Dengue is a mosquito-borne disease that infects over 400 million people worldwide each year. Forecasting incidence is challenging because of the difficulty of tracking mosquito populations. We adopt a data fusion approach with 13 climate and satellite data streams as proxies for mosquito density, using penalized regression models to retrocast weekly dengue cases, and map the $R^2$ error values at the municipality level of resolution.

**Background and Methods**

Dengue is a mosquito-borne disease that infects over 400 million people worldwide each year. Forecasting incidence is challenging because of the difficulty of tracking mosquito populations. We adopt a data fusion approach with 13 climate and satellite data streams as proxies for mosquito density, using penalized regression models to retrocast weekly dengue cases, and map the $R^2$ error values at the municipality level of resolution.

**Brazilian Municipalities**

**Takeaways**

- Vegetation predictors are important in tropical regions; temperature predictors are important in temperate regions.
- During 2010-16, dengue was endemic in all 14 municipalities of Natal, while it was absent in 16 out of the 29 municipalities of Curitiba.
- Next questions: is dengue newly emergent in Curitiba? Are there conditions that prevent its spread in certain temperate areas?

**Acknowledgements**

This research was supported by an appointment to the Intelligence Community Postdoctoral Research Fellowship Program at Oak Ridge Institute for Science and Education through an interagency agreement between the U.S. Department of Energy and the Office of the Director of National Intelligence, and also by the U.S. Department of Energy through the Los Alamos National Laboratory. Los Alamos National Laboratory is operated by Triad National Security, LLC, for the National Nuclear Security Administration of U.S. Department of Energy (Contract No. 89233218CNA000001).