



Regional Focus Group Weather and Forecasting Discussion 17 August 2017

**The parallax error in Himawari-8 data: A Singapore
Case Study, a New Zealand example and the
potential effect on other locations**

Bodo Zeschke Australian VLab Centre of Excellence Point of Contact

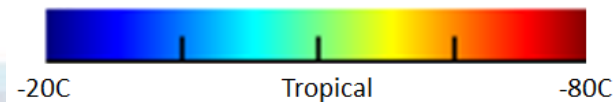
...some slides not shown...



Singapore thunderstorm event, 28th June 2017

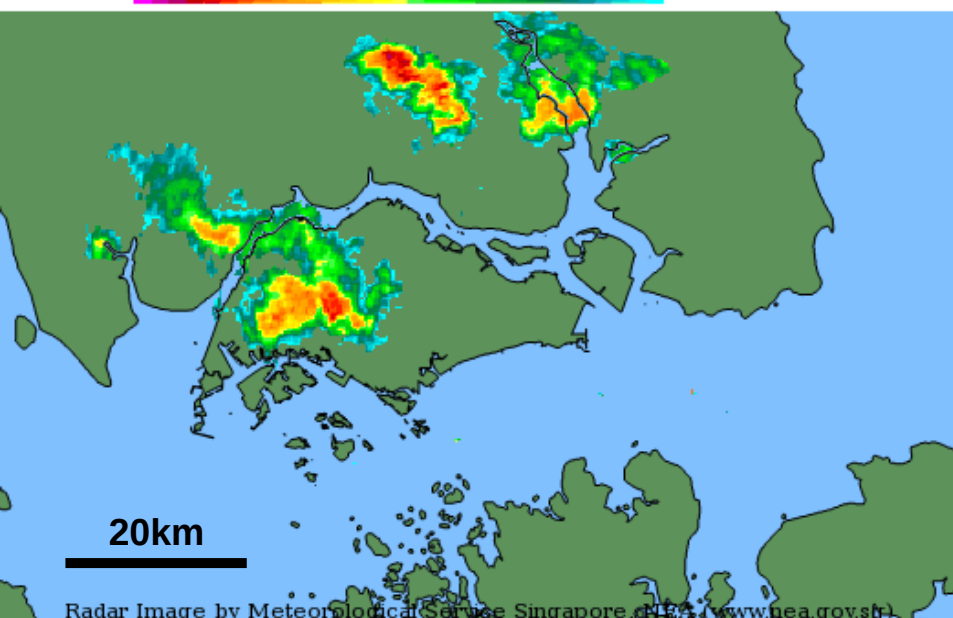
at the time 16:20 LST, 0810UTC

Comparing RADAR, Himawari-8 satellite and lightning data.



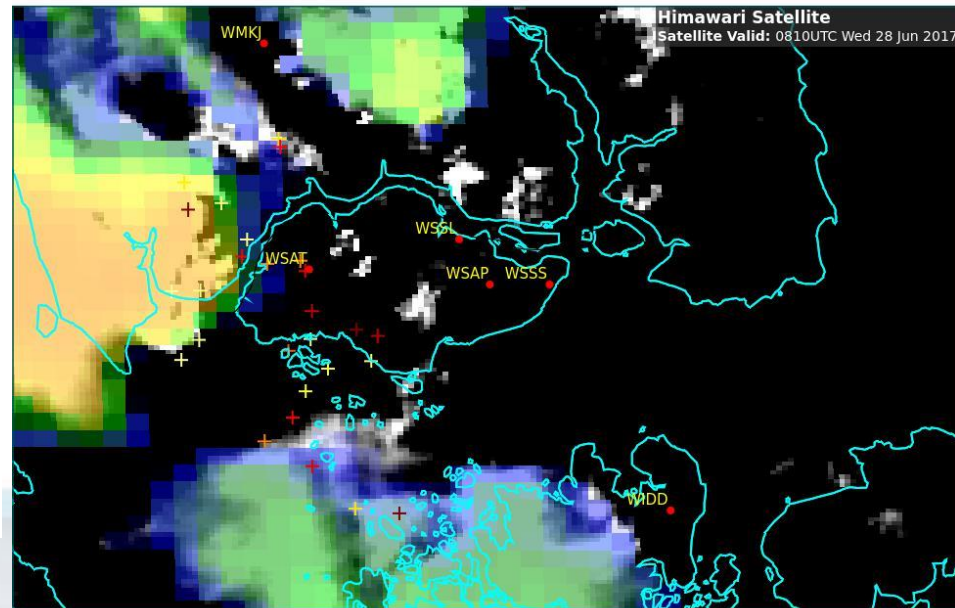
RADAR data courtesy NEA Singapore

Rain Intensities: Heavy Moderate Light
2017-06-28 16:20 hr

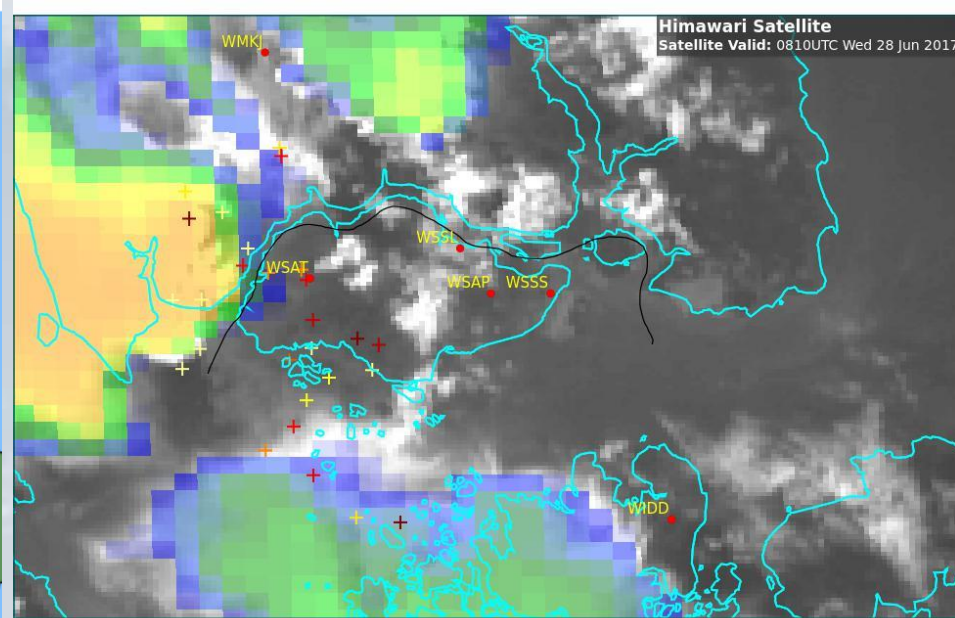


Modified Tropical Sandwich Product

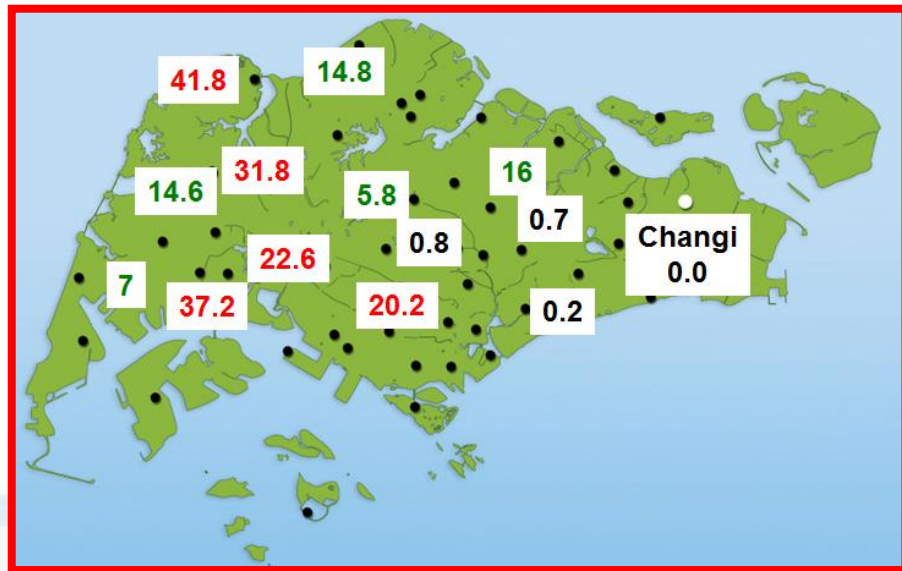
(vis brightness -170, contrast 400)



Tropical Sandwich Product

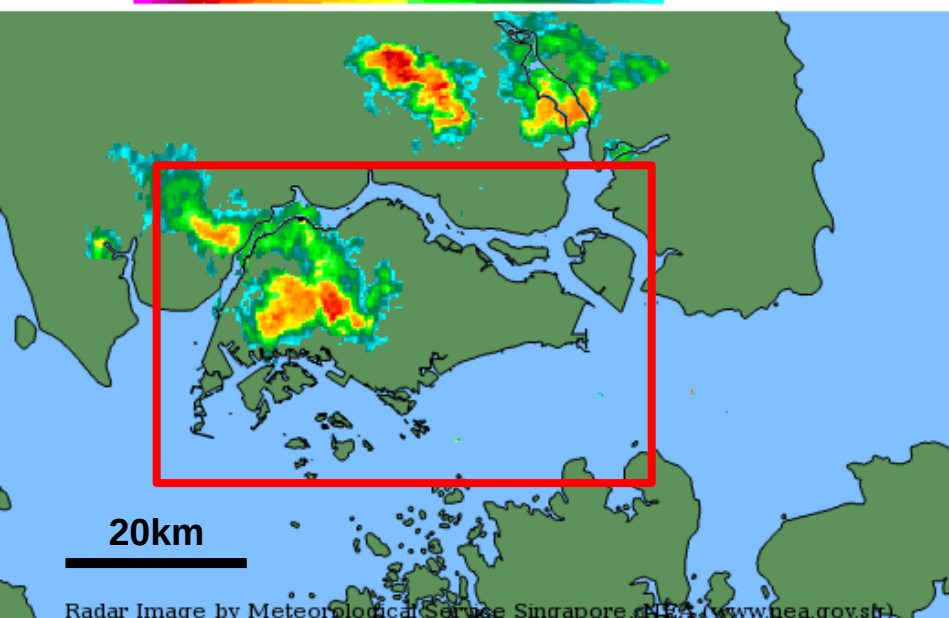


24 hour precipitation (mm)



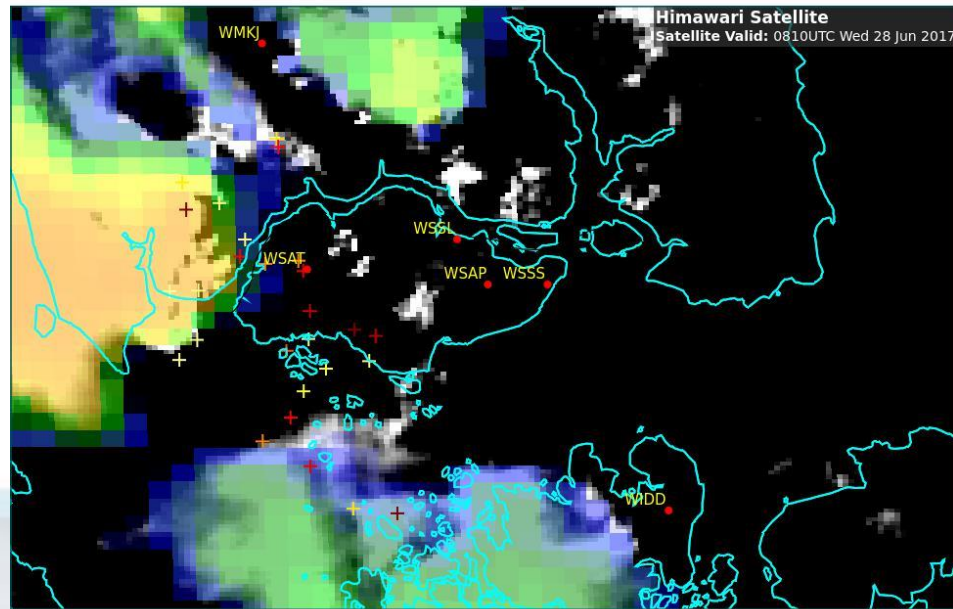
RADAR and precipitation data courtesy NEA Singapore

Rain Intensities: Heavy Moderate Light
2017-06-28 16:20 hr

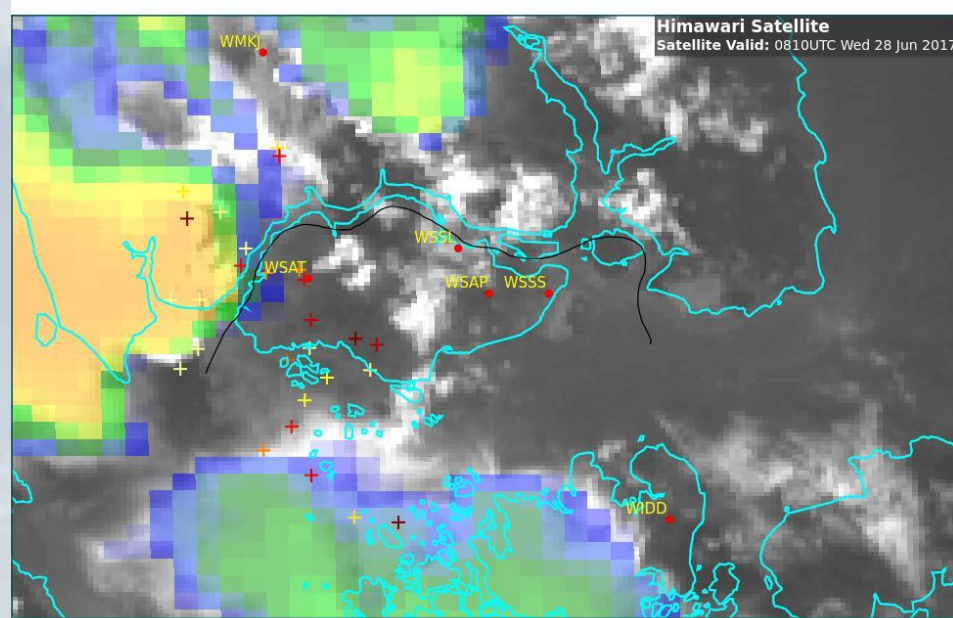


Modified Tropical Sandwich Product

(vis brightness -170, contrast 400)



Tropical Sandwich Product



...some slides not shown...



Explaining the Parallax error

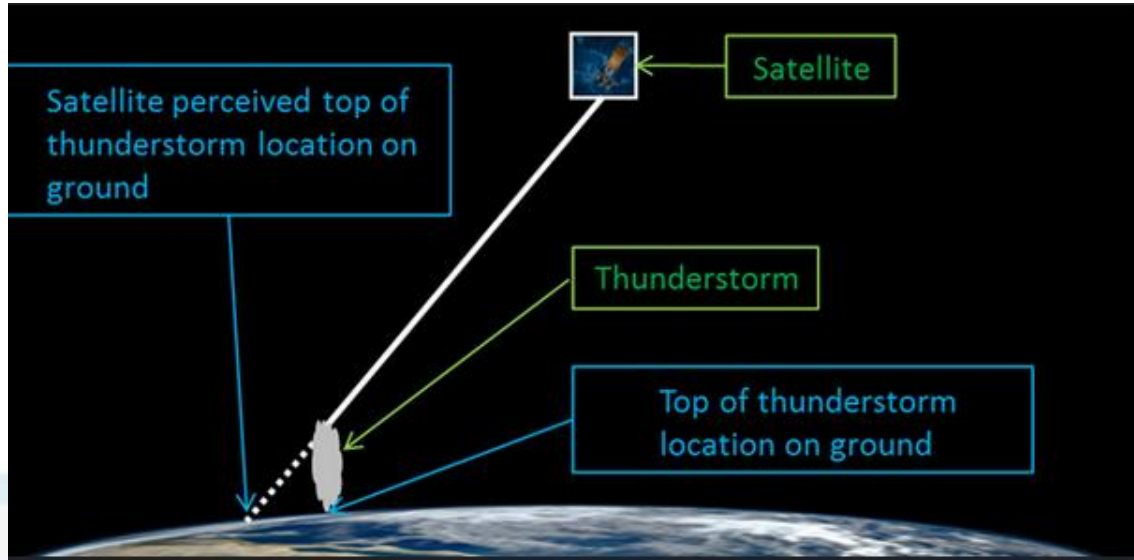
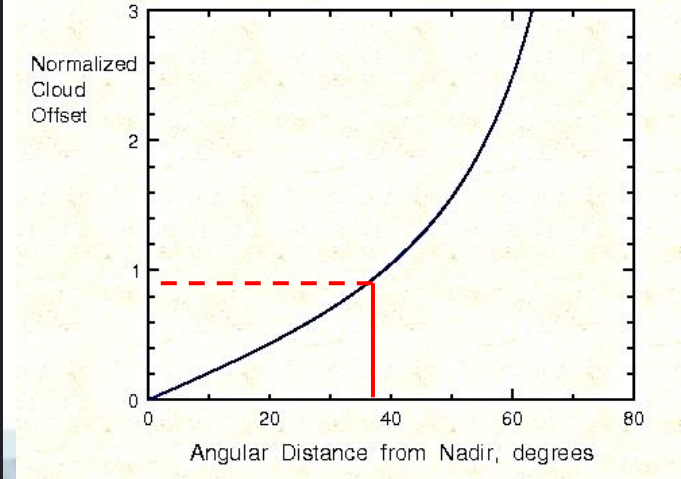


image modified from Satellite Liaison Blog submission by B.Line



from <http://www-das.uwyo.edu/~geerts/cwx/notes/chap02/parallax.html>

Singapore location	1.35° N, 103.82° E
Himawari-8 sub-satellite	0, 140.7E
Distance from sub-satellite point	~37 degrees
Normalise cloud offset	~ 0.8 to 0.9
Stormtop height	~14km (Tbb ~-65C)
Offset	~12 km away from (to west) of sub-satellite point

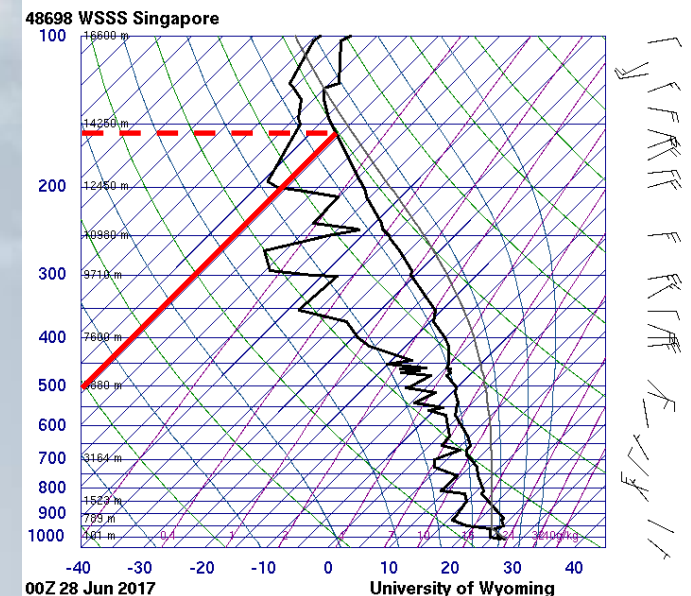
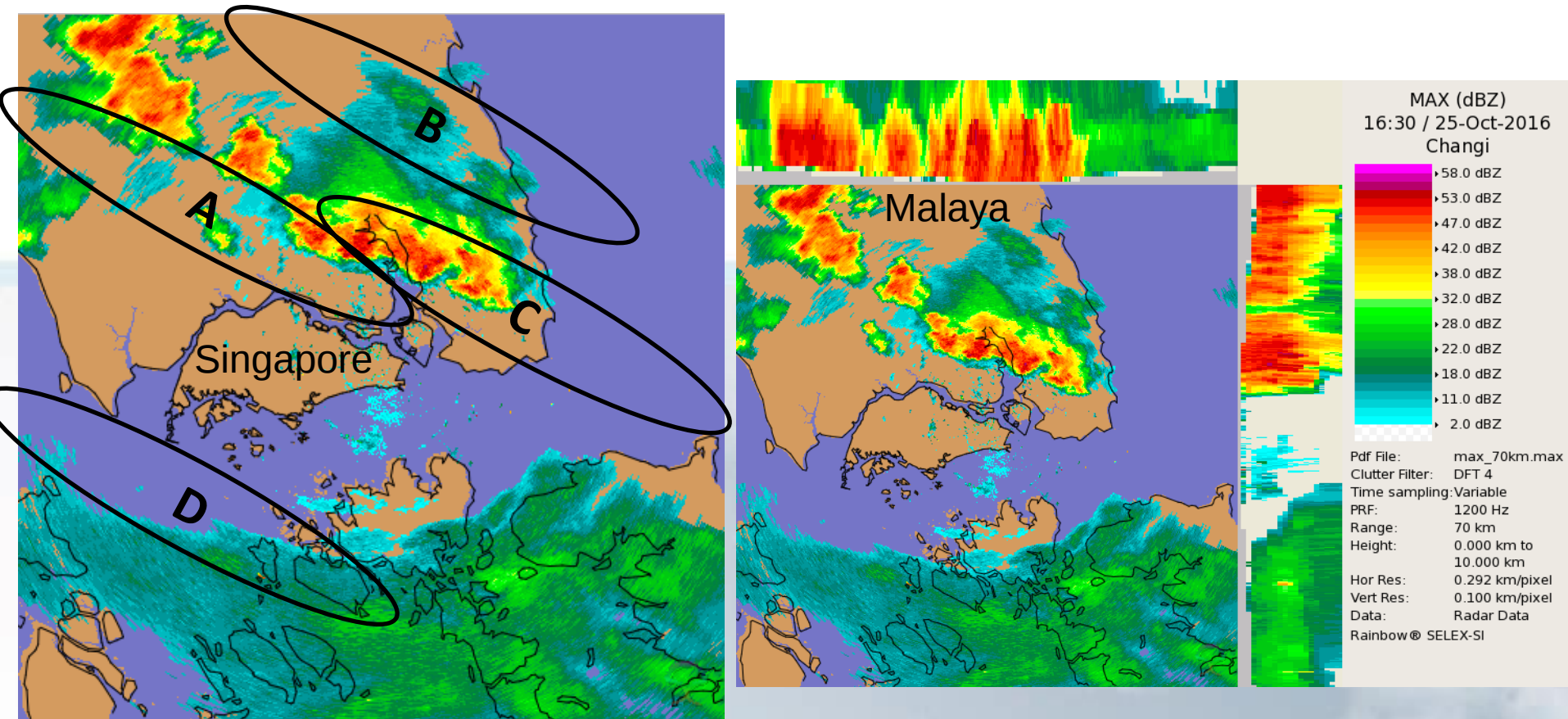


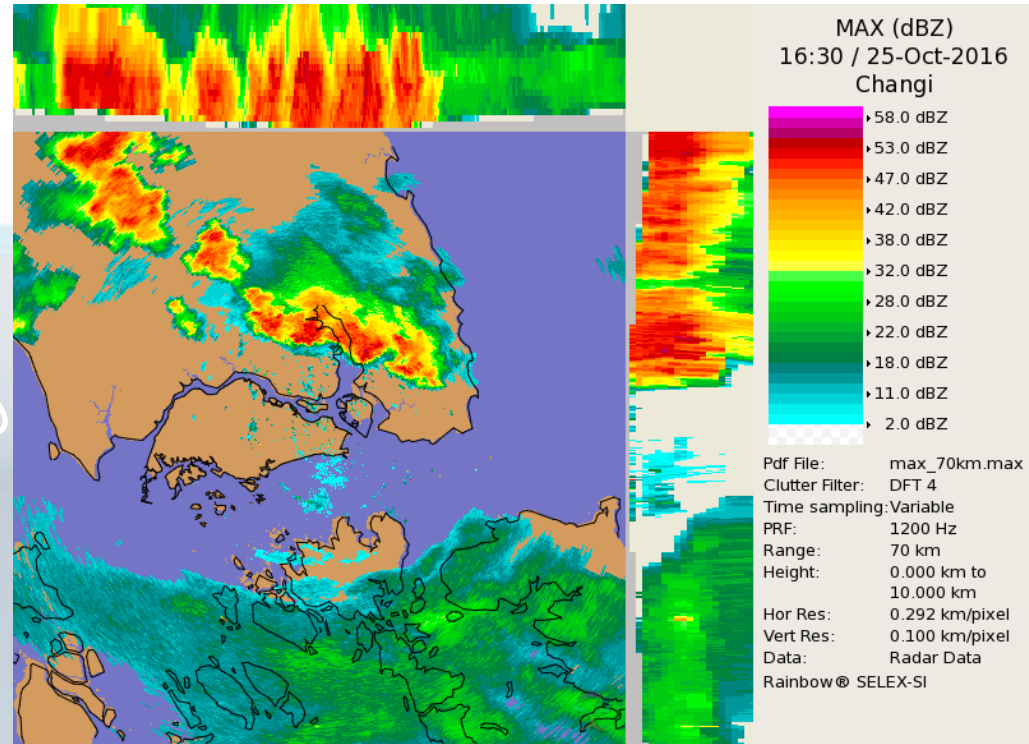
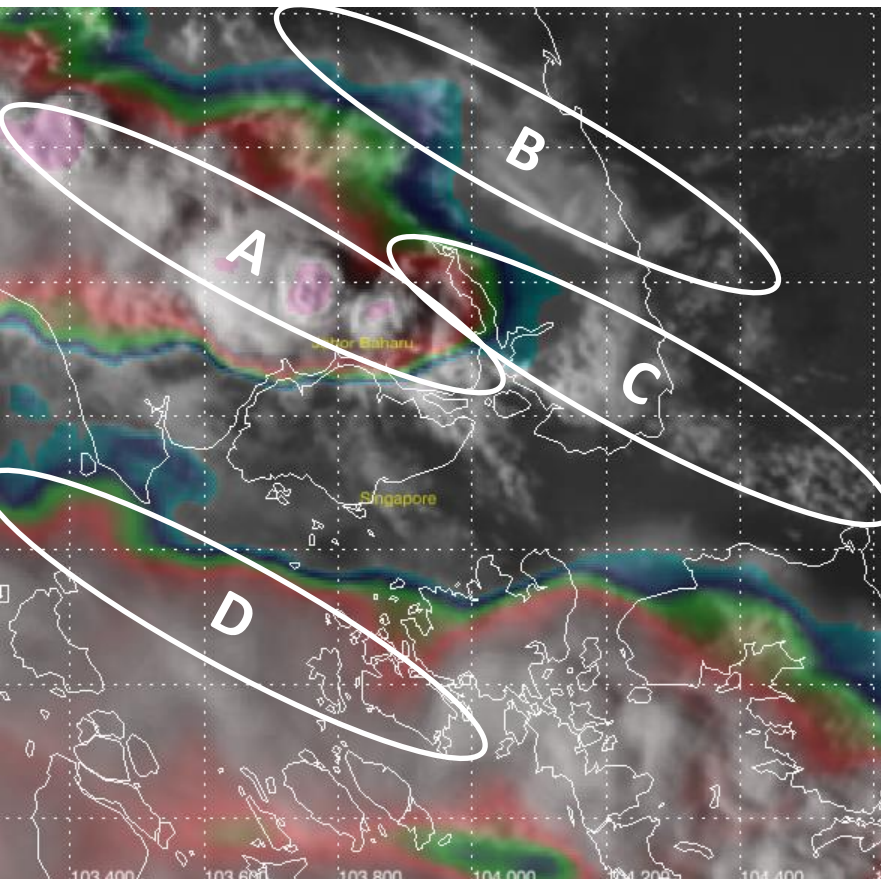
image from University of Wyoming

Exercise 1: Where would you expect to see the thunderstorms in the Himawari-8 satellite image?



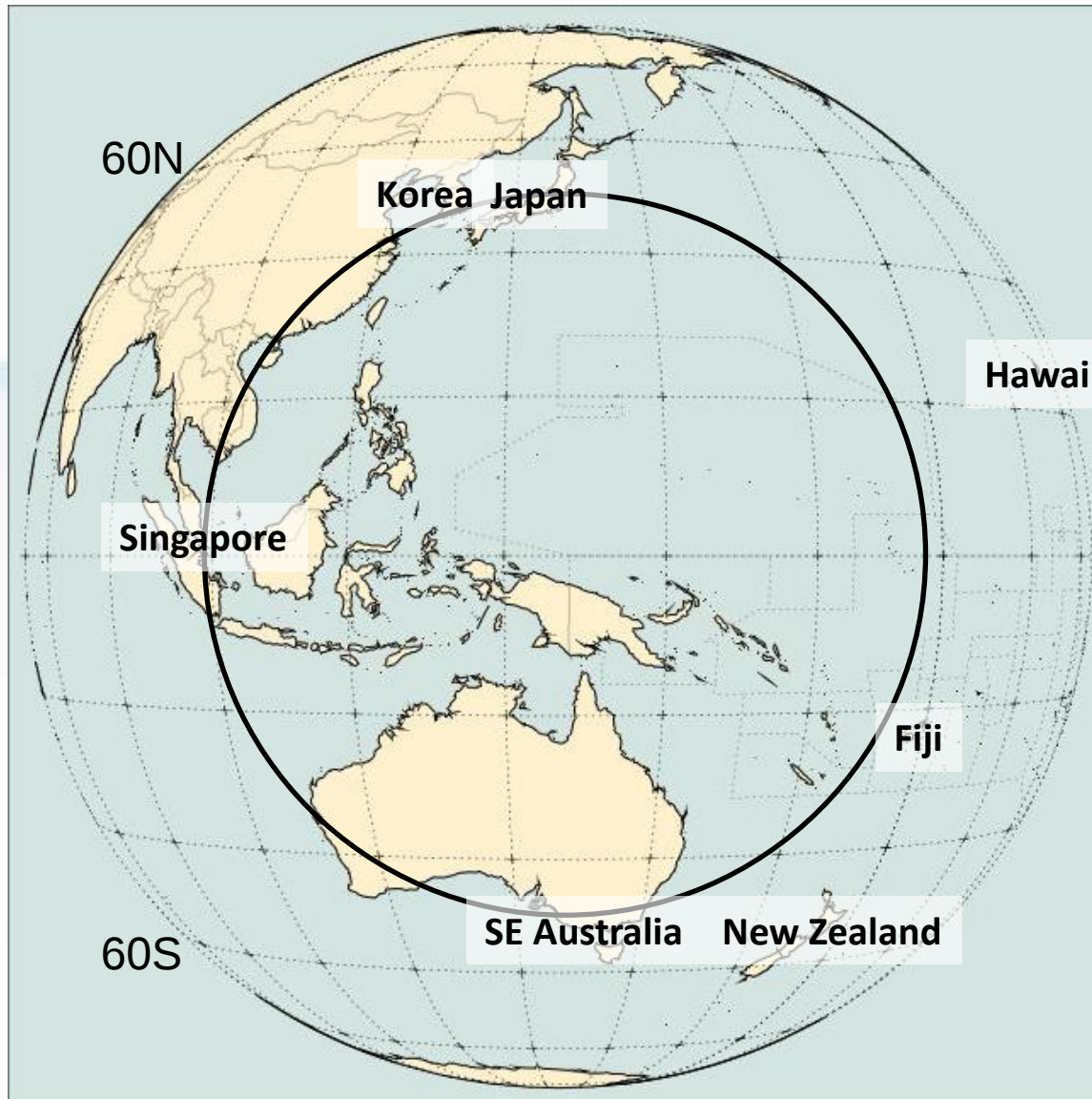
Thunderstorms over southern Malaya, 25 October 2016

Exercise 1: Where would you expect to see the thunderstorms in the Himawari-8 satellite image?

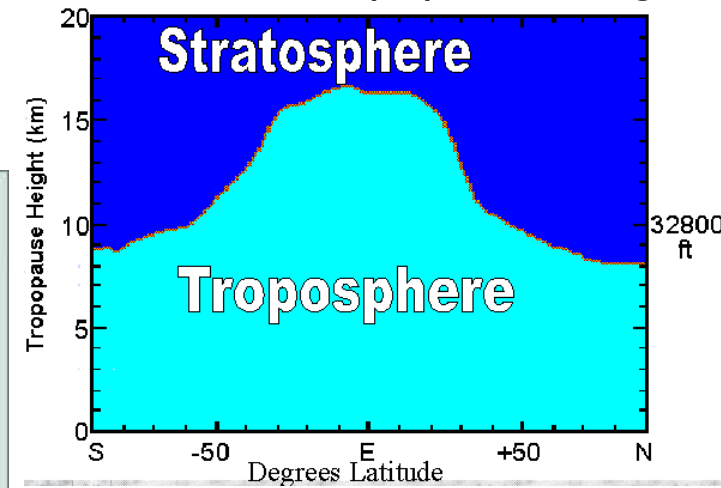


Thunderstorms over southern Malaya, 25 October 2016

Parallax Error over the Himawari-8 domain



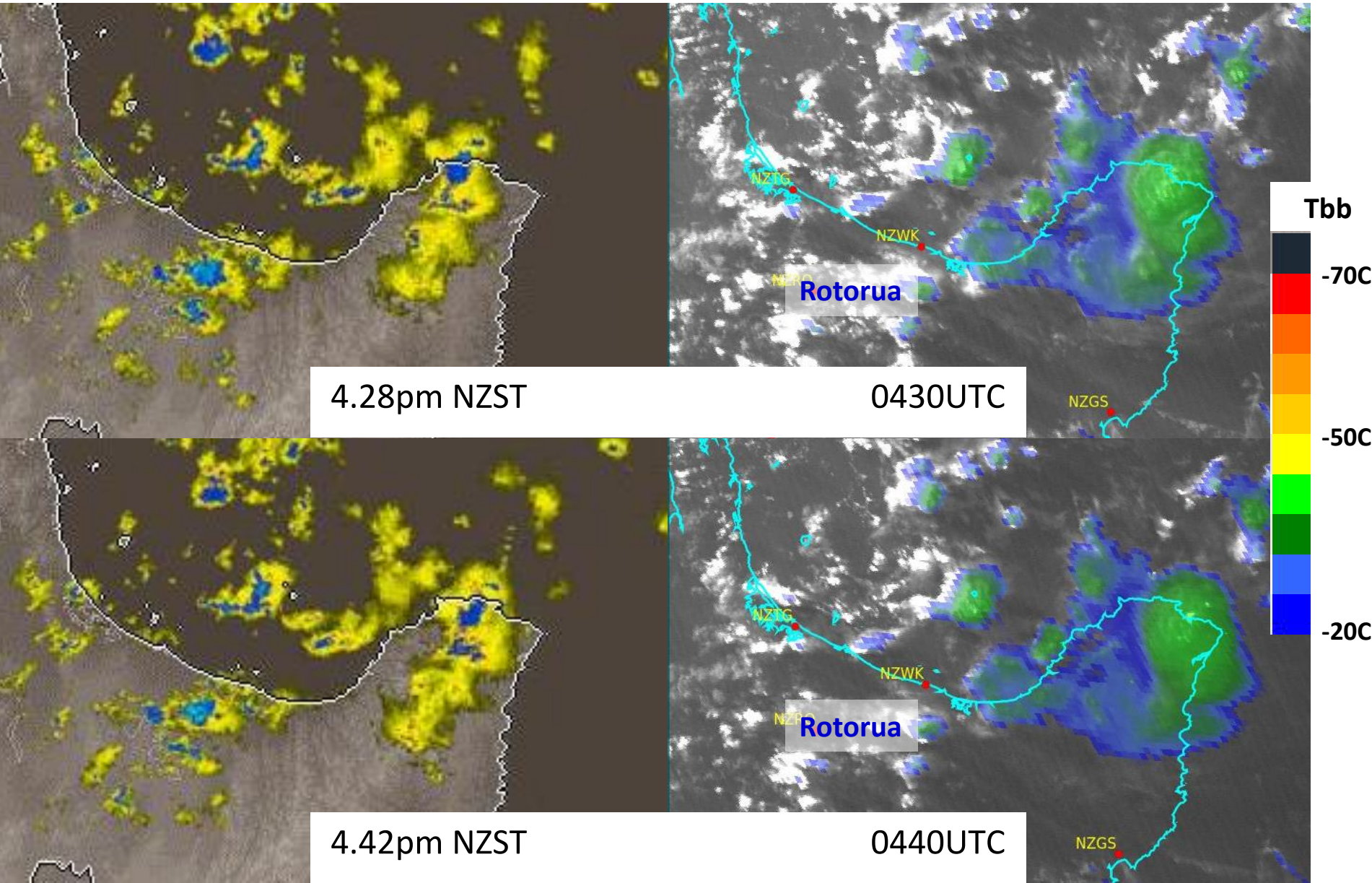
Annual mean Tropopause height



<http://www-das.uwyo.edu/~geerts/cwx/notes/chap01/tropo.html>

Location	Tropopause height
SE Asian summer monsoon	~18km
Oceanic Warm Pool (W Pacific)	~17.5km
Summertime Australia	~16km
Latitude > 60 degrees	<9km

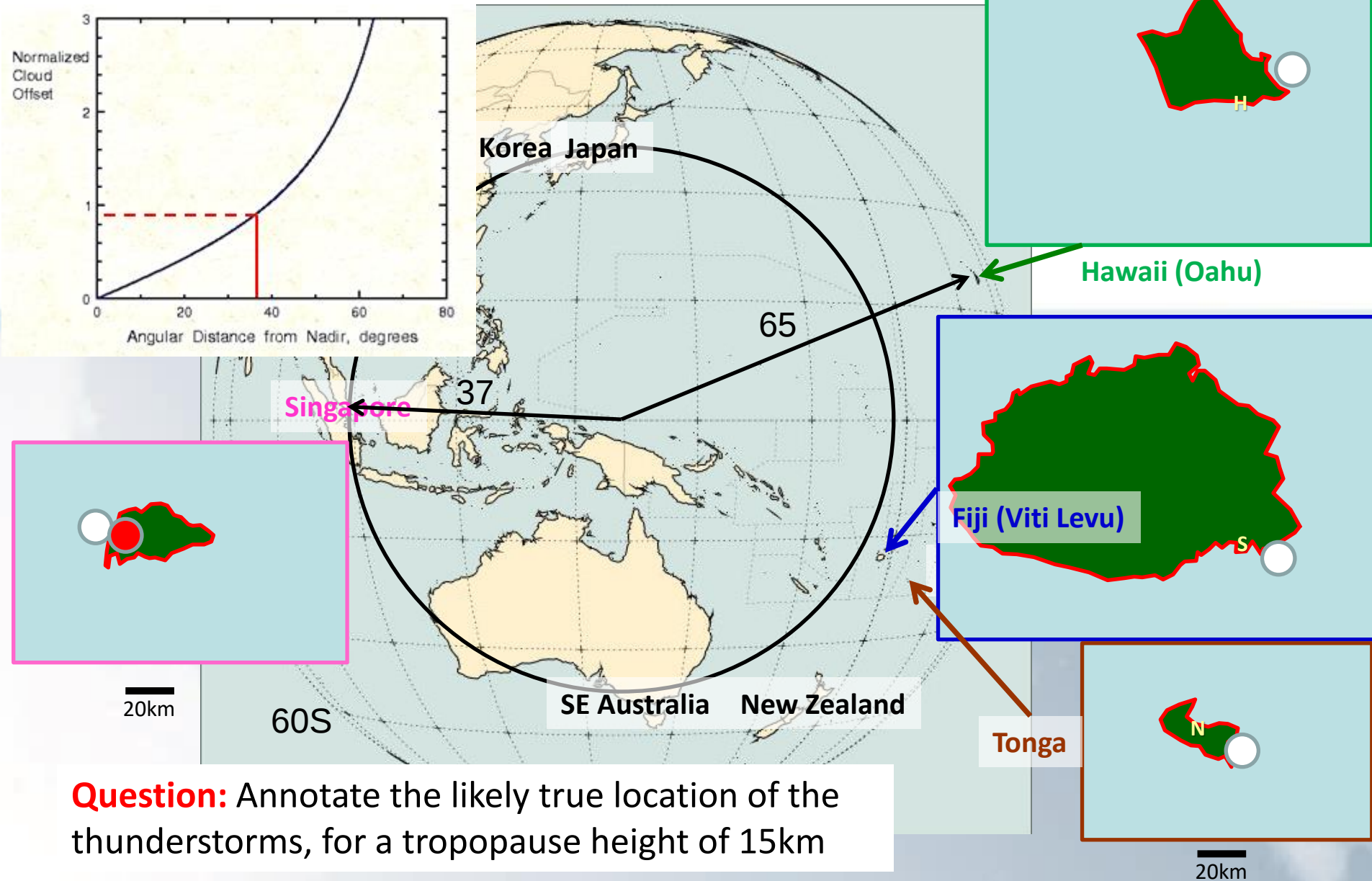
Comparison with New Zealand convection case, 3rd July 2017



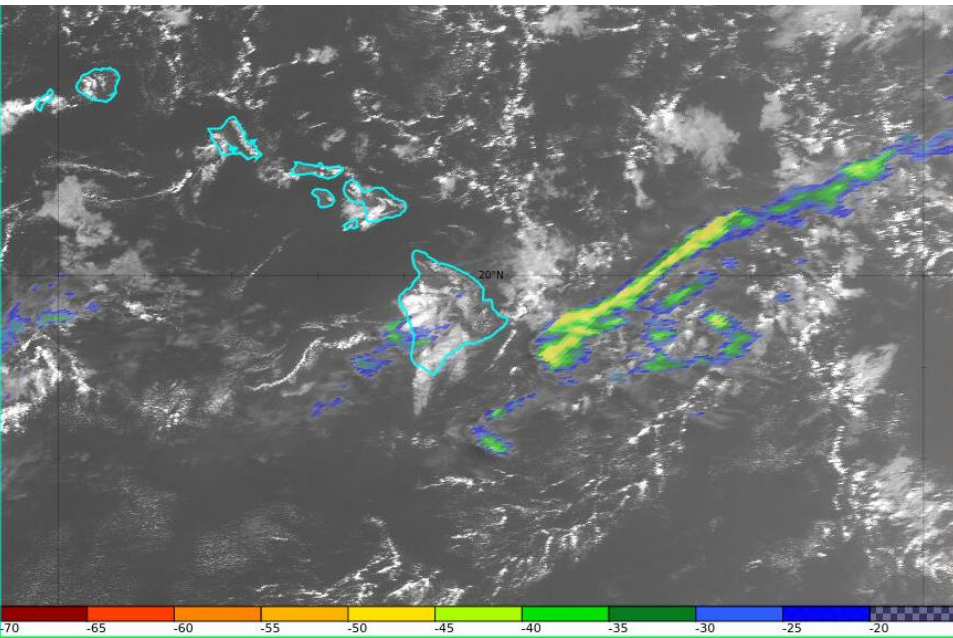
...some slides not shown...



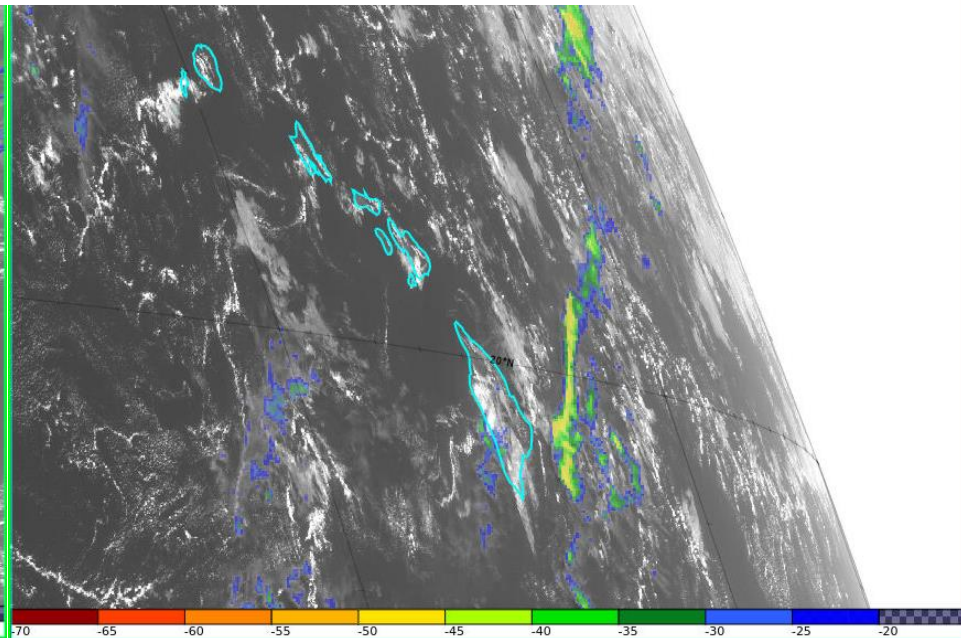
Parallax at other locations: Exercise 2



Hawaii – Mercator Projection, 9 Aug 2017

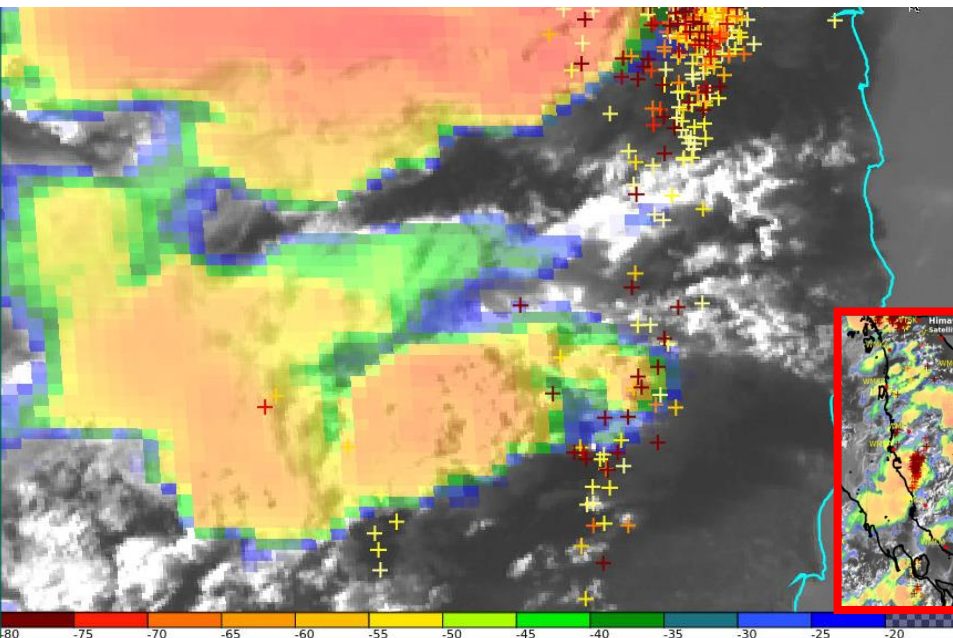


Hawaii – Satellite Projection

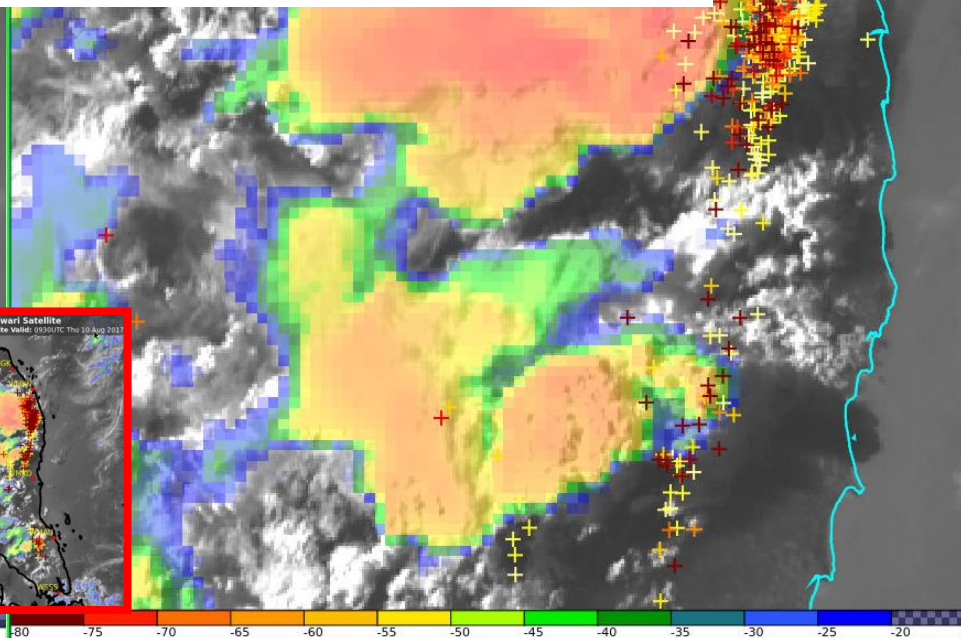


Satellite
lid: 0230UTC Wed 09 Aug 2017

Malaya – Mercator Projection, 10 Aug 2017



Malaya – Satellite Projection

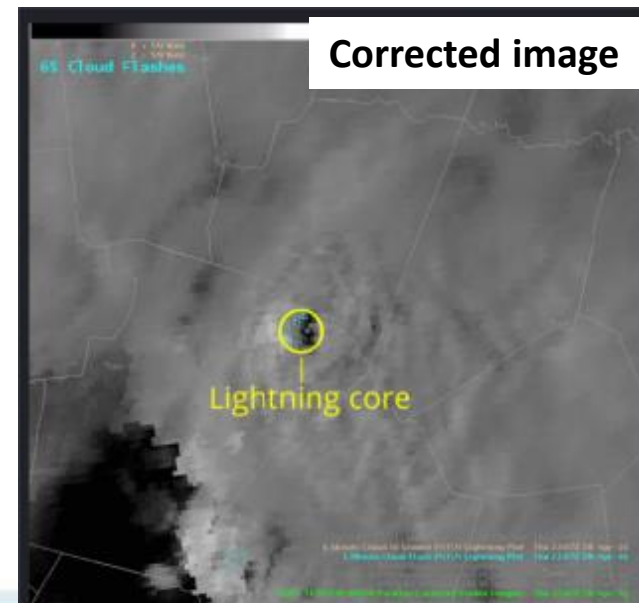
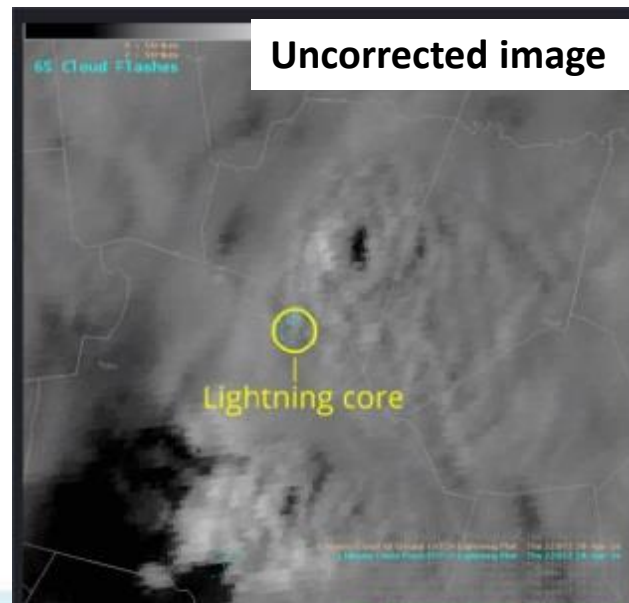


i Satellite
lid: 0930UTC Thu 10 Aug 2017

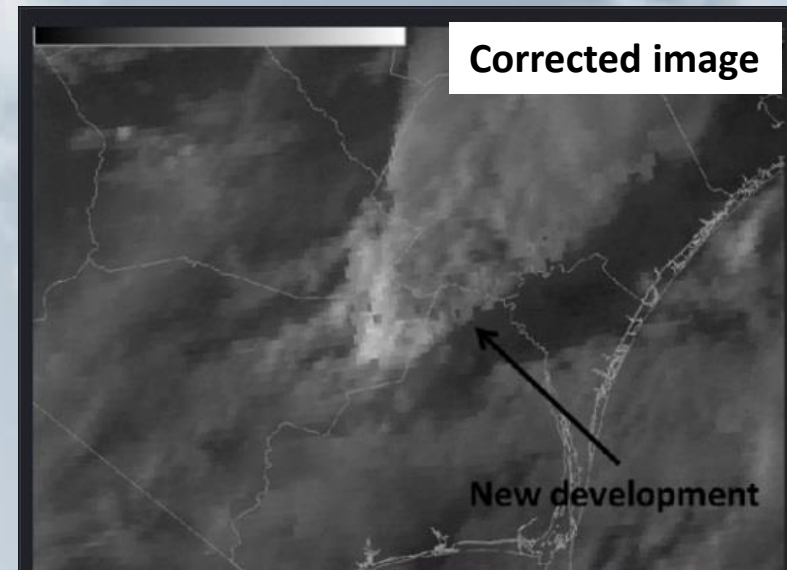
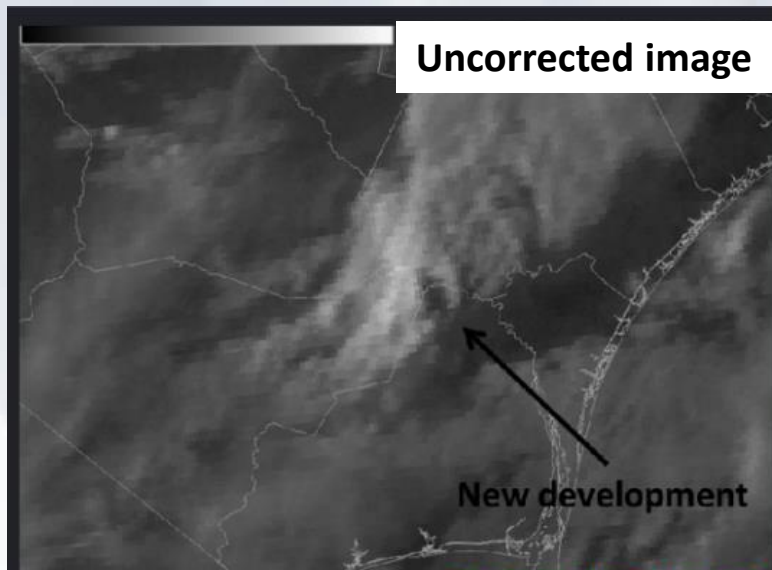
Correcting for parallax error

GOES-14 algorithms

- Delay in data delivery
- Can mask features
- Images more "blocky"



Virginia GOES-14 visible image example, 3rd May 2016



North Carolina GOES-14 visible image example, 28th April 2016

...some slides not shown...

