

Spatial Tools for Arctic Mapping & Planning (STAMP)

**SCOPING INTERVIEWS AND SURVEY:
KEY FINDINGS AND RECOMMENDATIONS**

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Acknowledgements

Thank you to all interviewees, survey respondents and advisory board members for sharing your time and insights, especially during a time when all animals in the north – human and non – are busy working and collecting food in preparation for winter. It is an honor and privilege to hear these perspectives. May all our efforts support healthy and resource-rich Bering and Chukchi Seas into the future.

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Executive Summary

Collection and synthesis of spatial data into visualization tools is a critical step for long-term collaborative planning in Alaska for a wide range of coastal uses. The Alaska Ocean Observing System (AOOS), The Nature Conservancy (TNC), and three other partner organizations are conducting the Spatial Tools for Arctic Mapping and Planning (STAMP) project to help address the need for new decision support tools. As an initial step, TNC and AOOS conducted a survey and interviews with potential tool users in the spring and summer of 2012. The survey and interviews were designed to collect information that can be used to define the needs and specifications for new spatial tools. This report presents key findings from the survey and interviews, and it provides recommendations for the next phases of STAMP.

Key Findings

- Marine resource management decisions are often made through processes that are not based explicitly on resource data.
- Decision-making processes could be improved through increased access to data, and the use of tools to summarize, view and analyze that data.
- The most important weaknesses in current decision-making processes involve two issues that spatial tools can help address: public participation and the availability of data and information.
- Currently, the most commonly used data types are oceanographic, fish stock, ice cover, marine mammals and regulatory boundaries.
- There is a demand for year-round data, and in the face of rapid change, current and real-time data.
- The most pressing management decisions revolve around climate change and the associated changes in environmental conditions coupled with increasing industrial development and consequent human uses of the ocean and near shore environments.

Recommendations

- Build a tool that fits into and complements an existing management decision-making process.
- When defining the tool concept and requirements, focus on addressing the needs of the people who are involved in that decision-making process. Make a tool that helps achieve their goal.
- Consider developing a comprehensive clearinghouse of data needed for the selected decision-making process, including high-quality data in a usable format and a variety of scales and resolutions. Develop strategies to ensure proper use of data (e.g., built in warnings of data limitations).
- Effectively meet one or a few well-defined management needs, while remaining open to the possibility that the tool could be useful for other purposes.
- Consider developing a tool that helps people explore the potential effects of climate change on environmental conditions and human uses of the ocean, and that enables them to illustrate and analyze scenarios and management responses.
- Make sure that the tool is extremely easy for the target audience to use. Involve the target audience in the tool development process from its earliest stages.

- Consider limitations of internet speed and bandwidth, particularly in rural communities, on tool design and use.
- Work with data providers, including subsistence users, and subsistence mapping projects to help determine appropriate protocols for displaying and providing access to subsistence use data.

Introduction

Collection and synthesis of spatial data into visualization tools is a critical step for long-term collaborative planning in Alaska for a wide range of coastal uses. The Alaska Ocean Observing System (AOOS), The Nature Conservancy (TNC), Axiom Consulting and Design, University of Alaska's Institute for Social and Economic Research, and Alaska Center for Climate Assessment and Policy, are conducting the Spatial Tools for Arctic Mapping and Planning (STAMP) project to help address the need for new decision support tools. A nine-person advisory group composed of local, state and federal employees and representatives of key stakeholder communities is guiding the project. STAMP is funded by the U.S. National Oceanic and Atmospheric Administration (NOAA).

As an initial step toward STAMP's goals, TNC and AOOS conducted a survey and interviews with potential tool users in the spring and summer of 2012. The survey and interviews were designed to collect information that can be used to define the needs and specifications for new spatial tools. This report presents key findings from the survey and interviews, and it provides recommendations for the next phases of STAMP.

The interviews and survey were designed to identify:

- the most important marine management issues facing decision makers in the northern Bering Sea and Chukchi Sea;
- decision making approaches, tools and data currently used in the region; and
- ways that STAMP could support marine management decisions through development of a spatial data tool.

Although the STAMP project includes the mission of creating a platform to assist with future decision-making related to potential commercial fisheries, the topic of potential fishery expansion was one of multiple concerns expressed through scoping. Responses suggested creating a tool to meet a broader range of issues relevant on a shorter timescale, rather than keeping the scope narrow and focused on the longer term.

We conducted 22 interviews and collected 30 responses to the online survey. The participants were people involved in or affected by marine management decisions in the Chukchi Sea and northern Bering Sea. They represented a range of settings from remote villages to cities.

The report concludes with recommendations on how the STAMP project can help address users' needs for decision support tools.

Appendix A provides information about the survey respondents and interviewees. Appendix B presents the interview and survey questions.

Methods

Study Area

The study area encompassed the Chukchi Sea and the Bering Sea northward from Norton Sound. The North Slope Borough, Northwest Arctic Borough, and Bering Strait region were included in the study area. While the project focuses on the United States and Alaska, the study area boundaries are not exclusive of the Russian sides of the Bering and Chukchi Seas.

Selection of Interview and Survey Participants

The STAMP advisory group produced an initial list of potential participants for the interviews and the survey. That list was supplemented with additional suggestions from AOOS staff and interviewees. To obtain a diversity of views, we selected interviewees and survey invitees representing five categories: state or federal government; local communities and tribal governments; intergovernmental entities; fishing industry; and the conservation community.

Interviews

From May 14 to July 26, 2012, we interviewed nine people in person and thirteen by telephone, using ten closed and ten open-ended questions. Interviews lasted from 20 minutes to more than an hour. Some interviews were shortened to accommodate the interviewees' schedules and/or to eliminate questions that were not relevant to the interviewee. In several cases, the interview consisted largely of listening as interviewees talked about issues that were important to them, rather than responding to specific questions. One interview was exceptionally short with comments that were difficult to match with survey questions. In addition to the 22 completed interviews, two people declined to be interviewed, and approximately five others did not respond to emails or telephone messages. Of the two people who declined, one was concerned that providing information could lead to fishery impacts on subsistence resources, and the other wanted to avoid engaging in a resource management regime that he or she felt to be ineffective.

Survey

From June 25 to July 18, 2012, we sent an online survey invitation to more than 110 people, and 30 of them participated in the survey. Survey questions were similar to the interview questions, but the wording was more specific, as respondents would not have access to an interviewer to clarify questions. The survey included additional questions to fill information gaps not covered in the interviews.

Limitations

Only 22 interviews were conducted, and despite the best efforts of the project team to achieve a representative sample, completed interviews were influenced by who was responsive, available, and willing to be interviewed. In the online survey, many of the responses came from federal employees, while the fishing industry had less representation, possibly due to the busy summer fishing season. Also, unlike the interviews, survey questions could not be quickly tailored to people's varied technical backgrounds and focuses, or to clarify any confusing questions. The online survey is likely not tuned or variable enough to meet the needs of less technically trained people.

RESULTS

Decision-making Processes

1. What primary processes do you use to make decisions?

Interviewees and survey participants were asked to identify the primary processes that they use to make decisions in the context of marine management. Expert opinion was the most commonly identified decision making method, followed by internal meetings, advisory meetings and public meetings/comment.

Interview results:

1. **Expert opinion (18%)**
2. Internal meetings (18%)
3. Advisory groups (12%)
4. Public meetings (12%)
5. GIS (11%)
6. Other computer-based tools or models (7%)
7. NEPA planning process (7%)
8. Internet search (7%)
9. Other (4%)
10. Personal experience (2%)
11. No formal process (0%)

Survey results:

1. **Expert opinion (90%)**
2. Internal meetings, advisory groups (72%)
3. Public meetings (69%)
4. GIS (59%)
5. Other computer-based tools or models (59%)
6. NEPA planning process (59%)
7. Internet search (38%)
8. Other (14%)
9. No formal process (7%)

Other responses: Workshops, local information from hunters, scientific papers, strategic mapping (Miradi software), North Pacific Fishery Management Council, one-on-one communications, government interagency teams, stakeholder collaboration.

KEY FINDING:

- Currently, marine resource management decisions are often made through processes that are not based explicitly on resource data, suggesting a need for tools to improve the accessibility and use of data in management decisions.

2. How effective are current decision-making processes?

Interviewees and survey participants were asked to rate the effectiveness of current decision-making processes for marine resource management. The results indicate that current decision-making processes are perceived as adequate to good.

Interview results:

- Excellent (18%)
- Adequate (46%)**
- Needing improvement (18%)
- Not asked (18%)

Survey results:

- Excellent (7%)
- Good (48%)**
- Adequate (17%)
- Needing improvement (28%)

KEY FINDING:

- An opportunity exists to improve decision-making processes through the use of critical information and tools to access, summarize and analyze data.

3. What do you see as the strengths and weaknesses of current decision-making methods?

Participants were asked to provide open-ended responses to this question. Overall, the responses included more weaknesses than strengths. The most common responses related to public participation and availability of data and information. It is noteworthy that the key strengths and weaknesses are essentially flip sides of those two topics.

Public Participation

- *Strength:* Decision-making processes are open, public, and available to all. They are intended to be inclusive and community based, and to gather local and stakeholder input.
- *Weakness:* Decision-making processes are complicated, labor intensive, time consuming, and intimidating, reducing the amount of actual public participation.

Data and Information

- *Strength:* Large amounts of data and information exist that could be used to support decision making.
- *Weakness:* Data and information tend to be inaccessible and difficult to use.

KEY FINDING:

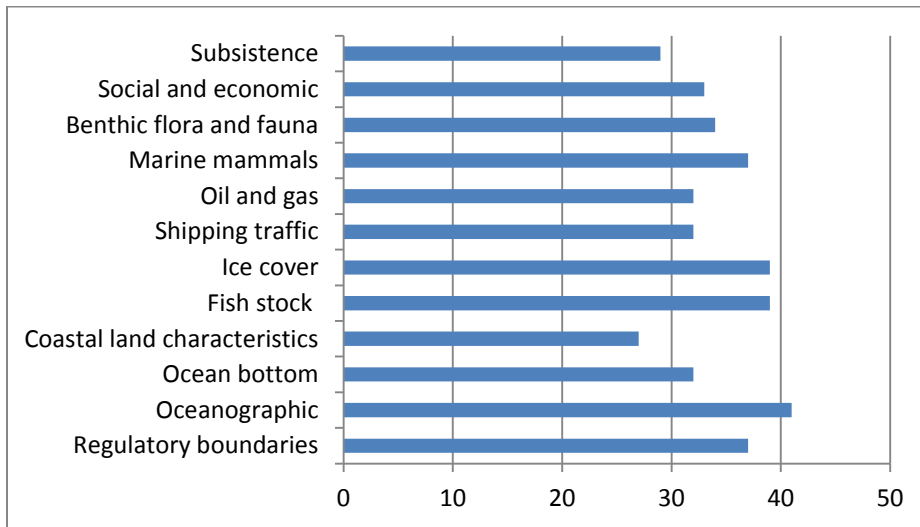
- The most important weaknesses in current decision-making processes relate to public participation and the availability of data and information. Both are issues that spatial tools could help to address.
-

Data

4. What geospatial/mapping data do you use?

This question presented participants with a list of data categories and asked them to indicate all that they used. The top five categories were oceanographic, fish stock, ice cover, marine mammals and regulatory boundaries. However, all of the data categories were used by 51% to 80% of the study participants, suggesting that all of these data types are relatively equal in their usefulness. The other data types were subsistence, social and economic, benthic flora and fauna, oil and gas, shipping traffic, coastal land characteristics and ocean bottom. People in the conservation community and in federal agencies seemed to use the broadest range of data, indicating that they use many or all of the data types. Data most important to the fishing community included fish stock, shipping, ice cover and benthic flora and fauna. To subsistence users, data on marine mammals, weather and ice cover seemed to be the most important.

Types of Geospatial/Mapping Data that Respondents Currently Use



KEY FINDING:

- While all data types received very similar amounts of usage, the most commonly used types of data were oceanographic, fish stock, ice cover, marine mammals and regulatory boundaries.
-

5. How do you use the above types of data?

Interviewees provided open-ended responses to this question. The following is a sampling of how people reported using the top five most commonly used types of data.

Oceanographic: Understanding timing of life history events such as migration, spawning, and smolting and predicted relative survival. Relating catch rates to critical bottlenecks in life histories.

Fish stock: Allocation decisions. Understanding interactions between fish and marine mammal populations, and overall ecosystem dynamics. Permitting and planning town infrastructure. Planning fishing activities and business strategies to maximize target catch while avoiding interactions with marine mammals and prohibited species.

Ice cover: Shipping. Oil and gas. Fishing. U.S. Coast Guard operations. Barge access for provisioning communities. Subsistence hunting. Designing research.

Marine mammals: Understanding fish and marine mammal population dynamics. Examining potential relationships between fisheries and marine mammals and bird populations in order to minimize impacts. Subsistence hunting. Reducing impacts of shipping. Permitting. Identification of important ecological areas.

Regulatory boundaries: Using fisheries regulation boundaries for subsistence and commercial districts as background information and for examining relationships. Important for fish and species protection and sometimes used for identification of important ecological areas.

6. What additional data would you like to have?

The responses to this question indicated an overall desire for more data of all types, including filling seasonal and spatial gaps in existing data. Data types that seemed to be most in demand were fish stock, oceanographic, real-time data, ice cover, bottom characteristics, marine mammals and subsistence maps. A diversity of user groups all pointed out the importance of and desire for real-time data and year-round data. The subsistence and conservation communities were more interested in biological data such as marine mammals and fish stocks for their role in the food web.

KEY FINDING:

- Demand exists for having real-time data as well as oceanographic, physical and biological data in a central repository or accessible across decision support tools. This will lend itself well for conducting a data gap analysis.
-

7. What prevents you from getting or using this data?

Respondents identified two main barriers to obtaining data: (1) the data do not exist, or (2) existing data are difficult to access. Respondents noted that Arctic data was a patchwork, with a general lack of baseline information. Funding for the collection of missing data is particularly challenging in the Arctic due to remoteness with limited infrastructure, a harsh climate, and a short ice-free season. Although the technology is available to operate in such conditions, it is cost prohibitive due to transportation and other factors. The main barrier to existing data is the time required to locate, obtain and format it. Often, individual data sets must be sought out, requiring staff time and money. Issues with confidentiality were also identified as a barrier. For example, groups such as the fishing community, subsistence users, or industry may own data but have an interest in protecting the data. There are also problems with data being outdated, and in differing and incompatible formats and resolutions. Technical barriers were also brought up by a minority of interviewees who indicated that people often do not have the technical skill or expertise to know how to access, use or analyze the data correctly.

KEY FINDING:

- Finding and accessing data is one of the biggest barriers to using data for decision making.
-

8. How would you use the data suggested in question 7 if they were available?

The following are examples of suggested uses:

- Members of the conservation community would use wildlife survey data to identify important ecological areas.
- Government agencies and the fishing industry would use oceanographic data such as temperature and salinity gradients to determine potential barriers for fish and crab migrations.
- Researchers would fill temporal and spatial gaps in knowledge. For example, bowhead whales have been surveyed in the Beaufort Sea but not the Chukchi Sea.
- Marine industries and the U.S. Coast Guard would use data to plan operations.
- Researchers would use data on complex ecological variables to identify ecological relationships.

KEY FINDING:

- Compiling these data into a central repository or across publicly available decision support tools allows users to begin analyzing relationships between data types.
-

9. What kinds of social and economic data do you currently use?

The responses indicated the importance of data related to subsistence, such as important subsistence areas, use patterns and changes in patterns over time and economics of subsistence, as well as information from federal regulatory process documents, research documents by academic institutions and state-generated reports. Examples of other types of social and economic data that respondents use are employment, number and sizes of households, revenue, homeport information, vessel value and place of capture.

10. For what types of decisions do you use, or would you like to use, social and economic data?

Respondents indicated that social and economic data are important for decisions related to subsistence and resource management. Subsistence data are used to examine the importance of subsistence harvests to individuals, households and communities, and the availability or lack thereof of alternate food sources, and for describing the cost of village life and potential impacts on cost. Fisheries management decisions require data on participants, homeports, revenues, target species and the needs for subsistence resources in the exclusive economic zone. Other types of decisions include planning and community health.

KEY FINDING:

- Designing decision support tools to incorporate socioeconomic data will allow users to illustrate critical relationships between social, economic, ecological, oceanographic and physical aspects of marine systems.
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Tools

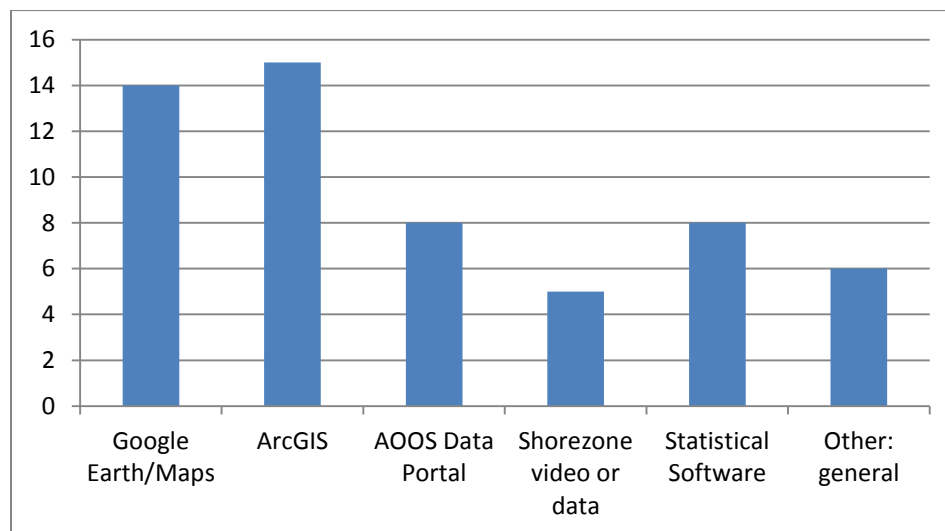
11. What tools do you currently use for data analysis or visualization?

The results indicate that geographic information systems (GIS) and Google Earth are the most commonly used tools for data analysis and visualization. Interviewees said ArcGIS was cost prohibitive and too difficult for most people to use, but they arrange for GIS work to be done by in-house staff or external partners.

KEY FINDING:

- Further exploration of types of decision support tools is necessary to determine which are cost effective and most suitable to the marine planning process in Alaska.
-

Tools Used by Interviewees



Other responses: internal documents, spreadsheets, NOAA modeling tools.

12. How often do you use decision support tools?

Google Earth and ArcGIS were used most frequently. Approximately half of the users of those two tools do so at least weekly. The next most commonly used tools were other web-based mapping software, which generally seem to be used on a monthly or annual basis.

KEY FINDING:

- GIS and Google Earth are the most commonly and frequently used spatial tools.
-

13. What do you see as the strengths and weaknesses of the tools that you use?

GIS is powerful because of its ability to create and overlay many different types of layers and to perform analysis functions. Its key weaknesses are that it requires specialized training, skills and knowledge, and it is expensive. These factors severely limit the number of people who can use it. Misuse of GIS is also a common problem.

Google Earth is very useful for communicating with a broad range of stakeholders because it can display data graphically, is easy to use and is available at low or no cost. However, it is much more limited in its functionality than GIS, the data are not always up to date and resolution varies across geographic areas.

The AOO Data Portal is a good resource for physical data on present conditions. Its main weaknesses are that it does not provide wildlife data, its complex user interface is intimidating for non-technical users and raw data are not well synthesized.

KEY FINDING:

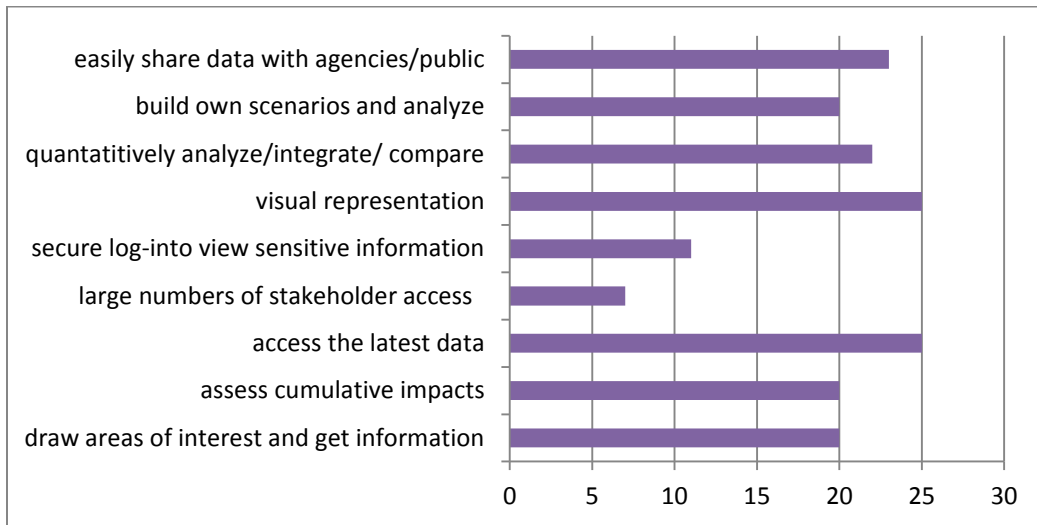
- There is a need to develop tools that do not require specialized training, skills and knowledge in order to use them.
-

Creating tools for today and tomorrow

14. If you could envision your ideal decision support tool, what functional capabilities would it have?

Respondents indicated a consistently high level of interest in nearly all of the functional capabilities listed as options in this question (see figure below). The highest-ranked ones were visual representation of data, access to the latest data, easy sharing of data with other agencies or the public and quantitative analysis/integration/comparison of data. Following close behind were building and analyzing scenarios, assessing cumulative impacts, and drawing areas of interest and getting more information. Two options did rank much lower than the others: secure log-in to view sensitive data and large numbers of stakeholder access.

Survey Responses for Functional Capabilities of an Ideal Decision Support Tool



15. What are the most pressing management issues you currently face?

Although respondents represented a wide variety of organizations, they identified a shared set of pressing management issues. The most pressing issues are related to climate change and the associated decline in ice cover, anticipated expansion of shipping traffic and rapid development of oil and gas infrastructure. Respondents were concerned about the potential for negative impacts of these changes, such as loss of subsistence hunting areas, ecological damage from oil spills, and interactions between ships and marine mammals.

Despite a moratorium on commercial fishing until 2019, the prospect of a commercial fishery in the North Bering and Chukchi Seas is perceived as a pressing management issue by government agency staff, conservationists, and subsistence hunters.

Other pressing issues identified by the study participants included the need to make management decisions based on inadequate data and information; the scarcity of funding to collect data; competition among different ocean uses; and cumulative impacts of ocean uses.

KEY FINDING:

- Increasingly, climate change is an important aspect to include in marine planning. This type of information needs to be incorporated into tools alongside other data types mentioned in this report.
-

16. What management decisions do you envision having to make in the future?

Respondents said that they anticipated their future decisions to focus on preparing for the unknown in the face of increasing oil and gas development, potential opening of a commercial fishery, and almost assured increases in shipping activity in an uncertain and changing environment. They expect to make decisions on:

- infrastructure and planning such as offshore zoning for boroughs, local permitting decisions, comments on development projects, and comments on state and federal plans;
- where to locate oil and gas development infrastructure to limit impacts on fish and wildlife resources;
- developing oil spill response capabilities and infrastructure along Alaska's west and northwest coasts;
- defining and mapping areas important for subsistence hunting and subsistence wildlife;
- adaptation of local communities to climate change; and
- measures to protect fisheries and marine mammals.

KEY FINDING:

- The most pressing management decisions revolve around climate change and associated rapid, major changes in environmental conditions and human uses of the ocean.
-

17. Based on your current management issues and pending decisions, how can your decisions be best supported with a tool?

Respondents identified several characteristics of a useful tool for management decisions.

KEY FINDING:

- Management decisions can best be supported by a tool with the following characteristics:
 - a central clearinghouse that makes many types of data easily accessible;
 - user-friendly for people without special expertise;
 - high-quality data in a usable format and a variety of scales and resolutions;
 - real-time data;
 - fast downloads;
 - ability to quickly add and visualize different types of data layers, such as relationships of shipping routes and wildlife habitats;
 - multiple levels of access or interfaces for technical and non-technical users; and
 - scenario-building tools, such as for oil spills or different configurations of oil and gas infrastructure in relation to natural resource values.
-

Recommendations

Based on the results of the scoping interviews and survey, we make the following recommendations for STAMP project:

- Build a tool that fits into and complements an existing management decision-making process.
- When defining the tool concept and requirements, focus on addressing the needs of the people who are involved in that decision-making process. Make a tool that helps achieve their goal.
- Consider developing a comprehensive clearinghouse of data needed for the selected decision-making process, including high-quality data in a usable format and a variety of scales and resolutions. Develop strategies to ensure proper use of data (i.e., minimize inadvertent misuse).
- Effectively meet one or a few well-defined management needs, while remaining open to the possibility that the tool could be useful for other purposes.
- Consider developing a tool that helps people explore the potential effects of climate change on environmental conditions and human uses of the ocean, and that enables them to illustrate and analyze scenarios and management responses.
- Make sure that the tool is extremely easy for the target audience to use. Involve the target audience in the tool development process from its earliest stages.
- Consider limitations of internet speed and bandwidth, particularly in rural communities, on tool design and use.
- Work with data providers, including subsistence users, and subsistence mapping projects to help determine appropriate protocols for displaying and providing access to subsistence use data.

APPENDIX A:
Characteristics of Interviewees and Survey Respondents
and List of Affiliate Organizations

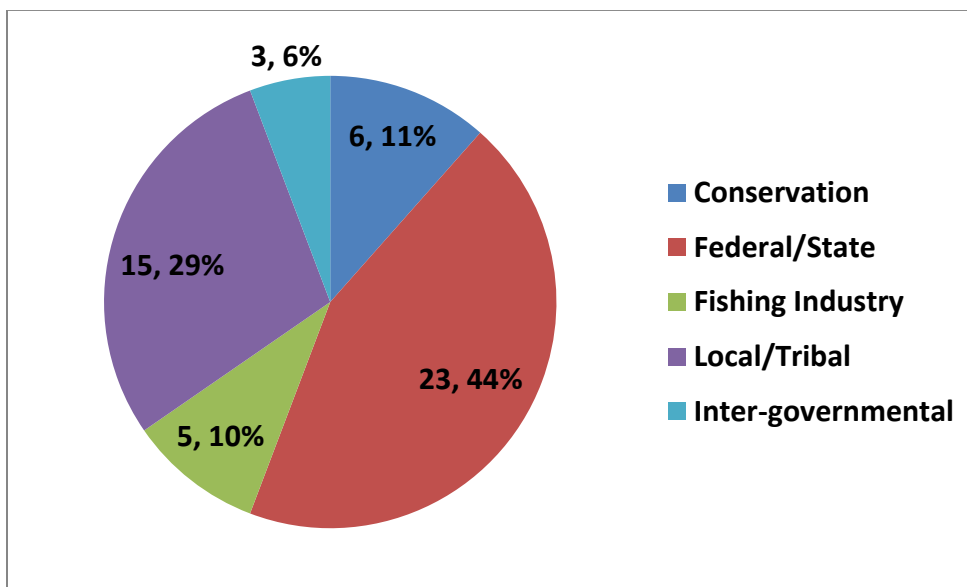
Affiliations of Interviewees and Survey Participants

Interviewees had the following affiliations:

- Federal or state agency: 32%
- Local or tribal representation 9 (30%), conservation 4 (18%) and fishing communities 4 (18%) and inter-governmental representation 1 (5%).

Responses by category for surveys was led by federal agencies 16 (53%), followed by local/tribal 9 (30%), conservation community 2 (7%), inter-governmental 2 (7%) and fishing community 1 (3%). Combined results from 22 interviews and 30 online survey responses are shown in the figure below.

Combined Survey & Interview Counts by Category



Residence or Work Location

Residence or work locations of interviewees were as follows: Anchorage (45%), Northwest Arctic Borough (20%), Juneau (14%), Bering Strait Region (14%), North Slope Borough (5%). Interviewees were from Anchorage, Barrow, Fairbanks, Juneau, Kotzebue, Nome and Savoonga. Determining residence or work location from the surveys was more difficult, as not all respondents filled out the question and it seemed there may have been some confusion as to if the question referred to work location or area of responsibility. It does however appear that all survey respondents were living or working in the same communities as the interviewees, with the exception of one respondent from Oregon.

Respondent Roles

Almost half of interviewees identified themselves as in a program/project manager role (40%), and about a third as upper-level managers (36%). Only two people identified themselves as geospatial data/tool use specialists (9%), and two people as staff (9%). The remaining person was an individual subsistence user who did not serve in a work or volunteer capacity with an organization.

Marine-related Decisions or Activities of Respondents

Research/science was the most common marine-related decision topic or activity in which respondents were involved, followed by planning, regulatory and conservation. All other categories listed—with the exception of subsistence, which was not included on the survey—were ranked equally. Although it might be expected that federal and state agencies would conduct significant levels of research and science activity, it was evident that all of the representative groups of local/tribal, federal/state, conservation and fishing communities do, too. Perhaps most notably, virtually all respondents and interviewees from staff level to upper management are involved in a broad range of marine management activities and decisions. Few of the responses listed people as making single decisions or being involved in single activities.

Interviewees:

1. Research/science (21%)
2. Planning (16%)
3. Subsistence (16%)
4. Conservation (16%)
5. Regulatory/permitting (14%)
6. Commercial fishing (11%)
7. Commerce/business (6%)

Other responses: outreach communication, shipping, identifying important ecological areas to help communities do better planning .

Survey respondents:

1. Research/science (93%)
2. Planning, regulatory/permitting (59%)
3. Conservation (52%)
4. Commercial fishing: large scale (19%)
5. Commercial fishing: small scale (15%)
6. Commerce/business (15%)
7. Other (15%)

Other responses: Alaska Eskimo Whaling Commission Conflict Avoidance Agreement, legislative/regulatory review, oil spill planning and response, public comment.

Organizations or Villages Represented by Interviewees and Survey Respondents

Alaska Department of Fish and Game
Alaska Eskimo Whaling Commission
Alaska Native Tribal Health Consortium
At Sea Processors Association
Audubon
Bering Sea Fishermen's Association
Bering Straits Native Corporation
Bering Strait Sub Network
Environmental Protection Agency (EPA)
Kawerak
Kotzebue resident
Local Resource Subsistence Users
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
North Pacific Fisheries Resource Management Council
North Slope Borough
Northwest Arctic Borough
North Slope Science Initiative
Norton Sound Economic Development Council
Oceana
Ocean Conservancy
PEW Environment Group
Private consultant
United Fishermen's Association
U.S. Coast Guard
U.S. Fish and Wildlife Service
Western Alaska Community Development Quota Program (WACDA)
World Wildlife Foundation

APPENDIX B:
Interview and Survey Templates

Interview Template

Spatial Tools for Arctic Mapping & Planning (STAMP): Interview Questions

Meeting date: _____ in person: ___ by phone: ___

Location of Interviewee: _____ Interviewer:(if different) _____

Interviewee name: _____ Interview consent given: ___

Organization: _____

Type of Organization:

- | | |
|--|--|
| <input type="checkbox"/> Federal Agency | <input type="checkbox"/> Conservation Community or other NGO |
| <input type="checkbox"/> State Agency | <input type="checkbox"/> Academic |
| <input type="checkbox"/> Local or Tribal | <input type="checkbox"/> Local Resource/Subsistence User |
| <input type="checkbox"/> Co-management | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> Fishing Industry (small or large scale) | |

Worklocation _____

- | | |
|---|---|
| <input type="checkbox"/> North Slope Borough | <input type="checkbox"/> Anchorage Municipality |
| <input type="checkbox"/> Northwest Arctic Borough | <input type="checkbox"/> Other _____ |
| <input type="checkbox"/> Nome Census Area | |

Position title: _____

Main job responsibilities within organization:

How would you describe your role?

- Specialist in geospatial data/tool use
- Upper level manager
- Program/Project manager
- Staff

What kind of marine-related decisions or activities are you involved with?

- Planning
- Regulatory/Permitting
- Research/Science
- Commercial Fishing (small or large scale?)
- Other Commerce/Business
- Subsistence
- Conservation
- Other _____

1. What primary processes do you use to make decisions? (check all that apply)

- Internal Meetings
- Advisory Groups

What additional data would you like to have?

What prevents you from getting, or using this data?

How would you want to use the data, if it were available?

3. Do you currently use any of the following tools for data analysis or visualization? (check all that apply).

- Google Earth/Google Maps
- ArcGIS
- AOOS Data Portal
- ShoreZone video, imagery, or data
- Statistical software
- Other _____
- Other _____

Importance of support tools to your decisions				
Low	Medium			High
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5

How often do you use decision support tools? (interviewer write down tools question pertains to)

- At least once a week
- At least once a month
- At least once a year
- Never

Of the tools you are using, what do you see as their strengths and weaknesses?

If you could envision your ideal decision support tool, what functional capabilities would it have? In other words, what would you want the data tool to be able to do to best assist you with your job? (interviewer to briefly explain the options below with some examples)

- Provide a visual presentation of spatial information*
- Provide tools to quantitatively analyze/integrate/compare spatial data*
- Ability to build your own scenarios and analyze them*
- Easily share data with other agencies or the public*
- Other _____*

4. What are the most pressing management issues you currently face?

What decisions do you envision having to make in the future?

Based on your current management issues and pending decisions, how can your decisions be best supported with a tool?

Survey Template

Spatial Tools for Arctic Mapping & Planning

Thank you for taking time to complete this survey. Your responses will be used to help inform the STAMP project, whose goal is to create user-friendly data visualization and integration tools to help improve access to data in the Northern Bering and Chukchi regions. You can find more information on STAMP here: www.aos.org/stamp. This survey seeks information on (1) how managers, planners, and others currently make decisions about the marine environment, (2) what data they use or would like to use, and (3) what capabilities would be most useful in a data tool. The survey should take approximately 10-20 minutes.

1. Name (optional)

2. Type of Organization:

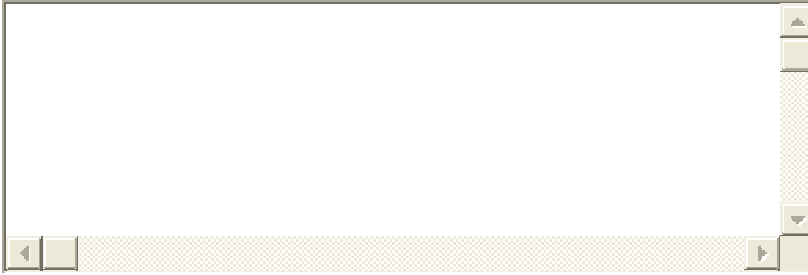
- Federal Agency
- State Agency
- Local or Tribal
- Co-management
- Fishing Industry (Small or Large scale)
- Conservation Community or other NGO
- Academic
- Other:

3. Work Location

- North Slope Borough
- Northwest Arctic Borough
- Nome Census Area
- Anchorage Municipality
- Other:

4. Position Title

5. What are your main job responsibilities within your organization?



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Section 2: Decision making processes

6. What kind of marine-related decision or activities are you involved with? Check all that apply

- Planning
- Regulatory/permitting
- Research/Science
- Commercial Fishing (Large scale)
- Commercial Fishing (Small scale)
- Other Commerce / Business
- Conservation
- Other:

7. What primary processes do you use to make decisions? (Check all that apply)

- Internal Meetings
- Advisory Groups
- Public Meetings/Comments
- Geographic Information System (GIS)
- Other computer based tools or models
- NEPA planning process - EA/EIS
- Expert opinion - consultation among experts
- No formal processes
- Internet search
- Other:

8. In your opinion, how would you rate the overall decision making processes listed in the previous question?

- Excellent
- Good
- Adequate
- Needing improvement

9. What do you see as the strengths and weaknesses of current decision making methods? Please list a pro

and a con.

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Section 3: Data priorities

10. What geospatial / mapping data do you currently use? Please assign a value to the data use use, based on the importance of the data to your decisions, with 1 being low and 5 being high

	1 LOW	2	3	4	5 HIGH
Regulatory Boundaries (Fisheries)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Oceanographic (currents, temp, wind, salinity)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ocean Bottom Characteristics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Coastal Land Charactersitics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fish Stock Information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ice Cover	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shipping and Marine Traffic	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	1 LOW	2	3	4	5 HIGH
Oil and Gas Leasing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Marine Mammal Population	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Benthic flora and fauna	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Social or Economic Information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Subsistence information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If you would like to elaborate, clarify, or add categories, please do so here:

For any answers ranked 3 to 5, please indicate your primary sources for accessing that information:

11. What data or information do you NOT have or use, but need? (Check all that apply)

- Regulatory boundaries (fisheries)
- Oceanographic (currents, temp, wind, salinity)
- Bottom characteristics
- Coastal land characteristics
- Fish stock Info
- Ice Cover
- Shipping and marine traffic
- Oil and gas leasing
- Marine mammal populations

- Benthic flora and fauna
- Social or economic information
- Subsistence maps or data
- Other:

If you know specifics of particular datasets you'd like, please elaborate here. With more specifics, the STAMP project can seek out relevant data resources and help make them available

12. What currently prevents you from getting or using this data? Describe a few of the main obstacles to using the highly ranked data. Some examples are below • Data doesn't currently exist • Don't have time/money or technical capacity to get and use it • Lack of GIS capacity to utilizing the data • Not a clear direction for implementing the data in a decision making process • Cost of processing data given the amount of benefit/use of the data • Prefer data to be synthesized into information products

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Section 4: Social & Economic data

13. For what decisions do you use (or would like to use) social and economic information? Some examples of social and economic data include income, employment by category, population, household size, or other

indicators on a community or census-area level.

14. If you already use social and economic information, what kind do you use? Please suggest specific indicators if possible. For example, you are involved in a NEPA EA or EIS, what social and economic indicators would you like to have to complete or review this type of analysis?

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Section 5: Data tools

15. Do you currently use any of the following tools for data analysis or visualization? Please rank each on the scale of importance to your decision making

	1 (Not Important)	2	3	4	5 (Very important)
Google Earth / Google Maps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ArcGIS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
AOOS Data Portal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ShoreZone video, imagery, or data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	1 (Not Important)	2	3	4	5 (Very important)
Statistical software	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other web based mapping tools	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fisheries based ecosystem models	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Remote sensing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

If you would like to elaborate or clarify, please do.

16. How often do you use decision support tools? This is referring to computer based programs that help you view or analyze data.

	More than once a week	Once a week	Once a month	Once a year	Never
Google Earth / Google Maps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ArcGIS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
AOOS Data Portal	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
ShoreZone video, imagery, or data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Statistical software	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other web based mapping tools	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fisheries based ecosystem models	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Remote sensing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Of the tools above that you regularly use, what are the greatest strengths and weaknesses? Please be specific about which tool you are referring to

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* Required

Section 6: Data tool capabilities and priorities

This is the final section of the survey, but perhaps the most important. Thank you for taking the time to respond thoughtfully.

17. If you could envision the ideal data tool to help you make decisions about the marine environment, what functional capabilities would it have? * In other words, what would you want the data tool to be able to do to best assist you with your job? (Please rank the following with 5 being 'most important')

	1 (least important)	2	3	4	5 (most important)
Provide a visual presentation of spatial information (map the data!)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provide tools to quantitatively analyze/integrate/compare spatial data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to build your own scenarios and analyze them	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Easily share data with other agencies or the public	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Draw areas of interest and get information from them (i.e. reports)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to assess cumulative impacts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to access the latest data	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to support thousands of stakeholders in an online tool for	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

1 (least important)

2

3

4

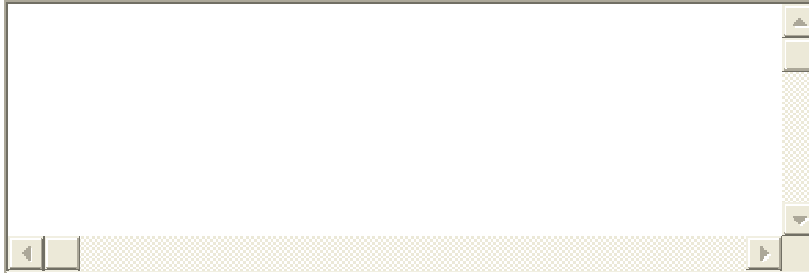
5 (most important)

submitting areas of interest or priority areas

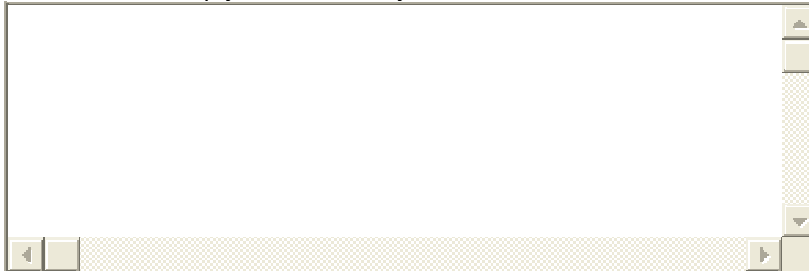
Ability to have secure log-in capabilities to view sensitive information on the web



Please provide more specifics if possible (ie. how you would like to visualize/compare, or use data sets)
This information will help greatly in designing a useful data tool



18. If the ideal data integration/visualization tool were available, what pressing resource/management/ issues could it help you address in your work?



19. What decisions regarding the marine environment do you envision having to make in the future?

