

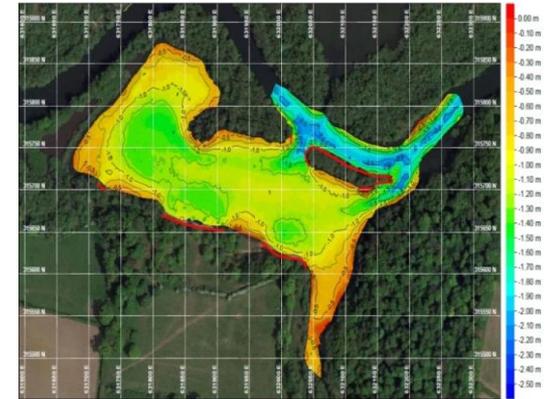
Managing Accumulated Sediments: Beneficial Use of Dredged Material (BUDM) and Working with Nature (WwN)

Presentation by:

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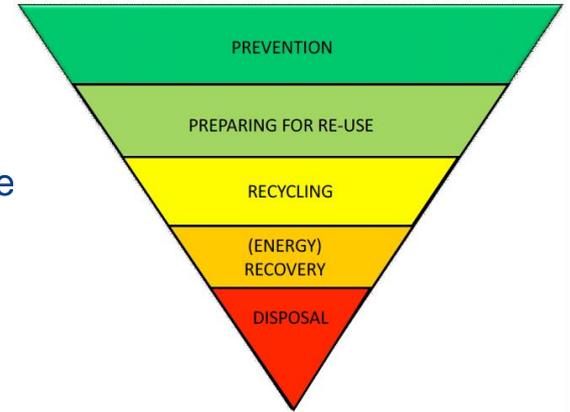
Accumulated Sediments

- * Sediment accumulation is a natural process that is dependent on geological and hydrological conditions, over a range of temporal and spatial scales.
- * The rate, quantity and location of sediment accumulation can vary as a result of changes to geomorphological and hydrological systems due to human activity.
- * The accumulation of sediments in aquatic environments poses risks to:
 - * Ecosystem health and functioning
 - * Flood management
 - * Navigation



Dredging (Sorry!)

- * Dredging can be simply defined as *“the excavation of material from below the waterline”*.
- * Dredged material defined as a waste under the Waste Framework Directive (2008/98/EC):
 - * 17 05 05: hazardous dredging spoil
 - * 17 05 06: non-hazardous dredging spoil
- * Waste Management hierarchy:
 - * When a “do nothing” approach is not possible, reuse of the waste mate is considered as the next best management option



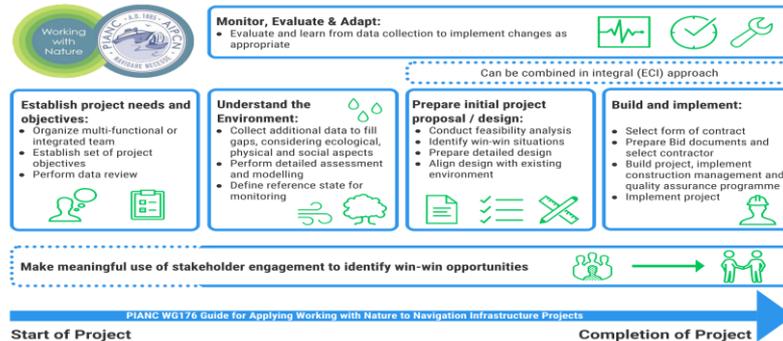
Reusing Sediment

- * CEDA, “Beneficial Use of Dredged Material (BUDM)”:

“Dredged material is a resource rather than a waste, with the potential to create positive impacts during sediment management activities”

- * PIANC, “Working with Nature (WwN)”:

“Identifying win-win solutions for navigational developments and the natural environment, rather than simply aiming to minimise ecological harm”



Case Studies

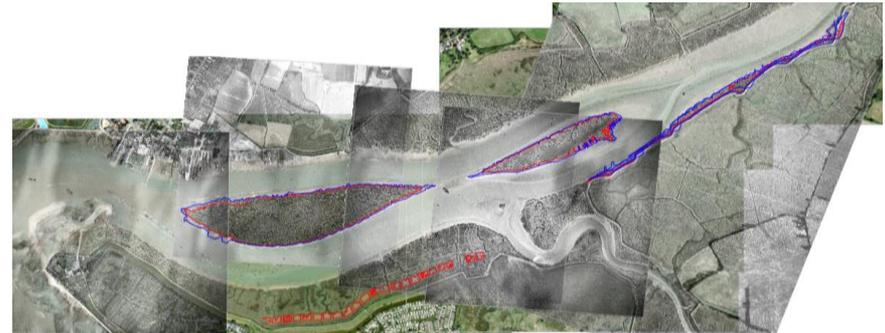
- * Examples of BUDM and WwN applications:

- * Restoration of protected intertidal mudflat and saltmarsh habitats in Brightlingsea Creek, Essex.
- * Use of geotextile bags to restore an eroded spit on Salhouse Broad, Norfolk.
- * Agricultural land spreading of dredged material from Windsor Marina, River Thames.
- * Waste valorisation through sediment stabilisation and creation of viable products.



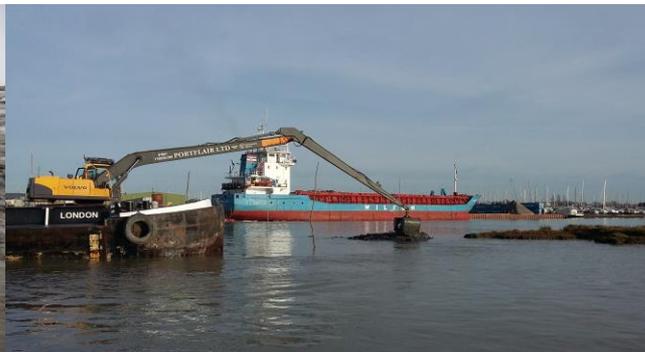
Habitat Restoration

- * Habitat creation, restoration and enhancement is one of the more common beneficial use practices.
- * Dredged material can be placed *in situ* to create conditions suitable for biological colonisation and subsequent succession.
- * Suitable for use over varying temporal and spatial scales.



Brightlingsea Creek, Essex

- * Brightlingsea Harbour Authority Interreg 2 Seas initiative, “Using Sediment As a Resource (USAR)”.
- * Requires the removal of 53,000m³ of accumulated sediments to maintain safe and efficient navigation.
- * Majority of this material beneficially reused to restore protected intertidal mudflat and saltmarsh habitats.



Geotextile Bags

- * Geotextile bags are containers comprised of woven or non-woven geosynthetic materials.
- * Repeated fill cycles using pumped material to achieve desired target height.
- * Applications in:
 - * Sediment dewatering and containment
 - * Habitat creation
 - * Bank protection



Salhouse Broad, Norfolk

- * Pilot project “Promoting Integrated Sediment Management (PRISMA)”.
- * Dredged material was used to create a contiguous geotextile bag structure and subsequent backfill.
- * Facilitated restoration of 7ha of reed-bed habitat and improved resilience of the feature to future erosion.



Agricultural Spreading

- * Agricultural spreading uses dredged material to improve depleted soil conditions following intensive cultivation.
- * Used as a source of nutrients and organic matter, thereby relieving pressure on the use of fertiliser.



Windsor Marina, River Thames

- * Windsor Marina required the removal of approximately 4,000m³ of accumulated sediments.
- * Physicochemical sediment analysis of both donor (marina) and receiver (agricultural) sites undertaken.
- * Dredged material ploughed in following adequate dewatering process.



Waste Valorisation

- * The valorisation of a waste through the manufacturing of a viable product.
- * The primary method of valorising dredged material is through stabilisation.



- * Applications in:
 - * Coastal and riverine erosion control
 - * Monopile and subsea cable protection
 - * Artificial reef habitat creation



GeoBlock

- * Currently establishing a European funded consortium.
- * Aims to research and develop techniques for the stabilisation and local application of fine sediments that typically dominate marine dredged material within the Interreg 2 Seas region.
- * Pilot studies currently being tested *in situ* (~18 months).



Interreg 
EUROPEAN UNION
2 Seas Mers Zeeën
European Regional Development Fund



Summary

- * Whilst sediment accumulation is a natural process, the rate, quantity and location of sediment accumulation can vary as a result of human activity.
- * Dredging provides a viable sediment management tool, particularly when a “do nothing” approach is not possible, such as when safe navigation is at risk.
- * Treating dredged sediment as a resource and beneficially reusing it in a manner that works with natural processes, offers a sustainable approach to sediment management in comparison to historic techniques.



