Impacts of Mercury Emissions Changes over Time

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Emission scenarios and timescales

- **Emissions:** Emissions scenarios incorporate socio-economic information that determine both Hg and greenhouse gas emissions

- **Timescales:**
  - *Short term (years):* response to emission changes and source-receptor
  - *Medium term (years to decades):* "legacy" anthropogenic emissions
  - *Long term (decades and longer):* climate forcing

- **Atmosphere and Ocean:** different response times and mercury species

Policy delay can have long-term implications

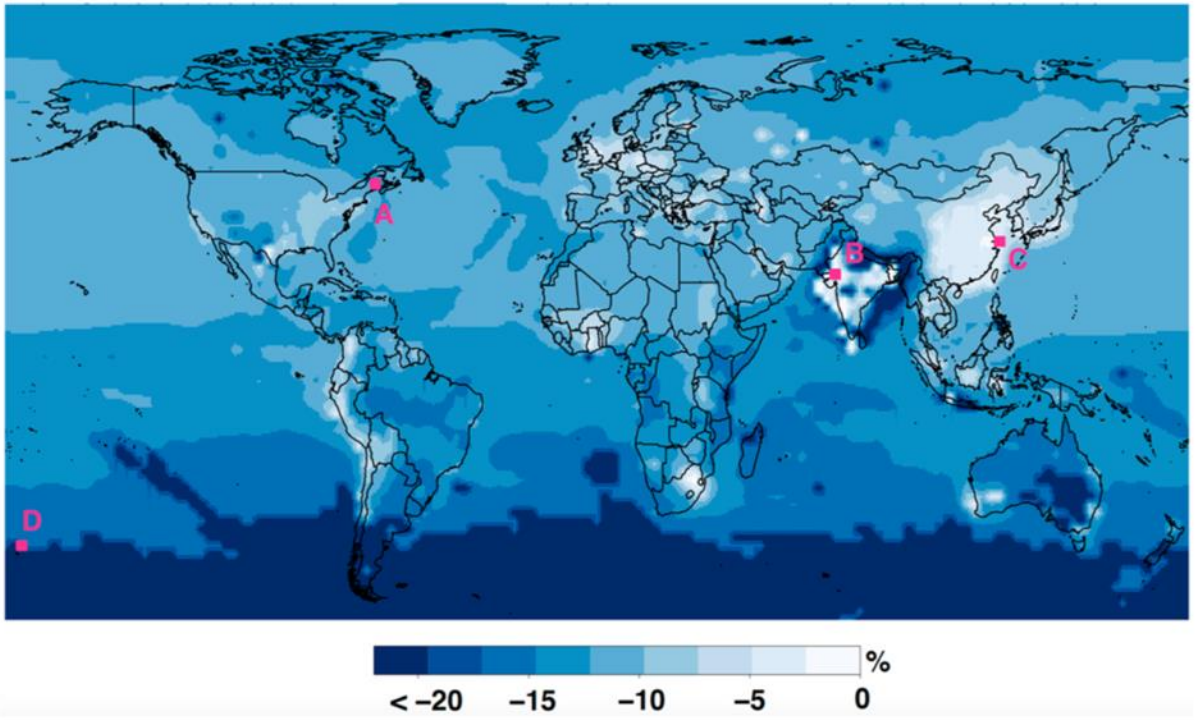


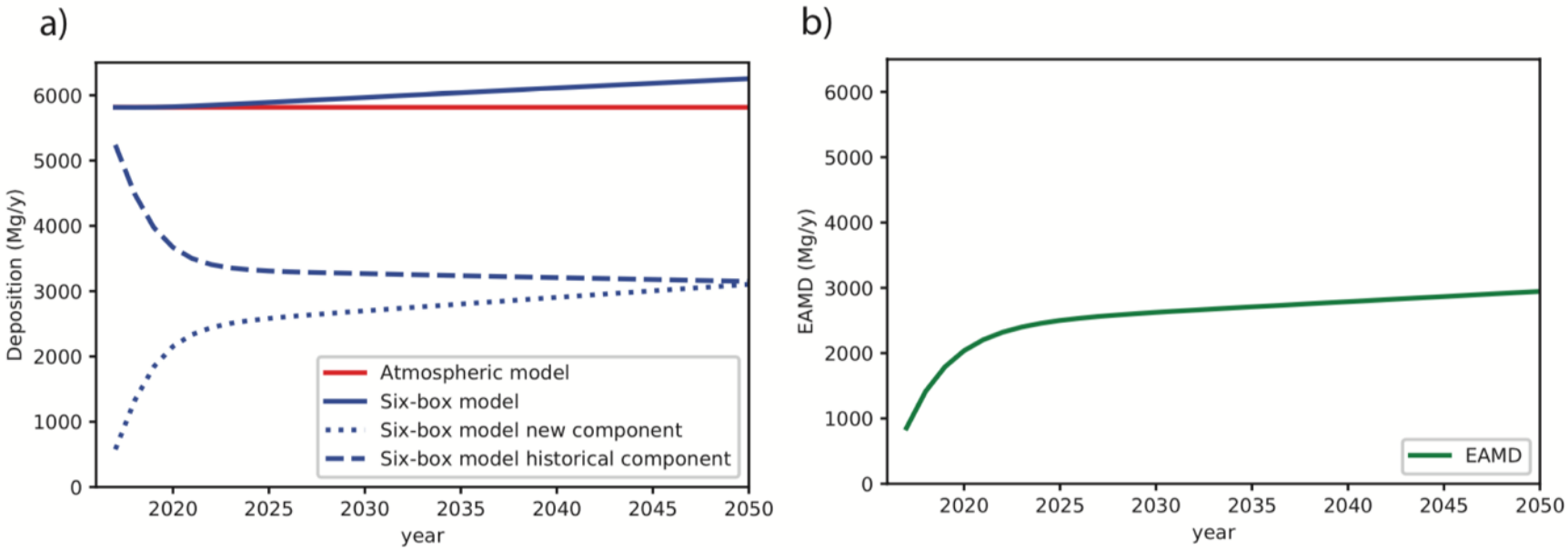
Figure 3. Mean percent change in policy impacts due to a near-term (2020–2035) 5-year delayed implementation of a New Policy (NP) scenario. Results are discussed at selected sites with varying impact from emissions sources, focusing on (A) tribal areas of eastern Maine, (B) Ahmedabad, India, (C) Shanghai, China, and (D) an area of the Southern Pacific known for albacore tuna fisheries. This Figure was made using the R package autoimage.[64]

H Angot, N. Hoffman, A. Giang, C. P. Thackray, A. N. Hendricks, N. R. Urban and N. E. Selin. 2018. "Global and Local Impacts of Delayed Mercury Mitigation Efforts." *Environmental Science & Technology*, 52(22):12968-12977.

Today's mercury emissions become tomorrow's legacy mercury!

Many analyses omit “new legacy” Hg

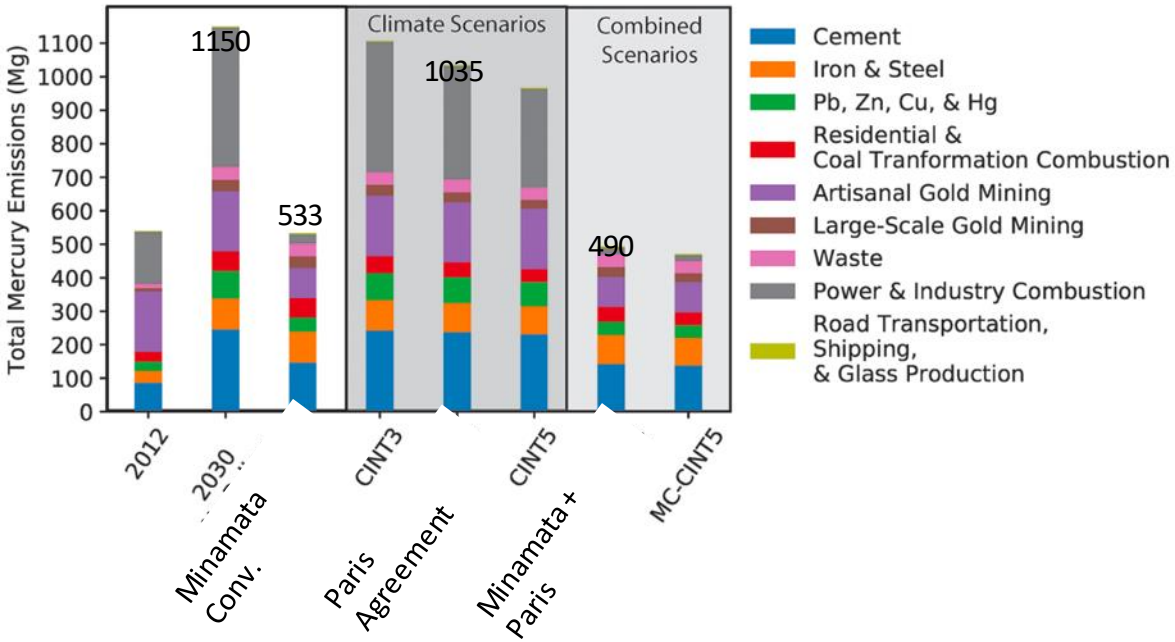
Straightforward correction factors can estimate the future impact of near-term emissions



N. E. Selin. 2018. "A proposed global metric to aid mercury pollution policy." Science 360(6389):607-609.

Mercury, energy, and greenhouse gas policies affect emissions in combination

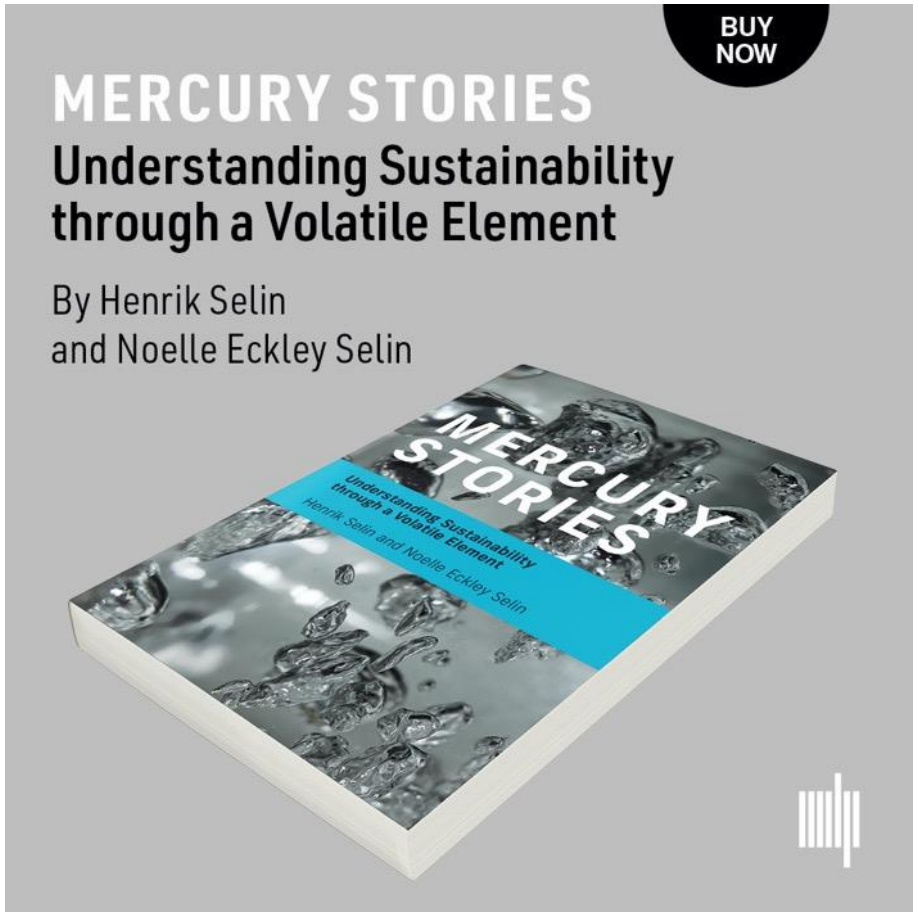
In China, policies are less than additive: some trade-offs on benefits



K. M. Mulvaney, N. E. Selin, A. Giang, M. Muntean, C-T. Li, D. Zhang, H. Angot, C. P. Thackray, and V. J. Karplus. 2020. "Mercury benefits of climate policy in China: Addressing the Paris Agreement and the Minamata Convention Simultaneously." *Environmental Science & Technology*.

Historical lessons can inform present-day policies

- Many benefits from previous actions to reduce air pollution
- Need to address inequities in exposure and capacity to act
- Choices about future emissions affect mercury in the context of broader (sustainable) development strategies



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