Improving nowcasting and synoptic forecasting of extreme weather across Africa
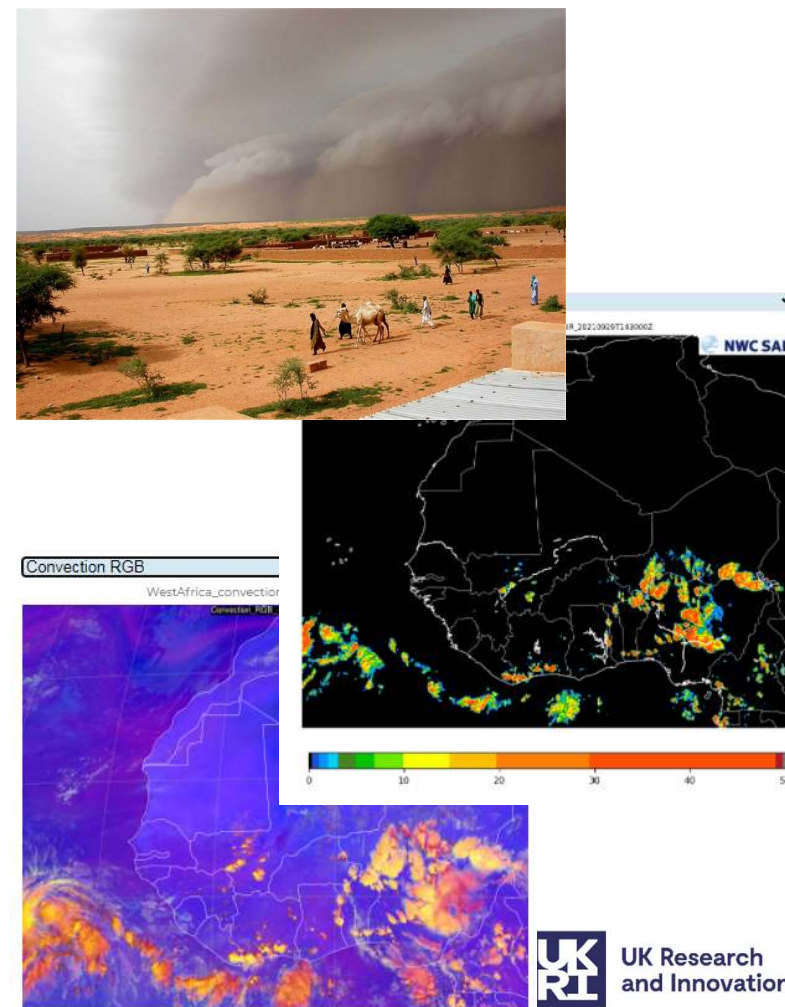
John Marsham (University of Leeds)

(Roberts et al, 2021)

Description of the **current state of the atmosphere and predictions for the next few hours** (WMO 2017)

1. **Includes analysis of near-real-time observations**, to define the current weather

2. **Forward projects observed weather features**, by extrapolation but also more sophisticated methods.

3. **Requires continued monitoring** made possible by a rapid workflow of data acquisition, processing and the dissemination of warnings and updates.

Typically:

- **Applied to high impact weather**
- **Focused on stakeholders who are vulnerable to those events**
- **Not strictly defined by timescale** *[But typically 0-6 hours].*
- **Facilitated by computer systems** that bring together disparate data ready for **input by seasoned forecasters**.

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Base-line and Opportunity

(Roberts et al., 2021, *Weather*)
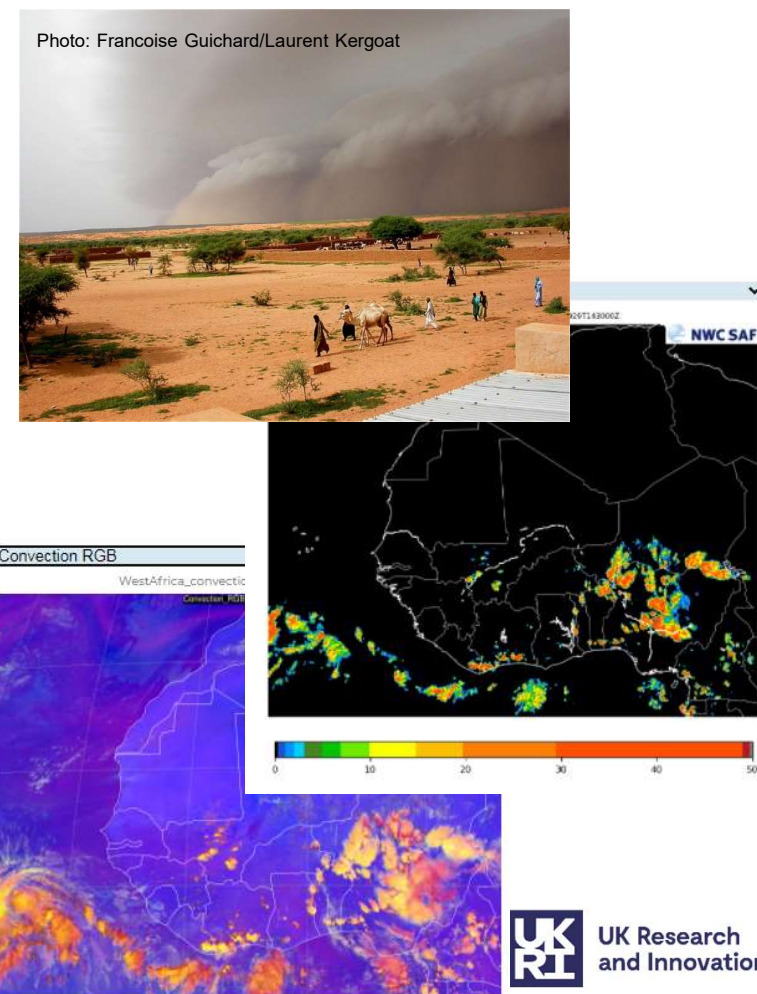
SWIFT base-line assessment:

- No use of automated nowcast products in Sub-Saharan Africa outside S Africa
- Outside S Africa, nowcasting limited to use of satellite imagery & surface observations, mainly at major airports

Opportunity

- Convective storms generate **high-impact weather→ Nowcasting**
- Even bias-corrected **NWP often has low skill**
  - For Africa often struggling to beat "climatology" (Vogel et al., 2018)
- Africa has **excellent coverage from Meteosat**
  - Extremely limited radar coverage
- **Enormous potential for satellite-based nowcasting**

SWIFT approach – focuses on convective storms

- Application and evaluation of **NWCSAF products**, from Meteosat data.
- Generated in **Africa and UK (shared online)**
- **Research** to evaluate/develop products, and understand storm behaviour

Photo: Francoise Guichard/Laurent Kergoat

NWC SAF

Convection RGB

WestAfrica_convection

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SCIENCE FOR WEATHER INFORMATION AND FORECASTING TECHNIQUES

- Large long-lived storms, poor NWP, and Meteosat provide a huge opportunity
- Some SWIFT Achievements
  - First Sub-Saharan African nowcasting setups & use outside South Africa
  - User engagement in Testbeds, supporting co-production of solutions
  - New platforms, Standard Operating Procedures (SOPs) and documentation
  - Demonstrated: (i) skill of nowcast products over many hours and (ii) usefulness to decisions
- Enormous scope for future improvement
  - Through research, and rapidly deploying existing research
  - Expansion across varied types of HIW
  - Through continued co-production across users & sectors
  - Application of new technology

Alex Roberts (University of Leeds)
Recent Progress in nowcasting tools for Africa

Maureen Abla Ahiataku (GMet)
Application of Nowcasting and its Impact in Ghana

Estelle De Coning (WMO, WWRP)
The importance of nowcasting in Africa – using satellite and other data sources

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