1116-L5-456 **John K Mayberry*** (jmayberry@pacific.edu). *How does losing team bias affect water polo games?*

Exclusion fouls play an important role in elite men's water polo generating over half of all goals. Here we investigate the impact of losing team bias in exclusion calls on the final outcome of such games by simulating pairs of random water polo contests between two equally matched teams. In one simulation, the game evolves according to a Markov chain where at each step, a goal is scored by the offensive team with probability g or possession changes with probability $1-g$. In the other coupled simulation, losing team bias is incorporated by decreasing g to $g-b_w$ when the offensive team is winning or the game is tied and increasing g to $g+b_\ell$ when the offensive team is losing. Using parameters based on data from the 2012 Olympics, 2013 World Championships, and 2014 European Championships, our simulations suggest that losing team bias alters the final score in over 50% of all contests and changes the actual outcome in about 15%. The most common alteration is from a victory for one team to a tie. We conclude by examining the dependence of the fraction f of games altered on the size of the losing team bias in the symmetric case $b_w = b_\ell = b$ and derive a simple formula for estimating f when b is small. (Received September 02, 2015)