

Progress Report (July 1, 2014 – November 7, 2014)

Title: Natural Variability in Water Quality and Changes after Forest Harvest in the Trask Watershed

Investigators: PI: Jeff Hatten, OSU FERM; Co-PIs: Alba Argerich, OSU FERM, Sherri Johnson, PNW.

Project duration: July 1, 2014 – June 30, 2016

Objectives:

To improve the current understanding of patterns and causes of variability in water quality across forest watershed landscapes we will characterize natural and post-disturbance variability in stream nutrients at the Trask River watershed. Specifically we will:

1. Characterize variability in background nutrient concentrations across time, by analyzing water chemistry samples collected over the pre-harvest period, and across space, by comparing water chemistry data across sub-catchments.
2. Analyze responses in nutrient concentrations to forest harvest by comparing pre- and post-harvest nutrient concentrations.
3. Compare pre- and post-harvest data to nutrient criteria under consideration for this ecoregion.

Summary of accomplishments toward objectives over past 5 months:

- Started analysis of water quality data from the Trask watershed collected on 194 dates between 2009 and 2013. The dataset contains a total of 1,219 water analysis including information of water concentration of nitrogen (Total dissolved nitrogen -TDN, Nitrate-NO₃, Ammonium-NH₄, Dissolved organic nitrogen -DON), phosphorus (Total dissolved phosphorus -TDP, Organic phosphorus- OP), and carbon (Dissolved organic carbon-DOC) compounds. The water samples were from five subwatersheds that differed in their management practices (GS3, PH3, PH4, UM1, UM2).
- We have also included in the analysis information on calcium, sodium and sulphate ion concentrations (Ca²⁺, Na⁻, and SO₄²⁻) from water samples collected at the five subwatersheds between 2009 and 2012 (140 analysis).
- On October 2014, we started the collection of storm water samples for the water year 2015 from the five watersheds (until today, we have collected water chemistry samples from 6 sampling dates).

Planned work for the next year:

- Fall 2014 – QA/QC the existing dataset of water chemistry and analysis of the pre-harvesting data.

- Winter 2014– We plan to keep sampling water chemistry to capture natural variability in nutrient concentrations and possible effects to management practices.
- Spring/Summer 2015- We plan to analyze water chemistry samples collected during WY 2015.
- Summer/Fall 2015 –
- Fall 2015 –Have the complete dataset of water chemistry data QA/QC and ready to share with the WRC
- Late fall 2015 – Data analysis and report complete. Presentation of the results to a conference.

List of names and brief overview of graduate and/or undergraduate engagement in project:

None to report

List of presentations, posters, etc.:

None to report

List of publications, thesis citations:

None to report

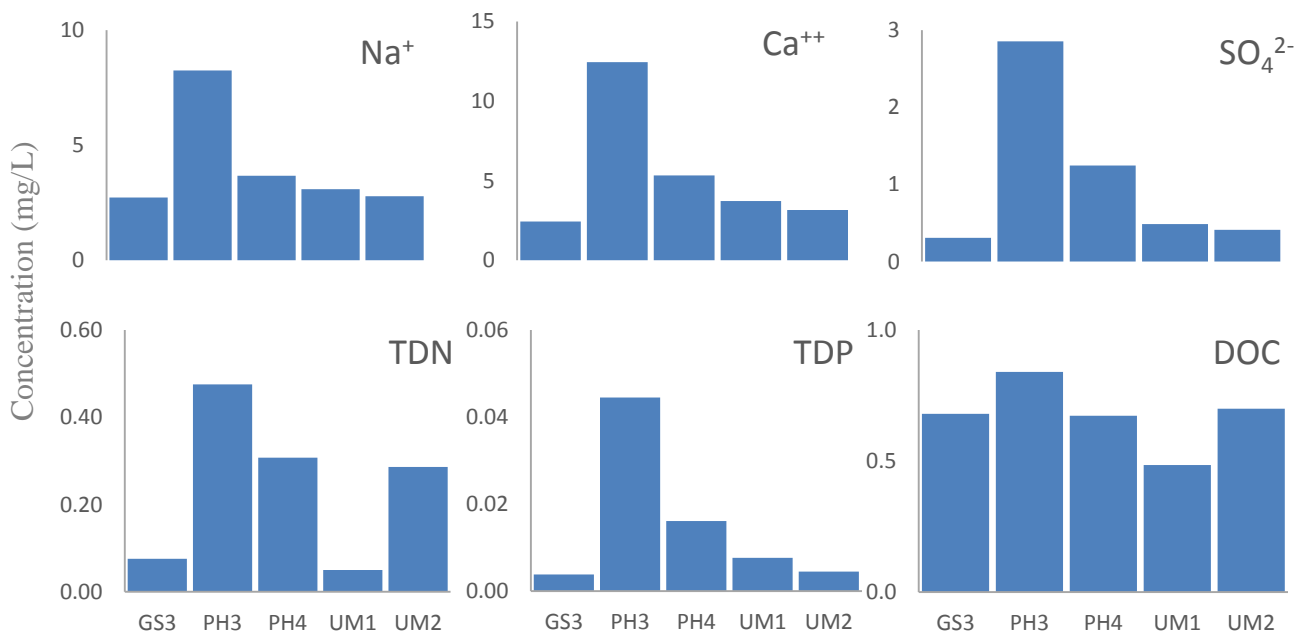


Figure 1. Mean solute concentrations during pre-harvesting (2009-2011) at the five subwatersheds. PH3 has a distinct signature from the rest of the watersheds, with higher ion and nutrient concentrations. PH3 and PH4 act more like a unit in terms of Total Nitrogen concentrations. In contrast with the rest of the solutes, DOC is fairly similar between the five subwatersheds, however DOC at PH3 doubles DOC concentrations at UM1.