Experience on epidemiological analysis and difficulties encountered in Poland

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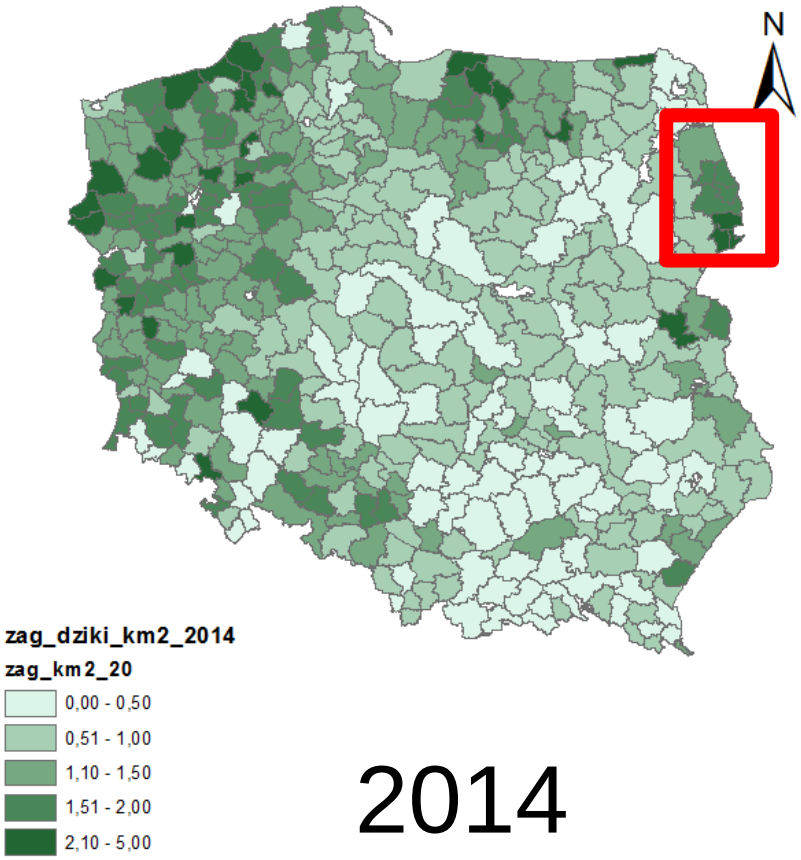
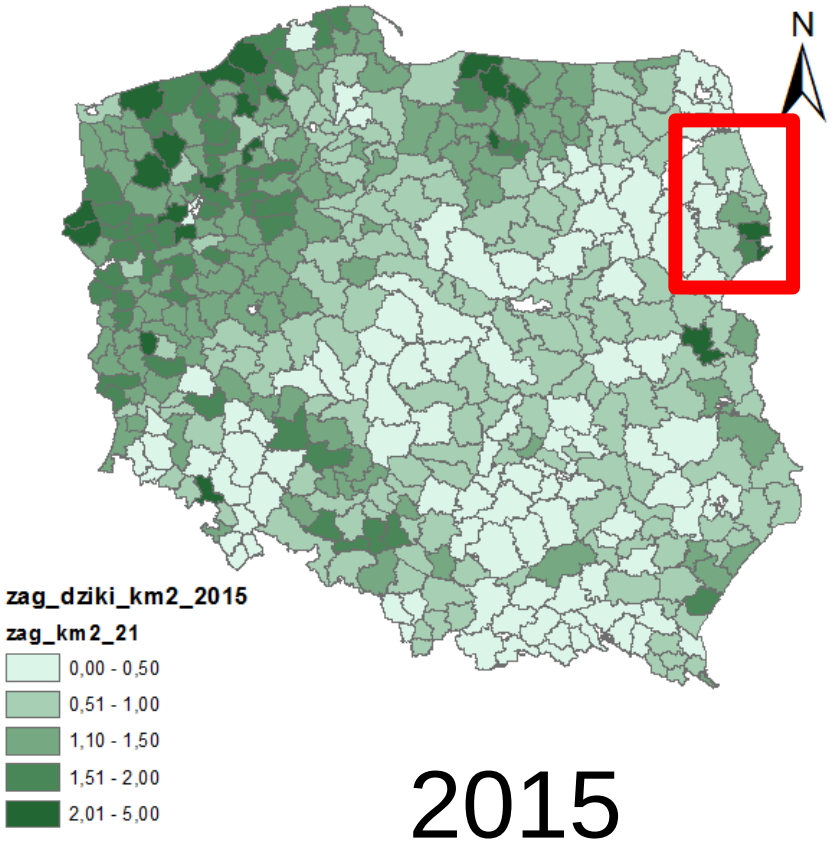
Workshop on „Harmonisation of data collection on African swine fever (ASF) virus in Baltic States (Estonia, Latvia and Lithuania) and Poland, EFSA, Parma, 23-25.11.2015

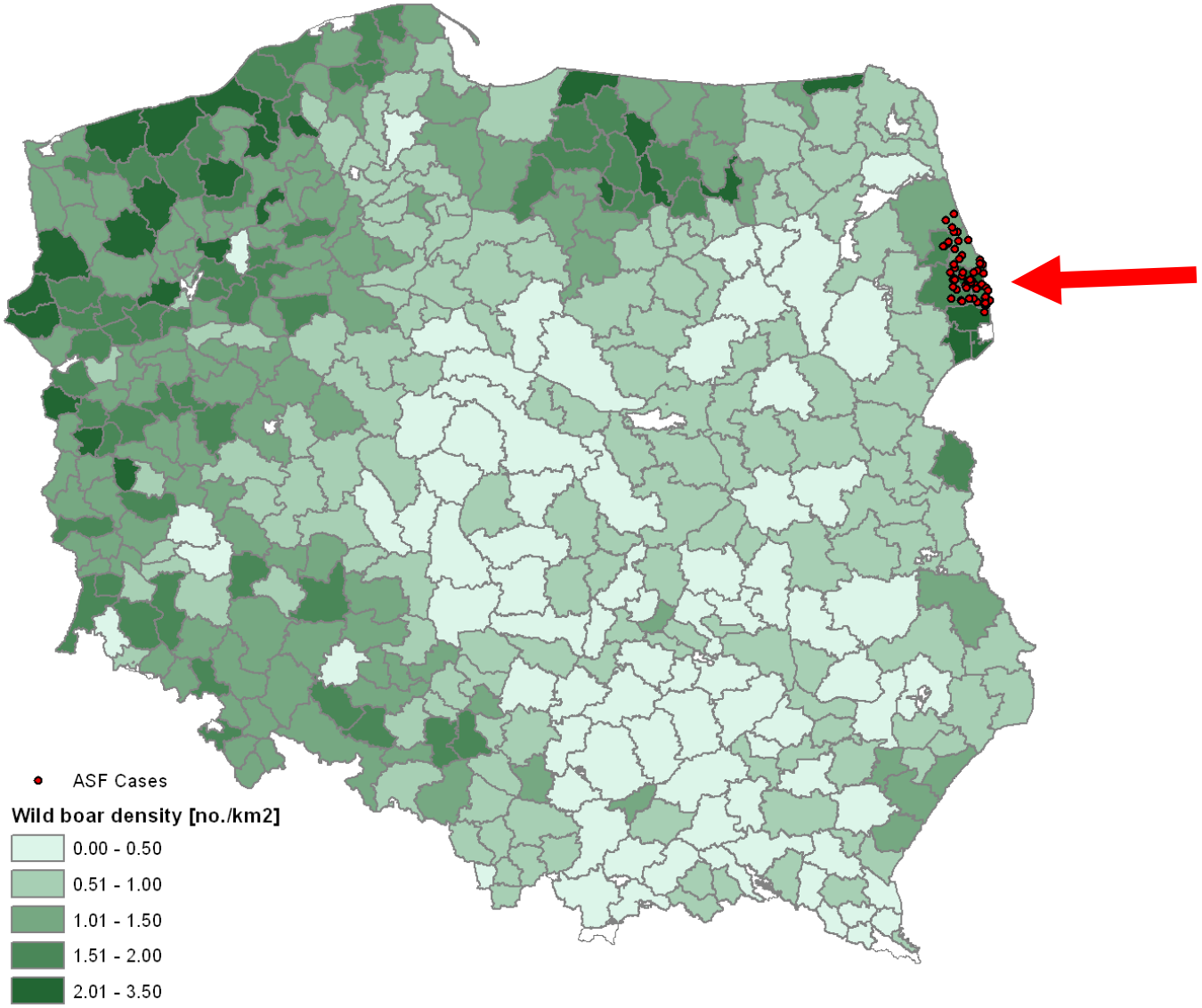
Comparison of WB density: 2014 & 2015 census



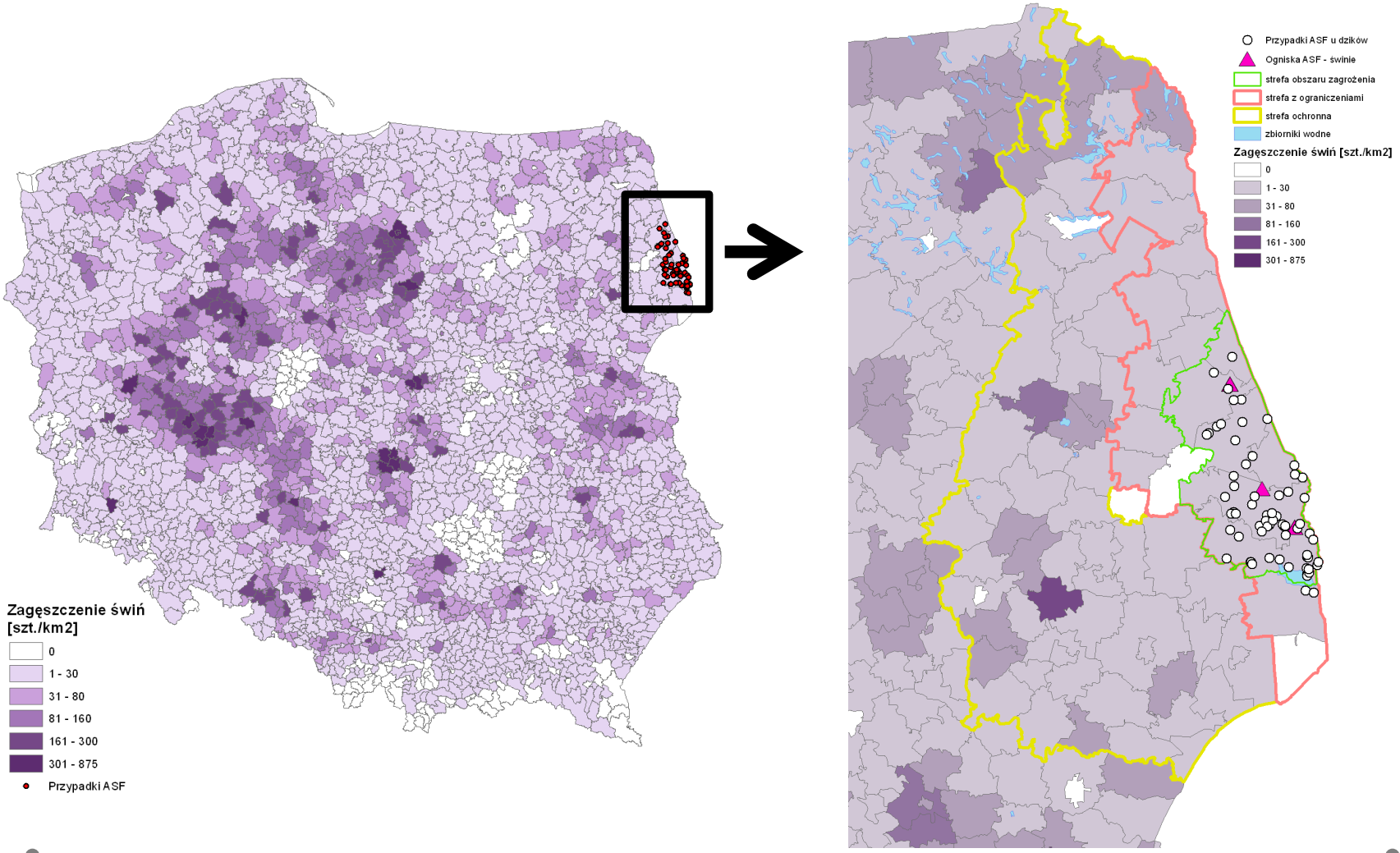
2014



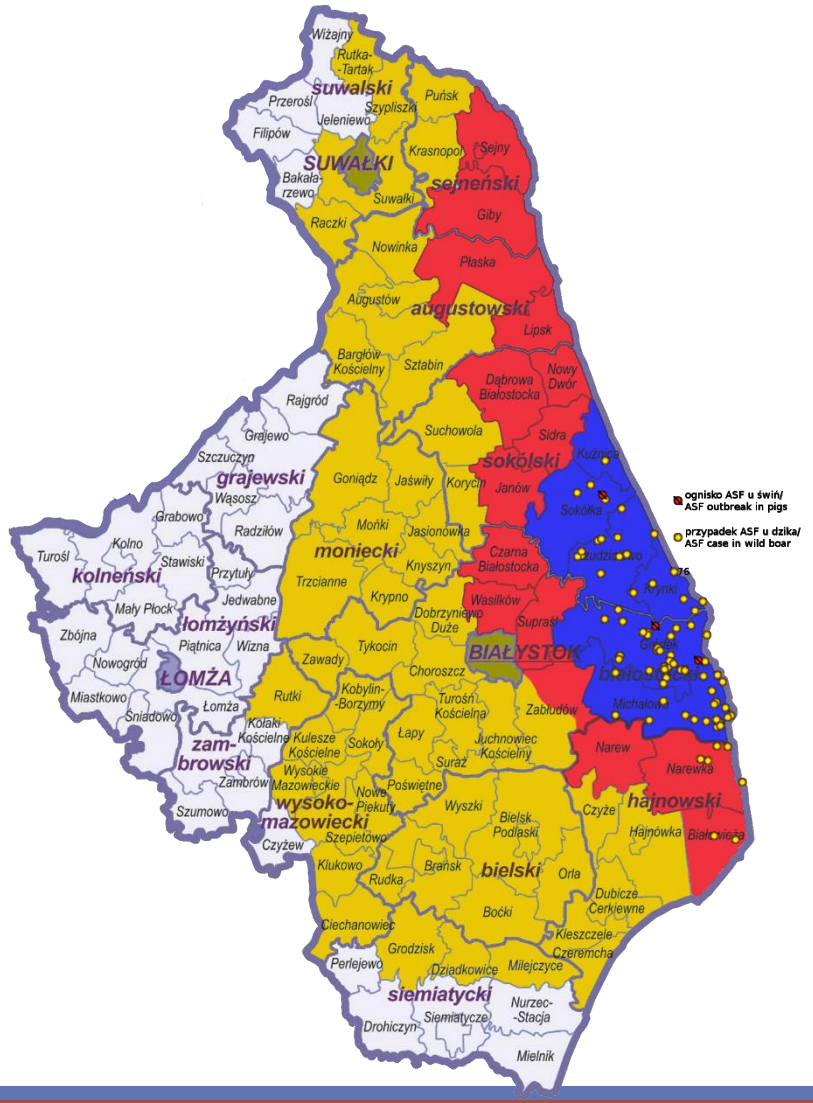
2015


ASF Cases
Wild boar density [no./km2]
0.00 - 0.50
0.51 - 1.00
1.01 - 1.50
1.51 - 2.00
2.01 - 3.50

Density of pig population in Poland (2014)



Epidemiological situation

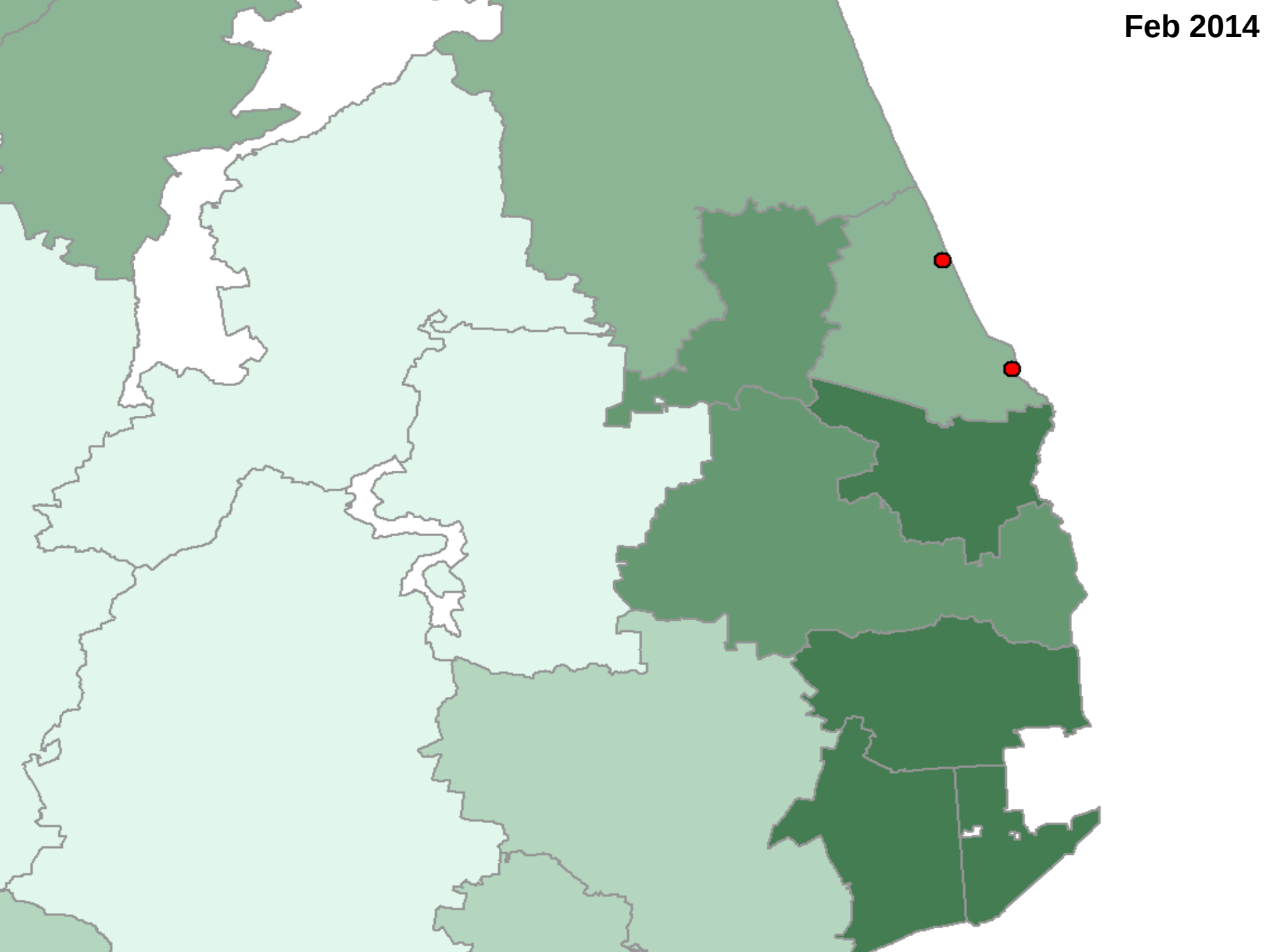


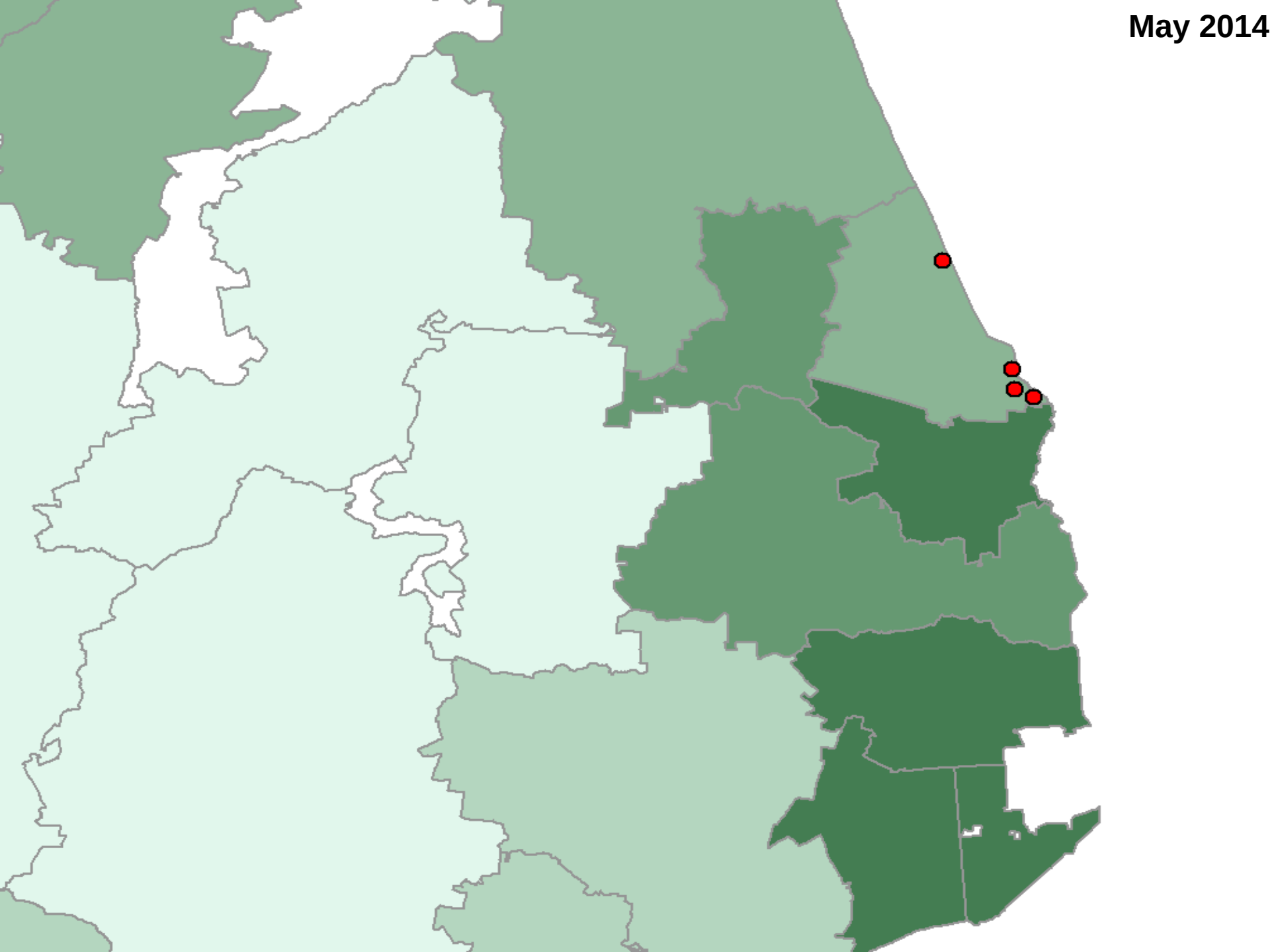
Cases of ASF in wild boar

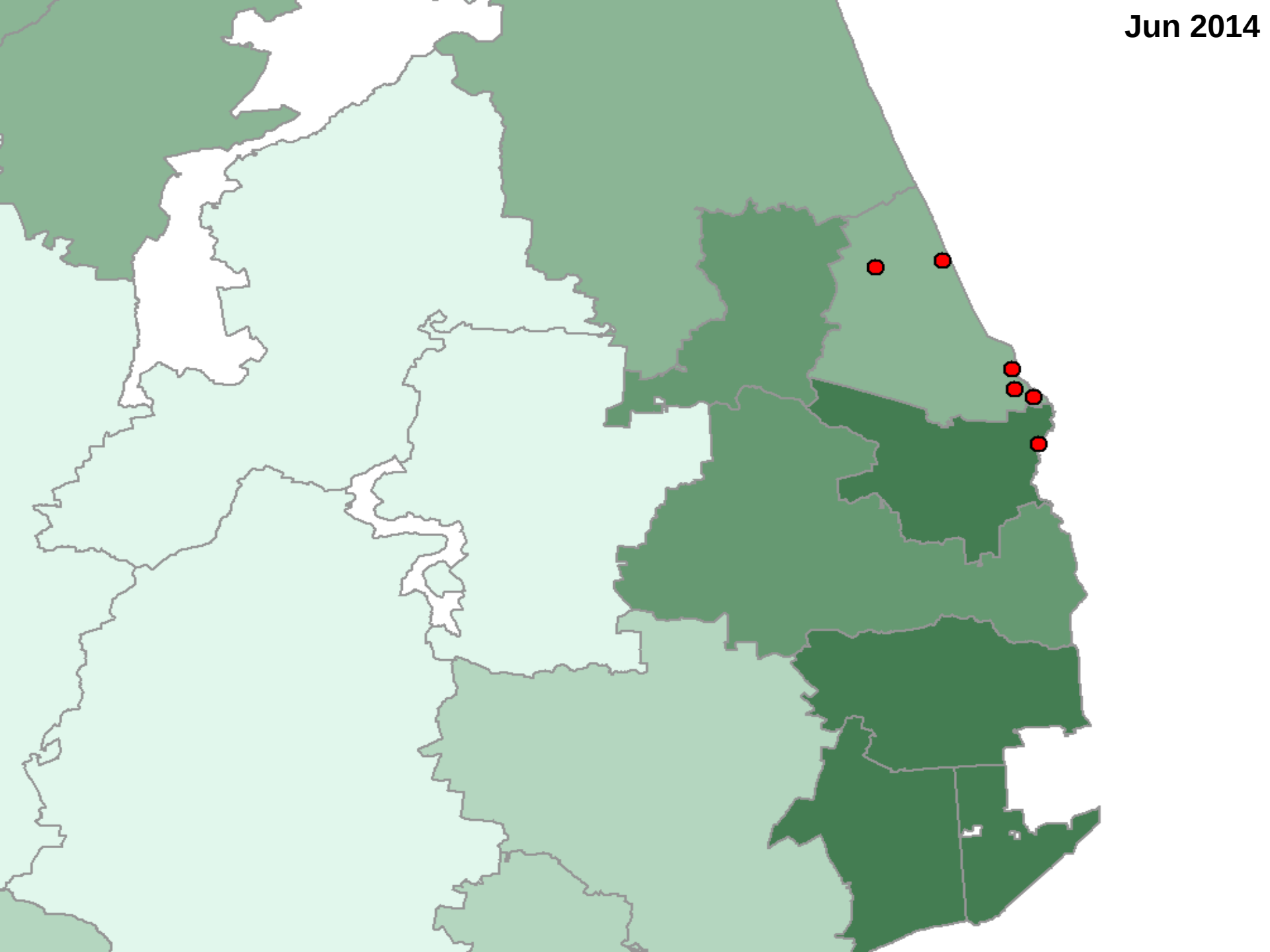
- First case of ASF was confirmed on 17 February 2014
- Since that time 77 cases in WB have been confirmed (30 cases in 2014 and 47 in 2015);

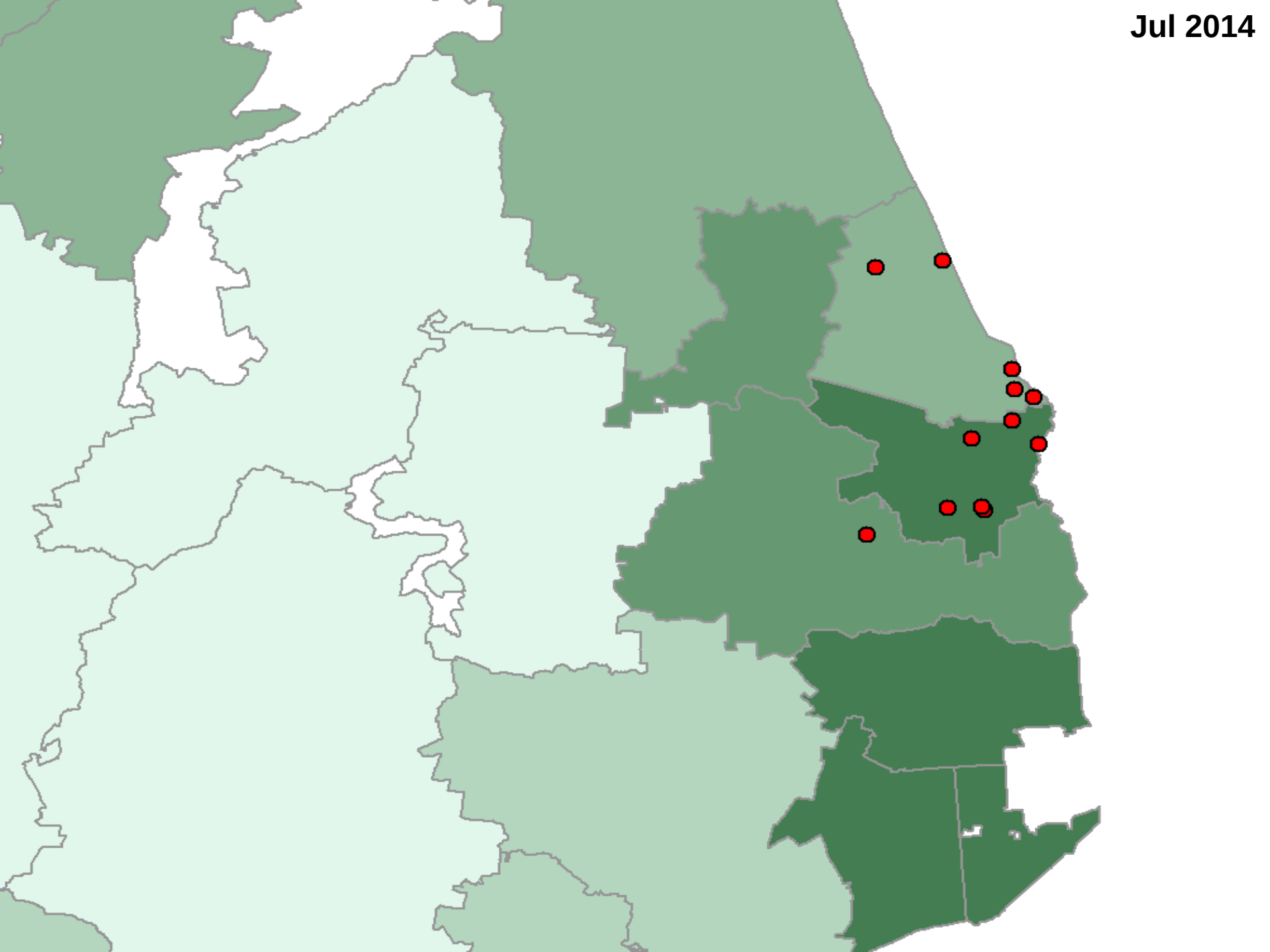
Outbreaks of ASF in domestic pigs

- 1st outbreak – 23 July 2014
- 2nd outbreak - 8 August 2014
- 3rd outbreak – 31 January 2015


Feb 2014


May 2014


Jun 2014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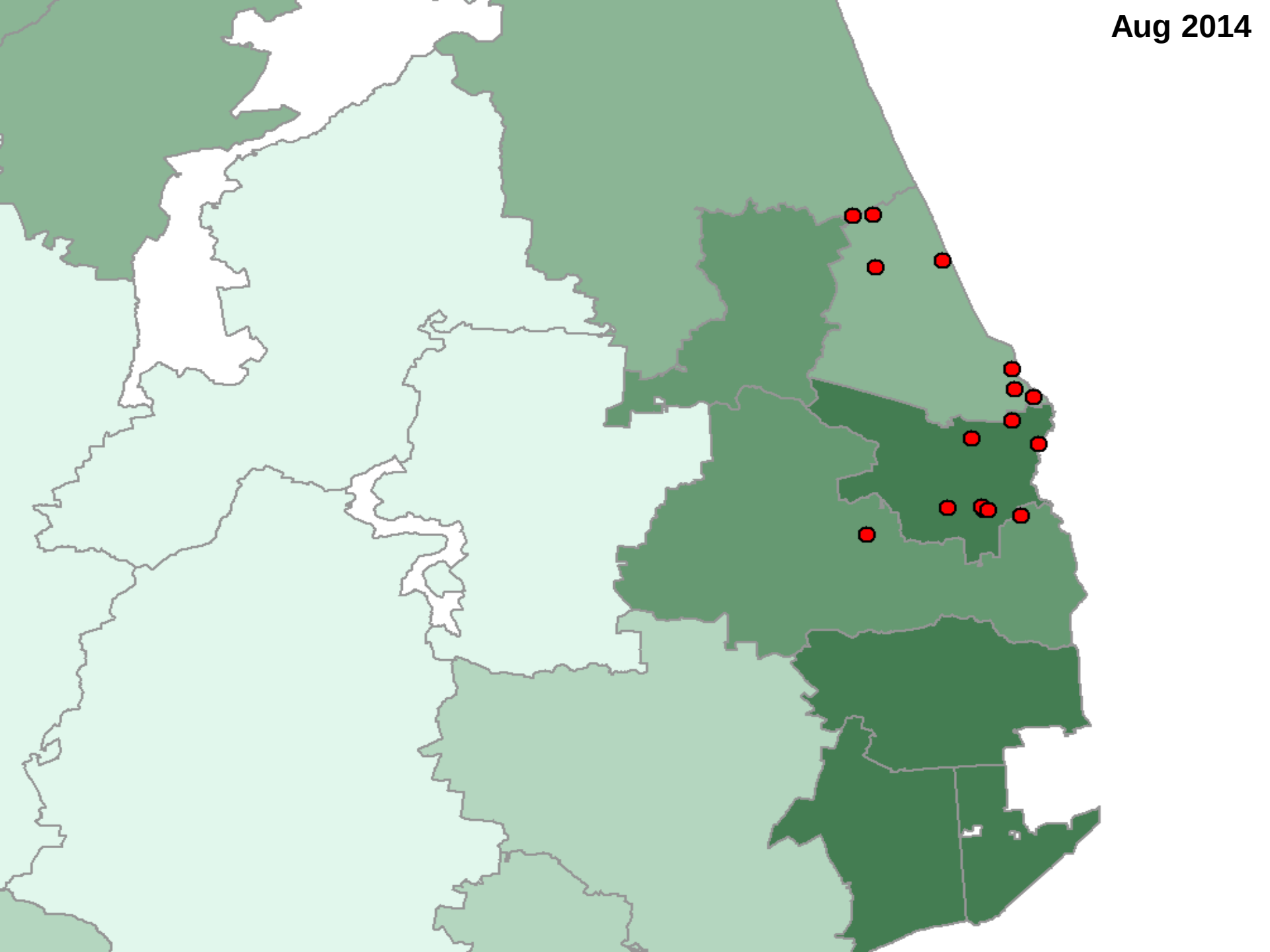
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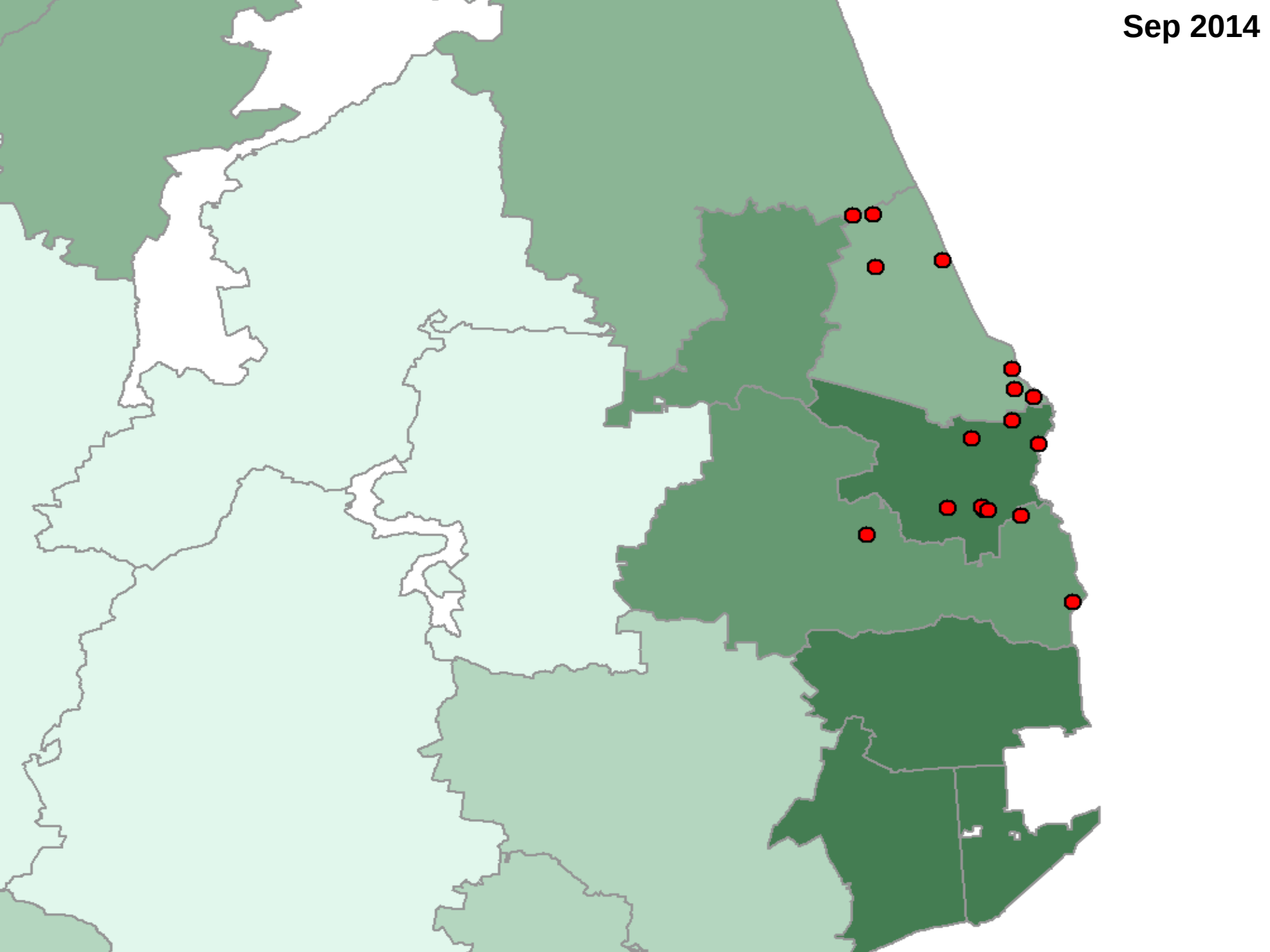
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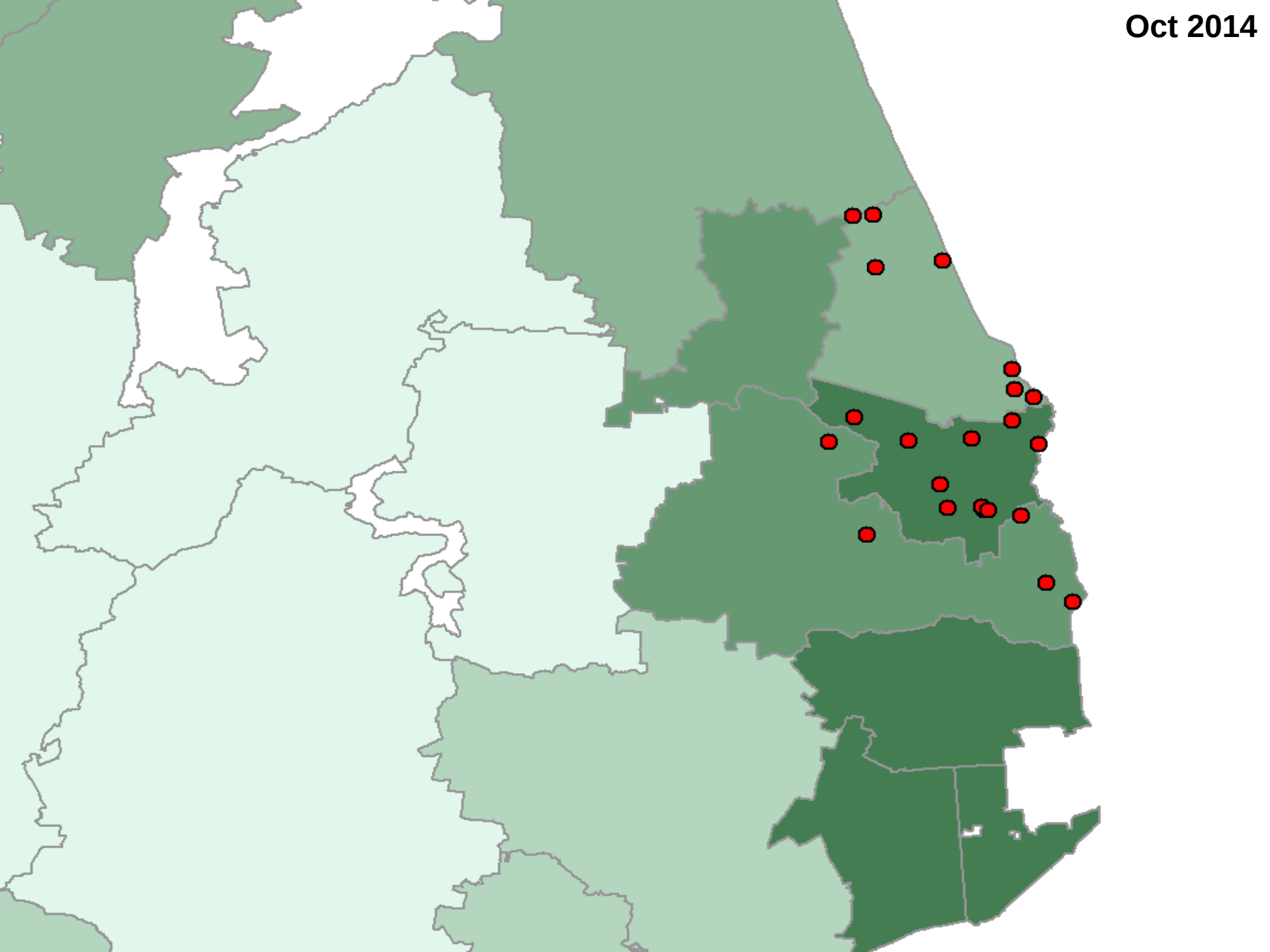
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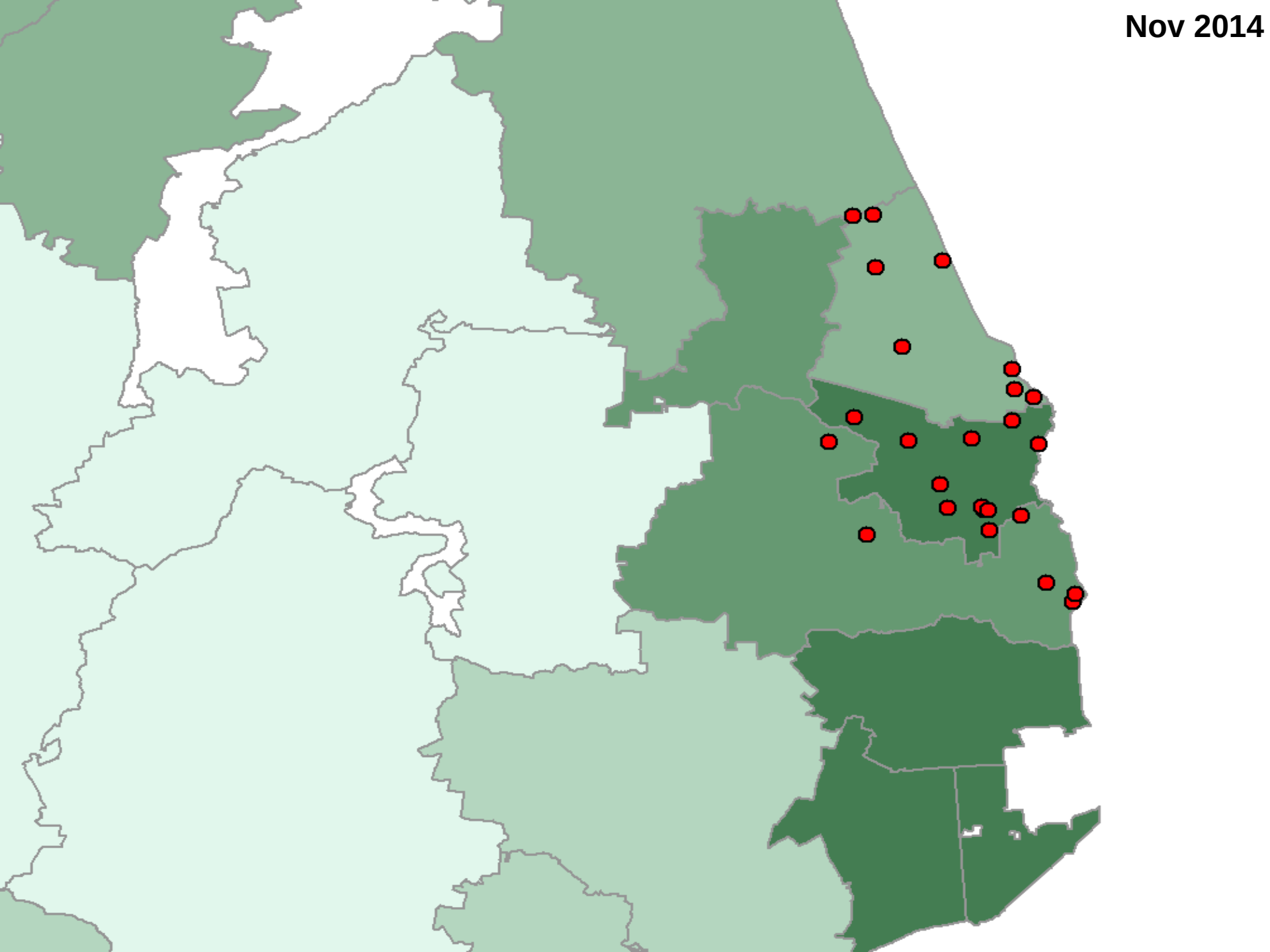
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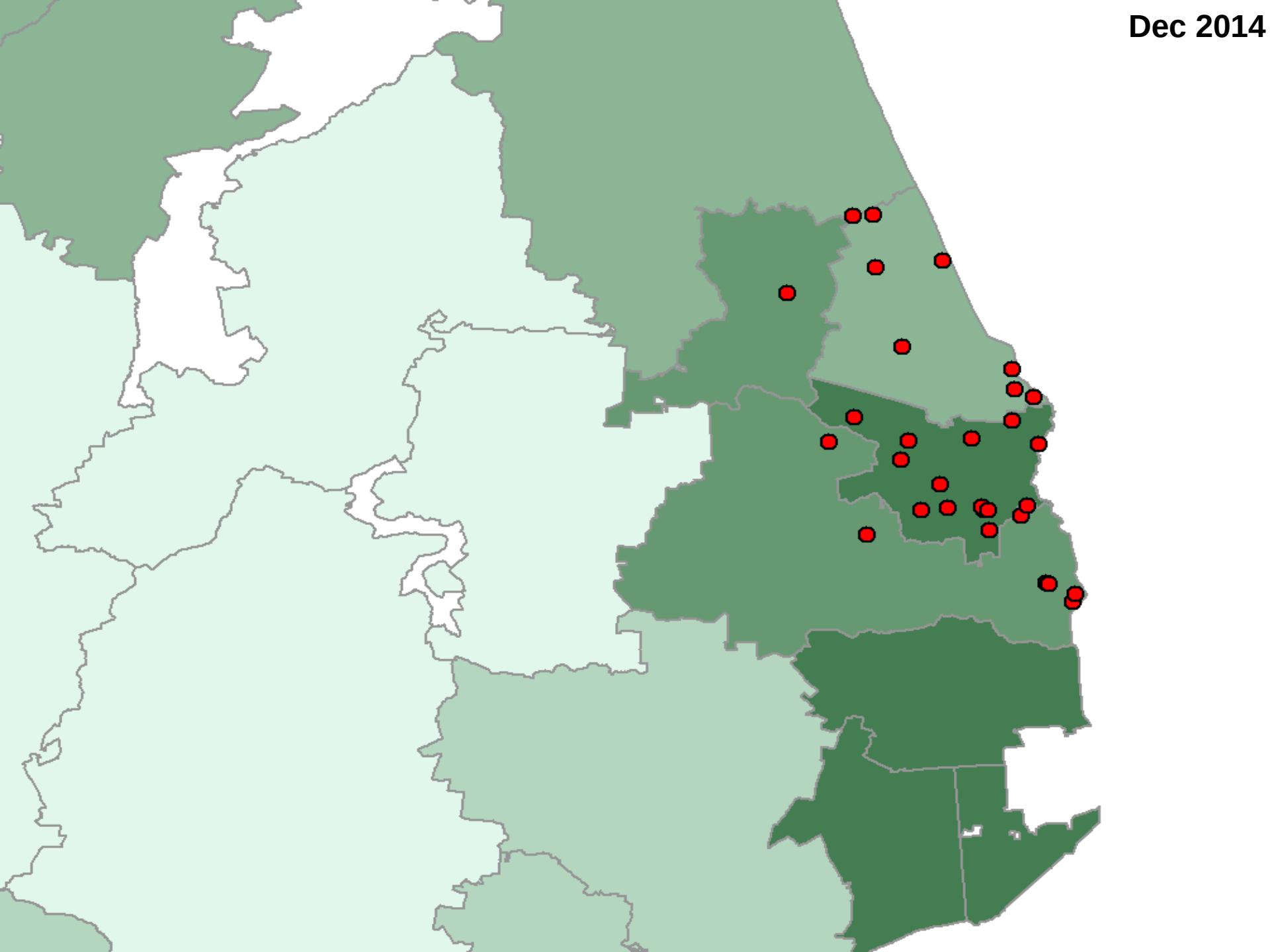
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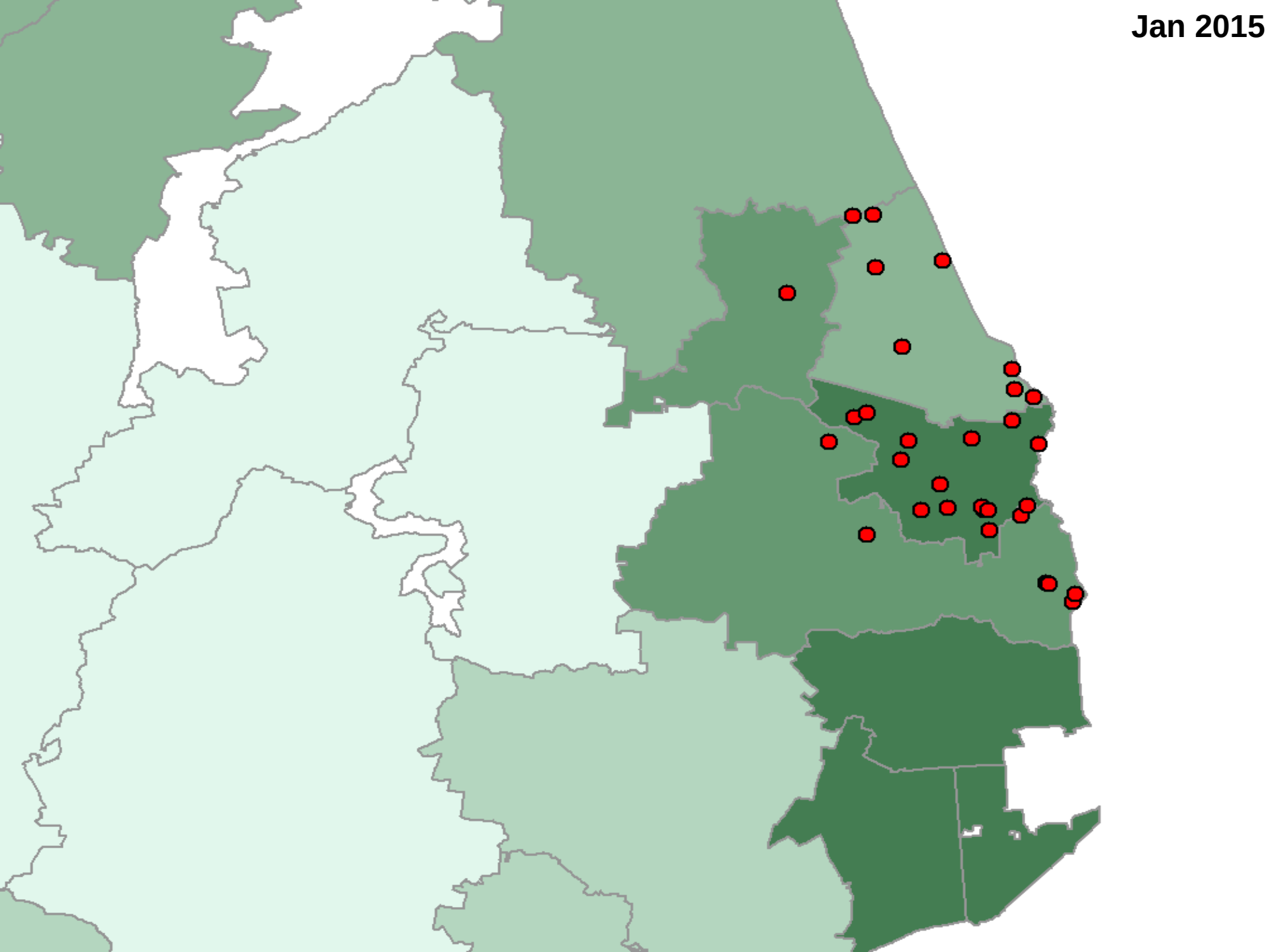
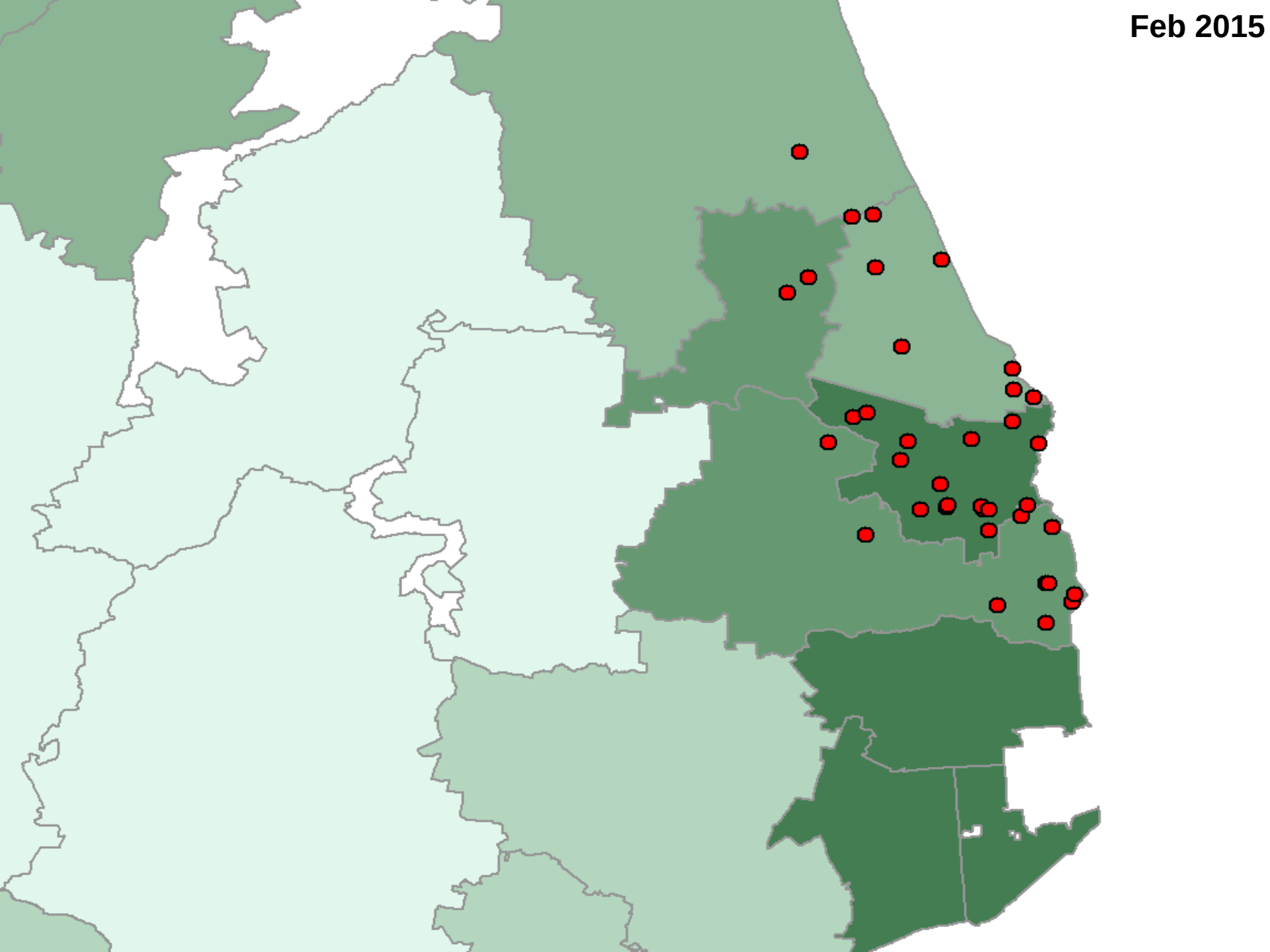

Jan 2015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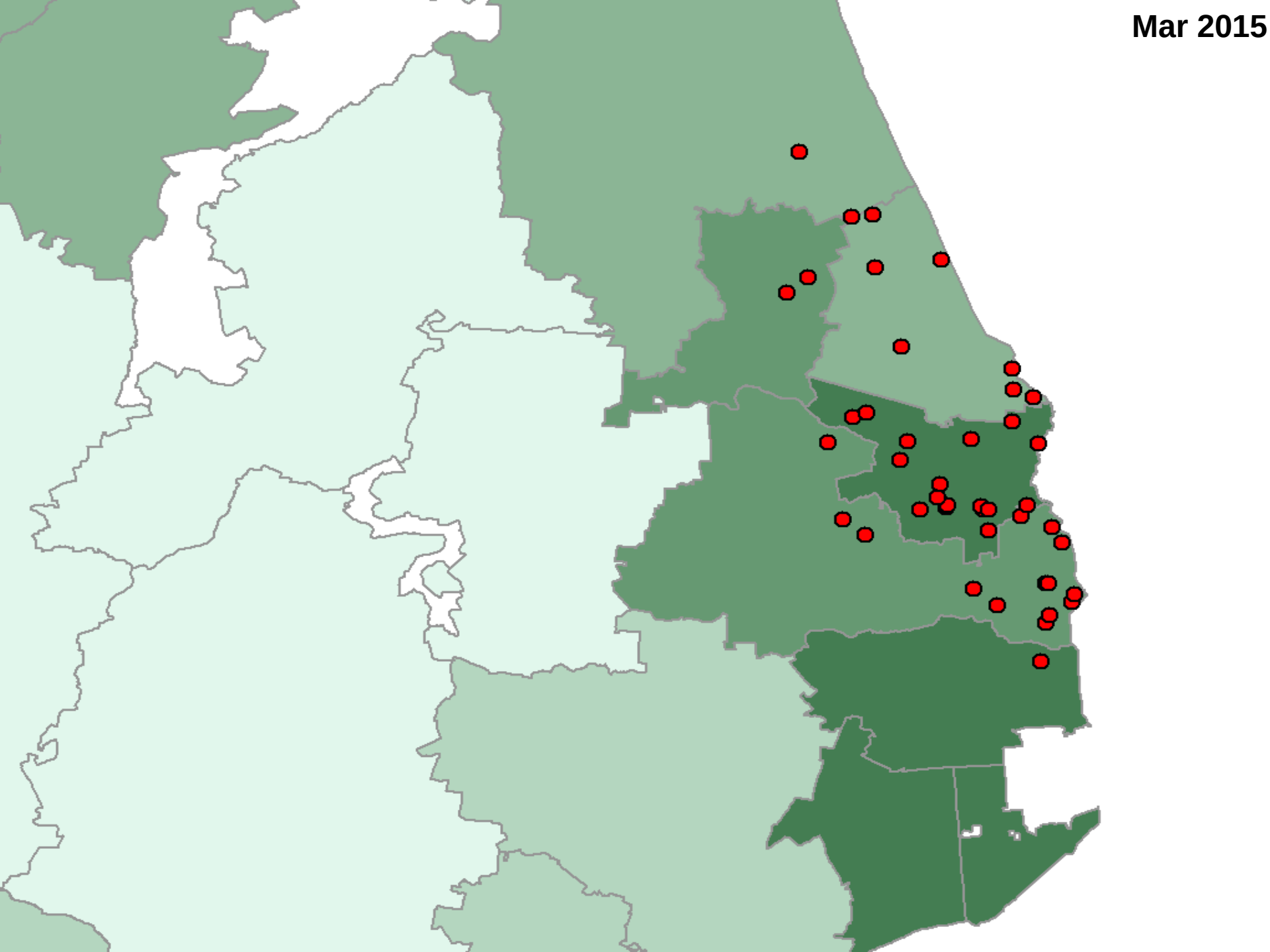
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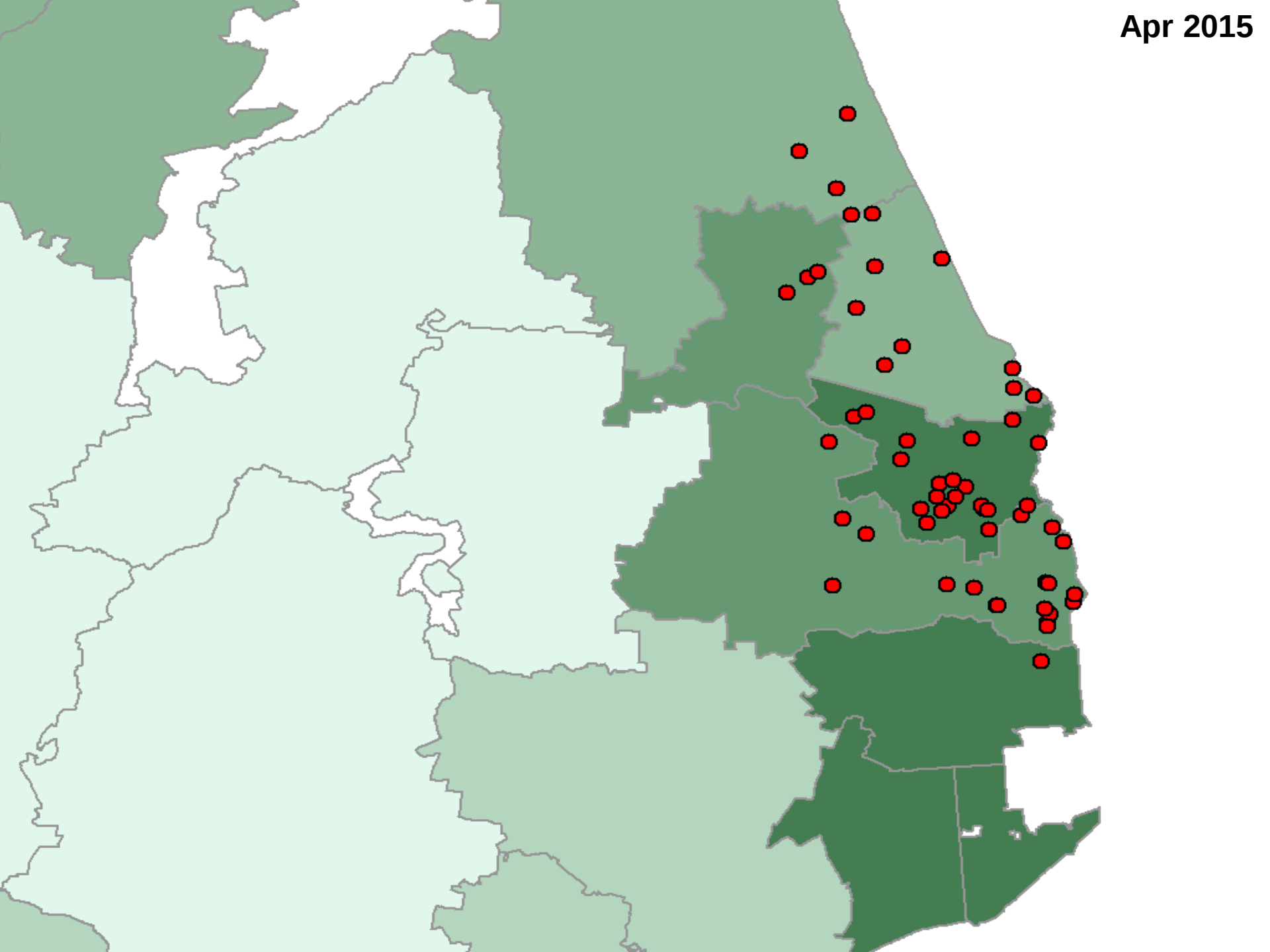
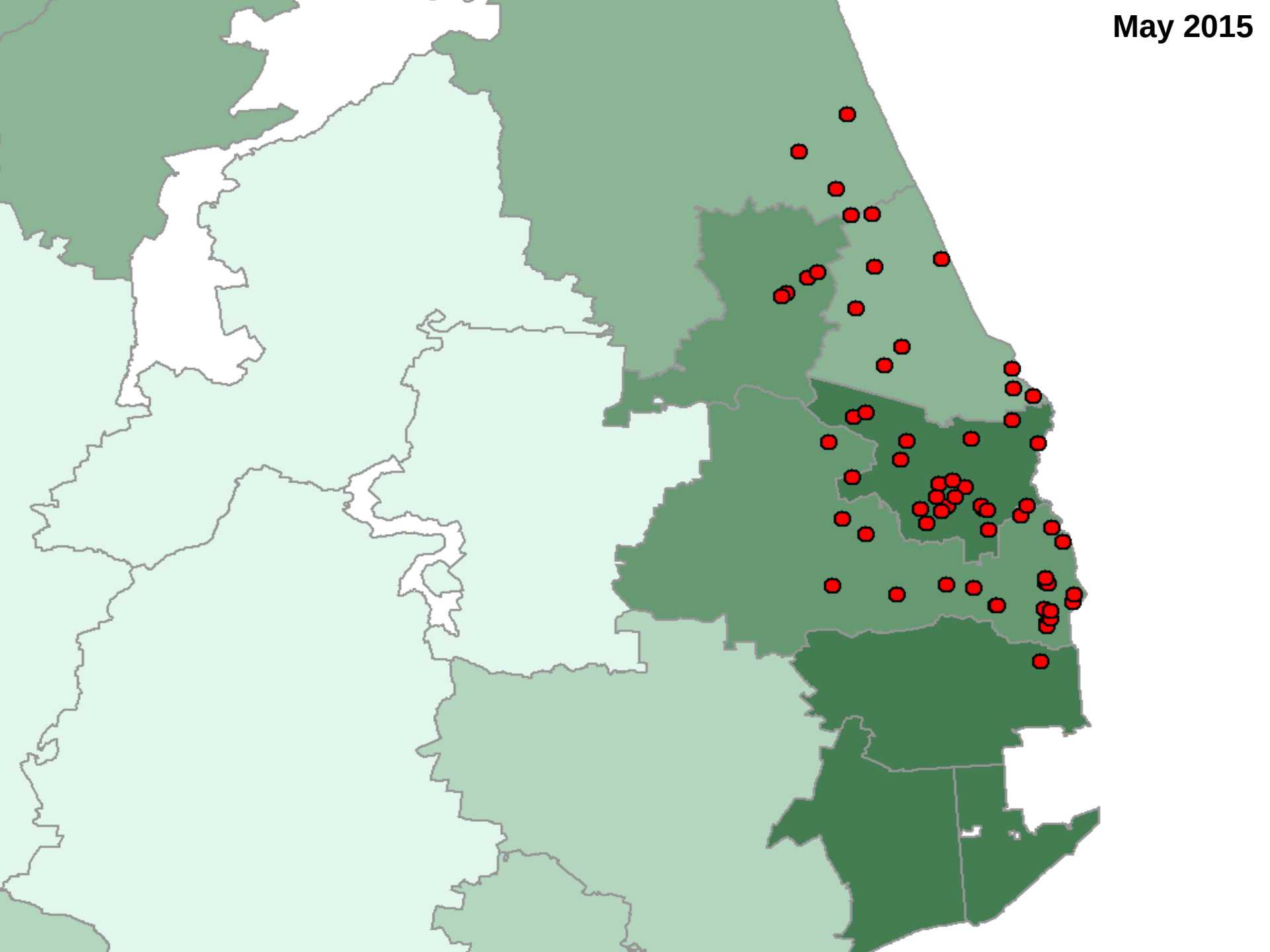

Apr 2015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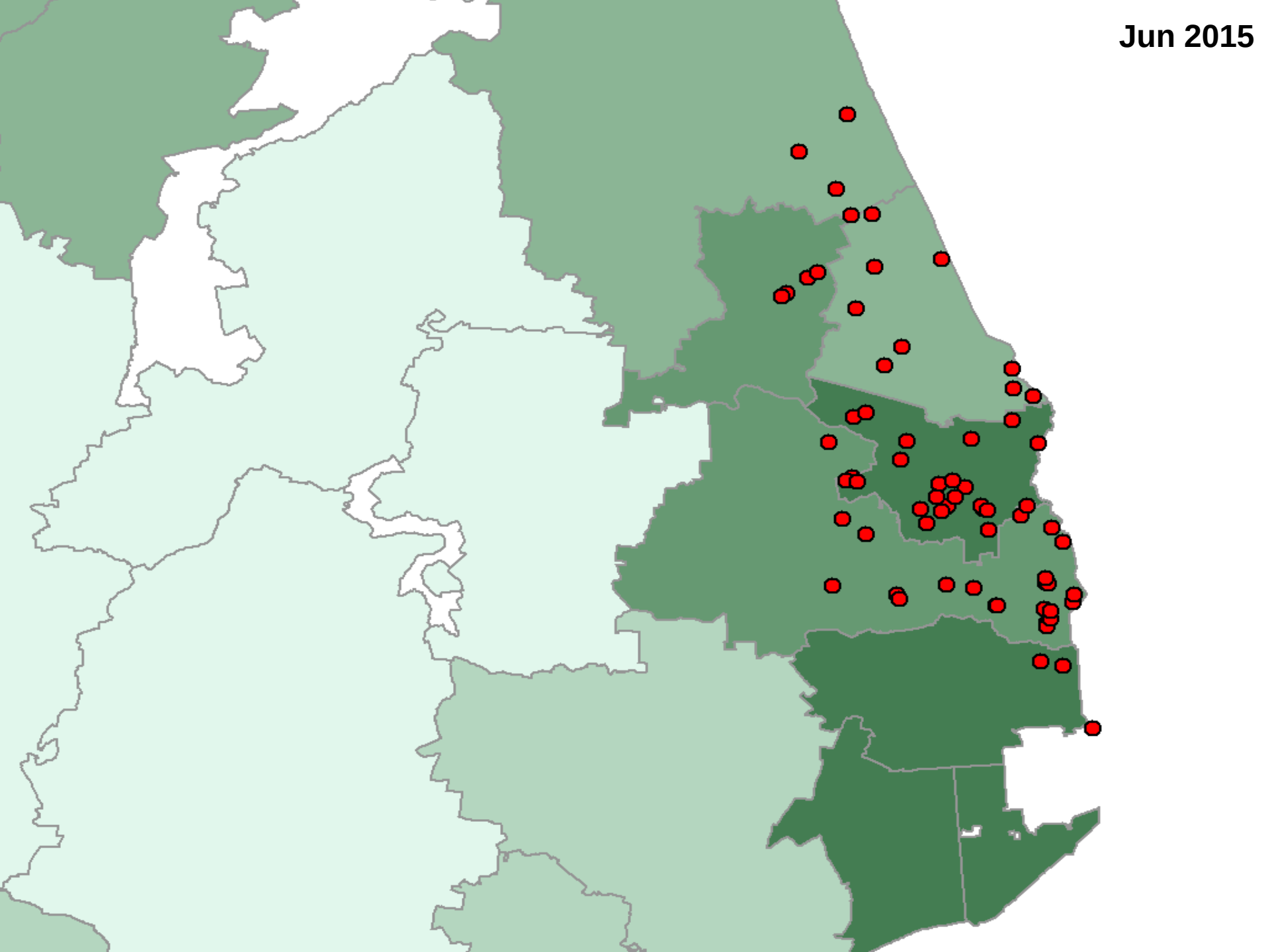
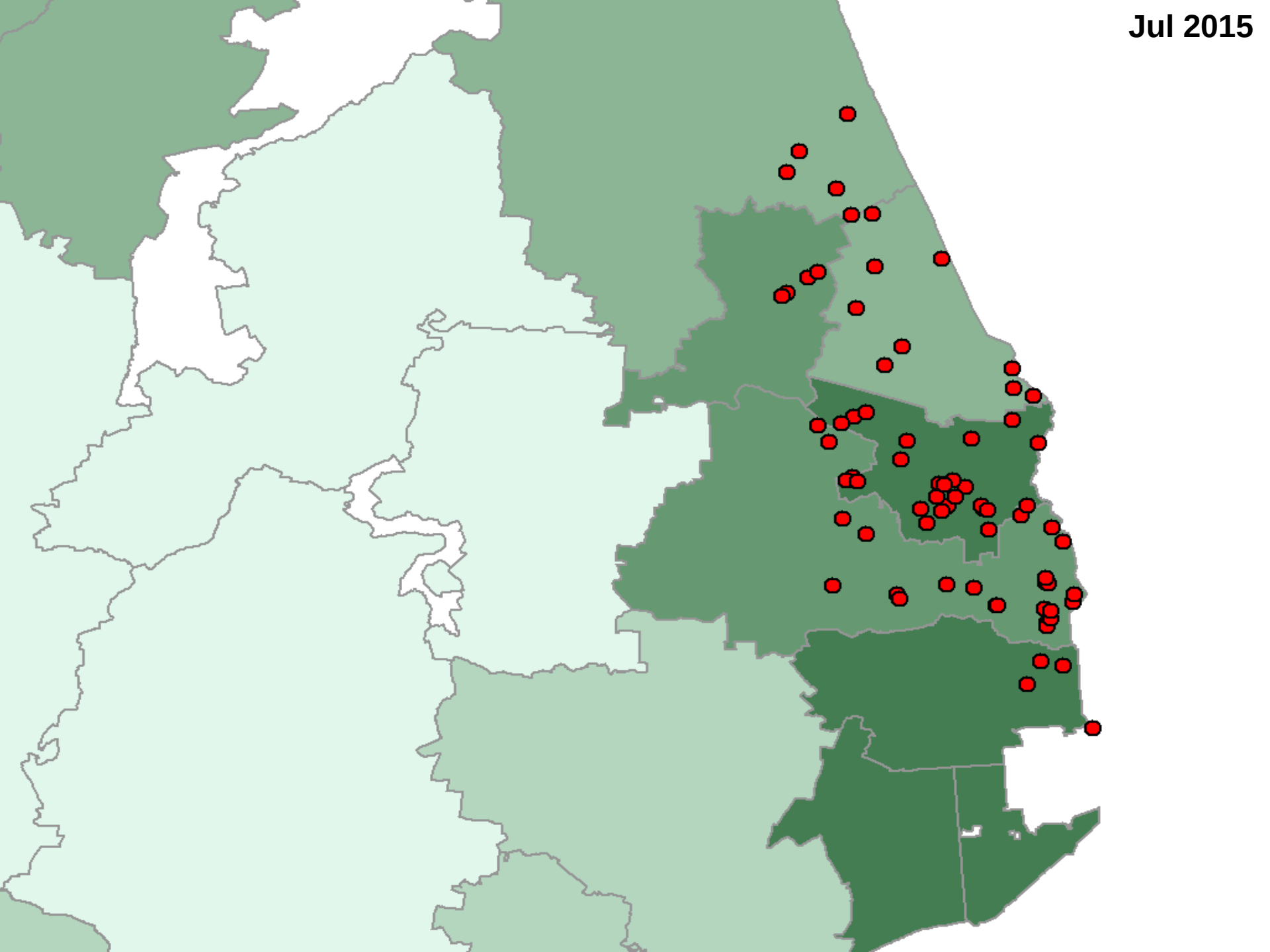

Jun 2015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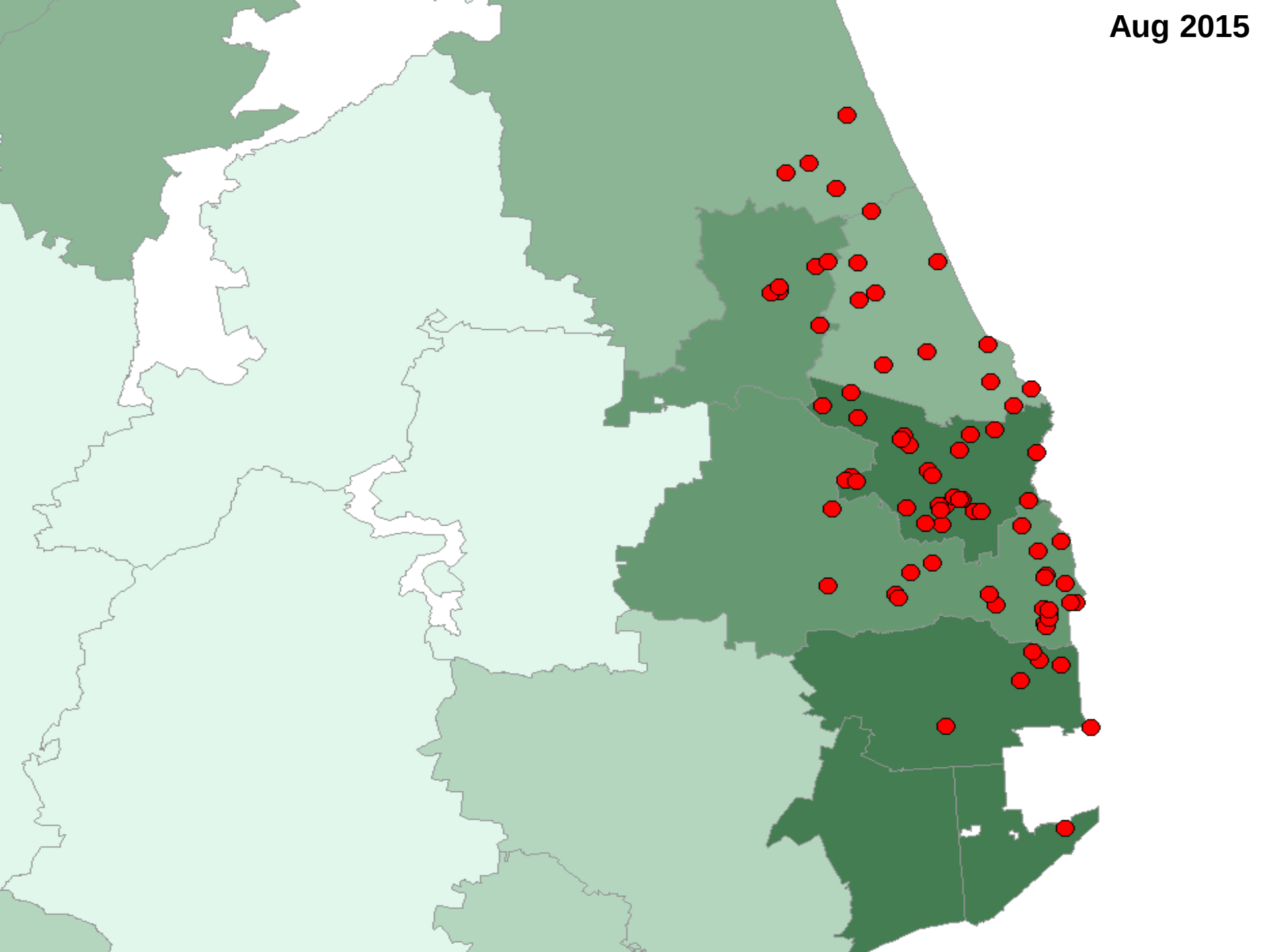
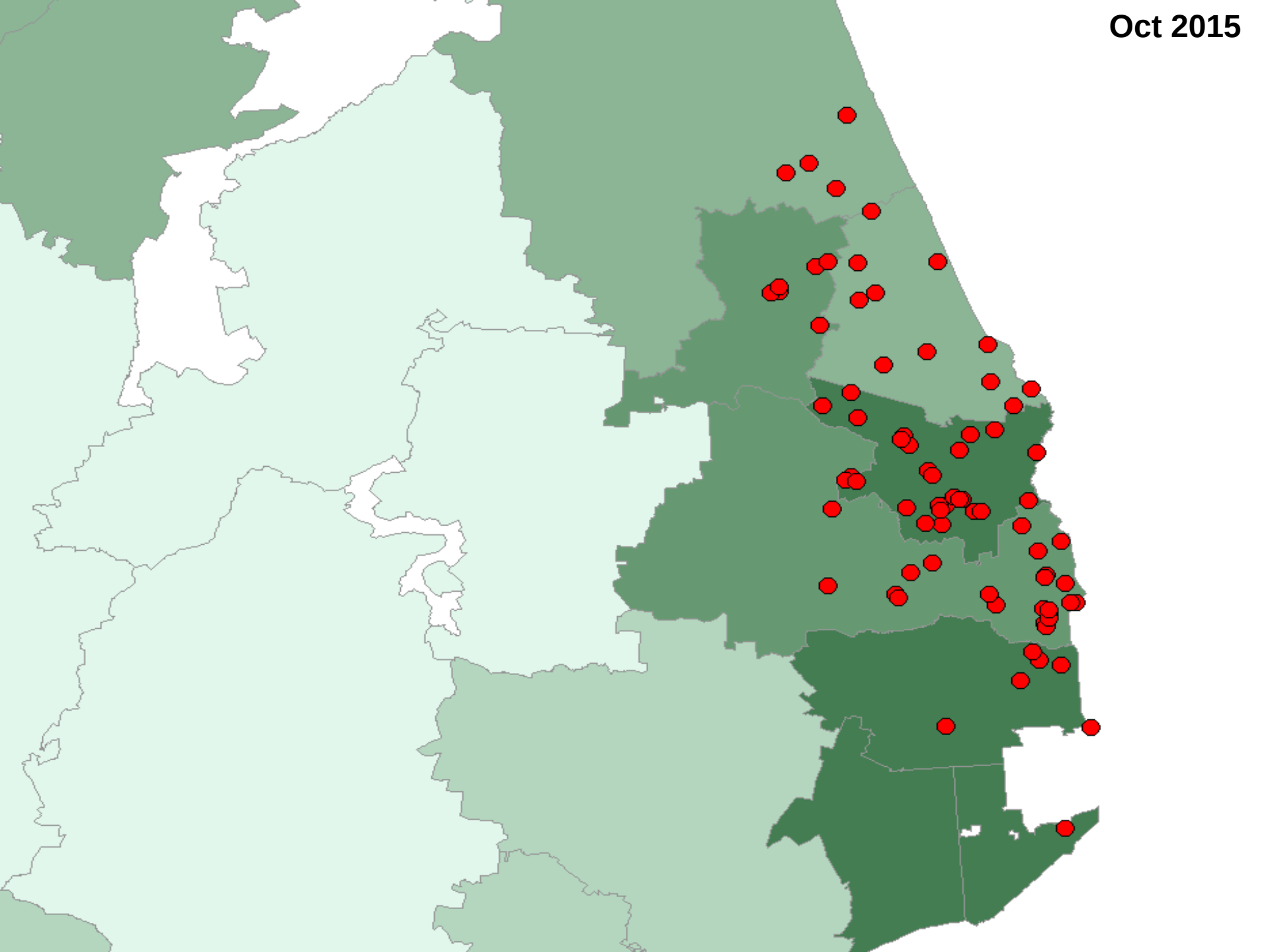
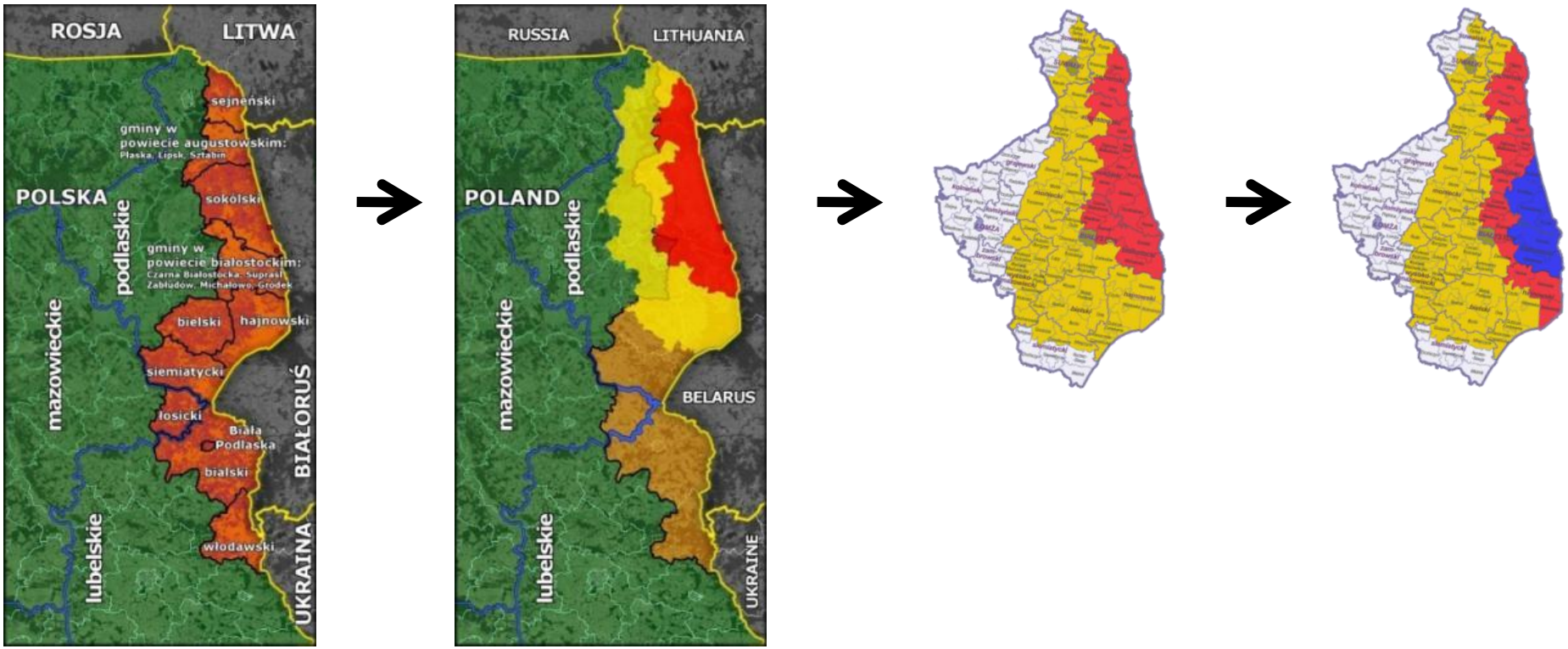

Aug 2015

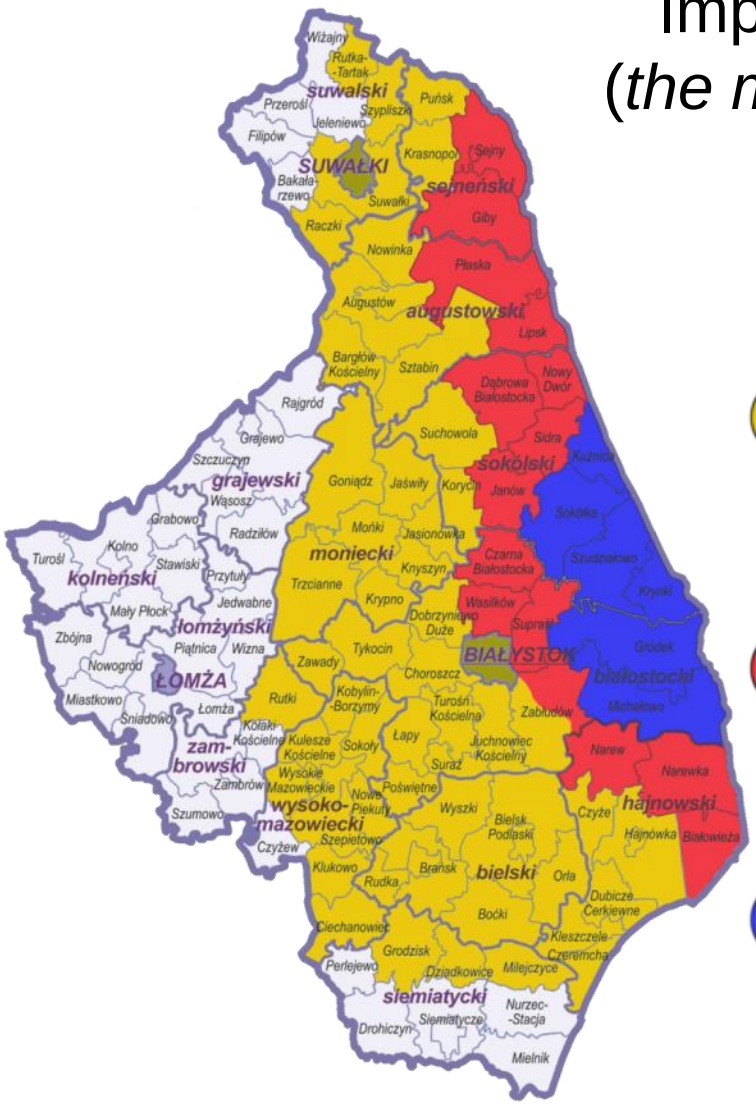

Oct 2015

Evolution of areas under various restrictions



Source: M. Popiołek, GVI Warsaw

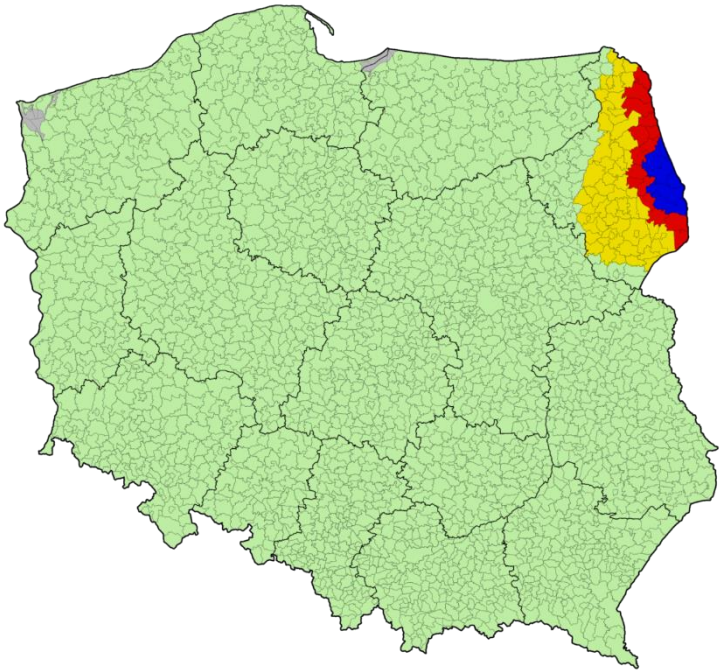
Currently applicable areas under various restrictions in accordance with Commission Implementing Decision 2014/709/EU (*the most recent amendment in Decision (EU) 2015/1783*)

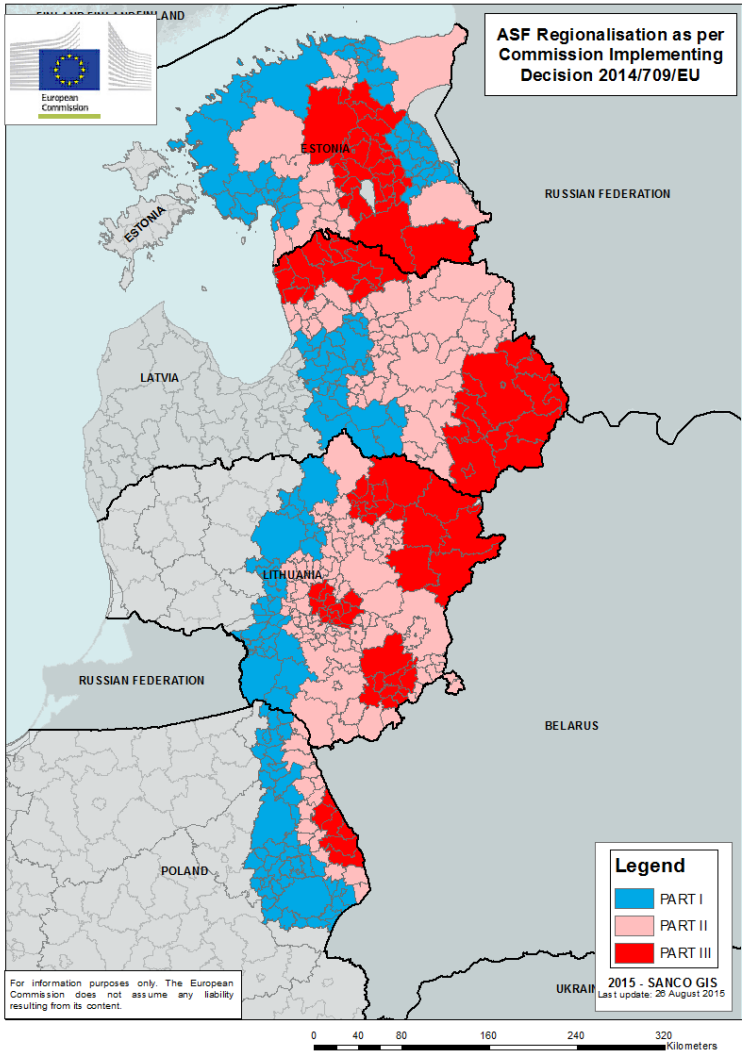


- Part I of Annex to decision 2014/709/EU
- Part II of Annex to decision 2014/709/EU
- Part III of Annex to decision 2014/709/EU

Source: M. Popiołek, GVI Warsaw

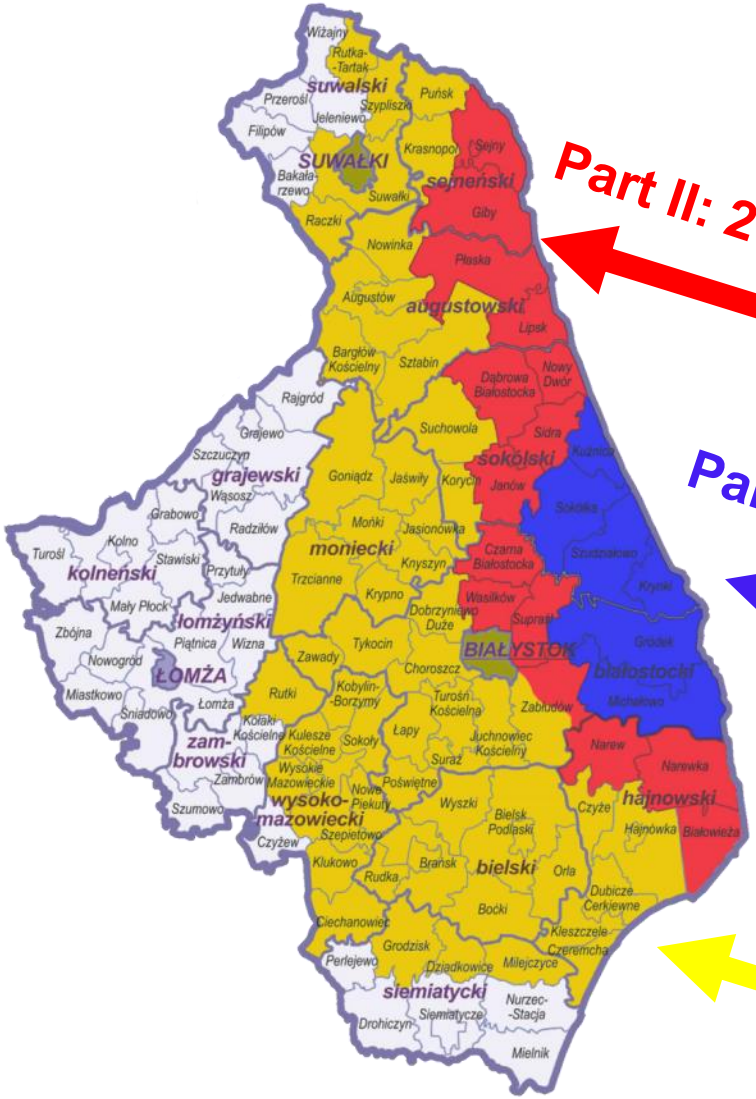
Be careful about the colours!





Old habits die hard…

Pig population in Part I, II, and III zones (as of 30 Sep 2015) –source of data: GVI Warsaw

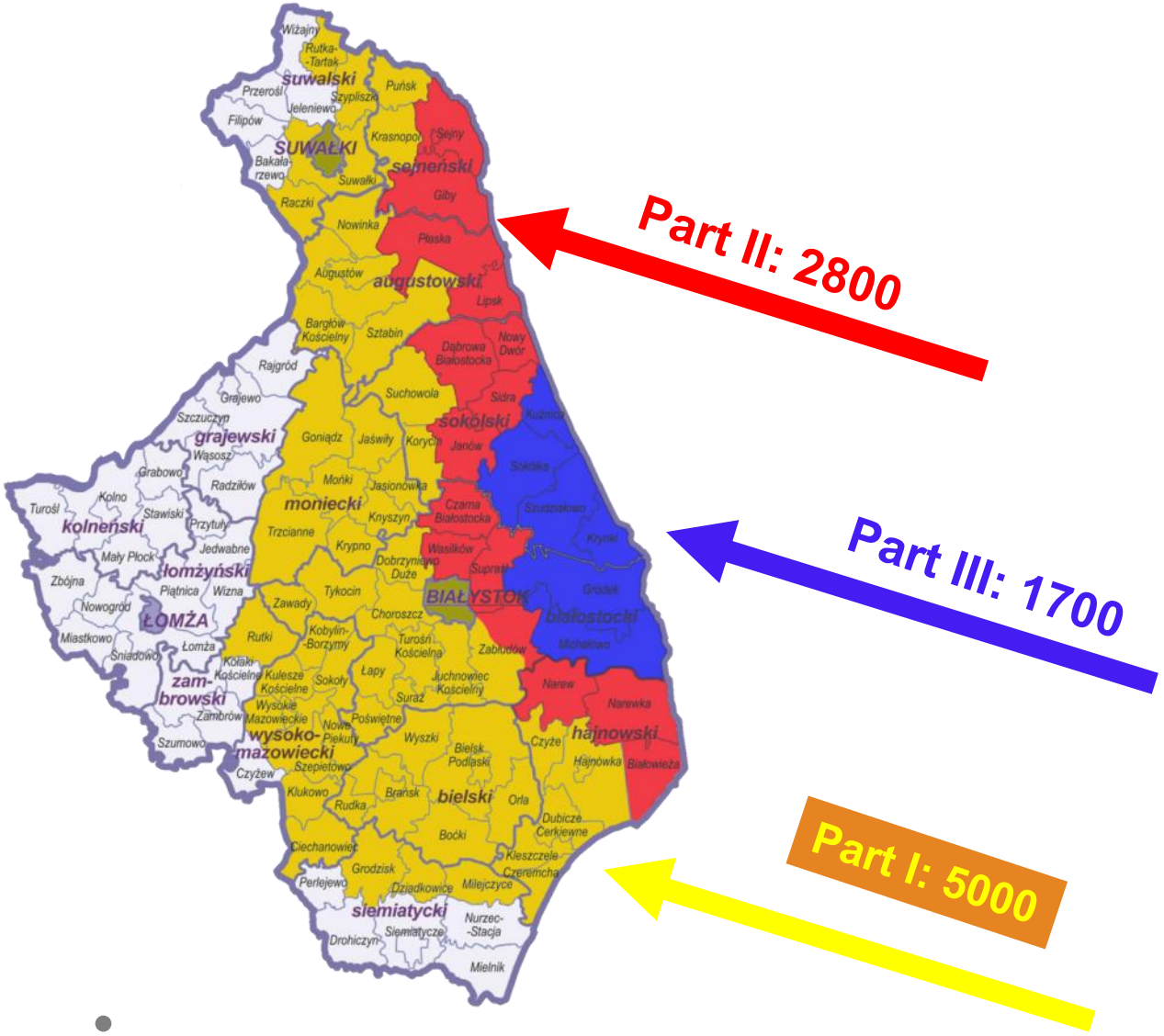


Part II: 21 370 pigs in 827 holdings

Part III: 279 pigs in 65 holdings

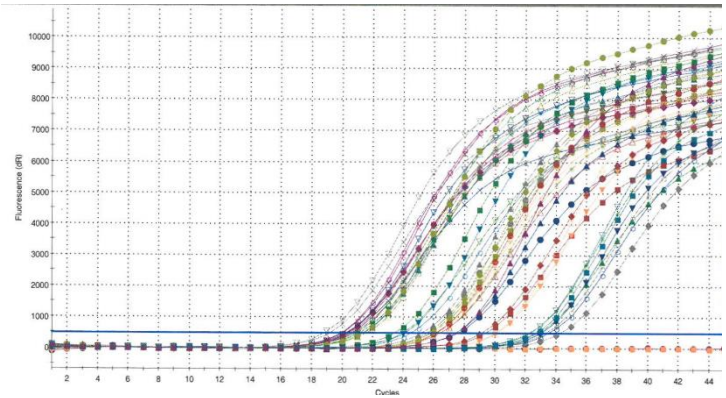
Part I: 205 500 pigs in 3172 holdings

Wild boar population in Part I, II, and III zones (as of March 2015) –source of data: National Forestry

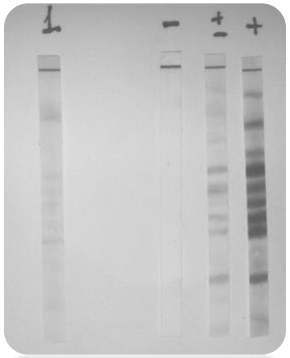


Diagnostics

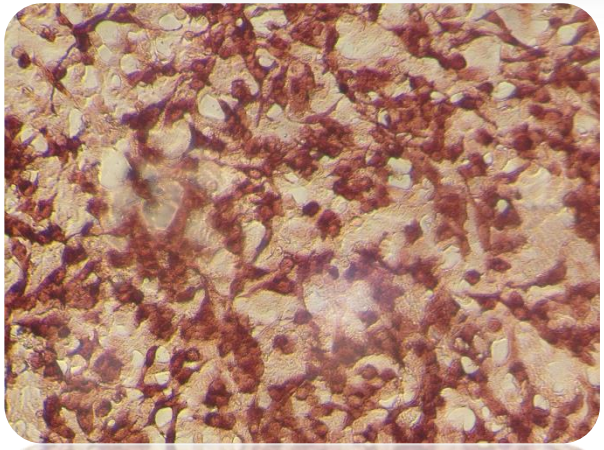
Real-time PCR with UPL probes



PPA Ingezim Compact 11.PPA.K3, Ingenasa



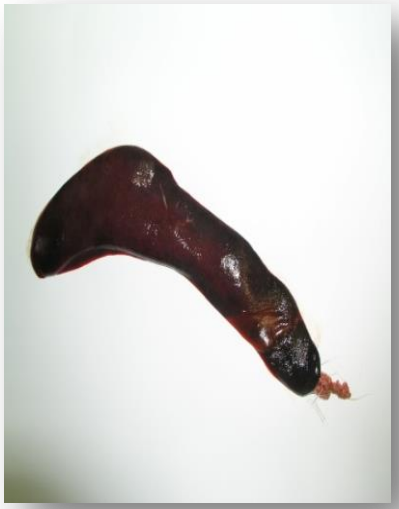
Immunoblotting techniques



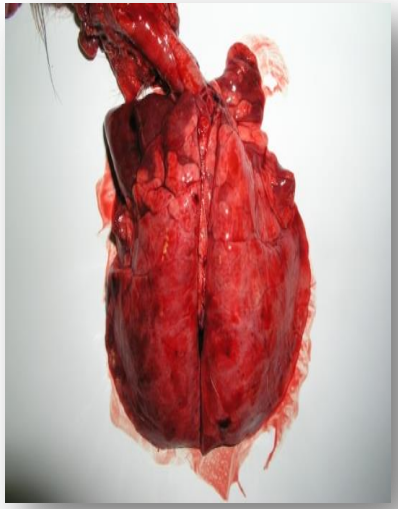
Confirmatory tests

Immunoperoxidase assay

Diversity of samples tested for ASFV



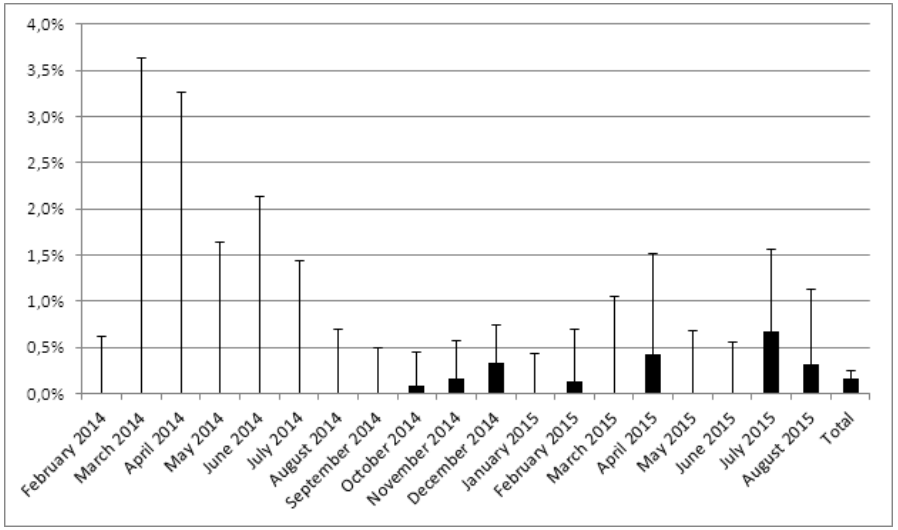
Source: E. Kozak

ASF surveillance in Poland: Jan 2014 – Nov 2015

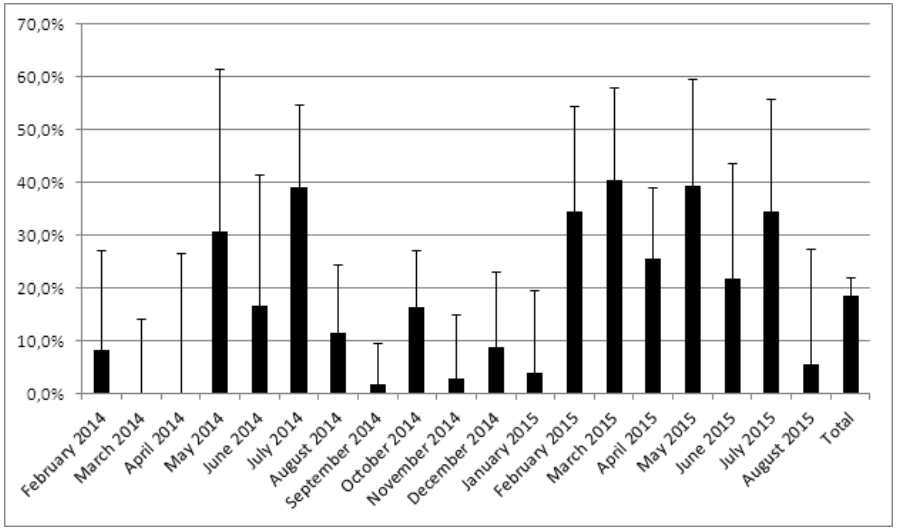
Tests	Domestic Pig		Wild Boar	
	samples	results	samples	results
		+		+
PCR	36.090	11	24.056	127
serological	2.562	0	10.622	15
Total number of examined animals	>36 000	11	>24 000	132

Active vs. passive surveillance (part I, II and III zones) February 2014 – August 2015

Active



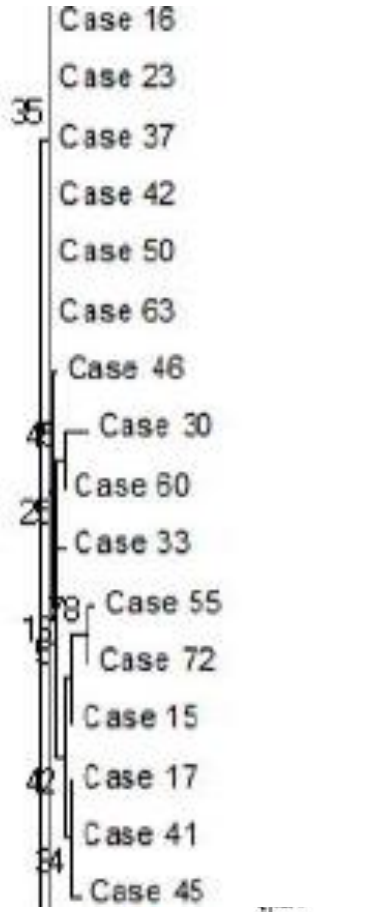
Passive

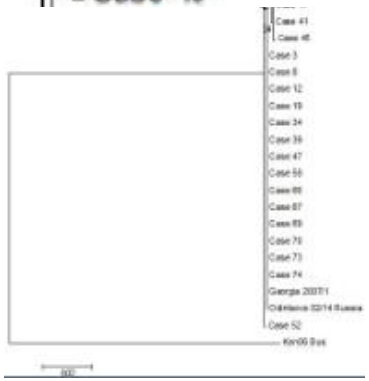


~0,2%

~18%

Seasonality (1 year included in the analysis)
: the only statistically significant difference was between Summer and Autumn in passive surveillance





Phylogenetic analysis

- primers specific to MGF505-2R
- expected product length 1173 bp

- all genotype II

- vast majority undistinguishable from Georgia/2007 and Odintsovo/2014

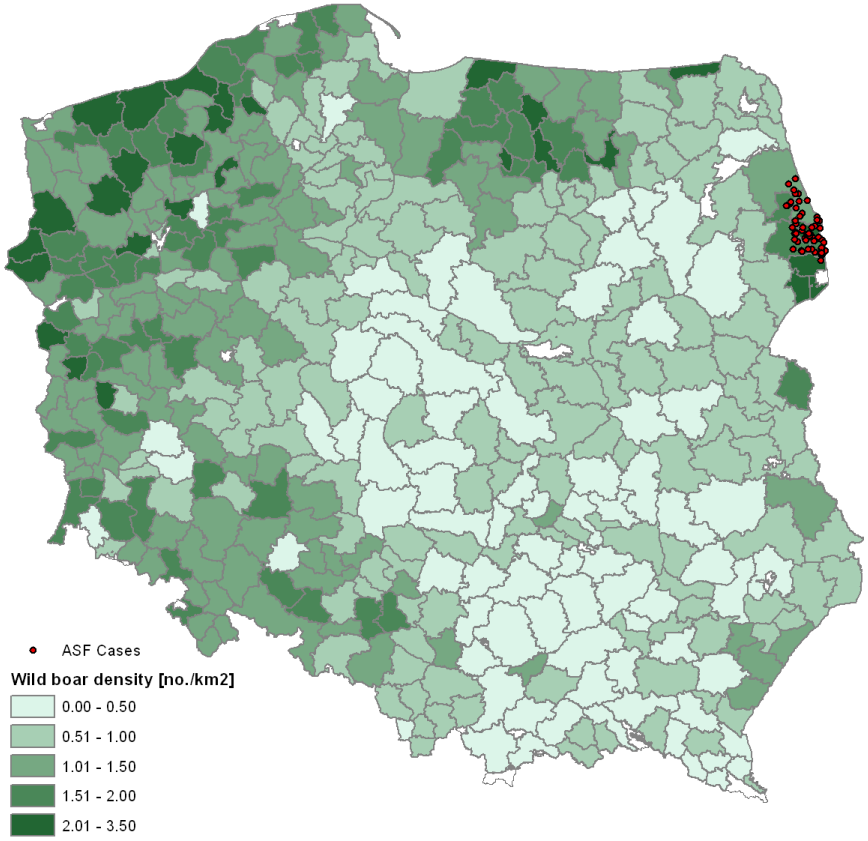
- Some level of genetic diversity:
  Evidence for repeated introductions?

- difference between ASFV responsible for outbreaks in pigs (no direct link between outbreaks)

Difficulties encountered

- understanding unique epidemiological features of ASF in the region

- why is ASF spreading so slowly?
- why is it entrenched in a small region for such a long time?



Suggested explanation

- low frequency of contacts between WB from different social groups (evidence-based) -> slow spread, relatively small proportion of WB population affected

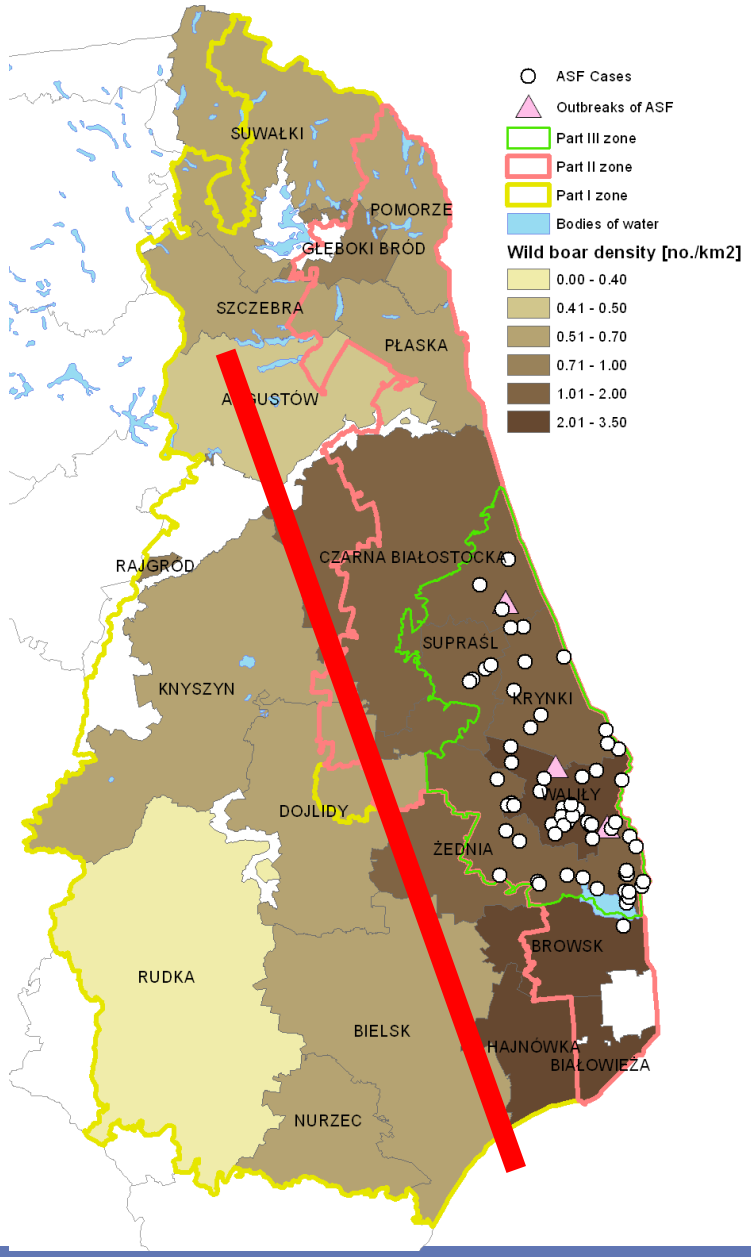
- High infectivity
- Low contagiousness
- High virulence
- High case fatality rate
- Low mortality rate

• high resistance of the virus – carcasses can be contaminated for weeks (months?) in temperate climate (e.g. Poland), and thus creating long-lasting source of infection

• introductions from affected country(ies)

• density of wild boar in the infected area enables sustained maintenance of ASF? What threshold?

• frequency of contacts with WB carcasses?



All cases in the areas with >1 individual/km^2

Difficulties encountered

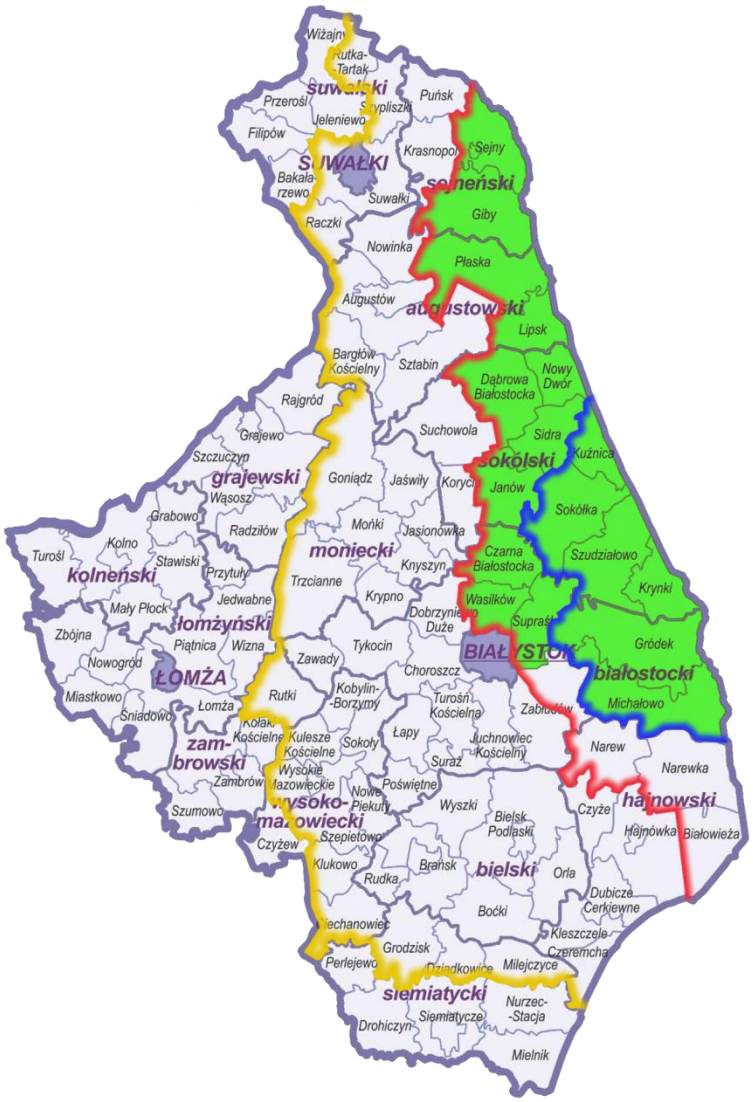
Diagnosis:

- PCR -, serology +:
  - interpretation: based on current approach – positive case

- quaility of blood samples from WB: misinterpretation possible
- disproportionate number ELISA-positive not confirmed by IPT (extensive validation in WB needed)

Biosecurity regulation (2015 – 2018)

- Pig owners are obliged to implement sringent biosecurity measures or terminate production
- If they decide to continue but not comply with the rules – culling of the pigs (compensations) + prohibition to keep the pigs until 2018
- If they decide to terminate production: compensations and reimbursment for 3 years



Thank You

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