

<b>AWARE Quarterly Progress Report</b> <b>Project ID: Q15</b> <b>Core Site: Causapsca, QC spruce budworm outbreak</b> <b>Black Brook, NB if outbreak occurs there</b>		<b>Institution: University of New Brunswick</b> <b>Project Supervisor: Dr. David MacLean</b> <b>HQP Name: Shawn Donovan</b>	
<b>Title: How can satellite and high spatial resolution optical imagery be used to augment spruce budworm forest health surveys?</b>		<b>Committee Members</b> <input type="checkbox"/> See Progress Report Year: _____ <input type="checkbox"/> Names: <u>Dr. John Kershaw, Dr. Mike Lavigne, Dr. Yun Zhang</u>	
<b>Report Period</b> <input checked="" type="checkbox"/> Q1 <input checked="" type="checkbox"/> Q2 <input type="checkbox"/> Q3 <input type="checkbox"/> Q4 Year: 2019        Apr - Jun    Jul - Sep    Oct - Dec    Jan - Mar (Q1 & Q2)		<b>Number of Courses Left to Complete:</b> <b>0</b>	
<b>Research Progress During this Reporting Period</b> <ol style="list-style-type: none"> <li><b>1. Finish narrow-band selection analysis for all 14 vegetation indices being examined.</b>  Analysis of narrow-band vegetation indices sensitive to annual SBW defoliation was completed using Random Forest variable importance metrics. Results show in decreasing order of importance Plant Senescence Reflectance Index, Simple Ratio, Normalized Difference Water Index, Normalized Difference Vegetation Index, and Moisture Stress Index were the top indices and selected for classifying defoliation.</li> <li><b>2. Compare classification differences between RF and SVM classifiers for mapping SBW defoliation.</b>  Both supervised classifiers RF and SVM were trained (321 plots) and validated (164 different plots) using accurate sample plot branch defoliation data. Classification accuracy metrics Producer's Accuracy, User's Accuracy, Overall Accuracy, Omission Error, and Commission Error were examined for comparing RF and SVM. Overall Accuracy for RF and SVM classifiers was 93.3% and 91.5%, respectively.</li> <li><b>3. Submit final manuscript for committee review and submit for journal publication.</b>  Manuscript draft is written and currently undergoing final committee review and once completed will be submitted to the journal of Remote Sensing of the Environment.</li> </ol>			
<b>Presentations Done</b>  <b>Papers Submitted</b>			
<b>Annual General Meetings</b> AGM1 <input checked="" type="checkbox"/> Attended <input checked="" type="checkbox"/> Reported results		AGM2 <input checked="" type="checkbox"/> Attended <input checked="" type="checkbox"/> Reported results	
		AGM3 <input checked="" type="checkbox"/> Attended <input checked="" type="checkbox"/> Reported results	
<b>Research Targets for next Reporting Period</b> <ol style="list-style-type: none"> <li>1. Finish final manuscript revisions and submit for journal publication.</li> <li>2. Enter and summarize sample plot SBW defoliation measurements collected August 2019.</li> <li>3. Begin work on manuscript regarding SBW defoliation pattern analysis from sample plot data 2014-2019</li> </ol>			
HQP Signature: Shawn Donovan Date: Sep. 17, 2019		Project Supervisor Signature: <i>David A. MacLean</i> Date: Sept. 17, 2019	