Spheer Application user manual

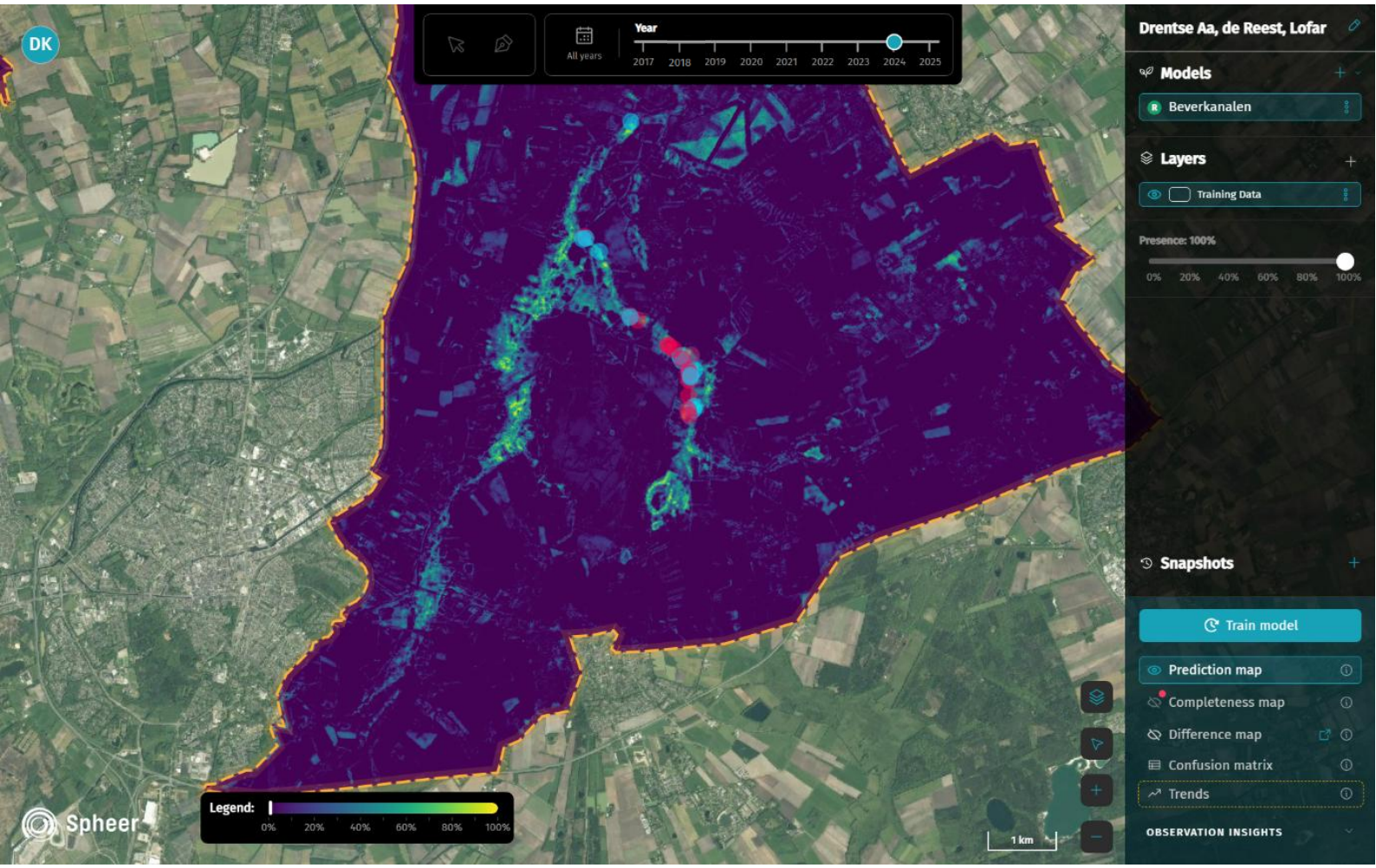


Table of Contents

Introduction 3
Disclaimer 3
Terminology 4
Logging in to the Spheer App 5
How do I create an account myself? 5
How do I accept an invitation? 5
What do I do if I forgot my password? 6
How do I change my password? 6
How to use Spheer 6
How do I create a new model? 6
How do I choose between regression and classification? 6
Meaning letters in figures: 7
How do I train an AI model? 9
- Select the model for which you want to train a model or create a new one (F). 9
- Draw or import an observation 9
- Draw observations 9
- Import observations 9
- Move observations 10
- Edit observations 10
- Delete observations 10
- Select and edit multiple observations at once 10
- Train the model 11
- View the prediction 11
- Iteratively improve the model 11

How do I see the prediction for a different year? 11
How do I export Spheer's results? 11
Exporting vector maps. 11
Getting more out of Spheer 12
How do I improve and clarify my predictions? 12
Model Settings: 13
How to make predictions or observations transparent 14
How do I use the Observation Insights? 15
How do I use different observation layers? 15
How do I use the confusion matrix? 16
How do I use the Completeness map? 16

How do I use difference maps? 17
How do I use trends? 19
How do I use snapshots? 20
How do I use the 'view only' links? 20
How do I change Spheer's background imagery? 21
How do I use the High-Resolution Model? 21
Keyboard Shortcuts: 23
Admin functions 24
How do I open my organization page? 24
How do I add a new user? 24
How do I remove a user? 24
How do I promote an existing user to administrator? 24
How do I change my organization details? 24
How do I start a new use case? 24
How do I change use case details? 24
How does the tech behind Spheer work? 25
Troubleshooting 25
Support 25

Introduction

Welcome to the Spheer Application user manual, our powerful AI tool for monitoring nature, agriculture, water, and biodiversity. Whether you work in nature management, urban planning, agriculture, or any other field that benefits from spatial insights, Spheer allows you to train Satellite-AI models with just one click, and easily scale them to large geographic areas. Not only that, Spheer also lets you review historical maps, enabling you to analyze trends and changes over time.

This manual will guide you step by step through Spheer's functionalities and provides all the information you need to fully utilize the application. We'll cover how to set up Spheer, use its various features, and train high-quality Satellite-AI models.

Disclaimer

The information and features offered by Spheer assist users in analyzing and interpreting geospatial data. While Spheer is a powerful tool, it is important to critically assess the results.

Users are strongly encouraged to:

1. Provide high-quality examples and counterexamples to Spheer for optimal results.

2. Carefully review Spheer's results and compare them with existing knowledge and expectations about the area or the data the models are based on.

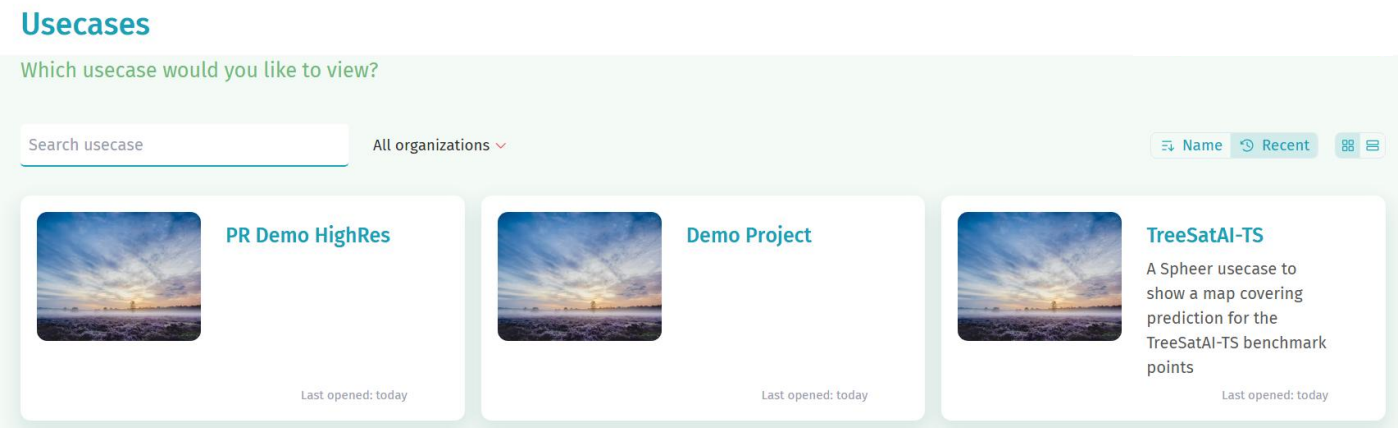
3. Keep in mind that each model in a Spheer usecase is accessible to all users with access to that usecase. We recommend carefully considering any changes to model, as modifications by one user can impact the models and results for other users.

Terminology

- **Usecase**: One or more areas that are monitored as a single unit. A usecase can contain multiple models.
- **Model**: A model what can be trained to monitor a specific phenomenon.
- **Observations**: The user-drawn examples and counterexamples that are used to train a model.

Logging in to the Spheer App

- Go to app.spheer.ai. Spheer takes you to the sign-in page. First enter your email address and click ‘Continue’. On the next screen, enter your password and click ‘Log in’.
- Already had a Spheer account? Then log in with the same email address and password as before. After logging in, you will see the overview of your usecases.



How do I create an account myself?

Don’t have an account yet and haven’t received an invitation? Then you can create one yourself.

1. Go to app.spheer.ai and click “Don’t have an account? Sign up” below the sign-in screen.
2. Enter your email address and click ‘Continue’.
3. You’ll receive an email from Spheer with the subject ‘Confirm your email address for Spheer’. Enter the code from that email. No email? Click ‘Resend’ and check your spam folder as well.
4. Choose a password of at least 8 characters and click ‘Create account’.
5. Accept the terms of use and enter your name. Your account is now ready.

Getting a message that the account couldn’t be created? There’s probably already an account with this email address. Log in instead or request a new password if you’ve forgotten it.

How do I accept an invitation?

1. You receive an email with an invite link to the organization. Be sure to check your spam folder as well.
2. Click the link. You will see which organization you have been invited to.
3. Enter your first and last name and click ‘Join’ the organization.
4. You are taken to a page where you choose a password of at least 8 characters. After that, you are logged in right away.

- Already have a Spheer account with this email address? Log in first, open the invite link again and click ‘Join’ the organization.
- Does the link no longer work? Ask an administrator of the organization for a new invitation.

What do I do if I forgot my password?

1. Go to app.spheer.ai, enter your email address and click ‘Continue’.
2. On the password screen, click ‘I want to request a new password’ and follow the steps.
3. You receive an email from Spheer (support@spheer.ai) with the subject ‘Choose a new password for Spheer’. Be sure to check your spam folder as well.
4. Click the link in the email and choose a new password. After that, you can log in again.

How do I change my password?

- Click your profile icon (A) and choose ‘Profile and settings’. Under ‘Account’, click ‘Change password’. You will receive an email with a link where you choose a new password.

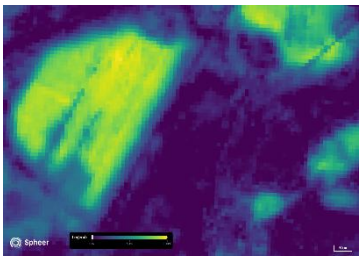
How to use Spheer

Watch the instruction videos on our Youtube channel for a visual introduction!

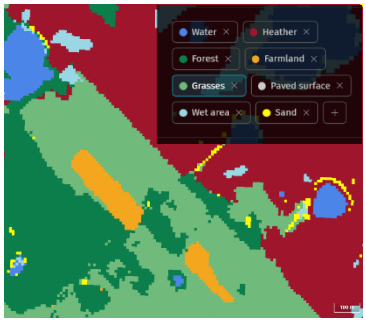
How do I create a new model?

- Select the usecase of your choice
- Click on the model panel (H in the image on the next page)
- Choose 'new model.
- Choose between regression and classification (see directly below) and give the model a unique name.

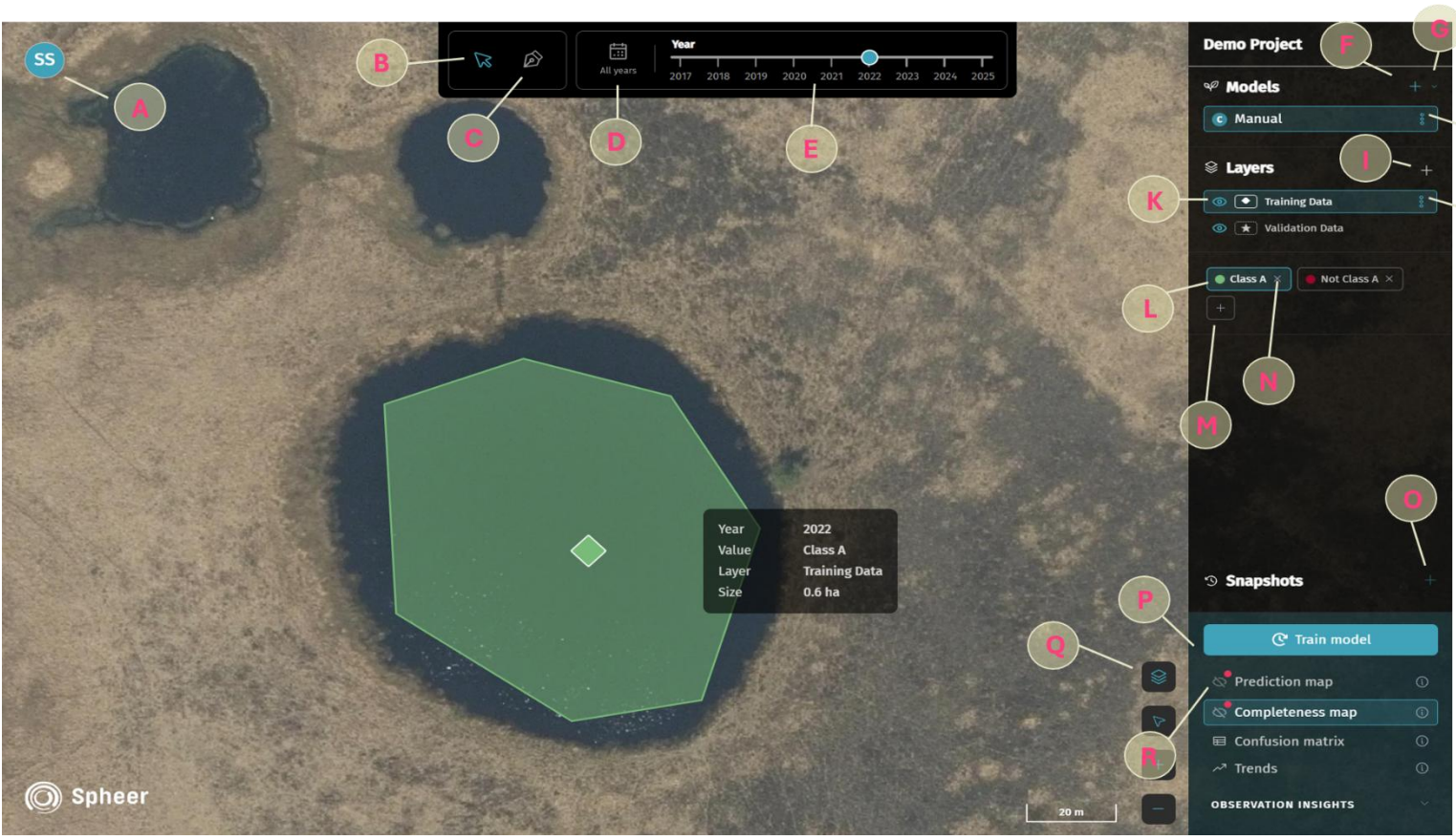
How do I choose between regression and classification?



- **Choose regression** when you want to predict a continuous value, such as the degree of vegetation cover or the concentration of a substance. The model will provide a percentage (0% to 100%) for each pixel within your area of interest.



- **Choose classification** when you want to categorize areas into distinct classes, such as different vegetation types, soil types, or land use categories. The model will assign each pixel to one of the defined classes.



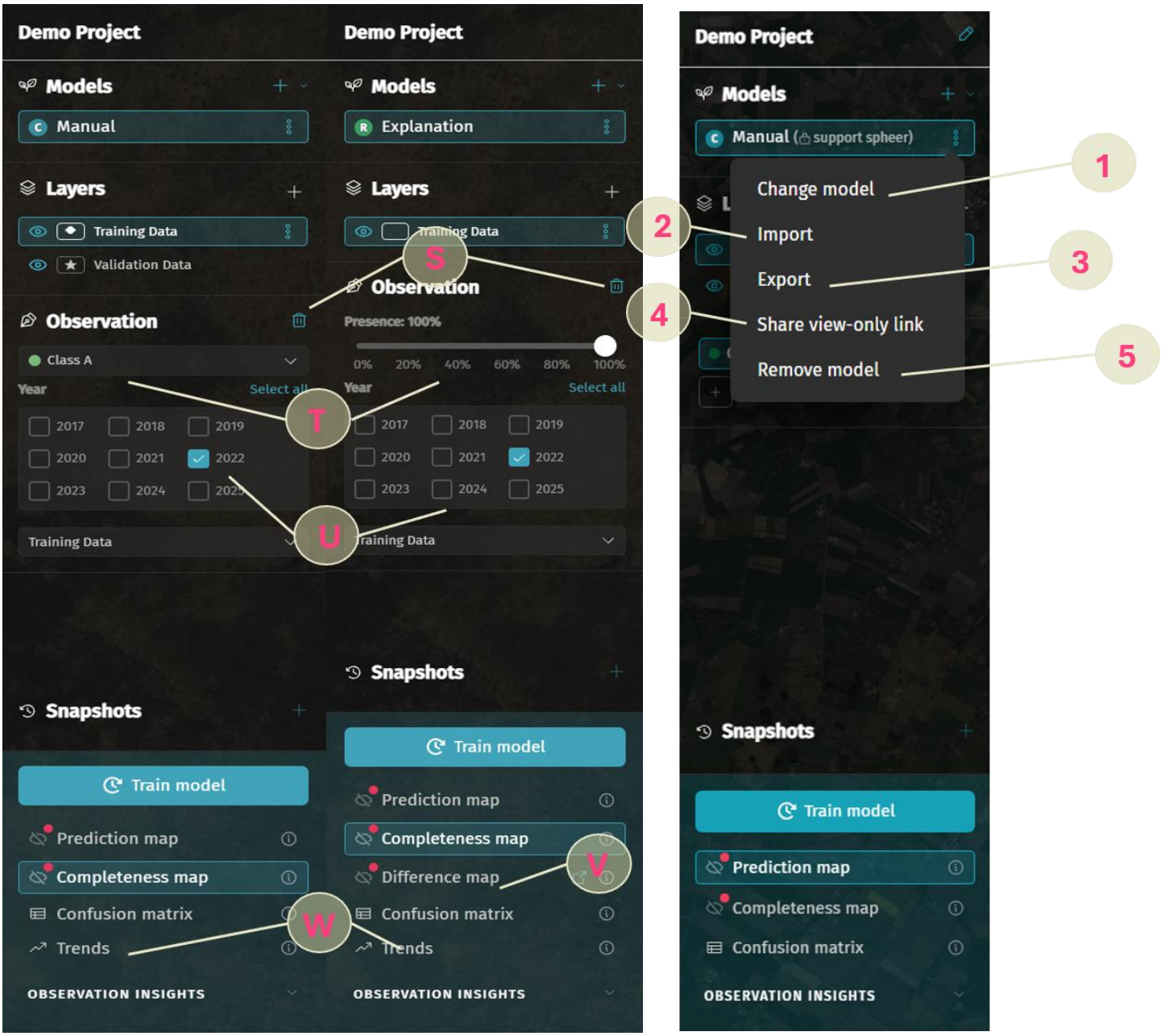
Meaning letters in figures:

In the figure above no observation is selected. The figures on the next page show the sidebar with an observation being selected for the regression and classification model, as well as the extra model options when selecting a model.

A. The Profile Icon
B. Select
C. Draw Polygon
D. Show observations from all years/ just the selected year
E. Year in which the map is presented
F. Create New Model
G. Expand model list
H. Model Settings (see next page)
I. Create new Observation layer
J. Observation layer settings
K. Show Observation layer
L. Change class colour
M. Create new class
N. Delete class
O. Create new snapshot
P. Train Model
Q. The layer-button to change the background
R. Show map

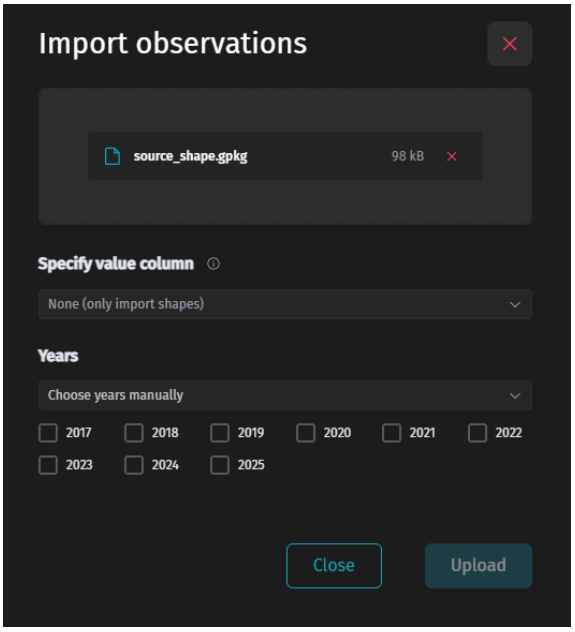
S. Delete Observation
T. Class or Value of Observation
U. Select years for the observation
V. Select difference map
W. Trends

1. Change model name, foundation model, user model, and ownership
2. Import Observations
3. Export Predictions and/or observations
4. Create and share a view-only link
5. Delete the model



How do I train an AI model?

- Select the model for which you want to train a model or create a new one (F).
- Draw or import an observation
- Draw observations
    - Select the 'Draw Polygon' icon (C) from the toolbox.
    - Draw an observation by clicking to create vertices and use a double-click to finalize the shape.
    - Assigning a value to an observation differs between regression and classification:
        i. Regression: Click on the observation and specify the degree of presence (0% means 'not present', 100% means 'fully present') (T).
        ii. Classification:
            1. Make sure *no* observation is selected and define one or more classes first (M). If needed, change the colour by clicking on the dot and selecting a new colour.
            2. Click on the observation to assign it to a class (T).
    - Observations must be completely within the usecase area of interest, which is marked on the map with a yellow dashed line.
    - Ensure that you are drawing for the correct year (E) in which the observation applies.
    - Tip: Select additional years (U) for which this observation is also valid. This prevents the need to redraw the same observation multiple times and makes trends over years more accurate.
- Import observations
    - Click the 'Import' icon (2) from the model settings.
    - Select a GeoPackage or a Shapefile containing the observations you want to import.
        i. Before a Shapefile can be successfully imported, it needs to have at least the following extensions: '.shp', '.shx', '.dbf', '. prj'.
    - Optional: Specify a column name that contains values for the observations. If you do not specify a column, all observations will be imported without assigned values, and you can manually assign them in Spheer, just like when drawing observations.
        i. For regression: The values in the column must be whole numbers between 0 and 100 (percentages).
        ii. For classification: The values in the column must be text. All classes will be automatically created by Spheer.



- Choose the years in which these observations apply by choosing a column of clicking the years manually. This prevents redundant imports and makes trend over years more accurate.
    i. The years in this column must be a string and multiple years separated by a comma. If this is not the case, or the column does not exist, the import will fail.
    ii. For example: “2017,2018,2019” or “2023”.

- Move observations
    - Select the ‘Select’ icon (B) from the toolbox.
    - Click on the observation you want to modify so that points appear at the corners.
    - Drag the entire observation to a new location if necessary.

- Edit observations
    - Select the ‘Select’ icon (B) from the toolbox.
    - Click on the observation you want to modify so that control points appear at the corners.
    - Adjust the observation by dragging the corner points or add a new corner by dragging the control points on the edges of the observation.

- Delete observations
    - Select the ‘Select’ icon (B) from the toolbox.
    - Select the observation you want to delete and remove it by clicking the trash icon (R), or pressing the ‘delete’ keyboard shortcut.

- Select and edit multiple observations at once
    - Hold **Shift** and drag a box over the map. Every observation the box touches is selected.
    - Hold **Shift** and click an observation to add it to the selection. Shift-clicking an observation that is already selected removes it from the selection.
    - Only observations that are visible on the map are selected. Want to include observations from other years or layers? Show them first with the calendar button (D) or the eye in front of the layer (K). Selecting does not work while you are drawing an observation.
    - The sidebar shows how many observations you have selected. Whatever you change there applies to all selected observations at once:
    - **Class or presence:** choose a class (classification) or set the percentage (regression). If the observations have different values, it says ‘Mixed’.
    - **Years:** check a year to add it to all observations, or uncheck it to remove it from all of them. A box with a dash means the year only applies to some of the observations. An observation always keeps at least one year.
    - **Layer:** move all observations to another layer. If they are in different layers, it says ‘Several layers’.
    - **Delete:** click the trash icon above the selection, or press Delete.
    - Clear the selection: click the cross above the selection, press Esc, or click an empty part of the map.

- Train the model
    - Make sure that the prediction map is selected (R). Click on ‘Train Model’ (P). The training process will start in the background. Once it’s finished, you will receive a notification.
    - N.B. Spheer requires both observations and counter-observations to train a model. Ensure that you have drawn examples with varying percentages (for regression) or for all the classes you want to monitor (for classification).
- View the prediction
    - Make sure that the prediction map is selected (R). Click on the closed eye in front of the prediction map (R) to see the prediction.
- Iteratively improve the model
    - Add new observations, retrain the model, and check if the predictions improve.

How do I see the prediction for a different year?

1. Train a model and click on ‘Show map’.
2. Use the slider (E) to navigate to different years.

How do I export Spheer’s results?

Once you’ve generated a prediction, you can export the map directly (3). When you click ‘Export all maps and observations’, the download of your predictions for each year in GeoTIFF format will start automatically. You can easily share this file, integrate it into other reporting systems, or further analyse and edit it in your own GIS software. Each prediction map has its own metadata file which will be automatically loaded into your GIS software. You can also choose to only download the observations or confusion matrices. The downloaded observations can be loaded into different usecases.

Exporting vector maps.

It is also possible to export the Spheer predictions as vector maps. For the vector maps, Spheer converts the rasterized predictions into the most suitable vector shapes.

The vector map uses the predicted classes for a classification map, and the set bins for a regression map. Before creating the vector shapes, Spheer cleans up the map. Very small patches (fewer than 4 connected pixels) are absorbed into the larger area surrounding them to prevent the export from being cluttered with tiny, scattered shapes. Neighbouring pixels with the same class are then combined into a single shape and the jagged, blocky edges left by the pixels are smoothed out

The export contains one GeoPackage file (.gpkg) for each year the model made a prediction. You can open these files in most GIS software, such as QGIS or ArcGIS. Each file contains one layer, called "predictions". The files use the standard WGS 84 coordinate system (EPSG:4326).

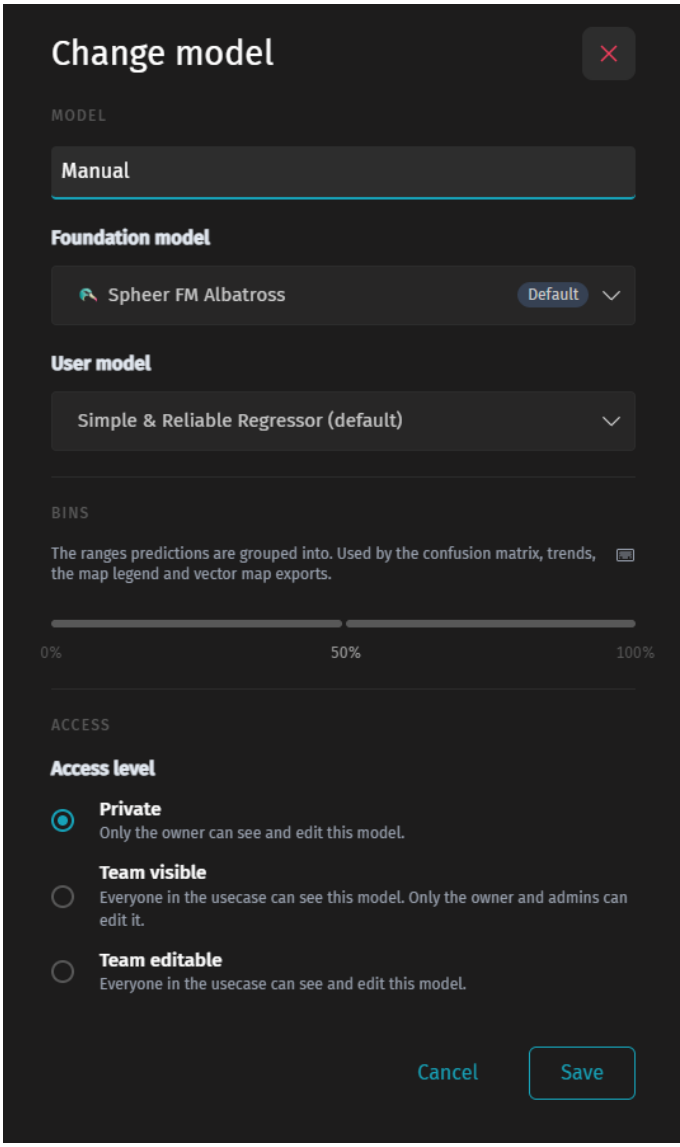
Getting more out of Spheer

How do I improve and clarify my predictions?

Good predictions start with good observations. Here are some tips for creating observations that help Spheer build the best version of your models:

- **Quality over quantity**: It's better to have a few precise observations than many less accurate ones. The more specific and precise your observations are, the easier it is for Spheer to recognize interesting patterns.
- **Make your examples specific**: Split up observations if needed. Instead of drawing a single large 50% block, divide it into separate 100% and 0% observations if that better reflects reality. This helps Spheer distinguish subtle differences in your data, leading to a more refined model.
- **Vary your observations**: Ensure that you not only add observations for the specific model you are interested in but also for other examples. This helps Spheer distinguish features more effectively and prevents unclassified areas from being misinterpreted. This applies to both regression (where you give a 0% value where it is not present) and classification (where you define an "other" class).
- **Draw observations for multiple years**: This helps Spheer better understand growth patterns and changes over time, as growth patterns do not look exactly the same every year. Experiments show that adding observations from more different years makes the pattern more stable, with the largest increase in stability occurring when moving from one to two different years. In general, the more different years for which observations are provided, the more stable the monitoring becomes.
- **Improve iteratively**: Start with a small number of observations and train the model. Gradually add new observations and assess if the predictions improve. Begin with observations you are absolutely certain about and only add the "edge cases" in a later iteration. By refining the model step by step, you can see quick results and easily make adjustments, allowing Spheer to get closer to the ideal prediction.
- **Observation size**: Make sure your observations are at least 10m x 10m and no larger than 1km x 1km. Smaller observations do not contain enough satellite pixels for training, while larger observations unnecessarily increase processing time.
- **Completeness Map**: When training a good model, it's important that Spheer has seen a sufficiently wide variety of pixels in the observations. If the drawn examples lack variation, the model may struggle to make reliable predictions. The Out of Distribution map shows which pixels Spheer still lacks observations for. This allows you to add new examples specifically in places where the model still has limited knowledge. See 'How do I use the Completeness map?' for more information on how to interpret and apply this map.

Model Settings:



In the Change Model menu (1), there are several options to adjust your model. Here you can:

1. Change the name of your model
2. Change the Foundation model
3. Change the User model
4. Change the Bins (only for regression)
5. Change the Access level

1. **Change model name**

- A model name change is visible for everyone that is allowed to see the model.

2. **Change Foundation model**

- Foundation models are the backbone of your predictions. Different foundation models can give different predictions, because the embeddings they generate differ slightly due to different training processes
- The **Default** foundation model is our current best. Use this one if you are unsure.

3. **Change User model**

- User models are what connect the foundation model to your observations. A different user model connects these in different ways, and will provide slightly different outcomes. Spheer provides a default user model for both the regression and classification models, but you can also use a different one:
    - **Simple & Reliable Classifier/ Regressor**: default for classification and regression models respectively, that creates reliable predictions with little amount of data.
    - **Many Observations Regressor**: Specifically for regression models. Works better with, and also needs, more observations.
    - **Advanced & Sensitive Classifier:** Specifically for classification models. Works better with, and also needs, more observations.

4. **Change Bins (only for regression)**

- The ranges predictions are grouped into. You can:
    - click on a bin to split it;
    - drag the gap to either side to resize;
    - click on the gap to merge the bins.
- Used by the confusion matrix, trends, the map legend and vector map exports.

5. **Change the Access level**

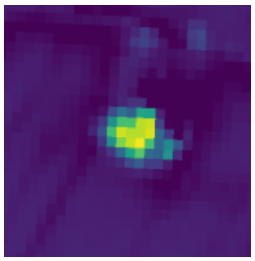
- The Access level decides who can view or change your model.

- You can have three different modes:
    - **Private**: Only the owner and an organisation admin can see and edit the model
    - **Team visible**: Everyone in the usecase can see the model, but only the owner can change it.
    - **Team editable**: Everyone in the usecase can see and edit the model
- Use Private when you do not want to publish your work yet, or when you are experimenting with a new model. Use Team visible when you are satisfied with your work and want to show it, but do not want others to change it. Use Team editable when you are building a model together with other people.

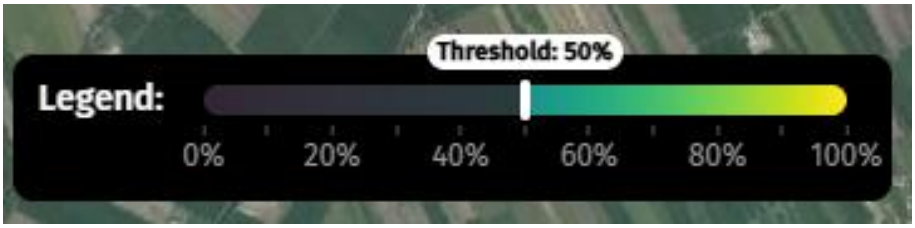
How to make predictions or observations transparent

Sometimes, it is easier to interpret Spheer's prediction when there is less clutter on your screen. You can achieve this by hiding certain classes or all regression values below a threshold. Observations can also be hidden for all years, or everything except the current year.

- **Make predictions transparent:**
    - **Threshold** value for regression models: The threshold setting allows you to specify the percentage at which a prediction becomes visible. For example, if you set the threshold to 20%, all predictions with a lower probability will be displayed as more transparent, giving you a clearer overview. See the image below for an example: left without a threshold, right with a 50% threshold.




The threshold can be set with a slider in the legend:



    - **Select classes** for classification models: This option allows you to make certain classes transparent in the prediction map, helping you visualise how different classes are being predicted.
        - Click the colour of the class, and press "Hide" to hide this class.
- **Make observations transparent**: Choose whether to display only the observations drawn for the selected year or all observations from all years by pressing the Calendar Icon button (D). This is useful for checking whether observations are consistent and for understanding the data on which Spheer bases its predictions.
    - To hide observations from one layer, close the eye in front of that layer.
    - To hide all observations, close all eyes in front of all layers.

How do I use the Observation Insights?

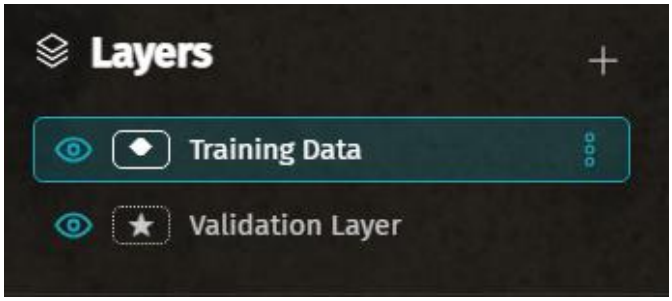
Observation Insights translates your observations into indicators. It helps you understand why a model performs well or less well, and which adjustment is likely to have the greatest effect.

The observation insights have their own manual, which can be found on our help centrum: https://spheer.ai/en/resources/helpcentrum

How do I use different observation layers?

Spheer offers the option to create different layers of observations. This is useful if you want to divide your training observations, for example by year, area, or species, and when you want to validate your model directly in Spheer.

- Start by creating a new layer by clicking the plus button next to Layers.



- Give the new layer a name, indicate whether it is a training layer or a validation layer, and click Save.
    - A training layer is used when training the model. Add observations that you know are correct to this layer, otherwise the model will learn to recognize the wrong things.
    - A validation layer is used to validate the model's prediction map. All observations in this layer are not used for training the model, but are compared with the prediction map, from which a confusion matrix is created; see the section below.
- Draw or import observations into the new layer.
    - You can show or hide all observations in the layer by clicking the eye icon in front of the layer.

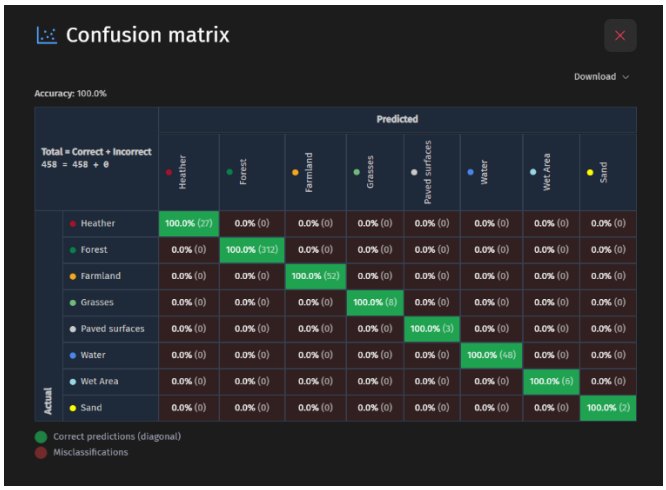
How do I use the confusion matrix?

A confusion matrix provides insight into the performance of your model. You can find an explanation of the confusion matrix itself on our website:

- https://spheer.ai/resources/artikelen/confusion-matrix

To use a confusion matrix in the app, you first need to create a validation layer and add observations to it. These are the observations used for creating the confusion matrix. It is important that these observations are correct, since you will use them to compare and assess the prediction map.

When the prediction map is ready, click the chart icon in front of the name of the validation layer. Here you will see the following:



- The rows show the actual values, which correspond to the observations in the validation layer. These are compared with the predicted layers, which are the values from the prediction map.
- The green cells are the correct predictions, and the red cells are the misclassifications. Each cell shows how much of the actual class falls into that category, both as a percentage and as the total number of pixels.
- The model's accuracy is calculated and shown in the top left. This indicates how well the model performs.

When more of the validation observations are predicted correctly and the accuracy increases, this is a clear sign that the prediction map is improving.

In classification models the different classes are being shown here, while for regression models the bins as defined in the Model Settings will be used

How do I use the Completeness map?

The Completeness map shows which areas within your use case are still 'unknown' to the model. In these areas, Spheer has seen few or no similar pixel time series in the observations you've drawn so far. By adding extra observations in these areas, you help Spheer train a more complete and robust model.

The OOD map only shows where the model has seen few similar pixel time series during training. That does not automatically mean predictions in those places are wrong. Sometimes Spheer still makes a perfectly fine prediction in an 'unknown' area, for example because those pixels best match other classes the model does know. Still, it's wise to give these areas some extra attention, especially if you suspect they're important for your analysis.

The Completeness map is divided into five colour bands. The more unfamiliar an area is to Spheer, the darker the colour. In the legend, the scale runs from 'Familiar' (0%) to 'Very unfamiliar' (100%). Use the slider in the legend to set a threshold: everything below it is shown with a dimmed colour. Move it to the right to see only the most unfamiliar areas.

Use the Completeness map as follows:

1. Select the Completeness map (R).
2. Then click 'Train Model' (P).
3. Click on the closed eye in front of 'Completeness map' (R) to see the map.
4. Focus on the coloured areas, especially the orange and dark red ones. These are places where Spheer has seen few or no comparable pixels in observations.
5. Add new observations there where possible.
6. Recalculate completeness and watch the coloured areas shrink.

How do I use difference maps?

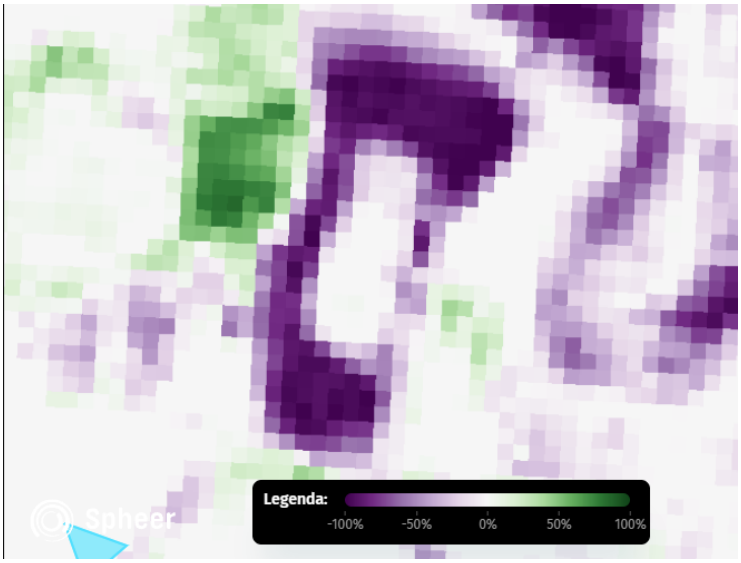
The difference map shows how a model's prediction changes between two years. This lets you see at a glance where something has increased, decreased, appeared or disappeared, helping you quickly spot trends and changes.

Note: The difference map shows differences in model predictions, not directly measured field values. Differences can also arise from data quality, coverage, or noise between years. Use the map as a starting point for analysis and verify notable patterns with your observations or by viewing the individual years separately.

Use the difference map as follows:

1. Train your model as usual.
2. Select the 'Difference Map' (V).
3. For a classification model: choose the class you want to follow below the list of maps.
4. Below the list of maps, choose the two years you want to compare: 'Start year' and 'End year'.
5. Make sure the eye before the 'Difference Map' is open (V).
6. Read the map using the legend (see below).
7. Zoom in on areas of interest and verify your findings by inspecting the individual years or adding more observations.

Difference map for regression models



The map shows, per pixel, how much the predicted value has changed, from -100% to +100%. Green means an increase, purple a decrease. Above the legend you see which years you are comparing, for example 'Change 2019 → 2024'.

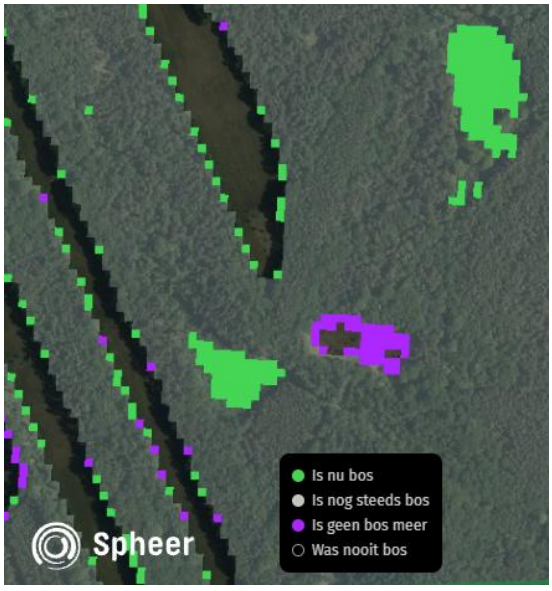
Use the two sliders in the legend to choose which changes you want to see. Everything outside the range between the sliders is dimmed. Click the bar to move the nearest slider there. Want to see only strong decreases, for example? Set the right slider to -20%. The sliders always stay at least 5 percentage points apart.

You can export the difference map of a regression model with the export icon next to 'Difference map'.

Difference map for classification models

You follow one class between the two selected years. The legend has four colours:

- **Gained [class]** (green): did not belong to the class in the first year, but did in the second.
- **Still is [class]** (grey): belonged to the class in both years.
- **Lost [class]** (purple): belonged to the class in the first year, but no longer in the second.
- **Never was [class]** (slightly darkened): belonged to the class in neither year.



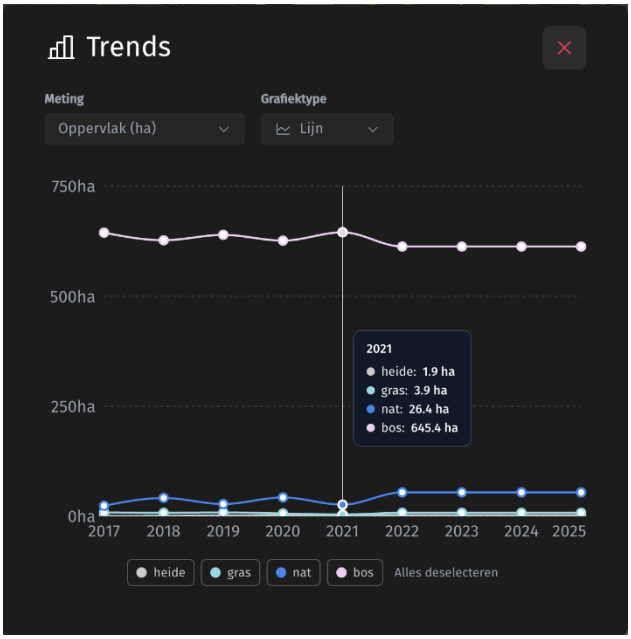
How do I use trends?

Trends show you in a single chart how your model's prediction develops over the years. For each year, Spheer adds up the prediction across the entire area of interest of the use case. This lets you see at a glance whether a class is growing or shrinking, or how the average predicted value changes, without having to go through all the years with the slider (E).

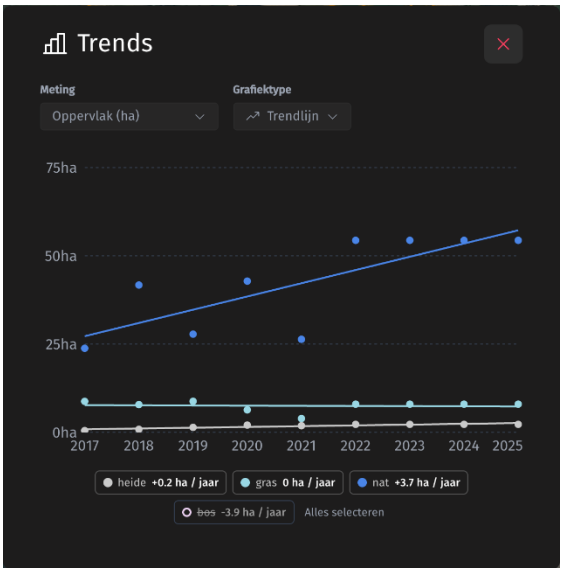
You use trends as follows:

1. First train your model and wait until the prediction map is ready. As long as there is no prediction map yet, or it is still being generated, Spheer cannot show any trends.
2. Click 'Trends' (W).
3. Under Measurement, choose what you want to see. The options depend on the type of model:
   - **Classification – Area (ha):** the total predicted area of each class in hectares.
   - **Classification – Area share (%):** the proportion of the area of interest covered by each class.
   - **Regression – Average value:** the average predicted value across the entire area of interest.
   - **Regression – Value distribution (%):** the proportion of the area of interest that falls within each interval. This uses the intervals from the Model Settings.
4. Under Chart type, choose how you want to view the data:
   - **Line:** the value per year as a line.
   - **Area and Bar:** the classes or intervals are stacked on top of each other, so you can also see the total.
   - **Trendline:** the values per year as individual points, with a straight line through them showing the overall direction (see below).
   - **Table:** the exact figures per year.
5. Hover your mouse over the chart to see the exact values for a given year.
6. Click a class or interval in the legend below the chart to hide or show it. Use 'Deselect all' and 'Select all' to turn them all off or on at once. Spheer remembers which classes you have hidden for each model.





The trendline



The trend line is a straight line that fits the values of all years as closely as possible. This shows you the overall direction, even when the values fluctuate somewhat from year to year. The legend shows, for each class, how much it increases or decreases on average per year, for example '+3.7 ha / year'. A plus sign indicates an increase, a minus sign a decrease.

Tip: hide large classes in the legend to get a better view of smaller classes. The chart adjusts its scale automatically.

Note: Trends show the model's prediction, not a measured field value. As with the difference map, differences can also arise from data quality, coverage, or noise between years. Have you added, edited, or deleted observations since the last training? Then Spheer will indicate that the trends are outdated. Retrain the model to update them.

How do I use snapshots?

Snapshots let you revisit previously saved moments within your use case. You can see which observations existed at that time and what the model's predictions were. You can also export those observations and predictions for further analysis in other tools. This way, you can easily experiment with changing the model and observing the impact of these changes.

Note: snapshots are not automatic. To view a point in the past, you must save it first. We recommend creating a snapshot before any important changes.

Use snapshots as follows:

1. Click the plus icon next to 'Snapshots' (O).
2. Enter a name for the snapshot and click Save.
    a. If you leave the name empty and click Save right away, the snapshot will be named automatically after the model name and the time of creation.
3. Repeat this whenever you want to capture a new moment (e.g., after adding observations or retraining your model).
4. Open 'Snapshots' by clicking on it and select the desired snapshot to view its observations and predictions.
    a. To go back to the most recent version, click once more on the same snapshot
5. Use 'Export' (3) in the model settings (H) to download observations and/or predictions from the selected snapshot for further analysis.

How do I use the 'view only' links?

The 'view only' links are intended for sharing your model outside your organization, or with people who don't have access to Spheer. This is useful when you want to share the results of your model with colleagues, a client, or an external party. It can also be helpful when you don't

want anything to be changed in your model, because with a 'view only' link the viewer cannot make any adjustments to the model.

In addition, a 'view only' link of a model is dynamic, which means that changes made to the model after the link has been created are also reflected in the link. So you can keep improving the model without having to send a new link!

Creating a 'view only' link works as follows:

1. Click on model settings (H) and then on "Share 'view only' link" (4).
2. Click the "Generate new share link" button.
3. Copy the generated link and share it.

How do I change Spheer's background imagery?

Click the layers button (Q). You'll see an overview of available background layers for this use case. Click the background you want to use. Do you have your own background layer that you would like to use? Let us know by mailing it to support@spheer.ai and we can add it for you.

How do I use the High-Resolution Model?

The High-Resolution Spheer model was developed to map more detail by combining Sentinel-2 data with the 25 cm RGB aerial imagery from PDOK. While the Sentinel-2 model has a resolution of 10 m × 10 m, this model works with an output resolution of 1.68 m × 1.68 m, which amounts to about 25× more detail. This allows spatial structures and patterns within a single pixel to be recognized more clearly, and it incorporates context (what lies around an object). A practical limitation is that no suitable PDOK dataset is available for 2021, which means no prediction is made for that year.

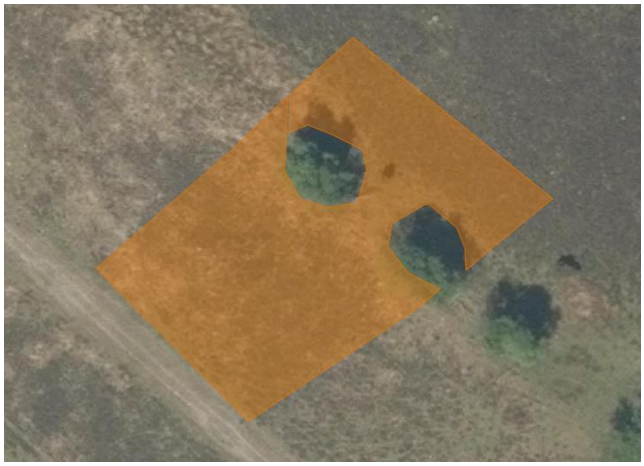
Method:



The workflow in the high-resolution model requires more care than in the regular model:

- Because more variation becomes visible at this level of detail, you need to add extra observations to represent that variation properly.
- In addition, transitions (for example between vegetation types, land use, or object edges) must be described explicitly, because model performance depends on context.
    - For the High-Resolution model, for example, trees in the center of a forest are different from trees at the edge (see image on the right).
    - The transitions between the different classes you want to distinguish therefore need to be clearly indicated.
- Furthermore, in this model it is more important that the added observations truly match the class.

- For example, when classifying a grass field, a small sapling within an observation of the grass field will need to be cut out, whereas this is much less of an issue in the Sentinel-2 model (see image on the right).



Considerations:

Using a High-Resolution model is therefore a trade-off. For some use cases it will deliver a significantly better result, while for others it will mainly require more work. Below are the main advantages and disadvantages.

- Advantages:
  - 25 times more detail
  - Context is included
  - Captures spatial structures and patterns within a pixel
- Disadvantages:
  - More sensitive to variation within species and across locations
    - Therefore requires more observations
  - Aerial imagery provides less stability over the years

Keyboard Shortcuts:

We have implemented several keyboard shortcuts to make working with Spheer easier:

Map / drawing

- S — select mode
- D — draw polygon mode
- T — trigger training / generate predictions
- Esc — cancel current draw / close right-click context menu
- Delete / Backspace — delete selected observation(s) (also deletes a vertex while actively drawing)
- Enter — finish the polygon while drawing
- Shift + drag — select multiple observations with a box
- Shift + click — add an observation to the selection or remove it

Map layers (sidebar)

- P — toggle Predictions layer
- O — toggle Completeness layer
- I — toggle Difference layer (difference map)

Observation navigation

- ← / → — select previous / next observation. The first press selects the first observation; after the last one, it starts again at the beginning
- Esc — deselect the current observation or selection

Class & value selection

- 1–9, 0 — select a class (from the classlist, matches class order, 0 = 10th class)
- 0–9 while the regression slider is focused — set coverage percentage in 10% steps (1 then 0 = 100%)

Form fields

- Enter — submit a class name edit; also activates the file upload dropzone
- Esc — cancel a class name edit
- Space — activate the file upload dropzone

Admin functions

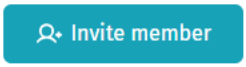
As an administrator you have additional permissions in Spheer.

How do I open my organization page?

- Click ‘My organizations’ under your profile icon (A). Then click the organization you want to add users to and select ‘Manage organization’.

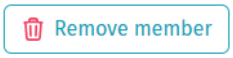
How do I add a new user?

- Go to your organization page and click ‘Members’. Click ‘Invite member’. Enter the first name, last name, and email address of the user you want to invite. You can also choose to make this user an administrator right away. The new user receives an email with an invite link (see ‘How do I accept an invitation?’).



How do I remove a user?

- Go to your organization page and click ‘Members’. You’ll see your active users here. Click the member you want to remove and then ‘Remove member’.



How do I promote an existing user to administrator?

- Go to your organization page. On the right you’ll see which users are administrators, which users have an outstanding admin invite, and at the bottom you can invite existing users to become administrators. Choose an email address from the list and click ‘Invite selected user’.

How do I change my organization details?

- Go to your organization page. In the middle you can edit your organization’s name and image.

How do I start a new use case?

- Admins can see a “Request new usecase” button on their homepage and organization page, where you can upload a file with the usecase area of interest. This file is checked by us, whereafter we open up access to the usecase for your organization.

How do I change use case details?

- Click the pencil icon next to the use case name (G). There you can add or edit the name, description, and an image.
  If you want to adjust the area of interest, email a GeoPackage of the desired new area of interest to support@spheer.ai and mention which use case it concerns. We aim to apply the change within 5 business days.

How does the tech behind Spheer work?

Spheer uses a foundation model developed by Spheer to recognize pattern in satellite imagery. This foundation model is highly advanced and has processed vast amounts of satellite data. It filters, analyzes, and summarizes the data into a set of numbers that serve as a base for user models tailored to specific models. Thanks to this foundation, you can quickly train advanced models and generate maps within minutes.

Each time you create an observation, you draw it for a specific year. These observations are not just visual; they are automatically linked to the satellite data available for that year. Spheer uses satellite images with a resolution of 10 meters per pixel, providing insights at a detailed level of 10 meters per pixel. The aerial photos in the background are for visual reference only and are not currently used by Spheer.

When you train a model, you build on the fixed foundation model and refine it using your observations for the selected years. This creates a model tailored to your specific situation. Spheer then generates predictions for all years in your area, enabling you to quickly and easily analyze how your model develops over time based on your observations.

Troubleshooting

- **My predictions do not match the expected results.** First, check if the observations have been drawn correctly and assigned the correct value. Make sure you have included both examples and counterexamples of a model. Also, refer to the section 'How do I make my predictions clearer?' for tips on drawing observations.
- **My prediction map is completely one colour.** This can happen if Spheer has only received observations with one value. Ensure you add observations with various values so that both examples and counterexamples of the model are present.
- **I don't see a prediction.** It may take some time for the predictions from all years and areas to load, depending on the size of the area of interest and the amount of data.
- **My observations are missing or have changed.** All users with access to a usecase can modify all model observations within that usecase.
- **I cannot export my prediction.** You can only click 'Export all maps and observations' once the model is finished training and has created the prediction maps. If the download does not start after clicking, check if your model has fully completed training, and contact support if you continue to encounter issues.
- **I can't log in.** Check that you are using the email address you were invited with. Forgot your password? On the password screen, click 'I want to request a new password'. Do you get a message that there is no Spheer account for your email address? Ask your organization's administrator for an invitation.

Support

Do you have questions or are you facing issues that you cannot resolve on your own? Contact our support team at support@spheer.ai. We're ready to help you with any technical issues or to collect feedback to further improve Spheer.