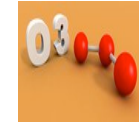




ANALYZING TRENDS IN HIGH EPISODE OZONE DAYS IN THE HOUSTON AREA IN RELATION TO ATTAINMENT OF FEDERAL STANDARDS



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INTRODUCTION

Ozone (O₃) is a gas formed when three oxygen atoms combine. Ground-level ozone, a harmful air pollutant, is created by a chemical reaction between oxides of nitrogen (NO_x) and volatile organic compounds (VOC's) in the presence of sunlight. Many contemporary human activities produce this "bad ozone": transportation, energy production, some industrial and commercial operations. As concentrations of ground-level ozone increase, more people experience more serious health effects.

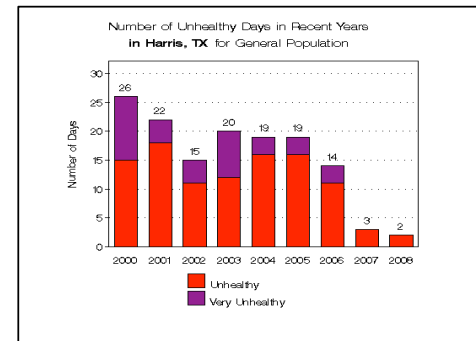
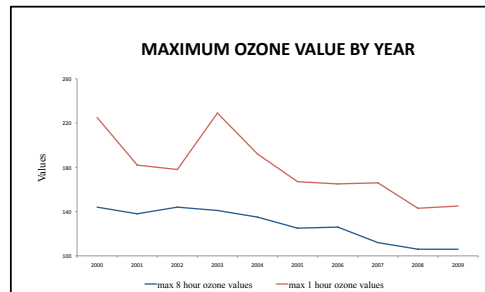
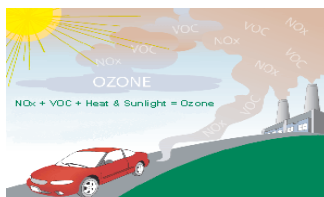
Nonattainment areas are areas that have failed to meet federal standards for ambient air quality. The Houston area was previously classified as *moderate* nonattainment of the 1997 8-hour ozone standard. However, when the Texas Commission of Environmental Quality (TCEQ) was required to submit a revision of 8-hour ozone standards, the Houston area was reclassified as *severe* nonattainment with a maximum attainment date of June 15, 2019.

OBJECTIVE

This study was conducted in an attempt to identify trends which may be present on ozone exceedance days, and to illustrate recognizable improvement in Houston's air quality over the past decade.

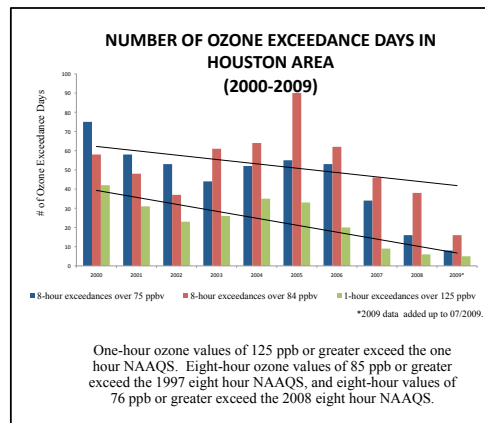
METHODS

- As much meteorological data as available was collected for years 2000-2009 to show one-hour and eight-hour averaged ozone values and weather conditions present on ozone exceedance days.
- Data was analyzed for trends in ozone formation and recognizable decline in formation of ground-level ozone in the Houston area.



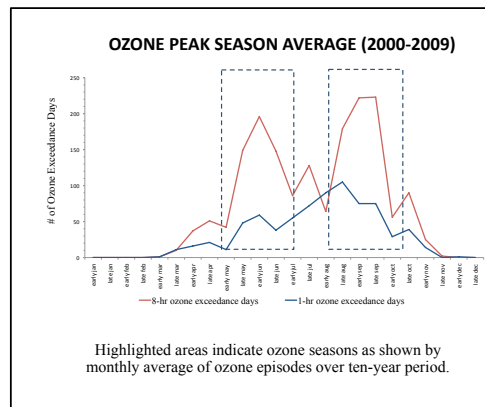
OBSERVATIONS

- Ozone seasons are well-defined, with higher levels of ozone occurring primarily from March through October.
- Higher levels of ozone usually occur on sunny days with light winds.
- Pollutants are very high during and immediately after very large rain events.
- High concentrations of ozone are typical for months with warm temperatures and strong sunlight.



CONCLUSIONS

- Areas with the highest frequency of ozone episodes tend to be in downwind suburban or rural areas.
- In Texas, higher levels of ozone usually occur on sunny days with light winds, primarily from March through October.
- Taking into consideration that adjustments must be made for meteorology, concentrations of ozone have declined significantly in the Houston area.



ACKNOWLEDGEMENTS

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