Cannabis Emissions and Predicted Ozone in Santa Barbara County

Dr. William Vizuete, Vizuete@unc.edu
Chi-Tsan Wang
Ph.D. Chemical Engineering,
Expert in Atmospheric Chemistry and Modeling
University of North Carolina- Chapel Hill

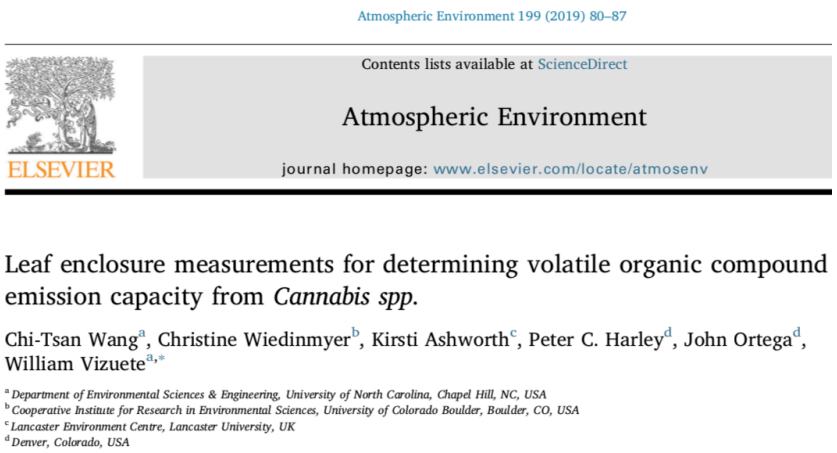
UNC
GILLINGS SCHOOL OF
GLOBAL PUBLIC HEALTH

Disclaimer

- All articles, reports, and presentations represent the opinions and views of the author and sponsors had no influence on results or conclusions
- NSF participation did not involve the manufacture, import, possession, use or distribution of cannabis
- All results presented here are publicly available and can be provided upon request - Vizuete@unc.edu

Can the cultivation of cannabis result in regional ozone increases?

S.B. County air quality model predictions say No.



Atmospheric Environment 199 (2019) 80–87

Contents lists available at ScienceDirect

Atmospheric Environment

journal homepage: www.elsevier.com/locate/atmosenv

Leaf enclosure measurements for determining volatile organic compound emission capacity from *Cannabis spp.*

Chi-Tsan Wang[a], Christine Wiedinmyer[b], Kirsti Ashworth[c], Peter C. Harley[d], John Ortega[d], William Vizuete[a,*]

[a] Department of Environmental Sciences & Engineering, University of North Carolina, Chapel Hill, NC, USA
[b] Cooperative Institute for Research in Environmental Sciences, University of Colorado Boulder, Boulder, CO, USA
[c] Lancaster Environment Centre, Lancaster University, UK
[d] Denver, Colorado, USA

Potential Regional Air Quality Impacts of Cannabis Cultivation Facilities in Denver, Colorado

Chi-Tsan Wang, Christine Wiedinmyer, Kirsti Ashworth, Peter C. Harley, John Ortega, Quazi Z. Rasool, and William Vizuete

acp-2019-479 Submitted on 20 May 2019
Atmospheric Chemistry and Physics

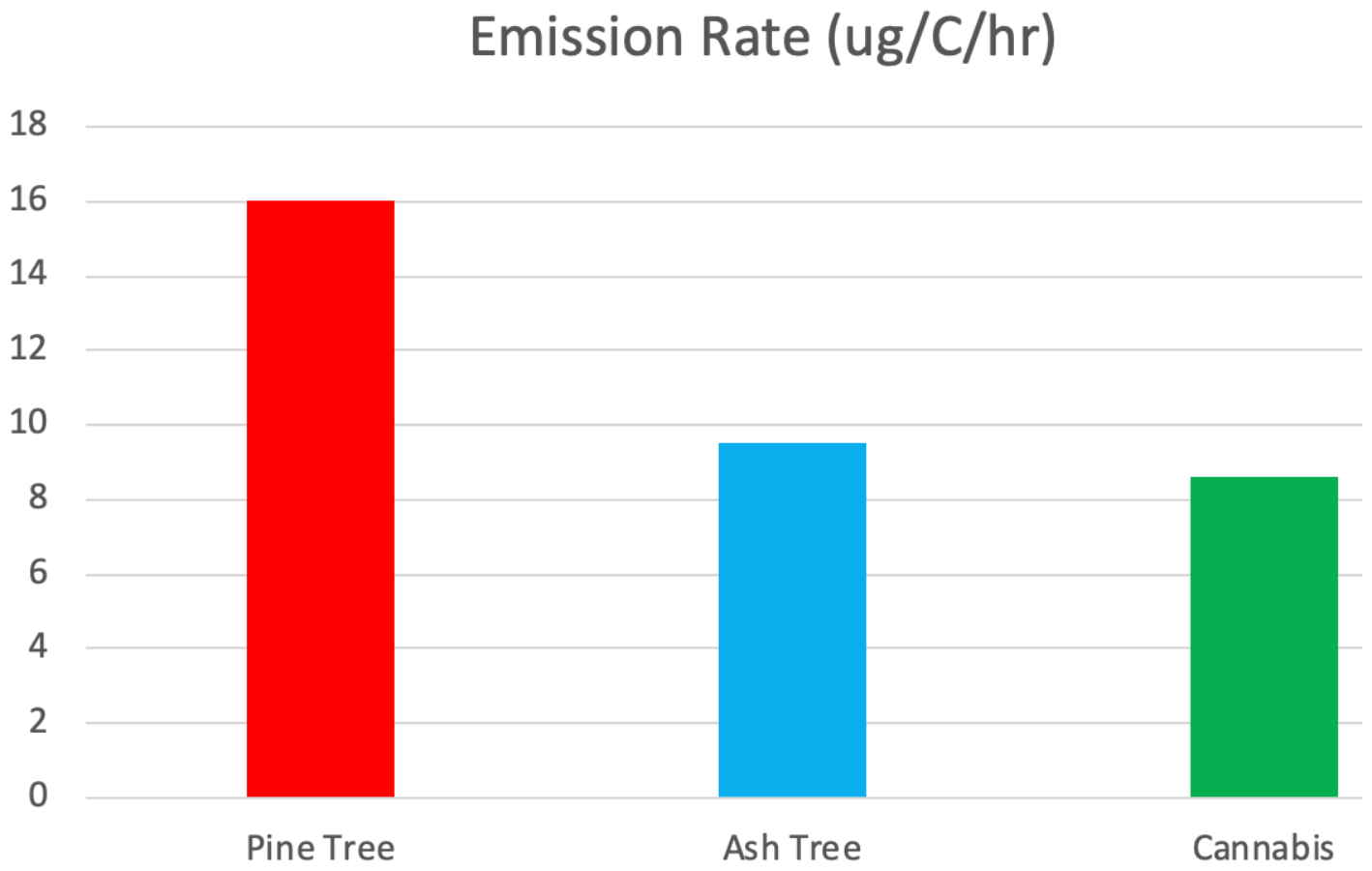
Cannabis has no impact on ozone

Model Scenario	Santa Barbara County BVOC emissions (tons/year)
Current baseline of BVOC from all plants in Santa Barbara County	39,042
Model: Add 5 tons BVOC to simulate addition of Cannabis Industry	39,047
Maximum Change in PPB on Worst Day Due to Addition of Cannabis Industry in SBC	No predicted Impact

More Conservative Emissions Still no impact on ozone

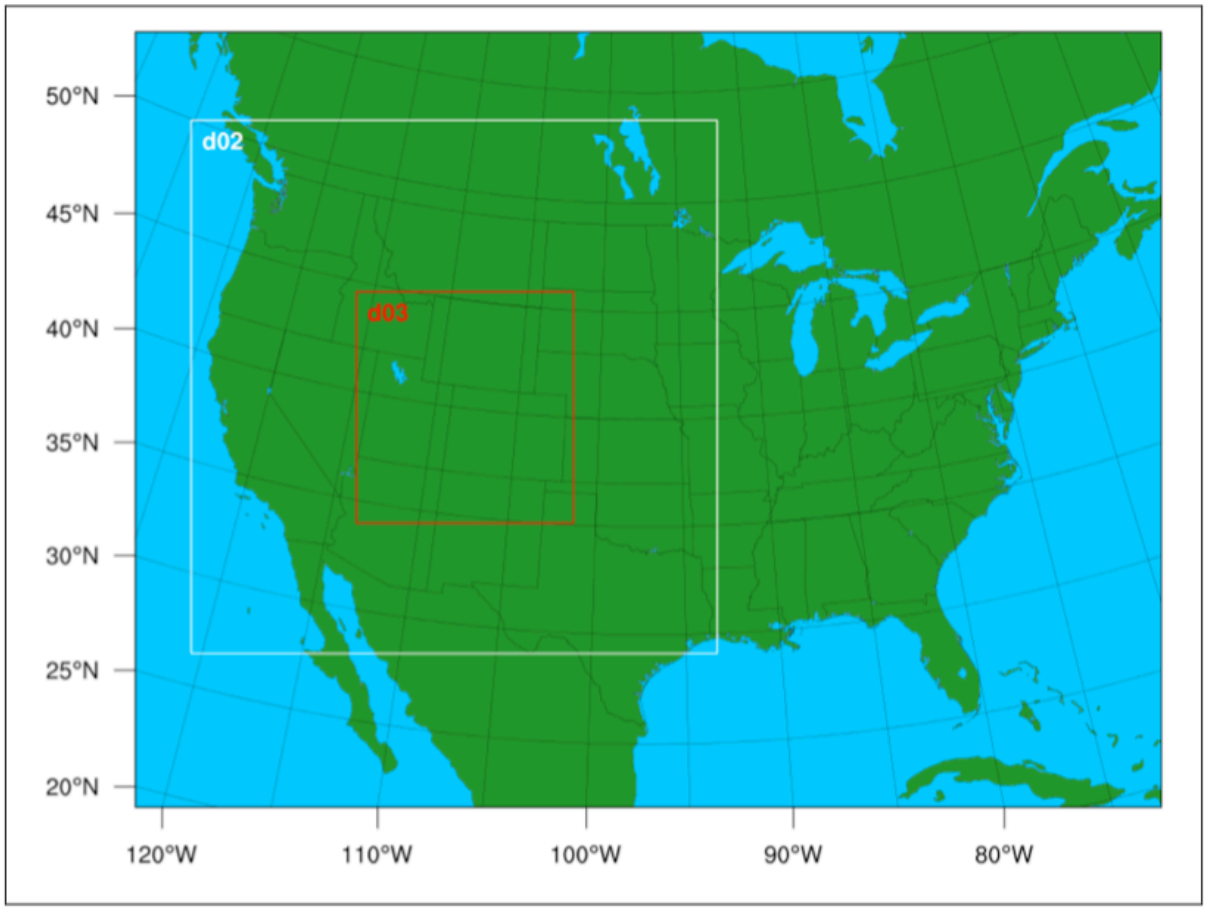
Model Scenario	Santa Barbara County BVOC Emissions (tons/year)
Current baseline of BVOC from all plants in SBC	39,042
Conservative Model: Add 50 tons BVOC (very high estimate) to simulate addition of cannabis industry	39,092
Maximum Change in PPT on Worst Day Due to Addition of Cannabis Industry in SBC	0.6% (.297 ppb)

Cannabis emit less terpenes than Pine Trees



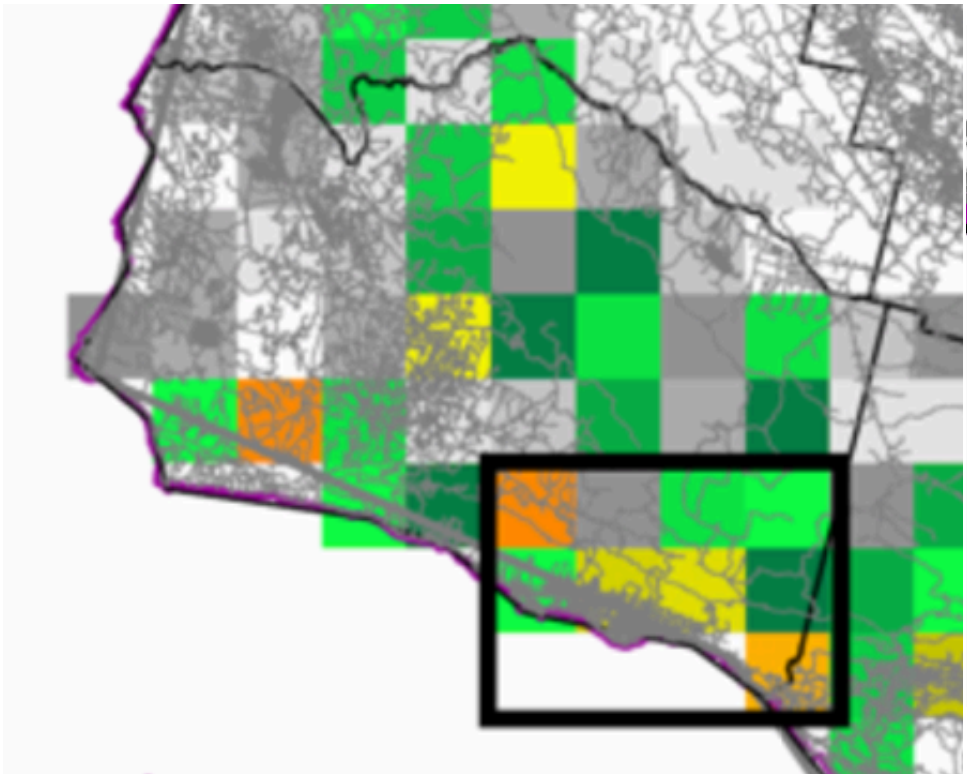
CCA EXH. 21

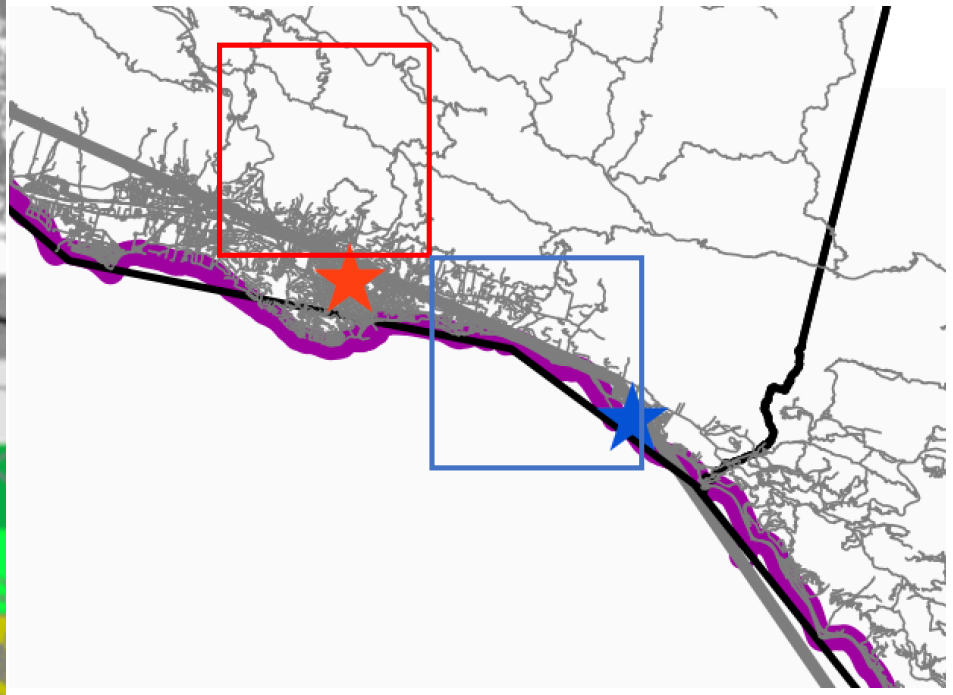
Air quality model



- Developed by Ramboll and UNC
- CAMx version 6.1
- June 15- Sep 15, 2011
- 12x12 km horizontal resolution
- Emissions developed by EPA
- Obtained from Intermountain West Data Warehouse.

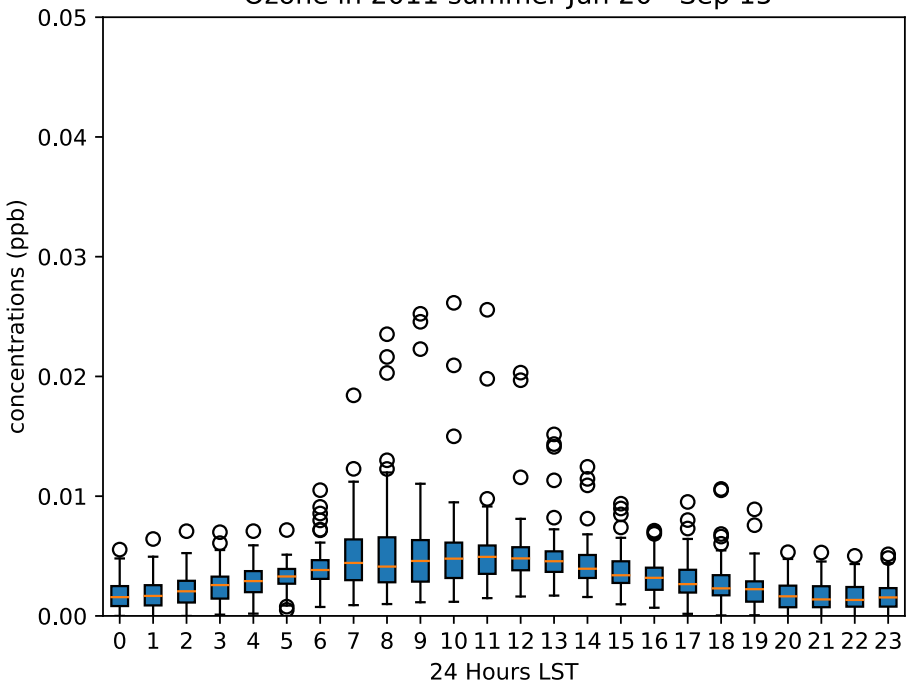
Model Resolution



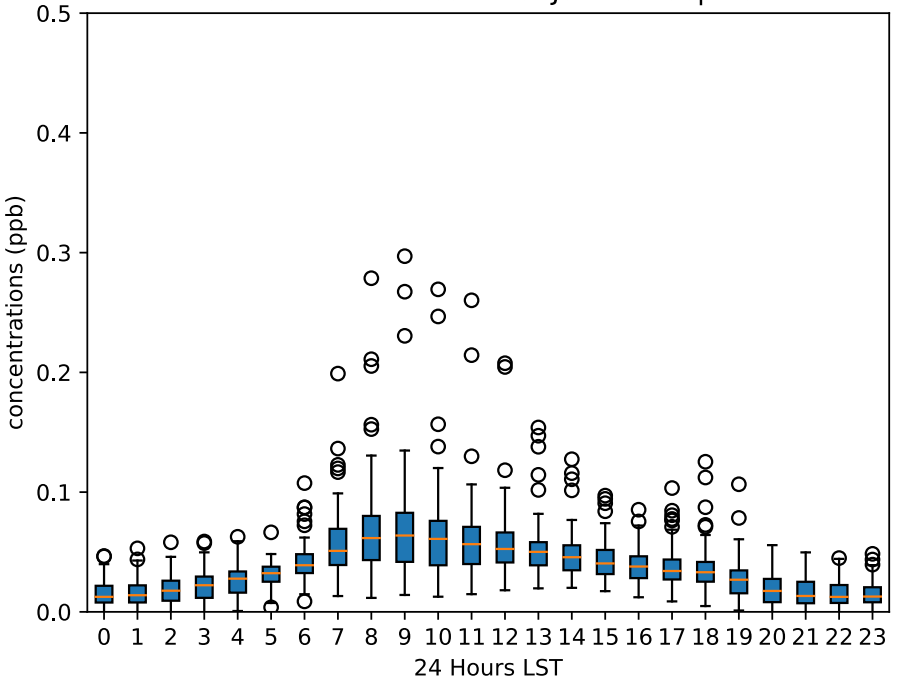


Hourly Ozone Increase

5 tons/year



50 tons/year



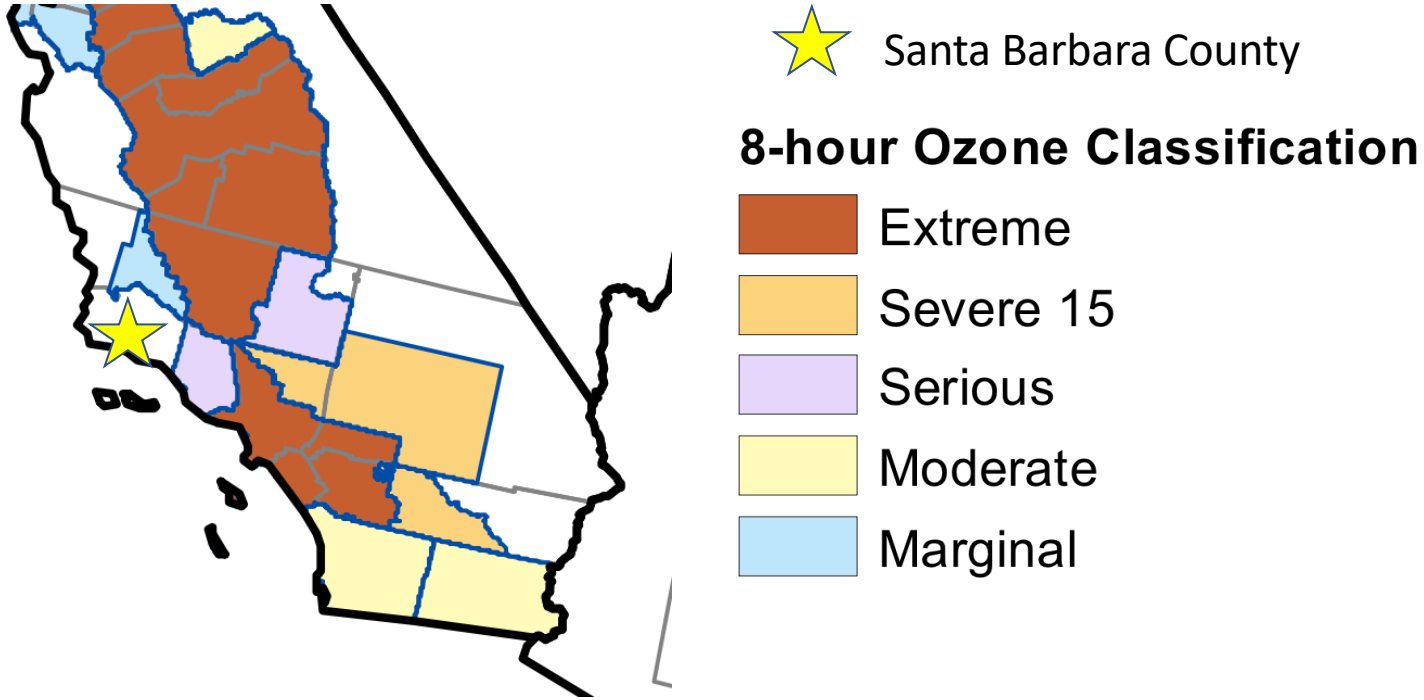
2088 Simulated Hours

Monoterpene Non-toxic

- Acute short term inhalation (limonene, α-terpineol, and α- and β-pinene) is ~106 ppm (106,000 ppb)

  - Santa Barbara County .25-.8 ppb (model)
  - Denver CO - 0.4 – 0.8 ppb (measured)
  - Amazon Rain forest – 2-4 ppb isoprene
  - Peeling an orange - ~100 ppb Limonene
  - Saw Mills – ~50-100 ppm of α-pinene

Ozone 2008 NAAQS Nonattainment areas in California (USEPA, 2019)



75 ppb