Kawai, Y., H. Nishikawa, and E. Oka, 2019: In situ evidence of low-level atmospheric responses to the Oyashio front in early spring. *J. Meteor. Soc. Japan*, **97**, 423-438. https://doi.org/10.2151/jmsj.2019-024

Plain Language Summary: In situ observations to capture atmospheric responses to the Oyashio (or subarctic) sea surface temperature (SST) front had not been carried out. Our intensive observations showed clear contrasts in the low-level atmosphere and cloud across the Oyashio front. Furthermore, we observed narrow, warm ocean areas with a width of a few kilometers and their effects on the atmosphere.

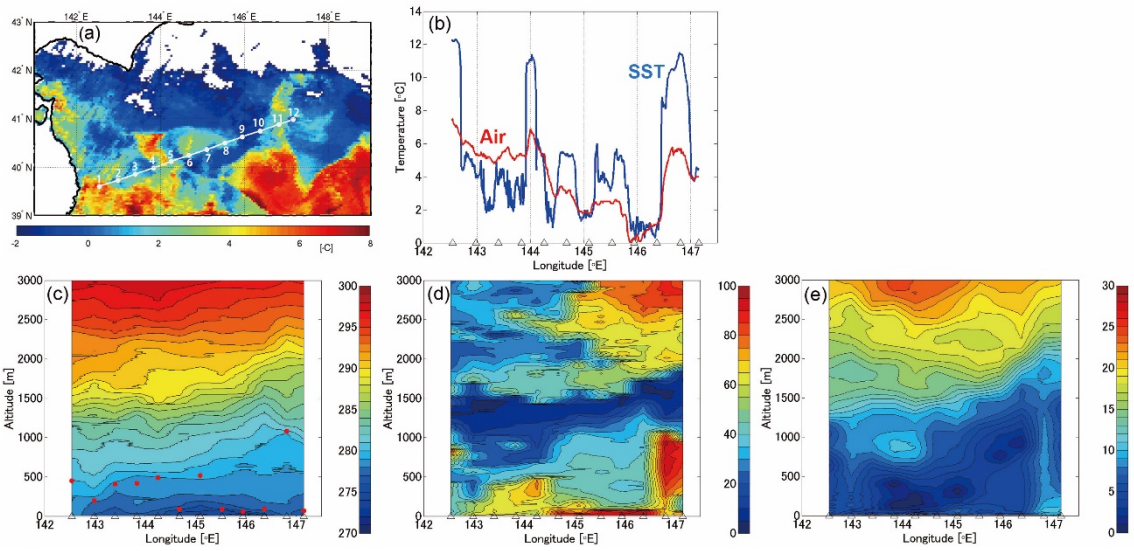

Figure. (a) Satellite infrared SST (Pathfinder SST) averaged over 4–6 April 2013. White areas denote land or mean SST < 2.0°C. All data, including those with the lowest quality flag, were averaged, so only the spatial distribution pattern should be considered. The white line and dots denote the ship track and the radiosonde launch positions from 2359 UTC 4 April to 1618 UTC 5 April. (b) In situ SST (blue) and surface air temperature (red). (c) Virtual potential temperature (K), (d) relative humidity (%) and (e) wind speed (m s^{-1}) observed with radiosondes. Triangles at the bottom of panels (b)–(e) show radiosonde launch positions. Red dots in (c) represent the mixed-layer height.

- In situ observations corroborated contrasts in the atmospheric marine boundary layer and cloud base height between the warm and cold sides of the Oyashio front.
- Sea level pressure anomaly caused by horizontal differential heating from the sea surface across the Oyashio front was estimated to at 1.2 hPa.
- Warm ocean streamers with a width of a few tens kilometers also significantly affected the atmosphere.