



Forest Insects in Penn's Woods

With

David Schmit

Forest Health Specialist

Pennsylvania DCNR

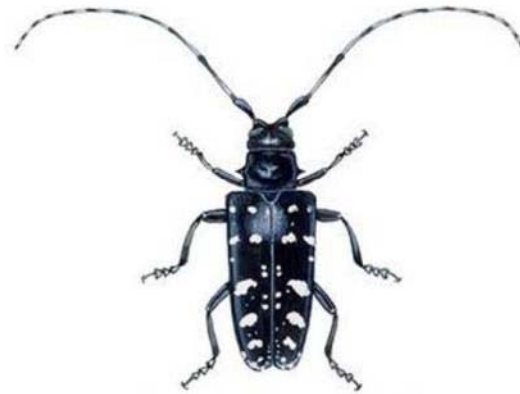
PA Forests Web Seminars

March 8, 2011



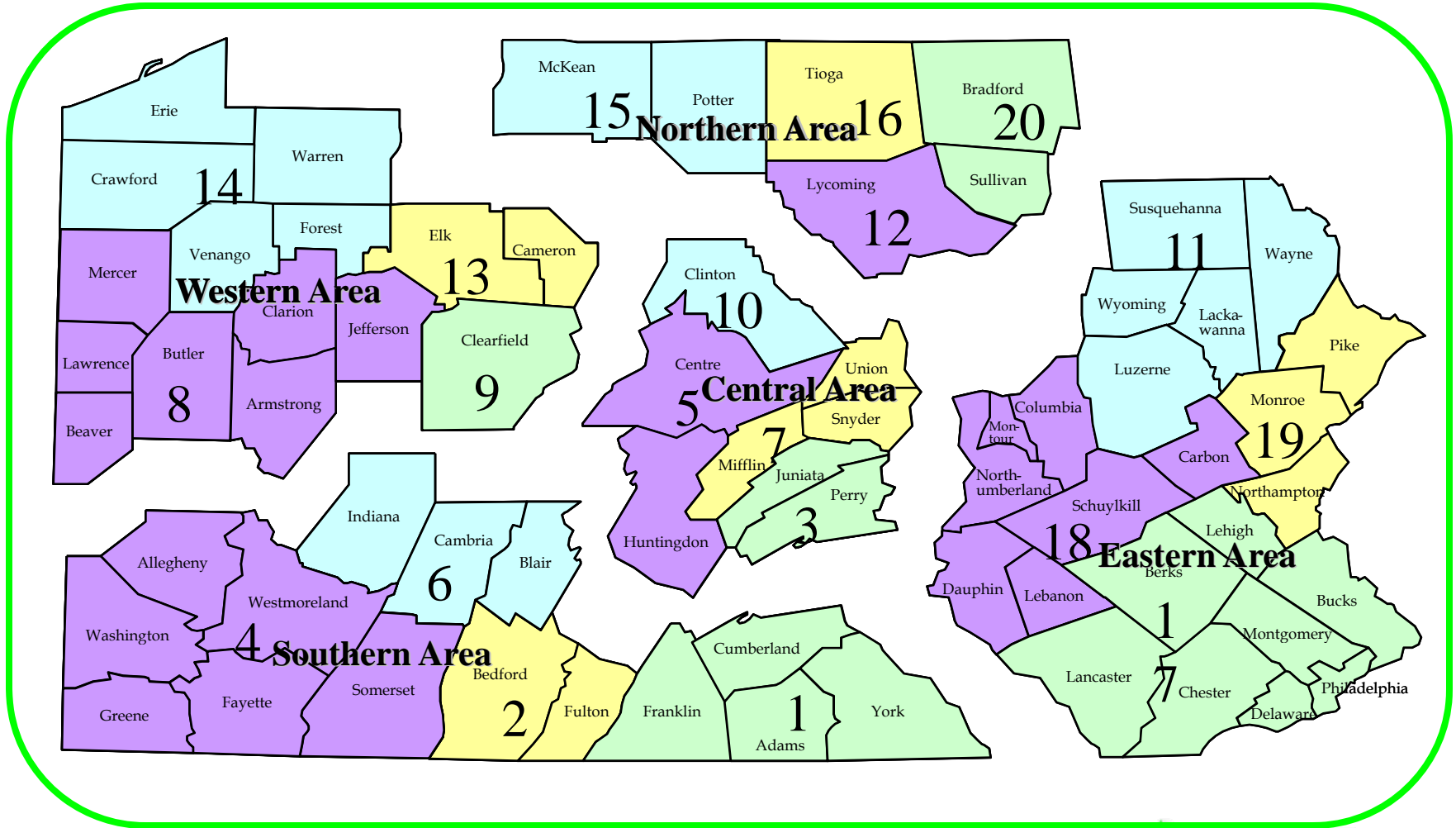
Overview

- Historical Insect & Disease Damage in PA
- B. M. Stinkbug
- Gypsy Moth
- Emerald Ash Borer
- Asian Longhorned Beetle
- Thousand Cankers Disease
- Forest Tent Caterpillar
- Fall Cankerworm
- Walking Stick
- Hemlock Woolly Adelgid
- Questions?





FOREST PEST MANAGEMENT





Division of Forest Pest Management

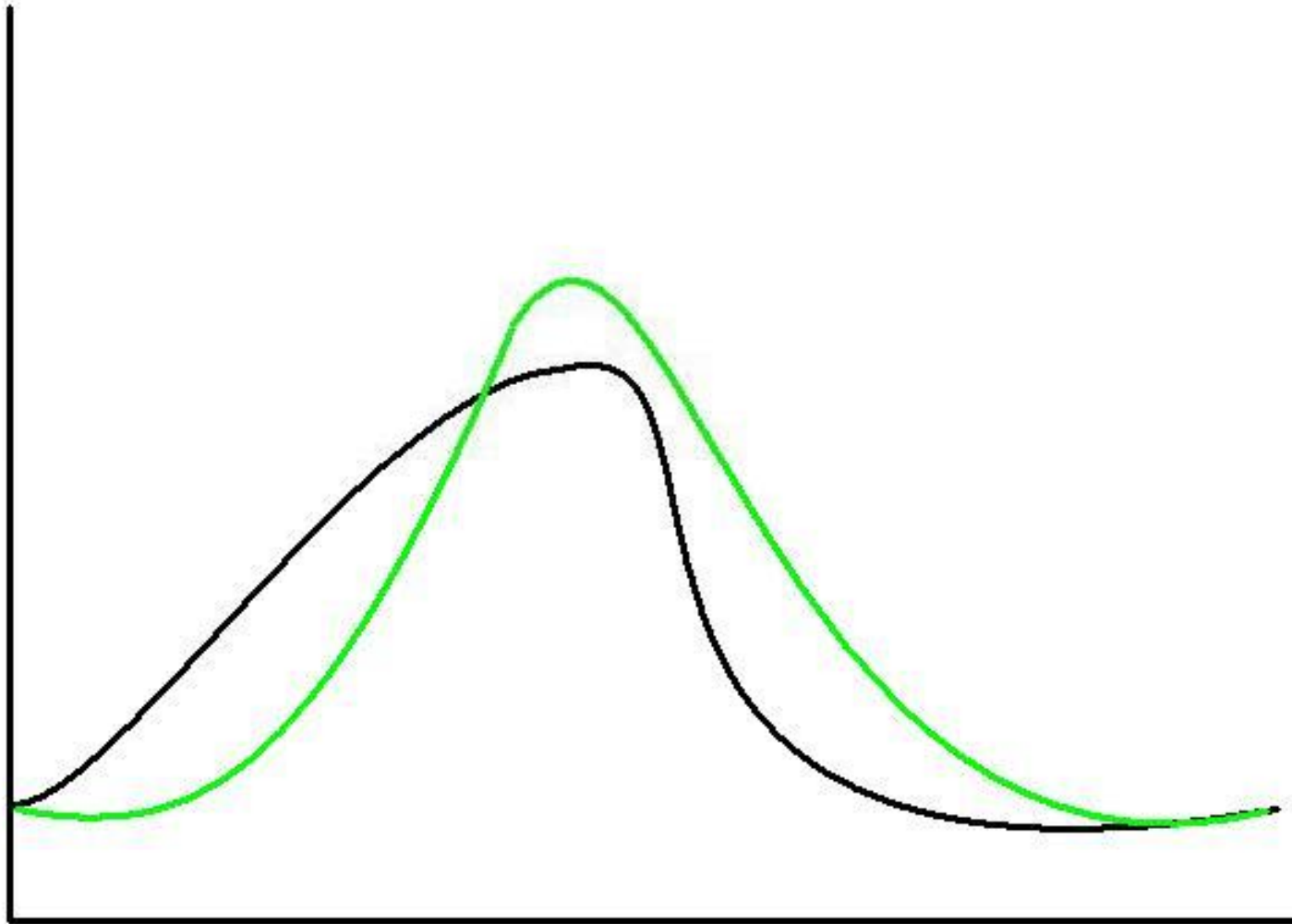
- General Pest Surveys
- Detection Surveys
- Forest Health Monitoring
- Suppression Programs
- Biological Control
- Training
- Education & Outreach
- Data Management
- Cooperative Research
- Management Recommendations



Beth Brantley PSU



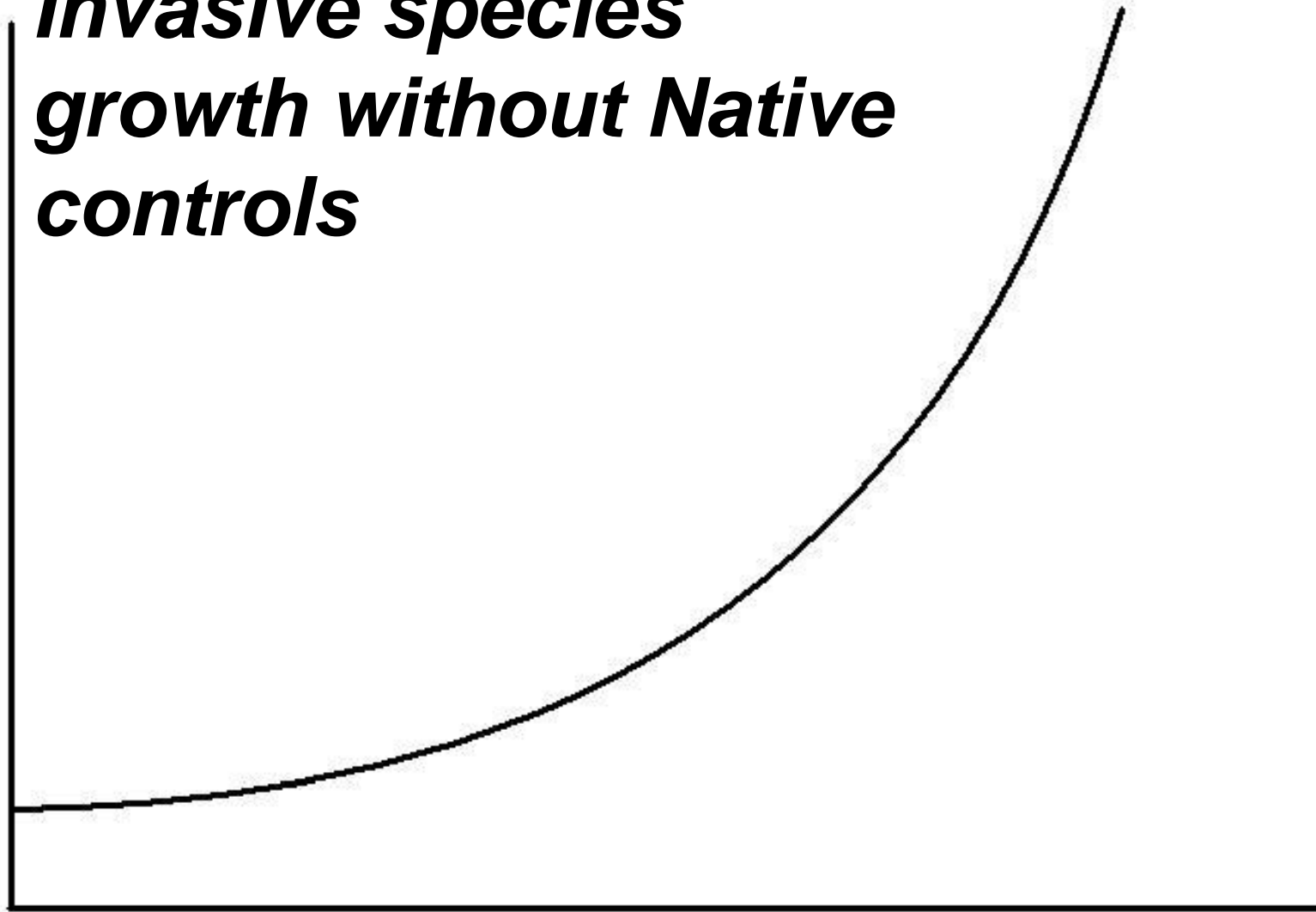
Host/Parasitoid Relationship



————— **Native defoliator (host specie)**

————— **Native parasitoid**

***Invasive species
growth without Native
controls***



Invasive Species Population

Naturally occurring parasitism

Baltimore Checkerspot



David A. Schmit PADCNR



2009 Forest Pest Damage in Penn's Woods

Agent	Defoliation	Mortality
Beaver Dam		38
Cynipid Wasp	1548	
Eastern Tent Caterpillar (ETC)	252	
Fall Cankerworm (FCW)	5507	
Frost	15785	
Forest Tent Caterpillar (FTC)	371267	547
Gypsy Moth (GM)	239694	108402
Hemlock Woolly Adelgid (HWA)	71	186
Other	2018	233
Tornado		171
Total	636142	109577



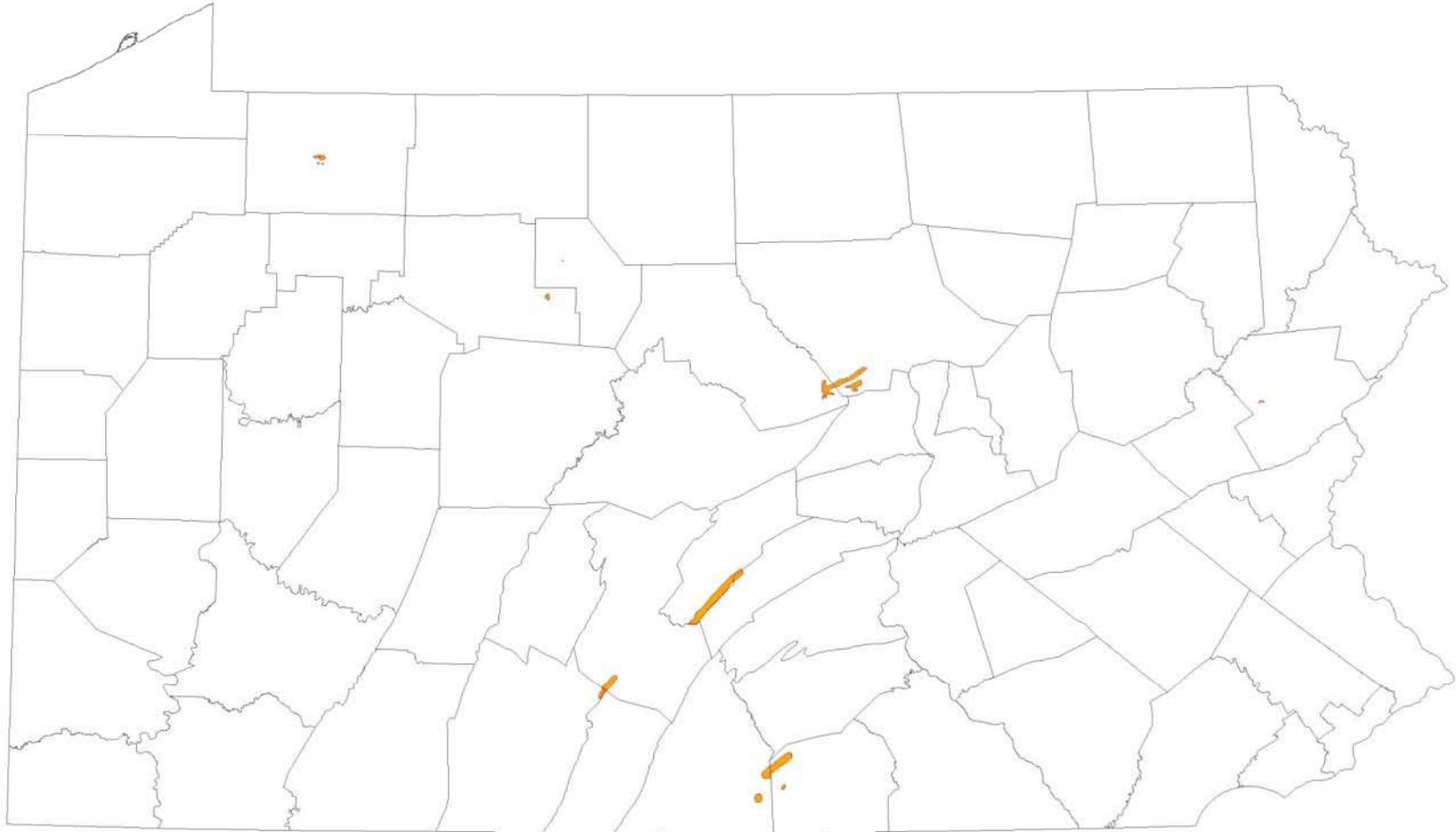


Historic Defoliation in Pennsylvania



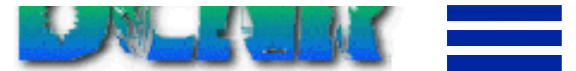
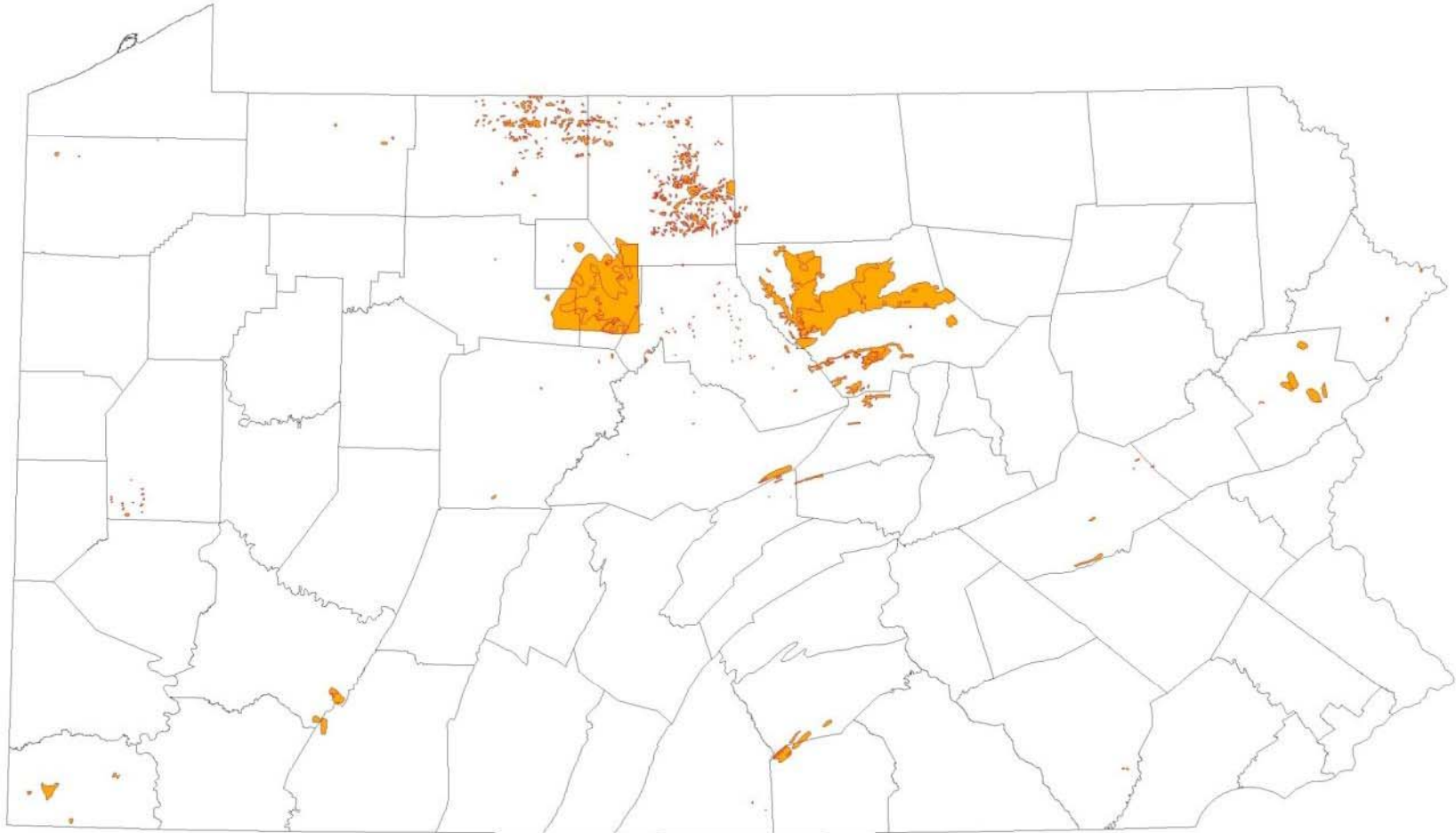


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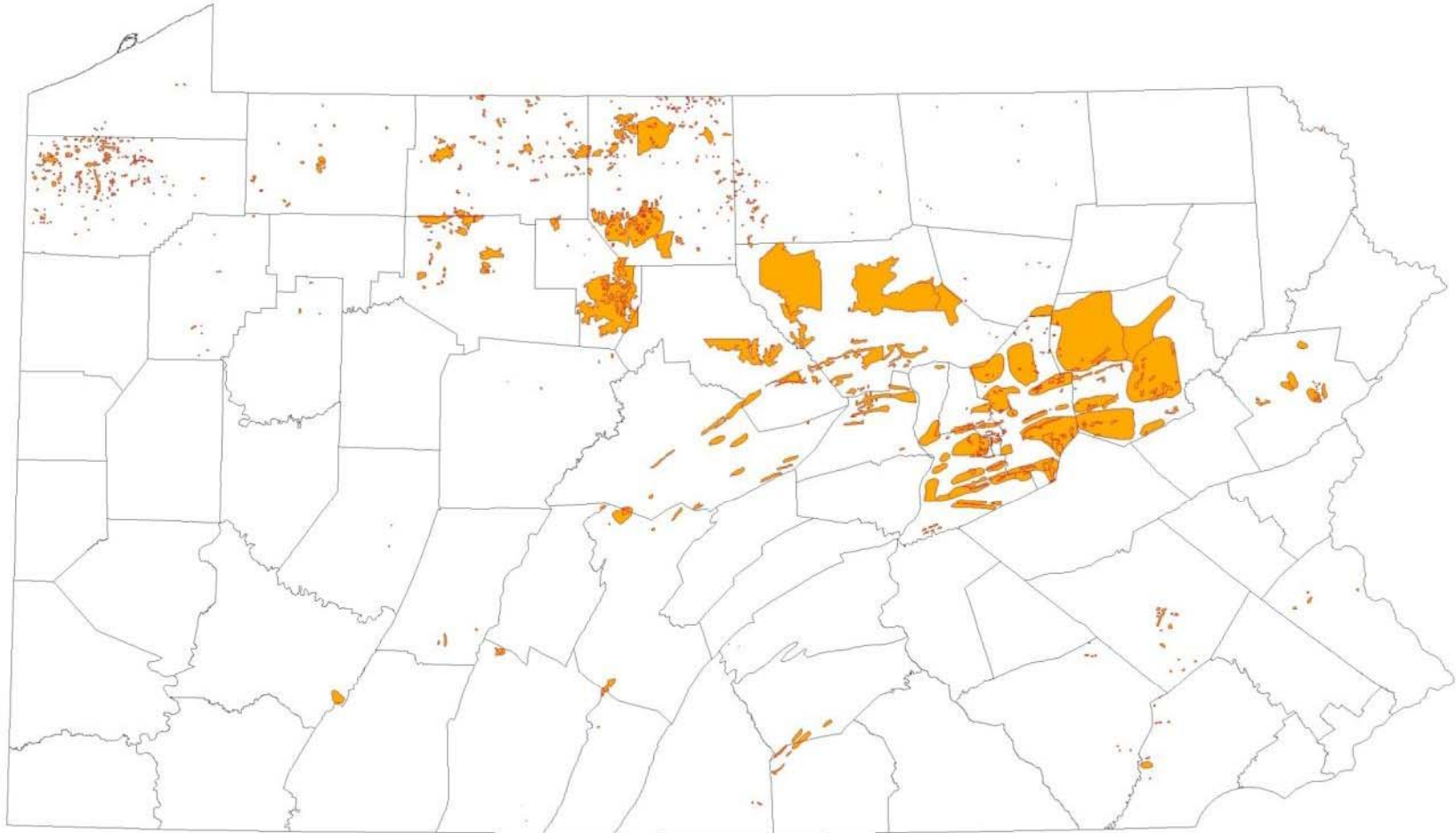


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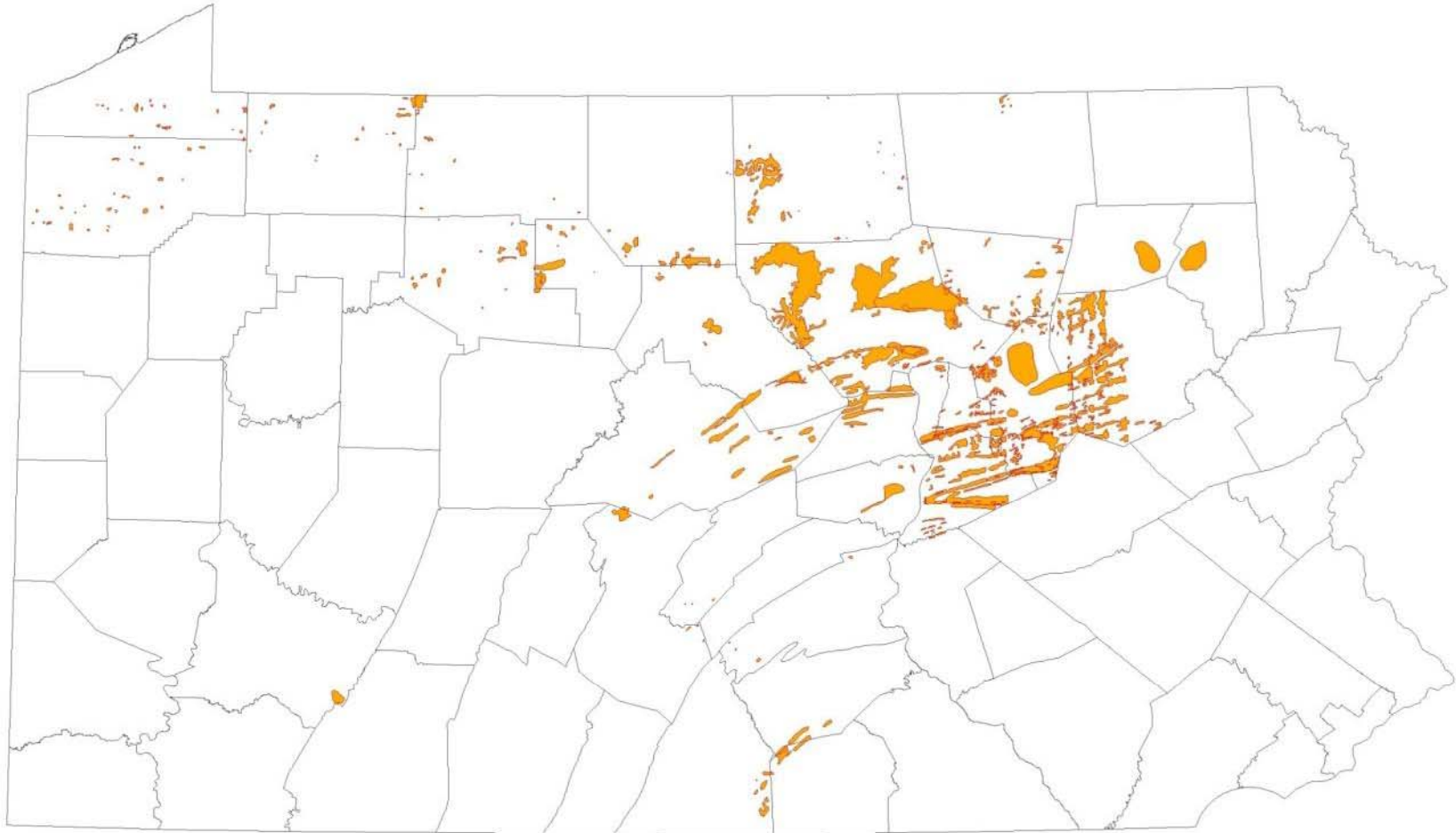


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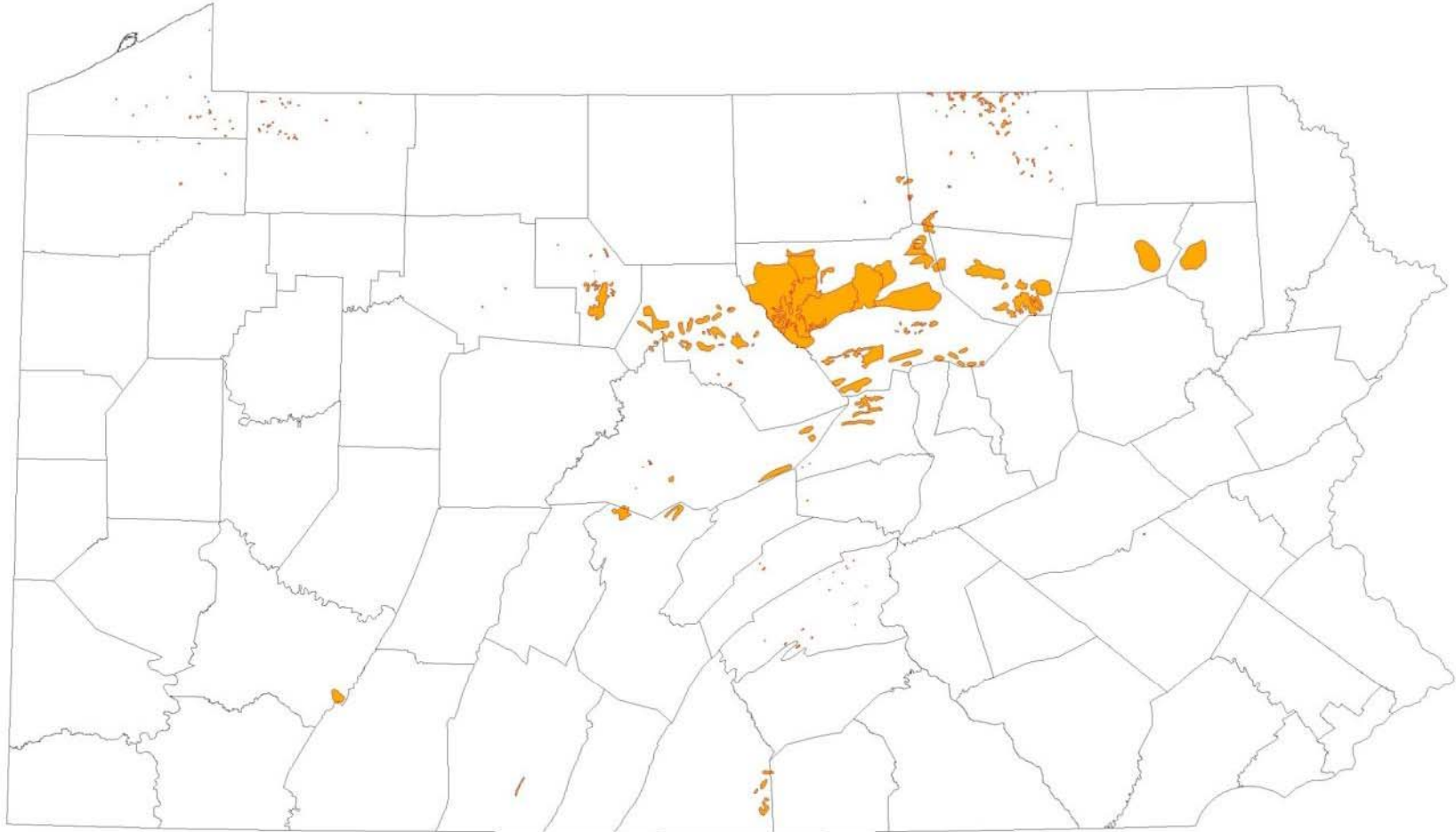


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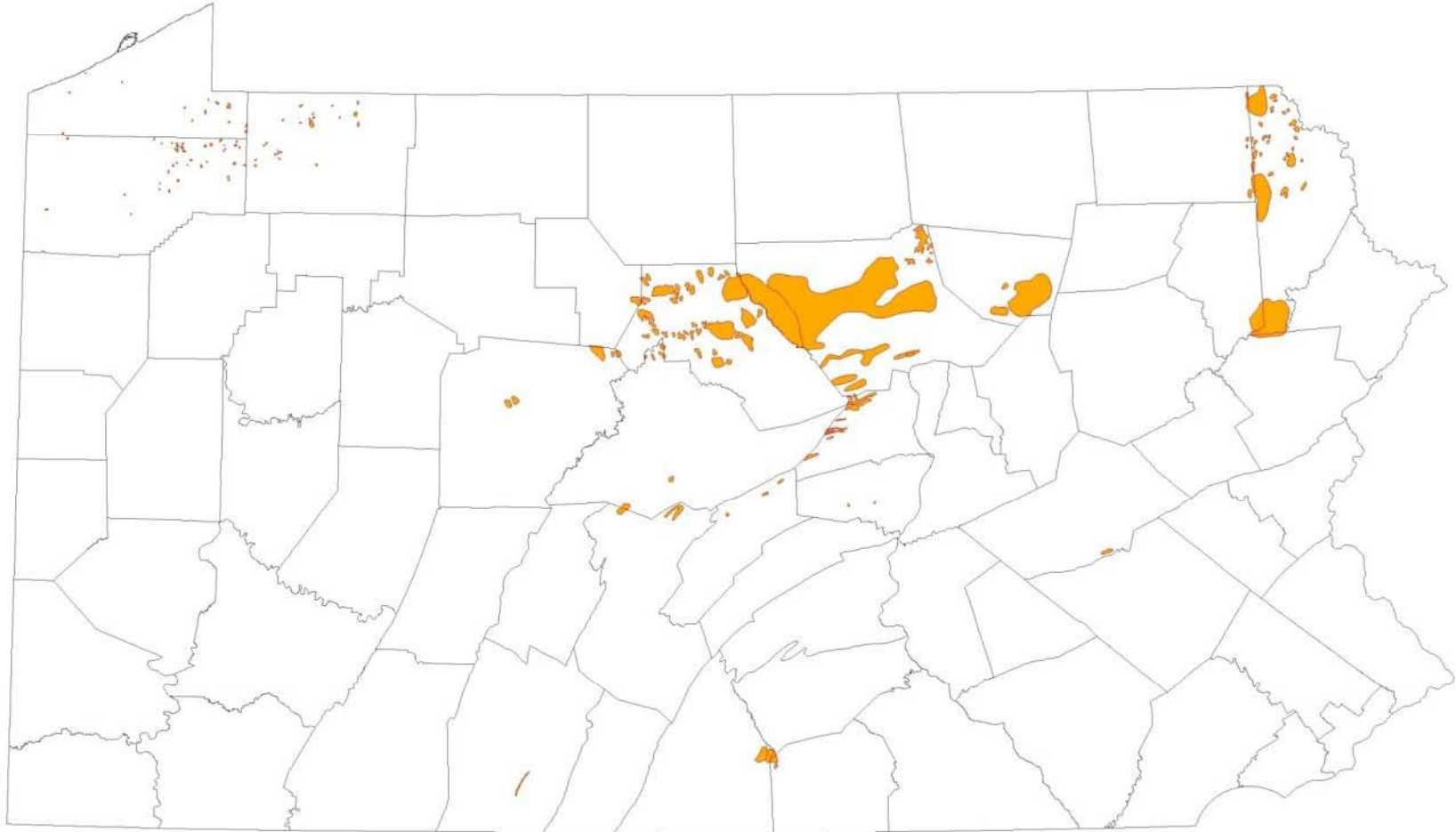


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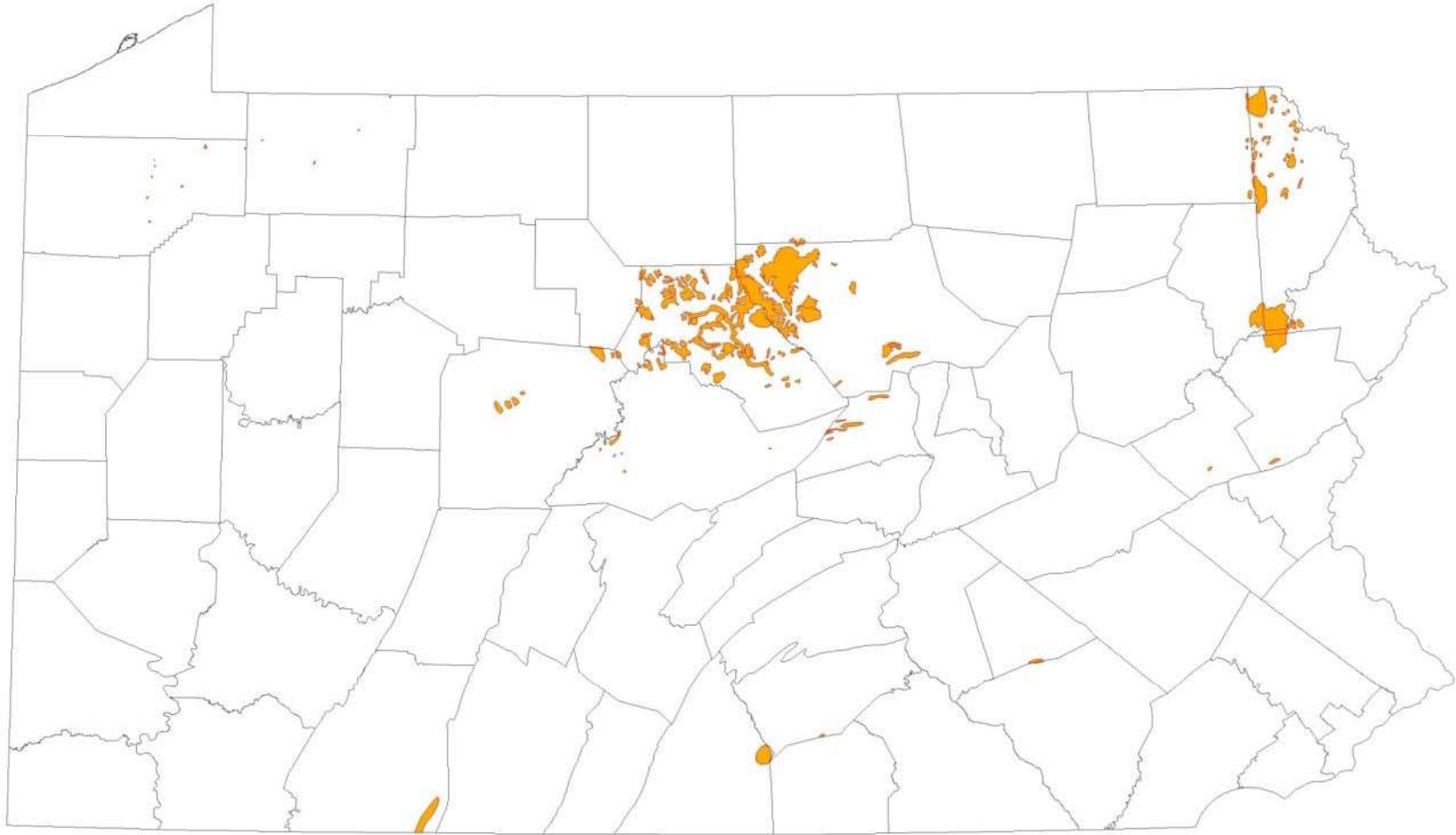


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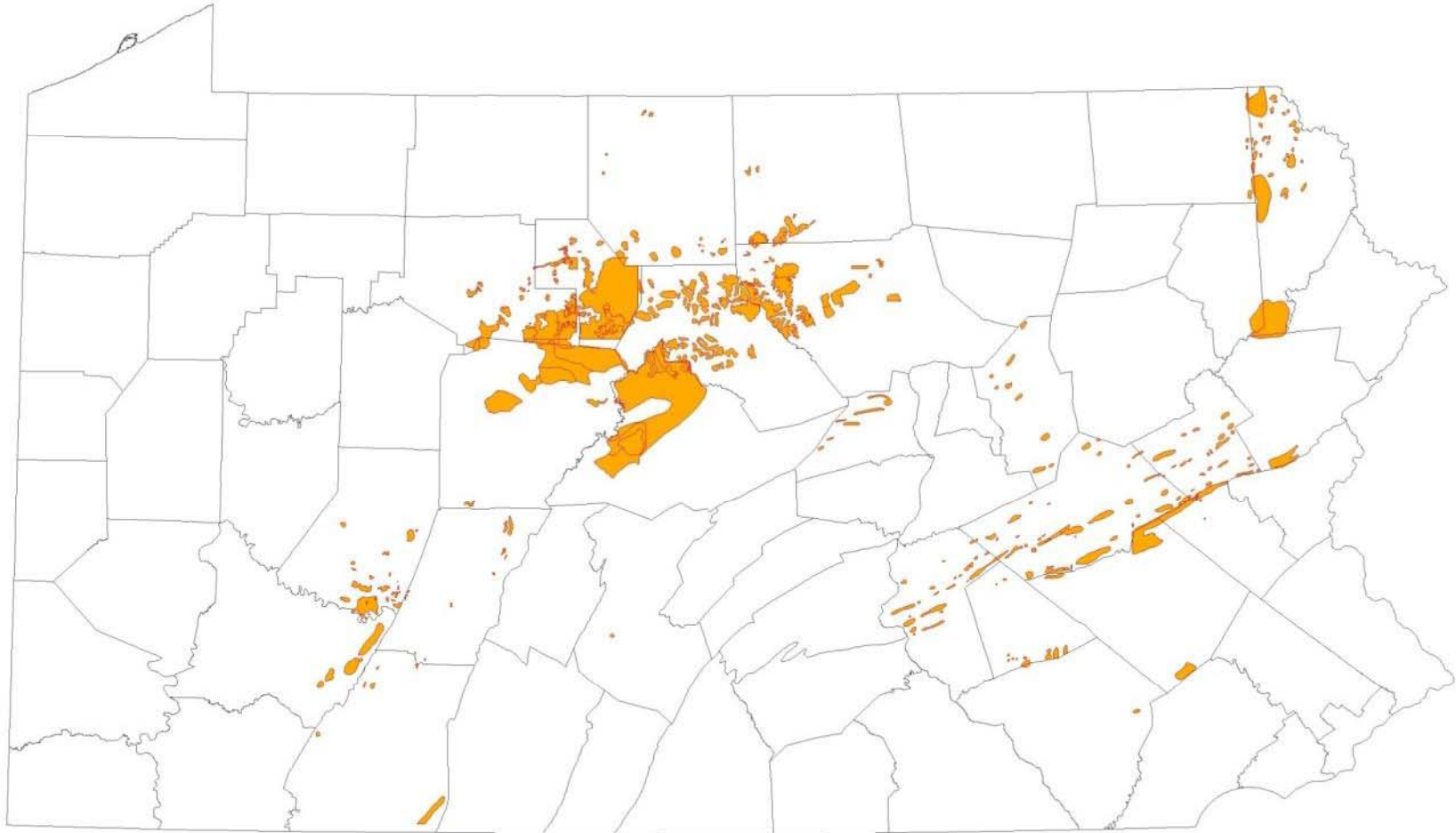


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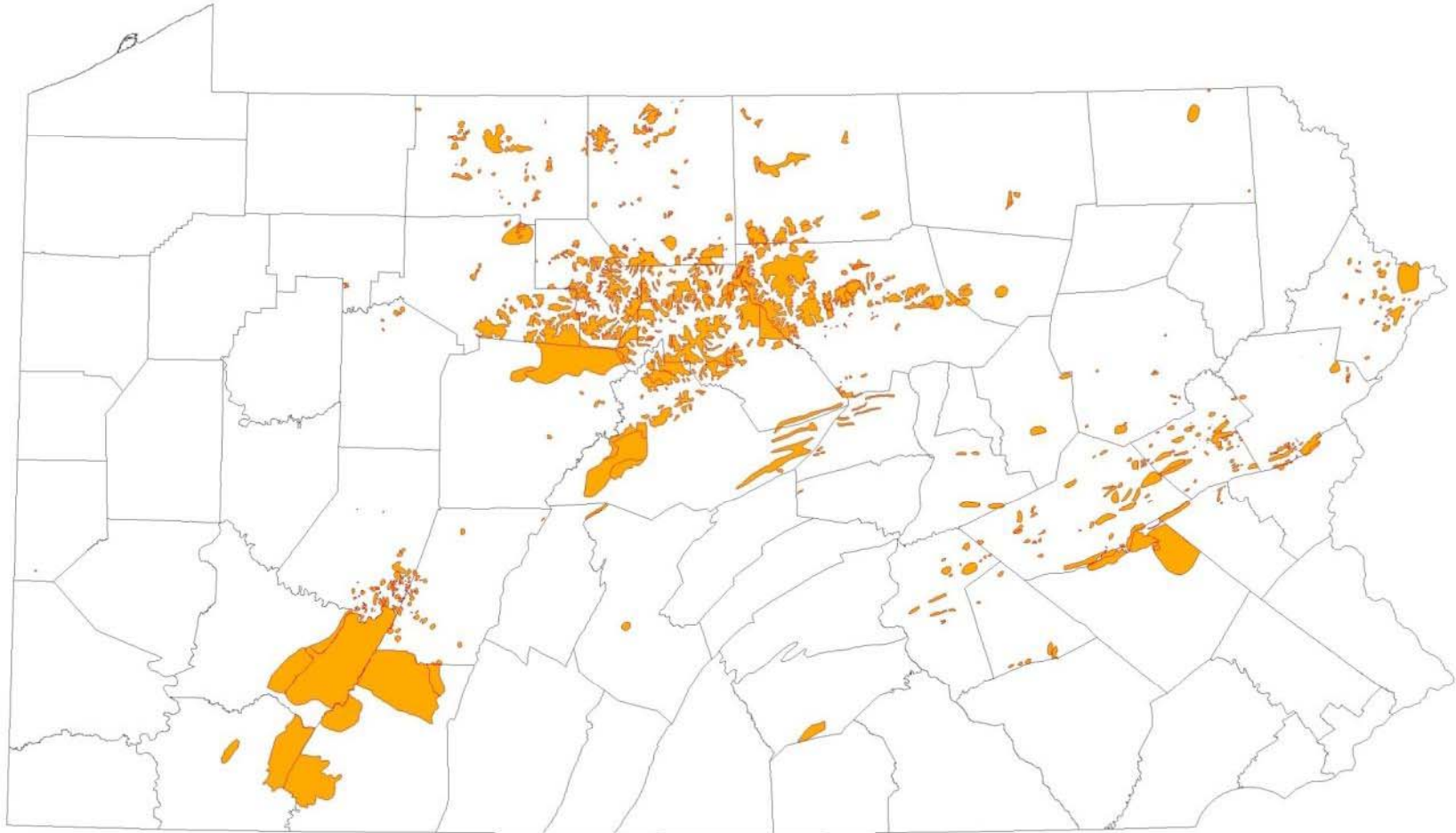


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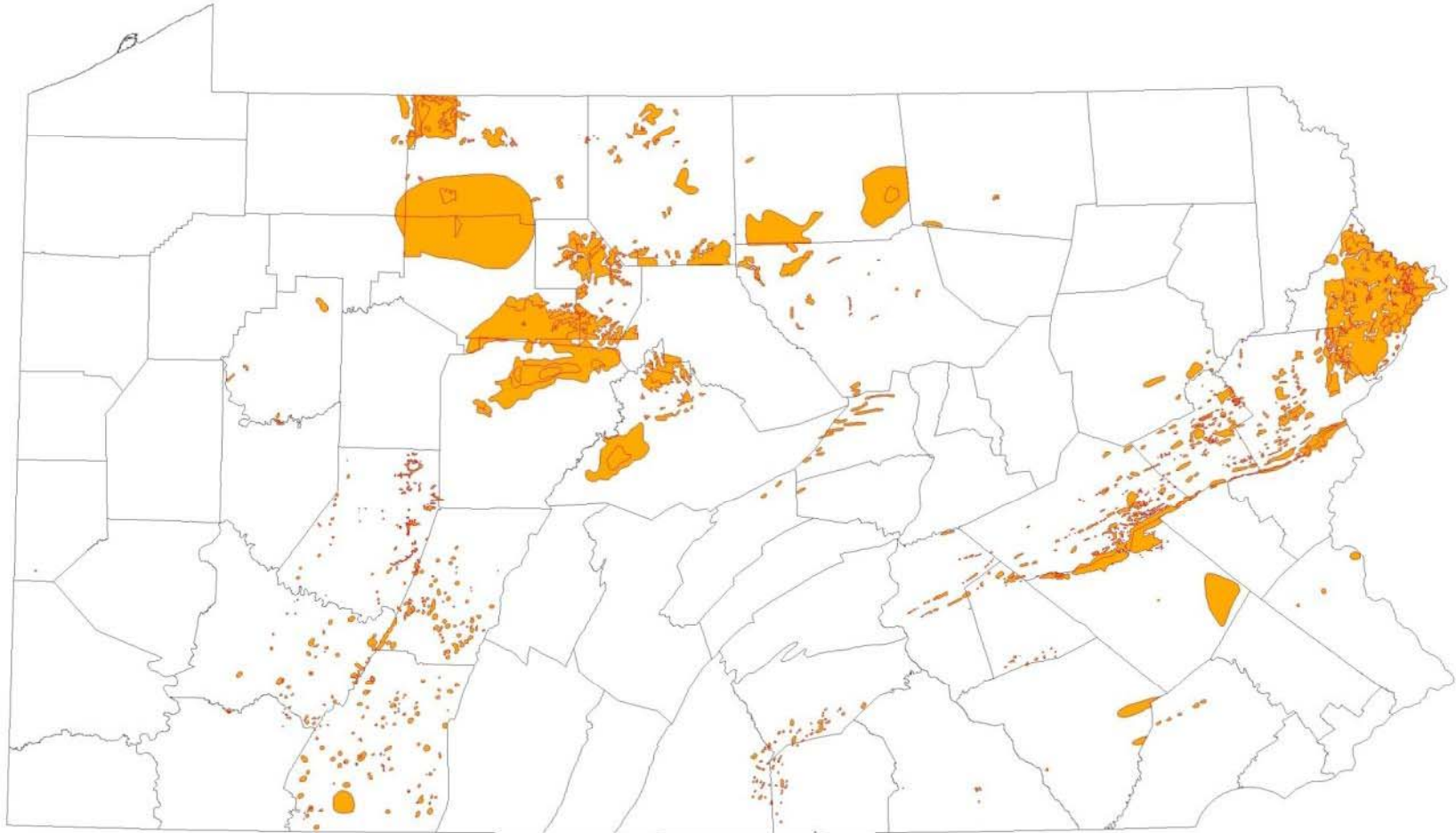


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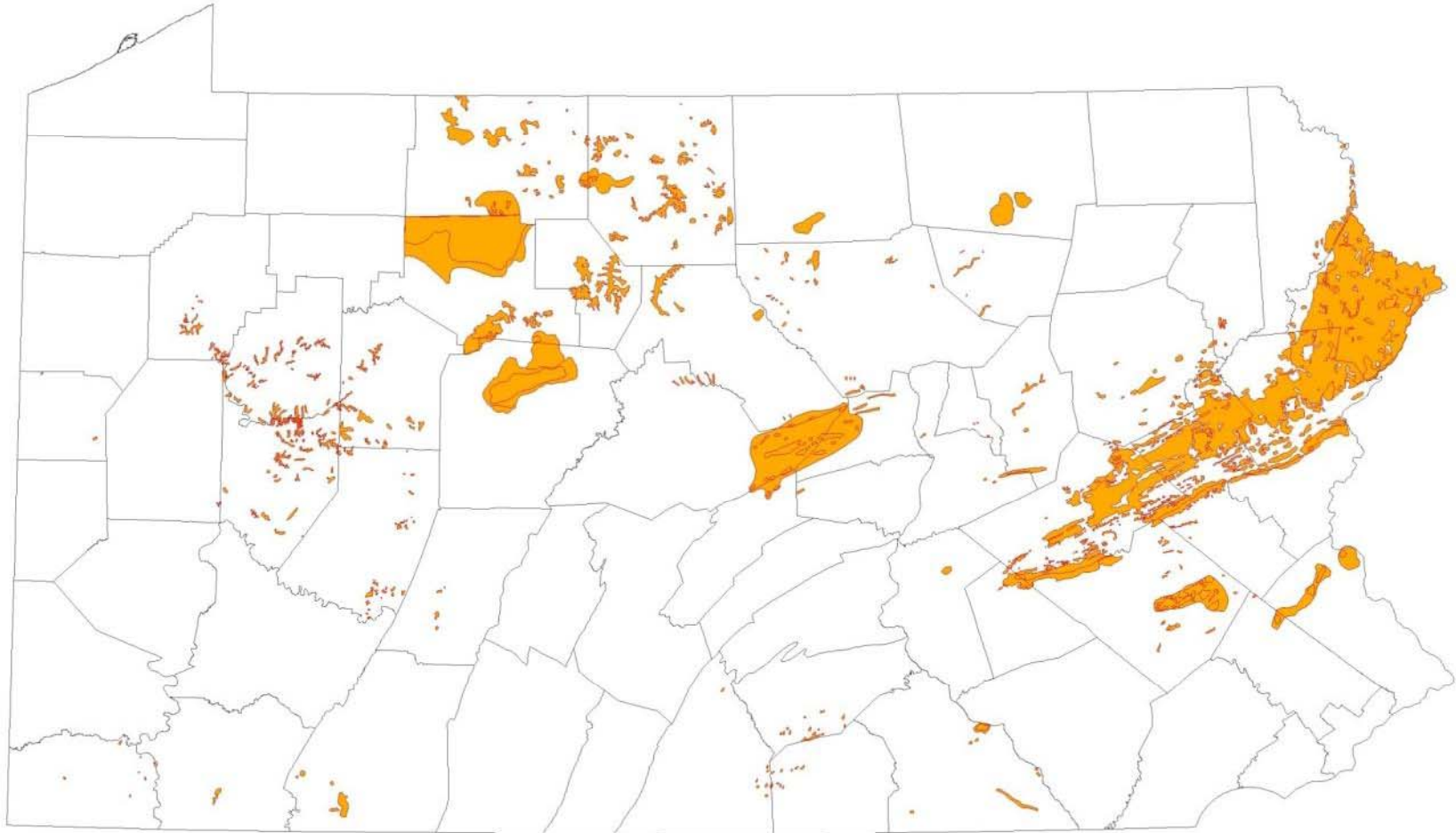


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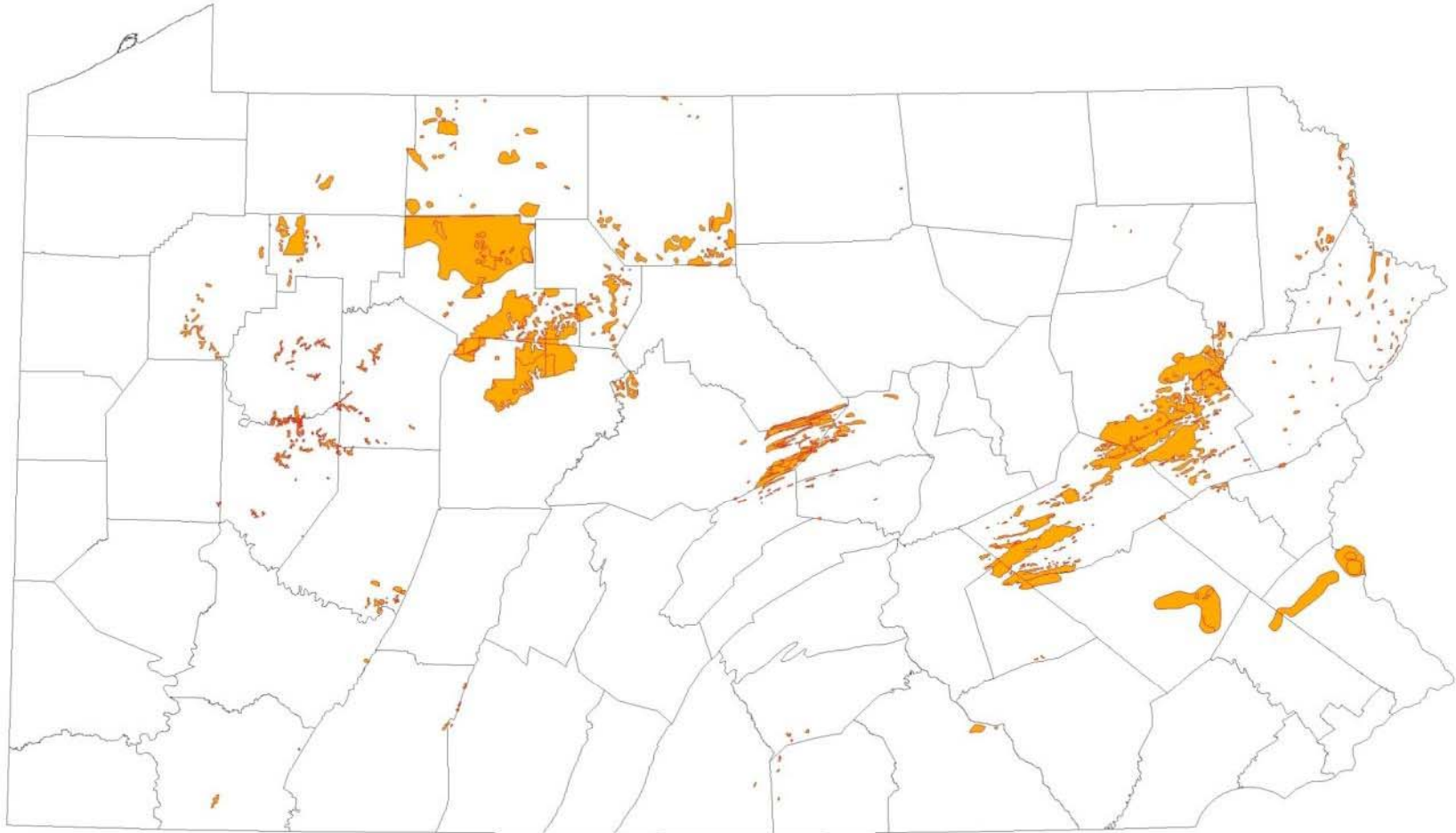


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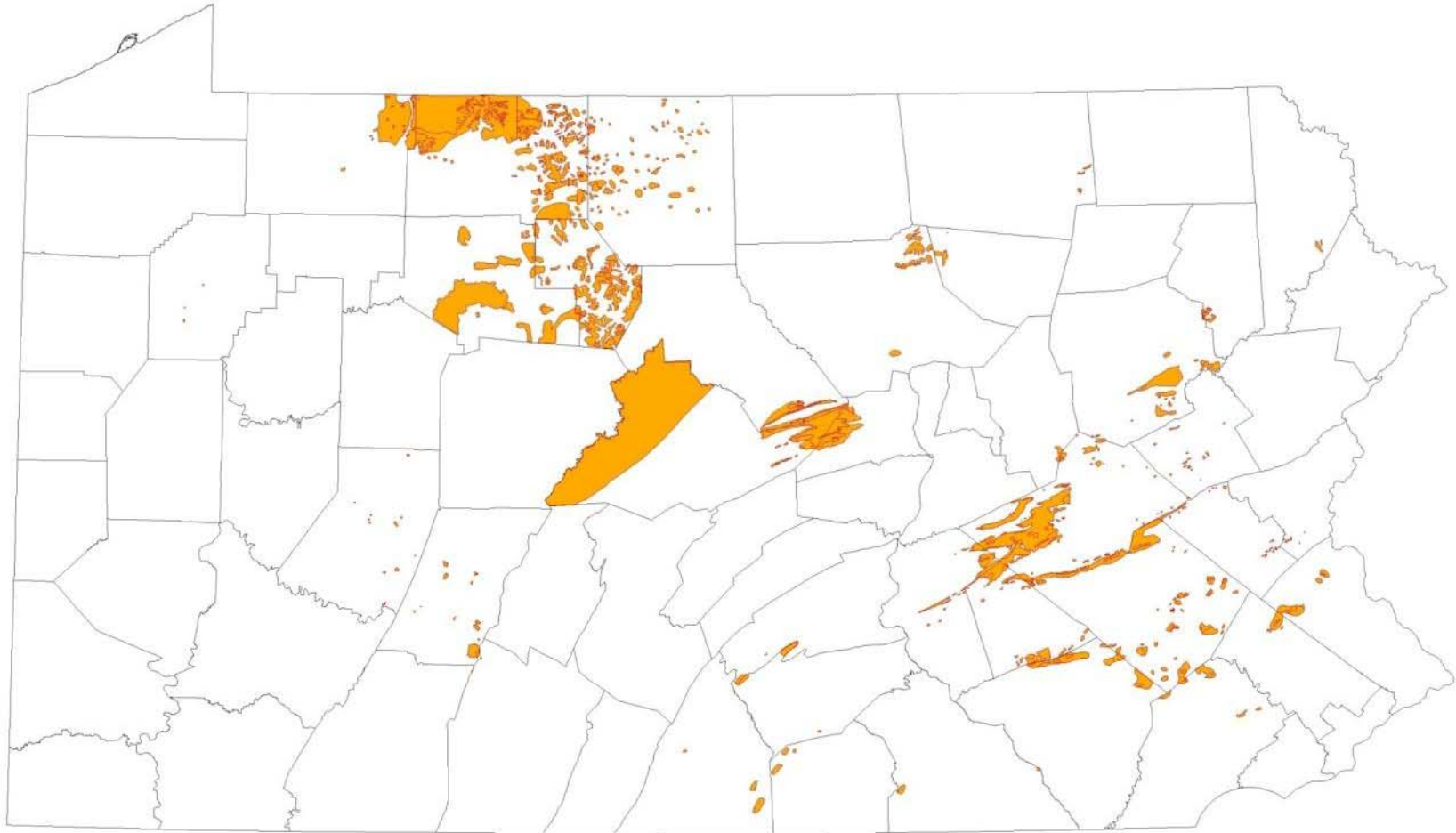


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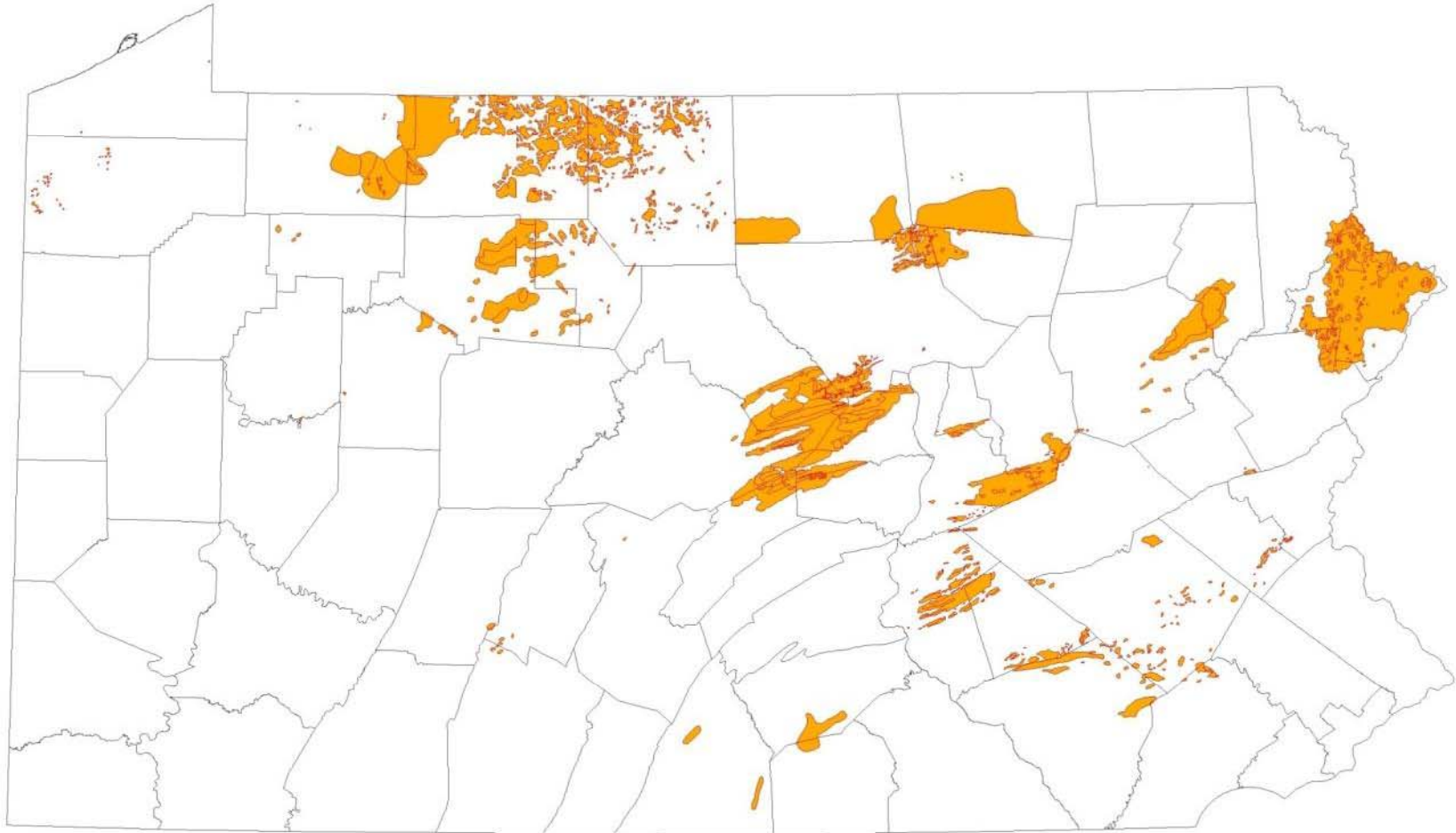


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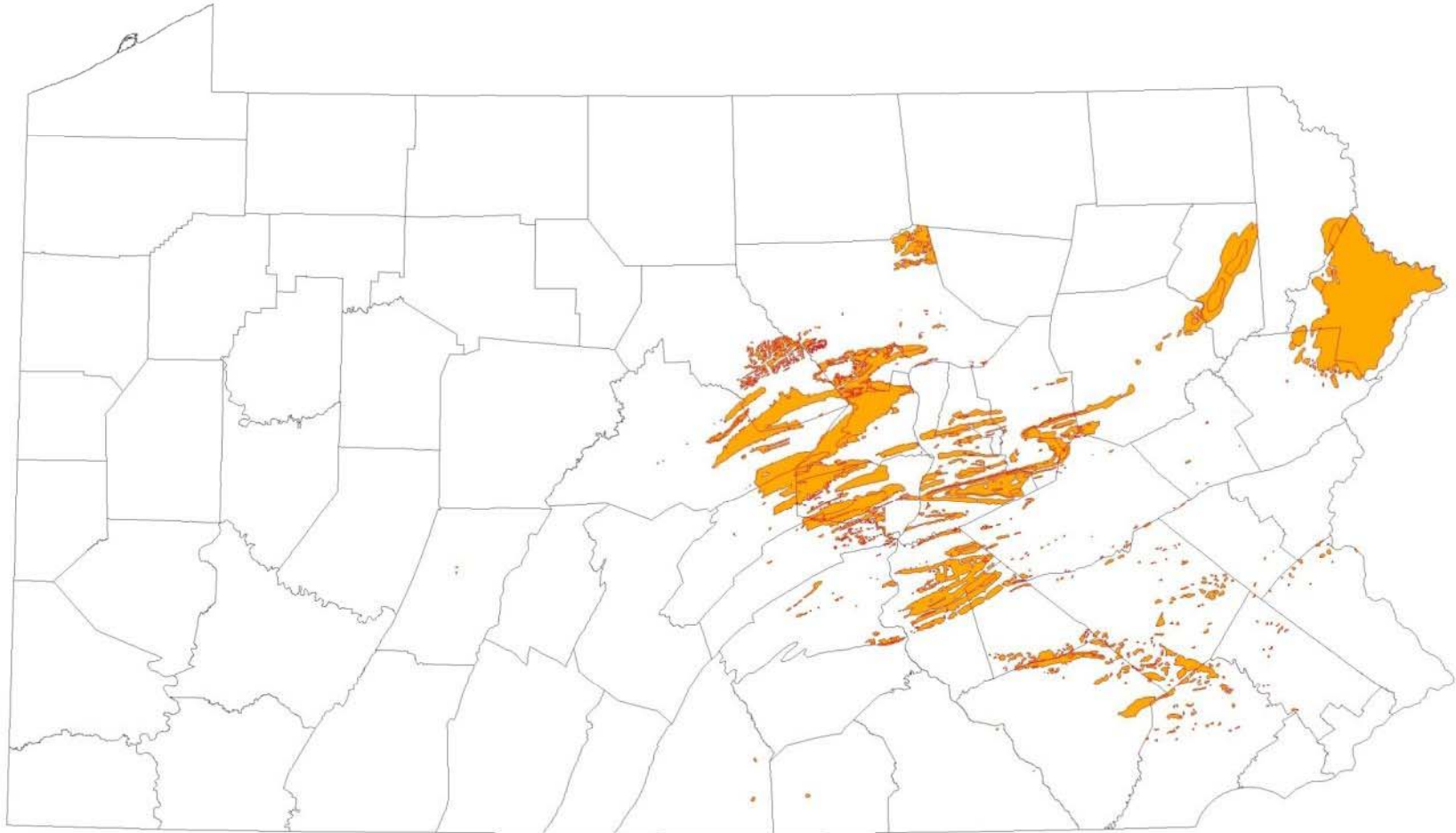


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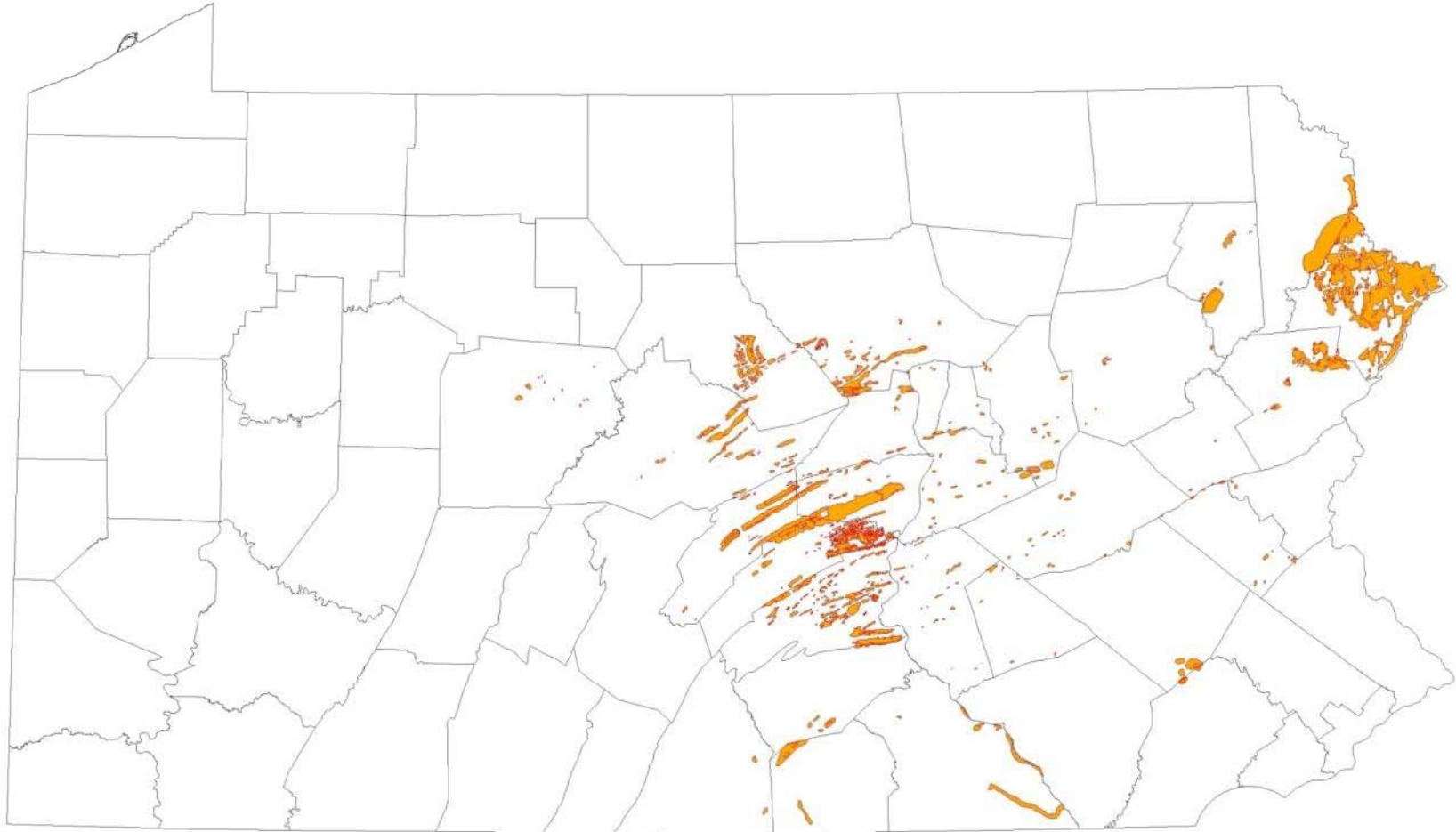


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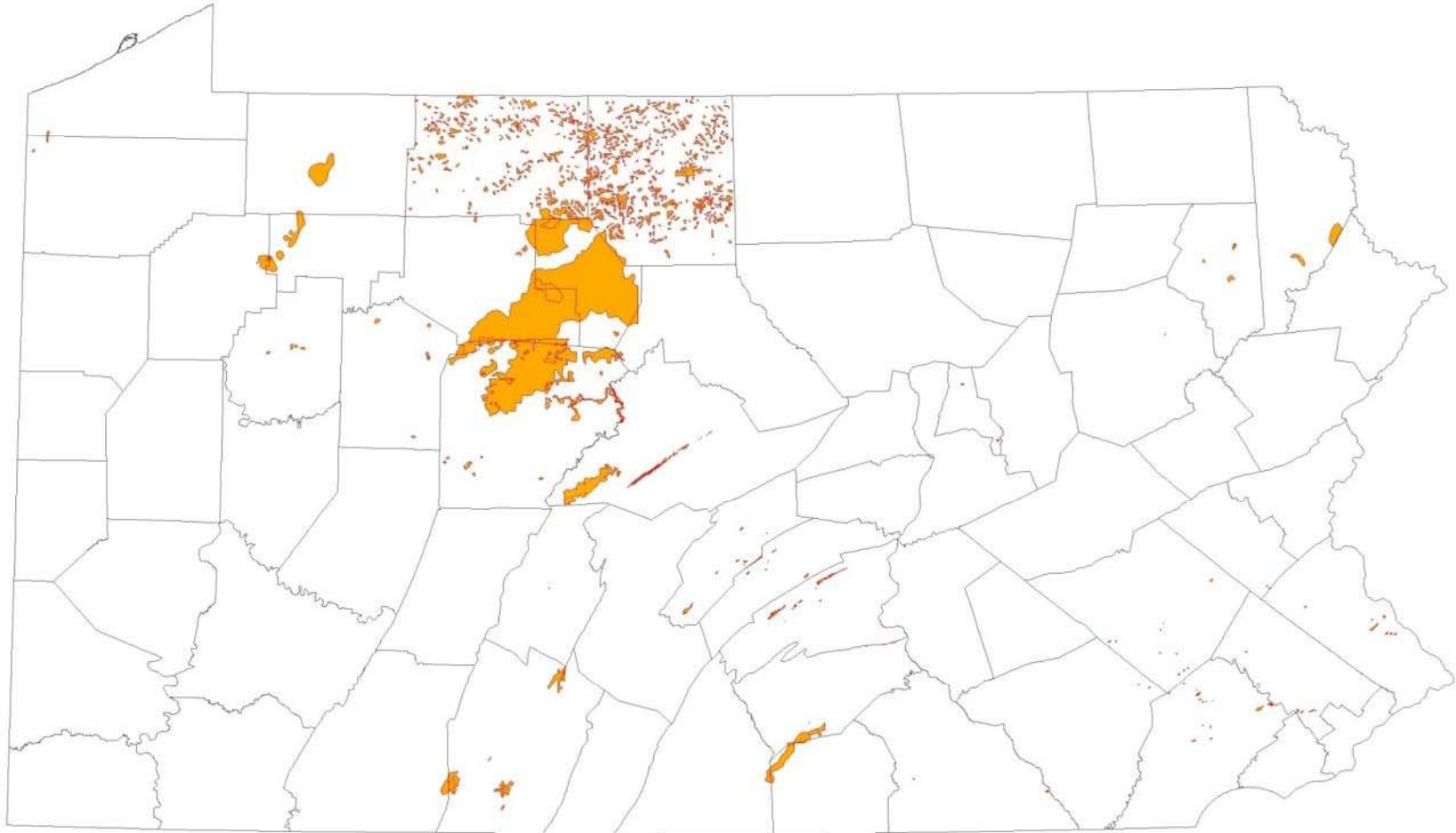


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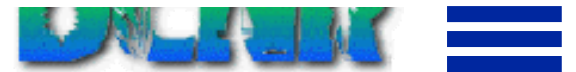
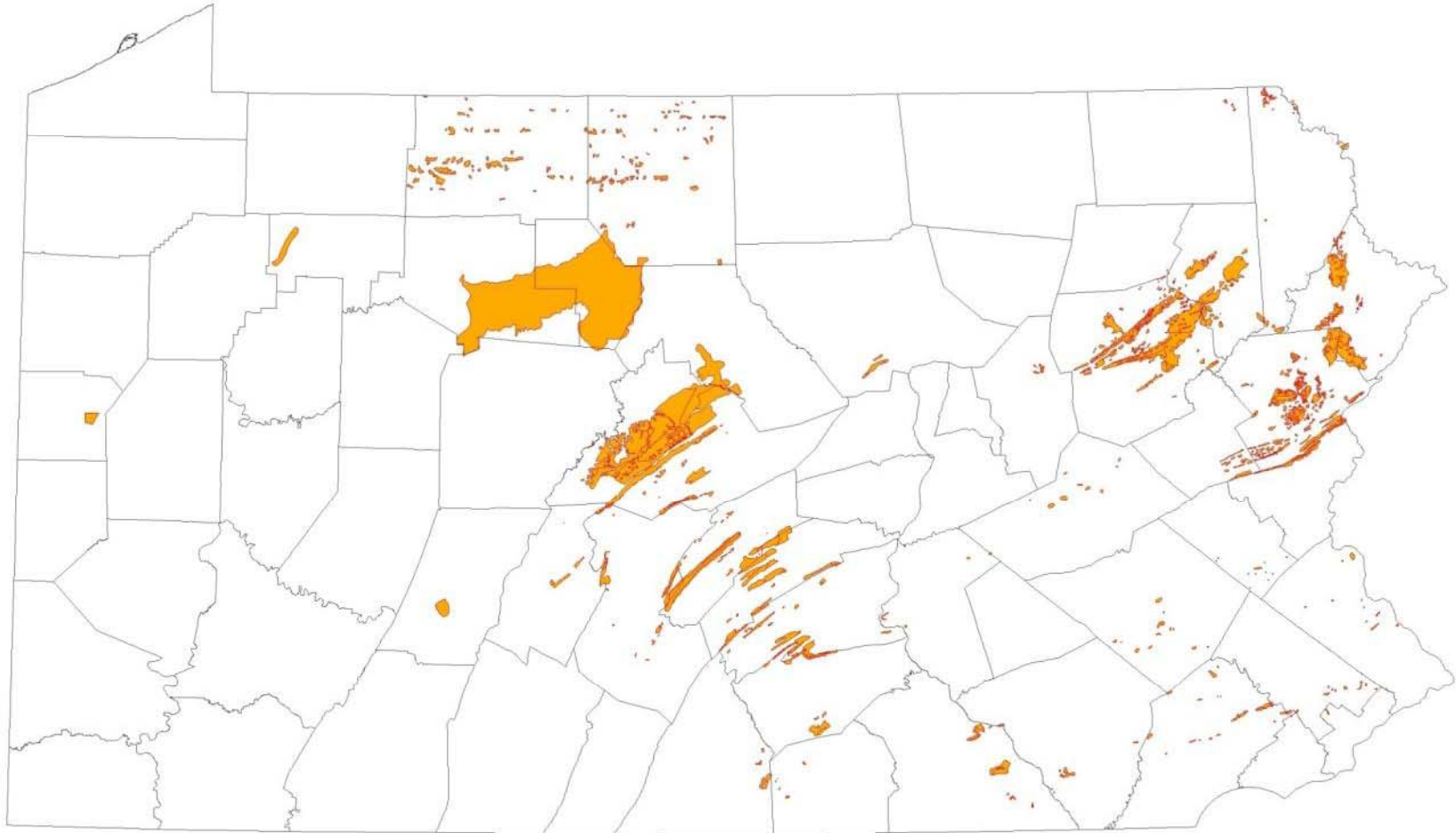


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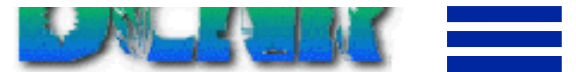
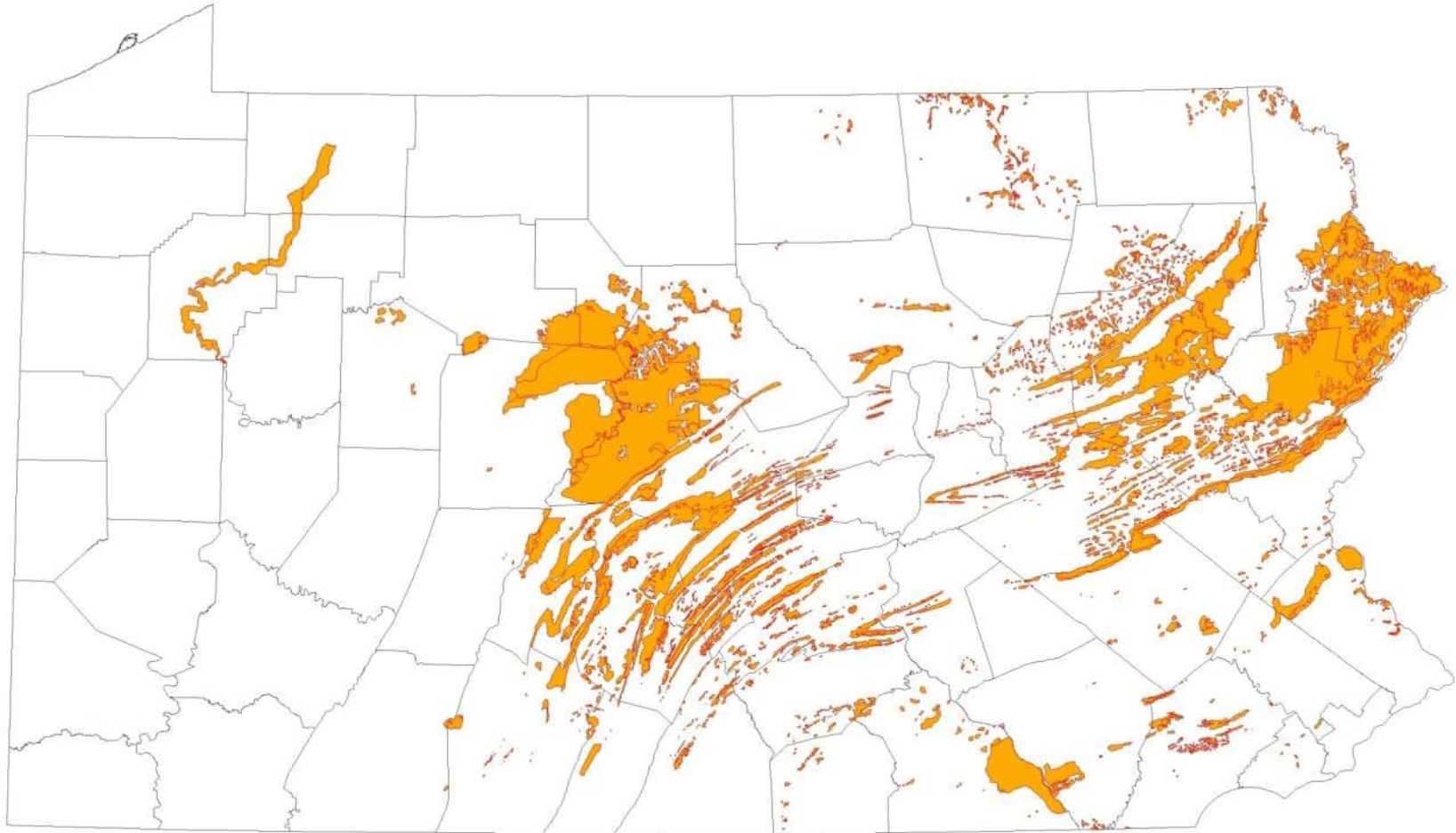


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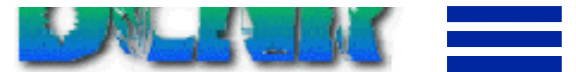
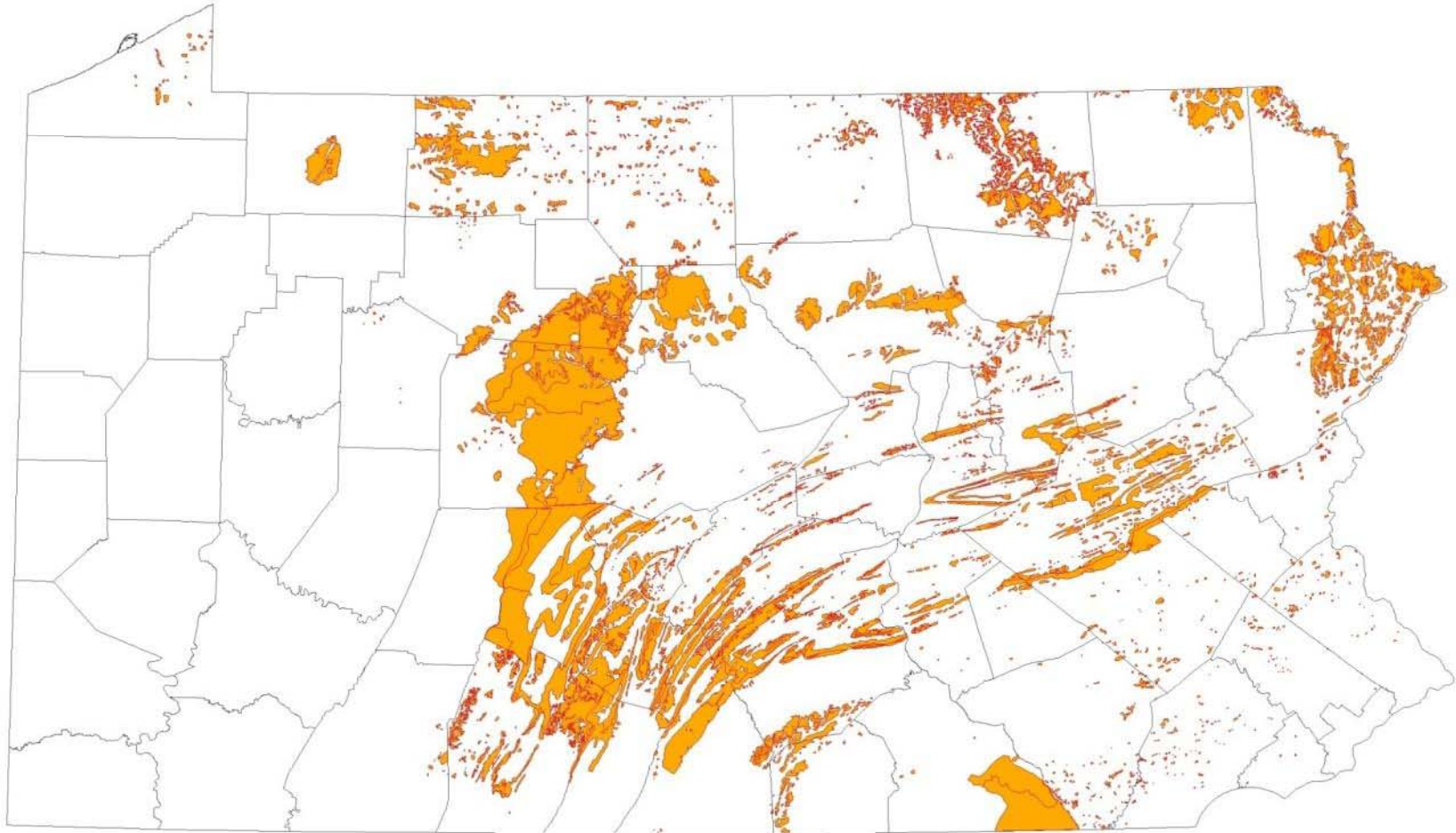


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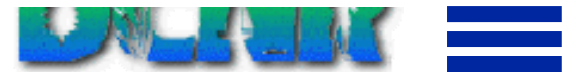
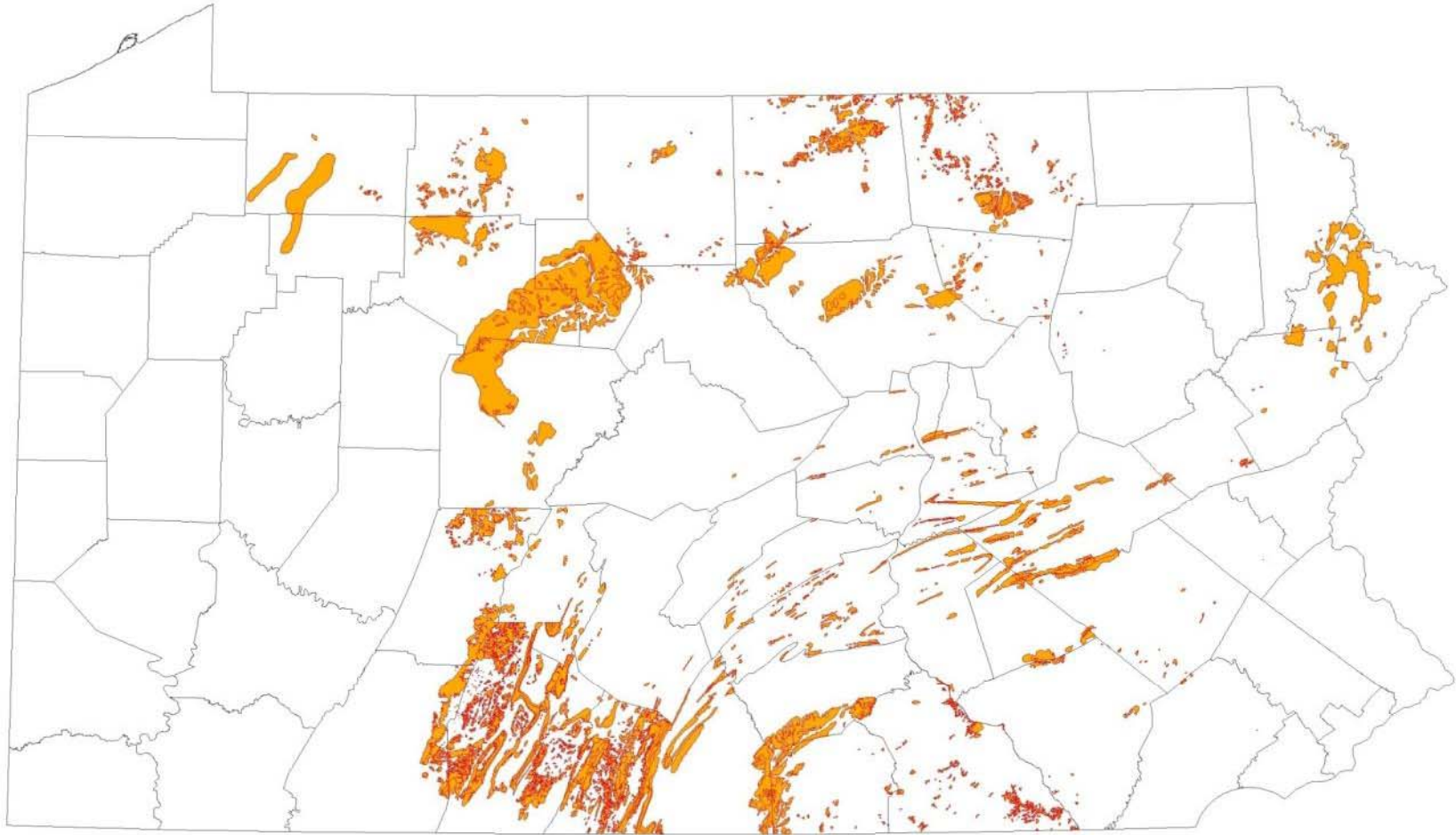


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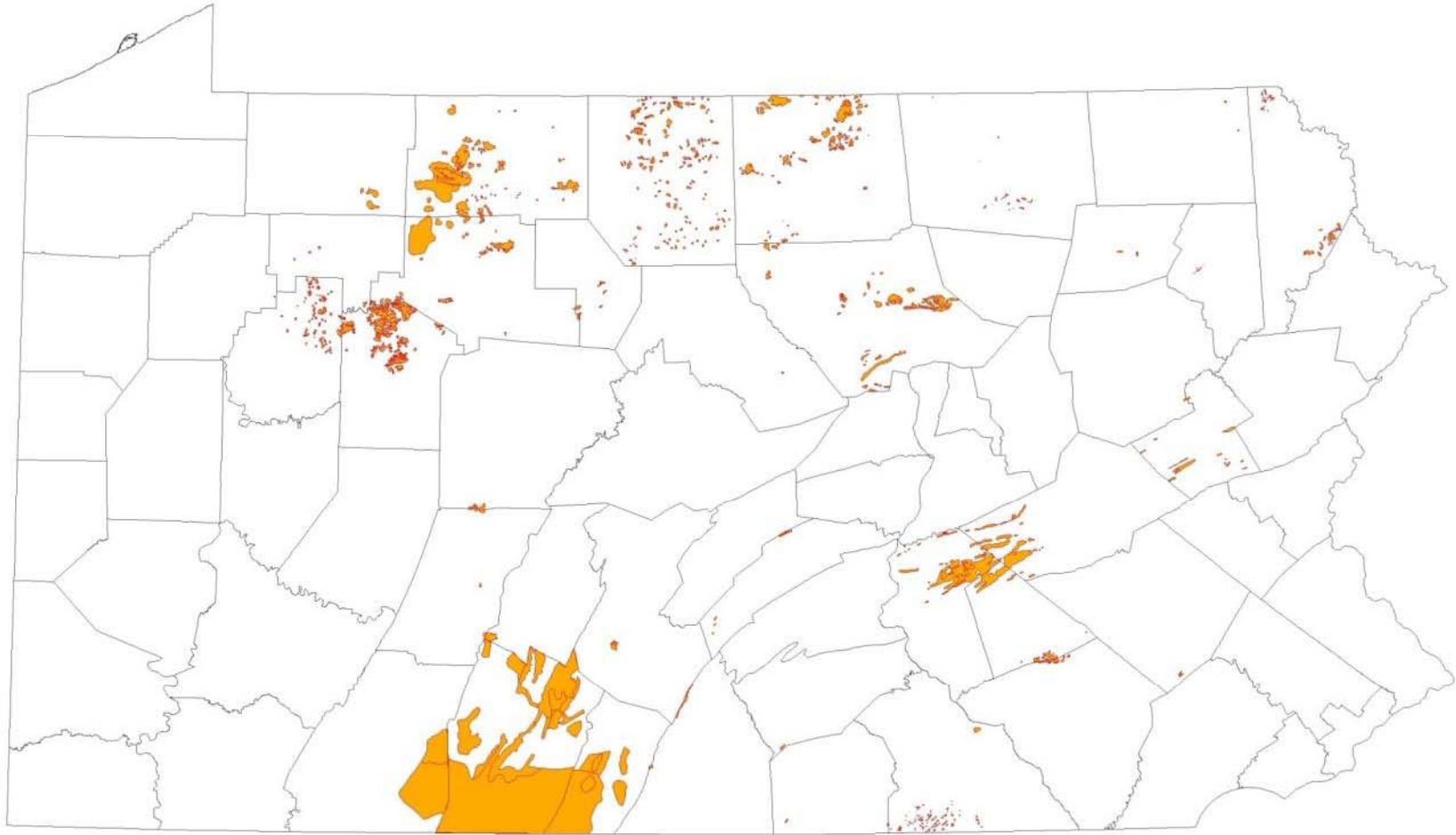


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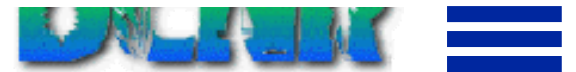
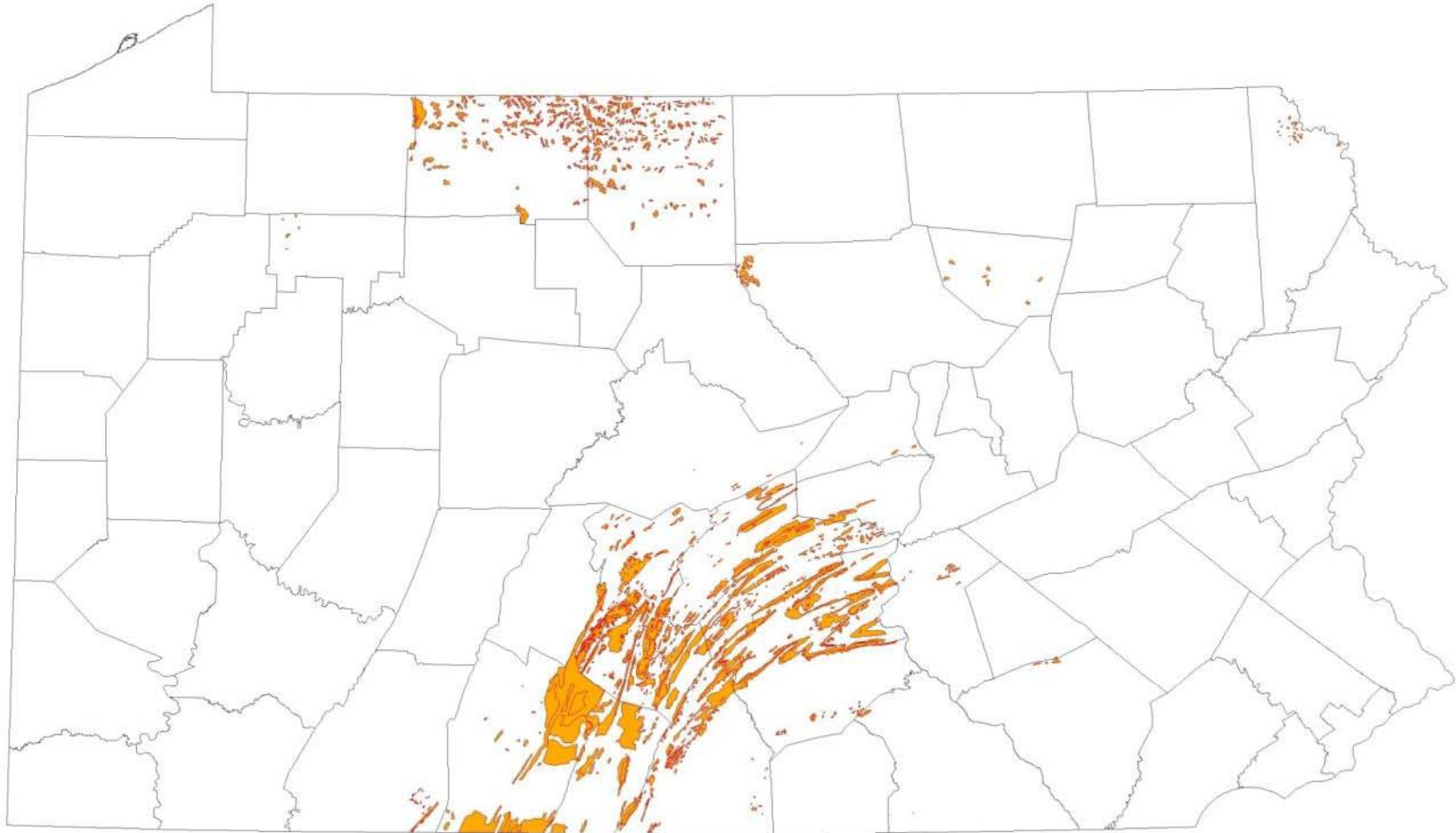


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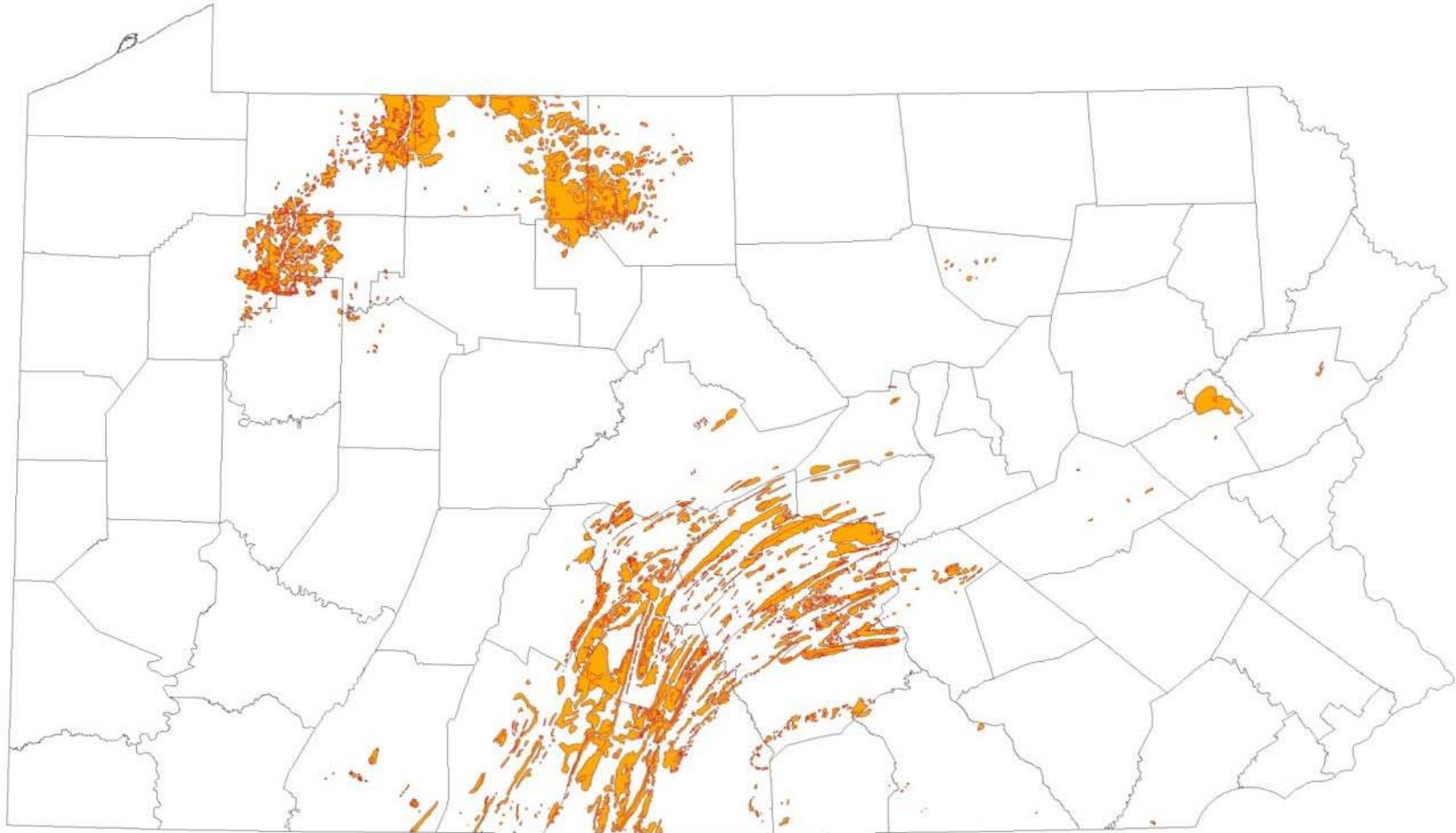


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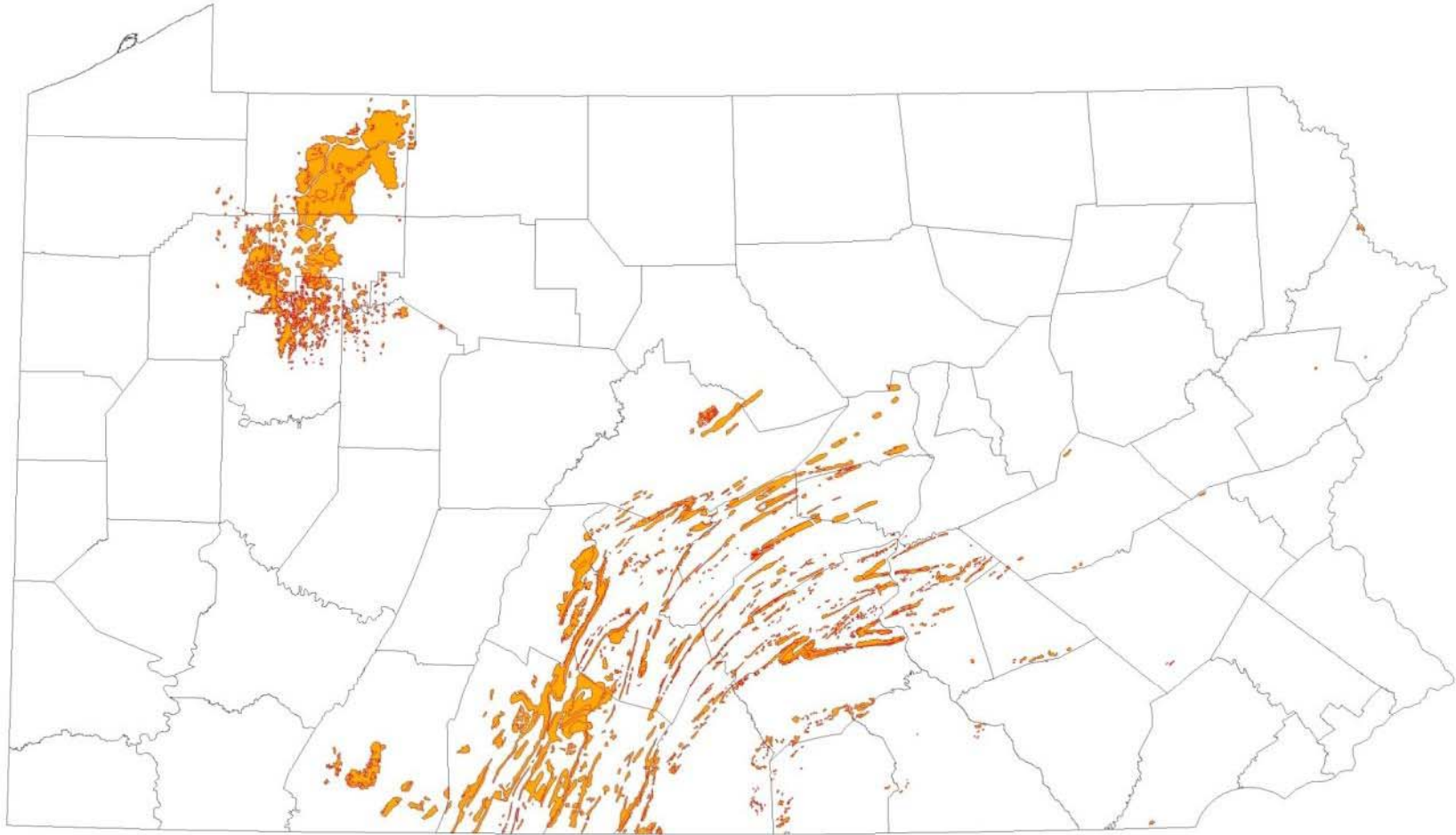


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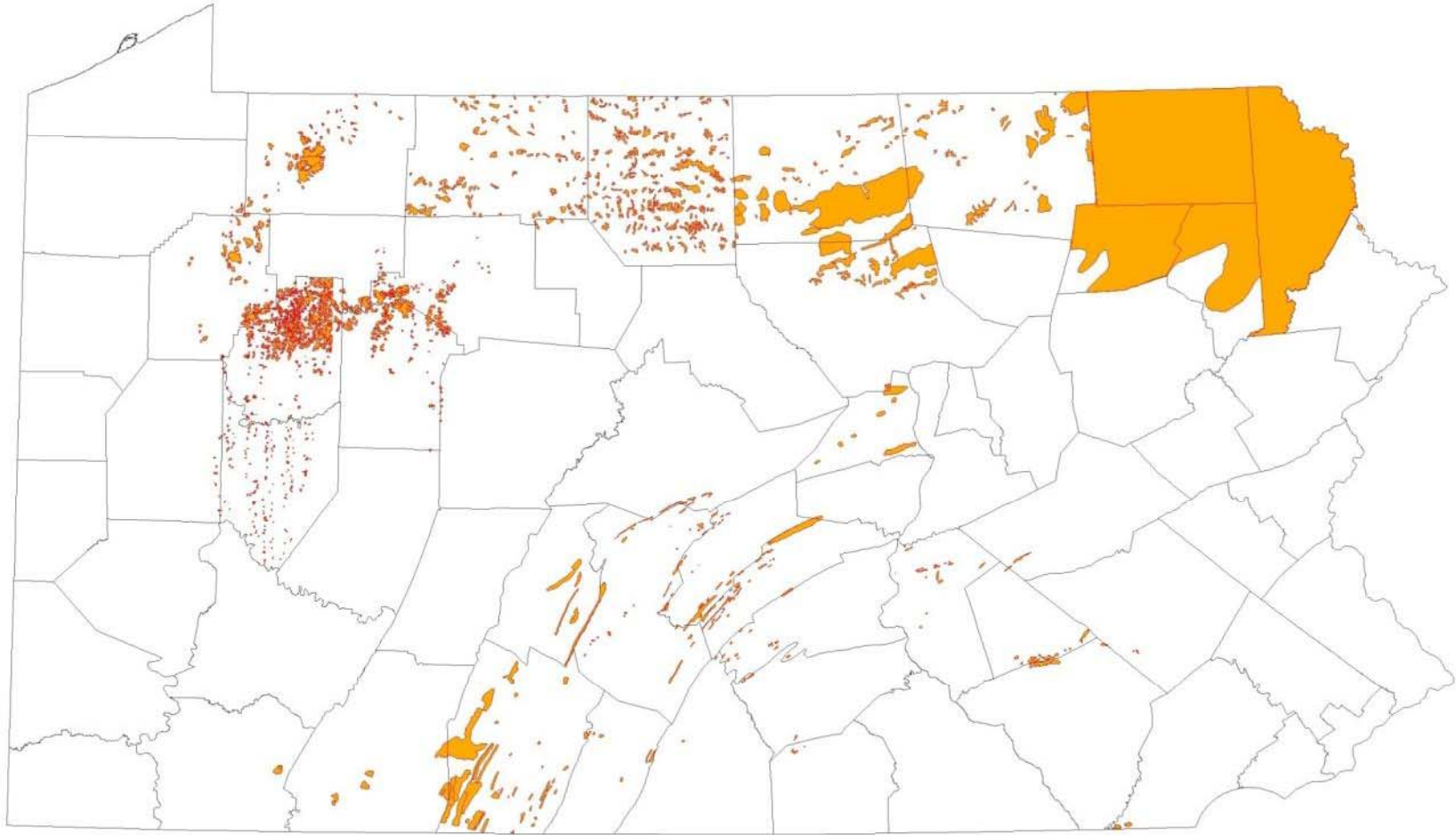


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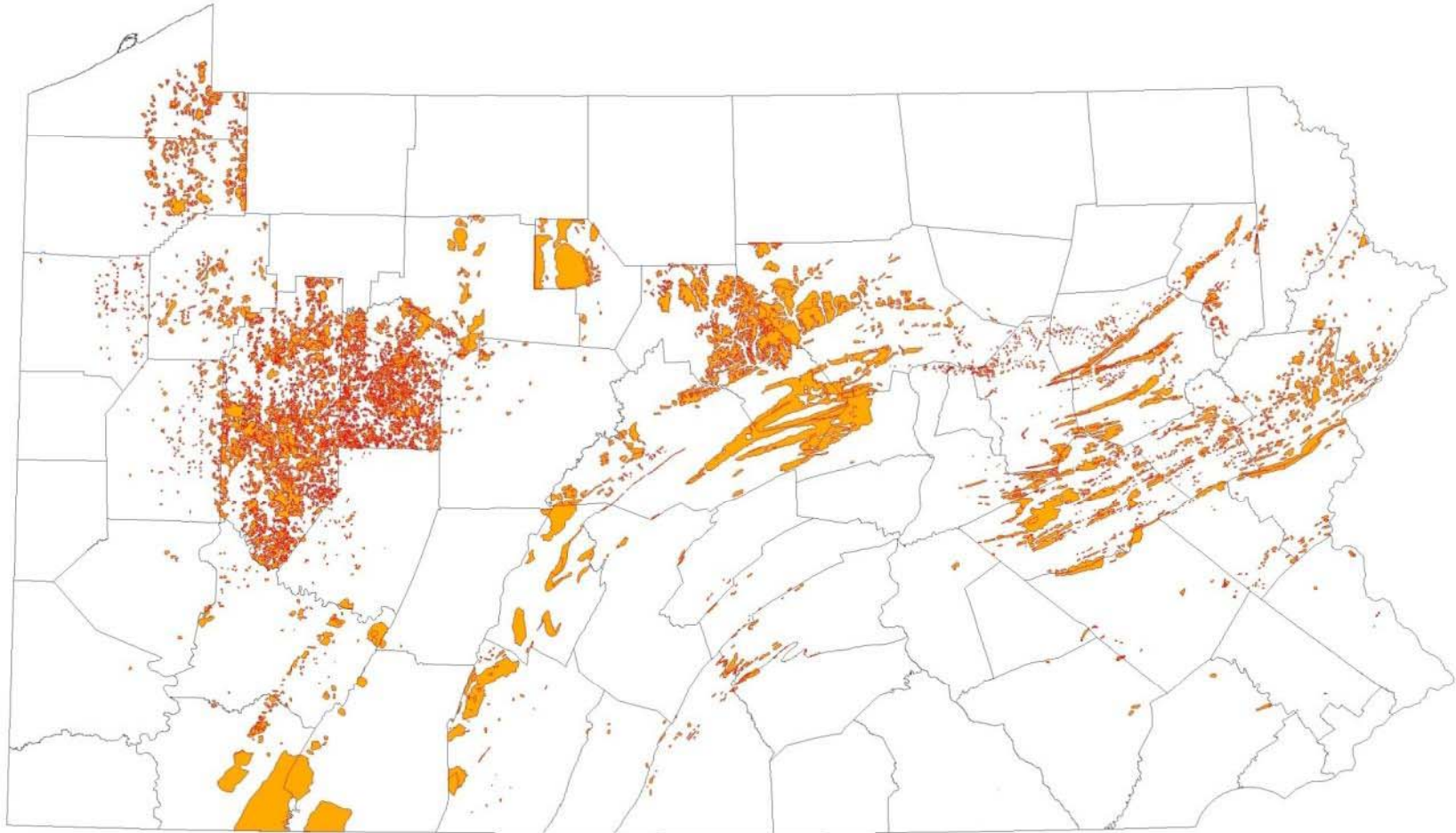


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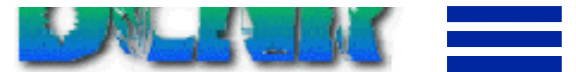
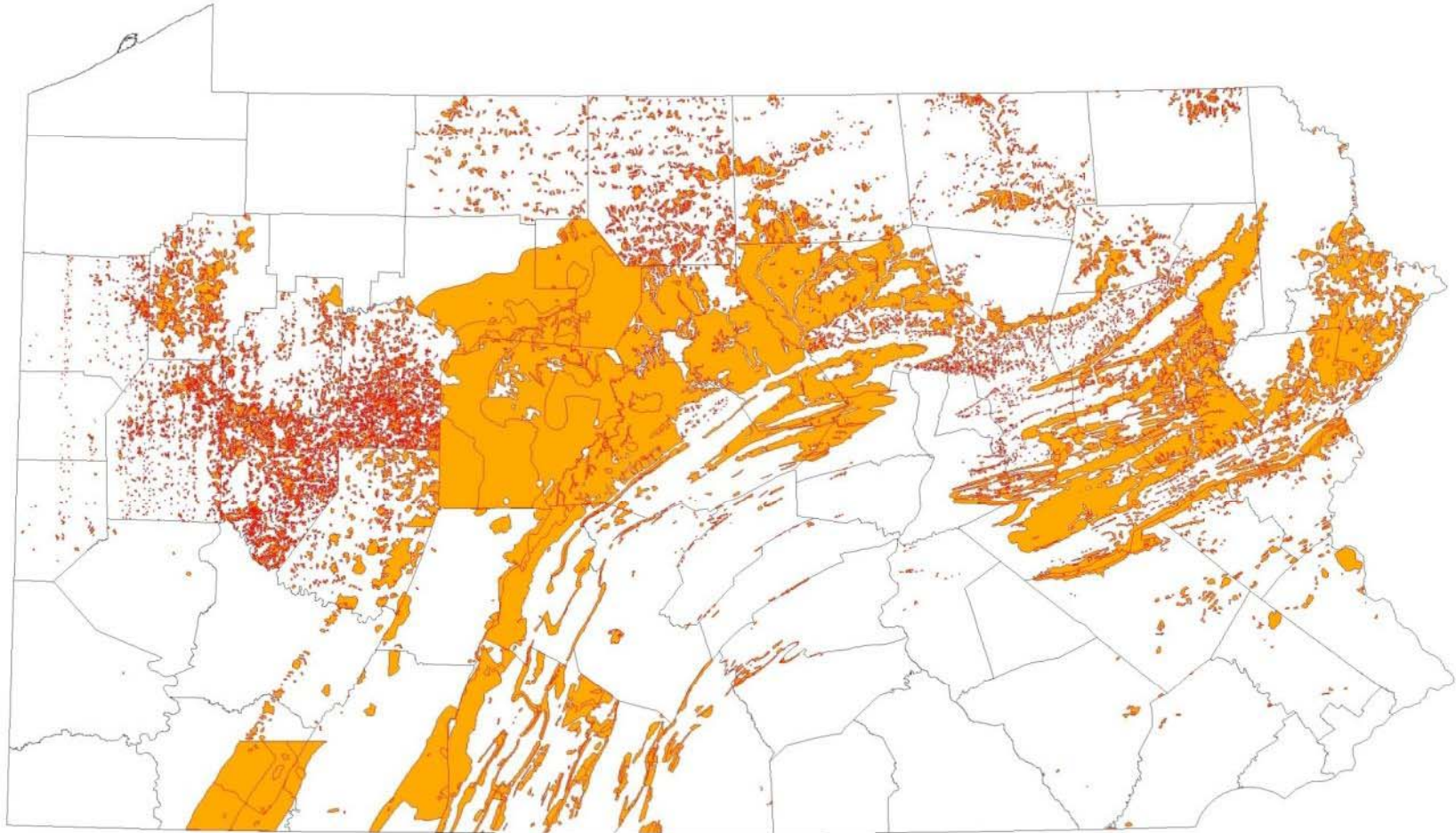


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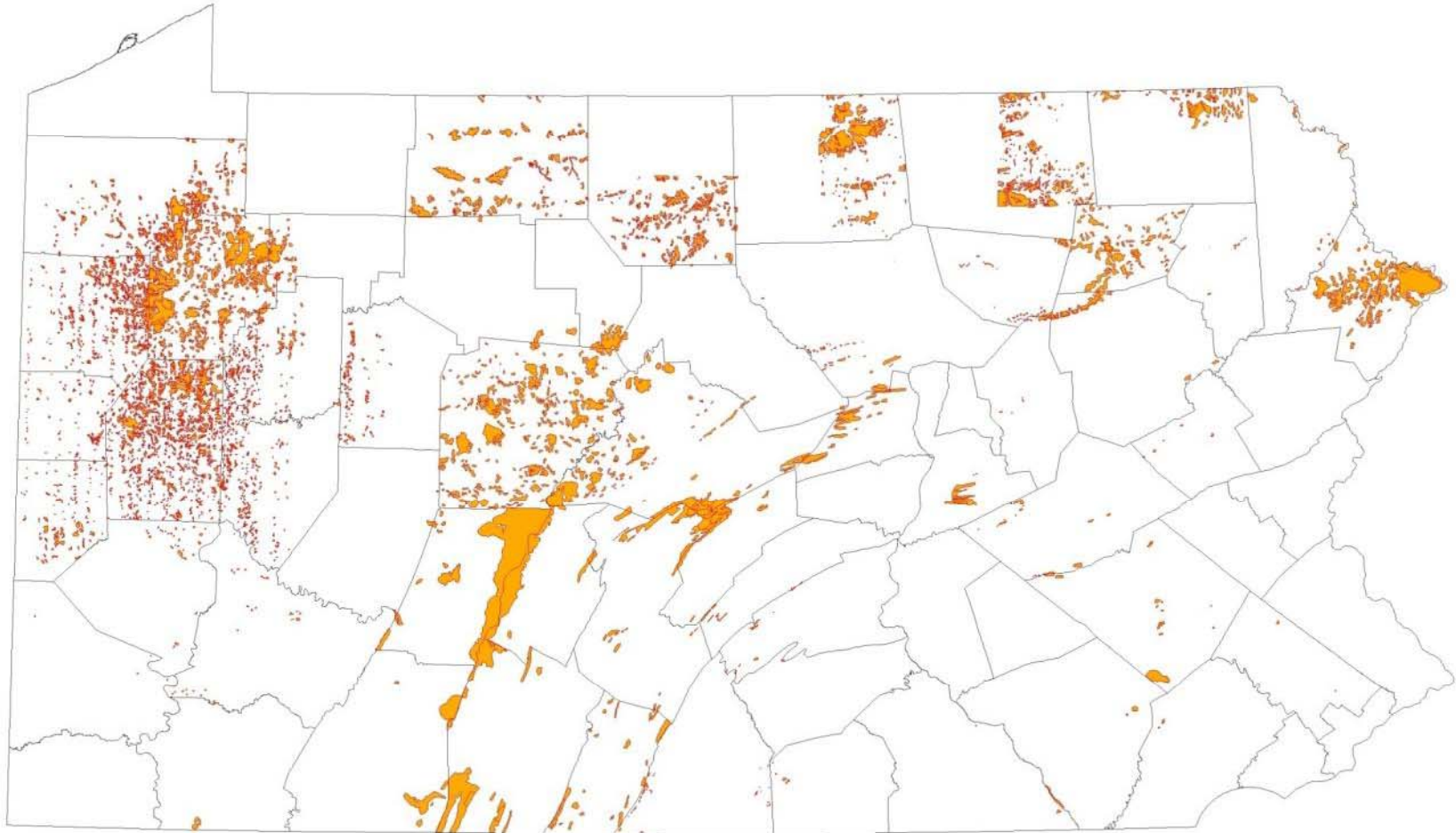


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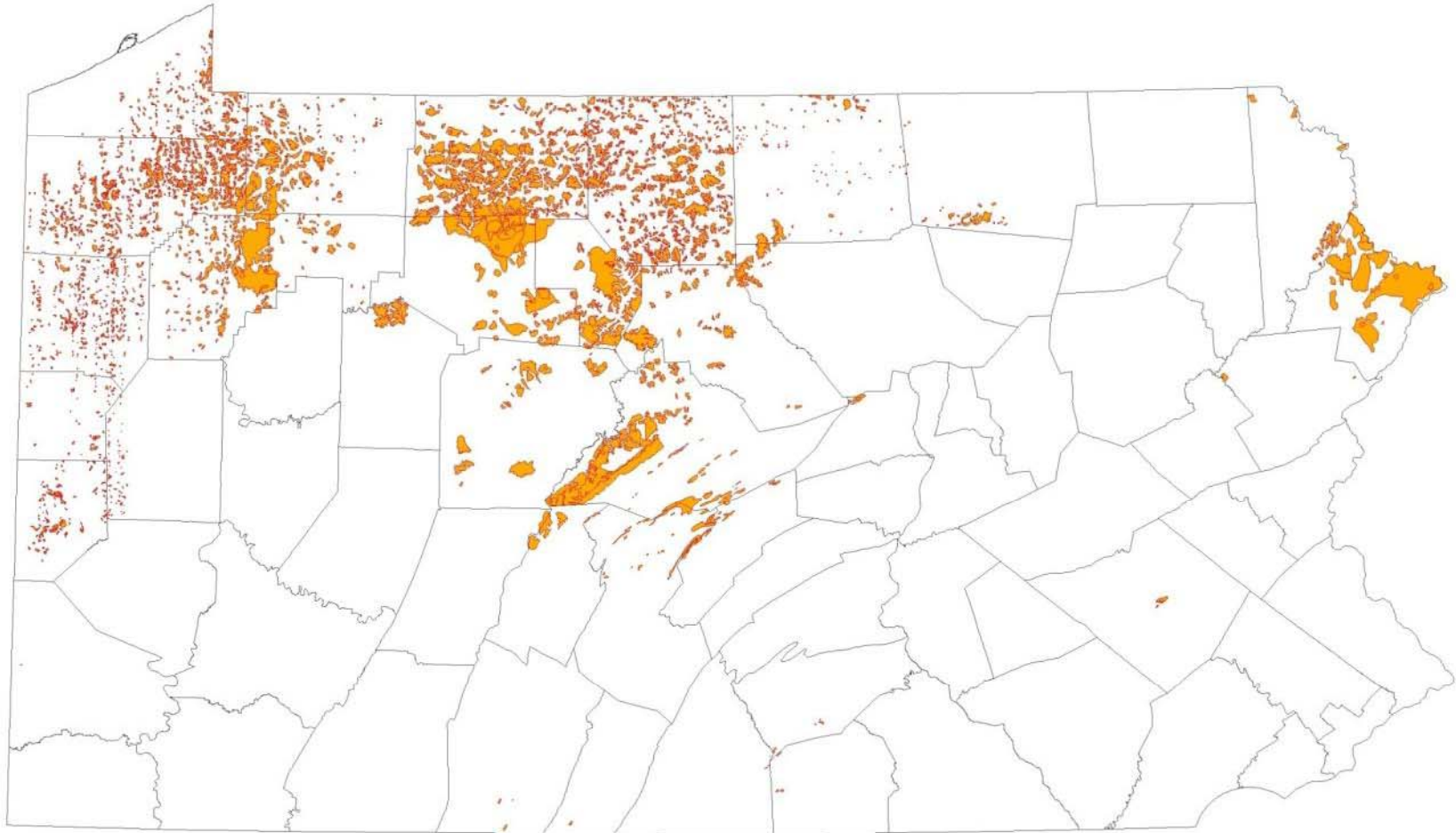


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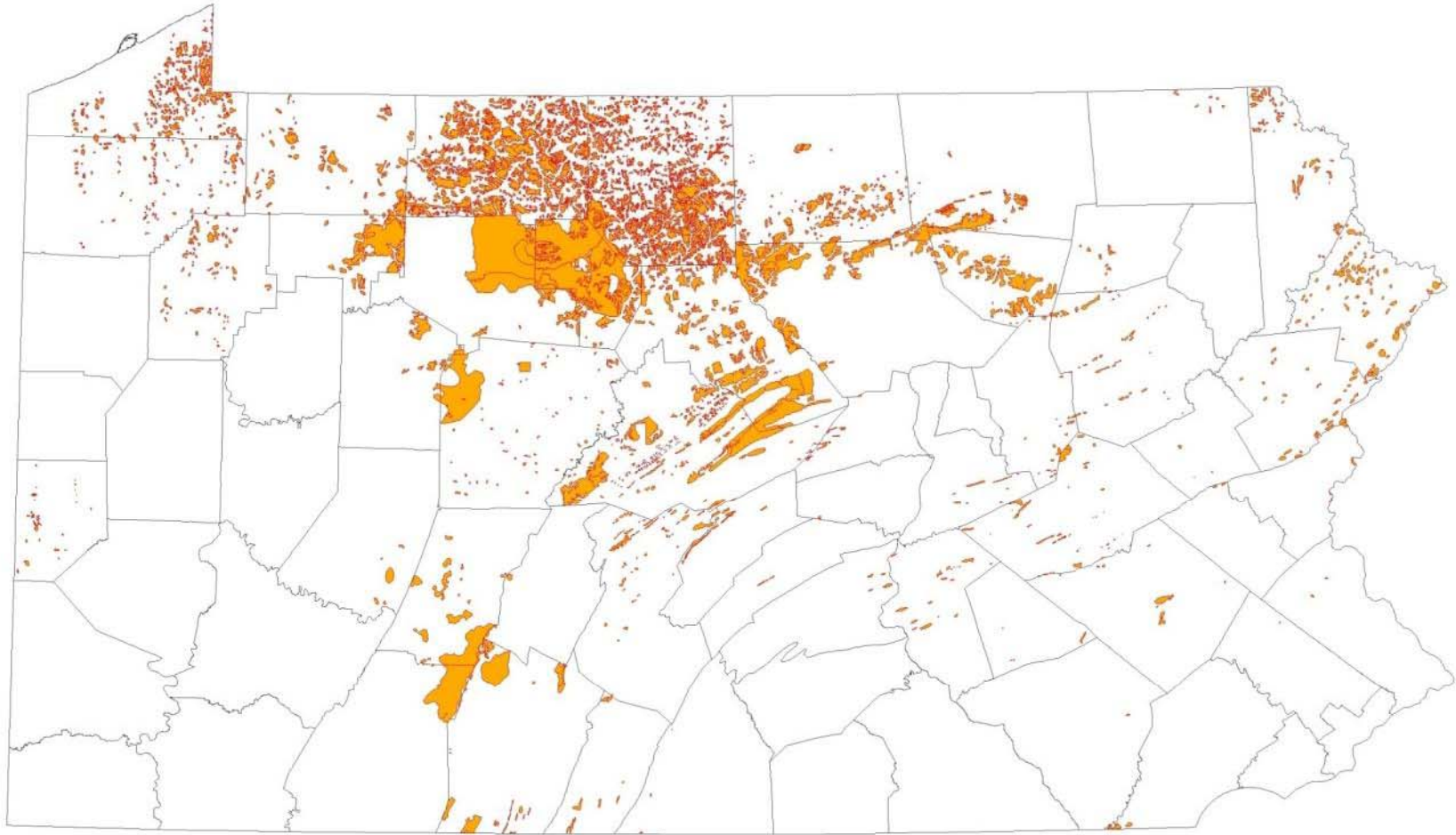


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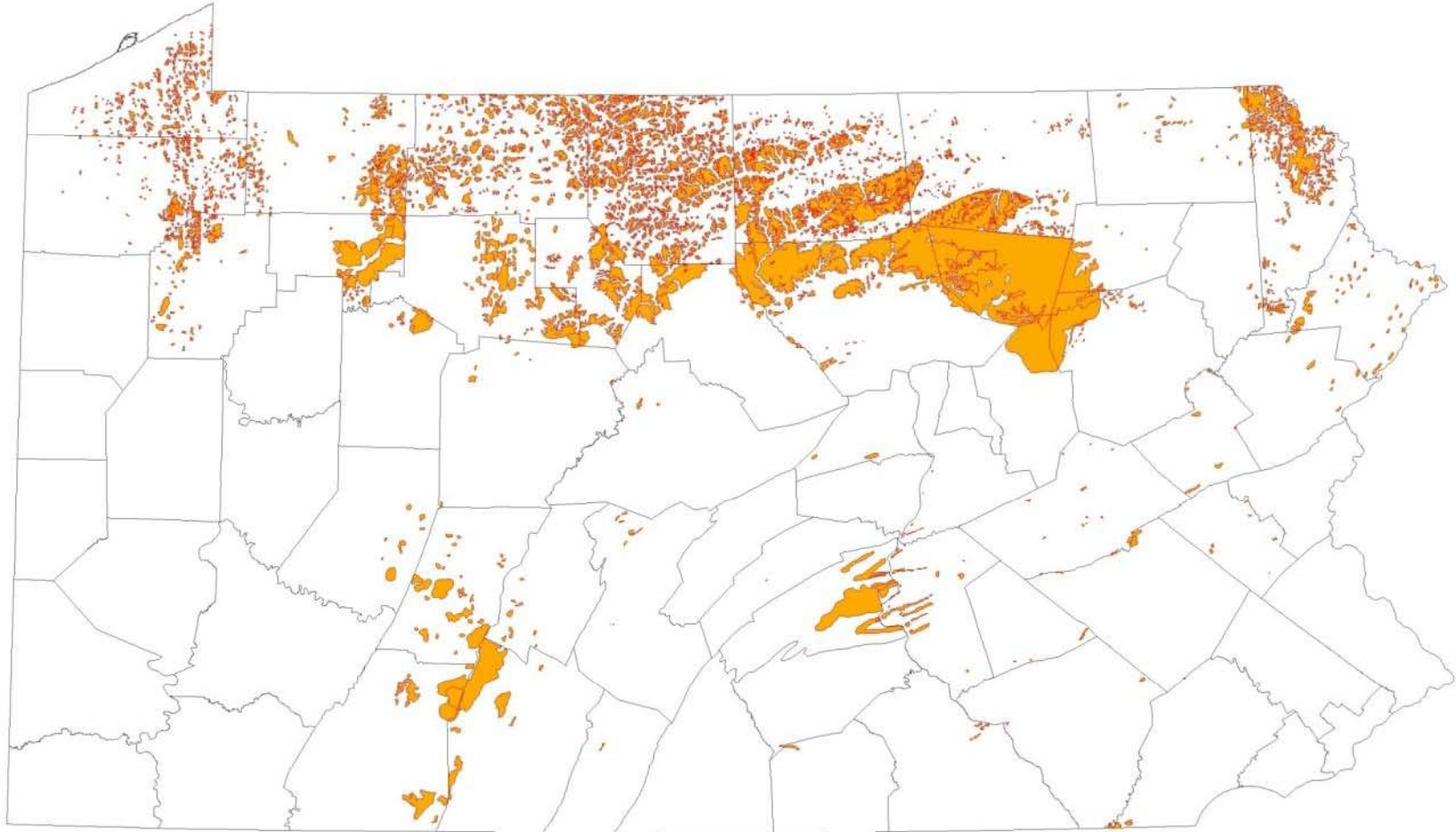


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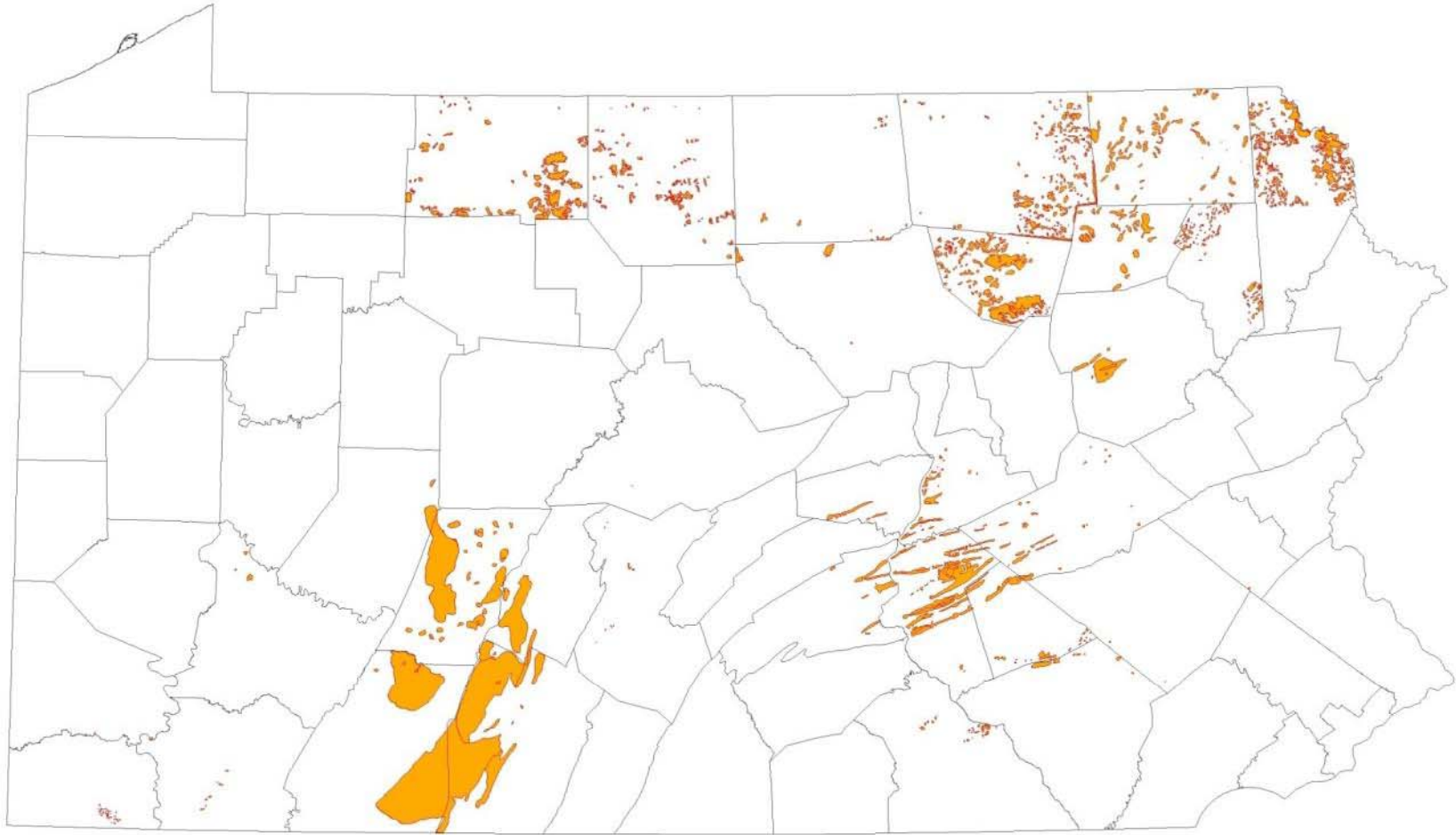


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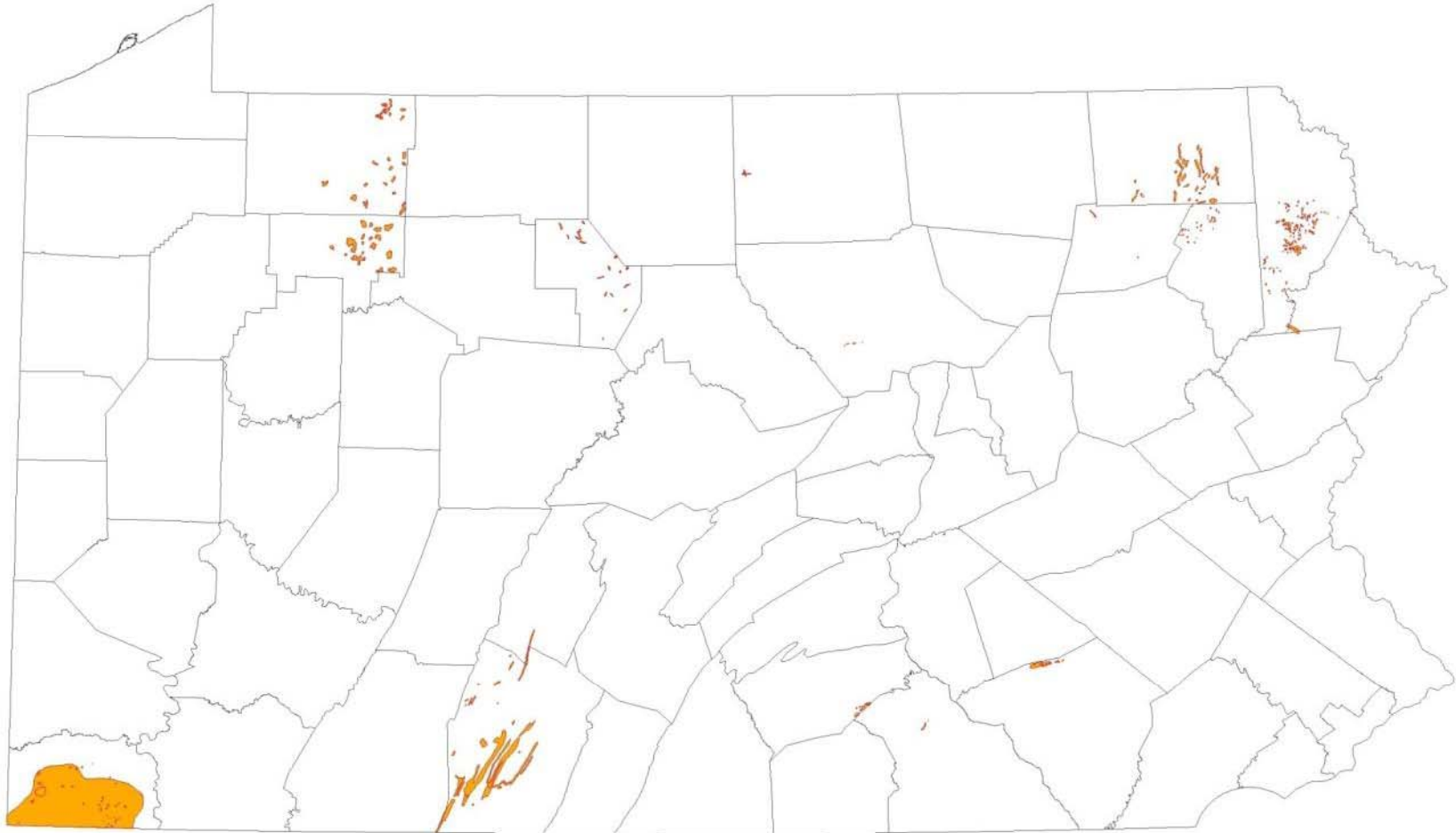


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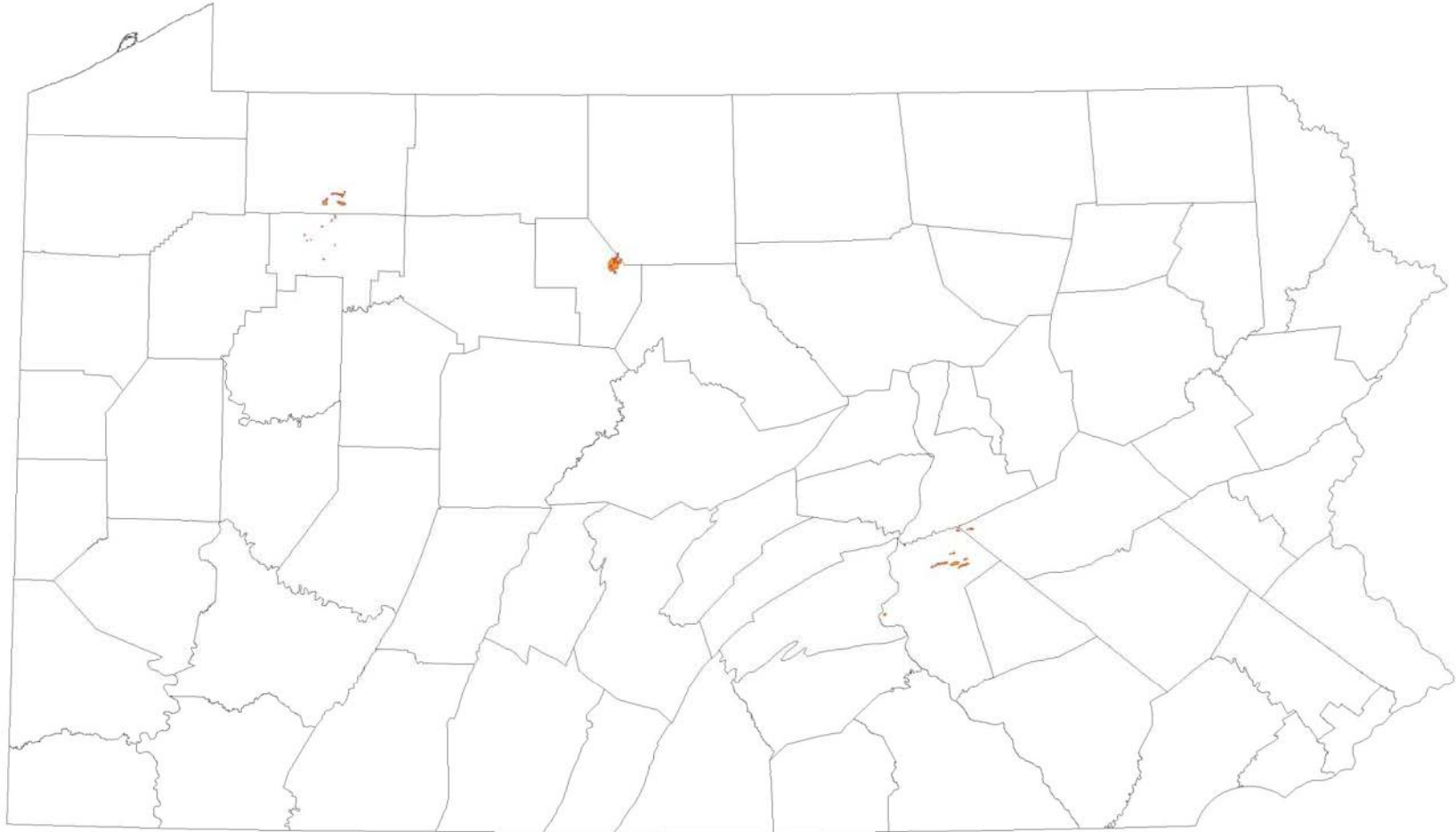


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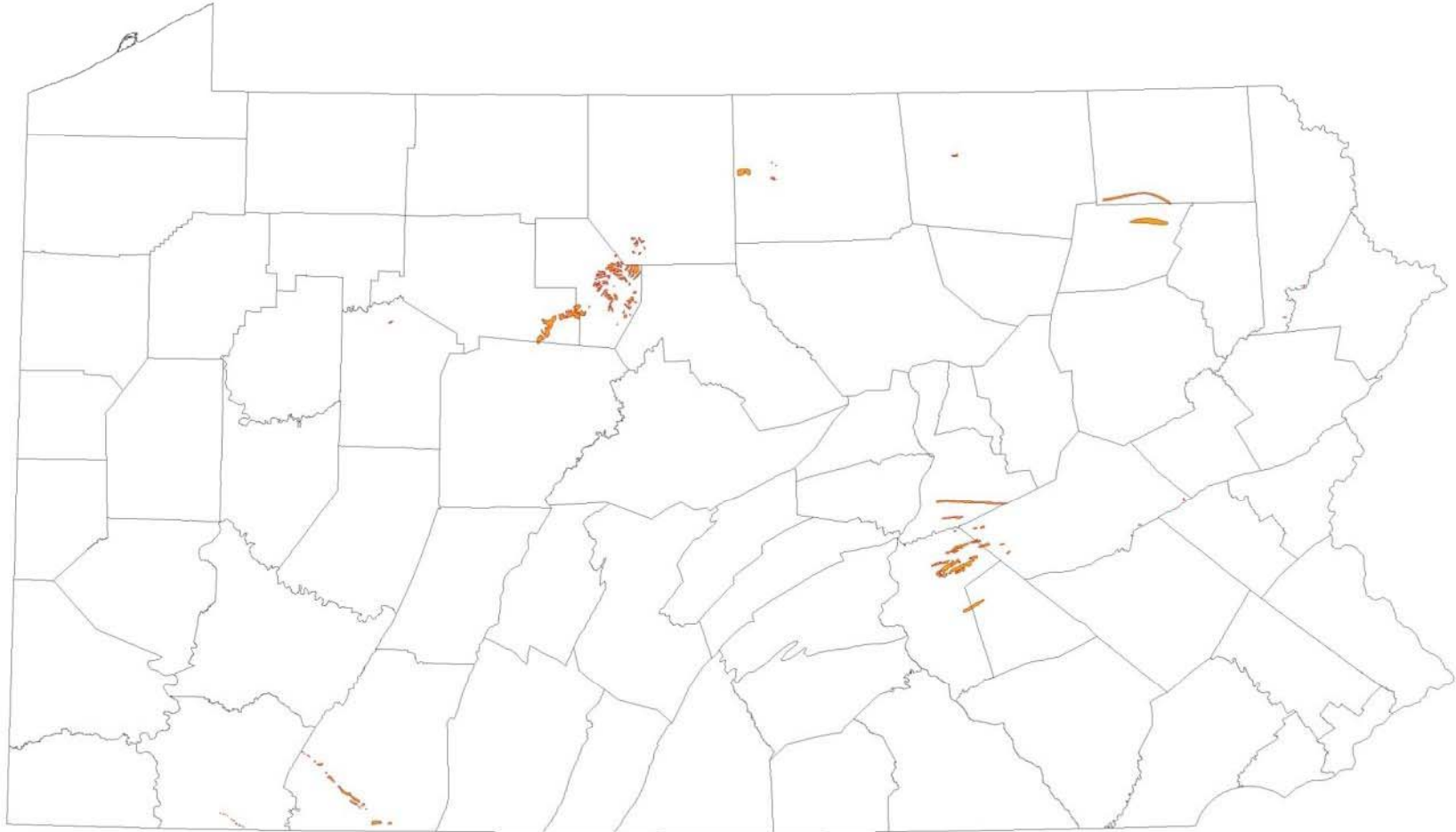


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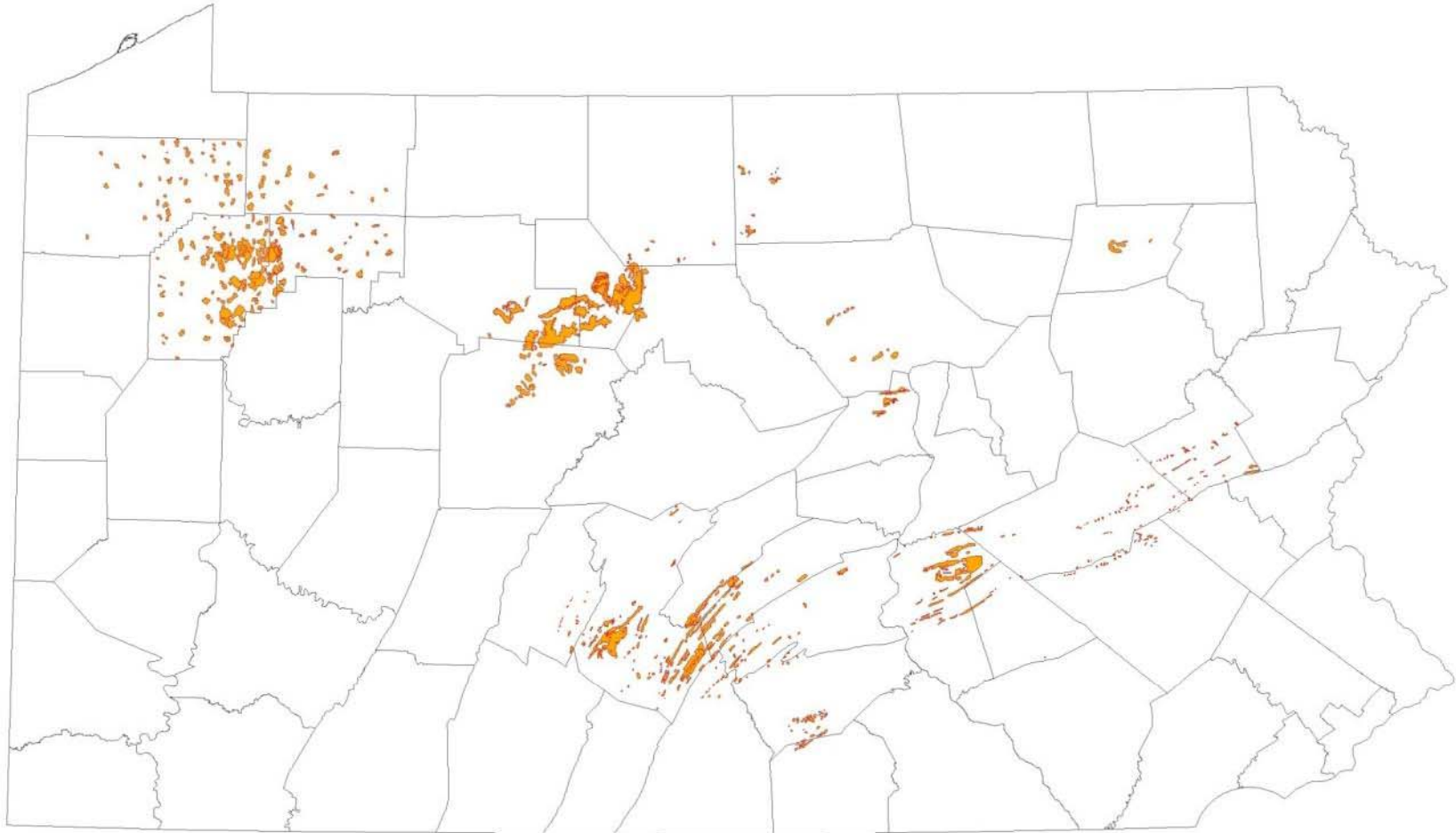


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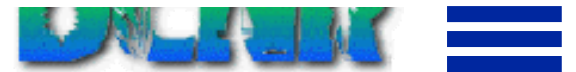
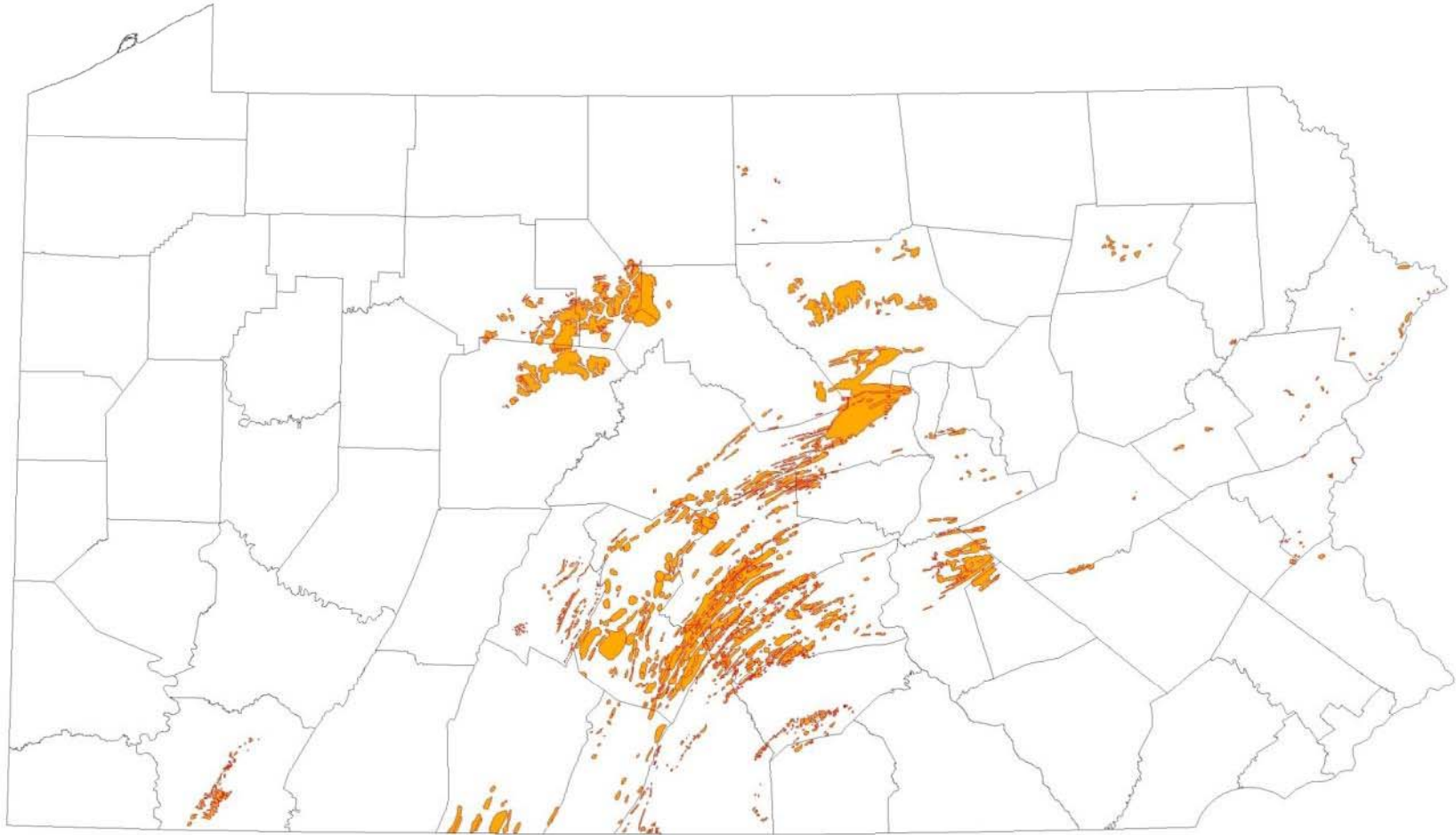


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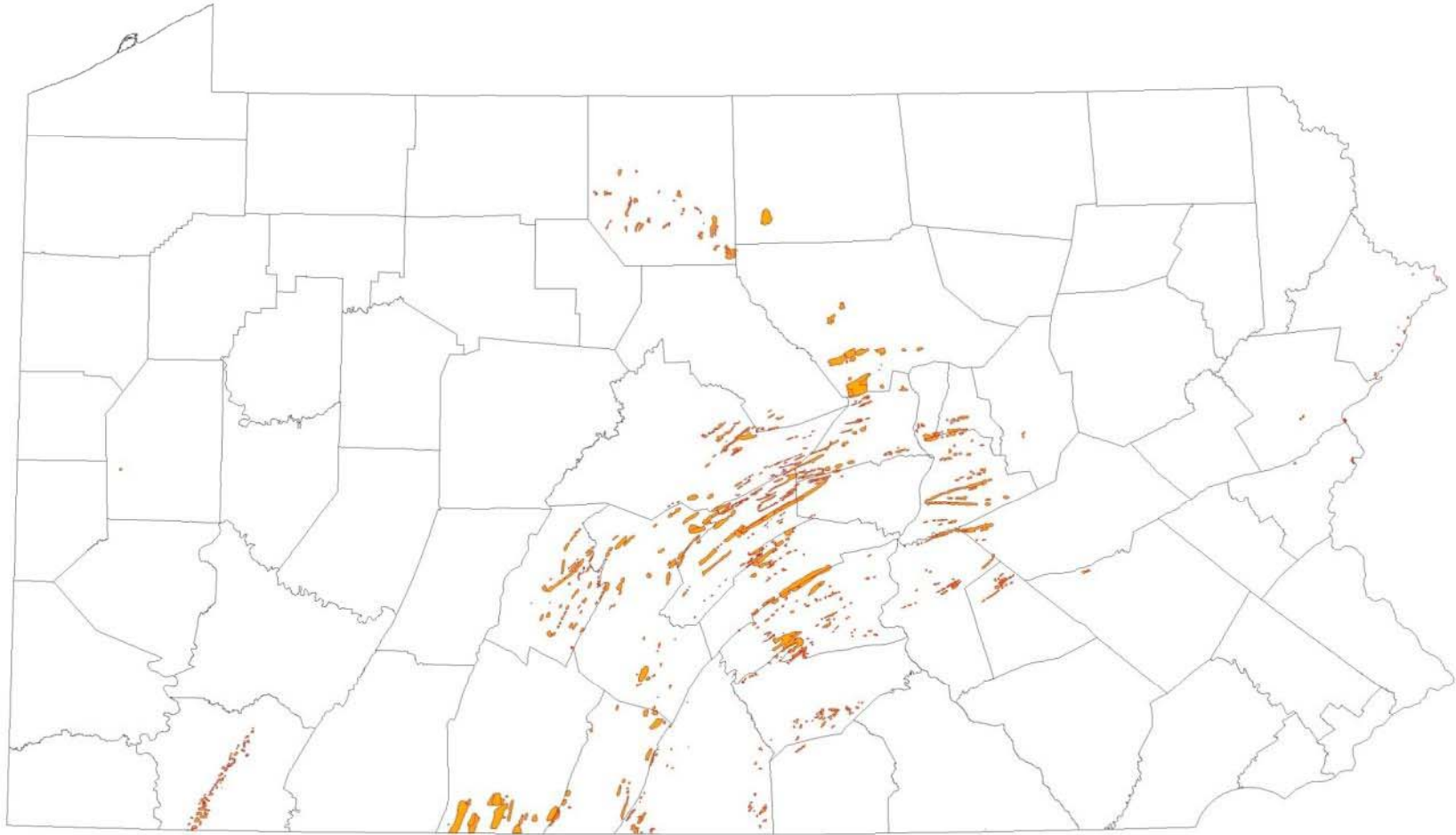


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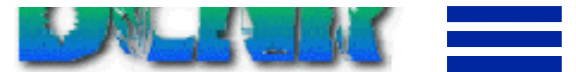
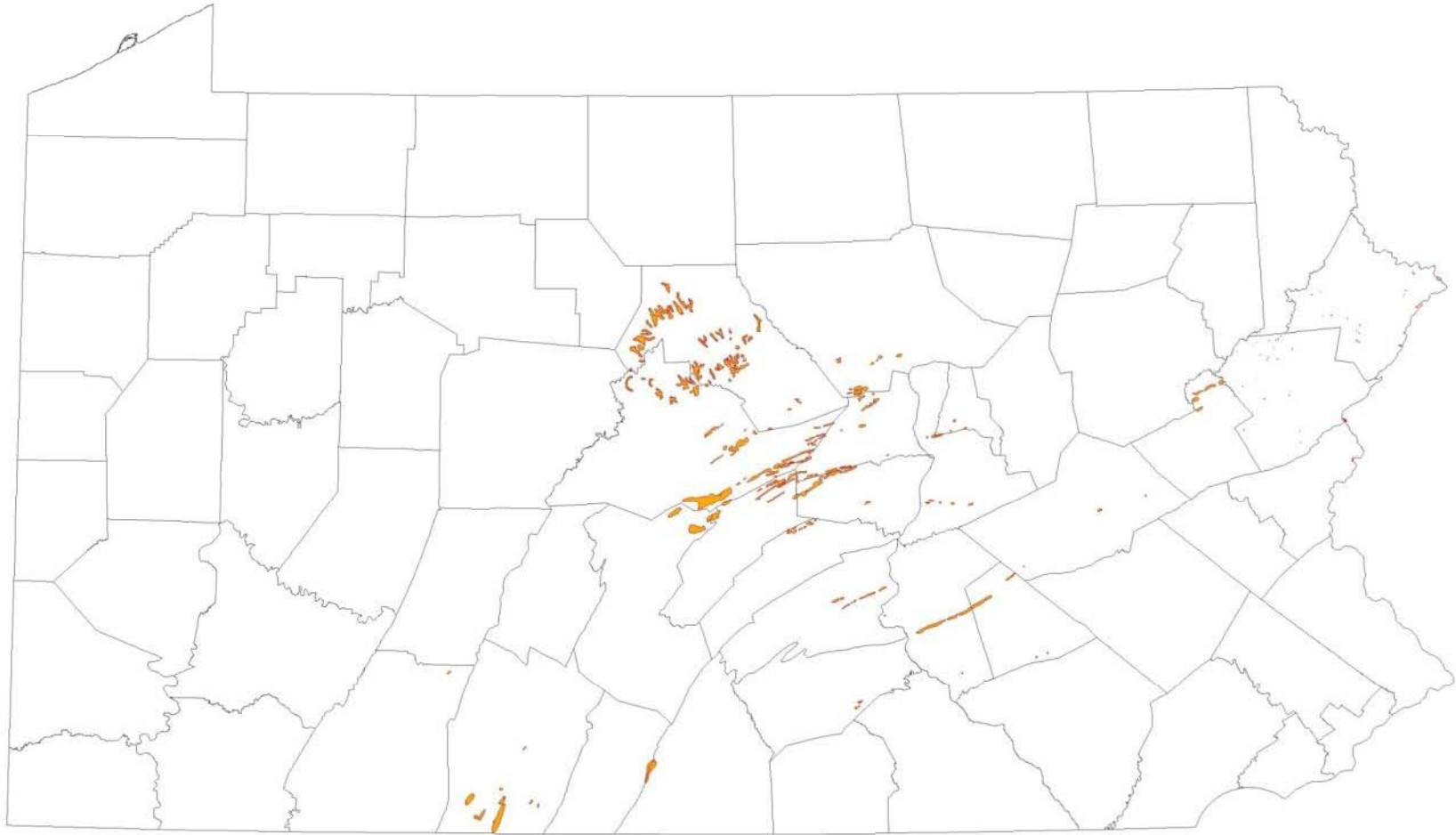


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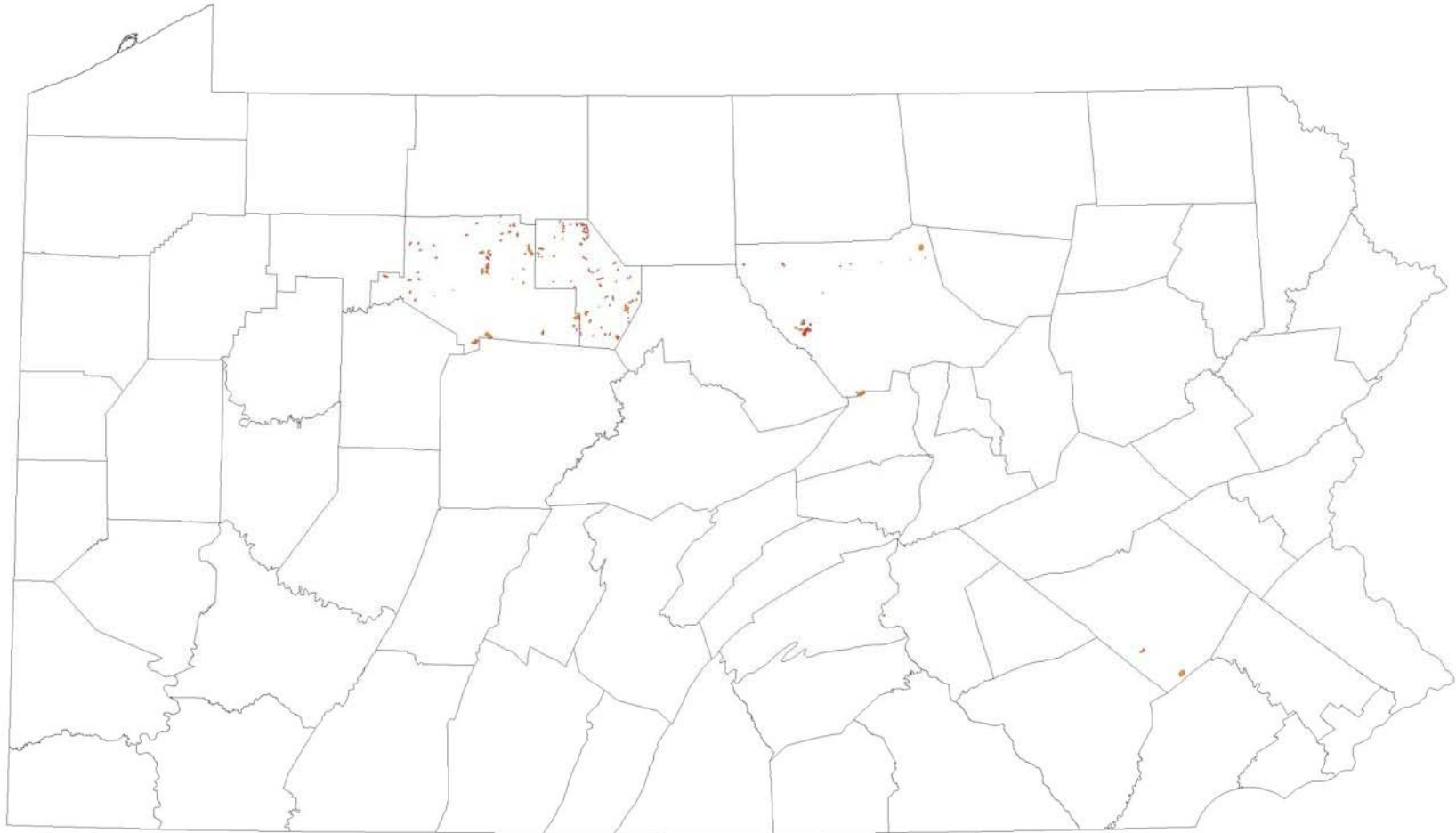


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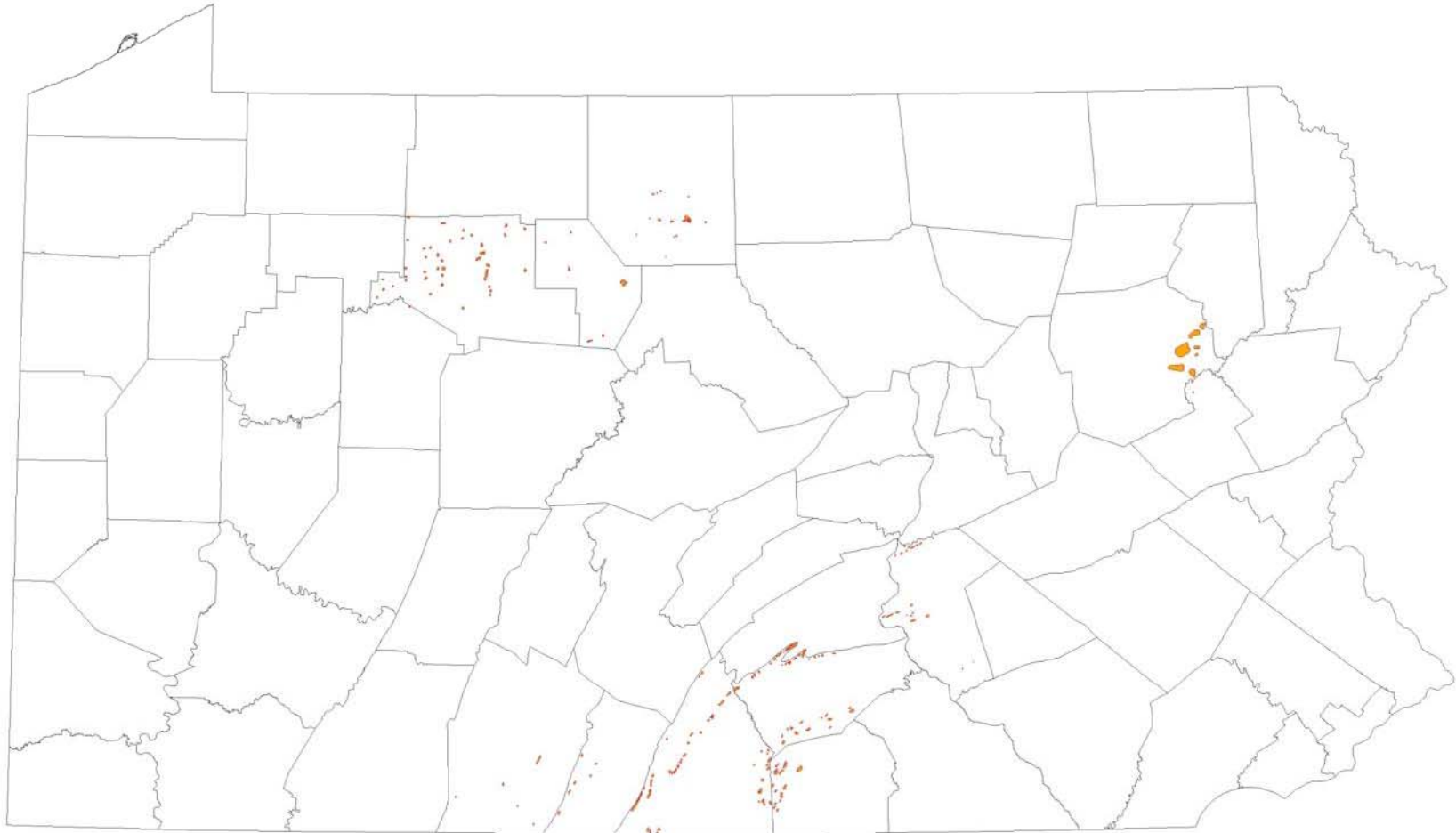


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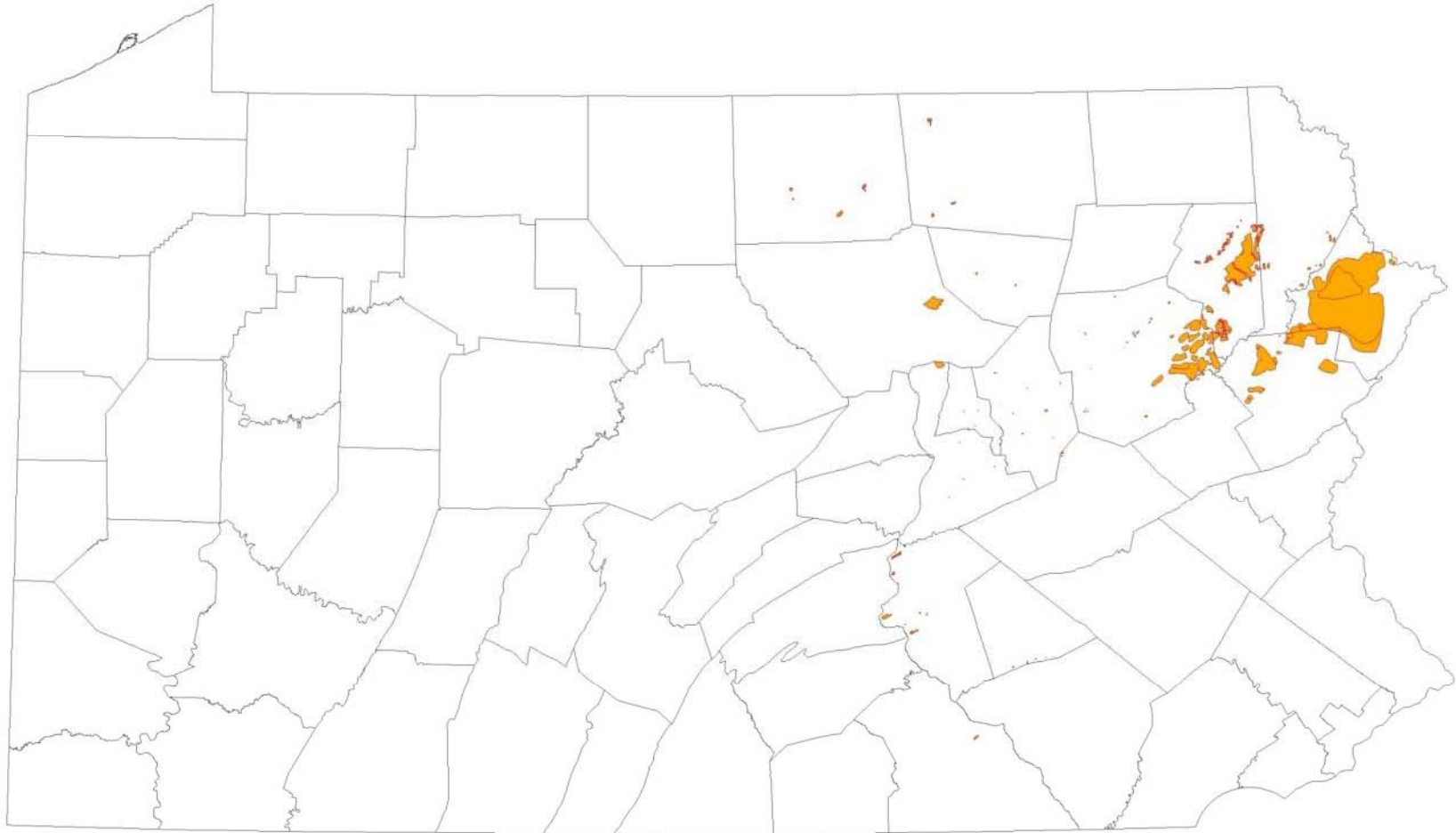


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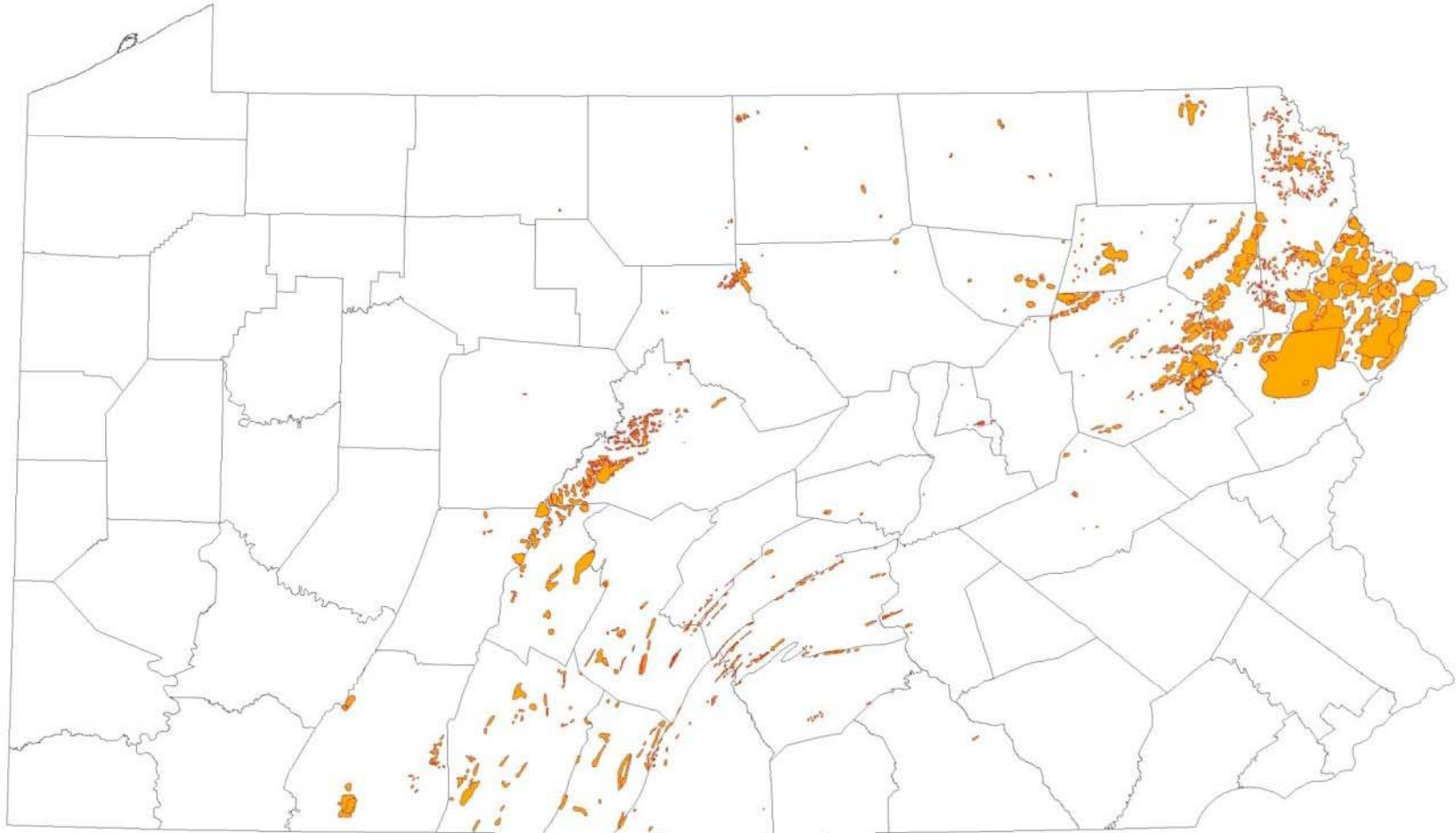


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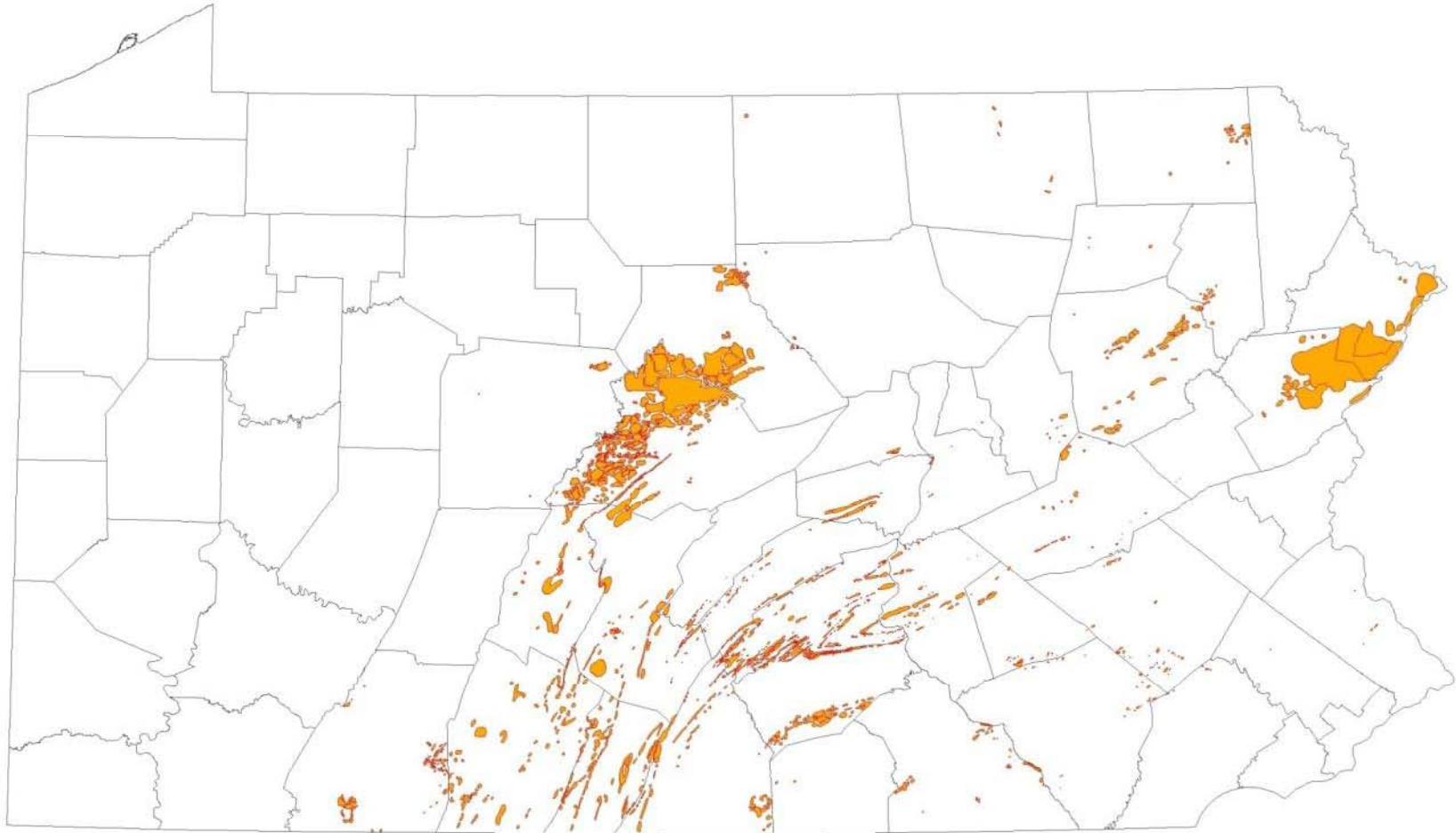


2006





2007





- Brown Marmorated Stinkbug
Halyomorpha halys

- Found in Allentown 1998

Damaging to fruit crops

- Now found coast to coast
- Egg parasitoid wasp found
- Can parasitize 80% of the eggs





David R. Lance



G. Brust





Gypsy Moth

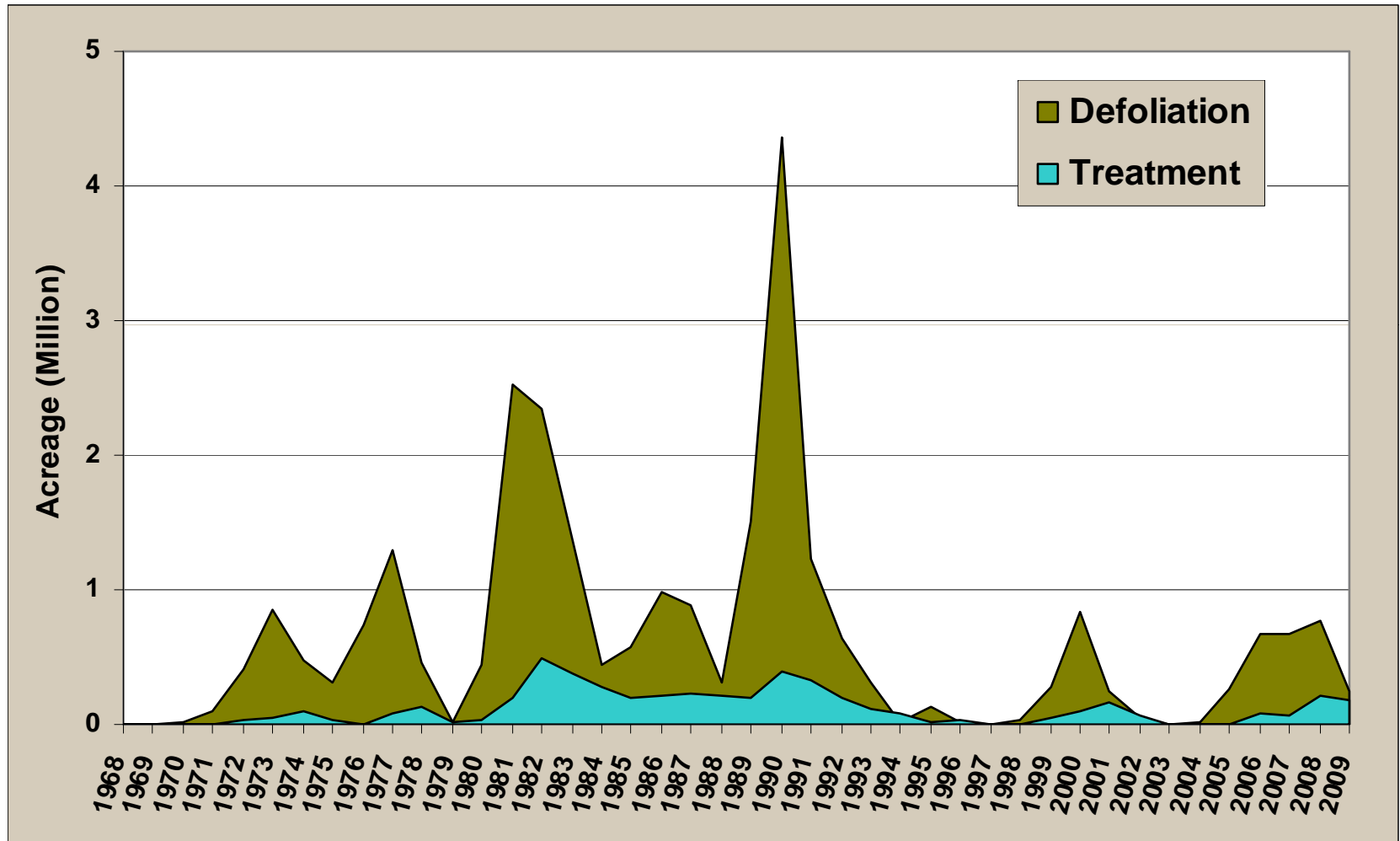


Lymantria dispar





Gypsy Moth Defoliation and Treatment Acreage 1968-2009





Eastern Tent Caterpillar

UGA0886011



Forest Tent Caterpillar

UGA2254042



Gypsy Moth





Gypsy Moth *Lymantria dispar* (L.)



- Most serious defoliator in NE;
- First arrived in PA in 1932..... now throughout state
- Repeated defoliations slow tree growth & kill many trees





Entomophaga maimaiga





Emerald Ash Borer

Agrilus plannipennis



David A. Schmit PADCNR





*Emerald ash borer adults emerging
note D-shaped exit hole*

David A. Schmit PADCNR





Emerald Ash Borer

- *Agrilus planipennis* (Buprestidae)
- Native to Asia, arrived approximately 1992
- Detected in MI in July 2002, in PA in 2007
- Present in 15 states and 2 Canadian provinces
- Been in PA since about 2000
- Moved of firewood, and ash nursery stock
- Phloem Feeder – kills trees in 3-4 years
- Attacks all Ash Species (*Fraxinus* spp.)



Howard Russell, Michigan State University, Bugwood.org

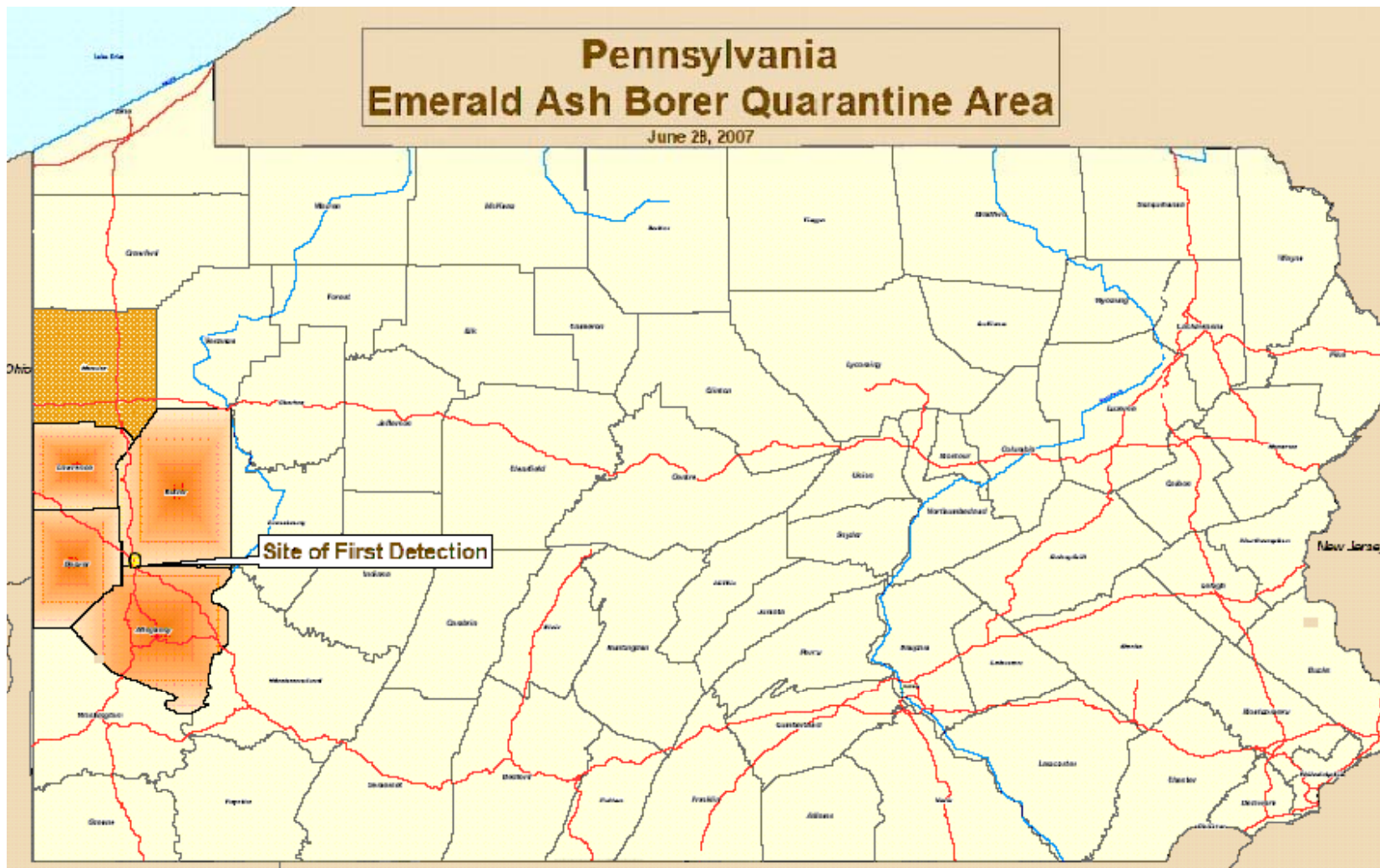


David A. Schmit PADCNR





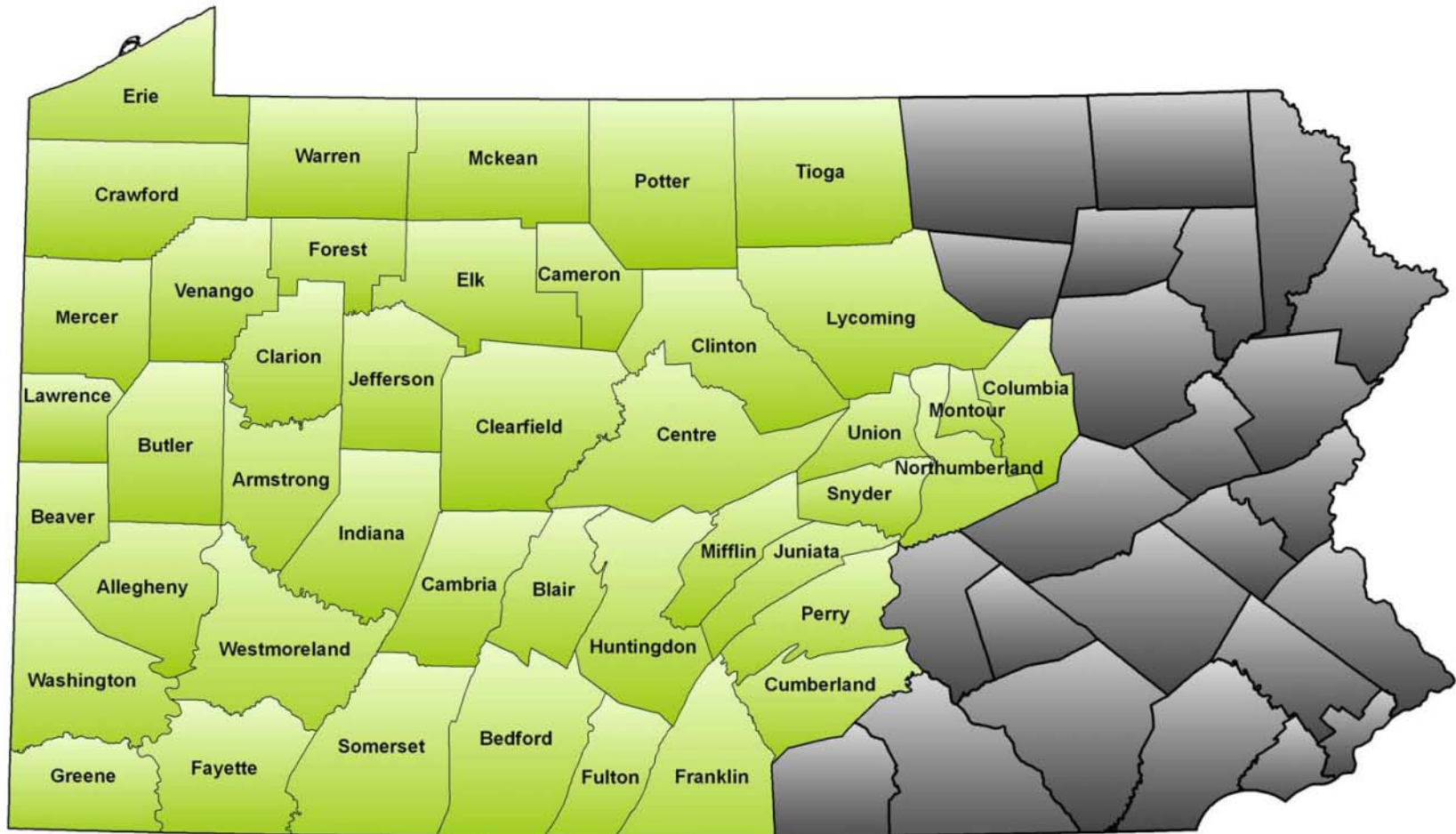
7 County Quarantine in June 2007





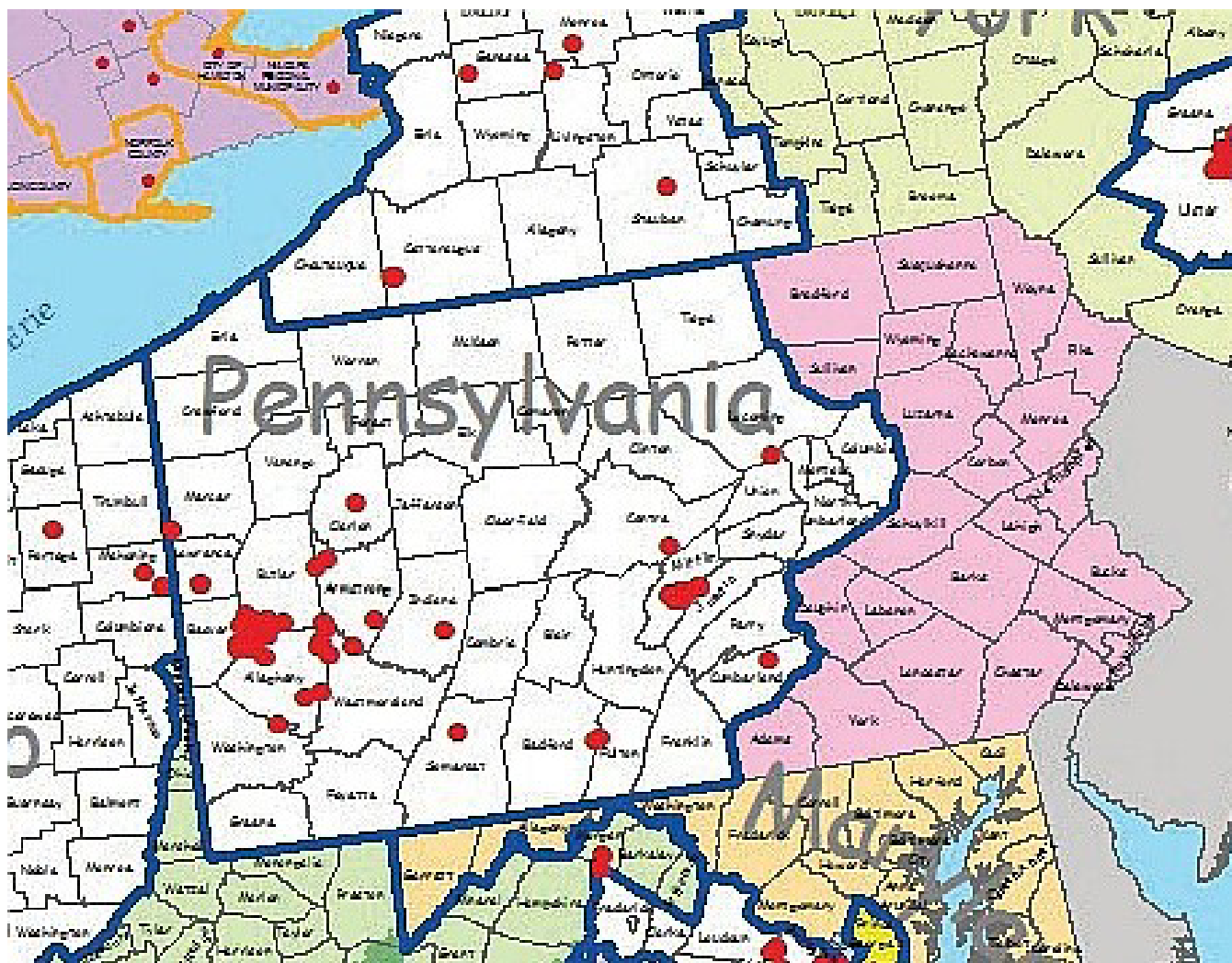
Pennsylvania Department of Agriculture Map of Counties

Quarantined for Emerald Ash Borer July 30, 2010





PA. EAB hits as of August 2010

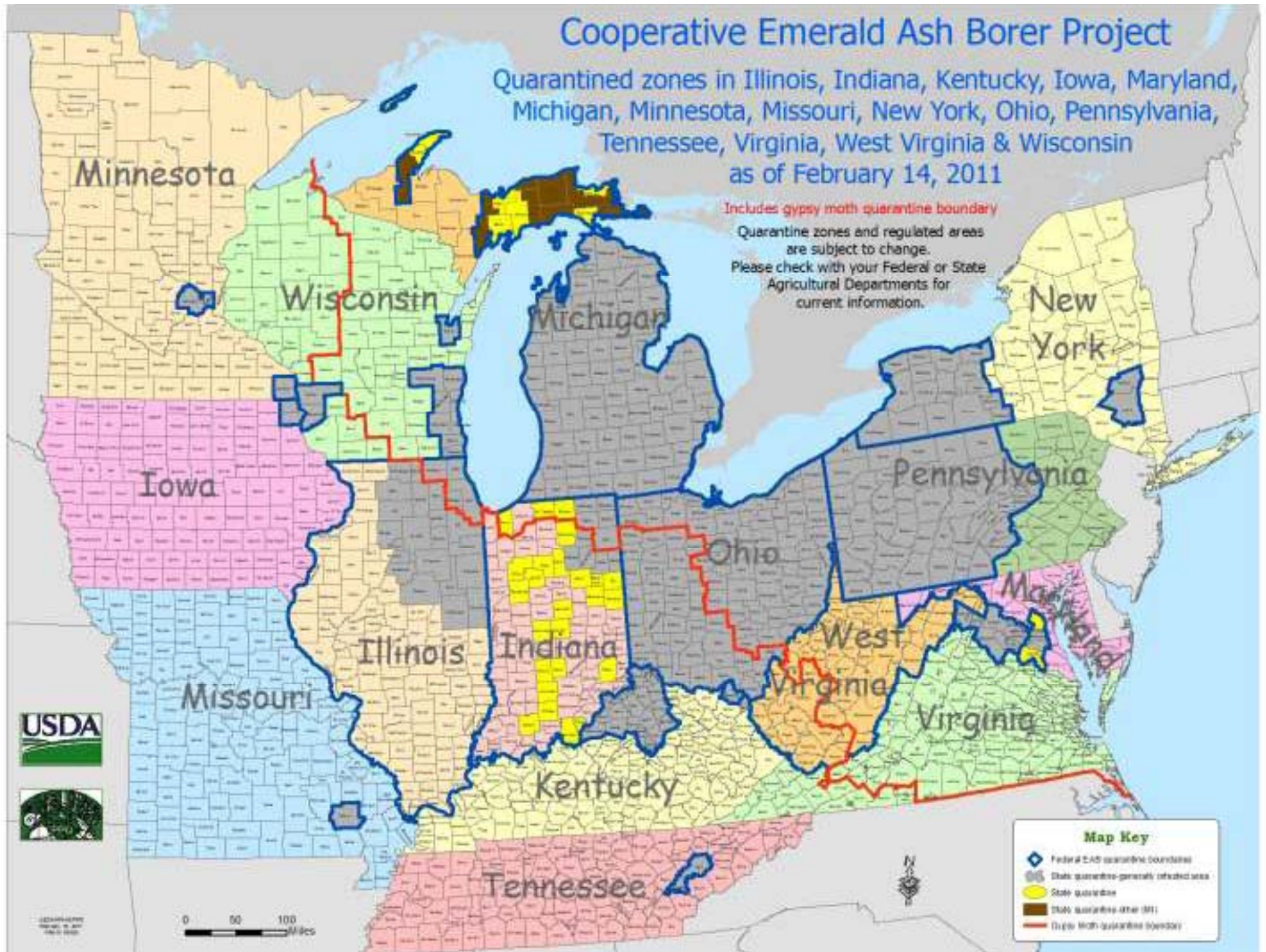


Cooperative Emerald Ash Borer Project

Quarantined zones in Illinois, Indiana, Kentucky, Iowa, Maryland, Michigan, Minnesota, Missouri, New York, Ohio, Pennsylvania, Tennessee, Virginia, West Virginia & Wisconsin as of February 14, 2011

Includes gypsy moth quarantine boundary

Quarantine zones and regulated areas are subject to change. Please check with your Federal or State Agricultural Departments for current information.



Larvae and Galleries





EAB pre-pupa and pupa



Key Symptom of EAB on Ash



Woodpeckers feeding on larvae in pupal cells



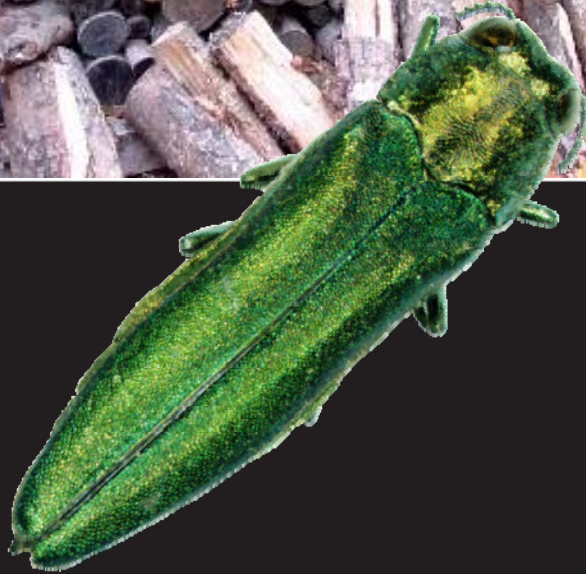
Symptoms of EAB on Ash





The Dangers of Street Tree monoculture



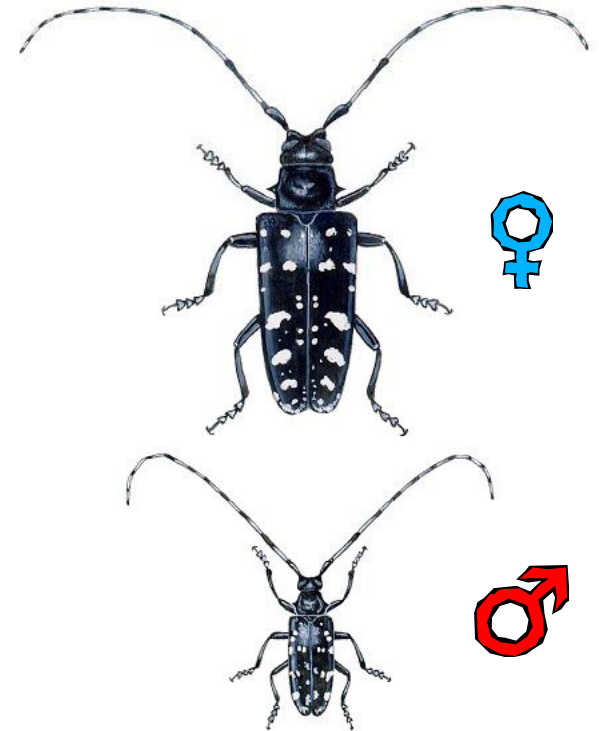


DON'T MOVE FIREWOOD



Asian Longhorned Beetle

Anoplophora glabripennis



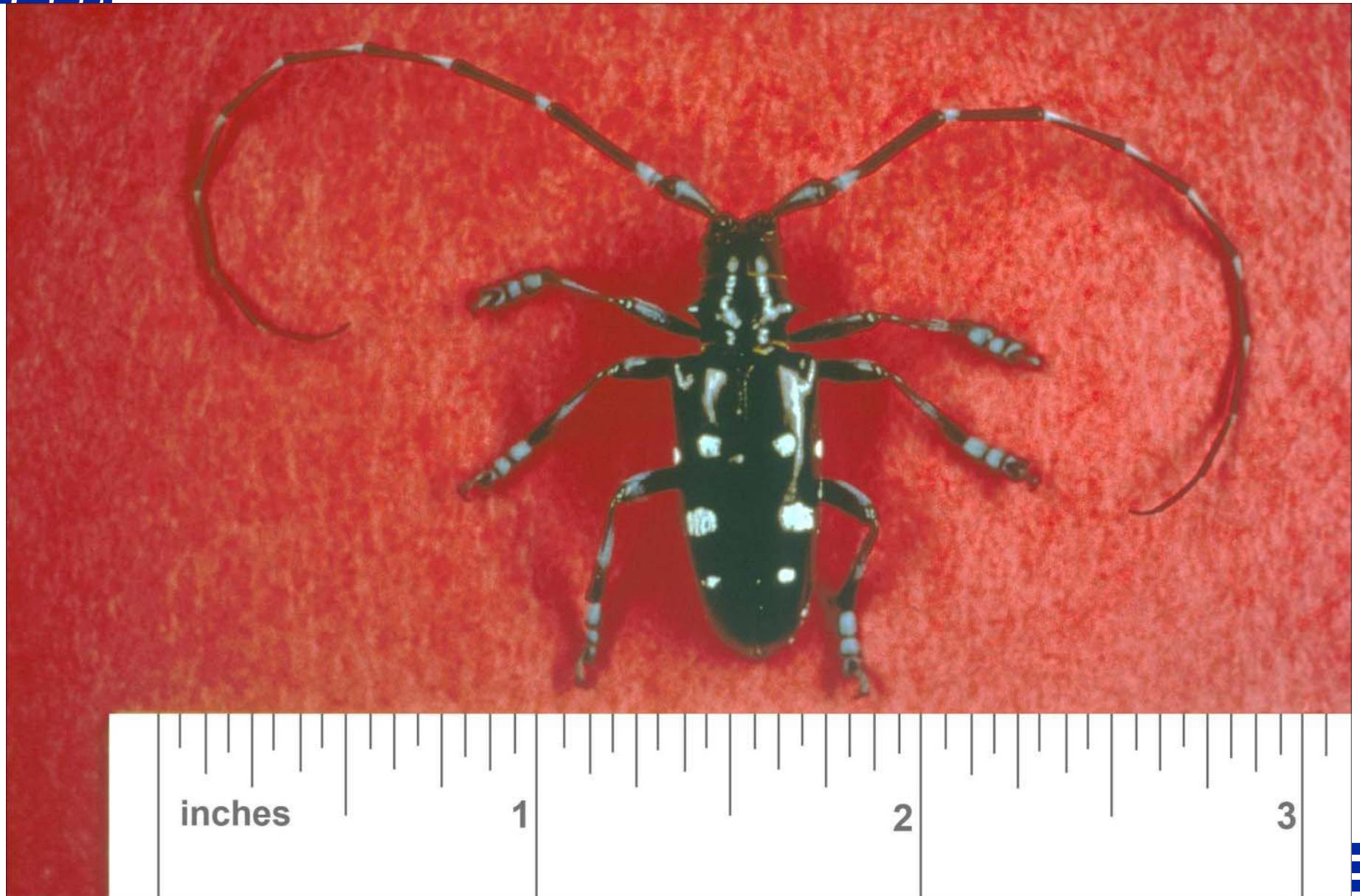


If the Asian Longhorned Beetle becomes established here, it has the potential to cause more damage than Dutch elm disease, chestnut blight, and gypsy moths combined.

United States Department of Agriculture •
Animal and Plant Health Inspection Service
January 2005



Adult ALB



ALB Life Forms





Before ALB



After ALB





Whitney Cranshaw, Colorado State University, Bugwood.org

Thousand Cankers Disease

This Insect / disease complex affecting black walnut –*Juglans nigra*, involves the Walnut Twig Beetle, *Pityophthora juglandis*, and the newly identified fungus *Geosmithia morbida*. It has been identified in Washington, Oregon, California, Idaho, Utah, Colorado, Arizona, New Mexico, and now Tennessee.





Walnut Twig Beetle

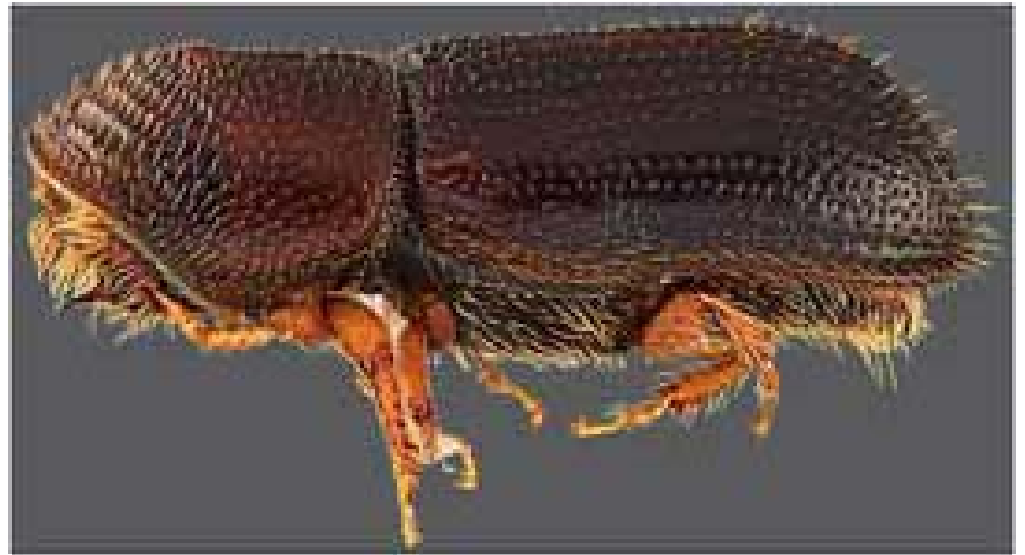
Pityophthorus juglandis



**Photo by Jim LaBonte, Oregon Department of Agriculture.*



Photo by Kathy Keatley Garvey



**Photo by Jim LaBonte, Oregon Department of Agriculture.*



walnut twig beetle (*Pityophthorus juglandis*) on black walnut (*Juglans nigra*)



5406087

Ned Tisserat, Colorado State University, Bugwood.org

Forest Tent Caterpillar
Malacosoma disstria



forest tent caterpillar (*Malacosoma disstria*)



UGA1394035

James B. Hanson, USDA Forest Service, Bugwood.org



forest tent caterpillar (*Malacosoma disstria*)



James B. Hanson, USDA Forest Service, Bugwood.org





Fall Cankerworm
Alsophila pomerata

David A. Schmit PADCNR

David A. Schmit PADCNR



Fall Cankerworm
Alsophila pomerata

David A. Schmit PADCNR

David A. Schmit

Fall Cankerworm
Alsophila pomerata





Walking Stick
Diapheromera femorata

David A. Schmit PADCNR



Walking Stick
Diaperomera femorata

David A. Schmit PADCNR

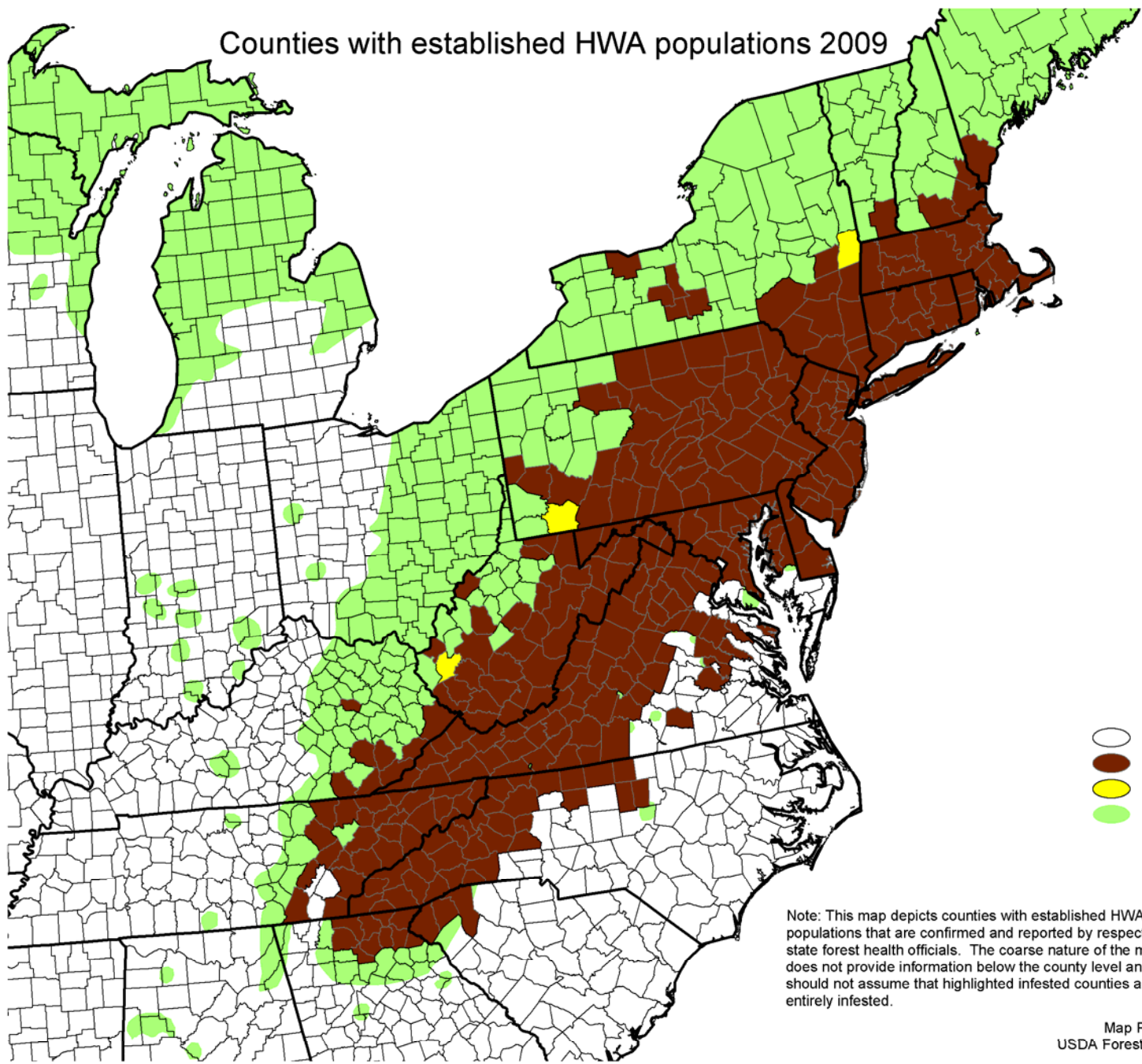


David A. Schmit PAD/CNR

Hemlock Woolly Adelgid



Counties with established HWA populations 2009



- Uninfested Counties
- Infested Counties
- Newly Infested in 2009
- Native Range of Hemlock

Note: This map depicts counties with established HWA populations that are confirmed and reported by respective state forest health officials. The coarse nature of the map does not provide information below the county level and users should not assume that highlighted infested counties are entirely infested.

Map Produced by:
USDA Forest Service 5/26/2010



David A. Schmit

**Forest Health Specialist
Bureau of Forestry**

Pennsylvania DCNR

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