Introduction
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.

The following is the workshop plan and agenda describing the Center’s 2019 Medium and Long Term Environment (MaLTE) workshop, “The Blue Economy: Identifying Northern Industry Opportunities.” In collaboration with the University of Alaska Anchorage Business Enterprise Institute (BEI), the University of Fairbanks Alaska Blue Economy Center, and the Alaska Ocean Cluster, ADAC seeks to connect with Arctic young adults (18 years or older) who are interested in an innovative advantage in creating opportunities for the Arctic region through the concept of a “Blue Economy.”
Concept Overview:

What is “Blue Economy?”

Transpired at the “Rio + 20” United Nations Conference on Sustainable Development (UNCSD), held in Rio de Janeiro in 2012, the concept of “Blue Economy” emerged as a means to cultivate appreciation and coordinated action for sustainably developing the world’s Oceans and Seas. At its core, “Blue Economy” strives to increase socio-economic and human wellbeing, while reducing environmental risks and ecological scarcities. 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. With broad applications, industries such as tourism, energy, marine biotechnology, coastal protection, carbon sequestration, bioprospecting, seafloor mapping, underwater autonomous technology, shipping, and mariculture, are only a snapshot of the abundant opportunities emerging from Blue Economy initiatives.

Alaska’s Blue Economy Opportunities

We know that many Arctic residents already derive their subsistence from the sea. As we look to the future, it is possible that the tenets of a Blue Economy will have unique and viable application in an Arctic context. 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. With unparalleled ocean access, Alaska displays immense potential for advancing economic security through Blue Economy initiatives.

Plan Overview:

The Arctic MaLSTE workshop method planned for the 2019 Utqiagvik workshop seeks to bring 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, this workshop seeks to focus 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, this workshop seeks an interactive and collaborative approach amongst the general public (particularly rural residents), industry experts, Blue Economy experts, entrepreneurial advisors, and academics. The workshop is oriented towards developing discussions and initiatives that could

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result in future research, or opportunities to compete in grants awarded to advance “Blue Economy” in the Arctic context.

The workshop will be interactive event composed of group activities, presentations, and innovative and creative brainstorming sessions. This is the fourth such ADAC conducted Arctic MaLTE workshop. This year’s 2019 MaLTE Workshop partners include the University of Alaska, the UAA Center for Economic Development, the UAA Center for Rural Collaboration, and the Alaska Ocean Cluster.

Planned Format:

The “Blue Economy: Identifying Northern Industry Opportunities” workshop is planned for an initial reception on June 25th, 2019 at the Barrow Arctic Research Center (BARC) in Utqiagvik, Alaska, with the main workshop conducted at the same location on Tuesday, June 26th, 2019, from 8AM to 5PM.

The workshop will follow a series of activity sessions developed in collaboration amongst the workshop planners. Sessions will take a variety of formats, including interactive group activities, presentations by both experts and participants, and roundtable discussions. This engaging and interactive approach is aimed to create a comfortable and creative space for workshop participants to explore and develop ownership of the opportunities presented by a Blue Economy in their respective communities. Furthermore, this workshop presents an opportunity for all individuals to not only learn more about the realm of Blue Economy, but to also learn from each other.

Desired Outcomes:

First, this workshop is intended to initiate an exploratory set of discussions in which participants can learn about the concept of Blue Economy, and to brainstorm the broad opportunities it presents in an Arctic context. Second, it allows all participants to expand and hone their skills in the realms of ideation, entrepreneurship, and business development. Third, the workshop intends to provide resources for those interested in taking their innovative ideas to action by creating a collaborative network amongst workshop participants, and by discussing potential sources for funding. Fourth, the workshop is oriented towards developing discussions and initiatives that could result areas of future research.

Registration:

Please register free at: http://adac.uaa.alaska.edu/home/workshops.
About ADAC's Workshop Partners

The UAF Alaska Blue Economy Center (ABEC)

In recognition of Alaska’s substantial ocean economy, and its potential to expand and strengthen the State’s health, workforce, and subsequently, its overall economy, the University of Alaska Fairbanks (UAF) recently founded the new interdisciplinary Alaska Blue Economy Center (ABEC). The aim of the Center is to serve as a source of support for research, education, training, and outreach, related to Alaska’s immense 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 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.

ABEC Website: https://www.uaf.edu/cfos/research/alaska-blue-economy-ctr/

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/

The University of Alaska Anchorage Center for Economic Development

Co-leading the workshop is the University of Alaska Anchorage 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/

DRAFT AGENDA

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
<th>Details</th>
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<tbody>
<tr>
<td>Arrival</td>
<td>Planners meeting at the Barrow Arctic Research Center (BARC).</td>
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<tr>
<td>2:00-4:00 PM:</td>
<td>Planners meeting at the Barrow Arctic Research Center (BARC).</td>
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<tr>
<td>5:00-6:00 PM:</td>
<td>Reception</td>
<td>The reception will entail a BBQ provided by the Arctic Domain Awareness Center at the Barrow Arctic Research Center.</td>
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<tr>
<td>Wednesday, 26 June 2019</td>
<td>Registration and light breakfast.</td>
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<tr>
<td>8:30-9:00 AM:</td>
<td>Opening prayer, welcomes, and keynote introductions.</td>
<td>UAA’s Chancellor, Dr. Cathy Sandeen, and UAF’s Dean of the College of Fisheries and Ocean Science, Dr. Bradley Moran, will provide keynote workshop introductions.</td>
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| 9:00-9:30 AM:    | “Mash Up” Activity.                                                      | Designed by CED, a “mash-up” activity includes the combining of two distinct concepts into one creative and innovative idea. Examples of two concepts suggested by the CED are: |- Technologies and tech companies that did not exist 20 years ago, combined with: | - Activities involving the ocean. 
This activity is not meant to produce outcomes. Rather, it is largely meant break the ice, and to set the tone for an interactive, comfortable, and collaborative workshop. |
| 9:45-10:30 AM:   | Ocean Economy Case Studies & Research Introduction                       | The case study session will involve an initial presentation by Craig Fleener, the Executive Director of the Alaska Ocean Cluster, and Richelle Johnson, the Lead Analyst at UAA’s CED. All |
participants will then breakout into groups to discuss three distinct case study topics: underwater autonomous vehicles, seafloor mapping and surveying, and bio prospecting.

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<tr>
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<th>Event</th>
<th>Description</th>
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<tr>
<td>10:30-10:45 AM</td>
<td>Coffee &amp; Snack Break</td>
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<tr>
<td>10:45-11:45 AM</td>
<td>Prototyping Session.</td>
<td>Led by CED, this activity will include low-fidelity prototyping of participants’ ideas developed during the initial “mash-up” activity.</td>
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<tr>
<td>11:45 AM-12:45 PM</td>
<td>Lunch</td>
<td>Light lunch will be provided by the ADAC, and will include a roundtable discussion led by Craig Fleener of the Alaska Ocean Cluster.</td>
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<tr>
<td>12:45-1:30 PM:</td>
<td>Customer Discovery</td>
<td>Participants will brainstorm and discuss the potential customers of their innovative ideas, and provide pitches to the board of advisors at the workshop.</td>
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<tr>
<td>1:30-1:45 PM:</td>
<td>Participants Present Ideas for Feedback from Experts</td>
<td></td>
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<tr>
<td>1:45-3:15 PM:</td>
<td>“TED Talk” Style Presentations by:</td>
<td>A series of presentations by expert residents, Blue Economy leaders, and industry professionals. Presentations will be in a quick and inspirational “TED Talk” style format, allowing time for discussion amongst the audience and presenters between each presentation. The presentations will cover topics such as Blue Economy, economic diversification, taking advantage of local assets, and ocean entrepreneurship.</td>
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<tr>
<td>3:15-3:30 PM:</td>
<td>Coffee &amp; Snack Break</td>
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<tr>
<td>4:30-4:15 PM:</td>
<td>Gaining Insights</td>
<td>“Gaining insights” provides participants with the opportunity to elaborate more on their thoughts, as well as to target their questions towards specific experts. In addition, this session is intended to:</td>
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<td></td>
<td>Gaining Insights</td>
<td>- Identify key enablers, shortfalls, and limiting factors when addressing Blue Economy opportunities in the context of the Arctic, and;</td>
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To identify specific innovative and entrepreneurial areas of interest.

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<td>4:15-4:30 PM</td>
<td>Available Resources Discussion</td>
<td>UAA’s Center for Rural Collaboration will give a brief presentation on the resources available for participants to apply their innovative ideas, such as funding sources, business enterprises, and grant opportunities.</td>
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<tr>
<td>4:30-4:45 PM</td>
<td>Feedback</td>
<td>The opportunity to gain feedback regarding the workshop from workshop participants.</td>
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<tr>
<td>4:45-5:00 PM</td>
<td>Closing Remarks</td>
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**Background**

Oceans and seas cover more than 70% of the earth’s surface, representing the largest national asset on the planet\(^5\). To name only several of its countless benefits, the ocean is responsible for the oxygen we breathe, it supplies countless 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\(^6\). 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\(^6\).

According to the United Nations Development Program (UNDP), the concept of Blue Economy takes a two-fold approach to addressing SDG 14. On one hand, Blue Economy recognizes 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\(^5\).

As mentioned previously, many Arctic tenants already capitalize on the ocean’s resources for both subsistence and livelihood activities. However, executing these activities has become increasingly complicated as climate change induces dynamic regional changes in the form of sea ice depletion, increased ocean acidification, and shifting food-web dynamics\(^7\). These changes have the potential to negatively impact the health, wellbeing, and economic stability of the Arctic’s residents. With such dynamic changes, the Blue Economy paradigm presents the opportunity to both protect and improve the ocean’s resources for sustainable future use, while also increasing economic diversification.

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While the umbrella of industries and innovations that can be categorized as Blue Economy initiatives is very broad, those that have been applied specifically to an Arctic context thus far encompasses a much smaller breadth. The following sections discuss three examples of industries targeting the Arctic region so far: bioprospecting, underwater autonomous vehicles, and seafloor navigation and mapping.

**Bioprospecting**

Bioprospecting is the process of organized research in search of organisms that can be utilized for medicinal purposes and other commercially viable products. These organisms are often obtained via a thorough examination of microscopic ocean flora and fauna. In the case of the Arctic, these organisms survive and thrive in harsh environments throughout the year. As such, research has found that these extremities have resulted in unique evolutionary adaptations that can be particularly useful for the development of future medicines and antibiotics.8

**Underwater Autonomous Vehicles**

Due to the harsh and largely frozen environment, scientific knowledge of the Arctic is woefully inadequate when compared to other regions of the world, with the region’s oceans and seas even less explored or understood. The creation of underwater autonomous vehicles (UAVs) allows mapping and navigation of the Arctic’s water bodies without a significant human footprint.

In the summer of 2015, the National Oceanic and Atmospheric Association (NOAA) launched the first UAV, which was used to conduct bathymetric surveying of the Alaskan Arctic. Due to the UAV’s unmanned characteristic, the vehicle was able to map and survey locations that were unreachable, and frequently too dangerous, for a human operated vessel.9

**Seafloor and Navigational Mapping**

As mentioned previously, due to the harsh conditions of the Arctic, navigating its seas and skies can be exceptionally difficult. Nonetheless, countless maritime operators, such as emergency responders and subsistence users, as well aviation operators, navigate the Arctic region on a frequent basis. That said, there is immense potential and need to improve the navigational mapping systems to allow these operators safe navigation. For example, mariners need up-to-date ice status conditions, and aviation struggles with degraded satellite navigation systems due to the high latitude, and the frequent presence of atmospheric phenomena (such as the Northern Lights). Significant research is underway (including

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some ADAC supported research projects), but further is needed, to produce innovative navigational technology to improve transportation through the Arctic¹⁰.

About the Workshop’s Opening Speakers

First Opening Speaker: Dr. Cathy Sandeen
Chancellor for the University of Alaska Anchorage

Opening the 2019 MaLTE Workshop will be Dr. Cathy Sandeen, Chancellor of the University of Alaska Anchorage (UAA). Beginning her service as the Chancellor of UAA in September 2018, Dr. Sandeen is an educational leader committed to providing more Alaskans with the opportunity to earn degrees and credentials through strategic innovation. Prior to joining the University of Alaska system, Dr. Sandeen was chancellor of the University of Wisconsin Colleges and UW-Extension for four years. Simultaneously, as vice president for education attainment and innovation at the American Council on Education (ACE), she lead ACE's nationwide effort to increase post-secondary educational attainment. She has also held leadership positions in the University of California system including at UCLA, Santa Cruz and San Francisco. Dr. Sandeen earned her Ph.D. in communication from the University of Utah and an MBA from the UCLA Anderson School of Management.

Second Opening Speaker: Dr. Bradley Moran
Dean of the UAF College of Fisheries and Ocean Sciences

Following the first opening discussion provided by Dr. Cathy Sandeen will be Dr. Bradley Moran, Dean of the UAF College of Fisheries and Ocean Sciences (CFOS). Dr. Moran received his Bachelor of Science degree in Chemistry from Concordia University, and his Ph.D. in Oceanography from Dalhousie University. As the Dean of CFOS, Dr. Moran’s background includes more than 25 years of leadership in marine research and education. Dr. Moran has further served for the White House Office of Science and Technology Policy as an advisor for the executive branch on ocean science and technology policy, plans, and programs, and has worked as the Program Director at the National Science Foundation for the Chemical Oceanography Program. Dr. Moran will open ADAC's workshop through his reflections of Blue Economy opportunities in Arctic Alaska, as well the vision, direction, and objectives of UAF’s new Alaska Blue Economy Center.

Case Study and Roundtable Discussion Leader: Craig Fleener
Executive Director of the Alaska Ocean Cluster

A born and raised Alaskan, Mr. Fleener was raised in Fort Yukon, Alaska, located just eight miles north of the Arctic Circle. Prior to his current role as the Executive Director of the Alaska Ocean Cluster, Mr. Fleener served for the U.S. Marine Corps, the U.S. Air Force, and the Alaska Air National Guard for a combined service of 32 years. In addition to his military experience, Mr. Fleener’s background includes experience in wildland firefighting, local and statewide politics, grant writing, wildlife and fisheries management, tribal management, healthcare, and education and environmental management. Mr. Fleener holds an extensive and varied educational background, including studies in Air Command and Staff College and Air War College at Air University; Squadron Officer’s School at Maxwell Air Force Base; a Bachelor’s of Science in Natural Resource Management from the University of Alaska Fairbanks; a Masters of Arts in Intelligence Studies from American Public University; and substantial work towards a Master’s of Science degree in Wildlife Biology from the University of Calgary. During ADAC’s MaLTE Workshop, Mr. Fleener will focus his discussions on the work of the Alaska Ocean Cluster, particularly

¹⁰ “Arctic Navigation Challenges.” Arctic Navigation Challenges, arkki-project.org/.
its role in entrepreneurship through Blue Economy opportunities, as well as discussions on successful Blue Economy approaches taking place throughout other regions of the Circumpolar North.

**Follow-Up Resources**

**The Alaska Ocean Cluster’s “Ocean Tuesday”**

Ocean Tuesday is a weekly webinar that offers key players in the Blue Economy a platform to discuss their ideas, industries, and challenges. Ocean Tuesday is open to anyone in the public, and represents Alaska Ocean Clusters most community-focused, public-oriented program.

Occasionally, Ocean Tuesday hosts special events. In November 2018, the Startup Week Special Edition Ocean Tuesday hosted Wheelhouse, a startup formed out of the Alaska Ocean Cluster's 2017 OTIS program, Designori, an Alaskan startup, and Salt, a Norwegian startup based out of the Norway Ocean Cluster.

- Tuesday morning at 10:00am AKST.
- To join the call, click on this Zoom Meeting link: [https://zoom.us/j/371837589](https://zoom.us/j/371837589).
- For more information on Ocean Tuesday, and to sign up for weekly reminders, visit the Alaska Ocean Cluster’s webpage here: [http://www.alaskaoceancluster.com/oceantuesday.html](http://www.alaskaoceancluster.com/oceantuesday.html).

**UAA’s Alaska Center for Rural Collaboration: 2.0 Website**

UAA’s Alaska Center for Rural Collaboration just launched their “2.0 Website” which lists various follow-up resources for rural community members and businesses to seek development and funding opportunities for their innovative business plans. Caroline Humphreys of the UAA ACRC will provide a brief overview discussion of the webpage during today’s workshop.

2.0 Website: [www.AlaskaCRC.com](http://www.AlaskaCRC.com)
Workshop Logistics Information

Workshop Location:
Barrow Arctic Research Center (BARC): 88FM+X3 Utqiagvik, Alaska, 99723

Recommended Accommodations:
1. **Top of the World Hotel (3-Star Hotel)**
   a. **Address:** 3060 Eben Hopson St, Utqiagvik, AK 99723
   b. **Phone Number:** (907) 852-3900
   c. **Website:** [http://www.tundratoursinc.com/](http://www.tundratoursinc.com/)

2. **King Eider Hotel (2-Star Hotel)**
   a. **Address:** 1752 Ahkovak St, Utqiagvik, AK 99723
   b. **Phone Number:** (907) 852-4700
   c. **Website:** [https://www.kingeider.net/](https://www.kingeider.net/)

3. **Airport Inn (2-Star Hotel)**
   a. **Address:** 1815 Momeganna St, Utqiagvik, AK 99723
   b. **Phone Number:** (907) 852-2525
   c. **Website:** [http://www.airportinnak.com/](http://www.airportinnak.com/)

Transportation in Utqiagvik:
1. Alaska Taxi
   a. (907) 852-3000
2. Barrow Taxi  
   a. (907) 852-2222 
3. City Cab  
   a. (907) 852-5050 
4. Arctic Cab  
   a. (907) 852-2227