

Portland Air Toxics Solutions Project Modeled Lead Data and the Hillsboro Airport



State of Oregon
Department of
Environmental
Quality

Air Quality Division Planning Program

811 SW 6th Avenue
Portland, OR 97204
Phone: (503) 229-5696
(800) 452-4011
Fax: (503) 229-6762
Contact: Sarah Armitage
www.oregon.gov/DEQ

*DEQ is a leader in
restoring, maintaining and
enhancing the quality of
Oregon's air, land and
water.*

Background

As part of the Portland Air Toxics Solutions Project, DEQ modeled 19 pollutants for the Portland region to identify pollutants above benchmarks, emissions sources, and potential emission reduction options. Using many complex inputs on emissions, topography, and weather, the DEQ air dispersion model produced estimated air toxics concentrations for the Portland area. Working with a broad based advisory committee DEQ used this model to prioritize sources of air toxics for reduction. The final draft Portland Air Toxics Solutions report will be posted on DEQ's website by the end of January 2012. For more information about Portland Air Toxics Solutions, please visit the DEQ website at: <http://www.deq.state.or.us/air/toxics/pats.htm>.

Oregon's Lead Benchmark

Air toxics ambient benchmark concentrations are reference values and clean air goals that DEQ uses to identify, evaluate and address air toxics problems. They are levels with negligible risk of harm to human health. In 2008, the U.S. Environmental Protection Agency adopted a new lower National Ambient Air Quality Standard for lead. After consultation with its Air Toxics Science Advisory Committee, (<http://www.deq.state.or.us/air/toxics/atsac.htm>) DEQ concluded that the benchmark for lead should be aligned with the federal standard, and decreased it from 0.5 to 0.15 micrograms per cubic meter. In August 2010, the Environmental Quality Commission unanimously adopted the new more protective benchmark concentration for lead. The revised standard is protective of children and sensitive populations.

PATS Lead Modeling

Lead is one of the pollutants that DEQ modeled for the Portland Air Toxics Solutions project. The primary sources of lead in the model were general aviation fuel and industrial metals production. For general aviation lead emissions, DEQ received activity data from the Port of Portland and applied emission factors, or rates, from EPA and then used the dispersion model to predict concentrations.

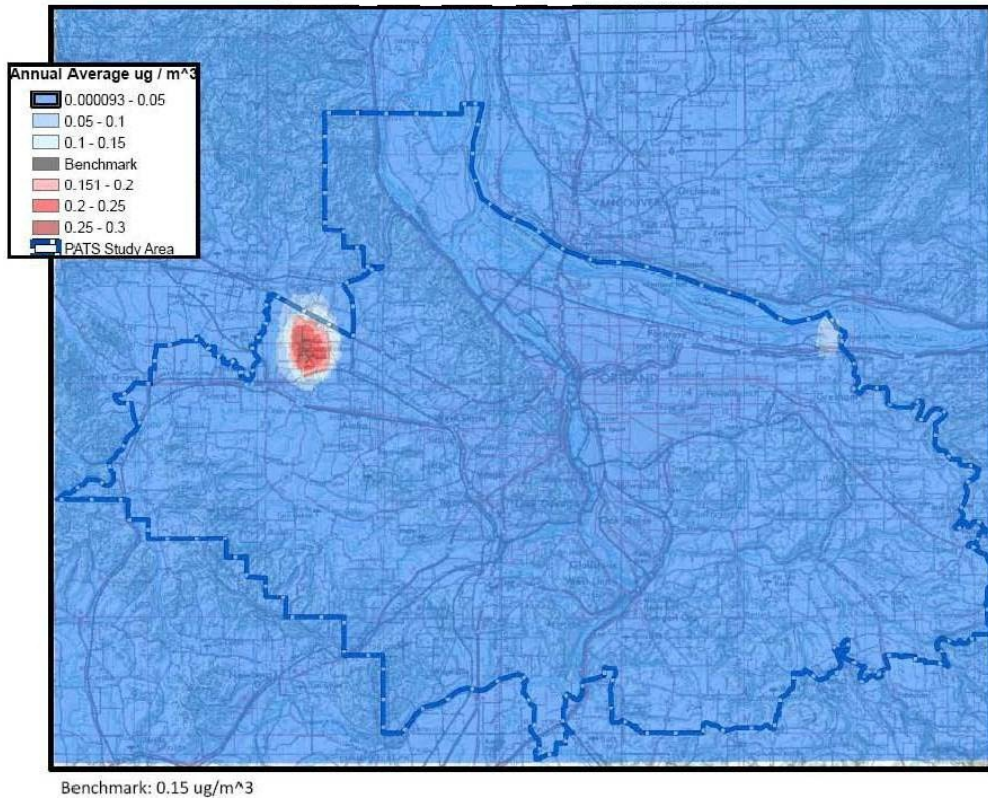
The modeling consisted of two phases. In the first phase DEQ modeled to establish an estimated concentration baseline from emissions in 2005. In the second phase, DEQ projected 2017 estimated emissions to understand current problems and to develop emission reduction strategies. The 2017 projections were reached by updating and increasing the 2005 emissions data to account for current conditions, regulatory requirements and economic growth.

The 2005 data were based on DEQ's 2005 air toxics emission inventory. The resulting modeled concentrations were considered draft data to be used as a basis for refining the inventory and for projecting to 2017 levels. Data refinements for the 19 pollutants included filling gaps where data was missing, removing emissions that no longer existed, improving emission factors to be more realistic, placing emissions in more accurate

locations, and using modeling assumptions that better approximated actual conditions. To project to 2017 levels, which are our most accurate estimates of emissions, DEQ applied Metro's economic growth factors to the refined 2005 data.

When DEQ estimated lead concentrations for 2005, it produced a map showing levels above the lead benchmark at the Hillsboro airport. On this map included below, areas colored pink to red are above the lead benchmark.

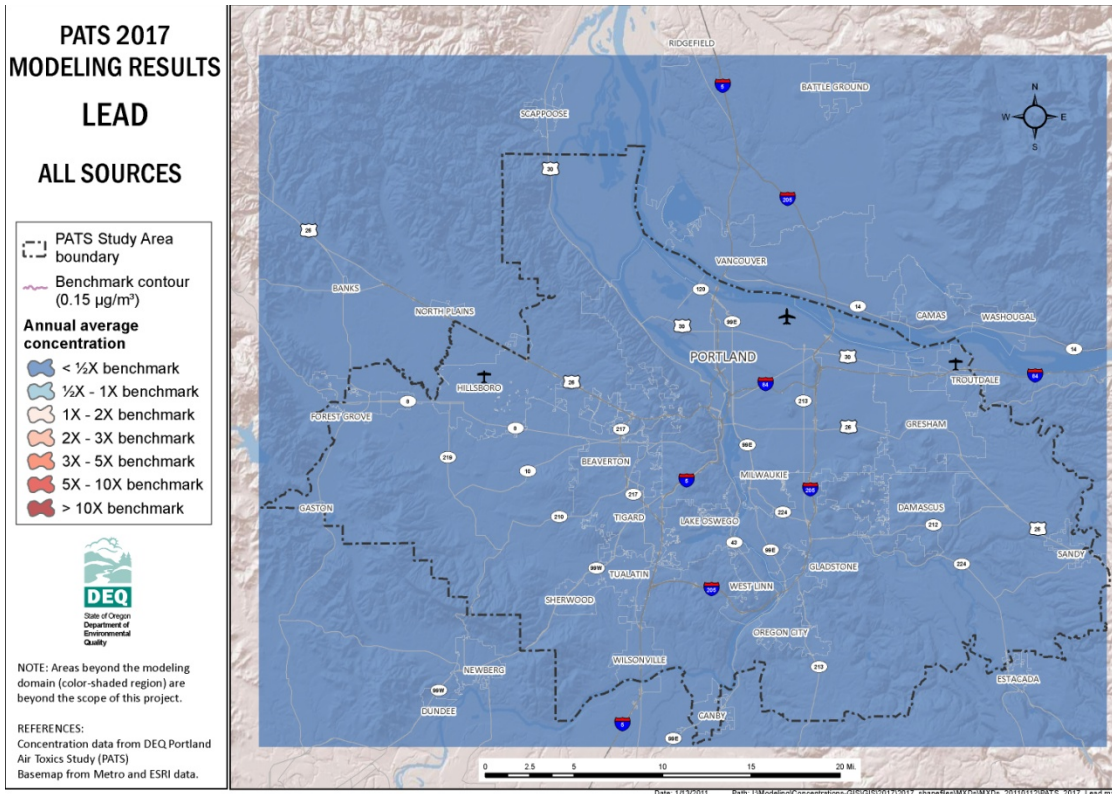
PATS 2005 Estimated Lead Concentrations



Consistent with its practice to validate data for all modeled air toxics emissions sources, DEQ discussed the 2005 estimated lead results with the Port of Portland to check on the accuracy of emissions input and modeling for the Hillsboro Airport. While the emissions estimates on aviation activity were the most current data available from the Port, the 2005 assumptions on emission release height were inaccurate because they placed all general aviation fuel lead emissions at ground level instead of in a vertical distribution matching aircraft take off and landing patterns.

Applying the more realistic emission data for the releases of aircraft emissions based on a refined airport emissions model used by the Port, DEQ corrected its lead emissions data at the Hillsboro Airport and re-ran the model, including growth assumptions for 2017. The 2017 estimated concentrations for lead showed no modeled concentrations above the benchmark. This result was due to the greater mixing and dilution of lead emissions within the air column through which arriving and departing aircraft operate. The 2017 estimated lead concentration map is below.

PATS 2017 Estimated Lead Concentrations



Port of Portland Lead Modeling

The Port of Portland's contractor CDM also produced a Hillsboro Airport Lead Study in September 2010. This study showed that lead emissions from the Hillsboro Airport were not estimated to exceed the National Ambient Air Quality Standard level of 0.15 µg/m³, based on a three-month rolling average. The CDM Hillsboro Airport Lead Study used a model that is different and more complex than the model DEQ used for the Portland Air Toxics Solutions project. DEQ has not conducted an analysis to compare the study to its Portland Air Toxics Solutions model.

Alternative formats

DEQ is committed to accommodating people with disabilities. Please notify DEQ of any special physical or language accommodations or if you need information in large print, Braille or another format.

To make these arrangements, contact DEQ Communications and Outreach in Portland at 503-229-5696 or call toll-free in Oregon at 800-452-4011; fax 503-229-6762; or email deqinfo@deq.state.or.us.

People with hearing impairments may call 711.