



**CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY**

Name(s) Callie M. McCaffery	Project Number 38146
Project Title Birds, Planes, and Winglets	
Objectives/Goals Does adding winglets to the ends of wind turbine blades affect the wind turbine's performance compared to a wind turbine with blades that have no winglets? Abstract Methods/Materials I designed and built my own wind turbine and wind tunnel that would allow for testing of different blade configurations. Data was gathered by counting rotations per minute. Results I found that winglets do affect wind turbine performance. I ran three different tests, making changes to each wind turbine blade design that focused on eliminating extra variables, such as center of gravity differences. After completing the testing analysis, I ran a fourth test that demonstrated some clear benefits to winglets. Conclusions/Discussion I found results that supported both advantages and disadvantages to winglets on wind turbine blades. Blade design appears to be a critical factor, and based on my results, I believe that continued testing in this area would be appropriate. Just as winglets on airplane wings have increased efficiency, saving millions of dollars, I believe that improved wind turbine blade design could increase wind turbine efficiency as well.	
Summary Statement Adding winglets to the blades of a wind turbine affects the performance of the wind turbine.	
Help Received My engineering teacher reviewed my theories and sketches. My science teacher and mentor assisted with review of materials and project concept. My parents assisted with some material construction, and data recording.	