

Interview Preliminary Summary Report

Associated with the research project:
“Linking School-Based Monitoring to Land & Water Decision-Making”

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Students from NVSS conducting water monitoring at Murray Creek in September 2020

This research takes place on the Traditional Territory of the Saik’uz First Nation. This project is happening in coordination with the “Koh-learning in our Watersheds” project and is supported by many community partners and funders including:



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Executive Summary

This interview report is part of a research project to explore how school-based monitoring can be connected to land and water decision-making. The project takes a community-based, action-oriented approach including phases of water monitoring trials and interviews. The research focuses on the case study of the ‘Koh-learning in our Watersheds’ education project at the Nechako Valley Secondary School, in Vanderhoof B.C. on the traditional territory of the Saik’uz First Nation. Interviews were conducted with students, teachers and decision-makers. The first part of the report provides a background of who was interviewed for the research.

Interview findings paint a picture of Koh-learning as an interdisciplinary outdoor-learning program that focuses on water monitoring and increasing place connection and appreciation in students. Students appreciate Koh-learning for going outside, learning from other students, and building social and leadership skills. Participants identified that at its essence, Koh-learning was about building hope that together we can make a positive difference to counter the damage done to our watersheds.

Interview participants across student, teacher and decision-maker groups saw potential for school-based monitoring to inform decision-making through multiple pathways, including (in no order): 1) increased attention on waterways, 2) identifying issues and imagining solutions, 3) filling gaps and providing new data, 4) growing awareness and the ability of the public to inform decision-making processes, and 5) contributing to reconciliation.

Students were most interested in monitoring living aspects of the waterways, including invertebrates, salmon and wildlife. Teachers were interested to see students measure across time and various locations. Decision-makers from different groups had a large range of data and information interests. The areas of overlapping interest included salmon and invertebrates, water quality, riparian condition, and taking a watershed-level focus.

Participants mentioned that they think the program is going in a really good direction, and we should keep learning together as we go forward. Suggestions for next steps included establishing signs on the property of farmers to acknowledge their contributions to the program, getting more Indigenous youth involved, and continuing to have discussions with decision-makers to identify where interests align.

Part 1: Background

This report provides a preliminary overview of the findings from interviews that took place between November 2020- February 2021, as part of the research project: “Linking School-Based Monitoring (SBM) to Land and Water Decision-Making”. Interviews are one phase of the research project alongside water monitoring trials with high school students, and literature review. **The goal** of the interviews was to explore the following two research questions:

- What are potential pathways of influence for school-based monitoring in the Koh-Learning project to inform land and water decision-making in the Nechako Watershed?
- How can we design school-based monitoring programs and protocols to inform land and water decision-making?

Interviews were conducted in two formats and included a range of perspectives. A total of 12 students, 8 teachers, and 14 decision-makers were interviewed. A description of the two types of interviews and the range of perspectives gathered during interviews is provided in Table 1. The range of perspectives is also represented in Figure 1.

Table 1. Types of interviews and distribution of perspectives of interview participants.

	Group Interviews		Individual Interviews	
Description	Took place with students and teachers from the Nechako Valley Secondary School (and one decision-maker group) to identify monitoring interests and pathways of influence.		Took place with decision-makers and other actors on the landscape to identify monitoring needs and pathways of influence (note: one set of decision-makers was interviewed as a group).	
Groups Interviewed and # of Participants	Role/Affiliation	Number of participants	Role/Affiliation	Number of participants
	High-school student	6	Local government	2
	Middle-years student	6	Saik’uz First Nation	1
	High school teacher	5	Provincial government agencies with land & water related responsibilities	5
	Middle years teacher	3	Environmental organizations	1
	Saik’uz First Nation	5		

Demographics: Based on a post-interview demographic survey (completed by 26/34 participants), 16 participants identified as female, and 10 as male. 17 participants identified as Caucasian/European, four identified as First Nation/Indigenous, three participants identified as First Nations and Caucasian and one identified as Metis.

This interview summary was developed to report back to interview participants about what was heard across groups. This report will help to build shared understandings around the possibilities for school-based-monitoring to inform decision-making in the context of the Nechako Valley Secondary School

and beyond. This report is part of the initial phase of analysis for the interviews. The results from these interviews will be used in three ways:

- 1) to inform the design of a second set of water monitoring trials,
- 2) as a resource for the Koh-learning project to improve connections with decision-making,
- 3) to improve our general understanding of how school-based monitoring can inform decision-making.

Guide to the report: This report includes both text descriptions, and summary graphics for various topic areas covered during the interviews. Quotes are attributed to interview participant using either an assigned code, their real names, or a pseudonym, based on the preference of the participant.



Figure 1. Summary of perspectives interviewed. Each shape represents a broad category of actors that play a role in land and water decision-making and/or school-based monitoring and were interviewed in this study. Dot points within the shapes represent specific perspectives interviewed within the broader categories (diagram based on Bodin & Crona (2009)).

Part 2: Collective Understandings of Koh-learning

Experiences: How do participants describe their experiences with Koh-Learning?

Interview participants had varied experiences and understandings of Koh-Learning. All of the students and teachers had participated in Koh-learning events or activities at least once. Some decision-makers interviewed had never heard of the program before, while others had attended Koh-learning events. When asked to describe their experiences with Koh-learning, students described how the program was “fun and crazy”, “eye-opening” and “interesting”. Students who had been mentored by older students described how much they liked learning from other students.

Teachers described how the program allowed them to develop community within their classrooms and to create a more authentic learning environment where different kinds of students could flourish. They also highlighted the cross-disciplinary elements of the program, and the benefits of learning in the community, and in the watershed itself.

‘When my students reflected on the assignments, they were most proud of for this term, they all tagged their nature poem, and said that it was the most engaging of their work, the most relevant of their work and I just really feel that it created a community, or connected us together as a team, or as a group within the classroom quicker than it usually takes me with students and classes’
– Participant T_G

Decision-makers who had attended Koh-learning events said that they enjoyed seeing how students were learning on the land and doing education that had direct relevance to the community. The word cloud below (Figure 2) shows some of the words that participants used when describing Koh-Learning.



Figure 2. Word cloud including some of the words that participants used to describe Koh-learning.

History of Koh-Learning: A story of community watershed stewardship

Some participants, particularly teachers, described their experiences with Koh-learning in terms of how the project came to be. Participants described that it had started with disparate teachers doing studies with their classes around watershed health. This eventually coalesced into the Koh-Learning project when UNBC started to show an interest in developing partnerships in the area. At this stage Koh-learning activities started with the 'pre-packaged' Pacific Streamkeepers watershed monitoring program. Koh-learning was an extension and expansion of other watershed education and engagement initiatives in the region. Participants described this story of watershed engagement as being intertwined with the story of Nechako River, the Nechako White Sturgeon, and small stream stewardship and restoration in Vanderhoof. As one participant described:

"My kind of enthusiasm with the Koh-learning project now, is that it's hopefully going to push to the next level, so hopefully it's not just 'how many bugs did we find, what kind where they'. What does that mean in terms of the health of the watershed, of the big picture? I guess for me it's all about the sturgeon too, how do all of these pieces fit into the health of a species that is so at risk and so close to extinction, what are we doing about it?" – Participant T_F

Often, participants described that the activities and collaborations that were taking place in the region, and with the School District were "not the normal" and "special". For example:

"We convinced the municipality, the community, to put forward a million dollars out of our community's monies, to enhance a SARA listed species, that's never been done in Canada, to my knowledge before, that a community has stepped forward like that" -Wayne Salewski

"You know I feel really fortunate to be [part of a community] that's not doing the normal. You know, what's happening at the school is not the normal" – Participant D_B

Koh-learning was also described as a program in evolution. From its first rendition as a program conducting the Streamkeepers protocols, it has since evolved into a more flexible format:

"The problem with [the Streamkeepers] program which we quickly came to understand is although there are things that you would do in that program that were good, it was not a good educational tool, it was a good community monitoring tool. ... other schools in the district started looking at ways in which the watershed was important to them, so Fort St. James is engaged with regards to monitoring the First Nations food fishery up there, and engaging from a First Nations perspective, Vanderhoof is engaging from an agricultural perspective and how the streams running through agricultural land are important, and Fraser Lake is engaging from a perspective of lakes rather than streams, and Burns Lake is looking at engaging around wetlands" – Casey Litton

Why is Koh-learning important?

When designing the interview questions, community advisors were interested in asking: why does Koh-learning matter? Why is school-based monitoring and community-based monitoring important? Figure 3 displays some of the responses, with quotes provided to channel the voices of interview participants.

Students explained that Koh-learning and taking care of the water were important because everything is interconnected, and our streams affect waters downstream. They also mentioned that it was important for building social relationships and learning about potential careers in environmental fields.

Teachers described that Koh-learning was important for grounding learning in a connection to place, and an appreciation for place. They discussed how Koh-learning was also important for building community amongst teachers and classes, and developing new skills related to outdoor leadership. They described that the outdoor learning component was very important for students who don't typically succeed and allowed them to engage in a new environment where they could thrive.

Decision-makers spoke about the importance of Koh-learning for students learning to value their watersheds and for building a community that was united around a shared goal to support the health of our waterways. Decision-makers also spoke about the importance of having youth know what life exists in our waterways (fish and invertebrates) and having them informed about their watersheds so as to one day contribute to decision-making. Saik'uz First Nation interviewees also spoke about the inherent importance in their culture of intergenerational learning as in the following quote:

“Water has always been an important aspect. And to have children involved is even better, they could learn newer and better ways to actually preserve watersheds and water quality throughout their territory or even out of it.” – Participant SF_C



NVSS grade 8 students conducting monitoring at Murray Creek

Why is Koh-Learning important?

An opportunity for the next generation to experience the land

"I think that it's very important that students have that opportunity to be on the land to actually experience it before they then become the next generation of ranchers, farmers, loggers, and have that understanding of the need for healthy watersheds, healthy landscape, and inform them in their future choices" -Kevin Moutray

Connecting around a shared focus

"So, to have our young people engaged early on really helps to create sustainable leadership within communities, and to know that, not only First Nations youth are being engaged in this process, but with other non-indigenous youth it really helps to create a greater understanding between two communities, and within this age-group, on the importance on connecting on a single focus area that impacts everybody, that connects everybody." - Participant SF_F

What we do here matters, all water is interconnected

"It's important what we did because if we didn't take care of our creeks and streams and stuff, that bad water can go into our good water and affect all of the waters in other places" - Participant S8_D

Learning about potential career options

"Personally, I find it really really important, because I'm almost out of high school, I don't even know what I want to do yet, so this is a really really interesting and fun possible career option, going into something like this learning about this, and going to college for ecology and learning about the watersheds" - Jason

Increasing knowledge of our waterways

"I think that the fact that we are even there collecting data is opening the door for that to become a more important part of the decision-making, the fact that we are already out there collecting it, might help for them to make room for that information."- Jorja Cranmer

Magnifying youth voices

"Also with getting more young people involved maybe it like, people who work at your job like at UNBC, ..., they might start to realize that our opinions do matter cause I guess we are kind of like the future of Vanderhoof, like we're going to be in your shoes one day so it really matters what we think and what we do now because we're going to have a big impact on it too" - Haileigh Pritchard

Providing equitable learning opportunities

"So there's always one or two or three or more students in the classroom who have difficulty learning in that environment, or learning from a teacher's approach, where going outside, where you have that tactile hands-on learning..., it makes such a difference, because they feel like they can contribute, as opposed sitting there going, 'I don't understand'. That whole aspect of not understanding gets washed away" - Participant T_B

Figure 3. Summary of responses for why Koh-learning is important in the eyes of participants.

Goals: What goals do participants have for students, communities and watersheds?

One of the five recognized steps for community-based monitoring to inform decision-making is for programs to define their goals, and the underlying issues they are trying to address (Wieler, 2006). Interview participants were asked to define their goals for students, communities and waterways as an outcome of Koh-learning. See a summary of responses in Figure. 5.

Some important goals that participants want to work towards through Koh-learning are the following.

- Communities with less polarization that are more connected to their lands and waters.
- Communities that can foster sustainable leadership and are working towards reconciliation.
- Students who are able to engage in the watershed using their own passions and can learn how to form their own opinions.
- Education where students can learn about possible careers and potential futures while developing a sense of community, and social and leadership skills.
- More opportunities for students to contribute to some kind of a legacy that represents their positive impact on their watershed.
- Waterways that are once again swimmable, supporting healthy fish populations and ecosystem health, and that are generally restored to as natural as possible.

What are the underlying issues that we trying to address?

As part of the interviews students and teachers were also asked to describe the underlying issues that Koh-learning is or could be trying to address. Some participants did not have a clear idea around this. However, some of the issues mentioned included salmon and sturgeon declines, biodiversity loss, watershed degradation, and divided and polarized communities that were disconnected from the landscape. Figure 4 attempts to group together how these issues are related to each other.

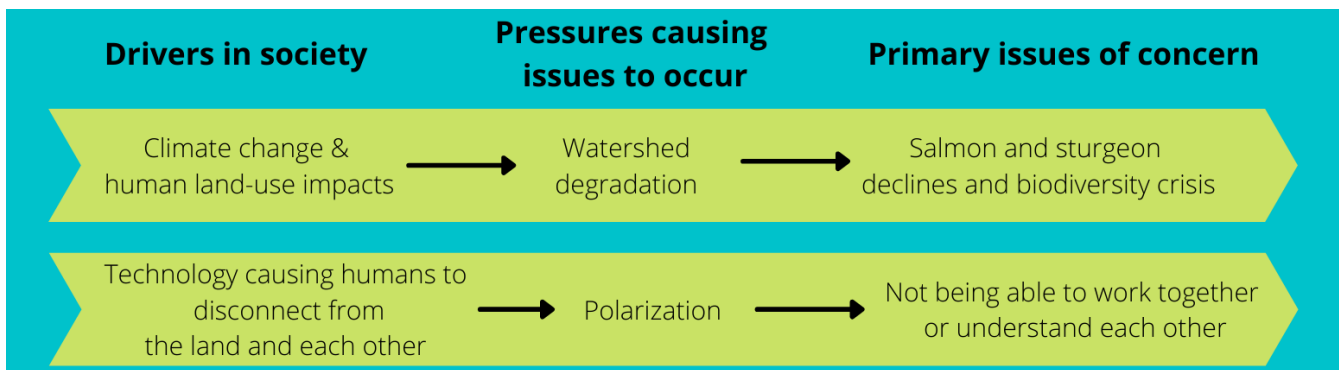


Figure 4. Some of the underlying issues described by participants that Koh-learning seeks to address.

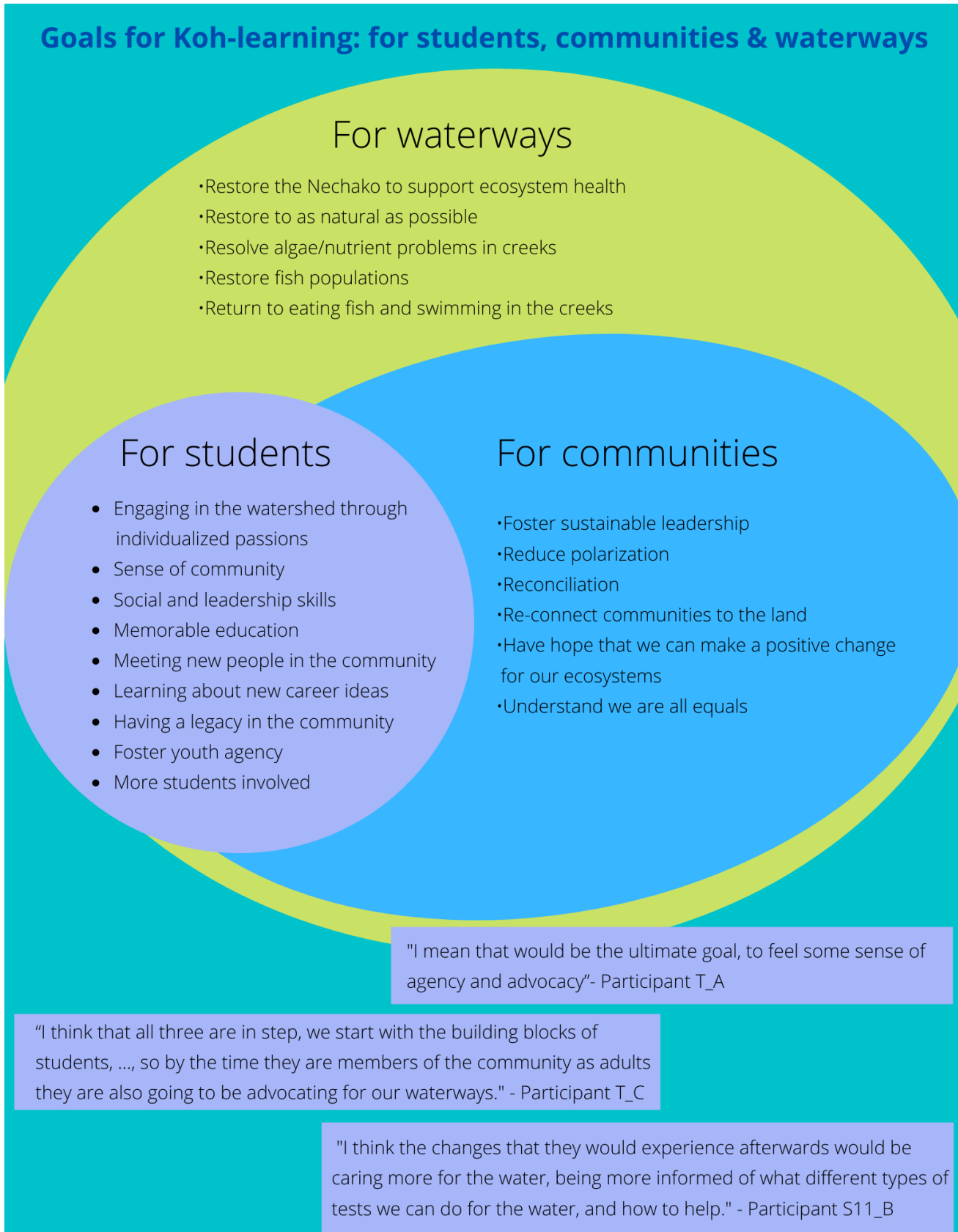


Figure 5. Goals for students, communities and waterways, to be achieved through Koh-learning.

Part 3: Pathways of Influence: How can Koh-learning inform decision-making?

Participant understandings of pathways for school-based monitoring to influence decision-making

Interview participants described **five main pathways** for school-based monitoring to inform decision-making. Students and teachers more often identified the pathway of “growing the awareness and ability of the public to inform decision-making”, whereas decision-makers saw the potential for school-based monitoring to inform decision-making through many other avenues in addition to raising awareness. The five pathways described are outlined in Table 2. Figure 7 provides an overview of these pathways and shows how the pathways are interconnected. The concept for this diagram is adapted from McKinley et al. (2017).

Ways that participants see that Koh-Learning is already influencing decision-making

Importantly, participants identified that the Koh-learning project was already influencing decision-making in a number of ways. Some of the ways that participants consider Koh-learning to already be informing decision-making are outlined in Figure. 6.

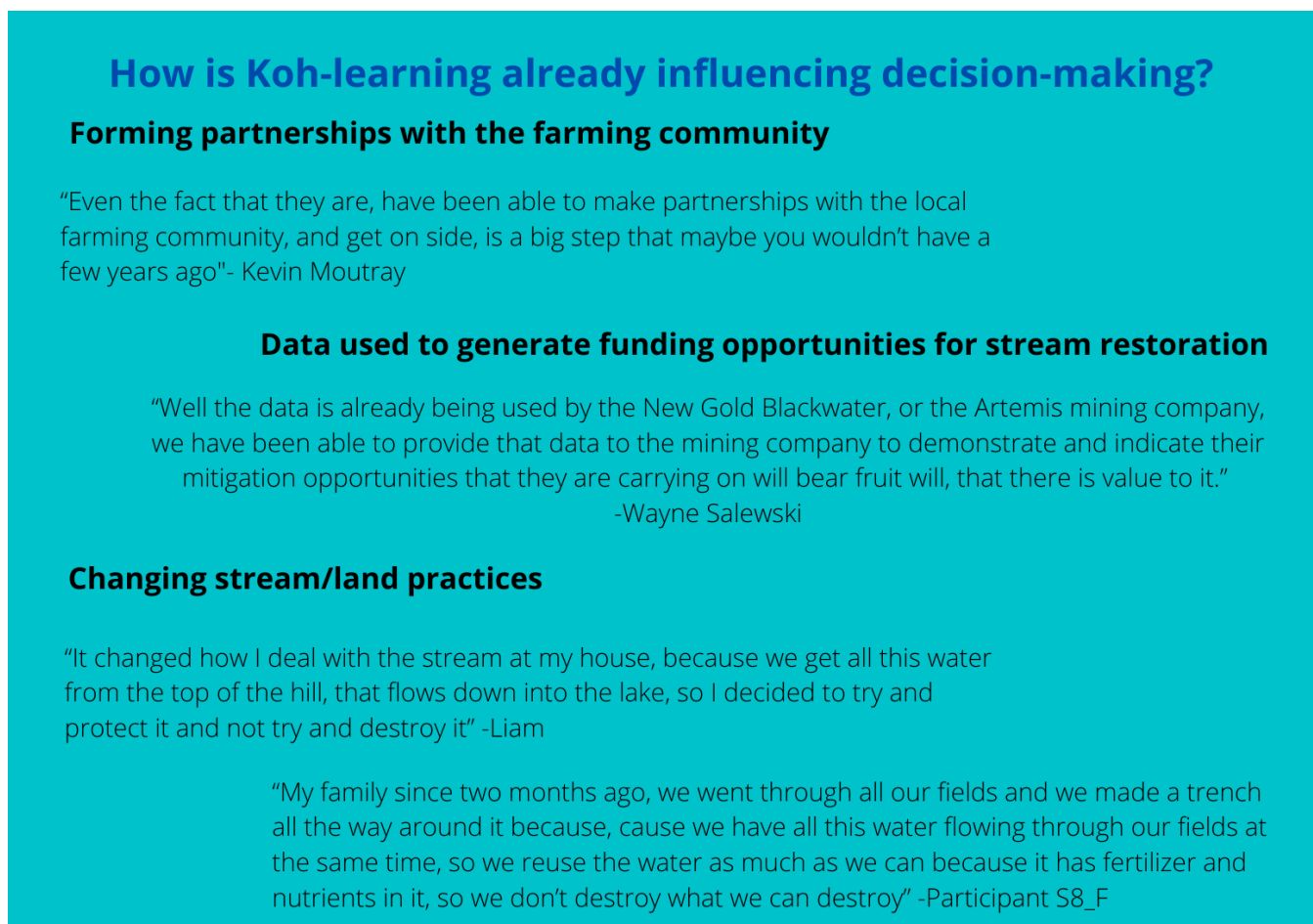


Figure 6. Some of the ways that participants see Koh-learning is already informing decision-making.

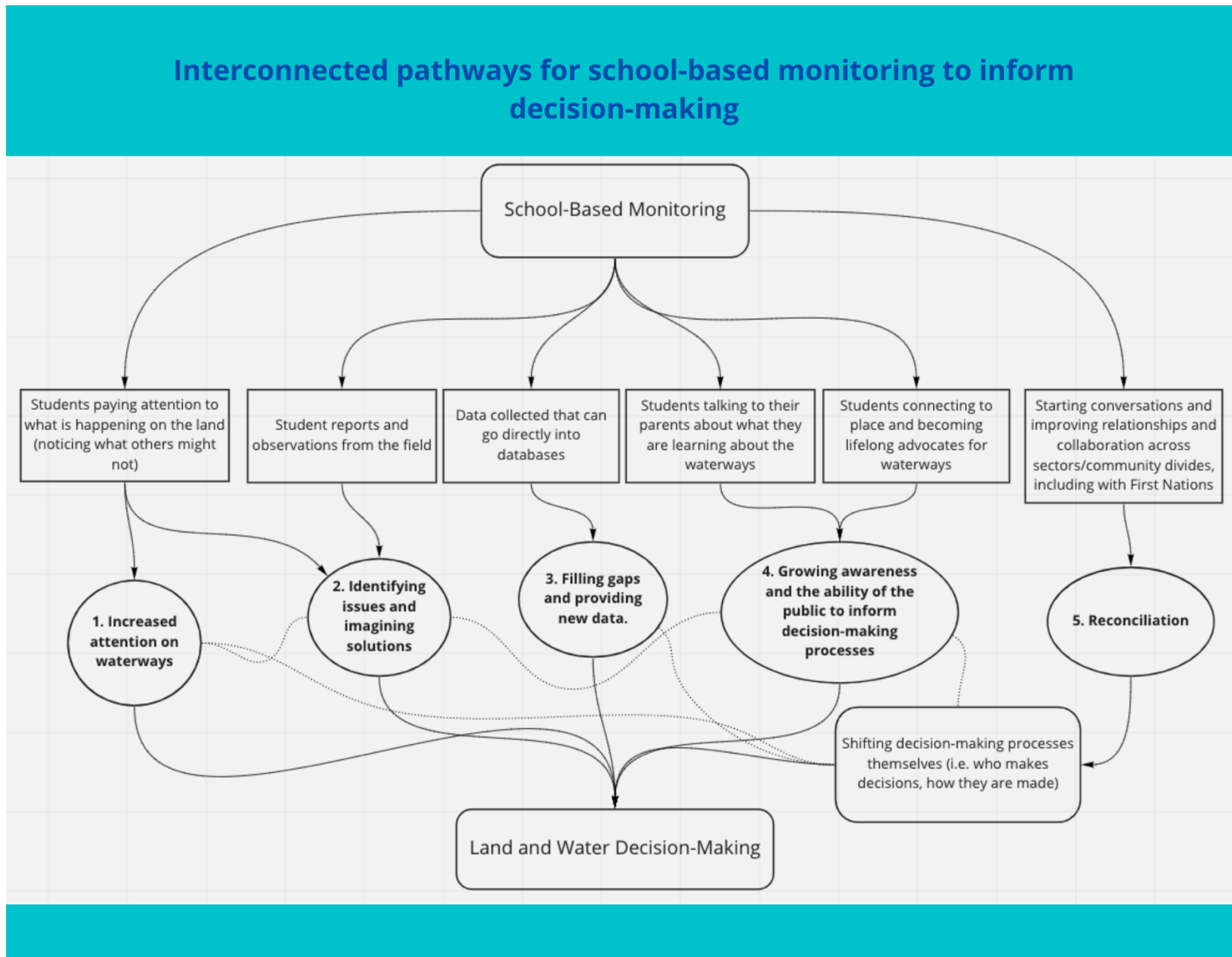


Figure 7. Diagram of interconnected pathways for school-based monitoring to inform land and water decision-making.

Table 2. Description and quotes illustrating the five main pathways for SBM to inform decision-making.

Pathway	Description	Illustrative Quote
<i>1. Increased attention on waterways</i>	Having students collecting data can increase government attention on waterways.	“We’ve got Murray creek, Knight creek, Stoney Creek, would be the major sort of creeks coming in, so if there is water quality and quantity data on those sorts of creeks, we can then lobby most of the areas where there could be better decision-making, ... lobby different levels of government, lobby different organizations to maybe change practices, change legislation, to change whatever needs to be changed, right”-Kevin Moutray
<i>2. Identifying issues and imagining solutions</i>	Observations from students can flag areas of concern that may otherwise go unnoticed, especially when paired with a vision for solutions.	<p>“Student’s observations and ideas, if they are captured and made available to us (would be of interest to us). ...if there is a pattern in what’s being seen... That could be observing invasive species, as an example, observing fish kills, a species that wasn’t previously reported for the stream.”- Participant D_E</p> <p>“You know we can collect a bunch of information, but what do we do with it, is it just information, or do we change something?”- Participant D_C</p>
<i>3. Filling gaps and providing new data</i>	If collected properly, data can go directly into government databases that are used by provincial decision-makers.	“If done according to the standards that are prescribed according to the permit that’s issued to do the work, the data is being reported and it goes into a provincial database and that is used by fisheries biologists regionally or provincially, to map species distribution, species presence absence, and so forth, so if adhered to proper standards and permitting, the data that’s produced through the programs are useful to decision-makers.” - Participant D_E
<i>4. Growing the awareness & ability of the public to inform decision-making</i>	Having student engaged in SBM and speaking to their parents can raise the overall awareness in the community and interest to advocate for waterways.	“I think it just starts to create awareness, ...just having the kids get engaged and bringing them out to a community creek it just brings it more into perspective and then it starts asking why, and they go home and they talk to their family about it and as a family they have a plan and they talk about what their part is to try to have a healthier stream, and why is it important to them as a family and as a community and from all the different levels up and down I think it just starts with awareness.” - Heather Hinz
<i>5. Contributing to reconciliation</i>	Formation of relationships and acknowledgement of Indigenous rights could contribute to reconciliation and shifting decision-making structures.	“[SBM] could really be an opportunity to advance the Truth and Reconciliation Commission’s Calls to Action, when a big component of that final report was around education, and you know by developing and establishing a stronger relationship with our community, as the rightsholders to the area, and you know rightsholders also to the Nechako river itself, I think you know as I mentioned before, it does take us on that path to reconciliation together...” -Participant SF_F

Participant ideas for interactions with decision-makers

Another important step for community-based monitoring to inform decision-making is for programs to identify how they plan to share their data and information with decision-makers (Wieler, 2006). To help move towards this, students, teachers and decision-makers were asked about their preferred methods for sharing data and interacting with each other. These ideas are summarized in Figure 8.

Students were particularly interested in reaching community members, parents, and school administrators with their monitoring information. They saw that school administrators and teachers held a lot of power over their ability to continue doing water monitoring and field studies. They felt the best way to do this was to distribute pamphlets in the community and spread information on social media and traditional media outlets. Students were also interested to connect with decision-makers by presenting to town council, sending letters to decision-makers and having decision-makers visit them in the field.

Teachers were interested to connect students with decision-makers through more informal avenues. They recommended having casual conversations between students and decision-makers and inviting decision-makers to classrooms and on field trips. However, teachers highlighted that energy needs to be channeled into learning how to create equally balanced conversations between adults and youth.

Decision-makers were interested to receive data from students through a couple of avenues. First, data that was collected according to specific protocols could be entered directly into databases. Decision-makers were also interested to see data and observations summarized in a report or email format. Some decision-makers also mentioned they would prefer to have casual conversations or sharing sessions with students to learn about school-based monitoring findings.

There was some disconnect between the avenues that students, teachers and decision-makers identified for interacting. Particularly, students and teachers were more interested in media formats and direct conversations but did not mention entering the data into databases.

Opportunities for school-based monitoring to meet the challenges of decision-makers

During interviews with decision-makers they were asked about what challenges they encounter with collecting data that they need to make decisions. Decision-makers identified many challenges, and particularly four that aligned with opportunities that could be provided by school-based monitoring. These challenges included, 1) having a lack of capacity, 2) accessing remote areas, 3) not having a watershed-level focus, and 4) not having time to conduct outreach. In Figure 9, quotes are provided to illustrate how school-based monitoring could serve as an opportunity to help respond to each of these challenges.



Figure 8. Ideas provided by different groups for how to share data and interact with decision-makers.

Opportunities for school-based monitoring to meet the challenges of decision-makers

Challenges for decision-makers

Opportunities with school-based monitoring

Lack of capacity

Build capacity in environmental areas

"I think it could provide an opportunity for the young people engaged in the school-based monitoring program to work, maybe have field days with our environmental monitors within our program, maybe to help with capacity in different ways, and also gain different forms of Indigenous knowledge, or, and to almost go through cultural protocols when conducting work in our territory, I think that provides an initial early opportunity." -Participant SF_F

Access to remote areas

Proximity to remote streams

"It takes a long time to drive out to Mackenzie for example and gauge a stream, or do some measurements, so we don't do it very often. So working with some community group out there, or a school out there... especially during periods of drought, it would be really good to develop a better understanding of certain streams, and then we can look at certain streams that are indicators for others" -Participant D_D

Lack of watershed approach

Ability to focus on whole stream/basin

"So in terms of gaps, I mean one thing that we often lack is very much a watershed based approach. We get data from permittees, which is just one site that has a discharge, and so we get data around that site. But we don't get data up and down the river because we haven't been monitoring there, ... coming at it from that perspective I think would be useful." -Participant D_G

Conducting outreach

Outreach as part of school

"I think it could be really cool to see how students would design some of our educational messaging, I mean, the public in general is definitely of course our target audience, but you know, as the age group of 12-16, what do they want? What kind of educational messaging would really speak to them?" - Participant D_H

Figure 9. Opportunities for SBM to tackle the challenges faced by decision-makers.

Part 4: Program Design: How to adapt the program to inform decision-making?

What is interesting, feasible & useful to monitor?

One of the main goals of the interviews was to identify how to adapt the Koh-learning water monitoring trials to make connections with decision-making. This requires finding a match between what is *interesting and feasible for students to monitor*, and what is *useful to decision-makers*. Figure 10 shows an array of the responses received from students, teachers, and decision-makers for what they are interested to monitor.

Students were particularly interested in monitoring anything that is living, as this was the most interesting and engaging part of Koh-learning for them. This meant they had a strong interest in monitoring fish, invertebrates and wildlife that live in and around the creek. Older students who had been involved in the fall 2020 monitoring trials were interested to measure water quality across more locations, particularly nitrates. They also were interested to monitor indicators of climate change, such as stream temperature over time.

Teachers also noted that anything living was the most engaging for students. They said that plant and wildlife data would be interesting. Teachers highlighted that it would be interesting to collect data over time, across locations, and at locations where it could be compared with government-collected data.

Decision-makers across the various groups were interested in many different kinds of data and information.

- Provincial decision-makers perceive that students could collect data to contribute to numerous databases, if rigorous protocols are co-developed and followed. This could include stream discharge data, fish collection on small systems and water quality data. Other opportunities include contributing to iNaturalist projects in BC Parks, and ecological monitoring in parks (squirrel monitoring for example).
- Local decision-makers were interested to understand water quality and quantity in small creeks, restoration effectiveness and understanding how watershed processes are working and what can be done about the issues.
- Saik'uz decision-makers were interested to see how the program could fill gaps in their water quality monitoring and how Saik'uz world views and values could be incorporated into the program. They were interested to learn about what youth are noticing on the land that others are not.

Logistical design suggestions for Koh-Learning to 'work better' and inform decision-making

In addition to suggestions for what to monitor, students and teachers provided ideas for how to improve the logistics of monitoring sessions. These suggestions fell into categories of: how to make it more engaging, how to make it more meaningful, how to make it run more smoothly, and how to connect it better with decision-making. Ideas are presented in Figure 11.

What is interesting, feasible and useful to monitor?

Students

Wildlife use of the creek (major predators) using cameras

Make connections with sea smart

Changes to the creek area

Nitrates, agricultural impacts

Use the colorimeter to measure water quality

Human impacts to rec. sites

Tree growth, plants around the creek, weeds

Salmon monitoring & release

Climate change, interested in water temperature and turbidity

Teachers

Wildlife & wildlife habitat

Invertebrates better learning experience for grade 8's (living things a highlight)

Herbarium/plants/vegetation

Invasive species

Repeated measurements over time

Data that can be compared to ministry data

Monitoring of the wetlands

Saik'uz First Nation

Learn about what youth notice on the land

Indicator plants

Water quality on sites not tested by Saik'uz (creeks and lakes)

Monitoring of logging impacts on streams

Provincial Agencies

Watershed level focus

Provincial Water Quality Objectives or Guidelines (ie temp., turbidity, dissolved oxygen)

Fish minnow trapping in small streams

Watershed health indicators, invertebrates

Local Government

Water quality & quantity in Nechako tributaries

Working together on plans for greenspaces

Air quality

Sedimentation in the Nechako

Understand resilience of watersheds

NGO's

Monitoring of restoration projects

Understand how small watersheds work (those with minimal impacts)

Help designing responsible recreation messaging

iNaturalist and ecosystem monitoring in Parks

Discharge on small systems

Water level in remote locations (drought mapping)

Figure 10. Monitoring interests of students, teachers and decision-maker groups.

Logistical design suggestions for Koh-learning monitoring

How to make field visits smoother?

- Better timing at stations, less waiting, more hands on
- Have a better path between stations
- Have a garbage can on site
- Go out all day so it's less rushed
- Worksheet didn't make sense, need help to fill it out
- Not have to climb over the fence
- Worried about damage to creek from traffic
- Outdoor classrooms set-up
- Wetland easier to access
- Introduce Grade 8's to the test kits at the wetlands first

How to make it more engaging?

- More active games as part of the learning
- Grade 8's mentor younger students too, and generally more peer-to-peer mentorship
- Go out more often
- More blended classes, and across ages and disciplines
- More time for relationships to be built between Grade 8's and mentors (have an icebreaker beforehand)
- Continue to get out at different times of the year

How to make it more meaningful for students?

- Measure areas students are familiar with \ (ie. the Nechako river near the school)
- Compare different times of the year
- Compare different creeks
- Have youth involved in planning
- Engage the community in it too, with community monitoring sessions
- Give mentors more knowledge beforehand to talk about
- Have discussions before and after about 'where do you see this going?'
- Visit other waterbodies in the area
- Have a picnic so students can build a relationship to place
- Look at aerial photos of where the creek used to be
- Read transcripts of Elders describing what the creek used to be like

How to connect it better to decision-making?

- Have the students talk to landowners about what they learned
- Have decision-makers visit the classes while they are in the field
- Have student-driven connections to community

"We have interviews where they did a traditional use study in the past, and they talked about all the different fish that were in certain creeks and rivers in the territory, and even looking back at that information and what existed then, to what exists now, like Stoney Creek for example, there are certain species that don't live in Stoney Creek anymore" -Participant SF_A

Figure 11. Suggestions for improving the logistics of the Koh-learning monitoring sessions.

Areas of overlapping interests

Students, teachers and decision-makers have converging interests particular around:

- monitoring fish and invertebrates,
- monitoring water quality (including temperature and turbidity),
- monitoring riparian condition,
- taking a watershed-level approach to monitoring, and
- conducting community outreach.

There was overwhelming interest from students and teachers to expand the program to monitor and compare multiple creeks (and/or wetlands) in the Vanderhoof area. There was also a lot of interest to understand how Koh-Learning might help to advance outreach goals of the various decision-makers interviewed.

Another commonality that spanned across students, teachers and decision-makers, was interest for students to define what they focused on. Teachers mentioned that learning was optimal when students engaged in some kind of structured monitoring, followed by sessions where they get explore their own passions, interests and research questions related to the creeks. In the same vein decision-makers noted that they would be interested to hear what students noticed on the land, or what they thought was important.

Part 5: Next steps and Conclusion

At the end of each interview, participants were asked what they thought were the most important next steps for school-based monitoring to start informing decision-making. Some of the ideas discussed are presented in Figure 12. One idea, from a Saik'uz First Nation participant is to start by establishing an orientation to Saik'uz Territory that can be conducted at the beginning of monitoring sessions:

“I think a good step is some of that, going through the cultural protocols early on, I think that you know that could be done in socially distant ways, you know, with our monitoring program, or to have maybe a knowledge holder present to do that. I think there are large enough spaces, outside, that we can do that in a way, but I think that would be an important first step for starting off this journey.” – Participant S_F

Conclusion

Overall, students, teachers and decision-makers interviewed in this study provided many insights into how to understand the pathways for school-based monitoring to inform decision-making, and how to start doing this with the Koh-learning project at the Nechako Valley Secondary School. These findings will be used to design a second set of water monitoring trials conducted as part of this research in Spring 2021. Further analysis of the interview data will be conducted, and a refined version of the findings will be presented in the final thesis document for this project.



Figure 12. Next steps identified for Koh-learning to start making linkages with decision-making.

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