UMRR A-Team Meeting February 8, 2023

Final Notes

Chairperson: Scott Gritters Iowa DNR

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
Nate De Jager
Jeff Houser
Danelle Larson
Jennifer Dieck

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

UMRBA:
Andrew Stephenson
Erin Spry

MN:
Nichole Ward

Wisconsin:
Jim Fischer
Patrick Kelly

Iowa:
Dave Bierman
Seth Fopma
Randy Schultz

Illinois:
John Chick
Jim Lamer

Missouri:
Dave Herzog

USDA:
Richard Vaughn

USFWS:

Note *** means an Action or "to do" item

Introduction and Roll Call:

The meeting was called to order by Chairperson Scott Gritters and a roll call was taken. All state and USFWS representatives were present.

Next meeting discussion:

Scott Gritters: The next meeting will be April 19th, we should decide on how we want to hold this meeting virtually or in-person. A discussion ensued about having this meeting coincide with the MRCC meeting which has been the tradition of the Analysis Team. It was decided that we would try our first in-person meeting in a long time with a virtual option. Location of the next meeting site was also discussed and three options were discussed. The USGS UMESC office, USFWS Visitor Center, and to hold this at the Radisson Hotel.

A-team corner Highlights:

SG: We have been discussing this at the past few meetings but we all know dated material is present on our USGS A-team corner website. We simply need to get this UTD and seem to be making progress in that direction. Just want to check in especially with the team leaders and see what progress has been made.

Jeff Houser: Mike Caucutt (mcaucutt@usgs.gov) makes updates to the A-Team corner. Send edits to me and I can forward to him to make changes or contact him directly.

KH: Field station descriptions are different from the A-Team corner. There are field station descriptions, staff lists, and A-Team corner where activities would be updated.

SG: I use A-Team corner to access the staff directory and Field Station descriptions are in it. Upper tab.

Nicole Ward: Chris wrote updated information, then I looked at what other field stations had. There is quite a range for field stations. Do we want to take this time to standardize in some way?

JH: I suggest having the same basic sub-headers on the pages.

SG: My preference is having complete and up to date information, if standardization gets us there I am for it but for now, I would just like descriptions complete and UTD.

JH: I would totally like to revamp this website at some future date, so I take back what I said. Lets just try to get this information complete for now. We can work on a more standardized set of information when we redo this and all the information will be correct to work with.

All: **** Seemed to be the consensus to get information correctly into the USGS website and then at a later date work on a more standardized format for this information on a new webpage.

from Jim Lamer to everyone: 1:19 PM - We plan to have a draft ready by next week to send in. We just had a discussion about it.

from Dave Bierman - Iowa DNR/LTRM to everyone: 1:20 PM -Ours is up to date on what Karen is showing now, not sure about A-Team Corner?

from Matt Vitello to everyone: 1:22 PM - Ours is not up to date, I'll check where an update stands

from Dave Bierman - Iowa DNR/LTRM to everyone: 1:24 PM - Feel free to use Iowa's as a template :-)

from Jim Lamer to everyone: 1:24 PM - Standardizing would be helpful, at least standardized sections

from Jeff Houser USGS-UMESC to everyone: 1:25 PM - I agree that having things up to date is priority. we don't need to have the perfect be the enemy of the good here.

from Nicole Ward - MN DNR she/her to everyone: 1:26 PM - Ok - I will send Chris's great Lake City description! Who do we send it to?

from Jeff Houser USGS-UMESC to everyone: 1:26 PM - I will forward to Mike Caucutt

from Matt O'Hara to everyone: 1:27 PM - I agree with you Scotty, update information should take priority.

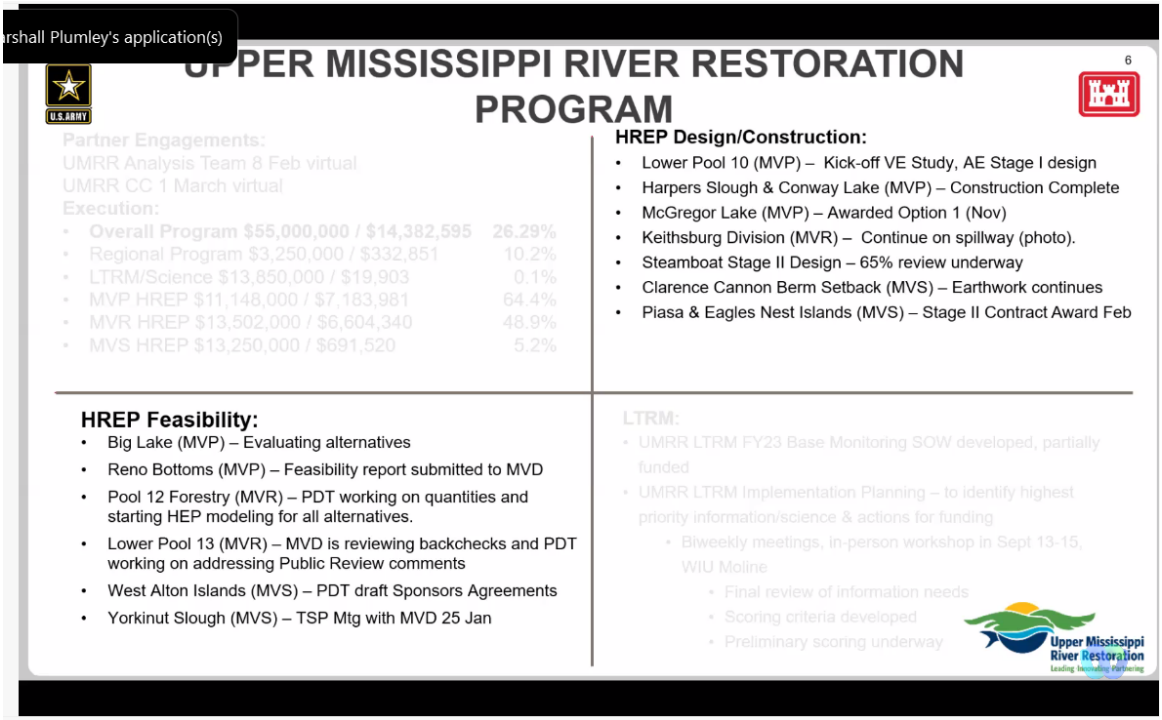
UMRR Updates – Marshall Plumley

Just over 25% obligation across program accounts.

FY23 is first year we were able to budget for $55M. We were appropriated that in late-December in final appropriations bill passed in December. Have been ready for this.

Historically have had PBud by now in year, but this year March 9 is the date for the PBud release.

WRDA 2022 increased UMRR authorization HREPs to $75M. LTRM was increased in WRDA 2020 to $15M. Total program authorization annually at $90M. First time to budget for this is FY25. May have opportunity to compete for work plan dollars above $55M.



[See slide for HREP updates]

Completed construction on Harpers Slough and Conway Lake since last A-Team meeting. Awarded first stage option 1 for McGregor Lake.

Report to Congress

Still with HQ: I will be back and forth with Senate and House. Will have follow-on communications

Environmental Justice

UMRR CC has been discussion how program and partners approach EJ differently. Had a small ad hoc group convene with some experts from agencies discuss EJ. Lots of information to learn from folks. The Analysis team did have a presence as Scotty represented Iowa. More to come on this important issue.

SG: Appreciated the EJ overview there. May discuss as a topic sometime in the future within the A-team as well as we want our Science to be for everyone. Never hurt to do a self-evaluation and make sure we are being as inclusive as possible.

LTRM USACE update: Davi Michl

Last year funded base monitoring at 6.3M and Science in support at $1.5 – for 8.8M. [see slide]

$13.85M for FY23 LTRM.

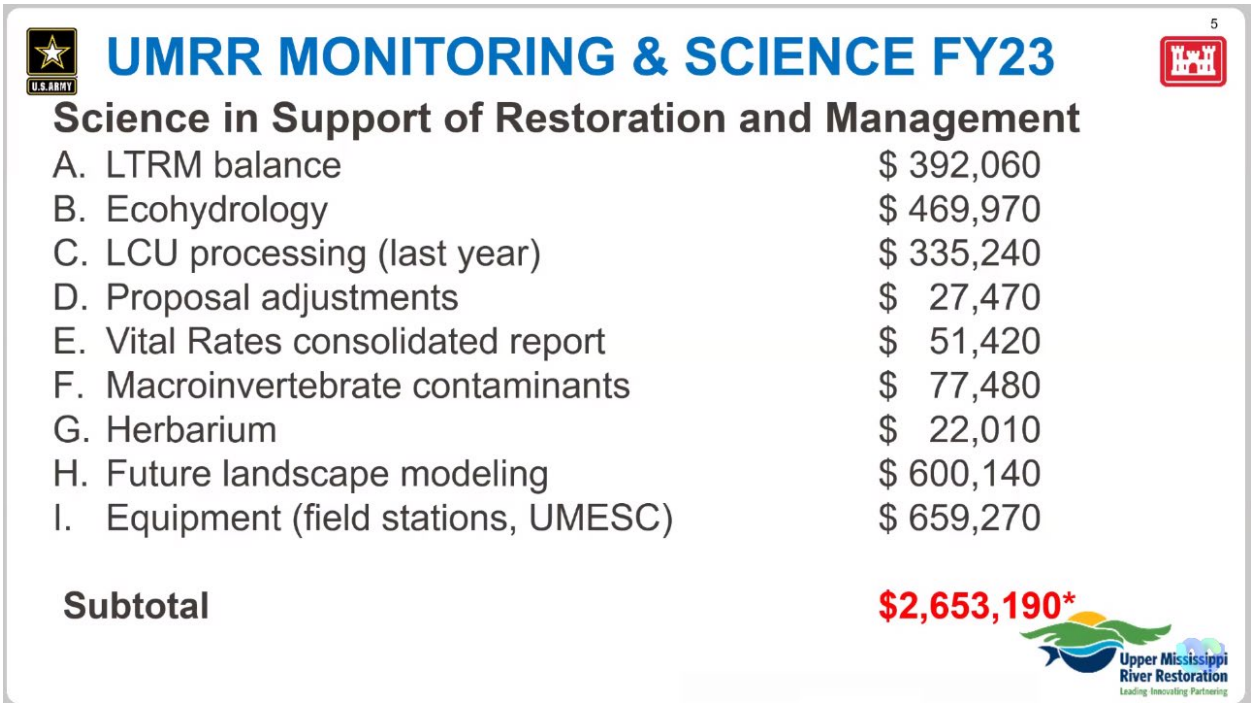
UMRR MONITORING & SCIENCE FY23

LTRM

	Budget (gross)
MN	$793,118
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)	**$3,916,953***
UMESC TOTAL	**$3,405,104**
Corps tech/science reps	$ 70,000
TOTAL FY23 LTRM BUDGET	**$7,392,057***

Upper Mississippi River Restoration
Leading Innovating Partnering

Not final funding amounts, awaiting state carryover amounts.



The LTRM balance is $392K which includes large equipment replacement line items and phytoplankton sample processing.

Ecohydrology dollars are available to fund Molly Van Appledorn work for 2 additional years.

LCU processing is slated for funding early for work in FY25.

Herbarium we need a central repository for all plant specimens.

Future landscape modeling is funding for John Delaney's work.

Equipment item includes field station and UMESC water quality lab equipment.

FY2022 SCIENCE PROPOSALS (PENDING)

6

Scoping and vetting new technology and methods for use in future hydrographic and topographic surveys	Strange (UMESC), Kalas (WI DNR)	$being revised
Avian associations with management in the UMRS: filling knowledge gaps for habitat management	Hohman (Audubon), Kirsch (UMESC)	$393,083
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)	$482,217
Substrate stability as an indicator of abiotic habitat for the UMR benthic community	Newton (UMESC)	$being revised
SUB-TOTAL		~$1,550,000

Remaining proposals from last science meeting have not been funded. Asking for some revisions on first and last proposals. Audubon now focuses on forest structure instead of rare species. Cost estimates revised for FLAMe.

Hoping to ask UMRR CC for funding on March 1.

UMRR MONITORING & SCIENCE FY23

7

Science in Support of Restoration and Management

High Priority Items **$2,653,190**

Future Items for FY23

A. Priority FY22 proposals $1,550,000
B. Updating topobathy (w/NESP support) ~$2.5M (estimated)*

Andrew Stephenson: Topobathy includes HREP and LTRM?

Karen Hagerty: $2.5M is what LTRM will bring to the table. That number is contingent upon NESP contributions so you may know more about available funds next month. HREP funding would come at end of year.

JH: One proposal to work on aquatic veg and energetics is not able to be resubmitted at this time.

Davi Michl: May resubmit in FY24.

from Karen H Hagerty to everyone: 1:43 PM - ***proposals will be submitted to UMRR CC at the MAY meeting***

Implementation Planning – Jeff Houser

Implementation Planning

Why? To prepare for potential increased funding resulting from increased UMRR authorization under WRDA 2020.

Goal: Develop a set of portfolios of actions that best address UMRR management and restoration information needs.

Examples of possible new work include (but are not limited to):

- Increased capacity for analysis of existing LTRM data
- Spatial expansion of baseline monitoring (and associated analyses)
- Addition of long-term monitoring components (and associated analyses)
- Fixed-term studies

Approach

- Formation of Implementation Planning Group and selection of facilitators
- **March 2022**: Bi-weekly meetings begin
  - Agree on Opportunity Statement
  - Draft Restoration and Management Information needs for the UMRS
  - Draft criteria for assessing information needs.
- **13-15 September**: In-person workshop:
  - Review revisions of information needs document
  - Agree on initial working draft of criteria
  - Discuss and test approach for prioritization of information needs and optimization of portfolios of work.
- **28 October:** Information needs and scoring criteria finalized
  - Provided as read ahead to UMRR CC
  - Sent via email to A team this morning

Approach (continued)

- **10 November** –scoring of information needs submitted to facilitators
- **17 November** – Facilitators present, and group discusses, results of second round of information need scoring
- **5 December**. Completed Initial, ***approximate estimates*** of costs of addressing each information need.
- **December 2022 and January 2023**
  - Initial trials of optimizing of Information Needs based on expected benefits (criteria score) and estimated costs.

Identifying (specifying) the information needs

- What is the Information need?
  - Briefly describe the underlying question or hypothesis to be addressed
- How will the information be used?
  - assessing ecosystem health
  - improving management & restoration
  - preparing for emerging issues
- What will be measured or what will be the endpoint?
- What will be the geographic extent?
- What will be the primary approach to meet the information need?
  - List any additional approaches

Information needs identified through general template.

Categories of Information Needs

- Floodplain ecology
- Hydrogeomorphic change
- Aquatic ecology
- Restoration applications
- Full list and description of information needs:
  - Distributed as a read ahead for November 2022 UMRR CC quarterly meeting packets
  - Distributed via email to A team earlier today

Four smaller groups based on topic areas.

Floodplain Ecology

- System-scale assessments of changes in floodplain vegetation
- Simulations of alternative future trajectories of floodplain plant species composition flowing different management actions and climate conditions
- Spatial and temporal distribution of birds and bats dependent on the UMRS floodplain
- Abundance, distribution and status of reptile and amphibian species within the UMRS.

Some information needs could fit in multiple categories.

Hydrogeomorphic change

- Where and how the geomorphology of the river and floodplain changing and can be expected to change over planning horizons of decades to centuries
- Process-based predictions of sediment dynamics (erosion, transport, and deposition)
- Evaluation of large woody debris source, transport, and fate

Aquatic Ecology

- Specific factors which limit aquatic plant distribution and (re)establishment throughout the UMRS
- Factors affecting broad-scale fish movement within the system
- 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
- Current age and spatial structure of fish populations across the system
- Abundance, distribution, and status of zooplankton and phytoplankton
- Expanded monitoring of major tributaries to understand how tributary inputs of water, sediment, and nutrients affect the UMRS as an ecosystem
- Ecological condition of the transitional portion of the UMRS between Navigation Pools 13 and 26.
- Effects of excess nutrients and contaminants on native species and their habitats

Restoration Ecology

- Biotic responses to restoration and management actions
- Local scale soil dynamics and floodplain ecosystem processes
- Restoration and management actions as experiments
- Floodplain connectivity
- Consequences of invasive species for restoration projects
- Using water level management as a restoration tool

Haven't historically approached these topics under LTRM science in support, but we have an opportunity to pursue these and gain a great deal of knowledge.

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

Optimization is about how to prioritize funding these INs over the next 10 years with monetary constraints.

Estimated benefit calculated by top three criteria. Those three things modified by extent of opportunity to learn determine expected benefit of funding opportunity. That expected benefit is then optimized over 10-year time given constraints.

Have not directly incorporated urgency or unique capacity into assessment of INs. And I am still thinking through that.

Optimization

- Considers:
  - Benefit: based on Relevance and Depth of Current Knowledge criteria
  - Expected Benefit: Benefit * Opportunity to Learn
  - Estimated Cost
  - Minimum number of years needed to obtain expected benefit
  - Annual funds available
- Allocates funds across years to maximize total expected benefit

Also assessed minimum number of years needed to obtain expected benefits. Recognized and expected that projects could carry on beyond the minimum years needed.

Ongoing work and next steps

- 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.

Working through what would be our actual initial assessment of output, given ongoing modifications to algorithms.

Danelle Larson is not on team but did facilitators use a specific framework they worked from? Trained?

JH: The criteria was theory, maximizing expected benefits was informed

AS: Asked about the value of information.

JH: yes, theoretical underpinning of this approach.

AS: It is great to be a part of the process. Hope everyone here has felt involved as team members ask for agency feedback on items. Developing a great path forward. Also reserving some funds to ensure we can keep a science meeting process going forward.

Martial Plumley: I wanted thank Jeff and team for all the work they have put into this. Ground breaking stuff and this is tough to figure out how to move forward and tell the story about the importance of science in the program. Looking forward to sharing over the next several months.

from Danelle Larson to everyone: 2:09 PM - Thank you Jeff and the entire Planning Group! Nice work, this is exciting.

from Jeff Houser USGS-UMESC to everyone: 2:09 PM - People have invested an enormous amount of time. I echo Marshall's thanks to all involved.

from Jeff Houser USGS-UMESC to everyone: 2:10 PM - I gotta work on the story telling part...

from Karen H Hagerty to everyone: 2:11 PM - @Jeff, you did a very good job!

Integration Summary:

Scott Gritters: Wanted to put a bow on our previous integration discussions over the past few A-team meetings. As you know the discussion was lively at times and sometimes contentious. However, as we all know communication is key. We have so many more ways have to communicate these days but seem to do less of it. I felt as chair it was my role to drill down to what role the A-Team's can play and found out it is a major player. Had two spirited discussions on the integration topic which was time well spent. Points made about not using data for decisions which was demoralizing to some. Need to get data out

ahead of projects. Whatever data or trend is available we need to get that out. Data won't be only thing that helps to planning projects. Will use data as much as we can. Will present data, but we have to understand that there are other considerations as well, societal influences for example that may also help shape projects. Projects are not just about formed around data but data must be presented as one of the factors to shape projects.

Obviously, the A-team is a major player as it has been a sound board often by those frustrated that the data voice was not always heard or perceived to be heard. It was felt by some that we didn't need more people on the PDTs but also noted that many A-Team members do join PDTs. But, as a member of the A-Team, if you don't see data being used try to get that piece inserted that it is inserted as soon as possible. Want to make sure the data we collect is shared. We will talk about flyers later but that is a great way to get trend data into hands of PDTs and others. Getting data inserted EARLY in the process is key.

Nicole Ward: Scotty I appreciated the summary there. My reaction is that I don't want it to be putting it to bed or that we solved it and I want it to be ongoing. Eric Lund and I have been involved in Lower Pool 4 and we have learned a lot. We could think about how to make a smoother process for providing LTRM data for HREPs.

SG: I appreciate that it has to be ongoing all the time.

USGS LTRM update: Jeff Houser

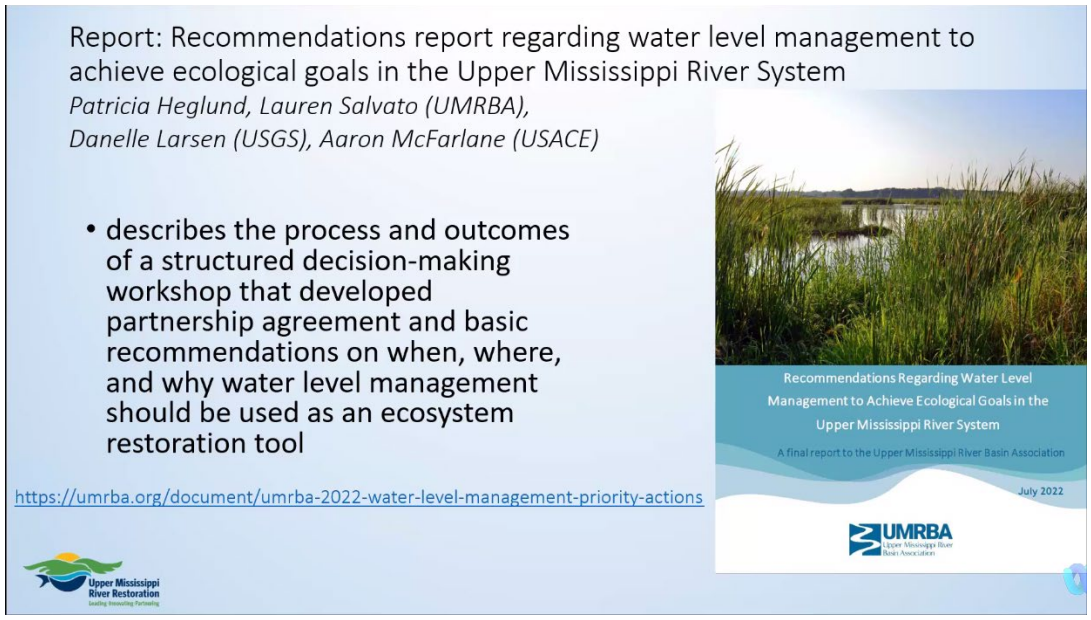
Science products from previous quarter:

- Vegetation publication – Annual Summer Submersed Macropyte Standign Stocks Estimated from Long-Term Monitoring Data in the Upper Mississippi River. *Journal of Fish and Wildlife Management*. Deanne Drake, Eric Lund, Becky Kreiling.

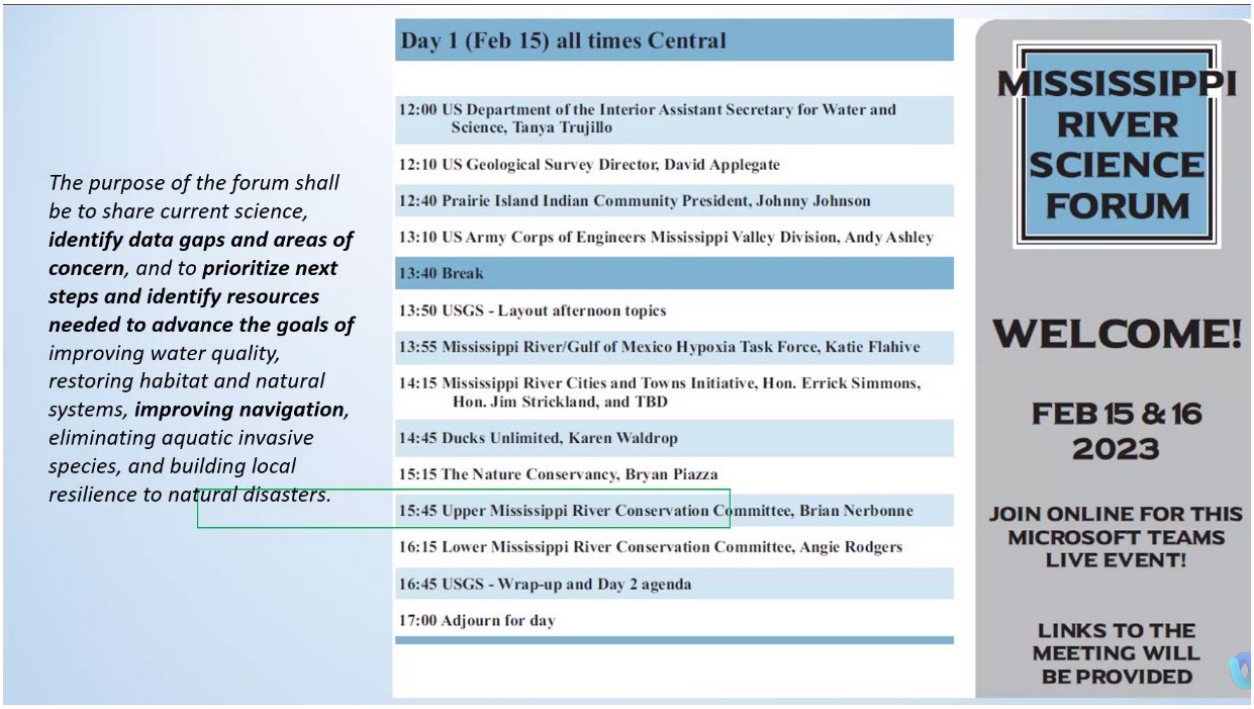
  Rake scores is an estimate of how much material is on the rake and not just presence/absence. Information is not biomass directly. It may provide suitable surrogate for biomass. Used sites with direct biomass collection by divers and rake scores. Morphology matters in models.

  2001-2013 in Lower Pool 13 the percent frequency increased by x% but biomass increased by factor of 3.

- WLM publication:



from umrba to everyone: 2:24 PM
https://umrba.org/sites/default/files/documents/umrba-wlm-priorities-2022.pdf



KathiJo: Data gaps, resource needs, etc. are being requested in the Survey. Results of survey and forum discussion will be incorporated into report to Congress.

***** Scott G to distribute the invitation to the A-Team.**

from Kathi Jo Jankowski to everyone: 2:29 PM

Here's the link to the survey for now, will send invitation as well:
https://forms.office.com/pages/responsepage.aspx?id=urWTBhhLe02TQfMvQApUlMpyCmLLmtJGoI8abe0ujrpUMVRVT0xTSEVUQzFaVjE5RlFVVE5DNlJCUy4u

Break

During break Scott Gritters discussed the need for rooms for A-Team meeting.

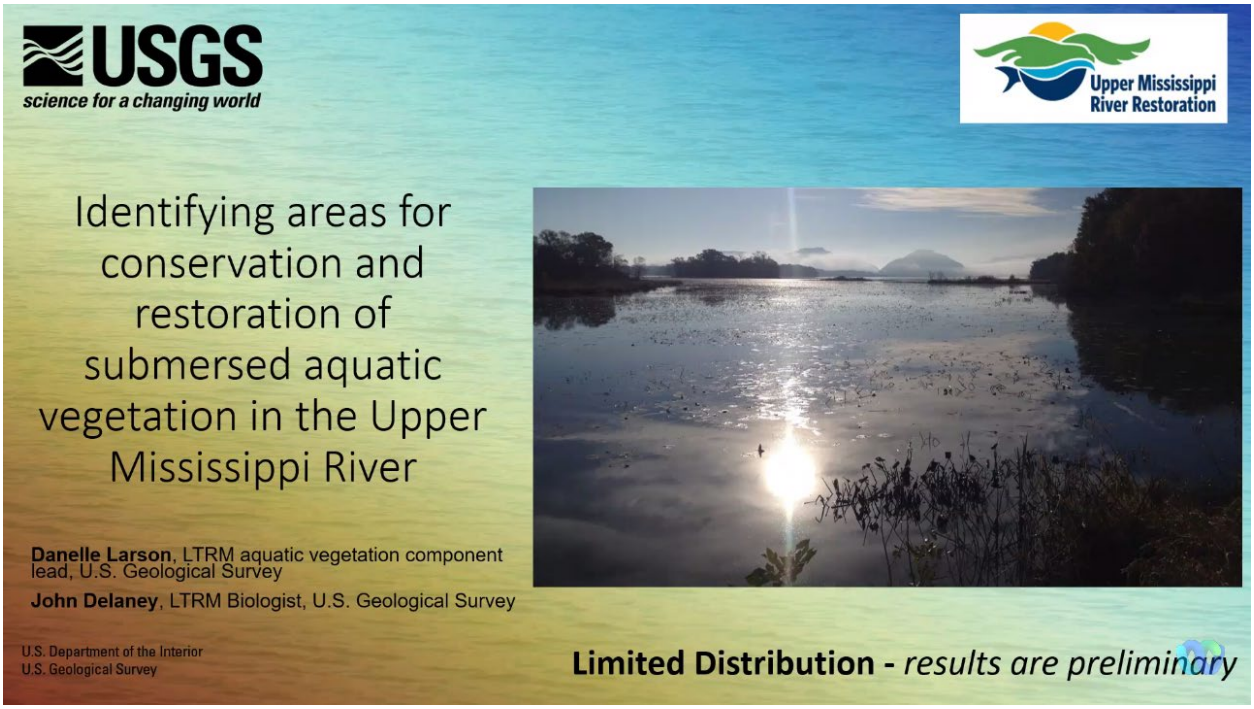
from Matt Vitello to everyone: 2:51 PM

I intend to get hotel room (dependent on flight)

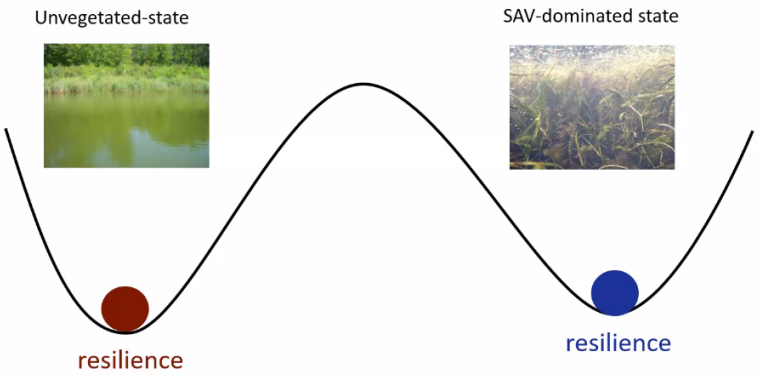
from Jim Lamer to everyone: 2:51 PM

I will be coming in on Tuesday night and will be staying for conference as well

SG: Next up on the agenda is Danelle Larson, I so appreciate Danelle stepping up early on in the agenda forming process to volunteer to give this important talk.



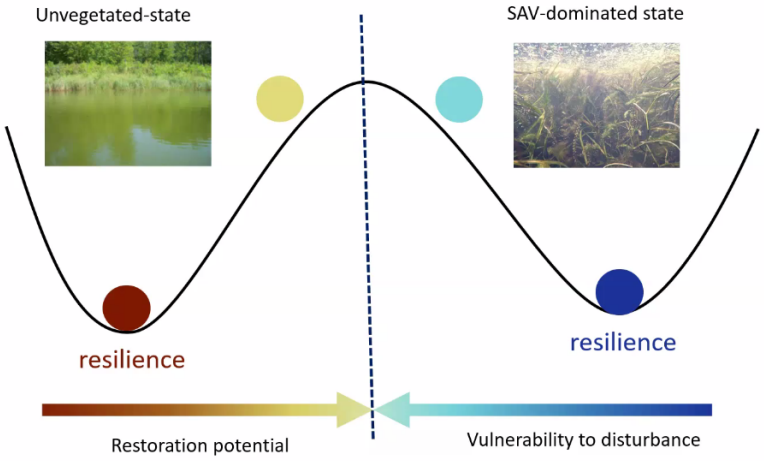
Upper Mississippi River *Ecosystems States*



USGS science for a changing world

SAV = submersed aquatic vegetation

Upper Mississippi River *Ecosystems States*



USGS science for a changing world

Research Goals

1) Can we create accurate, predictive model of ecosystem states?
   - SAV-state, unvegetated-state, vulnerable, restoration potential

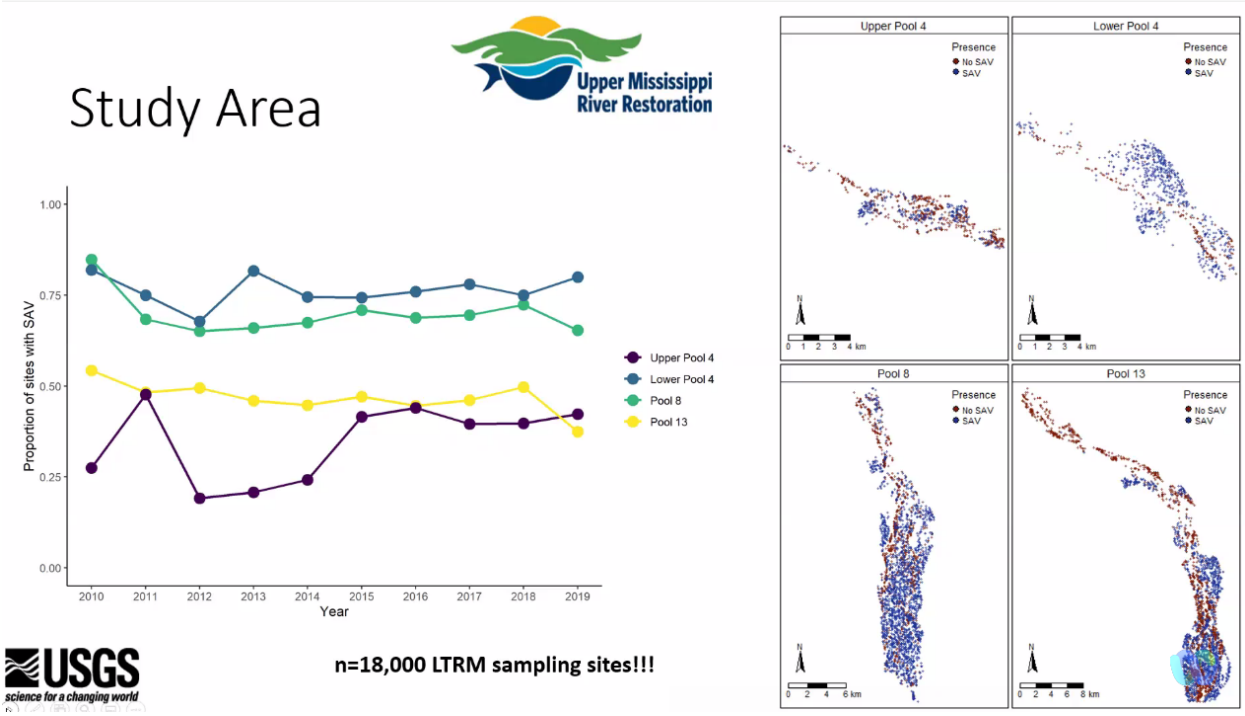
2) What environmental predictor variables best explain SAV presence?
   - Ecological understanding & quantitative restoration targets

3) Which sites have greater restoration potential and why?

4) Create an online, interactive tool for researchers and managers to learn, discuss, & apply adaptive management

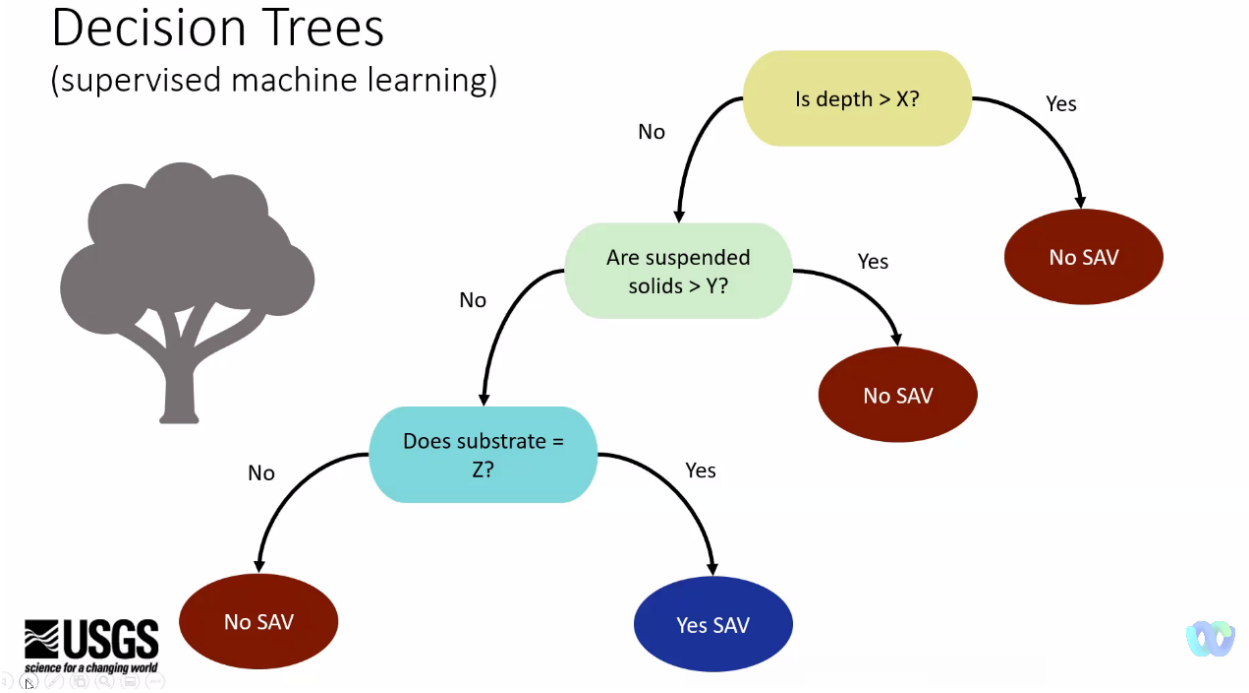
Cool SAV photo by Alicia Carhart, WI DNR

USGS science for a changing world



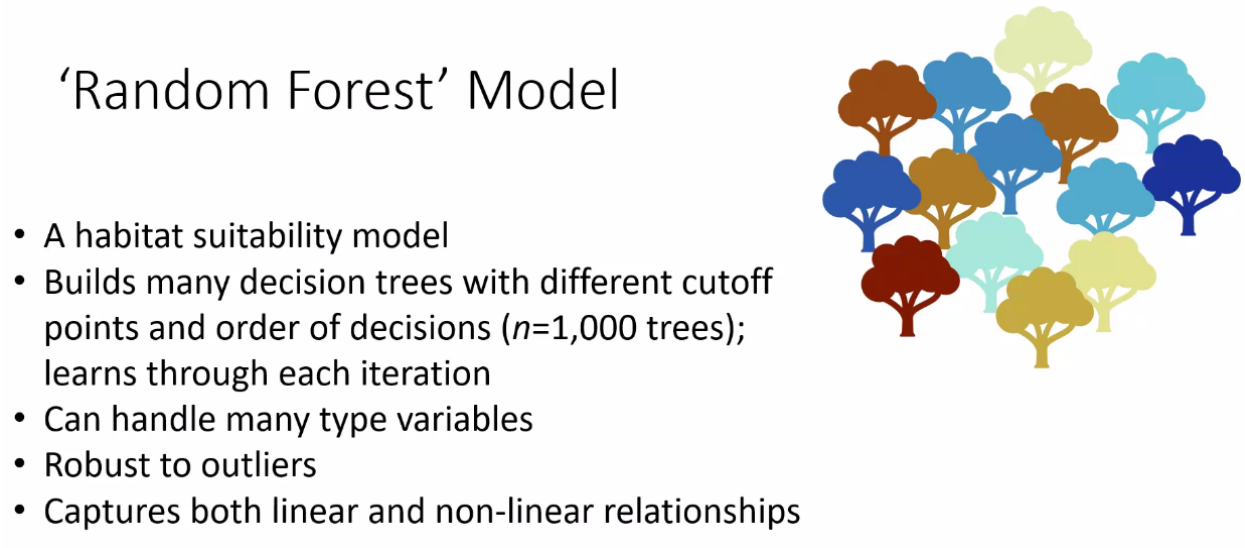
SAV LTRM data from upper and lower pool 4, pools 8 and 13.

From 1998 to 2010 we had great change in aquatic veg prevalence, recovery but unstable. Since 2010, have had stable percent frequency within pools and used last 10 years of SAV data with over 18K sampling sites.

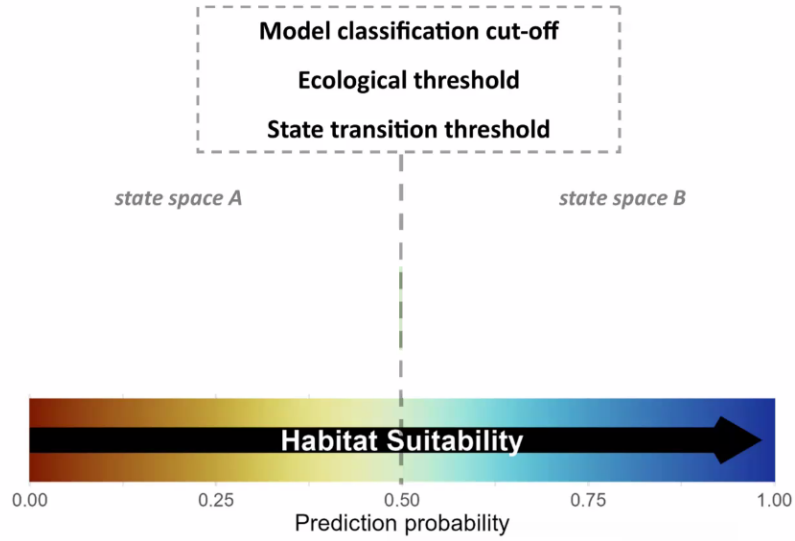


Arbitrary thresholds – then decision tree process.

Once is regression tree – a thousand times is “random forest” model.

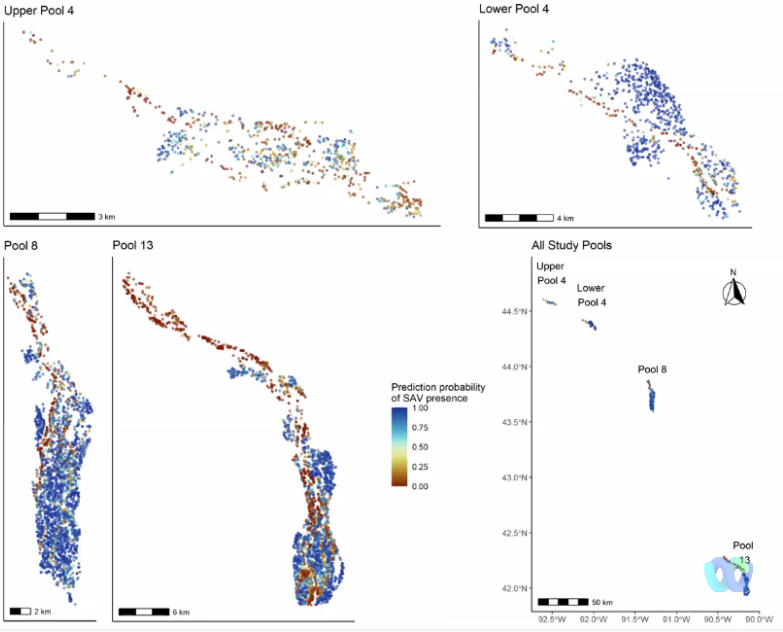


‘Random Forest’ Model Outputs



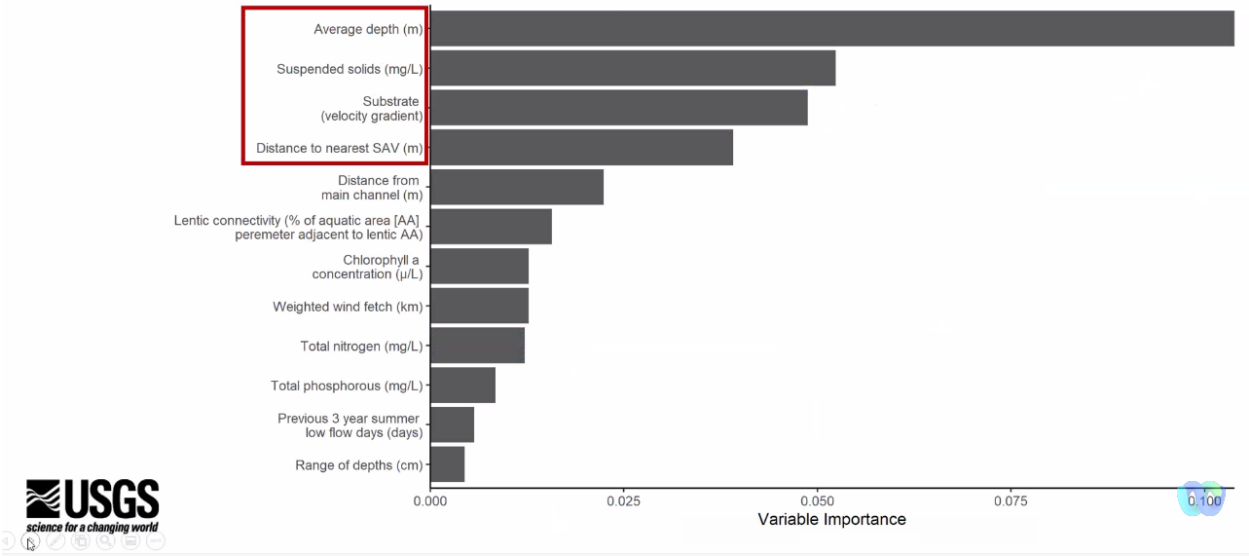
Model Performance

- 89% accurate; very, very good!!
- No obvious spatial bias of inaccuracies



Model performs well across pools and habitat strata.

4 Predictors Are Important 'State Variables'



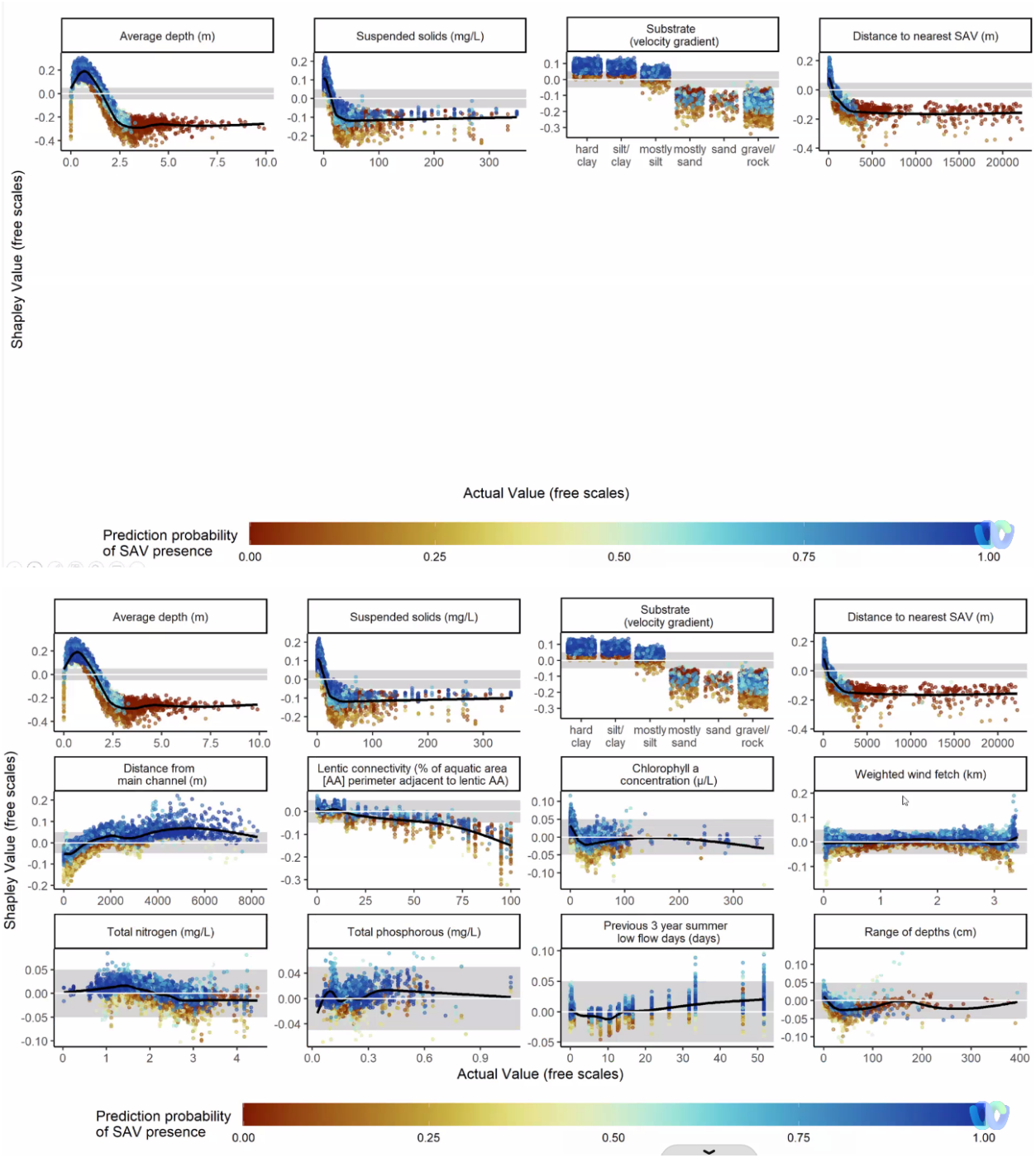
DL: Depth was most important variable. Silty to rock substrate, could also be velocity gradient. Distance to nearest SAV also could be positive feedback or dispersal limitations.

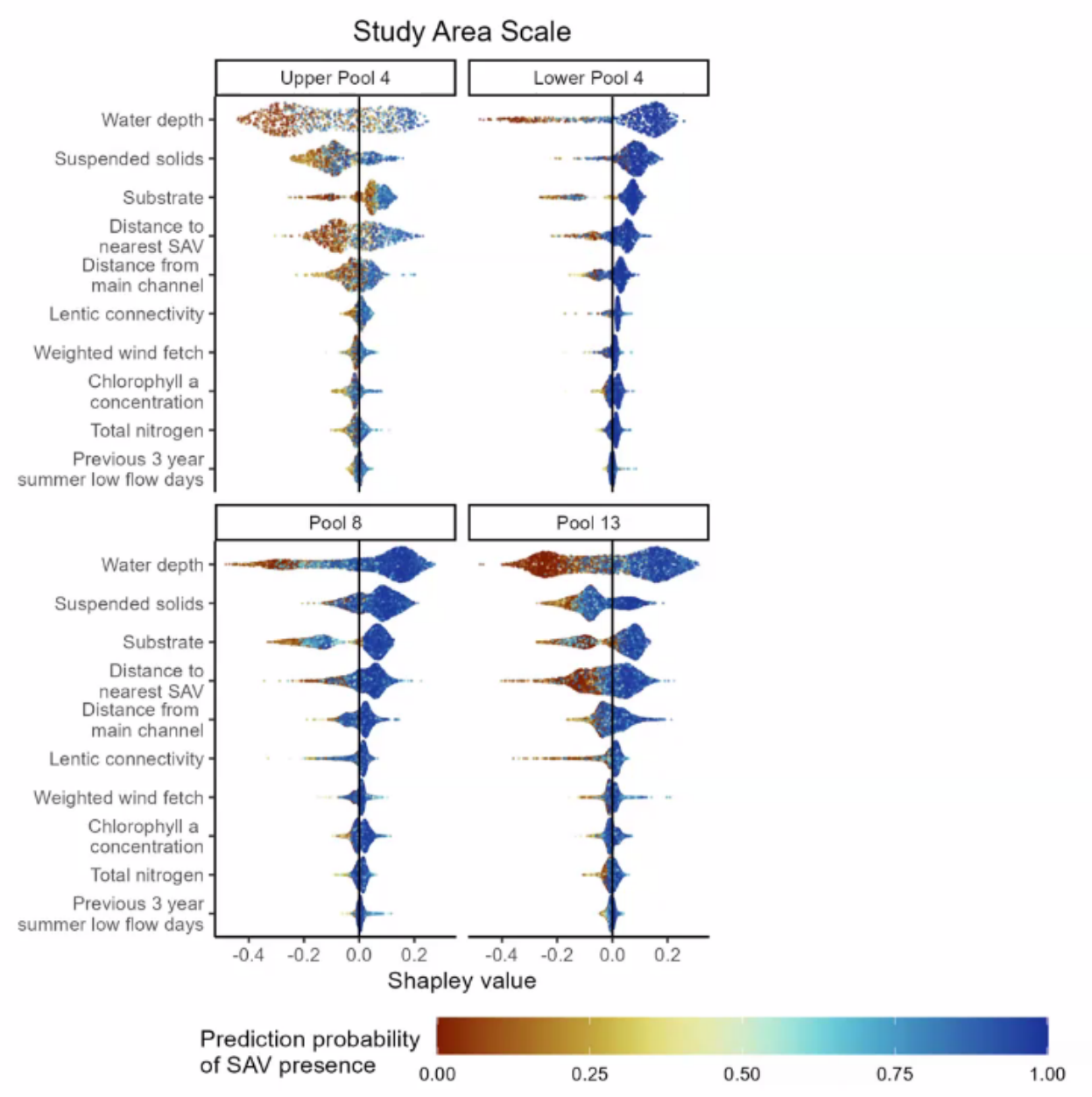
How is the model making its predictions?

- Calculated "Shapley values"
  - From cooperative game theory (Shapley, 1952); For each prediction (the game), contribution (the payout) of each predictor (the player) is calculated
  - Estimates both the magnitude and the direction (+/-) of the contribution
  - **The contribution is interpretated as 'environmental drivers' and their 'response types' (like +/- response, as well as linear, non-linear, or threshold responses)**

USGS
science for a changing world

DL: Using a Sports analogy certain players (successful players) paid more for their contributions in a game.


Average depth (m)
Suspended solids (mg/L)
Substrate (velocity gradient)
Distance to nearest SAV (m)
Shapley Value (free scales)
hard clay
silt/ clay
mostly silt
mostly sand
sand
gravel/ rock
Actual Value (free scales)
Prediction probability of SAV presence
0.00
0.25
0.50
0.75
1.00
Distance from main channel (m)
Lentic connectivity (% of aquatic area [AA] perimeter adjacent to lentic AA)
Chlorophyll a concentration (µ/L)
Weighted wind fetch (km)
Total nitrogen (mg/L)
Total phosphorous (mg/L)
Previous 3 year summer low flow days (days)
Range of depths (cm)



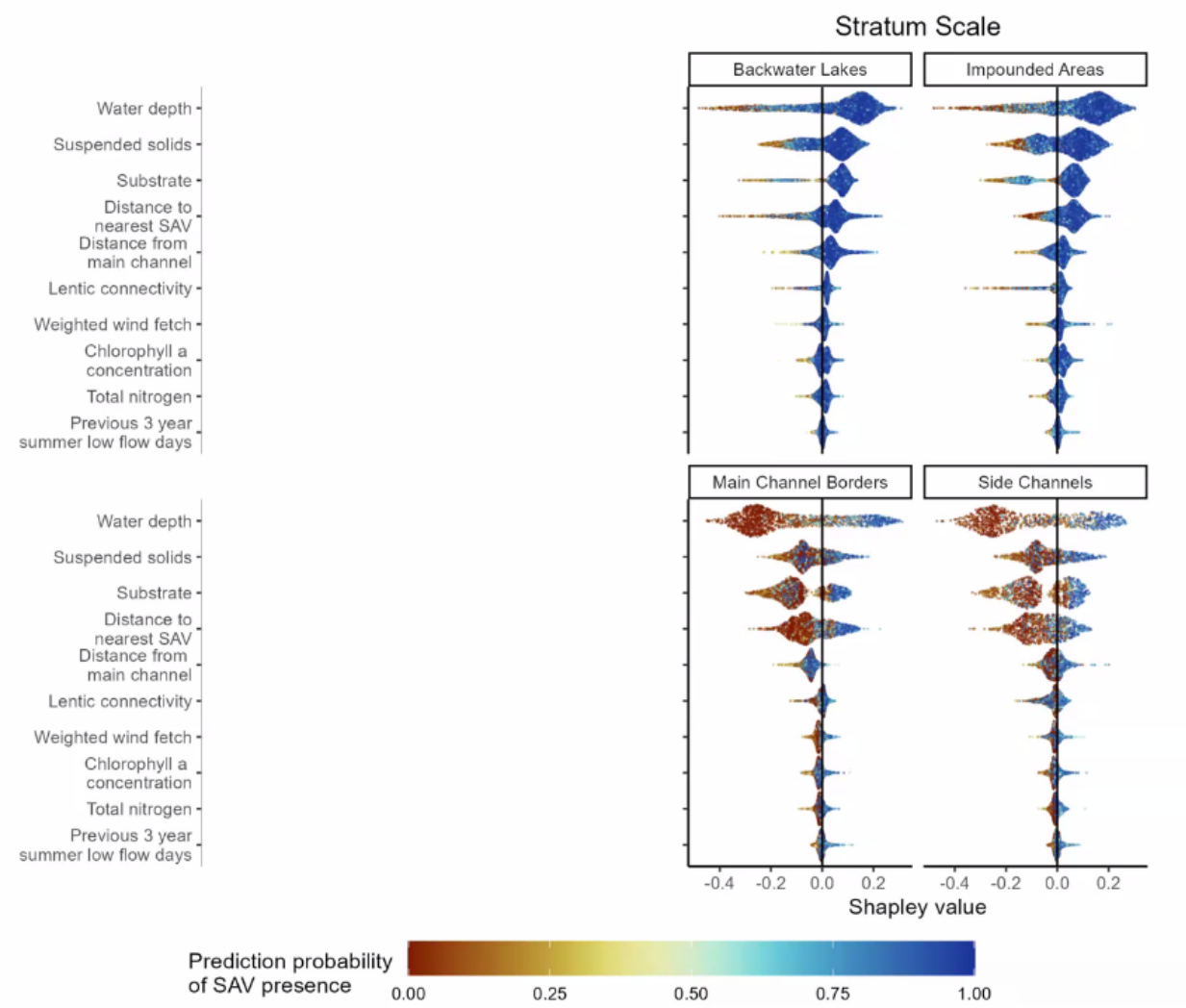
Pool scale Shapely values:

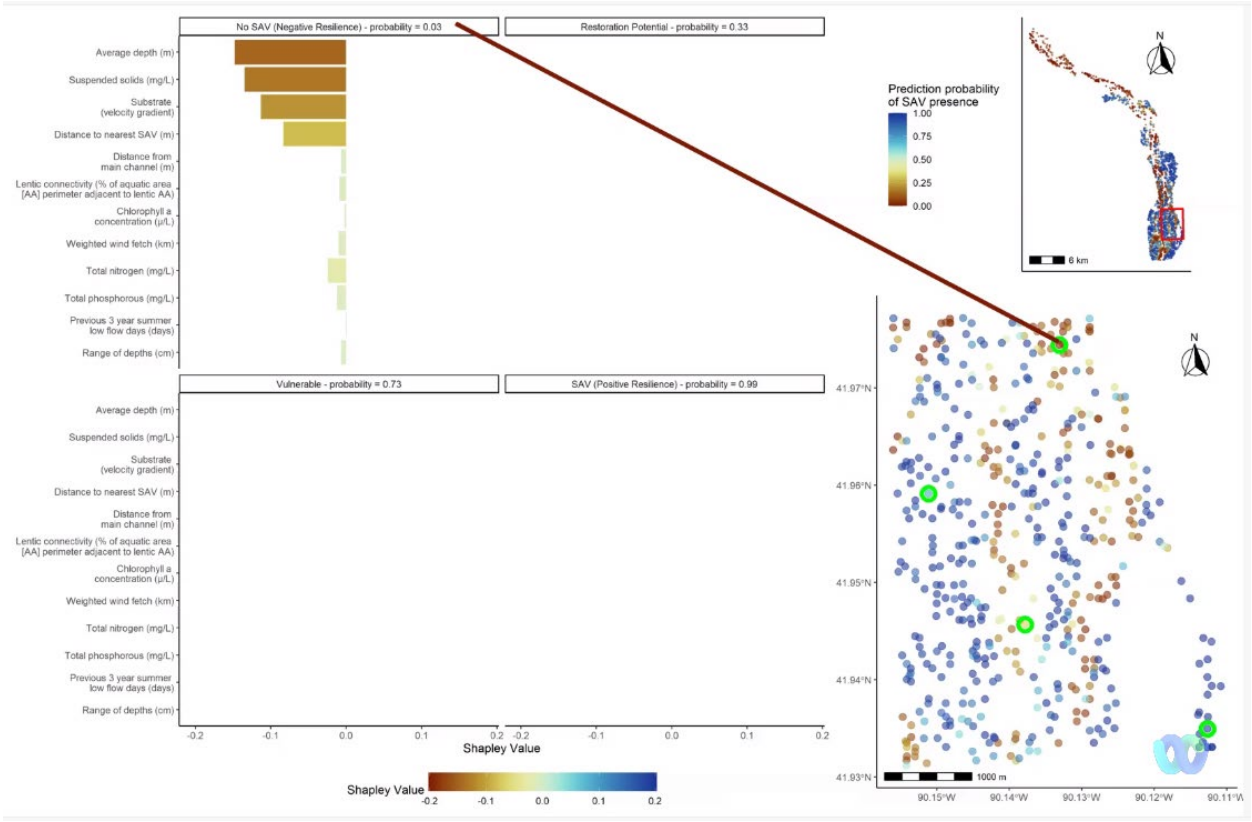
For Upper Pool 4, only a 50% probability in pool with deep water depths, high TSS, substrates and distance to nearest SAV issues.

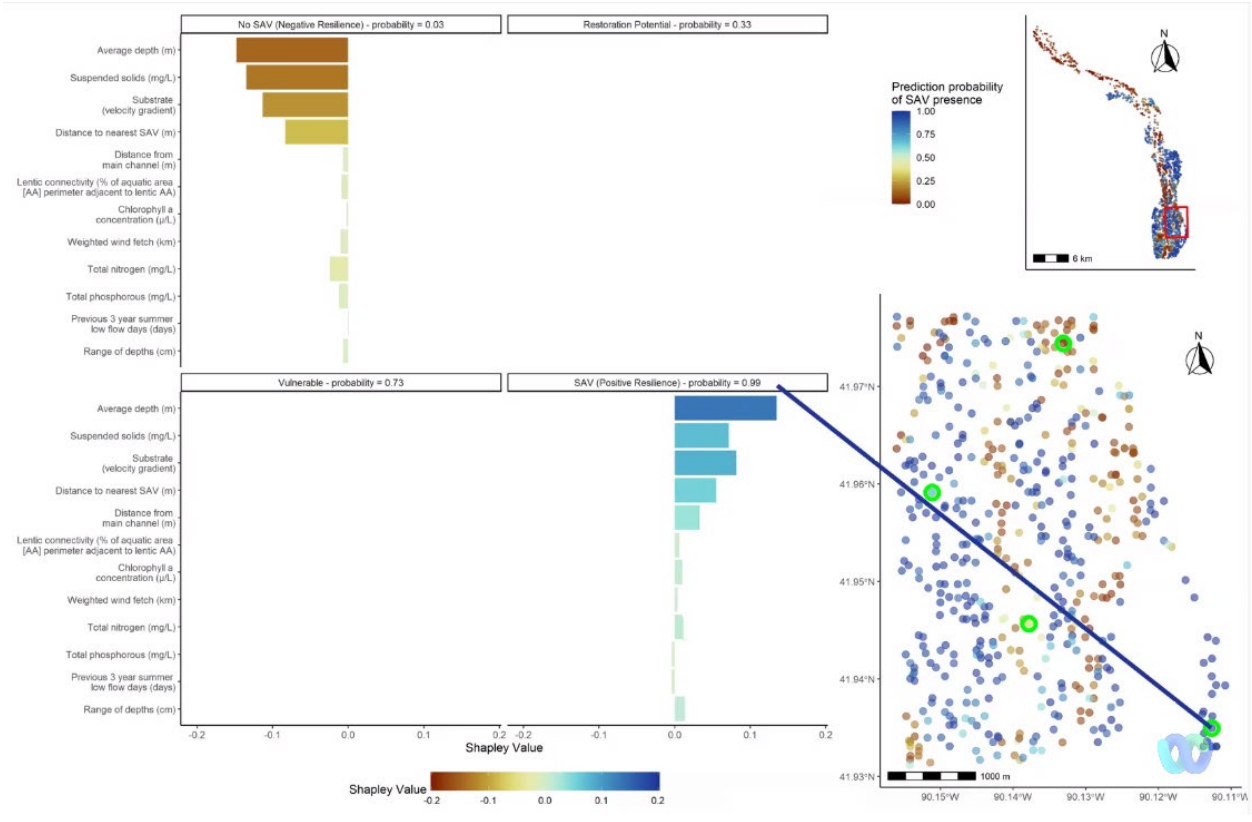
Lower Pool 4 and Pool 8 which is mostly vegetated value suffer from deep water depths or wrong substrate type.

For Pool 13 which has a mix of vegetated and unvegetated percent of veg suffers from deep water depths, TSS, and distance to nearest SAV.

We can look at the stratum scale such as main channel and side channels which value often suffer suffers from deep water and poor substrates.


Stratum Scale
Backwater Lakes
Impounded Areas
Main Channel Borders
Side Channels
Water depth
Suspended solids
Substrate
Distance to nearest SAV
Distance from main channel
Lentic connectivity
Weighted wind fetch
Chlorophyll a concentration
Total nitrogen
Previous 3 year summer low flow days
-0.4
-0.2
0.0
0.2
Shapley value
Prediction probability of SAV presence
0.00
0.25
0.50
0.75
1.00


No SAV (Negative Resilience) - probability = 0.03
Restoration Potential - probability = 0.33
Vulnerable - probability = 0.73
SAV (Positive Resilience) - probability = 0.99
Average depth (m)
Suspended solids (mg/L)
Substrate (velocity gradient)
Distance to nearest SAV (m)
Distance from main channel (m)
Lentic connectivity (% of aquatic area [AA] perimeter adjacent to lentic AA)
Chlorophyll a concentration (µ/L)
Weighted wind fetch (km)
Total nitrogen (mg/L)
Total phosphorous (mg/L)
Previous 3 year summer low flow days (days)
Range of depths (cm)
-0.2
-0.1
0.0
0.1
0.2
Shapley Value
Prediction probability of SAV presence
1.00
0.75
0.50
0.25
0.00
N
6 km
41.97°N
41.96°N
41.95°N
41.94°N
41.93°N
1000 m
90.15°W
90.14°W
90.13°W
90.12°W
90.11°W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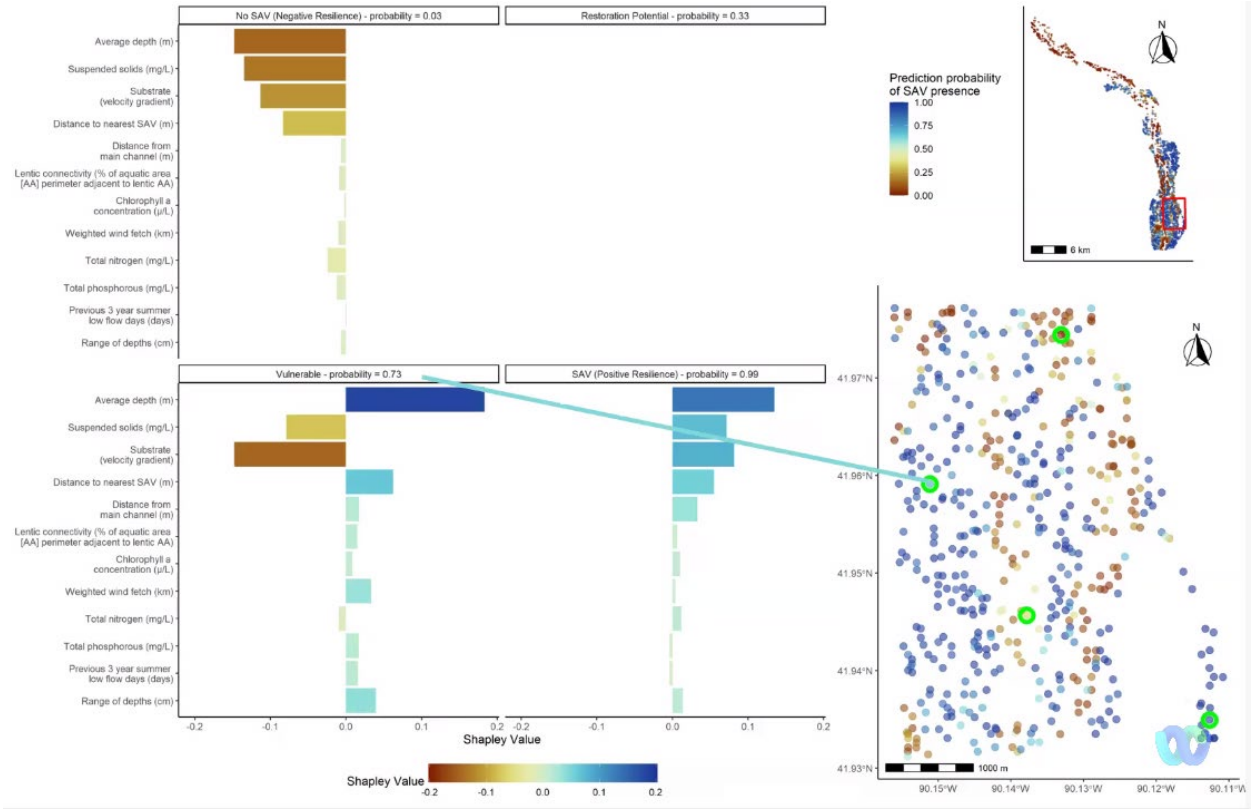
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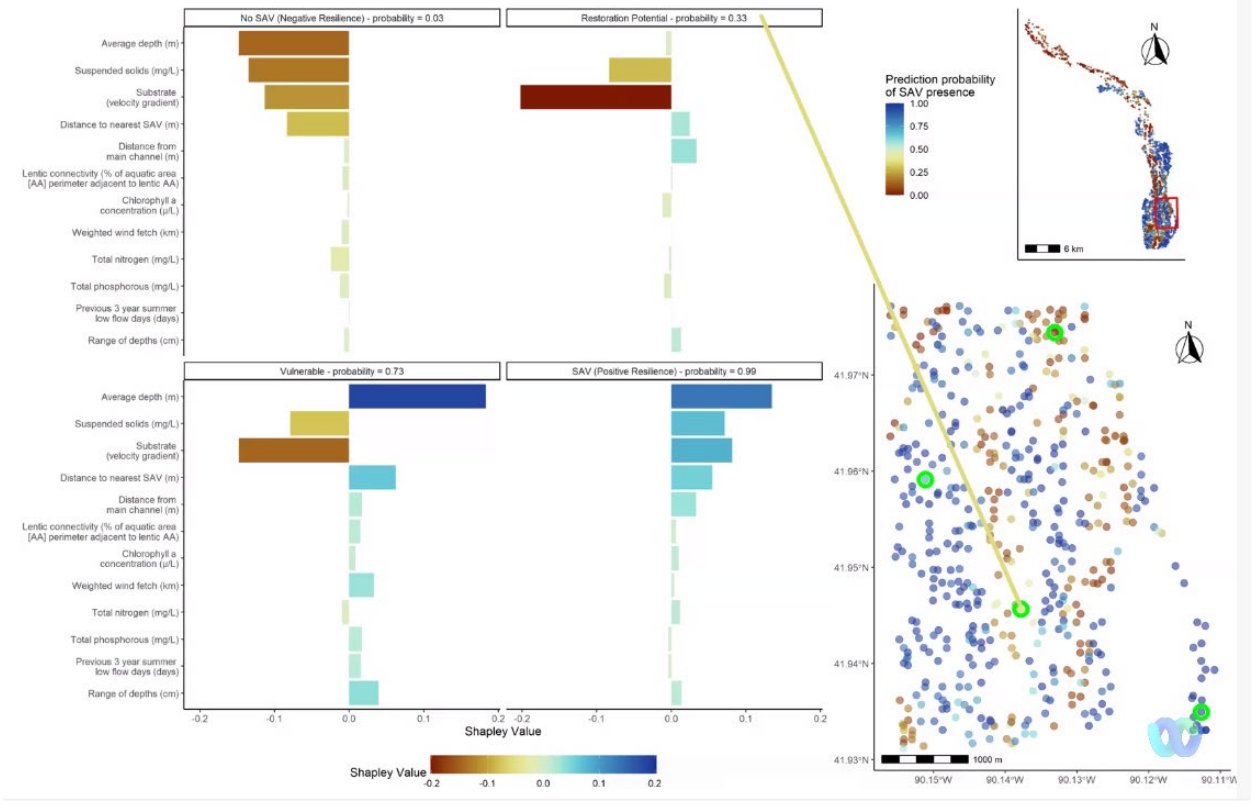
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90.15°W
90.14°W
90.13°W
90.12°W

KH: Looks like this tool could predict sites that may be at risk of becoming unvegetated or switching states?

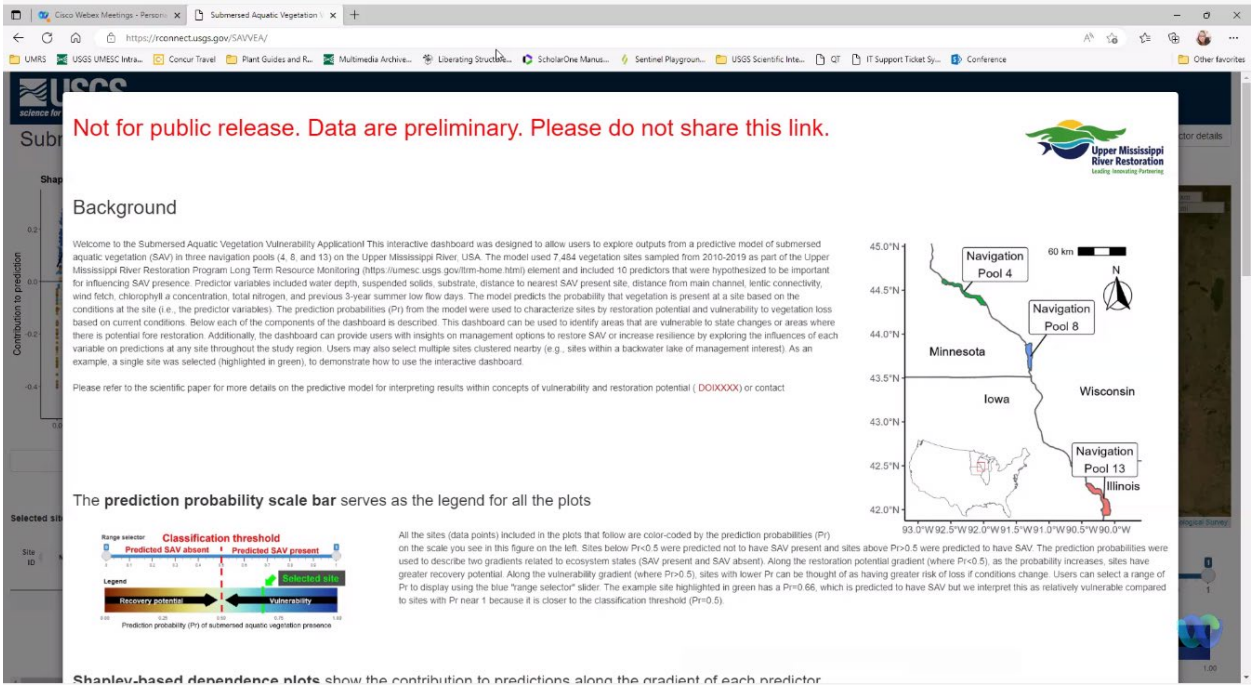
Steve Winter: Can predict sites that have right sediment and other things but don't have the veg. Maybe the key variable there is the proximity to SAV and it may not be restoration of features, but organisms there.

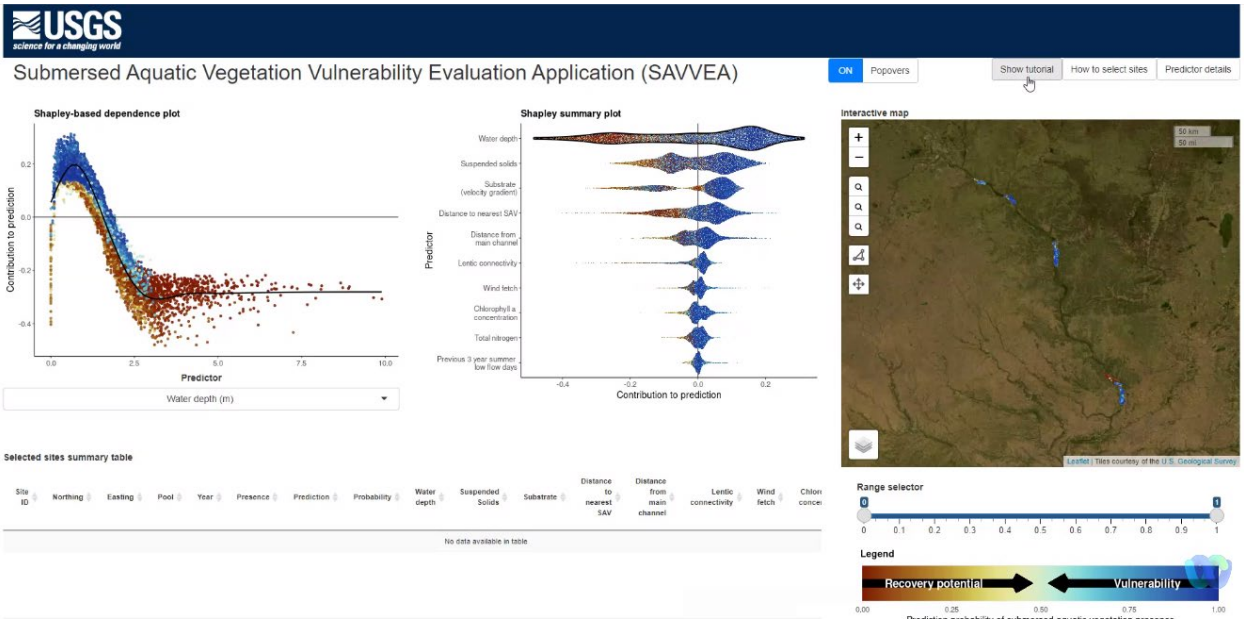
DL: In Upper Pool 4, the distance to SAV is signal in lots of places and could influence places to do plantings.

from umrba to everyone: 3:15 PM - Can you use this in conjunction with the findings from the Drake et. al paper Jeff presented to estimate biomass at sites?

DL: Models lend themselves well to that.

from Karen H Hagerty to everyone: 3:16 PM - we could use this tool to select new HREP areas!





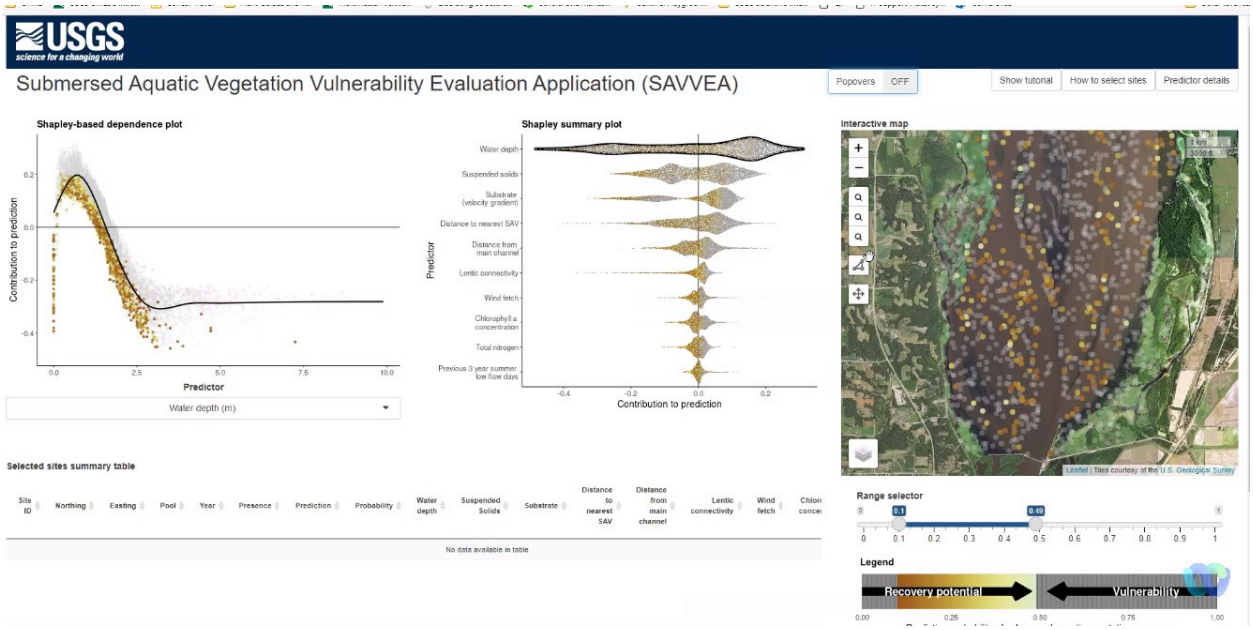
Predictor Details

The following table provides details on the predictors chosen for inclusion in the model along with ecological relevance and data sources for each. Further detail can be found in the publication associated with this application here: doi:...

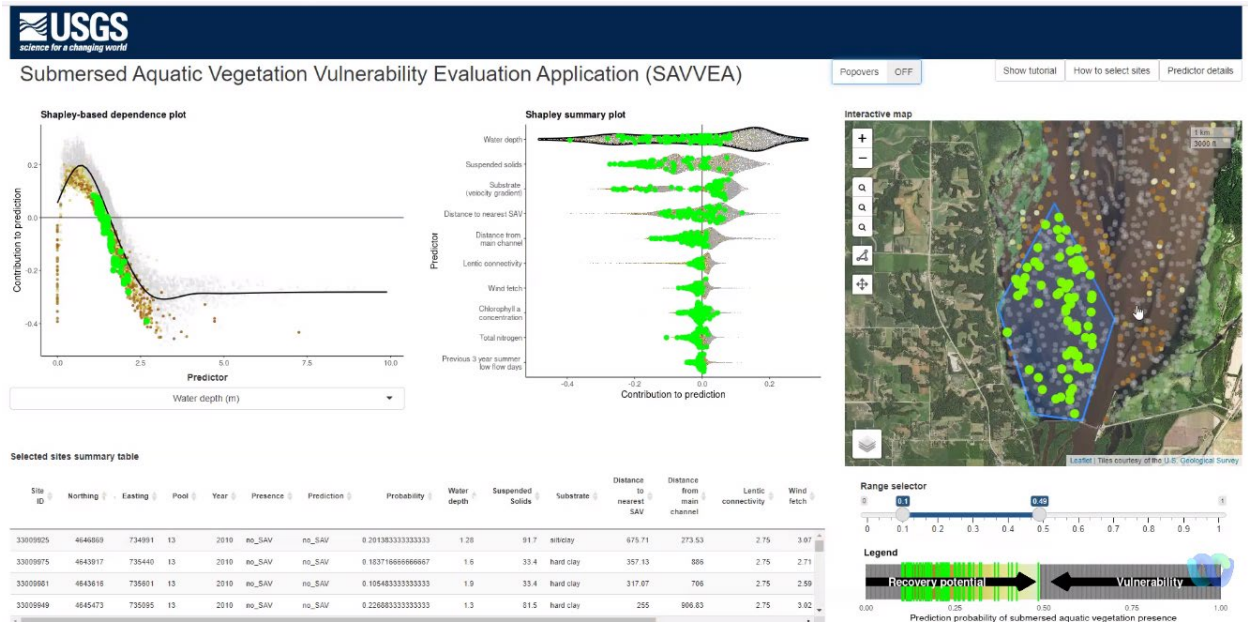
Predictor (Measurement Units)	Explanation	Ecological relevance to submersed aquatic vegetation (SAV)	Data source
Water depth (m)	Water depth was recorded at the time of vegetation sampling. Depth is the average measurement of six depth measurements taken at each subsampling area around the sampling boat.	SAV cannot withstand dewatering (depth is 0.0 m); light attenuation sets maximum water depth for photosynthesis	Long Term Resource Monitoring Program - SRS Vegetation Data Query
Suspended solids (mg/L)	Suspended solids were collected at different locations and times than vegetation data. Suspended solids data was assigned to each vegetation site using the nearest suspended sediment sample in space and time (within <30 days and <500 m of the vegetation sampling site).	Organic and inorganic materials in the water that intercepts light needed for SAV growth; particle settling can cause sedimentation and burial of SAV	Upper Midwest Environmental Sciences Center - Water Quality Database Browser
Substrate (types)	Substrate type was recorded at the time of vegetation sampling. Substrate was categorized into one of six categories (hard clay, silt/clay, mostly silt, mostly sand, sand, gravel/rock)	Substrate can represent gradients of water velocity, sediment nutrient content, and organic matter content, which are often limiting factors of SAV	Long Term Resource Monitoring Program - SRS Vegetation Data Query
Distance to nearest SAV (m)	The nearest distance in meters to a site that had SAV present within the sampling year.	May indicate SAV dispersal limitations or biological feedbacks	Long Term Resource Monitoring Program - SRS Vegetation Data Query
Distance from main channel (m)	The distance of each vegetation sampling site from the sail line (i.e., the center of the navigation channel).	This predictor serves as a hydrologic connectivity surrogate depicting proximity to the main channel. Habitat near the main channel may be less suitable for SAV due to barge and boat disturbance, as well as high turbidity, deep water, and fast currents	Upper Mississippi Restoration Program, 1994, Upper Mississippi River System Sail Line
Lentic connectivity (% of aquatic area perimeter adjacent to lentic aquatic areas)	The percent of aquatic area polygon perimeter adjacent to aquatic area polygons classified as lentic (contiguous floodplain lake, isolated floodplain lake, or contiguous impounded).	Low lentic connectivity could indicate either greater shoreline habitat or high lotic connectivity. High lentic connectivity indicates the area has many hydrologic connections to lentic areas, and likely has less shoreline habitat for SAV. Greater lentic connectivity could contribute to greater competition and reduced light availability due to higher abundance of phytoplankton or free-floating plants (e.g., duckweed), and may negatively affect SAV with hydrologic dispersal	U.S. Army Corps of Engineers' Upper Mississippi River Restoration Program Long Term Resource Monitoring element 2010/11 Level 3 Aquatic Areas Dataset
Wind fetch (km)	The unobstructed distance that wind travels over water in a constant direction.	Fetch is the unobstructed distance that wind travels over water. Fetch creates large waves and orbital velocities that uproot SAV, erode shoreline habitat, suspend sediments, and reduce water clarity	Mapped weighted wind fetch distances within the Upper Mississippi River System for 2010/2011
Chlorophyll a concentration (µg/L)	Chlorophyll a concentration was collected at different locations and times than vegetation data. Chlorophyll a concentration data was assigned to each vegetation site using the nearest Chlorophyll a concentration sample in space and time (within <30 days and <500 m of the vegetation sampling site).	Proxy for phytoplankton biomass; phytoplankton can compete with SAV, and high concentrations may indicate an unvegetated-state or 'turbid-state'	Upper Midwest Environmental Sciences Center - Water Quality Database Browser
Total nitrogen (mg/L)	Total nitrogen was collected at different locations and times than vegetation data. Total nitrogen measurements data was assigned to each vegetation site using the nearest total nitrogen	Nitrogen can be a limiting nutrient; excess nitrogen causes SAV to be outcompeted by phytoplankton, periphyton, and non-rooted floating plants	Upper Midwest Environmental Sciences Center - Water Quality

Twelve predictors were chosen through workshops with explanations, relevance, and data sources.

In Lower Pool 13 with the ongoing HREP we have collected aquatic plant data. Red is absent, blue is present. The absent areas are 0.1 to 0.5 but hopefully we can learn more about what is needed to restore these sites.

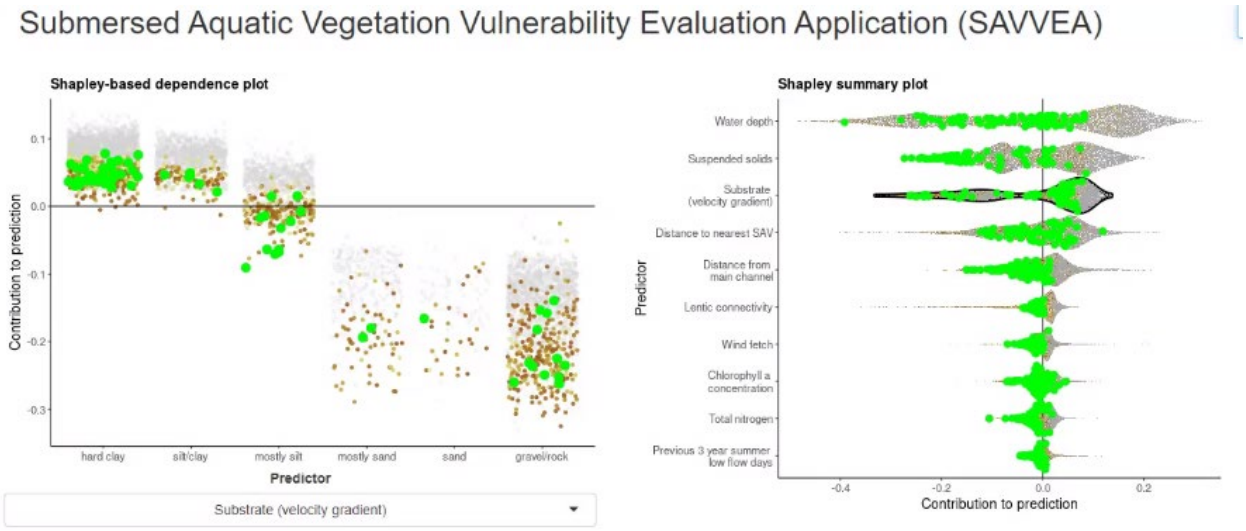


Non-selected sites go gray.



DL: Demonstration on Pool 13… Draw an area of interest and highlights sites within in Green.

Indicated some depth issues here, perhaps in conjunction with other variables e.g, TSS. Turbidity is quite a problem in this particular area. Substrate seems right, which is silty with some gravel rocky substrate.



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from Karen H Hagerty to everyone: 3:25 P - probs have mussels on those rocky sites :-)

DL: Restoration focus here might be on substrates and addressing TSS.

SG: Incredible tool. Very well done Danelle. I can see a lot of applications for this with HREPs. Need to get this information into the hands of HREP folks early on in the process as we discussed with our integration discussions. Thank you for contacting me to present to the Analysis team!

KH: Can you use this tool elsewhere if you had this data?

DL: yes, can get a prediction probability for other areas with this data. Have put in proposals to do that. Could rerun things to address certain species or pools of interest. Know wild celery acts different than other plants.

Steve Winter: Was WQ data incorporated?

DL: Yes, we integrated various LTRM datasets with Aquatic Plants dataset.

SW: UMRCC does out-pool sampling and we have some of the data on parameters, others are available (wind fetch) without collection. How much more effective out-pool UMRCC data would be if we collected WQ data as well and to combine in this tool.

DL: Would like predictive model across the system and then use UMRCC data to validate the model.

from Nicole Ward - MN DNR she/her to everyone: 3:28 PM - And Danelle sent to me ahead of the Robinson Lake Kickoff!!

from Matt O'Hara to everyone: 3:28 PM - Great tool!

from Nicole Ward - MN DNR she/her to everyone: 3:28 PM - (thanks Danelle!)

from Karen H Hagerty to everyone: 3:30 PM - @Steve, great idea!

Shawn Giblin: Would be good presentation to share with Lower Pool 10 HREP team. Lots of decisions made by that team that are antithetical to what you've presented. If project teams don't internalize information we won't get any further ahead. Would be good to share with that team.

Scott Gritters: We know carp have an impact on vegetation and one impact may be in TSS – but is there any way to overlap a third layer and get carp data from LTRM and integrate into this model? Carp also root around and physically dislodge vegetation.

AS: At the Huron Island project it showed vegetation response in area with high TSS with exclosures. This is indicating herbivory may be driver of low vegetation.

SW: We have to be realistic about where some projects are and whether information can be used to change projects fundamentally. The data may tell us we want to tweak something but it may be too late in the process.

Scott Gritters: If the data tells us we're working in the wrong spot we may need to learn it wherever we are at in the process.

from Karen H Hagerty to everyone: 3:32 PM - it would be a great presentation at the next HREP workshop too
from Jeff Houser USGS-UMESC to everyone: 3:32 PM - @ Stephen -- transparency tube is a low-tech way to measure water clarity.
from Matt O'Hara to everyone: 3:32 PM - quincy bay team also
from Nick Schlesser to everyone: 3:32 PM - back
from Jim Lamer to everyone: 3:35 PM - Good job, Danelle!
from Jeff Houser USGS-UMESC to everyone: 3:35 PM - Excellent presentation, Danelle. Thank you.

Steve Winter: I think we should be transparent with the people on this call, is the assertion that this data should be used to change a planned feature in lower Pool 10?

Shawn G: absolutely it could be used in Lower Pool 10 for Ferry Slough. None of the variables Danelle highlighted are addressed in South Ferry Slough.

Steve Winter: What you're advocating for then was not possible for… That's a closed area and the Service does not want to increase human activity in an area in the fall. Human activity would increase if we improved lentic areas for fisheries. That is an issue we have with in Lake Onalaska. The refuge does not want increased fishing activity in closed areas in the fall. Why would we talk about using this data to change a feature that would increase human activity in that area in the fall?

Shawn G: The project objective was for vegetation. How would more vegetation increase human activity?

Steve Winter: Your analyses showed how it would improve overwintering habitat for centrarchids.

Shawn G: Respectfully disagree. Our work was geared toward improving vegetation endpoints.

Steve Winter: Your second report scrubbed that.

Shawn G: There was no data that was scrubbed. What was shown here is important to include if the objective is aquatic vegetation.

Scott G: I do not know the Pool 10 situation but always encourage the use of data whenever possible and not be afraid of what it says.

Marshall Plumley: This type of application will be useful as we think about new projects over the next 18 months to two years. This could be part of initial ground laying for new projects. This predictive capability may help think through where to focus consideration and project identification.

Scott Gritters: if the data tells us we're working in the wrong spot we may need to learn it wherever we are in the process.

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from Jeff Houser USGS-UMESC to everyone: 3:35 PM - Excellent presentation, Danelle. Thank you.

Andrew Stephenson: presentation on the Flyer's being developed and specifically the aquatic vegetation flyer.

Scott Gritters: It would be really helpful to share this with media who may need filler on new stories. Great resource!

Shawn Giblin: Nice work, looks great.

from Erin Spry UMRBA to everyone: 4:01 PM - thank you everyone for your thoughtful feedback!

from Nathan De Jager to everyone: 4:03 PM - Layouts look nice Andrew

*****Andrew will send WQ word and PDF versions to Scotty for distribution. Review request by Friday at noon.**

LTRM personal changes:

Karen Hagerty reported that Davi Michl is on 120-day detail. Kyle Bales is backfilling Davi as UMRR LTRM technical representative. Dan Meden will be there for 120-day detail after Davi.

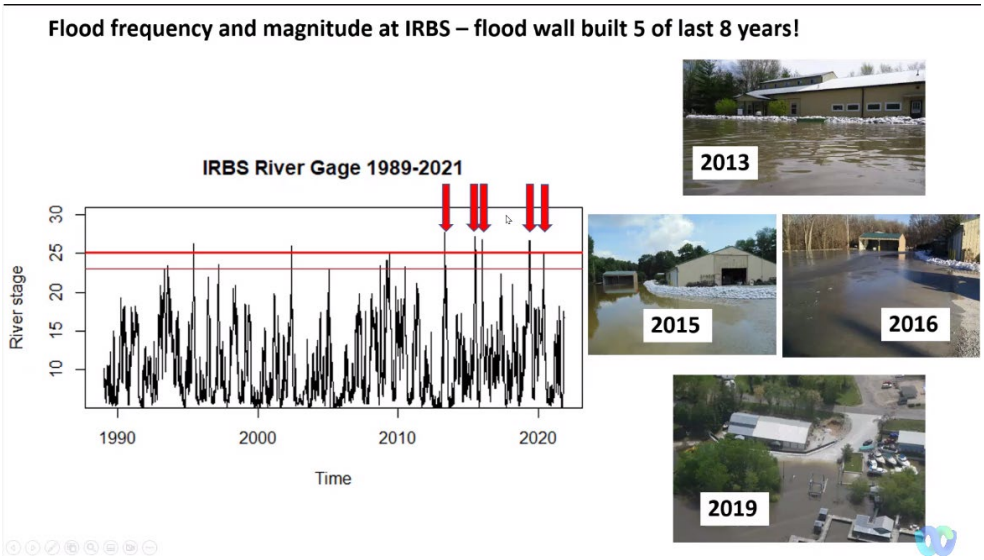
Field Station in Focus:

Scott Gritters: My favorite segment of the A-team meeting notes. I have known Jim Lamer a long time and always impressed by his command of so many subjects from impacts of turtle harvest, wq, invasive

carp and macro. Look forward to hearing about the great work from great folks at the Illinois La Grange Pool Field Station.

Jim Lamer

Plan 2 dozen events throughout the year – interact with 3800 folks.



Scott Gritters: Long history there. Congrats to you and staff, they joy to work with for me personally. Relate a thank you on behalf of the A-Team. Goes to all team leaders as well. We're a group made up of

Chairperson Gritters notes: here is the new writeup of the Illinois Team for the website:

The La Grange Pool Long Term Resource Monitoring (LTRM) Field Station is also known as the Illinois River Biological Station and is operated by the Illinois Natural History Survey (INHS). The INHS is one of five Surveys under the Prairie Research Institute and University of Illinois. The field station is located in a leased facility on the bank of the Illinois River in Havana, Illinois.

Major funding for the station is provided through the LTRM, an element of the Upper Mississippi River Restoration program (UMRR). The UMRR is a cooperative effort of the U.S. Army Corps of Engineers, the U.S. Geological Survey, and the natural resource agencies of the five states that border the Upper Mississippi River system UMRS (Illinois, Iowa, Minnesota, Missouri, and Wisconsin). The primary responsibility of the field station's LTRM staff (ten full-time biologists, staff, and technicians) is monitoring fishes and water quality along the 80-mile long La Grange pool of the Illinois River. Monitoring includes sampling main channel borders, side channels, and backwaters. Beginning in 2023, IRBS will be leading the reinstated macroinvertebrate component, which was recently funded from 2023-2027.

In the past, field station staff have been involved in a variety of other projects, including research on native mussels, invasive zebra mussels and their larvae, zooplankton, sport fish ecology, invasive

species impacts and biological monitoring at Habitat Rehabilitation and Enhancement Projects and other restoration sites.

Currently, LTRM staff are also involved with studying the ecology of non-sport fishes (gars, buffalo spp.) and effects of a system wide lock closure on riverine ecology while continuing study of impacts of invasive carp, zooplankton, sport fish ecology, and habitat restoration.

Most research beyond the LTRM monitoring is funded through grants or contracts. Total staff at the field station varies from 20 to 35, depending on the season and the number and scope of additional research projects. Field station staff collaborate with INHS scientists from the INHS main office on the campus of the University of Illinois at Urbana-Champaign, the nearby Forbes Biological Station at Havana, five other INHS field stations, Illinois Department of Natural Resources as well as a number of other state, federal, or NGO partners. Other collaborative efforts include scientists from the LTRM's Upper Midwest Environmental Sciences Center at La Crosse, WI and the other five LTRM field stations. The Illinois River Biological Station also coordinates research activities on the Mississippi and Upper Illinois rivers through biologists located at satellite offices at Nauvoo State Park, Silver Springs State Park, and Starved Rock State Park in Illinois.

Currently IRBS's facility consists of 2460 square feet of office space with a 620 square foot conference room, a 1400 square feet of lab space, 2880 square feet of connected and heated shop/garage area, and a 1200 square foot covered boat shed on site that is not heated or connected to the main building. LTRM staff at the station have a total of six boats with associated motors, trailers, and support equipment: two electrofishing boats and two netting boats (a primary and a backup), water quality boat, and airboat. LTRM also owns two field vehicles that are housed at IRBS. Other equipment at the field station includes the following:

Field equipment

- Three Garmin global positioning system units.
- A variety of LTRM nets along with other sampling nets and all gear/equipment required to deploy and retrieve.
- Three ETS Electrofishing control boxes.
- Field laptops for electronic field data entry: two fisheries and two water quality
- Three Hydrolab sondes, three YSI Pro2030 units, three Hach FH950 flow meters.

Laboratory equipment

- Two Buehler Isomet, low-speed saws.
- Multiple freezers for storage of biological specimens.
- Dissecting microscopes for fish identification and other uses.
- Full water quality lab with all equipment needed to conduct LTRM sampling or other water quality-based research.

- Satorius analytical balance along with other scales.

Illinois Natural History Survey
Havana Field Station
704 North Schrader Avenue
Havana, IL 62644

Telephone: 309-543-6000

AS: Your Facebook page is terrific with great information and content on there. Also great photos!

Jim Lamer: Kris Maxson is a great driver behind that.

from Scott Gritters to everyone: 4:11 PM - Agency Report will be in this order: UMRBA, USGS, USFWS, COE, MN, WI, IA, IL MO and anyone I missed

from Marshall Plumley to everyone: 4:16 PM - I have to drop off. Great discussion today and I appreciate all your hard work and support for the Program.

from Dave Bierman - Iowa DNR/LTRM to everyone: 4:31 PM - No wonder we can't find seasonals...Lamer has 'em all!! ;-)

from Kristen Bouska to everyone: 4:31 PM - Nice overview!

from Karen H Hagerty to everyone: 4:33 PM - Kris does a great job of posting our UMRR social media postings too!

from Matt O'Hara to everyone: 4:34 PM - Great Overview Jim! IRBS is so diverse, incredible place to work.

USFWS: Steve Winter – we're understaffed at this time. Working hard with NESP and HREP stuff now across refuge. The FWWG is identifying NESP projects to move forward if funding is available, and several projects under consideration would be on the refuge..

USACE: Karen Hagerty, I'm retiring July 29. Lots of jobs available at Corps in different areas.

MN DNR: Nick S. Vanessa Perry will start on February 16 and backfill for Megan Moore on UMRCC. Also interviewing for new assistant area supervisor in Lake City which is largely a river-centric position. Lead sampling that Neil Rude and other have been doing. No set date, but Kevin Stauffer will likely be retiring over the summer some time.

WI DNR: Shawn Giblin the trend numbers on Chloride moving are moving in the wrong direction. Cumulative efforts of UMRCC, UMRBA, and states getting movement on legislature and making good progress there. Working on nitrogen as well with good movement on farmer led groups to decrease nitrogen. On the river I am working on cyanobacteria cyanotoxin areas. Also, backwater residence times and the data is looking good.

Scott Gritters: I will still be chair for the next meeting in April then it will switch and maybe go to Shawn Giblin will be next A-Team Chair? Discussion ensued…

Shawn Giblin: two-year gap there?

Nick: I took over from Matt Vitello.

SG: Maybe it goes to Illinois… **but we will check it out and get it set by next meeting ****

IA DNR Update: Scott Gritters presented for all Eastern Iowa Bass clubs with donations taken for Friends of Pool 9 group. Presentation mostly on Bass, but was asked questions for a long time on forest loss, pelicans, etc. Flyers would be helpful for that group. Also, a large amount of LTRM data goes into all these types of presentations. Trends, movement, growth… etc

IL DNR: Matt O'Hara, Have a new Director here.

MO DOC: Matt Vitello we are holding Corps partners meeting. Have 5-6 Corps districts. St. Louis and Rock Island Colonels and MO DNR and MO DOC leadership will be meeting on Friday.

NRCS: Rich Vaughn: New Missouri and Mississippi River Coordinator but have been with USDA there for 28 years working on

Wetlands, endangered species, watershed planning

Park service - wetland restoration specialists

USACE – NEPA and endangered species.

University of Minnesota – worked at Gull Lake

Karen H: Glad to have NRCS at the table for A-Team. Not sure we've had NRCS at this level but have had it at the UMRR CC level. Anything we can do to help you catch up, willing to help!

Scott G: Do not forget the UMRCC meeting is to be held in Red Wing.

Adjourn 4:57 p.m.

from Davi Michl to everyone: 4:56 PM

Great meeting, thanks Scotty!

from Nick Schlesser to everyone: 4:56 PM

Thanks everyone

<u>Chat</u>

from umrba to everyone: 1:03 PM

Andrew Stephenson, UMRBA

from Erin Spry UMRBA to everyone: 1:03 PM

Erin Spry, UMRBA

from Seth Fopma to everyone: 1:03 PM

Seth Fopma, Iowa DNR

from Kristen Bouska to everyone: 1:03 PM

Kristen Bouska, USGS UMESC

from Danelle Larson to everyone: 1:03 PM

Danelle Larson,USGS

from Jeff Houser USGS-UMESC to everyone: 1:03 PM

Jeff Houser USGS UMESC

from Dave Bierman - Iowa DNR/LTRM to everyone: 1:03 PM

Dave Bierman - Iowa DNR/LTRM

from Davi Michl to everyone: 1:03 PM

Davi Michl, USACE, Rock Island

from Nick Schlesser to everyone: 1:03 PM

Nick Schlesser MN DNR

from David Potter to everyone: 1:03 PM

David Potter, RPEDN, St. Paul District

from Lane Richter to everyone: 1:04 PM

Lane Richter, USACE, MVS

from Karen H Hagerty to everyone: 1:04 PM

Karen Hagerty USACE, Rock Island, UMRR LTRM

from Jim Lamer to everyone: 1:04 PM

Jim Lamer, Illinois River Biological Station, INHS

from Nicole Ward - MN DNR she/her to everyone: 1:04 PM

Nicole Ward - MN DNR LTRM

from Marshall Plumley to everyone: 1:04 PM

Marshall Plumley Corps of Engineers Rock Island District

from Nathan De Jager to everyone: 1:04 PM

Nathan De Jager USGS UMESC

from Richard Vaughn to everyone: 1:04 PM

Richard Vaughn, USDA-NRCS Missouri River and Upper Mississippi River Basins Coordinator

from Matt O'Hara to everyone: 1:04 PM

Matt O'Hara Illinois Department of Natural Resources

from Randy Schultz to everyone: 1:05 PM

Randy Schultz Iowa DNR

from Jennifer Dieck to everyone: 1:07 PM

Jennifer Dieck USGS UMESC

from Karen H Hagerty to everyone: 1:08 PM

we can certainly have a hybrid meeting.

from Karen H Hagerty to everyone: 1:08 PM

@Jeff, would UMESC be willing to host, both physically and the web link?

from Karen H Hagerty to everyone: 1:13 PM

I would propose the meeting time as 12-4. registration for MRRC starts at 4:)0

from Karen H Hagerty to everyone: 1:13 PM

4:00

from Karen H Hagerty to everyone: 1:15 PM

Plenary session starts at 6:00

from Randy Schultz to everyone: 1:18 PM

Unique way to vote Scotty, but that works!

from Jim Lamer to everyone: 1:19 PM

We plan to have a draft ready by next week to send in. We just had a discussion about it.

from Dave Bierman - Iowa DNR/LTRM to everyone: 1:20 PM

Ours is up to date on what Karen is showing now, not sure about A-Team Corner?

from Matt Vitello to everyone: 1:22 PM

Ours is not up to date, I'll check where an update stands

from Dave Bierman - Iowa DNR/LTRM to everyone: 1:24 PM

Feel free to use Iowa's as a template :-)

from Jim Lamer to everyone: 1:24 PM

Standardizing would be helpful, at least standardized sections

from Jeff Houser USGS-UMESC to everyone: 1:25 PM

I agree that having things up to date is priority. we don't need to have the perfect be the enemy of the good here.

from Nicole Ward - MN DNR she/her to everyone: 1:26 PM

Ok - I will send Chris's great Lake City description! Who do we send it to?

from Jeff Houser USGS-UMESC to everyone: 1:26 PM

to Jeff Houser

from Jeff Houser USGS-UMESC to everyone: 1:26 PM

I will forward to Mike Caucutt

from Matt O'Hara to everyone: 1:27 PM

I agree with you Scotty, update information should take priority.

from Davi Michl to everyone: 1:30 PM

I'll arm wrestle for it! :)

from Karen H Hagerty to everyone: 1:43 PM

proposals will be submitted to UMRR CC at the MAY meeting

from Stephen Winter to everyone: 2:06 PM

Nope, you gave a good overview Jeff.

from Nicole Ward - MN DNR she/her to everyone: 2:08 PM

No questions - great overview and really excellent job, Implementation planning group!

from Danelle Larson to everyone: 2:09 PM

Thank you Jeff and the entire Planning Group! Nice work, this is exciting.

from Jeff Houser USGS-UMESC to everyone: 2:09 PM

People have invested an enormous amount of time. I echo Marshall's thanks to all involved.

from Jeff Houser USGS-UMESC to everyone: 2:10 PM

I gotta work on the story telling part...

from Karen H Hagerty to everyone: 2:11 PM

@Jeff, you did a very good job!

from umrba to everyone: 2:24 PM

https://umrba.org/sites/default/files/documents/umrba-wlm-priorities-2022.pdf

from Kathi Jo Jankowski to everyone: 2:29 PM

Here's the link to the survey for now, will send invitation as well: https://forms.office.com/pages/responsepage.aspx?id=urWTBhhLe02TQfMvQApUlMpyCmLLmtJGoI8abe0ujrpUMVRVT0xTSEVUQzFaVjE5RlFVVE5DNlJCUy4u

from Matt Vitello to everyone: 2:51 PM

I intend to get hotel room (dependent on flight)

from Jim Lamer to everyone: 2:51 PM

I will be coming in on Tuesday night and will be staying for conference as well

from Matt O'Hara to everyone: 3:05 PM

I would need a room, Thanks

from Davi Michl to everyone: 3:13 PM

So cool, Danelle!

from Nicole Ward - MN DNR she/her to everyone: 3:14 PM

Nice presentation!! Thanks Danelle!

from Davi Michl to everyone: 3:15 PM

Great example of integration, also!

from Dave Bierman - Iowa DNR/LTRM to everyone: 3:15 PM

Good stuff for sure

from umrba to everyone: 3:15 PM

Can you use this in conjunction with the findings from the Drake et. al paper Jeff presented to estimate biomass at sites?

from Karen H Hagerty to everyone: 3:16 PM

we could use this tool to select new HREP areas!

from Karen H Hagerty to everyone: 3:25 PM

probs have mussels on those rocky sites :-)

from Nicole Ward - MN DNR she/her to everyone: 3:28 PM

And Danelle sent to me ahead of the Robinson Lake Kickoff!!

from Matt O'Hara to everyone: 3:28 PM

Great tool!

from Nicole Ward - MN DNR she/her to everyone: 3:28 PM

(thanks Danelle!)

from Nick Schlesser to everyone: 3:29 PM

have to let kids in from school be right back

from Karen H Hagerty to everyone: 3:30 PM

@Steve, great idea!

from Karen H Hagerty to everyone: 3:32 PM

it would be a great presentation at the next HREP workshop too

from Jeff Houser USGS-UMESC to everyone: 3:32 PM

@ Stephen -- transparency tube is a low-tech way to measure water clarity.

from Matt O'Hara to everyone: 3:32 PM

quincy bay team also

from Nick Schlesser to everyone: 3:32 PM

back

from Jim Lamer to everyone: 3:35 PM

Good job, Danelle!

from Jeff Houser USGS-UMESC to everyone: 3:35 PM

Excellent presentation, Danelle. Thank you.

from Jennifer Dieck to everyone: 3:40 PM

Thanks for the great presentation, Danelle!

from Nathan De Jager to everyone: 3:41 PM

Thanks Danelle and John!

from Patrick Kelly to everyone: 3:49 PM

Unfortunately have another meeting to run to. Thanks everyone!

from Erin Spry UMRBA to everyone: 4:01 PM

thank you everyone for your thoughtful feedback!

from Nathan De Jager to everyone: 4:03 PM

Layouts look nice Andrew

from Karen H Hagerty to everyone: 4:03 PM

same for me!

from Dave Bierman - Iowa DNR/LTRM to everyone: 4:04 PM

none here

from Karen H Hagerty to everyone: 4:06 PM

it would help if I had looked at the agenda, sorry

from Scott Gritters to everyone: 4:11 PM

Agency Report will be in this order: UMRBA, USGS, USFWS, COE, MN, WI, IA, IL MO and anyone I missed

from Marshall Plumley to everyone: 4:16 PM

I have to drop off. Great discussion today and I appreicate all your hard work and support for the Program.

from umrba to everyone: 4:27 PM

Sounds like you need some copies of the flyers!

from Dave Bierman - Iowa DNR/LTRM to everyone: 4:31 PM

No wonder we can't find seasonals...Lamer has 'em all!! ;-)

from Kristen Bouska to everyone: 4:31 PM

Nice overview!

from Karen H Hagerty to everyone: 4:33 PM

Kris does a great job of posting our UMRR social media postings too!

from Matt O'Hara to everyone: 4:34 PM

Great Overview Jim! IRBS is so diverse, incredible place to work.

from Matt Vitello to everyone: 4:44 PM

It was a great two years

from umrba to everyone: 4:45 PM

2015 - otation of the Chair: When Maher was new to A-team, IL was immediately up for the chair. John

Sullivan of WI took the chair to avoid burdening a new A-team member

from umrba to everyone: 4:48 PM

2011-2013 seems like it was Kirk Hansen or other IA DNR staff.

to Scott Gritters (privately): 4:51 PM

Scott - I think we're getting there - but it might be good to call on Rich Vaughn - new NRCS representative to UMRR CC to introduce himself.

from Matt Vitello to everyone: 4:56 PM

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from umrba to everyone: 4:56 PM

UMRCC - March 20-24

from umrba to everyone: 4:56 PM

23

from Davi Michl to everyone: 4:56 PM

Great meeting, thanks Scotty!

from Nick Schlesser to everyone: 4:56 PM

Thanks everyone