

IGARSS 2009 SC-4

Case Study

Storms, Fires, Snow in South Africa, August 30 – September 1, 2008

Summary

Each group of 2 or 3 students will prepare and present a 15 minute Powerpoint report on the storms and related events which occurred in South Africa from August 30 to September 1, 2008. The storms were associated with the following environmental effects: Strong Winds, Heavy Rain, Flooding, Snow, Wildfires, and Smoke Plumes. Students should pick a few aspects of the storms and their effects to describe in their report.

There are numerous newspaper articles describing the event. We suggest you start with <http://news24.co.za> and search on “weekend of fire and storms”.

All reports should contain the following sections:

1. Summary of the event
2. What happened on the day(s) of the event
3. What were the major impacts of the event (e.g., damage, fatalities, injuries, road closures, floods, etc.)

All sections should include supporting observations and data sources.

Suggestions to investigate

Severe Storms in Western Cape

- Preconditions
 - Meteorological conditions prior to the advance of the Low Pressure system
 - Forecasts of impending onset of storm
- During the event
 - Monitoring the observations of strong winds and heavy rains in Cape Town and the surrounding region
 - When and where it happens
 - What MODIS products were useful in helping to identify the severity of the storm
 - Identify regions where there may be atmospheric turbulence, and aircraft icing, and/or severe weather
- Post event analysis

- Analyze the quality of the DBCRAS forecasts
 - Compare satellite imagery with SEVIRI observations
 - Compare precipitation amounts to those observed in Cape Town
- Use the MODIS data and products to compare pre to post event
 - Did it snow?
 - Are there changes in reflectivity and/or thermal properties of the surface?
- What products/tools/data sets would have been most useful in preparing and monitoring this event?

Example Report Outline 2

Suggestions to investigate

Wildfires

- Preconditions
 - Meteorological conditions prior to the onset of the fires
 - Forecasts of fire potential for the Eastern South Africa and Mozambique
- During the event
 - Monitoring the fire locations and aerosols associated with them.
 - What MODIS products were useful in helping you identify the location and severity of the event
 - What meteorological forecasts are showing about the persistence and intensity of the fires and aerosol transport
- Post event analysis
 - Analyze the quality of the DBCRAS forecasts of fire potential (temps, moisture, winds), and morphology of fire and aerosols
 - Use the MODIS data and products to compare pre to post event
 - Are there changes in reflectivity and/or thermal properties of the surface?
 - What products/tools/data sets would have been most useful in preparing and monitoring this event?

Available Data (P:\LET\Geografie\IGARSS09\Day4\ August_September_2008_Storms)

- MODIS data (Terra and Aqua) from August 30, August 31, September 1 (days 243, 244, 245, respectively)
 - Subdirectory MODIS_data
- DBCRAS model runs (subdirectory DBCRAS_model_runs)
 - Coarse model 48 km grid 72 hour forecasts (ex: 30Aug08.12z.dbCRAS.grib2)
 - Finer scale 16km grid 48 hour forecasts (ex: 30Aug08.12z.NdbCRAS.nest.grib2)
- Terra and Aqua orbit track images
 - subdirectory Orbit_Tracks
 - Example filename: orbitmap1.global.2008243.gif
- True color images with fire location overlays from Rapid Response
 - subdirectory Google_Earth
- Excel spreadsheet of hourly precipitation at Cape Town from SA Weather Service containing hourly precipitation, wind direction and wind speed
 - subdirectory Surface_Observations\Capetown_Precipitation_Winds_Spreadsheet)
- Animations of surface observations (HTML) from SA Weather Service
 - subdirectory Surface_Observations\Station_Plot_Loops/Aug30-Sep2_METARS.html
- Animations of SEVIRI IR window, water vapor and visible band images
 - subdirectory SEVIRI_animations
 - SEVIRI_visible.html
 - SEVIRI_water_vapor.html
 - SEVIRI_11_micron_BT.html

Software: Hydra, McIDAS-V, Google Earth, Powerpoint, Web browser.

Useful Information

South Africa local time = UTC + 2 hours.

To capture the entire screen to the Clipboard, press Print Screen.

To capture the active window to the Clipboard, press Alt Print Screen.

For news stories on the event, go to <http://news24.co.za/> and search for “weekend of fire and storms”.