



HIGHWAY Visualisation Fact Sheet

Description: Information on current and future visualisation of model and satellite products for East Africa from the Met Office

Issued to: Key NMHS staff, WISER HIGHWAY participants

Authors: Caroline Bain, John Faragher, Andy Hartley (Met Office)

Issue Date: October 2019*

**please ensure the information in this document is still relevant at time of reading as websites and available products may change in time*

Current remote visualisation capability

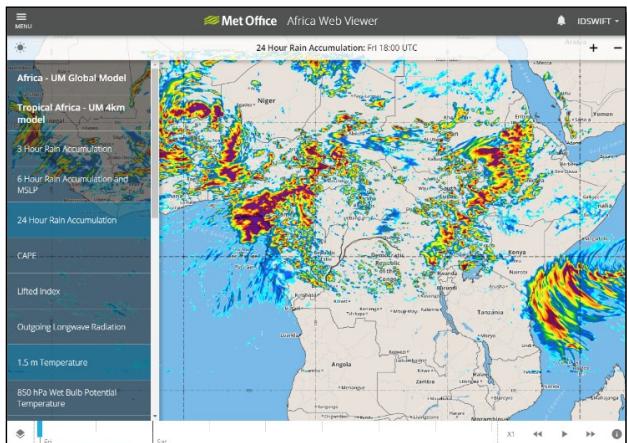
The following online platforms are currently available for visualising model and satellite data. Each of the platforms have advantages and disadvantages so it is suggested that operational meteorologists use the best performing option for them.

1. Met Office WMO VCP Africa Web Viewer

(Model, satellite and lightning for operational use)

<https://www.metoffice.gov.uk/premium/vcpafrica>

- Each National Met Service should have been given a unique username and password so please use these. If you have lost them please get in touch with international@metoffice.gov.uk.
- This website is recommended as the primary place to go to for access to Met Office models and is operationally maintained by the Met Office**



Summary

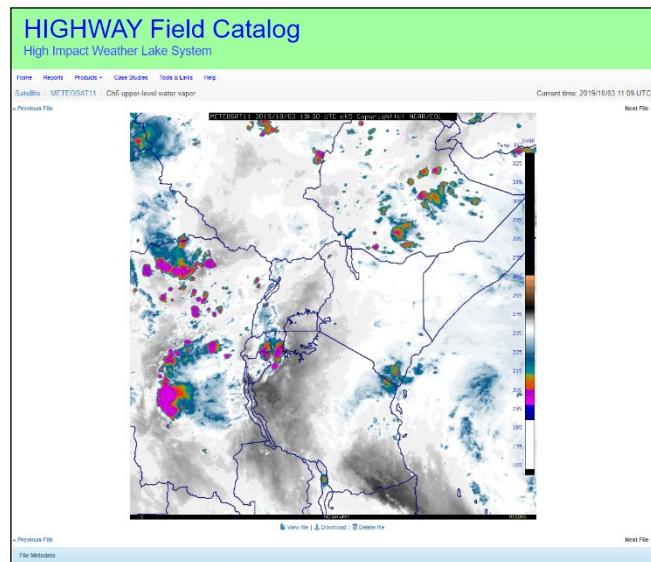
- Has Met Office global (parameterised convection) and the 4km Tropical Africa Model (explicit convection), satellite and ATD lightning.
- Use the bottom left button to navigate different options, and the menu button for more information.
- You can zoom into your country and pan just like Google maps
- You are not able to go back in time or look at previous forecasts (though screenshots could be taken and stored).

2. NCAR HIGHWAY catalogue

(Observations, satellite, lightning and reports)

<http://catalog.eol.ucar.edu/highway>

- Multiple products are available through the drop-down menus from the top along with information on case studies and other activities within the HIGHWAY project
- Loops, animations and archives available for multiple observation products
- Maintained by NCAR, a HIGHWAY partner. A help section with frequently asked questions is available on from the top drop-down menu

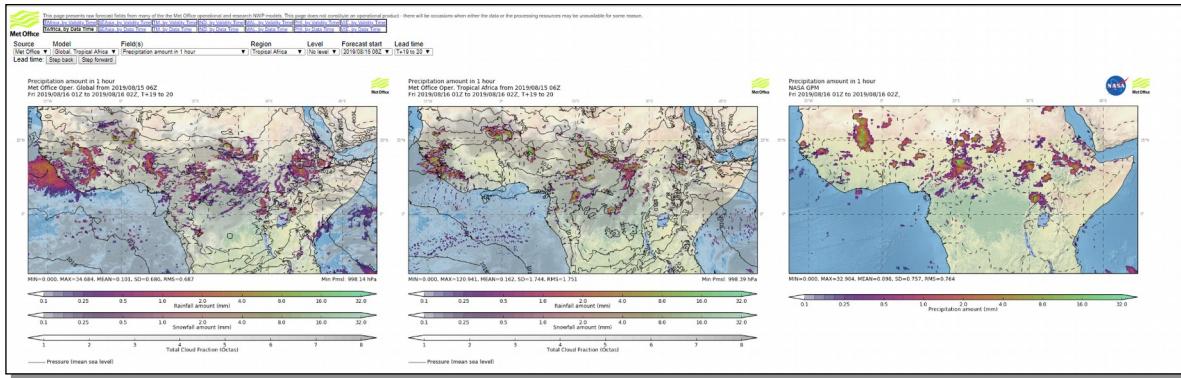


3. Met Office CEDA Group Work Space website

(Model and satellite for science use)

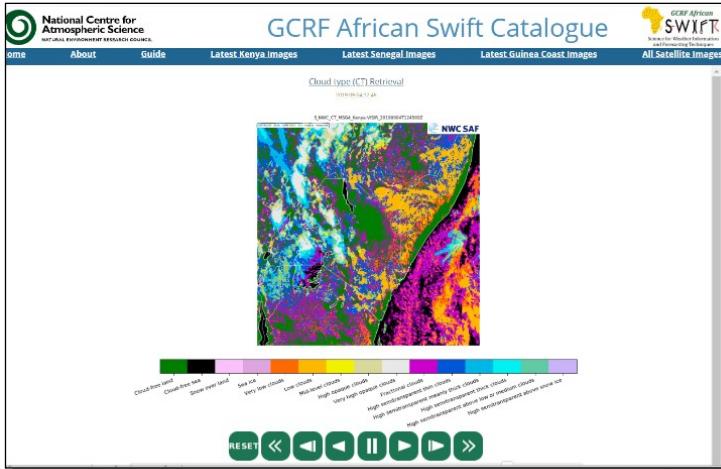
http://gws-access.ceda.ac.uk/public/mo_forecasts/restricted/TropAfrica/mo_f_tafr_dtime.html
o username: **Tafrika**; password: **TAfrica_4p4**

- This website shows Met Office models side by side and is intended for use by scientists and NMSs who are collaborating on projects with the Met Office. You can navigate backwards in time to view previous forecasts and compare to GPM rainfall observations from satellite.
- This is a non-operational service meaning that it might be taken down for maintenance at short notice. It is primarily designed to encourage collaboration between operational meteorologists and scientists and could be useful for evaluation of past events
- Forecasts are kept for up to 10 days. The disadvantage is that although you can choose different views from the drop down menu, they are predetermined and you cannot zoom or pan



4. Visualisation of NWC SAF through NCAS African SWIFT Catalogue

- NCAS GCRF African-SWIFT: <https://sci.ncas.ac.uk/swift/>
 - o This is a collaborating project with HIGHWAY and aims to improve the science and practice of forecasting in Africa



- o The NCAS website provides images of several NWC SAF products over East Africa including RDT and CRR products
- o There are animations and still images for the current day and access to an archive to get images from the past
- o The disadvantage is that there is no zoom facility and although the whole of Lake Victoria is covered, the domain doesn't extend to the southern border of Tanzania
- o This website is non-operational and may experience interruption to service

Future remote visualisation capability

The challenge for the future is that we would like each country to be able to see the latest data, zoom in where they want and be able to go backwards in time to create lagged ensembles. We would also like meteorologists to be able to view satellite, model and NWC SAF products all in the same viewer. We need a visualisation that is intuitive, robust and doesn't rely on expensive hardware. We also need a platform that has the ability to visualise data from different sources (internet/ cloud, local data etc). This is fundamentally 'big data analytics' at its most cutting-edge, with added complication that we need it to work over the internet and be fast even with limited bandwidth!

Ref.: 33854/2019-1.0 DRA/AFLDC

FOREST

- FOREST is a leap in technology in that it accesses data directly from source and plots the images in real-time rather than pre-processing plots. On the surface it probably won't look too revolutionary, but the technology underneath is highly innovative. In the long-run, being able to process and view any data in real-time will change the ability to access and explore big data.
- The current development of forest is at <https://forest.informaticslab.co.uk>
- Requirements for FOREST:
 - Visualise global and high-resolution model data (from any model)
 - Visualise satellite data
 - Visualise processed fields such as the NWC SAF products, e.g. RDT, CRR
 - Visualise lightning observation data
 - Visualise Nearcast data for nowcasting
 - Work from any web browser – does not require complicated or expensive local hardware or installation
 - Should be able to access data from the internet and/or locally
 - Be able to access data back in time (e.g. from yesterday, last month) as well as the latest forecast data. This means it can also be used for science as well as forecasting.
 - Be intuitive to use with clear navigation
 - Be fit for the future – able to cope with even higher resolution data and new parameters
 - Be fast enough to be practical to use
- HIGHWAY has contributed to defining the requirements as well as the development of FOREST
- The development of the software will continue beyond the life of HIGHWAY with the aim of providing long term sustainability of data visualisation and will potentially move to replace the Met Office WMO VCP in time if it proves fit for purpose.
- However, it is recognised this is a long-term goal and the software is still being developed. Therefore, the current release should be considered as experimental until a stable version is publicised.
- FOREST is an open-source project meaning that anyone can download, develop and contribute to it. It is being hosted on github: <https://github.com/informatics-lab/forest>
- September 2019 Latest: Test WRF data from TMA has been visualised in FOREST for basic model fields, and TMA is arranging FTP transfer of operational model output to FOREST.

