



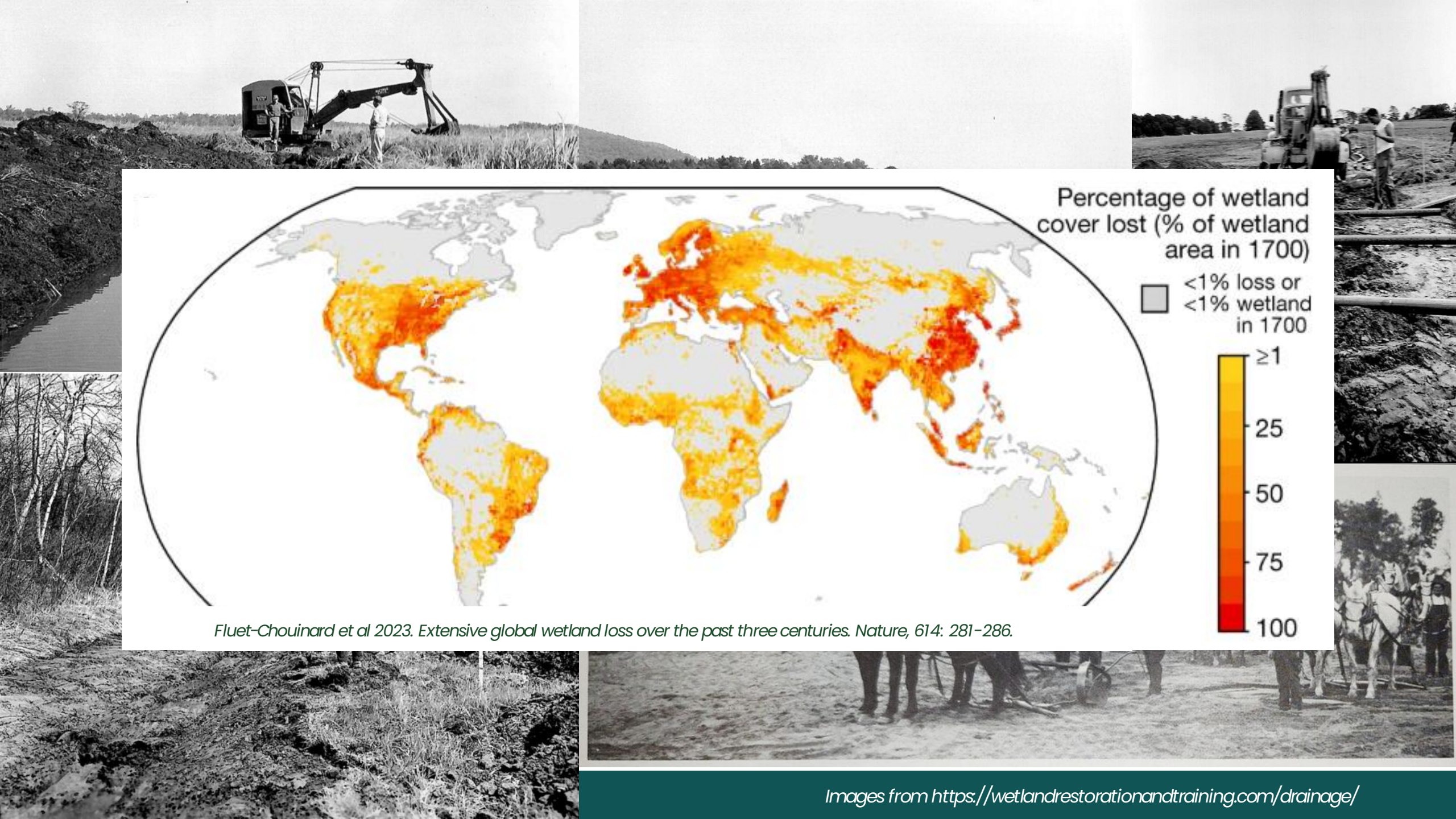
Mapping the Gap: Quantifying the effects of the *Sackett v. EPA* decision on wetland jurisdiction in Colorado

**National Association for Wetland Managers (NAWM)
Enhancing State and Tribal Programs (ESTP) Virtual Workshop**

September 2, 2026

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Colorado Natural Heritage Program





Fluet-Chouinard et al 2023. Extensive global wetland loss over the past three centuries. *Nature*, 614: 281-286.

History of Federal Wetland Regulation

1972: Clean Water Act

Water quality regulation extended to wetlands.

1985: "Swampbuster" Provision

Farm Bill policy to limit wetland drainage on cropland.

2001: SWANCC v. U.S.

Removed isolated wetlands.

2023: Sackett v. EPA

Removed significant nexus.

1977: CWA Expansion and EO 1190

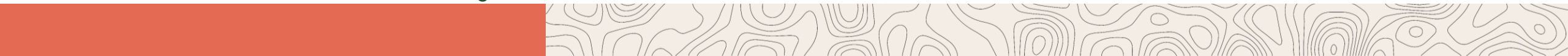
Tributaries and isolated wetlands included in CWA. Federal agencies ordered to avoid damage.

1988: "No Net Loss" Policy

Bush issues national policy on wetland acres and functions.

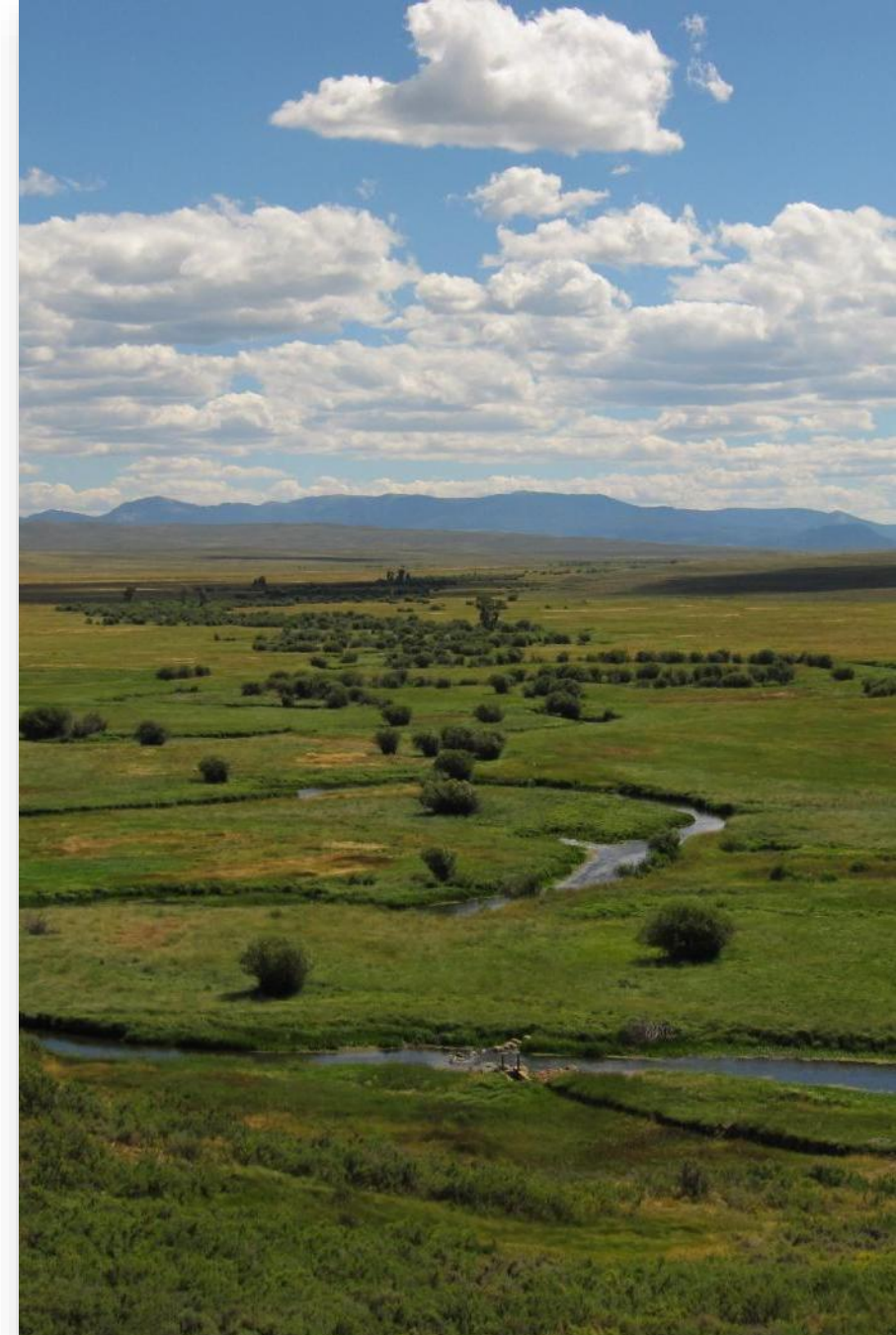
2006: Rapanos v. U.S.

Introduced significant nexus. Guidance issued on the watershed approach.



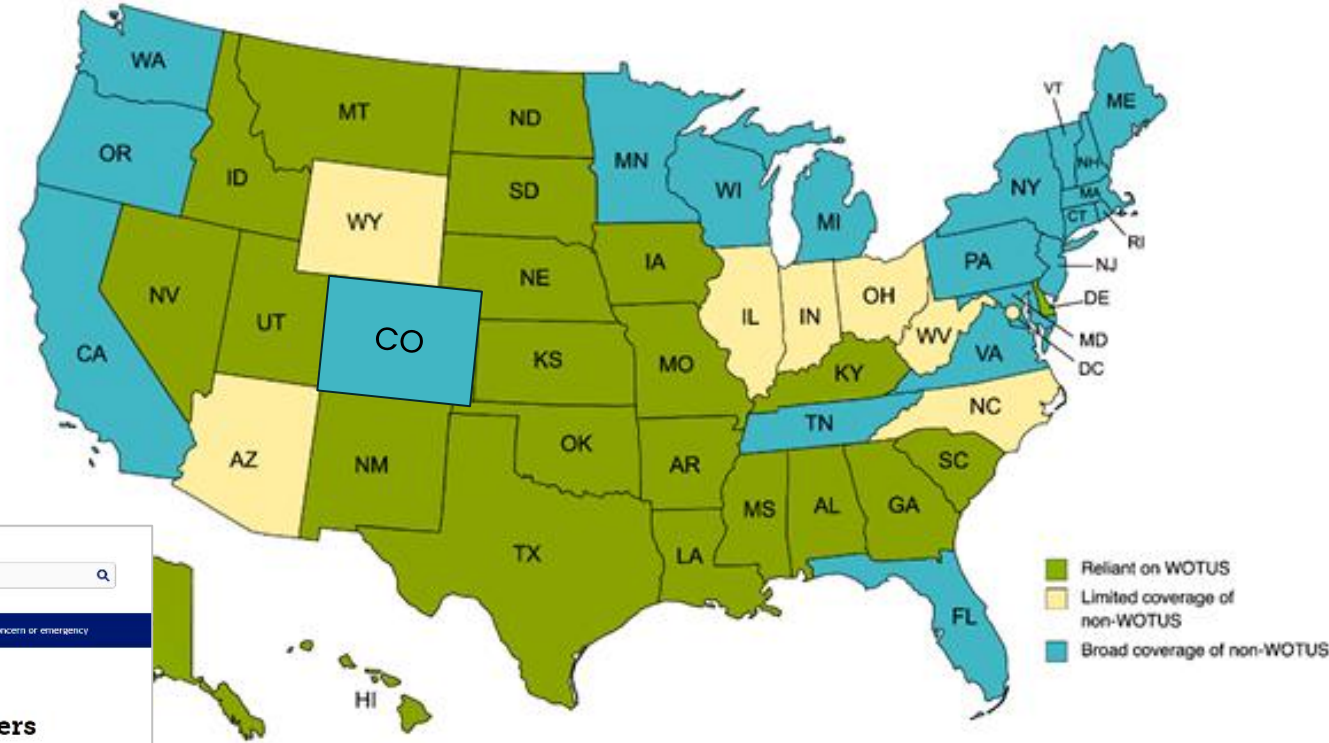
EPA v. Sackett

- **2023 Supreme Court decision removed significant nexus as a test for determining if a wetland would be considered WOTUS.**
- **2024 Conforming Rule**
 - In effect in 24 states, stayed in 26 states.
 - Traditionally Navigable Waters (TNW).
 - Tributaries to TNW with relatively permanent flow.
 - Adjacent wetlands with a continuous surface connection.
- **2025 Proposed Rule**
 - Released in November 2025, currently under revisions.
 - Reinforces concept of relatively permanent flow for tributaries.
 - Added guidance that flow must be in the wet season or in response to the wet season, adding timing and duration.
 - Wetlands must also have a relatively permanent surface water connection, not only qualifying wetland vegetation and soils.



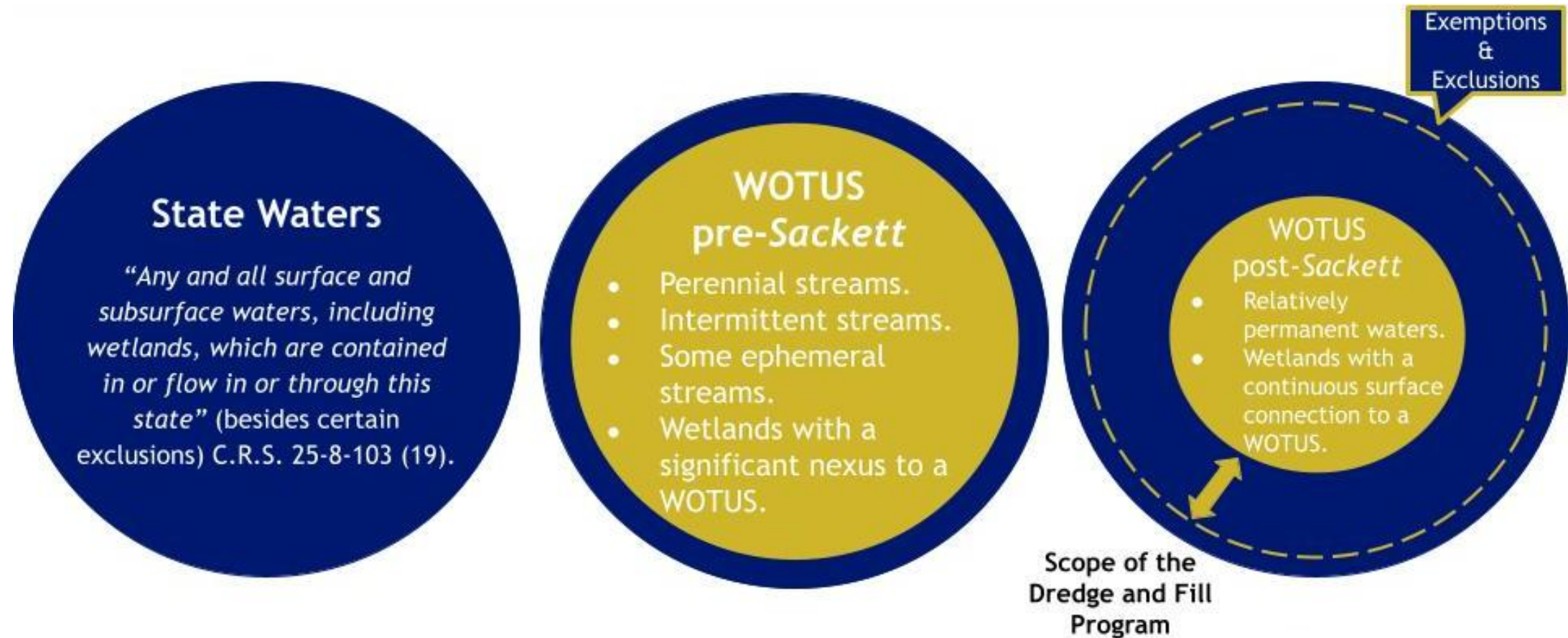
State Wetland Protection

- Patchwork of state wetland regulation
- Less than half of states have a comprehensive wetland protection program beyond federal protections
- In 2024, Colorado passed HB 24-1379 to create a state dredge and fill permit program



Kihlsinger et al. 2023. Strategies for States/Tribes for Protection of non-WOTUS waters: A Taxonomy. Environmental Law Institute, Washington, D.C.

Colorado Dredge and Fill Program

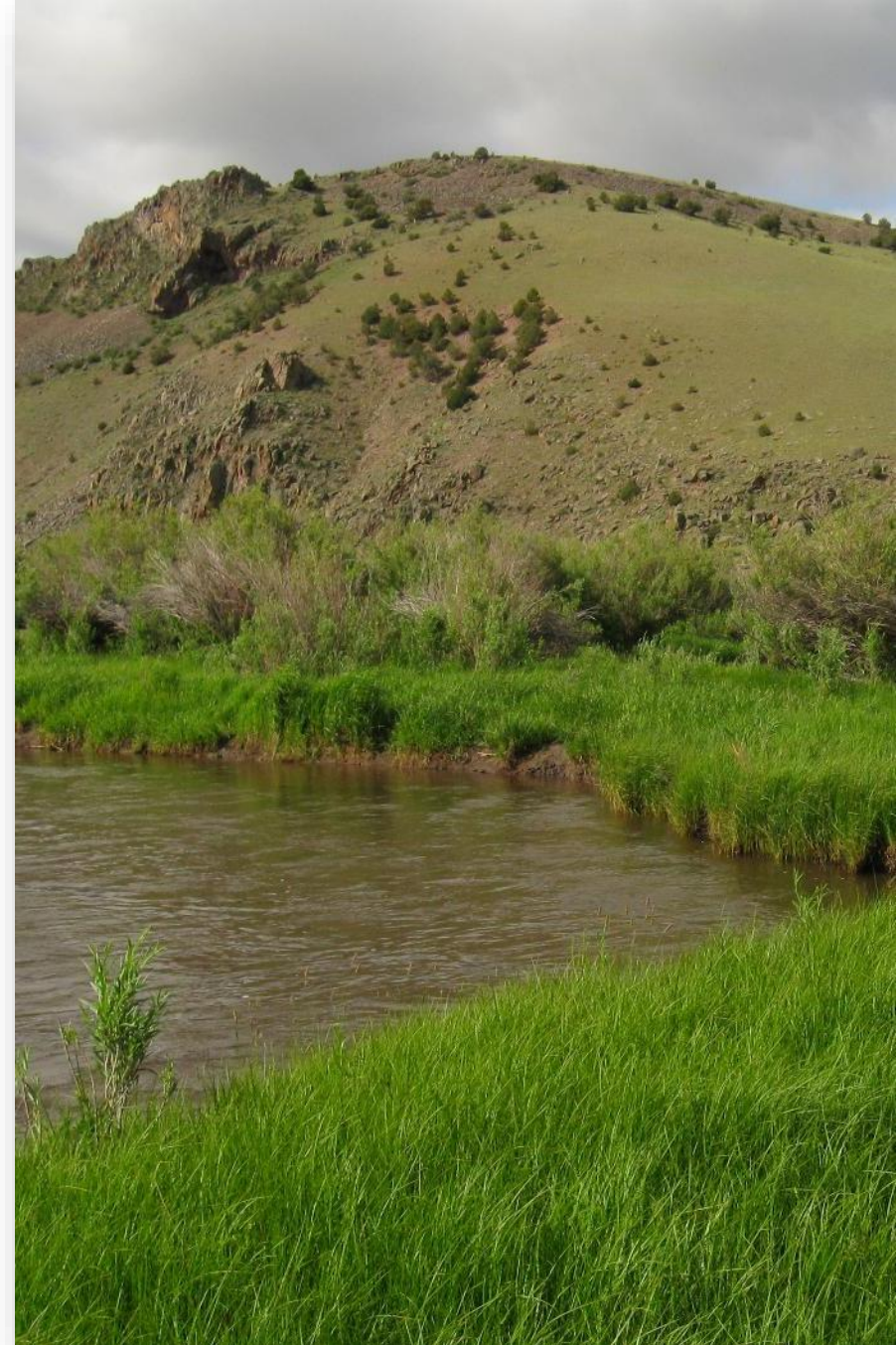


COLORADO
Department of Public
Health & Environment

Model Goals

To estimate which wetlands and waterbodies would remain under federal jurisdiction vs. the new state program.

- **Use nationally available data with minimal manipulations to easily repeat as future data updates occur.**
 1. USGS National Hydrography Dataset
 2. USFWS National Wetland Inventory
- **Identify tiers of regulatory certainty based on three different scenarios.**
 1. Current federal guidance on WOTUS
 2. Loose interpretation of the 2025 Proposed Rule
 3. Strict interpretation of the 2025 Proposed Rule
- **Create a public facing map to display the tiers of regulatory certainty in one seamless layer.**



Input Data

National Hydrography Data (NHD)

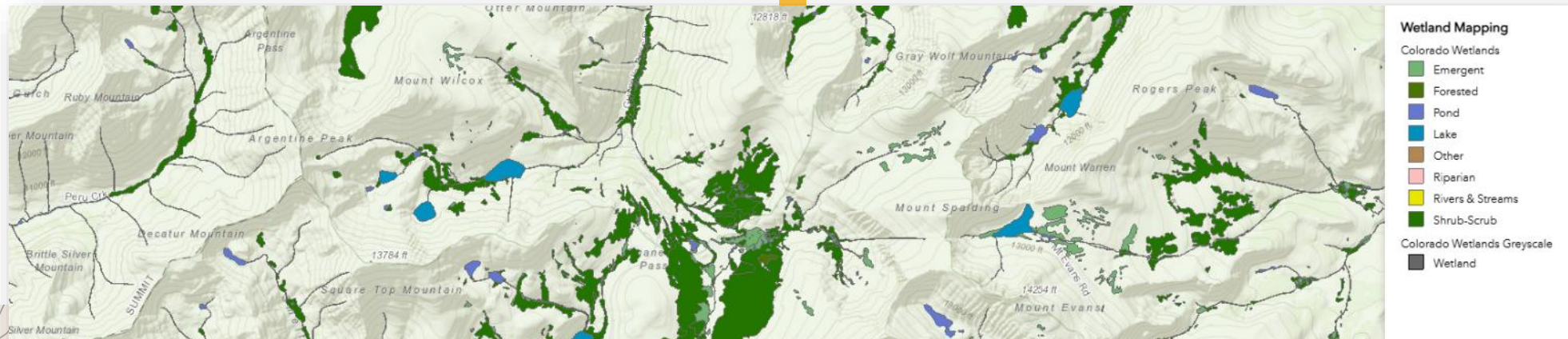
- Flowlines of perennial and intermittent streams, ditches and canals, and connecting segments
- Area and waterbody polygons of large rivers, lakes, reservoirs

National Wetland Inventory (NWI)

- Polygons of wetlands, ponds, lakes and rivers
- Full attribution of wetland type and water regime

Limitations

- Datasets developed over decades, variable age and resolution depending on methods
- Spatial inaccuracies, especially in older data
- Ephemeral streams only drawn in NHD for certain areas
- Inconsistent attributes between project areas
- Separate datasets depicting the same resources in slightly different ways
- Not developed for regulation, attributes do not align with regulatory language



Scenario Assumptions

Current federal regulation

- Relatively permanent = perennial & intermittent streams
- Adjacent wetlands that meet delineation criteria regardless of water regime (seasonal or permanent)

Loose interpretation of 2025 Proposed Rule

- Relatively permanent = perennial & intermittent streams
- Adjacent wetlands with relatively permanent surface water = permanently saturated or wetter water regimes

Strict interpretation of 2025 Proposed Rule

- Relatively permanent = perennial streams only
- Adjacent wetlands with relatively permanent surface water = permanently saturated or wetter water regimes

Limitations

- 2025 Proposed Rule is under revisions based on comments
- No associated implementation guidance
- Multiple options for some aspects, unclear which will be chosen
- Wet season requirement is very unclear for western states where precipitation is can be dependent on multiple events throughout a year: winter snowpack, spring runoff, monsoon season.



Tiers of Regulatory Certainty

Federal Jurisdiction	Definitely no	Tier 1 Streams: All intermittent and perennial streams that do not connect to downstream jurisdictional waters (isolated streams). Ephemeral streams with an ordinary high water mark (OHWM).
	Currently yes Probably yes	Tier 2 Streams: Intermittent (seasonal) streams that connect to downstream jurisdictional waters <u>and</u> perennial reaches separated from downstream jurisdictional waters by intermittent reaches. Also includes ditches and canals.
	Definitely yes	Tier 3 Streams: Perennial streams that connect to downstream jurisdictional waters (permanent streams).

Tiers of Regulatory Certainty

Scenarios

				Current	Loose	Strict
Federal Jurisdiction	Definitely no	Tier 1 Streams: All intermittent and perennial streams that do not connect to downstream jurisdictional waters (isolated streams). Ephemeral streams with an ordinary high water mark (OHWM).	Tier 1A Wetlands: Wetlands that are either abutting isolated streams, close by not abutting jurisdictional streams, OR fully isolated from any stream (isolated wetlands).	STATE	STATE	STATE
	Currently yes	Tier 2 Streams: Intermittent (seasonal) streams that connect to downstream jurisdictional waters <u>and</u> perennial reaches separated from downstream jurisdictional waters by intermittent reaches. Also includes ditches and canals.	Tier 2A Wetlands: Wetlands with <u>seasonal water regimes</u> abutting Tier 2 or Tier 3 streams. (NWI Water Regime = B, C)	FEDERAL	FEDERAL	FEDERAL
	Probably yes		Tier 2C Wetlands: Wetlands with <u>permanently saturated or wetter water regimes</u> abutting Tier 2 streams. (NWI Water Regime = D, E, F, G, H)			
	Definitely yes	Tier 3 Streams: Perennial streams that connect to downstream jurisdictional waters (permanent streams).	Tier 3 Wetlands: Wetlands with <u>permanently saturated or wetter water regimes</u> abutting Tier 3 streams. (NWI Water Regime = D, E, F, G, H)			

Tiers of Regulatory Certainty

		Subject to regulation		
		Definitely yes	Possibly	Not Likely
Federal Jurisdiction	Definitely no	Tier 1A Wetlands: Wetlands that are either abutting isolated streams OR are fully isolated from any stream (isolated wetlands).	Tier 1B Wetlands: Wetlands with <u>temporary or artificial water regimes</u> and are either abutting isolated streams OR are fully isolated from any stream. (NWI = A or K)	1C Wetlands: All wetlands with intermittent water regimes or mapped as farmed. Highly temporary wetlands that likely do not pass the three-parameter test. (NWI Water Regime = J or Pf)
	Currently yes	Tier 2A Wetlands: Wetlands with <u>seasonal water regimes</u> abutting Tier 2 or Tier 3 streams.	Tier 2B Wetlands: Wetlands with <u>temporary or artificial water regimes</u> abutting Tier 2 or 3 streams. (NWI Water Regime = A or K)	
	Probably yes	Tier 2C Wetlands: Wetlands with <u>permanently saturated or wetter water regimes</u> abutting Tier 2 streams.		
	Definitely yes	Tier 3 Wetlands: Wetlands with <u>at permanently saturated or wetter water regimes</u> abutting Tier 3 streams.		

Model Methods: Waterway Network

1. Developed a linear network of waterways based on NHD Flowlines.

- Retained FCodes = 46000 (generic), 46003 (intermittent), 46006 (perennial).
- Removed FCode = 46007 (ephemeral).
- Extracted attributes from polygonal area and waterbody datasets and applied to artificial path, connector, and some pipeline flowlines.
- Simplified all other flowline FCodes to perennial, intermittent, or not applicable.

2. Identified major perennial waterways.

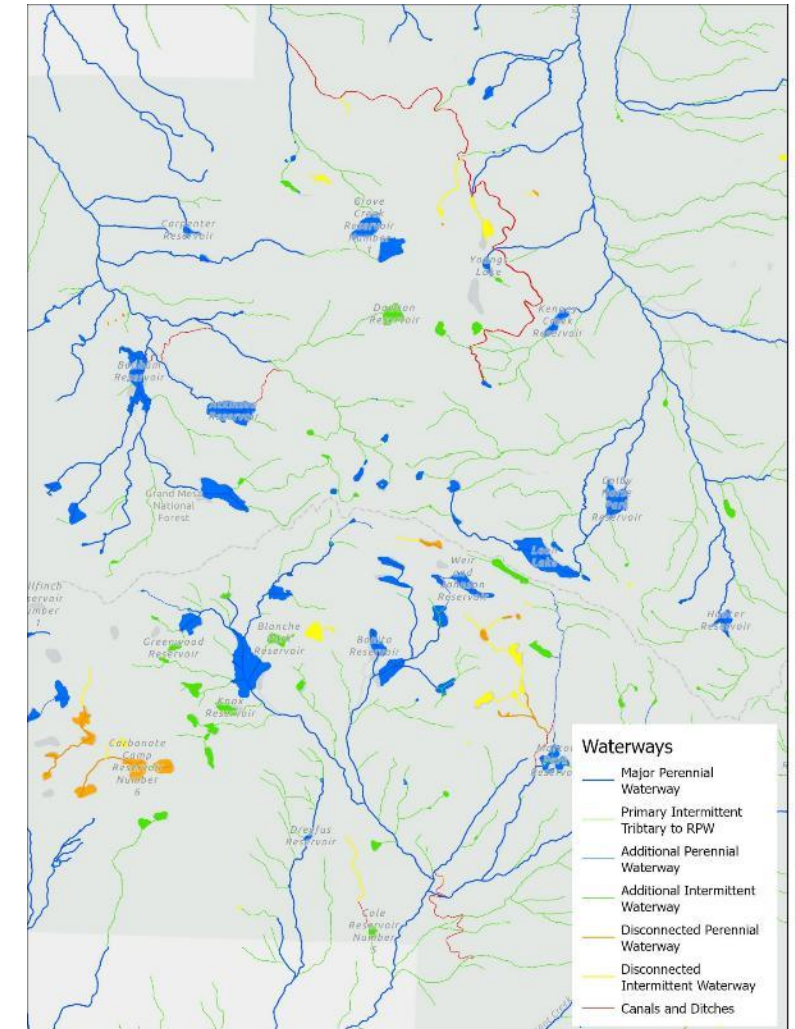
- Very few TNWs in Colorado and none officially designated on eastern slope.
- Assumed that all major rivers exiting the state were tributaries to TNWs.
- Reviewed all smaller rivers and streams exiting the state to establish connection to downstream waters.

3. Established connections between flowline segments.

- Converted flowlines to polygons to intersect adjacent features.
- Ran intersect tool to build a connected network of perennial and intermittent streams vs. disconnected segments and smaller networks.
- Reviewed disconnections of major waterways and made minimal corrections.

4. Developed a ditch network.

- Merged flowlines for ditches and canals with linear excavated features in NWI to create a ditch network.



Model Methods: Adjacent Wetlands

1. Rejoined flowlines to NHD area and polygon features.

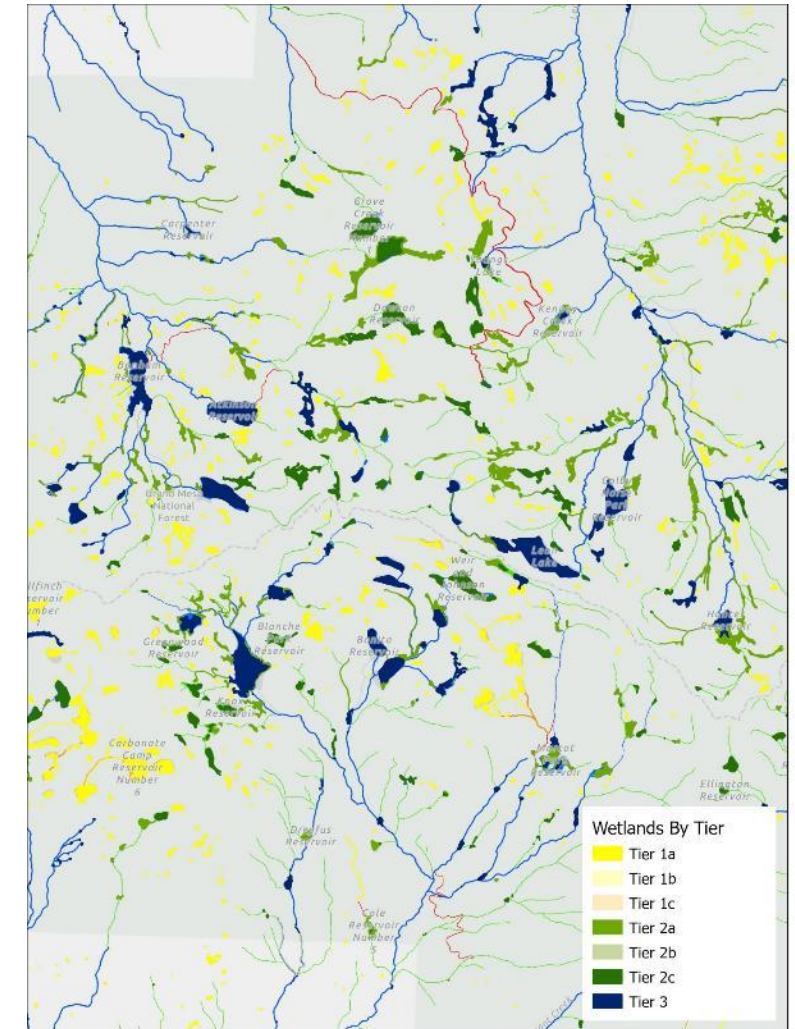
- Spatial join between NHD flowlines and NHD area and waterbody polygons to link attributes of connected vs. disconnected network.
- Spatial join between flowlines and NWI Riverine features to link attributes of connected vs. disconnected network.
- This ensured that the full area of the rivers and streams could be used to establish adjacency with wetland polygons.

2. Identified adjacent wetlands under each tier of regulatory certainty.

- Iteratively ran a series of select by attribute and intersect using different NWI water regimes to identify which wetlands fit under each tier of regulatory certainty.
- Iteratively built connections between adjacent polygons, as appropriate.

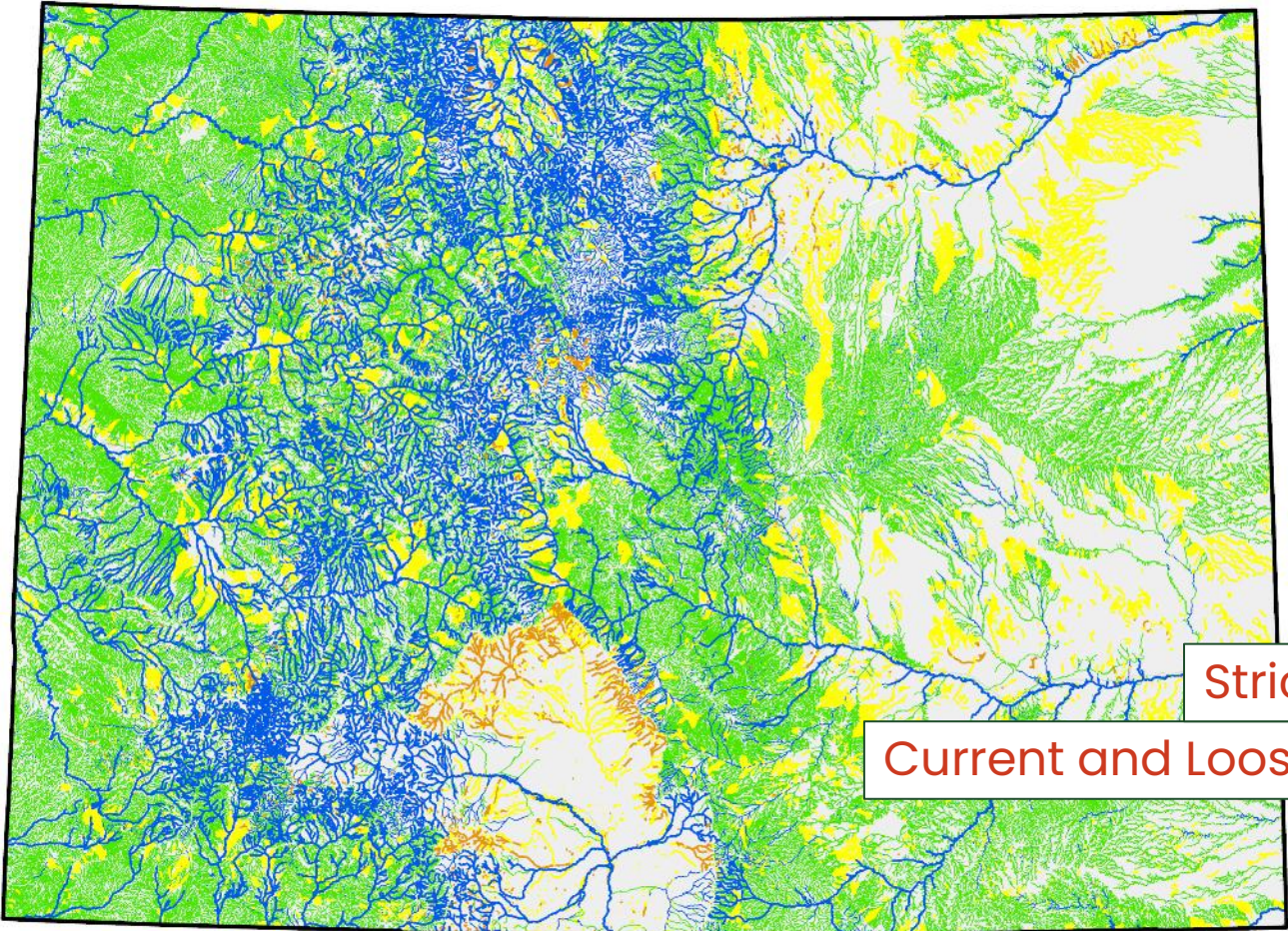
3. Summarized results by scenario.

- Summarized data within each tier to calculate results by scenario.
- Example: Current federal regulation = Tier 2a, 2b, 2c, 3.



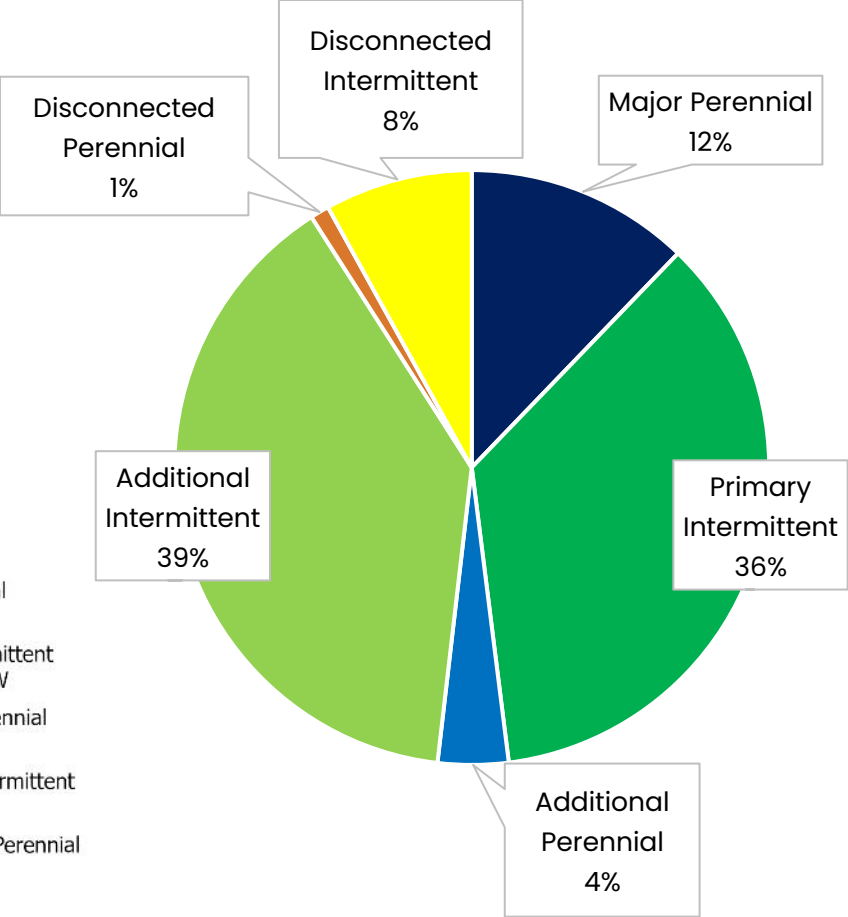
Results: Waterways

Network of Perennial and Intermittent Waterways



WaterwayType

- Major Perennial Waterway
- Primary Intermittent Tributary to RPW
- Additional Perennial Waterway
- Additional Intermittent Waterway
- Disconnected Perennial Waterway
- Disconnected Intermittent Waterway

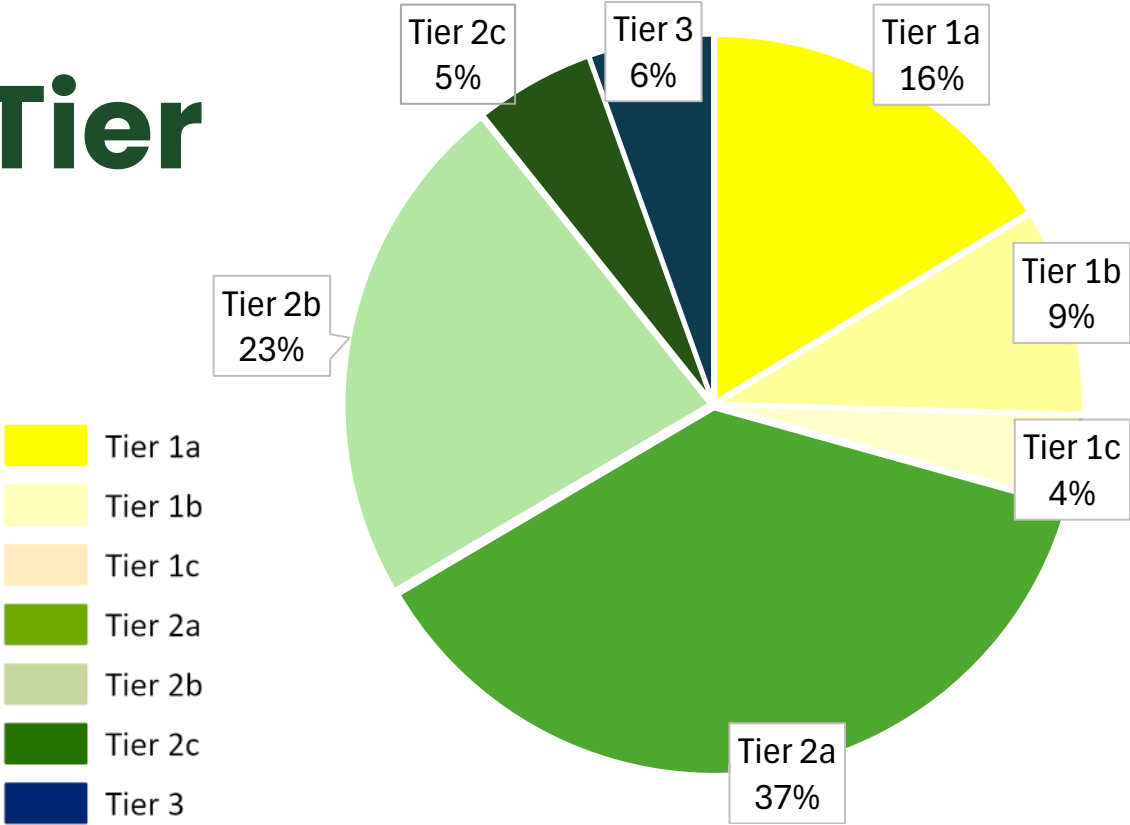
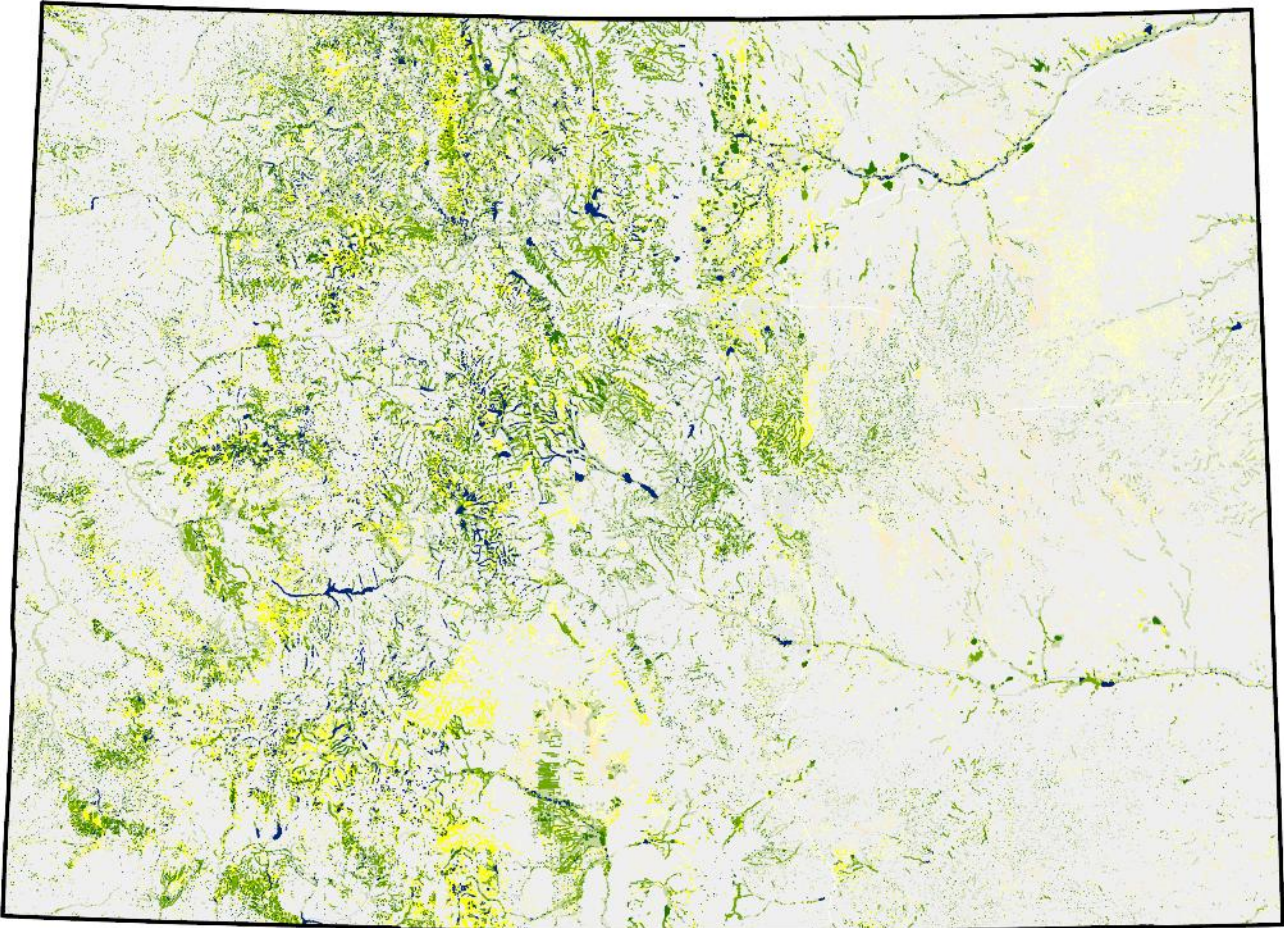


Strict
Current and Loose

Waterway Types	Stream Miles
Major Perennial Waterway	28,133
Primary Intermittent Tributary	82,530
Additional Perennial Waterway	8,835
Additional Intermittent Waterway	90,127
Disconnected Perennial Waterway	2,368
Disconnected Intermittent Waterway	18,513
Grand Total	230,506

Results: Wetlands by Tier

Wetlands and Lakes by Regulatory Tier



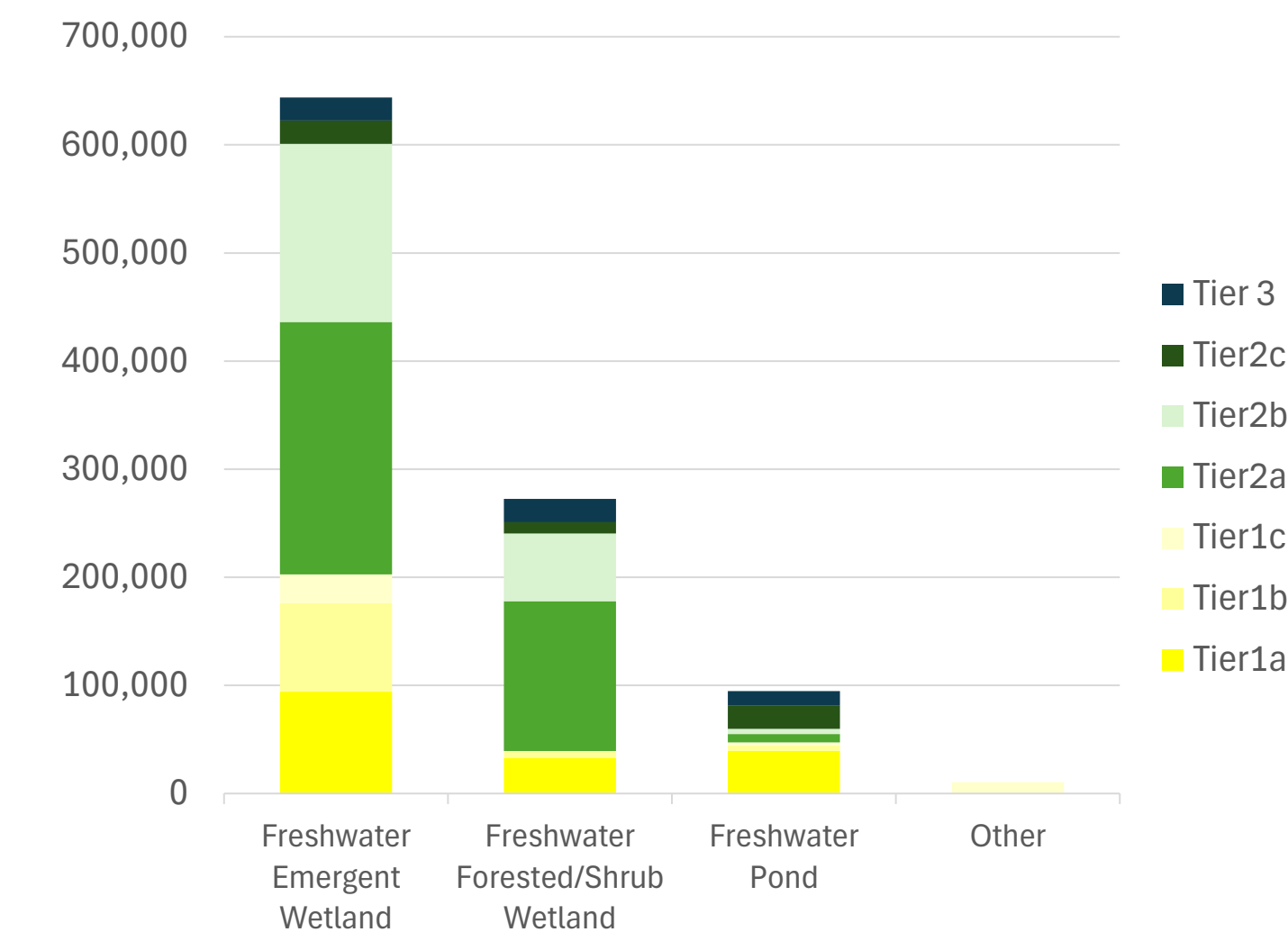
Wetland Acres by Tier		Subject to regulation			
		Yes	Possibly	Not Likely	Total
Federal Jurisdiction	No	1a 166,822	1b 92,907	1c 39,890	299,619
	Current	2a 379,830	2b 232,406		612,237
	Possibly	2c 53,605			53,605
	Yes	3 55,949			55,949
	Total	656,206	325,314	39,890	1,021,410

Strictly

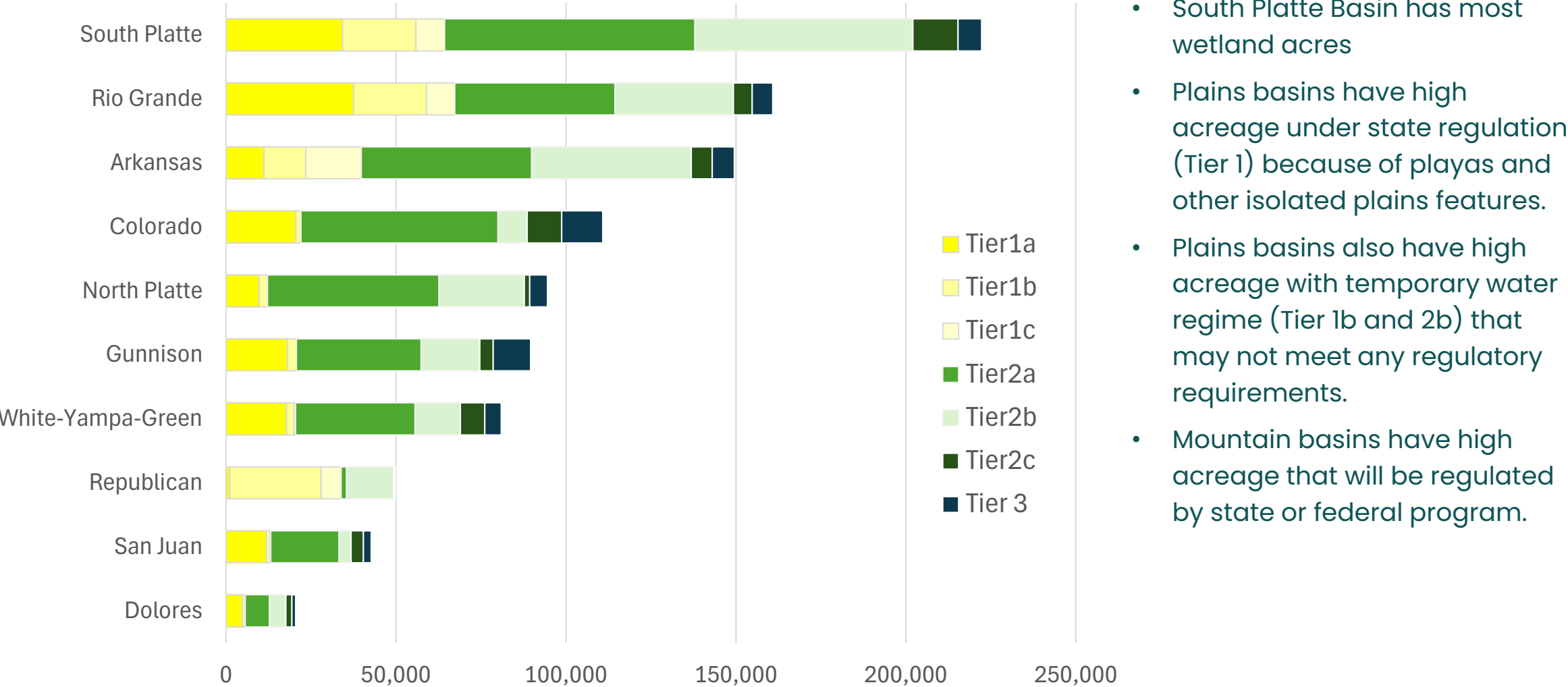
Results: Wetlands by Water Regime

Water Regime		Acres	Percent
A	Temporarily flooded	325,261	31.8%
B	Seasonally saturated	166,884	16.3%
C	Seasonally flooded	315,283	30.9%
D	Permanently saturated	43,045	4.2%
E	Seasonally flooded / saturated	42,335	4.1%
F	Semi-permanently flooded	51,460	5.0%
G	Intermittently exposed	33,085	3.2%
H	Permanently flooded	4,267	0.4%
J	Intermittently flooded	29,427	2.9%
K	Artificially flooded	118	0.0%
Pf	Farmed	10,650	1.0%
Grand Total		1,021,814	100.0%

- Temporary and seasonal wetlands are the most abundant water regimes in the state.



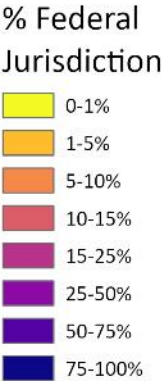
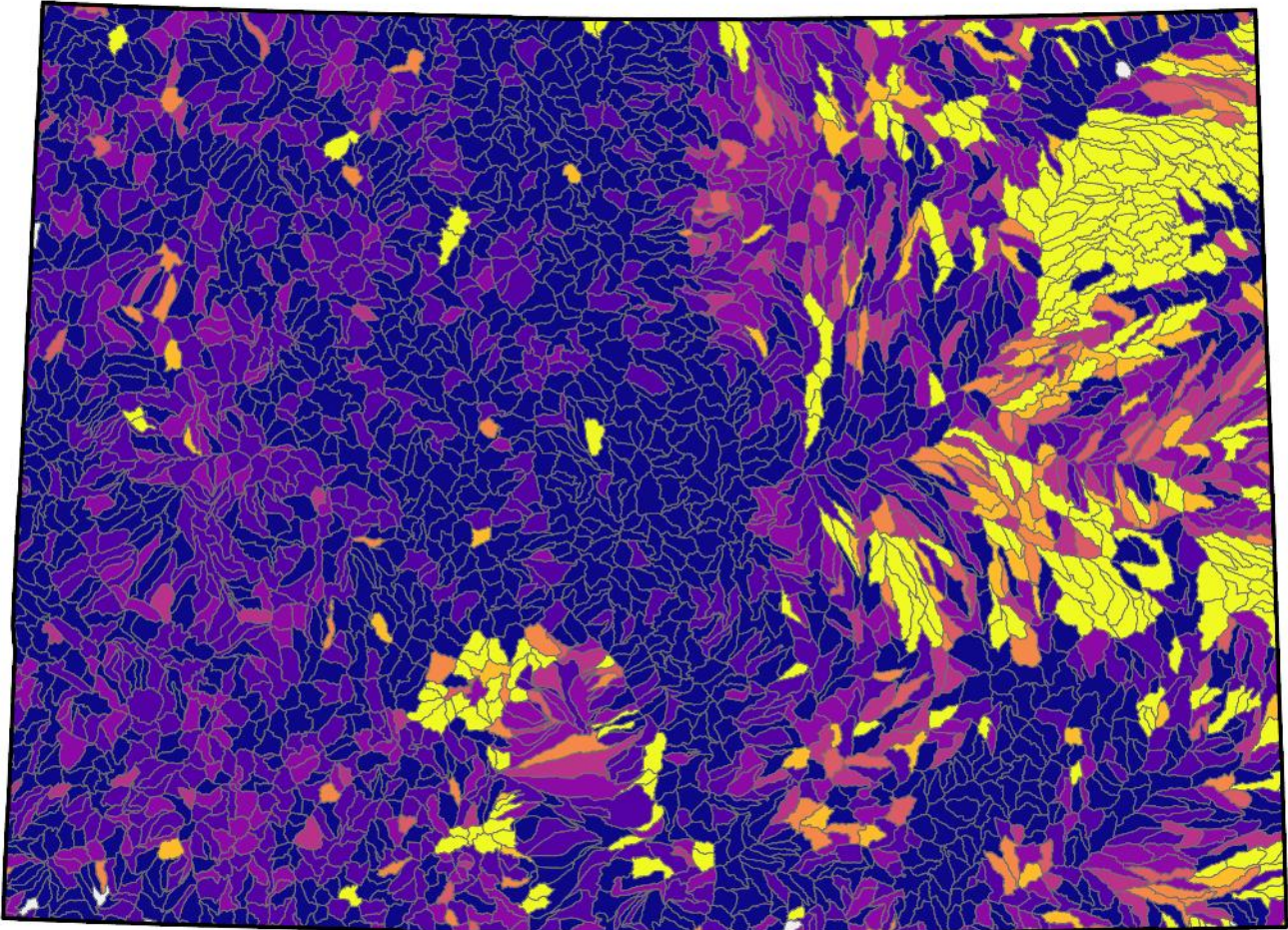
Results: Wetlands by River Basin



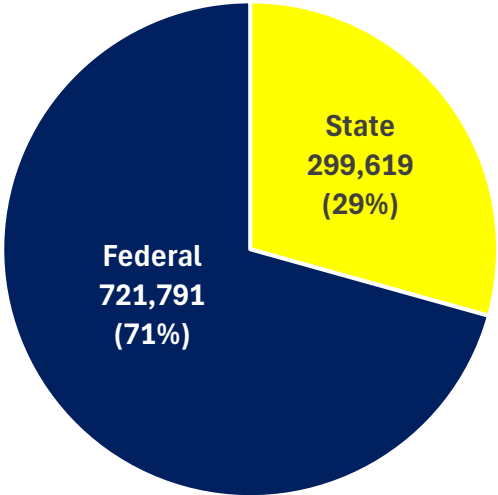
- South Platte Basin has most wetland acres
- Plains basins have high acreage under state regulation (Tier 1) because of playas and other isolated plains features.
- Plains basins also have high acreage with temporary water regime (Tier 1b and 2b) that may not meet any regulatory requirements.
- Mountain basins have high acreage that will be regulated by state or federal program.

Results: Wetlands by Scenario

Percent of Vegetated Wetlands under Federal Jurisdiction
Current Regulatory Assumptions

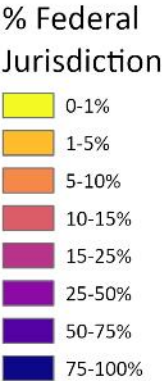
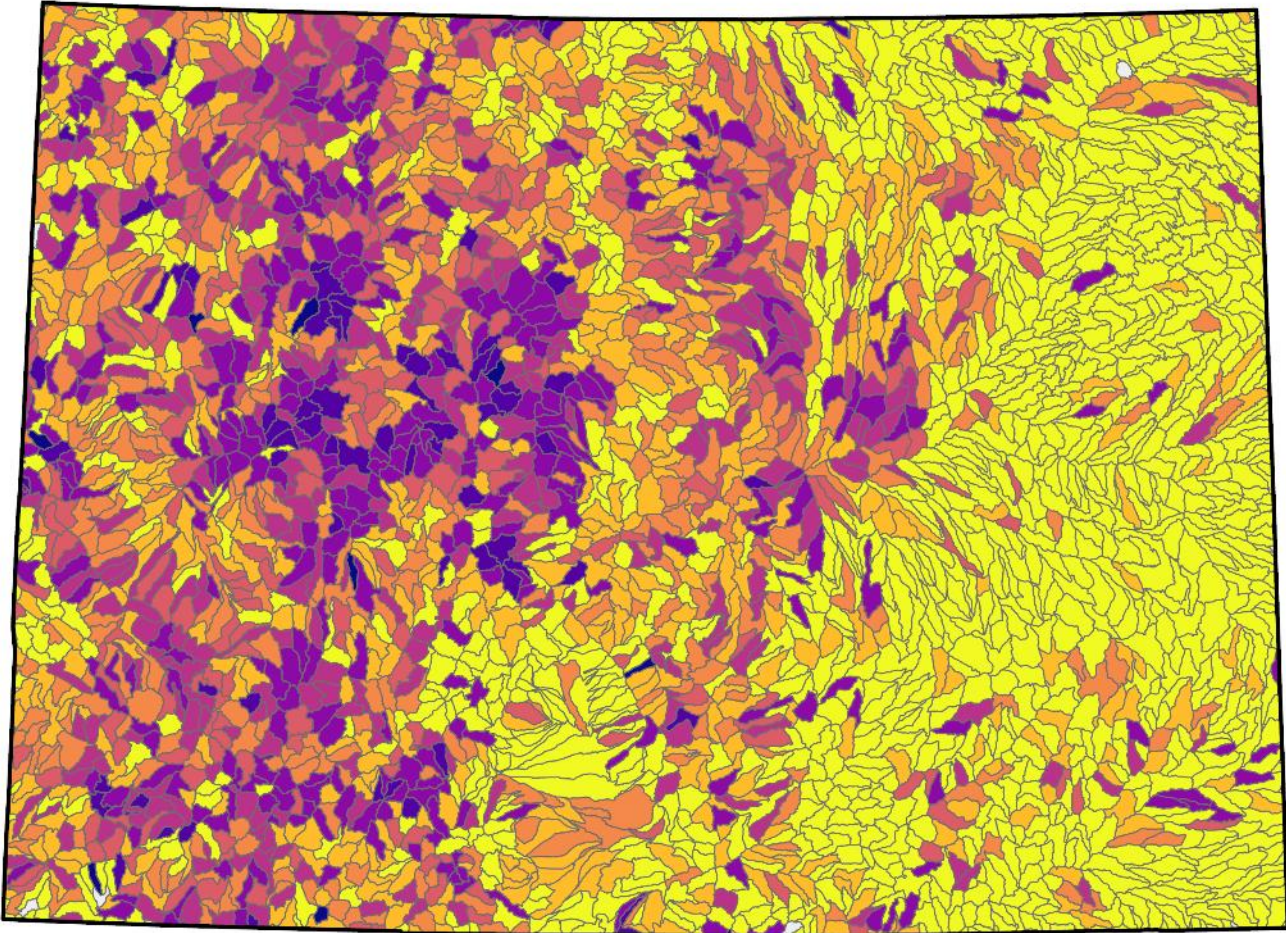


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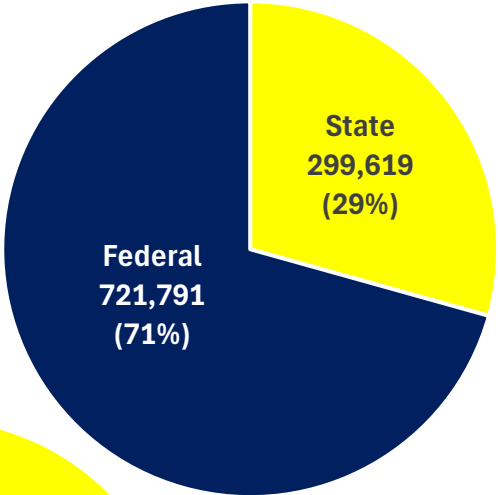


Results: Wetlands by Scenario

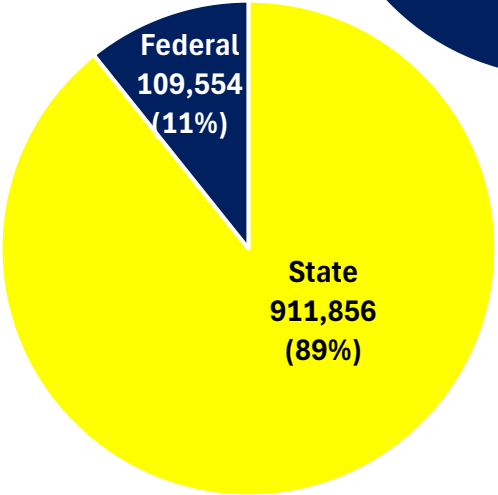
Percent of Vegetated Wetlands under Federal Jurisdiction
Loose Interpretation of 2025 Proposed Rule



Current

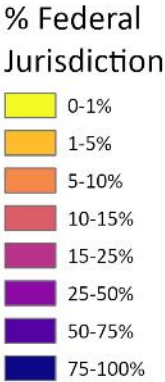
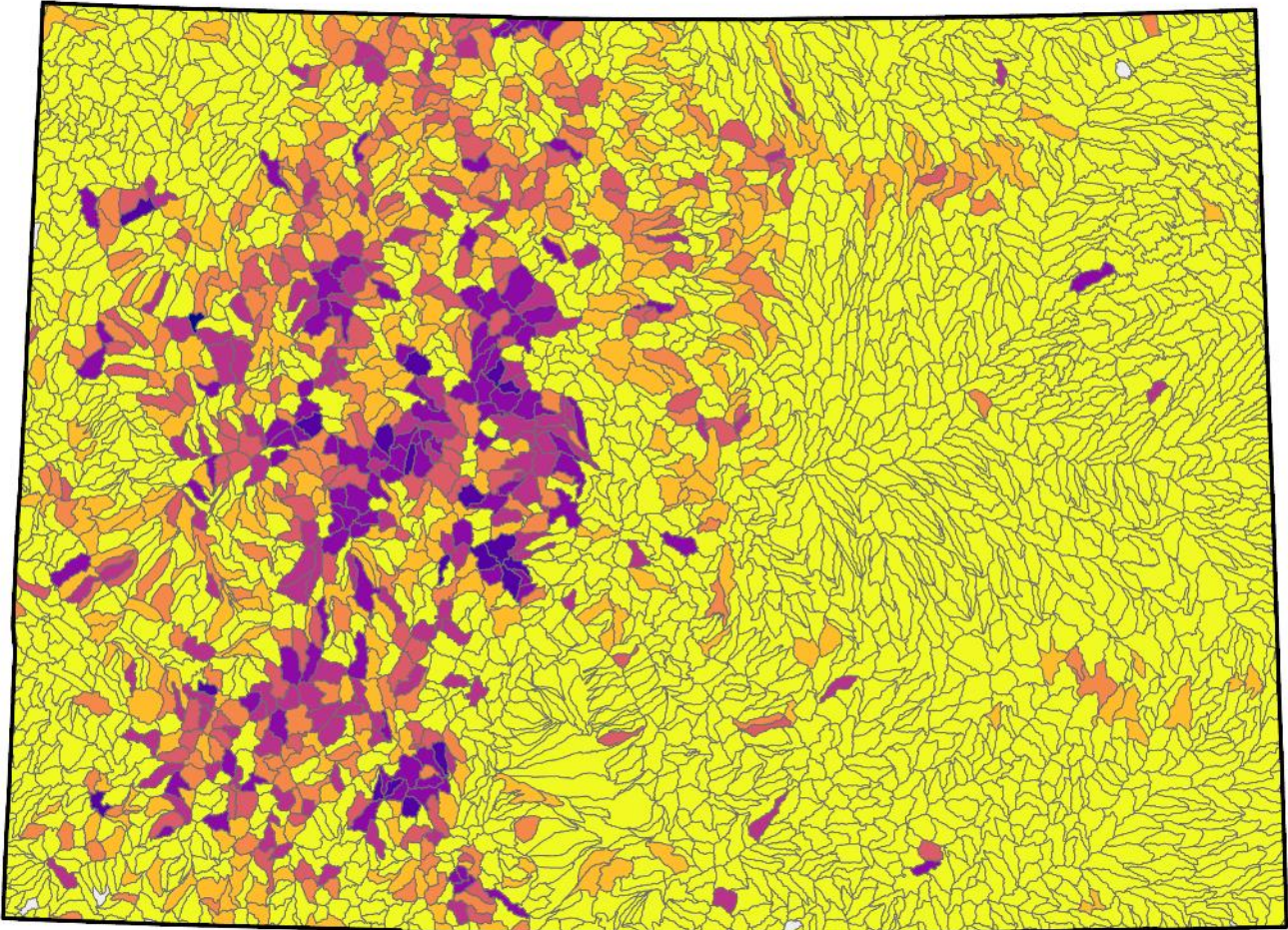


Loose

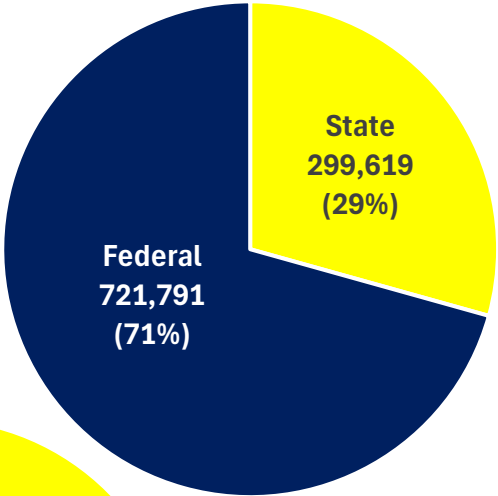


Results: Wetlands by Scenario

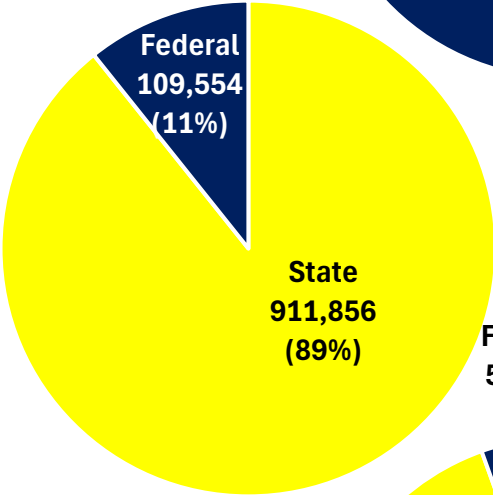
Percent of Vegetated Wetlands under Federal Jurisdiction
Strict Interpretation of 2025 Proposed Rule



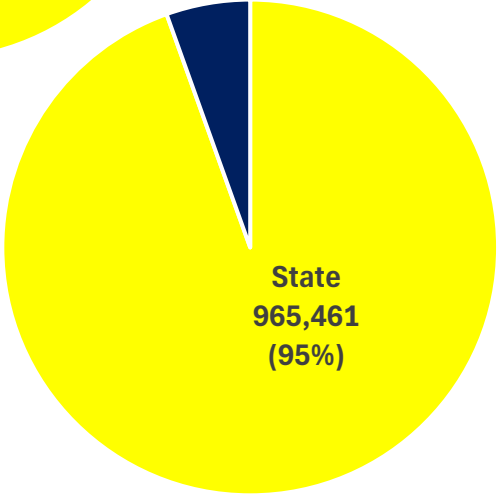
Current



Loose

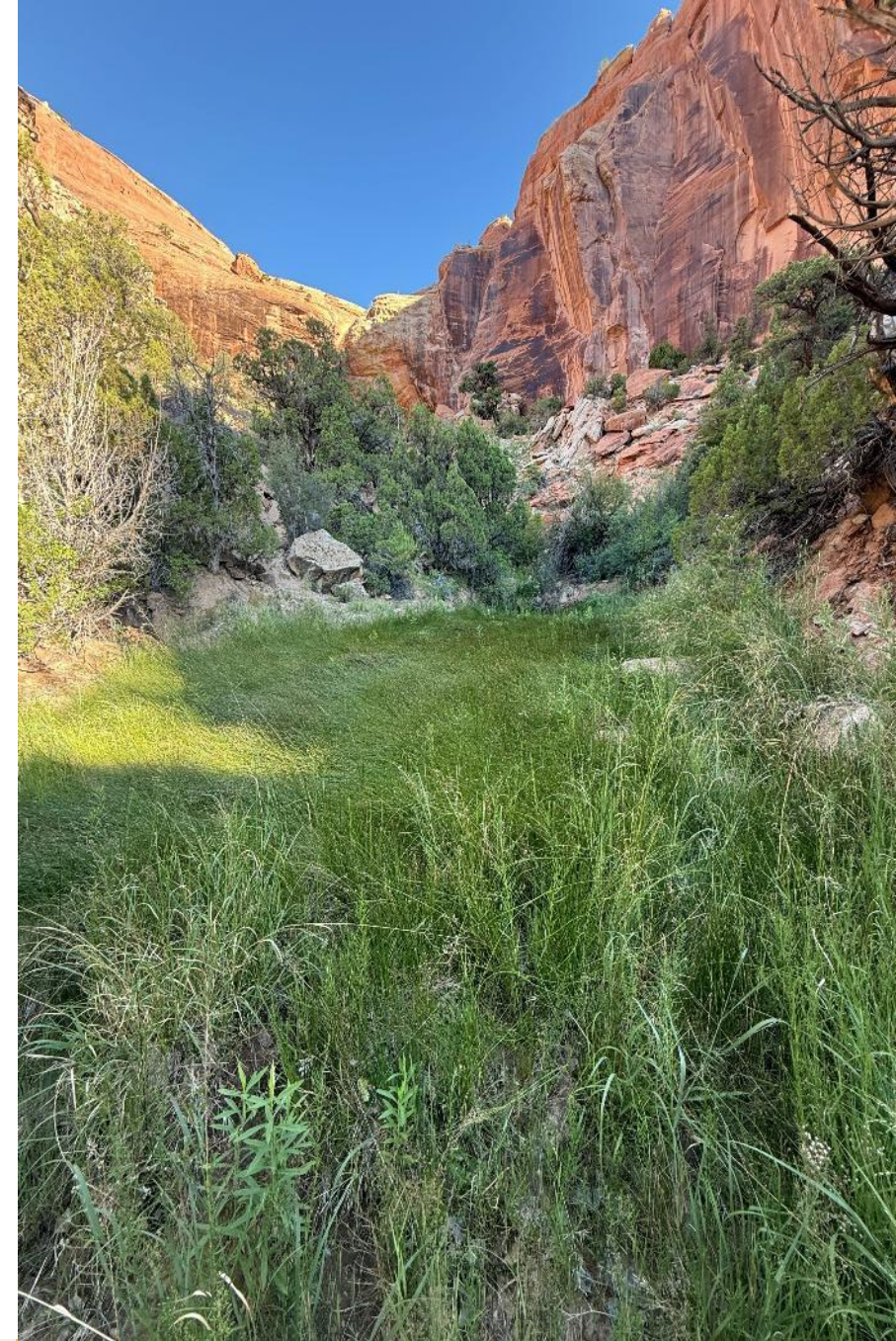


Strict



Major Takeaways

- Federal jurisdiction has already contracted under Sackett and could contract further, depending on how the 2025 Proposed Rule is implemented.
- Intermittent streams and seasonally flooded wetlands are the most at risk. They constitute the largest share of Colorado's waters but are least likely to meet a "relatively permanent" and "continuous surface connection" standards.
- Colorado's new state dredge-and-fill program *could* take on a substantial portion of wetlands and waters that no longer receive federal protection.
- Nationally available data (NHD + NWI) can support replicable, updatable regulatory modeling, but data limitations require transparent assumptions and interpretive judgment.
- This framework can be adapted by other states facing similar post-Sackett regulatory gaps.



Next Steps

- **Accuracy Assessment:**
 - Review 20 2x2 mile squares randomly selected across the state and assess the accuracy of the models results
 - Compare model with previous jurisdictional determinations
- **Incorporate aspects of the Colorado Dredge and Fill program**
 - Identify excluded waters to the extent possible
 - Identify fully isolated wetlands meet the general authorization
- **Convert model to a Python script so it can easily be replicated with updated NWI and NHD data**
- **Create a Story Map and online data viewer so the public can see the model results**



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