

**Supply of project management, air quality  
information management, behavior change  
and communication services.**

**Contract No: RFP / MFK /2019/ QCBS / No. 006**

## **Air Quality Portal Kosovo User Guide**

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# 1. Introduction

## a. General information

Air Quality Portal Kosovo <https://airqualitykosova.rks-gov.net/> is a service for the public providing air quality information from the monitoring stations and from 3-day forecast: today, tomorrow and next day. Information is visualized on maps and included in reports.

Data from monitoring stations contains validated data for six pollutants: PM10, PM2.5, NO<sub>2</sub> (nitrogen dioxide), O<sub>3</sub> (ozone), SO<sub>2</sub> (sulphur dioxide) and CO (carbon monoxide).

Forecast is prepared for four major pollutants (NO<sub>2</sub>, PM10, PM2.5 and O<sub>3</sub>) using modeling forecast system. Results are based on the European Air Quality Index (AQI) methodology, with pollution bands from Good through to Extremely Poor. The Portal provides maps of NO<sub>2</sub>, PM10, PM2.5 and O<sub>3</sub> concentrations and Air Quality Index level map, which is the highest of the AQI levels separately for four pollutants at every location. The default map view covers all Kosovo municipalities, but the user can zoom in to view the air pollution forecast for an individual location. Separate map with much higher resolution is prepared for Prishtina. The background maps are based on the free OpenStreetMap.

Air quality forecast for Kosovo is calculated every day for the next 3 days. Finally forecast includes forecast data for current day and two next days. Every hour assimilation of measurement data in modelling process is carried out to increase accuracy of the forecast. For NO<sub>2</sub> and ozone 1 hour concentrations are displayed on the maps. For PM10 and PM2.5, based on one-hour concentrations, running 24-hour average values are calculated. The forecast of air pollutants, in addition to the meteorology forecast, is also based on the emission load forecast.

## b. What is air pollution?

Clean air is a mixture of nitrogen (78%), oxygen (21%), carbon dioxide (CO<sub>2</sub>), argon, water vapor and other inert gases. Air pollution refers to release of substances in the atmosphere that are harmful to humans, living organisms or plants, and cause damage to climate, materials and buildings. Air pollution consists of chemicals or particles: gases, solid particles, or liquid droplets. Primary air pollution is emitted from domestic or municipal heating systems, factories, cars, large combustion sources like power plants, agriculture or natural sources like volcanoes. Air pollution is most common in large cities where emissions from many different sources are cumulated.

Air pollution often appears as a cloud making the air murky. It is called smog. The word "smog" comes from combining the words "smoke" and "fog."

## c. Air quality limits

The EU's air quality directives (2008/50/EC Directive on Ambient Air Quality and Cleaner Air for Europe and 2004/107/EC Directive on heavy metals and polycyclic aromatic hydrocarbons in ambient air) set pollutant concentrations thresholds that shall not be exceeded in a given period of time. Selected EU standards and the World Health Organization (WHO) guidelines are summarized in the



table below. These apply over differing periods of time because the observed health impacts associated with the various pollutants occur over different exposure times.

The WHO guideline values are set for the protection of health and are generally stricter than the comparable politically agreed EU standards.

Comparison of EU air quality standards and WHO guidelines:

Pollutant	Averaging Period	EU Air Quality Directive		WHO Guidelines	
		Objective and concentration	Other information	Concentration	Other information
PM <sub>2.5</sub>	24-hour average			25 µg/m <sup>3</sup>	3 days/year
	Annual	25 µg/m <sup>3</sup>	20 µg/m <sup>3</sup> – since 2020 indicative limit value to be reviewed by the Commission *	10 µg/m <sup>3</sup>	
PM <sub>10</sub>	24-hour average	50 µg/m <sup>3</sup>	Not to be exceeded on more than 35 days per year	50 µg/m <sup>3</sup>	3 days/year
	Annual	40 µg/m <sup>3</sup>		20 µg/m <sup>3</sup>	
O <sub>3</sub>	Maximum daily 8-hour mean	120 µg/m <sup>3</sup>	Not to be exceeded on more than 25 days per year  Averaged over three years	100 µg/m <sup>3</sup>	
NO <sub>2</sub>	Hourly	200 µg/m <sup>3</sup>	Not to be exceeded for more than 18 hours per year	200 µg/m <sup>3</sup>	
	Annual	40 µg/m <sup>3</sup>		40 µg/m <sup>3</sup>	
CO	Maximum daily 8-hour mean	10 µg/m <sup>3</sup>	No exceedances per year		
	Annual	No limit			
SO <sub>2</sub>	Annual	No limit			
	24-hour average	125 µg/m <sup>3</sup>	Not to be exceeded on more than 3 days per year	20 µg/m <sup>3</sup>	
	Hourly	350 µg/m <sup>3</sup>	Not to be exceeded for more than 18 hours per year		
	10-min			500 µg/m <sup>3</sup>	

\* Indicative limit value to be reviewed by the Commission in 2013 in the light of further information on health and environmental effects, technical feasibility and experience of the target value in Member States.

#### d. Forecast of air quality

Air quality forecasts are based on weather forecasts, Copernicus Atmosphere Monitoring Service (CAMS) and run of the regional model CALPUFF. Additional information comes from national air quality monitoring system – set of 13 monitoring stations.

The data on pollution sources in Kosovo are based on annual average emissions and do not include day-to-day variations in the emissions.

The concentrations of four pollutants are calculated: nitrogen dioxide (NO<sub>2</sub>), particulates (PM10 and PM2.5) and ozone (O<sub>3</sub>). From the concentrations the daily Air Quality Index (AQI) of each pollutant is derived. The AQI corresponding to the pollutant which gives the highest value of the AQI is the value presented, so the AQI shown may correspond to a different pollutant (NO<sub>2</sub>, PM10, PM2.5 or O<sub>3</sub>) on different days.

The operational model configuration was run with hourly observed meteorological data and hourly background concentrations of PM10 and PM2.5, taken from the CAMS Ensemble Reanalysis dataset, which combines regional-scale modelled data, in situ observations and satellite observations to give a 'best guess' picture of pollution levels at 0.1 degree resolution across Europe.

### e. European Air Quality Index <sup>1</sup>

The European Air Quality Index allows users to understand more about air quality where they live, work or travel. Displaying up-to-date information for Kosovo, users can gain insights into the air quality in regions and cities.

The Index is based on concentration values for up to five key pollutants, including:

- particulate matter (PM10),
- fine particulate matter (PM2.5),
- ozone (O<sub>3</sub>),
- nitrogen dioxide (NO<sub>2</sub>),
- sulphur dioxide (SO<sub>2</sub>).

It reflects the potential impact of air quality on health, driven by the pollutant for which concentrations are poorest due to associated health impacts.

These data are not formally verified.

By default, the air quality index depicts the situation of the last full hour. Users can then select any hour in the preceding 24 hours.

European Union legislation sets air quality standards for both short-term (hourly or daily) and long-term (annual) air quality levels. Standards for long-term levels are stricter than for short-term levels since serious health effects may occur from long-term exposure to pollutants.

The Index indicates the short-term air quality situation. It does not reflect the long-term (annual) air quality situation, which may differ significantly.

**The air quality index is not a tool for checking compliance with air quality standards and should not be used for this purpose.**

#### Methodology

The Index uses 'up-to-date' air quality data from Kosovo monitoring station and from forecast modelling using Calpuff and CAMS models.

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<sup>1</sup> EEA – European Air Quality Index (<https://airindex.eea.europa.eu/>)

Concentrations values for up to five key pollutants (PM<sub>10</sub>, PM<sub>2.5</sub>, SO<sub>2</sub>, NO<sub>2</sub> and ozone) determine the index level that reflects air quality at each monitoring station. The index corresponds to the highest level for any of five pollutants, according to the table shown below. For the forecast, 4 pollutants are used: ozone, nitrogen dioxide, and particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>).

Icons on the map represent the locations of air quality monitoring stations. The colors reflect air quality at the given hour at that station.

### Averaging time for pollutants

For NO<sub>2</sub>, O<sub>3</sub> and SO<sub>2</sub>, hourly concentrations are fed into the calculation of the index.

For PM<sub>10</sub> and PM<sub>2.5</sub>, the 24-hour running means for the past 24 hours are fed into the calculation of the index.

### Bands of concentrations and index levels

The bands are based on the relative risks associated to short-term exposure to PM<sub>2.5</sub>, O<sub>3</sub> and NO<sub>2</sub>, as defined by the World Health Organization in its report on the Health Risks of Air Pollution in Europe project ([HRAPIE project report](#)).

The relative risk of exposure to PM<sub>2.5</sub> is taken as basis for driving the index, specifically the increase in the risk of mortality per 10 µg/m<sup>3</sup> increase in the daily mean concentration of PM<sub>2.5</sub>.

Assuming linearity across the relative risk functions for O<sub>3</sub> and NO<sub>2</sub>, we calculate the concentrations of these pollutants that pose an equivalent relative risk to a 10 µg/m<sup>3</sup> increase in the daily mean of PM<sub>2.5</sub>.

For PM<sub>10</sub> concentrations, a constant ratio between PM<sub>10</sub> and PM<sub>2.5</sub> of 1:2 is assumed, in line with the World Health Organization's [air quality guidelines](#) for Europe.

For SO<sub>2</sub>, the bands reflect the limit values set under the EU Air Quality Directive.

Pollutant	Index level (based on pollutant concentrations in µg/m <sup>3</sup> )					
	Good	Fair	Moderate	Poor	Very poor	Extremely poor
Particles less than 2.5 µm (PM <sub>2.5</sub> )	0-10	10-20	20-25	25-50	50-75	75-800
Particles less than 10 µm (PM <sub>10</sub> )	0-20	20-40	40-50	50-100	100-150	150-1200
Nitrogen dioxide (NO <sub>2</sub> )	0-40	40-90	90-120	120-230	230-340	340-1000
Ozone (O <sub>3</sub> )	0-50	50-100	100-130	130-240	240-380	380-800
Sulphur dioxide (SO <sub>2</sub> )	0-100	100-200	200-350	350-500	500-750	750-1250

Air quality measurements that exceed the maximum values in the 'extremely poor' category are not taken into account for the index calculation, since these values are typically found to be erroneous.

## f. Health recommendations

### Which groups of people are more sensitive to air pollution?










- **People with lung disease** (COPD, asthma, lung cancer), **heart disease** (such as angina, and a history of heart attacks) **or diabetes** are more sensitive to air pollution.
- **Seniors** are at higher risk because of weakening of the heart and lungs and an increased likelihood of health problems such as heart and lung disease.
- **Children** are also more vulnerable to air pollution because they have a less-developed respiratory system. Because of their size, children inhale more air per kilogram of body weight than adults.
- **Pregnant women** - Exposure to air pollution during pregnancy can increase the risk of premature birth and low birthweight. Premature birth is birth that happens too soon, before 37 weeks of pregnancy.










Please follow the 3 steps below to use the Air Quality Index:


**Step 1:** Determine whether you (or your children) are likely to be at-risk from air pollution. For more information on people who may be affected by air pollution on a short-term basis visit [niph-rks.org](http://niph-rks.org). Your doctor may also be able to give you advice.

**Step 2:** Check the air pollution forecast.

**Step 3:** Use the health messages below corresponding to the highest forecast level of pollution as a guide.

Air Quality Index	General population		Sensitive populations <sup>1</sup>	
Good 	The air quality is good. Enjoy your usual outdoor activities.		The air quality is good. Enjoy your usual outdoor activities.	
Fair 	Enjoy your usual outdoor activities.		Enjoy your usual outdoor activities.	
Moderate 	No need to modify your usual outdoor activities unless you experience symptoms such as coughing and throat irritation.		Stay at home if you do not need to go out. Adults and children with lung problems, and adults with heart problems, who experience symptoms, should consider reducing strenuous physical activity, particularly outdoors. If you have to go out wear masks with proven efficiency <sup>2</sup> . Strengthen immune system. Have healthy food with a lot of fruit and vegetables. Consult your physician. Visit your family doctor or health clinic if you feel unwell or are experiencing any adverse effects	

Air Quality Index	General population	Sensitive populations <sup>1</sup>	
Poor 	Anyone experiencing discomfort such as sore eyes, cough or sore throat should consider reducing activity, particularly outdoors. Strengthen immune system. Have healthy food with a lot of fruit and vegetables. Visit your family doctor or health clinic if you feel unwell experiencing any adverse effects from air pollution.		from air pollution.  Stay at home if you do not need to go out. Adults and children with lung problems, and adults with heart problems, should reduce strenuous physical activity, particularly outdoors, and particularly if they experience symptoms. Pregnant women should stay indoors. People with asthma may find they need to use their inhaler more often. Older people should also reduce physical exertion. If you have to go out wear masks with proven efficiency <sup>2</sup> . Strengthen immune system. Have healthy food with a lot of fruit and vegetables. Consult your physician. Visit your family doctor or health clinic if you feel unwell or are experiencing any adverse effects from air pollution. 
Very poor 	Stay at home or reduce physical exertion, particularly outdoors, especially if you experience symptoms such as cough or sore throat. Strengthen immune system. Have healthy food with a lot of fruit and vegetables. Visit your family doctor or health clinic if you feel unwell experiencing any adverse effects from air pollution.		Stay at home if you do not need to go out. Adults and children with lung problems, adults with heart problems, and older people, should avoid strenuous physical activity. Pregnant women should stay indoors. People with asthma may find they need to use their inhaler more often. If you have to go out wear masks with proven efficiency <sup>2</sup> . Strengthen immune system. Have healthy food with a lot of fruit and vegetables. Consult your physician. Visit your family doctor or health clinic if you feel unwell or are experiencing any adverse effects from air pollution. 
Extremely poor 	Stay at home or reduce physical exertion, particularly outdoors, especially if you experience symptoms such as cough or sore throat. Strengthen immune system. Have healthy food with a lot of fruit and vegetables. Visit your family doctor or health clinic if you feel unwell experiencing any adverse effects from air pollution.		Stay at home if you do not need to go out. Adults and children with lung problems, adults with heart problems, and older people, should avoid strenuous physical activity. Pregnant women should stay at home. People with asthma may find they need to use their inhaler more often. If you have to go out wear masks with proven efficiency <sup>2</sup> . Strengthen immune system. Have healthy food with a lot of fruit and vegetables. Consult your physician. Visit your family doctor or health clinic if you feel unwell or are 

Air Quality Index	General population		Sensitive populations <sup>1</sup>	
			experiencing any adverse effects from air pollution.	
No data 				

<sup>1</sup> Adults and children with respiratory problems, adults with heart conditions, pregnant women, elderly and other sensitive groups (see details on Health Advisories on <https://www.niph.org>).

<sup>2</sup> Masks or particulate respirators may help in special circumstances if you have to be outside whilst pollution levels are high although scientific evidence is limited on their effectiveness against air pollution. Masks need to be of a special type and require special fitting. Masks should be disposable, regularly changed and have a rating of at least N-95 meaning that the mask is adequate for filtering out 95% of PM<sub>2.5</sub> particles. Masks should provide a tight seal around the wearer's mouth and nose. This may be particularly difficult for children. Paper or cloth "comfort" or "dust" masks offer little protection from fine particles.

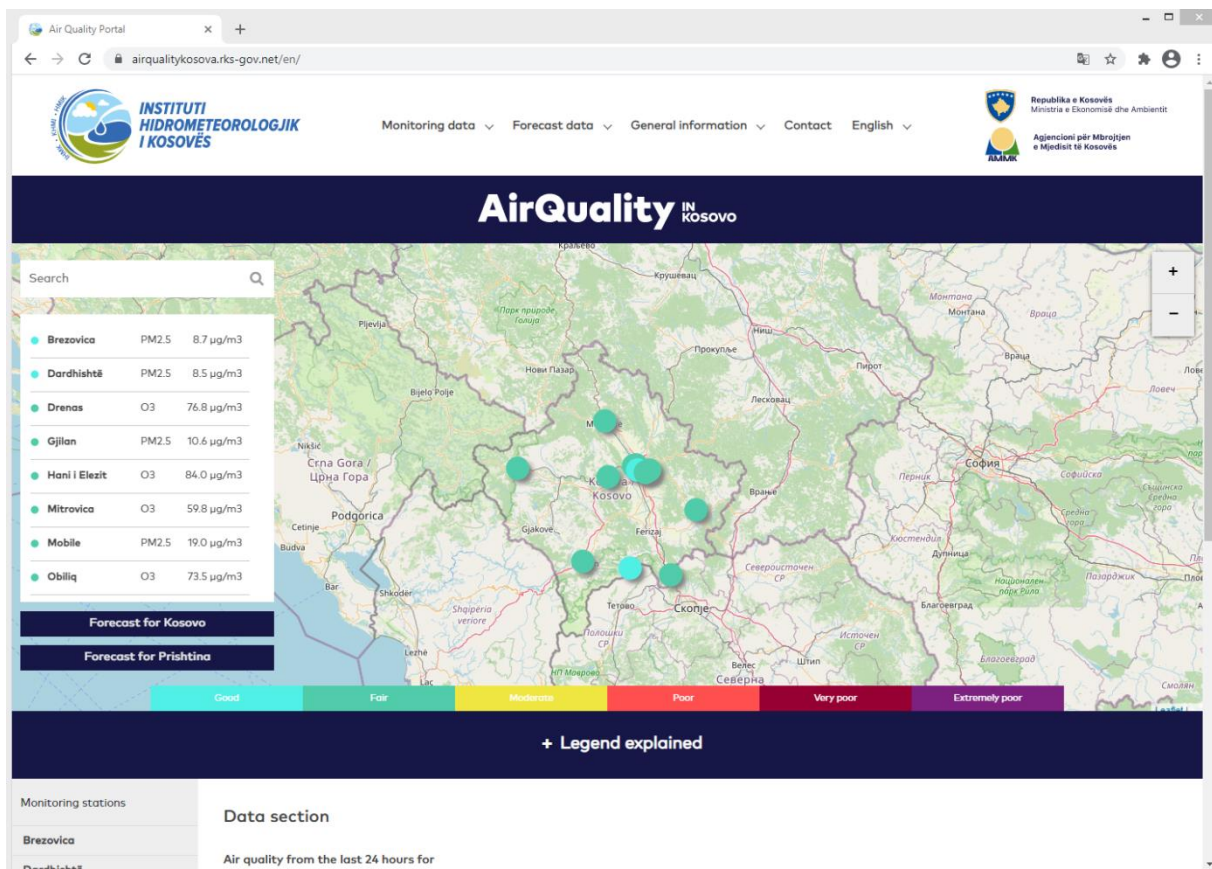
## 2. Air Quality Portal – layout

### a. Front page

The front page of the Air Quality Portal consists of the following main items:

- Map section
  - Map with monitoring stations displayed in a frame with current air quality data
  - Legend for the map with expandable description
- Data section - pie chart with air quality and descriptions of monitoring stations
- Top banner with the menu and the KHMI, the Ministry of Environment and KEPA logos.
- Bottom banner with other logos and some general information.

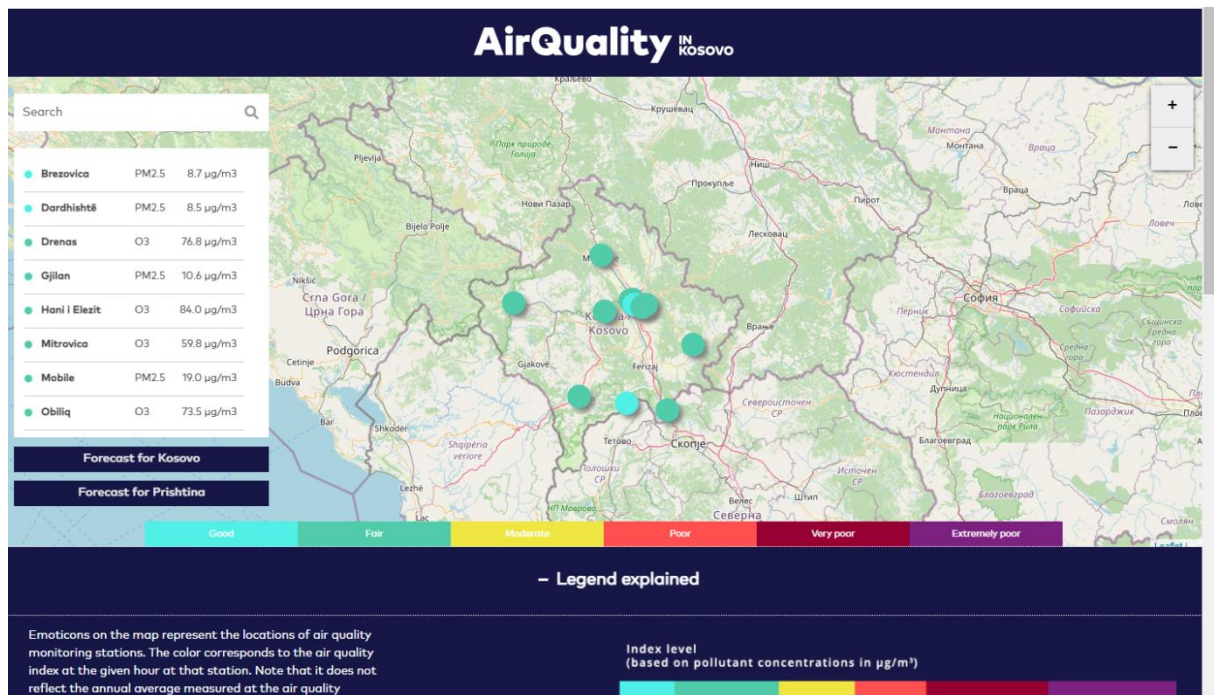
The screenshot below shows the front page.





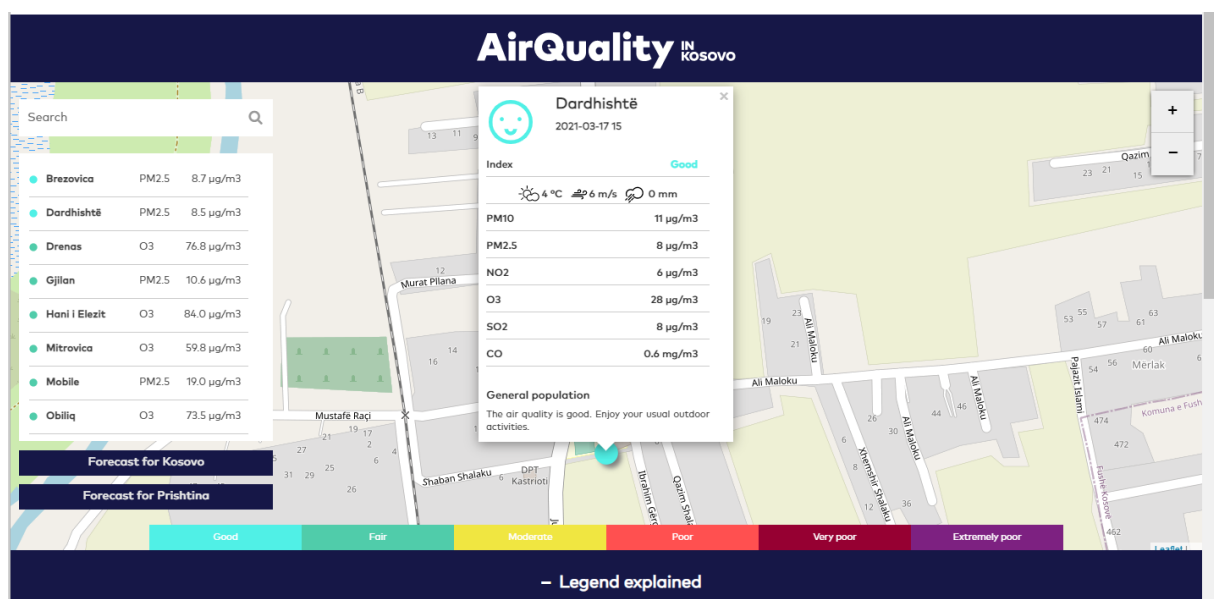
## b. Map of the monitoring stations

The map contains the monitoring stations marked with dots colored according to AQ Index levels. Offline stations are shown in gray.



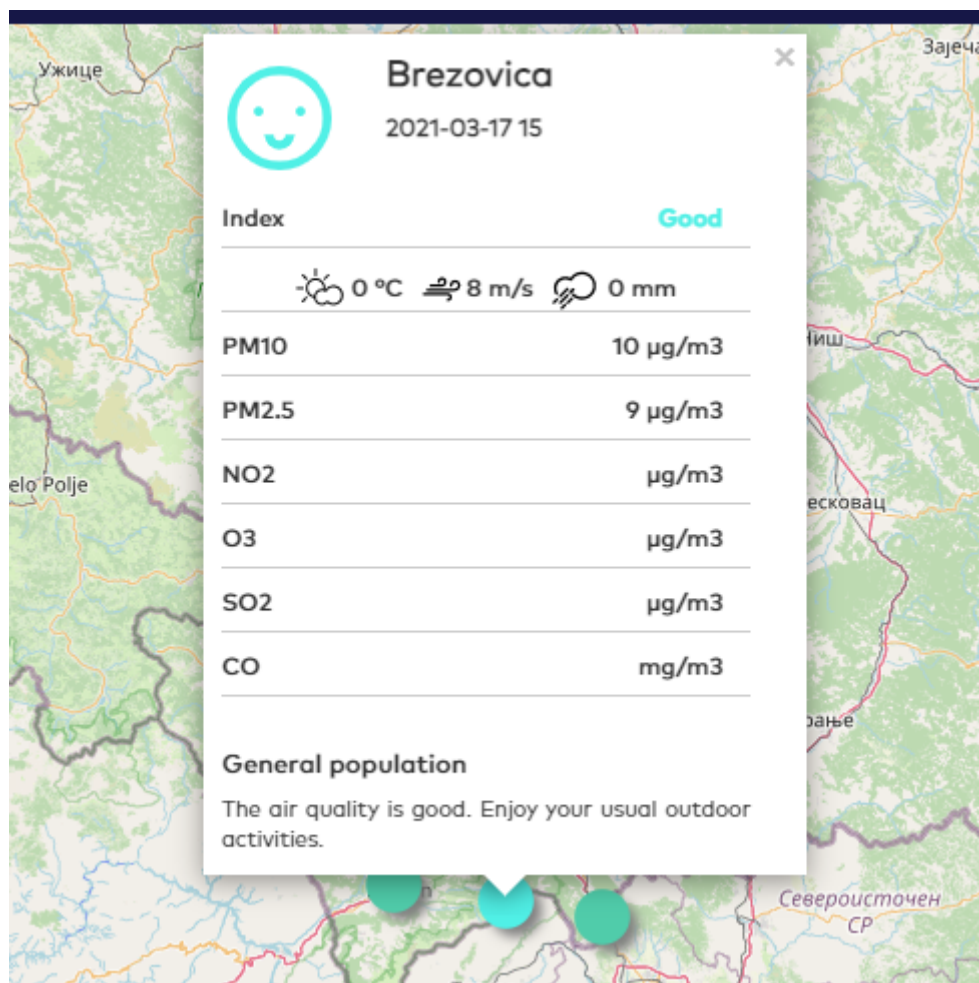
On the left of the map there is a scrollable list of monitoring stations. Each list item contains a colored dot corresponding to AQ Index level, the station name and the name of the leading pollutant and its concentration.

When the user clicks on a list item, the map will be placed and zoomed in on the selected station and the station details will be displayed in a popup.



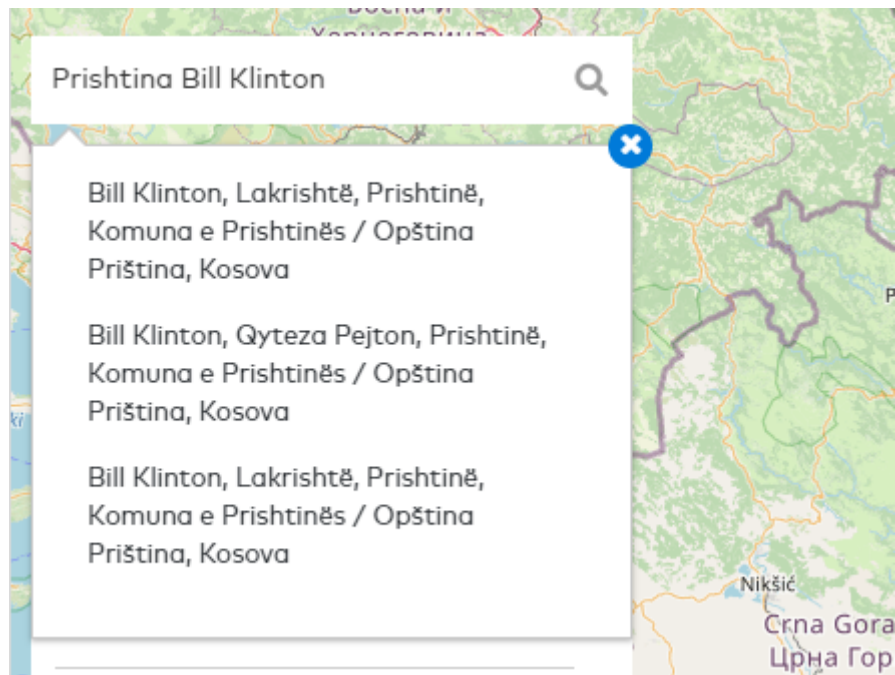
The details of the station are also displayed after the user clicks the dot marking the station:



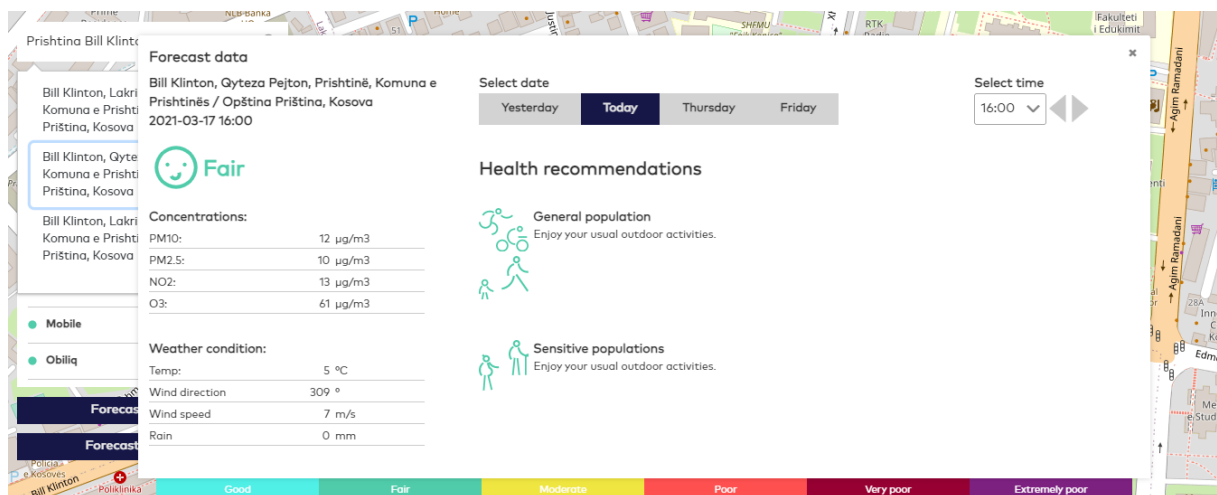


For gases the hourly average concentration values are displayed. For PM10 and PM2.5 24-hour running averages are displayed.

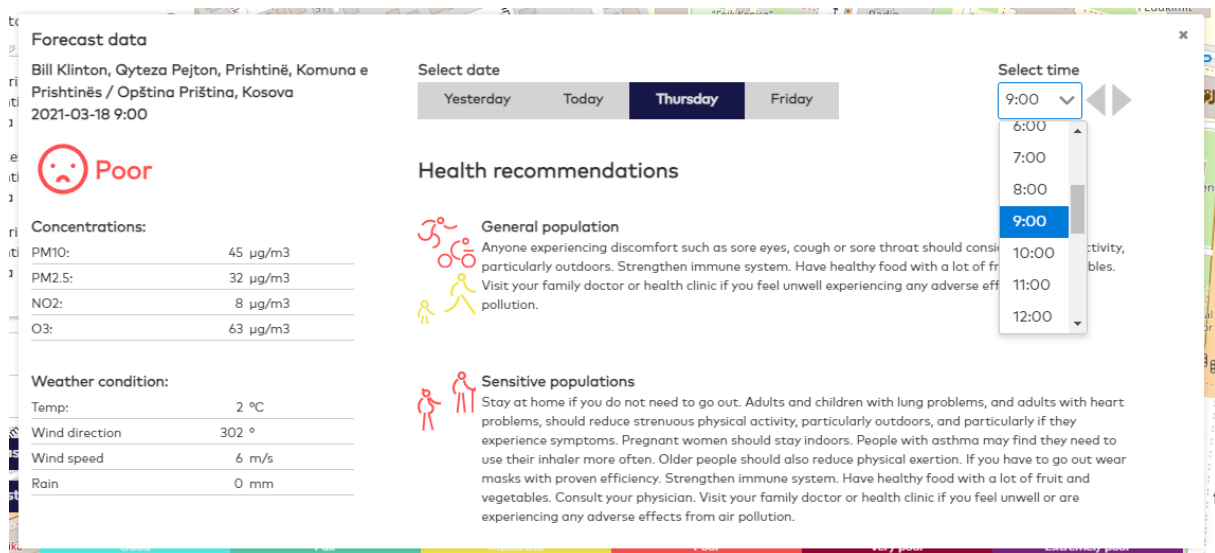
Above the station list, there is a text box for entering an address to search for places in Kosovo. After the user enters the address, a list of found locations is displayed below.



When the user clicks the selected location, the map will be placed and zoomed in on the location and will be displayed popup with the air quality data forecast.



It is possible to browse the forecast data using the buttons for days (3-day forecast with yesterday) and hours – the popup displays data for selected day and time.



Below the station list, there are two buttons for displaying forecast for Kosovo and Prishtina in new browser tabs.



### c. Menu

The main menu consists of the following items:

- Monitoring data
  - Map of monitoring stations – monitoring stations displayed on map in full screen with data from the last 48 hours
  - Data from monitoring stations – line charts with data from monitoring stations
  - Annual statistics - annual average concentrations and exceedances statistics
- Forecast data
  - Forecast maps for Kosovo – 3-day forecast data on map in full screen
    - AQ Index
    - PM10
    - PM2.5
    - NO<sub>2</sub>
    - O<sub>3</sub>
    - Districts
    - Municipalities
  - Forecast maps for Prishtina – 3-day forecast data on map in full screen
    - AQ Index
    - PM10

- PM2.5
  - NO<sub>2</sub>
  - O<sub>3</sub>
  - Average data for districts – line charts with average forecast data for districts
  - Average data for municipalities – line charts with average forecast data for municipalities
- General information
  - About Air Quality Portal – description of the Portal and its data sources, especially forecast data
  - Air pollution – what is air pollution, what causes air pollution and how air pollution can affect your health
  - Air Quality Index – description of the Air Quality Index
  - Health recommendations – behavioral recommendations for groups of people according to the level of air quality
  - Monitoring network – information page about the chronology of development of the state automatic air quality monitoring network
  - Smartphone application download – contains description and links to download the smartphone applications
  - User guide – allows to download the user guide in PDF format.
- Contact – contains KHMI contact details (address, e-mail, phone), a map with location and links to social media.
- Language selection (Albanian, Serbian or English).

### 3. Using the Advanced Map Tool

#### a. Overview

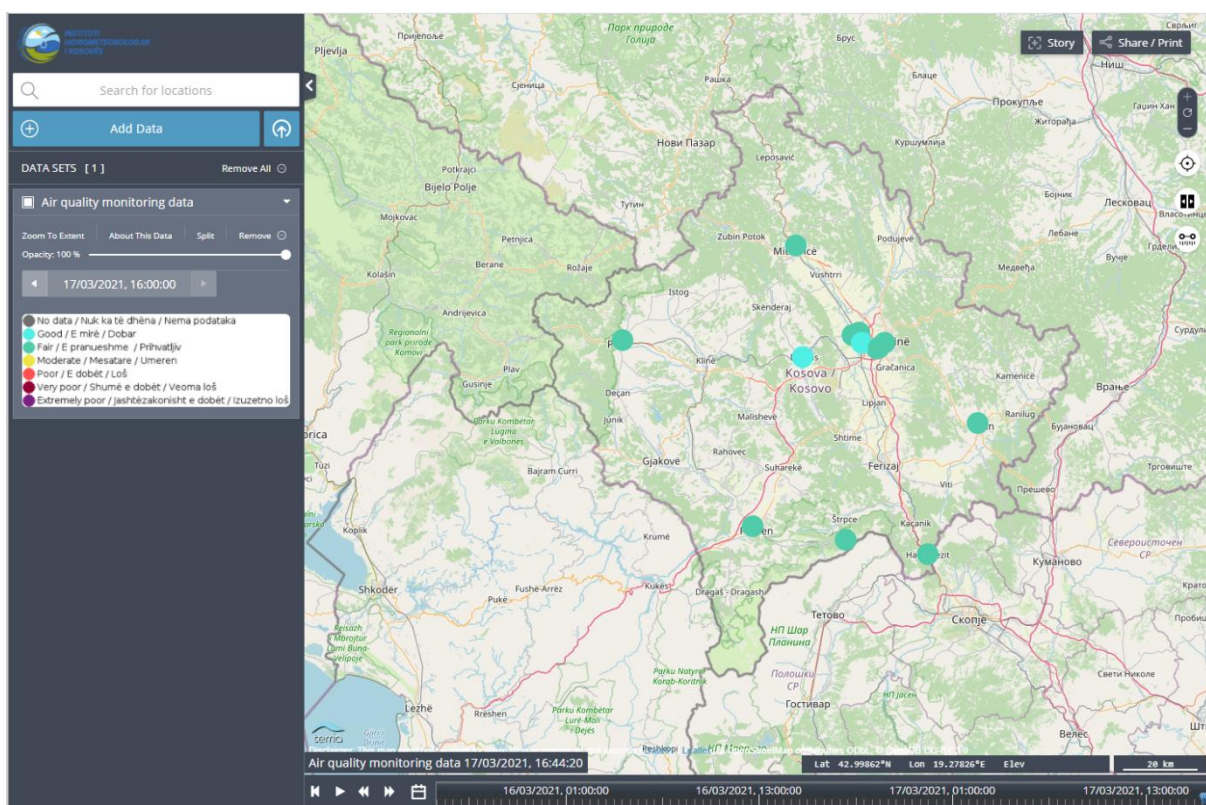
The Advanced Map Tool is a full-featured web mapping application and is used in the Air Quality Portal Kosovo to visualize the time-varying air quality data on the map.

The data on the map is displayed as layers. The map layers in are called “data sets” or simply “data”.

In the Air Quality Portal multiple layers are entered, such as: monitoring stations, isolines for forecast parameters, concentration values for Kosovo regions.

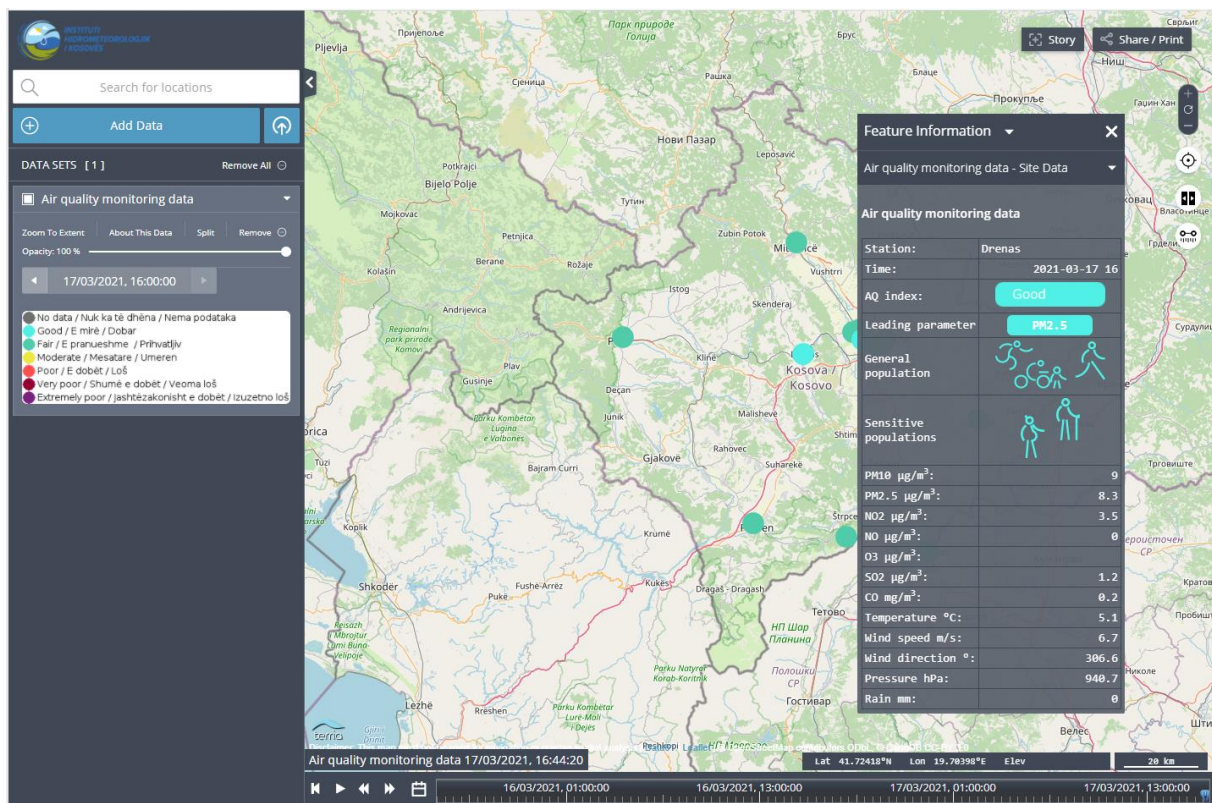
#### b. Monitoring stations

View the full screen map using the menu item **Monitoring data** -> **Map of monitoring stations**. The map will display the *Air quality monitoring data* layer. The stations are displayed on the map as dots. The color of the dots is set according to Air Quality Index for the monitoring station at the selected time. Grey color means the station was down.





After clicking on a station - a pop-up window will appear with the details of the station.



The pop-up window contains:

- Station name
- Current time
- Air Quality Index as description and color
- Leading parameter
- Health recommendations for population groups
- Concentrations of measured pollutants
- Values of meteorological parameters.

### c. Map layout and positioning

Advanced Map Tool page consists of three main parts:

- Workbench – the left panel (can be hidden)
- Map
- Time slider – at the bottom of the page.

In the upper left corner of the workbench there is the KHMI logo - when you click it, the front page will be displayed.

You can change the geographical area covered by map by dragging it or using the arrow keys.

The map can be zoomed in or out using the “+” and “-” buttons in the upper left corner. The middle between the “+” and “-” buttons resets the zoom and position of the map. Zooming can also be done with the mouse wheel.

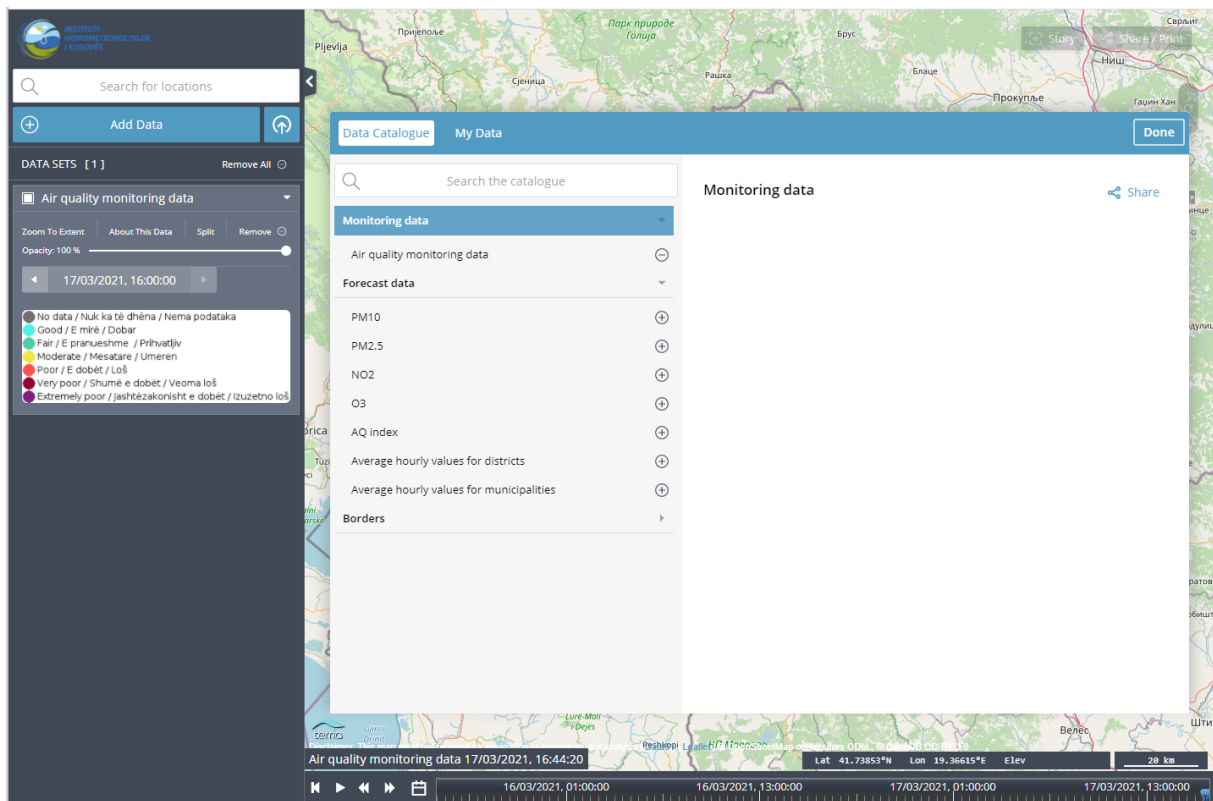
The current time can be changed using the time slider:

- By dragging the slider
- By buttons: go to the beginning, play, slower, faster.

The current time can also be changed from the workbench in the *Time* section using the arrow buttons.

#### d. Map layers

Click the *Add Data* button on the workbench. A pop-up window with available layers will appear. You can use it to add layers to the map or remove them.



Add PM10 and O<sub>3</sub> layers by clicking “+”.

Existing layers on the map are like a set of sheets on a table. You can see all layers, if their opacity is low enough.

If the first layer has 100% opacity you will only see the first layer. If you reduce the opacity - you will see other layers.

You can also change the order of the layers by dragging them in the workbench.

The last layer added is set first in the list.

## e. Map splitting

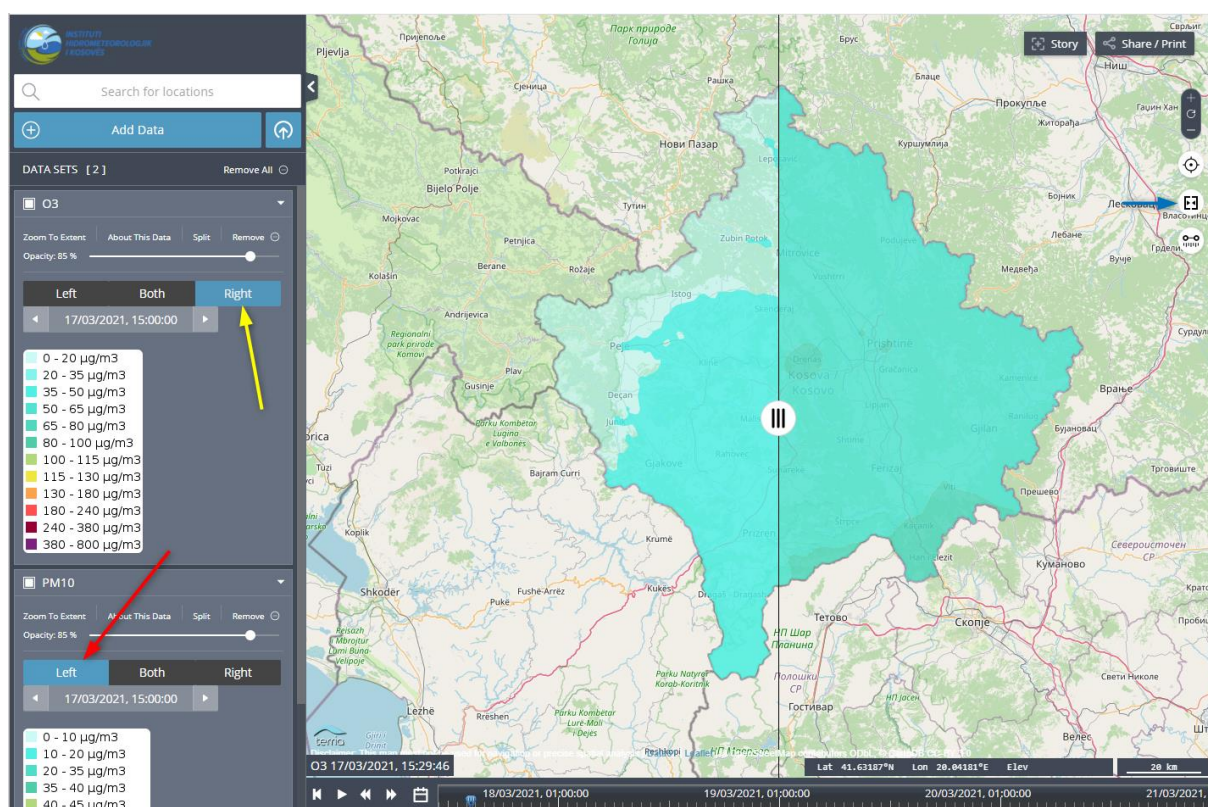
To compare data on two different layers, but in the same time slider position, use a *Side-by-side comparison between two different sets of data*.

For example:

1. Click the *Forecast data* -> *Forecast map for Kosovo* -> *PM10* menu item.
2. Click *Add data* and select  $O_3$  and add to the map.
3. Click the *Enable side-by-side comparison* button:



4. Click *Left* on the PM10 layer in the workbench
5. Click *Right* on the  $O_3$  layer.
6. By moving the split border, you can compare data for PM10 (on the left) and  $O_3$  (on the right).



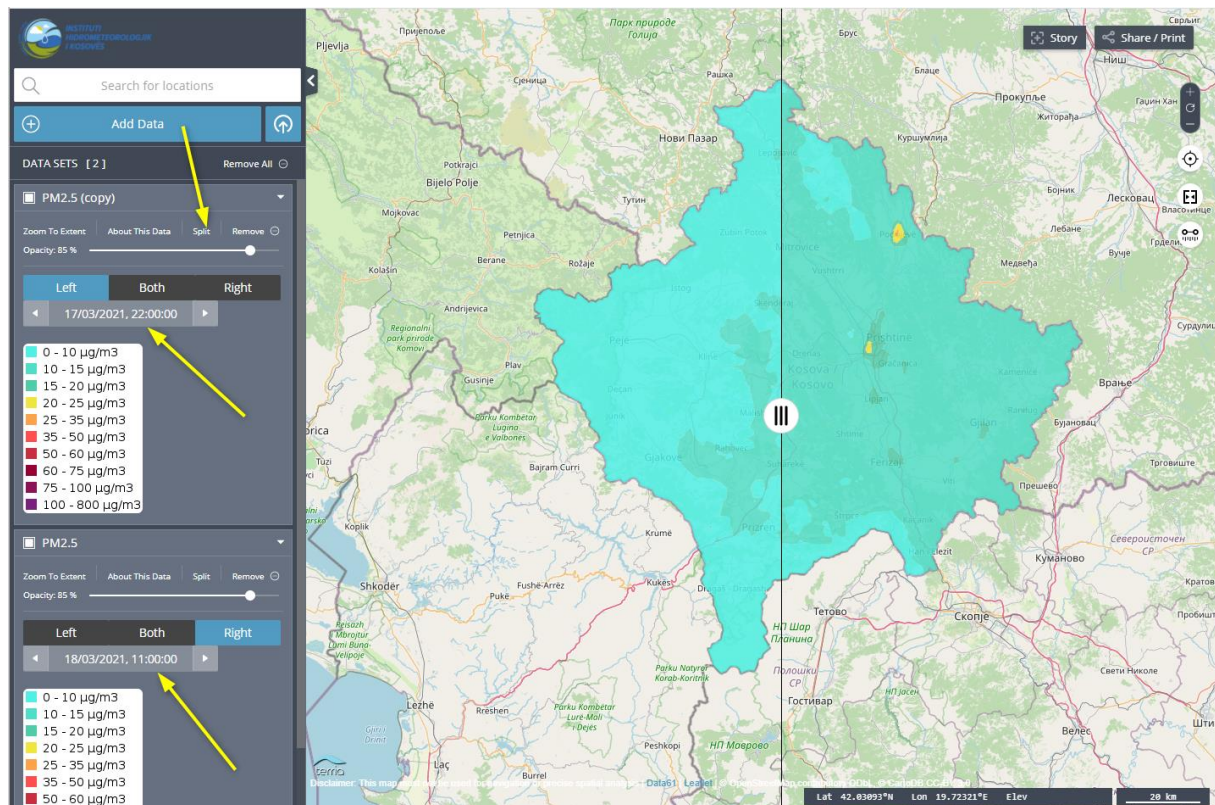
To compare data on the same layer but at different times - use the "Split" button on the selected layer in the workbench.

For example:

1. Click the *Forecast data* -> *Forecast map for Kosovo* -> *PM2.5* menu item.



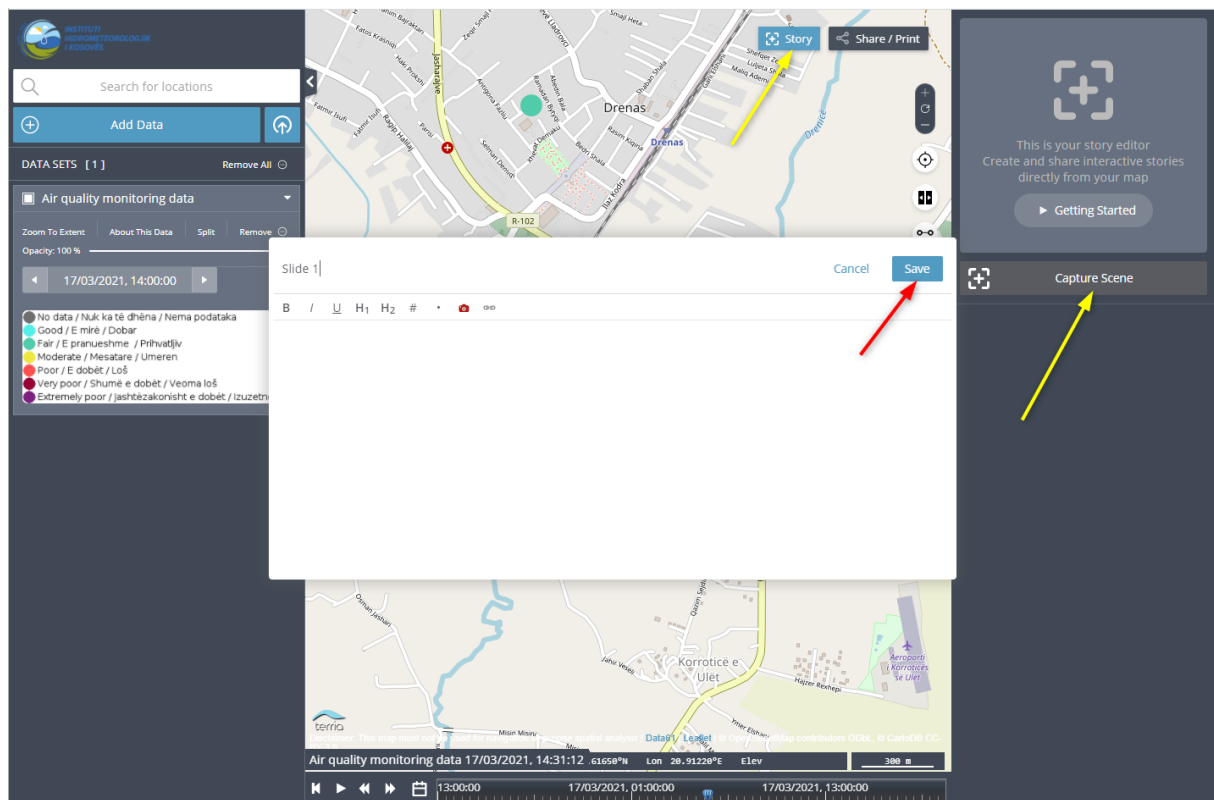
2. Click the *Split* button on the layer PM2.5 in the workbench – the map will be divided into two parts.
3. In the left part, change the time to the nighttime (from the workbench in the *Time* section using the arrow buttons).
4. In the right part, change the time to the daytime.
5. Move the split border and compare the data during the day and night.



## f. Stories, sharing map and others

To create and share interactive stories directly from your map use the *Story* function:

- Click the *Story* button in the upper right corner of the map.
- Move the map to the desired location and time.
- Click the *Capture Scene* button. You will get a form to describe the captured scene.
- Enter a title and optional scene information and click *Save*.



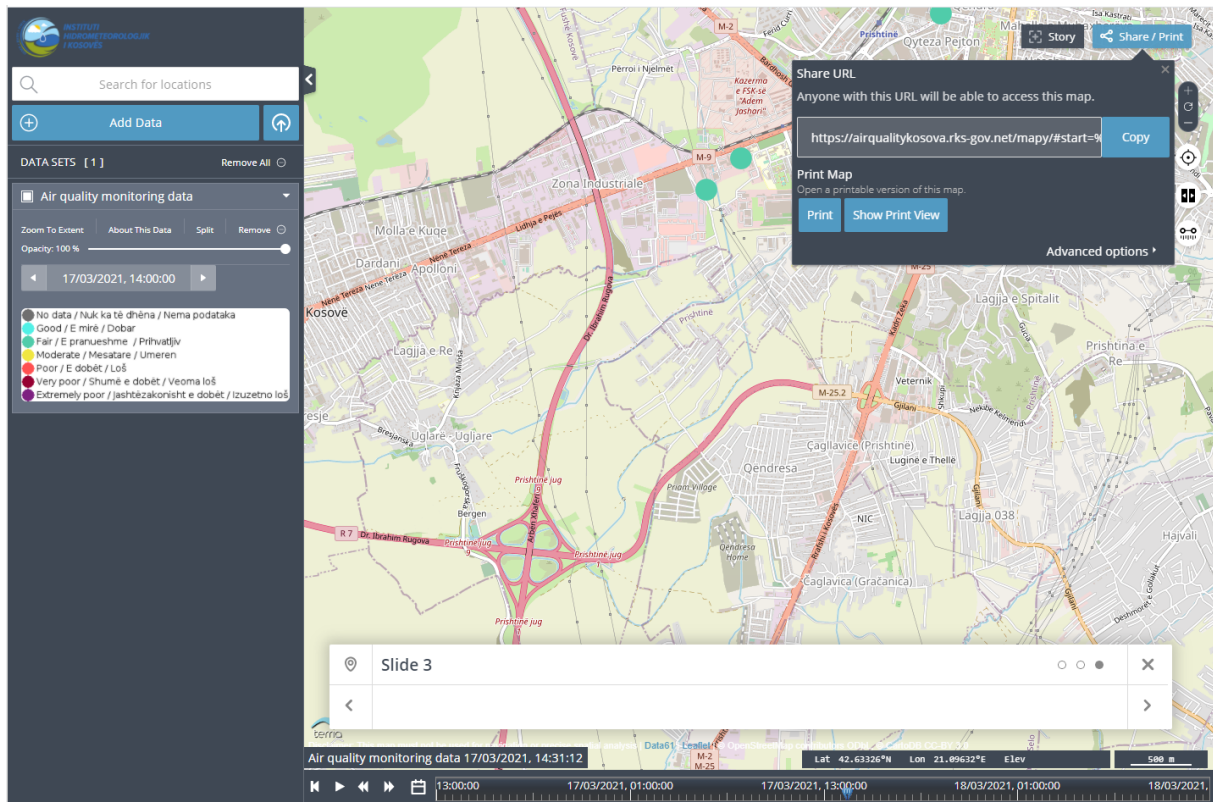
Repeat the last three steps for the next slides.

After completing the steps for all slides, click the *Play Story* button - you can move from one slide to another by clicking the "<" and ">" buttons.

You can copy the slideshow using *Share / Print* function.

Click the *Share / Print* button, then the *Copy* button. The URL for accessing the slideshow is copied to the clipboard.

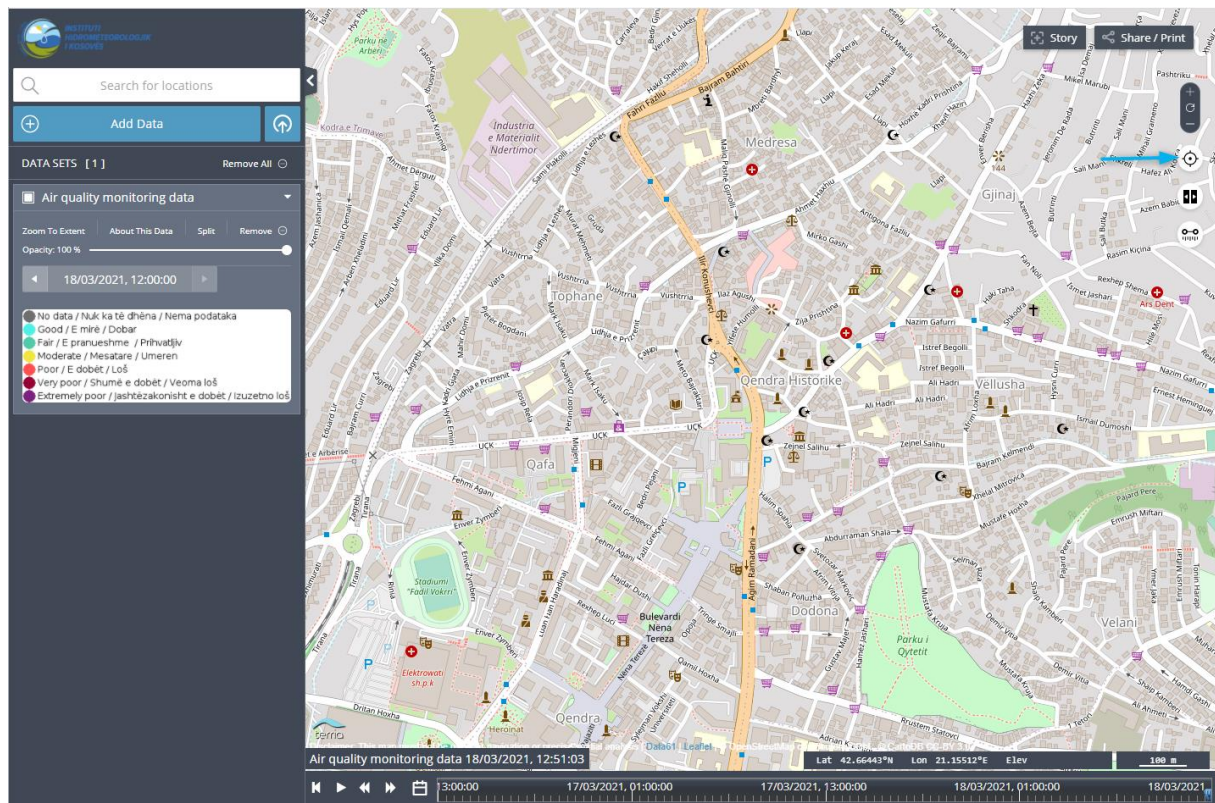
In the same way you can copy the URL of any map. You can paste the copied URL into a browser and view a map or slideshow.





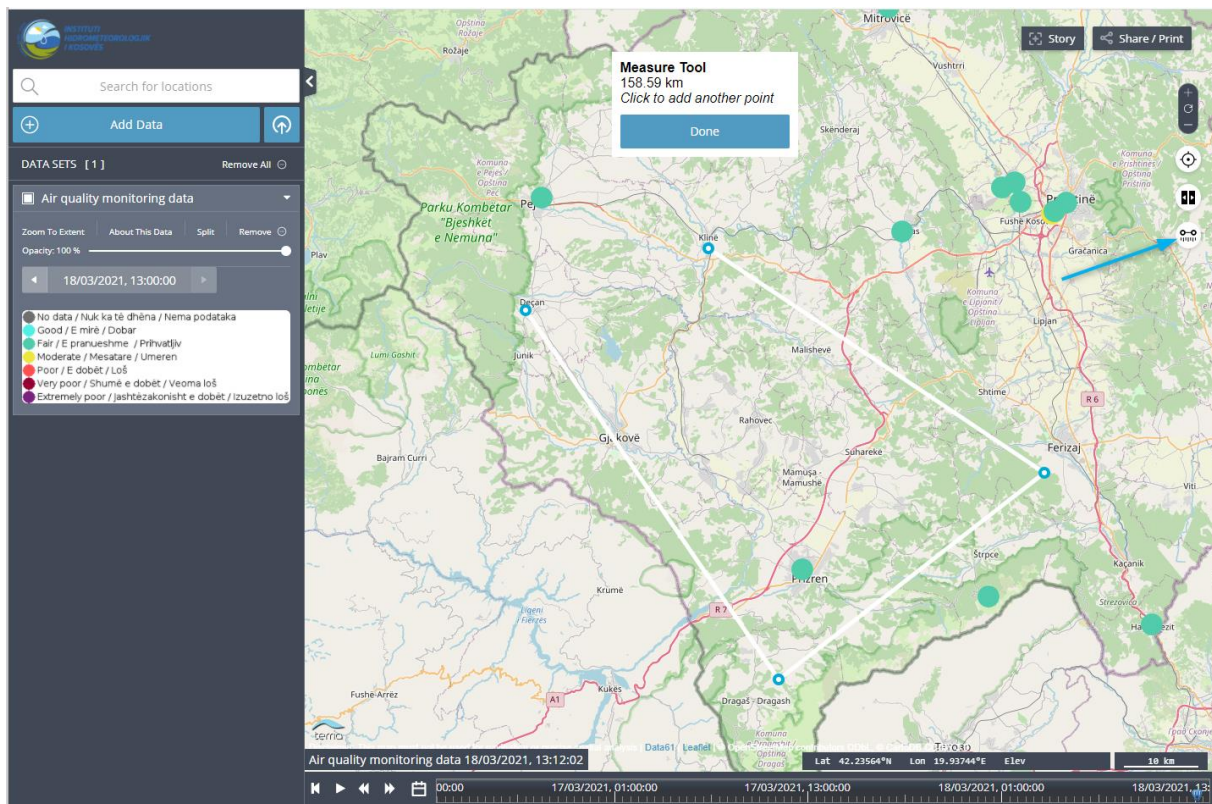
You can center the map on your current location using the button under the zoom buttons.

If you allow the Portal access to your location, the map will be centered.



The Advanced Map Tool also allows you to measure distances between locations.

Click *Measure distance between locations* and click on the map to add points. The total distance will be displayed in the pop-up window.



## 4. Full screen maps

### a. Overview

Full-screen maps are available using the main menu items. The full-screen maps include the monitoring stations map and the Kosovo and Pristina forecast maps.

The menu item **Monitoring data -> Map of monitoring stations** is used to display a map of monitoring stations.

The menu items for 3-day forecast maps are placed in two groups in the **Forecast data** menu item:

- Forecast data for Kosovo – maps for AQ Index, pollutants, districts and municipalities in Kosovo
- Forecast data for Prishtina – maps for AQ Index and pollutants in Prishtina.

After clicking the selected menu item, the corresponding map will be displayed in full screen.

All maps use for displaying data:

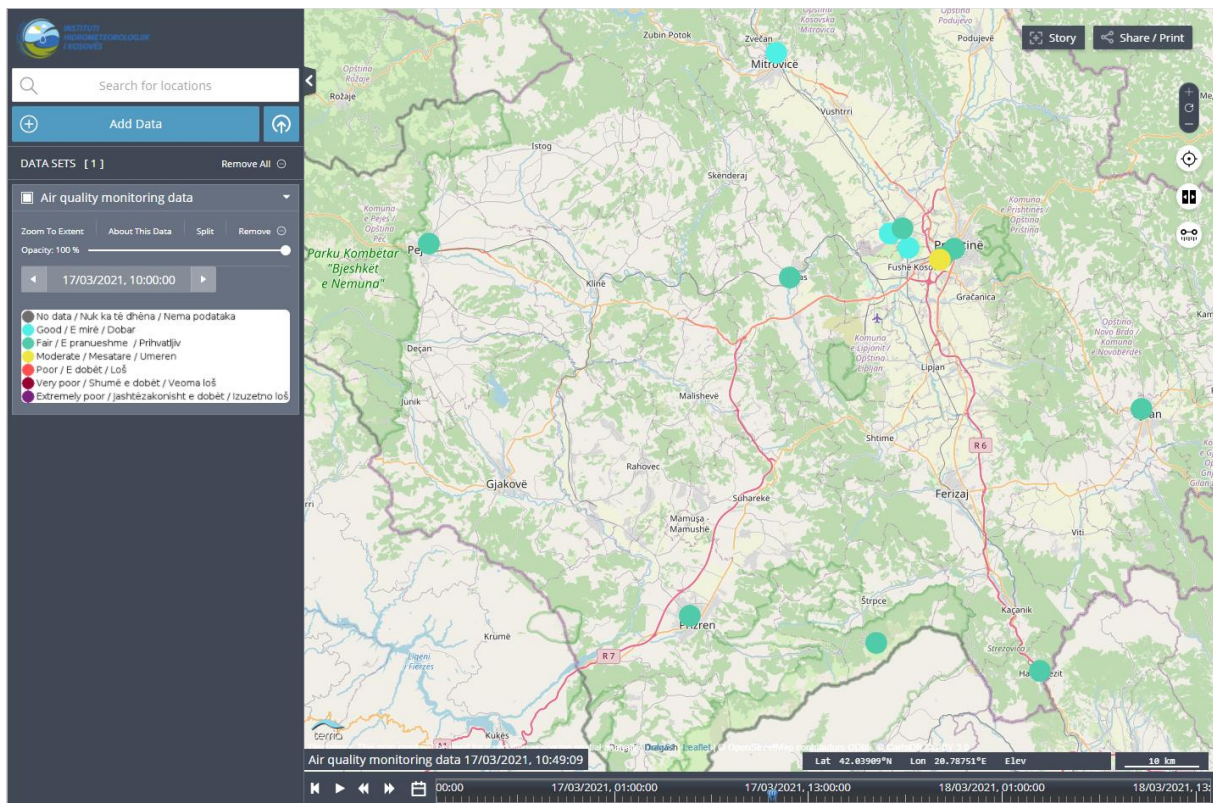
- for gases - hourly average concentration values,



- for PM10 and PM2.5 – 24-hour running averages.

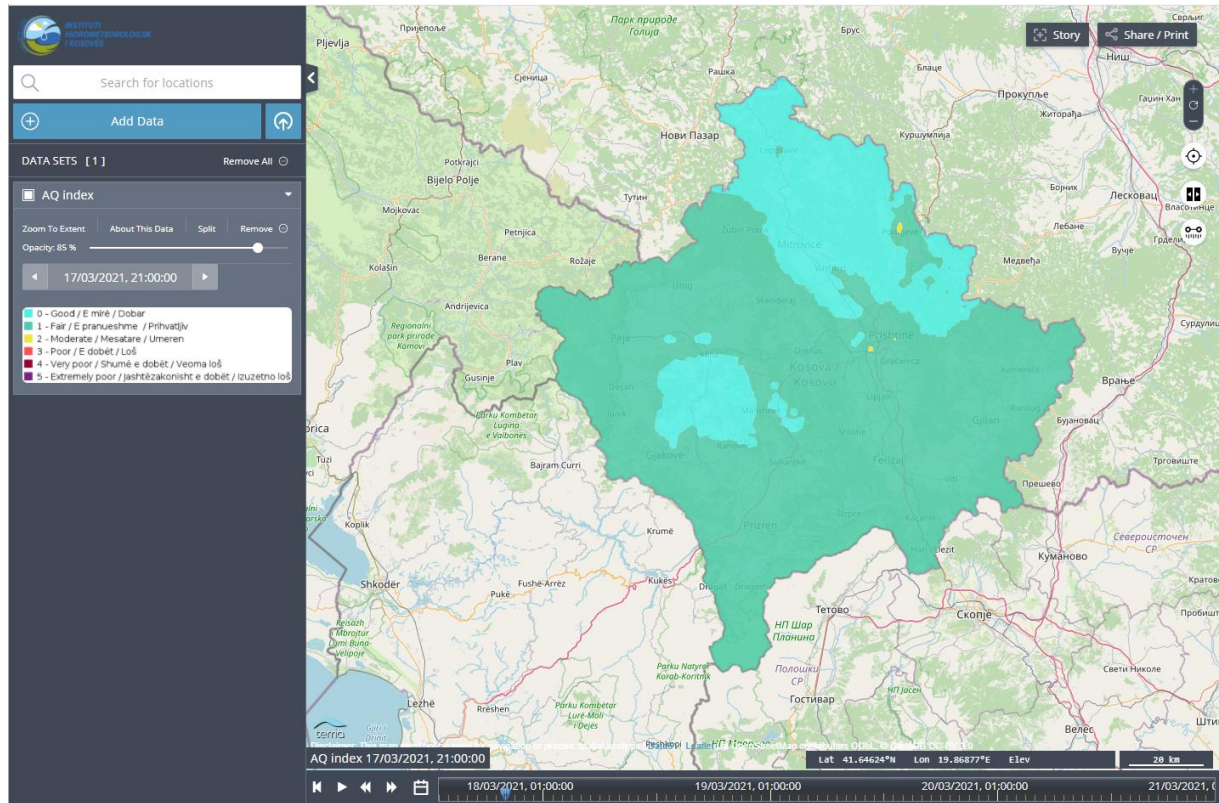
## b. Air quality monitoring data

This layer presents in full screen hourly data from air quality monitoring stations from the last 48 hours.

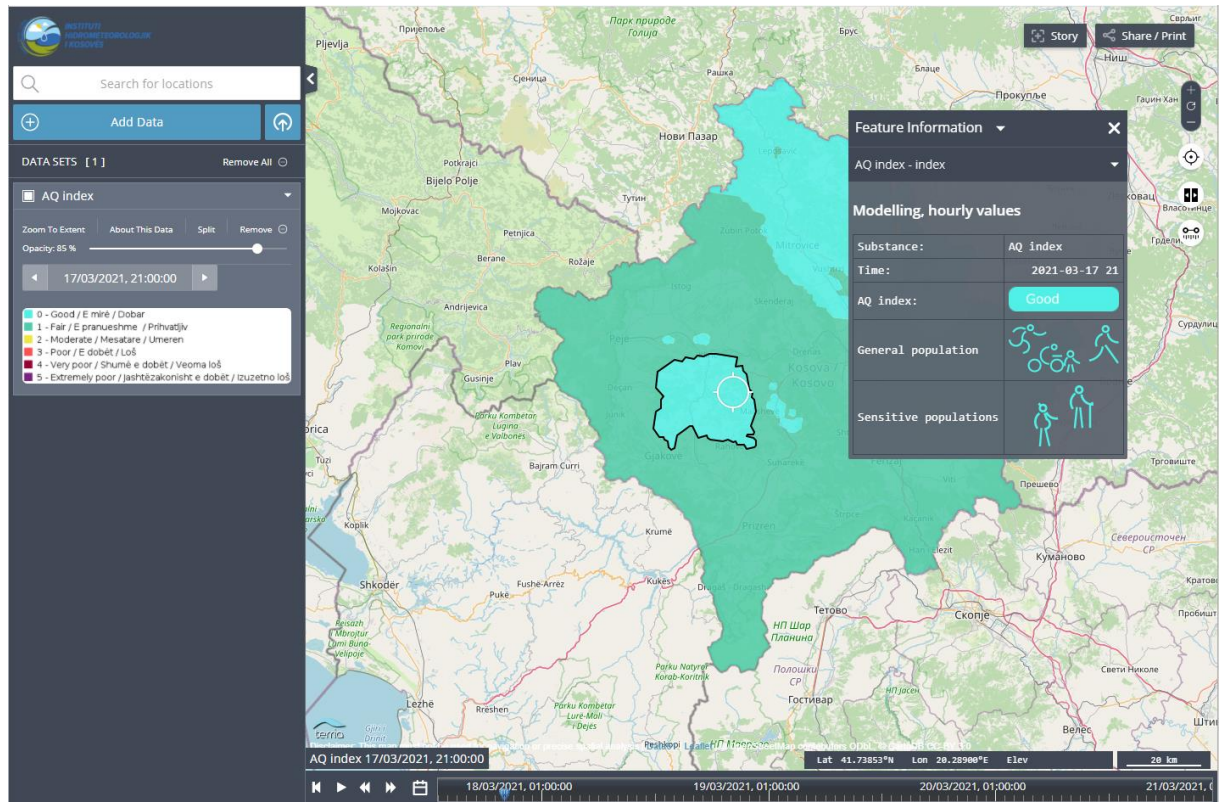


### c. AQ Index – 3-day forecast data for Kosovo

The map displays hourly values for Air Quality Index – 3-day forecast and the last 24 hours.



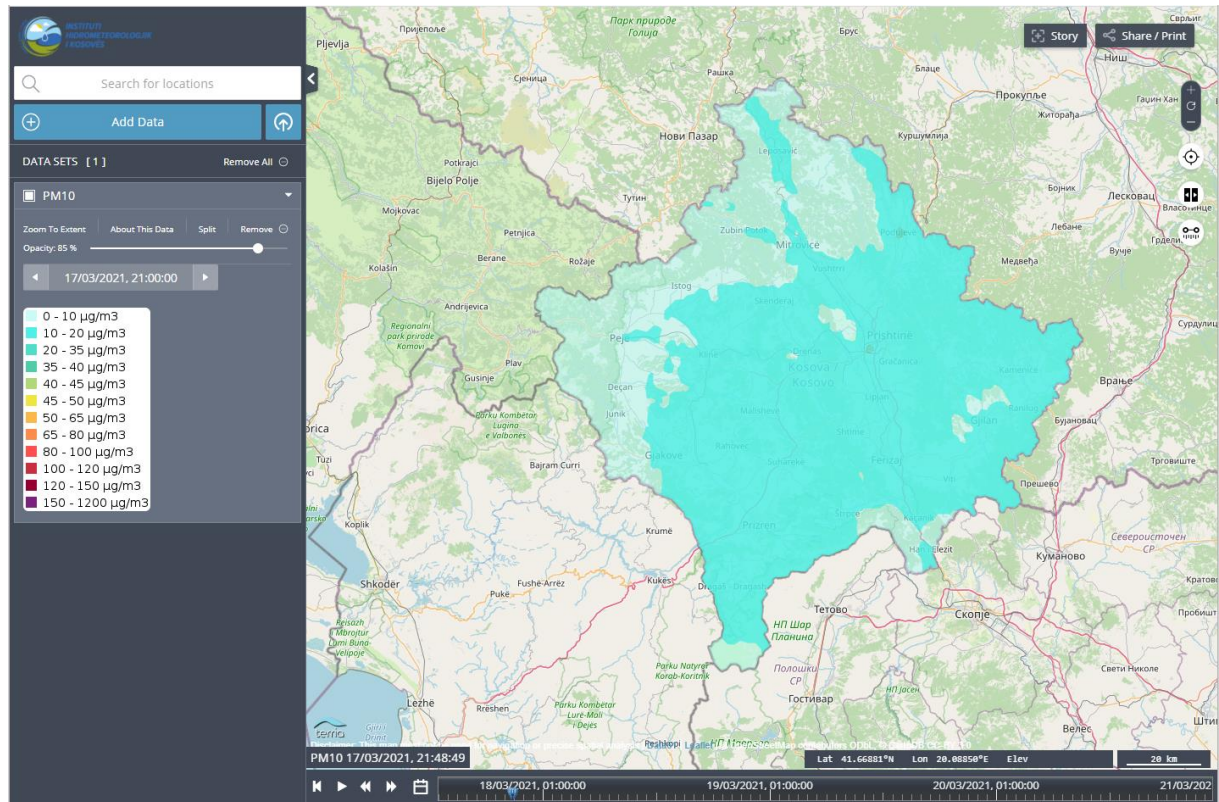
After clicking any point on the map of Kosovo, you will see the highlighted isolines for that point and a pop-up window with the time, description of AQ Index level and health recommendations.



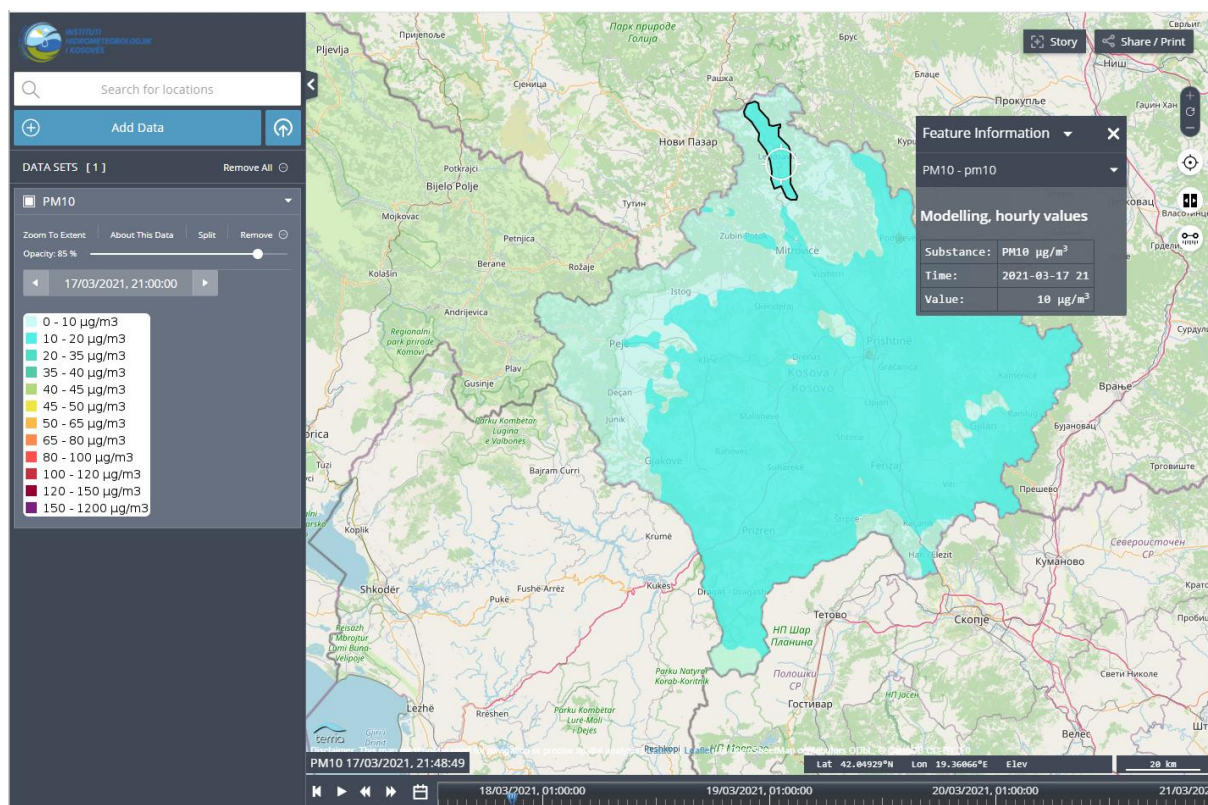


#### d. PM10 – 3-day forecast data for Kosovo

The map displays hourly values for PM10 – 3-day forecast and the last 24 hours.

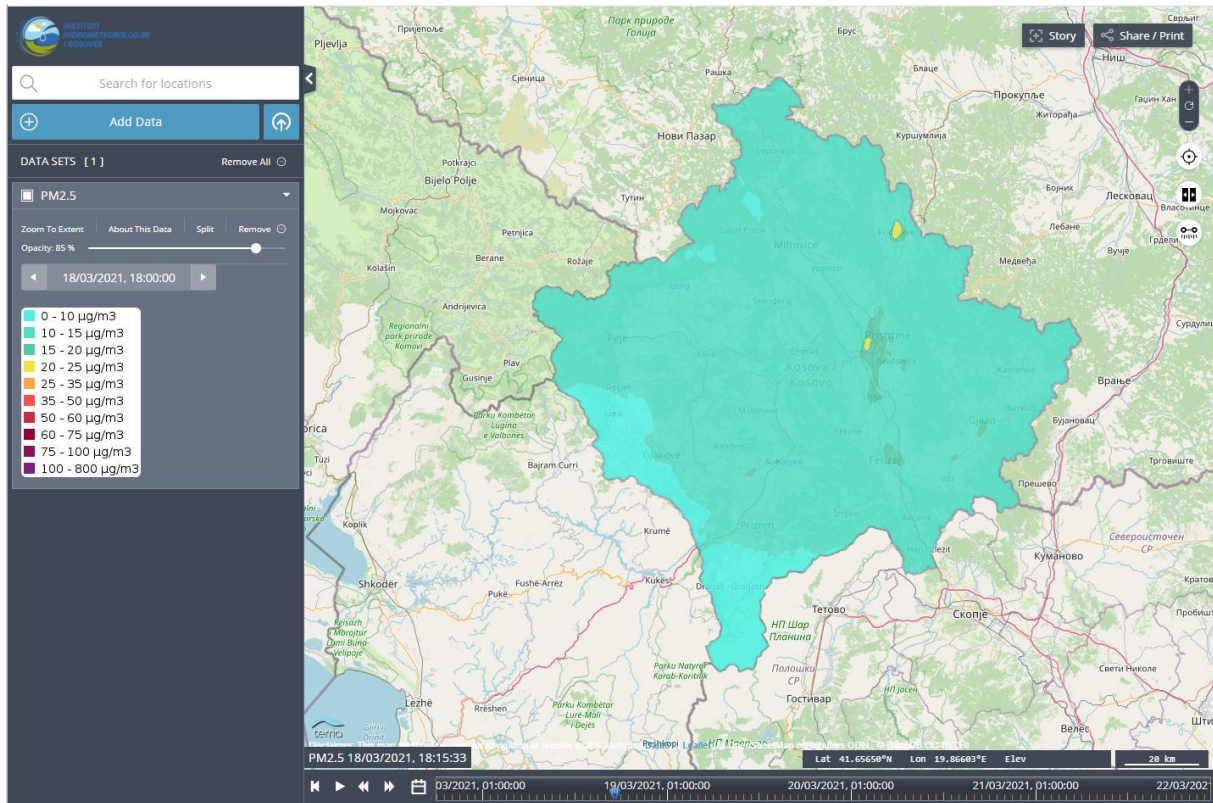


After clicking any point on the map of Kosovo, you will see the highlighted isolines for that point and a pop-up window with the name of the substance, time and concentration value.



### e. PM2.5 – 3-day forecast data for Kosovo

The map displays hourly values for PM2.5 – 3-day forecast and the last 24 hours.

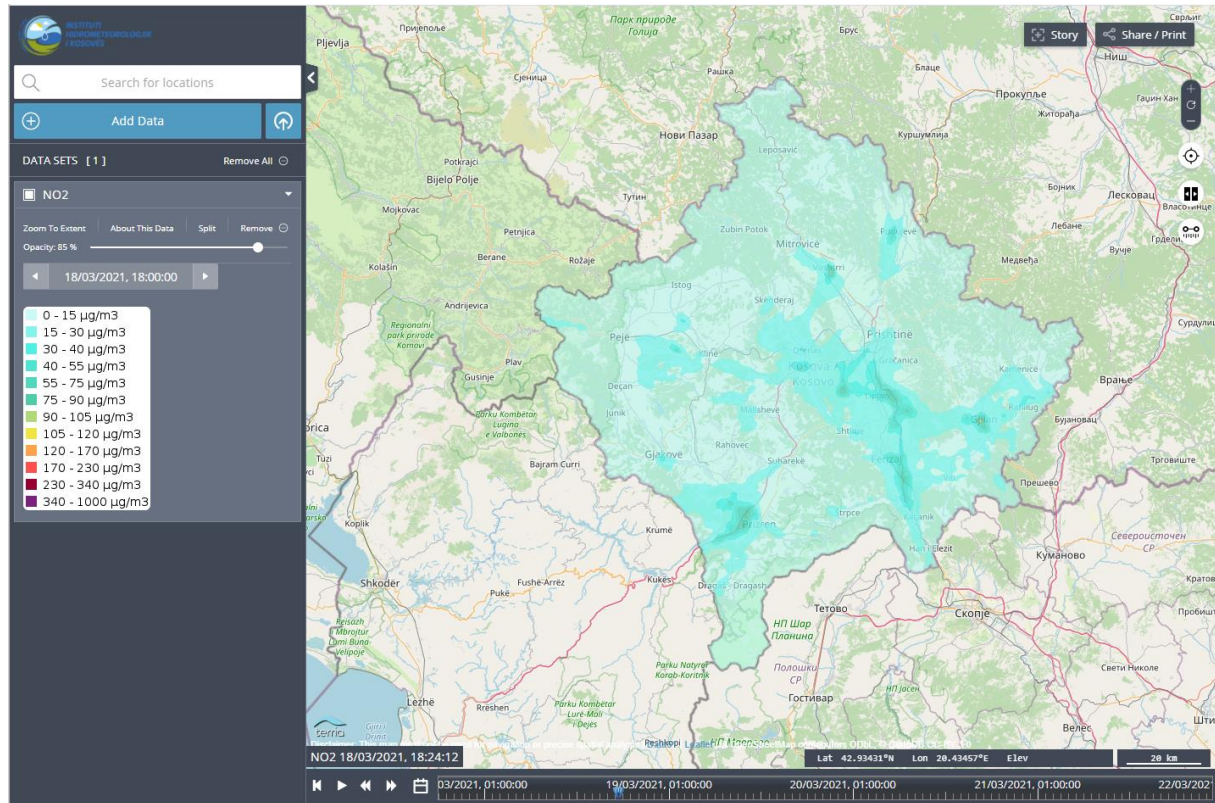


After clicking any point on the map of Kosovo, you will see the highlighted isolines for that point and a pop-up window with the name of the substance, time and concentration value.



## f. NO<sub>2</sub> – 3-day forecast data for Kosovo

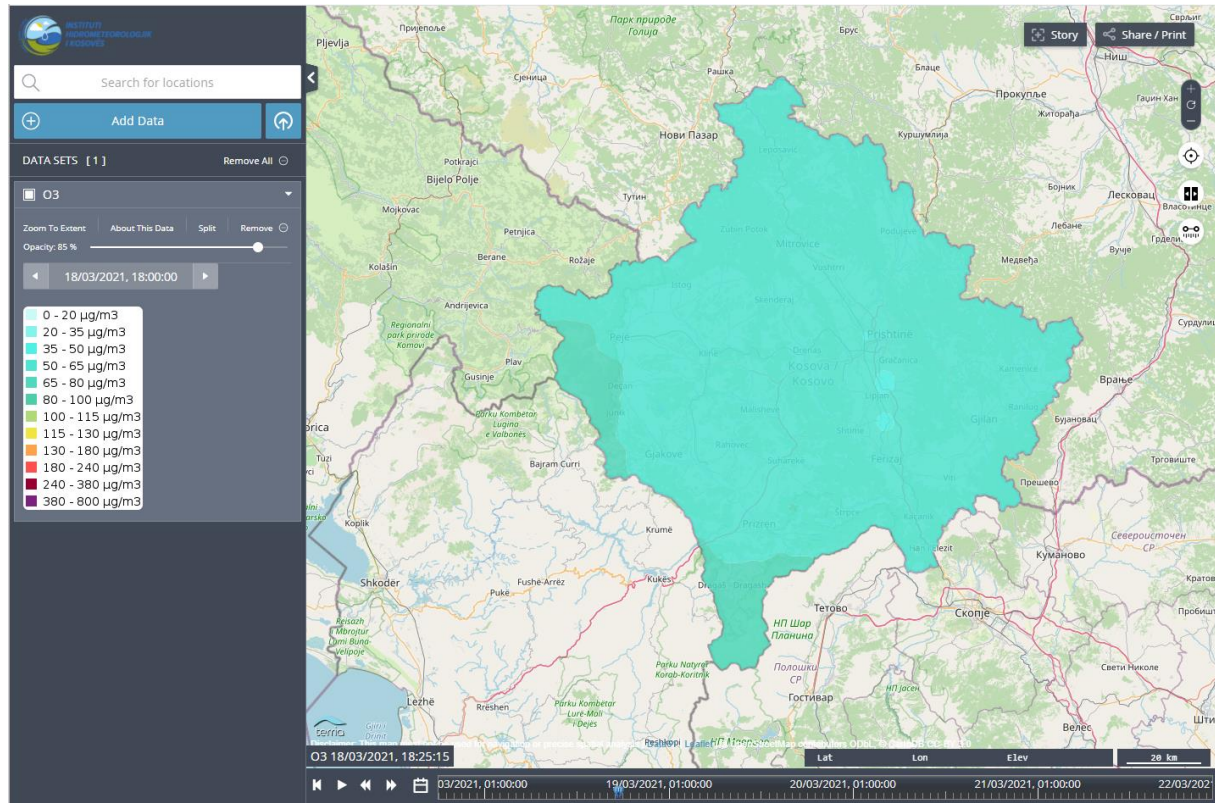
The map displays hourly values for NO<sub>2</sub> – 3-day forecast and the last 24 hours.



After clicking any point on the map of Kosovo, you will see the highlighted isolines for that point and a pop-up window with the name of the substance, time and concentration value.

### g. O<sub>3</sub> – 3-day forecast data for Kosovo

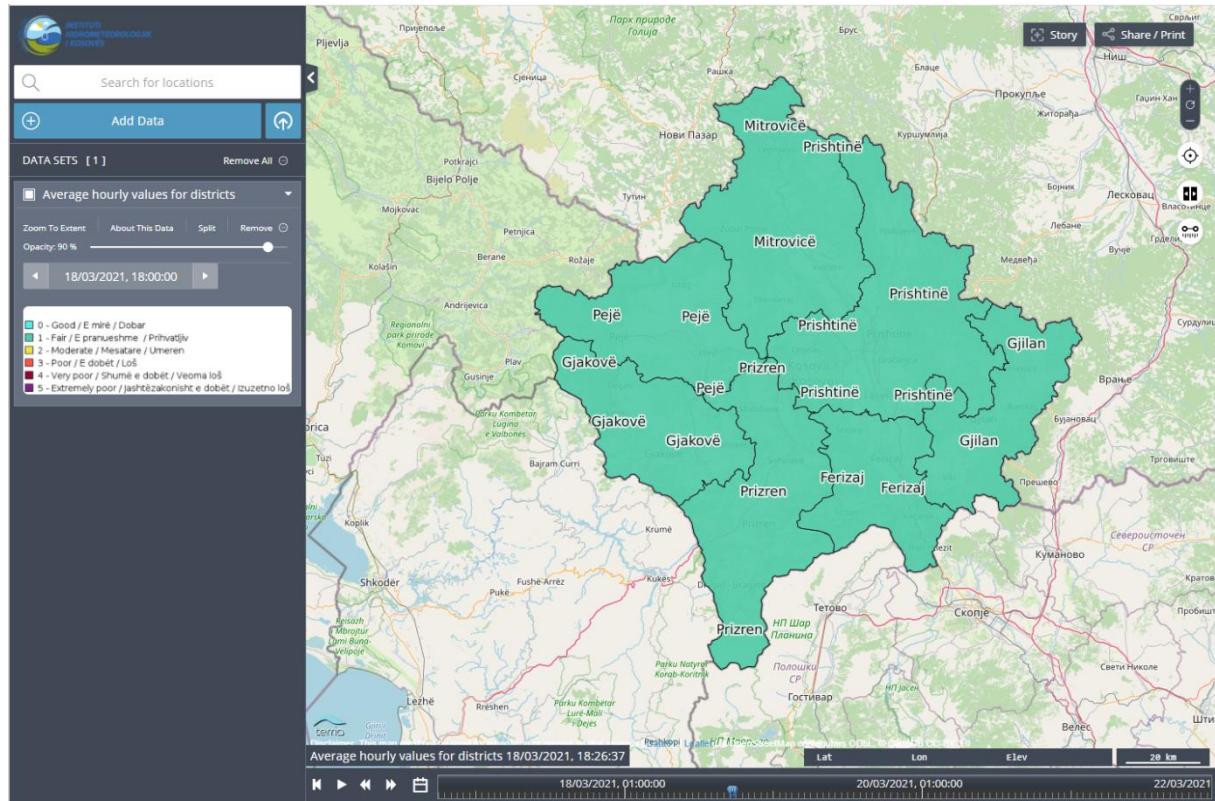
The map displays hourly values for ozone – 3-day forecast and the last 24 hours.



After clicking any point on the map of Kosovo, you will see the highlighted isolines for that point and a pop-up window with the name of the substance, time and concentration value.

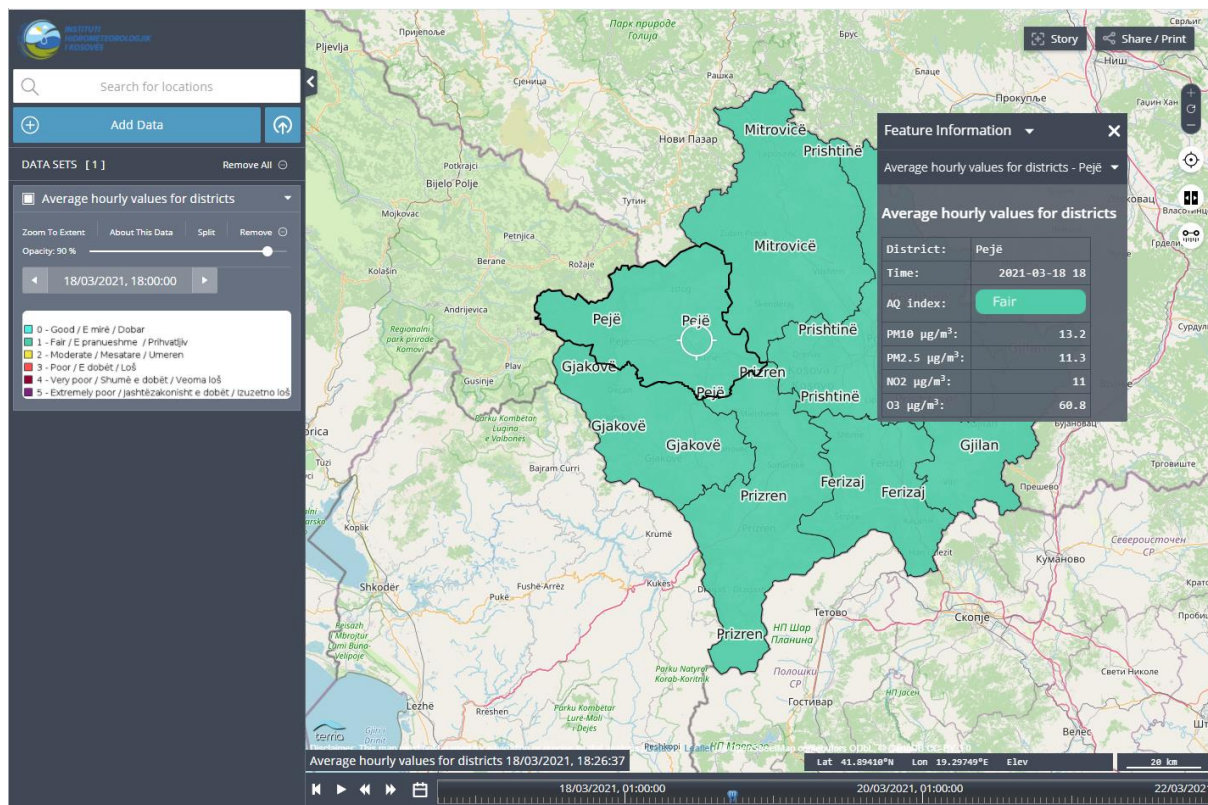
## h. Districts – 3-day forecast data for Kosovo

The map displays hourly values for districts – 3-day forecast and the last 24 hours.

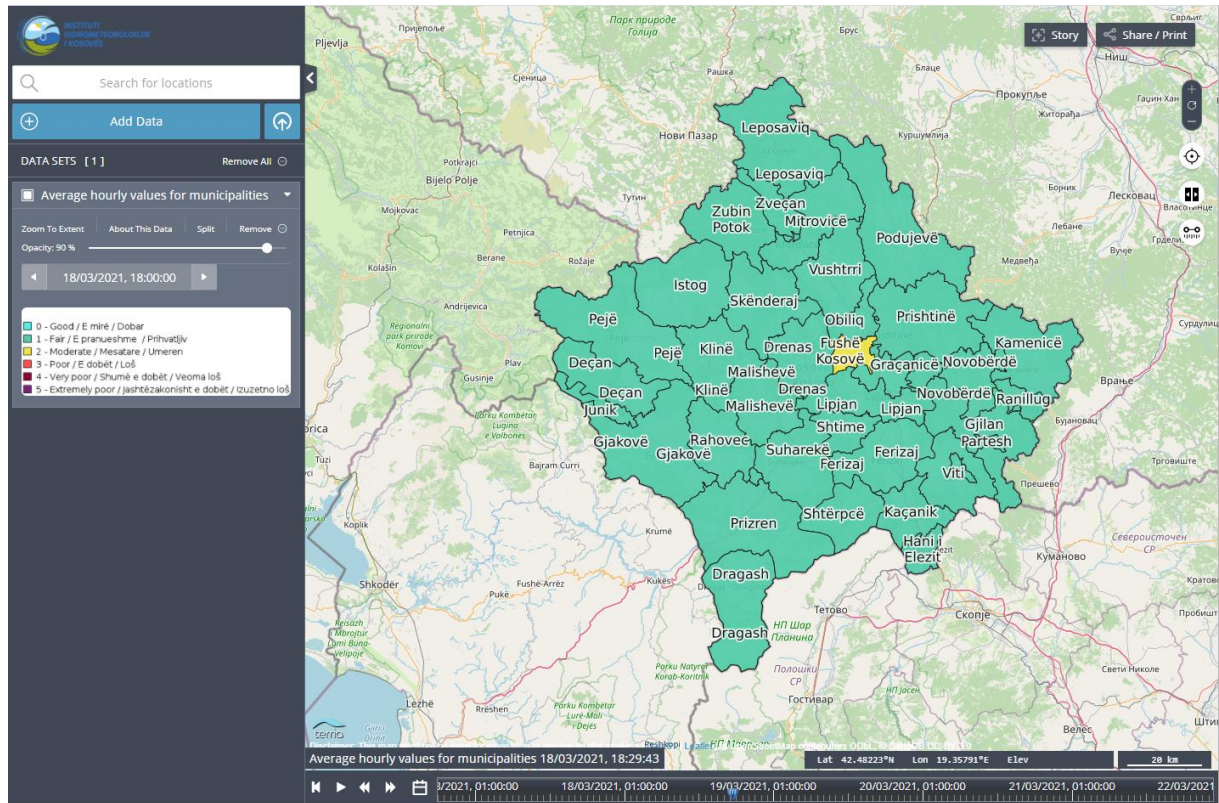




After clicking any point on the map of Kosovo, you will see district border highlighted for that point and pop-up window with the district name, time, description of the AQ Index level and the names and concentration values for all substances.

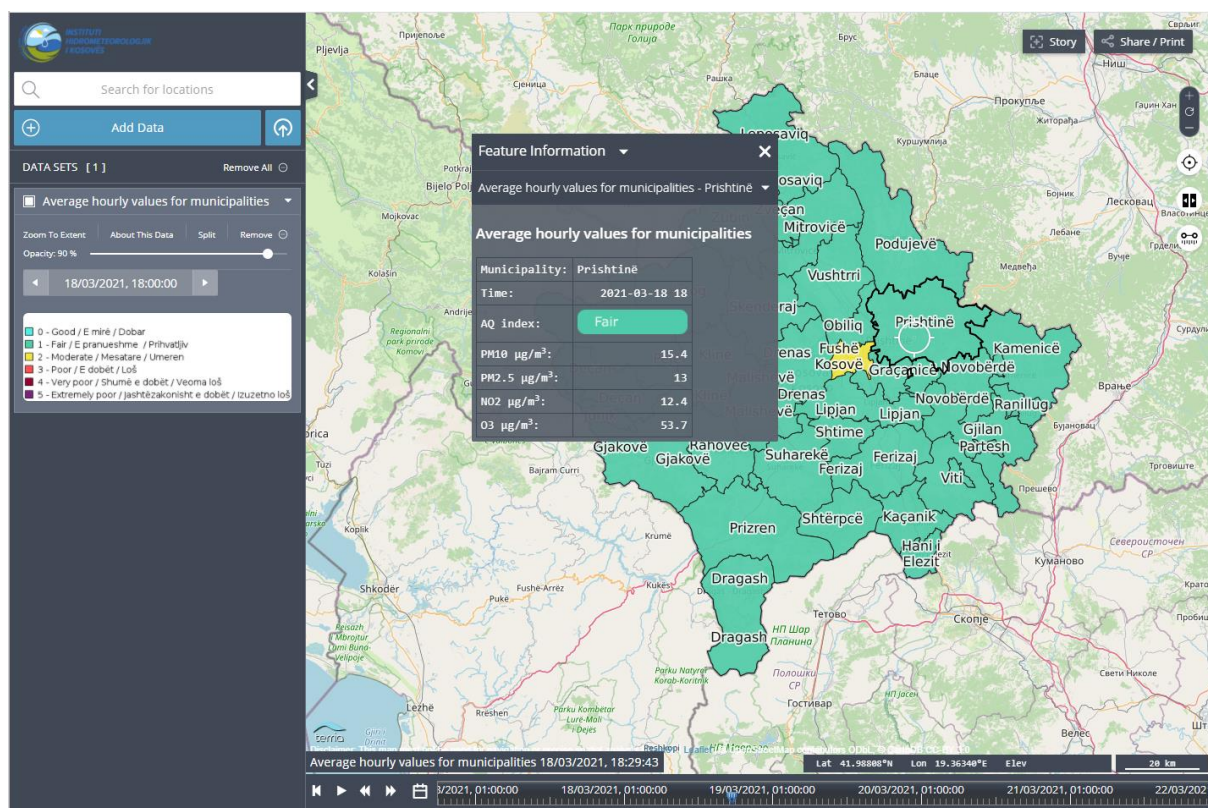


The map displays hourly values for municipalities – 3-day forecast and the last 24 hours.



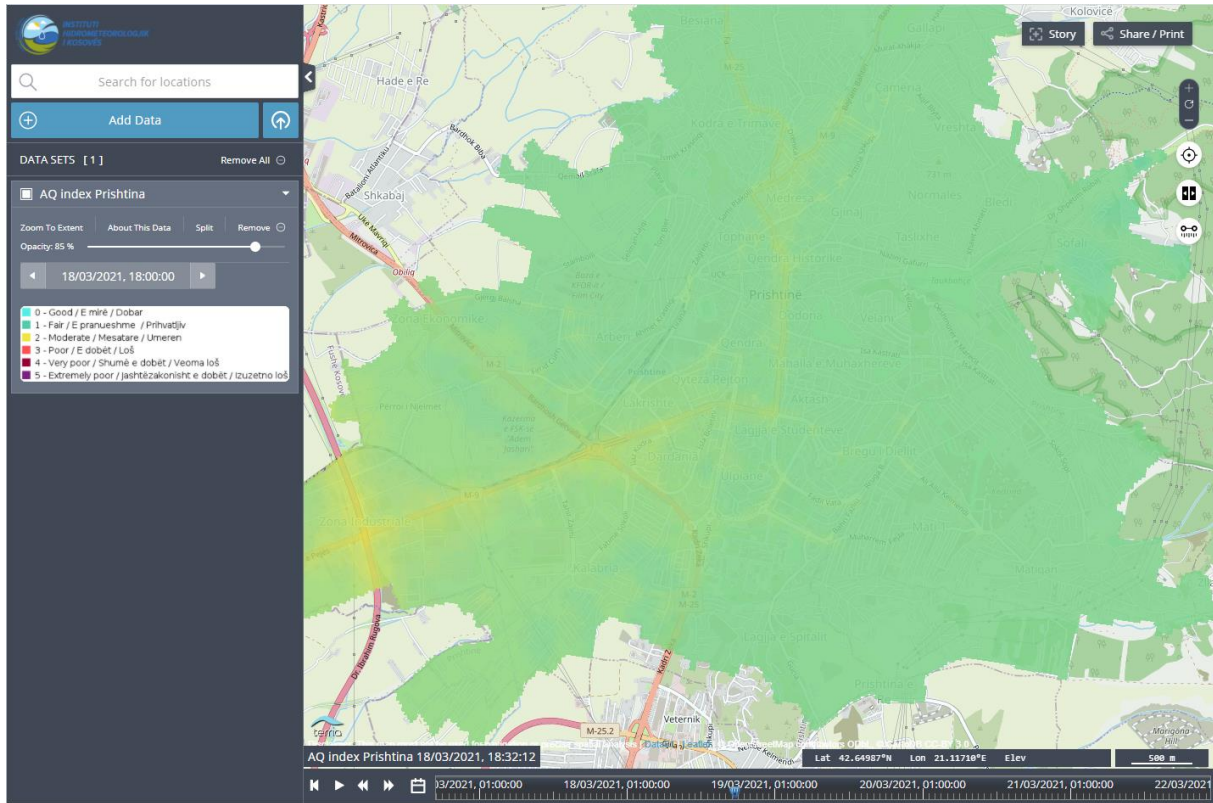


After clicking any point on the map of Kosovo, you will see municipality border highlighted for that point and pop-up window with the municipality name, time, description of the AQ Index level and the names and concentration values for all substances.

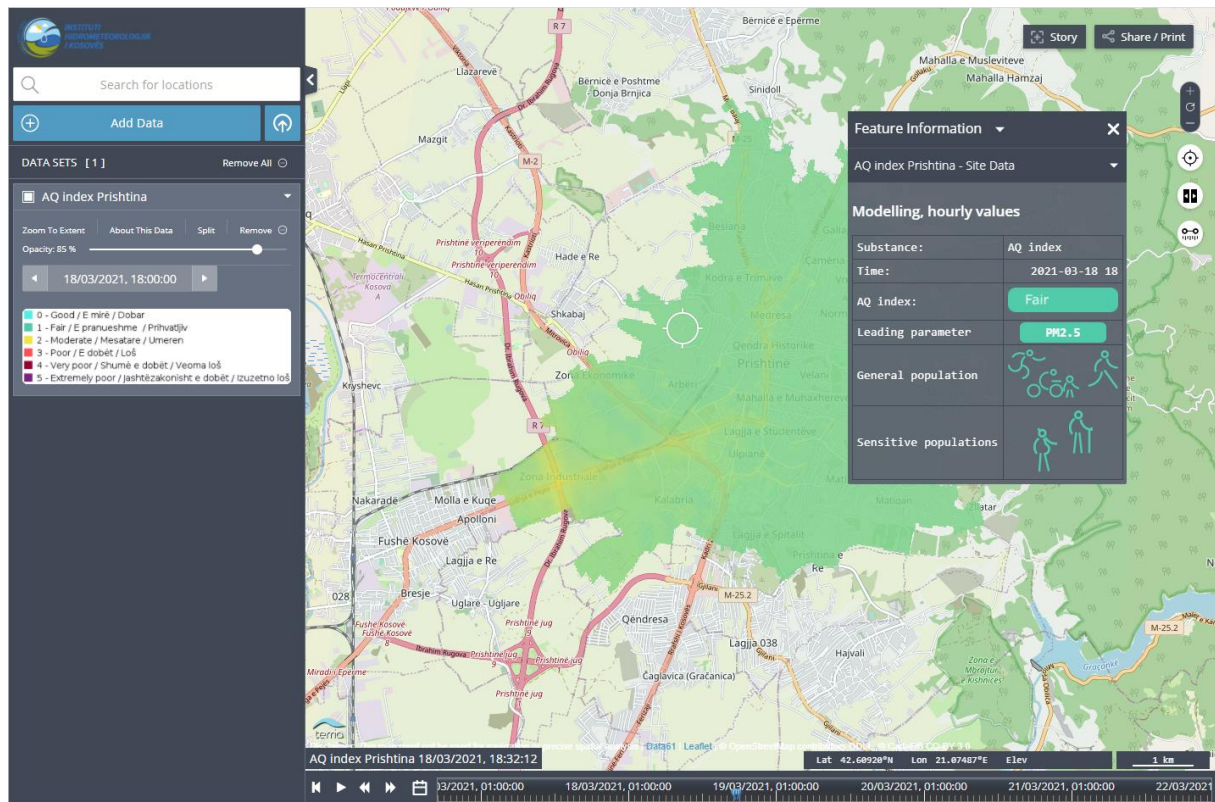


## j. AQ Index – 3-day forecast data for Prishtina

The map displays hourly values for Air Quality Index – 3-day forecast and the last 24 hours.



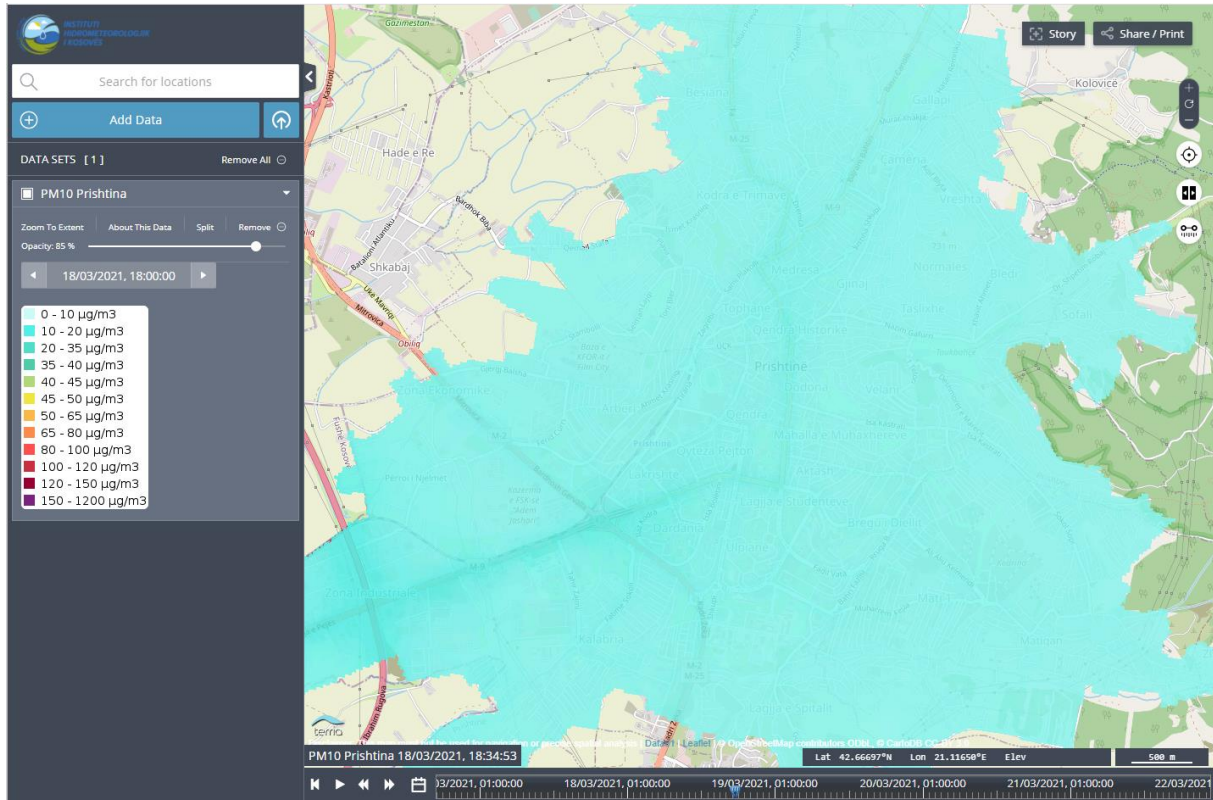
After clicking any point on the map of Prishtina, you will see a pop-up window with the time, description of AQ Index level, leading parameter name and health recommendations.





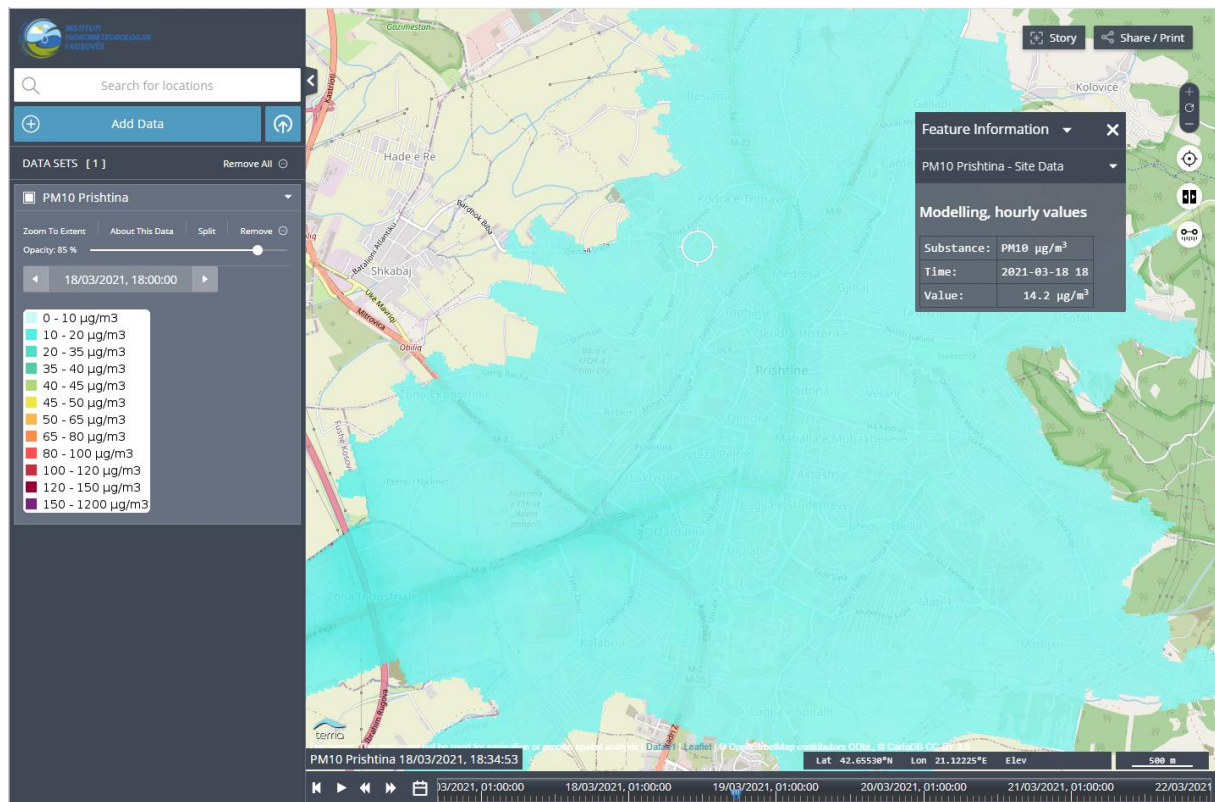
## k. PM10 – 3-day forecast data for Prishtina

The map displays hourly values for PM10 – 3-day forecast and the last 24 hours.



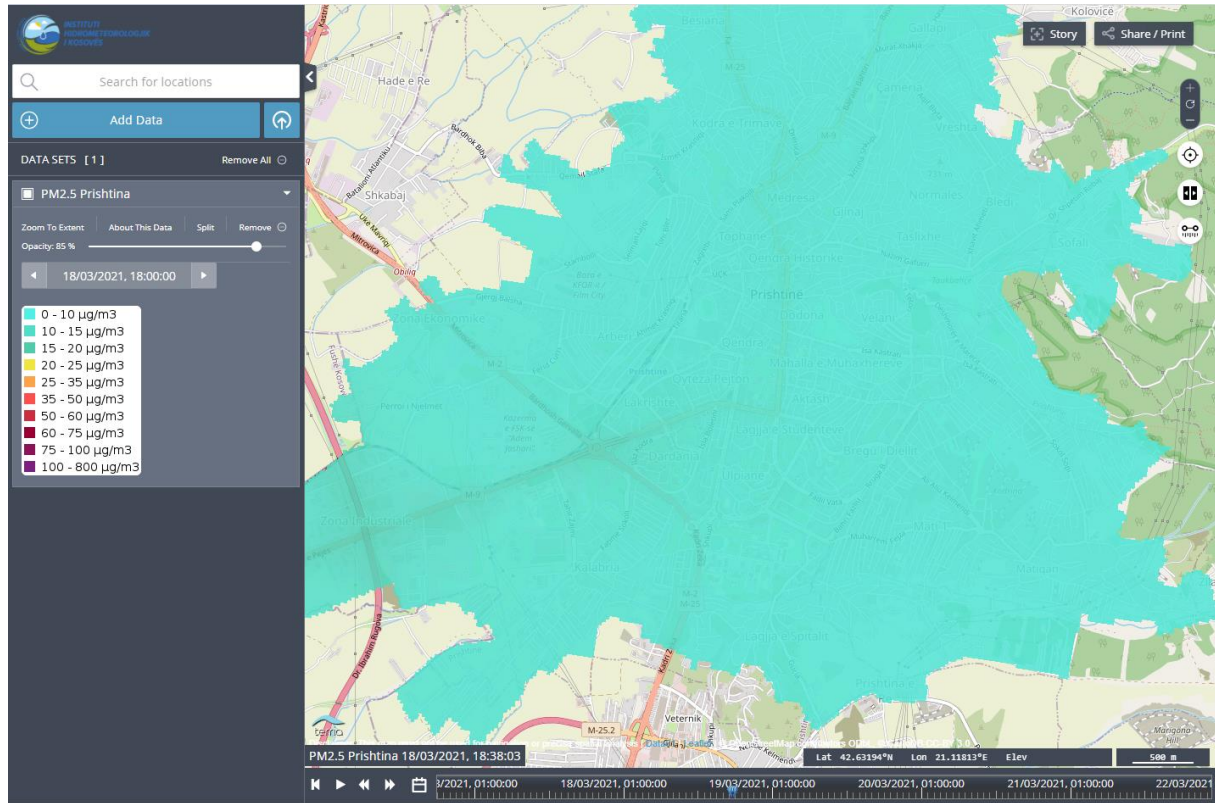


After clicking any point on the map of Prishtina, you will see a pop-up window with the name of the substance, time and concentration value.



## I. PM2.5 – 3-day forecast data for Prishtina

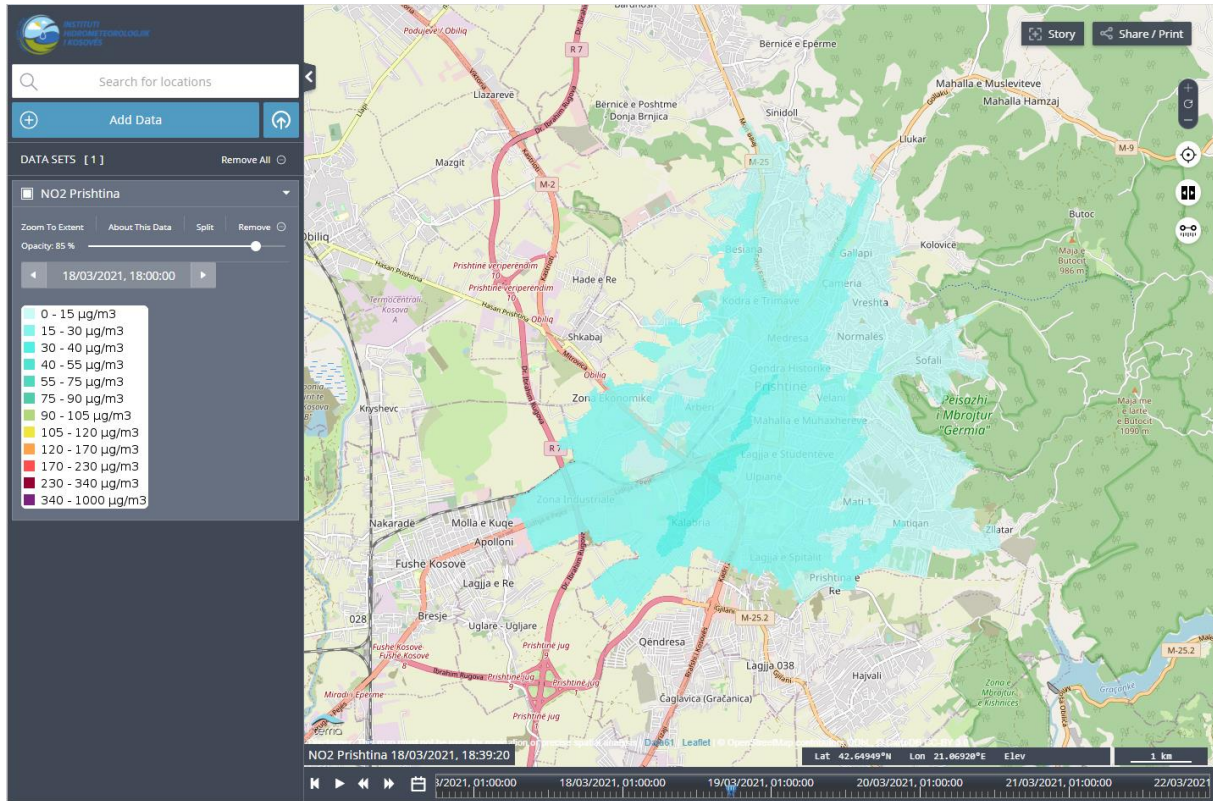
The map displays hourly values for PM2.5 – 3-day forecast and the last 24 hours.



After clicking any point on the map of Prishtina, you will see a pop-up window with the name of the substance, time and concentration value.

### m. NO<sub>2</sub> – 3-day forecast data for Prishtina

The map displays hourly values for NO<sub>2</sub> – 3-day forecast and the last 24 hours.

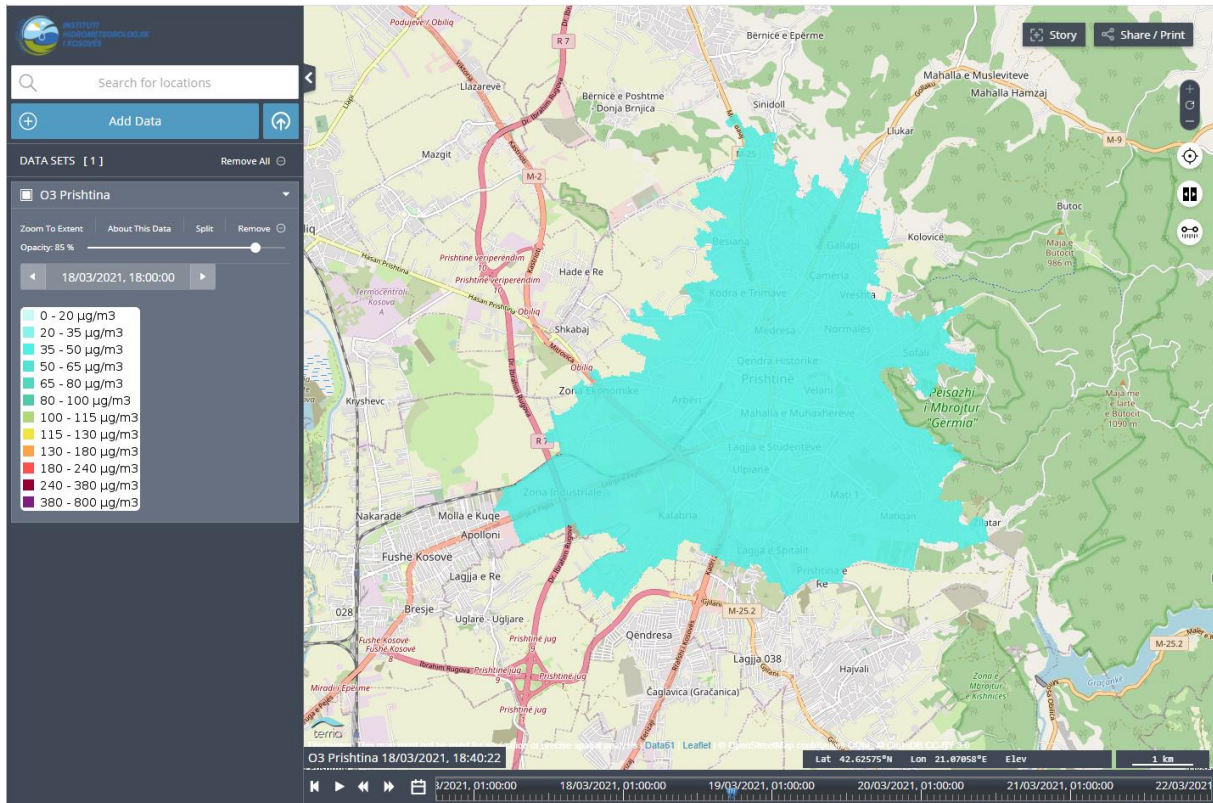


After clicking any point on the map of Prishtina, you will see a pop-up window with the name of the substance, time and concentration value.



## n. O<sub>3</sub> – 3-day forecast data for Prishtina

The map displays hourly values for ozone – 3-day forecast and the last 24 hours.



After clicking any point on the map of Prishtina, you will see a pop-up window with the name of the substance, time and concentration value.



## 5. Reports

### a. Air quality from the last 24 hour/30 days/365 days for monitoring stations

The report is displayed on front page in the report section.

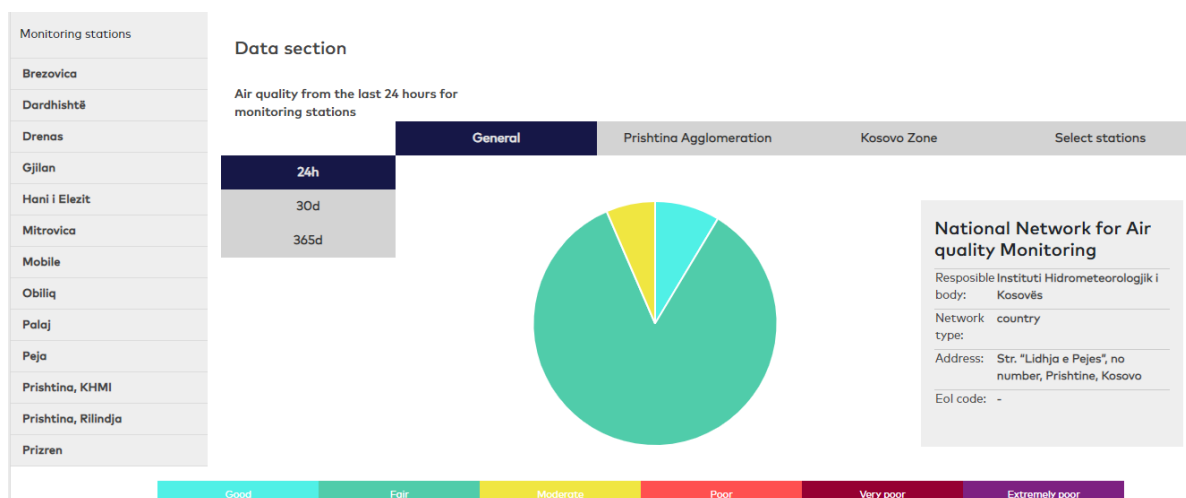
The report indicates the percentage of hourly measurement results from monitoring stations for individual AQ Index levels for these measurements over the last selected period.

For example, if a pie chart shows that 75% of the air quality is “fair”, it means that 75% of hourly indices of all stations in the last selected period were in a "fair" state.

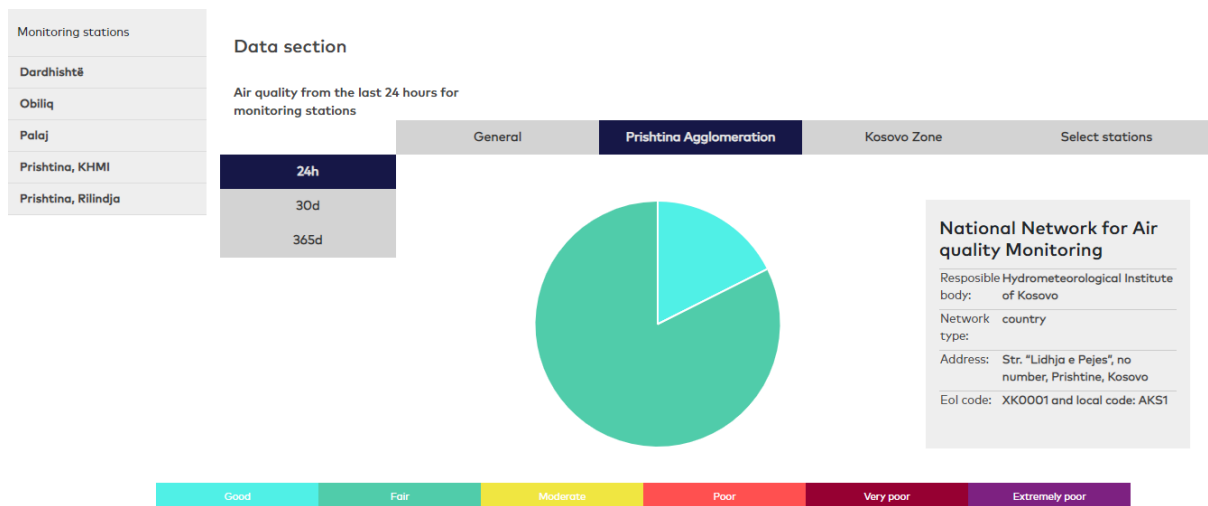
The report can be run for three groups of monitoring stations and for stations selected separately, and within each group, you can select a period (24 hours, 30 or 365 days).

In the panel on the left is displayed an appropriate list of the stations. When the user clicks on a station, a popup will be displayed with the details of the selected station.

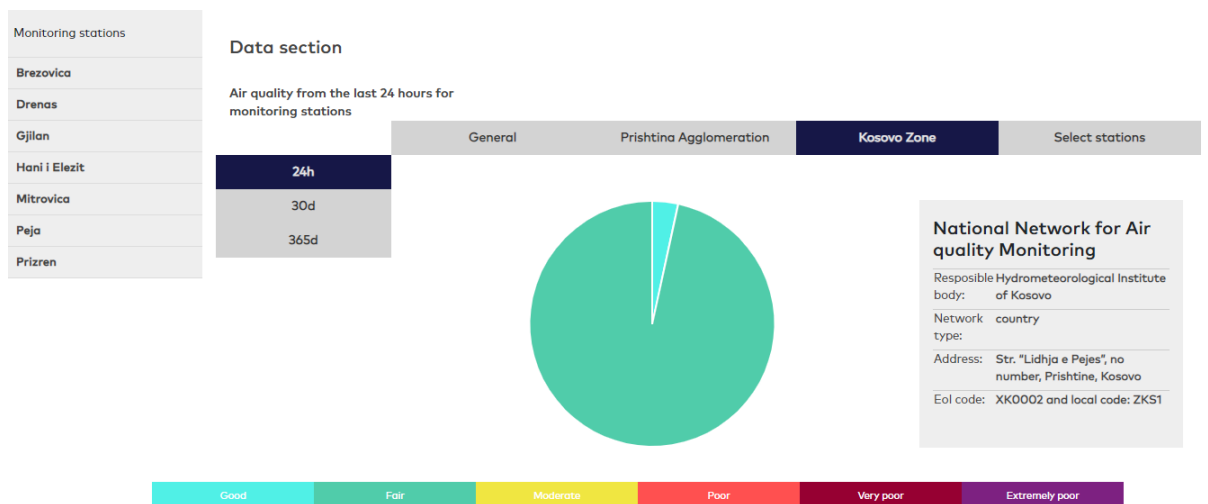
- General (all stations in Kosovo):



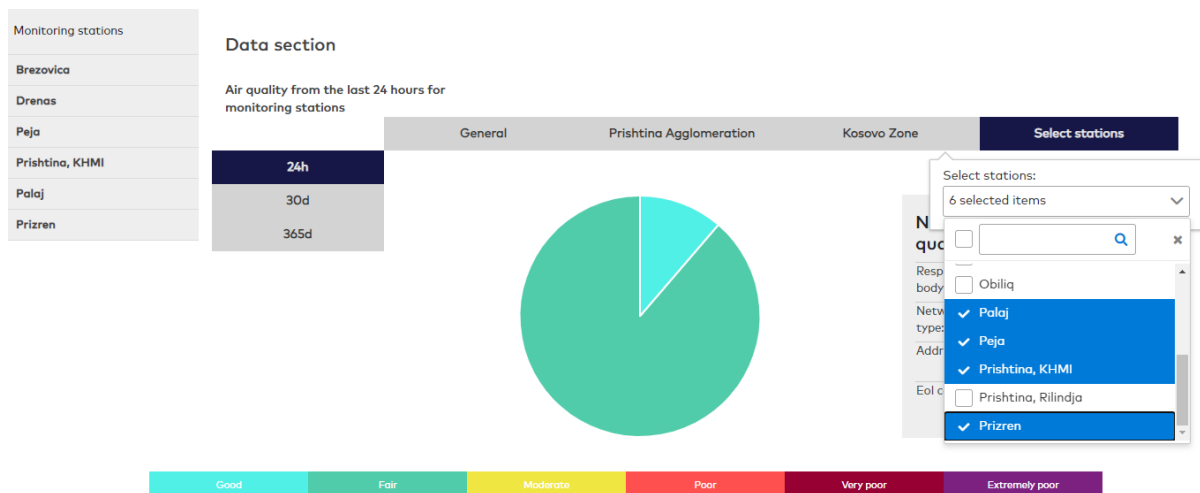
- Prishtina Agglomeration:



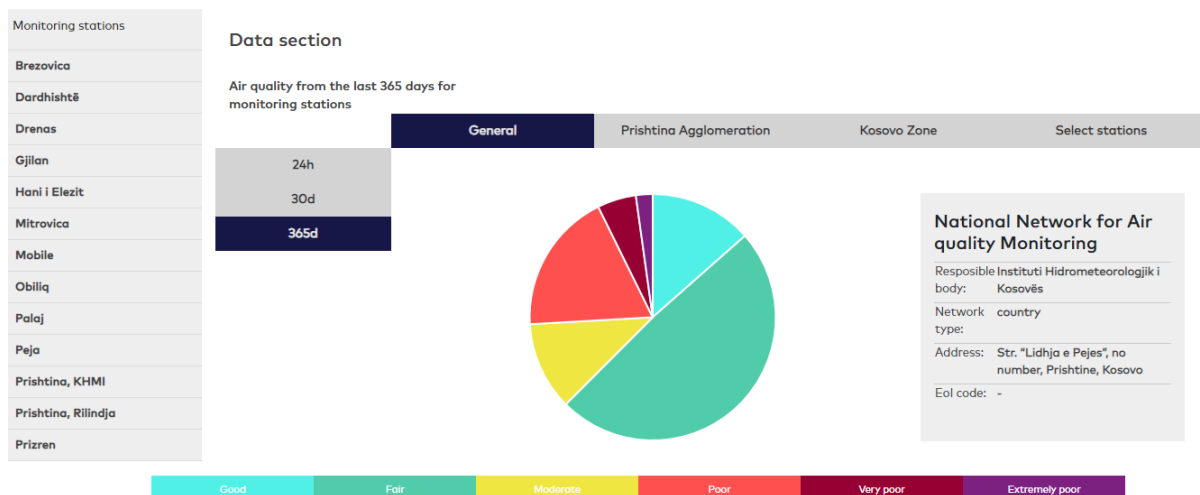
- Kosovo Zone (other stations – outside of Prishtina agglomeration):



- Selected stations:



- General (all stations in Kosovo) from the last 365 days:



## b. Data from monitoring stations

Data from the monitoring stations can be viewed using the **Data from monitoring stations** item from the **Monitoring data** menu.

Hourly concentration measurements from the stations are used for reporting calculations – for all substances.

Data are displayed for selected parameters and stations in a given time resolution and time range.

Hourly line charts with selected criteria are displayed below.

## Data from monitoring stations

Provisional data.

It is possible that there are missing data points for some parameters at interspersed periods of time. This situation may be caused by a hardware or software failure.

Parameters

7 selected items

Stations

13 selected items

Time resolution

hourly

daily

monthly

annual

Time range

8h

24h

48h

select date

Apply

Start date:

2021-03-26

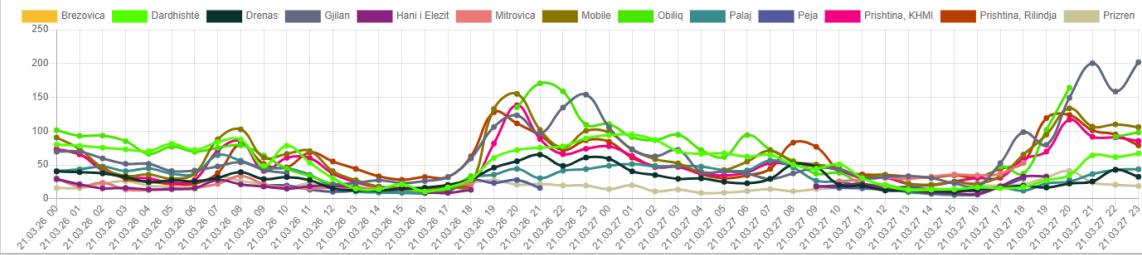
End date:

2021-03-27

Charts

Table

PM10  $\mu\text{g}/\text{m}^3$  :





The user can select multiple parameters and stations. An example is below.

Parameters

5 selected items

☐

☐ NO<sub>2</sub>

☒ NO

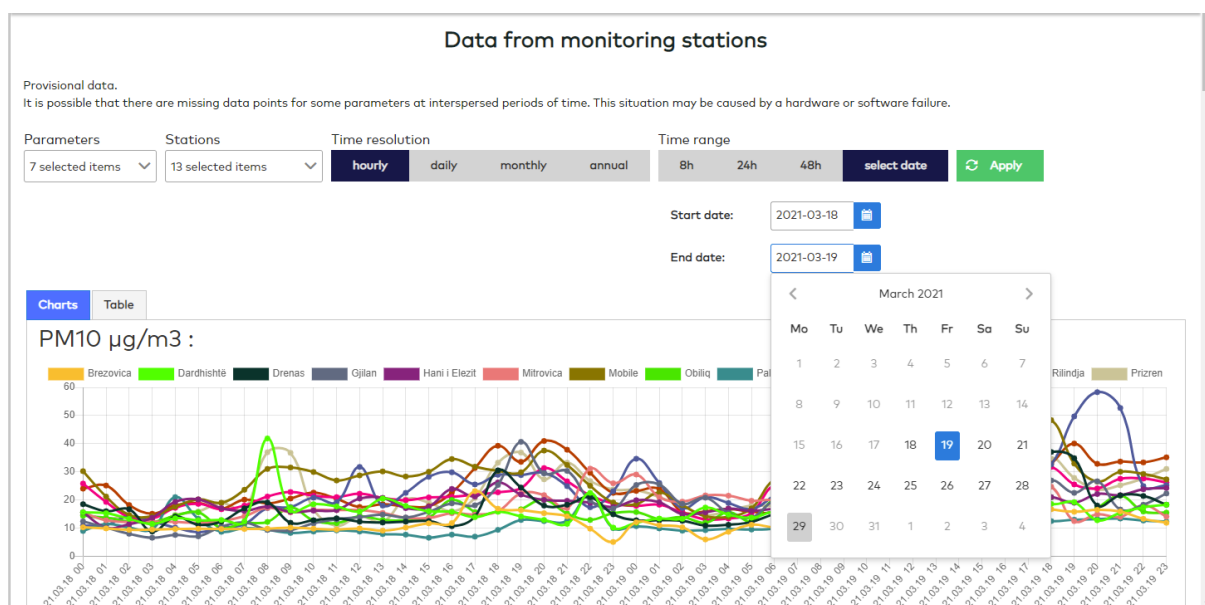
☐ O<sub>3</sub>

☐ SO<sub>2</sub>

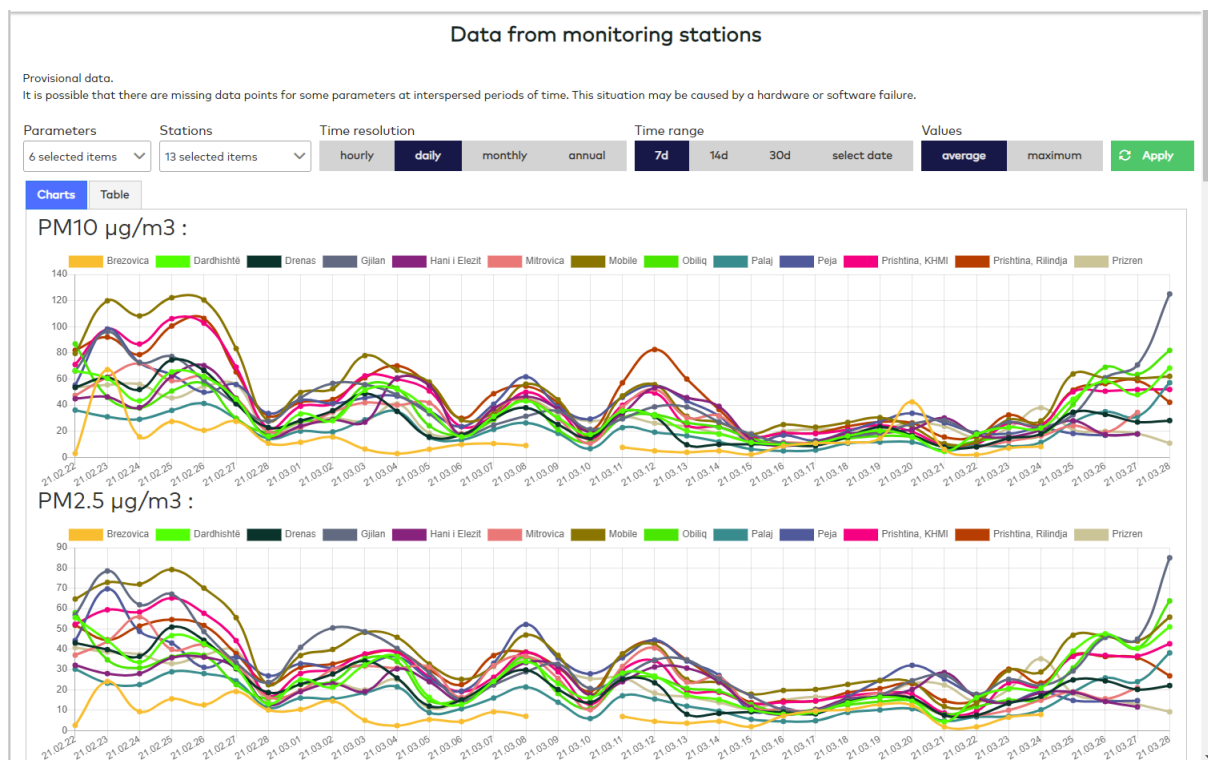
☒ CO

☒ Index

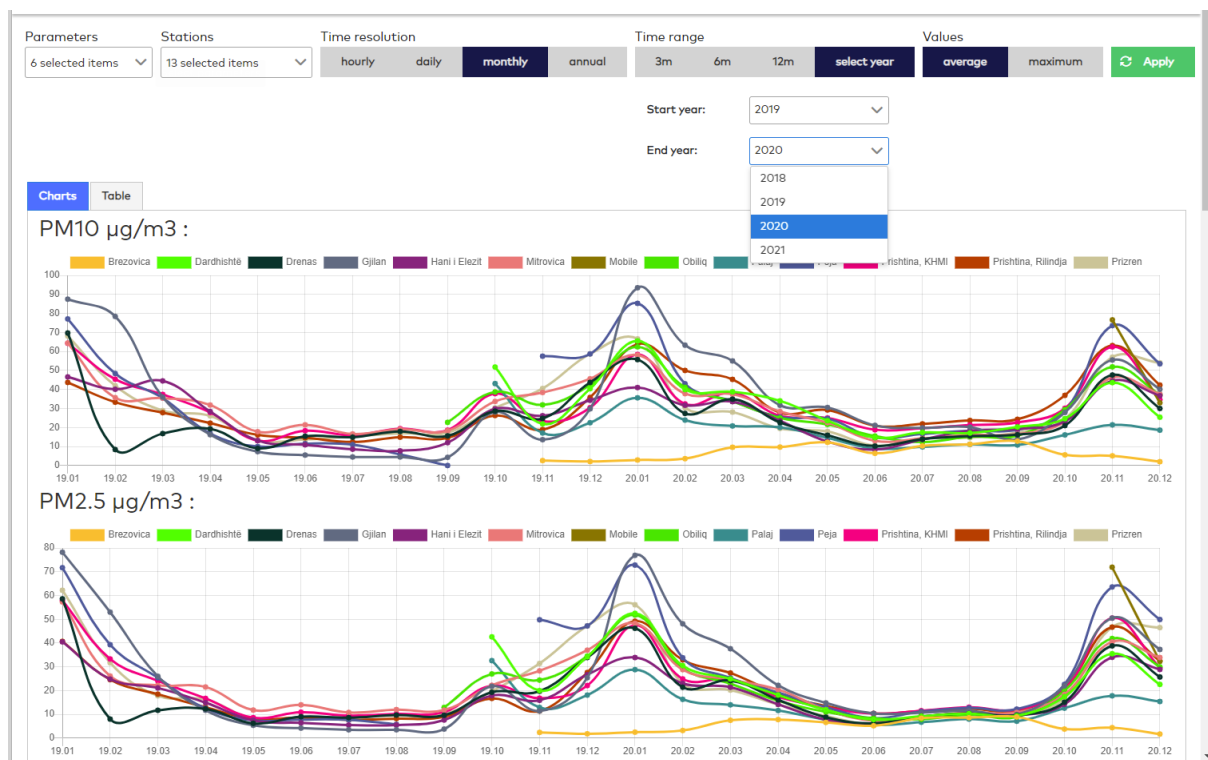
In the hourly time resolution, the user can select a time range (8, 24 or 48h) or a date range from the calendar.



In the daily time resolution, the user can select a time range (7, 14 or 30 days) or a date range from the calendar. There is also a choice of data type (average, maximum).



In the monthly time resolution, the user can select a time range (3, 6 or 12 month) or a year range from the list. There is also a choice of data type (average, maximum).



In the annual time resolution, the user can select a year range from the list. There is also a choice of data type (average, maximum).



To apply the criteria, click the *Apply* button.



To display the data in tabular form, click the *Table* tab. The report data will be displayed in a paged table.

Parameters

Stations

Time resolution

Time range

7 selected items

4 selected items

hourly

daily

monthly

annual

8h

24h

48h

select date

Apply

Charts

Table

CSV

EXCEL

Station	Date	Hour	PM10 µg/m3	PM2.5 µg/m3	NO2 µg/m3	O3 µg/m3	SO2 µg/m3	CO mg/m3	AQ Index	Leading parameter
Drenas	2021-03-27	15	10.8	7.3	5	111.5	1.4	0.2	2	PM2.5
Drenas	2021-03-27	16	13.6	8.8	8.4	106.7	1.5	0.3	2	PM2.5
Drenas	2021-03-27	17	16.4	9.5	12.3	96.4	1.3	0.3	2	PM2.5
Drenas	2021-03-27	18	19.2	14.5	15	92.5	2.2	0.4	2	PM2.5
Drenas	2021-03-27	19	16.7	12.1	12.8	97.9	1.9	0.4	2	PM2.5
Drenas	2021-03-27	20	22.6	17.6	15.9	88.7	3.8	0.5	2	PM2.5
Drenas	2021-03-27	21	25.7	18.2	17.4	83.5	3	0.5	2	PM2.5
Drenas	2021-03-27	22	43	30.6	32.4	52.5	5.5	0.9	2	PM2.5
Drenas	2021-03-27	23	32.6	24.9	25.7	54.6	6	0.8	2	PM2.5
Drenas	2021-03-28	0	33.1	25.6	23.8	40.1		0.7	1	PM2.5
Drenas	2021-03-28	1	23.2	18.6	18.8	35.8	1.1	0.5	1	PM2.5
Gjilan	2021-03-27	15	22.8	12.5	12.4	102.8			3	PM2.5
Gjilan	2021-03-27	16	19	10.4	7.1		0.9	0.2	3	PM2.5
Gjilan	2021-03-27	17	52.7	25.1	21.3	93.2	1.6	0.4	3	PM2.5
Gjilan	2021-03-27	18	98.6	51.2		53.9	2.2	1.1	3	PM2.5
Gjilan	2021-03-27	19	79.7	43.6	46.6	53.5	2.2	1.1	3	PM2.5
Gjilan	2021-03-27	20	149.3	85	98.2	18.1	2.7	2.7	3	PM2.5
Gjilan	2021-03-27	21	200.4	111.5	93.2	18.5	3.5	3.7	3	PM2.5
Gjilan	2021-03-27	22	158.6	92.4	77.7	17.3	3.8	3.4	3	PM2.5

You can export the table to a CSV or Excel file by clicking the appropriate key above the table.

### c. Annual statistics

The *Annual statistics* report contains annual average concentrations and exceedances statistics for the calendar year, based on the EU standards.

Description of the air quality standards is presented in the table below:

Parameter	Annual concentration limit	24 h limits		8 h limits		1 h limits	
		Concentration	Exceedances	Maximum daily 8 h mean concentration	Exceedances	Concentration	Exceedances
PM10	40 µg/m³	50 µg/m³	35				
PM2.5	25 µg/m³						
NO <sub>2</sub>	40 µg/m³					200 µg/m³	18
SO <sub>2</sub>		125 µg/m³	3			350 µg/m³	24
O <sub>3</sub>				120 µg/m³	25		
CO				10 mg/m³	0		

The report can be started using the **Annual statistics** item from the **Monitoring data** menu.


The user can select multiple stations and one year.

Sample report is shown below:

#### Annual statistics

Stations  
11 selected items ▼

Year  
2019 ▼

 Apply

Reporting year: 2019

Station: Dardhishtë

Parameter	Average annual concentration	Exceedances 24 h	Exceedances 8 h	Exceedances 1 h
PM10	38.0 µg/m3	17		
PM2.5	32.3 µg/m3			
NO2	19.1 µg/m3			0
SO2	12.2 µg/m3	0		0
O3	32.5 µg/m3		0	
CO	5.8 mg/m3		0	

#### d. Average data for districts

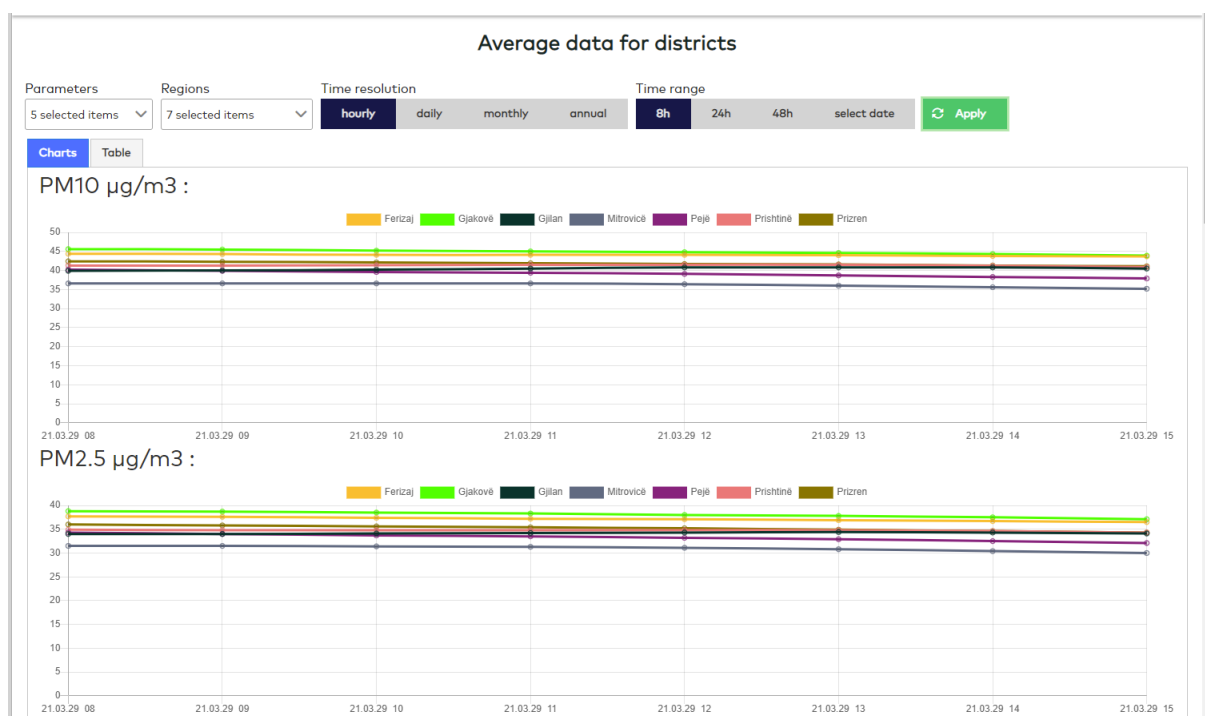
Data for districts can be viewed using the **Average data for districts** item from the **Forecast data** menu. Forecast data is used for the calculations.

Data from the modeling grid are used for reporting:

- for gases - hourly average concentration values,
- for PM10 and PM2.5 – 24-hour running averages.

The calculated data contains average concentrations for selected parameters and districts in a given time resolution and time range.

Line charts with default criteria are displayed below.



The criteria for the time resolution and time range are the same as for reports from monitoring stations. Similarly - running the report and using the tabular form.

## e. Average data for municipalities

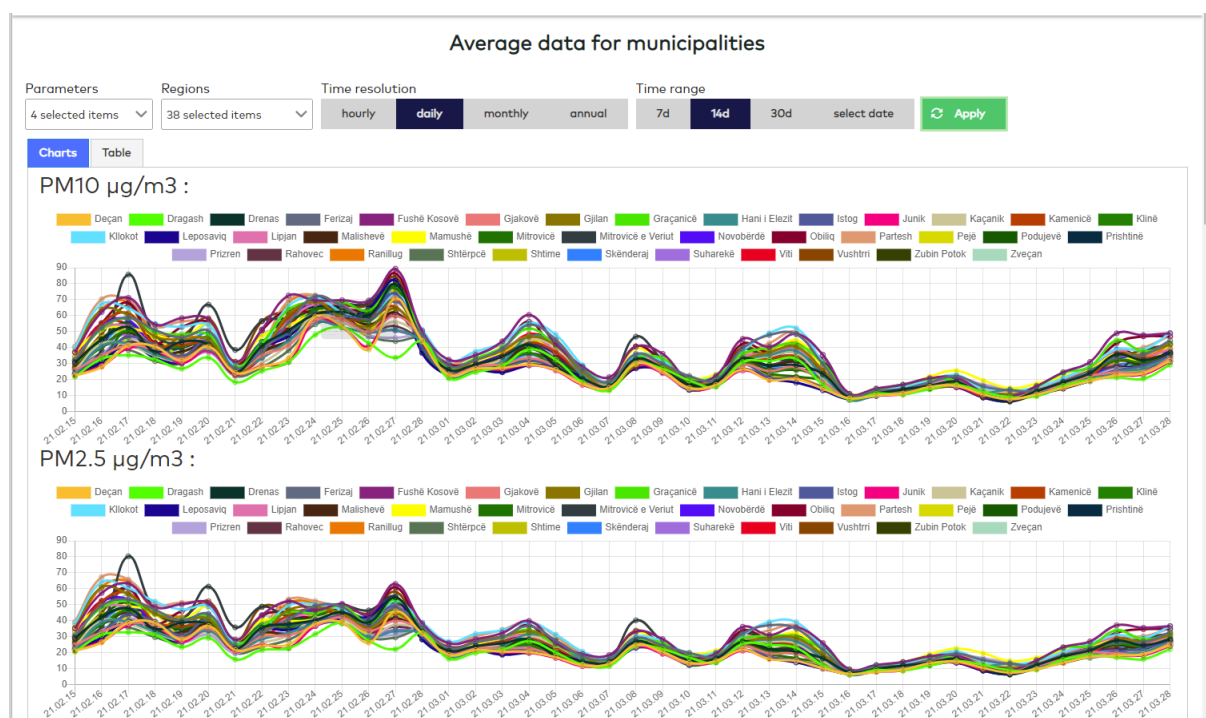
Data for municipalities can be viewed using the **Average data for municipalities** item from the **Forecast data** menu.

Data from the modeling grid are used for reporting:

- for gases - hourly average concentration values,
- for PM10 and PM2.5 – 24-hour running averages.

The calculated data contains average concentrations for selected parameters and municipalities in a given time resolution and time range.

Line charts with selected criteria are displayed below.



Applying criteria and handling reports is the same as for district data.