

SUMMARY: GITGA'AT CLIMATE CHANGE ADAPTATION PROJECT (CCAP)



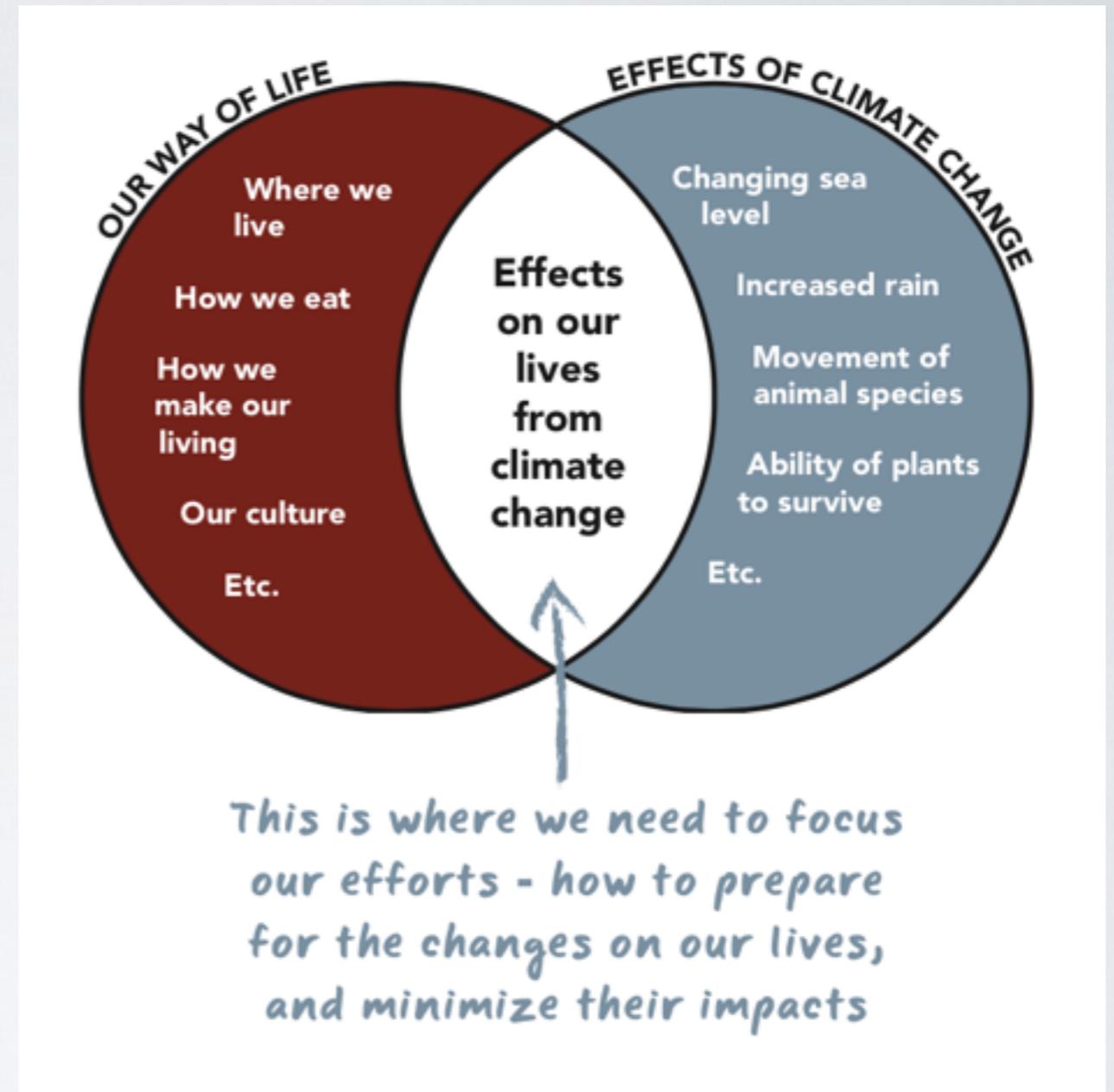
BACKGROUND

- Project funded through AANDC to address risks and challenges posed by climate change and help communities become more resilient.



- The Gitga'at First Nation CCAP team

- Our approach: four phased value based, participatory strategic planning process:
 - Phase one: What's happening? (year 1)
 - Phase two: Vulnerability Assessment (year 1)
 - Phase three: What can we do about it? (year 2)
 - Phase four: Are we doing it? (year 3)



YEAR 1: WHAT'S HAPPENING AND THE VULNERABILITY ASSESSMENT

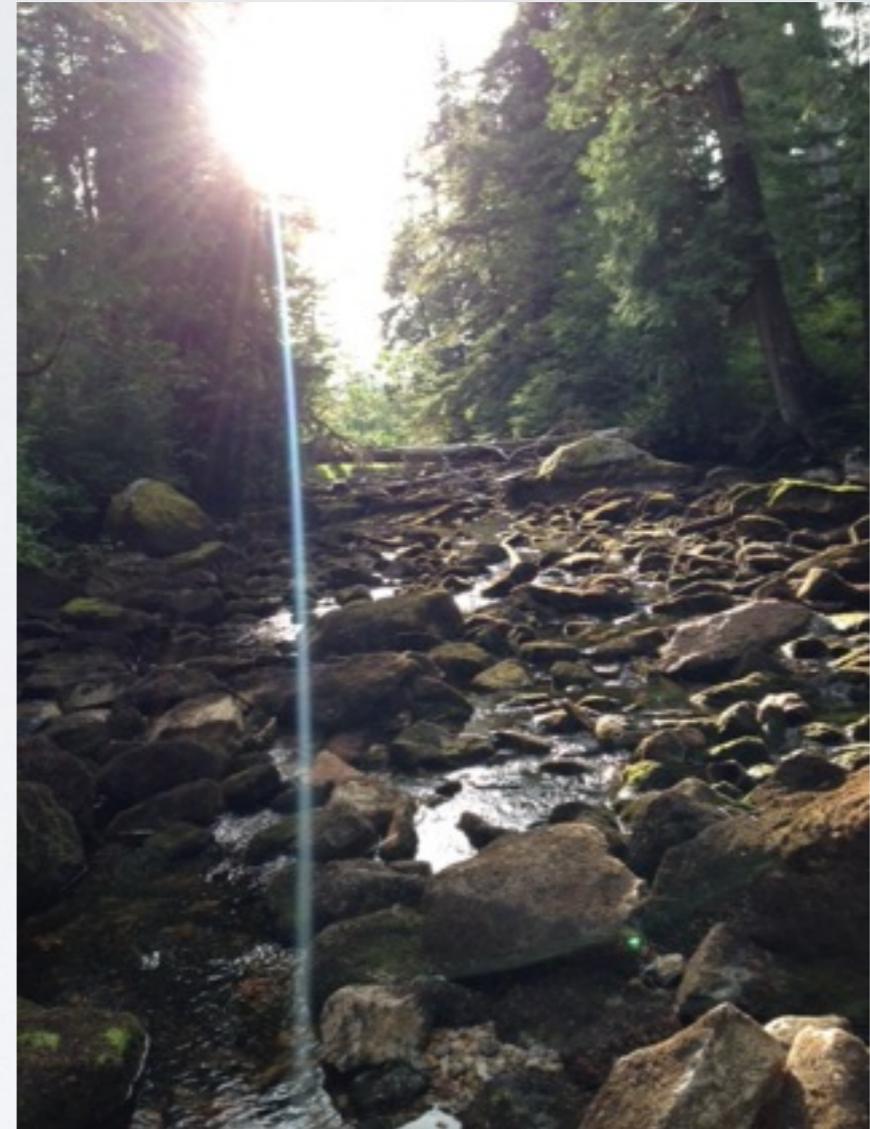
- Hosted several community meetings to introduce the concept of climate change and some anticipated impacts in the region (HB, PR, HBS).
- The community was well aware of the impacts of climate change.



- We go out picking seaweed every year of our lives, and the last probably 10 years we noticed we don't get the same seasonal weather where we can dry our product. The season is too short for drying our product. We are getting mostly rainy seasons instead of long north westers that blow. (Workshop participant, 2012)



- The thing that I've noticed too in September some of the creeks are so dry, we had one year out of the three that was so dry the salmon were waiting at the mouth of the creek, and then they left, we don't know where they went. Salmon are coming later.
(Workshop participant, 2012)



- The other impact that we know for sure is the level of water in Hartley Bay has risen over the last 2-3 decades. Hightide used to be below the boardwalk and now you're finding it lapping over the boardwalk...I know that if there's a storm it will lap clean over the boardwalk. We're already feeling that affect. I don't remember it ever used to get that high. We used to have a boathouse and a smoke house down there and now you can't have one, they'd have been washed away. So I think the issue of erosion...is going to be a big one in Hartley Bay. (Workshop participant, 2012)

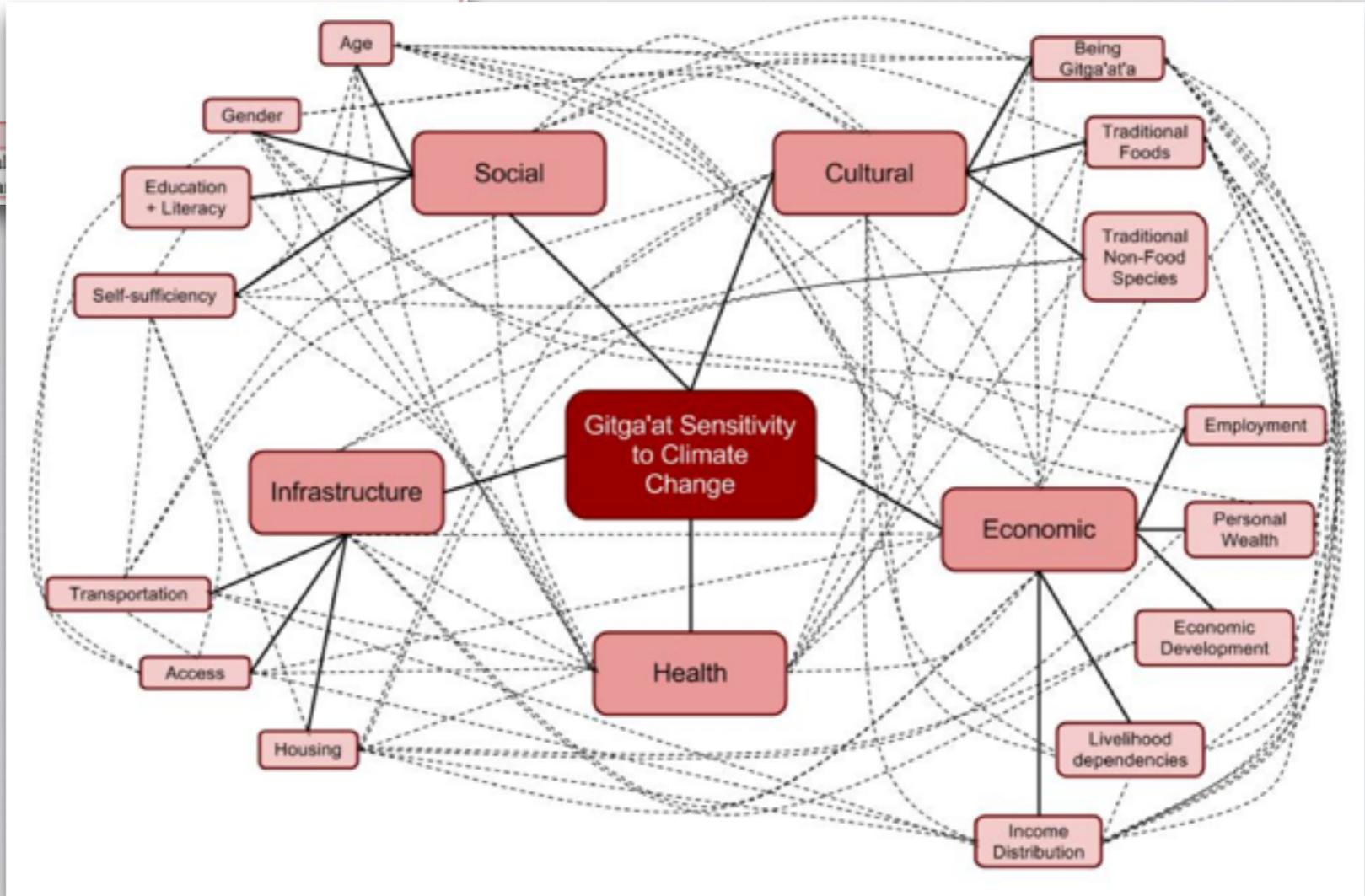


- Our approach to determining the vulnerability of the Gitga'at people and Hartley Bay:

Vulnerability= Exposure+ Sensitivity + Adaptive Capacity

- Three main questions:
 1. How has and/or will climate change affect Gitga'at lands, waters and resources?
 2. What are the possible adverse consequences of climate change to the Gitga'at?
 3. How well are the Gitga'at able to adapt to climate related changes?
- We decided to conduct two assessments:
 - Biophysical Assessment-(Lamontagne and Matthews, 2013)
 - Sensitivity and Adaptive Capacity Assessment-(Stoner and Reid, 2013)

Human Impact Categories	Exposure (Climate Hazard)	Sensitivity (Projected Effects)
Social		
Age	<ul style="list-style-type: none"> Changes in temperature (especially extreme highs and lows) Changes in ecosystem function, services and resource production Increased frequency and severity of storms Climate change related 'disaster' 	<ul style="list-style-type: none"> Discomfort/illness/death Increased stress on caregivers Traditional knowledge transmission could be interrupted Elder's knowledge on climate change impacts a valuable resource for adaptation
Gender	<ul style="list-style-type: none"> Increased frequency and intensity of storms Climate change related disaster Changes in ecosystem function, services and resource production 	<ul style="list-style-type: none"> Females often have a harder time recovering from disasters Gender-specific cultural roles may be altered
Education + Literacy	<ul style="list-style-type: none"> Changes in ecosystem function, services and resource production Climate change related disaster Increased frequency and intensity of storms 	<ul style="list-style-type: none"> Slow economic diversification may be further slowed Health impacts Dependence on traditional knowledge which is vulnerable itself
Self-Sufficiency	<ul style="list-style-type: none"> Changes in temperature norms Changes in precipitation levels Changes in ocean temperatures Changes in ocean salinity Increased ocean acidification Increased frequency and intensity of storms Increased winds Floods Seasonal drought Forest fire Sea level rise Increased landslides 	<ul style="list-style-type: none"> Self-sufficiency dependent on natural resources vulnerable to climate change impacts Travel on territory more difficult with unpredictable storms and winds
Cultural		
Being Gitga'at'a	<ul style="list-style-type: none"> Changes in temperature norms Changes in precipitation levels 	<ul style="list-style-type: none"> Loss of cu Loss of na



Exposure		Sensitivity		Adaptive Capacity	Vulnerability ²
Climate Change Hazard	Hazard Area/ Location	Sensitive Features (Social, Cultural, Economic, Health, Infrastructure)	Risk Probability/ Magnitude of potential consequences	Adaptive Capacity Status (H-M-L) (socio-economic, cultural, technological and infrastructural)	Relative (/9)
Flood	Hartley Bay, salmon bearing streams, Oldtown	Social (self-sufficiency); Cultural (being Gitga'at'a, traditional foods, non-food traditional species, places + place names); Economic (employment, personal wealth, livelihood dependencies, economic development, income distribution); Health; Infrastructure (housing)	Med probability Med consequence	M	6
Seasonal Drought	Salmon bearing streams, Hartley Bay,	Social (self-sufficiency); Cultural (being Gitga'at'a, traditional foods, non-food traditional species, places + place names); Economic (employment, personal wealth, livelihood dependencies, economic development, income distribution); Health; Infrastructure (access)	Med probability High consequence	M	7
Ocean Acidification	Entire territory (marine realm)	Social (self-sufficiency); Cultural (being Gitga'at'a, traditional foods, non-food traditional species, places + place names); Economic (employment, personal wealth, livelihood dependencies, economic development, income distribution); Health	High probability High consequence	M	8
Changes in mean average temperature	Entire territory	Social (age, self-sufficiency); Cultural (being Gitga'at'a, traditional foods, non-food traditional species, places + place names); Economic (employment, personal wealth, livelihood	High probability	H	6

² The relative vulnerability score was calculated based on the following point system (out of 9):

Probability: High=3 points, Med= 2 points, Low=1 point

Consequences: High=3 points, Med= 2 points, Low=1 point

Adaptive Capacity: High=1point, Med=2 points, Low=3 points

Scores from 1-5 demonstrate low vulnerability, scores from 6-7 demonstrate medium vulnerability, and scores from 8-9 demonstrate high vulnerability.



GITGA'AT

CLIMATE CHANGE ADAPTATION PLAN

VULNERABILITY ASSESSMENT SUMMARY

JUNE 2013



SEAWEED

Seaweed is very sensitive to levels of salinity (salt) in the water. Increased freshwater inputs from rain at low tide and increased stream runoff will likely reduce seaweed growth, or lead to poorer quality plants. Seaweed is also sensitive to physical damage, and could be negatively impacted by increased hail events at low tides, and debris battering during more severe storms.



Photo by Phil Smith (Baker.com)



EXPOSURE

	2040	2060	2080
Annual Precipitation Change (%)	+8	+10	+14
Winter Precipitation Change (%)	+10	+12	+19
Spring Precipitation Change (%)	+7	+11	+25
Summer Precipitation Change (%)	-2	0	-2
Autumn Precipitation Change (%)	+10	+14	+21

"We go out picking seaweed every year of our lives, and the last probably 10 years we noticed we don't get the same seasonal weather where we can dry our product (seaweed). The season is too short for drying our product. We are getting mostly rainy seasons instead of long North Westers that blow."

—WORKSHOP PARTICIPANT, 2012



LESS SNOW

Though there will be more precipitation in winter, it will increasingly be falling as rain instead of snow. We will likely see a major decrease in snow pack in the next 75 years due to the increase in winter and spring temperatures. This will likely cause changes to stream levels and runoffs, droughts, and impact different plant and animal species.

Predicted Changes in Snowfall

	2020	2040	2060	2080
Annual Snowfall Change (%)	-38	-46	-54	-64



WIND

There is very little research on the potential changes in winds in our area, however, it is likely that we will see local winds increasing, particularly in winter.



STORMS

Increased temperatures will mean more warm, moist air in our atmosphere, which is a contributing factor for storms. Evidence suggests that we will see an increase in storm severity (how strong the storm will be). However, climate models do not agree on whether or not we will see a change in the frequency of storms.



COASTAL EROSION AND FLOODING

Rising sea levels and more severe storms will likely lead to increased coastal erosion and potentially flooding. We are already seeing the impacts of coastal erosion in Old Town.

YEAR TWO: WHAT CAN WE DO ABOUT IT?

- Developed adaptation action ideas/strategies to address the vulnerabilities identified in year one.
- These discussions were guided by 4 key community values identified at earlier meetings (health and wellness, infrastructure, culture and self reliance).
- Research adaptation options and create a short list of actions/strategies.
- Develop an adaptation and implementation plan.



							Key points from vulnerability assessment	Key points from vulnerability assessment	Key p vulner asses
1									
2		How popular was this idea with the community? (darker green = more popular)	Urgency (notes from CCAP team, but real urgency must be determined by the community)	Current Status or notes (is it already happening? Does it exist in other plans? Who is doing it?)	How could it be integrated into other plans or projects	How many points from the vulnerability assessment does this action impact? (columns H to AH show relationships)	Increased precipitation in every season except summer	Storms	Coast flood areas
11	Religion (the creator)								
12	More community planning								
13									
14	Revive the system of house checks			Not currently in practice.	infrastructure, health	6		x	
15	Band to do regular housechecks for safety, to see if people need help		Low						
16									
17	Traditional skills documentation project			Happening through a youth program called 'Documenting Our	CCP, school, health, stewardship	10			
18	Create a central library of 'how-to' for cultural and traditional skills		High						
19	Video-tape elders demonstrating traditional skills								
20									
21	Traditional skills education and outreach			Teaching traditional knowledge and harvesting practices is happening as part of the Young	CCP and Young Guardian Strategic Plan (which doesn't exist but should)	19			
22	Teach traditional skills to youth, young mothers, and others								
23	Teach using workshops, practice sessions, group harvesting practice								
24	Teach youth traditional food skills as part of the summer program		High						
25	Elders should be brought into the schools to teach lessons								
26									
27	Build a stronger, healthier community								
28	Focus on mental health and resilience (conflict resolution, problem solving,								
29	Build a sense of community through sports, choir, celebrations, clubs								
30	Enforce bylaws around no drinking								
31	Promote/educate about the fact that we are a sharing culture								
32	Promote physical exercise (healthy people are better able to respond and		High		CCP? Health, Emergency	5			
33									
34	Jobs of Tomorrow Project			Training already happening. Not likely specially chosen	CCP? Hartley Bay School Plans? Social Development department plans?	9			
35	Training youth (and retraining others such as fishers) for the jobs of		Medium						
36	Service contract - when the band pays for someone's education, they should								
37									
38									
39	Conduct additional or ongoing research (general climate change)			Sharing observations is currently happening as part of CCAP process but there is no process or	Could be integrated into the Gitga'at Guardian Strategic Plan. + Others!	13	x	x	x
40	Continued research into climate change's effects and updated predictions for		Medium (only because we just did a bunch of research)						
41	Regular meetings to discuss observed changes								
42	Documentation of observations - knowledge bank								
43	Share climate change information with other communities (what are they								
44									
45	Ongoing community education about climate change								
46	Share case studies from around the world								
47	Educate people about new weather patterns and how to adapt their behavior								

11	Foundational (policies, procedures, general guidelines)								
12				Strong and honest leadership	Skilled workforce			Emergency Management Plan Community developed Clearly communicated the Plan to everyone (example: Tullus has this network in every home, forest with instructions)	
13				Honesty, openness, willingness, accountability, responsibility, transparency Putting each other's interests first, support the community Help each other More community planning Work together Respect for elders Keep village morally together Believe (the creator)					
14									
15									
16									
17									
18									
19									
20									
21	Quickstart								
22				Hold regular meetings for threat and climate research on climate change Documentation of observations Knowledge bank Promote/educate about the fact that we are a sharing culture Build a sense of community through sports, choir, parties and clubs Enforce bylaws around no drinking Share climate change information with other communities (what are they doing? What are we doing?) Community celebrations				Emergency management info to every home (see link in header file for examples) Share emergency management plans with other communities	
23									
24									
25									
26									
27									
28									
29	Medium long term								
30	Document food preparation and other culture practices for our favourite species AND other species Central library of 'how-to' for cultural and traditional skills Get elders to lead a tour of all the old places where people used to harvest other species Video-taping elders demonstrating traditional skills Different processing methods for fish and land berry (and other examples using cedar to dry wild)			Programs for youth, culture, work ethics, motivation them Teach traditional skills to youth, young mothers, and all community members (through workshops, practice sessions, group harvesting practice, etc.) Knowledge of traditional plants needs to be recorded and passed on Getting commercial licensing of different species Training youth (and retraining others) for the jobs of CCAP/CCP - looking forward and seeing what industries are going to be doing well. (for example, commercial	These people in header			Revive system of housechecks (check to see if houses are clean, free of mold, fire inspection, wildfire follow) Breakdown + action research	Promote physical exercise (important links to all types of health) Focus on mental health and resilience (conflict resolution, problem solving, coping skills). It is the foundation.
31	Teaching traditional skills to youth, young mothers, and all community members (through workshops, practice sessions, group harvesting practice, etc.)								

KEY THEME	ACTIONS	TIMING
1. Document and teach traditional knowledge (especially around food)	1.1 Cultural skills "How-To" library	- Ongoing for existing activities - Short-term (0-2 years) development and implementation of additional initiatives
	1.2 Traditional skills workshops and learning events for all	- Ongoing for existing activities - Quick Start (0-6 months) to develop
	1.3 Continue cultural learning in the school	
2. Increase our food self-sufficiency	2.1 Ongoing mapping and surveying of historic and new harvesting sites	
	2.2 Organize communal harvesting, processing, distribution	
	2.3 Ongoing research into traditional and	

KEY THEME	ACTIONS	WHO IS THE LEAD?	TIMING
1. Document and teach traditional knowledge (especially around food)	1.1 Cultural skills "How-To" library	- Hartley Bay School will lead - Support from Gitga'at Guardians	- Ongoing for existing activities - Short-term (0-2 years) development and implementation of additional initiatives
	1.2 Traditional skills workshops and learning events for all	- HBBC will coordinate - HBBC, Health Clinic and School will implement	- Ongoing for existing activities - Quick Start (0-6 months) to develop a schedule and secure funding to run workshops
	cultural in the school	- Hartley Bay School	- Ongoing for existing activities - Quick Start (0-6 months) for program enrichment

1 DOCUMENT AND TEACH TRADITIONAL KNOWLEDGE

ACTION NAME: CULTURAL SKILLS 'HOW-TO' LIBRARY

Description:	This action would ensure that Gitga'at knowledge would be preserved for current and future generations. This would entail documenting important knowledge and harvesting activities and making this knowledge accessible to the entire Gitga'at community.
Rationale/context:	Gitga'at knowledge holders are aging and passing before important knowledge can be relayed onto future generations. The resilience of the Gitga'at people is linked to our ability to harvest traditional foods and engage in cultural practices. It defines our identity as Gitga'at people and connects us to one another through a variety of cultural practices. Broadening this knowledge base by making information accessible to all Gitga'at people will make us more resilient to future changes associated with climate change.
What is already happening:	The Hartley Bay School is currently spearheading an initiative to video document important food harvesting activities (e.g. https://vimeo.com/user20032378/videos) and other important cultural events (e.g. feasts, pole raisings, etc.).
How can we build on this:	Work on this to date has occurred primarily through the school. Integrating this effort into the Gitga'at Guardians 5-year Strategic Plan and ongoing activities within the Lands and Marine Department would encourage greater involvement from the community and increase the scope of information that we could document.

IMPLEMENTATION

Who is the lead? Entity and/or individual	The Hartley Bay School would continue to lead this effort with support from the Gitga'at Guardians.
Timing:	Ongoing; short-term (0-2 years) development and implementation of additional initiatives outlined above.
Resources required:	
Next step(s):	Identify a representative from the community to 'champion' this effort. Secure ongoing funding for implementation.



INDIGENOUS CLIMATE CHANGE ADAPTATION PLANNING USING A VALUES-FOCUSED APPROACH: A CASE STUDY WITH THE GITGA'AT NATION

Michael G. Reid¹, Colleen Hamilton², Sarah K. Reid³, William Trousdale⁴,
Cam Hill⁵, Nancy Turner⁶, Chris R. Picard⁷, Cassandra Lamontagne⁸ and
H. Damon Matthews⁹

Local values and knowledge can be important components in creating robust climate change adaptation strategies for marginalized communities. Incorporating local values into the climate change planning process in a structured way and effectively using local knowledge not only improves the identification of priority actions for climate change adaptation, but also supports successful implementation. Much of climate change adaptation planning in recent years identifies actions derived from expert-driven vulnerability assessments and adaptation actions. Yet the values of each community influence how climate change impacts are perceived, and what adaptation actions are locally acceptable and will have local buy-in for implementation. Thus, it is important that planning incorporates local values if the goal is successful adaptation to climate change. This paper provides one approach for addressing this through a participatory, values-based process for climate change adaptation planning. The approach is contextualized through a case study of the Gitga'at Nation, located in northern coastal British Columbia, Canada, where key values were found to be culturally important food sources, culture, environmental resources, self-sufficiency, health, infrastructure to enable us to live well, and Gitga'at pride and cooperation. These values were used throughout the planning process to contextualize climate change impacts on Gitga'at members' way of life and to develop and evaluate adaptation actions. It is hoped that this case study provides further proof of the utility of values-based planning in the context of adaptation planning for marginalized communities.

Keywords: coastal adaptation, adaptation planning, resource dependent communities, values-based planning, First Nations, Indigenous peoples, Aboriginal peoples.

Introduction

Anthropogenic climate change is, undoubtedly, a serious threat to social, ecological, and economic systems around the world (Adger 2003; IPCC 2007;

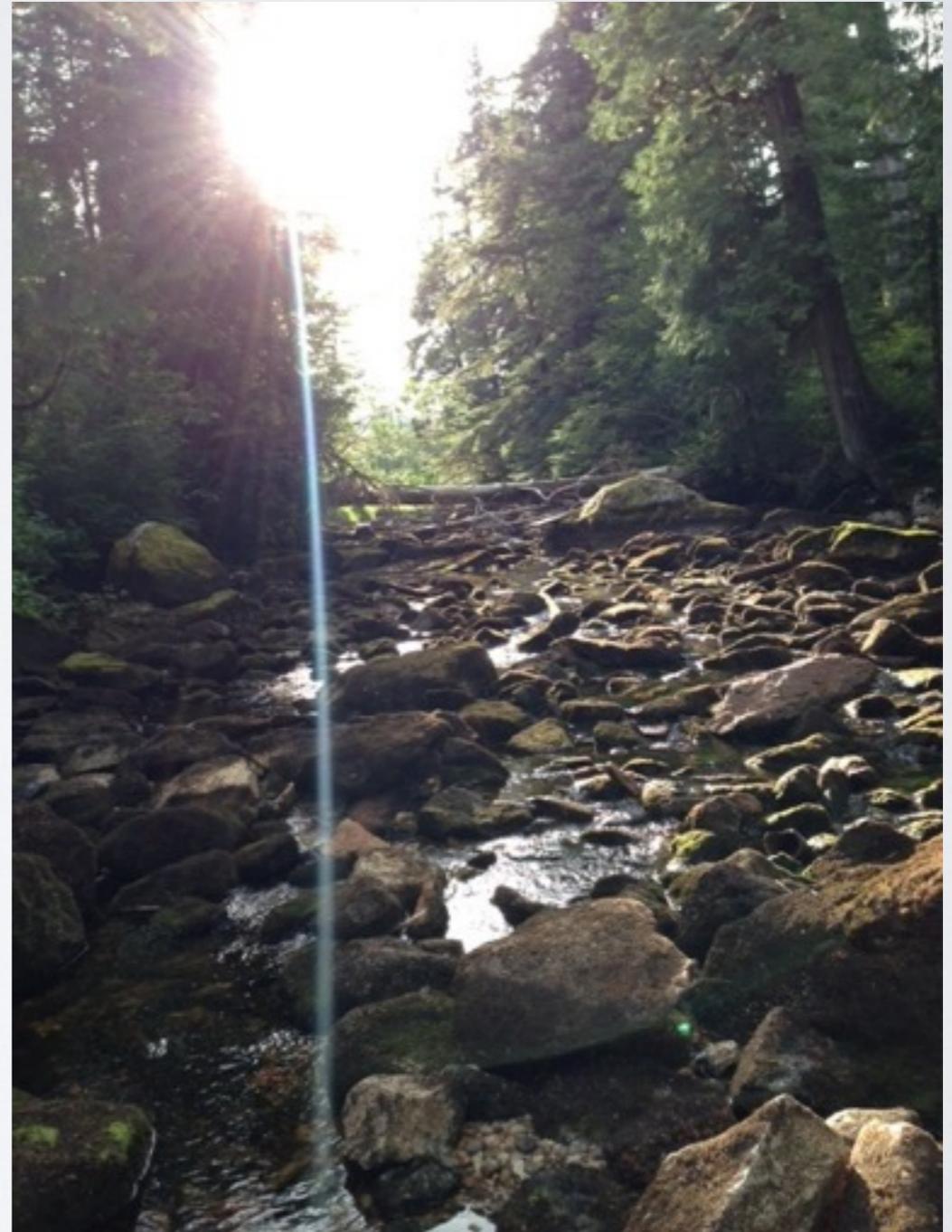
1. Corresponding author. Gitga'at First Nation, 445 Hayimiisaxaa Way, Hartley Bay BC, Canada V0V 1A0 (michaelgeorgereid@gmail.com)
2. Ecoplan International, 208-131 Water Street, Vancouver BC, Canada V6B 4M3 (colleen@ecoplan.ca)
3. A Closer Look Consulting, 2210 Victor St., Victoria BC, Canada V8R 4C5 (sarahkristenreid@gmail.com)
4. Ecoplan International (william@ecoplan.ca)
5. Gitga'at First Nation, 445 Hayimiisaxaa Way, Hartley Bay BC, Canada V0V 1A0 (chill@sd52.bc.ca)
6. University of Victoria, School of Environmental Studies, PO Box 1700 STN CSC, Victoria BC, Canada V8W 2Y2 (nturner@uvic.ca)
7. Gitga'at First Nation, 445 Hayimiisaxaa Way, Hartley Bay BC, Canada V0V 1A0 (chris.r.picard@gmail.com)
8. Concordia University, Department of Geography, Planning and Environment, Concordia University, 1455 de Maisonneuve Blvd. W., Montreal, Quebec Canada H3G 1M8 (lamontagnecass@hotmail.com)
9. Concordia University, Department of Geography, Planning and Environment, Concordia University, 1455 de Maisonneuve Blvd. W., Montreal, Quebec Canada H3G 1M8 (damon.matthews@concordia.ca)

Note: The first three authors co-lead authorship of this manuscript.

YEAR 3: ARE WE DOING IT?

ADAPTATION TOOLS

- Develop tools that will allow the work done as part of the project to be utilized by Gitga'at staff and leadership into the future, as well as other groups interested in embarking on a similar process.
- Some examples include: Simplified guides to conducting a vulnerability assessment and adaptation plan, tools for integrating adaptation actions into planning or decision making processes (e.g. checklists), monitoring and evaluation checklist to help identify if adaptation strategies are having the intended effect, and the knowledge bank for documenting observations.



We've always been here, we've always adapted. Our forefathers have always done what they've need to do to stay in the area...

-Workshop participant, 2012

