**Calculating the Distance and Bearing of Geo-tagged Tweets from the Location of the Hurricane**

**Step 1** Calculate the likely position of the hurricane during any particular moment by extrapolating from the NOAA best track data[[1]](#footnote-1). A basic way of doing this is to calculate intermediate points on a great circle in-between consecutive longitude-latitude coordinates from the NOAA data. The weakness of this method is that it assumes that the hurricane will be moving at a constant rate and ‘as the crow flies’. The ‘**geosphere**’[[2]](#footnote-2) package in R provides a ‘**gcIntermediate**’ function suitable for this:

e.g. **gcIntermediate(c(-87.64283545,41.93555928),c(-76.4,18.9), n=20, addStartEnd=TRUE)**

**Step 2** Calculate the initial and final bearing of a tweet from the hurricane position at the moment the tweet was posted, and the distance between the two. The bearings can be calculated using the **bearing** and **finalBearing** functions in geosphere, whilst the distance can be calculated using the **distVincentyEllipsoid** function, though other functions are available for this purpose depending on preference.

e.g. **bearing(c(41.93555928,-87.64283545),c(18.9,-76.4))**

e.g. **finalBearing(c(41.93555928,-87.64283545),c(18.9,-76.4))**

e.g. **distVincentyEllipsoid(c(-76.4,18.9),c(-87.64283545,41.93555928), a=6378137, b=6356752.3142, f=1/298.257223563)**

**Step 3** The results can reveal how the distances between the location of the hurricane and the origin of the tweets change….

1. http://www.nhc.noaa.gov/data/tcr/AL182012\_Sandy.pdf [↑](#footnote-ref-1)
2. http://cran.r-project.org/web/packages/geosphere/geosphere.pdf [↑](#footnote-ref-2)