Savannah River National Laboratory™

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Climate Change Resilience Planning at the Department of Energy's Savannah River Site

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Savannah River Site (SRS)

- Savannah River National Laboratory
- Tritium Extraction Facility
- Mixed OXide (MOX) fuel facility (under construction)
- US Forest Service
- Savannah River Ecological Laboratory

Executive Order 13693 (2015)

Charges each agency with

- **"identifying…projected impacts of climate change"**
- **"calculating the potential cost"**.

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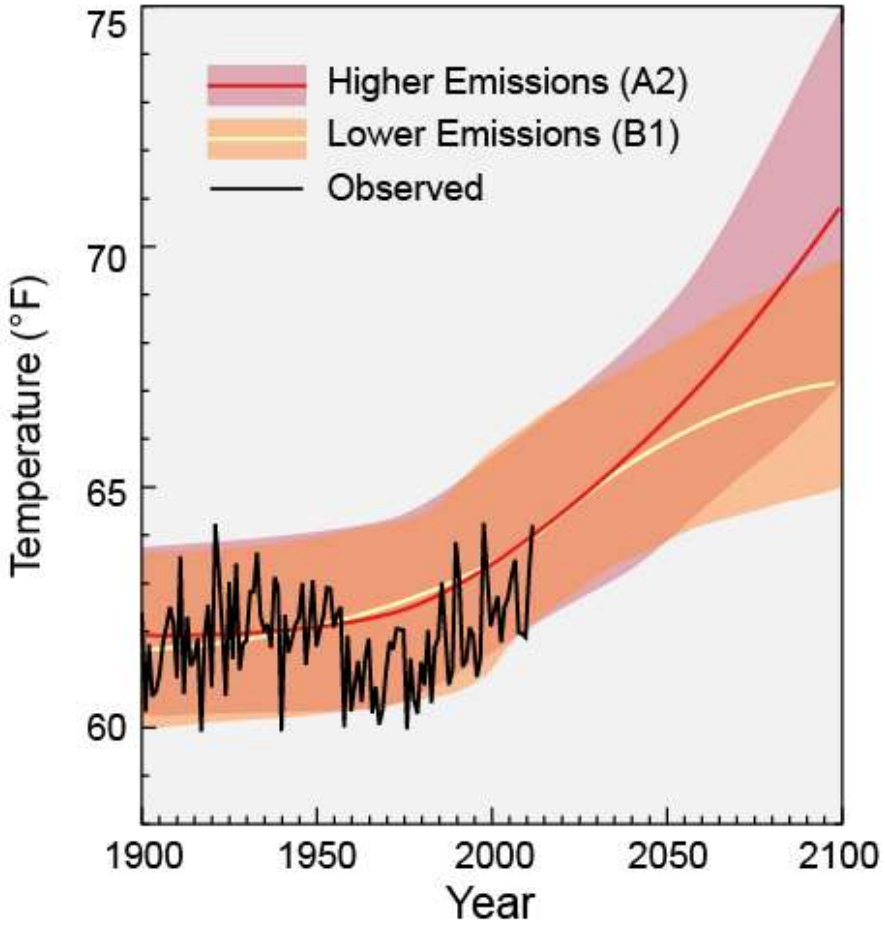
How do we comply with this order?

Q #1: How has climate changed at SRS?

Southeast Temperature: Observed and Projected

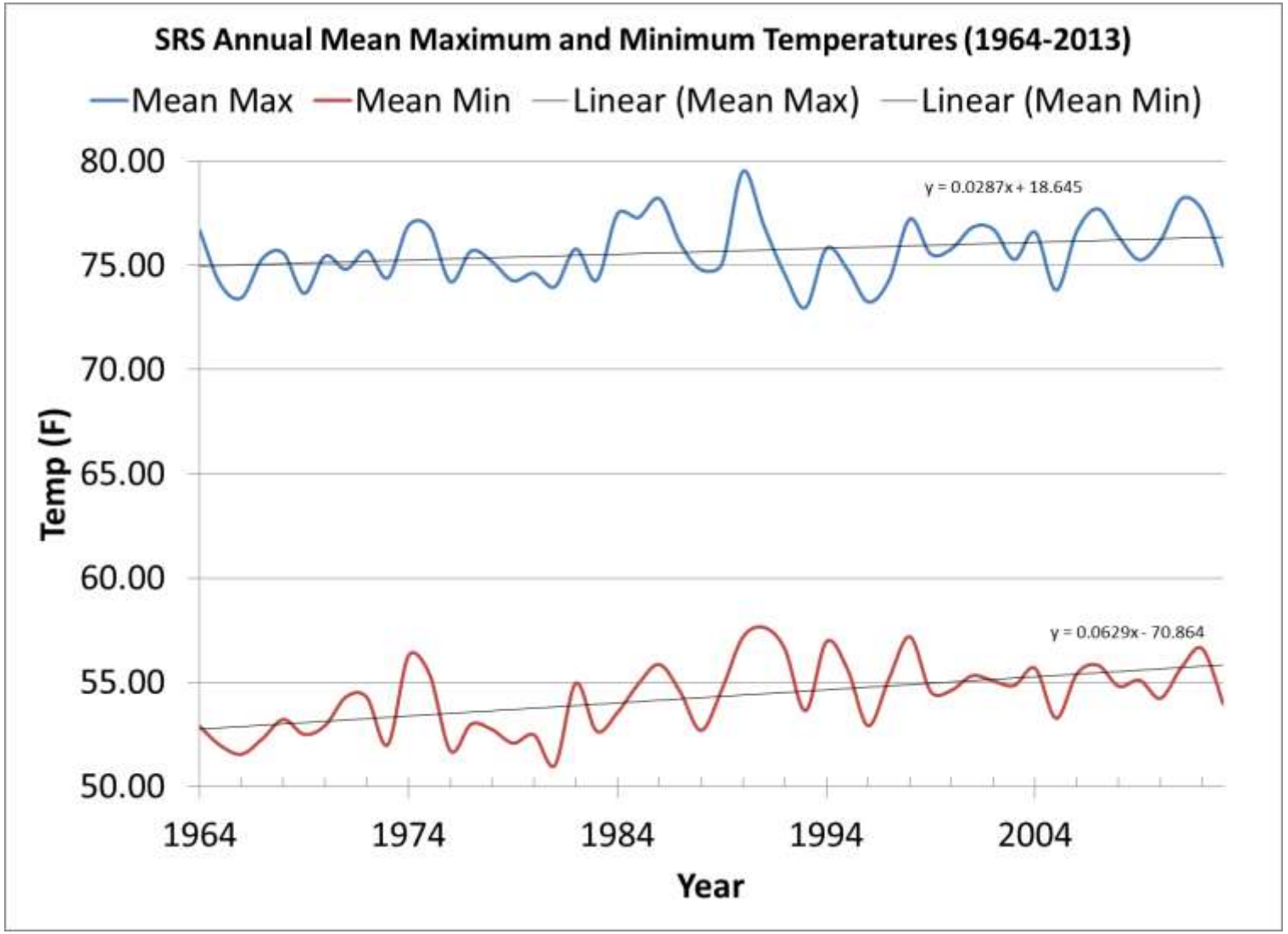


'A warm peak occurred during the 1930s and 1940s followed by a cool period in the 1960s and 1970s.'

'Temperatures increased again from 1970 to the present by an average of 2°F.'

Adapted from: Regional Climate Trends and Scenarios for the U.S. **National Climate Assessment**: Part 2. Climate of the Southeast U.S. NOAA Technical Report 142-2

Observed Climate Change at SRS (Weinbeck, 2016)



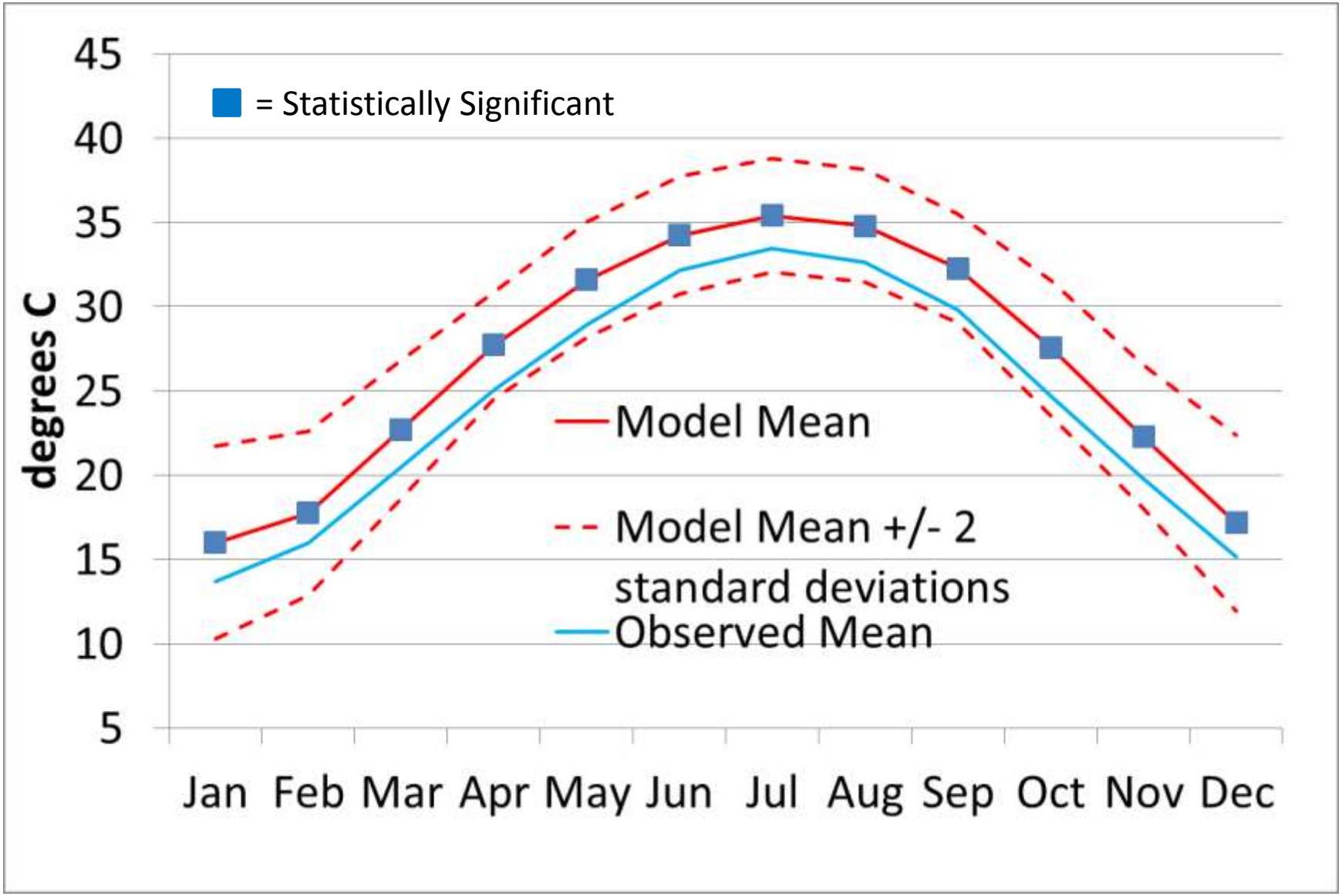
Q #2: How will climate change at SRS in the future?

Multiple global climate model (GCM) simulations of the years 2040-2049

Q #2: How will climate change at SRS in the future?

GCM	Organization	Number of Realizations
CCSM4	National Center Atmospheric Research	3
Can-ESM2	Environment Canada	4
GISS-E2-H	Goddard Inst. For Space Studies (NASA)	4
MPI-ESM-LR	Max Planck Inst.	3

Daily Maximum Temperature, 2040-2049



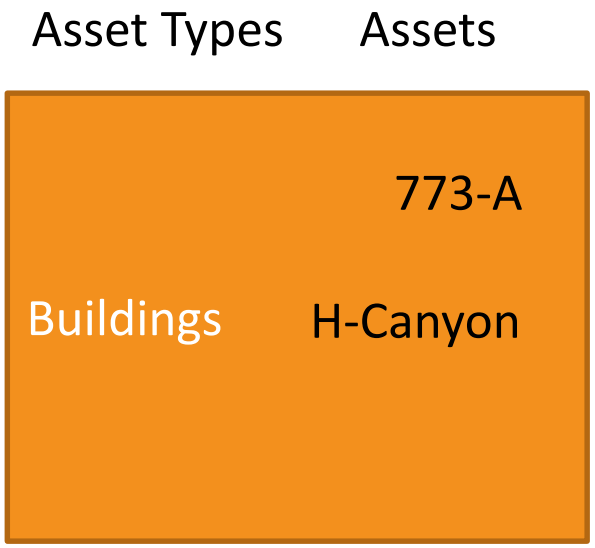
Q #3: How will site operations be affected by climate change?

Vulnerability Assessment Scoring Tool (VAST)

- Developed by U.S. Dept. of Transportation
- Part of U. S. Climate Resilience Toolkit
- Excel-based
- Accepts user inputs, assigns ‘scores’, and outputs estimates of asset vulnerability

Vulnerability

1. Exposure
2. Sensitivity
3. Adaptive Capacity

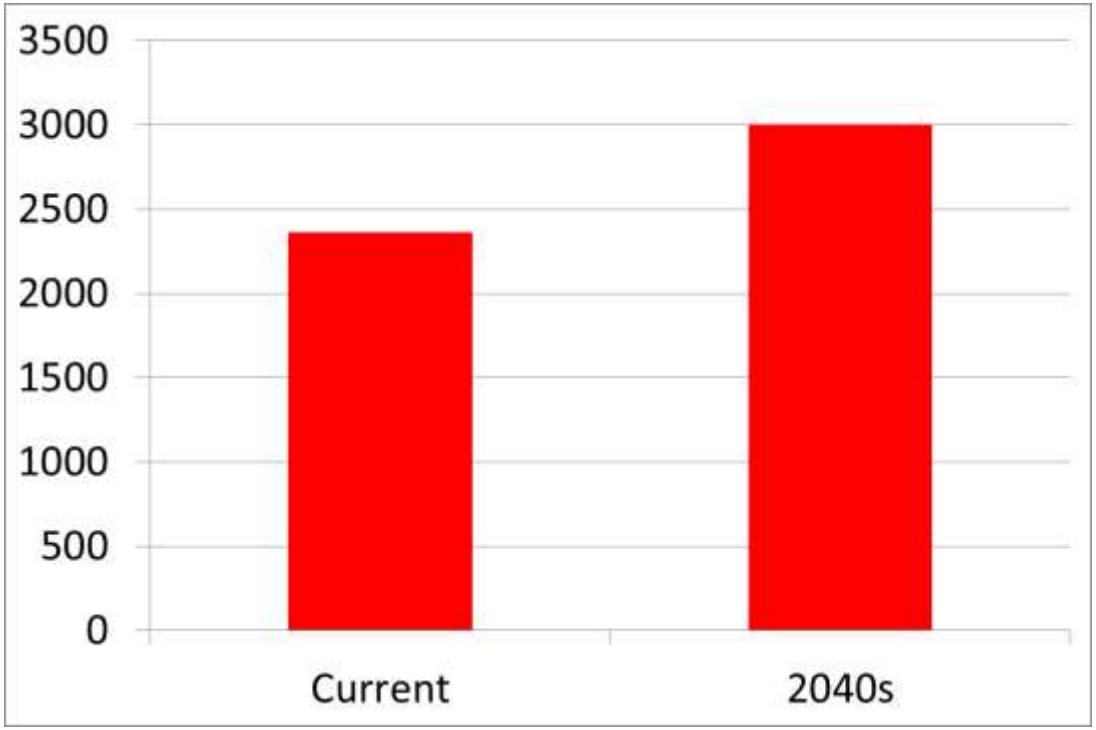


Select ‘Asset Types’ and ‘Assets’

Stressors	1. Exposure Indicators
Temperature	Cooling Degree Days (annual) [CDD] Heating Degree Days (annual) [HDD]

Select ‘Stressors’ and ‘Exposure Indicators’

Average Annual Number of CDD



Exposure Scores

Parameter	Score
CDD	4
HDD	1

Asset Types

Buildings

2. ‘Sensitivity’ score

	Annual Power Use (Mwh)	
Asset Name	Value	Score
SRNL 773-A	11264.0	2
SRNL 735-A	2427.0	1
H Canyon 221-H	34096.0	4

Asset Types

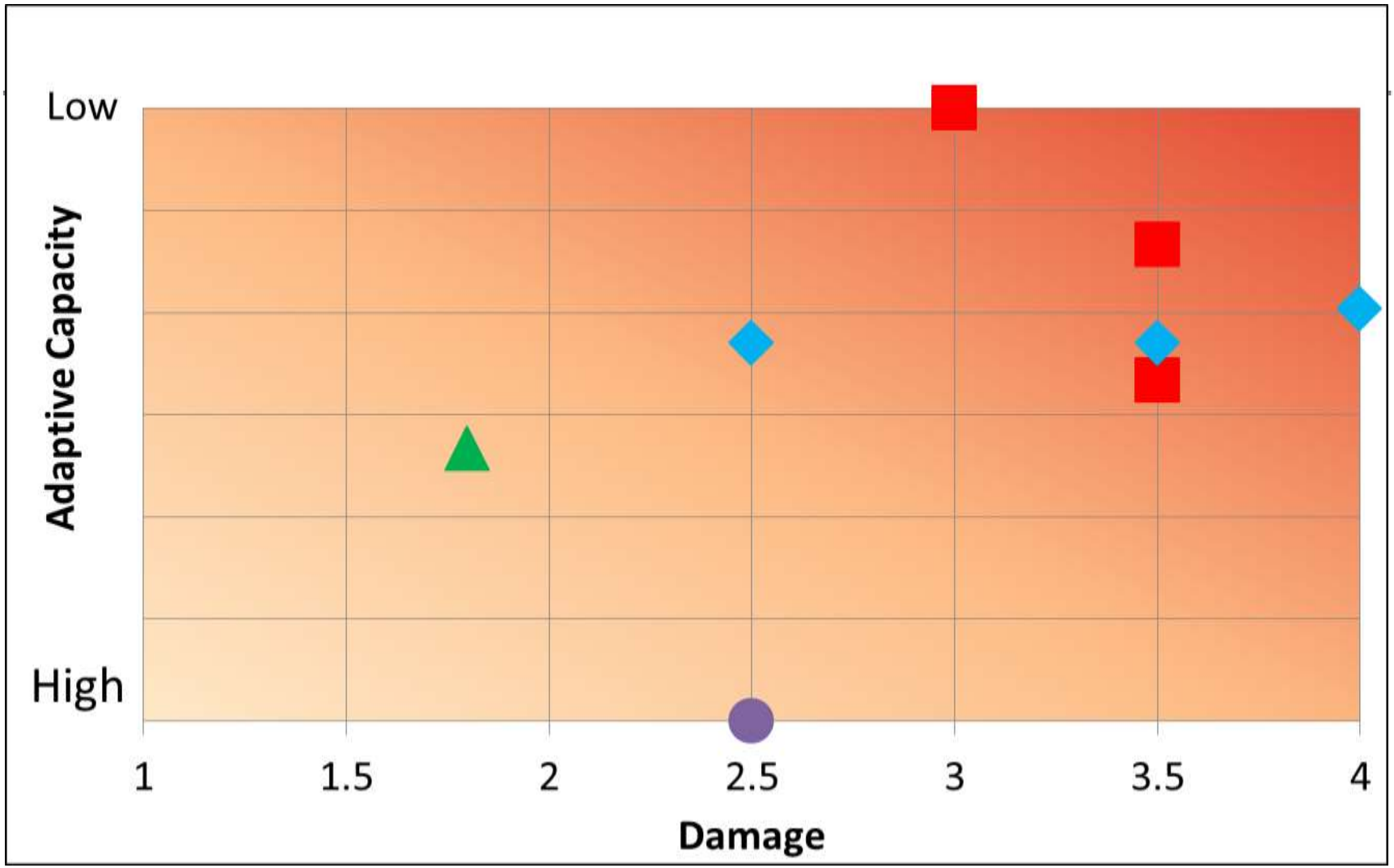
Buildings

3. Adaptive Capacity score

	Cost of High Efficiency System	
Asset Name	Value	Score
SRNL 773-A	Chill	4
H Canyon 221-H	HVAC	1

HVAC → Facility serviced by HVAC unit

Chill→ Facility serviced by Chilled Water facility



= Site buildings

= Site forest

= Site ponds/lakes

= Outdoor workers

Future Work

- Report results to Dept. of Energy

- Work with site managers to develop a plan to maintain site operations under conditions of climate change