Shipboard Measurements of Highly Reactive VOCs

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ALL DATA AND FINDINGS SHOWN ARE

PRELIMINARY ONLY

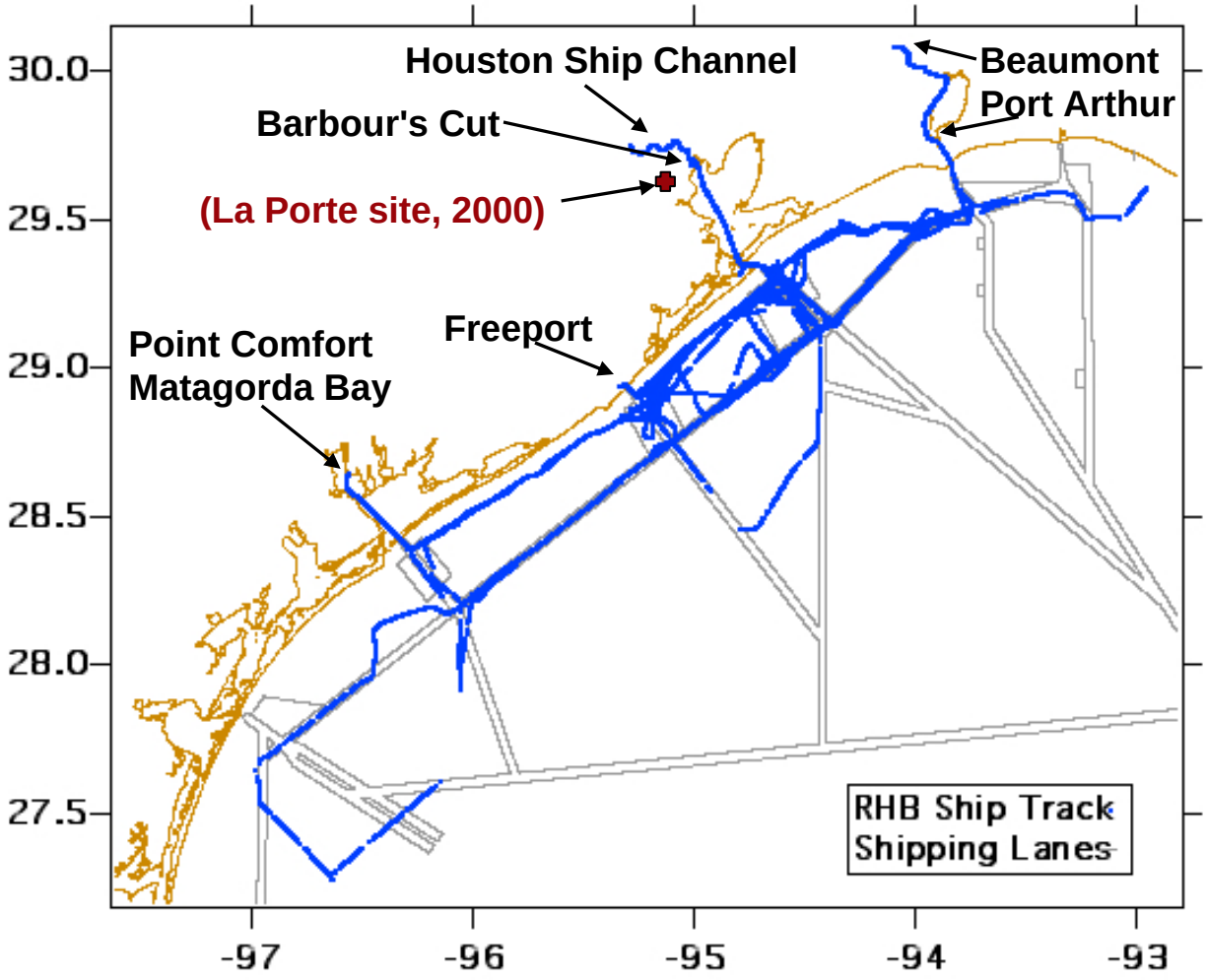
AND SUBJECT TO CHANGE

NOAA Research Vessel Ronald H. Brown

Dan Welsh-Bon

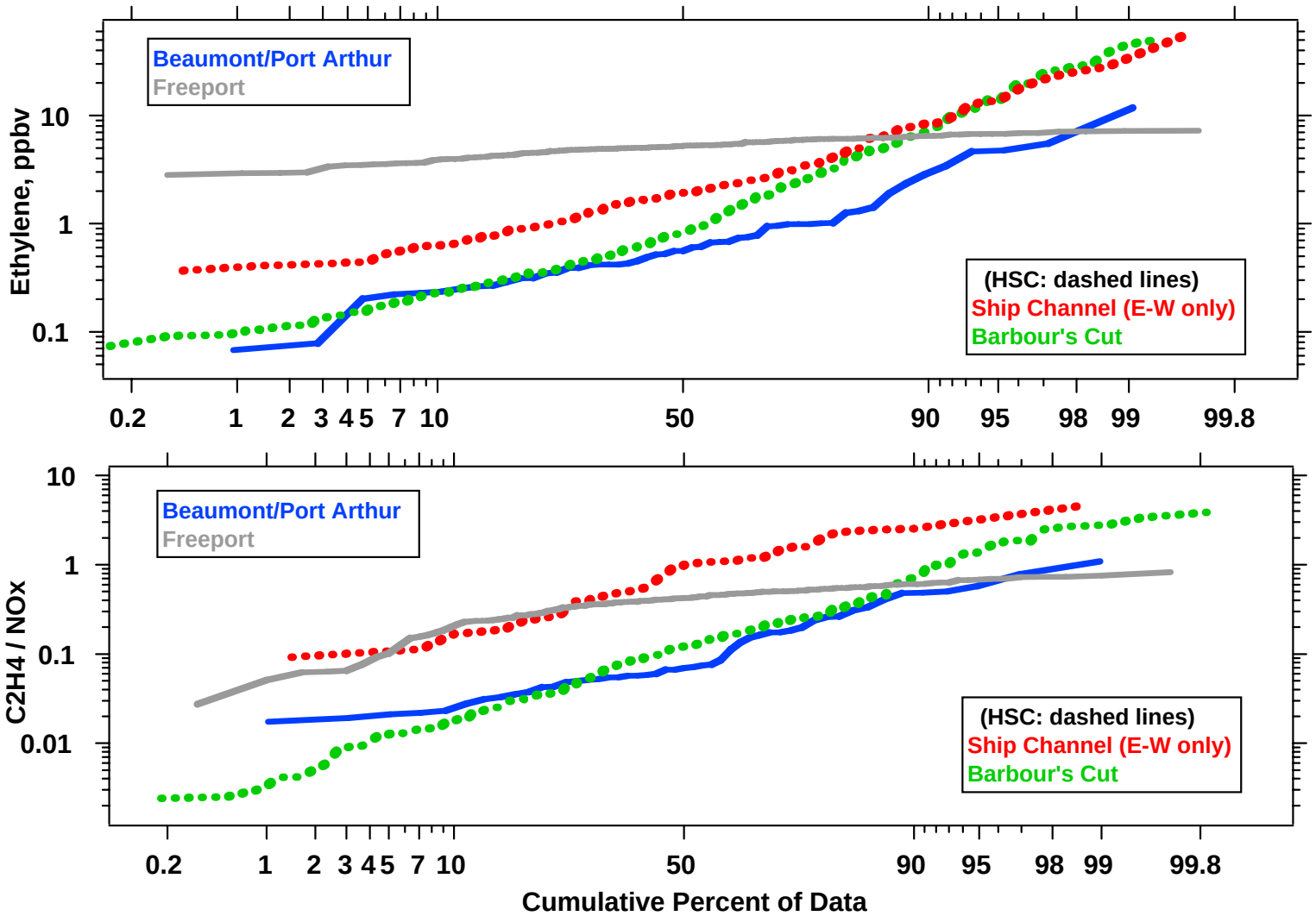
- Ethylene and propylene measurements via GC-FID (5 min. every 30 min.)
- Ethylene measurements via Quantum Cascade Laser (1 min. data)
- NO_x measurements via photolysis/chemiluminescence (10 sec. data)

Areas Studied by R/V Ronald H. Brown



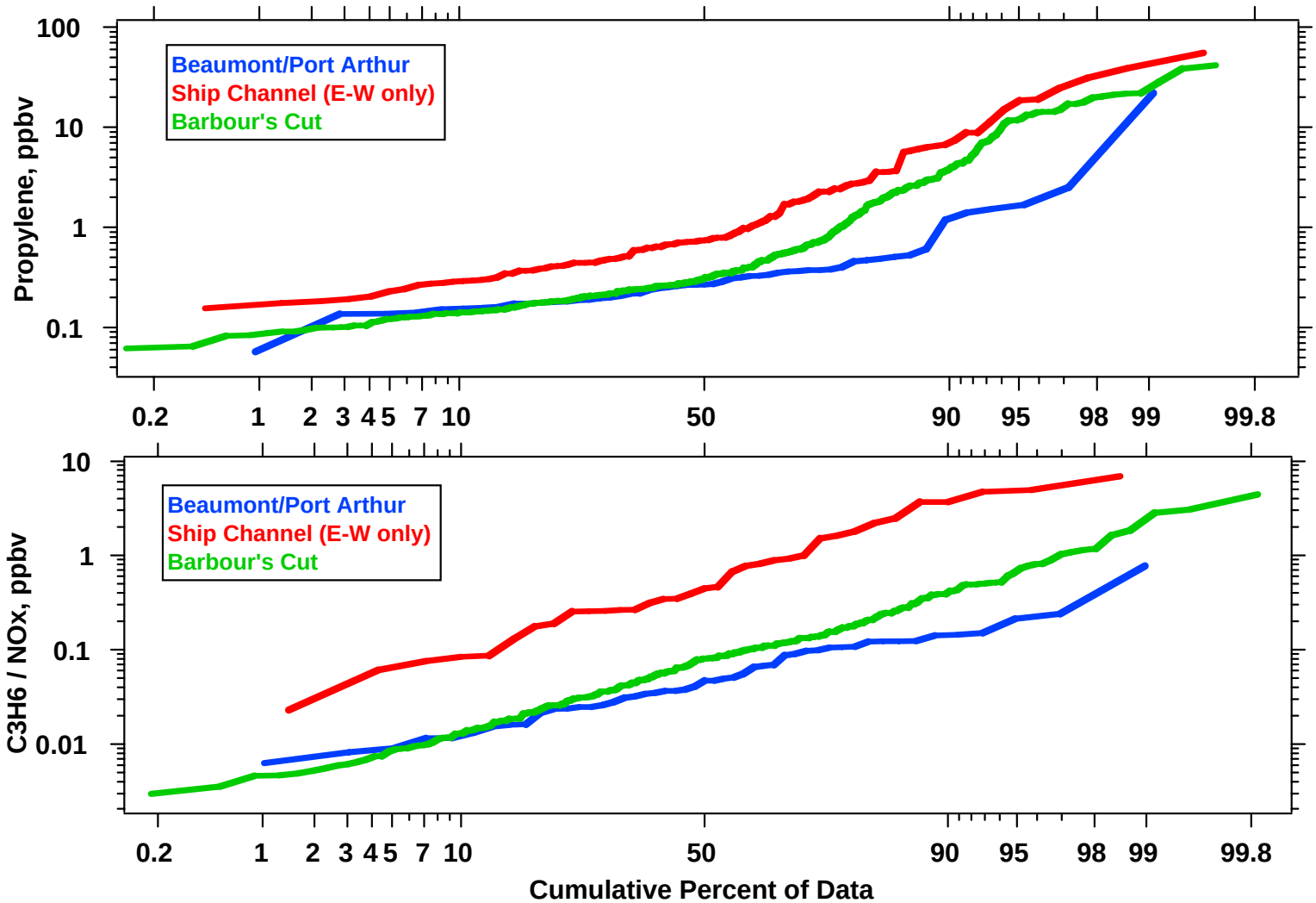
- The ship did not visit the ports of Bayport, Brownsville, Corpus Christi, and Texas City
- Time was limited in the ports of Beaumont/Port Arthur, Freeport, and Point Comfort/Matagorda Bay

Ethylene and Ethylene/NO_x at Different Regions



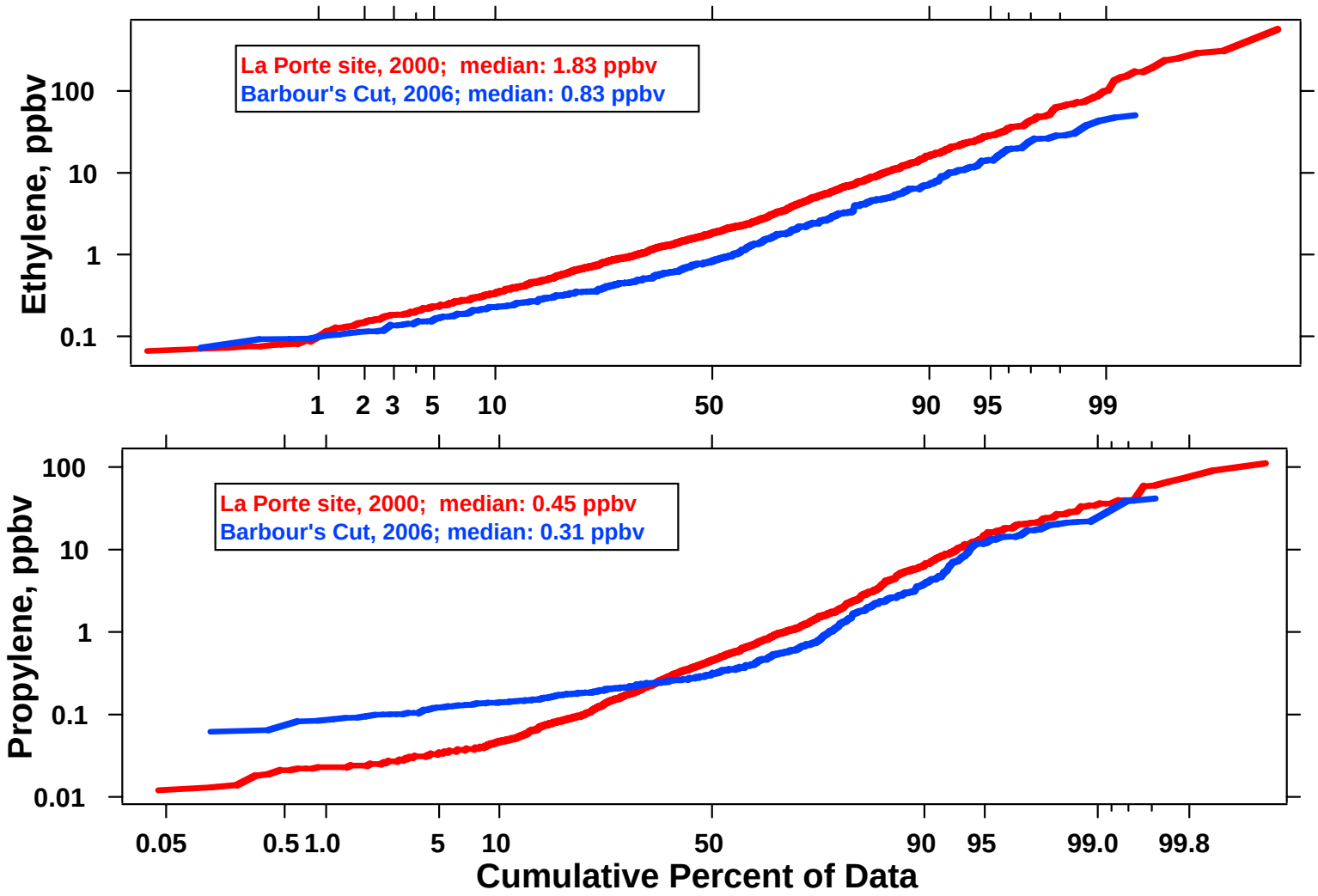
- Freeport stands out due to short sample period with ~constant data
- Beaumont/Pt Arthur and E-W sector of HSC are similar, except magnitude
- Barbour's Cut and E-W sector of HSC have different distributions

Propylene and Propylene/NO_x at Different Regions



- E-W HSC and BC have similar distributions; E-W sector has higher levels
- Beaumont/Port Arthur appears to have a different distribution than HSC

Ethylene and Propylene Between 2000 and 2006



- Distributions for C_2H_4 are similar; suggests the comparison is legitimate
  if so, then C_2H_4 has decreased by ~factor of 2!!
- Distributions for C_3H_6 are different, but suggest a decrease (more data!!)

Observations and Findings

- HRVOC data from the ship are limited, except for Barbour's Cut

- Distributions of ethylene and ethylene/NO_x ratio data suggest that Beaumont/Port Arthur is similar to E-W sector of HSC and that the Barbour's Cut area is different than the HSC

- Distributions of propylene and propylene/NO_x ratio data suggest that Beaumont/Port Arthur is different than the HSC

- Distributions of ethylene data from Barbour's Cut and La Porte supersite in 2000 suggest that C_2H_4 has decreased ~X2

- Distributions of propylene data from Barbour's Cut and La Porte supersite in 2000 suggest only a small decrease for C_3H_6