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Air pollution due to ozone continues to **increase** in the tropics

Methods

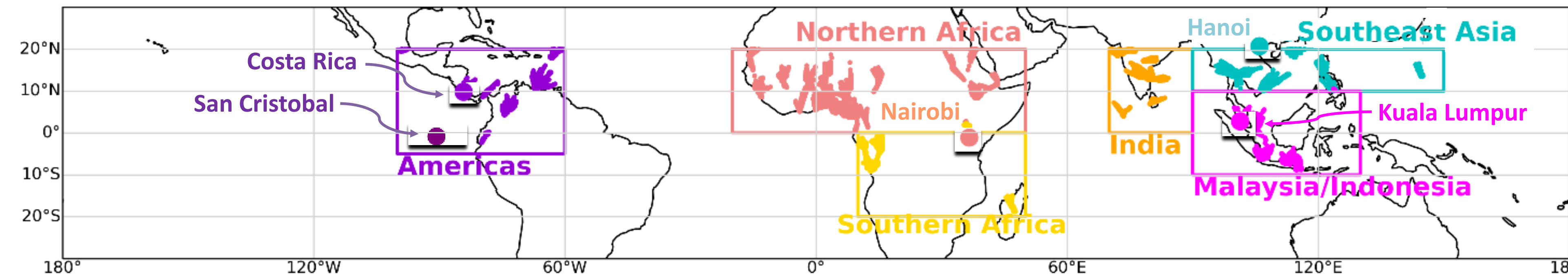
Profiles of ozone from the commercial aircraft program IAGOS and the ozonesondes network SHADOZ averaged on a common vertical resolution of 50 hPa.

For IAGOS, 6 key regions available. All profiles from all flights averaged within a same defined region.

For SHADOZ, 5 sites where ozonesondes are launched located within IAGOS regions. These profiles are merged with IAGOS ozone profiles.

Annual trends using quantile regression and account for ENSO (El Niño-Southern Oscillation) and QBO (quasi-biennial oscillation).

Trend Model:
anomaly = $b_0 + b_1 \text{Trend} + b_2 \text{ENSO} + b_3 \text{QBO}(30\text{mb}) + b_4 \text{QBO}(50\text{mb}) + \text{Noise}$
where b_0 is the intercept, b_1 is the linear trend, b_2 is the regression coefficient for ENSO, b_3 and b_4 are coefficients for QBO at 30 and 50 mb, respectively.



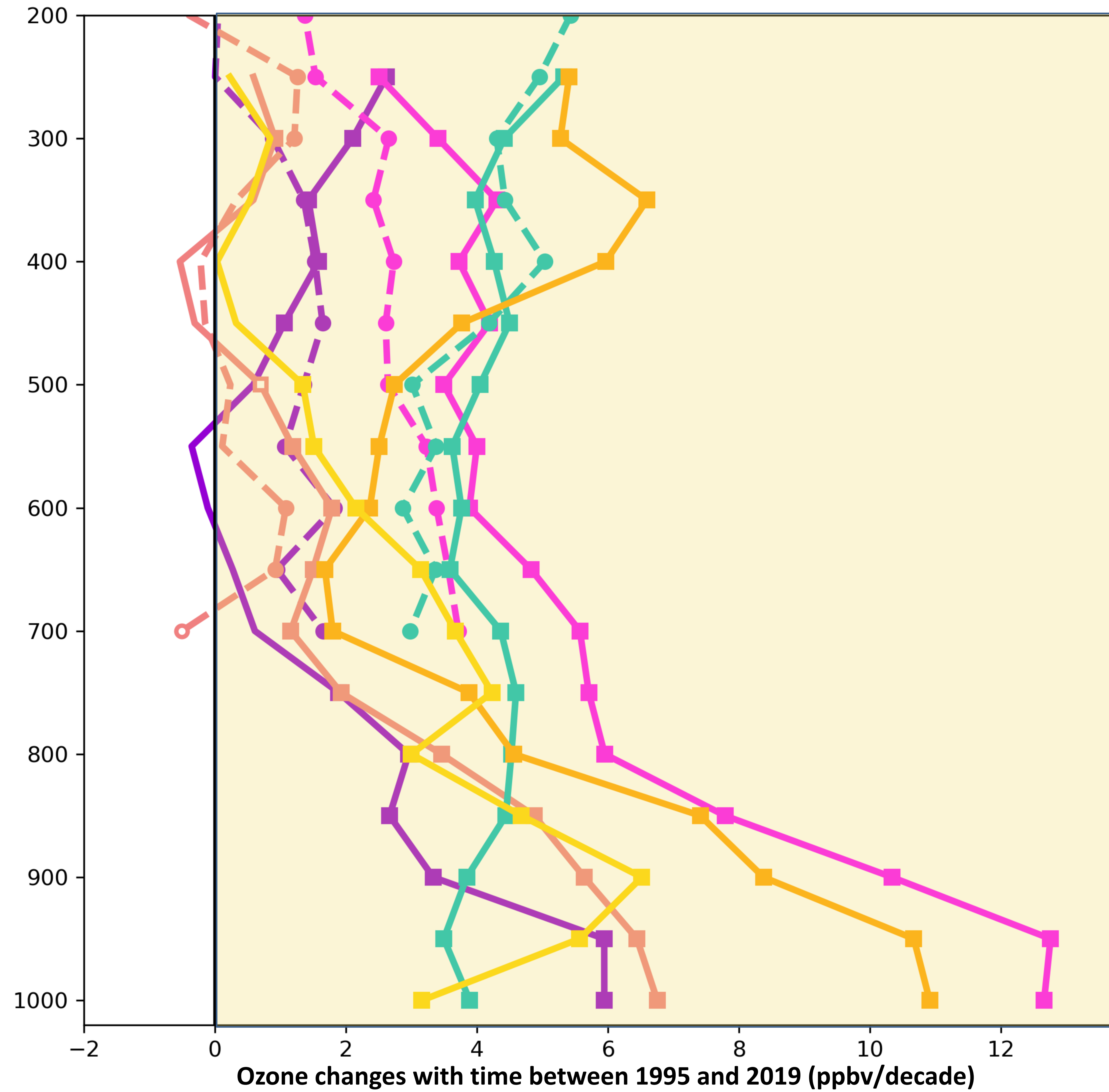
Commercial aircraft program



Ozonesondes network



Pressure level (hPa)



- Commercial aircraft only
- - Commercial aircraft + ozonesondes
- - Americas
- - Malaysia/Indonesia
- - Northern Africa
- - Southeast Asia
- - India
- - Southern Africa

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IAGOS and SHADOZ teams made high quality ozone profiles over the tropics publicly available.

Dr. Kai-Lan Chang conducted the statistical analysis of the ozone trends.



Check out the Ozone and Precursors in the Tropics (OPT) working group for TOAR-II

