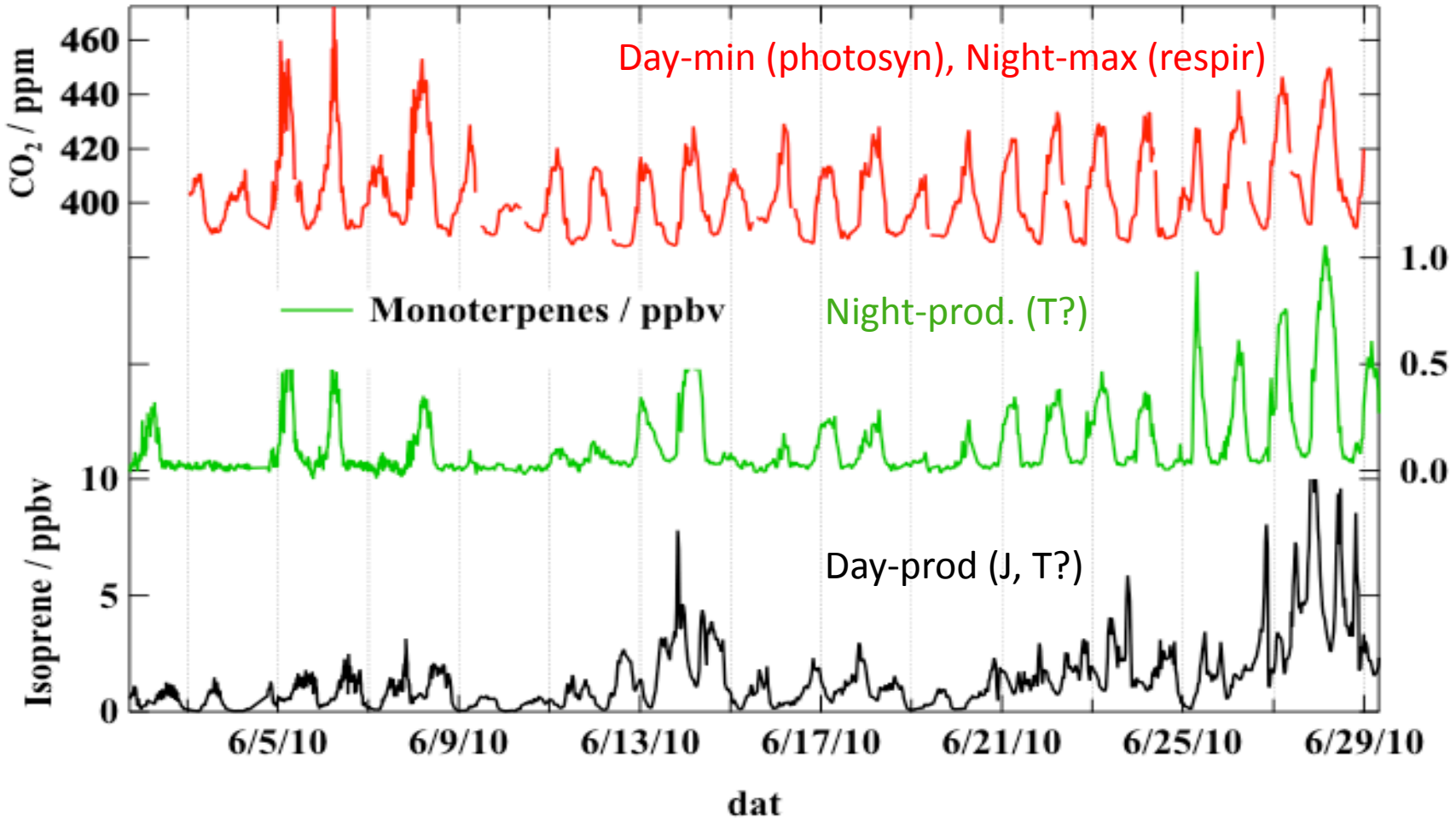
# Biogenic Cycling of $CO_2$, isoprene and mono-terpenes at Cool during CARES

Flowers, Floerschinger, Klein, Dubey*, Knighton, Herndon, Guenther, Zaveri et al

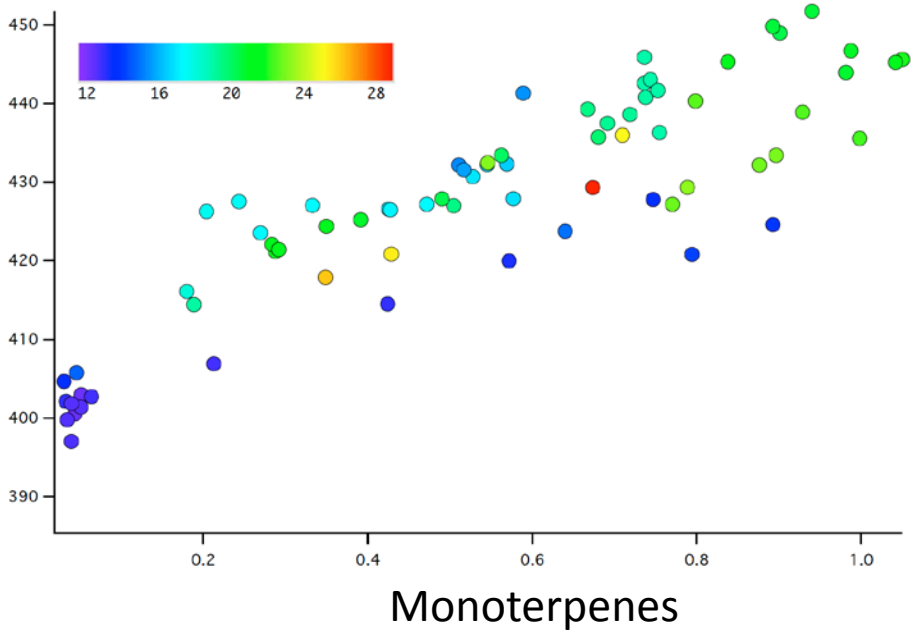
Covariations from common spatially coherent ecosystem sources/sink: Insight into mechanism




Function of (airmass-local, BL-height, T, J (cloud))

# $CO_2$-Monoterpene (T, night)

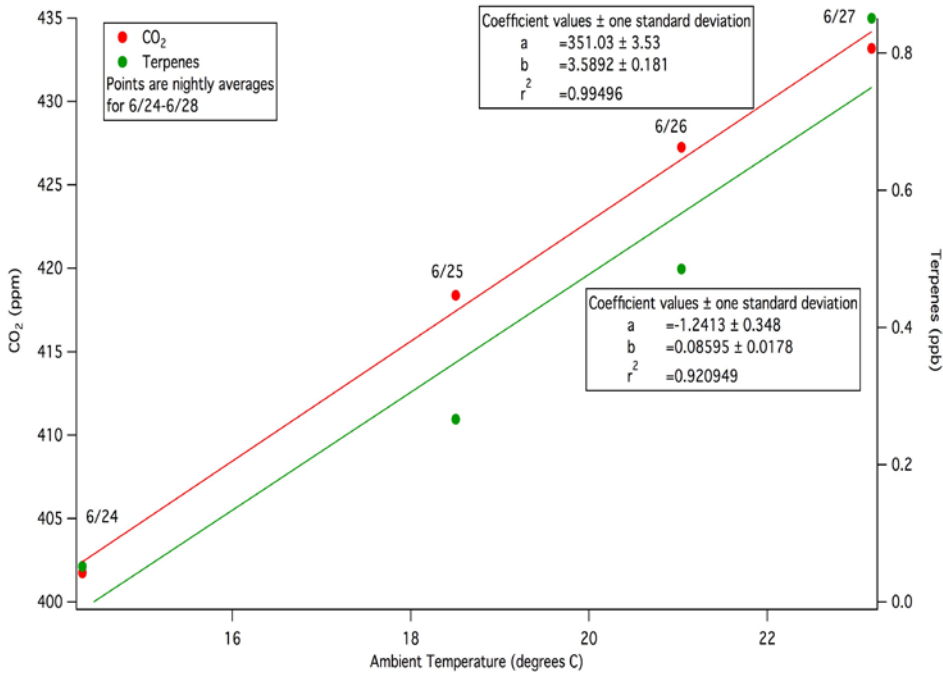
$CO_2$




Monoterpenes

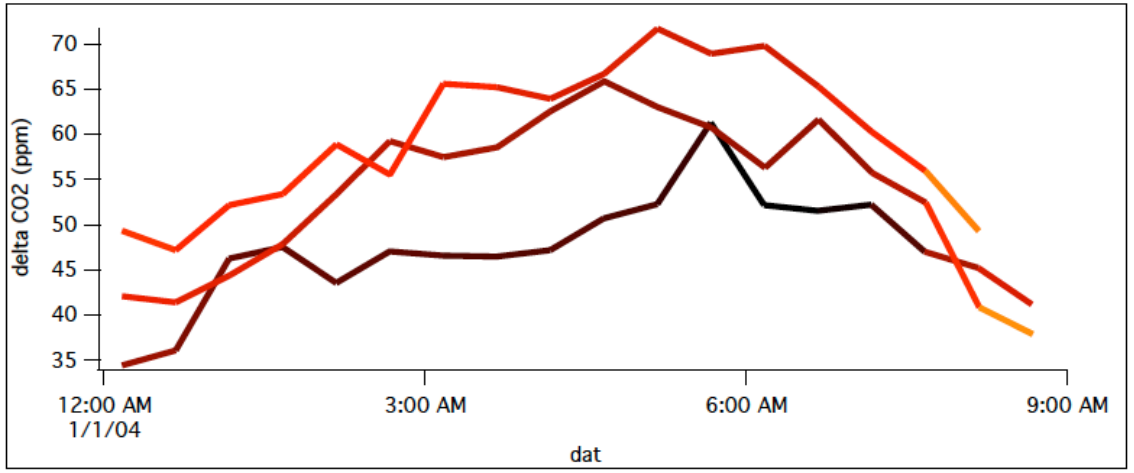
$CO_2$

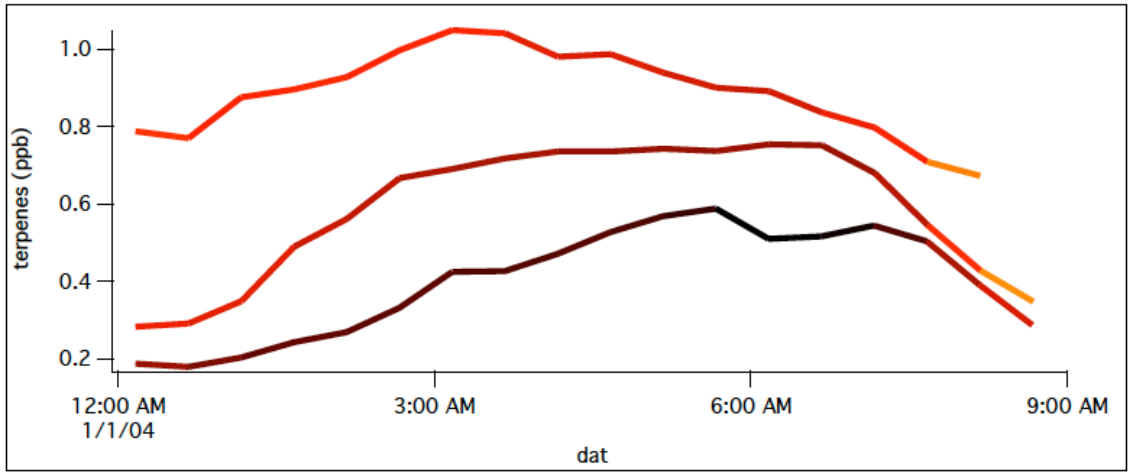
Monoterpenes

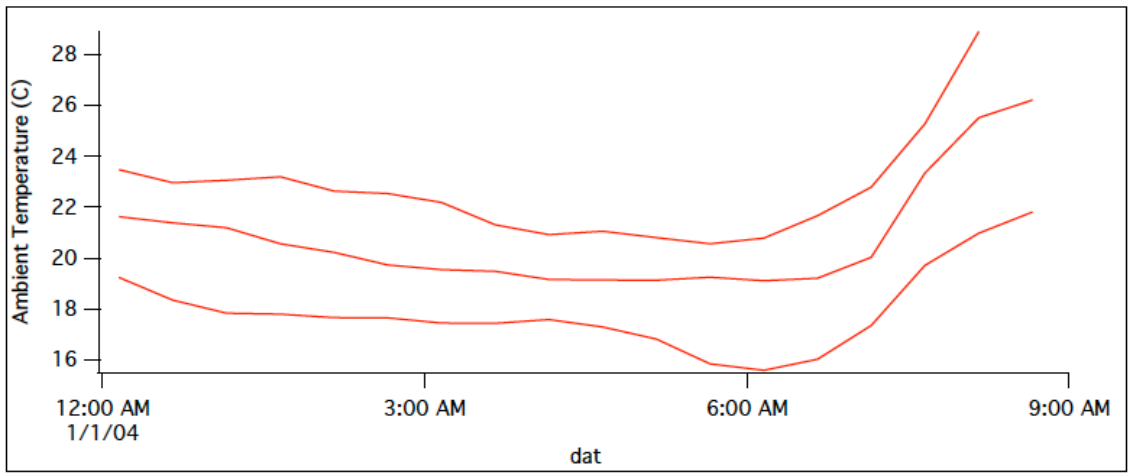



T

$CO_2$
Terpene
Temp
Nocturnal
Evolution
(last high
signal days)



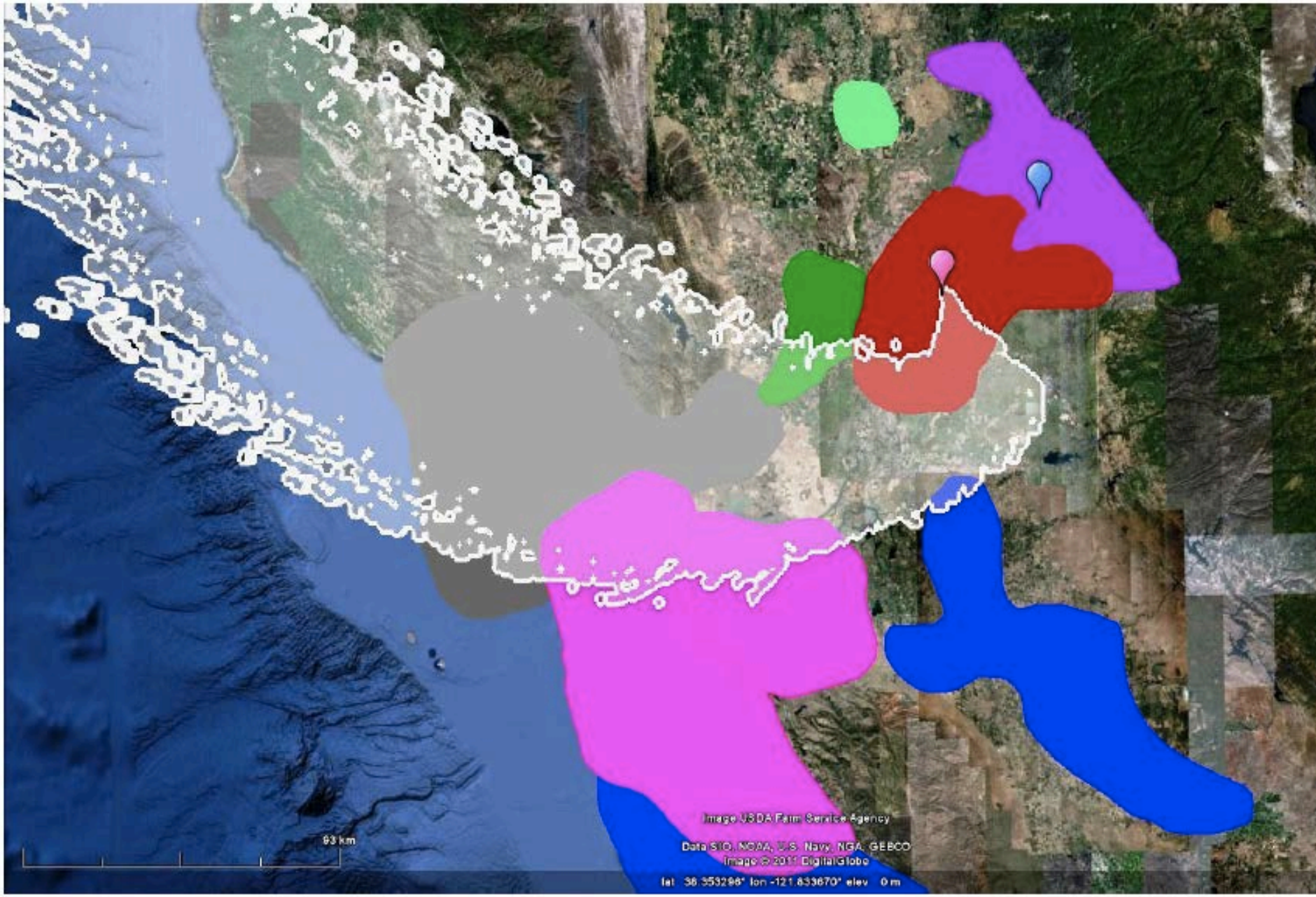



# Retro-plume

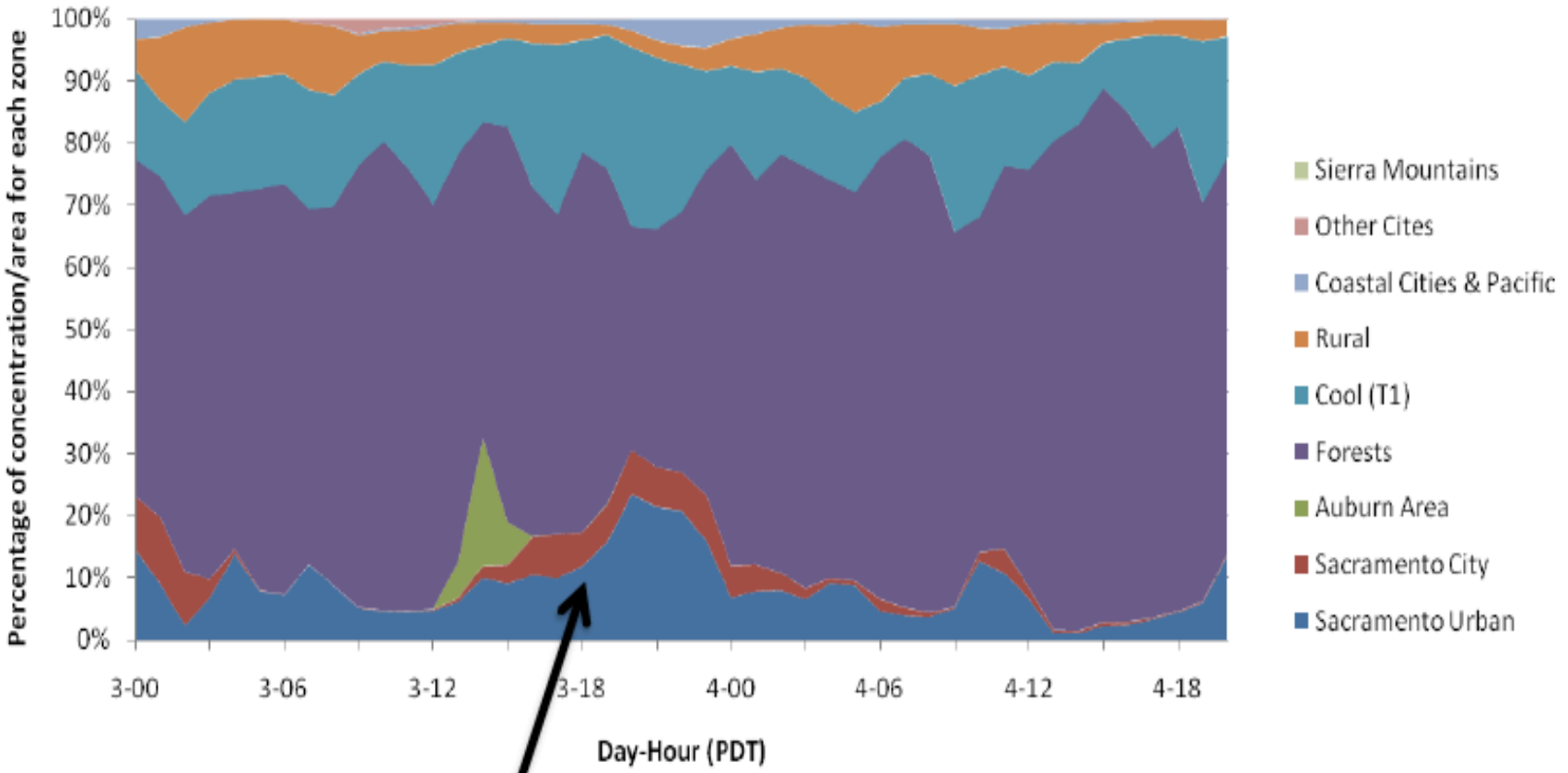
- The goal was to make an easy way to compare back trajectories to the data series. So first off I needed to convert the pollution maps into a usable time series.
- To accomplish this I used hysplit dispersion model, which released 6000 particles from the site (T1 or T0) and ran the meteorological data backwards. This creates a retro-plume of the pollution.
- I then divided California into different zones representing cities, rural area, mountains ext.
- Then I combined the retroplume and the zones to calculate what the concentration over each zone was.
- I then normalized by the exposure area in each zone to get a concentration/area for each zone which is what is shown in the graphs.

# Retroplume overlaid on the zones



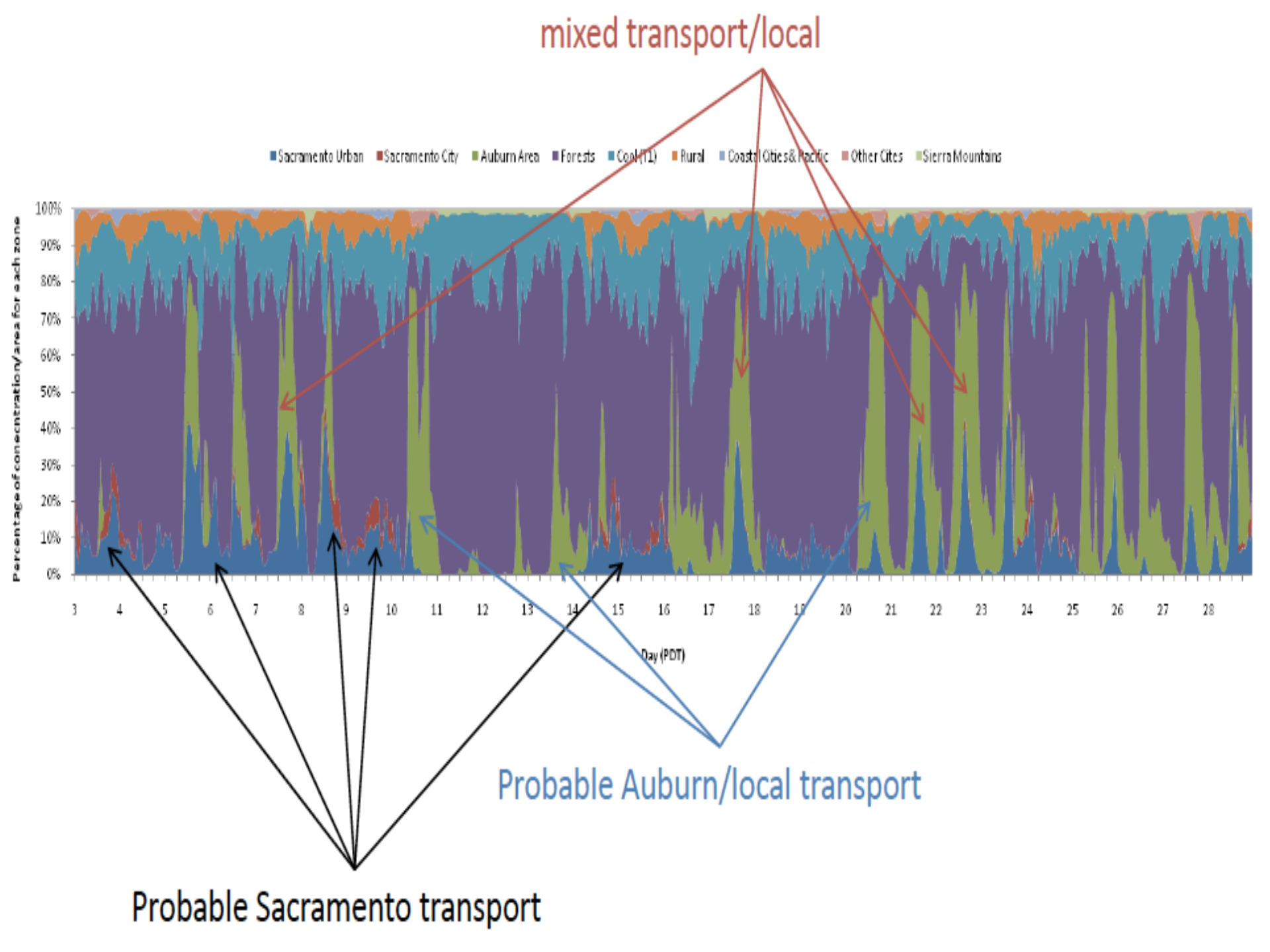
whole campaign.

## All the data presented is for T1




Rise in Sacramento contribution, meaning stronger transport.

This graph shows where the airmass is coming from, but even though the Forests zone percentage is 50% doesn't mean 50% of the signal is from that zone.


mixed transport/local
Sacramento Urban
Sacramento City
Auburn Area
Forests
Coal(T1)
Rural
Coastal Cities & Pacific
Other Cities
Sierra Mountains
Percentage of concentration/area for each zone
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
3
4
5
6
7
8
9
10
11
12
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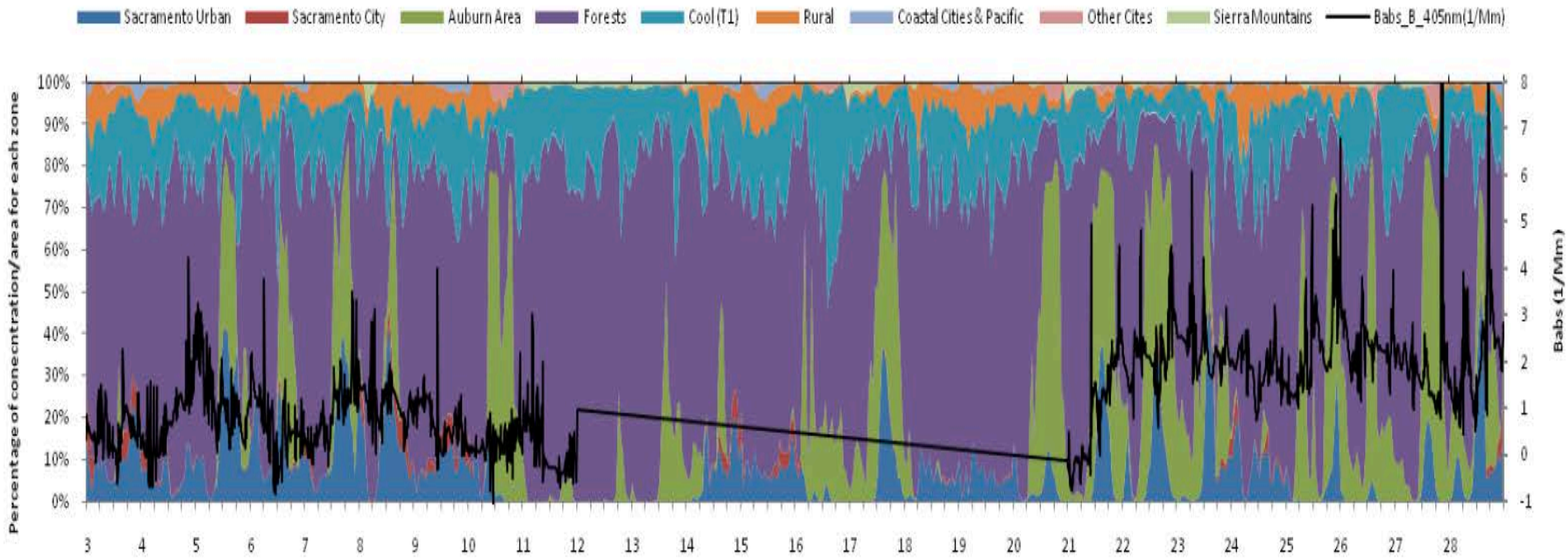
Day (PDT)
Probable Auburn/local transport
Probable Sacramento transport

# Retro-plume




Useful for other data interpretation