COASTAL HABITAT RESEARCH PROGRAM

STEERING COMMITTEE

MINUTES OF MEETING NO. 45

HELD BY VIDEOCONFERENCE ON JANUARY 12, 2022

PRESENT:	Réal Courcelles	Hydro-Québec
	Marc Dunn	Niskamoon Corporation
	Carine Durocher	Hydro-Québec
	Louie Kanatewat	Cree Nation of Chisasibi
	Josée Lefebvre	Canadian Wildlife Service
	Geraldine Mark	Cree Nation of Wemindji
	Ernie Rabbitskin	Niskamoon Corporation
	Robbie Tapiatic	Cree Nation of Chisasibi
	Alain Tremblay	Hydro-Québec
	James Bobbish	Cree Nation of Chisasibi
	Jean-Philippe Gilbert	Hydro-Québec
	Kelly Leblanc	Cree Nation Government
	Roderick Pachano	Cree Nation of Chisasibi
ABSENT:	Norman Cheezo	Cree Nation of Eastmain
	John Lameboy	Cree Nation of Chisasibi
	Ernest Moses	Cree Nation of Waskaganish
GUESTS:	Mhaly Bois-Charlebois	Hydro-Québec
	Zou Zou Kuzyk	University of Manitoba
	William MacLeod	Niskamoon
	Mary O'Connor	University of British Columbia
	Mélanie-Louise Leblanc	McGill University
	Catherine Fortin	Université de Sherbrooke

PROPOSED AGENDA

9:00 a.m. to 10:00 a.m. Cree pre-meeting

10:00 a.m. – 4:00 p.m.

1) Approval of the agenda

2) Approval of the minutes of the 44th SC meeting held on November 3, 2021

3) Memo to researchers – November 17, 2021

4) Update Research Teams
a. Eelgrass - Comment on M. Leblanc's manuscript (**W. MacLeod, Mary O'Connor and M. Leblanc to join by phone at 10:15 a.m.**)
b. Cree Knowledge and Land Use
c. Oceanography – Coastal (fieldwork summer 2021, C. Fink-Mercier)
- Manitoba team
- End of Laura Lee's contract
- UQAR/ISMER Team – Summer 2021 Report (C. Fink-Mercier)
- Orphan moorings

d. Oceanography – Rivers – Comments on P. del Giorgio's manuscript (**Paul del Giorgio to join by phone at 1:00 p.m.)**
e. Waterfowl – New videos online
f. Cree Field Support

5) Symposium
a. Establishment of a sub-committee for the planning and organization
b. April 6 and 7 – Meeting with Chisasibi land users
c. Proposed date for the symposium: July 5, 6 and 7

6) Update on the river gauging stations acquisition

7) Update on Website

8) Miscellaneous
a. What do we do with the mobile lab?
b. What do we do with the furnishings from the house?

9) Next meeting
Proposed dates:
February 16, 2022
March 30, 2022
June 8, 2022

CHAIR AND SECRETARY

Réal Courcelles chaired the meeting. Mhaly Bois-Charlebois acted as Secretary.

The meeting began at 10:05 a.m. on Wednesday, January 12, 2022.

1) APPROVAL OF THE AGENDA

Mr. Courcelles reviewed the agenda. The agenda was approved with the following modifications:

Marc Dunn suggested that, as some members had their children at home because of the pandemic restrictions, the agenda be shortened by revising the minutes and addressing the item about the memo and both manuscripts.

Carine Durocher said that since the minutes were sent out a bit late, they should postpone the item.

The members agreed.

[Secretary's note: The minutes reflect the order in which items were addressed.]

2) MEMO TO RESEARCHERS – NOVEMBER 17, 2021

Mr. Dunn shared the memo on the screen and asked if the researchers had received it. The memo is attached to the minutes.

Zou Zou Kuzyk said they had all received it.

Mr. Dunn said that the memo had been distributed before Christmas and that nobody had returned their comments.

Ms. Kuzyk said that the researchers had a meeting last December to go through the memo. She said that she believed it is helpful to focus on the discussion and the integration of the data. She said that the researchers are interested in knowing if there are more questions regarding the project. She said that it was helpful having Ernie Rabbitskin, John Lameboy and Louie Kanatewat at the meeting in that it provided a sense of the perspective on a focus area. She said that the researchers would focus on the synthesis and that members should send them any questions they may have.

Mr. Dunn said that he believed that some of the feedback he got from the members who reviewed the manuscripts is that it is difficult for some people to understand that it is an integrative research program. He said that he believed it is important to explain that these articles are written for an academic audience and focus on specific scientific components and are not meant to be comprehensive articles.

Ms. Kuzyk said that it was a good point and that all those manuscripts will ultimately lead to the symposium and a comprehensive article. She said that only a few journals will accept comprehensive articles, but that they must build those scientific bases before being able to produce a comprehensive article. She said that the scientific bases must be sent to very specialized journals and that the members will have to read a lot of similar things before something more comprehensive and integrative can be produced.

Ms. Durocher said that, before talking about the synthesis, she believed it would be good to separate two things, namely water elements and inland elements. She said they should do an exercise of summarizing those two questions in two separate reports.

Ms. Kuzyk said she believed it was a good point and that so far, they had not worked in those two groups. She said that it was a logical starting point and that it was a reminder to the researchers that they still have to bring both aspects together. Ms. Kuzyk said that they had planned an eelgrass/goose conversation at the end of January or February. She said that last December, they mostly worked on the water segment. She said that they also want to merge everything together. She asked how important it is to have both of the components together or to stay with two separate components.

Mr. Dunn said that he believed it is important to have some links and that they should not treat them at two separate reports.

Ms. Durocher agreed that one report would have to be done at the end but that two separate reports should be done first.

Mr. Dunn agreed that one report would be an information overload at first.

Roderick Pachano said that they had a few comments this morning at the pre-meeting. He said that scientific articles are just one component of the comprehensive research program. He said that Crees are not used to categorizing things like that and that they look at things holistically. He said that everything impacts everything else.

Ms. Kuzyk said that it would be a great idea to develop a few bullet points for a summary of each article in order to explain the context. She said that although they did not think that way at first, they need to do that and they will.

Mr. Dunn said that he would propose a text that he would circulate in the committee and that once it is final, the researchers could add it to the articles. He said it would reflect Crees' views better.

Ms. Kuzyk said it was a good idea and that it could be placed in the acknowledgement section. She said that at the end of the introduction, there are usually a few lines that provide context, outline the contributions from Cree participants, explain that it is a comprehensive program, etc.

Mélanie-Louise Leblanc said she agreed with Ms. Kuzyk and Mr. Dunn. She said that it should be explained in the article that it is part of a comprehensive project and the contributions by Cree participants should also be mentioned.

Kelly Leblanc said she had a comment about the comprehensive report. She said that she believed it should outline how the research components complement one another in order to provide an overview of the project as a whole. She said that it would be interesting to have an overview of what was done overall over a period of four or five years.

Ms. Kuzyk agreed.

3) UPDATE RESEARCH TEAMS

a. Eelgrass - Comment on M. Leblanc's manuscript

Mr. Courcelles welcomed Ms. Leblanc and asked her if she wanted to introduce the manuscript before going to the comments section.

Ms. Leblanc said she had prepared a small presentation. She shared the presentation on the screen. The presentation is attached to the minutes. She said that one of the first objectives of the research was to monitor eelgrass health by mapping eelgrass and comparing their recent and past data. Ms. Leblanc explained the factors influencing eelgrass and the methods used in the research. She said that the highest abundance of eelgrass was observed in the 1980s and the largest decline was seen in 1999. She said that the research provides insight regarding the limitations but that it is too early to draw any conclusions.

Mr. Courcelles asked Ms. Leblanc to explain what she considers the northern limit.

Ms. Leblanc explained that *northeast* refers to the samples where biomass samples were taken by Hydro-Québec above Rivière Castor (sample sites 1 to 6, page 13).

Mr. Dunn said that he just wanted to confirm that the observations regarding the decline up until 1990 are corroborated by the interviews done with the land users.

Ms. Leblanc replied that they do say that the highest abundance of eelgrass was observed in 1990. She said that they do not talk about a gradual decline because it is not a linear regression.

Mr. Dunn said that he just wanted to confirm that the decline that the land users described is included in the report.

Ms. Leblanc said that she would verify with Julian Idrobo regarding what can be included.

Mr. Dunn said he would also verify what information he could send to Ms. Leblanc.

Ms. Durocher thanked Ms. Leblanc for her presentation and said that she had some comments on the presentation as well as some on the manuscript. She said that she believed that the two study areas should be clearly indicated and described. She added that the reason why they separate those two areas should be explained well.

Ms. Leblanc said that the reason they separated both areas is because they did not have biomass samples from the southern area. She said that the data is restricted to this area only because they do not have biomass samples for the other area. She added that it is simply a way to be careful and that what they found in the southern area cannot be extrapolated to other areas because there is less available information.

Ms. Durocher said she was also wondering to what extent the freshwater discharge of the Grande Rivière influences the water properties of the bay. She said that, in the manuscript, it is somewhat implicit that the influence is for the northern region but she believed additional details should be provided.

Mélanie said that, as outlined in the appendix, the summer plume does not extend as far as the winter plume but that it is highly variable. She said that the article mentions the extent of the summer plume, but that although she used summer discharge to analyze the data, it is not clear how the discharge influences each station.

Ms. Durocher said that, for future research, instead of having one large northern region, it could be divided between the area under the influence of the summer plume and the other area. She said that they could logically expect that the eelgrass beds directly impacted by the plume would have seen an earlier decline.

Ms. Leblanc replied that she did not have that data but agreed it could be interesting in the future.

Ms. Durocher asked if it would be useful to separate the northern region into subregions for the comprehensive article.

Ms. Leblanc replied that it would. She said that she knows someone in the eelgrass team who looks at river positions on all the sites they sampled, not just for the Grande Rivière. She added that she would have more detailed data that is not so restricted to the northern and southern areas. She said that another problem is that they just have one year of data and that it would have to be assessed over a longer period.

Ms. Kuzyk asked if they would be comfortable separating those six stations.

Ms. Leblanc said that they did see that the bed closer to the Grande Rivière has less biomass but they don't know if it is because of the influence of the plume or because it is naturally less abundant. She said that the monitoring was not done at the time Julian Idrobo said the users noticed the beginning of the decline.

Ms. Durocher said she believed the manuscript should provide better sources when referring to Cree knowledge. She said that it should say where it comes from or which community it comes from, because they know that Cree knowledge can be different from one community to another. She added that it is important to not consider that data as being all the same.

Ms. Leblanc agreed that she could provide more information about the source of the data and see with Mr. Idrobo if she could use other sources of information. She added that given that the scientific article is not meant to be comprehensive, they did not want to highlight it, but they do want to acknowledge the Crees. She said they can work on that aspect.

Ms. Durocher said that the article emphasizes what is going on in June and July in terms of freshwater. She said that if this is the key part of the analysis, it can have a lot of implications in the future, so she

believes it is really important to explain why the decision was made to choose June and July and not April and May, for instance.

Ms. Leblanc said that they did not include August data because the data was generally collected at the beginning of August only. She added that they focused on the period after the ice melt in June and July, when eelgrass grows.

Ms. Durocher asked if they tested the correlation of other periods.

Ms. Leblanc replied that they typically want to understand what is the optimal month to collect eelgrass. She said that they restricted the analysis to June and July because it is the growing season, but that they also used what they had for previous years. She explained that they did not include the winter fresh discharge but that they are not opposed to including it. She added that it gets complicated because they have bad winter data and good data in summer, therefore they made the decision to keep the data from June and July. Ms. Leblanc said that Ms. Durocher was bringing up important points. She said that the article does say that other studies could expand outside the growing season and that this article is more of a guide for other studies. She said that it does not propose anything definitive and that other studies could go further in answering those questions.

Roderick Pachano said that he would appreciate a table of contents. He said that the article seems to explain that the Crees only saw a decline in 1999 but in reality, they started to see the decline when the Grande Rivière changed. He said that he believed Ms. Leblanc should refer to this. He added that he believed that the article should specify that it is one component of a comprehensive research program. Mr. Pachano said that it should also indicate which percentage of the territory was covered by the field sampling because three traplines were not covered. He added that the article should also mention what CERRI does.

Alain Tremblay said he read the article in detail and that he believes it does a great job of including everything that was done in the past. He added that he believes they did a very good job but that he did have some concerns. He said that the way he read it, he still has the impression that there is an assumption that the Grande Rivière changed the eelgrass beds but the results do not show that. He said that according to the results in figure 6, the healthier eelgrass beds are located where the impact of the plume would be greater, which is the opposite of what one would instinctively think. He added that the article states that the eelgrass conditions can be related to air temperature and freshwater, and that he believed it would be interesting to compare that data to other rivers in order to have a better understanding of what happened on the entire coast. Mr. Tremblay said that he is not sure that the conclusions are supported by the results.

Ms. Leblanc said that this was the main challenge of the article. She said that she understands that they should have emphasized that, regionally, the 1990s were the odd years, that the changes brought to the Grande Rivière could have impacted the eelgrass and that the Grande Rivière freshwater discharge would represent an additional stressor, even if they are unable to extrapolate. She added that they can emphasize that message because we know that those changes alone do not explain the decline.

Mr. Tremblay said that, if it was possible to scientifically explain the freshwater influence, it should be obvious on the beds closer to the Grande Rivière, but it is not. He added that it is a contradiction between instinct and science. He said that there are other things that play a role in the decline.

Ms. Leblanc said that there are surely more parameters, for instance, the beds of the Bay of Many Islands are protected from freshwater discharge, which could be a factor that provides protection. Ms. Leblanc asked Alain Tremblay to provide an example of figures where contradictions are present.

Mr. Tremblay replied that figures 6 and 8 in the manuscript contain contradictions. He said that most of the eelgrass with the highest cover is closer to the Grande Rivière. He said that, instinctively, that should not be the case if the river has an influence. He added that the Grande Rivière cannot be the only factor because there has been a big decrease in eelgrass everywhere. He said that the text seems to assume that the Grande Rivière has an influence on the eelgrass beds but he does not see it in the data.

Mr. Dunn said that he did not believe that it is possible to do a study like this without mentioning the Grande Rivière, because a lot of data comes from sampling done near the Grande Rivière. He said that he thought that Ms. Leblanc had explained the limitations of the data well. He added that there might be something special going on in the Bay of Many Islands, but the results are limited by the data, and unfortunately, the tallyman did not want the researchers to go and see what is happening in that location. Mr. Dunn said he understood what Mr. Tremblay was explaining but that he believed the limitations were clearly stated in the article and he does not know how this problem could be assessed.

Mr. Tremblay said he agreed that the manuscript must mention the Grande Rivière without necessarily focusing on it. He said that the wording used in the manuscript gives the impression that the Grande Rivière has an influence on the eelgrass beds even if the work is done properly.

Mr. Dunn said that they have to keep in mind that they need to compromise because some people say the study does not go far enough in its analysis of the influence of the Grande Rivière and some will say the opposite.

Ms. Kuzyk said that there are natural variations in eelgrass beds and since the 1970s, eelgrass has responded to so many things. She said that the researchers are looking for the best way to incorporate all of those things. She said that they could add a couple of sentences to provide a better explanation of those natural variations and the variety of possible influences. She added that everyone thinks about freshwater when it comes to the eelgrass beds, but the rivers also bring nutrients, which can be beneficial. Ms. Kuzyk said that the nutrients are very low in James Bay and Hudson Bay.

Ms. Leblanc said that Mr. Tremblay's comments were accurate and wanted to explain that the data they have from 1996 comes from a map. She said that they took that map and compared the data with the samples they took in the same locations. She added that it is imperfect baseline data.

Ms. Leblanc said that it is possible to have an abundance of eelgrass beds above 70% and it can still not be as abundant as before. She said that the land users were quick to say that the abundance is far from what it was before.

Mr. Tremblay said that, from what he understood, the density is being compared to that of 1996 and that now, although the density is higher than before, it is not what it was in the 1990s. He said that there is a slow return to high density, but not to the level seen in the 1990s. He added that it looks like this everywhere.

Ms. Leblanc said it was true and the reason why subarctic eelgrass does not recover as quickly as it does elsewhere is because it does not reproduce via reproductive shoots. She said that it might take some decades to recover and that there might be regional stressors. She said that they do not know this and that eelgrass recovering slowly does not mean there are no stressors. She added that there are two possible directions that need to be explored further and that although they cannot ignore the Grande Rivière, the reasons why they mention it can be explained more clearly.

James Bobbish said that he had some general comments and a couple of questions. He said that he was expecting that at this point in the research, they would have a better understanding of the situation. He asked how Mélanie's article relates to the two main questions of the research program. He asked if there would be supplementary questions. Mr. Bobbish said that Paul del Giorgio was saying that the highest discharge of freshwater is during the winter, when there is a high demand for electricity. He said that he believed that although global warming is evident throughout the world, a line must be drawn between what is happening along the James Bay coast and global warming in general. He added that since 1996, there has been a 40% decrease in the density of eelgrass meadows. He said he wondered what the percentage in some other regions might be. Mr. Bobbish said that he would tend to think that freshwater is a major factor affecting eelgrass in addition to whatever is happening with global warming. He said he would second-guess the fact that no evidence is showing what is contributing to the decline because the land users could not see the bottom of those shores in the past, whereas now they can. He said that, according to Paul del Giorgio's article, the different reservoirs acted as sinks for things floating in the bay. He said that he wondered how the various river properties and the saltwater inputs can influence the eelgrass beds.

Ms. Leblanc said that she is curious to know what is going on with eelgrass around the globe and whether what is happening in James Bay is unique because most of the eelgrass beds have declined. She said that pollution and the fact that there are more nutrients are the two main factors affecting eelgrass globally. She said that the James Bay case is unique because it is a big area where there is no major city on the coastline, so it is difficult to compare with other areas on the globe. She added that it is the first time they are seeing a major decline in eelgrass in northern areas. She said that there are not a lot of studies analyzing the impact of freshwater discharge on eelgrass. According to one study in the United States and another one in France, beds near freshwater have declined. She added, however, that the study was conducted on a very small scale.

Ms. Kuzyk said that, at the beginning of the meeting, they did talk about how those scientific articles are peer-reviewed and more specific than integrative. She said that those articles can only provide part of the answer to the bigger questions. Mélanie is not looking at all the data collected by the researchers, just at the specific data related to eelgrass. She explained that it is the reason why the manuscript questions seem so different. She said that she did not remember if it was mentioned in the article or not, but it is a good point to say that where the water flow has been reduced, water gets saltier closer to the mouth of a river. Ms. Kuzyk said that you would think it would have a positive impact on eelgrass, but then again, there are a lot fewer nutrients in those rivers and browner water, even if there is less water coming in. She added that, in a small area, the conditions would be worse, but in a larger region, there should be less impact overall. She said that, as far as the importance of winter discharge, Ms. Leblanc explained why she did not put it in the study.

Ms. Leblanc said that they could include that data, because even if it does not become an important factor, it does not mean it has no impact. She said she can include it, but she cannot draw a clear conclusion about those results because she does not have all the necessary data.

Ms. Kuzyk said that they could write something about all the comments raised in the meeting and report back to the members with it. She said that, regarding shallow water, you would expect eelgrass beds to shift down to deeper water and for those shoots to be better.

Mr. Bobbish said that the Crees saw changes in shallow water, but he did not see a lot of studies further offshore.

Ms. Kuzyk explained that they do not see a lot of eelgrass beds in deeper water and that they are more frequently seen in shallow water.

Mr. Bobbish asked how far eelgrass beds can be seen in the plume.

Ms. Kuzyk replied that it varies from week to week, according to the tides, winds and storms. She said that they can determine an average distance, but day after day there would be changes.

Mr. Pachano said that they talked about temperature warming with the Grande Rivière input. He asked if somebody looked at the difference between the coast and the airport air temperatures because the land users can see a difference on the field. He asked if this difference would have an impact.

Ms. Leblanc replied that they compared the temperatures measured between the coast and the airport and that they noticed a similar trend. She added that it is always cooler by about 4 degrees on the coast and that this detail is included in the manuscript.

Mr. Dunn said that he would send his comments by email. He said he wondered if they needed to add Fred Short as a coauthor since they used his data. He said that he believed it should be acknowledged.

Ms. Leblanc asked if she should contact him.

Mr. Dunn replied that it should at least be acknowledged. He added that she did really good work merging all the information they had. He said that it is a really important contribution to the research and that even if it is clear from the comments that it is not yet ready to be published, it is close.

Ms. Kuzyk said that going back to raw data is a tremendous amount of work and this work is incredibly solid, including powerful data synthesis. She said that they are talking about how they interpret those new answers. She added that, after Ms. Leblanc submits the article, the reviewers will send all the comments back and then another revision process will begin. Ms. Kuzyk said that she just wanted to say that it is important to send the article to a journal soon because this process takes time.

The meeting paused at 12:16 p.m. and resumed at 1:04 p.m.

d. Oceanography – River

Paul del Giorgio introduced Michaela de Melo.

Mr. Dunn suggested showing a few figures to start the discussion.

Mr. del Giorgio showed the manuscript on the screen. The manuscript is appended to the minutes. He said that the reason they care about rivers is because they deliver water to James Bay and materials to the coast, like sediments, nutrients and organic matter. He said that those materials influence the coast and the habitats so it can affect the eelgrass habitat. Mr. del Giorgio said that, over the three years, they sampled rivers across the eastern area of James Bay and their mandate was to characterize the pattern of the discharges over the bay. He explained the methodology and the different components analyzed. He showed the map of the sampling stations, which includes 18 rivers. Mr. del Giorgio said that, in order to reconstruct the discharges from the rivers, they used historical data provided by Hydro-Québec or previous hydrological stations that no longer exist. He said that they also installed new stations with Niskamoon funding and Hydro-Québec technical support. He said that they have both historical data and a network of 11 hydrological stations functioning right at this moment. He added that they reconstruct the discharges for rivers where they do not have stations with models. He showed the map of the watershed and the table of the parameters sampled, namely nitrogen phosphorus, sediments, organic matter, color, conductivity and pH. He explained that they can estimate how much of each of those parameters is present in the rivers. He showed the graphs of the connections between the parameters and the graphs showing what landscape parameters influence the water. He then showed the graph of the discharges. He explained that the hydrograph of James Bay and the rivers have similar patterns because it is a region, but that they are not all the same. Mr. del Giorgio explained that the Grande Rivière is different because it is regulated and depends on power consumption. He finished the presentation with the exports, explaining that the southern rivers tend to be turbid and are carrying a lot of clay and a lot of solids. He added that when unit per watershed is taken into account, the Grande Rivière has the lowest concentration of the parameters. However, there are a lot of parameters because there is

more water. Mr. del Giorgio said that all the research teams will need that data to conduct their research.

Mr. Bobbish said that what comes down from different reservoirs is affecting the growth of eelgrass but also other organisms and animals. He said he heard people saying that the quality of fish might be affected, too. He explained that there are subtle changes in the taste, for example. He said that the land users can taste the difference because they've been making the same kinds of meals for decades. He said that the fact that reservoirs in the Grande Rivière area are acting like sinks, they stop a lot of materials from coming down to the bay. Mr. Bobbish asked about the amount of phosphorus and nitrogen coming into the Grande Rivière area through the inputs.

Mr. del Giorgio said that he and Ms. de Melo have studied this. He said that with the diversion of the Opinaca and Eastmain rivers, there is obviously less water going into James Bay now than before at the outlet of the Eastmain River. He said that the Grande Rivière area is big and the materials tend to settle upstream from the dams. He explained that he was not saying whether it was good or bad, but compared with before the diversion, there is more phosphorus in the bay now. He added that it is not a huge difference but a sizable one. He said that it is also the same thing for solids, but for nitrogen it is less obvious. He said that the consequences this is having on eelgrass is a good question. He explained that these river nutrients are going to the bay and circulating in the bay so there is no question that those nutrients play a role in the bay. He said that the rivers put a lot of nutrients in the bay and it develops sediments with a lot of nutrients, but they have to see what the consequence is on eelgrass because eelgrass tends to take nutrients from sediments. Mr. del Giorgio said that his colleagues know a lot more than he does on this topic but he can confirm that some areas have many more nutrients than before the diversions and some have fewer nutrients. He added that he did not feel qualified to reply to the fish question. He said that it might have been changes in the food web. He said that if fish have changed in taste or texture, it could be that their fat content has changed because their food sources have changed.

Mr. Tremblay said he wanted everyone to understand the amount of work it took to get this manuscript and that Ms. de Melo did great work reconstructing the river discharges and changes in the bay. He said that his comments are more about the wording. Mr. Tremblay said that he wondered about the sheer magnitude of the materials being retained by the reservoirs and the comparison of before and after the creation of the reservoirs. He wondered what the percentage was. He added that it is mentioned in the manuscript but it is not as clear as he would like. He said he would like to see how those rivers behave compared to other rivers in Québec. Mr. Tremblay said that it remains a poor watershed system even before and after the flooding. He explained that comparing this watershed with other areas could help to visualize the proportions. He said that even if there have been diversions of the Eastmain and Opinaca rivers to the Grande Rivière, on an annual basis, they release the same amount of water in the bay.

Mr. Courcelles said that that is not the case and that it was one of his comments. He said that he will send the suggestions to Mr. del Giorgio and Ms. de Melo. He explained that it is not because water is diverted from rivers that it all goes right through the bay. He said that the annual flow of the Grande Rivière does not reflect what was in the Opinaca and Eastmain rivers.

Mr. Tremblay said that he was referring more to the fact that James Bay will be the area in Québec most affected by climate change.

Ms. de Melo said that, for a period covering more than 20 years, they have some data regarding water, but not for all the parameters.

Mr. del Giorgio said that they have provided as much detail as possible regarding the reconstruction given the data they have. He said that they are repeating this research in the La Romaine area but they have real-time data. He explained that they had emphasized the historical aspect to the best of their ability.

Mr. Dunn said he sent his comments by email but wanted to say that the Grande Rivière is a huge watershed. He said that it cannot be assumed that 100% of the water is diverted to the Grande Rivière, so it must be well explained. He said that the water currents in James Bay circulate in a counterclockwise manner and that the watershed of the western James Bay area is much bigger than in the eastern area. He added that nitrogen is mainly absorbed by the soil, so it could come from anywhere. He said he wondered if they are missing something because a lot of rivers in the western area of James Bay and Hudson Bay might be contributing a significant amount of nutrients. He asked if the retention of nutrients extends beyond the region and if they should analyze what is coming from the western area.

Mr. del Giorgio said that it was a good question and that he could not respond, but that what he could say was that when you look at rivers, you can see the extent of the plume. He added that he was not saying that those rivers do not influence the water elsewhere in the bay, but since they are concerned with habitats very close to the coast, it is more on a local scale.

Ms. Durocher said that the comparison between both manuscripts provides an interesting image, because they are going in two different directions. She said that Ms. Leblanc is looking more at what the Grande Rivière brings into the bay that might hurt eelgrass and Mr. del Giorgio is looking more at what the Grande Rivière does not bring into the system. She added that, regarding this article, she believed that the link with eelgrass research needs to be emphasized a little more. She said that eelgrass is mentioned once or twice in the manuscript. Ms. Durocher said that the potential link between the parameters of this research and eelgrass could be more explicit and could offer a more global perspective. She said that her second comment was more about the timing. She explained that in this research, they have included the Rupert River and it was diverted in 2009. She said that, given that the objective of the entire research project is to make a link with what happened around the late 1990s, sometimes they lose this historical perspective because the diversion was more recent. She said she wondered if the conclusion would be different without the Rupert River in the equation.

Mr. del Giorgio said that the reason they did this work is because of eelgrass and that they are not working in James Bay just in the rivers. He said that he would like to explain to the group that there are two stages in their work. He explained that the article has been shared with the group of researchers for further analysis, but to reach the second stage, the article has to be solid, which is why it needs to be published. Mr. del Giorgio said that all these things in the article are shared with

the group to understand what is happening in the bay. He said it is difficult to write a river paper as an eelgrass paper and that they must write it as it is.

Ms. Durocher said she understood that but just wanted to mention that the link must be made.

Mr. del Giorgio said he understood the concern, but that he just wanted to explain to the committee that it is one thing to publish this article with strong and robust science and to write a comprehensive article. He said that they must write the unit in a way that it makes sense, but all the data in this article is shared with the group and will go in the eelgrass analysis. He said that it will be repackaged to understand what is happening with eelgrass.

Ms. Durocher said that her comment may not have been well formulated. She said that this morning, Mr. Dunn had mentioned the importance of the introduction and that she meant that the manuscript has to mention that this research is part of a larger program.

Mr. del Giorgio said he had tried and that they had constantly reinforced this but that they put it in the context instead of in the introduction.

Mr. Dunn said that he told Ms. Leblanc that they could draft a text regarding the overall project and explain how this project is part of it and then send it to the researchers. He explained that it is important that the article acknowledge that it is part of the study commissioned by the Crees. Mr. Dunn said that the idea is to embrace a Cree way of looking at things, which in some ways is more holistic than academic. He said that they all agree this peer-review process is important, especially from an academic perspective, but it is also important from a Cree perspective that the project reflect their expectations.

Mr. Bobbish said that it should just be a text emphasizing the fact that the river study is part of the project as a whole.

Mr. del Giorgio said he agreed and that it would be good to have a shared paragraph of acknowledgement. Mr. del Giorgio suggested a text in the chat. The text is appended to the minutes.

Ms. Kuzyk said that the question is to strengthen the link with the eelgrass component. She said that it would be useful to describe some details from the 1990s for the synthesis.

Mr. del Giorgio said he would have to see what data was available.

Ms. de Melo said she believed that it should be part of another article. She said that eelgrass does not affect rivers, but rather, rivers affect eelgrass, so she believes it is important to have an article explaining what the rivers contain and how it is affecting eelgrass.

Ms. Kuzyk agreed but said that it would be interesting to show how the water output changed during the 1980s and the 1990s.

Mr. del Giorgio said that the last time the group of researchers met, they discussed how to match what they are doing with the eelgrass research data and specific periods of time.

Mr. Bobbish said that he believed the context would be important here.

Mr. del Giorgio said he agreed. He said that they talked about having the current portrait of the present state of the riverine situation in the James Bay but also some idea of the past. He said that they will go little by little, but that he completely agreed with the eelgrass matching.

Mr. Dunn said that he would write something based on the acknowledgement sent by Mr. del Giorgio.

Mr. del Giorgio said he agreed it needs to be more explicit.

Mr. Dunn said that this article received minor comments, so it could go further in the publication process and not come back to this committee. He said that the committee assumed they would integrate their comments into the article.

Ms. Durocher asked for a timeline for sending the comments.

Mr. Dunn said that if they agreed with the publication protocol the committee and the researchers had agreed on, they could publish after this meeting and once the comments had been integrated.

Ms. Durocher reminded those present that the articles were not sent two weeks before the meeting.

The committee decided that they would give the members another week to send their comments on both articles to Ms. Bois-Charlebois and that she would send an email to remind them of the deadline.

Mr. Pachano said that Mr. del Giorgio had said that every eelgrass bed is affected by the plume of the rivers. He asked if it would be correct to assume that Hydro-Québec's opinion that the Grande Rivière plume protects eelgrass beds is incorrect.

Mr. del Giorgio said he was not sure if he was qualified to answer the question because he does not know the state of the eelgrass beds near the Grande Rivière.

Mr. Pachano said that he read a report from Hydro-Québec saying that the Grande Rivière's plume protects eelgrass.

Mr. Dunn said he believed this was one specialist's interpretation at the time.

Mr. del Giorgio said that he does not know if it was a general statement about the eelgrass beds in the plume of the Grande Rivière where they are naturally more affected by it, but that everything that increases in size in the plume will increase as the plume increases. He said that the assumption seemed strange to him. He added that the river plume affects the water environment but that it does not necessarily affect it negatively.

Jean-Philippe Gilbert said that it is right that this assumption was stated in 1999 in the report following the decline. He said that it was not a fact that Genivar wanted to point out, but rather, it was more a hypothesis that the configuration of James Bay as a circular pattern brings salt water into the bay in a way that it could have protected the eelgrass beds. He explained that this hypothesis was made because it is almost the only place where there was eelgrass each time they took samples.

Mr. del Giorgio said that he interpreted that it might not be the plume that was protecting the beds, but instead, it was the islands that protected the eelgrass beds from the plume.

Ms. Kuzyk said it was an interesting discussion and that they would try to uncover additional details.

The rest of the agenda was postponed. The meeting adjourned at 3:50 p.m.

Réal Courcelles, Chair of the meeting

Mhaly Bois-Charlebois, Secretary