

Unveiling hidden migration: Analysis of 6 million phones around a cyclone in Bangladesh

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Methodological challenges for climate-migration research

- Panel survey data
 - not planned around climate change impact;
 - out-migration;
 - doesn't account for in-migration, or net migration!



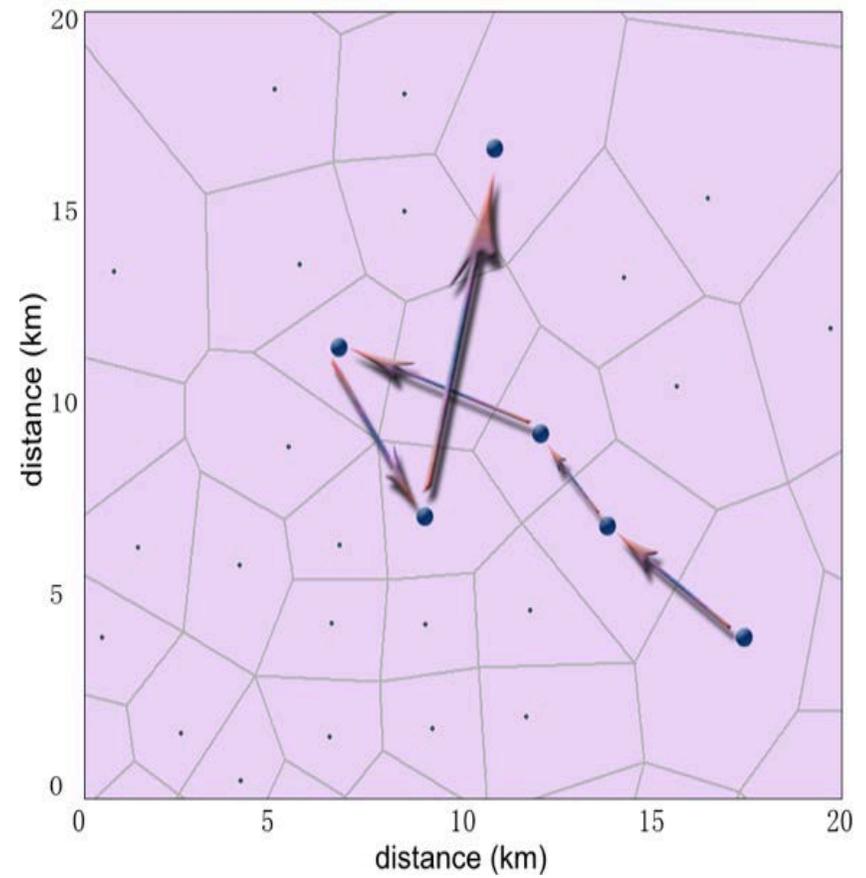
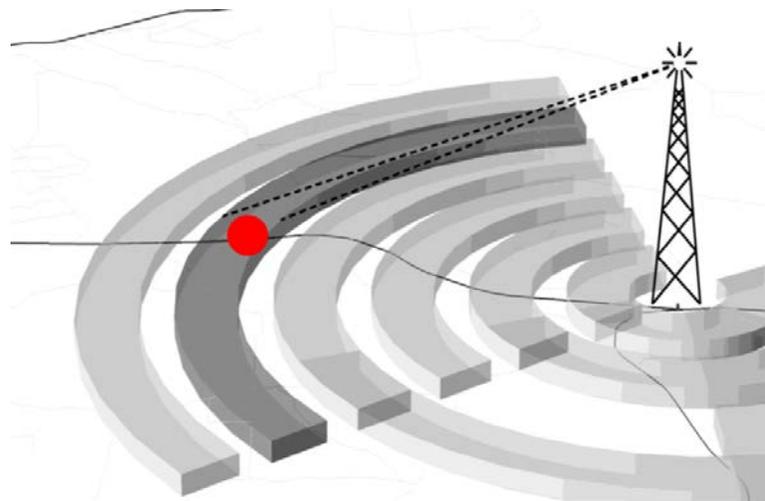
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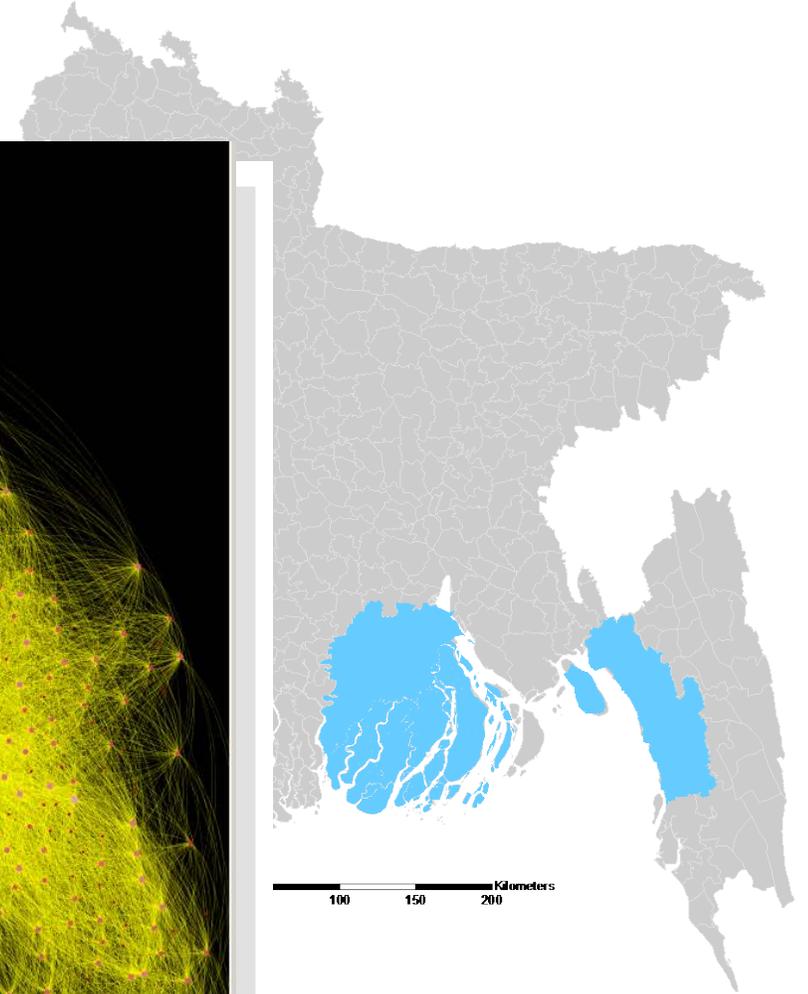
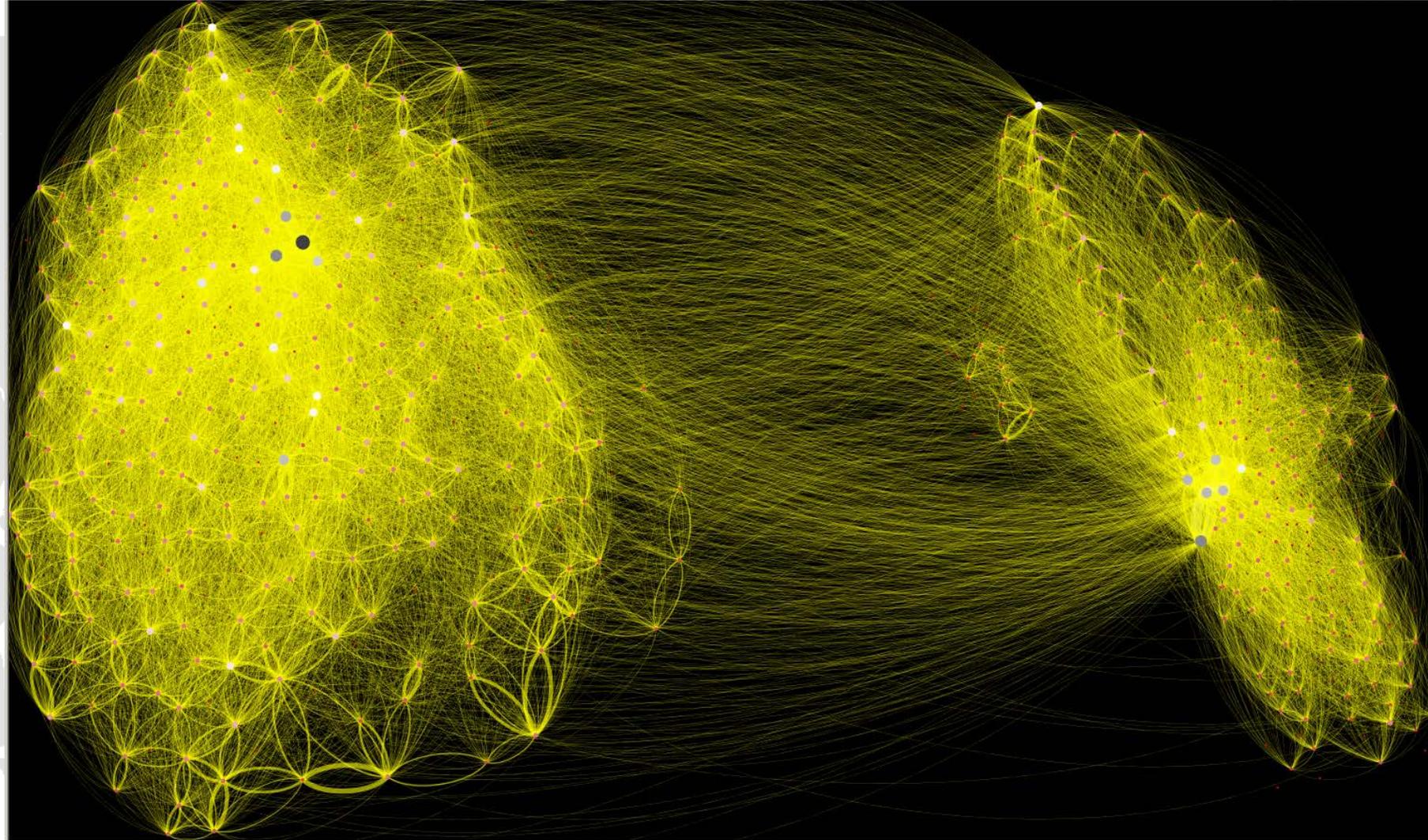
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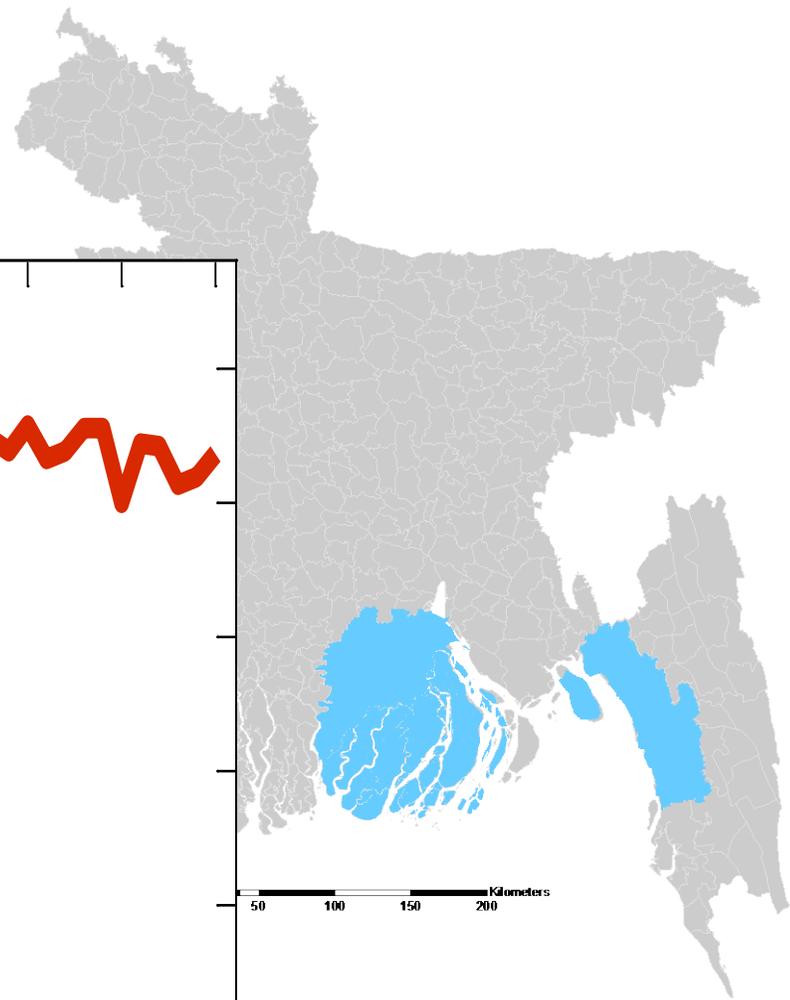
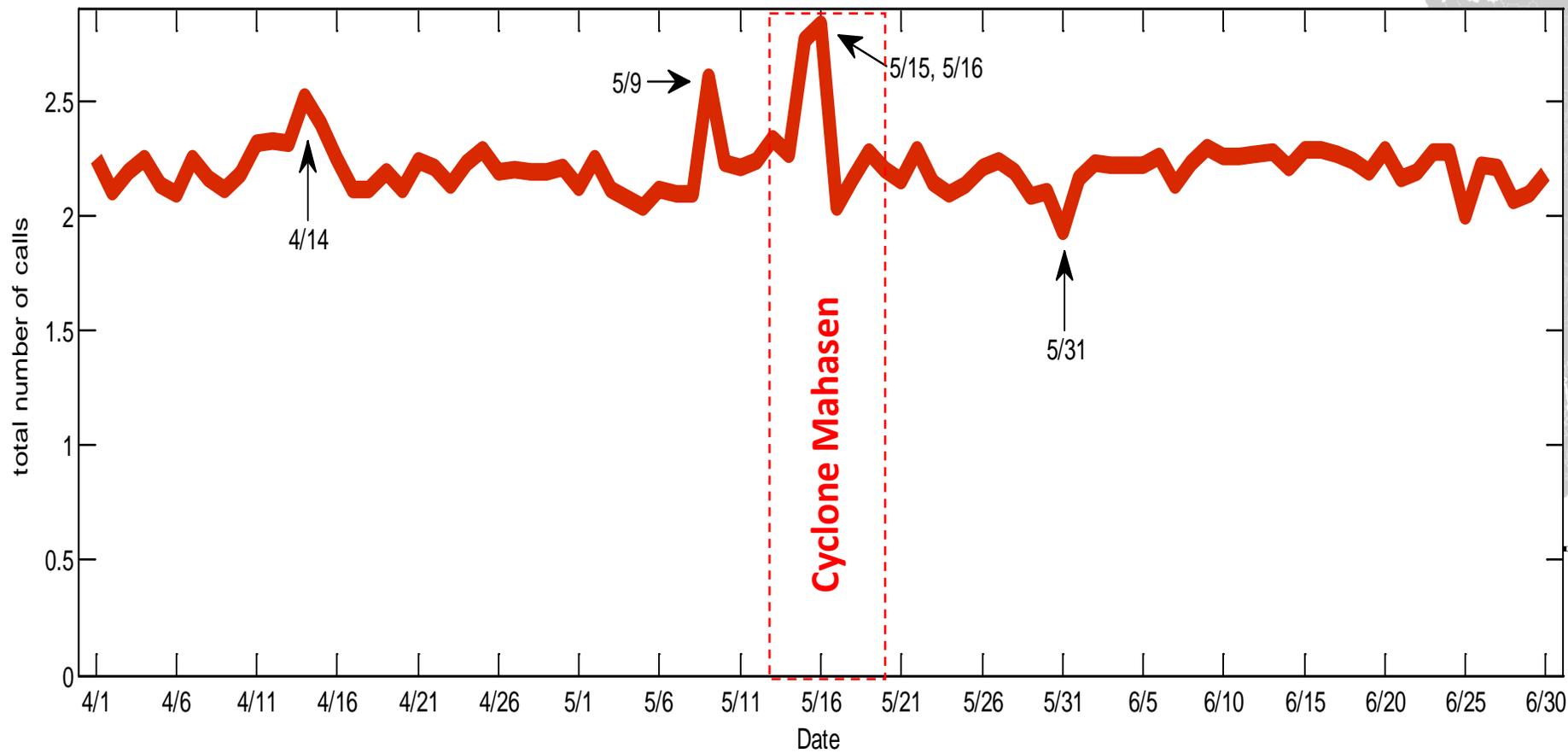
Mobile network data



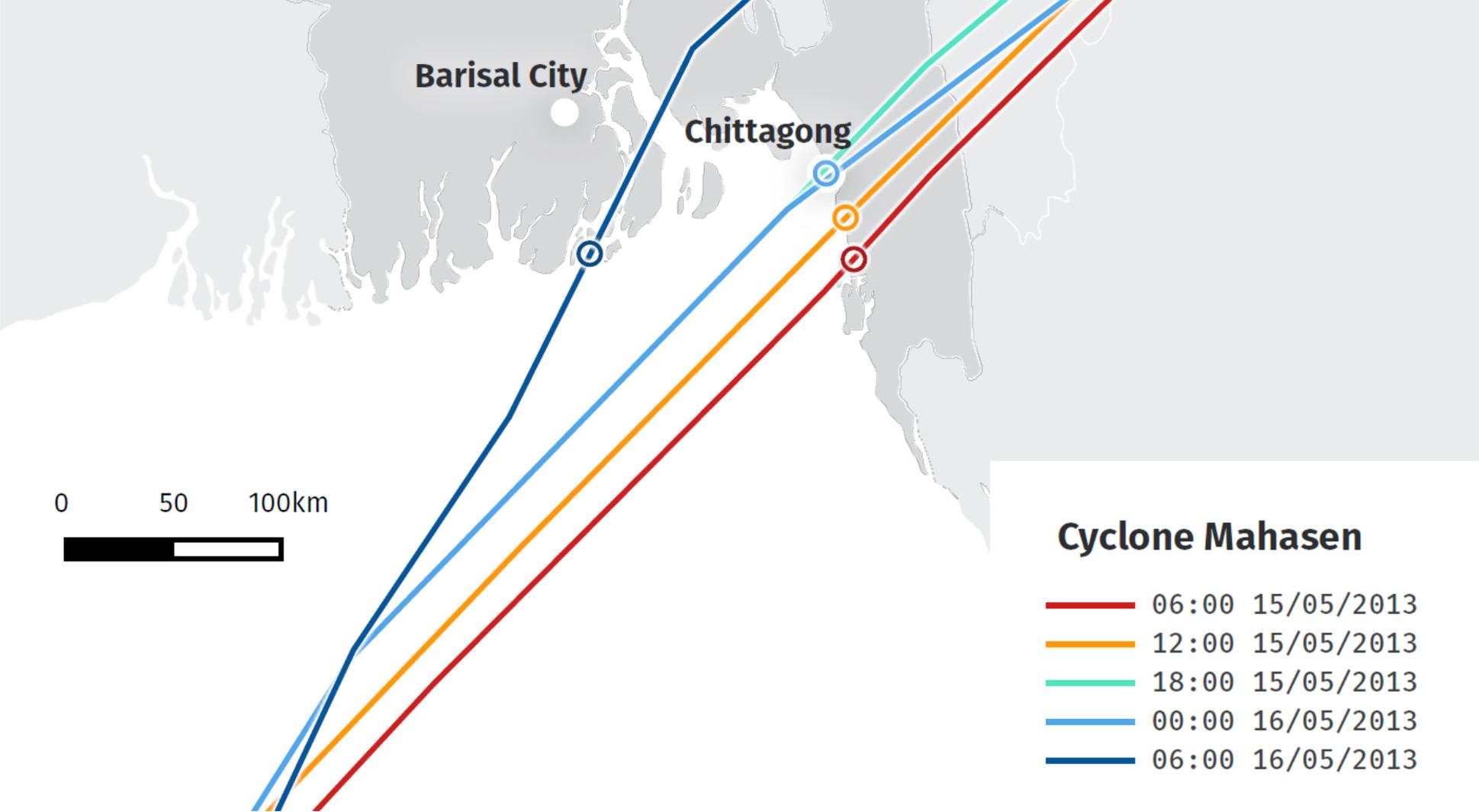
Study area: Barisal and Chittagong Divisions, Bangladesh



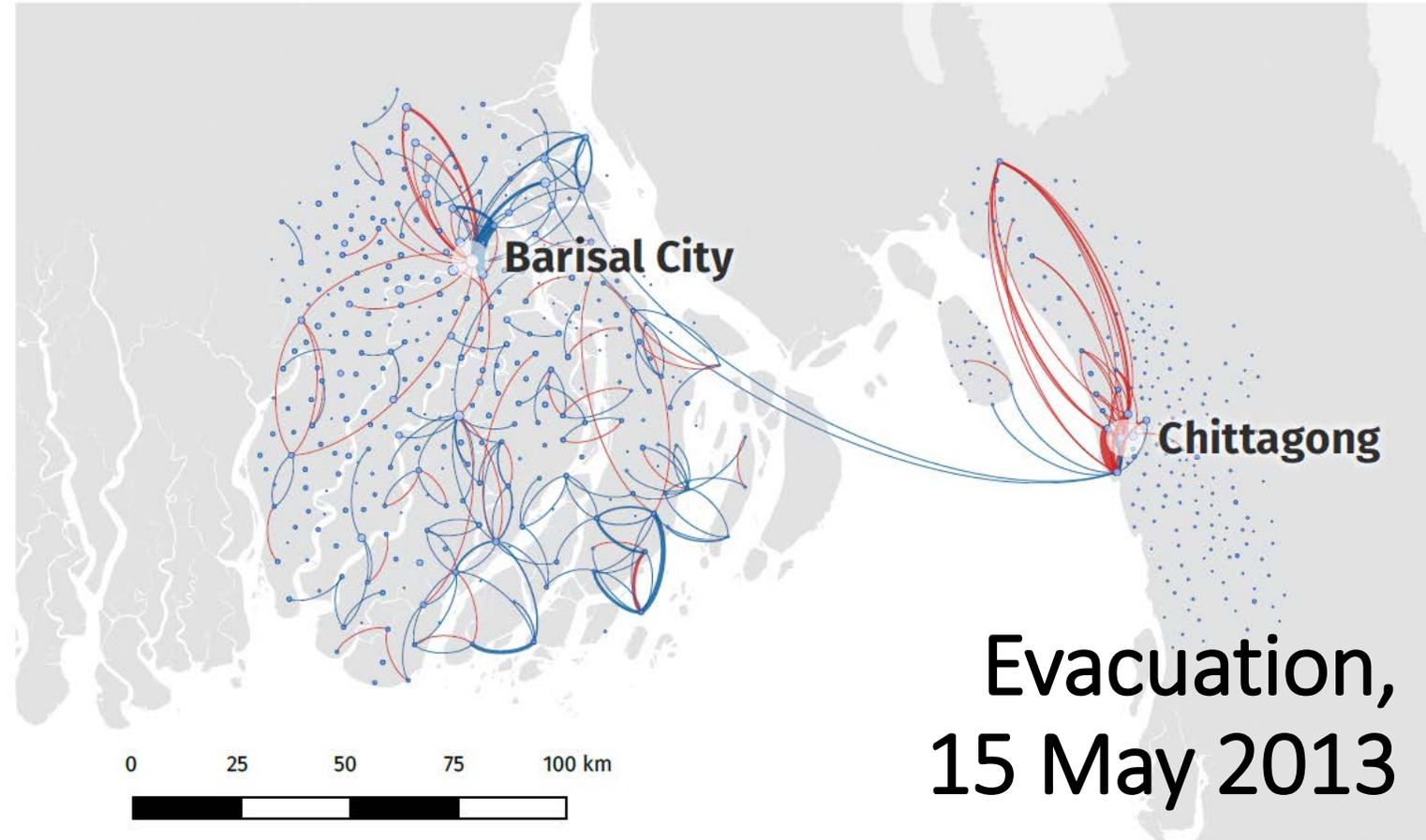
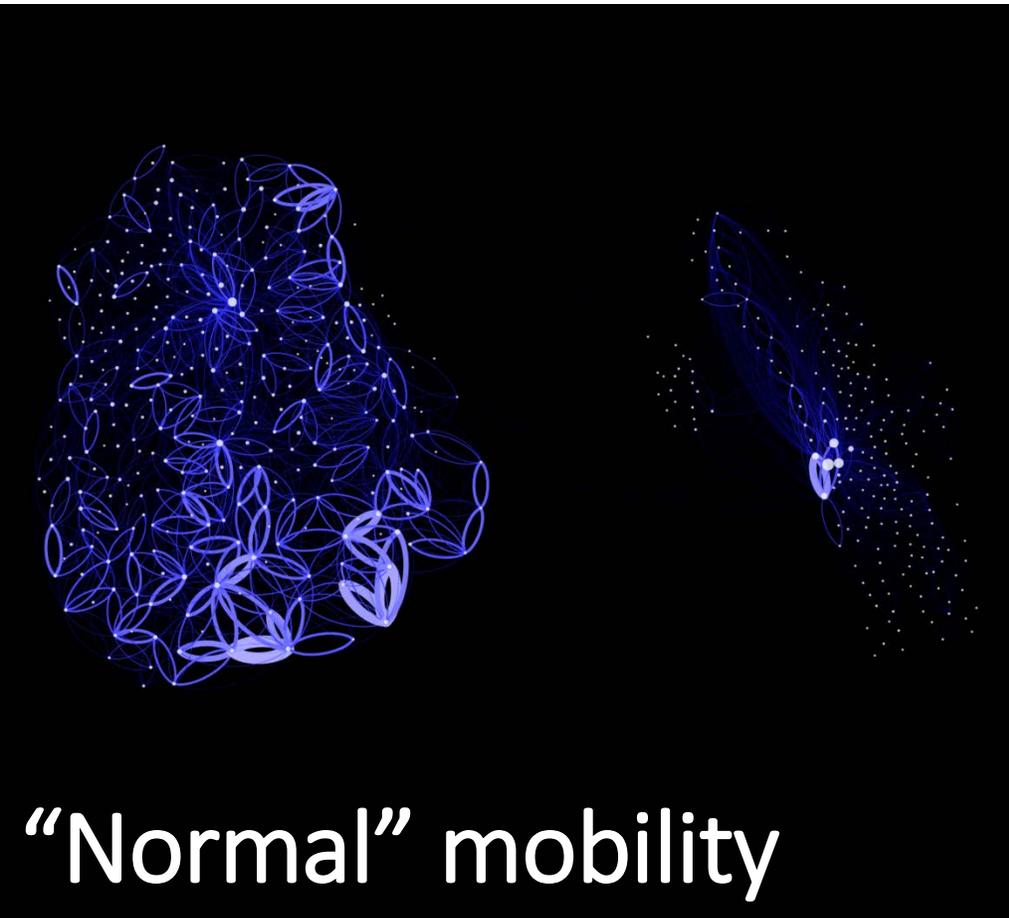
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Cyclone Mahasen (16 May 2013): Forecasted versus Actual Landfall



An aside: Short-term patterns of mobility:

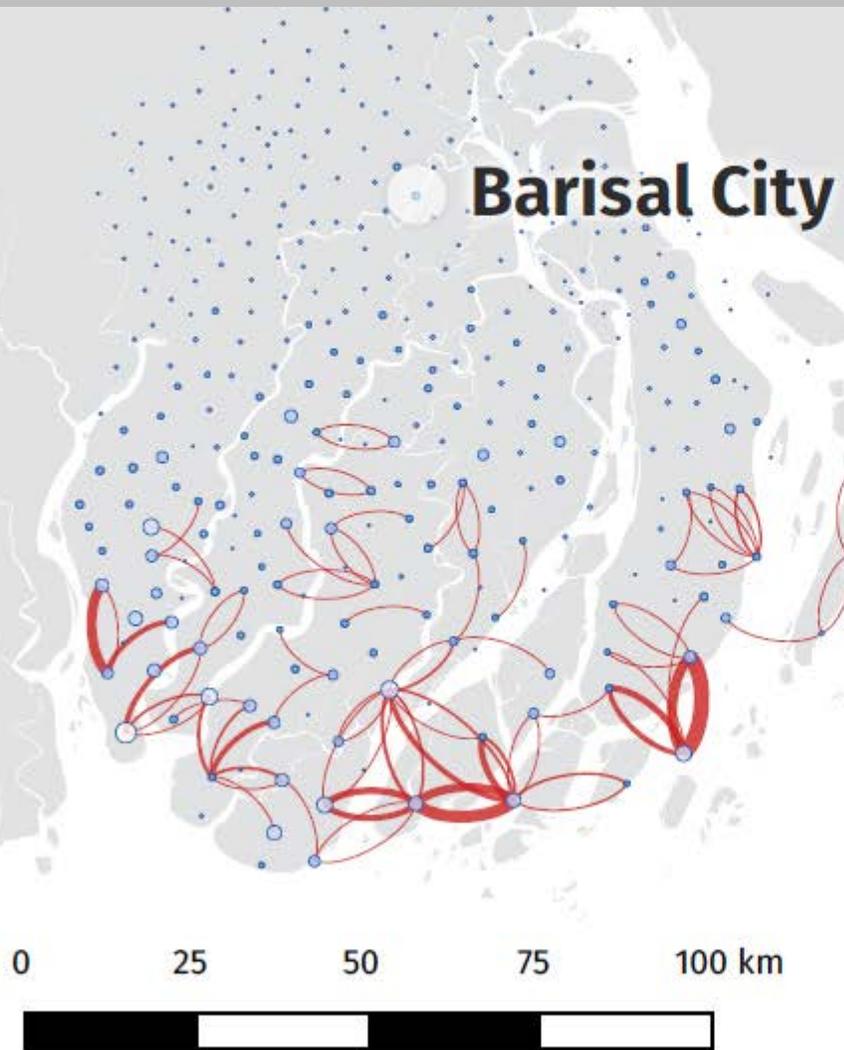


Red = positive flows compared to normal

Blue = negative flows compared to normal

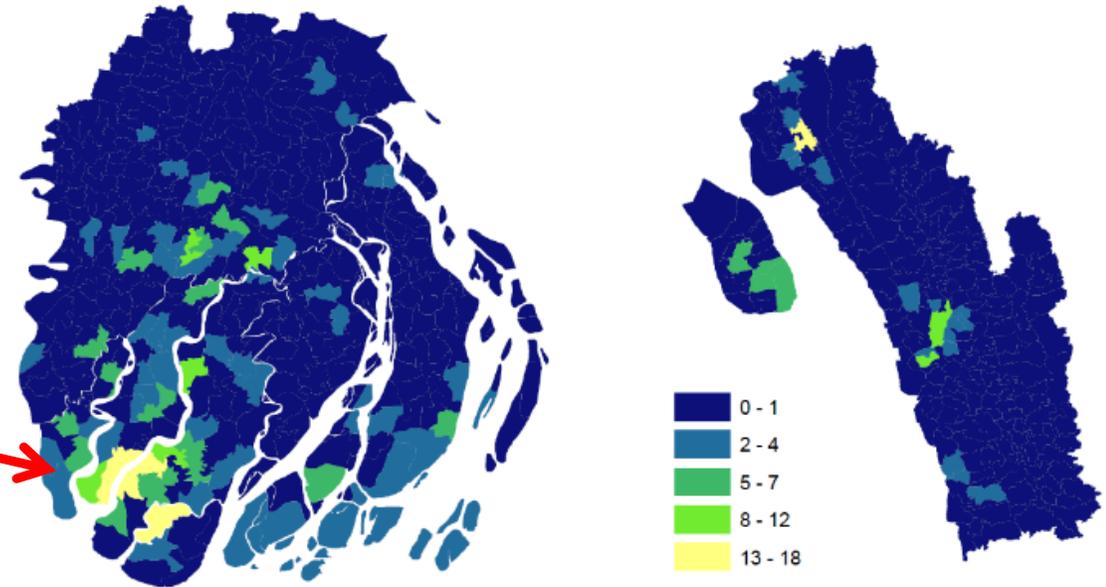
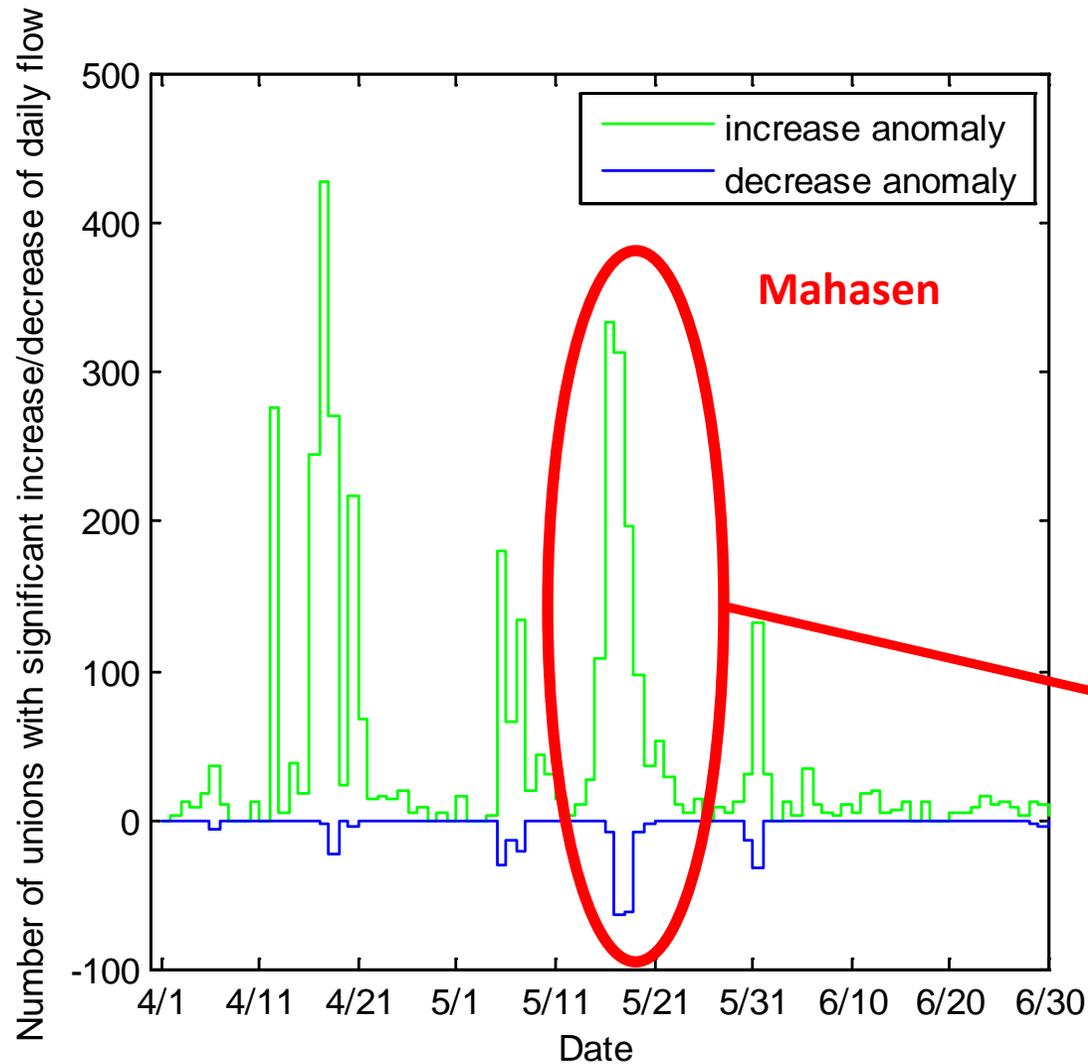
An aside: short-term patterns of mobility

During landfall
00:00 to 06:00
16 May 2013



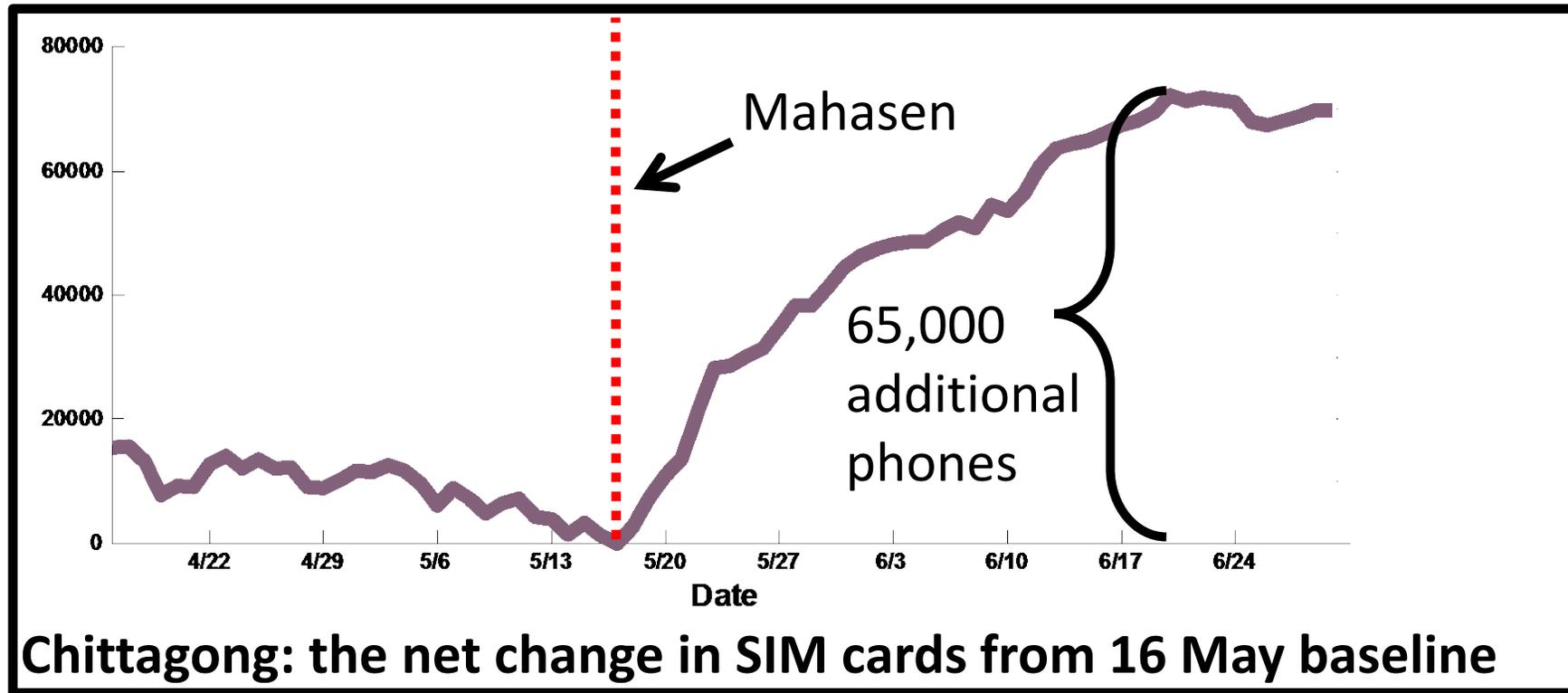
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What is “normal” mobility? Anomaly detection

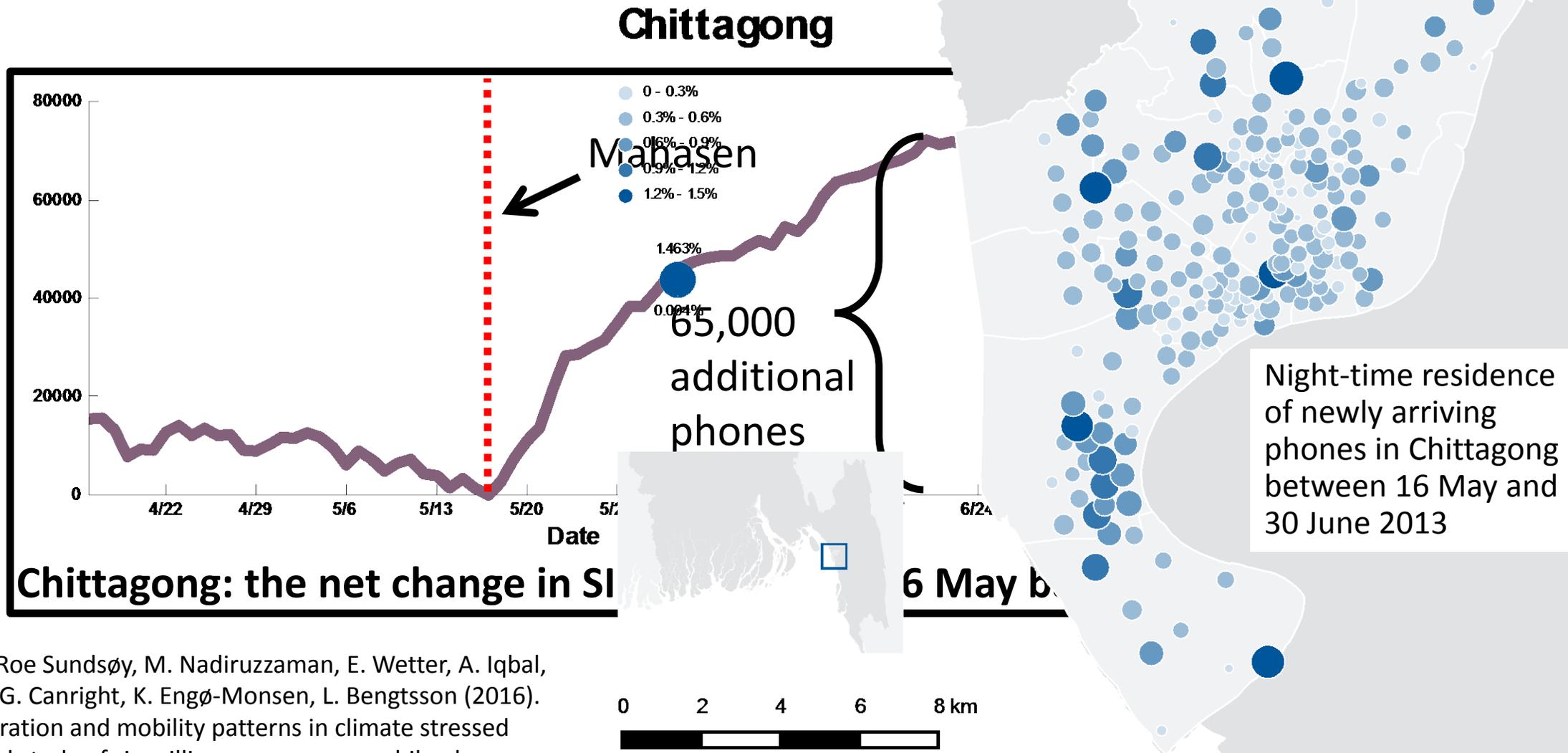


Lu, X., **D. Wrathall**, P. Roe Sundsøy, M. Nadiruzzaman, E. Wetter, A. Iqbal, T. Qureshi, A. Tatem, G. Canright, K. Engø-Monsen, L. Bengtsson (2016) Detecting climate adaptation from anomalies in mobile network data: analysis of Cyclone Mahasen in Bangladesh. *Climatic Change*

Long-term patterns of migration:



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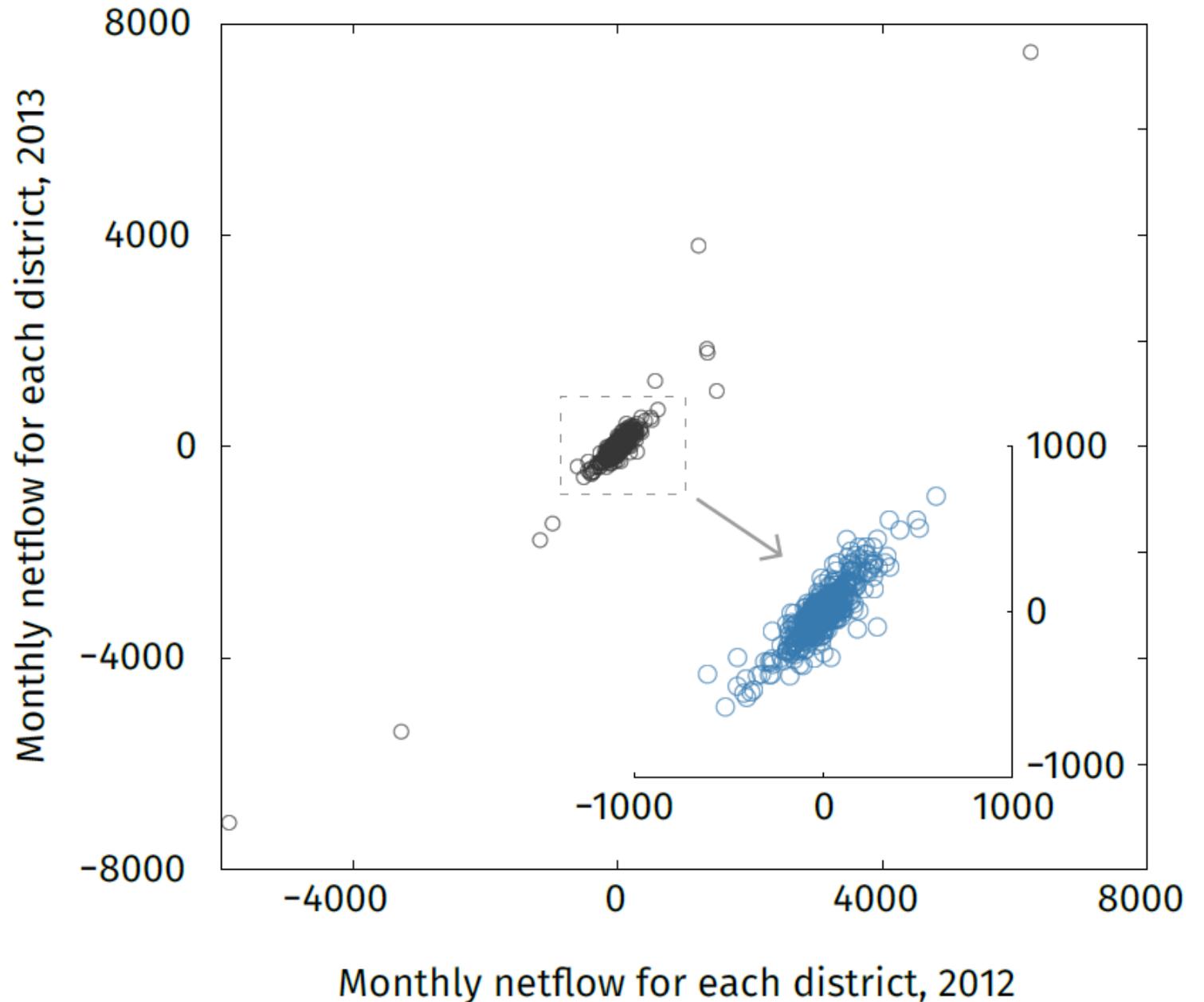


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Net migration:

[Published] 0.96
correlation between net
flows in 2013 (the storm
year) to flows in 2012
(a non-storm year).

IT WAS THE MONSOON!



Conclusions



Climate change will amplify a very predictable pattern.
We need larger-scale, long-term, spatiotemporally resolved data,
including unaffected areas.

Thank you

