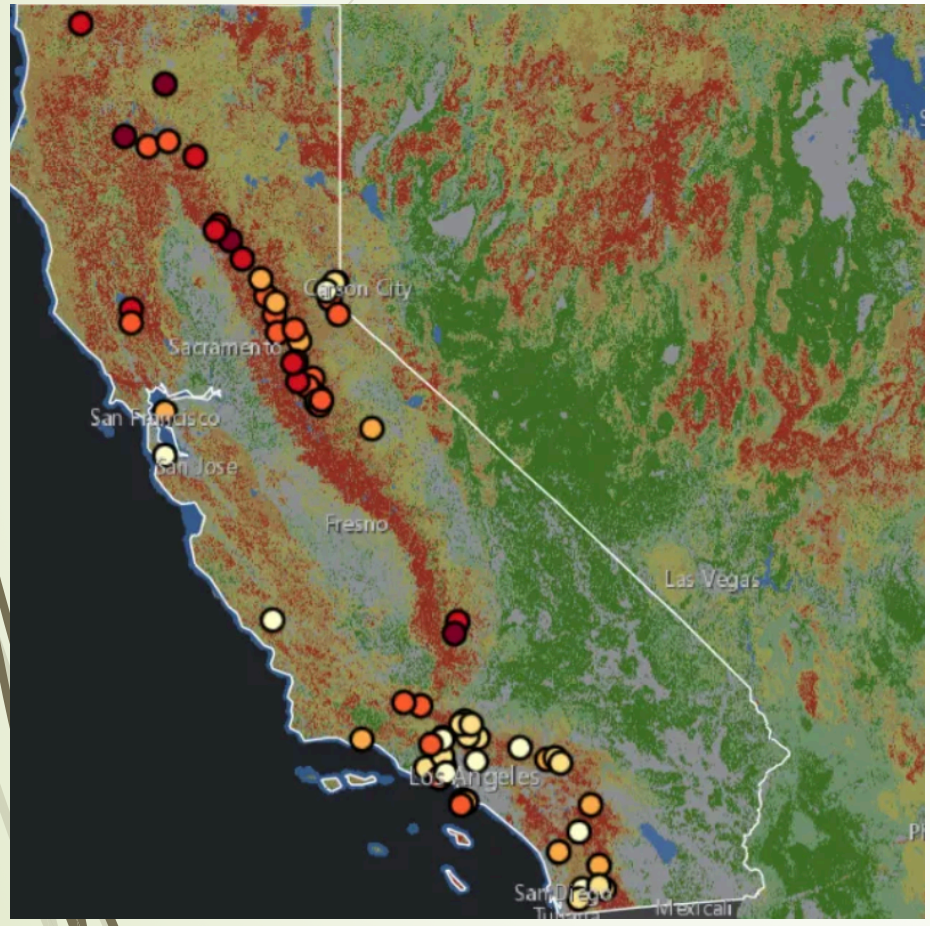
California Wildfire forecast

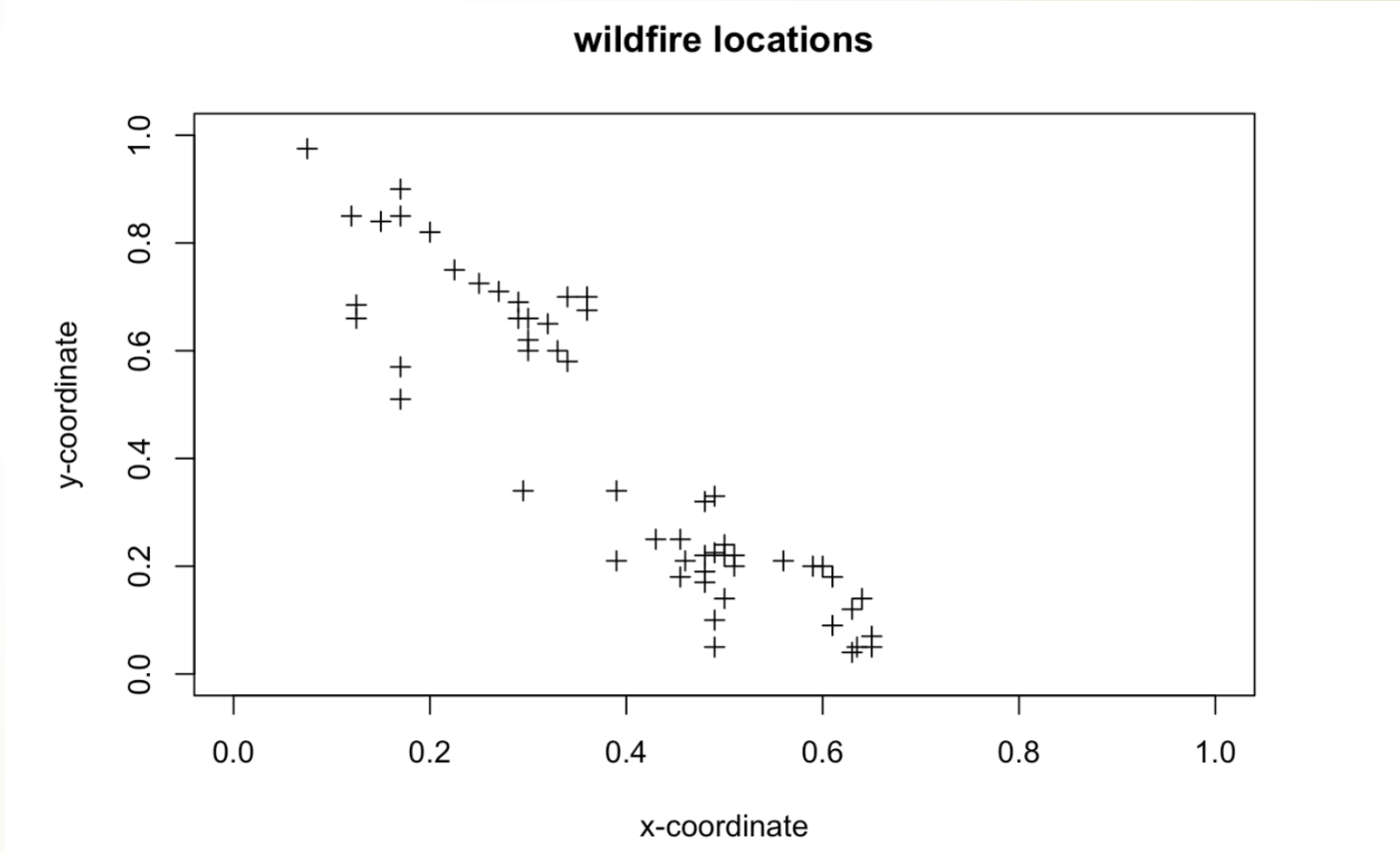
Presented by Shu Jiang

Background of data

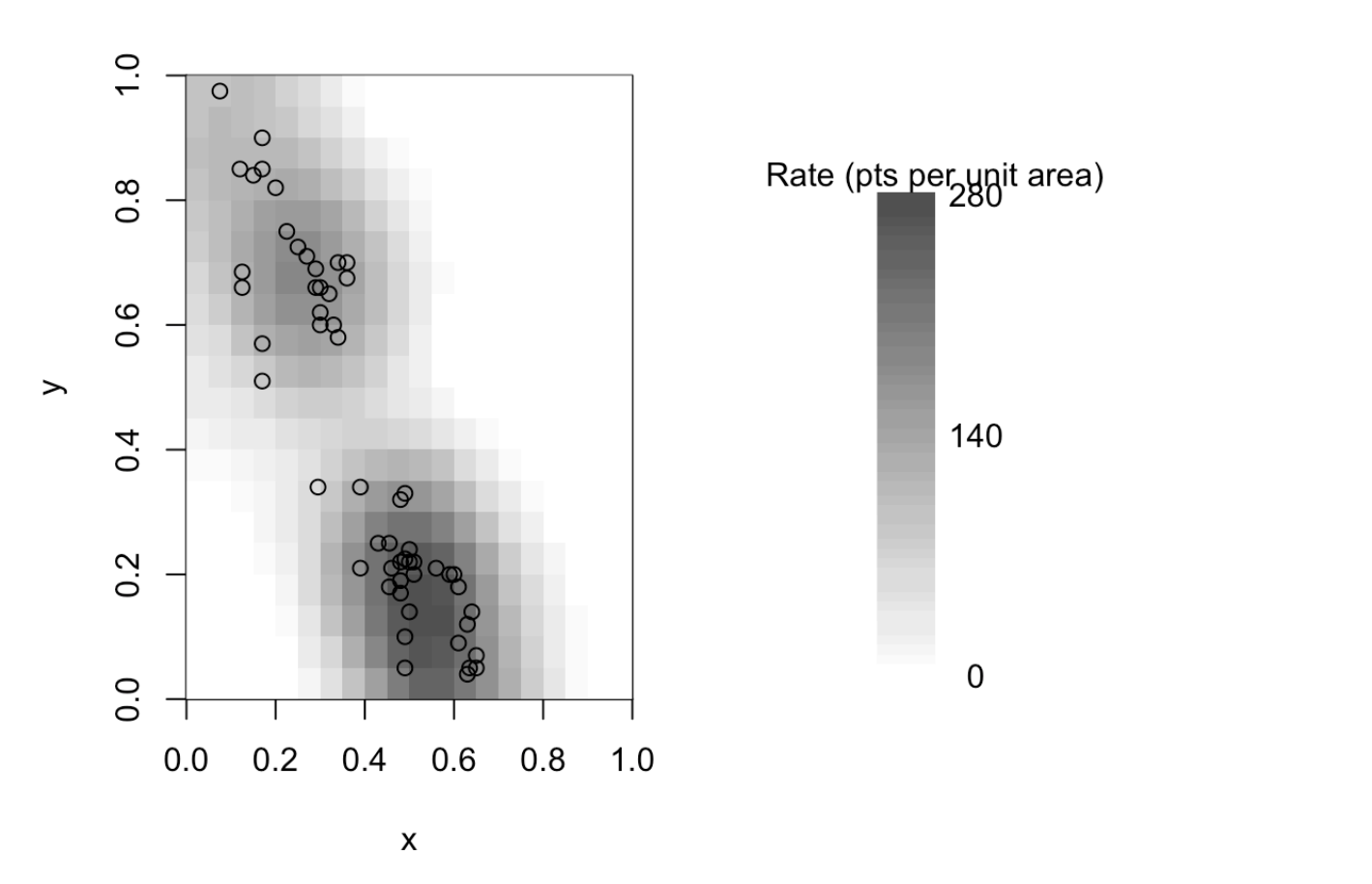
- Every year the happening of the wildfire has caused billions of dollars of property damage, burned hundreds of thousands of acres, and displaced thousands people from their communities.
- Data provided by the direct relief website
- X and Y coordinates set to determine the location of each point

Input data from website





Kernel smoothing

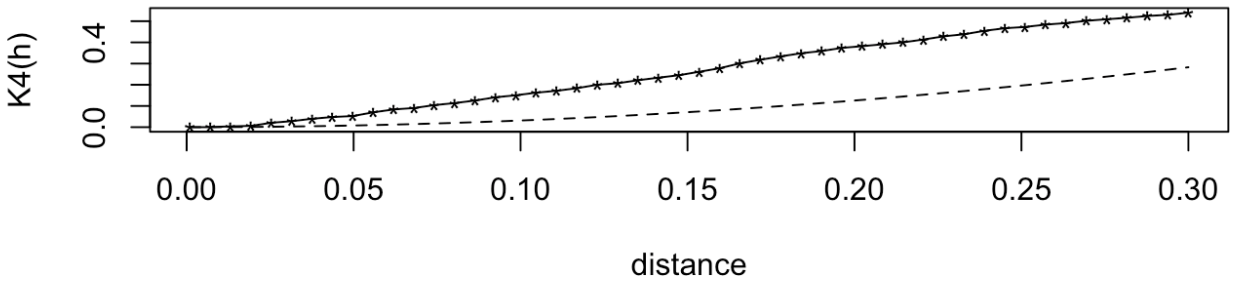


Bdw=0.2

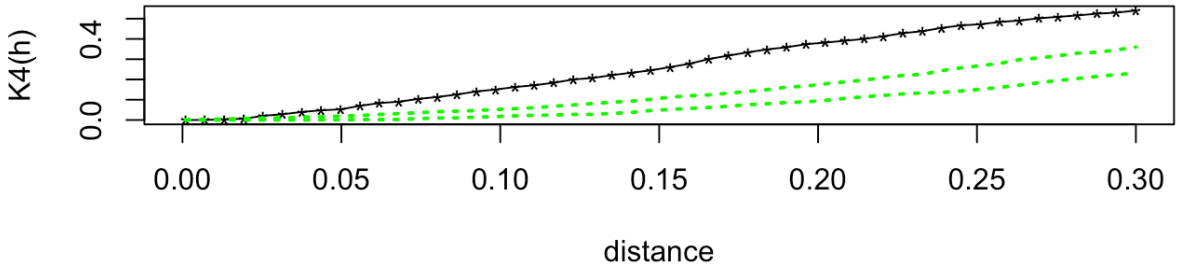
K function and L function

Green line: confidence bound by simulation
Orange line: theoretical confidence bound

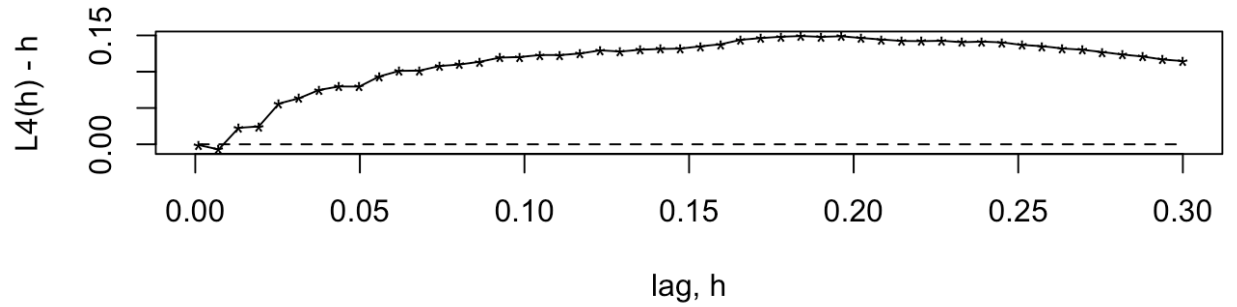
K function



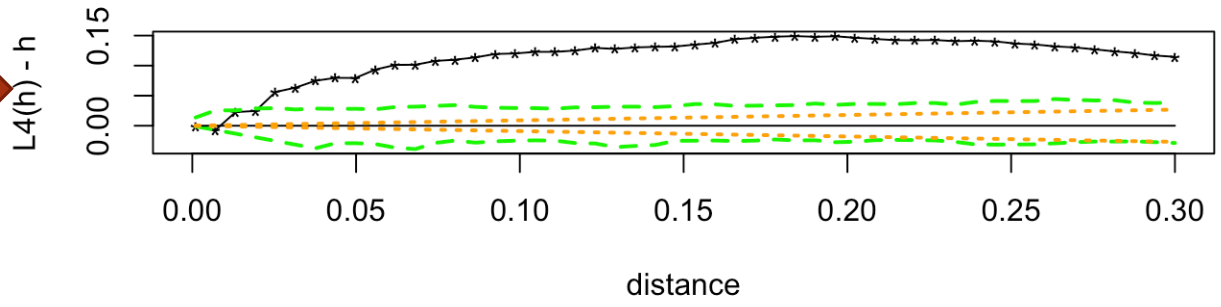
K function and confidence bund



L function

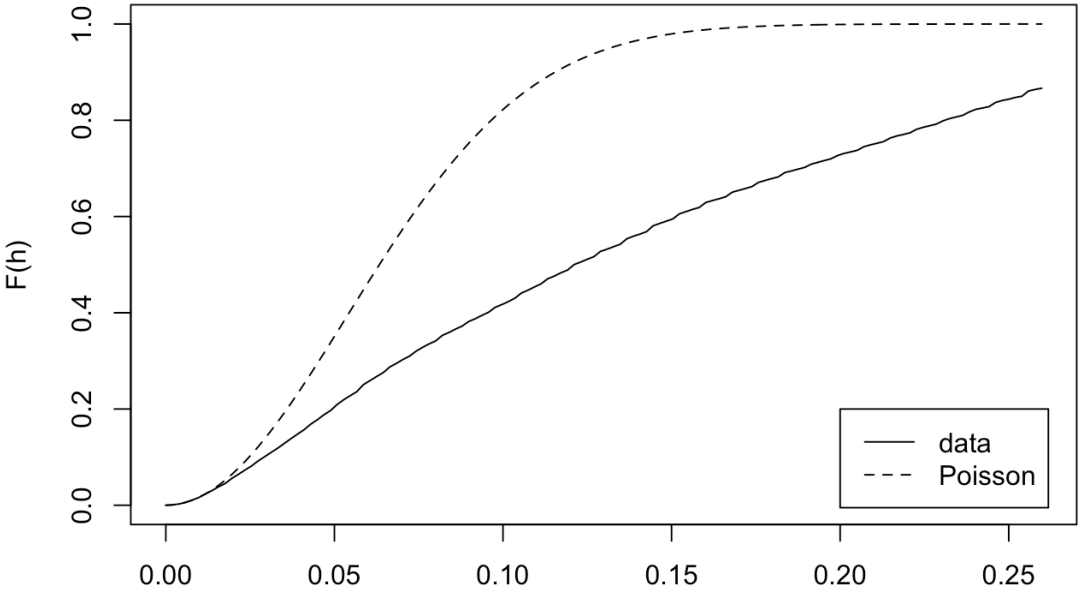


L function and confidence bund

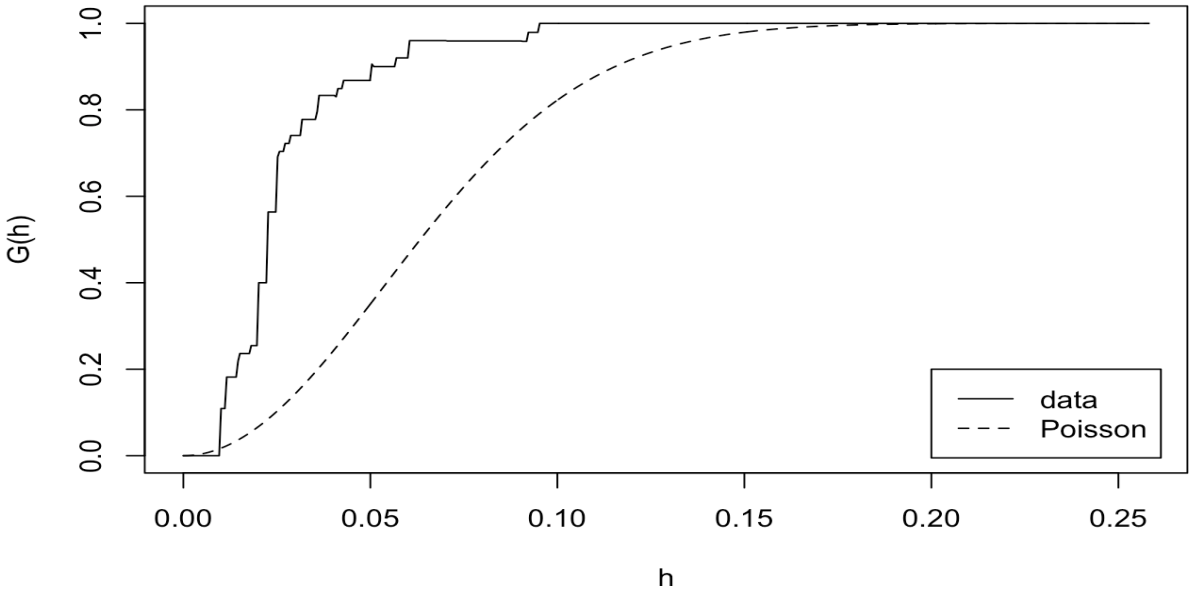


F , G and J function

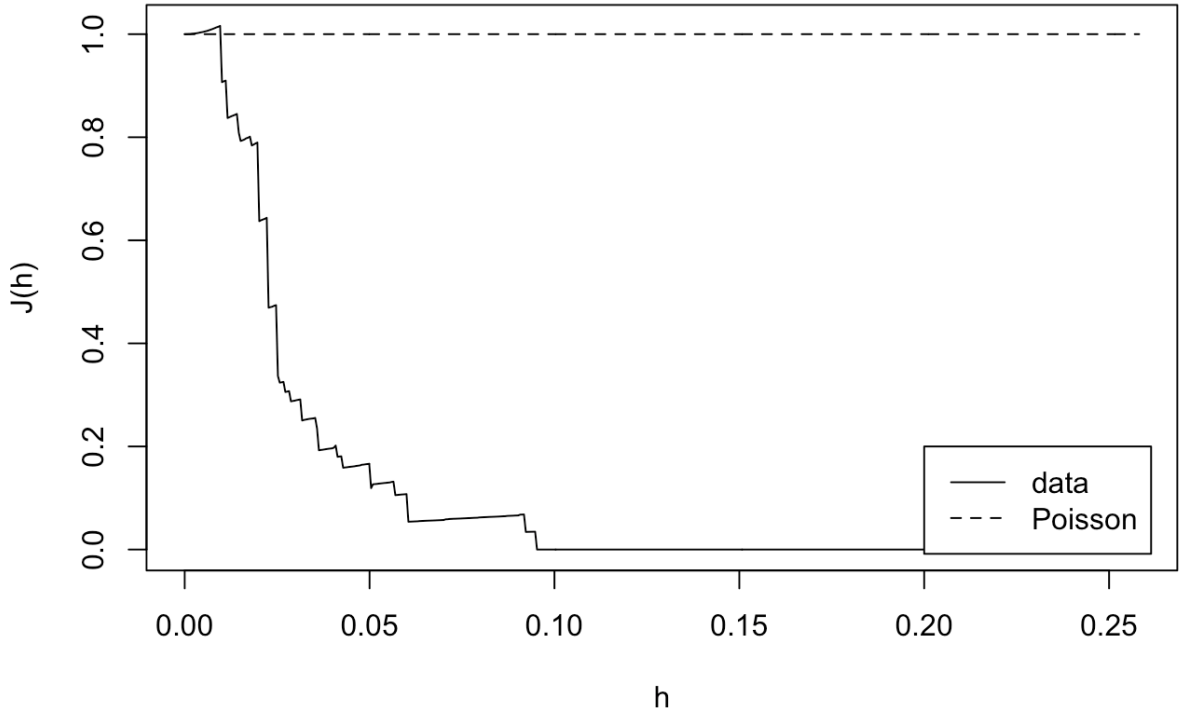
F function



G function



J function



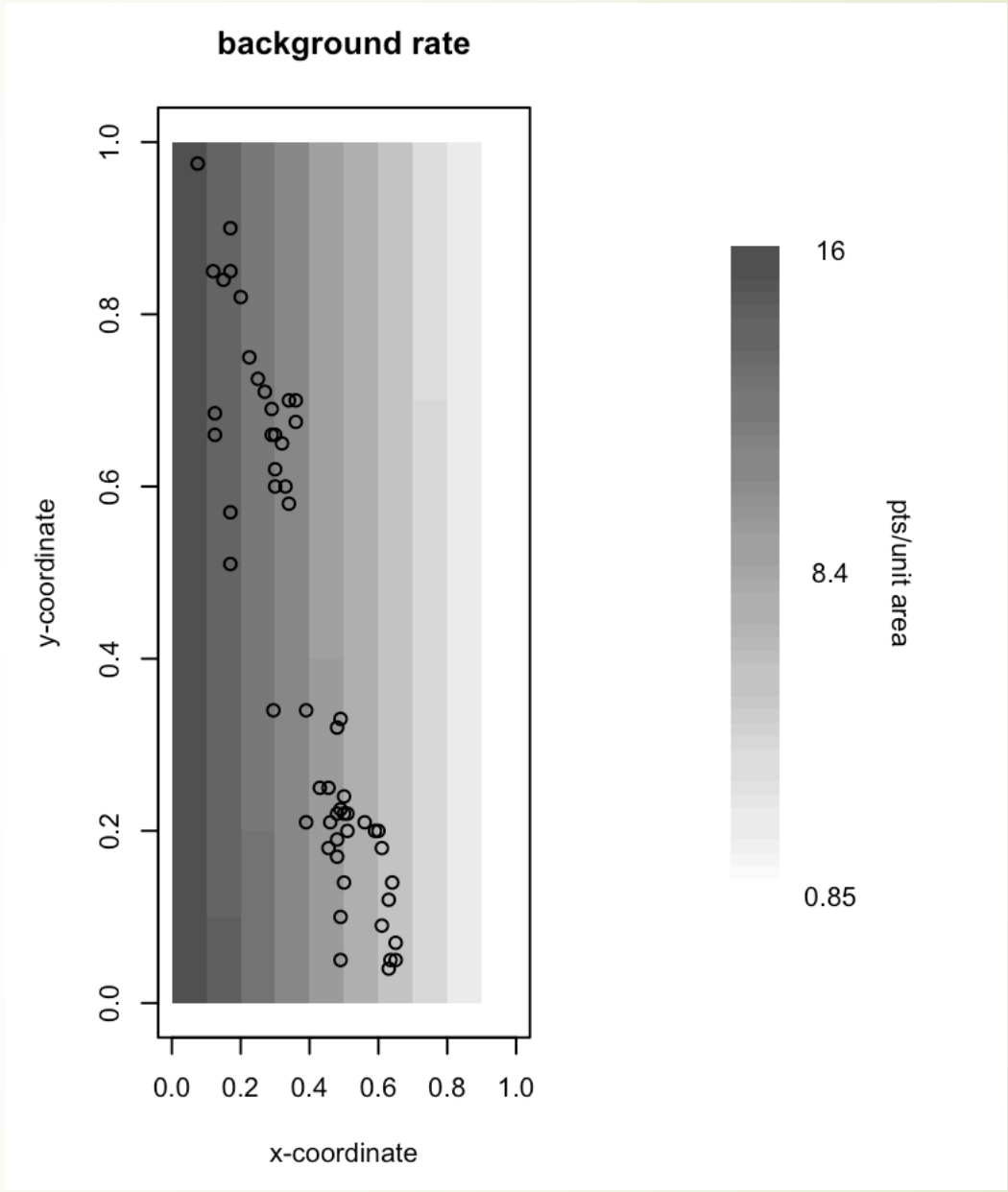
Fitting a Pseudo-Likelihood model

- Model: $\lambda_p(z \mid z_1, z_2 \ldots, z_k) = \mu + \alpha x + \beta y + \gamma \sum_{i=1}^{k} a_1 e^{-a_1 D(z_i, z)} / 2\pi D(z_i, z)$
- Negative Pseudo-Likelihood: -132.1996 to -235.03
- Maximum log-likelihood: 235.03
- Parameter estimate:

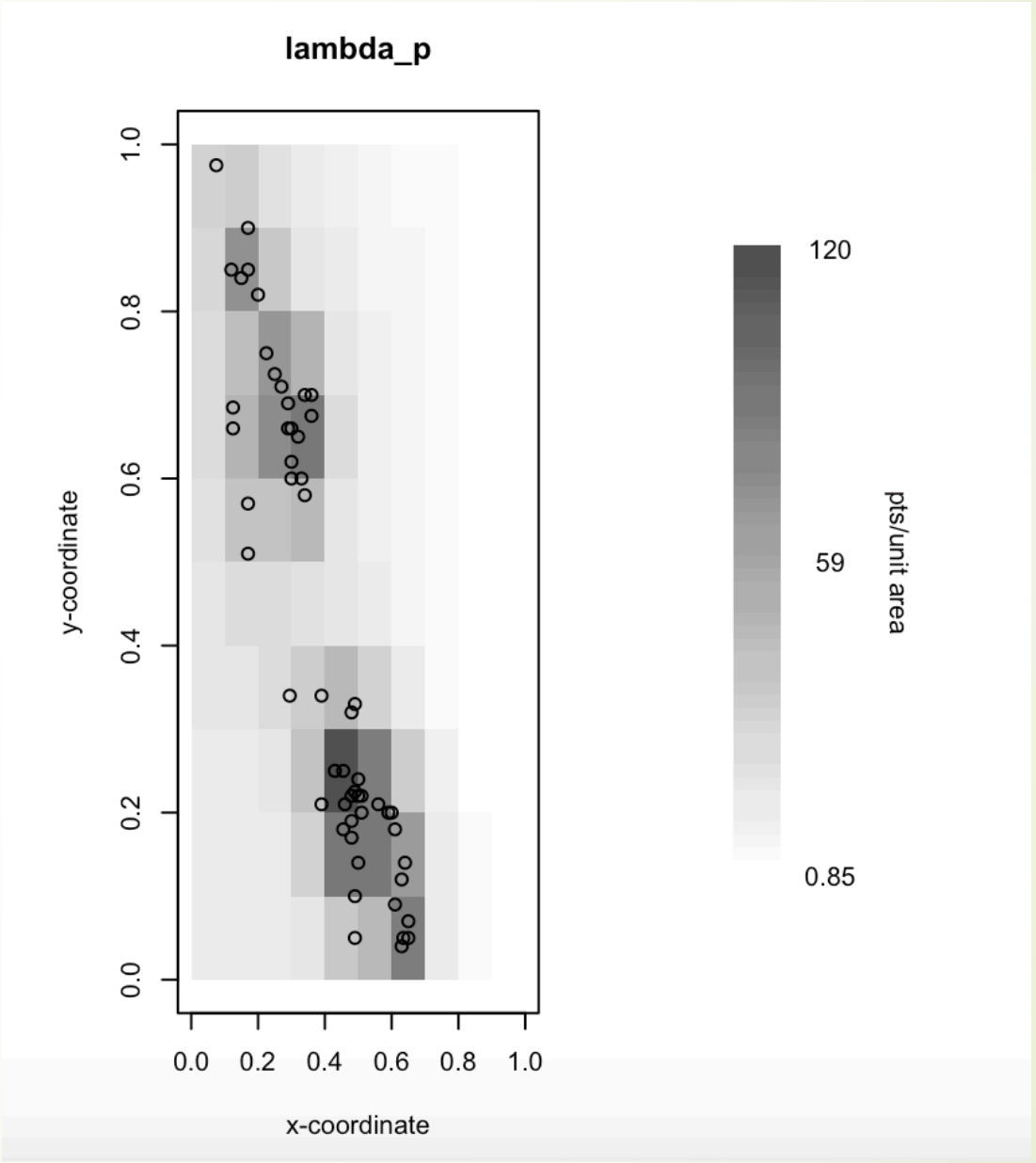
parameters	μ	α	β	γ	a1
values	16.89	-16.89	-0.004	0.93	21.8

Background Rate:

$$\lambda_p(z \mid z_1 \ldots, z_k) = \mu + \alpha x + \beta y$$



Plot of The Full Model



Further research

- Find the actual clustering fire area in California and do something in advance to reduce or prevent the happening of wildfire
- Combine the data of the past ten years and compare the clustering area, analyze the most probable place of wildfire in California and think of major factors of the wildfire.
- …

Thank you !