

Implementation Plan for Alaska's Arctic Policy

January 30, 2015



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Introduction

The Alaska Arctic Policy Commission (Commission) offers this Implementation Plan with the intent that current and future lawmakers can use recommendations contained herein to recognize, initiate and prioritize state action in the Arctic. The Commission has framed the following strategic recommendations into four lines of effort: economic and resource development; response capacity; healthy communities; and science and research. These four lines of effort would benefit from innovative solutions, increased investment and a solid stance of state leadership. The Commission identified items that fall within state jurisdiction and for which it has the authority to implement associated action plans.

The four lines of effort and strategic recommendations of the Commission ultimately address the socio-economic factors related to Arctic activity. The recommendations address and respond to change, opportunity and risk. Within each line of effort, the Commission has identified factors necessitating high priority consideration given their potential scale of impact – responding to significant gaps and/or opportunities. These recommendations, as part of the Implementation Plan for the state’s Arctic policy, should be considered a suite of options for future action. The Implementation Plan provides near ‘shovel-ready’ actions for consideration by state policymakers as Arctic interest develops and resources become available.

Each strategic recommendation identifies a *lead* state agency and presents a brief *justification* for why the topic is important to the Alaskan Arctic and highlights existing gaps that could be filled. The *resources needed* section covers both fiscal and leveraged resources, including suggesting *partners* that may offer contributions from state, federal and other organizations. The *execution section* focuses on some key actions the lead agency and partners could take, while the *legislative actions* lists suggested actions for Legislative consideration. Each strategic recommendation concludes with an *evaluation* section that includes several measures that can help assess and track progress made to realize the recommendation.

It is critical that Alaska’s response to an increase in Arctic activity proceed in a prudent manner. The work of the Commission is a culmination of many years of effort, resources and legislative attention directed to further understand and prepare for 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 – international, national, state, local and tribal – and sought to balance a breadth of values to protect, promote and enhance the well-being of the Alaskan Arctic including the people, flora, fauna, land, water and other resources. Alaska must stake a demonstrative and intentional leadership role in Arctic activities ensuring the alignment of developing policies with the priorities and needs of Alaskans.

Acronyms Frequently Used

ACEP	Alaska Center for Energy and Power	DNR	Alaska Department of Natural Resources
AEA	Alaska Energy Authority	DOL	Alaska Department of Law
AIDEA	Alaska Industrial Development and Export Authority	DOLWD	Alaska Department of Labor and Workforce Development
AOOS	Alaska Ocean Observing System	DOT&PF	Alaska Department of Transportation and Public Facilities
DCCED	Alaska Department of Commerce, Community and Economic Development	DOR	Alaska Department of Revenue
DEC	Alaska Department of Environmental Conservation	MXAK	Marine Exchange of Alaska
DF&G	Alaska Department of Fish and Game	OIT	Alaska Office of International Trade
DMVA	Alaska Department of Military and Veterans Affairs	SCoR	Alaska Statewide Committee for Research

Alaska's Arctic Policy

The Alaska Arctic Policy Commission submits to the Legislature for consideration this language for an Alaska Arctic Policy bill. It is possible that through the legislative process changes will be made.

An Act Declaring the Arctic Policy of the State

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF ALASKA:

LEGISLATIVE FINDINGS AND INTENT

***Section. 1.** The uncoded law of the State of Alaska is amended by adding a new section to read:

- (a) The legislature finds that
 - (1) the state is what makes the United States an Arctic nation;
 - (2) the entirety of the state is affected by the activities and prosperity in the Arctic region, and conversely, the Arctic region is affected by the activities and prosperity in the other regions of the state;
 - (3) residents of the state, having lived and worked in the Arctic region for decades, have developed expert knowledge regarding a full range of activities and issues involving the region;
 - (4) residents of the state recognize the risks that come with climate variability and emerging threats to ecosystems, as well as increased maritime activity, but are optimistic that the skillful application of expertise, coupled with circumpolar cooperation, will usher in a new era of economic and resource development that will improve the quality of life for residents of the state;
 - (5) the development of the state's natural resources in an environmentally and socially responsible manner is essential to the development of the state's economy and to the well-being of the residents of the state;
 - (6) respect for the indigenous peoples who have been the majority of the inhabitants of the Arctic region for thousands of years and who depend on a healthy environment to ensure their physical and spiritual well-being is critical to understanding and strengthening the Arctic region;
 - (7) the United States, other nations, and international bodies, including the Arctic Council, are rapidly developing Arctic strategies and policies, and therefore it is essential that both the state and the nation communicate the reality, richness and responsibility that comes with being in the Arctic, including communicating the need to provide safety, security and prosperity to the region;
 - (8) it is essential for the state and federal government to strengthen their collaboration on Arctic issues, including coordination when creating strategies, policies and implementation plans related to the Arctic, as both continue to engage in international circumpolar activity;
 - (9) the state should develop and maintain capacity, in the form of an official body or bodies within the executive or legislative branch, or both, to develop further strategies and policies for the Arctic region that respond to the priorities and critical needs of residents of the state.
- (b) It is the intent of the legislature that this declaration of Arctic policy
 - (1) be implemented through statutes and regulations;
 - (2) not conflict with, subjugate, or duplicate other existing state policy;
 - (3) guide future legislation derived from the implementation strategy developed by the Alaska Arctic Policy Commission;
 - (4) clearly communicate the interests of residents of the state to the federal government, the governments of other nations and other international bodies developing policies related to the Arctic.

***Sec. 2. AS 44.99** is amended by adding a new section to read:

Sec. 44.99.105. Declaration of state Arctic policy.

- (a) It is the policy of the state, as it relates to the Arctic to,
- (1) uphold the state's commitment to economically vibrant communities sustained by development activities consistent with the state's responsibility for a healthy environment, including efforts to
 - (A) ensure that Arctic residents and communities benefit from economic and resource development activities in the region;
 - (B) improve the efficiency, predictability, and stability of permitting and regulatory processes;
 - (C) attract investment through the establishment of a positive investment climate and the development of strategic infrastructure;
 - (D) sustain current, and develop new, approaches for responding to a changing climate;
 - (E) encourage industrial and technological innovation in the private and academic sectors that focuses on emerging opportunities and challenges;
 - (2) collaborate with all levels of government, tribes, industry and nongovernmental organizations to achieve transparent and inclusive Arctic decision-making resulting in more informed, sustainable and beneficial outcomes, including efforts to
 - (A) strengthen and expand cross-border relationships and international cooperation, especially bilateral engagements with Canada and Russia;
 - (B) sustain and enhance state participation in the Arctic Council;
 - (C) pursue opportunities to participate meaningfully as a partner in the development of federal and international Arctic policies, thereby incorporating state and local knowledge and expertise;
 - (D) strengthen communication with Arctic Council Permanent Participants, who include and represent the state's indigenous peoples;
 - (E) reiterate the state's long-time support for ratification of the Law of the Sea Treaty;
 - (3) enhance the security of the state through a safe and secure Arctic for individuals and communities, including efforts to
 - (A) enhance disaster and emergency prevention and response, oil spill prevention and response and search and rescue capabilities in the region;
 - (B) provide safe, secure and reliable maritime transportation in the areas of the state adjacent to the Arctic;
 - (C) sustain current, and develop new, community, response, and resource-related infrastructure;
 - (D) coordinate with the federal government for an increase in United States Coast Guard presence, national defense obligations and levels of public and private sector support; and
 - (4) value and strengthen the resilience of communities and respect and integrate the culture and knowledge of Arctic peoples, including efforts to
 - (A) recognize Arctic indigenous peoples' cultures and unique relationship to the environment, including traditional reliance on a subsistence way of life for food security, which provides a spiritual connection to the land and the sea;
 - (B) build capacity to conduct science and research and advance innovation and technology in part by providing support to the University of Alaska for Arctic research consistent with state priorities;
 - (C) employ integrated, strategic planning that considers scientific, local and traditional knowledge;
 - (D) safeguard the fish, wildlife and environment of the Arctic for the benefit of residents of the state;
 - (E) encourage more effective integration of local and traditional knowledge into conventional science, research and resource management decision making.
- (b) It is important to the state, as it relates to the Arctic, to support the strategic recommendations of an implementation plan developed by the Alaska Arctic Policy Commission to encourage consideration of recommendations developed by the Alaska Arctic Policy Commission. Priority lines of effort for the Arctic policy of the state include
- (1) promoting economic and resource development;
 - (2) addressing the response capacity gap in the Arctic region;
 - (3) supporting healthy communities; and
 - (4) strengthening a state-based agenda for science and research in the Arctic.
- (c) In this section, "Arctic" means the area of the state north of the Arctic Circle, north and west of the boundary formed by the Porcupine, Yukon, and Kuskokwim Rivers, all contiguous seas, including the Arctic Ocean, and the Beaufort, Bering, and Chukchi Seas, and the Aleutian Chain, except that, for the purpose of international Arctic policy, "Arctic" means the entirety of the state.

List of Strategic Recommendations

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

1A - Facilitate the development of Arctic port systems in the Bering Strait region to support export, response and regional development.

1B - Strengthen or develop a mechanism for resource production-related revenue sharing to impacted communities.

1C - Lead collaborative efforts between multiple levels of government that achieve predictable, timely and efficient state and federal permitting based on good information, sound science, clear legal foundation and reasonable economic feasibility.

1D - Promote entrepreneurship and enterprise development.

1E - Support and advocate for multiple-use of Arctic public and ANILCA lands and promote prudent oil and gas exploration and development in the Arctic.

1F - Increase economic returns to Alaska and Alaskan communities and individuals from maritime and fisheries activities.

1G - Support the continued exploration and development of the Ambler Mining District, Mid Yukon-Kuskokwim River and the Northern Alaskan Coal Province.

1H - 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.

1I - 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 capacity gap in Alaska's Arctic

2A - Ensure strengthened capacity within the Administration to address Arctic maritime, science, climate and security issues.

2B - Support efforts to improve and complete communications, mapping, nautical charting, navigational infrastructure, hydrography and bathymetry in the Arctic region.

2C - Expand development of appropriately integrated systems to monitor and communicate Arctic maritime information.

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

2E - Assure the state of Alaska Spill Prevention and Response programs have sufficient resources to meet ongoing spill prevention and response needs in the Arctic.

2F - Strengthen private, public and nonprofit oil spill response organizations 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.

2G - Ensure that a variety of response tools are readily available and can be deployed during an oil or hazardous substance discharge or release.

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

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

3A - Foster the delivery of reliable and affordable in-home water, sewer, and sanitation services in all rural Arctic communities.

3B - Reduce power and heating costs in rural Alaskan Arctic communities.

3C - Support long-term strategic planning efforts that utilize past achievements, leverage existing methods and strengthen local planning that assesses and directs economic, community and infrastructure development, as well as environmental protection and human safety.

3D - Anticipate, evaluate and respond to risks from climate change related to land erosion and deterioration of community infrastructure and services; and support community efforts to adapt and relocate when necessary.

3E - Develop and support public education and outreach efforts that (a) enhance the understanding of Arctic conservation including biodiversity and the sustainable use of biological resources and management of natural resources and (b) promote public participation in development of fish and wildlife management plans within existing management systems and policies.

3F - Enforce measures that protect and help further understanding of food security of Arctic peoples and communities.

3G - Identify and promote industry, community and state practices that promote sustainability of subsistence resources while protecting against undue ESA listings and broad-brush critical habitat designations.

3H - Create workforce development programs 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

4A - 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.

4B - Increase collaboration and strengthen capacity for coordination within the Arctic science and research communities.

4C - Strengthen efforts to incorporate local and traditional knowledge into science and research and use this collective knowledge to inform management, health, safety, response and environmental decisions.

4D - Improve, support and invest in data collaboration, integration, management and long-term storage and archiving.

4E - Support monitoring, baseline and observational data collection to enhance understanding of Arctic ecosystems and regional climate changes.

4F - Invest in U.S. Arctic weather, water and ice forecasting systems.

4G - Update hydrocarbon and mineral resource estimates and mapping in the Alaskan Arctic.

Create a Legislative Committee(s) on Arctic Issues.

Lead: Legislature

Justification

The Legislature has invested time and resources toward understanding the diverse and complex Arctic issues facing the state now and in the future. The Alaska Northern Waters Task Force, (ANWTF), was legislatively created in the Spring of 2010 and held meetings across the state from October 2010 to December 2011. ANWTF issued its final report in January of 2012 at which time the Alaska Arctic Policy Commission, (Commission or AAPC), was formed. Upon the delivery of the Commission's Final Report, Arctic Policy, and Implementation Plan, the Legislature will need to consider how it will proceed. The Arctic is a dynamic environment, rich in resources and the potential for economic development in the face of decreasing summer sea ice and an increase in marine traffic. The value of ensuring public, environmental and cultural safety and security continues to be a priority. Arctic issues are currently either not receiving direct attention in the Legislature, or are appropriated in a piece-meal manner to numerous committees.

Resources Needed

Fiscal — Cost to create new committee(s) is absorbed within the Legislature's budget.

Leveraged — Existing legislative processes.

Partners — Governor's office and AAPC members.

Execution

There are a number of options including, but not limited to: House Special Committee on Arctic Affairs; Senate Special Committee on Arctic Affairs; Joint Committee on Arctic Affairs; House Standing Committee on Arctic Affairs; Senate Standing Committee on Arctic Affairs. The Special Committees would require a Simple Resolution passed by the respective body; the Standing Committees would require a Concurrent Resolution passed by both bodies; and the Joint Committee would require either a House or Senate Concurrent Resolution passed by both bodies. None of these types of resolutions require committee referrals; they can go straight to the House or Senate floors. After passage of the relevant resolution(s), the House's and/or Senate's Committee on Committees would meet and populate the Arctic Committees.

Legislative Actions

1. Each Legislative body should consider which type of Committee(s), structure and membership would best serve the needs of the Legislature and take the steps necessary to create the appropriate Committee(s).
2. Committee(s) should host overviews on Arctic issues and meet to review Arctic legislation.
3. The Legislature will ask the Administration and appropriate state agencies to address priorities relating to the four lines of effort in the Commission Implementation Plan: (1) promoting economic and resource development; (2) addressing the Arctic's response capacity gap; (3) supporting healthy communities; and (4) strengthening an Alaska Arctic science and research agenda.
4. The Legislature should request that the Governor establish a host committee for the Arctic Council and Arctic Economic Council.

Evaluation

Success will be measured by: 1) the number and quality of Arctic Committee(s) meetings; (2) how well the Committee(s) illuminates Arctic issues and understanding among all Legislative members; and 3) the creation or enhancement of Arctic-related legislation.

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

The Commission recognizes that natural resource development has been, is, and will be the most important economic driver in Alaska. 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 established by prudent 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. This support is important to global shipping routes and critical to national security.

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

- **Capital Intensity** – recognize that high capital costs required to develop new infrastructure and natural resources in the Arctic and to address high energy and transportation costs in communities.
- **Regulatory Uncertainty** – advocate for sound regulatory policies that are legally defensible and minimize third-party lawsuits, which increase the risk and cost to project planning and discourage investment.
- **Revenue Sharing** – explore new avenues to cost-share between communities or with neighboring jurisdictions to ensure concrete community benefits that are shared by Arctic residents.
- **Distance to/from markets and communication centers** – identify and invest in small-scale value-added businesses that displace 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 hurdles to consider when evaluating the Arctic. However, with increased national and international attention, the state is in an advantageous and historically significant position to address such challenges. The state should be strategic in its approach by leveraging assets currently in place and facilitating intelligent investments. The state can achieve these goals by promoting competition, removing project barriers, promoting sound, sustainable investments and by fostering a climate ripe for private investment.

Alaska's Arctic has an enviable resource base that, with careful consideration and investment, will continue to produce returns to the state and its communities that ensure community health and vitality. Alaskans have long argued that economic development should not come at the cost of environmental stewardship; federal agencies should respect Alaska's long-standing commitment to deliver both.

RECOMMENDATION 1A

Facilitate the development of Arctic port systems in the Bering Strait region to support export and regional development.

Lead: Department of Transportation & Public Facilities

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, regional shipping support 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.

Resources Needed

Fiscal – 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.

Leveraged – 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.

Partners – **State** – AIDEA, DCCED, DNR; **Federal** – USACE, USCG, NOAA, DOT, DOD, USNORTHCOM, DOI; **Other** – Alaska Native Regional and Village Corporations, private sector companies, local government.

Execution

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 other 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.

Legislative Actions

1. Request an update from landowners, DOT&PF and USACE on the status and future plans for Arctic port systems 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 Immediate Action Work Group (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.

Evaluation

Success will be evaluated based on 1) whether the strategy leads to the development of Arctic port systems; 2) whether a port(s) is economic over its lifespan, including streamlined site control and/or property acquisitions for specific projects; and 3) whether the ports lead to an increased number of investment opportunities, resource development, new firms entering Alaska and a more favorable business climate.

RECOMMENDATION 1B

Strengthen or develop a mechanism for resource production-related revenue sharing to impacted communities.

Lead: Department of Commerce, Community and Economic Development - Office of the Commissioner

Justification

As the state of Alaska advocates for both Arctic development opportunities on and offshore and more advanced capabilities for emergency preparedness and response, it is imperative to consider the benefits to impacted communities. With declining North Slope oil production, explorative industry access to federal land and Outer Continental Shelf (OCS) waters is critical to Alaska's economic stability. Alaskans residing in proximity to these efforts have an opportunity to directly support development by providing services, labor and equity investment in projects. Organized boroughs and municipalities have taxing authority; the North Slope and the Northwest Arctic Boroughs are two successful examples of communities that have instated development taxes that resulted in the provision of essential services. However, state revenue sharing does not have the flexibility to designate specific revenue recipients; the state cannot allocate specific project revenue to a nearby community though the revenue would increase funding for schools, roads and utilities, with tangible socio-economic benefits. The state of Alaska should continue to be a vocal proponent of federal revenue sharing from offshore development.

Resources Needed

Fiscal – No additional resources are necessary at this time, or in implementation, depending on the scenario.

Leveraged – 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.

Partners – **State** – DNR-OPMP, AIDEA; **Federal** – EDA, DOI, Congress; **Other** – Alaska Native corporations and organizations, local governments, AML, ARDORS.

Execution

After considering the current state revenue sharing mechanism as well as other options, DCCED-DCRA will make a recommendation to the Governor's office and/or the state Legislature. It is envisioned that scenarios include: 1) creation of a mechanism within current statute to directly benefit impacted communities; 2) encourage the state of Alaska to act as facilitator between industry and communities; 3) create the ability to negotiate revenue sharing within AIDEA, possibly in the form of infrastructure investment; and 4) promote federal revenue sharing directed at local government, state government or Alaska Native organizations.

Legislative Actions

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; anticipate and fund future needs.
4. Strengthen capacity of tribal organizations to accept 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 1C

Facilitate the development of Arctic port systems in the Bering Strait region to support export and regional development.

Lead: Department of Natural Resources — OPMP

Justification

The economic well-being of Arctic residents depends on the ability to prudently 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 develop the Alaskan Arctic's vast resources. The state can take a leadership role by engaging with federal partners to improve coordination between state and federal agencies.

Resources Needed

Fiscal — DNR staff would receive funding to lead interagency coordination.

Leveraged — There is an existing federal interagency group charged with addressing permitting. With integrated Arctic management priorities there may be additional federal funds to facilitate greater coordination between pertinent entities.

Partners — **State** — DEC; Department of Law; **Federal** — DOI, DOD, DOC, USDA, DOE, DHS, EPA, CEQ, OSTP, OMB; USACE; **Other** — Local governments; private sector industry; Alaska Native tribes, corporations, and organizations; trade groups

Execution

For more than 50 years state agencies 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 utilize their previous experience to streamline the permitting process. The division should also continue to lead federal agencies in a collaborative work group such as the Regional Interagency Working Group or Interagency Working Group on Coordination of Domestic Energy Development and Permitting in Alaska, to discuss increased resource development activity in the Arctic and support efficient processes that respect environmental concerns. The multi-agency permitting initiative has resulted in incremental improvements in Alaska's permitting system. This is a tried and tested model and should be viewed as a continuous adaptive management process. The administration needs to continue to hold firm against federal overreach and, where necessary, use the court system to avoid burdening projects.

Legislative Actions

1. Ensure permitting agencies have necessary resources to meet existing and intensifying workload as development increases.
2. Consider legislative proposals that improve the predictability, timeliness and efficiency of the permitting systems, as well as to bring heightened accountability to the appeals and litigation processes.
3. Support the administration when needed to counter expanding federal regulatory jurisdiction.
4. Request DNR to lead interagency work group meetings focused on permitting and regulatory standards, and strategies to increase coordination, identify any need for future baseline data collection, research and monitoring and to enhance sharing and accessibility of scientific data.
5. Provide funding for the involvement of local governments and boroughs in working group meetings.

Evaluation

Success will be measured by: 1) decreased review period of permitting and regulatory applications; 2) whether local communities contend 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) decreased protracted and frustrating litigation that delays the completion of projects.

RECOMMENDATION 1D

Promote entrepreneurship and enterprise development.

Lead: Department of Commerce, Community and Economic Development — Division of Economic Development

Justification

Business development and entrepreneurship in Arctic communities is challenging. The bulk of economic activity in this region is conducted by government and outside vendors. Locally-owned and operated companies provide one mechanism for taking advantage of increased economic Arctic activity, even as it supports a community-managed transition towards a market-led, outward-looking economy. Communities' natural entrepreneurs are often fully employed and do not have the capacity to start a business on their own. Yet many rural entrepreneurs have not had exposure to many (or any) business startup plans or trained professionals. Thus they justly maintain misperceptions regarding this process. 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 of business financial management and fiscally feasible and sustainable start-up enterprise planning. Additionally, there exists a lack of access to outside project investors. Therefore, there is a strong need to expose would-be entrepreneurs to entrepreneurial thinking and practices. This education should occur as early as K-12. Alaska Native regional and village corporations have been able to respond to this challenge to some extent, but there is a strong need for a developed comprehensive educational approach for an entrepreneurial ecosystem in Arctic communities.

Resources Needed

Fiscal — Current resources could be redirected to support this effort.

Leveraged — Alaska Native regional corporations and CDQ “marketplace” initiatives; State Chamber and UAF Business Week; technical assistance programs.

Partners — **State** — DCCED-DCRA, ARDORs, local government; **Federal** — DOC, USDA, Small Business Development Corporation; **Other** — University of Alaska, Alaska Native Regional and Village Corporations, CDQs, AFN.

Execution

Starting young is essential. Support for programs like Lemonade Day Alaska or Junior Achievement encourages the initiation of an entrepreneurial mindset to communities and to young and emerging leaders. 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 only encompasses bake sales that 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 the regional corporation. Reliable communications tools are essential for creating a network between investors, owners and global markets. Small start-up businesses can only begin to blossom once these other businesses begin to drive down the costs associated with bringing goods to these communities; a stronger entrepreneurial culture will follow.

Legislative Actions

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.

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

RECOMMENDATION 1E

Support and advocate for multiple-use of Arctic public and ANILCA lands and promote prudent oil and gas exploration and development in the Arctic.

Lead: Governor's office

Justification

Continued withdrawal of productive land from multiple-use designation would leave striking implications for Alaska's economy and communities. 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 that this area is considered the nation's most promising onshore oil and gas prospect. The NPR-A was designated by Congress in 1976 as a petroleum reserve yet each year more land is extracted from leasing plans that prohibit development. Oil production in the Arctic OCS could generate billions in federal revenue dollars 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.

Resources Needed

Fiscal – Continued funding on a large scale to support the Department of Law (DOL) to defend unwarranted and illegal land lockups.

Leveraged – Continued funding of programs that work 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.

Partners – **State** – DNR, DOL, CACFA; **Federal** – DOI, EPA, NMFS; **Other** – regulated community, local municipalities, Alaska Native Regional Corporations, American Petroleum Institute, private sector business associations.

Execution

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, Alaska Native Regional Corporations (ANCs), local governments and industry, the state should use all avenues and tools to insure Alaskans can develop their land. The Governor's Office, DNR and DOL have the capability to respond to resource development matters through staff that focus part of their efforts on oil and gas and ANILCA issues. It is essential that the state continue to fund organizations, such as Arctic Power, which have the expertise and experience in Washington, D.C. to advance the ANWR effort when the opportunity presents itself.

Legislative Actions

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 participation in activities that involve multiple use land rights and to push back on expanded federal jurisdiction.
2. Continue to pass resolutions supporting oil and gas development in the Arctic; develop outreach strategies that target grassroots efforts to meet with federal Congressional delegations in support of exploration in areas that are currently closed for development activities.
3. Ensure administration and legislative participation in Arctic Council and Congressional activities to share information about the benefits of oil and gas development. This should include a "Why Arctic Development Matters" campaign, with the production of printed, video and web educational materials illustrating the benefits of Arctic oil development to the nation, the state of Alaska and Arctic communities.
4. The state should oppose any new federal land withdrawals, marine protected areas, Antiquities Act designations and BLM Wilderness studies on federal land in Alaska.

Evaluation

Success will be measured 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 for development.

RECOMMENDATION 1F

Increase economic returns to Alaska and Alaskan communities and individuals from maritime and fisheries activities.

Lead: Alaska Industrial Development and Export Authority

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. 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 property and sales tax on maritime businesses is the largest source of local government revenue. Seafood harvesting and processing jobs provide more than 50 percent of the private sector employment in coastal Alaska. Some estimates put the fleet's docking in Seattle as a \$5 billion boost to the Pacific Northwest's economy each year. It is essential that the state consider ways to capture additional revenue from the maritime industries without compromising economic viability of activities or health of species. Currently, the Alaskan ports of Dutch Harbor, Kodiak and Seward are actively pursuing increased infrastructure to expand port facilities and opportunity. Additionally, CDQ communities and the Port of Nome 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 to support the needs of the industry.

Resources Needed

Fiscal — Significant capital resources should be anticipated.

Leveraged — Existing port facilities in Adak, Dutch Harbor, Kodiak and Seward.

Partners — **State** — DOT&PF, DEC, DF&G, ASMI, DCCED; **Federal** — NMFS, NOAA, USACE; **Other** — CDQs, At Sea Processors, local governments and port commissions, fishing industry.

Execution

A multi-part strategy must be considered to increase vessels and vessel hours at Alaska port facilities, including: 1) aiding the availability of resources the fishing fleet requires to service vessels; 2) import or strengthen the workforce and expertise necessary to repair and maintain vessels; 3) develop freshwater ports that can protect vessels from corrosive saltwater; 4) provide facilities that allow all-weather servicing of vessels; and 5) conduct expansive outreach to fishermen, vessel owners and, more broadly, the fishing community identifying a home base in Washington state, despite benefiting from a healthy Alaskan fishery.

Legislative Actions

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 Marketing Institute (ASMI) to add the marketing of Alaskan port facilities.

Evaluation

Success will be measured by: 1) an increase in the number of vessels that utilize Alaskan port facilities; and 2) an increase in the number of vessel hours at Alaskan ports; and 3) an increase in local government port revenue.

RECOMMENDATION 1G

Support the continued exploration and development of the Ambler Mining District, Mid Yukon-Kuskokwim River and the Northern Alaskan Coal Province.

Lead: Department of Natural Resources

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 collaboratively 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 Arctic region is the elevated level of investment needed. The result of high energy and transportation costs, complicated access, a commitment to a healthy environment and stakeholder engagement is projects with high sticker prices. The potential benefits to the region from mineral development are impressive and – apart from oil and gas development occurring on the North Slope – are the most significant opportunity for residents of the region.

Resources Needed

Fiscal – High levels of capital investment.

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.

Partners – **State** – AIDEA, DEC, DF&G, DOT&PF; **Federal** – DOI, EPA, USACE; **Other** – ANCs, village corporations, local governments, private sector industry and investment companies.

Execution

The state must identify clear priorities as it relates to mineral development, and these three action items would create the most opportunity in the Arctic: 1) DNR will assign a task force within OPMP to streamline regulatory and permitting efforts and increase avenues for local community involvement; 2) establishing a goal of collaborative communication between all necessary state and federal agencies, as well as landowners; and 3) state co-investment in energy or transportation to ensure positive economics, (AIDEA currently has the authority to drive this action and would be able to do so more effectively with a clear set of priorities). Long-time efforts at 'roads to resources' should be directed toward these three objectives, implemented in a phased approach. Recognizing that state resources are finite, operational stages should result in completed projects and revenue potential.

Legislative Actions

1. Resource Committees should convene hearings on high potential 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 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."

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.

RECOMMENDATION 1H

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.

Lead: Alaska Energy Authority and Alaska Center for Energy and Power

Justification

Alaska has built a small industry around developing and supporting the 150+ microgrids – isolated systems individual to a community – 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 to 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 nonprofits with specialized expertise operating in Alaska. Many of these enterprises 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.

Resources Needed

Fiscal – Support for UAF's Alaska Center for Energy and Power (ACEP), and a capital budget request for microgrid design and implementation.

Leveraged – The Renewable Energy Grant Fund and the Emerging Energy Technology Fund.

Partners – **State** – DCCED; DOLWD; **Federal** – NREL, DOE, DOI, DOS, Denali Commission; **Other** – ACEP; University of Alaska; Alaska small businesses, utilities and local governments.

Execution

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 currently 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 that incorporates 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 nonprofit organization, formed through UAF/ACEP and tasked with exporting Alaska microgrid know-how and expertise globally.

Legislative Actions

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 that incorporates renewable resources to highlight microgrid-based expertise.

Evaluation

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.

RECOMMENDATION 11

Encourage foreign and domestic private sector capital investment in Alaska's resource industries through stable, predictable and competitive tax policies.

Lead: Department of Revenue

Justification

Potential investors need a reliable and predictable set of rules before making investment decisions. 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. Changing tax structures creates uncertainty about whether Alaska is a favorable place to conduct business. More than 90 percent of the state's general fund comes from the oil and gas industry, and a full third of jobs in the state have ties to oil and gas development. Thus, the entire state economy relies on a healthy and vibrant oil industry. Like the oil and gas industry, mining provides high-paying jobs. The most efficient way to increase these jobs is to develop more mines in Alaska. Alaska has six large producing, hard rock mines with only one in the Arctic despite the Arctic region's position as a global leader in mineral potential. The state of Alaska must encourage and support both foreign and domestic private sector capital investment in the Arctic's resource sector.

Resources Needed

Fiscal — Further investment in DOR's technical expertise and capacity should be considered, deepening knowledge held by the civil service.

Leveraged — Federal lease sales, land management and fiscal policy should also be considered for review.

Partners — **State** — DNR, APFC; **Federal** — IRS; **Other** — Local government, ANCs.

Execution

The current oil and gas production tax law should be maintained and more work is needed 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 that 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.

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. Regularly review the effect of current tax policy on 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.

Strategic Line of Effort #2 – Address the Response Capacity 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— a universal and encompassing approach is not plausible.

Time and distance are big logistical challenges for security and defense operations; Alaska’s Arctic compounds these hurdles with a lack of communications and response infrastructure. Essentially, capabilities to address threat or aggression are sufficient; capabilities to support the civil sector and execute response operations – whether for oil spills or search and rescue – are limited. The strains on these provisions are 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. Areas rich in natural resources correlate to high economic activity and resource development. Oil spill response will either be executed by resource development companies or through oil spill response organizations, which are the ‘boots on the ground’ for oil spill response. There is also a high level of 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 organization for developing and implementing the Unified Plan and sub-area planning process. Additional resources can be found in local government. An exemplary entity is the North Slope Borough who currently conducts search and rescue operations north of the Brooks Range with the assistance of the Alaska Air National Guard and United States Coast Guard.

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 2A

Ensure strengthened capacity within the Administration to address Arctic maritime, science, climate and security issues.

Lead: Governor's office

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 base and federal decision-making. Additionally, the ability to make recommendations to the Governor that would increase budget prioritization for the above-mentioned activities would result in more efficient 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 impacts Alaska's economy and community health. The implications of international efforts that result from Arctic Council policy-shaping documents or IMO negotiations about the Polar Code are significant for Alaska. Further support should be given to the 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.

Resources Needed

Fiscal – Possible increase in administrative support; anticipate significant travel budget for national and international policy discussions.

Leveraged – State agencies and local government will be able to contribute valuable ground expertise to this position.

Partners – **State** – All agencies; **Federal** – DOS, DOI; **Other** – IMO, Arctic Council.

Execution

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 the state of Alaska's priorities and perspectives on these important issues. Strengthening capacity within the Governor's office on Arctic policy issues 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. Some consideration should be given to the value of nonpolitical appointments that can provide continuity over time.

Legislative Actions

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) has the ability to act as a liaison between industry, the public and private sectors and indigenous organizations.

Evaluation

Success will be determined by: 1) enhancement 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 issues and intermodal transportation infrastructure development; and 3) deliver local and sub-national input into federal and international negotiations.

RECOMMENDATION 2B

Support efforts to improve and complete communications and mapping, nautical charting, navigational infrastructure, hydrography and bathymetry in the Arctic region.

Lead: Alaska Geospatial Council

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. Alaska's western and northern coasts have not been mapped since 1960. Insufficient mapping results 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 in Alaska that affect marine transportation. For the state of Alaska — with a commitment to enhancing safety, environmental protection and economic development — this is 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 by employing proper legal guidance. Terrestrial mapping is an increasing focus of the state as well, which is conducted by the Alaska Geospatial Council. While the state does not have sole jurisdictional authority over the Arctic, especially over northern waters, and neither does it have a desire to take on federal responsibilities without due compensation, the international need for accurate Arctic mapping is a good opportunity to partner with federal agencies for mutual benefit.

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.

Leveraged — UAF's Geographic Information Network (GINA) of Alaska and the Sikuliaq research vessel; federal land management agencies; the private sector also makes incredible investments in data collection and mapping.

Partners — **State** — DOT&PF, DEC and DNR; **Federal** — USCG, MARAD, NOAA, DOI; **Other** — MXAK, AOOS, Alaska Marine Pilots.

Execution

DNR has been the lead agency on mapping efforts in the state, and has done much of its work in collaboration with state and federal agencies. The Alaska Geospatial Council, (AGC), was recently created and one of its top priorities is to research how to manage, make available and find an appropriate home for data. Hydrography research is well underway through the Hydrography Technical Working Group, under the auspices of the Alaska Climate Change Executive Roundtable and the AGC. The AGC can take a proactive role in articulating their top priorities and establishing objectives within the Arctic 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, encourage consideration of improvements to the Coast Pilot in the Arctic region and working with the USGS for terrestrial priorities.

Legislative Actions

1. Broaden the scope of the Alaska 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, including new technologies, maximizing use of satellites, unmanned underwater and aerial vehicles and submarine systems.
4. Continue statewide mapping efforts initiated by Alaskan agencies 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 share appropriately.

Evaluation

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

RECOMMENDATION 2C

Expand development of appropriately integrated systems to monitor and communicate Arctic maritime information.

Lead: Marine Exchange of Alaska and Alaska Ocean Observing System

Justification

Integrated systems are 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 addresses the maintenance of operational awareness of maritime activity, especially vessel tracking, but also transmission of information on ice and water, ship speed and closed or sensitive areas for navigation. The primary asset for increased maritime domain awareness is Automatic Identification Systems, (AIS), supplemented by Long Range Tracking Systems. AIS is a piece of navigational equipment aboard many vessels, installed voluntarily or due to regulation, and which regularly transmits vessel data. However, AIS receivers have a limited spectrum and cannot provide comprehensive coverage so there will always be portions of Alaska and U.S. waters without AIS coverage. In those cases of remote operations, it is necessary to use several different forms of satellite tracking. An expanded AIS capacity will strengthen emergency response and ensure safe maritime transportation as well as provide a future ability to transmit localized weather reports and local information including but not limited to sea ice conditions, waves and currents and marine mammal and endangered species observations. 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.

Resources Needed

Fiscal — Investment needs are currently unclear, and will depend on 1) increase in basic infrastructure and 2) need for increased data management.

Leveraged — Both MXAK and AOOS have structures that allow outside investment, whether through members or user groups. The cruise ship excise tax funds could be leveraged to support integrated systems for safe navigation.

Partners — **State** — DEC, DF&G, Alaska State Troopers, Alaska National Guard, DCCED, DMVA; **Federal** — USCG, USARC, NOAA, DHS; **Other** — local government, subsistence users, Alaska Native organizations, industry.

Execution

The Marine Exchange of Alaska, (MXAK), 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, (AOOS), is a major partner 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 has an opportunity to increase engagement, provide additional input and work more closely with international, federal partners and the private sector to manage communication information more effectively. A review should be conducted of the Great Circle Route and Bering Strait traffic.

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 and evaluate implications of the recommendations from the Aleutian Islands Risk Assessment.

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; and 3) increase in industry participation.

RECOMMENDATION 2D

Facilitate and secure public and private investment in support of critical search and rescue, oil spill response and broader emergency response infrastructure.

Lead: Department of Military and Veterans Affairs

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 publications reference a set of obligations each nation has to maintain a minimum infrastructure and response capacity. Alaska communities bear the brunt of risk associated with increased marine activity, from shipping through the Bering Strait to 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 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. Nearly 90% of Alaska's population lives on or near the coastline and depends on access to safe and affordable marine transportation. Thus, marine transportation safety should be a fundamental priority for the state of Alaska and the nation.

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 appropriately fund its priorities.

Partners — **State** — AIDEA, Alaska National Guard, DEC, DOT&PF; **Federal** — USCG, DOT, CMTS, DHS; **Other** — MXAK, UAF

Execution

The Alaska State Legislature has made significant headway to begin addressing this issue through AIDEA investment. That will need to be carefully coordinated with the DEC and DHS, as well as with other federal partners, to ensure successful implementation that results in direct state funding and/or public-private partnerships that address further 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.

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.

RECOMMENDATION 2 E

Assure the state of Alaska Spill Prevention and Response Programs have sufficient resources to meet ongoing spill prevention and response needs in the Arctic.

Lead: Department of Environmental Conservation - Spill Prevention and Response

Justification

The state of Alaska Spill Prevention and Response Division, (SPAR), in the DEC has broad statutory authority to require spill prevention measure and response capacity for oil exploration, production, storage and transportation on state land or in state waters. SPAR also oversees the cleanup of contaminated sites by responsible parties. SPAR's operating budget for this and related work is largely funded by legislative appropriations from the Oil and Hazardous Substance Release Fund. With declining production, and no overall increase in the amount of the surcharge, this surcharge cannot support SPAR's work at its current level, much less cover new demands that will arise in the Arctic from anticipated energy exploration and production, marine transportation and tourism. Although many of these new activities will take place in federal waters, potential spills would likely impact state waters and lands. Further, these new activities in federal waters will spur other activity on state lands and waters, such as development of ports, camps, pipelines, fuel storage and other infrastructure, which could also be a source of spills. SPAR routinely collaborates with interested communities to lower the risk of spills, including local input on spill prevention and contingency plans, building local capacity to respond to spills and local participation when a spill occurs.

Resources Needed

Fiscal – Current funding is adequate for current needs but increased funding will be needed for increased operations, planning, and response purposes.

Leveraged – EPA and USCG are partners in subarea planning. Garnering more industry involvement may provide financial support for sub-area planning work.

Partners – **State** – DMVA; **National** – USCG, EPA, DOD, RRT, NOAA; **Other** – OSROs, Alaska Native organizations and companies

Execution

The Governor should make this a priority. The state of Alaska has a functioning and effective spill response planning and response program that needs to be maintained at current levels to support increased resource development. SPAR should be adequately funded so that it can have a robust public education and awareness campaign that encourages stakeholder engagement, involves communities and stakeholders through subarea planning and provides local response training to maintain local spill response equipment to ensure timely, effective and safe response efforts. The Alaska State Legislature should respond accordingly and include this funding request in its budget discussions, working at the same time to identify alternative funding mechanisms. Working with EPA and USCG, SPAR needs to expand subarea planning efforts. One method to improve industry and community involvement would be the development of a drill and exercise schedule for the region. Currently drills are company-specific rather than regionally-focused which results in inefficient and costly duplicative efforts. During an actual event, all resources within an area would likely be called upon. SPAR's continued involvement in international fora and with federal agencies with Arctic jurisdiction, such as the USCG, EPA and the DOI, will be key to assuring good environmental performance and protection of the Arctic. Much of the marine traffic that passes by Alaska is in "innocent passage" and not subject to federal or state jurisdiction. Only by working through the IMO and similar bodies can the state advocate for adequate international measures.

Legislative Actions

1. Invite testimony from the DOS and USCG 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 subarea planning and to shift drill and exercise planning to the subarea plan and engage them in a more regional effort.
3. Review similarly structured and successful sub-national spill response programs to look for best practices.
4. Consider reliable alternatives in order to fully fund the prevention account and program.

Evaluation

Success will be evaluated by: 1) sustainable funding for prevention and response planning; 2) increased public and industry participation in sub-area planning; 3) increased public confidence in the state of Alaska's oil spill planning, preparedness and response; and 4) adequate response activity during an event.

RECOMMENDATION 2F

Strengthen private, public and non-profit oil spill response organizations to ensure expertise in open water, broken ice, near shore and sensitive area protection; be able to meet contingency plan requirements and operate effectively in the Arctic.

Lead: Department of Environmental Conservation - Spill Prevention and Response

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. OSRO capacity is relegated to the types of activities occurring. Without production in open water at this time, there is no OSRO with the ability to adequately respond to offshore incidents. Vessels in innocent passage, (not visiting a U.S. port), are not required to comply with state or federal laws, have membership in a local OSRO or have their own response capacity. Beyond OSROs, the state should explore ways to strengthen the capacity of oil spill response organizations, including private sector companies or other mechanisms.

Resources Needed

Fiscal – Participation in OSROs would incur a membership fee, which should be considered an additional investment in oil spill response capacity. Investment could also be considered for other mechanisms outside the OSRO structure.

Leveraged – Private sector assets, Coast Guard activities and increased attention to the Arctic.

Partners – **State** – DMVA, local governments; **National** – USCG, EPA, DOD, RRT, NOAA; **Other** – OSROs, Alaska Native organizations or companies, Alaska Maritime Prevention and Response Network, ASRC Energy Services Response Operations.

Execution

In addition to continued support of the DEC's ongoing communication with the USCG in reviewing alternative compliance programs development and applications, the state of Alaska should consider new ways of interacting with oil spill response organizations. If the state were to join an OSRO, for instance, this could provide 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 a partnership, developing a more strategic relationship that should result in heightened spill response capability. State participation in oil spill response organizations could also result in strengthened ability to gather data and fundamental science on ecosystems – ocean stratification, ocean current movements and ice formation – which will be critical to understanding and responding to an incident.

Legislative Actions

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, MXAK).
2. Ask the Attorney General for an opinion about the state membership in OSROs.
3. Alaska Maritime Prevention and Response Network should work toward coordination between public, private and nonprofit efforts.

Evaluation

Success will be measured by: 1) the increased capacity of oil spill response organizations to respond to a potential or real oil spill; and 2) public confidence in oil spill planning, prevention and response.

RECOMMENDATION 2G

Ensure that a variety of response tools are readily available and can be deployed during an oil or hazardous substance discharge or release.

Lead: Department of Environmental Conservation - Spill Prevention and Response

Justification

When faced with an oil spill incident it is imperative to have a variety of resources readily available. The best tool is determined by a variety of factors including type of oil, location of spill, and weather conditions. While mechanical recovery is always considered ideal, in some cases it may not be possible. Dispersants and in-situ burning are important secondary response tools in the Oil Spill Toolbox. State statutes require companies to contain or control and clean up oil discharge. New technologies and products are in development such as herding agents that consolidate dispersed oil, increasing the mechanical recovery. There is significant research showing that dispersants are effective in cold waters and that the oil produced in Alaska responds favorably to dispersants. One particular hindrance is that Alaska is the only coastal U.S. state without statewide preauthorization of dispersant use for oil spills. 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 additional measures. All response tools should be available and considered during a spill. The State should work with its federal partners and industry to test and develop response tools such as dispersants and in-situ burning for an Arctic response scenario before an event occurs so that their effectiveness and safety are well documented before they are needed.

Resources Needed

Fiscal – Current funding is adequate for planning and policy development purposes but increased funding will be needed for implementation

Leveraged – USCG and EPA are already collaborating on efforts to establish preauthorization guidelines along Alaska's coast; these partnerships should continue.

Partners – **State** – DMVA, local governments; **National** – USCG, EPA, DOD, RRT, NOAA; **Other** – OSRO, Alaska Native organizations or companies, Alaska Maritime Prevention and Response Network.

Execution

Through sub-area planning, the state, EPA and USCG should discuss various response options and the risk/benefit analysis that is utilized when deciding response options. The DEC, USCG and the EPA are currently working on amending the preauthorization areas for dispersant use along the Aleutian chain and the Gulf of Alaska, which will replace the current patchwork of preauthorization zones. The Arctic is not being considered for preauthorization at this time. Subarea plans in the preauthorized zones will be taking the additional step of identifying environmentally important areas, including critical spawning and other wildlife habitat where dispersants should be prohibited. 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.

Legislative Actions

1. Invite testimony on the feasibility and need for dispersants and other non-mechanical response tools along the Alaskan Arctic coastline and the process for approving, testing, evaluating, monitoring and reporting use.
2. The Legislature should review oil spill response planning statutes and ensure they allow and encourage the development of effective response tools.
3. Work with the USCG and DEC on designation of port of refuge in Bering Straits; and follow with the development of an emergency mooring system.
4. Purchase and distribute Emergency Towing Systems and stage in the Arctic region.
6. Support requirements for crude oil shipment companies that operate in waters near the state to store supplies of dispersants. Require shipment companies to deploy dispersants within seven hours following an approval for use decision.
7. Support the sub-area planning effort to identify sensitive areas.

Evaluation

Success will 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 and other non-mechanical response tools in Arctic waters.

RECOMMENDATION 2H

Foster and strengthen international partnerships with other Arctic nations, establishing bilateral partnerships with, in particular, Canada and Russia, to address emerging opportunities and challenges in the Arctic.

Lead: Office of International Trade

Justification

Alaska has been an active participant in international Arctic relations throughout its history. This has occurred through business activities, (CH2M Hill's Sakhalin project, 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 DOS, 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.

Resources Needed

Fiscal — Potentially some additional travel funding, but basic communications are fairly cost-neutral.

Leveraged — 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.

Partners — **State** — DCCED, DEC, DF&G, DNR, DMVA; **National** — DOS, USCG, DOD, NOAA, NSSI; **Other** — Northern Forum, University of the Arctic, PNWER, World Trade Center, ICC, AIA, AAC, GCI, AK Chamber of Commerce, Kawerak, Alaska Marine Mammal Coalition.

Execution

The Governor's office should engage in a campaign to strengthen, renew or initiate the state's international partnerships. The scale this effort requires depends on available resources and alignment of interests, but fact-finding missions to both Canada and Russia could assist. Additionally, Alaska would benefit from participation in Arctic Council activities, 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.

Legislative Actions

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.

Evaluation

Success will be measured by: 1) increase in international engagements by state officials; 2) increase in public awareness/ confidence in bilateral working relationships; and 3) increase in knowledge about Russian and Canadian activities and infrastructure in the Arctic.

Strategic Line of Effort #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. To employ these processes will require trans-jurisdictional coordination and cooperation among all levels of government – international, national, state, local and tribal – with clearly-defined functions and roles. To achieve this requires a balance of 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. This collaborative effort ensures 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 the historical and current presence of Arctic peoples, 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; or effective governance supported by meaningful and broad-based citizen participation.

RECOMMENDATION 3A

Foster the delivery of reliable and affordable in-home water, sewer, and sanitation services in all rural Arctic communities.

Lead: Department of Environmental Conservation

Justification

Economic stability and opportunities have profound effects on the social characteristics and health of a community. In all eight Arctic nations, where distance and geography mean remote communities often face 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 an innovative and results-driven leadership role in the circumpolar region. As a primary leader the state will seek to address DEC's estimation 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 with at high risk of failure. Often multiple generations of families share housing. Overcrowding contributes to water rationing and increased health risks.

Resources Needed

Fiscal – Sustain or increase funding for DEC's Water and Sewer Challenge.

Leveraged – Support efforts of the Alaska Rural Water and Sanitation Working Group.

Partners – **State** – Alaska State Legislature, AHFC, DCCED-DCRA, DHSS; **Federal** – EPA, HUD, Denali Commission, IHS, USDA, CDC, NREL, DOE, DOI, USARC; **Other** – RurAL CAP, engineering companies, utilities, ANTHC.

Execution

DEC will coordinate state actions, working with other agencies, including federal agencies, to drive this effort. The effort will entail searching for best practices from around the Arctic and working with regional nonprofits to determine priority criteria and 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. Public education and outreach is needed to convey the important connections between water provision, (both quality and quantity), and health in rural Alaskan communities.

Legislative Actions

1. Continue support of the DEC's "Alaska Water and Sewer Challenge."
2. Improve public education and outreach regarding the connections between water use and health.
3. Augment funding to replace aging and failing water and sanitation infrastructure.
4. Support and provide additional funding to programs for technical service providers.
5. Re-examine efforts such as the Local Utilities Management Program (LUMP) and the Alaska Rural Utility Collaborative (ARUC) as models for a state-federal partnership approach that would focus on providing an allocation to incentivize improved operation and maintenance and protect investments in rural water and sanitation infrastructure.
6. Support an analysis of the remaining unserved communities to determine where it is feasible to be served by piped water and sewer service, and report on the barriers that are preventing this service.
7. Identify and evaluate approaches to reducing piped water and sewer construction costs to make sanitation projects more economically viable.

Evaluation

Success can be evaluated by: 1) whether the overall sanitation and related health effects have improved in communities where solutions have been applied, relative to communities where they have not; 2) community members' opinions about whether needs are better met with new or redesigned infrastructure or technology; and 3) the associated capital, operations and maintenance costs have been reduced.

RECOMMENDATION 3B

Reduce power and heating costs in rural Alaskan Arctic communities.

Lead: Alaska Energy Authority

Justification

Economic stability and economic opportunities have a profound effect on the social stability and characteristics of a community. In the Arctic, energy prices have an outsized and interconnected effect on these two issue areas. The communities that derive their power from stand-alone grids have, to a large degree, similar negative economic outlooks. Arctic communities simultaneously suffer from joblessness and decreasing amounts of public support. High energy costs discourage private investment, which in turn creates high unemployment and social dependence. While not solely an Arctic issue, addressing the energy needs of Arctic communities is a critical and fundamental first step to supporting their economic and social well-being. Applied and basic research is an underutilized or undeveloped resource that Alaskans need to be able to count on to develop new solutions to the challenge of remote power and heat, through identification of emerging energy technologies, increased efficiencies, or leveraged resource development infrastructure. Communities have a practical capacity that can be leveraged, such as the wind energy program in Kotzebue. Emphasis should be on cold-weather design and engineering, exploration of local and/or renewable sources, and integrated systems; as well as to investigate alternative approaches that are less costly to build, operate and maintain housing and utilities in Arctic communities. Diversifying energy sources and supporting innovation that translates to practical application will help promote the development and maintenance of affordable and safe housing, including working with interested parties within the United States and other Arctic nations to investigate alternative approaches that are less costly to build, operate and maintain housing and utilities in Arctic communities.

Resources Needed

Fiscal — Sustain and/or increase investment in the Emerging Energy Technology Fund, Renewable Energy Fund and select capital projects.

Leveraged — Plan for future funding of implementation, either as part of a pilot project, public-private partnerships, or international collaborations.

Partners — **State** — Alaska State Legislature, AHFC, DCCED-DCRA; **Federal** — Denali Commission; NREL, DOE, DOI, USARC; **Other** — RurAL CAP, engineering companies, utilities, ANTHC, ACEP, CCHRC, REAP.

Execution

Alaska can address basic needs by promoting energy efficiency and supporting and funding energy efficient upgrades and renewables. Increasing the energy efficiency of current systems and researching alternative sources of energy will decrease diesel fuel use helping to address the immediate infrastructure needs and diesel fuel dependence of many small Arctic villages. The state should also support research that explores innovative alternative solutions for adequate housing through reducing construction costs and increased energy efficiency in housing in the Arctic environment. The AEA 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 of the public-private network. This network could research and develop new energy technologies that address affordability and efficiency. Simultaneously, AEA should consider launching an energy X-prize competition that would stimulate real-world applications of research to an Arctic environment.

Legislative Actions

1. Provide immediate funding to facilitate more efficient existing energy infrastructure.
2. Committee hearings should invite energy researchers to present findings on new and emerging energy technologies and processes and facilitate coordination of interdisciplinary partnerships.
3. Consider funding an X-prize energy competition that will create an incentive for long-term energy solutions.

Evaluation

Success will ultimately be measured in the direct and indirect reduction of the cost of heating and power costs in the Alaskan Arctic. However, in the medium term, this effort should be evaluated by 1) funding energy efficiency programs for existing energy infrastructures; 2) an increase in university, state agency, and private sector collaboration that leads to more applied research; and 3) an established and stable funding stream available to address challenges such as renewable energy.

RECOMMENDATION 3C

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.

Lead: Department of Commerce, Community, and Economic Development - Division of Community and Regional Affairs

Justification

To address complex issues of change and activity in the Arctic, long-term planning processes must be strengthened or developed. This could be achieved by encouraging local communities to contribute knowledge, prioritize challenges and opportunities and assist in the development of approaches or solutions. Long-term strategic planning should be conducted in collaboration with state and federal officials who, in concert with local subject matter experts — who bring comprehensive planning and Comprehensive Economic Development Strategies (CEDS), 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. An effective 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.

Resources Needed

Fiscal — 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.

Leveraged — Fortunately there are existing studies, reports, CEDS and transportation plans that can be used to assist in this effort. Additionally, with federal attention on integrated Arctic management, there may be an opportunity for increased federal funding.

Partners — **State** — DED, DEC, DOT&PF, DNR, AHFC, AEA, local governments; **Federal** — EDA, DOI, DOE, Denali Commission, USACE, NSSI; **Other** — Alaska Native tribes, corporations, and organizations; private sector companies; co-management organizations; ARDORs.

Execution

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. Examples of plans worth considering in this effort include: AEA's regional energy planning, DEC's sub-area planning, NSSI Scenario Planning, local Planning Commissions and DNR's North Slope Plan for state lands and resources. DCCED will also coordinate with other state agencies and the federal government to leverage interest and evaluate collaboration, as well as the impact of state-federal or state-local interaction and produce a recommendation for best practice. DCCED Division of Economic Development's ARDOR program currently addresses some regional economic development planning in the state, which can be more closely tied to community comprehensive planning. There is a huge need for planning funds and technical assistance support for local governments, as well as complementary funding to DCRA to provide meaningful planning support. Additionally, the state will engage with IASC and/or the SCoR to determine the best approach for assessing and mobilizing the scientific community both across the state and internationally.

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. Consult with local governments to determine effectiveness of current programs and/or opportunities for increased stakeholder engagement beyond legislative process.
4. Consider providing planning funds and technical assistance support for local governments, as well as complementary funding to DCRA to provide meaningful planning support.
5. Consider additional resources devoted to data management, access, integration and visualization.

Evaluation

Success will be evaluated by: 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.

RECOMMENDATION 3D

Anticipate, evaluate and respond to risks from climate change related to land erosion and deterioration of community infrastructure and services and support community efforts to adapt and relocate when necessary.

Lead: Department of Commerce, Community, and Economic Development and Department of Environmental Conservation

Justification

Alaska has been on the front lines of climate change for nearly a decade, as work conducted by the Climate Change Sub-Cabinet demonstrates. With the Arctic experiencing change at twice the global average, Alaska's communities and peoples are faced with new and significant challenges and have a need to immediately react. It is critical to make swift decisions and apply innovative solutions when villages are faced with relocation and survival while they are also considering the economic opportunities of resource or port development. The state and nation have an obligation to focus on local adaptation measures that help communities better understand risk and prevent erosion. Erosion revetment ensures that pro-active preventive steps are taken while preparing for longer term adaptation to climate changes. 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.

Resources Needed

Fiscal – This will require increased capital spending, either for village relocation, erosion mitigation or structure stabilization.

Leveraged – Federal agencies will have a primary role, often, in funding and facilitating the response to climate-associated risk.

Partners – **State** – AIDEA, AHFC, local governments, DNR-DGGS, DOT&PF; **Federal** – Denali Commission, USACE, DOI, FEMA, NOAA; **Other** – AOOS, RurAL CAP, Alaska Native regional nonprofits, CCHRC.

Execution

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 assess 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 entities can work with federal agencies to assess future investment needs. Resources provided through DCRA's Alaska Climate Change Impact Mitigation Program, (ACCIMP), can help imperiled communities by funding two types of projects: 1) Hazard Impact Assessments and 2) Community Adaptation Plans. However, when immediate action is necessary the Governor, Legislature and/or federal government will need to have dedicated resources and capacity to address needs. The associated costs of response are too high to address alone or without commitment from all levels of government and in particular those in high level positions. There are communities, such as Newtok, that have plans for relocation but they cannot be implemented until they receive funding.

Legislative Actions

1. Expand DCCED Risk MAP program and partner with communities who are ready to take action.
2. Conduct high resolution mapping of communities and surrounding landscapes for the development and deployment of evacuation plans in areas where river and coastal flooding are regular occurrences or are likely to occur in coming decades. Prioritize communities currently threatened.
3. Encourage cross-agency collaboration, perhaps through a reconvening of the Climate Change Sub-Cabinet.
4. Convene committee hearings with public testimony by local communities, tribal and local government.
5. Request an annual report to the Legislature on those communities of imminent concern to monitor progress.
6. 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.
7. Increase support to state of Alaska agencies so they can adequately evaluate their programs and goals against the recommendations made by the Alaska Climate Change Sub-Cabinet.
8. 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 E

Develop and support public education and outreach efforts that (a) enhance the understanding of Arctic conservation including biodiversity and the sustainable use of biological resources and management of natural resources and (b) promote public participation in development of fish and wildlife management plans within existing management systems and policies.

Lead: Department of Fish & Game

Justification

Alaskans depend on healthy ecosystems with access to and the ability to harvest natural living resources like fisheries or wildlife. For some, this may be recreational; to others it is an economic necessity. For Alaska Natives this is a cultural priority. Alaska has a constitutional obligation, too, to ensure these resources for use by future generations. However, the ecosystems upon which Alaskans depend are often not completely understood, especially as they relate to fish and wildlife productivity and abundance or management processes. A baseline assessment of fish and wildlife resources, as well as a tracking of trends and factors that drive change, informs the public of natural living resource availability and harvest strategies. Alaskans' observations and understanding of both strategies are important contributions to sustainable, adaptive management approaches and allow them to make informed decisions. Increased public education and outreach efforts will contribute to a more knowledgeable and interested public. Education will also highlight who is interested in and knowledgeable about the benefits to Alaskans of natural living resources and the environment, biodiversity of a healthy ecosystem, as well as threats to that health. Public awareness should include species, habitats, ecosystem structure, processes, functions and stressors. Additionally, education programs should address the interplay between humans and ecosystems, the dynamism in naturally occurring processes and those that fall outside natural variability.

Resources Needed

Fiscal — Support expansion of DF&G education and outreach programs and collaborations with local and regional entities, perhaps through a grant competition open to eligible applicants.

Leveraged — 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 education.

Partners — **State** — DNR, DEC, Board of Fish, Board of Game, local governments, Alaska Congressional Delegation; **National** — NOAA, DOI, NPRB, NMFS, NSSI; **Other** — NPFMC, CAFF, AOOS, Alaska Sea Grant MAP.

Execution

Use the Alaska Joint Boards of Fish and Game advisory committee process to promote local participation and constructive input to state fish and wildlife management plans. DF&G should continue to participate in existing federal management activities to promote sustained yield management and use. DF&G should continue to build outreach and education programs and encourage collaborative research and management projects and prioritization with land owners, local or regional governments, tribes and other user groups. A grant competition could be funded via 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 Alaskan experts and expertise. 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 resources such as: Upward Bound, the Marine Advisory Program, Cooperative Extension coursework, ANSEP and Alaska Resource Education.

Legislative Actions

1. Review locally-driven subsistence mapping projects through invited testimony.
2. Review baseline assessment needs of fish and wildlife resources, as well as a tracking of trends and factors that drive change and inform the public about availability and harvest strategies. Ensure that consideration is given to Alaskans' observations, including local and traditional knowledge.
3. Work with local communities, landowners, ANCs and tribal groups to identify and prioritize projects.
4. Consider DF&G budget request for grant competition.
5. Enhance the Alaska Joint Boards of Fish and Game advisory committee process to promote local participation and constructive input to state fish and wildlife management plans.

Evaluation

Success will be measured through an increase in public awareness of these issues, possibly through a poll for current state of knowledge.

RECOMMENDATION 3F

Enforce measures that protect and help us better understand the food security of Arctic peoples and communities.

Lead: Department of Fish & Game

Justification

Environmental shifts taking place in the Arctic such as weather variability, changing ice freezing patterns, more frequent and intense storms, higher temperatures, decreased sea ice extent and stability combine to produce an unpredictability to long-established hunting, fishing, and gathering harvest patterns. Access to food resources and ability to adequately store these foods is uncertain and raises risks from toxins and emerging diseases. These concerns occur 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 in particular, food security is a fundamental priority that extends to cultural and 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 assessment, monitoring and development activities will need to support local needs for food safety and ecosystem health. Greater awareness of factors affecting traditional food abundance, access, use patterns and the cultural component of food security demands will be important. Additional opportunity to reinforce local traditional food access could include active management programs that expand or introduce populations. The Arctic region is rich in healthy natural range habitat for ungulates. This habitat could support additional introduced animals such as reindeer, musk ox, and bison.

Resources Needed

Fiscal — Strengthen capacity within DF&G's Division of Subsistence to respond to food security concerns.

Leveraged — 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. Canada has done extensive work on food security and this would be a good opportunity to collaborate.

Partners — **State** — DNR, DCCED-DCRA, DHSS, local governments, Alaska State Section of Epidemiology; **National** — NOAA, DOI, CDC, NIH; **Other** — Arctic Council; ICC; AIA; Alaska Native tribes, corporations and organizations; University of Alaska, ANTHC

Execution

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 interests in fish and wildlife management and harvest assessment programs. The state will facilitate efforts to ensure subsistence activities are supported for Arctic residents. Other state agencies have a role to play here; in particular the Alaska State Section of Epidemiology has a program in place to assess the health benefits and risks of subsistence food consumption. Within DF&G's Division of Subsistence, as one option, the state should consider forming a Committee on Cultural Habitat, which would reinforce the eco-cultural relationship found within food security. A program such as this, or similar, would allow the state to manage not just for the health of the subsistence resource but also for access to that resource by indigenous peoples who depend on it for cultural well-being.

Legislative Actions

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 and all Alaskans.
3. Form a Committee on Cultural Habitat within the Division of Subsistence.
4. Explore solutions to limitations on serving locally harvested food in schools and public service buildings.
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 studies on food security, including continued research on contaminants.
7. Support UAF School of Natural Resources and Extension program educational training programs.

Evaluation

Success will be measured by: 1) increased attention and agency response to food security issues; 2) improved co-management of subsistence resources; 3) and successful subsistence activities.

RECOMMENDATION 3G

Identify and support industry, community and state practices that promote sustainability of subsistence resources, while protecting against undue ESA listings and broad-brush critical habitat designations.

Lead: Department of Law

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, it could be said, 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 on the basis 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 conflict avoidance agreements are all examples of how the state of Alaska can serve as a model to other Arctic nations.

Resources Needed

Fiscal — Support proactive research efforts by the DF&G that can serve to provide the science needed to avoid unwarranted ESA listings. Ensure the DOL has resources needed to challenge unwarranted listings.

Leveraged — Collaborate with Western Governor’s Association and others with aligned interests regarding ESA policy.

Partners — **State** — DF&G, Alaska State Legislature; **Federal** — Alaska Congressional Delegation; **Other** — Alaska Native communities, Industry.

Execution

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 demand targeted litigation that requires 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.

Legislative Actions

1. Ensure funding is available for the DF&G and DOL, 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.

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.

RECOMMENDATION 3H

Create workforce development program to prepare Arctic residents to participate in all aspects and phases of Arctic development.

Lead: Department of Labor and Workforce Development

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 stemming from new activities. Many of these activities demand skilled labor and/or post-secondary 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 educational resources. The largest job growth is forecasted to be healthcare 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, engineering, management and high-level leadership positions.

Resources Needed

Fiscal – Fund DOLWD and/or Alaska Workforce Investment Board (AWIB) agency staff to develop targeted workforce development plan for the northern region.

Leveraged – 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.

Partners – **State** – AWIB; Division of Teaching & Learning Support, Career Technical Education; DOLWD, Alaska's Institute of Technology, ATC; **Federal** – USCG, USDOL, EDA; **Other** – APICC; Alaska Marine Pilots; Alaska Native tribes, corporations, and organizations; University of Alaska; Ilisagvik Tribal College

Execution

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. The Construction Workforce Development Plan, Alaska Health Workforce Coalition Plan and the Alaska Maritime Industry Workforce Plan are 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 as 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 through postsecondary education promoting skills that foster creativity, initiative, and 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: 1) lower unemployment rates and increases in the percentage of Alaskans filling available jobs, (versus a seasonal workforce that commutes from out of state); and 2) increase in local entrepreneurs establishing a social or commercial activity.

Strategic Line of Effort #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 conducted in the Alaskan Arctic encompasses a broad spectrum of interests, from the public to the private sector including non-governmental organizations, the state 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. In addition, while local and traditional knowledge and subsistence activities inform many of the above entities' research priorities, activities and findings, regional traditional knowledge must receive a higher level of consideration. 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 reveal the forces influencing 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 and economic development infrastructures, it remains necessary to clearly identify the limitations of models that are developed to aid in decision making. Even as baseline data and component parameterizations improve, awareness of these limitations assists the evaluation of contingencies and determination of proper levels of precaution in management and strategic approaches.

State government priorities pertaining to the Arctic are influenced by state objectives. Establishment of these priorities will ensure organized state input to federal, local and institutional decisions on Arctic research and monitoring needs.. As the state's engagement with Arctic issues increases, the executive branch will play an important role in improving coordination of state agencies' positions in Arctic research and associated matters. Alaska should pursue strategies to broaden and strengthen the influence of its agencies, its academic experts and its local governments and associations.

Benefits include an increase in 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, allowing them to address opportunities and challenges in the emerging Arctic.

RECOMMENDATION 4A

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.

Lead: Statewide Committee for Research

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. A stronger partnership between user groups and the science and research community will yield greater understanding and translatable results for users and more consistent funding for researchers. The variability of annual funding is a challenge for the University system and leads to erratically or at least irregularly funded research being conducted. Increased alignment between state priorities and University research capacity should not be seen as impacting the independence of the University or its research. Joint objectives will increase the usability of the research findings and the efficacy of or return on investment. The state of Alaska has the opportunity to define its leadership role in the Arctic. The capacity of the University system is directly related to the state's ability to project competency and competitive advantage in a crowded field. While the state will count on "best science" from any research, it is in the state's interest to build capacity within Alaska and within Alaskan institutions to produce this.

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 efforts through NSF, USARC, IARPC, Polar Research Board and the NPRB would be valuable and partnership might result in increased inclusion of state expertise.

Partners – **State** – DEC, DNR, SCoR, DF&G, local governments; **Federal** – IARPC, USARC, NOAA, DOI, NSF, DHS, DHHS, NPRB, NSSI; **Other** – private sector R&D, environmental nongovernmental organizations, AOOS, University of the Arctic, University of Alaska and branch campuses, regional nonprofits.

Execution

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 Statewide Committee for Research (SCoR) 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

1. Consider revising the makeup and scope of the Alaska Statewide Committee for Research.
2. Invite testimony from federal agencies - IARPC, NSF, USARC, NOAA and DOI - on research priorities.
3. Convene committee hearings related to applied research opportunities and related opportunities for business development.
4. Fund the SCoR 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 ACEP that have that the capacity to support local, national and international science needs.
6. Work with Governor to ensure that the Administration has capacity to identify science/research portfolios and portfolio holder(s), engage with SCoR and broader efforts to establish science and research priorities and agencies, and allocate appropriate budgets to meet these 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 4B

Increase collaboration and strengthen capacity for coordination within the Arctic science and research community.

Lead: Department of Natural Resources

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 and in considering the current limited capacity to address Arctic science and research demands. 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 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 a more comprehensive understanding of the Alaskan Arctic.

Resources Needed

Fiscal — This will depend on scale of support or expansion of the program, but at the minimum require an increase in 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.

Partners — **State** — DF&G, DEC; **Federal** — NSSI, DOI, NOAA; **Other** — Alaska Native organizations and co-management groups; University of Alaska and its branch campuses; local governments

Execution

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 sub regions 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 state university system and at least two members be Alaskans from local government entities.
4. 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 jointly address, and determine topics that would benefit from international cooperation.

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.

RECOMMENDATION 4C

Strengthen efforts to incorporate local and traditional knowledge into science and research and use this community-based knowledge to inform management, health, safety, response and environmental decisions.

Lead: Department of Environmental Conservation

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 ANWTF 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 *Traditional Knowledge and the Arctic Environment*, 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.

Resources Needed

Fiscal – 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.

Leveraged – Existing interagency efforts provide good opportunities for addressing this topic without a significant increase in funding by the state.

Partners – **State** – DF&G, DNR, local government, HSS; **Federal** – DOI, DOS, NPRB, NSSI; **Other** – University of Alaska, UArctic, Arctic Council, co-management groups, Alaska Eskimo Whaling Commission.

Execution

The Administration and Legislature should give this recommendation due consideration 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 indicates that the state must strengthen this effort. 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 currently in development through a grant from NSF and will be released at the 2015 Alaska Forum on the Environment.

Legislative Actions

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 lists of recommendations and best practices.
2. Invite testimony of local and traditional knowledge holders to committee hearings.
3. Work with regional and community tribal authorities to identify traditional knowledge experts who have expertise in matters pertaining to ice movement, ocean currents and weather patterns as a means of creating a rapid-response knowledge network that could be utilized in the event of an oil spill or other disaster.

Evaluation

Success will be measured by: 1) an increase in public confidence in management decisions, and their responsiveness to local and traditional knowledge; 2) an increase in traditional knowledge represented in and co-producing scientific research; 3) the development of standards of use; and 4) an increase in conflict avoidance.

RECOMMENDATION 4D

Improve, support, and invest in data collaboration, integration, management and long-term storage and archiving.

Lead: Statewide Committee for Research

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 could improve safety and enhance economic development, as well as environmental protection. Groups such as the Alaska Climate Change Subcommittee, AOOS, NSSI 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.

Resources Needed

Fiscal — 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

Leveraged — The University of Alaska and AOOS have already been working to manage researcher data, therefore the state of Alaska can build upon these and other capacities.

Partners — **State** — all agencies; **Federal** — NSF, USARC, NSSI; **Other** — University of Alaska; AOOS; local government; Alaska Native organizations; industry groups.

Execution

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 Geospatial Council 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).

Legislative Actions

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.

Evaluation

Success will be measured by the 1) increased amount of accessible data and 2) increased actual use of this data.

RECOMMENDATION 4E

Support monitoring, baseline, and observational data collection to enhance understanding of Arctic ecosystems and regional climate changes.

Lead: Statewide Committee for Research

Justification

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 cultural practices, 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.

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 — 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.

Partners — **State** — Governor’s Office, DEC, DNR, DF&G, local governments; **Federal** — IARPC, USARC, NOAA, DOI, NSF, DHS, DHHS, NPRB, NSSI, USACE; **Other** — private sector R&D, AOOS, environmental nongovernmental organizations, University of the Arctic, University of Alaska and branch campuses; ANTHC.

Execution

Benchmark data, (reference points measured over time), provide the most reliable monitoring of ecosystems in an active and changing Arctic. The Local Environmental Observation Program, managed by ANTHC, is a successful network of citizen scientists that report unusual plants and wildlife, extreme weather, flooding, drought and wildfires to a central database. 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 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 convene a working group to evaluate priorities related to baseline monitoring and observations, perhaps through the Statewide Committee for Research, and make recommendations to the executive and legislative branches regarding resources needed to meet high priority items.
2. Support baseline data planning at five 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 4F

Invest in U.S. Arctic weather, water and ice forecasting systems.

Lead: Department of Environmental Conservation

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 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 the ocean's behavior — ocean circulation, currents and 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 employed 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 tools to forecasting systems should be a high priority to ensure safety 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.

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, (NOAA, USN), maintain operational analysis and forecasting systems and many other federal and academic partners, such as AOOS, invest in supportive observing systems and science research activities. State partnership could help fill gaps.

Partners — **State** — DMVA, DNR, DF&G, local governments; **Federal** — IARPC, USARC, NOAA (NWS, NESDIS, NOS, OAR), DOI, NSF, DHS, NPRB, NSSI, NSIDC, DOD (USN); **Other** — private sector R&D, AOOS, environmental nongovernmental organizations, University of Alaska and branch campuses.

Execution

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; the 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 organizations provide valuable resources 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 and other equipment. 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 maximize information from existing efforts since that information can 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 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) increased use of this data for forecasting and response capabilities.

RECOMMENDATION 4G

Update hydrocarbon and mineral resource estimates and mapping in the Alaskan Arctic.

Lead: Department of Natural Resources - Division of Geological and Geophysical Surveys

Justification

DNR's Division of Geological and Geophysical Surveys, (DGGS), 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.

Resources Needed

Fiscal – 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.

Leveraged – 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.

Partners – **State** – DNR Division of Mining, Land, and Water, AIDEA; **Federal** – DOI, NOAA; **Other** – private sector companies; Alaska Native tribes, corporations, organizations; Alaska Miners Association; University of Alaska and its branch campuses; GINA.

Execution

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 a high priority. The Airborne Geophysical/Geological Mineral Inventory is 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). Hyper-spectral 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 benefits 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 lines of effort 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; 4) incorporate the value of meaningful inclusion of Alaskans in these approaches; 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 these strategic lines of effort 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, seeks 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.

7 List of Acronyms

AAC	Arctic Athabaskan Council
AAPC	Alaska Arctic Policy Commission
ACADIS	Advanced Cooperative Arctic Data and Information Service
ACCIMP	Alaska Climate Change Impact Mitigation Program, Alaska DCCED-DCRA
ACEP	Alaska Center for Energy and Power
AEA	Alaska Energy Authority
AFN	Alaska Federation of Natives
AGC	Alaska Geospatial Council
AHFC	Alaska Housing Finance Corporation
AIA	Aleut International Association
AIDEA	Alaska Industrial Development and Export Authority
AIS	Automatic Identification System
AMATII	Alaska Marine and Aviation Transportation Infrastructure Initiative
AML	Alaska Municipal League
ANC	Alaska Native Corporation
ANILCA	Alaska National Interest Lands Conservation Act
ANTHC	Alaska Native Tribal Health Consortium
ANSEP	Alaska Native Science and Engineering Program
ANWR	Arctic National Wildlife Reserve
ANWTF	Alaska Northern Waters Task Force
AOOS	Alaska Ocean Observing System
APFC	Alaska Permanent Fund Corporation
APICC	Alaska Process Industry Careers Consortium
ARDOR	Alaska Regional Development Organization
ARMAP	Arctic Research Mapping Application
ARUC	Alaska Rural Utility Collaborative
ASMI	Alaska Seafood Marketing Institute
ATC	Alaska Technical Center in Kotzebue
AVTEC	Alaska Vocational Technical Center
AWIB	Alaska Workforce Investment Board
BLM	Bureau of Land Management, United States DOI
BOEM	Bureau of Ocean Energy Management, United States DOI
CACFA	Citizen's Advisory Commission on Federal Areas
CAFF	Conservation of Arctic Flora and Fauna Working Group, Arctic Council
CANNOR	Canadian Northern Economic Development Agency
CCHP	Climate and Cryosphere Hazards Program, Alaska DNR-DGGS
CCHRC	Cold Climate Housing Research Center
CDC	Center for Disease Control, United States HHS
CDQ	Community Development Quota
CED	Center for Economic Development, University of Alaska
CEDS	Comprehensive Economic Development Strategies
CEQ	Council on Environmental Quality, United States Executive Office of the President
CMTS	U.S. Committee on the Marine Transportation System
CTE	Career and Technical Education, Alaska DEED
DCCED	Alaska Department of Commerce, Community, and Economic Development
DCCED-DCRA	Division of Community and Regional Affairs
DEC	Alaska Department of Environmental Conservation
DED	Division of Economic Development, Alaska DCCED
DEED	Alaska Department of Education and Early Development
DF&G	Alaska Department of Fish and Game
DGGS	Division of Geological and Geophysical Surveys, Alaska DNR
DHHS	United States Department of Health and Human Services
DHSS	Alaska Department of Health and Social Services
DMVA	Alaska Department of Military and Veterans Affairs
DNR	Alaska Department of Natural Resources
DNR-OPMP	DNR Office of Project Management and Permitting
DOC	United States Department of Commerce
DOD	United States Department of Defense
DOE	United States Department of Energy

DOI	United States Department of the Interior
DOL	Alaska Department of Law
DOLWD	Alaska Department of Labor and Workforce Development
DOR	Alaska Department of Revenue
DOS	United States Department of State
DOT&PF	Alaska Department of Transportations and Public Facilities
EDA	United States Economic Development Administration
EETF	Emerging Energy Technology Fund
ELOKA	Exchange for Local Observations and Knowledge of the Arctic
EPA	United States Environmental Protection Agency
ERMA	Environmental Response Management Application
ESA	Endangered Species Act
FEMA	United States Federal Emergency Management Agency
GCI	Gwich'in Council International
GINA	Geographic Information Network of Alaska
HUD	United States Department of Housing and Urban Development
IARPC	United States Interagency Arctic Research Policy Committee
IASC	International Arctic Science Committee
IAWG	Immediate Action Working Group
ICC	Inuit Circumpolar Council
IHS	United States Indian Health Service
IMO	International Maritime Organization
IRS	United States Internal Revenue Service
LUMP	Local Utilities Management Program
MARAD	United States Maritime Administration
MXAK	Marine Exchange of Alaska
NASA	National Aeronautics and Space Administration
NIH	United States National Institutes of Health
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPR-A	Nation Petroleum Reserve-Alaska
NPFMC	North Pacific Fishery Management Council
NPRB	North Pacific Research Board
NREL	National Renewable Energy Laboratory
NSF	National Science Foundation
NSIDC	National Snow and Ice Data Center
NSSI	North Slope Science Initiative
NWS	National Weather Service
OCS	Outer Continental Shelf
OIT	Alaska Office of International Trade
OMB	United States Office of Management and Budget
OSRO	Oil Spill Response Organization
OSTP	Office of Science and Technology Policy, United States Executive Office of the President
PNWER	Pacific Northwest Economic Region
REAP	Renewable Energy Alaska Project
RRT	Regional Response Team
RurAL CAP	Rural Alaska Community Action Program
SAR	Search and Rescue
SCoR	Alaska Statewide Committee for Research
SPAR	Spill Prevention and Response, Alaska DEC
STAP	Science Technical Advisory Panel
UAA	University of Alaska Anchorage
UAF	University of Alaska Fairbanks
USACE	United States Army Corps of Engineers
USARC	United States Arctic Research Commission
USCG	United States Coast Guard
USDA	United States Department of Agriculture
USDOL	United States Department of Law
USF&WS	United States Fish and Wildlife Service
USGS	United States Geological Survey, United States DOI
USN	United States Navy
USNORTHCOM	United States Northern Command



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