**NFL Betting Line Analysis**

We created this analysis for the Carolina Data Challenge. We were given NFL cumulative statistics from 2000 to 2013. We worked to create a model to show which variables best predicted the point difference in any given NFL game. This information would be applied to predict the point difference for future games, given average statistics for each significant variable, in order to set a realistic line used for betting.

Based on various statistical models created using R Studio, we determined that the “best” model used every variable given in the dataset. Our goal then became to condense the number of variables needed to create an accurate model for predicting future line bets. Thus, we created a model with the 10 most impactful variables and plotted the predicted point differences versus the actual point differences **(Figure 1)**. For comparison, we created a plot to associate the real line of the game at the time with the actual point difference **(Figure 2)**.

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***Figure 2. NFL Line Prediction vs Actual Points***

***Figure 1. Predicted Points vs Actual Points***

From the figures above, it is apparent that our model predicted the point difference much better than the line at the time of the game. Considering we acted retrospectively in determining which factors impacted point differentiation, this result is not surprising. However, this model and its most significant predictors could be used in future seasons to improve line bets. Our model uses statistics that do not occur until game time. By that effect, the model would become increasingly effective as the season progresses and more data is collected. An average of things like fumble recoveries, pass completions per game, and 3rd down conversions for each team would create a solid set of data to use for predictions with the model further into the season.

Obviously, it is impossible to perfectly predict a football game’s outcome. At the end of the day it is still a game. However, using retroactive statistics may lead to greater insights for the future that might result in some financial reward.