clustermax
Stata command to create clusters from point coordinates

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Overview

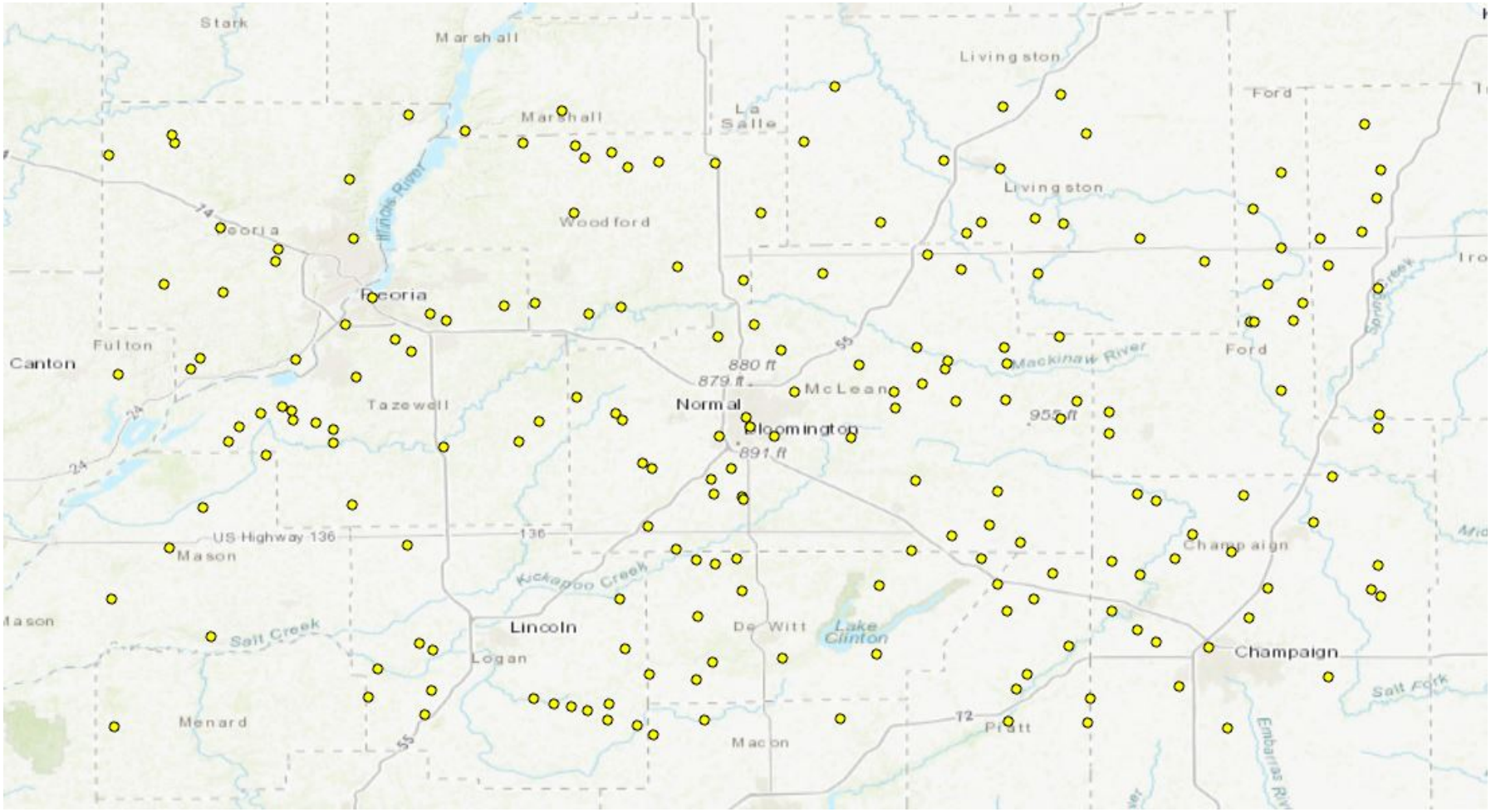
Overview

Examples

Generate 200 random points in Illinois, USA

```
. set seed 1
. set obs 200
. gen lat = 40 + runiform()
. gen lon = -90 + runiform()*2
```

Examples


Stark
Marshall
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Canton
Tazewell
Normal
McLean
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880 ft
879 ft
891 ft
955 ft
Mackinaw River
Ford
US Highway 136
Mason
Champaign
Kickapoo Creek
Salt Creek
Lincoln
De Witt
Lake Clinton
Logan
Champaign
Salt Fork
Menard
Piatt
Macon

Examples

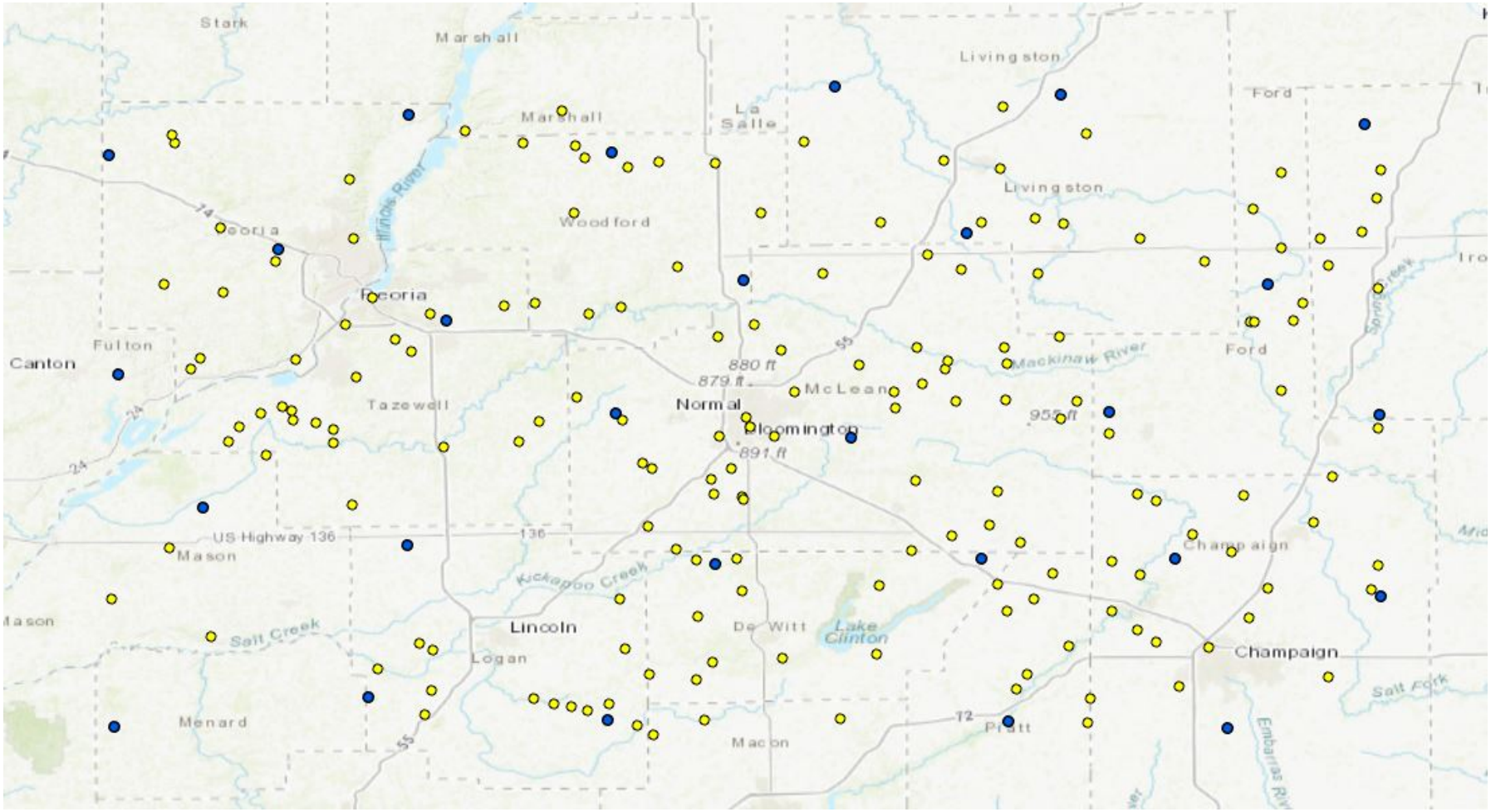
Question:

> How many points with a minimum mutual distance of 25km can be drawn from this map?

Run the command:

```
. clustermax lat lon, gen(cid) n(1) between(25)
seed(1)
```

Examples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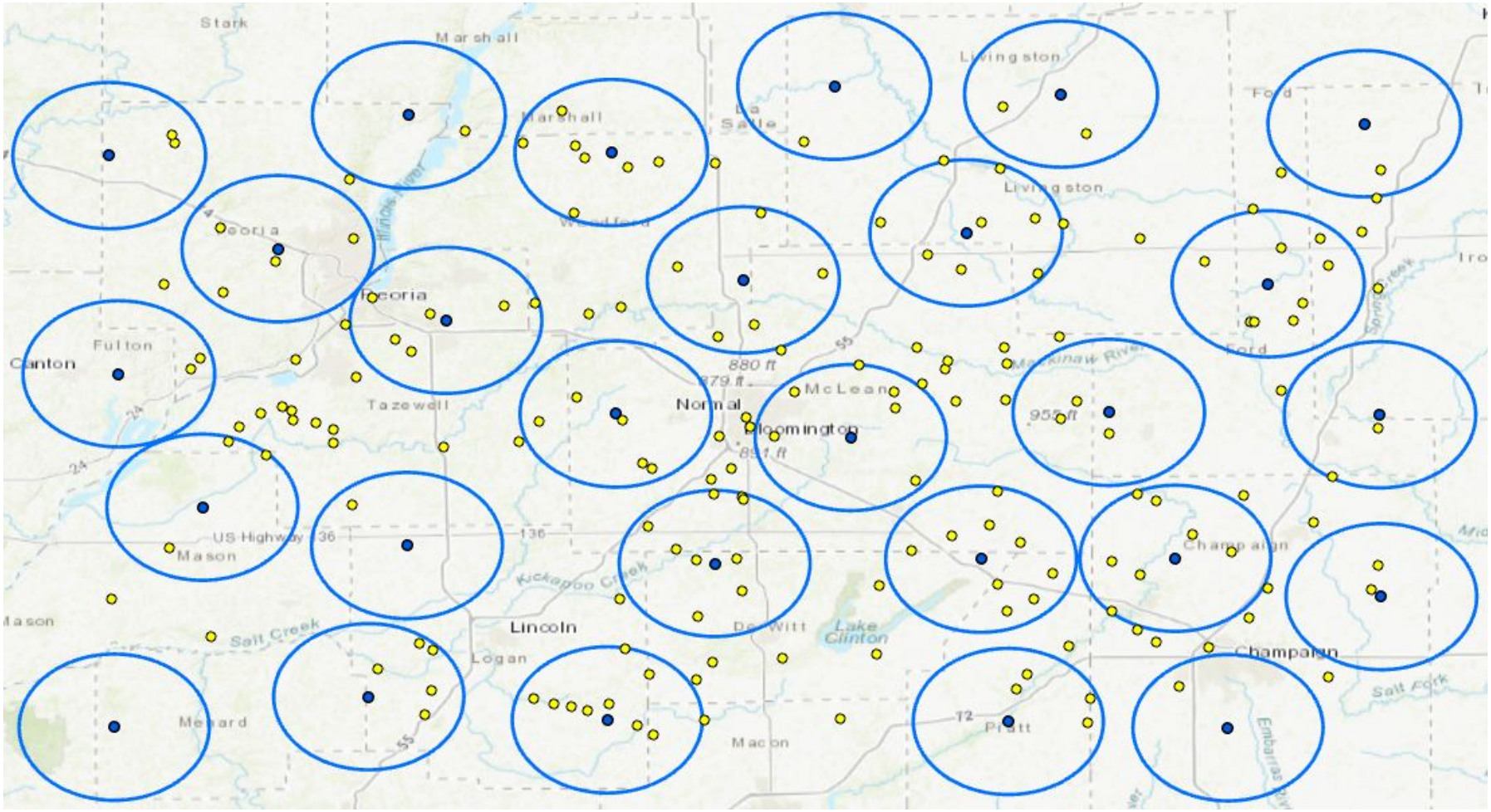
Examples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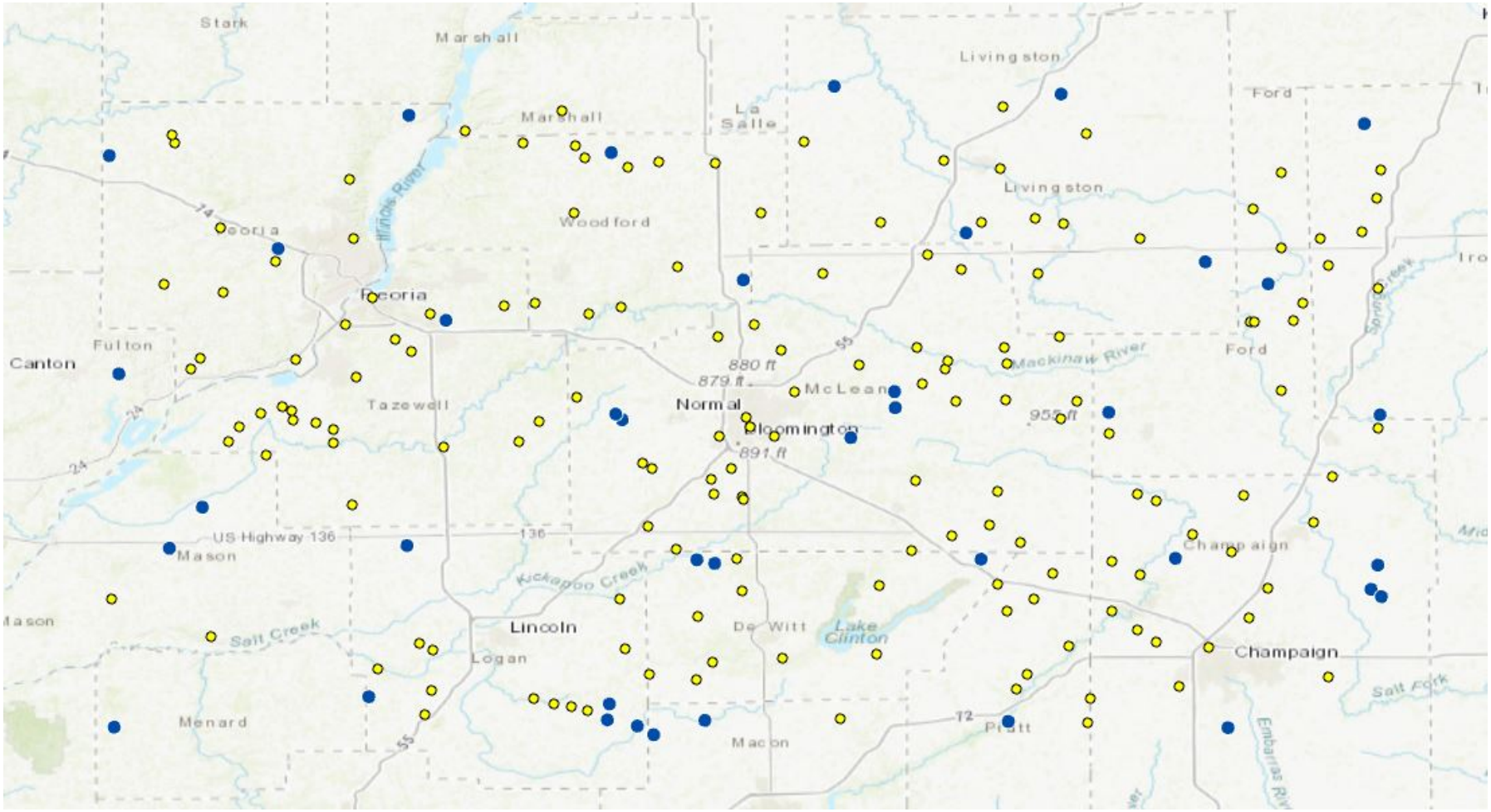
Examples

Can more points be added, given they satisfy the distance constraints?

```
. clustermax lat lon, gen(cid) n(1) between(25)
within(15) seed(1)
```

Examples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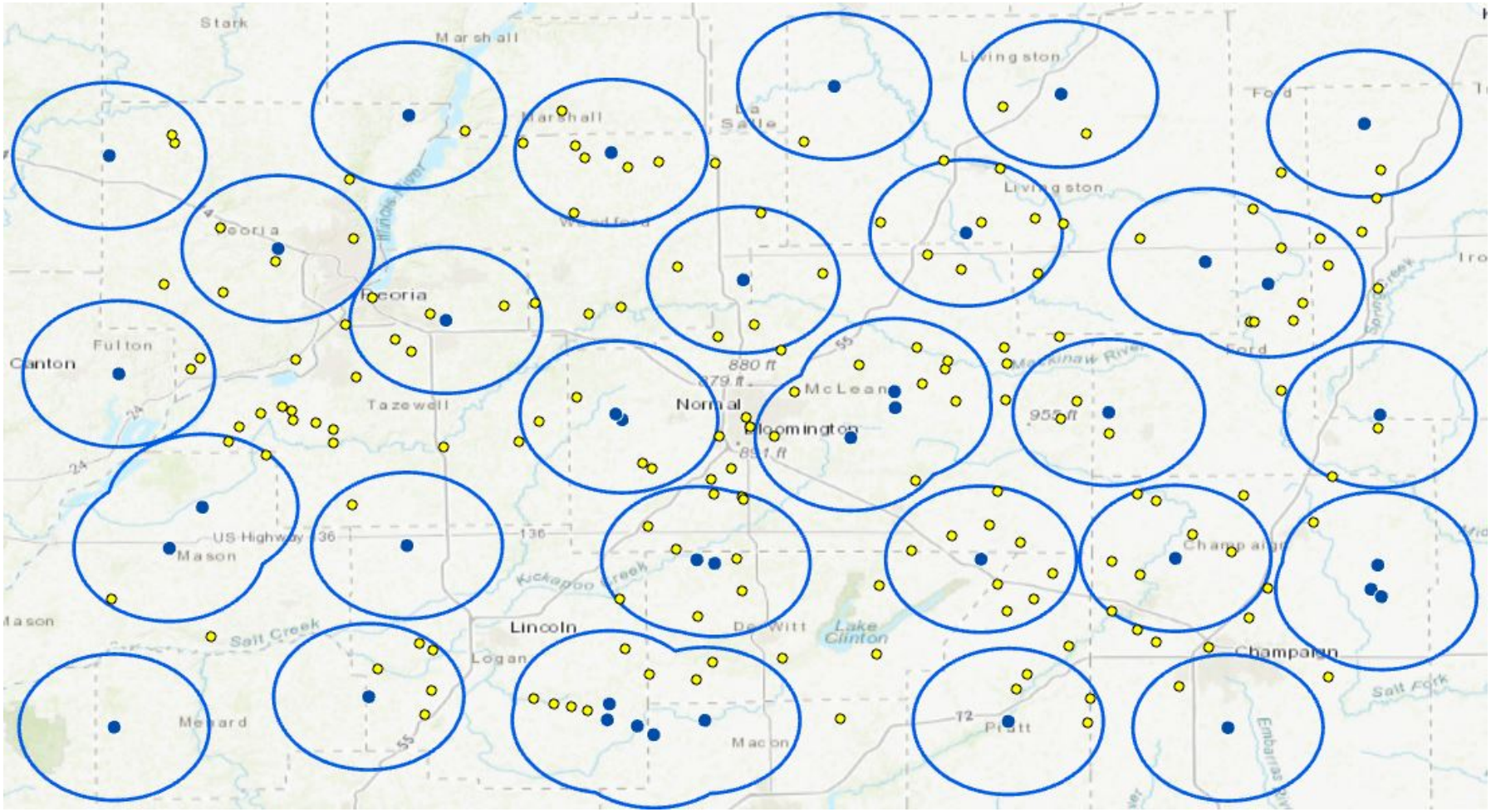
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880 ft
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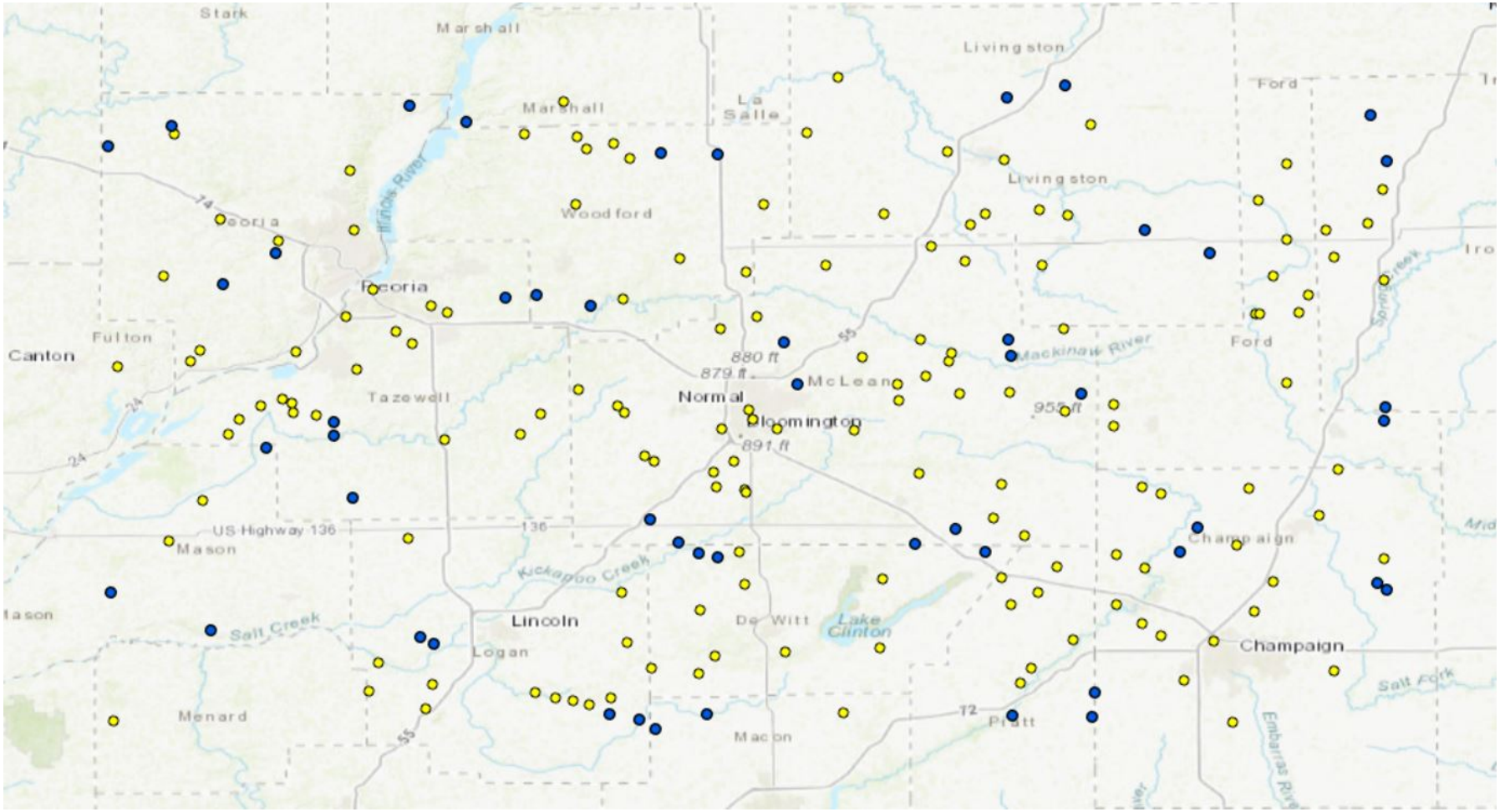
Examples

Two points per cluster:

```
. clustermax lat lon, gen(cid) n(2) between(25)
within(15) seed(1)
```

Examples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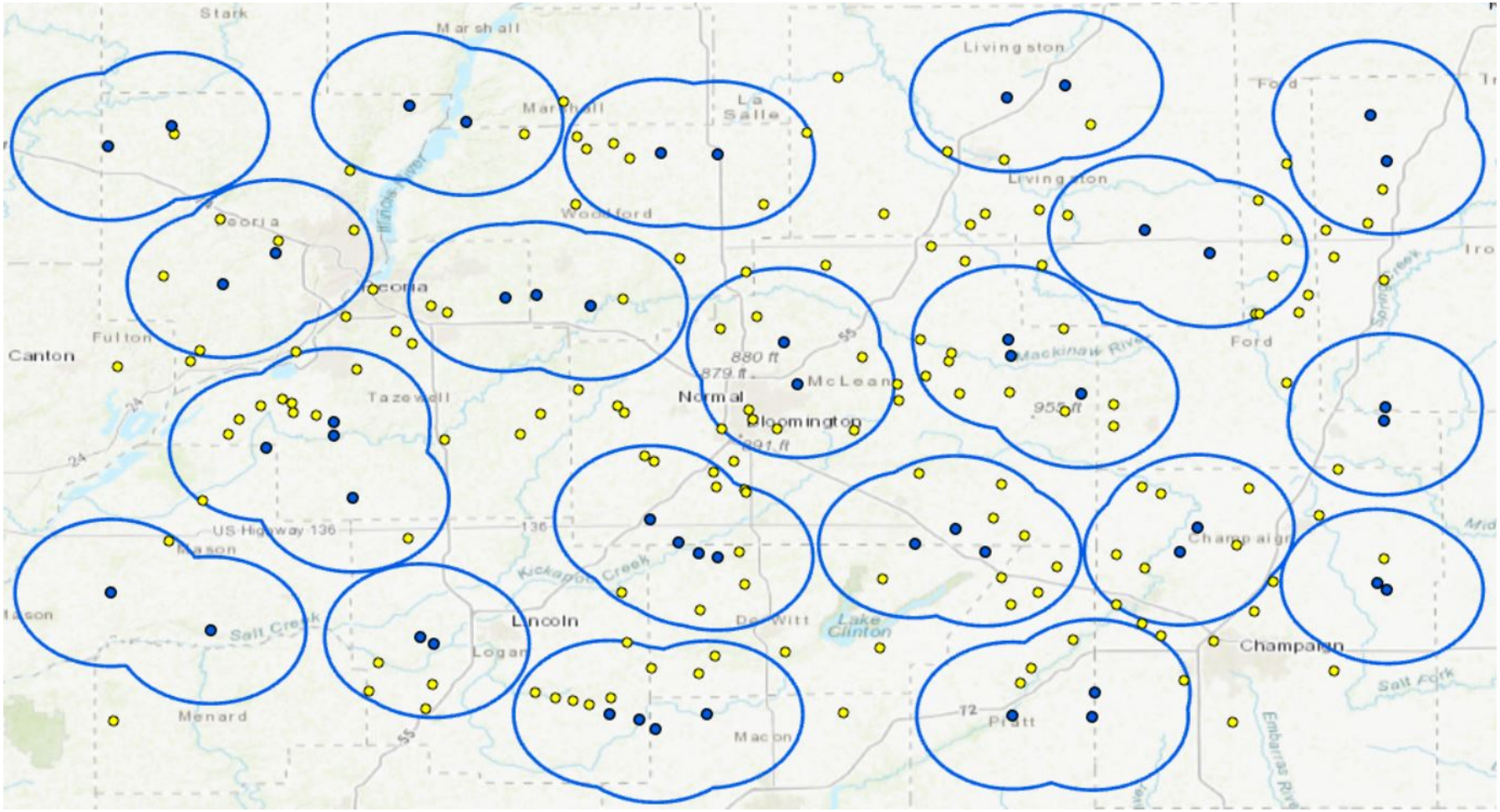
72
55

Examples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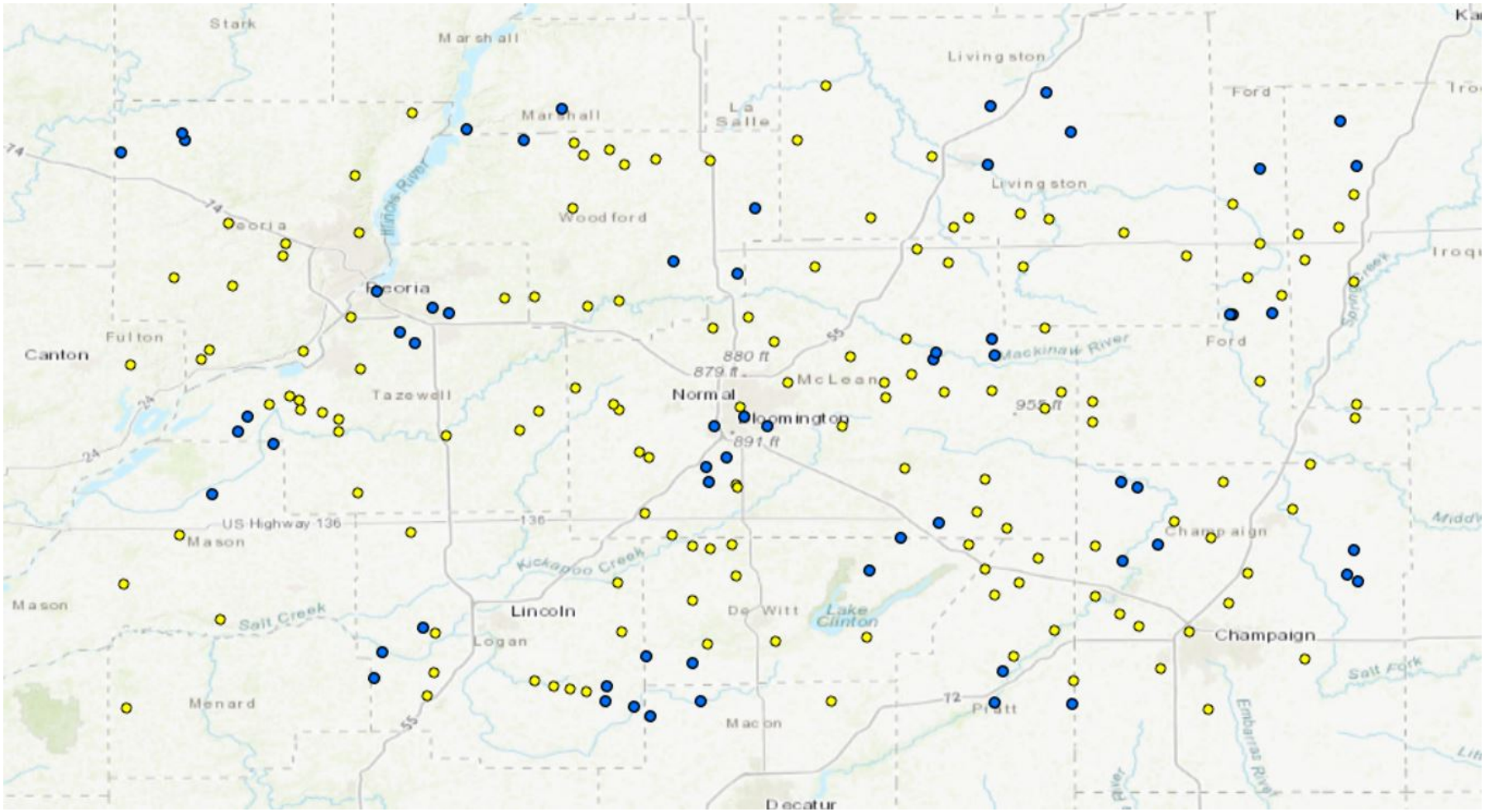
55
136
24

Examples

Three points per cluster:

```
. clustermax lat lon, gen(cid) n(3) between(25)
within(15) seed(1)
```

Examples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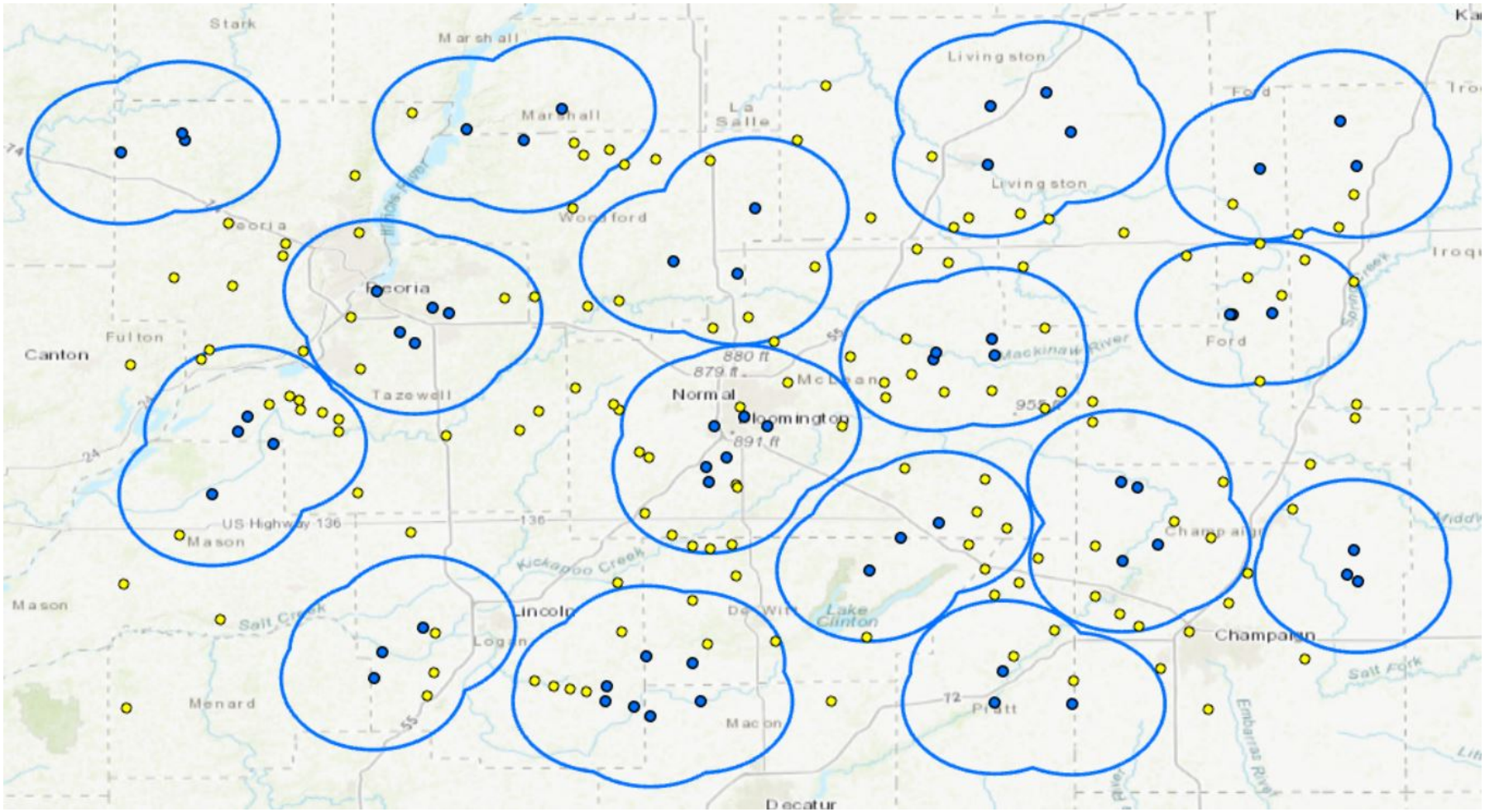
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Overview

The Algorithm

1. Find groups of *n*() points mutually in *within*() distance
2. Resolve *between*() cluster conflicts
3. Join additional points

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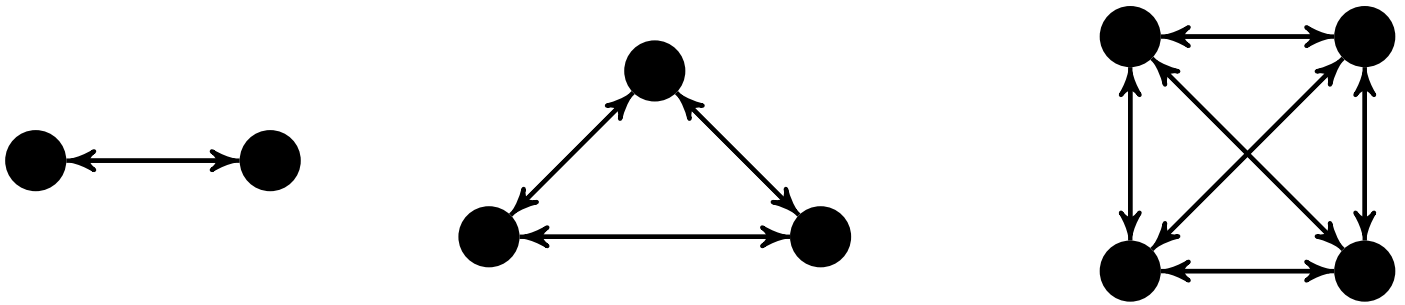

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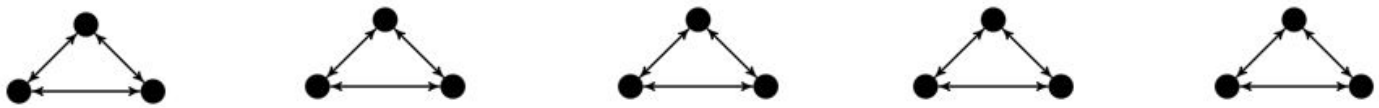

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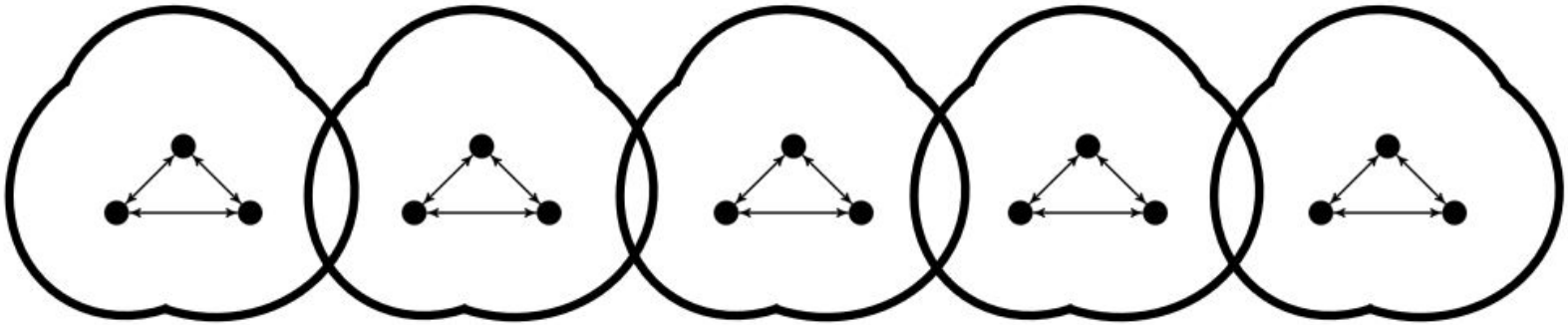

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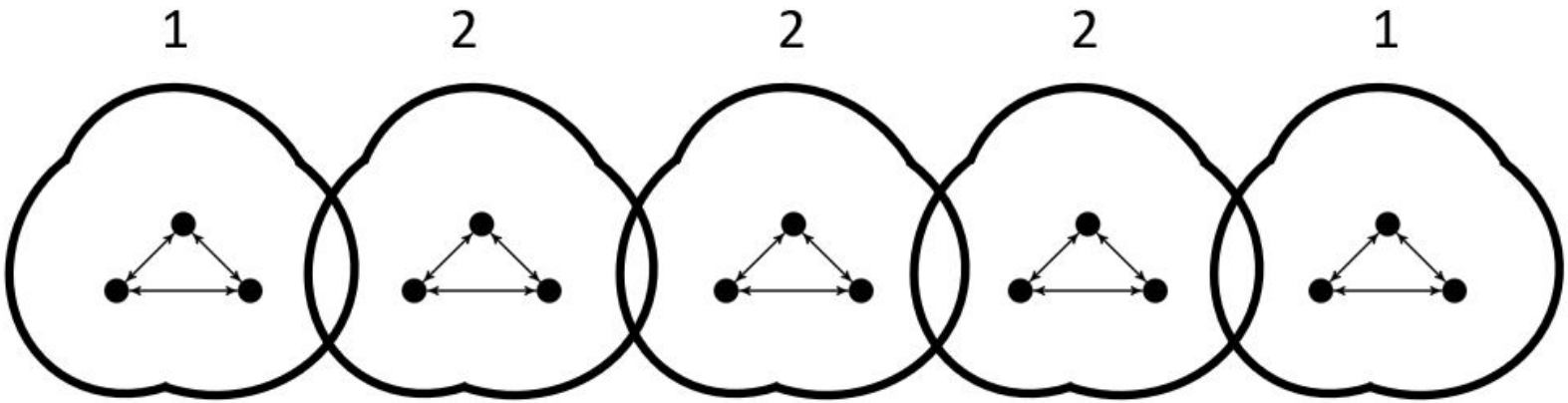

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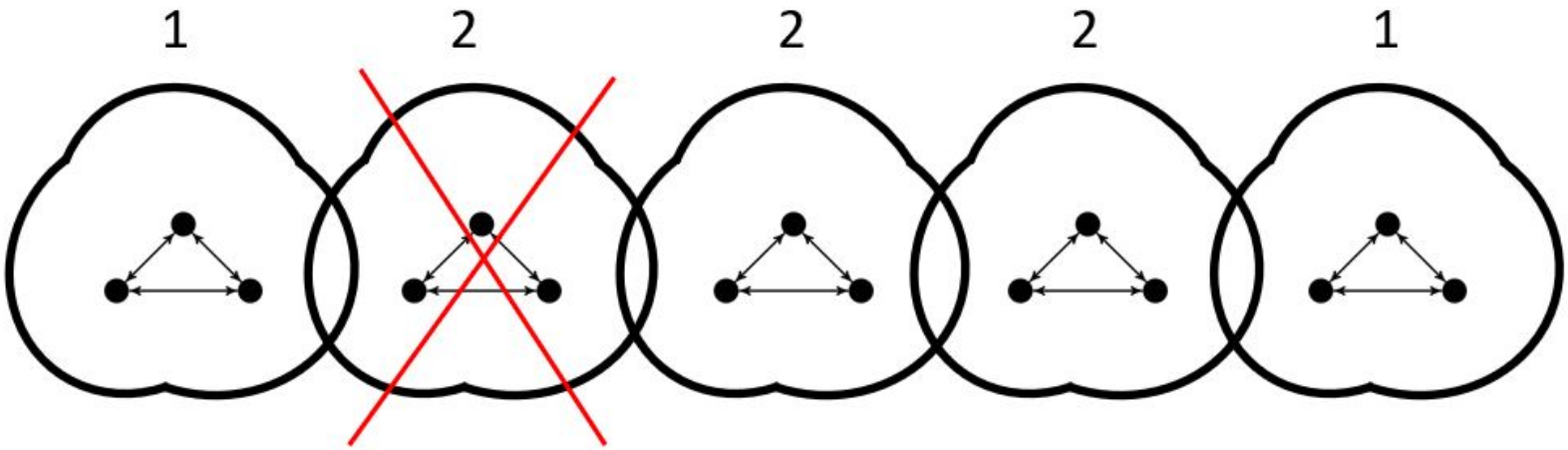

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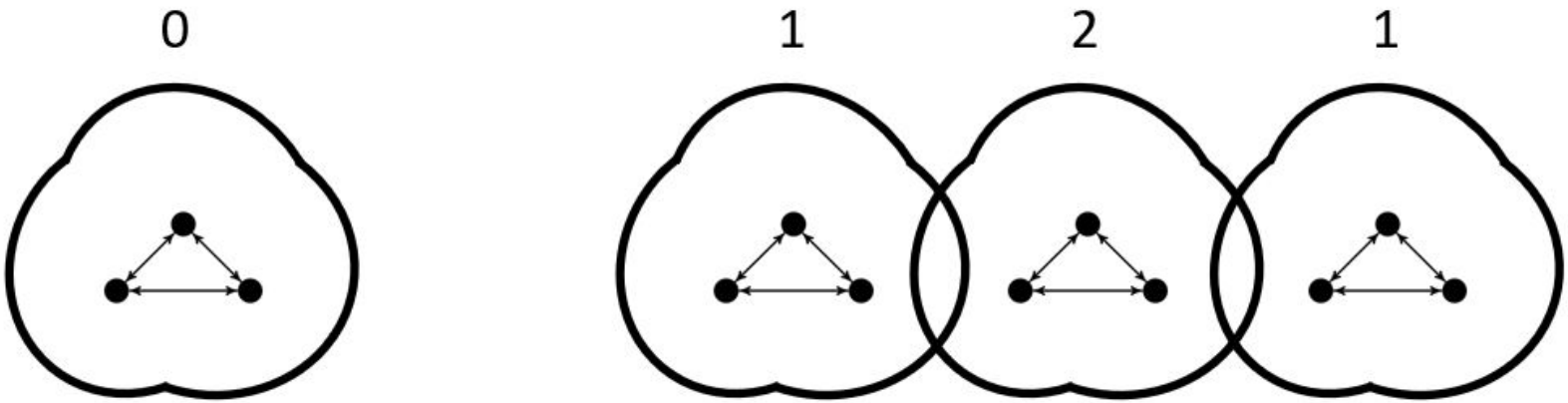

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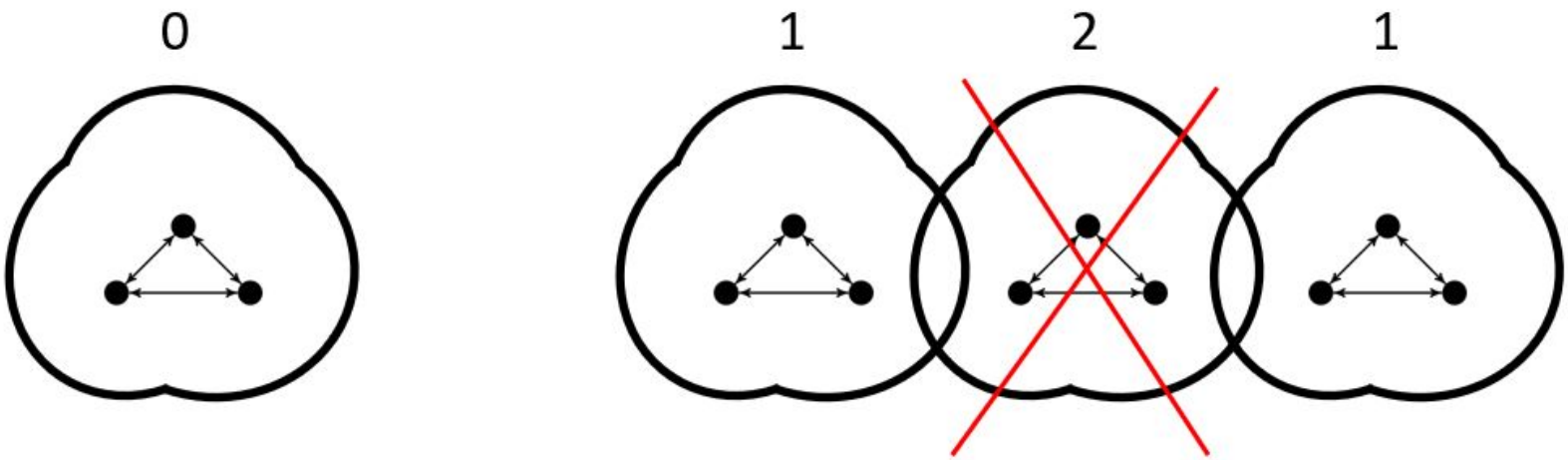

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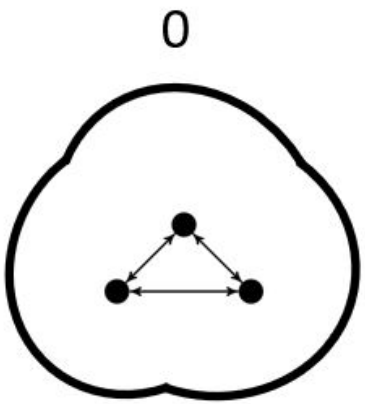

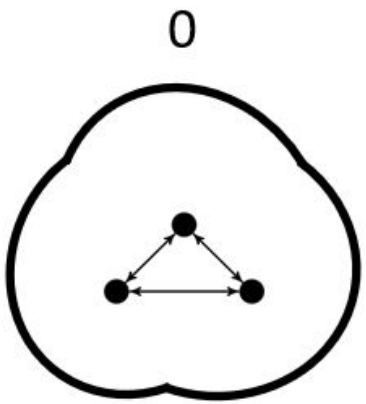

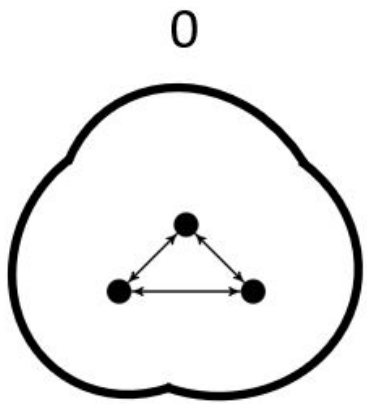

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Further Improvements

Additional options

- Add option to import own distance matrix (travel time, social distance, etc.)
- Add within-cluster stratification conditions (at least 1 male and 1 female, etc.)

Download and Related Literature

Stata ado-file and helpfile:

```
https://github.com/fmbarba
```

Related Literature:

Jade Benjamin-Chung, Benjamin F Arnold, David Berger, Stephen P Luby, Edward Miguel, John M Colford Jr, Alan E Hubbard (2018)

Spillover effects in epidemiology: parameters, study designs and methodological considerations

International Journal of Epidemiology, 2018, 332-347