

Applying DStretch to Central Coast Rock Art

Aurora Skala

Introduction:

In 2013-2015, I worked closely with Wuikinuxv Nation and Heiltsuk Nation to select the study area within their territories and design the research and objectives for two regional studies of rock art. This project is identified as a short-term study as it was instigated by me to fulfill the requirements of a two-year MA program. Deliverables and community goals included: accurately-plotted GPS locations of rock art sites (thus updating Heiltsuk Nation's and Wuikinuxv Nation's respective databases); hiring within the community; identifying "new" archaeological sites which had not been previously recorded as sites (though some of these were recorded by oral history); and high resolution photographs and post-processing contrast adjustment. Fifty-eight rock art sites were used in the analysis of my MA thesis (viewable at UVic's DSpace). The two study areas were: Roscoe Inlet (the Heiltsuk portion of this project) and Owikeno Lake/Eastern end of Rivers Inlet (Wuikinuxv portion of this project).

This research focused on documenting petroglyph and pictograph sites, using GPS and high resolution photography (which were then post-processed to bring out images not visible with the naked eye). DStretch, a plugin, created by archaeologist and rock art researcher Jon Harman (Harman 2013), was used to do this.



Figure 1: Map of MA study area, Roscoe Inlet and Rivers Inlet/Owikeno Lake. Created by Aurora Skala using Google base layer in QGIS.

During this research I sought to answer 5 questions:

1. Can the existing record of rock art sites be verified? By attempting to revisit these previously-recorded sites it will be possible to record or refute the sometimes unclear or incomplete information about their location.
2. Are there additional, previously unrecorded-by-archaeologists, rock art



Figure 2: EkSr-11 (recorded as a site during this research). Photo by Aurora Skala.

sites within the study area to be recorded during this study. Community members have retained knowledge of sites which have not been visited by archaeologists. During previous time spent on the Central Coast, I have recorded rock art in locations where it had not been reported. It was found because we were in areas not frequently visited.

3. How can DStretch best be applied to the study of pictographs in Heiltsuk and Wuikinuxv territories? Innovative new techniques are available to rock art researchers which were not when rock art in this area was last studied. By using digital contrast-adjustment software (DStretch), new information regarding these sites is anticipated. DStretch was specifically developed in 2005 by Jon Harman for rock art research (Le Quellec et al. 2013:178). It is akin to programs such as Adobe Lightroom used to manipulate images.

4. By revisiting recorded and previously unrecorded rock art sites can the current typology of rock art in this area be expanded? Some typological groupings have been proposed for coastal BC rock art, but specific concerted research on rock art has not been done for the two locations in this study.

5. Can the application of underwater research techniques be of

benefit in studying rock art in this area? Some rock art in the area is not visible because it is covered by water (i.e., seasonal changes, or because of sea level change) (Skala 2015).

Roscoe Inlet (the Heiltsuk portion of this project) and Owikeno Lake/Eastern and Rivers Inlet (Wuikinuxv portion of this project) are essentially deep fjords (which in the Wuikinuxv project area gives way to a vast freshwater lake). They both include steep cliffs and what could be thought of as high-probability locations

for rock art (though, in fact, the

results of this project indicate that rock art is not only to be found in highly visible locations). In addition, they are both known for having an abundance of rock art. Archaeologists and visitors have been documenting rock art in this region since the 1930s, with the majority of sites being recorded in the late 1960s and early 1970s. However, many of these sites have not been reported since that time and frequently have no details associated with them (e.g. what the design depicts, how well preserved they are, precise location data). No academic study which focused on rock art was ever done on these two areas. However, Doris Lundy's remarkable work (Lundy 1974) which covers rock art of the entire Northwest Coast does

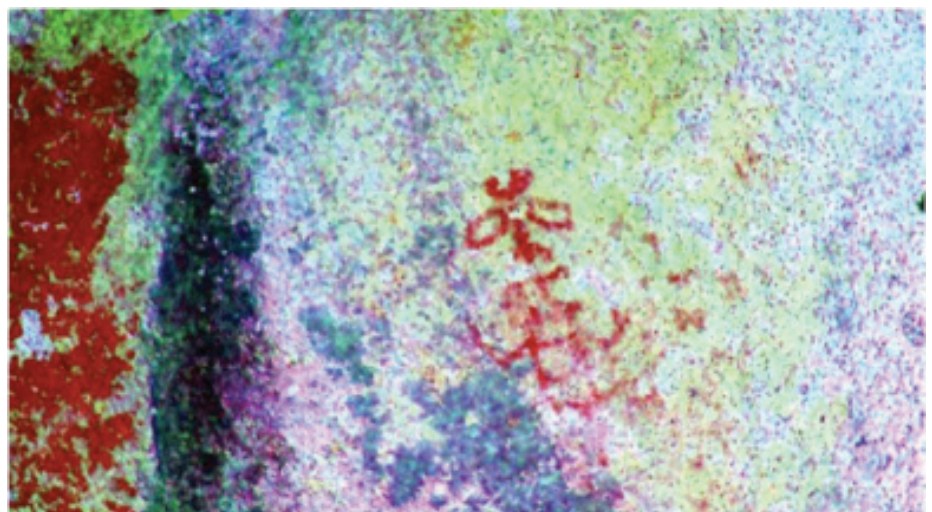


Figure 3: EkSr-11 with DStretch applied. Photo and contrast-adjustment by Aurora Skala.



Figure 4: FcSx-5, grouping #3. Photo by Aurora Skala.



Figure 5: FcSx-5, grouping #3, with DStretch applied. Photo and contrast-adjustment by Aurora Skala.

include this area. She had to rely on others' reports and sketches. She did not get to see photographs of many of the sites in these two study areas until I began this project. Additionally, Beth and Ray Hill's work (Hill and Hill 1974) recording petroglyphs did include a couple of the Roscoe Inlet petroglyphs. Roscoe Inlet and Owikeno Lake have more pictographs than petroglyphs. The petroglyphs in Rivers Inlet, though known to the Wuikinuxv community, were not recorded as archaeological sites until this project. Therefore the Hills' project only provided direct information on 2 of the 58 sites.

Method:

The nature of this community-engaged research project meant that even before field work began a lot of information was gained by talking to community members and people with knowledge of the rock art, as well as the literature which was surveyed for mention of rock art.

Field surveys were conducted mostly by boat, slowly cruising past the shore to look for sites. This method omits sites not visible from the water, but in the interests of time constraints and not putting the crew at risk of wildlife encounters (such as grizzly bears!) it was the method decided upon. This method helped in locating pictograph sites, but because many of the petroglyph sites are intertidal it was not effective for locating new petroglyph sites as we did not always survey at low tides. After returning to the lab, DStretch was used on the computer to adjust the contrast in the images.

Other aspects of the research included scuba diving to locate submerged petroglyphs, but for this article I will showcase DStretch which was the primary method used.

Results:

We found 47 of the 51 previously-recorded sites in the RAAD database, 3 of the 8 sites remembered by the community (but not recorded in RAAD), and 8 sites we found by surveying the inlets. I do not think these 8 additional sites are ones remembered/recorded (they do not fit the descriptions given by community members or the location information on site forms). Some sites we only conclusively identified as rock art after I had applied DStretch to the image. For example, the design is under 0.5 metres and was only faintly visible when we were right in front of it. The use of DStretch, besides defining the design, confirmed that there was, in fact, a design there.

In the case of the next example, a site inventory form existed, however the site's location was mis-plotted. A drawing existed, but not all of the images were visible, either in 1969 (by the original recorders J. Stoutamire, J. Anthony Pomeroy, K. Conover, and M. Finnegan) nor in 2014 by myself and my team. Only with DStretch were we able to see the second face and hand in the below design. This entirety of the design in the photo is ~0.75 metres by ~1.5 metres. These are but two small examples of how DStretch increased the number of recognizable images at rock

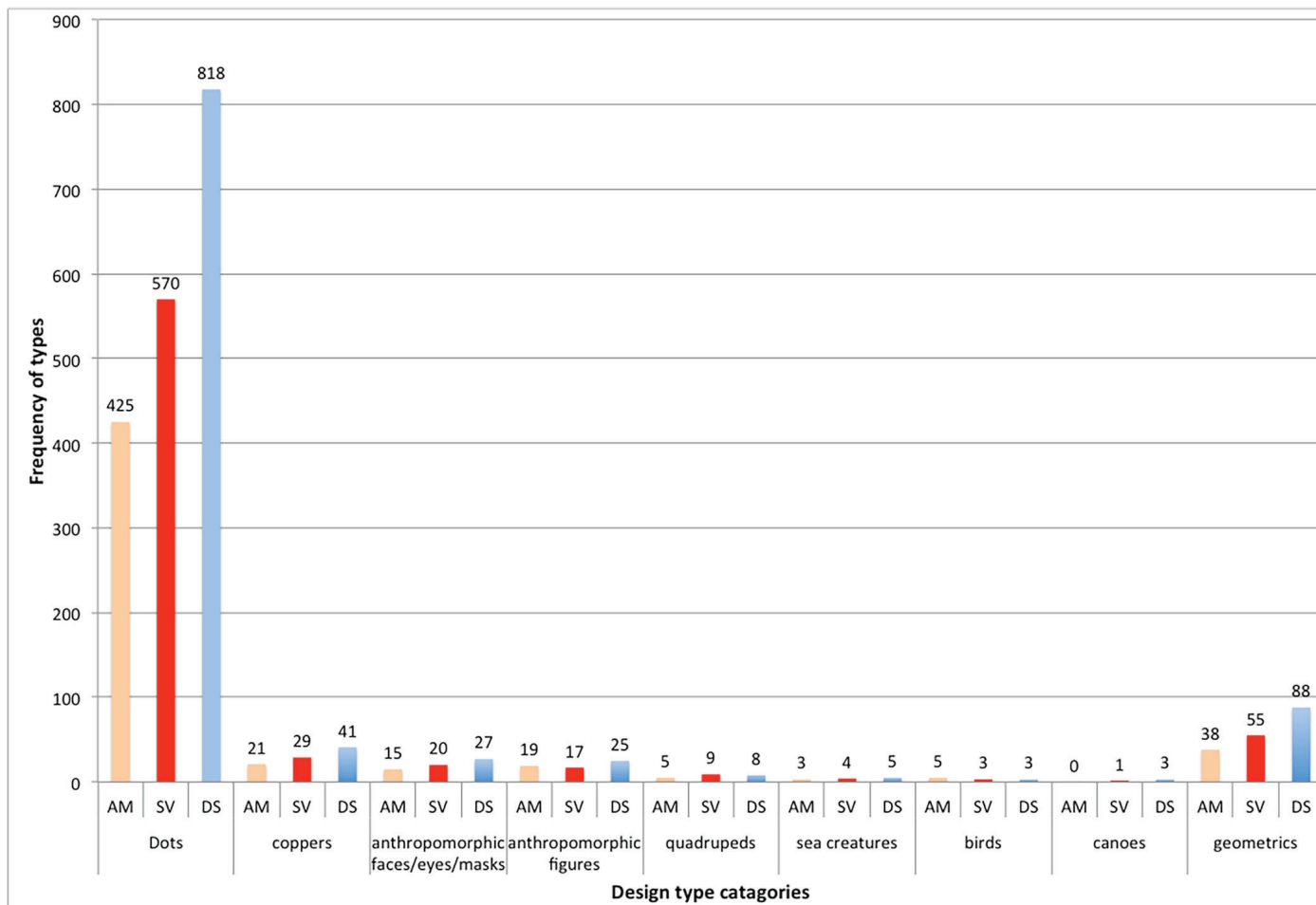


Figure 6: Graph indicating the dramatic difference between what was visible based on archival material (AM), contemporary field visits in 2013-2015 (FV), and post-processing use of DStretch (DS).

As is indicated by the above graph

art sites and added to the number of recorded rock art sites in the area. Below I have combined the data from both the study areas to show what a difference the use of DStretch can make to recording rock art sites. The bars in the graph are ordered temporally by the earliest archival material in the form of rubbings, photographs, and site inventory forms (AM), field visits conducted during this research 2013-2015 (FV), and DStretch which was applied to photographs after the fieldwork (DS). Overall, DStretch enhanced visibility of the rock art images compared with what was visible during the contemporary field visits or reliance on the original site inventory forms and other archival material. These increases are illustrated by design type categories. When these categories were combined this totaled a 44% increase in designs between the field visits and DStretch, or a 92% increase between designs identified in the archival material and current photos where DStretch had been applied.

As is indicated in Figure 6, certain designs recur on the Central Coast. However, this graph was created to showcase the use of DStretch and does not indicate which of the two study areas the designs are in, for example some categories of designs do not appear in both study areas.

Conclusions:

Partnerships and collaborations are essential for this type of research project to occur. The information obtained by talking to band members including elders and the knowledge provided by the team (in particular the boat operators who had vast knowledge of the landscape: Chris Corbett, Johnny Johnson, Wesley Vickers) added immeasurably to the success of this project.

Designs recur and are persistent. As is to be expected, the Central Coast rock art has salient differences in artists' choices than other British Columbia rock art. The persistence of designs continues to be



Figure 7: Spray-painted design outside Bella Bella Airport.
Photo by Aurora Skala

evident in both communities which participated in this research project. For example, while material has changed to spray paint in some cases, a design I saw outside the airport in Bella Bella reminded me of this continuity of design. It seems taken straight from the corpus of images also used in rock art of the area, reimagined with contemporary materials.

DStretch is a valuable addition to the tools available to contemporary documenters of rock art. It can turn back the clock, making visible images that were once clear but have become too degraded to view with the naked eye. Unlike many other techniques we use as archaeologists, such as excavations, digital photography techniques (e.g. DStretch) can serve as powerful tools, which do not physically damage a site therefore documenting in a non-invasive way.

Acknowledgments:

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Bio:

Aurora Skala is an alumna at Hakai Institute and University of Victoria where she recently completed her MA. Her research passions include documenting rock art and underwater archaeology.



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