



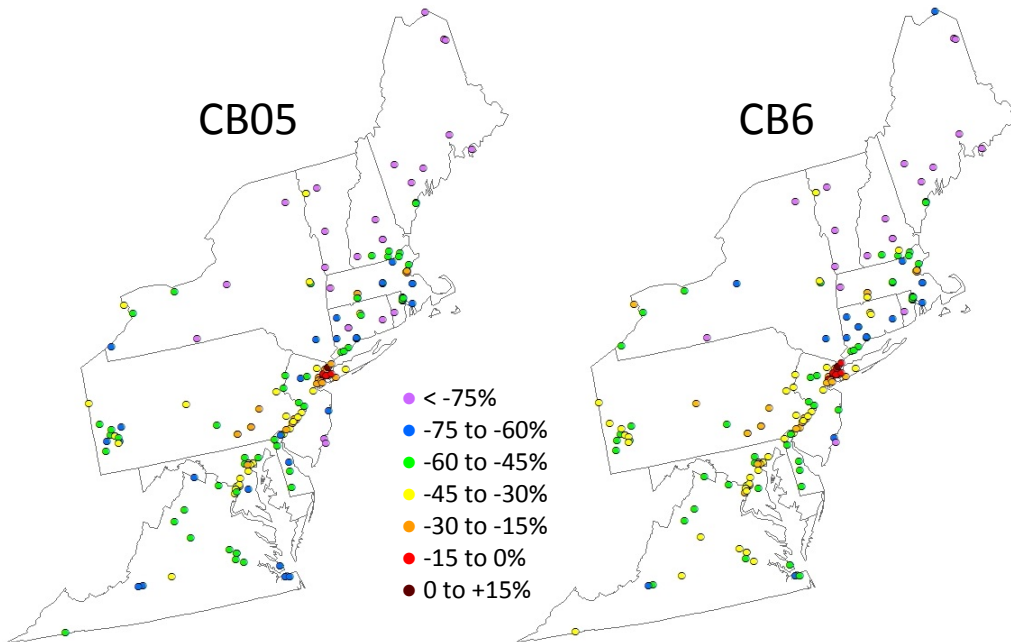
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Issues with predicting $PM_{2.5}$ in the Northeast: a few examples from recent modeling exercises

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HAQAST3 meeting
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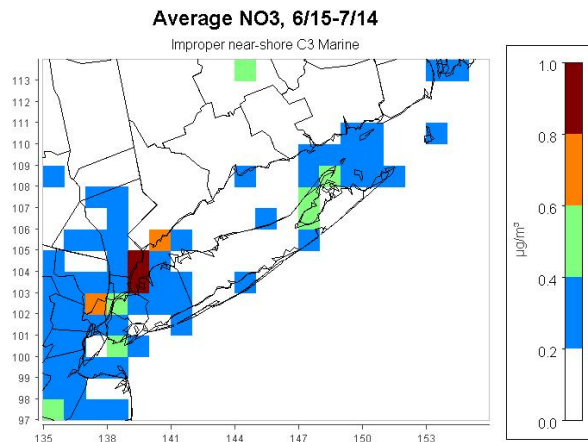
Chemical mechanism – CB05 vs CB6



Mean fractional bias, June-August 2011

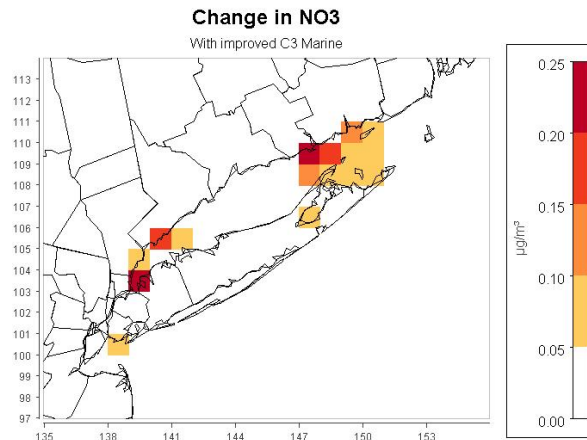
- For these model runs, CAMx underpredicted PM_{2.5} mass except in NYC
- The use of CB6 reduced the mean fractional bias by ~5-10% at most sites
- The use of CB6 had minimal impact on some secondary PM_{2.5} species (SO₄, NO₃, NH₄), but had a relatively large impact on secondary organics
- Overall on average, PM_{2.5} mass increased ~5% but secondary organics increased about 33% (0.96 μg/m³ to 1.28 μg/m³), mostly associated with biogenic precursors

Near-shore C3 Marine emissions



- Summer NO₃ concentrations increased by up to 0.25 µg/m³ in LIS
- Similar decreases in SO₄
- EC saw both increases and decreases

- Near-shore Class 3 (C3) marine vessel emissions were initially treated as area sources and confined to surface layer
- Emissions improved by treating more like point sources – better reflect ship stack heights and plume rise
- Ring et al. (2017) showed that this can result in MD08 increases of ~3-4 ppb in Long Island Sound (but decreases in Chesapeake Bay)



Thank You

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