

Downloading a vegetation index time series in SEPAL

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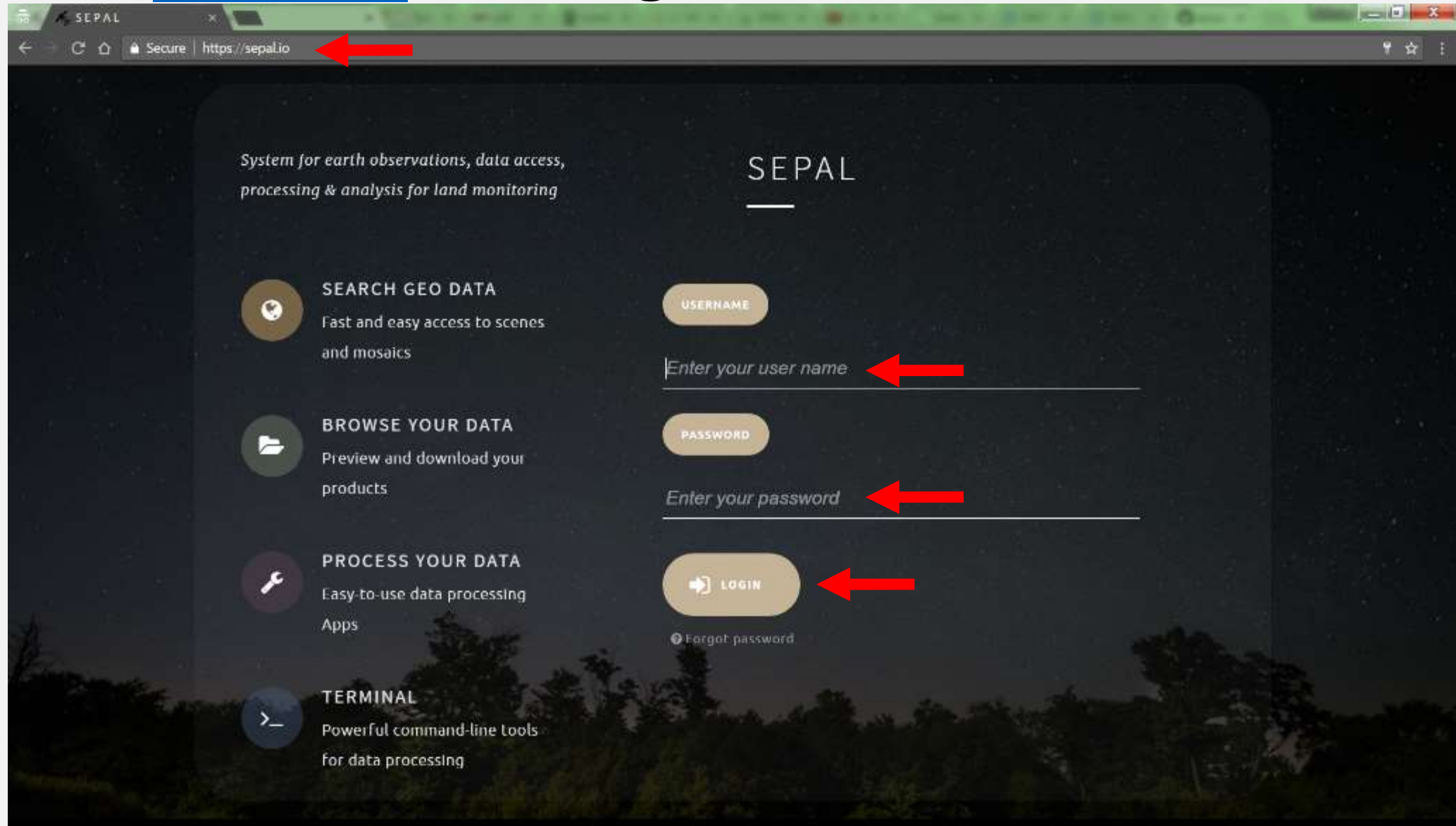
Food and Agriculture
Organization of the
United Nations



SEPAL

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

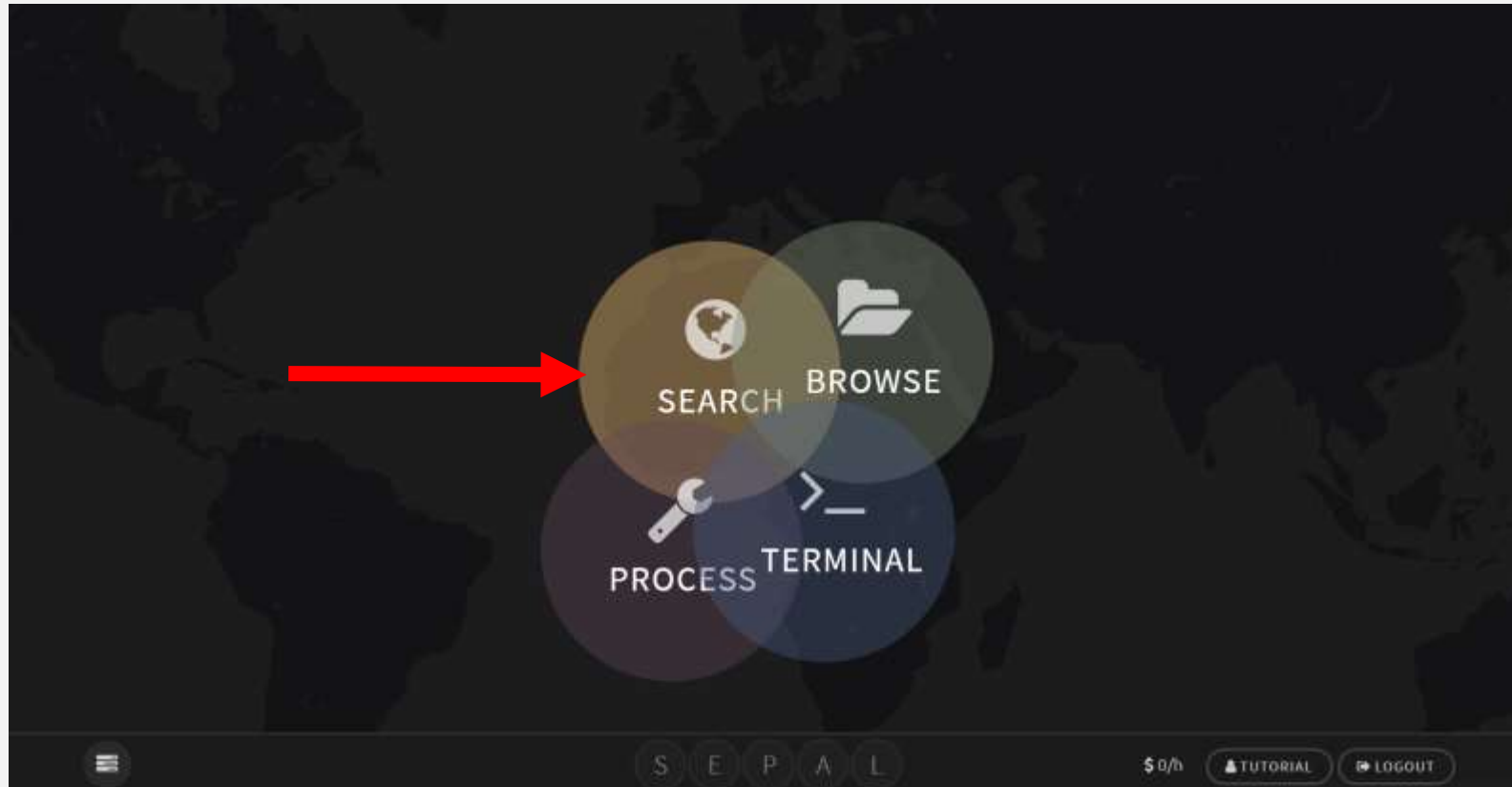
Go to sepal.io and login



Start the SEARCH tab

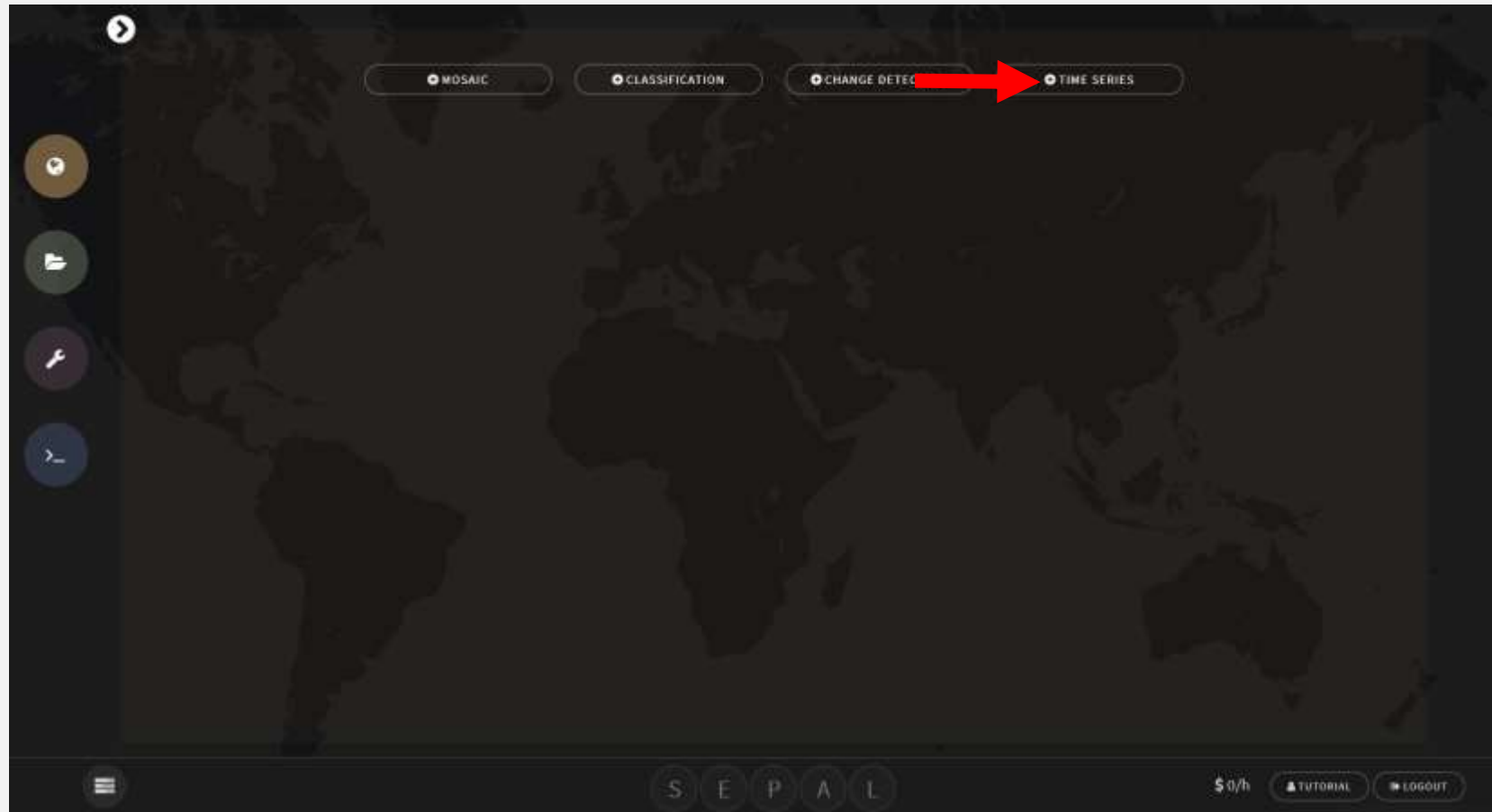
There are four fields in SEPAL

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



Use SEPAL to create a time series stack

- Use the time series module to create an 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

The screenshot displays the SEPAL web interface for creating a time series stack. The interface is dark-themed with a world map background. On the left, there is a vertical sidebar with icons for home, layers, settings, and a search icon. The main content area contains the following fields and options:

- NAME:** A text input field containing "time-series-2018-02-01-1225".
- AREA OF INTEREST:** A dropdown menu with the text "Select a country". To its right are two alternative options: "OR DRAW A POLYGON" with a polygon icon, and "OR Enter a fusion table id" with a text input field.
- SENSORS:** Three buttons labeled "LI", "LT", and "LS".
- FROM DATE:** A date input field showing "2017 / 01 / 01".
- TO DATE:** A date input field showing "2018 / 02 / 01".
- INDICATOR:** Four buttons labeled "NDVI", "NDMI", "EVI", and "EVI2".
- Processing Options:** Two buttons labeled "MASK SNOW" and "BRDF CORRECT".
- Export Button:** A large button at the bottom labeled "EXPORT TO SEPAL" with a cloud icon.

At the bottom of the interface, there is a navigation bar with the letters "S E P A L" in large, spaced-out font, and on the right, a status bar showing "\$ 0/h", a "TUTORIAL" button, and a "LOGOUT" button.

Use SEPAL to create a time series stack

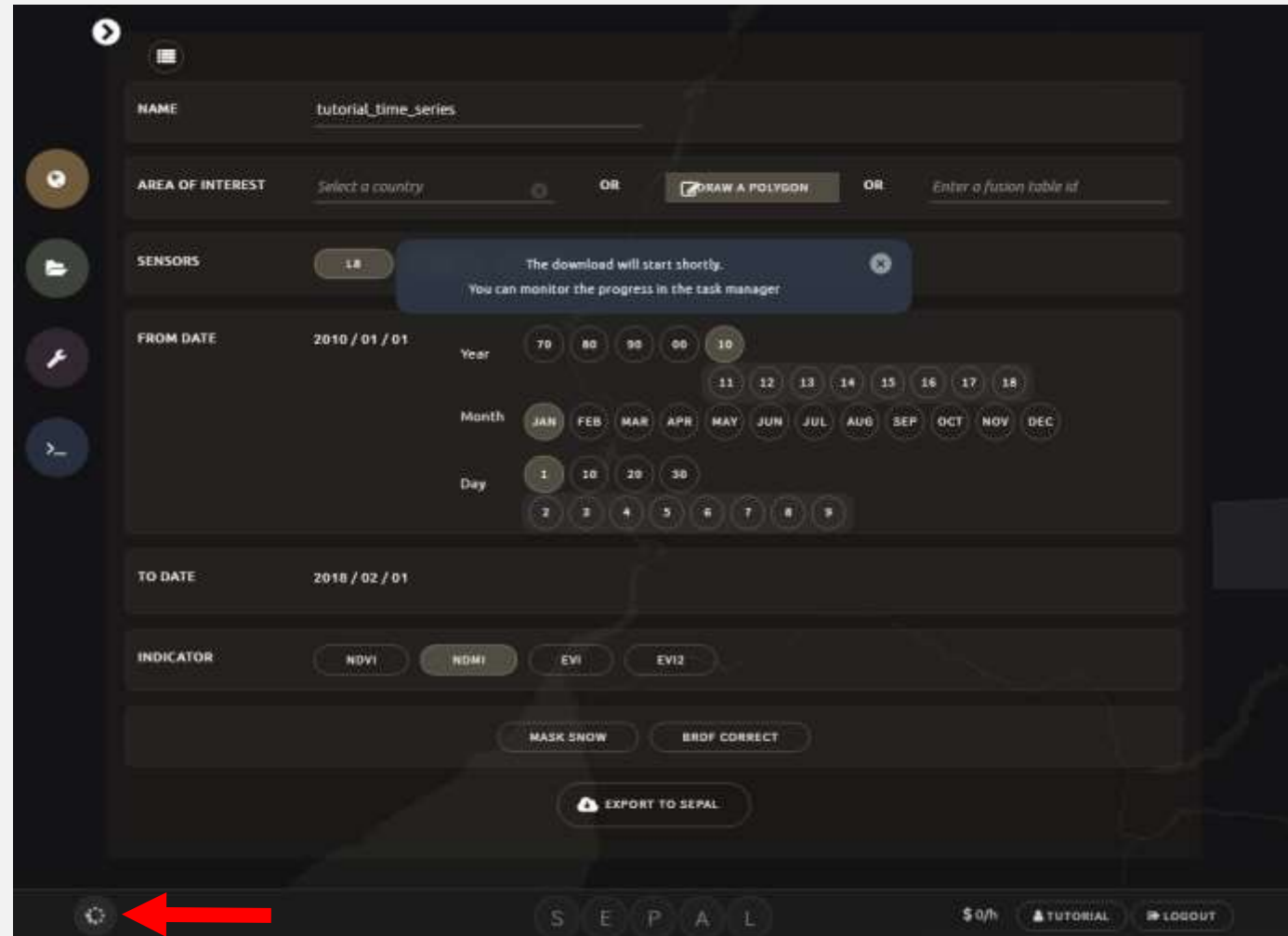
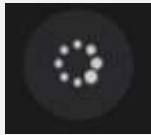
1. First give the time series a custom name, this will be the name of the folder in the downloads folder where you can find the downloaded time series
2. Country boundaries, a custom polygon or a fusion table ID can be used as the area of interest.
3. Landsat 5, 7 and/or 8 can be included in the time 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. The final step is to export the time series stack to SEPAL

The screenshot shows the SEPAL web interface with the following steps highlighted:

- NAME:** A text input field containing "tutorial_time_series".
- AREA OF INTEREST:** A section with three options: "Select a country", "DRAW A POLYGON", and "Enter a fusion table id".
- SENSORS:** A section with three buttons: "L8", "L7", and "L5".
- DATE RANGE:** A section with "FROM DATE" (2010 / 01 / 01) and "TO DATE" (2018 / 02 / 01). It includes a calendar interface for selecting Year, Month, and Day.
- INDICATOR:** A section with four buttons: "NDVI", "NDMI", "EVI", and "EVI2".
- OPTIONS:** A section with two buttons: "MASK SNOW" and "BRDF CORRECT".
- EXPORT:** A red arrow points to the "EXPORT TO SEPAL" button at the bottom.

Use SEPAL to create a time series stack

- 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



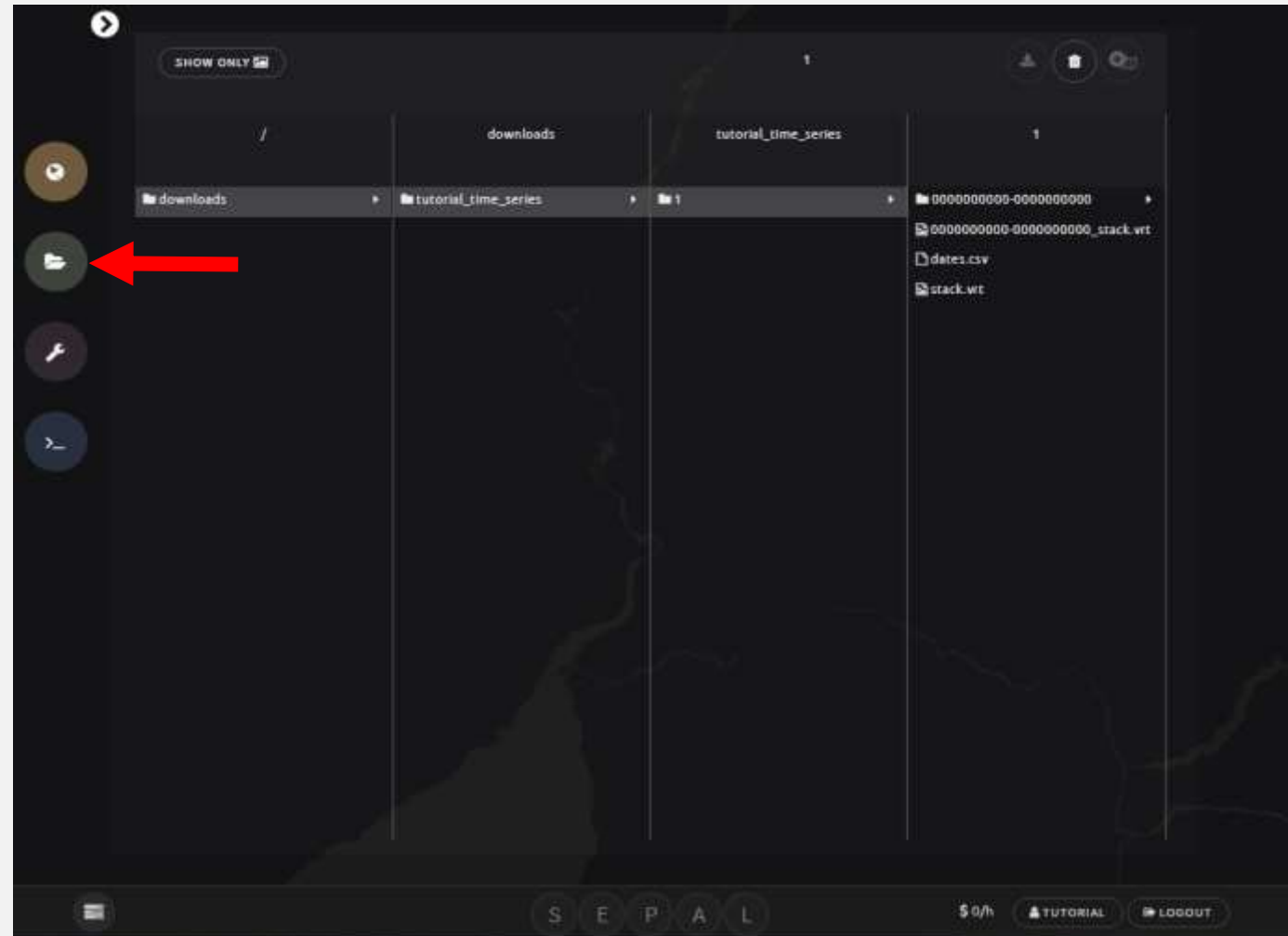
The screenshot displays the SEPAL web interface for creating a time series stack. The form includes the following fields and options:

- NAME:** tutorial_time_series
- AREA OF INTEREST:** Select a country, OR DRAW A POLYGON, OR Enter a fusion table id
- SENSORS:** 18
- FROM DATE:** 2010 / 01 / 01. The date picker shows Year (70, 80, 90, 00, 10), Month (JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP, OCT, NOV, DEC), and Day (1, 10, 20, 30, 2, 3, 4, 5, 6, 7, 8, 9).
- TO DATE:** 2018 / 02 / 01
- INDICATOR:** NDVI, NDMI, EVI, EVI2
- Buttons:** MASK SNOW, BROF CORRECT, EXPORT TO SEPAL

A notification banner states: "The download will start shortly. You can monitor the progress in the task manager". A red arrow points to the spinning wheel icon in the bottom left corner of the interface.

Use SEPAL to create a time series stack

- When the download is complete the time series stack is saved as a .vrt file in the downloads folder in a folder that has 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



Run a times series analysis on the stack

- The data is ready for time series analysis
- 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.

