CAFF
Conservation of Arctic Flora and Fauna

CIRCUMPOLAR BIODIVERSITY MONITORING PROGRAM

CAFF CBMP Report No. 13
March 2008

A STRATEGY FOR FACILITATING & DEVELOPING COMMUNITY-BASED MONITORING

APPROACHES IN ARCTIC BIODIVERSITY MONITORING

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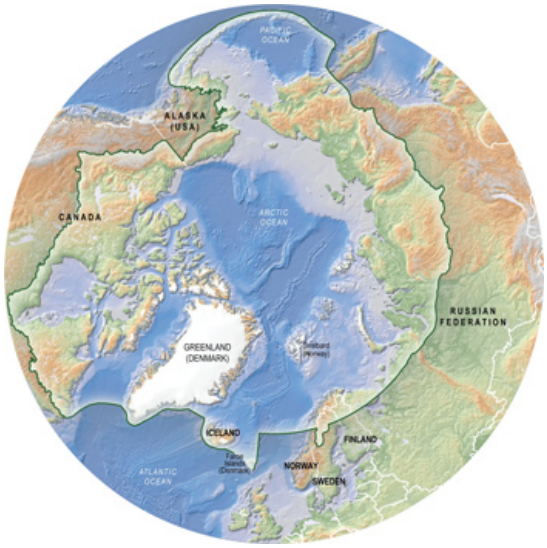

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A Strategy for Facilitating and Promoting Community-Based Monitoring Approaches in Arctic Biodiversity Monitoring

A Supporting Publication to the
Circumpolar Biodiversity Monitoring Program
Framework Document

Prepared by Henry Huntington

CAFF CBMP Report No. 13
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1. Introduction

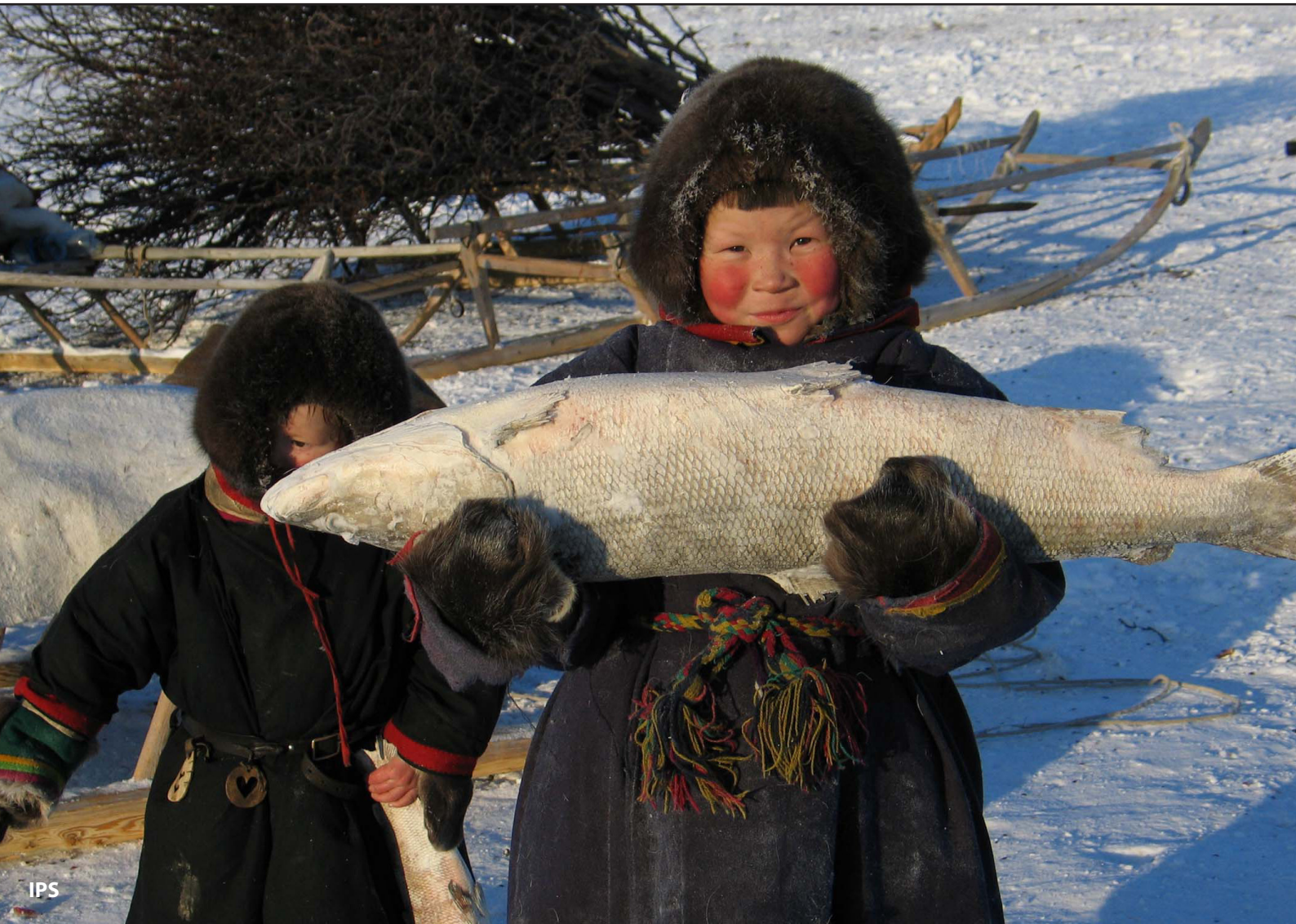
1.1 Background

The peoples inhabiting the various regions of the Arctic spend vast amounts of time on the land and at sea. Drawing on personal experience, information shared with others, and knowledge handed down through the generations, residents of the Arctic are able to recognize subtle environmental changes and offer insights into their causes. They are community-based monitors by virtue of their day-to-day activities.

In addition to their inherent capacity in community-based monitoring (CBM), Arctic residents have the ability to employ standard scientific monitoring procedures in the practice of citizen science, thereby extending the reach and effectiveness of programs which tend to rely solely on a limited number of trained scientists to carry out monitoring.

Indigenous and other Arctic peoples wish to impart their environmental understanding to scientific discourse, not only because they have a great deal to offer but also because this exchange represents an important step towards full participation in resource management activities.

The Circumpolar Biodiversity Monitoring Program (CBMP) believes that CBM has significant contributions to make to circumpolar monitoring efforts. The Arctic Council's Permanent Participants and other Indigenous and local organizations desire a strong CBM element within the CBMP. The communities of the Arctic region will directly benefit from the powerful information gathering and dissemination approach that the CBMP offers. Maximizing the contributions of circumpolar peoples to the CBMP will help ensure that the program is relevant and responsive to local concerns.



1.2 Challenges of Community-Based Monitoring

CBM efforts face similar challenges to more conventional science-based biodiversity monitoring programs. Both require funding continuity and organizational support beyond that of one or two committed individuals. Proper data management requires advanced planning and technical capacity, as well as considerable attention to detail and quality control. In addition, connecting individual monitoring efforts to a larger program for maximum reach typically requires modifications to methodology or scope to ensure that data are comparable and the parameters being monitored are relevant to an overall assessment of biodiversity.

CBM also carries its own unique set of challenges. While citizen science-based efforts are designed to conform to accepted scientific procedures, Indigenous knowledge does not lend itself easily to most data management approaches, therein risking the loss of invaluable data and interpretation. The use of technical scientific terminology – particularly in the context of communities where Indigenous languages are still prevalent - may pose a significant barrier to the storage of and access to information. Community-based programs may be harder to sustain due to the limited human and institutional resources of the smaller communities in which they typically occur. Developing a sense of shared enterprise between residents and scientists requires accommodating different perspectives and overcoming long-standing fears of environmental management actions that hinder local practices. Finally, CBM efforts are generally less developed in the Arctic than scientific monitoring programs.


Carsten Egevang/ARC-PIC.COM

1.3 Goals and Objectives

With these challenges in mind, the CBMP seeks to facilitate and promote CBM projects and their "champions" in all aspects of its activities. The CBMP is not intended to be a funding vehicle for its member monitoring networks or projects – including those involving CBM. Rather, the CBMP can provide value-added services to CBM initiatives, such as certain aspects of data management and reporting, training manuals, and assistance for CBM representatives to attend meetings and events organized through the CBMP. Additionally, the CBMP will help connect CBM projects with related monitoring efforts through its Expert Monitoring Groups (EMGs) and member monitoring networks.

The CBMP has three primary goals with respect to CBM:

1. To incorporate data, interpretation, and expertise from CBM in the CBMP's efforts to detect, understand and report on significant Arctic biodiversity trends.
2. To make CBMP data, interpretation, and expertise available to CBM efforts.
3. To promote the extension and/or replication of established CBM approaches and programs to other regions of the Arctic in conjunction with existing monitoring networks.

2. Incorporating Community Based Monitoring into the CBMP

To achieve these goals, the CBMP has six specific objectives for the next five years:

1. Create and sustain a CBM Guidance Group.
2. Develop training manuals to engage Arctic peoples in monitoring activities.
3. Recruit CBM projects to collaborate with the CBMP and help connect them with relevant EMGs and member monitoring networks within the CBMP.
4. Develop and provide a data management system for community-based information, including Indigenous knowledge and related interpretation.
5. Involve CBM participants in the analysis and interpretation of CBMP data from all sources.
6. Provide summary information from the CBMP to all community-based members.

The following strategy prescribes a general course of action for the CBMP to follow in order to achieve its CBM-related objectives.

The CBMP's key objectives with respect to the incorporation of CBM are described in the following sections to emphasize specific tasks relevant to CBM and to illustrate how the CBM effort will connect to the CBMP as a whole. Some of the CBM-related objectives overlap with related CBMP key program areas and will require a coordinated effort to accomplish – specifically, the data management, data analysis and interpretation, and community outreach components (which will be shared with the data management subgroup, Expert Monitoring Groups (EMGs) and communications group, respectively).

Björn Frantzen

2.1 Community-based Monitoring Guidance Group

The strong emphasis the CBMP is placing on the meaningful involvement of Arctic residents – in addition to the long-standing call from the Arctic Council's Permanent Participants for greater Indigenous participation in circumpolar monitoring – warrants the creation of a dedicated group to oversee CBM activities within the CBMP. This group will be instrumental in ensuring that the CBM perspective is incorporated into all of the CBMP's key program areas.


Christoph Zöckler

The membership of the CBM Guidance Group should initially include at least two Permanent Participant representatives, a representative of a minimum of one of the EMGs, a data management expert, and a member of the CBMP Steering Committee. Once the first round of CBM projects have been selected for CBMP collaboration and support, one or more project representatives should be chosen.

The CBM Guidance Group will be responsible for overseeing the fulfillment of the five remaining objectives in conjunction with other CBMP groups. The group would not seek to duplicate the data management, analysis and interpretation, and outreach functions of other CBMP groups. Rather, it would provide assistance as needed - most likely during the initial development stages - and focus primarily on the recruitment and support of CBM projects and the overall CBM effort.

Most of the group's work could be accomplished by teleconference and email, but at least one face-to-face meeting should be scheduled each year, ideally coinciding with other CBMP meetings so that group members may connect with other CBMP participants and likewise, other CBMP members may join the CBM discussions.

2.2 Training Manuals

Training manuals will be developed as the primary means of engaging Arctic residents in monitoring activities. Manuals highlighting specific CBM methods (e.g., body condition sampling) will promote the adoption of these techniques within other regions and monitoring programs. An overarching training manual that examines the full spectrum of successful and established CBM programs (i.e., from citizen science programs to local and traditional knowledge) will also be developed to direct the creation of new programs. Both types of training manuals can also form the basis for an informal network of CBM practitioners who can share their experiences and lessons learned.

2.3 Community-based Based Monitoring Project Partnerships with the CBMP

While some of the CBMP's members already incorporate CBM approaches into their activities and projects, additional efforts should be made by the CBMP to identify and recruit projects that are specifically designed with CBM in mind. Existing CBM projects and programs may not be a perfect "match" for the CBMP's indices and indicators or key program areas (as is the case with some monitoring networks allied with the CBMP). Nonetheless, they are likely to share sufficient common ground in their goals and objectives to support a collaborative approach.

Several criteria should be employed in the consideration of potential CBM projects to recruit for partnership with the CBMP, including but not necessarily limited to the following:

- Willingness to partner with the CBMP;
- Potential for continuation;
- Compatibility and/or synergy with the CBMP's indicators and key program areas;
- Geographic coverage of various Arctic regions;
- Coverage of EMG areas of expertise; and;
- Data management needs and capacity.

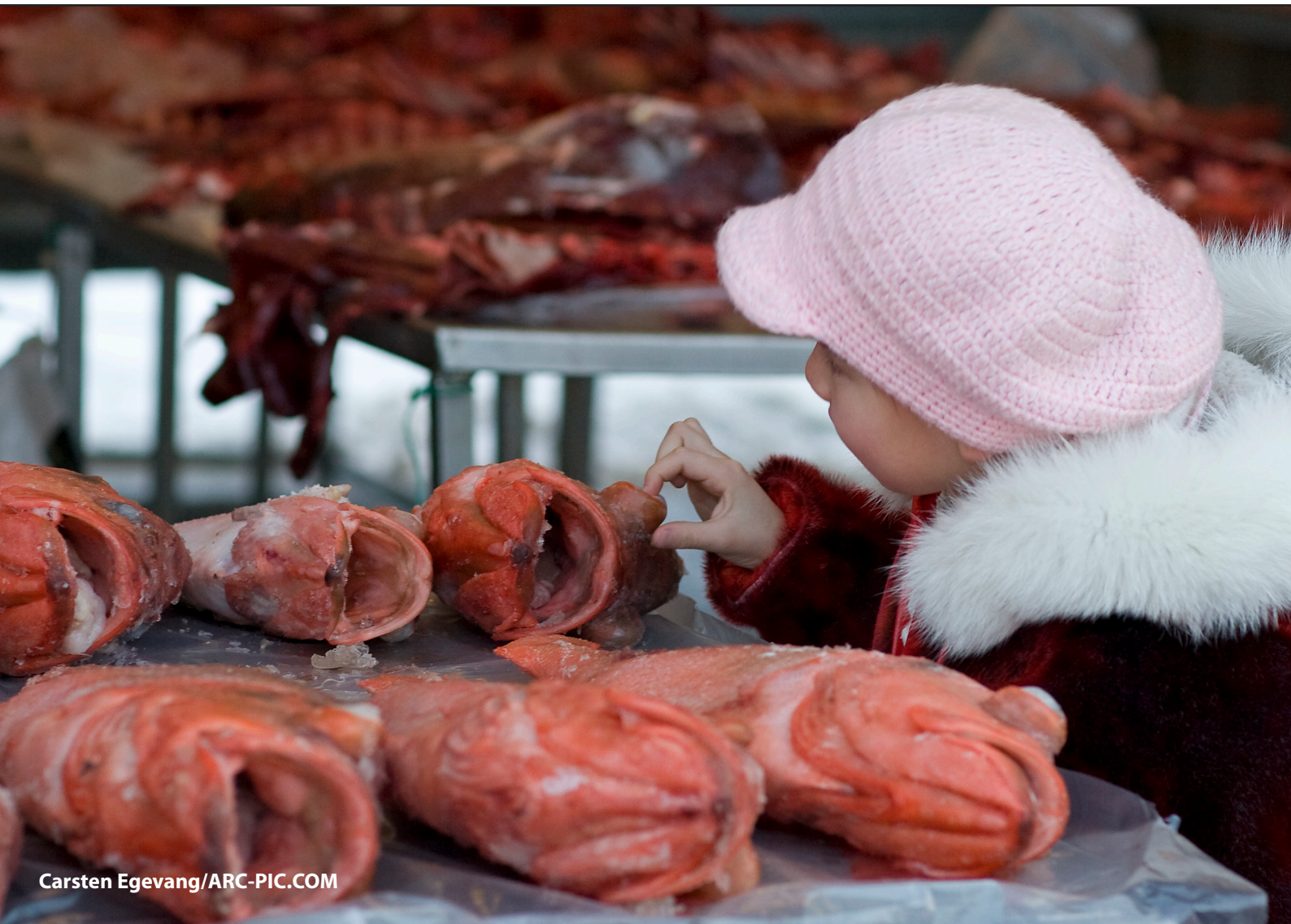
The CBM Guidance Group will be responsible for the final selection and application of criteria. CBM project identification could be undertaken via solicitation of the Arctic Council's Permanent Participants,

announcements on email list servers, and other indirect means. The scale of initial project recruitment efforts should be minimized, as the identification of too many potential projects may render the selection process cumbersome and disappoint prospective candidates. Once the first round of selected projects are working effectively as CBMP partners, then broader recruitment can begin.

In addition to recruiting existing CBM projects and strengthening CBM components of other monitoring efforts, the CBMP can help encourage the development and/or expansion of CBM projects by providing technical assistance. For example, training manuals will help CBM project organizers and participants design their programs with the benefit of best practices in citizen science and the application of Indigenous knowledge from around the Arctic region. In addition to providing written guidance, the training manual can also provide a basis for an informal network of CBM practitioners who can share success stories and challenges.

The CBM projects chosen for partnerships should become fully integrated with other related aspects of the CBMP. After the recruitment of CBM projects is complete, the CBM Guidance Group and the CBMP Steering Committee can jointly determine how best to connect CBM partner projects with both the EMGs and the CBMP's member monitoring networks. For example, a CBM project focusing on marine mammals could be connected with the Marine EMG and the appropriate marine mammal monitoring networks and component projects, participating in communications and meetings similar to the manner in which the CBMP collaborates with its members.

Some CBM projects may overlap with multiple EMGs and/or monitoring networks in their research and/or monitoring focus. In these cases, the CBM projects can be connected with all the relevant groups and networks to make best use of the data and expertise available.



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2.4 Data Management System[1]

CBM is likely to involve the recording of observations and analysis based on Indigenous and/or traditional knowledge. Such knowledge is often qualitative and highly contextual in that observations are made in relation to other environmental components, previous conditions, human practices, and other factors that influence perception and use of the physical and biological environment. While such information can be captured in succinct form and easily accommodated within a database, other information may be lost if observations are reduced to numerical expression or a short menu of keywords. Capturing longer narratives and any accompanying explanations poses a different data management challenge, however.

Capturing the full breadth and depth of CBM-related information and making it available to the CBMP and its members poses a substantial challenge. A data management system will need to reflect the interests, priorities, and technical capabilities of the community members who contribute to and maintain the CBM project in question. It will also require some degree of consistency (at least insofar as providing adequate metadata) with other datasets used within the CBMP. Finally, it must be searchable in a reasonably transparent fashion: that is, without specialized knowledge of that particular dataset or community.

Addressing these and related data management needs must be a priority if CBM is to be successfully incorporated within the activities of the CBMP. A successful approach will facilitate the connection of CBM projects to other monitoring projects within the CBMP's member networks. While the CBMP may decide to develop its own data management system, there are other projects attempting to support data management for projects involving Indigenous knowledge and CBM. The CBM Guidance Group should consider whether collaborating with such projects would be mutually beneficial.[2]

2.5 Data Analysis and Interpretation[3]

CBM's potential contributions to the CBMP are by no means limited to data and information. Arctic residents who provide environmental observations are likely to be able to further analyze and interpret those observations based on their wealth of first-hand experience and inter-generational knowledge. This data interpretation capability especially pertains to inter-relationships between environmental components, such as the influence of weather on plants and animals or the predation patterns that affect population levels of predator, prey, and other animals.

One of the CBMP's first major undertakings is the development of indicators and indices for Arctic biodiversity. Depending on the timing and recruitment of CBM projects, either the Permanent Participants or potential CBM projects can be included in this phase. Once the indicators and indices have been developed, the interpretation of monitoring results can include CBM participants as outlined here.

An effective data management system will be able to capture some of this interpretation, but it is also desirable to have CBM contributors involved hands-on in the discussions and meetings of their related monitoring networks. This approach allows the community participants to explore other data being gathered, compare those data with conditions in their own area, and help determine the implications for biodiversity on a range of scales, from local to circumpolar.

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[1] The sub-tasks in this section should be carried out as part of the overall data management effort of the CBMP. They are listed separately here to emphasize the specific requirements of CBM.

[2] One such project, the Exchange for Local Observations and Knowledge in the Arctic (ELOKA), has participated in CBMP meetings already and is working with CBM projects that are also likely candidates for CBM pilot projects with the CBMP (e.g., the Bering Sea Sub-Network being run by the Aleut International Association).

[3] Analysis and interpretation within the CBMP will be done largely through the EMGs, in which CBM projects will be full participants. Thus, the tasks listed here are not separate activities but rather a part of the work of the EMGs.

In addition to the substantiation that CBM observations bring to monitoring data, the inclusion of CBM participants in broader discussions and meetings serves to reinforce the principle that CBM is a full partner in the CBMP. Participants from communities will be able to learn from others, take information back to their communities, and see first-hand how their efforts contribute to the overall program, all of which helps to foster the sense of shared enterprise that is so essential to a lasting cooperative effort.

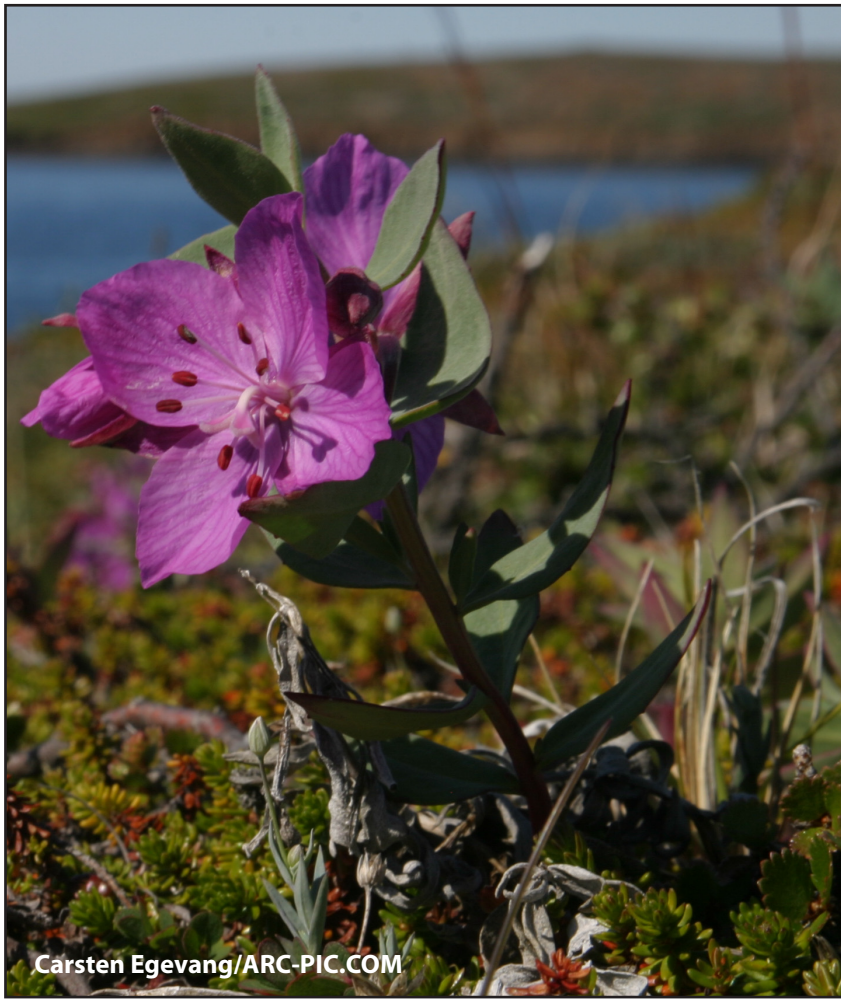
2.6 Reporting to Community-based Partners[4]

Information should ideally flow in both directions between the CBMP and CBM. Representatives from CBM projects can contribute their perspectives and input to the CBMP's initiatives, but the CBMP must make an equal effort to share its information with CBM partners and Arctic communities. This effort will serve two purposes. First, it helps disseminate information to those who can make use of it at a local level. Second, it signals to Arctic communities the importance of local involvement in the CBMP, encouraging greater participation through CBM and in other ways.

The CBMP will produce frequent reports, host a website, and pursue other avenues of communication designed to reach Arctic communities in ways that will be accessible, understandable, and useful. For example, the provision of information in local dialects is critical if the CBMP is to reach more than the select few leaders who understand English or can arrange for translations. The Internet is not universally available in the Arctic, so it can not always be relied upon to reach remote communities. Technical language will be a barrier to many potential users, particularly in Arctic communities where levels of formal education may be low even among community leaders.

Summary information should also indicate the origin of supporting data and how any conclusions were reached. All too often, resource management decisions affecting Arctic communities are made without local input and based upon conclusions that do not concur with local observations and understanding. For this reason, Arctic communities may be reluctant to accept broad statements about environmental status if the basis for those statements is not clear.

Ideally, locally provided data and interpretation should feature prominently in any conclusions that are reached and ultimately communicated. This will not be possible in all cases, but the general principle should be upheld nonetheless. A full and meaningful partnership between Arctic communities and the CBMP, including CBM, will produce more information, a greater degree of confidence in how the data is interpreted, and broader acceptance of the policy and management actions they ultimately inform.



[4] As with data management, the sub-tasks listed here are part of the CBMP's outreach activities, but are listed separately here to emphasize specific requirements or ideas that will help with CBM.

3. Workplan and Budget

3.1 Five-Year Workplan

Tables 1 and 2 provide an overview of the various tasks associated with the CBMP's six major objectives for CBM over the next five years. Timelines, anticipated costs, and task leads are further identified.

Table 1. Community-based Monitoring Strategy Workplan: Development Phase (Years 1 and 2)

Objective	Task	Timeline	Responsibility	Estimated Cost (CDN $)
Create and sustain CBM Guidance Group	Identify group membership	May 2008	CBMP Steering Committee	Minimal
	Hold initial meeting	By August 2008	CBM Guidance Group	$10,000
	Develop detailed workplan, including communications and meetings	By October 2008	CBM Guidance Group	Minimal✚ (or $2500*)
	Hold additional meetings (e.g., annual) and other activities as described in the workplan	Ongoing	CBM Guidance Group	$10,000+ for travel (depending on number of members)
	Recruit additional members as CBM projects partnerships are established	As appropriate	CBM Guidance Group	Minimal
Develop CBM training manuals	Commission CBM Program Development Manual	September 2008	CBMP Office	$25,000*
Recruit CBM projects into CBMP networks	Identify potential CBM projects	June 2008	CBMP Steering Committee, CBM Guidance Group, Permanent Participants, CAFF National Reps.	Minimal
	Evaluate potential projects against selection criteria	August 2008	CBM Guidance Group	Minimal
	Invite selected CBM projects to join CBMP	September 2008	CBM Guidance Group, CBMP Office	Minimal
	Identify EMGs and monitoring networks with which to connect CBM projects	October 2008	CBM Guidance Group, CBMP Steering Committee, EMGs, monitoring network leads	Minimal
Recruit CBM projects into CBMP networks	Enable CBM projects to participate in relevant EMG and monitoring network activities	As appropriate	CBM Guidance Group, EMGs, Monitoring Network Leads	Travel costs
	Develop strategy for recruiting additional CBM projects, including consideration of CBM data management capacity within CBMP	April 2009	CBM Guidance Group with assistance from CBMP Steering Committee	Minimal✚ (or $2500*)
Develop a data management system	Create specific objectives and parameters for CBM data management system	August 2008 (at initial CBM Guidance Group meeting)	CBM Guidance Group, CBMP data management group	Minimal (NB: some costs borne by CBMP data management group)
	Identify potential providers of data management services	August 2008	CBM Guidance Group, CBMP data management group	Minimal
	Select data management provider	September 2008	CBM Guidance Group, CBMP data management group	Minimal
	Develop design criteria for CBM data management	October 2008	CBM Guidance Group, CBMP data management group	Minimal
	Identify specific data management needs for CBM pilot projects, general needs anticipated for later projects	February 2009	CBM Guidance Group, CBMP data management group, CBM pilot projects, CBM data management provider	$15,000* for CBM data management provider
	Create pilot data sets to test design criteria	July 2009	CBM data management provider, CBM pilot projects	$25,000*
Develop a data management system	Test pilot data and revise accordingly	October 2009	CBM data management provider, CBM pilot projects, CBM Guidance Group, CBMP data management group	$15,000*
	Develop full data management system for CBM	April 2010	CBM data management provider, CBMP data management group	$50,000*
Involve CBM participants in interpretation	Identify CBM participants who can interpret their own project	May 2009	CBM Guidance Group, CBM pilot projects	Minimal
	Invite those individuals to appropriate meetings or events	As appropriate	EMGs, monitoring networks, CBM pilot projects	Travel costs
	Explore potential for online discussions of data and interpretation to allow wider participation of CBM participants	October 2009	CBM Guidance Group, EMGs and monitoring networks, CBMP Steering Committee	Minimal
	Evaluate the effectiveness of	April 2010	CBMP Steering Committee,	Minimal

Table 1 continued: Community-based Monitoring Strategy Workplan: Development Phase (Years 1 and 2)

Objective	Task	Timeline	Responsibility	Estimated Cost (CDN $)
	participatory approach and revise accordingly		CBM Guidance Group, others as appropriate	
Provide summary information	Develop templates for summary information to test with target audience(s)	April 2009	CBMP staff, CBM Guidance Group, Permanent Participants	Minimal (NB: Outreach Strategy)
	Based on test results, select appropriate templates and communication methods for further development	October 2009	CBMP staff, CBM Guidance Group, Permanent Participants, others as appropriate	Minimal
	Identify key languages needed to reach Arctic residents in all countries	August 2008	CBM Guidance Group, Permanent Participants	Minimal
	Develop communication strategy for CBM partners and Arctic residents	April 2010	CBMP staff, CBM Guidance Group	Minimal

***** assumes that the task is carried out on a contractual basis; **+** assumes that the task is carried out with in-kind assistance

Table 2: Community-based Monitoring Strategy Workplan: Implementation Phase (Years 3+)

Objective	Task	Timeline	Responsibility	Estimated Cost (CDN $)
Sustain CBM Guidance Group	Oversee CBM effort	Continuous	CBM Guidance Group, CBMP Steering Committee	Minimal
	Evaluate CBM Guidance Group and revise mandate as needed	April/May 2012	CBMP Steering Committee	Minimal
	Hold annual (?) meetings	Annually (?)	CBM Guidance Group	$10,000+
Develop training manuals	Commission CBM Best Monitoring Practices manual	September 2010	CBM Guidance Group	$25,000*
Recruit CBM projects into CBMP	Publicize CBM component of CBMP and identify and select new partner projects	Continuous	CBM Guidance Group, Permanent Participants, others	Minimal; possibly travel costs
	Provide support for CBM projects to participate in relevant CBMP activities	As appropriate	CBM Guidance Group, EMGs, monitoring network leads	Travel costs
CBM data management	Continue to provide data management as needed and evaluate on regular basis	Continuous	CBM data management provider, CBMP data management group, CBM Guidance Group	Minimal (if covered by CBMP data management) or $25,000* /year
Involve CBM participants in interpretation	Invite CBM participants to meetings and events (contingent on evaluation in Development Phase)	Continuous	CBM projects, CBMP Experts' Groups and Monitoring Networks, CBM Guidance Group	Travel costs
Provide summary information	Follow communication strategy prepared at end of Development Phase, re-evaluation on regular basis	Continuous	CBMP staff, CBM Guidance Group	Minimal (NB: Main costs covered by Outreach Strategy)

***** assumes that the task is carried out on a contractual basis

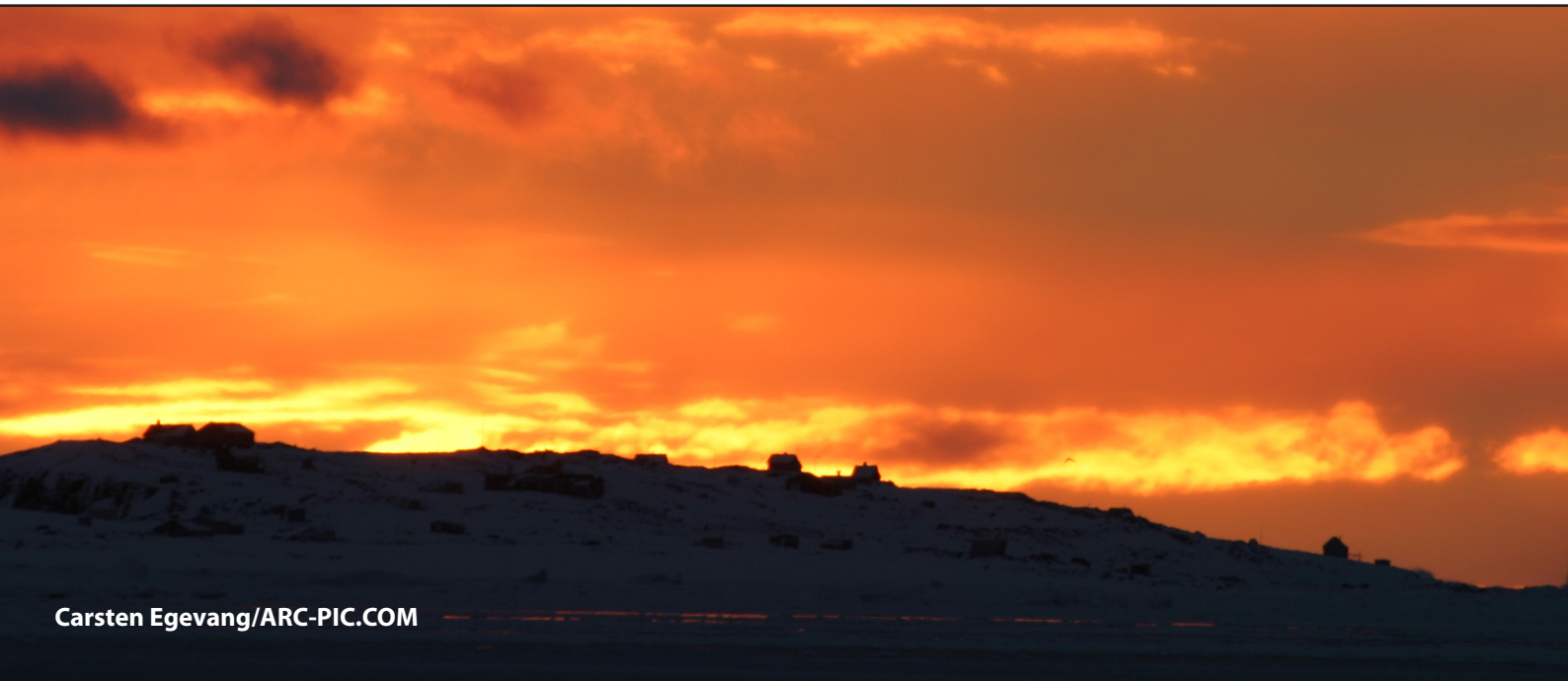
3.2 Budget

Table 3 summarizes annual estimated costs for those items requiring more than minimal funding. This table does not include costs that may be incurred if some activities are undertaken through contracts, such as drafting a CBM Guidance Group workplan and other sub-tasks. The five year cost of the program outlined here is estimated at US$422,000.

Table 3: Community-based Monitoring Workplan Budget

		Estimated Costs (US$)		
Objective	**Task/Sub-Task**	**Year 1**	**Year 2**	**Years 3 +**
Create and sustain CBM Guidance Group	Annual meetings	$10,000 (travel costs for five members)	$14,000 (same as Year 1 + 2 CBM project participants)	$16,000 (same as Year 2 + 1 more CBM project participant)
Develop CBM training manuals	Develop CBM manuals	$25,000*		$25,000* (Year3 only)
Recruit CBM Projects into CBMP networks	CBM participation in EMGs and monitoring network meetings	$4,000 (travel costs for two CBM project participants)	$8,000 (travel for four CBM participants)	$16,000 (eight CBM participants)
Develop a data management system	Identify data management needs	$15,000*		
	Create pilot data sets		$25,000*	
	Test and revise		$15,000*	
	Develop full data management system for CBM		$50,000*	
	Provide ongoing data management services for CBM			$25,000*
Involve CBM participants in Interpretation	Connect CBM participants in relevant meetings and events	$4,000 (travel costs for two CBM participants)	$8,000 (travel costs for four CBM participants)	$16,000 (travel costs for eight CBM participants)
TOTAL		**$58,000**	**$120,000**	**$98,000 in Year 3; $73,000/year after**

* assumes that the task is carried out on a contractual basis



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