

## Systemic Mitigation

### Systemic Mitigation:

Offset increased commercial barge traffic impacts

#### 5 Key areas:

1. Fisheries
2. Submerged Aquatic Vegetation
3. Backwater & Secondary Channel Sedimentation
4. Bank Erosion
5. Historic Properties

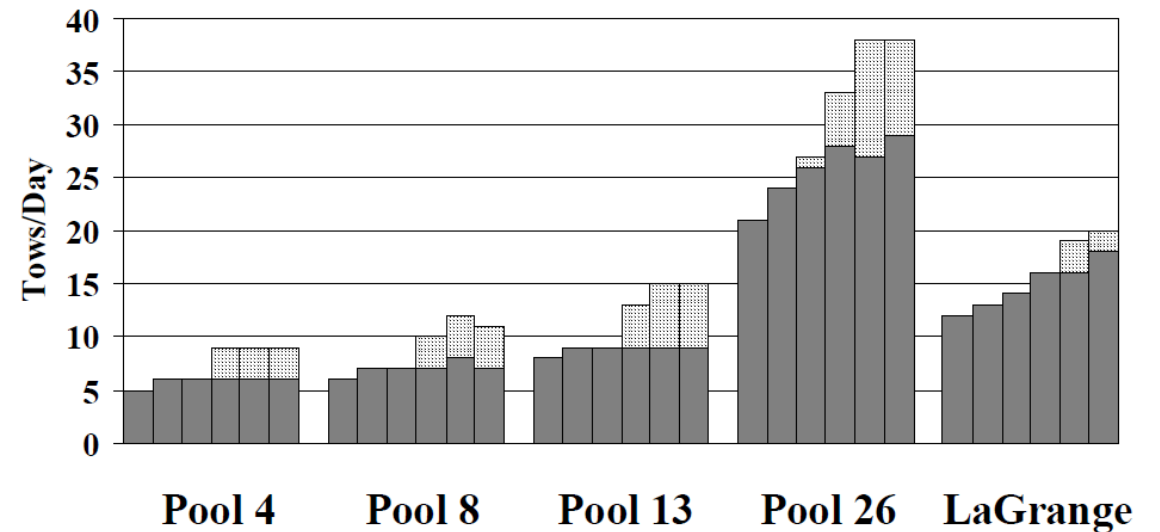


## Systemic Mitigation

### Why do we need systemic mitigation?

- Required to offset the adverse effects of projected increases in navigation traffic associated with our navigation efficiency measures.
- Increased nav traffic will, in turn, adversely affect:
  - Fisheries
  - Submerged Aquatic Vegetation (SAV)
  - Backwaters and Secondary Channels
  - Banklines, including Historic Properties
- We need to offset those projected adverse impacts by implementing mitigation measures that benefit those resource categories in the UMR-IWW.

Alternative 6



## Systemic Mitigation

### **Systemic Mitigation for Fisheries Impacts.**

- Incremental increases in navigation traffic are expected to impact fisheries through larval fish mortality due to barge entrainment. Larval mortality estimates were used to estimate impacts to adult fish populations and to estimate costs required to offset those impacts.
- Potential measures proposed as mitigation include:
  - Large Woody Debris Anchors
  - Backwater Dredging
  - Wood Pile Dikes
  - Stone Dike Alterations
  - Gravel Bars
  - Fish Nursery Areas
  - Side Channel Restoration
- Specific locations were not identified, but numbers of features by pool groups were proposed.

## Systemic Mitigation

**Table 10-2.** Summary of potential fisheries mitigation measures and quantity based upon traffic forecasts by reach.

Reach	Potential Measures	Alt 4	Alt 6	Alt 4 & 6	Units
Upper St. Anthony – Pool 3	Large woody debris anchors	210	575	575	Structures
Pools 4-8	Large woody debris anchors	250	250	250	Structures
	Backwater imp. (dredging)	0	5	5	Acres
Pools 9-15	Backwater imp. (dredging)	20	20	20	Acres
	Modified pile dike	5	10	10	Structures
	Large woody debris anchors	1000	1000	1000	Structures
	Dike alterations	0	30	30	Structures
	Gravel Bar	30	60	60	Acres
Pools 16-27	Fish nursery area (2)	0	180	180	Acres
	Backwater imp. (dredging)	0	25	25	Acres
	Modified pile dike	0	5	5	Structures
	Large woody debris anchors	770	770	770	Structures
	Dike alterations	5	30	30	Structures
	Side channel restoration	10	50	50	Acres
	Gravel bars	30	40	40	Acres
Open River	Modified pile dike	5	10	10	Structures
	Dike alterations	0	10	10	Structures
Lower IWW	Side channel restoration	0	110	130	Acres
	Large woody debris anchors	0	0	250	Structures
Middle IWW	Side channel restoration	0	50	55	Acres
	Large woody debris anchors	5	0	200	Structures
Upper IWW	Side channel restoration	0	20	30	Acres



## Systemic Mitigation

### Systemic Mitigation for SAV Impacts.

- Incremental increases in navigation traffic are expected to impact SAV through vessel wake wave action causing changes in current patterns and associated plant fragmentation/entanglement and by causing increased suspended sediment.
- Potential measures proposed as mitigation include:
  - Vegetation Plantings
  - Off-shore Revetments
  - Island Construction
- Pool water level management was also considered but not included because effectiveness of the measure was unknown.
- Specific locations for mitigation measures were identified in Pools 5, 9, 11, 13, and 19.

## Systemic Mitigation

**Table 10-6.** Comparison of model-predicted affected areas by alternative for plant mitigation. Note: Unaffected river reaches are not shown.

Pool	Alternative 4	Alternative 6 and Alternative 4 & 6
5		Near Alma (752R)
9		Crooked Slough Cut Daymark (653L)
		Atchafalaya Bluff (658R)
		Indian Camp Daymark (665L)
		Lost Channel (670R)
11		Near Island 212 (590R)
		Island 201 (599L)
		Sweezy Island (604R)
		Island 189 (609L)
13	Smith Bay Lower Daymark (528.0L)	Same as Alternative 4
	Smith Bay Light (528.5L)	
	Near Smith Bay Cut Light (529.0R)	
	Smith Bay Lower Daymark (530.5L)	
	Mound Island (532.5L)	
	Hubbell Island (534.5)	
	Edick Lake (535.5L)	
	Sweeney Islands/Island 266 (538.5L)	
	Near Riprap Island (540.5L)	
	Island 259 (543.0L)	
Savanna Depot (547.0L)		
19		Larry Creek (369L)
		Nauvoo Point (375L)
		Devil's Island (378R)
		Hass's Island (380L)
		Old Niota (382L)
		Lead Island (387R)
		Pontoosac (388L)
		Grape Island (393L)
		Upper Twin Island (396R)
		Kemps Landing (397R)
		Craigel Island (399L)
		Near Craigel Island (400R)
		Moore/Charcoal Island (405L)

Each cell in Pools 5, 9, and 19 requires a minimum of 1/3 mile of protection, where Pool 13 requires 1/6 mile of protection

## Systemic Mitigation

### **Systemic Mitigation for Backwater and Secondary Channel Sedimentation Impacts.**

- Incremental increases in navigation traffic are expected to increase deposition and movement of re-suspended sediments into backwaters and secondary channels.
- Potential measures proposed as mitigation include:
  - Dredging
  - Diversion or Barrier Structures
  - Placement of Rock to Contain Fine Sediments
  - Island Construction
- Specific locations for mitigation measures were proposed.



## Systemic Mitigation

**Table 10-8.** Summary of backwater/secondary channel mitigation locations and measures.  
 Note: Mitigation for Alternative 4, Alternative 6, and Alternative 4 & 6 is the same.

Pool	Name - River Mile (Code)	Mitigation Measure
UMR		
5	near Alma - 752R (BW2)	off shore revetment
	Fisher Island - 747L (BW4)	off shore revetment
	Muench Island - 746L (BW4)	off shore revetment
6	Black Bird Slough - 728R (BW1)	drop structure
	Near Argo Bend - 727R (BW1)	closure structure
8	Broken Arrow Slough - 696R (BW2)	bank protection, closure structure
9	Battle Slough - 671L (SEC3)	closure structure
10	Frenchtown Lake - 620R (BW10)	Dredging
	Frenchtown Lake - 620R (BW10)	closure structure
11	Goetz Slough - 612R (BW3)	barrier island, bank protection
13	Soupbone/Indian Island area - 542R (SEC8)	closure structure, dredging
IWW		
Dresden	Treats Island - 280L (BW2)	closure structure
Marseilles	Sugar Island - 261R (SEC1)	closure structure, bank protection
	Barry Island - 256R (SEC-A)	barrier island, bank protection, dredging
Starved Rock	Hill Island - 239L (SEC1)	closure structure
	Sheehan Island - 236R (SEC2)	Dredging
Peoria	Swan Lake - 201R (BW10)	Dredging
	near Whitney Lake - 195R (SEC2)	dredging, closure structure
	Upper Twin Sisters Island - 204L (SEC-B)	dredging, closure structure
	Lower Twin Sisters Island - 203R (SEC-C)	dredging, closure structure
LaGrange	Bath Chute - 113L (BW4)	Dredging
	Wood Slough - 96L (BW5)	Dredging
	Wood Slough - 92L (BW5)	Dredging
	Sugar Creek - 95L (BW6)	closure structure, dredging
	Turkey Island - 148R (SEC1)	closure structure, dredging
	Coon Hollow - 141L (SEC3)	closure structure, dredging
Alton	Hurricane Island - 28R (BW2)	closure structures
	Buckhorn Island - 46R (SEC-B)	closure structure, dredging
	Fisher Island - 39L (SEC-D)	closure structure, dredging
	Twin Islands - 38R (SEC-E)	closure structure
	Willow Island - 31L (SEC-F)	closure structure



## Systemic Mitigation

### **Systemic Mitigation for Bankline Erosion Impacts (Including Historic Properties).**

- Incremental increases in navigation traffic are expected to cause bankline erosion through increased vessel wake wave action.
- Field surveys conducted in the 1990s identified areas with active bankline erosion.
- Studies and modeling conducted in the 1990s identified areas susceptible to navigation-related erosion.
- Archaeological sites were also identified.
- Potential measures proposed for mitigation include:
  - Vegetative Bank Stabilization
  - Traditional Revetment
  - Offshore Revetment
  - Data Recovery for At-risk Archaeological Sites

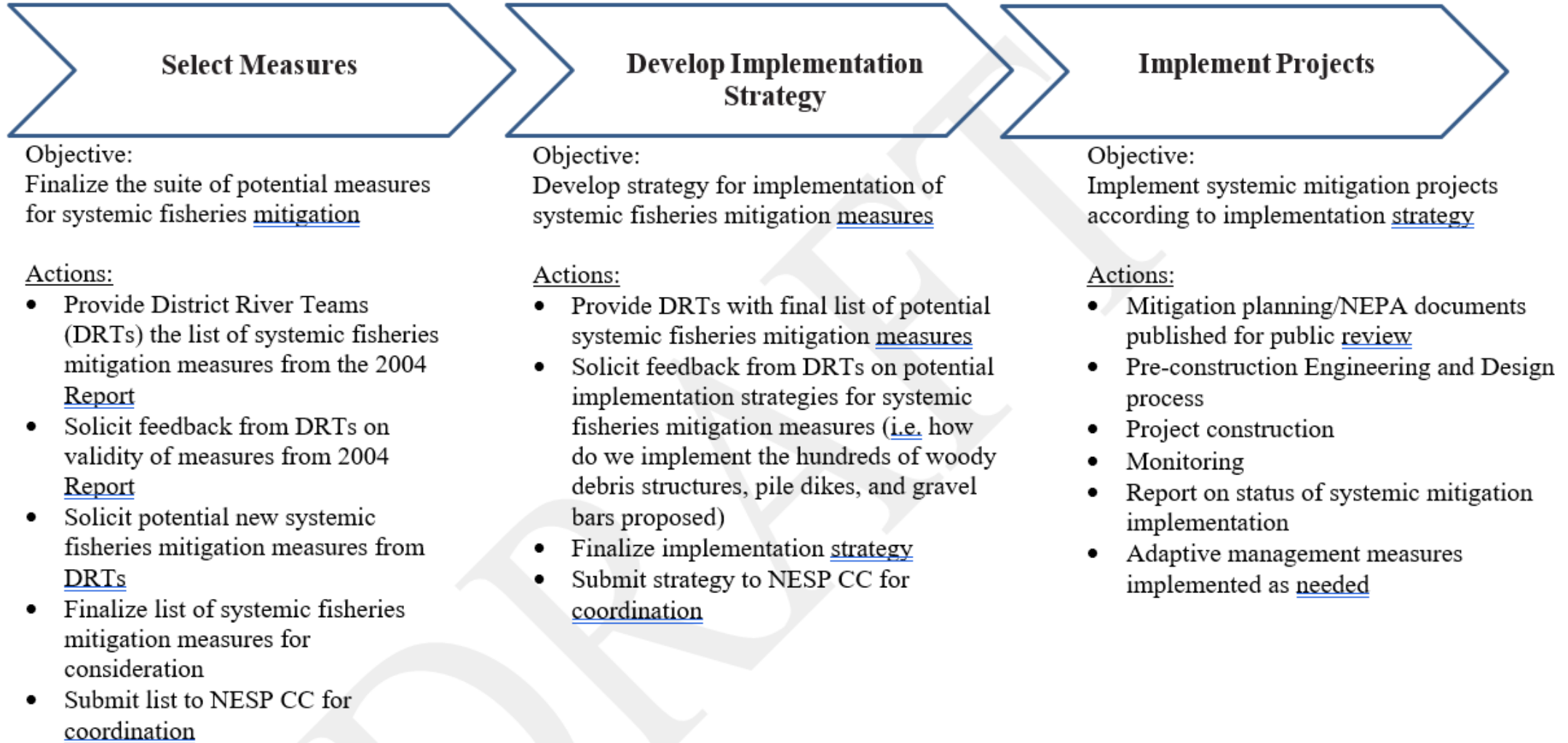
## Systemic Mitigation

### Systemic Mitigation Project Selection Process

- Category 1
  - Simple measures implemented across wide geographic range that require little planning once locations are selected
  - Fisheries mitigation measures – large woody debris anchors, pile dikes, gravel bars, etc.
- Category 2
  - More complicated measures associated with specific locations that will require detailed plan formulation/design process
  - Backwater dredging, side channel restoration, SAV, fish nursery areas, etc.

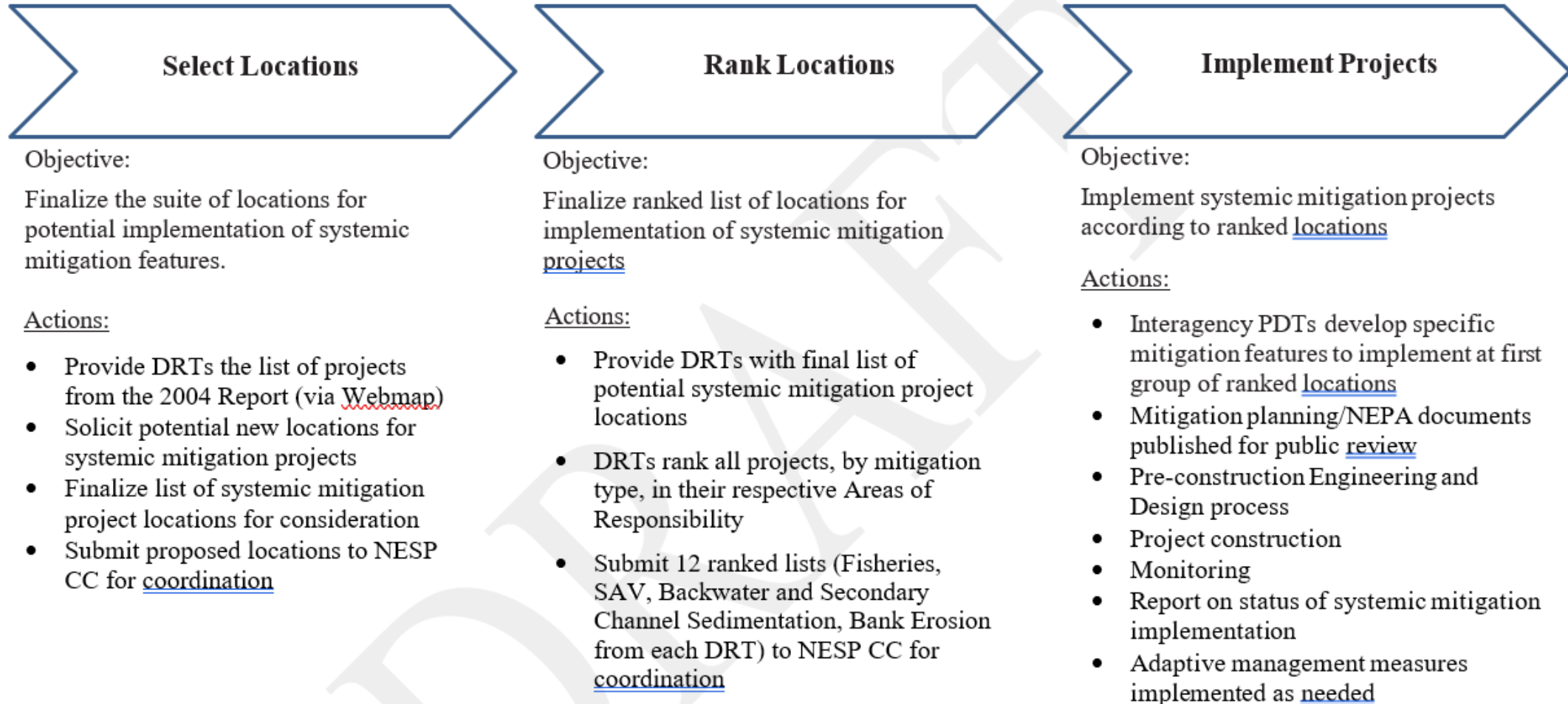
## Systemic Mitigation

### DRAFT NESP Systemic Mitigation Project Selection/Ranking/Implementation Process Diagram – Category 1



## Systemic Mitigation

### DRAFT NESP Systemic Mitigation Project Selection/Ranking/Implementation Process Diagram – Category 2



## Systemic Mitigation

### Next Steps

- Currently finalizing Systemic Mitigation Implementation Plan
- Coordinate with River Teams
  - Finalize suite of fisheries mitigation measures
  - Develop implementation strategy for fisheries mitigation measures
  - Finalize suite of potential locations for other systemic mitigation measures
  - Rank locations
  - Coordinate locations/rankings with NESP CC
  - Implement projects based on rankings

## Systemic Mitigation

Web Viewer ...

<https://usace-mvs.maps.arcgis.com/apps/webappviewer/index.html?id=42c419bbc30f4b47ad83f276746cb0c6>

# DISCUSSION