

Design Project: Repeat Photography in Environmental Restoration

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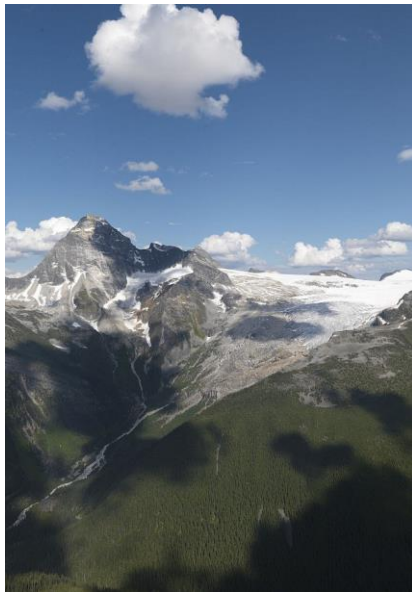
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Repeat Photography: The 'What'

Repeat photography is an ecological monitoring method that is used in various situations in which monitoring is valued and desired, and has many applications in ecological restoration. It can be seen in many cases as a valuable tool when measuring glacial decline in major mountain zones, such as Glacier National Park, or Jasper National Park. Historical landmarks, tourist attractions, and restoration sites are also candidates for the practice of repeat photography. Historically, repeat photography was pioneered as a means to monitor glacial decline in the nineteenth century (Webb, R.H., Boyer, D.E., Turner, R.M. 2010). Early in the twentieth century, repeat photography began being used to document landscape change and flora population. Still today, grasslands and desert plains remain the most frequently documented cases of repeat photography as a monitoring method, as they are vast plots of land, often unobstructed by trees and other natural barriers (Webb, R.H. *et al.* 2010).

A repeat photography project is, in practice, quite similar to a photo-point monitoring project, simply with a wider range of possibilities and applications. Repeat photography projects can be started with little to no historical or past contribution by taking a few things into consideration (to be discussed in the next section), or can be started using historical insight or photographs. It can be very interesting to use historical photographs as the base, then repeating these photographs to compare how the land has changed (Figure 1 & 2).



*Figure 1--Abbot Ridge as Photographed
by Mountain Legacy Project (2011).*



*Figure 2-- Abbot Ridge as Photographed
by Mountain Legacy Project (1901)*

The goal of this document is to provide students in the ES 471/ER 412 field course on Galiano Island a reference manual to aid in the production of a repeat photography project. This document outlines the importance of repeat photography, its relevance to the course and the Galiano Conservancy Association (GCA), how to perform the project, and how to process the results.

Basics: The 'How'

To begin a repeat photography project, there must first be a few key considerations. These considerations are as follows:

- 1) First, the question of why the monitoring is taking place must be addressed. Finding an answer to why the project is being conducted sets the stage for other considerations. Is this a restoration monitoring project? Is it to record the impacts of humans? Animals? Climate change? (Hall, F.C. 2001)
- 2) The next consideration is where the photography is to take place. Does it make sense to monitor the effects of clear cutting in a fully-functioning, pristine Douglas Fir ecosystem? Probably not. Thus, 'where' becomes the next topic of discussion.
- 3) Next, of course, is what the subject of the photo is, and what you are trying to demonstrate or convey with the photograph; what part of the site is of interest? What will this tell us about the 'why'? For example, a sea wall to monitor sea star decline, or a body of water to monitor algae bloom.
- 4) Lastly, 'when' is an important part of the 'repeat' part of repeat photography. This is the time frame that will occur between each photo. If it is a more immediate and pressing issue, perhaps a few weeks or months is appropriate. If the project is, for example, monitoring the growth of a new forested ecosystem, perhaps years is an effective measure of time.

Determining answers to these questions can be a daunting task, but for the purpose of this assignment, most of the answers will already be evident. That said, there are two directions this project may go. These are as follows:

- 1) The 'when', 'where', and 'why' will be pre-determined by the instructor. This leaves you with 'what'. Finding the exact location, distance, and angles for each photograph to be repeated is half the fun! For each photograph to be repeated, or perhaps even projects with no prior photographs, it is vital that the information gathered from each site is repeatable. It may seem obvious, but is incredibly important. For each photograph, there is information that must be recorded. This includes GPS coordinates, camera make, weather conditions, and location (Figure 3).
- 2) Students are encouraged to propose their own repeat photography project on a site of interest to the community, the class, or the GCA. To perform this, students must consider the above questions in detail. This could be any project (A degraded watershed, the decomposition of a fallen tree, effects of ocean acidification on wildlife

growth on cliff sides, etc.). For each photograph to be repeated, or perhaps even projects with no prior photographs, it is vital that the information gathered from each site is repeatable. It may seem obvious, but is incredibly important. For each photograph, there is information that must be recorded. This includes GPS coordinates, camera make, weather conditions, and location (Figure 3).

Repeat Photography Galiano Island

Location:		Repeat date:		Station Narrative:			
Year (historic):		Repeat date:					
Start time:		Finish time:					
Group members:							
Source of historical photograph (e.g. postcard, private photograph):							
Repeat camera (e.g. make, model, lens):				Weather Narrative (e.g. wind, sun, rain):			
Repeat Image Data							
Location*	Original Photo no. (if available)	Repeat Photo no. (from camera)	Azimuth (e.g. SSW)	Latitude	Longitude	Location camera**	Location photo no.

*Location: If more than 1 location, use numbers to designate locations (e.g., 2)
 **Camera used to document the tripod location

Figure 3-- Fillable field work form

Equipment

Necessary Equipment for this project is as follows:

- 1. Camera/tripod
- 2. GPS
- 3. Compass
- 4. Fillable field work form
- 5. Clipboard
- 6. Measuring tape
- 7. Previous photographs (For those continuing existing projects)

Now, what?

After the project is completed and photographs are taken, students embark on the final stretch of the project: submitting and recording the photographs. The projects completed by students in the ES 471/ER 412 field course will document their findings online, on the webpage created for this project, which can be found at <http://galianorepeatphotography.weebly.com/>. The purpose of this is to allow prospective students considering the course, community members, and general public to see the results of this project, as well as creating a compiled database to store the information gathered from these projects (Figure 4). There are 4 main tabs on this website; “Home”; “About”; “Photos”; and “Contact”. The Home page is a basic, introductory page with an example of the repeat photography showcased in GIF format for an impactful look at the changes occurring on Galiano Island. The About tab contains a short introduction to the project as a whole, what repeat photography is, and why it is being done. It is a sort of “abstract” to this document.



Figure 4—The website.

Past and present projects can be found under the “Photos” tab on the webpage (Figure 5). Visitors can click on these pictures to be taken to a separate page containing various information on the respective project (Figure 4). This is laid out in this manner to create an easy, comprehensible way for students, visitors, and community members to inform themselves on a project.

Students will prepare a small description of the project they take on, including answers to the above questions (why, where, what, when), as well as insight into the relevance of their particular project to the course to be added onto the project’s specific page on the website (Figure 5).

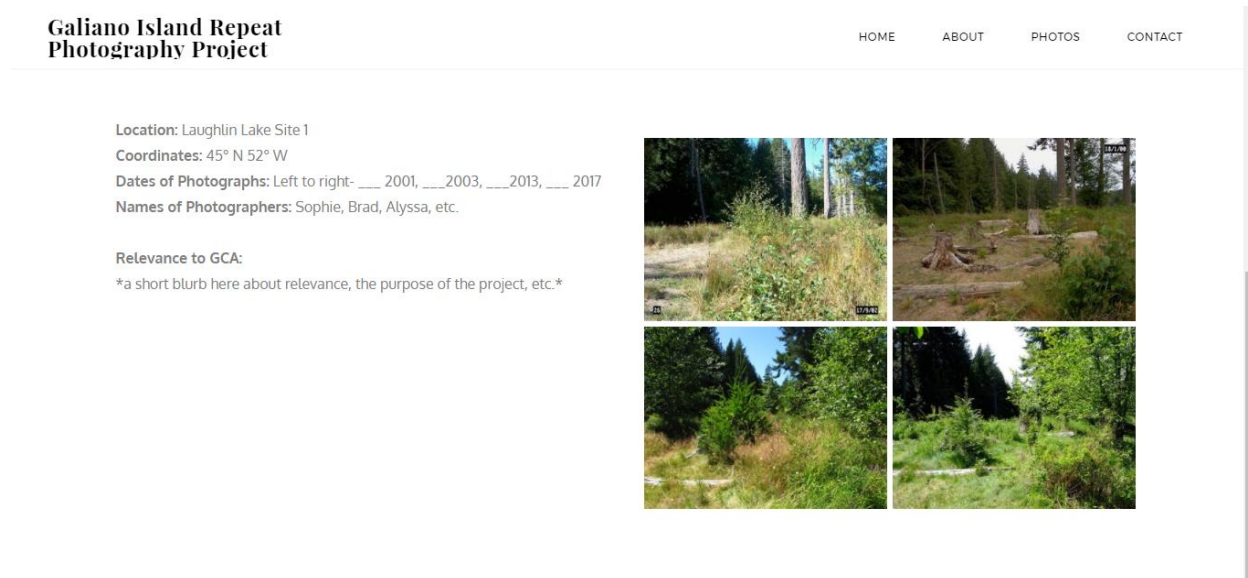


Figure 5—A preliminary example of what a post on the website is to look like.

The Contact page takes visitors to a page where they may submit comments, questions, and other inquiries to the course’s instructor, Eric Higgs.

In Context: Course Application and Community Implications

Repeat photography is an innovative practice for monitoring restoration efforts, environmental degradation, and other ecological concerns. Introducing this project into the course not only gives students a valuable look at hands-on environmental monitoring, but also positively impacts the community—in particular, the GCA. Community members and staff alike are eager to have this project implemented into the field course, believing that it will bring about a positive change as an effective restoration practice that will allow students and professionals to understand and take on pressing environmental concerns in a non-intrusive way.

Upon proposing this project, Eric and myself received much positive feedback, with community members already raising ecological concerns they would like to see addressed by this project, such as the shifting structure of creek beds, soil composition, and vegetation population changes. This project, as mentioned by GCA members and citizens of Galiano, is going to be greatly helpful to the research being conducted on the site of the Millard Learning Centre as well as other protected areas on Galiano Island. The hope is that over the years, this project will be a valuable tool to the GCA and that it can be expanded to address issues on the rest of the island. The overwhelmingly positive response from the attendees at the project proposal are a good indicator of the importance of this project, and how valuable a learning experience it is to take part in it.

As an example, a project has already been in the works at Laughlin Lake on Galiano Island. This land has been overgrown for years, and has been victim to invasive species, crowding out the potential for native species growth. There have been multiple efforts for restoration in these areas, and repeat photography has been a great way to monitor these efforts (Figure 6).



Figure 6-- Laughlin Lake Project over 16 years. (Left-Right: 2001, 2003, 2013, 2017)

This project proves as an interactive way to monitor and manage the environment on Galiano Island, and if successful, will provide a database for the restoration efforts by the GCA, which is an extremely valuable tool when monitoring successes and failures in restoration, and allowing a potential for troubleshooting problematic areas of concern. Robert Webb describes repeat photography as a “decidedly low-technology tool that yields high information content of value to many disciplines” (2010: 310). It is an inexpensive, low-commitment (in some cases), and highly relevant and useful tool. This project can also be used to monitor invasive species’ effects on the land, human impact, and climate change. With technology advancements, it is likely that repeat photography will only become more valuable and advanced with the development of film technology (Webb, R.H. *et al.* 2010). If this project is successful and continuous, it will become an important resource for education, keeping historical records of the land, and restoration efforts on Galiano Island.

Resources

Hall, Frederick C. 2001. *Photo point monitoring handbook: part A—field procedures*. Portland, OR. Department of Agriculture, Forest Service, Pacific Northwest Research Station.

Webb, R.H., Boyer, D.E., Turner, R.M. 2010. *Repeat photography: Methods and applications in the natural sciences*. Washington, DC. Island Press.

Mountain Legacy Project. (n.d.) Retrieved from: <http://mountainlegacy.ca/index.html>

Galiano Repeat Photography Project. (n.d.) Retrieved from: <http://galianorepeatphotography.weebly.com/>