

DRAFT Adaptation Options to Reduce Impacts of Climate Change on Other Economic Activities

Option #	Option Title	Option Leads
EA-1	Evaluate Potential Needs for Expanded Arctic Ocean Oversight and Regulatory Activities	Shane Montoya, Michael Cerne
EA-2	Explore Economic Activity Opportunities Offered by Climate Change	John Hellén, Pete Larsen
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EA1. Evaluate Potential Needs for Expanded Arctic Ocean Oversight and Regulatory Activities

Option Description

Recommendation

This option recommends that the State of Alaska recognize and address the potential for increased Arctic economic activities by identifying potential gaps in ability (federal, state, local, NGOs) to provide an adequate presence in the Arctic coastal region to protect environmental resources and human health and safety. Potential gaps may exist in emergency response operations and regulation of industry.

This option recommends the authorization of a Capital Improvement Project (CIP), managed by AK-DOT and involving other stakeholders, to collaboratively identify the capabilities required to address response and regulatory needs concerning the Arctic maritime industry as climate change drives the expansion of economic activity. The Arctic Ocean area encompassed will be coastal waters north of and including Norton Sound.

Issue

Melting sea ice in the Arctic Ocean is likely to result in increased ship presence and infrastructure that will require support in terms of environmental and safety protections.

Overview

- Many scientific models predict that Arctic sea ice will continue to retreat, creating longer ice-free summers along the Alaska Arctic coast. This will result in growth of maritime economic

activities in this region such as shipping, mining, fishing, tourism, and oil & gas exploration. To a small extent, this is already happening today. To support increased economic activity, ports, infrastructure, and other facilities are expected to follow as warming temperatures result in longer seasonal access. This will bring increased ship traffic and a greater human presence, not only creating job and business opportunities, but also requiring investments to ensure essential government functions such as safety, security, and environmental protection are provided.

- This option recommends the State of Alaska recognize and address the potential for increased Arctic economic activities by identifying the gaps in government capabilities (federal, state, local, NGOs) to provide an adequate presence in the Arctic coastal region. For example, the state must be prepared to conduct emergency response operations (search and rescue, pollution), regulate industry (tourism, oil & gas, and fishing) and protect our sovereignty. In essence, most state and federal government agencies with regulatory responsibilities in Alaska will realize a need to expand their presence to the Arctic region commensurate with the growth in economic activity.
- Implementing this option will provide the state with the necessary information upon which to plan accordingly in ensuring capabilities for future economic growth are in place, and put the state in a better position to compete for federal funding to meet the demands of the future. Moreover, extending government programs into the Arctic is resource intensive. There could be tremendous opportunities to share costs, facilities, equipment, and responsibilities, thus increasing efficiency and strengthening interagency partnerships. For example, the U.S. Coast Guard shares common responsibilities with the Alaska Departments of Fish & Game, Environmental Conservation, and Military & Veterans Affairs/Homeland Security.
- If this recommendation is not implemented, the State of Alaska will lack needed understanding of what capabilities are required to meet expanding economic growth, miss opportunities for efficiencies with other agencies, and be less competitive in an austere federal budget climate.

Option Design

Structure/design

The primary component of this option is the creation of an Arctic infrastructure CIP, managed by AK-DOT that contracts a firm to identify the capabilities required to address response and regulatory needs in the Arctic region as climate change drives the expansion of economic activity. This effort will compile information on real and potential industry growth in the Arctic coastal region (see EA-3), determine what government services need to be expanded, and provide recommendations on how to foster cooperation for expansion of these capabilities.

Targets/Goals

The overarching objective would be to build a set of Arctic requirements along a scalable continuum to support recommended strategies on which organizations (federal, state, local, NGOs) need to expand types of capabilities and recommend a schedule of that expansion focused on immediate needs, potential needs in 5-10 years, and longer term needs that are 11+ years in the future.

Timing

The firm contracted under the CIP would need to be established as soon as practicable. Arctic maritime industry is already starting to expand. There is presently a lack of capabilities for current conditions; any expansion would increase risk and exasperate the need for increased presence.

Parties involved

Recommend the Governor's office task AK-DOT to implement a CIP to begin the process of forward planning for the Arctic capabilities/requirements assessment. This would likely occur after development

of economic scenarios in EA-3. If a new climate change task force or council is established to manage several new projects, this group should manage the CIP.

Evaluation

The firm contracted under the CIP should be given a period of time in which to review and understand the goals of this option, create a two year work plan identifying key milestones, and submit periodic progress reports. AK-DOT will review and approve the work plan and monitor progress. Correction/changes can be made upon review of the quarterly reports.

Research and Data Needs

Data identifying climate models and their predicted impact on Arctic economic growth; see EA Option 3.

Implementation Mechanisms

Implementation of this option requires State approval and funding of a new Arctic CIP. To proceed with this option, the Governor's office will need to assign AK-DOT (primary manager) to implement the CIP and commit funds to contract a firm to carry out the assessment. Federal, state, academic, and industry participation should be solicited similar to the Climate Change Advisory Groups but on a volunteer basis, including assistance from both the North Slope Borough and NW Arctic Borough. The State should involve each agency with responsibility in the Arctic.

Related Policies/Programs and Resources

Related Policies and Programs

- USCG District 17 (Alaska) is conducting an Arctic capabilities analysis.
- US Arctic Research Commission Arctic Marine Shipping Assessment
- Institute of the North is coordinating several programs relating to current and future Arctic industry.
- The Pubic Infrastructure TWG may also be addressing infrastructure development, specifically with regard to increased Arctic shipping.

Available Resources

Unknown at this time – will require commitment of state funding.

Feasibility

This proposed option is primarily within the authority of the State with assistance from federal agencies and industry. Representatives from various federal agencies would be needed and could be a constraining factor. Strategic partnerships with all affected agencies would be required to ensure overall agreement on recommendations of future capability needs for Alaska to move forward in synch with industry growth – all agencies would retain authorities. A key limiting factor will be funding to manage the project. The end goal will be the creation of a document to identify capabilities gaps, recommended improvements, primary agency responsibilities, and an action/implementation plan. The State will have immediate benefits of having information available to strategically plan and prioritize projects to appropriately govern/regulate industry as the industry adapts to growing opportunities in the Arctic.

Adaptation Benefits and Costs

The benefits of this recommendation would be an orderly expansion into the Arctic, increased safety for citizens, environmental protection, and reduced expenditures through cost sharing. The state would need

to commit resources from AK-DOT to develop and implement a CIP, including identifying the costs to contract a firm to conduct the assessment.

TWG Approval and Deliberations

During the ranking and evaluation by members, this option was the highest ranked option with no minority views. No significant concerns have been raised about this option from EA TWG members.

EA2. Explore Economic Activity Opportunities Offered by Climate Change

Option Description

Recommendation

Identify and foster economic development opportunities by influencing state, federal, and international climate strategies, establishing business incentives, and monitoring and proactively responding to economic consequences to regional climate change.

Issue

Climate change will create both economic challenges and opportunities. Adapting to and taking advantage of these opportunities may generate new economic activity throughout the state.

Overview

The unique Alaskan environment and experiences of the state in dealing with climate impacts provide opportunities for new and as yet unforeseen economic activities, as well as the development of climate adaptive strategies that may be useful (and exportable) elsewhere. The intent of this option is to explore and foster these economic opportunities.

This option explores the economic opportunities that may result from climate change in existing economic sectors and in potential new sectors: (and policies put in place to address climate change), such as:

- Existing Economic Sectors
 - Agricultural production
 - Fisheries
 - Tourism
 - Oil & gas
 - Mining
 - Forestry
 - Other areas
- Potential New Opportunities
 - Greenhouse gas management
 - Renewable energy (tidal, wind, hydroelectricity, solar, biomass)¹
 - Energy efficiency
 - Sustainable infrastructure development
 - Other areas

¹ Currently, Alaskan residents and businesses receive approximately 24% of Alaskan energy from hydroelectric sources, and only 0.2% from wind/solar /biomass - *Renewable Energy Atlas of Alaska, 2007*, Alaska Energy Authority. <http://akenergyauthority.org/Reports%20and%20Presentations/EnergyAtlas2007.pdf>

The [Alaska Industrial Development and Export Authority](#) (AIDEA), which provides means of financing to promote economic growth and diversification in Alaska, may provide an opportunity for partnership/coordination to foster green innovation and economic development.

Option Design

Structure/design

Effective implementation of this option could involve promoting/exporting scientific innovation, strategic engagement on national/regional climate change policy, and monitoring/modeling the impacts of climate change impacts/legislation to identify new opportunities. Note that before any funding is dispersed to capitalize on future opportunities, it is critical to define what sustainable development, low carbon-equivalent fuels, financial incentives, and other important criteria mean.

- Engage on future national/regional climate change legislation with the following objectives:
 - Receive equitable share of nature-based and physical infrastructure adaptation funding directed to Alaska;
 - Identify financial incentives for developing low carbon-equivalent fuels (e.g. natural gas pipeline);
 - Identify financial incentives for geologic and forest carbon sequestration activities (e.g., carbon credits for controlling forest fires, replanting);
 - Continue to receive substantial R&D funding for Alaskan-based research institutions as well as federal/state/local agencies operating within Alaska.
- Use funding from national/regional climate markets to foster innovation
 - Provide significant financial incentives to promote renewable energy and efficiency efforts across Alaska;
 - Encourage AIDEA or another state clearinghouse to create a fund for loans to sustainable businesses and communities;
 - Enhance the Alaska Energy Authority’s role in developing renewable energy;
 - Provide tax incentives to sustainable businesses and communities;
 - Build out infrastructure to support (inter-tie expansion, communications, ports, roads, etc.);
 - Consider the cost-effectiveness of nature-based adaptation strategies versus new infrastructure development (e.g., in some places it may be more inexpensive to protect a coastal wetland than build a seawall in order to reduce community risk from coastal erosion/inundation);
 - Develop complete net metering regulations;
 - Develop and enforce standards for collecting community-level business and economics data over time; and
 - Develop research and development export clearinghouse to market ideas and innovation outside of Alaska to new marketplaces.
- Monitor and model climate change to identify new opportunities
 - Encourage monitoring of climate change to see where new opportunities may be present;
 - Model future economic impacts of climate change on fisheries, forestry, and other sectors to identify opportunities; and
 - Model future economic impacts of climate change legislation on fisheries, forestry, and other sectors to minimize risk and capitalize on opportunities.

Targets/Goals

The overarching goal of this option is to prepare the state of Alaska and its residents to receive significant funding from impending markets that will regulate GHGs and then disperse these funds in an efficient way to maximize future opportunities and minimize future financial risk to the state.

Timing

This option should be implemented in the near-term, as markets to regulate greenhouse gases are expected to come online within the next few years. Significant workforce development and incentive systems will need to be discussed and started before these markets are functioning.

Parties Involved

Consider establishment of public/private board to identify and foster climate change-related opportunities including:

- AIDEA
- AEA
- AOGCC
- USARC
- CCHRC
- Native Corporations
- Sustainable business owners and operators
- Industries developing low carbon-equivalent resources (Natural Gas, Renewables, etc.)
- Universities
- NGOs
- Other local/state/federal agencies operating in Alaska

Evaluation

Benchmarks and goals will need to be explicitly set for each sector to receive direct funding, grants, and incentives to promote opportunities. In addition, an independent auditor may need to be identified to determine if statewide goals are being achieved in a reasonable timeframe. Among other things, the auditor could determine whether or not a business is truly sustainable or if certain workforce objectives (e.g., 1,000 new engineers in five years, etc.) are being met. It is probably safe to assume that significant funding and resources will need to be set aside to ensure the successful implementation of this option.

Research and Data Needs

Better time-series economics data is needed as well as workforce development programs to begin training new workers to capitalize on these opportunities. Time will need to be spent analyzing climate change legislation to align state's interests with the requirements identified in these impending bills.

Implementation Mechanisms

There are numerous implementation mechanisms needed for this option including: 1) an executive order from the Governor directing some level of coordinated preparations prior to any climate change legislation, and 2) national/regional legislation to regulate greenhouse gases and distribute auction revenues to the state and region.

Related Policies/Programs and Resources***Related Policies and Programs:******Available Resources:*****Feasibility**

To be determined

Adaptation Benefits and Costs

There may be some substantial up-front costs from administering this option, but the long-run benefits from capitalizing on opportunities will more than offset the early costs. It has been shown in economics literature that making early investments in workforce development, financial structures to support sustainable businesses and R&D more than pay for themselves as the climate continues to change.

TWG Approval and Deliberations

This option has strong support from those that have participated regularly in the EA TWG discussions. No significant concerns have been raised about this option from EA TWG members.

EA-3: Develop Scenarios for the Alaska Economy Affected by Climate Change

Option Description

Recommendation

Provide funding to a research entity to conduct and manage a project that examines scenarios for the Alaska economy.

Issue

Specific components of the Alaskan economy will experience varying impacts due to climate change. An assessment of economic strengths, weaknesses, opportunities and threats (SWOT) is needed for each segment of the Alaskan economy in order to develop optimum adaptive strategies and policies. It is not possible to quantify the extent of economic impacts or develop appropriate strategies before defining the potential conditions of the operating environment.

Overview

This option will consist of a series of steps leading to an economic forecast for segments of the Alaska Economy affected by climate change. Climate change assumptions, expectations, and uncertainties will first be developed by credible climate scientists. Planning scenarios will be developed for critical climate parameters such as temperature, precipitation, snow and ice cover, sea level rise, and ground subsidence. Climate scenarios are currently developed by the Scenario Network for Alaska Planning (SNAP). The economy will be segmented for planning purposes, and assessed based on climate scenarios. An economic assessment (SWOT) will be prepared for use by agencies planning adaptive strategies and public policies. To develop coherent response plans, this set of scenarios must be consistent across all planning groups.

How does this option address the issue of concern? Economic assessments must be closely linked to credible climate change assumptions, expectations and planning scenarios utilizing scientific methods and authorities of the highest reliability. If the range of potential changes can be defined over the target time frame, then actual impacts can be anticipated and reasonable response plans can be developed.

Why is this option necessary? A better understanding of the potential range of economic effects is needed based on a clear understanding of current components of the economy and their potential strengths and vulnerabilities under changing climate regimes. Public policy related to climate change will be misguided unless based on scientifically credible climate predictions. Response actions will be implemented by various state agencies and private entities; however, if action plans developed by various legislative actions are based upon different assumptions of expected changes, then it will be difficult to coordinate priorities and expenditures.

Option Design

Structure/design

1. Establish project organization, and schedule. Prepare option plan document, including scope, objectives, resources, performance measures and feedback mechanisms.
2. Assemble a panel of climate change scientific experts. Establish climate change assumptions, expectations, and uncertainties.
3. Develop climate change planning scenarios for relevant climate parameters (temperature, precipitation, snow and ice cover etc).
4. Identify significant economic sectors of the Alaska economy. Assemble a panel of sector subject matter experts.
5. Identify scenarios for the Alaskan economy affected by climate change. Prepare economic segment SWOT analysis based on climate scenarios.
6. Prepare draft Report and obtain public comments. Prepare final Report.
7. Establish climate change economic review board or panel to communicate results and provide periodic review and update of economic scenarios as appropriate.

Targets/Goals

1. Prepare a report on Scenarios for the Alaska Economy Affected by Climate Change
2. Outline a process for ongoing review and update of economic scenarios as appropriate

Timing

1. Complete final report on Scenarios for the Alaska Economy prior to year end 2009.

Parties involved

- The Institute of Social and Economic Research (ISER), the University of Alaska , the Alaska Center for Climate Assessment and Policy, a program funded by NOAA at UA-Anchorage and UA-Fairbanks, or other suitable economic or scientific academic entity could lead the overall effort
- UAF Institute of Northern Engineering and/or International Arctic Research Center would assemble a panel of scientific and engineering authorities (e.g., industry and regulatory agencies) to establish climate change assumptions, expectations and uncertainties
- UAF SNAP would prepare climate change scenarios following the climate change panel assumptions.
- Lead agency (to be named) to identify panel of economic sector subject matter experts
 - Possibly the [Department of Commerce, Community & Economic Development](#)
- Lead agency (to be named) to produce draft and final report
 - Possibly the [Department of Environmental Conservation](#)
- Lead agency (to be named) to outline continuous improvement processes and communicate results to climate change stakeholders
 - Possibly the [Department of Natural Resources](#)

Evaluation

Assignment of project scoping and management accountability to a suitable economic or scientific academic entity (to be named) is recommended. Assignment of oversight accountability to a lead agency (to be named) is recommended. Effectiveness measures and performance indicators will be proposed by the project management entity and evaluated by the oversight agency. A formal assessment should be conducted in 2014 and 2019 to ascertain scenario accuracy and if necessary incorporate advancements in model performance to improve predictive guidelines.

Research and Data Needs

Research will be needed to:

1. Identify scenario building and climate modeling methods most appropriate for north circumpolar regions
2. Establish climate change assumptions, expectations, and uncertainties for Alaska
3. Determine a listing of suitable climate parameters for use in climate and economic modeling
4. Obtain data required to support climate modeling and characterize current components of the Alaska economy
5. Apply modeling methods for predicting future Alaska Climate conditions, compare with Canadian and other circumpolar modeling results
6. Assess economic response to climate change scenarios for each segment of the Alaskan economy

Implementation Mechanisms

An executive order may be needed to establish a mandate for this option. Legislation may be needed to establish lead agency and project management accountability and funding is needed to execute the work.

Related Policies/Programs and Resources

Related Policies and Programs

The UAF Scenarios Network for Alaska Planning (SNAP: <http://www.snap.uaf.edu/>) program is tasked with developing high quality predictions for Alaskan climate; however, they are funded to produce climate scenarios of air temperature and precipitation only. This information is certainly essential, but not all that is needed.

Available Resources

This information is required for planning by multiple state and federal agencies operating in Alaska. It is anticipated that costs could be distributed among multiple beneficiaries of such an effort.

Feasibility

The proposed action could be supported by available technical and budgetary resources. The project should be coordinated with other international, federal, state, and private entities (such as the American Society of Civil Engineers) with interest and expertise in climate change issues. Public and interagency involvement will be needed to conduct economic assessment, and to prepare and review final report documents. There should be little delay between project reporting and the realization of planning benefits.

Adaptation Benefits and Costs

Costs are to be determined. Benefits can be expected in the form of public policy improvements resulting in increased economic activity, at reduced cost compared with the no action alternative. Benefits are expected to exceed costs by at least an order of magnitude.

TWG Approval and Deliberations

This option has strong support from those that have participated regularly in the EA TWG discussions. No significant concerns have been raised about this option from EA TWG members.

EA4. Establish a Center for Knowledge Sharing on Arctic Issues**Option Description****Recommendation**

Establish an online Arctic Issues Center that allows interested participants to network, coordinate, communicate and share information on the Arctic Ocean and that provides a central data archive for information related to Arctic issues and policy.

Issue

Numerous activities relevant to Alaska are underway to address Arctic issues, both within state agencies, among Alaskan research institutes, at the federal level and in international organizations. There is not always a broad awareness of these activities, and participation is not always leveraged or coordinated. Results and findings from Arctic issues forums could be shared more broadly.

Overview

Coordination and Collaboration: Many agencies, universities and individuals are currently conducting research or monitoring activities relevant to climate change and its impacts in Alaska. A number of coordinating forums currently exist whose mission is to share current and planned projects relating to climate change, including the Alaska Marine Ecosystem Forum, the State-Federal Climate Change Roundtable, the Alaska Ocean Observing System, and the Governor’s Sub-Cabinet on Climate Change. This option recommends that the State of Alaska review these initiatives and consider how to better coordinate state, local, federal, university, and private activities in order to maximize the benefits of these efforts and minimize duplication. This option would include the establishment of an online Arctic Issues Center that allows interested participants to network, coordinate, communicate and share information on the Arctic, and identify approaches to coordinate and encourage participation in national and international forums dealing with Arctic issues on topics such as resource management, boundaries, shipping, navigation and health. Participants in this Center would work to better inform Alaska on other/international efforts and to prepare U.S. delegations on the desires, needs and interests of the residents of the State, including its native populations associated with changing climate.

Data Management: Many of the entities described above are currently conducting research or monitoring activities relevant to climate change and its impacts in Alaska. However, Alaska lacks a comprehensive inventory of data and access locations for observations, data, and information, as well as a central web-based “gateway” to easily access Alaska/Arctic projects, data, and information. There are some initiatives currently underway such as the Alaska Marine Information System for ocean and coastal information, sponsored by the Alaska Ocean Observing System, the North Pacific Research Board, and the Geographic Information Network of Alaska. This option recommends that the primary state and federal data providers develop a consensus process and system for archiving and accessing climate change data in Alaska that is integrated and interoperable with other data across the nation and globe.

Option Design**Structure/design**

Central to this option will be the establishment of a focal point (individual or organization) for collecting and disseminating information relative to the various national and international forums on these Arctic issues. It is expected that this organization or individual will maintain the appropriate web-based system(s) to facilitate this knowledge sharing. This organization or individual will also be responsible for maintaining a directory of contacts and events that is easily accessible by those wishing to make contacts

for inquiries or knowledge sharing. This focal point could be in a state agency, such as DEC or DNR, or could be an effort located within the university. This focal point could store all the relevant information locally or would be a clearinghouse that links to other information repositories.

Targets/Goals

Initially, goals will be associated with a timeline to establish processes and tools for knowledge sharing. Over time, the goals and targets will be associated with utilization of the Center (e.g. how many “hits”, how many contributions, etc...)

Timing

In 2009, identify the focal point (individual or organization) that would coordinate this center or network on Arctic issues, either within a state agency, at a university research center or at another location. Following this, assemble initial list of appropriate contacts that would be involved in this center and begin online communications about Arctic issues and using the network of individuals to help form a clearinghouse of information.

Parties involved

The Sub-Cabinet on Climate Change would identify the best state agency or university body for hosting this coordination and information management of Arctic issues.

This entity would identify the relevant stakeholders to invite and involve in this network of information sharing, including the University of Alaska, members of Alaska state government, applicable Alaska organizations that work on Arctic issues, industry representatives, native populations, and others.

Evaluation

Metrics could be established around effectiveness and utilization of the network; Routine user surveys could be conducted.

Research and Data Needs

This option is only for a clearinghouse of information and knowledge sharing, so no additional research is anticipated. It is expected that this climate change evaluation has generated enough participation to result in the initial list of network participants.

Implementation Mechanisms

No implementation mechanisms necessary. Budgeting may be an issue, but depending on the organization identified, costs should be minimal.

Related Policies/Programs and Resources

To be determined

Feasibility

Ensuring participation from those that work on Arctic issues.

Adaptation Benefits and Costs

Benefits

This option would involve relevant stakeholders in discussions on Arctic issues, and could result in more fruitful and coordinated discussions occurring at the state, regional and federal level.

TWG Approval and Deliberations

This option has strong support from those that have participated regularly in the EA TWG discussions. No significant concerns have been raised about this option from EA TWG members.

EA5. Improve Availability of Mapping, Surveying, Charting, and Imagery Data

Option Description

Recommendation

Invest in an accurate and high-resolution statewide digital base map that includes a digital elevation model and an acquisition system for imagery. Ensure that the base map and associated data are available to all users, with a first priority on mapping coastal areas and floodplains.

Issue

Specific information about the distribution and magnitude of changes (in near real time) is needed to better address economic challenges and opportunities. In many cases in Alaska, it is not possible to quantify changes until good baseline information is collected to define the existing conditions accurately. This will include having information (surveys) to address issues associated with changing boundaries (e.g., shorelines). High resolution topographic mapping is required to properly assess changes in permafrost degradation and thermokarst development, glacier melting, streambed changes, coastal erosion and many other dynamic geomorphic processes that will have real economic impacts on the State of Alaska.

Overview

Improve the availability of real-time mapping, surveying, charting, digital elevation models (DEM), and imagery data to provide means to better track and understand economic impacts of and opportunities to address climate change. Consider management of this spatial information within a geographic information system to promote use and distribution of the data. Development of these spatial data sets will contribute to a more robust information infrastructure to plan and adapt to climate change. Coordination with University of Alaska research centers, such as SNAP, Geographic Information Network of Alaska (GINA) and the International Arctic Research Center may be an approach for this option. Ideally, this option will help make available data in near real time, with a first priority on coastal areas and floodplains, as they will be changing the most with warming temperatures and changed weather. Such information is needed and utilized by most state agencies and private entities engaged in land management, monitoring, planning, or development.

The state currently has an effort to create a digital basemap ([Statewide Digital Mapping Initiative - SDMI](#)), and this option could use the SDMI as a vehicle to implement this option.

Option Design

Structure/design

There are two components to this option: the digital elevation model, and imagery.

1) Alaska lacks an accurate digital elevation model. The current base DEM for Alaska is the National Elevation Dataset (NED), which is maintained by the USGS and is based on Alaska's old USGS topographic maps. The resulting DEM is highly inaccurate, with entire mountains misplaced by several miles in some cases. Vertical displacements in the data of up to several meters at the boundaries of USGS quadrangle maps are not uncommon. Alaska must first create an accurate base DEM at a reasonable

resolution that serves a broad range of purposes. Then, the resolution of the statewide DEM can be improved for specific areas where needed for floodplain mapping and erosion tracking, etc.

2) The second component is the need for a statewide system for acquiring real-time accurate imagery. One option would be to acquire a ground station that would enable agencies to acquire real-time imagery from an appropriate space-based satellite platform.

Targets/Goals

- 1) Develop an accurate DEM for the entire state, with a priority on coastal areas and floodplains, as they will change the most under climate change.
- 2) Develop a system for acquiring imagery for Alaska, and making the imagery easily available to the public, agencies, and academia.

Timing

The timing is dependent upon the availability of funding. An interagency effort has already identified the specifications for a statewide DEM, and an implementation plan is currently being developed which will identify a strategy for acquiring the funding (an estimated \$50 to \$100 million for IFSAR data acquisition and processing for a 20 foot contour interval statewide). This plan should be complete in January 2009. A parallel effort is underway to develop the specifications for an imagery acquisition system, and should be complete in February 2009. The estimated funding necessary for a satellite ground station is between \$6 and \$10 million.

Parties involved

Currently, the SDMI effort is being led by the Alaska Departments of Natural Resources, Transportation and Public Facilities, and Military and Veterans Affairs, and the University of Alaska. Leadership is also being provided by the USGS and the BLM. This information will be utilized by a wide array of users, so this effort will necessitate the involvement of a broad spectrum of stakeholders.

All state, federal, and local resource agencies will benefit from this mapping effort, and should contribute. Academia, emergency and disaster management agencies, and the aviation and transportation agencies and industry will also benefit greatly. Coordination with UA-associated research centers may be needed, as well as other relevant U.S. and Canadian researchers, U.S. EPA and Alaska DNR and DEC.

Evaluation

If successful, this option will provide the public, agencies, the private sector, and other Alaskan stakeholders with an accurate basemap, which will facilitate the understanding of the impacts of climate change on our state. Some fields must be updated periodically in situations where environmental conditions are changing rapidly.

Research and Data Needs

As explained above, the initial research and development work for this option is largely already underway and will be completed in early 2009.

Implementation Mechanisms

The implementation mechanism, SDMI, is already in place. SDMI is willing to serve as a governing body, or can be used as a template if a broader representation is required.

Related Policies/Programs and Resources

Related Policies and Programs

There are a myriad of agencies and private interests that are acquiring DEM and imagery data for Alaska. The goal of this effort is to coordinate all these data acquisition efforts to the extent feasible.

Available Resources

SDMI has received state funding for \$6 million. Using this funding, work has already progressed in developing specifications for the DEM and imagery system, and a website has been created to inventory and serve existing public domain imagery (www.alaskamapped.org). The University of Alaska Fairbanks has some existing ground receiving and processing facilities, storage capabilities and tools and personnel developed for distribution of large geospatial datasets.

Feasibility

This option will necessitate a close coordination among a wide spectrum of stakeholders. Each stakeholder will have differing needs and uses for a statewide digital map, and will undoubtedly have differing needs for the specifications. It is the purpose of SDMI to bring these stakeholders together to develop a common set of specifications that provides the greatest benefit to the most, and provide for a mechanism to allow upgrading the statewide map as other users acquire more accurate and current data.

Adaptation Benefits and Costs

The public benefit will be realized almost immediately—in fact the existing SDMI website is already making this data available to the Alaskan public.

TWG Approval and Deliberations

This option has strong support from those that have participated regularly in the EA TWG discussions. No significant concerns have been raised about this option from EA TWG members.