National Aeronautics and Space Administration
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# CYGNSS Unveils Monsoon Convections

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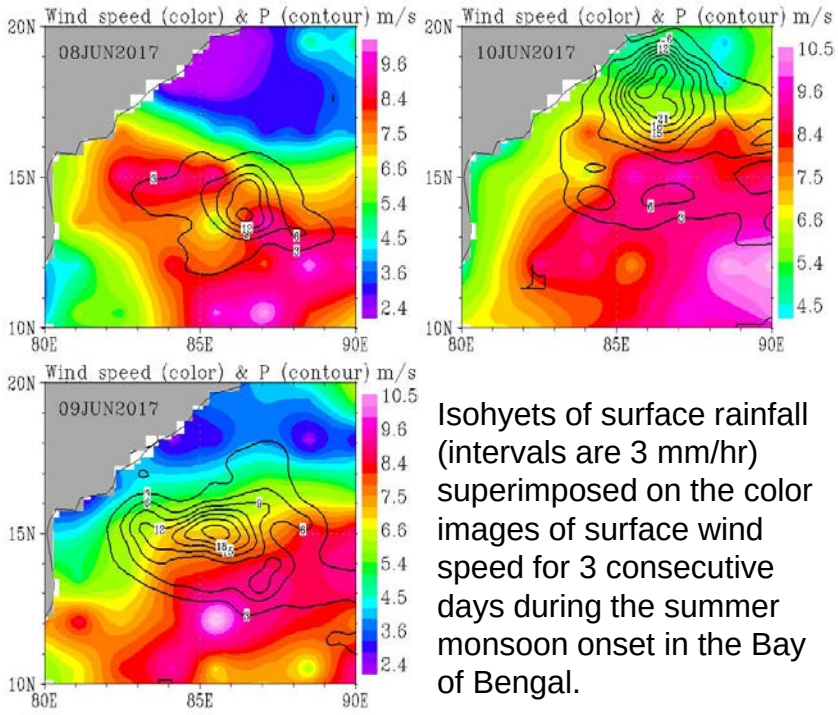


Isohyets of surface rainfall (intervals are 3 mm/hr) superimposed on the color images of surface wind speed for 3 consecutive days during the summer monsoon onset in the Bay of Bengal.

**Goal and Background :** The unique high frequency sampling of ocean surface wind speed under rainy conditions by the Cyclone Global Navigation Satellite System (CYGNSS) is demonstrated in monitoring organized convections. Summer monsoon onsets in the Northern Indian Ocean have been shown to be associated with the northward migration of organized convections (1), The migration has long been recognized as part of the large scale tropical intraseasonal oscillation (2). The influence of surface latent heat flux driven by wind speed in destabilizing the convection systems has been postulated, but remains to be validated (3). Remote sensing of surface wind speed under the convection systems has been handicapped by insufficient sampling of sun- synchronous sensors and obscured by heavy rain.

**Results:** The convection systems in the Bay of Bengal during summer monsoon onset in 2017 were identified by the rainfall measured by the Global Precipitation Mission (GPM). Coincident surface wind speeds were measured by CYGNSS. The example in the figure shows that, as the system moves northwest, wind speed decreases and the convection system intensifies, as exhibited by the tightening of isohyets.

**Caveats:** These are very preliminary results with the sole purpose of timely demonstration of CYGNSS uniqueness in research application. More scientific analysis will be performed after more data release and improved geophysical retrieval.

**Liu, W.T. and X. Xie, 2018: Applications of CYGNSS non-sun-synchronous ocean surface wind measurements under heavy rain Proc. of 39th IGARSS Symposium, IEEE, in press.**

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**[2] Wang, B. and X. Xie, 1997: A model for the boreal summer intraseasonal oscillation. J. Atmos. Sci.,54, 72-86.**
**[3] Riley Dellaripa, E.M. and E.D. Maloney, 2015: Analysis of MJO wind-flux feedbacks in the Indian Ocean using RAMA buoy observations. J. Meteor Soc. Japan, 93A, 1-20.**