

January 15, 2013 AAPA Meeting - Port Hueneme

**The Importance of Proper Testing Design,
Sampling, and Analysis of Sediments:
A CDF Case Study in North Carolina**

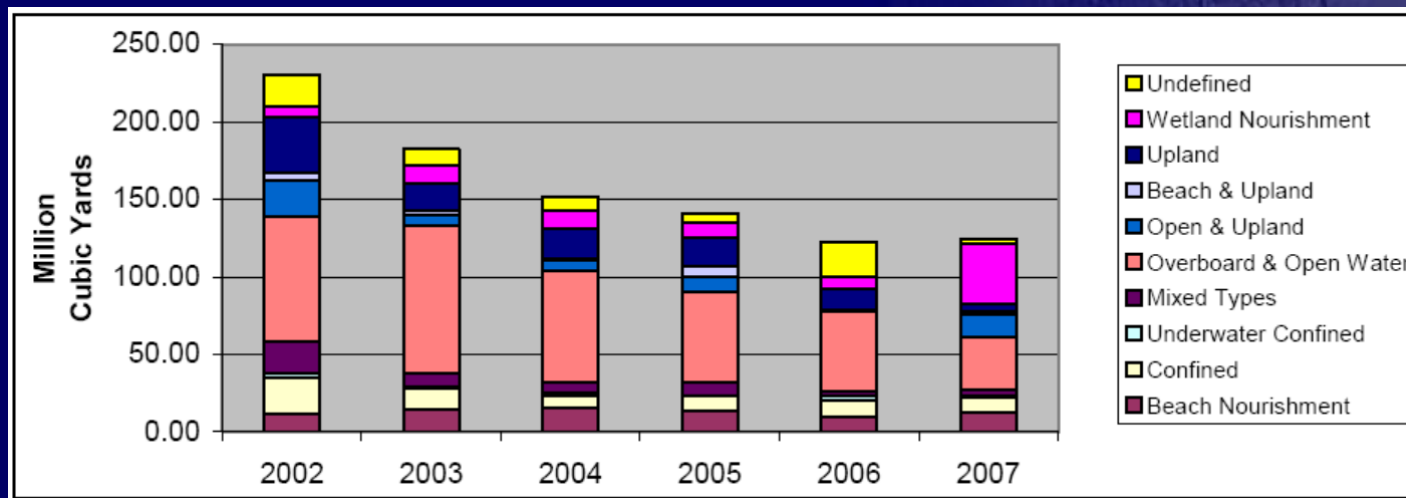
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Sustainable Confined Disposal Facilities for Long-term Management of Dredged Material

Survey: *ERDC TN-DOER-D10 – July 2010*

- 5-10% of total dredged volume for all COE districts placed in CDFs
- 15 of 24 districts indicated that CDFs were primary disposal facilities in their districts
- 17 of 20 projected shortages of CDF capacity within next 20 years, with some facing more critical shortages



Sustainable Confined Disposal Facilities for Long-term Management of Dredged Material

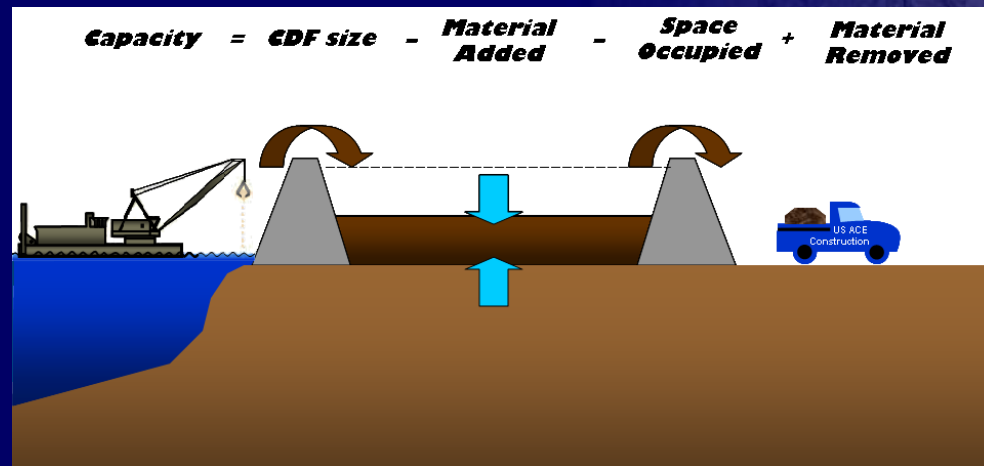
Findings: *ERDC TN-DOER-D10 – July 2010*

1. Most CDFs are currently designed and managed as permanent storage facilities. However, only a portion of the material requires permanent disposal.
2. Developing new CDF capacity is not considered a sustainable practice, economically or logistically.
3. In order to recover material from a CDF:
 - Beneficial use application must be available
 - The material must meet physical and chemical requirements necessary for the intended use
 - The CDF AND material within the CDF must be accessible

Sustainable Confined Disposal Facilities for Long-term Management of Dredged Material

Recommendations: *ERDC TN-DOER-D10* – July 2010

“At this writing, the best available management practice is to remove from the CDF as much material as possible, after necessary dewatering and classification, and utilize these materials beneficially.”



Sustainable Confined Disposal Facilities for Long-term Management of Dredged Material

Recommendations: *ERDC TN-DOER-D10 – July 2010*

“As high levels of contaminants are not tolerated for most beneficial uses, compartmentalization of the CDF may be necessary to segregate the clean material from the contaminated. Compartmentalization may also be used to keep different types of materials separate (e.g. coarse versus fine-grained materials).”

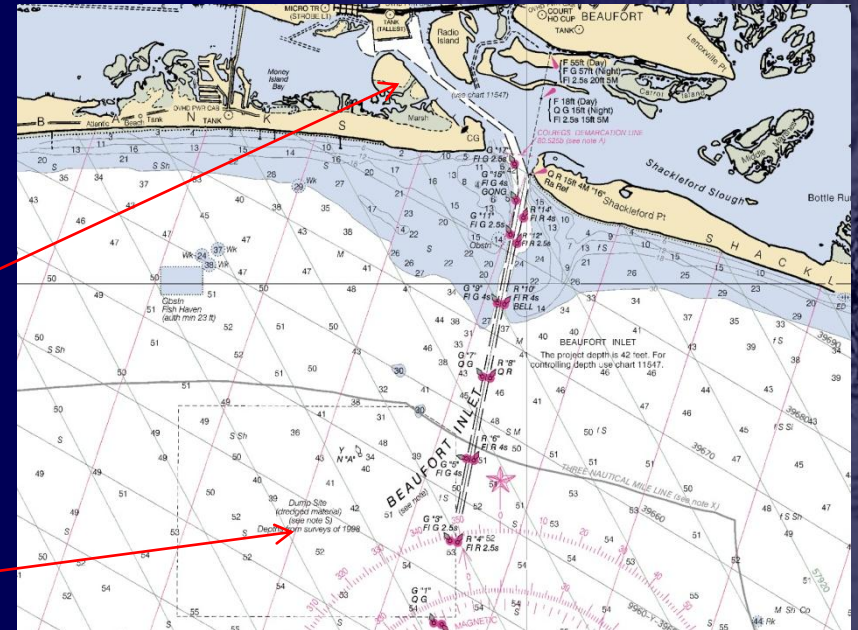
Introduction

Morehead City Harbor Maintenance

- Inner Harbor maintenance approx. 700,000 cy every 2 years
- Material placed on beaches or stored at Brandt Island (96-acre CDF)
- Sand-recycling facility
- Fine grained material accumulated overtime

Brandt Island

Morehead City
ODMDS



Introduction

Brandt Island CDF – Morehead City Harbor

- Divided into 2 cells by interior dike
- As capacity in the fine-grained cell is limited, material in the fine-grained cell is periodically removed and ocean-dumped

Sand recycling facility

Fine-grained, non-beach-quality material (>10% silt/clay)



CDF Testing

Sampling and Analysis Needs Vary – Why is it Being Tested?

- Sampling Challenges
- Chemical and Physical Characterization
- Toxicity Testing



Sampling

Sampling Complexities

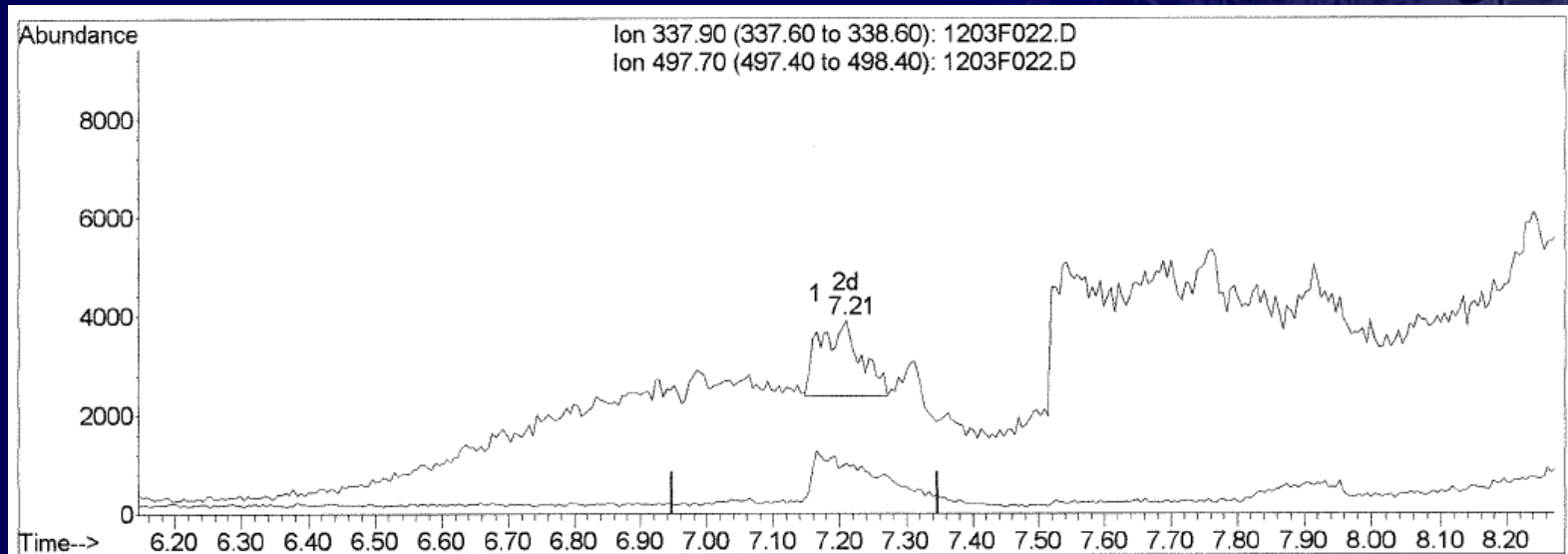
- Purpose of sampling, what type of permit?
- Study design: (number of samples and sampling grid)
- Limited accessibility & sample volume (as much as ~35 gal)
- Upper 2.0 feet was removed for representative sample
- Use of de-conned stainless steel tools a must!



Chemical Testing

Some factors to consider...

- Where was the sediment collected (history)?
- Communication with the laboratory
- Experience at handling sediment, especially marine
- Matrix interferences (i.e., salinity and trace metals)



Toxicological Testing

Some factors to consider...

- For offshore disposal dry sediment must be tested and compared to its eventual disposal location
- Moisture content, salinity, ammonia, and sulfur
- Dewatered and/or dry sediment has the potential for artifactual toxicity, acclimatization is important!



Summary

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- Proper testing design, sampling, and analysis of sediments are key factors in the sustainable long-term management of dredged material in CDFs
- Without proper testing and identification of the Brandt Island sediment, it could have been deemed unsuitable for ocean disposal
- Proper sampling and characterization has helped make sure the site has capacity for many years to come

Thanks for Attending!

