Spatial smoothing of zero-inflated abundance data

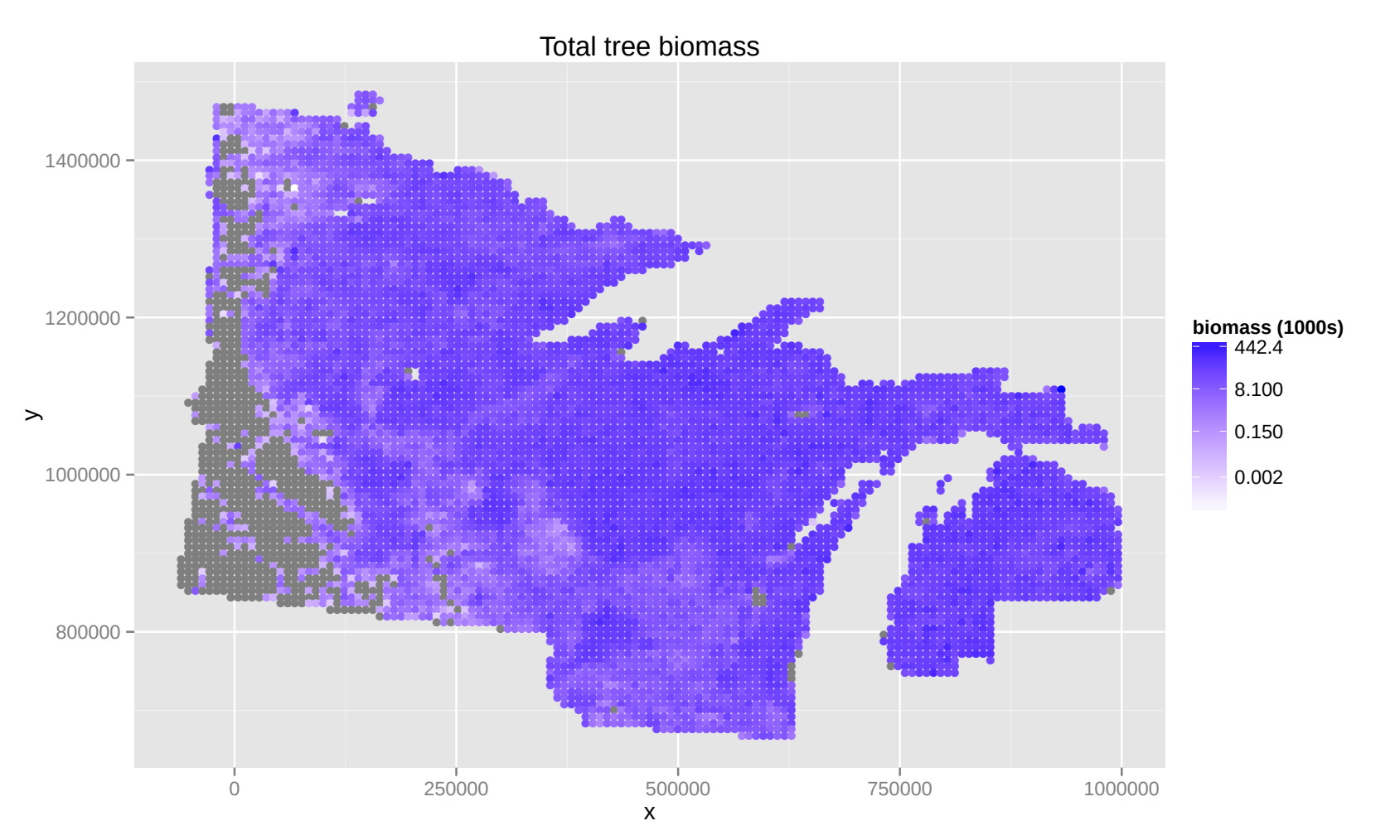
Wesley Brooks

Department of Statistics
University of Wisconsin–Madison

somesquares.org

Motivation

Take a look at some data



Title

Tweedie distribution

- Exponential dispersion model:

$$f(y;\theta;\phi) = a(y,\phi)\exp\left[\phi^{-1}\left\{y\theta - \kappa(\theta)\right\}\right]$$

- test:

Since $2y = 4x$

$y = x$

Title

Tweedie distribution

- Exponential dispersion model:

$$\lambda = \frac{\mu^(2-p)}{\phi(2-p)}$$
$$\alpha = \frac{2-p}{1-p}$$
$$\gamma = \phi(p-1)\mu^{p-1}$$

Title

Tweedie distribution

- Probability of exact zero:

$$P(Y = 0) = \exp\left\{ -\frac{\mu^{2-p}}{\phi(2-p)} \right\}$$

Title

Tweedie distribution

- test:

$$a(y,\phi) = y^{-1}W(y,\phi,p)$$

$$W_j = \frac{y^{j\alpha}(p-1)^{j\alpha}}{\phi^{j(1-\alpha)}(2-p)^j j!\Gamma(-j\alpha)}$$

References I