MEETING NOTES

UMRR Analysis Team Agenda April 19, 2023, 12:30 – 4:30 pm

Scott Gritters- Iowa DNR current Chairperson

In-Person meeting with Microsoft Teams connection

Here's a Google Maps link: https://goo.gl/maps/H7HWsWkvtRgi9DcA7

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Date: April 19, 2023
Time: 12:30 pm – 4:30 pm
Chair: Scott Gritters, Iowa Department of Natural Resources

12:30 - 12:40 – Introduction and Roll Call- Scott Gritters

Attendance

A-Team Reps:

Scott Gritters (Chair and IA Rep)
Nick Schlesser (MN Rep)
Shawn Giblin (WI Rep)
Matt O'Hara (IL Rep)
Matt Vitello (MO Rep)
Steve Winter (USFWS Rep)

USGS:
Kristen Bouska
KathiJo Jankowski
Jeff Houser
Jennifer Dieck
Nate De Jager

USACE:
Karen Hagerty
Marshall Plumley
Davi Michl
David Potter
Eric Hanson
Lane Richter

UMRBA:
Andrew Stephenson

MN:

Wisconsin:
Jim Fischer
Patrick Kelly

Iowa:
Dave Bierman
Seth Fopma

Illinois:
Jim Lamer

Missouri:
Dave Herzog

USDA:
Richard Vaughn

USFWS:
Steve Winter
Neal Jackson

12:40 - 12:50 – Time, place, and type of next meeting and approval of February 8th, 2022, A-team meeting minutes

- Anticipated next meeting dates July 15 – August 1. Matt O'Hara will send out doodle request for meeting dates and times.

- Discussion on taking notes for A-Team, currently Andrew S assist with providing notes, Andrew Stephenson – past A-team minutes show discussion of next A-Team Chair being responsible for note taking. Have

also discussed if it could be included as part of UMRBA support service contract, Matt O will discuss with John C and Jim L about using field staff to assist in taking notes KH – note taking under UMRR UMRBA support service contract – would have a cost associated with it. KH – Terry Dukershein_____ previously took notes – was court reporter.

- Approval of February 8th, 2023, meeting notes and minutes
  Steven Winter motion to approve and Matt Vitello 2nds

- Scott Gritters will provide Matt O'Hara with Email list and Materials SG - Have 49 people on A-Team list. Have been very inclusive of list in my tenure. Welcome folks listening in. I will transfer email list and other necessary information to Matt O.

- Other Discussions – No comments from Group

12:50 - 1:20 – “Chloride levels on UMR” River by Kathi Jo Jankowski

USGS
Upper Midwest Environmental Sciences Center

Upper Mississippi River Restoration

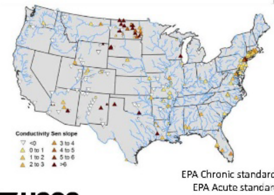
Chloride in the Upper Mississippi River System
Update to the A-Team

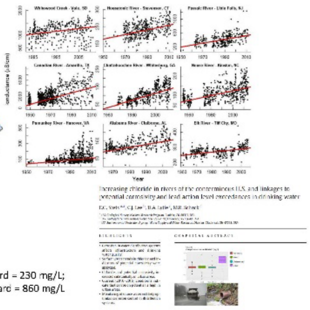
Kathi Jo Jankowski
U.S. Geological Survey, Upper Midwest Environmental Sciences Center
La Crosse, WI
April 19, 2023

U.S. Department of Interior
U.S. Geological Survey

This information is preliminary and is subject to revision. It is being provided to meet the need for timely best science. The information is provided on the condition that neither the U.S. Geological Survey nor the U.S. Government shall be held liable for any damages resulting from the authorized or unauthorized use of the information.

Rising trends in conductivity and chloride across US





EPA Chronic standard = 230 mg/L;
EPA Acute standard = 860 mg/L

USGS

Chloride concentration at Lock & Dam 9, UMR

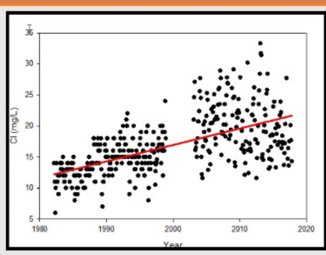


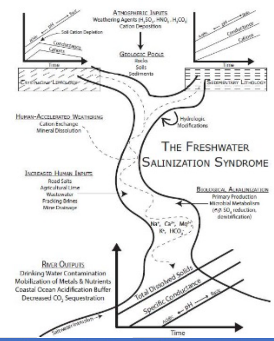
Figure 16 from: How's the River Doing? Mississippi River Clean Water Act Pilot Water Quality Summary for Minnesota-Wisconsin

USGS

“Freshwater Salinization syndrome” and chloride

“**Salt pollution and human-accelerated weathering** are shifting the chemical composition of major ions in fresh water”.

The FSS includes multiple ions from both **anthropogenic and geological** sources such as Na^+, Ca^{2+}, Mg^{2+}, K^+, NO_3^-, SO_4^{2-}, Cl^-, Br^-, etc. and secondary mobilization of other elements (Sr, Cu, Mn, Cd, Zn, Pb, radionuclides etc.) **into chemical cocktails** (Kaushal et al. 2019, 2020; Lazur et al. 2020). - Kaushal et al. 2021



USGS

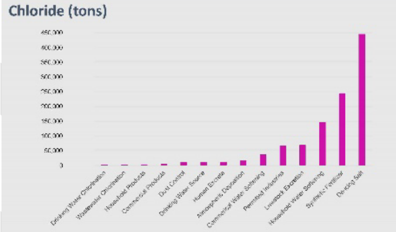
What are the consequences of saltier water?

- Mobilizes contaminants
- Corrosive of city infrastructure (lead pipes in Flint, underground electric wires)
- Biological effects – behavioral change, affects reproduction, alters moisture balance for reptiles/amphibians
- Other effects on habitat conditions: the facilitation of invasion of saltwater species, the interference with the natural mixing of lakes, deposition of salts on the floodplain

USGS

Major Chloride Sources and Their Contributions to the Environment in Minnesota

Chloride (tons)



Major Sources of salts (Kaushal et al. 2019)
- **anthropogenic salt inputs** (e.g., road salts, sewage, brines, sodic/saline irrigation runoff);
- **accelerated weathering** of natural geologic materials by strong acids (e.g., acid rain, fertilizers, and acid mine drainage);
- **human uses of easily weathered resource materials** (e.g., concrete, lime)

Slide: Rob Burdis

Overbo and Heger. n.d. Estimating annual chloride use in Minnesota. Water Resources Center. wrc.umn.edu/chloride

USGS

LTRM Chloride data specifics

- 1993-2002 – all sites, all year
- 2020-2023 (chloride sampling reinstated)
  - Fixed sites:
    - All year, June 2020-current
    - 10-15 fixed sampling sites per sites per study reach
    - Primarily main channel and tributary sites, some side channels and backwaters
  - Stratified random sampling
    - Winter SRS 2021 -2023
    - Main channel, side channel, backwater, impounded, riverine lake

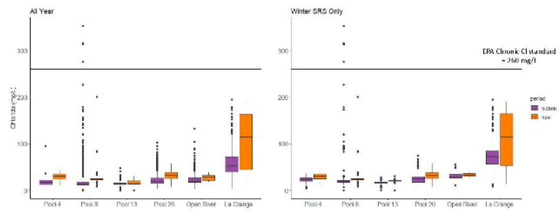
USGS

What do we know so far?

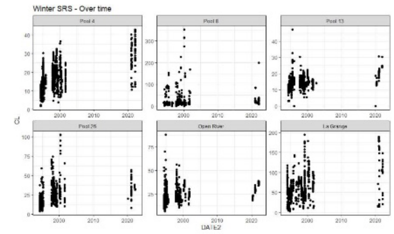
Main questions
- Which reaches have the highest concentration?
- Have concentrations increased over time?
- Where are concentrations highest within the pool?
- Which tributaries are major contributors?
- When are concentrations highest?
- Should we keep monitoring?

USGS

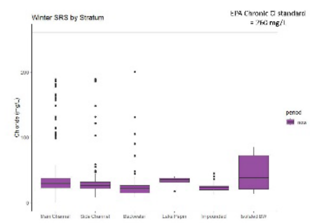
How do concentrations differ across reaches? Past (1993 vs Current)?



Has concentration during winter changed over time?



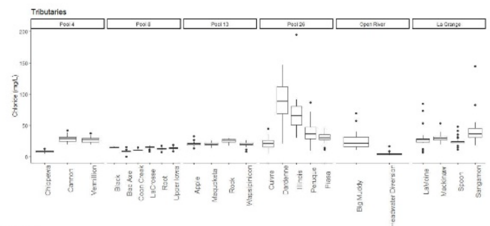
How do concentrations differ across strata?



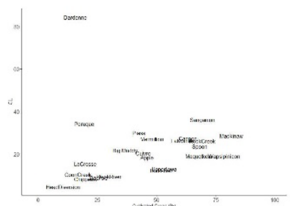
- Concentrations greatest in isolated backwater
- Isolated Backwater > Lake Pepin/Swan Lake > Main Channel > Side channel > Backwater

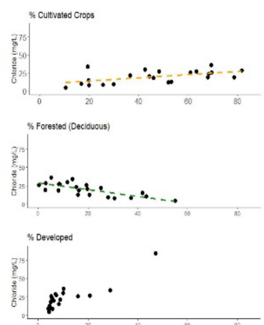
Strata	Median Cl (mg/L)	Max Cl (mg/L)
MC	33.2	188.2
SC	28.9	129.2
BW	23.6	200.5
IMP	23.7	40.2
BW I	38.3	44.6
LP/SL	35.5	34.4

Which tributaries are contributing?

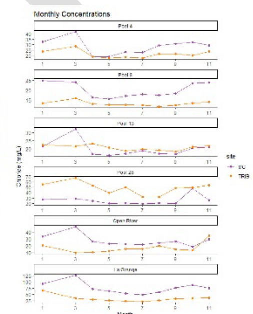


Which tributaries are contributing?





When do concentrations peak during the year?



Use of the data and what's next?

- Use of data so far –
  - UMRCC (Burdis, Giblin)
  - WI DNR chloride report (Giblin, King, Kalas)
- Recommendation on continued monitoring:
  - Recommend continued monitoring at current level
  - Future Consideration: EPA "ion criteria" in development - (salinization; Na^{+1}, K^{+1}, Ca^{+2}, Mg^{+2}, Cl^{-1}, SO_4^{-2}, and HCO_3^{-1}/CO_3^{-2}))

Thank you!

Special thanks -

- Shirley Yuan, John Manier, and Derek Craig of the UMESC Water Quality Lab
- All field station staff - Rob Burdis, John Kalas, Ashley Johnson, Lori Soeken-Gittinger, Sara Sawicki, Luke Zuklic

Upper Mississippi River Restoration

Chloride – winter SRS and all year fixed sites

Category	Position	Comments	2020	2021	2022	2023	2024	2025
Fixed site analysis			$24,570	$18,018	$19,656	$22,604	$23,735	$24,921
Winter SRS analysis			$6,275	$4,602	$5,020	$5,773	$6,062	$6,355
Ion Chromatograph			$27,304					
Total Direct			$58,149	$22,620	$24,676	$28,377	$29,796	$31,286
Indirect Cost	0.57613		$33,502	$13,032	$14,217	$16,349	$17,167	$18,025
TOTAL COST (Gross)			$91,651	$35,652	$38,893	$44,726	$46,963	$49,311

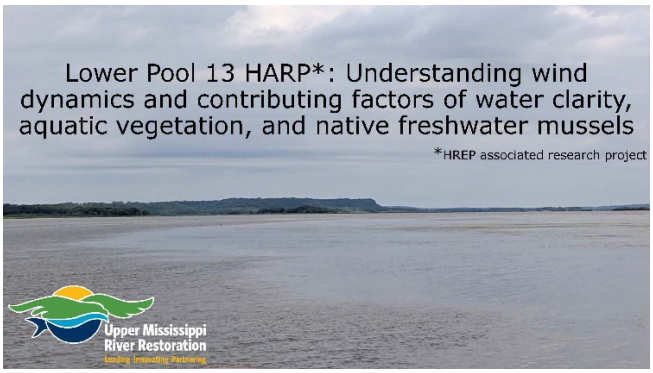
Chloride – full year SRS and fixed sites

Category	Position	Comments	2020	2021	2022	2023	2024	2025
Fixed site analysis			$24,570	$18,018	$19,656	22,604	25,005	29,904
Winter SRS analysis			$6,275	$4,602	$5,020	23,092	24,247	25,439
Ion Chromatograph			$27,304					
Total Direct			$58,149	$22,620	$24,676	45,696	50,242	55,350
Indirect Cost	0.57613		$33,502	$13,032	$14,217	26,327	28,946	31,891
TOTAL COST (Gross)			$91,651	$35,652	$38,893	72,023	79,187	87,244

PRESENTATION DISCUSSION

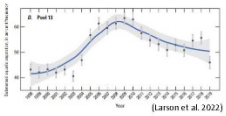
- As a pilot project, added chloride monitoring back into regular WQ monitoring. Last done in 90s – then dropped in 2003 – but increasing concern about Chloride in the basin – were able to add that back in short term. Will share those results and potential recommendations.
- Rising trends in conductivity and chloride across US – many studies show this.
- "Freshwater Salinization syndrome" and chloride – salt pollution and human-accelerated weathering – FSS includes multiple ions from both anthropogenic and geological sources into chemical cocktails.
- Consequences include mobilizes contaminants, corrosive of city infrastructure, biological effects – behavioral change, reproduction, moisture balance for reptiles/amphibians -and other effects.
- Major sources of salts include deicing salts, fertilizer, household water softening among others.
- Item to UMRCC: keep chloride monitoring annual cost is about 45K Possible couple with invert or other fauna to
- Formal recommendation to vote and recommend to keep the existing level of Chloride monitoring in LTRM A-team voted all AYES no Nays, more detailed on budget

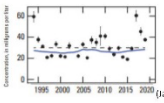
1:20 – 1:50 – “Lower Pool 13 HARP” by Kristen Bouska



Background

- Prevalence of submersed aquatic vegetation, especially wild celery (*Vallisneria americana*), increased from 1998 to 2008 but has since declined in Pool 13
- Water clarity in Pool 13 has exceeded criteria established for sustaining submersed aquatic vegetation in 54% of years since 1994


(Larson et al. 2022)



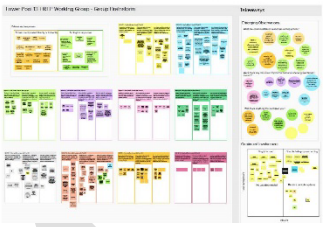
(Jankowski 2022)

Background

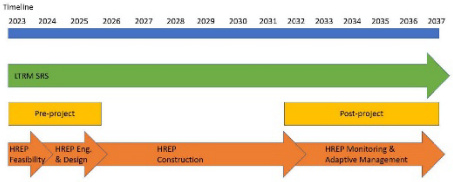
- Concern regarding further loss of wild celery prompted natural resource managers to propose an HREP to improve conditions for submersed aquatic vegetation
  - Water clarity
  - Velocity
- Secondarily to aquatic vegetation, resource managers recognized the opportunity to diversity flow and substrate in the project area to benefit mussels

Research Opportunity

- Brainstorming session at 2022 UMRR Science Meeting
  - Physical drivers
    - Sediment resuspension
    - Upstream turbidity
    - Substrate composition
    - Velocity
  - Ecological responses
    - Aquatic vegetation
    - Mussels
  - Portfolio of physical and ecological responses and interactions



Big picture



Objectives

(1) Pilot a radar wave monitoring system to measure existing (pre-project) wave conditions in Lower Pool 13;

(2) Evaluate relationships between wind, waves, and turbidity, and assess the relative contributions of upstream sources and local resuspension on turbidity in the project area;

(3) Assess spatial patterns and quantify relationships among wild celery, turbidity, and wave dynamics through additional pre-project water clarity and aquatic vegetation field collections;

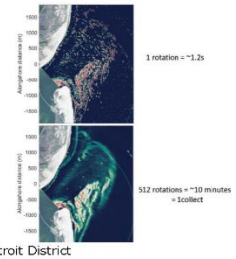
(4) Estimate substrate stability and population size, density, and species richness of mussels pre-project and determine if areas with stable substrates (RSS<1) have more robust mussel assemblages relative to areas with unstable (RSS>1) substrates.

Collaborators

- USGS: Kristen Bouska, Kathi Jo Jankowski, Danelle Larson, Teresa Newton, Jeff Houser, Luke Loken, Angus Vaughan
- IA DNR: Dave Bierman, Seth Fopma, Ashley Johnson
- USACE: Jesse McNinch, Elizabeth Bruns, Steve Gustafson, Dillan Laaker, Rachel Malburg, Kara Mitvalsky, Anton Stork
- USFWS: Steve Winter

Objective 1 - Pilot a radar wave monitoring system to measure existing (pre-project) wave conditions in Lower Pool 13

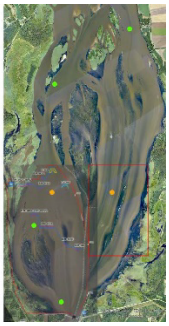
Humberston 2021



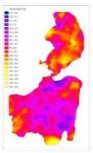
- Collaborators
  - Jesse McNinch and Rachel Malburg, USACE Detroit District

Objective 2 - Evaluate relationships between wind, waves, and turbidity, and assess the relative contributions of upstream sources and local resuspension on turbidity in the project area

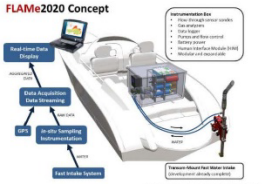
- Data collection
  - Existing weather stations
  - Six continuous turbidity sensors (YSI EXO3)
  - Two continuous wave sensors (RBRsolo|wave 16)
  - One Acoustic doppler velocity meter (Sontek Argonaut)
- Data analysis
  - Nonlinear relationships between wind speed, gust, dir & wave height and period
  - Spatial and temporal patterns in turbidity
  - Threshold analyses to detect velocity or wave characteristics indicative of resuspension
  - Time series analyses of threshold exceedance to estimate contribution of resuspension
  - Hysteresis patterns from turbidity-discharge relationships
- Collaborators
  - New hire, UMESC
  - Kristen Bouska, USGS UMESC
  - Kathi Jo Jankowski, USGS UMESC
  - Elizabeth Bruns, USACE Rock Island District
  - Ashley Johnson, IA DNR



Objective 3 - Assess spatial patterns and quantify relationships among wild celery, turbidity, and wave dynamics



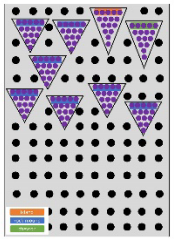
- Data collection
  - FLAMe surveys – turbidity and chlorophyll
    - Project area and control
    - Six surveys across a range of discharges
    - 2024 and 2025
  - Augment LTRM SRS vegetation
    - Project area only
    - +55 sites/year
    - 2023 – 2025
- Analyses
  - Wild celery habitat suitability model
    - Bathymetry, waves, turbidity, chlorophyll, velocity
- Collaborators
  - New hire, UMESC
  - Kathi Jo Jankowski, USGS UMESC
  - Luke Loken, USGS UMid
  - Ashley Johnson, IA DNR
  - Seth Popma, IA DNR
  - Danelle Larson, USGS UMESC



https://flame.wisc.edu/

Objective 4: Estimate substrate stability and population size, density, and species richness of mussels pre-project and determine if areas with stable substrates (RSS<1) have more robust mussel assemblages relative to areas with unstable (RSS>1) substrates.

- Data collection
  - 300 systematic sites in project area (~10 m apart in feature footprint, ~50 m apart elsewhere)
  - **Mussels:** species identity, no. live, age, shell length
  - **Substrate:** % substrate composition, substrate resistance (penetrometer), sediment sample for particle size analysis
- Data analysis
  - **Mussels:** population size, density, species richness
  - **Substrate:** particle size analysis (estimate D50 and D84), and estimate relative substrate stability (RSS)
  - **Combined:** model mussel responses to RSS
- Collaborators
  - Teresa Newton, USGS UMESC
  - Angus Vaughn, USGS UMESC
  - Anton Stork, USACE Rock Island District
  - Kristen Bouska, USGS UMESC



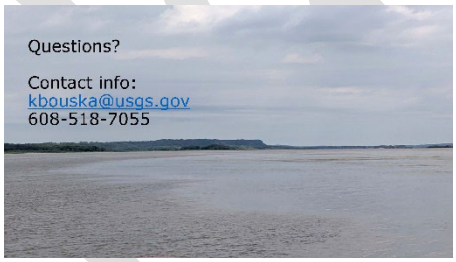
Products

- A minimum of four manuscripts on the topics of:
  1. Wind, wave, turbidity interactions
  2. Contributions of resuspension and upstream delivery to local turbidity
  3. Spatial patterns and correspondence among wave dynamics, turbidity, and aquatic vegetation
  4. Linkages between native freshwater mussel assemblages and substrate stability
- Data products - Baseline, pre-project information for post-construction assessments on the effects of specific project features on wave dynamics, velocity, substrate, water clarity, aquatic vegetation, and mussels

Budget

Objective 1: $133,840
Objective 2: $354,678
Objective 3: $173,277
Objective 4: $394,492
USACE coordination: $25,000

Total: $1,081,287



- ATEAM review of proposal- END of Month to REVIEW
- 3 fiscal year budget
- OBJ1 134K
- OBJ2 345K
- ObJ 3 173K
- OBJ4 394K
- Total $1M budget
- Support with the project

1:50 – 2:05 – My final check-in on the A-team corner highlights and Field station descriptions update, how is that going? Scott Gritters and Team Leaders?

- Get field station information ASAP and correctly, eventually standardize to the page
- Recommended agenda item at next meeting on standardizing of information on this page

2:05 – 2:15 – Reminder of the Chair rotation to Matt O'Hara and will try to have a smooth handoff of responsibilities. Scott Gritters and Matt O'Hara

2:15 - 2:30 – UMRR fisheries flyer's-status, what is done, what is next and when can they be shared- Andrew Stephenson

- Completed all the flyers, submitted flyers publishing, having final by end of Week. UMRBA web page versions. Will submit to Karen, printed versions will be sent out, coordinated release through PR department. Tool kit will be separated out by state and be forthcoming by

- Andrew will send me email when flyers are available and send out to broad group
- Report to congress flyer come out by June.

- Print versions and digital versions

- AS - Update – all five flyers completed – noticed some inconsistencies across them in language used – aquatic vegetation in one aquatic plants in another – so we just sent final comments to the designer to address. Social media push anticipated for this summer.
- SG – job well done. Great products – hard to distill down to two-pages. Excited to use them.

2:30 - 2:45 – The progress and preliminary outputs from the LTRM Implementation Planning Team, how does this circle back to the Analysis team? Jeff Houser and Karen Hagerty

UMRR LTRM Implementation Planning Update

Analysis Team Meeting
19 April 2023
La Crosse, WI

Upper Mississippi River Restoration
Leading. Innovating. Partnering.

Conclusion of the previous A-team update

- Currently
  - Refining optimization based on initial trials
- Next steps
  - Use optimization results as starting point for discussion of recommendations regarding what information needs to funding and the order in which that should be implemented.

Criteria for assessing Information Needs

- Relevance/Importance to Ecosystem Understanding and Assessment
- Relevance/Importance to Management and Restoration
- Depth of Current Knowledge (less current knowledge -> higher score)
- Opportunity to Learn
- Urgency
- Unique capacity

Qualitative Value-of-information (QVoI)

- Relevance & Importance
  - Ecosystem Understanding/Assessment
  - Management and Restoration
- Depth of Current Knowledge

Qualitative Value of Info

- Opportunity to Learn

Feasibility

Expected Benefit

- Cost

Expense

- Urgency
- Unique capacity

Context or Tie-breakers

Optimization

- Considers:
  - Expected Benefit
  - Estimated Cost
  - Minimum number of years needed to obtain expected benefit
  - Annual funds available
- Allocates funds across years to maximize total expected benefit over 10 year period.

Scenarios considered

1. Optimize total expected benefits over 10 years
   - Results in **highest total benefits** over 10 years.
   - Selects greatest number of information needs
   - Selects smaller information needs at the expense of really big ones
2. Optimize total expected benefits but restrict number of new starts each year (3, 4 or 5)
   - Favors large information needs with highest expected benefits
   - Selects fewer information needs with larger individual expected benefits
3. Select Information needs with high individual expected benefits
   - Fewer Large information needs with larger expected benefits

Information Needs tentatively selected for further development (1 of 2)

- System-scale assessments of changes in floodplain vegetation
- Spatial and temporal distribution of higher trophic levels on the UMRS floodplain (birds, bats, reptiles, amphibians)
- Where and how the geomorphology of the river and floodplain changing and can be expected to change over planning horizons of decades to centuries
- Community composition, abundance, and distribution of native and non-native macroinvertebrates in the UMRS
- Status and trends of mussel species within the Upper Mississippi River and Illinois Rivers

Information Needs tentatively selected for further development (2 of 2)

- Abundance, distribution, and status of zooplankton and phytoplankton
- Ecological condition of the transitional portion of the UMRS between Navigation Pools 13 and 26
- Restoration and management actions as experiments (Hypothesis Testing)
- Floodplain vegetation change at restoration project scales
- Effects of restoration on habitat conditions

Next

- Revise and refine tentatively selected information needs:
  - More detailed description of the work that would be done
  - Refined cost estimate
- Update UMRR CC at May quarterly
  - Tentative list of information needs selected for further development (previous two slides)
- Develop specific recommended portfolio of information needs to address in FY 24 – 26/27
- Present that portfolio during August A-team meeting
- Seek UMRR CC endorsement of that portfolio at the August Quarterly meeting.

Information Need Title	Small group participants
Floodplain Ecology: Vegetation Change Across the System	**Nate DeJager**, Rob Cosgriff, Davi Michl
Floodplain ecology: terrestrial and aquatic herpetofauna	Andrew Stephenson, Nate DeJager, Rob Cosgriff, Davi Michl, Ryan Burner (USGS), Eileen Kirsch (USGS), Mark Roth (USGS), Tara Hohman (Audubon), Dale Gentry (Audubon)
Hydrogeomorphic change: Geomorphic trends	Jeff Houser, Robb Jacobson
Aquatic ecology: river gradients	Molly Sobotka, Jim Lamer, Karen Hagerty, Jeff Houser
Restoration Applications: hypothesis testing	Steve Winter, Kristen Bouska, Rob Cosgriff, Matt Mangan, Kirk Hansen

Implementation Planning Group

- Kirk Hansen IADNR
- Jim Lamer IRBS
- Molly Sobotka MDC
- Matt Vitello MDC
- Rob Burdis MDNR
- Nick Schlesser MDNR
- Neil Rude MDNR
- Andrew Stephenson UMRBA
- Davi Michl USACE
- Rob Cosgriff USACE
- Karen Hagerty USACE
- Matt Mangan USFWS
- Steve Winter USFWS
- Kristen Bouska USGS
- Nate De Jager USGS
- Jeff Houser USGS
- Jennie Sauer USGS (retired)
- Robb Jacobson USGS
- Jim Fischer WDNR
- Madeline Magee WDNR

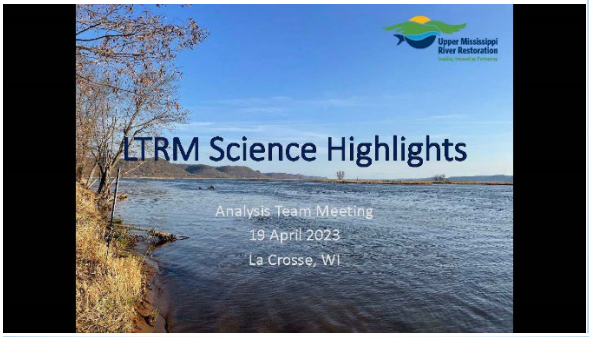
Facilitators:
David Smith (USGS, retired)
Max Post van der Burg (USGS)

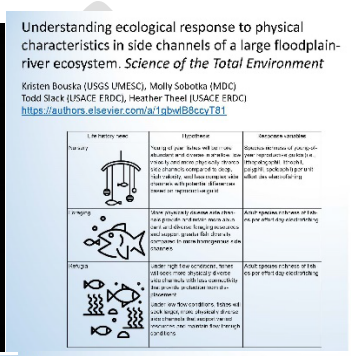
- Dave Potter – Restoration applications – how does that compare to Adaptive Management?
- Jeff H – HREPs alter some fundamental drivers of ecosystem – this would be to evaluate how ecosystems respond. Better understand cause and effect.
- KH – laying out that
- SW – testing hypothesis – collecting hypothesis.
- DP - Conceptual ecological models – evaluating them?
- Matt O'Hara – how does catastrophic events fit into this? 5,000-year flood. With information needs.
- JH – how does reacting quickly to a major environmental issue
- AS – Reserved some funds in our science in support budget to maintain flexibility to address science needs that arise outside of this.
- Nick S – increases staff capacity – to address upcoming things.
- Jeff H – rapid response.
- Nate DeJager - One response to that question could be that by increasing and diversifying our staff, that we'd be in a much better situation to address emerging issues and punctuated disturbances.

- Scott Gritters – how does the whole process circle back to the A-Team. Do we endorse something? How does that circle back?
- Jeff H – for context – we started process – big undertaking – need broad set of perspectives to bear on it. UMRR CC directed us to form this group to make recommendations. We have 3 members of A-Team on that group as well as other expert perspectives from the
- Not sure how to formally have two groups making recommendations to the UMRR CC. My understanding was that that IP group would make that set of recommendations – but in making those recommendations it is incorporating direct perspectives from the various agencies into the process.
- KH – ad hoc was initiated by UMRR CC
- Nick Schlesser – I would support it either way. If Scotty or Matt feels it would be beneficial – think we could add an A-Team recommendation on top of that. I'm confident in what we will be putting out from that process.
- Scotty G – It seems a little weird to have these two groups running in parallel – why wasn't this tasked to the A-Team – since that's what this group does. The question is to ensure you circle back to the A-Team. I think we have to keep on the agenda and keep us in the loop. Kirk and Dave and I talk daily about it – but can see it being an issue.
- KH – UMRR CC has several options available for how they want to get information – one is to stand up an *ad hoc* group -which they chose to do here. It's their prerogative – important to have A-Team on board – conscious effort to make sure all field stations, UMRR CC, and Field Stations were involved.
- Jeff H – Want to have a period of time during these meetings so we can have questions/concerns on suggestions etc for us to take back to the discussions. The expertise in this group is important and extensive and outputs will benefit from that -but it seems that expertise is routed through that other group for this particular effort.
- Update LTRM Implementation and Planning Update Houser
- Criterial for assessing information needs

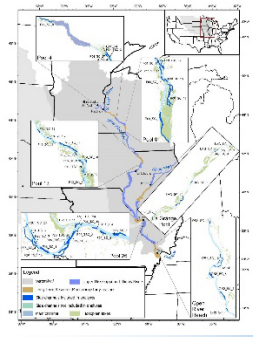
- 10 needs were identified
- Refining lists and meeting IMP
- Flexibility in addressing at biannual meeting
- How does this circle back to ATEAM- Perspective already in group
- Giving updates

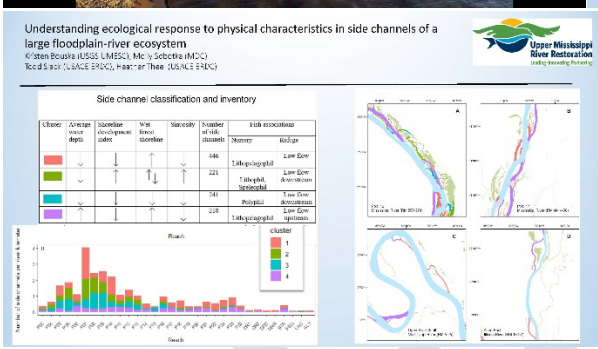
2:45 – 3:00 – LTRM Science Highlights and upcoming new proposals- Jeff Houser UMRCC

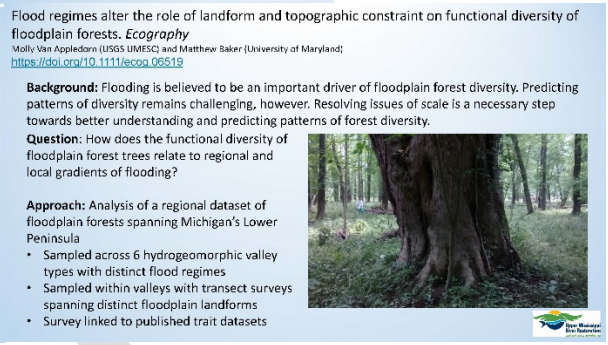



Understanding ecological response to physical characteristics in side channels of a large floodplain-river ecosystem. *Science of the Total Environment*

Kristen Bouska (USGS UMESC), Molly Sobotka (MDC)
Todd Slack (USACE ERDC), Heather Theel (USACE ERDC)
https://authors.elsevier.com/a/1qbwlB8ccyT81






Flood regimes alter the role of landform and topographic constraint on functional diversity of floodplain forests. *Ecography*

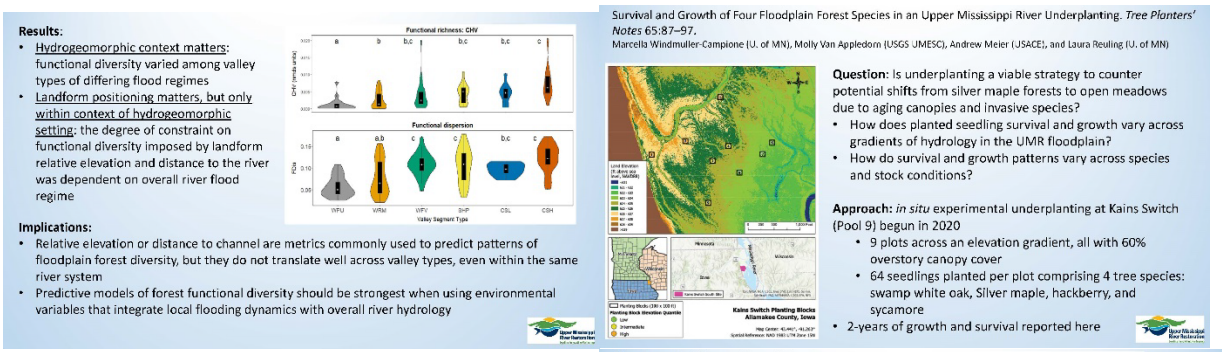
Molly Van Appledorn (USGS UMESC) and Matthew Baker (University of Maryland)
https://doi.org/10.1111/ecog.06519

Background: Flooding is believed to be an important driver of floodplain forest diversity. Predicting patterns of diversity remains challenging, however. Resolving issues of scale is a necessary step towards better understanding and predicting patterns of forest diversity.

Question: How does the functional diversity of floodplain forest trees relate to regional and local gradients of flooding?

Approach: Analysis of a regional dataset of floodplain forests spanning Michigan's Lower Peninsula

- Sampled across 6 hydrogeomorphic valley types with distinct flood regimes
- Sampled within valleys with transect surveys spanning distinct floodplain landforms
- Survey linked to published trait datasets



- Series of Pubs on Side Channels
- Floodplain Forests conditions Pubs
- Spotted bass expanding their range

3:00 - 3:15 – Break

3:00 – 3:15 – Preparing for a UMRR LTRM without Karen Hagerty in the Lead. Acknowledgment of a job well done! Scott Gritters, all

- Karen Hagerty Acknowledgement
- Karen – remodel kitchen, convert yard to prairie, learn Spanish, paint, visit kids. Short-term goal is to get mom into assisted living.
- Scott G – I know you're excited about retirement, but you have passion.
- Karen – I will go to UMRCC as retiree. What we collectively do is phenomenal. I am honored to work with you all. Partners make this job.
- SG – formal thanks from A-Team. You've been great to work with and keeping me on track. Thank you. What are Corps plans for your position?

- KH – Going to open my position as GS-12 to public. May be offered in any of the three districts. Hopefully that announcement will go out before I leave.
- Marshall Plumley – We're working to get advertisement ready to go for Karen's backfill. Goal is to have it filled as closely to Karen's departure as I can. Working through chain of command to get that done. Advertising that regionally. Internal to agency and for outside candidates to apply for as well.
- SG – thank you for all your work.
- Jeff H – I agree enthusiastically. I appreciate all your efforts over many years. You've done a lot for the program so thank you.
- SG – you won't be at the next A-Team meeting?
- KH – if it's before July 29, I will.
- SW – very welcoming to me in the partnership when I joined. I appreciate it.
- Thanks for all the work, Scotty and Jeff.
- Working on backfill and getting out Regionally and outside and getting hire before Karen retires,
- Before July 29th Karen can attend meeting
- Davi Michl did a 120-day detail. Dan Meden is currently doing one.

3:15 - 3:30 – UMRR and LTRM update-Marshal Plumley and Karen Hagerty

UMRR ANALYSIS TEAM

Marshall Plumley
Regional Program Manager
St. Paul District
Rock Island District
St. Louis District

19 April 2023

Upper Mississippi River Restoration
Leading · Innovating · Partnering

US Army Corps of Engineers

BUILDING STRONG® *and Taking Care of People!*

UPPER MISSISSIPPI RIVER RESTORATION PROGRAM

Partner Engagements:
UMRR CC 24 May St Paul

Execution:

•	**Overall Program $55,000,000 / $29,984,537**	**54.5%**
•	Regional Program $3,250,000 / $1,223,620	37.6%
•	LTRM/Science $13,850,000 / $4,052,903	29.3%
•	MVP HREP $11,148,000 / $8,201,393	73.6%
•	MVR HREP $13,502,000 / $7,657,472	56.7%
•	MVS HREP $13,250,000 / $8,829,148	66.6%

HREP Design/Construction:

- Lower Pool 10 (MVP) – Complete SOW, AE Stage I design
- Base Ponds (MVP) – Dedication (11 Oct)
- Harpers Slough & Conway Lake (MVP) – Complete Construction
- McGregor Lake (MVP) – Award Stage II
- Steamboat Island (MVR) – Awarded Stage I contract (31 Aug)
- Huron Island (MVR) – Ribbon Cutting (07 Sep) (photos)
- Keithsburg Division (MVR) – Working on storage building (photo)
- Clarence Cannon Berm Setback (MVS) – Earthwork underway
- Plaza & Eagles Nest Islands (MVS) – Completed Stage I

HREP Feasibility:

- Big Lake (MVP) – Evaluating alternatives
- Reno Bottoms (MVP) – Feasibility report submitted to MVD
- Pool 12 Forestry (MVR) – PDT working on quantities and starting HEP modeling for all alternatives.
- Lower Pool 13 (MVR) – MVD is reviewing backchecks and PDT working on addressing Public Review comments
- West Alton Islands (MVS) – PDT draft Sponsors Agreements
- Yorktaut Slough (MVS) – TSP Mtg with MVD 25 Jan

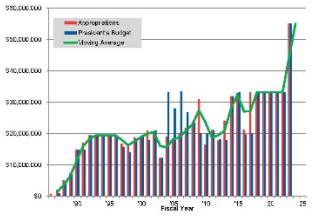
LTRM:

- UMRR LTRM FY23 Base Monitoring SOW developed, partially funded
- UMRR LTRM Implementation Planning – to identify highest priority information/science & actions for funding
  - Biweekly meetings, in-person workshop in Sept 13-15, WIU Moline
    - Final review of information needs
    - Scoring criteria developed
    - Preliminary scoring underway

Upper Mississippi River Restoration

FUNDING

- Since 2018, Congress has funded the program to levels matching UMRR's full authorized annual amount of $33.17 million
- WRDA 2020 Authorization $55M
- FY 23 $55 Appropriation
- WRDA 2022 Authorization $90M



BUILDING STRONG®

Upper Mississippi River Restoration

FY 24 APPROPRIATIONS

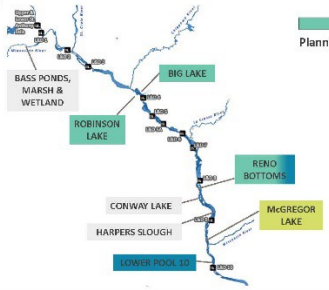
President's Budget	$55,000,000
House	?
Senate	?
FINAL APPROPRIATION	?

BUILDING STRONG®

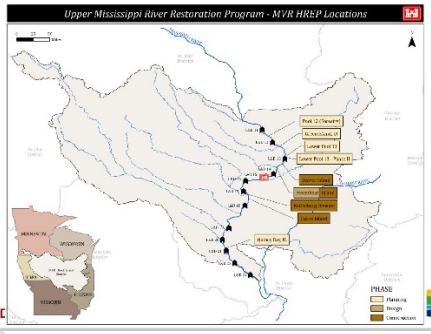
Upper Mississippi River Restoration

ST. PAUL DISTRICT (MVP)

Planning Design Construction

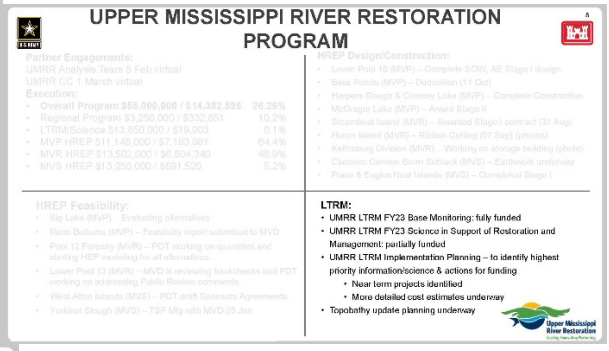


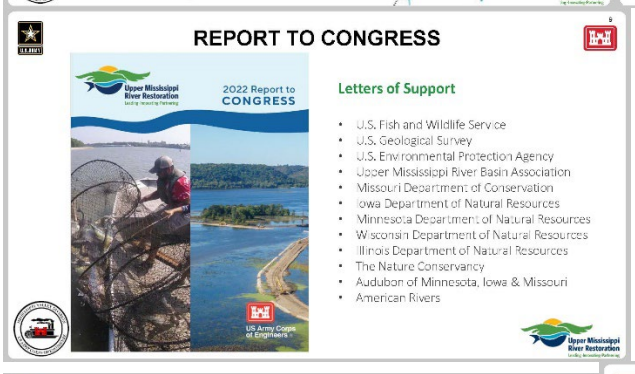
Upper Mississippi River Restoration

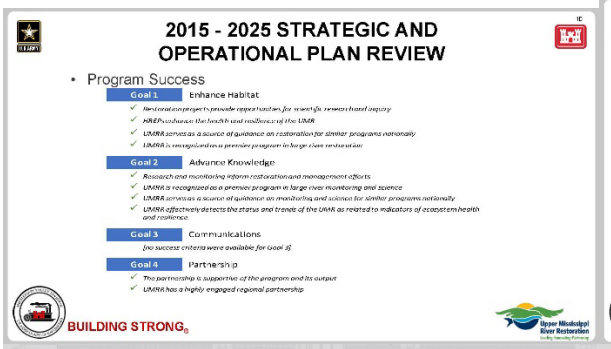


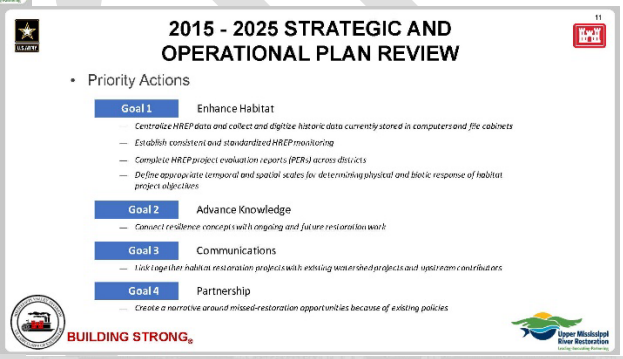
BUILD

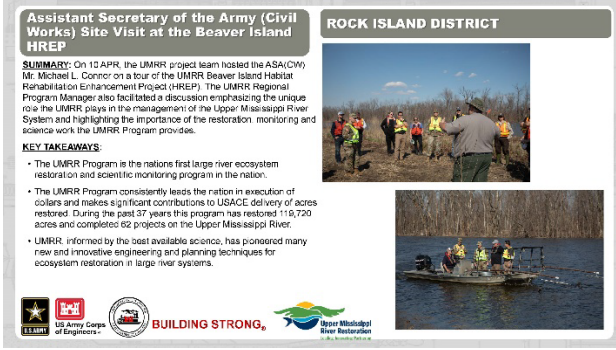
Upper Mississippi River Restoration











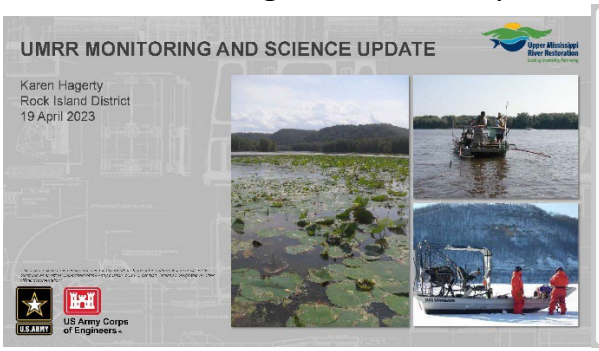
- Congress has increased authorization to $90M. $75M for HREP and $15M for LTRM.
- President's FY24 budget was released – includes $55M for UMRR. Will have to see where House and Senate end up.
- May be a year of tightening budgets.

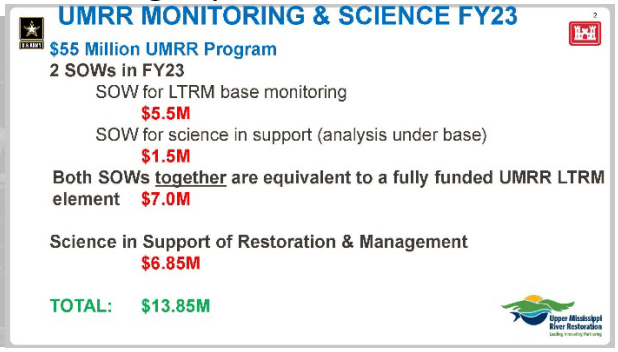
- Robinson Lake will have public meetings on May 17.
- Developing Model PPA for State of Iowa to consider for Green Island project.
- Quincy Bay – TSP expected later this year.
- Huron completed physical construction – doing monitoring and adaptive management.
- Spillway continues at Keithsburg- spillway and building.
- Groundbreaking at beginning of May was anticipated, but water levels may delay.
- Beaver Island – some tree planting work to occur over next 6-10 months after contract award. Hope to add to completed category in Fy24.
- Harlow Island – may be construction award in FY24 – Oakwood possibly in Fy25. Design work for now.
- Piasa and Eagles Nest, Clarence Cannon, and Crains Island are in construction – Clarence Cannon is closest to being finished, but still considerable work.
- At last quarterly meeting, provided draft summary review of that report. Andrew can provide copy of report. As we approach end of 10-year planning horizon we identified what we can
- 200 folks surveyed across partnership.
- Items where folks felt we were doing well – with goals laid out in strategic plan.
- Priority Actions to work on.
- Work program has been doing with defining resilience and applying concepts to restoration work that is ongoing.
- Communications and partnership – how do we link projects within authorized area with work in watershed.
- Partnership – narrative around barriers – how to neatly package that information to get in front of folks can have them understand additional work that can be done if issues were resolved. Report is pretty finalized – will springboard into development of next strategic plan – to kick off in

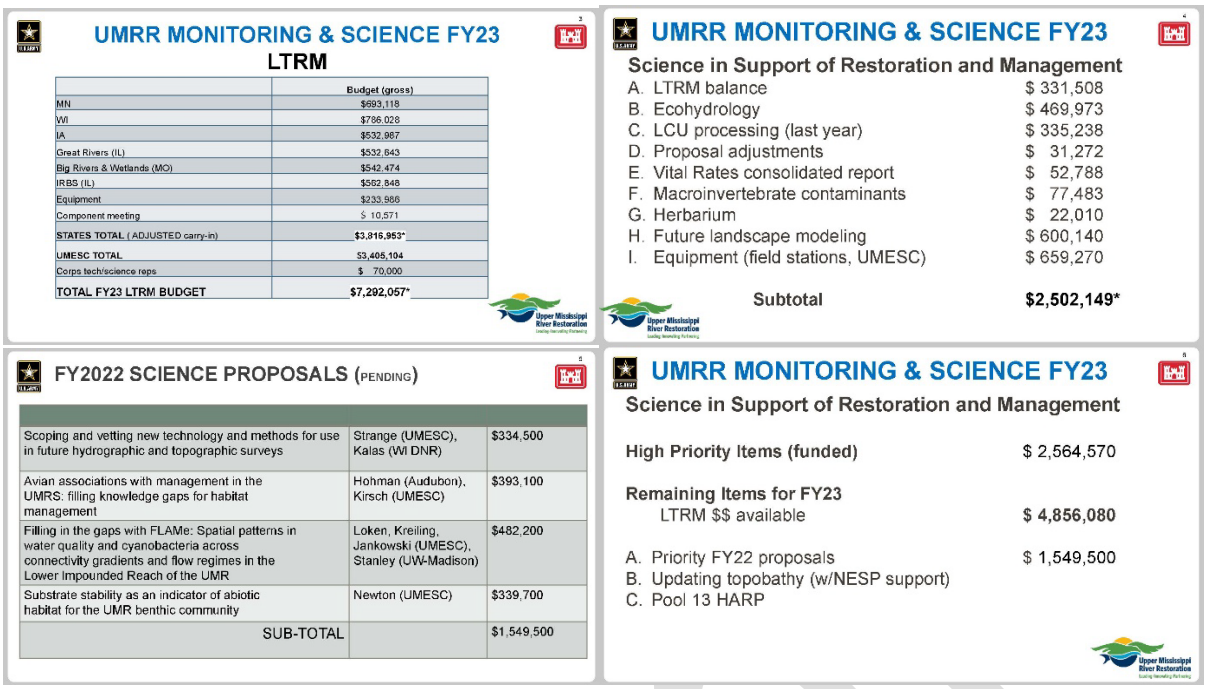
2024. I imagine there will be some discussions about how A-Team will contribute to strategic plan.

- Secretary Connor – wanted to get to project site and get briefing on UMRR. Had 9 boats on the water that day at Beaver Island. I had 45 minutes to provide high level overview of partnership and work that LTRM is doing. Fantastic visit – he got a lot out of it – feedback I got after visit – he was extremely impressed by program – Iowa was kind to get secretary and commander on electrofishing boat. In 3-4 hours with him, he got a great understanding of what program does and what partnership is all about. He asked great questions. His interest was driven by request for $55M for program and he wanted to see what we are doing. Thanks to all partners for helping to show what this program is all about.
- UMRR UPDATE
- May 24 UMRR CC
- Budget is where we need to be at this time of year
- FY24 President budget is at 55M again
- Tightening spending maybe divergence in sure
- HREP project statuses
- Groundbreaking on Steamboat Island maybe delayed
- Report to congress has been moved up to Assistant Secretary of Army
- Strategic Review
- Survey of Partnership –
- Priority ACTIONS- 4 Goals
- Assistant Secretary of Army on Beaver updated on UMRR partnership and was impressed
- Questions for Marshall
- Appropriations committee, letter from Daren LaHood in support of 55M

UMRR Monitoring and Science update-Karen Hagerty







UMRR MONITORING & SCIENCE FY23

LTRM

	Budget (gross)
MN	$693,118
WI	$786,028
IA	$532,987
Great Rivers (IL)	$532,643
Big Rivers & Wetlands (MO)	$542,474
IRBS (IL)	$562,848
Equipment	$233,986
Component meeting	$ 10,571
STATES TOTAL (ADJUSTED carry-in)	**$3,816,953***
UMESC TOTAL	**$3,405,104**
Corps tech/science reps	$ 70,000
TOTAL FY23 LTRM BUDGET	**$7,292,057***

UMRR MONITORING & SCIENCE FY23

Science in Support of Restoration and Management

A. LTRM balance	$ 331,508
B. Ecohydrology	$ 469,973
C. LCU processing (last year)	$ 335,238
D. Proposal adjustments	$ 31,272
E. Vital Rates consolidated report	$ 52,788
F. Macroinvertebrate contaminants	$ 77,483
G. Herbarium	$ 22,010
H. Future landscape modeling	$ 600,140
I. Equipment (field stations, UMESC)	$ 659,270
Subtotal	**$2,502,149***

FY2022 SCIENCE PROPOSALS (PENDING)

Scoping and vetting new technology and methods for use in future hydrographic and topographic surveys	Strange (UMESC), Kalas (WI DNR)	$334,500
Avian associations with management in the UMRS: filling knowledge gaps for habitat management	Hohman (Audubon), Kirsch (UMESC)	$393,100
Filling in the gaps with FLAMe: Spatial patterns in water quality and cyanobacteria across connectivity gradients and flow regimes in the Lower Impounded Reach of the UMR	Loken, Kreiling, Jankowski (UMESC), Stanley (UW-Madison)	$482,200
Substrate stability as an indicator of abiotic habitat for the UMR benthic community	Newton (UMESC)	$339,700
SUB-TOTAL		$1,549,500

UMRR MONITORING & SCIENCE FY23

Science in Support of Restoration and Management

High Priority Items (funded)	$ 2,564,570
Remaining Items for FY23	
LTRM $$ available	**$ 4,856,080**
A. Priority FY22 proposals	$ 1,549,500
B. Updating topobathy (w/NESP support)	
C. Pool 13 HARP	

- Had a lot of carry-over this year, and uncertainty around funding level.
- Current commitments for this year. A-F are typically funded items. Ecohydrology is funding Molly Van Appledorn for 2 more years. LCU processing, adjustments to proposals. Vital rates group wanted to provide consolidated report. Had postponed macroinvertebrate contaminants portion to fund a fourth funding.
- Last three funding items are new – asked for concurrence from Coordinating Committee – will work with university to establish herbarium. Then wanted to also fund future landscape modeling efforts – John Delaney has a three-year scope there. Invested in equipment as well.
- $2.5M went out to UMESC week before last. UMRR obligations Marshall showed did not include this amount.
- Want to fund four additional funding proposals from 2022 science meeting. One proposal to quantify available energy from aquatic and floodplain plants fell off. These numbers are approximate – should have updates soon. Prepared to ask UMRR CC to endorse these proposals that were scored and reviewed last Three buckets to fund this year at $4.8M – four proposals, Pool 13 HARP – and updating topobathy (with NESP support). We will

award task orders still this fiscal year. In addition, NESP has indicated it will provide funds for topobathy, it will be less than $4.5M, but not sure what. Also have to consider how much to fund for P13 HARP this year.

Presentation Discussions

- Shawn G – what is extent of topobathy – pools? Reaches?
- KH – last time we did not update study reaches because they had complete bathymetry. For Lidar, we had 30M DEMs – then went down to 1 point per square meter – now more 8-16 points per square meter. Have some shallow vegetated backwaters – trying to determine how best to approach.
- Davi M – also looking at how to approach upper impounded reach shallow backwater areas.
- KH – Lidar is cheaper than bathymetry.
- Dave Potter - NCER abstracts for next year. Will UMRR program be ready to be going to that kind of conference and presenting alongside Chesapeake Bay?
- Karen H – I worked with someone from ERDC – we sponsored whole section on the river. Focused a lot on the Upper River. We've been ready for that.
- Dave Potter – abstracts are due next month for symposiums.
- Karen H – at our special NCER session in LA – same people we always talk to were the main attendees.
- Dave Potter – someone on Corps planning team we should reach out to. Those need lead time to organize.
- Marshall Plumley – Corps has been approached about putting sessions together. I've been approached about including UMRR for Upper Miss. More information to follow.
- *Dave Herzog - Can the equipment list be resent to stations for a reminder of approval?*
- FY23 LTRM 7 M
- Science 6 M
- John Delaney 600K

- Field station equipment 660K
- Fund the next 4 projects from FY22 instead new proposals
- 4.8 M left over in budget
- Pool 13 HARP proposal
- Topobathy
- Corp and HREP contributions

3:30 - 3:40 – Introduction of "new" staff in the UMRR LTRM- Field Station Leaders, Karen Hagerty, Jeff Houser and Team Leaders

- Jim Lamer - _____ started for us as coordinator.
- Nick S – Lake City area has supervisor who will be starting soon – previous work on Illinois River. Neil Rude's old position.
- Dave Herzog – structure update and new techs. Molly Sobotka is LTRM program supervisor, and I will supervise Molly. Have new techs – turning over left and right.

3:40- 3:55 – Field Station in Focus, the people that make up the Great Bellevue Field Station, past and present by Dave Bierman and Scott Gritters

Iowa DNR Mississippi Monitoring Station

Bellevue, IA – RM 556.4

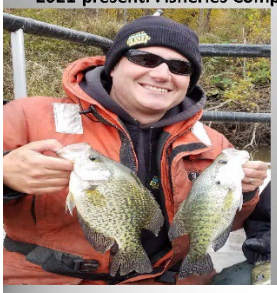
STAFF

Dave Bierman – Team Leader
Travis Kueter – Fisheries Component Specialist
Seth Fopma – Vegetation Component Specialist
Ashley Johnson – WQ Component Specialist

Five seasonal positions 2023:
Run April 1 through mid-November
Graduate Assistant, ~ 2.5 year term

Travis Kueter – Fisheries Specialist

- B.S. Biological Research - Loras College, 2004
- 2004-2005: Seasonal with IDNR Bellevue stations, EMAP
- 2005-2007: Nebraska GFP - MO River pallid sturgeon recovery effort
- 2007-2021: WQ Component Specialist, Bellevue LTRM Station
- 2021-present: Fisheries Component Specialist



Favorite part of working on the Miss:
"Every day is different; I'm very thankful to have the opportunity to spend almost every day on this amazing resource!"

Wife Cortney; father of two boys and two girls. Enjoys hunting, fishing and being on the River with his family.

Dr. Seth Fopma – Vegetation Specialist

- B.S. Biology - Dordt College, 2014
- PhD South Dakota State, 2020 - studied native, non-game fish distributions in the Black Hills
- 2020-2021: Nebraska GFP - MO River pallid sturgeon recovery effort
- 2021-present: Vegetation Component Specialist

Favorite part of working on the Miss:
"Being able to witness the dynamic shifts in the River and participate in ecosystem restoration efforts."

Enjoys spending time with his wife Katie and trying to keep up with his bird dog Cato.

Ashley Johnson – Water Quality Specialist

- B.S. Aquatic Ecology – Eastern Illinois University, 2014
- M.S. Western Illinois University, 2020 – studied blue catfish diets
- IRBS: LTEF Pools 19-21; zooplankton monitoring
- MODOC: MO River pallid sturgeon recovery effort
- 2021-present: Water Quality Component Specialist

Favorite part of working on the Miss:
"Getting to explore all the different parts of the River that most people don't usually get to see."

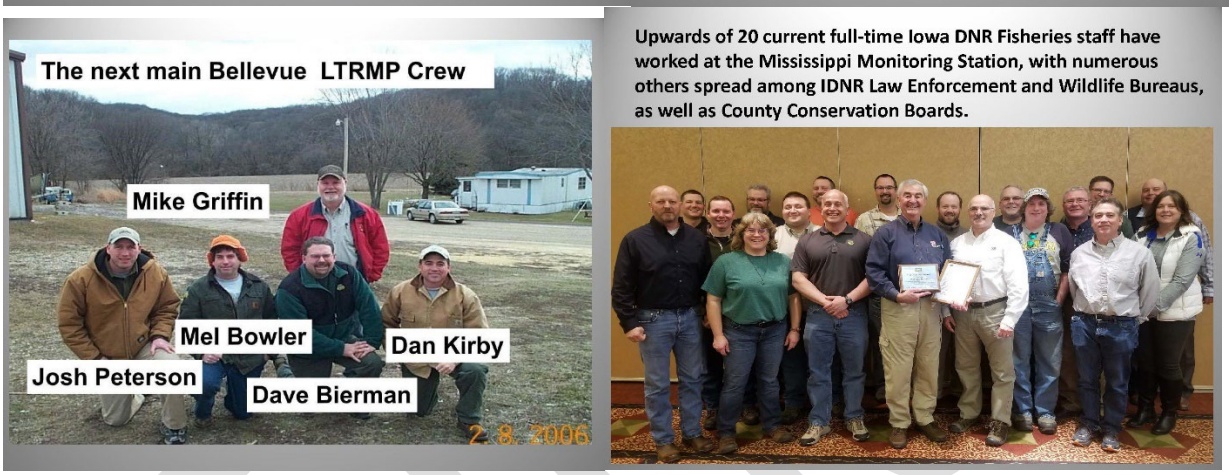
Enjoys camping and hiking with her husband Jonathan and their dog Ollie.

Dave Bierman – Team Leader

- B.S. Biology – Wartburg College, 1995
- M.S. Natural Resources Management - UW-Stevens Point, 1999
- 1999-2000: Seasonal at Bellevue LTRM station
- 2000-2002: IDNR Environmental Services Division field offices
- 2002-2007: Bellevue LTRM Water Quality Specialist
- 2007-present: Bellevue LTRM Team Leader

Favorite part of working on the Miss:
"Everything about working on and learning about Iowa's most important natural resource."

Father of one adult son and two high school girls. Enjoys fishing, gardening, wild foraging and spending time with friends.



- KH – thanks for this piece of the meeting – has been great to see what field stations are working on.
- Scott G – program of people.
- Dave Bierman – Agree.
- Typically have 5 seasonals.
- Travis Kueter – longest technician with Mel Bowler retirement. Fisheries Tech – previous WQ tech
- Dr. Seth Fopma – Veg specialist
- Ashley Johnson – Water Quality specialist.
- Dave Bierman – Team Leader – most of career with the river. Iowa's most used natural resource.
- Scott Gritters – Original crew photo, "new" crew photo – mike Griffin, Josh Peterson, Mel Bowler, Dave Bierman, and Dan Kirby,

- Numerous people in the Iowa "system" had their start working full time or as a seasonal with the LTRM program. Picture with Marv Hubell and just the folks in our fisheries department that had experience with LTRM. Does not include our game wardens, environmental protection, or wildlife state. The LTRM program permeated our department.

3:55 -4:30 – Agency Updates

UMRBA –

- Congressional Support

USGS-

- we continue to ongoing process of hiring Jenny S position in a couple weeks,

- WQ Lab is a UW La Crosse temporarily; move back to UMESC in September

USACE-

- Not UMRR Specific, congressional support,
- Next meeting update on Invasive species
- MP – had congressional visits recently- went well. People seem to be happy with what we're doing.
- KH – feedback during congressional visits – really great.
- Dave Potter(?) – [missed]

USFWS-

- The Upper Mississippi River National Wildlife and Fish Refuge (refuge) will receive Inflation Reduction Act funds and some of it will be spent on research-related efforts. Proposals have been submitted by partnership researchers and are being considered.
- The following are the status of or changes to staffing at the refuge:
    - The Deputy Refuge Manager position in the refuge's HQ office continues to be vacant.
    - The Deputy District Manager position in the refuge's Winona District continues to be vacant.
    - The Wildlife Biologist position in the refuge's La Crosse District was recently filled by Quanit Ali. Quanit's previous duty station was Necedah NWR.
    - The Wildlife Biologist position at the refuge's Savanna District will soon be vacant when Angela Dedrickson begins her new position at Necedah NWR.

NRCS Department of Ag –

- next meeting introduction of Richard Vaughn

Minnesota-

- Charmayne Anderson new assistant biologist hired will start May 10.
- Kevin Stauffer delayed retirement to September.
- Pool 4 Creel is in swing now – 24-month creel – suspended on Monday.

Wisconsin-

- WI nitrogen workgroup is continuing to meet to discuss the possibility of nitrogen criteria for WI Waters (including the Miss. R.)
- WI DNR is in the writing phase for the backwater residence time project. This project will provide useful backwater flushing targets for Miss R. backwater restoration efforts.
- Additional work to examine nitrogen thresholds for backwaters is planned for 2023.

- The WI DNR chloride workgroup is beginning to address recommendations made from its recent “Recommendations on a Statewide Chloride Strategy” report.
- WI DNR is continuing emerging contaminants work in conjunction with EPA to identify chemical of concern for the Mississippi River.

Illinois-

- WOOSH – fish ladder – to see if we can move invasive carp – moving to floating platform – want to get into water in 2 weeks. Training AI tech to recognize desirable species. Hope it will be in water and operational in next couple weeks.
- Macroinvertebrate has started for us – did 10 samples yesterday including mayflies.
- Have continuation of rock river shovelnose project. Some large sturgeon there. DNR has interest in learning more about them.
- All hands meeting – inventorying all otoliths – QA’ing them already have bluegill done, channel cat almost done. Will have inventory system set up for those.
- Also have database project going on within field station

IA –

- research team working with sustainable rivers program on the Des Moines and Iowa River systems. Early-May they conduct shovelnose sturgeon work on the Cedar River and tag 1500 per year. This is near Pallisiades State Park where the shock and drift nets.

- Wapsipinicon River Scott Gritters is doing mussel blitz again this year near Central City the week of August 21. Have stocked mussel on fish and documented them falling off. We have even documented reproduction Of Higgens eye.

- Mussel blitz program – have collected 40K mussels, 35 species – lots of volunteers.

- Walleye spawning had tremendous egg production from our hatchery system. Spawn occurred late but was short in duration.
- Research folks looking in periodicity issues in how long between spawning events, aging of sturgeon getting published

Missouri-

Mississippi River Unit/Big Rivers and Wetlands

MDC partnered with the University of Missouri-Columbia College of Agriculture Food and Natural Resource, and the Missouri Conservation Heritage Foundation in announcing the Institute of Fisheries, Wetlands and Aquatic Systems. There is much ahead for this endeavor (see College of Agriculture, Food, and Natural Resources // MU Announces New Institute of Fisheries, Wetlands and Aquatic Systems (missouri.edu). Agency governance and process continues to be informed while building working groups and programs. More to come as the FY25 strategic plan roles out. Wetland sampling was completed for southeast region and is beginning for St Louis region. The mini-fyke surveys capture species of conservation concern from amphibian and fish groups and informs wetland managers of resources needed during critical life history for species while completing management practices. Walleye brood stock (i.e., Black River strain) were captured by regional staff. Through telemetry efforts management staff note synchrony in movement with likely reproduction. Invertebrate sampling will begin in the LTRM during May after a long hiatus—so glad to see this resurrected. On April 17, 2023 St Louis Fisheries biologist Sarah Peper noted Lake Sturgeon spawning again (i.e., for the third time since 2015—the second year in a row) below Locks and Dam 26. Sarah is partnering with the Sustainable River Program and others for this effort and is doing media outreach as we speak. Our ongoing Paddlefish study (i.e., main period 2015-2019) continues to yield information from jaw banding. Wide ranging emigration and movement along with exploitation continues to be updated through tag return efforts from

snagging and commercial harvest seasons. Invasive carp management and control continues through developing contracts for incentivized harvest. MDC hopes to have contracts in place during summer 2023. The invasive carp project also inform movement and habitat utilization through use of telemetry. The UMRS, Missouri River basin, Lower Mississippi River and Ohio River have hundreds of telemetry stations deployed monitoring transmittered fishes. If ever there was a time for beginning other fish telemetry projects—now is the opportunity for leveraging efforts!

MICRA congressional visit day Lock and Dam 19 May 16

4:30 – Adjourn