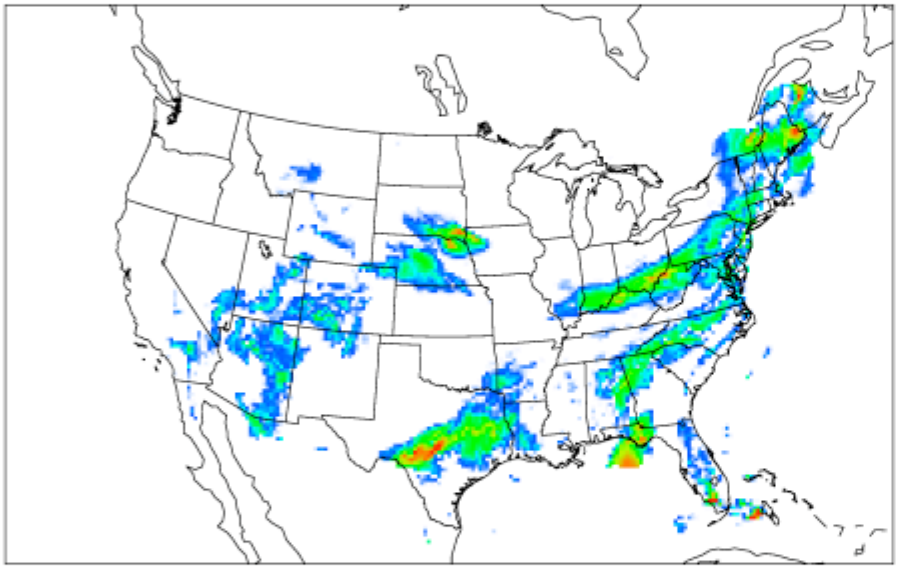
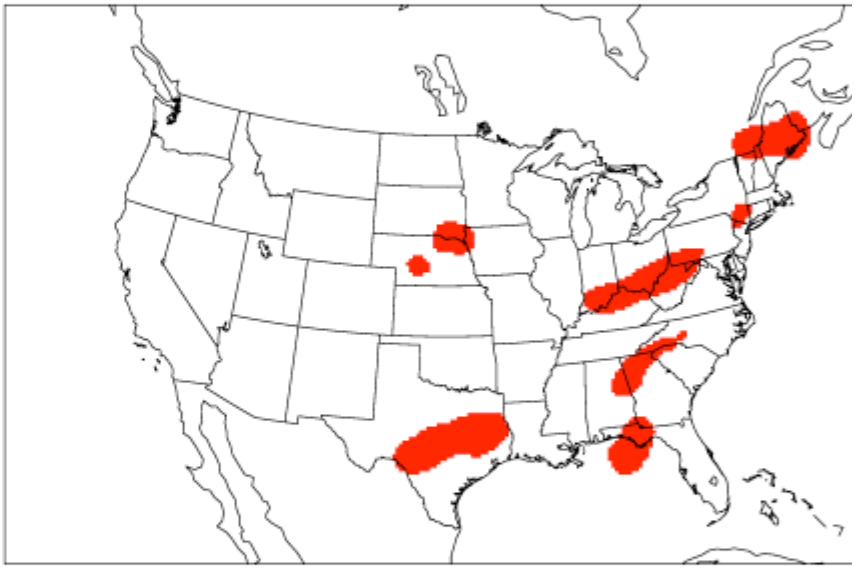
What are Objects?

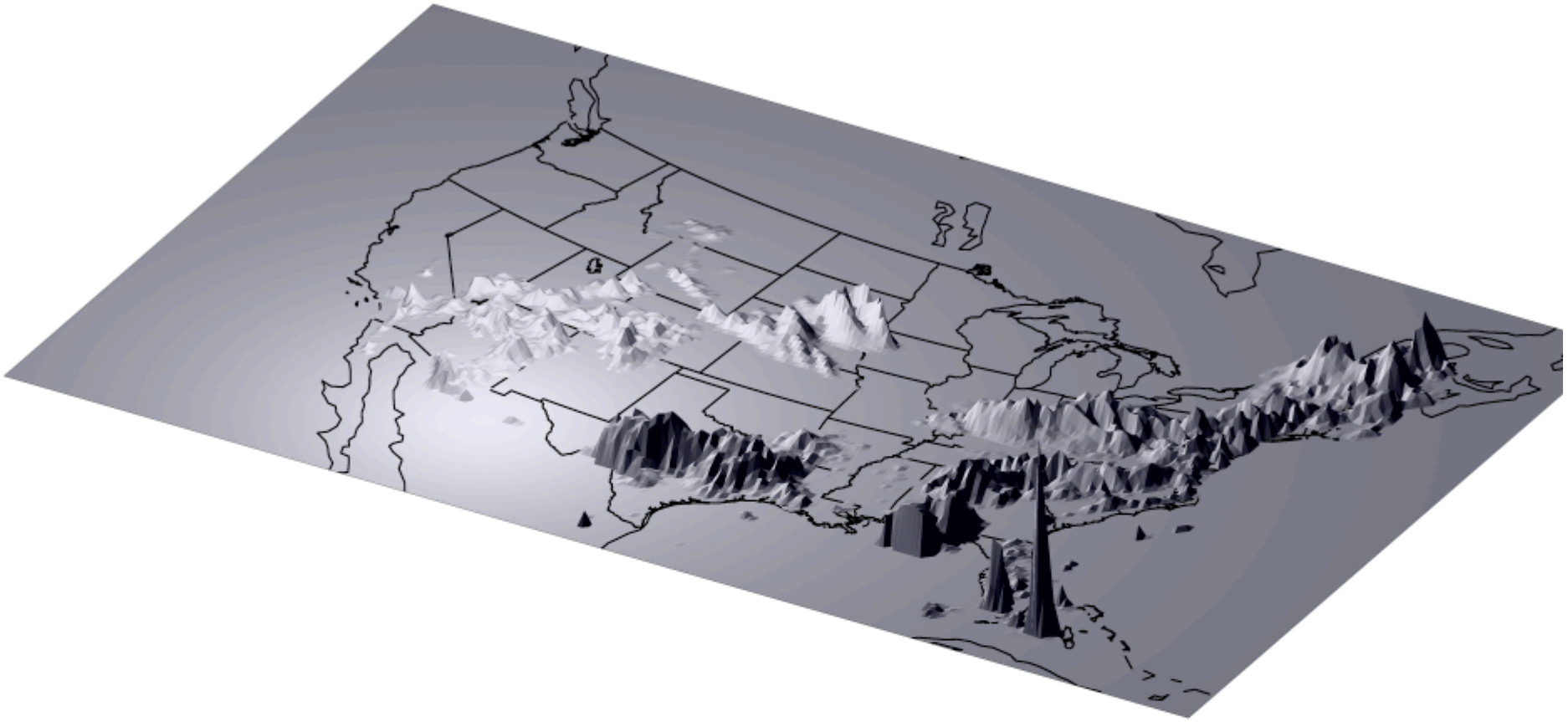


Raw Field



Object Field

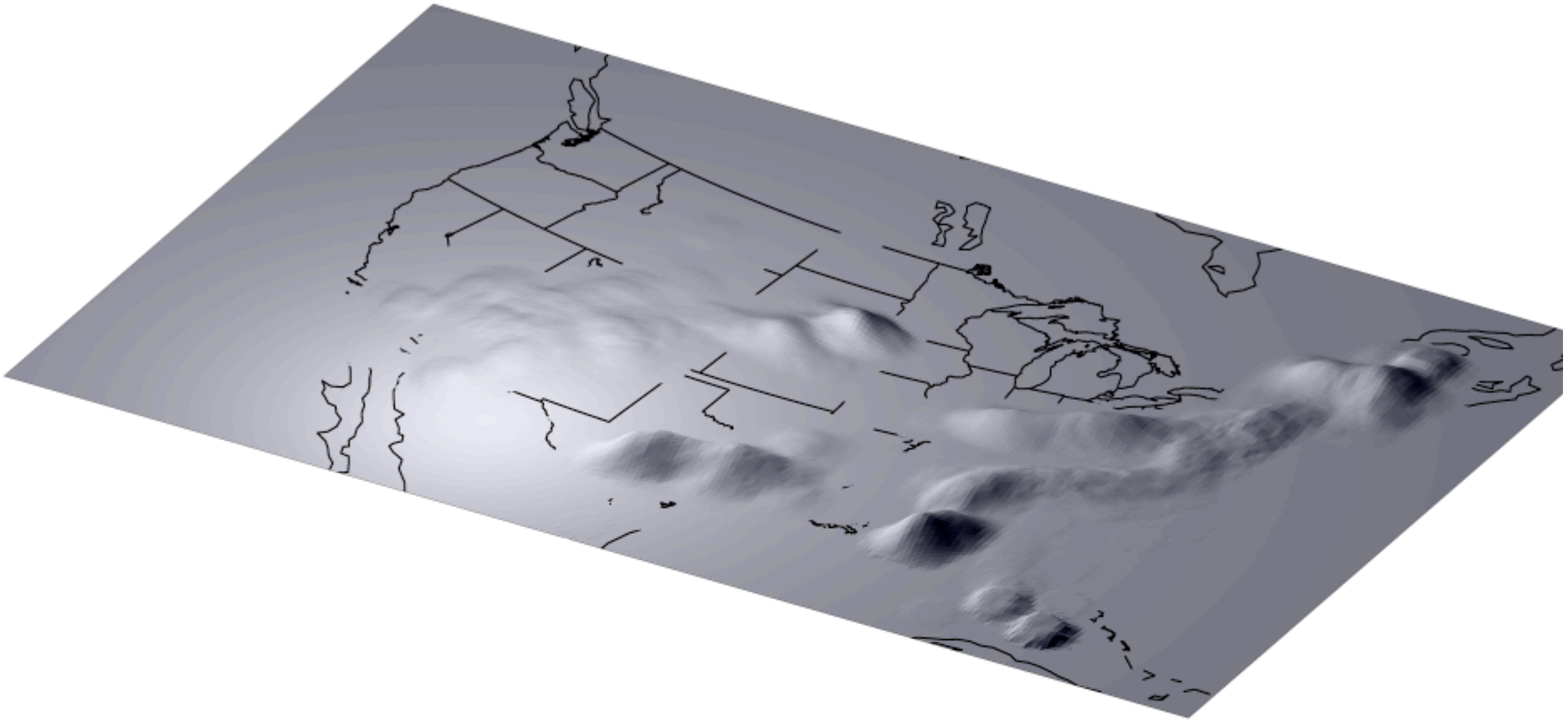
Objects are Regions of Interest



Step #1

Start with the raw data field.

In this case, a precipitation field.

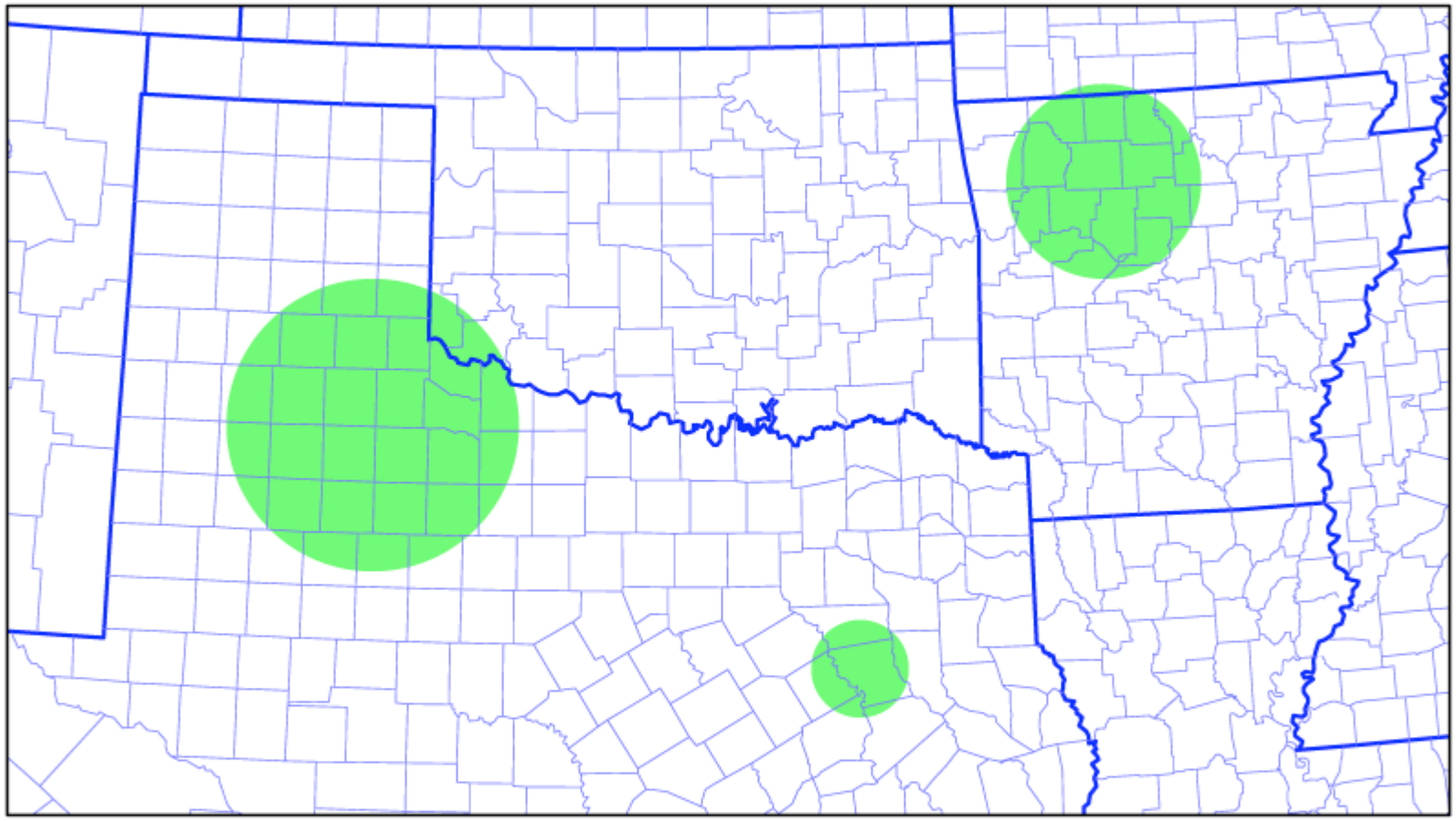


Step #2

Apply convolution operator.

This is basically a smoothing operation.

Convolution Radius



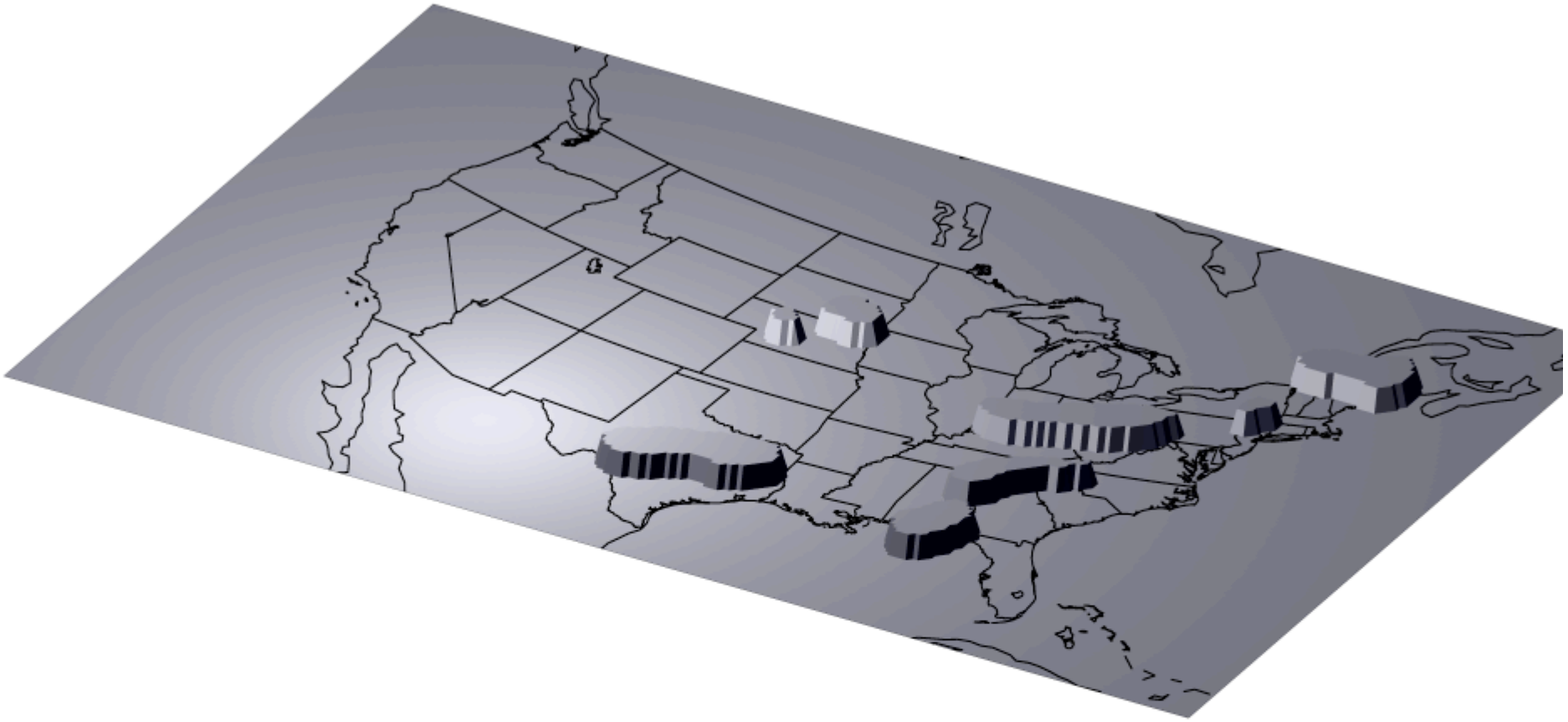
Radius of Influence

Convolution

Uses raw field $f(x, y)$ and

filter function $\phi(x, y)$

$$C(x, y) = \sum_{(\hat{x},\hat{y})\in G} \phi(\hat{x}, \hat{y})\, f(x - \hat{x}, y - \hat{y})$$



Step #3

Threshold the smoothed field.

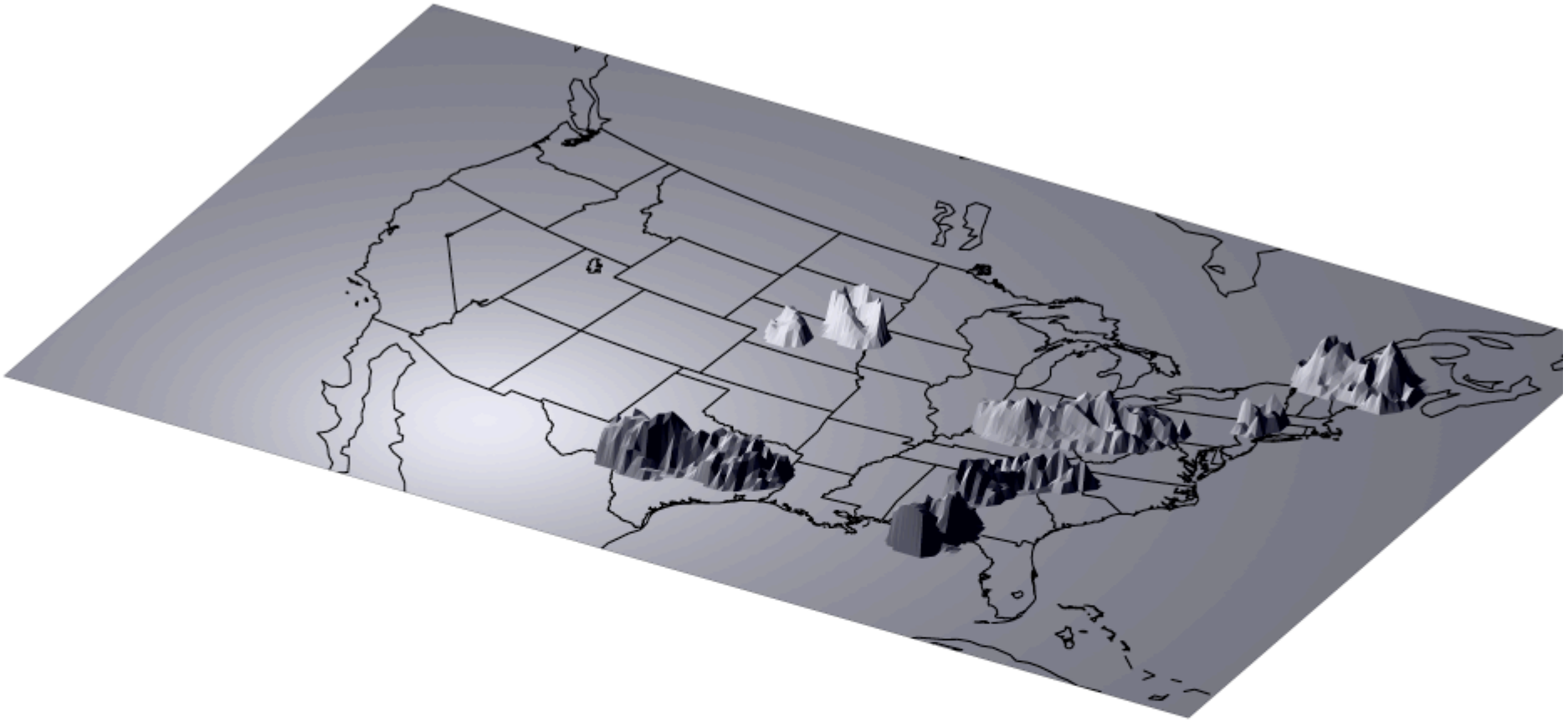
This produces an on/off mask field.

Masking

Uses convolved field $C(x, y)$

and threshold T

$$M(x,y) = \begin{cases} 1 & \text{if } C(x,y) \geq T \\ \\ 0 & \text{else} \end{cases}$$



Step #4

Restore original data to object interiors.

This gives us our objects.

Changing Object-Definition Parameters