

FMS's expectations of new-generation satellites for hazard monitoring

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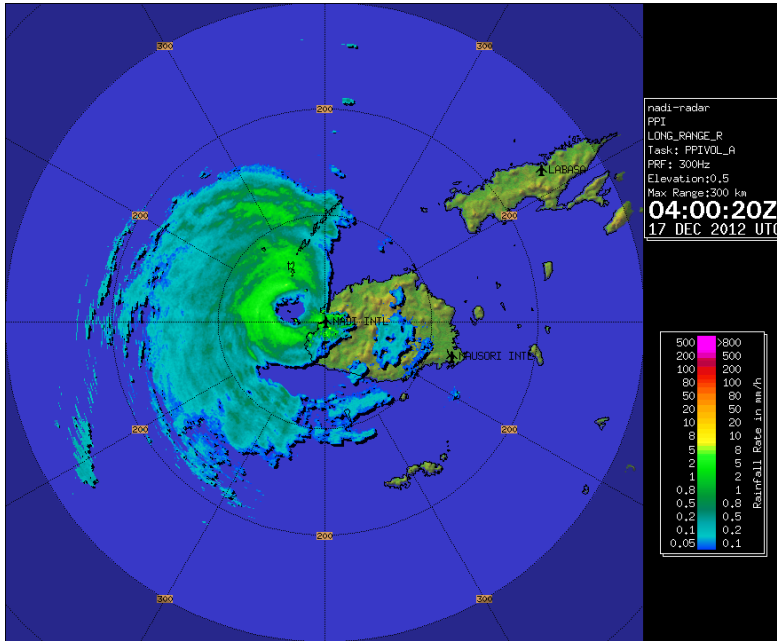
Tokyo International Exchange Center/Plaza Heisei Meeting Facilities

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FMS's top three hazards that can be monitored by satellite

- Hazard 1: Tropical Cyclones (Typhoons)
 - Cyclone Evan was the first cyclone to affect the Fiji Group during the 2012/13 tropical cyclone season. Evan reached a maximum intensity as a category four system with sustained winds estimated to be 100 knots and gusts to 140 knots as it moved over the northern and western parts of the Fiji Group. Evan was the strongest tropical cyclone to affect the western division since Cyclone Gavin.
 - Tropical Cyclone Evan (Dec. 2012) . Along with the hurricane force winds associated with Evan damaging heavy swells and large storm surges devastated the western and northern parts of the Fiji Group with damage estimates of FJD\$75 million. A total of 86 schools and close to 6000 homes were partially or completely destroyed by TC Evan.

FMS's top three hazards that can be monitored by satellite



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- Hazard 2: torrential rain
 - A tropical disturbance TD17F was analysed to the northwest of Fiji on the 26th of March, 2012 at about 6pm FST. It was gradually moving in a southeast direction and by 6pm on the 27th of March, it was located just to the northeast of Vanua Levu. The associated active convergence zone was affecting the whole Fiji group. On the 28th of March, TD17F was lying over the Lomaiviti group, however, the primary rain band was to the east of the system centre (Next Page)
 - By this time, TD17F was a slow moving system and the moist north-easterlies were feeding into the system and hence developing it. The environmental conditions during this time were perfect to produce significant amount of rainfall. The depression self sustained itself for time being as it had all the atmospheric conditions to produce significant amount of rainfall. The four factors that generally lead to this is: good upper divergence, low to moderate shear, good mid-level cyclonic vortices and good low level convergence.
 - Prolonged heavy rain and reoccurring floods incidents caused the worst flooding in the western division. All towns in the western division suffered huge losses to businesses and properties. Most of the losses are irrecoverable with a significant number of shops closing down business permanently. Damages to road, bridges, crossing, pathways and building were huge. The total damages caused by this flood were estimated to be around \$FJD120 million dollars.

FMS's top three hazards that can be monitored by satellite

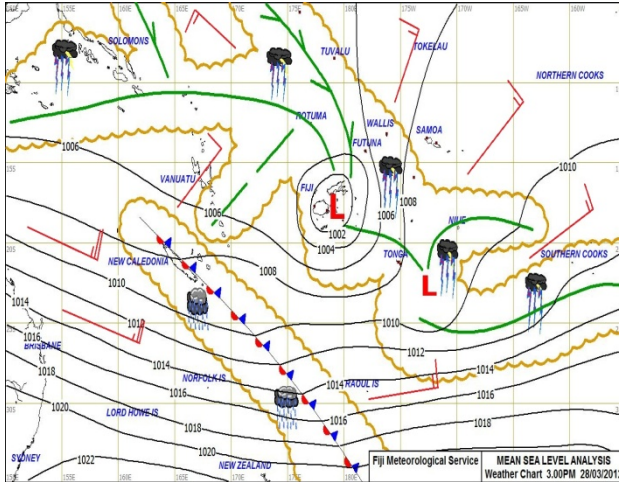


Fig1(a): Mean Sea Level Pressure Analysis on 28th March

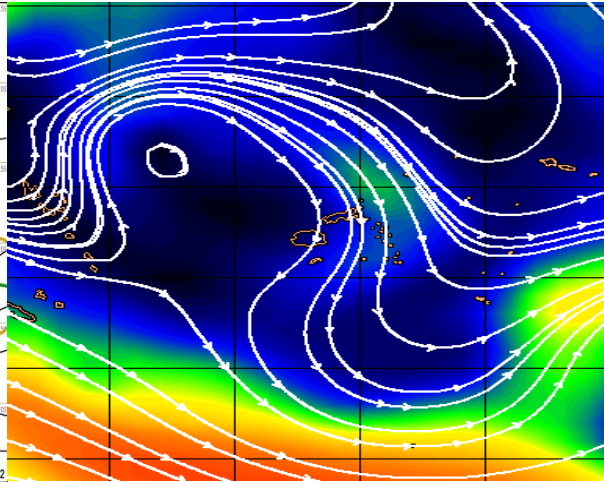


Fig1(b): Steering flow 700-250HPa at 280300 UTC

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- **Hazard 3: Severe thunderstorms / Aviation hazards**
 - During summer, conditions over the larger islands of Fiji Group are highly conducive for the formation of active thunderstorms that can potentially produce hailstorms. Hailstorms are rare in Fiji.. The northeastern parts of Kadavu and Sigatoka experienced hail event on 8 October, 2010. The hailstones that fell in these areas were from thunderstorm which had its lifting mechanism mainly from a front that was moving northwards from the south of the group. The event caught residents of these areas by surprise and for the younger generation, it was the first time experience to many. The hailstone size was not measured but it is assumed that the hailstones were not large enough to cause any significant damage.



HAIL

Figure 3 : Hail stones in Kadavu and Nadroga in October, 2010. (source: Mr Noa Baivatu, Kadavu).

FMS's expectations of new series of satellites for hazard monitoring

Major hazard	Features of new generation GEO met. satellite
Hazard 1: tropical cyclones	Multi-spectral bands: New channels derived from multi-spectral-band observations will support issuance of new and more effective warnings.
Hazard 2: torrential rain	Multi-spectral bands: New quantitative products will be derived from multi-spectral band observation data. High Spatial Resolution: High resolution images will assist in clarifying atmospheric particulars
Hazard 3: torrential rain	Multi spectral bands: New signals derived from multi-spectral band observation before extremely heavy rainfall are expected to be useful.

FMS's requirements to get desired benefits from the new generation of satellites

Major hazard	Features of new generation GEO met. Satellite
Hazard 1: tropical cyclones	Training in imagery analysis High spatial resolution Training would support the retrieval of new signals from multi-spectral band observation and detect atmospheric particulars
Hazard 2: torrential rain	Training in imagery analysis High spatial resolution Training would support the retrieval of new signals from multi-spectral band observation and detect atmospheric particulars
Hazard 3: severe thunderstorms / aviation hazards	Training in imagery analysis High spatial resolution Training would support the retrieval of new signals from multi-spectral band observation and detect atmospheric particulars

FMS's plans/expectations for utilization of new-generation geostationary meteorological satellite data

- Development our current system using enhanced features of new-generation satellites such as high spatial resolution, multi-spectral bands and product development
- Development of its current delivery mechanism's and product delivery by integrating new technology due to vast geographic locations within Fiji
- Active participation in meetings with focus on the utilization of new-generation satellite imagery
- Utilize VLAB educational system to better to educate Forecasting competences
- HimawariCloud as Primary
- HimwariCast as Backup

FMS's Obstacles

- Visualisation conversion from HSD to other formats

Thank you