

## Title: The role of catchment storage in controlling stream temperature response to forest harvesting

### Investigators:

PI: Catalina Segura (OSU FERM); Co-PI: Kevin Bladon (OSU FERM)

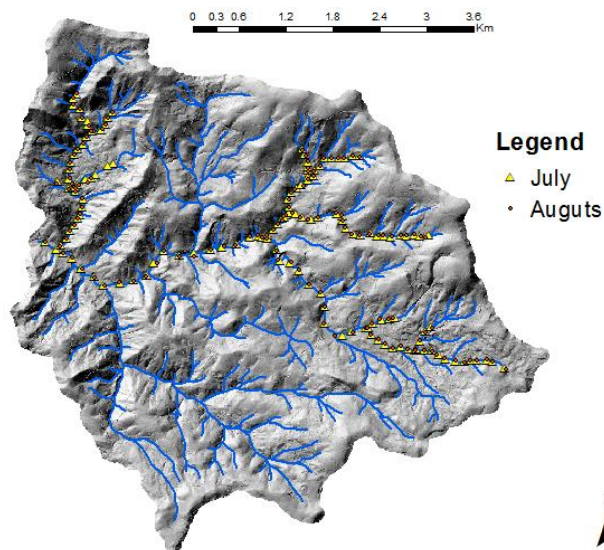
### Project duration:

July 1, 2016 – June 30, 2017

### Objective:

Stream water temperature ( $T_s$ ) response to timber harvest has been widely studied for decades in the Pacific Northwest; yet there is still a lack of understanding of  $T_s$  response at spatial scales larger than the individual harvest unit. Preliminary analysis of stream temperature data pre- and post-harvesting in the Trask Watershed indicated notable differences in downstream  $T_s$  response that appear to be related to differential hydrologic behavior of the catchments (i.e., ground water contributions to summer base flow) likely related to rock permeability (i.e., geology) of the contributing areas. However, the current data set does not allow us to describe the mechanisms that produce the differential  $T_s$  responses. More importantly, the data do not yet allow for prediction or anticipation of the sensitivity of streams across the landscape. ***Our project intends to investigate the spatial variability of groundwater contributions and its relation to stream temperature under natural (reference) and harvested conditions.***

### Summary of accomplishments toward objectives over past year:



- We collected ~130 water samples for lab analysis during each of 3 field campaigns (~390 total samples) in July, August, and September 2016 (Fig. 1)
- 30% percent of the samples have been analyzed for water stable isotopes

Fig 1. Water sampling locations in the Trask Watershed from July, August, and September 2016.

**Problems, barriers, proposed changes to objectives:**

No problems or barriers to report other than two changes in research group personnel:

1. The postdoctoral scholar Nicholas Cook accepted a position in a consulting firm in Portland and left the project on August 31, 2016.
2. The PhD student, Lydia Nickolas who was going to work in the project has decided to pursue a Master's degree instead and will not participate in this project.

Considering the mentioned changes in personnel, the budget has been adjusted to include salary for a lab technician who will aid with the isotope analysis in the laboratory; salary for temporary personnel to conduct some on the analysis (i.e., spatial GIS) and a higher FTE to cover summer salary for the PI (Segura) and Co-PI (Bladon). It is important to emphasize that none of the objectives or deliverables of the project have changed.

**Planned work:**

- The analysis of samples for water stable isotopes will be complete between November and December 2016.
- Data analysis will follow, incorporating the 2016 stream temperature data that has been collected in the Trask.
- Spring 2016 – Segura will participate in a workshop “Spatial Statistical Network Models” to strengthen the analysis.
- Summer 2017 – Synthesize data and prepare manuscript.

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

A graduate student (Amelia Yeager) and 4 undergraduates (Joey Tinker, Cameron Minson, Noah Kanzig, and Ryan Cole) were involved in water sampling during the summer. Cameron Minson has also been involved in the analysis of water samples in the lab. Part of the funds to support these students came from the College of Forestry Mentored Employment Program.

**List of presentations, posters, etc.:**

None to report

**List of publications, thesis citations:**

None to report