

MAIA analytical Tool



Manual v 0.1.0

SarVision 7 June 2022



View and Report

View

The MAIA analytical tool can be used for viewing and reporting. To get acquainted with the tool viewing will be a good start.

First click on a country to get the available layers for that country. Not all countries have layers available. Some layers are only available for registered users after login.

If there are layers available, select the 'All' for viewing all available layers. The layers will be ordered according to the CICES structure. A 'click' on the layer will either open up the nodes ► or if it is an end-node ►, it will show the layer. A second 'click' will close the layer again.

It is possible to combine layers.

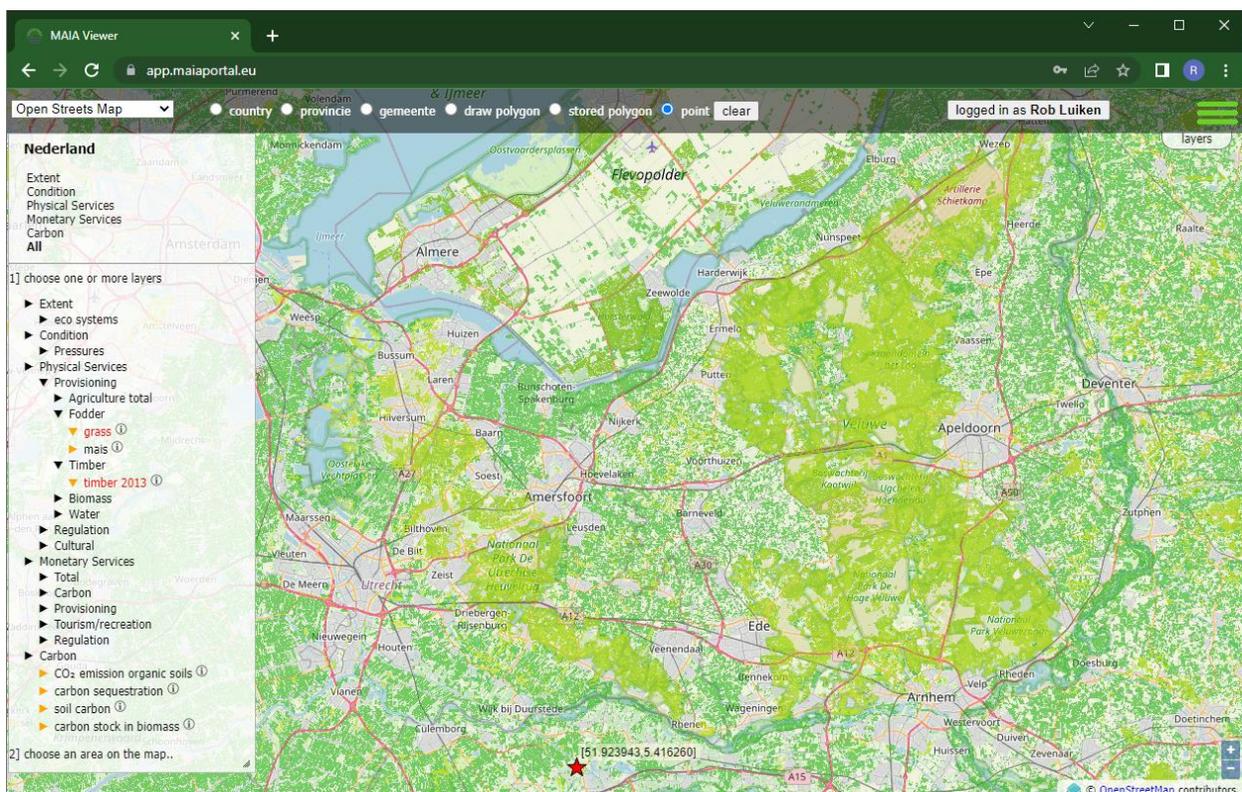
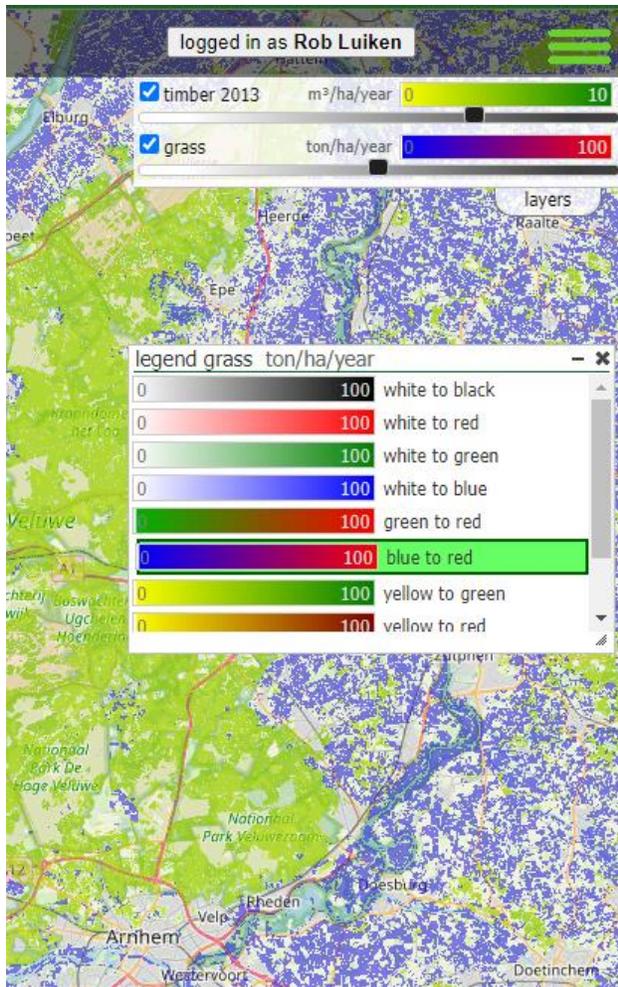


Figure 1: Grass and Timber selected for viewing

It is possible to zoom in and out and pan, just like in Google Maps. It is also possible to change the background layer. The default is a neutral Open Streets Map layer, but it is also possible to use aerial imagery composites with or without toponyms or for instance the black and white Stamen Toner layer.



After clicking on the 'layers' tab on the right-top side it is possible to see the legends of the selected layers.

It is also possible to change the legend colorization for numerical layers.

In the example in figure 2, the colorization of the 'Grass' layer is changed from 'green to red' to 'blue to red', thus making it easier to distinguish it from the 'yellow to green' legend for Timber.

Figure 2. view and change legends

The MAIA analytical tool has support for local languages, including Cyrillic and Greek alphabets. The default language is English, Dutch and Spanish are also supported, but if you want to help to make translations, you can contact SarVision.

Analysis

Point

The easiest way to do analysis is in the 'point' modus. Select the layers you are interested in and click on the map.

The point location will be shown and the underlying values will be loaded. Only the data for the selected layers will be shown and only if there is a value available. If there is 'no data' for this point, nothing will be shown.

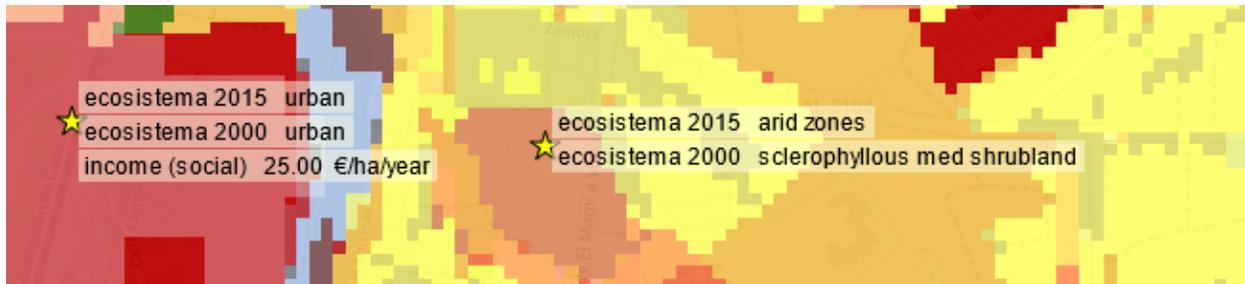


Figure 3. point data will be shown after clicking in the 'point' modus.

The 'point' modus is also a quick alternative for the legend. Just click and the underlying value will be shown. The 'clear' button will remove all points.

Polygons

Not only point data can be shown, but data can also be shown and calculated for polygons. Administrative areas are available per country and can be selected, but custom polygons can also be drawn or stored, imported or re-used.

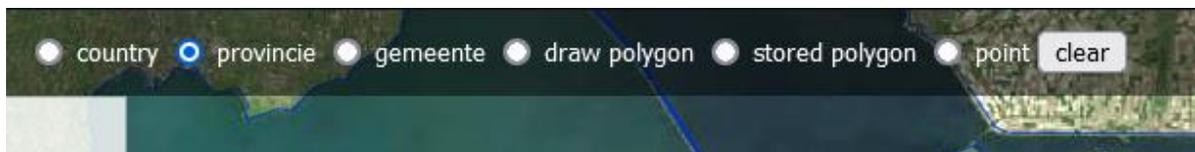


Figure 4. The 'modus' selector

Administrative areas

After selecting a country, the administrative areas for a country will be available, like provinces and communities. Some countries have only 2 administrative levels (e.g. oblast and obshtina in Bulgaria) and some have more. Up till 3 administrative levels will be supported. After clicking on the map the statistics for the selected administrative unit will be shown.

Custom drawn areas

With the 'draw polygon' modus it is possible to draw a custom polygon on the map. The polygon may not overlap or cross itself, and it is not useful to draw beyond the area of the layer of interest, but apart from that you can draw any polygon you want.

Drawing can be done by selecting the 'draw polygon' modus. After that, add the corners of the polygon by clicking on the map. A double-click will close the polygon and statistics will be shown. The corners can be re-edited afterwards to improve the polygon.

Once you have drawn the polygon, it can be named and saved for future use if you are a registered user.

Stored polygon

In the 'stored polygon' modus you will get a list of polygons which have been saved before. It is also possible to import a polygon from WKT or GeoJSON. This part is only available for registered users.

Import (multi)polygons

It is possible to import polygons from other sources. The polygon definition must be available as WKT (Well Known Text) or GeoJSON. Shape files are not supported, but with several tools it is possible to extract a feature from a shapefile as WKT or GeoJSON and thus import the polygon.

Select the 'stored polygon' modus to get the list with stored polygons. At the bottom of this list is a button that says 'import new'.

Clicking this button will open a new form where the polygon definition can be added. Copy your definition there.

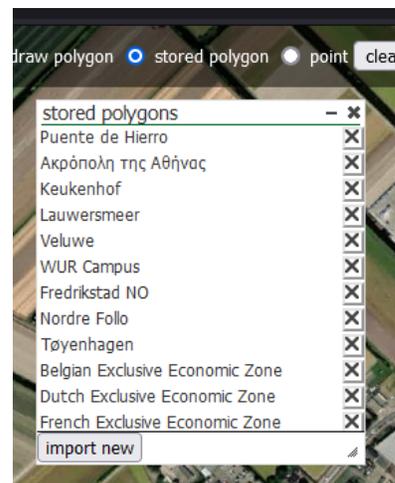


Figure 5. The list with stored polygons

Before saving is allowed, the polygon must be validated. After clicking the validate button, the polygon will be projected with a yellow border on the map. If it is not right, the projection is probably wrong. Select the right projection in the selector or reproject your source file using another tool.

If the result is as expected, the polygon can be saved under a unique name and reused as 'stored polygon'. It will only be available for your own account.

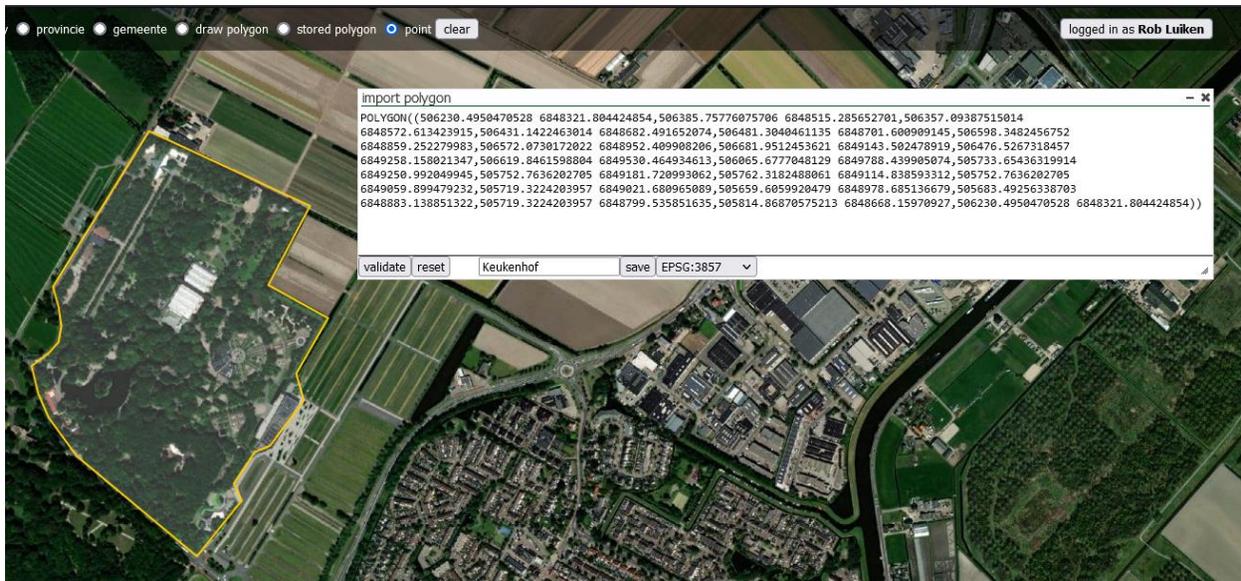


Figure 6. Import a polygon for future use

Histogram

One of the standard reporting methods is a histogram. Select the reporting method "histogram", and the layers. After selecting a polygon, a histogram will show up.

This will show the distribution of the data within the polygon. Values which are 0 or have 'no data' within the polygon are left out.

In the example in Figure 7 the community of Anna Paulowna is chosen, and the production of 'Flower Bulbs' 2018.

The total area of Anna Paulowna is 8111 hectare. The total area with 'Flower Bulb' production is 1725 hectare. The average of production on those fields is 7.93 tons per hectare per year.

For calculating the total production and total area it is assumed that any area within the polygon with a yield/production not 0 or 'no-data' contributes to the total. In most cases this will work out well. If not, one can request the raw data and do a custom calculation.

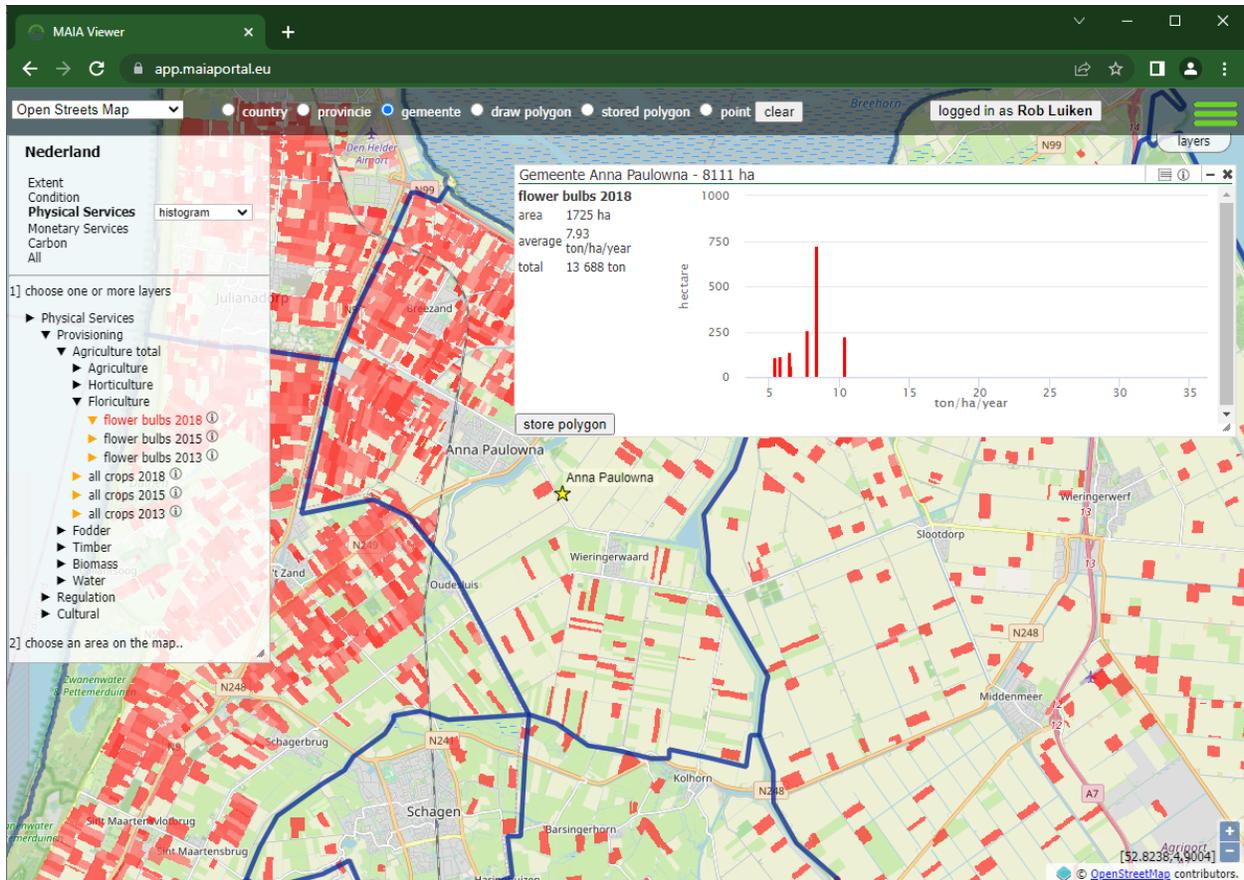


Figure 7 Flower Bulb production in the community of Anna Paulowna

To get the raw data, the report menu can be called by clicking on the 'report-menu' icon



The chart can be exported as PDF, clicking on this option depends on your browser settings and will either open up a PDF or make it downloadable.

The 'workbook' option will export the data as workbook in CSV format. An intermediate popup will appear where a choice can be made on which elements will be exported and what the 'interval' will be. If you choose 'discrete', all available numbers will be exported. Depending on the data, this can be a whole lot.

Other options can be 1 till 1000 where the data will be grouped with an interval of 1 till 1000, thus making the data more manageable.

The application will preselect a sensible interval, but this can be overridden by the user. For categorical data there is no choice on interval and just one option: 'category'.

The third option in the 'report menu' is the unit settings. This will define the area units from m², hectare or km². The delimiter for the workbook can also be chosen. This can either be international, using a point as digital separator and a comma as item separator, or European with a comma as digital separator and semicolon as item separator. A thousand separator is not used in the export.

Microsoft Excel might overrule these settings, depending on the local settings of your computer. Either change your local settings or use the import wizard in Excel if this is problematic.

Account table for extent

It is possible to see the change in extent over the years if two or more issues of the extents are available.

Choose 'Extent' in the left top corner and then 'account table' (see Figure 8).

Choose two issues, in this case 'Land cover Corine 2000' and 'Land cover Corine 2018', and then a polygon. In this case fylke (county) Åstfold.

The report will then show the bruto distribution of the land use over the 2 issues. In this example it shows that in 2018 there is 6.0 km² more builtup area in this fylke compared with 2000.

8.1 km² of forest however got a different land use.

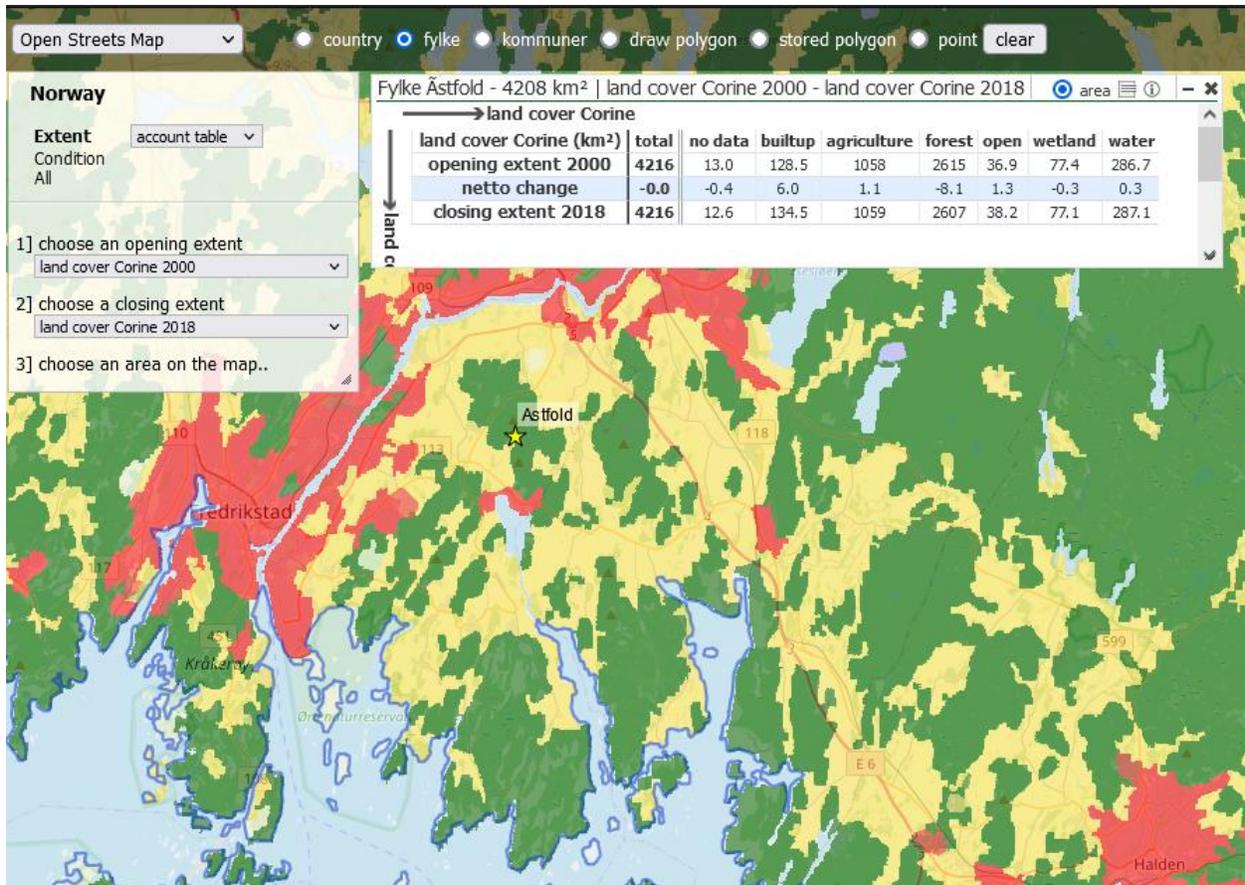
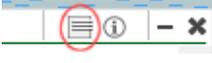


Figure 8 An account table with Land Cover in 2018 compared with 2000 for the fylke Åstfold

By clicking on the 'report-menu' icon  it is possible to export the table as PDF or export the raw values to a workbook (CSV) for further use.

The third option, the 'unit-settings' is already explained in the 'Histogram' chapter.

Account table for services

The account table for services looks like the account table for extents, but is more complicated.

First 2 issues of a service account must be chosen. The application will then try to find 2 matching issues of the extent. If these are not found, the extent issues must be selected manually.

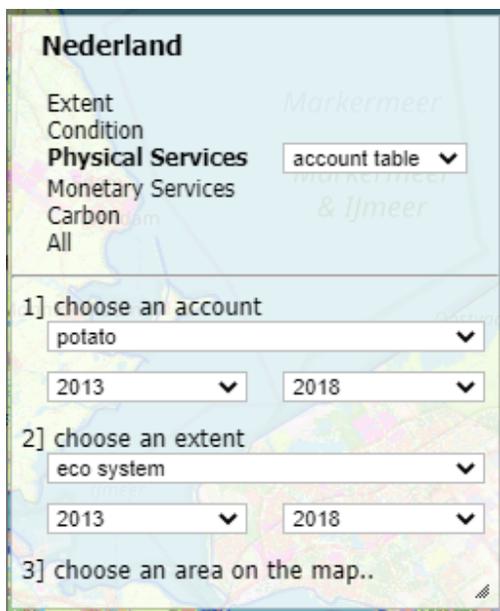


Figure 9 selecting an account table for services

After selecting a polygon, the report will be created.

The report will then show the production of the service distributed over the eco systems over the 2 years. It is also possible to switch from production to area to get the area in use for this service.

With the settings of figure 9 it will show the distribution of potato production in the province of Flevoland in 2013 and 2018.

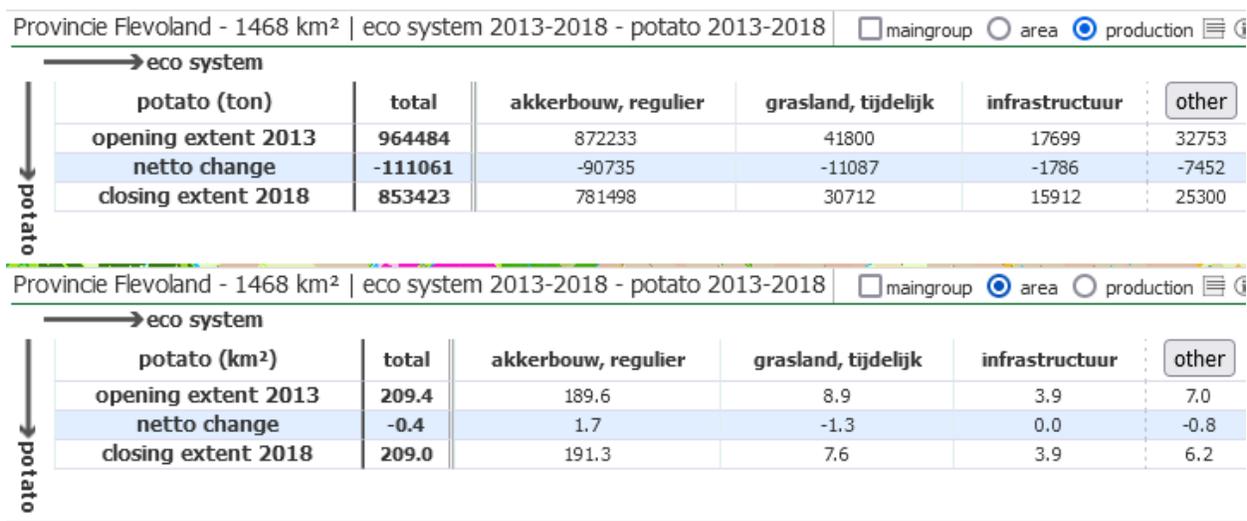


Figure 10 the distribution of potato production in the province of Flevoland in 2013 and 2018.

The report will then show the production of the service distributed over the eco systems over the 2 years. It is also possible to switch from production to area to get the area in use for this service.

In this example it shows that in 2018 there is -111061 less tons of potato produced in Flevoland then in 2013. The crop area however did hardly change between the years.

The distribution over the eco system types is also calculated, but mind that there can be geographical and temporal artefacts with the service layer and the eco system layer. The fields at Flevoland are often outlined with waterways or roads, which can give some border effects in interpretation.

It might be that during the modelling of the eco system map, the farmer had grass on the fields, while at the time of monitoring the crops, the farmer already replaced the grass with potato and so on.

The columns hidden behind the 'other' button have less than 0.1% of the area for all rows and are usually artefacts. They can be made visible by clicking on the button.

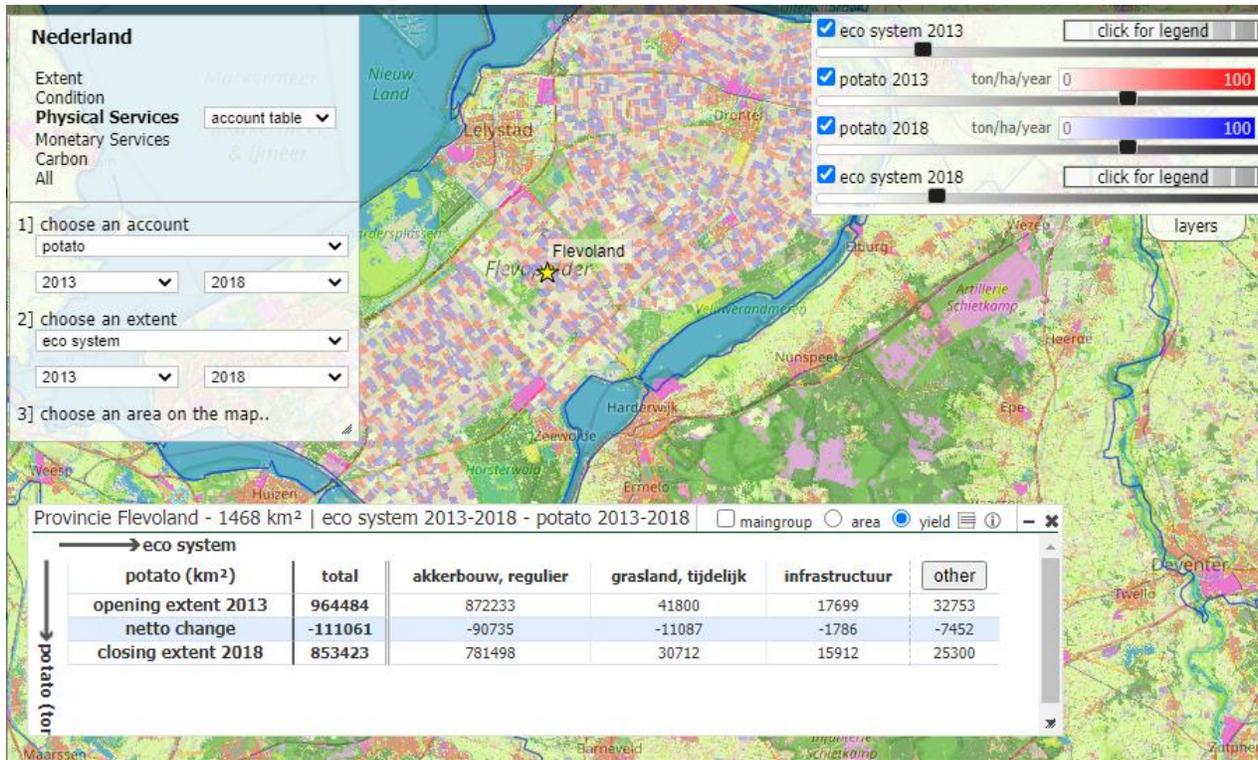


Figure 11 Visual overview of the example in this chapter

The export options are the same as for the account table for extent

Change matrix/Extent Breakdown

This option can be chosen for extents.

This table typically shows the net shift of one ecosystem to the other.

First choose 2 issues for an extent and then an area on the map.

The matrix which shows up contains the extent with the first extent (usually the latest issue) on the horizontal axis, and the second extent (usually an older issue) on the vertical axis.

The cells with a blue background show the net unchanged values, thus the common area with the same ecosystem between the issues. It calculates the net change, so if one sub-area is changed, but another sub-area has a reverse change it will be subtracted and only the result is taken into account.

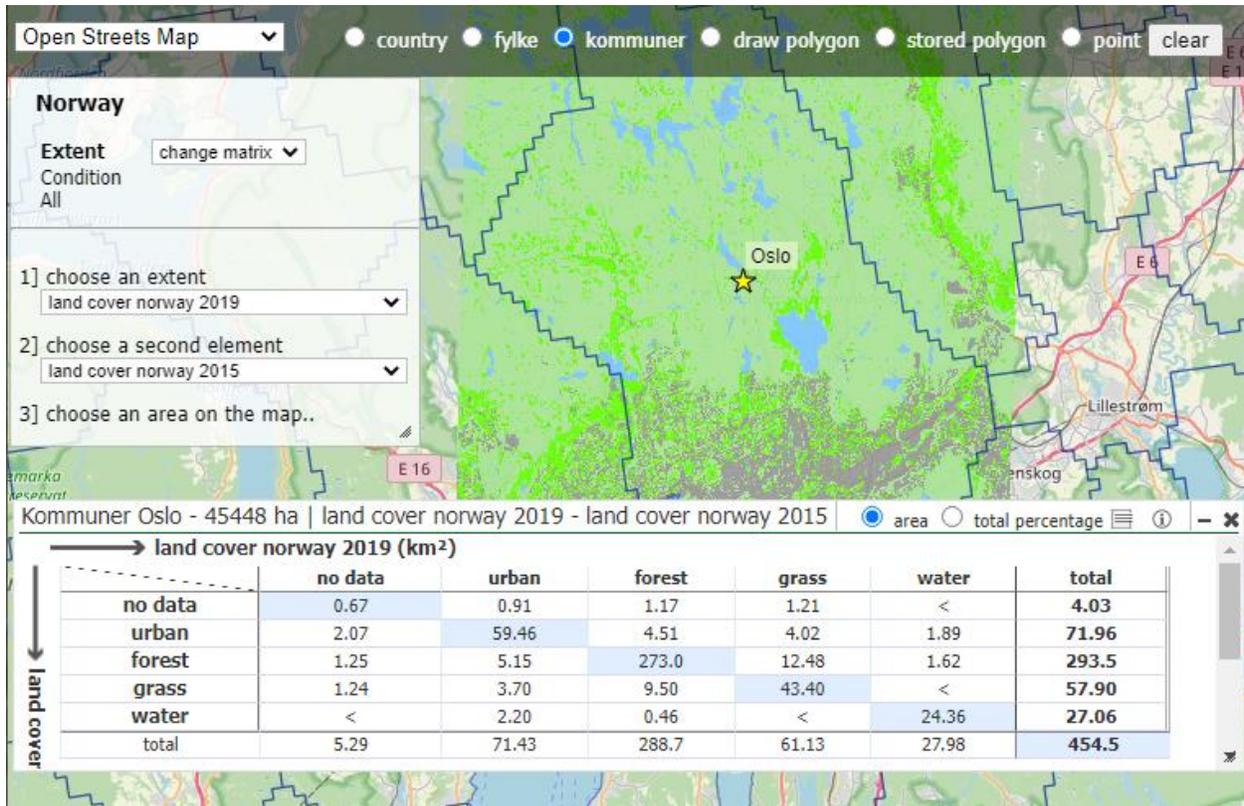


Figure 12 Change matrix for land cover 2015-2019 for Kommuner Oslo

In the example in figure 12 it shows that 273 km² forest kept the same land use. 4.51 km² of forest in 2015 has changed to urban area in 2019 whereas 5.15 km² urban area in 2015 changed to forest in 2019. The tooltip can be useful to see what the changes are (Figure 13)

The areas with a '<' are smaller than 0.05% of the total area and are usually artefacts.

urban	forest	g
0.91	1.17	3
59.46	4.51	4
5.15	273.0	1
3.20	9.50	4
2.20	5.15 (km ²) forest→urban	
71.43	288.7	6

Figure 13 The hint shows the shift from one ecosystem to the other

Like in the other reports clicking on the 'report-menu' icon  does export the table as PDF or export the raw values to a workbook (CSV) for further use.

The third option, the 'unit-settings' is already explained in the 'Histogram' chapter.