THE NORTH-EAST CORRIDOR:
BALTIMORE / WASHINGTON

URBAN GREENHOUSE GAS MEASUREMENTS PROJECT

https://www.nist.gov/topics/northeast-corridor-urban-test-bed
Anna Karion
National Institute of Standards and Technology
# NORTHEAST CORRIDOR – BALTIMORE/WASHINGTON

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<tr>
<th>NIST</th>
<th>University of Maryland</th>
<th>Earth Networks</th>
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<td>David Allen</td>
<td>Russ Dickerson</td>
<td>Steve Prinzivalli</td>
<td>Northern Arizona University: Kevin Gurney</td>
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<td>Subhomoy Ghosh</td>
<td>Ross Salawitch</td>
<td>Clayton Fain</td>
<td>Boston University: Lucy Hutyra &amp; team</td>
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<td>Sharon Gourdji</td>
<td>Ning Zeng</td>
<td>Uran Veseshtha</td>
<td>Bowdoin College: Barry Logan</td>
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<td>Israel Lopez Coto</td>
<td>Kayo Ide</td>
<td>Bryan Biggs</td>
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<td>Kimberly Mueller</td>
<td>DaLin Zhang</td>
<td>Michael Stock</td>
<td>DOE/ORNL: Melanie Mayes &amp; Jeff Warren</td>
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<td>Kuldeep Prasad</td>
<td>Xinrong Ren</td>
<td>Charlie Draper</td>
<td>Purdue University &amp; Stony Brook University:</td>
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<td>Tamae Wong</td>
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<td>William Callahan</td>
<td>Paul Shepson</td>
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<td>James Whetstone</td>
<td>Cory Martin</td>
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<td>Shaun Howe</td>
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<td>Doyeon Ahn</td>
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<td>Courtney Grimes</td>
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<td>Scripps &amp; JPL: Kris Verhulst, Jooil Kim, &amp; the</td>
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<td>LA Megacities team</td>
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Determine whole-city emissions & separate influences from different cities (e.g. Baltimore vs. Washington)

Estimate emissions for CO₂ & CH₄ at appropriate spatial & temporal resolutions (need to be identified)

Develop methods for background (incoming air) determination (isolating concentration enhancements due to urban influence)

Extend and compare inversion methods

Investigate application of low-cost sensors in a high-density, hybrid network

Link biological GPP, respiration, and uptake to solar induced fluorescence (SIF) & other optical remote sensing methods
High-accuracy CO$_2$, CH$_4$ measurements

Anthropogenic CO$_2$ inventory

Urban and regional inverse models

Modeling
- WRF-Stilt
- WRF-Chem, LES
- Inversions
- LETKF

Tower Network
High-accuracy CO$_2$, CH$_4$ measurements

Aircraft (FLAGG-MD)
- Mass balance
- Inversion modeling

(see 2 posters)
(see 1 poster)

Emissions Modeling
- Hestia

(see 1 poster)

Also:
- Low-Cost Sensors
- Biogenic fluxes & SIF testbed
Aircraft inverse modeling emissions estimates


Also:


Ahn, D. et al., in prep and poster “Emissions of CO2 from Baltimore-Washington area: Results from FLAGG-MD 2015 campaign”.

• Ahn et al., poster session

• Lopez Coto et al., poster session
Baltimore/Washington NIST Tower Network

- 16 sites inside and around Washington/Baltimore region
- Established & Operated by Earth Networks
- Additional sites throughout the Northeast for regional studies
- Flasks for $^{14}$CO$_2$ & other gases at 4 sites (1 BG, 3 urban)
- Began in Fall 2015
- Observations being used for CO$_2$ & CH$_4$ top-down emissions estimates

Karion et al., poster session
High-accuracy CO₂, CH₄ measurements
Anthropogenic CO₂ inventory
Emissions Modeling
Tower Network
High-accuracy CO₂, CH₄ measurements

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Also:
• Low-Cost Sensors
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NEC-BW PROJECT ELEMENTS