This study considered the impact of grid resolution on wind velocity simulated by Weather Research and Forecasting (WRF) model. The period simulated spanned November 2009 through January 2010, for which, multi-resolution nested domains were examined. Basic analysis was performed utilizing the data assimilation tools of NCEP/NCAR (National Center for Environmental Prediction/National Center for Atmospheric Research) to determine the ideal location to examine during the simulation was the Pacific Northwest portion of the United States, specifically the border between California and Oregon. The simulated multi-resolution nested domains in this region indicated an increase in apparent wind speed as the resolution for the domain was increased. These findings were confirmed by statistical analysis which identified a positive bias for wind speed with respect to increased resolution as well as a correlation coefficient indicating the existence of a positive change in wind speed with increased resolution. An analysis of temperature change was performed in order to test the validity of the findings of the WRF simulation model. The statistical analysis performed on temperature change throughout the increased grid resolution did not indicate any significant change in temperature. In fact the correlation coefficient values between the domains were found in the 0.90-0.96 range, indicating the non-sensitivity of temperature across the increased resolutions. These results validate the findings of the WRF simulation: increased wind velocity can be observed at higher grid resolution. The study then considered the difference between wind velocity observed over the entire domains and the wind velocity observed solely over offshore locations. Wind velocity was observed to be significantly higher (an increase of 68.4%) in the offshore locations. The findings of this study suggest simulation tools should be utilized to examine domains at a higher resolution in order to identify potential locations for wind farms. The results go further to suggest the ideal location for these potential wind farms will be at offshore locations.