DAILY SYNOPTIC SERIES - HISTORICAL WEATHER MAPS

SOUTHWEST PACIFIC SEA LEVEL.

SOME COMMENTS ESPECIALLY AS TO TYPHOON ORIGINS.

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I. GENERAL REMARKS AND CONCLUSIONS.

A) Insufficiency of Data.

In studying typhoon origins on these charts, one of the greatest handicaps was found to be the entire absence of data from the Dutch East Indies. As our "Upper Air Circulation in the Philippines and Adjacent Regions" showed, equatorial westerlies in this precise region are very instrumental in typhoon formation. This deficiency alone would render the feasibility of a really detailed study of these charts, at least for most months of the year, practically negligible.

The Northern Hemisphere Historical Charts are even more discouraging for a study of the Philippine region because of their even greater paucity of data there.

Insufficiency of data is a general complaint in the tropical region. How overcome this defect?

a) Study the possible common configurations of wind, pressure, etc., since one or two critical observations may often tell the air flow, etc., for a whole region. E.gr. Use Basco's winds for the polar front, Guam and Saipan and Yap for the ITC, etc.

b) Be sure you are actually using all data available, such as inflight reports, etc.

c) Make special study of the characteristic weather of your station along the lines of "Weather and Clouds of Manila" by the author.

d) Make monthly means of winds, humidity especially aloft, etc. Also means for the main air streams. Make use too of the qualitative mean to bring out inversions, etc. Cf. author's "Upper Air at Manila."

B) Surface Winds not Representative.

There is another fundamental disadvantage, common to all sea level charts of the equatorial regions, i.e. the unreliability of surface winds. On land the circulation is much influenced by local land and sea breezes and topography, and with the usual weak tropical pressure gradient, mild winds even on the ocean are frequently not representative of the general circulation. On the other hand, the necessity in the tropics of a clear, detailed delineation of the air currents, to show possible convergence and divergence, is becoming more and more apparent. We therefore cannot too strongly recommend the following:

a) The maintenance of as many pilot balloon stations as possible.

b) Cloud Directions: There should be included in the International Weather Code the directions of the lower clouds, or better still, the direction and speed of all cloud layers, as Dr. Brooks also urges. On our Manila Observatory Maps the presence of air stream discontinuities was often shown by the the directions of the lower clouds (always reported in our own Philippine Code) when the sea level winds (especially 6 a.m.) were entirely unrepresentative.

Gradient and especially geostrophic winds should be carefully used in the tropics due to the weakness of the Coriolis force. Many formulae become illusory in the tropics since the formulae are approximations and have sine of the latitude in the denominator. cf. thermal wind equation, advective pressure tendency, 'isobaric-channel" formulae, and isallobaric winds and gradients. (cf. my unpublished "Equations of Motion in the Equatorial Region." The winds become, near the equator, antitriptic at the surface rather than gradient. Cf. Grimes' papers etc. for Malaya.

Although air stream analysis is so imperative, we must guard against using it exclusively. There are other critical factors, such as moisture content and lapse rate aloft. Get wet bulb temperature means. Use of virtual temperature in tropics suggested as giving truer lapse rate than ordinary temperatures. Influence of equatorial westerlies may be due as much to its moisture as to convergence.