Erratum

Erratum to "Distinct Characteristics of SST Variabilities in the Sulawesi Sea and the Northern Part of the Maluku Sea During the Southeast Monsoon"

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In [1], the citations in the text do not correspond with the reference list as published. The correct text on the second, third, fourth, and sixth pages, as well as the full reference list, is as follows.

Surface wind data are obtained from the cross-calibrated multiplatform (CCMP) gridded surface vector winds version 2.0, which can be downloaded from www.remss.com [29]. CCMPs are produced using various satellites, moored buoy, and model wind data, and as such, are considered to be a level-3 ocean vector wind analysis product. Spatial and temporal resolutions of the surface wind data are $0.25° \times 0.25°$ and quarter daily, respectively. The accuracy of this wind product is higher than the other wind reanalysis data.

For heat flux analysis, we examined daily latent heat fluxes on a 0.5° grid for 2003–2016, obtained from the Objectively Analyzed Air-Sea Fluxes Project [30]. Topography is obtained from Global 30 Arc-Second Elevation (GTOPO30) (https://www.usgs.gov/centers/eros/science/usgs-eros-archive-digitalelevation-global-30-arc-second-elevation-gtopo30?qt-science_center_objects=0#qt-science_center_objects), whereas bathymetry is obtained from ETOPO, a 1-arc-min global relief model of the earth's surface that integrates land topography and ocean bathymetry [31] (https://www.ngdc.noaa.gov/mgg/global/).

B. Method

Since the regions of interest are located at the latitude poleward from ∼1 °N, the Coriolis Effect may work to influence the impact of surface wind on the ocean dynamics. To obtain the influence of the Coriolis Effect, Ekman mass transport (EMT) was calculated from surface wind stress (τ). Since our study area is located in the equatorial region, we did not use the classical EMT equation, e.g., as used by Wang and Tang [32]. The classical EMT equation fails near the equator due to the diminishing *f* parameter approaching the equator. Thus, we follow the Hsieh and Boer [33] equation for calculating EMT

$$\tau = \rho a C d U 210 \tag{1}$$

$$\text{EMT}x = (\delta\tau x + f\tau y)\rho w(f2 + \delta 2) \tag{2a}$$

$$\text{EMT}y = (\delta\tau y - f\tau x)\rho w(f2 + \delta 2) \tag{2b}$$

where ρa is the density of air (1.25 kg/m3), ρw is the density of seawater (1.025×103 kg/m3), *Cd* is the drag coefficient, and U10 is the wind speed 10 m above sea level, δ is the frictional dumping parameter (480−1 days), and *f* is the Coriolis parameter [34]. EMT*x* and EMT*y* denote EMT in zonal and meridional directions, respectively. The value of *Cd* follows WAMDI [35], i.e.,

$$1000Cd = 1.29 \text{ for } 0 \text{ m/s} < U10 < 7.5 \text{ m/s} \tag{3a}$$

$$1000Cd = 0.8 + 0.0065U10 \text{ for } 7.5 \text{ m/s} < U10 < 50 \text{ m/s}. \tag{3b}$$

The correct text on the fourth page is as follows.

Furthermore, we also examined the relation between latent heat flux and wind speed in both areas. Latent heat flux is thermal energy that is released or absorbed by the sea surface and is determined by the wind speed and difference between specific humidity at the sea surface and 10 m above [36], [37]. Thus, the more the latent heat release from the sea surface, the cooler the SST will be. This is known as the evaporative cooling mechanism.

Fig. 3(c) and (d) show the increasing wind speed in both areas resulting in the increase of latent heat release. However, it is also clearly shown that the rate of increasing latent heat release is higher in the front of the wind gap in the Sulawesi Sea than the northern part of the Maluku Sea. Thus, the result is contradictive with the result depicted in Fig. 3(a) and (b), which shows that the rate of decreasing SSTs due to the increasing wind speed is higher in the northern part of Maluku Sea than in front of the wind gap in the Sulawesi Sea.

The correct text on the sixth page is as follows.

The Sulawesi Sea is characterized by the warm SSTs during the SE monsoon since the strong southerly wind from the Maluku Sea is blocked by the existence of the Gorontalo and North Sulawesi Mountains. A similar case is also reported by Wirasatriya *et al.* [38] in the western side of Matsumae Peninsula and Shirakami Mountain in Japan during summer. High SST and high diurnal SST amplitude are observed in those areas as a result of the easterly wind being blocked by the existence of high mountains. Moreover, low wind speed leads to the reduction of the latent heat release from the ocean to the atmosphere that can accelerate the increase of SST under clear sky condition, e.g., [39].

The existence of the wind gap between Gorontalo and North Sulawesi Mountains allows some parts of the southerly wind to pass to

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the Sulawesi Sea and modify the SST pattern in the region. The strong wind off the wind gap is possibly due to a decrease of the marine atmospheric boundary layer height after passing the gap and the resulting wind accelerations. This phenomenon is called the expansion fan, e.g., [40], [41]. Although coastal upwelling is not generated and evaporative cooling is also not significant, SST is still slightly reduced in the area in front of the wind gap. This may be caused by the mixing process controlled by the wind speed. In other studies, the occurrence of the wind-induced oceanic mixing can still increase the Chl-a concentration, e.g., [8], [9]. In this study, there is no Chl-a variation in the weak wind area in the lee side of Gorontalo Mountains or in the strong wind area in front of the wind gap [see Fig. 6(a) and (b)]. However, by adjusting the scale of Chl-a axis during SE monsoon [see Fig. 6(c)], it can be seen that the variation of Chl-a in front of the wind gap follows the variation of surface wind speed. Thus, although upwelling is weak, vertical mixing may still occur to induce nutrient enrichment in the surface layer and it may also slightly cool the SST. This indication is similar to the Chl-a variation in Sunda Strait as discussed in [8] with the stronger amplitude both for wind speed and Chl-a. To prove this process, further investigation is needed by analyzing the nutrient profile. However, this is beyond the scope of this study and it is left for future work. It is also important to note that in August, the Mindanao Current that brings warm water equatorward from the equatorial Pacific is weak. Ren *et al.* [42] revealed the seasonality of the Mindanao Current, which is stronger in spring and weaker in fall. Thus, the role of the Mindanao Current in influencing the oceanographic condition in the Sulawesi Sea and Maluku Sea is likely to be less dominant than the surface wind that generates coastal upwelling. However, this possibility still needs to be examined by analyzing the vertical profile of oceanographic data. This is also left for future work.

Finally, the distinct characteristics of SSTs in the Sulawesi Sea and the Maluku Sea have been revealed in this study. Tittensor *et al.* [43] suggest that SST is the most important indicator for marine biodiversity. Furthermore, Sanciangco *et al.* [44] statistically showed the significant positive correlation between SST and habitat diversity in the tropical Indo-Pacific region. This means that the greater the SSTs, the higher the marine biodiversity. As part of the tropical Indo-Pacific region, this study shows that the Sulawesi Sea has higher SSTs than the Maluku Sea. On the other hand, Sanciangco *et al.* [44] have shown that the number of marine species in the Maluku Sea is greater than that in the Sulawesi Sea, indicating the inconsistency from their statistical analysis. However, their statistical analysis is only significant for large grid size, i.e., greater than 368 000 km^2, which is much larger than the areal size of this study. Therefore, the investigation of the relation between marine biodiversity and SSTs at local scales for the Maluku Sea and Sulawesi Sea is a promising topic for future research. Moreover, since both areas are close to each other, the interaction among organisms living in both areas may also become an interesting topic. These topics are left for future studies.

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