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- This study examined seven indices of cool summer climate in northern Japan associated with the cool easterly wind or Yamase in terms of spatial representativeness and interannual variability. Based on the common and different characteristics of the indices, we can now choose a suitable index for the intended use.
- Atmospheric fields represented by the indices show the following features in common: (1) northwestward tilting of the vertical axis of the Okhotsk high, a ridge in the mid-troposphere, and the developed Okhotsk high at the surface; (2) southward extensions of low SAT, high SLP, low specific humidity, and high cloud water along the Pacific coast of northern Japan and along the Japan Sea coast of the Eurasian continent; and (3) high speeds of the easterly/northeasterly surface winds to the east and west of northern Japan.
- The differences between the indices lie in (1) locations of the ridge in the mid-troposphere and the vertical structure of the Okhotsk high, (2) center locations of the low SAT and the enhanced easterly/northeasterly surface winds, and (3) degree of the southward extension of the cool air along the Pacific coast of northern Japan and the resulting contrast between the Pacific/Okhotsk Sea and the Japan Sea.

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Figure 1. Composites of sea level pressure (contour) for the index exceeding the threshold. Contour interval is 1 hPa and the bold contours represent 1012 hPa. Color shades indicate anomalies from the climatological mean in June-August for 32 years (1979-2010) with statistically significant differences from the mean at the 95 % level. The index used is depicted in the left of each panel. Black circles in (e,f) denote the locations of the weather observation stations whose data were used for defining the indices.

