Paper to be presented at the 3rd EMBRIO International Workshop (3rd EIW) on Marine Biodiversity: Understanding, Utilization and Conservation, Bogor 9-10 October 2018.

DEVELOPMENT OF INTERNET OF THINGS FOR SEAGRASS ECOSYSTEM MONITORING

Indra Jaya, Mujizat Kawaroe, Muhammad Iqbal, Dony Apdilla, and Ratih Deswati
Dept. Marine Science & Technology, FPIK, Bogor Agricultural University
Corresponding Authors Email: indrajaya@apps.ipb.ac.id

Abstract

Seagrass ecosystem is one of the most productive ecosystems in coastal area. Its function as ecological niche for various species associated with the ecosystem as well as source of economic benefit for the community near the ecosystem. In the past 20 years, the coverage area of seagrass ecosystem is estimated to decrease significantly, both from environmental changes and human activities that altered the seascape of the ecosystem. This situation prompts an urgent sound management to prevent further degradation and set up a rehabilitation program. To have a sound management in place, it requires adequate data and information that could reflect the situation and status of the ecosystem. For this purpose, we developed an observation system that relay on internet technology. The seagrass observation system consists of underwater video-camera, wave measurement buoy, acoustic tide gauge, anemometer, and autonomous surface vehicle (ASV). Wave buoy are equipped with accelerometer, sea surface temperature, turbidity meter, and chlorophyll sensor, while ASV is equipped with echo sounder and underwater video-camera. Each of this instrument has a transmitter that can send data to the server. A dedicated web [www.lamun-bintan.net] was developed to display the real-time observation measurement as well as the processed data in the form of table, graphic or pictures. During the trail, the instruments were placed and deploy in the Bintan Sea Conservation Area., Bintan Island, Riau Archipelago. The underwater video-camera was able to send stream of pictures that depict the underwater situation around seagrass; wave buoy instrument was able to provide wave data in the form of wave spectral density, sea surface temperature, turbidity, and chlorophyll concentration; the acoustic tide gauge was able to send from time to time the sea level; and the anemoter was able to give wind speed and direction in the area all day, Hence, all Instrument was function properly and able to send data successfully. The internet of things for seagrass has been successfully developed, and the observation results can be displayed and downloaded via internet.

[This work is supported by research grant from DDRG-LIPI, Contract No: B-1201/IPK.02/KS/III/2018 and No: 238/KS.00.00/2018 to Prof. Dr. Indra Jaya/FPIK-IPB].

Keywords: seagrass, internet of things