

# Ethylene / Propylene Trends at Lake Jackson C1016 Auto-GC and Clute C11 Canister

John Jolly

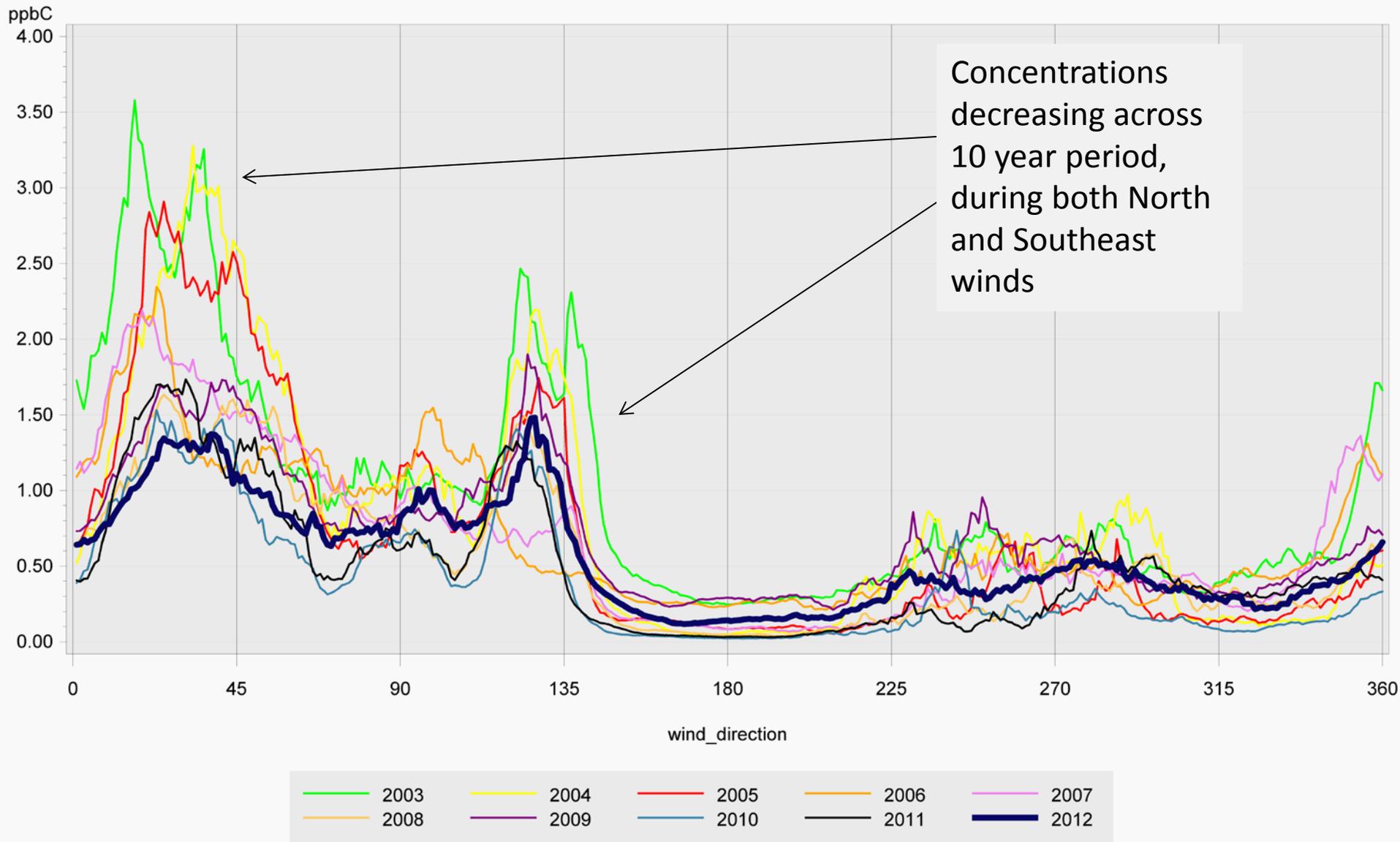
21 March 2013

# Update on Lake Jackson Auto GC Data – What it Shows and the Value of its Information

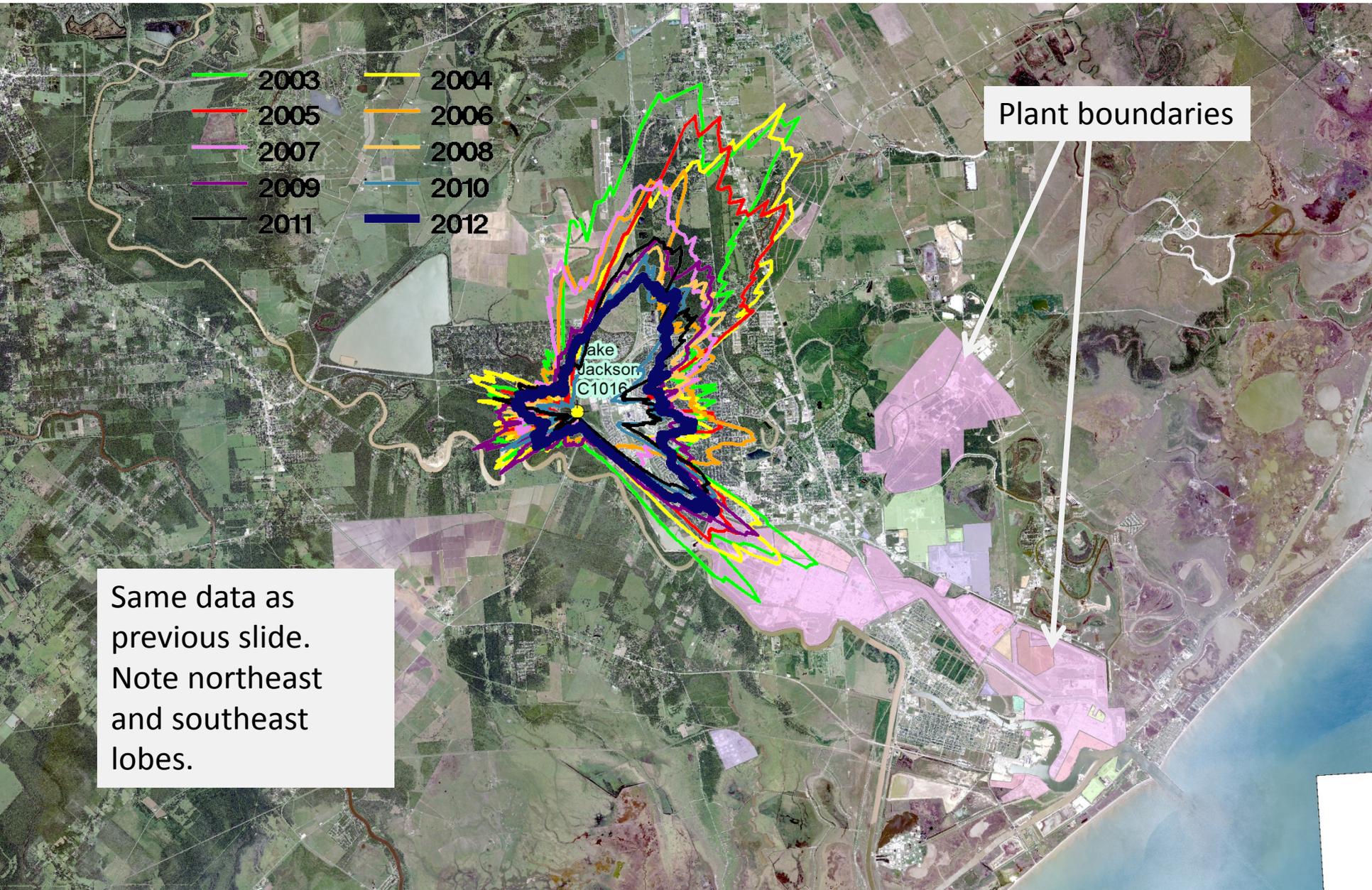
- **What it is:** An Industry-sponsored (EISM) AutoGC, in operation since 2003, near the Freeport industrial facilities in Southern Brazoria County (40 some VOC species, 1-hr measurements)
- **What's up: How important is ongoing collection of this VOC data to TCEQ?**
- **TCEQ's uses of Lake Jackson data**
  - Modeling Evaluations – test HRVOC model performance in Southern Brazoria County, including isoprene (partly rural area, biogenic emissions). May be important to have all EISM data for possible future modeling of upcoming Discover/AQ period
  - Monitoring Trends – do concentrations continue to remain relatively low? Monitoring data important to assess nearby industry emissions, as reported EI VOC data has large amount of statistical error
- **In this presentation:**
  - Trends in ethylene/propylene concentrations at Lake Jackson C1016 and nearby Clute C11 24-hr canister
  - EI trends
  - Comparison of concentrations to those of other Brazoria monitors, and Texas City and Ship Channel
  - Plant expansions planned? How likely is this, given area NA status?

# 1. Propylene

# Geometric Mean Propylene at Lake Jackson C1016

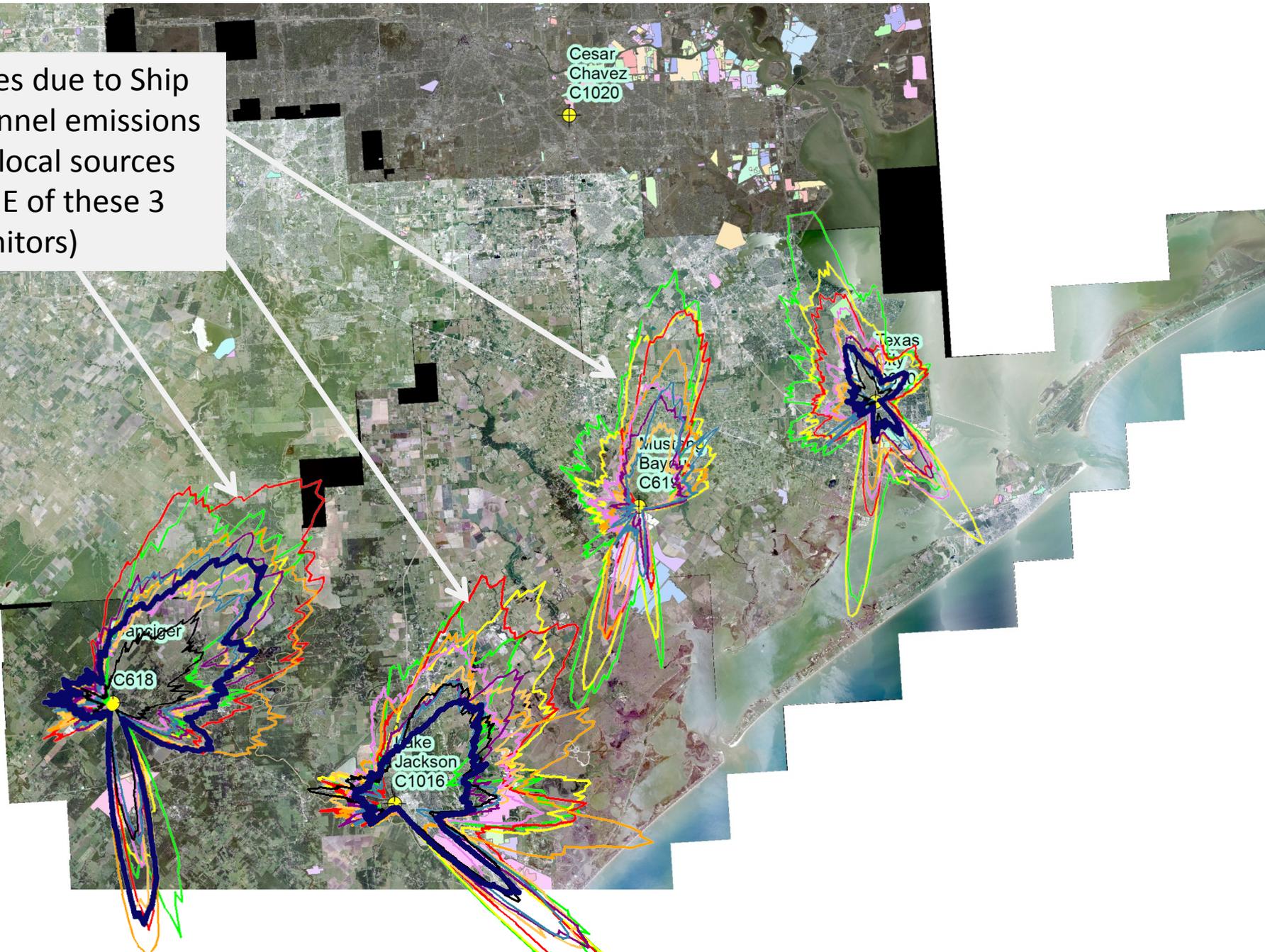


# GM proylene by wind direction

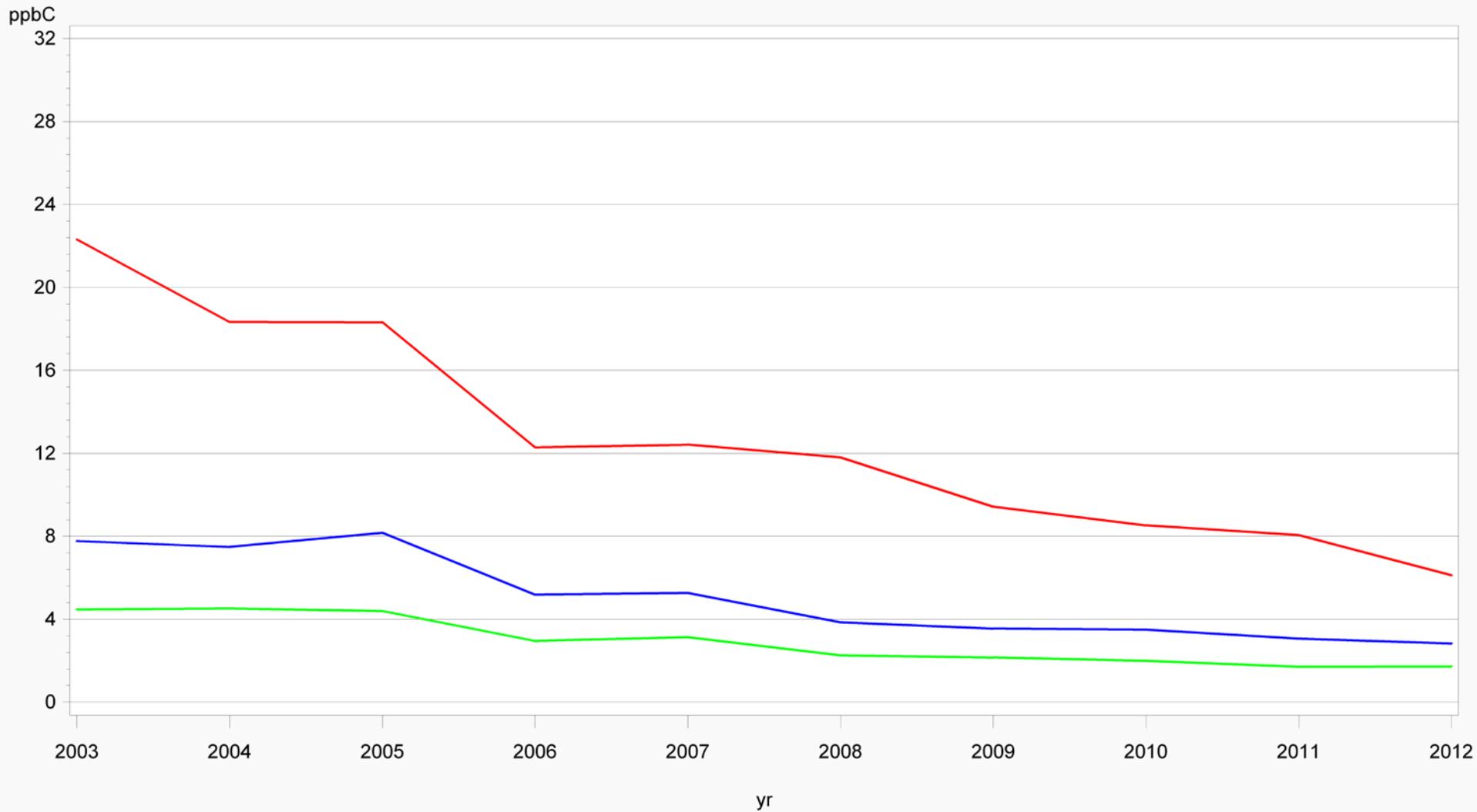


# GM ethylene by wind direction

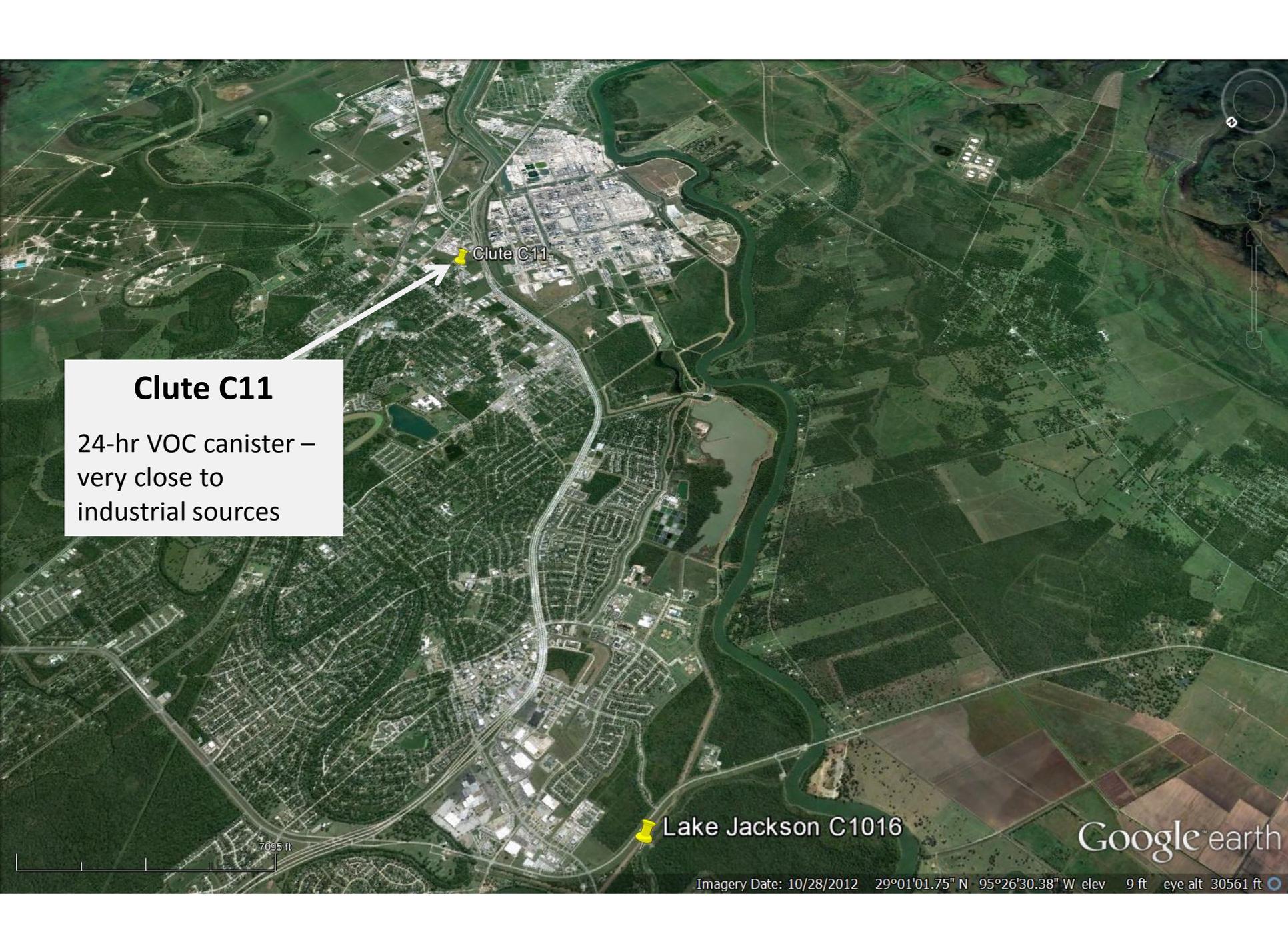
Lobes due to Ship Channel emissions  
(no local sources to NE of these 3 monitors)



# 90th, 95th, and 99th percentile Propylene at Lake Jackson C1016, 2003-2012



— conc\_ppbC\_P90    — conc\_ppbC\_P95    — conc\_ppbC\_P99



Clute C11

Lake Jackson C1016

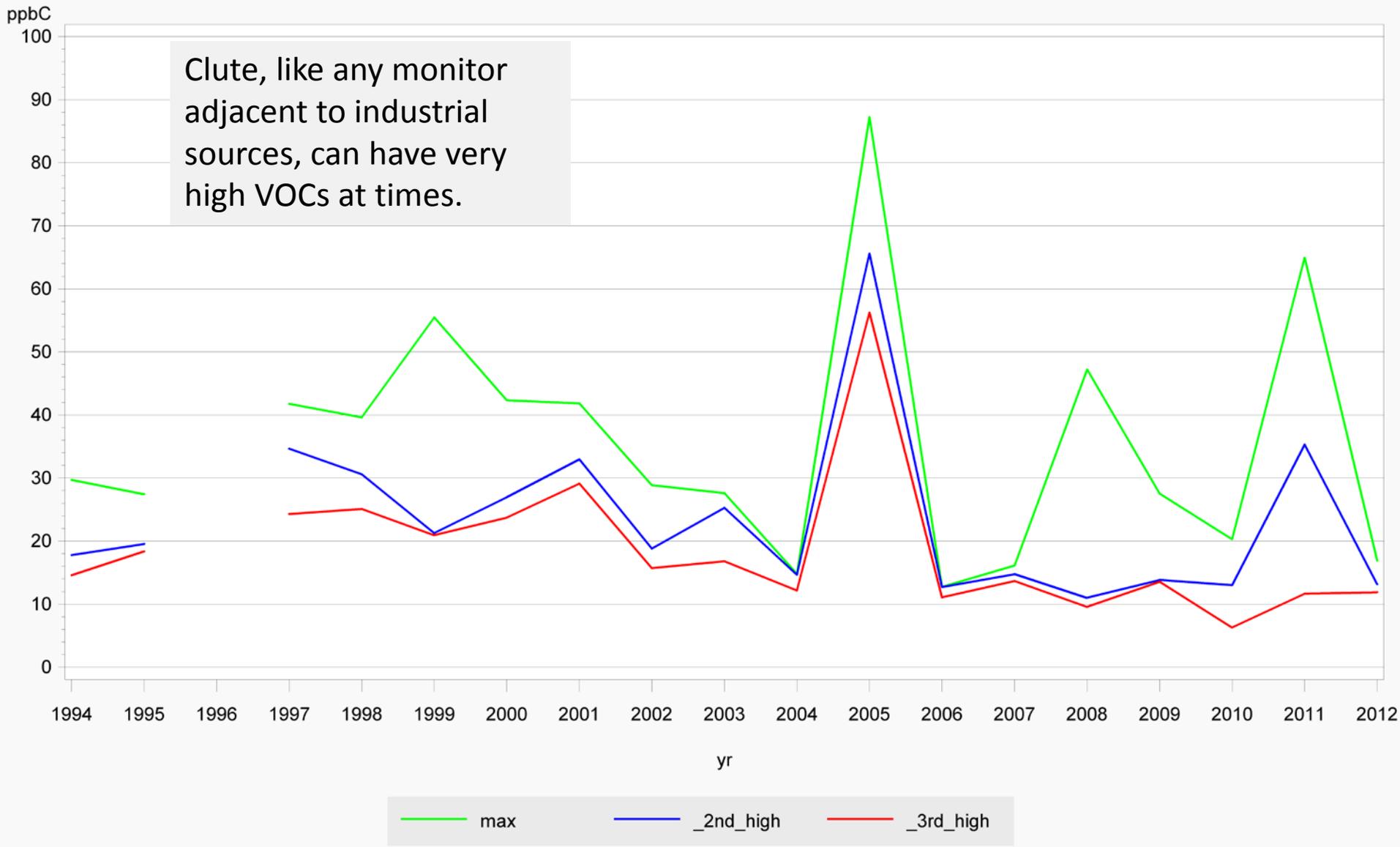
**Clute C11**  
24-hr VOC canister –  
very close to  
industrial sources

7095 ft

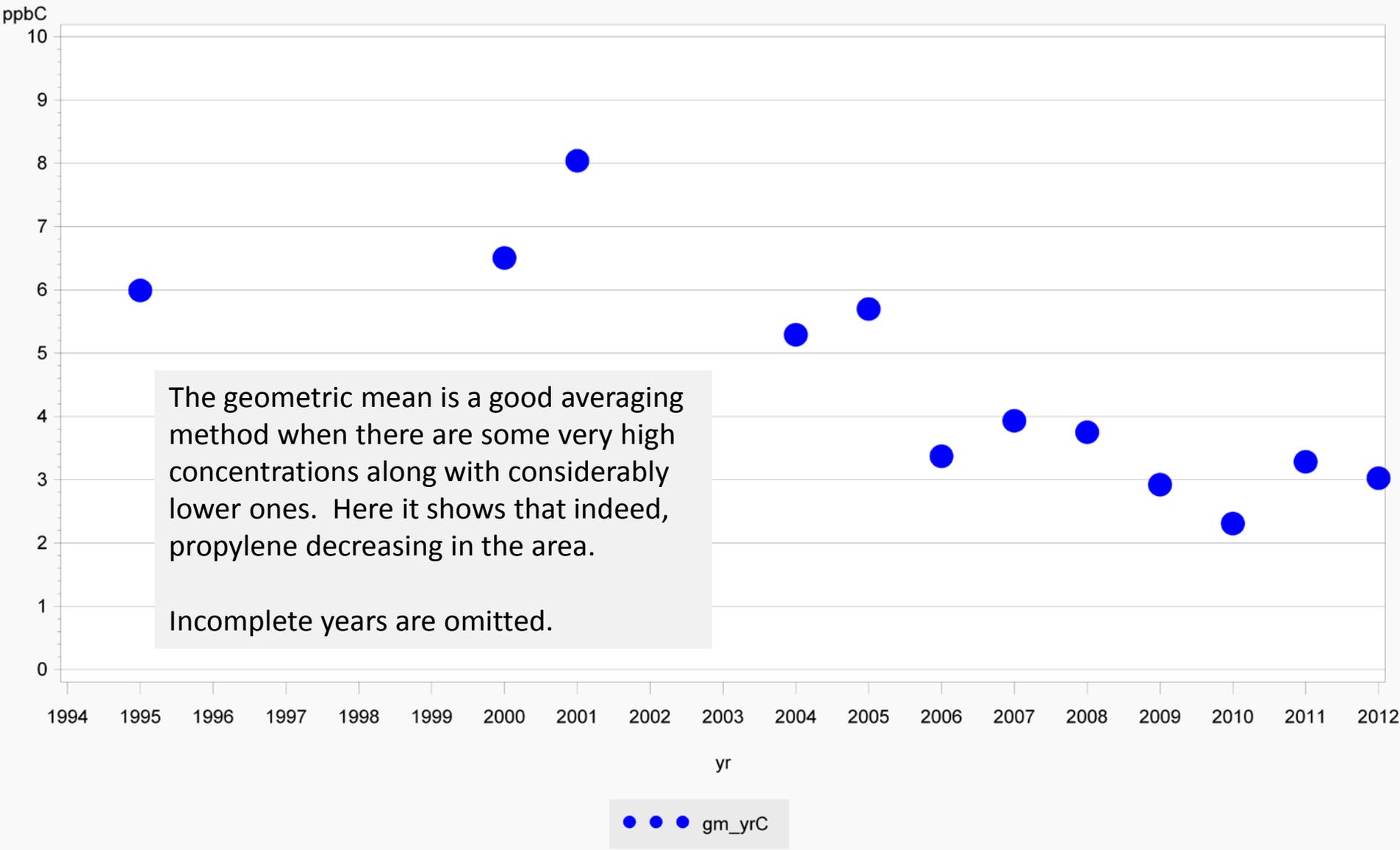
Google earth

# Top 3 Propylene Values by Year, 24-Hr Canister, Clute C11, 1994-2012

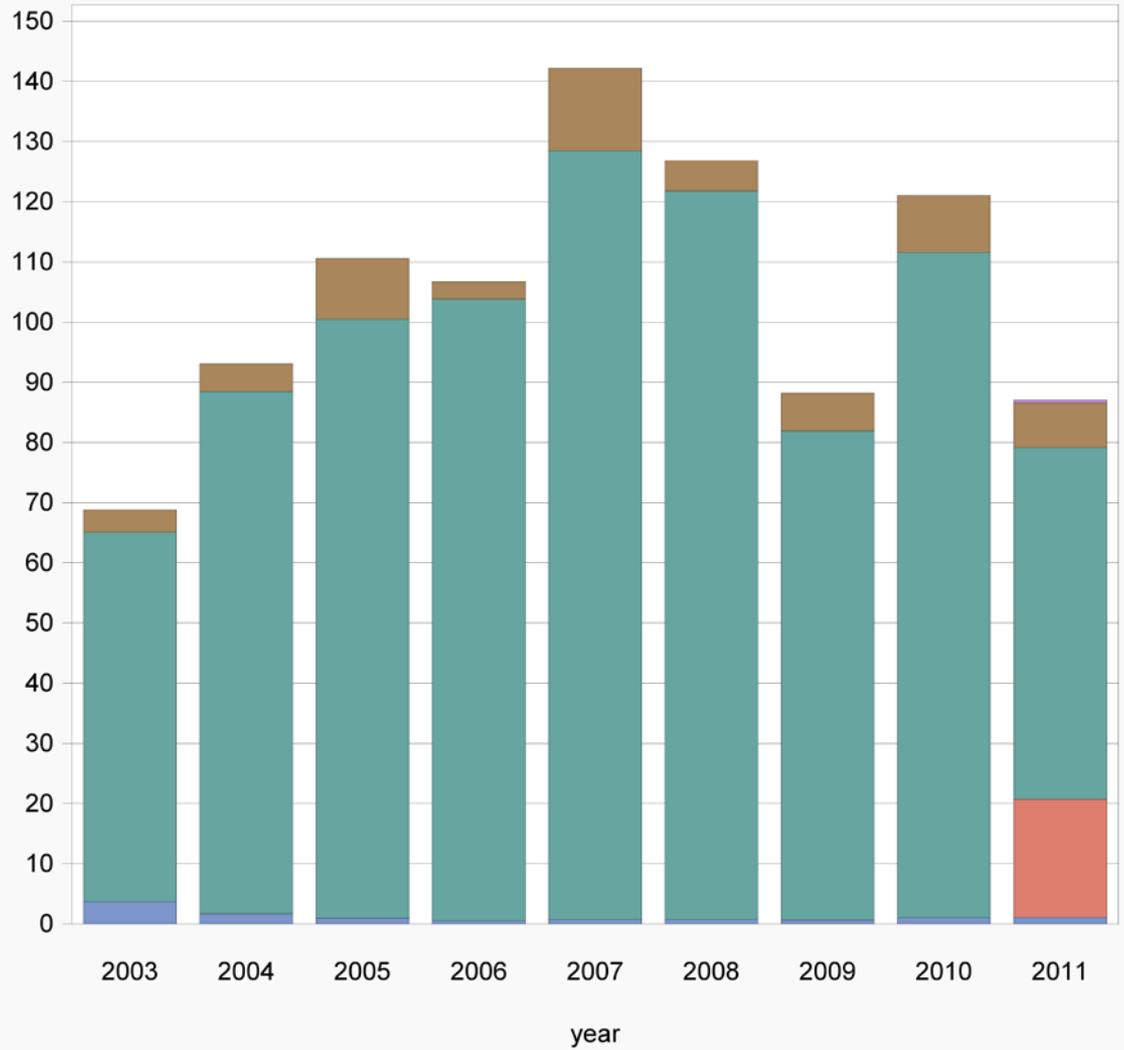
Clute, like any monitor adjacent to industrial sources, can have very high VOCs at times.



# Geometric Mean Propylene by Year, 24-Hr Canister, Clute C11, 1994-2012



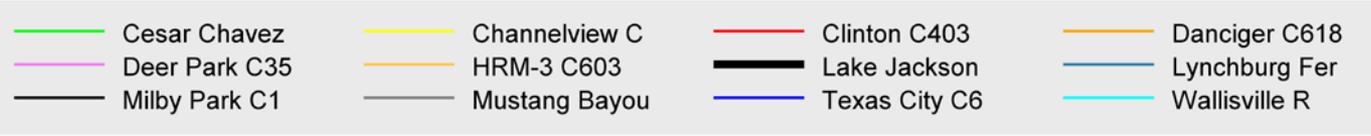
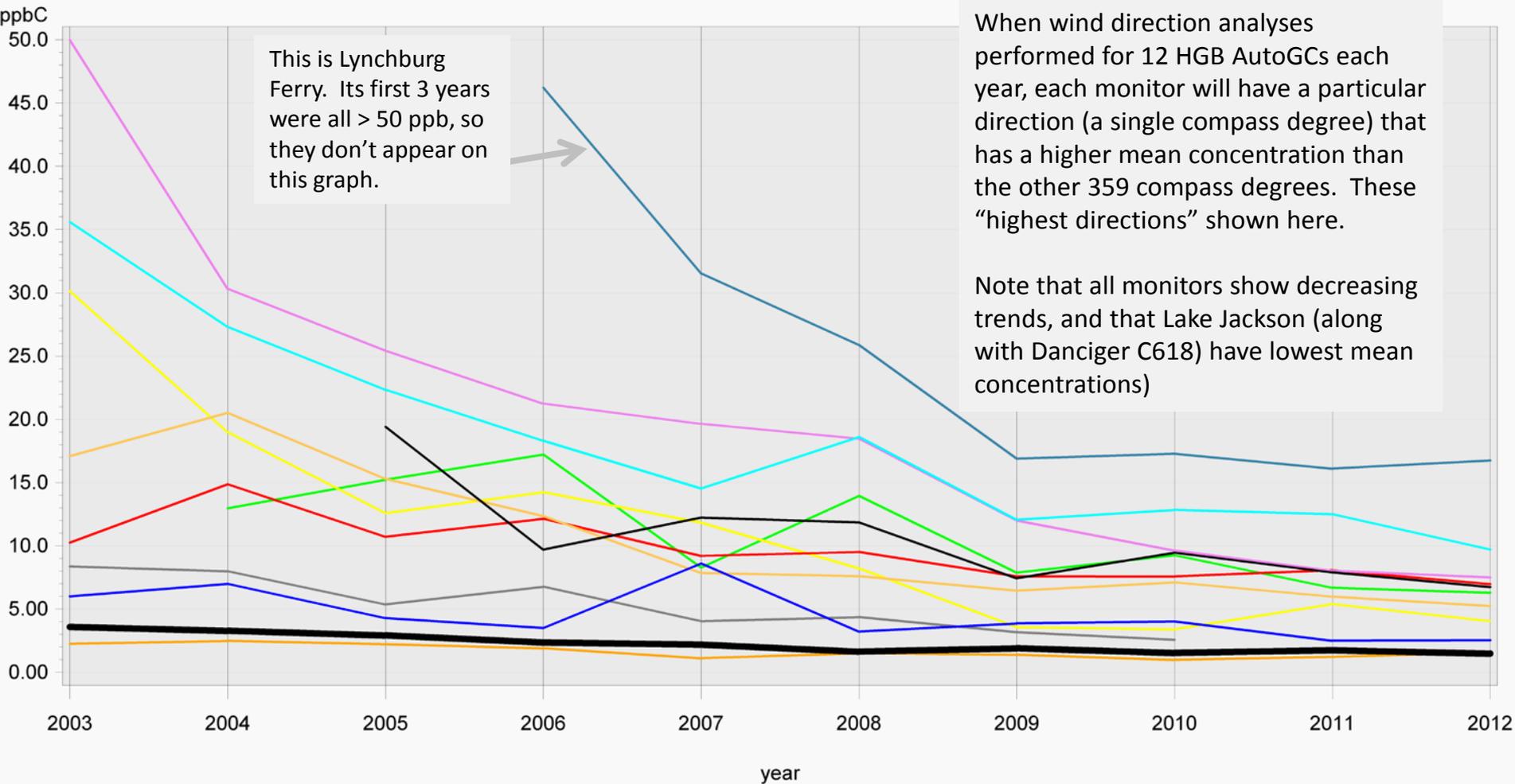
# Reported EI Propylene Emissions, Tons/yr, from Facilities Near Lake Jackson C1016



Legend:

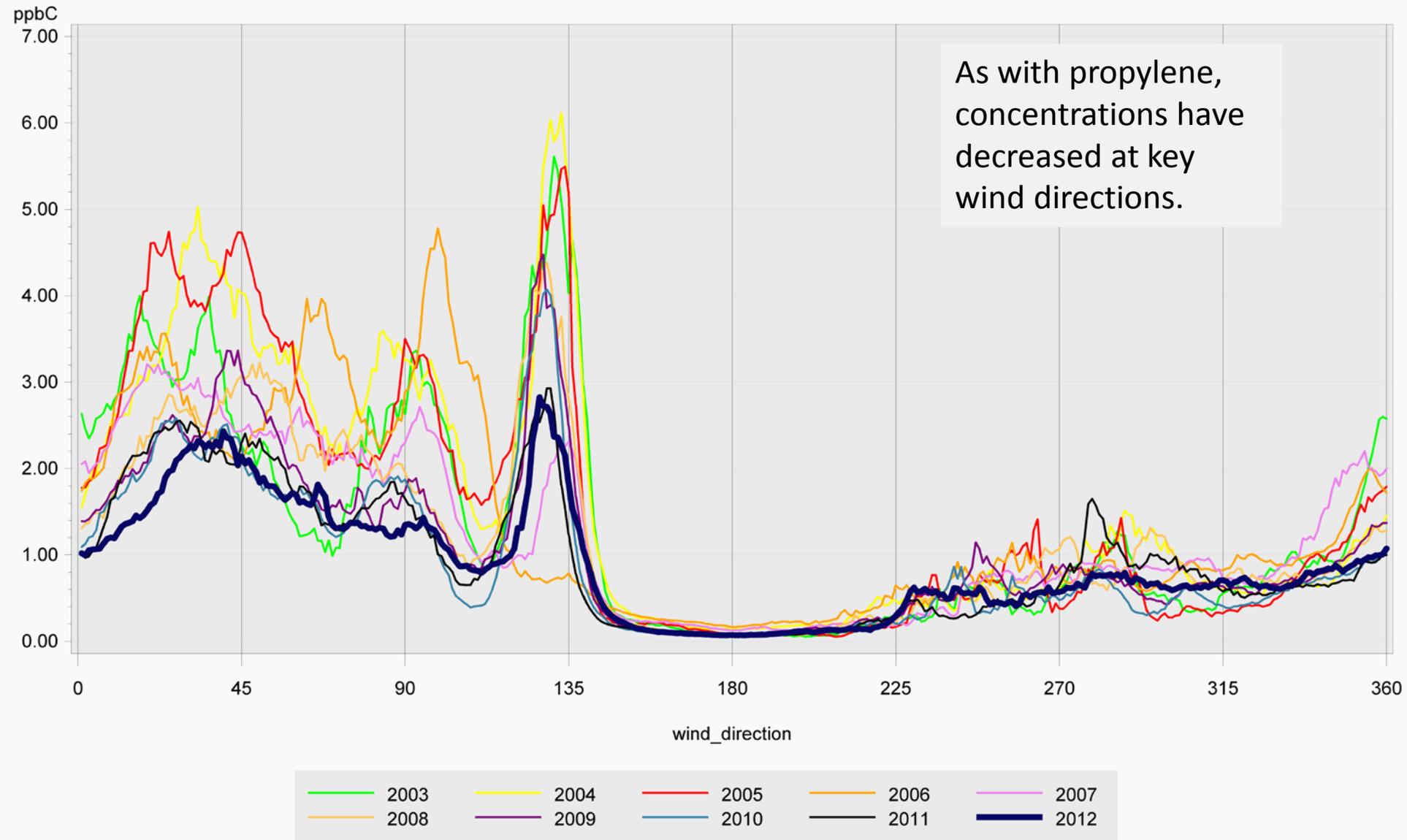
- BASF Corporation
- Ineos Usa Llc
- Braskem America Inc
- Si Group Inc
- Dow Chemical Co

# Peak Mean Propylene, by Monitor and Year, for highest wind direction

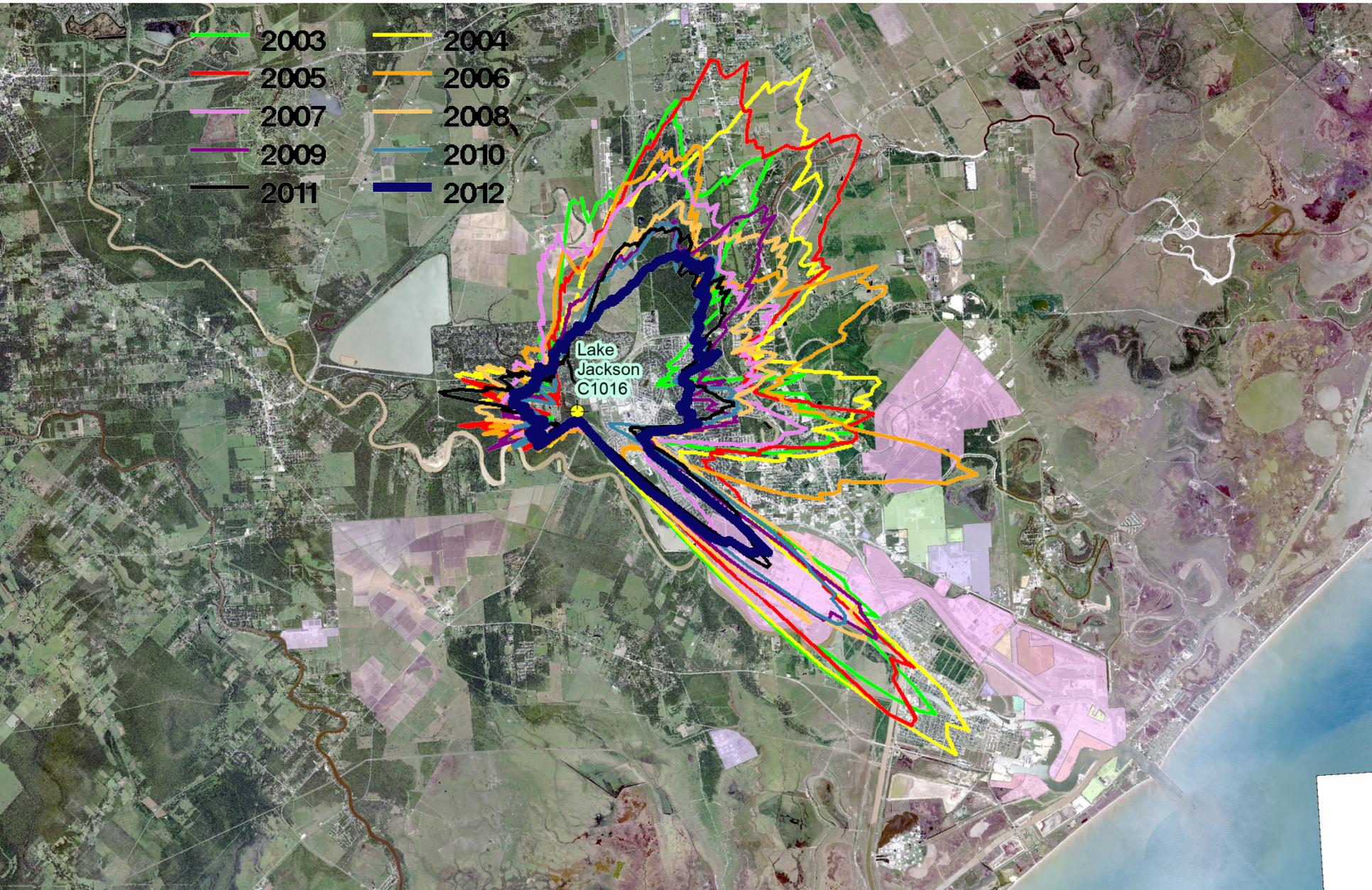


## 2. Ethylene

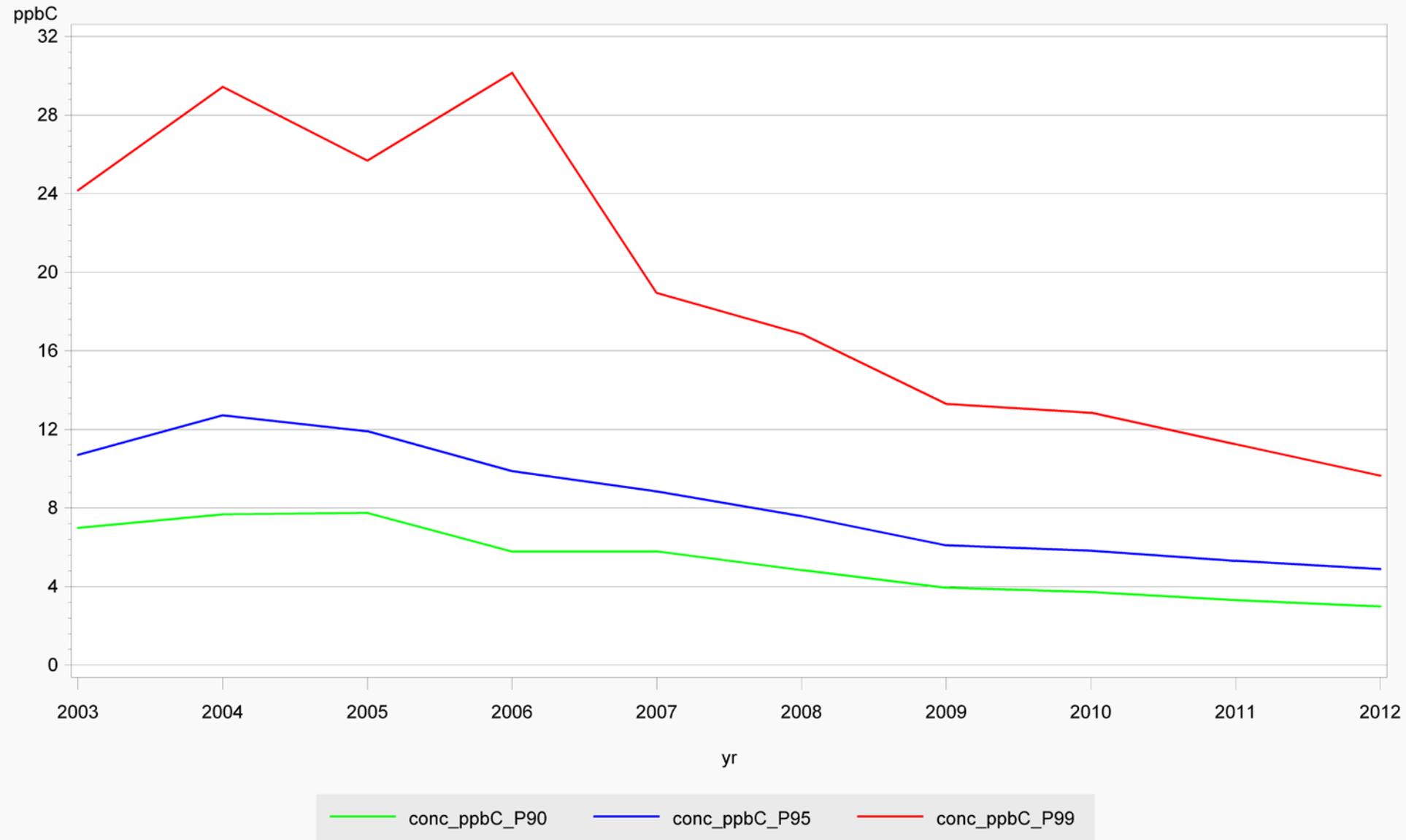
# Geometric Mean Ethylene at Lake Jackson C1016



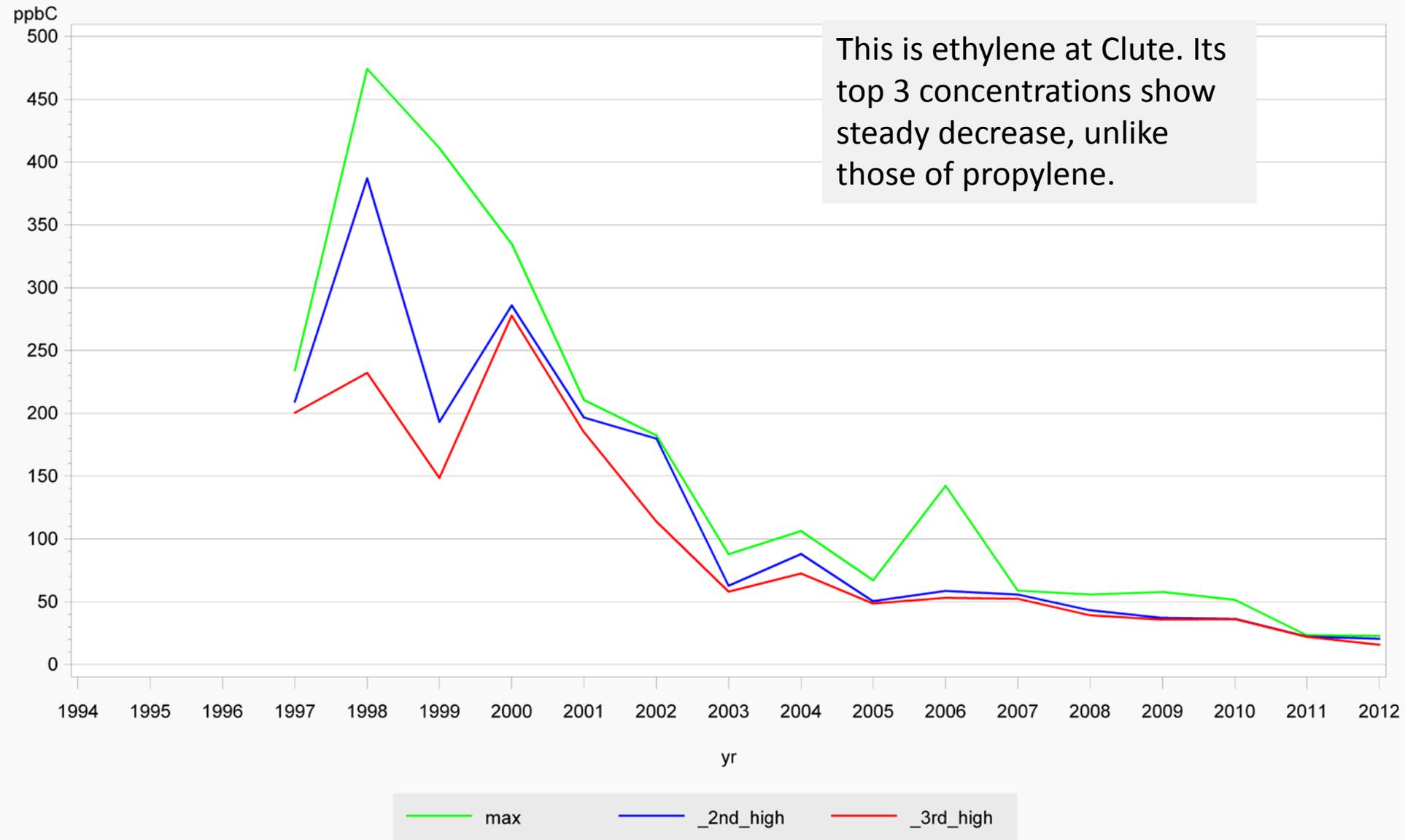
GM ethylene by wind direction (same data as previous slide)



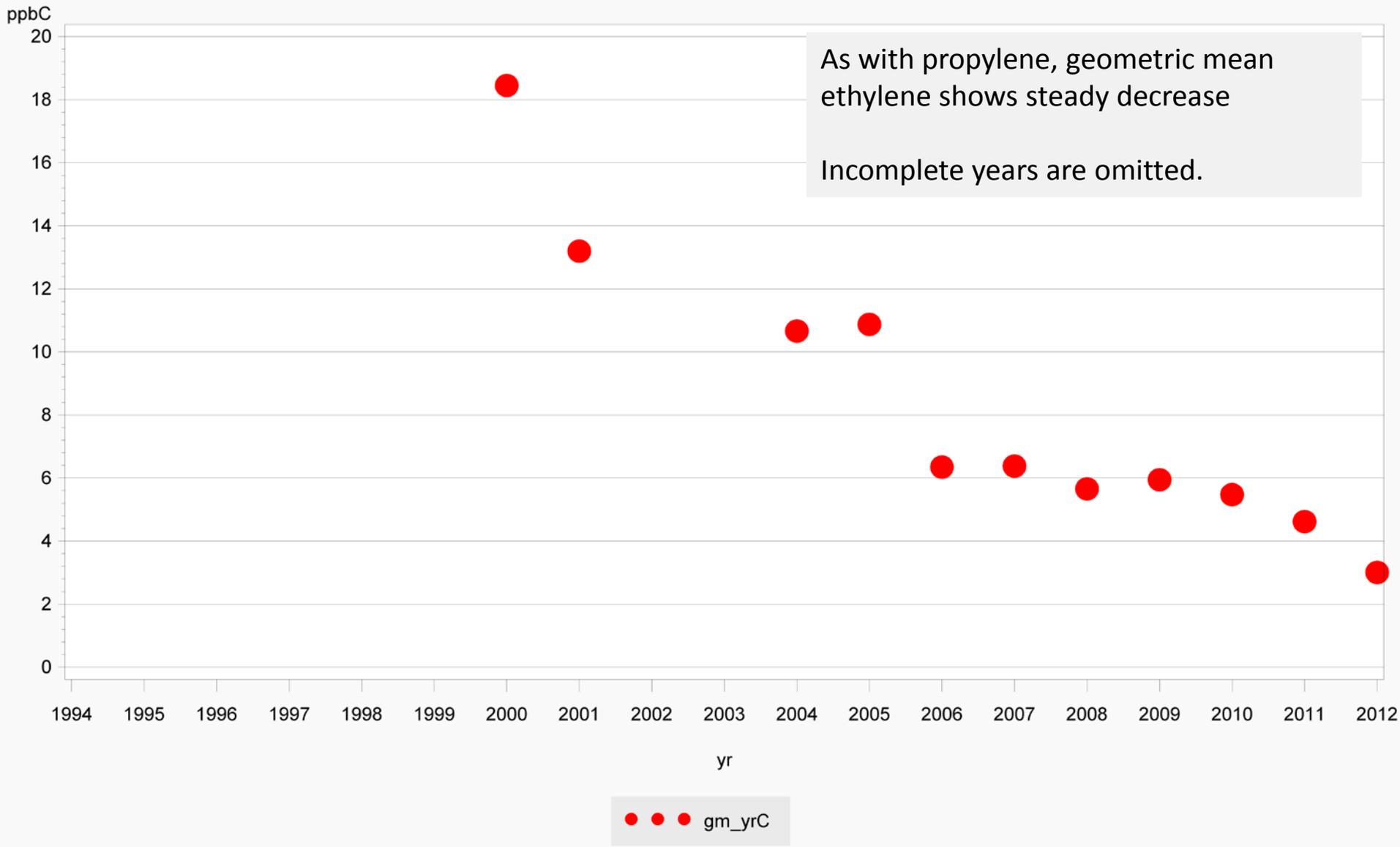
# 90th, 95th, and 99th percentile Ethylene at Lake Jackson C1016, 2003-2012



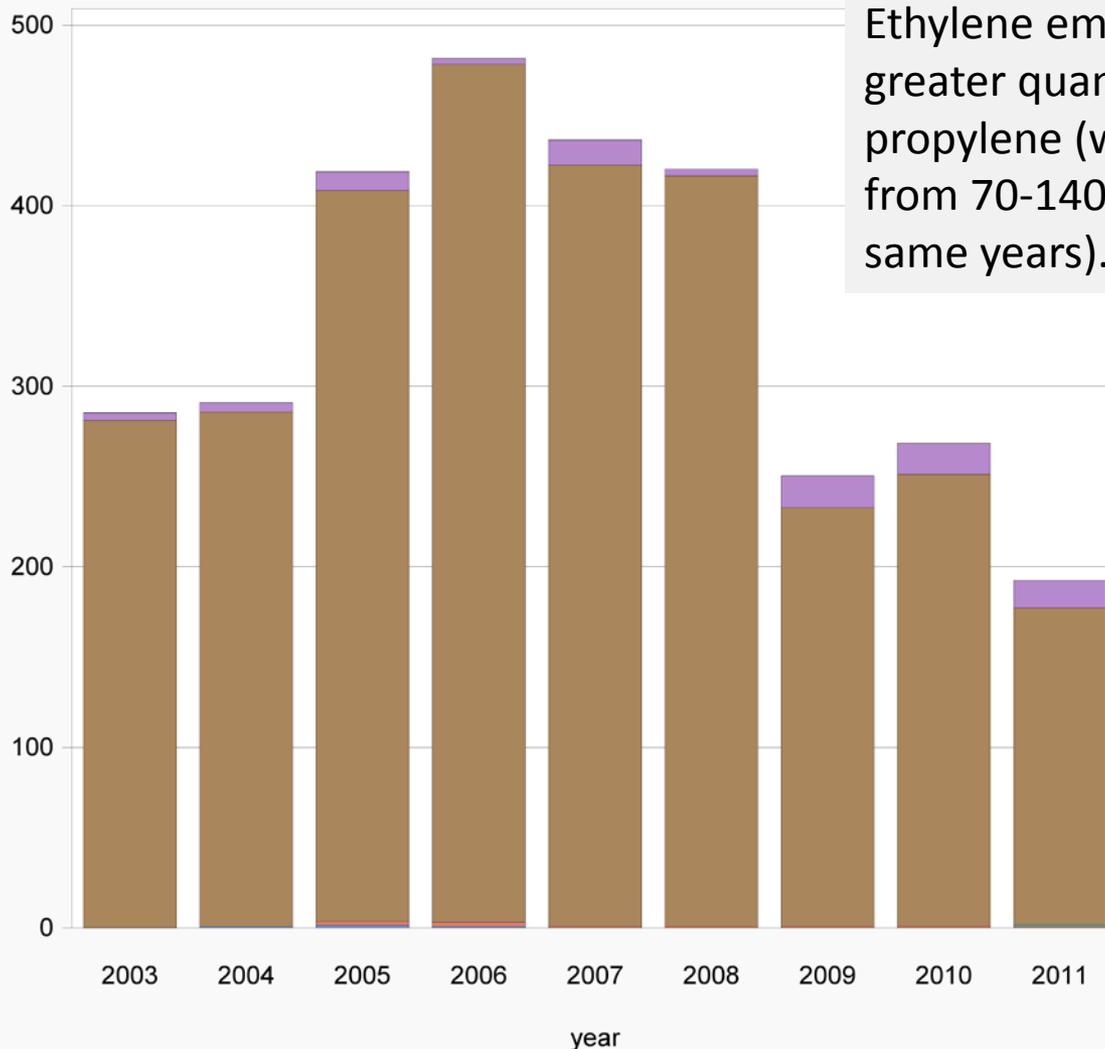
# Top 3 Ethylene Values by Year, 24-Hr Canister, Clute C11, 1997-2012



# Geometric Mean Ethylene by Year, 24-Hr Canister, Clute C11, 1994-2012



# Reported EI Ethylene Emissions, Tons/yr, from Facilities Near Lake Jackson C1016



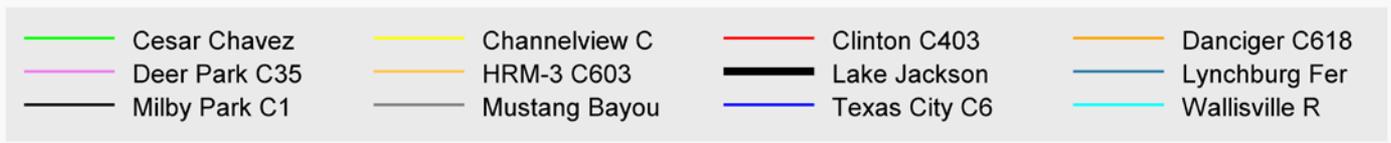
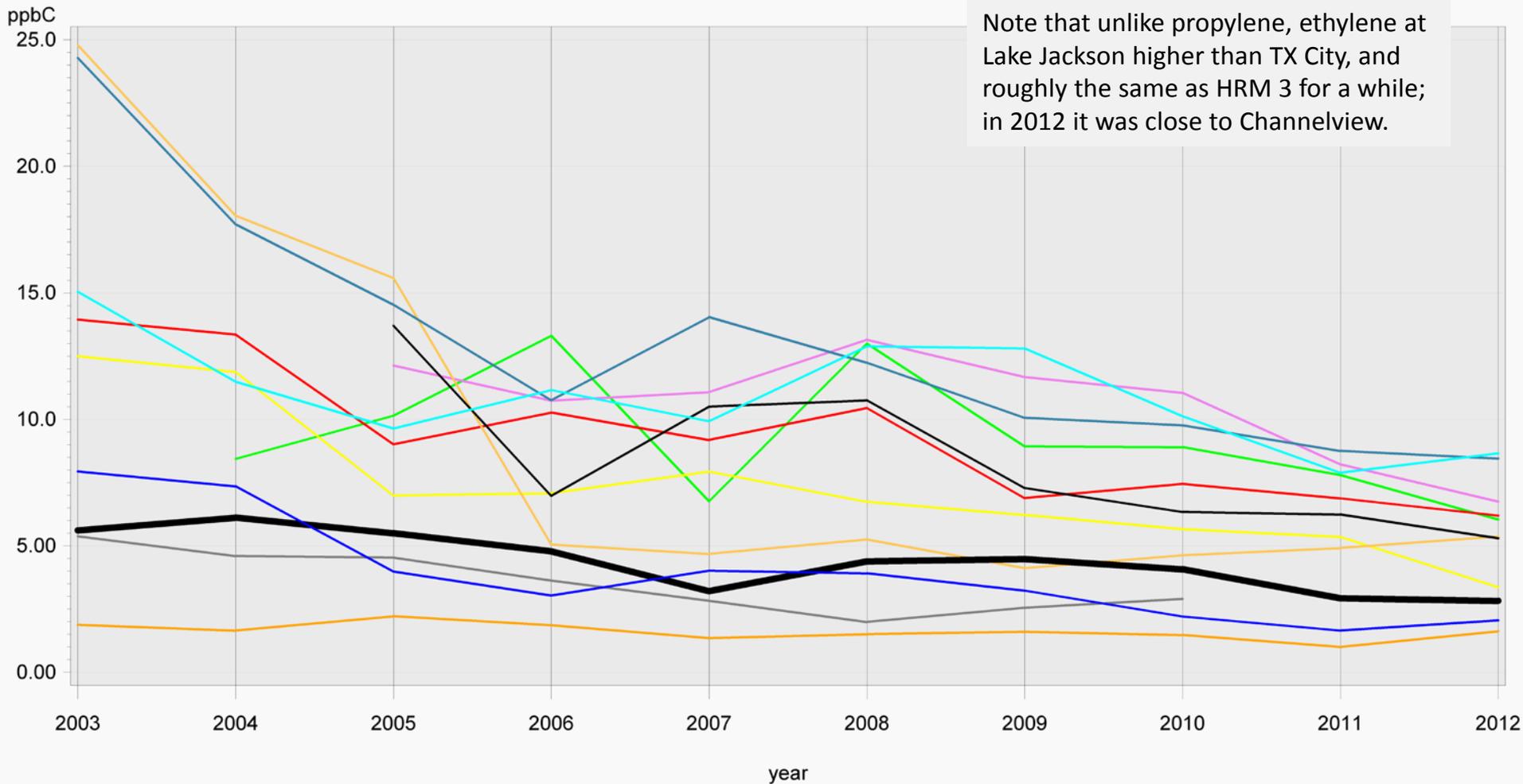
Air Liquide Large Industries Us Lp  
Dow Chemical Co

Basf Corporation  
Ineos Usa Llc

Braskem America Inc  
Oyster Creek Ltd

# Peak Mean Ethylene, by Monitor and Year, for highest wind direction

Note that unlike propylene, ethylene at Lake Jackson higher than TX City, and roughly the same as HRM 3 for a while; in 2012 it was close to Channelview.



# Moving forward

- **Plant expansions/modifications**
  - If 25 or more tons/year increase in NO<sub>x</sub> or VOC, must offset these increases with **decreases at 1.3 to 1 ratio**
    - Can buy these “offsets” from anyone in NA area
  - In spite of these offsetting emission decreases, lots of permit applications for plant expansions (low cost of nat. gas)
  - **Problem: Generating or finding VOC offsets**

## Summary / Next Steps

- Steadily decreasing concentrations of ethylene and propylene in Freeport area at both 1- and 24-hr monitors
- HRVOC concentrations remain low relative to Ship Channel
- Lake Jackson data likely to be important for future modeling of AQ/Discover period
- Permit applications for plant expansions increasing, but no VOC offsets in HGB area for increasing emissions – uncertain future regarding plant expansions.