

2015 Extension of Ammonium and Nitrate Wet Deposition Models for the Chesapeake Bay Watershed and Tidal Waters

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Objective

Provide updated and refined estimates of nitrate and ammonium wet deposition to the Chesapeake Bay Watershed and tidal waters for the period 1983 through 2014 using revised and expanded data sources for:

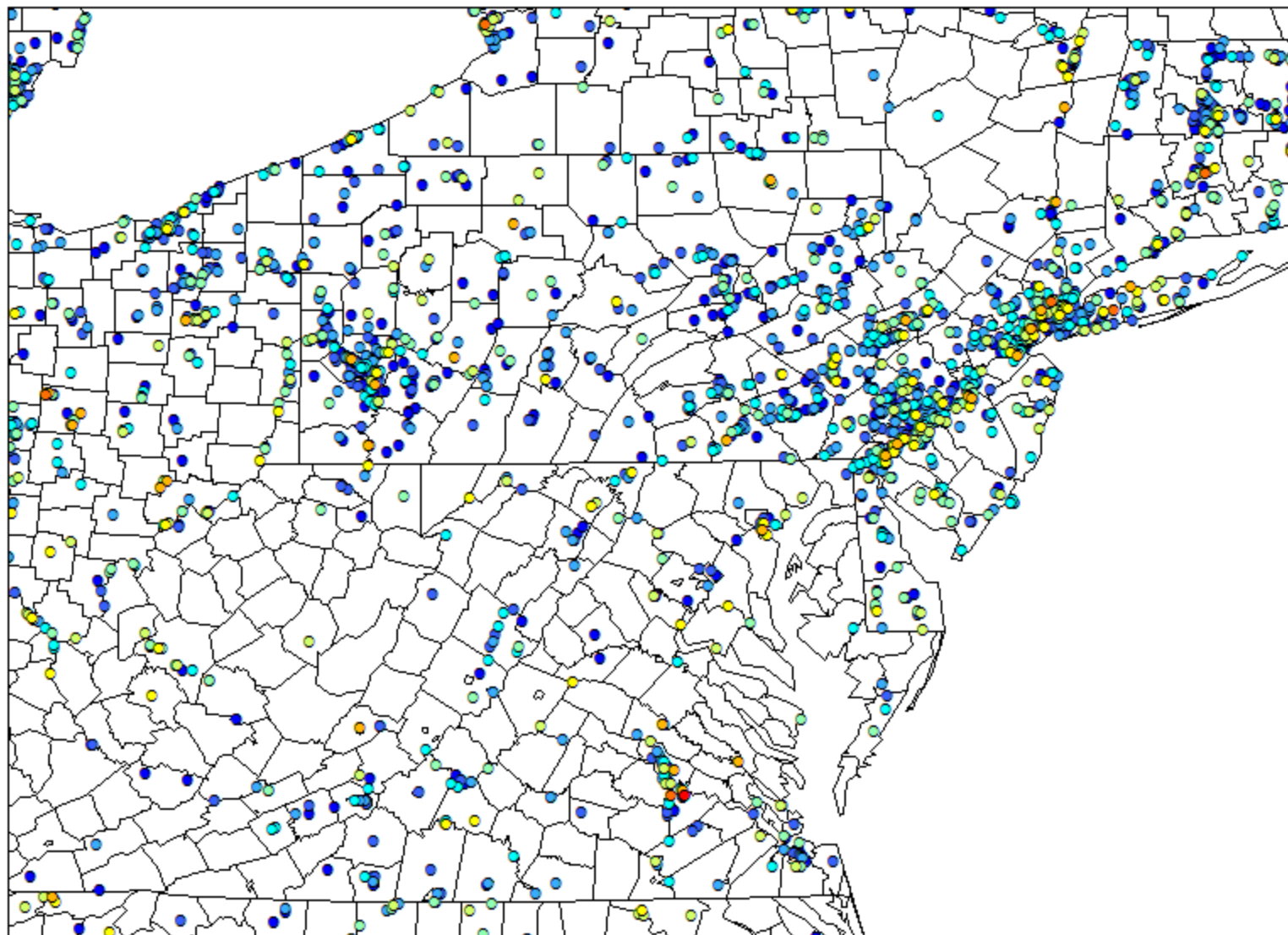
- Nitrous oxide and ammonia emissions and emissions transport
- Land cover and land use
- Agricultural and anthropogenic activity including fertilizer application and transportation
- Rainfall and other meteorological parameters
- NADP/NTN and AirMON Precipitation chemistry observations

Modeling effort will build upon models developed by Grimm and Lynch, 2007 for the 1985 through 2005 time span.

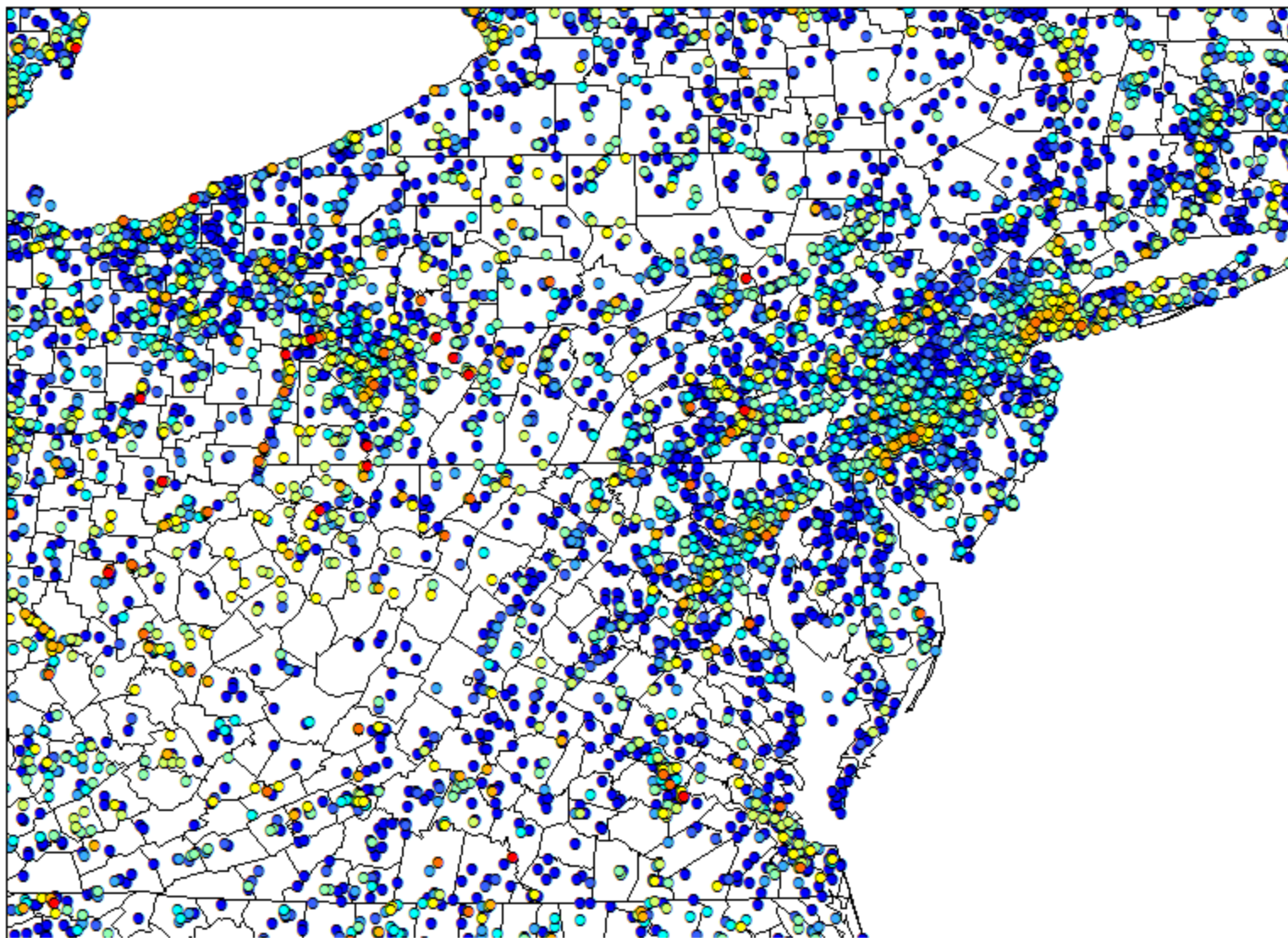
What is New in the 2015 Update

- Model output time span increased from 1984 through 2005 to 1983 through 2014
- Extended precipitation chemistry data include observations since 2005
- Precipitation and surface meteorological parameters standardized to NLDAS
- New NLCD data issues for 2001, 2006, and 2011 will improve land use characterization during the latter part of modeling period and correct issues in 1992 NLCD.
- Additional facility and non-point source emissions data from 2005, 2008, and 2011 NEI data releases will be incorporated.
- The spatial and temporal distribution of fertilizer applications will also be refined using NASS crop phenology data.
- Representation of boundary-layer effects on emissions movement will be improved in the transport model.
- Model verification will be expanded to include representation of trends at long-term precipitation chemistry monitoring stations.

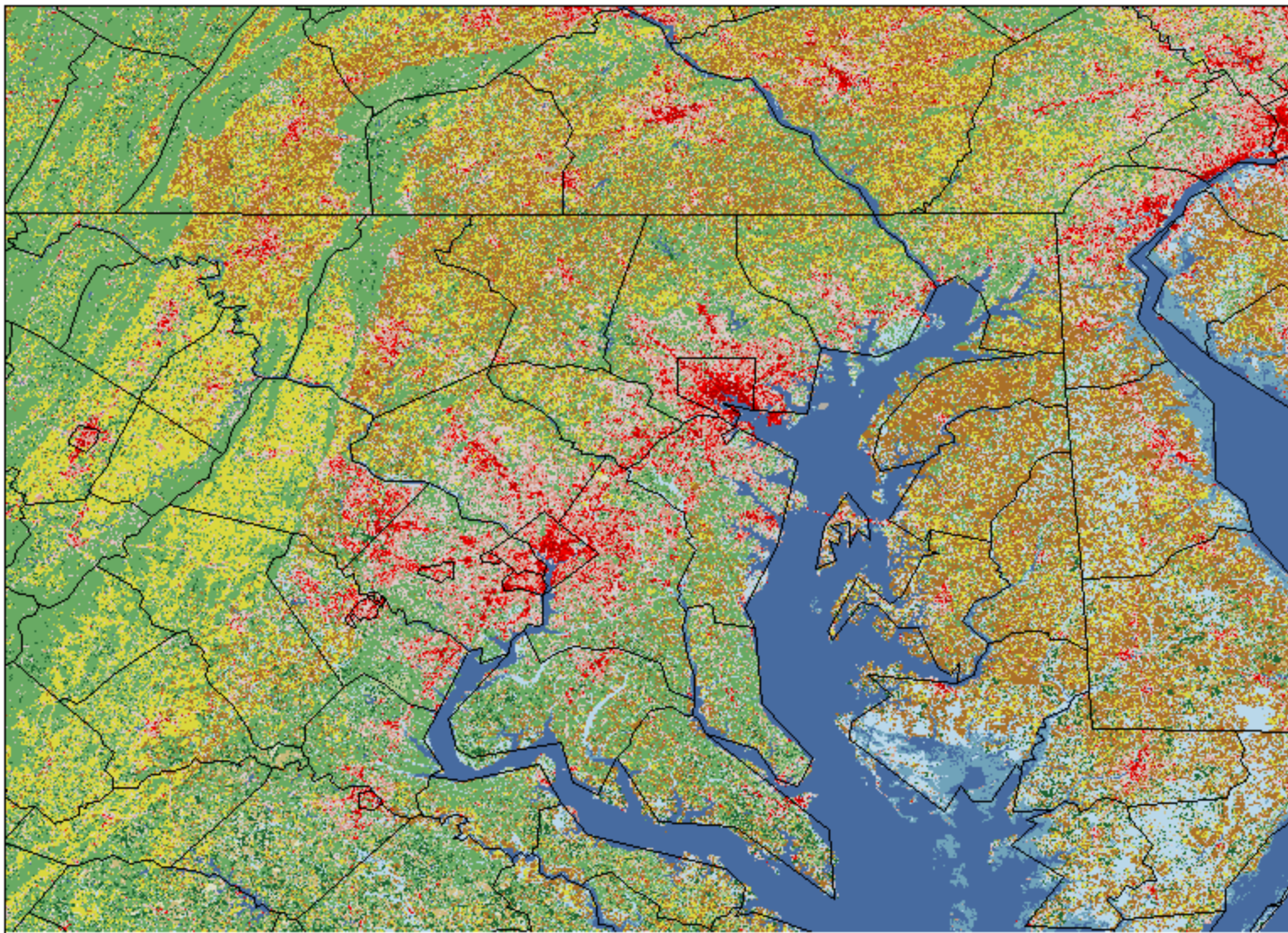
Ammonia Facility Emissions from 2011 NEI



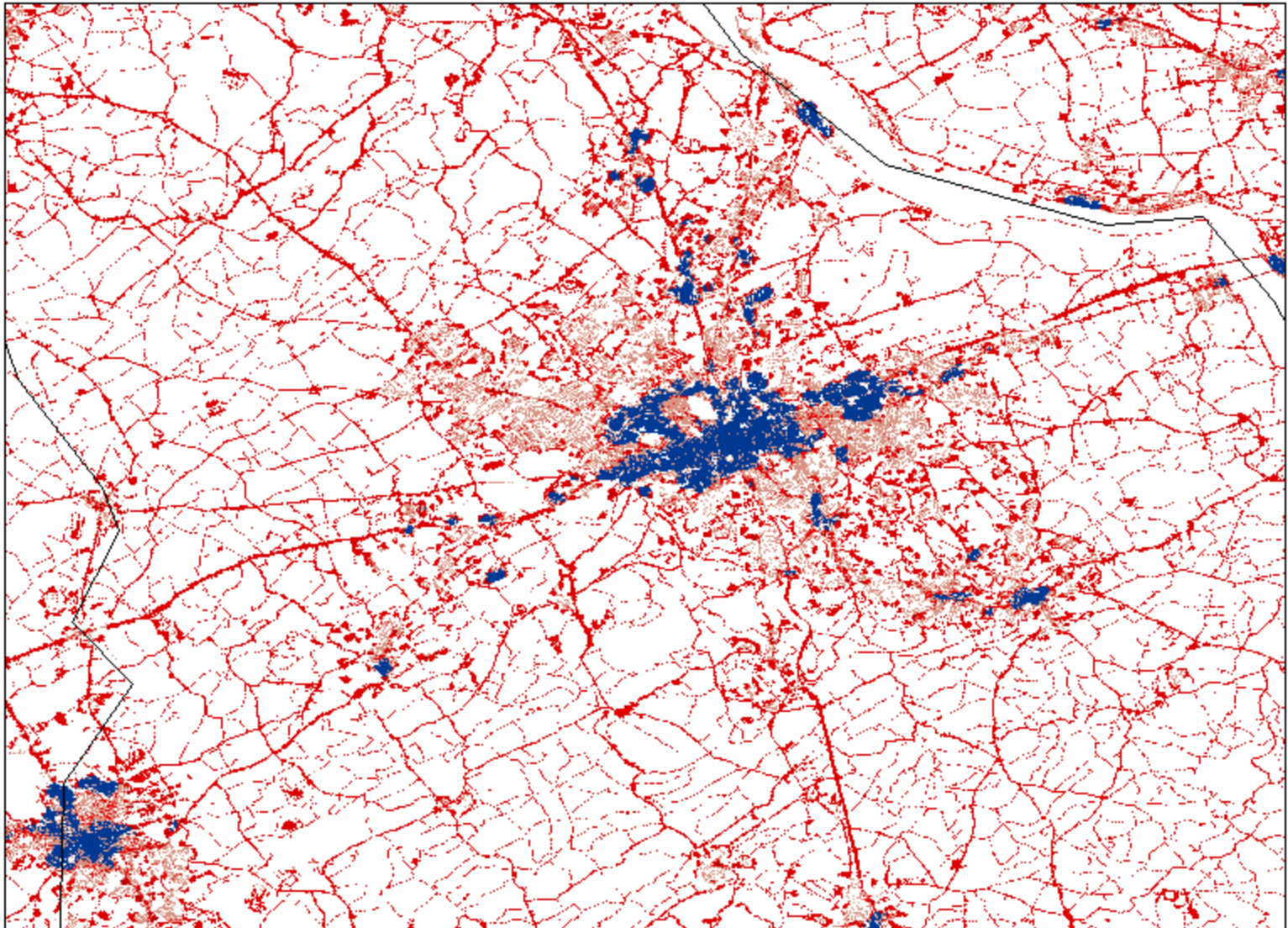
Ammonia Facility Emissions from 2011 NEI



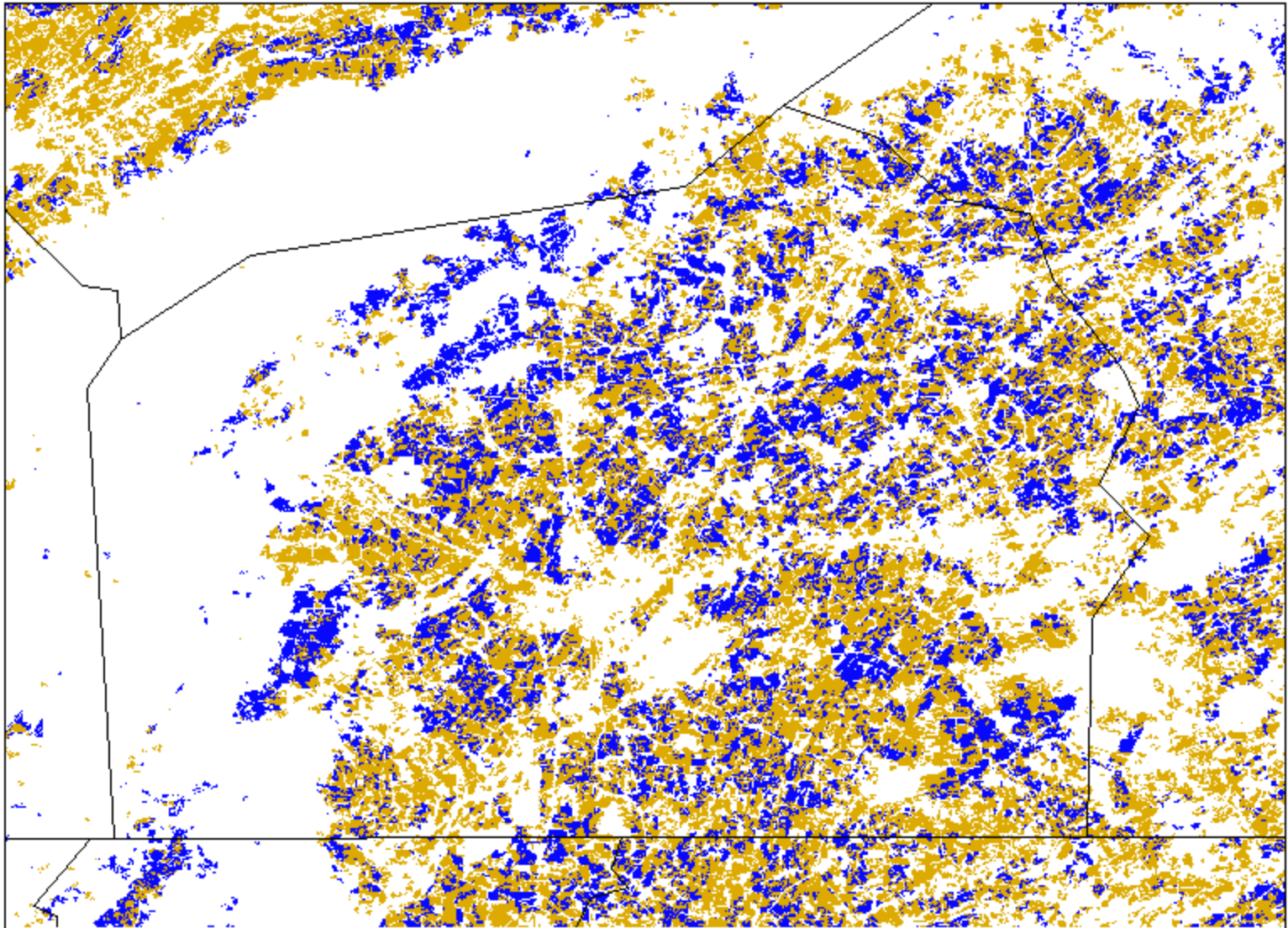
2011 National Land Cover Data (NLCD)



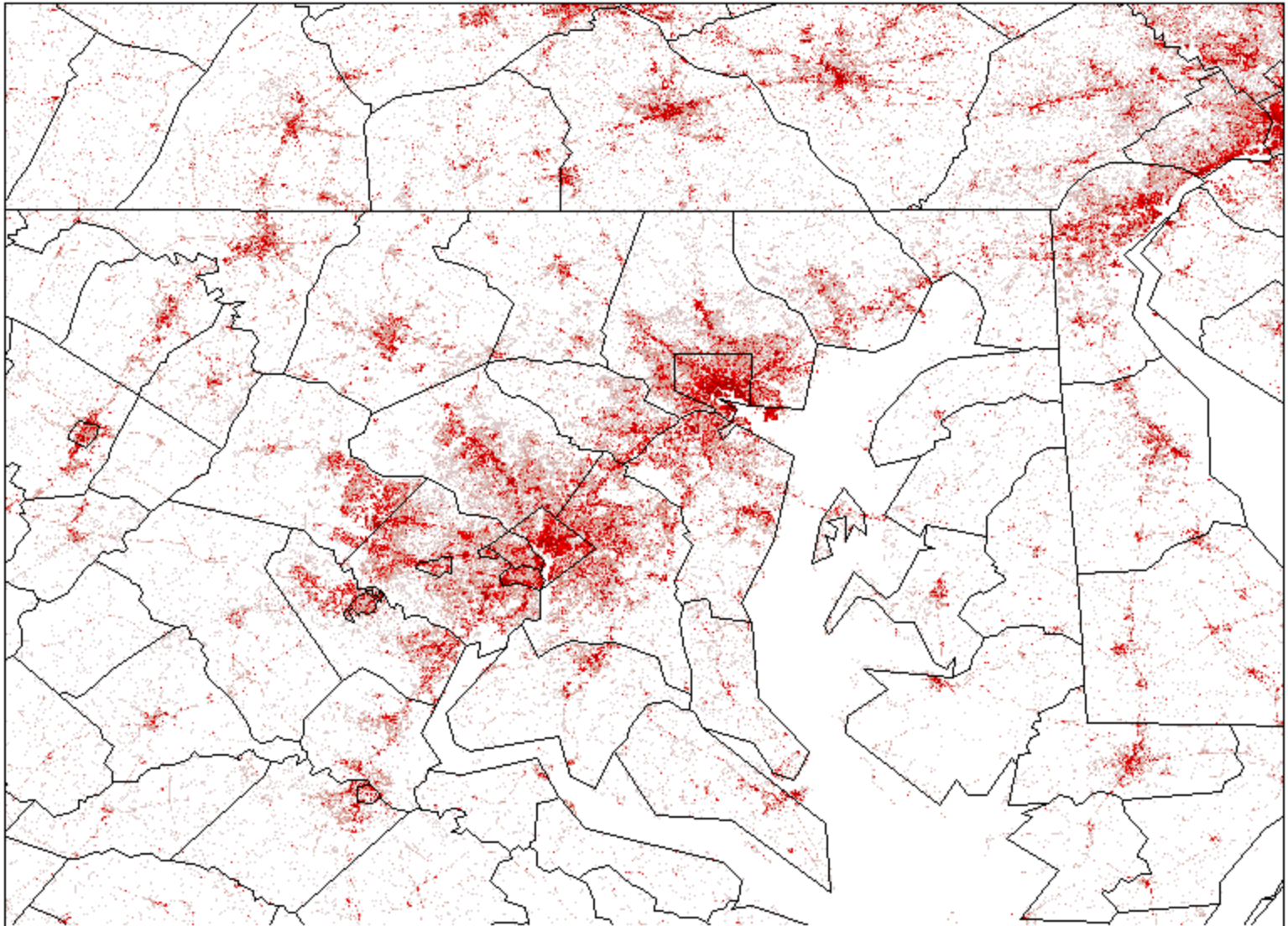
Classification of Transportation Corridors and Industrialized Areas from NLCD at 36m



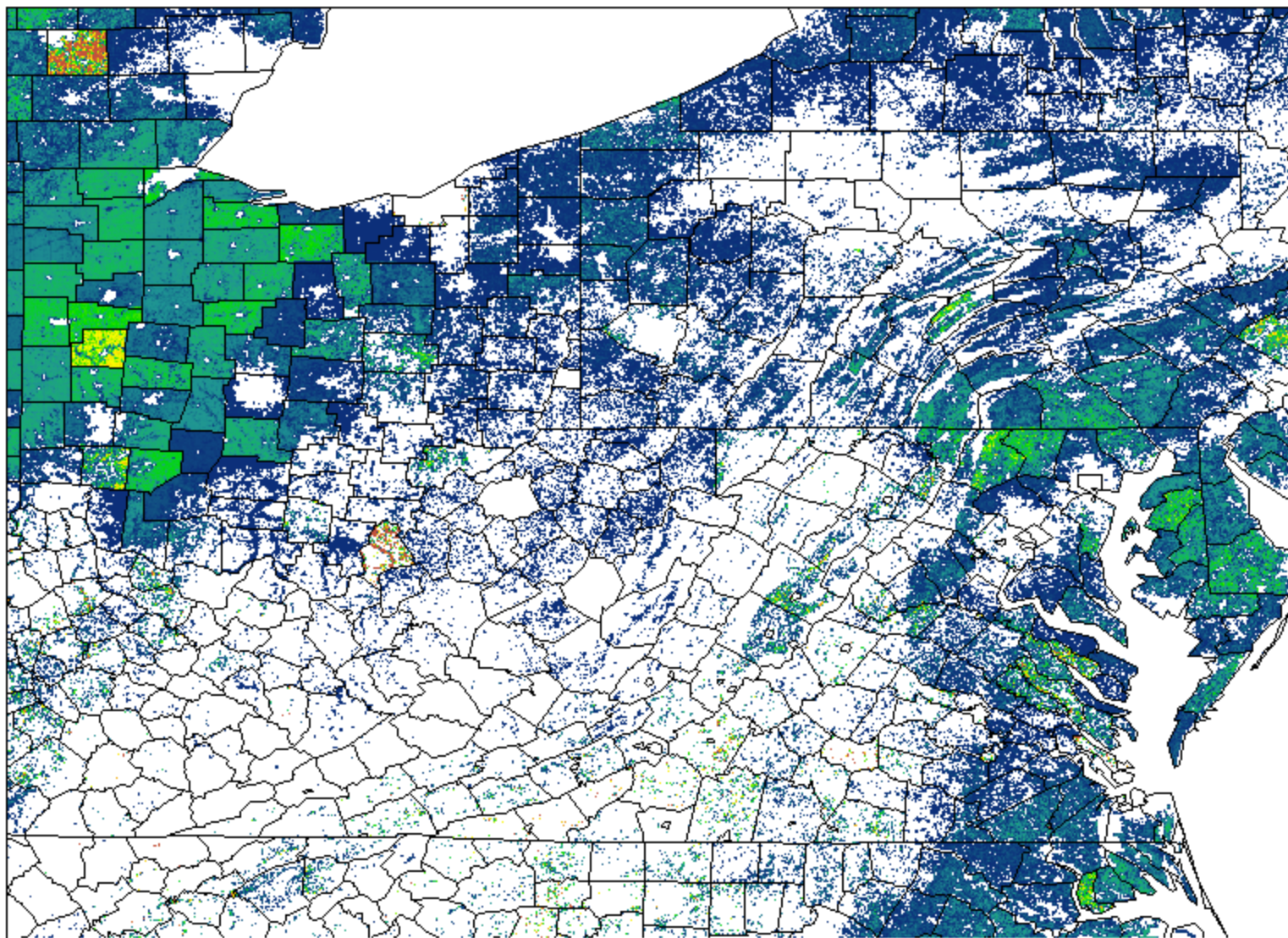
Classification of Croplands and Potential Livestock Production Areas from NLCD at 36m



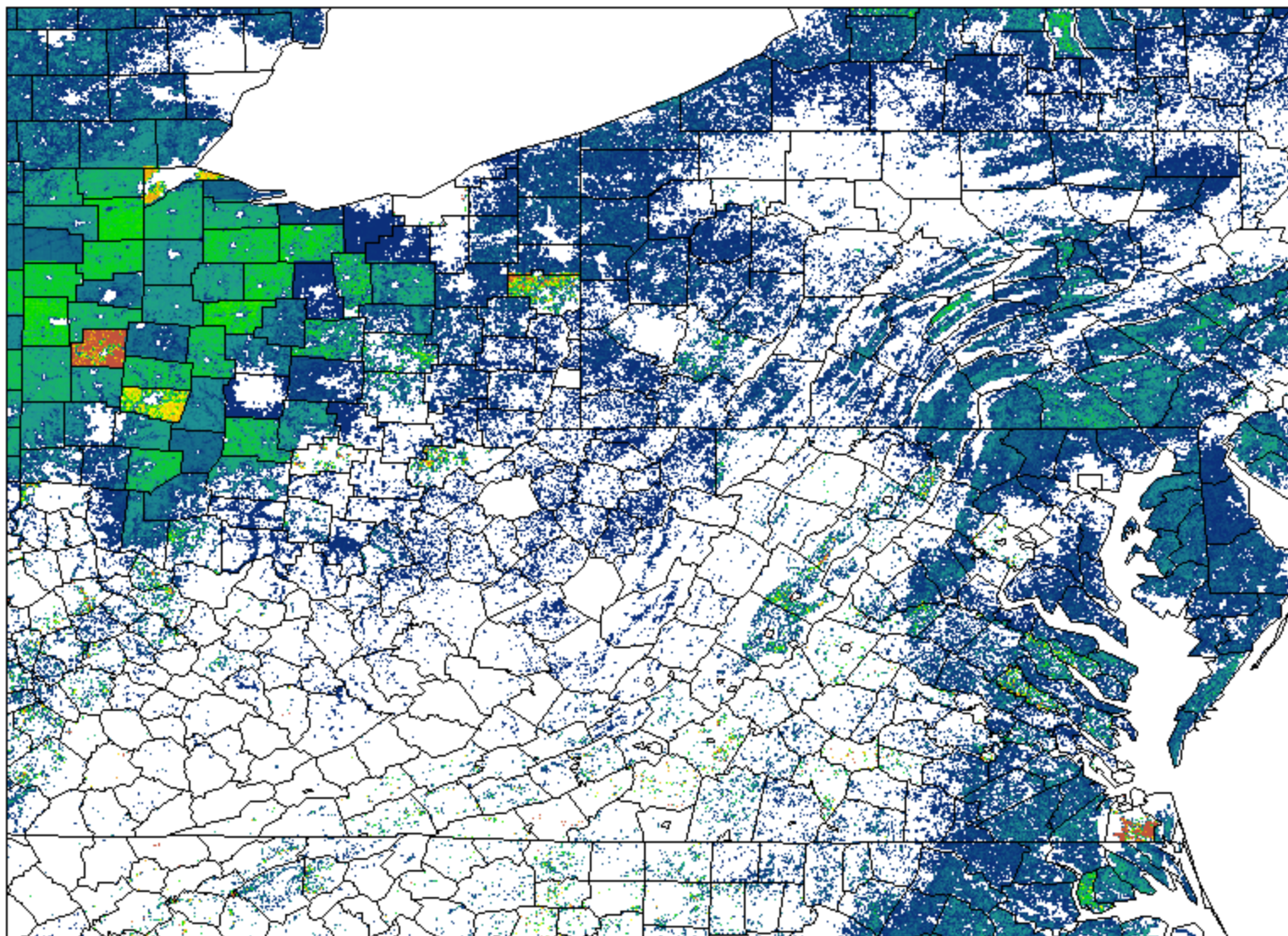
Classification of Residential Areas from NLCD at 36m



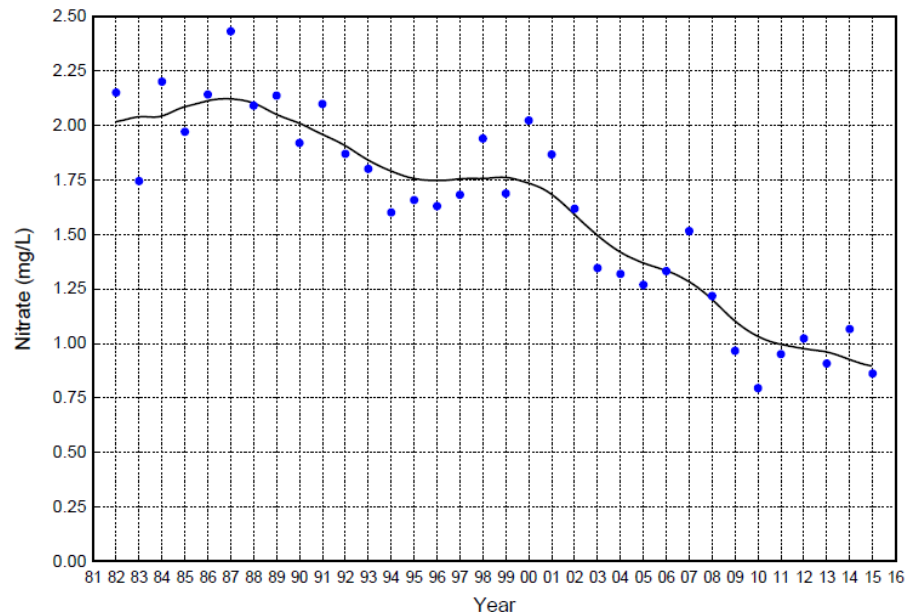
NEI 2008 Annual Ammonia Emissions from Fertilizer Applications



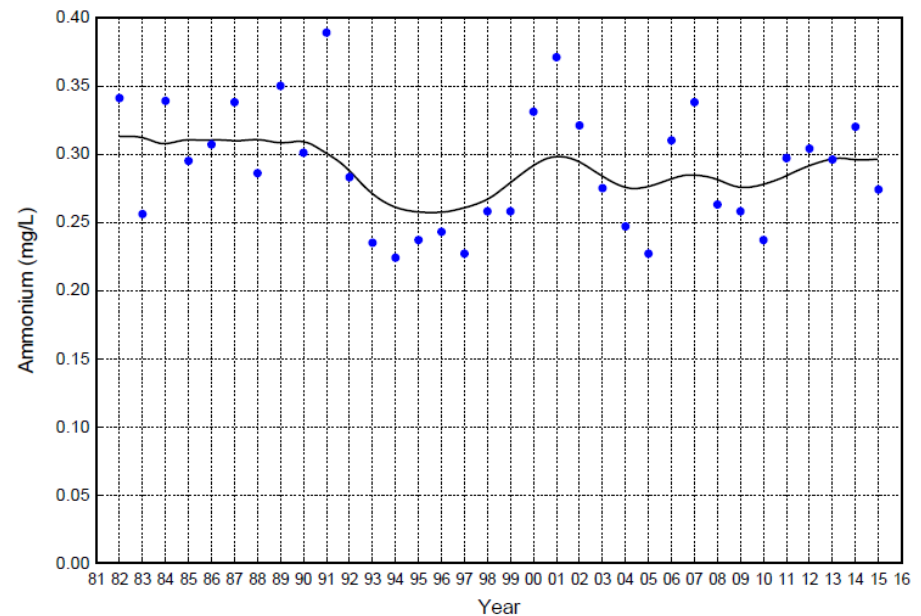
NEI 2011 Annual Ammonia Emissions from Fertilizer Applications



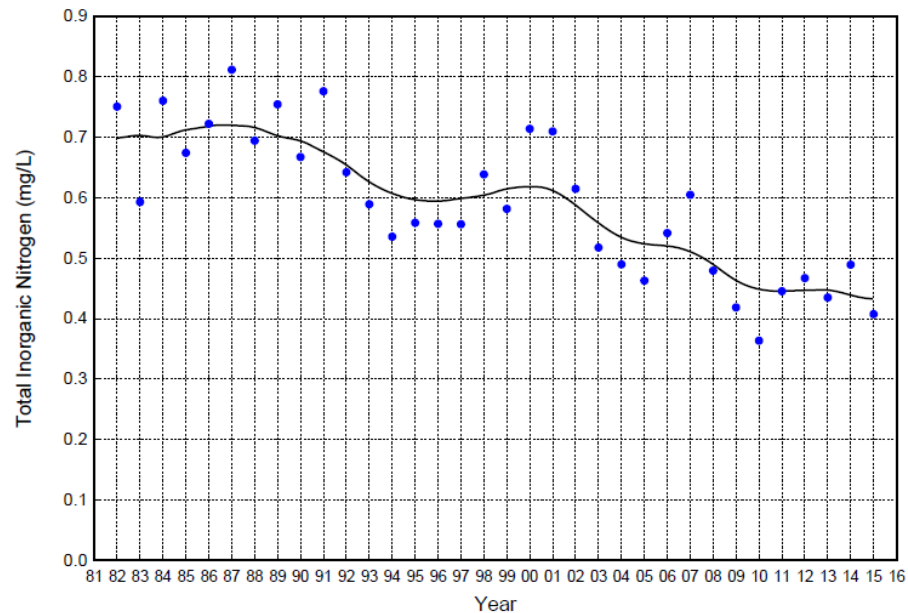
Leading Ridge
Annual Wet-Fall Nitrate Ion Concentration



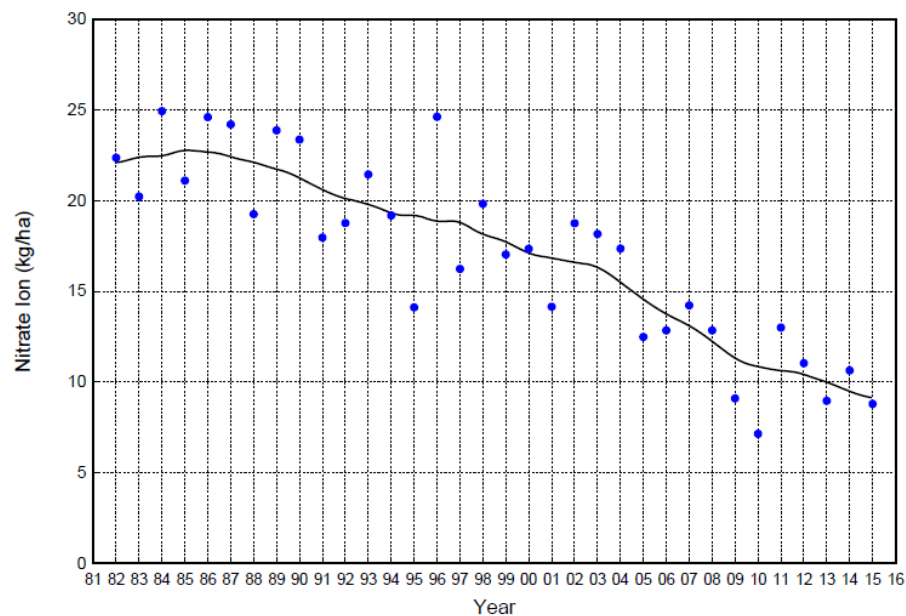
Leading Ridge
Annual Wet-Fall Ammonium Ion Concentration



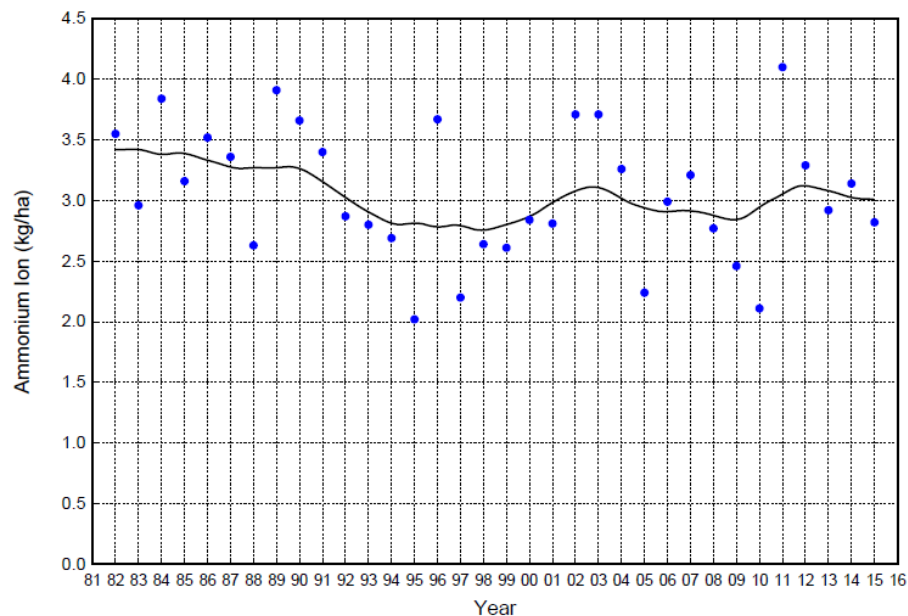
Leading Ridge
Annual Wet-Fall Total Inorganic Nitrogen Concentration



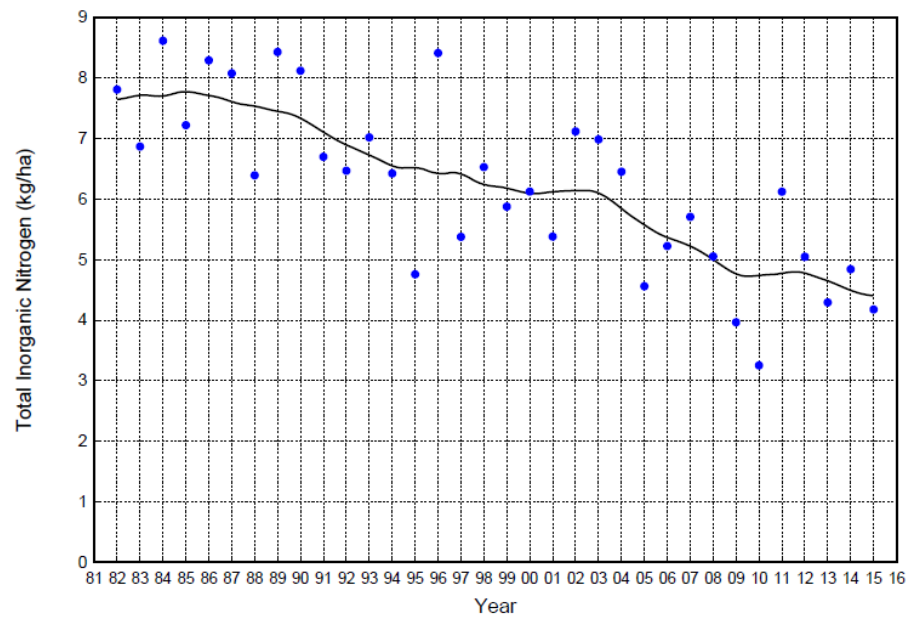
Leading Ridge
Annual Nitrate Ion Wet Deposition



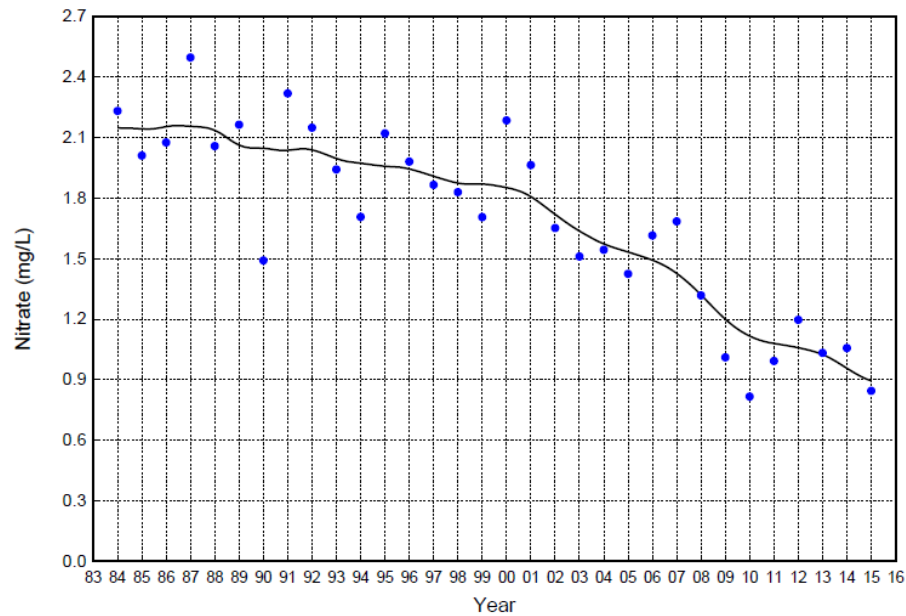
Leading Ridge
Annual Ammonium Ion Wet Deposition



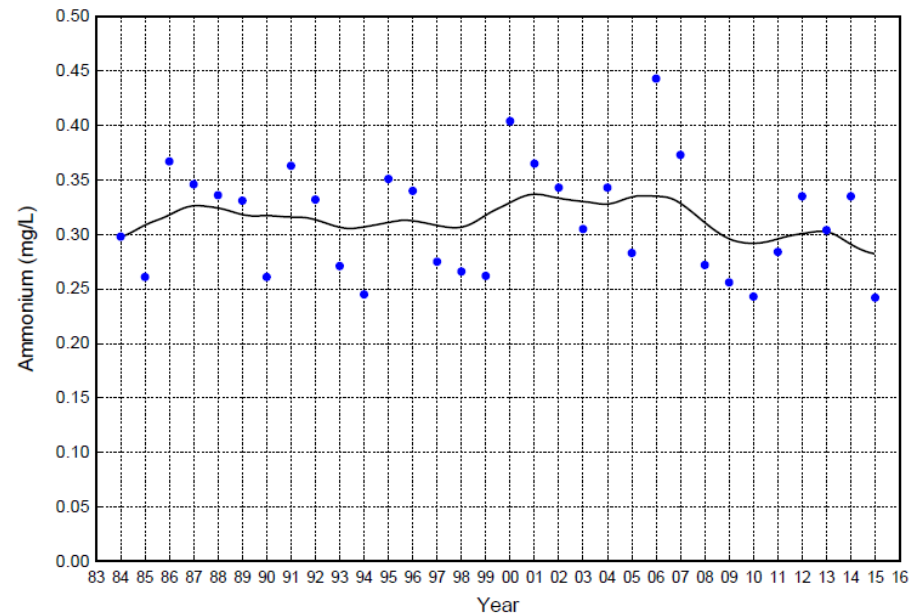
Leading Ridge
Annual Total Inorganic Nitrogen Wet Deposition



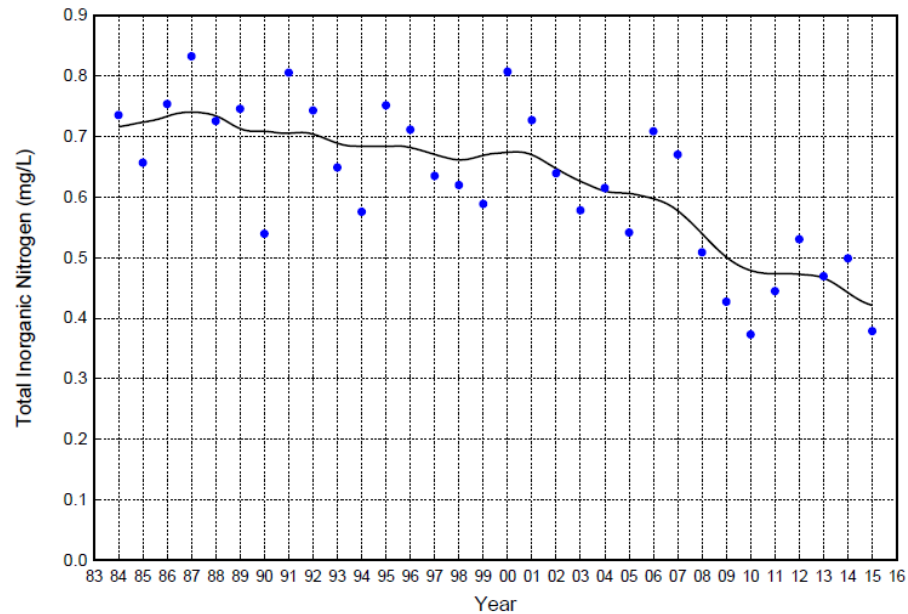
Little Pine State Park
Annual Wet-Fall Nitrate Ion Concentration



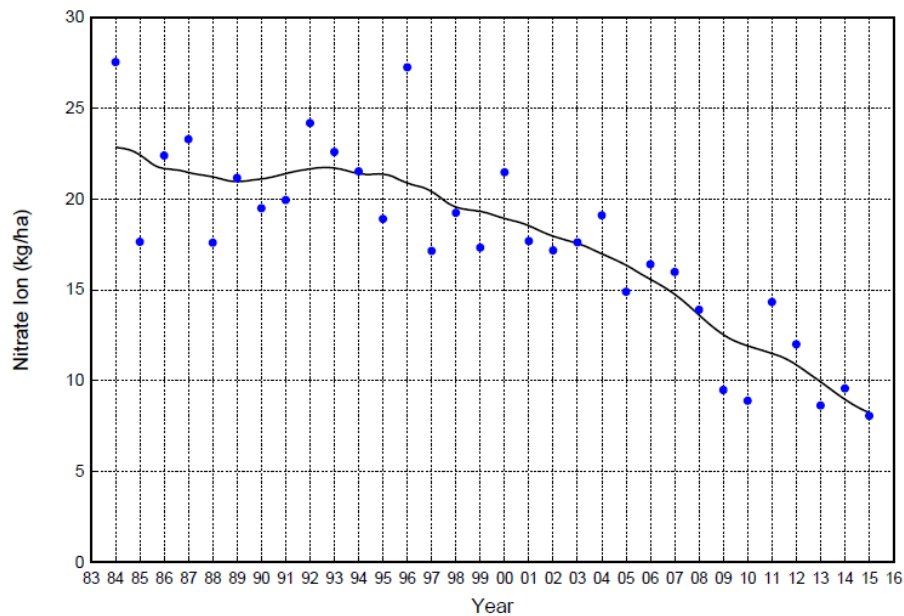
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Annual Wet-Fall Ammonium Ion Concentration



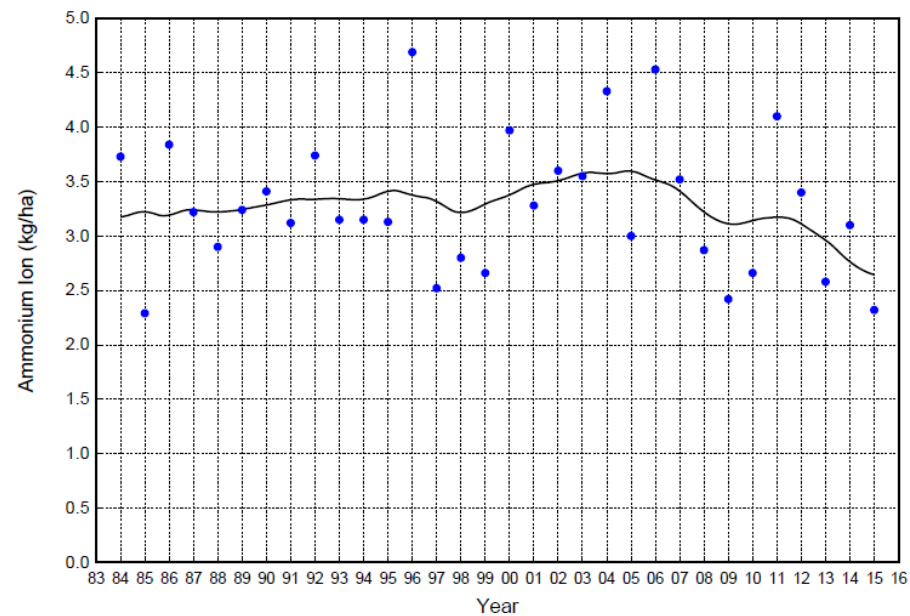
Little Pine State Park
Annual Wet-Fall Total Inorganic Nitrogen Concentration



Little Pine State Park
Annual Nitrate Ion Wet Deposition



Little Pine State Park
Annual Ammonium Ion Wet Deposition



Little Pine State Park
Annual Total Inorganic Nitrogen Wet Deposition

