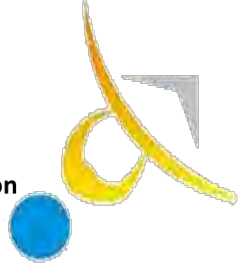




ISES
International Space
Environment Service



Indonesia Center of Excellence
In Space Weather Information and Prediction



SWIFS
SPACE WEATHER INFORMATION AND FORECAST SERVICES

INDONESIA REGIONAL WARNING CENTER

<http://swifts.sains.lapan.go.id>



SWIFS Pusat Sains Antariksa LAPAN
ISO9001:2015



Google Play



Indonesia Space Weather Services During COVID-19 Pandemic

Tiar Dani
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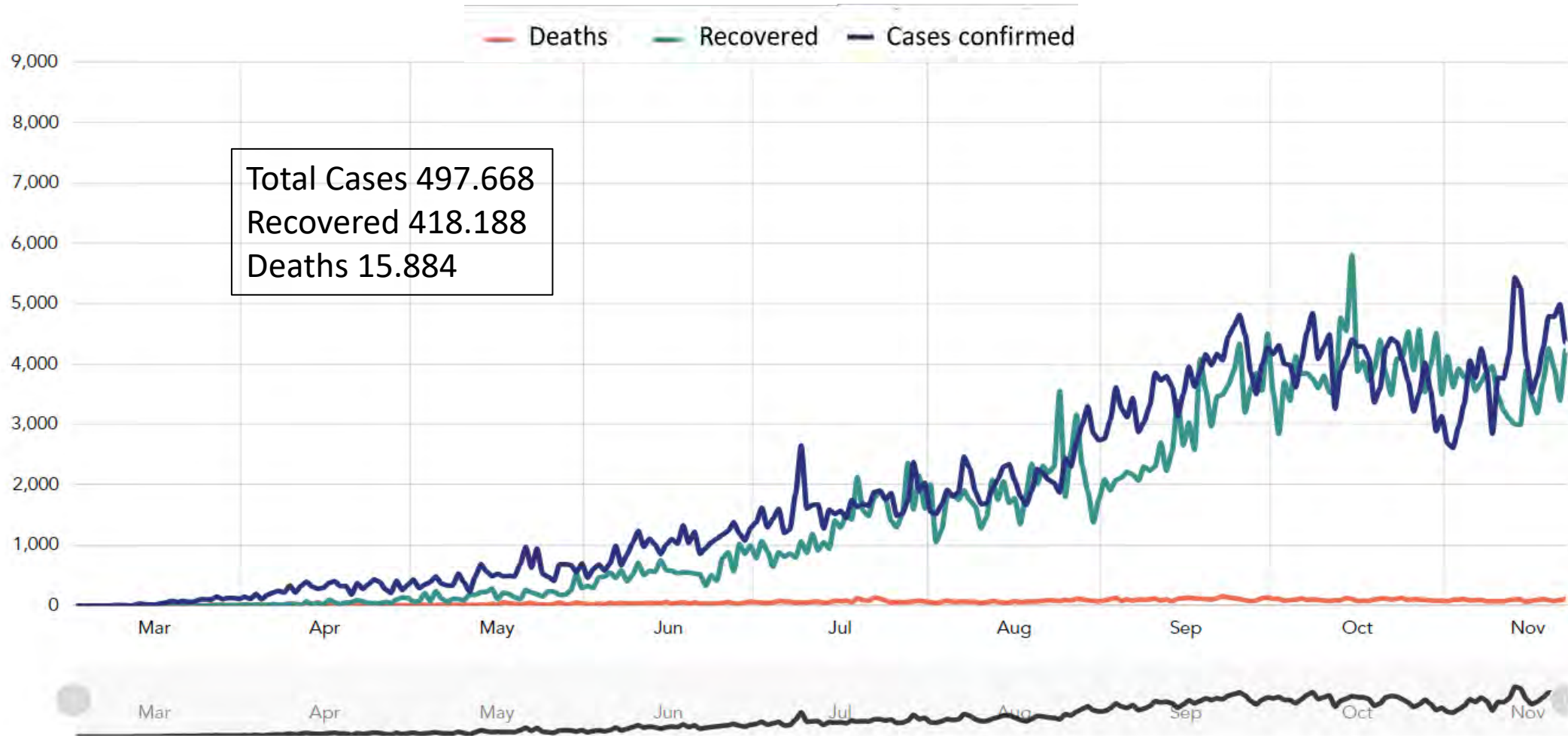
AOSWA
Asia-Oceania Space Weather Alliance

Indonesian National Institute of Aeronautics and Space





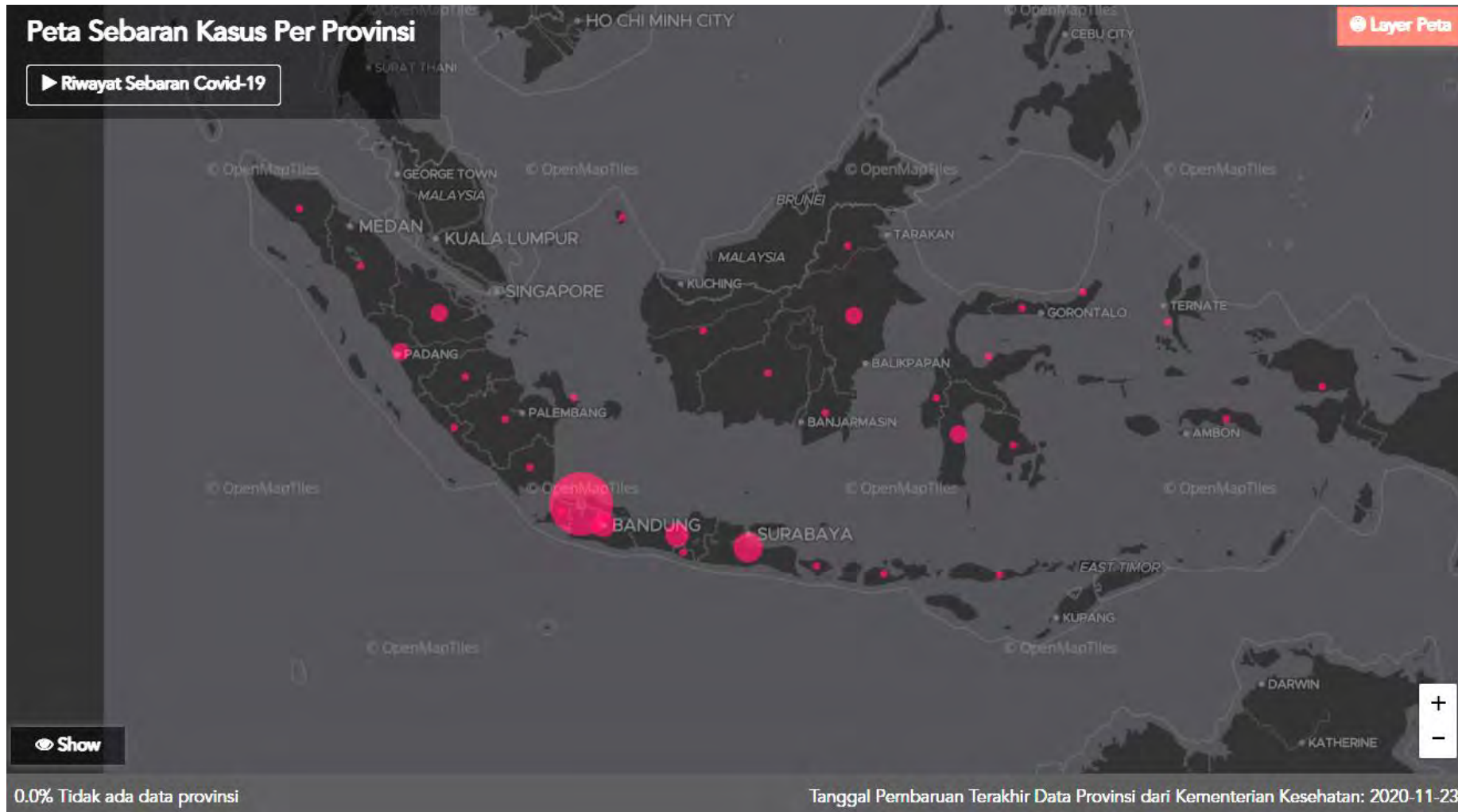
Indonesia COVID-19 Reported Cases (per 23 November 2020)



Source: covid19.go.id



Indonesia COVID-19 Reported Cases (per 23 November 2020)



Source: covid19.go.id



Indonesia COVID-19 Reported Cases (per 13 September 2020)

The first cases of COVID-19 were confirmed in Indonesia on 2 March 2020 announced by the President, with two residents of Depok, West Java tested positive for the virus.

Large-scale social restrictions (LSSR) (Indonesian: **Pembatasan Sosial Berskala Besar or PSBB**) are currently in place in Indonesia in response to the COVID-19 pandemic. The restrictions are implemented by local governments with the approval of the Ministry of Health. It includes measures such as closing public places, restricting public transport, and limiting travel to and from the restricted regions.





Indonesia Space Weather Services during the pandemic

Since the first case of COVID-19 in Indonesia announced by the President in early March, the activities of LAPAN Space Weather R&O in Indonesia begin to conduct at home in the middle of March which all of the SWIFtS activities conducted online utilized WhatsApp for the discussion between forecaster and expert team. And the results are submitted online via the SWIFtS backend website.

The online forecast using WhatsApp has been conducted several times during a long holiday before the COVID-19 pandemic so all of the team is ready and familiar with this Standard Operating Procedures. And the online submission system is already prepared since the beginning of SWIFtS operation in 2014. And also some of the space weather models and information which not running automatically before the pandemic, we developed the automatic system and the result is accessible via the website or utilizes TeamViewer to run the prediction model from home. And we also utilize Github as a temporary server for displaying the on-going research forecast models.

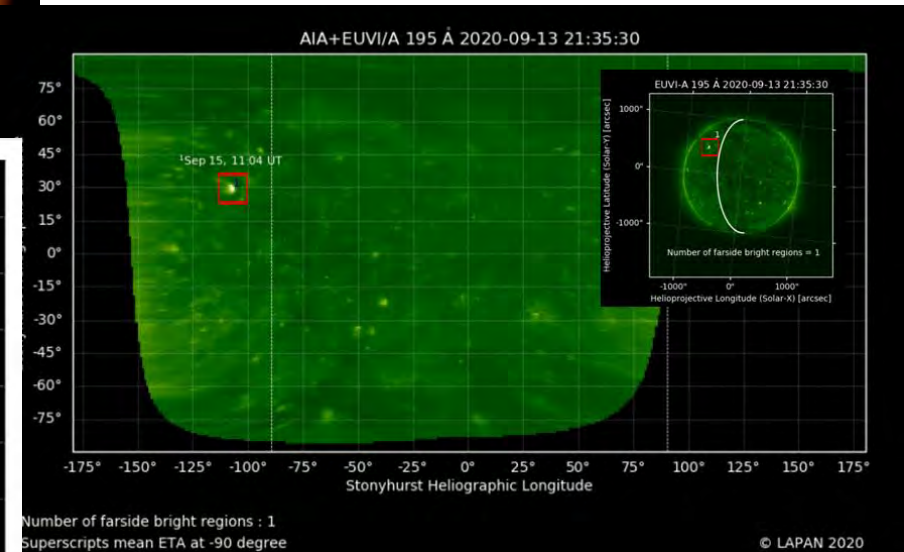
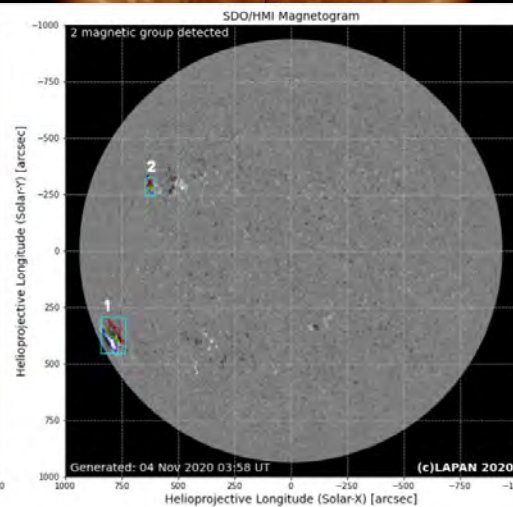
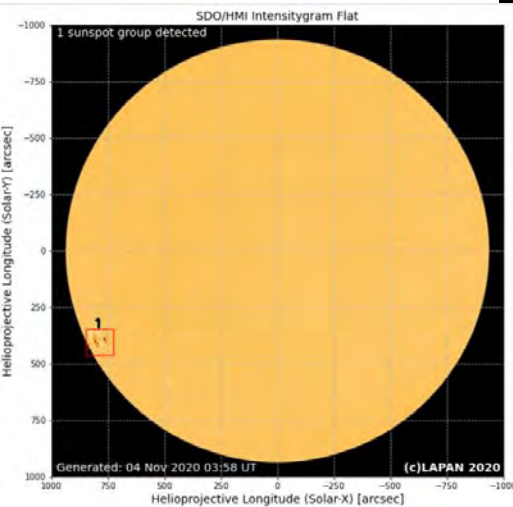
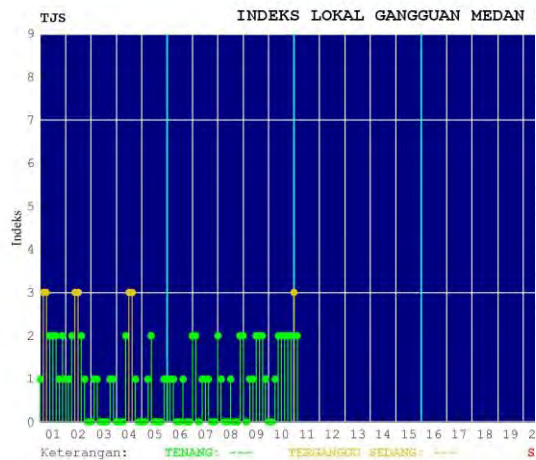
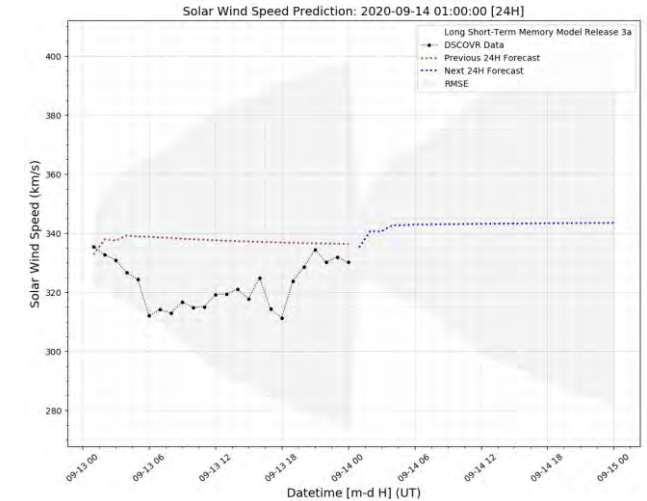
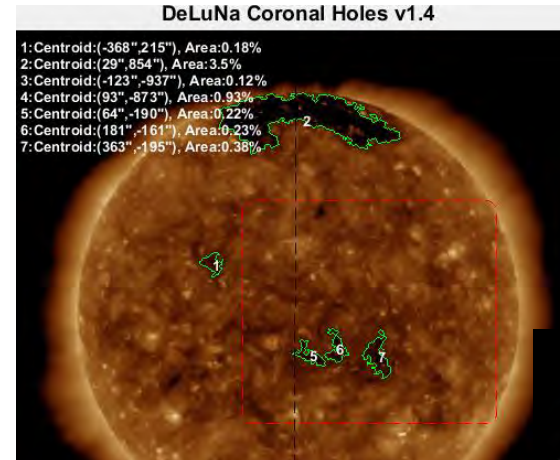
As for the space weather research conducted from home which utilized remote connection to office computers and servers. Some of the space weather observation data also processing at home before uploading to the server



Indonesia Space Weather Services during the pandemic

Some of our space weather models which run automatically:

- Active Region Detection
- Magnetic Region Detection
- Solar Flare Forecast
- Solar Wind Prediction
- Far side Active Region Detection
- Coronal Hole Detection
- W-index
- k-index





Indonesia Space Weather Services during the pandemic



HF RADIO COMMUNICATION



NAVIGATION



AVIATION SERVICE

Regional T-Index
HF Frequency Prediction
HF Radio Propagation
HF Channel Evaluation

Ionospheric TEC Disturbance Index

Information on:

- K-Index
- S4
- TEC

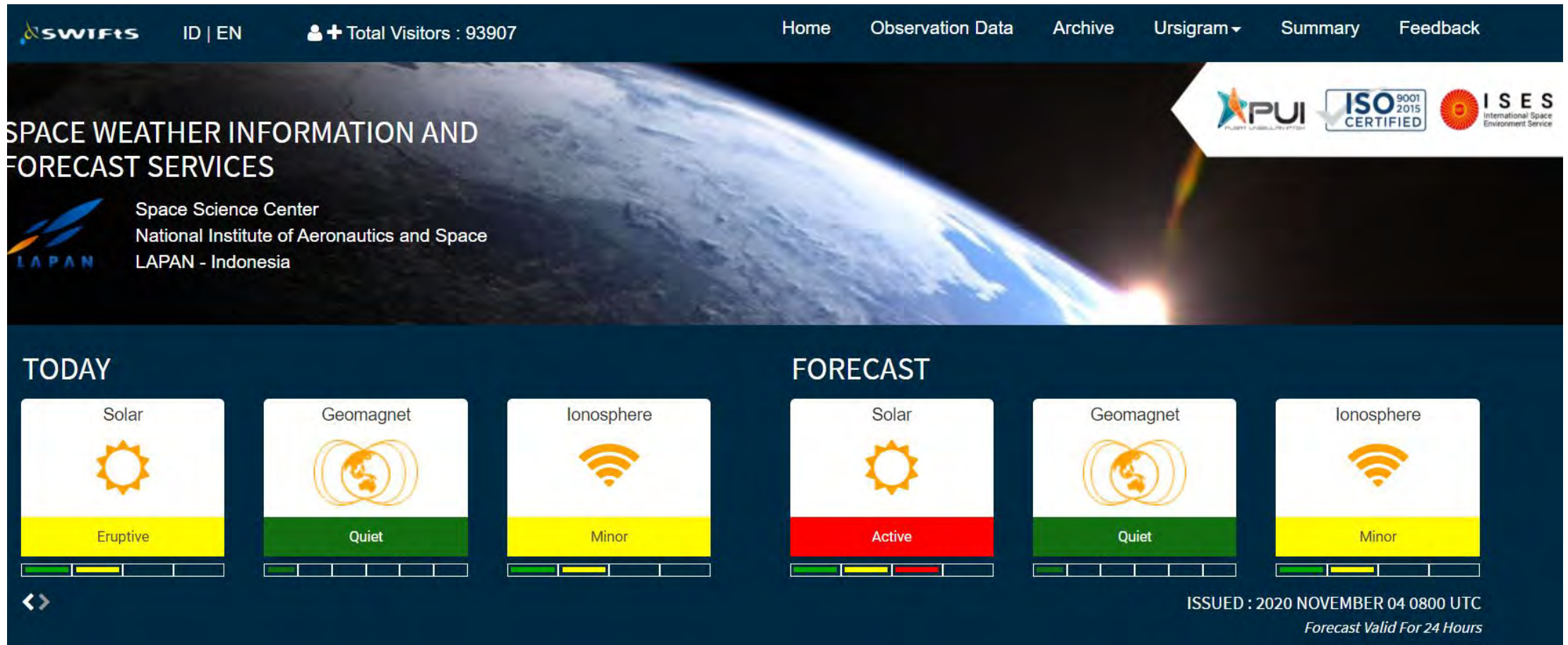
Daily Brief of Space Weather Condition and Forecast:

- Solar Activity
- Solar Wind/ Geomagnetic Activity
- Ionosphere/Scintillation
- Solar Energetic Particles/Proton



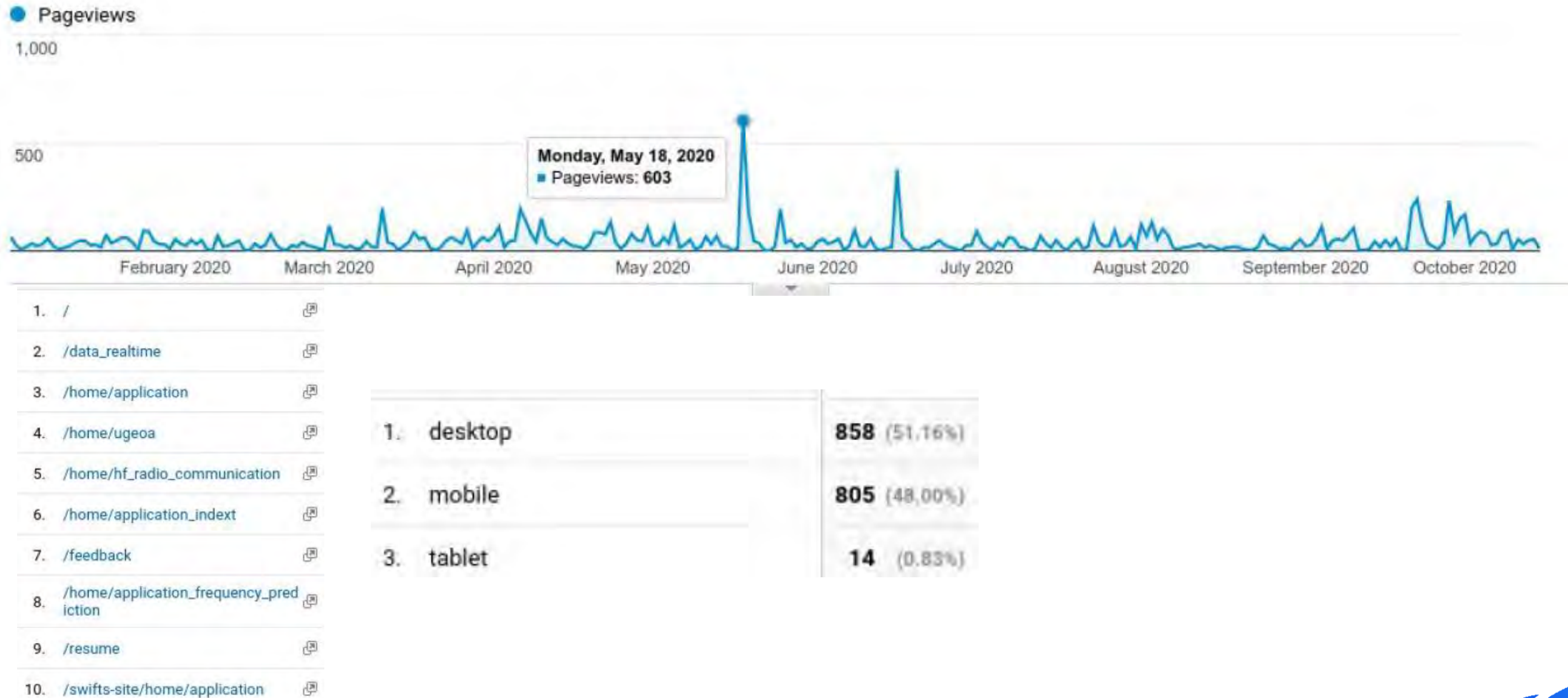
Indonesia Space Weather Services during the pandemic

SWIFTs web access (1 January – 15 October 2020)





Indonesia Space Weather Services during the pandemic SWIFTs web access (1 January – 15 October 2020)





Indonesia Space Weather Services during the pandemic

SWIFtS re-certified ISO9001:2015 again in early March just before the Work From Home policy begins.

The online discussion to prepare the MoU between LAPAN and BATAN (Indonesia Nuclear Agency) for the joint research on Radiation Dose for Aviation in Indonesia. The MoU signed in early October 2020.

Unfortunately, due to the COVID-19 pandemic, the discussion about co-operation regarding ICAO Annex 3 Space Weather Advisories with Indonesia Meteorological, Climatological, and Geophysical Agency (BMKG) is coming to a halt.



Indonesia National Observatory

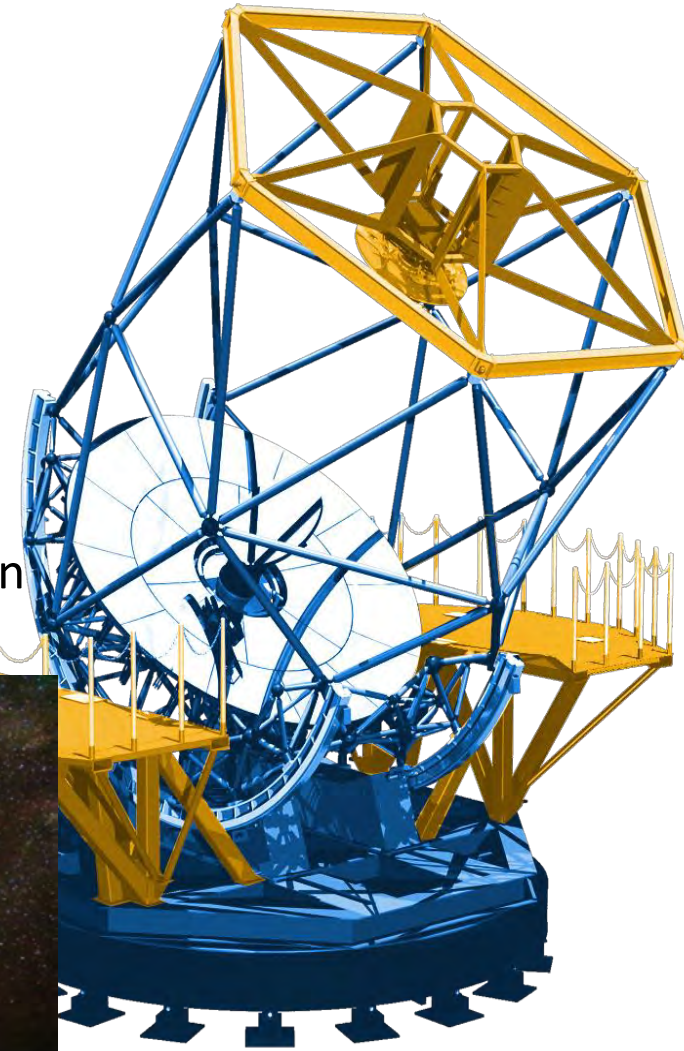


Planned Instruments:

- 3.8m telescope
- 1.2m telescope
- 50cm telescope
- Solar telescope
- Radio telescope
- Magnetometer
- Automatic Weather Station



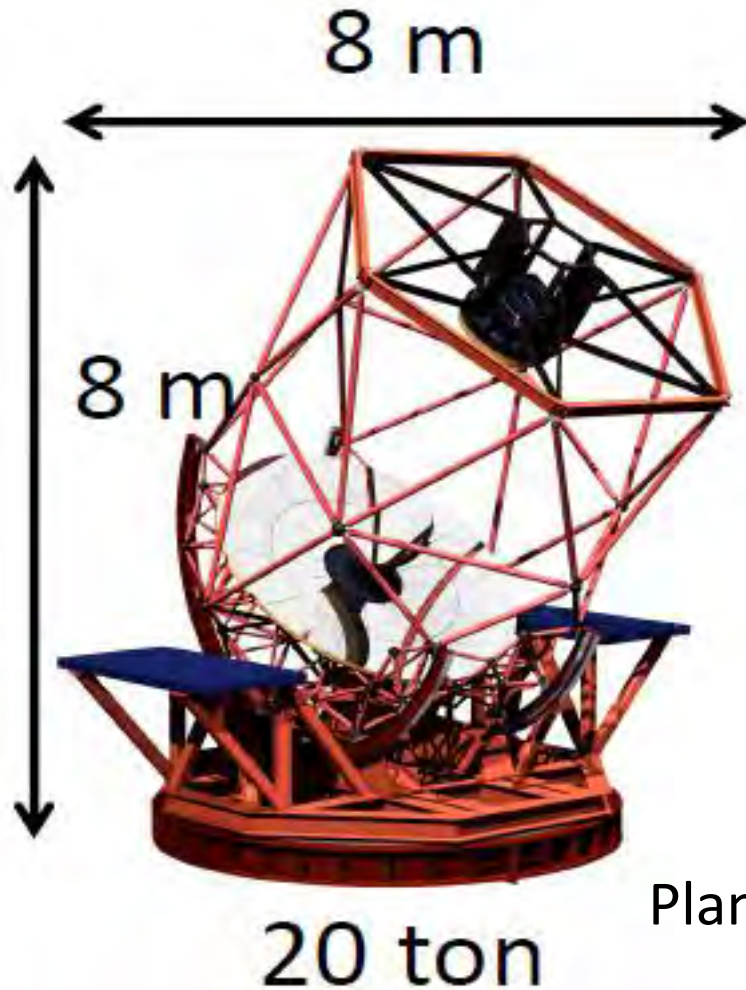
Credit: M. Zamzam N.



One of its scientific missions is the Solar Activity Observation and Space Weather Monitoring



Indonesia National Observatory



Planned engineering first light in 2021



Lesson Learned and Step For The Future

- ❑ Cloud database for observation data → Increase the storage capacity and easy access anywhere anytime
- ❑ Automatic forecasting models results → Easy for displaying in the website and always update content
- ❑ Auto-update on space weather information and forecast → Manage the link between data/forecast results and website server for having always update data content
- ❑ Discussion and forecast meetings utilize Zoom, WhatsApp, etc → Need to revise the procedure during maximum solar activities.



Thank You

STAY HOME
STAY SAFE

