

WIGOS Data Quality Monitoring System (WDQMS)

How to use the WDQMS web tool

<https://wdqms.wmo.int/>



WMO OMM

World Meteorological Organization

Organisation météorologique mondiale

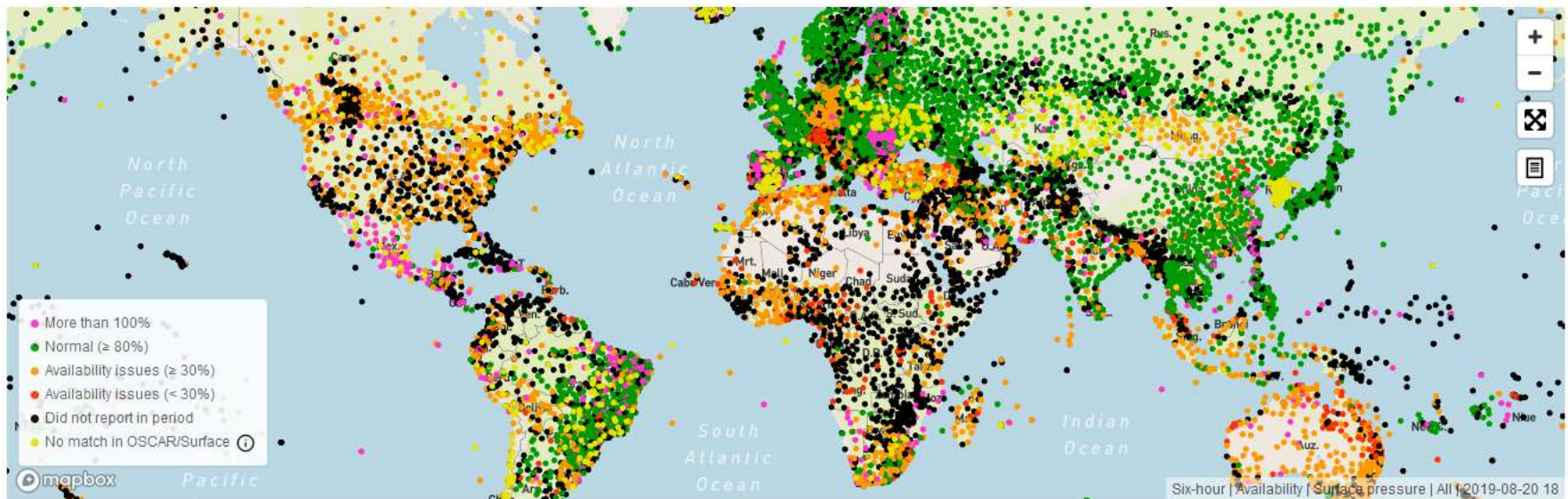


Outline

- I. Introduction to the WDAQMS Webtool
- II. Selections/options:
 - Performance categories
 - Date/time and type of period
 - Variables
 - Monitoring Centres
 - Toogle features
 - Detailed performance views

Interface controls for the WDAQMS Webtool:

- Type of period: Six-hour
- Performance report: Availability
- Variable: Surface pressure
- Center: All
- Date: 2019-08-20
- Six-hour period: 00, 06, 12, 18 (12 is selected)



Inputs to the WDQMS web tool

- Four WIGOS Monitoring Centres (MC)/ Global NWP Centres (ECMWF, NCEP, JMA, DWD) are providing quality monitoring reports in near-real time (every six hours);
- Simple ASCII files in commonly agreed format contain the following information for each individual observing station:
 - Observation received within operational data cut-off (yes/no)
 - Observation used in assimilation (yes/no)
 - If not used, why not (flag)
 - Observation minus background residual (value)
- Quality monitoring reports for different variables (surface pressure, 2m temperature, wind and 2m relative humidity)

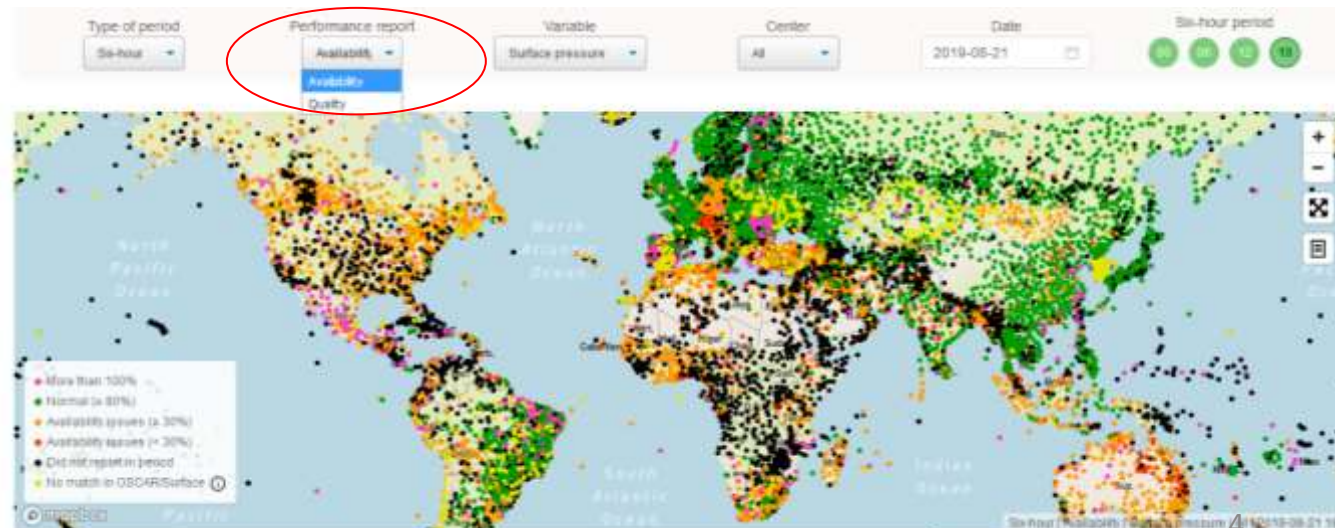


Categories monitored in the WDQMS tool

The WDQMS web tool offers two different selections of quality monitoring categories under **‘Performance’**

- **‘Availability’** - comparing the observations received via the WIS to those expected according to the schedule of international exchange declared in OSCAR/Surface metadata.
- **‘Accuracy’** - Average of Observation against Background (O-B) values over the selected period (e.g. 6-hourly or daily)

→ station
display only
if O-B values
available
(no display
of “no data”
– no black dots)



Date and type of period

The WDAQMS web tool offers the selection of a particular **date** and three different **types of periods**

1. 6 hour period (display of the quality monitoring outputs)
→ available for 'Availability' and 'Accuracy'
2. Daily aggregations of the quality monitoring reports
→ available for 'Availability' and 'Accuracy'
3. Alerts 5-day average across the WIGOS Monitoring Centres
→ available for 'Accuracy' only at the moment



Type of period – DAILY versus ALERT

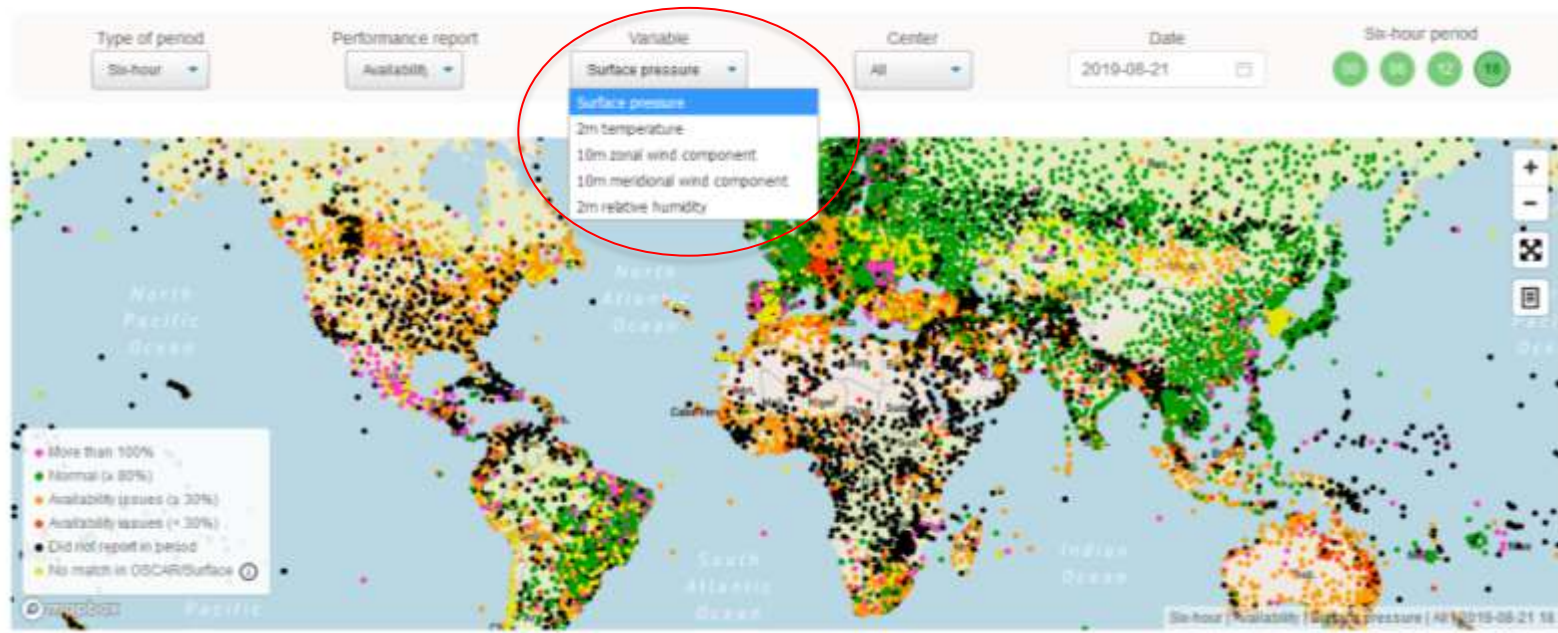
- The alert map is based on the **best 5-day average across the NWP Centres** (which is based on the latest 5 daily mean values when available).
- This measure is mainly used to take into account the persistence of an existing daily issue.
- Cases in which an issue deteriorates may be reflected in the daily map quicker than in the alert map.
- However, model performance under certain conditions might be the reason for sudden outliers that wouldn't last more than a couple of days (such as in the case of a bad short-range forecast)
- Hence, it is better to have the **alert with 5-day average** because the influence of different model performance will probably not be seen in the 5-day average and will not trigger a false issues.

Category 'Timeliness'

- Timeliness consists of the delay between the **standard observation time** of a particular observation message issued by the station of a Member and **reception time at users' database** of this message received via the WIS.
- The nominal observation time of a SYNOP message is typically HH+00. Hence, the timeliness of a SYNOP message is calculated by computing the delay between the reception time of the observations database time stamp of each WIGOS MC and HH+00;
- At this stage none of the WIGOS MCs can deliver information about timeliness. **Therefore, there won't be any operationally aggregated values in the current version of the web tool.**
- RWC will have to use other systems instead to monitor this category (e.g. GISC portals, or others)

Variables monitored in the WDQMS web tool

- The WDQMS web tool offers the selection of a **particular variable** for evaluation (*e.g. surface pressure, 2m temperature, 10m zonal wind component, 10m meridional wind component, 2m relative humidity*)
- To be noted: most of the messages received from GOS stations (both surface and upper-air) contain several variables → in most cases if one variable is missing, all other variables will be missing, too, for a particular station (category: availability)

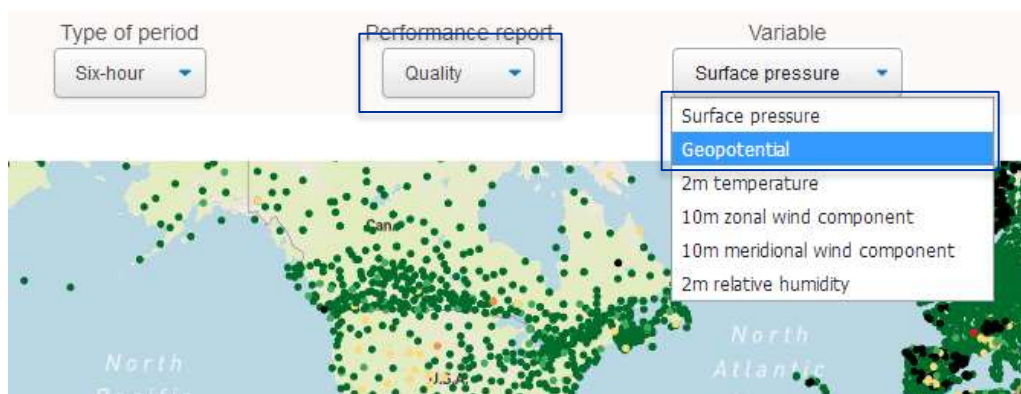
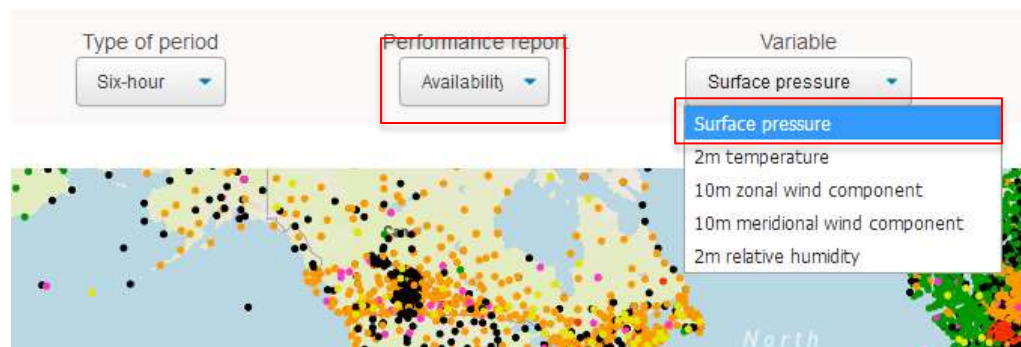


Variable ‘Surface pressure’ and ‘Geopotential’

- The WDQMS web tool offers the selection of the variable **‘Surface pressure’** and **‘Geopotential’**
- To distinguish between land stations in mountainous areas (high elevation stations which report geopotential instead of surface pressure) and the rest of the land surface stations
- WIGOS Monitoring Centres assess surface pressure, while in the case of stations in mountainous areas they assess geopotential height (not all).

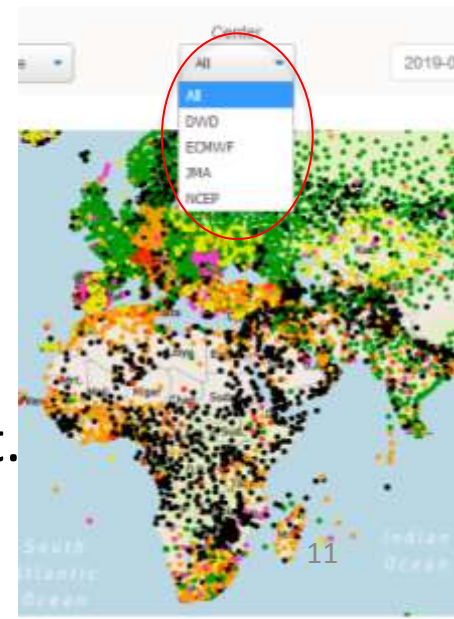
Variable 'Surface pressure' and 'Geopotential'

- In the '**Availability**' map these two variables are combined to '**Surface pressure**'
- In the '**Accuracy**' map these **two variables are displayed** to be able to evaluate the results for surface pressure and geopotential height separately.



Different WIGOS MC results

- The WDQMS web tool allows selecting results of a **particular WIGOS Monitoring Centre** or the aggregation of all centres.
- If 'All' is selected the results of all WIGOS MCs are combined into **one figure** concerning 'Availability' and one figure for 'Accuracy'.
- The WIGOS MC results might differ due to various reasons
See [Potential differences in results of WIGOS Monitoring Centres](#) for more details
- Hence, the combined selection of daily performance of the quality monitoring category **availability** will show **the best of all Centres**, respectively the **maximum availability result**.
- For **accuracy** the NWP model **whose background field is closest to the observed value** will be selected as it exhibits the best performance result.



Zoom, full-screen and legend toggles



The WDQMS web tool offers several ways of zooming into the maps to view the performance of a particular region or country:

- Either by using the mouse scroll-wheel or
- by using the zoom buttons on the right hand side of the maps



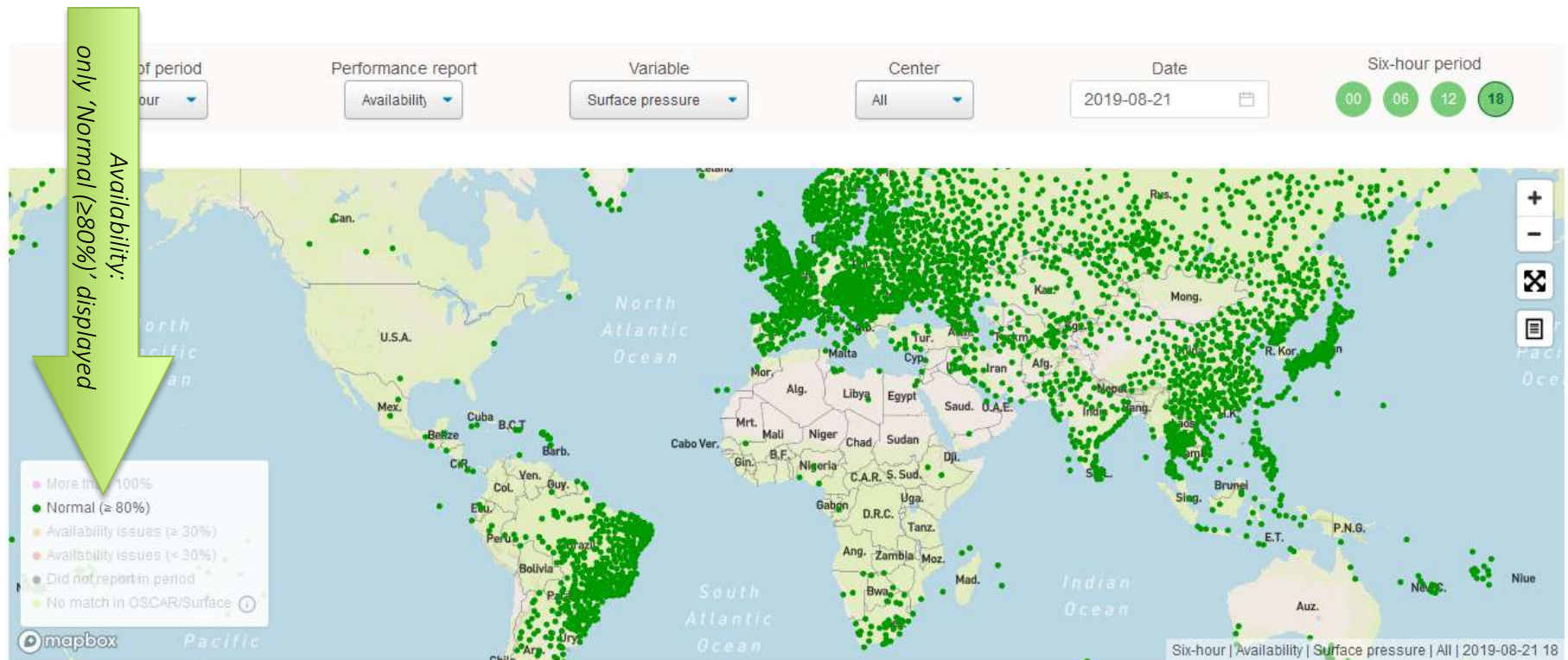
The map can be displayed in full-screen mode by using the toggle button



The legend can be displayed or hidden by using the toggle

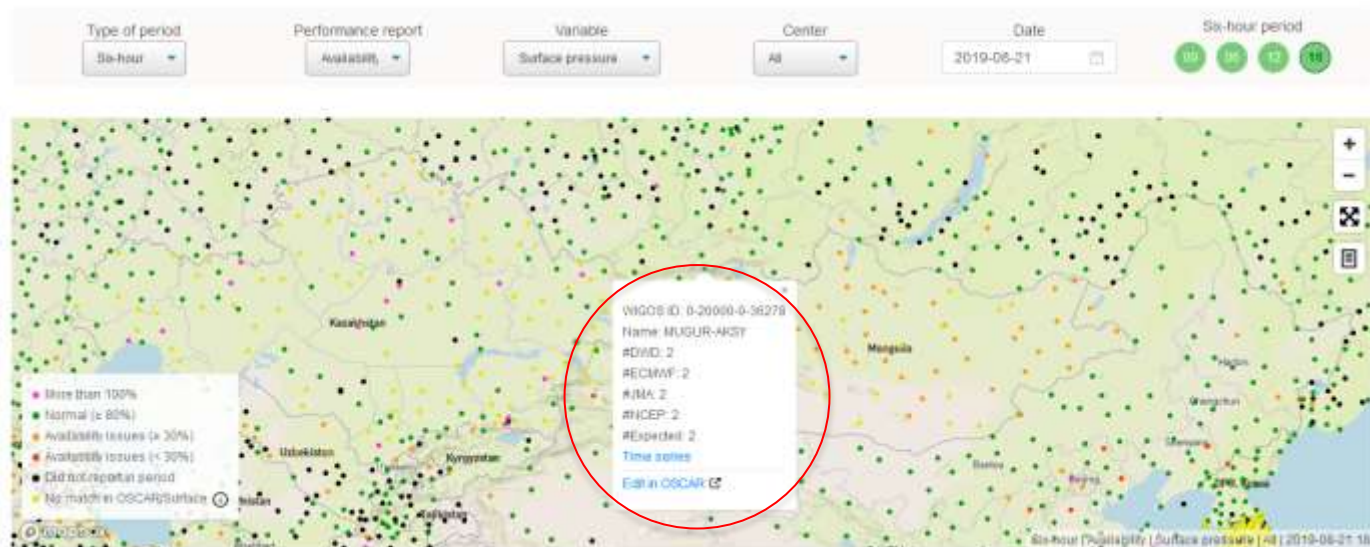
Display of certain performance levels

- ❗ By clicking onto each performance level (colored dots) in the legend each of these can be switched off and hidden from the display map



Detailed performance of a particular station for 'Availability'

- By clicking on a particular dot on the map the WDAQMS web tool displays more details about the availability performance of the corresponding station
- A popup window displays:
 - the WIGOS Station Identifier (WSI) and station name
 - the number of received messages of a selected WIGOS MC or each WIGOS MCs (if 'All' selected under 'Center') as well as the number of expected messages according to the schedule declared in OSCAR/Surface

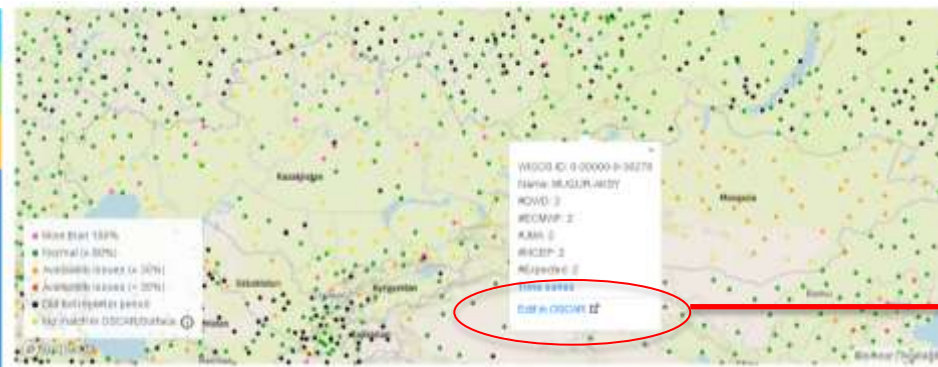


Detailed performance of a particular station for 'Availability' (cont.)

- The popup window contains a link to the stations' time series of data availability displaying the number of messages received and expected of the previous periods (6h/daily steps) for each WIGOS MC

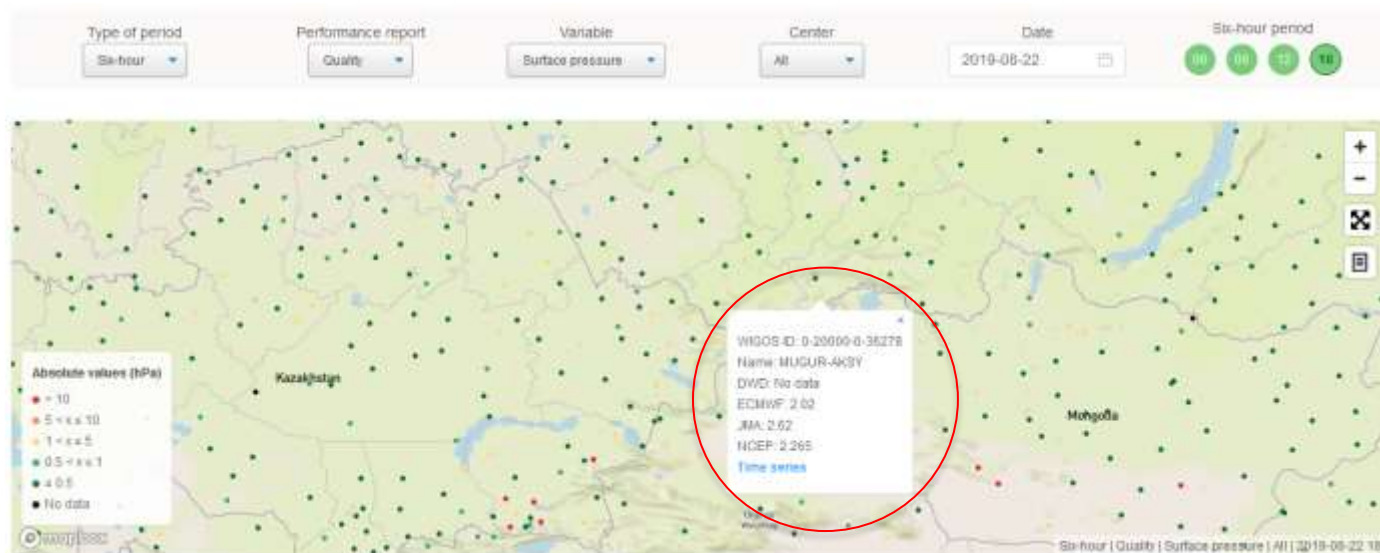


- It also contains a link to the corresponding metadata page of the station in OSCAR/Surface



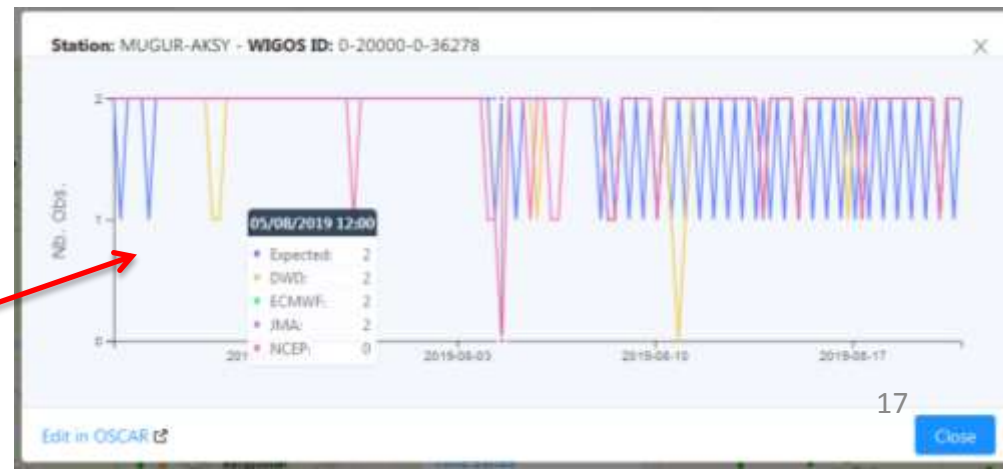
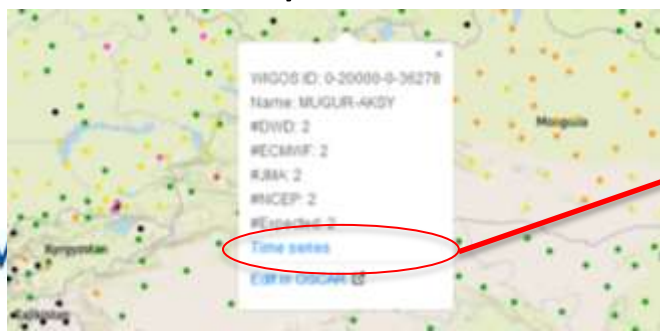
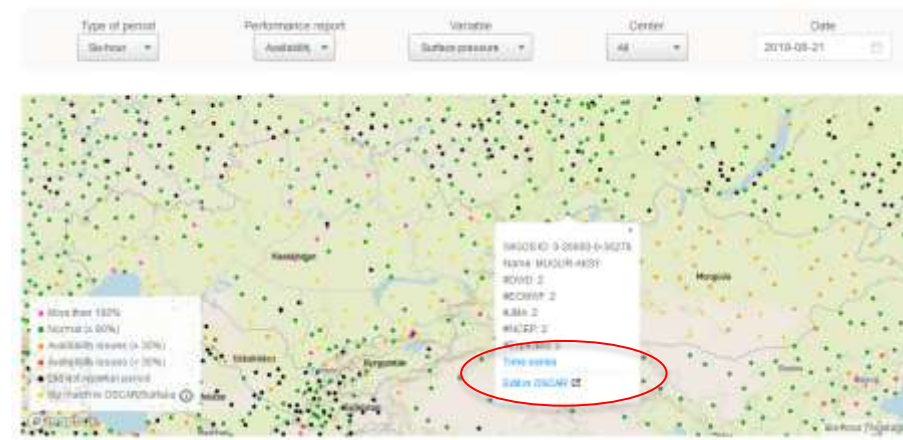
Detailed performance of a particular station for 'Accuracy'

- By clicking on a particular station the WDQMS web tool displays more details about the accuracy performance of a station
- A popup window displays:
 - the WIGOS Station Identifier (WSI) and station name
 - the O-B values of a selected WIGOS MC or each WIGOS MCs (if 'All' selected under 'Center') of the selected variable (e.g. surface pressure)



Detailed performance of a particular station for 'Accuracy' (cont.)

- The popup window contains a link to the corresponding metadata page of the station in OSCAR/Surface
- It also contains a link to the stations' time series displaying the O-B results of the previous periods (6h/daily steps) for each WIGOS MC (WIGOS MCs with the same results will overlap, the cursor popup information will show all results of each WIGOS MC)



Thank you

Tanja.Kleinert@dwd.de
www.wmo.int/wigos



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