INTRODUCTION TO THE NEW NATIONAL MANUAL ON THE ORDINARY HIGH WATER MARK

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WRAP WETLANDS REGULATORY ASSISTANCE PROGRAM

US Army Corps of Engineers

ERDC ENGINEER RESEARCH & DEVELOPMENT CENTER

OHWM | What is the Ordinary High Water Mark?

REGULATION

"The term ordinary high water mark means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas."

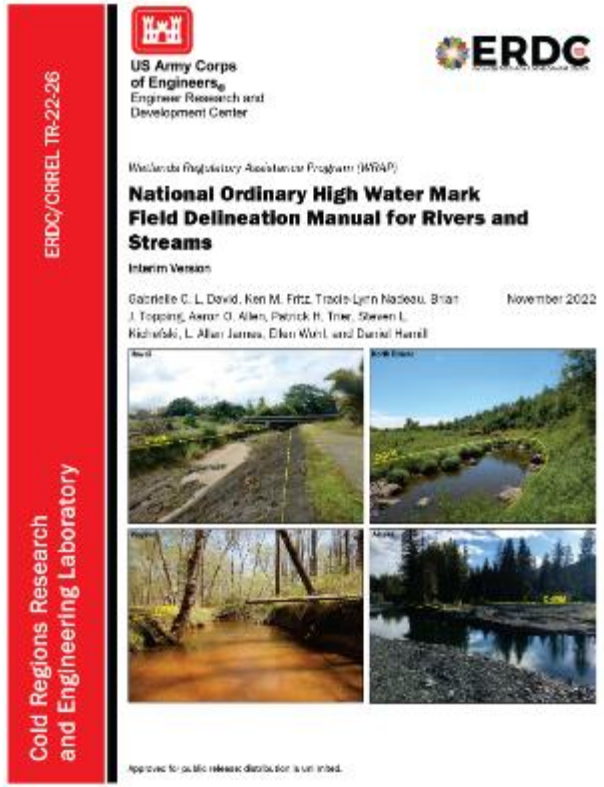
33 CFR 328.3(e)

GUIDANCE

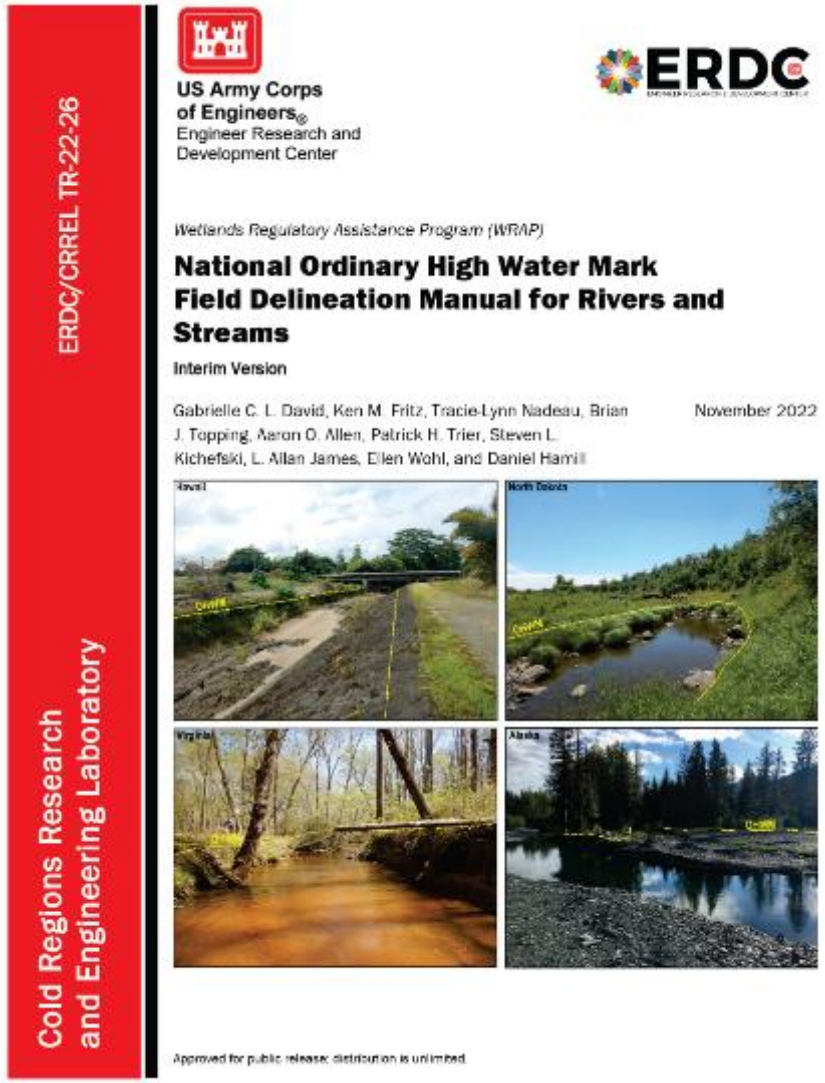
Natural line impressed on the bank
Shelving
Changes in the character of soil
Destruction of terrestrial vegetation
Presence of litter and debris
Wracking
Vegetation matted down, bent, or absent
Sediment sorting
Leaf litter disturbed or washed away
Scour
Deposition
Multiple observed flow events
Water staining
Change in plant community

***Physical characteristics listed in USACE RGL 05-05**

TECHNICAL MANUAL



Publication of the Interim Draft National OHWM Manual on November 29, 2022



Joint public notice from USACE and EPA requests feedback from USACE districts, other practitioners, and public through December 1, 2023.

Link to public notice:
https://www.usace.army.mil/Media/Announcements/Article/3233308/1-december-2022-release-of-the-interim-draft-of-the-national-ordinary-high-wate/

Link to Interim Draft National OHWM Manual:
https://hdl.handle.net/11681/46102

Why do we need a national OHWM field delineation manual?

One definition that is being applied to many different systems.

Why do we need a national OHWM field delineation manual?

We need:

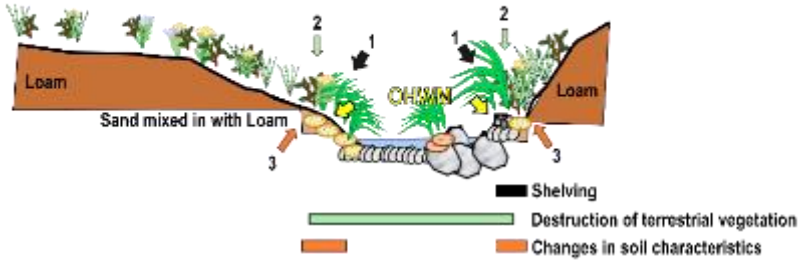
1) a standardized language for communication among scientists, regulators, and the public

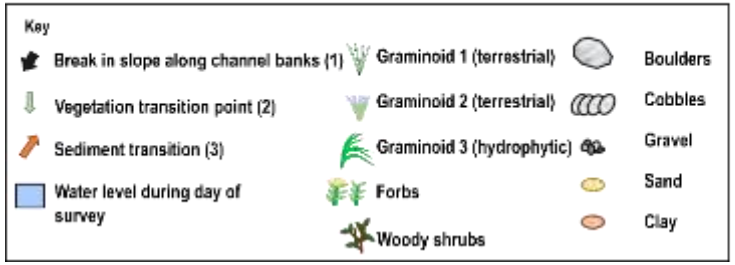
2) to focus on identifying characteristics of high flow rather than low flow

3) consistent OHWM identification despite differences in land use, season, or impacts from natural disturbances.

Goals of the OHWM National Manual

1) Provide consistent, science-based definitions of OHWM indicators
2) Outline a clear decision-making process using the Weight-of-Evidence approach
3) Provide a form for rapid and consistent field data collection
4) Describe landscape-scale considerations for OHWM interpretation
5) Provide examples of case studies for difficult OHWM delineations



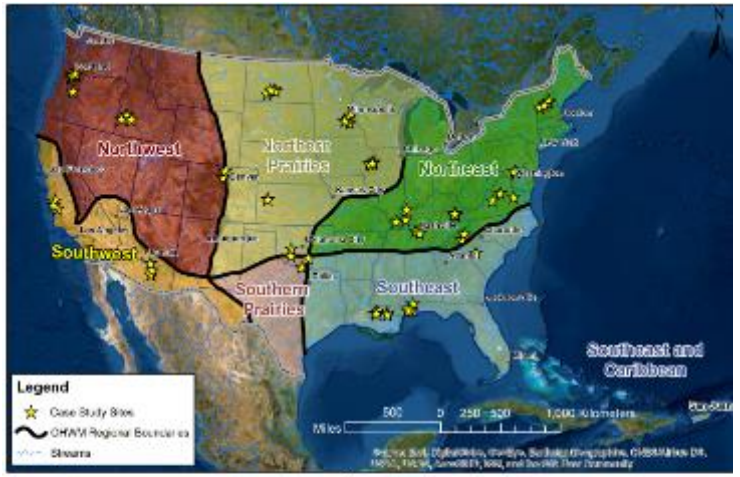


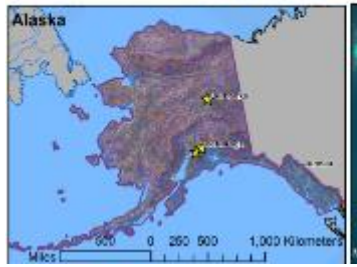
Case Study locations included in the OHWM National Manual


Alaska


Northwest


Hawaii






Southwest

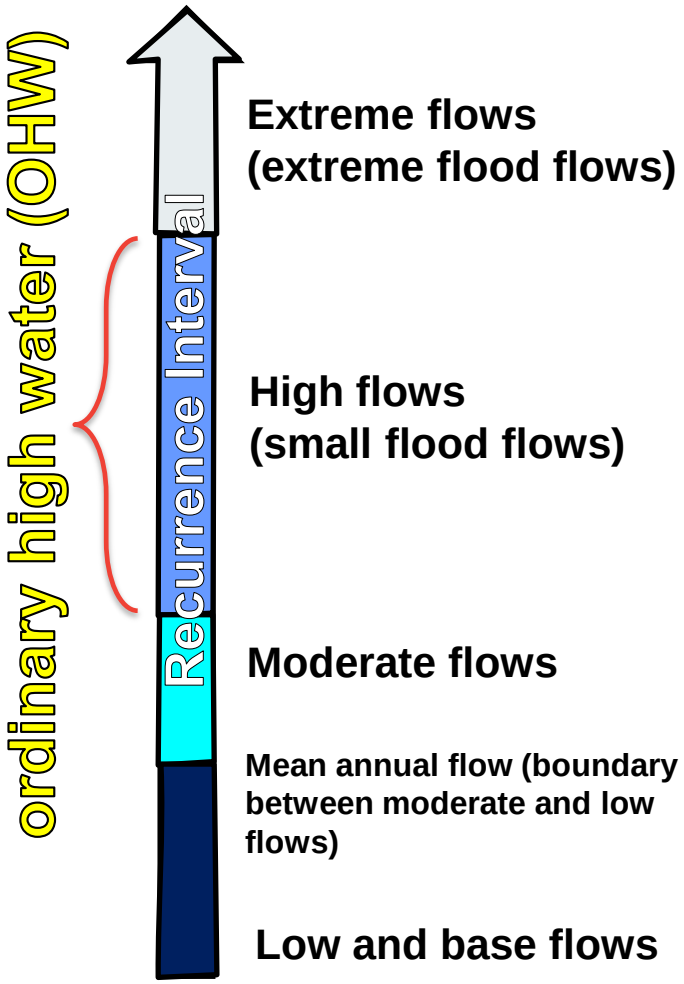

Northern prairies

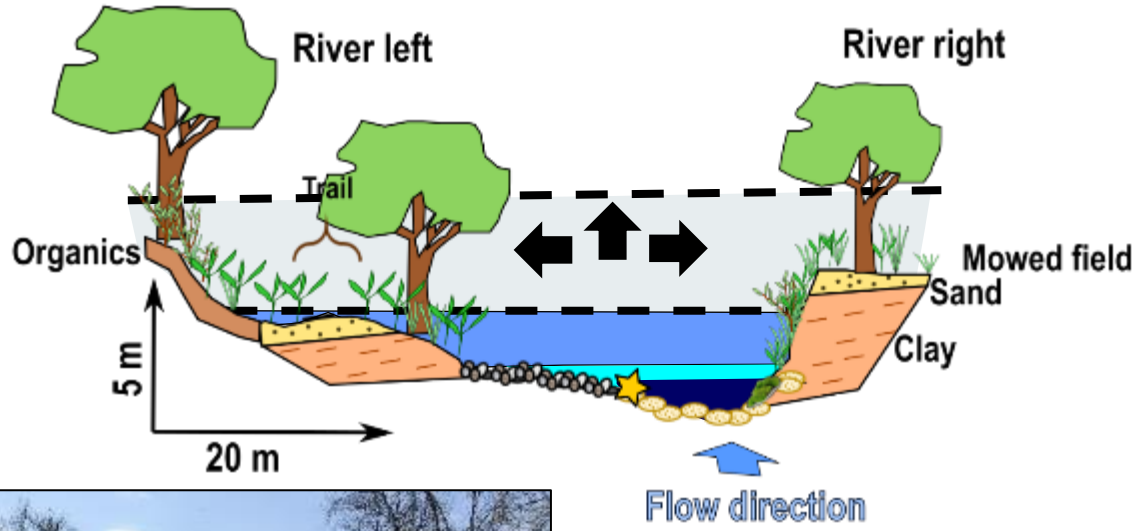

Southern prairies

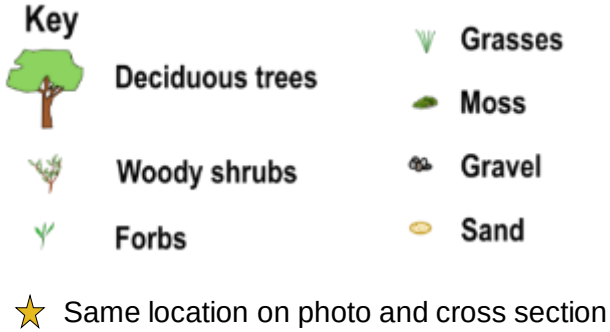

Northeast


Southeast

Goal 1 | Science of OHWM: What are high flows?







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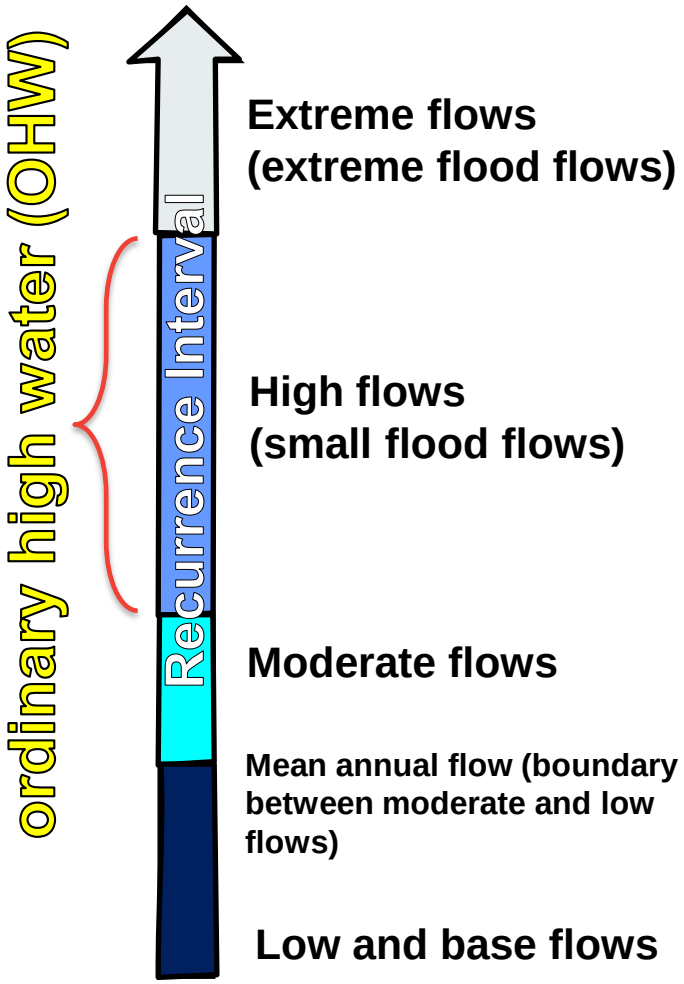
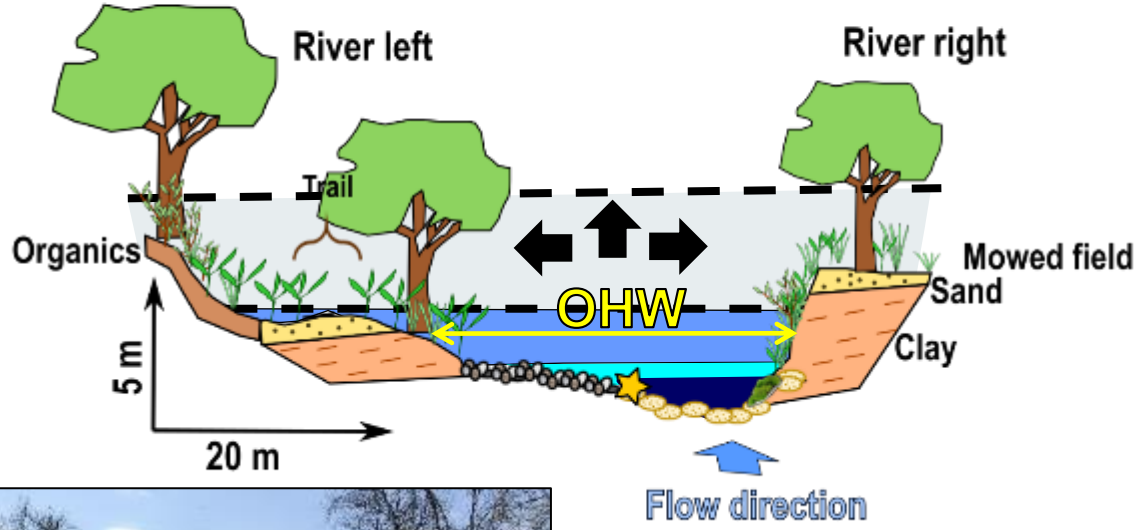
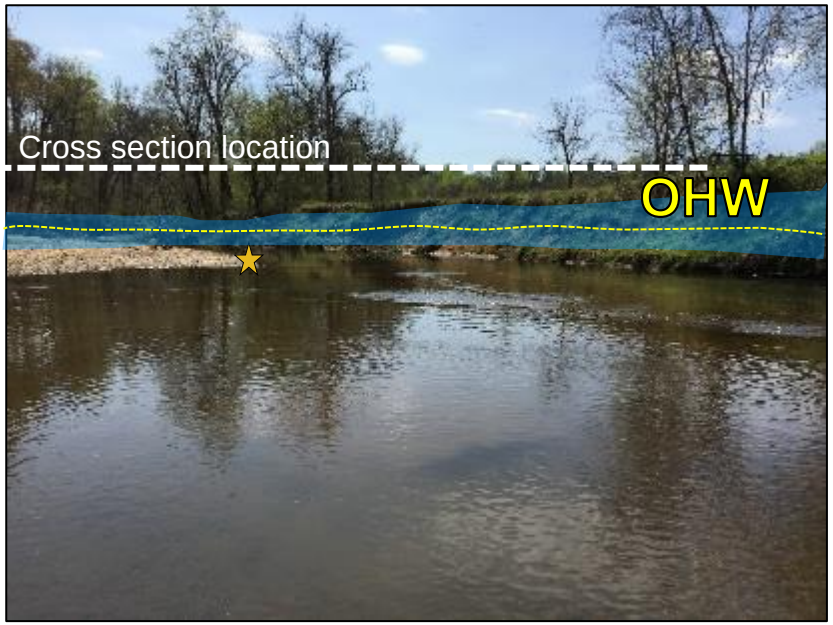






Key

Deciduous trees

Woody shrubs

Forbs

Grasses

Moss

Gravel

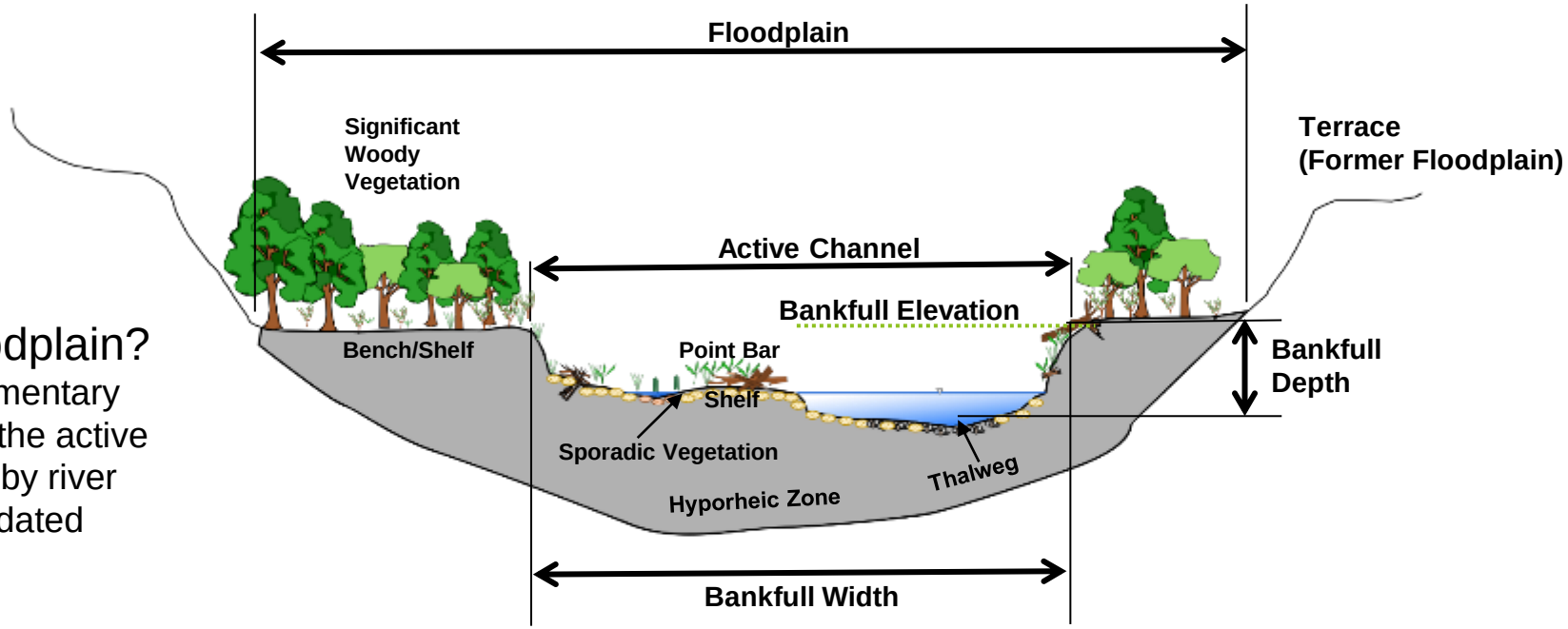
Sand

★ Same location on photo and cross section

Goal 1 | Science of OHWM: What are the scientific counterparts?

What is the floodplain?

A relatively flat sedimentary surface adjacent to the active channel that is built by river processes and inundated frequently.



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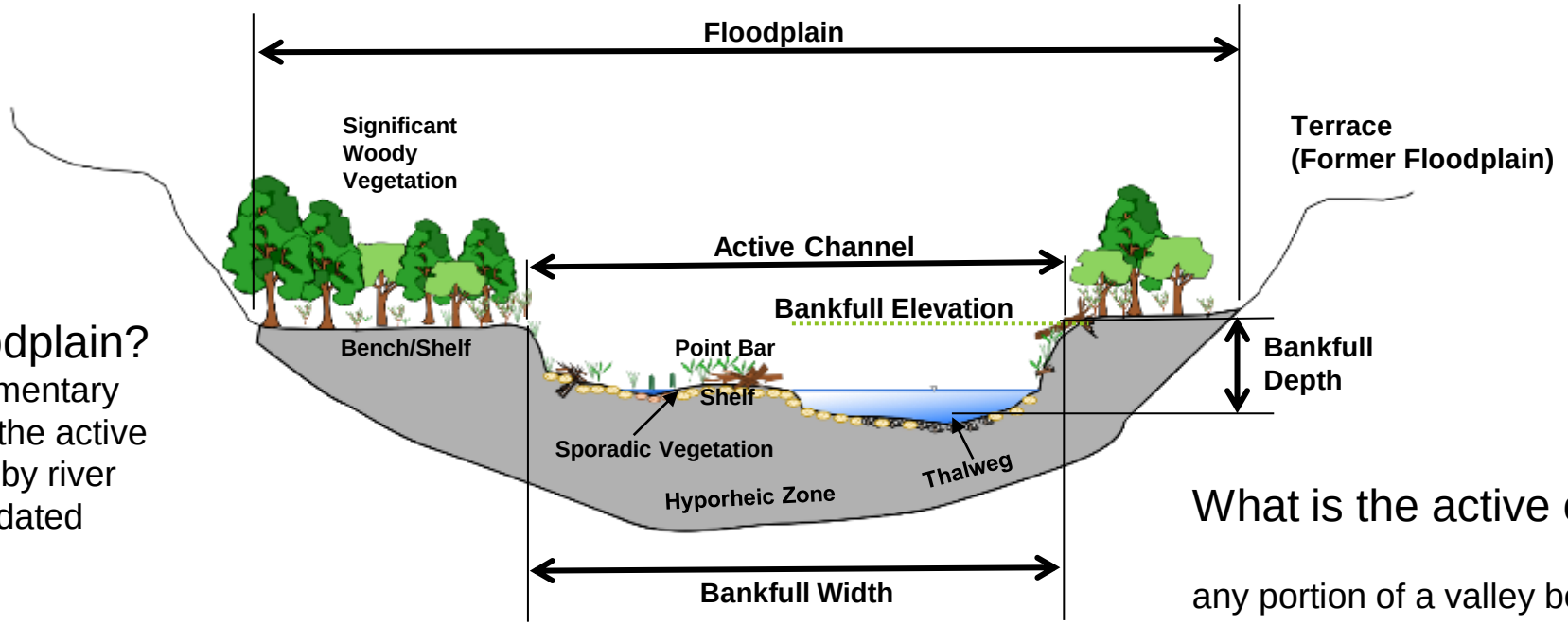

What is the active channel?

any portion of a valley bottom within channels defined by erosional and depositional features created by ongoing river processes with the exception of overbank sedimentation and as opposed to upland processes such as sheet flow or debris flow

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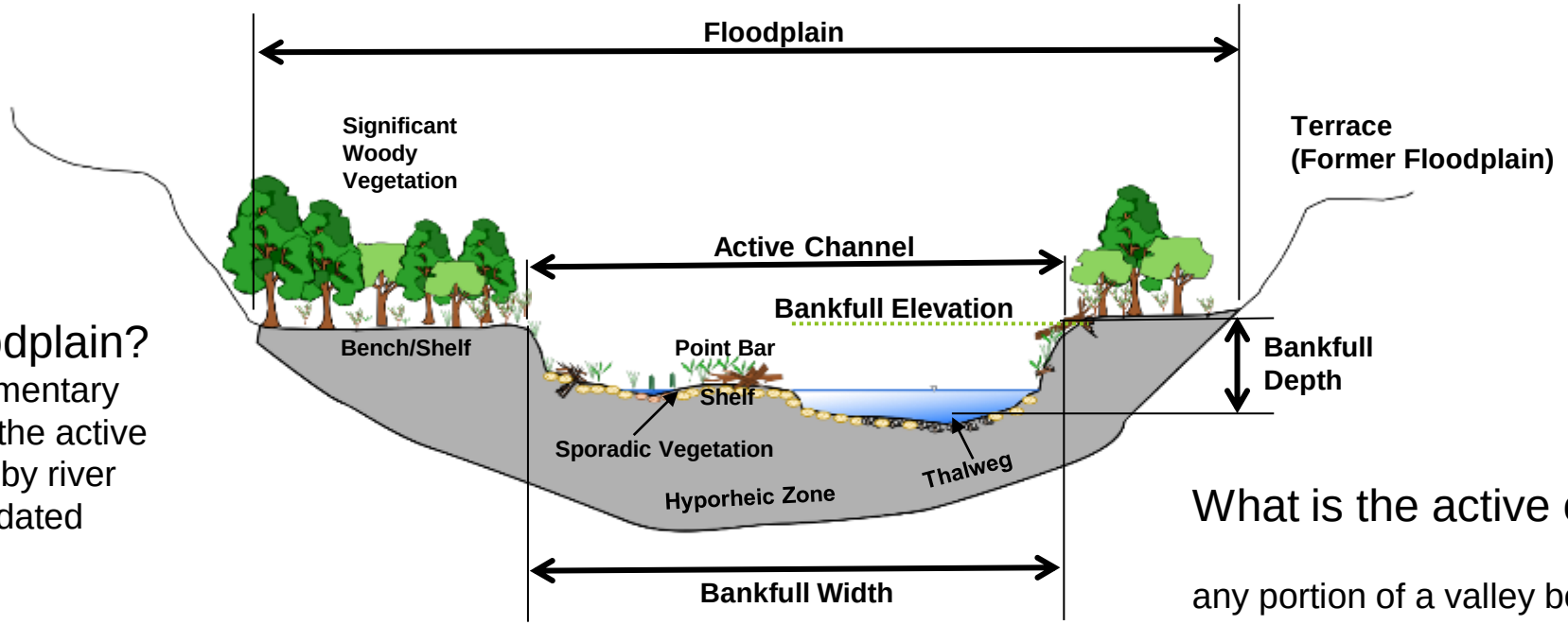

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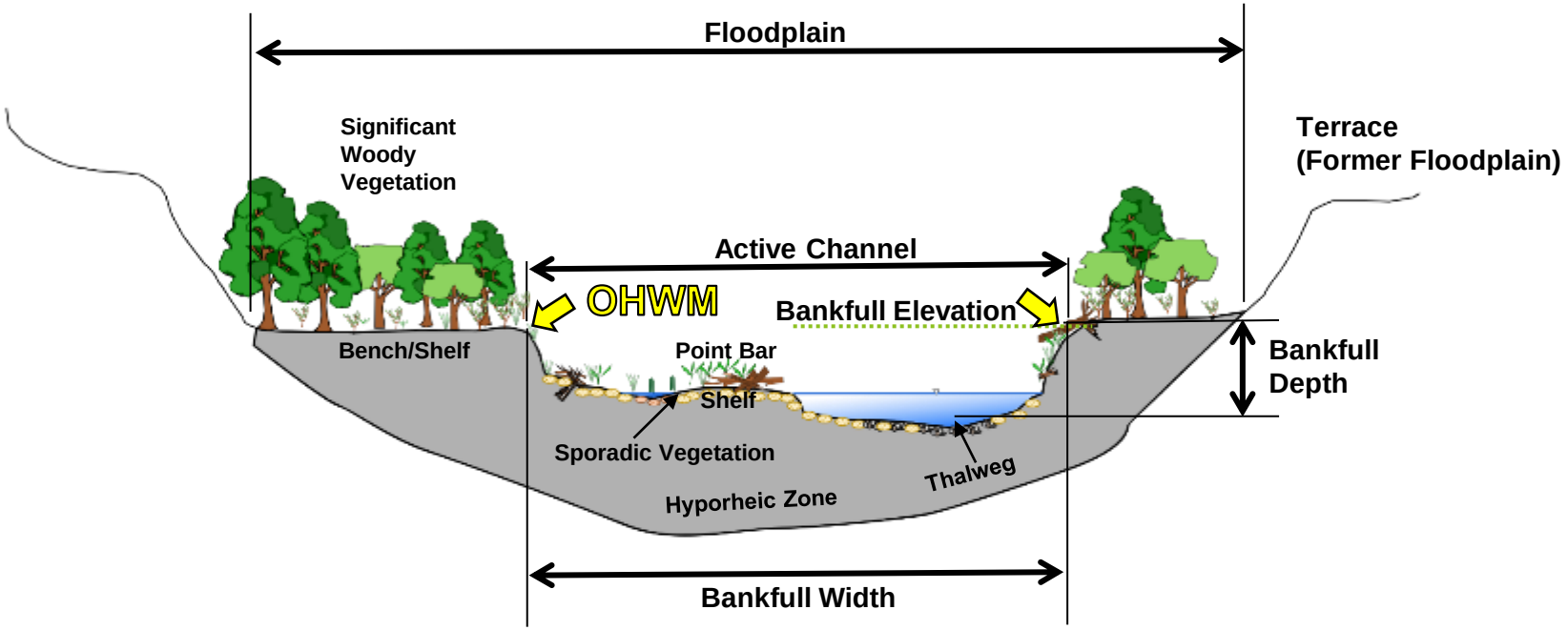
What is bankfull?

The boundary between the active channel and floodplain commonly exists as a clear, natural line impressed on the bank of a river (Wolman and Leopold 1957).

Goal 1 | Science of OHWM: What are the scientific counterparts?

OHWM	Bankfull
[a] clear, natural line impressed on the bank, shelving	The boundary between the active channel and floodplain commonly exists as **a clear, natural line impressed on the bank** of a river (Wolman and Leopold 1957).
"…changes in the character of soil"	The boundary between the active channel and surrounding floodplain creates hydraulic conditions what will **cause a transition between river sediment and soils on an adjacent floodplain** (Leopold and Skibitzke 1967).
"…destruction of terrestrial vegetation"	**Terrestrial vegetation is commonly destroyed** by the hydraulic forces associated with frequent flows below bankfull discharge (Leopold and Skibitzke 1967)).
"…the presence of litter and debris"	**Litter and debris** will likely be deposited and persist above bankfull discharge (Leopold and Skibitzke 1967).

Goal 1 | Science of OHWM: What are the scientific counterparts?

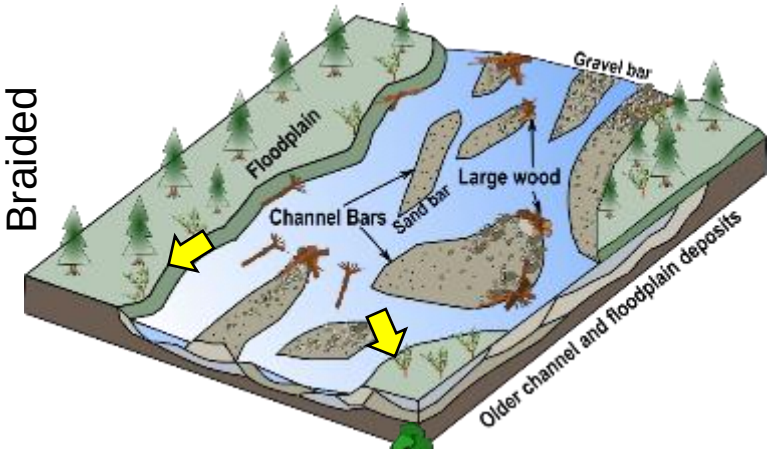


Goal 1 | Science of OHWM: What are the scientific counterparts?

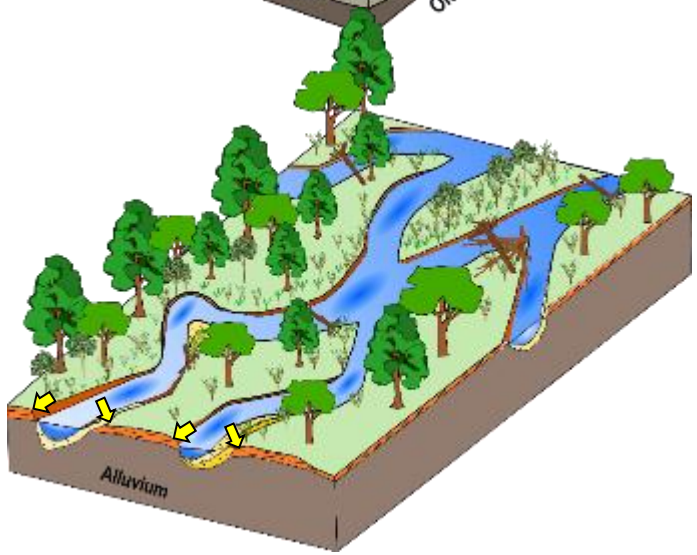
OHWM, bankfull, and active channel in same location

OHWM and bankfull in same location; active channel in different locations

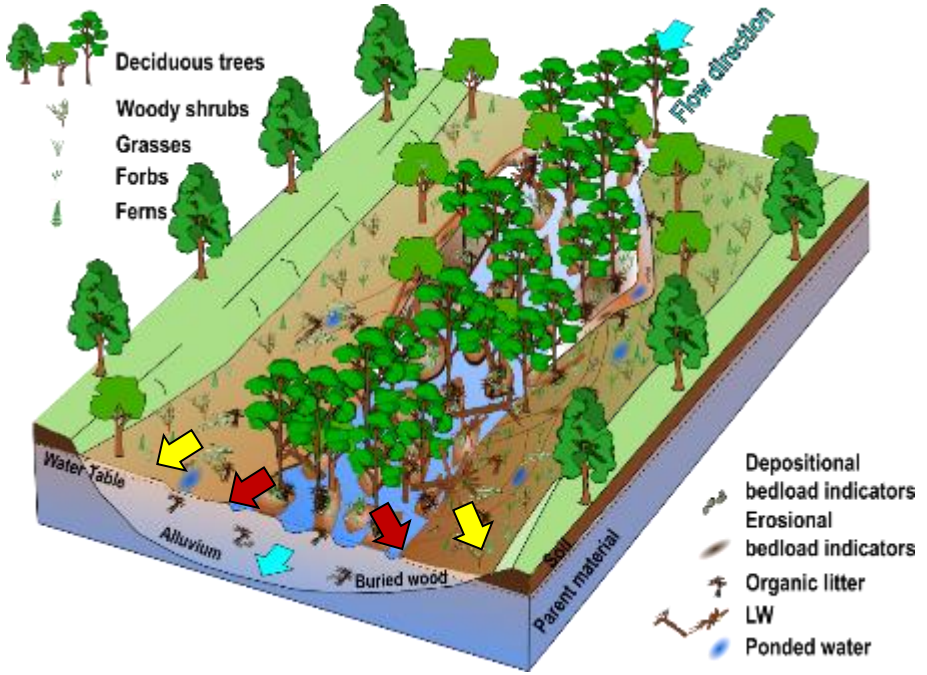
Braided



Anastomosing



Stream-wetland complex



Goal 1 | Science of OHWM: identifying stream characteristics

OHWM Indicators – physical and vegetative indicators consistent with recurring high flows:

⇒ Geomorphic Indicators:

- Break in bank slope (i.e., “top of bank”) – limited to relatively stable systems with active floodplain
- Upper limit of point bars/lateral bars

⇒ Vegetation Indicators:

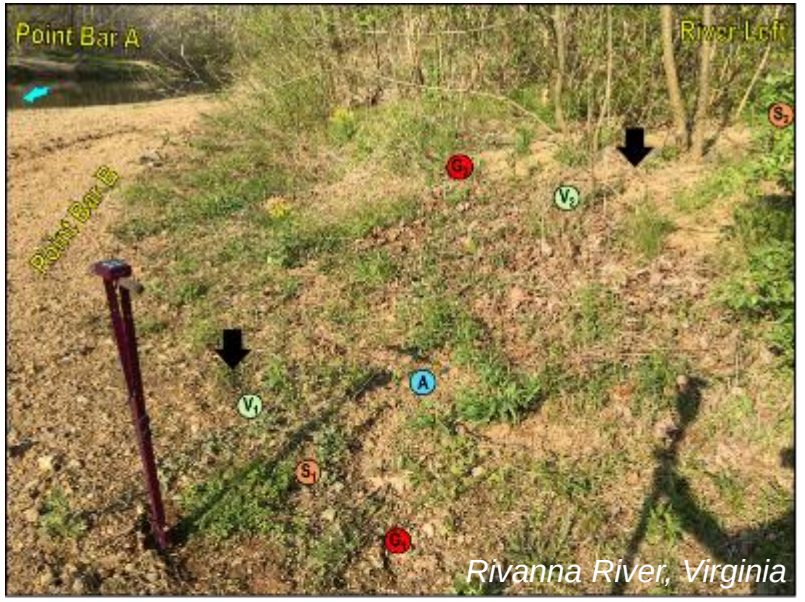
- Transition in vegetation type and/or density
- Exposed roots below intact soil layer

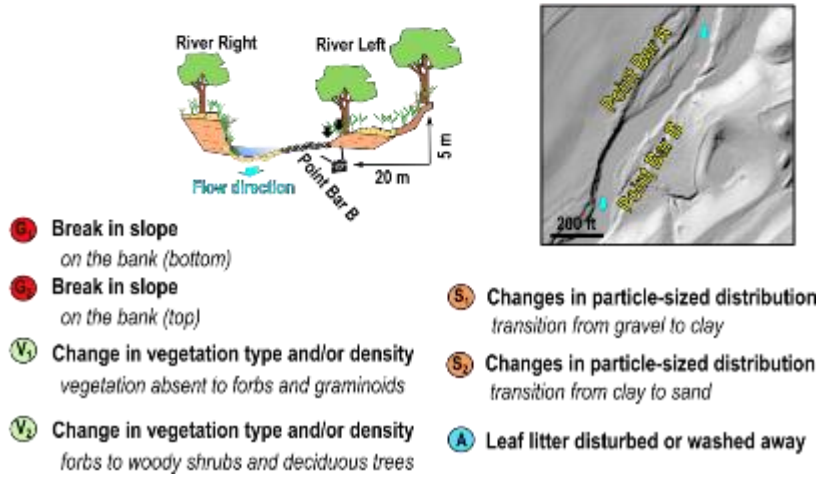
⇒ Sediment Indicators:

- Change in sediment texture and/or soil development
- Change in character of soil

⇒ Ancillary Indicators:

- Wracking/presence of organic litter
- Leaf litter disturbed or washed away





Goal 1 | Key points about science of OHWM

Linking regulatory concept of OHWM to science of streams provides common language for communication about OHWM between practitioners and public.

- ✓ Bankfull stage and the active channel limits are scientific counterparts to the regulatory concept of the OHWM
- ✓ River and stream morphologies are shaped by relatively infrequent flows that typically occur on the order of several times per year to several times per decade.
- ✓ The relationships between streamflow and stream characteristics are highly variable in time and space.

OHWM delineations should utilize robust indicators of recurring high flows.

Goal 2 | Weight-of-Evidence Procedure

Assemble evidence

⇒ Assemble = gather evidence at the site

⇒ What are the surrounding landscape characteristics that may influence both observations and interpretation of flow indicators?

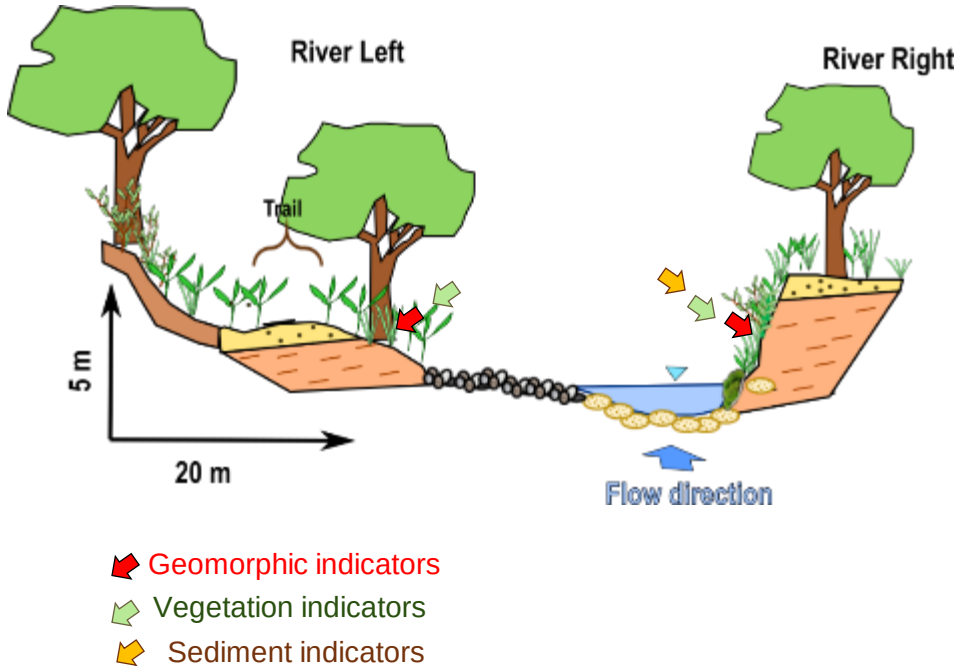
Weight the Evidence

⇒ Weight

⇒ Relevance – Is the indicator left by low, high, or extreme flows?

⇒ Strength – Is the indicator persistent at the same elevation across multiple locations of the reach?

⇒ Reliability – Will the indicator persist over time?



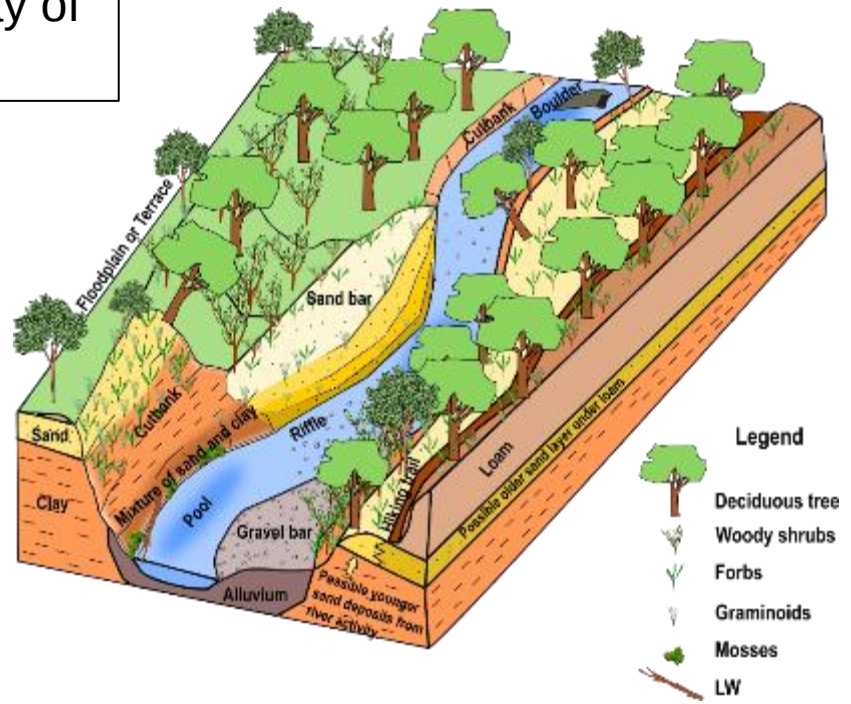
Goal 2 | Weight-of-Evidence Procedure

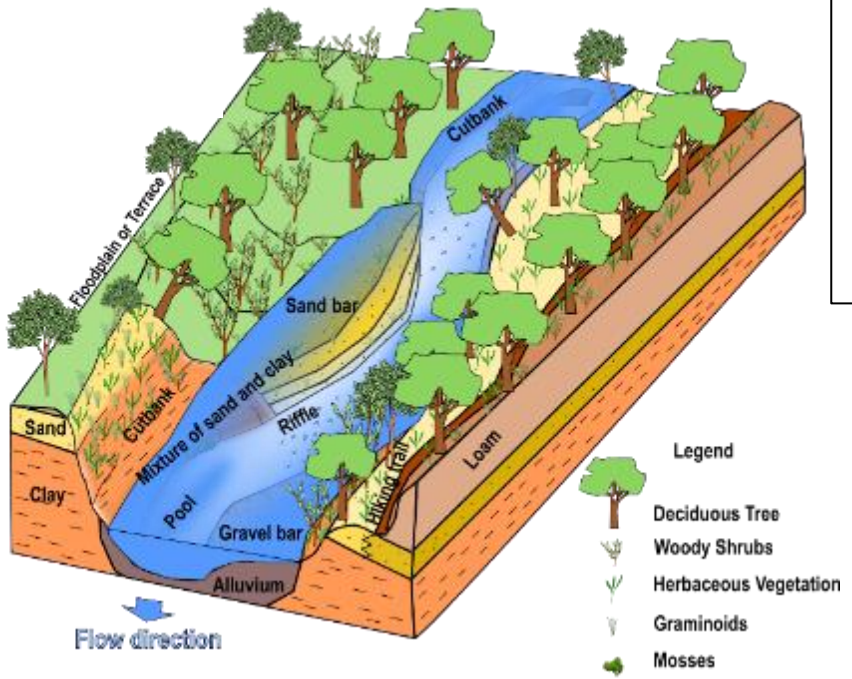
Weigh Body of Evidence

⇒ Weigh = arrive at a final decision

⇒ What combination of high flow indicators represent the OHWM?

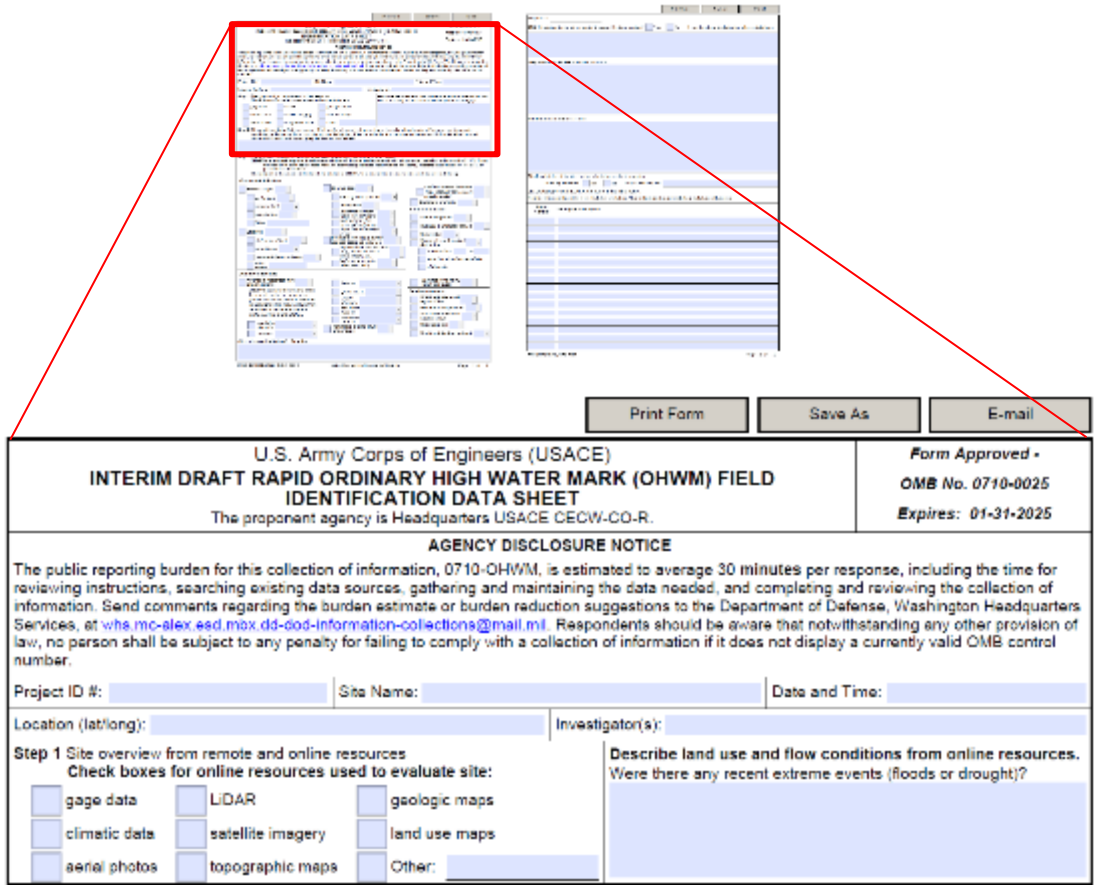
Schematic of site on day of field visit





Schematic showing hypothetical high flow that connects OHWM indicatorsv

Goal 3 | OHWM Delineation Data Sheet and Field Procedure



Print Form | Save As | E-mail

U.S. Army Corps of Engineers (USACE)

INTERIM DRAFT RAPID ORDINARY HIGH WATER MARK (OHWM) FIELD IDENTIFICATION DATA SHEET

The proponent agency is Headquarters USACE CECW-CO-R.

Form Approved -
OMB No. 0710-0025
Expires: 01-31-2025

AGENCY DISCLOSURE NOTICE

The public reporting burden for this collection of information, 0710-OHWM, is estimated to average 30 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or burden reduction suggestions to the Department of Defense, Washington Headquarters Services, at whs.mc-alex.esd.mbx.dd-dod-information-collections@mail.mil. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

Project ID #: | Site Name: | Date and Time:

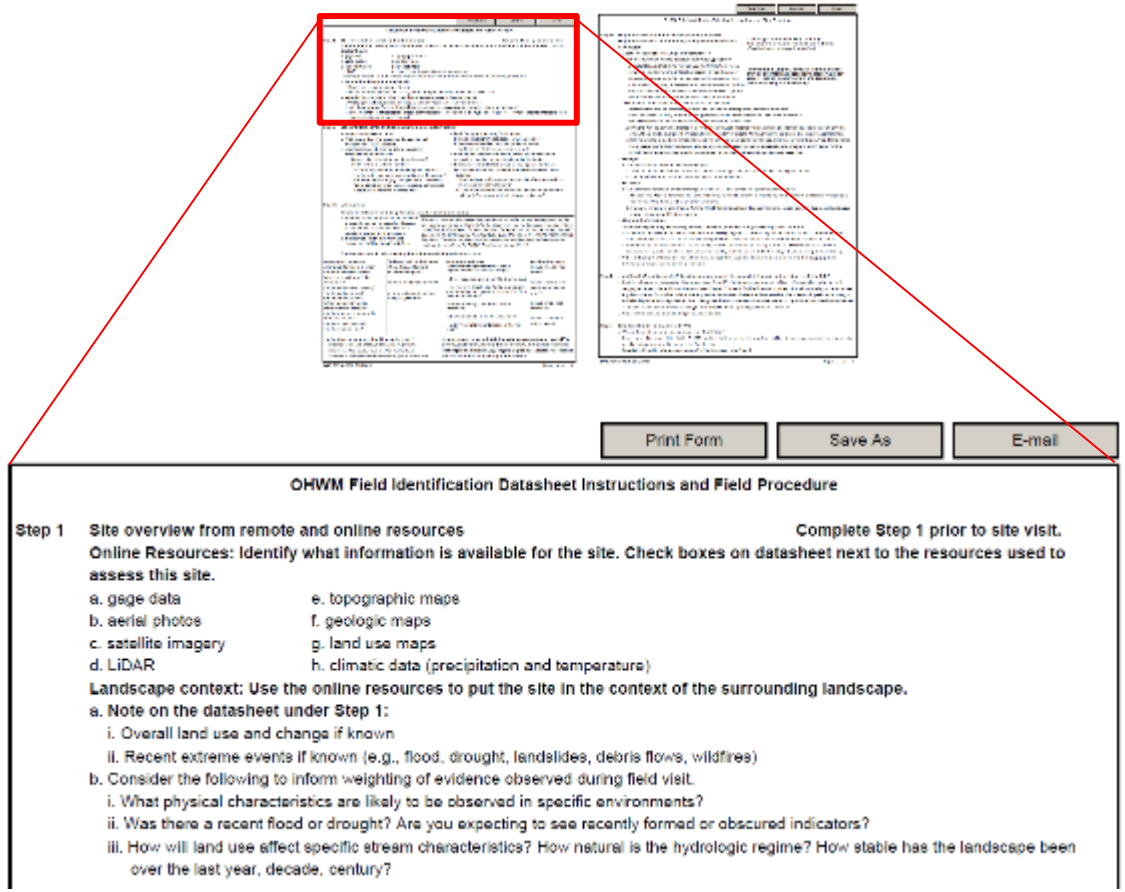
Location (lat/long): | Investigator(s):

Step 1 Site overview from remote and online resources
Check boxes for online resources used to evaluate site:

- gage data
- LiDAR
- geologic maps
- climatic data
- satellite imagery
- land use maps
- aerial photos
- topographic maps
- Other:

Describe land use and flow conditions from online resources.
Were there any recent extreme events (floods or drought)?

Data Sheet: Step 1



Print Form | Save As | E-mail

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 1 **Site overview from remote and online resources** — **Complete Step 1 prior to site visit.**

Online Resources: Identify what information is available for the site. Check boxes on datasheet next to the resources used to assess this site.

a. gage data
b. aerial photos
c. satellite imagery
d. LiDAR
e. topographic maps
f. geologic maps
g. land use maps
h. climatic data (precipitation and temperature)

Landscape context: Use the online resources to put the site in the context of the surrounding landscape.

a. Note on the datasheet under Step 1:
- i. Overall land use and change if known
- ii. Recent extreme events if known (e.g., flood, drought, landslides, debris flows, wildfires)

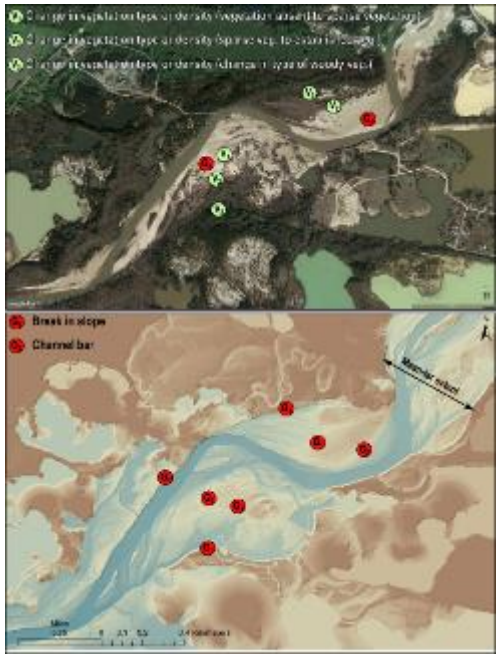
b. Consider the following to inform weighting of evidence observed during field visit.
- i. What physical characteristics are likely to be observed in specific environments?
- ii. Was there a recent flood or drought? Are you expecting to see recently formed or obscured indicators?
- iii. How will land use affect specific stream characteristics? How natural is the hydrologic regime? How stable has the landscape been over the last year, decade, century?

Field Procedure: Step 1

https://www.erdc.usace.army.mil/ohwm/

Goal 3 | Summary: Field Procedure for the OHWM

When faced with multiple possibilities for OHWM, apply the WoE method to draw a logical conclusion



Step 1: Site overview from remote and online resources

Why?

Provides landscape context

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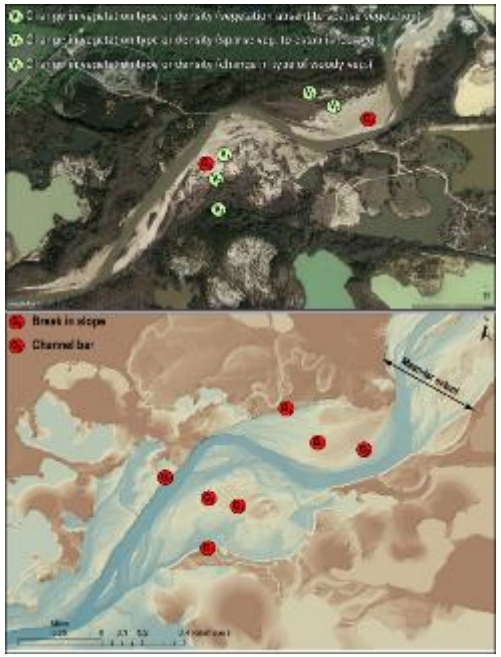

Step 1: Site overview from remote and online resources

Step 2: Describe site conditions during field assessment

Why?

Provides landscape context

Assembling evidence

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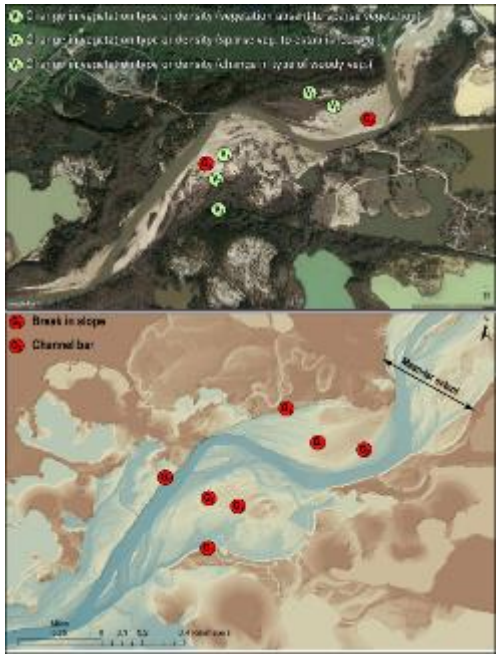

Why?

Step 1: Site overview from remote and online resources	Provides landscape context
Step 2: Describe site conditions during field assessment	Assembling evidence
Step 3a: Check boxes next to indicators used to identify the OHWM.	Assembling evidence
Step 3b: Weight each line of evidence and weigh body of evidence.	Eliminate lines of evidence that are not relevant

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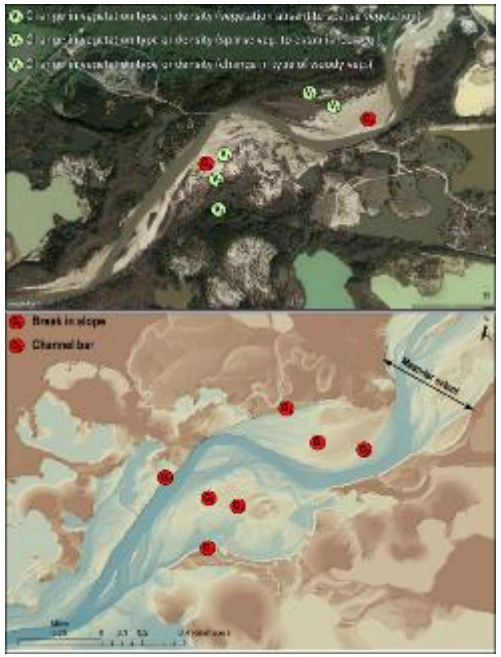

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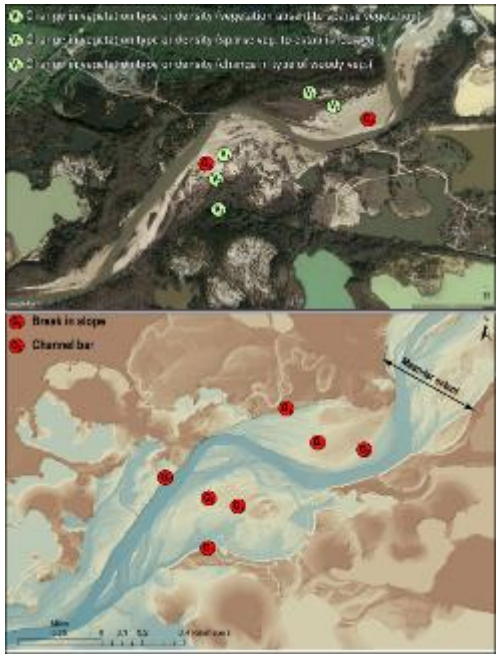

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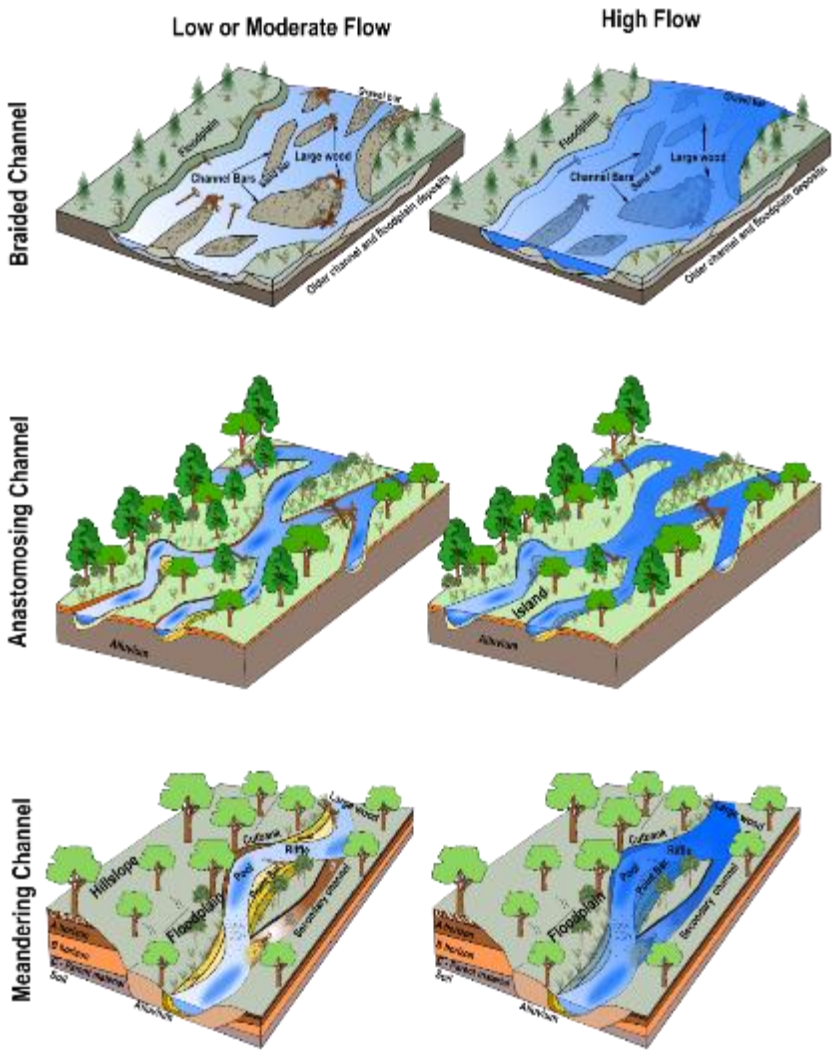
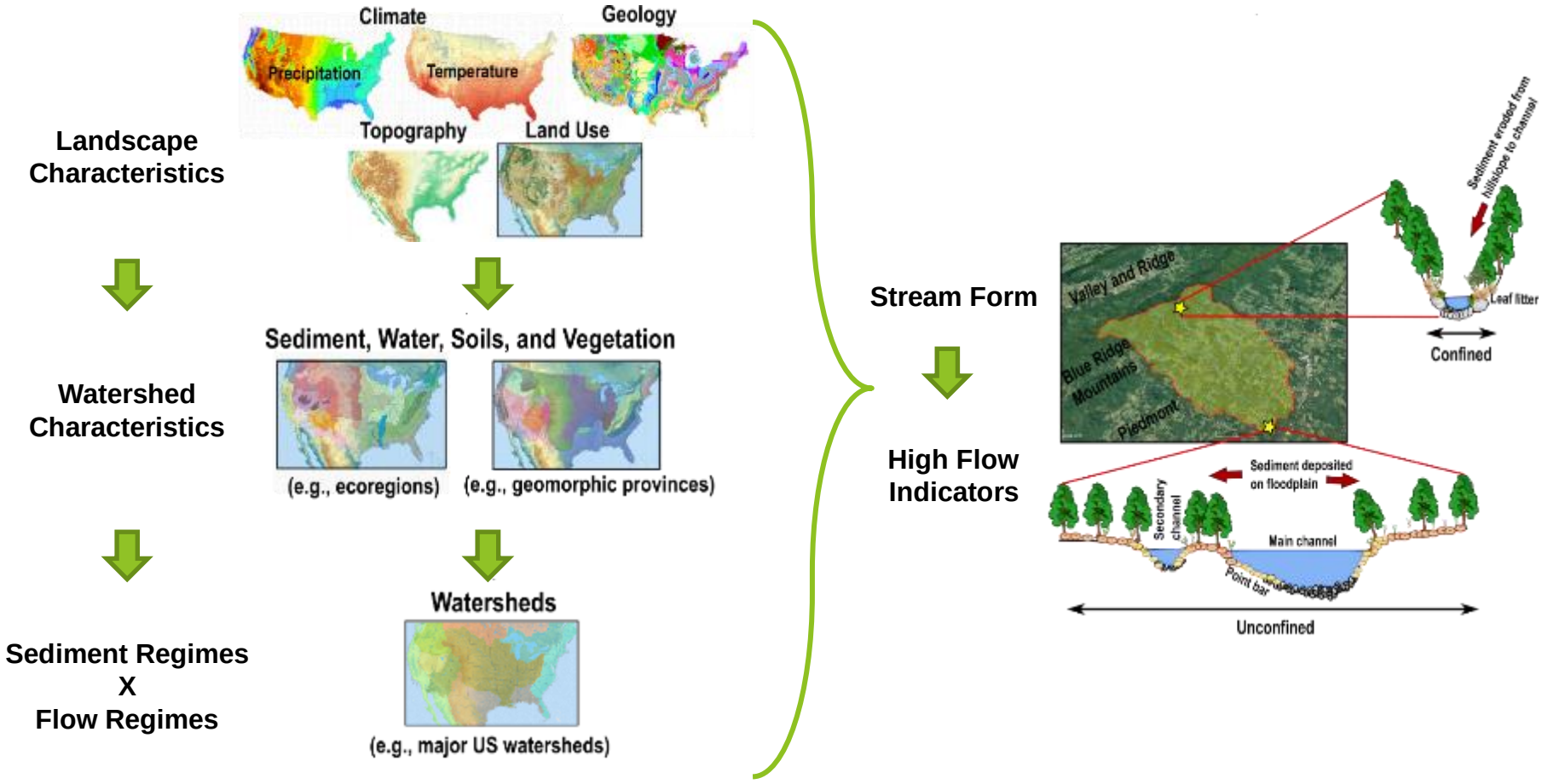
Step 4: Determine if additional information is needed.	Other resources such as remote/online tools can help support information observed on the ground.
Step 5: Describe rationale for location of OHWM	Weigh the strength and reliability of the relevant indicators to identify the location of the OHWM.

Goal 3 | Key points about field procedure for the OHWM

- ✓Assemble and list evidence
  - ✓Consider the following types of indicators: Geomorphic, Vegetation, Sediment, Ancillary
- ✓Look for a “signature” of recurring fluvial action
- ✓Consider relevance, strength, and reliability of each indicator (weight evidence and weigh body of evidence)
- ✓Remember stream channels are in a constant state of flux

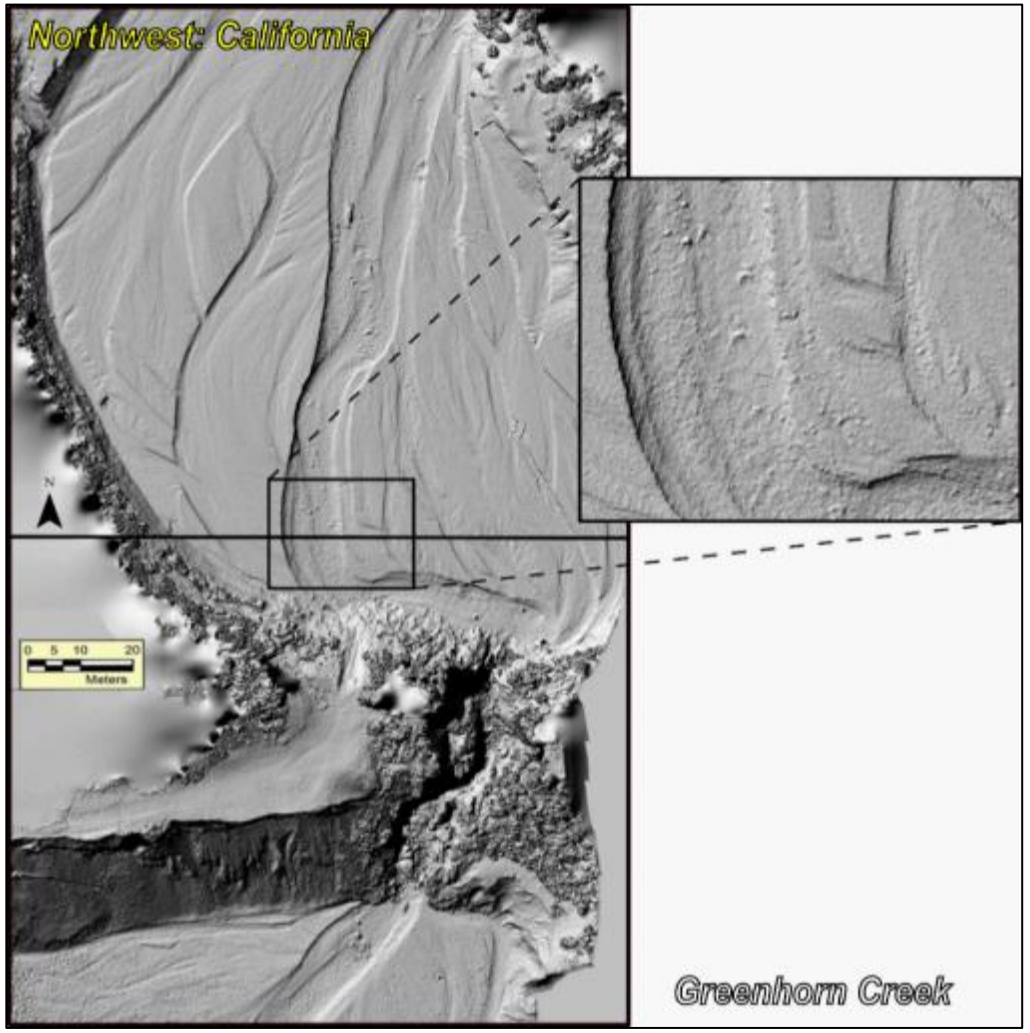


Goal 4 | Landscape-scale considerations for interpreting OHWM indicators



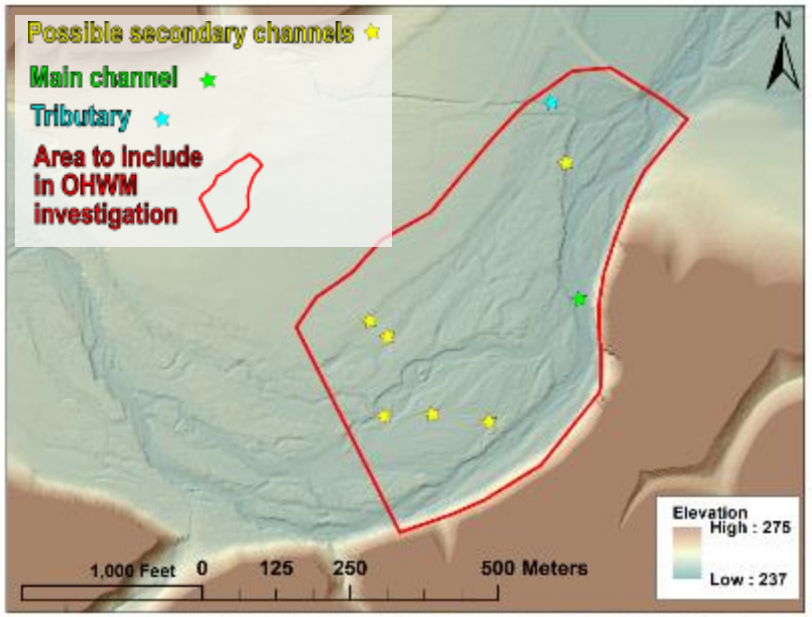
Goal 4 | Key points about OHWM and surrounding landscape

- ✓ Satellite imagery, lidar, and other spatial data can aid in recognizing significant controls on channel form both before and after a site visit.
  - Anthropogenic controls on channel form include dams, culverts, bridges, and other significant land use changes.
  - Natural controls on channel form include underlying geologic characteristics

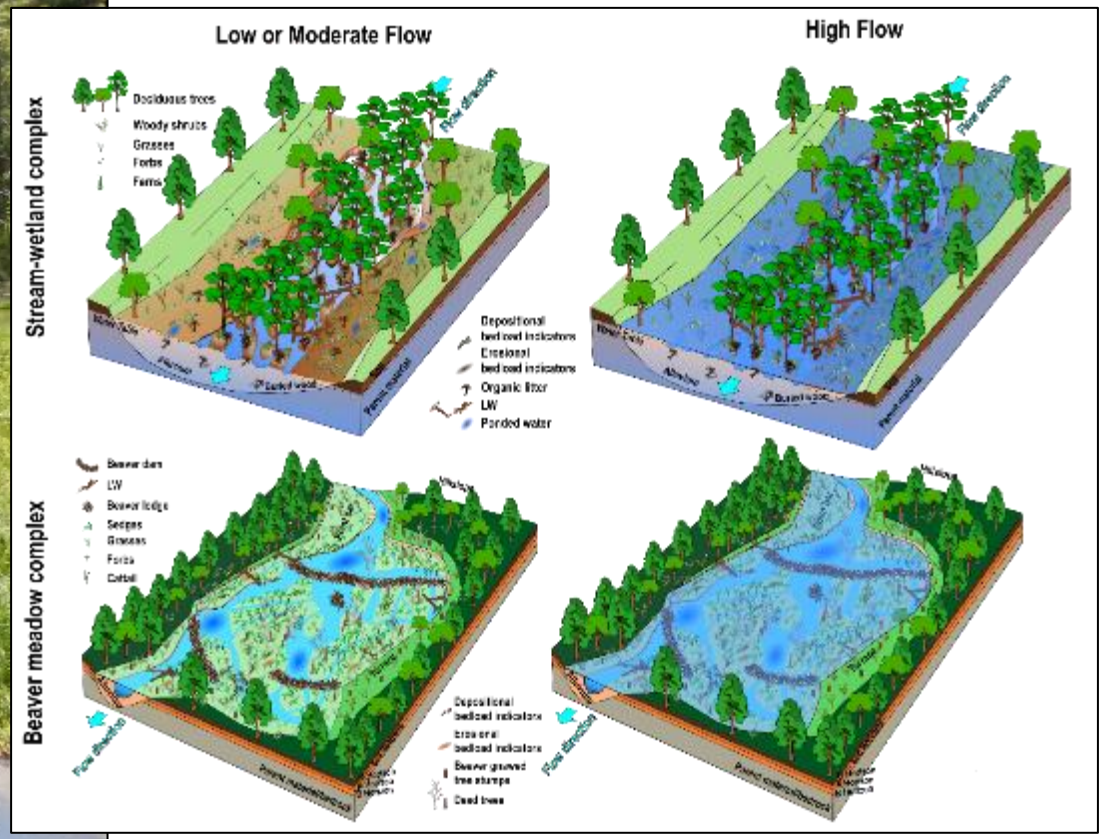


Supporting material: Technical note recently released on “Remote Sensing Tools to support OHWM”, Haring, C. Gordon, K., Darby, T., 2023, ERDC/TN WRAP-23-1, https://hdl.handle.net/11681/46448

Goal 5 | Case studies for difficult OHWM delineations

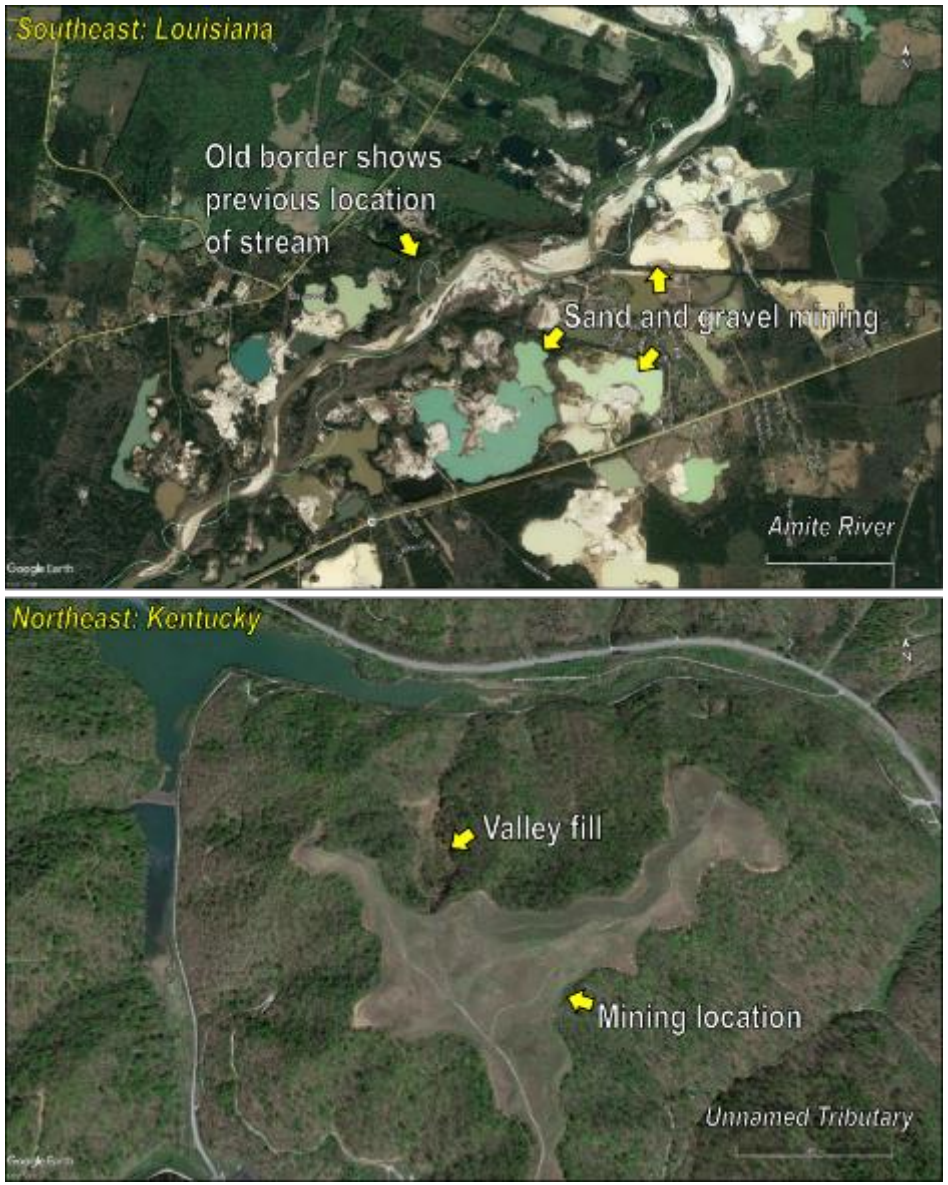


Goal 5 | Case studies for difficult OHWM delineations



Goal 5 | Key points about case studies

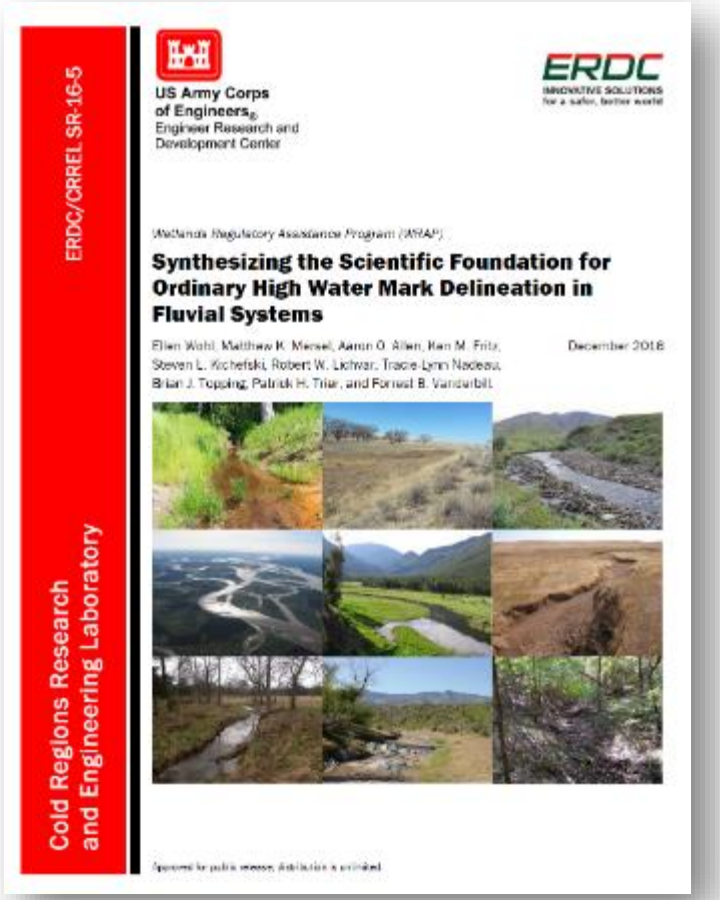
- ✓ Provide examples for how disturbance from either human-induced or natural causes can affect observation of OHWM
- ✓ Provide discussion of complex channel types including stream-wetland complexes and beaver-meadow complex
- ✓ Human-induced disturbances include:
  - Flow regulation
  - Culverts
  - Mining
  - Agriculture and livestock
  - Urbanization
- ✓ Natural disturbances include:
  - Fires and debris flows
  - Extreme flood flows



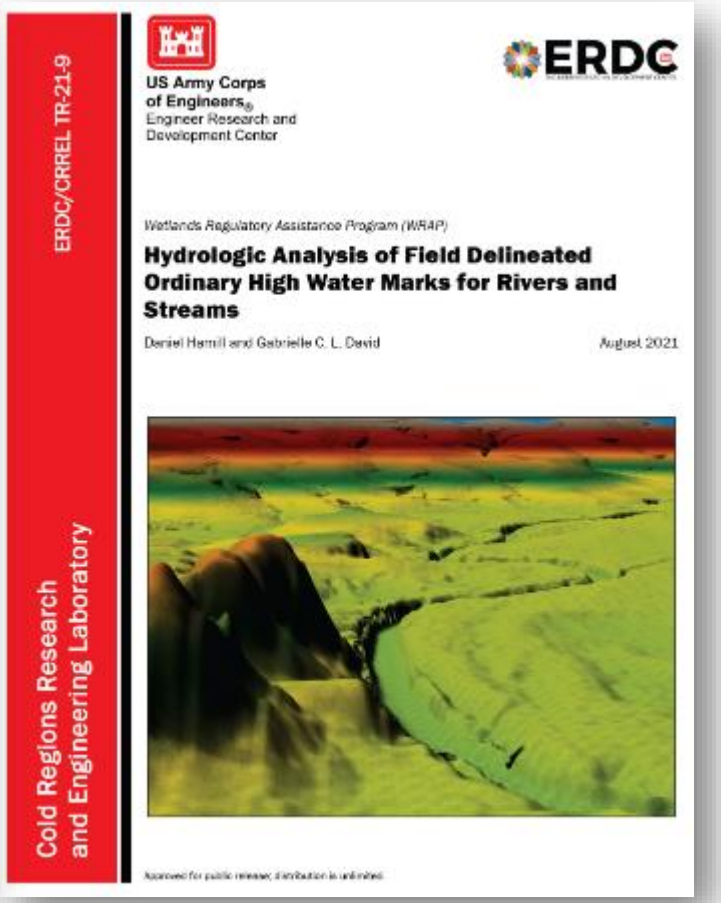
Supporting documents

Additional research available at: www.erdc.usace.army.mil/ohwm

Background literature



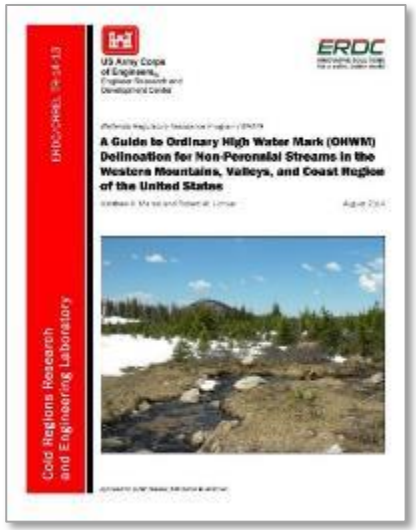
Hydrologic analysis



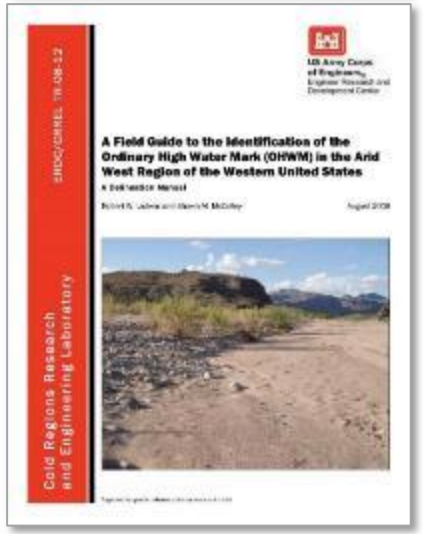
Other field guides

Upper extent field guide

Western Mountains



Arid West



Summary

Goal 1: Provides a better scientific understanding of OHWM.

Goal 2: The Draft Manual provides a decision-making process through the WoE procedure.

Goal 3: Provides details on applying the WoE procedure with accompanying field procedure and data sheet.

Goal 4: Provides information on interpreting OHWM indicators based on landscape context of the site.

Goal 5: Provides case studies to better understand how to interpret indicators at difficult sites.




Thank you!

WRAP Wetlands Regulatory Assistance Program
U.S. Army Engineer Research & Development Center

Joint public notice from USACE and EPA requests feedback from USACE districts, other practitioners, and public through December 1, 2023.

www.erdc.usace.army.mil/ohwm

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