3rd GWIS and GOFC-GOLD Fire IT meeting
1st -2nd Oct 2018, Univ of Maryland

SAFNet

AFIS
ADVANCED FIRE INFORMATION SYSTEM

GOFC-GOLD
Global Observation of Forest and Land Cover Dynamics

START

SAFNet

South African National Parks

10th Southern African Fire Network (SAFNet) Meeting

15th - 19th April 2018

Venue: Skukuza, Kruger National Park, South Africa

Collaborative fire information, resource sharing, training and research in support of integrated fire management in Southern African countries: Science in Action

Report prepared by Navashni Govender & Anja Hoffmann

The Southern Africa Fire Network (SAFNet) held its tenth meeting in Skukuza at the Kruger National Park, South Africa from the 15-19th April 2018. The overall theme of the meeting was "Collaborative fire information, resource sharing, training and research in support of integrated fire management in Southern African countries: Science in Action".

The workshop was attended by 27 delegates representing 12 countries (Germany, Madagascar, Malawi, Mozambique, Netherlands, South Africa, Swaziland, Tanzania, USA, UK and Zimbabwe).

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Aim, Objectives and Outcome of the 10th SAFNet meeting

This meetings main aim was to update and rejuvenate the networks activities, thereby making SAFNet a more visible and lively network in the region.

The overall objectives were to:

1. To **exchange and foster cooperation and collaboration** on national and international fire research and science to improve national and regional fire and natural resource management strategies
2. To **Increase Awareness and Application of Global and Regional Wildfire Information Systems**
3. To **improve fire science capacity** building and application of science results into practice

The key outcomes anticipated were:

1. Revival, renewal and reactivating of the SAFNet community
2. Updated website for the Network
3. Establishment of joint regional and international fire science projects, with possible validation sites
4. Exposure to the state of the art of methodologies on how to calculate fire emissions, available satellite-based fire monitoring products, biomass estimates for fuel monitoring with application of the various technologies and methods.

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Fieldwork

Measurements on Emissions and fuel load and structure

SAFNET Report summary

Reviving the network:

- Upgrading the SAFNET website
- Africa Fire Assessment
- Are SA fire regimes changing
- Citizen Science

Need to increase participation within the Network

- Update the email/contact list
- Establish new country focal points
- Each country focal points has to recruits two others members
- Annual reports from each country (half page)
- Active webpage and or other social networking

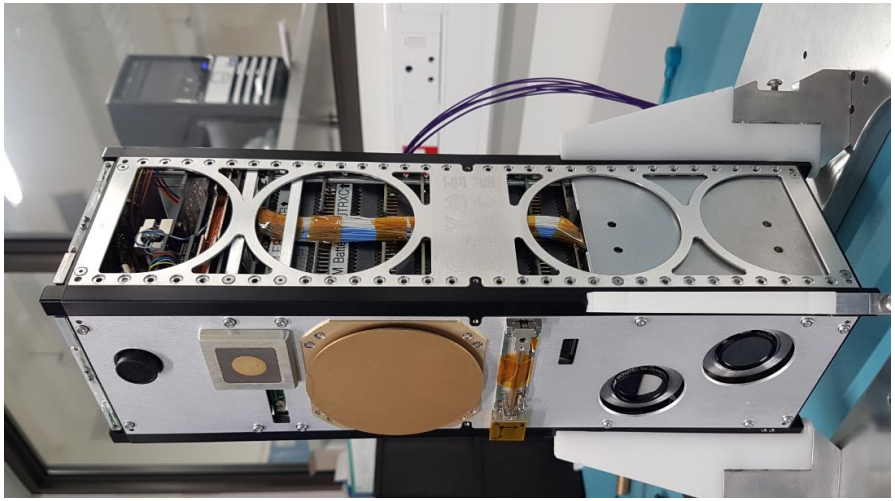
For the next meeting

- Focus areas for next meeting:
  - Eg: database/network of sites in Africa that are applying experimental fires.
  - Eg: Developing or validating a fuel model for Africa
  - Eg: plans for calibration of combustion completeness
- Invite SASSCAL representative to this meeting. Also Miombo Network participation.

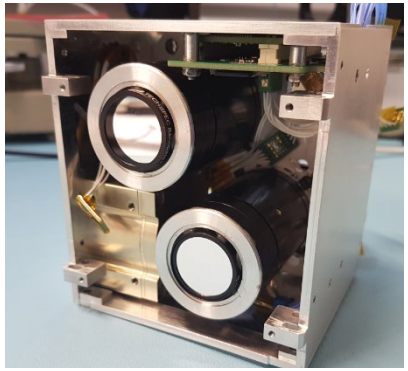
What worked	What didn't work?
David Roy MODIS validation Philip Frost and AFIS and EU MESA Themed meetings (eg Morogoro) Glue funding…. START GOFC-GOLD	Maintaining active country focal points Communication – within the group and to outside people

K-Line Nanosat constellation for AFIS

Soyuz launch: 25 December 2018



ZACube-2



Sensor Concept

FireSat sensor, operating at two very narrow spectral bands, designed to detect and discriminate emissions which originate from large vegetation fires

Aim: 75 km Swath, 90m ground resolution for fire detection
Altitude: 600km
Orbit: Sun Synchronous
Equator: 11:30 GMT

Follow on missions

- FireSAT

UK Space Agency/Clyde Space/CSIR:
4 nanosats with K-line by 2020

- MuliloSAT

CSIR/CPUT: 2020

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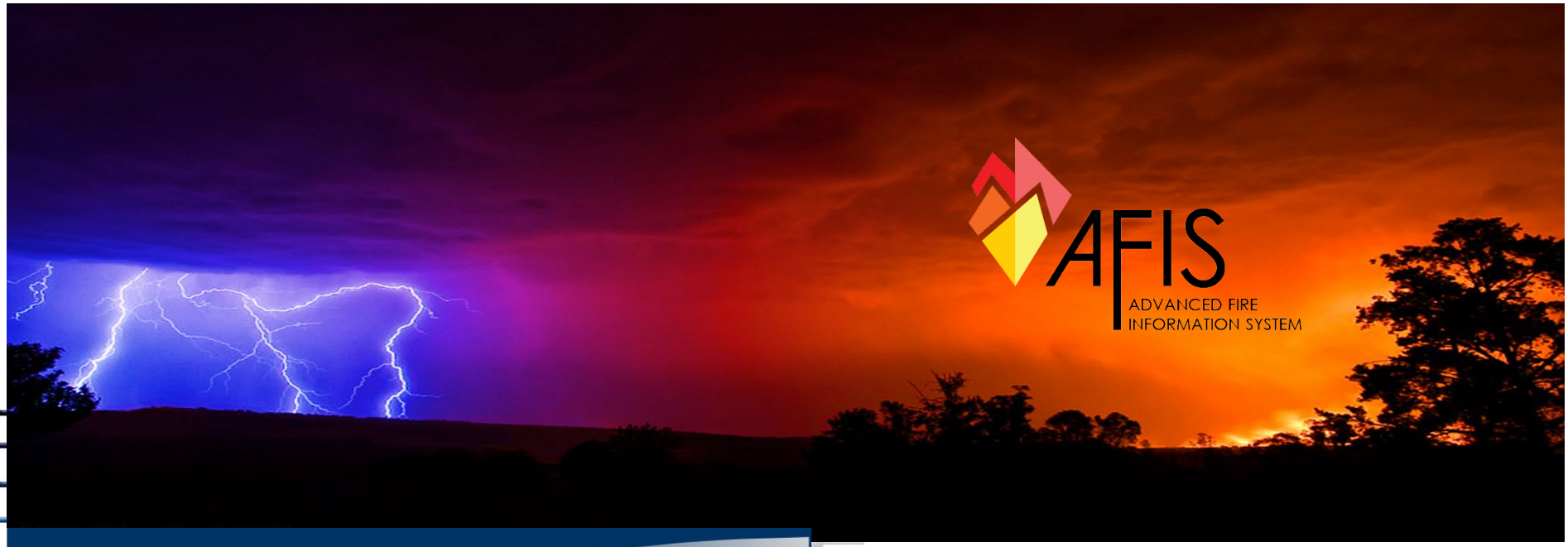
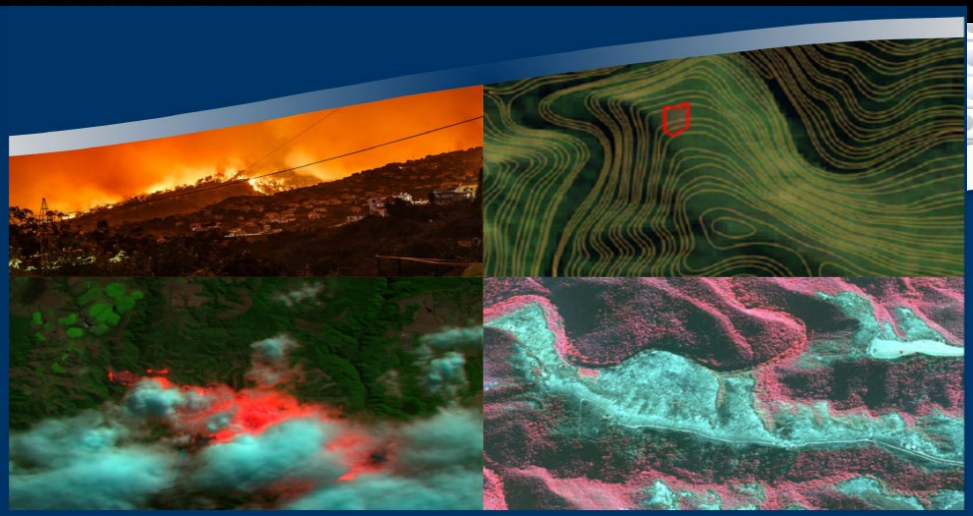
AFIS ADVANCED FIRE INFORMATION SYSTEM

Elandskraal Fire, Knysna
A data driven analysis





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Garden Route fires by numbers

6 Fatalities.

11 Aircraft have been working in the region including three SANDF Oryx helicopters.

500 - 800 Firefighters remain on duty in the region working in shifts.

408 Formal structures in Knysna destroyed.

200 Informal structures in Knysna destroyed.

20 Private homes destroyed in Plettenberg Bay.

150 Residents of Fairview and Gansvlei communities were evacuated during the night and early hours of the morning.

31% Electricity and water supply remains a cause for concern in the Knysna area with the dam level at 31%.

Van Staden's Bridge

Port Elizabeth

Plettenberg

Simola

Rheenendal

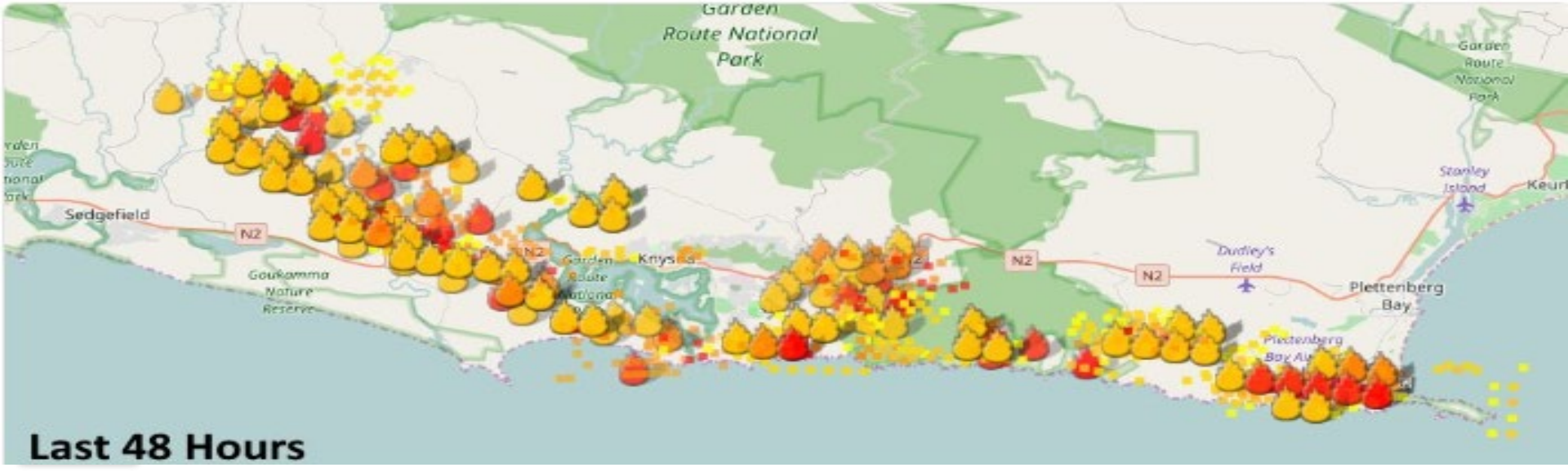
Knoetzie

Knysna

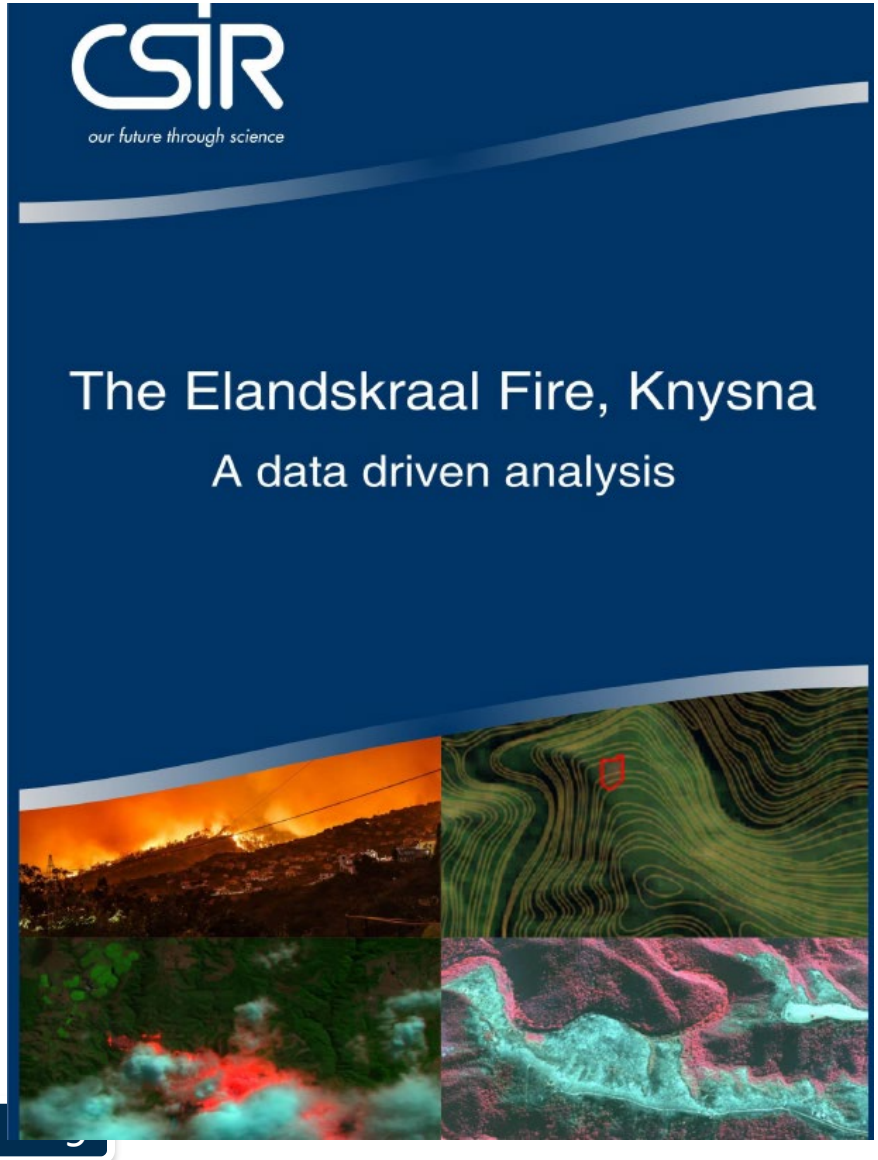
Sedgefield

Buffelsbaai

Graphic: Rowan Abrahams/ANApictures



CSIR Knysna Report released



eNCA
DStv Channel 403

LATEST NEWS BUSINESS SPORT ANALYSIS LIFE SEARCH

TRENDING

1 JMPD officer gunned down in Hillbrow

CSIR pinpoints cause of devastating Knysna fires

Sunday 1 July 2018 - 4:08pm

The Citizen

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news business sport phakaaathi lifestyle motoring horses tr

south africa 28.6.2018 06:58 pm

Strong bergwind fanned lightning-induced Knysna fire – scientific report

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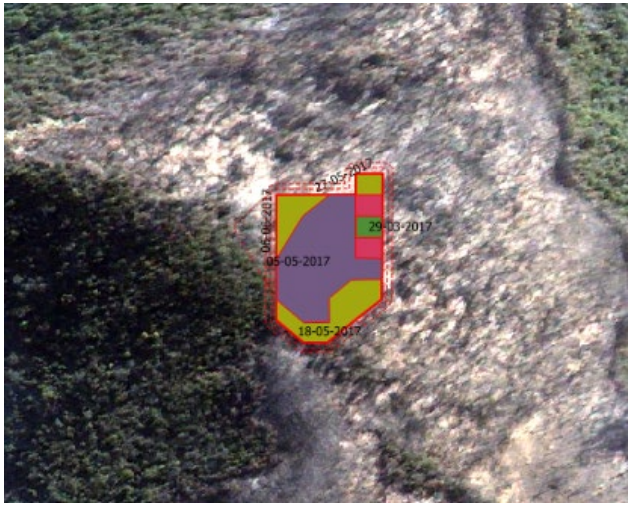
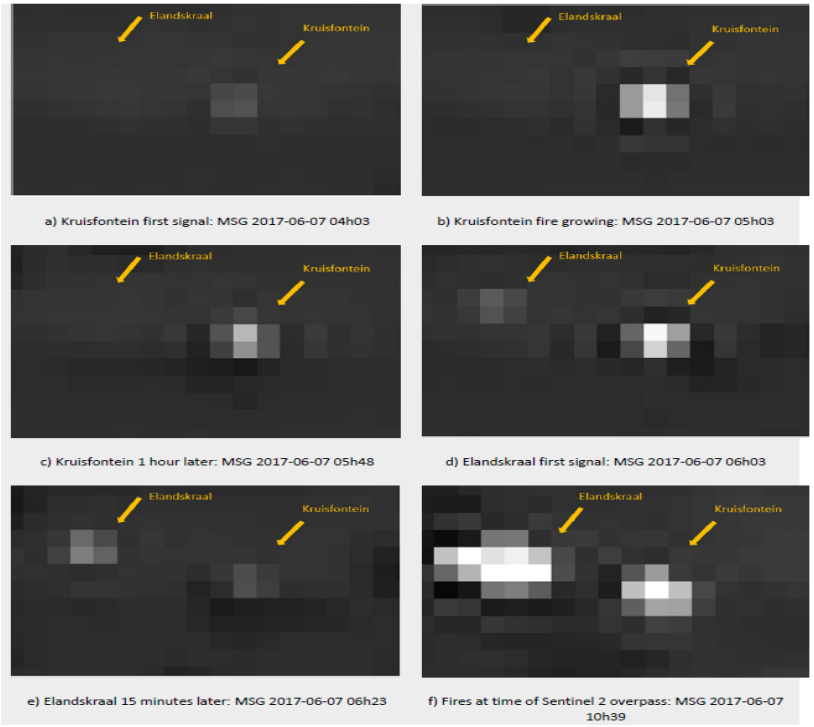
Multi sensor incident analysis

Drone: 3 April 2017

Sentinel 2: Mar – June 2017



MSG: 7 June 2017



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Main conclusions from CSIR analysis

1. Confirmation of the location of the smouldering vegetation within the Elandskraal burn scar
2. Estimated size of smouldering area was 4000m^2 by 7 June
3. Identified probable cause of ignition of smoulder to be a positive lightning strike on 22 March 2017 at 20H55
4. The first evidence of a fire at Elandskraal was at 06h03 when the MSG geostationary satellite detected a hotspot
5. The probable time of flare-up of the smouldering vegetation is estimated between 05h00 and 05h30 based on the detection time of the satellite as well as calculated rate of spread
6. Recommendations: AFIS development of a Lightning Induced Fire Ignition probability index for monitoring smouldering fires

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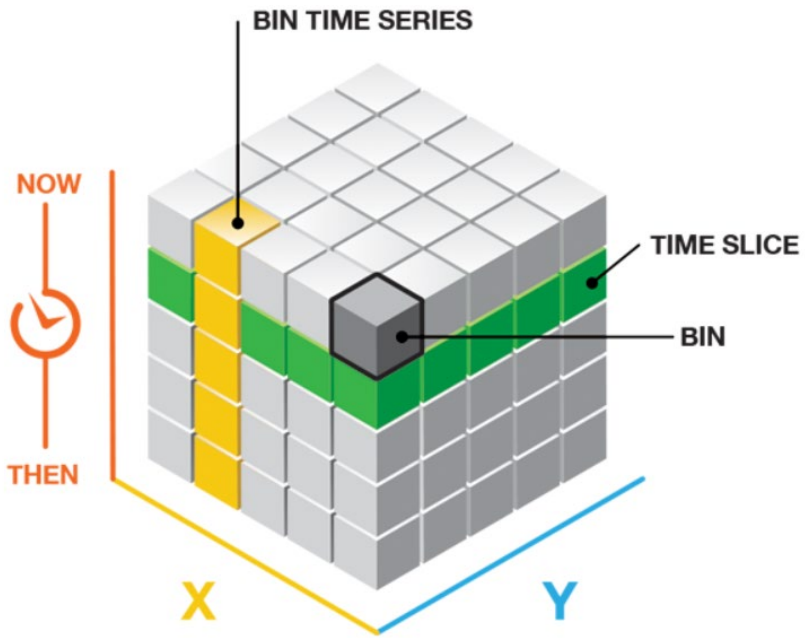
Development of a Fire Weather Data Cubes

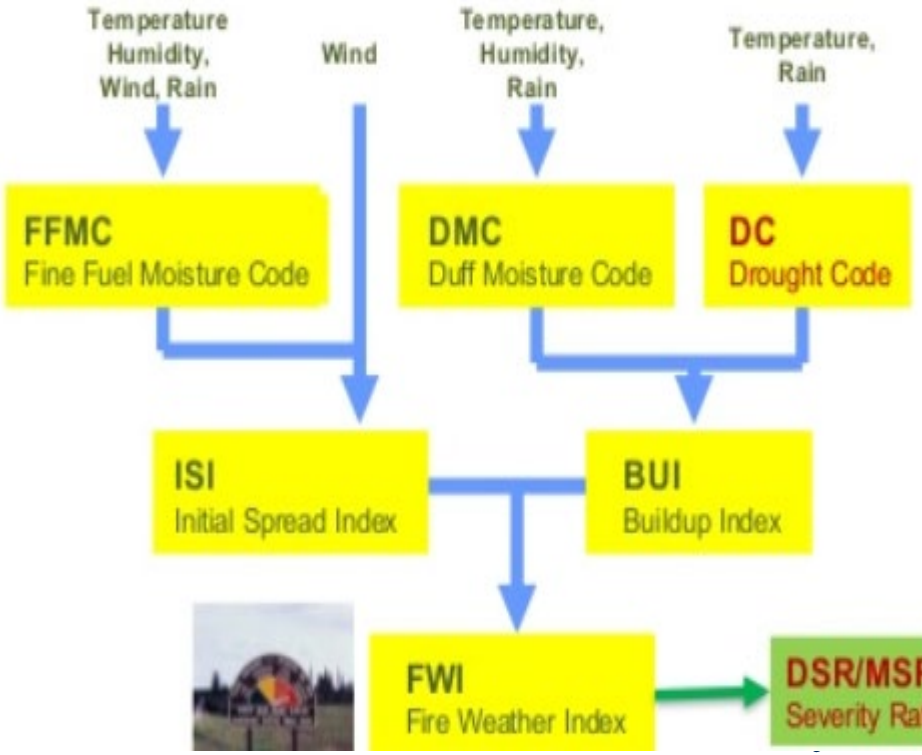


python ⟷ netCDF

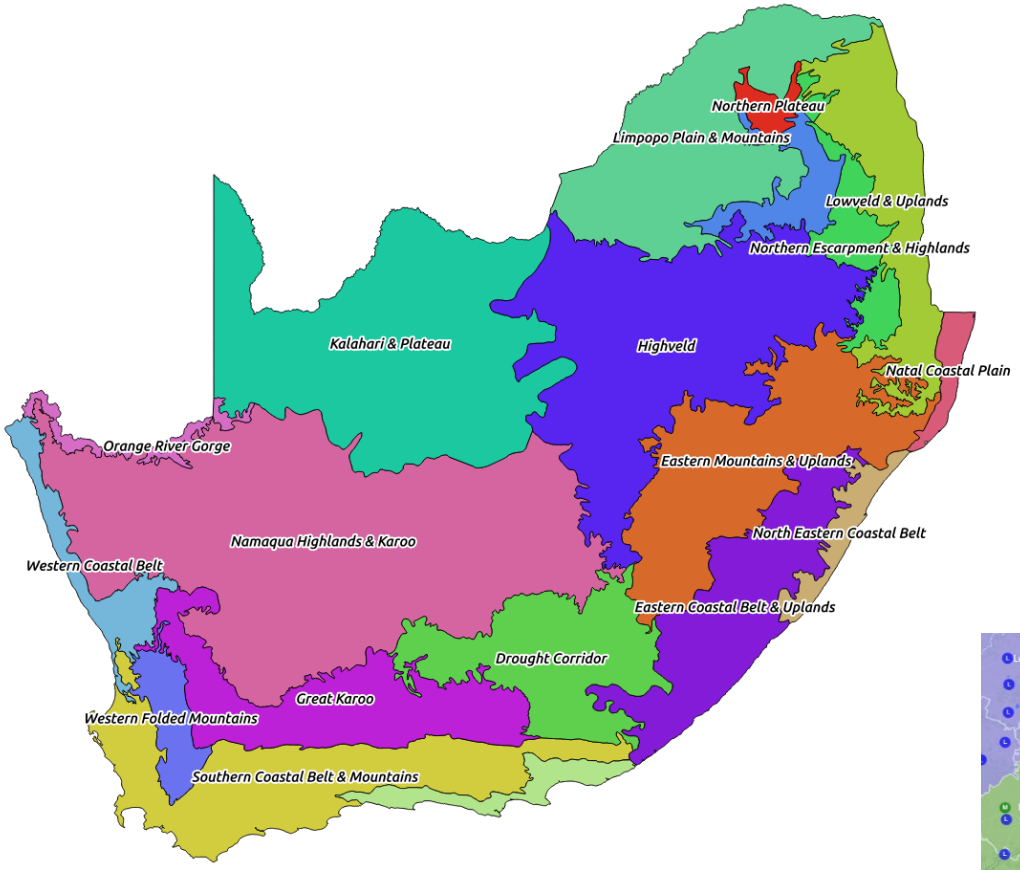
Earth

Global Fire WEather Database

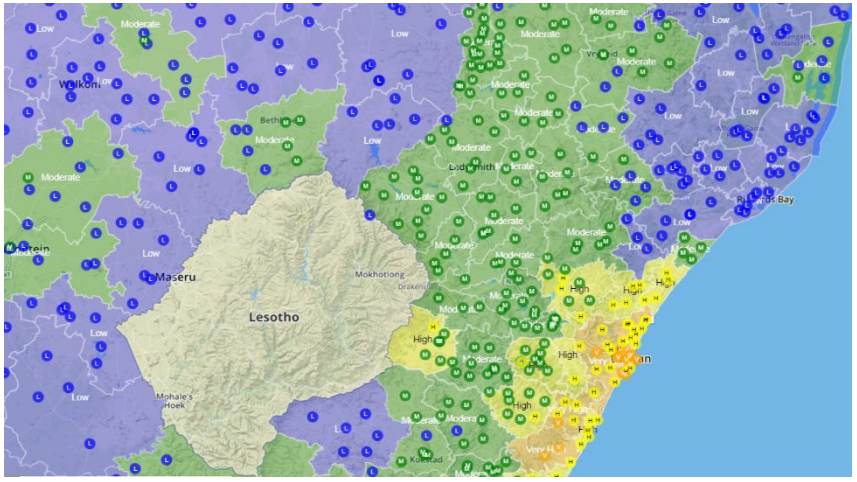
1984 - 2018



Calibration of the GFWED FWI

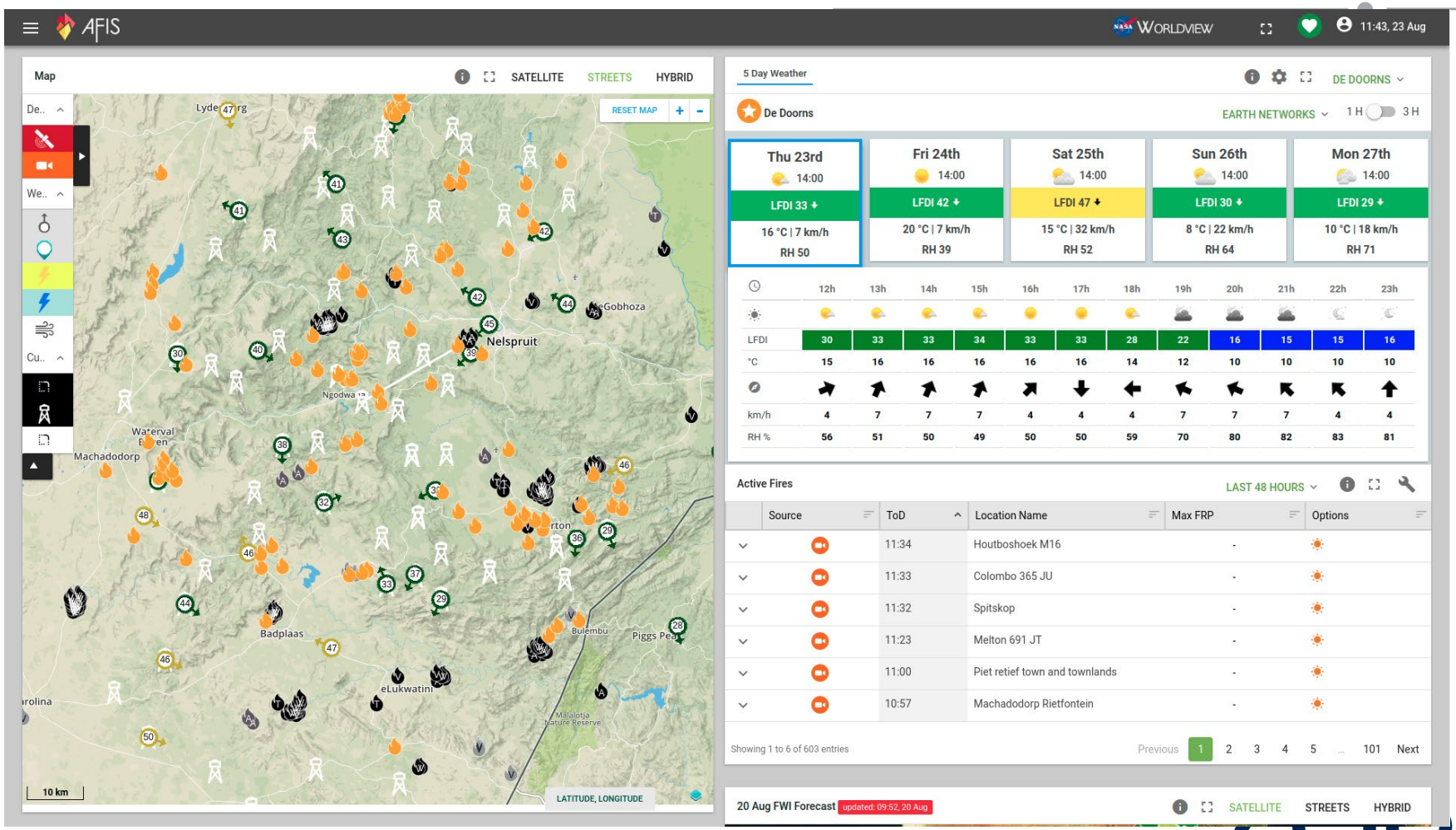


Calibrated Fire Danger Rating modelling based on enhanced weather forecasting and satellite based fuel characterization



- 19 Unique Fire Weather Regions identified from 31 Eco Regions

GFWED calibrated forecasts



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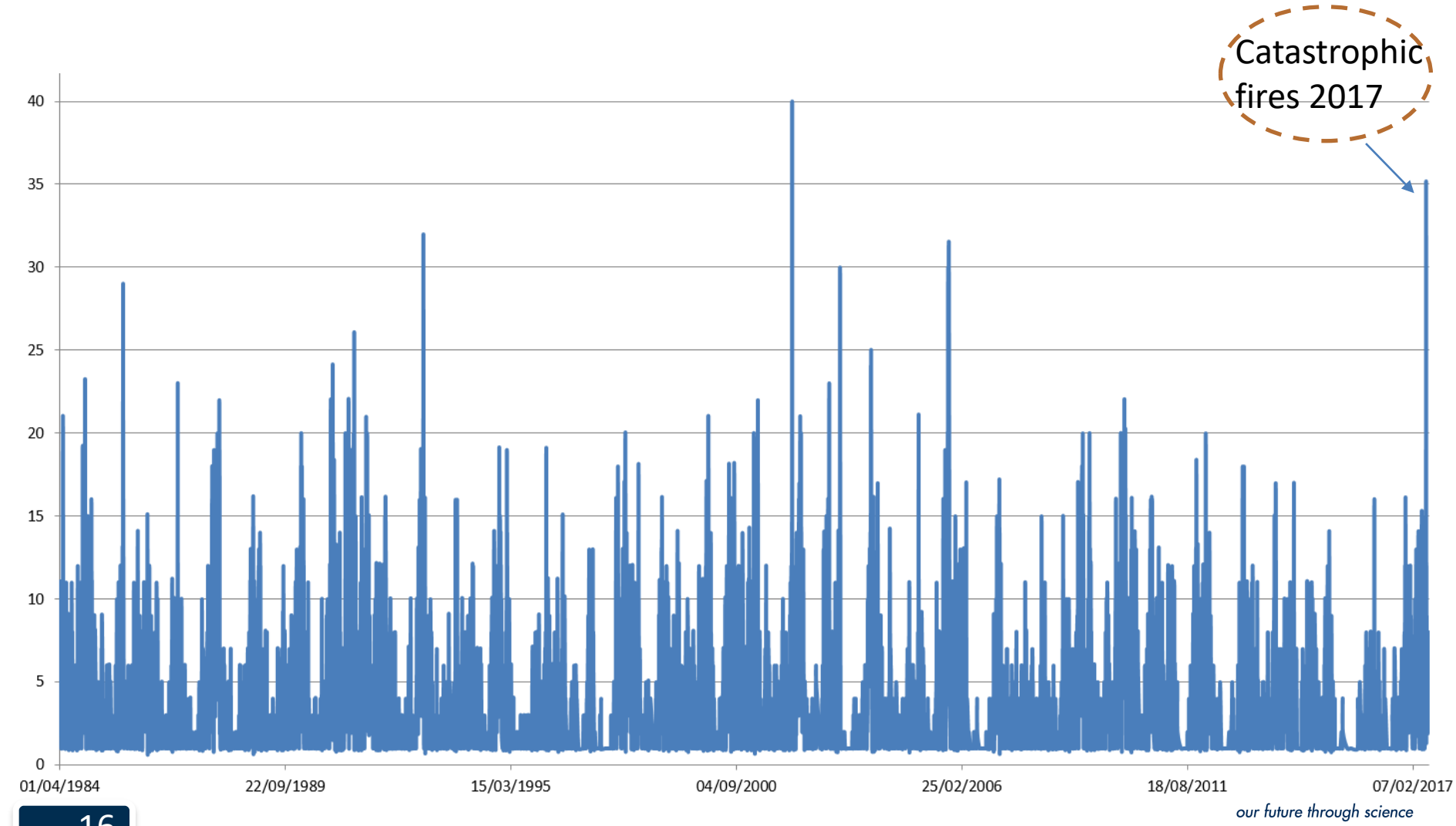
Validation of the GFWED for Knysna

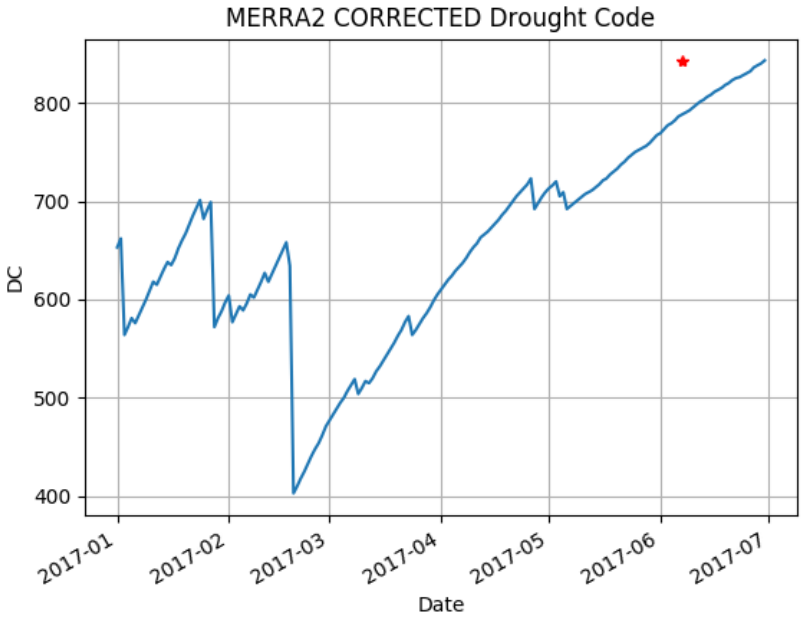
- The **Daily Severity Rating** (DSR) is a numeric **rating** of the difficulty of controlling fires. It is based on the Fire Weather Index but more accurately reflects the expected efforts required for fire suppression.

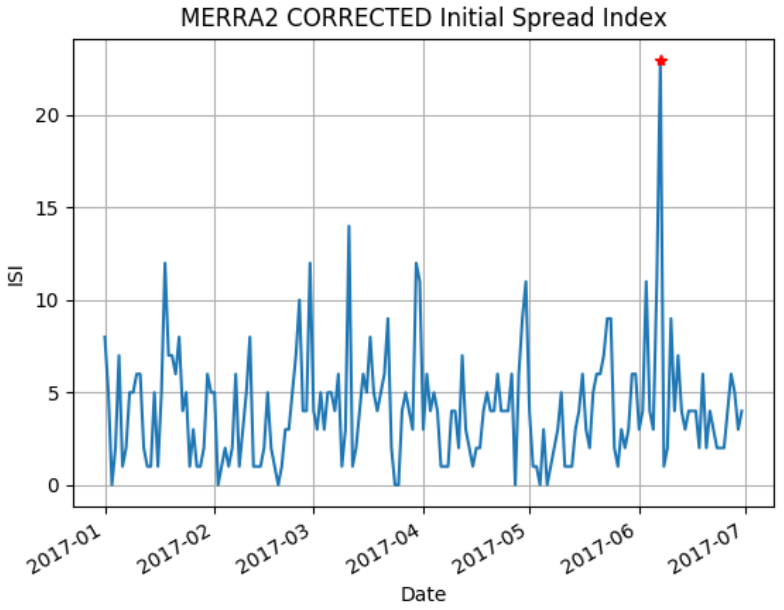
- The effectiveness of the DSR in characterising the Knysna fires in 2017
- Comparison between the DC, ISI, DSR and local SA Lowveld model

DSR over Knysna: 1984 - 2017



Knsyna 2017: DC, ISI





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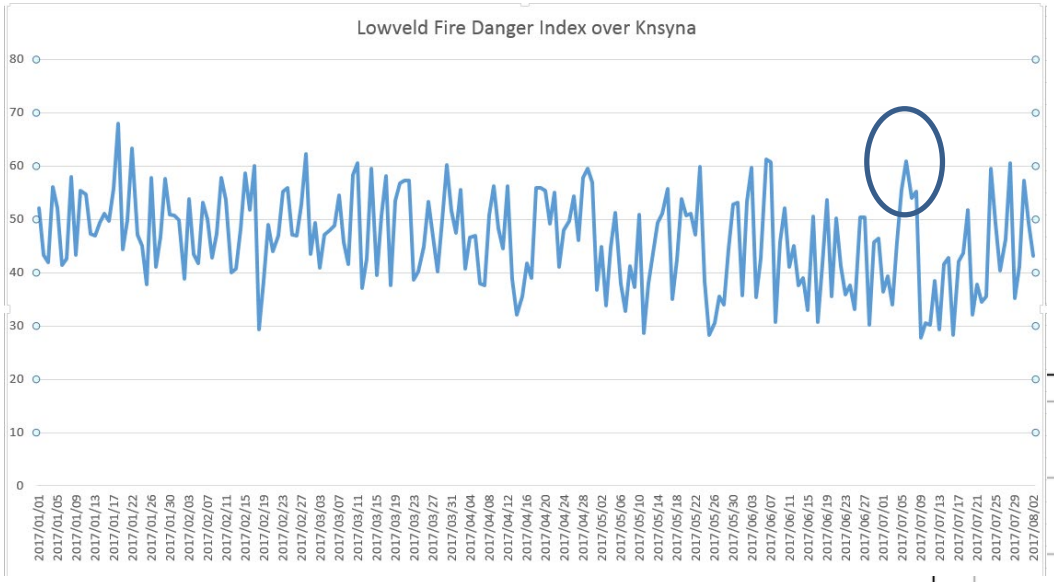
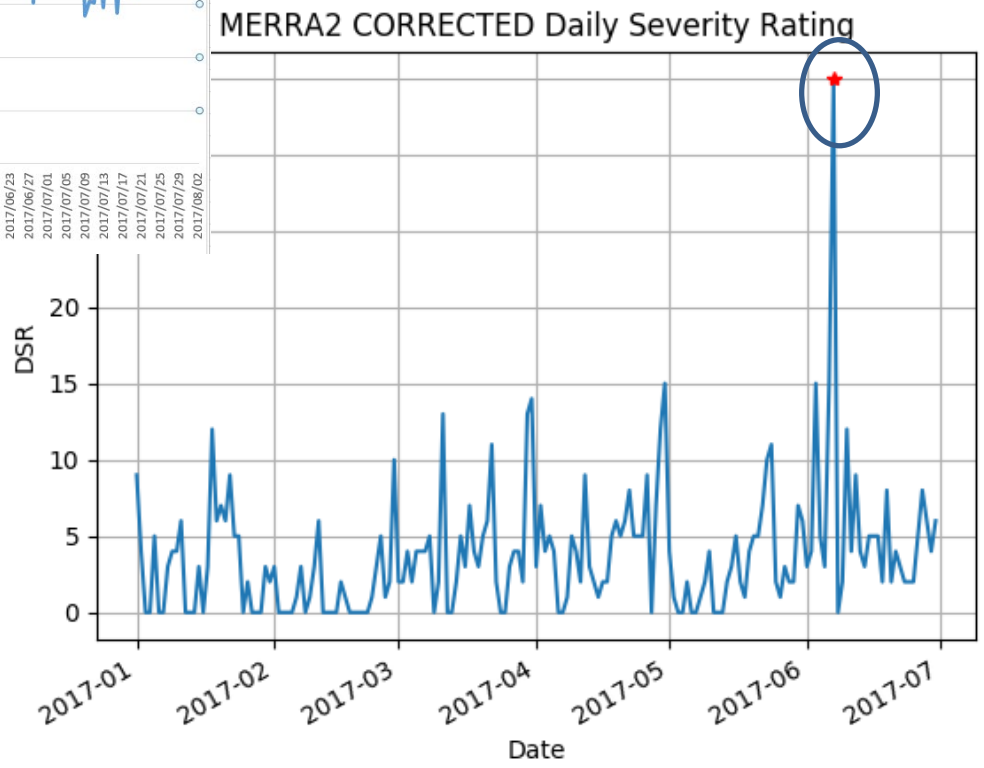
Comparison between DSR and LFDI: Knysna 2017

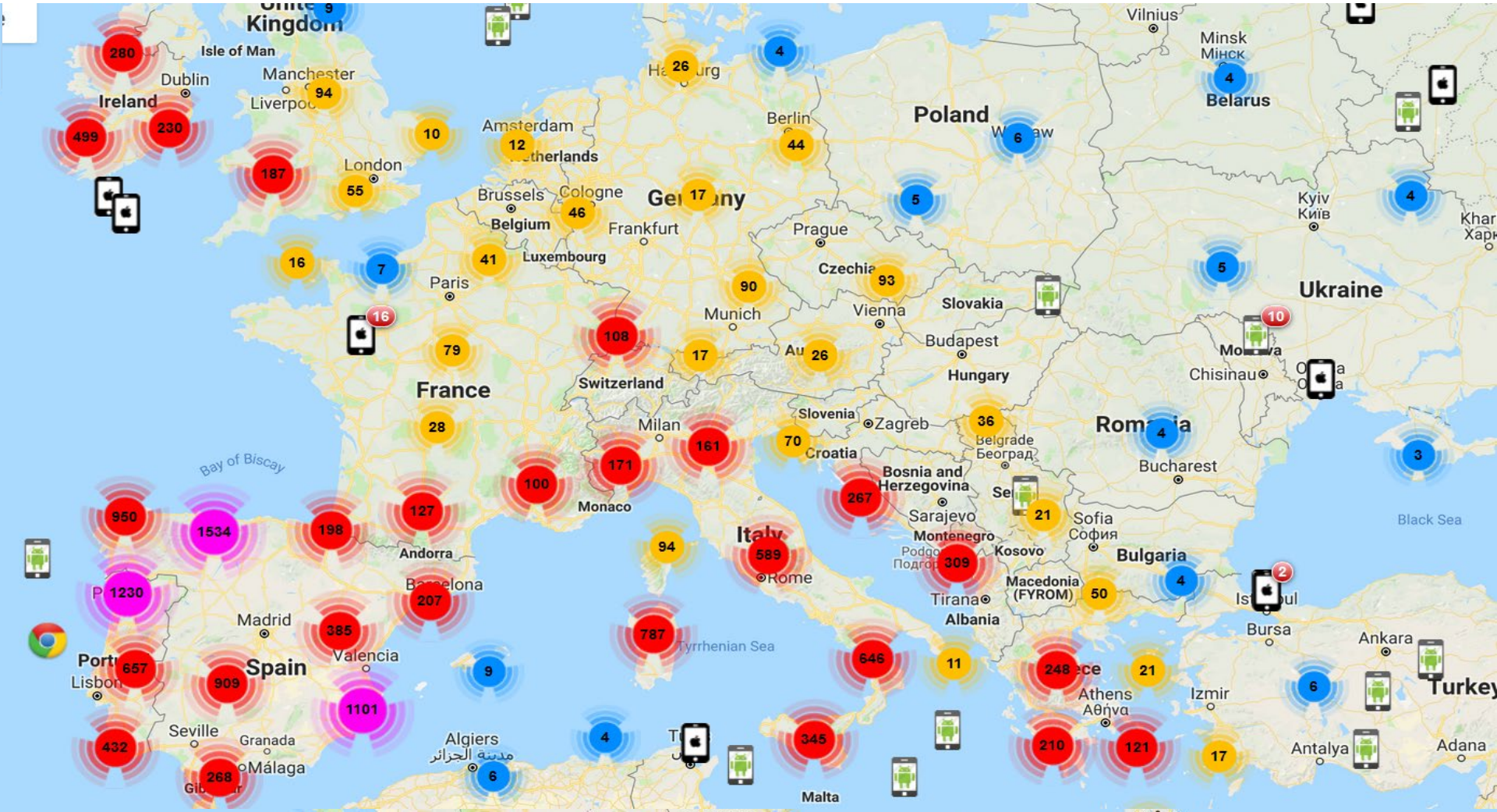


Knysna Fire Disaster 7 June 2017



AFIS mobile app usage

2016: 600 000 | 2017: 700 000 | 2018 Jan-Aug: 740 000



In Memory of
Tony, Madré and their son Michael Johnston

Thank you

Name (email@csir.co.za)