



# TES Observations of Global Tropospheric Ozone and CO: Characteristics of Their Seasonal and Vertical Distributions

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TES observations of tropospheric CO and Ozone:  
global distributions in the lower/mid/upper troposphere,  
seasonal variations in regions, and long term trends

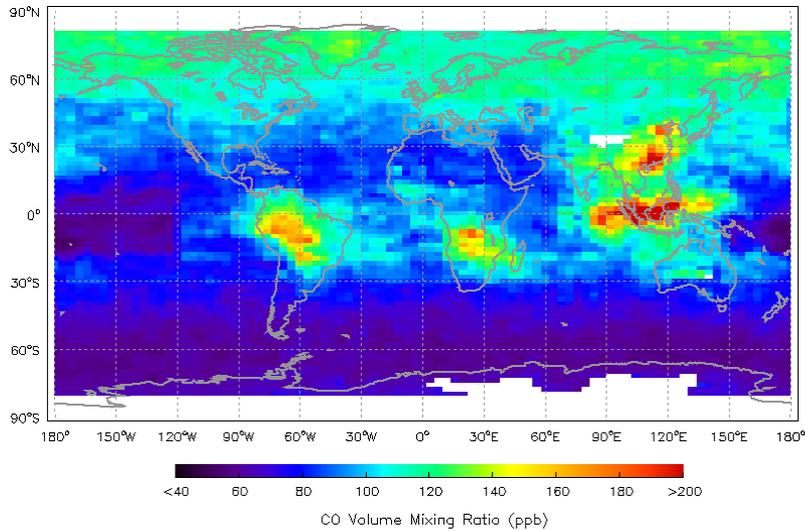
<http://tes.jpl.nasa.gov/visualization/>

- Browsing plots/images for TES products of Ozone, CO and other species/temperature are made available on the TES public website.
  - **Monthly average** images for species **global distributions** on selected tropospheric pressure levels.
  - **Time vs. pressure** curtain plots for species height dependent seasonal variations and **long-term trends** in selected regions.
  - Detailed diagnostic plots (e.g., averaging kernels) for **Special Observations** taken in science campaigns.
  - Daily interpolated global species distribution images for TES Global Surveys.
  - Images mapped / located on Google Earth.

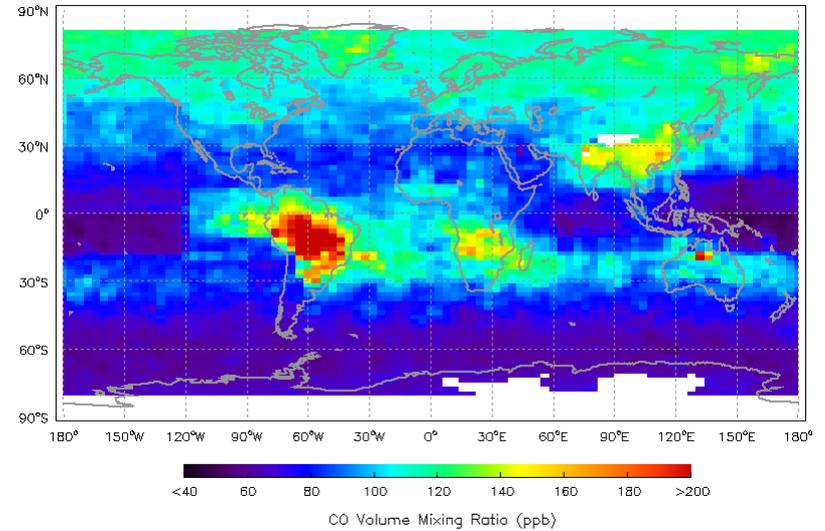


# Global Distributions of TES CO and Ozone at 681 hPa

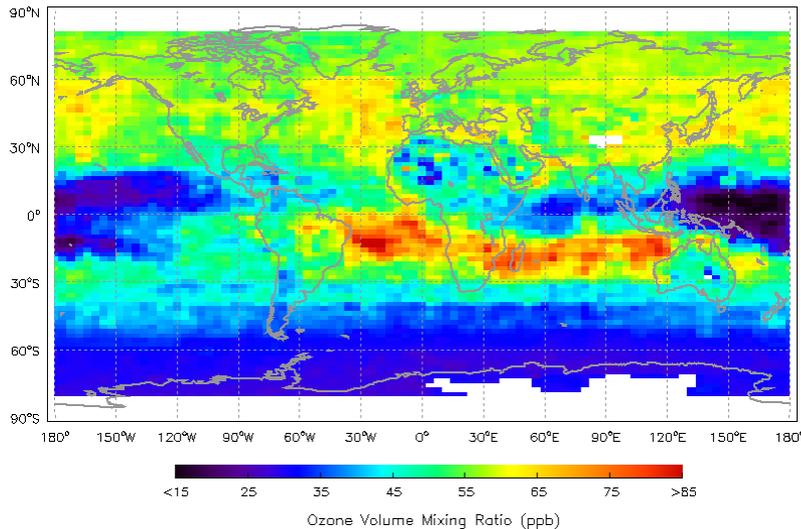
## CO: Oct 2006



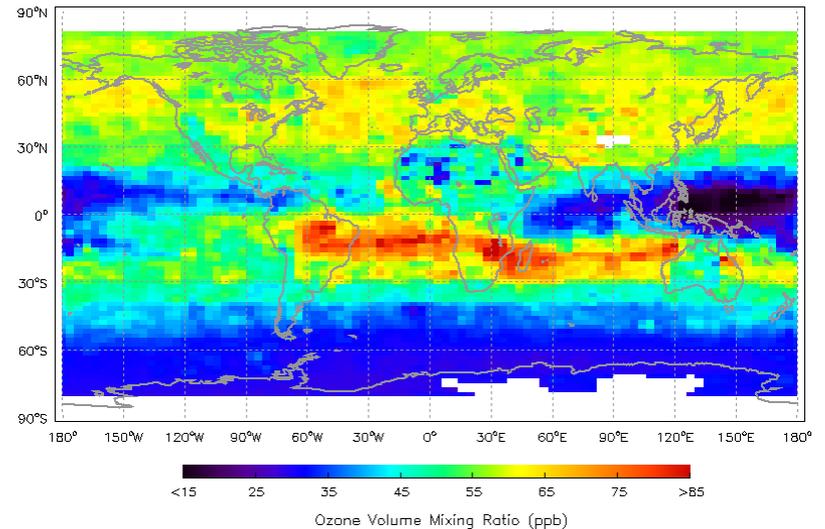
## CO: Oct 2007



## Ozone: Oct 2006



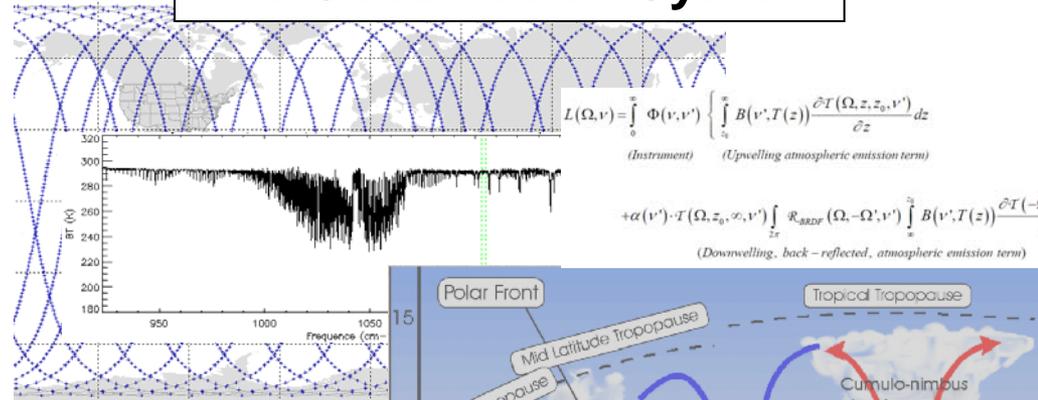
## Ozone: Oct 2007



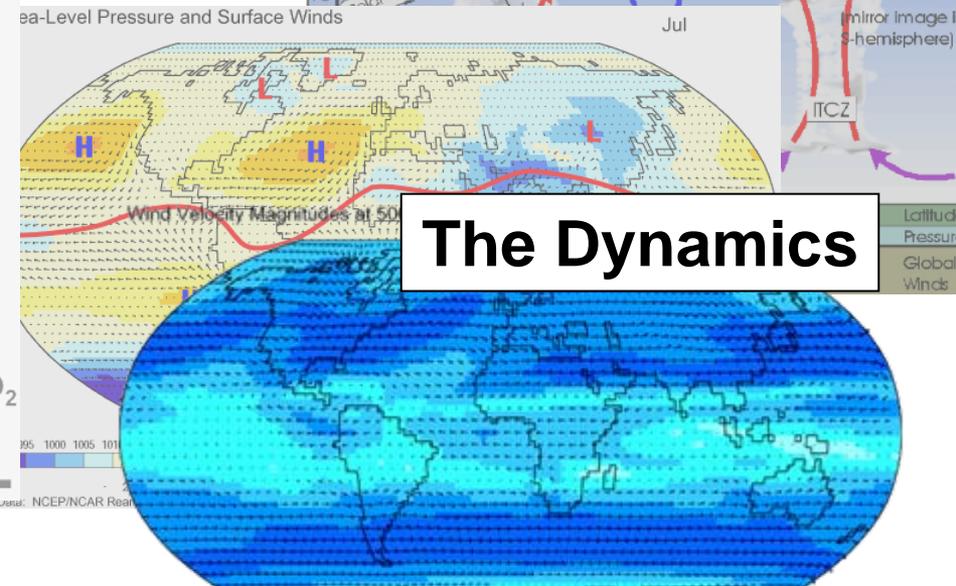
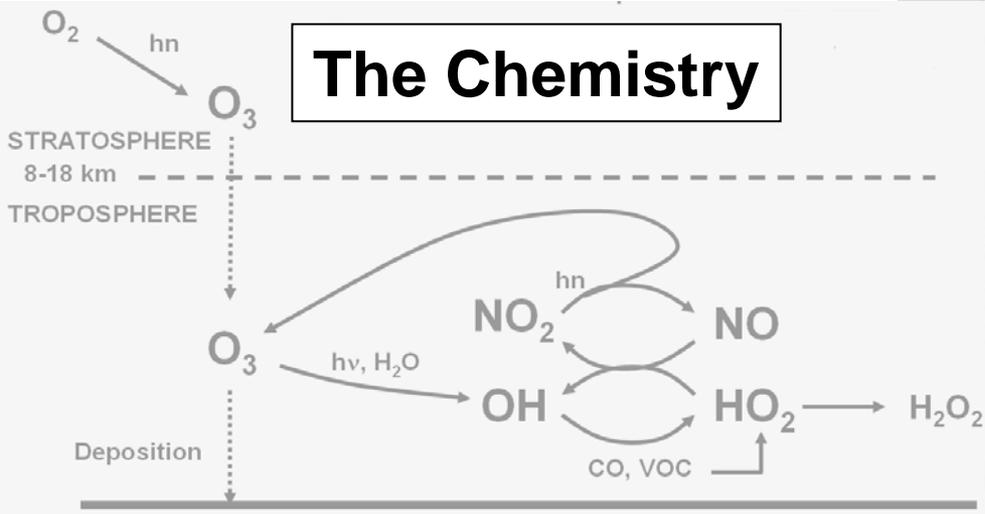


The Distributions of TES Observed Ozone and CO fields are determined by many factors, including ...

# The Observation System

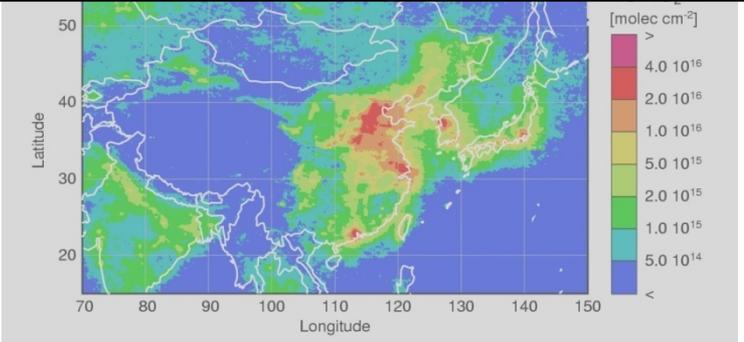


# The Chemistry

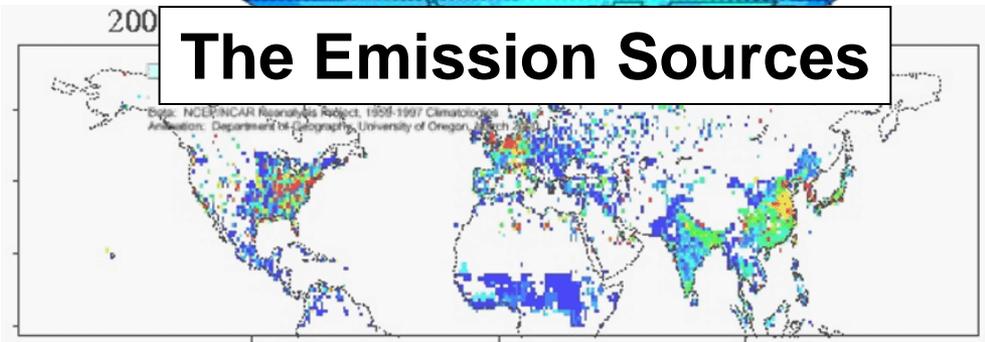


# The Dynamics

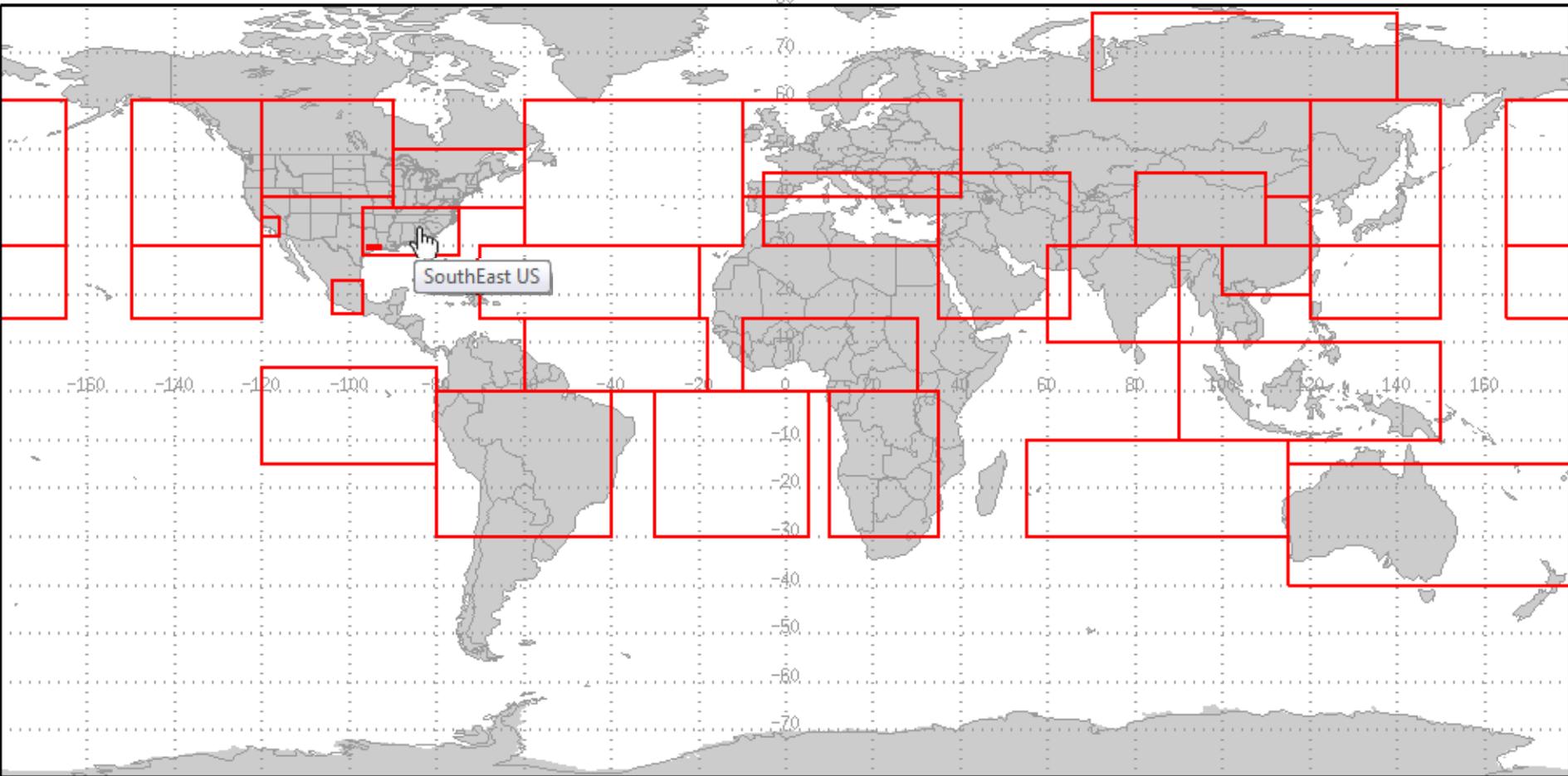
# The Distributions of Other Species



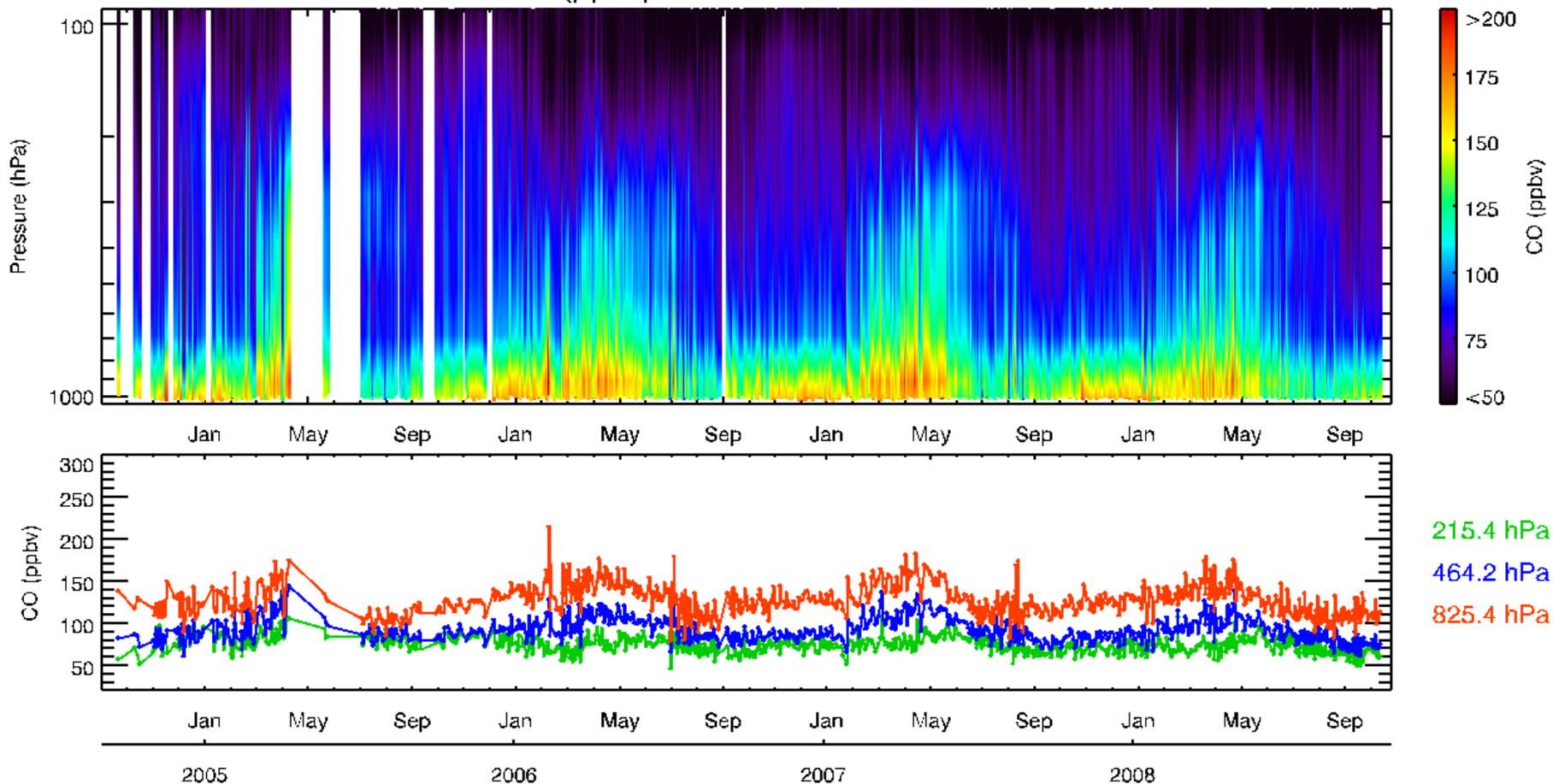
# The Emission Sources



Regions for the TES species time-trend plots: **Click on the area box** or **pick from the list below**

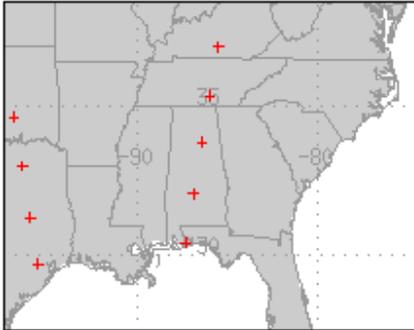


### TES CO (ppbv) Time Trend: US: South-East

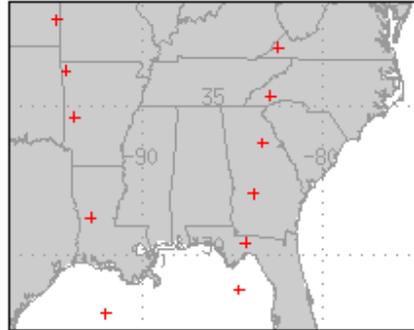


Geolocations of TES Observations for Profile Averaging: US: South-East

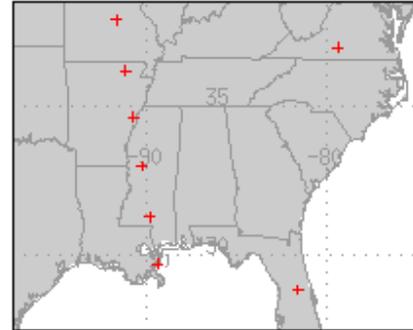
9/ 2/2007



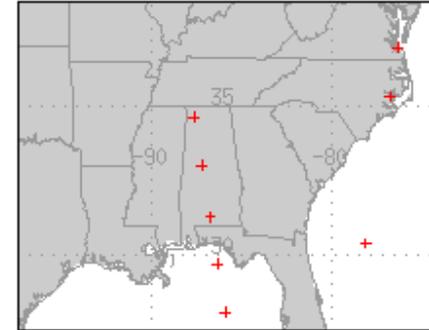
9/ 4/2007



9/ 6/2007



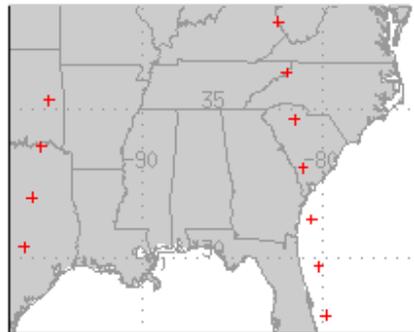
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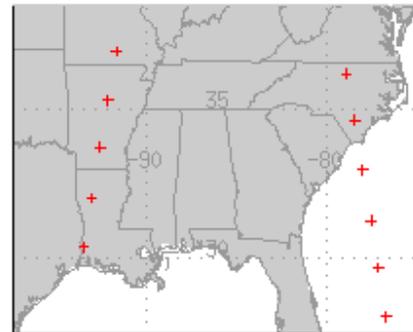
9/10/2007



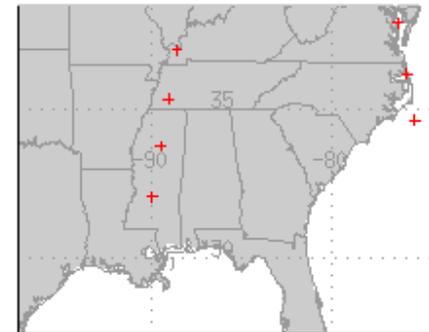
9/12/2007

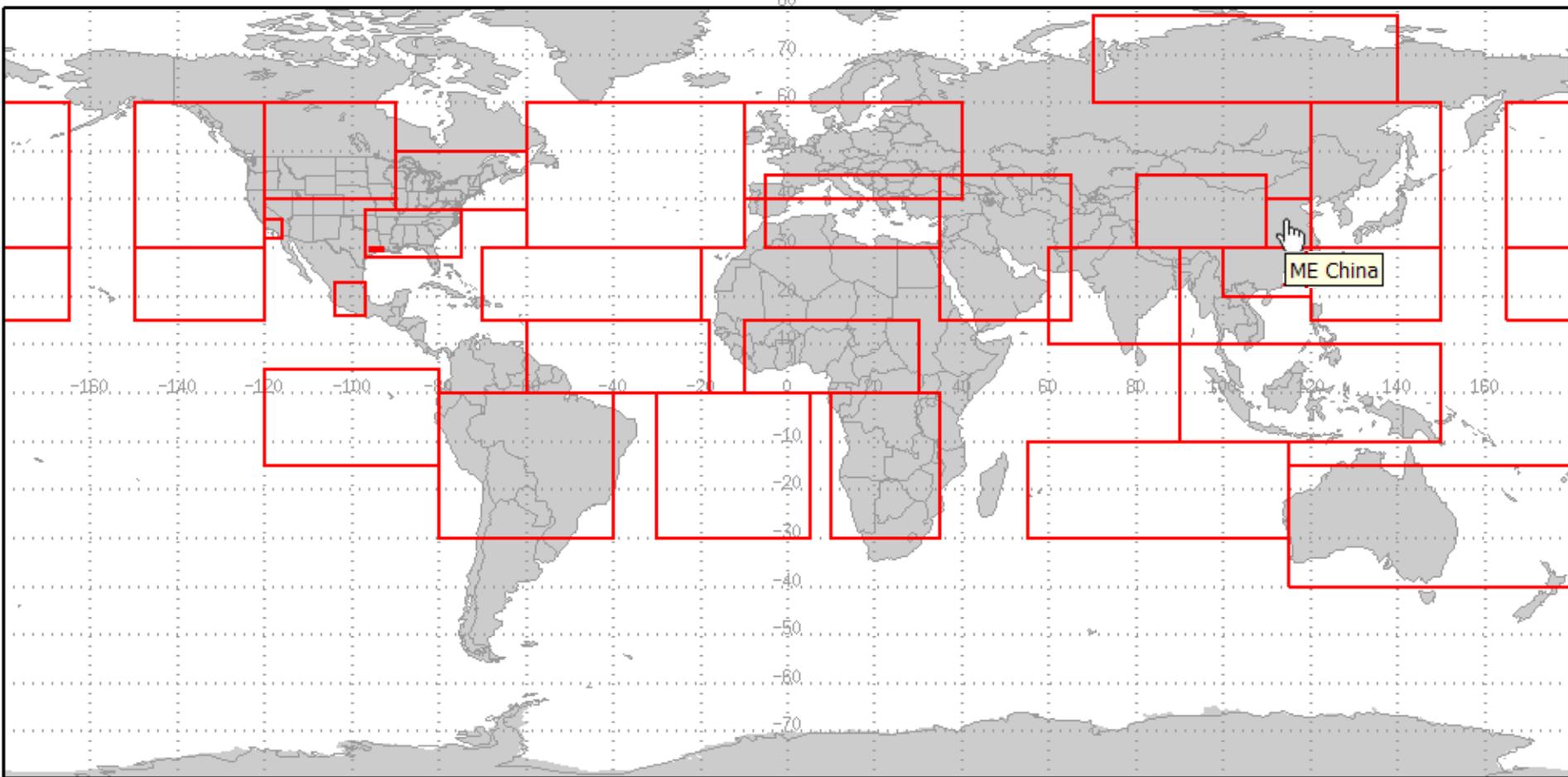


9/14/2007

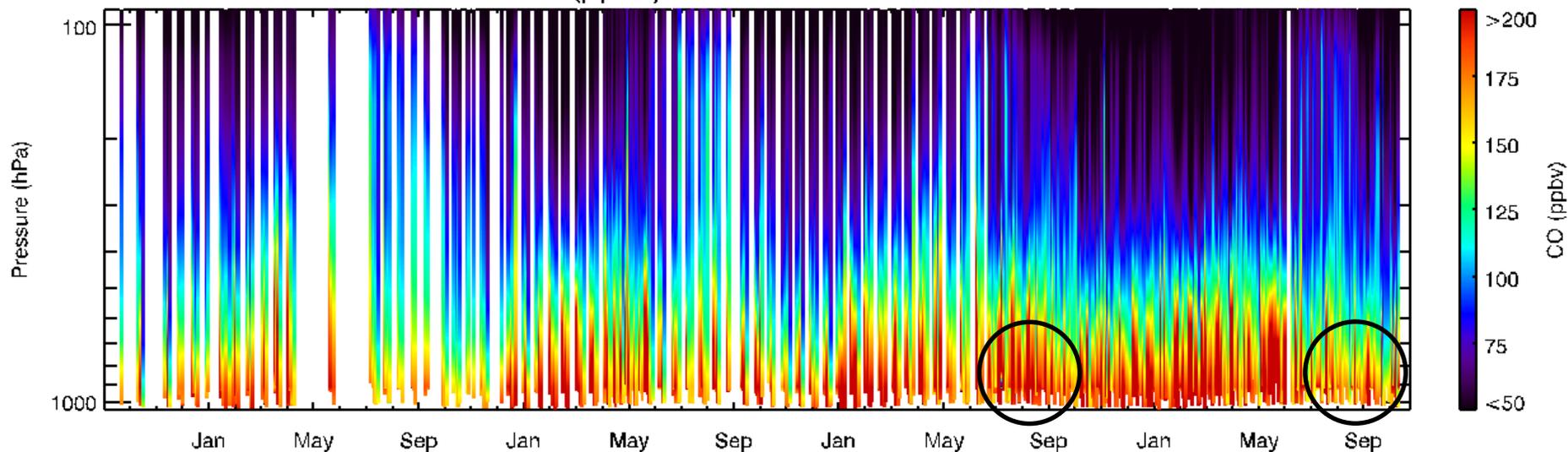


9/16/2007

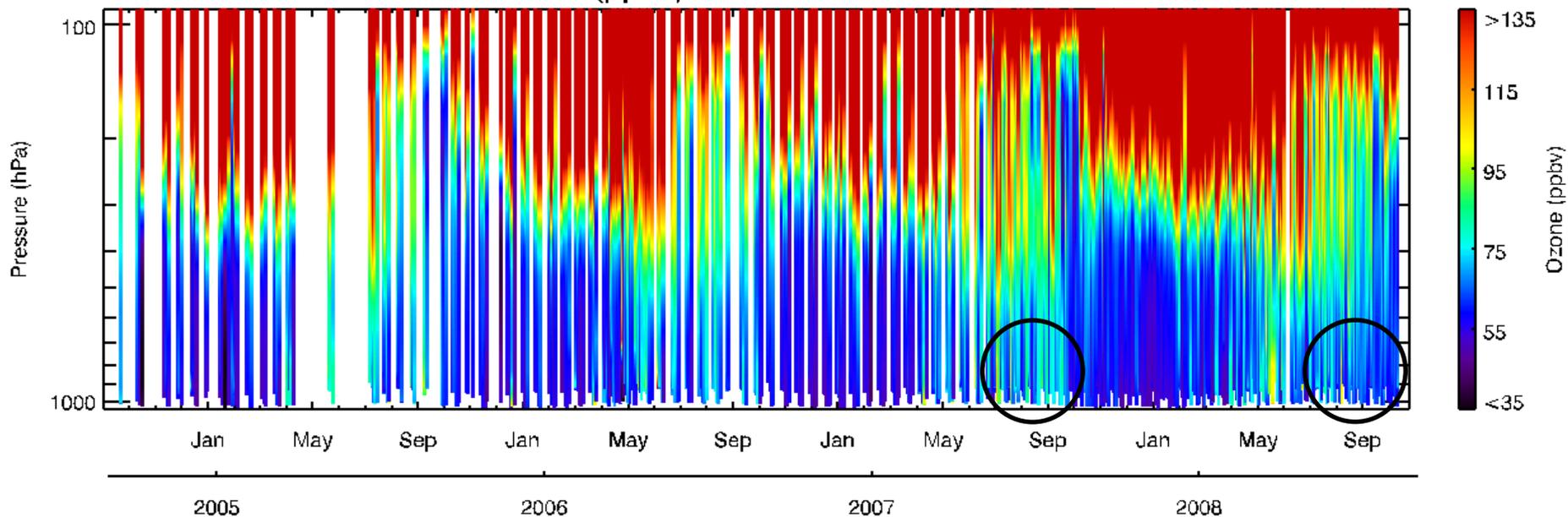


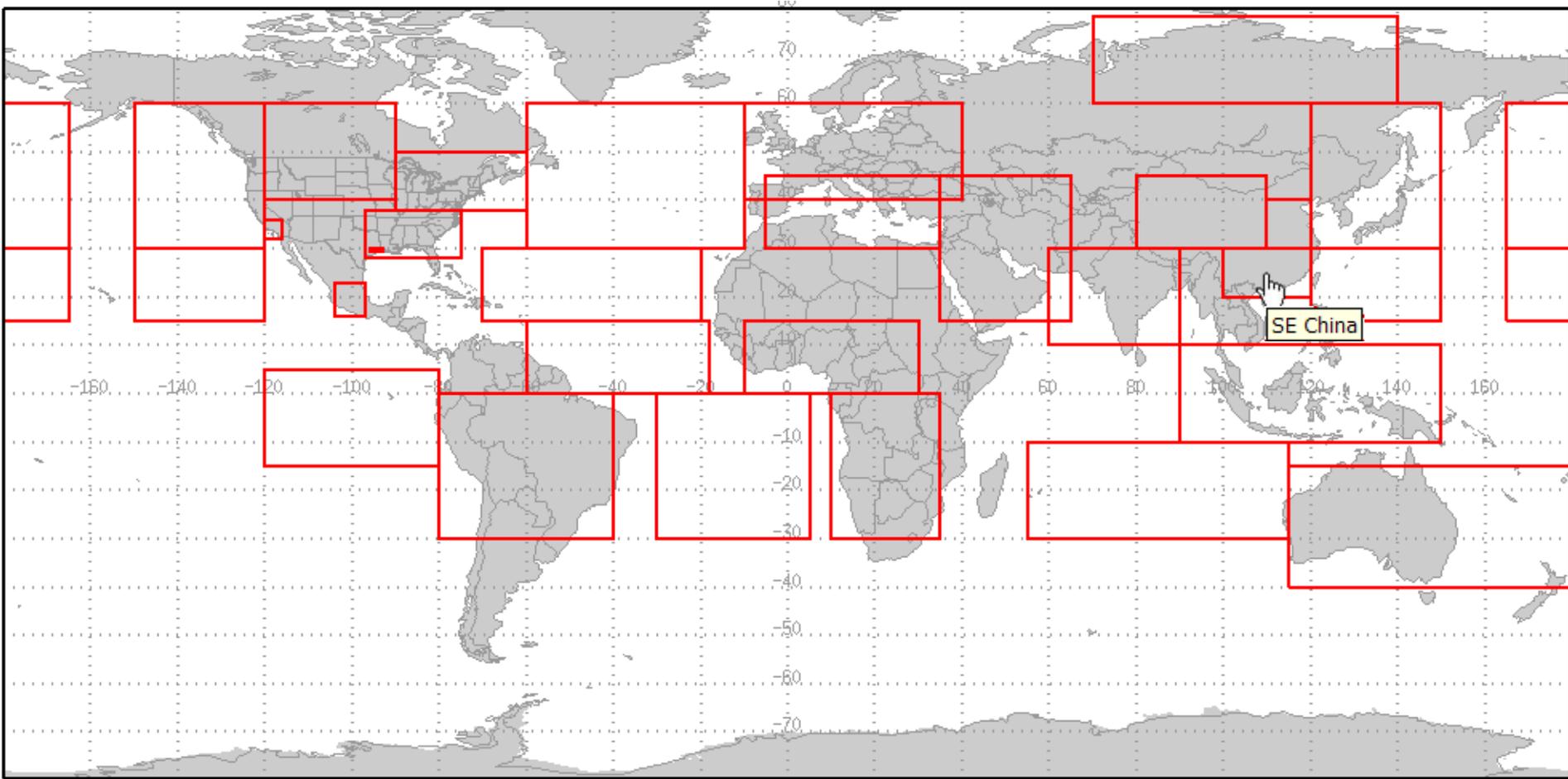


TES CO (ppbv) Time Trend: Mid-East China

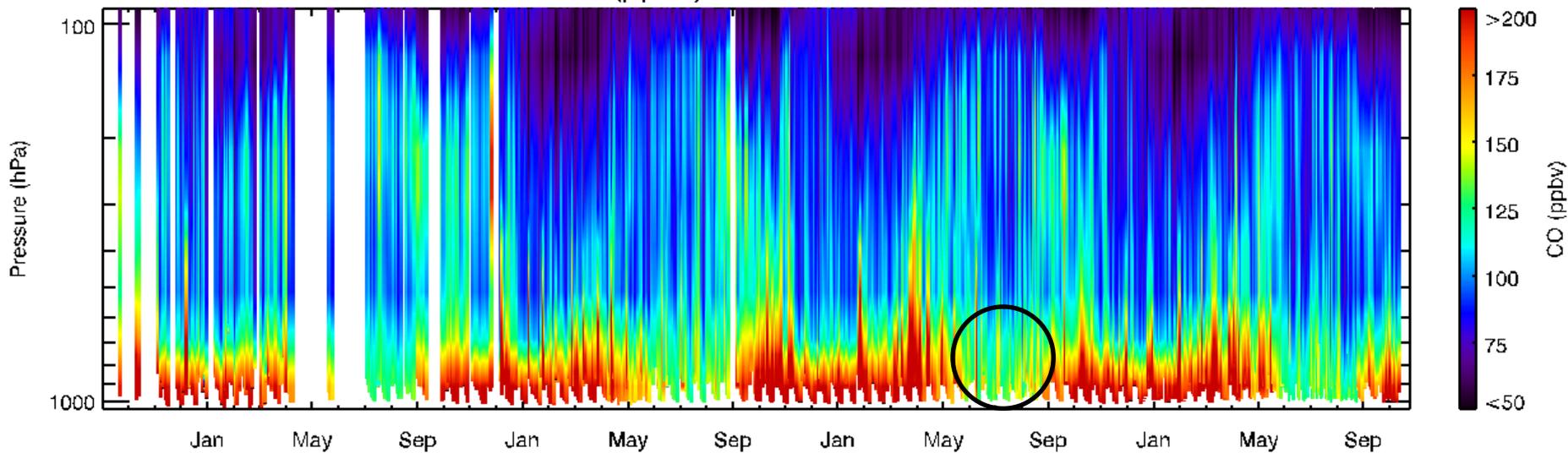


TES Ozone (ppbv) Time Trend: Mid-East China

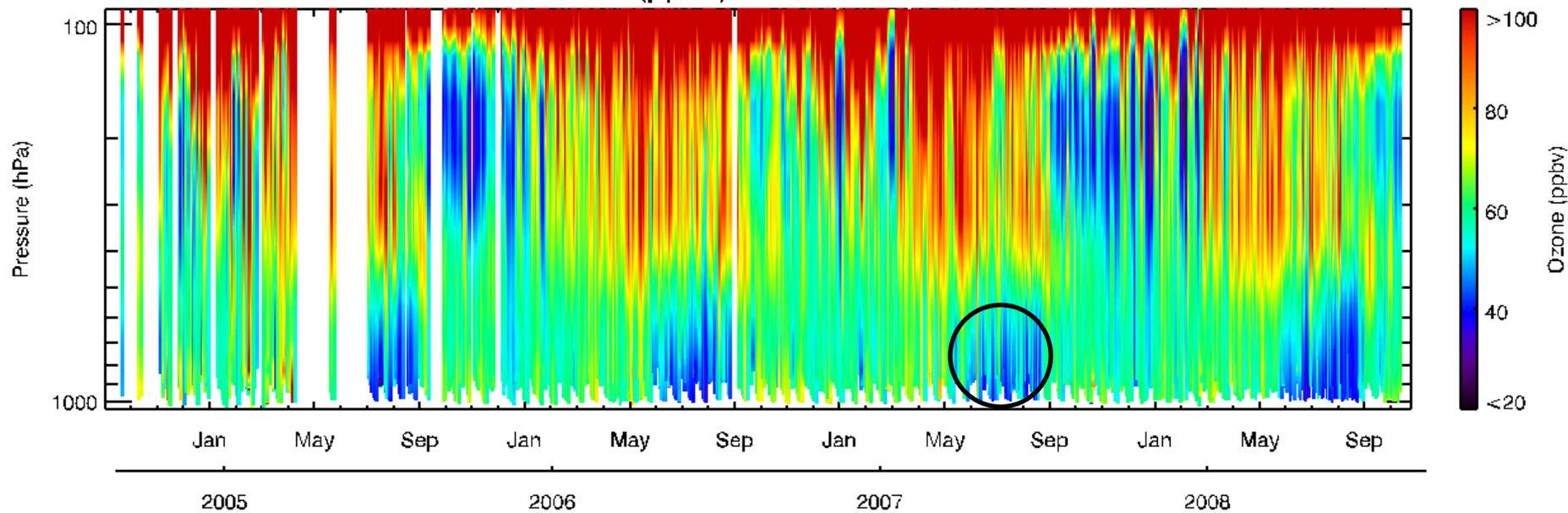




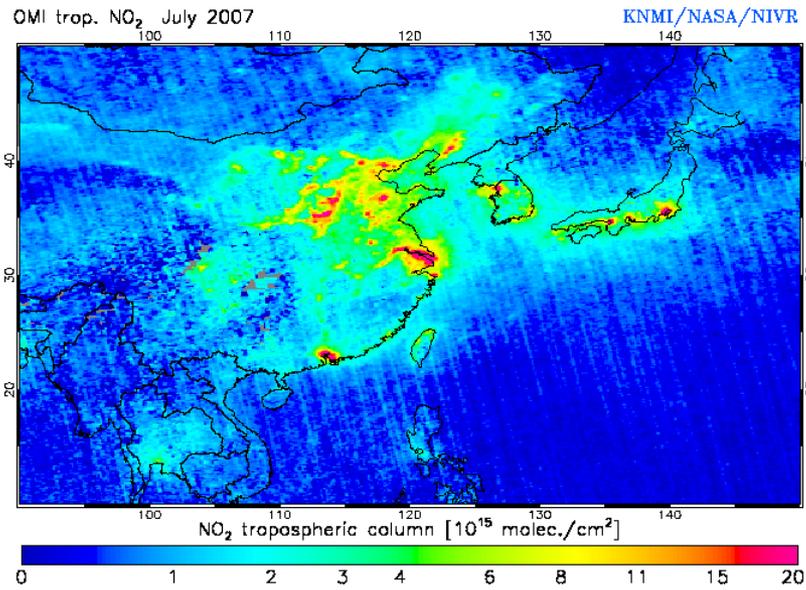
TES CO (ppbv) Time Trend: SE China



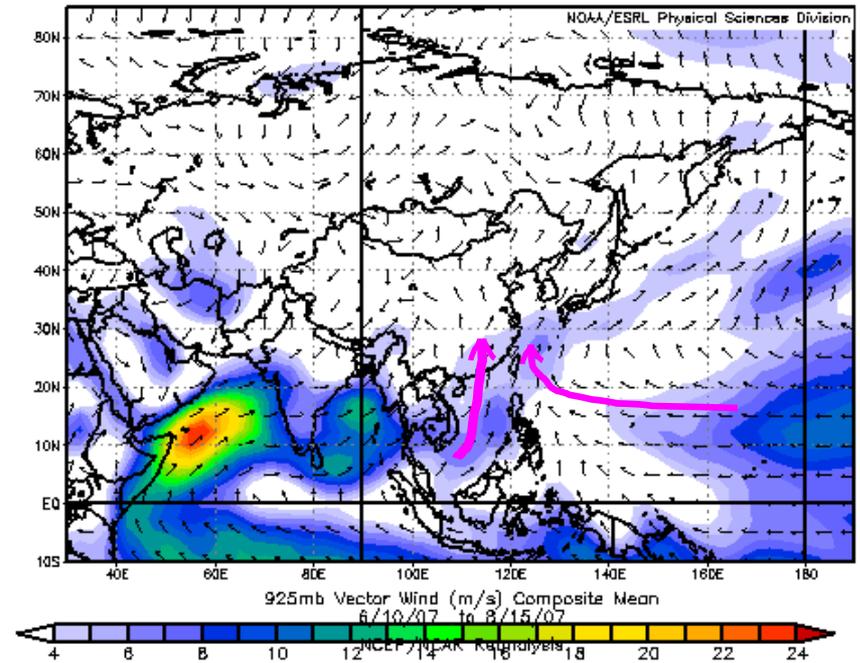
TES Ozone (ppbv) Time Trend: SE China



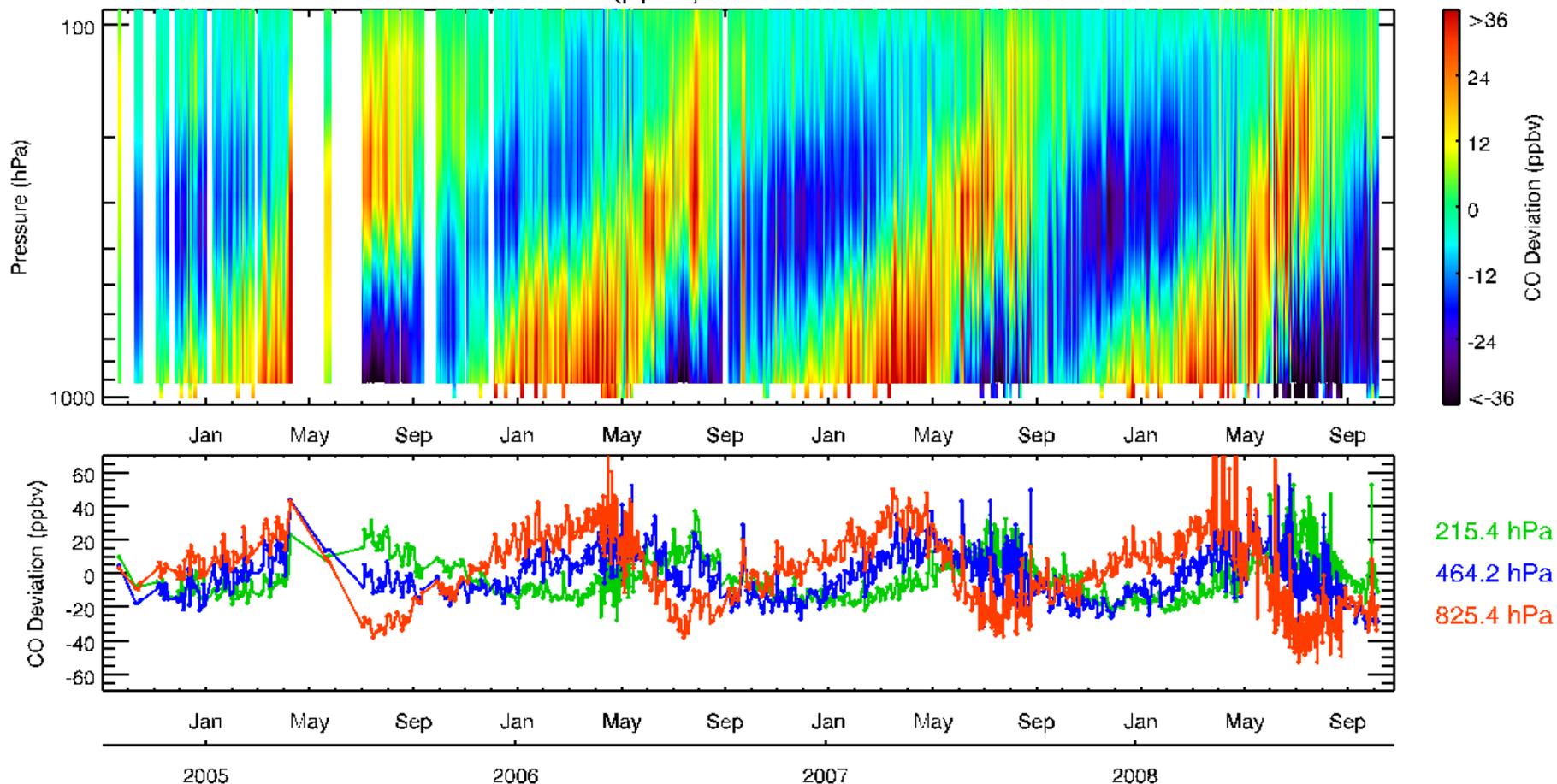
# OMI NO<sub>2</sub> Tropospheric Column: July 2007



# NCEP/NCAR Reanalysis: Vector Wind at 925 hPa for Summer 2007



### TES CO Deviation (ppbv) Time Trend: North-West Pacific





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global distributions in the lower/mid/upper troposphere,  
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<http://tes.jpl.nasa.gov/visualization/>

- Applications
  - Understand TES observation strategies (**time / spatial patterns**) and **retrieval characteristics**.
  - **Validation** and **science investigations**.
  - Monitoring **long-term trends** and **anomalies**.
  - **Education** and outreach.

