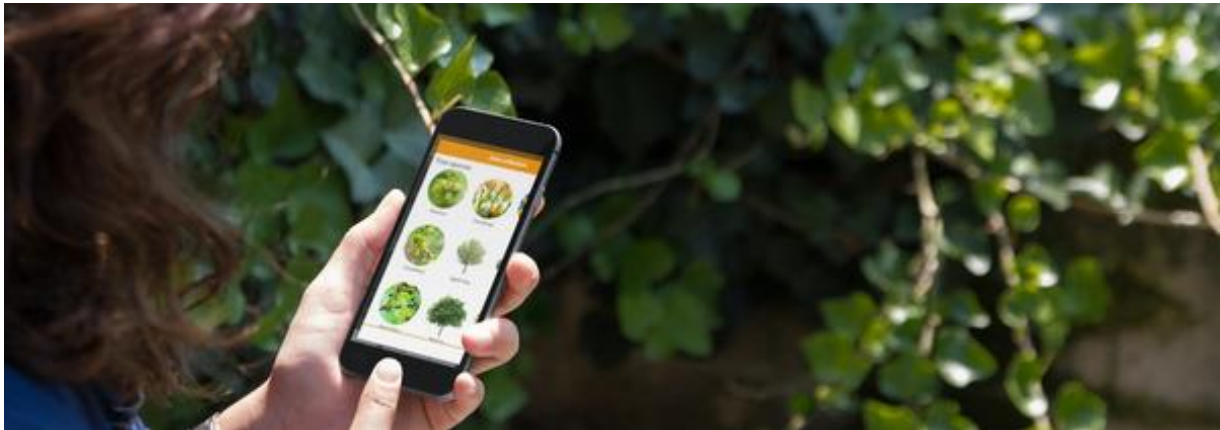
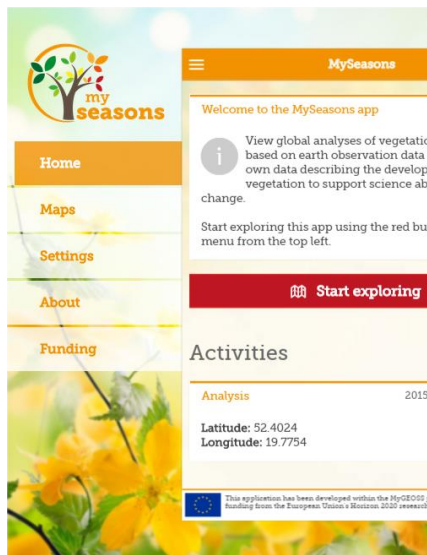


# Operations Manual

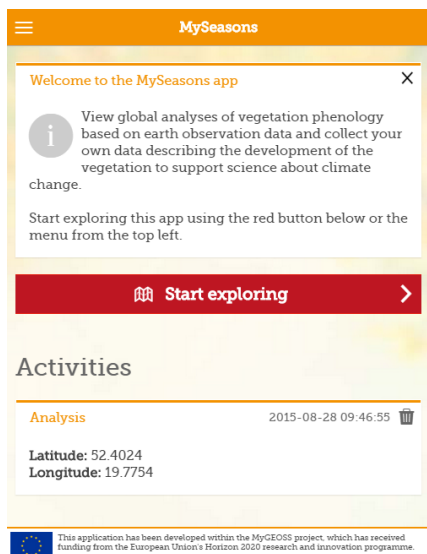


## Menu



Please use the button on the top left corner to open the menu. From this menu you can navigate into the start page, maps, settings, about and funding.

## Home



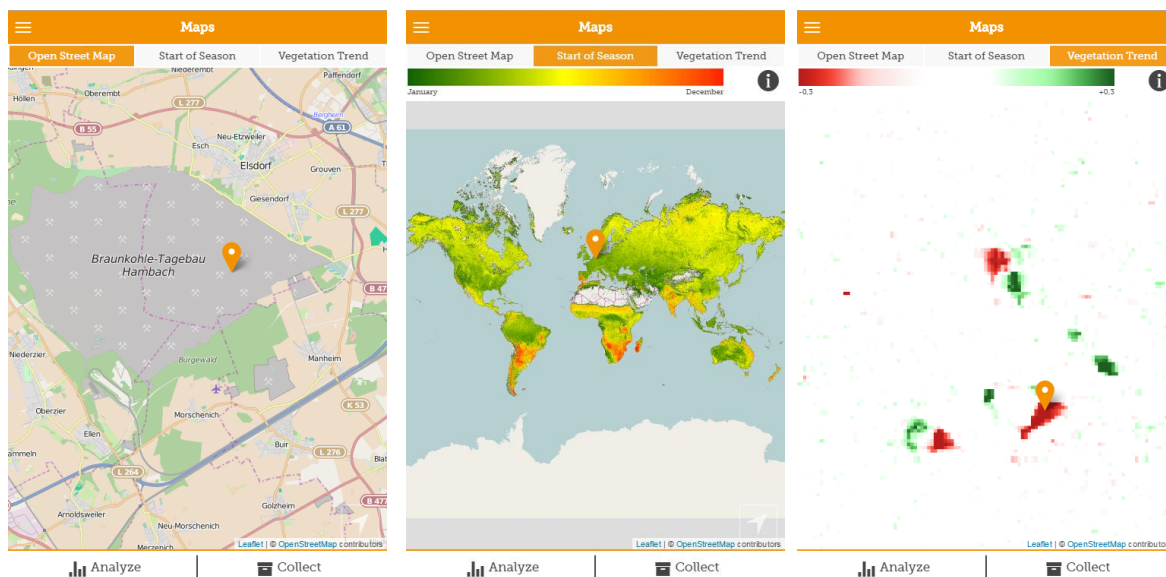
The start page shows a welcome message, a button to start exploring our datasets, the analysis and the data collection tasks, as well as the activities that has been done by the user. If you start the app the first time, of course you will see no activity. Use the “Start exploring” button to navigate to the maps. This is the same page than using the map link within the menu (top left button).

Within the activities all kinds of analysis and data collection tasks you have done is listed here. With a click on the item the analysis or data collection results are shown in a new window. You can delete one entry from the local database with the trash icon. You can clear the complete local database on the settings page. Please note: You will manage only your local database, data collection tasks submitted to the server will not be deleted.

## Maps

In the maps section you can first discover two of our maps we have produced and provided for interactive exploration. The “Start of Season” map shows the start of the vegetation season as mean value from 2001 to 2013 based on the MODIS MCD12Q2 Yearly Land Cover Dynamics dataset with a spatial resolution of 500m. It indicates whether the season starts early (green) or late (red) in the year. The “Vegetation Trend” dataset shows the slope of a linear trend of the vegetation from 2001 until 2014 based on the MOD13Q1 Enhanced Vegetation Index dataset with a resolution of 250m resampled to 500m. Red pixels show a negative trend, green pixel shows a positive trend. Please note: In most places you have to zoom in to explore individual areas with negative and positive vegetation trends.

You can click on the info icon beside the legend graphic to get a description of the map.



If you have GPS enabled on your device you can use the geolocation button on the bottom right of the map to navigate to your current location.

## Analysis

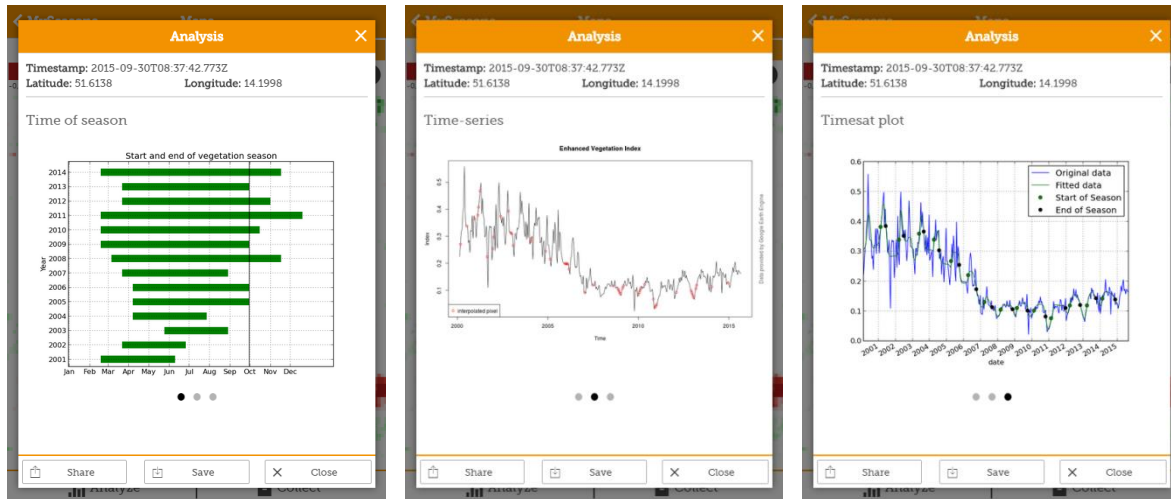
Use the button “Analyze” to get some time-series data and analysis plots. You may see the cross icon in the middle of the map. To move this cross icon to another place on the map, just tap on the map. The analysis is always being executed for the pixel that is related to the center point of the cross icon. The execution can take up to 30 seconds; you will see a loading bar on top and a waiting button in the center. The resulting graphs are displayed in a slider. You can slide the graphics to the left to see the other graphics.

Three plots are created (see screenshots below):

1. Time of season (Start and end of vegetation season)
2. Data plot from MODIS MOD13Q1 Enhanced Vegetation Index data (the red markers show interpolated pixel because of bad data quality)
3. Plot with the original time-series data, the fitted curve and start and end of season resulting from the phenology analysis using the Timesat software

For more information about the Timesat software, please follow this link:

<http://www.nateko.lu.se/timesat/timesat.asp?cat=1>



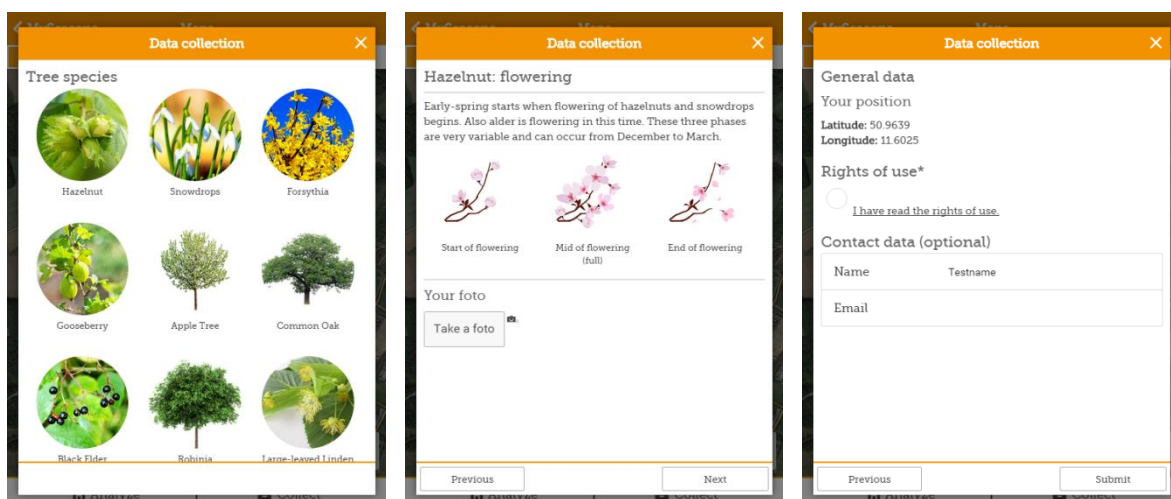
## Collect

If you wish to support scientists and collect some data, you need to have GPS enabled on your device as you can only collect data while you are in the field. Please be aware: Any data collection you submit is related to the current GPS position!

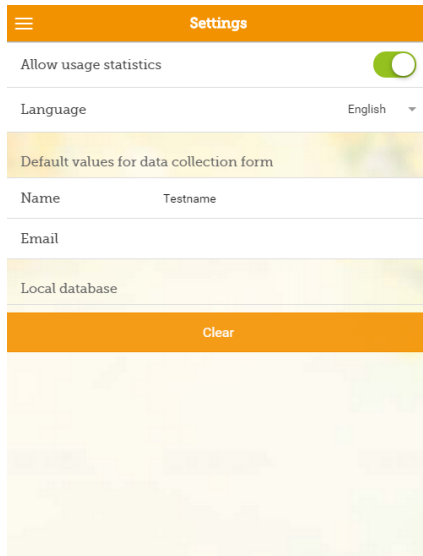
First of all you need to select the tree species that you are observing. You can scroll down for other tree species. You can select a tree by tapping on the icon. We have prepared a setting of properties for each tree that can be seen relevant to vegetation phenology. In total we provide the following properties, but not all are available for any species:

- Flowering: Start, Mid (Full), End
- Leaf development: Begin, End
- Fruit maturity: Yes, No
- Leaf discoloring: Yes, No
- Defoliation: Yes, No

For any of the properties that are related to a specific tree species you can select a value and take a foto of the leaf, the fruit or the tree. Please select the value of the property, take a photo (optional) and click on the "Next" button in the lower right. Finally you have to accept the rights of use and use the "Submit" button to send the data collection to our server. Optionally you can also provide your name and your electronic mail address. Your mail will never be published or transferred to other institutions (see rights of use).



## Settings



Within the settings page you can...

- Disallow the app to send usage statistics to our Google Analytics account.
- Change the language of the app (at the moment you can select between English and German)
- Set default values for name and electronic mail if you want to provide this information during the data collection tasks.
- Any activity (analysis, data collection) is locally stored in a Web SQL database and is accessible through the start page of the app. You can clear this database if you like.

## Bugs

There are still some bugs in the software:

- Using the analysis there could be an error in the data processing task. If you do not get results within one minute, you should close and start the app again.
- For areas especially in the southern hemisphere or with late starts of the vegetation season, the resulting "Time of season" plot looks not perfect. This need to be improved.
- Some times the map is not being loaded correctly. It sometimes helps to go the "About" page and then back to the map. If this does not help, you should close and start the app again.

## Future work

There are some tasks we would like to do before releasing this app and before GEO Ministerial Summit in Mexico City:

- Upload app to Google Play Store and Apple Store.
- Improve the "Time of season" plot for areas especially in the southern hemisphere or with late starts of the vegetation season.
- Build a small webpage to make the data collection database accessible to all
- The app can be easily translated to other languages, if someone can provide translation to Spanish, we could include this for the final release.
- Improve some texts within the data collection task.

