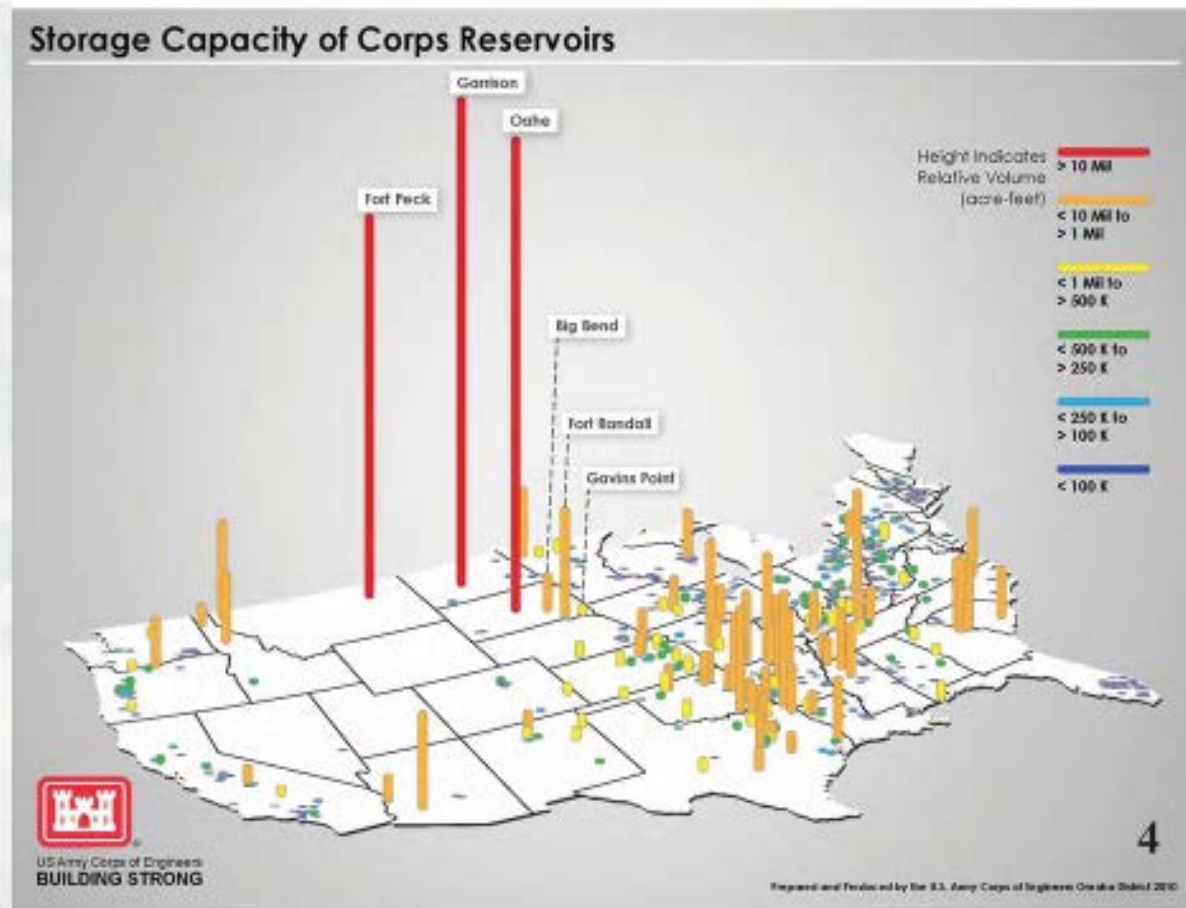


Omaha - Comprehensive Inventory of Reservoir Sediment Management Activities in the U.S. Army Corps of Engineers

BLUF: There are over 400 U.S. Army Corps of Engineers (USACE) water storage reservoir projects listed in the (RSI) Data Portal.

- Each managed independently by the local project office, district, and division water management office.
- To consider the regional impacts and benefits of sediment management, an inventory of the past and current sediment management practices implemented at each project is necessary.
- The result will be a national snapshot of reservoir sediment management and provide a current reference point when considering the projected future conditions of the projects and sustainability actions that may be taken.



FY17 RSM IPR

Omaha - Comprehensive Inventory of Reservoir Sediment Management Activities in the U.S. Army Corps of Engineers

Challenge

- USACE is starting to look at sustainability of Civil Works projects – including reservoirs
- USACE is working in US and International project on reservoir management and aims to be a global expert
- No comprehensive collection of reservoir sediment management data/actions
- Vast amount of data about sediment management is at the project offices
- Some data may be anecdotal
- Data is vital to begin assessing the need for sustainability plans and actions

Approach

- Identify a POC for each reservoir project(s)
- Contact by phone and request information on reservoir sedimentation actions and studies*
- Follow up on and data/reports
- Organize the findings and add fields to RSI databased to archive the information

*Many watershed studies in progress that consider sedimentation are being inventoried also



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Objectives

- Determine the current state of reservoirs through survey data (RSI database)
- Collect information on past and present reservoir sediment activities
- Populate RSI database with findings for future assessment
- Inventory past and present sediment studies (not part of original scope)

District/Other USACE PDT Members

Paul Boyd, P.E. – CENWO-ED-HF, RTS for Sedimentation, RSM Program Mgr

Daniel Pridal P.E. - CENWO-ED-HF, River and Reservoir Engineering Section Chief

Benjamin Ream - CENWO-ED-HF Civil Engineer

Larry Morong – CENWO-ED-HF, Hydrologic Technician

Bill Williams – CENWO-ED-HF, Hydrologic Technician

Bryan Baker – ERDC-CRREL-NH, RSI Project Manager

CECW-CE, Civil Works Sustainability Program

Blair Greimann and Sean Kimbrel – US Bureau of Reclamation, River Engineers

Stakeholders and Partners

Bureau of Reclamation



Omaha - Comprehensive Inventory of Reservoir Sediment Management Activities in the U.S. Army Corps of Engineers

■ What we know right now (USACE & BoR):

Table 1: Known Federal Reservoir Sediment Management Activities

Regular Drawdowns

Reservoir	Type	Motivation	Frequency	Notes
Fall Creek	Drawdown (2 week)	Fish Passage	Annually	Run of River
Guernsey Reservoir	Drawdown (2 week)	Limit Canal Infiltration	Annually	Not Run of River

Regular Pressure Flushes

Reservoir	Type	Motivation	Frequency	Notes
Longview	Pressure Flush*	Clear Gates	4X/year	
Cherry Creek	Pressure Flush*	Clear Gates	Annually	Alternate low and high flows
Blue Springs	Pressure Flush*	Clear Gates	4X/year	
Long Branch	Pressure Flush*	Clear Gates	4X/year	
<u>Kanapolis</u>	Pressure Flush*	Clear Gates	4X/year	

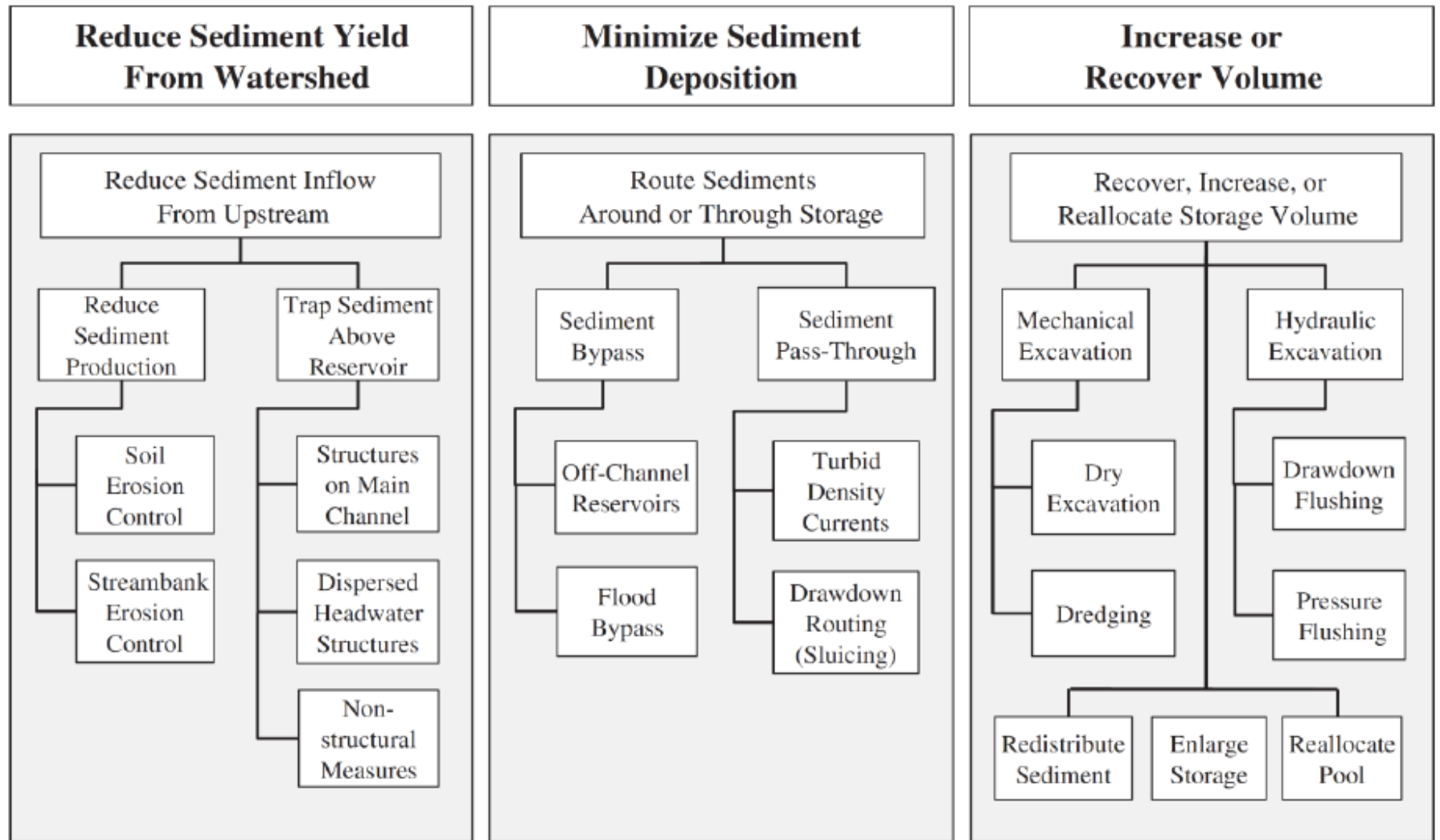
ad hoc Operations

Reservoir	Type	Motivation	Date(s)	Notes
John Redmond	Dredge		2016	
Mount Morris	Dredge or Flush	Clear Gates		Dry Dam - Dredge every year, flush when head is sufficient
Granite	Drawdown Flush			
<u>Kanapolis</u>	Dredging		2010	
Cougar Reservoir McKenzie River	Drawdown	Fish Passage Outlet Inspection	2012	
<u>Paonia Reservoir</u>	Drawdown flushes	Reservoir Storage	Occasional since 1997	Huang et al. (2017)
Lake Seminole	Dredging	Water Quality Improvements	2017 (planned)	
<u>Paonia Reservoir</u>	Drawdown and Mechanical Removal	Intake Rehabilitation	2016	Sediment buried 19m of the 21m intake tower.



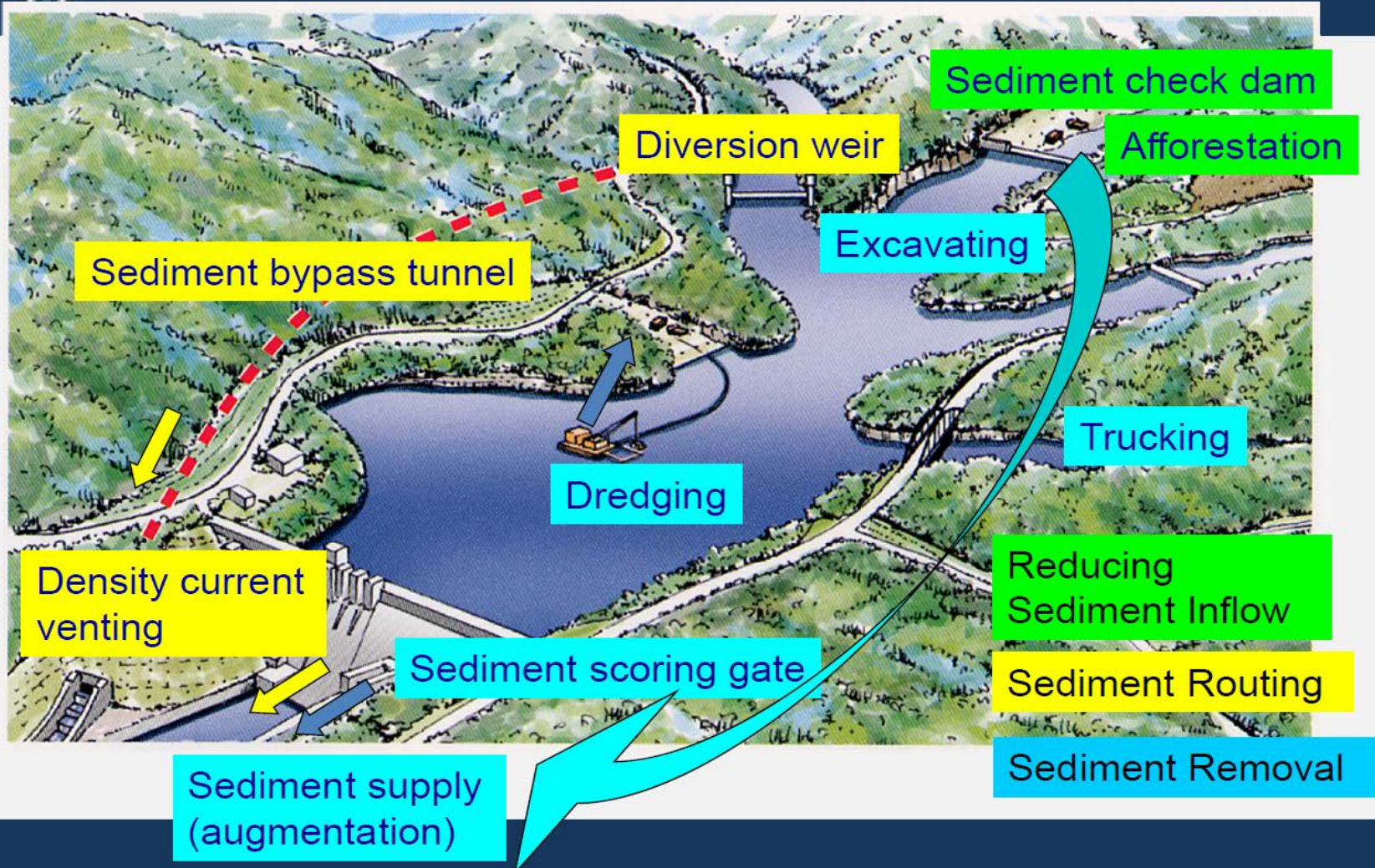
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in the U.S. Army Corps of Engineers

Kondolf's Taxonomy of Reservoir Management Strategies





How should we select suitable measures for reservoir sediment management?



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- Challenge: Finding a POC for each reservoir project

Project Name	Project Agency	Division	USACE District	BOR Region	Area Office	State	Owner	Area Office	Position	OPM Contact #1	Contact #1 Phone Number
Bear Creek	USACE	Northwestern	Omaha			CO	USACE	Tri-Lakes Project	OPM	Joe Maxwell	720-922-3858
Big Bend Dam	USACE	Northwestern	Omaha			SD	USACE	Big Bend Project	Div Chief	Keith Fink	
Bowman Haley	USACE	Northwestern	Omaha			ND	USACE	Garrison Dam	OPM	Todd Lindquist	701-654-7702
Chatfield Dam	USACE	Northwestern	Omaha			CO	USACE	Tri-Lakes Project	OPM	Joe Maxwell	720-922-3858
Cherry Creek Dam	USACE	Northwestern	Omaha			CO	USACE	Tri-Lakes Project	OPM	Joe Maxwell	720-922-3858
Cold Brook Dam	USACE	Northwestern	Omaha			SD	USACE	Big Bend Project	Acting OPM		
Cottonwood Springs Dam	USACE	Northwestern	Omaha			SD	USACE	Big Bend Project	Acting OPM		
Fort Peck Dam	USACE	Northwestern	Omaha			MT	USACE		OPM	Darrin McMurry	406-526-3411
Fort Randall Dam	USACE	Northwestern	Omaha			SD	USACE		OPM	Thomas Curran	605-487-7845 x3000
Garrison Dam	USACE	Northwestern	Omaha			ND	USACE	Garrison Dam	OPM	Todd Lindquist	701-654-7702
Gavins Point Dam	USACE	Northwestern	Omaha			SD	USACE		OPM	David Becker	402-667-2530
Oahe Dam	USACE	Northwestern	Omaha			SD	USACE		OPM	Eric Stasch	605-945-3400
Papillion Creek Site 11 - Cunningham	USACE	Northwestern	Omaha			NE	USACE	Missouri River Project	OPM	David Sobczyk	402-996-3745
Papillion Creek Site 16 - Standing Bear Lake	USACE	Northwestern	Omaha			NE	USACE	Missouri River Project	OPM	David Sobczyk	402-996-3745
Papillion Creek Site 18 - Zorinsky Lake	USACE	Northwestern	Omaha			NE	USACE	Missouri River Project	OPM	David Sobczyk	402-996-3745
Papillion Creek Site 20 - Wehrspan Lake	USACE	Northwestern	Omaha			NE	USACE	Missouri River Project	OPM	David Sobczyk	402-996-3745
Pipestem Dam	USACE	Northwestern	Omaha			ND	USACE	Garrison Dam	OPM	Todd Lindquist	701-654-7702
Salt Creek Site 10 - Yankee Hill Dam	USACE	Northwestern	Omaha			NE	USACE	Missouri River Project	OPM	David Sobczyk	402-996-3745
Salt Creek Site 12 - Conestoga	USACE	Northwestern	Omaha			NE	USACE	Missouri River Project	OPM	David Sobczyk	402-996-3745
Salt Creek Site 13 - Twin Lakes Dam	USACE	Northwestern	Omaha			NE	USACE	Missouri River Project	OPM	David Sobczyk	402-996-3745
Salt Creek Site 14 - Pawnee Dam-	USACE	Northwestern	Omaha			NE	USACE	Missouri River Project	OPM	David Sobczyk	402-996-3745
Salt Creek Site 17 - Holmes Lake	USACE	Northwestern	Omaha			NE	USACE	Missouri River Project	OPM	David Sobczyk	402-996-3745
Salt Creek Site 18 - Branched Oak	USACE	Northwestern	Omaha			NE	USACE	Missouri River Project	OPM	David Sobczyk	402-996-3745
Salt Creek Site 2 - Olive Creek Dam	USACE	Northwestern	Omaha			NE	USACE	Missouri River Project	OPM	David Sobczyk	402-996-3745
Salt Creek Site 4 - Bluestem	USACE	Northwestern	Omaha			NE	USACE	Missouri River Project	OPM	David Sobczyk	402-996-3745
Salt Creek Site 8 - Wagon Train Dam	USACE	Northwestern	Omaha			NE	USACE	Missouri River Project	OPM	David Sobczyk	402-996-3745
Salt Creek Site 9 - Stagecoach Dam	USACE	Northwestern	Omaha			NE	USACE	Missouri River Project	OPM	David Sobczyk	402-996-3745
Spring Gulch	USACE	Northwestern	Omaha			CO	USACE	Tri-Lakes Project	OPM	Joe Maxwell	720-922-3858

- Problem: Initial review only identified POC's for about 25% of projects



Omaha - Comprehensive Inventory of Reservoir Sediment Management Activities in the U.S. Army Corps of Engineers

- What about where there were no POC's?

1	Project Name	Project Agency	Division	USACE District	BOR Region	Area Office	State	Owner	Area Office	Position	OPM Contact #1	Contact #1 Phone Number
2	Cedars Dam	USACE	Great Lakes & Ohio River	Detroit			WI	USACE				
3	Depere Dam	USACE	Great Lakes & Ohio River	Detroit			WI	USACE				
4	Kaukauna Dam	USACE	Great Lakes & Ohio River	Detroit			WI	USACE				
5	Little Chute	USACE	Great Lakes & Ohio River	Detroit			WI	USACE				
6	Little Kaukauna Dam	USACE	Great Lakes & Ohio River	Detroit			WI	USACE				
7	Lower Appleton Dam	USACE	Great Lakes & Ohio River	Detroit			WI	USACE				
8	Menasha Dam	USACE	Great Lakes & Ohio River	Detroit			WI	USACE				
9	Upper Appleton Dam	USACE	Great Lakes & Ohio River	Detroit			WI	USACE				

- Found OPM Managers Gateway and Smartbook database that filled in many gaps
- <https://operations.erdc.dren.mil/projmgrs.cfm>
- Telephone sleuthing required to find the correct POC for some reservoirs



Omaha - Comprehensive Inventory of Reservoir Sediment Management Activities in the U.S. Army Corps of Engineers

Accomplishments/Deliverables

Lessons Learned

- Determined POC for most reservoirs – much harder than expected
- Approx 25% of reservoirs complete
- Many take multiple follow up calls
- Kyoto paper not published, cannot cite



How is this project benefiting the USACE and Nation

- First comprehensive survey of sediment management actions
- Increases USACE position as expert in the field
- Necessary information that will be needed for any reservoir sustainability plan/assessment
- Can aid in prioritizing studies/pilot projects/resources for reservoir management



Omaha - Comprehensive Inventory of Reservoir Sediment Management Activities in the U.S. Army Corps of Engineers

What is working? Ups? Success?

- Have identified POC's for about 85% of Reservoirs
- Added the inventory of watershed and sedimentation studies
- Created a standardize excel worksheet to inventory calls
- Found a few ongoing sediment management activities so far
- Developed paper for Kyoto Sediment Bypass Conference to kickstart our efforts

Reservoir Flushing, Routing, and Bypass in the United States:

A Survey of US Practice and Models of Proposed Activities

Stanford Gibson, Paul Boyd, Blair Greimann, Sean Kimbrel, Jianchung Huang,
John Shelley

Abstract

Many dams in the United States are approaching or have passed their economic design life. However, in most cases, sustainable reservoir management approaches, like flushing, routing, or bypass could significantly extend the operational life of these reservoirs. Active management may make these reservoirs more economically and environmentally sustainable, extending the benefits and mitigating their impacts. Most US reservoirs that actively manage sediment either dredge or pressure flush. Three known reservoirs in the US drawdown annually to pass substantial sediment (Spencer Dam, Guernsey Reservoir, and Fall Creek). These three operations have distinct objectives and diverse morphological settings which drive different operational approaches. As US infrastructure ages, agencies and private dam owners are looking to flushing, routing, and bypass alternatives to maintain benefits. This paper presents a sample of current reservoir sediment management practices at US reservoirs and some of the numerical model results for flushing, routing, and tunnel bypass at these and other facilities.

Keywords: Sediment Transport, Reservoir Flushing, Sustainable Sediment Management, Sediment Modeling

What is not working? Downs? Issues?

- Extremely labor intensive
- Feel like a telemarketer
- Not able to attend Kyoto conference, paper not published in proceedings

