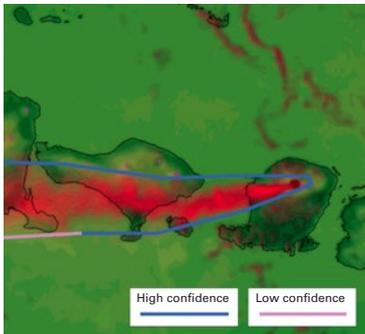


AVIATION WEATHER PRODUCTS

Volcanic Ash Strength of Evidence Assessment (VASEA)

Bureau of Meteorology › Aviation Meteorological Services



VASEA graphically depicts confidence in the observation (T+0) polygon of the Volcanic Ash Advisory (VAA).

When the T+0 polygon is included in the Volcanic Ash Advisory (VAA), the VAAC has a high level of confidence that discernible volcanic ash is present everywhere within that T+0 polygon. However the VAA user has no indication of the confidence associated with the delineation of the polygon boundaries. The updated VASEA product will provide a more in-depth look at the situation by using a high resolution polygon (not limited by number of points) around the ash in situations where the ash is discernible. In situations where ash is partially discernible or not discernible, the T+0 polygon will be used as the VASEA polygon. In all situations, the VASEA polygon will be completely contained within the T+0 polygon or will be the exact same. The product shows a single time-step for T+0 with polygon edges colour coded according to confidence level. Blue boundaries represent high confidence and pink boundaries represent low confidence. Background imagery is chosen by the VAAC forecaster to best highlight the distribution of ash and notes relating to the assignment of confidence are incorporated into the product.

A **high confidence** boundary exists when the transition from ash to no ash is sharply discernible in satellite imagery; for example, in situations where within the 30 minutes prior to the observation, the separation between clearly discernible ash pixels and pixels where ash is clearly not discernible, is less than or equal to 6 nm (4–5 pixels in Himawari 12 μ m IR). Where possible an ensemble approach to forecaster ash assessments is used.

A **low confidence** boundary exists when the transition from ash to no ash is not sharply discernible in satellite imagery; for example, in situations where within the 30 minutes prior to the observation, the separation between clearly discernible ash pixels and pixels where ash is clearly not discernible, is greater than 6 nm (4-5 pixels in Himawari 12 μ m IR). Where possible an ensemble approach to forecaster ash assessments is used.

In all situations where a T+0 polygon is included in the VAA, the VAAC has high confidence that ash is present within the T+0 polygon.

Factors that influence confidence level of the polygon:

- Part of or the entire ash cloud is obscured by non-volcanic clouds.
- The availability of visible satellite imagery to discern low altitude ash clouds.
- Sun angle impacts on the discernibility of diffuse ash clouds.
- Ash dissipation and/or wind regimes that result in ash clouds with gradual ash concentration gradients.
- The timeliness of observational evidence.

A confidence level is provide for the eruption or ash cloud height based on the following factors:

- Clearly discernible on satellite imagery.
- Infra-red temperature reading of cloud to obtain height.
- Wind regimes matching current ash movement.
- Accompanying ground report and/or pilot report or other sources.

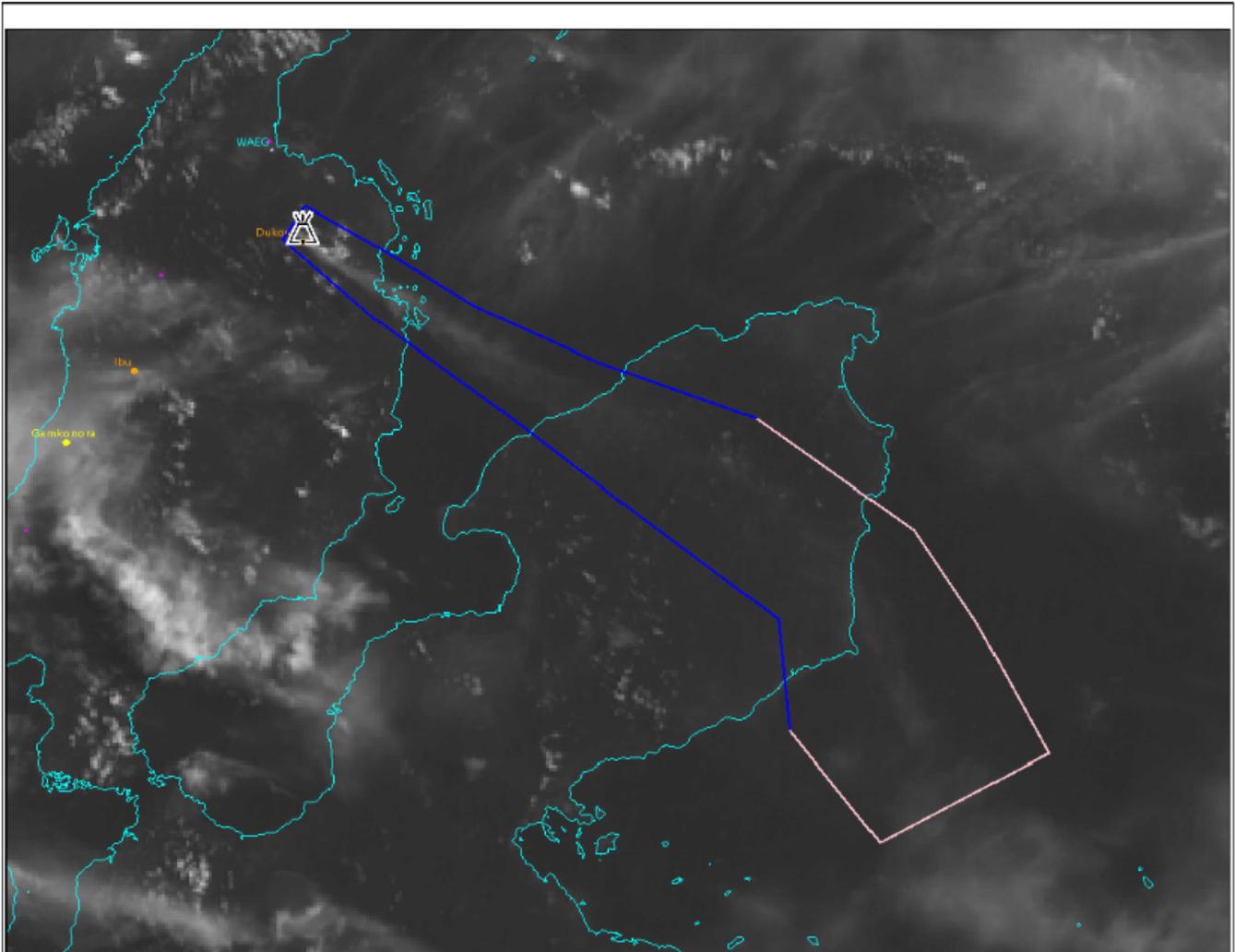
The VASEA now includes a T+3 hour written forecast to help extrapolate between the T+0 observation and T+6 forecast. The comment is a forecaster assessment of the situation with a confidence on the situation. Factors that influence the T+3 assessment confidence:

- Time of last confirmed observation.
- Wind regimes.
- Model guidance and dispersion model.
- Volcano source predictability or volcanology of the volcano.



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Sample 1



Volcano: Dukono

Issued: 0020 Z 05/04/2018

VAAC: DARWIN

Low Confidence

High Confidence

T+0 confidence assessment:

High confidence in majority of polygon:

- Discernible in VIS, IR and RGB at 04/2340z

High confidence in plume top to FL070:

- IR temperature 16.4 degrees
- All winds/models in agreement
- Ground report with image at 04/2318z

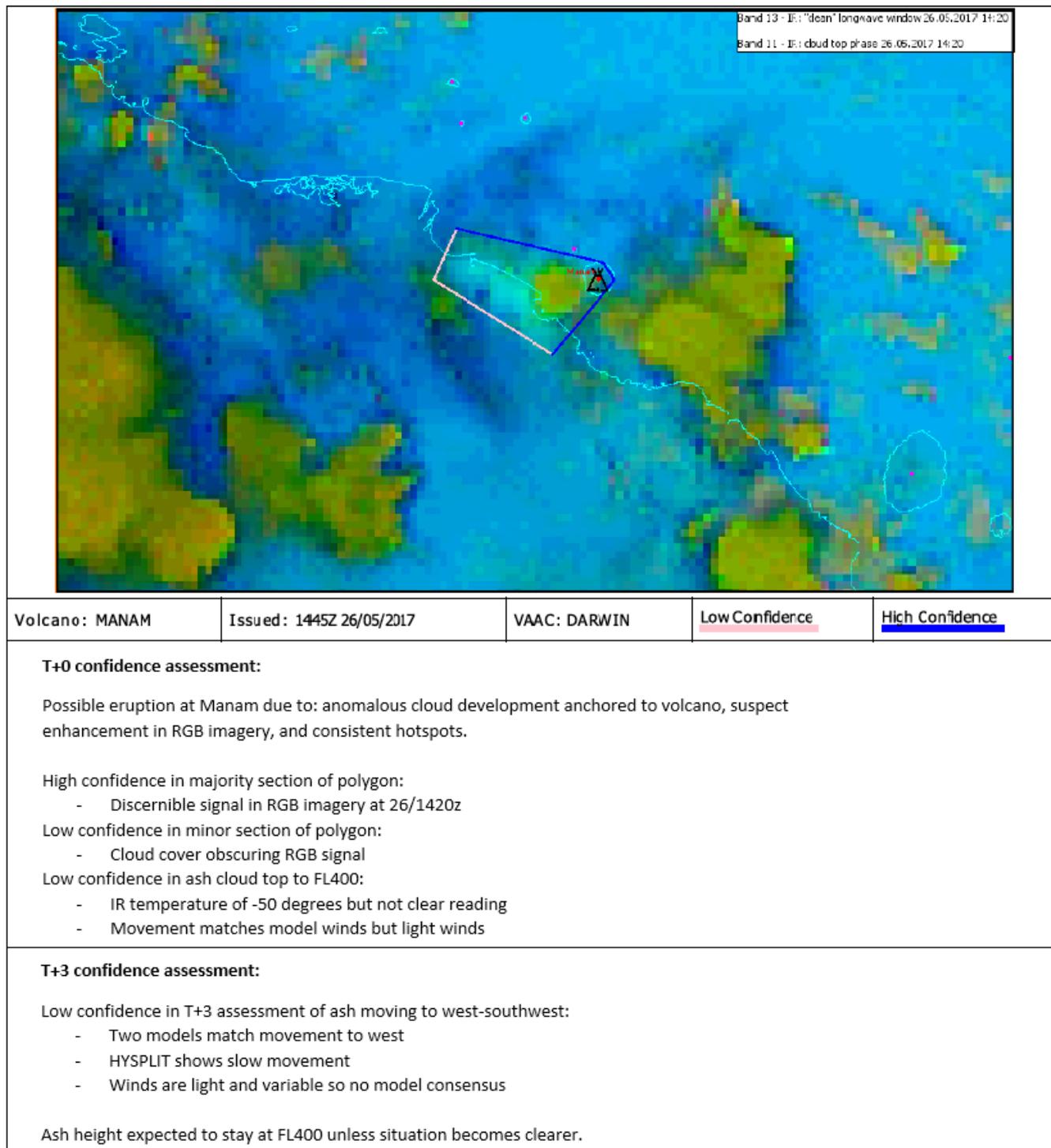
T+3 confidence assessment:

High confidence in T+3 assessment of ash moving to southeast:

- All models match current ash movement
- Models predict the ash will still be moving to the southeast with 10kt winds
- HYSPLIT results confirm movement to southeast

Ash height expected to stay at FL070 if conditions remain unchanged.

Sample 2



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Airservices Australia is the official distributor of aviation forecasts, warnings and observations issued by the Bureau of Meteorology. Airservices' flight briefing services are available at www.airservicesaustralia.com. Telephone contact details for elaborative briefings are contained in Airservices' Aeronautical Information Publication Australia (AIP), which is available online through their website.

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