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Underground Information through Phenology Changes using Innovated Hyper-sensor Tecnology in High Carbon Reservoir Ecosystems affected by Climate Change

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High Carbon Reservoir Ecosystems is most important Ecosystem for Carbon Flux affecting strongly Climate Change and Human Impact, where are as Peatland/Wetland (CO_2), Costal Ecosystem including Mangrove and Coral Reef (CO_2), and Permafrost (CH4). The REDD+ is very important for storage and conservation of carbon as well as the conservation of water stock and biodiversity. To establish REDD+, an MRV system that is coupled with two components – satellite sensing and grand truth data - is urgently required. For this purpose, several satellite data were integrated with ground truth data in our JST-JICA (SATREPS) Project on "Wild Fire and Carbon Management in Peat-Forest in Indonesia", then it is successes to make carbon content mapping and water table mapping in peatland, using model and remoto seinsing dada, which were first success in the world. These mappings are excellent innovated technology, however as these mapping must integrate many data of satellite sensing and grand truth, resolution of mapping is low and it is not real time. As LCTF (Liquid Cristal Tunable Filter) and Hyper-sensor of HISUI as next generation sensor have high performance of Ecological Sensing on Plant Phenology Changing, which make a possibility to take under ground information, such as nutrients condition, water table in Peatland/Wetlands, Carbon accumulation in Peatland/Wetland, Permafrost melting level, so on. Thus, Hyper-sensor function in UAV and Airborne is introduced and discussed on innovation of ecological research.