An ADAC and Partnered Arctic Medium & Long Term Environment (MaLTE) Workshop Report, 30 September

The Blue Economy...

Identifying Northern Industry Opportunities.

A Partnered effort by: ADAC, UAA BEI, UIC-Science and AOC

Medium and Long Term Environment (MaLTE) Workshop.

Workshop Partners
The Blue Economy, Identifying Northern Industry Opportunities

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Executive Summary

In June 2019, the Arctic Domain Awareness Center (ADAC), together with the Alaska Ocean Cluster (AOC), the Center for Economic Development (CED), and the Alaska Center for Rural Collaboration (ACRC) conducted an inaugural workshop in Utqiaġvik, Alaska, called “The Blue Economy: Identifying Northern Industry Opportunities.” The workshop explored the creative and evaluative processes at the heart of developing an idea into a business, with a particular emphasis on business opportunities presented by a “Blue Economy” in an Arctic context.

The intent of the workshop was two-fold. First, the workshop sought to teach participants the process in which an idea can be evaluated for its business potential. Second, the workshop aimed to introduce the concept of Blue Economy into the Arctic by exploring its potential applications. Throughout the workshop, it became evident that local Arctic residents have countless innovative and creative ideas on how to capitalize on Blue Economy opportunities in the region. However, it was simultaneously apparent that the available resources to do so are not entirely clear. As a result, this report strives to achieve three major goals. First, this report will provide the context to the workshop by discussing the concepts of Blue Economy, entrepreneurship, and their applications in an Arctic context. Next, it will summarize the methods and findings of the workshop. Lastly, this report seeks to provide the resources and contacts for readers interested in pursuing their innovative Blue Economy ideas in the world of entrepreneurship.
Acknowledgements

ADAC extends our sincerest appreciation to a remarkable team of professionals who supported this workshop...starting with the workshop partners at CED, ACRC (housed within the UAA Business Enterprise Institute), and AOC. Their individual and collective investment in this workshop has provided an immense amount of insight into small business development and the development of a Blue Economy.

Accordingly, ADAC, CED, ACRC, and AOC are very appreciative of the efforts of the following workshop planners, organizers, supporters and collaborators. This workshop would not have been possible without the invaluable contributions of the following organizations:

- Ukpeaġvik Iñupiat Corporation (UIC)
- The University of Fairbanks College of Fisheries and Ocean Sciences (CFOS)
- The University of Alaska (UA)
- The Barrow Arctic Research Center (BARC)
- North Slope Borough Emergency Management
- The City of Utqiagvik Alaska

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**Introduction to Blue Economy**

Oceans and seas cover more than 70% of the earth’s surface, representing the largest natural asset on the planet\(^1\). To name only several of its countless benefits, the ocean is responsible for the oxygen we breathe, it supplies a myriad of nutrients for humanity’s needs, it serves as a highway for both transportation and traded goods, it helps to regulate our climate and weather, and it provides livelihoods and income to billions of the earth’s residents\(^1\). As such, in January 2016, the United Nations dedicated Goal 14 of its 17 Sustainable Development Goals (SDGs) to sustainably conserving and utilizing the earth’s oceans, seas, and marine resources for sustainable development\(^2\).

While the term “Blue Economy” can be referred to as a “buzzword,” containing a plethora of definitions depending on the context, the concept can be generally understood as the use of water resources\(^3\) to increase socio-economic and human wellbeing, while reducing environmental risks and ecological scarcities\(^4\). As such, the mission of a Blue Economy takes a two-fold approach to addressing SDG 14. On one hand, Blue Economy initiatives recognize the necessity to protect the ocean, as the existing resource supplies food and livelihoods to billions of people. On the other hand, Blue Economy calls to action the need to enhance sustainable economic activity by utilizing the ocean’s resources, particularly when referencing coastal communities\(^1\). Beneath its broad umbrella lies the introduction of innovative market-based technologies aimed at increasing cash flow, job opportunities, economic development, and subsequently, improved economic security\(^5\).

With broad applications, the United Nations has designated six major sectors of Blue Economy: 1) harvesting and trade of living marine resources; 2) extraction and the use of non-living resources; 3) renewable energy; 4) commerce and trade; 5) technology; and 6) indirect contributions. Given the breadth of each of the latter sectors, each individual sector further contains a myriad of industry opportunities as subsectors\(^2\). Figure 2 on the following page lists the major categories of Blue Economy, as well as several industry examples of each.
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*Figure 2 – A list of the six overarching sectors of Blue Economy as determined by the United Nations, along with examples of their subsector industries. Image sources: Pixabay.com.*
Introduction to Entrepreneurship

How does Blue Economy relate to Entrepreneurship? In order to answer this, let us first discuss the meaning of “entrepreneurship.” The concept of entrepreneurship has many definitions. For instance, the Oxford Dictionary defines entrepreneurship as “the activity of setting up a business or businesses, [and] taking on financial risks in the hope of profit,” whereas the Merriam-Webster dictionary defines it as “the activity of organizing, managing, and assuming the risks of a business enterprise.” Alternatively, the Cambridge Dictionary defines entrepreneurship as “skill in starting new businesses, especially when this involves seeing new opportunities.” Evidently, the meaning of the term is somewhat ambiguous. Furthermore, while these definitions may be applicable in many circumstances, utilizing a singular definition for such a broad concept has the potential to limit those with innovative ideas, who may not know that their ideas could have entrepreneurial potential. Therefore, rather than using one definition to describe “entrepreneurship,” this report will use the many characteristics used to describe an “entrepreneur” to show its readers that entrepreneurship is not just for the experts (Figure 3).

While the list of characteristics depicted in Figure 3 illustrates that entrepreneurship is perhaps not for the faint of heart, it also demonstrates that ideas of entrepreneurial potential are not

![Figure 3 – Commonly used terms to describe "entrepreneurs."](image-url)
reserved for the business savvy. Rather, they arise from a compilation of basic character traits that fuel individuals and/or organizations to create change.

Now that we have introduced the topics of Blue Economy and entrepreneurship, the following section will delve deeper into the intersection between these concepts, and discuss why this juncture is important to economic security in the U.S. Arctic in particular.

**Blue Economy and Entrepreneurship in Alaska**

Alaska exhibits a notable disparity regarding the geography of economic opportunities distributed throughout the state\(^\text{11}\). In particular, there is a pronounced urban-rural divide when it comes to income levels, unemployment rates, and the cost of living\(^\text{11}\). For instance, in July 2019, the State of Alaska Department of Labor and Workforce Development released a report stating that five of Alaska’s thirty census boroughs exhibited an unemployment rate of at least 12%, or four times the national average. Together, these boroughs represent 78% of Alaska’s total land area and only 6% of the population\(^\text{12}\). Alternatively, Alaska’s two Metropolitan Statistical Areas (MSA), Anchorage/Mat-Su and Fairbanks, which represent 68% of the State’s population, exhibit unemployment rates of 5.1% and 4.8%, respectively\(^\text{11}\) (Figure 4). Contributing to this urban-rural divide are the high costs of utilities, transportation, and infrastructure in rural Alaska.

How do these statistics relate to entrepreneurship and Blue Economy in Alaska? Alaska’s mainland alone (excluding the State’s many islands) boasts approximately 6,640 miles of coastline – amounting to more than the coastlines of the United States’ remaining 49 states combined\(^\text{13}\). In addition, Alaska contains more than 40% of the nation’s surface water resources, with approximately 12,000 rivers and 3 million lakes greater than 5 acres\(^\text{14}\). With unparalleled access to “blue”

Figure 4 - Map of Alaska illustrating the rate of unemployment in the state’s 30 census boroughs\(^\text{12}\).
resources, Alaska’s entrepreneurial minds may have the potential to improve the existing economic divide by capitalizing on these resources to increase economic diversification.

In addition, as stated previously, at the core of Blue Economy lies the mission to reduce environmental risks and ecological scarcities. The rapidly changing environment in the Arctic is inducing a host of changes on Alaska’s blue resources, threatening not only marine and aquatic ecosystems, but also the health and well-being of the humans that rely on these systems for both subsistence and economic purposes. For example, the region is experiencing increased ocean acidification, declining sea ice, thawing permafrost, and shifting food web dynamics. The consequences of these changes include, but are not limited to, increased coastal erosion and exposure to storm surges, infrastructure damage, danger and difficulty hunting for subsistence species, and increasing ice-related injuries and deaths\textsuperscript{15} (see Figure 5 for illustration of these damages). These challenges do not only warrant action to protect the available water resources, but also further represent the need to develop a resilient and diversified economy in Alaska, as environmental changes continue to threaten existing sources of food and income.

\textbf{Figure 5} – A series of images illustrating the impacts of coastal erosion in rural Western Alaska\textsuperscript{15}.
Workshop Context

We know that many Arctic residents already derive their subsistence and livelihoods from the sea. Thus, as we look to the future, it is possible that Arctic residents will have unique and viable applications for cultivating a “Blue Economy” that could greatly benefit the region’s residents, particularly those who already have strong ties to the blue environment. *The Blue Economy: Identifying Northern Industry Opportunities* workshop sought to take this theory to action.

The Blue Economy workshop method brought together a collection of innovative minds for an exploratory discussion of Alaska’s “blue” opportunities. In particular, as the future inheritors and innovators of tomorrow’s Arctic Domain, the workshop focused on the perspectives of young adults (specifically coastal residents, 18 years and older) in order to gather insight into sustainably capitalizing on the ocean’s resources for the benefit of the Arctic and its residents. With young adults as the focus, the workshop took an interactive and collaborative approach amongst the general public, industry experts, Blue Economy experts, entrepreneurial advisors, and academics.

The workshop followed a series of activity sessions developed in collaboration amongst the workshop planners. Sessions took a variety of formats, including interactive group activities, presentations by both experts and participants, and roundtable discussions. This engaging and interactive approach aimed to create a comfortable and creative space for workshop participants to explore and develop ownership of the opportunities presented by a Blue Economy. Furthermore, not only did the workshop present an opportunity for all individuals to learn more about the realm of Blue Economy, but also to learn from each other. The following sections will delve deeper into the methods and discussions that took place during the workshop.
**Workshop Method and Overview**

The workshop’s method and agenda was a product of collaboration between CED and ADAC. As stated in the previous section, the event sought an interactive and creative approach, with the aim to create a supportive and inclusive atmosphere that encouraged both individual and group innovation. As such, the activities included in the workshop largely encompassed group activities, team presentations, and participatory brainstorming. Not only was this method designed to level all participants to an equal platform, but also to allow each participant to create and maintain ownership of their unique and innovative ideas.

The workshop agenda was composed of two major sessions. The first session sought to teach workshop participants of the process in which ideas can be evaluated for their business potential, particularly those with an entrepreneurial focus. The second theme was centered on the topic of Blue Economy, and included a series of presentations and roundtable discussions facilitated by experts in the field. The following sections will provide a detailed summary of the material covered in each of the two workshop sessions.

**Workshop Session 1**

Workshop Session 1 provided participants with the tools and resources to develop their own entrepreneurial ideas, and explored the various avenues in which these ideas should travel before they can be formulated into a potential business. This process consisted of four main segments:
Ideation

Designed by UAA CED, the ideation activity (also called a “mash-up” activity) included the combining of two distinct concepts into one creative and innovative idea. While these ideas were not always feasible, the activity forced wheels to churn as participants considered which rare combinations may actually have potential as business schemes. In order to begin this activity, participants were given one minute to create a list of technologies created in the last 20 years. These technologies were then combined, or “mashed,” with a list of as many ocean-related activities as they could think of in one minute (Figure 6). In doing so, participants created novel ocean-related technologies. While some ideas were clearly more practical than others, the feasibility and applicability of these ideas were explored in the following activity segment, prototyping.

Prototyping

During the prototyping session, participants further developed and refined the business ideas they created during the “Ideation” activity. To begin the process, participants were separated into six distinct breakout groups. Each group then selected their most favorable business scheme from the ideas created by individual group members during the previous activity. Each group’s top choice was selected based on their determination of its viability, feasibility, desirability, and sustainability. Next, to prototype the product, each group illustrated a visual model of their selected business scheme. For example, Figure 7 depicts a group’s illustration of their created product, a hazard warnings phone application called “Go Fish.” The idea behind “Go Fish” was to develop a phone application that fishermen could use as a “one-stop-shop” for information regarding environmental conditions, safety hazards, subsistence preparation, fish identification, local guide suggestions, and much more.

Figure 7 - The visualization of “Go Fish,” a prototyped phone application created by workshop participants. The drawing of the application face is on the left, and the benefits and details of the application are listed on the right.
Customer Discovery

Following the “Prototyping” session was “Customer Discovery,” in which groups were required to brainstorm the potential customers of their prototyped products. In order to do so, participants were asked to create “user personas” for their products by identifying what the potential goals, behaviors, and demographics of their product’s users might be. Once several user personas were identified, participants were then asked to identify their “best user,” or in other words, their primary customer. The identified primary customer was next used to develop their targeted sales pitch.

Pitching

In order to practice “pitching” their products to their identified primary customers, each group was tasked with creating a 30-second sales pitch to present to the entire workshop. Each pitch was designed to show potential investors that the homework had been done, and that there was a high likelihood that the product would succeed in the market. The image below (Figure 8) depicts one workshop group “pitching” their prototyped product to the room of workshop participants.

Figure 8 - A workshop group is pitching the product they developed during Session 1 of the workshop.
Workshop Session 2

The second session of the workshop was composed of presentations by academics, local residents, workshop planners, and industry experts regarding current and potential Blue Economy opportunities specific to Alaska. Presentations were made by Mr. Craig Fleener from the Alaska Ocean Cluster (AOC), Ms. Richelle Johnson from the Center for Economic Development (CED), Dean Dr. Bradley Moran from the University of Alaska Fairbanks (UAF), and Mr. Nagruk Harcharek from Ukpeaġvik Iñupiat Corporation (UIC).

Presentation 1 - Blue Economy through an Alaska Lens

Alaska Ocean Cluster’s Mr. Craig Fleener

Followed by UAA CED’s Ms. Richelle Johnson

The first presentation was given by Craig Fleener, Executive Director of the AOC, and Richelle Johnson, Lead Analyst at CED. This presentation contextualized Blue Economy through an Alaskan lens, as well as presented further avenues for opportunity. Mr. Fleener and Ms. Johnson began by challenging participants to consider how Alaska could increase its involvement in the Arctic by utilizing ocean-based economic opportunities. Mr. Fleener noted that Iceland was a model example in this regard.

Next, Mr. Fleener presented general statistics and facts about Alaska. He stated that the majority of products generated by the ocean economy in Alaska are exported. Furthermore, the state has a high cost of living, which is partially spurred by the high cost of shipping goods and services to the state. Regarding potential economic opportunity, Mr. Fleener mentioned that 20% of the private sector jobs are related to the ocean. Due to these facts, Mr. Fleener highlighted that Alaska has tremendous potential in fourteen specific Blue Economy industries, which are listed in Figure 9 below.

Figure 9 - List of Alaska’s current and potential Blue Economy industries according to Mr. Craig Fleener of the Alaska Ocean Cluster (image adapted from the AOC website).
Following Mr. Fleener, Ms. Johnson discussed emerging economic opportunities in the Blue Economy in Alaska, and potential opportunities for the future. Renewable energy, biotechnology, micro-air vehicles, and climate change solutions were all touted as potential emerging sectors to be explored. Additional options presented by the team included tidal and wave-powered generators, the potential for whalers to share their ice and navigational knowledge with shipping companies, utilizing seaweed as a potential packing material, and bio-prospecting.

**Presentation 2 – Roundtable Discussion with Mr. Craig Fleener**

The second presentation took the format of a lunchtime roundtable discussion facilitated by Mr. Fleener, oriented towards the origins and overall mission of the AOC. The vision and organization of AOC was inspired by the Icelandic Ocean Cluster, which was formed as a collaboration amongst researchers and fishermen after Iceland’s fish harvest cap was reduced. Similarly, the AOC was founded by Karen Gilliset of the Bering Sea Fisherman’s Association, an organization established to give commercial fishermen a voice in sustainably developing the fishery resources of the Bering Sea and western Alaska.  

AOC has three major focus areas: business incubation, mariculture, and building cluster houses. Business incubation entails growing scalable, innovative ocean related businesses in Alaska, with the goal of increasing the capacity and resiliency of the Alaskan economy, specifically in coastal communities. Incubation is intended to build greater market share, increased revenues, expanded workforce, and export potential of marine-based companies. Support is provided through investment support and through a mix of non-profit and for-profit support.

The purpose of AOC’s mariculture strategy is to support community-based mariculture as an economic driver in coastal Alaska, while enhancing the availability of mariculture resources under sustainable management principles. Furthermore, the program seeks support and investment, builds public support, develops new markets and products, and aims to grow the mariculture workforce in support of the work done by the Alaska Mariculture Task Force.

Mr. Fleener further explained that global seaweed markets exceeded $4 billion USD in 2017, and projections estimate that the market will exceed $9 billion in 2024. Therefore, seaweed mariculture presents a significant and sustainable economic opportunity for Alaska, especially with
increasing worldwide demand for seaweed for food, health and beauty products, animal feed, medical biotechnology, bioplastics, and biofuels.

Lastly, AOC’s cluster houses are designed as a coalition of private, public and academic stakeholders, forming around a base industry. This layout is aimed to support both the industry and surrounding stakeholders through economic transactions and circulated assets to create a combination of standard office space boosted by an Innovation Center. The houses include both custom office space for lease, private offices, and open workspace, with shared meeting rooms, access to technology, and common spaces. The houses focus mainly on ocean-related companies, but also incorporate industries with the potential to add to the seafood value line, such as research, marketing, product design, supporting services, etc. These cluster houses are envisioned as a space for ocean sector entrepreneurs and small businesses to come together and synergize for problem solving strategies, development, collaboration, industry needs, networking, and marketing.18

Presentation 3 – UAF CFOS Dean, Dr. Bradley Moran

The third presentation given during the workshop’s second session was by Dr. Bradley Moran, Dean of the University of Alaska Fairbanks (UAF) College of Fisheries and Ocean Science (CFOS), as well as founder and Executive Director of UAF’s new Alaska Blue Economy Center (ABEC).

Dr. Moran first began his discussion by recounting his personal journey towards becoming Dean of CFOS. In 1990, Dr. Moran graduated with a Ph.D. in Oceanography, and was interested in advancing his qualifications with a Master’s in Business Administration (MBA). However, at the time, no MBA programs existed that involved oceanography. As a result, Dr. Moran went on to play a pivotal role in the creation of a Blue MBA at the University of Rhode Island (URI) – a program that focused on his desired intersection between business and the ocean’s resources. The first of its kind, the Blue MBA is a dual degree program that combines an MBA with a Master’s in Oceanography. Upon completion of the program, numerous opportunities emerged in his career, such as an appointment to an administrative position at URI, followed by an executive branch position in Washington, D.C.

Now living and working in Fairbanks, Alaska, Dr. Moran’s background served as a foundational component to the recent creation of the Blue MBA at UAF. The UAF Blue MBA program combines an accredited Master of Business Administration in the School of Management (SOM) with a concentration in fisheries, marine biology and oceanography, offered through the CFOS.19 Based at America’s Arctic University, the UAF Blue MBA degree program is designed to increase the marketability and workforce opportunities for individuals interested in pursuing a career focused on the intersection of business and aquatic resources.

Dr. Moran’s discussion of the Blue MBA program segued into his introduction of the new ABEC, also located at UAF. The aim of ABEC is to serve as a source of support for research, education, training, and outreach related to Alaska’s immense marine and aquatic resources and ecosystems. In particular, ABEC seeks to advance the research and education opportunities found in the fisheries, subsistence, mariculture, energy, coastal tourism, marine observing, and technology industries. Such
advancement includes the support of innovative strategies to grow Alaska’s entrepreneurial community, while diversifying economic opportunities throughout the State and its communities.

Foundational to ABEC is the notion that the rapidly changing Arctic creates cascading implications on the region’s marine and aquatic ecosystems, as well as those that depend on their ample resources. Therefore, during times of such rapid environmental change, ABEC aims to focus its efforts on the intertwined relationship between Alaska’s environmental and fiscal challenges in order to position the state to grow a healthy Blue Economy into the future.

**Presentation 4 – UIC Science’s Mr. Nagruk Harcharek**

Following Dr. Moran was a presentation by Mr. Nagruk Harcharuk, the Director of Barrow Operations for the Ukpeaġvik Inupiat Corporation (UIC). Mr. Harcharuk detailed the context of Utqiaġvik’s history with the field of Arctic research, and its somewhat limited economic opportunity in terms of exports. Utqiaġvik has a long history with research, which has been an important part of the village since the 19th century. In fact, Utqiaġvik is the only Alaska Native village with territory specifically designated for research (the 7,466-acre Charles Etok Edwardsen Barrow Environmental Observatory). In addition, Mr. Harcharuk noted that a deep-water port could dramatically change the structure of Utqiaġvik’s economy, as importing and exporting goods would perhaps become more feasible.

Lastly, Mr. Harcharuk stated that the next-generation of local leaders will need to come from within the local community, closing on the note that people from both higher and lower education will be needed in the future, as both offer irreplaceable skillsets.
Workshop Conclusion

The Blue Economy: Identifying Northern Industry Opportunities Workshop was a light-hearted, entertaining, and truly enlightening gathering of community-oriented individuals with a passion for Arctic economic security. The complex issues impeding the growth and diversification of Arctic economies are challenges that must be faced head-on with enthusiasm, innovation, and creativity. These characteristics were clearly exposed in each of the workshop participants as a collaboration of unique and diverse perspective were leveraged to brainstorm novel approaches to a Blue Economy in the Arctic. However, as highlighted by the workshop participants, finding innovative and entrepreneurial minds is not the challenge, it is the difficulty of finding available resources to take their innovative ideas to action that pose the greatest hurdle. On the pages that follow, this report will attempt to provide some of the resources available to those interested in pursuing a potential small business, while also providing several inspirational examples of both emerging and present opportunities in the realm of Blue Economy in the Arctic. That said, these resources and examples are by no means exhaustive, their intent is to simply provide a starting point for any budding entrepreneurs reading this report.

Figure 12 - Workshop related illustrations
The Intersection of Blue Economy and Entrepreneurship: Case Studies from Alaska

Throughout the workshop, numerous participants and presenters referred to the notion that the state of Alaska has begun to explore Blue Economy opportunities in several sectors, but many sectors remain largely untapped. The following section will illustrate these comments by providing several examples of existing case studies from the Arctic.

Emerging Opportunities

Case Study 1: Arctic Seafloor and Navigational Mapping

The Arctic Ocean has historically been one of the least studied environments on our planet. Consequently, navigational charting and seafloor mapping activities in the region has been relatively minimal. Combined with a variable and extreme climate, uncharted sea ice, and limited telecommunications, most economic activity in the region faces a high amount of risk. Discussion around increased shipping traffic\(^2\) and offshore drilling in the arctic\(^2\) has brought some of these discussions to a head.

A Pew Charitable Trust 2014 analysis on the topic noted that a number of immediate resources are needed for safer economic activities in the Arctic:

- Updated hydrographic charting,
- Added aids for navigation, and
- Improved weather forecasting.\(^2\)

While Unmanned Marine Vehicles offer one solution, providing increased capacity to NOAA’s charting activities, subsistence hunters in the Arctic are also providing entrepreneurial solutions to one area of concern mentioned above, finding solutions to changing and variable sea ice. One subsistence hunter, from Shishmaref, Alaska, has begun using a drone to chart increasingly variable sea ice.\(^2\)

While subsistence hunters have long been the leading authority on ice conditions in the Arctic, use of a drone to chart routes across the sea ice is an innovative solution to the increasing issue of changing sea ice patterns. It enables hunters to chart the safest path across the ice, but also saves...
them time. The drone can go farther easier, enabling hunters to extend their range, “instead of having to go out and just mess around on the ice.”

**Case Study 2: Arctic Marine Bioprospecting**

Bioprospecting is the search for and identification of organisms for pharmaceutical purposes, nutraceutical uses, feedstock, cosmetics, bioenergy, and more. Bioprospecting occurs across the globe; however, the marine environment is experiencing increasing attention, especially in the Arctic.

Focus has settled on the Arctic for a number of reasons. First, the extreme conditions of the Arctic have evolved specialized organisms adapted to thriving in harsh environments. Second, there is comparatively little scientific knowledge of the Arctic so the potential for discovery is large.

The Norwegian government has identified marine bioprospecting as an area of economic opportunity. Norway’s MabCent project has been sampling locations around the Arctic Svalbard archipelago since 2007. The team has collected more than 1,000 species of invertebrates and microalgae.

While the potential of bioprospecting in the Arctic is immeasurable, as activities in this realm increase so do the concerns over indigenous values and rights. Intellectual property, conservation of subsistence resources, and rights over natural resources are all areas of unease, which have all caught the attention of the Inuit Circumpolar Council.

Traditional indigenous knowledge as it relates to bioprospecting is one area where Arctic communities could have an advantage. Although not marine based, one example of entrepreneurship in this realm is Western Alaska based cosmetics company, ArXotica. The company uses plants and berries harvested from the tundra around Bethel to manufacture cosmetics and soaps.

Another example, Alaska based Arctos Pharmaceuticals, holds a patent for a product using blueberry plants. The company has stated that it is “reliant on assistance provided by local indigenous communities to source appropriate plants based on indigenous traditional knowledge”, and holds contracts with several Alaskan Native corporations to source its products.
Case Study 3: Unmanned Marine Vehicles

In 2015, the National Oceanic and Atmospheric Administration completed its first survey of the Arctic Ocean using an unmanned marine vehicle (UMV). The project was made possible by an Alaskan based company, TerraSond, which had worked, designed, and commissioned an unmanned surface vehicle for remote sensing and mapping.30

While TerraSond has a long history in Alaska, their use and development of UMVs is relatively recent and is increasingly valuable to their activities. Use of UMVs allows the company to double its productivity with a more efficient cost model. TerraSond is also using UMVs for offshore wind applications in Texas and the east coast of the United States.31

Since 2015, TerraSond has designed and used a number of UMVs. The company’s services are sought by clients in oil and gas, pipeline, power, telecom, renewable energy, mining, shipping, dredging, construction, and engineering sectors as well as by federal, state, local, and foreign government agencies, and UMV applications can be applied to almost all of those services.32

On another frontier, scientists at the University of Alaska Fairbanks have developed and tested autonomous underwater gliders.33 These gliders have been used to collect data in a number of areas: including, marine biomass movements, the effect of shipping noise on marine mammal migration, and the ecological impacts on a changing Arctic.34
Examples of Existing Blue Economy Industries and Businesses in Alaska

**River Powered Turbine Generator – Kvichak River, Igiugig, AK**

In July 2019, the Southwest Alaska Native Village of Igiugig received the first underwater twin-turbine generator. The generator creates a source of renewable energy that frees Igiugig’s residents from dependency on costly diesel fuel that can only be acquired by barge or plane. The new generator will supply half of the town’s electricity, and up to ninety percent with one more device scheduled to be installed in 2020.35

**UIC Science and the Barrow Arctic Research Center - Utqiaġvik, AK**

The Ukpeaġvik Inupiat Corporation (UIC) is one of Alaska's largest companies, and is headquartered in Utqiaġvik (formerly called Barrow), Alaska. As an Alaska Native Corporation, UIC provides social and economic resources to over 2,900 Inupiat shareholders and their descendants. In 1992, UIC set aside 7,400 acres of private land for scientific research when it created the Barrow Environmental Observatory. Every year, researchers come from all over the world to study the Arctic at the Barrow Environmental Observatory, extending into research of the surrounding marine and aquatic environments. The researchers play an important role in Utqiaġvik’s local economy as they utilize their local resources (accommodations, food, supplies, etc.) to accomplish their research. UIC states that "[w]e believe that by supporting western science we ultimately support the Inupiat way of life."36

For more information, visit UIC’s website at: [https://uicalaska.com/our-lands/science-support/](https://uicalaska.com/our-lands/science-support/).
**Barnacle: Coast to Kitchen – Juneau, AK**

Barnacle: Coast to Kitchen is a local food business that makes a variety of products from Bull Kelp sourced in Southeast Alaska. Started by two lifelong Alaskans, Barnacle is known for their salsas, pickles, and seasonings. Their products are now distributed throughout the state, as well as used in local restaurants. For more information, visit their website at: https://www.barnaclefoods.com/pages/news.

**Salt & Soil Marketplace – Juneau & Haines, AK**

Salt & Soil Marketplace is an online community marketplace that connects Southeast Alaska food consumers and growers, fishermen, foragers, and gardeners with real-time shopping. Each week, Salt & Soil Marketplace vendors (such as fishermen, growers, foragers, and gardeners) post their catch or crop to the online system in which members can select their products for purchase. Once the vendors receive their order, all items are sent to a central pick-up location in Juneau or Haines for members to collect their goods. Salt & Soil taps into the needs and desires of local Alaskans to be able to sell and consume local goods, recycling cash flow into local economies. For more information, visit their website at: https://www.saltandsoilmarketplace.com/.

**Tourism – Arctic, AK**

Numerous tour companies throughout the state of Alaska have capitalized on the draw of the Arctic domain by providing unique tours, such as Arctic Circle tours and polar bear viewing. Several participants of the Blue Economy: Identifying Northern Industries workshop felt that tourism in the Arctic region could be expanded, particularly emphasizing the use of local rural Alaska guides as opposed to non-locals.
## List of Resources

### Small Business Advising

<table>
<thead>
<tr>
<th>Resource</th>
<th>Description</th>
<th>Website</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Alaska Small Business Development Center</td>
<td>The Alaska SBDC provides resources, advice, and assistance that help small businesses grow and create measurable economic impact throughout Alaska. Assistance is provided by experienced business advisors and experts through on-site and/or online interactions or training, and at no cost to clients.</td>
<td><a href="https://aksbdc.org/">https://aksbdc.org/</a></td>
</tr>
<tr>
<td>The Alaska Ocean Cluster - Blue Pipeline Incubator (BPI)</td>
<td>The purpose of BPI is to cultivate and grow scalable, innovative ocean-related businesses in Alaska. The goal of BPI is to increase the capacity and resiliency of the Alaskan economy specifically in coastal communities. BPI is designed to build greater market share, increased revenues, expanded workforce, and export potential of marine-based companies.</td>
<td><a href="https://www.alaskaoceancluster.com/engage/blue-pipeline/">https://www.alaskaoceancluster.com/engage/blue-pipeline/</a></td>
</tr>
<tr>
<td>The State of Alaska Small Business Assistance Center</td>
<td>The Small Business Assistance Center provides direction for entrepreneurs, start-ups, and existing businesses in Alaska. In particular, the Center's online website serves as a resources list for events and training, marketing and export support programs, financing, licenses and permits, tax information, competitions, and research.</td>
<td><a href="https://www.commerce.alaska.gov/web/ded/DEV/SmallBusinessAssistanceCenter.aspx">https://www.commerce.alaska.gov/web/ded/DEV/SmallBusinessAssistanceCenter.aspx</a></td>
</tr>
<tr>
<td>Anchorage Economic Development Center</td>
<td>AEDC is a private nonprofit corporation (IRS code 501(c)(6)), operating since 1987. It exists to encourage growth and diversity in the Anchorage economy, promote a favorable business climate and improve the standard of living of Anchorage residents. Funding sources for the corporation are private contributions, municipal and state grants and contracts.</td>
<td><a href="https://aedcweb.com/about/">https://aedcweb.com/about/</a></td>
</tr>
</tbody>
</table>
### Workshops and Engagement Opportunities

| **The Alaska Ocean Cluster - Ocean Tuesdays** | Ocean Tuesday is a weekly webinar that offers key players in the blue economy a platform to discuss their ideas, industries, and challenges. Started in 2017, Ocean Tuesday took off quickly, and now has more than 80 speakers in its alumni base. Ocean Tuesday is open to anyone in the public and represents our most community-focused, public-oriented program.  

**Website:** [https://www.alaskaoceancluster.com/engage/ocean-tuesday/](https://www.alaskaoceancluster.com/engage/ocean-tuesday/) |
|---|---|
| **Launch Alaska - Tech Deployment Track** | Launch Alaska pairs startups with decision makers to validate technologies and scope projects for deployment. Startups work with investors, policy wonks and customers in a collaborative and structured event—all focused on getting solutions to the companies and communities who need them most.  

**Website:** [http://www.launchalaska.com/fall-19](http://www.launchalaska.com/fall-19) |
| **The Alaska Ocean Cluster - Ocean Technology Innovation Sprint (OTIS)** | The Ocean Technology Innovation Sprint (OTIS) is an elite program based on the Google Ventures Sprint process engaging designers, engineers, marketers, finance and startup enthusiasts, forming interdisciplinary teams. These teams experience the excitement of ideation to solve big challenges in Alaska’s blue economy – the sustainable and impactful development of our ocean resources.  

**Website:** [https://www.alaskaoceancluster.com/engage/ocean-technology-innovation-sprint/](https://www.alaskaoceancluster.com/engage/ocean-technology-innovation-sprint/) |
| **The Center for Economic Development** | The Center for Economic Development (CED) overs a suite of services, such as applied research, planning and development, entrepreneurial development, and professional development.  

**Website:** [https://ua-ced.org/services](https://ua-ced.org/services) |
| **Alaska Startups** | Alaska Startups originated with the startup community itself. The University of Alaska Center for Economic Development manages Alaska Startups as a community-owned initiative, and offers a number of resources for the startup community such as a list of events and funding resources.  

**Website:** [https://www.alaskastartups.com/alaska-startups](https://www.alaskastartups.com/alaska-startups) |
<table>
<thead>
<tr>
<th>Funding Resources</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alaska Startups - Funding Search Engine</strong></td>
<td>Alaska Startups provides a &quot;Directory&quot; in which startups can search for funding opportunities using a filtered search engine tool.</td>
</tr>
<tr>
<td><strong>Website:</strong></td>
<td><a href="http://directory.alaskastartups.com/">http://directory.alaskastartups.com/</a></td>
</tr>
<tr>
<td><strong>The Alaska Center for Rural Collaboration</strong></td>
<td>The Alaska Center for Rural Collaboration lists a number of resources and contacts for funding small business ventures - whether they are in the startup phase or needing additional support.</td>
</tr>
<tr>
<td><strong>Website:</strong></td>
<td><a href="https://www.alaskacrc.com/funding">https://www.alaskacrc.com/funding</a></td>
</tr>
<tr>
<td><strong>The Alaska Center for Rural Collaboration</strong></td>
<td>Coming soon, the Alaska Center for Rural Collaboration will offer a filtered funding database tool for individuals, organizations, and current businesses in rural Alaska looking to fund their current or future business.</td>
</tr>
<tr>
<td><strong>Website:</strong></td>
<td><a href="https://www.alaskacrc.com/funding-database">https://www.alaskacrc.com/funding-database</a></td>
</tr>
<tr>
<td><strong>Spruce Root</strong></td>
<td>Spruce Root provides local entrepreneurs with access to business development and financial resources in the form of loan capital, business coaching, workshops, and competitions. Together, these programs support both new and existing businesses in Southeast Alaska and empower business owners through increased self-sufficiency.</td>
</tr>
<tr>
<td><strong>Website:</strong></td>
<td><a href="https://www.spruceroot.org/">https://www.spruceroot.org/</a></td>
</tr>
<tr>
<td><strong>United States Department of Agriculture (USDA) - Rural Development Grants</strong></td>
<td>The USDA's Rural Development Grants program is designed to provide technical assistance and training for small rural businesses. Small means that the business has fewer than 50 new workers and less than $1 million in gross revenue. Those that can apply include: towns, communities, state agencies, nonprofit corporations, federally-recognized tribes, rural cooperatives, and institutions of higher education.</td>
</tr>
</tbody>
</table>
About the Workshop & Report Collaborators

The Arctic Domain Awareness Center (ADAC)

The Arctic Domain Awareness Center (ADAC) is a U.S. Department of Homeland Security (DHS) Science and Technology (S&T) Center of Excellence in Maritime Research, hosted by the University of Alaska. ADAC’s principle customer is the United States Coast Guard (USCG). The Center investigates capability shortfalls and gaps, and orients research activity to support USCG needs as they relate to the Arctic domain, particularly supporting search and rescue, humanitarian assistance, disaster response, and security matters. ADAC’s mission is to develop and transition technology solutions, innovative products, and educational programs to improve situational awareness and crisis response capabilities related to emerging maritime challenges in the dynamic Arctic environment.

The University of Alaska Center for Economic Development

Co-leading the workshop is the University of Alaska Center for Economic Development (CED). The Center is a university-based partnership promoting economic diversity through entrepreneurship, community building, and action oriented strategy. CED is a program of the University of Alaska Anchorage Business Enterprise Institute and is one of 52 University Centers designated by the U.S. Economic Development Administration. In particular, CED supports economic growth in Alaska by providing technical assistance in the form of information and data. Furthermore, the Center is guided by their mission to promote economic diversity through entrepreneurship, community building, and action-oriented strategy.

CED Website: https://ua-ced.org/.

The University of Alaska Anchorage Alaska Center for Rural Collaboration

An additional program of the University of Alaska Anchorage Business Enterprise Institute, the Alaska Center for Rural Collaboration’s (ACRC) mission is to increase the accessibility of business resources housed within Alaska in support of entrepreneurship, and to increase small business growth in rural Alaska.

ACRC Website: https://www.alaskacrc.com/
The Alaska Ocean Cluster

As a means to promote and enhance the growth of Alaska’s maritime industry, the Bering Sea Fishermen’s Association (BSFA) created the Alaska Ocean Cluster (AOC) in 2017. Inspired by the successes of other Arctic regions throughout the world, such as Canada, Iceland, Norway, and Ireland, the AOC focuses on a cluster concept involving public, private, and industry stakeholders. This clustered and collaborative approach encourages support of the maritime industry, as well as each individual stakeholder, by facilitating economic transactions and asset circulation. AOC’s primary mission is to increase opportunities for innovation and entrepreneurship, while spreading awareness of Blue Economy opportunities. Furthermore, the AOC aims to increase collaboration amongst business, government, and non-profit entities, as well as to strengthen relations with other Arctic nations.

AOC Website: http://www.alaskaoceancluster.com/
Appendix A
Twenty Questions to answer before starting a business (provided courtesy of UAA Business Enterprise Institute BEI):

1. Why am I starting a business?
2. What kind of business do I want?
3. Who is my ideal customer?
4. What products or services will my business provide?
5. Am I prepared to spend the time and money needed to get my business started?
6. What differentiates my business idea and the products or services will I provide from others in the market?
7. Where will my business be located?
8. How many employees will I need?
9. What types of suppliers do I need?
10. How much money do I need to get started?
11. Will I need to get a loan?
12. How soon will it take before my products or services are available?
13. How long do I have until I start making a profit?
14. Who is my competition?
15. How will I price my product compared to my competition?
16. How will I set up the legal structure of my business?
17. What taxes do I need to pay?
18. What kinds of insurance do I need?
19. How will I manage my business?
20. How will I advertise my business?
Appendix B

Checklist for starting a business (provided courtesy of UAA Business Enterprise Institute):

- Perform a feasibility study for your business idea:
  1. Know what type of business you would like to start and learn all you can about it.
  2. Conduct thorough research of potential customer, your trade of industry, your competition, your licensing and tax requirements, location and name.

- Check on local zoning ordinances, licenses, regulations, building permits, ADA compliance and fire codes through the State, City and Borough government.

- Determine whether your business requires a state or federal license or permit to operate.

- Also, check on state and federal regulations that may affect your business.

- Evaluate possible site locations. Check physical condition, suitability, traffic flow, parking utility requirements and cost.

- Reserve your business name with the State of Alaska. [Link](http://www.commerce.state.ak.us/occ/register.html)

- Prepare a written business plan, complete with financial statements.

- Prepare a timeline detailing your action timetable.

- Secure necessary capital: Bank loans, private investors, personal savings, family, friends, home equity, etc.

- Determine whether you wish to operate as a sole proprietorship, partnership, corporation, or limited liability company.

- If you decide to incorporate, obtain the necessary incorporation papers from Division of Corporations, Business, and Professional Licensing. [Link](http://www.dced.state.ak.us/occ/)

- Secure all necessary permits and licenses. Contact the appropriate department to determine licensing requirements specific to your business.

- Obtain an Alaska Business License from Division of Corporations, Business, and Professional Licensing. [Link](http://www.dced.state.ak.us/occ/)

- Register your business name with the State of Alaska (if applicable).

- Obtain a sales tax license from the City or Borough if applicable. [Link](http://www.juneau.org/financeftp/forms.php)

- Contact the IRS, Taxpayer Education Service to determine potential tax obligations and filing requirements. Phone the IRS for a free “Small Business Tax Kit” at 1-800-829-3676. For more information about free Tax Education Workshops, call 1-800-829-1040 or visit the IRS website: [http://www.irs.gov/businesses/index.html](http://www.irs.gov/businesses/index.html)

- Select a banking institution and open a business account (separate from a personal account).

- Contact an insurance agent and consult with him or her regarding liability, fire, accident, theft and or other types of commercial insurance such as bonding.

- Consult with an attorney for legal issues regarding your business.

- Contact an accountant to assist you with tax requirements and compliance. Determine if you are required to make quarterly estimated tax payments to the IRS.

**Hiring Employees:**


- Obtain an Unemployment Insurance Identification Number from the Alaska Department of Labor and Workforce Development; Employment Security Division. [http://www.labor.state.ak.us/estax/home.htm](http://www.labor.state.ak.us/estax/home.htm)

- Contact your insurance company and obtain worker’s compensation insurance. Determine necessary compliance with the “Workers’ Compensation Act” by contacting the Alaska Department of Labor & Workforce Development; Division of Worker’s Compensation. [http://www.labor.state.ak.us/wc/er-profit.html](http://www.labor.state.ak.us/wc/er-profit.html)

- Contact the Alaska Department of Labor & Workforce Development; Division of Labor Standards and Safety to determine compliance with the “Occupational Safety and Health Act”. [http://www.labor.state.ak.us/lss/oshhome.htm](http://www.labor.state.ak.us/lss/oshhome.htm)
References


3 The concept of Blue Economy is most often used in reference to capitalizing on marine resources, but it does not exclude aquatic resources, such as rivers and lakes.


26 Inuit Circumpolar Council, 2016. Inuit Arctic Policy.


31 CED interview with Tom Newman, CEO of TerraSond.


