

A dark blue background featuring a central globe of the Earth. Surrounding the globe are several semi-transparent, overlapping maps and data visualizations in various colors (purple, green, blue, red). The maps show different geographical features and data points, suggesting a focus on spatial analysis and GIS technology.

Discover, Share, Decide, Act: Propelling Community Resilience Through GIS

2024

ADC Installation Innovation Forum



Jennifer Alley, PE, LEED AP
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Sustainability at HDR



Jared Ware, CEM[®], CGP-G[™], GISP[®]
Senior Engineer / Director @
Railroad Commission of Texas (RRC)



Kevin Lariscy
IMCOM IGI&S Program Manager
and Command Lead



CONNECTION

BACKGROUNDS

INTERESTS

DISCIPLINES

A GLOBAL COMMUNITY
OF GIS PROFESSIONALS

CULTURES

ORGANIZATIONS

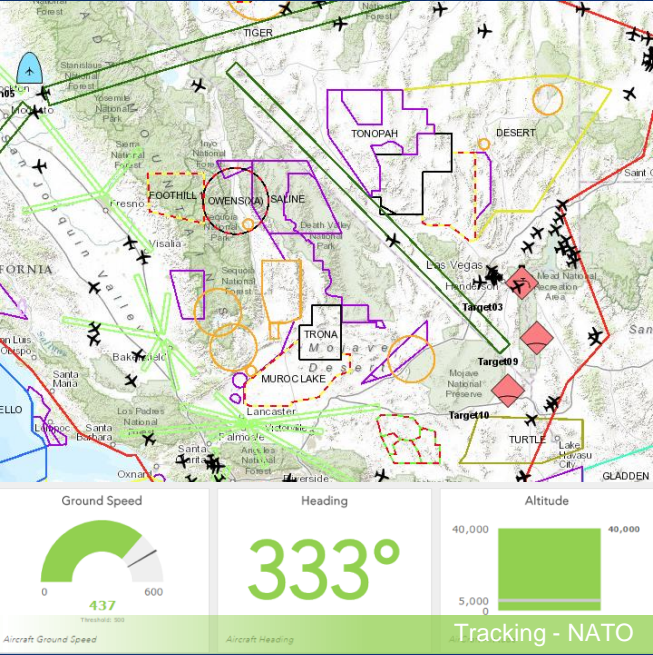
NATIONALITIES



Barriers



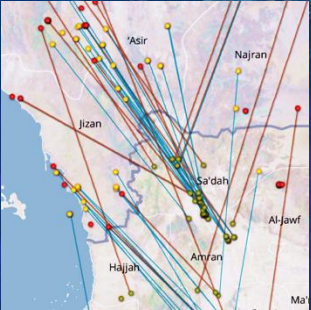
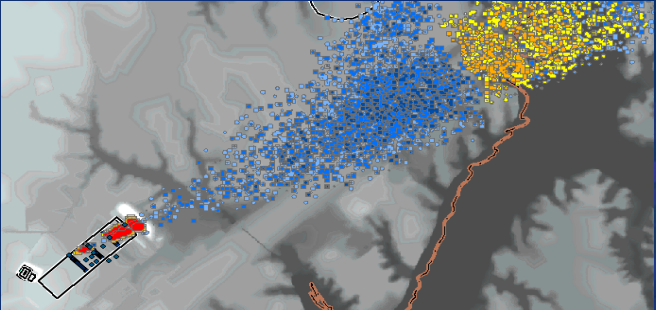
Maps | Communicate



Learning



Knowledge



Communicating

GEOGRAPHY

The Science of Our World

Helps Organize Everything We Know

What

When

Where



Seeing the World
as an Interconnected Ecosystem

MAPS



The Language of Geography

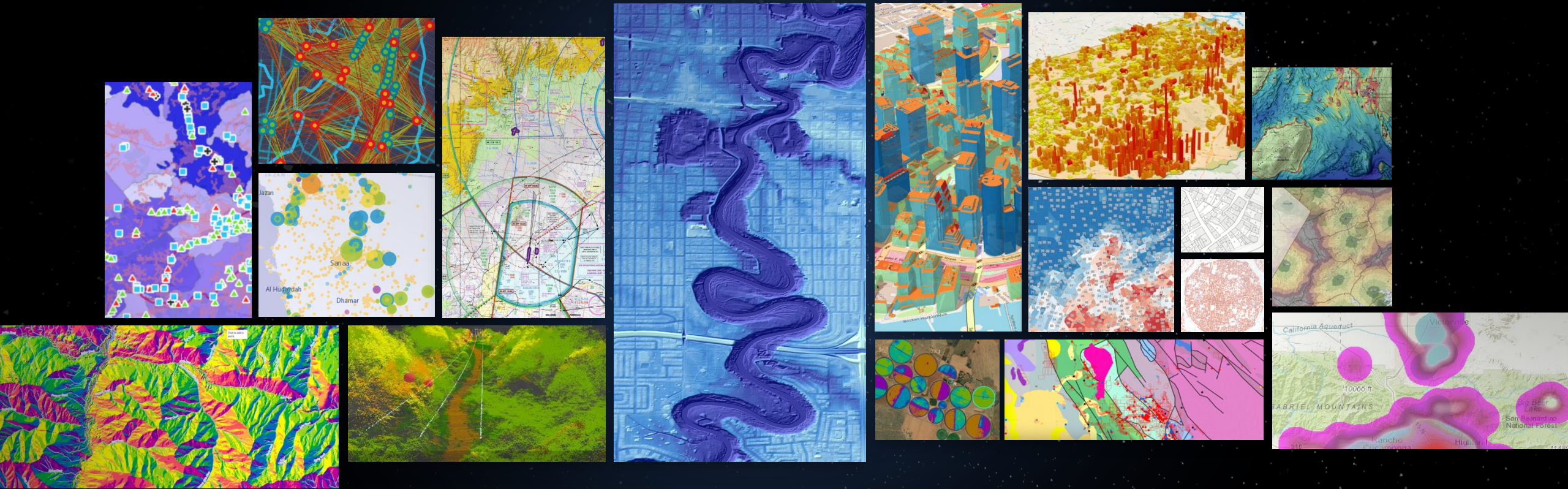
Communicating . . .
Content and Context

Providing Clarity
. . . and Valuable Insights

Making the Complexity
of Our World More Understandable

Maps

Synthesize, Reveal Patterns, Relationships and Systems
... Helping Us Think Differently



Often Beautiful and Elegant

Communities and Installations—a Shared Map



What Is a GIS?

A System for Managing, Sharing and Applying Geographic Information



*Delivering Value Across Organizations
Improving Efficiency, Communications, Decision Making and Collaboration*

GIS

and The Geographic Approach

Provide the Framework . . .
. . . and Process

Integrating All the Factors . . .

Creating Understanding . . .

Finding Solutions . . .

. . . and Improving Collaboration



Action

Data
Collection

Visualization &
Mapping

Analysis &
Modeling

Planning &
Geodesign

Decision-
Making



ArcGIS

Brings People Together to Solve Real Problems

Economic Development

Pollution Nature Conservation Health

Energy Transparent Government

Natural Resources Climate Change

National Security Science & Technology

Business Environment Water Resources

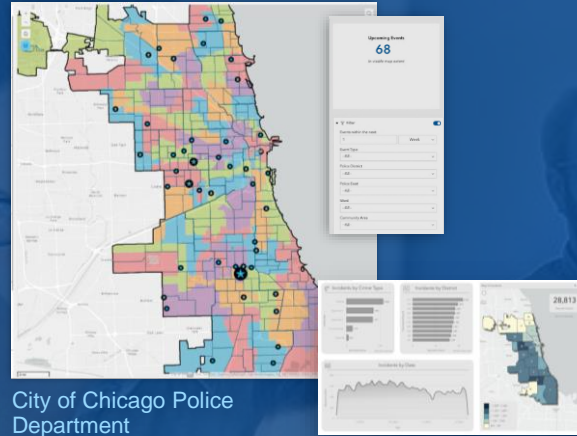
Agriculture Social Conflicts

Urbanization & Development

Natural Disasters

Infrastructure

Law Enforcement Analysis and Reporting



Construction Monitoring



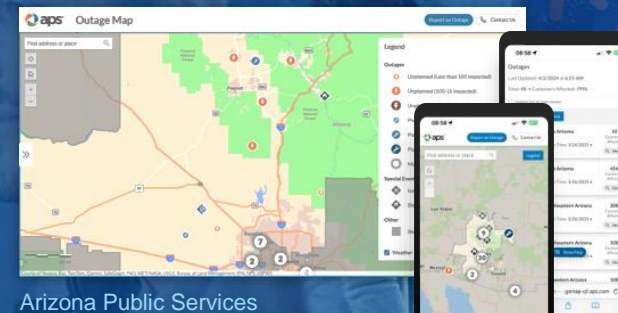
Citizen Reporting



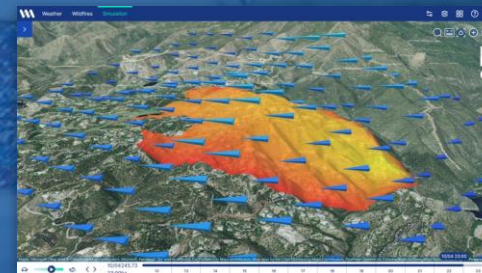
Open Data



Public-Facing Outage Map



Wildfire Modeling



Citizens Trail Management





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Propelling Community Resilience Through the Geographic Information System (GIS)

How it relates to Climate Assessments and Utility Infrastructure Resilience

October 2024

Jennifer Alley, PE, LEED AP

Sr Sustainability & Resiliency PM

Climate Lead





What?

HDR as a Federal A-E Resiliency Firm

HDR is looking at how buildings, infrastructure, and communities are designed and built to support sustainability, resiliency, and human health.

We leverage Executive Orders and other federal guidance and identify key technologies and initiatives directed for implementation, i.e. microgrids, electric vehicles (EV), and climate resiliency planning).

Communication and coordination are key for these projects that extend to include “outside the fence” entities and providers like utilities.

Who?

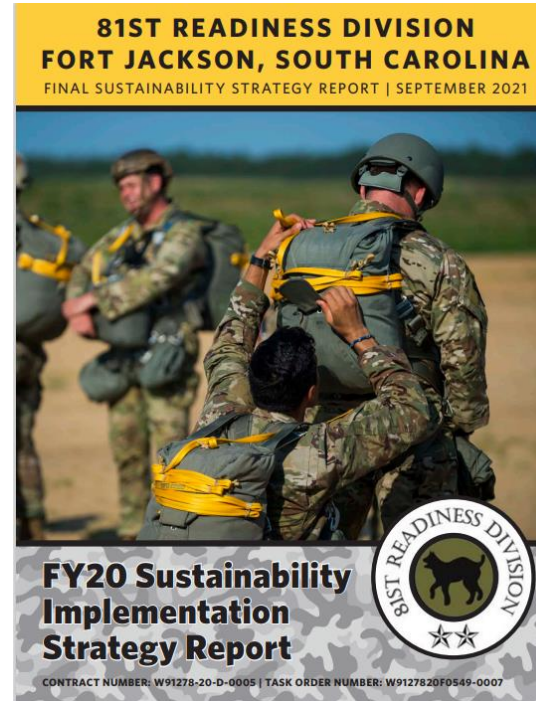
A look at HDR Climate Resiliency & Sustainability Projects

Client	Project Description	Scope of Work	Communities
Air Force	Air Force Installation Energy Plans (Phases III, IV & V)	Installation Energy & Water Resiliency Planning. Completed 50 IEPs.	Albuquerque, NM; Boise, ID; Fairfield, CA; Grand Forks, ND; Great Falls, MT; Little Rock, AR; Shreveport, LA; Washington, DC; Wichita, KS
Air Force	Air Force Installation Climate Resiliency Plans (24 sites)	Climate Resiliency Planning. On-going efforts to develop ICRPs at 24 installations	Abilene, San Angelo, & Wichita Falls, TX; Biloxi, MS; Charleston, SC; Colorado Springs, CO; Homestead, FL; Niagara Falls, NY; Phoenix, AZ
DLA	DLA Energy Program Support Services / Climate Resiliency Plans (19 sites)	CFE / Climate Planning / Energy Studies / Electrification / EV Planning / Microgrid Planning & Concept Design	Corpus Christi, TX; Honolulu, HI; Jacksonville, FL; Norfolk, VA; Oklahoma City, OK; San Diego, CA
Army Reserves	81st RD FY20 & FY22 Sustainability Strategy Reports / FY23 & FY24 Retro-commissioning	Sustainability Action Planning & Retro-commissioning (SE region of US)	Birmingham, Montgomery, & Tuscaloosa, AL; Chattanooga, Knoxville, & Nashville, TN; Gainesville, Orlando & Tallahassee, FL; Louisville, KY; Wilmington, NC
DLA	MIT LL / DLA Susquehanna, Pennsylvania Substation Relocation	Substation Relocation / PV-Generator Microgrid / EV	Berwick, PA

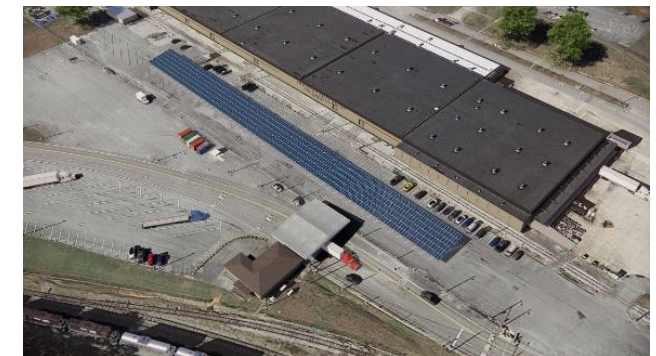
How?

Sample HDR Deliverables

- Climate Resiliency Plans
- Energy Resiliency Projects
- Sustainability Plans
- Installation Energy / Water Plans
- Electric Vehicle Planning
- Assistance with finding grants to improve sustainability



AF IEP Site Visit, Incirlik AB, Turkey

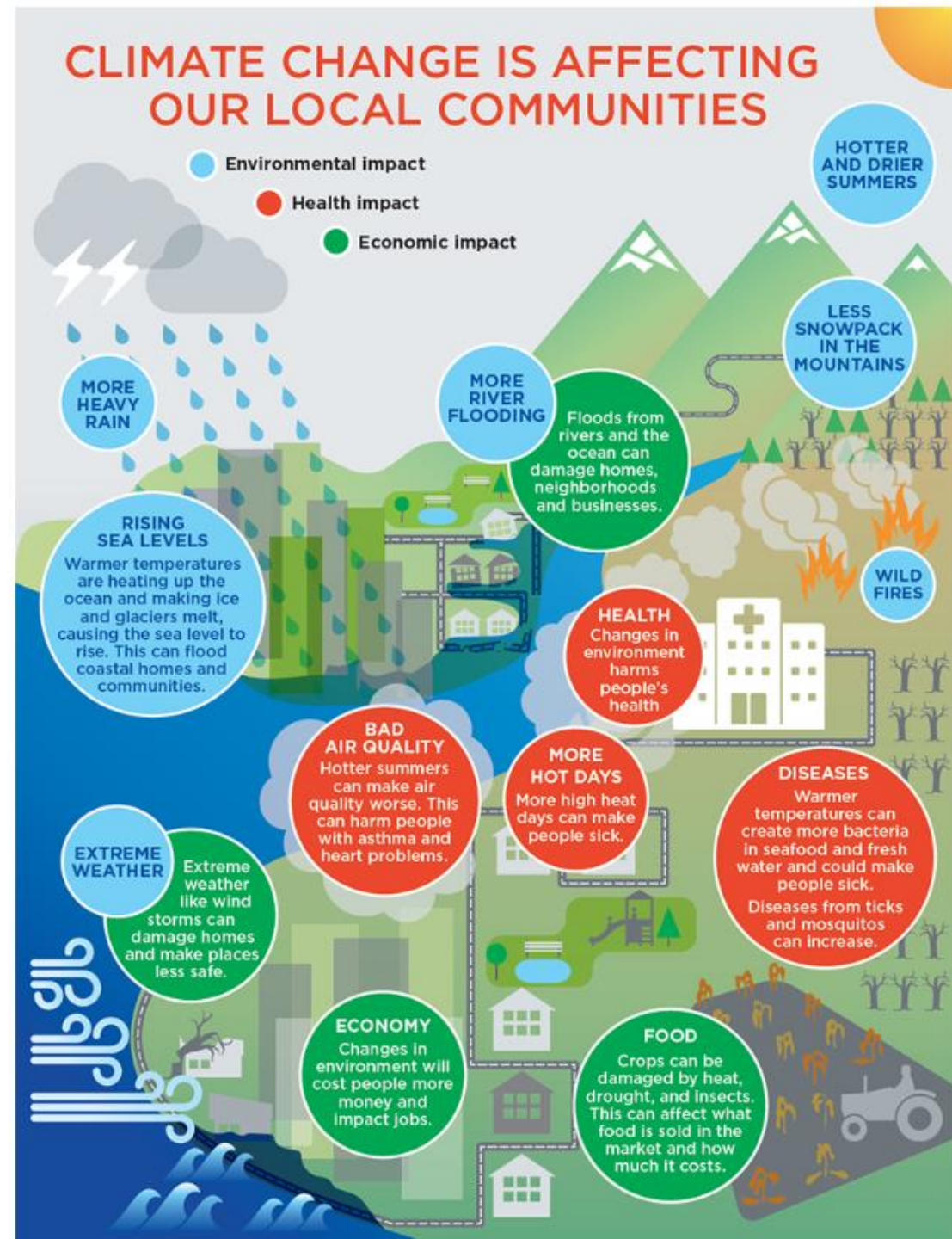


DLA Distribution Anniston Army Depot, B362 Microgrid

Outcome

Resilience – Operate Better

- How we build and manage our Communities and Installations impact each other. Operations separate, outcomes combined.
- Leveraging data tied to location (GIS) **eases coordination** between entities and **improves understanding of shared challenges**.
- We can eliminate the data barrier and information gap that occurs at the Installation boundary.
- Better coordination => improved understanding, use of funds, and outcomes.





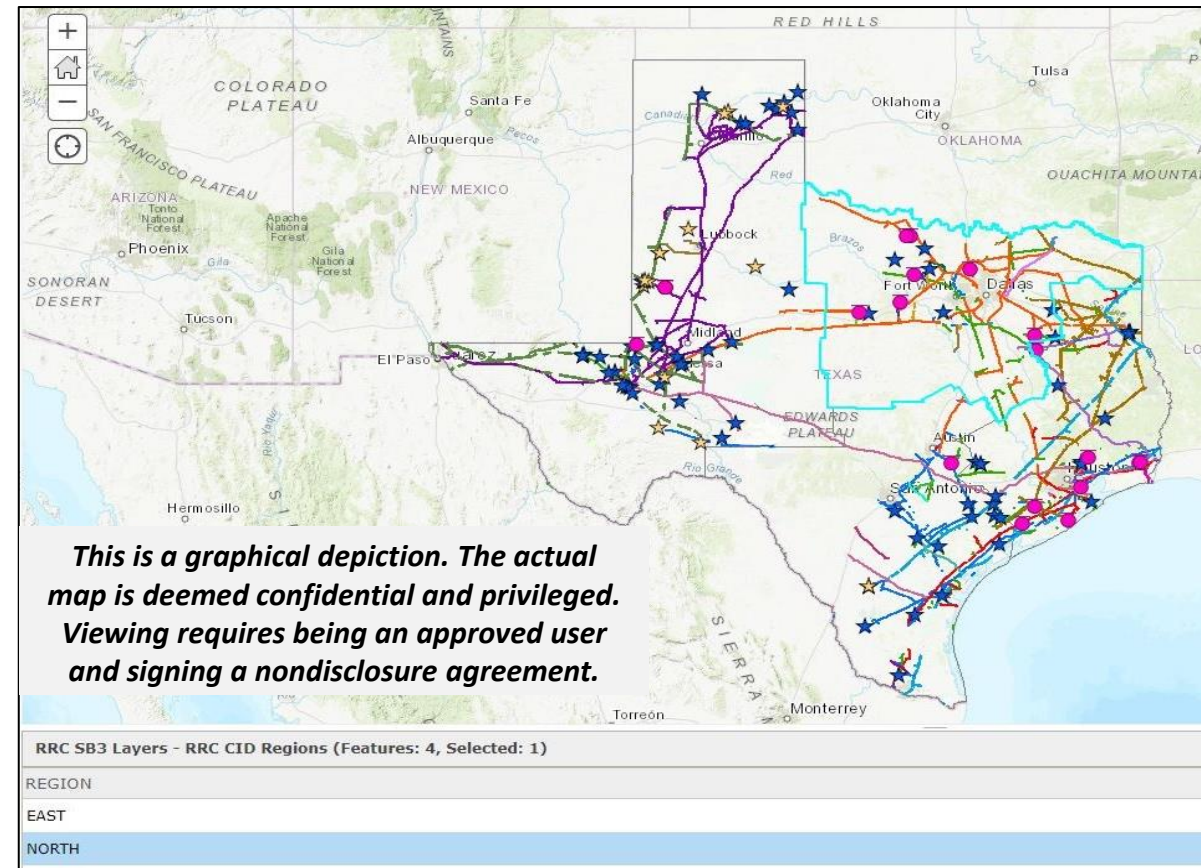
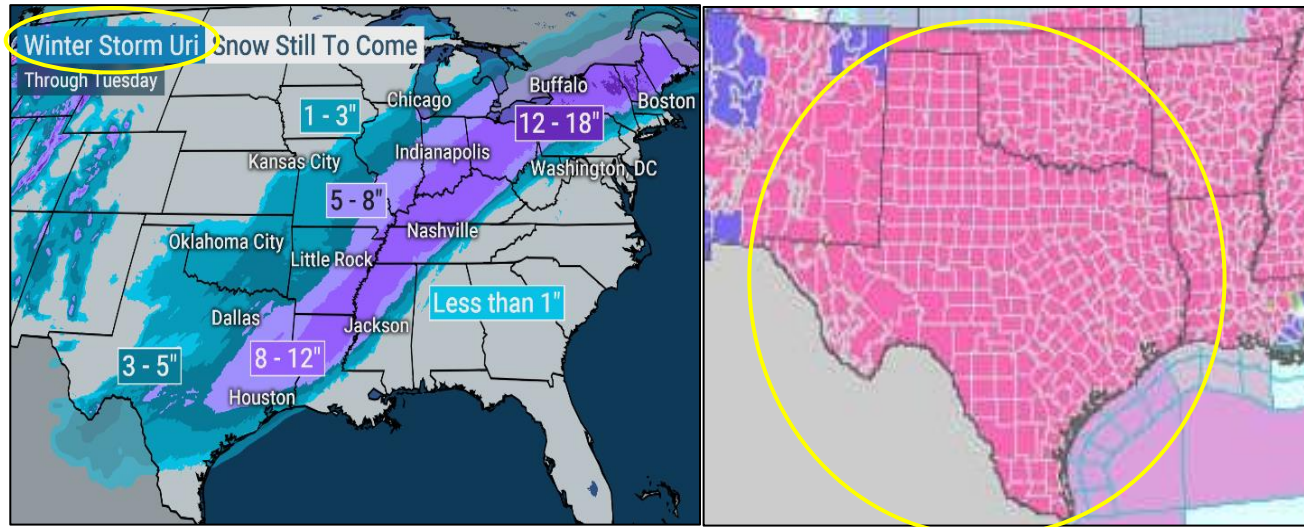
Jennifer Alley, PE, LEED AP
Sr Sustainability & Resiliency PM
Climate Lead

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Winter Storm Uri – February 2021

Winter storm arrives – Texas freezes over – Multiple power outages

GIS is maintained using Esri's ArcPro & ArcGIS Online



The Not-So-Good

Then It Got Better

- Legislation defined the requirement for an electricity supply chain map
- It defined critical infrastructure - the “features and attributes”
- It required a climate assessment in a formal report every two years

Community Resilience & Leadership

- **Leaders implement policy**

- “GIS provides tools to create and analyze designs, collaborate with stakeholders, and justify policies that create community resilience”

- **Leaders create plans**

- “By utilizing this framework, decision-makers can systematically enhance interactions among diverse stakeholders, creating a roadmap to improve community resilience.”

- **Leaders make decisions**

- “Identifying and quantifying community resilience before a disaster occurs is increasingly becoming a prerequisite for managers to make informed decisions and take action.”

- **CR + GIS = P²**

- Community Resilience (CR) enabled by Geographical Information Systems (GIS) results in Portfolio Preparedness (P²)

Achieving Portfolio Preparedness (P²)

- **DOD Resilient & Healthy Defense Communities Strategy**

- 280,000 buildings across 538 installations
- Approximately 26 million acres of land
- 2 million military and civilian personnel and their families.

- **Focus efforts by**

- Adopting human-centered requirements
- Optimizing DOD's footprint
- Transforming how DOD manages its portfolio

- **Community Resilience Considerations**

- What's on your installation and where is it located?
- Who's on your installation and why are they there?
- When do you need to know and how do you track it?



“Create environments that do not just meet utilitarian needs and compliance standards, but promote purpose, productivity, and camaraderie.”

“Ensure the scale and scope of its infrastructure is aligned with the needs of DoD's people and their mission.”

“Adopting a sustainment management strategy to help target investments that have the greatest impact on the condition of DoD facilities.”

Creating and managing credible data that is available in real-time



U.S. ARMY



From Desktop to Geospatial Gateway: Modernization of U.S. Army IMCOM

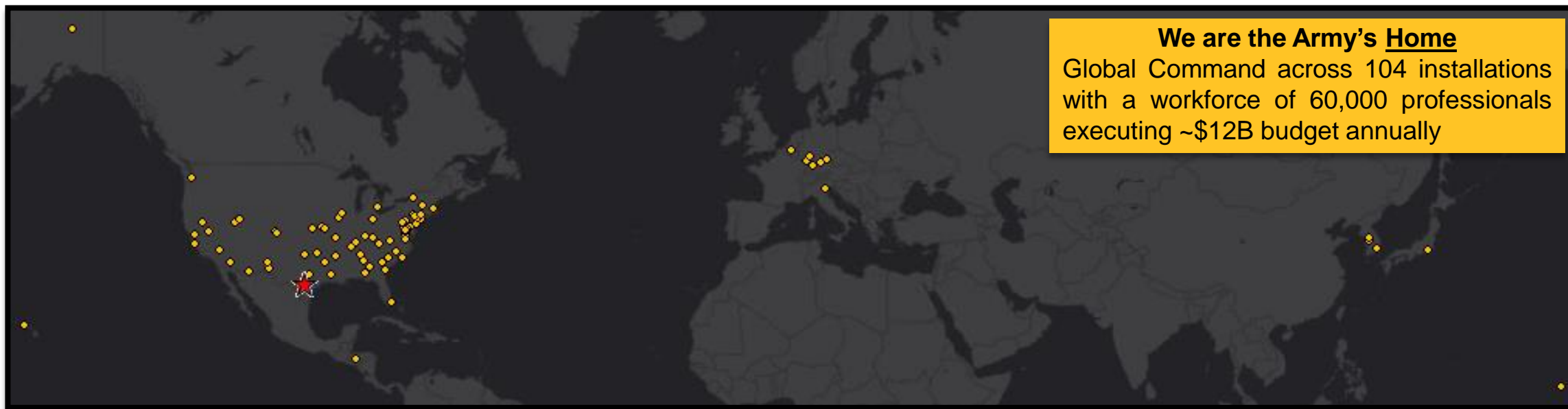
Kevin Lariscy - U.S. Army Installation Management Command



Installation Management Command (IMCOM)

Mission: IMCOM delivers quality base support from the Strategic Support Area, enabling readiness for a globally responsive Army.

Vision: Every installation delivers superior base support, enabling readiness and the highest quality of life for our Soldiers, Families, and Civilians.



We are the Army's Home
Global Command across 104 installations
with a workforce of 60,000 professionals
executing ~\$12B budget annually

IMCOM Core Competencies



Soldier/Family Services



Infrastructure



Readiness/Deployability

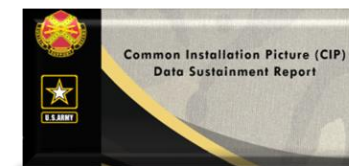


Base Operations

IGI&S Operations Center



Direct Garrison Support



HQ IMCOM Program Support





Hi Bob! I need a map.





Why change?

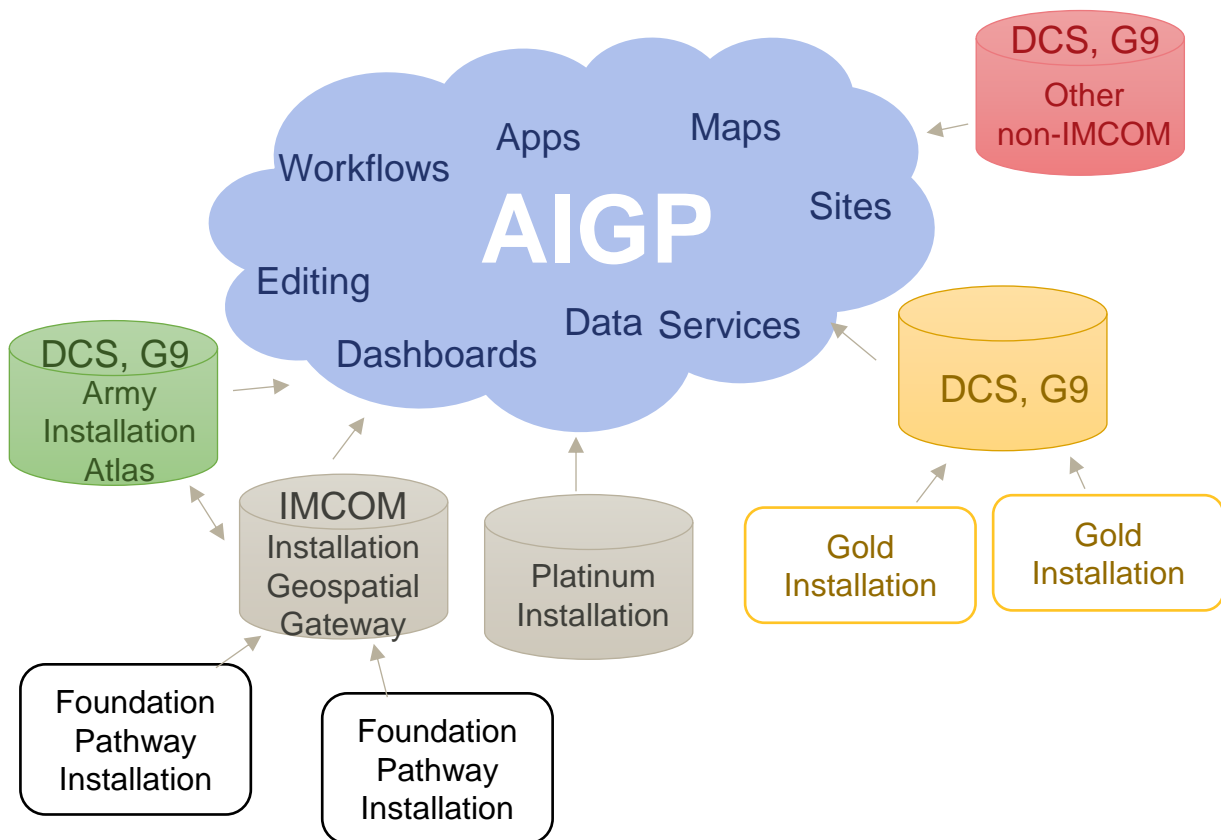
Factors Necessitating Change		Strategy for Addressing	
IGI&S data and capabilities are being selectively used, due to Commercial-Off-The-Shelf (COTS) GIS hardware requirements and software complexity, missing opportunities to use GIS in decision making	Selective use of IGI&S Data and Capabilities	Accessible Web GIS	Make COTS WebGIS, and it's easy to use apps, accessible to all echelons of IMCOM to improve availability of data and analysis
IGI&S staff at installations are struggling to problem solve IT issues individually	IT Issues	Centralized Assistance	Provide centralized assistance to eliminate or minimize the system administration aspects of GIS software management
Existing GIS software at installations is performing poorly because of growing IT frictions, such as implementation of the Joint Regional Security Stack (JRSS) IT system/process	Poor Performance of Existing Software	Develop Workflows	Identify COTS GIS software deployment and configuration patterns and develop workflows that overcome IT frictions. Triage garrisons first, then develop long-term solutions
Risk Management Framework (RMF) Assess Only certification process for COTS GIS software is very burdensome if left to individual garrisons	Burdensome RMF Access Only Process	Inherit RMF Certifications	Address RMF requirements in coordination with the Army organizations who have financial responsibility for the COTS software. Inherit RMF certifications from those organizations to lessen installation impact
The Army Data Plan asserts that all Army data is to be VAUTI. Current IT challenges make VAUTI difficult or impossible to achieve for IGI&S data	VAUTI Difficult to Achieve	Develop Standards and Processes	HQ IMCOM will continue to work with DCS, G9 to develop standards and processes, and leverage enterprise systems, that will support making IGI&S data VAUTI and turning GIS data into valuable information accessible across the Army to both GIS consumers and other authoritative systems of record.
Best available data consolidated at a quarterly tempo is insufficient for today's operations	Quarterly Data Consolidation Insufficient	Use Service Based Data	Use a service-based method for data consolidation to minimize manual tasks, speed up processing, and increase frequency of data sharing
GIS staff are time constrained, and can't tackle large real property data development efforts on top of their daily work	Limited Staff Time	Provide Staff Augmentation	Provide strategic centralized staff augmentation, smart tools, and automation processes to address priority data gaps
GIS staff efficiency has plateaued after years of limited time in training, leaving them unable to take advantage of improvements in COTS GIS	Limited Staff Training	Develop Task Training	Develop a collaborative task-based training approach to advance staff from good practices to best practices on software and processes





Installation Management Command (IMCOM)

- ✓ Tiered responsibility, capabilities, and access
 - Platinum, Gold, Foundation Pathway



Function	Foundation Pathway	Gold	Platinum
	Living with Mom & Data	Condo Scenario	House Scenario
Portal for ArcGIS access	Through web apps and services created by IMCOM IGI&S Operations Center	Shared instance with several installations	Full capabilities within dedicated, installation-specific instance
Cloud hosted geodatabase managed by	IMCOM IGI&S Operations Center	Installation	Installation
Geospatial data services hosted by	IMCOM IGI&S Operations Center	Installation	Installation

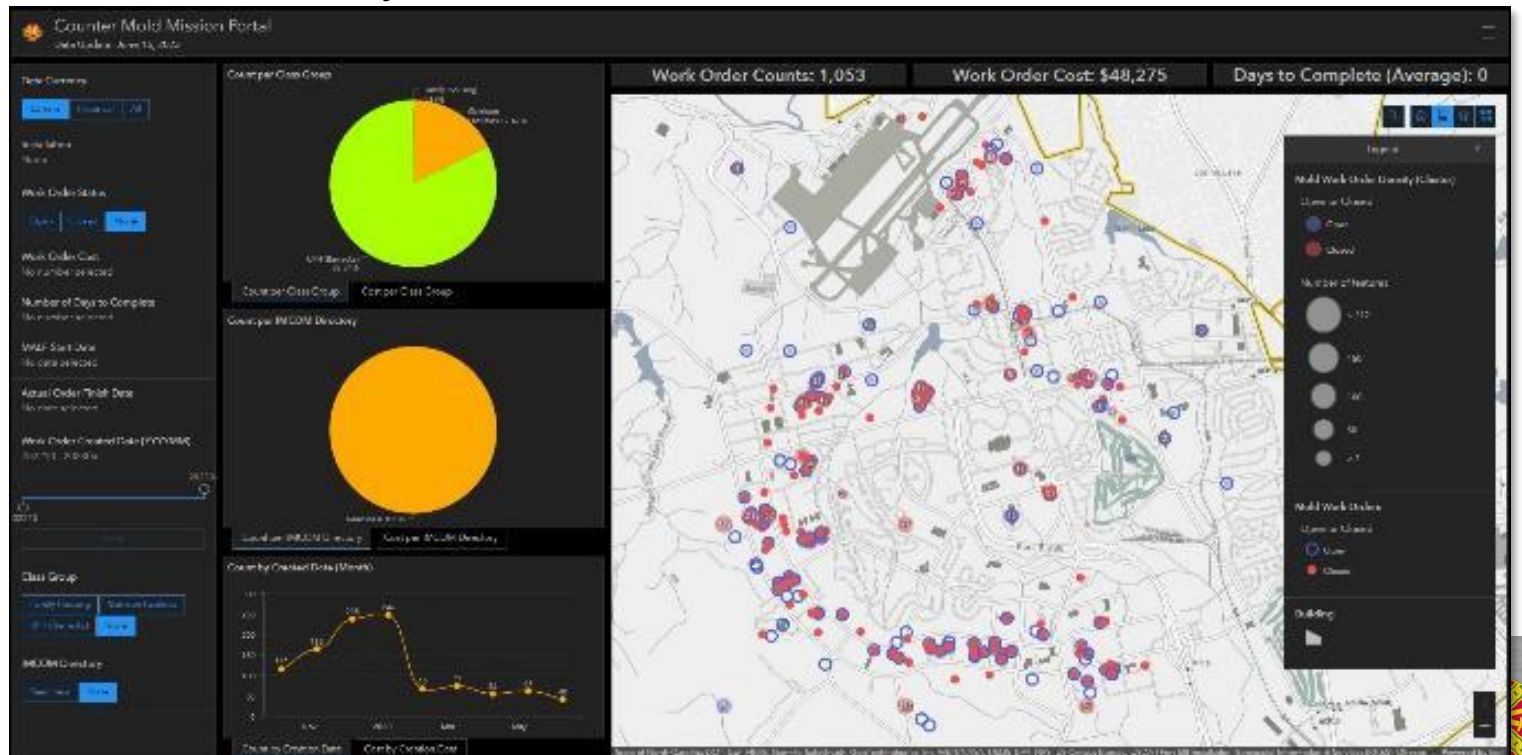
IMCOM will manage 23 Installations





Counter Mold Mission Portal

- Mold remediation work orders are summarized in a dashboard
 - Updated weekly.
 - Excel sheet is appended to an Enterprise GDB table with a Python script.
 - A view performs joins and derives new columns.
 - Data published in a registered data store, products automatically updated.
- Filters, charts, and graphs summarize data by:
 - Directorate
 - Installation
 - Dates
 - Building type
 - Cost
 - Open or closed orders
 - Days to complete
- Map view visualizes data by
 - Open or closed orders
 - Hot spot clusters





USAG Alaska Master Planning Portal

- Living plan connected to IGI&S/MP data in IMCOM IIGG
- Built with ArcGIS Experience Builder

USAG ALASKA Master Planning Portal

Real Property Master Plan Components

- Vision Plan
- Master Plan Explorer
- Installation Development Plan (IDP)
- Arctic Strategy
- Installation Planning Standards (IPS)
- About the RPMP
- Climate Resilience
- Quality of Life

VISION PLAN

REAL PROPERTY VISION & GOALS

USAG Alaska's planning vision is to create a *customer-focused, mission-driven, energy-efficient Garrison* in an Arctic environment through compact districts, versatile buildings, and interconnected transportation networks.

- Goal 1: Customer-Focused/Mission-Driven
- Goal 2: Energy-Efficient Installation
- Goal 3: Compact Districts
- Goal 4: Versatile Buildings
- Goal 5: Interconnected Transportation Networks

Access the ADP PDF

- Notional Growth Area
- Fort Greely Growth Boundary
- Fort Greely Buildings (MNA)

Mapax. Powered by Esri





Operation Roi Recovery Dashboard

UNCLASSIFIED//FOUO

UNCLASSIFIED

https://aigp-igg.obs.army.mil/portal/apps/dashboards/2ce3110f4eeb4859a75ea4cc57cde56d

Roi Recovery (R3) - Briefing Dashboard

FACILITY STATUS	
FACILITY	BLDG
2000 GAL POLLUTANT CATCHMENT TANK	8477
AAFES LAUNDRY/VENDING PAVILION	8107
ACTIVE PADS	8998
ADMINISTRATION,ALTAIR OPS,TRANSFORMER	8110
AIR TERMINAL, MULTIPURPOSE	8035
AKADRIK COMMUNITY "C" BUILDING	8212
ALCOR CORRIDOR	8232
ALCOR, RADAR ANTENNA	8141
ALTAIR ANTENNA, RADAR	8111
ALTAIR TUNNEL	8113
ALTAIR, UTILITY BUILDING	8112
ARMY OPTICAL STATION	8104
BACHELOR QUARTERS, AJAX	8011
BACHELOR QUARTERS, APACHE	8012
BACHELOR QUARTERS, NIKE	8114
BACHELOR QUARTERS, RALIK "B"	8213
BACHELOR QUARTERS, RATAK "A"	8211
BACHELOR QUARTERS, SPARTAN	8115
BACHELOR QUARTERS, ZEUS	8017
BACHELORS QUARTERS, SPRINT	8103
BICYCLE REPAIR/HOBBY SHOP	8102
BOAT YARD	8246
BORESIGHT "A" EQUIPMENT BLDG.	8204
BORESIGHT TOWER	8203

PERSTAT				
Company	X-PAT	rmi	3rd Island	
V2X	56	4	159	
Chenega	6	3	0	

DISPLACED		CASEVAC ESTIMATE		
Initial	80	Litter (Boat)	1 +3 +1+...	KWAJ>RO...
Current	0	Ambulato...	1.5hr+25...	Notificatio...

MARINE AVAILABLE ASSETS	
VESSEL	REMARKS
LCU 2015	
Patriot (PAT)	Replacment engines ODC pr...
Catamaran (CAT- 5)	Srenson

MARITIME MOVEMENTS NEXT 24-48 HOURS				
MSN#	DEP TIME	ETA	DEST	VESSEL
A1101-K	0600	1105	KWAJAL...	LCU
A1101-R	0630	0930	ROI	PATRIOT
A1102-K	1500	1800	KWAJAL...	PATRIOT

AVIATION AVAILABLE ASSETS		
AIRCRAFT	STATUS	REMARKS
680 - Fixed Wing	green	
691 - Fixed Wing	red	Scheduled Mainte...
LUH-72	red	4x NMC

AVIATION MOVEMENTS NEXT 24HR				
MSN#	KWAJ DEP	ROI DEP	AC	# PAX
	0650	0720	680	
	0755	0825	680	
	1000	1030	680	
	1425	1455	680	



POTABLE WATER	
RAW 2.1M gal	TREATED 87K gal
DOS 60 gal / last 24 hrs	
COLLECTED 100K gal / last 24 hrs	
BOTTLED WATER	
PALLETS 39	DOS 25

FUEL			
DIESEL 664 gal	MOGAS 1090 gal	RMI SALES Last 24 253 gal	SBM 3018 gal

FOOD		
HEADCOUNT (Last 24)		
DOS 81	Breakfast 86	Lunch 89
		Dinner 64

CRITICAL UTILITIES & INFRASTRUCTURE UPDATES	
Utility Type	Remarks
Potable Water	Water is running throughout Roi-Namur. Reverse osmosis produced 34K gal of permeate last 24h, ...
Non-Potable Water	FMC 1 of 2 axels. 4x wastewater pumps on station.
Sewer	Main Lift Station pipe leak issue. Fix ongoing. All other Lift Stations FMC.
Incineration	Equipment is FMC but unable to burn daily trash production levels. Open Burn Pit operation - ong...
Power	Power Plant FMC. Analysis ongoing of the A/249 Prime Power submitted report.

ROI UPDATE	
LAST 24	
<ol style="list-style-type: none"> Execute flight line operations SeaBee work projects Water plant seawall repair 	
CURRENT 24	
<ol style="list-style-type: none"> HAZMAT / XO / SAFETY Downtown debris removal Asbestos - Sprint (finish) SBM fuel pump repair Saltwater leak Surf/TDX road SeaBee projects work Open Burn Pit preparation 	
NEXT 24	
<ol style="list-style-type: none"> Downtown restoration Nike restoration Outrigger Restoration Water Plant seawalls Monitor UXO/HAZMAT on island 	
PRIORITIES OF WORK	
<ol style="list-style-type: none"> HAZMAT/UXO/SAFETY Cleanup of Roi Open Burn Pit operation SeaBee project execution 	
NEEDED ON NEXT VESSEL	
Item/Service	Priority
Vehicles / Golf Carts	High
DFAC Cold Service Li...	High
SeaBee Backhoe	High
SeaBee 2x20' contain...	High

STATUS	DESCRIPTION
	No or negligible damage or degradation
	Min to MOD damage or degradation
	Significant damage or degradation
	Unknown Status
	Probable or total loss/Offline

**STATUS CONDITIONS ARE FOR OPN R3 EFFORTS AND DO NOT REFLECT ISR SERVICE RATINGS - POC LTC Travis Lynch : travis.j.lynch.mil@army.mil : 808-580-3530

Windows taskbar showing search, task icons, and system tray with date/time: 9:40 AM 4/19/2024



Thank You!





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SCIENCE
OF
WHERE**[®]

