

YOU JUST FOLD IN THE SHELL: REINCORPORATION OF SCREENED OUT SHELL INTO BEACH FILL ON USACE SAJ BEACH NOURISHMENT PROJECTS

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OUTLINE



- Why do we screen dredged material?
- What is MEC and where is it?
- USACE screening specifications
- Screening methods
- Impacts of screening
- Fate of screened out shell
- Reincorporation
- Project examples
- Conclusions

BLUF: REINCORPORATION OF SCREENED SHELL VIA BLENDING KEEPS COMPLIANT MATERIAL IN BEACH FILL AND NATURAL SYSTEM



WHY DO WE SCREEN WHILE DREDGING?



- Geotechnical
- Environmental
- Unacceptable material
- Protecting equipment
- Hazards





WHAT IS MEC?



Munitions and Explosives of Concern (MEC)

- Military munitions that may pose unique explosives safety risks
 - Unexploded Ordnance (UXO)
 - Potential unexploded ordnance
 - Partially exploded ordnance
 - Inert ordnance
 - Ordnance fragments and similar explosives debris material
 - Discarded Military Munitions (DMM)
 - Material Possibly Presenting an Explosive Hazard (MPPEH)
 - Munition Debris (MD)
 - Munitions Constituents (MC, e.g. TNT, RDX)



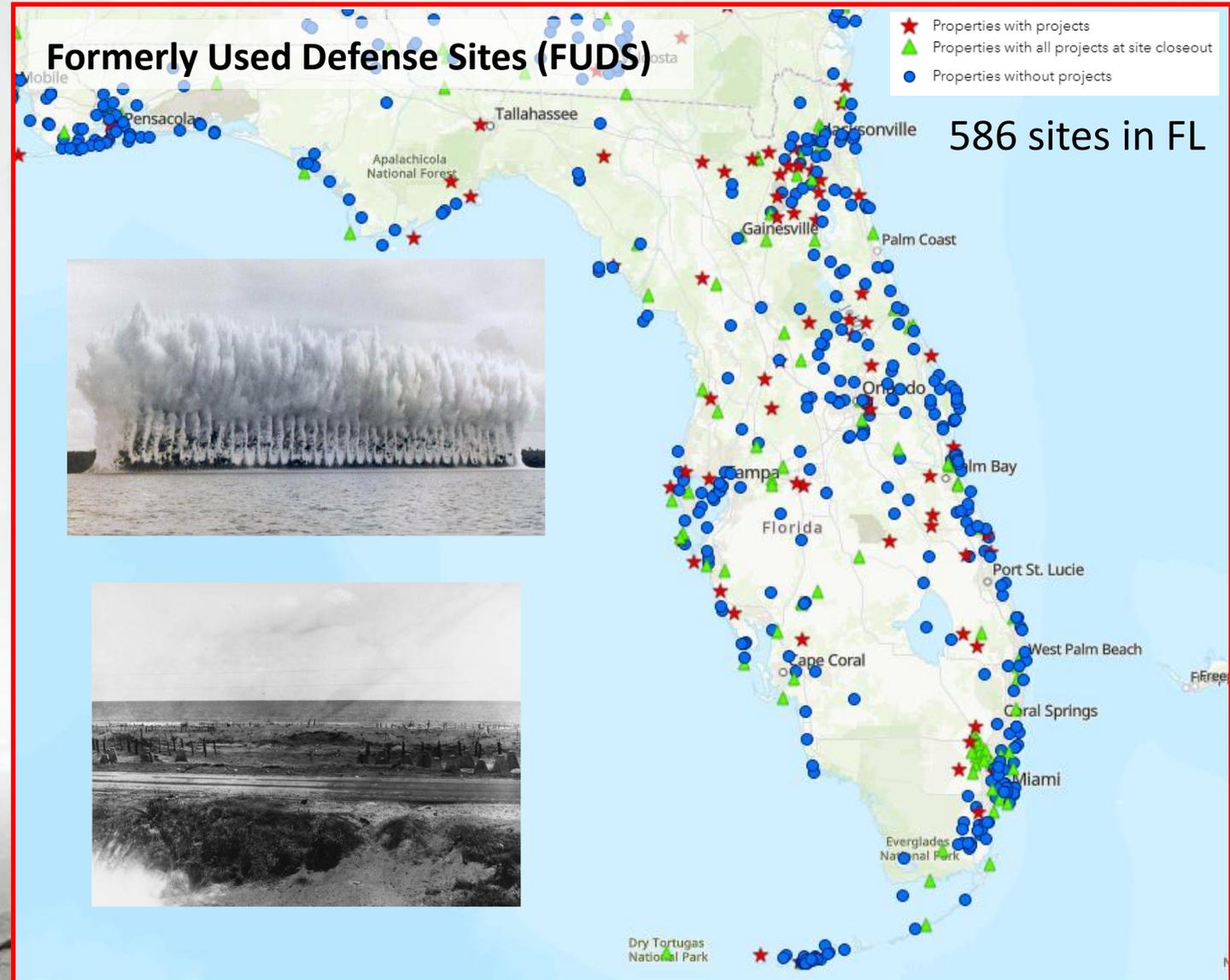


WHERE CAN MEC BE FOUND IN FL?



MEC is widespread...

- MEC may be found along the entire coastline of Florida, in State and Federal waters.
- Historically the Department of War (DOW) has used land throughout the United States for both training and testing weapons to ensure the nation's military readiness.





USACE SCREENING SPECIFICATIONS



- Geotechnical
 - Typically discharge screening (2" or 0.75")
- MEC
 - MEC Probability Assessment
 - Low – screening at discharge (2")
 - Moderate or High – Drag head and discharge screening (0.75")





TYPES OF SCREENING



Drag Head Screening

- Screen placed on drag head
- Oversized material left behind in the ocean



Pipeline Screening

- Two kinds of Pipeline Screening
 - Active
 - Passive





IMPACTS OF SCREENING



- Both methods result in a volume of retained material larger than screen sized
- Retained large shell, would otherwise be placed on the beach and kept in coastal system (MEC screening)





IMPACTS OF SCREENING



- Volume of screened out material takes up room on construction site
- Handling of large volumes of screened material complicates construction logistics (reuse or disposal)
- Concerns of environmental impact





FATE OF SCREENED SHELL



- Stockpiled for use as road base or fill
- Dispose of in landfill





FATE OF SCREENED SHELL



- Add shell back into the beach fill
 - In the case of large screened shell it is **typically ~0.1% of total fill**
 - Shell separated via screening was part of beach compatible borrow area material.

How do add compliant shell material back in the beach fill in the context of MEC screening?





REINCORPORATION



You just simply, fold in the shell!

FOLD in The SHELL
what DOES THAT mean?
YOU JUST FOLD it in!

*Based on "Fold in the Cheese" from Schitt's Creek



REINCORPORATION



- Shell is spread out in a thin layer on beach
- Typical done for MEC screening
- Thin layer of shell worked back into fill by bulldozers
- Compliant shell is blended back into beach fill

UXO technician scanning screened material for MEC



Bulldozer working material





REINCORPORATION - BENEFITS

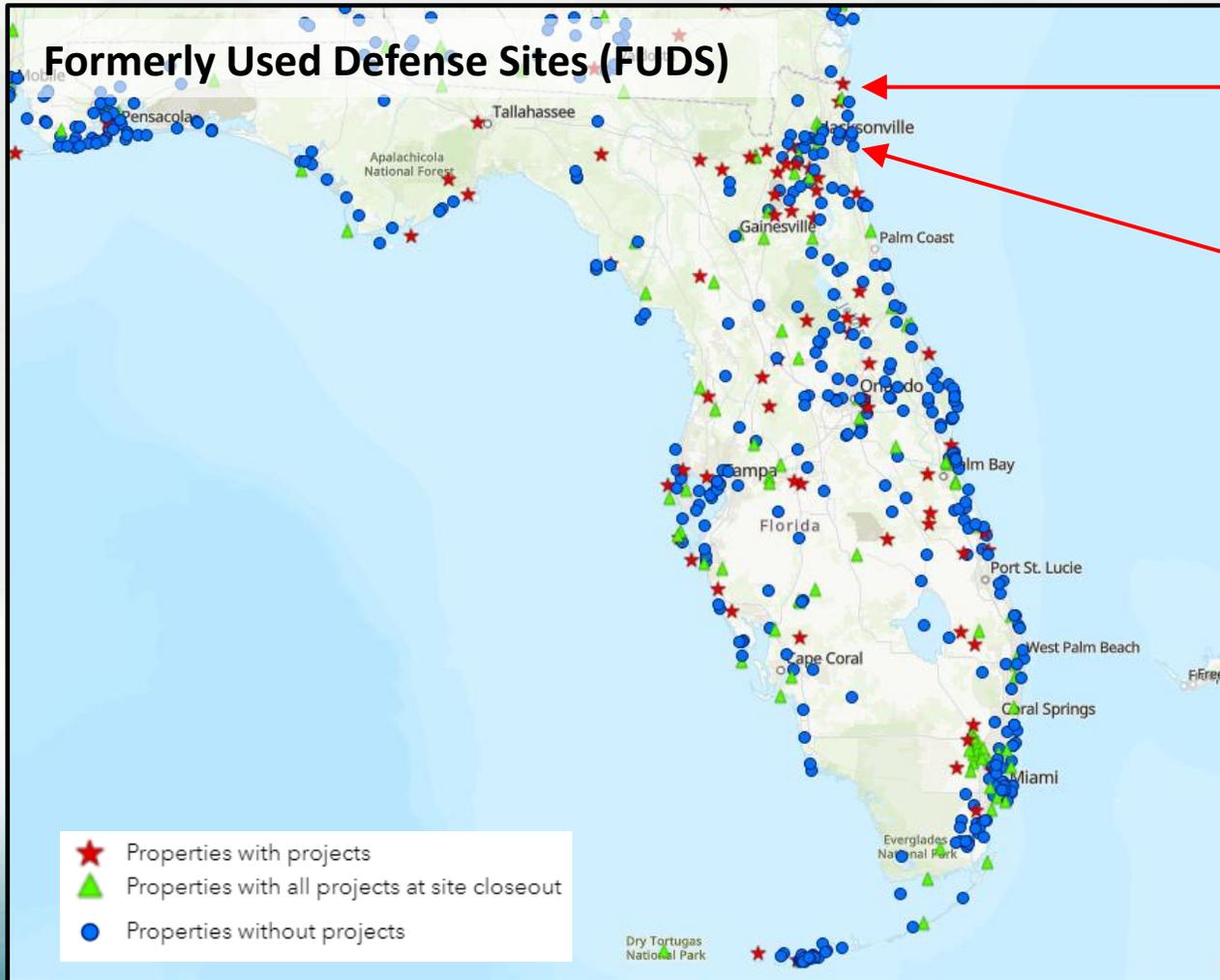


- Saves time and space
- Simplifies logistics of shell handling
- More cost effective
- Keep compliant shell in constructed beach and the coastal system





PROJECT EXAMPLES WITH SCREENING



**Naval Submarine Base Kings Bay Entrance Channel
Maintenance Dredging– Ft. Clinch State Park
Nassau County SPP – Fernandina Beach**

**St. Johns County Projects -
St. Augustine SPP
Vilano CSRM**



PROJECT EXAMPLE – VILANO BEACH CSR

Contractor: Weeks Marine



- 1,113,121 cy of material placed
- Passive and active screening
- 715 cy of large shell screened (0.064% of total fill)
- Screened shell disposed of by Contractor
- Beach fill compliant with QA/QC plan



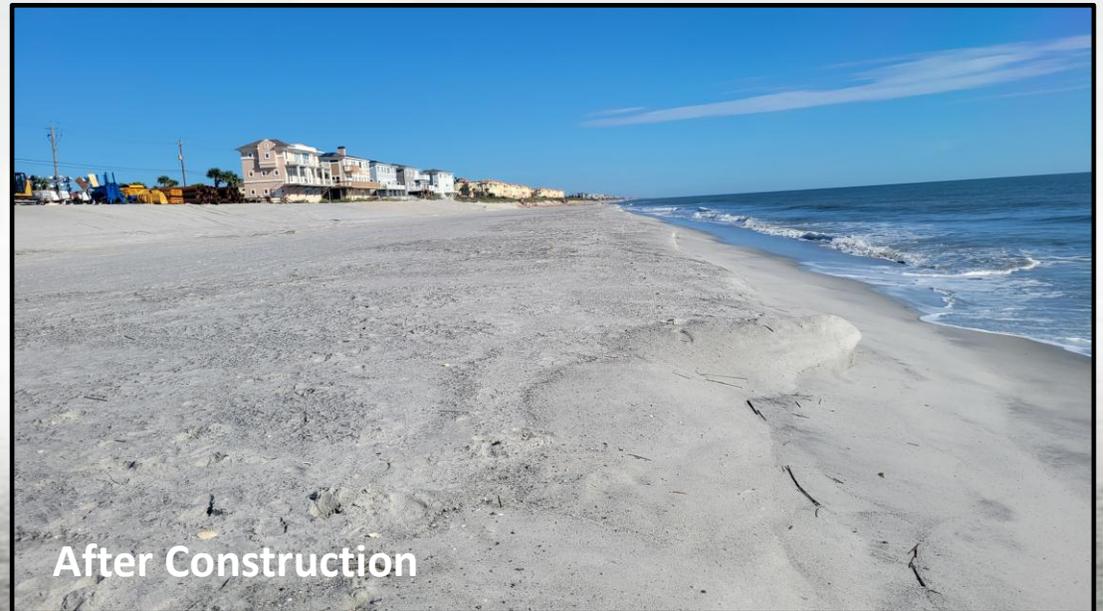
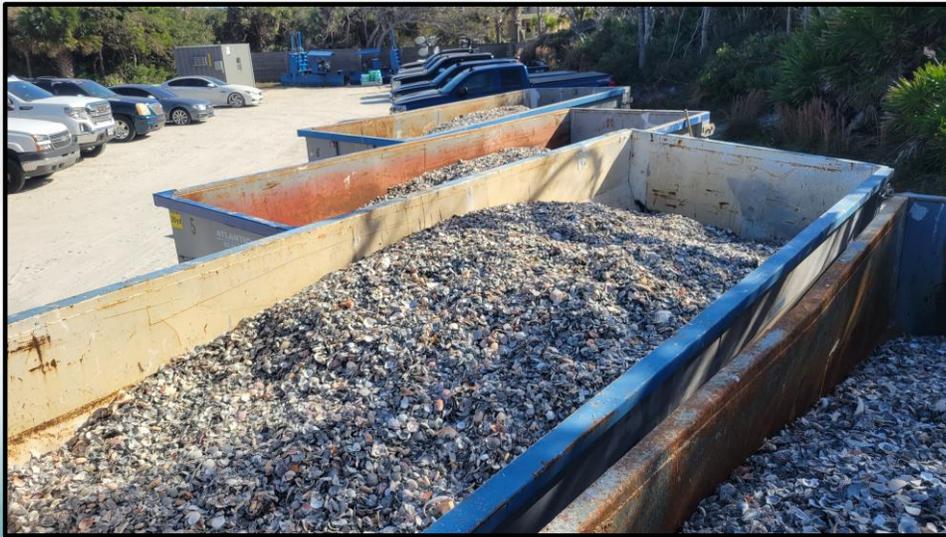
Borrow Area Shell Content*: 0.50%
Constructed Beach Content*: 0.42%
Max Allowable Shell Content (QA/QC)*: 5%
*Retained on #4 sieve



PROJECT EXAMPLE – VILANO BEACH CRSM



- Challenges during construction related to MEC screening
 - Concerns about impact to the environment





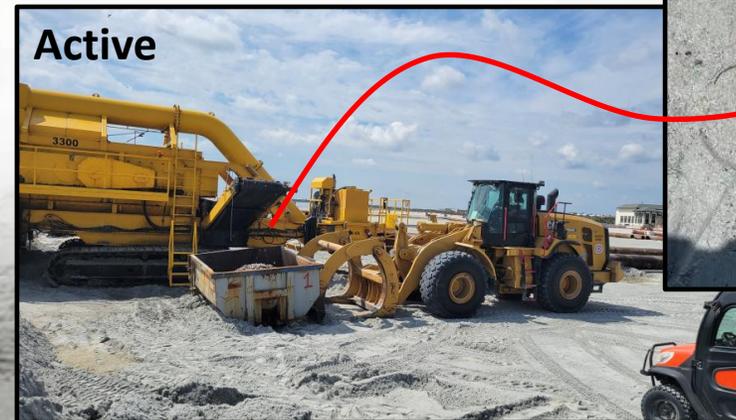
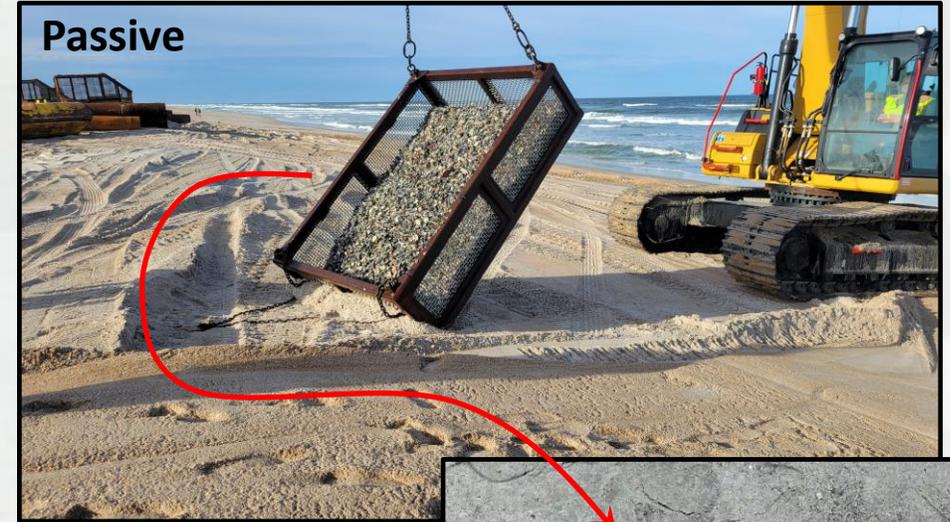
PROJECT EXAMPLE – ST JOHNS COUNTY CSRM

Contractor: Great Lakes Dredging

St. Augustine Beach



- 2,388,389 cubic yards placed
- 1,685 cy of large shell screened (0.07% of total fill)
- Passive screening and active screening





PROJECT EXAMPLE – ST JOHNS COUNTY CSRM



During construction right outside of the hotel...





PROJECT EXAMPLE – ST JOHNS COUNTY CSRM

Contractor: Great Lakes Dredging



- Reincorporation implemented during construction
- Shell material laid out for MEC check by UXO technician
- Bulldozer worked in screened shell as fill material was placed
- Constructed beach compliant with QA/QC criteria

Borrow Area Shell Content*: 0.66%
Constructed Beach Shell Content*: 1.35%
Max Allowable Shell Content (QA/QC)*: 5%
*Retained on #4 sieve





PROJECT EXAMPLE – NASSAU COUNTY CSRM

Contractor: Marinex Construction

Fernandina Beach



- 728,468 cubic yards placed
- Active screening
- Shell reincorporation implemented from the beginning of construction
- Screened shell blended in with bulldozer
- Final constructed beach compliant with QA/QC criteria

Borrow Area Shell Content*: 1.66%
Constructed Beach Shell Content*: 2.7%
Max Shell Content*: 5%
*Retained on #4 sieve

During Construction - 2025



After Construction





PROJECT EXAMPLE – FT. CLINCH STATE PARK

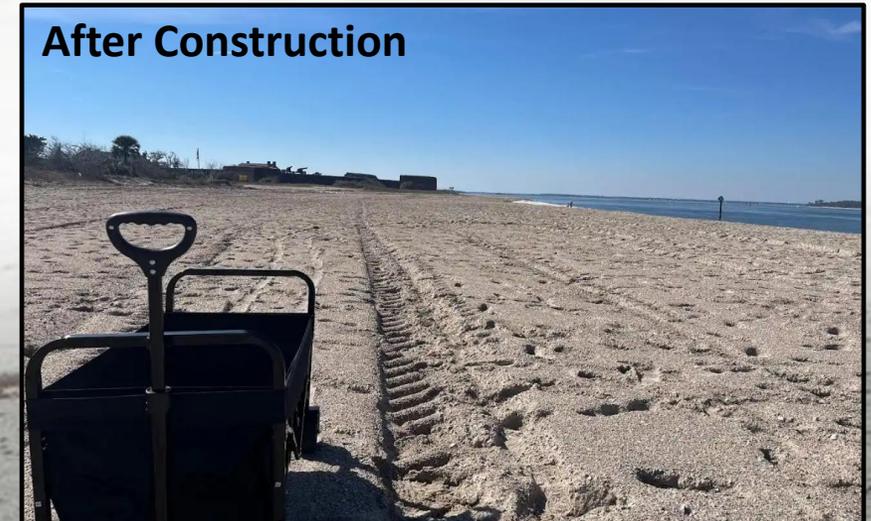
Contractor: Manson Construction

Kings Bay Entrance Channel O&M Dredging



- 446,384 cubic yards placed
- Active screening
- Shell reincorporation implemented from the beginning of construction
- Screened shell blended in with bulldozers
- Final blended material met QA/QC criteria

Anticipated Dredge Material Shell Content*: 3.71%
Constructed Beach Shell Content*: 3.54%
Max Allowable Shell Content (QA/QC)*: 15%
*Retained on #4 sieve





CONCLUSIONS



- Screened shell is a minor fraction of the total fill volume
- Reincorporation
 - Has less associated logistics when compared to disposal
 - is simple to implement in conjunction with MEC protocols
 - keeps compliant shell material in fill material and natural system
- Final constructed beach is compliant with shell content QA/QC criteria
- Moving forward, reincorporate as much shell as possible (USACE).



THANK YOU!



QUESTIONS?

