

**AWARE Semester Progress Report**

Project ID: Question #17a

Core Site: Newfoundland

Title: A multi-indicator framework for mapping the potential impacts of forest management activities on Aquatic Ecosystem Services (AES)

Institution: USherbrooke

Project Supervisor: Fournier, R., Luther, J.

HQP Name: Aurélie Schmidt

**Committee Members**
 See Progress Report Year: \_\_\_\_\_ Q \_\_\_\_\_

 Names: \_\_\_\_\_
**Report Period**

Year: 2018

✓ S1

S2

S3

Jan-

May-

Sep-

Apr

Aug

Dec

**Number of Courses Left to Complete****Work Completed from Precedent Reporting Periods**

----- **Quarterly 3 Oct-Dec 2015** -----

Milestone: Completion of 3 on 5 course load

- Deliverable: 3 courses completed of 5 required for the MSc
- Status: Completed

Milestone: Initial literature review on mapping ES

- Status: completed and documented

----- **Quarterly 4 Jan-Mar 2016** -----

Milestone: A detailed description of all relevant data available for the Harry's River Watershed.

- Deliverable: A detailed description table of data selected
- Status: completed and documented

Milestone: A detailed description of all relevant indicators selected for one ES (water quality service) for the HBW.

- Deliverable: A detailed description indicators selected
- Status: completed and documented

Milestone: Quantification of one aquatic ES (water quality service)

- Deliverable: A description of a selected method for quantifying water quality service at sub-watershed level of the HRW in Western Newfoundland
- Status: completed and documented

Milestone: Preliminary tests on potential mapping methods of one aquatic ES applied at sub-watershed level on the HRW in Western Newfoundland.

- Deliverable: Mapping method applied to sub-watershed level of the HRW for water quality service.
- Status: completed and documented

Milestone: Develop preliminary tests assessing the impact of forest management activities on water quality service at sub-watershed level for the HRW.

- Deliverable: A report and resulting maps representing the water quality service and the impacts of forest management activities.
- Status: completed and documented

----- **Quarterly 1 Apr-Jun 2016** -----

Milestone: Completion of 1 course (the 4th out of 5).

- Deliverable: 4 courses completed of 5 required for the MSc.
- Status: Completed.

Milestone: Improvement of mapping method of Aquatic Ecosystem Services (AESs) applied on the Harry's River Watershed (HRW) in Western Newfoundland.

- Deliverable: Abstract and presentation of the project for mapping AESs.
- Status: Presented at the first AWARE AGM.

Milestone: Final choice of the three AESs that will be quantified and mapped for the HRW in Western Newfoundland and improvement of the multi-indicator framework definition applied to the HRW.

- Deliverable: Flowchart approved by supervisors.
- Status: Completed and documented.

Milestone: A detailed description of all relevant spatial indicators selected to represent the three AESs.

- Deliverable: A detailed description of the selected indicators.
- Status: Completed and documented.

----- **Quarterly 2 Jul-Sep 2016** -----

Milestone: Writing the 1st MSc report on Objectives & Methods of the project and presenting it at a public seminar (GMQ800)

- Deliverable: A 20p report and public presentation.
- Status: Completed and presented on the 23<sup>rd</sup> September 2016.

Milestone: Revised delineation of the study area following discussion with CBPPL.

- Deliverable: Presentation and discussion on study area delineation.
- Status: Discussed and documented.

Milestone: Preliminary results of a more relevant spatial reference unit for AES mapping

- Deliverable: Presentation and discussion on the spatial reference unit size.
- Status: Presented at the meeting of 19th July organized with CBPPL.

Milestone: Validation of spatial indicators selected for AESs mapping in the Harry's River Watershed (HRW).

- Deliverable: Spatial indicators for quantifying and mapping AESs validated by stakeholders.
- Status: Presented and documented at the meeting of 19th July organized with CBPPL.

----- **Quarterly 3 Oct-Dec 2016** -----

Milestone: Completion of 1 course (the 5th out of 5) the last one required in the MSc program.

- Deliverable: Two session projects and practical works.
- Status: Completed.

----- **Semester 1 Jan-Apr 2017** -----

Milestone: Spatial database preparation (soil, slope and landcover) which are used to create hydrologic response units for the hydrological SWAT model. The SWAT model will be implemented for studying and modelling the clean water provision service at hydrologic response level and sub-watershed level.

- Deliverable: Organization and description of data
- Status: Completed and documented.

Milestone: Ground database preparation (Climate, water quality and flow) which are used to calibrate the SWAT model for the clean water provision service.

- Deliverable: Organization and description of ground data.
- Status: Completed and documented.

Milestone: Calibration and validation of the flow parameters of the SWAT model by using SWATCUP interface.

- Deliverable: Calibrated and validated flow parameter.
- Status: Completed and documented.

Milestone: Preliminary results of Function Indicators for the clean water provision service on the new mapping units (sub-watershed units).

- Deliverable: Function Indicators maps.
- Status: Completed and documented.

Milestone: Preliminary results of the supply index for the clean water provision service on the new mapping units (sub-watershed units).

- Deliverable: Supply Index for the clean water provision maps.
- Status: Completed and documented.

Milestone: Presentation of preliminary results of a more relevant spatial reference unit for AES mapping

- Deliverable: Presentation and discussion on method and forest disturbances indicators.
- Status: Presented and documented at the *Colloque of Centre d'étude la forêt* of 1 -2<sup>nd</sup> May, Montréal.

----- **Semester 2 May-Aug 2017** -----

Milestone: Presentation of preliminary results at AWARE AGM

- Deliverable: Presentation of preliminary results and discussion.
- Status: Presented and documented at the 2<sup>nd</sup> AWARE AGM of 17 -18 May, Edmunston, NB.

Milestone: Presentation of preliminary results at Corner Brook Pulp & Paper Ltd meeting

- Deliverable: Presentation of preliminary results and discussion on methods and preliminary results.
- Status: Presented and documented at the Corner Brook Pulp & Paper Ltd meeting of 15 June 2017, Corner brook, Newfoundland.

Milestone: Improvement in selection of Function Indicators.

- Deliverable: Guidelines for the calculation.
- Status: Completed and documented.

Milestone: Weights allocation for each FI based on expert opinions.

- Deliverable: Guidelines for the weighting system.
- Status: Completed and documented.

Milestone: Preliminary results of the supply index for the clean water provision service on the sub-watershed units for five-year period.

- Deliverable: Five maps for the supply Index for the clean water provision service.
- Status: Completed and documented.

Milestone: Preliminary assessment of the effects of planned forest management activities on AESs of the HRW for 2014-2018 period.

- Status: Completed and documented.

Milestone: Writing of the 2nd MSc report and seminar (GMQ805) on Preliminary Results of the project.

- Deliverable: Report (20 pages).
- Status: Completed and documented.

Milestone: First pictures and video for the AES mapping project.

- Deliverable: Preliminary pictures and video support in Newfoundland.
- Status: Completed.

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***Semester 3 Sep-Dec 2017***

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Milestone: Presentation of the 2nd MSc report and seminar (GMQ805) on Preliminary Results of the project.

- Deliverable: A 20p report and public presentation.
- Status: Completed and presented on the 22<sup>nd</sup> September 2017.

Milestone: Presentation of method and results.

- Deliverable: Presentation and discussion on method function indicators selection.
- Status: Presented and documented at the Conférence de Vision Géomatique of 17 -19<sup>th</sup> October 2017, Sherbrooke.

Milestone: Complete validation test of the framework with the SWAT hydrological model.

- Deliverable: Calibrated and validated sediment parameters (model).
- Status: Completed and documented.

**Research Progress During this Reporting Period: Semester 1 Jan-Apr 2018**

**----- COMPLETED -----**

Milestone: Using SWAT hydrological model calibrated for different scenarios of forest management and compare SWAT outputs to developed Index.

- Deliverable: Statistical analysis.
- Status: Completed.

Milestone: Establishment of the plan of the Scientific publication for a scientific journal.

- Deliverable: Plan of the Scientific publication.
- Status: Completed and documented.

**----- STARTED & ON-GOING FOR NEXT SEMESTER -----**

Milestone: Publication writing for a scientific journal

- Deliverable: Preliminary version of Scientific publication.
- Status: Planned to be completed by the beginning of June 2018.

Milestone: Submission of the MSc thesis for initial review prior to final submission to the university.

- Status: Planned to be completed by the end of August 2018.

Milestone: Official video of the aquatic ecosystem service mapping project.

- Status: Planned to be completed by October 2018.

Milestone: Internship at Resource Innovations, Corner Brook, Newfoundland to implement my research project framework.

- Status: Planned to be completed by September 2018.

**----- PLANNING AHEAD -----**

- Thesis done

**Annual General Meetings**

AGM1

- Attended
- Reported results

AGM2

- Attended
- Reported results

AGM3

- Attended
- Reported results

**Research Targets for next Reporting Period**

Complete a manuscript for submission to a scientific journal and complete the MSc thesis. Implement research framework at Resource Innovations, Corner brook (internship).

HQP Signature:

Date: 04/05/2018



Project Supervisor Signature:

Date: 9/05/2018



