Types of Spatial Data

- Regularly spaced data vs Irregularly spaced data
- Point measurement vs block averages (or areal data)
- Point patterns
- Directional data
- Data from moving stations
Irish wind data

(source: Haslett and Raftery (1989), Applied Statistics)
Total column ozone levels (TOMS data)

TOMS ozone level (Dobson units) on May 1, 1990

Canadian census data

(source: www.statcan.ca)
Wind speed and direction data

(source: courtesy of A. Hering)
R is a free statistical package similar to S-plus (http://r-project.org)

Even if you are a first time R user, there are more than enough resources for you to get started:

- http://dist.stat.tamu.edu/pub/rvideos/
- http://www.statmethods.net/index.html
- http://zoonek2.free.fr/UNIX/48_R/all.html
R packages for spatial statistics

- fields (http://www.image.ucar.edu/Software/)
- geoR (http://www.leg.ufpr.br/geoR)

useful link:

- Pages 1-15 can be useful
  (http://www.unc.edu/~rls/s890/ShortCourseMalta.pdf)
Download “data 1” from the course webpage. The data set consists of latitude, longitude, and variable $x$ value at each spatial location. Using R and software fields, do the following:

1. Calculate mean and standard deviation of $x$ over the spatial domain.
2. Plot histogram and Q-Q plot of $x$.
3. Using “image.plot” command in fields, plot variable $x$ levels over the spatial domain.

Due September 8, 12:45 pm (class room).