

IMPLEMENTATION PLAN OF THE



WORKING DRAFT 11.10.14

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1 Implementation Plan

Introduction

The Commission has framed the recommendations that follow around four strategic areas of interest – economic and resource development, response infrastructure, healthy communities and science and research. These lines of effort would benefit from innovative solutions, increased investment and state leadership.

These four lines of effort, which comprise the strategic recommendations of the Commission, ultimately address the socio-economic factors related to Arctic activity, while responding to change, opportunity and risk. Within each line of effort, Commissioners have identified strategic recommendations as important for priority consideration given their potential scale of impact – responding to significant gaps and/or opportunities. These have been further developed under the Implementation Plan, as a suite of options for future action. The Implementation Plan provides ‘shovel-ready’ actions for state policy-makers as interest develops and resources become available.

In an increasingly busy Arctic, it is critical that Alaska proceed prudently. The work of the Commission is a culmination of the many years of effort, resources, and attention the Legislature has devoted to further understanding the current and emerging challenges in the Arctic. Through this process the Commission has learned about and relied upon coordination among jurisdictions, cooperation at all levels of government – including international, national, state, local and tribal – and sought to balance multiple values to protect, promote, and enhance the well-being of the Alaskan Arctic including the people, flora, fauna, land, water and other resources. Alaska should fully engage and lead now so that policies developed will align with priorities and needs of Alaskans.

Overview of Lines of Effort and Strategic Recommendations

n = new; r = revised; o = old

Strategic Line of Effort #1 – The state of Alaska will promote economic and resource development.

This can be achieved through consideration of the following recommendations:

- 1(a) n - Facilitate the development of an Arctic port in the Bering Strait region.
- 1(b) r - Strengthen or develop a mechanism for resource production related revenue sharing to impacted communities.
- 1(c) r - Lead collaborative efforts between multiple levels of government that achieve predictable, timely and efficient state and federal permitting based on sound science and economic feasibility.
- 1(d) n - Promote entrepreneurship and enterprise development.
- 1(e) n - Support access to and advocate for multiple use of Arctic public lands; uphold and defend ANILCA; and promote prudent oil and gas exploration and development in the Arctic.

1(f) n - Increase returns to Alaska and Alaskan communities and individuals from maritime and fisheries activities.

1(g) n - Support development of the Ambler mining district, Donlin Creek prospect, and North Slope coal; including consideration of road and rail to resources.

1(h) n - Build on and promote Alaska's position as a global leader in microgrid deployment and operation to advance a knowledge-based export economy, creating new jobs and revenue for the state.

1(i) n - Encourage foreign and domestic private sector capital investment in Alaska's resource industries through stable, predictable and competitive tax policies.

Strategic Line of Effort #2 – The state of Alaska will address the response infrastructure gap in Alaska's Arctic.

This can be achieved through consideration of the following recommendations:

2(a) r - Strengthen capacity within the Governor's office to address Arctic maritime, science, climate, and security issues.

2(b) o - Improve and support, invest in and complete communications and mapping, nautical charting, navigational infrastructure, hydrography and bathymetry.

2(c) o - Expand development of appropriately integrated systems to monitor and communicate Arctic marine, terrestrial, and air information.

2(d) r - Facilitate and secure public and private investment in support of critical search and rescue, oil spill response, and broader emergency response infrastructure.

2(e) r - Strengthen the Department of Environmental Conservation's Spill Prevention and Response efforts.

2(f) o - Strengthen Oil Spill Response Organizations (OSROs) to ensure expertise in open water, broken ice, near shore, and sensitive area protection, and be able to meet contingency plan requirements and operate effectively in the Arctic.

2(g) o - Foster and strengthen international partnerships with other Arctic nations, establishing bilateral partnerships with, in particular, Canada and Russia, to address emerging challenges in the Arctic.

2(h) n - Explore preauthorization of dispersants as a response tool in oil or hazardous substance discharge or release.

Strategic Line of Effort #3 – The state of Alaska will support healthy communities.

3(a) r - Improve the living conditions in Arctic communities by a) fostering the delivery of reliable and affordable in-home water, sewer, and sanitation services and b) reducing power and heating costs.

3(b) r - Support long term strategic planning efforts that leverage existing methods, synthesize past work, and strengthen local planning that assesses and directs economic, community, and infrastructure development, as well as environmental protection and human safety.

3(c) o - Evaluate and respond to risks from climate change related to erosion to community infrastructure and services and support community efforts to adapt and relocate when necessary.

3(d) o - Develop and support education of the public through outreach efforts that enhance the understanding of the conservation of Arctic biodiversity and sustainable use of biological resources and management of natural resources.

3(e) o - Enforce measures that protect the food security of Arctic peoples and communities.

3(f) n - Identify and promote industry, community and state practices that protect subsistence resources, while guarding against undue ESA listings and broad-brush critical habitat designations.

3(g) o - Create workforce development program to prepare Arctic residents to participate in all aspects and phases of Arctic development.

Strategic Line of Effort #4 – The state of Alaska will strengthen Alaska’s Arctic science and research.

4(a) r - Ensure state funding to, and partnership with, the University of Alaska for Arctic research that aligns with state priorities and leverages the University’s exceptional facilities and academic capacity.

4(b) r - Increase collaboration and strengthen capacity for coordination within the Arctic science and research community.

4(c) o - Strengthen efforts to incorporate local and traditional knowledge into research and science and use this collective knowledge to inform management decisions.

4(d) n - Improve, support, and invest in data collaboration, integration, management and long-term storage and archiving.

4(e) n - Support monitoring, baseline, and observational data collection for key ecosystems.

4(f) n - Invest in a real-time Arctic ocean ice meteorological forecasting system.

4(g) o - Update hydrocarbon and mineral resource mapping and estimates in the Alaskan Arctic.

2 Strategic Line of Effort #1 – Promote Economic and Resource Development

The Commission recognizes that natural resource development is the most important economic driver in Alaska, today and into the future. Alaska has successfully integrated new technology, best practices and innovative design into resource development projects in Alaska's Arctic and must continue to be a leader. The strong economy put in place by responsible natural resource development provides a base for Alaska's Arctic communities to thrive by creating new economic opportunities such as infrastructure, jobs, contracting services, and community revenue sharing. The State must continue to foster an economic investment climate that encourages and promotes development of the Arctic.

With a sound base in place, economic opportunity can be created and leveraged through stable and strong state and federal government investment; mobilization of capital by Alaska Native regional and village corporations; and local economies that are supported by tourism, fishing, arts and other small businesses. Investment is necessary to take advantage of Alaska's strategic location in the opening Arctic, which is critical to the nation's security and important to global shipping routes.

While the state is rich in resources, there are five major barriers to economic and resource development to address:

- Capital Intensity – Fiscal policies must recognize the high capital costs required to develop new infrastructure and natural resources in the Arctic and the high energy and transportation costs in communities: utilize hybrid power systems for communities that result in more affordable energy.
- Regulatory Uncertainty – Advocate for sound regulatory policies that are legally defensible and minimize third-party lawsuits which only increase the risk and cost to project planning and discourage investment in the Arctic.
- Revenue Sharing - find new ways to cost-share between communities or with neighboring jurisdictions to ensure community benefits are real and shared by those that live in the Arctic.
- Distance to/from markets and communication centers– identify and invest in small-scale value-added businesses that displaces outside dependence; evaluate and cultivate new markets; and invest in improved communication systems in Alaska's Arctic.
- Access –demand access to/through federal land holdings and consider state co-investment in resource-based infrastructure.

These are important to consider, especially, when evaluating the Arctic. However, with increased national and international attention, this could be the right moment in history to overcome basic challenges. The state should be strategic in its approach by leveraging assets currently in place and facilitating strategic investments. The state can do this by promoting competition; removing project barriers; promoting sound, sustainable investments; and foster a climate for private investment.

Alaska's Arctic has an enviable resource base that, with careful consideration and state investment, will continue to produce returns to the state and communities that ensure community health and vitality. Economic

development has not in the past and will not in the future come at the cost of stewardship and federal agencies should respect Alaska’s long-standing ability to deliver both.

Recommendation: 1(a) Facilitate the development of an Arctic port in the Bering Strait region.	
Status: Create entirely new effort	Timeline for Action: Medium Term
<p>Justification: Arctic port(s) development has been identified as one of the most critical pieces needed to support and respond to economic opportunity in the quickly developing Arctic. The improvement of existing onshore facilities and development of new facilities to serve the growing traffic in the Arctic is critical not only for resource development activities and community development but for environmental protection and the safety of mariners. The primary landowners in the region are Alaska Native village or regional corporations and access to most lands for improvement or construction of facilities requires their involvement and active participation. An organized effort to bring these landowners and interested parties together for project-specific prioritization and planning would enhance infrastructure development related to other efforts including spill response planning and staging, vessel routing, search and rescue, and commercial activities. The private sector also plays a large role here in the development of leases and new lease sales that will support new Arctic ports, which requires additional private and public sector buy in. The Coast Guard has no full-time assets beyond Dutch Harbor, a considerable distance from the Bering Strait, let alone Barrow. The construction of one or more deep draft ports along Alaska’s coastline would assist in ensuring maritime safety, increasing economic development, and maintaining Arctic domain awareness. Port development in the region is a priority for the state as it relates to economic and resource development, as well as protection of the environment and safety at sea, but port development will not occur without public and private sector investment, including commitments by user groups to utilize these assets.</p>	
<p>Lead and Partners: <i>Primary</i> – Department of Transportation & Public Facilities</p> <p><u>Supportive</u> <i>State</i> – AIDEA, DCCED, DNR <i>Federal</i> – USACE, USCG, NOAA, DOT, DOD, USNORTHCOM, DOI <i>Other</i> – Alaska Native Regional and Village Corporations; Kawerak, private sector companies, local government</p>	<p>Resources needed: <i>Fiscal</i> – Continued funding will be needed for planning and permitting; anticipate a multi-year investment in construction costs, and possible maintenance and operations depending on ownership.</p> <p><i>Leveraged</i> – This will depend on land ownership and the form of public-private partnership that develops, but it can be assumed that all parties will have an interest in pooling resources.</p>
<p>How will it get done: DOT&PF will convene a Bering Strait Port Immediate Action Working Group that can follow up on the Deep Draft Port Study and work closely with landowners, state and federal agencies, and user groups. Local port authorities will be an additional asset in this work. One of the primary areas of consideration will be the ability to leverage investment, which should include options such as a regional port authority, a state-led port authority and/or AIDEA.</p>	
<p>Legislative Actions:</p> <ol style="list-style-type: none"> 1. Request an update from landowners, DOT&PF and USACE on the status and future plans for Arctic port development. 2. Request from Bering Strait Native Corporation and AIDEA the further development of funding scenarios to determine the best return on state investment. 3. Form an IAWG that involves potential project partners to develop a strategic plan for port development. 4. Consider development of an Alaska arctic port authority, or linking of local port authorities/commissions, which could also liaise with AIDEA to facilitate public-private partnerships and investment. 	

<p>Evaluation: Success will be evaluated based on 1) whether the strategy leads to the development of a deep draft port; 2) whether a port is economic over its lifespan, including streamlined site control and/or property acquisitions for specific projects; and 3) whether the port leads to an increased number of investment opportunities, resource development, new firms entering Alaska and a more favorable business climate.</p>	
<p>Recommendation: 1(b) Strengthen or develop a mechanism for resource production related revenue sharing to impacted communities.</p>	
<p>Status: Expand on current efforts</p>	<p>Timeline for Action: Medium Term</p>
<p>Justification: As the state of Alaska advocates for additional development opportunities onshore and offshore in the Alaskan Arctic and seeks more advanced capabilities for emergency preparedness and response, there must also be due consideration given to how communities impacted by that development will benefit. With declining North Slope oil production, industry access to federal land and Outer Continental Shelf (OCS) waters is critical to future exploration and development success, and ultimately to Alaska’s economic stability. Those Alaskans nearest that activity have an opportunity to support development directly by providing services, considering job opportunities and even equity investment in projects. At the same time, organized boroughs or municipalities have taxing authority and the North Slope and the Northwest Arctic Boroughs are two examples where successful taxes on development in their boundaries have provided essential services. However, state revenue sharing does not have the flexibility to direct revenue from a specific project to benefit a specific community near that project even as communities are hopeful that project development might also mean investment in schools, roads, utilities, with tangible socio-economic benefits. The state of Alaska should continue to be a vocal proponent of federal revenue sharing.</p>	
<p>Lead and Partners: <i>Primary</i> – DCCED Division of Community and Regional Affairs</p> <p><u>Supportive</u> <i>State</i> – DNR, AIDEA, local governments <i>National</i> – EDA, BOEM, Congress <i>Other</i> – Alaska Native corporations and organizations, AML, ARDORs</p>	<p>Resources needed: <i>Fiscal</i> – No additional resources are necessary at this time, or in implementation, depending on the scenario.</p> <p><i>Leveraged</i> – Current state practices, AIDEA’s ability for public private partnerships, local government, industry stakeholder engagement, and federal efforts can all be utilized to offset review and analysis, and possibly implementation.</p>
<p>How will it get done: DCRA will review successful best practices for impact benefit agreements, which have traditionally been executed between a company and indigenous organization, and also review the federal fine process for violations to see if those resources are coming back to communities. Based on this analysis, and after considering the current state revenue sharing mechanism as well as other options, DCRA will make a recommendation to the Governor’s office and/or State Legislature. It is envisioned that scenarios include 1) creation of mechanism within current statute to direct benefit to impacted community; 2) encourage the state of Alaska to act as facilitator between industry and community; 3) create within AIDEA the ability to negotiate revenue sharing, possibly in the form of infrastructure investment; 4) work outside the state structure to implement; and 5) federal revenue sharing directed at local government, state government or Alaska Native organizations.</p>	
<p>Legislative Actions:</p> <ol style="list-style-type: none"> 1. Direct DCRA’s review of options and consider recommendations thereof 2. Conduct hearings on offshore development to assess benefits to region and state 3. Consider initiating a community savings account and process to anticipate and fund future needs 4. Review ability to build capacity of tribal organizations with revenue from resource-related development. 	

Evaluation:

Success will be measured by 1) the state’s ability to create a funding stream from Arctic development that supports the socio-economic needs of impacted communities and 2) an increased ability for a community to respond to the question “who benefits?” with “we do.”

Recommendation: 1(c) Lead collaborative efforts between multiple levels of government that achieve predictable, timely and efficient state and federal permitting based on sound science and economic feasibility.

Status: Expand on current efforts

Timeline for Action: Medium Term

Justification: The economic well-being of residents of the Arctic depends on the ability to responsibly develop natural resources. Oil, gas and mineral development has provided the means to dramatically improve living conditions and opportunities for Arctic residents. State revenues from resource development will continue to be essential to support public services, infrastructure development and response capacity in the region. However, regulatory uncertainty and inefficiency threatens to discourage private sector investment. Alaska has some of the most sophisticated interagency coordination and permitting processes in the country, with the expertise, experience and commitment to safely to develop the Alaskan Arctic’s vast resources. The state can take a leadership role in engaging with federal partners to improve coordination between state and federal agencies.

Lead and Partners:

Primary – DNR

Supportive

State – DEC; Department of Law

Federal – DOI, Interagency Working Group on Coordination of Domestic Energy Development and Permitting in Alaska; EPA; Corps of Engineers; BOEM; BSEE

Other – Local governments; private sector industry; Alaska Native tribes, corporations, and organizations; Trade groups

Resources needed:

Fiscal – Department of Natural Resources staff would be funded to lead interagency coordination.

Leveraged – There is an existing federal interagency group looking at permitting and with integrated arctic management priorities, there may be additional federal funds to put toward facilitating greater coordination.

How will it get done:

For over 50 years state agencies, including the Department of Environmental Conservation, the Department of Natural Resources, the Department of Fish and Game and the Department of Transportation and Public Facilities have provided thorough environmental oversight for exploration and development activities in the Arctic. The state of Alaska leads and participates with federal agencies in several collaborative working groups on permitting. As the lead agency, DNR should draw on history and previous experience, to continue to lead federal agencies in a collaborative work group, such as the Regional Interagency Working Group, to discuss increased resource development activity in the Arctic and support efficient processes that respect environmental concerns. The multi-agency permitting initiative has resulting in incremental improvements in Alaska’s permitting system. This is a good model and should be viewed as a continuous adaptive management process. The administration needs to continue to push back on federal over reach and where necessary use the courts to avoid increasing burdens on projects without demonstrated benefits.

Legislative Actions:

1. Ensure permitting agencies have resources necessary to meet their existing workload and to scale up as development increases.
2. Consider legislative proposals that improve the predictability, timeliness and efficiency of the permitting systems, as well as to bring more accountability to the appeals and litigation processes that relate to resource and infrastructure development projects
3. Support the administration when needed to push back on expanding federal regulatory jurisdiction

4. Request DNR to lead interagency work group meetings focused on permitting and regulatory standards, and ways to increase coordination, identify future needed baseline data collection, research and monitoring and to enhance sharing and accessibility of scientific data
5. Provide funding for local governments and boroughs to be involved in working group meetings
Evaluation: Success should be measured by 1) decreased time for permitting and regulatory applications to be reviewed, 2) local communities feel as though they have an opportunity to provide meaningful input, 3) greater interest from industries looking to invest in Alaska, i.e. foster a competitive investment environment, and 4) less protracted litigation that frustrates and delays projects.

Recommendation: 1(d) Promote entrepreneurship and enterprise development.	
Status: Enhance or expand a current effort.	Timeline for Action: Medium term.
Justification: Business development and entrepreneurship in remote Arctic communities or hubs is challenging, with limited opportunity and the bulk of economic activity being driven by government and outside vendors. Locally-owned and operated companies provide one mechanism for taking advantage of increased economic activity, even as it supports a community-managed transition towards the state becoming a market led, outward looking economy. The community’s natural entrepreneurs are often already fully employed with no capacity to start a business on their own. At the same time, many rural entrepreneurs have not been exposed to many (or any) business startups so there are many misperceptions regarding what it takes to start and run a business. There is also a fear of failure. Successful entrepreneurs have been exposed to mentorship, which provides them with encouragement, guidance, and training on the technical, business, and fundraising aspects of bringing a product to market. Compounding these challenges is weak financial literacy and understanding regarding what it takes to manage the finances and plan for the fiscally feasible and sustainable start-up of an enterprise, as well lack of access to outside investors that bring capital to projects. Therefore, there is a strong need to expose would-be entrepreneurs to entrepreneurial thinking and practices and this should happen starting as early as k-12 education. Alaska Native regional and village corporations have been able to respond to this challenge to some extent, but a comprehensive approach to developing an entrepreneurial ecosystem in the Arctic is necessary.	
Lead and Partners: <i>Primary</i> – DCRA <u>Supportive</u> <i>State</i> – Division of Economic Development, ARDORS, local government <i>Federal</i> – Dept. of Commerce, USDA, Small Business Development Corporation <i>Other</i> – University of Alaska, Alaska Native regional and village corporations, CDQs, AFN	Resources needed: <i>Fiscal</i> – Current resources could be redirected to support this effort. <i>Leveraged</i> – Alaska Native regional corporations and CDQ “marketplace” initiatives; State Chamber and UAF Business Week; technical assistance programs
How will it get done: Starting young is essential. Support for programs like Lemonade Day Alaska encourages the bringing of entrepreneurial thinking to a community and for young and emerging leaders to be exposed. There is also a need to encourage entrepreneurial thinking in the school system. Several rural/remote schools have successfully adopted entrepreneurial curriculum even if it is only for bake sales to offset costs associated with attending regional sporting events. The types of businesses that will bring wealth to the Arctic region include small businesses like local food production, or mid to large enterprises, such as bulk purchasing cooperatives, barging and transportation firms, and/or supply chain firms to either oil and gas or shipping. These businesses might be best started as hybrid entities of regional corporation. Reliable communications tools are essential for creating a network between investors, owners and global markets. Small start-up businesses will only begin to blossom once these other businesses begin to drive down the costs associated with bringing goods to these communities; and a stronger entrepreneurial culture follows.	

<p>Legislative Actions:</p> <ol style="list-style-type: none"> 1. Review investment in the Small Business Development Center and the University of Alaska’s Center for Economic Development 2. Consider more effective alignment between DCRA, ARDORS and CED. 3. Conduct review of business plan competitions and consider state investment or facilitation 4. Evaluate co-investment options 5. Encourage the federal government to create a Northern Economic Development Agency (modeled off of CANNOR), which would promote business development in the U.S. Arctic and facilitate project development
<p>Evaluation: Success will be measured by 1) expansion of and increased profit to current locally-owned businesses; and 2) development of new small, medium and large businesses.</p>

<p>Recommendation: 1(e) Support access to and advocate for multiple use of Arctic public lands; uphold and defend ANILCA; and promote prudent oil and gas exploration and development in the Arctic.</p>	
<p>Status: Enhance current efforts</p>	<p>Timeline for Action: Short term</p>
<p>Justification: While the state’s constitution clearly declares that “It is the policy of the State to encourage the settlement of its land and the development of its resources by making them available for maximum use consistent with the public interest,” Alaska has only scratched the surface of its resource potential. Continued withdrawal of land from productive multiple uses would leave striking implications for Alaska’s economy and communities. At the same time, access to and development of Arctic resources within the 1002 Area of the Coastal Plain of ANWR, NPR-A, North Slope and OCS are a top priority of Alaska. The 1002 Area was intentionally excluded from the Wilderness designation in 1980 and should remain so given this area is considered the nation’s most promising onshore oil and gas prospect. Similarly, the National Petroleum Reserve- Alaska (NPR-A) was designated by Congress in 1976 as a petroleum reserve but has since been locked to future development. Oil production in the Arctic OCS could generate billions in federal revenue and support Alaska’s economy while benefitting local government. Oil production holds immense potential for supporting Arctic economies, creating jobs, refilling the Trans-Alaska Pipeline, and generating billions of dollars in government revenues to help sustain local communities and deliver essential public services.</p>	
<p>Lead and Partners: <i>Primary</i> – Governor’s Office</p> <p><u>Supportive</u> <i>State</i> – DNR, Law, CACFA <i>Federal</i> – Department of Interior, EPA, USFWS, NMFS <i>Other</i> – Regulated community, Arctic Power, local municipalities, Alaska Native Corporations, American Petroleum Institute, private sector business associations</p>	<p>Resources needed: <i>Fiscal</i> –Continued funding on a large scale to support the Department of Law to defend these unwarranted and illegal land lockups are needed.</p> <p><i>Leveraged</i> – Continued funding of programs such as Arctic Power will be needed to inform public policy makers in Washington, D.C. and elsewhere. The State of Alaska should continue efforts to open arctic areas to exploration and oppose federal efforts to extend Wilderness designations.</p>
<p>How will it get done: The State needs to be relentless in its defense of Alaska’s ability to develop its resources as part of a multiple use approach to public lands management. Working with the congressional delegation, native corporations, local governments, and industry, the State should use all avenues and tools to insure Alaskans can develop their land. The Governor’s Office and the Departments of Natural Resources and Law have the capability to respond to resource development matters through staff who focus part of their efforts on oil and gas and ANILCA issues. It is essential that the State continue to fund Arctic Power, which has the expertise and experience in Washington, D.C. to advance the ANWR effort when the opportunity presents itself.</p>	
<p>Legislative Actions:</p> <ol style="list-style-type: none"> 1. Support ANILCA training for federal agencies and Congress; administration-led efforts to defend ANILCA and communicate Alaska’s multiple use guidelines and constitutional mandates; and agency 	

<p>participation in activities that involve multiple use land rights and to push back on expanded federal jurisdiction.</p> <ol style="list-style-type: none"> Continue to pass resolutions supporting oil and gas development in the arctic; develop outreach strategies that target states’ grass roots efforts to meet with governors and other state legislatures in support of exploration in areas that are currently closed for development activities. Ensure administration and legislative participation in Arctic Council activities and to inform Congress about why oil and gas development should occur. This should include a “Why Arctic Development Matters” campaign, with the production of printed, video and web educational material showing the benefits of Arctic oil development to the nation, the State of Alaska and Arctic communities. The State should oppose any new federal land withdrawals, marine protected areas, Antiquities Act designations, and BLM Wilderness studies on federal land in Alaska.
<p>Evaluation: Success can be measure by 1) a decrease in how often the state’s multiple use land management guidelines are violated; 2) an increase in multi-use activity granted and 3) an increase in available designated land open for development.</p>

<p>Recommendation: 1(f) Increase returns to Alaska and Alaskan communities and individuals from maritime and fisheries activities.</p>	
<p>Status: Entirely new effort.</p>	<p>Timeline for Action: Medium term.</p>
<p>Justification: Alaska’s maritime Arctic is comprised of some of the richest fishing grounds in the world. The sustainable fishing practices in the region have benefited Alaskans, communities and the economy for decades if not millennia. RDC notes that fishing is the core economy for much of coastal Alaska where fish harvesting and processing often provide the only significant opportunities for private sector employment and where fisheries support sector businesses provide property and sales tax as the largest source of local government revenues. Seafood harvesting and processing jobs provide more than 50 percent of the private sector employment in coastal Alaska. However, greater returns could be seen by communities if more of the fleets were based in Alaska. The hundreds of vessels that make up the North Pacific fishing fleet are not based in Alaska. In fact, they travel thousands of miles each year to dock in Seattle, even though more convenient ports exist in the state. Some estimates put the fleet’s docking in Seattle as a \$5 billion boost to the Pacific Northwest’s economy each year. Currently, the Alaskan ports of Dutch Harbor, Kodiak and Seward are actively pursuing increased infrastructure to expand port facilities and opportunity. CDQ communities and the Port of Nome, too, are a significant consideration. The state should mount a campaign that increases the number of vessels and amount of vessel time in Alaskan communities by investing significantly in the needs of the industry.</p>	
<p>Lead and Partners: <i>Primary – AIDEA</i></p> <p><u>Supportive</u> <i>State – DOT&PF, DEC, DF&G, ASMI, DCCED</i> <i>Federal – NMFS,NOAA, USACE</i> <i>Other – CDQs, At Sea Processors, local governments and port commissions, fishing industry</i></p>	<p>Resources needed:</p> <p><i>Fiscal – Significant capital resources should be anticipated.</i></p> <p><i>Leveraged – Existing port facilities in Adak, Dutch Harbor, Kodiak and Seward.</i></p>
<p>How will it get done: A multi-part strategy needs to be considered as part of increasing vessels and vessel hours at Alaska port facilities, including 1) bringing in the resources the fishing fleet needs to have vessels serviced; 2) import or strengthen the workforce and expertise necessary to repair and maintain vessels; 3) develop a freshwater port that can protect vessels from corrosive saltwater; 4) provide facilities that allow all-weather servicing of vessels; and 5) conduct expansive outreach to fishermen, the owners of vessels, and the fishing community more broadly that traditionally has called Washington home, even as it benefits from a healthy Alaskan fishery.</p>	

<p>Legislative Actions:</p> <ol style="list-style-type: none"> 1. Review of the Port of Seattle competitive advantages against what Alaskan ports can offer 2. Assign fisheries development task force to address gaps and strengthen capacity 3. Work with local governments, CDQs and the fisheries industry to craft an appropriate investment strategy 4. Consider developing a maritime academy at AVTEC with potential internships at the Vigor Shipyards in Ketchikan 5. Build capacity within Alaska Seafood Market Institute to also market Alaskan port facilities
<p>Evaluation: Success will be measured by 1) an increase in the number of vessels that utilize Alaskan port facilities; 2) an increase in the number of vessel hours at Alaskan ports; and 3) an increase in local government port revenue.</p>

<p>Recommendation: 1(g) Support development of the Ambler mining district, Donlin Creek prospect, and North Slope coal; including consideration of road and rail to resources.</p>	
<p>Status: Enhance current efforts</p>	<p>Timeline for Action: Medium Term</p>
<p>Justification: Historically, mining has been a cornerstone of Alaska’s economy. Many roads, docks and other infrastructure throughout Alaska were originally constructed to serve the mining industry. Major communities like Fairbanks, Juneau, and Nome were founded on mining activity. Today, a rejuvenated mining industry brings a broad range of benefits to Alaska, offering some of the highest paying jobs in both urban and rural Alaska, as well as generating significant local government tax payments and royalties to Native corporations for activity on their land. Recognizing that the Alaskan Arctic has vast reserves of mineral resources – from traditional base and precious metals to rare earth elements and coal. Beyond supply, however, the state has essential elements of strong governance, including effective policy, clear regulatory and permitting standards, and a stable fiscal regime. To responsibly advance the exploration and development of Northern Region minerals, policy makers, community leaders and the private sector must work together to explore and develop resources safely and responsibly - developing policies that balance risk mitigation, cultural integrity, and economic opportunity. The most significant challenge in the region is the incredible investment needed – high energy and transportation costs, complicated access, and commitment to a health environment and stakeholder engagement all mean that projects are incredibly expensive. The potential benefits to the region from mineral development are impressive and – apart from oil and gas development occurring on the North Slope – this is the most significant opportunity for residents of the region.</p>	
<p>Lead and Partners: <i>Primary – DNR</i></p> <p><u>Supportive</u> <i>State – AIDEA, DEC, DF&G, DOT&PF</i> <i>Federal – BLM, DOI, EPA, USACE</i> <i>Other – ANCs, village corporations, local governments, private sector industry and investment companies</i></p>	<p>Resources needed:</p> <p><i>Fiscal – High levels of capital investment will be needed.</i></p> <p><i>Leveraged – The state has a number of partners that can bring assets to the table, including private companies, investment firms, state agencies and Alaska Native corporations.</i></p>
<p>How will it get done: The state must identify clear priorities as it relates to mineral development, and three prospects create the most opportunity for the region. DNR will assign a task force within OPMP to streamline regulatory and permitting efforts, bringing together all necessary state and federal agencies, as well as landowners. State co-investment in energy or transportation will be necessary and will ensure positive economics; AIDEA currently has the authority to drive this portion and would be able to do some more effectively with a clear set of priorities. Long-time efforts at ‘roads to resources’ should be directed toward these three prospects, with a phased approach considered. Recognizing that state resources are finite, stages should result in projects and revenue potential.</p>	

<p>Legislative Actions:</p> <ol style="list-style-type: none"> 1. Resource committees should convene hearings on these three prospects, identifying key stakeholders and reviewing opportunities for streamlined investment and permitting. 2. Capital investment will be needed, and the legislature should consider renewed focus on roads to resources connected to these prospects, as well as remote energy solutions 3. The legislature should consider leveraging AIDEA’s role as an investment partner that could help attract domestic and international investment 4. The Legislature’s Resources committees should convene a “mining session.”
<p>Evaluation: Success will be measured by 1) increased investment aimed at reducing energy and transportation costs; and 2) forward movement toward production of mineral development at these prospects.</p>

<p>Recommendation: 1(h) Build on and promote Alaska’s position as a global leader in microgrid deployment and operation to advance a knowledge-based export economy, creating new jobs and revenue for the state.</p>	
<p>Status: Expand on current efforts</p>	<p>Timeline for action: Short term</p>
<p>Justification: Alaska has built a small industry around developing and supporting the 200+ microgrids across its geographically diverse regions. Since the 1960’s, electricity generation in the remote regions of Alaska has been heavily reliant on diesel generators, which serve numerous islanded microgrids. Over the past decade, investment in renewable generation has increased dramatically to meet both a desire for greater energy independence and reduce the cost of delivered power. The integration of variable resources (wind and PV), as well as limitations of local hydro and geothermal power has led to significant experience in the design, development, and operation of these microgrids. Today, there are over 100 small businesses, utilities, and non-profits with specialized expertise operating in Alaska, many of which are interested in applying their knowledge outside of the state. Globally, the microgrid market is on the verge of exploding. A recent report by Navigant Research estimates the microgrid market will grow nearly 5-fold, to an estimated \$40B in revenue by 2020. This is driven by both a need for greater grid surety and reliability in developed regions such as the continental U.S., as well as the expansion of electric grids in previously unserved regions of developing nations.</p>	
<p>Lead and Partners: <i>Primary</i> – AEA; University of Alaska <i>Supportive</i> – <i>State</i> – DCCED <i>Federal</i> – NREL, DOE, DOI <i>Other</i> – Alaska Center for Energy and Power; University of Alaska <i>Other</i> – Alaska small businesses, utilities and local governments</p>	<p>Resources needed: <i>Fiscal</i> –Support for UAF’s Alaska Center for Energy and Power, and a capital budget request for microgrid design and implementation. <i>Leveraged</i> – The Renewable Energy Grant Fund and the Emerging Energy Technology Fund.</p>
<p>How it will get done: The state is positioned to capture 1% of the global microgrid market (\$400M) in the next 5 years by capitalizing on an untapped business opportunity in Alaska. Much of this revenue would be generated by the 100+ small businesses working in this field, with significant potential for job growth across the state. This could be done by mirroring the highly successful 3-prong approach Iceland has taken in knowledge export of geothermal energy. There are three strategies to consider. 1) Use the Emerging Energy Technology Fund (EETF) as a model, request proposals from the private sector to develop and advance the needed technology for microgrid development. 2) Design an international training program in the development, operation, and management of microgrids incorporating renewable resources to highlight microgrid-based expertise. This program would be developed in collaboration with more rural Alaska communities serving as ‘living laboratories’ to highlight varied technologies and strategies related to microgrid design and operation. 3) Design a mechanism to pool Alaska talent from across the state through the creation of a for-profit or non-profit organization, formed through UAF/ACEP and tasked with exporting Alaska microgrid know-how and expertise globally.</p>	

<p>Legislative Actions:</p> <ol style="list-style-type: none"> 1. Support ACEP to convene a work session and catalogue the extensive microgrid expertise found within the state, matching that expertise with opportunities elsewhere, and deploying both industry and academic resources to facilitate Alaska market entry that supports high quality jobs for Alaskans. 2. Consider designing an international training program in the development, operation, and management of microgrids incorporating renewable resources to highlight microgrid-based expertise.
<p>Evaluation:</p> <p>Success will be measured by: 1) expansion of jobs and revenue-generating opportunities for the state and 2) demonstration of new technology in microgrid systems.</p>

<p>Recommendation: 1(i) Encourage foreign and domestic private sector capital investment in Alaska’s resource industries through stable, predictable and competitive tax policies.</p>	
<p>Status: Support current efforts.</p>	<p>Timeline for Action: Long term</p>
<p>Justification: Potential investors demand a reliable, durable and fair set of rules before making investment decisions. Historically, the State of Alaska has sent mixed messages to oil and gas investors by changing tax structures every few years, creating doubt and uncertainty about whether Alaska is a favorable place to do business. The cruise ship head tax passed by voter imitative resulted in a redeployment of ships to other jurisdictions and decrease in cruise ship sailings to Alaska. Currently, a new oil and gas production tax law is in place and is already proving effective at attracting investment dollars to the state. At the same time, Alaska only has six large producing hard rock mines in Alaska and only one in the Arctic in spite of being a global leader in mineral potential. Alaska must continue to promote a strong development climate with stable and competitive tax policies to maintain positive momentum in oil, gas and mineral investment and to attract new capital investment in other resource industries. More than 90 percent of the State’s general fund comes from the oil and gas industry, and a full one-third of jobs in the state can be tied to oil and gas development, so the entire state economy relies on a healthy and vibrant oil industry. Like the oil and gas industry, mining provides high paying jobs that can be best increased by developing more mines in Alaska. The State of Alaska must encourage and support both foreign and domestic private sector capital investment in the Arctic’s resource industries.</p>	
<p>Lead and Partners:</p> <p><i>Primary</i> – Dept. of Revenue</p> <p><u>Supportive</u></p> <p><i>State</i> – AIDEA, DNR, APFC</p> <p><i>Federal</i> – BOEM, IRS, DOI, BLM</p> <p><i>Other</i> – Local government, Alaska Native corporations</p>	<p>Resources needed:</p> <p><i>Fiscal</i> – Further investment in DOR’s technical expertise and capacity should be considered, deepening knowledge held by the civil service.</p> <p><i>Leveraged</i> – Federal lease sales, land management and fiscal policy should also be considered for review.</p>
<p>How will it get done: The current oil and gas production tax law is working and should be maintained. State officials should speak out in support of maintaining the tax structure, and should also work to inform citizens about the benefits a healthy oil and gas industry provides to all Alaskans. Should a new tax law be proposed for any industry, state and local officials, as well as corporations and communities, should insist upon durability and longevity for all tax policies in order to keep Alaska a competitive place to conduct business. Any tax law proposals should include objective evaluation of the impacts of the proposals on the global competitiveness of Alaska to attract investment capital.</p>	

Legislative Actions:

1. Support current legislative efforts to track capital investments and evaluate return.
2. Calculate the immediate and long-term economic impact prior to changes in the current tax law, or proposing a new tax law using outside economic analysts.
3. Review of combined effective tax from local, state and national government take.
4. Review regularly the effect of current tax policy or capital investments

Evaluation: Success will be evaluated by 1) an increase in capital investment within the state; 2) new entrants to the state; and 3) maximization of state funding.

3 Strategic Recommendation #2 – Address the Response Infrastructure Gap

One of the primary motivating factors for addressing an “emerging Arctic” is the concern for human and environmental security in the face of increasing change and activity. Alaska’s response capacity is measured in infrastructure, assets and planning. When considering strategic investment in infrastructure in the Alaskan Arctic, it is important to understand the scope of the region, diversity, and its current resources. Differences in proximity, risk, geography, and scale of challenge make evaluation of response capacity and the design of solutions difficult—there is not a one-size-fits-all approach.

Time and distance are big logistics challenges for security and defense operations, and Alaska’s Arctic compounds these with a lack of communications and response infrastructure. Essentially, capabilities to address threat or aggression are sufficient; capabilities to support the civil sector and carry out response – whether for oil spills or search and rescue – operations are limited, further stressed by the lack of 1) economic activity, 2) infrastructure, and 3) public awareness. Often, agencies and organizations responsible for responding are poorly resourced.

Industry carries the primary responsibility for prevention, preparedness and response, and where economic activity or resource development occurs will most often be found the most resources. Resources will either be brought to bear by the companies themselves, or through Oil Spill Response Organizations, which are the ‘boots on the ground’ for oil spill response. There is also a high level of very effective coordination and communication between the private sector, state and federal agencies and a clear recognition that no single entity can address Arctic issues alone, which reinforces the need for collaboration. The Alaska Regional Response Team is the state, federal and tribal coordinating body for response operations and is an effective mechanism for developing and implementing the Unified Plan and sub-area planning process. Additional resources can be found in local government, e.g. the North Slope Borough currently conducts all Search and Rescue operations north of the Brooks Range.

Action is needed to enable the responsible development of resources; facilitate, secure, and benefit from new global transportation routes; and safeguard Arctic residents and ecosystems. Response infrastructure will by necessity require strong partnership and communication to prepare for incidents, respond, and develop best practices.

Recommendation: 2(a) Strengthen capacity within the Governor’s office to address Arctic maritime, science, climate, and security issues.	
Status: Create entirely new effort	Timeline for Action: Medium Term
<p>Justification: With the rate of change and increasing activity in Arctic waters and lands, the Governor and cabinet would benefit from specialized knowledge and policy expertise related to international, national and local waterways and land management, legal regimes, science, climate, security and defense. The U.S. counts on the Coast Guard, among others, for similar contributions, and strengthening the capacity of the Governor’s office to liaise directly with the Coast Guard and other federal agencies would ensure a direct feedback loop between state of Alaska knowledge and federal decision-making. Additionally, the ability to make recommendations to the Governor that would increase budget prioritization would result in better Arctic coordination. It is important to recognize that maritime traffic – goods delivered to Alaska via Washington ports; community goods and fuel resupply along the coast; Bering Strait traffic; academic and government research vessels; and trans-Arctic shipping – directly impact Alaska’s economy and community health. The implications of international efforts that come out of Arctic Council policy-shaping documents or International Maritime Organization negotiations about the Polar Code are significant for Alaska. Further support should be given to research and development of new technologies, as well as the use of best practices to, for example, reduce the risk of hazardous releases in the Arctic.</p>	
<p>Lead and Partners: <i>Primary</i> – Governor’s office</p> <p><u>Supportive</u> <i>State</i> –Department of Environmental Conservation <i>National</i> – U.S. Coast Guard; State Department; Maritime Administration <i>Other</i> – International Maritime Organization; Arctic Council</p>	<p>Resources needed: <i>Fiscal</i> – possible increase in administrative support; anticipate significant travel budget for national and international policy discussions.</p> <p><i>Leveraged</i> – State agencies and local government will be able to contribute valuable on the ground expertise to this position.</p>
<p>How will it get done: The Governor’s office has the ability to specifically respond to Arctic-related matters and climate change through Commissioners and Deputy Commissioners who focus part of their portfolios on these important issues. Increasing capacity specifically on arctic maritime, science, climate, security and defense issues would ensure the delivery of concrete policy recommendations and provide to others the state of Alaska’s priorities and perspectives on these important issues. Strengthening capacity within the Governor’s office also provides an opportunity for increased facilitation of collaborative efforts between state and federal agencies, as well as outreach to local governments and the private sector within Alaska and with national and international partners.</p>	
<p>Legislative Actions:</p> <ol style="list-style-type: none"> 1. Develop a scope of work, including goals and desired outcomes, for an Arctic maritime, science, climate, security and defense portfolio 2. Work with Governor’s office to identify capacity for an Arctic maritime, science, climate, security and defense portfolio and accompanying budget 3. Request that the portfolio holder(s) have the ability to act as a liaison between industry, the public and private sectors, as well as indigenous organizations 	
<p>Evaluation: Success will be determined by 1) expansion of the Governor’s office portfolio to include Arctic issues; 2) the ability of the Governor’s office to coordinate and streamline state of Alaska policy statements and positions related to Arctic maritime issues and intermodal transportation infrastructure development; and 3) deliver local and sub-national input into federal and international negotiations.</p>	

Recommendation: 2(b) Improve and support, invest in and complete communications and mapping, nautical charting, navigational infrastructure, hydrography and bathymetry.	
Status: Support current efforts	Timeline for Action: Long term
Justification: Nautical charting and terrestrial mapping of the American Arctic, to the extent that it's been done, began in the 1800s with what today is considered outdated technology, and Alaska's western and northern coasts haven't been mapped since 1960, both factors that result in a lack of confidence by communities and industry alike. Even today, Alaska's coastline mapping is occurring at 1% annually versus 5% in the rest of the United States. NOAA currently estimates that it will take 25 years just to survey their high priority areas that affect marine transportation. For the state of Alaska – with a commitment to enhancing safety, environmental protection and economic development – this is simply unacceptable. NOAA charting requires the gold standard of bathymetric data – it is expensive and slow to acquire. Other data is already being acquired by private sector ships and tugs and barges, and could be shared with proper legal guidance. Terrestrial mapping is an increasing focus of the state, too, through the Alaska Statewide Digital Mapping Initiative. While the state does not have sole jurisdictional authority over the Arctic and especially over northern waters, and neither does it have a desire to take on federal responsibilities without due compensation, this is a good opportunity to partner for mutual benefit.	
Lead and Partners: <i>Primary</i> – Alaska Geospatial Council <u>Supportive</u> <i>State</i> – DOT&PF, DEC and DNR <i>Federal</i> – U.S. Coast Guard, Maritime Administration, USGS, NOAA <i>Other</i> – Marine Exchange of Alaska, Alaska Ocean Observing System; Alaska Marine Pilots	Resources needed: Fiscal – The state of Alaska should anticipate increased leadership as a facilitator of multi-agency cooperation; there is also the possibility of co-investment in this area. <i>Leveraged</i> – Statewide Digital Mapping Initiative; UAF's Geographic Information Network of Alaska and the <i>Sikuliaq</i> research vessel. The private sector, too, is makes incredible investments in data collection and mapping.
How will it get done: DNR has been the lead on mapping efforts in the state, and has done much of its work in collaboration with state and federal agencies. The Governor recently created the Alaska Geospatial Council whose top priority is to figure out where to store data, how to manage it and make it available for users. Hydrography is well underway through the Hydrography Technical Working Group, under the auspices of the Alaska Climate Change Executive Roundtable, and the Alaska Geospatial Council. The state of Alaska's DOT&PF can take a proactive role in articulating the top priorities and establishing priorities within the region, assisting NOAA where necessary to establish a geospatial foundation and ensure marine domain awareness. For instance, the state of Alaska could provide or assist in funding an increase of aerial and satellite imagery. DOT&PF should also be working closely with the Office of Coast Survey (Coast Pilot) to update hydrographic priorities, including navigation of the Bering Sea and Arctic approach waters, and USGS for terrestrial priorities.	
Legislative Actions:	
<ol style="list-style-type: none"> 1. Broaden the scope of the State Geospatial Council to include oceanographic charting and continue to support efforts to link state and federal mapping and charting work. 2. Encourage federal agencies to work with and incorporate state, local and traditional knowledge holders. 3. Consider state co-investment in mapping, charting, hydrography and bathymetry new technologies, maximizing use of satellites, unmanned underwater and aerial vehicles, and submarine systems. 4. Continue statewide mapping efforts initiated by DOT&PF to update hydrographic priorities, including navigation of the Bering Sea and Arctic approach waters. 5. Continue to support the State's airborne geophysical program. 6. Work with federal and state agencies and the private sector to consider ways to “crowd-source” bathymetric and water level data acquired by the private sector and make available through shared data systems. 	

Evaluation:
 Success will be measured by 1) increasing the percentage of mapping and charting complete and 2) enhanced user confidence.

Recommendation: 2(c) Expand development of appropriately integrated systems to monitor and communicate Arctic marine, terrestrial, and air information.

Status: Expand on current efforts	Status: Expand on current efforts
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Justification: Integrated systems are necessary and paramount to ensure effective communication, situational awareness, and safety in the Alaskan Arctic. There are multiple domains – land, water, and space – that span both state and federal jurisdiction. There are two complementary types of marine information important to the future of the Alaskan Arctic. The first has to do with maintaining operational awareness of maritime activity, and especially vessel tracking, but also transmission of information on ice and water, ship’s speed, and closed or sensitive areas for navigation. The primary asset that delivers increased maritime domain awareness is Automated Identification Systems, supplemented by Long Range Tracking Systems. AIS is a piece of navigational equipment carried – by regulation or voluntarily – aboard many vessels, and which transmits vessel information regularly. However, AIS receivers can only see so far offshore, and there will always be portions of Alaska without AIS coverage. In those cases of remote operations, it is necessary to use several different forms of satellite tracking. The expanded capacity of automated integration systems (AIS) will allow a strengthened emergency response capability and ensure safe maritime transportation as well as have the future ability to transmit localized weather reports, as well as local information about sea ice conditions, waves and currents, marine mammal and endangered species observations, etc. Secondly, there is an increased need for environmental awareness that provides decision-makers with a better understanding of coastal hazard mitigation, ecosystem and climate trends, and monitoring water quality. Data management related to these areas of interest is also a significant concern and should be integrated into other efforts.

<p>Lead and Partners: <i>Primary</i> – Marine Exchange of Alaska and the Alaska Ocean Observing System</p> <p><u>Supportive</u> <i>State</i> – DEC and DF&G; Alaska State Troopers; Alaska National Guard; DCCED, DMBA; USARC <i>Federal</i> – U.S. Coast Guard, BOEM and NOAA <i>Other</i> –local government, subsistence users, Alaska Native organizations, industry</p>	<p>Lead and Partners: <i>Primary</i> – Marine Exchange of Alaska and the Alaska Ocean Observing System</p> <p><u>Supportive</u> <i>State</i> – DEC and DF&G; Alaska State Troopers; Alaska National Guard; DCCED, DMBA; USARC <i>Federal</i> – U.S. Coast Guard, BOEM and NOAA <i>Other</i> –local government, subsistence users, Alaska Native organizations, industry</p>
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How will it get done:
 The Marine Exchange of Alaska has a sustainable organizational and methodological framework that aligns well with state of Alaska priorities. Continued state investment and attention to growth opportunities will deliver results. The Alaska Ocean Observing System is a primary funder of MXAK and is similarly providing a valuable service, in cooperation with a broad and diverse group of participating agencies and organizations. In each case the state of Alaska has an opportunity to increase engagement and provide additional input and work more closely with international, federal partners, and the private sector to manage information communication more effectively.

- Legislative Actions –**
1. Compile and review state agency maritime traffic and environmental data and collection processes, as well as data sharing and open data policies to better understand cost-benefit relative to Arctic priorities
 2. Consider future legislation that responds to any identified gaps in current capacity, such as common repositories and quality control, or prioritization of expansion.
 3. Identify information needed for future state decision making and develop plan for acquiring information.
 4. Convene a mariner information working group to ensure benefits meet mariner needs
 5. Strengthen support for the Marine Exchange of Alaska and Alaska Ocean Observing System.
 6. Track and intervene if necessary on the possible closure of the NOAA weather station in the Aleutians.

7. Support the recommendations from the Aleutian Islands Risk Assessment Project and assess application to Great Circle Route vessel traffic.

Evaluation:

Success will be evaluated based on 1) increase in data collection and use; 2) increase in resource manager and mariner confidence in data available; 3) increase in industry participation.

Recommendation: 2(d) Facilitate and secure public and private investment in support of critical search and rescue, oil spill response, and broader emergency response infrastructure.

Status: Expand on current efforts

Timeline for Action: Medium Term

Justification: The Arctic Council’s *Arctic Marine Shipping Assessment* (2009) and the CMTS *U.S. Arctic Marine Transportation System: Overview and Priorities for Action 2013* identify and recommend addressing the infrastructure gap related to Arctic marine transportation. More recently, and importantly, the eight Arctic nations have signed agreements, facilitated by and convened under the auspices of the Arctic Council, that respond to search and rescue activities, as well as oil spill response. Both reference as obligations of each nation minimum infrastructure and response capacity. As Alaska communities bear the brunt of risk associated with increased marine activity, whether it is shipping through the Bering Strait or offshore development in Russia or the U.S. Clearly, the U.S. has a responsibility in this area, and Alaska can play an active role both in the interests of facilitating economic development, promoting human safety, and protecting the environment. Strengthened response capacity provides a good argument for offshore resource development; and, with nearly 90% of Alaska's population living on or near the coastline, depending on access to safe and affordable marine transportation, this should be a fundamental priority for the state of Alaska and the nation.

Lead and Partners:

Primary – DOT&PF

Supportive

State – AIDEA, Alaska National Guard, DEC
Federal – U.S. Coast Guard, DOT, CMTS, DHS
Other – Marine Exchange of Alaska, UAF

Resources needed:

Fiscal – This has the single highest potential for state investment and should be approached strategically, considering a phased or scaled approach.

Leveraged – The federal government has the lead in much of this, as an obligation as an Arctic nation and in the national interest, and should be pressured to fund appropriately its priorities.

How will it get done:

The Alaska State Legislature has made significant headway to begin addressing this issue through AIDEA investment. That will need to be carefully coordinated with DEC and DHS, as well as with federal partners, to ensure successful implementation that results in direct state funding and/or public-private partnerships that address the development of telecommunications, coastal infrastructure, maritime assets and aviation infrastructure and assets. Specific attention should be on support for icebreaker(s) in Arctic waters and a WX C-130 size aircraft hangar(s) on the North Slope.

Legislative Actions:

1. Convene committee review of status and plans for port, hangar, communications and other Arctic infrastructure projects
2. Encourage AIDEA’s careful selection of priority investments, including as they relate to economic development opportunities and/or human safety and environmental protection
3. Facilitate streamlined regulatory or permitting processes that navigate local, state and federal processes and recognize that authority and jurisdiction may be different for each project
4. Demand federal action on icebreaker investment to ensure national security and interest, as well as

stewardship of the Arctic region
<p>Evaluation: Success will be measured by 1) increased number of response assets placed in the Arctic region; 2) expanded marine infrastructure; 3) increase in cached search and rescue, and oil spill response, supplies and equipment; and 4) increased public confidence in maritime operations and the ability of an Arctic nation and state to respond.</p>

Recommendation: 2(e) Strengthen the Department of Environmental Conservation’s Spill Prevention and Response efforts.

Status: Expand current efforts	Timeline for Action: Short term
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Justification: The state of Alaska has an existing spill response system through DEC’s Spill Prevention and Response division. SPAR coordinates its activities with USCG and the EPA through the Regional Response Team, which organizes oil spill planning, prevention and response for the entire state both onshore and offshore. The state’s efforts to plan for and prevent oil spills in Alaska are largely paid for by the Oil and Hazardous Substance Release Prevention and Response Fund. The Response account can be accessed by the Governor or DEC Commissioner with notice given to the legislature and used to assist the state when it responds to the exigencies of a spill. The Prevention account is also an important resource for the state and is used to fund the operating expenses of DEC’s SPAR Division, including the Industry Preparedness Program and other prevention activities. While the ‘polluter pays principle’ places the burden to pay for and respond to an incident on industry, and significant infrastructure is in place, the region remains at risk. One of the assets the state has is the Unified Plan, which also Sub-area planning is the most direct path for the application and integration of local and traditional knowledge as part of broad stakeholder engagement. Communities interested in having a role in spill response can do so through the sub-area planning that takes place, ensuring that responders have as much of the data available to them as possible, as well as an understanding of stakeholder priorities. Their early engagement should result in better risk communication and mitigation, protection of the environment and food resources, and human safety.

<p>Lead and Partners: <i>Primary</i> – DEC SPAR</p> <p><u>Supportive</u> <i>State</i> – Division of Homeland Security, Emergency Management, Alaska National Guard <i>National</i> – U.S. Coast Guard, EPA, DoD <i>Other</i> – OSROs, Alaska Native organizations and companies</p>	<p>Resources needed: <i>Fiscal</i> – Current funding is adequate for planning purposes but increased funding will be needed for increased operations.</p> <p><i>Leveraged</i> – Spill response training would be handled not by DEC but by OSROs, therefore DEC can build upon existing capacity at that level and leverage USCG and DoD responsibilities.</p>
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How will it get done:
The state of Alaska has a functioning and effective spill response planning and response program. Local communities often are unaware, or don’t understand the importance, of sub-area planning as a component of this process. DEC can begin a more robust public education and awareness campaign that encourages increased stakeholder engagement, involving communities and stakeholders through Subarea Planning and provide local response training, to maintain local spill response equipment to ensure timely, effective, and safe response. The Governor should make this a priority – both in the interests of expanding spill response capabilities and as a justification for increased resource development activities – and provide a suggested alternative or increase to the current tax structure, and related increase in funding to the SPAR program and Fund. The Alaska State Legislature should respond accordingly and take up the funding request in its budget discussions.

- Legislative Actions:**
1. Invite testimony from the State Department and U.S. Coast Guard on the Arctic Council’s *Agreement on Cooperation on Marine Oil Pollution, Preparedness and Response in the Arctic*, and assess its impact
 2. DEC and federal agencies can conduct town hall meetings to inform Alaskans of sub-area planning

3. Review similarly structured and successful sub-national spill response programs to look for best practices
4. Consider reliable alternatives to fully funding the account and program

Evaluation:
 Success should be evaluated by 1) increased public participation in sub-area planning, 2) increased public confidence in the state of Alaska’s oil spill planning, preparedness and response and 3) increased local training opportunities provided by OSROs. Success will be measured by having a mechanism in place with a pool of funds from which to draw from, if an event requires a response.

Recommendation: 2(f) Strengthen Oil Spill Response Organizations (OSROs) to ensure expertise in open water, broken ice, near shore, and sensitive area protection, and be able to meet contingency plan requirements and operate effectively in the Arctic.

Status: Expand on current efforts	Timeline for Action: Short term
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Justification: Oil Spill Response Organizations (OSROs) are membership based nonprofit organizations that fulfill compliance obligations for companies operating on land and in or near the US maritime environment. Their sole purpose is to provide oil spill response capacity to those companies, thereby reducing liabilities and responding to state of Alaska and U.S. environmental regulations. Their response is determined by the needs of their membership base and generally speaking no OSRO has the capacity to respond to an offshore incident. OSRO capacity is contingent upon the types of activities occurring and with no production in open water yet, there is no OSRO with the ability to adequately respond to that type of event. For example, Shell was required to bring all its response capacity to the Arctic for their exploration work. Similarly, vessels in innocent passage (not visiting a U.S. port) are not required to comply with State of federal laws and be a member of a local OSRO or have their own response capacity. It is OSROs that are the primary responders to an oil spill in the Alaskan Arctic, with the state of Alaska, and EPA (land-based spill) or USCG (water-based spill) acting as incident commanders. State of Alaska assets are limited to cached equipment and supplies geared toward small incidents. OSROs also maintain a contingent of local responders and regularly conduct exercises and trainings depending on resources available or identified needs.

<p>Lead and Partners: <i>Primary</i> – Department of Environmental Conservation Division of Spill Prevention and Response</p> <p><u>Supportive</u> <i>State</i> – Alaska National Guard, Division of Homeland Security, Emergency Management, local governments <i>National</i> – U.S. Coast Guard, EPA, DoD <i>Other</i> – OSROs, Alaska Native organizations or companies, Alaska Maritime Prevention and Response Network</p>	<p>Resources needed: <i>Fiscal</i> – Participation in OSROs as a member would incur a membership fee, which should be considered an additional investment in oil spill response capacity. Assets staging by DEC would also require increased funding.</p> <p><i>Leveraged</i> – Current and potential OSRO membership, Coast Guard activities and increased attention to the Arctic.</p>
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How will it get done:
 In addition to continuing to support the Department of Environmental Conservation’s ongoing communication with the U.S. Coast Guard in reviewing alternative compliance programs development and applications, the state of Alaska should consider new ways of interacting with OSROs. If the state were to join an OSRO, for instance, this could provide for a more equitable distribution of resources and ensure increased response capacity in specific regions of concern (i.e.; the Aleutians and Bering Strait). As a member, the state would move beyond regulation of OSROs to partnership, developing a more strategic relationship that should result in spill response capability. State participation could also result in strengthened ability to gather data and fundamental science on ecosystems – ocean stratification, ocean current movements, ice formation – which will be critical to understanding and responding to an incident.

<p>Legislative Actions –</p> <ol style="list-style-type: none"> 1. Explore current database availability and functionality as they relate to effective emergency response, such as concentration of sea ice, locations of ports, and vulnerable environmental resources (AMATII, Arctic Portal, Arctic ERMA, AOOS, Marine Exchange of Alaska) 2. Ask the Attorney General for an opinion about the state of Alaska joining OSROs as a member 3. Alaska Maritime Prevention and Response Network should work toward coordination between state and federal OSROs.
<p>Evaluation: Success will be measured by the increased capacity of OSROs to respond to a potential or real oil spill, as well as in public confidence in oil spill planning, prevention and response.</p>

<p>Recommendation: 2(g) Foster and strengthen international partnerships with other Arctic nations, establishing bilateral partnerships with, in particular, Canada and Russia, to address emerging challenges in the Arctic.</p>	
<p>Status: Expand on current efforts</p>	<p>Timeline for Action: Short Term</p>
<p>Justification: Alaska has been an active participant in international Arctic relations throughout its history. This has occurred through business activities (CH2M Hill’s Sakhalin, or Teck’s investment in Red Dog), environmental issues (DEC’s active communication with Canadian territories and provinces), policy (through the Northern Forum, for a time) and as part of the US delegation to the Arctic Council, where Alaska contributes its knowledge and expertise to projects of the Working Groups or Task Forces. While international relations are the domain of the U.S. government and State Department, Alaska’s strategic location as part of the Arctic necessitates a good working relationship with its neighbors. Especially important will be how Arctic shipping through the Bering Strait, and offshore development in Russia and Canadian waters, have an impact on Alaska’s environment and communities. The ability to ensure safe operations and to mitigate risk will be the thrust of the two bilateral relationships, which may be expanded to account for a sharing of best practices and joint infrastructure development.</p>	
<p>Lead and Partners: <i>Primary</i> – Office of International Trade</p> <p><u>Supportive</u> <i>State</i> – DCCED, DEC, DF&G, DNR, DMVA <i>National</i> – US Department of State, US Coast Guard, DoD, NOAA, NPS <i>Other</i> – Northern Forum, University of the Arctic, PNWER, World Trade Center, ICC, AIA, AAC, GCI, AK Chamber of Commerce, Kawerak, Alaska Marine Mammal Coalition</p>	<p>Resources needed: <i>Fiscal</i> – Potentially some additional travel funding, but basic communications are fairly cost-neutral.</p> <p><i>Leveraged</i> – There are a number of international forums for dialogue whereby state of Alaska participation could guarantee additional relationship-building. Further, through federal programs, the state could develop partnerships in these areas.</p>
<p>How will it get done: The Governor’s office should engage in a campaign to strengthen, renew or initiate the state’s international partnerships. The scale at which this is done depends on resources available and alignment of interests, but fact-finding missions to both Canada and Russia could assist in this. Additionally, Alaska would benefit from participation in or attendance at – and follow up from – Arctic Council activities; and international Arctic conferences such as Arctic Frontiers (Norway), Arctic Circle (Iceland), and the Arctic: Territory of Dialogue (Russia). The state of Alaska should also consider reengaging with the Northern Forum, as a full member.</p>	

<p>Legislative Actions:</p> <ol style="list-style-type: none"> 1. Convene hearing related to current bilateral or international relationships, with testimony from all state agencies and associated organizations. 2. Assess current capacity of state agencies or the Governor’s office to engage internationally, and expand as necessary. 3. Invite testimony from Arctic Council Permanent Participants, or Northern Forum members, to better understand the value that relationship might bring.
<p>Evaluation:</p> <p>Success will be measured in 1) increase in international engagements by state officials; 2) increase in public awareness of or confidence in bilateral working relationships; 3) increase in knowledge about Russian and Canadian activities and infrastructure in the Arctic.</p>

<p>Recommendation: 2(h) Explore preauthorization of dispersants as a response tool in oil or hazardous substance discharge or release.</p>	
<p>Status: Enhance current activity.</p>	<p>Timeline for Action: Short term</p>
<p>Justification: It is of utmost importance when faced with an oil spill incident to have many different resources readily available, any one of which might respond best to the current environmental conditions. Dispersants are an important tool in that Oil Spill Toolbox. There is significant research showing that dispersants are effective in cold waters and that the oil produced in Alaska is amenable to enhanced dispersion by dispersants. Alaska is the only coastal U.S. state without preauthorization for dispersant use for oil spills.</p>	
<p>Lead and Partners: <i>Primary</i> – Department of Environmental Conservation Division of Spill Prevention and Response</p> <p><u>Supportive</u> <i>State</i> – Alaska National Guard, Division of Homeland Security, Emergency Management, local governments <i>National</i> – U.S. Coast Guard, EPA, DoD <i>Other</i> – OSROs, Alaska Native organizations or companies, Alaska Maritime Prevention and Response Network</p>	<p>Resources needed: <i>Fiscal</i> – Current funding is adequate for planning and policy development purposes but increased funding will be needed for implementation.</p> <p><i>Leveraged</i> – USCG and EPA are already collaborating on efforts to establish preauthorization guidelines along Alaska’s coast, these partnerships should continue.</p>
<p>How will it get done: Dispersant pre-approval in Alaska should be based on sound science, including research on fates and effects of chemically dispersed oil in the Arctic environment, experiments using oils that are representative of those in the Arctic, toxicity tests of chemically dispersed oil at realistic concentrations and exposures, and the use of representative microbial and lower-trophic benthic and pelagic Arctic species at appropriate temperatures and salinities. DEC, USCG, and EPA are currently working on amending the preauthorization areas for dispersant use along the Aleutian chain, which is an extension of a current patchwork of preauthorization zones in the Gulf of Alaska that takes into consideration the environmentally important areas, including critical spawning and other wildlife habitat areas. Decision trees for dispersant use are employed after coordination with members of the Alaska Regional Response Team, federally recognized tribes, and other stakeholders. Current processes and policies should be employed to examine the feasibility of preauthorization for dispersant use along Alaska’s entire coastline.</p>	
<p>Legislative Actions:</p> <ol style="list-style-type: none"> 1. Invite testimony on the feasibility of preauthorization for dispersant use along the Alaskan Arctic coastline and the process for approving, testing, evaluating, monitoring, and reporting dispersant use. 2. Support requirements for companies that ship crude oil to store supplies of dispersants in Alaska and be 	

able to use them within seven hours following an approval for use decision.

3. Outline procedures for stakeholders, including federally recognized tribes, to identify “exclusion zones” (i.e. areas within the preauthorization area where dispersant use should be considered on a case-by-case basis). [#2 and #3 are items under the current plans for dispersant use]

Evaluation: Success should be evaluated by 1) increased public confidence in the state of Alaska’s oil spill planning, preparedness and response and 2) clear preauthorization plan in place for use of dispersants in Arctic waters.

4 Strategic Recommendation #3 – Support Healthy Communities

Increasing changes and activity in the Alaskan Arctic are likely to hold enormous implications for the health and well-being of inhabitants of the region as socio-economic systems react, additional stress is placed on both existing and future infrastructure, and global processes impact local planning. While there is a strong link between vibrant economies and healthy communities, socio-economic and environmental factors that lead to healthy communities can have a huge impact mitigating adverse health impacts that may emerge in the future.

In an increasingly busy Arctic, it is critical that Alaska continue to utilize transparent public processes that engage stakeholders, lead to informed decision making, and hold decision makers accountable. It must include coordination among jurisdictions, cooperation at all levels of government – including international, national, state, local and tribal – with clearly defined functions and roles, and balancing multiple values to protect, promote, and enhance the well-being of the Alaskan Arctic including the people, flora, fauna, land, water and other resources. Much of this is already in place.

Local governments with active resource development within their boundaries work collaboratively with the state and industry to support and sustain the communities in their region, ensuring that rural development includes protections for subsistence resources, cultural identity and lands, while providing needed infrastructure, services, and employment training opportunities.

The justification for addressing Arctic issues is not only to better understand increasing changes taking place or human activity in the region, but to recognize that Alaskans live here, with corresponding needs to enjoy a quality of life consistent with and responding to national standards, traditional ways of living, and a remote Arctic environment. With increased attention to the Arctic, local communities should see corresponding workforce development, revenue sharing, and access to affordable energy and transportation.

With sound economic opportunity for Alaskans, the state can build a vibrant economy, driven by private sector growth and a competitive business environment that has the potential to deliver social benefits while responding to the needs for a healthy environment. The state of Alaska can seek a better quality of life for the whole Arctic region without compromising the economic security and well-being of other communities or the state as a whole; healthy marine and terrestrial ecosystems; and effective governance supported by meaningful and broad-based citizen participation.

Recommendation: 3(a) Improve the living conditions in Arctic communities by a) fostering the delivery of reliable and affordable in-home water, sewer, and sanitation services and b) reducing power and heating costs.	
Status: Expand on current efforts	Timeline for Action: Short term
<p>Justification: Economic stability and opportunities have a profound effect on the social characteristics and health of a community. In all eight Arctic nations, where distance and geography mean remote communities face often difficult living conditions, governments, communities and the private sector are working to implement effective and affordable delivery of public services. The state of Alaska is well-positioned to take a leadership role in the circumpolar region as innovative and results-driven, even as the U.S. Arctic Research Commission has estimated that it would cost \$300 million to provide running water and sewer to all unserved homes and an additional \$427 million to upgrade and replace aging infrastructure at high risk of failure. At the same time, energy prices have an outsized and interconnected effect on these two issue areas. Addressing the energy needs of Arctic communities is a critical and fundamental first step to supporting their economic and social well-being. Applied research can assist in developing new solutions to the challenge of remote power and heat, through identification of emerging energy technologies and increased efficiencies. Communities can also leverage new resource development infrastructure. Finally, many organizations are investigating cold-weather design and engineering, exploration of local and/or renewable sources, and integrated systems; alternative approaches that result in affordable construction, operation and maintenance.</p>	
<p>Lead and Partners: <i>Primary</i> – DEC and AEA</p> <p><u>Supportive</u> <i>State</i> – Alaska State Legislature, Alaska Housing Finance Corporation, DCCED, DHSS <i>Federal</i> – Environmental Protection Agency (EPA), Bureau of Indian Affairs (BIA), HUD, Denali Commission; Indian Health Service, USDA, CDC; NREL, DOE, BOEM, DOI <i>Other</i> – RurAL CAP, engineering companies, utilities, ANTHC, ACEP, CCHRC, REAP</p>	<p>Resources needed: <i>Fiscal</i> – Sustain and/or increase investment in the emerging energy technology fund, renewable energy fund, and select capital projects; and sustain or increase funding for DEC’s Water and Sewer Challenge.</p> <p><i>Leveraged</i> – Plan for future funding of implementation, either as part of a pilot project, public-private partnerships, or international collaborations. Support efforts of the Alaska Rural Water and Sanitation Working Group</p>
<p>How will it get done: <u>Water and Sewer</u> – DEC will coordinate state actions, working with other agencies, including federal agencies, to drive this effort, including searching for best practices from around the Arctic to deliver new approaches to the Alaskan Arctic. DEC’s Alaska Water and Sewer Challenge is an innovative approach that can provide clearer insight into Arctic-specific needs and solutions. Basic water data, an understanding of how the water supply is changing, and the fundamental process of changing permafrost systems is also warranted. <u>Energy</u> - The Alaska Energy Authority has a very broad and under-resourced mandate to address the energy needs of Alaskan communities. AEA should convene a working group that will examine the state’s research capacity and leverage that public-private network for research and development of new energy technologies that delivers affordability and efficiency. At the same time, AEA should consider launching an energy X-prize competition that would stimulate real-world applications of research to an Arctic environment.</p>	
<p>Legislative Actions:</p> <ol style="list-style-type: none"> 1. Conduct or support current efforts conducting a needs assessment of energy, water, sewer and sanitation 2. Prioritize highest need communities and invest appropriately in technology, processes and infrastructure 3. Evaluate long-term costs of proposed projects related to energy, water, sewer, and sanitation 4. Committee hearings should invite energy researchers to present on new and emerging energy technologies and processes and facilitate coordination of interdisciplinary partners 5. Consider funding an X-prize energy competition. 	

Evaluation:
 Success can be evaluated by assessing 1) the improvement of living conditions in Arctic communities; 2) community members’ opinions about whether needs are better met with new or redesigned infrastructure or technology; 3) increased collaboration between sectors; and 4) the associated capital, operations and maintenance costs have been reduced.

Recommendation: 3(b) Support long term strategic planning efforts that leverage existing methods, synthesize past work, and strengthen local planning that assesses and directs economic, community, and infrastructure development, as well as environmental protection and human safety.

Status: Expand on current efforts	Timeline for Action: Short Term
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Justification: To address complex issues of change and activity in the Arctic, processes must be strengthened or developed whereby local communities have the opportunity to contribute knowledge, prioritize challenges and opportunities, and assist in the development of approaches or solutions. This needs to be done in collaboration with state and federal officials, who in concert with local subject matter experts (who bring Comprehensive Planning and Comprehensive Economic Development Strategies, as well as other valuable planning efforts) explore and evaluate long-term scenarios and objectives.. In order to better integrate these individual plans and to contribute to broader regional strategies in the Alaskan Arctic, the state should encourage more robust strategic planning that assesses and supports new infrastructure and resource development opportunities. A more coordinated planning strategy will effectively leverage limited resources, avoid duplication of efforts, and deliver socio-economic benefits to Alaskans. Additionally, this can lead to more effective environmental protection and human safety, providing a baseline assessment of current conditions, monitoring cumulative impacts of human activity, and assisting land and resource managers.

<p>Lead and Partners: <i>Primary</i> – DCCED and DEC</p> <p><u>Supportive</u> <i>State</i> – DOT&PF; Alaska Housing Finance Corporation; AIDEA; local governments <i>Federal</i> – Economic Development Administration; Department of Interior; Department of Energy, Denali Commission, Corps of Engineers, NSSI <i>Other</i> – Alaska Native tribes, corporations, and organizations; private sector companies; co-management organizations; ARDORS</p>	<p>Resources needed: <i>Fiscal</i> – Competitive grant to DCCED for agency staff to review and compile a region or sub-regional plan; anticipate and plan for future needs related to planning efforts.</p> <p><i>Leveraged</i> – Fortunately there are existing studies and reports, CEDS, and transportation plans that can be used to assist in this effort. At the same time, with federal attention on integrated arctic management, there may be an opportunity for increased federal funding through EDA or Arctic initiatives undertaken during the U.S. Chairmanship of the Arctic Council.</p>
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How will it get done:
 DCCED has a well-established history of economic development planning. As the lead agency, it will be responsible for identifying current efforts and organizing a structure for producing region-wide plans. AEA’s regional energy planning, DEC’s sub-area planning, or DNR’s North Slope Plan for state lands and resources (under development) might provide good examples. DCCED will also coordinate with other state agencies and the federal government to leverage interest and evaluate collaboration, as well the impact of state-federal or state-local interaction, and produce a recommendation for best practice. Additionally, the state will engage with IASC and/or the Alaska State Committee on Research to determine the best approach for assessing and mobilizing the scientific community. NSSI Scenario Planning and local Planning Commissions all have established processes and information that can be built upon.

- Legislative Actions –**
1. Request that DCCED assess previous work and current planning efforts, and fund, as necessary
 2. Review framework for region-wide comprehensive planning that acts as synthesis of existing plans
 3. Evaluate the membership of the Alaska State Committee on Research

<p>4. Consult with local governments to determine effectiveness of current programs and/or opportunities for increased stakeholder engagement beyond legislative process.</p> <p>5. Consider additional resources devoted to data management, access, integration and visualization for decision making</p>
<p>Evaluation: Success can be evaluated through metrics that include 1) reduction in duplication and increased engagement between agencies, communities and organizations; 2) stabilized and/or growing economic performance; 3) development of a strategic plan related to environmental change and assessment; and 3) a legislature more informed about cumulative impacts of human activity in the Arctic.</p>

<p>Recommendation: 3(c) Evaluate and respond to risks from climate change related to erosion to community infrastructure and services and support community efforts to adapt and relocate when necessary.</p>	
<p>Status: Expand on current efforts</p>	<p>Timeline for Action: Medium Term</p>
<p>Justification: Alaska has been on the front lines of climate change for nearly a decade, as work conducted by the Climate Change Sub-Cabinet will demonstrate. With the Arctic experiencing change at twice the global average, Alaska’s communities and peoples are faced with new and significant challenges and the need to immediately take action is clear. Between the space where villages are faced with relocation and survival, and resource or port development is considered to advance economic opportunity, must be timely and innovative solutions, as well as strategic investment. The state and nation have an obligation to move focus at the local level on adaptation measures that help communities better understand risk and respond appropriately. Two elements are central to this effort: the building of human and organizational capacity to adequately move forward and built infrastructure investments that relocate or stabilize existing structures. Ensuring a direct response to the state's most vulnerable resources – its people – during a period of climatic uncertainty and variability, will be of paramount importance.</p>	
<p>Lead and Partners: <u>Primary</u> – DCCED</p> <p><u>Supportive</u> <i>State</i> – DEC, AIDEA, Alaska Housing Finance Corporation, local governments, DNR/DGGS, DOT/PF <i>Federal</i> – Denali Commission, USACE, DOI, FEMA <i>Other</i> – RurAL CAP, Alaska Native regional nonprofits, Cold Climate Housing Research Center</p>	<p>Resources needed: <i>Fiscal</i> – This will require increased capital spending, either for village relocation, erosion mitigation or structure stabilization.</p> <p><i>Leveraged</i> – Federal agencies will have a primary role, often, in funding and facilitating the response to climate associated risk.</p>
<p>How will it get done: DCCED’s Risk MAP program is a good start to identifying and prioritizing risk, though as a FEMA-funded project it is very specific in the communities it can include. DNR/DGGS has a Climate and Cryosphere Hazards Program (CCHP) that was developed to asses geologic hazards associated with climate variability and change and to publish information that can be used for forecasting and proactive planning, hazard mitigation, and emergency response in high-risk communities and developing areas. DEC can provide a lot of expertise on the topic, and both can work with federal agencies to assess future investment needs. However, if action is to occur it will need to be driven by the Governor, legislature and/or federal government. Associated costs of response are too high to address alone or without commitment from the highest levels. There are communities, such as Newtok, that have plans in place and are waiting for funds to make a move happen.</p>	
<p>Legislative Actions –</p> <ol style="list-style-type: none"> 1. Expand DCCED Risk MAP program and partner with communities who are ready to take action now 2. Encourage cross-agency collaboration, perhaps through a reconvening of the Climate Change Sub-Cabinet 3. Convene committee hearings with public testimony by local communities, tribal and local government 	

4. Request an annual report to Legislature on those communities of imminent concern to monitor progress as well as fiscal needs
5. Request that federal agencies designate a single coordinating agency, and identify a designated funding stream, that will be responsive to climate change impacts requiring community relocation
6. Increase support to state of Alaska agencies so that they can adequately evaluate their programs and goals against the recommendations made by the Alaska Climate Change Sub-Cabinet.
7. Map the history of storm surges and other natural disasters and evaluate capacity to respond

Evaluation:
 Success will be measured by 1) relocation of highest priority communities; 2) risk mitigation measures implemented in the next level of prioritization; and 3) state-federal investment leveraged effectively for greatest efficiency of effort.

Recommendation: 3(d) Develop and support education of the public through outreach efforts that enhance the understanding of the conservation of Arctic biodiversity and sustainable use of biological resources and management of natural resources.

Status: Expand on current efforts	Timeline for Action: Short Term
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Justification: Alaskans depend on healthy ecosystems, on access to and the ability to harvest natural living resources like fisheries or wildlife. For some, this may be recreational, others an economic necessity, and for Alaska Natives a cultural priority. Alaskans have an obligation, too, to ensure these resources for use by future generations. However, the systems upon which Alaskans depend are often not completely understood, especially as they relate to biodiversity or ecosystem health. A baseline assessment of these, as well as a tracking of trends and patterns in the face of change, determines the resource availability and use, and Alaskans’ understanding of both. To make informed decisions about these resources, public awareness is important and critical. Increased public education and outreach efforts should lead to a more informed public who is interested in and knowledgeable about the biodiversity of a healthy ecosystem, as well as threats to that health. Public awareness should include species, habitats, ecosystem structure, processes, functions and stressors. At the same time, education programs should address the interplay between humans and ecosystems, the dynamism in naturally occurring processes and those that fall outside natural variability.

<p>Lead and Partners: <i>Primary</i> – Department of Fish & Game</p> <p><u>Supportive</u> <i>State</i> – DNR, DEC, Board of Fisheries, Board of Game, local governments <i>National</i> – NOAA, DOI, NPRB, NMFS <i>Other</i> – NPFMC, CAFF, NSSI, AOOS, Alaska Sea Grant MAP</p>	<p>Resources needed: <i>Fiscal</i> – The most effective way for this to take place would be through a grant competition open to eligible applicants.</p> <p><i>Leveraged</i> – There are multiple state, national and international efforts underway, so process should focus on highlighting current practices and research, integrating cross programs and linking to k-12.</p>
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How will it get done:
 DF&G should include a request to the legislature in the next budget cycle or otherwise identify a funding and organizational mechanism for this to occur. The grant competition should prioritize grantee knowledge of and responsiveness to not only Alaskan experts and expertise, but international fora such as the Arctic Council’s CAFF working group. Additionally, the successful grantee should have strong relationships with local government and industry partners who can contribute their science and research as well as stakeholder engagement. Many individual efforts are ongoing in Alaska and new networks should build on these resources: Upward Bound, the Marine Advisory Program, Cooperative Extension coursework, Alaska Natives in Science and Engineering Program, Alaska Resource Education etc.

<p>Legislative Action:</p> <ol style="list-style-type: none"> 1. Review of locally-driven subsistence mapping projects through invited testimony, including related testimony from local stakeholders and research institutions 2. Consideration of DF&G budget request for grant competition
<p>Evaluation:</p> <p>Success will be measured through an increase in public awareness of these issues, possibly through a poll for current state of knowledge, which could be updated every year. This would be the responsibility of the successful grantee in a report to the Legislature.</p>

<p>Recommendation: 3(e) Enforce measures that protect the food security of Arctic peoples and communities.</p>	
<p>Status: Expand on current efforts</p>	<p>Timeline for Action: Short Term</p>
<p>Justification: Increased change taking place in the Arctic, as well as weather variability, changing ice freezing patterns, more frequent and intense storms, and higher temperatures combine to make access to food resources uncertain. At the same time, an increase in toxins, emerging diseases, altered migration routes, and decreased sea ice extent and stability produce an unpredictability to long established hunting, fishing and gathering harvest patterns. This, in communities that are paying some of the highest energy and food prices in the world. Food security, however, must be considered as more than ensuring communities are free from hunger, or ensuring affordability and accessibility. In the Arctic, for indigenous peoples, food security is a fundamental priority that extends to cultural as well as environmental or economic health. While economic and resource development activities will address one portion of socio-economic concerns, they cannot displace cultural dependence on the living resources of the region. With this in mind, future development will need to respond to local concerns for food safety and ecosystem health, keeping in mind the social license of the people who live there. Greater awareness of the cultural context that food security demands will be important.</p>	
<p>Lead and Partners: <i>Primary</i> – Department of Fish and Game</p> <p><u>Supportive</u> <i>State</i> – DNR, DCCED, DHSS, local government <i>National</i> – NOAA, NPS, FWS <i>Other</i> – Arctic Council; Inuit Circumpolar Council; Alaska Native tribes, corporations and organizations; University of Alaska</p>	<p>Resources needed:</p> <p><i>Fiscal</i> – Strengthen capacity with DF&G’s Division of Subsistence to respond to food security concerns.</p> <p><i>Leveraged</i> – Increased cooperation and communication between state and federal agencies, local government and Alaska Native organizations should result in effective promotion of food security without additional resources being needed. Our international neighbor Canada has done extensive work on food security and this would be a good opportunity to collaborate.</p>
<p>How will it get done:</p> <p>DF&G has existing protocols in place to address food security concerns and has decades of experience ensuring the sustainable yield of living natural resources. It can provide a leadership role in increasing collaboration between agencies and organizations with concern for and management of fisheries. The state will facilitate efforts ensure subsistence activities are supported for arctic residents. Within DF&G’s Division of Subsistence, the state should consider forming a Committee on Cultural Habitat, which would reinforce the eco-cultural relationship found within food security.</p>	

<p>Legislative Actions –</p> <ol style="list-style-type: none"> 1. Invite regular testimony in committee hearings to assess the sustainable management of local marine and terrestrial subsistence animals, fisheries, and flora. 2. Consider a food security policy as it relates to the cultural health of indigenous peoples as well as the well-being of all Alaskans. 3. Form a Committee on Cultural Habitat with the Division of Subsistence. 4. Explore solutions to current limitations on serving locally harvested food in schools and other public service buildings, e.g. hospitals etc. 5. Support DF&G programs that support access to and harvesting of subsistence foods and with the participation of local and indigenous peoples, continue to support the development of a cohesive and comprehensive Arctic wildlife policy, including the identification and assessment of climate-related impacts and threats at the community level. 6. Continue to fund science and research studies food security; one specific focus could be on the issue of contaminants in subsistence foods.
<p>Evaluation: Success will be measured by increased attention to and agency response to food security concerns.</p>

<p>Recommendation: 3(f) Identify and promote industry, community and state practices that protect subsistence resources, while guarding against undue ESA listings and broad-brush critical habitat designations.</p>	
<p>Status: Support current efforts</p>	<p>Timeline for Action: Short term</p>
<p>Justification: Over the past decade, federal agencies have strived to make Alaska “ground zero” for climate change legislation and regulation. Primarily, those efforts have been evident in ESA listings, which have included the Polar Bear, Bearded Seals, and Ringed seals. ESA listings and critical habitat designations affect and alter subsistence hunting practices, industry activities and infrastructure development. Unlike other listings in the history of the ESA, these listings have been predicated entirely on modeling and conjecture. Each of the species listed is currently healthy. However, the ESA predicts that climate change over the next century will result in these species becoming threatened and/or endangered. Even ignoring the speculative nature of these listings, the immediate problem is that the ESA will serve to punish Alaskans and the local economy of issues that, by definition, are global in nature. The State of Alaska must continue to challenge unwarranted ESA listings that will halt economic development and healthy communities. Additionally, Arctic Alaska has numerous examples of balancing environmental protection with development activities. Co-management groups, Red Dog Mine’s subsistence committee, and Shell’s conflict avoidance agreements are all examples of how the State of Alaska can serve as a model to other arctic nations.</p>	
<p>Lead and Partners: <i>Primary</i> – SOA Dept. of Law, Alaska Department of Fish and Game</p> <p><u>Supportive</u> <i>State</i> – Legislature <i>Federal</i> – Federal legislative delegation <i>Other</i> – Native communities, Industry</p>	<p>Resources needed: <i>Fiscal</i> – Support proactive research efforts by the Alaska Department of Fish and Game which can serve to provide the science needed to avoid unwarranted ESA listings. Ensure the Dept. of Law has resources need to challenge unwarranted listings.</p> <p><i>Leveraged</i> – Collaborate with Western Governor’s Association and others with aligned interests regarding ESA policy.</p>

<p>How will it get done?: Industry, state and local agencies, corporations and communities can collaborate to determine the best legal and regulatory strategy relative to federal listings. The primary strategy will necessarily demand targeted litigation that demands federal agencies act with legitimacy, transparency and candor. Tangentially, state and local regulators should take into account the additional burdens of ESA listings when determining their respective regulatory endeavors. Ongoing, sound scientific research is essential for regulatory agencies, industry, and native communities.</p>
<p>Legislative Actions:</p> <ol style="list-style-type: none"> 1. Ensure funding is available for the Dept. of Fish and Game and Dept of Law, as well as outside counsel to continue and pursue proactive research and litigation efforts as necessary. 2. Convene an industry-focused task force that identifies best practices and develops recommendations for public outreach, including to federal agencies and Congress 3. Evaluate state and local government activities that effectively mitigate risks of private sector activity as it relates to subsistence resources
<p>Evaluation: Success will be measured by 1) protection of species 2) fewer litigation efforts and 3) the health of those industries and businesses that are operating in areas subject to ESA related regulations.</p>

<p>Recommendation: 3(g) Create workforce development program to prepare Arctic residents to participate in all aspects and phases of Arctic development.</p>	
<p>Status: Expand on current efforts</p>	<p>Timeline for Action: Medium Term</p>
<p>Justification: Emerging resource development opportunities and the opening of maritime routes will create increased demand for workers in trades such as construction of industrial infrastructure, equipment operations, carpentry and architecture for new structures and housing, food and tourism services, scientific research, as well as other entrepreneurial pursuits that build from new activities. Many of these activities demand skilled labor and/or postsecondary education including, for example, education for entrepreneurship that capitalizes on an individual’s ability to turn ideas into action. Ongoing public investment in construction, infrastructure, and resource development projects in Alaska will require active attention to providing training and education resources. The largest job growth is forecasted to be health care and social assistance, mining, construction, and the leisure and hospitality sector. Consideration should be given to all aspects of development projects, including research, monitoring, regulatory oversight, project development, construction, operation, remediation, and reclamation, as well as ice navigation, marine mammal observation, spill response, SAR, pilotage, and engineering.</p>	
<p>Lead and Partners: <i>Primary</i> – Alaska Department of Labor and Workforce Development (DLWD)</p> <p><u>Supportive</u> <i>State</i> – Alaska Workforce Investment Board (AWIB); Division of Teaching & Learning Support, Career Technical Education; DLWD, Alaska’s Institute of Technology, Alaska Technical Center (Kotz) <i>Federal</i> – U.S. Coast Guard, Dept. of Labor, EDA <i>Other</i> – Alaska Process Industry Careers Consortium (APICC); Alaska Marine Pilots; Alaska Native tribes, corporations, and organizations; University of Alaska; Iñisagvik Tribal College</p>	<p>Resources needed: <i>Fiscal</i> – Fund DLWD/AWIB agency staff to develop targeted workforce development plan for the northern region.</p> <p><i>Leveraged</i> – Federal resources should be applied to Arctic workforce development as an emerging field of study. Additionally, there are numerous programs that could incorporate or co-develop an Arctic training and workforce program.</p>

How will it get done:

The state of Alaska has many resources already focused on workforce development – AWIB, DEED, CTE, AVTEC, ATC, ANSEP. Job and workforce planning will have to incorporate innovative ideas that are applicable to the Arctic and its unique set of challenges - the current *Alaska Integrated Workforce Development Plan* mentions “arctic” once, in relation to offshore oil fields. AWIB has a history of working with industries to develop targeted workforce development plans, see Construction Workforce Development Plan and Alaska Health Workforce Coalition Plan for examples, and continued work could focus on industries important to the Arctic.

Legislative Actions –

1. Request that AWIB implement plans already in place, as well as assess current job market for gaps, emerging job markets, such a renewable energy and energy efficiency subsectors, and form strategies and priorities for an Arctic Workforce Development Plan that connects the dots between regional plans.
2. Request that AWIB convene a working group to look at education programs that support entrepreneurship all the way from primary school thru postsecondary education promoting skills that foster creativity, initiative, innovation as well as specialized knowledge about business development.
3. Fund, as needed, the work necessary to complete implementation, recurring assessments and updates to develop plan(s).
4. Evaluate current workforce development strategies for effectiveness in rural Alaska.

Evaluation:

Success will be evaluated by lower unemployment rates and increases in the percentage of Alaskans filling available jobs (versus a seasonal workforce that commutes from out of state) and increase in local entrepreneurs establishing a social or commercial activity.

5 Strategic Recommendation #4 - Strengthen Science and Research

Alaska's future prosperity depends in large part on the scientific, technological, cultural and socio-economic research it promotes in the Arctic in the coming years and its ability to integrate science into decision making. Ongoing and new research in the Arctic must be designed to help monitor, assess and improve the health and well-being of communities and ecosystems; anticipate impacts associated with a changing climate and potential development activities; identify opportunities and appropriate mitigation measures; and aid in planning successful adaptation to environmental, societal and economic changes in the region.

The vast amount of science and research being done in the Alaskan Arctic is by a broad spectrum of interests, from the public to the private sector and including non-governmental organizations, the University system and many others. It is crucial that the state of Alaska be involved in the various forums that build the information base available to policy makers. Also, while local and traditional knowledge and subsistence activities inform many of the above entities' research priorities, activities and findings, there is a need for more effective use of traditional knowledge. Inquiry into how researchers can better collaborate with local people and include traditional knowledge into their projects is receiving more attention.

Observational systems are among the most effective means for monitoring and documenting change, improving inputs to models and informing permitting decisions. They are also a valuable way to meaningfully involve Arctic communities in research activities. Process studies can add to this knowledge and help to reveal the forces shaping ecosystem structure and function. In addition, the transfer of findings from process studies to models can reduce uncertainties and improve the accuracy of projections.

While models have practical use in developing strategies for managing wildlife and for sustainable and adaptable communities, civil infrastructure, and economic development infrastructure, there are also concerns that the limitations of models developed to aid in decision making be clearly identified. Even as baseline data and component parameterizations improve, decision makers must have a clear understanding of uncertainties present in model projections in order to evaluate contingencies and determine proper levels of precaution in management and strategic approaches.

To ensure organized state input to federal, local and institutional decisions on Arctic research and monitoring needs, a process is needed to establish state government priorities guided by state objectives in the region. As the state's engagement with Arctic issues increases, the executive branch will play an important role in improving coordination of state agencies' roles in matters related to Arctic research. Alaska should pursue strategies to broaden and strengthen the influence of its agencies, its academic experts, and its local governments and associations.

Benefits include increasing the knowledge available to decision makers in both the public and private sectors; strengthening and refining of findings through data synthesis; reducing duplicative research; and enhancing the effectiveness of interdisciplinary research efforts. More coordinated research efforts driven by state of Alaska priorities would have significant impact for policy makers and decision makers being able to respond to opportunities and challenges in the emerging arctic.

Recommendation: 4(a) Ensure state funding to, and partnership with, the University of Alaska for Arctic research that aligns with state priorities and leverages the University’s exceptional facilities and academic capacity.	
Status: Expand on current efforts	Timeline for Action: Short Term
Justification: Of primary importance is the ability of the state of Alaska to articulate clear research goals that are consistent with the state’s interests. The greater degree to which science and research have an understanding and can respond to the needs of user groups, the stronger the relationship and the more consistent the funding. The variability of annual funding is a challenge for the University system and leads to erratic or at least irregular research being conducted. Increased alignment between state priorities and University research capacity should not be seen as impacting the independence of the University or research conducted. In point of fact, it simply increases the usability of the information produced and the efficacy of or return on investment. The state of Alaska has the opportunity to define what kind of leadership role in the Arctic it wants to have. The capacity of the University system is directly related to the state’s ability to project competency and competitive advantage in a crowded field.	
Lead and Partners: <i>Primary</i> – State Committee for Research <u>Supportive</u> <i>State</i> – DEC, DNR, SCoR, DF&G, local governments <i>Federal</i> – IARPC, USARC, NOAA, DOI, NSF, DHS, DHHS, NPRB, NSSI <i>Other</i> – private sector R&D, environmental nongovernmental organizations, AOOS, University of the Arctic, University of Alaska and branch campuses	Resources needed: <i>Fiscal</i> – Funding commensurate with desired outcome; increased funding for specific research projects or studies or agency staff for project management of investments. <i>Leveraged</i> – Federal efforts through NSF, USARC, IARPC, Polar Research Board and the NPRB would be valuable and partnership might result in increased inclusion of state expertise.
How will it get done: The Governor’s office will have to take a direct role in prioritizing efforts and identifying acceptable funding levels. At the same time, state agencies should consider additional roles related to assessment and monitoring activities and identifying new efforts that are complementary to ongoing research. The State Committee for Research should consider an arm directly related to Arctic science and research. The success of this recommendation depends on a strong partnership between the University of Alaska and state agencies both in science collaboration and coordination, and the necessary co-investment to support these efforts.	
Legislative Actions: <ol style="list-style-type: none"> 1. Consider revising the makeup of the Alaska State Committee for Research with its membership and charge be broadened. 2. Invite testimony from IARPC, NSF, USARC, NOAA and DOI on research priorities in the Arctic. 3. Convene committee hearings related to applied research opportunities and related opportunities for business development. 4. Fund the State Committee for Research to lead the assessment of current state efforts and develop a report identifying state priorities and to make recommendations to the Governor on budgets necessary to realize those priorities for science and research. 5. Invest in existing UA facilities including research stations such as Toolik Lake Research Station and the Alaska Center for Energy and Power that have that the capacity to support local, national, and international science needs. 	

Evaluation:

Success will be measured by evaluating 1) development of a state research agenda; 2) the extent to which collaboration is taking place; 3) incorporation of University research in future decision-making by state agencies or policy makers; 4) confidence amongst lawmakers that funding is achieving outcomes.

Recommendation: 4(b) Increase collaboration and strengthen capacity for coordination within the Arctic science and research community.

Status: Expand on current efforts

Timeline for Action: Short Term

Justification: Coordination and prioritization of research activities must be improved. Federal interagency efforts in this sphere are already substantial and a number of them include state agency participation. The federal government has called for a review of interagency activities in the Arctic in order to identify and address overlapping missions and reduce duplication of effort, which should include evaluation of state and local engagement. The state of Alaska has an increasingly important role to play in the review and in the crafting of recommendations for how to more wisely use limited capacity to address Arctic science and research requirements. Alaska should pursue strategies to broaden and strengthen the influence of its agencies, its academic experts, and its local governments and associations. Of significant concern to Alaska is the amount and quality of Alaskan participation in scientific research and federal decision-making, as well as the geographic scope of that coordination through NSSI. The mission of the NSSI is to improve scientific and regulatory understanding of terrestrial, aquatic and marine ecosystems on the North Slope of Alaska. This intergovernmental organization has provided an open forum for discussing resource development activities, climate change, monitoring needs, best practices and other research and inventory issues but is limited to the North Slope and could be expanded for more a comprehensive understanding of the Alaskan Arctic region.

Lead and Partners:

Primary – Department of Natural Resources

Supportive

State – DF&G, DEC

Federal – North Slope Science Initiative, BLM, BOEM, NOAA

Other – Alaska Native organizations and co-management groups; University of Alaska and its branch campuses; local governments

Resources needed:

Fiscal – This will depend on scale of support or expansion of the program, but will at the very least increase staff time and travel budgets.

Leveraged – Federal agencies committed to a more integrated management of the Arctic and who have identified the State of Alaska and Alaska Natives as partners in stewardship of that region, and for whom federal resources should be expended.

How will it get done:

The State of Alaska should not only continue active participation in the NSSI but also a) explore expanding the scope of participation and work for the group; b) consider creating a similarly structured entity for the Northwest Arctic and Bering Straits region, as well as one for the Aleutians and Western Alaska; or c) consider the creation of a similarly structured organization whose scope would include the whole of Alaska's Arctic region. Ideally, there would be three geographic groups represented (North slope including Chukchi and Beaufort Seas, Bering Sea/Aleutians, and Gulf of Alaska) that also have an overarching coordinating committee.

Legislative Actions:

1. Identify common research goals and outcomes by Alaska subregion that can inform the development of a state research agenda
2. Increase efforts to incorporate local and municipal level perspectives in state-federal planning bodies
3. Urge the amendment of Section 348 of the Energy Policy Act of 2005 to require that at least two members on the NSSI's Science Technical Advisory Panel (STAP) be Alaskans from state agencies, at least three members be Alaskans from the Alaska university system, and at least two members be

<p>Alaskans from local government entities.</p> <p>4. Task the Governor’s science advisor with implementation of this recommendation.</p> <p>5. Consider convening a pan-arctic organizing council to look across regional priorities, identify the narrow subset of topics that the state and federal agencies can work on together, and determine those topics that would benefit from international cooperation.</p>
<p>Evaluation: Success will be measured by evaluating 1) an increase in engagement opportunities for local, state and federal agency land and resource managers, leading to 2) the development of greater cooperation and partnership that 3) results in streamlining of regulatory processes for more efficiency.</p>

<p>Recommendation: 4(c) Strengthen efforts to incorporate local and traditional knowledge into research and science and use this collective knowledge to inform management decisions.</p>	
<p>Status: Expand on current efforts</p>	<p>Timeline for Action: Short Term</p>
<p>Justification: In 2012 the ANWTF noted that “the local and traditional knowledge gathered by Alaska’s indigenous peoples over thousands of years is critically important to a fuller understanding of our northern ecosystems and the multitude of marine and land-based resources within them.” The NWTF went on to recommend that “the local and traditional knowledge of the state’s indigenous inhabitants be incorporated into all relevant areas of study” in the Arctic. Alaska laws do require public notice and comment periods related to agency decisions on permits, authorizations and area management plans, but many representatives from local governments and Alaska Native organizations have voiced discontent with the lack of specific reference to traditional knowledge and tribal consultation in that body of law. While the goal of using traditional knowledge in conjunction with conventional research is of considerable importance, there also exists a pressing need for increased investigation into precisely how to effectively and meaningfully do so. In <i>Traditional Knowledge and the Arctic Environment</i>, published by the Pew Charitable Trusts U.S. Arctic Program in August 2013, the authors assert that it is time to assess the use of traditional knowledge to date and ask, “What can be done to make better use of what traditional knowledge has to offer while respecting the time, patience, and expertise of its holders?” This question, and the extent to which state agencies and the university have embraced the incorporation of traditional knowledge, remains challenging.</p>	
<p>Lead and Partners: <i>Primary</i> – DEC</p> <p><u>Supportive</u> <i>State</i> – DF&G, DNR, local government <i>Federal</i> – DOI, BOEM, State Department, NPRB <i>Other</i> – University of Alaska, UArctic, Arctic Council, co-management groups, NSSI, Alaska Eskimo Whaling Commission</p>	<p>Resources needed: <i>Fiscal</i> – Formalization of the practice of engaging local and traditional knowledge holders beyond the current public comment processes would require greater staff and travel budgets for state agencies.</p> <p><i>Leveraged</i> – Existing interagency efforts provide good opportunities for addressing this topic without a significant increase in funding by the state.</p>
<p>How will it get done: The Governor’s office will have to make this a priority, at some level, in order to facilitate implementation. The state does have public processes that draw on and invite local and traditional knowledge, but discontent from Alaska’s Arctic communities would indicate that the state is simply not doing enough. The Governor should direct state agencies to be proactive in identifying a solution that meets public demand while maintaining effective stakeholder engagement practices in making resource management decisions. The Governor can build off the Community Based Monitoring workshop held in April 2014 that identified best practices and lessons learned from activities that include local and traditional knowledge. A manual of these is being developed through a grant from NSF and will be released at the 2015 Alaska Forum on the Environment.</p>	

<p>Legislative Actions:</p> <ol style="list-style-type: none"> 1. Establish a working group, with members of local government, state agencies, and the university to identify and assess current state practices, producing a report and list of recommendation 2. Invite to committee hearings the testimony of local and traditional knowledge holders
<p>Evaluation:</p> <p>Success will be measured in an increase in public confidence in management decisions, and their responsiveness to local and traditional knowledge; an increase in traditional knowledge represented in and co-producing scientific research; the development of standards of use; and an increase in conflict avoidance.</p>

<p>Recommendation: 4(d) Improve, support, and invest in data collaboration, integration, management and long-term storage and archiving.</p>	
<p>Status: Expand a current effort</p>	<p>Timeline for Action: Short - Medium</p>
<p>Justification: Collaborative efforts to integrate existing and new data from various sources and support long-term management of databases will help reduce uncertainty, optimize resources, and realize gains in competitive advantage in the Alaskan Arctic. With increased human activity in the Alaskan Arctic, acquiring, mapping and making accessible accurate data - geospatial, monitoring, observational, baseline, mapping, and charting – will be important for decision making and modeling of future scenarios. Once data is available, integrated, and well-documented there is potential for decision making to be more optimized and efficient. Data-sharing between the public and private sector, academia, across regions, and in the circumpolar north has the potential to improve safety and enhance economic development, as well as environmental protection. Groups such as the Alaska Climate Change Subcommittee, AOSS, the North Slope Science Initiative and others have raised data management issues repeatedly. Addressing data challenges is a pressing need that with some planning and small investment now will support responsive, well-informed decisions for a competitive and growing Alaskan economy.</p>	
<p>Lead and Partners: <i>Primary</i> – State Committee on Research</p> <p><u>Supportive</u> <i>State</i> – all <i>Federal</i> – NSF, USGS <i>Other</i> – University of Alaska; Alaska Ocean Observing System; local government; Alaska Native Organizations; industry groups; NSSI</p>	<p>Resources needed:</p> <p><i>Fiscal</i> – The state of Alaska, via the Alaska State Geospatial Council, should anticipate increased leadership as a facilitator of multi-agency cooperation; current funding is adequate for planning purposes but increased funding would be needed for implementation.</p> <p><i>Leveraged</i> – The University of Alaska and AOOS have already been working to manage researcher data, therefore state of Alaska can build upon these and other capacities.</p>
<p>How will it get done: The Alaska State Geospatial Council is currently working on the challenge of data storage related to increased mapping and charting efforts in the state. The Alaska Data Integration Working Group is looking at the broad challenges associated with integrating and sharing data. AOOS has developed a new cloud-based data sharing system called the Research Workspace to promote scientific data sharing and integration. The system provides secure access to data to project teams for internal synthesis and data sharing, with protocols for publishing data to the AOOS Ocean Data Explorer. The Alaska Statewide Digital Mapping Initiative (SDMI) is working towards digitizing airborne and satellite imagery, digital elevation model data, landsat, topographic maps and navigational charts. Federal responsibilities include data access and management and this is a good area for partnership, including with the Arctic Research Mapping Application (ARMAP); Arctic Environmental Response Management Application (ERMA); the Exchange for Local Observations and Knowledge of the Arctic (ELOKA); National Snow and Ice Data Center (NSIDC); and the Advanced Cooperative Arctic Data and Information Service (ACADIS).</p>	

<p>Legislative Actions:</p> <ol style="list-style-type: none"> 1. Encourage federal agencies to work with state of Alaska agencies to identify data storage, integration, and management solutions. 2. Encourage state co-investment in implementing these solutions, including funding of data centers and online storage systems 3. Increase state research funding, or consider matching private sector or NSF funding for Alaska Arctic science and research 4. Require that all projects completed under state of Alaska funding to archive data someplace with appropriate metadata (i.e. descriptors such as how it was collected, units etc) that is then created and edited to ISO 19115 standard and receive a Digital Object Identifier (DOI) registration number for identification, retrieval, exchange and maintenance of intellectual property.
<p>Evaluation: Success will be measured by the increased amount of accessible data and increased actual use of this data</p>

<p>Recommendation: 4(e) Support monitoring, baseline, and observational data collection for key ecosystems.</p>	
<p>Status: expand a current effort</p>	<p>Timeline for Action: Short - Medium</p>
<p>Justification: To be able to better anticipate and adapt to changes across the Arctic region, Alaska needs to continue to advance basic research. In summarizing its chief recommendations, the Alaska Climate Change Sub-Cabinet noted: “The success and accuracy of downscaled models is largely dependent upon the quantity and quality of data available.” The compiling of comprehensive baseline knowledge of existing environmental conditions is also crucial to measure, in order to subsequently mitigate the impacts of increased activity in Arctic ecosystems. Focuses should not only include marine and terrestrial physical, chemical, and biological variables but also the cultures, social sciences, economics, and health of Arctic populations. Some federal agencies are mandated to provide baseline information and the state does not have a desire to take on federal responsibilities without due compensation, however this is a good opportunity to partner for mutual benefit.</p>	
<p>Lead and Partners: <i>Primary</i> – Governor’s office, SCoR</p> <p><u>Supportive</u> <i>State</i> – DEC, DNR, DF&G, local governments <i>Federal</i> – IARPC, USARC, NOAA, DOI, NSF, DHS, DHHS, NPRB, NSSI <i>Other</i> – private sector R&D, environmental nongovernmental organizations, University of the Arctic, Univ of Alaska and branch campuses; ANTHC</p>	<p>Resources needed: <i>Fiscal</i> – Funding commensurate with desired outcome; increased funding for specific research projects or studies or agency staff for project management of investments.</p> <p><i>Leveraged</i> – NSSI, ANTHC, and AOOS as well as federal efforts through NSF, DOI, and NASA would provide a valuable starting point to bring data together in an integrated way that would support real-time decision making.</p>
<p>How will it get done: Benchmark data (reference points measured over time) provide the most reliable monitoring of ecosystems in an active and changing Arctic. Local Environmental Observation Program, managed by ANTHC, is a successful network of citizen scientists that report to a central database unusual plants and wildlife, extreme weather, flooding, drought and wildfires. Other monitoring initiatives could focus on the following: 1) High frequency radars that monitor ocean currents in the Chukchi and Beaufort Seas to be used for oil spill trajectories and ecosystem modeling; 2) Ocean acidification monitoring using buoys and ship transects; 3) Underwater glider observations to detect marine mammals and measure other subsurface ocean conditions; 4) Year-round ocean measurements of physical, chemical, geological and biological parameters to track seasonal, annual and long-term changes; 5) Wave measurements to improve storm surge and coastal erosion mapping and planning; 6) Adding marine weather and sea ice forecasts to</p>	

vessels using AIS tracking; and 7) Ice property and movement data from drifting sensors and coastal radar to identify hazards and improve forecasting.

Legislative Actions:

1. Request that the Governor’s office to convene a working group to evaluate priorities related to baseline monitoring and observations, perhaps through the Science Committee on Research, and make recommendations to the executive and legislative branches regarding resources needed to meet high priority items.
2. Support baseline data planning at 5 year intervals to ensure that data collected is responsive to identified priorities and user needs.

Evaluation: Success will be measured by 1) the establishment of an integrated network for baseline and monitoring; and 2) increased availability and use of baseline data for forecasting.

Recommendation: 4(f) Invest in a real-time Arctic ocean ice meteorological forecasting system.

Status: Expand a current effort

Timeline for Action: Medium term

Justification: Alaska has a long history of navigating in and on ice covered waters. Hunters and whalers are active in the arctic region and have extensive experience nimbly accomplishing subsistence activities. In recent years, the northern ice has become less predictable and incidents endangering local activities have increased. Safe marine and air operations rely on knowing how the ocean behaves – ocean circulation, currents, storm surges – and having general domain awareness coupled with adequate response capacity. An understanding of ocean parameters is also critical in oil spill response as the type of tools use for any response will be determined by how oil behaves in, on, and under the ice. Robust, sustainable, and effective acquisition of relevant observational ocean data that can serve as inputs to forecasting systems should be a high priority to ensure people are safe in the Arctic region. NOAA/NWS are mandated to provide the service of a forecasting system. Working with NOAA and other partners, the state can position itself to provide the most accurate and timely information about ice in U.S. Arctic navigable waters, thereby promoting safe and efficient maritime operations and to help protect Alaska’s environment.

Lead and Partners:

Primary – DEC

Supportive

State – DNR, DF&G, local governments
Federal – IARPC, USARC, NOAA, DOI, NSF, NWS, DHS, NPRB, NSSI, NSIDC
Other – private sector R&D, environmental nongovernmental organizations, Univ of Alaska and branch campuses

Resources needed:

Fiscal – Funding commensurate with desired outcome; increased funding for specific research projects or studies or agency staff for project management of investments.

Leveraged – Federal agencies are active in this research area and state partnership could fill gaps.

How will it get done: There are a number of ocean observing programs ongoing in Alaska: Alaska Corps of Coastal Observers for weather and shore-line process; Sea Ice for Walrus Outlook for weekly reports of sea ice conditions; Local Environmental Observer Network (sea and land observations); and the Bering Sea Sub-Network for local environment and subsistence harvest data. As community-based monitoring programs these provide valuable avenues to track information from people active in the arctic. This important information needs to be considered along with the quantitative data from wave buoys, ice mass balance buoys, flux buoys, sea and wave gliders etc. Co-production of knowledge from local observations, mechanical systems observing ocean and ice conditions, and forecast modeling would enhance understanding of: variations in sea ice coverage and thickness; patterns of ice movement, ice type, sea state,

ocean stratification and circulation, storm surges, and improved resolution and response in areas of potential risk. Beyond the U.S., the state can draw on expertise from the Canadian Ice Service and the Finnish Meteorological Institute among others in the Arctic. The lead agency should look at the number of efforts underway that may not necessarily be sustainable on their own. It would be important to build on existing momentum and develop a plan for near-term action on how to best get the maximum information out of existing efforts since that information can then help refine and focus future, operational efforts.

Legislative Actions:

1. Invite testimony from the ocean observing, monitoring, and modeling programs in Alaska and nationally.
2. Convene a workshop that explores best practices in the circumpolar north, drawing on experience from all eight Arctic nations and cold-weather regions. Outcomes should develop into an inventory of current efforts, evaluation of the sustainability of each effort, and examples of the application of traditional knowledge and cultural use.
3. Consider co-investment with NOAA on appropriate technologies and practices.

Evaluation: Success will be measured by 1) increased coverage and ocean and ice measurements in the arctic region and 2) increase in use of this data for forecasting and response capabilities.

Recommendation: 4(g) Update hydrocarbon and mineral resource mapping and estimates in the Alaskan Arctic.	
Status: Support current efforts	Timeline for Action: Long Term
Justification: DNR’s Division of Geological and Geophysical Surveys has the statutory authority to “conduct geological and geophysical surveys to determine the potential of Alaskan land for production of metals, minerals, fuels, and geothermal resources...” (Alaska Statutes Sec. 41.08.020). The USGS estimates that the circumpolar Arctic region could hold about 13% of the world’s undiscovered oil reserves. While this certainly can make the Alaska attractive for investment, other formidable challenges such as distance and geography could be alleviated, in part, through greater certainty from mapping.	
<p>Lead and Partners: <i>Primary</i> – Alaska Geospatial Council, via Department of National Resources, Dept. of Geological and Geophysical Surveys</p> <p><u>Supportive</u> <i>State</i> – Univ of Alaska, Department of Mining and Geological Engineering; DNR Division of Mining, Land, and Water; Geographic Information Network of Alaska (GINA) <i>Federal</i> – Dept of Interior, USGS; EPA; Arctic Environmental Response Management Application (ERMA) <i>Other</i> – private sector companies; Alaska Native tribes, corporations, organizations; Alaska Miners Association</p>	<p>Resources needed: <i>Fiscal</i> – Legislative grant to DNR for agency staff to review current work and develop plan to address most pressing needs and high potential locations. As the Alaska Geospatial Council has been established, this coordinating body should be funded adequately to collect elevation data for the entire state.</p> <p><i>Leveraged</i> – GINA can be used as the existing mechanism for sharing and Arctic ERMA may use topographic data to help facilitate coordinated emergency responses across the state. Existing interagency mechanisms are established and should be used efficiently. Federal agencies have much to gain from any mapping data and should contribute funds accordingly.</p>
How will it get done: DNR has a well-established history of mineral and natural resource mapping and the recently formed Alaska Geospatial Council is expected to consider the Arctic as a high priority. See the Airborne Geophysical/Geological Mineral Inventory as an example that has already identified 40 million acres of state land with high potential for mineral deposits. However, the state has only mapped about an eighth of those 40 million acres (as of February 2013). Hyperspectral technologies that identify specific minerals could be used more and add value to mapping information. The private sector has some of this data and collaborative work could focus on ways to make that information available. As the lead agency, DNR will	

be responsible for identifying current efforts and organizing a plan to coordinate various efforts by other entities with an eye toward prioritizing high potential areas, as well as initial assessments for unmapped areas.

Legislative Actions –

1. Request that DNR assess previous work and current mapping efforts and strategically plan for immediate needs and long term investments
2. Fund, as needed, the work necessary to complete the assessment and planning
3. Evaluate the effectiveness of current strategy for mapping and explore collaborative investment to meet goal of updating hydrocarbon and mineral resource mapping and to refresh existing (but often incomplete) imagery.
4. Review and revise, as necessary, the process for long term data storage, management, and promoting the shared use of data.
5. Increase as needed the funding to DNR to work with federal partners to complete mapping the state.

Evaluation:

Success will be evaluated by 1) the percentage of Alaska mapped for hydrocarbon and mineral resources estimates and 2) the extent to which this data is openly accessible to, and used by, the public.

6 Conclusion

Alaska's future will be determined by a commitment to a framework of governance driven by leadership, collaboration, and transparent and inclusive decision making that achieves outcomes that benefit Arctic peoples and all Alaskans. Furthermore, Alaska's Arctic must be both economically and environmentally vibrant, achieved through resource development and respect for the environment upon which Alaskans depend. Governance – the exercise of decision-making authority – will respect the need for a robust economy, vibrant communities and healthy environment, and Alaskans' diverse cultures, practices and traditional values.

These principles are reflected in Alaska's Constitution, specifically the development, management and conservation of all natural resources for the maximum benefit of Alaskans (constrained by the sustained yield management principle). The state Constitution protects the inherent personal rights of all people, and provides for varying levels of government and jurisdiction, as well as for maximum local self-government.

The four strategic recommendations that the Commission recommends the State pursue, should be achieved through five main objectives of governance that support broad inclusive participation, transparent planning processes, and a cross-sectoral, integrated approach. The Commission stresses the importance of 1) local government, 2) use and consideration of traditional knowledge, 3) the role of integrated approaches that 4) value meaningful inclusion of Alaskans and 5) improve information access to support an informed decision making process. Guidelines for how issues are addressed in the Arctic will help foster standards of practice that can be applied to future challenges in an ever changing region.

With this in mind, the Commission has taken a long-term perspective (that includes both the present and the future) and meets challenges through integrated solutions (avoiding fragmented approaches). The Commission's work mobilizes the state's human, natural and financial resources to address current needs while recognizing that adequate resources should be available for future generations, and understanding that these might come in new and different forms as technology and demands shift over time. The Alaska Arctic Policy and Implementation Plan, then, seek a better quality of life for the whole Arctic region without compromising the well-being of other communities or the state as a whole; healthy marine and terrestrial ecosystems; effective governance supported by meaningful and broad-based citizen participation; and economic security.