CHMI

Standing International Road Weather Commission

SIRWEC 2012

Helsinki, 23 - 25 March

Finland

Miroslav Škuthan

Central Forecasting Office

Czech Hydrometeorological Institute

CHMI

Road Weather Data Presentation in BUFR Format

by

Miroslav Škuthan
skuthan@chmi.cz

Presentation of Road Weather Data

Primarily implemented in

- RWIS on the national level
- Sophisticated systems used in the NMS
- As a part of SW applications of the RWS providers

Basic tool for

- Composing specialized road weather forecasts
- Its verification

VW - Visual Weather Solution

Sophisticated system installed on forecasting centres of the CHMI

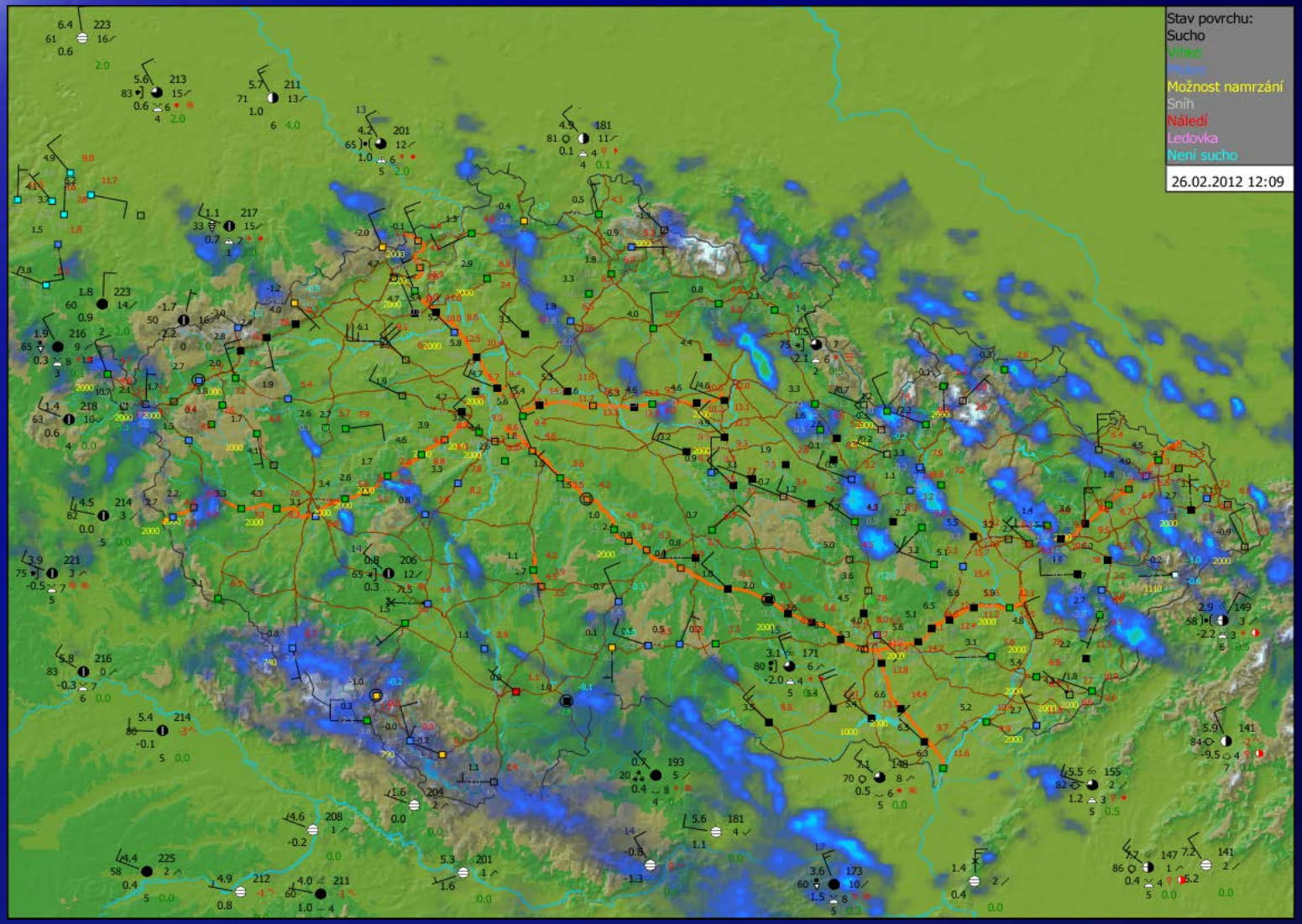
- Central Forecasting Office
- Regional level

VW works on the basis of unique database and is capable decoding various data formats

Installation caused (among others)

- Data implementation of the BUFR (SH70) format
- Substantial improvement of road weather data presentation

Menu VW


Stav povrchu:
Sucho
Vlhko
Mokro
Možnost namrzání
Sníh
Náledí
Ledovka
Není sucho
26.02.2012 12:09

CHMI

Application of BUFR

Binary Universal Form for Representation of meteorological data

Best solution

- Due to universal concept of decoding separate data of various formats in VW
- Moreover supports International exchange of road weather data

The idea of mutual road weather information and data exchange was brought up on the conference in Sapporo – Project Šumava

Unified Road Weather Data Format

SH70 data format

- Modified version of the DWD SH10 Code
- SH70 code derived in co-operation of the specialists from CHMI and DWD
- Code reminds classic meteorological report SYNOP created by group of 5 digits in each section
- Basis for international data exchange between CHMI a DWD

Road BUFR Code

Stimulus - migration WMO to BUFR code

BUFR template

- Replace traditional alphanumerical codes by the table driven code

Advantage

- Code is capable transfer not only data
- Also other useful information about the individual road weather station (position of road sensor, type of road etc.)

Another Possibilities

Process support of RWS standardization

- Placing the temperature / humidity sensor 2 m above surface
- Measuring wind speed and direction 10 m above terrain

It enables to apply acquired data into BUFR as valid information source

The utilization of data in RWIS – sometimes difficult in case the measuring standards vary from regulation

BUFR Development

Road BUFR

- Very flexible
- Open code for next development

In the near future addition of chemical aspects

- Freezing temperature
- Salt concentration

VW Road Data Presentation

The system based on BUFR code

- Create variable outputs
- Results based on unique database

Big advantage

- Parallel utilization of more product from the main menu of VW
- It is possible any product can be viewed in classical windows presentation

Restriction?

There is no need reduce the presentation only to the road weather data

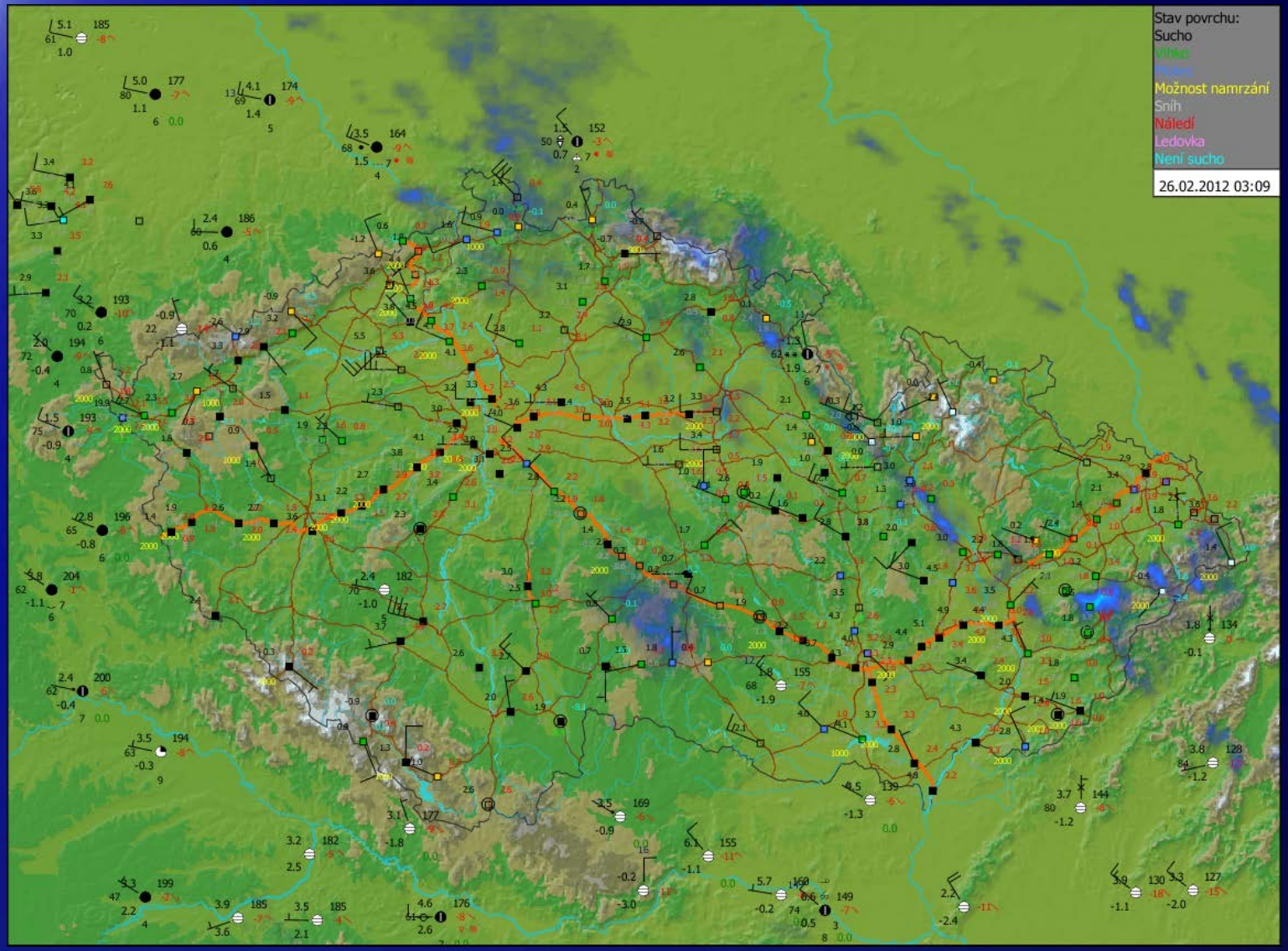
But we can utilize all possibilities of Visual Weather without any restrictions

Important Presentation Tools

Data utilization and map presentation allow

I. Data synthesis included in the VW database
II. Presentation from the meteorological point of view
III. Simple method of data presentation in the international context

Road and Weather Stations



Data Synthesis

Visual Weather

Enables unique data synthesis

- There are about 416 road weather stations on the territory of the Czech Republic
- Outputs of these stations can be supplemented by data from professional weather station
- Also other sources can be decoded by product

RWS Presentation

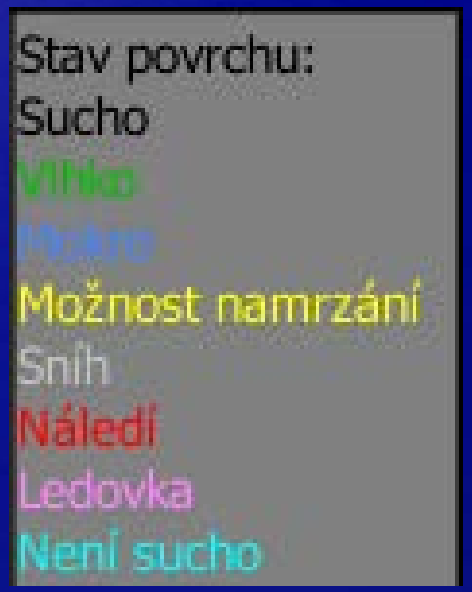
RWS data

- Main part of VW presentation concerning road meteorology
- Data are interpreted on the base map of the Czech Republic

RWS

- Presented by classical meteorological symbols convenient for the forecasters
- Use a square in contrary to classical weather stations presented by circle

Surface Status



The filling of the square indicates the surface status on the site of the road weather station

Tooltip

0 mm/hr (Rainrate) *[Radar]*	
D5 Svojkovice 70.3 k	
49°44'N 13°28'E	
330 m	
Sensors: 1 betw.tracks 2 betw.tracks	
Bridge/Fast Lane: FL1 FL2	
Road Surface Temperature 1	**13.8 °C**
Road Surface Temperature 2	**14.1 °C**
Road Temperature Diff 1	**6.9 °C**
Road Temperature Diff 2	**7.2 °C**
Sub-Surface Temperatures 1	**3.4 °C**
Depth below surface 1	**0.3 m**
Sub-Surface Temperatures 2	**N/A**
Depth below surface 2	**N/A**
Road Surface Condition 1	**Dry**
Temperature	**9.7 °C**
Dewpoint Temperature	**6.9 °C**
Temperature Sensor Height	**N/A**
Wind direction	**225 °**
Wind speed	**4.2 m/s**
Wind Sensor Height	**N/A**
Relative Humidity	**82 %**
Horizontal Visibility	**2000 m**
[Silnicni data]	

Positioning of the mouse on individual station is possible display tooltip

Other Information

- The measured values are presented around the station square

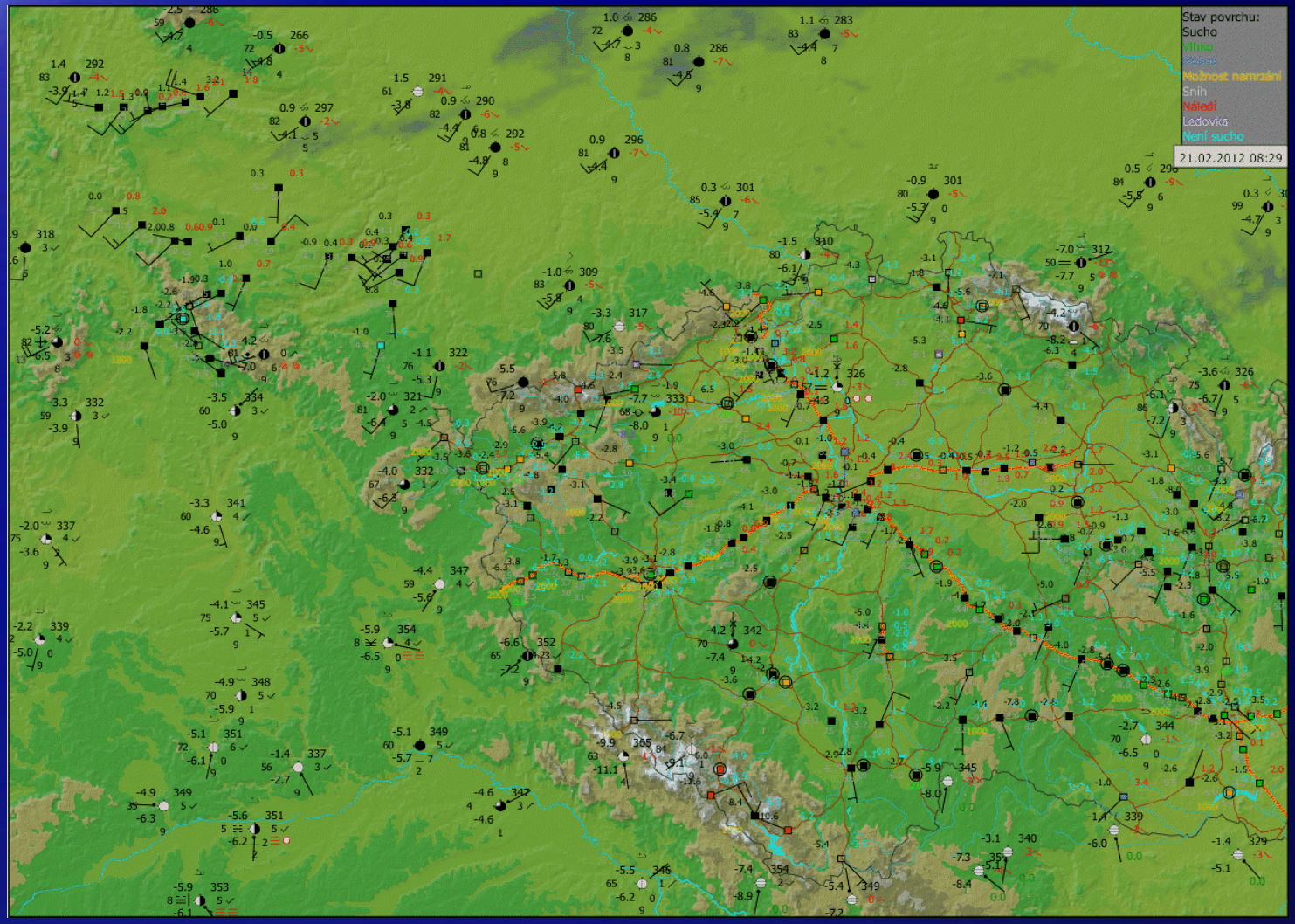
- The data visualization can be switched on or off on demand of the forecaster

International Exchange

International exchange of the road weather data

- For the first time take place as a part of the project „Šumava“
- Exchange among the Czech Republic and Germany
- At this moment the exchange uses the SH70 format

Results of the International Data Exchange



CHMI

Future of Data Exchange

- SH70 format will be probably replaced by BUFR within the year 2012
- Visual Weather would be capable to interpret data from cross-border region of both countries
- Besides the data can be implemented into international traffic telematics systems

Other Features

- The system is able to interpret also calculated values, e.g. difference of Ts-Td
- The value are marked in corresponding colours presenting danger of rime located below the station circle
- Another feature is possibility of application of various overlays on the map
  - Orography
  - Radar
  - Satellite images

Next Step

Model implementation for forecast of the road surface state on the territory of the Czech Republic

- Model is developed in co-operation between IAP and CHMI
- With respect of adjusting to conditions of the Czech Republic
- Significant emphasis will be on the input data verification
- Results will be presented as the next layer of VW system

Conclusions

- The above mentioned presentation of road weather data in BUFR format by the sophisticated Visual Weather system is currently in regular use on the forecasting centres of the CHMI
- It is one of the basic tools of the software support for the forecasters who provide special forecasts

Last But not Least

Is necessary to believe that the idea of international road weather data and information exchange will be continue and step by step will create universal platform for data presentation independently on the region of the origin

CHMI