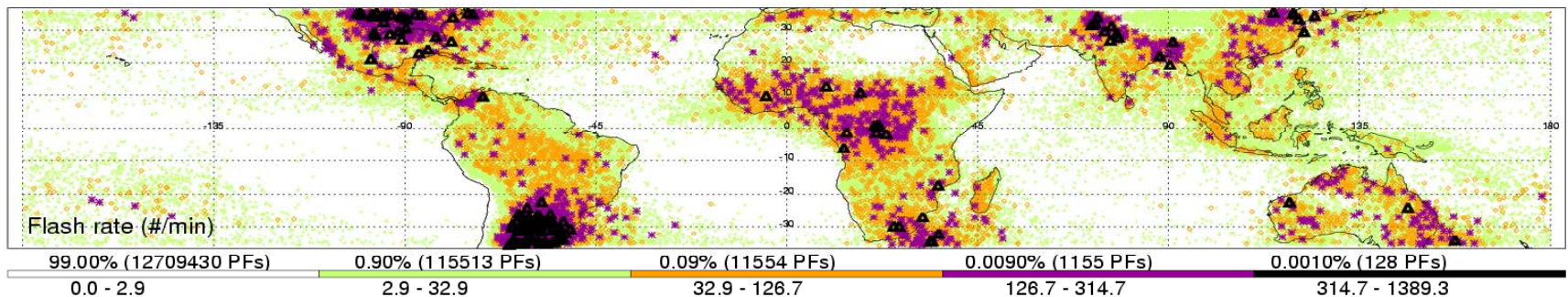
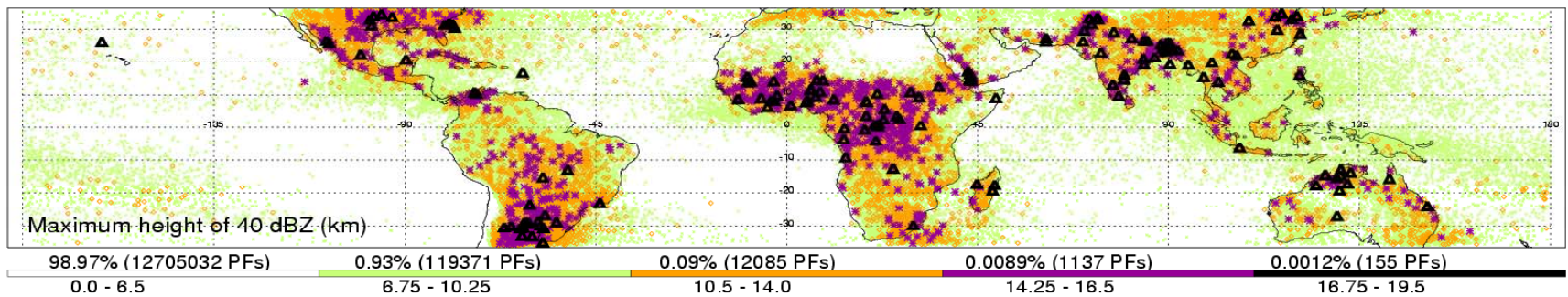
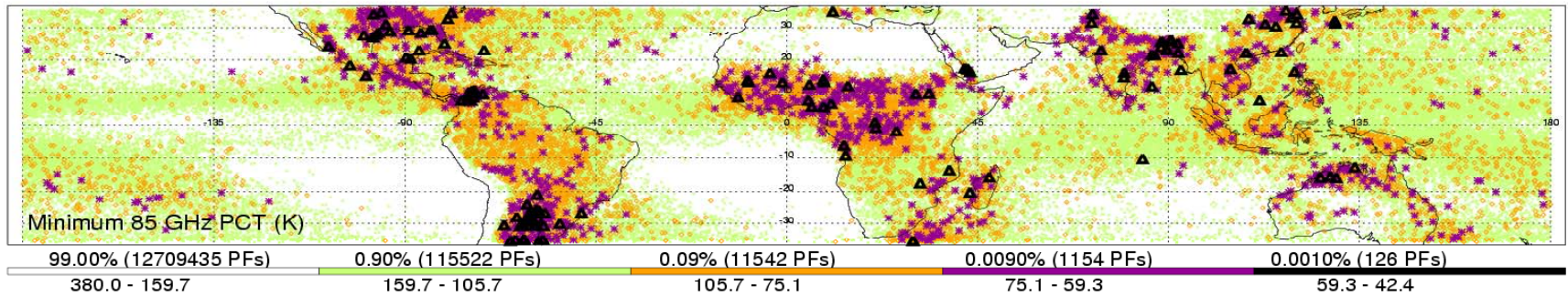
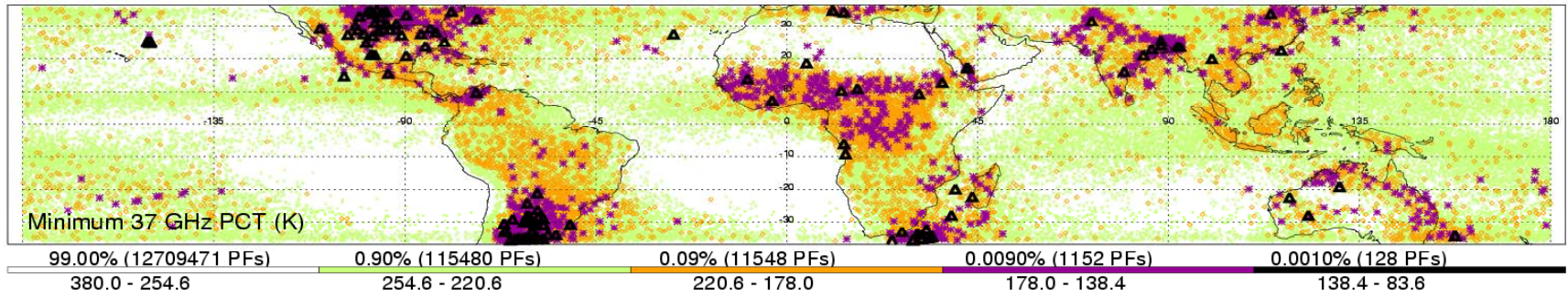


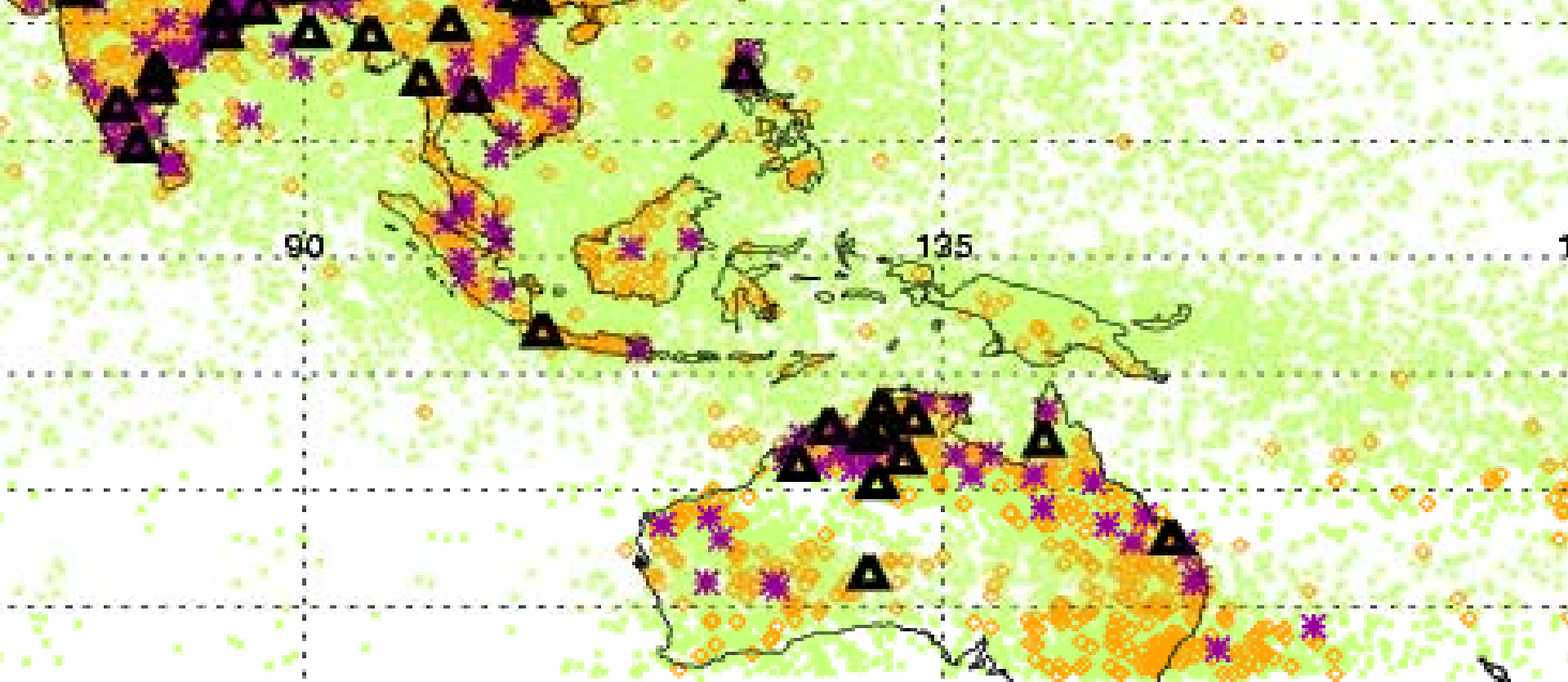
Convective Clouds and Mesoscale Convective Systems

Opportunities for playing
in the TWP-ICE data sandbox

Ed Zipser
University of Utah
+ many, many colleagues

Intense convection using 4 quasi-independent proxies from 8 years of TRMM data (after Zipser et al. BAMS Aug 06)



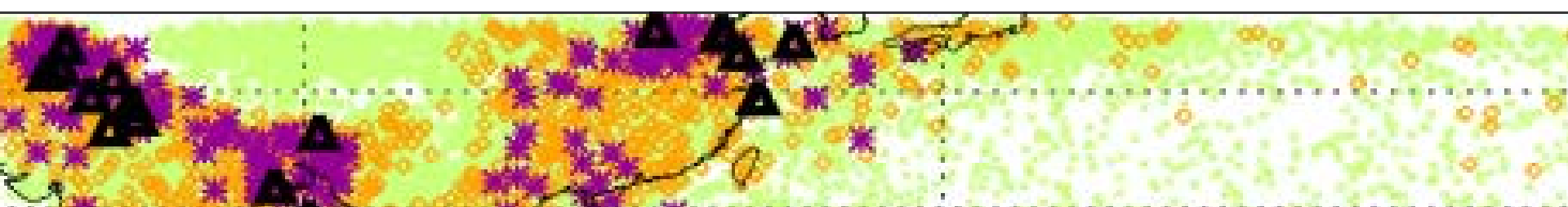


37 PFs)

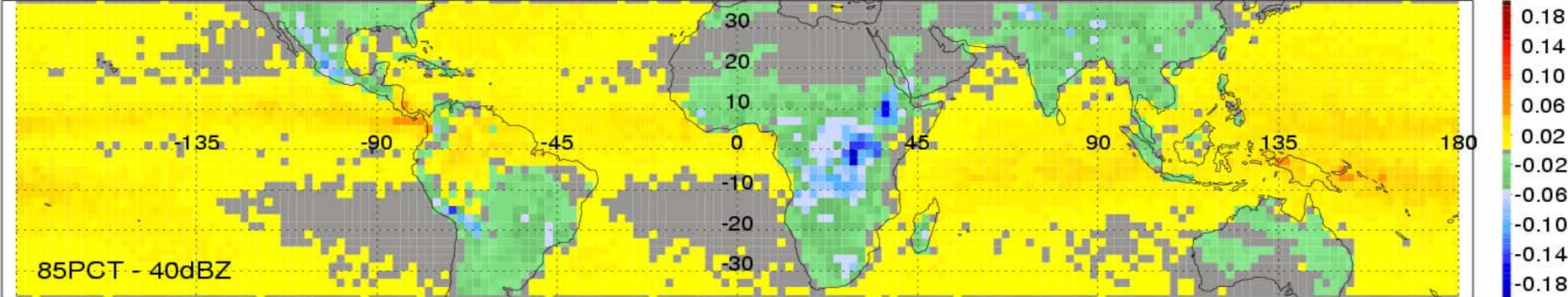
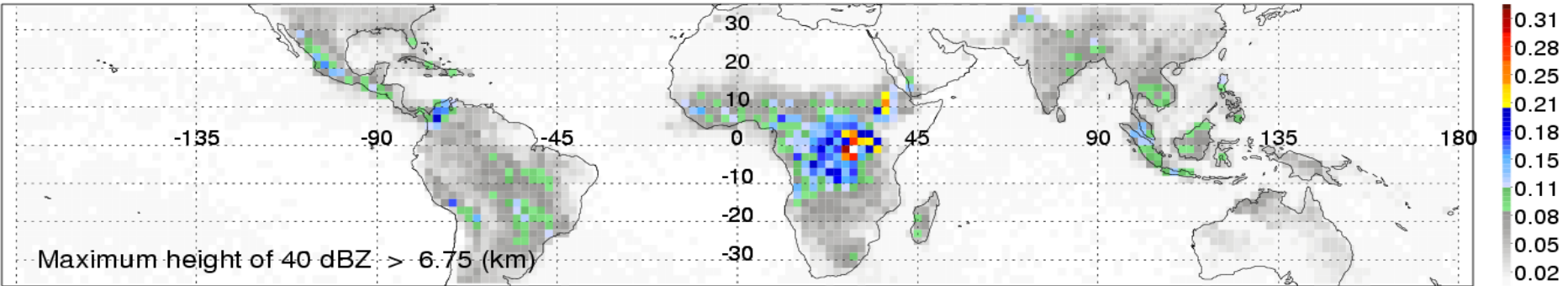
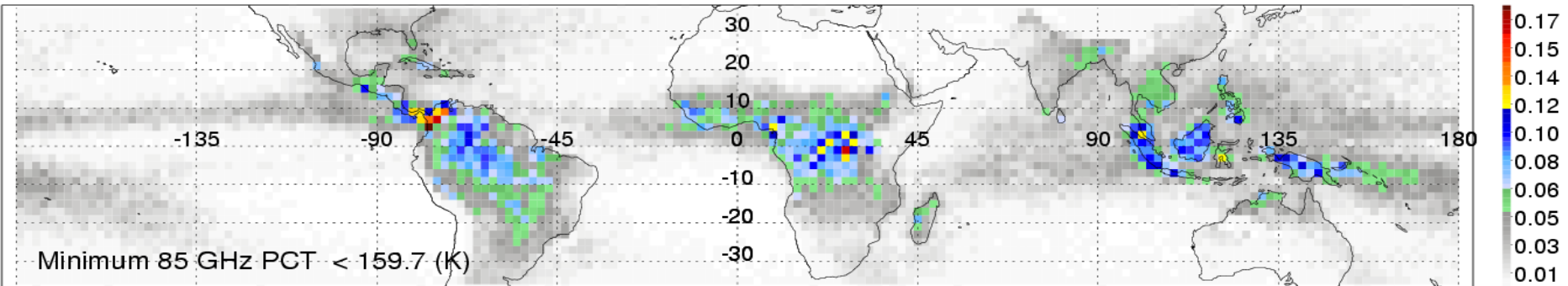
0.0012% (155 PFs)

16.5

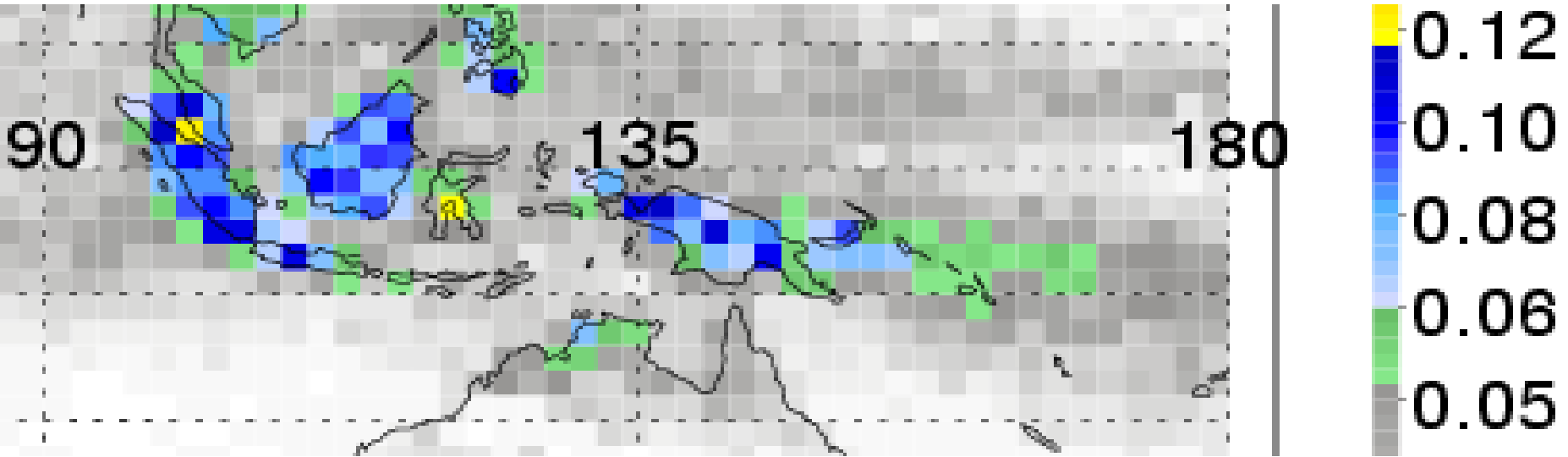
16.75 - 19.5



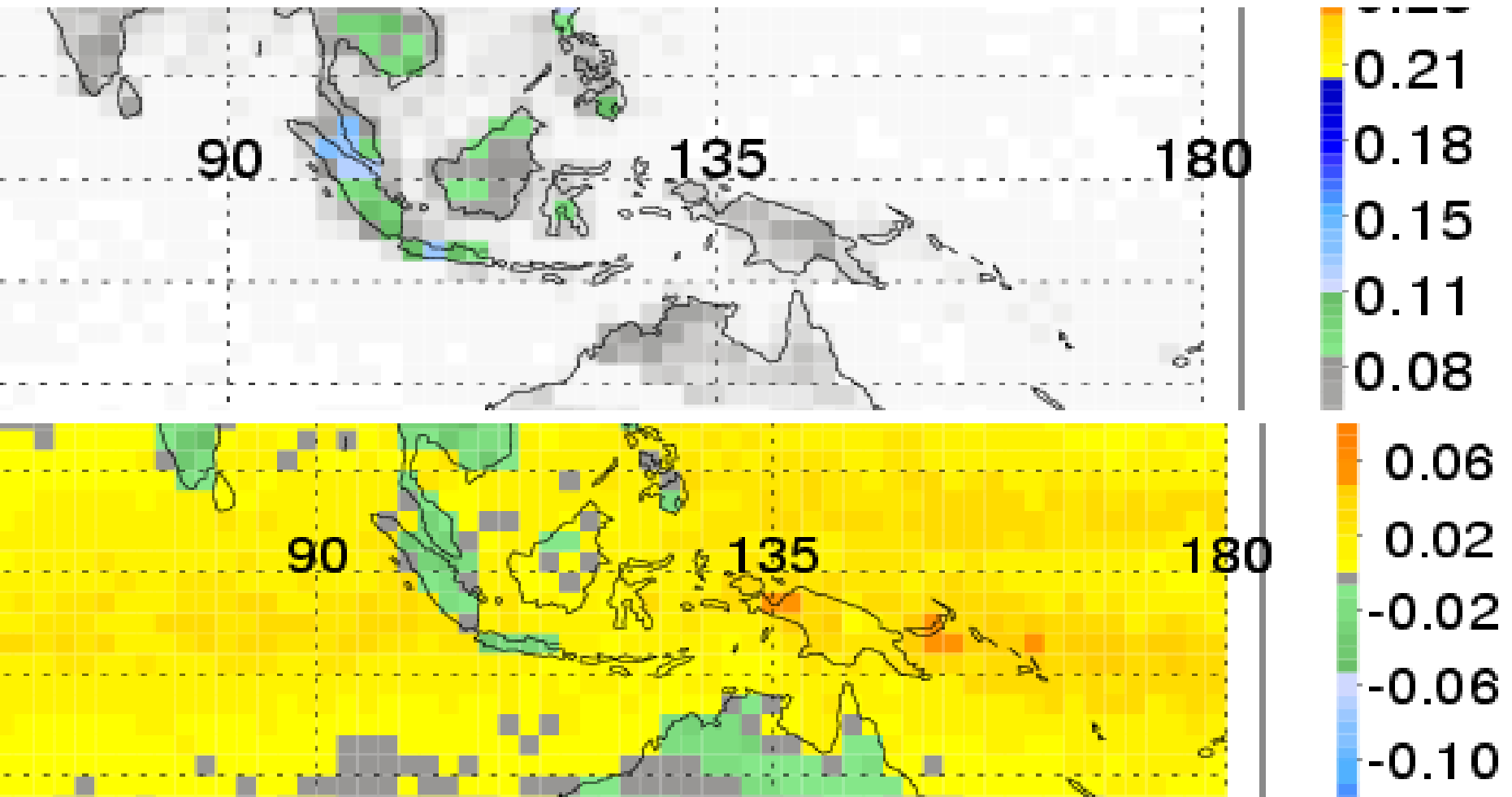
Intense convection proxies are indeed concentrated over land, but careful comparison shows that land and ocean meet different proxies with different frequencies. This map is for relative frequency of moderate strength proxies.

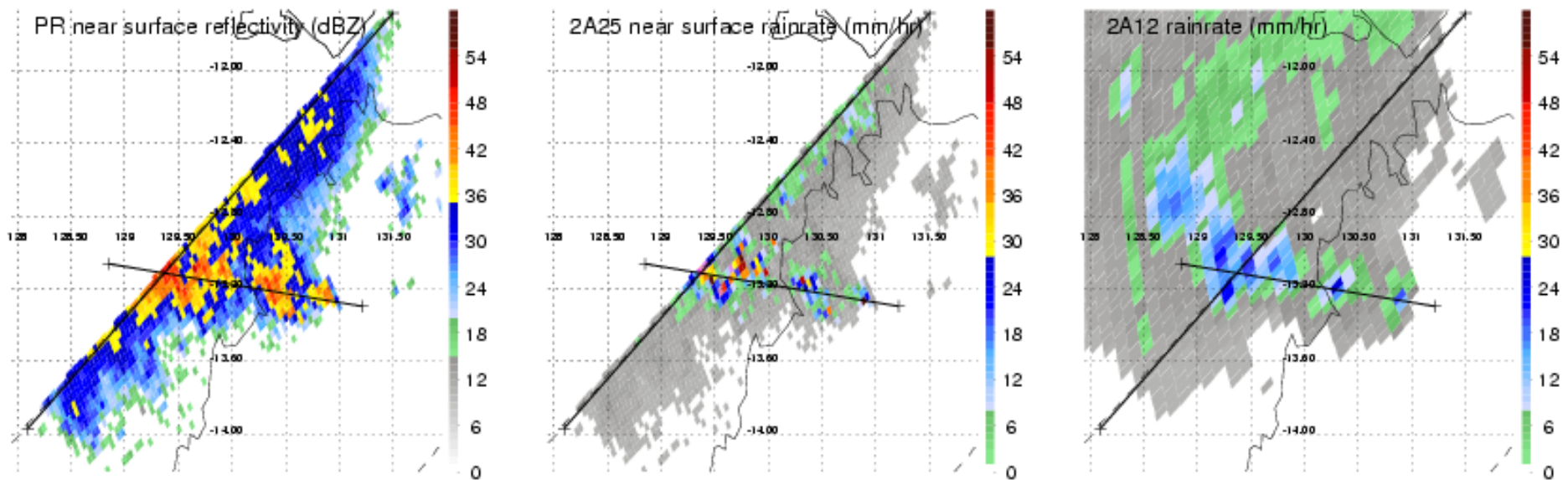
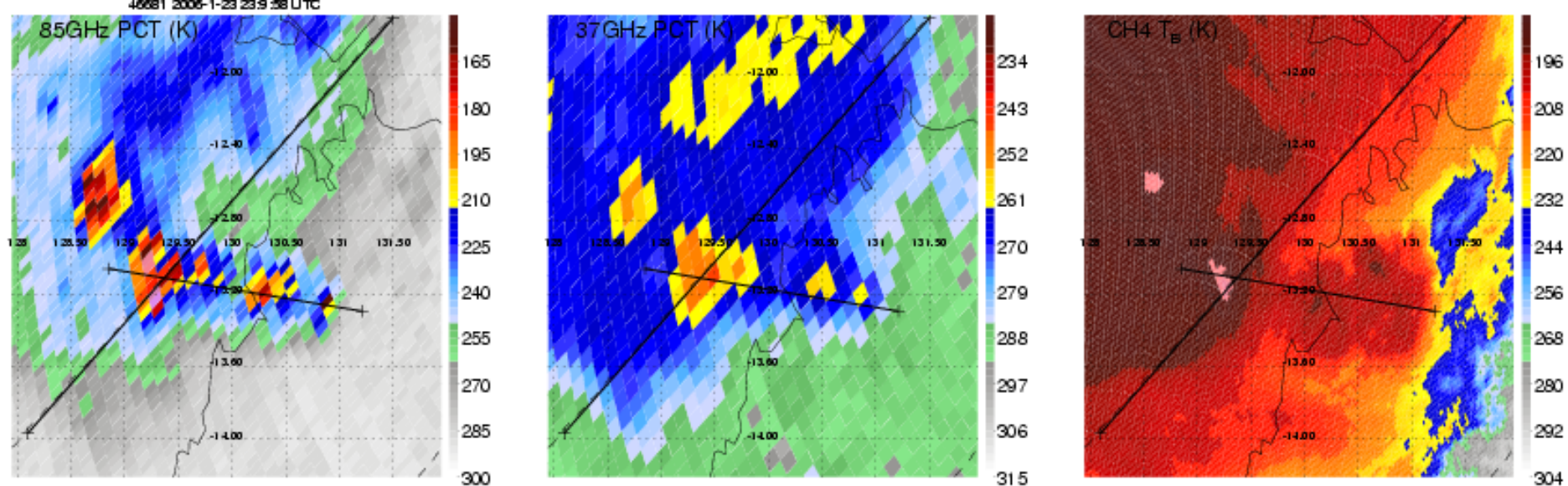


This map is for relative frequency of moderately large ice water path (85 GHz Tb < 160K), showing mainly a longer season of storms over Indonesia compared with Australia.



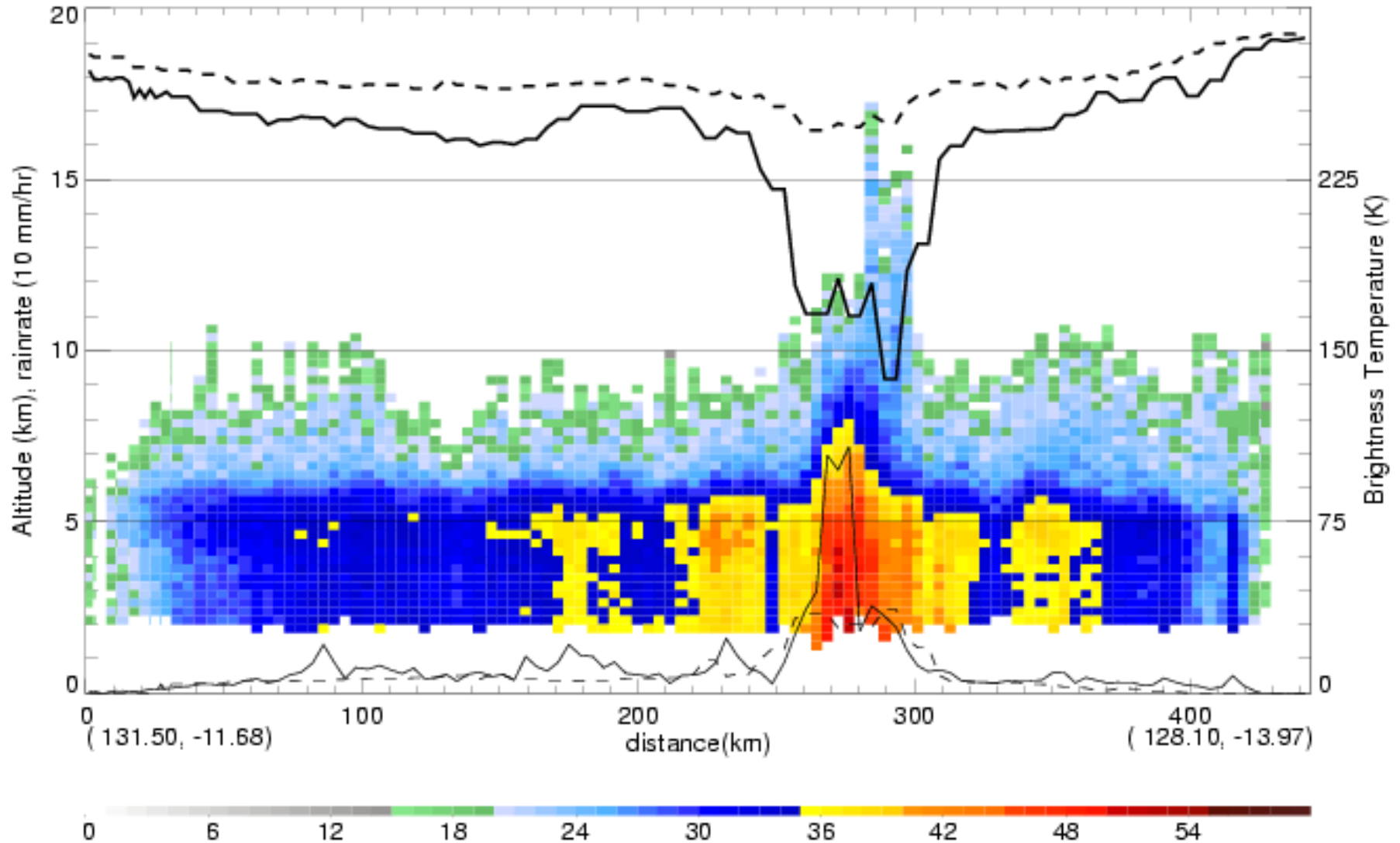
Top: Relative frequency of 40 dBZ tops above 7 km (shorter season in Australia)
Bottom: **Difference** between relative frequency of IWP and radar proxies.
Positive (yellow) more “maritime”, negative (green) more “continental”.





TRMM view of MCS 23 UTC on 23 January. Huge area of IR tops < 196K with spots below 184K. (But even strongest convection barely makes moderate intensity category)

46681 2006-1-23 23:9:58 UTC



450-km cross-section through MCS. Some very high tops but moderate intensity. (vertical resolution at edge of swath is 1.5 km so bright band is not so prominent)

Some science questions

Issue: Convective intensity is known to have a poor relationship to CAPE- so what environmental conditions have a better relationship?

Possibility: CAPE is related to “maximum potential intensity” (MPI),
and

The *fraction* of MPI actually achieved depends upon the magnitude of low-level forcing (reducing entrainment)

- TWP-ICE may have one of the best datasets anywhere for cataloging proxies for convective intensity, and for characterizing the environment
- OBVIOUSLY, we should plan on collaborative studies for linking convective core properties to the anvil cirrus that they produce.

- The 23 January MCS is one of the best examples of upscale growth of a circulation ever observed!
- It's squarely in the middle of a superb sounding array *and*
- It has C-POL radar for study of convective intensity, microphysical properties, and winds while it's happening.
- **We should jump all over this case.**

- Planetary Boundary Layer “recovery” after convective downdrafts have created a cold pool
- Some good opportunities exist for getting pre-convective environments with Dornier data, followed by post-storm conditions at ridiculously low levels from the 4D flights

4D= “daredevil death-defying Dimona”