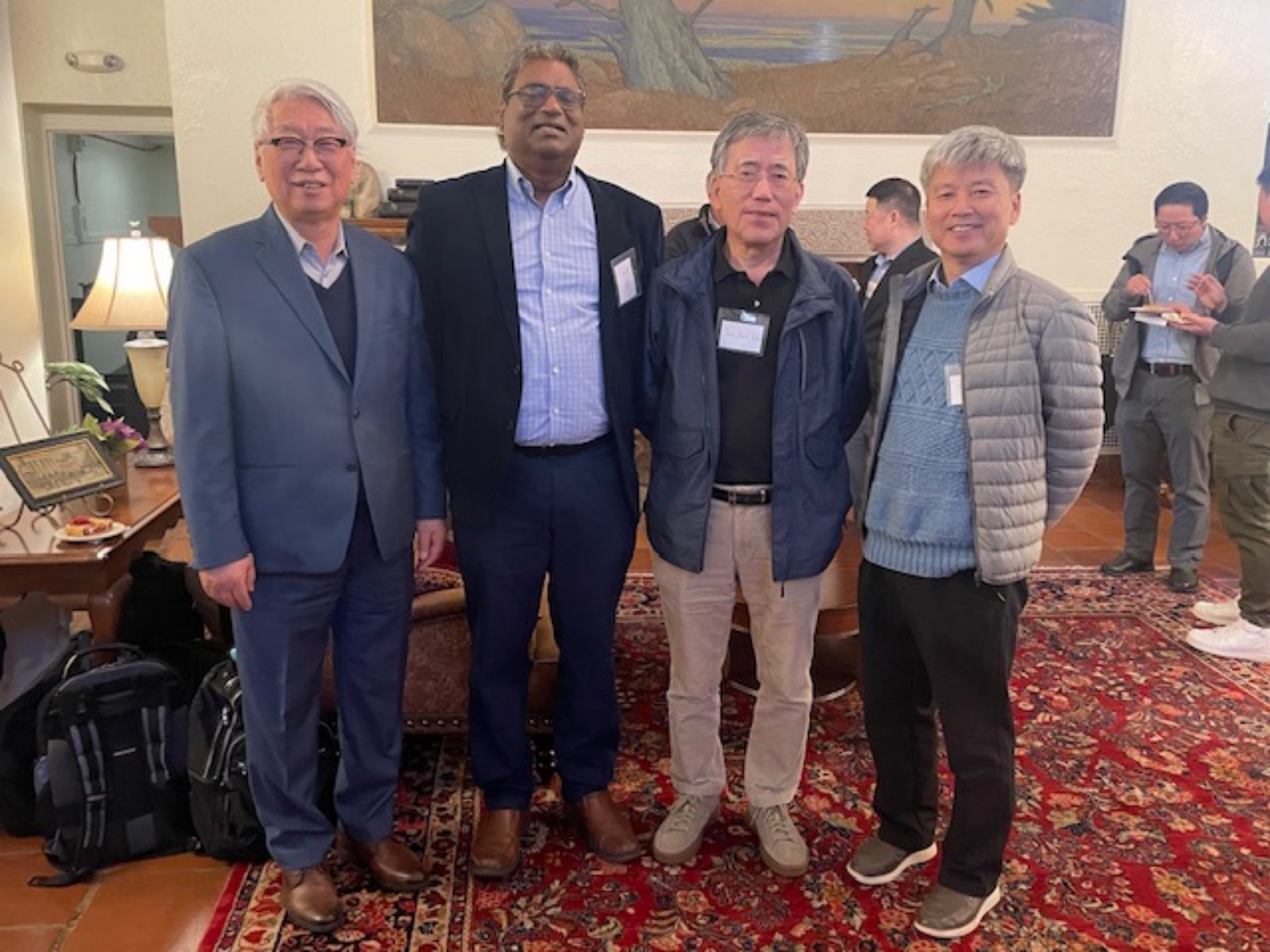


































Summary and conclusions

Frequent fog events occur over the Grand Sand area.

A deep layer of coexisting fog and cloud was observed over Grand Sand during the passage of an intense front bringing warm and moist air. Strong thermal stability was in the lower levels.

SUP dropped 11 hPa/12 hours - subsidence of the deep to 24 hPa indicates characteristic of an explosive cyclone.

Based on station report, satellite and RACE data, fog lay to 500m and cloud 80-220m over Grand Sand during 1400-2300 UTC 13 July 2018. Fog formed without substantial advection of the surface air temperature to the low 500s.

Three mechanisms relevant to this observed phenomenon were discussed:

- Synoptic evolution and the formation of wind convergence

- Precipitation increased the wet-bulb temperature and evaporative cooling reduced the wet-bulb and increased humidity near the surface allowing near-saturation and saturation condensation. Clouds formed by precipitation and evaporative cooling into the subcloud layer, but also due to the structure of the frontal cloud systems, which led to a deep layer of fog and cloud.

- Two-layer instability and generation of K₂ and moisture waves could also have contributed to future fog.

