Some questions on future climate change in Rwanda

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Embassy of the Kingdom of the Netherlands

Climate trends

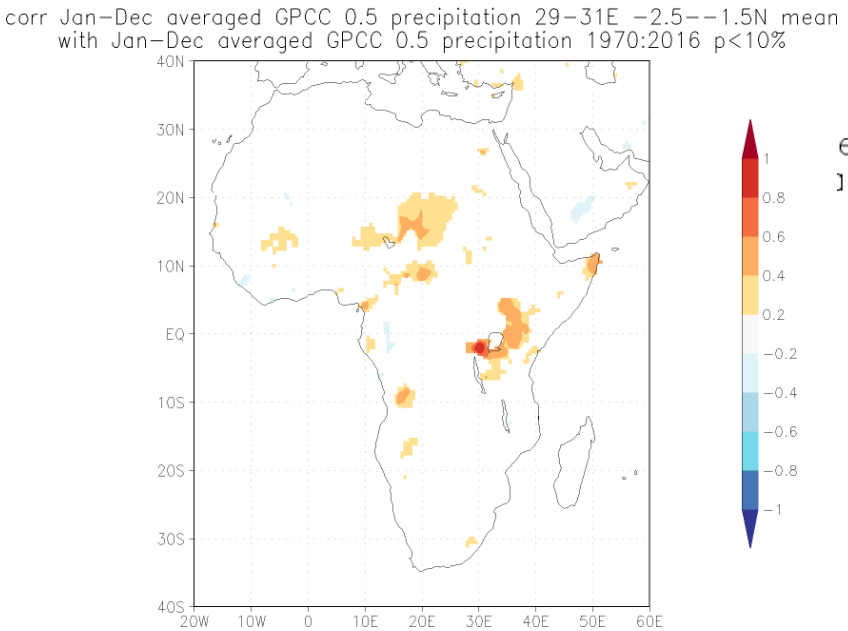
According to Cole et al (2011)

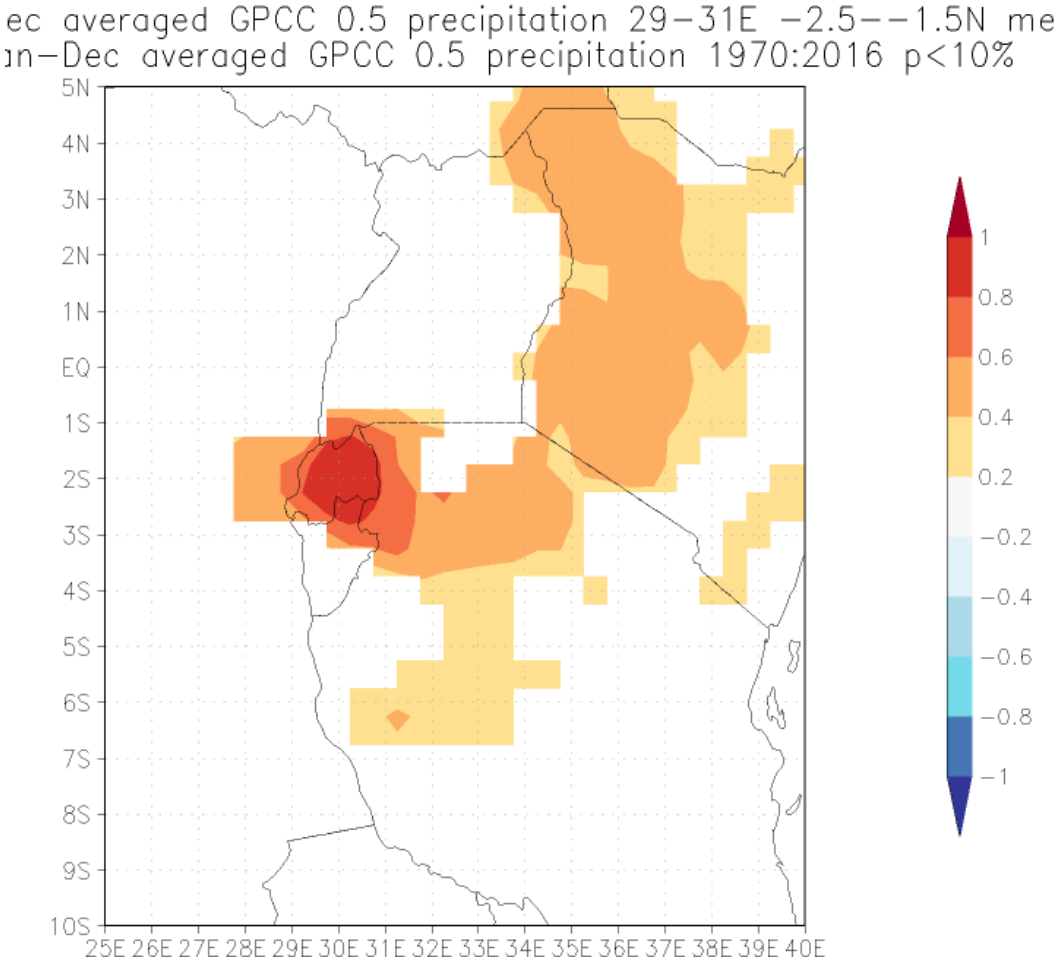
- Temperature increased by 1.4 ^{o}C since 1970, expected to increase
- Rainfall stable, expected to increase

Temperature trends

- Abnormal increase in temperature likely caused by deforestation and urbanisation
- Since about 2010, warming has slowed down
- **Different datasets give different pictures**
- Differential warming changes pressure, changes winds, could change rain?

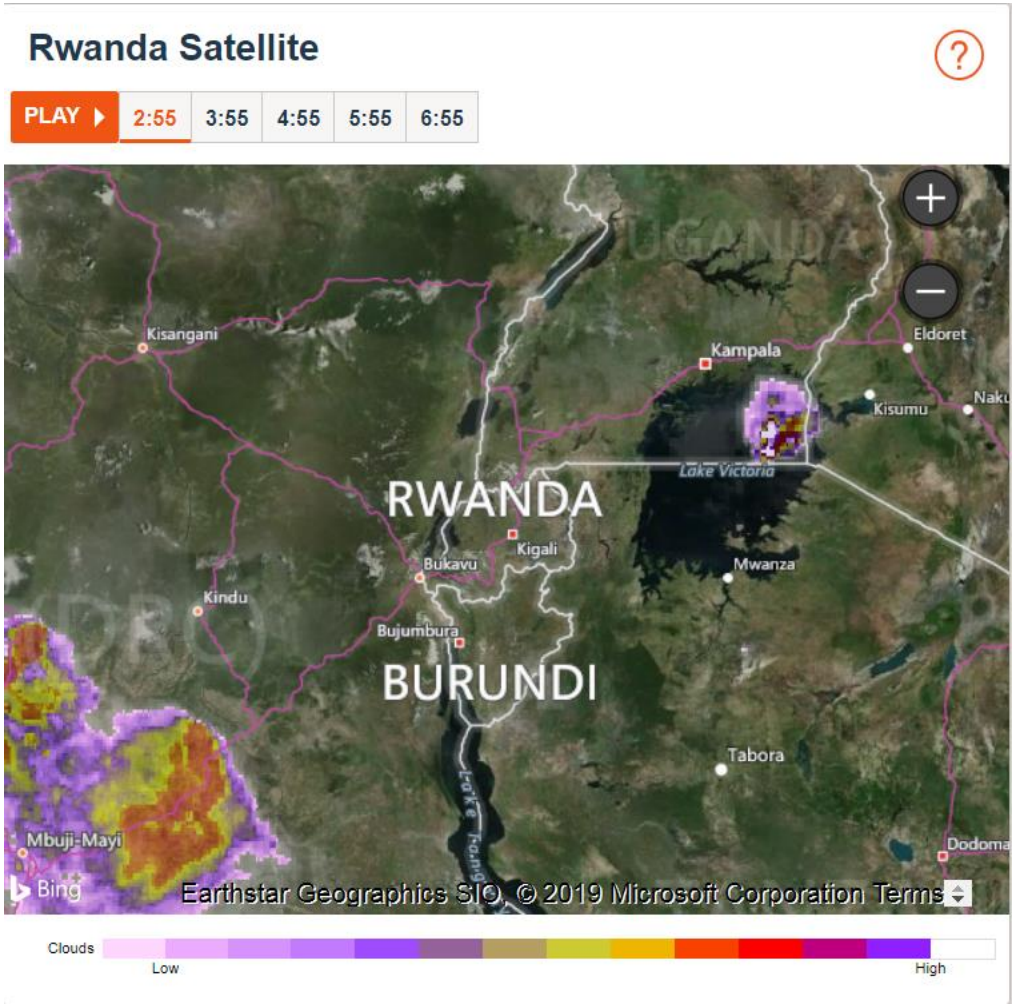
Rainfall over Rwanda mostly correlates to rainfall over Rwanda





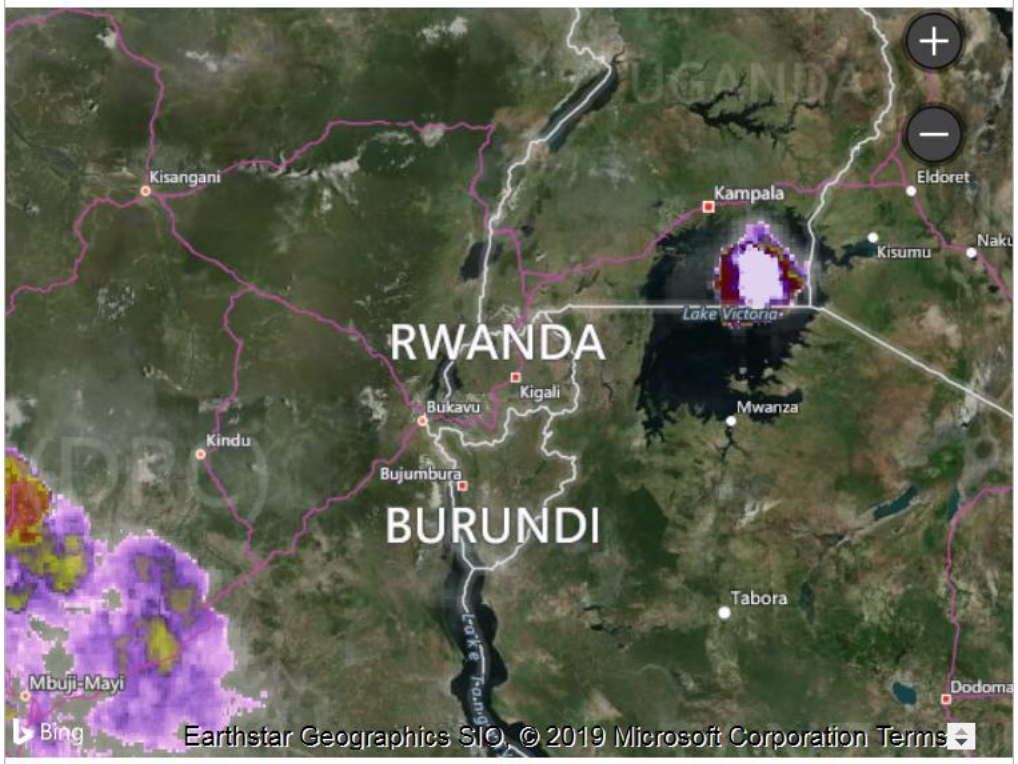
Most big showers come from Lake Victoria

- The following images are from www.accuweather.com, taken on 14 March 2019 between 02:55 and 14:55


Rwanda Satellite
PLAY
2:55
3:55
4:55
5:55
6:55
Kisangani
Kampala
Eldoret
Kisumu
Lake Victoria
RWANDA
Kigali
Bukavu
Mwanza
Kindu
Bujumbura
BURUNDI
Tabora
Mbuji-Mayi
Dodoma
Bing
Earthstar Geographics SIO, © 2019 Microsoft Corporation Terms
Clouds
Low
High

Rwanda Satellite

PLAY | 2:55 | 3:55 | 4:55 | 5:55 | 6:55



Clouds

Low — High

Rwanda Satellite

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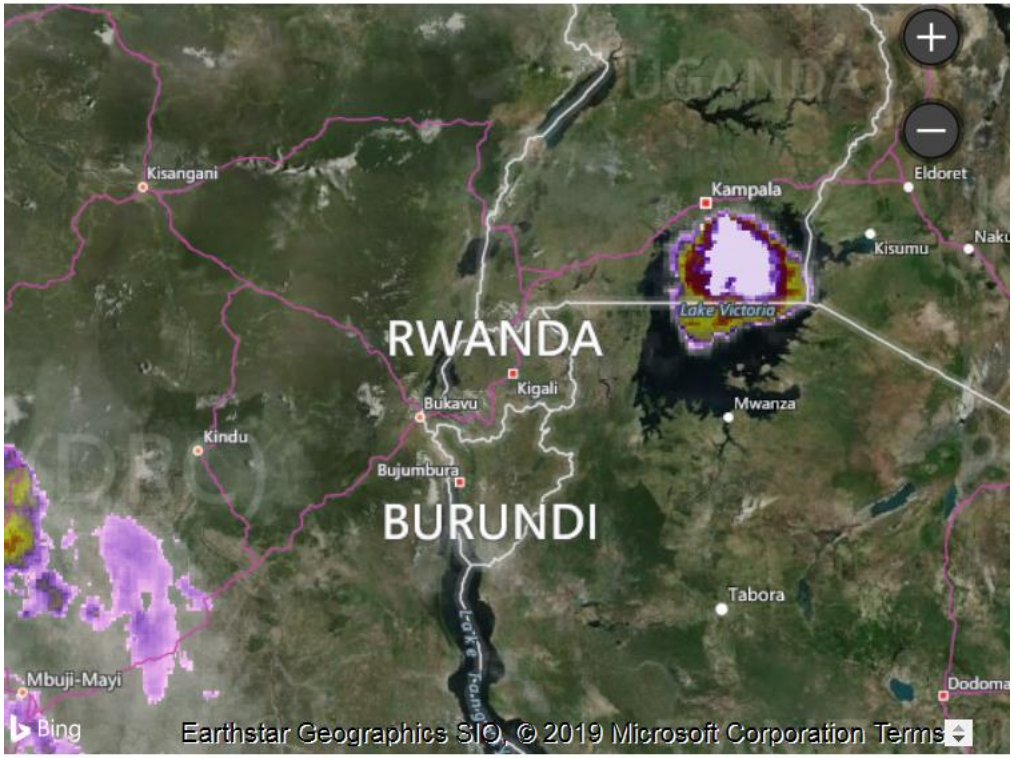

Clouds

Low — High

Rwanda Satellite

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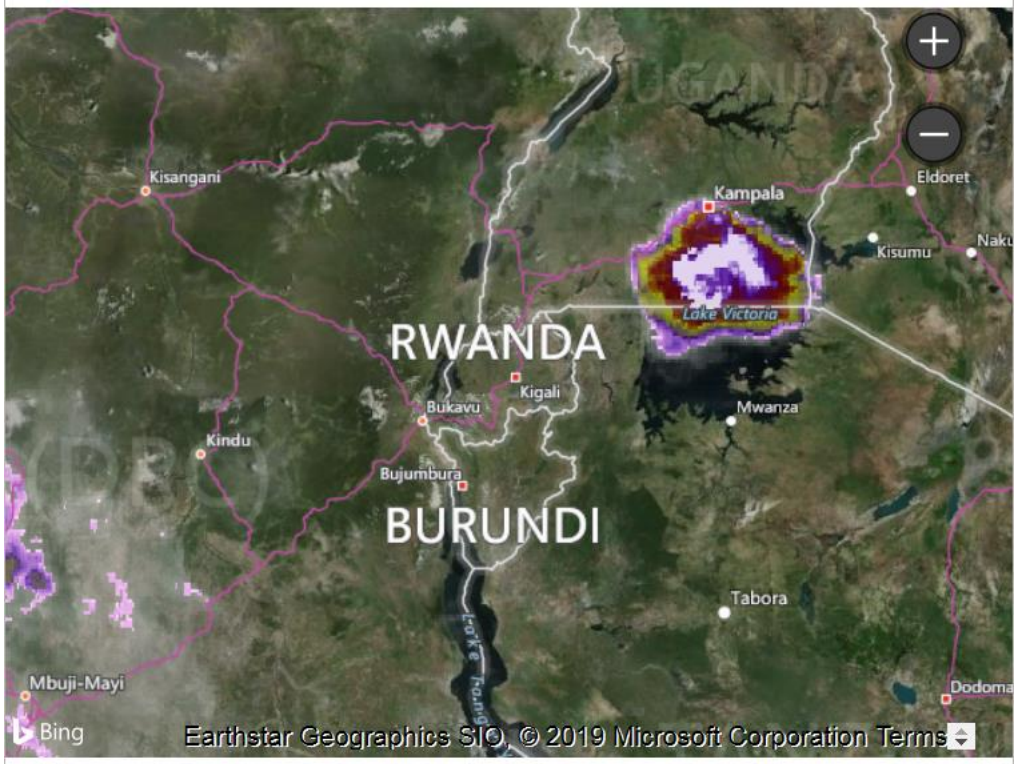

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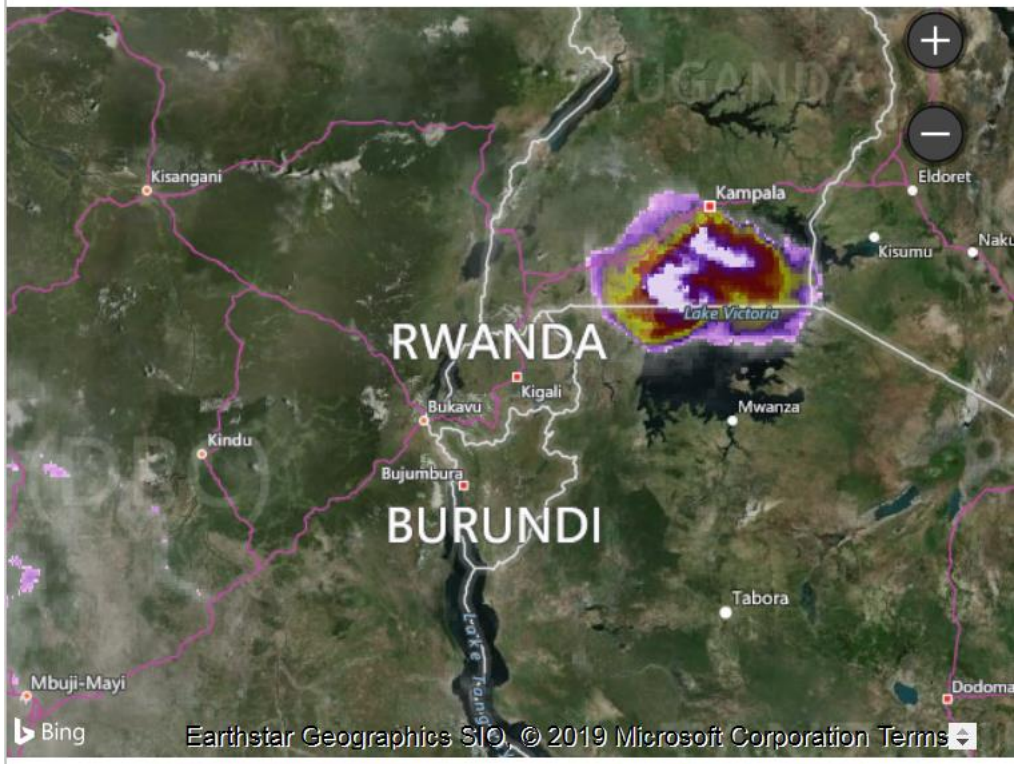

Clouds

Low — High

Rwanda Satellite

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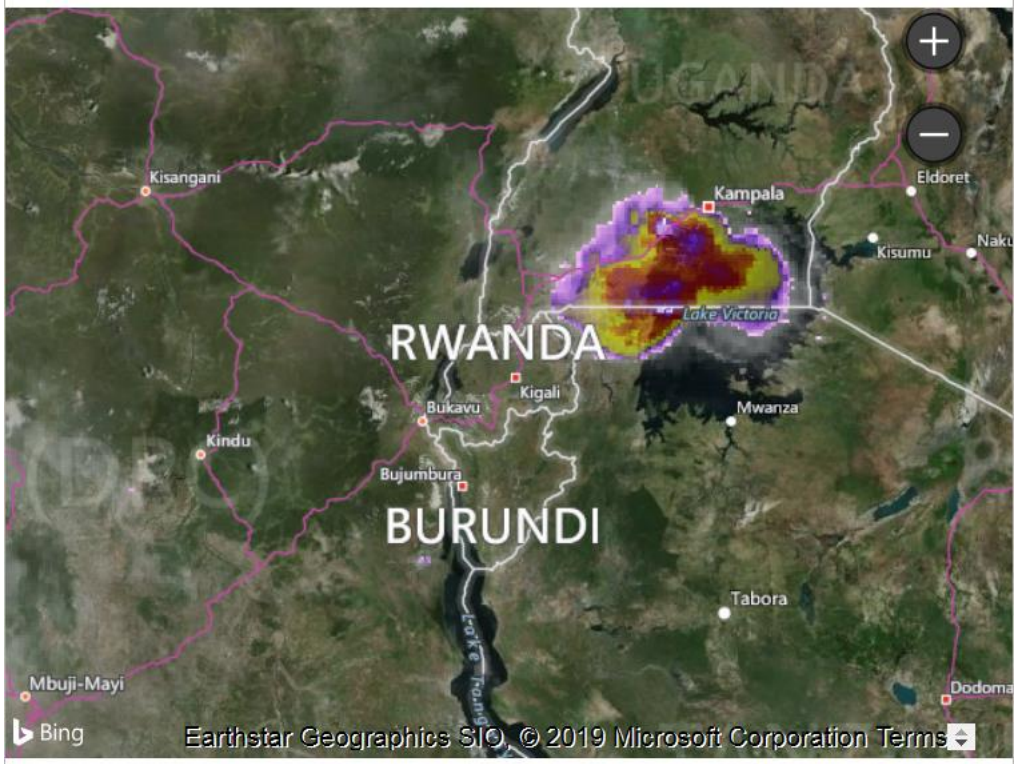
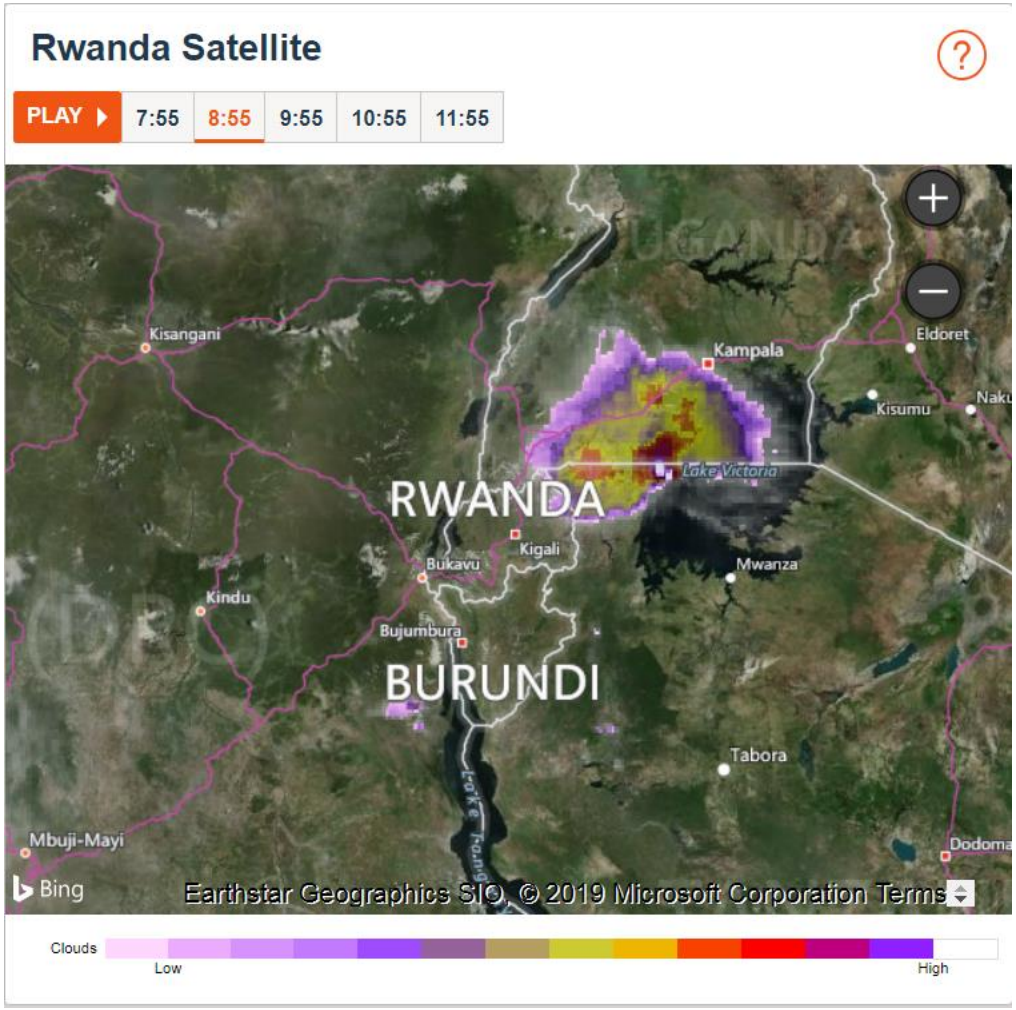


Clouds

Low — High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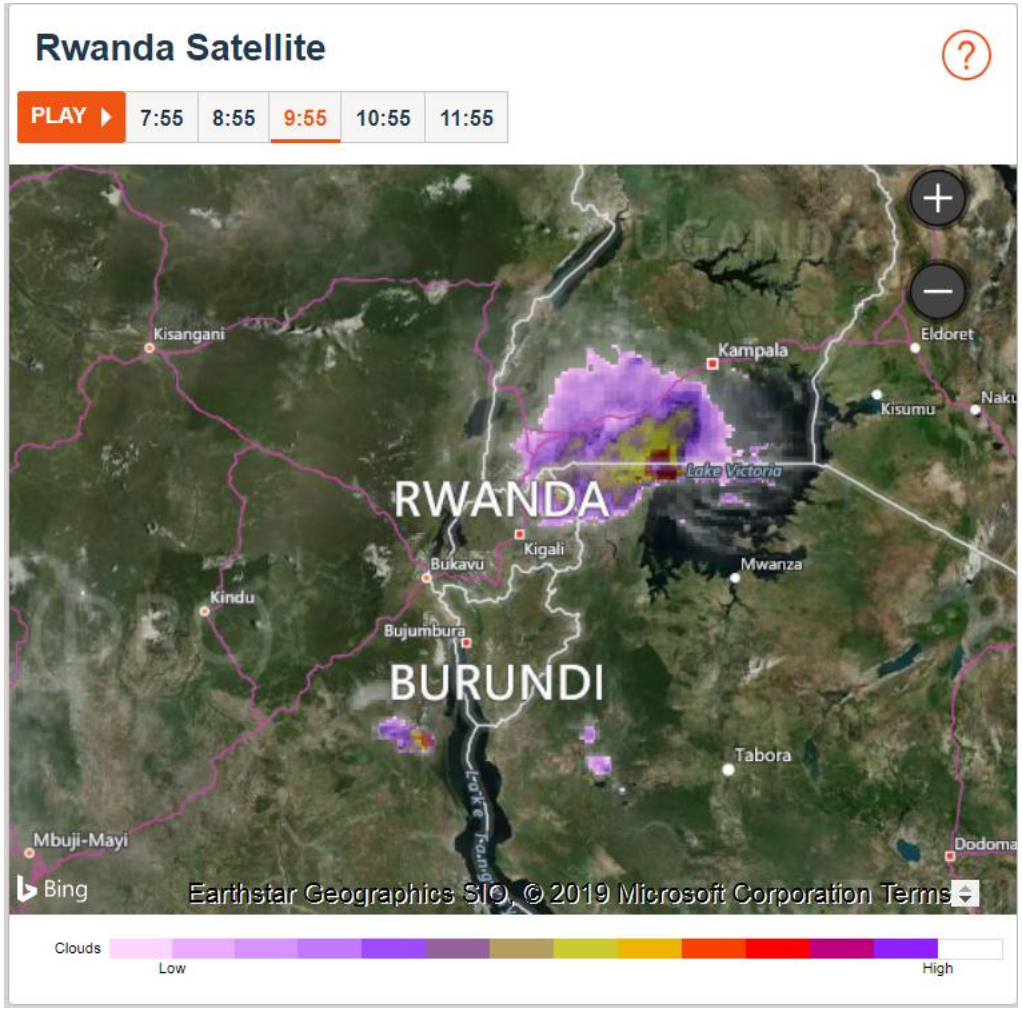
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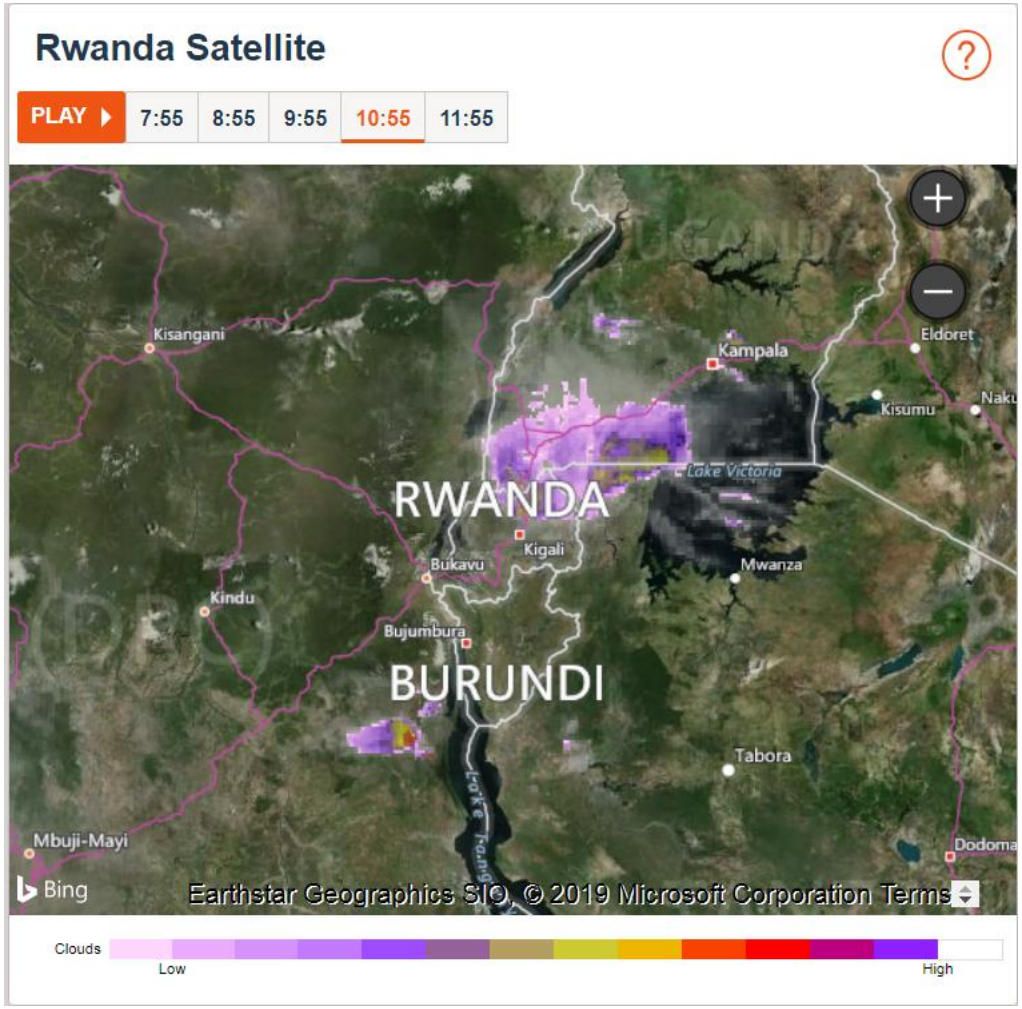
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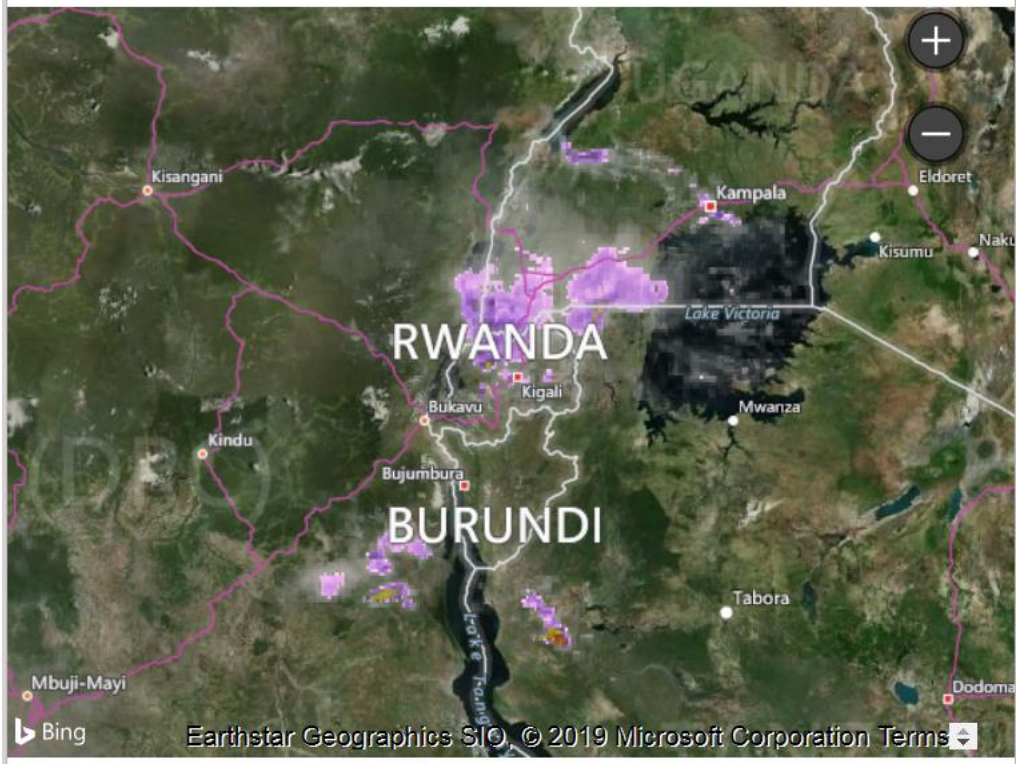

Clouds
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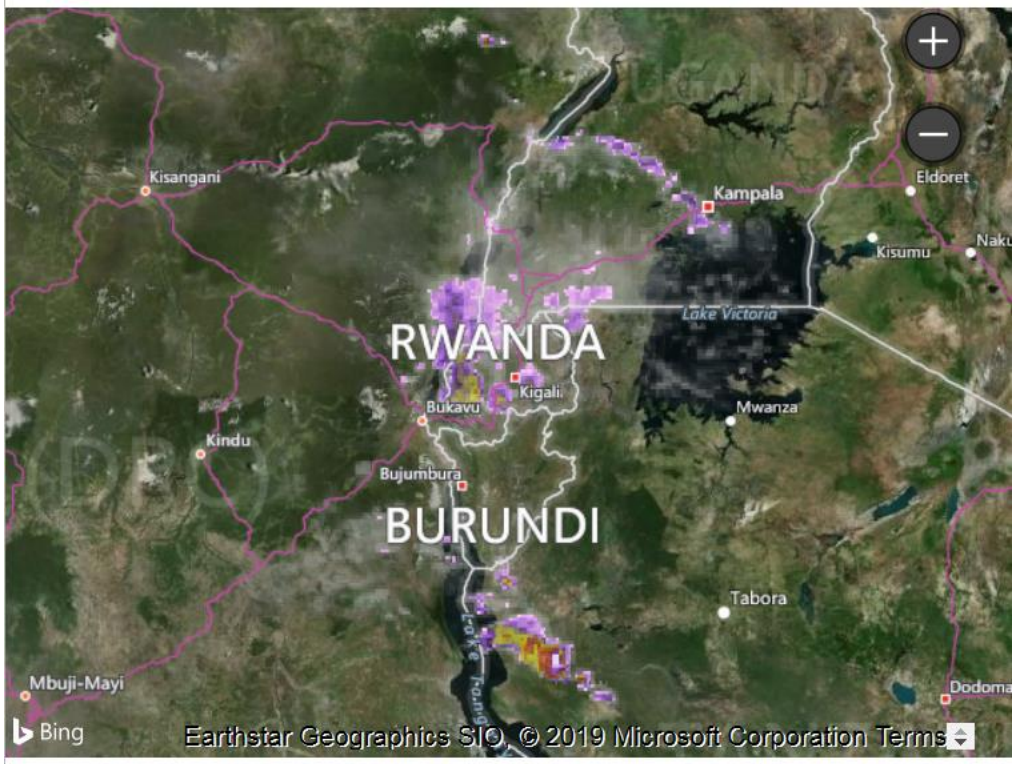
High

Rwanda Satellite

PLAY | 10:55 | 11:55 | 12:55 | 1:55 | 2:55



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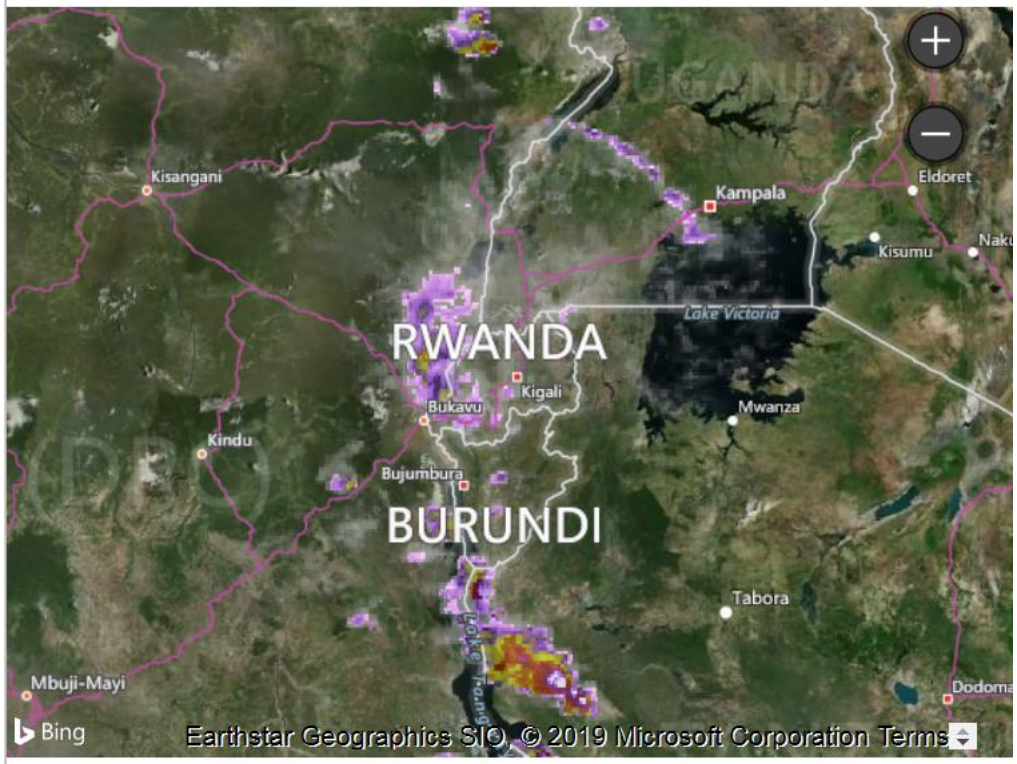

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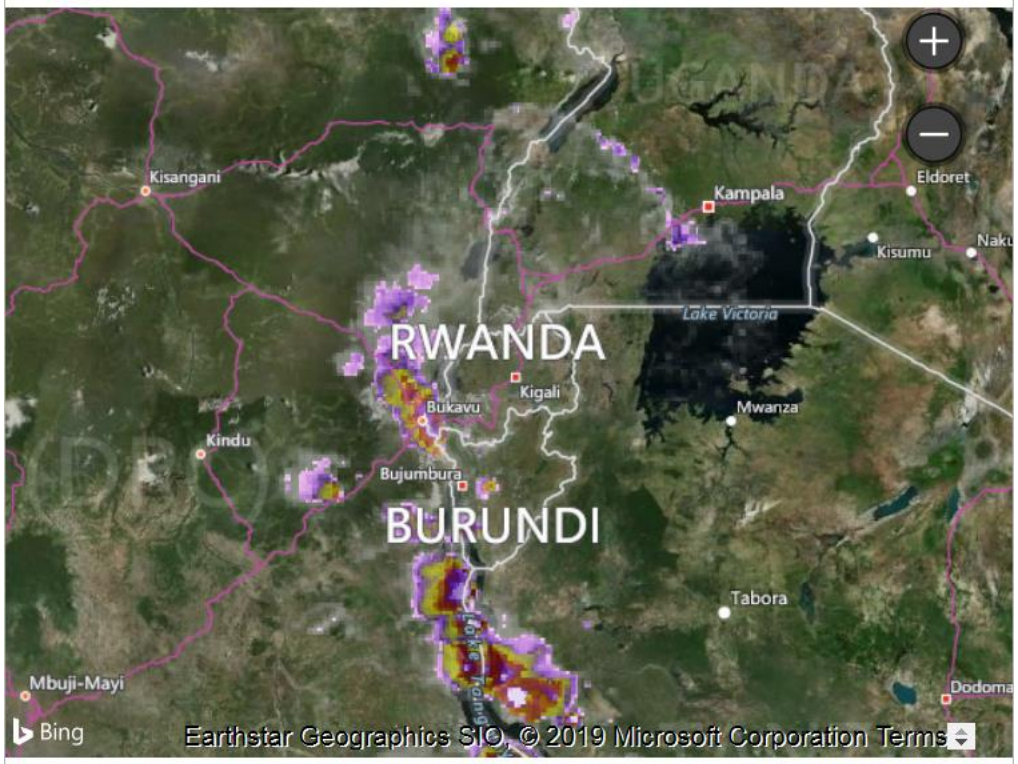

Clouds
Low
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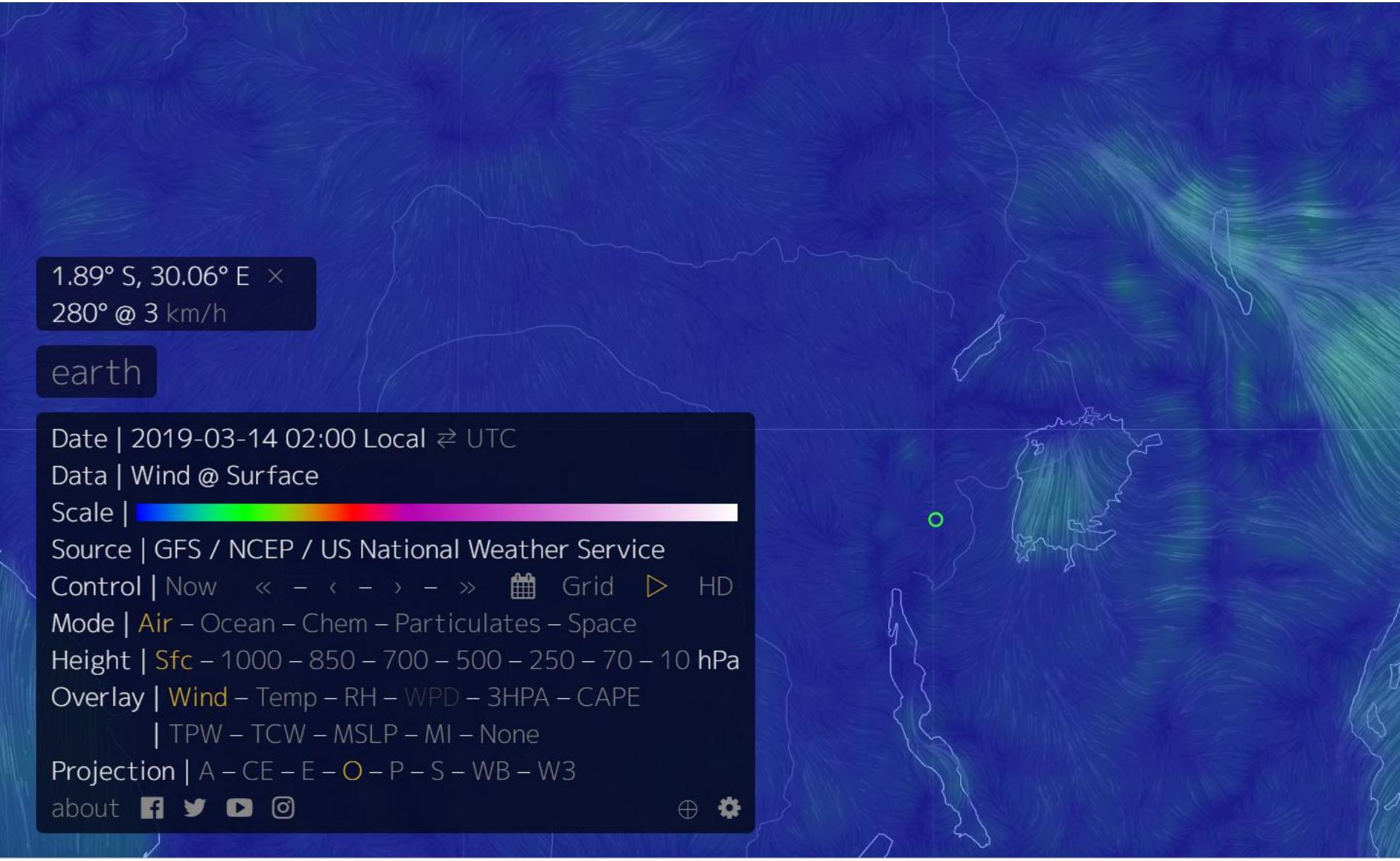
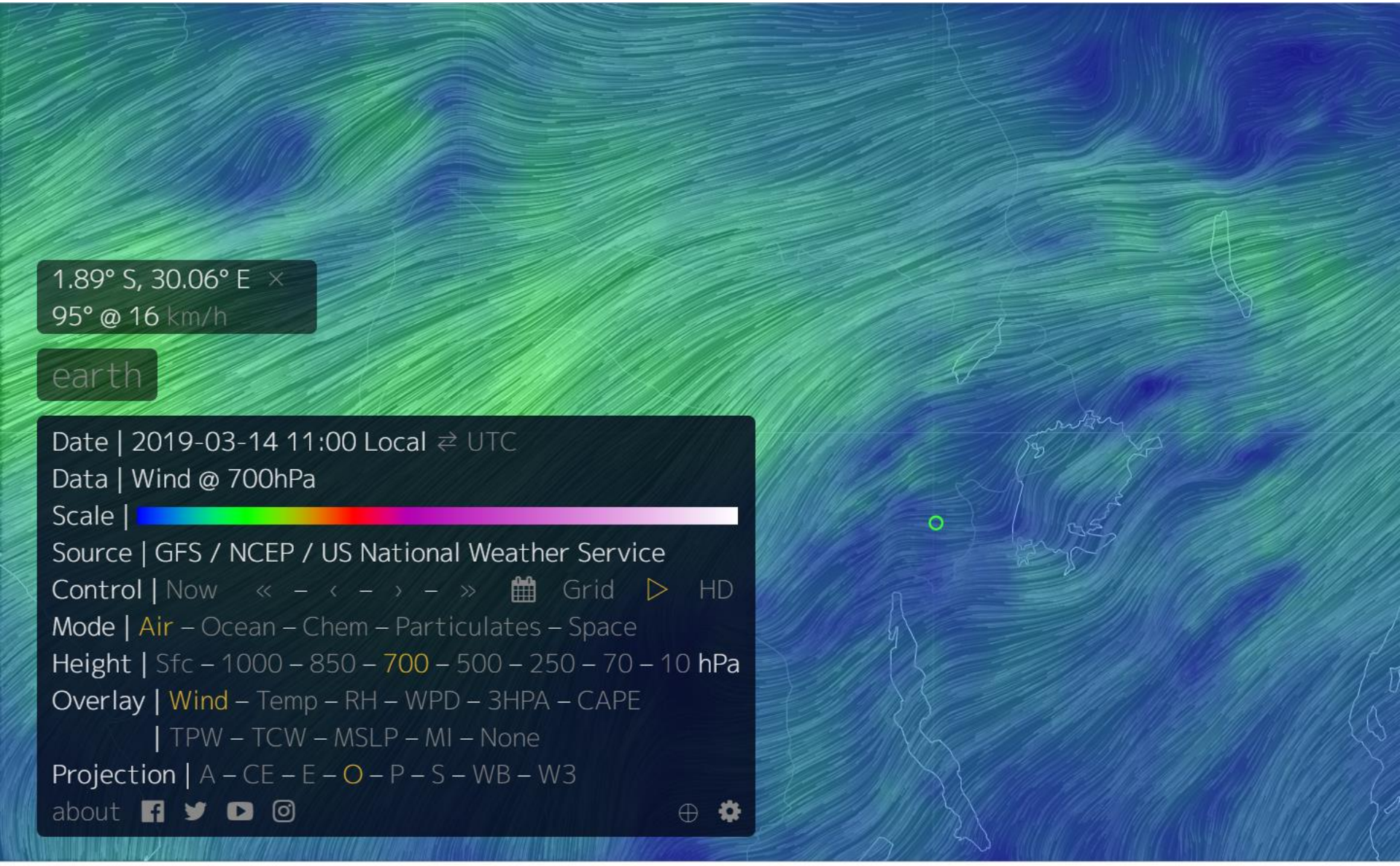
Surface winds in the night

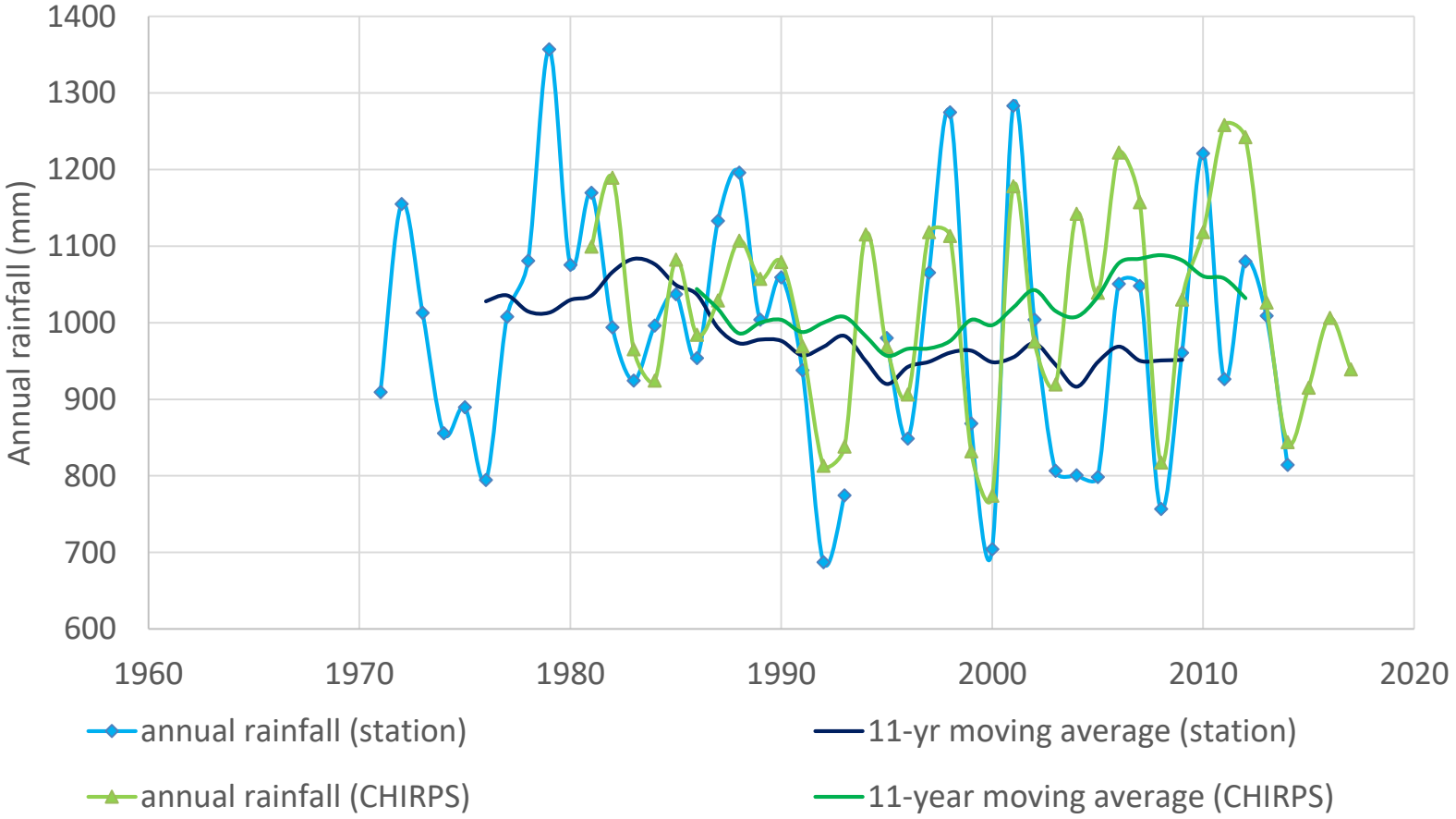


High level winds in the day

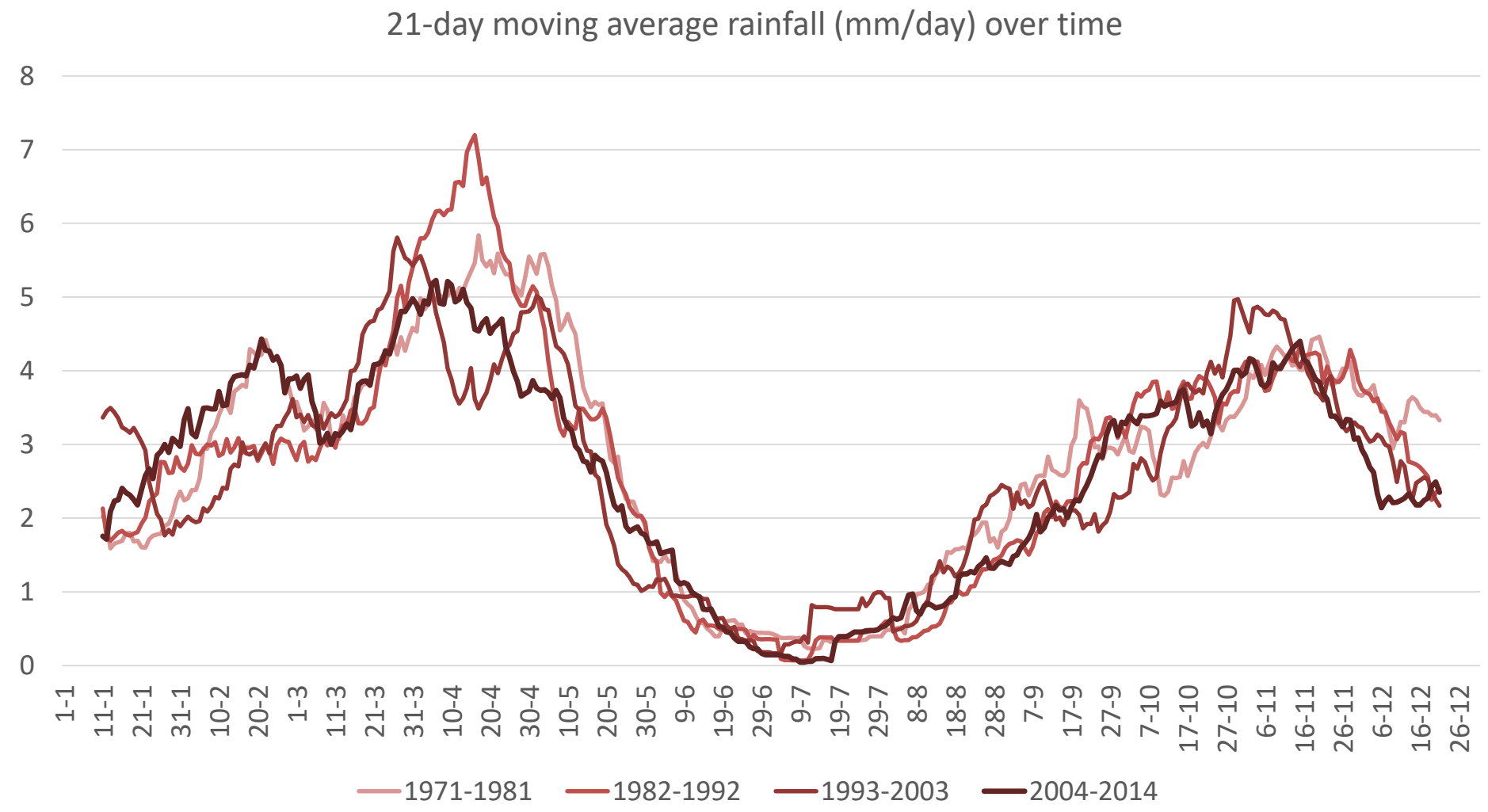


Rainfall trends

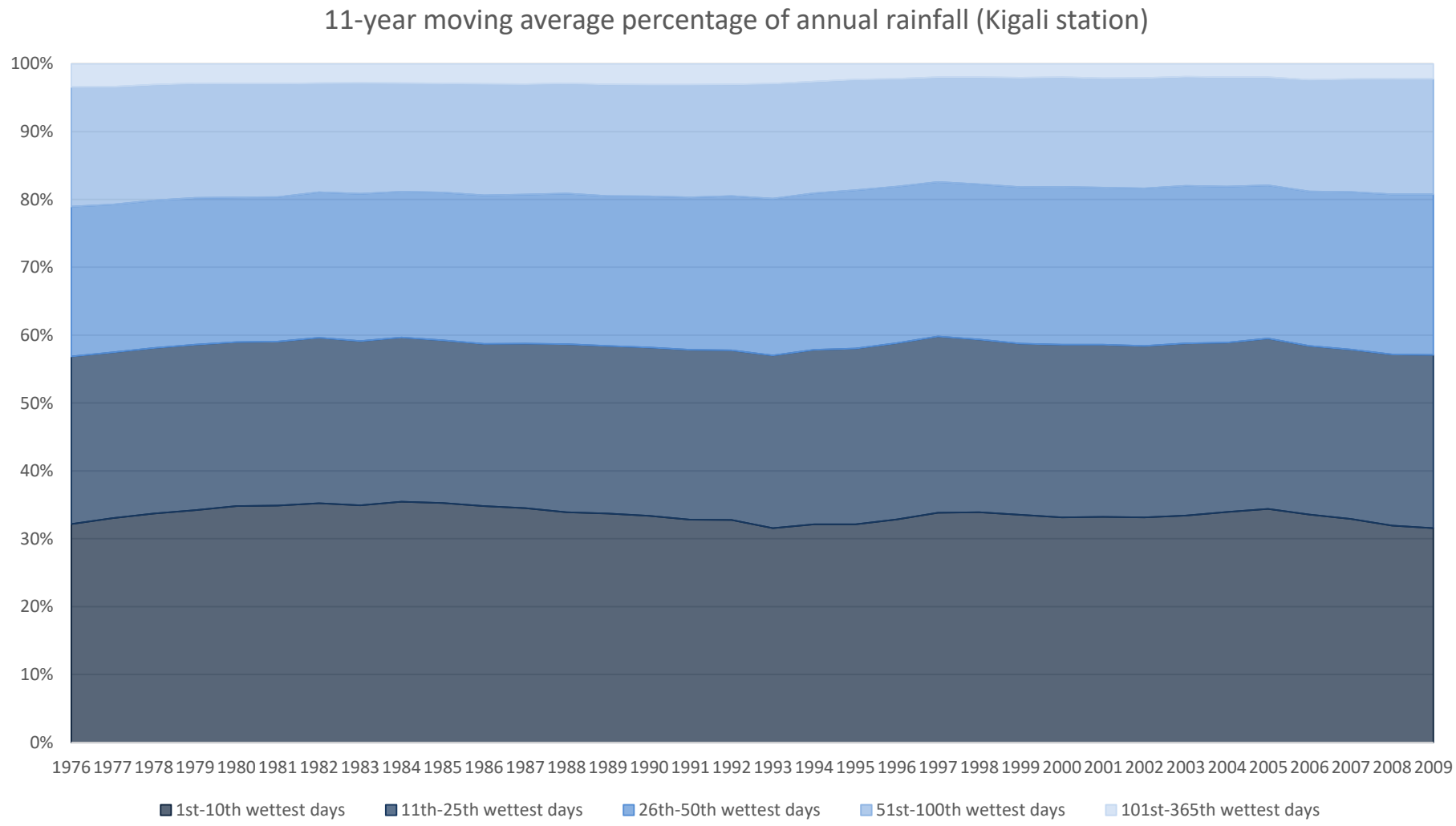
- Rainfall fluctuates from year to year
- Station data indicates decline, CHIRPS indicates stable trend



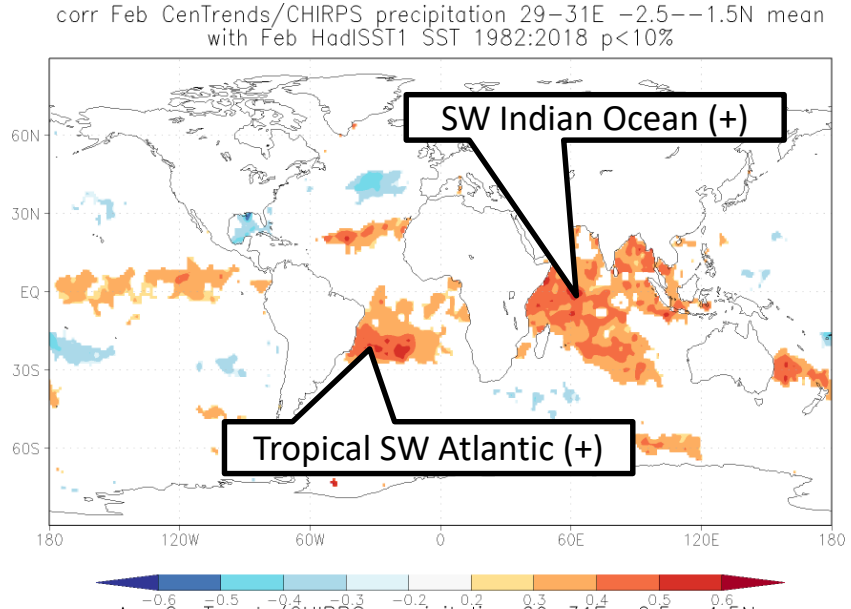
Changes within the year

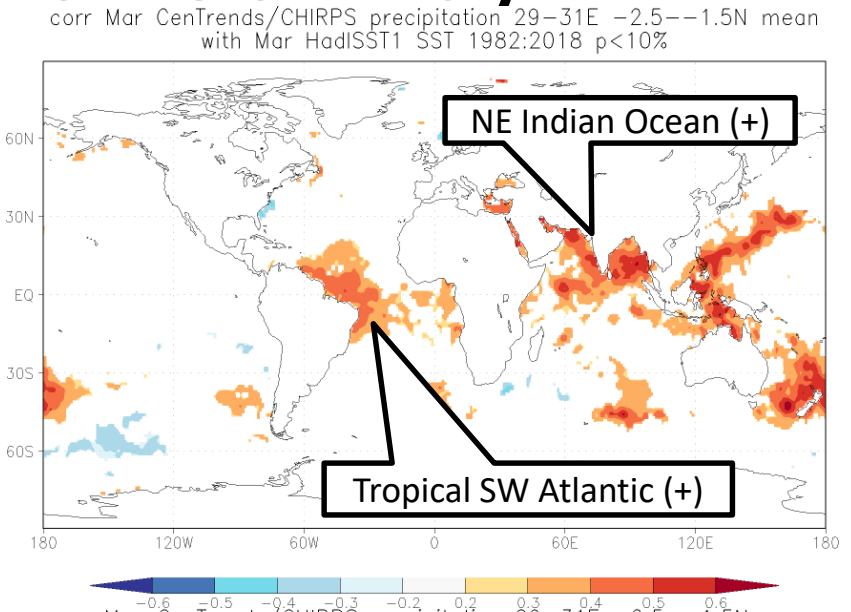


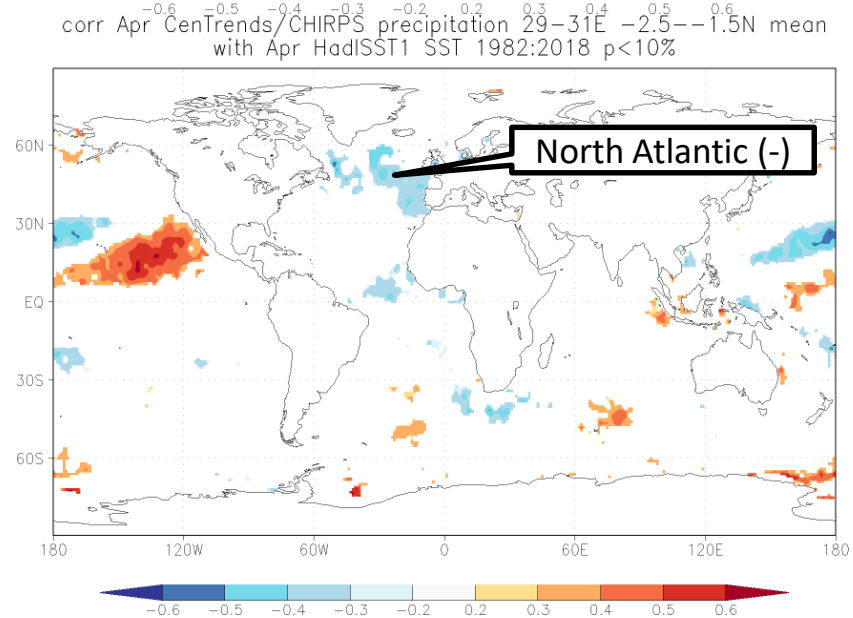
Peak rainfall has not changed despite substantial warming

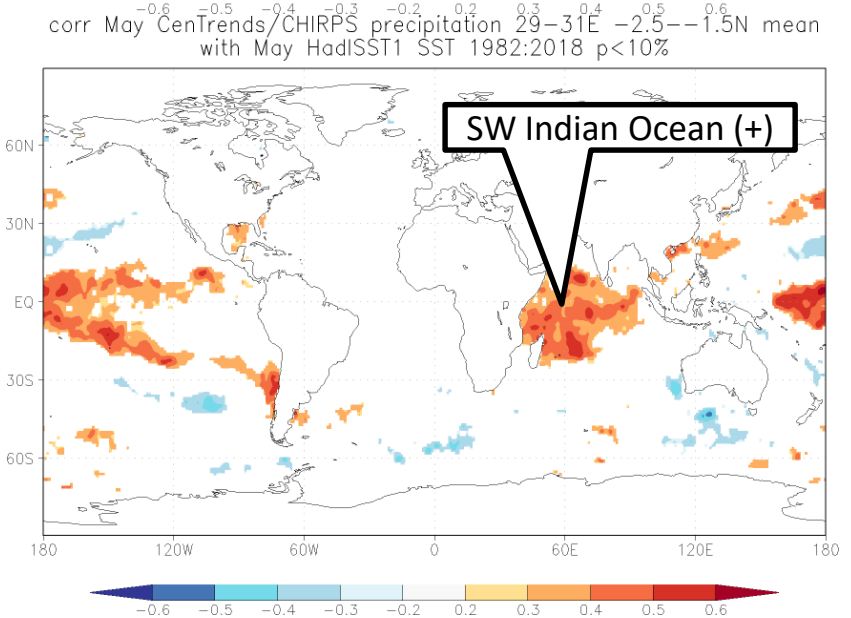


SST correlations Feb-May

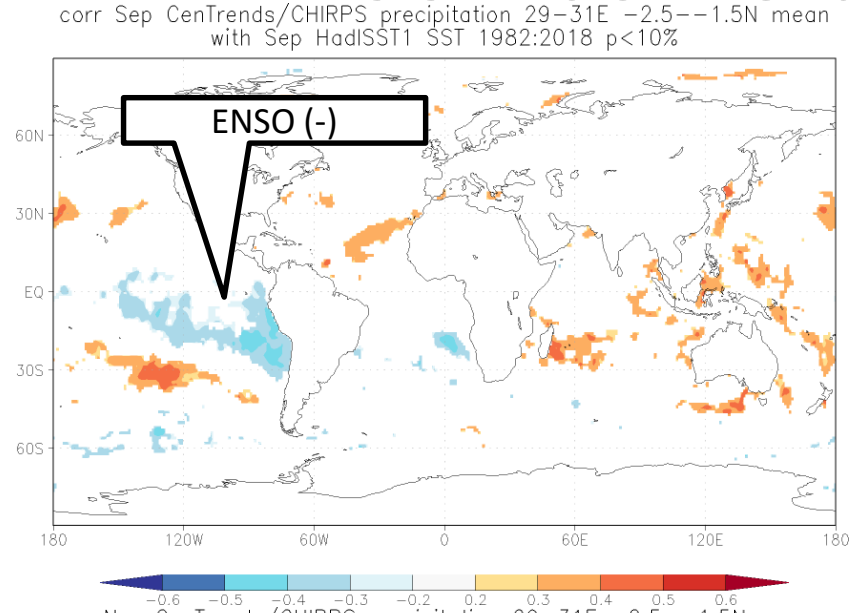


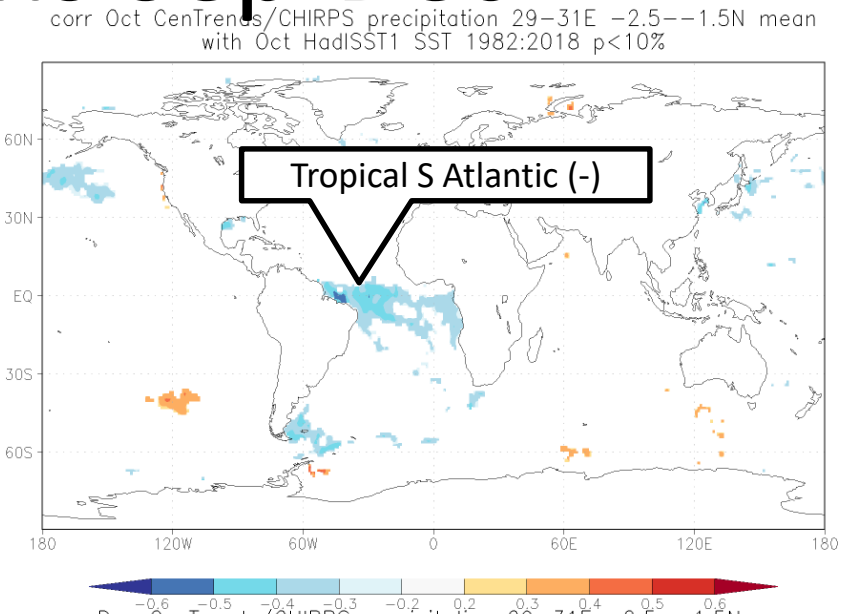


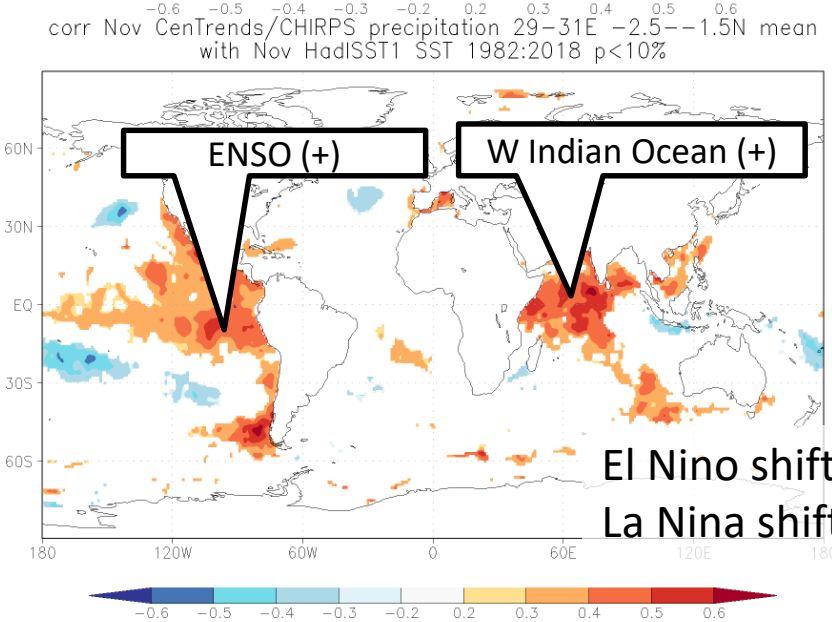


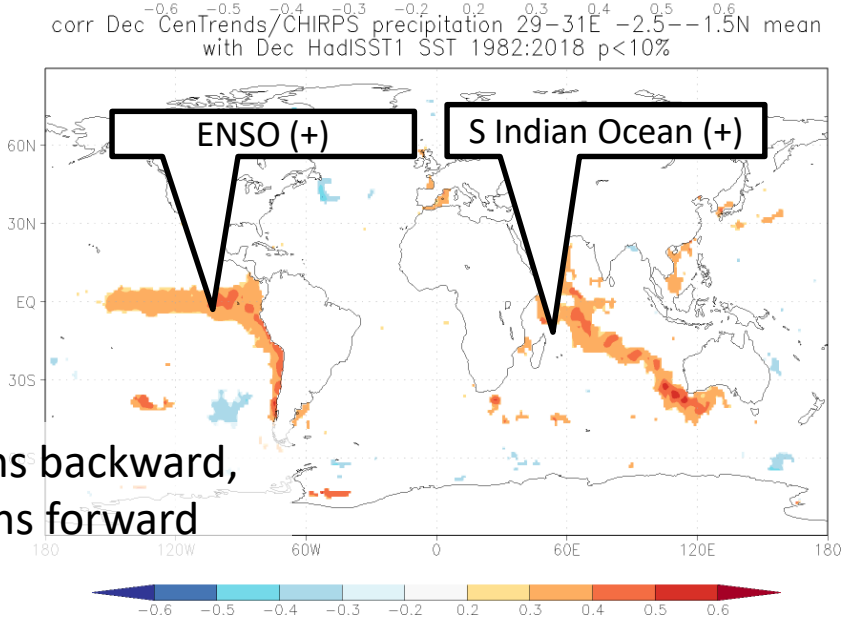


SST correlations Sep-Dec









El Nino shifts the rains backward,
La Nina shifts the rains forward

Questions for further study

- Which datasets are reliable?
- What do these data tell us about regional changes?
- What else explains rainfall variability?
- Can we quantify the effect of land use change (and landscape restoration)?
- What does all this mean for future expectations?