An aerial photograph of a river valley. A large river winds through a lush green landscape. In the foreground, a small town with several buildings and a baseball field is visible. The background shows rolling green hills and mountains under a cloudy sky.

# CO Reactivity Update

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Smog Reyes

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# ***consistent bias* for CO seen before by Carter**

- Carter, Tonnessen, and Yarwood (2003) specifically state on page 56:
- “For most model species the EKMA results are surprisingly close to the comparable regional relative reactivity metrics given the significant differences in the types of models and scenarios employed..... However, there are some consistent differences in EKMA vs. regional relative reactivities for certain model species. Perhaps the most significant is the ***consistent bias*** for the EKMA scales towards predicting lower relative reactivities for the slower reacting species, specifically CO, ethane and to a lesser extent PAR.”

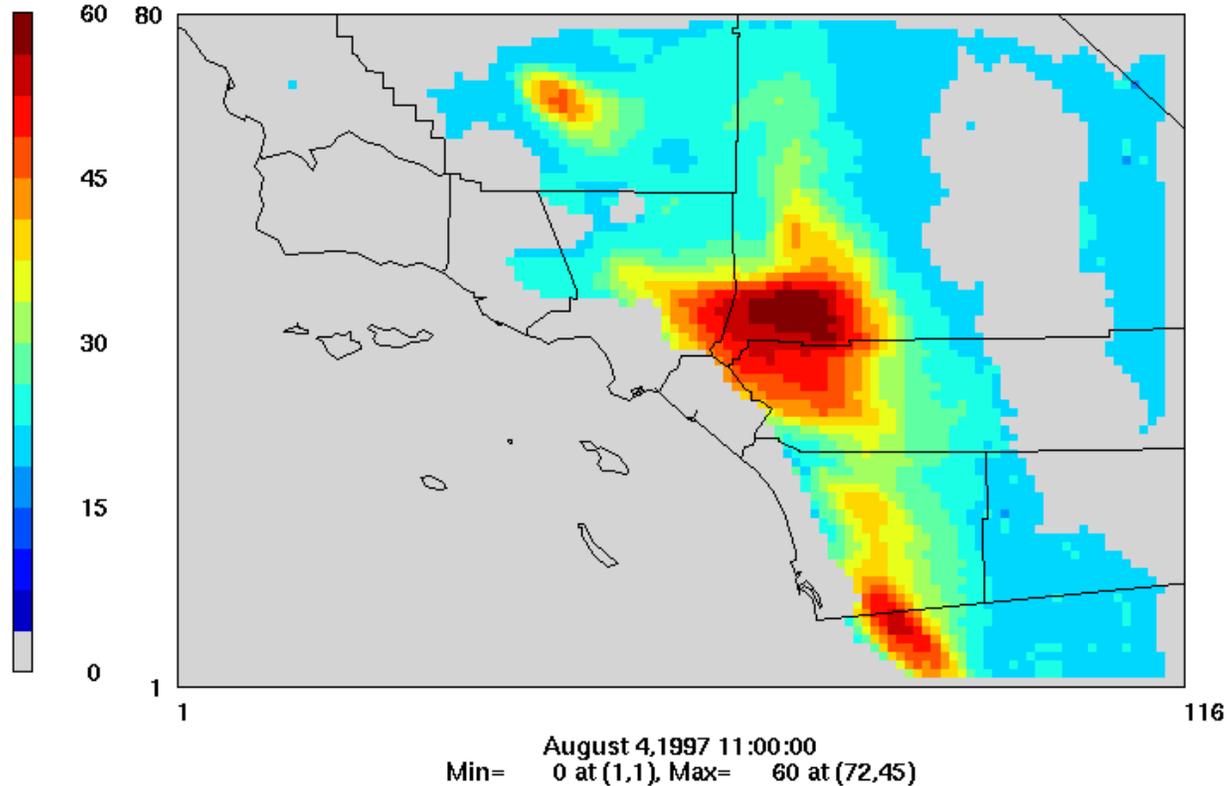
# ARB CALGRID Study

- Showed 39 to 1 reactivity ratio for exhaust VOC to CO at 8-hour max ozone.
  - 38 to 1 when population weighted
  - 8-hour max. ozone was 119 ppb.
- Current MIR ration near 60 to 1.

# ROG to CO Reactivity Ratio for 8-hour Ozone

CALGRID: ROG to CO Reactivity Ratio where 8-hr O<sub>3</sub> > 60 ppb

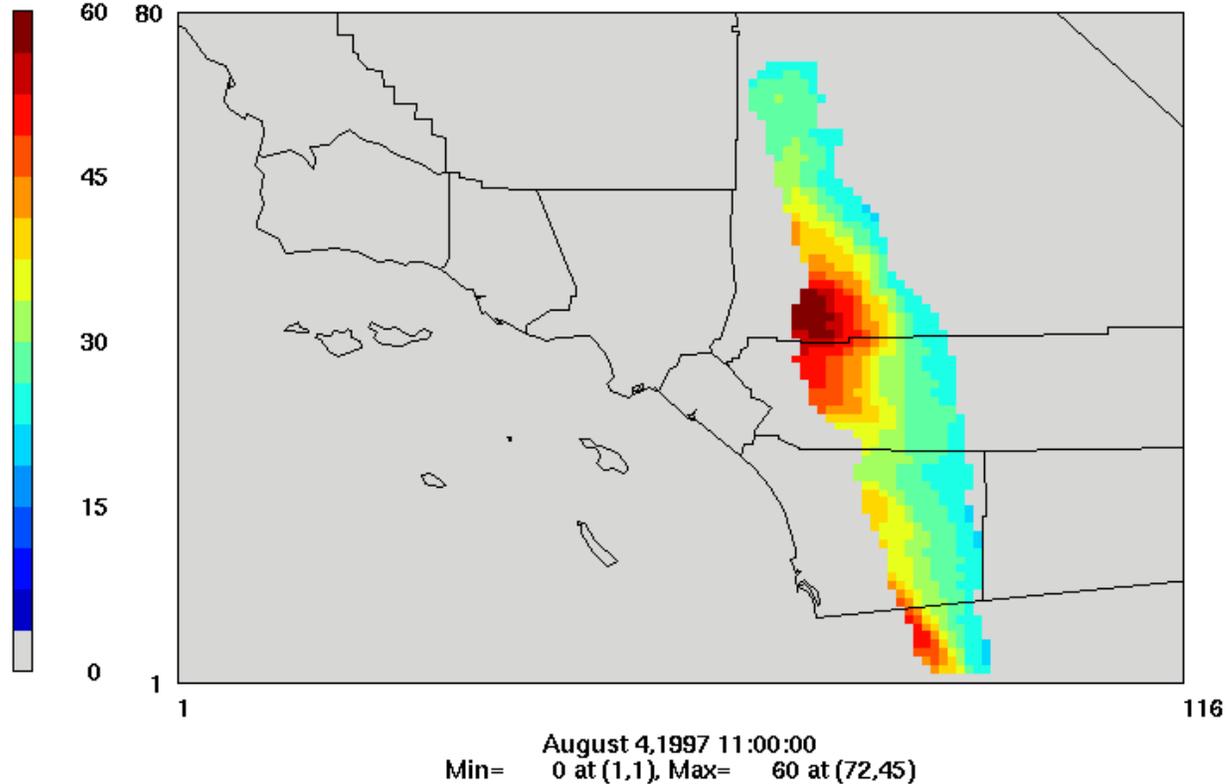
$((936.0/44.0)^*(O3w - O3u + 0.0001)/(O3u - O3v + 0.0001))^*(O3u >= 0.06)$   
u=DO1.extract.8hr.bin, v=DO2.extract.8hr.bin, w=DO3.extract.8hr.bin



# ROG to CO Reactivity Ratio for 8-hour Ozone

CALGRID: ROG to CO Reactivity Ratio where 8-hr O<sub>3</sub> > 85 ppb

$((936.0/44.0)^{(O3w-O3u+0.0001)} / (O3u-O3v+0.0001))^{(O3u \geq 0.085)}$   
u=DO1.extract.8hr.bin, v=DO2.extract.8hr.bin, w=DO3.extract.8hr.bin

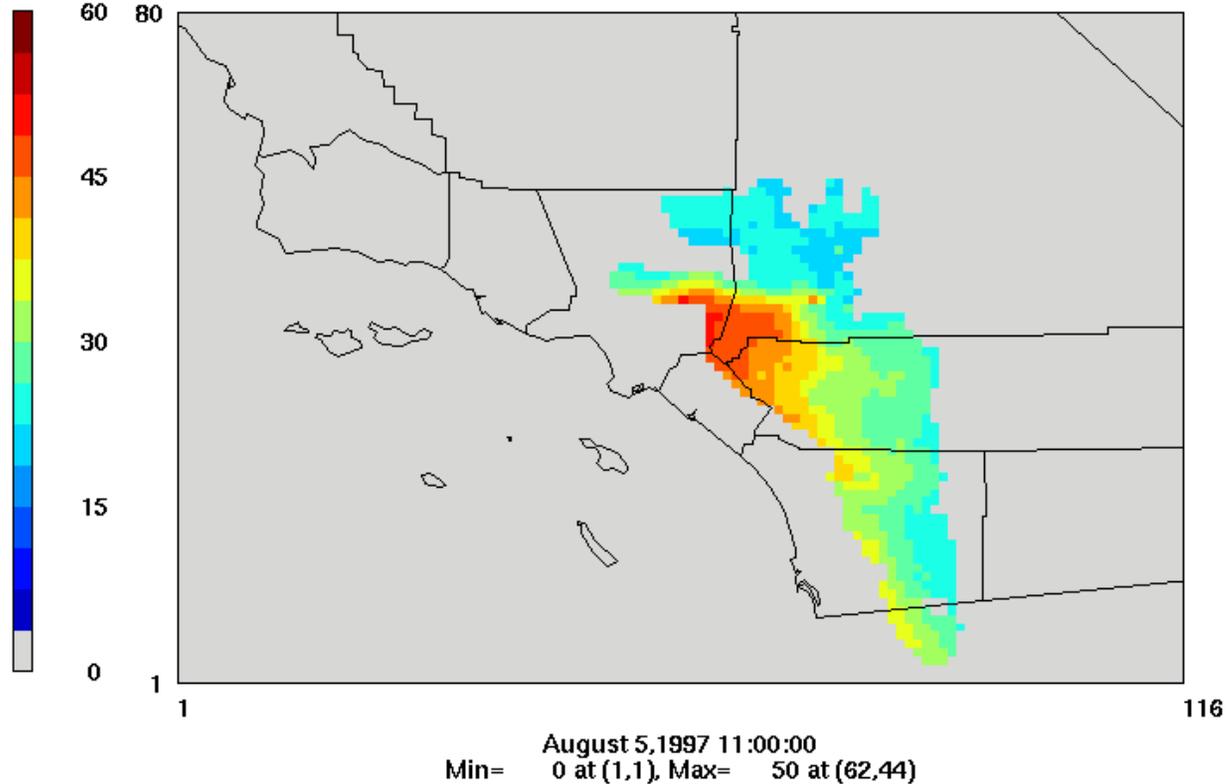


# ROG to CO Reactivity Ratio for 8-hour Ozone

CALGRID: ROG to CO Reactivity Ratio where 8-hr O<sub>3</sub> > 85 ppb

$$\left(\frac{936.0}{44.0}\right)^{\left(O_3w - O_3u + 0.0001\right)} \left(O_3u - O_3v + 0.0001\right)^{\left(O_3u > -0.085\right)}$$

u=DO1.extract.8hr.bin, v=DO2.extract.8hr.bin, w=DO3.extract.8hr.bin



# ROG to CO Reactivity Ratio for 8-hour Ozone

CALGRID: ROG to CO Reactivity Ratio where 8-hr O<sub>3</sub> > 85 ppb

$((936.0/44.0)^{(O3w-O3u+0.0001)} / (O3u-O3v+0.0001))^{(O3u >= 0.085)}$   
u=DO1.extract.8hr.bin, v=DO2.extract.8hr.bin, w=DO3.extract.8hr.bin

