

# **Science Coordination Process for the Long Term Resource Monitoring Program, an element of the Upper Mississippi River Restoration - Environmental Management Program**

6 May 2012, Draft for EMP-CC Review

**Purpose:** This document describes a process to address science priorities as identified in the LTRMP Strategic Plan, by

- determining what science LTRMP will conduct annually,
- promoting coordination among science projects and with monitoring efforts, and
- enhancing cooperation, both within the Partnership and with outside collaborators, to increase our collective capability to conduct science.

## **Introduction**

The Long Term Resource Monitoring Program (LTRMP), an element of the Upper Mississippi River Restoration-Environmental Management Program (UMRR-EMP) has, since its inception in 1987, combined environmental monitoring, research, modeling, data management, and reporting to provide a solid scientific foundation for management actions and environmental policy on the Upper Mississippi River System (UMRS). The first phase of LTRMP developed a sampling design and methodology that has served as a model for other large river monitoring programs world-wide. Since its inception, the program has amassed the most comprehensive data sets in the world on large river ecology and dynamics.

Data from LTRMP are used to provide a scientific basis for UMRR-EMP. Researchers within LTRMP use these data to investigate status and trends of ecological indicators, document baseline conditions and variability, explore patterns and relations within and among components, and provide input to develop models and decision support tools. Within the Habitat Rehabilitation and Enhancement Project (HREP) component of UMRR-EMP, LTRMP data provide information on pre-project baseline conditions, information on bathymetry and land cover used in project design, and reference data sets to help assess project response. In addition, LTRMP staff and collaborators have conducted focused research studies and evaluations of HREP's that provided additional information to build upon and compliment the LTRMP data.

The LTRMP data sets continue to grow in both size and value each year. As conditions in the river vary over time, new data document ecological responses to those changes and provide further insight into understanding river structure and function.

## **Role of the LTRMP Strategic Plan**

The "Strategic and Operational Plan for the Long Term Resource Monitoring Program, 2010-2014" (the Strategic Plan), recognizes the accomplishments of the LTRMP. The Plan gives highest priority to maintaining basic LTRMP monitoring and data sets into the future. However, the partnership also recognized that many important insights can only be gained through data analyses, focused studies, or evaluation of management actions that address specific

hypotheses about how the river system functions. Thus, the second priority in the Strategic Plan is to increase emphasis on applied science within LTRMP to improve river management. This priority stresses work on Goals 1 (Understand the system) and 3 (Develop and assess alternate management actions) in the 1993 Operating Plan. New science will build on previous work and incorporate input from other UMRR-EMP and partnership documents including reach objectives reports, the report of the A-Team ad hoc indicators group, the EMP-CC Implementation Issue Assessment of Adaptive Management, and strategic planning efforts within UMRR-EMP.

The primary areas for additional analyses and focused studies as identified in the Strategic Plan include:

- Develop and implement focused research plans (Output 2.2) for five priority topics:
  - Setting management objectives and defining indicators (Output 1.2)
  - Aquatic vegetation
  - Mussels
  - Connectivity of the river to its floodplain
  - Landscape patterns in the river corridor
- Analyses of data (Output 2.1) from LTRMP and other sources to improve our knowledge of system function as related to management needs and to help accomplish the research frameworks (Output 2.2).

Work within these priority areas may involve targeted data analyses, modeling, generating and testing hypotheses, field experiments, new data collection efforts, and developing decision support tools for managers. Work on other aspects of LTRMP (monitoring, data management, communication) may also provide valuable input for science and should be coordinated with science projects when appropriate. Science within LTRMP will be implemented mainly through the LTRMP annual Scope of Work, but may also include work conducted through Cooperative Agreements funded by LTRMP, evaluation of HREP's, or through external funding received by LTRMP staff or outside cooperators (e.g., through U.S. Department of Interior cyclical funding, collaboration with academic institutions on grant proposals, graduate student support, etc.).

Coordination of these multiple aspects of science should lead to better integration of work to achieve long term goals. The Strategic Plan, in Output 2, calls for developing a process that will,

“guide and coordinate outputs under Outcome 2, including as they relate to Outcomes 1 and 3. This plan will consider ways to prioritize and sequence analyses and focused research, create opportunities for designing and implementing field experiments, generate data and information needed for modeling efforts, and make effective use of LTRMP and HREP capabilities.”

To date, the LTRMP has conducted or funded a wide variety of science and research efforts, both within UMRR-EMP and with outside cooperators. These science efforts have been coordinated with program managers and among the staff and partners directly involved with the work, and have produced valuable knowledge for UMRR-EMP and river science generally. However, LTRMP could benefit from a science-management process that more broadly engages staff, collaborators, and managers to help integrate science and monitoring across the program.

Such a process would identify science elements to include in LTRMP annual scopes of work that can help make progress on the goals of the Strategic Plan in an organized and coherent manner. When possible, the process should also consider science conducted by programs outside of UMRR-EMP and how that work can help achieve UMRR-EMP goals. The remainder of this document describes that process within LTRMP.

### **A Process for Integrating Science within UMRR-EMP LTRMP and with Collaborators**

Managing and coordinating science within LTRMP requires a means to:

- gather science information and input from program staff and researchers,
- make decisions regarding what science to include in the Scope of Work for each fiscal year,
- develop specific work plans for each science project in the Scope and coordinate that work with other projects, and
- decide when needed science is best pursued through other funding sources or through collaborators.

LTRMP science should build on past and current work across the elements of the Strategic Plan to address the identified science priorities, while using labor and funding efficiently.

In short, the process described below is organized around a biennial meeting of LTRMP science staff and collaborators to communicate science progress and discuss future steps.

The process uses a 3-year running plan, developed by UMESC staff using input from other LTRMP staff and from the biennial meeting. The 3-year plan translates the science priorities from the Strategic Plan and the research frameworks into a series of annual increments with consideration for integration across projects, continuity of work among years, project sequencing, and expected capabilities within the partnership during the period. These annual increments form the basis for specific projects to be included in the annual Scope of Work. The 3-year running plan is updated at least every 2 years following the science meeting.

The description below of this process is based on an annual cycle of activities occurring during each quarter of the year (Figure 1). The description begins in the 2<sup>nd</sup> quarter of the fiscal year (January-March) and follows through to development of the new draft scope of work in the 1<sup>st</sup> quarter of the next fiscal year (September-December).

### **Step 1: Communicate New Science and Develop the 3-year Running Science Plan**

#### **(2<sup>nd</sup> quarter of the fiscal year, January – March)**

Keeping up-to-date on new science will require communication annually to review progress in LTRMP and UMRR-EMP science activities and, when possible, pertinent activities outside of UMRR-EMP. This communication will occur within a 2-year cycle using a face-to-face meeting (or webinar) in one year, and web or email based communication in the following year. The meeting and email-based communication will be organized by UMESC. During winter of the first year of the cycle (January or February), we will convene a Science Coordination Meeting of LTRMP funded researchers (UMESC, Field Stations, graduate students/faculty, partners, contractors, etc.), the A-Team, the LTRMP management team, and interested managers and partners to review and exchange information on research conducted during the past year. This would include work on analyses of LTRMP data, focused research projects, modeling, new data collection, HREP evaluations, literature reviews, tool development, etc.

One month before the meeting, the Principal Investigator responsible for each active science project supported by LTRMP will be asked by the LTRMP Science Director to provide a very short written summary (see attached Form 1) of progress over the past year, including implications of any results to river management and suggested next steps or new questions derived from the project. These summaries will be sent to all meeting participants. For projects that are at or near completion, the investigator(s) will be asked to provide a short PowerPoint presentation of results and should provide draft products, if available. Researchers will also have the opportunity to suggest new science questions if unanticipated, but important, information needs arise. The meeting is expected to last 2 days and will be coordinated with the winter meeting of the Analysis Team.

For this meeting, we will encourage participation by collaborators who are not directly supported by LTRMP, but whose work either makes use of LTRMP data or is directly related to questions critical to the goals of UMRR-EMP and LTRMP. These collaborators will be encouraged to submit summaries of their work and to attend the meeting.

In addition, the Science Director will also work with the UMRR-EMP Program Manager to request an update on current HREP projects and on monitoring or evaluation of those projects. The update should not be exhaustive, but should concentrate on those projects that HREP staff feel provide good opportunities for science and learning. The UMRR-EMP program manager will determine specific personnel from the HREP component to participate in the meeting and provide the review.

At the meeting, participants will review progress in each area of current research, based on presentations and written summaries, then discuss potential next steps and questions as related primarily to the research frameworks. They will also discuss any opportunities for collaboration among science projects (internal or external to LTRMP) or with monitoring efforts, data analyses, HREP's or other management actions, new data collection efforts, etc. For any potential new project, participants will also discuss possible approaches for conducting that work, including whether that work is appropriate for LTRMP funding, or would be best pursued under other funding sources requiring development and submission of grant proposals.

After the initial science coordination meeting, the Science Director and component specialists at UMESC will consider all discussions and input from participants, then draft a 3-year plan that identifies and sequences annual increments of work based on science priorities in the Strategic Plan. The foundation of the plan will be the research frameworks that were developed for each priority research area and vetted with the partnership. The 3-year plan will provide a bridge between the general science priorities expressed in the Strategic Plan and the specific work plans needed in annual scopes of work. It also provides short-term (3-year) continuity in planning among projects and for multiple year projects.

This plan will provide the basis for selecting science projects and activities to include in the annual SOW. The 3-year plan will not be detailed, but will identify basic yearly steps, including coordinated actions needed in other aspects of LTRMP or UMRR-EMP, that are designed to make efficient progress toward answering the science questions in the research frameworks and the goals of the Strategic Plan. Details regarding how the steps will be carried out annually will be developed by the PI's and collaborators when that work is included in a new Scope of Work (see Step 2). The 3-year plan will be due in early March and will be sent to the A-Team and to the LTRMP management team for review, due within 3 weeks. Comments on the plan will be considered by UMESC and any revisions will be completed within 3 weeks. The plan will then be distributed to LTRMP staff, cooperators, and the EMP-CC. After its initial development,

the 3-year plan will become a 3-year running document that is updated at least every other year (after the face-to-face meeting).

In the year following the face-to-face meeting (i.e., in year 2 of the biennial cycle), written summaries of progress in the preceding year will be requested from PI's (using Form 1) and submitted to the LTRMP Science Director in January for distribution to LTRMP staff, collaborators, the Analysis Team, and program managers. All staff and collaborators can provide written feedback by email to the LTRMP Science Director at UMESC regarding the new summaries, progress made, potential collaborations, next steps proposed, and the work identified for the upcoming year in the 3-year plan. The Science Director and component specialists at UMESC will review the 3-year plan, considering the new progress summaries and input received from staff and cooperators, then determine whether the plan needs revision. If so, UMESC staff will revise the plan and the new version will be provided to the A-Team and LTRMP management for review, then posted on the LTRMP web page. The revised 3-year plan will then provide the basis for projects to include in the new SOW.

Based on results of past and current research, the Science Director and UMESC staff may recommend that the research frameworks developed under Strategic Plan Output 2.2 be updated to recognize new findings or pursue new directions. If so, LTRMP managers will look for an appropriate leader to accept that task.

## **Step 2: Develop work plans for individual projects considered for the next SOW**

### **(3<sup>rd</sup> quarter of the fiscal year, April – June)**

In the 3<sup>rd</sup> quarter of the fiscal year, after the 3-year plan is developed or revised, LTRMP managers from the COE and UMESC will develop a "first cut" for science projects that could be included in the next SOW. They will then work with LTRMP science staff at UMESC, field stations, and the Corps to designate Principle Investigators or research teams for each potential project. PI's may come from the LTRMP staff (UMESC, field stations, Corps), non-LTRMP staff at partner agencies, or cooperators (e.g., universities, non-governmental organizations). The most appropriate PI for a project may be obvious, such as for continuing projects, for work under a specific research framework, or for questions proposed by specific individuals. But, there may be times when the most appropriate individuals do not have the time required for a specific project or when projects require expertise outside the original PI's realm. If so, the management team will look for alternate or co-PI's (inside or outside of UMRR-EMP) or contractors, if appropriate.

The designated PI's will then develop draft work plans for their projects. The work plan must provide details of work to be carried out in the next fiscal year (following the basic template for the Annual Scope of Work as provided by UMESC), a list of co-PI's or other critical staff involved, first-cut budgets, and expected products. If work plans require coordinated effort among UMESC, field stations, or other cooperators (for tasks such as data compilation, data analyses, field data collection, sample processing, chemical analyses, GIS support, modeling, development of decision support systems, or writing), the joint work and any specific coordination needed should be described, including any staff or other contributors who are critical to the effort. For multiple year projects, the work plan should also provide details, or at least summaries, of work in out years.

Work plans will be due by June 1. Plans will be sent for review by the LTRMP Science Director to the A-Team and other appropriate subject matter experts within UMRR-EMP. If deemed

appropriate by UMESC or the LTRMP management team, review by outside experts will be sought. Reviews will be due by July 15, and revised work plans due by August 30.

In addition, based on HREP reporting at the Science Coordination meeting, the LTRMP and HREP management teams will collaborate to look for ways to integrate HREP projects into science needs, and to integrate LTRMP (or USGS) scientists as liaisons with HREP delivery teams for projects that provide good potential to learn about critical questions for science or management. Liaisons would offer science advice as needed, including getting other experts involved (within, or outside of, LTRMP) if different expertise is required. Advice could relate to project design and formulation, developing learning objectives, use of existing LTRMP data (or other data sources), developing experimental designs, pre- or post-project monitoring plans, and leveraging of LTRMP infrastructure for assistance.

These collaborations between LTRMP and HREP would occur only if appropriate staff, and any needed funding, are available. Also, the collaboration would operate under the timeframes associated with HREP's and not by the LTRMP planning cycle. However, these efforts could provide project ideas to be considered for inclusion in future LTRMP Scopes of Work or as part of HREP evaluations.

### **Step 3: Generate the draft SOW given likely funding scenarios**

#### **(4<sup>th</sup> quarter of the fiscal year, (July – September))**

Reviews of work plans for science projects are due by July 15. Comments will be sent to PI's and their teams for revisions, which will be due by August 30. Revised work plans will be distributed to LTRMP and HREP science staff.

By September 30, UMESC will work with the Corps to develop the draft Scope of Work for the next fiscal year. Science input for the Scope will come from the work plans developed by the PI's and from other needs identified in the 3-year plan. This will include any coordination needed in work conducted under different Outputs or Activities (e.g., monitoring, data analyses, etc.) of the Strategic Plan. In developing the draft Scope, UMESC will consider science to be included within the LTRMP base scope and additional projects for funding beyond the basic scope, with the realization that adjustments may be required depending upon the level of appropriation passed by Congress. In deciding among projects, consideration will be given to continuing projects first, then new projects, with attention to the proposed time frame and any long term funding commitments required for new work.

If science activities in the Scope of Work include staff time for developing proposals to outside funding agencies, either with LTRMP staff as PI's or in collaboration with staff from other agencies or academic institutions, the time required will be identified and supported within the Scope. If previous proposal submissions that included LTRMP staff were successful and received funding, the work to be conducted will be included in the Scope of Work. The time commitment needed for the work should include any time required by staff to conduct the work proposed, including time needed to administer the funding received or to participate in activities required to manage the grant (e.g., progress reports to the granting agency (in writing or orally), participation in graduate student advising, etc.).

The draft Scope of Work will be reviewed by the A-Team in fall as they have in the past (typically September or October). Comments will be considered during development of the final draft Scope (see Step 4).

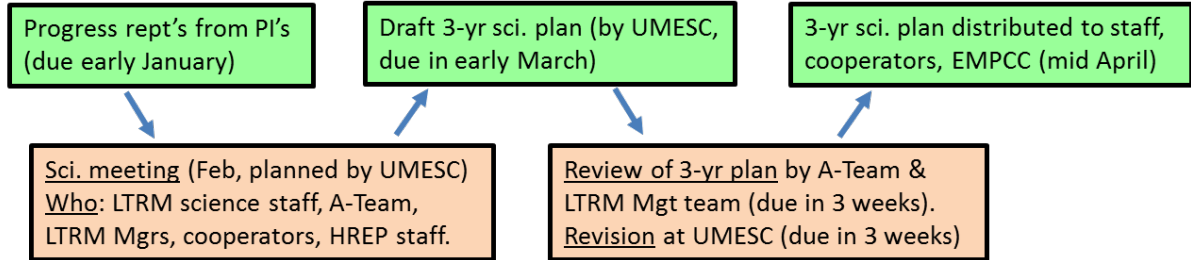
**Step 4: Finalize the SOW****(1<sup>st</sup> quarter of the next fiscal year, October – December)**

In the first quarter of the fiscal year, or whenever the Corps UMRR-EMP Manager is given internal guidance to proceed with developing commitments for the new fiscal year, the COE and UMESC will finalize the draft Scope of Work. The final draft, including science projects, will reflect priorities of the partnership, funding received, availability of labor, coordination with non-LTRMP funded research, and unique opportunities. The final draft will be presented to the EMP-CC for endorsement, ideally at the November meeting.

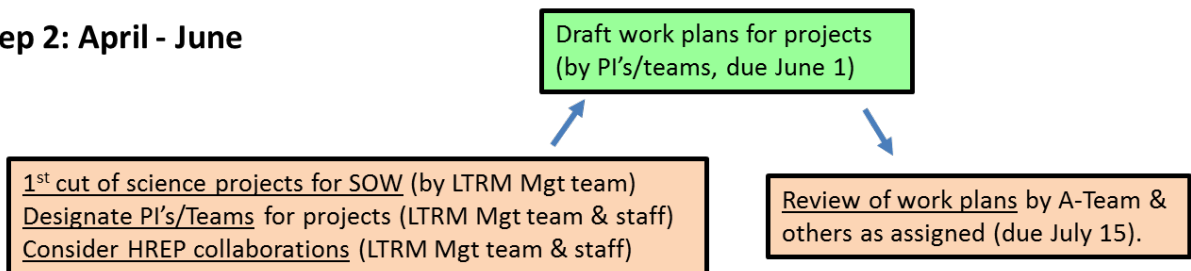
The number of science projects funded will depend on final appropriation levels received from Congress. It is likely that some projects for which work plans were requested will not be included in the final SOW due to funding or logistic considerations. However, these projects, or additional work identified in the 3-year plan, may be funded either later in the fiscal year, if additional dollars become available to LTRMP, or in the next fiscal year. The amount of science that can be accomplished in any one year, or cumulatively over many years, will be directly related to the level of funding committed to support science beyond the funding needs for monitoring and other work.

Figure 1. Time line for the LTRMP Science Planning Process. The Science meeting in Step 1 is expected to be a face-to-face every other year, and conducted by webinar or email in intervening years.

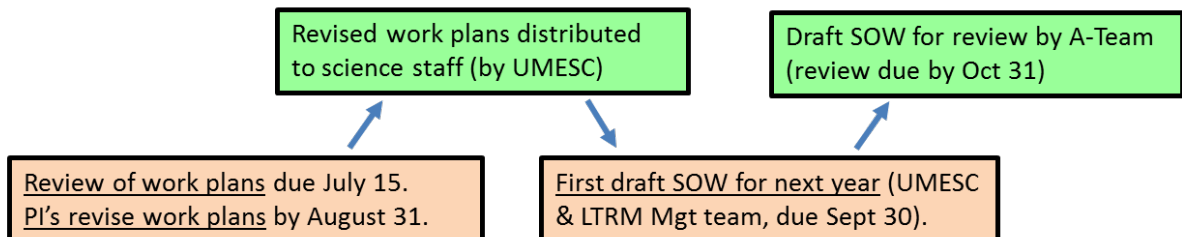
### Step 1: January - March



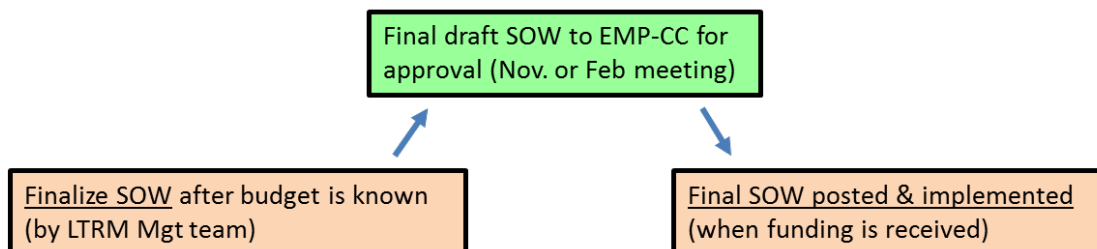
### Step 2: April - June



### Step 3: July - September



### Step 4: October - December





**FORM 1: Annual Progress Report for LTRMP Science Projects and Collaborations**  
**(2-page maximum)**

Project Title: \_\_\_\_\_

P.I. or Team Leader: \_\_\_\_\_

Funding Source: \_\_\_\_\_

LTRMP Product Tracking Number (if applicable): \_\_\_\_\_

Covers progress from \_\_\_\_\_ to \_\_\_\_\_

Progress/Results:

Implications of results for river management:

Next steps or new research questions suggested: