**Beneficial Use Comprehensive Benefits Tool (BUCBT): Working for USACE Districts, and of interest to HQ USACE Environmental Advisory Board (EAB)**

*Impact Statement: The Beneficial Use Comprehensive Benefits Tool (BUCBT) was developed to help Navigation Operations planners efficiently evaluate the comprehensive benefits of dredged sediment placement alternatives. The BUCBT recently supported preliminary HQ USACE approval for a USACE Honolulu District (POH) beneficial use alternative analysis. The USACE Chief's Environmental Advisory Board is reviewing the BUCBT along with other comprehensive benefit and social equity evaluation methods.*

The Beneficial Use Comprehensive Benefits Tool (BUCBT) was developed under the USACE Dredging Operations Technical Support (DOTS) Program in response to a January 2023 USACE HQ request for support to implement the Water Resource Development Act of 2020 (WRDA 2020), Section 125 which renews the Congressional commitment to beneficial use of dredged material (BUDM). This new policy, along with the comprehensive benefit assessment policy, requires USACE Districts to calculate the economic and environmental benefits of dredge placement alternatives. The BUCBT was developed as a simple approach for District dredge planners to evaluate the benefits of sediment placement alternatives. The initial Excel spreadsheet was refined with feedback from HQ and from the USACE North Atlantic Division's (NAD) district dredge planners. It was widely accepted and funded for FY24 – FY25 under the USACE Dredging Operations and Environmental Research (DOER) Program to be improved as a web-based application easily accessible across a range of platforms. The new approach will be reviewed in regional engagements with USACE Districts starting with the USACE Mississippi Valley Division (MVD, Upper Mississippi) and the USACE North Atlantic Division (NAD) in January-February 2024, and progressing to the USACE Great Lakes and Ohio River Division (LRD), USACE Northwestern Division (NWD, Columbia River), and the USACE South Atlantic Division (SAD) later in the year.

The BUCBT is a simple and easy-to-use matrix approach to associate dredge Sediment Placement Alternatives (SPA) defined in USACE EM 1110-2-5025 ("Dredging and Dredge Material Management") with Ecosystem Goods and Service (EGS) benefits defined in the USACE EGS Framework (Wainger et al. 2018). The EGS Framework recommends that Project Delivery Teams (PDTs) build a narrative for each placement alternative and use conceptual modeling of placement method effects on ecosystem structure and function to identify impacts to EGS outcomes or metrics. A site information sheet collects the narrative and successive spreadsheets guide PDTs though EGS identification and prioritization steps that are automatically summarized in standardized tables and graphs suitable for reporting. A structured decision matrix Excel spreadsheet allows PDTs to assign weights to EGS classes to match local opinion of perceived benefit and urgency. Figure 1 shows Sediment Placement Alternatives (SPA), and Ecosystem Goods and

EM 1110-2-5025 Dredging and Dredged Material Management
Sediment Placement Alternatives

| Aquatic Habitats |
|---|
| Beach Nourishment (littoral, nearshore, or shallow water) |
| Beach Nourishment (maintenance dredging) |
| Beach Nourishment (new borrow material) |
| Beach Nourishment (rehandle stockpiled material) |
| Confined (Diked) Placement |
| Confined Aquatic Disposal |
| Construction and Industrial/Commercial Uses |
| Island Habitats |
| Multipurpose Uses and Other Land Use |
| Open-Water Placement |
| Parks and Recreation |
| Strip Mine Reclamation, Solid Waste Landfill, and Alternative Uses |
| Upland Habitats |
| Wetland Habitats |

USACE Ecosystem Goods and Service Framework

- Raw goods/materials
- Navigation maintenance
- Water purification
- Water supply
- Hazard mitigation
- Recreation
- Cultural, spiritual, educational
- Aesthetics
- Carbon sequestration
- Ecosystem sustainability
- Food provisioning
- Human health support

Figure 1. (left) Dredging and Dredged Material Management (DDMM) Sediment Placement Alternatives (SPS). (right) USACE Ecosystem Goods and Service (EGS) Framework.

The BUCBT has been tested with USACE North Atlantic Division (NAD), South Atlantic Division (SAD), Rock Island District (MVR), and most completely for the Honolulu District (POH) at Agat Harbor, Guam. The Agat Harbor, Guam, location has small sediment volumes to manage, but very high environmental considerations and operating costs (Figure 2). Finding environmental beneficial use was a priority of the PDT which developed four alternatives which they scored in the BUCBT using about 6 hours Full-Time Equivalent (FTE) effort. The BUCBT alternative outcomes were briefed in a conference call with HQ where the outcomes were reviewed and assessed, and where it was recommended that the BUCBT output be included in the Beneficial Use Decision Document Information (BUDDI) which the local command approves and transmits to HQ for approval.

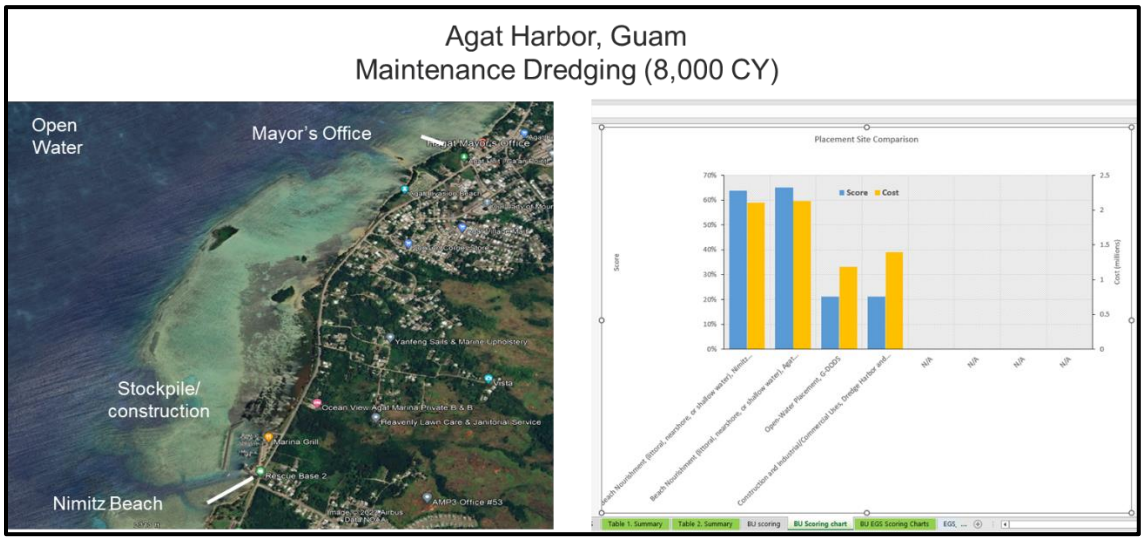


Figure 2. Maintenance dredging activities at Agat Harbor, Guam, in the USACE Honolulu District (POH).

The development and demonstration of the BUCBT was started in FY23 under the USACE Dredging Operations Technical Support (DOTS) Program and continues in FY24-25 funded by the USACE Dredging Operations and Environmental Research (DOER) R&D Program.

This CW R&D development and demonstration of the BUCBT fully supports USACE Statement of Need (SoN) 2013 “Technical Methods for Quantifying Environmental Benefits Associated with Dredged Sediment Management to Fulfill WRDA 2020 Section 125 Requirements”.

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