

SMALL COMMUNITY OIL SPILL PREPAREDNESS RESEARCH PROJECT

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## **Small Community Oil Spill Preparedness Research Project**

### **Abstract**

As transportation through the Arctic becomes more prevalent with tourism and oil exploration, small communities within the Arctic are susceptible to oil spills from fuel barges, passing ships, tank farms, and oily discharges. Oil spills threaten both humans and animals that co-habitat these Arctic regions. Little has been done to prepare these small communities in preparation for an oil spill and as a result they are not well protected. As the notion of globalization is incorporated into the Arctic it will be imperative to protect these small communities.

To better understand this topic, the researcher took an analytical approach to identify and benchmark best practices, define the elements of preparedness, and then build the foundation for the overall project. An integral component of this research project was to build and deploy a self-assessing questionnaire to provide small communities the ability to self-assess their oil spill preparedness level. The results of the questionnaire will be used to derive a preparedness index value. The preparedness index value will be overlaid an interactive map to provide Arctic governments a better view of the level of preparedness of their small communities.

### **Key Words**

Arctic

Oil Spill

Arctic Nations

Preparation

Prevention

## **Introduction**

### **Arctic Domain Awareness Center**

The University of Alaska Anchorage (UAA) hosts the Arctic Domain Awareness Center (ADAC) whose main customer is The United States Coast Guard (USCG). ADAC's mission is to provide the tools necessary to the USCG decision makers about how to best proceed when taking action. ADAC utilizes an integrated approach to blend together academics and industry, as well as Local and Federal Governments to bridge the gap between small communities and the governing bodies. This blended approach improves the decision making process which ultimately makes operations within the Arctic safer. Ultimately this makes small communities more aware of the inherent dangers of oil spills and how to best prevent them (ADAC, 2015).

### **Institute of the North**

*“Most of the Arctic, like most of the world, is commonly owned. With ownership comes the obligation to manage our resources for the benefit of the total. To do that, we must understand the reality, the richness, and the responsibility of the North.”*

Governor Walter J. Hickel, Founder

Governor Walter J. Hickel founded the Institute of the North (ION) in 1996 because he believed the important issues of the Arctic need discussion and understanding. ION is non-profit organization that has been the foundation for past and present policies that affect communities within the Arctic. ION understands the inherent challenges associated with living and operating in the Arctic, and if communities are to thrive in the Arctic, critical infrastructure must be in place to sustain small communities and drive development. ION drives initiatives that bridge the gaps between sectors of government and communities located in the Arctic which empowers both communities and people. ION has reach into communities, State and National Governments, Arctic infrastructure, and policy makers in an effort to aid nations in taking better care of their communities located in the Arctic. ION has been able to concatenate the issues of small communities in order to drive polices that makes living in the Arctic safer for everyone. (Institute of the North, 2016)

### **Alaska Department of Environmental Conservation**

Alaska Department of Environmental Conservation (ADEC) is the lead agency for oil spill prevention and response within the state of Alaska. ADEC Spill Prevention and Response



(SPAR) is responsible for preventing oil spills and other hazmat situations as well as responding to incidents where oil spills are reported in order to protect the environment and the members of small communities. ADEC has several tools that have been successfully implemented within the state of Alaska and have been well received (ADEC, 2016). In the wake of the 1989 Valdez oil spill the need arose to protect the environment from such a catastrophe from ever happening again. One year after the Valdez oil spill the U.S. mandated that all oil tankers have double hulls within 25 years (EPA, 1990).

There are roughly 2000 oil spills reported to ADEC each year, most of the reported oil spills are large fishing vessels, tanker trucks, leaking storage tanks, and freighters (ADEC, 2016). Due to the size and remoteness of Alaska sometimes the local residents of small communities are the first line of defense to contain oil spills until further provisions are in place. An excerpt from the 1990 Alaska Oil Spill Commission explains that

*"A substantive role should be given to the affected communities in any response system... local interests, local knowledge and experience... often made the community-based work force the most efficient available"* (ADEC, 2016).

ADEC has built relationships with local communities by recognizing the importance of local involvement. ADEC has been most effective because they approached this issue from a local perspective and not from big government agency perspective. ADEC understands the value of having local on-scene members who are willing to prevent, protect, and respond to oil spills.

ADEC has entered into agreement with 40 small communities that allows them to have access to state provided hazmat spill response containers that are pre-positioned across the state (Ryan, 2016). The contents of the containers provide small communities with supplies for an initial oil spill response. These agreements allow for small communities to use the equipment at no cost unless the spill was determined to be the fault of the small community (ADEC, 2016).

### **Challenges of Oil Spill Preparedness**

The challenges associated with oil spill preparedness are to find the right blend of policies, emergency plans, personnel, equipment, training, and funding, and then determine who will be responsible for each item. The research conducted illustrates that oil spill preparedness is reactionary. The Valdez oil spill of 1989 spurred the Oil Pollution Act of 1990 commonly called

OPA 90 (EPA, 1990). One month following the Deepwater Horizon Oil Spill in the Gulf of Mexico a new “US federal agency the Bureau of Ocean Energy Management, Regulation and Enforcement was created to oversee energy exploration, replacing another agency that had been criticized for its conflicts of interest” (Polar Research, 2011). The challenge with oil spill prevention is to have an adequate blend of the elements of preparedness that constitute a prepared community.

The research illustrates emergency plans are exceedingly difficult to initiate, develop and implement from a government agency standpoint. This is because community members’ viewpoints of oil spills are vastly differently than how their government views oil spills. These two viewpoints could not be more diametrically opposed. The vast majority of oil spills happen during the transfer of heating fuel from a storage facility to a residential house; members of small communities don’t necessarily see this as an oil spill however, ADEC would perceive this as an oil spill. This notion that oil spills only come from large ships and not during the transfer of heating fuel has a lot to do with the culture of the community. If the culture of a small community is geared toward prevention and preparation, then its members will follow suit. Nome is a prime example of a small community that embraces a preparation and prevention culture. Nome has taken the preventive measures of having emergency plans in place and exercises them regularly ensuring Nome’s security in the event of an oil spill in the harbor and beyond.

The existence and exercise of emergency plans is one of the benchmarks of a small community’s oil spill preparedness. The USCG along with ADEC are the two governing/regulatory agencies that are the closest to the issues of oil spill preparation, prevention and response within the state of Alaska. These two agencies bridge the gap between the government and the small community to keep them as safe as possible. Alaska State Statute *SEC 26.23.071 ALASKA STATE EMERGENCY RESPONSE COMMISSION* provides the guidance on what the state of Alaska is responsible for with regard to emergency planning (State of Alaska, 2016). These planning efforts begin at the Federal level and then Alaska further divides up the state into 10 sub-areas for improved planning efforts. Each of these 10 sub-areas have their own specific hazards as well as local risks that could potentially be affected by an oil spill. The USCG and ADEC lead the effort to drill down further and develop sub-area contingency plans that partition Alaska into

regions. These plans are updated every 5 years to reflect the current state and new risks of those regions. The sub-area contingency plans are guidelines for establishing operations in the event of an oil spill event. The plans provide for the Unified Command Structure, which is a necessity of any large oil spill. These plans identify all of the resources available: equipment, personnel, information directories, logistics, local/state/federal hazmat response actions, areas of environmental concern, response scenarios, response strategies, as well as places of refuge that are unique to those regions (USCG, 2015).

The researcher interviewed representatives from the Division of Homeland Security and Emergency Management and it was their opinion that finding the right person within the community is the single greatest challenge. Finding the correct person to act as the conduit to bridge the gap between community and government was their biggest concern and issue (Weibl & Fonteyn, 2016).

Oil spill equipment is expensive and costly to maintain. The challenge associated with equipment is determining who is responsible to acquire the equipment, and then maintain the equipment. Due to the presence of the oil industry within the Arctic there are several Oil Spill Removal Organizations (OSRO's) contracted with the State of Alaska to provide response to oil spills. The researcher interviewed two OSRO's and each of them has a different approach to oil spill response.

Chadux Corp. is a member-funded not-profit OSRO that provides oil spill protection services through contracts with its members. Chadux has their equipment pre-packaged for rapid deployment via land, sea, or air. Additionally, Chadux has prepositioned containers in 20 communities within its area of responsibility and in the event of an oil spill Chadux dispatches containers of pre-packaged equipment. Chadux coordinates response planning by using 120-mile radius circles, as most of the business that Chadux is responsible involves bulk fuel transportation (Melton, 2016).

Alaska Clean Seas (ACS) is another member-funded non-profit OSRO that provides services through contracts. Their business model is to have all necessary tools, materials, and equipment in place and ready for use (LLoyd, 2016).

Each of these organizations has a different approach to solving the same issues. ACS integrates their business model into local communities. This approach is two-fold. Initially, it provides integration into the communities but also raises oil spill awareness from an industry perspective. By raising oil spill awareness these companies have impacted the culture of the local communities they serve.

ADAC facilitated workshops for small communities and those learning sessions have been instrumental in shedding light on areas that need attention. During workshop breakout sessions several small communities illustrated a need for oil spill response training. The lack of trained personnel within small communities is a commonly identified shortfall within the Arctic. Small communities have asked for training to be taught locally to reduce the dropout rates. Additionally, community members asked for those training materials to be left behind for the purpose of annual refresher training (BREA, 2013).

Research was conducted domestically and internationally to provide depth to this project as there are eight nations represented in the Arctic Community. There is a fundamental difference in the approach taken by Norway. Norway has a dedicated oil spill training program that provides a robust process to ensure no oil ever reaches their small communities along their coast ways. Norway does this with a dedicated stream of funds that allows such training to exist. Norway provides a level of commitment and care to its local communities that could be affected by oil spills and has taken the necessary precautions to mitigate such occurrences (NOFO, 2013).

The research suggests that a dedicated stream of funds is one of the differentiating factors in how well small communities are prepared to respond to oil spills. Funding has to be where it all begins. The funds have to be made available in order for equipment to be purchased, training to be accomplished, and preparation to begin.

Nations' governments need to be involved at all levels to ensure small communities are provided with the necessary tools to keep their communities safe from oil spills. There are several elements of oil spill preparedness that indicate how well prepared these small communities are. Interviews that were conducted with members of OSROs illustrate the notion that the culture of the community was the biggest differentiating factor. No matter how much technology, equipment, training, or funding that is provided, very little would ever overshadow the culture.

From the perspective of the oil spill recovery industry, culture was the number one factor in determining how well prepared small communities are (Alaska Clean Seas, 2016).

When asked during interviews, most industry insiders stated that they thought small communities are not well prepared for an oil spill. Oil spill prevention, preparation, and response has waxed and waned over the years depending on how long it has been since the last oil spill (Ryan, 2016).

High personnel turnover rates in small communities make the challenge of finding the right person to act as the liaison between government and small communities very difficult. The decline of large oil spills coupled with slimming budgets has made this challenge exceedingly difficult (Weibl & Fonteyn, 2016).

The challenges of small communities thriving the Arctic are vast and expansive. Without the aid of nations' governments to provide funds, training, equipment, and emergency plans these small communities will continue to be ill prepared to deal with oil spills.

### **Problem Statement**

Small communities within the Arctic are susceptible to oil spills from fuel barges, passing ships, tank farms, and oily discharges. Oil spills threaten both humans and animals life in the Arctic region. Even though oil spill response and clean-up is the responsibility of the party who spilled the oil, it is the small communities that are left with the downstream effects of that oil spill for years to come. It is imperative for these villages to be prepared to up-channel oil spill information and even respond in a limited capacity if able. This capstone project is to research oil spill preparedness for small communities in the circumpolar region. This research paper will clarify and consolidate existing information and examine the gaps that exist currently in the Emergency Prevention Preparedness and Response (EPPR) community. By understanding what information exists, the researcher will be able to properly identify the gaps in the information and gain a better understanding of what preparedness encompasses for small communities.

## **Research Methodology**

### **Methods**

Research of oil spill preparedness was conducted through a literature review and interviews with members of government aid agencies, industry responders, and port directors. This research project seeks to accomplish the following:

- Evaluate and consolidate existing information with respect to oil spill preparedness from a small community perspective
- Design, build and deploy a questionnaire that will allow small communities the ability to self assess their level of preparedness
- Build a tool that will evaluate the questionnaire results, thus generating a numerical value that will serve as a preparedness index for that small community

### **Analysis Approach**

The research conducted for this project was two-fold. Initially research had to be conducted to properly scope the project as well as research the topic of oil spill preparedness from the perspective of a small community located within the Arctic. The researcher assessed data from both domestic and international sources to give an accurate representation from a global perspective

This project was initiated by the researcher and subsequently co-sponsored by the Arctic Domain Awareness Center (ADAC) and the United States Coast Guard. There are eight Arctic nations represented within ADAC and every two years the Committee Chair changes. This time period was the United States' chance to chair the board and gain some perspective on how well the small communities of the eight countries located within the Arctic are able to deal with oil spills.

The research that was conducted was to identify what emergency plans, equipment, and materials are in place; identify risks, determine community readiness, and evaluate existing training plans. A secondary benefit of conducting this research is the ongoing discovery of best practices of small communities and the ability to share that tribal knowledge.

### **Interview Protocol**

Interviews were conducted to collect data from different perspectives. One of the issues that was illustrated during the initial research was the idea that there needed to be a better mechanism to

communicate with small communities. The researcher interviewed representatives from the list of aid agencies below:

- Department of Homeland Security Emergency Management
- United States Coast Guard
- Alaska Department of Environmental Conservation
- Chadux Oil Spill Removal Organization
- Alaska Clean Seas Oil Spill Removal Organization
- Institute of the North
- Nome Port Director

### **Department of Homeland Security Emergency Management**

The Department of Homeland Security Emergency Management (DHSEM) maintains Small Community Emergency Response Plans (SCERP). A SCERP is a voluntary document that the DHSEM carefully coordinates with small communities to develop this emergency response plan. A SCERP is a tool that a small community can use as a guidebook from the time of the emergency until 72 hours later. It is a step-by-step triage guide to provide a community the best chance possible to identify the emergency, communicate needs, coordinate response agencies, and protect local community members. The SCERP is a document that is geared toward the overarching goal of community emergency response and not necessarily to oil spill response. However, any layer of protection that can be provided to a small community with regard to emergency response is step in the right direction.

The researcher interviewed two Emergency Management Specialists for the DHSEM who illustrated several important facts about small communities in Alaska. There have been challenges in the past when attempting to coordinate with small communities to provide them with emergency plans. This is partially because the perception from the small community has been that the government is implementing another policy and very little local input has ever been solicited. Consequently, the DHSEM has had to modify their approach to solicit input from local communities. This newly adopted approach has proved to be more effective in implementing emergency plans due to small communities feeling as though their concerns are being heard and addressed. Again the perception from the two interviewees was that small communities are not well prepared to deal with oil spills (Weibl & Fonteyn, 2016).

### **United States Coast Guard**

The United States Coast Guard (USCG) is the regulatory body that is charged with defending the Nations' interest in the Alaskan maritime region. An interview with Lt. Commander Matt Mitchell of the USCG illustrated the level of regulatory presence the USCG provides to the arctic region. Mitchell explained the regulatory process starting from the federal government all the way down to the small community level.

As mentioned above, in the wake of the 1989 oil spill disaster in Valdez Congress enacted the Oil Pollution Act of 1990 commonly called OPA 90 (EPA, 1990). This law united the USCG and the U.S. Environmental Protection Agency (EPA) with an increased ability to prevent and respond to catastrophic oil spills. Additionally, OPA required the state of Alaska to prepare a statewide master plan (Unified Plan) that addresses oil and hazardous substances discharges (USCG, 2015). Alaska statute further divided the state into 10 sub-area regions for increased planning and preparedness purposes. This division allows for each region to have their own specific plan that identifies information that is unique to their location. Information that is commonly found in these plans is: emergency response contact info, response equipment location(s), response techniques and guidelines, sensitive area protection, and location of hazmat substances (USCG, 2015). These plans are updated by ADEC aided by the USCG on a five-year continual basis. Sub-area plans are the most comprehensive set of documents that drill down to the small community level and identifies all of the areas of concern in the event of an oil spill. Additionally, these plans provide a structured approach and act as the conduit to up-channel information to the appropriate support agency in the event of an oil spill (Mitchell, 2016).

### **Alaska Department of Environmental Conservation**

ADEC is the state's leading agency with regard to oil spill prevention. The researcher interviewed Kristen Ryan who works for ADEC and she addressed concerns over nations' willingness to admit their level of oil spill prevention, preparedness and response. By illustrating how ill prepared that nation's Arctic communities are would show weakness and make that nation look bad (Ryan, 2016).

When asked about how to best communicate with small communities to gain their insight with a questionnaire, Ryan cautioned the researcher to frame the questions in a conservative manner. The ADAC representative also spoke about how there is a general lack of education about what



constitutes an oil spill and what does not. ADEC utilizes a tiered approach to mount a response that is commensurate with the spill size. ADEC works closely with the USCG to ensure that small communities are doing their part to be prepared for the risks that are relevant to their situation. The reason why these two agencies work so closely together is the USCG is the regulatory agency that monitors the transfer of fuel from the fuel barge to pump house. ADEC is the regulatory agency that monitors the operations from pump house to place of use. ADAC's recommendation is to focus on education and training in order to mitigate oil spills going forward.

The researcher spoke with Kristen Ryan an Emergency Management Specialist with ADEC about prevention and this was her response.

“It's cheaper to prevent than it is to respond” (Ryan, 2016).

### **Oil Spill Removal Organizations**

Due to the size of Alaska the state is divided into regions that OSROs are responsible for. The researcher believes it is imperative to gain the industry's perspective of what contribution these companies can provide to the prevention, preparation, and response community.

Chadux Corp. president Matt Melton spoke about how blending industry into a community strengthens the ties and bolsters small communities' oil spill preparedness. Though he thinks there needs to be a greater emphasis on prevention from an industry perspective. He stated “preparedness follows industry” (Alaska Chadux Corp., 2016). For instance, when Shell came to Alaska in search of oil in the Chukchi Sea the surrounding communities' oil spill awareness level rose significantly.

Alaska Clean Seas president Craig “Bark” Lloyd had a different perspective of what spurs preparedness. Lloyd operates under the notion that “preparedness follows disasters” (Alaska Clean Seas, 2016). His perspective was illustrated with the 1989 Valdez oil spill disaster. In the wake of a disaster there tends to be considerable attention given to the regulatory response as well as the physical response. After the Valdez oil spill disaster the state of Alaska purchased and distributed a considerable amount of equipment throughout the state, but failed to consider who would be responsible for the upkeep of this equipment. Lloyd highlighted several instances of what he considered to be best practices: Hazardous Waste Operations and Emergency

Response (HAZWOPER) training, emergency plans in place and exercised annually, and Incident Commander System Training. Lloyd advised finding small communities that perform oil spill preparedness better than anyone and then benchmarking those communities' best practices. Lloyd expressed an opinion that was unlike any others with regard to oil spills in small communities. Lloyd stated that if oil washed up on the shore then someone was getting sued and that means money for small community members. Additionally, his perspective is that community members aren't likely to contribute to oil spill prevention, preparation or response unless there was something in it for them.

### **Port Director of Nome**

An interview was conducted with Joy Baker who is the Port Director for the city of Nome. As the Port Director she is able to provide a great amount of insight as to how well prepared Nome and the surrounding communities are to respond to oil spills. Nome has emergency plans and exercises them to the fullest extent annually. Nome conducts itself in a manner that is consistent with the law and other regulatory compliance matters. Additionally, Baker spoke very highly of the work being conducted by USCG with regard to the sub-area contingency plans. She said that the work being conducted was beneficial to the local communities and the Arctic as a whole (Baker, 2016).

## **Literature Review Results**

### **Problem Formulation**

As the arctic region is becoming more accessible, traffic in and out of this region will increase - especially as additional oil and gas deposits are discovered (ITOPF, 2014). Small Communities in this region are at an increased risk for oil spills due to this increase in traffic. While reviewing the literature it was necessary to identify both domestic and international regulatory documents. This requirement was to understand oil spill prevention, preparation, and response efforts and how they are regulated within the Arctic Nations

### **International**

“Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic” (MOSPA) is an agreement between the Arctic Nations that strengthens the cooperation, coordination and mutual assistance among the Arctic Nations in order to protect the marine environment from pollution from oil (EPPR, 2013).

The Canadian Coast Guard Joint Marine Pollution Contingency Plan is the Canadian equivalent to the United States Unified Plan (Canadian Coast Guard, 2013).

While the “Oil Spill Preparedness and Response report series summary” doesn’t directly correlate to the Arctic there are a great deal of best practices in this document (IPIECA, 2008).

The International Association of Oil and Gas Producers (OGP) formed the Global Industry Response Group (GIRG) after the Macondo and Deep Horizons oil spills to document lessons learned from these two incidents. This document will become more relevant as the Arctic is opened up for oil and gas exploration (Global Industry Response Group , 2011).

### **Domestic**

“The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States and regulating quality standards for surface waters (Environmental Protection Agency, 2015).”

The Oil Pollution act of 1990 governs liability of oil spills within the United States (EPA, 1990).

The Alaska Federal/State Preparedness Plan for Response to Oil and Hazardous Substance Discharges/Releases (the Unified Plan) provides basic response guidelines for federal and state agencies (ADEC, 2016).

Under the Unified Plan the State of Alaska has 10 Sub-Area Contingency Plans that contain information about individual small communities and their capacities, response measures, resources, scenarios, and sensitive areas (Dept. of Environmental Conservation, 2010).

It is important to illustrate the scientific aspects of oil spill research in the Arctic. Oil Spill Response Limited (OSRL) published “Oil Spill Response” a field guide that illustrates the technical aspects of oil spill response and the unique challenges associated with oil spill cleanup (Oil Spill Response, 2015).

### **Oil Spill Response Industry**

Alaska’s oil and gas industry presence necessitates the need for oil spill preparedness, prevention, and response capabilities. Oil Spill Removal Organizations (OSROs) provide equipment, material, trained personnel, and response capabilities. Each OSRO has close ties

with small communities within their area of responsibility that have the potential of being impacted by an oil spill.

Alaska Chadux Corporation provides oil spill response plans, trained personnel, equipment and capacity to effectively deliver an oil spill response with pre-packaged equipment that can be transported by truck, aircraft and by sea within a few hours of being activated. Additionally, Chadux has equipment caches across the State of Alaska and response plans in place and scenarios to simulate oil spill response (Alaska Chadux Corp., 2016).

Alaska Clean Seas responds to oil spills in a different manner. ACS has all of their equipment on location within their area of responsibility; ACS is responsible for the North Slope region. “ACS is now organized to respond, like a fire brigade, to an emergency with both trained people and equipment. ACS is active in streamlining approval processes and in fostering a common organizational structure for responding to and managing spills on the North Slope of Alaska (Alaska Clean Seas, 2016).”

### **Alaska**

“North Slope Borough Workshop Report 2012” discusses the need to engage with local communities with respect to early planning for spill response and Natural Resource Damage Assessment (NRDA) which requires coordination with local communities to ensure that: protection priorities are correctly identified, appropriate baseline data for a NRDA are collected, empirical data collected and planned, and natural resources and their services are evaluated and restored (NOAA, 2012).

Highlights from the report include:

- Need to provide training to individuals
- Access to up-to-date information regarding spill response
- Local participation in response
- Stronger relationship with OSROs
- Include information from villages in Environment Response Management Application (ERMA) database

## Canada

Canada's level of preparedness to respond to oil spills in the arctic region is very minimal. Over the past 30 years oil and gas exploration has been virtually nonexistent within Canada's arctic region so the need for oil spill prevention on the large scale is not necessary. The small communities that exist in these regions have local spill prevention efforts in place to combat spills during loading or unloading operations, which support community resupply operations. Canada's Coast Guard has placed caches of spill equipment in small communities but there have not been enough spills in this region to necessitate increased response capacities. As oil and gas exploration are ramping up, Canada's Western Arctic has their regulatory agencies assessing the gaps in their oil spill response capacities. Training could be conducted in local schools, learning centers, and in the field. Additionally, training videos could be kept in the community to act as a reference. Videos would allow individuals to review the material on their own time, create public awareness, and be used for educational purposes in local schools (BREA, 2013).

Highlights from the report include:

- Both industry and regulators want members of Inuvialuit communities to play a significant role in oil spill preparedness and response
- A general lack of preparedness and capacity in oil spill response were cited by regulator and industry representatives for near shore and offshore areas
  - **Nearshore:** There is limited preparedness and capacity with some individuals trained for small Tier 1 level spills. There are small amounts of spill response equipment in some communities
  - **Offshore:** There is no community preparedness or capacity at this time for responding to offshore spills
- All communities expressed an interest in being active participants in all phases of oil spill response and were interested in receiving the training necessary to participate
- Lack of training and trained personnel to effectively respond to oil spills
- Lack of capacity in communities, limited number of people trained, limited oil spill equipment

Excerpt from e-mail correspondence with Bernard Funston "Executive Secretary at Arctic Council Sustainable Development Working Group"

*“Preparedness in the context of Arctic communities in Canada, as in Alaska, is often more robust on paper than it is on the ground. One observation which might help you focus this issue is the following: for the most part, offshore oil and gas activities in Arctic Canada have been almost non-existent for the past 30 years. There are no offshore wells in operation. So where will oil spills come from? 1) Potentially from neighboring Arctic states; 2) from the few vessels that operate scientific and tourist operations in the Arctic; 3) from the community resupply vessels that bring oil into the Arctic to provide heating oil and other petroleum products for use in communities. These latter operations have been going on for more than 50 years and while there have been some minor spills, generally operations have not created large environmental risks. So in other words, one needs to assess preparedness in the context of current and likely operations.” (Funston, 2016)*

## **Russia**

The current state of affairs of Russia’s oil spill response is somewhat bleak. There is no Russian legislation that clearly states that an Oil Spill Emergency Response system has to be established or that specifies the authority responsible for its implementation. Information regarding Russia’s small community oil spill preparedness either exists on non-public forums or does not exist at all (Ivanova, 2011).

Highlights from the report include:

- Regional oil spill response system has not been fully developed.
- Lacks a clearly formulated state policy, a single governing authority and a unified structure.
- Lack of funding which reduces oil spill preparedness when combating oil spills
- Lack of funding affects the ability of response organizations to purchase new equipment which hobbles response effectiveness
- No system exists to monitor or track oil spills
- No research being conducted on oil spill behavior
- The scientific component of oil spill emergency response is almost completely absent

## **Norway**

Norway is a country that takes great pride in its ability to prepare, prevent and respond to oil spills. “In Norway, most major oil spills have been from shipping near the coast. The Norwegian

petroleum industry has not been the cause of any major oil spills that have resulted in environmental damage. In the roughly 50 years since Norway's petroleum activities began, no oil spill from the industry has ever reached the shoreline (NOFO, 2013).”

Highlights from NOFO's spill response plan include:

- All personnel associated with all types of oil removal vessels will be educated, trained and drilled according to plan (at least once a year).
- Comprehensive training plan
- Access to significant oil spill response resources
- Agreements with Governmental, Municipality, and private partners

### **Best Practices**

In the process of reviewing the literature pertaining to oil spill preparedness in small communities it became evident that there are gaps in prevention, preparation, and response measures from the federal level all the way down to the small community level. These best practices are represented in any community that is well prepared to deal with oil spills and includes many or all of the following:

- Regional Response Teams
- Hazmat response teams
- Hazmat containers located in communities
- Prioritized funding stream (Norway)
- Comprehensive training plans
- Emergency response plans and oil spill response exercises
- Contingency Plans

### **Development of Questionnaire**

The researcher along with ION developed a questionnaire that was a blend of questions that give a small community the ability to self-assess their level of oil spill preparedness. The questionnaire is comprised of five broad categories containing a total of 88 questions. The following categories were chosen to provide a range of answers that would convey how prepared a small community is to deal with oil spills. The categories are as follows:

- Materials, equipment, and vessels
- Effects of an oil spill on Property, Environment and Community
- Risk
- Training
- Local Plans

It is important for aid agencies to understand what materials, equipment and vessels are readily available to aid in oil spill response. The questionnaire needed to address both terrestrial and coastal communities, as the risks for each of them are different. For instance, a coastal community is at greater risk for oily discharges from a passing ship as where a terrestrial community is not.

It is important to understand the hazards that are represented within each small community to better assess the risks. Each small community will have some general corollary to each other with regard to risk, but each of them will have differences that makes them unique.

### **Analytical Tool**

The researcher and ION worked with Institute of Social and Economic Research (UAA survey department) to develop and deploy the questionnaire to small communities. The researcher built a weighted matrix (Microsoft Excel sheet) as the analytical tool that takes the output from the questionnaire and generates a numerical score approximating the oil-spill preparedness index of a given community. This is the process the researcher will use to analyze the results from the questionnaire.

### **Interpreting data**

Initially the researcher had to build a model (weighted matrix) that would accept the data that was exported from the survey website. Once the model was built and tested the quantification of results could begin. The researcher wanted to answer two important questions from the data:

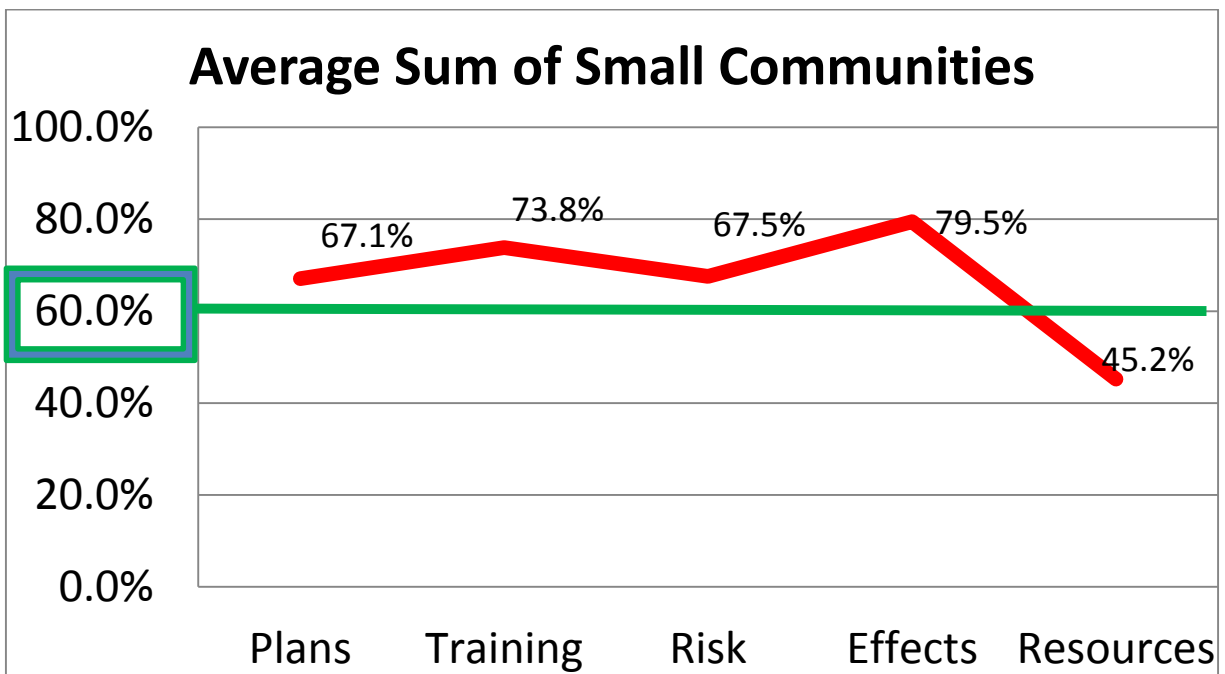
- Is the questionnaire sufficiently nuanced to gain an accurate understanding of a small community's oil spill preparedness?
- Are small communities located within the Arctic prepared to deal with oil spills?

To answer the first question, the researcher counted the number of times respondents answered each question and that provided the percentage of times each question was answered. This gave



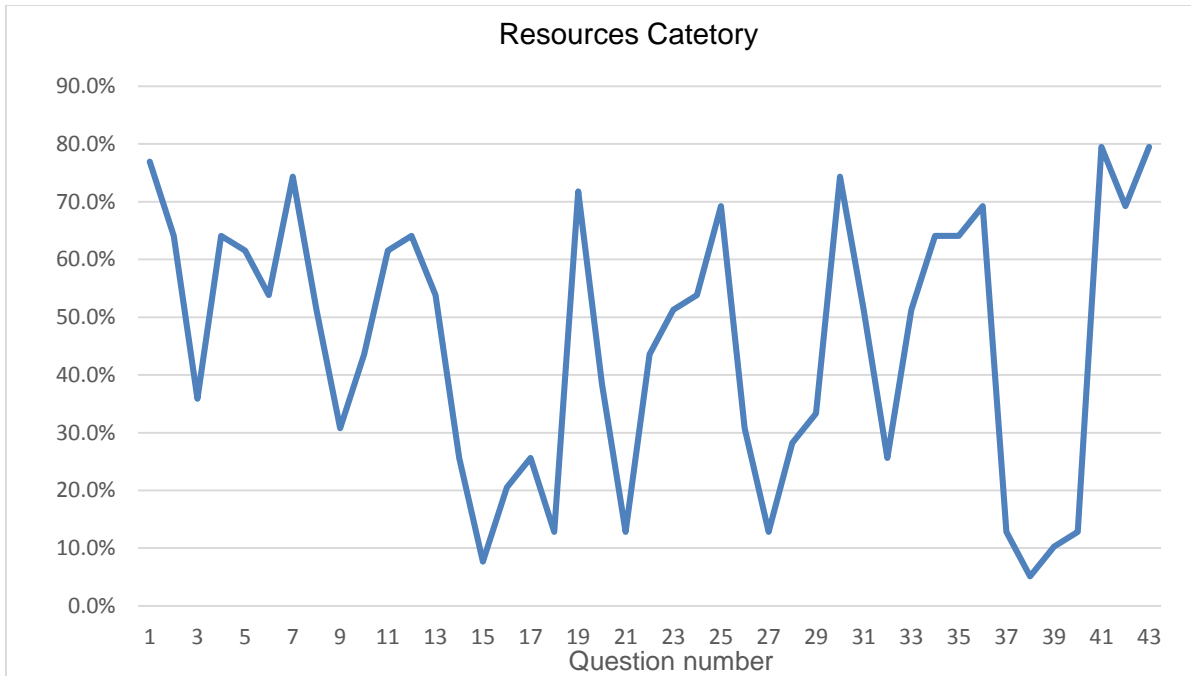
the researcher an idea of how well each question was received. The researcher then summed up the percentages of questions per category. This number aided in determining how well each community was prepared per category of questions.

The successful development and deployment of this questionnaire was a critical factor in the overall success of the project. During the initial scoping of this project the researcher along with ION determined that if respondents answered 60 percent of the time then the questionnaire was determined to be successful. The analysis of the data shows there was one category of questions that scored lower than 60 percent. Overall the questionnaire was a success due to four out of five categories being answered above 60 percent of the time. See Figure 1.



**Exhibit 1 – Average Sum of Small Community Responses**

The researcher wanted to understand more about the data from the questionnaire. Beyond the scope of determining what percentage of the time questions were answered, the researcher wanted to know if the questions being asked were relevant. The researcher discovered some categories were erratic in the responses. The following chart is data from the resources category, the only category that did not meet the 60 percent threshold for success.



**Exhibit 2 – Data Analysis of Question Applicability**

The researcher discovered that the “valleys” in the graphs are associated with being too specific with the questions. The “peaks” in the graph depict the response to more general questions for example: “do you have access to absorbents?” These kinds of questions were answered 75 percent of the time. Questions like “who owns the absorbents?” resulted in being answered 50 percent of the time. When asked “what are the age of the absorbents?” respondents answered 25 percent of the time. The researcher postulated that the more specific the question the less likely small communities were to respond. Additionally, if there was an “other” category to solicit feedback that was not encompassed by the question, it was only answered 15-20 percent of the time. The researcher posited that the reason the resources category did not meet the 60 percent threshold was that the questions were too specific. See Figure 2.

**Preparedness Index**

The second question the data needed to answer is: How prepared are the small communities located within the Arctic to respond to oil spills. The approach the researcher took when determining each community’s responses was to aggregate the scores per category. This was done to provide depth to the data being collected and not just to aggregate a score and provide a

preparedness index. Each small community’s score was further analyzed by category to propose areas of improvement. Each of the values shown in the cells below are all out of 1.0 except the total. See Figure 3.

SMALL COMMUNITY NAME	Local Plans	Training and Updates	Risk	Effects	Resources	TOTAL
	Questions H through T	Questions U through Y	Questions Z through BK	Questions BL through BT	Questions BU through DK	
Akutan	0.6	0.6	0.2	0.4	0.6	2.4
Kotzebue	0.2	0.5	0.6	0.6	0.4	2.4
Hooper Bay	0.0	0.0	0.6	0.6	0.1	1.3
City of Bethel	0.3	0.4	0.4	0.7	0.5	2.3
Kivalina	0.3	0.4	0.7	0.7	0.2	2.2
Holy Cross	0.3	0.0	0.5	0.3	0.1	1.2
Huslia	0.4	0.3	0.3	0.5	0.5	2.0
White Mountain	0.5	0.3	0.2	0.4	0.6	2.0
Longyearbyen, Svalbard	0.6	0.6	0.3	0.7	0.7	2.8
Russian Mission	0.1	0.2	0.2	0.7	0.2	1.4
City of Fort Yukon	0.2	0.2	0.2	0.4	0.4	1.3
Bränåy	0.8	0.6	0.6	0.7	0.7	3.4
Sårkjosen	0.8	0.7	0.6	0.7	0.6	3.3
Newhalen	0.3	0.2	0.4	0.6	0.3	1.8
Nome	0.7	0.7	0.5	0.8	0.7	3.4

### Exhibit 3 – List of Weighted Matrix Categories

The overall approach taken to illustrate the Preparedness Index is as follows:

- Aggregate totals from answered questions into respective categories
- Aggregate scores from categories into an overall total
- Determine if the category falls into the Preparedness or Risk group
- Divide Preparedness group by Risk group to generate Preparedness Index

Once the categories have been calculated the researcher had to determine how to make an index that would accurately represent a small community’s preparedness index. The approach the researcher took was to determine if the categories belonged into the group of Preparedness or Risk. The Preparedness value is comprised of plans, training, and resources. The Risk value is comprised of risks and effects. See Figure 4.

PREPAREDNESS = Plans + Training + Resources	RISK = Risks + Effects	PREPAREDNESS INDEX = PREPAREDNESS/RISK			
		1.75 and up	Between 1.0 and 1.74	.99 and below	
1.8	0.6	2.78			Akutan
1.2	1.2	0.95			Kotzebue
0.1	1.2	0.05			Hooper Bay
1.2	1.2	1.02			City of Bethel
0.9	1.4	0.63			Kivalina
0.4	0.7	0.62			Holy Cross
1.1	0.8	1.41			Huslia
1.4	0.6	2.29			White Mountain
1.8	1.0	1.77			Longyearbyen, Svalbard
0.5	0.9	0.53			Russian Mission
0.7	0.6	1.22			City of Fort Yukon
2.0	1.3	1.54			Brännåy
2.0	1.3	1.50			Sårkjosen
0.8	1.0	0.75			Newhalen
2.1	1.3	1.63			Nome
0.9	0.7	1.34			Keke
1.5	1.1	1.41			False Pass

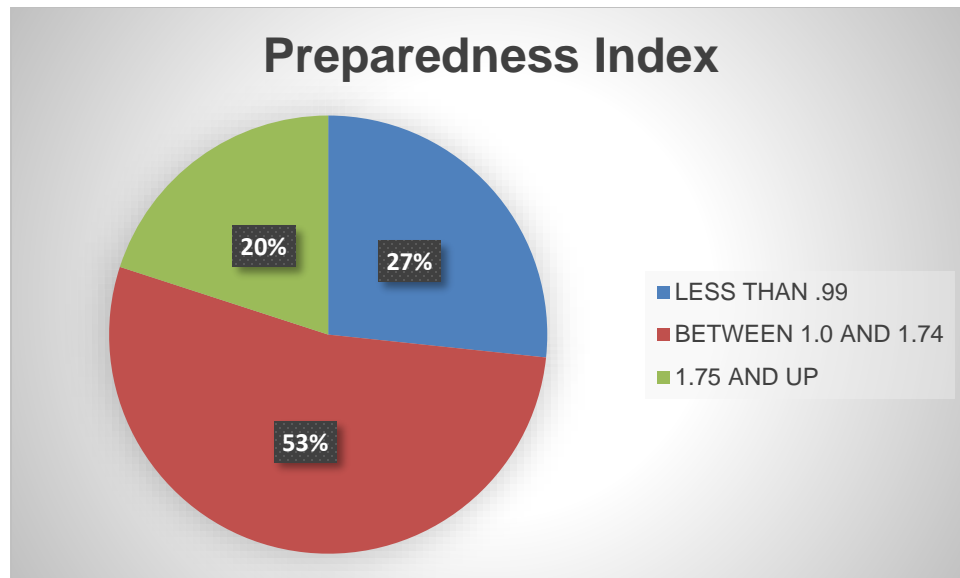
#### Exhibit 4 – Small Community Oil Spill Preparedness Index

The preparedness index is derived by dividing the composite scores of Preparedness by Risk. The value represented in the Preparedness index cell is the overall score and the “Small Community Oil Spill Preparedness Index.” The Preparedness index values are conditionally formatted to populate with:

- Green if index was 1.75 and up (high level of preparedness vs risks)
- Yellow if index was between 1.74 and 1.0 (medium level of preparedness vs risks)
- Red if index was .99 and below (low level of preparedness vs risks)

These index values were chosen based on the data that was collected and analyzed. If a small community had more elements of risk and exposure than of preparation then the score would go down, and conversely if the community had more elements of preparedness than risk and exposure then the index would rise.

There are more responses that are being analyzed by the researcher but due to the time constraints and scope of this project the researcher limited this study to 30 responses. The researcher concluded that 53 percent of the small communities polled are moderately prepared to deal with oil spills. While only 20 percent of the small communities are well prepared for oil spills. The remainder of 27 percent are in the bottom tier of not well prepared. See Figure 5.



**Exhibit 5 – Pie Chart of Results**

**Summary of Results/Conclusion**

After reviewing the literature on this subject it has become apparent that there are a large number of documents that regulate oil spill prevention, preparedness and response efforts in the Arctic Region yet little has been done to prepare small communities for oil spills. An interesting aspect is that the small communities that are the most affected by oil spills have the least amount of power to do anything about it.

When it comes to best practices Norway implements oil spill prevention, preparedness and response efforts better than any other nation in the Arctic. The absence of oil spill awareness is indicative of a lack of oil spill prevention culture. The absence or existence of oil and gas industry breeds awareness and drives the oil spill culture. There seems to be a desire in the small communities in the Arctic to acquire training to be able to better prepare themselves for oil spills and to participate in oil spill response measures. Overall, small communities within the Arctic are not very well prepared to deal with oil spills but the Arctic Council along with several regulatory agencies are doing a great job of bootstrapping these small communities' oil spill body of knowledge.

## **Recommendations for Further Research**

There is a lack of specific literature that is related to small community oil spill preparedness. This project provides opportunities for the Arctic Council and governing agencies to review concerns that have gone unaddressed. The literature from the Arctic Council workshops address the growing concern of providing adequate training and education to the local community members. Local community members have tribal knowledge of the area and are crucial to filling in the blanks on the sub-area contingency plan. Additionally, funding has been a topic of concern in just about every piece of literature that was reviewed. A corollary can be drawn between Norway's prepared arctic communities and the prioritized funding stream. Funding leads to training, education, equipment, and engaged local community members who will in turn shift the oil spill culture. It is the perspective of the researcher that the culture is the greatest indicator of how well a small community is prepared to deal with oil spills. The approach to oil spill preparedness needs to be multi-faceted and applied judiciously across all arctic nations. The work accomplished within the scope of this project is part of a larger project that will identify the best practices illustrated within this research to create a Guidebook or Library of Best Practices. Additionally, an Awareness Video will be created to highlight the challenges communities might face along with solutions; describing diversity and variability between communities; and answer "what ifs" that community might have (Everett, 2016).

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## **Appendix A**

### **Alaska Oil Spill Commission**



Alaska Oil Spill  
Commission.pdf

## **Appendix B**

### **Oil Pollution Act of 1990**



Oil Pollution Act 1990  
OPEN 90.pdf

## **Appendix C**

### **Sub Area Contingency Plan Intro**



NWA 1-Introduction  
(Jan 2012).pdf

## **Appendix D**

### **Sub Area Contingency Plan Part A**



NWA A-Response  
(Jan 2012).pdf

## **Appendix E**

### **Sub Area Contingency Plan Part B**



NWA B-Resources  
(Jan 2012).pdf

## **Appendix F**

## **Sub Area Contingency Plan Part C**



NWA C-HazMat (Jan  
2012).pdf

## **Appendix G**

## **Sub Area Contingency Plan Part D**



NWA D-SensAreas  
(Jan 2012).pdf

## **Appendix H**

## **Sub Area Contingency Plan Part E**



NWA E-Background  
(Jan 2012).pdf

## **Appendix I**

## **Sub Area Contingency Plan Part F**



NWA F-Scenarios  
(Jan 2012).pdf

## **Appendix J**

## **Sub Area Contingency Plan Part G**



NWA G-GRS (Jan  
2012).pdf

## **Appendix K**

## **Sub Area Contingency Plan Part H**



NWA H-PPOR (Jan  
2012).pdf

## **Appendix L**

### **Unified Plan Intro**



1-Intro (Jan10).pdf

## **Appendix M**

### **Unified Plan Annex B**



Annex B (Jan 10).pdf

## **Appendix N**

### **Unified Plan Annex C**



Annex C (Jan 10).pdf

## **Appendix O**

### **Unified Plan Annex D**



Annex D (Dec 15).pdf

## **Appendix P**

### **Unified Plan Annex E**



Annex E (Jan 10).pdf

## **Appendix Q**

### **Unified Plan Annex F**



Annex F  
Appendix1(Jan 16).pd

## **Appendix R**

### **Unified Plan Annex G**



Annex G (Oct  
2012).pdf

## **Appendix S**

### **Unified Plan Annex H**



Annex H (Jan 10).pdf

## **Appendix T**

### **Unified Plan Annex I**



Annex I (Jan 10).pdf

## **Appendix U**

### **Unified Plan Annex K**



Annex K (Jan 10).pdf

## **Appendix V**

### **Unified Plan Annex L**



Annex L (Jan 10).pdf

## **Appendix W**

### **Unified Plan Annex N**



Annex N (Jan 10).pdf

## **Appendix X**

### **Unified Plan Annex O**



Annex O (Jan 10).pdf

## **Appendix Y**

### **Unified Plan Annex P**



Annex P (Jan 10).pdf

## **Appendix Z**

### **Arctic Oil Spill Response Research**



3 Arctic Oil Spill  
Response Research \_ |

## **Appendix AA**

### **Deepwater Horizon Incident**



Deep Water Horizon  
Incident Specific Prep:

### **Appendix AB**

## **Guidelines and Strategies for Oil Spill Waste Management in Arctic Regions Final report**



Guidelines and  
Strategies for Oil Spill

### **Appendix AC**

## **North Slope Borough Workshop Report**



NorthSlopeBorough\_  
workshop\_report\_FIN.

### **Appendix AD**

## **MOSPA**



MOSPA.pdf

### **Appendix AE**

## **Clean Water Act**



Clean Water Act.pdf

### **Appendix AF**

## **Oil Spill Response Field Guide**



oil-spill-response-fiel  
d-guide.pdf

## Appendix AG

### Canadian-US Joint Marine Pollution Contingency Plan



Canadian Unified  
Plan.pdf