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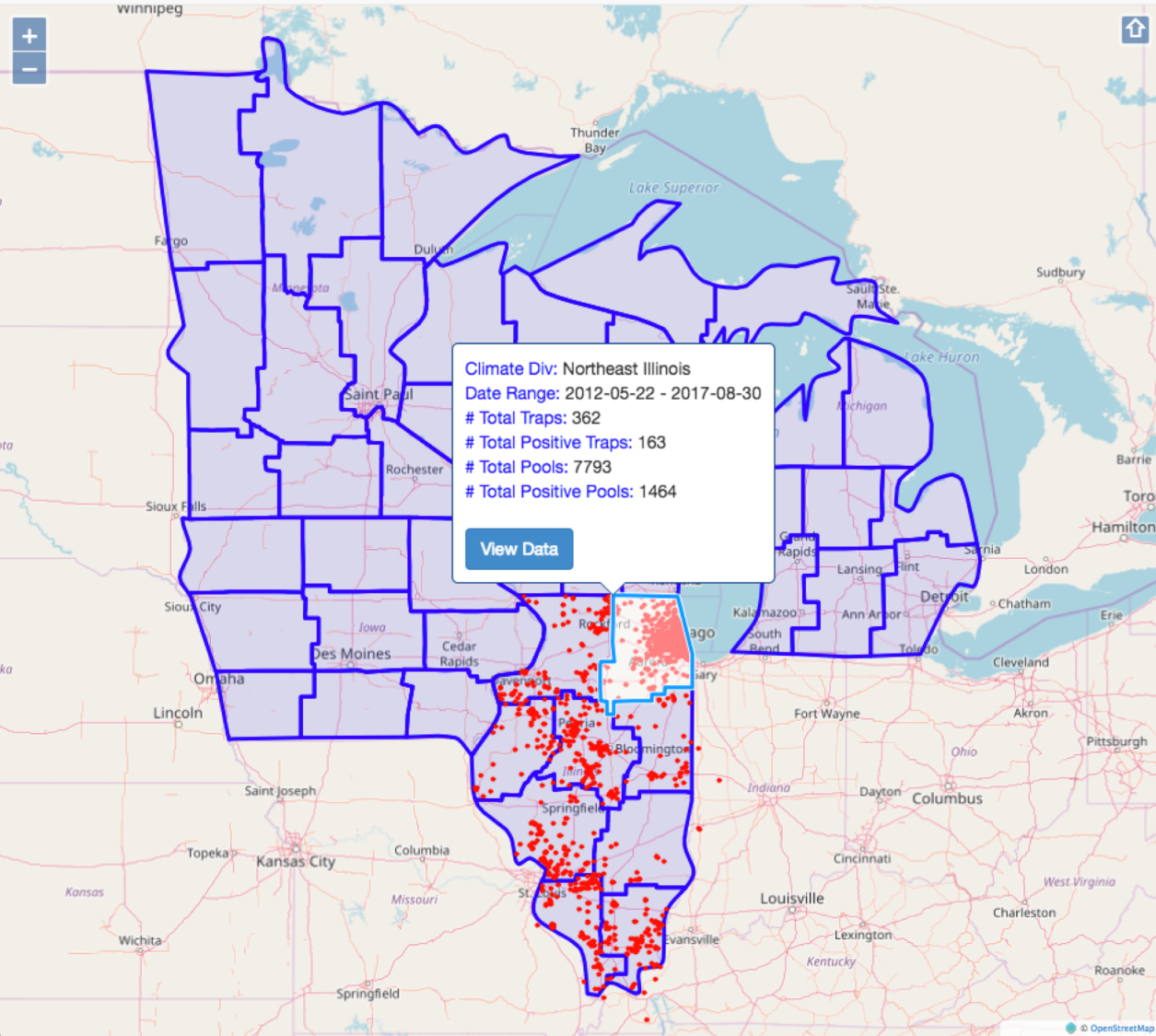
VECTOR BORNE DISEASE

Marcus Slavenas

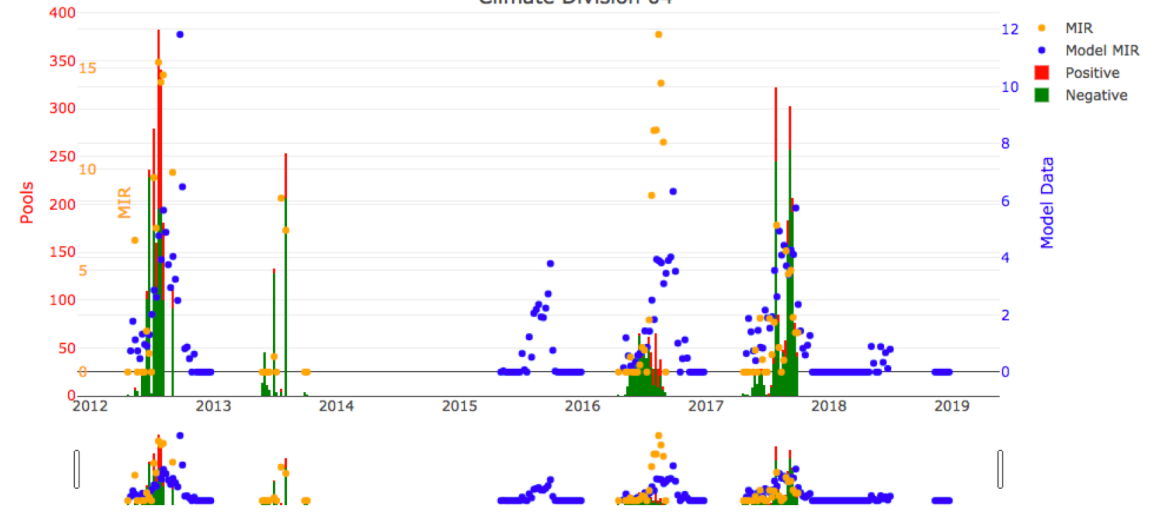


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Mosquito Infection and Model Data
Central Illinois
Climate Division 04



Vector Borne Disease - Overview

- CDC funded project
- Collaboration with UIUC Epidemiology
- Predict mosquito infection rates up to two weeks in advance
 - Currently, West Nile
 - PresVBD – Prediction System for Vector-Borne Diseases Prediction
 - Uses previous mosquito infection data, weather data, and daylight hours
- Uses mosquito infection data
 - Traps catch mosquitos
 - A pool is all the mosquitos collected on a single data
 - Pool ground up and tested – designated positive or negative
 - Minimum infection rate
 - $Mir(\text{date}) = (\# \text{positive pools} / \# \text{mosquitos tested}) * 1000$

Technology

- Clowder
 - Parse mosquito data into geostreams
- Flask (Python)
 - Rendering webpages
 - Endpoints
- Openlayers
- Bootstrap
- Javascript
- Plot.ly (love it)
- A node library (EPI Week)
- Fortran – run model

Model

Independent Variable Name	Explanation
dwlag1	Abnormal degree week of previous week (lag1)
dwlag2	Abnormal degree week of 2 weeks back (lag2)
dwlag3	Abnormal degree week of 3 weeks back (lag3)
dwlag4	Abnormal degree week of 4 weeks back (lag4)
preclag1	Abnormal weekly precipitation of previous week (lag1)
preclag2	Abnormal weekly precipitation of 2 weeks back (lag2)
preclag3	Abnormal weekly precipitation of 3 weeks back (lag3)
precilag4	Abnormal weekly precipitation of 4 weeks back (lag4)
dw1preci1	Interaction between degree week lag1 and precipitation lag1
dw1preci2	Interaction between degree week lag1 and precipitation lag2
dw1preci3	Interaction between degree week lag1 and precipitation lag3
dw1preci4	Interaction between degree week lag1 and precipitation lag4
dw2preci1	Interaction between degree week lag2 and precipitation lag1
dw2preci2	Interaction between degree week lag2 and precipitation lag2
dw2preci3	Interaction between degree week lag2 and precipitation lag3
dw2preci4	Interaction between degree week lag2 and precipitation lag4
dw3preci1	Interaction between degree week lag3 and precipitation lag1
dw3preci2	Interaction between degree week lag3 and precipitation lag2
dw3preci3	Interaction between degree week lag3 and precipitation lag3
dw3preci4	Interaction between degree week lag3 and precipitation lag4
dw4preci1	Interaction between degree week lag4 and precipitation lag1
dw4preci2	Interaction between degree week lag4 and precipitation lag2
dw4preci3	Interaction between degree week lag4 and precipitation lag3
dw4preci4	Interaction between degree week lag4 and precipitation lag4
springtemp	Abnormal average temperature of spring (wks 10-22) of same year
wintertemp	Abnormal average temperature of winter
lastfalltemp	Abnormal average temperature of last fall
lastsummertemp	Abnormal average temperature of last summer
lastspringtemp	Abnormal average temperature of last spring
springpreci	Abnormal average precipitation of spring (wks 10-22) of same year
winterpreci	Abnormal average precipitation of winter
lastfallpreci	Abnormal average precipitation of last fall
lastsummerpreci	Abnormal average precipitation of last summer
lastspringpreci	Abnormal average precipitation of last spring
daylighthrs	Weekly average daylight hours
daylightlag1	Weekly average daylight hours of previous week

- Coefficients
 - Created with R
 - Glmulti
 - MuMin

Plotly

```
var layout = {
  xaxis: {
    autorange: true,
    range: [x_axis[0], x_axis[-1]],
    rangeslider: {range: [x_axis[0], x_axis[-1]]}
    {#,#}
    {#type: 'date'#}
  }
};

var trace_degree_week = {
  x: x_axis,
  y: degree_week_c,
  name: "Degree Week",
  mode: 'markers',
  type: 'scatter',
  marker: {color: 'red'}
}

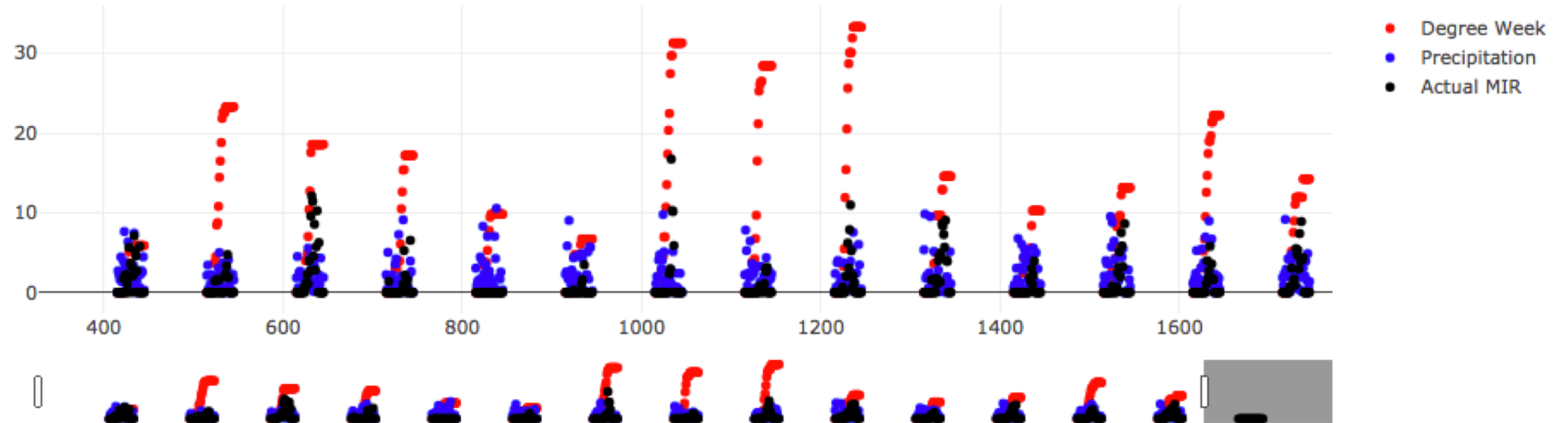
var trace_precip_week = {
  x: x_axis,
  y: precip_cm,
  name: "Precipitation",
  mode: 'markers',
  type: 'scatter',
  marker: {color: 'blue'}
}

var trace_actmir_week = {
  x: x_axis,
  y: act_mir_graph,
  name: "Actual MIR",
  mode: 'markers',
  type: 'scatter',
  marker: {color: 'black'}
}

var data = [trace_degree_week, trace_precip_week, trace_actmir_week];

Plotly.newPlot('act_mir_graph', data, layout);
```

The JSON on the left is all you need for the plot below.





THANKS
QUESTIONS?



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