

**BEAUFORT REGIONAL
ENVIRONMENTAL ASSESSMENT**

BREA Research Results
Forum:
Taking Stock and Looking
to the Future – Involving
Communities and
Informing Decision-
Making

February 24 to 26, 2015
Midnight Sun Recreation Centre
Inuvik, NWT

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1 Introduction

The Beaufort Regional Environmental Assessment (BREA) 2015 Research Results Forum was held on February 24 to 26 at the Midnight Sun Recreational Complex in Inuvik, NWT. The objectives of the Forum were:

1. To present and discuss the key results and findings from the four-year (2011-2015) \$21.8 million *BREA Research Program*. A cross section of the research results and findings in defined topic areas will be presented. Other research projects will be represented through displays (e.g., posters; information panels; maps; models) and accessible via interactive laptop computers.
2. To present and discuss the work and outcomes of the six BREA Working Groups.
3. To present an overview and directly relevant findings from the *BREA 2011-2015 Research Program* evaluation.
4. Hold a panel discussion on BREA Results - Successes, Challenges and Gaps. This will include discussion of the current contribution and future potential contribution to knowledge, various review and decision-making processes.
5. Hold a panel discussion on Future Directions for Beaufort Region Research. This will include consideration of (a) the current and emerging factors that are shaping both Beaufort region and Arctic research initiatives; and, (b) ways to strengthen the applied use of the research results in various review and decision-making processes.
6. Present and discuss the next steps to bring forward the Forum outcomes and include them into a *Final Synthesis Report* on the BREA Research Program.

The Agenda for the Forum is provided in Appendix A. More than 85 participants representing Inuvialuit communities and organizations, co-management bodies, the federal and territorial government, industry, academia and consultants attended the Forum. The list of participants is provided in Appendix B.

This report summarizes the Forum discussions and questions/answers, according to the key themes on the agenda. The Forum presentations are available on the BREA website at: <http://www.beaufortrea.ca/>; their content is not summarized here. Participants also received a copy of the presentations on a memory stick or in a resource binder at the Forum.



2 Part A: BREA in Context

Following an opening prayer by Annie Goose (Ulukhaktok), Forum participants were welcomed by Frank Pokiak, Chair of the Inuvialuit Game Council (IGC). He reviewed the history of the BREA initiative, and its origins a decade ago in response to community concerns relating to proposed drilling in the Beaufort Sea. The Beaufort Sea Strategic Regional Plan of Action (BSStRPA) made a number of recommendations in 2009 with respect to the activities needed to prepare for oil and gas development in the region, and following the Macondo incident in the Gulf of Mexico in 2010, federal funds were allocated to the four-year BREA research program. Frank noted that although much had been achieved by BREA, more work remains to be done.

Nellie Cournoyea, Chair of the Inuvialuit Regional Corporation (IRC), noted that the BREA process had involved many people and organizations, and built on extensive previous efforts and agreed that much remains to be done. She thanked the IGC, the Joint Secretariat and the communities in particular for their involvement. Although a 'BREA 2' has not been announced, she expressed her belief that the next steps will unfold with time, and that it is important to plan for them now in anticipation of a window of opportunity. It is in the long-term interest of Inuvialuit to ensure that decisions are based on scientific and traditional knowledge, to allow for a balanced approach to understanding risk and benefits. BREA and other initiatives have contributed to the growing knowledge base. This Forum will solicit ideas for moving forward.

Daniel VanVliet (Aboriginal Affairs and Northern Development Canada, AANDC) set the context for the Forum with a presentation that provided an overview of the history leading up to BREA; its goals, scope and work plans; research priority areas and projects; the working groups; and communication of results. Several questions were posed:

- Joshua Oliktoak (Ulukhaktok) asked if there are any new projects on the declining caribou herds across the north? Daniel noted that there is some research in the NWT and Nunavut, but that he could not speak directly to it. Frank Pokiak noted that there is work being done on the mainland and in the Sahtu region on the Bluenose herd.
- Richard Gordon (Inuvik HTC) asked what the two 'community priorities' projects are? These are the 'Regional Coastal Monitoring in the ISR: Ecosystem Indicators' project (presented by Lisa Loseto later in the Forum, see S. 4.2 below), and 'Polar Bears in Deep Off-shore Regions of the Beaufort Sea' (presented at the 2013 BREA Results Forum). Norm Snow added that there will be at least another year of work on the community-based monitoring project. A third community priority is the 'Beaufort Region Oil Spill Response Training Course' (presented by John Korec later in the Forum, see S. 3.5 below). It is hoped that this course will be delivered locally through Arctic College; it is intended for non-industry participants.

3 Part B: BREA Working Groups

On Days 1 and 2, the BREA working groups presented to the Forum. Due to time constraints and the addition of a presentation in the Day 2 agenda, an abbreviated version of the Waste Management Working Group's presentation was made on Day 3.

3.1 *Climate Change Working Group*

Daniel VanVliet (AANDC) reported on the activities and outcomes of BREA's Climate Change Working Group. The Working Group's activities were summarized, and an overview of the research results and recommendations was provided.

Forum participants provided comments and questions:

- Billy Archie (Fisheries Joint Management Committee) noted that Aklavik adopted a climate change adaptation plan in 2009, but that there is not enough collaboration amongst various initiatives and organizations. A caribou calculator developed as part of Arctic Borderlands research was not accurate. The local knowledge of communities is often at odds with the predictions of models based on science. Therefore the communities are cautious with respect to models and their value. Doug Chipertzak, one of the authors of the Working Group report, noted that modelling is a predictive tool, but is not exact, and only as good as the available data used in it. 'Ground-truthing' and community verification are essential.
- Al Kennedy (Imperial Oil Limited) asked if there is a need to have climate change integrated into environmental impact assessment. Is this a regulatory or environmental assessment need? Daniel VanVliet responded that it is not prescriptive, but should be considered. Chris Milley (AMEC Foster Wheeler) stated that climate change must be addressed in environmental assessments.
- Vic Gilman (Fisheries Joint Management Committee) asked how detailed the recommendations will be with respect to what needs to be done in terms of the input parameters for long-term modelling. Doug Chipertzak noted that the Working Group identified some types of modelling that would be useful in reports prepared a couple of years ago. Additional guidance would be needed in terms of environmental assessment.
- Jon Pierce asked if there will be data from the Working Group on the potential effects of climate change. Doug Chipertzak responded that there is information with respect to ice, less so for the biological environment. It is understood that things will have changed 30-40 years from now.
- Richard Gordon (Inuvik HTC) stated that the oral history – local and traditional knowledge – must be recorded and recognized. Community concerns must be taken seriously, we need to be out there monitoring. Do not want to repeat the mistakes made during exploration 30 years ago, e.g., sumps.

3.2 Information Management Working Group

Two presentations were made on behalf of BREA's Information Management Working Group:

- Sophie Vallée (Aboriginal Affairs and Northern Development Canada) - *Information Management Working Group* provided an overview of objectives, results e.g. BREA website 'hub', data and information management policy, linkages to Hydrocarbon Impacts Database, Polar Data Catalogue and other initiatives.
- Gabrielle Alix (University of Waterloo) – *BREA's Contribution to the Polar Data Catalogue* reviewed the Canadian Cryospheric Information Network; described the PDC and the types of information available through it; the PDC was also demonstrated with participants during breaks/over lunch.

Following the presentations, the following questions were asked or comments made:

- Joshua Oliktoak (Ulukhaktok) asked if the communities could use the PDC. Gabrielle noted that the PDC is available on-line, and that she could show community members how the PDC, including 'PDC Lite' version, work during breaks or at lunch. She encouraged communities to test drive the site and provide feedback.
- The last slide of the Working Group presentation stated: “[ensuring] stakeholders are better prepared for future oil and gas exploration and development in the Beaufort” and “[filling] regional information and data gaps” – what are the gaps that have been identified, and will we have access to information in the future? Sophie noted that BREA information can be accessed through the PDC and the BREA website. BREA filled some, but not all gaps – it focused on the priorities.
 - Earl Esau (Sachs Harbour) stated that there is so much science information out there; is it all getting shared, or just selectively?
 - Jim Elias (Tuktoyaktuk HTC) added that the communities are more than 'stakeholders'; and that many factors are contributing to change, e.g., the highway, climate change, cultural change. Tuk and other communities are 'down river' to everything that happens upstream. Coastal communities especially need to be prepared.

3.3 Cumulative Effects Working Group

Chris Milley (AMEC Foster Wheeler) presented an overview of the Working Group's project '*Cumulative Effects Framework – Development of a Road Map for Cumulative Effects of the Beaufort Region*'. He defined cumulative effects, the methodology used to prepare the Framework, and the selection of Valued Components and indicators. Cumulative effects management and monitoring were touched upon, as was the importance of information management. The following questions and comments were raised:

- Is there more information 'out there' that is undetected or unavailable? Need more information sharing and access to improve cumulative effects assessment.
- It is important to convey results in a way the communities can use – provide information related to industry, climate change to the HTC resource people
- The project is at a 'Framework' level – what about implementation and cumulative effects management?
- The available datasets are largely 'western science' – less local and traditional knowledge right now, and deal with little activity other than climate change.

- The focus seems to be on information sources rather than assessment.

3.4 Social, Cultural and Economic Indicators Working Group

Bob Simpson (Inuvialuit Regional Corporation) reported on the activities of BREA's Social, Cultural and Economic (SCE) Working Group, including work being done on the *Inuvialuit Indicators* and other projects. The partnership with the NWT Bureau of Statistics was described. The Working Group's activities, objectives, and deliverables to date/next steps were summarized. Following the presentation, the following questions were asked or comments made:

- What is the forecast, given the data/information we have now? e.g., education - even if it is improving, there are still challenges.
- The data illustrate problems, successes, and give a relative prospective, i.e., we are not keeping up with the rest of Canada.
- Government and IRC to use the data in developing policies and to identify actions for the problems, e.g. school attendance. There is a difference in attendance in Sachs where kids have transportation support – buses – especially in colder months, vs. Tuk where there are no buses. Many organizations have related responsibilities.
- Need to disaggregate data for communities, and for Aboriginal/non-Aboriginal.
- 'Social passing' of students when they are not ready – has this been studied? There is an education project being done with Lakehead University. Social passing is not supported by 90%. Early intervention and access to supports is needed. Grade 12 grads need additional skills when entering post-secondary institutions.
- We have issues with staffing here – if using a sports analogy – 'need to change the General Manager' – need more people from the communities.
- What will happen post-BREA with the SCE work and other projects?

3.5 Oil Spill Preparedness and Response Working Group

John Korec (National Energy Board, NEB) made two presentations on behalf of BREA's Oil Spill Preparedness and Response Working Group:

- *Oil Spill Preparedness and Response* – reviewed the role of the Working Group, reports that have been prepared, workshops (e.g. 2011 Dispersant Use Workshop) and follow-up studies (e.g., 2013 Training Needs Workshop; Mandates and Roles Survey. The Net Environmental Benefit Analysis (NEBA) project was presented later in the Forum (see S. 4.1 below).
- *Beaufort Region Oil Spill Response Training Course* - provided an overview of the Oil Spill Response Training Curriculum Development project and the materials that have been prepared. A copy of the training materials was available for review at the Forum. A report on the status of the recommendations from the training needs study is in progress; initial findings were provided in the presentation.

Participants had a number of comments and questions:

- John Ritchie (GNWT) asked if any work had been done on different dispersants and their toxicity. John Korec noted that the Working Group had not done that, although it was discussed at the 2011 workshop. Ken Trudel added that the risk associated with some of the dispersants was considered as part of the NEBA project (see S. 4.1 below). The US Environmental Protection Agency is reviewing dispersant toxicity criteria.
- Richard Gordon (Inuvik HTC) stated that there is no action plan to address some of the concerns. Industry has a responsibility. Implementation of the training for response to an oil spill is needed for all six communities. Spills could result from tankers, cruise ships or other vessels, in addition to oil and gas activities. John noted that the recommendations do address some of the concerns that have been raised by communities.
- Norm Snow (Joint Secretariat) added that the next steps could include advanced training. The training will need to be offered in perpetuity; it was designed to be expandable and sustainable. The Spill Guide and SCAT Manual products of the Arctic Council's Emergency Prevention, Preparedness and Response Working Group have been distributed to the HTCs.
- This 'downtime' in advance of oil and gas development provides an opportunity to provide the training. What is the role of the HTCs in 'quick response'? The goal is to build a core group of trained first responders in the communities, with skills being kept current.
- Frank Pokiak (IGC) noted that Inuvialuit have been pushing for this training for a long time; the communities should select who will be trained.
- Billie Archie (Fisheries Joint Management Committee, FJMC) stated that the training should not be put on hold because of the slowdown in oil and gas activity. The World Wildlife Fund was in the communities recently with their trajectory model, but it did not accurately predict the path of the NTCL barge that is now floating towards Japan. Models have limitations; need accurate scientific, local and traditional knowledge. Increased shipping activity presents additional risk to the nearshore. We have been told by industry that beluga are smart enough to avoid leads filled with oil – where is the evidence for this?

3.6 Waste Management Working Group

On Day 3, Sophie Vallée (AANDC) provided an abbreviated version of the presentation due to time constraints and the addition of a presentation in the Day 2 agenda.



4 Part C: BREA Priority Areas Research Projects

4.1 *Biological Information to Inform Oil Spill Response*

4.1.1 **Biological Data Needed for Net Environmental Benefit Analysis for Dispersants and In-situ Burning in Spill Response in the Beaufort Sea**

Ken Trudel, SL Ross Environmental Research Ltd. provided a presentation on *Species Oil Spill Vulnerability Profiles for Net Environmental Benefit Analysis (NEBA) in the Beaufort Sea*. He described the project objectives, the study area, background and approach. A number of Valued Ecosystem Components (VECs), and related information needs for an oil spill assessment and NEBA were identified. An example NEBA scenario was described, and some ‘next steps’ suggested.

Several questions followed:

- John Korec asked for confirmation that the NEBA would be done to decide which spill countermeasure to use for a specific event. Ken Trudel responded that the NEBA would systematically identify the pros and cons of each, to assist in decisions about which combination of countermeasures should be used.
- Richard Gordon (Inuvik HTC) noted that the Community Conservation Plans (CCPs) can inform the NEBA, and in turn scientific information can inform the CCPs, which are being updated. Ken Trudel noted that the CCPs were the best source of information for the NEBA exercise.
- Lisa Loseto (Department of Fisheries and Oceans, DFO) asked if the indirect effects of the spill and countermeasures are considered as part of the NEBA. Ken Trudel responded that they were not; the NEBA only looks at primary impacts.
- Darrel Nasogaluak (Tuktoyaktuk HTC) stated that there are many variables that affect actual conditions in the field – e.g., changing winds, ice, from year to year. Ken Trudel observed that for this reason, it is important for the communities to review the model – for those who live here to correct any limitations. The model will need to be reviewed and updated.

4.2 Community Priorities

4.2.1 Regional Coastal Monitoring in the Inuvialuit Settlement Region: Ecosystem Indicators



Lisa Loseto and Jasmine Brewster (Department of Fisheries and Oceans) presented the results of a project examining ecosystem indicators for regional coastal monitoring in the ISR.

Questions and comments are summarized below:

- Billy Storr (Aklavik HTC) thanked them for an interesting and understandable presentation. The important role of the communities and the elders in the sampling program was noted.
- Annie Goose (Ulukhaktok Elders Committee) agreed, thanking Lisa and Jasmine for the presentation and the work. She noted that Inuvialuit are visual people, and seeing this work on the screen is beautiful.
- Eddie Okheena (Ulukhaktok HTC) observed that he has observed the climate changing in the time since he was a child. The land-fast ice used to be 5 to 6 feet thick; in the last 10-15 years it has barely reached 3 feet. We used to travel to summer camp in July; now the ice is gone in early June. This summer, have seen little critters in the ocean that have not been seen before – 1000s of them. As a child, doing fish nets in the weather, my hands would get cold – but now I can do them without getting cold.
- Joshua Oliktoak (Ulukhaktok) asked if the mercury levels in beluga – cooked or not - affect those who eat it? Lisa Loseto responded that the beluga samples are analyzed raw. The comment from health authorities is that they are good to eat. There is a project by a student working in

Tuktoyaktuk to look at how cooking affects contaminants and other nutritional aspects of beluga. In the Beluga Bulletin there is an update on that.

4.3 Baseline Fish Information

4.3.1 Offshore Marine Fishes Project



Figure 1: 2014 F/V Frosti

The findings of a marine fishing program that integrates knowledge of the offshore Beaufort Sea fishes were provided by Andy Majewski (Department of Fisheries and Oceans) on behalf of Jim Reist and other project collaborators.

Questions and comments for both fish presentations are summarized below.

4.3.2 Active Acoustic Mapping of Fish

A presentation on active acoustics mapping of fish and the distribution of Arctic cod in the Canadian Beaufort Sea was provided by Andy Majewski (DFO) on behalf of Maxime Geoffroy (ArcticNet). Questions and comments for both fish presentations are summarized below.

- Eddie Okheena (Ulukhaktok HTC) asked about the difference between hydroacoustics and active acoustics. Is it possible that this work is scaring belugas in our area? Andy Majewski responded that there were rare encounters with beluga and they were not able to observe their reaction. With active acoustics the sound wave is directly under the vessel.
- Ernest Pokiak (Wildlife Management Advisory Council – North Slope) asked about which species of fish might be most affected by dispersants, based on their location in the water column. Andy noted that 60 of the 68 species live on the bottom, and in general are less mobile than the fish in upper waters; this may make them vulnerable to localized chemical use. Additional work is needed to understand this, especially as new species may be coming in. Funding is not secured for addressing the gaps. Ken Trudel (SL Ross) added that traditional use of dispersants is to apply them at the surface. This allows the oil on the surface to degrade and dilute. It's only a tiny fraction that ultimately gets sedimented on the seabed. It mainly gets dispersed into the water column.
- The persistence of dispersants has been in the news recently.
- Vic Gillman (FJMC) observed that in 2006/7 the communities expressed the need to better understand what is in the offshore. At the time we couldn't answer those questions or concerns. I am pleased with the amount of information we have now. We can now address some of the

concerns and questions expressed in the Beaufort Sea Framework, which identifies six areas of concern. The FJMC will work to identify funding sources for needed future work too.

- Darrel Nasogaluak (Tuktoyaktuk HTC) asked re: toxicity of dispersants vs. toxicity of oil itself - where does the info come from that says that the oil is less toxic once it's dispersed? Ken Trudel responded that oil is a mixture of hydrocarbons, some more toxic than others. When oil is spilled, it is the more toxic components that do the most damage. When dispersants are used, the oil is moved into the water column. Those more toxic components, e.g., PAHs, are more quickly degraded and eliminated. The more persistent, heavier components of oil are less toxic. There are studies that indicate this. Dispersed oil is less impactful. The dispersants degrade reasonably quickly. Dispersants are similar in toxicity to oil, and degrade relatively quickly. Darrel stated that every time we talk about dispersants we are told to 'not worry about it'.
- Richard Gordon (Inuvik HTC) – From an Inuvialuit perspective, the offshore is a new area to learn about. If those areas are disturbed, how does that affect the food chain for those species we rely on in the near-shore? Will noise from development affect fish movement and the food chain? Arctic cod have many habitats but the slope is important. Andy Majewski noted that Arctic cod are an important food source for so many animals. Any change to Arctic cod may lead to some significant changes to the food web. Arctic cod are found in many habitats. If they were driven out of a habitat, how would that affect the Arctic cod population on a whole?
- Richard Gordon stated that the Inuvialuit go out to whaling and fishing camps on the coast. Inuvialuit knowledge of the deep offshore is limited, so they rely on scientific information. Need to understand year-to-year variability. We have to depend on the scientific community to inform us about the offshore. It is important that the scientific community communicates with us on this so we can make the right decisions to help us protect our way of life. Andy responded that to answer those questions it is important to understand the variability of those fishes. We need further studies in the variability in the cod over a longer time scale. Richard asked how the NEB would deal with this gap. Andy noted that any regulatory assessment would have to recognize the slope habitats as important habitat for cod. As for the long-term importance of it, we do not have those answers yet.
- Sharan Green (Sachs Harbour HTC) asked if ice arthropods are worms. Andy clarified that they are plankton in the water column. Sharan asked if there been research on worms in the water/benthic zone and climate change; Andy responded in the affirmative, that there are studies looking at worms. Sharan noted people are seeing more worms, and asked if that is the result of the warming of water? Andy noted that may be the case.
- Billy Archie (FJMC) stated that the community voice is still not getting to the scientific community. We need community capacity building. There needs to be a mechanism and funding for community monitoring to be better implemented. Andy asked if this was in terms of these projects specifically or scientific work in general? Billy responded that a few years ago the community noticed that there were warmer waters. We need to sit down and share local observations and learn together.
- Earl Esau (Sachs Harbour) stated we are noticing changes. You are saying that species like Arctic cod are going to be impacted by new fish, killer whales, and different birds. Your studies will have to broaden to consider other species that are coming in. Andy responded that the main purpose of this work is to establish a baseline understanding of where the system is at now. Then we can look at how it's changing. It is tricky when things are changing.
- Doug Chipczak (Kavik-Stantec) asked about the 2014 absence of Arctic cod – were you able to take measurements of upwellings in those areas? Weather pattern changes? Other possible drivers that could explain that? Andy responded that right now we have our hands full dealing

with the fish data. We do take oceanographic data while out at sea and can access other data. We are also now looking at the age at length distribution for the years we have. We notice differences in the distribution of the size of cod in 2013. There might be something that happened in 2013 in the cod population survival rates that might have impacted the 2014 population. Is it recruitment or distribution?

- Andrea Niemi (DFO) stated that the rest of the ecosystem was different too. In 2014 there was lots of phytoplankton/zooplankton blooms. There was a shift in the ecosystem and production was different. Adult cod decreased but total cod increased. Age structure was different.
- Charles Pokiak (Wildlife Management Advisory Council – Northwest Territories) noted that the study is saying there was no cod out there in 2014. I hunt beluga whale and we noticed that the belugas were not as fat as in other years. We used to see 4-5 inches and we saw only 2-3 inches of fat. They were also faster.

4.4 Sea Ice Types and Extreme Ice Features

4.4.1 Distribution and Thickness of Different Sea Ice Types and Extreme Ice Features in the Beaufort Sea

Christian Haas (York University) presented on the *Thickness of Sea Ice Types and Extreme Ice Features in the Beaufort Sea*. Questions and comments for the two ice projects presented by Christian are summarized at the end of section 4.4.2.

4.4.2 Quantifying Sea Ice Dynamics in the Beaufort Sea

The presentation on *Changes in Sea Ice Motion and Exchange in the Beaufort Sea: 1997-2012* was provided by Christian Haas on behalf of Chris Derksen (Environment Canada).

Questions and comments for the two ice projects presented by Christian are summarized below.

- Jim Elias (Tuktoyaktuk HTC) noted that all this work is on a small scale. Things are happening on a global scale. The Russians are going into the North Pole in their icebreaker and breaking up ice. Do you consider things like that? *Christian* responded that this specific project is BREA-focused, but my other research looks at Ellesmere Island to North Pole. It shows that the ice there is thicker than Beaufort Sea. We've seen that the thickness as reduces almost a meter there too from 4 m to 3m. I used to work on a German icebreaker going to the North Pole. We see ice thickness reduced there too.
- Jim Elias asked if reduced ice thickness is the result of ice breakers. *Christian* noted that one of the strategies for industry is to perform ice management during drilling. That would change the albedo/reflectivity of the ice and produce local melting. But as the ice drifts it really doesn't make a difference. There isn't much traffic in the North Pole and traffic mainly occurs when the ice has gone away.
- Billy Archie (FJMC) asked if there is the capacity to know how ice islands are out there. *Christian* responded that we've surveyed only 3 or 4 of them, about 30 m thick. We don't know much about them individually. It is quite an effort. We need closely spaced RADARSAT images and an

expert tracking them to better understand their movement. If the ice islands were in a lease area they would present a hazard for drilling operations. We could go up to Ellesmere Island and drop a GPS buoy on these ice islands as they calve off to track them, if we had money. Industry would need to monitor for multi-year ice and extreme ice features upstream, which we cannot do due to lack of funds. They need this information to decide if or when to abandon drilling as a result of ice movement.

- Richard Gordon (Inuvik HTC) asked if the buoys float once the ice melts. Christian noted that a buoy sits on the ice and floats with it. We want it to sink once the ice melts so we know when there is no ice. Most buoys sink.
- Richard asked if the gyre loses momentum due to less ice. We need to know more about these currents to better understand influence on potential hazards. Christian responded that there are oceanographic studies of water flows/the gyre, and oil spill behavior on ice vs. water. The gyre is still there even when there is no ice. Oil would move differently if there is ice versus when there isn't.

4.4.3 CanICE – A Sea Ice Information Database and Web-based Portal

Gabrielle Alix (University of Waterloo) provided an overview of the CanICE Project.

- Richard Gordon (Inuvik HTC) stated that he knows it is early in the stages of making this accessible to the public, but he did try to access it and found it complicated, not very user-friendly. Gabrielle responded that they really want this sort of feedback, and are aware that it is more of a scientific research tool. We are trying to adapt it for community use. We have some user surveys going out next summer, and would like them filled out by different types of users.
- Andy Majewski (DFO) added that Julie Friddell took the feedback about the cameras that was suggested at the 2013 forum very seriously, and tried to implement it.
- There are a number of variables that influence ice thickness e.g., weather, events (e.g. earthquakes), wind direction. Gabrielle responded that the charts were done by the Canadian Ice Service and created by satellite imagery. They are observations, and may be analyzed by others. There are tools created to help collate useful charts for a certain time and space.
- Charles Pokiak (Wildlife Management Advisory Council – Northwest Territories) stated that our elders go out to hunt polar bear. There's lots of east wind now. The ice moves out. You can travel quite a ways out and there's no land fast ice. You can't go too far out due to the east wind. When there's lots of open water, you don't waste your time out there. The last 20 years with climate change that has affected how far out you can go. Once they see landfast ice then they're safe. We pass that information to each other through word of mouth.
- Billy Storr (Aklavik HTC) asked if there is corresponding air temperature data that can be linked to all the ice data from years past? Gabrielle responded that this project looks only at ice charts. I don't know if anyone has/is looking at air or water temperature and ice.

4.4.4 Seasonal Forecasting of Ocean Ice Conditions in the Beaufort Sea

Gregory Flato (Environment Canada) presented *Forecasting Ocean and Ice Conditions for the Beaufort Sea Region from One to Twelve Months in Advance* on behalf of the Canadian Centre for Climate Modelling and Analysis.

Billy Storr (Aklavik HTC) asked re: wind speeds –is there any way to extrapolate how strong the wind would be if there was no ice? Would there be tornados or hurricanes? How much stronger are these winds going to get? Gregory responded that the figure in the presentation showed a 10-15% increase in average wind speed at the prediction for the end of the century. The summertime sea ice has been predicted to near zero at that time. This doesn't seem to be associated with changes in extreme or intense individual storm events. There are not the same conditions here as in the tropics that result in tornadoes/hurricanes.

4.4.5 Radarsat Mapping of Extreme Ice Features in the Southern Beaufort Sea

An Integrated Sea Ice Project for BREA: Detection, Motion and RADARSAT Mapping of Extreme Ice Features in the Southern Beaufort Sea was presented by Greg McCullough (University of Manitoba).

- Billy Storr (Aklavik HTC) stated that this presentation goes to show that as we do more research, we are finding that we need to know more.
- Darrel Nasogaluak (Tuktoyaktuk HTC) stated that this was a good presentation - it may help us understand where dispersed oil might go vs. oil trapped in ice. It will move differently depending on where it is in the water column as the flows are very different at 50m+ depths.
- Danny C. Gordon (Inuvik HTC) stated that in my life I have witnessed 2 occurrences. We were snow machining near Herschel Island in April. The current picked up all of a sudden and the ice cracked. There was an east current going west at 12 miles an hour. We moved out of there quickly. In another incident near Kaktovik, Alaska in July, we were out on the ice in camp. Very nice weather and then ice next to us started to move. My dad said that he knew about a family that was lost due to ice piling up over the tent. The ice started moving, with no wind. It continued to move up the bank onto the gravel and started piling up. I don't think you can stop that ice. If the wind and current worked together, it would be even more violent. The ice and water can move independent of the wind. Greg responded that he certainly agrees with that. The motions we noticed with our beacons, ice moves along with the wind and then moves in a completely different direction due to the gyres, independent of wind.

4.5 Coupled Ocean-Ice-Atmosphere Observations, Modelling and Forecasting

4.5.1 Forecasting Extreme Weather and Ocean Conditions in the Beaufort Sea

Forecasting Extreme Weather and Ocean Conditions in the Beaufort Sea was presented by Simon Higginson (DFO).

Questions and comments for the two coupled ocean-ice-atmosphere projects are summarized below.

4.5.2 Southern and Northeastern Beaufort Sea Marine Observatories

Alexandre Forest (Golder Associates) presented *Southeastern and Northeastern Beaufort Sea Marine Observatories*.

Questions and comments for the two coupled ocean-ice-atmosphere projects are summarized here:

- Billy Archie (FJMC) asked if the scientific community know about the big salt kill in 1999 in the Delta. I worked with a seismic company in 2006 and we had to drive over 4 feet of overflow. Might have been connected to the tsunami on the other side of the world? Alexandre stated that he personally was not aware of the specific salt kill event.
- There could be impacts on the ice and all-weather road at Tuk.
- The upwelling in the delta is a regular phenomenon; I see here the need to do some written publications/record of these events. All together they can make a good dataset.



4.6 Offshore Geohazards and Coastal Processes

4.6.1 Regional Assessment of Deep Water Seabed Geohazards for Oil Spill Prevention

Steve Blasco (Geological Survey of Canada/Natural Resources Canada) presented a *Regional Assessment of Deep Water Seabed Geohazards for Oil Spill Prevention Research – Canadian Beaufort Sea*. The questions and comments for the Blasco and Whalen presentations are summarized in section 4.6.2.

4.6.2 Regional Synthesis of Coastal Geoscience

Dustin Whalen (Natural Resources Canada) did a presentation on *Regional Synthesis of Coastal Geoscience* for the Beaufort Sea.

- Richard Gordon (Inuvik HTC) asked how do we respond to oil spills in an eroded coastline environment? Does coastal erosion speed up the process? Dustin responded that a spill event could increase melting/erosion. An oil spill will affect the coast whether it is eroded or not. I am hoping this data will help inform oil spill response options. Knowing what type of coast will help decide which response technique should be used.
- Ernest Pokiak (Wildlife Management Advisory Council – North Slope) asked how much time it would take for Tuktoyaktuk Island to erode completely. This will affect Tuk's inner harbour. Dustin noted that the island is made of ice and frozen glacial till. There is about 80m left at the top, and at 2m/year of erosion, that would suggest +/-40 years. But increased temperatures and wave action that might accelerate erosion. I agree that losing the island would lead to other impacts. We also need to look at where that sediment is going to. Movement of sediment may impact local harvesting.
- McKinley Bay was dredged in the past; that area is now back-filled by 1.5 m of deposited material from natural drifting processes.
- Danny C. Gordon (Wildlife Management Advisory Council, – North Slope) - I had to move our camp 3 times in the last 12 years. We lost about 200 feet. You showed a photo of Cape Point. There used to be a harbor there 30 years ago. We used to go there to go fishing for char. That harbor was deep enough to go in with schooners. Flat ice came in and completely blocked it. There is no harbor there now. The floods happen; we live with it and go on.
- Richard Gordon (Inuvik HTC) - Would all those existing harbours (Pauline Cove, McKinley Bay, Wise Bay etc) used for staging, are those harbours filling up due to the coastal erosion? How might it affect industrial development, and vice versa? Dustin responded that we're losing sand from the top of the sand spit and moving into McKinley Bay where the big pit was dredged. The process of sediment dynamics is not just removal/erosion but also of deposition. It flows to the deepest spot.
- Joshua Oliktoak (Ulukhaktok) - Is there a link to permafrost melt? Dustin noted there is an important relationship. Erosion is the result of wind and waves. You also have a shoreline that is melting because it is filled with ice/permafrost.
- Renie Arey (Aklavik HTC) - I worked with a crew in the past with elders telling stories about the coast (1990's). We went along the coast with the elders and as we were flying they noticed many rivers that are gone. We can share stories from the elders about coastal erosion from the 1930s to 1990s.
- Steve Blasco asked if anyone know what year the Hudson Bay post closed in Tuktoyaktuk? Was it in the 30's? No one at the Forum knew.

5 Part D: BREA Results and Future Direction

5.1 BREA Evaluation Overview

Sophie Vallée (Aboriginal Affairs and Northern Development) provided an overview presentation of the recently completed BREA Evaluation. The evaluation considered five aspects: success in achieving objectives, governance, engagement, communications, and achievement of outcomes. The methodology included interviews and a document review.

5.2 Panel One – BREA Results: Successes, Challenges and Gaps

During Panel One, panel members responded to three questions:

1. What have been the most significant successes and challenges of the BREA Research Program, and why?
2. How has /may the results of the BREA Research Program inform the work and decision-making in your organization?
3. Are there significant knowledge gaps remaining, and if so, what are they? How are/might those gaps be addressed?

Panel members were:

- Jon Pierce, Environmental Impact Review Board (EIRB)
- Bharat Dixit, National Energy Board (NEB)
- Al Kennedy, Imperial Oil Limited
- Frank Pokiak, Inuvialuit Game Council (IGC)
- Daniel VanVliet, Aboriginal Affairs and Northern Development Canada (AANDC)

The panel discussions and subsequent comments and questions from Forum participants are summarized below.

5.2.1 Q. 1 Successes and Challenges

Jon Pierce (EIRB)

- Successes: Very impressed with the research work. Information management, socio-economic indicators, fish research, oil spill training course, ice management, sea bed research – there were large knowledge gaps and these research programs helped fill these gaps.
- Challenges/gaps – Cumulative effects, and factoring climate change in decision making. These are areas that are difficult to deal with in general and more work is needed to inform environmental assessment.
- The Waste Management Working Group should continue its work.

Bharat Dixit (NEB)

- The preceding presentation on the BREA evaluation addressed this.
- 4 main areas of success:
 - Inclusive model where most affected parties have been involved;
 - Additional baseline information that has been gathered;

- Accessibility of information that has been collected;
- Important foundational work in spills management and getting communities ready for a possible spill.

Al Kennedy (Imperial Oil Limited)

- We've spent more than 100 years exploring, developing and producing oil products in the North. Norman Wells, Mackenzie Delta 1960-1980's, Beaufort Sea, Mackenzie Gas Project approval process. Current work in deep offshore.
- Successes: Responsiveness of BREA to identified needs; the advancement of many tools for sharing data; the commitment from government. We saw for the first time the leveraging of funding - that helped.
- Challenges: Governance and overall mechanism of the process seemed onerous to us; our industry is cyclical and that has affected our participation during BREA. Access to information was a challenge for us. How do we exchange information between governments, researchers and industry?

Daniel VanVliet (AANDC)

- Successes:
 - BREA did a lot of work with a small group of people. It was a different approach. More holistic and collaborative.
 - Research – the lead role was assigned to the group that made most sense e.g., researchers, industry, government, Inuvialuit.
 - Timing of BREA allowed for building upon existing programs (e.g. International Polar Year)
 - Leveraging, e.g., sharing time on ships, matching contributions.
 - Opened up dialogue/government departments worked together.
 - Deliberate effort at sharing of information.
- Challenges – Limited time to gather data in field due to short field season.
- Gaps – Many different avenues of research that needed to happen; for example, spill response and cumulative effects need further work.

Frank Pokiak (IGC)

- BREA was a good start to addressing some of the information needs, concerns and questions related to potential oil & gas development and impacts in the Beaufort Sea. Key successes include:
 - Offshore Marine Fishes Project.
 - The beluga monitoring work - this project also showcases the benefits of working with the community in a meaningful way on an ongoing basis.
 - The ice science presentations show that some good ice movement data has been collected but only for a few years.
 - The offshore polar bear study.
 - Oil spill response training curriculum has been developed.
- Challenges:
 - Longer-term data sets – biological, physical environments.
 - DFO enforcement capacity in the Inuvialuit Settlement Region.
 - Improved predictive capacity in models.

- Investment in delivery of oil spill response course; ongoing building of expertise and capacity in anticipation of increased ship traffic, tourism as well as oil and gas locally, regionally and internationally (e.g. with Alaska).

5.2.2 Q. 2 BREA Informing Work/Decision-Making

Bharat Dixit (NEB)

- There are currently no Beaufort applications before the NEB.
- It is incumbent upon the proponent to show that they can operate safely and respond to emergencies. BREA can provide the research that will help in this.
- The NEB issued filing requirements for offshore Arctic drilling. As new information is provided, we are updating those filing requirements.

Al Kennedy (Imperial Oil Limited)

- Use of information in environmental assessment (e.g., fish study, active acoustics, engineering design – The ice studies are very important to us).
- Operational planning – The coastal sensitivity mapping has direct implications for our planning.

Daniel VanVliet (AANDC)

- BREA provided us with more information in order to make decisions.
- We want to share this information with international community.
- We will also share the information internally – e.g. for the Northern Contaminants Program etc.

5.2.3 Q.3 Knowledge Gaps

Bharat Dixit (NEB)

- Drilling safety while protecting environment – Building on the baseline information in a changing Arctic. Year-to-year variability, as well as long-term changes, need to be addressed.
- Responding effectively – Spill response and contingency plans/logistics. Need robust models, community preparedness.

Al Kennedy (Imperial Oil Limited)

- How changing climates can be dealt with in environmental assessments? How do we predict successfully in a changing climate?
- Continuing studies – the fisheries and ice work needs to be continued.

Frank Pokiak (IGC)

- For many of the baseline studies (e.g., fish, beluga, offshore polar bear, ice), a few years of data is not enough; we need long-term data sets.
- The oil spill response course should be delivered regularly on an ongoing basis. More advanced courses need to be developed. We cannot sit and wait for development to be proposed. Now that we have time, we should be looking to providing this training to all 6 communities. This should involve communities, government and industry. Industry needs to be part of this course and help fund it as they are the potential employers.

5.2.4 Panel One – Roundtable Discussion

Following the Panel One discussion, an enthusiastic roundtable discussion amongst Forum participants followed, as summarized below. In addition to discussions about future research directions, key themes that emerged were the importance of youth involvement (at the Forum and more generally), and the need for integrating and respecting local and traditional knowledge – how can these be strengthened?

- Doug Chipczak (Kavik-Stantec) – I agree that the research was good and filled in some initial gaps, especially in the deeper offshore and for fish. That was exciting to see. There are some challenges. For the field programs that just ended, there is a need for analysis, synthesis and reporting. There needs to be some recognition in funding that the work is more than just collection of information. Another challenge is integrating information, e.g., the physical with the biological data. There is some collaboration, but it would be good to see some more. I'd like to see something towards a strategic environmental assessment – a more integrated, unified assessment.
- Billy Archie (FJMC) – Who is responsible for ship traffic? Transport Canada? Coast Guard? They are not present at this Forum. We see the erosion of government responsibilities in the region. It would be nice to know who is responsible and who to contact if anything happens. Daniel VanVliet (AANDC) noted that they were invited; he will follow-up and let them know that people would like to see those agencies present at regional events. Concerns about the mandate and communications re: emergency response will be conveyed to the federal family. Frank Pokiak added that he was glad to hear that - even with minor spills in the Delta, we could not track down who was responsible for dealing with it. We kept on being passed off to others. John Korec (NEB) acknowledged the frustrations, and stated that he will take this back to the Spills Working Group. Mike Martin with GNWT is responsible for Spills Working Agreement and spill line. As a group we meet twice a year. In total there are 12 organizations that signed onto that agreement. Now we need to get back to the communities to make sure that they are aware that there is one number to contact. This tells me that the process and procedures are not as clear as they should be.
- Richard Gordon (Inuvik HTC) – I am looking at the questions from a community perspective and as a member of a community board. Our responsibilities are to our people. You are responsible for the organization you represent. Your idea of success is different from the community's idea of success. I've listened to the panel and learned about the BREA studies that have been done these last 4 years. Traditional and local knowledge is not being taken seriously. We come to these meetings and voice our concerns. Our livelihood is changing too. Climate change is affecting that. We have to take into account our cultural identity. It's a changing world for us as a culture. Can the scientific community fill those gaps for us? Yes and no. We have to work together to ensure that scientific researchers and government are going to respect our traditional and local knowledge.
- Ernest Pokiak (Wildlife Management Advisory Council – North Slope) – There's been lots of studies on ice conditions, but there are gaps in research about what we have in the ocean. I strongly believe that right now is a good time to seek funding for more research. Baseline studies are good but there needs to be more than that. Some of the areas regarding fish need to be revisited. It's good to do it now that it's quiet. There's been training for equipment

operators etc., but we need Aboriginal people that are in both technical work and management. We need more support from industry, government and leadership in the communities.

- Annie Goose (Ulukhaktok Elders Committee) – I would like to thank the other community members that spoke. When we come to meetings like this, it's good to take in everybody's points and come away with something that is going to direct us to the future for us and for our youth. We know that in our communities, living out in the land is something we enjoyed until we were told to come into the communities, to be part of the communities. Along the way, challenges came. Sealing and trapping and those using the land to make income for their families have decreased. Our country food chain is not what it used to be. We know there are changes in climate, ocean, and environment. Industry so many hundreds of miles away has affected us. Those are the challenges we face. At the same time the researchers tell us about their work and some gaps are still in place. We need those gaps filled. The government agencies that needed to be aren't all here today. There are challenges in wellness, job and housing. Many are not against jobs for our people. But at the same time, country food is impacted. Our traditional way of life does not bring in what it used to. Our elders' knowledge needs to be taken into account. They knew these things were going to happen. We see the changes happening.
- Steve Blasco (Geological Survey of Canada) – To reinforce what Daniel VanVliet said earlier - as a researcher, I think the biggest legacy that BREA has is that we had a major shift in how research happens. The government research model needs to include communities, academia, industry, and northern governments or else we will not be successful.
- Joshua Oliktoak (Ulukhaktok) – Need to continue the work that we started here. In the communities it's getting harder, more expensive to go on the land. Research in the future might be able to help us learn where our wildlife is moving away and why.
- Jim Elias (Tuktoyaktuk HTC) – I agree with Richard. We have lots of researchers from the south coming up. We don't see the traditional knowledge as part of their work. Researchers should be using TK and consulting the communities more.
- Darrel Nasogaluak (Tuktoyaktuk HTC) – One of the successes is the accessibility of the information. I looked at the PDC and it's very user friendly and I appreciate it. In the 70'-80s, there was an oil spill co-op. They were ready to deal with small spills. They were not prepared for a large spill like Macondo. There hasn't been enough research in how oil reacts in our environment. They did some oil spill research in McKinley Bay. We got two answers back. The written document said that they were successful in retrieving the oil. But the guys on the ground said that the success was overstated. I would like to see research done looking at oil spills in ice and see if they can collect it. We hear about dispersants and that whales will avoid the dispersed oil plumes. We don't accept that. There hasn't been enough research on toxicity of oil and dispersed oil in the Arctic.
- Gerald Inglangasuk (FJMC) - Waste management is a big concern. We have industry and government leaving stuff behind. There needs to be a policy that whatever you bring in, you bring out. There's no enforcement up here. Knowledge gaps – I think the fish studies have just started. We need more ice studies.

- Fred Arey (Aklavik Community Corporation) – As a young leader, I play many roles. I see other youth in this audience. I want to let you know that I am very honored to be here and thank the other youth for being here. We are the next generation. We have good mentors to look up to. Just glad to be here today to learn. Can the youth from the ISR who are here at the Forum please stand up? All these youth are our next generation. It's important for them to be active and go to meetings and continue learning.
- Issiac Elanik (Sachs Harbour HTC) –What is the scope of the oil spill response training program? Are we going to be certified? Norm Snow responded that the course will be open to people in all 6 communities. The key is to get student financial assistance, we're bundling it up with other courses so you can get funding. The intent is that it will be a sustainable course that can be expanded as new countermeasures are available. It's intended to be run every year, for people to retake it every 3 years to keep up to date. John Korec (NEB) added that we are trying to get this set up as a certificate course that industry recognizes, that meets the standards outlined by Arctic Council, and have it delivered by Aurora College. Ideally if industry is looking to hire people then this course is the basic training that would be required. Then they can continue with more advanced training as needed or desired. Issiac noted that there needs to be more work on communicating response coordination and the role of communities – more than just training, e.g., clear understanding of key contact people.
- Deon Arey (Aklavik Community Corporation) – I see gaps with organizations not working together. There needs more communication between groups. We have cruise ships coming through our waters and you don't know what's coming off of them from other countries.
- Billy Storr (Aklavik HTC) – My job as a representative is to ensure that our resources are protected. I think prevention is the best method. Education is important to our people. We need to get them educated, but they run into problems getting student financial aid. We want them to get good jobs. Groceries are expensive, and so is going out on the land. We need to protect our resources for our young people.
- Crystal Lennie (Government of the Northwest Territories) – I'm in my last 2 weeks of an interdisciplinary Bachelor degree in business and psychology. Health research is another important area. It's important to build the information dissemination piece into the research, and for researchers to consider the TK of our elders seriously. Universities must recognize the support they get from communities and provide recognition for that community knowledge. Research priorities should focus on community needs.
- Renie Arey (Aklavik HTC) – We learned as children going out on the land with our parents. It's important to have the youth involved in research – in everything. We also need Grade 11-12 students here so they can learn. They should be included in these meetings.
- Michael Green (Paulatuk HTC) – Our elders have concerns about oil spills and how fast they can be responded to. We have lots of ships that go past Darnley Bay. We are so far from the Delta. Climate change is a big concern. There was a base camp in Johnny Green Bay - that whole long point eroded, it was rocks. Now the bay is an island. We see that spring is coming earlier. The ice

melts, it doesn't go on into the summer. We can go boating in June, instead of July. We see a lot of different animals too.

- Billy Archie (FJMC) – I think we have to move on this. We have the young folks with their concerns. Where's the action items on this? We looked at this in the FJMC with Community-Based Monitoring. How do we build capacity in the communities for good paying positions? We have to look within our own Inuvialuit organizations, including IGC and IRC, to address the community needs. We tried this with CBM but there's no money.
- Al Kennedy (Imperial Oil Limited) – I am wondering if there is a possibility for a BREA 2, and if so, to have an outreach program built into it before the research studies are planned. How do we get the research to the schools, communities? Can we have a plan in place even before the research starts? Daniel VanVliet (AANDC) responded that there is no plan for a BREA 2. There are federal departments here at the Forum, and we are listening. The communities are clear about what they're looking for. The idea of outreach to schools and communities is good.
- Frank Pokiak (IGC) – We rely on the HTC's to pick who they want to bring to workshops, and youth can get involved that way. Through the co-management system, we have to get youth involved more. I think it is a good idea to go into the schools and start promoting our land claim. We did go into the schools for some of the BREA tours. Students had some really good comments and questions. Maybe Norm (Snow, Joint Secretariat) should consider that when we go to the communities, that we should also go into the schools to speak. Bring youth into the discussions about research, and future development. Jon Pierce (EIRB) added that the EIRB did have a community tour last year and we went into the schools in all the communities. We're going to visit the communities again in April and go into the schools when we can.
- Annie Goose (Ulukhaktok Elders Committee) – I'm really happy all the comments are coming together and that's how it is in meetings. Everybody gets heard. There's no right way or wrong way of saying what you feel. It warms my heart to see our young people speak up. We need to include our youth. How do we come together so our communities are heard? We want things to happen in a safe manner. That's one of the biggest things. When the Exxon Valdez happened, in our small communities so far away, we felt for those people. The people in charge of transportation need to be here to answer questions. We have to look after ourselves in a good way, in a productive way. It's a struggle for many of us in the communities. We are dealing with housing problems (like mold) and wellness issues. We need to look after ourselves, to be successful. Elder and youth need to communicate. Communication is important. Education is important. There's a huge amount of blocks that we face. Wellness has to be a priority in the communities.
- Andrew Applejohn (GNWT) – How many of the science teams funded through BREA spent time in communities? Did the HTC's see the scientists in the communities, hamlet office, and schools?
- Richard Gordon (Inuvik HTC) – From my own observations, we do have the researchers involved in the FJMC, and DFO is more involved in the communities because they are tied with the communities. For other researchers, we only see their applications. We have questions: why are there so many studies in one area – is there duplication or overlap? In their research applications, it's all about the dollars. They don't have funds to brief the HTC's or CC on what

they're studies are about. Who's making these research priorities? That is a big gap. We are wondering if there is too much research and if it is affecting the ecosystem. How much study do we allow to happen? When we talk about elders it's that generation that we are losing that has that knowledge with the land, they lived it, they speak it. The next generation of elders is not the same. We have adapted with new technologies. I am scared of science over-riding traditional knowledge. The IFA is the only document that carries the elder's guidance, it set our path.

- Ernest Pokiak (Wildlife Management Advisory Council – North Slope) – When there's research happening, proper authorities are contacted including the hamlet and HTC. It costs a lot of money to do research. When there's research on the land or ice, they should have a wildlife monitor as part of the research permit.
- Charles Pokiak (Wildlife Management Advisory Council – Northwest Territories) – I'm really proud of the DFO and FJMC for the beluga research and the long-term data, and putting the community at ease. The researchers that do that work - Lisa, Sonja & company - they go into the communities, the schools and HTCs and show the work that they did. They are there for the whole day or 2 days. The feedback is that the kids are interested. They are always asking what the whales are eating - and now we're learning more about it. Hopefully that study can go on.
- Norm Snow (Joint Secretariat) – It is very gratifying to hear the comments from youth and elders. I'm going to pick up on the comments Frank and Jon made about going out into the communities. We've done that as much as we could in the past. It is very worthwhile and rewarding to see so many of the students and teachers. We should be doing more of that. Re: Al Kennedy's comment - it is a logical extension of BREA to provide this type of outreach, whether this is part of BREA 2 or an extension of BREA 1.
- Frank Pokiak (IGC) – I think I might be jumping to the next panel's topic, but when we started in BSSrPA we talked to the communities to determine what we needed to do to be prepared for oil and gas. We came out with 32 recommendations. It was the IGC and Joint Secretariat that had to prioritize these for BREA. There are a lot of recommendations that still need to be addressed. Through the co-management process we have a responsibility to make decisions about harvesting and activity based on data and research. I know there are concerns about research – e.g., collaring data etc.), but that's the only way we can get the information. I don't think the communities want to see the government take over again. Whatever we harvest, we want to have that for future generations. That's why we do the research. We as communities have to prioritize what research happens. Today there's lots of pressure on caribou and polar bears, and we have to continue research on these species because they are important to us.
- Evan Birchard (Imperial Oil Limited) - Imperial is going back into the communities in April to give an update. We've offered ArcticNet some seats on our charter. We typically try to get into the schools and will again this time around. Wendy is going to briefing the IGC at their March meeting.
- Jim Elias (Tuktoyaktuk HTC) - All our animals are important. We also have species at risk up here. You're focused on cleaning up the oil. What about deterrents to keep animals away from the oil? Al Kennedy (Imperial Oil Limited) responded that yes, that's a good point. There's a part of

the NEBA tool called “Valued Components’. We need to know more about these, including species at risk, before we start a response plan.

- Darrel Nasogaluak (Tuktoyaktuk HTC) –Take caution when using data – we tell researchers that when you go out there, it’s just a snapshot picture of a time period. We live in a world of cycles. When a researcher comes here, they’re just taking a picture of that moment. The beluga studies that have been going on, now there’s research that’s more like a movie versus a slide show.
- Kendra Tingmiak (Inuvialuit Regional Corporation) – I worked on the community-based monitoring program at the Joint Secretariat. I’d like to thank everybody for attending this very informative Forum. I particularly enjoyed learning about the erosion at Kendall Island, as my family has a camp out there. It’s good to know that there are so many individuals so concerned. I got involved in the Natural Resource Technology Program (NRTP) to make sure that we can maintain a traditional culture and sustainable future for me and my son. I look forward to many gatherings with more youth involved.

5.3 Panel Two – Future Directions for Beaufort Region Research

During Panel Two, panel members responded to three questions:

1. What are the most significant factors that are shaping preparation for oil and gas development in the Beaufort Sea following completion of the BREA Research Program?
2. What are your ideas for strengthening the use of research results (BREA and other) in review and decision-making processes in the Beaufort region?
3. How could your organization collaborate with others on future initiatives? Does your organization have ideas or actions that could further contribute to the foundational work of BREA?

Panel members were:

- Jon Pierce, Environmental Impact Review Board
- John Korec, National Energy Board
- Paul Barnes, Canadian Association of Petroleum Producers
- Andrew Applejohn, Government of the Northwest Territories
- Daniel VanVliet, Aboriginal Affairs and Northern Development
- Frank Pokiak, Inuvialuit Game Council

The panel discussions and subsequent comments and questions from Forum participants are summarized below.



5.3.1 Q.1 Factors Shaping Preparation for Oil and Gas

Jon Pierce, Environmental Impact Review Board

- We heard about science and science communication and outreach. In our experience, some organizations are better than others at doing this. Better effort should be made. There needs to be a change of mindset. Instead of community informing research, research should better inform community decision making.
- Oil and ice is an area of research that needs additional work - this would be useful for co-management bodies.
- Another area is shipping - a growing concern as traffic has increased. This is a regional level issue that deserves attention; it does not fit neatly into the regime of co-management institutions.

John Korec, National Energy Board

- Public participation is an important part of the process. We heard northerners have a deep connection to the land and sea, and want to be involved through all stages of the development process. Inuvialuit have a role through the co-management and Canadian Environmental Assessment Act processes.
- Developers have to listen to northerners concerns regarding safety and environmental protection. NEB will be looking for that in applications that come to us.

Paul Barnes, Canadian Association of Petroleum Producers

- We've a partner in BREA since the beginning. We're likely only going to see 1 or 2 exploration projects in the next decade in the Beaufort; even if there is a discovery, it will be another decade or more to development. Globally, only 10% of discoveries go into development. We're also dealing with uncertainty in the oil and gas industry and the commodity prices are low. Exploration funding comes from production. Conoco Phillips and Chevron have stopped work on their projects. Imperial and Exxon Mobil are still looking at exploration. Costs are very high in the offshore, even more so in the Arctic. There is a lack of infrastructure.
- Canada has a very robust regulatory process. The BREA work can help industry put together documents needed for the regulatory process

Andrew Applejohn, Government of the Northwest Territories

- One of the big things we can do is build those key pieces of infrastructure – human and physical.
- In the past, I taught a Pre-Trades course in Aklavik. The students there knew a lot more about oil & gas and environmental studies than I learned from environmental science in school.
- We have to look at is ‘human infrastructure’. People are an asset.
- We still need to work on physical infrastructure such as roads.
- Despite progress on research laboratories, schools, and post-secondary education, we have a ways to go.
- The price of the commodity is a big influence - if the price of oil had doubled, we wouldn’t struggle about how to pay for ‘BREA 2’.
- We have to find a way to turn the data that has been collected into long-term data sets.

Daniel VanVliet, Aboriginal Affairs and Northern Development

- Canada has a northern agenda that looks at economic development and sovereignty. It’s significant not just for AANDC, but many other federal departments. The investments in icebreakers and the Canadian High Arctic Research Station (CHARS) are examples that demonstrate the federal commitment.

Frank Pokiak, IGC

- BREA was envisioned as a 5-year program, but shrunk to 4. It was a good start. It has shown that we need a longer term research program to further address many information gaps that have been identified through the BREA projects and working groups.
- BSStRPA, the predecessor to BREA, called for 5-year research segments - BREA should just be considered the 1st of many 5-year segments.
- We had to prioritize the 32 BSStRPA recommendations at the start of BREA; many of these recommendations have yet to be addressed.
- There is a need for long-term dataset for a number of research topics. In some cases, we still need to address baseline data needs.
- BREA would not have happened if it weren’t for the Macondo incident and the same-season relief well issue at the NEB that resulted in Inuvialuit pushing for BREA.
- We should not be reactive, but proactive in our efforts to be prepared for oil and gas development in the Beaufort Sea. We have time now when there is little off-shore activity to further prepare. Discussions for ‘BREA 2’ haven’t started, but perhaps should begin in a more serious way.

5.3.2 Q.2 Strengthening Use of BREA Results

Jon Pierce, Environmental Impact Review Board

- We heard about science and science communication and outreach. In our experience, some are better than others at doing this. Better effort should be made. There needs to be a change of mindset. Instead of community informing research, research should better inform community decision making.

John Korec, National Energy Board

- The NEB has a role though out the project lifecycle.
- There is a need for industry to use BREA and other research results as per the Arctic drilling requirements.

Paul Barnes, Canadian Association of Petroleum Producers

- The important linkages to communities and sharing of information must continue.
- Information from BREA and other research will be useful in developing applications.
- Need continued communication of BREA results including the synthesis report, and promotion of website.
- Some of the research has already being used in other projects and development of guidelines, e.g. by the Tanker Safety Expert Panel, and in the development and use of predictive tools/models.

Andrew Applejohn, Government of the Northwest Territories

- We need to celebrate those science teams that make it a priority to do community outreach and partnership work. They build it into their work in the front end. Pursuing community-based monitoring is something we ‘must’ do. This is how something like BREA is made relevant to the communities.
- Time and money needs to be spent to disseminate information into communities through schools, community tours, meetings.

Daniel VanVliet, Aboriginal Affairs and Northern Development

- BREA is one of the best research models that has been developed, and could be used elsewhere. It’s a work in progress; there’s been a lot of community involvement. Part of our role is sharing the successful approach used for BREA with the Steering Committee and other federal departments.

Frank Pokiak, IGC

- We are committed to sharing BREA results with communities. Bob Simpson/IRC should be telling leadership what they think are next steps and needs based on the social, cultural and economic work that has been done.
- We need to provide all levels of decision makers and stakeholders with the needed capacity and information to make the right decisions and to be able to respond in a timely manner.

5.3.3 Q. 3 Future Collaboration and Ideas*Jon Pierce, Environmental Impact Review Board*

- We’ve heard from the communities that this is not the end of BREA. I want to discuss the funding issue that both Nellie and Frank have spoken to. When we started BSStRPA and attached that funding to the Mackenzie Gas Project, the timing was right and got the BREA process started. Nellie’s suggestion re: having a ‘proposal ready to go’ is a good one – be opportunistic.
- I think we need to put the ‘Regional Environmental Assessment’ (REA) back into BREA. It became a science funding program, not an REA. People who live here have gone through change and continue to go through change. The Canadian Environmental Assessment Agency has published guidelines for regional environmental assessments that could apply in many regions. In northwestern BC, over the years there has been huge development of oil and gas but it has been incremental. The First Nations are seeing their traditional territory disappearing bit by bit. They can’t get a handle on it or have their concerns heard. Need information to help deal with

change in the communities. Don't look at this as the end of BREA, but as an early stage of data collection and research in the 'REA'.

John Korec, National Energy Board

- The NEB has a focused mandate, and work with regulators around the world. We don't actually fund or do this sort of research, but can participate in programs like BREA and Environmental Research Studies Fund (ESRF). We are part of the Arctic and marine oil spill community, where there is research looking at oil and ice – maybe this could be a future focus for the Beaufort.
- NEB staff is also involved in peer-review of related research.

Paul Barnes, Canadian Association of Petroleum Producers

- We've a partner in BREA since the beginning, and are involved in a number of oil and gas/Arctic /northern forums involving industry collaboration on national and international levels, e.g. ArcticNet., CHARS (has a pan-arctic mandate) that might help for further research.
- The Canadian Arctic Research Development (CARD) Centre in eastern Arctic is looking at similar issues.
- Some of the work being doing by these organizations can build upon BREA and fill the identified gaps.
- It is important to know who is doing what nationally and internationally.

Andrew Applejohn, Government of the Northwest Territories

- In spite of devolution and GNWT's greater role in land management, Canada still has a responsibility in the offshore. Someday GNWT would like to be part of the responsibility. We can bring infrastructure and people to those areas needed.
- GNWT is paying attention for those areas we are responsible for, e.g., education, transportation.
- As part of devolution, GNWT has assumed responsibility for some research activity, e.g., the NWT Cumulative Impact Monitoring Program. That needs to be explored as a way to address identified gaps.
- GNWT's Department of Industry, Tourism and Investment is now involved in the on-shore science portion of ESRF and the Program of Energy Research and Development (PERD).
- CHARS – Canada is making a huge investment in science in the Arctic. Although located in Nunavut, CHARS is mandated to be a national program. You have as much influence as any other northern group on how this program is planned and implemented. This is Canada's next big step in northern science. We have to do everything we can to influence the science program, as well as community and social research.

Daniel VanVliet, Aboriginal Affairs and Northern Development

- We will be advising senior management of BREA / Government of Canada re: BREA results and the advice/ideas provided at the Forum.
- There are a number of opportunities:
 - While the physical CHARS facility is located in Nunavut, the science program is national in scope.
 - Amundsen will be sailing again in summer 2015, and some of that work will build on BREA research.
 - NASA's Arctic-COLORS (Coastal Land Ocean Interactions) science program will be looking at the Western Arctic.
 - The Arctic Boreal Vulnerability Experiment (ABVE)

- As new researchers and ideas come in, we have to make sure the results and technique of BREA are shared.

Frank Pokiak, IGC

- Be assured that the IGC and IRC will continue to discuss and push for research with the various partners, and find funding.
- Representatives from Nunavut were invited to attend this Forum, but got weathered in and were unable to attend.
- A joint exercise/controlled spill could perhaps be planned.

5.3.4 Panel Two – Roundtable Discussion – ‘Where to From Here?’

Following the Panel Two discussion, the roundtable discussion amongst Forum participants continued, as summarized below, with a focus on ideas/actions for building on the work of BREA.

- Bob Simpson (IRC) – One thing I would like to add - put the ‘REA’ (Regional Environmental Assessment) back into BREA. We also need an ‘Inuvialuit Assessment.’ We get stuck into these processes, where a decision is made by somebody else. The Inuvialuit will be looking at any development and making their own assessment. Is there enough info? What are the impacts and benefits, what conditions are needed? Would industry and regulators proceed without Inuvialuit approval? If an oil spill were to happen, it would be devastating on many levels. I’ve been looking at socio-economic aspects. When development was onshore, the Inuvialuit businesses were there and there were economic benefits. As development moves further offshore, there’s less benefits for the communities. It’s a more self-contained operation. The Inuvialuit will be left with the environmental impact/residue, but will have little of the economic benefit. Yes, there are reviews by the NEB, EIRB, but need to ensure that Inuvialuit leadership and citizens agree. We need to make sure the Inuvialuit have all the information needed to be able to be comfortable to make a decision. The community-based monitoring program is slowly starting, needs support, as it underpins resource management. Further work is needed on cumulative effects. What is the threshold of development? What is the pace of development? What can the environment sustain? BREA has not provided the information or tools to answer this. With respect to traditional and local knowledge, we are starting a database, GIS, and an atlas. Regardless of whether there is BREA 2, Inuvialuit will continue their work and participation.
- Steve Blasco (Geological Survey of Canada) – I think we should turn the tables. The economic viability of the north is tied to local energy. Until we have local energy viability we cannot proceed with economic development. Inuvialuit need to develop their own energy supply – oil and gas or alternative - and drive the process, e.g. Ikhil. The IRC needs to put together a team like that for the BSStRPA to look at sources of funds, especially new ones. We know about Horizon 2020 and Canada First funding pots, CHARS. Look at Inuit community links to academia, industry and government.

- Richard Gordon (Inuvik HTC) – We have a number of management plans to guide the HTC's' future decisions. The information from BREA is very technical. How are we going to use the BREA work and develop an off-shore management plan? This is offshore development and most of our concerns are on the coastline. We have to change our way of managing and making decisions at the local level. We have a strong Inuvialuit Final Agreement and management plans to guide us. We are trying to protect traditional values. We need our own trained resource people. How can we reach our people to help them make decisions? We need to get youth involved, develop curriculum, educate and train them to be prepared to make decisions and manage our resources.
- Billy Archie (FJMC) – Have seen the threat of commercial fisheries in recent years. Looking at the data, is this commercially viable? Can BREA research help us understand if this is possible? All we talk about is money. Look at Exxon Mobil and what they did in Prince Williams Sound, where there are still ongoing court cases. Will we allow that here? What is a vibrant and sustainable community? Look back to the 80s we still had trapping but also wealth. Everyone was working and happy. We have outsiders influencing our lives, like the International Whaling Commission trying to ban commercial whaling.
- Steve Baryluk (Joint Secretariat) – Re CHARS as a potential venue for funding – I have trepidation about that. One of the panelists said that Inuvialuit have involvement in CHARS, but we haven't had much to date, similar to other Inuit across the north. We're still trying to figure out what our relationship with CHARS is to be. CHARS is pan-arctic, covering more than half this country. While there is a lot of money, it is being spread pretty thin over many research topics. BREA was focused specifically on oil and gas development in the Beaufort and Inuvialuit interests. There's been good work done, e.g., by Steve Blasco, Dustin Whalen, Andy Majewsky, Lisa Loseto, and people can relate to it. There was a lot of involvement of communities in BSStRPA. It was understood that another vehicle was needed to carry out the recommendations. One of the key things was that there were some champions in the government like Jon Pierce and Ruth McKechnie that believed in the BREA concept and coordinated the effort in the federal family. The final work for BREA was internal within the federal government. We don't have that champion or team of champions in the departments to work on the proposal for what needs to happen next within the federal government. We need to prepare a proposal that is coordinated and focused, ready to take advantage of opportunities, rather than trying to chase funding through other broad arctic programs like CHARS. In my view, this should be led by the federal family and funded by Treasury Board.
- Lisa Loseto (DFO) –Re: the federal family – the 'science' part is here at the Forum, but not the 'leadership'. The federal researchers are eager to continue the work – there are questions to be answered and analysis to be done. When this all began, there was a large governance structure that included the ADMs. Those are the federal family members that should be championing this. Sophie Vallée (Aboriginal Affairs and Northern Development Canada) responded that there will be at least one more meeting of each of the various BREA management groups, e.g., the National Executive Committee, the Steering Committee, and ADM Executive Committee (federal departments). Lisa stated that the scientists can draft up a plan, but we need the ADMs to support it. Steve Blasco added that most of the folks here are the researchers, and we need to push this up amongst the policy levels – IRC and IGC can push, but there still needs to be a 'champion' individual or department to help take the lead and help coordinate this. The fiscal

situation is tight, but we need to be prepared for the window of opportunity to address the outstanding BSStRPA recommendations.

- Bob Simpson (IRC) – I’ve observed that going through the CHARS process, that there’s no invitation to look at resource development in the ISR – there are other themes. AANDC should investigate this.
- Vic Gillman (FJMC) – What is it that you’re going to ask for? Maybe ‘Son of BREA’ is not what we should be looking at. Maybe it is something more pan-Arctic or related to shipping. I appreciated the number of reports/presentations that talked about the missing pieces at the community level. We have to seriously look at building community capacity and knowledge that contributes to decision-making. The community-based monitoring program that has been initiated could be a key to that.
- Nellie Cournoyea (Inuvialuit Regional Corporation) – I am Vice Chair of the Canadian Polar Commission – we were given the task to clean it up – then it was announced that it was going to be part of CHARS. We are looking for a highly competent person to lead that. You now have another institution that needs feeding over the long term. What will be left for us? We need to get a package together to put it on the table when we have a chance. Tie it all together. Government needs to know what we want them to do. We know we have traditional knowledge that is just as important as science. It does not have to be a big process. The scientists have been using it forever. We have to tie up the BREA report and put forth recommendations.
- Doug Chipczak (Kavik-Stantec) – CHARS has some potential in helping out in the Beaufort Region, but they have to be aware of the Beaufort priorities. I’d like to see BREA and other information collected to develop a strategic regional environment assessment. Bob Simpson referenced the TK Database – not sure if he’s referring to the harvest study database? Not sure if there is a total TK database, it would be very useful to refer to and build upon. Jen Lam (Joint Secretariat) clarified that the TK database that was referenced is a meta-database being developed through the Beaufort Sea Partnership.
- Jasmine Brewster (DFO) – I got into science pretty early and came into contact with scientists very early through the Aurora Research Institute and the Dept. of Environment and Natural Resources. It’s important to have this information go through the schools. We need more researchers from the north; it is happening, but need more.
- Kate Snow (DFO) – I want to encourage the youth age 18-30 to be educated, to do your own research, go to school, go to HTC meetings, public meetings with researchers. You’ll find mentors through your family, community or work, and that has been the main reason for success for me. I worked at the Aurora Research Institute and met a lot of researchers. Lisa Loseto mentored me through the beluga project. Now I’m working at DFO. The work is enjoyable and you can learn much from others of all ages.
- Billy Storr (Aklavik HTC) - I graduated from the NRTP program when I was 50 years old. I am glad there are others that went through that program at a younger age. I’ve been on the IGC for 12 years and have sat in a lot of meetings. I am happy how BREA turned out; it shows us our next

steps. People put their heads together and figure out what we need to do, and then we look for funding. We're lucky we have people to help us at the IRC and JS. At IGC we just give direction for things to happen and we don't have to worry about how it happens, it just happens. Education and training is a big need. In the ISR, we pave the way for our own destiny.

- Annie Goose (Ulukhaktok Elders Committee) – We had many things happen in our past; we moved on and carried on. The time that people spent has led us to this point. We have a real good land claim; we took risks back in the days of COPE. The programs that we have were met with really good success. When we want to do something, there are barriers. In the last 2 days, we heard a lot. All in all, everybody put their effort together. As time goes by, our communities are looking for work. There are never enough jobs. We've got to make this choice to move ahead. It's important for the youth. We have done so before and will now.
- Joshua Oliktoak (Ulukhaktok) - I want to thank the people from the communities and the people that came from outside. We couldn't do this without you guys. It was such a uniting thing. I want to comment on youth. Each of our communities has youth councils. Maybe we can have them involved in the future.
- Dustin Whalen (Natural Resources Canada) – in terms of exploring options for regional studies, cumulative effects is one gap. Shipping is or could be addressed in a number of forums. Oil spill preparedness and response – Norm and others have spoken about the next steps. We all need to take back what we have heard; the meeting has been very articulate about the issues and needs. The BSStRPA recommendations need to be reviewed to identify remaining gaps. The BREA synthesis report will be published in the spring.
- Nellie Cournoyea (Inuvialuit Regional Corporation) – in addition to my earlier comments, I wanted to raise that research is an educational process, that we have been giving free education from Inuvialuit experts – use these skills to move research forward. “Don't talk, just do it”.
- Frank Pokiak (IGC) – we will push hard to continue this work. Companies may come and go, but Inuvialuit will always be here. We rely on the ocean. I must emphasize the importance of youth – I ask that you don't be shy. Talk about what you know. Inuvialuit want work, but to be able to live on the land. It was nice to see most people speak at this meeting – thanks to you all.

6 Wrapping Up BREA – Next Steps

Daniel VanVliet (AANDC) provided brief remarks at the close of the Forum. He noted that participants had provided many insights and suggestions regarding the way forward post-BREA. Cumulative effects and shipping were among the topic areas that participants came back to over the course of the three days, as was oil spill preparedness and the implementation of the response training curriculum in the communities. AANDC participants will report back to our department and to others in the Government of Canada on the Forum and what we have heard. The remaining recommendations from the BSStRPA can also inform the next steps. The BREA Synthesis Report will be issued in the spring of 2015. Sincere thanks were expressed to all participants for their time and thoughtful contributions to the Forum and to the BREA program overall.

A closing prayer was given by Renie Arey (Aklavik).



APPENDIX A: FORUM AGENDA

Beaufort Regional Environmental Assessment 2015 Research Results Forum

*Taking Stock and Looking to the Future:
Involving Communities and Informing Decision -Making*

*February 24-26, 2015
Midnight Sun Recreational Complex, Inuvik, NWT*

OBJECTIVES AND AGENDA

FORUM OBJECTIVES

The *BREA 2015 Research Results Forum* will bring together Inuvialuit organizations and communities, regulators, governments, industry and academia to achieve the following objectives:

7. To present and discuss the key results and findings from the four-year (2011-2015) \$21.8 million *BREA Research Program*. A cross section of the research results and findings in defined topic areas will be presented. Other research projects will be represented through displays (e.g., posters; information panels; maps; models) and accessible via interactive laptop computers.
8. To present and discuss the work and outcomes of the six BREA Working Groups.
9. To present an overview and directly relevant findings from the *BREA 2011-2015 Research Program* evaluation.
10. Hold a panel discussion on BREA Results - Successes, Challenges and Gaps. This will include discussion of the current contribution and future potential contribution to knowledge, various review and decision-making processes.
11. Hold a panel discussion on Future Directions for Beaufort Region Research. This will include consideration of (a) the current and emerging factors that are shaping both Beaufort region and Arctic research initiatives; and, (b) ways to strengthen the applied use of the research results in various review and decision-making processes.
12. Present and discuss the next steps to bring forward the Forum outcomes and include them into a *Final Synthesis Report* on the BREA Research Program.





Beaufort Regional Environmental Assessment: 2015 Research Results Forum <i>Taking Stock and Looking to the Future: Involving Communities and Informing Decision –Making</i> February 24-26, 2015 <i>Midnight Sun Recreational Complex, Inuvik, NWT</i> WORKING AGENDA: DAY 1 – TUESDAY, FEBRUARY 24, 2015		
2:30 – 3:15 p.m.	<ul style="list-style-type: none"> Welcome and Opening Remarks Opening Prayer 	Annie Goose, Ulukhaktok
	<ul style="list-style-type: none"> Opening Remarks 	Frank Pokiak, Inuvialuit Game Council, Nellie Cournoyea, Inuvialuit Regional Corporation
	<ul style="list-style-type: none"> Forum Objectives, Agenda and Outcomes Forum Resource Binder/Materials Round Table Introductions <p>● <i>Roundtable comments and questions</i></p>	Facilitator All
PART A: BREA In Context		
3:15 – 3:35 p.m.	Agenda Item #A -1: BREA in Context <ul style="list-style-type: none"> Presentation: BREA overview, context and chronology <p>● <i>Roundtable comments and questions</i></p>	Daniel VanVliet on behalf of Catherine Conrad, AANDC All
3:35 – 3:50 p.m.	<i>Refreshment Break</i>	
PART B: BREA Working Groups		
3:50– 4:15 p.m.	Agenda Item #B-1: BREA Working Group: Climate Change <ul style="list-style-type: none"> Presentation: Climate Change <p>● <i>Roundtable comments and questions</i></p>	Daniel VanVliet, AANDC All
4:15 – 4:45 p.m.	Agenda Item #B-2: BREA Working Group: Information Management <ul style="list-style-type: none"> Presentation: Information Management Presentation: Polar Data Catalogue <p>● <i>Roundtable comments and questions</i></p>	Sophie Vallée AANDC, Gabrielle Alix, PDC All
4:45 – 5:10 p.m.	Agenda Item #B-3: BREA Working Group: Cumulative Effects <ul style="list-style-type: none"> Presentation: Cumulative Effects <p>● <i>Roundtable comments and questions</i></p>	Chris Milley, AMEC All
5:10 – 5:40 p.m.	Agenda Item #B-4: BREA Working Group: Social, Cultural & Economic Indicators <ul style="list-style-type: none"> Presentation: Social, Cultural and Economic Indicators <p>● <i>Roundtable comments and questions</i></p>	Bob Simpson, IRC All


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5:40 – 5:45 p.m.	Day 1 Wrap Up <ul style="list-style-type: none"> Facilitators observations on Day 1 and outline for Day 2 Roundtable comments and questions 	Facilitator All

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8:15 – 8:30 a.m.	Refreshments	
8:30 – 8:40 a.m.	Introduction to Day 2 <ul style="list-style-type: none"> Review Day 2 agenda and process Roundtable comments and questions 	Facilitator All
	PART B: BREA Working Groups (Continued...)	
8:40 – 9:35 a.m.	Agenda Item #B-5: BREA Working Group: Oil Spill Preparedness and Response <ul style="list-style-type: none"> Presentation: Oil Spill Preparedness and Response Presentation: Beaufort Region Oil Spill Response Training Course <p>● Roundtable comments and questions</p>	John Korec NEB, All
	Agenda Item #B-6: BREA Working Group: Waste Management <ul style="list-style-type: none"> Presentation: Waste Management (<i>Note – an abbreviated version of this presentation was made on Day 3, as an additional presentation was added at the Forum to the Day 2 agenda</i>) <p>● Roundtable comments and questions</p>	Sophie Vallée, AANDC All
	PART C: BREA Priority Areas Research Projects	
9:35 – 10:00 a.m.	Agenda Item #C-0: Presentation - Biological Information to Inform Oil Spill Response <ul style="list-style-type: none"> Biological Data Needed for Net Environmental Benefit Analysis for Dispersants and In-situ Burning in Spill Response in the 	Ken Trudel, SL Ross Environmental Research Ltd.

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	Beaufort Sea  <i>Roundtable comments and questions</i>	
10:00 – 10:35 a.m.	Agenda Item #C-1: Presentation – Community Priorities : <ul style="list-style-type: none"> Regional Coastal Monitoring in the ISR: Ecosystem Indicators  <i>Roundtable comments and questions</i>	Lisa Loseto, DFO and Jasmine Brewster, DFO <i>All</i>
10:35 – 10:50 a.m.	<i>Refreshment Break</i>	
10:50– 12:00 p.m.	Agenda Item #C-2: Presentation – Baseline Fish Information <ul style="list-style-type: none"> Offshore Marine Fishes Project Active Acoustic Mapping of Fish  <i>Roundtable comments and questions</i>	Andy Majewski, DFO Andy Majewski, on behalf of Maxime Geoffroy, ArcticNet <i>All</i>
12:00 – 1:00 p.m.	<i>Lunch (provided)</i>	
1:00 – 2:00 p.m.	Agenda Item #C-3: Presentations – Sea Ice Types and Extreme Ice Features <ul style="list-style-type: none"> Distribution and Thickness of Different Sea Ice Types and Extreme Ice Features in the Beaufort Sea Quantifying Sea Ice Dynamics in the Beaufort Sea CanICE: A Sea Ice Information Database and Web-Base Portal  <i>Roundtable comments and questions</i>	(TBD) Christian Haas, York University Christian Haas, on behalf of Chris Derksen, EC Gabrielle Alix, University of Waterloo <i>All</i>
2:00-2:45 p.m.	Agenda Item #C-3: Presentations – Sea Ice Types and Extreme Ice Features Continued <ul style="list-style-type: none"> Seasonal Forecasting of Ocean Ice Conditions in the Beaufort Sea Radarsat Mapping of Extreme Ice Features in the Southern Beaufort Sea  <i>Roundtable comments and questions</i>	Gregory Flato, EC Greg McCullough, University of Manitoba <i>All</i>
2:45 – 3:00 p.m.	<i>Refreshment Break</i>	

Beaufort Regional Environmental Assessment: 2015 Research Results Forum <i>Taking Stock and Looking to the Future: Involving Communities and Informing Decision -Making</i> February 24-26, 2015 <i>Midnight Sun Recreational Complex, Inuvik, NWT</i> WORKING AGENDA: DAY 2 – WEDNESDAY, FEBRUARY 25, 2015		
3:00-3:50 p.m.	Agenda Item #C-4: Presentations – Coupled Ocean-Ice- Atmosphere Observations, Modeling and Forecasting <ul style="list-style-type: none"> Forecasting Extreme Weather and Ocean Conditions in the Beaufort Sea Southern and Northeastern Beaufort Sea Marine Observatories <p>● <i>Roundtable comments and questions</i></p>	<p>Simon Higginson, DFO</p> <p>Alexandre Forest, Golder Associates</p> <p>All</p>
3:50 – 4:40 p.m.	Agenda Item #C-5: Presentation – Offshore Geohazards and Coastal Processes <ul style="list-style-type: none"> Regional Assessment of Deep Water Seabed Geohazards for Oil Spill Prevention Regional Synthesis of Coastal Geoscience <p>● <i>Roundtable comments and questions</i></p>	<p>Steve Blasco, GSC</p> <p>Dustin Whalen, GSC</p> <p>All</p>
4:45 - 5:00 p.m.	Day 2 Wrap Up <ul style="list-style-type: none"> Facilitator’s observations on Day 2 and outline for Day 3 Roundtable questions and comments 	<p>Facilitator</p> <p>All</p>

Beaufort Regional Environmental Assessment: 2015 Research Results Forum <i>Taking Stock and Looking to the Future: Involving Communities and Informing Decision -Making</i> February 24-26, 2015 Midnight Sun Recreational Complex, Inuvik, NWT WORKING AGENDA: DAY 3 – THURSDAY, FEBRUARY 26, 2015		
8:15 – 8:30 a.m.	<i>Refreshments</i>	
8:30 – 8:45 a.m.	Welcome and Introduction <ul style="list-style-type: none"> Facilitator’s reflection on Day 2 Review Day 3 agenda and process Roundtable comments and questions 	Facilitator <i>All</i>
	PART D: BREa Results and Future Direction	
8:45 – 9:20 a.m.	Agenda Item #D-1: Presentation – BREa Evaluation Overview  <i>Roundtable comments and questions</i>	Sophie Vallée, AANDC <i>All</i>
9:20 – 10:30 a.m.	Agenda Item #D-2: Panel One– BREa Results: Successes, Challenges and Gaps <ul style="list-style-type: none"> Panel Moderator outline of the panel discussion purpose, process and panel members’ introduction. Panel discussion  <i>Open roundtable comments and discussion</i>	Jon Pierce, EIRB Bharat Dixit, NEB Al Kennedy, Imperial Oil Andrew Applejohn, GNWT Frank Pokiak, IGC Daniel VanVliet on behalf of Catherine Conrad, AANDC <i>All</i>
10:30 – 10:45 a.m.	<i>Refreshment Break</i>	
10:45 – 12:00 p.m.	Agenda Item #D-2: Panel One - BREa Results – Successes, Challenges and Gaps (continued)  <i>Open roundtable comments and discussion</i>	<i>All</i>
12:00 – 1:00 p.m.	<i>Lunch (provided)</i>	
1:00 – 2:45p.m.	Agenda Item #D-3: Panel Two: Future Directions for Beaufort Region Research <ul style="list-style-type: none"> Panel Moderator outline of the panel discussion purpose, process and panel members’ introduction. Panel discussion  <i>Open roundtable comments and discussion</i>	Jon Pierce, EIRB John Korec, NEB Paul Barnes, CAPP Andrew Applejohn, GNWT Frank Pokiak, IGC Daniel VanVliet on behalf of Catherine Conrad,

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		AANDC <i>All</i>
2:45 – 3:00 p.m.	Refreshment Break	
3:00 – 3:45p.m.	Agenda Item #D-3: Panel Two: Future Directions for Beaufort Region Research (continued)  Open roundtable comments and discussion	<i>All</i>
3:45 p.m.	Forum Wrap Up <ul style="list-style-type: none"> • Closing Remarks • Closing Prayer 	Renie Arey, Aklavik

APPENDIX B: LIST OF PARTICIPANTS

BREA Final Results Forum Participants List	
Name	Affiliation
Alikamik, John	Ulukhaktok HTC
Alix, Gabrielle	University of Waterloo
Applejohn, Andrew	Government of the Northwest Territories
Archie, Billy	Fisheries Joint Management Committee
Arey, Deon	Aklavik Community Corporation
Arey, Frederick	Aklavik Community Corporation
Arey, Renie	Aklavik HTC
Barnes, Paul	Canadian Association of Petroleum Producers
Baryluk, Steve	Joint Secretariat
Binder, Richard	Environmental Impact Review Board
Birchard, Evan	Imperial Oil Limited
Blakeston, Connie	Department of Fisheries and Oceans
Blasco, Steve	Natural Resources Canada
Brewster, Jasmine	Department of Fisheries and Oceans
Charlie, Stephen	Government of the Northwest Territories
Chiperzak, Doug	Kavik-Stantec
Christie, Darrell	Environmental Impact Screening Committee
Cournoyea, Nellie	Inuvialuit Regional Corporation
Dixit, Bharat	National Energy Board
Elanik, Issiac	Sachs Harbour HTC
Elias, Jim	Tuktoyaktuk HTC
Esagok, Doug	Inuvik HTC
Esau, Earl	Sachs Harbour
Fabijan, Mike	Kavik-Stantec
Flato, Greg	Environment Canada
Forbrich, Suzanne	Environment Canada
Forest, Alexandre	Golder Associates
Gillies, Aneta	Canadian Northern Economic Development Agency
Gillman, Vic	Fisheries Joint Management Committee
Goose, Annie	Ulukhaktok Elders Committee
Gordon, Danny C.	Wildlife Management Advisory Council – North Slope
Gordon, Richard	Inuvik HTC
Green, Brandon	Paulatuk
Green, Michael (Nolan)	Paulatuk HTC
Green, Sharan	Sachs Harbour HTC
Haas, Christian	York University
Higginson, Simon	Department of Fisheries and Oceans
Hynes, Kristin	Fisheries Joint Management Committee
Illasiak, Jody	Paulatuk
Illasiak, Joe Jr.	Paulatuk HTC
Inglangasuk, Gerald	Fisheries Joint Management Committee
Kennedy, Al	Imperial Oil Limited
Kennedy, Dean	GXT
Kitekudlak, Joseph	Ulukhaktok Community Corporation
Korec, John	National Energy Board
Kudlak, Joe	Sachs Harbour HTC

BREA Final Results Forum Participants List	
Name	Affiliation
Lam, Jennifer	Joint Secretariat
Lennie, Crystal	Government of the Northwest Territories
Loreen, Dez	Environmental Impact Review Board
Loseto, Lisa	Department of Fisheries and Oceans
Majewski, Andrew	Department of Fisheries and Oceans
Martin, Mike	Government of the Northwest Territories
McAllister, Joel	Aurora College
McCullough, Greg	University of Manitoba
McCulloch, Vicki	DPRA Canada
McLeod, Brandon	Aklavik HTC
McNicoll, Darcy	Department of Fisheries and Oceans
McPhee, Shannon	Department of Fisheries and Oceans
Milley, Chris	AMEC Foster Wheeler
Nakimayak, Herb	Inuit Circumpolar Council
Nasogaluak, Darrel	Tuktoyaktuk HTC
Niemi, Andrea	Department of Fisheries and Oceans
Okheena, Eddie	Ulukhaktok HTC
Oliktoak, Joshua	Ulukhaktok
Oliver, James	Canadian Environmental Assessment Agency
Pierce, Jon	Environmental Impact Review Board
Pitt, Rob	GXT
Pokiak, Charles	Wildlife Management Advisory Council – Northwest Territories
Pokiak, Ernest	Wildlife Management Advisory Council – North Slope
Pokiak, Frank	Inuvialuit Game Council
Ritchie, John	Government of the Northwest Territories
Simpson, Bob	Inuvialuit Regional Corporation
Smith, Duane	Inuit Circumpolar Council
Smith, Jennifer	Wildlife Management Advisory Council – North Slope
Snow, Kate	Department of Fisheries and Oceans
Snow, Norm	Joint Secretariat
Sonnichsen, Gary	Natural Resources Canada
Storr, Billy	Aklavik HTC
Sumanik, Ron	Yukon Government
Swagar, Marty	Government of the Northwest Territories
Swainson, Danny	Fisheries Joint Management Committee
Swiderski, Andy	Gaea Consulting
Thrasher, Fred	Paulatuk HTC
Tingmiak, Kendra	Inuvialuit Regional Corporation
Trudel, Ken	SL Ross
Vallée, Sophie	Aboriginal Affairs and Northern Development Canada
VanVliet, Daniel	Aboriginal Affairs and Northern Development Canada
Walkusz, Wojciech	Department of Fisheries and Oceans
Wall, Erica	Department of Fisheries and Oceans
Whalen, Dustin	Natural Resources Canada