

Volatile Times:

The Effects of Munitions and Explosives of Concern on Florida Dredging Projects

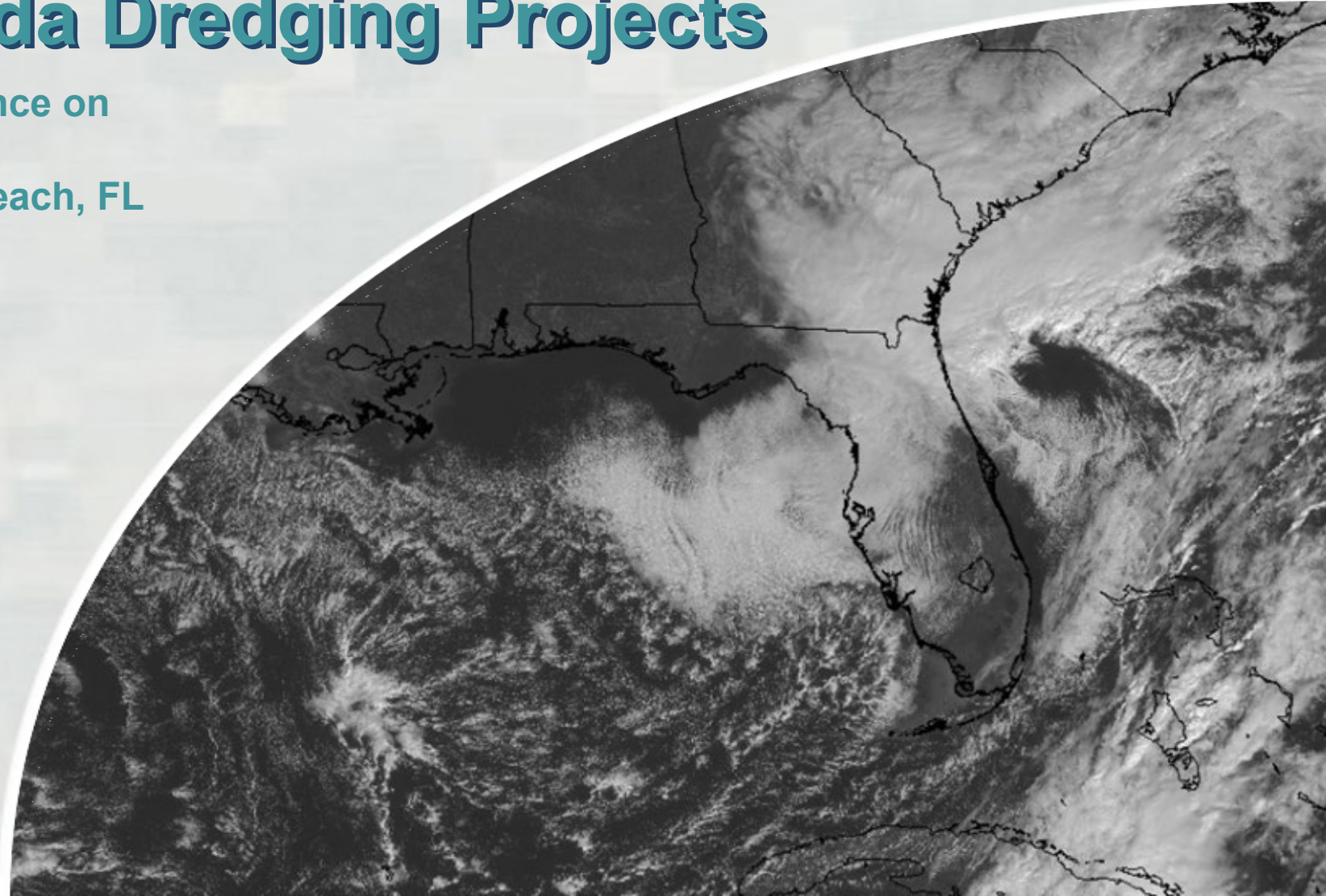
FSBPA 37th Annual National Conference on
Beach Preservation Technology
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US Army Corps of Engineers
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WHAT IS MEC?



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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
 - 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)



WHAT'S IS/ARE FUDS?



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Formerly Used Defense Sites (FUDS)

- During the past two centuries, the Department of Defense (DOD) has used land throughout the United States to both train Soldiers, Airmen, Sailors and Marines, and test new weapons to ensure the nation's military readiness. As training and testing needs changed, DOD obtained property or returned it to private or public uses.

<https://www.usace.army.mil/Missions/Environmental/Formerly-Used-Defense-Sites/FUDS-GIS/>

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WHAT'S IS/ARE FUDS?



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Formerly Used Defense Sites (FUDS)

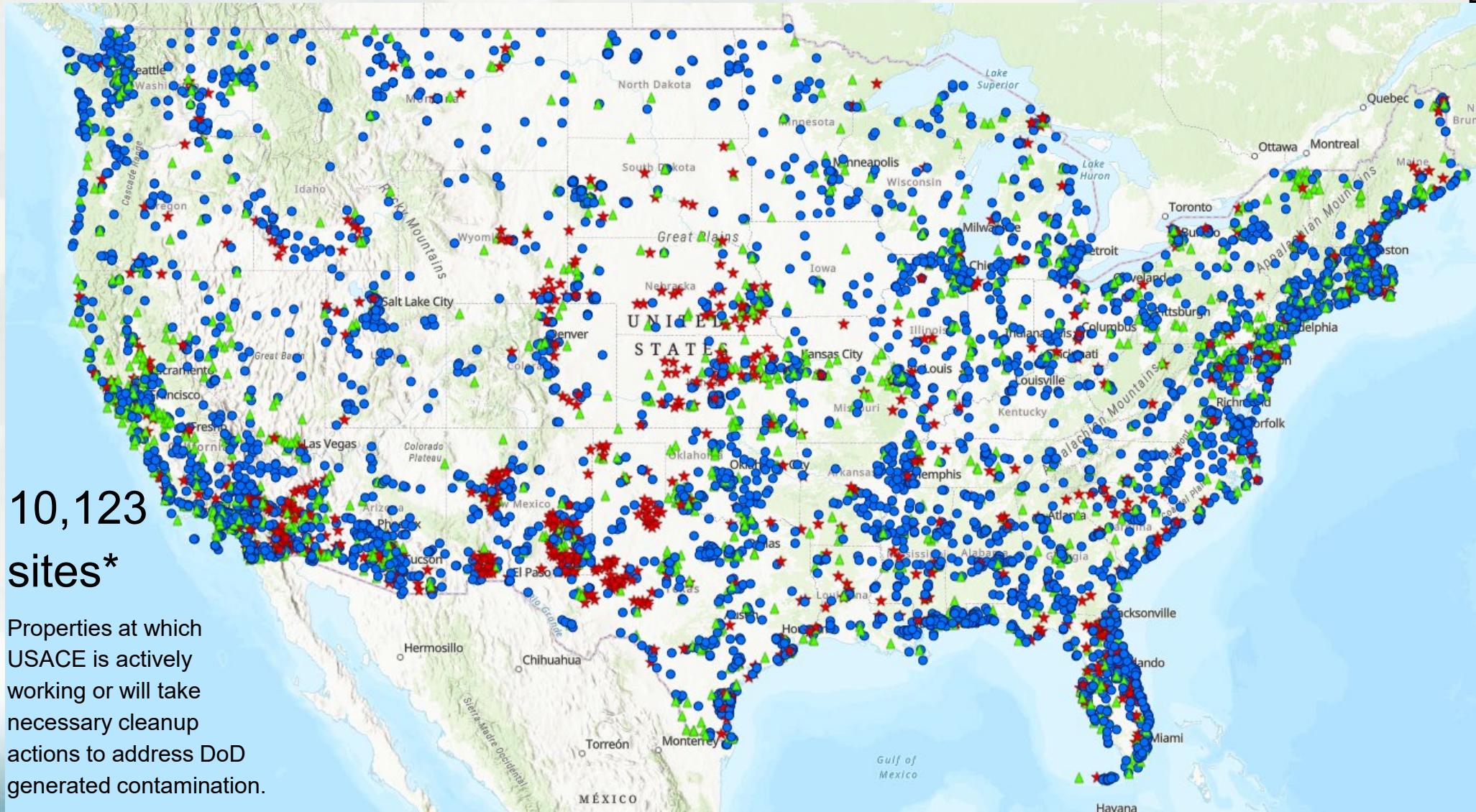
- Today, **DOD is responsible for the environmental restoration (cleanup)** of properties that were formerly owned by, leased to or otherwise possessed by the United States and under the jurisdiction of the Secretary of Defense prior to October 1986. Such properties are known as Formerly Used Defense Sites or FUDS. The U.S. Army is DOD's lead agent for the FUDS Program. The U.S. Army Corps of Engineers executes the FUDS Program on behalf of the U.S. Army and DOD. The **U.S. Army and DOD are dedicated to protecting human health and the environment** by investigating and, if required, **cleaning up potential contamination or munitions** that may remain on these properties from past DOD activities.



WHERE ARE FUDS?



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10,123
sites*

Properties at which
USACE is actively
working or will take
necessary cleanup
actions to address DoD
generated contamination.

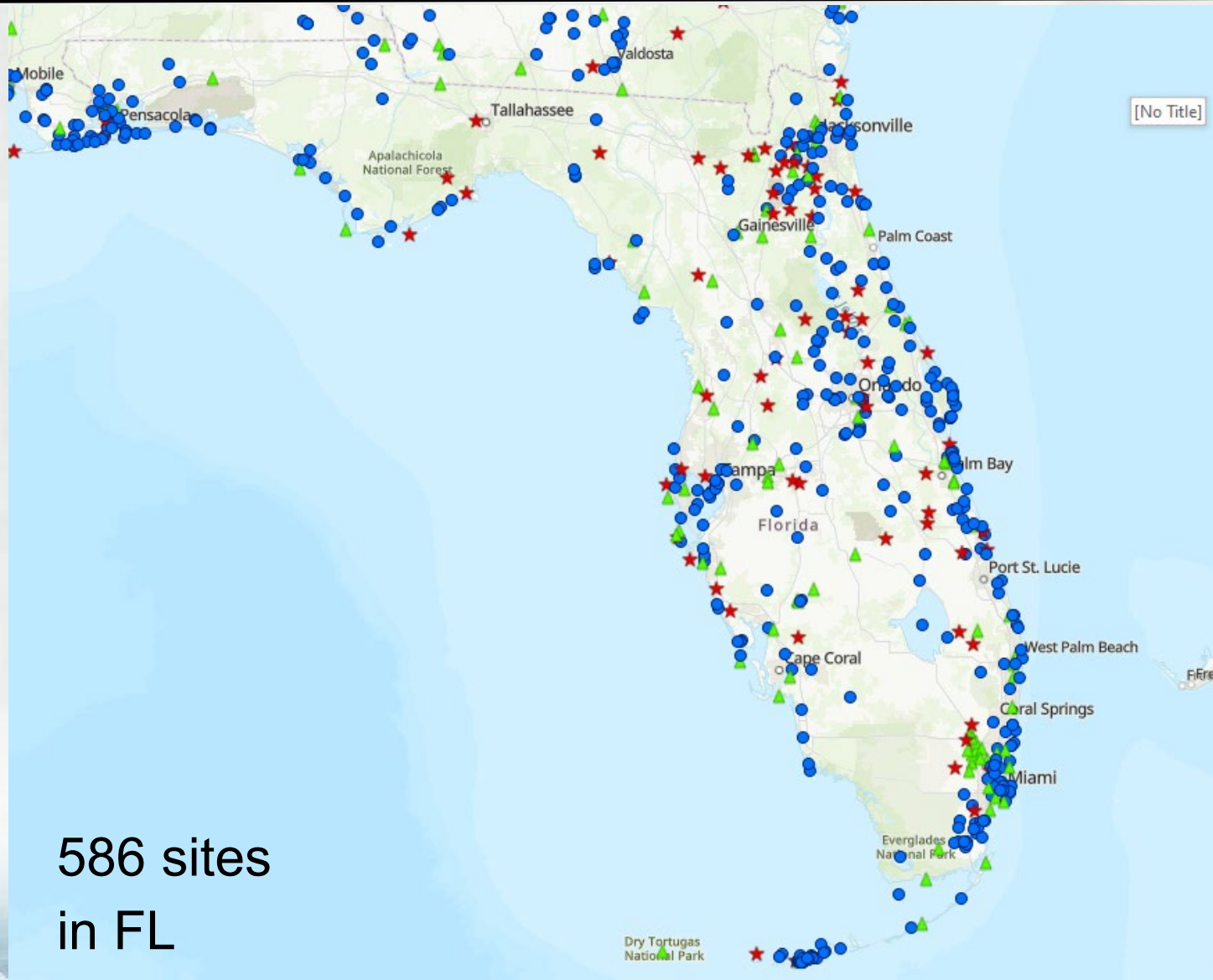
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WHERE ARE FUDS?



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MUNITIONS USE IN FLORIDA

- FUDS are not the only source of MEC along the coastline of Florida. MEC may be found along the entire coastline of Florida, both on land and in State and Federal waters.
- The State of Florida was used extensively for war preparations in the 1940s
- The militaries of the U.S. and other countries have conducted live-fire training and combat operations at sea for centuries, and commonly disposed of excess, obsolete, and unserviceable munitions in coastal waters





MUNITIONS USE IN FLORIDA



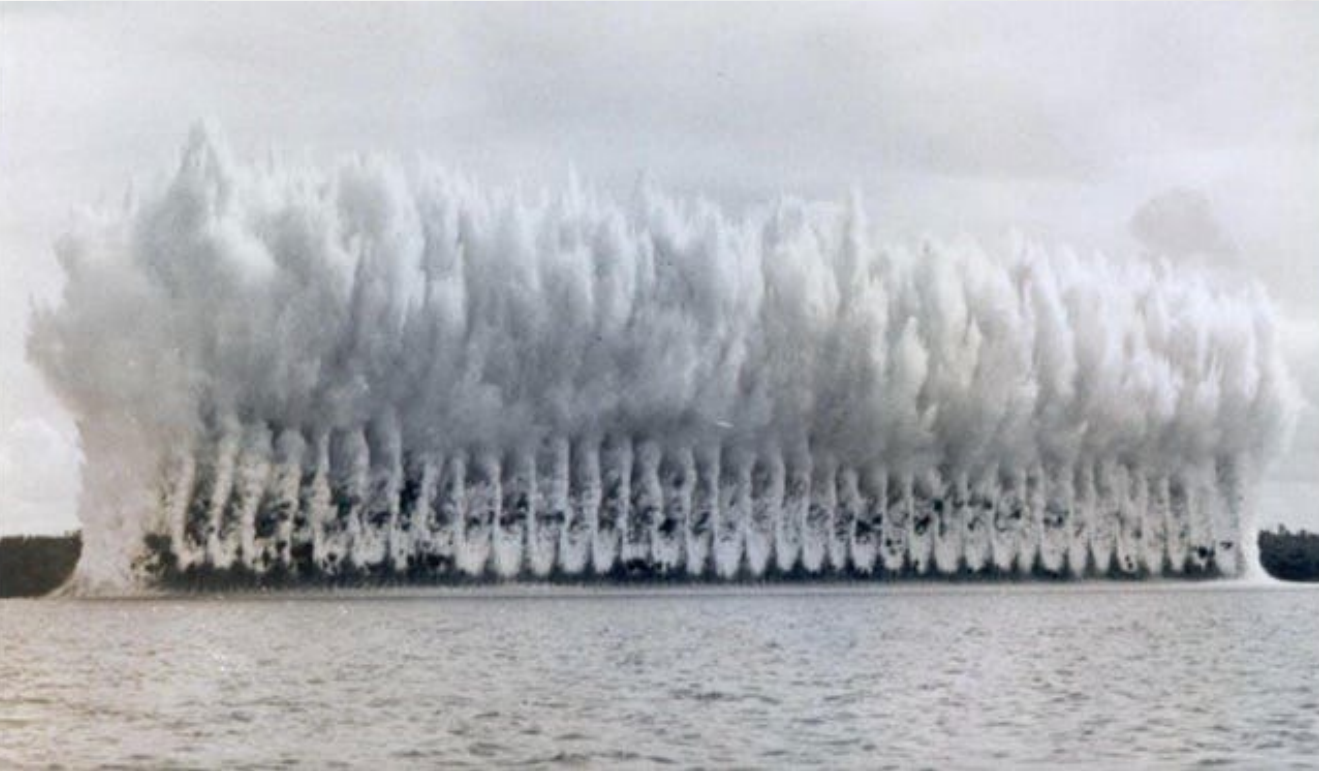
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Fort Pierce Naval Amphibious Training Base

- Joint Army & Navy training, 1943-1945
- Beach obstacle training
- Ordnance-related training
- Munitions use included practice and High Explosive (HE)
 - 81mm projectiles
 - 105mm projectiles
 - Tiny Tim, 7.2-in, 11.75-in, Hedgehog rockets
 - 500 & 1000-lb general purpose bombs
 - Various mines (land and water)
 - Marine markers
 - Explosive charges



MUNITIONS USE IN FLORIDA



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MUNITIONS USE IN FLORIDA



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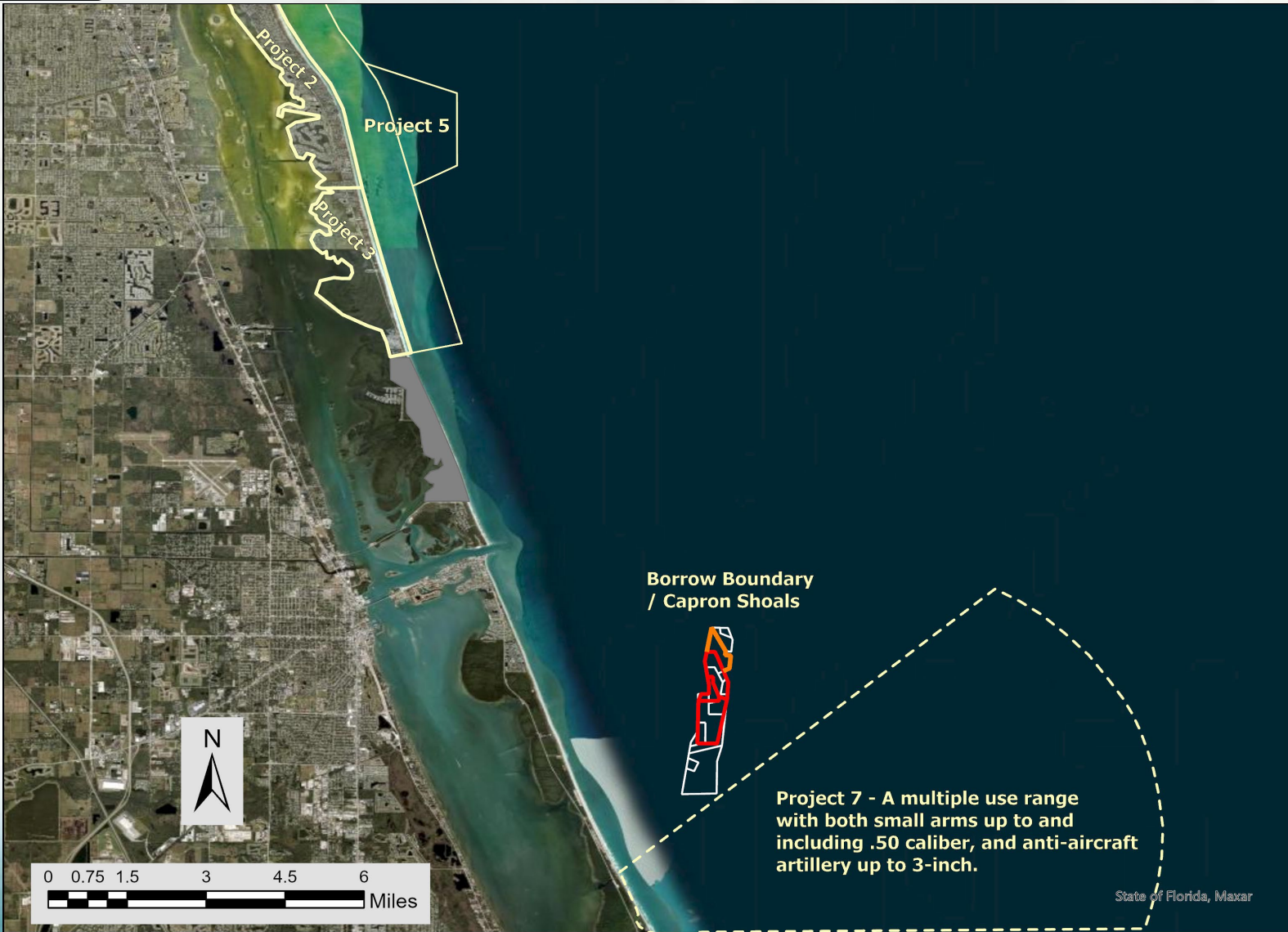




PROJECT ENCOUNTERS



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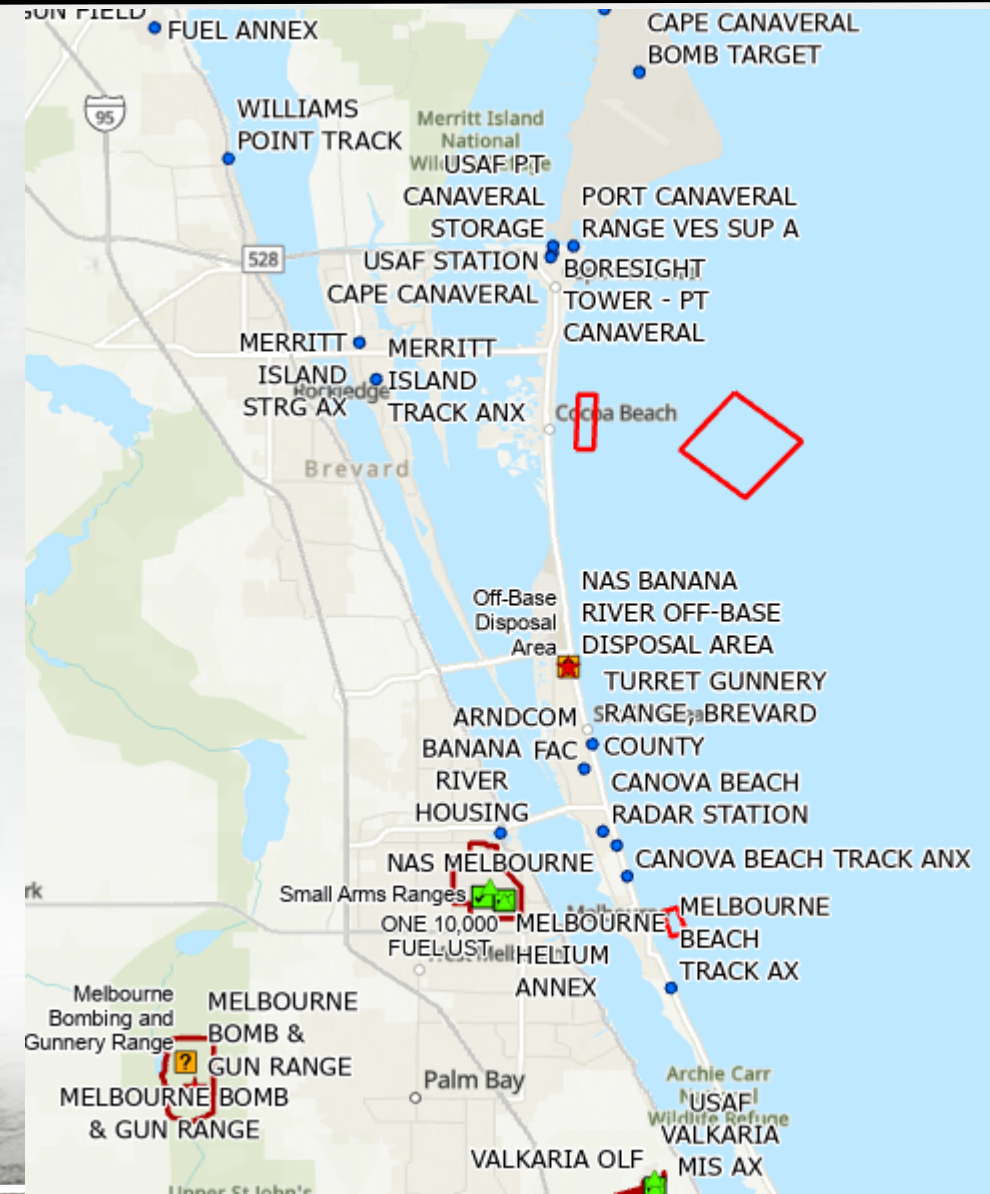


PROJECT ENCOUNTERS



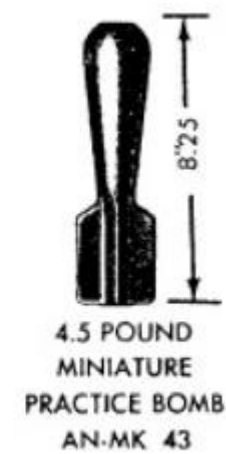
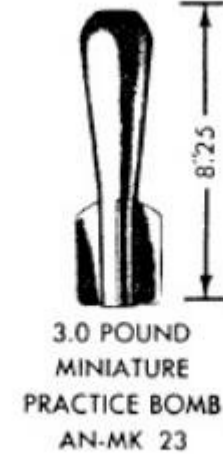
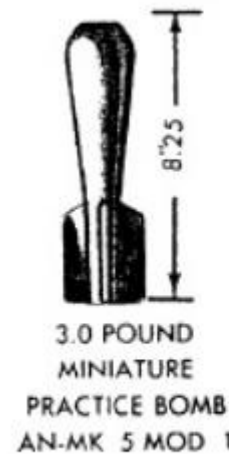
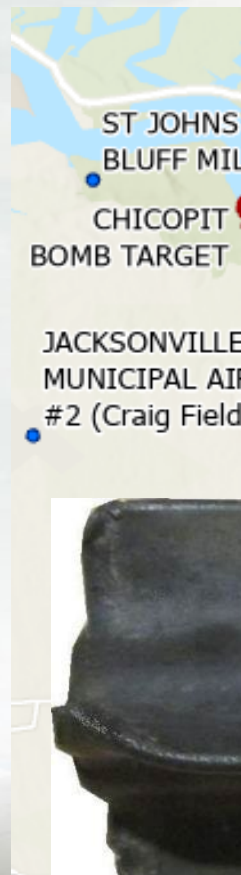
Brevard County SPP

- No evidence of any ordnance being fired from nearby FUDS to borrow area
- 3 x AN-MK 5 practice bombs have been found in Canaveral Shoals II



Duval County SPP

- Chicopit Bombing Target located approximately 6 miles from the project area
 - utilized miniature practice bombs (AN-Mk 5, AN-Mk 23, **AN-Mk 43**) with spotting charges (AN-Mk 4)
- Mk-23's, Flares, and Small Arm Ammunition were found in Borrow Area F in 2016 and 2018
 - No known bombing target (dumped or transported)

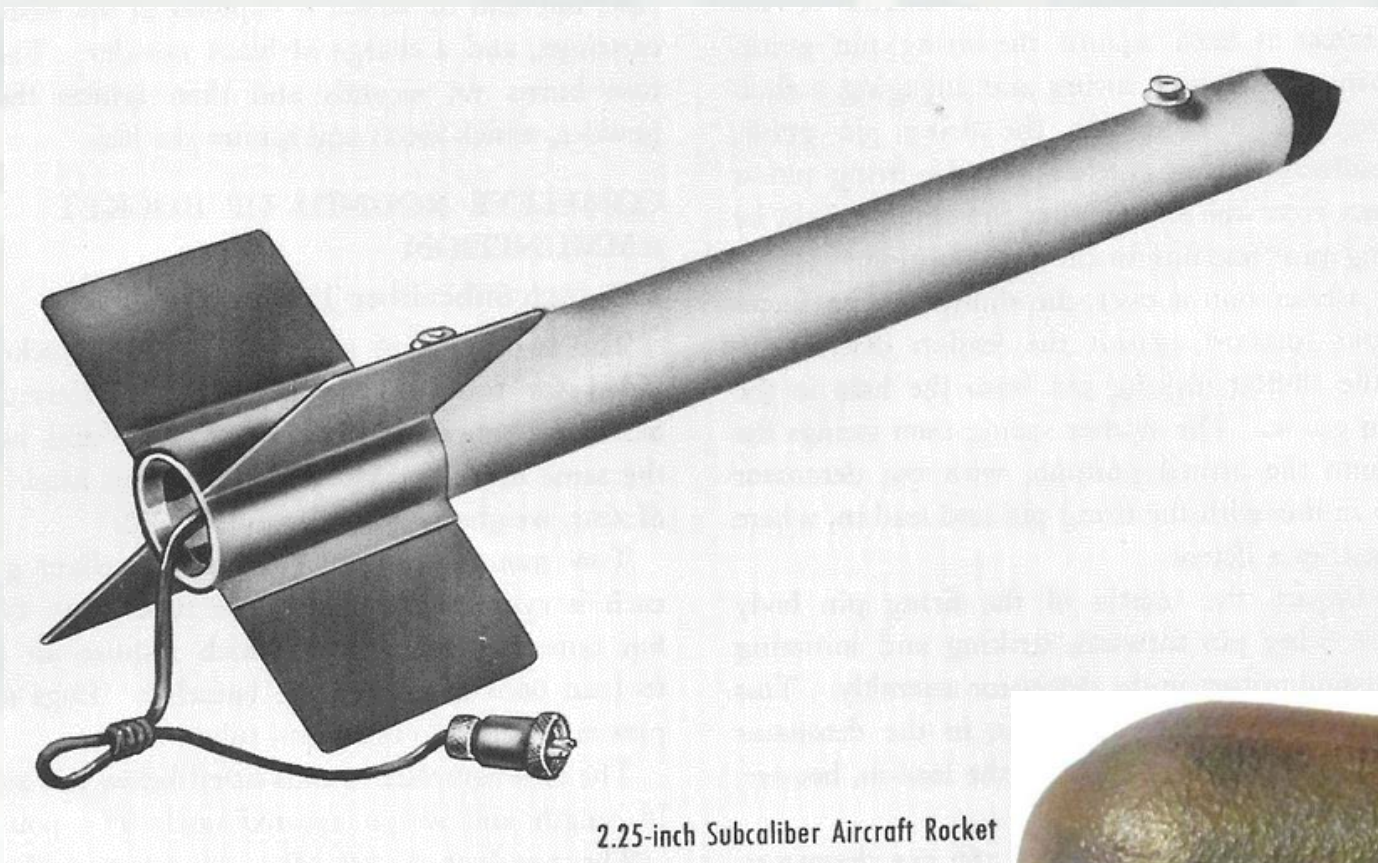




PROJECT ENCOUNTERS



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2.25-inch Subcaliber Aircraft Rocket



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LOCATING MEC



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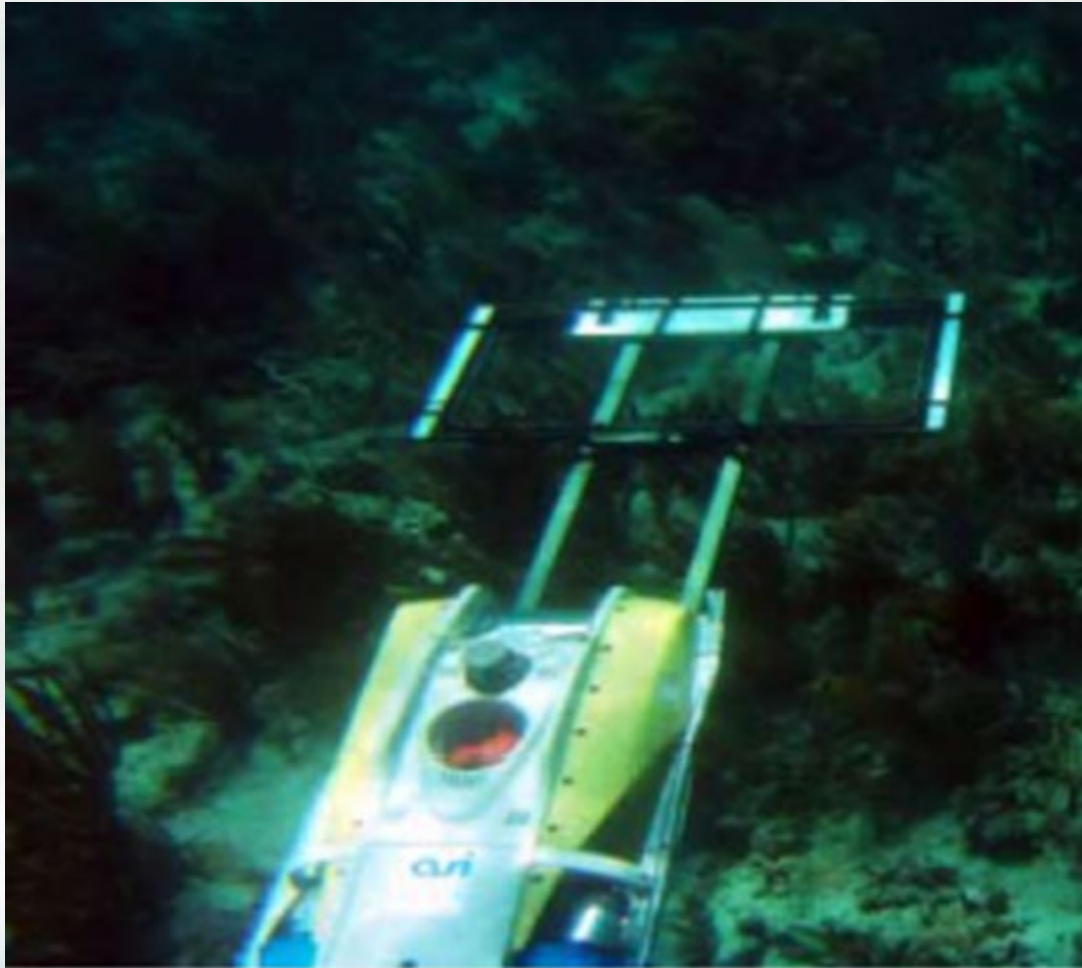
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LOCATING MEC



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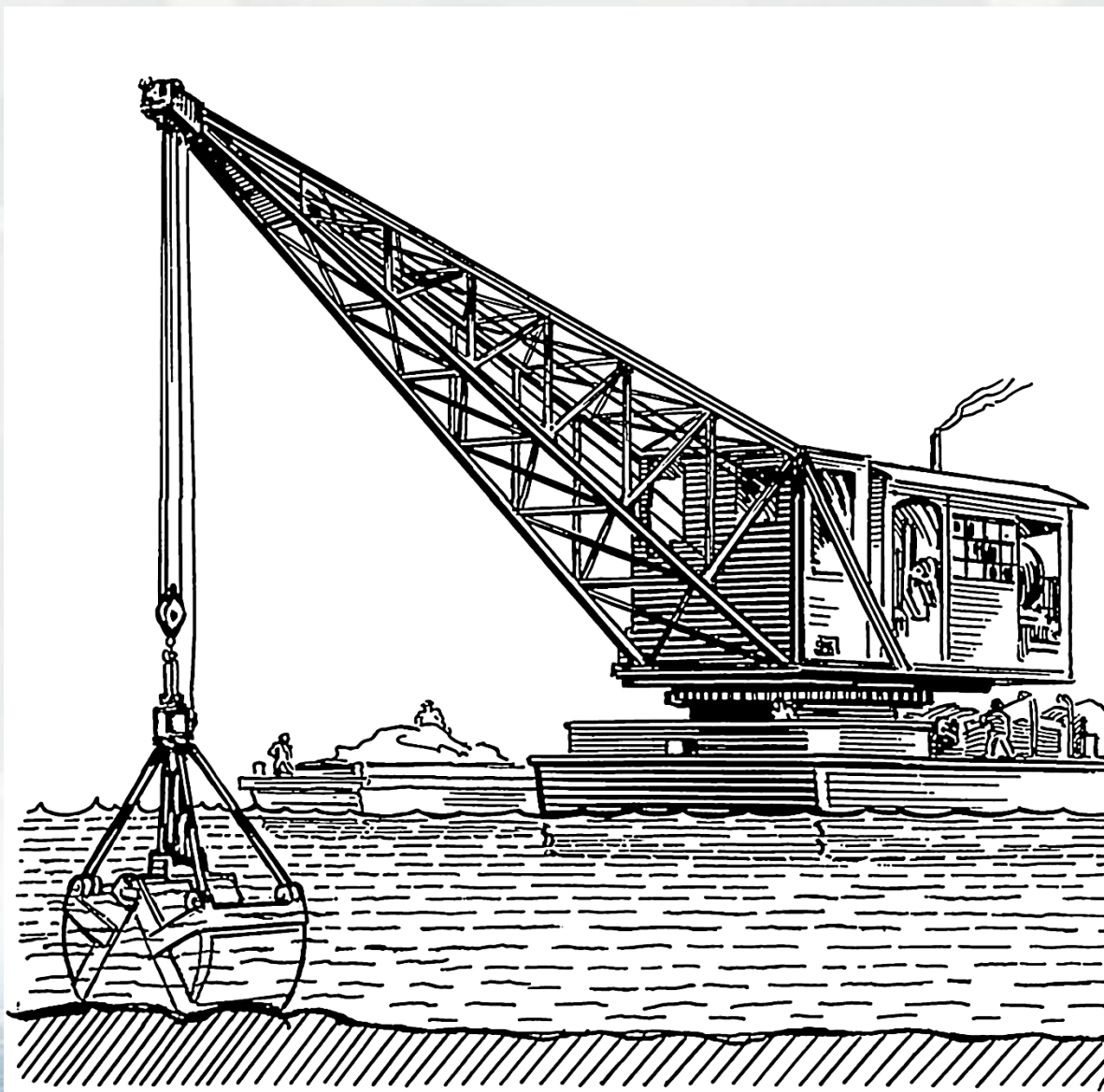
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LOCATING MEC



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USACE REGULATIONS



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U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	Safety and Health Requirements Manual
EM 385-1-97	(2013) Explosives -- Safety and Health Requirements Manual
EP 75-1-2	(2004) MUNITIONS AND EXPLOSIVES OF CONCERN (MEC) SUPPORT DURING HAZARDOUS, TOXIC, AND RADIOACTIVE WASTE (HTRW) AND CONSTRUCTION ACTIVITIES

U.S. DEPARTMENT OF DEFENSE (DOD)

DDESB TP-18	(Revision 1, 2020) Department of Defense Explosives Safety Board (DDESB) Technical Paper 18
DESR 6055.09	(Edition 1, 2019) Defense Safety Regulation 6055.09, Edition 1
DODI 4140.62	(Change 3, 2019) DOD INSTRUCTION 4140.62, MATERIAL POTENTIALLY PRESENTING AN EXPLOSIVE HAZARD (MPPEH)
DODM 4140.72	(2021) DOD MANUAL 4140.72, MANAGEMENT OF MATERIAL POTENTIALLY PRESENTING AN EXPLOSIVE HAZARD

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USACE REGULATIONS



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TABLE Z.1

Munitions Type

Physical or historical evidence suggests High/low Explosives (i.e., pyrotechnics, Riot control filler, propellants, or Chemical Agent) regardless of configuration may be located on site.	10
Small Arms Ammunition. Physical or historical evidence supports that no military munitions other than small arms were used on the site.	2
Physical or historical evidence supports that no military munitions or small arms ammunition were used on site.	0

Circle the highest score that applies to the site.

TABLE Z.2

Hazard Source

Physical or historical evidence supports the site is a former or active range (practice or Live), for Open Burning/Open Detonation of Munitions, munitions burial pit, or the site is a former or active munitions maintenance, manufacturing, or demilitarization facility.	5
Physical or historical evidence supports the site was a firing point, munitions storage or transfer point, or small arms range.	2
Physical or historical evidence supports that no military munitions or small arms ammunition were used on site.	0

Circle the highest score that applies to the site.

MEC Probability Assessment (EM 385-1-97 Appendix Z)

Combined score from Z.1 and Z.2	Probability
0	"No"
1 to 7	Low
8 to 15	Moderate to High



USACE REGULATIONS



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Probability Assessment (EP 75-1-2)

*If...the probability of encountering MEC is **low**, only MEC **standby** support will be required.*

*...the probability of encountering MEC is **moderate to high**, Unexploded Ordnance- (UXO-) qualified personnel must conduct a **subsurface removal** for the known construction footprint and remove all discovered MEC.*

*The level of effort for construction support is site/task-specific and will be determined on a **case-by-case basis by the project delivery team (PDT)**.*



USACE REGULATIONS



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Dredging Projects (EM 385-1-97)

III.B.08 Dredging projects. Planning for dredging projects must consider the possibility of encountering MEC or MPPEH during operations. Plans shall include equipment (maintenance), material screening, and disposal procedures. The selected MM Design Center should be contacted to determine requirements on a case-by-case basis.

General considerations include:

- a) If a hydraulic dredge is used, it **shall be equipped with a screen on the suction/intake** end to prevent unwanted objects from reaching the removed sediment. The screen shall be capable of removing the smallest MEC item expected to be encountered. Additionally, screening mechanism of the same or smaller size is recommended at the outfall point of the dredge material.*



USACE REGULATIONS



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Dredging Projects (EM 385-1-97)

*I.2.U.02.06 The potential for encountering MEC on **any dredging project** that is classified as '**new work**' is **moderate to high**. Maintenance dredging, in previously dredged areas, will not normally be expected to encounter MEC unless the dredging site is within an active range area.*

Dredge Intake Screening

- 1.25" x 6" screen on the dredge head
- Most often and highly recommended measure by MMDC
- Best way to reduce encounters with large MEC on beach or dredge is by keeping it in the ocean
- Leaves hazards in the water
- May decrease production
- May "harden" borrow area
- Require SARBO supersede request





MEC MEASURES



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Pipeline Discharge Screening

- 0.75" x 0.75" (typical) screening on the beach
- Screen sizing based on expected MEC size
- Allows for "clean up" of MEC in borrow area
- Allows for on-beach inspection and clearing of screened material, and removal/disposal of MEC
- Removes shells that may be beach compatible
- May impact production, depending on material character and equipment type





MEC MEASURES



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Training

- 3Rs, MEC recognition, safety, visual inspection

Personnel

- Ordnance and Explosives Safety Specialist (**OESS**)
 - Government personnel that perform Probability Assessments, advise PDT, and oversee MEC Construction Support activities
 - On-site at startup and on-call as needed
- Unexploded Ordnance Technician (**UXO**)
 - Contractor personnel that perform MEC Construction Support
 - Inspect and clear screened material
 - On-site or on-call, depending on project



SAJ CSR M PATH FORWARD



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Offshore Borrow Areas

- Discharge screening of all material
- Inspection and clearance of all screened material by UXO Technician
- UXO Technician(s) on site 24/7
- Case-by-case: Dredge intake screening (depends on potential MEC)

Inlet / Shoal / Nearshore Borrow Areas

- Case-by-case depending on Probability Assessment, OESS recommendations, project history (PDT decision)



QUESTIONS?



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3Rs of Explosives Safety



Recognize

– when you may have encountered a munition, and that munitions are dangerous.

Retreat

– do not approach, touch, move, or disturb it, but carefully leave the area.

Report

– call 911 and advise the police of what you saw and where you saw it .



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