Appendix A: Details of the Strategic Planning Process

Over the past decade the VMC has undertaken several visioning and review activities. In 2001 the VMC Operations Guide was updated by VMC staff with input from the Steering and Advisory Committees. This document clearly summarized the VMC mission and goals and outlined critical VMC activities and services[18]. The following year, 2002, an external review team with members from the Missouri Department of Conservation, US Geological Survey and US Forest Service convened to review the VMC program and activities[19]. This was followed in 2004 by an internal review of VMC staff positions and duties, and overall VMC activities. In March 2014, the VMC Steering Committee decided to initiate a strategic planning initiative to revisit the VMC mission statement, examine how it is aligns with the missions and goals of our partners and identify a set of priority activities for VMC focus moving forward.

Informed by these previous activities, as well as the strategic planning undertaken by each of the primary partnering organizations that comprise the VMC collaborative, we outlined an iterative evaluation of the VMC mission, objectives and activities in 2014 to sharpen our focus, strengthen relationships across organizations, and ensure continued relevance and impact of the collaborative. This planning process allowed for full input from the Advisory Committee, refinement by the Strategic Planning Committee and then feedback from the larger group of VMC collaborators.

APRIL 18, 2014 ADVISORY COMMITTEE MEETING

The VMC Advisory Committee reviewed and edited a list of SWOTs (strengths, weaknesses, opportunities, threats) generated by the VMC staff. Among VMC's **strengths** the committee listed its continuous, long-term data records and data archive, co-location of cross-cutting research/monitoring projects, the new website and data portal, cross-cutting Annual Meeting format, VMC's dedicated network of cooperators and philosophy of collaboration, multidisciplinary perspective, and education and outreach. For the full list of SWOTs see (Appendix B).

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[18] Available online at http://www.uvm.edu/vmc/documents/2001_VMCOperationsGuide.pdf.

[19] Available online at http://www.uvm.edu/vmc/documents/2002_VMCReviewFinalReport.pdf.

Also at the meeting, committee members reviewed the current VMC mission statement which reads: "Its mission is to serve Vermont through improved understanding of long-term trends, annual conditions and interdisciplinary relationships of the physical, chemical and biological components of forested ecosystems in Vermont. The VMC facilitates the collection of environmental data, and provides to Vermonters and others the information needed to understand, protect and manage forested ecosystems within a changing global environment."

The following goals were identified by the Advisory Committee as being crucial to VMC's future mission:

Goal 1: Monitoring and Analyzing conditions and trends (DOING)
To promote an improved understanding of the conditions, trends and relationship in the physical, chemical and biological components of the forested ecosystems in Vermont.

Goal 2: Efficient Coordination (COORDINATING)
To promote the efficient coordination of multidisciplinary environmental monitoring and research activities among Federal, State and Private Sector Agencies and Institutions with common interests in the long-term understanding, management or protection of forested systems.

Goal 3: Outreach (USING)
Disseminate information to inform natural resource professionals, resource managers, policy makers, and the public about important environmental issues. This should include documenting and describing impacts of VMC monitoring and research done by our cooperators.

Goal 4: Planning....looking forward
Keep an eye on the horizon to identify the next threat or threats to Vermont's forested ecosystems and develop plans to collect data needed to fill knowledge gaps and make scientifically sound policy and management decisions to mitigate detrimental consequences. This includes periodic review and update to the Strategic Plan to keep VMC nimble and able to respond to relevant Vermont and regional environmental issues.

JUNE 5, 2014 VMC STRATEGIC PLANNING COMMITTEE RETREAT

In June, a specially-formed Strategic Planning Committee comprised of cooperators and leaders from state and federal partnering organizations considered the VMC mission and goals put forth by the Advisory Committee as a part of a larger strategic planning effort. This group defined a set of high-level objectives and related activities that they felt VMC should pursue over the next ten years in order to meet the larger mission and goals.

The proposed VMC mission statement from Strategic Planning Retreat appears on pages 12 of the Strategic Plan. The full list of priorities and activities to achieve those priorities developed at the Strategic Planning Retreat appears on page 6 of Appendix A.

JULY 2014 ELECTRONIC SURVEY:

To solicit feedback on these draft objectives and related activities, a quantitative survey was designed to better understand where VMC collaborators feel efforts should focus. Such feedback is particularly crucial to ensure that the VMC continues to provide valuable services to the environmental community, filling current gaps in our collective efforts and minimizing overlap with activities that may be more efficiently completed by others. In a time when budgets are stretched thinner, yet the need for monitoring, research and coordination around environment grows, this information will allow the VMC to focus its efforts for maximum impact.

Specific questions were targeted to:

- Prioritize stated objectives

- Rank specific activities where VMC should focus efforts

- Prioritize a set of high level objectives and activities to help refine VMC goals

- Identify collaborator needs - Solicit other objectives and activities to achieve those objectives

Overall, this survey provided a unique opportunity to evaluate how collaborators would like to see VMC finances and efforts directed. The results indicate that the continuation of long-term monitoring activities, analysis and reporting of the resulting information and facilitation of networking among collaborators are priorities. However, it is important to consider that the results of this effort allocation activity represent an idealized world, where activities that may be of highest priority are represented by relatively low "effort" cost compared to the true costs of successfully accomplishing them. For example, while maintaining funding for long-term monitoring was the highest valued activity, with the largest effort point allocation (14% of total available), in reality maintaining ongoing monitoring of forest health, wildlife populations, air and water quality currently require over 50% of the VMC budget and staff time. Adding on costs associated with data management, web functionality and access consumes an additional 25% of the current VMC budget and staff time. So while these results are useful to prioritize activities, the full list that can successfully be accomplished may differ from the idealized list presented here. While this may pose a challenge during yearly VMC budget discussions, this information

should prove useful to direct resources for the greatest benefit or identify other activities to cut if necessary in the future.

VMC Strategic Planning Survey Summary

This group defined a set of objectives and related activities that the VMC should pursue over the next ten years in order to meet the larger mission and goals. To solicit feedback on these draft objectives and related activities a quantitative survey was designed to better understand where VMC collaborators feel efforts should focus. Such feedback is particularly crucial to ensure that the VMC continues to provide valuable services to the environmental community, filling current gaps in our collective efforts and minimizing overlap with activities that may be more efficiently completed by others. In a time when budgets are stretched thinner, yet the need for coordination around environmental monitoring and research grows, this information will allow the VMC to focus its efforts for maximum impact.

Survey Structure and Response

In August of 2014, VMC collaborators, steering and advisory committee members were asked to complete an online survey to evaluate and rank the suite of objectives and activities outlined in the VMC draft strategic plan.

While the overarching goals were set by the strategic planning committee, respondents were asked to prioritize each of the individual objectives included under each goal based on a 1 (lowest) to 5 (highest) scale.

Similarly, potential activities to accomplish each goal were ranked, but with respondents asked to assume a limited amount of financial resources available to conduct their selected activities.
From a pool of 100 total "points" respondents were able to allocate points as they deemed appropriate, with the ability to more heavily weight activities they felt were more

important, or equally weight a larger number of activities. The concept follows both financial and effort allocation, such that assigning 10 effort points would correspond with approximately 10% of the available VMC budget and staff effort.

You have 100 points to "spend" on the set of activities you think are most important. You can give all your points to one thing, or spread them out, use them all or leave some unspent

Points remaining: 70 out of 100

Proposed activity	Points
Host annual meetings to convene a wide audience of environmental professionals	0
Provide VMC database training workshops to expand data integration	10
Inform collaborators of upcoming meetings, trainings and workshops	20
Expand the VMC collaborative base through outreach and presentations	0
Disseminate regular newsletters with the latest environmental findings	0

There were also opportunities to provide feedback, additional ideas and information. This information is summarized below, and reflected in this final strategic plan to ensure that the VMC is able to best meet the needs of researchers, ecosystem professionals and policy makers across the region.

The full proposed list of objectives and associated activities available for consideration is summarized here with activities bulleted under each related objective and goal. Because this feedback from the ranking and prioritization of this full list was used to subset and finalize the final set of guiding objectives and activities included in this final strategic plan, you may note that there are activities listed here that are not included in the final strategic plan. Narrowing down activities allows the VMC to focus its efforts where they are needed, while allowing other, lower impact activities to be removed from our responsibilities. In the next several pages we summarize the results of this ranking process, and how decisions were made to retain, remove or add activities in response to this survey.

Original Full List of VMC Objectives and Associated Activities Included in the Survey

Goal 1: coordination

To promote the efficient coordination of multidisciplinary environmental monitoring and research activities among Federal, State and Private Sector Agencies and Institutions with common interests in the long-term understanding, management or protection of forested systems.

Objective 1: Provide regular opportunities for networking
- Host annual meetings
- Provide database training workshops
- Provide event information
- Develop an outreach plan
- Expand circulation of newsletters
- Coordinate volunteer and student interns
- Enhance web access and functionality

Objective 2: Coordinate efforts around high priority issues to produce integrated products.
- Mini-grant competitions
- Coordinate grant writing for external funding

Objective 3: Provide a forum to inform future activities among partners.
- Reevaluate the VMC strategic plan
- Identify emerging needs

Goal 2: data analysis and synthesis

To promote an improved understanding of trends and relationship in the physical, chemical and biological components of the forested ecosystems through data analysis and synthesis

Objective 1: Facilitate the development and distribution of VMC data syntheses.
- Data syntheses and trends

Objective 2: Initiate analyses of and integration across new datasets.

- Novel integrated analyses
- Comparison to other long-term research sites
- Identify new data users

Goal 3: long-term monitoring

To conduct long-term monitoring in order to report on current forest ecosystem health and emerging threats.

Objective 1: Maintain long-term monitoring activities.
- Maintain funding for monitoring
- Data management and archive
- Maintain intensive sites
- Document impact

Objective 2: Monitor and report on current environmental conditions and potential threats.
- Annual report of current conditions and threats
- Public relations support
- Online indicators dashboard

Survey Results

Survey Demographics

Of the 45 participants, response was highest from academic institutions and the Vermont Agency of Natural Resources, but also included responses from Federal Agencies such as the US Forest Service and US Geological Survey, non-profit organizations and the private sector. The majority of respondents were researchers and land managers. Responses from those involved in policy, education and consulting were lower, indicating that a secondary effort to elicit their opinions may be warranted to ensure the VMC captures the diversity of perspectives expected in our regional natural resource community. By discipline, most respondents worked in forestry and wildlife. Because ongoing VMC efforts also include monitoring of water, soil and air resources, it may be warranted to increase representation from collaborators working on water, soil and climate/air quality issues.
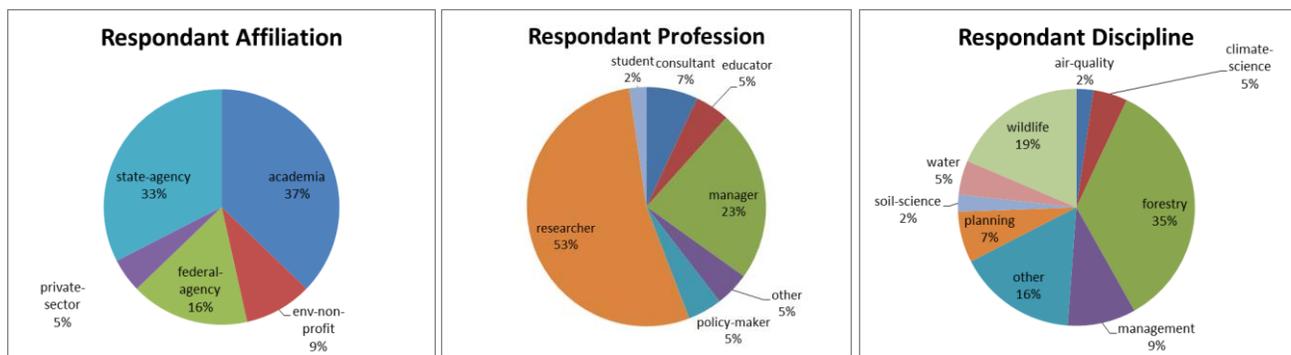
Objectives

The mean ranking of all seven proposed objectives was over 4, indicating that most respondents consider each of these to be important objectives for VMC to pursue. However, there was a distinction among the objectives, with **Objective 3.1.** (Maintain long-term monitoring activities, mean rank = 4.76, median rank = 5) significantly higher than most almost all other objectives. Other high ranking objectives included **Objective 3.2** (Monitor and report on current environmental conditions and potential threats, mean rank = 4.53, median rank = 5), Objective **2.1** (Facilitate the development and distribution of VMC data syntheses, mean rank = 4.46, median rank = 5) and **Objective 1.1** (Provide regular opportunities for networking, mean rank = 4.37, median rank = 5). While still considered relatively high priority on the 1-5 scale, objectives pertaining to expanded data syntheses (new analyses around high priority issues, (**Objective 1.2,** mean rank = 4.04, median rank = 4) or data integration and analysis efforts (**Objective 2.2,** mean rank = 4.06, median rank = 4)) were significantly lower than those associated with monitoring, reporting and networking efforts. The lowest ranked objective involved providing a forum to inform future activities among partners (**Objective 1.3,** mean rank = 4.02, median rank = 4).
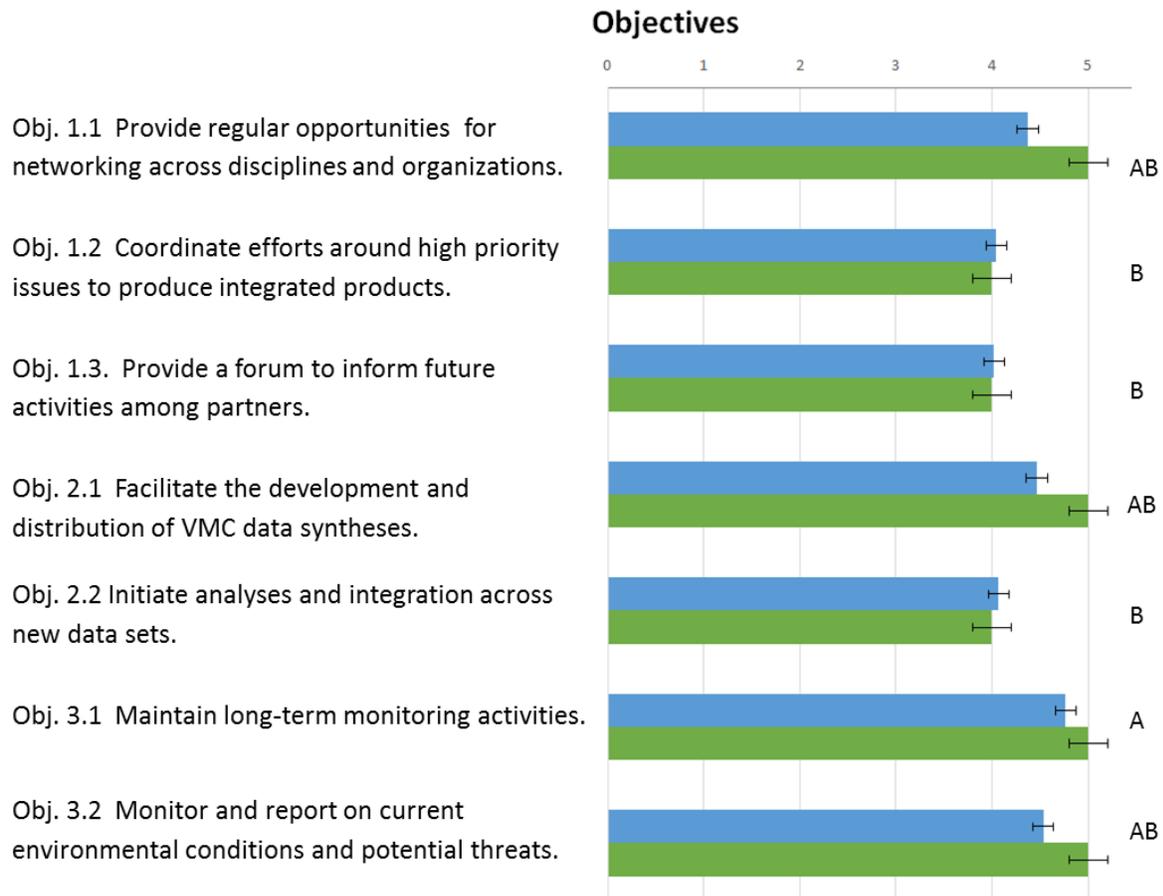
Figure 13. Mean (blue) and median (green) ranks of the seven proposed objectives with standard error. Objectives that share a letter designation are not significantly different.

Activities

Although the potential activities were ranked independently of the objectives, survey results followed a similar pattern, with the highest prioritization going to activities under Objective 3.1 (Maintain long-term monitoring activities) and Objective 1.1 (Provide regular opportunities for networking). However, within objectives, certain activities were allocated significantly more resources than others, providing an opportunity to target a smaller subset of activities to accomplish each objective. To summarize this, each of the activities evaluated in the survey are presented here within their associated objectives. Statistical analyses of points allocated were then used to identify if more effort targeted on a subset of activities should be the focus of VMC efforts moving forward. To reiterate the value ranking of objectives discussed above, objectives are presented in order, from highest to lowest rank.
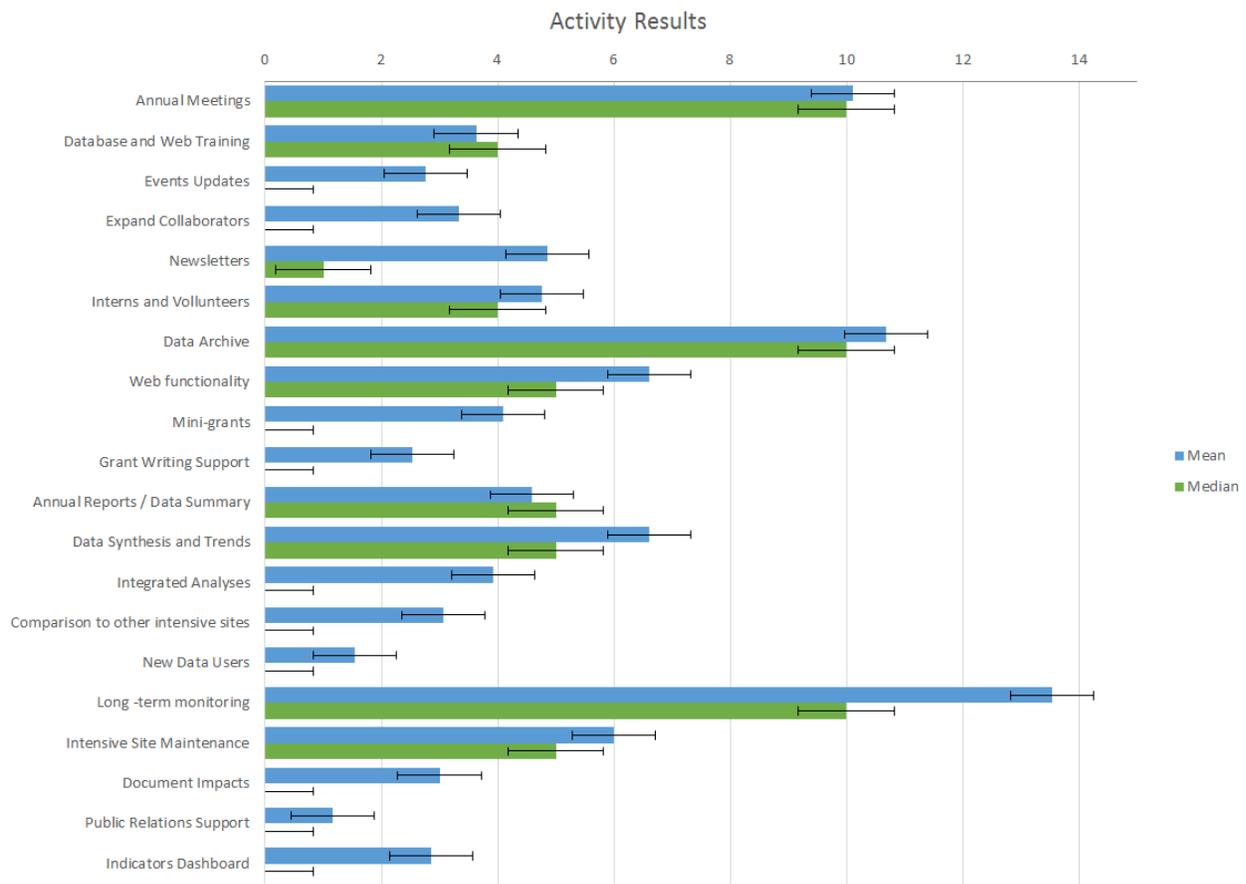
Figure 14. Mean (blue) and median (green) ranks of the twenty proposed activities with standard error.

Objective 3.1 Maintain long-term monitoring activities.

Following Objective 3.1's top ranking among objectives, two associated monitoring activities were also allocated the greatest number of effort points. These activities involved maintaining funding for long-term monitoring (mean = 13.5, median = 10) and data management and maintenance of the VMC database archive (mean = 10.7, median = 10). These were assigned significantly higher points than the other long-term monitoring related activities (Intensive site maintenance mean = 6.0, median = 5) and documenting impacts of monitoring activities (mean = 3.0, median = 0). While this might justify dropping infrastructure maintenance and documentation of how data is utilized from VMC's priority list, it is clear that without these activities, the others would not be possible. Without maintaining infrastructure, air quality, water quality and climate data would be jeopardized. Similarly, without directing efforts to documenting impacts, justification of VMC funding and collaborator participation is at risk. The strategic planning committee therefore determined that all four activities under objective 3.1 should be retained.

Final Objective 3.1 activities to maintain long-term monitoring activities.

- o   Maintain funding for long-term monitoring (rounded mean 14, *actual requirement 51)
- o   Data storage, access and archive support (rounded mean 11)
- o   Maintain intensive site infrastructure and permitting (rounded mean 6)
- o   Document impact of VMC related activities (rounded mean 3)

Final Objective 3.1 Effort: 71 effort units
Note that the mean survey allocation to maintain funding for long-term monitoring does not reflect the actual costs required to do so (currently 51% of the VMC budget). Therefore, effort allocation has been adjusted to reflect what is required to accomplish this (the highest ranked) activity.

Objective 3.2 Monitor and report on current environmental conditions and potential threats

While monitoring and reporting on environmental conditions was the second highest ranked objective, when faced with assigning a limited number of points to specific activities, reporting-related activities were not ranked as high as collaboration and networking activities. Among reporting activities, the publication of an annual report to summarize current conditions of long-term VMC monitoring datasets (mean = 4.6, median = 5) received almost double the points allocated to the creation of an indicators dashboard to summarize current conditions relative to historical baselines (mean = 2.9, median = 0). Also included in this objective, activities designed to disseminate these findings to the public and facilitate public relations was the lowest ranked of all activities (mean = 1.2, median = 0). This indicates that collaborators recognize the importance of analyzing and reporting VMC collected data on a regular basis, rather than focusing efforts only on the data collection and storage itself. These results further suggest that the publication of a high quality annual report should be sufficient to meet this objective. Therefore, we chose to allocate the sum of effort units for this objective to the production of formal VMC annual reports.

Final Objective 3.2: Monitor and report on current environmental conditions and potential threats
- Annual report of current conditions and threats (objective sum 9)
- ~~Public Relations support~~
- ~~Online indicators dashboard~~

Final Objective 3.1 Effort: 9 effort units
Total Cumulative Effort by Ranked Objective Order: 80 out of 100 available effort units

Objective 2.1 Facilitate the development and distribution of VMC data syntheses

VMC data analysis and synthesis activities were highly ranked among both the objectives and activities. Respondents prioritized coordinating syntheses of VMC for examination of long-term trends (mean = 6.6, median = 5) and threat identification as high as data management activities. This indicates that while the collection and safe storage of data is important, respondents recognize that allocating the time and expertise to interpreting this information is essential. While syntheses have been conducted sporadically in the past,

planning for regular coordination of cooperators to both summarize and synthesize long-term data sets will be given a higher priority for VMC efforts over the coming years.

Final Objective 2.1: Facilitate the development and distribution of VMC data syntheses.
- Data syntheses and long-term trends (rounded mean 7)

Objective 2.1 Effort: 7 effort units
Total Cumulative Effort by Rank Order: 87 out of 100 available effort units

Objective 1.1 Provide regular opportunities for networking

The next two highest ranking activities also reflect the high ranking of Objective 1.1. Specifically respondents prioritized hosting annual meetings (mean = 10.2, median = 10) and expanding the VMC website for enhanced data search, download, visualization and analysis across datasets (mean = 6.6, median = 5). This was significantly higher than providing regular newsletters (mean = 4.9, median = 1), coordinating interns and volunteers (mean = 4.8, median =4), providing data management training (mean = 3.6, median = 4), expanding the collaborative base (mean = 3.3, median = 0) or maintaining a calendar with updated event information across organizations (mean = 2.8, median = 0). Similar to some activities required for long-term monitoring, some of the lower-ranked activities here are necessary to ensure the success of the higher-ranked activities. For example, data management and web training is necessary to ensure that collaborators are able to fully utilize the structures that result from the (highly ranked) web and database enhancement. Other lower-rated activities can be considered "low cost" in that much of the work or organization required to complete them is already completed. For example, a recent collaboration with organization comprising the ecoNEWS effort has ensured that regular newsletters with the most recent environmental findings and information can continue with minimal VMC resources moving forward. Considering this, the final list of recommended high priority activities to accomplish Objective 1.1 in the strategic plan include the following:

Final Objective 1.1 activities to provide regular opportunities for networking
- Host Annual meetings (rounded mean 11)
- Provide database training workshops (rounded mean 4)
- ~~Provide Event Information~~
- ~~Develop an Outreach Plan~~
- Expand circulation of newsletters (rounded mean 5)
- ~~Coordinate volunteer and student interns~~
- Enhance web access and functionality (rounded mean 7)

Cumulative Objective 1.1 Effort: 27 effort units
Total Cumulative Effort by Rank Order: 114 out of 100 available effort units

Objective 1.2 Coordinate efforts around high priority issues to produce integrated products

While overall this objective receive a mean rank of 4.04 on the 1-5 scale, most respondents ranked both associated activities (providing mini-grants to support directed work (mean =

4.1, median = 0) and facilitating external grant writing (mean = 2.5, median = 0) as non-priorities (median of 0). This suggests that while the overall goal of coordinating efforts around high priority issues is worthwhile, when resources are limited other activities are favored. Therefore, this strategic plan maintains support for mini-grants, but other new initiatives such as grant writing support will remain limited in scope.

> **Final Objective 1.2: Coordinate efforts around high priority issues to produce integrated products.**
> - o   Mini-grant competition (rounded mean 4)
> - o   *Focus on novel integrated analyses (lumped from objective 2.2 below)*
> - o̶   ~~Coordinate grant writing for external funding~~

> **Cumulative Objective 1.2 Effort: 4 effort units**
> **Total Cumulative Effort by Rank Order: 118 out of 100 available effort units**

Objective 2.2 Initiate analyses of and integration across new datasets

Similar to the results for coordinating efforts around high priority issues, the objective of initiating integrated analyses across new datasets received relatively low rankings for all proposed activities, with the majority of respondents listing them as non-priorities for VMC. Of the integrated analysis activities, the initiation of novel integrated analyses was the highest ranked activity (mean = 3.9, median = 0). If in the future the VMC advisory and steering committees wish to initiate such activities, it would be possible to design a mini-grant to support such an activity. The strategic plan has therefore been modified to it include the initiation of integrated analyses across datasets into Objective 1.2 for more streamlined efforts moving forward. While the comparison of VMC data to other long-term intensive sites is a valuable opportunity to provide regional context to VMC efforts, the realities of budget, staff and time constraints indicates that such activities may not be possible at this point.

> **~~Objective 2: Initiate analyses of and integration across new datasets.~~**
> - o   *Novel integrated analyses (moved to objective 1.2 above)*
> - o̶   ~~Comparison to other long-term research sites~~
> - o̶   ~~Identify new data users~~

> **Cumulative Objective 2.2 Effort: 0 effort units**
> **Total Cumulative Effort by Rank Order: 118 out of 100 available effort units**

Objective 1.3 Provide a forum to inform future activities among partners.

Specific activities related to Objective 1.3 were not included in the prioritization exercise in this survey. These activities were considered necessary to the relevance and function of the organization as a whole, and thus not up for debate. Without regular discussions of the current state and future direction of the organization, the VMC would fail to meet its charge. The forested landscape is constantly changing and responding to changing environmental conditions. The ability to redirect energy and resources is key to staying on top of a complex reality. Therefore, this strategic plan includes by default a charge to regularly discuss and revise the goals, objectives and activities of the group. These

activities will naturally manifest in other activities described here (e.g. the focus of mini-grant competitions, synthesis reports or annual meeting themes). But in addition, the charge is to revisit this strategic plan every 5 years. As such, this objective should occupy a small (and highly variable depending on the 5 year strategic planning cycle) effort. For accounting purposes here, 2 effort points should be reserved in each year to represent these discussions.

Objective 1.3 Provide a forum to inform future activities among partners.
- o   Reevaluate the VMC strategic plan
- o   Identify emerging needs

Cumulative Objective 1.3 Effort: 2 effort units
Total Cumulative Effort by Rank Order: 120 out of 100 available effort units

Survey Summary

Overall, this survey provides a unique opportunity to evaluate how collaborators would like to see VMC finances and efforts directed. The results indicate that the continuation of long-term monitoring activities, analysis and reporting of the resulting information and facilitation of networking among collaborators are priorities. However, it is important to consider that the results of this effort allocation activity represent an idealized world, where activities that may be of highest priority are represented by relatively low "effort" cost compared to the true costs of successfully accomplishing them. For example, while maintaining funding for long-term monitoring was the highest valued activity, with the largest effort point allocation (14% of total available), in reality maintaining ongoing monitoring of forest health, wildlife populations, air and water quality currently require over 50% of the VMC budget and staff time. Adding on costs associated with data management, web functionality and access consumes an additional 25% of the current VMC budget and staff time. So while these results are useful to prioritize activities, the full list that can successfully be accomplished may differ from the idealized list presented here. While this may pose a challenge during yearly VMC budget discussions, this information should prove useful to direct resources for the greatest benefit or identify other activities to cut if necessary in the future.

Revised List of VMC Objectives and Associated Activities Based on Survey Feedback

Goal 1: coordination

To promote the efficient coordination of multidisciplinary environmental monitoring and research activities among Federal, State and Private Sector Agencies and Institutions with common interests in the long-term understanding, management or protection of forested systems.

Objective 1.1: Provide regular opportunities for networking
- Host annual meetings
- Provide database training workshops
- Expand circulation of newsletters
- Enhance web access and functionality

Objective 1.2: Coordinate efforts around high priority issues to produce integrated products.
o Mini-grant competition
o Focus on novel integrated analyses

Objective 1.3: Provide a forum to inform future activities among partners.
- Reevaluate the VMC strategic plan
- Identify emerging needs

Goal 2: data analysis and synthesis

To promote an improved understanding of trends and relationship in the physical, chemical and biological components of the forested ecosystems through data analysis and synthesis

Objective 2.1: Facilitate the development and distribution of VMC data syntheses.
- Data syntheses and trends

Goal 3: long-term monitoring

To conduct long-term monitoring in order to report on current forest ecosystem health and emerging threats.

Objective 3.1: Maintain long-term monitoring activities.
- Maintain funding for monitoring
- Data management and archive
- Maintain intensive sites
- Document impact

- Annual report of current conditions and threats

Objective 3.2: Monitor and report on current environmental conditions and potential threats.

OCTOBER 14, 2014 STEERING COMMITTEE MEETING:

The Strategic Planning document, having been informed and revised with results from the Electronic Survey, will be presented to the VMC Steering Committee for discussion, and approval. This will include a newly-worded mission statement and VMC priorities for the next 5 years. Input and discussion from this meeting will be incorporated into a final draft of the Strategic Planning document to be publically unveiled at the 2014 VMC Annual Conference.

DECEMBER 11, 2014 VMC ANNUAL CONFERENCE:

The newly-adopted VMC Strategic Plan will be made public.

The strategic plan is intended to not only guide our activities going forward, but also to serve as an action plan. In developing these objectives and specific activities, we have provided specific milestones and timelines to demonstrate our commitment to achieving these goals.

CONTINUING REVIEW OF STRATEGIC PLAN IMPLEMENTATION

In 2017 we will conduct a detailed preliminary review to determine if steady, significant and measurable progress is being made toward meeting our goals. If progress is deemed unsatisfactory at that point, new steps will be implemented to help get us back on track to achieve all goals by 2020.