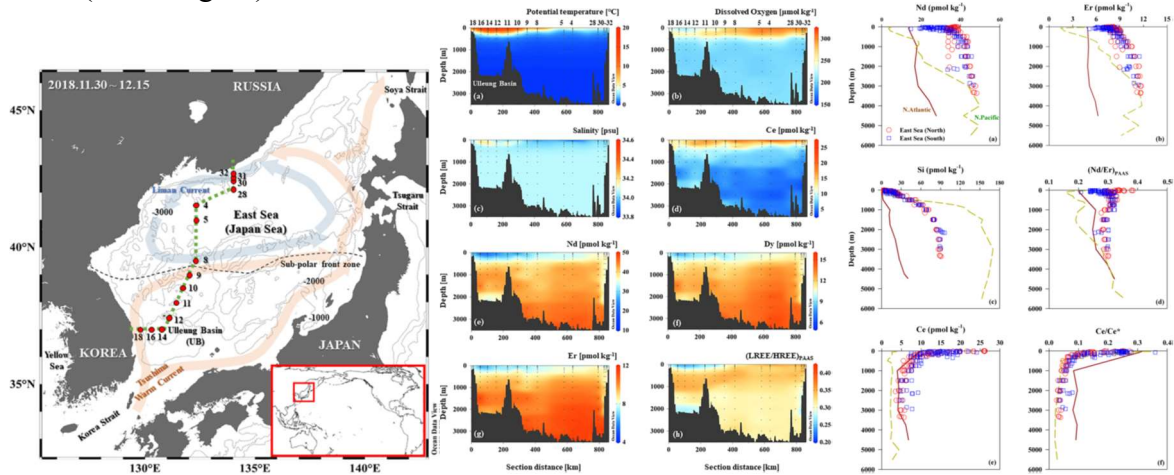


# ANNUAL REPORT ON GEOTRACES ACTIVITIES IN SOUTH KOREA

April 1st, 2020 to April 30th, 2021

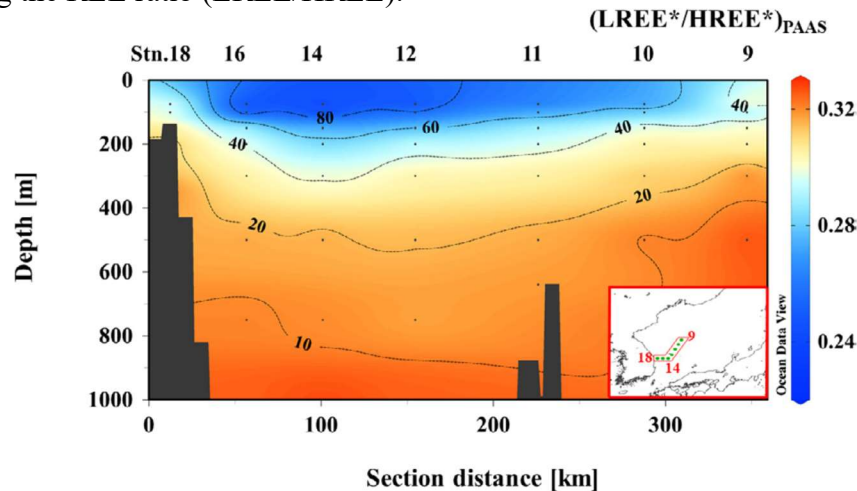
## New GEOTRACES or GEOTRACES relevant scientific results

- H.J Seo and G. Kim (2020, GCA) reported the distributions of rare earth elements (REEs) were measured at 14 stations from 0 to 3365 m (n = 176) in the entire East Sea for the first time. The East Sea has its own deep-convection system, which operates on a time scale that is approximately one tenth that of the global ocean; it is also a downwind region of Asian dust (below figure).



**Figure** Map showing the current patterns of the surface waters in the East (Japan) Sea and locations of sampling stations (left figure). Vertical distributions of (a) potential temperature, (b) dissolved oxygen, (c) salinity, (d) Ce, (e) Nd, (f) Dy, (g) Er and (h) PAAS normalized LREE/HREE in the East Sea (Center). Vertical distributions of (a) Nd, (b) Er, (c) Si, (d) (Nd/Er)<sub>PAAS</sub>, (e) Ce, and (f) Ce/Ce\* in the East Sea.

- In this study, in the deep layer below 750 m, large increases of heavy-REEs (HREEs) relative to light-REEs (LREEs), opposite to the re-mineralization trend, were observed suggesting that LREEs were preferentially re-scavenged by sinking particles. In addition, the boundary scavenging of REEs was also observed for all REEs in the bottom layer of the East Sea (Seo and Kim, 2020, <https://doi.org/10.1016/j.gca.2020.07.016>). They also trace the water mass and physical mixing patterns of Tsushima Warm Water (TWW) in the upper ocean using the REE ratio (LREE/HREE).



**Figure:** Distributions of PAAS-normalized LREE/HREE ratios corrected for re-mineralization using AOU in the southern part of the East Sea (0–1000 m). Mixing ratio (%) contours are shown as a dashed black.

***GEOTRACES or GEOTRACES relevant cruises***

- The research cruise in 2020 for section study in western Indian Ocean (68E and 65E including the Seychelles-Chagos Thermocline Ridge (SCTR) region) in 2020 using R/V Isabu (of Korea institute of Ocean Science and Technology, KIOST), were cancelled due to the Covid-19 situation, and postponed/re-scheduled later after 2021. The Korean communities are still watching the vaccination situation and the international situation for next Korean-GEOTRACES cruises.
- Instead, the domestic research activities and cruises are continuing steadily. Recently, in March 2021, trace element-clean seawater sampling were conducted in South Sea and Yellow sea cruises by R/V Isabu, KIOST. The details of sampling location are as below.



	<b>Lat.</b>	<b>Lon.</b>	<b>Note</b>
YS-1	33.6000	126.0000	Ultra Clean CTD (UCC),
YS-2	33.6000	125.5000	UCC, CTD
YS-3	33.6000		UCC, CTD
YS-4	33.6000	124.5000	UCC, CTD
YS-5	34.0000	124.5000	UCC, CTD
YS-6	34.5000	124.5000	UCC, CTD
YS-7	35.0000	124.5000	UCC, CTD
YS-8	35.5000	124.5000	UCC, CTD
YS-9	36.0000	124.5000	UCC, CTD
YS-10	36.5000	124.5000	UCC, CTD
YS-11	37.0000	124.5000	UCC, CTD

***New GEOTRACES or GEOTRACES-relevant publications (published or in press)***

- Seo, H., & Kim, G. (2020). Rare earth elements in the East Sea (Japan Sea): Distributions, behaviors, and applications. *Geochimica et Cosmochimica Acta*, 286, 19-28. <https://doi.org/10.1016/j.gca.2020.07.016>

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