



V E R S A R

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# 3D Visualization for Contingency & Master Planning

Enabling New Joint Service  
Collaboration Capabilities

- Demonstrate how 3D applications are integrating and synthesizing disparate datasets within the DOD enterprise and other authoritative sources
- Illustrate how advancements in e-Tools continue to evolve to provide a responsive, flexible support to multiple commands by maximizing effectiveness, reduce program risk, and evolve to minimize impact on limited DOD resources
- Ensure 3D visualization is focused on enabling and generating combat power and lethality for the warfighter.
- Leverage existing Joint Staff, NAVFAC, and USACE capabilities and stakeholders investments
- Share how 3D visualization is being prototyped to support contingency and master planning

## Generate Combat Power for the Warfighter

Planners, engineers, and those charged with monitoring and directing operations, should always seek to ensure that friendly forces have the ability to gain and maintain the relative combat power advantage required to accomplish the mission within the risk parameters set forth by the commander.

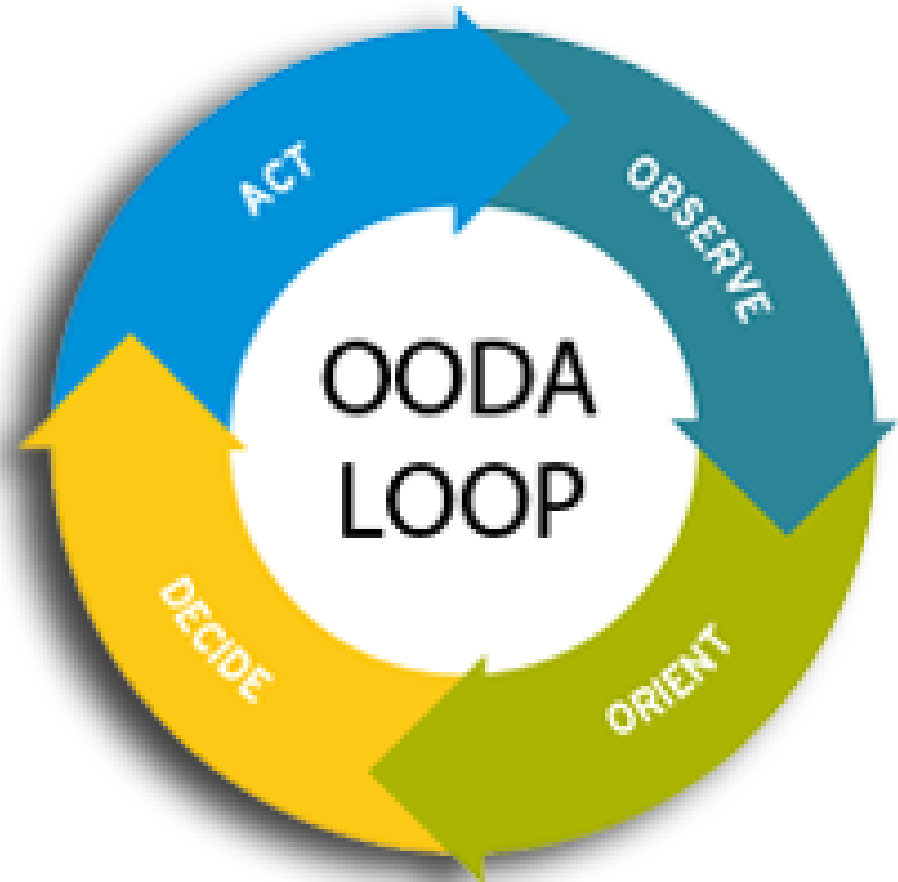
*Ex: Readiness of Mission Critical Waterfront Infrastructure, Airfields, and Installations*

## Enabling Warfighter Lethality

Commanders engineers, and warfighters must have capabilities that increase lethality, mobility, situational awareness and protection while countering threats. New systems will be designed to employ emerging technologies to ensure our warfighters have a decisive advantage over potential adversaries.

*Ex: Integrated Joint Expeditionary Systems, Rehearsing Exercises, & Multi-Domain Data Systems*

- To meet the defined goals, efforts need to be made to leverage databases, tools, and systems that expand use and access to site-specific information that drive the OODA loop.
- The battlespace henceforth will be run by synthesizers, forces able to put together the right information at the right time, think critically about it, and make critical decisions in timely and wise manner.



# How 3D Visualization Drives OODA

## Element One

Integrates broad range of datasets.

## Element Two

Geo-enables web-based 3DVE

## Element Three

Facilitates joint coordination

## Element Four

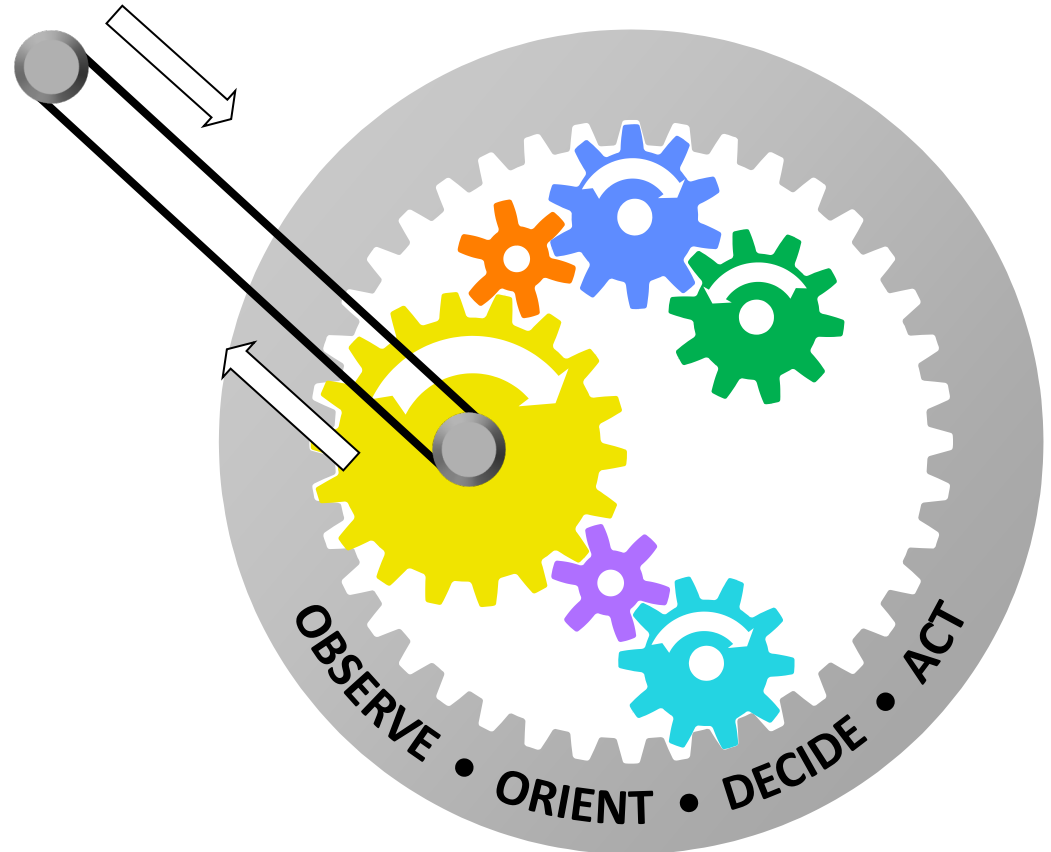
Enhances risk & process assessment

## Element Five

Generates engagement at Phase 0

## Element Six

Drives planning scenarios.



**5D = 3D Graphics + Timelines + Data**

- Currently site characteristics data is dispersed and disparately formatted
  - Sourced from wide range of organizations and methods
  - No centrally curated database/source
- To meet the intent of OODA, we need to maximize existing e-Tools (e.g., NAVFAC SPIDERS 3D, USACE UROC REDi) to integrate multiple disparate systems is required
- Small invest in SPIDERS 3D have generated advancements. Examples include: delivery of digitally integrated and networked theater planning capabilities being sought by Expeditionary enterprise and CERTs
  - No technology blockers with SPIDERS 3D. It is tailorable, scalable and can be transitioned to SIPR
- In order to create, implement and sustain existing e-Tools, a structured and resourced approach is required

## Generate Combat Power for the Warfighter

Master Planning (MP), Area  
Development Planning, and  
Joint Land Use Planning



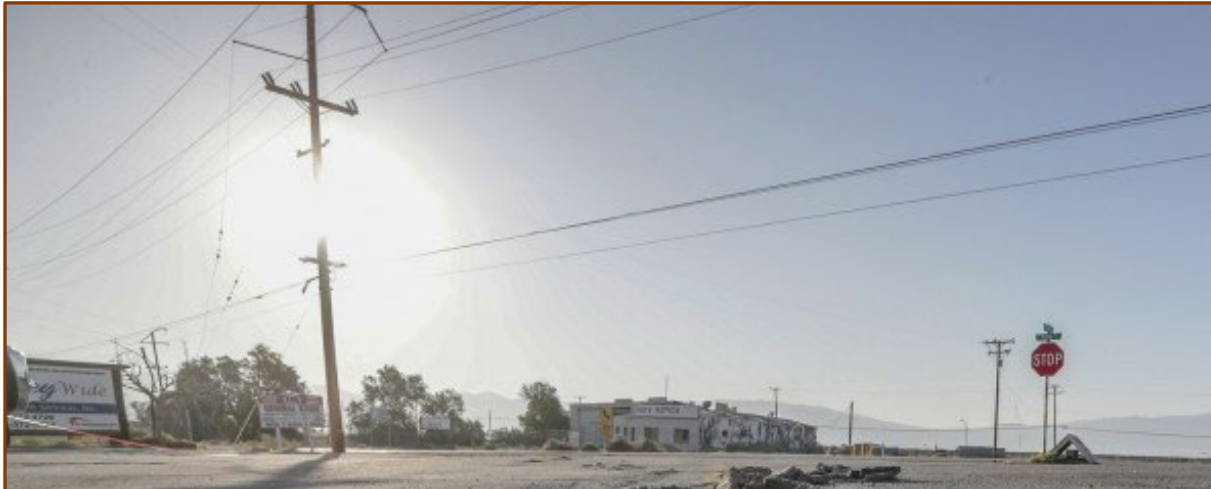
## Enabling Warfighter Lethality

Contingency Engineering (CE),  
Phase 0 Support, and CE Tools  
(e.g., CERT)





# CE Ex.1: China Lake Ridgecrest Earthquake



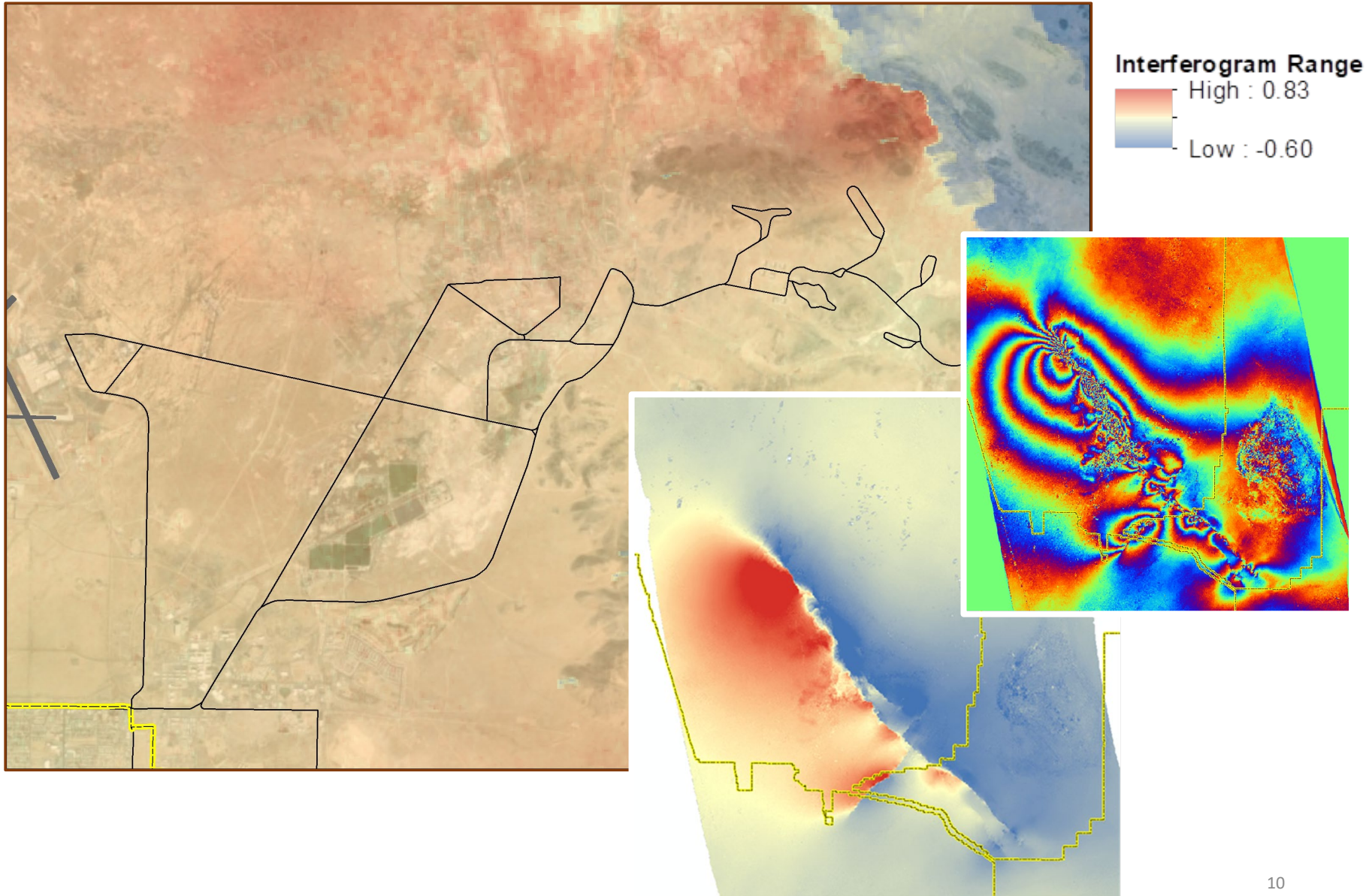
**Providing Contingency Response Teams with 3DVE  
Site-Specific Information for Naval Air Weapons  
Station China Lake Ridgecrest Earthquakes**





- The U.S. Army Corps of Engineers (USACE) Reachback Operations Center (UROC) has developed the next generation in Automated Route Reconnaissance capabilities.
- Smaller and less complicated with fewer wires than previous versions of the AARK, AARK 5 provides a new, simple to use plug and play platform to rapidly execute mounted reconnaissance to support a wide range of contingency related assessments.
- Compared to traditional route reconnaissance techniques, soldiers and first responders can reduce time, minimize security risks, and acquire quantitative data sets in order for commanders and stakeholders to make informed decisions.

# Interferogram of Ridgecrest Earthquakes



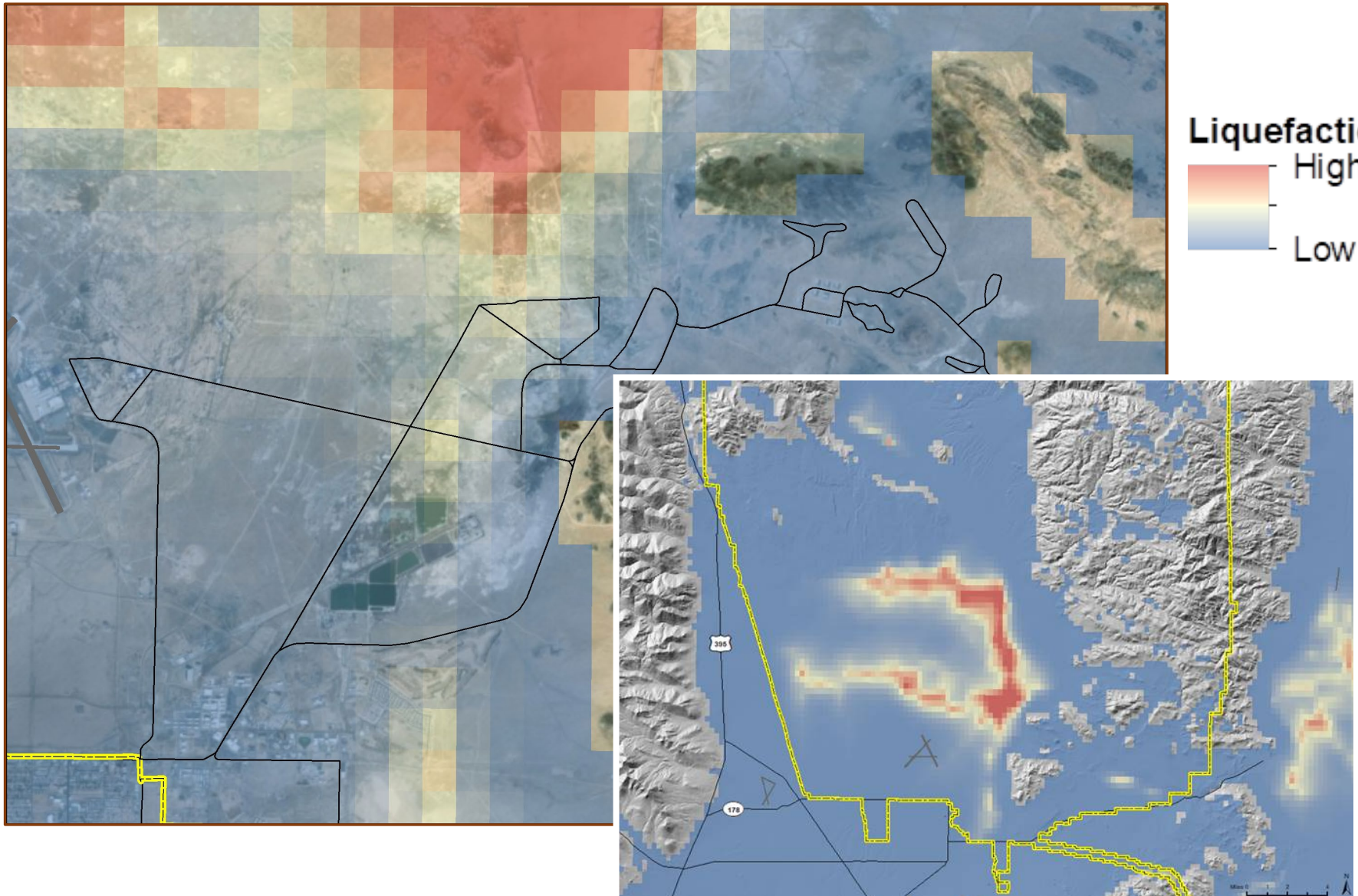


# Post- Ridgecrest Earthquake Image





# Liquefaction Model





# Correlate AARK 5 Findings with Data





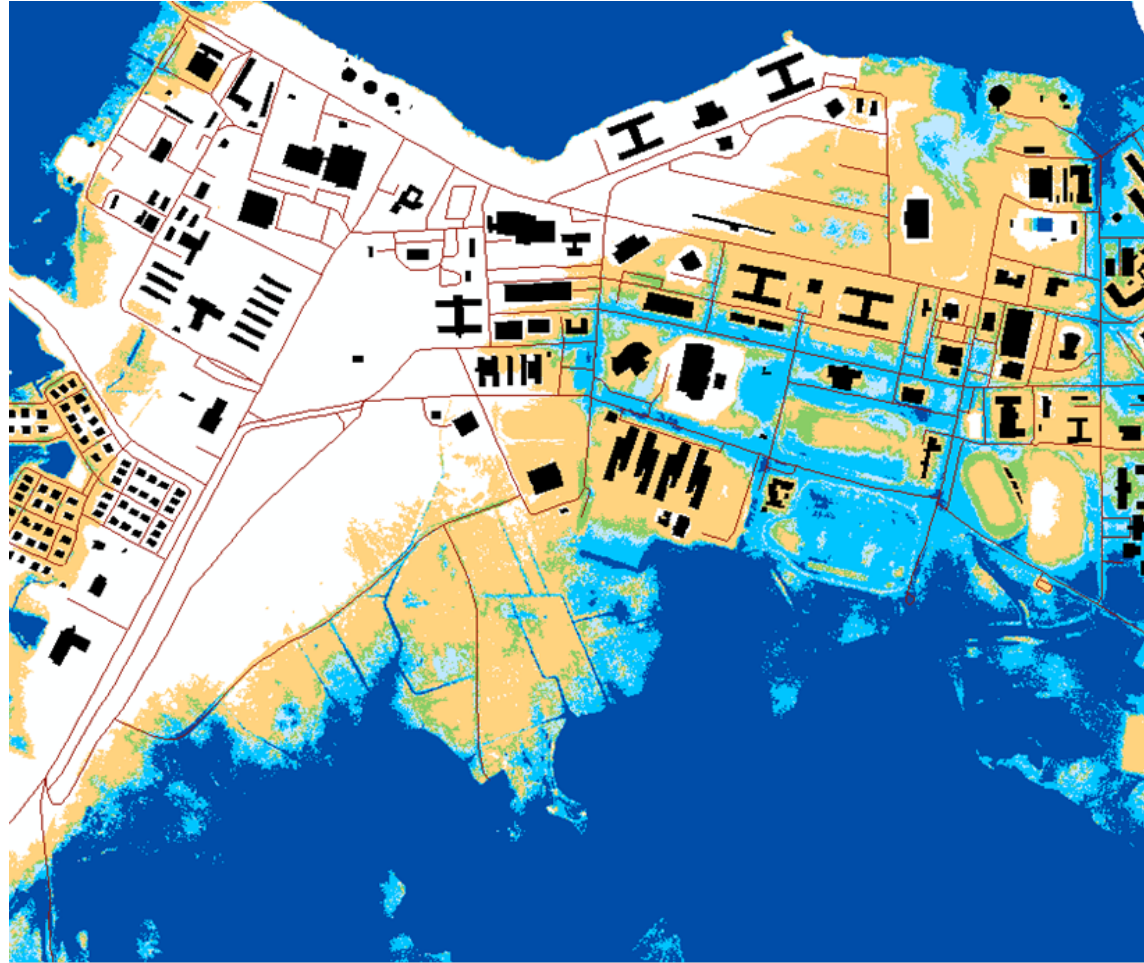




# Hurricane Matthew Impact on Parris Island



- Last 10 years DOD has funded several studies to develop coastal resilience and climate adaptation assessments for several installations (e.g., Parris Island).
- These studies have modeled a variety sea level rise, storm surge, and flood inundation scenarios to assess impact to mission and vulnerability of critical assets.
- Efforts need to be made to leverage and disseminate this data in a manner that empowers CERTs and improves visibility.

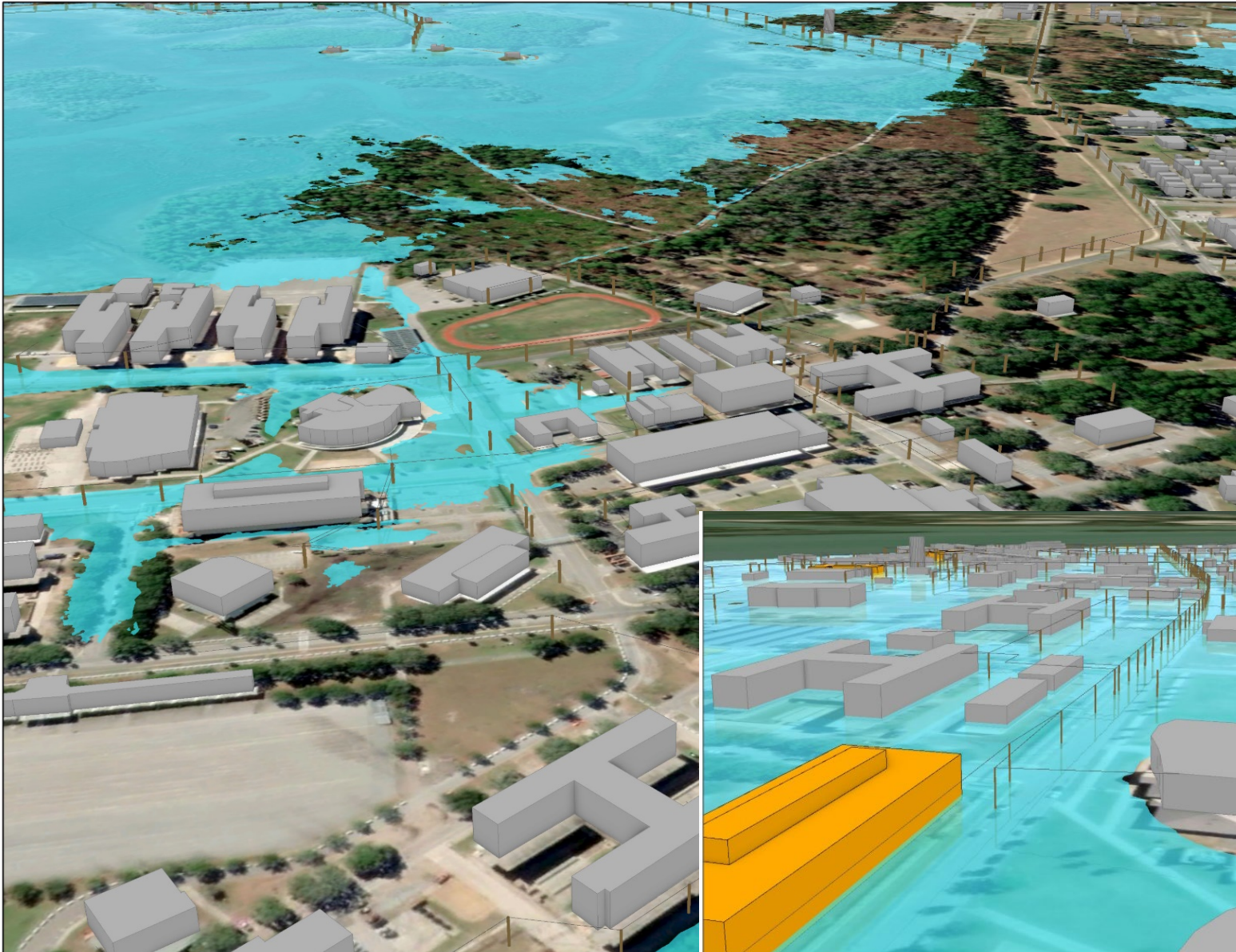








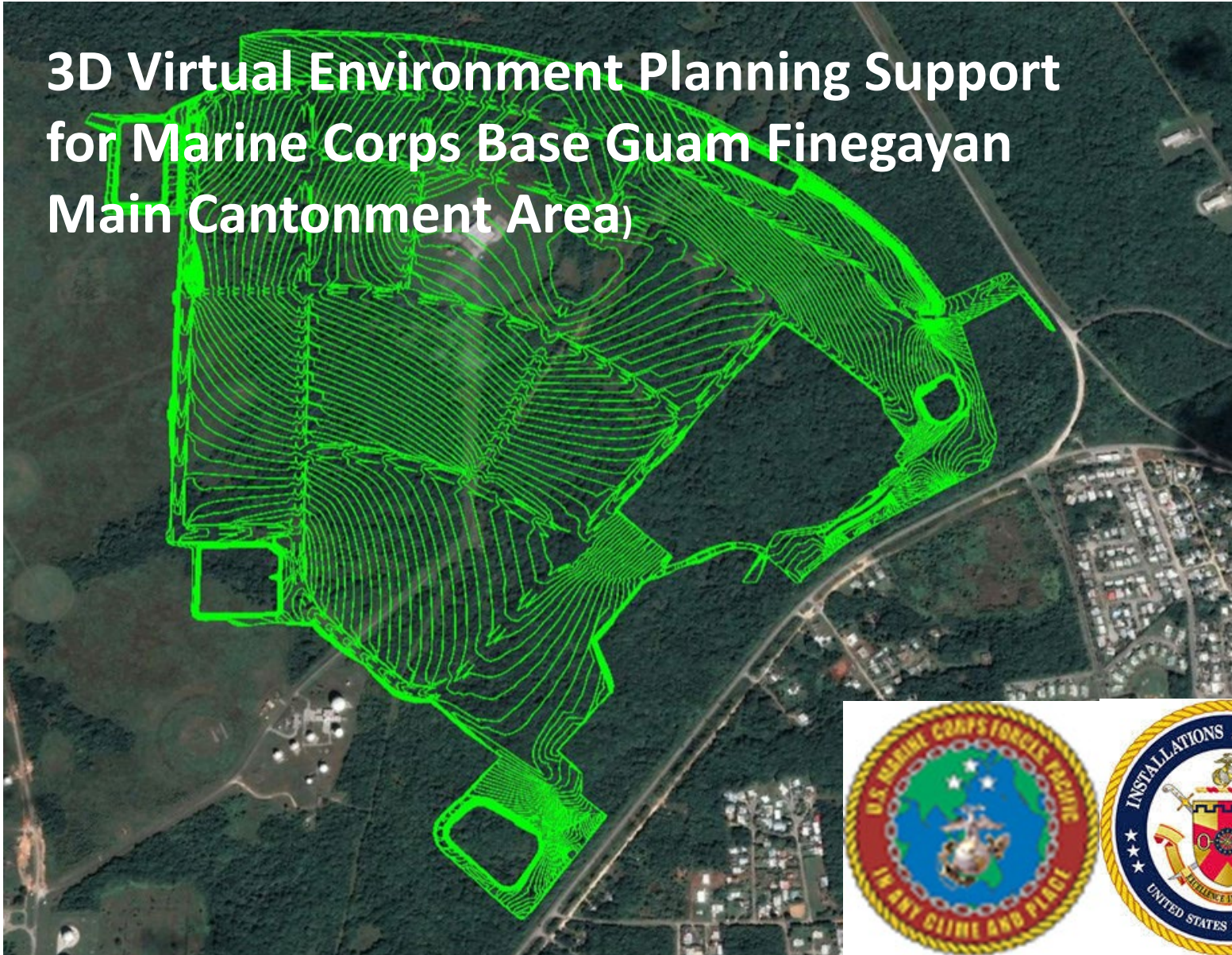
# Modeling Climatic Scenarios (SLR)



- Continue to evaluate how 3D capabilities can be leveraged to assist CE support exercise and crisis planning, natural disaster support, remote construction, and technical reach-back support to the U.S. Navy's expeditionary forces; Commander, Navy Installations Command; Fleets; and Combatant Commanders
- Present relevant installation data, natural disaster models, and USACE UROC AARK 5 data in SPIDER 3D
- Illustrate how the integration of disparate digital data within the Navy enterprise and across the federal government can benefit field assessments of natural disasters and battle damage.
- Facilitate real-time multi-user communication across the Navy enterprise to identify mitigation measures and drive repair designs
- Interoperability with USACE REDi and other joint service planning eTools

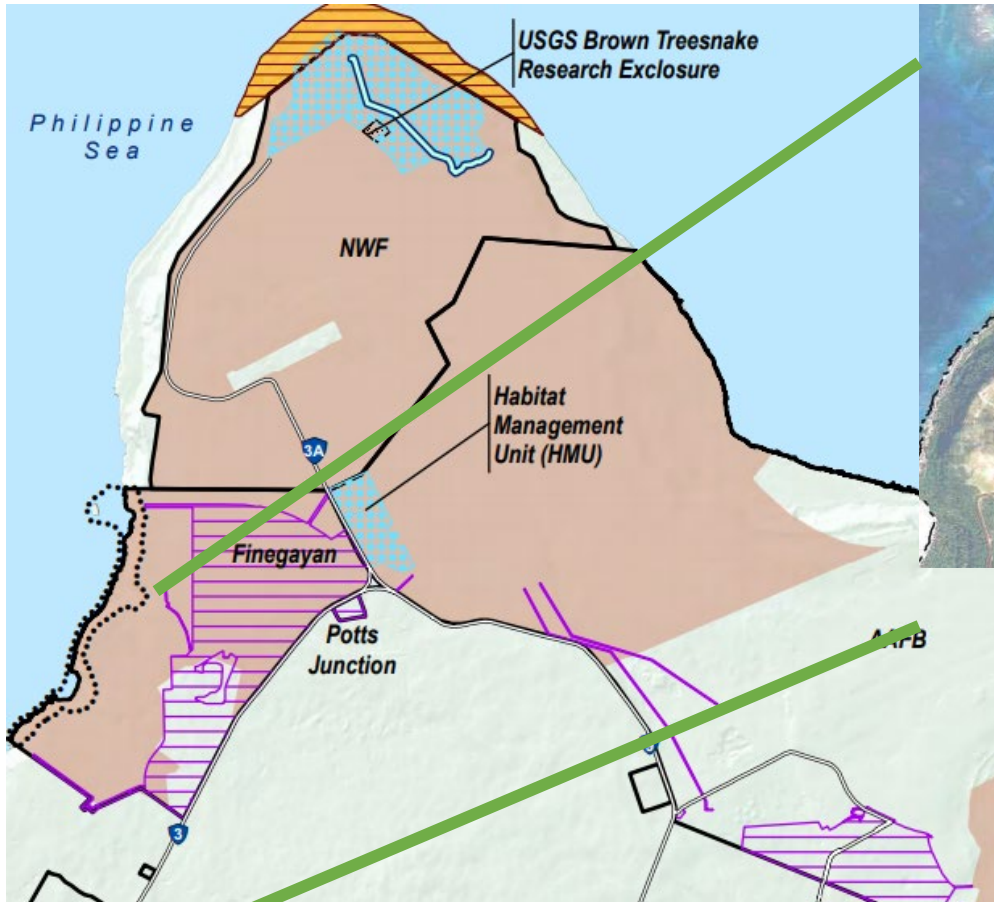


## 3D Virtual Environment Planning Support for Marine Corps Base Guam Finegayan Main Cantonment Area)

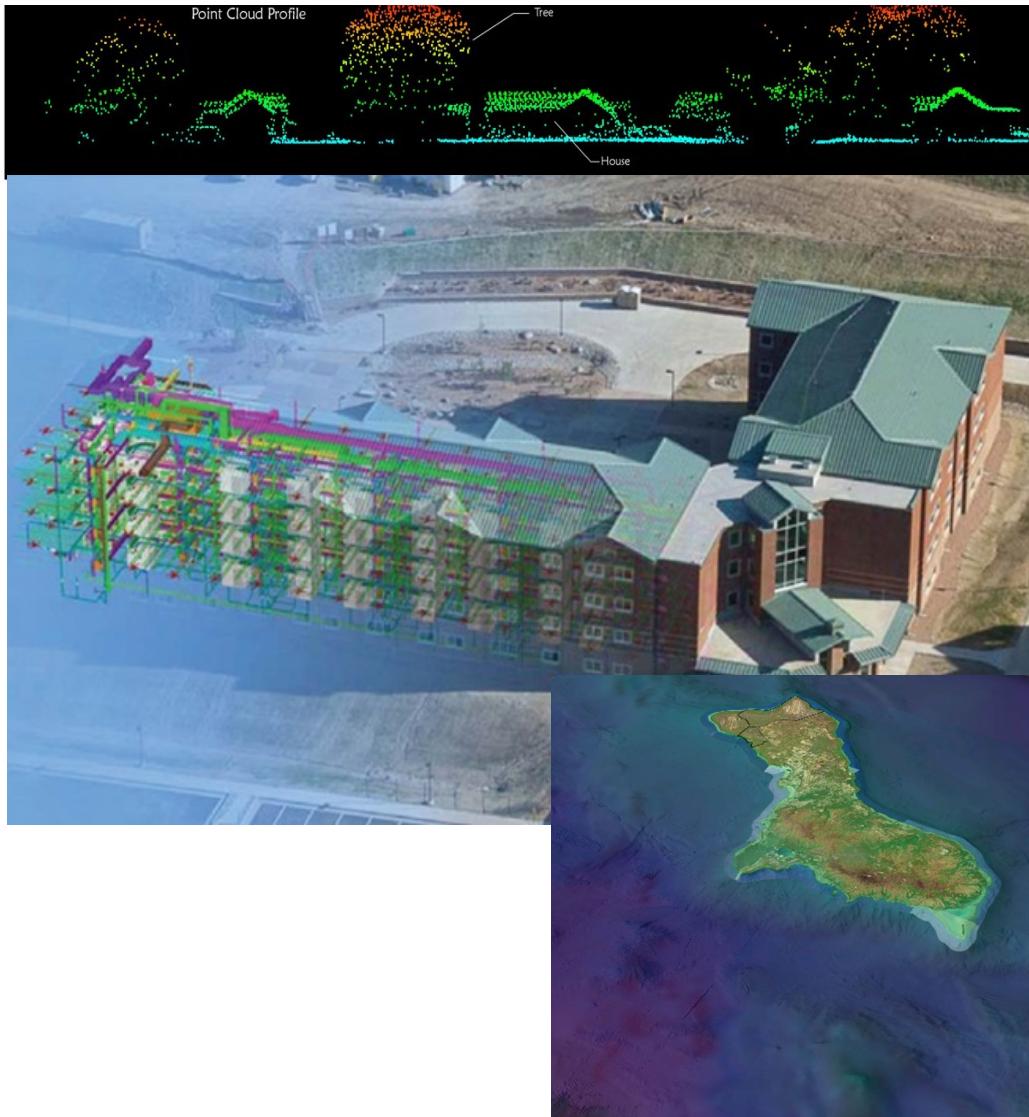




# Main Cantonment Area



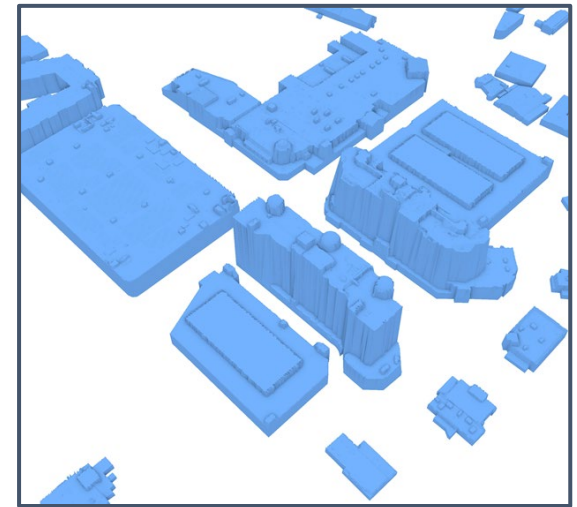
The Main Cantonment Area functions include headquarters and administrative support, bachelor housing, family housing, supply, maintenance, open storage, community support, some site-specific training functions, and open space (e.g., parade field, green space).



- Create a virtual Main Cantonment Area in SPIDERS 3D
- Establish a Digital Master Plan that will be digitally available to all stakeholders
- Tasks include:
  - Develop a digital elevation model using LiDAR and Survey Data
  - Incorporate infrastructure/utility designs/as-builts and BIM products (e.g., BEQ Barracks) into the digital scene
  - Leverage MCICOM digital scans of existing infrastructure to constrict MILCON schedule



- Digital Master Plan visually integrates existing robust design and implementation plan. It enables key architectural principles to be agreed, infrastructure and systems to be prioritized, budgets to be defined for approval and the most appropriate sourcing model, and provider landscape to be established.
- Most importantly, it lays out a clear plan of execution to reach the destination, while minimizing the risk of going off-track or stagnating mid-way.



**Success = Vision + Strategy + Execution**



- One of our goals is to maximize ADP flexibility, scalability and affordability by repurposing and increasing value of GPMO and DPRI existing data (e.g., iNFADS and Maximo).
- Assess SPIDERS 3D ability to scale to meet asset managements requirements. A digital foundation is being created to visualize and coordinate planning actions from the component to JLUS scale.

- With better communication and collaboration, fewer changes would be necessary and those that were necessary would be managed expeditiously upstream and down. A recent McKinsey analysis of large investment projects found that 80% of average cost overruns in the sector occur due to change orders.
- Goal is to instill simplicity. Empower installation and community planning by bringing the building and construction ecosystem into 3D environment.
- Why not extend this capability another step, where each and every building is modeled and access to the model is shared and permissioned? Why not allow the installation to utilize these designs to monitor power usage, water and other civic concerns? Why not create interconnected, 3-D models that allow greater interoperability between installation commands and their tenants?



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Thank You

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