PICTURE OF THE MONTH

Diurnal Variations of Convection over the "Maritime Continent"

GREG J. HOLLAND AND THOMAS D. KEENAN[1]

Bureau of Meteorology, DSE, Melbourne, Victoria, 3001, Australia

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Over the myriad of tropical islands, local interactions between the prevailing winds, the diurnal heating cycle and topography result in distinctive cycles of convective activity. These have been well documented by Leopold (1949), Riehl (1954), Atkinson (1971), Jacobson (1976) and others. The introduction of regular observations from geostationary satellites has emphasized the large-scale consistency of these "local" effects.

This note presents a striking example of the convective cycle over the "maritime continent" of southeast Asia (Ramage, 1968) and northern Australia observed by the Japanese GMS-1 geostationary satellite on 10 December 1978.

The prevailing synoptic situation is shown in Fig. 1. This is the 0000 GMT surface streamline/isotach analysis from the WMONEX first look data set. The Siberian anticyclone was reasonably intense with a well-developed winter monsoon over southeast Asia, though the summer monsoon had not penetrated into northern Australia. A monsoonal shearline lay over the Javanese islands, and a buffer zone between the northeasterly and northwesterly flows was located just north of the equator. Over Australia, a

[1] Present affiliation: Department of Atmospheric Science, Colorado State University, Fort Collins 80523.

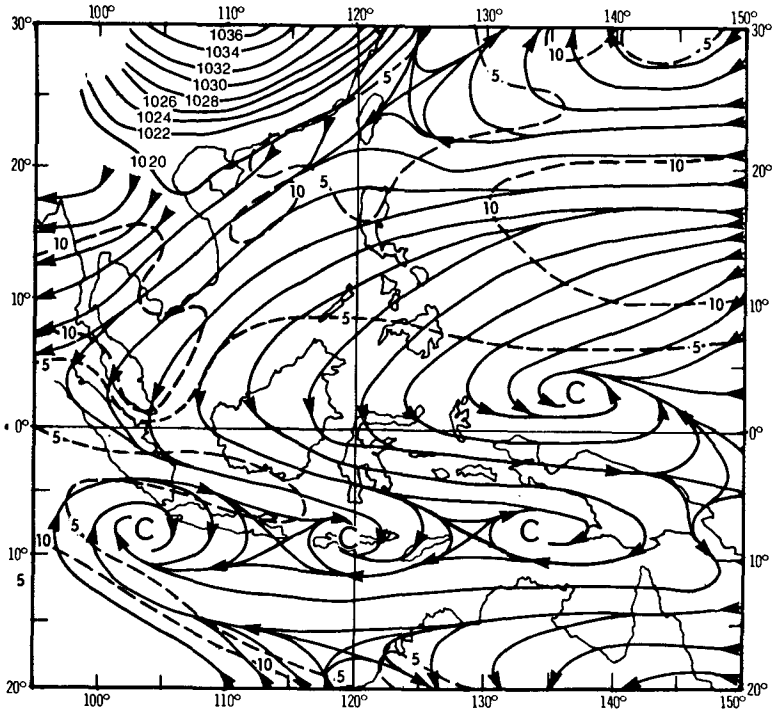

FIG. 1. Surface streamline/isotach (m s^{-1}) analysis for 0000 GMT 10 December 1978.

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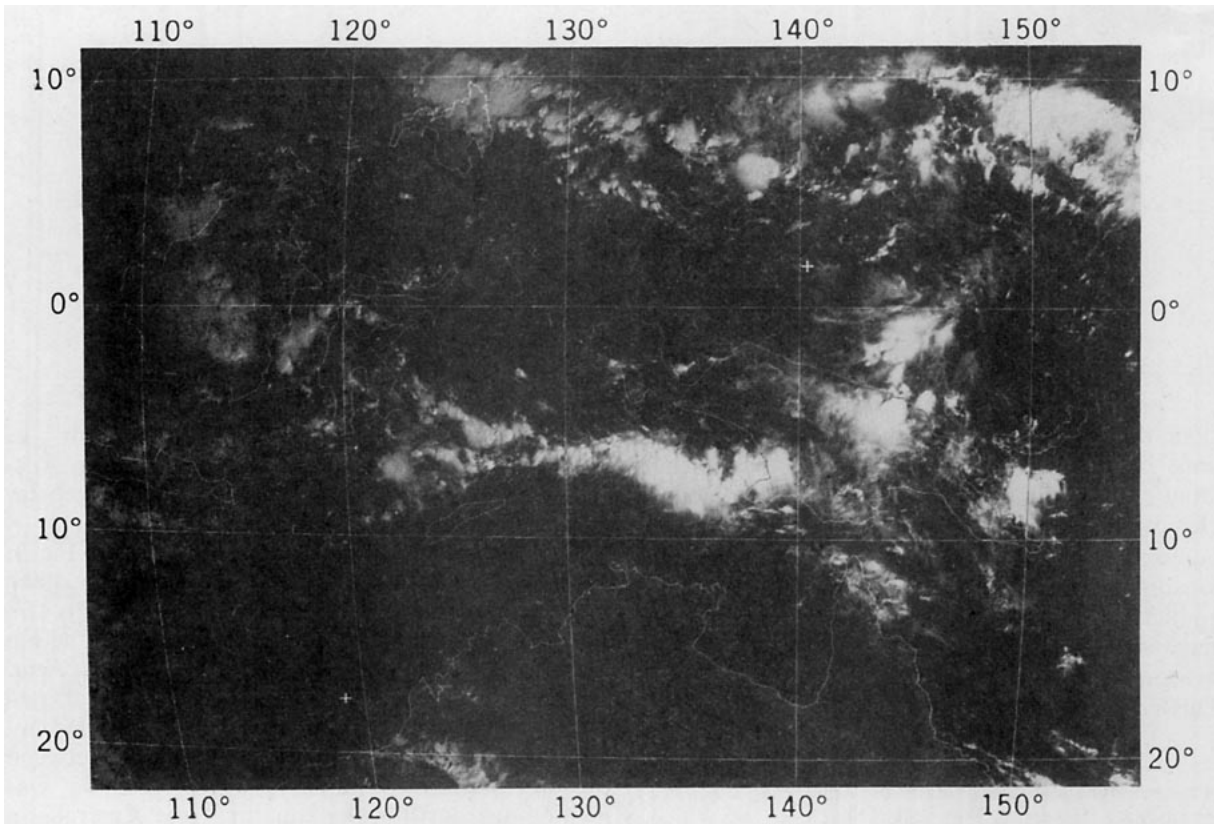

FIG. 2. GMS-1 visible imagery for 0000 GMT 10 December 1978.

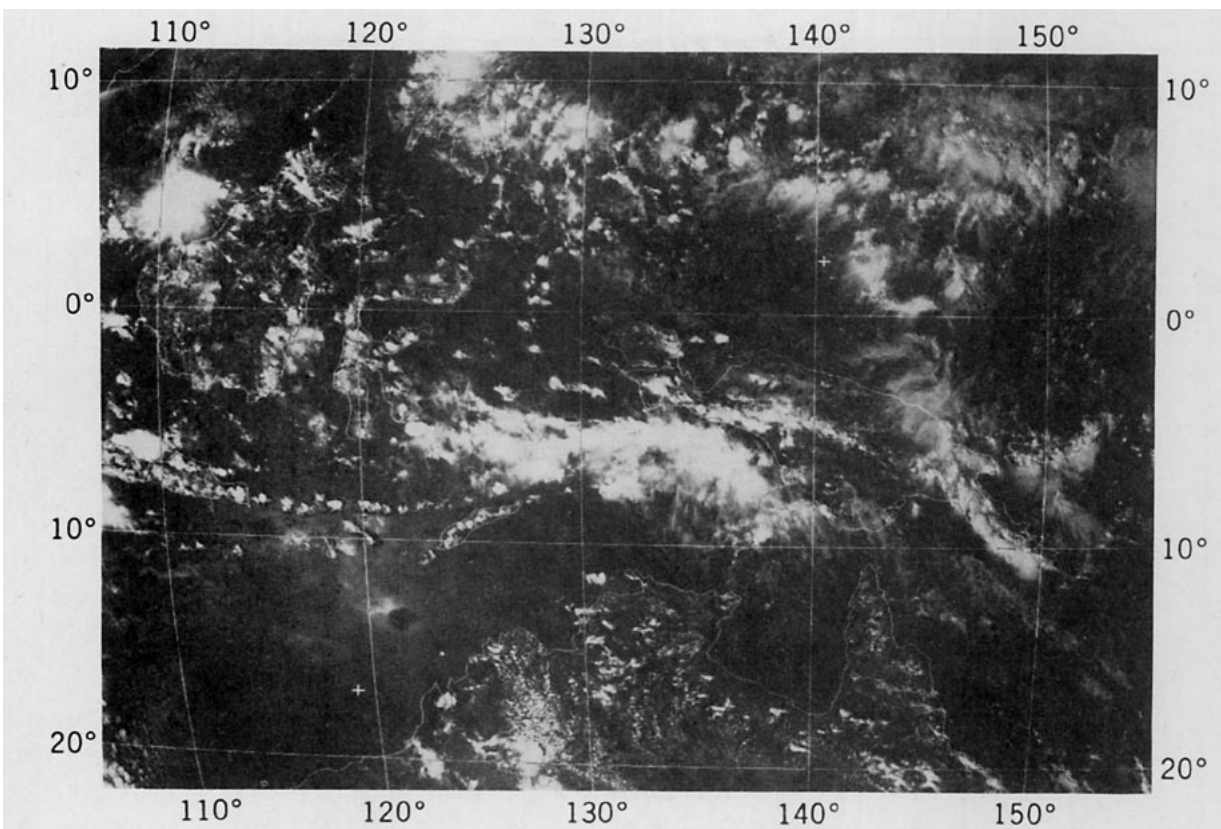

FIG. 3. GMS-1 visible imagery for 0600 GMT 10 December 1978.

ridge extended along the east coast and a trough in the westerlies protruded over northwest and central regions.

The variation in convection between 0000 GMT and 0600 GMT (about 0800 and 1400 LST at 120°E) is shown in Figs. 2 and 3. At 0000 GMT (Fig. 2) there was generally suppressed convection over all land areas with the exception of two tropical convergence zones along 5°S and 8–10°N. A spectacular change occured during the next 6 h as large convective clouds developed over land throughout the region (Fig. 3). This afternoon convection provides a near perfect map of the region; every island and mountain range is delineated by one or more cumulonimbi and there is a rash of towering cumulonimbi interspersed with smaller cumuli over northern Australia.

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