



City of Ridgecrest, California

**Military Installation
Resiliency Study/Risk
Assessment of China
Lake, Ridgecrest, and
Surrounding Areas**



CITY OF RIDGECREST, CALIFORNIA

Military Installation Resiliency Study/Risk Assessment of China Lake, Ridgecrest, and Surrounding Areas

Agenda

- Introductions
- Project Overview
- Project Approach
- Technical Process Overview
- Next Steps
 - Schedule
 - Roles & Responsibilities

Stantec Overview

- We live, work, and raise our families in the communities our clients defend and sustain.
- Stantec unites more than 22,000 specialists working in more than 400 locations. We collaborate across disciplines and industries to make facilities, infrastructure, energy, and community development projects happen.
- Each of our projects—supporting defense, compatible community development, infrastructure, security, and resilience—are given personal and professional attention by our experts. Our goal is to protect the military mission and support continued community growth and economic development.
- Our diverse team of experts provide planning, design, and engineering services to communities, facilities, infrastructure, and natural resource projects across the globe.





Core Project Management Team



Jim Paulmann, FAICP
Principal-in-Charge



Cyrena Chiles Eitler, AICP
Project Manager



John Malueg, PE
Resiliency Advisor



Derek Rapp, TE
Deputy Project Manager



Craig Bloxham
*Cardno - NAWS China Lake
Advisor*



Christine Davis, PMP
*Cardno - Deputy Project
Manager*



Lisa Beutler
Stakeholder Engagement



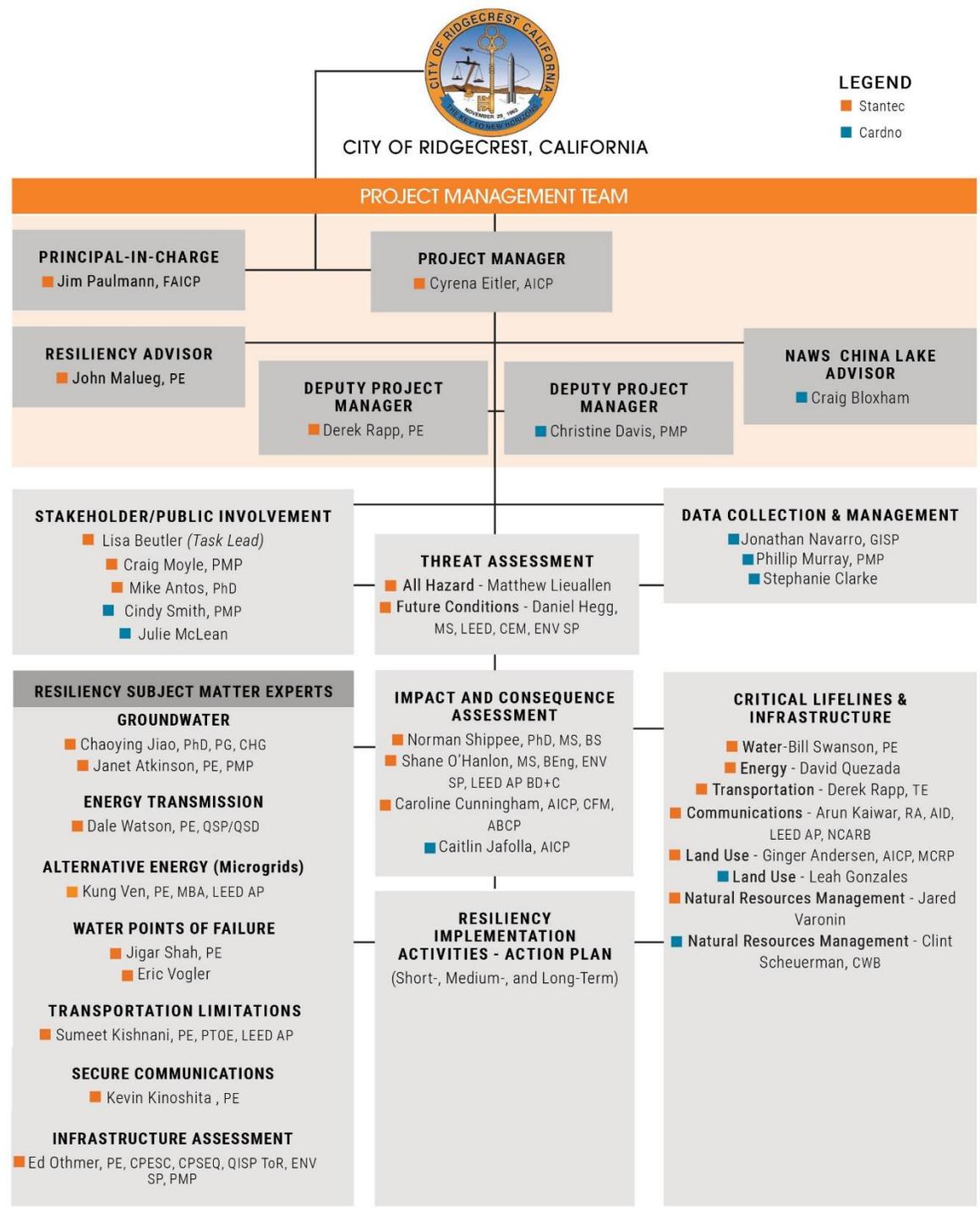
Shane O'Hanlon
*Climate Risk and Resilience
Assessment*



Caroline Cunningham, ACIP
*Climate Risk and Resilience
Assessment*



Stantec/Cardno Team



Project Overview

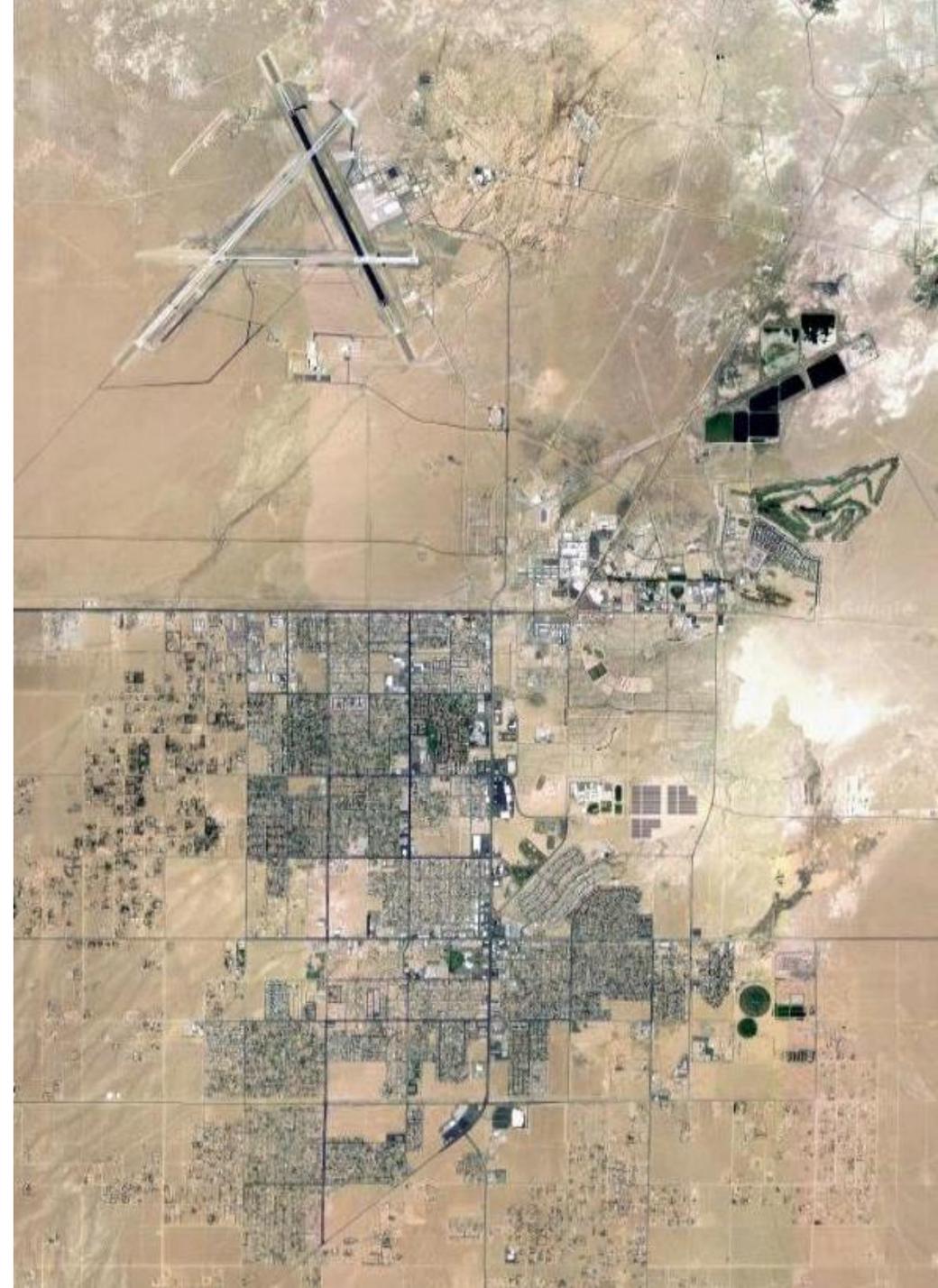
Community sponsored resilience planning process

City of Ridgecrest as Project Sponsor

Community Committee Structure

- Policy Committee
 - Members include decision makers, directors, military leaders and elected officials
- Technical Committee
 - Members include subject experts from surrounding jurisdictions, military personnel, business and community representatives, and special organizations
- Working Groups

Roles and Responsibilities



Policy and Technical Committee Members



Policy Committee

- Jed McLaughlin, Deputy City Manager, City of Ridgecrest
- Councilman Scott Hayman, Ridgecrest City Council
- Supervisor Phillip Peters, District 1, Kern County Board of Supervisors
- Captain Jeremy Vaughan, Commanding Office, NAWS China Lake (Ex-Officio Member)
- Dave Janiec, China Lake Alliance Executive Director

Technical Committee

- Travis Reed, Public Works Director, City of Ridgecrest
- Loren Culp, City Engineer, City of Ridgecrest
- Lorelei Oviatt, AICP, Director, Kern County Planning
- John Kersey, Community Planning Liaison Officer, NAWS China Lake (Ex-Officio Member)
- Renee Morquecho, Chief Engineer, Indian Wells Valley Water District
- Calvin Rossi, Region Manager, Southern California Edison
- Scott O'Neil, Executive Director, Indian Wells Valley Economic Development Corporation

Roles and Responsibilities

Project Sponsor

- City of Ridgecrest organizes Resilience Planning Team and Network to support the project
- **Convene the right people, organizations and resources to identify and address risks and vulnerabilities**
 - Shared and independent
 - Special attention to unique resilience requirements of installation
- Serves as **DoD Grantee**

Policy Committee

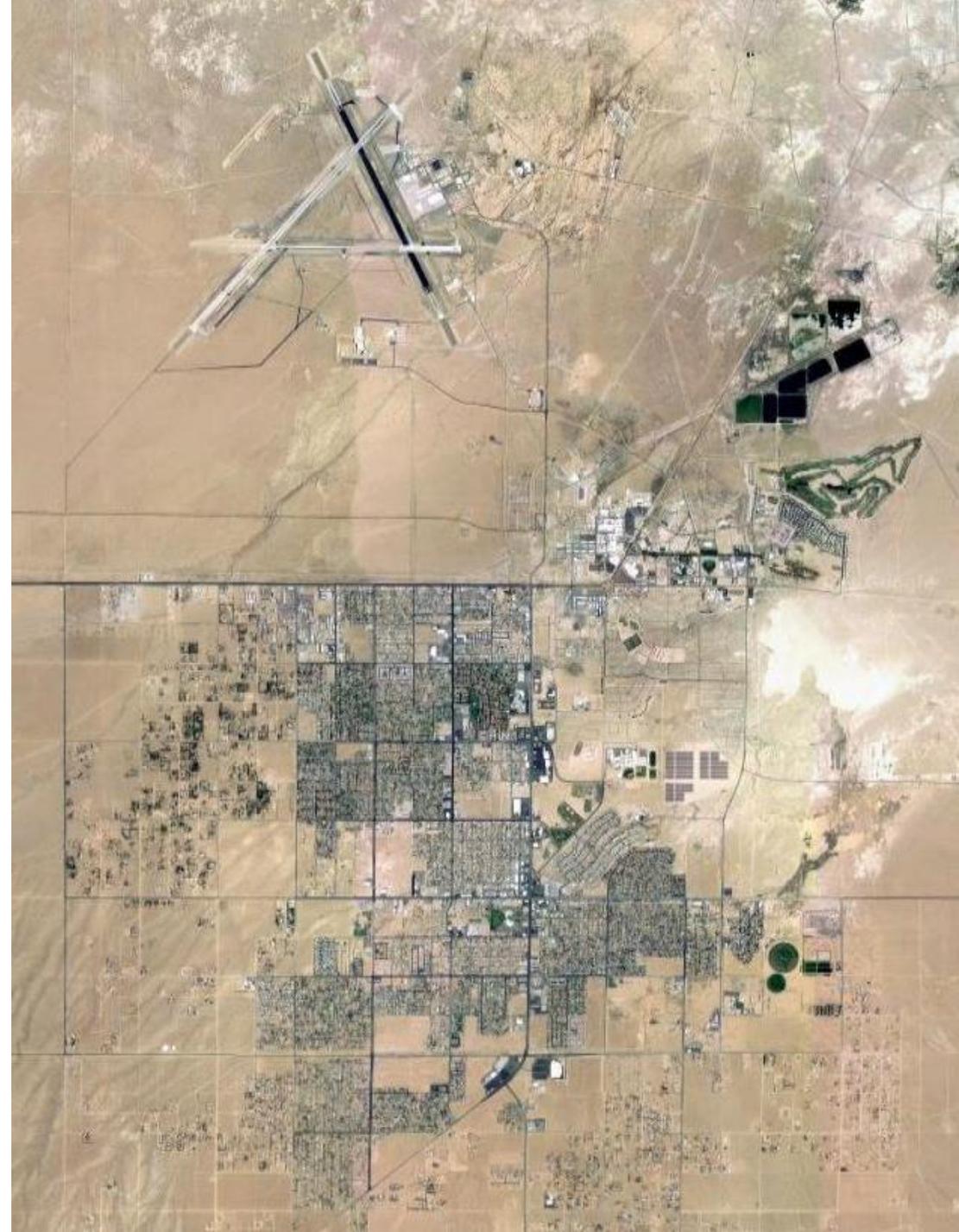
- **Serves as steering committee to guide planning process, coordinate efforts, accept final project deliverables**
- Develop effective strategies to enhance resilience, promote quality of life and public safety
- Work together to gather resources, data and contribute expertise to identify a path forward
- Define geographic boundary of study area
- Define network of systems, infrastructure, service and people needed to maintain both community and installation resilience

Technical Committee / Potential Working Groups

- Contributes to resilience planning process through knowledge, expertise, sharing and collaboration
- **Represents technical and subject matter experts**
- **Direct interface with Stantec Team** to identify and gather data and resources to support planning process
- Develop and recommend strategies and actions to present to Policy Committee

Project Approach

- Resilience is about making our communities and installations stronger, now and in the future, for everyone.
- **Resilience planning framework will enable the region, together with NAWS China Lake, assess shared risks and vulnerabilities with special attention given to unique resilience requirements for NAWS China Lake**
- Provide methods to assess risk and vulnerabilities not only independently but also in coordination with threats to installation resilience





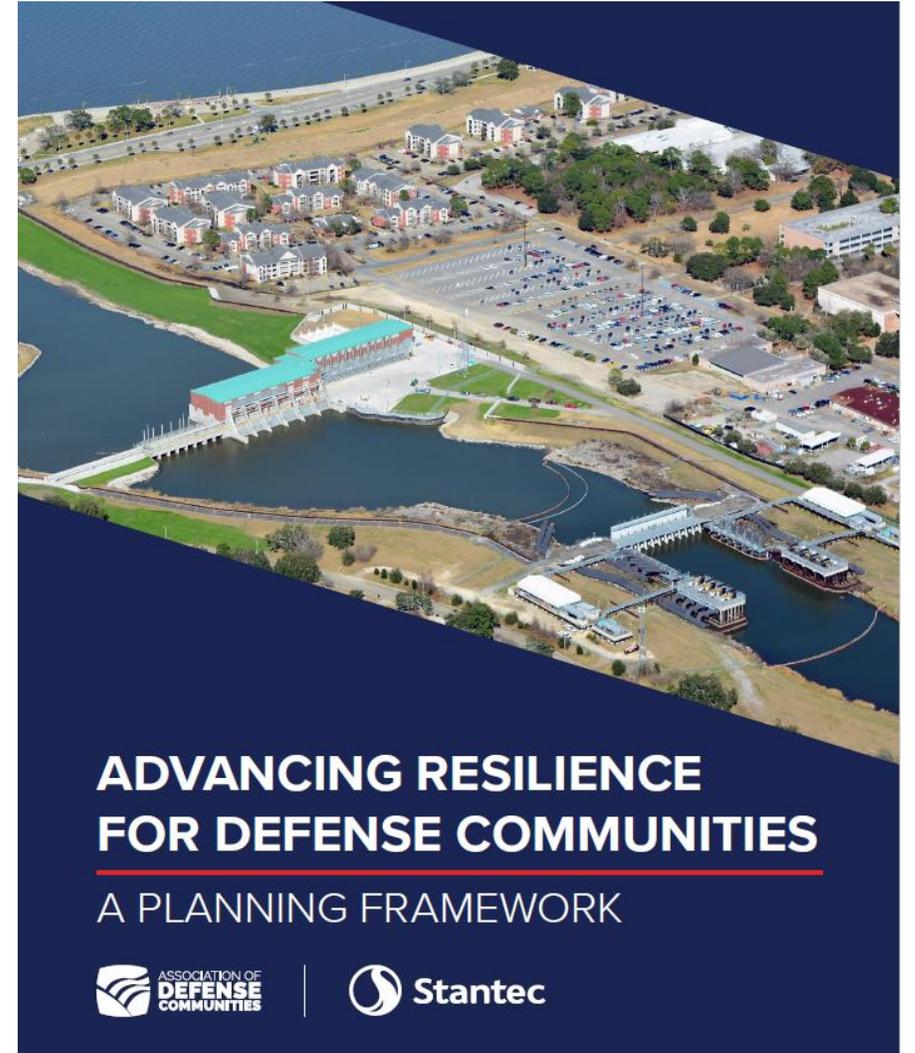
Military Installation Resilience

*“The capability of a military installation to avoid, prepare for, minimize the effort of, adapt to, and recover from extreme weather events, or from anticipated or unanticipated changes in environmental conditions that do, or have the potential to, **adversely affect the military installation** or essential transportation, logistical, or other necessary resources **outside of the military installation** that are necessary in order to **maintain, improve, or rapidly reestablish installation mission assurance and mission-essential functions.**”*

Source: FY 2019 National Defense Authorization Act

Advancing Resilience for Defense Communities

- Stantec research partnership with Association of Defense Communities (ADC)
 - Advance defense community resilience
 - Advance installation mission assurance and mission-essential functions
- **Defense communities and installations**
 - **MUST understand their collective risks and vulnerabilities**
 - Together they must plan, design, and finance a resilient future.
- Defense Community Resilience Planning Framework
 1. Convening effective stakeholders;
 2. Assessing shared risks and vulnerabilities;
 3. Prioritizing mitigation strategies and resilience projects;
 4. Leveraging funding



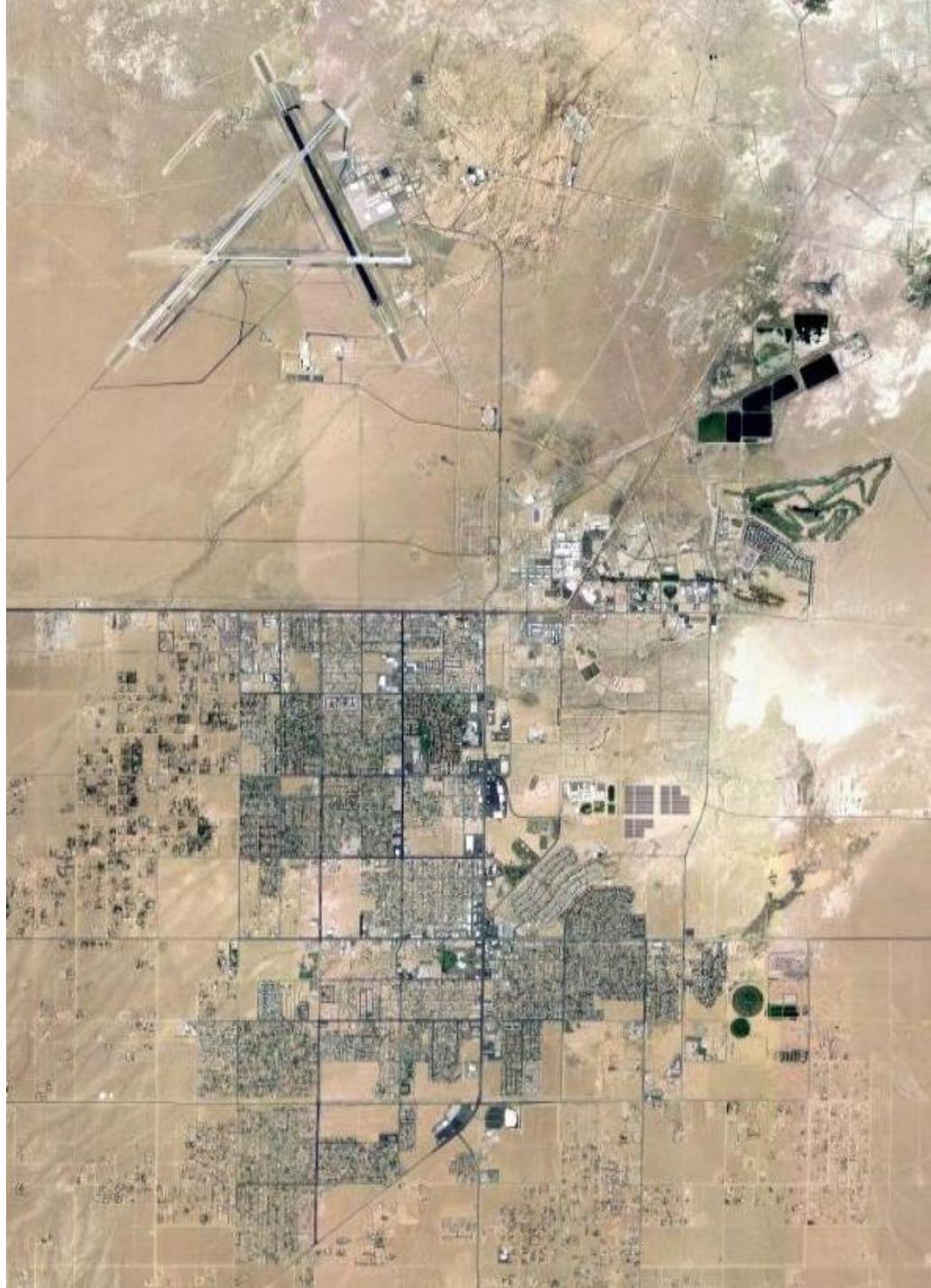
ADVANCING RESILIENCE FOR DEFENSE COMMUNITIES

A PLANNING FRAMEWORK





Technical Process Overview

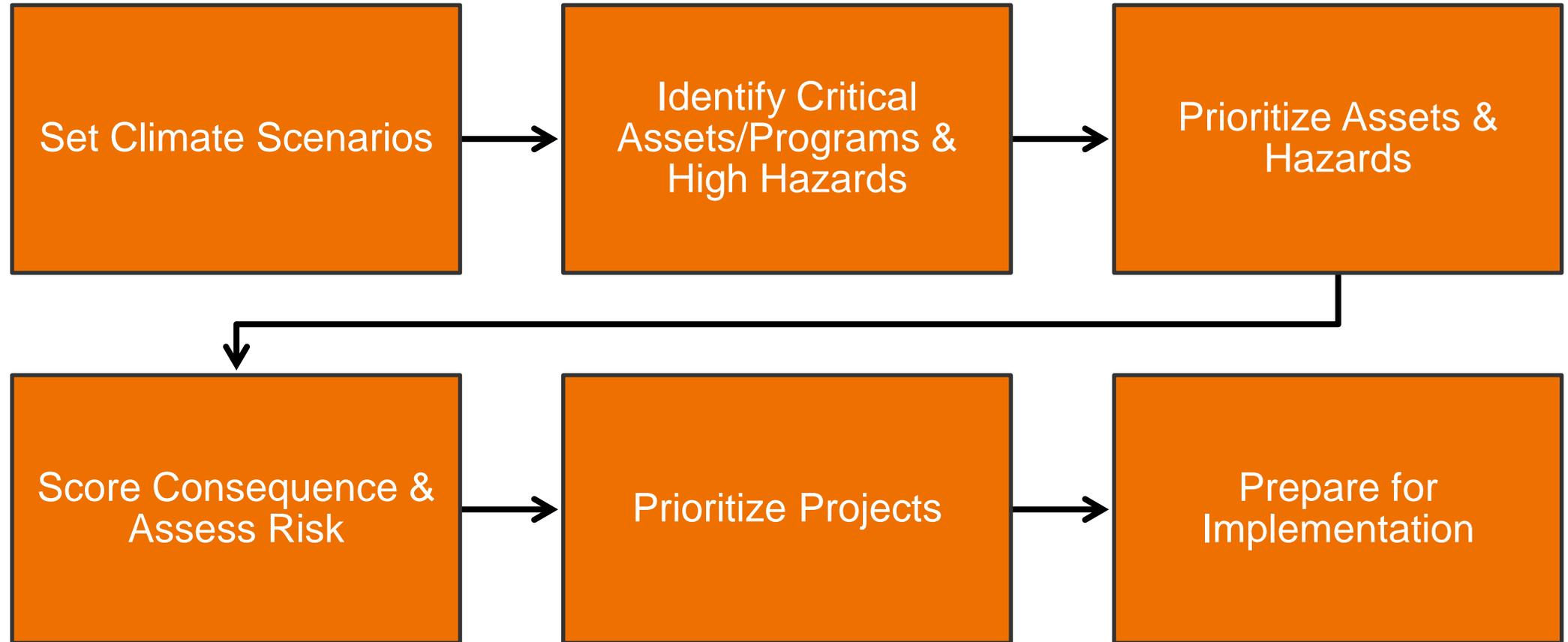




What Keeps You Up At Night?



Process for Military Installation Resilience Assessment



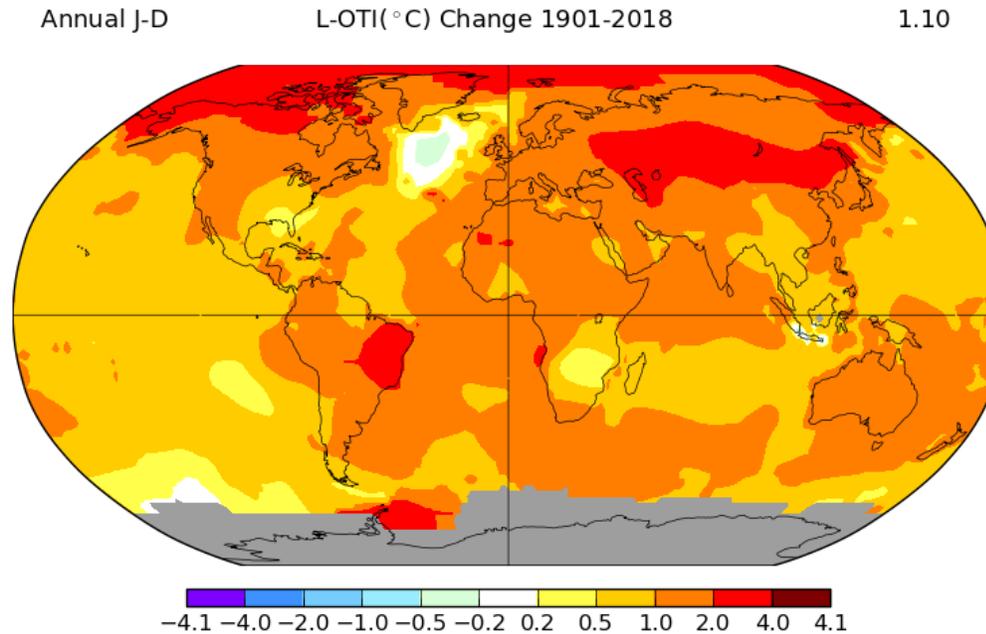
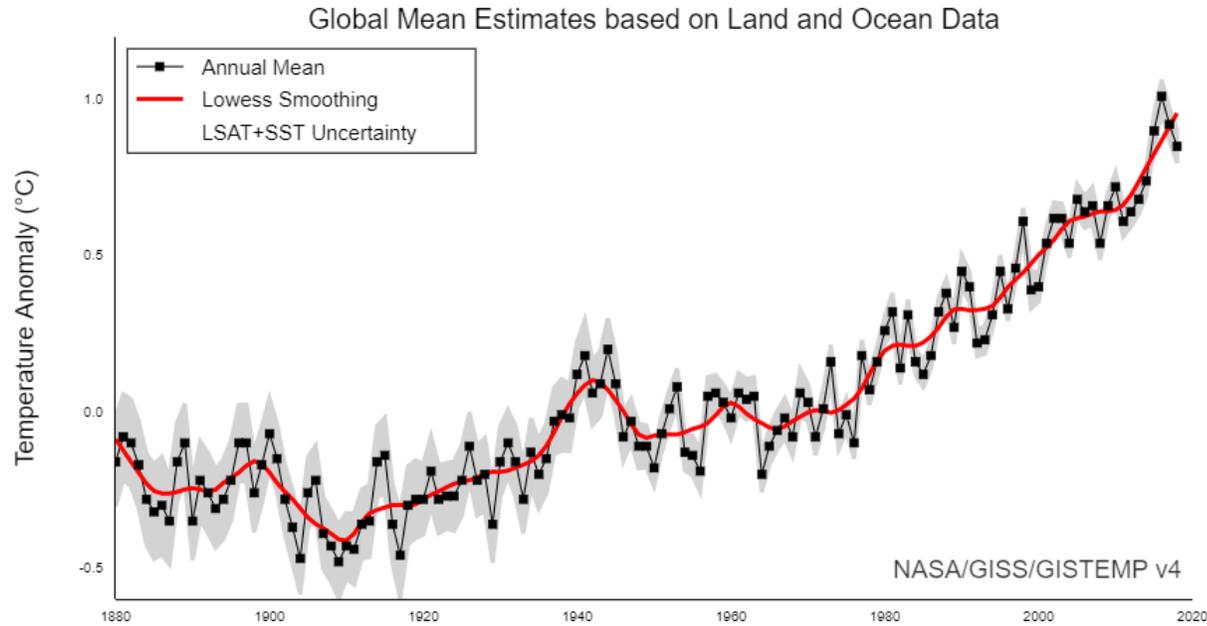


Resilience

Past \neq Future

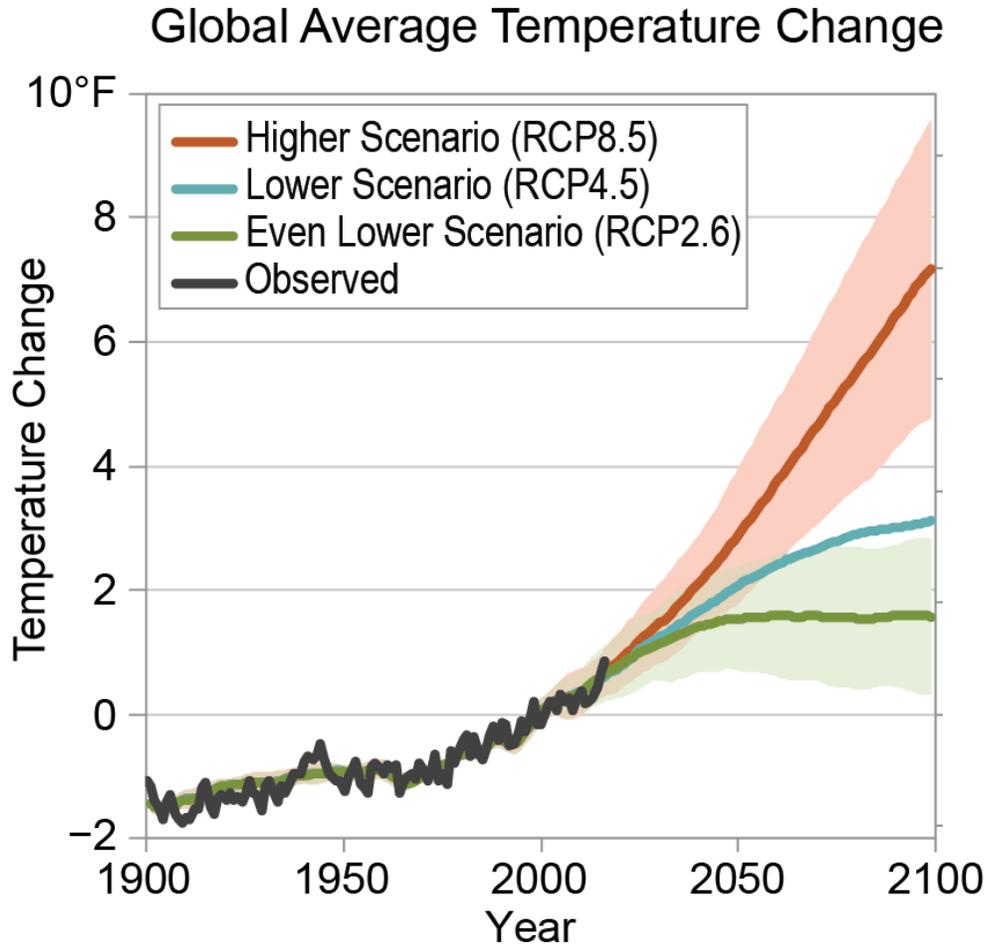
Building and planning codes, regulations, and standards are based on historical data

Climate Context





Future Climate Scenarios



Intergovernmental Panel on Climate Change (IPCC) Scenarios:

Representative Concentration Pathway (RCP) 8.5

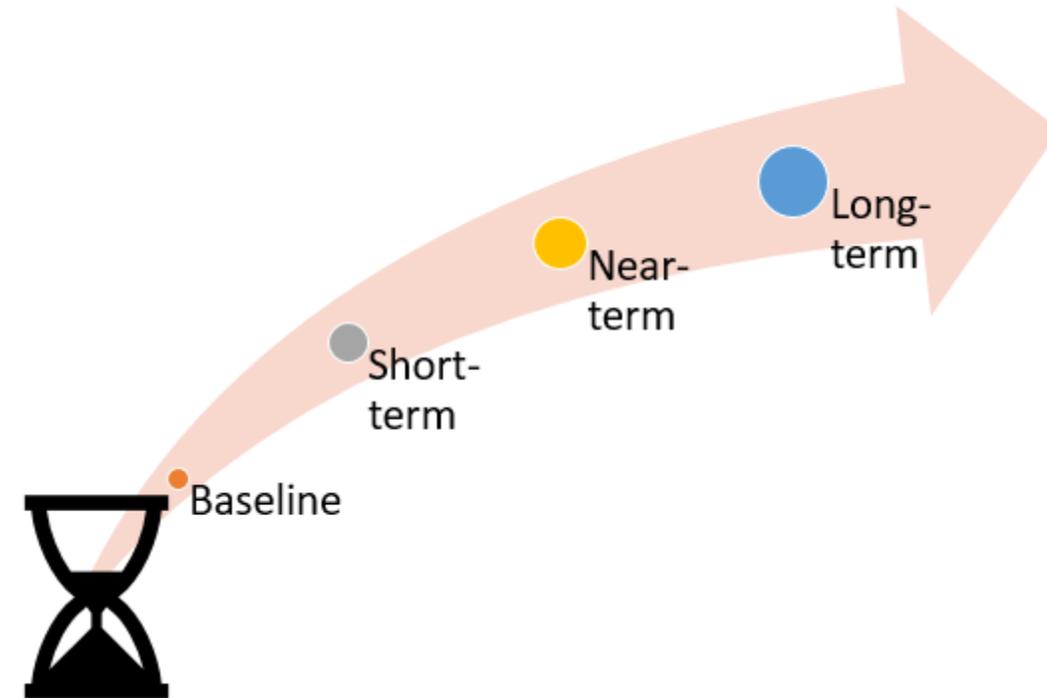
- “Business-as-usual” emissions scenario
- Temperature Change: **6.7°F** (4.7°F to 8.6°F)

Site specific data will be generated as part of this project



Time Horizons

- **Climate:** ~30-year average
- Current climate baseline:
 - **1981-2010**
- Future climate projections:
 - Based on asset lifecycle or design horizons:
 - Short-term: **2020s** (2011-2040)
 - Near-term: **2050s** (2041-2070)
 - Long-term: **2080s** (2071-2100)



Set Climate Scenarios

Identify Critical
Assets/Programs & High
Hazards

Prioritize Assets &
Hazards

Score Consequence &
Assess Risk

Prioritize Projects

Prepare for
Implementation



Community Lifelines



Water:
Groundwater, Water/Wastewater Treatment Plants, Distribution



Safety and Security:
Public Safety Building



Health and Medical:
Hospital, Stormwater Park, Nature-Based Solution, Health System



Energy:
Power Grid, Microgrids, Renewables



Communications:
Communication Updates



Transportation:
Road Elevation, Evacuation



Food, Shelter:
Community Housing





Ridgecrest/China Lake Critical Service Nexus

				Military, Community, or Both?			
		Asset	Location	Owner	User	Controller	Concerns / Notes
Lifeline Category	Energy	Power Supply	China Lake		Both		Seismic hazard risk; geothermal
	Water						
	Safety/Security						
	Food/Shelter						
	Health/Medical						
	Communication						
	Transportation						



Draft Hazard List

Natural	Non-Natural
Drought / Water Shortage	Power Grid Failure / Power Outage
Earthquake	Aircraft Accident
Extreme Cold / Freeze	Civil Disorder
Extreme Heat / Heat Wave	Cybersecurity Threats
Extreme Wind	Hazardous Materials and/or Chemical Release
Flood (Riverine and Pluvial)	Infectious Disease Outbreak
Landslides (Mud / Debris Flows)	Labor Strikes
Lightning	Supply Chain Disruption
Wildfire	Terrorism and Malevolent Attacks
Volcanic Hazards	

Prioritize Assets & Hazards

Impact = Critical Asset * Hazard Event

Engagement with Committee Members

- Prioritize assets
 - What are existing criteria used to determine criticality?
- Identify high hazards
- Survey to follow



Asset

X



Hazard

=



Impact

Set Climate Scenarios

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Score Consequence & Assess Risk

$$\text{Risk} = \text{Probability Rating} * \text{Consequence Score}$$





Risk Assessment Matrix

Consequence of Impact Rating	Catastrophic	5	5	10	15	20	25
	Major	4	4	8	12	16	20
	Moderate	3	3	6	9	12	15
	Minor	2	2	4	6	8	10
	Insignificant	1	1	2	3	4	5
			1	2	3	4	5
			Very Low	Low	Moderate	High	Very High
			Event Probability Rating				





Probability		
Occurrence	Qualitative Descriptor	Rating
>1:50 yrs	Highly Unlikely	1
1:10 – 50 yrs	Remotely Possible	2
1:1 – 10 yrs	Occasional	3
10/yr – 1:1	Normal	4
>10/yr	Frequent	5

Consequence	
Qualitative Descriptor	Rating
Insignificant	1
Minor	2
Moderate	3
Major	4
Catastrophic	5

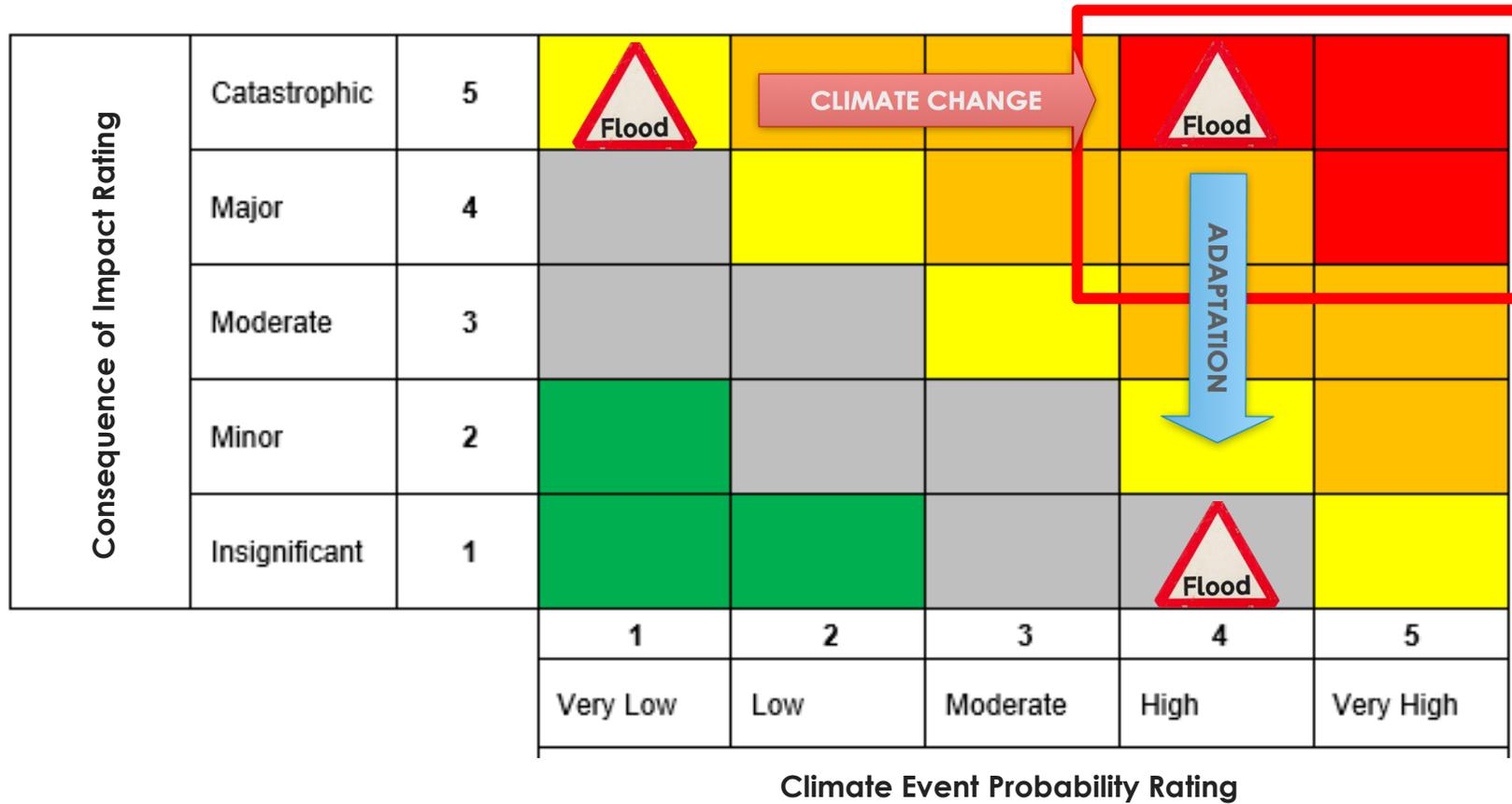
Consequence Criteria
Structural Integrity
Operational & Maintenance
Functionality

*Sample scales, to be adjusted based on research and feedback





Risk Assessment - Example





Prioritize Projects

Project Types



Prioritize Scoring Example

Example Project Scoring

Prioritization Metric		Weighting Factor	Score	Points	Notes
1	Environmental Considerations	20%	5	100	Significant impact due to p
2	Project Costs	20%	5	100	Cost < \$100K.
3	Project Benefits to Community (i.e., losses avoided)	25%	3	75	Large number of homes s outage.
4	Ease of Implementation	20%	5	100	Although situated in a resik the community, and constr
5	Urgency	15%	3	45	Fairly urgent with moderat events in the near term.
Total		100%		420	

Project Prioritization Scores

Project 1	500
Project 2	420
Project 3	400
Project 4	290
Project 5	240
Project 6	250
Project 7	250

Prioritization Legend:

VERY HIGH
HIGH
MEDIUM
LOW



Ready, Set, Implement

- Fund
- Monitor
- Adapt



Set Climate Scenarios

Identify Critical
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Prioritize Assets &
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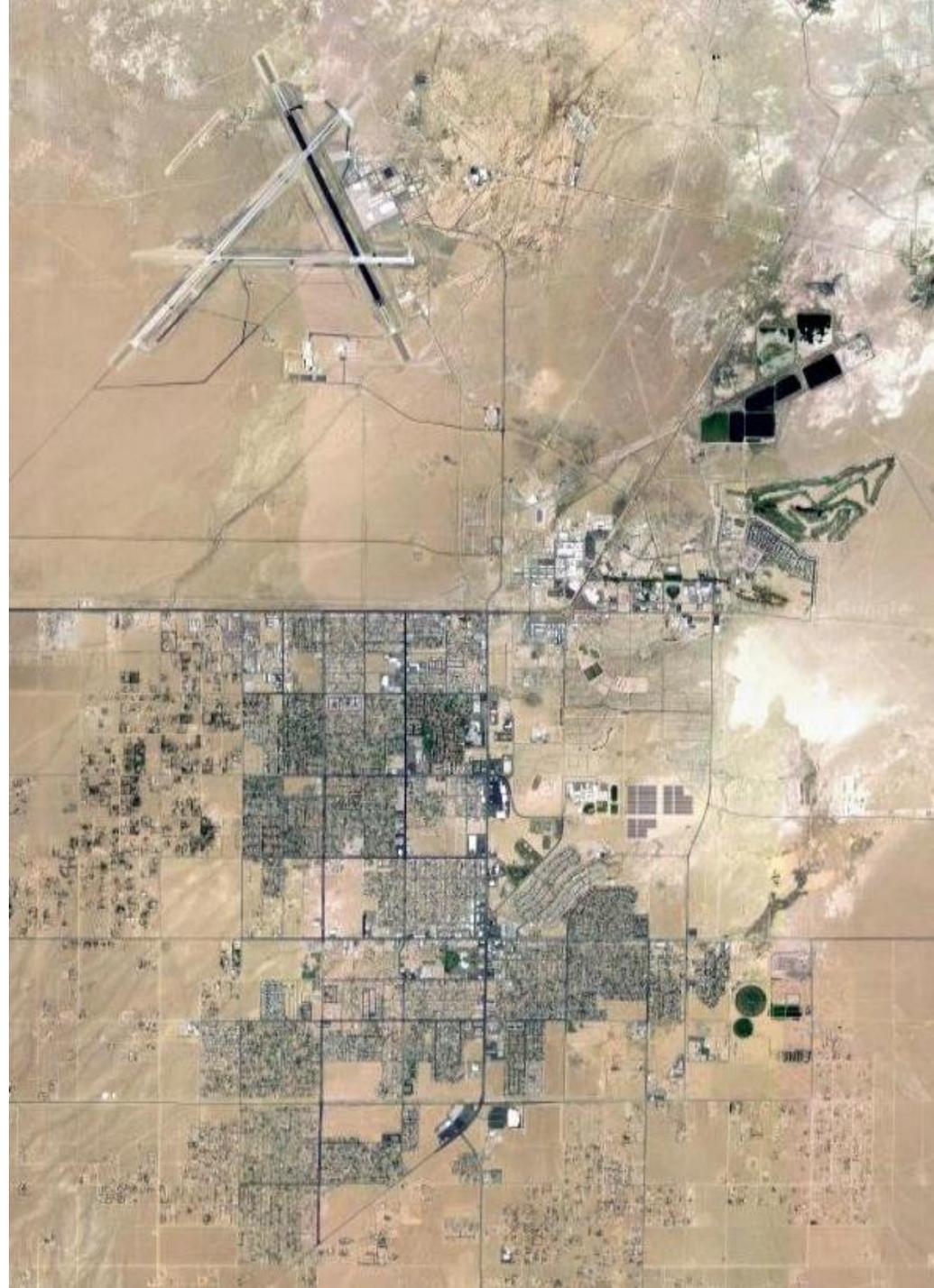
Score Consequence &
Assess Risk

Prioritize Projects

Prepare for
Implementation

Review

- Summary of Key Items Covered
- Schedule
- Roles & Responsibilities
- Next Steps
- Close & Questions





Summary of Key Items Covered

- Project Overview
- Climate Context
- Planning Scenarios and Timelines
- Critical Assets; Programs
- High Hazards - Preliminary
- Risk Assessment
- Project Prioritization
- Resiliency Project Implementation – Criteria and Alignment





Schedule

Tasks	2021							2022			
	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Apr
PM/General	Technical Kick-Off										
Climate Scenarios		Data Retrieval									
Critical Assets & Hazards*			Survey								
Prioritize Assets+Hazards				Workshop							
Assess Risk						Workshop					
Prioritize Projects								Workshop			
Implementation									Draft Action Plan	Draft Study Report	Final Report

*Access to installation and community data may impact this timeline



Roles & Responsibilities – Technical Process

Committee Members/Stakeholders

- Provision of data
- Completion of surveys
- Input on Assets, Criticality and Ownership
- Input on Hazards

Stantec

- Data request
- Survey administration
- Technical lead
- Drafting
- Facilitation, coordination

Cardno

- Data input
- GIS support



Next Steps

Distribution Survey #1

- Assets
- Hazards

Data requests on asset information

- Coordination via Cardno and Ridgecrest

Workshop #1

- Focus on survey results; Asset screening and prioritization
- August/September timeframe

Discussion & Close

