ABSTRACT

Since carbon offset retailers can calculate carbon emissions and the price of offsets down to the mile, we wanted our Red Sox flight plan to be as specific as possible. When mapping on a globe, the shortest distance between two places is not a straight line but a curve of the Earth. When projected on a twodimensional surface, these lines will appear as arcs along the Great Circle Directions. The shortest distance between the home run and the sites of the games was calculated using the Great Circle projection (Ginsburg 1973). To increase the accuracy of this projection, we changed the origin from the North Pole to Boston (61.89 ° N, 45.03 ° W). The lines drawn upon this projection still appear to be straight, but the actual distance between the Great Circle is accounted for in the increased curve of the continental ball.

METHODS

To calculate the distances using ArcGIS, we created a new shapefile with custom projections. Using the editor tools in our new shapefile, we were able to draw vector lines that extend from Boston to opponent cities. The distances traveled by the team were then estimated using the coordinates of the home runs and other key events. The ArcGIS mapping program was able to calculate the travel distances for each flight segment accurately according to the flight distance categories, yielding an accurate price per passenger for offset carbon emissions for each scheduled road trip. The price to offset carbon per passenger for each road trip was multiplied by 54 (the 40 man roster plus the 14 coaches and staff) to obtain the price for the team for each road trip. These prices were summed to estimate the total price to offset 2008 regular season hotel-related emissions.

RESULTS AND CONCLUSIONS

By showing the United States on an Lambert Azimuthal Equivalent Projection, we were able to calculate the distances of the Red Sox road trips (Figure 1). We also were able to show the routes into which the short haul (less than 900 km), medium haul (900 km to 2500 km), and long haul (greater than 2500 km) flights from Boston fall. A majority of the opponents (9) lie within the range of medium haul flights with five teams within a short haul and six as being long haul from Boston. Shorter flights emit lower carbon dioxide equivalents per mile than the shorter flights, but overall a longer period of time. These facts were taken into consideration when determining the emissions for Red Sox travel in the 2008 season.

According to our model, the Red Sox 2008 regular season travel will contribute a total of approximately 833 tons of carbon dioxide equivalent emissions to the atmosphere. Figure 2 shows the relative carbon emissions from travel as represented by the price to offset each road trip. Figure 2 also shows that the trips to West Coast cities contribute the greatest amount of carbon to the atmosphere.

Would cost the Red Sox a total of $54,378 to offset their 2008 season carbon emissions with the carbon offset retailer Native Energy (Table 1). To reach this number, we made the assumption that the Red Sox will fly directly to every opponent’s city. Even with this assumption, our model is an accurate representation of Red Sox regular season travel-related emissions because it accounts for actual road trip travel and the flight distance categories. Because our model does not account for the emissions of opponents’ teams traveling to Boston, every MLB team should take the initiative to do similar research to reach total carbon neutrality. By being the first team to completely offset their travel-related carbon emissions, the Red Sox will be true leaders in climate change mitigation and Major League Baseball.

The Boston Red Sox have enormous power in New England society. By purchasing carbon offsets from Native Energy, a Vermont-based retailer, the Red Sox would be supporting renewable energy projects within the heart of Red Sox Nation. If they were to attempt to reduce their contribution to climate change, Red Sox fans everywhere would gain a better understanding and appreciation for the need for climate change mitigation. As the reigning World Series Champions, the Boston Red Sox have a great opportunity to influence Red Sox Nation and beyond.

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LITERATURE CITED


