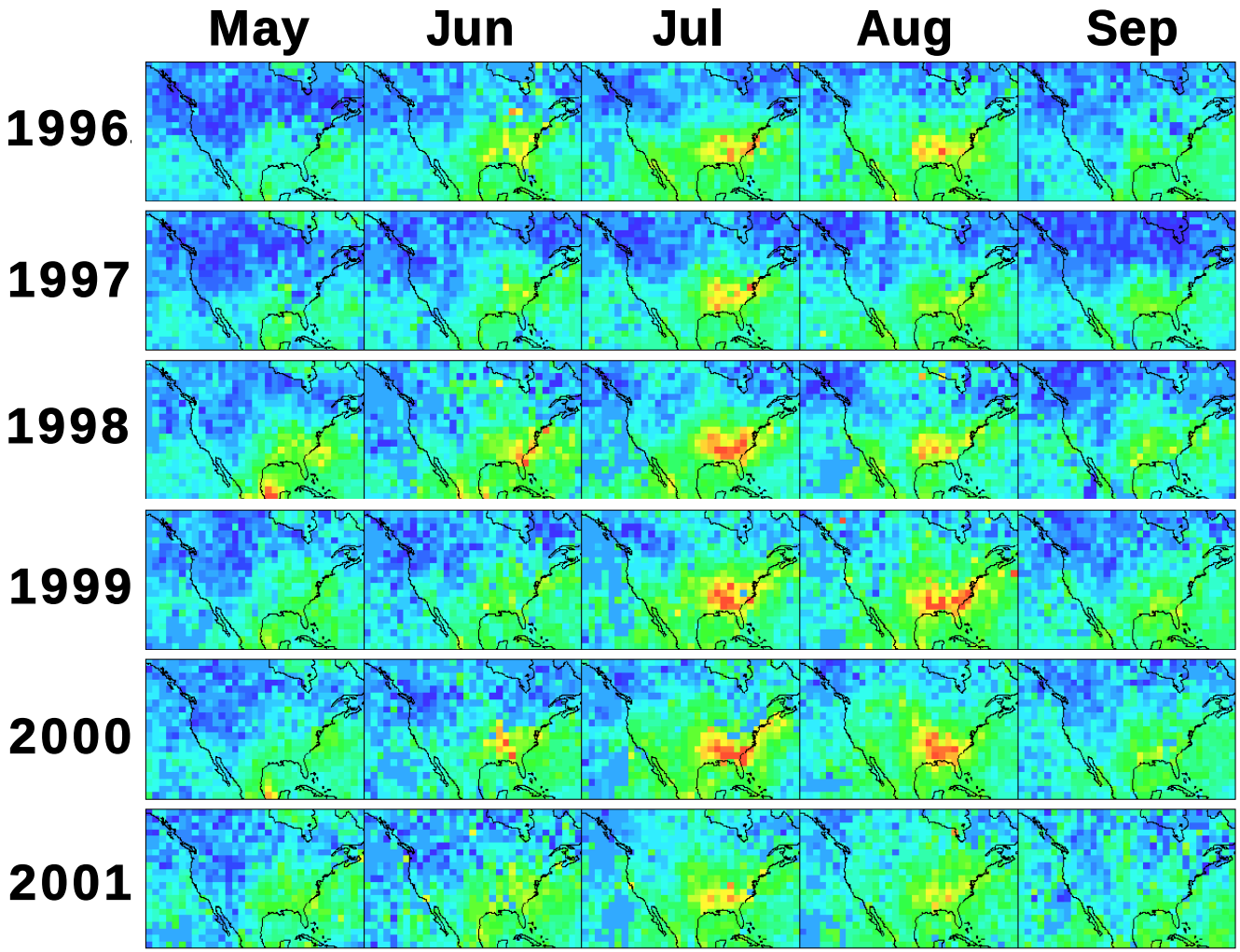
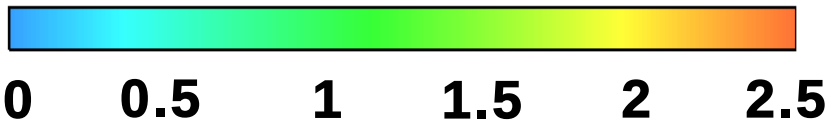
Improved Understanding of Biogenic Emissions Using HCHO Column Data: From GOME to OMI





GOME HCHO column
[10^{16} molec cm^{-2}]

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Kelly Chance,
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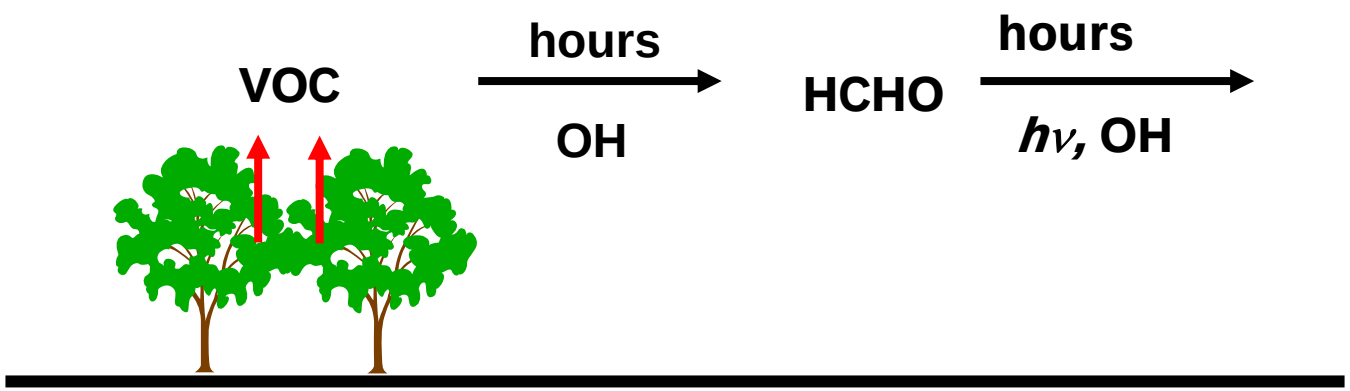
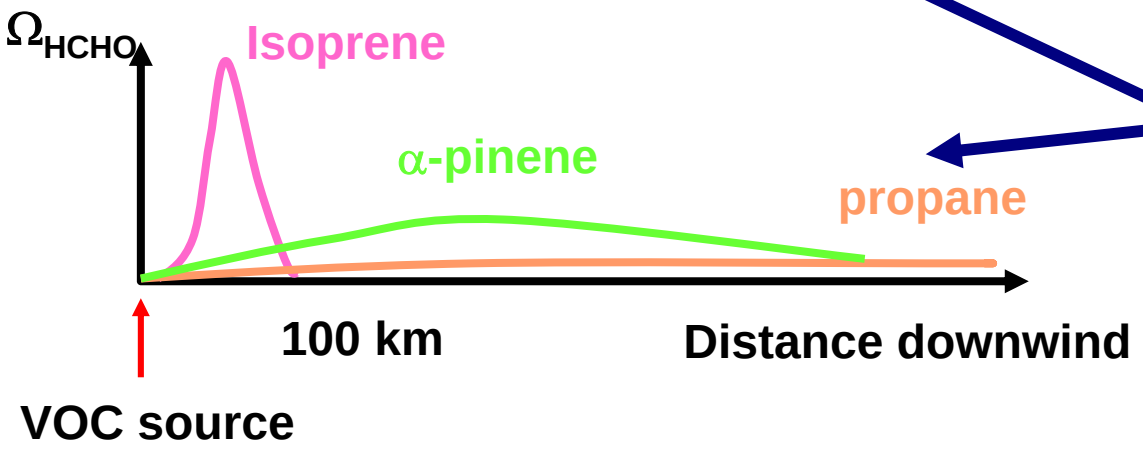
Relating HCHO Columns to VOC Emissions



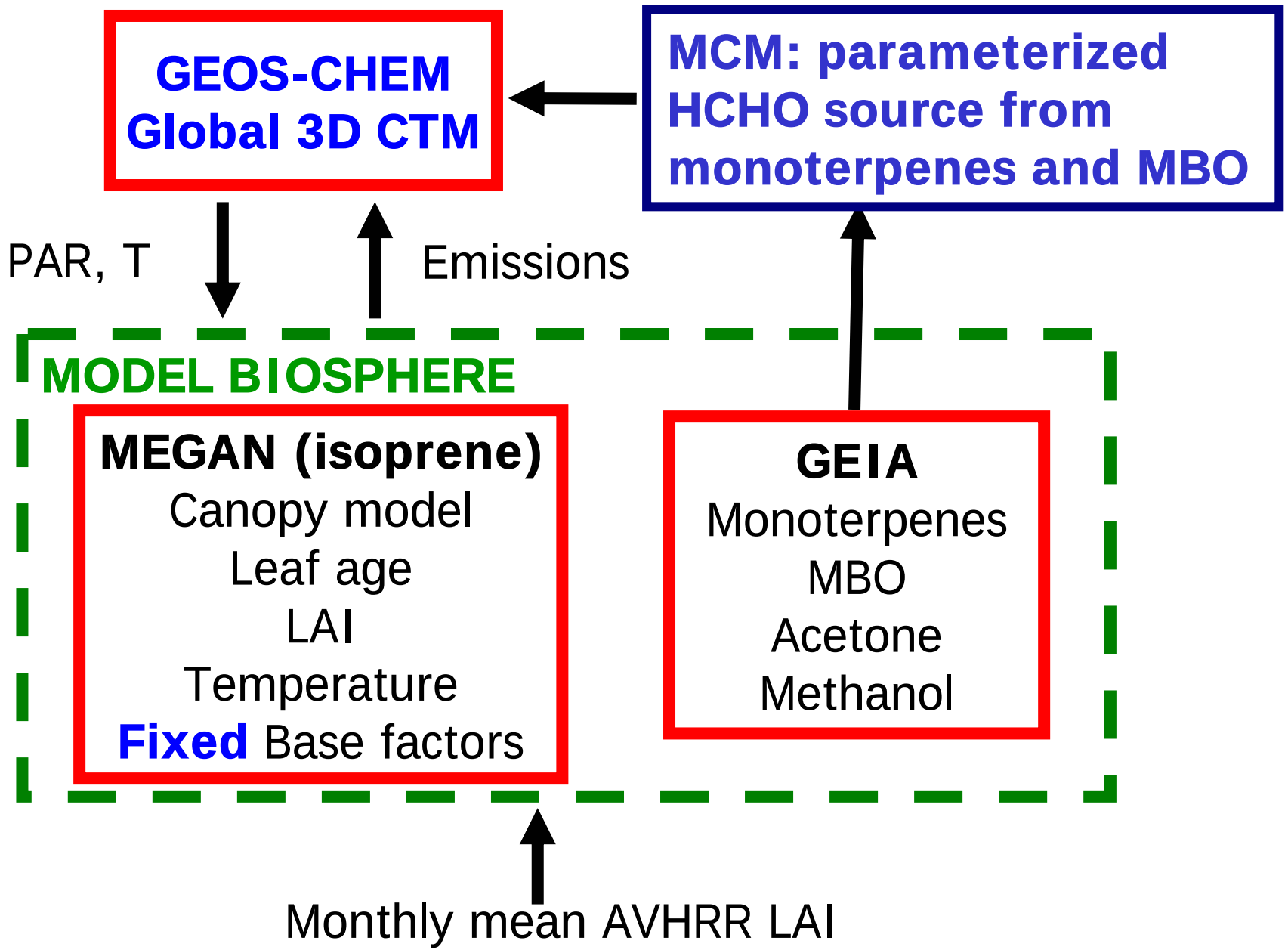
$$E_{VOC} = \left[\frac{k_{HCHO}}{\sum (k_{VOC} Y_{VOC \rightarrow HCHO})} \right] \Omega_{HCHO}$$

Local linear relationship between HCHO and E

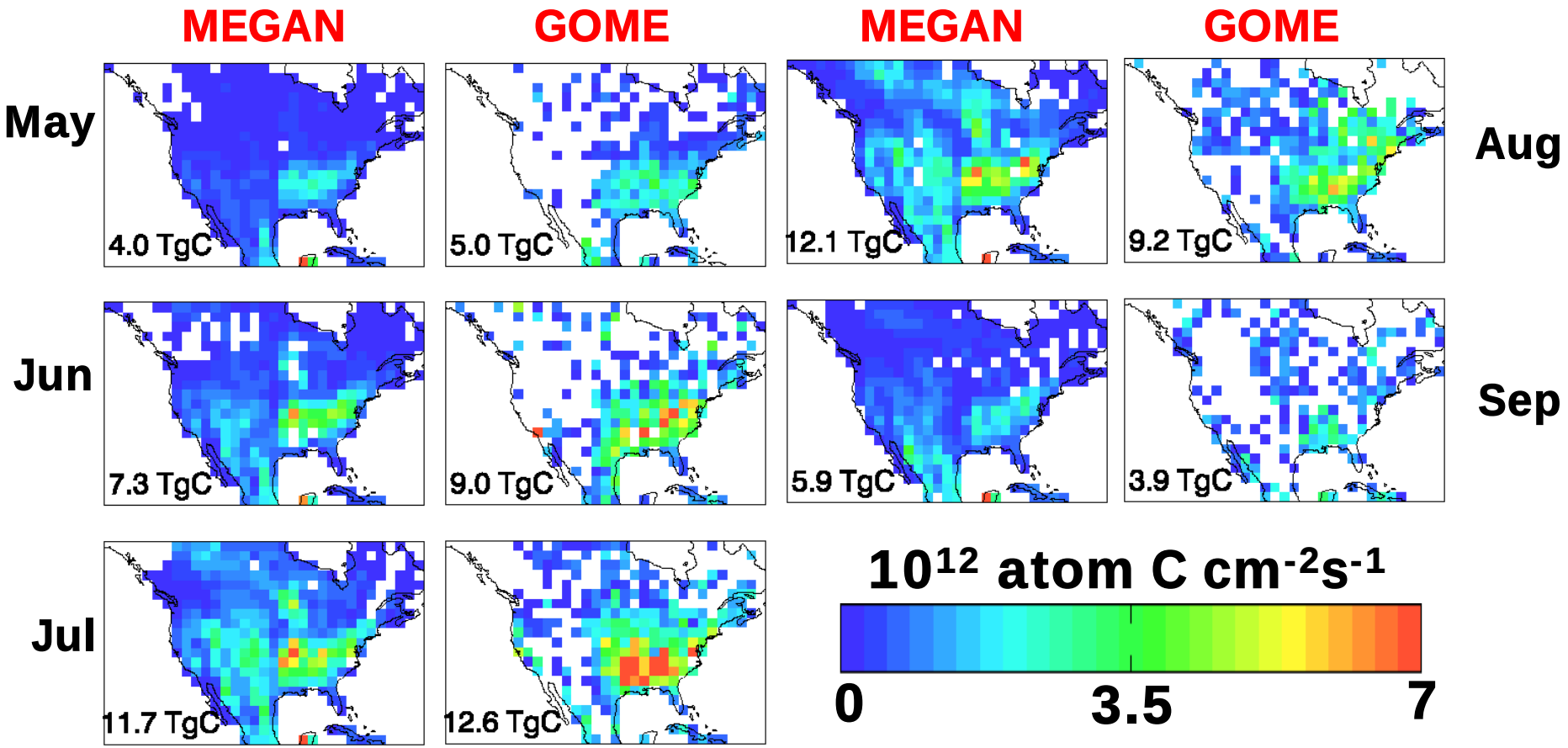


E_{VOC}: Ω_{HCHO} from GEOS-CHEM and MCM models

Modeling Overview

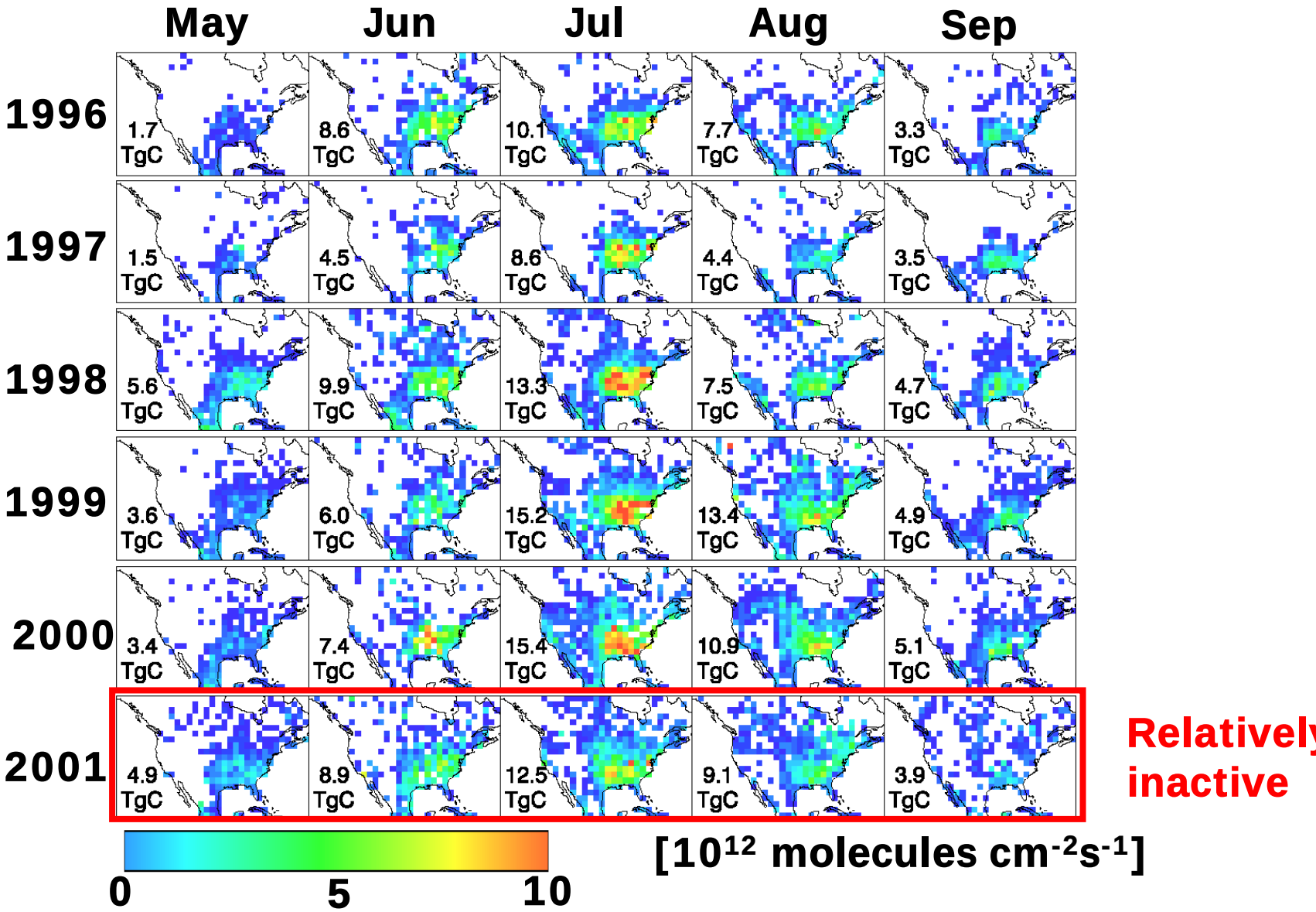


Seasonal Variation of Y2001 Isoprene Emissions



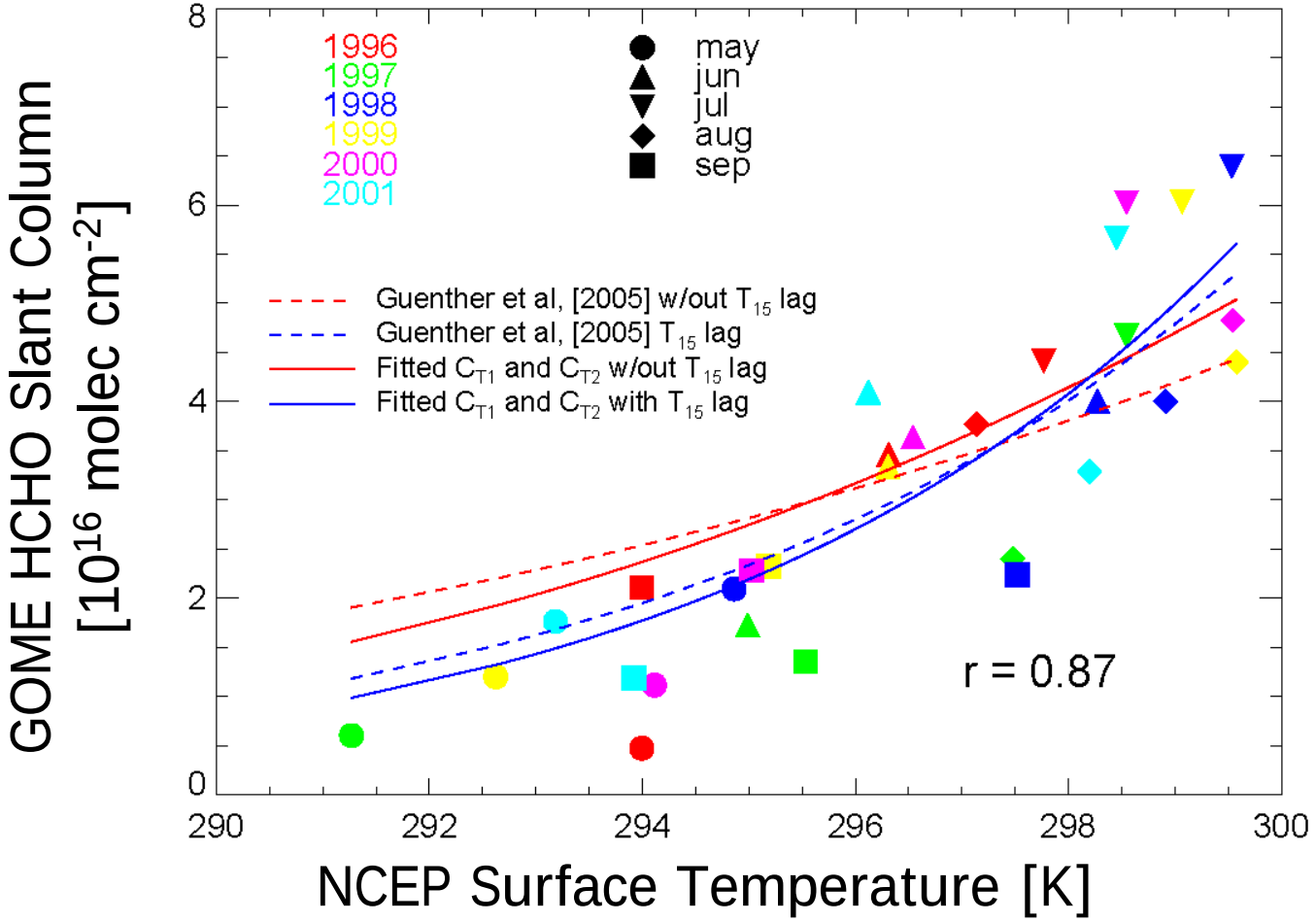
- Good accord for seasonal variation, regional distribution of emissions (differences in hot spot locations – **implications for O_3 prod / loss**).
- Other biogenic VOCs play a small role in GOME interpretation

GOME Isoprene Emissions: 1996-2001



Relatively inactive

Surface temperature explains 80% of GOME-observed variation in HCHO

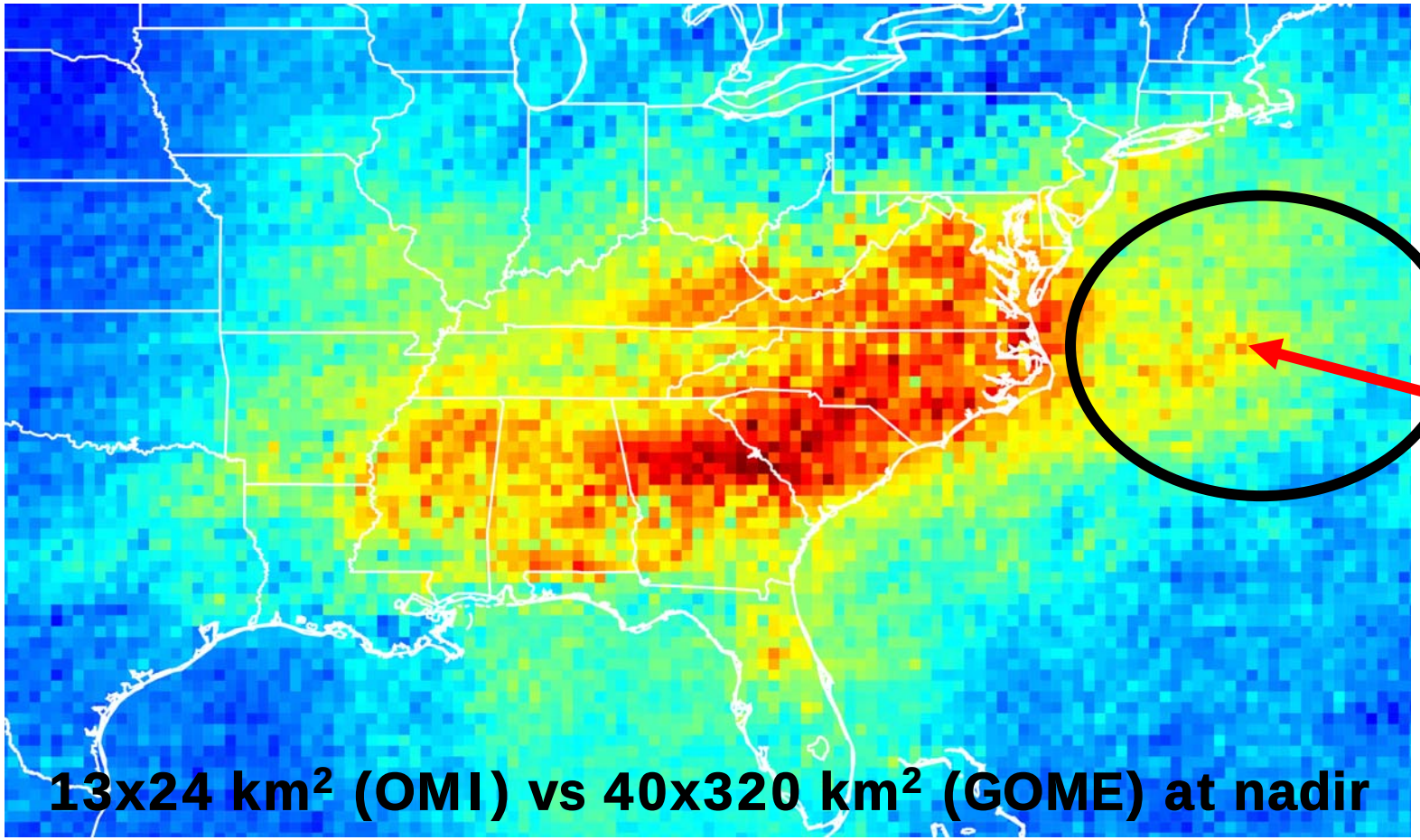


Curves fitted to GOME data

Modeled curves

Time to revise model parameterizations of isoprene emissions?

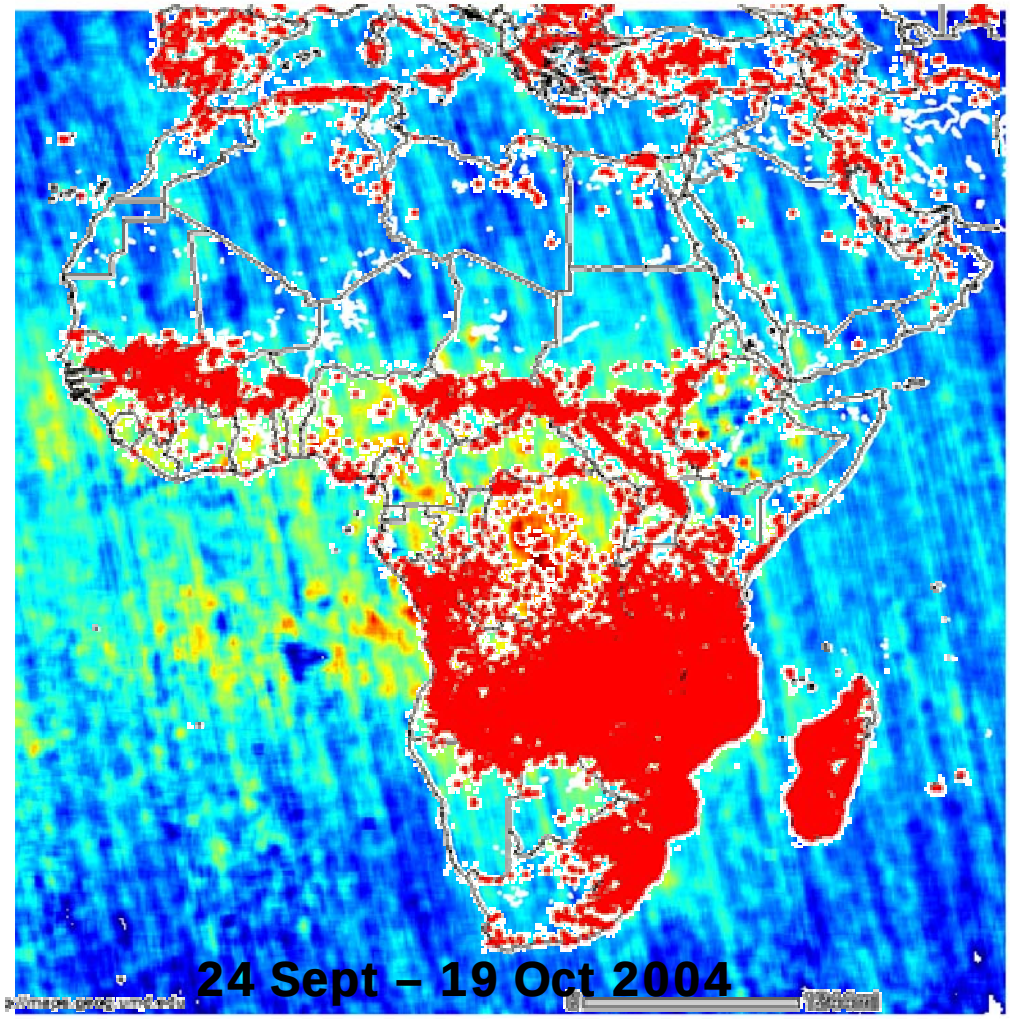
Superior spatial resolution of OMI is more suitable for air quality applications



Offshore HCHO: real or artifact?

Improved O_3 regulatory studies: NO_x limited/saturated conditions

OMI data will allow more detailed studies of biospheric VOC emissions – esp remote regions

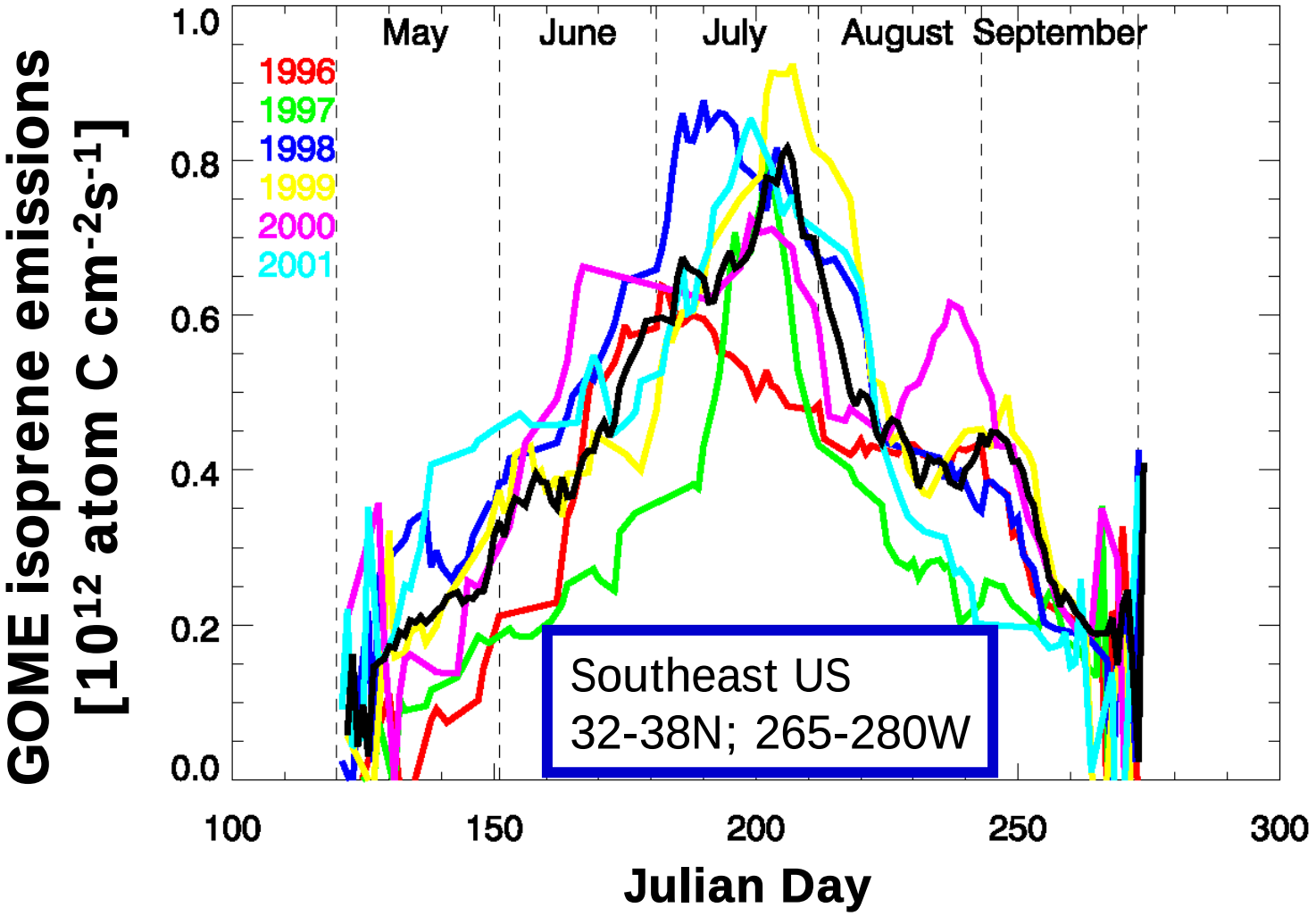


Can also use HCHO columns to quantify biomass burning emissions

OMI HCHO columns, MODIS Fire Counts

Spare Slides

30% Interannual Variability of Isoprene Emission over SE USA



Large variations → implications for air quality modeling