ASU Climate Resilience Emergency Management Plan

V 1.1, Last Updated July 2020

The ASU Climate Resilience Emergency Management Plan is a living document outlining layers of emergency management for immediate and long-term climate impacts affecting both ASU campus communities and the physical infrastructure of ASU campus environments.

Introduction

To continue its mission, Arizona State University will take the lead to anticipate climate related impacts and manage resources and risks to ensure resilience without interruption of operations. In 2016, President Crow signed the Second Nature Climate Commitment, which reaffirmed ASU's commitment to carbon neutrality and also committed ASU to developing a Climate Resilience Plan. Resilience can be defined as increasing the ability to survive disruption and to anticipate, adapt, and flourish in the face of climate change. ASU intends to build resilience across its university-enterprise to continue its operations in serving students, staff, faculty and the broader community.

ASU will frame the Climate Resilience Plan in two ways:

1) Climate Resilience Emergency Management Plan: specific actions, indicators, metrics and targets to address immediate climate impacts
2) Climate Resilience Enterprise Planning Framework: an outline of indicators, metrics, and targets to be integrated and inform enterprise planning

This document will serve as the Climate Resilience Emergency Management Plan. The plan will use the following structure:

- **Sectors**: a key strategic area
- **Planning Areas**: a key objective
- **Indicators**: demonstrates achievement of climate resilience in a given planning area for mitigation and management of climate event impacts
- **Metrics**: measures indicator progress
- **Targets**: sets a time frame and goal for achieving an indicator

Extreme Heat

Climate change is expected to exacerbate Arizona's dry arid climate[1]. Climate change will increase the number of extreme heat days, which can be exacerbated by the urban heat island effect[2]. Extreme heat is defined as numerous days of heat with temperatures above 90 degrees[3]. As extreme events become more frequent and severe, ASU can expect increased cases of heat-related illnesses and greater pressure on energy infrastructure.

There are two primary sectors for which ASU will seek to improve resilience:

1. **People and Services**: ensuring public health and access to adequate services (primarily health)
2. **Infrastructure and Operations**: ensuring that ASU facilities can thrive under the stresses of extreme heat and provide refuge during extreme heat events

The following will outline these sectors, mitigation strategies, and metrics:

Sector: People and Services

Planning Area: Health: Health risk including increased cases of dehydration, heat stroke, and heat exhaustion

Mitigation Indicator: Comprehensive heat illness mitigation strategies

Metrics:

1. Develop an adequate water, shade, and cooling accessibility plan
2. Develop a commuting support strategy
    a. Develop alternative commuting options for commuters exposed to extreme heat (walkers, bikers, etc)
3. Develop strategies for accessible learning
    a. Develop remote learning contingency plan (online lectures, etc)

Management Indicator: Adequate health services for influx for heat-related illnesses

Metrics:

1. Develop a heat illness treatment plan with Health Services

Sector: Infrastructure and Operations

Planning Area: Buildings

Need for climate adapted buildings that are resilient to power outages to ensure proper cooling[4]

Mitigation Indicator: Reliable energy and building systems

Metric:

1. Develop an electricity and cooling redundancy plan
2. Design, build, and retrofit buildings to increase passive resilience to extreme heat
3. Design landscaping for maintaining thermal comfort for walkability
4. Increase energy efficiency in buildings to reduce stress on energy supply

[1] Arizona Climatologist on Extreme Heat https://www.azcentral.com/story/news/local/arizona-environment/2020/08/05/heat-infectious-diseases-deaths-climate-change-global/5576583002/

[2] Tewari et al, 2019 https://iopscience.iop.org/article/10.1088/1748-9326/aaf431/pdf

[3] AZ Emergency Information Network https://ein.az.gov/hazards/extreme-heat

[4] APS and SRP urge customers to conserve power during peak demand https://www.azfamily.com/news/aps-and-srp-both-asking-customers-to-conserve-power-during-peak-hours/article_ec69f460-e258-11ea-84cf-3316eaae141b.html

[5] AZ Emergency Information Network https://ein.az.gov/hazards/drought

Management Indicator: Secure cooling centers

Metric:

1. Develop a cooling center plan that includes:
    a. Identification of buildings designated as cooling shelters proportionate to campus population
    b. Minimum duration of cooling services capacity to be provided
    c. Backup A/C plan in case building systems fail
    d. Ensuring safety of ASU research

Drought

Arizona is a drought-prone state with limited water resources[5]. As climate change accelerates, the prevalence of drought events will increase. Water conservation, water storage, and water policy will be essential to building climate resilience. As drought events become more common, ASU can expect decreased water availability, increased cases of heat-related illnesses, and potential mandatory water use cut backs.

There are two primary sectors for which ASU will seek to improve resilience:

1. **People and services**: ensuring access to water and adequate services
2. **Infrastructure and Operations**: ensuring that ASU facilities can thrive under the stresses of drought and continue to provide thermal comfort and water during extreme events

The following will outline these sectors, mitigation strategies, and metrics:

Sector: People and Services

Planning Area: Health: Increased health risk including increased cases of dehydration, heat stroke, heat exhaustion, and respiratory illnesses due to an increase in wildfires

Mitigation Indicator: Comprehensive heat illness mitigation strategies

Metric:

1. A plan for adequate water and cooling accessibility is in place
2. Develop strategies for maintaining class attendance

Management Indicator: Adequate health services for influx of heat-related illnesses

Metric

1. Develop a heat illness treatment plan with health services

[1] Arizona Climatologist on Extreme Heat https://www.azcentral.com/story/news/local/arizona-environment/2020/08/05/heat-infectious-diseases-deaths-climate-change-global/5576583002/

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[3] AZ Emergency Information Network https://ein.az.gov/hazards/extreme-heat

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[5] AZ Emergency Information Network https://ein.az.gov/hazards/drought

Sector: Infrastructure and Operations

Planning Area: Buildings

Need for drought-contingency plan to supply and conserve water

Mitigation Indicator: Water conservation and availability plan

Metric:

1. Develop a Water Conservation Strategy and Plan that includes:
   a. Metering and leak detection
   b. Water efficiency opportunities in buildings
   c. Water efficiency opportunities in landscaping
   d. Water efficiency opportunities in infrastructure

Management Indicator: Secure water access strategy

Metric:

1. Develop secure water access strategy that includes:
   a. Redundancy in water supply (for campus infrastructure and for drinking water)
   b. Drought contingency plan
   c. Water cut-backs contingency plan
   d. Water reuse opportunities
   e. Water harvesting opportunities
   f. Water quality risks
   g. Identification of inter-dependencies, risks, mitigation strategies and contacts with municipal, regional, utility and state water systems and agencies

[1] Arizona Climatologist on Extreme Heat https://www.azcentral.com/story/news/local/arizona-environment/2020/08/05/heat-infectious-diseases-deaths-climate-change-global/5576583002/

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[5] AZ Emergency Information Network https://ein.az.gov/hazards/drought