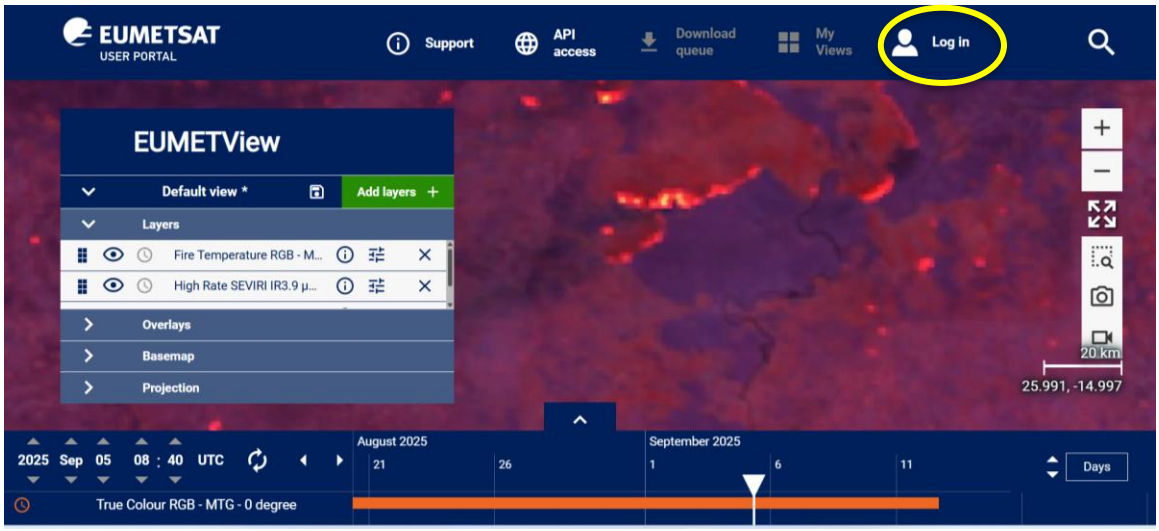
Exercises: Using EUMETView Graphical User Interface / Satellite Principles

Exercise 1: Meteosat Satellite Coverage

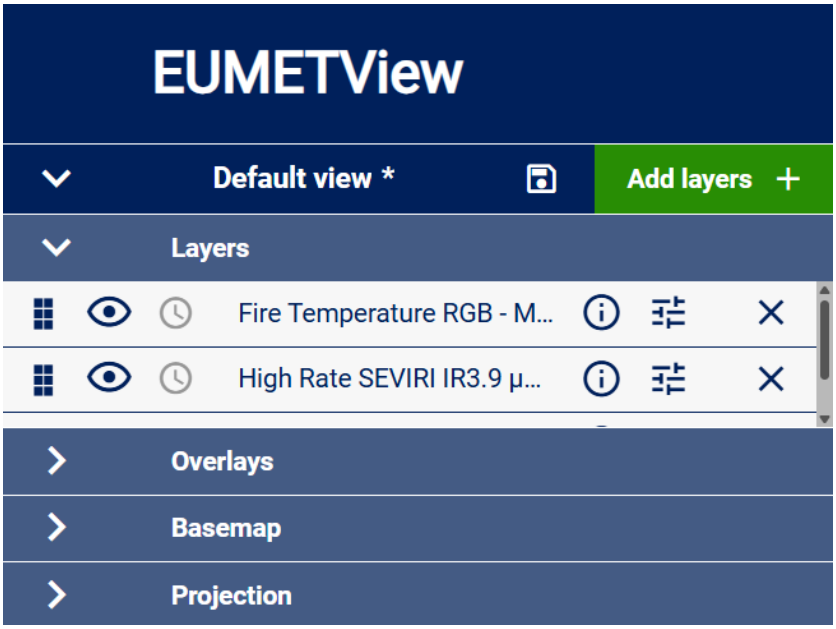
1: Click on the link below to enter **EUMETView**

https://view.eumetsat.int/

2: **Log in** to EUMETView with your username and password. If you do not have one, please register.



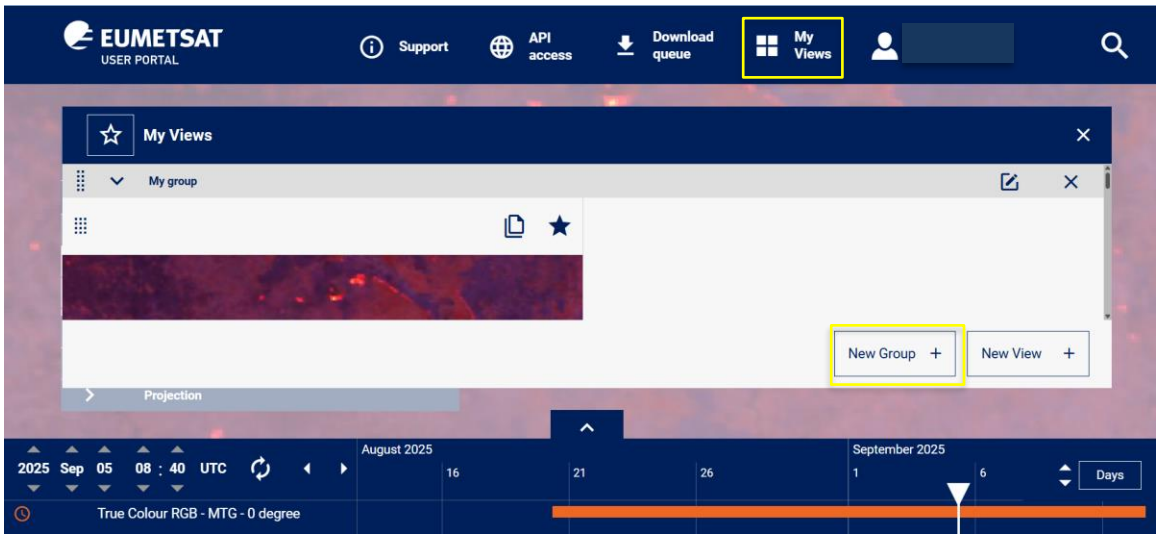
3: By default, a view will open. **Remove the layers** by clicking on the crosses as shown in the figure below

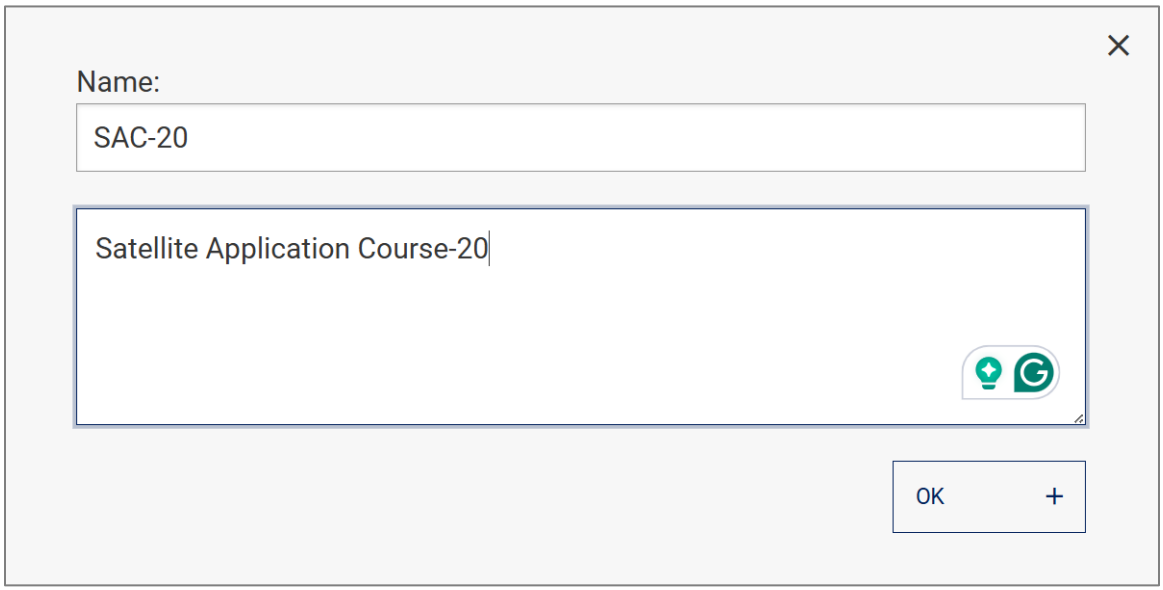


4: By exploring the menu, make sure the following map features are selected:

- Projection: Geographic
- Basemap: OSM Light
- Overlays: Coastlines and Boundaries on ( ).
- All the others will need to be turned off ( )

5. Great new group for the workshop work: (My Views / New Group +/ Group name (SAC-20)





Exercise 1: Where can each satellite see?

Date: 2025-Aug-07, 1500 UTC

Objective

Understand how the **longitude position of satellites** affects the field of view (FOV) and the suitability of different satellites for monitoring regional weather phenomena.

Steps:

1. **Turn off the auto-toggle button** next to the date: This freezes the imagery at a specific time for clearer comparison.
2. **Display full-disk products** from:

    - MSG-IODC/ RGB composite / Dust RGB
    - MTG / RGB composite / True color RGB
    - MSG-0 / Dust RGB

3. **Compare coverage** by switching between satellites:

    - Can you see how the satellite longitude position (0° vs 41.5°E) affects the field of view?

- Which satellite gives the best coverage for tracking tropical cyclones in the Indian Ocean?
- Which satellite is best to detect African dust outbreaks?

Exercise 2: How sharp is the view?

Objective

Understand how spatial resolution improvements from MSG to MTG help forecasters detect and monitor atmospheric features more clearly, and how resolution degrades away from the satellite nadir toward the limb.

Steps:

Date: 2025-Aug-07, 1500 UTC

1. Add **MTG / Single channel / VIS 0.6**
2. Add **MSG-0 / Single channel / VIS 0.6**
3. Zoom to **Morocco** and compare pixel size → observe the **3-fold improvement** in MTG spatial resolution (1 km vs 3 km at nadir).

    - ***Discussion Point:*** How does higher resolution enhance early detection of developing convective cells and storm growth?

4. Move to the east and examine convection over **Oman**. Change the time to 1200 UTC → compare how cloud detail looks over Morocco (closer to nadir) versus over Oman

    - ***Discussion Point:*** Why do clouds over Morocco look sharper in MTG imagery than those over Oman, even though both are captured by the same satellite?

    - **Discussion Point:** How can forecasters adapt to resolution changes across the disk when monitoring multiple regions?

5. *"Not only do pixels get larger at the edge, but tall clouds are also displaced (shifted) because of the viewing angle."*

    - Add MSG-0/Composite RGB/HRV RGB
    - Add MSG-IODC/Composite RGB/ HRV RGB
    - Change the date: **2023 Oct 26 1200-1300UTC** (reminder: Turn off the auto-toggle button)
    - Zoom over convection near the **coast of Oman** (east limb region).

- Identify the position of the cloud base relative to the coastline.
- **Compare the position of the convection at the coast of Oman** in different time steps and note any displacement of cloud tops.

Discussion Point: Why does the convection appear slightly **offshore** in the MSG-0 compared to the MSG-IODC position at the coastline?

Discussion Point: If you were issuing a thunderstorm warning, would you place it over land or sea?

Exercise 3: How often do you get updates?

Objective

Show how improved temporal resolution (refresh rate) in MTG enables earlier detection and tracking of rapidly evolving storms compared to MSG.

Steps:

1. You can close the HRV layers of MSG-0 and MSG-IODC
2. Back to the Morocco case,
3. Compare the updates of the products from MSG-0 and MTG.
4. Create two animations covering the same time window, one from MSG and one from MTG.
5. Play them side by side and compare the evolution of convective cells.

6. When did you first recognize convective initiation in MSG? In MTG?"
7. How many minutes of lead time could MTG add to your decision-making?

- ***Discussion Point:*** How does higher temporal resolution improve warning lead time?
- ***Discussion Point:*** Which features are easier to identify in MTG compared to MSG?

Exercise 4: Radiometric Resolution

Objective

Understand how improved radiometric resolution

- MSG IR 10.8 µm (10-bit → 1024 levels)

- MTG IR 10.5 µm (12-bit → 4096 levels)

allows detection of subtle differences in brightness temperature, especially in low-contrast scenes and near the limb.

Steps

For the case of Morocco:

- Load MSG-0 / IR 10.8 μm imagery.
- Load MTG / IR 10.5 μm imagery.

Discussion Point: What is the main difference in how cloud-top cooling is shown between MSG 10.8 and MTG 10.5?

Discussion Point: Compare the cirrus cloud over land from MTG and MSG.

Exercise 5: Spectral Resolution (How many channels do we have to work with?)

Date: (Trainer to set, case dependent)

Objective

Demonstrate how the additional spectral channels in MTG (16 vs MSG's 12) improve discrimination of atmospheric features such as dust, fog, thin cirrus, volcanic ash, and fires.

Steps

- Check the RGB products of MTG and compare them with RGB on MSG. What are the New RGBs? Why is this RGB available only in MTG?

Exercise 6: Features on Day-time product

Steps:

- Load VIS 0.6 μm imagery from MSG and MTG over the Northern Oman Sea.
- Set the Date to: 11 Jun 2025 0300UTC
- Identify the bright reflective area over the sea surface in MTG/Vis0.6. compare it with MSG-0 and MSG-IODC.

Discussion:

- What is this feature?
- Why is it brighter on MSG-0 and MTG than on MSG-IODC?
- Why is it brighter in MTG than on MSG-0?
- If you were monitoring aerosols, how could this feature affect your analysis