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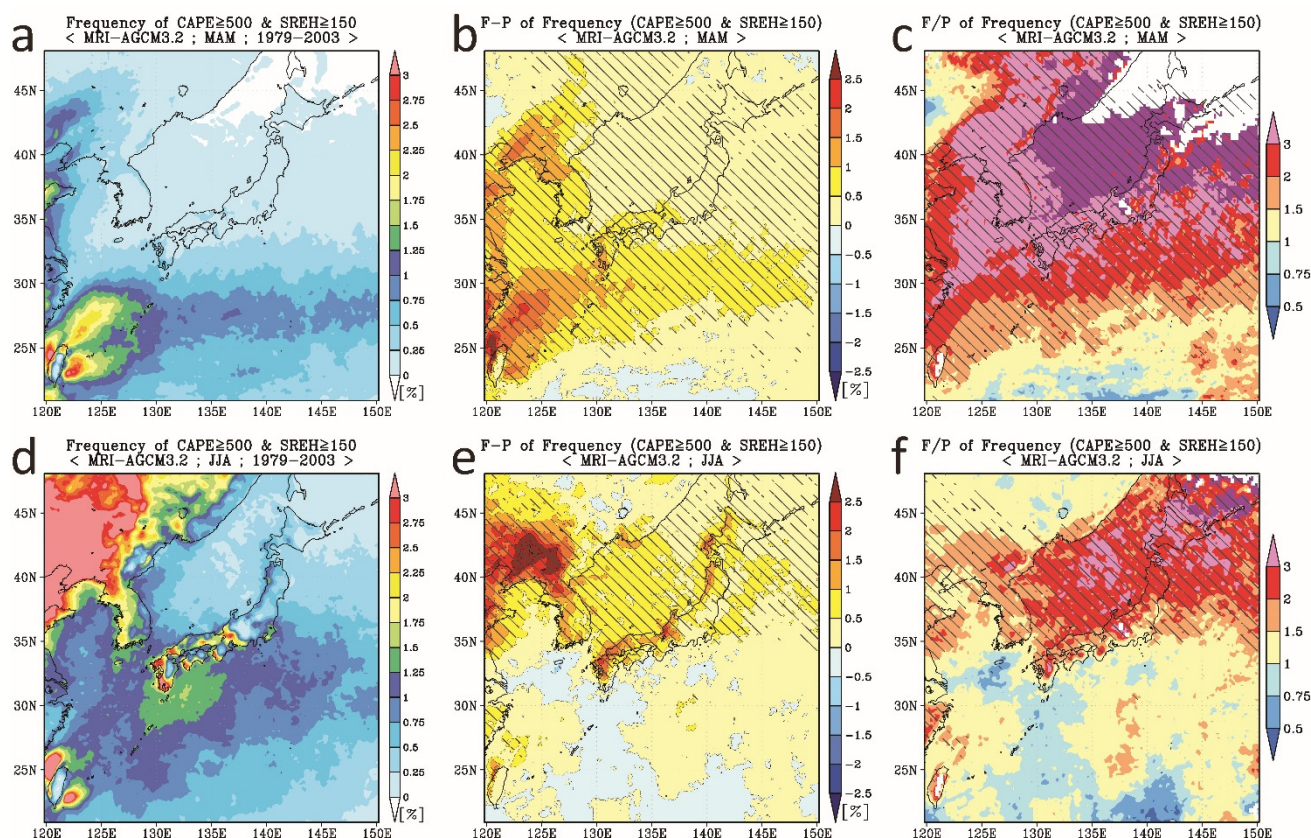


Fig. 1 Future changes in the “appearance frequency of conditions suitable for tornadogenesis” (abbreviated to FSC) in Japan. (a) Distribution of FSC in the present-day climate experiment in MAM, and (d) that in JJA. (b) Difference (F – P) between the present-day and future climate experiments in MAM, and (e) that in JJA. (c) Change ratio (future/present) in MAM, and (f) that in JJA. Areas with a FSC less than 0.1% in the future climate are not shaded in (c) and (f). Areas with a change ratio ≥ 3.0 and a FSC less than 0.1% in the present-day climate are shaded purple in (c) and (f). In (b), (c), (e), and (f), areas where the differences of FSC between present-day and future climate are statistically significant at $p < 0.10$ by a two-tailed t-test are marked with diagonal lines.

- This is the first study to assess future changes in the occurrence of environmental conditions favorable for strong tornadoes (F2 or greater on the Fujita scale) in Japan using the results of climate experiments under the A1B emissions scenario with a 20-km-mesh, high-resolution atmospheric global circulation model.
- Nearly a doubling of the FSC was projected in almost all areas of the Japanese Islands in MAM and on the Japan Sea side of the Japanese Islands in JJA (Fig.1c and 1f).
- Future increases of the FSC are mainly caused by intensification of atmospheric instability caused by increases of the water-vapor mixing ratio and a temperature rise in the lower troposphere.