The CHMI Nowcasting Webportal
Presentation of Nowcasting-related Information to General Public in the Czech Republic

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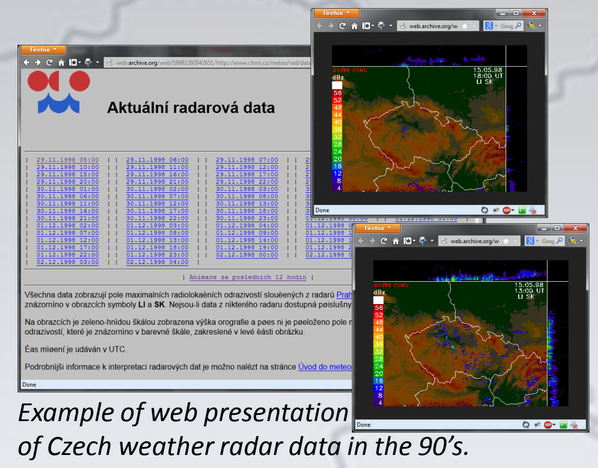
Motivation

For successful nowcasting of meteorological phenomena, it is important to have access to precise high-resolution measurements and to run sophisticated nowcasting systems, but also to present obtained analyses and forecasts to the end-user with minimal time delay and with possibility of detailed geographical and temporal localization of hazardous meteorological events.

History

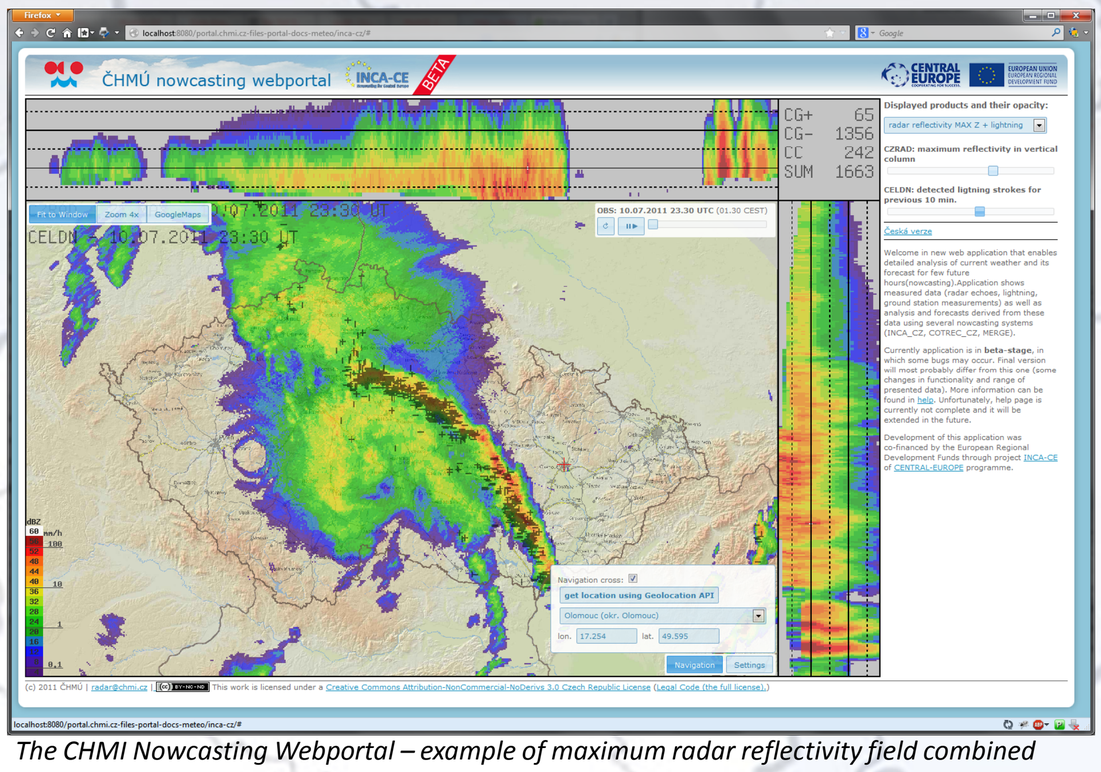
- ✓ 1996 – start of presentation of remote sensing data (radar, satellite) on the Czech Hydrometeorological Institute (CHMI) public webserver in form of static images, later also animated GIF files; lightning detection data since 1999.
- ✓ Weather radar (and also lightning) data became shortly very popular for precipitation and convective storms nowcasting among public despite of low resolution (2x2km horiz. resolution, update every 1h).
- ✓ 2003 – webpages updates - weather radar (lightning) data still only 2x2km horiz. resolution and update every 1h, but significantly updated user interface (Javascript-based, user controllable animations, possibility to place navigation cross to the user selectable location); 2005 – weather radar data every 30 minute.
- ✓ 2010 – new web presentations on new CHMI public webserver – new Javascript-based web-application for weather radar data presentation (radar data 1x1km hor. res., updated every 15 min.).



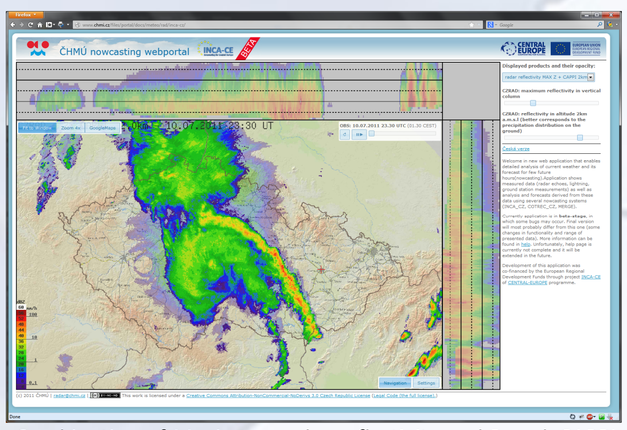
Example of web presentation of Czech weather radar data in the 90's.

The CHMI Nowcasting Webportal

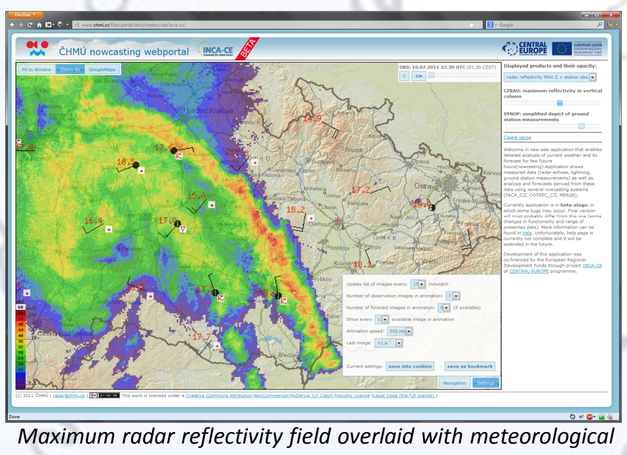
- ✓ New web-based tool for presentation of nowcasting related data to the public.
- ✓ It is based on experiences with previous development of the JSMeteoView, web-based visualization tool of remote sensing data used operationally by the CHMI forecast offices (Novak, 2007).
- ✓ Participation of the CHMI in the INCA-CE project accelerated its development.
- ✓ All meteorological data and high resolution (250mx250m) pre-generated geographical underlays (orography, borders, roads, rivers, cities) are prepared in Mercator projection to be compatible with Google Maps that can be used as additional underlays (support for OpenLayers/OpenStreetMaps was also developed but not used currently in public beta version).



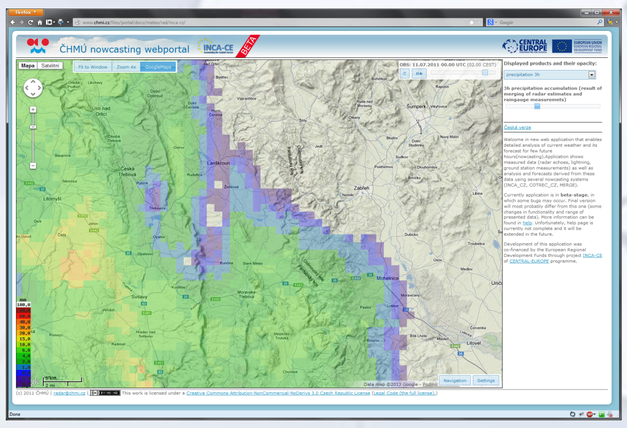
The CHMI Nowcasting Webportal – example of maximum radar reflectivity field combined with lightning strokes from CELDN detection network. Navigation dialog.



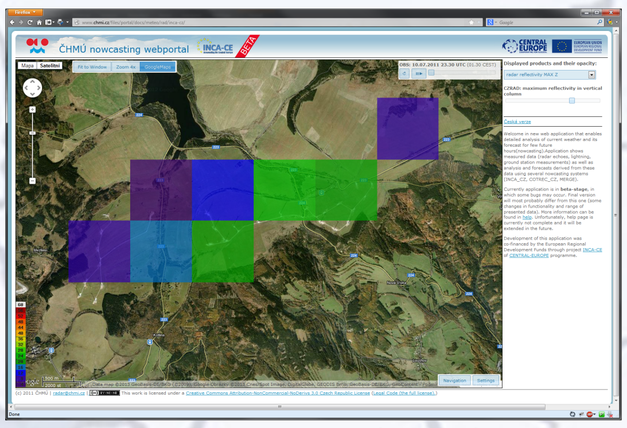
Combination of Maximum radar reflectivity and PseudoCAPPI 2km fields gives better information about 3D structure of clouds and precipitation on the ground.



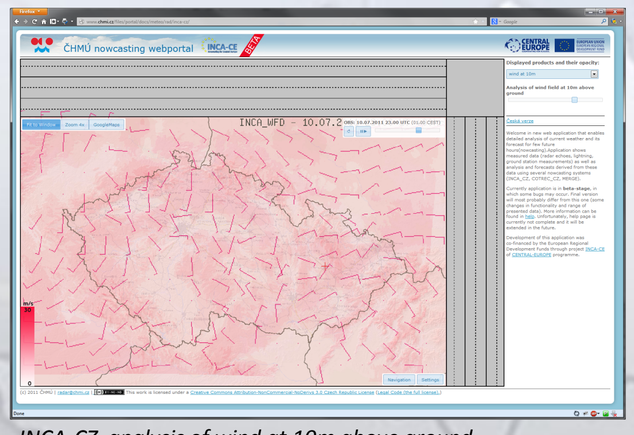
Maximum radar reflectivity field overlaid with meteorological station data (temperature, wind, cloudiness, significant weather). 250m resolution underlays. Settings dialog.



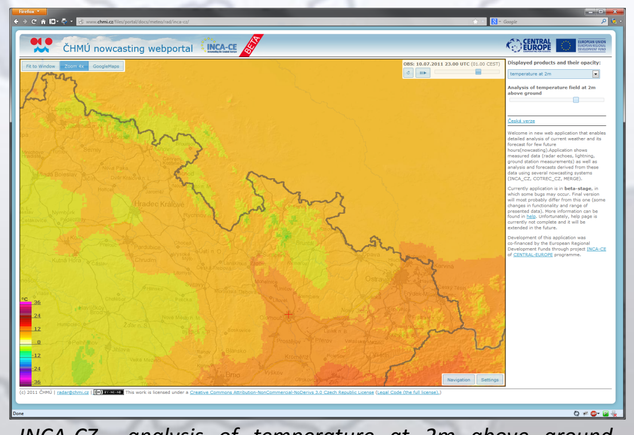
3h precipitation accumulation (result of merging of radar estimates and raingauge measurements) displayed above Google Maps.



Highly zoomed maximum radar reflectivity field displayed above detailed Google Maps enables to improve data quality analysis (residual ground clutters caused by a wind farm).



INCA-CZ analysis of wind at 10m above ground.



INCA-CZ analysis of temperature at 2m above ground. Zoomed into 250m resolution pre-generated underlays.

http://www.chmi.cz/files/portal/docs/meteo/rad/inca-cz/

- ✓ Meteorological data included: maximum and PseudoCAPPI 2km radar reflectivity and COTREC extrapolation of these fields (Novak, 2007), lightning strokes from CELDN detection network (Novak and Kyznarova, 2011), meteorological station data (temperature, wind, cloudiness, significant weather), 1h, 3h and 6h precipitation analysis (result of merging of radar estimates and raingauge measurements), temperature and wind analysis from INCA-CZ system (Kyznarova et al., 2012).
- ✓ Data horiz. resolution 1x1km, updated every 10min/1h(temp., wind).
- ✓ It enables animation of images from chosen time series of data fields (also animations of analysis together with forecasts if they are available). Images can be also changed interactively by the user.
- ✓ It enables combination of different data sources into one display.
- ✓ It enables putting navigation cross into user defined location (chosen from predefined location list or defined by latitude and longitude).
- ✓ Works in all major desktop web browsers and in smartphones.
- ✓ Future plans: Integration of more products (more INCA fields, precipitation forecasts, CELLTRACK (Kyznarova and Novak, 2009), MSG satellite data), more layers combinations (e.g. temperature analysis and meteorological station data), more optimization for smart mobile phones, help section.

References

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INCA-CE Nowcasting for Central Europe

CENTRAL EUROPE COOPERATING FOR SUCCESS.

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