

Headquarters U.S. Air Force

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Integrating Water Resilience: Progress, Challenges, and Opportunities for Water Security



**Ms. Kelsey Semrod, CTR
SAF/IEE**

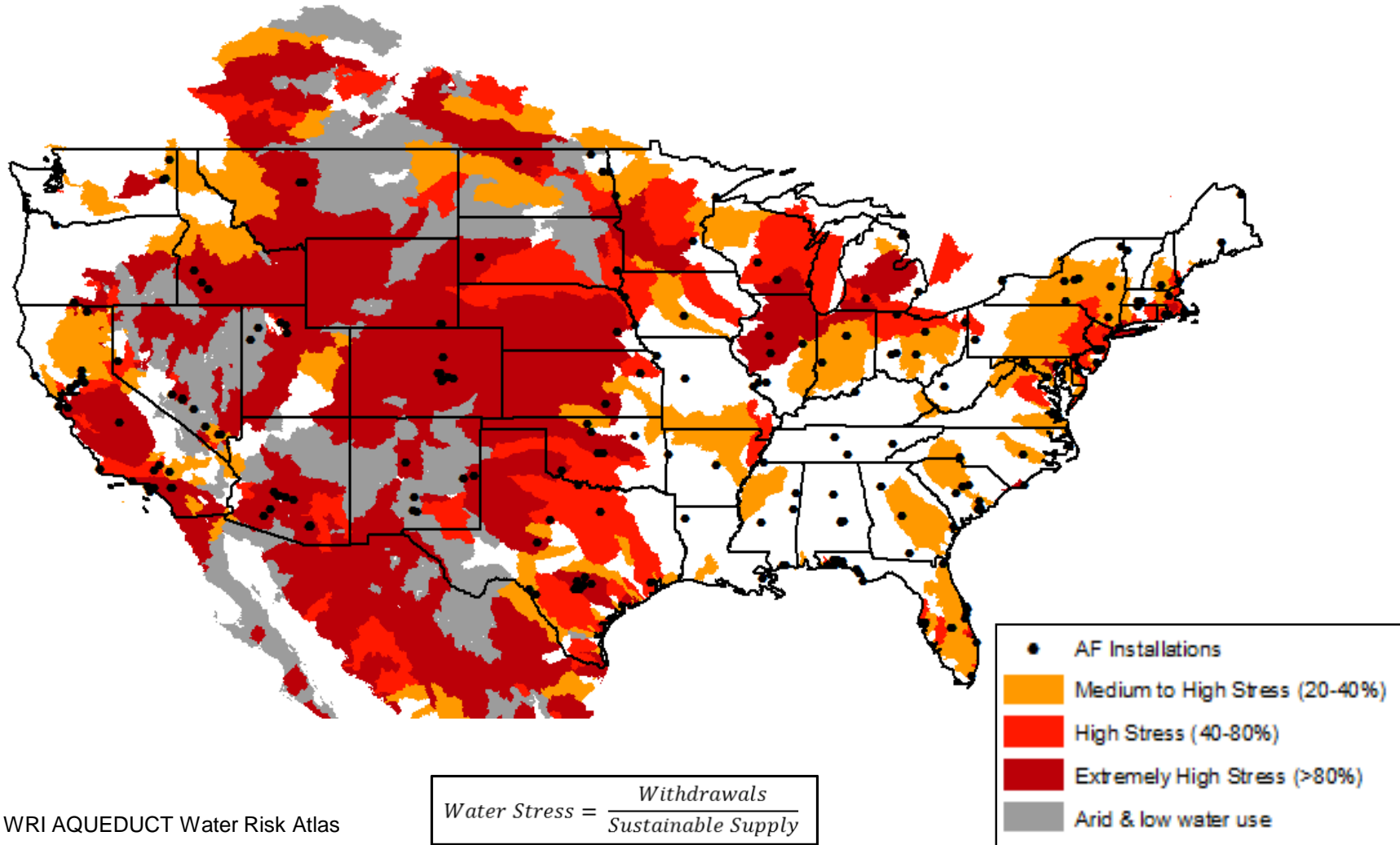
**DoD Water and Energy Forum
10 Dec 2019**

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Threat Picture - 2030



Source: WRI AQUEDUCT Water Risk Atlas



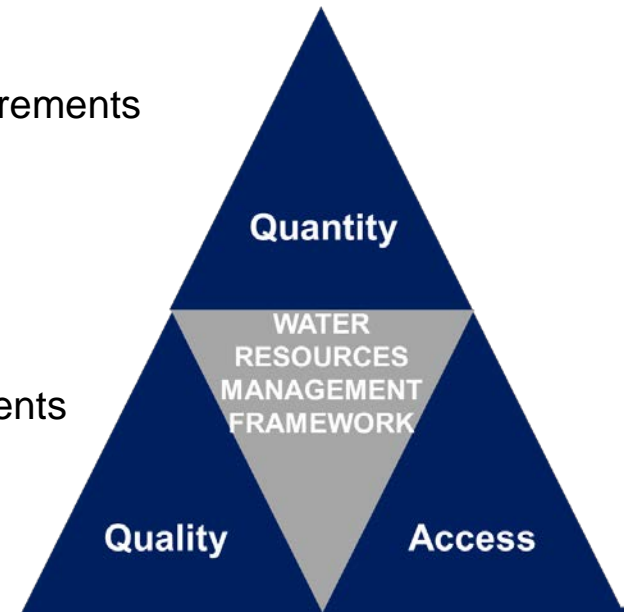
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Problem Statement

- **Water is a limited, non-substitutable resource vital to support many mission sets, yet it is under increasing pressure**

- **Water Availability**
 - **Water quantity** – sufficient volume of water to meet requirements
 - **Water access**
 - **Physical** (infrastructure)
 - **Regulatory** (water rights, permits, policy, regulations)
 - **Financial** (affordability, investment)
 - **Water quality** – adequate water quality to meet requirements

- **Existing Capabilities**
 - Track water conservation and promote efficiency goals
 - Monitor water quality and comply with regulations



Risk-based approach to water management that directly supports mission assurance



Air Force Lines of Effort

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Goal/Concept	Supporting Action
Clarify roles and responsibilities for water resources management	AFMAN 90-17xx, Water Resources Management
Increase transparency into mission needs and readiness	Water Needs Assessment Tool (WNAT)
Inform and influence long-term planning to reduce anticipated vulnerabilities	Stakeholder engagement
Identify critical enabling (water) systems	Mission Thread Analysis (MTA)
Analyze risks from water system architecture	Hydraulic Modeling
Ensure available, reliable, and quality water for critical missions	Installation Energy Plans (IEPs)

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Guiding Policies to Improve Water Security

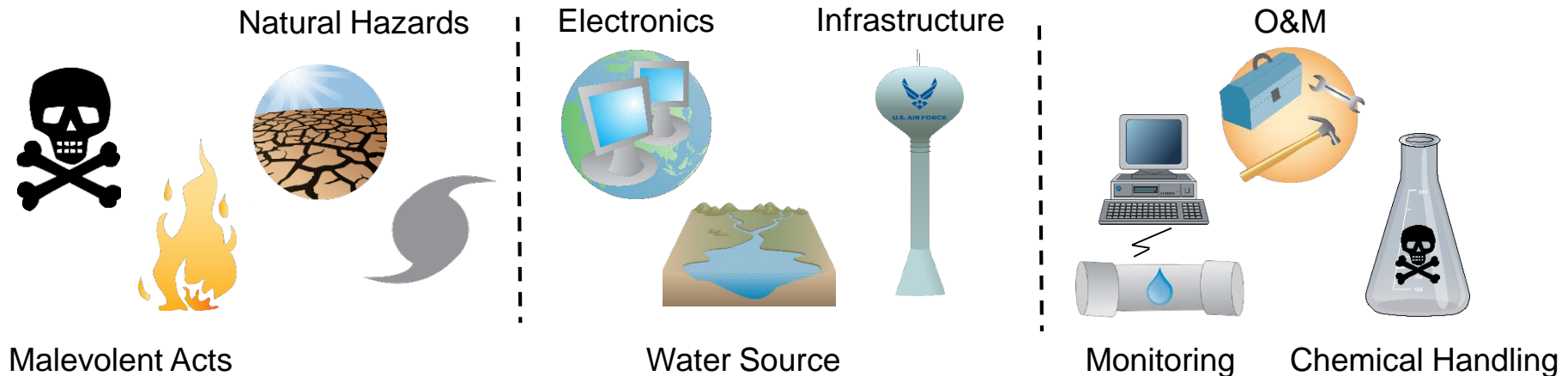
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America's Water Infrastructure Act (AWIA)

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- AWIA passed in October 2018
- Requires Risk and Resilience Assessments (RRAs) for all community water systems serving 3,300 - 50,000 people by June 30, 2021
- RRAs must assess:



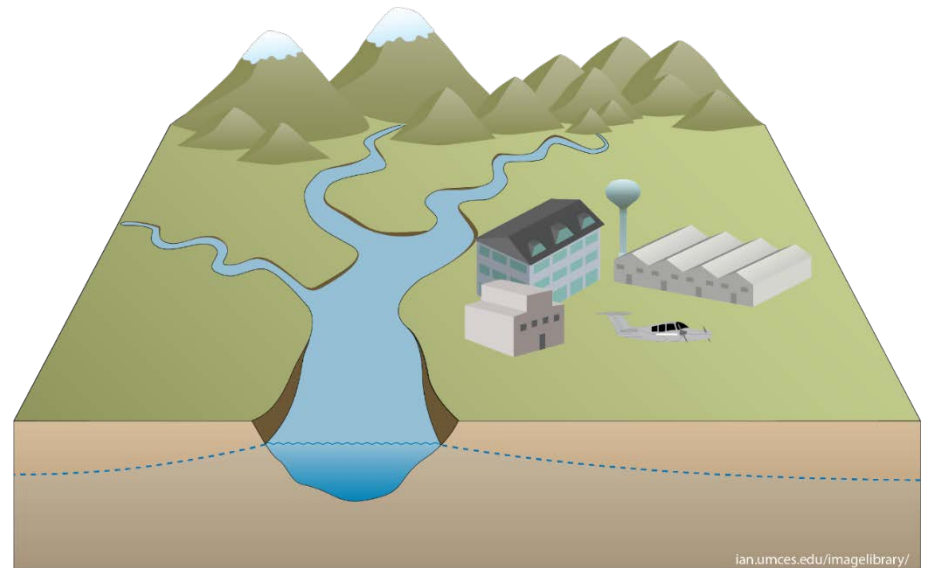
- Approach to meet RRA requirement will be to document existing efforts and fill any gaps; will not require a standalone report
- AF is in collaboration to develop specific policy guidance



OSD Water Resilience Priorities

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1. Clear understanding of DoD water needs, supply and related requirements
2. Protect DoD water sources through a comprehensive, watershed-based approach
3. Informed decision-making and long-term planning



House Report 116-120 on H.R. 2500 (FY 2020 NDAA) directs DoD to report to Congress regarding the California Sustainable Groundwater Management Act (SGMA), potable water use in landscaping, and AWIA compliance



USAF Water Policies

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Policy	Concepts Covered
AFI 90-1701: Energy and Water Management (In policy coordination)	Water resilience, Installation Energy Plans
AFI 90-2001: Mission Sustainment (2019)	Water hazards, Risk assessment
AFI 10-211: Civil Engineer Contingency Response Planning (2011)	Contingency Response Plans, Back-up water sources
AFI 32-1061: Providing Utilities to U.S. Air Force Installations (2016)	Utilities privatization, Metering, Water efficiency
AFI 32-1067: Water and Fuel Systems (Under review)	Water rights documentation, Water Vulnerability Assessments
AFI 32-7001: Environmental Management (2018)	Natural Infrastructure Assessments
AFI 32-7062: Comprehensive Planning (2017)	Sustainability Development Indicators
AFI 48-144: Drinking Water Surveillance Program (2014)	Drinking water quality, Regulatory tracking
Guidebook: AF Water Conservation Guidebook (2002)	Water conservation, Estimating consumption



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Identifying Water Supply Challenges



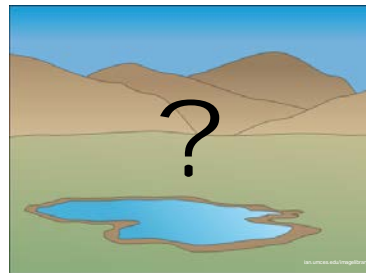
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Assessing Long-term Risk: Water Availability

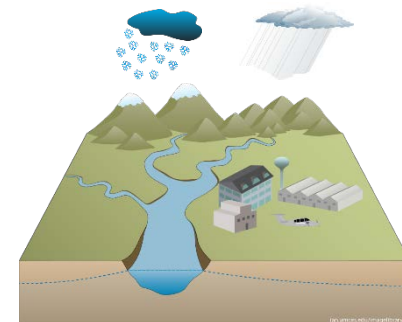
- Foundational question – What is my water source?
 - AF tracks source type (SW/GW), not specific water body
 - FY19: Created a data set of primary installation water sources
 - Must consider redundant or back-up sources/connections
- Consider regional, long-term risks within and beyond fence line



Water Needs



Source capacity



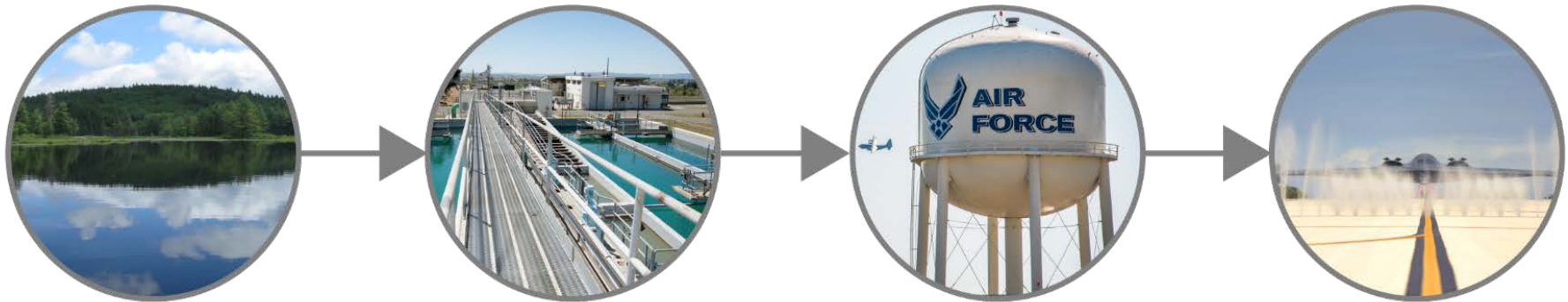
Change in hydrologic conditions
affecting watershed



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Identifying Mission Critical Water Needs

- Need reliable ability to access an adequate quantity and quality of water for mission
- The AF continues to improve understanding of how water scarcity or a denial of service can impact mission





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Opportunities for Water Supply Solutions

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Water Needs Assessment Tool

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GAP

Current visibility into water-related risks does not provide sufficient knowledge for mission assurance and investment decision-making

PROCESS

WNAT estimates water needs based on *function*

- Uses CATCODE & base personnel input to estimate water need

INSTALLATIONS TO DATE

14 AF installations in Phase 3

- **7 Active** – Cannon AFB, Dover AFB, Hill AFB, Los Angeles AFB, Laughlin AFB, Offutt AFB, Peterson AFB
- **6 ANG** – Hector ANGB, Klamath Falls ANGB, Lincoln ANGB, Mansfield Lahm ANGB, Pease ANGB, Volk Field ANGB
- **1 Reserve** – March ARB

March Air Force Reserve Base

Service: U.S. Air Force

Summary Water Need Report

Note: Summary Report values will automatically update with any subsequent changes to Tool entries. However, to update Detailed Report values, select the "Generate Detailed Report" button below after any additional changes or additions to Tool entries.

<u>Building/Facility Category</u>	<u>Subtotal</u>
Operation & Training	13,743 Kgal / yr
Maintenance & Production	12,450 Kgal / yr
Research, Development, Test, and Evaluation	0 Kgal / yr
Supply	86 Kgal / yr
Hospital & Medical	0 Kgal / yr
Administrative	5,522 Kgal / yr
Housing & Community	15,985 Kgal / yr
Utility & Ground Improvements	180 Kgal / yr
Land	50,920 Kgal / yr

Total Estimated Water Need for the Installation: 98,888 Kgal / yr
(Estimated by Tool from Step 3 entries)

Total Known Water Use at the Installation: 102858 Kgal / yr
(From Step 1 entry)

% Variation Between Estimated Water Need and Known Water Use: -3.86007 %

Tool results suggest that the installation uses more water than it needs.

Base is operating at 80% of maximum population capacity.

Water Use Intensity

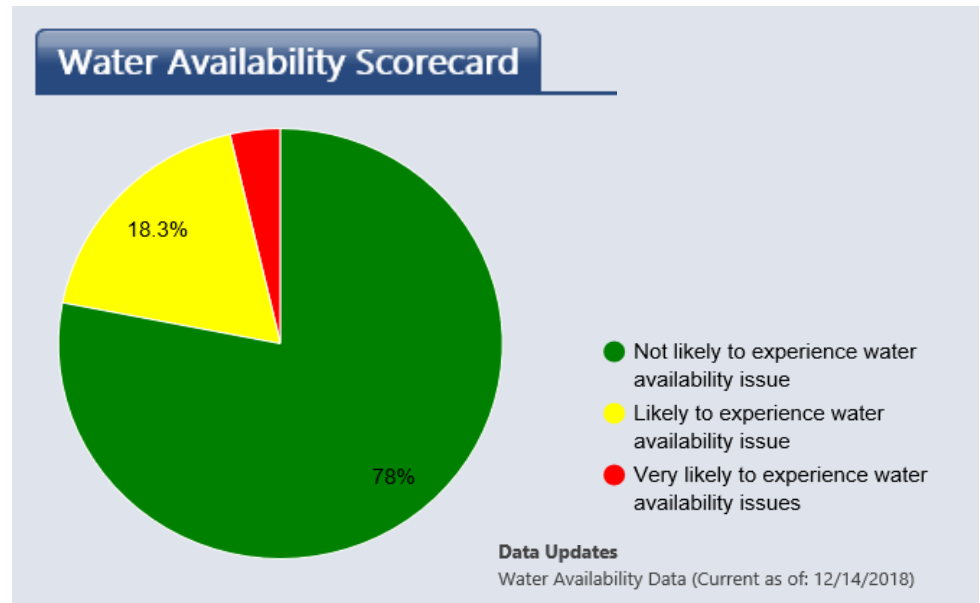
Total Square Feet of Real Property at the Installation:	2,661,846 square feet
Estimated Water Use Intensity (from Step 3 entries):	0.0372 Kgal / yr / sf
Known Water Use Intensity (from Step 1 entries):	0.0386 Kgal / yr / sf



Water Availability Scorecard

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- Snapshot in time, screening-level assessment
- 15 Yes/No questions about water supplies, water quality, drought, and legal frameworks to identify installations that may have water availability concerns
- Hosted on eDASH
- Updated semi-annually



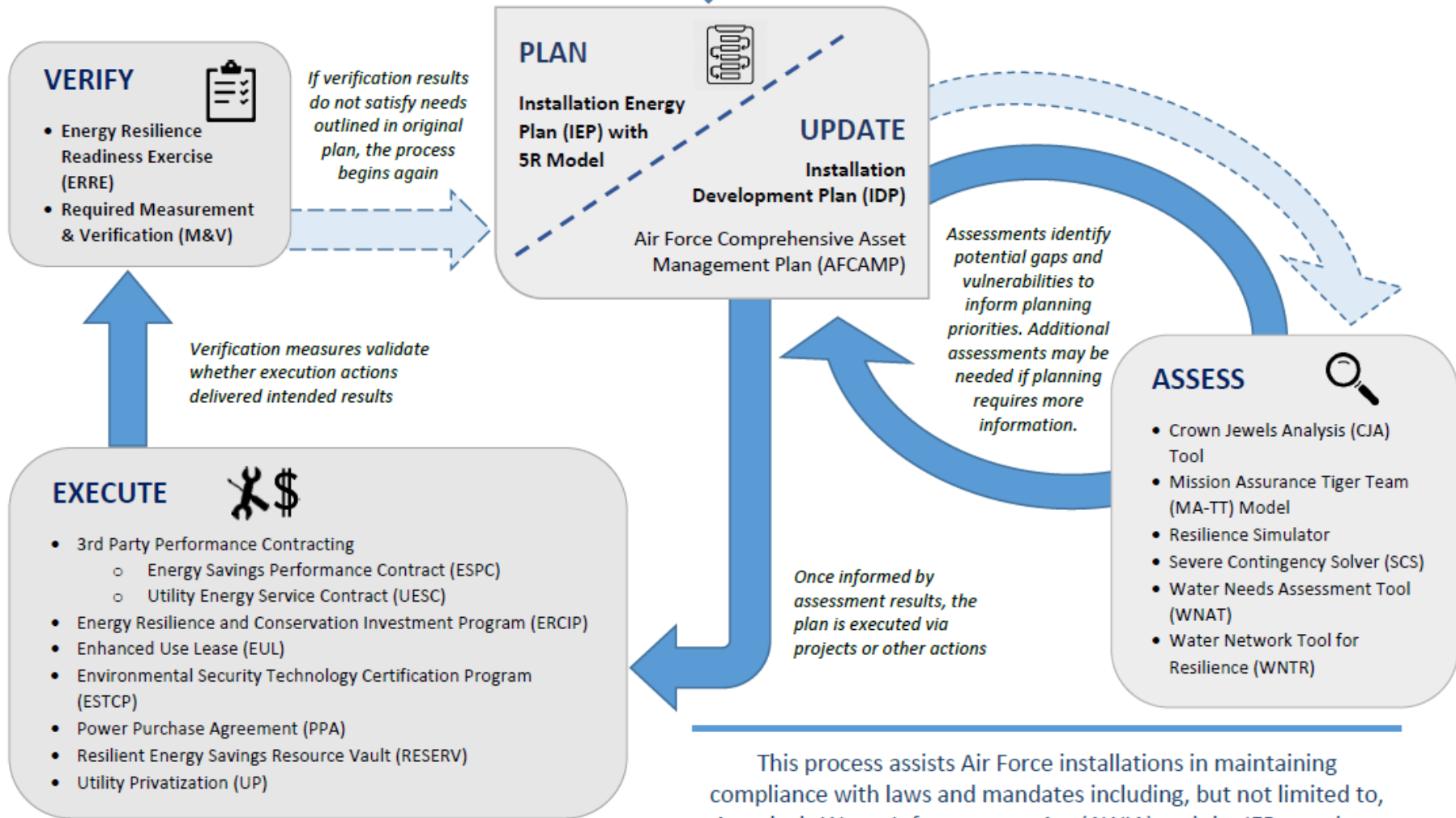
Water Availability Scorecard Link: <https://cs2.eis.af.mil/sites/10040/WPP/WaterAvailabilityScorecard/WaterAvailabilityScorecard.aspx>



U.S. Air Force Mission Capabilities

Bold = Mandated

Strategies drive planning to meet objectives established by mission, policy or law



This process assists Air Force installations in maintaining compliance with laws and mandates including, but not limited to, America's Water Infrastructure Act (AWIA) and the IEP mandate.





Water Supply Solutions: Guiding Principles

1. Preserve water rights¹

- Legal regime varies state by state – seek legal counsel
- Important during privatization or when changing water sources

2. Conservation

- Conserve to maximum extent practicable; past water security does not ensure future water security
- Consider water re-use, xeriscaping, or other conservation approaches

3. Need for a regional approach

- Water flows through multiple political and managerial jurisdictions
- Consider risks both within and beyond the fence line
- Collaborative approach will yield best outcomes

¹ See AFI 32-1067 Water and Fuel Systems for guidance on how to document water rights.



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