Forest Ecosystem Monitoring Cooperative: 2017/2018 Regional Work Plan

Last updated: April 12, 2017

The Forest Ecosystem Monitoring Cooperative 2017/2018 Regional Work Plan is intended to guide FEMC staff in supporting the Cooperative for the 2017/2018 funding cycle. This document describes the prioritization of the regional work plan elements based on what can be accomplished and the potential impact of the projects for Cooperative members. These priorities were developed in consultation with the VMC Steering and Advisory Committees and subsequent work by VMC staff, and include three projects to focus on in the current year, and three projects to potentially develop in future years.

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REGIONAL WORK PLAN – SUMMARY

Below is the prioritized list of planned activities FEMC staff will undertake to support the Cooperative. This is a summary of information developed in each of the sections below. These issue areas were defined through a meeting of the Joint Committees of the then-VMC, with additional details in the appendices.

Chosen topics for the coming year

Below are the top three work items on which FEMC staff can make immediate progress, and that provide some level of service to every partner. FEMC staff will focus on advancing these goals in the next year.

Topic	Impact	Difficulty	Anticipated Products
Tracking of fragmentation and the impacts of fragmentation	High	High	<u>Synthesis white paper</u> • Collate and compare all efforts to date in the region on forecasting or quantifying fragmentation. • Review gaps and available tools and data. • Recommendations for analyses or simulations that could be done on a periodic basis. <u>Online clearinghouse or dashboard</u> • Categorized summaries and links to key source materials and tools.
Standardization of methods and measurement	High	Moderate	<u>Workshop</u> • Discussion between key practitioners and content experts on how to harmonize methods while keeping individual collection methods intact. <u>White paper</u> • Use case defined through consultation with partners. • Proposed standardization of a method.
Climate variables and climate change	Unclear	Moderate	<u>Report</u> • Document on existing regionally-specific climate indicator data and what gaps are still existing. <u>Online clearinghouse</u> • Access point on FEMC site for linking to relevant climate data • Support expansion of the climate clearinghouses for NY, MA and VT.

Topics to focus on in the future

The topics below will be revisited in the next year to see if progress can be made on them going ahead. FEMC staff will be looking for opportunities to advance these issues in the current year if possible.

Topic	Impact	Difficulty	Potential Products
Quantifying and monitoring soil carbon	Moderate	High	• Report: Document on current state of knowledge, data and model gaps, and stakeholder needs. • Data: New holdings in the FEMC database on this topic. • Workshop: Gathering on specific gap in the region not being met by state or national efforts.
Monitoring trends in regeneration and soil productivity	High	Unclear	• Integration point or clearinghouse for the various resources. This could be a report or a website. • Long-term trend update in the Long-Term Monitoring Update • New holdings in the database
Coordination and information sharing on specific stress agents	Unclear	Moderate	• Information sharing network system? • Regional mapping initiative or other online-driven framework for sharing and responding to information

PRIORITY ISSUE AREA ASSESSMENTS AND IMPLEMENTATION DETAILS – CURRENT YEAR

Each priority issue area was assessed and a potential scope of work defined.

Tracking of fragmentation and the impacts of fragmentation

Regional tracking of fragmentation and the impacts of fragmentation and parcelization on ecosystem services and environmental resources.

Overall assessment of need, impact and difficulty: High impact, high difficulty

This project is clearly desirable to a number of partners and could address a number of issues of concern in the region. The level of effort required to develop a comprehensive system is substantial and beyond the reach of the FEMC staff, budget, capacity and partners. However, that doesn't mean that we can't move the needle in some meaningful way that would provide new insight or a baseline upon which future efforts can build.

Tasks to Undertake

- **Conduct initial gap assessment**: Catalog past and present efforts to forecast future fragmentation, quantify past fragmentation, and/or quantify the effects of fragmentation. This will include an assessment of how the available studies and tools do and don't align.
- **Develop information clearinghouse:** Create a dashboard or online resource to describe and link to all available fragmentation information in the region.
- **Identify possible impact metrics**: Document the measures of 'impact' and the 'ecosystem services and environmental resources' used by others that could be useful for a regional tracking effort
- **Identify models that should be rerun periodically: I**dentify key simulation or forecasting models that should be rerun periodically when new data are available to provide updated historical trends and future possibilities.

Products

- Synthesis white paper
    - Collate and compare all efforts to date in the region on forecasting or quantifying fragmentation.
    - Review gaps and available tools and data.
    - Recommendations for analyses or simulations that could be done on a periodic basis.
- Online clearinghouse or dashboard
    - Categorized summaries and links to key source materials and tools.

Outcomes

- Improved regional understanding of fragmentation rates and vulnerability
- New data are available and integrated into long-term monitoring update

Possible Partners

- State forestry, wildlife and water agencies
- USFS (S+PF, FIA)
- Nature Conservancy
- North Atlantic Landscape Conservation Cooperative
- Environmental Monitoring and Management Alliance (New York)
- Vermont Natural Resources Council
- Forest Planners and county/town planners

Related Efforts

- USFS Forest Inventory and Analysis (regional)
- USFS Northern Forest Futures Project (regional)
- Vermont Natural Resources Council (Vermont and regional)
- Environmental Monitoring and Management Alliance (New York)
- Harvard Forest Forecasting effort (Regional)

Standardization of methods and measurement

Standardization of methods and measurement across states – for example, how can we help develop categorizations or crosswalks that overlay ongoing monitoring efforts an enable them to be compared in a regionally consistent way.

Overall assessment of impact and difficulty: High impact, moderate difficulty.

This is the development of a new service, and could be very impactful for specific groups who want to ramp up network design quickly, or adapt their monitoring effort to be regionally comparable. This could be difficult because the specific topics would drive the skills we need (and whether we'd have to hire more people to do a given task) and the uptake of the resulting proposal is dependent on people conducting the monitoring.

Tasks to Undertake

- **Develop a use case:** Work with partners to identify an initial need for standardization
- **Perform initial assessment:** Examine existing monitoring efforts to see what is already being done that can be adapted, and what basic level of information is needed.
- **Plan and host a workshop:** Identify experts and leaders of current monitoring efforts that could inform the needed method, and work with likely adopters to make sure it can work for them.
- **Promote uptake:** Work with likely adopters to encourage use of the standardization or lower the barrier to collecting additional or modified data.
- **Document a workflow:** Provide a document describing the use case, process and service model for repeating this service.

Products

- **Workshop:** Discussion between key practitioners and content experts on how to harmonize methods while keeping individual collection methods intact.
- **White paper:** Use case defined through consultation with partners; Proposed standardization of a method.

Outcomes

- A nimble and adaptable process available to partners for solving a range of monitoring network modification and/or set-up problems.
- Depending on partners, an ecosystem monitoring program is standardized or expanded across the region.

Possible Partners

- Staff scientists who establish or execute monitoring protocols.
- Academic and content experts who can advise on standardization.
- Program managers who can assess the pilot project and possibly advocate to others in their programs.

Related Efforts

- Primarily environmental consulting firms such as Stone Environmental or TetraTech.

Climate variables and climate change

Delivery of or easier access to climate variables and climate change information relevant to our region.

Overall assessment of impact and difficulty: Unclear impact, moderate difficulty.

Access to climate variables that are related to forest ecosystem issues in our region may be a challenge not currently being met by ongoing efforts, or the results are not distributed in a way that is easily used by partners. This project would enhance access to relevant climate variables and climate change information, including indirect impacts on invasive species. This project could be impactful in two ways. It could be transformative if there are clear needs not already being met by existing climate efforts and FEMC is able to fill that gap. If those needs could be met with existing data, FEMC could focus on distribution and packaging.

Tasks to Undertake

- **Document current efforts:** Document and link to efforts currently curating climate indicators that are tailored to region.
- **Assess stakeholder needs:** Identify the climate information stakeholders feel they lack.
- **Identify content to add to existing networks:** Work to expand content on existing platforms such as the New York Climate Science Clearinghouse

Products

- **Report:** Document on existing regionally-specific climate indicator data and what gaps are still existing.
- **Online clearinghouse:** Access point on FEMC site for linking to relevant climate data; Support expansion of the climate clearinghouses for NY, MA and VT to address key factors, and possibly expand to other states.

Outcomes

- Stakeholders have easier access to tools to answer management, forecasting or evaluation questions and target their surveys and monitoring
- Cooperative is better linked into the regional climate networks as a way to connect to more stakeholders.

Possible Partners

- State and federal agency forest health protection and invasive species monitoring staff
- Nature Conservancy
- NESCAUM (Climate Clearinghouses)

Related Efforts

- Northern Institute of Applied Climate Science
- Climate Science Clearinghouse (NY, in progress for VT and MA)
- Existing or developing state-specific efforts

Future Effort: Quantifying and monitoring soil carbon

Quantifying and monitoring soil carbon – there is more and more interest, but a lack of models to better estimate soil carbon and understand how forest management and land use change impact soil carbon.

Overall assessment of impact and difficulty: Moderate impact, high difficulty.

This is research work being done in pieces by researchers/staff scientists in multiple places, and the driver of this effort is that sufficient understanding and/or models don't exist. Since model development would require some higher-level scientific support, this would require additional funding and new research.

Possible Activities

- Add soil carbon measurements to FHM network.
- Catalog current state of knowledge and existing resources in the region on this topic.
- Work with key partners to develop recommendations for the research and data collection needed to fill the gaps.
- Work with non-academic stakeholders to define what information they need and in what format.
- Support development of new grant proposals that would fund new research.

Potential Products

- **Report:** Document on current state of knowledge, data and model gaps, and stakeholder needs.
- **Data:** New holdings in the FEMC database on this topic.
- **Workshop:** Gathering on specific gap in the region not being met by state or national efforts.

Idealized outcomes

- There is a new research grant awarded on one of the topics identified.
- Soil carbon impacts are incorporated into management planning somewhere in the region.

Future Effort: Monitoring trends in regeneration and soil productivity

Assess and/or monitor trends in regeneration and soil productivity, which integrate drivers and effects including invasives, climate change, earthworms and soil carbon.

Overall assessment of impact and difficulty: High impact, unclear difficulty.

This project would seek to improve access to regional trend information on forest regeneration and productivity. The potential outcomes of this project could be very timely and useful for partners, but the unclear nature of what would be done and how makes it hard to describe an exact work flow.

Possible Activities

- Conduct survey of current monitoring streams that capture this information.
- Identify and archive historical data that might be of use.
- Integrate existing data streams into some sort of access point, if justified.
- Fill in gaps with new monitoring if feasible and desired, or work with partners to expand their existing collections to bolster the spatial and temporal record on these processes.

Potential Products

- Integration point or clearinghouse for the various resources. This could be a report or a website.
- Long-term trend update in the Long-Term Monitoring Update
- New holdings in the database

Idealized Outcomes

- New information or analyses of trends in regeneration and productivity are available.
- Planning or management activities incorporate new knowledge or data.
- New soil productivity or regeneration monitoring is established within current state programs.

Future Effort: Coordination and information sharing on specific stress agents

Support the preparation and assessment of impacts from specific stress agents such as spruce budworm.

Overall assessment of impact and difficulty: Unclear impact, moderate difficulty.

Since the exact need is unclear, the impact is difficult to assess. Given the large number of people already involved and the various networks that support them, this might be difficult to make any new headway with our limited resources.

Possible Activities

- Survey current stakeholders and see what coordination, information sharing or data curation needs are not being met by existing systems
- If there are needs found from above step, seek to support or develop regional system that will provide new and valuable pest detection and response services

Potential Products

- Information sharing network system?
- Regional mapping initiative or other online-driven framework for sharing and responding to information?

Idealized Outcomes

- Pest detection and response is more robust and brings in people from a broader group of interested parties than happens today.

APPENDIX 1. TOP TWO TOPICAL GOALS FROM JOINT COMMITTEE MEETING

On February 5, 2016, the Joint Committees of the VMC/FEMC met to brainstorm key needs in each of six themes. Below are the top two vote-getters from each ecosystem topic area.

- Air
  - Goal 1: Advocate for continued monitoring in situations that have had improvements
  - Goal 2: Maintain air quality monitoring programs at Proctor Maple Research Center
- Water
  - Goal 1: Collate effects of forest development on flood resilience and forest-stream interactions
  - Goal 2: Improve understanding of change in forest cover and impacts on water quality in the region.
- Forest/Vegetation
  - Goal 1: Provide regional approach or system to monitor changes and trends in forest fragmentation and subdivision
  - Goal 2: Coordinate spatial data access on invasive species and prioritization for additional data collation/collection(?)
- Soil
  - Goal 1: Track and communicate soil productivity knowledge - compaction, down woody material, organic material, erosion, etc.
  - Goal 2: Communicate the connection between soil carbon and land use
- Wildlife
  - Goal 1: Identify how changing forest landscapes (including fragmentation) are shifting the relative abundance of wildlife communities (by guild)
  - Goal 2: Define habitat characteristics for important species so that habitat can be modelled with regional inventory data
- Socioeconomic
  - Goal 1: Track trends in log-grade markets, impact on harvesting and the resulting forest health implications
  - Goal 2: Communicate economic value of select intact forest ecosystem services for stakeholders such as producers and recreationalists

APPENDIX 2. MAPPING REGIONAL PRIORITY ISSUE AREAS TO TOPICAL GOALS

The table below identifies how each **Regional Priority Issue** scoped by the Joint Committees meets the top two topical goals from each ecosystem component (see list above).

	Air		Water		Soil		Forest/Veg		Wildlife		Socioeconomic	
Priority Issue	Goal 1	Goal 2	Goal 1	Goal 2	Goal 1	Goal 2	Goal 1	Goal 2	Goal 1	Goal 2	Goal 1	Goal 2
Tracking of fragmentation and the impacts of fragmentation	N	N	Y	Y	N	Y	Y	?	Y	Y	Y	Y
Standardization of methods and measurement	N	N	?	?	?	?	Y	Y	?	?	Y	?
Climate variables and climate change	N	N	N	N	N	N	N	Y	Y	Y	N	N
Quantifying and monitoring soil carbon	N	N	N	?	Y	Y	N	Y	N	Y	Y	?
Monitoring trends in regeneration and soil productivity	Y	Y	N	?	Y	Y	Y	N	N	N	Y	?
Coordination and information sharing on specific stress agents	Y	Y	N	?	N	N	Y	Y	N	N	N	N

APPENDIX 3. NOTES FROM THE VMC JOINT COMMITTEES MEETING.

VMC Joint Committees Meeting Notes

Meeting Date: February 9, 2017 Notes Date: February 14, 2017

Attendance (full affiliations are at the end of these notes)

Steering Committee Members Attending: Steve Sinclair, Jerry Carlson, Peter Church, Neil Kamman, Kyle Lombard, Nancy Mathews, Justin Perry, Dave Struble, Tom Vogelmann and Jim Westfall.
Advisory Committee Members Attending: John Austin, Ryan Hanavan, Bill Keeton, Jim Kellogg, Bennet Leon, Randy Morin, Angie Quintana, Barbara Schultz, Deane Wang and Sandy Wilmot.
Others Attending: Sam Lincoln, Jen Pontius
VMC Staff: Jim Duncan, Mike Finnegan, Mim Pendleton, Judy Rosovsky and John Truong.

NOTE SECTIONS

BRIEF OVERVIEW OF VMC ACTIVITIES AND THE YEAR AHEAD

- Jim D. gave an overview of recent and planned VMC activities - coordination, data management and infrastructure, monitoring; regional projects in MA, ME, NH and NY; Ecological dendrochronology database; Forest Health Atlas.
- Nancy Mathews announced that the Mt. Mansfield Science and Stewardship Center was cleared through another step and approved to move forward by the University.

REGIONALIZATION AND THE VMC/FEMC WORK PLAN

Regionalization Goals

After reviewing the FEMC vision, mission statement and current goals (coordination, data, monitoring), the committees discussed other possible overarching goals that could be valuable for the Cooperative to focus on.

The additional regional goals for consideration include:

- Harmonization/standardization of methods
    - Support groups trying to harmonize state- or landscape-specific monitoring networks for larger regional monitoring efforts (e.g. aerial surveys are fairly consistent across states, but on-the-ground monitoring can differ depending on pest/stressor)
- Increased data access and archiving if federal resources are more limited
- Education and outreach
    - Serving as independent voice to share information, telling ecosystem professionals' story and identifying the right terminology and language to communicate to the public
- Resiliency planning and connecting human systems

Priority Regional Issues for the Forest Ecosystem Monitoring Cooperative

Committee members then participated in exercise to list regional monitoring priorities on flipcharts in each of six themes - air, water, soil, forest/vegetation, wildlife, and socioeconomic. The focus was on identifying both high-impact (but potentially difficult) activities and low-hanging fruit. After discussion, each person voted on their top two in each theme. The full compiled list is available at: https://docs.google.com/document/d/1Dsl8_u4lms3KtrMD9OyfDHuU2MvGr-W8u-FWIsHMNXU/edit

The priority issue areas that emerged are:

- Regional **tracking of fragmentation and the impacts of fragmentation** and parcelization on ecosystem services and environmental resources – even periodic assessments could be helpful.
- Regional **climate variables and climate change**, including indirect impact on invasive species.
- Specific stress agents – for example, spruce budworm arrival is coming, is there more that can be done to support coordination and information
- **Standardization of methods and measurement** across states – for example, how can we help develop predefined categorizations, crosswalks or breakpoints for assessing quantities impacts in a similar-enough way to enable regional comparisons
- **Monitoring trends in regeneration and soil productivity**, which integrate drivers and effects including invasives, climate change, earthworms and soil carbon.
- **Quantifying and monitoring soil carbon** – there is more and more interest, but a lack of models to better estimate soil carbon and understand of how forest management and land use change impact soil carbon.

Transition to the FEMC

The committees reviewed the new governance structure and the process for setting up new committees. The three components of the new structure are:

- Expanded **Steering Committee** with state representatives (budget, strategic direction) meeting two time per year
- New **State Partnership Committees** (SPCs) composed of at least 5 members from at least 3 departments or organizations. SPCs provide expertise and guidance at the state level, recommend budgets, identify regional priorities, etc. State foresters will choose a chair and VMC works with chair and existing committees to identify other participants. SPCs meet twice per year (once in state and once at the Annual Conference).
- New **Advisory Resource Group** that provides more generalized scientific expertise to advise on work programs around regional issues.

These levels interact at joint meeting and/or FEMC annual meeting. Existing Advisory Committee members will distribute to the Vermont SPC and the Advisory Resource Group. Current Steering Committee members will be maintained.

FEMC will be rolled out in the next two months now that five states are represented on the Steering Committee.

Action Items

- VMC staff will assess the regional priority issue areas, looking at what is being collected and what could be better collected. VMC staff will then consolidate these into a work plan proposing new regional efforts around key issue(s) of interest and circulate to the committees.
- VMC staff will work with state foresters/designees and committee members to collate lists of potential State Partnership Committee members that includes ecosystem representation across disciplines and organizations.
- VMC will evaluate the possibility of providing funding for some SPC members to travel and stay over during the FEMC annual meeting.
- VMC staff will work on updating strategic plan sometime in 2017 to better reflect the regional strategy, including an evaluation of proposed new goals for the Cooperative and if/how to incorporate.
- VMC will announce a change to the Forest Ecosystem Monitoring Cooperative (FEMC) by April 15, 2017.

PRODUCTS AND BUDGET UPDATES

Products

- New Management Portal: New capacity for many users to manage data. Request from committees to better document and link to other data portals.
- Long-term Monitoring Update: Looks at current year summary and long-term trends. We need to identify and market to target audience, and perhaps speed up reporting, such as rolling updates. https://www.uvm.edu/vmc/about/annual_report/2015
- 2016 Conference Proceedings: Just out - http://www.uvm.edu/vmc/annualMeeting/2016/proceedings
- Regional (state level) project reports: For each state pilot project, VMC is developing a broader, fully detailed report as well as a one-page summaries to track progress and deliverables.

- Ecosystem Monitoring and Assessment Services – VMC has a new fee-for-service model to provide cooperators with Advanced Data Services, Basic Data Services, Field Monitoring Services and Meteorological Monitoring Services more efficiently.

Budget

The VMC core and related grants and funds were reviewed. Operations through 2018 are covered, but some monitoring work is planned to terminate.

The prospect of FFY2018 funding is uncertain given turnover at USFS Washington Office. Jim Hubbard retired as deputy chief, and Monica Lear (WO Forest Health director) also moved. New acting director, but is there a loss of support to maintain core funding right now for the cooperative? We need state foresters to advocate for this. Budget advice may be as late as May.

If there is a reduction in funding, VMC would likely receive a reduced amount, instead of a complete cut. VMC staff will continue to work with partners to compile success stories to motivate continued funding. DEC may have funding to keep Ranch Brook running. The committees discussed private partnerships, State Wildlife Grants, and regional wildlife grants as options to backfill wildlife monitoring. May be interest to keep the wildlife collections going if we can maintain outside funds.

Action Items

- VMC will work to package successful stories in multiple formats for easy reuse and advocacy for additional funds.
- VMC staff will develop better mechanism to link to other repositories of data, such as VT IWIS.
- Steering Committee members asked to advocate (as appropriate) to USFS for additional funding.

ANNUAL CONFERENCE

The committees reviewed the survey results from the 2016 conference and discussed possible themes and speakers for the 2017 conference.

The themes considered included:

- Ecosystem services as a lens for forest management (from survey)
- Monitoring and managing biodiversity and landscape connectivity (from survey)
- Land use change and forest ecosystem management (from survey)
- Connecting social and ecological sciences for better monitoring and management (from survey)
- The impact of political borders on monitoring and managing ecosystems (from meeting)
- Communicating science effectively (from meeting)
- Marketing forest health monitoring and science to non-science community e.g. connecting recreational activities (from meeting)

Planned Theme for 2017

After some discussion, there was interest in the following theme: **Communicating Science: Marketing your work, information and resources.**

- How do we develop messages and share information in such a way that the public sees the relevance of science to their lives?
- Include general intro at plenary by an expert, followed by flash talks of examples of communicating science.
- Include workshops at the end to bookend the conference.
- Possible sources/resources:
    - Climate Connection group (Vancouver) have lots of materials about communicating climate science.
    - Gund Institute/Jon Erickson can give sessions with targeted workshops (with exercises) on how to talk about your work and show relevance of your group to the resources you protect.
- Joanne Garten, Tom Rogers (ANR) and DEC Eco AmeriCorps member may be able to help with generating flash-talk examples of good science communication.

UPCOMING VMC/FEMC MEETINGS FOR 2017

Please add these dates to your schedules.

Note that these may be changed slightly as we restructure, but for now we will keep the same schedule in place.

April 14 – Advisory Committee Meeting (9:30am to 11:00am)

July 10 – Steering Committee Meeting (1:00pm to 3:00pm)

September 21 – Advisory Committee Meeting (1:00pm to 3:00pm)

December TBD – Annual Conference

FULL ATTENDANCE LIST WITH AFFILIATION

Attending from Steering Committee	Attending from Advisory Committee
Steve Sinclair (Chair, VT Forests, Parks and Recreation); **Jerry Carlson** (NY Department of Environmental Conservation); **Peter Church** (MA Department of Conservation and Recreation) **Neil Kamman** (VT Department of Environmental Conservation); **Kyle Lombard** (NH Department of Resources and Economic Development); **Nancy Mathews** (UVM Rubenstein School of Environment and Natural Resources); **Justin Perry** (NY Department of Environmental Conservation);	**John Austin** (VT Fish and Wildlife Department); **Ryan Hanavan** (USFS Northeastern Area); **Bill Keeton** (UVM Rubenstein School of Environment and Natural Resources); **Jim Kellogg** (VT Department of Environmental Conservation); **Bennet Leon** (VT Department of Environmental Conservation); **Randy Morin** (USFS Northern Research Station); **Angie Quintana** (USFS Green Mountain and Finger Lakes National Forests); **Barbara Schultz** (VT Forests, Parks and Recreation); **Deane Wang** (UVM Rubenstein School of Environment and Natural Resources);

Dave Struble (Maine Forest Service); **Tom Vogelmann** (UVM College of Agriculture and Life Sciences); **Jim Westfall** (USFS Northern Research Station)	**Sandy Wilmot** (VT Forests, Parks and Recreation);
Additional Attendees **Sam Lincoln** (Deputy Commissioner, VT Forests Parks and Recreation); **Jen Pontius** (UVM, USFS and VMC) **Jim Duncan, Mike Finnegan, Mim Pendleton, Judy Rosovsky** and **John Truong** (VMC Staff).	