

# Repurposing CDFs for Contaminated Sediments

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**RAMBOLL**

Bright ideas.  
Sustainable change.

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# Problem Statement

- USACE dredged material management facilities have reached or are approaching their respective capacities
- Few new dredge-management facilities are being proposed or likely to be developed
- USACE could recover capacity through Beneficial Use, and extend operational life

# Project Goals

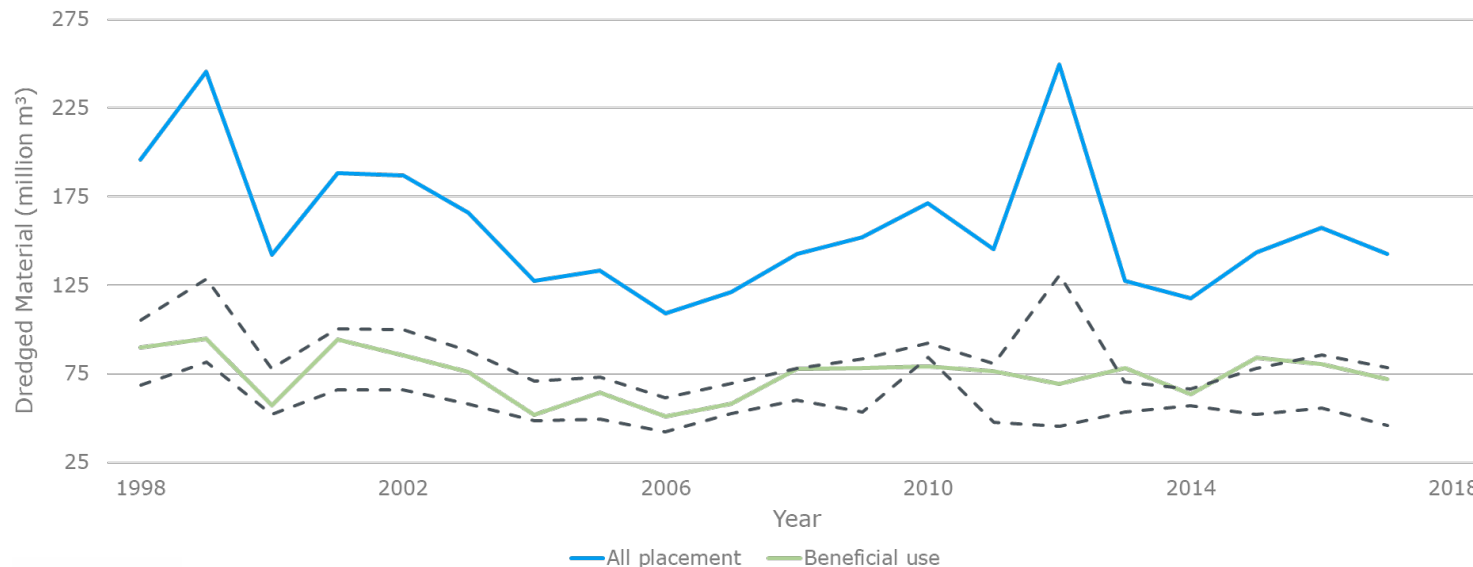
- Gather information on the USACE Detroit District CDFs
- Identify and evaluate potential beneficial use (BU) opportunities
- Develop a conceptual site model (CSM) for the life cycle analysis of one to three BU alternatives
- Perform a life cycle cost-benefit analysis for dredged material management in the Detroit District



# Beneficial Use and the “70/30 Goal”

WRDA 2020: **maximize beneficial use** of dredged material, considering **environmental and economic benefits**

USACE “Beneficial Use of Dredged Material Command Philosophy Notice (2023)



Data from the USACE RSM BU Database (<https://rsm.usace.army.mil/BUDB>). Adapted from Searcy Bell et al. (2021).



# Approach



## Categorize Dredged Material

- Review harbor sediment quality
- Review dredging contract data
- Identify CDF lifecycles and costs



## Screen for BU opportunities

- Evaluate DM quality / quantity
- ID compatible reuse categories
- Identify BU
- Identify offsets / avoided costs



## Perform LCA and CBA

- Costs for new CDF
- DM BU markets
- Cost-share opportunities
- Value creation / cost offsets / unforeseen costs

# Categorize Dredged Material

- **In-water**

Beach Nourishment/Flood Risk Management, Habitat Development and Restoration

- **Residential**

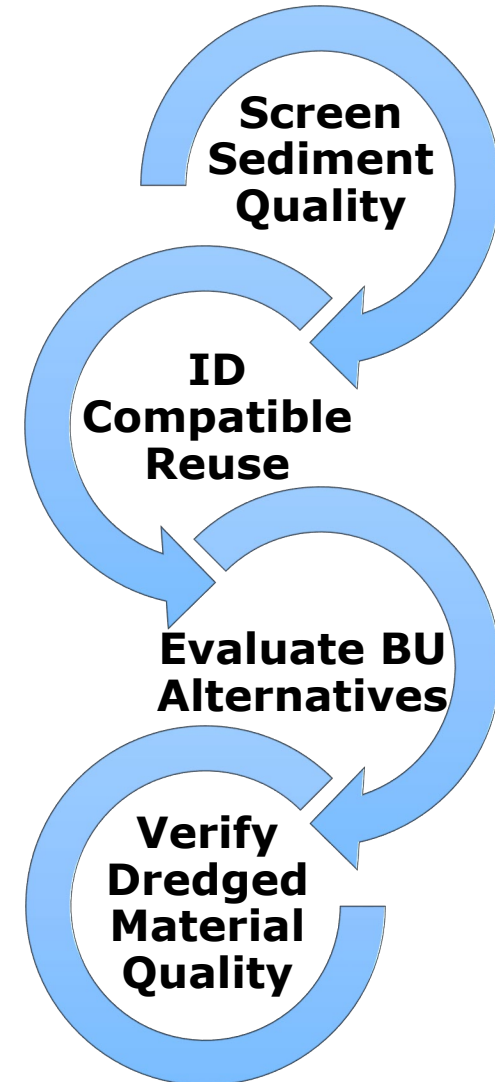
Parks and Recreation

- **Industrial**

Construction, geotechnical

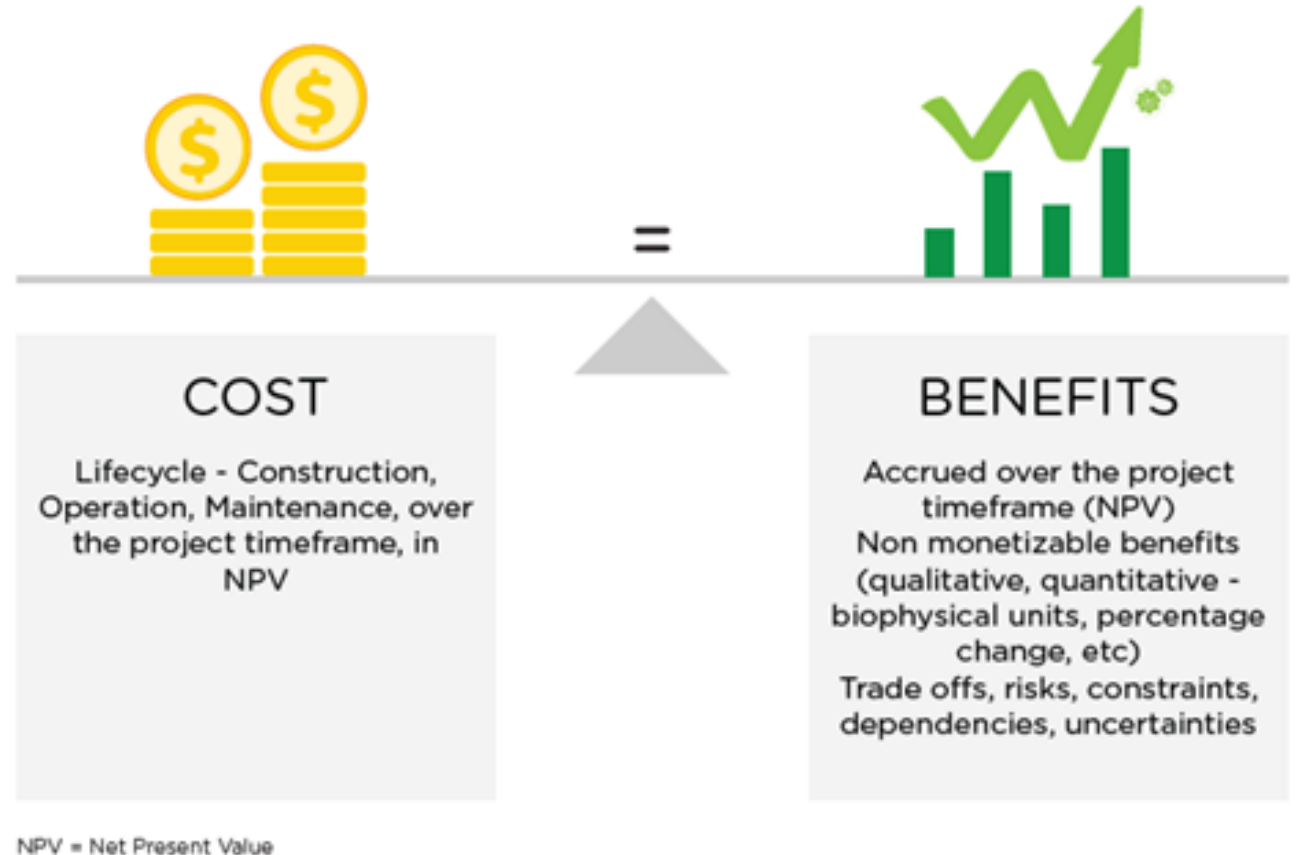
- **Contaminated material**

Solids separation, contain/treat, repurpose for land applications

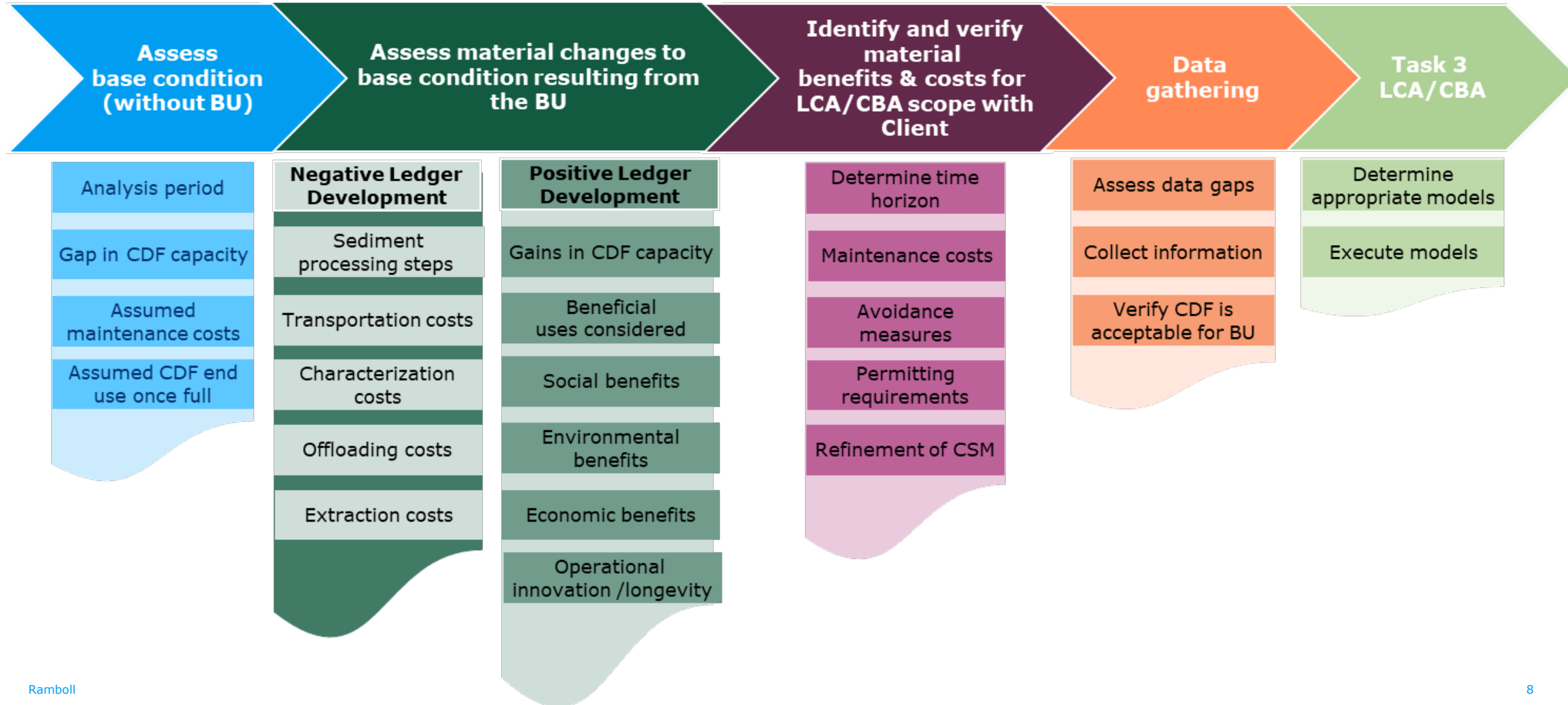


# Life Cycle Analysis and Cost Benefit Analyses

- Perform LCA and CBA for value creation by recovering CDF capacity through sediment BU
- Developing BU cost estimates for future DM management options
- Facilitate creation of new markets for dredged sediment



# LCA/CBA Approach





# New CDF Construction Cost Estimate

## Constructed CDFs 1960-98

in 2023 dollars

- Min: \$1.78/CY
- Max: \$120/CY
- Median: \$16/CY
- Mean: \$24/CY

## • Milwaukee DMMF Estimate

- 1.6MM CY capacity for contaminated sediment
- 2023 Bids: \$115M to \$150M
- \$72 – \$79 per CY
- \$61/CY expansion to 1.9MM CY with navigation material

## • Cleveland DMMF

- USACE estimate \$465M
- Locally preferred alternative  
- CHEER \$300M

## Recommendations

- Current DMMF costs are substantially more than historical
  - State of the art
  - Current economic and permitting conditions
- Use \$24- \$80 per CY range

# Summary

- Repurposing CDF material is a potential solution to increasing space limitations for current and future dredge material management
- LCA/CBA results can lead to more efficient and cost-effective management of dredge material and dredge-material management facilities
- Supports USACE dredge operations mission of BU
- Supports sustainable management decisions
- Approach can facilitate project cost sharing and matching sediment supply and beneficial use opportunities
- Approach can give USACE a comprehensive look at budget alternatives