

Development Of Gridded Ocean-going Vessel Emission Inventories



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2006 Emissions Inventory
New Orleans, LA
May 17, 2006





Port Emissions Impacts

- International or global in scope
- Regional for nonattainment of national standards
- Local (such as a facility or neighborhood) evaluation



Large Vessel Emissions

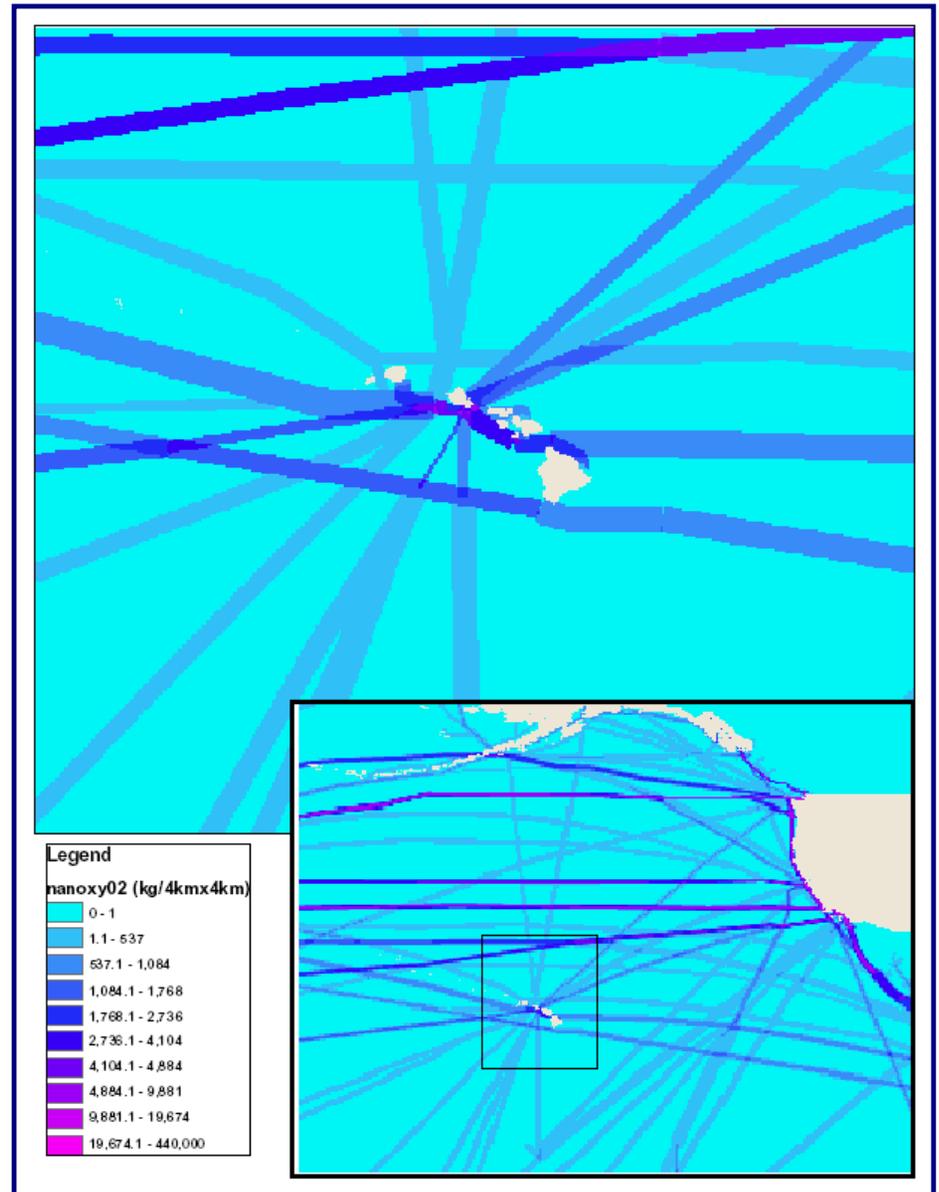
- Large Vessel Emissions
 - Cruise Mode; outside of pilot boarding zone and often outside of the region of interest
 - Reduced-speed zone between port and pilot pick-up point along ship channels usually within a metropolitan region
 - Hotelling and Maneuvering modes within short distance of each port



Superregional - Global

- Empirically derived shipping lane links
 - Ship positioning systems (weather and other observations)
 - Mapped to describe individual links
- Vessel traffic activity on links derived from port calls of entrances and exits and last and next ports.

Super Regional (Shipping Lanes)





Regional (Air Basin)

- Cruising
 - At operating speed
 - Imposed speed reduction zones
- Reduced speed zone (navigation challenges)
- Maneuvering
 - In and out from berth
 - Shifts from one berth to another or to nearby port
- Hotelling
 - At berth
 - At anchor

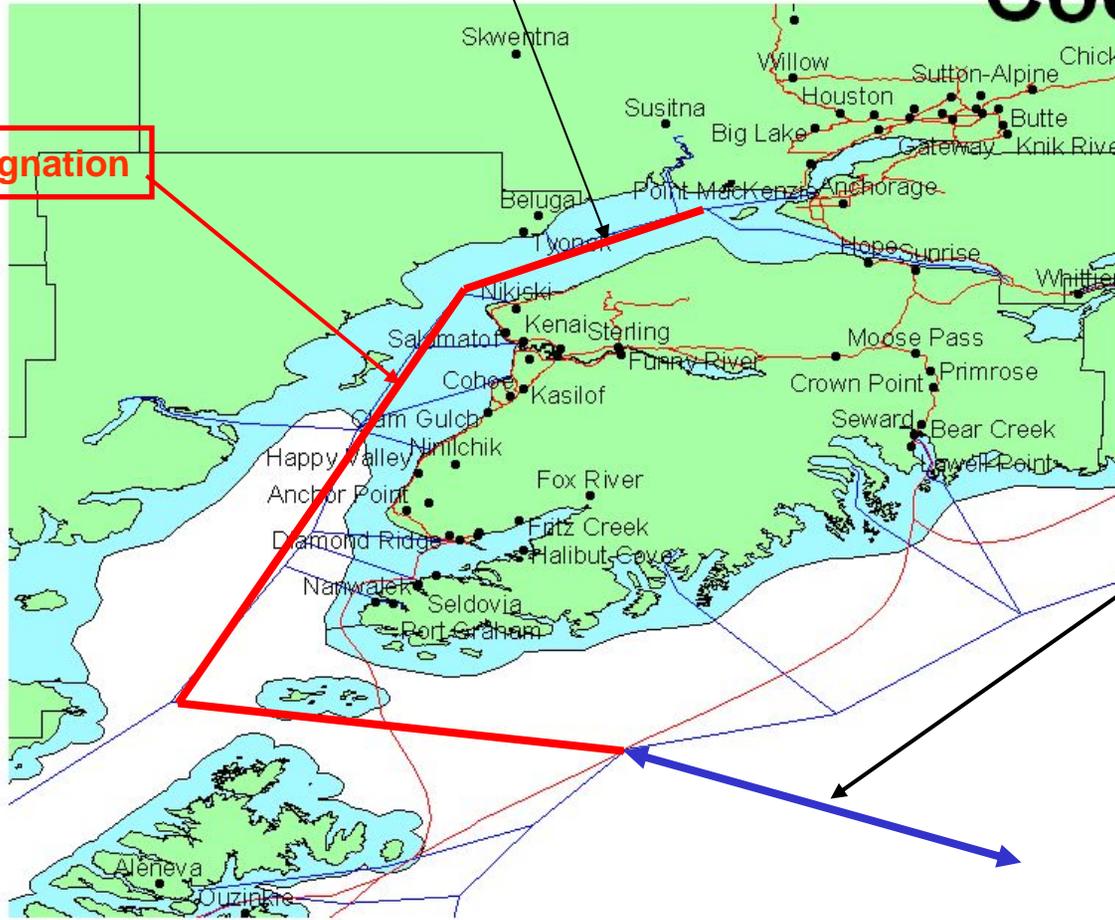
Regional and County Level

Cook Inlet

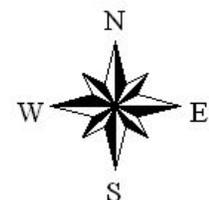
County boundary on shipping lane

RSZ Designation

Cruise Mode



- Place2000.shp
- Nhpn.shp
- Nav_water.shp
- County.shp
- Hydropol.shp





Detailed Spatial Allocation

- Proximity to affected populations
- Local air quality modeling
 - Detailed placement of emission
 - Routes
 - Berths
 - Detailed activity types
 - Engine load \propto (vessel speed)³

Conclusion

- Type of spatial allocation depends upon use of inventory
 - Global impacts, regional air quality modeling, or local health risk assessments
- Activity modes and spatial allocation interrelated
 - Vessel speed
 - Engine load

Acknowledgements

- EPA, California Air Resources Board (ARB), Western Regional Air Partnership (WRAP), Lake Michigan Air Directors Consortium (LADCO)