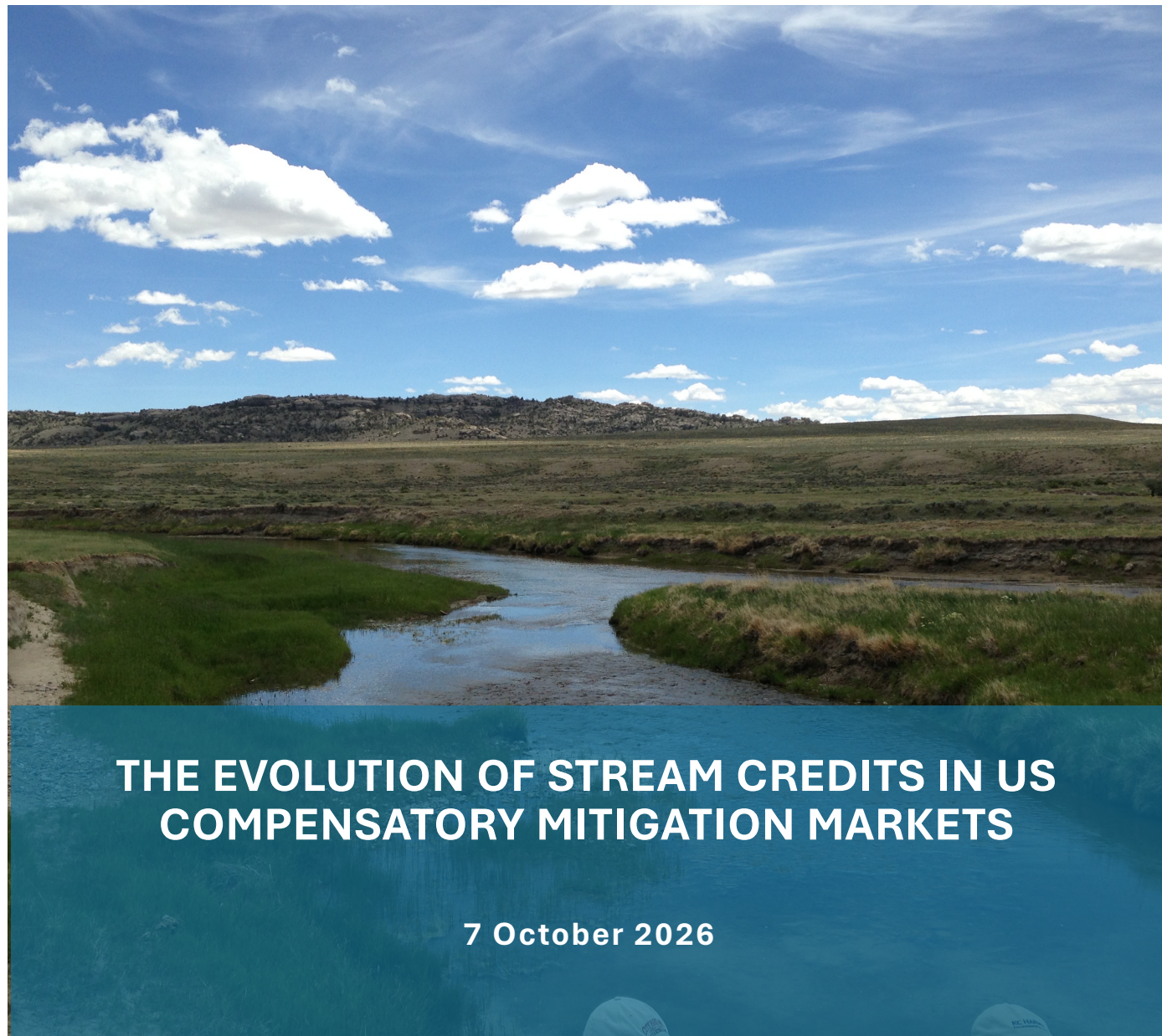


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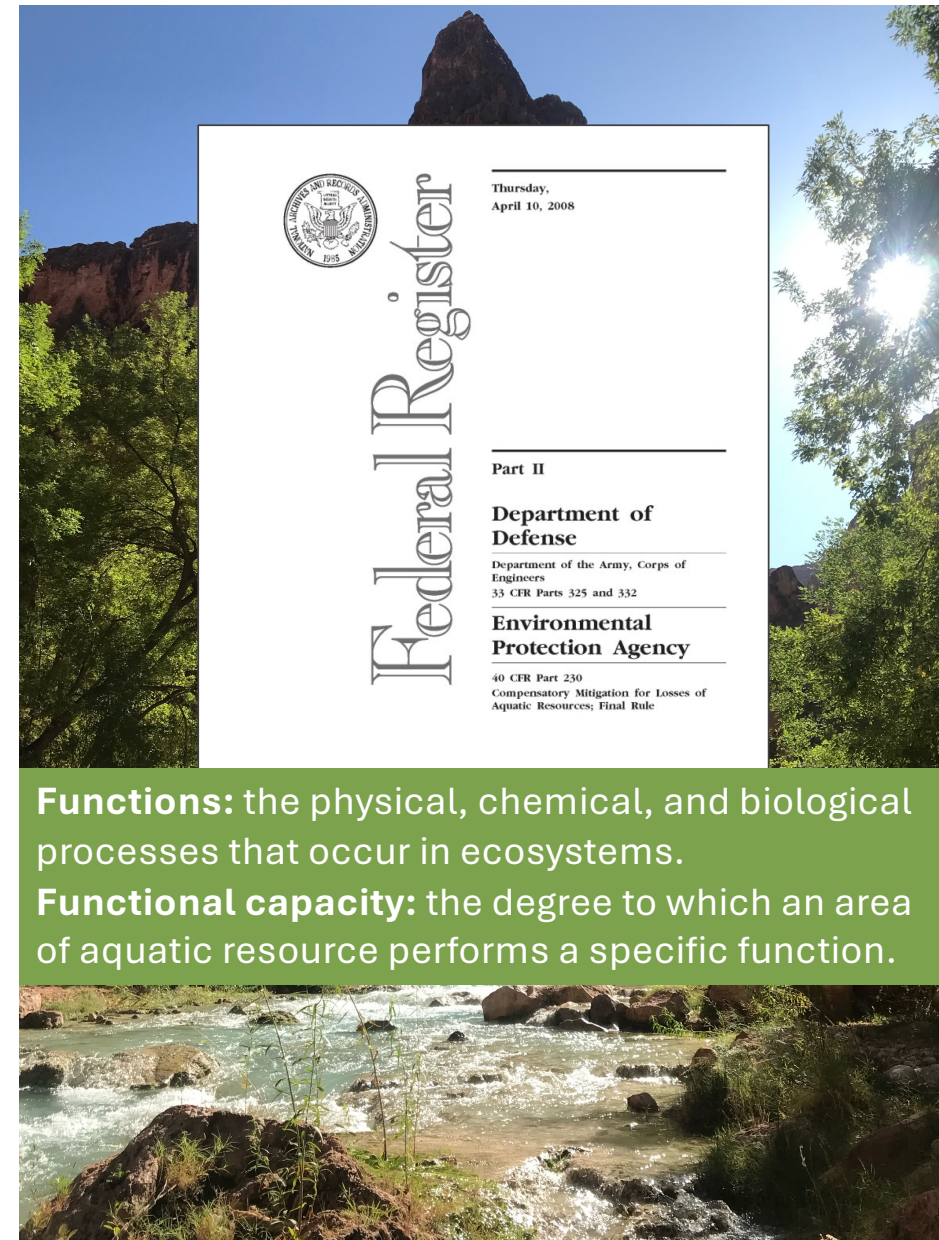


THE EVOLUTION OF STREAM CREDITS IN US COMPENSATORY MITIGATION MARKETS

7 October 2026

Stream and wetland markets in the USA

- **Type of market:** compensation (offset)
- **Driver:** Compliance with Clean Water Act permitting of dredged and fill activities in Waters of the US
- **Policy goal:** no net loss
- **Relevant regulations:**
 - 1980 implementing regulations establish mitigation hierarchy
 - 2008 Mitigation Rule outlines equivalent standards for all forms of mitigation and clear policy incentives to improve ecosystem functions

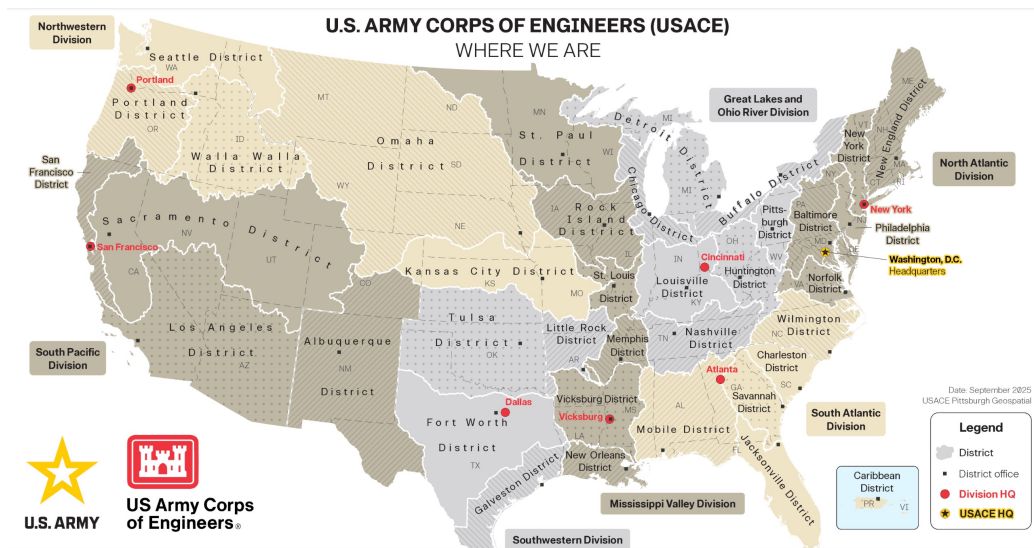


Functions: the physical, chemical, and biological processes that occur in ecosystems.

Functional capacity: the degree to which an area of aquatic resource performs a specific function.

How do you calculate debits or credits?

2008 Mitigation Rule definition: A credit (*or debit*) is a unit of measure, e.g., a functional or areal measure or other suitable metric, representing the accrual or attainment (*or loss*) of aquatic functions at a project site. The measure of aquatic functions is based on the resources restored, established, enhanced, or preserved (*or impacted by the authorized activity*).



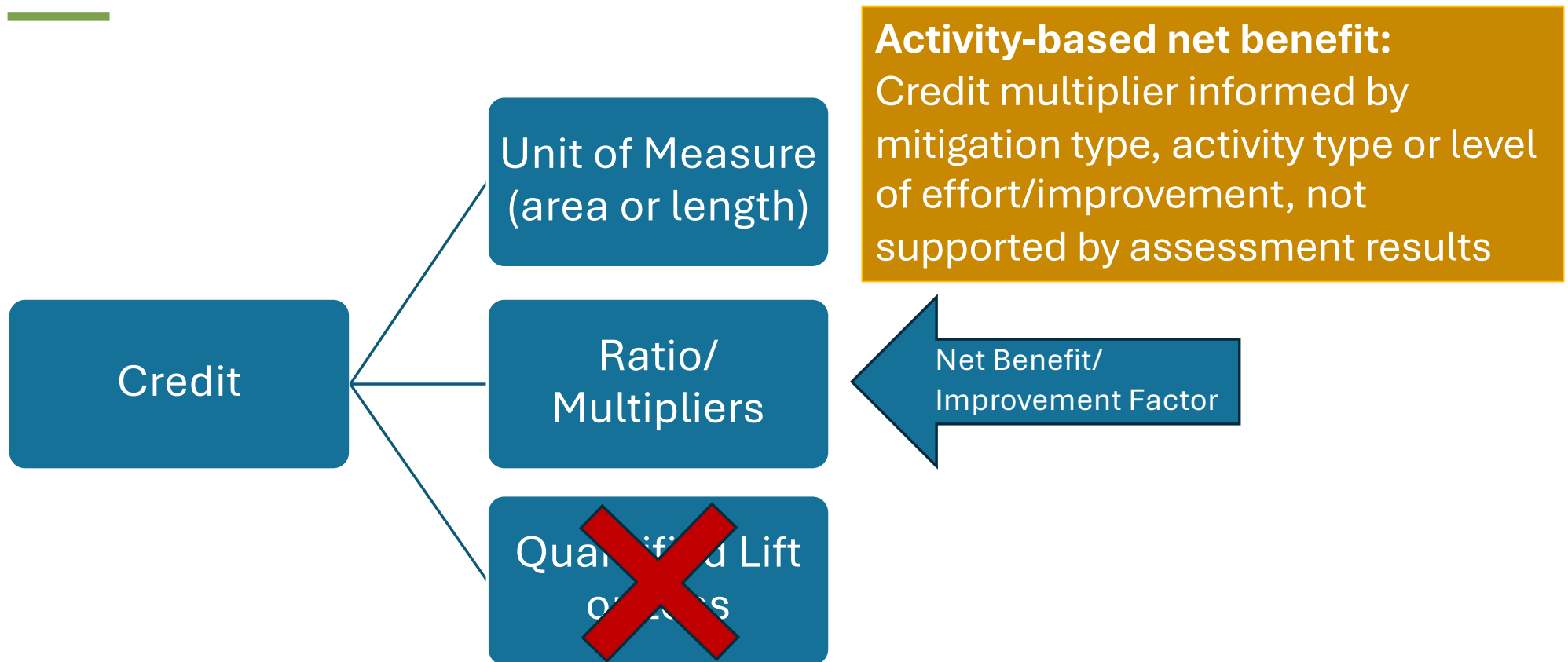
Regional standard operating procedures (SOPs) provide field-level guidance:

- How credits (debits) are calculated
- Approved assessment approaches

Emerging practice around stream restoration

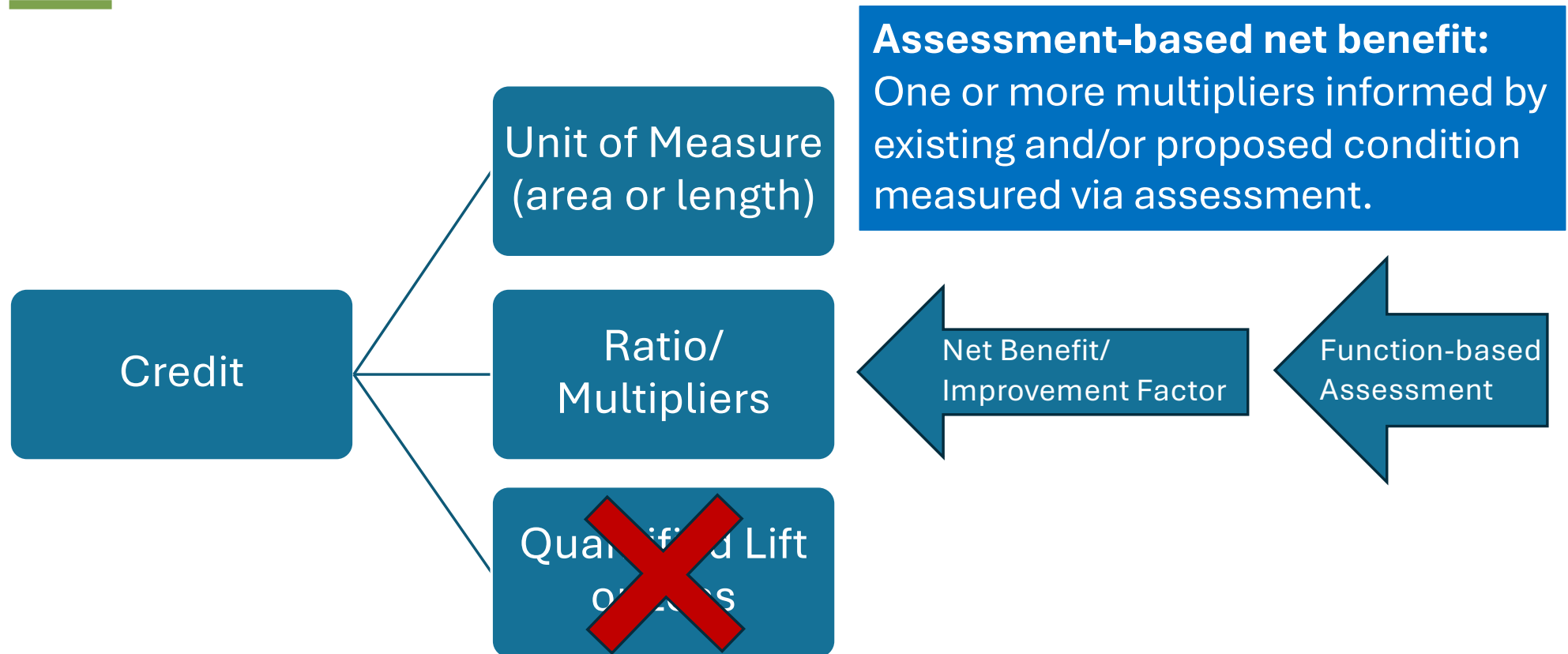


The anatomy of a credit



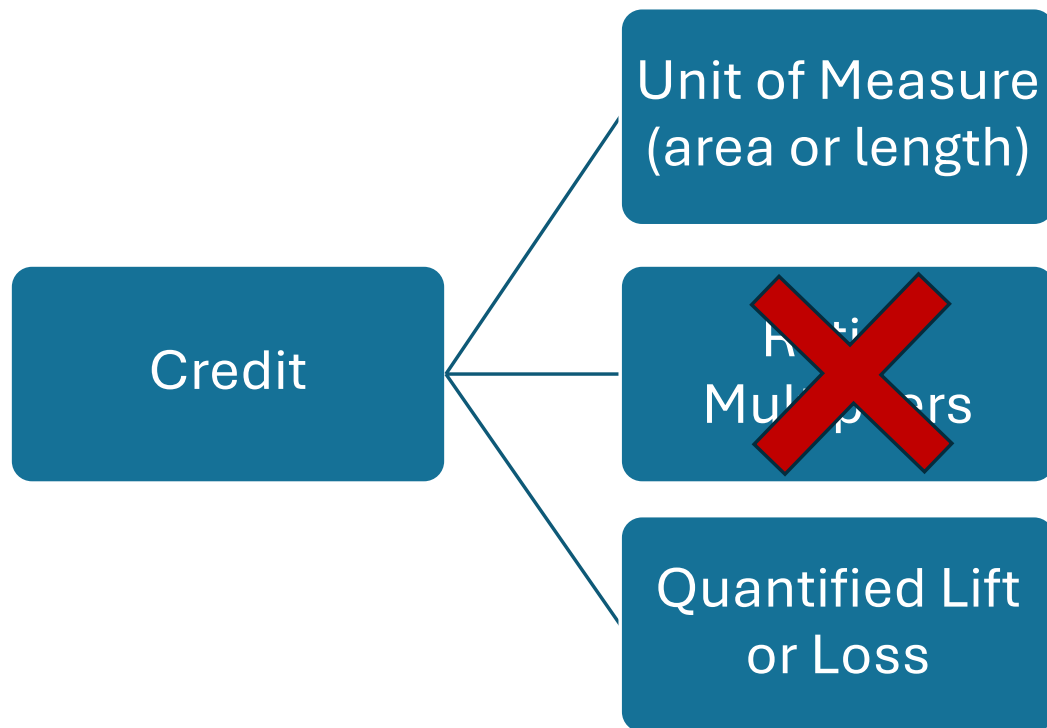
$$\text{Credit} = \text{Linear Feet} \times \sum (\text{multipliers for all factors})$$

The anatomy of a credit



$$\text{Credit} = \text{Linear Feet} \times \sum (\text{multipliers for all factors})$$

The anatomy of a credit



Assessment-based credit:

Credit value based on uplift measured via function-based assessment

$$\text{Credit} = \text{Linear Feet} \times \Delta \text{ assessment score} \times \Sigma (\text{multipliers})$$

Function-based
Assessment

$$\text{Credit} = \text{Linear Feet} \times \Delta \text{ assessment score}$$

2016: The State of Stream Mitigation Science Policy and Practice



Environmental Law Institute, Stream Mechanics and The Nature Conservancy (2016) Stream Mitigation: Science, Policy, and Practice

- Programmatic review of stream mitigation, science, policy and practice
- 27 protocols (38 states), not all included stream credit guidance
- Credit determination is variable:
“In many Districts, credit determination continues to be primarily tied to stream length plus multipliers, as opposed to functional changes.”

“Relatively few SOPs attempt to link functional lift to the amount of credits generated, and where they do, they generally do not incorporate specific methods.”

Activity-based
net benefit

Assessment-
based net benefit

Assessment-
based credit



Fast forward 2016 to 2026

- In the last 10 years:
 - 6 new stream crediting protocols
 - 9 existing protocols have been updated

**Activity-based
net benefit**

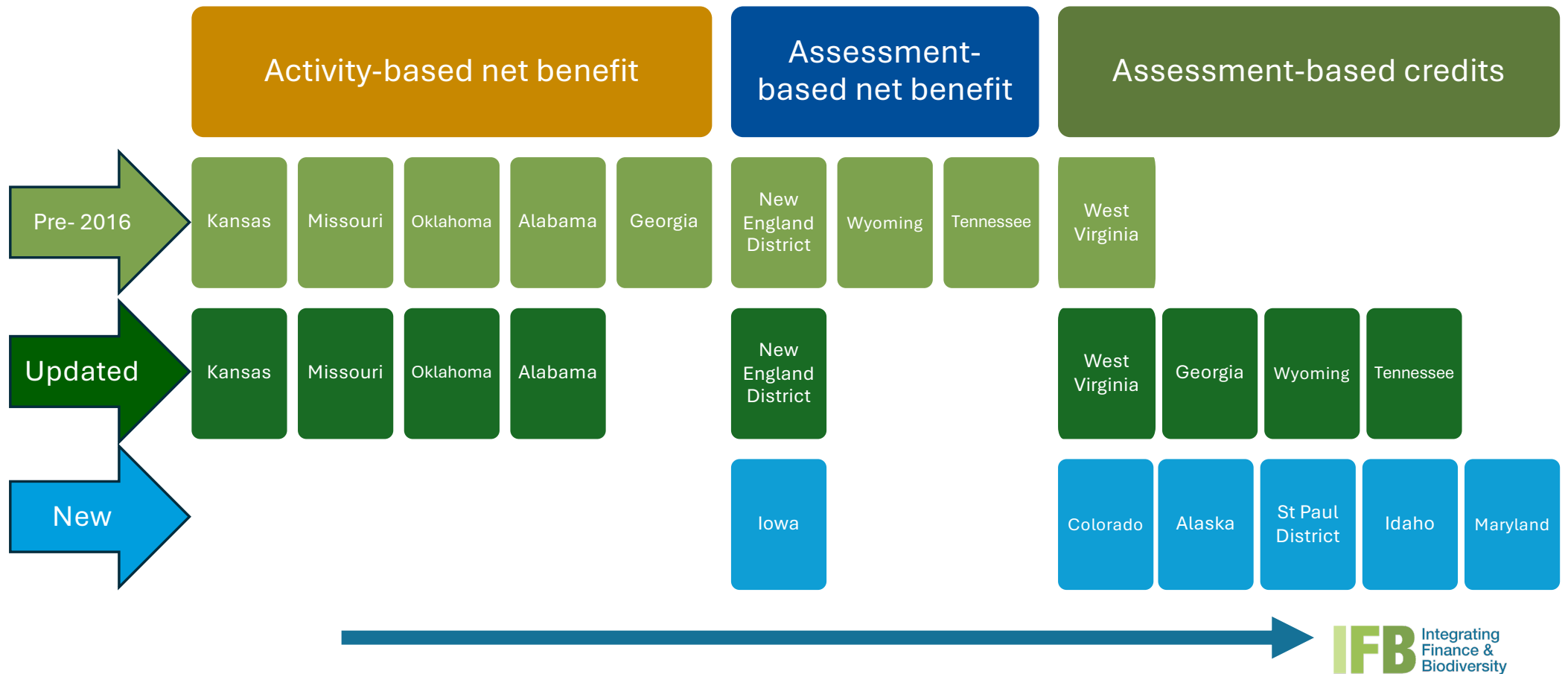
**Assessment-
based net benefit**

**Assessment-
based credit**

- 
- Have we seen progress in incorporating functional assessment methodologies into credit determination?



Integrating function into credit protocols



Integrating function into credit protocols

Assessment-based credits

Approved Assessment Approaches:

West Virginia Stream and Wetland
Valuation Method v3.0

Georgia Stream
Quantification
Tool v1.0

Wyoming Stream
Quantification
Tool v2.0

Tennessee
Stream
Quantification
Tool v2.0

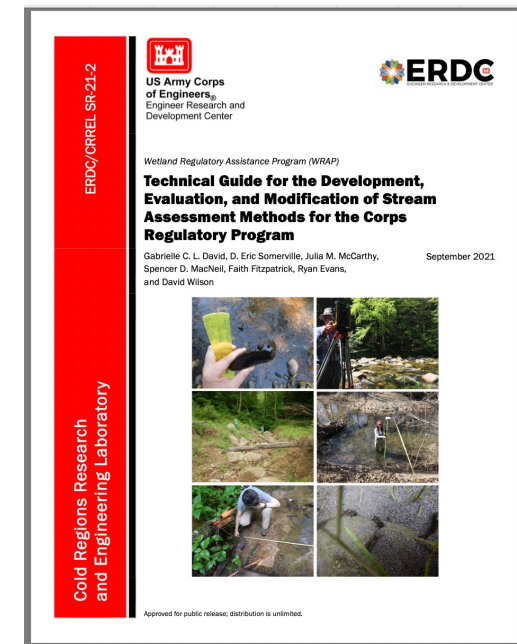
Colorado Stream
Quantification
Tool v1.0

Alaska Interior
Stream
Quantification
Tool v1.0

Minnesota and
Wisconsin
Stream
Quantification
Tool v1.0

Idaho Stream
Functional
Assessment
Method

Maryland
Function-based
Rapid Stream
Assessment
Methodology



David, G.C.L., Somerville, D.E., McCarthy, J.M., MacNeil, S.D., Fitzpatrick, F., Evans, R. and Wilson, D. 2021. Technical Guide for the Development, Evaluation, and Modification of Stream Assessment Methods for the Corps Regulatory Program. ERDC/CRREL SR-21-2. U.S. Army Corps of Engineers, Washington, DC 20314-1000.

Are we there yet?

- Do stream credits correlate with the desired outcome of no net loss?
- Are market mechanisms built to accommodate innovation and meaningful change?
 - Commitment to continually invest in method development, evaluation and improvement
 - Plan for how the market/metric can be adapted following implementation

