AIR QUALITY CHARACTERIZATION FOR THE CALIFORNIA REGIONAL PM$_{10}$/PM$_{2.5}$ AIR QUALITY STUDY

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EPISODE DETERMINATION FACTORS

• Synoptic Analyses
• Stability Indicators
  o (850 MB temperature at Oakland – surface minimum temperature)
  o 500 MB heights
• Precipitation patterns
• Surface and aloft wind flow characteristics
• Temperature profile
  o Morning and afternoon
• PM$_{2.5}$ and PM$_{10}$ mass and chemical speciation data
EPISODE SYNOPTIC PATTERN RECOGNITION

- Mid-Tropospheric ridges (850 and 925 MB) tend to indicate stable events
- 500 MB ridge off the West Coast, results in general subsidence
- Strong surface high positioned over the Intermountain Region, results in offshore flow
- Weak surface pressure gradient
850 MB TEMPERATURE AND 500 MB HEIGHT FOR DECEMBER 1999 EPISODE (12/1/1999)
CORCORAN-PATTERSON (PM$_{2.5}$, PM$_{10}$ & COARSE) AND FRESNO 1$^{st}$ (PM$_{2.5}$) FOR DECEMBER 1999

- Corcoran PM10
- Corcoran Coarse
- Corcoran PM2.5
- FAT-1st PM2.5

Particulate Matter (micrograms / cubic meter)
850 MB TEMPERATURE AND 500 MB HEIGHT FOR DECEMBER 2000 AND JANUARY 2001

Plymouth State Weather Center

850 mb Temperature (C)
500 mb Geopotential Height (m)

WXP analysis for 1200Z 4 JAN 01

LO: -23.9  HI: 17.7
LO: 5047.6  HI: 5856.1
FRESNO-1ST (COARSE) AND (PM$_{2.5}$) DECEMBER 2000 AND JANUARY 2001

Particulate Matter (micrograms/cubic meter)

- FAT-1st Coarse
- FAT-1st PM2.5
- FAT-1st PM2.5 Trend Line
FRESNO-1<sup>ST</sup> PM<sub>2.5</sub> CRPAQS AND ROUTINE CHEMICAL SPECIATION DATA FOR DECEMBER 2000 AND JANUARY 2001
CONCLUSION & SUMMARY

• Long duration episodes
• Nitrate buildup
• Majority fine fraction
• Holiday carbon signature
• Residential Wood Burn Curtailment Program winter 2003/2004 season