IMPROVING DIESEL PARTICULATE MATTER EXPOSURE ASSESSMENT FOR VULNERABLE POPULATIONS

LESSONS LEARNED FROM THE COMMUNITY-SCALE AIR TOXICS MONITORING 2017 AWARD

State of Oregon
Department of Environmental Quality

Portland State
UNIVERSITY

NEIGHBORS FOR CLEAN AIR

Sarah Armitage
Eric Feeley
Anthony Barnack
Ben Ayres
Phil Allen
...

Linda George
Kirsten Sarle
Lyndsey Boyle
Andrew Rogers
Vivek Shandas
Yasuyo Makido
Cordero Ortiz
Julie Fry
...

Mary Peveto
Nakisha Nathan
John Wasiutynski
Nadege Dubuisson
Monique Smiley
Sergio Lopez
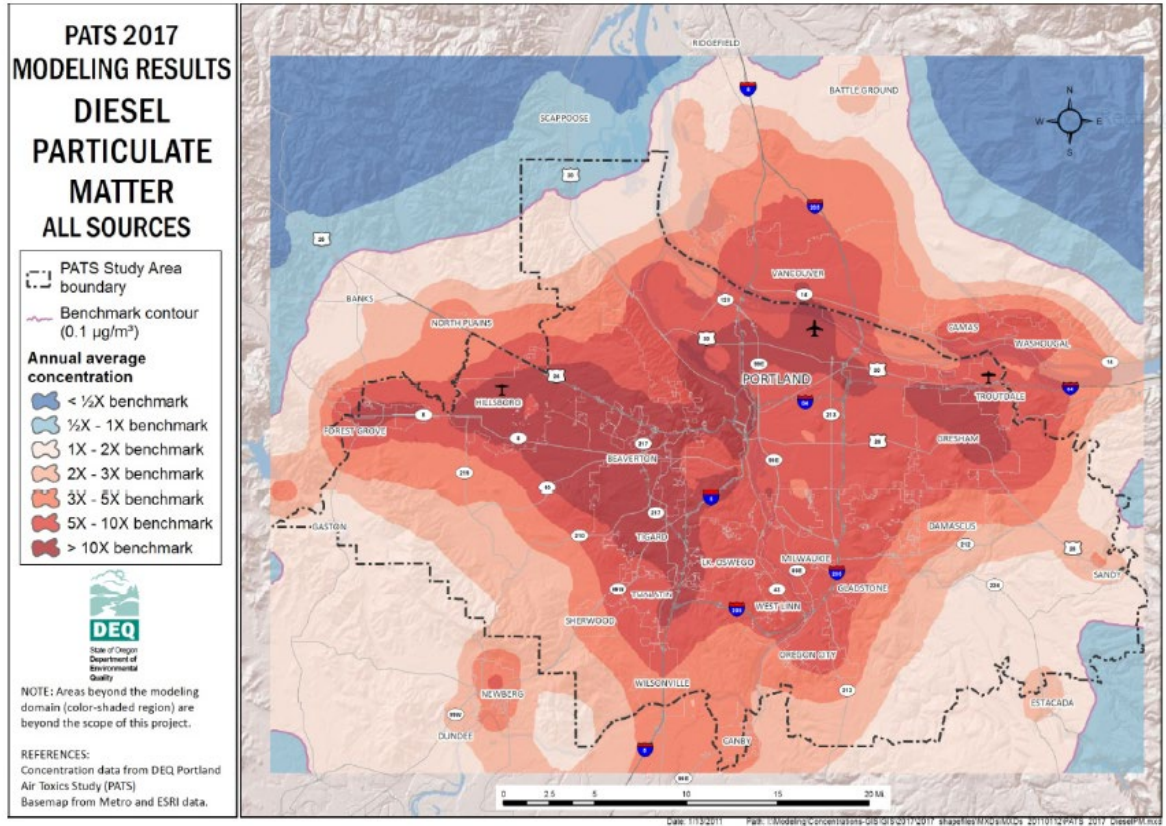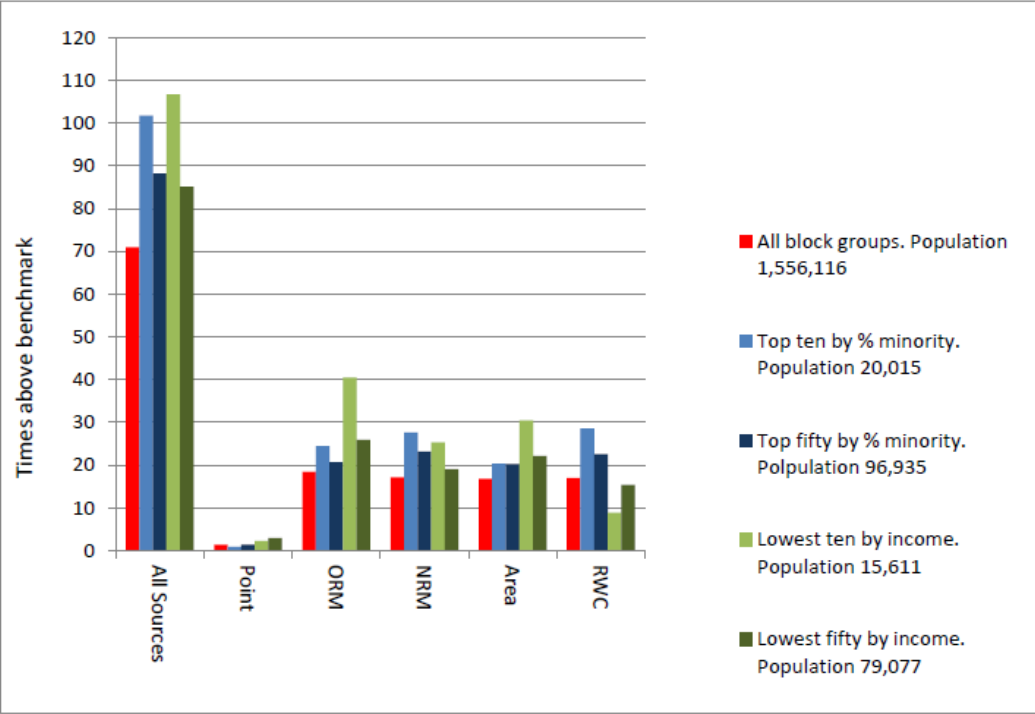Jairaj Singh
...
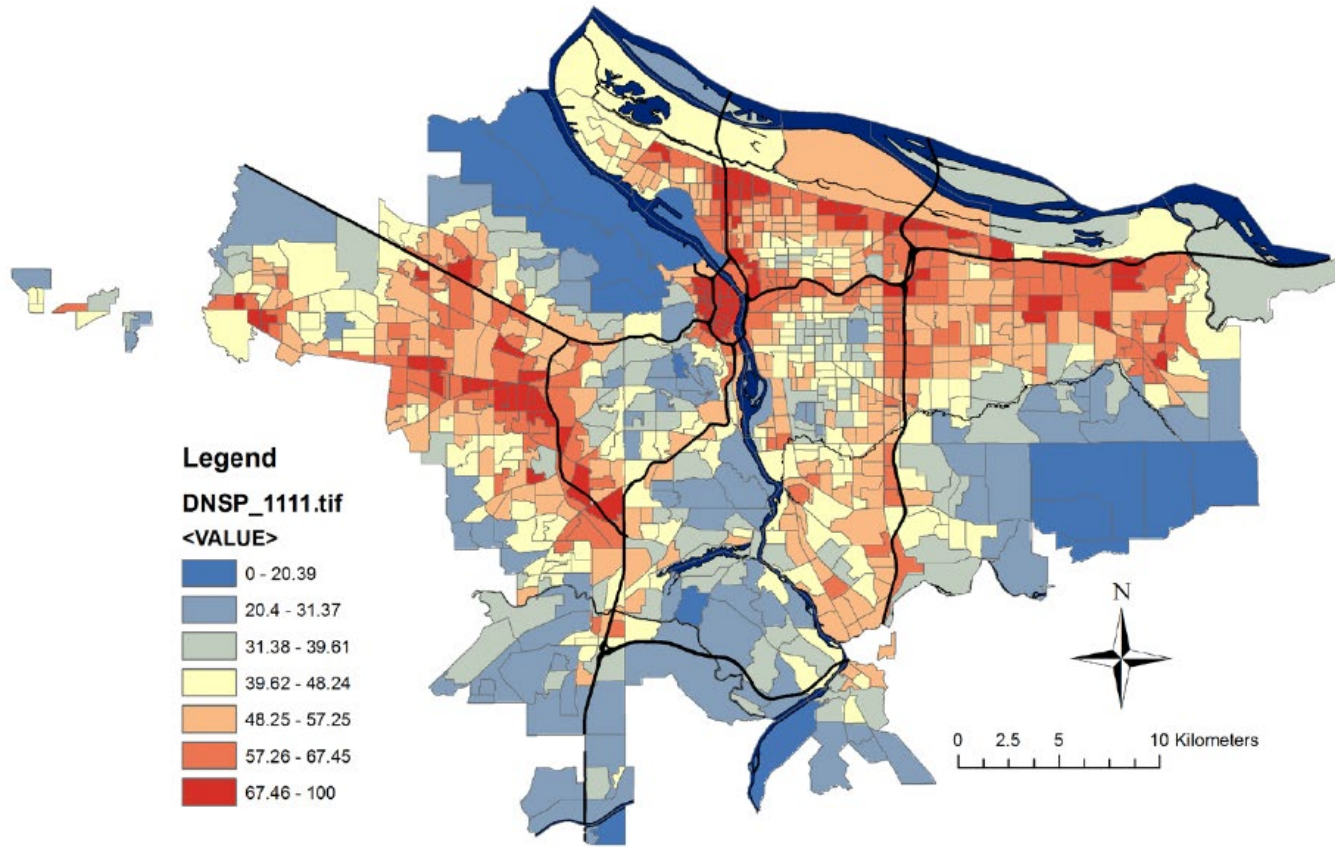
Coordinated by Meenakshi Rao (DEQ)

Figure 112: Comparison of Times above Benchmark between 10 and 50 Selected Block Groups Based on Income and Percentage Minority and Average Times above Benchmark for all Block Groups within PATS Study Area

1. Identify two communities with high vulnerability to DPM
2. Characterize DPM emissions
   a) Assess the contributions of different sources to DPM in these two vulnerable communities
   b) Inform these two communities about the sources of DPM impacting them

Diesel : NO2 : Socioeconomic : Population = 1 : 1 : 1 : 1

Legend
DNSP_1111.tif
<VALUE>
- 0 - 20.39
- 20.4 - 31.37
- 31.38 - 39.61
- 39.62 - 48.24
- 48.25 - 57.25
- 57.26 - 67.45
- 67.46 - 100

Goal 1

Identify two vulnerable communities

Vulnerability =
   exposure + socioeconomic + pop
exposure:
   DPM
   NO2
socioeconomic:
   % non-white
   % poverty
   % no high school education
   % under 18
   % over 65
pop: # of people exposed

Identified Cully and Jade neighborhoods as vulnerable communities

Yasuyo Makido & Vivek Shandas

State of Oregon
DEQ Department of Environmental Quality

Construction

Railways

Marine

Distribution Centers

Goal 2a

Characterize sources of DPM
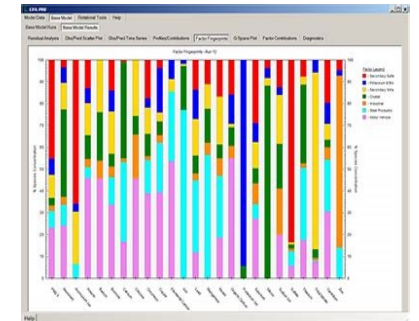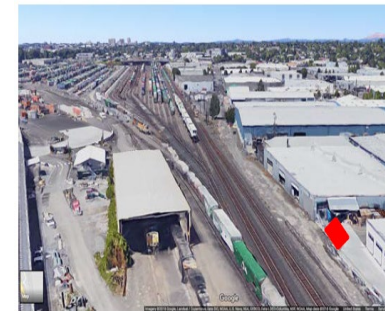
Focus on (based on PATS):
    Construction
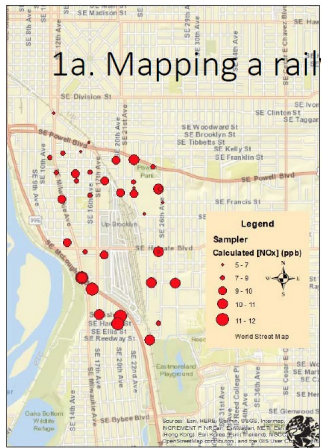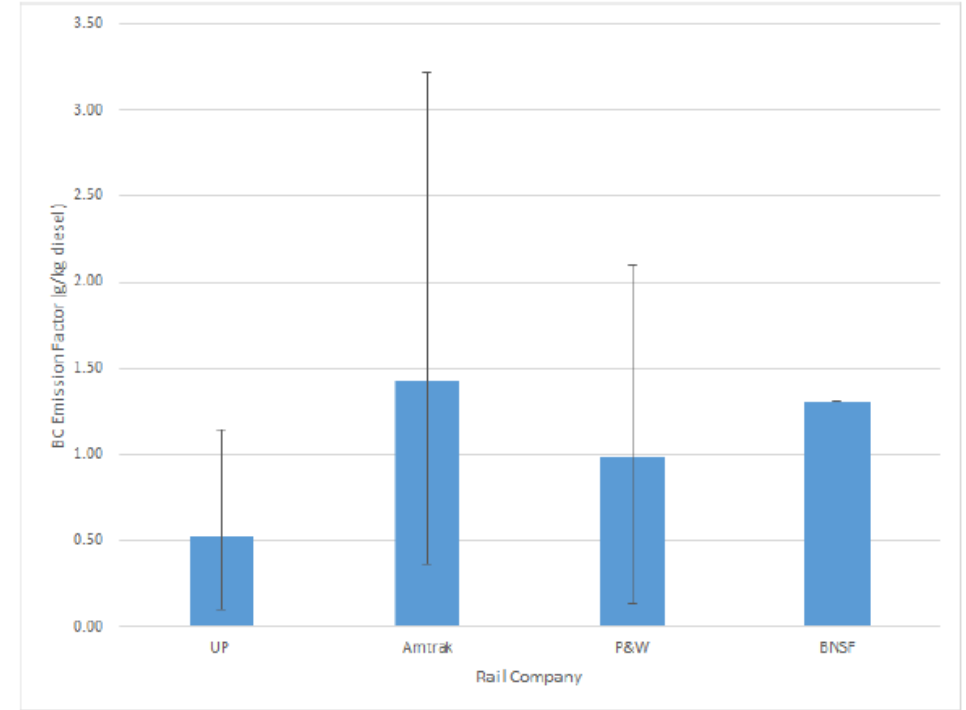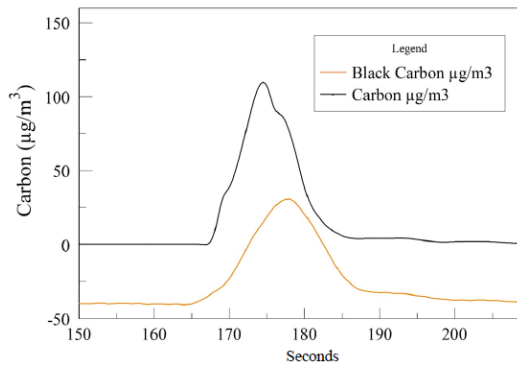   Railways
    Marine
    Distribution Centers

Goal 2: Characterizing DPM

Characterizing rail

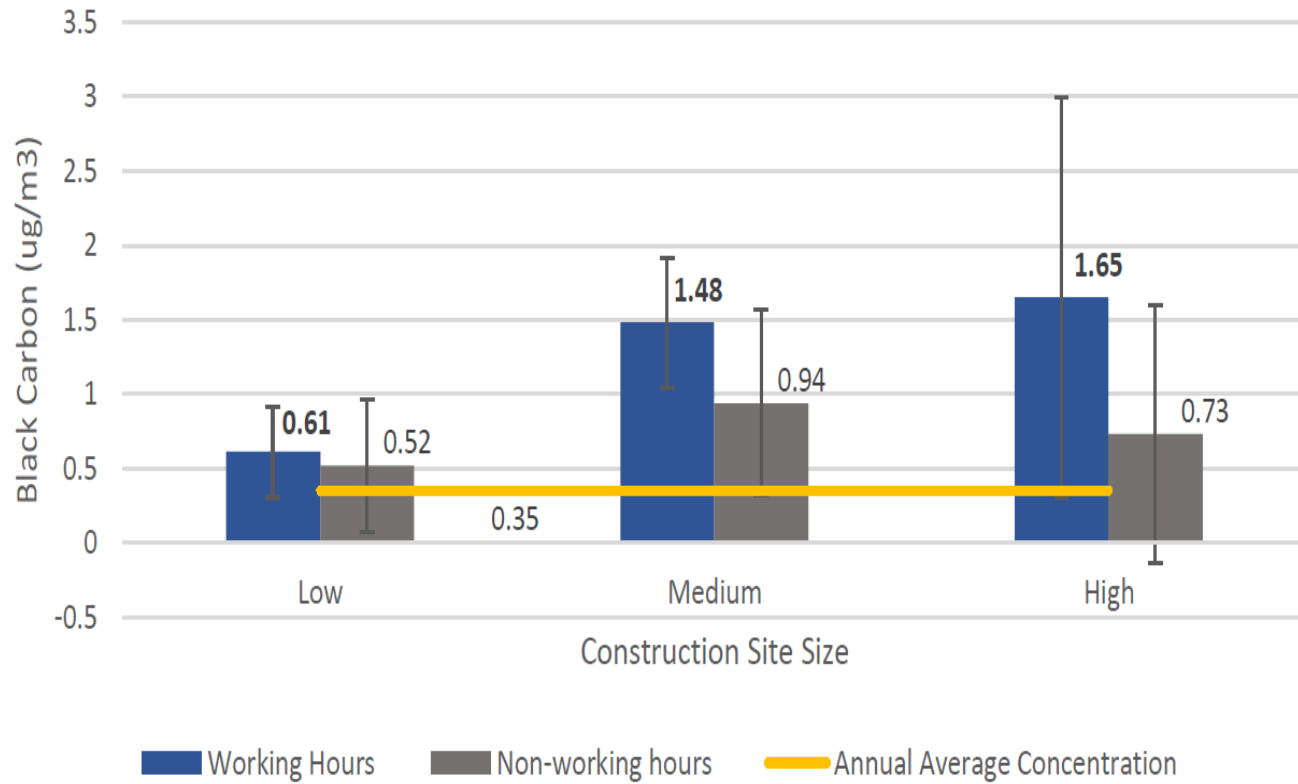Emission factors based on engine tier
Rail engine activity characterization

1a. Mapping a rail

Engage students!
Reed ES 200 class

Rail emission factors and activity patterns

Kirsten Sarle & Linda George
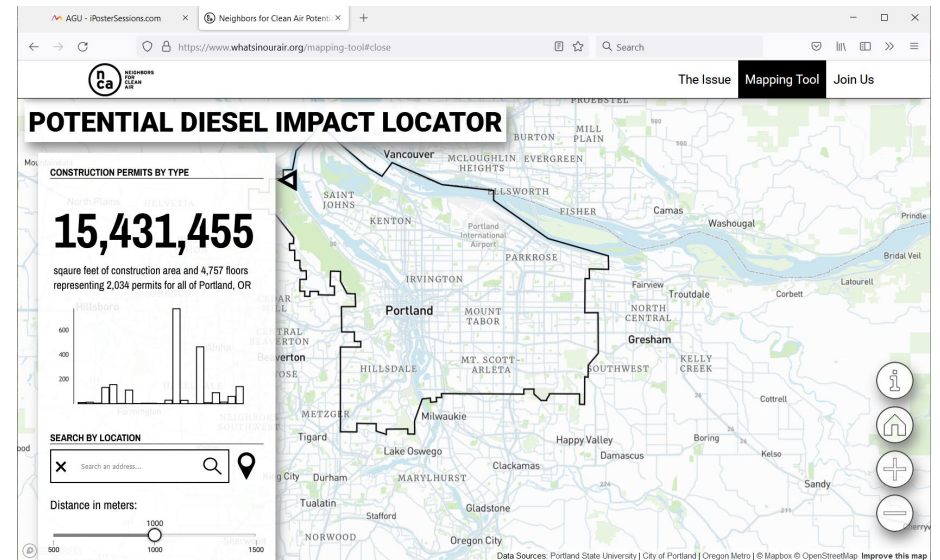
Goal 2: Characterizing DPM

Characterizing construction

Attribute DPM based on construction size
Connect to PDX permit database
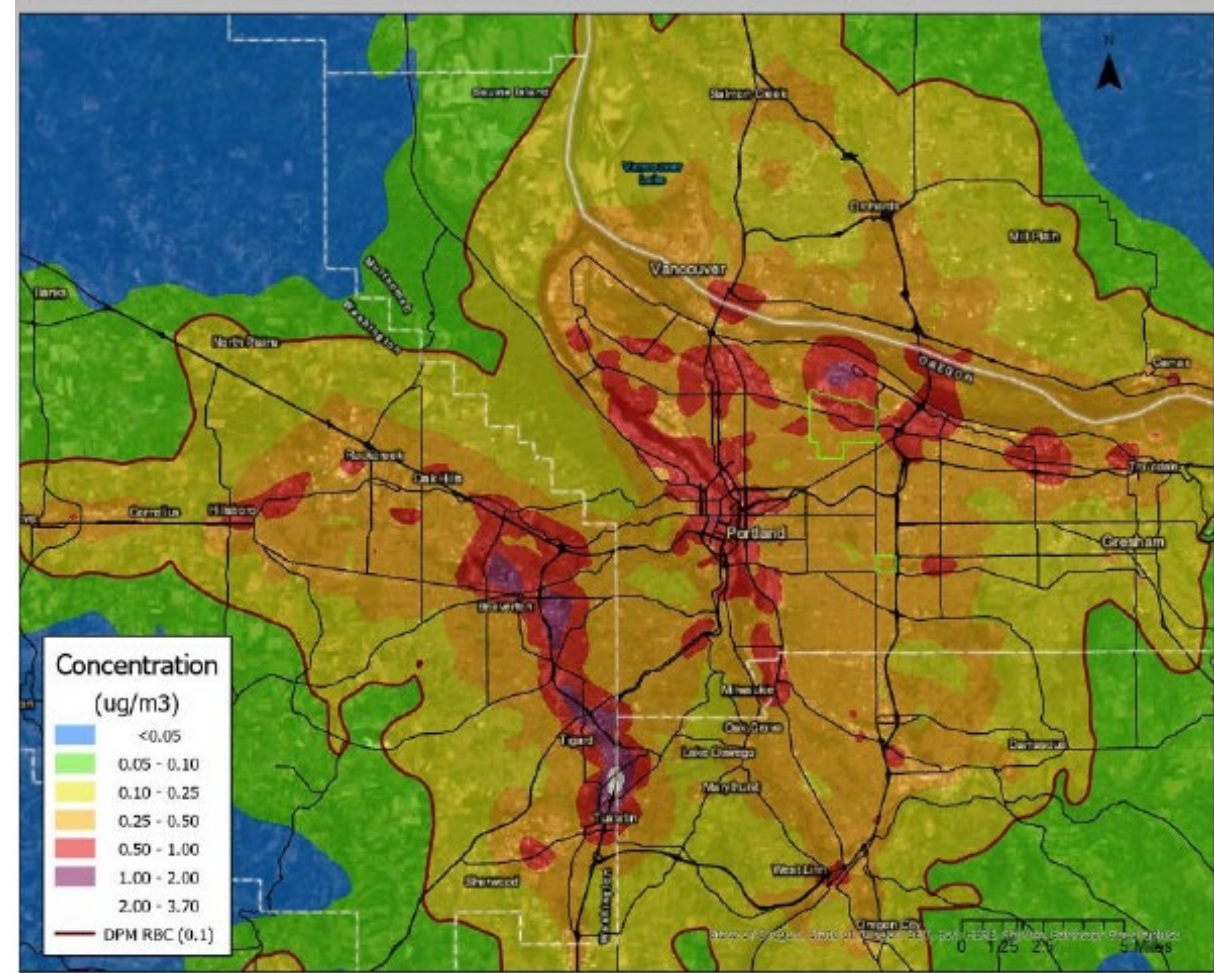Tool for visualizing DPM from construction

Construction emissions and spatial patterns

Lyndsey Boyle & Linda George

Goal 2a: DPM impacting communities

DPM model
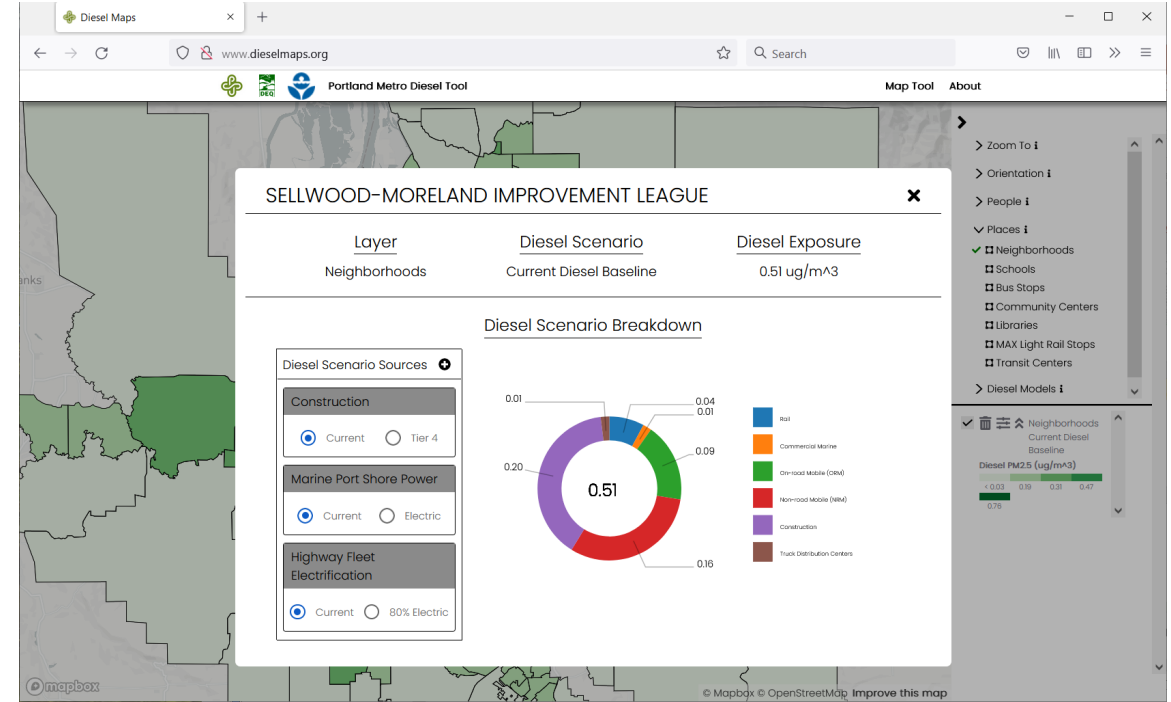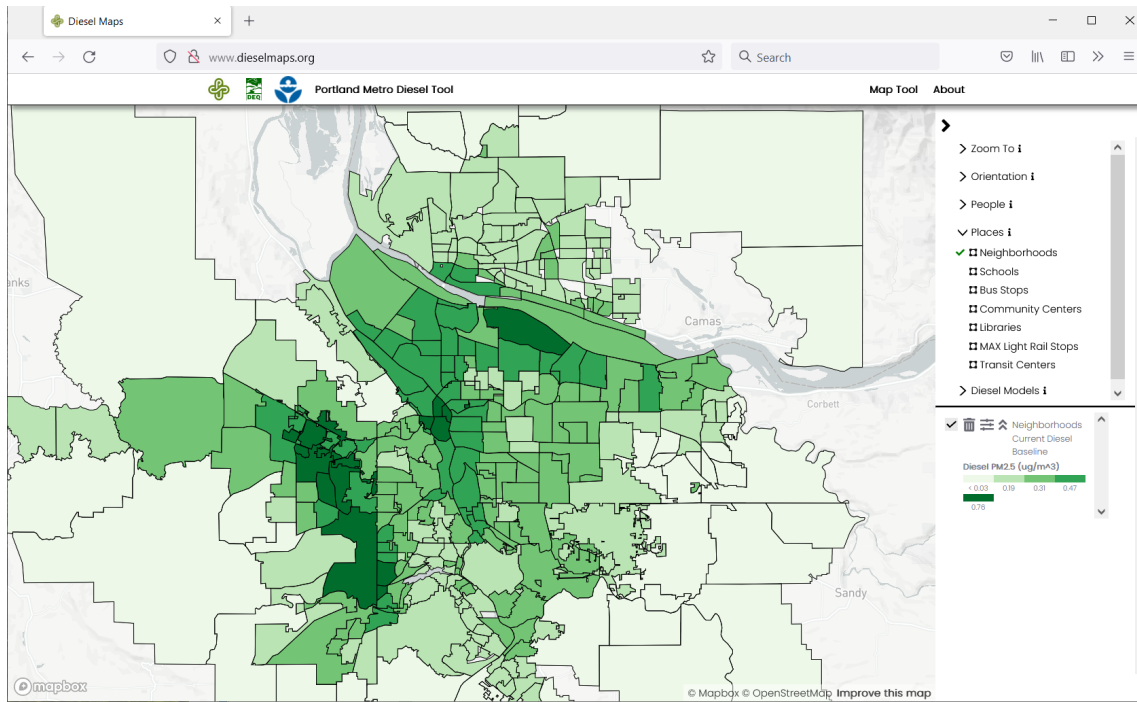- 2020 emissions estimate*
- Improved met
- Emissions updated based on observations:
  - Rail
  - Marine
  - Construction
  - Distribution Centers

Concentration
(ug/m3)
- <0.05
- 0.05 - 0.10
- 0.10 - 0.25
- 0.25 - 0.50
- 0.50 - 1.00
- 1.00 - 2.00
- 2.00 - 3.70
- DPM RBC (0.1)

Updating PATS DPM model
Andrew Rogers & Linda George

State of Oregon
DEQ Department of Environmental Quality

Goal 2b: Inform communities

| Original plans	Pandemic-adapted plans
* Two communities	* All communities?
* In-person	* virtual? Leveraging partnerships?

Visualizing DPM at the neighborhood scale

Cordero Ortiz, Andrew Rogers, Linda George & Vivek Shandas

State of Oregon
DEQ Department of Environmental Quality

Goal 2b: Inform communities

Added policy scenarios:
- Switching shore power to electric
- Clean construction
- HB 2007 (2010 compliant vehicles)
- HB 2007 + 20% vehicle electrification
- HB 2007 + 40% vehicle electrification
- HB 2007 + 60% vehicle electrification
- HB 2007 + 80% vehicle electrification
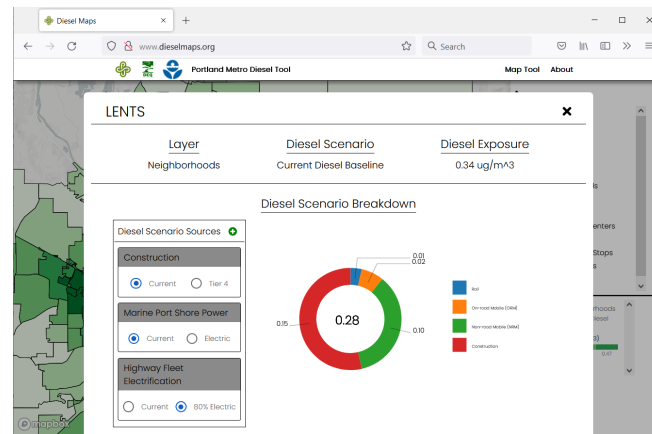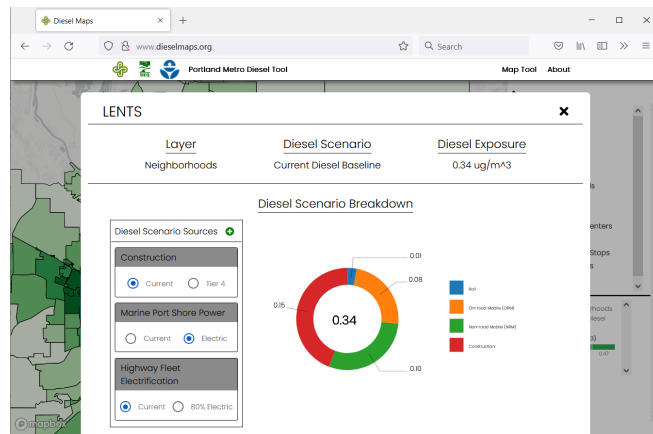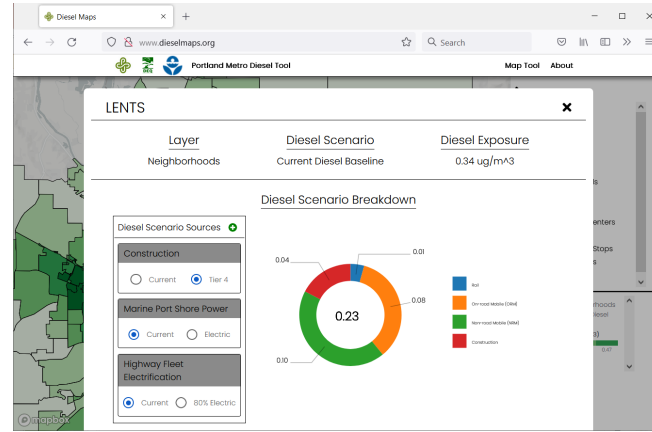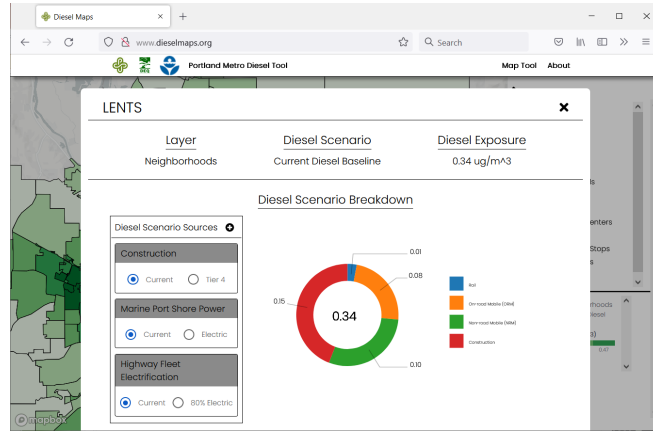
Visualizing DPM policy scenarios the neighborhood scale

Cordero Ortiz, Andrew Rogers, Linda George & Vivek Shandas

State of Oregon
Department of Environmental Quality

Community Engagement

Community Engagement Workgroup Members
- The Community Engagement Workgroup consists of representatives from local community based organizations, educational and governmental institutions.

  - Neighbors for Clean Air
  - Unite Oregon
  - Verde
  - Multnomah County
  - Oregon Department of Environmental Quality
  - Portland State University

Transforming the Community Engagement Approach

Initial Proposal
- 3 workshops
- build community knowledge of diesel among underserved and environmentally burdened communities
- inform policy strategies to reduce the impact of diesel pollution on these communities

Updated Approach
- Coordinate engagement efforts to
  - include more than a handful of one-off educational workshops
  - align with communities' needs; support unique, culturally relevant engagement
  - take advantage of resources of and commitments made by County and DEQ
  - fuel deeper, long-term, transformational engagement that enhances understanding of diesel pollution, connects lived experiences with data that visualizes exposure, and share connections with each other to influence changes in policies

Community Engagement Planning and Opportunities

Planning Process

- Community Engagement Workgroup meetings began nearly one full year before both results of data collection and the visualization tool were complete

- Nearly a dozen planning meetings were held

    - discussions concerned …

    - facilitated by …

    - consisted of workgroup meetings and one on one meetings

Engagement Opportunities

- Unite Oregon: Listening Tour & Mapping Justice
- Verde: Lideres Verde Cohort Workshop
- NCA: Continued Engagement with Partners and Potential Partners

Partner Commitments for Successful Community Engagement

- **Language Translation**

- **Technical Support**

- **Enhance Tool with Additional Layers**

- **Provide Resources for Understanding**

- **Create a Story Map Combining Lived Experiences with Diesel Mapping Data**

- **Constituent Convenings with Elected Officials**

Evaluation

- **Potential discussed but not yet finalized, focus on transformational metrics**

- **Quantitative Examples**

- **Qualitative Examples**

State of Oregon
DEQ **Department of Environmental Quality**

Transition to Nakisha