Creation and Analysis of vegetation index time series in SEPAL

SEPAL
SYSTEM FOR EARTH OBSERVATION DATA ACCESS, PROCESSING & ANALYSIS FOR LAND MONITORING

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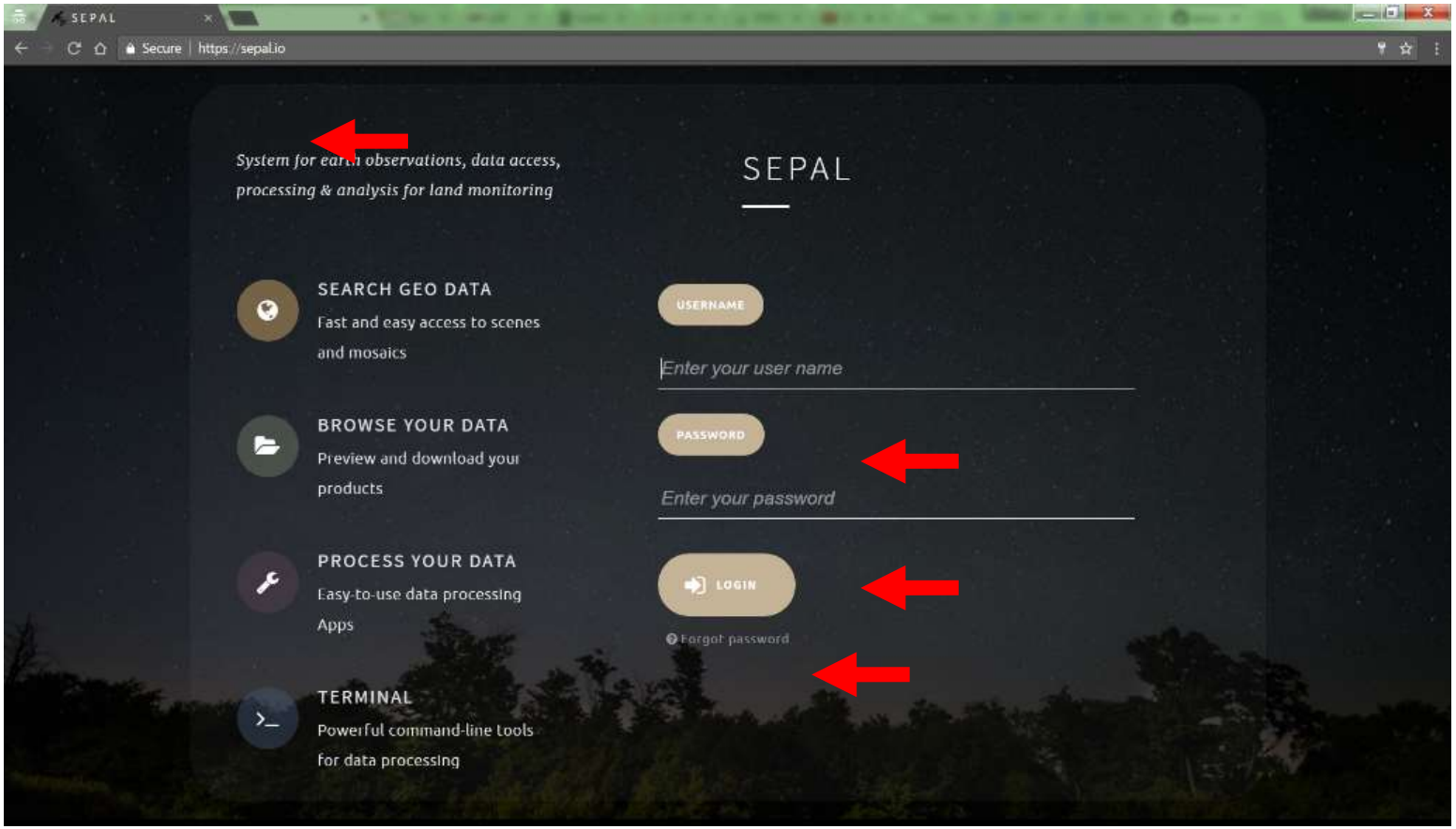
Methodological approach

Create time series of vegetation index

Analyze the time series with BFAST

Test different parameters and compare

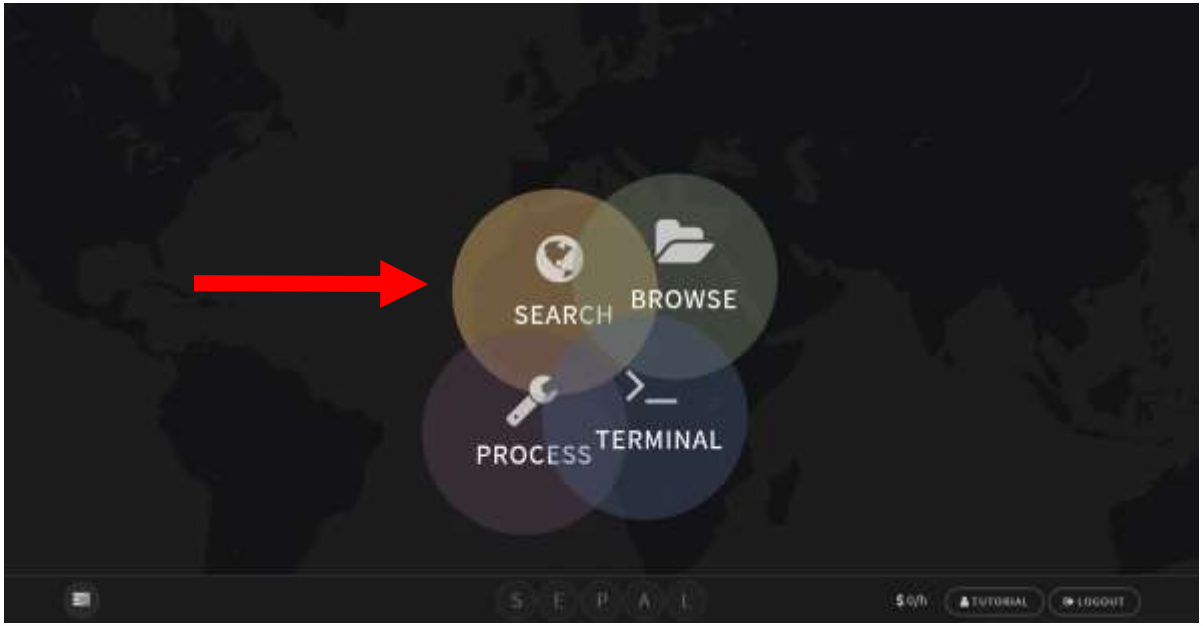
Go to sepal.io and login



Start the SEARCH tab

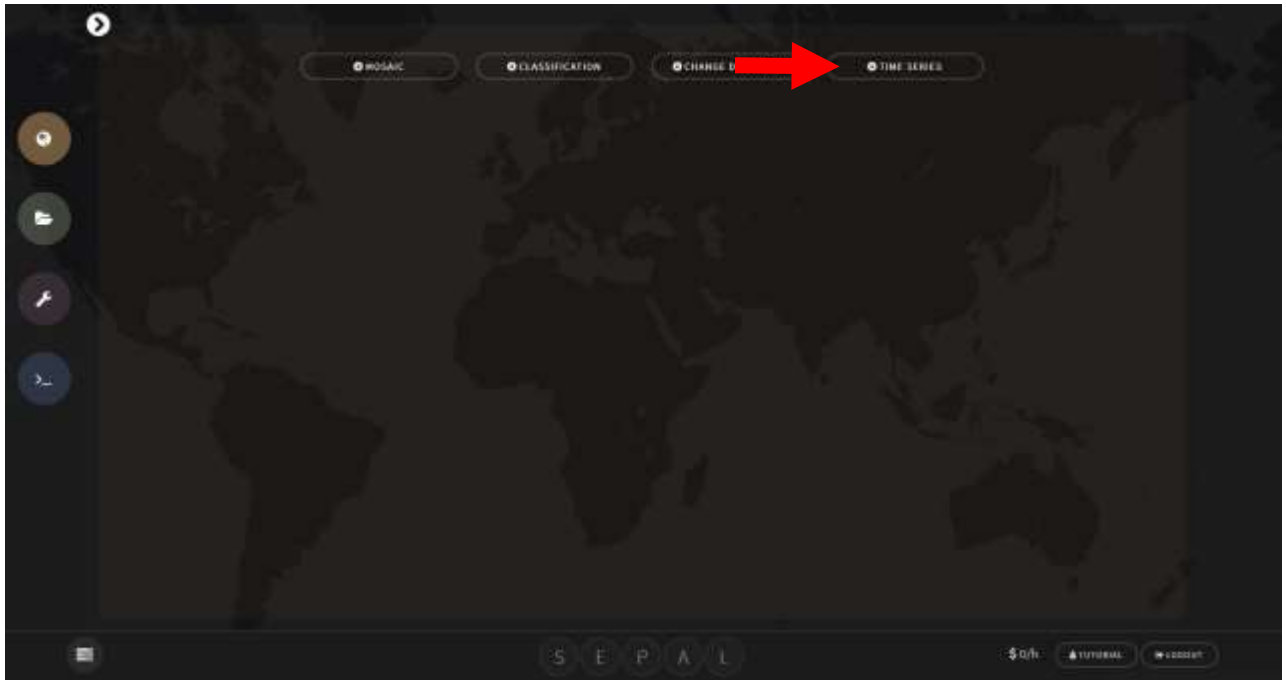
There are four fields in SEPAL

SEARCH	for imagery and creating mosaics
BROWSE	through your personal folders and visualize your data
TERMINAL	to access all the command line possibilities of the LINUX server
PROCESS	access pre-loaded tools and chains of processing



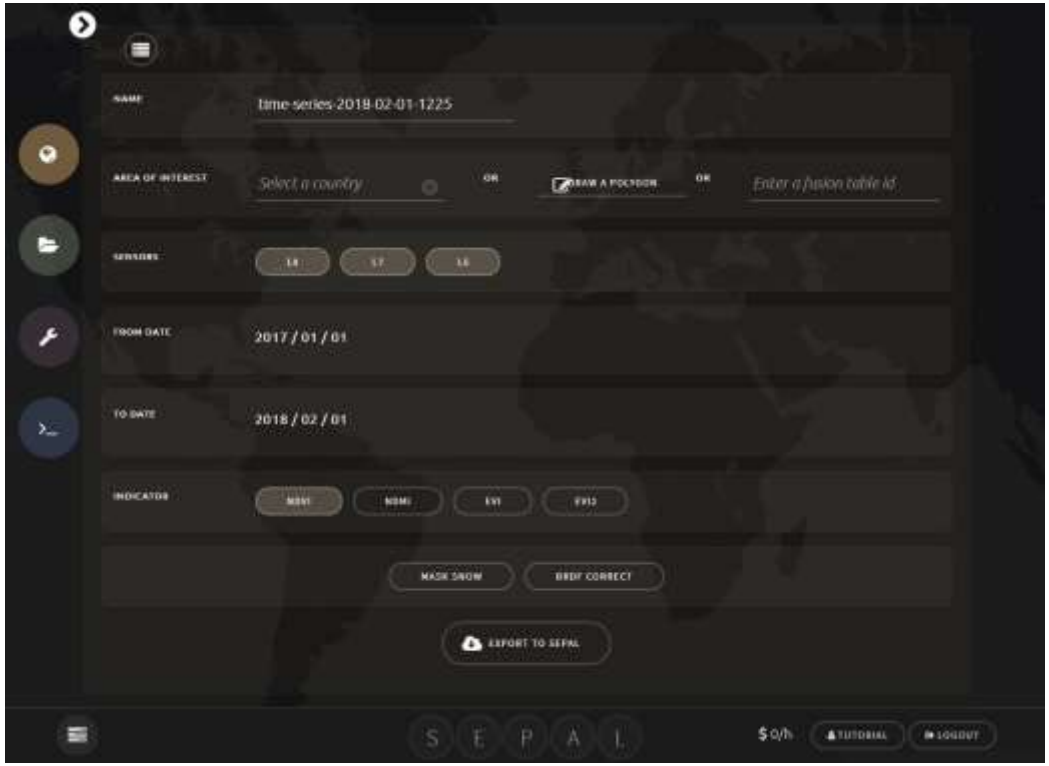
Open the time series stacker

Use the time series module to create a time series stack for an area of interest



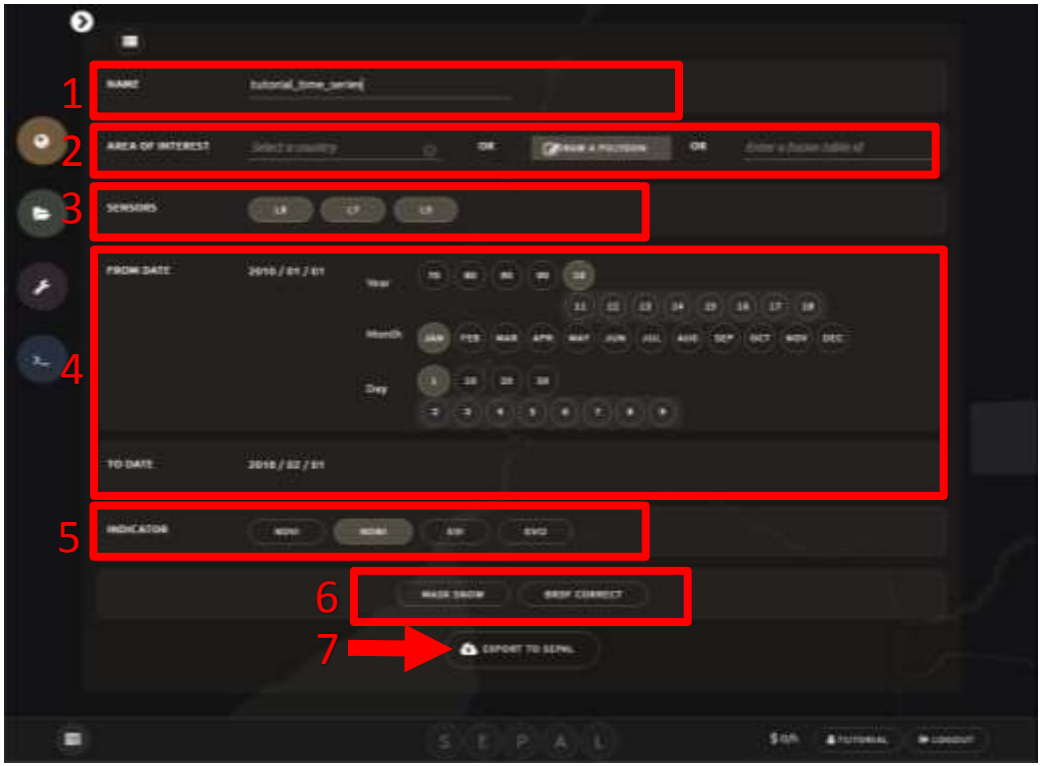
Use SEPAL to create a time series stack

- The time series tab creates a stack of images for the chosen indicator and time span for the area of interest.
- In the result each band in the image represents a unique date



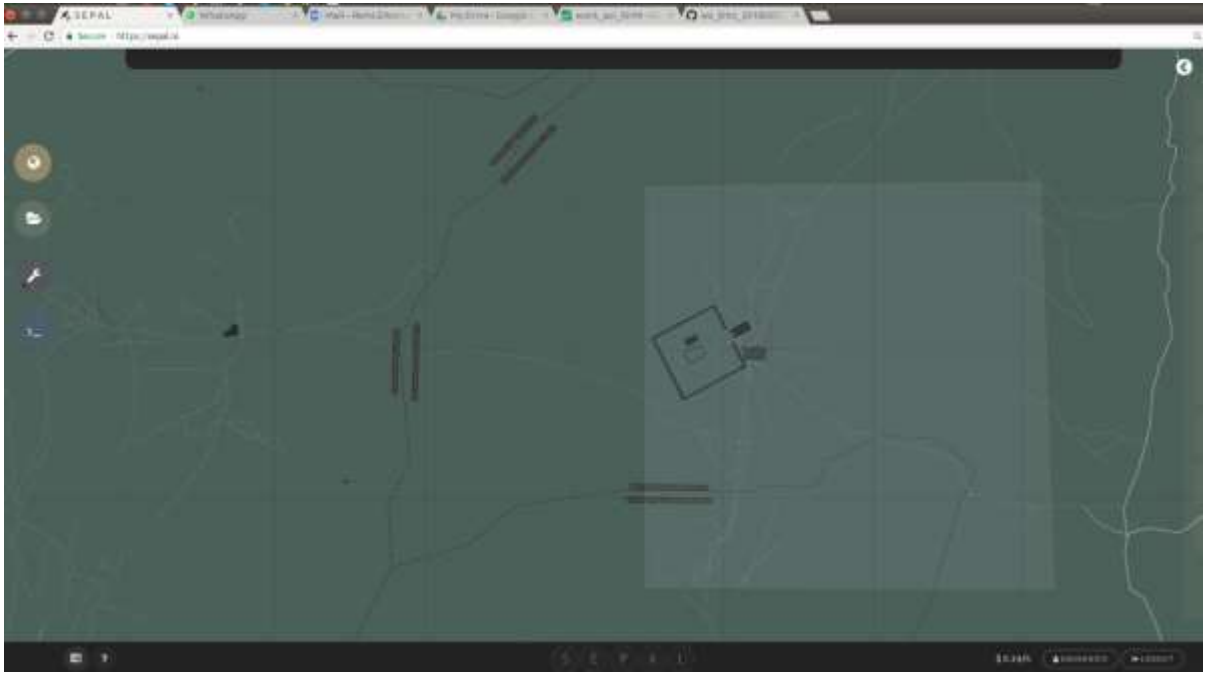
Parameters of the Time Series stacker

1. First give the time series a custom name, this will be the name of the folder in the downloads folder where you can find the downloaded time series
2. Country boundaries, a custom polygon or a fusion table ID can be used as the area of interest.
3. Landsat 5, 7 and/or 8 can be included in the time series
4. Choose the 'from' and 'to' dates. The time series will start at the from date and end at the to data
5. The indicator is the vegetation index that is calculated for each date.
   - NDVI= normalized vegetation index
   - NDMI= normalized moisture index
   - EVI= enhanced vegetation index
   - EVI2= enhanced vegetation index (2 bands)
6. Options to mask snow and correct for view and illumination angle effects using BRDF
7. Final step is to export the time series stack to SEPAL

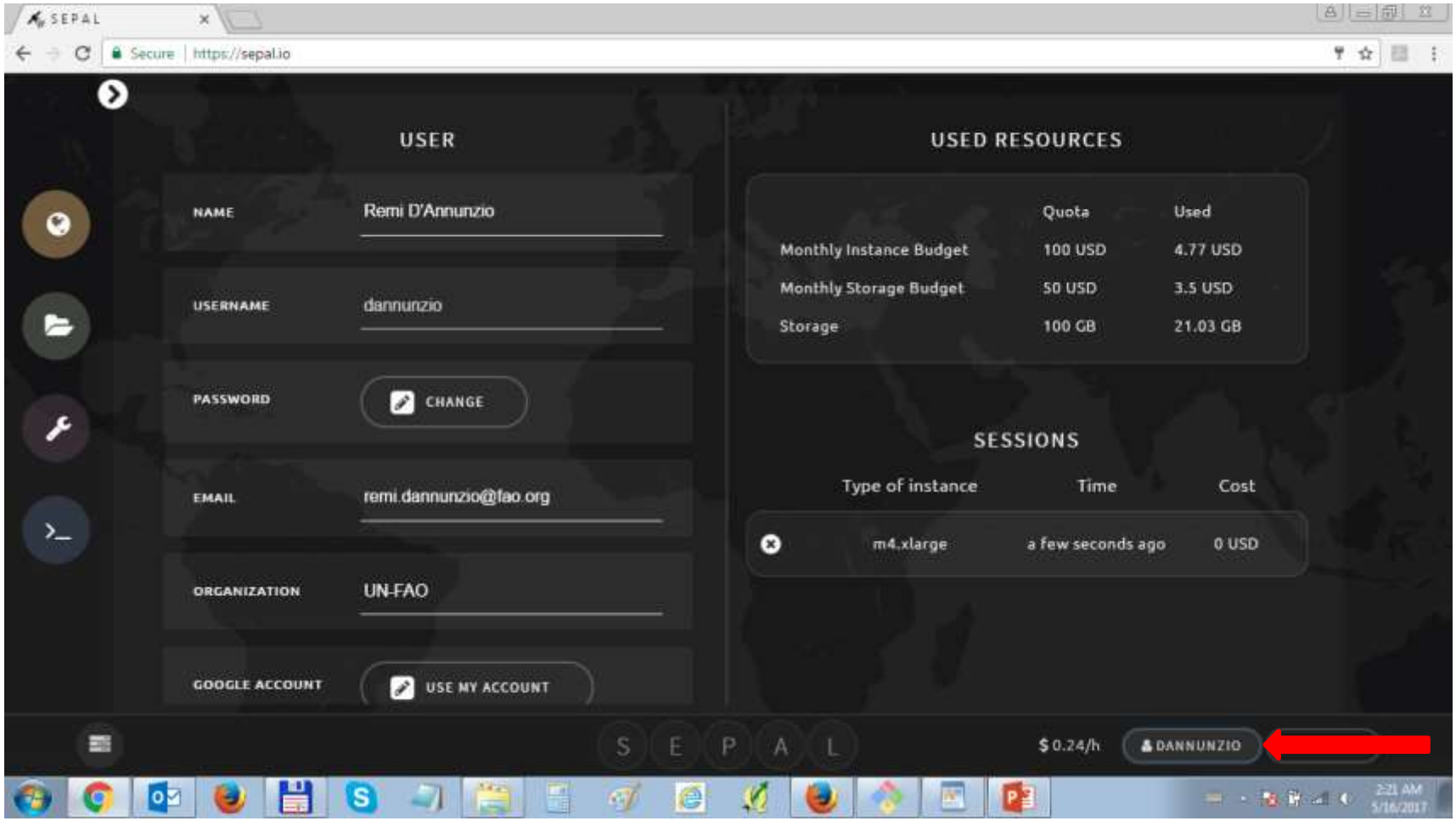


Draw an Area of Interest

- Define an AOI by drawing a polygon over a zone with known disturbances
- Choose ~10x10 km to start with



Check parameters and budget



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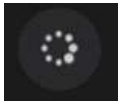
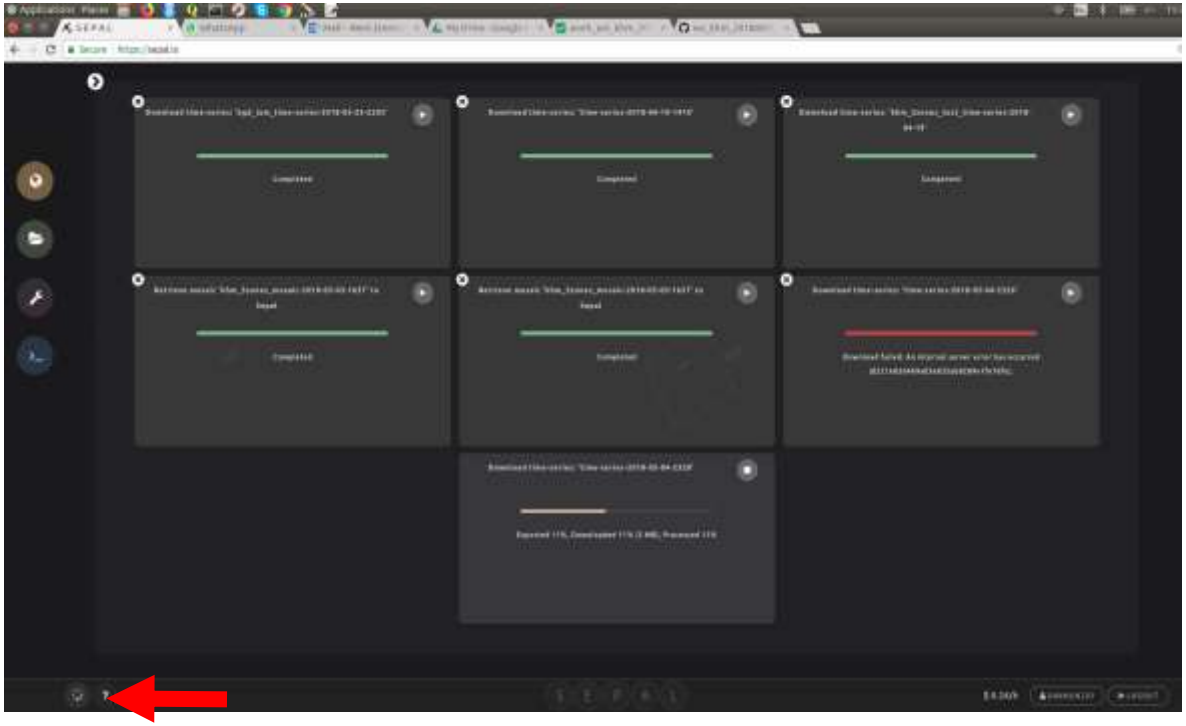
Download time series

- Once the download is initiated you can monitor the progress of the download by clicking on the spinning wheel 

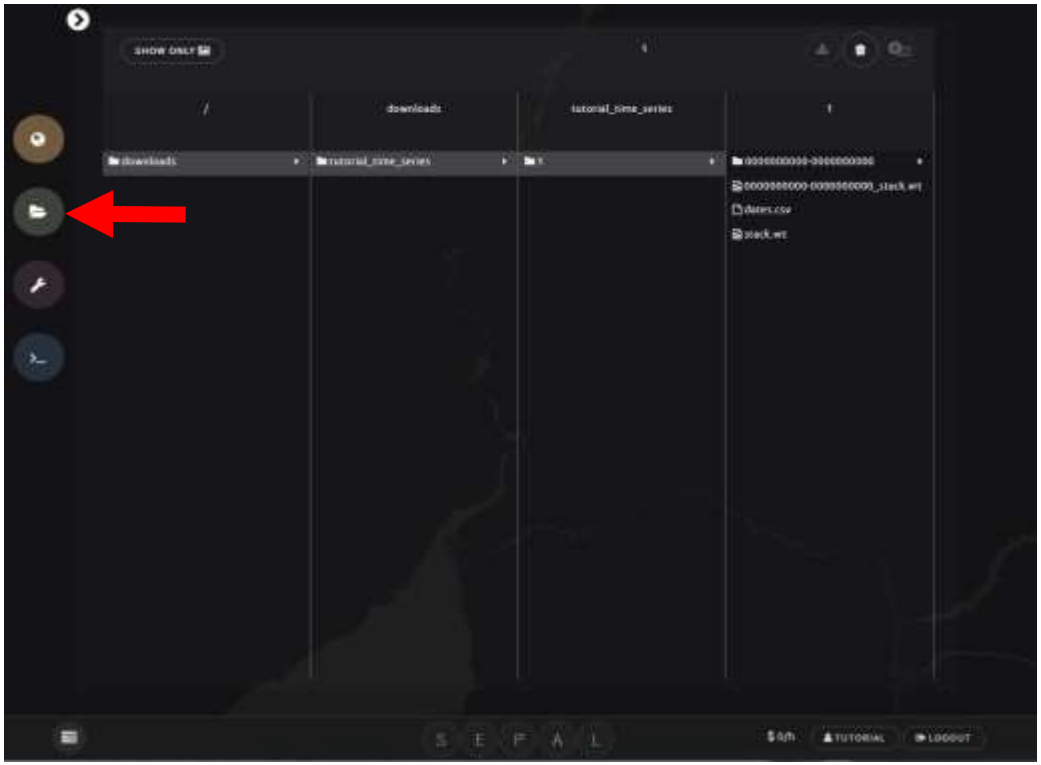
- The time series stack will download into the download folder in your SEPAL account



Check that download produced data

- When the download is complete the time series stack is saved as a .vrt file in the downloads folder with the same name specified in the download parameters (1)

- The two main outputs are stack.vrt and dates.csv
  - stack.vrt stores the vegetation index for each date in the bands
  - dates.csv stores the date corresponding to each band

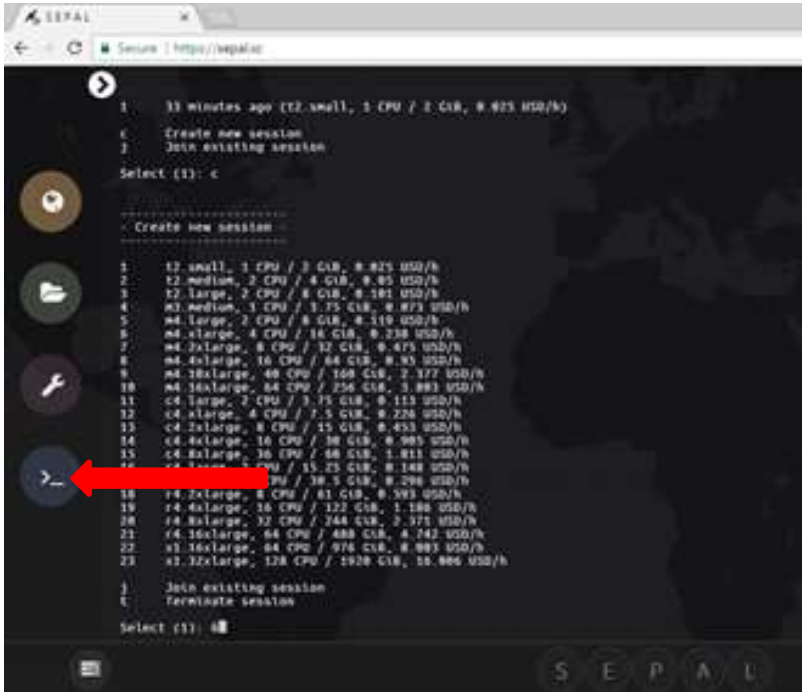


Start a terminal and Select a large instance

Start a large instance in the terminal, time series analysis is very heavy.

Choose an instance with more CPUs and less memory, such as the c4.4xlarge.

Running a larger instance saves time, depending on the size of the area, with a smaller instance the same process can take days to complete.



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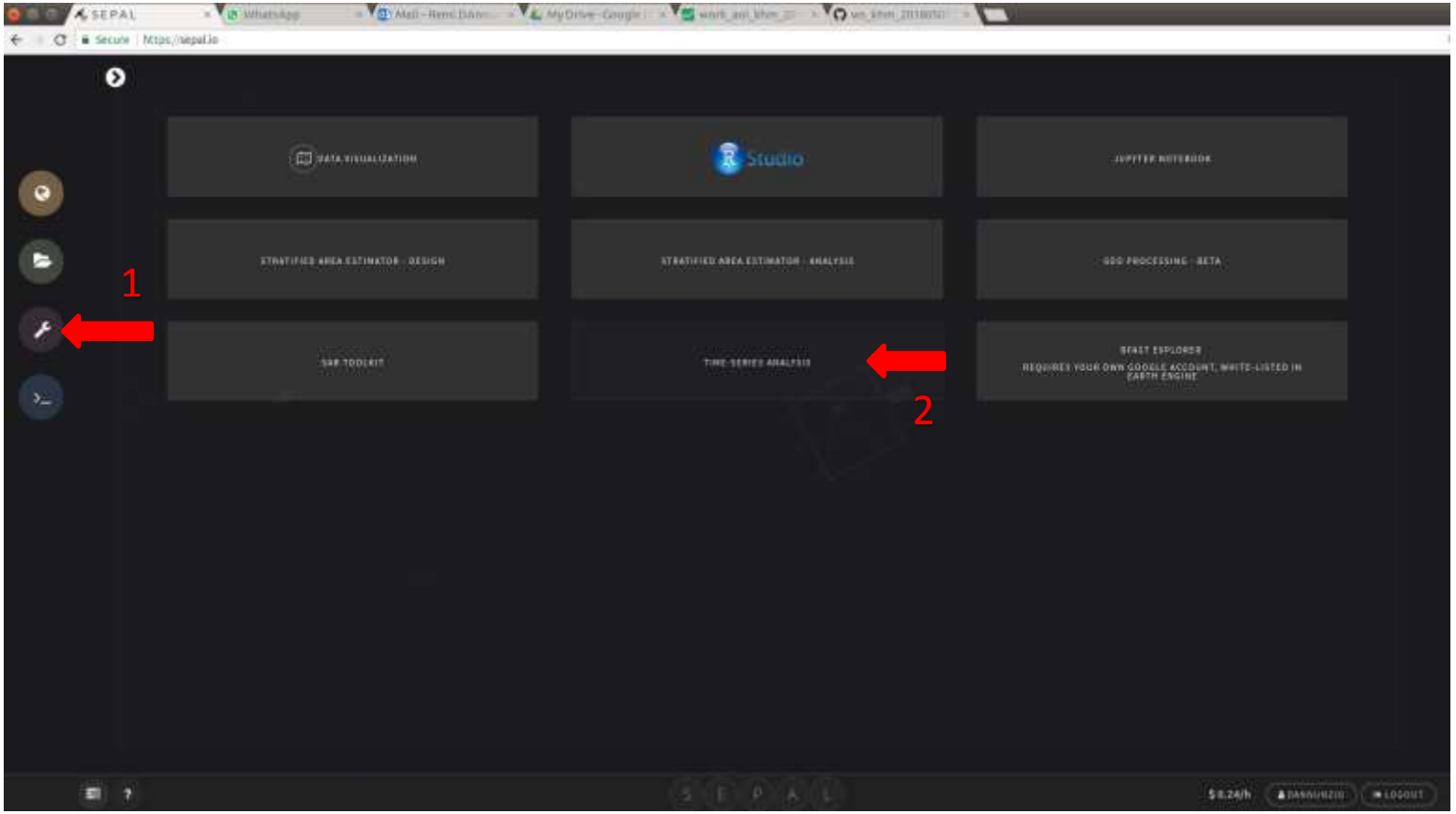
Select Process / Time Series Analysis



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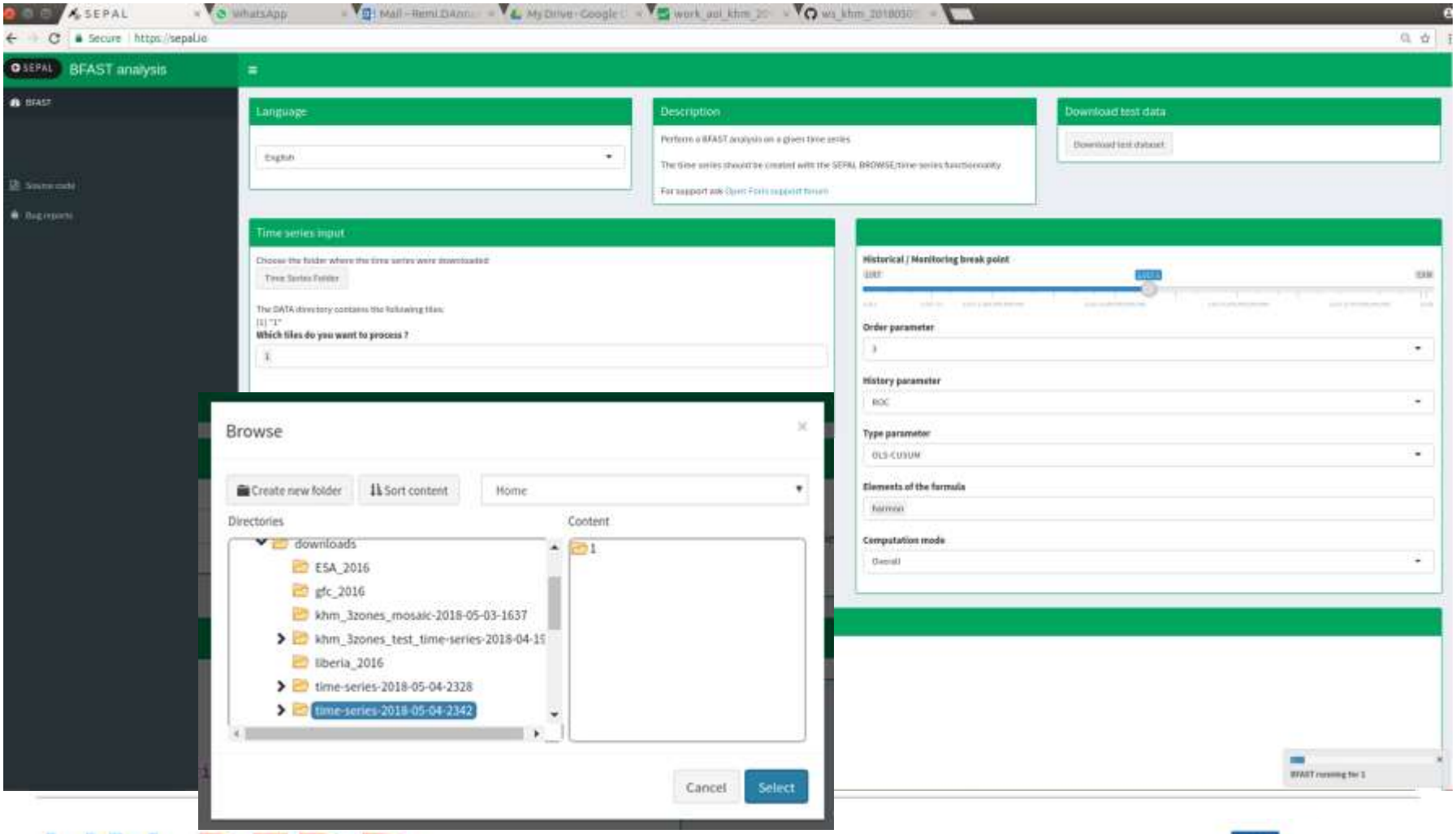
Select Time Series folder, choose parameters



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