



**Copernicus Climate Change Service**



# **Urban SIS**

## **D4.4 Visualisation report**

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# **Urban SIS**

## **D4.4 Visualisation report**

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## Introduction

This report summarizes the work on interface design and visualisation for the data portal in WP4 lead by Veryday. During the work input has been collected via workshops and end user interviews to create guide lines for the design of the web portal. The guidelines consist of a user guide that describes how the user can search and download Urban SIS data.

In this report we start with a brief overview of the used method and summarize some of the main features of the design. The full design journey is presented in Appendix A.

## Design method

In order to understand and establish the relevant data and functionality requirements, as seen from the end user perspective a number of qualitative end user interviews were conducted prior to initiating the design phase. The interviews were explorative and generative in nature. The synthesized outcome set the scope for the UX design and system requirements.

## Workshops and interviews

The work has been performed using an iterative approach where workshops and interviews has been used as input to the design process. The following steps have been performed to collect input to the design proposal for the interface.

Date	Activity	Participants	Description
Dec 17 <sup>th</sup> 2015	Workshop	End users from Stockholm	Urban SIS workshop with Stockholm end users to get a first introduction to the problem space.
Feb 20 <sup>th</sup> 2016	Workshop	End users from Bologna	Urban SIS workshop with Bologna end users to get a first introduction to the problem space.
Apr 22 <sup>nd</sup> 2016	Workshop	SMHI, Veryday	Internal workshop between WP4 and WP7 to discuss general user and data requirement and review portals with similar data content.
<b>May 1<sup>st</sup></b>	<b>Report</b>		<b>First mock-up of the user journey</b>
May 12 <sup>th</sup> 2016	Interview	SMHI end users	Review of the mock-up based on the user's need.
May 26 <sup>th</sup> 2016	Interview	Stockholm Vatten end user	Review of the mock-up based on the user's need.
May 26 <sup>th</sup> 2016	Interview	WSP end user	Review of the mock-up based on the user's need.
<b>June 2016</b>	<b>Report</b>		<b>Second version of the mock-up based on user interviews.</b>
Sep 1 <sup>st</sup> 2016	Workshop	SMHI, Veryday	Internal workshop between WP4 and WP7 to discuss and prioritize functionality
<b>Oct 2016</b>	<b>Report</b>		<b>Final version of the mock-up.</b>

## Results

The design resulting from this workshop is presented in Appendix A. In this section we summarize some of the main features.

### Search for indicators

There are a large numbers of indicators produced for each city within Urban SIS. It is important that the user easily gets an overview of indicators. Therefore the design proposes to present



indicators as an hierarchy, based on the hierarchy defined in the indicator report D4.2. In this hierarchy the user can choose based on category and, in addition, there is a possibility to search indicators by writing, where matching items in the hierarchy will be highlighted (figure 1 left)

Once a main indicator has been selected the a menu will appear where the user can choose details about which statistics of the indicator he wants to visualise on the map at the top or as a graph at the bottom.

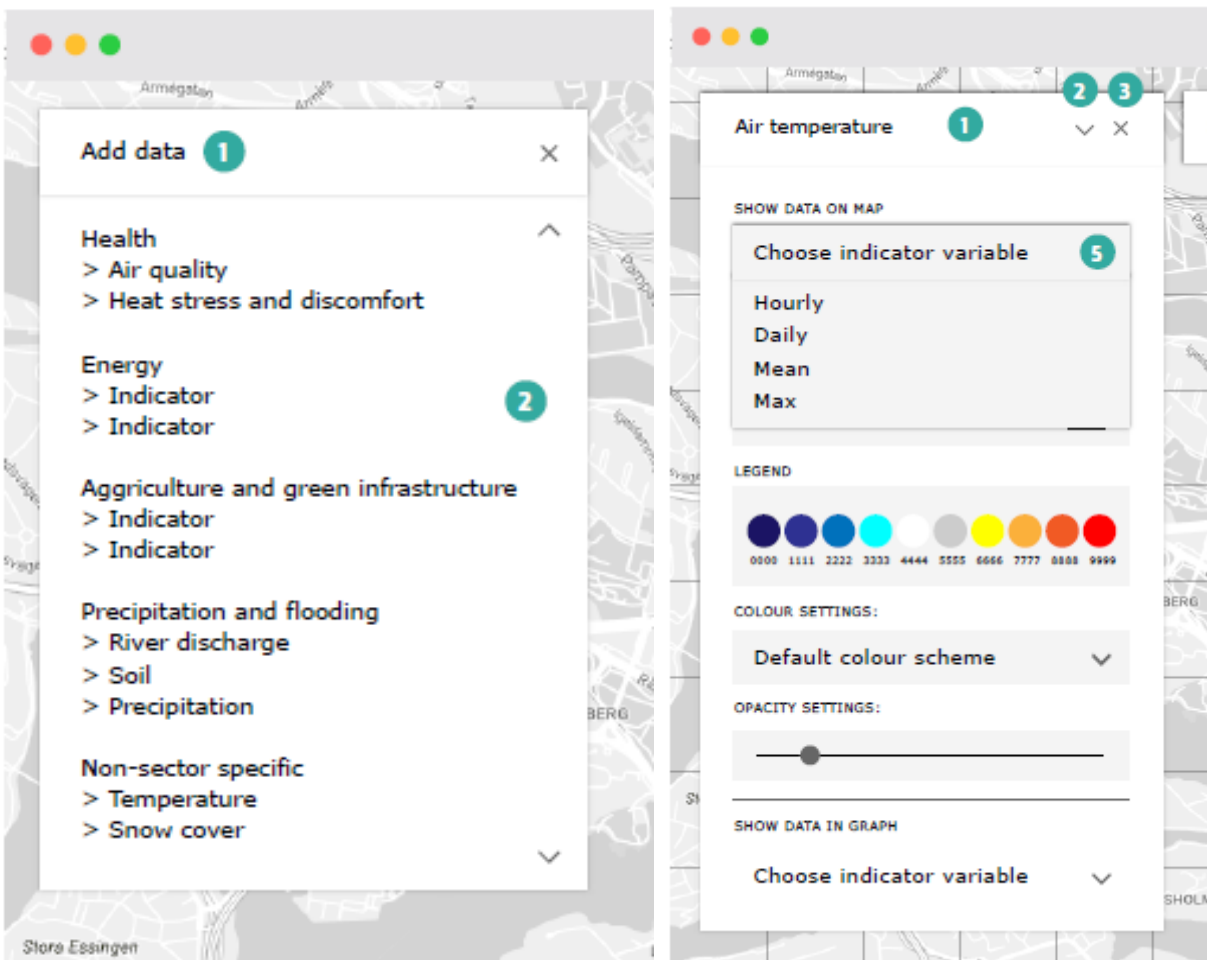


Figure 1: Selection of indicators.

### Identifying relevant data

One main use case that has been identified for the portal is to find an event of interest and then select a subset of data (time and space) based on this event. In the design, this is accomplished by allowing the user to show time series data for selected points and use this information to identify events and select which time periods to show on the portal. Figure 2 shows the design for this and figure 3 shows how it is currently implemented in the portal with real data for a rain event.



Figure 2: Showing time series data as a basis for selecting interesting events for further discovery or download.

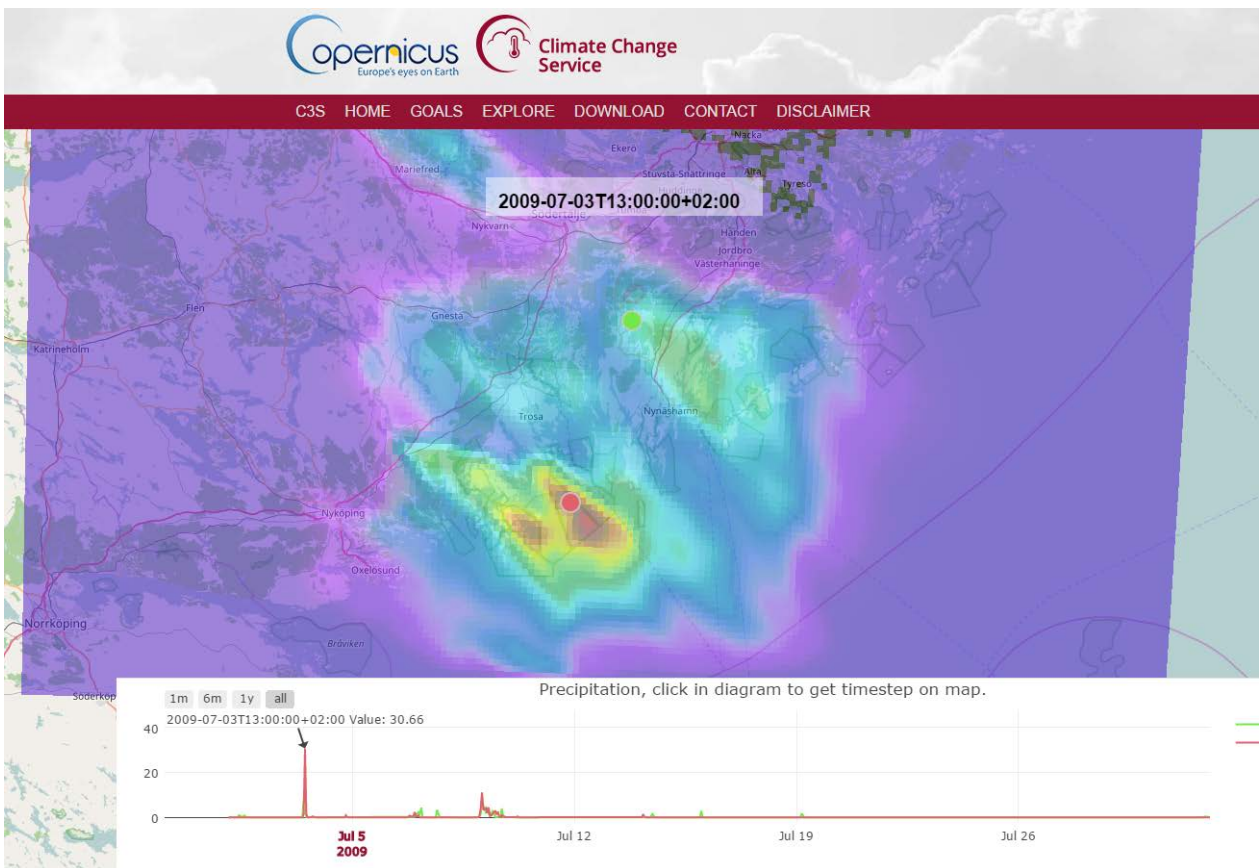


Figure 3: Detail from how this functionality is implemented in the portal with real precipitation data.



## Saving and sharing interesting views

To make it easy to save interesting views of the data and then continue exploring the rightmost pane contains a button for saving an interesting view (figure 4 left). The button “saved views” shows a list of all views that has been saved during the current session. A sample list of saved views is showed to the right in figure 4. Based on this list the user can return to any of the views, share views to other users, or remove views that are no longer interesting.

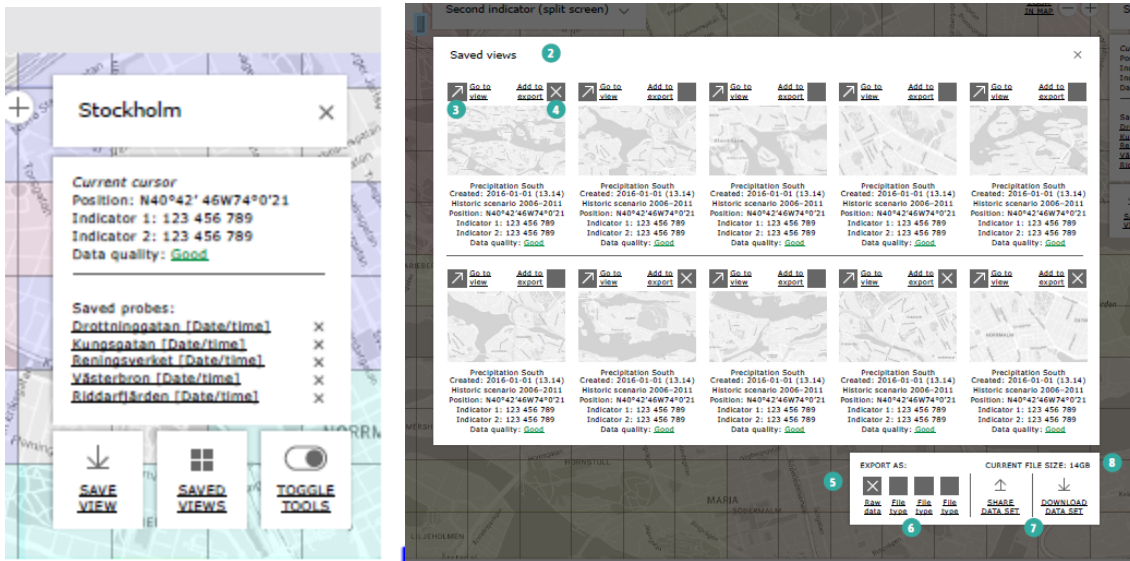


Figure 4: Saving and sharing views.

## Exporting data

The list of saved views is also the basis for export of data. The idea is that the user selects which of the views he wants to export and then the desired export format. The user will then export data relevant for this view, i.e. data for the selected probes and time period currently shown in the view. However, the user will be presented with details of the current export and will be able to further specify or change these settings. For instance, if export of data for an area instead of for specific points is desired, the user will be requested to specify this area.

Currently we plan to support export as NetCDF and at least one additional format, probably csv or GeoTIFF. The final decision on details of data export will be taken together with end users and based on tests with actual data.

## Further work

WP 7 has already started the process of adapting the design to the look and feel required by Copernicus C3S. A first version of the updated portal is already available on the Urban SIS web pages (See <http://urbansis.climate.copernicus.eu/> menu item “Access ECV:s and indicators”.) This version contains all features of the suggested design except the split window functionality. During early 2017 more data and information will be added to the portal. This will allow further user input during the spring 2017 and, based on end-user experiences in Stockholm and Bologna, modifications of the system during fall 2017.





## Appendix1: User journey in the Urban SIS portal



*People Design Innovation*

SMHI

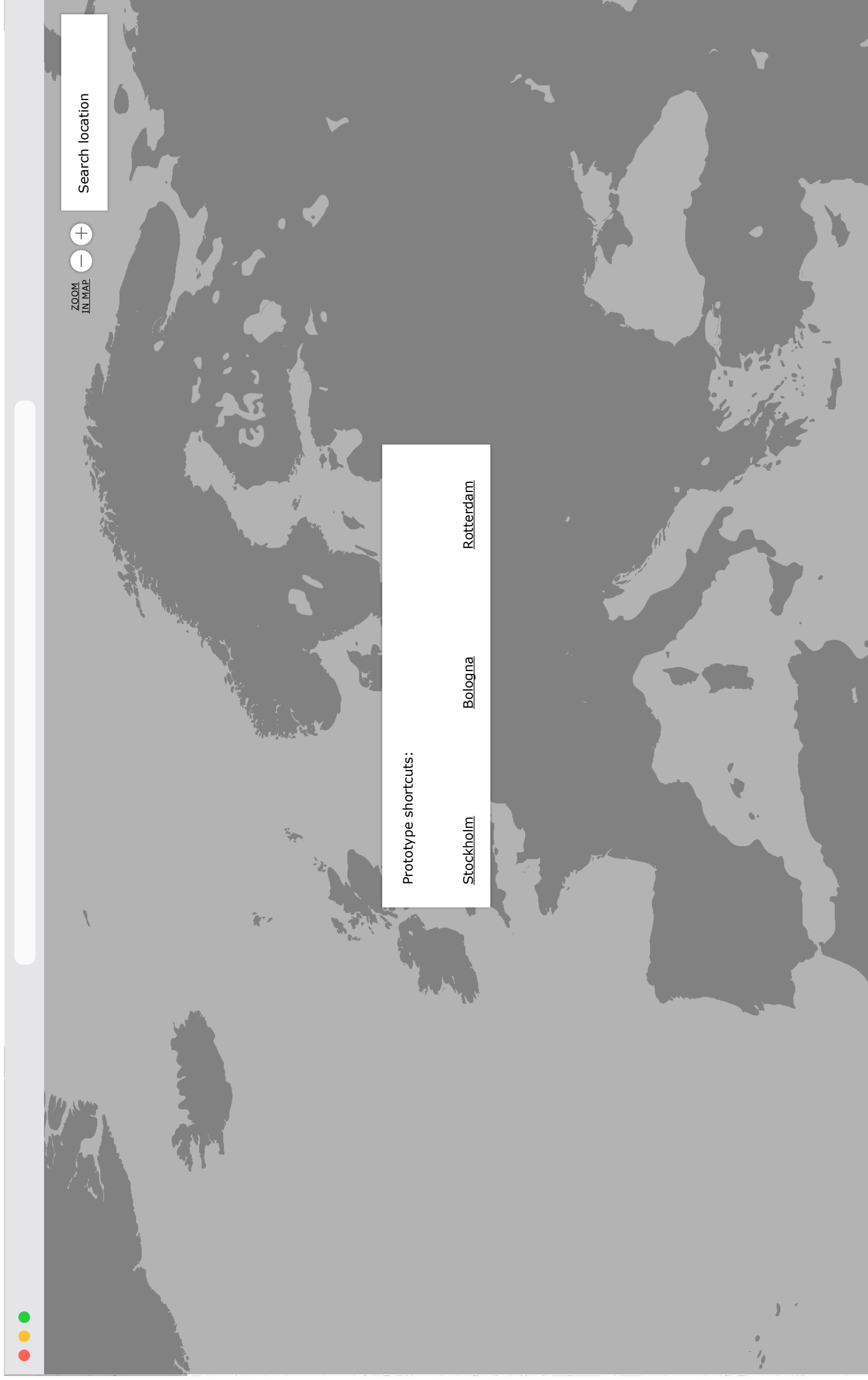
# User Journey

## 1. Start screen

Start screen with a grayed out map of entire Europe, a hint of what the start screen could look like when all Europe is available. On top of the map a dark gray layer with prototype shortcuts to the available cities. Layer with shortcuts can later be removed.

### Headers/footers

Branded headers and/or footers added to the interface is recommended to be kept to a minimum. In a best practice they could be used either 1) as a start page where needed information is placed along with a link that opens the interface in a popup window, or 2) that headers and/ or footers scrolls out of screen when mouse is not in near area.



# User Journey

## 2. Navigating the map

The selection of Stockholm loads a map with a large view of the entire data area. Tools and information about location and map settings is found in the top **1** right interface area.

Below the navigation options the menu contains an data information area **2** and the options to save the view **3** including current map and indicators, and to export the saved views **4** from separate menu (see page 16).

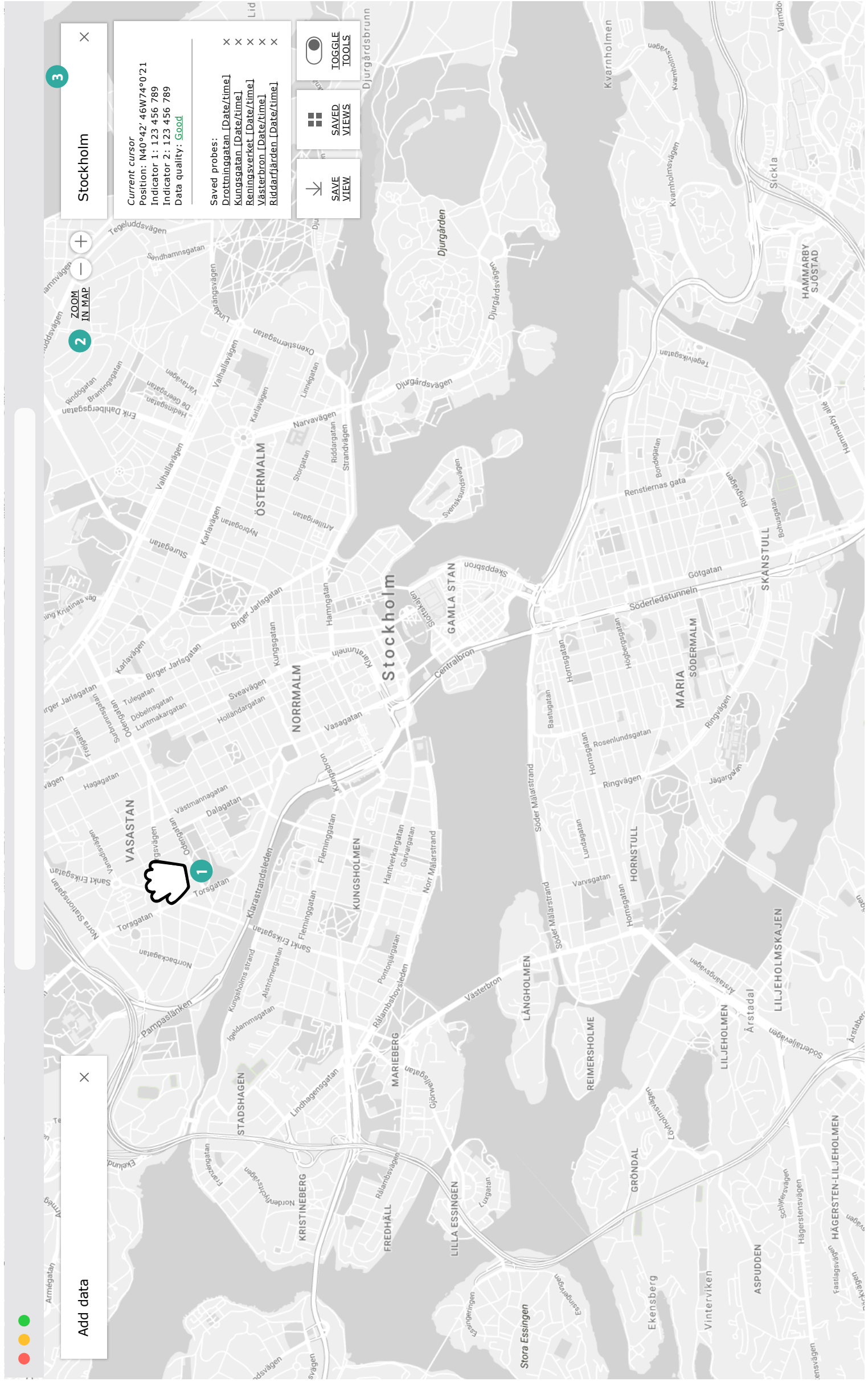


SMHI

# User Journey

## 3. Set view

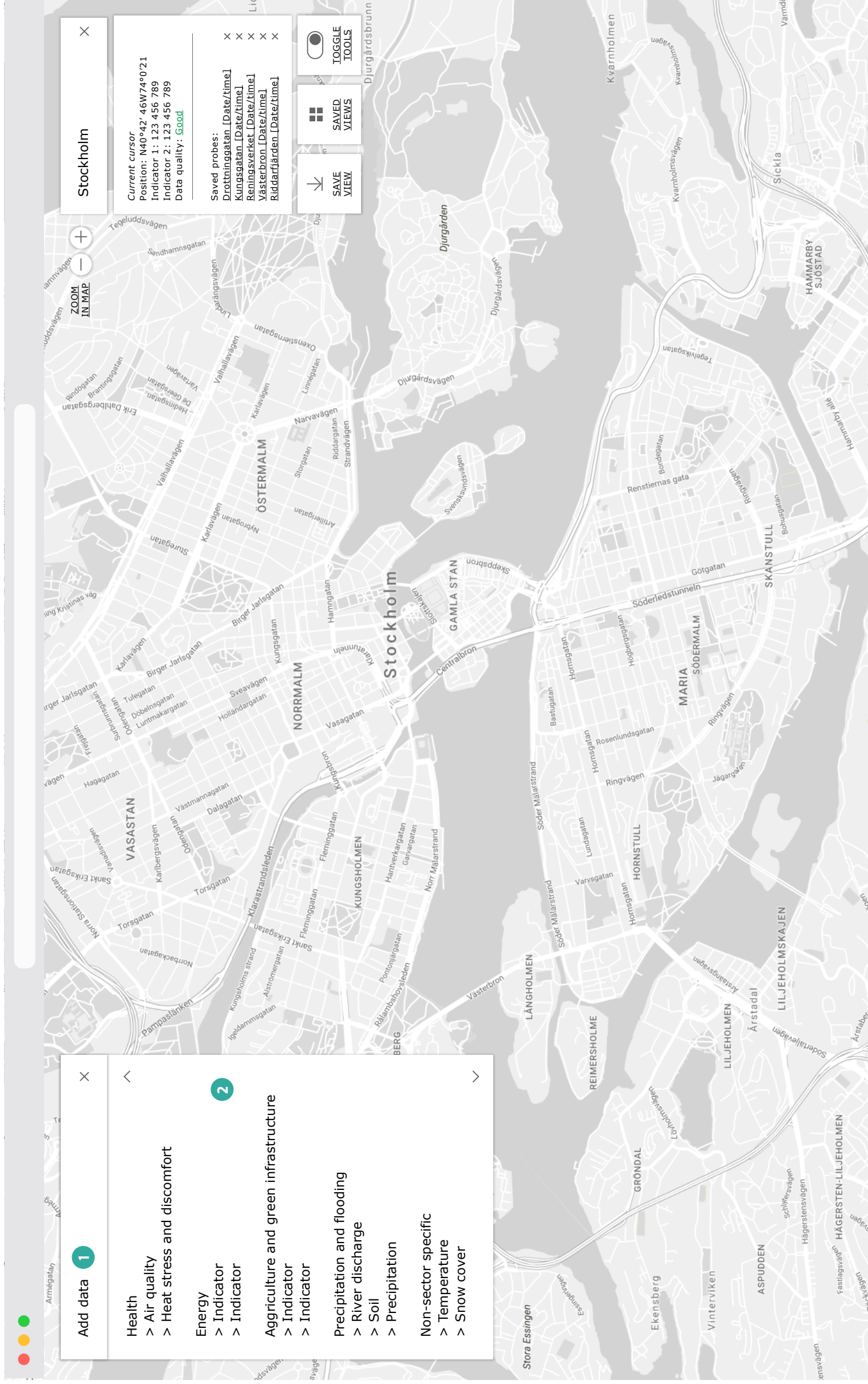
The hand cursor **1** and the zoom buttons **2** can be used to navigate in the map. The search bar **3** can also be used to find the desired area and zoom level.



# SMHI User Journey

## 4. Add data

The left interface area is the **Add data** menu, where user adds what indicator to see in the view. The menu is both an area **1** for text search in all levels of the menu, and at the same time a drop down menu allowing visual navigation and selection in the menu **2**, in the number of levels needed in the hierarchy.

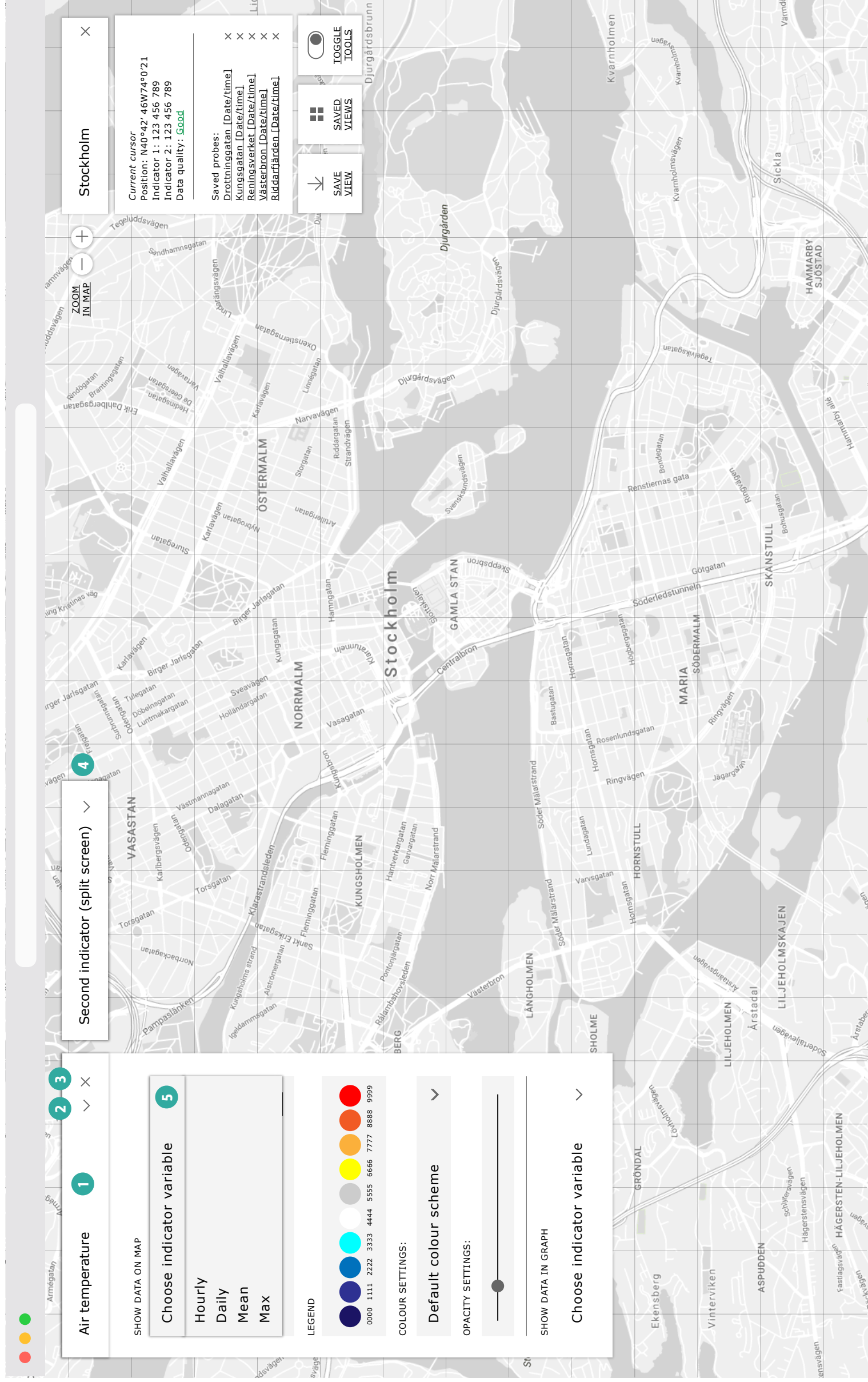


# SMHI User Journey

## 5. Set indicator

The indicator **Air temperature** is added, opening a new drop down menu bar **1**. The arrow **2** allows the drop down to be minimized. The **X** **3** deletes the selection of Air temperature and returns to Add data menu (as on page 2). When first indicator is set, the option for adding a **Second indicator** in a split screen is added to the right **4** (for use case see page 15).

Available options for the indicator is available in a number of menus and settings. A first step is to choose the desired variable of the viewed data in the drop down menu **5**.

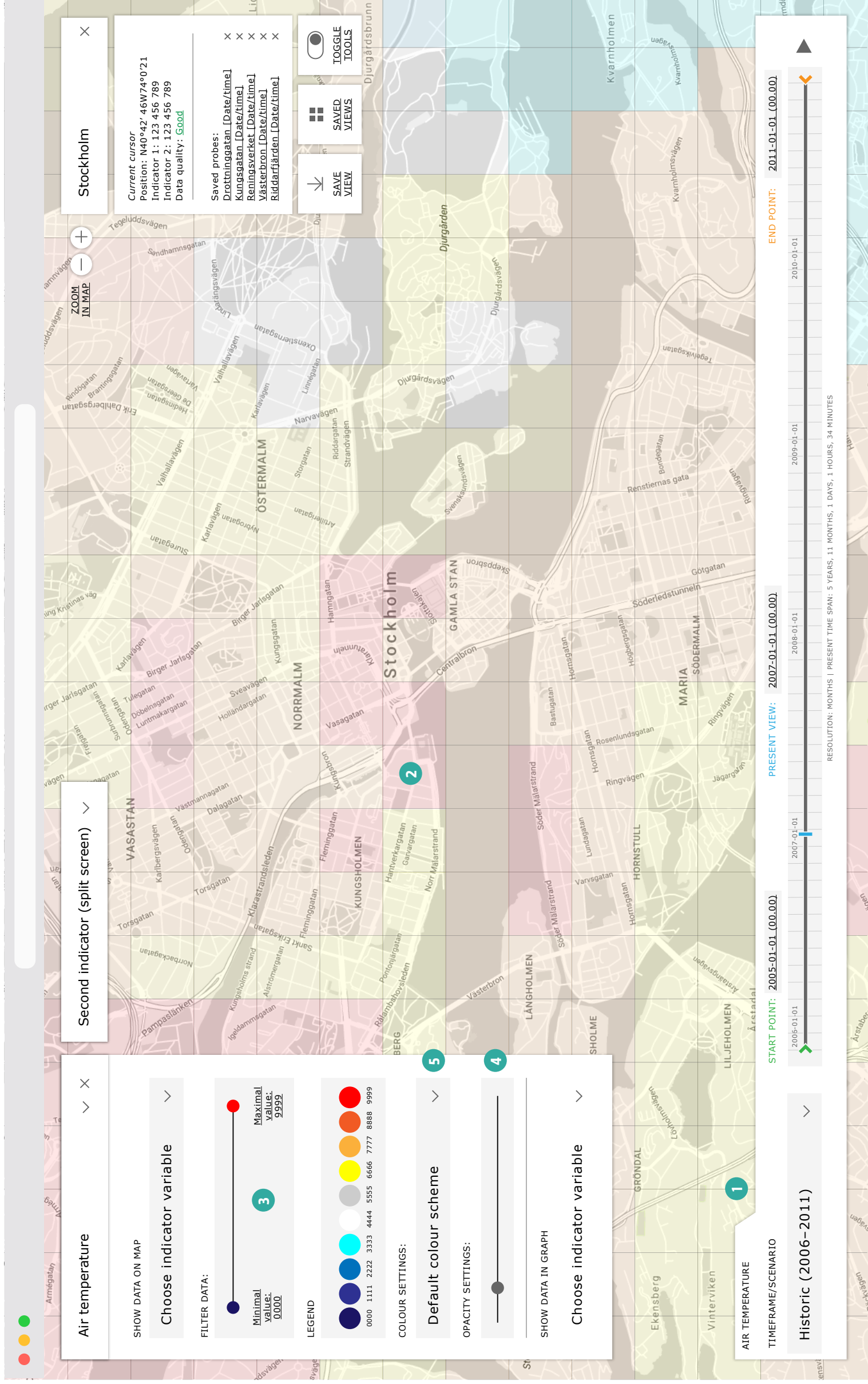


# SMHI User Journey

## 6. Set variable

When a desired variable is set the timeline **1** and the gridded data **2** is shown. Additional settings of the data layer can be made, filtering the data visualization **3** by changing the minimal and maximal value, and the opacity of the legend **4**.

The colour settings **5** opens a drop down menu showing options for user to change settings not yet specified (for example colour blindness or other colour schemes than the default one).



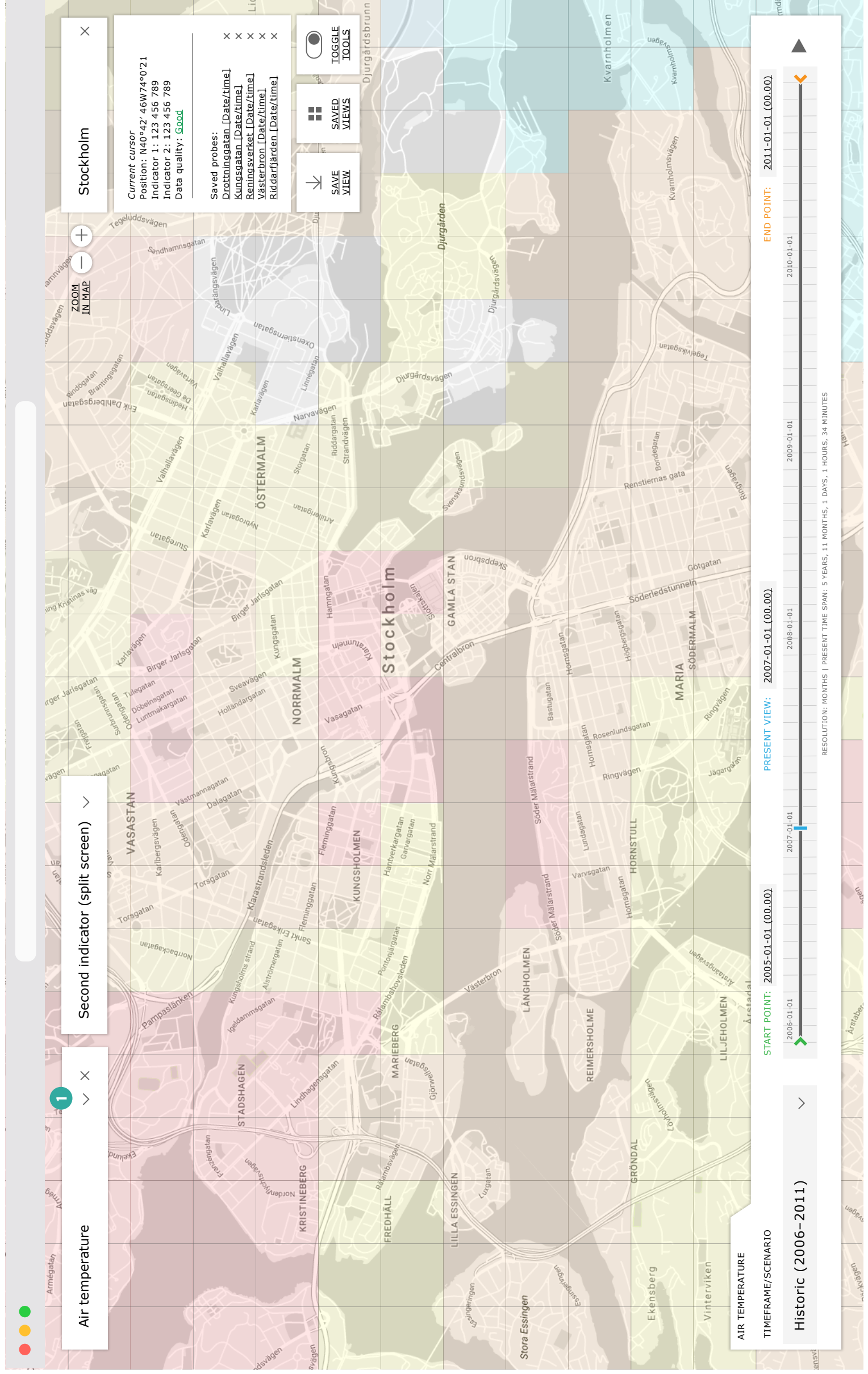


SMHI

# User Journey

## 7. Minimize variable

A click on the arrow **1** in the top area of the indicator menu pulls the drop down menu up, minimizing the menu, showing more of the map.

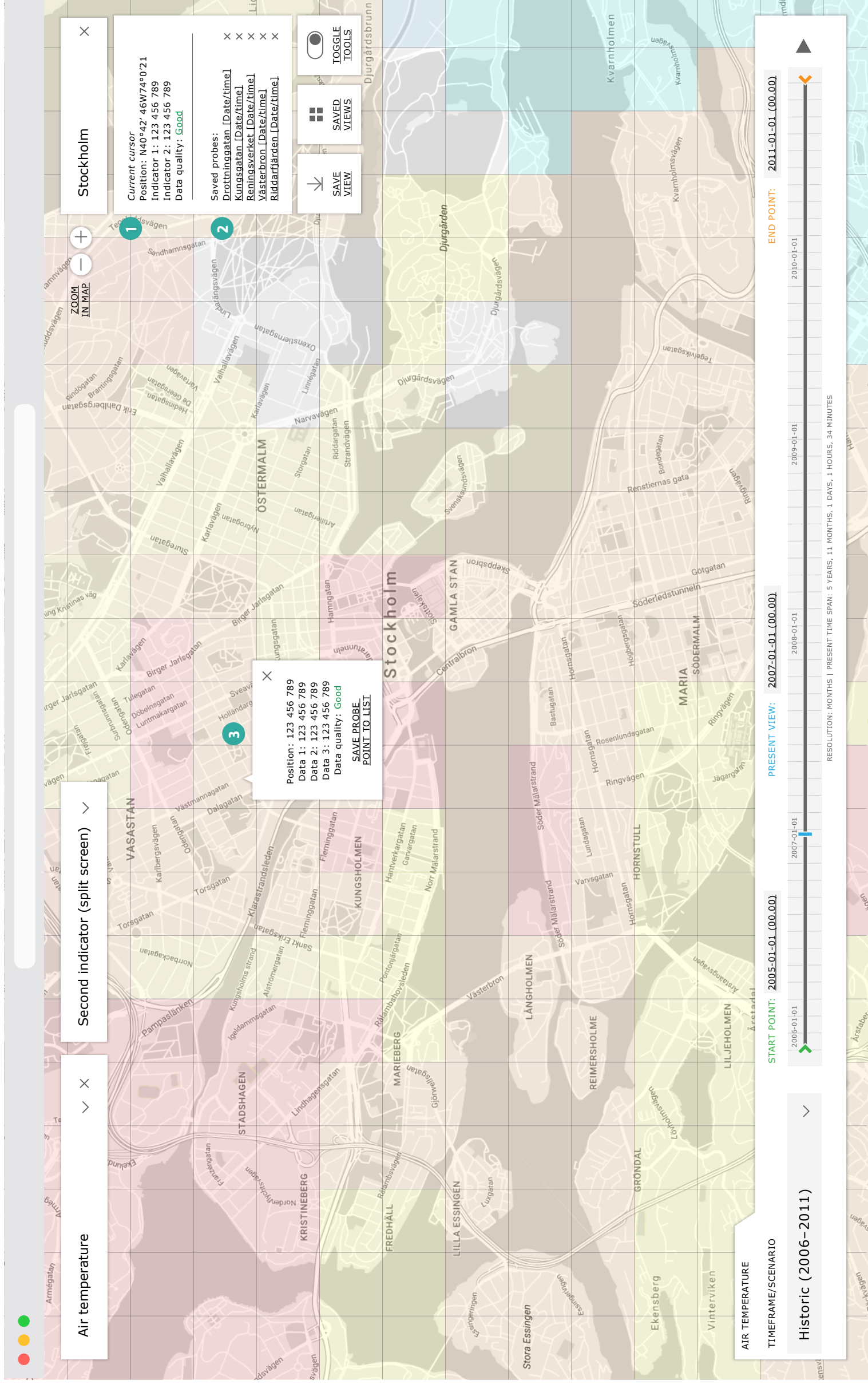


# SMHI User Journey

## 8. Probe points

The information area **1** to the right allways shows specific data for a specific point on the map. By default it shows the position of the cursor (a time delay may be needed to avoid real time rendering). The bottom half of the menu **2** is a list of saved probe points manually added by the user. Clicking one of the probe points shows it's data in the information area instead of the cursor. Clicking an X beside a saved probe point deletes it from the list.

A probe point is added by right clicking **3** on the map and selecting **Save probe point to list**.

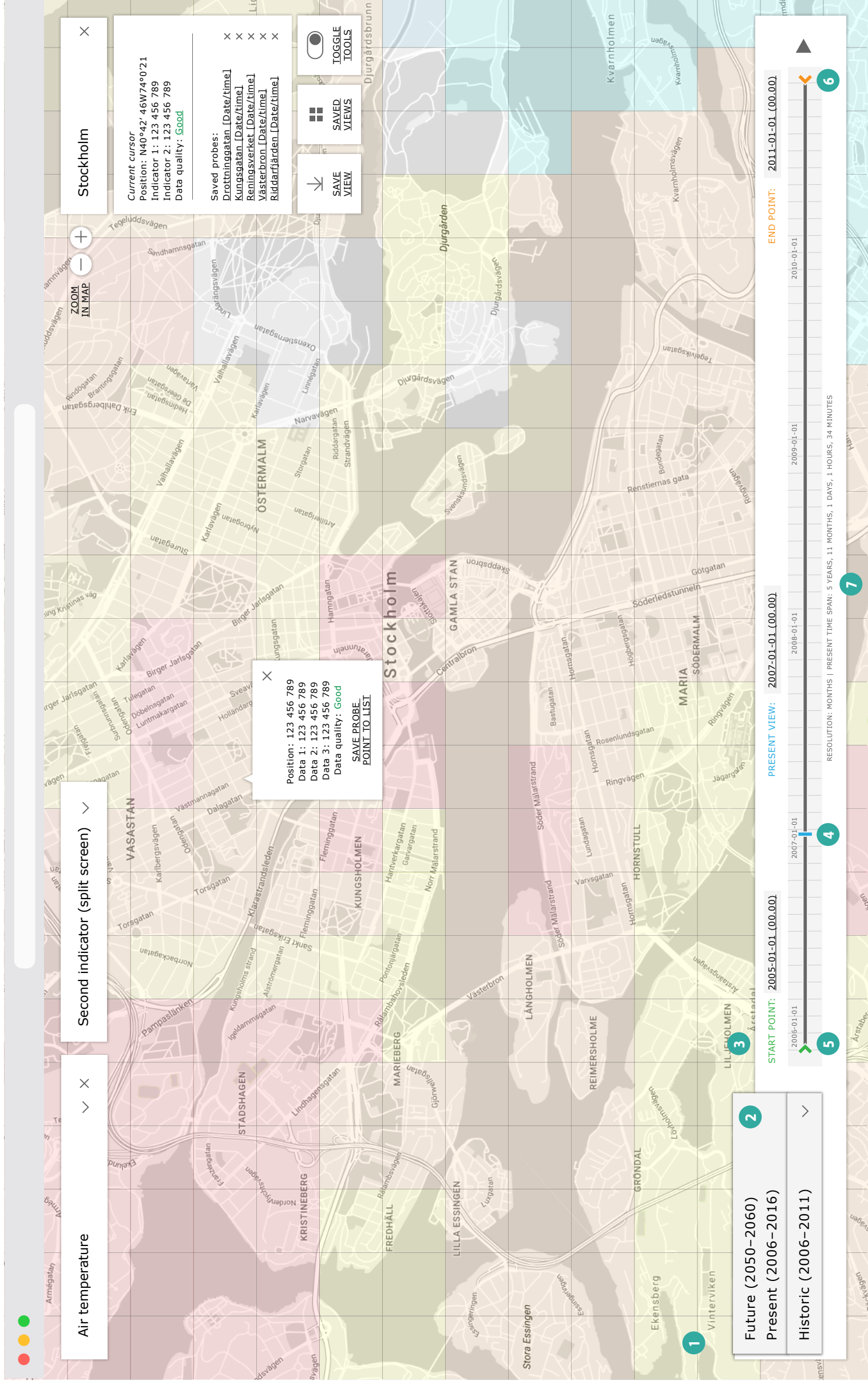


# SMHI User Journey

## 9. Time line

The timeline **1** on the bottom of the interface is the time controller of the data visualization. It renders the data out of three scenarios; historic, present and future. The desired scenario is selected in a drop down menu **2** to the left, where more options easily can be added later on.

The right and main **3** part of the tool is the actual time line, controlling the date and time of the data shown on the map. The blue handle **4** is the navigation tool on the time line, setting the time and date for the data shown on the map. The green start handle **5** and orange end handle **6** sets the time frame available for navigation. As default this time frame is all data available in the selected scenario. Below the time line is a text **7** presenting the present time resolution between the start and end handles.

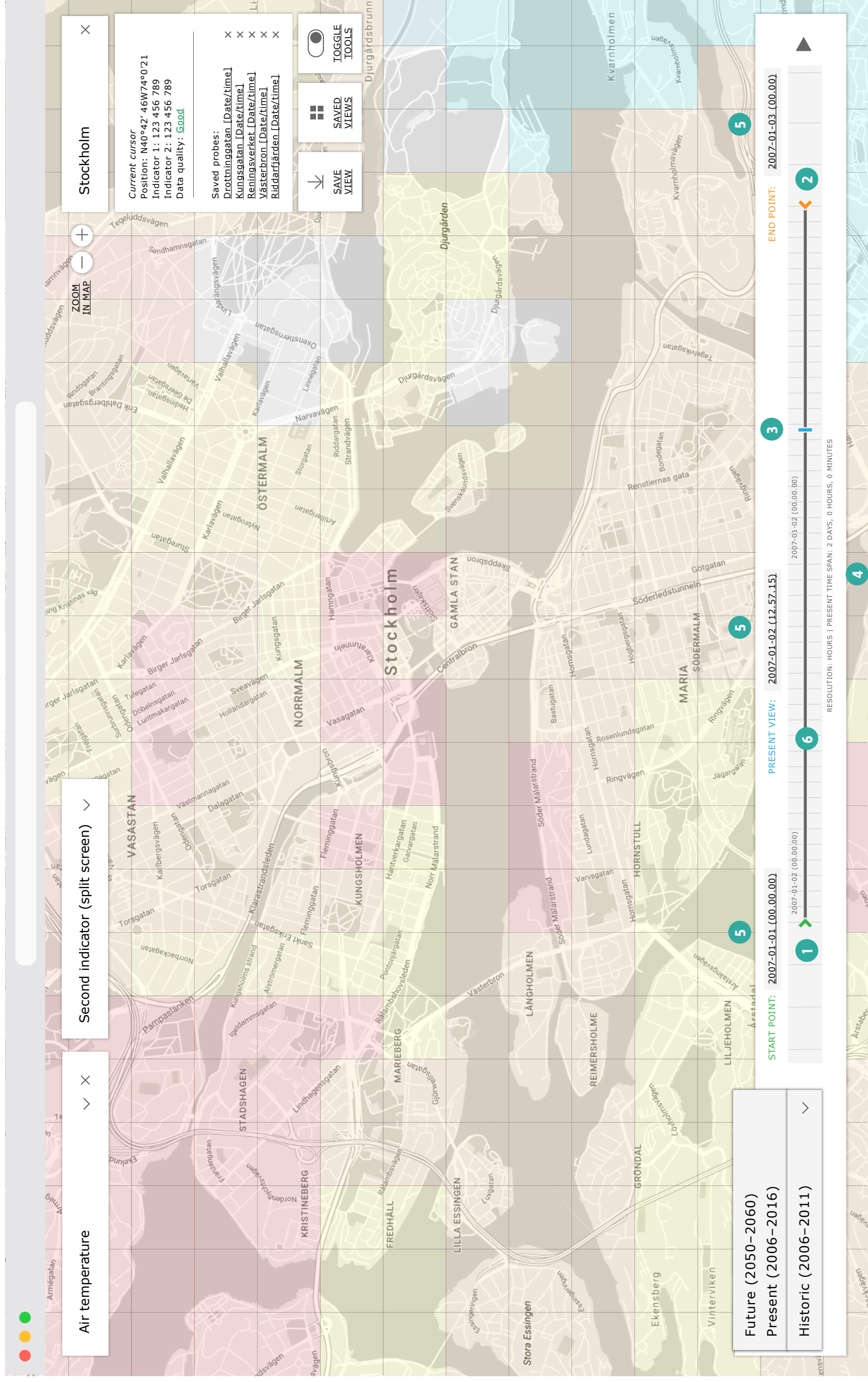


# SMHI User Journey

## 10. Using the time line

Dragging the start **1** and stop **2** handles changes the start and end time, hence the time frame and resolution of the time line, allowing the user “zoom” in the time line and navigate to more exact moments with the blue handle **3**.

The grey guides in the time line is shown in months, weeks, days, hours or minutes depending the time resolution, and are also specified in the below **5**. The date and time of the handles can also be typed in manually **5** by clicking their text labels. Dragging the gray line between the handles **6** moves the entire time frame on the time line.

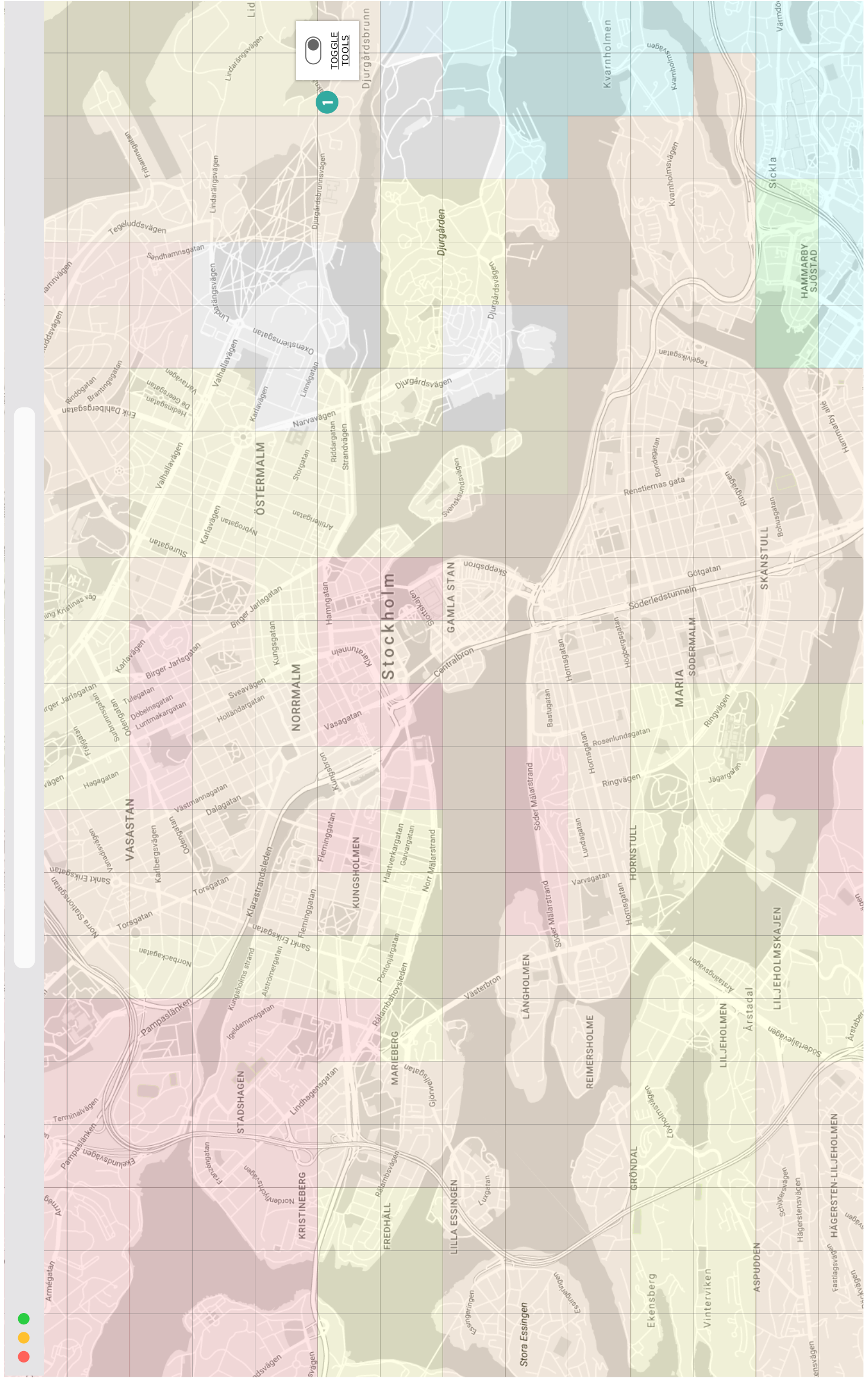


SMHI

# User Journey

## 11. Toggle tools

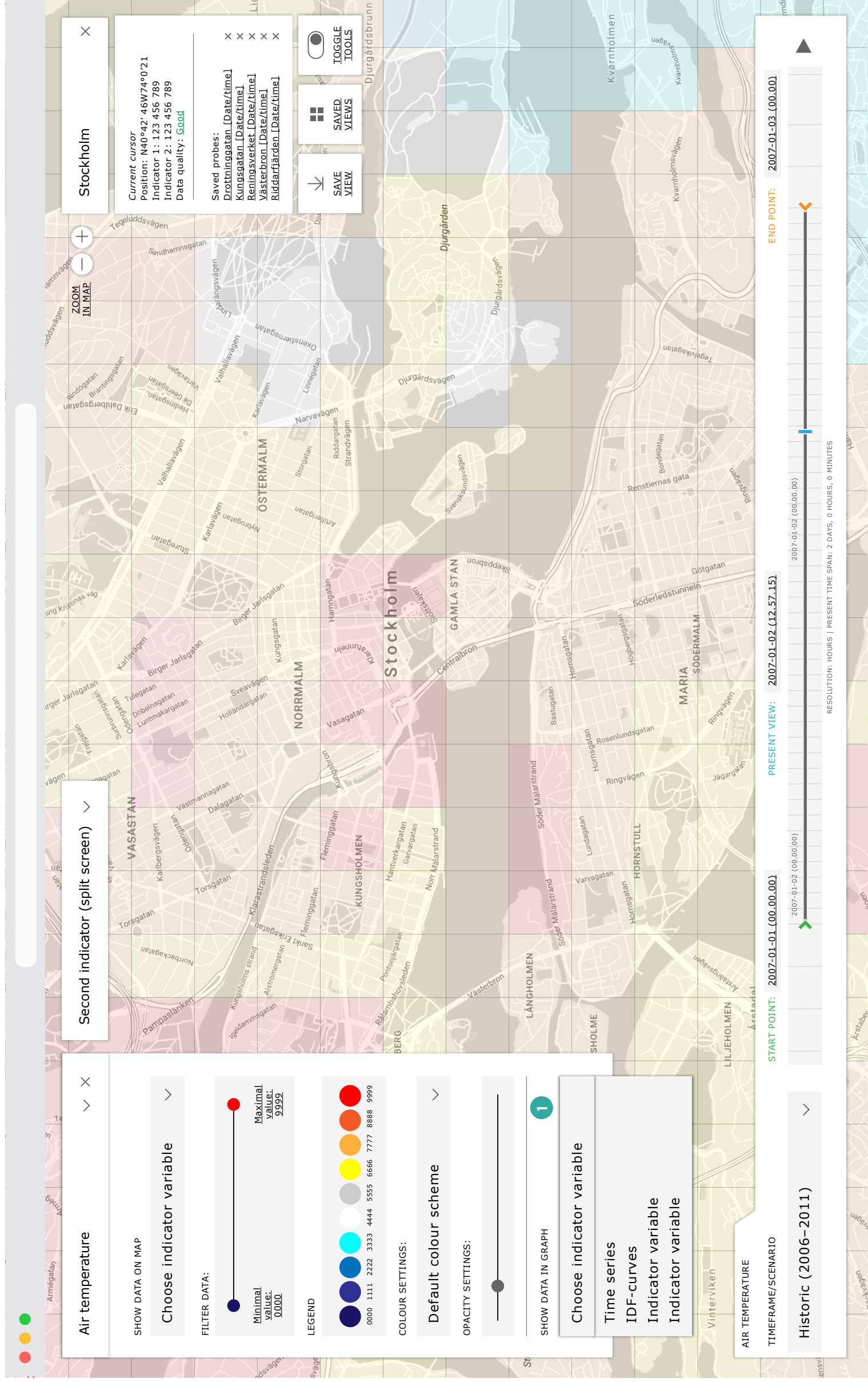
To maximize the map and data view the tools and menus can be toggled **1** on and off.



# SMHI User Journey

## 12. Add data as graph

In the indicator menu, the option Show data as graph **1** opens a new interface area, allowing the viewing of data types that needs to be shown as graphs instead of a map layer.



# SMHI User Journey

## 13. Data as graph

The graph is added in the bottom of a bigger version of **1** the timeline, where the data in the graph can be related directly to the current set time frame.

The data shown in the graph is related to the current cursor and the saved probe points **2**, just as the information area in the top right **3** interface area. Desired points to be represented in the graph is selected by clicking the checkboxes **4**.

Clicking the X **5** closes the graph and reverts to default timeline.

If the data in the graph isn't relative to the timeline, a separation of the two fields may be necessary to avoid misunderstandings.



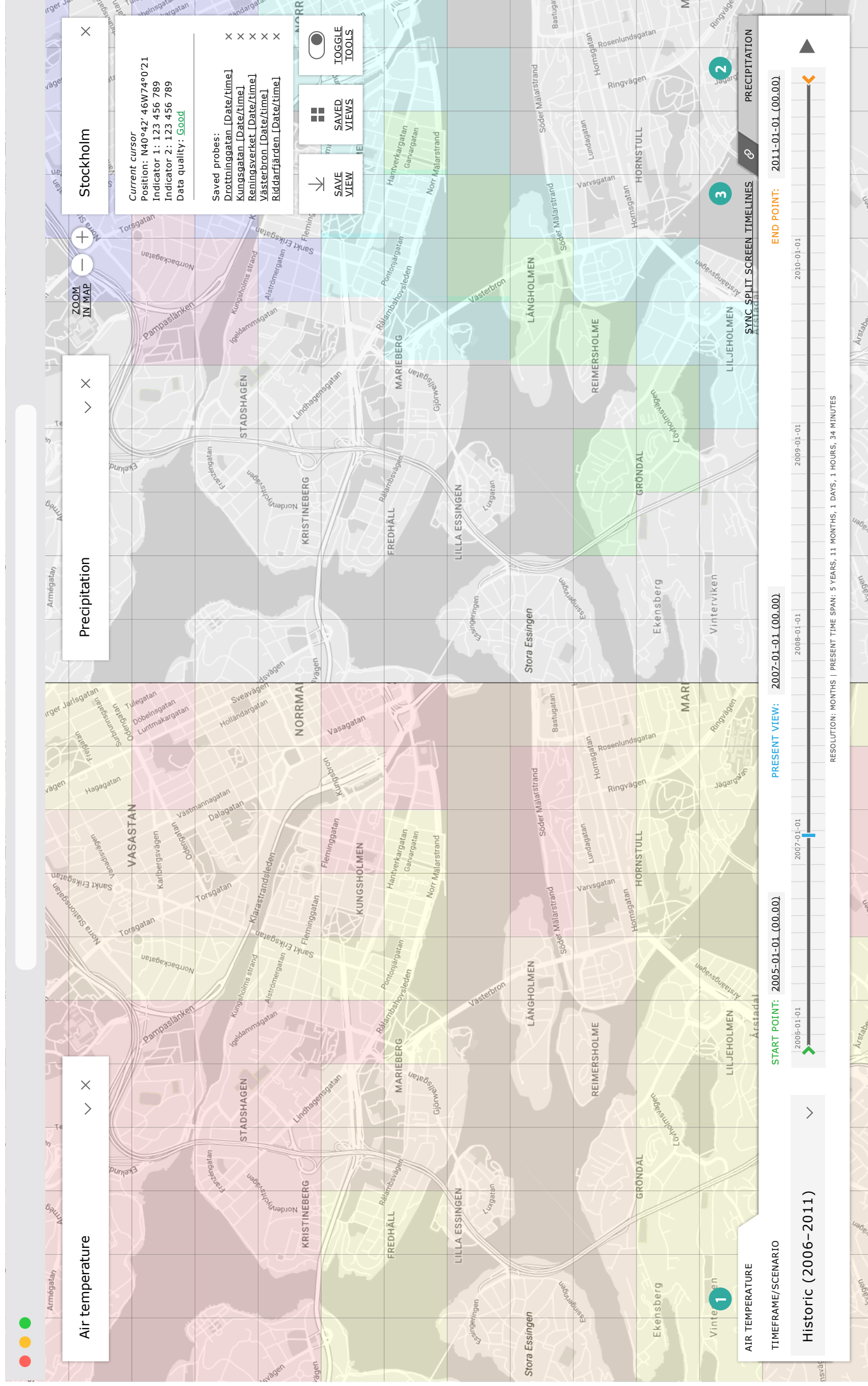
# User Journey

## 14. Split screen

Adding a second indicator opens a split screen with two versions of the same map with one indicator on each screen. All map settings of the indicators uses the same principles, navigating in one map also changes the other one in the same way.

The time line has added features in split screen. It has tabs to toggle between controlling the left **1** or the right **2** indicator.

There is also the option of syncing the time lines **3**, making one time line control the time frame for both indicators in the same way.

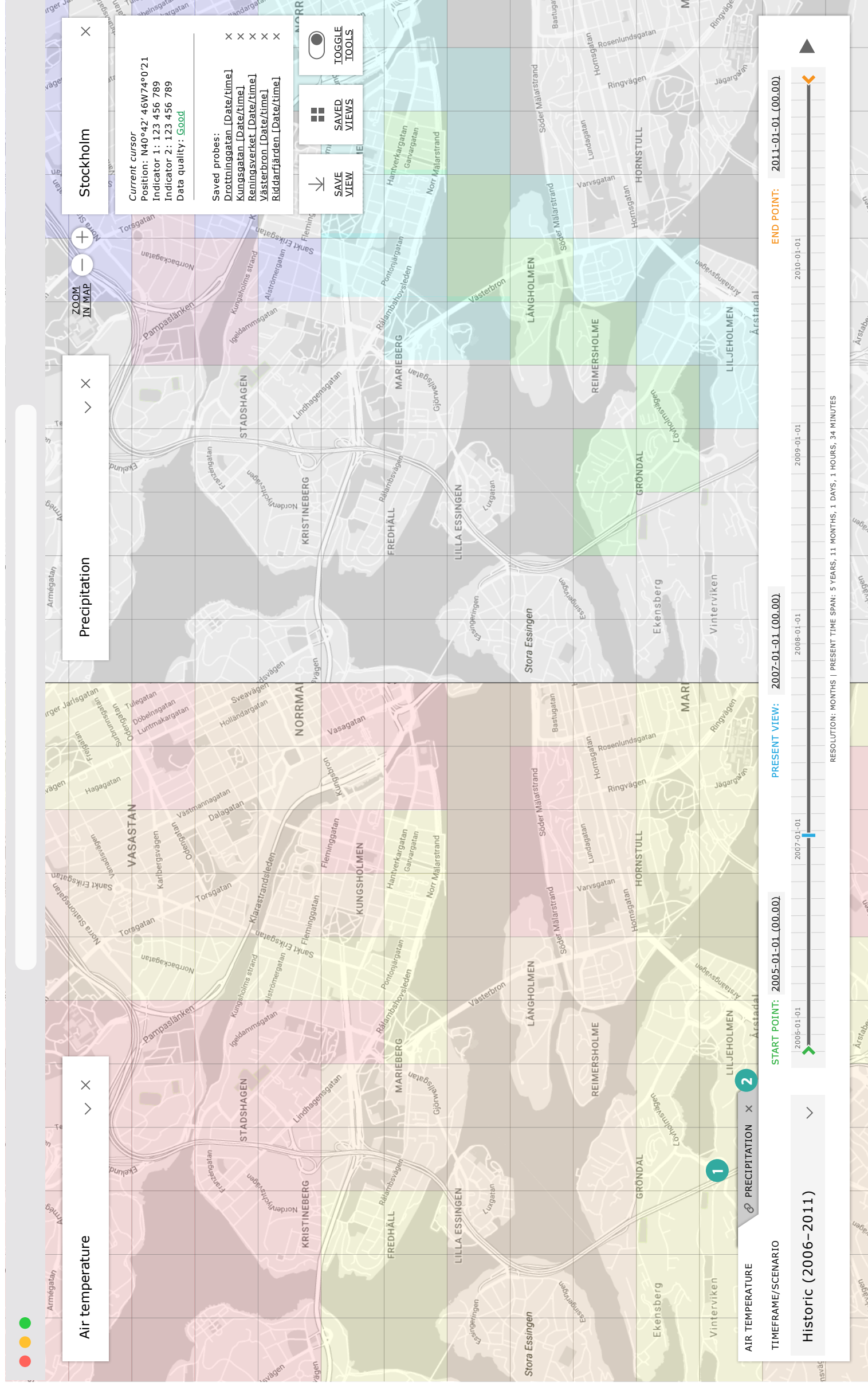




# User Journey

## 15. Synced time line

The selection of syncing the time lines moves the right tab over to the left tab **1** and renders unclickable to indicate that one time line now control both indicators. Clicking the X **2** divides the time lines to default.



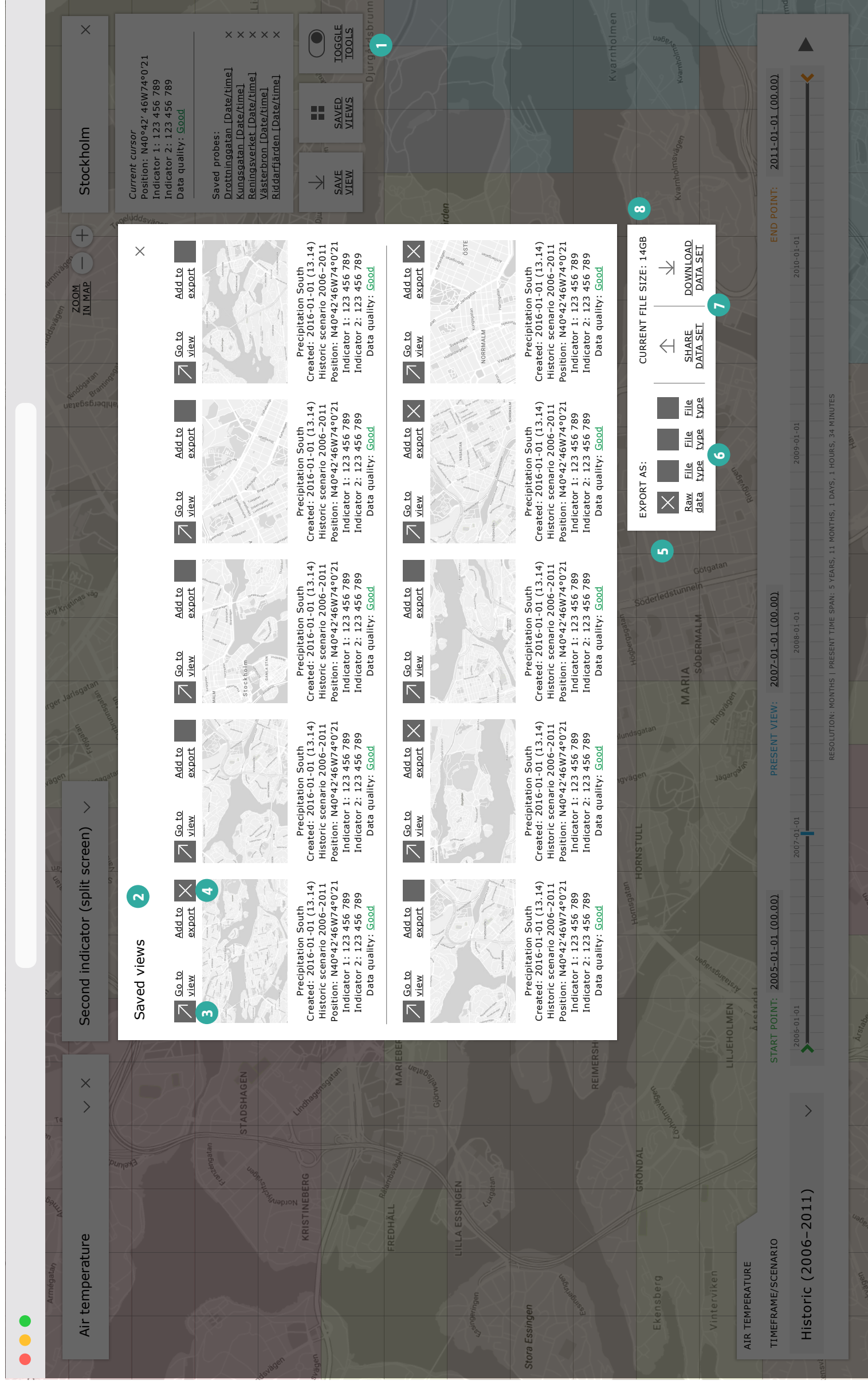
# SMHI User Journey

## 16. Export views

The menu **1** for viewing all saved views allows both bookmarks to re-open the views in the interface, and to export the desired views in a data set.

The upper part **2** of the menu scrolls down to show all items. All views has a shortcut **3** and an export **4** option.

The lower part **5** of the menu is the export options, allowing the selection of available file types **6** and the options of sharing or downloading **7** the data set. The file size of the data set is shown **8** as a reminder of the large data that is handled.





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