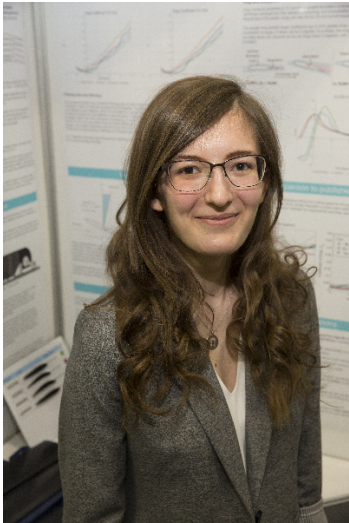


# CWSF 2019 - Fredericton, New Brunswick



## Sophie Hoyer Pacholek

### From Sea and Sky: Biomimetic Wings for Enhanced Aircraft Performance

**Challenge:** Innovation

**Category:** Intermediate

**Region:** Calgary Youth

**City:** Calgary, AB

**School:** Henry Wise Wood High School

**Abstract:** Inspired by the evolutionary adaptations of birds and whales, a standard wing design was modified to create an avian airfoil, a blended winglet, and whale-like tubercles. Wind tunnel testing demonstrated that an avian airfoil improves lift, delays stall, and exhibits optimal efficiency characteristics. A tubercle wing additionally displayed more consistent lift performance. These modifications could be applied to unmanned drones for disaster relief and reconnaissance.

#### Biography

Hi, I'm Sophie Hoyer Pacholek, currently a grade 10 student at Henry Wise Wood High School in Calgary. Ever since I was eight I've wanted to work as an aeronautical engineer for NASA, but since then I've decided that that's not my only option and love anything that has to do with science. Science fairs have been about expanding my learning in a variety of fields. In addition to science, I love classical and jazz music, and burying my nose in a good book. I'm inspired by the natural world (as it turns out, most of my projects come from something in nature), and enjoy hiking in the summer and cross-country skiing in the winter. Science fairs have always been the highlight of my school year, and while I've done well in the past (earning multiple national and local awards), I get the most enjoyment out of the amount of learning and experience involved during each individual project.

#### Awards

#### Value

Excellence Award - Intermediate - Gold Medal Sponsor: Youth Science Canada	
Western University Scholarship Gold Medallist - \$4000 Entrance Scholarship Sponsor: Western University	\$4 000
Total	\$4 000