

# Applied Methods in Community-Engaged Environmental Science 205 Course

## GOALS

- 1. Explore how students learn to account for and incorporate community perspectives into the planning process for ecological restoration.
- 2. Explore ways to incorporate real-time monitoring data into the student learning experience.

## CONTEXT AND RATIONALE

The motivation for this project stems from a desire to learn more about how students can learn most effectively when they engage with the local community. There is an active community surrounding Stoney

Creek, a small but viable salmon-bearing creek beginning its 4 km watercourse near UniverCity at SFU and eventually flowing into the Brunette River near Lougheed Highway.

This inquiry project is part of the larger curriculum development of the Environmental Science 205 (EVSC 205) course that began by identifying a series of research and learning opportunities that serves academic, student scientific knowledge, and community needs and interests. The specific research opportunity that integrated knowledge and action for the mutual benefit of all partners was the creation of an in-stream monitoring network along Stoney Creek.



Figure 1: Students practicing the many methods learned in EVSC 205. Foreground: Stream invertibrate analysis. Background: Streambed material testing. Photo Credit: Tommy Rodengen

## PRELIMINARY FINDINGS

### Goal 1

We, through the use of video, captured the thoughts and ideas of those community members directly involved in ecosystem restoration projects along Stoney Creek. The interviews allowed community members to identify issues around Stoney Creek. Community members represented Burnaby Engineering, Department of Fisheries and Oceans, Stoney Creek Environmental Committee, UniverCity, UniverCity Neighbours for Environmental Sustainability, and other organizations.

The involving of the community in a common project was not easy. Volunteer groups can have their own vision and direction, which may or may not be in line with the course objectives. Our videos are the first step to “bridge” the cultural divide between “students” and the “community,” such that we can engage the community in restoration efforts.

Ten videos with community members covering four ecological restoration projects were produced and posted on the Internet for student and

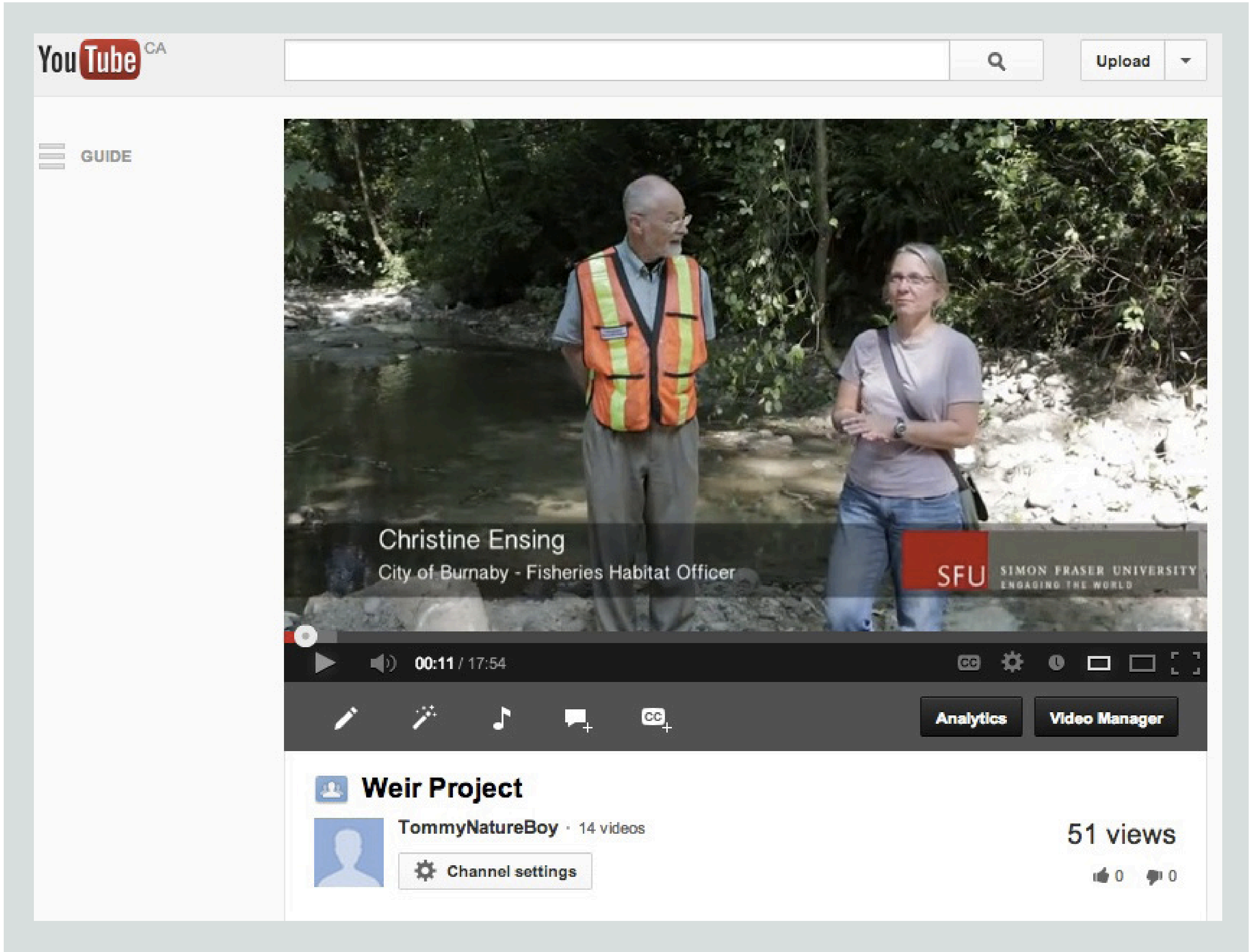


Figure 2: Screenshot of the publicly available community member interviews.

public viewing (Figure 2). Students were able to gain first-hand experience of how members of the community envision the process of restoration. The students of EVSC 205 have incorporated the videos in various ways into their final project for the course, “Post Project Appraisal of an Ecological Restoration Project on Stoney Creek.” These projects are available on the publicly accessible Simon Fraser institutional repository, SUMMIT.

### Goal 2

The EVSC 205 course has as its central objective the restoration and recovery of the Stoney Creek watershed. This is a long-term commitment to the watershed. Initial steps are restoration; the

follow-through is an essential component, which allows for assessment and adaptation of applied methods if required. It is envisioned that students of the EVSC 205 will as part of the degree requirements establish and maintain this long-term project. As such it will be unique in that today, there are few long-term data sets available that allow for assessment of a response of an ecosystem to recovery. Further, there is little information that has evaluated whether applied restoration techniques are actually effective.

Real-time measurement is an important part of interpreting an ecosystem response to perturbations such as extreme weather events. Nature does not operate just on Tuesdays and Thursdays from 2 to 4 when the

course runs. Monitoring stations allow for the visualization of real-time events and the archiving of a long-term data set that can be accessed by students for projects and reports.

We use real-time data in the classroom transmitted wirelessly from an in-stream monitoring station in Stoney Creek, including temperature, conductivity, dissolved oxygen, pH, oxidation reduction potential, and turbidity. Using real-time data in the classroom has added a unique and exciting component to help the students experience learning about quality control, natural disturbance, and various other analytical methodologies used commonly in academia and industry (Figure 3).



Figure 3: EVSC 205 students gathering pH data in the field to be corroborated in the classroom by EVSC Stream Monitoring Station #1 (right photo). Photo Credit: Tommy Rodengen

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