***5. Underway chlorophyll-a***

## 10 June 2021

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**(2) Method**

The Continuous Sea Surface Water Monitoring System of fluorescence (Nippon Kaiyo, Japan) automatically had been continuously measured seawater which is pumped from a depth of about 4.5 m below the maximum load line to the laboratory. The flow rate of the surface seawater was controlled by several valves and adjusted to about 0.6 L min−1. The sensor in this system is a fluorometer 10-AU (S/N: 7062, Turner Designs, United States).

**(3) Observation log**

The chlorophyll-*a* continuous measurements were conducted during the entire cruise; from 12 Jun. to 3 Jul., 2019 in Leg 1, and from 10 Jul. to 2 Aug., 2019 in Leg 2.

**(4) Water sampling**

Surface seawater was corrected from outlet of water line of the system at nominally 1 day intervals. The seawater sample was measured in the same procedure as hydrographic samples of chlorophyll-*a* (see Chapter C5 “Phytopigments”).

**(5) Calibration**

At the beginning and the end of legs, a raw fluorescence value of sensor was adjusted in sensitivity of the sensor using deionized water and a rhodamine 0.1ppm solution measured.

After the cruise, the fluorescence value was converted to chlorophyll-*a* concentration by programs in the system based on nearby water sampling data (chlorophyll-*a* concentration and distance from location of sensor data).

**(6) Data**

Underway fluorescence and chlorophyll-*a* data is distributed in JMA format in “49UP20190612\_40N\_underway\_chl.csv”. The record structure of the format is as follows;

Column1 DATE: Date (YYYYMMDD) [JST]

Column2 TIME: Time (HHMM) [JST] (= UTC + 9h)

Column3 LATITUDE: Latitude

Column4 LONGITUDE: Longitude

Column5 FLUOR: Fluorescence value (RFU)

Column6 CHLORA: Chlorophyll-*a* concentration (g L−1)

Column7 BTLCHL: Chlorophyll-*a* concentration of water sampling (g L−1).