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Locating Cloud-to-Ground Lightning Strikes to the Forest of Barro Colorado Island, Panama

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Abstract

To study the effects of lightning on the tropical forest of Barro Colorado Island in Panama, we have combined a network of electric field change meters with a network of CCTV cameras to monitor lightning strikes to the forest. An integral part of our work is to locate trees that have been struck by lightning and subsequently survey the damage; thus, the accuracy of cloud-to-ground lightning strike locations derived from our combined network of sensors needs to be greater than the accuracy typically attained with either long-baseline lightning locating systems or satellite-based detectors. Specifically, for the 2019 wet season we have deployed four electric field change meters and six cameras. The field change meters are of two types: three of the type described in Zhu et al. (2019) and one of the type described in Bitzer et al. (2013). The cameras are described in Yanoviak et al. (2017). Using these, we combine image-based triangulation with time-difference of arrival techniques to locate lightning strikes. Here, we present an overview of our methods for locating cloud-to-ground lightning within the study area along with results from the 2019 wet season.

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