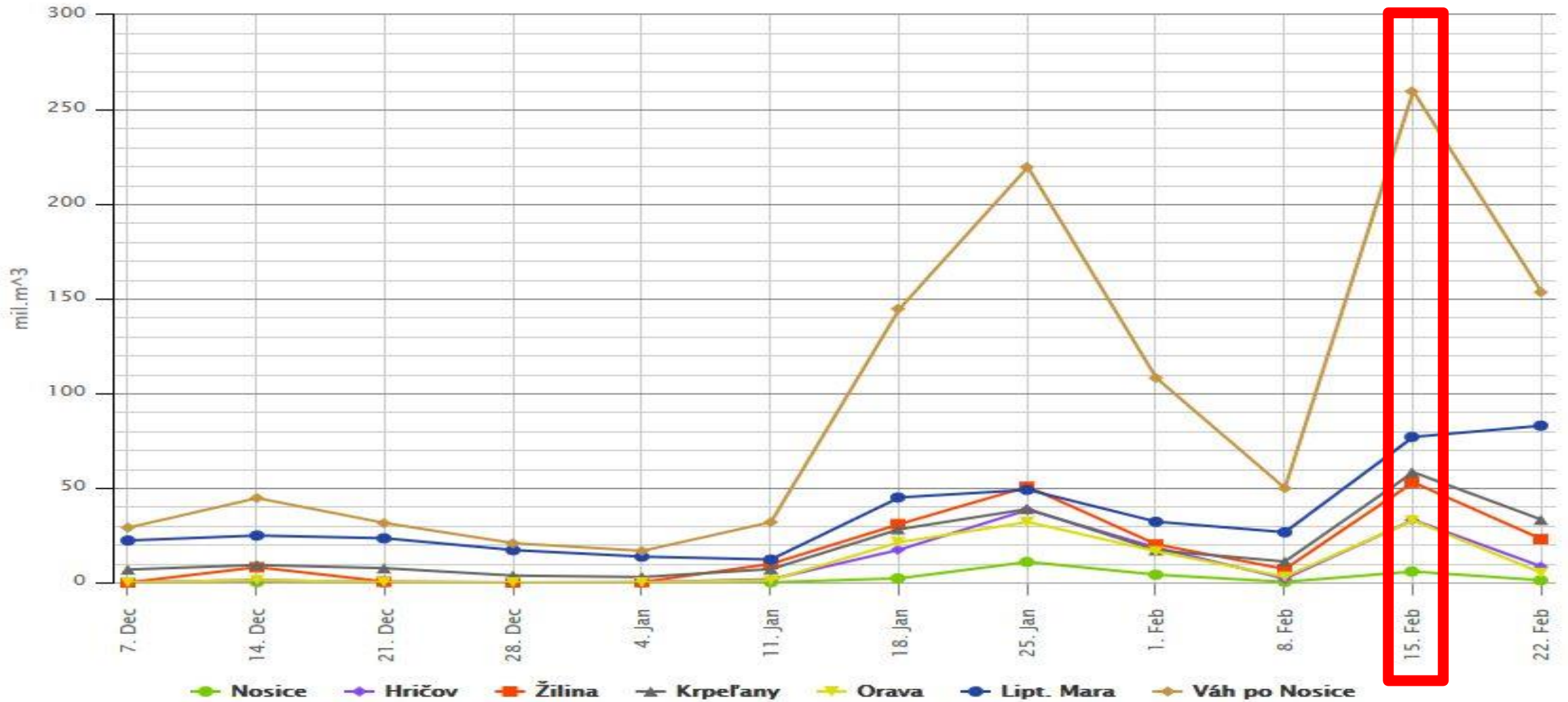
Select

Water content in snow cover [mil. m³] - Vah river basin 2015/2016

Date	Lipt. Mara	Orava	Krpeľany	Žilina	Hričov	Nosice	Váh po Nosice
07.12.2015	22.18	0	6.81	0	0	0	28.99
14.12.2015	24.79	1.16	9.21	8.06	1.26	0.11	44.58
21.12.2015	23.32	0.1	7.5	0.4	0.02	0	31.34
28.12.2015	17.07	0	3.61	0.01	0	0	20.7
04.01.2016	13.64	0	2.85	0.19	0.02	0	16.7
11.01.2016	12.1	1.16	7.06	9.79	1.68	0.07	31.86
18.01.2016	44.91	21.27	28.12	30.8	17.31	2.15	144.56
25.01.2016	48.94	31.93	38.82	50.59	38.38	10.84	219.5
01.02.2016	32.09	16.44	16.99	20.09	18.34	4.09	108.03
08.02.2016	26.53	2.98	11.04	7.05	1.99	0.27	49.86
15.02.2016	76.89	32.77	58.23	52.88	33.02	5.76	259.55
22.02.2016	82.85	5.04	33.12	22.87	8.36	1.13	153.37

Snow cover data use – water content calculation

Water content in snow cover [mil. m³] – Váh river basin – 2015/2016





Heading
to the
top of
Chopok

Peak position



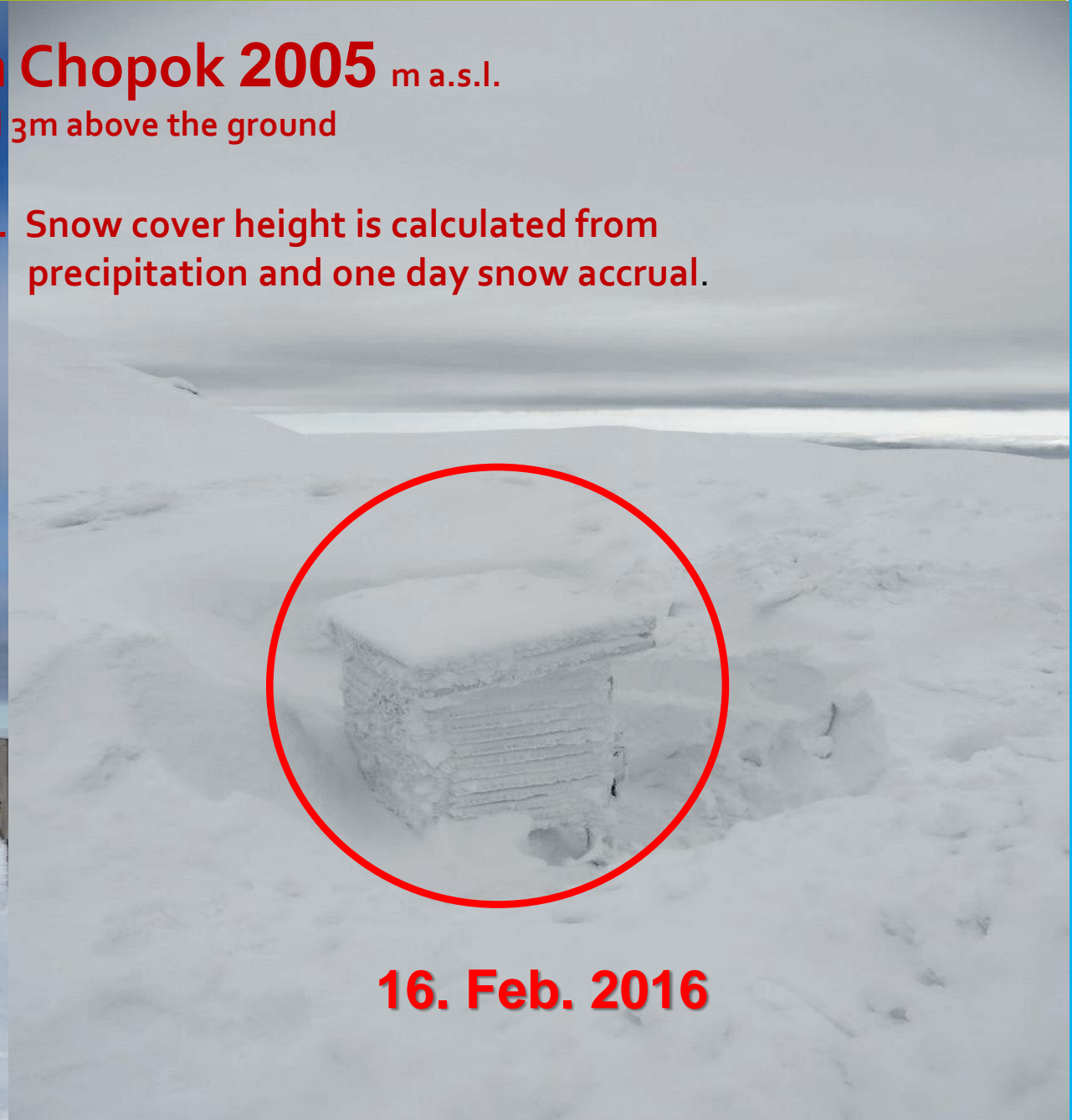
Meteorological station Chopok 2005 m a.s.l.

Meteorological box positioned 3m above the ground

No snow cover measurements due to the peak position. Snow cover height is calculated from precipitation and one day snow accrual.



06. Feb. 2016



16. Feb. 2016

Internal workshops – Presentations

(available at :<http://www.harmosnow.eu/>)

15 Feb	Ali Nadir Arslan	COST ES 1104 HARMOSNOW
	Kateřina Hruřkov	Snow profile measurements and their use in operative hydrology
	Ladislav Holko	Snow hydrology research in Slovakia
	Maria Derkova	Snow links to (numerical) weather forecasting and nowcasting at SHMU
	Branislav Chvila	Snow and snow cover measurements in SHMI network and the use of data
16 Feb	Marek Biskupiĉ	Snow measurement for operational avalanche forecasting in Slovakia
	Martin Bartk	Effect of forest stand damage on the hydrophysical properties of snow cover in mountainous spruce forests Zapadne Tatry Mts.
	Pavla Daggson Walthauseroval	Spectral reflectance measurements of absorbing impurities on snow
	Pavol Nejedlik	Influence of snow cover on the spring phenological phases of European hazel in Central Slovakia
	Anna Seres	AvalMap - a snowpack and avalanche hazard model for Chopok
	Michal Mikloř (TU ZV)	Comparison of physical characteristics of artificial and natural snow cover
Miriam Hanzelov (TU ZV)	Microorganisms of snow cover in high mountains of Slovakia	

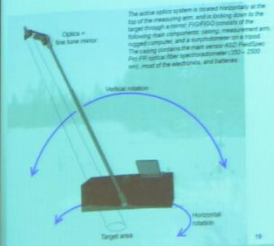


Workshoping



Workshoring

THE FINNISH GEODETIC INSTITUTE FIELD GONIOSPECTROMETER FIGIFIGO



The active sensor system is located horizontally at the top of the measuring arm, and is pointing down to the target through a lens. FIGIFIGO consists of the sensor, the computerized control, measurement arm, support structure, and a sunshade over the sensor. The system includes the main sensor (FIGIFIGO) and the FIGIFIGO (FIGIFIGO) spectrometer (FIGIFIGO) and most of the electronics and software.

- THIS INSTRUMENT USES MULTIANGULAR REFLECTANCE TO MEASURE THE ALBEDO AND POLARIZATION, HEMISPHERICAL DIRECTIONAL REFLECTANCE FACTOR (HDRF), AND OTHER SNOW PROPERTIES



Workshoping



Workshoping

General description of model

- The model creates high resolution (10m) avalanche hazard maps, refreshed twice daily, that are based on:



- Avalanche risk due to weather

- Avalanche risk due to snowpack characteristics



- Avalanche risk of terrain

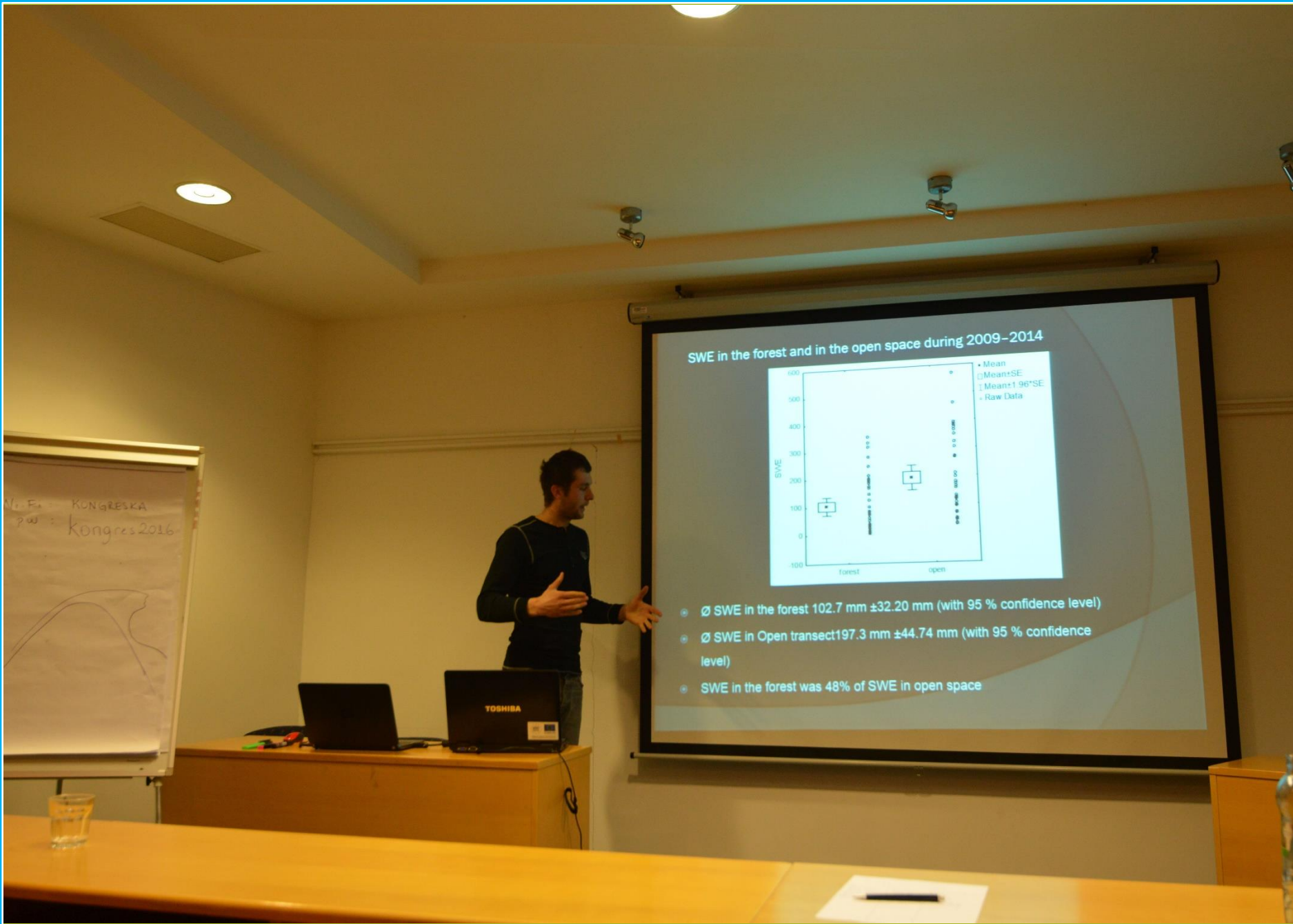


- Avalanche risk from land cover

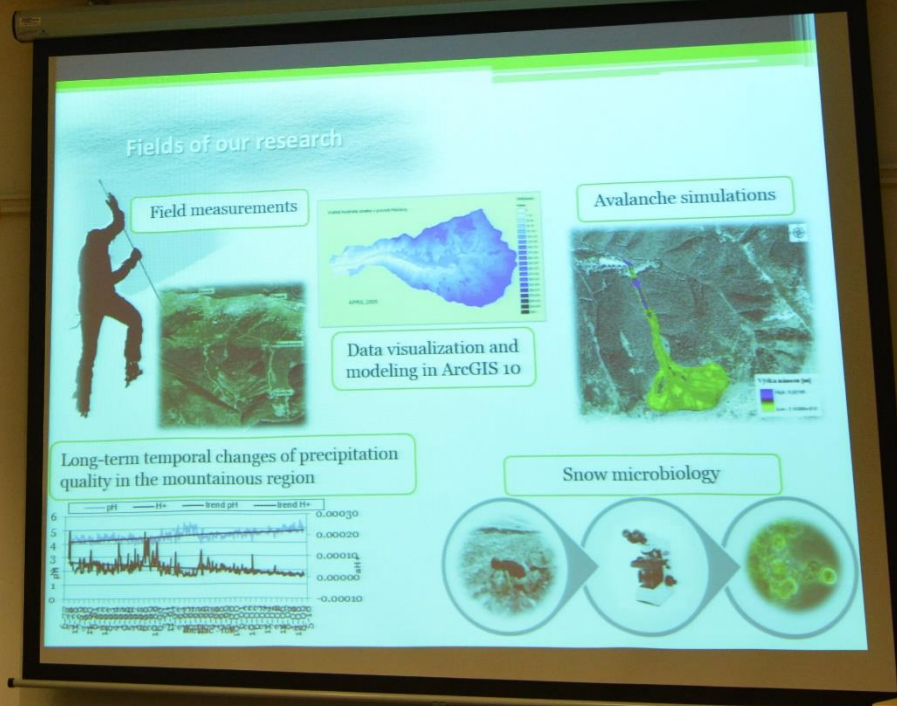


Workshoping

Workshoping



Workshoring



KONGRESKA
Kongres 2016



Results of Slovak campaign

- 2 short shows of methodology of manual measurements used by the Hydromet office
- attending peak station where snow cover measurements are not done but calculated as the position does not represent the surrounding
- 2 internal workshops on snow and snow cover measurements and snow data use
- broadening contacts and involvement in the WGs