

UCR

Global Climate Change Workshop Series

High School Science Fair Projects

University of California Riverside
Dept. of Chemical & Environmental
Engineering

UCR | College of Engineering- Center for
Environmental Research & Technology

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GCC Workshop: High school Science Fair Ideas

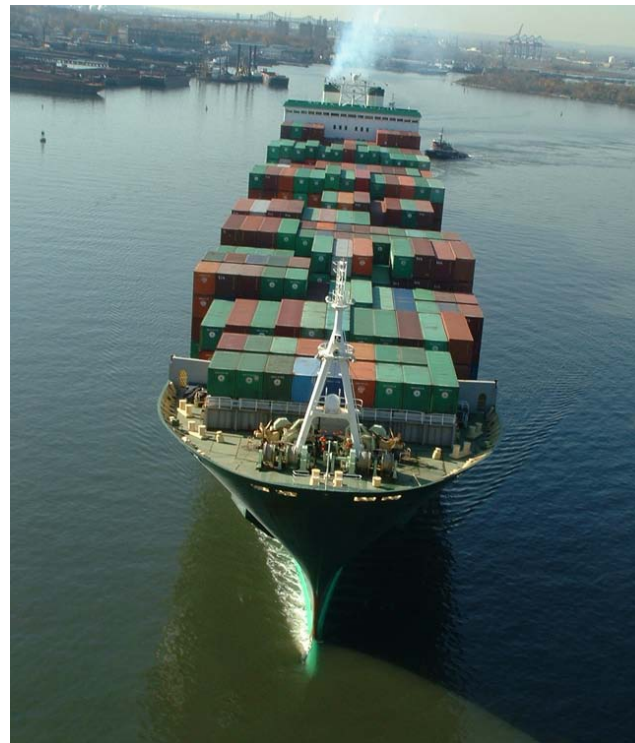
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Research – Aerosol Formation

Idea 1

- › Estimate the (g/mile)/ton of emissions from various modes of transport using the federal transportation database and combining with our emission estimates.



Idea 2

- Improve the emission estimates of any source (jet, ship, truck, etc.) or collection of them by surveying literature and then estimating the impact in Riverside.

Idea 3

- Evaluate physical characteristics of wood smoke or diesel exhaust (conventional or biodiesel).
- This could include particle density and/or morphology (shape)



Idea 4

- › Evaluate chemical characteristics of wood smoke or diesel exhaust (or any other source)

Other Ideas

- ▶ Chamber projects would include starting compounds from either
 - ▶ agricultural precursors (amines)
 - ▶ aromatic precursors
 - ▶ m-xylene
 - ▶ Trimethylbenzene
 - ▶ ethylbenzene
 - ▶ biogenic (α-pinene, isoprene)

Other Ideas

- Measure/report for/on agricultural compounds present in the atmosphere using high resolution mass spectrometry

Characterization of particles

- Use advanced chamber instrumentation to evaluate fine particle formation
- Evaluate particle aging by investigating changing
 - volatility
 - hygroscopicity (water uptake)
 - particle density
 - chemical composition
- Evaluate particle growth using scanning mobility particle sizer