



SOCALGAS CAVA PUBLIC WORKSHOP

CPUC Climate Adaptation
Order Instituting Rulemaking
(Climate Adaptation OIR)
R.18-04-019

February 13, 2024



Agenda

- » Introduction (**5 min**)
- » Background & Climate Education (**10 min**)
- » Vulnerability Assessment Methodology (**45min**)
 - Q&A
- » Vulnerability Assessment High-Level Results (**45min**)
 - Q&A
- » Break (**15 min**)
- » Community/Tribal Outreach Results (**45 min**)
 - Q&A
- » Wrap Up & What's Next (**15min**)

INTRODUCTION



Introduction to Climate Adaptation Planning

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- » California Public Utilities Commission (CPUC) issued Order Instituting Rulemaking (R.18-04-019) to Consider Strategies and Guidance for Climate Change Adaptation

- Ordered utilities to submit on **four-year cycles**:

Community Engagement
Plan (CEP)

&

Climate Adaptation
Vulnerability Assessment
(CAVA)

- » The purpose of the **CAVA** is to:

- Assess how climate change could affect **Infrastructure, Operations, and Services**
- Assess impacts in **Disadvantaged Vulnerable Communities (DVCs)**
- Identify and address **key system vulnerabilities** to ensure that energy utilities continue to fulfill their mission to provide **clean, safe, reliable and affordable service**



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Regulatory Compliance Requirement

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- » Hold a **workshop discussing CAVA findings** 90 days before final submission
 - Notify the public 20 days before the workshop
 - Include an educational session for non-experts
 - Allow questions and comment from attendees
 - Summarize stakeholder feedback in the CAVA report

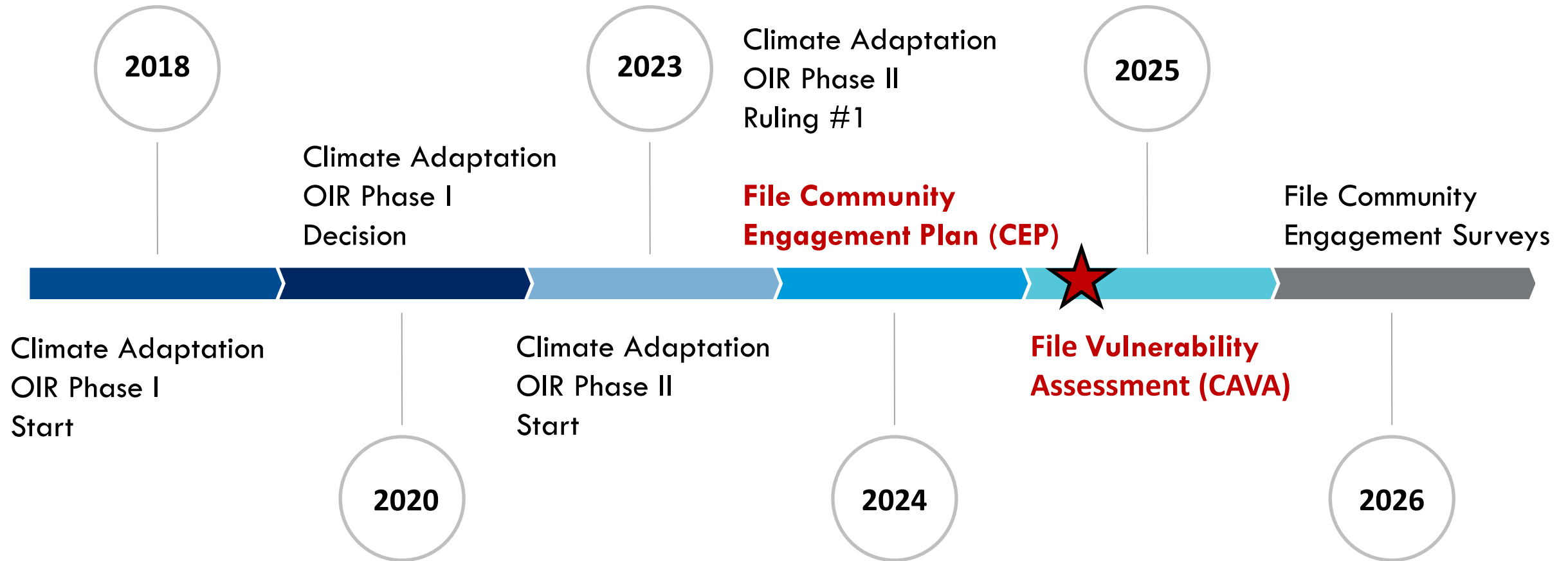
- » **SoCalGas's Guiding Principles** are as follows:
 - Align with CPUC rulemaking
 - Leverage best available climate science in CA
 - Ground analysis in data and observation
 - Incorporate Subject Matter Expert (SME) input
 - Engage communities, particularly DVCs
 - Use climate resilience best practices



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Timeline for Climate Adaptation OIR

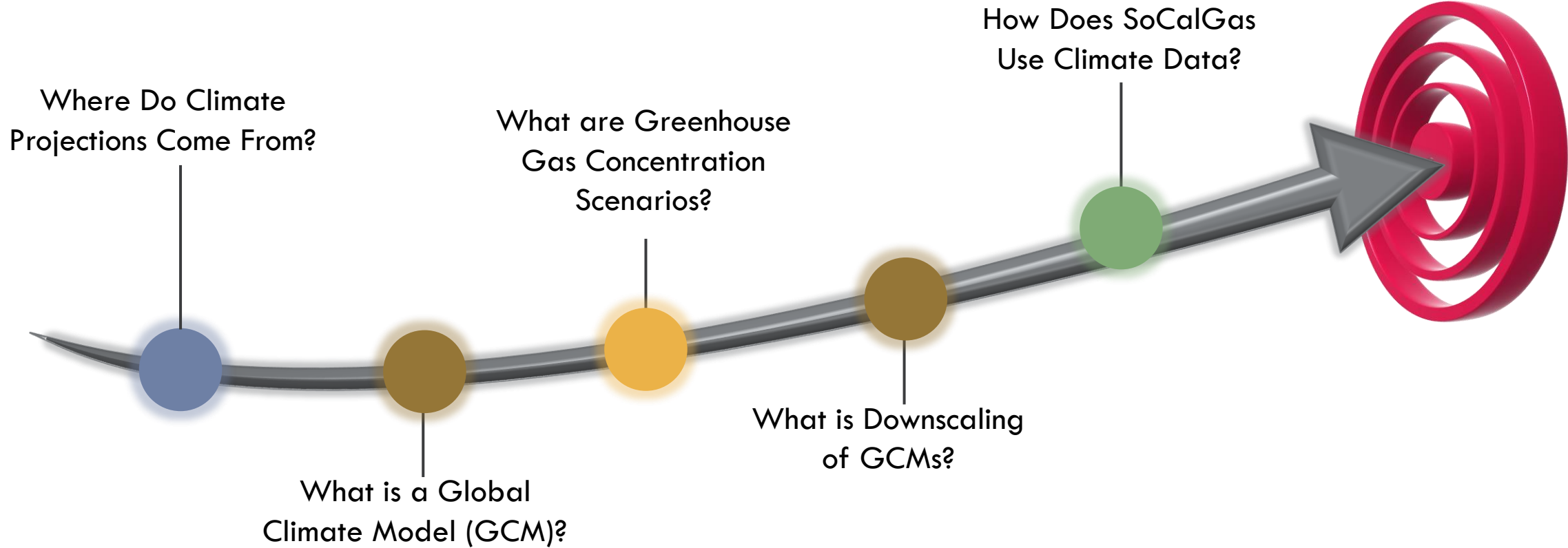
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BACKGROUND AND CLIMATE EDUCATION

Learning Objectives

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Where Do Climate Projections Come From?

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- » **Intergovernmental Panel on Climate Change (IPCC)** is a United Nations body for assessing climate change science

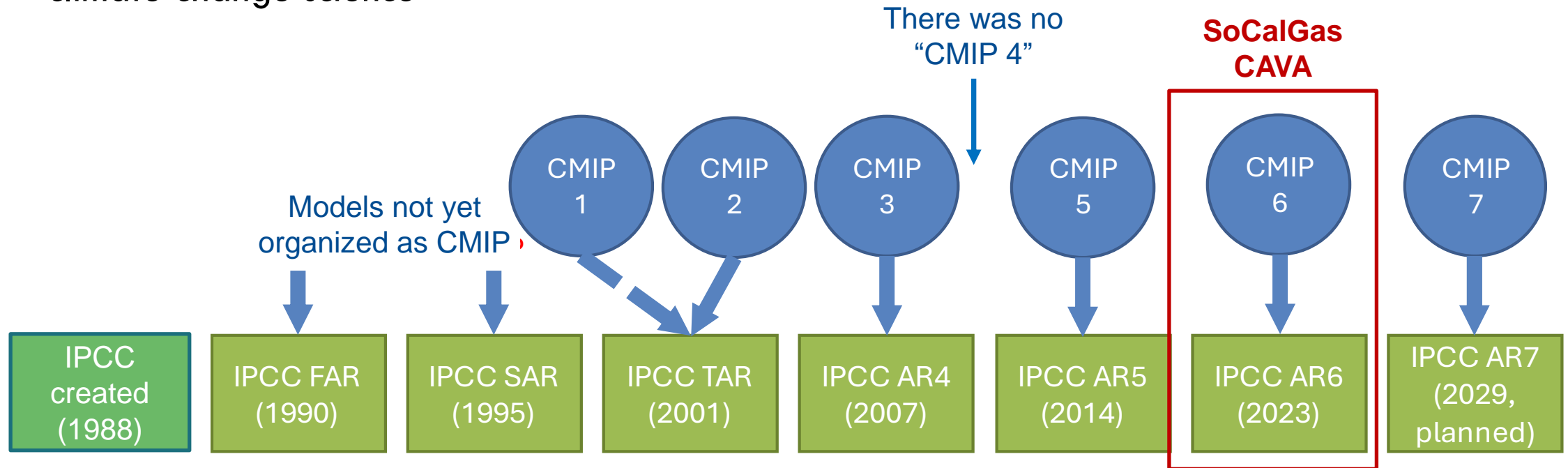


Fig. 1 of Emori et al. (2016)

LEGEND:

CMIP = Coupled Model Intercomparison Project

AR = Assessment Reports

Global CMIP6 Modeling Centers



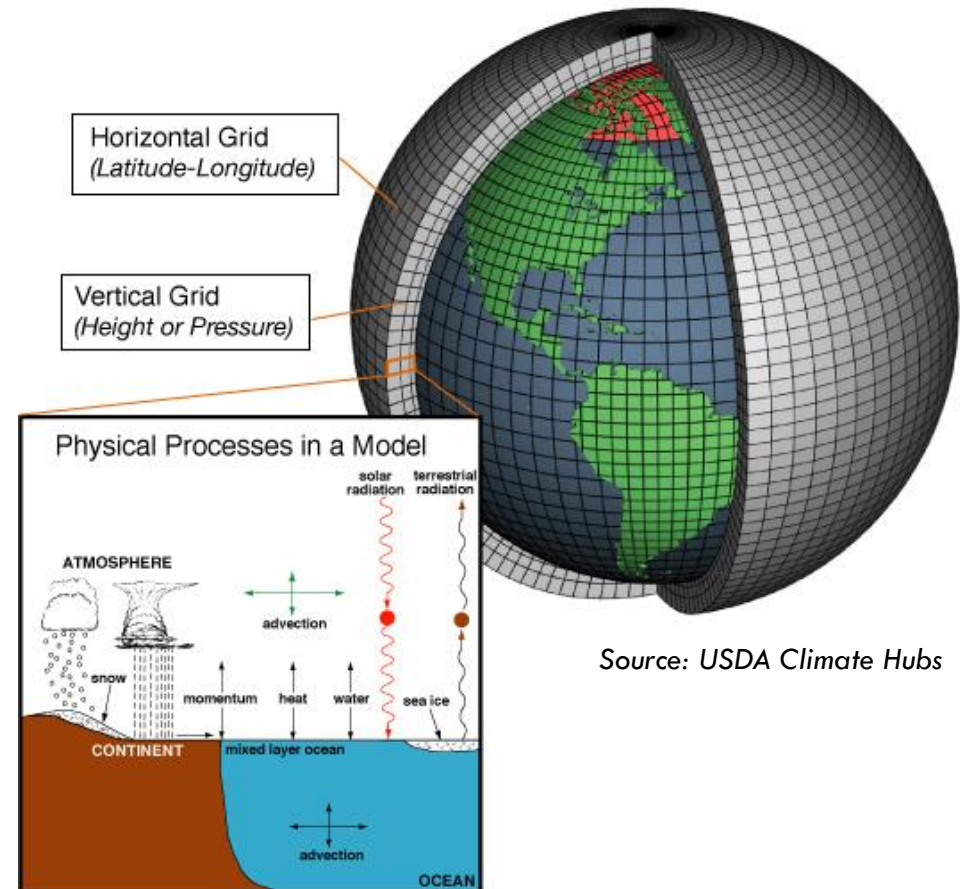
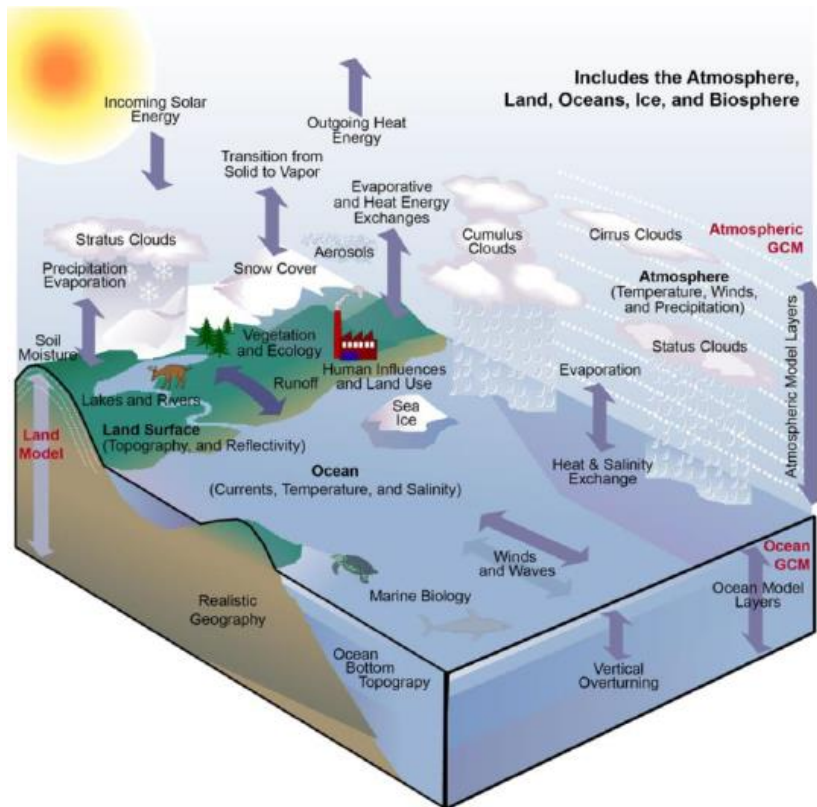
What is a Global Climate Model (GCM)?

10

- » **GCM** is a complex numerical model that simulates **Earth's climate system** to study **past, present, and future conditions**

- » It divides the Earth into a **3D grid** and applies differential equations that are based on **physics, fluid motion, radiation, biogeochemistry, etc.**

Example of a Global Climate Model

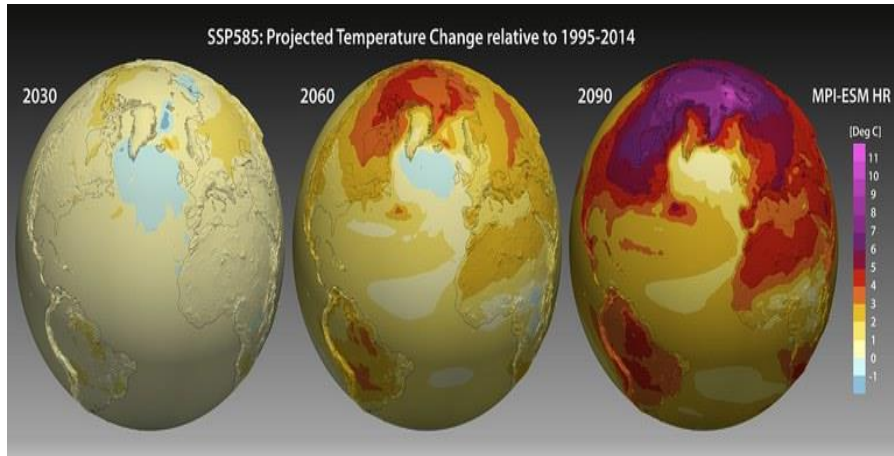


Source: USDA Climate Hubs

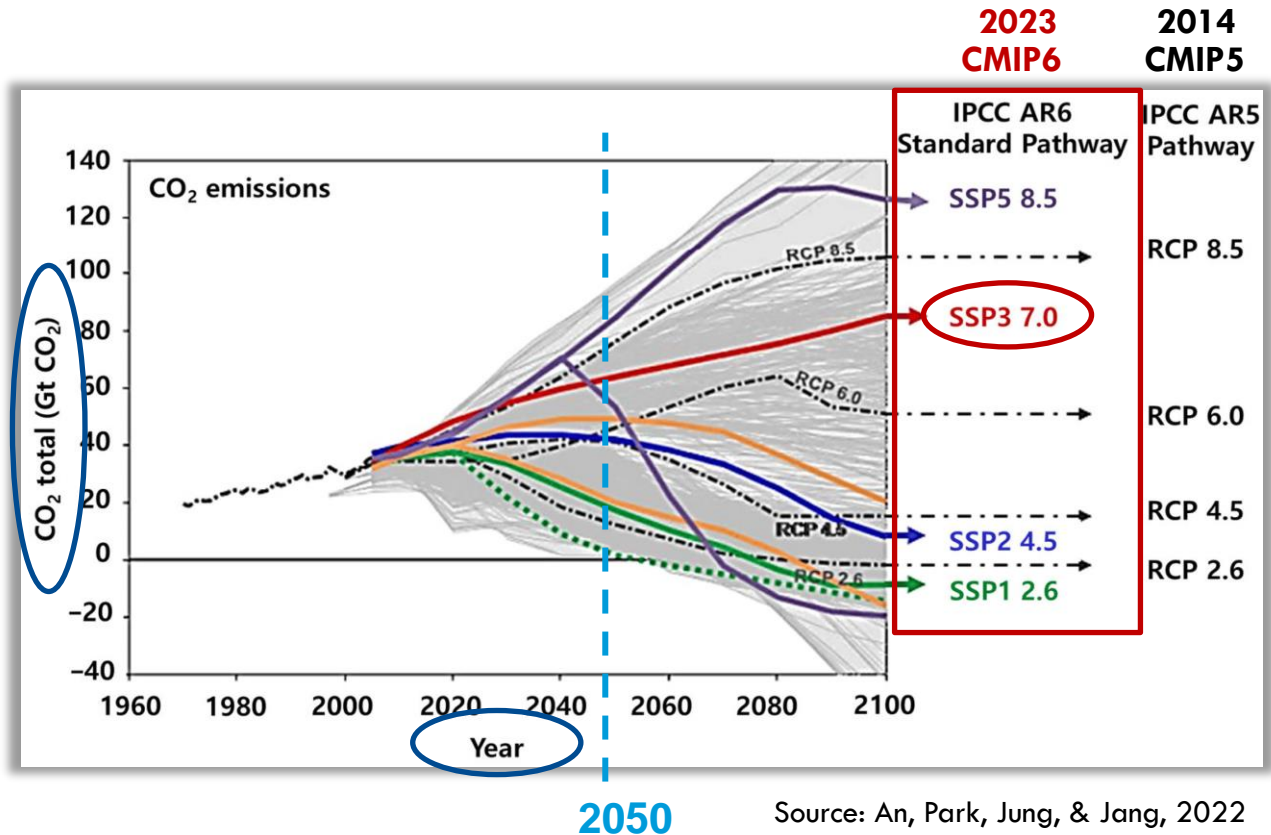
What are Greenhouse Gas Concentration Scenarios?

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- » CMIP simulations are performed under **predetermined emission scenarios**
- » **Shared Socioeconomic Pathways (SSPs)** - based on the **social** and **economic factors** which drive **fossil fuel usage** resulting in greenhouse gas concentration trajectories.



Example of SSP8.5 Temperature Change in Years 2030, 2060, 2090



Source: An, Park, Jung, & Jang, 2022

LEGEND:

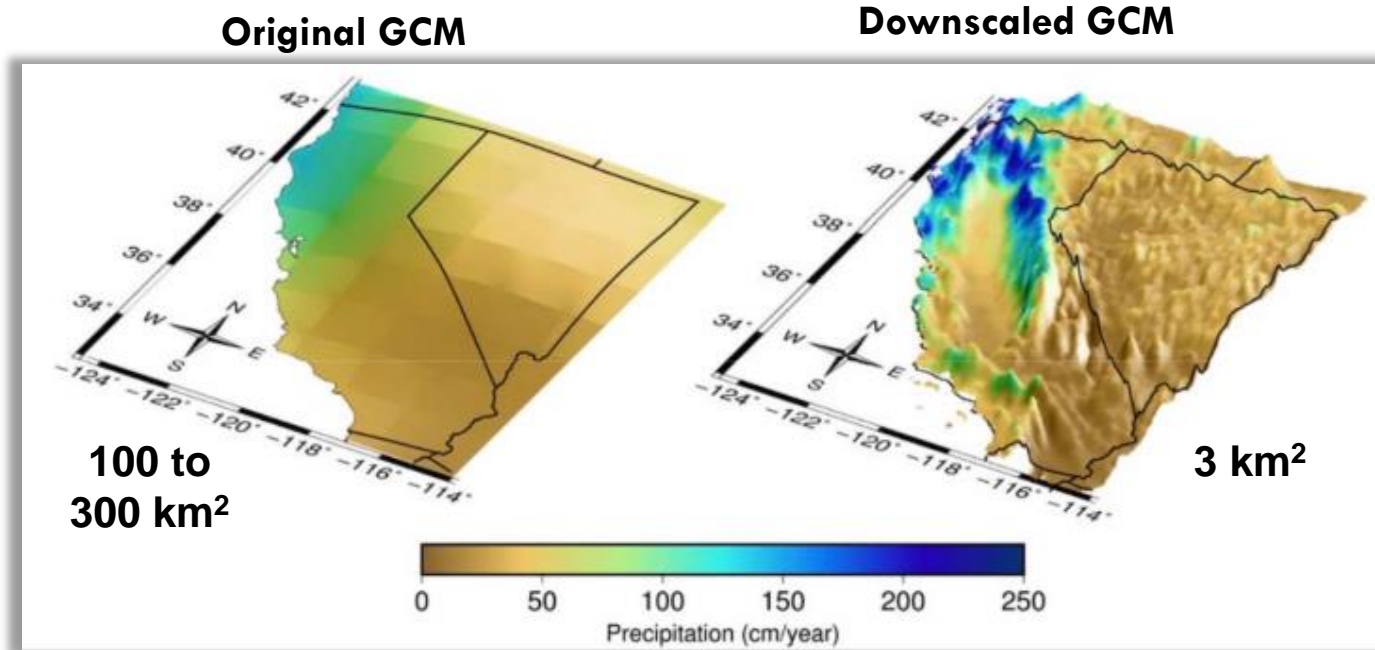
RCP = Representative Concentration Pathway

Gt CO₂ = Gigatonnes of Carbon Dioxide

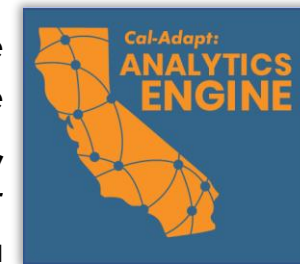
What is Downscaling of Climate Models?

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- » **Downscaling** helps better capture California's **diverse** topography and **unique** climate characteristics
- » California has selected **15 GCMs** based on how well they capture the unique characteristics of California's climate
- » These 15 models have been **downscaled to 3-km x 3-km** to better depict climate change's impact on a specific location via **Localized Constructed Analogs (LOCA)**
- » **Output from emission scenarios** become an **input for the GCMs**



Climate projections are made available on the **Cal-Adapt Analytics Engine**, a climate data platform for California



Source: Cal-Adapt

SoCalGas CAVA Climate Projections

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» Analysis Years: **2023 (baseline), 2030, 2050, 2070**

» **Temperature, Precipitation, Runoff Projections**

Source:	Emissions Scenarios:	15 Models (Tailored to California):					
2023 CMIP6: Scripps LOCA 2 CA	SSP 2-4.5	ACCESS-CM2	CNRM-ESM2-1	EC-Earth3-Veg	GFDL-ESM4	INM-CM5-0	
	SSP 3-7.0	CESM2-LENS	EC-Earth3	FGOALS-g3	HadGEM3-GC31-LL	IPSL-CM6A-LR	
	SSP 5-8.5	KACE-1-0-G	MIROC6	MPI-ESM1-2-HR	MRI-ESM2-0	TaiESM1	

» **Special Case: Wildfire Projections**

Source:	Emissions Scenarios:	4 Models:	
2014 CMIP5: UC Merced/ Westerling	RCP 8.5	CanESM2	HadGEM2-ES
	RCP 4.5	CNRM-CM5	MIROC5

SoCalGas CAVA Climate Projections (cont.)

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» Special Case: Sea Level Rise Projection

Sources:

2023
CMIP6

2024
OPC State of CA
SLR Guidance

2018 & 2021
USGS CoSMoS

Emissions Scenarios:

SSP5-8.5 + LC
Processes

SSP5-8.5

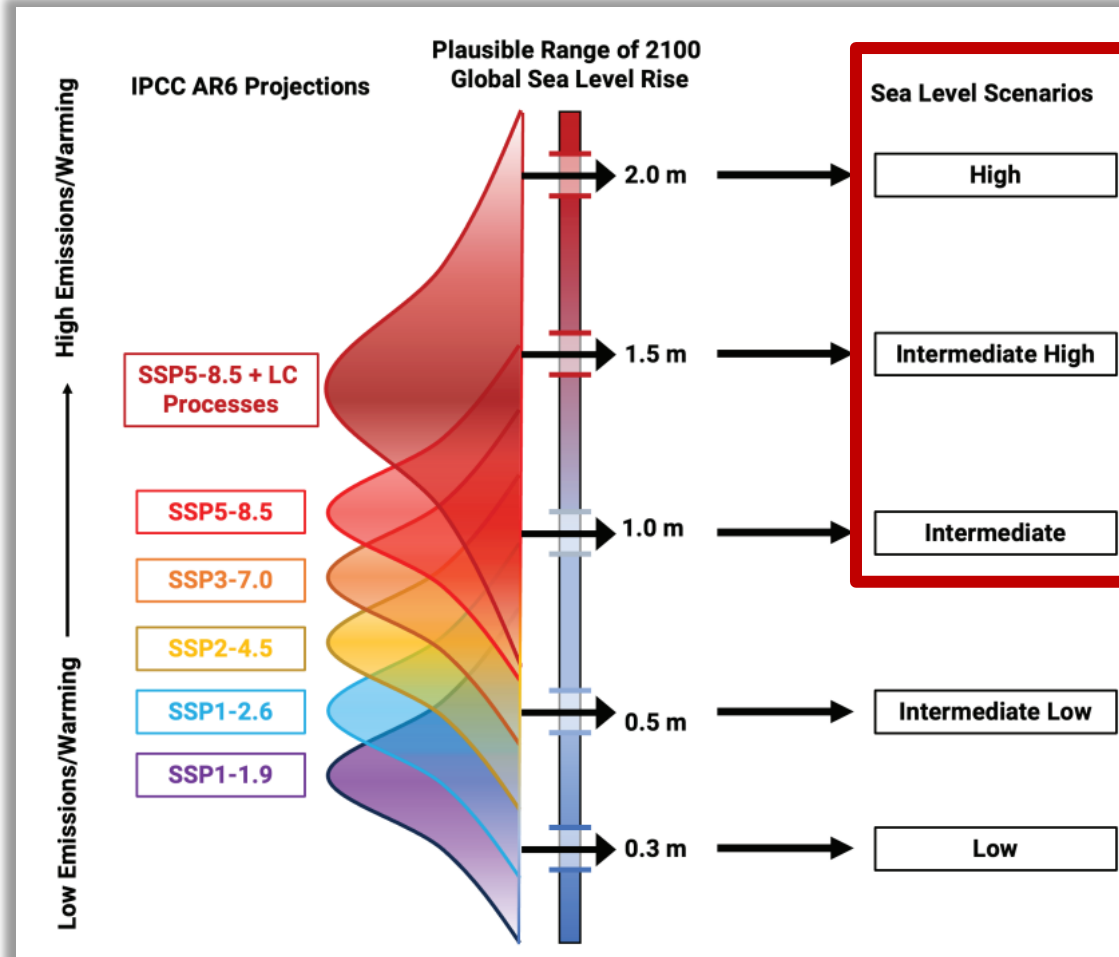
SSP3-7.0

SSP2-4.5

SSP1-2.6

SSP1-1.9

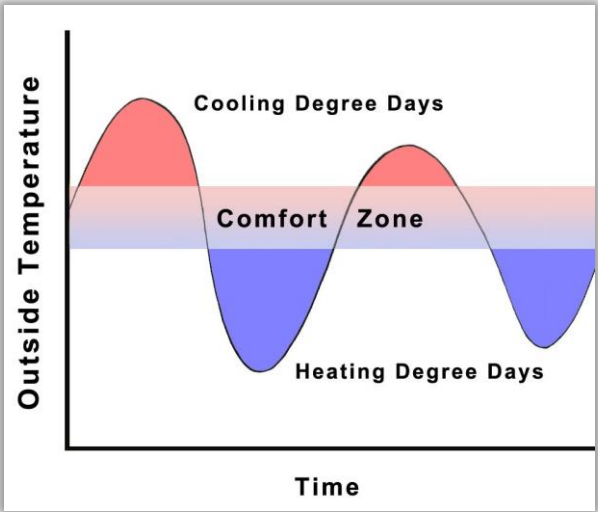
Model:



Connecting Climate Projections to Local Hazards



Example Metrics	Associated Hazard
Peak annual 60-day total precipitation	Landslides
Peak annual streamflow	Inland Flooding
Heating and cooling degree days	Gas Demand
Heat and humidity extremes	Outdoor Worker's Health



CAVA Key Steps

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What changes in weather and climate can we expect?



How will these changes affect SoCalGas?



In turn, how will these changes impact communities?



What actions should SoCalGas take to address these issues?



QUESTIONS & FEEDBACK

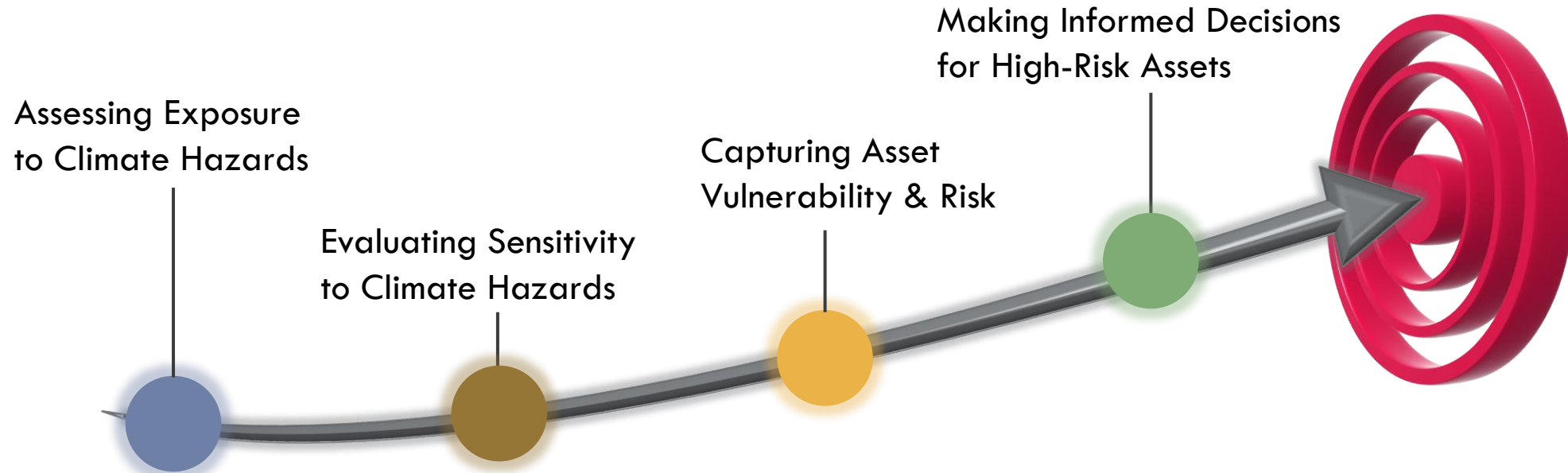


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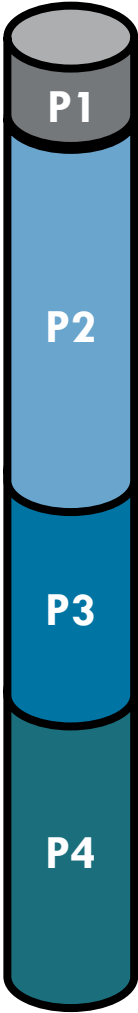
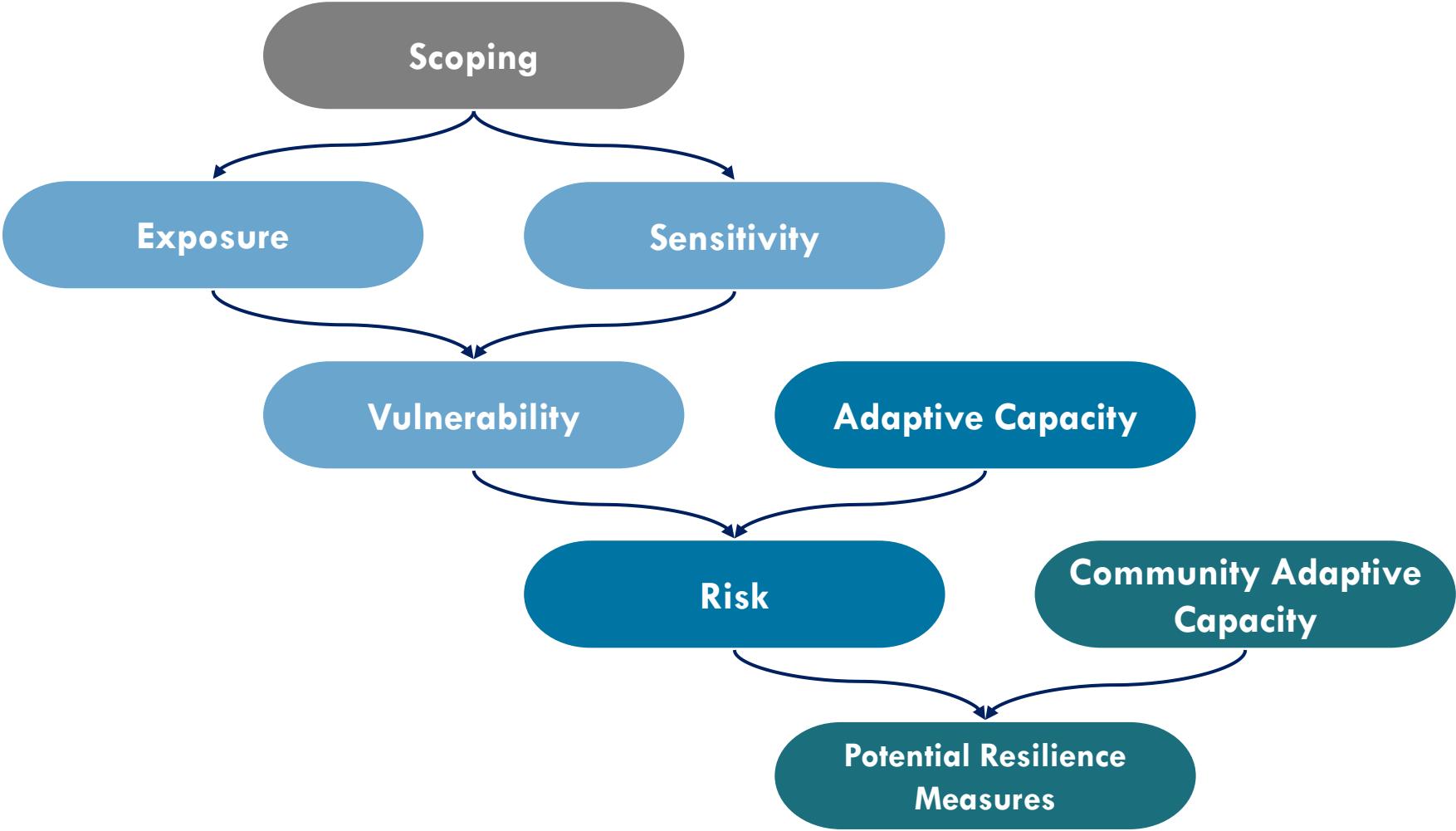
METHODOLOGY: OVERVIEW

Learning Objectives

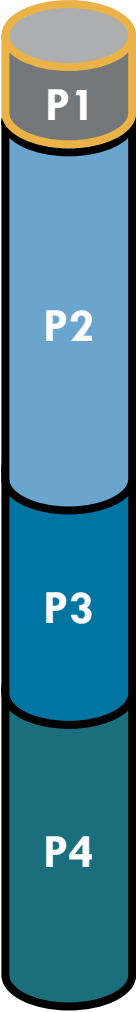
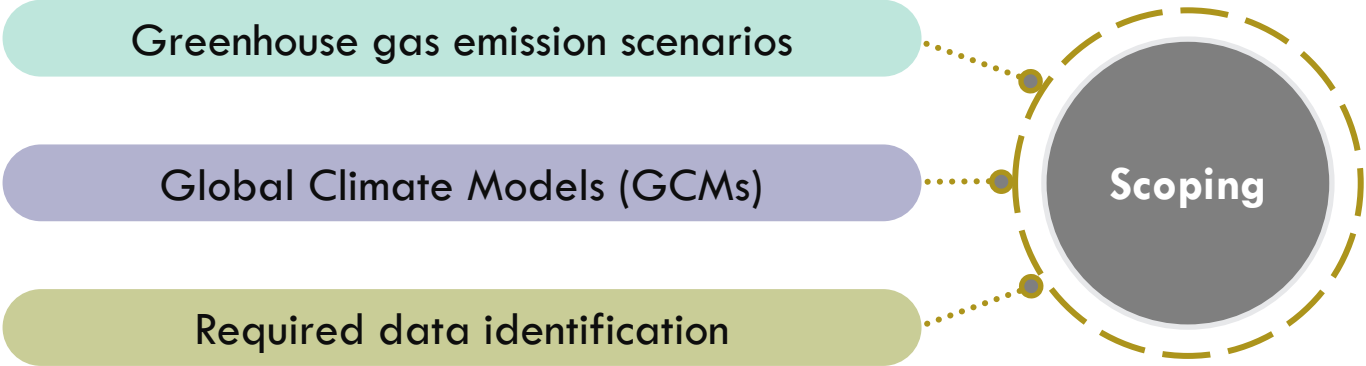
19



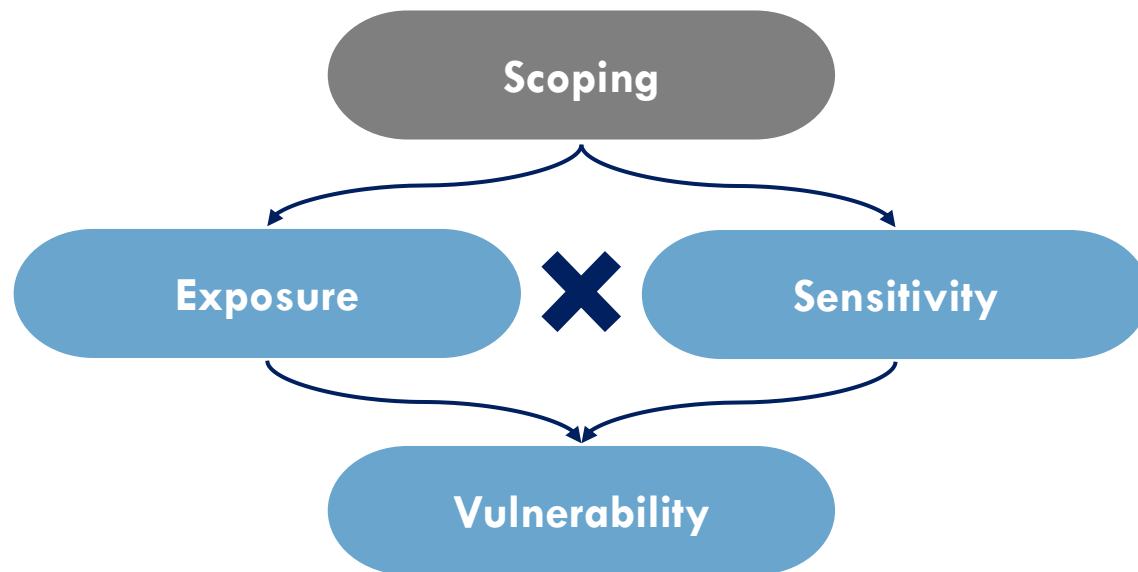
CAVA Framework



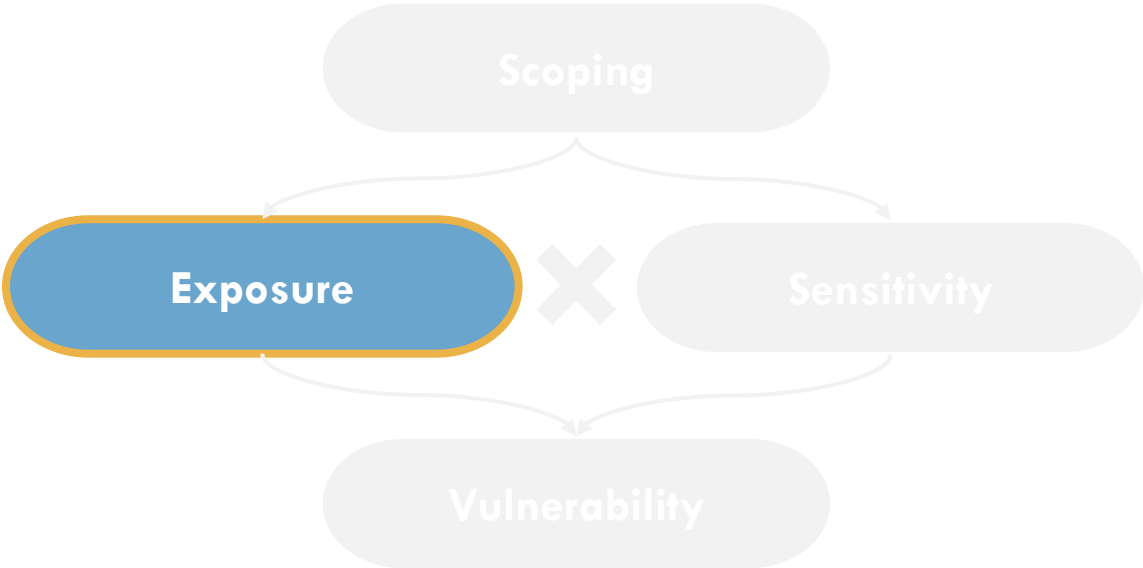
Scoping



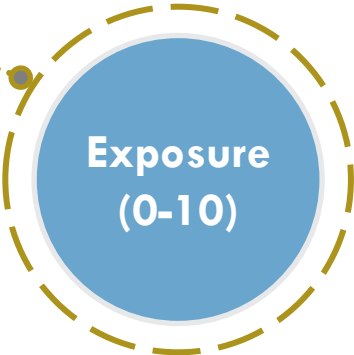
Exposure



Exposure



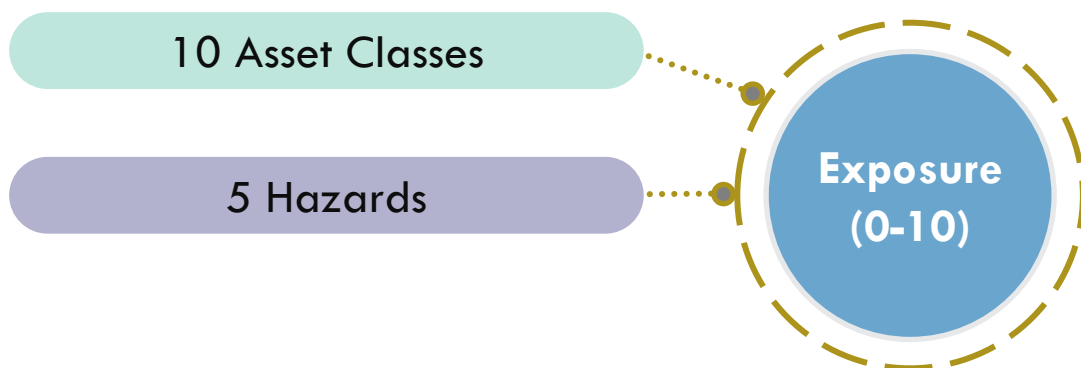
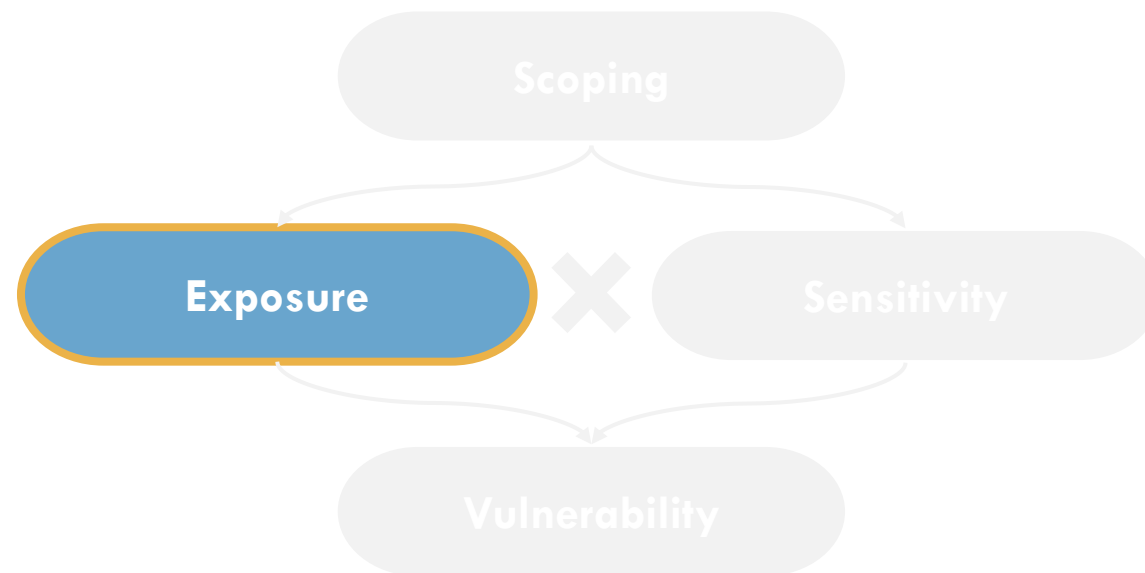
10 Asset Classes



Asset Classes	
Facilities	Storage Fields
High-Pressure (HP) Pipes	Compressors
High-Pressure Service Pipes	Regulators
Medium-Pressure (MP) Pipes	Controllable Gas Valves
Medium-Pressure Service Pipes	Non-Controllable Gas Valves



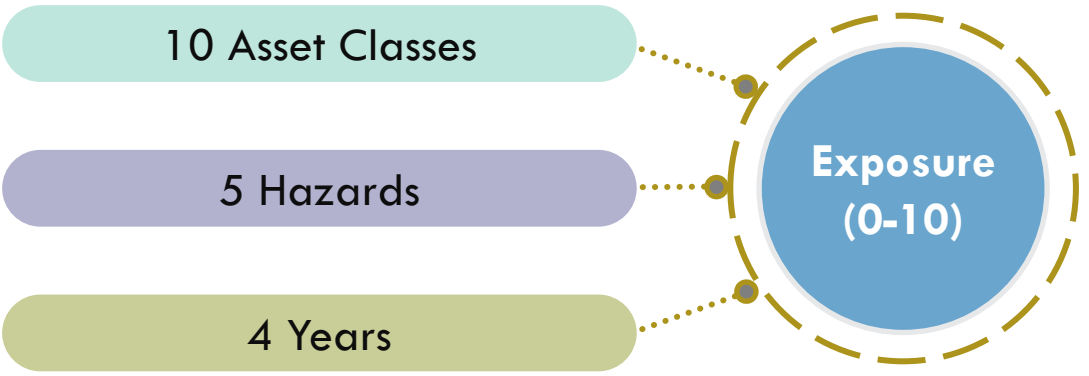
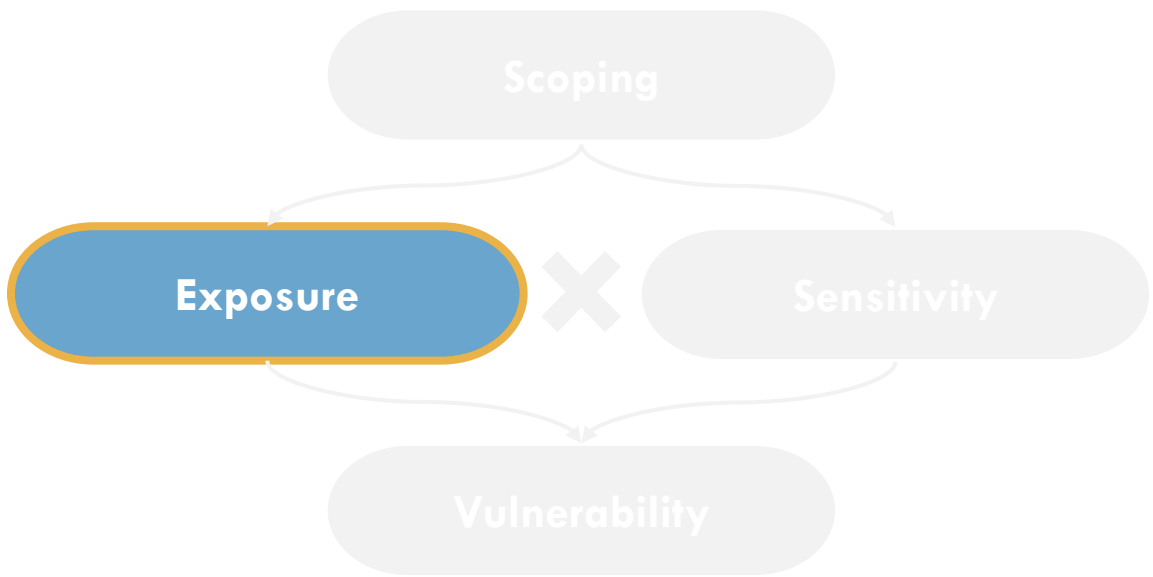
Exposure



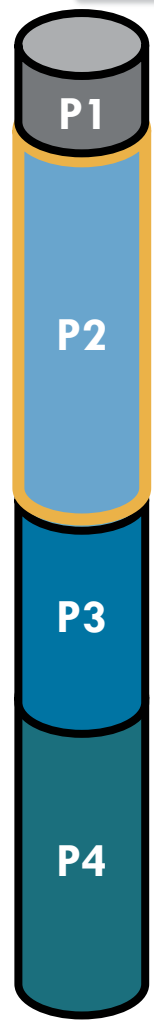
Hazards
Wildfire
Inland Flood (incl. associated erosion and debris flow)
Landslide
Coastal Flood (incl. effects of Sea Level Rise)
Coastal Erosion (incl. effects of Sea Level Rise)



Exposure



Years
Current (~2023 baseline)
2030
2050
2070



Exposure Metrics Overview

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- Facilities
- Controllable Gas Valve
- Compressor Stations
- HP Pipes Services
- MP Pipes Mains
- Regulator Stations
- Non-Controllable Gas Valve
- Storage Fields
- HP Pipes Mains
- MP Pipes Services



Wildfire



Inland Flood



Coastal Flood



Coastal Erosion



Landslide



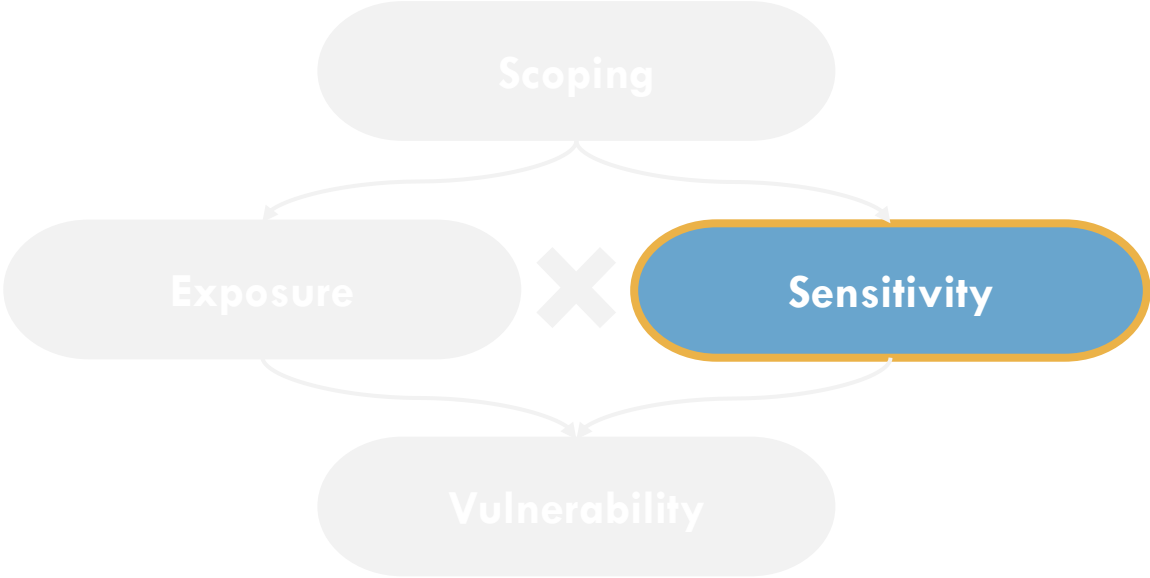
2023

2030

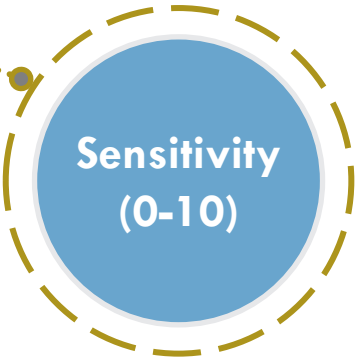
2050

2070

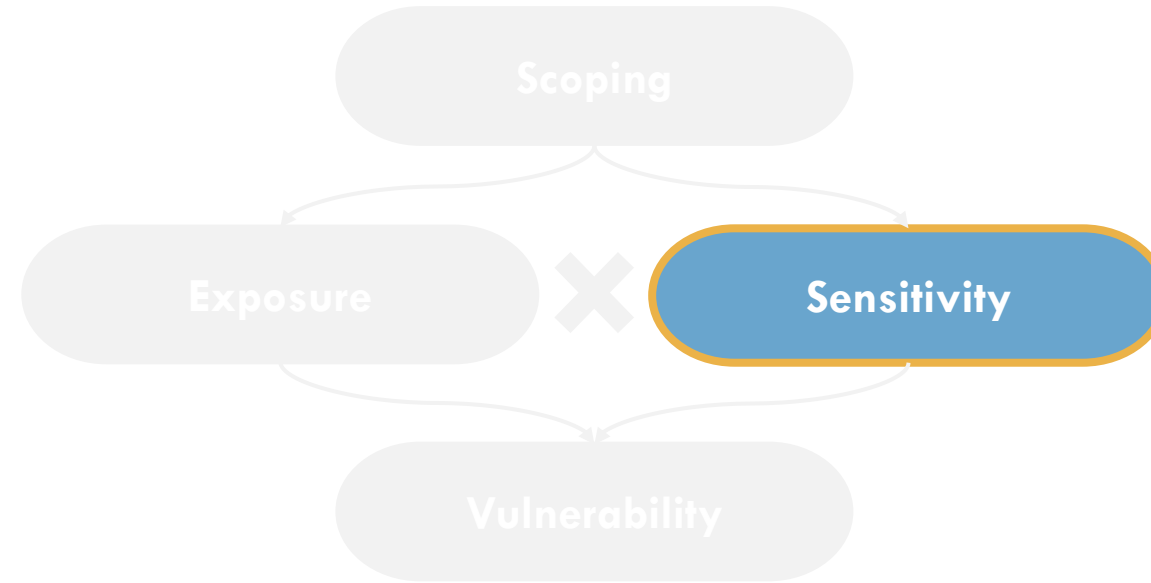
Sensitivity



Asset Class Relative Consequence



Sensitivity



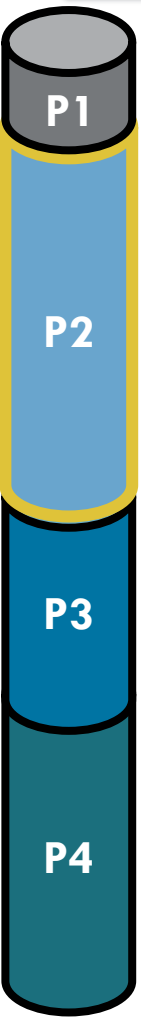
Asset Class Relative Consequence

Asset-Specific Metrics

Sensitivity
(0-10)

Subject Matter Experts (SMEs) inputs on:

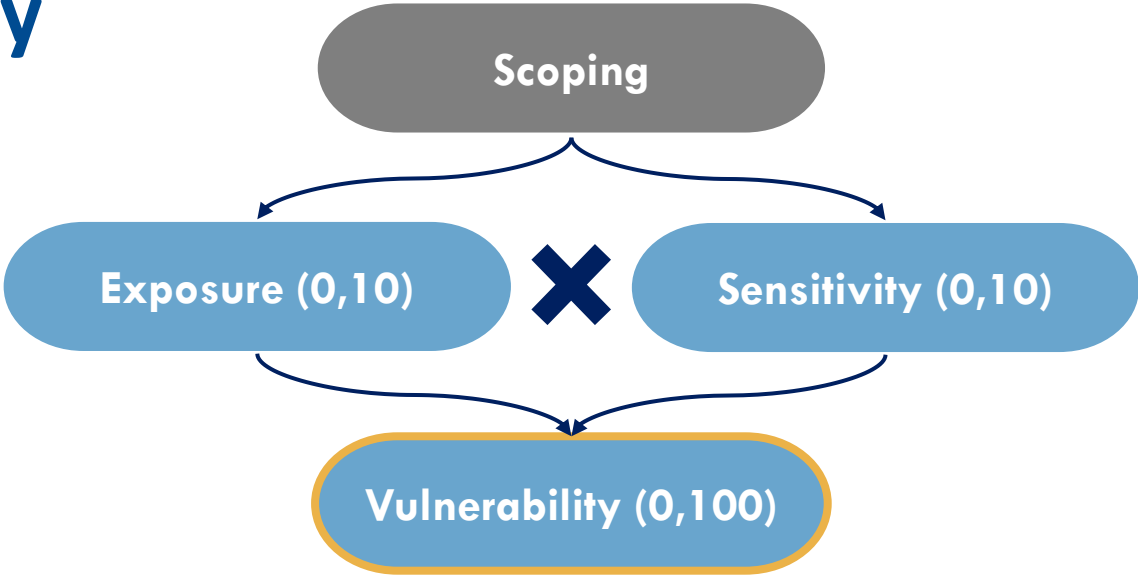
- » Criticality
- » Susceptibility



Sensitivity Metric Weights (Consistent Across Hazards) – Based on SME Input

[illegible]

Asset Vulnerability

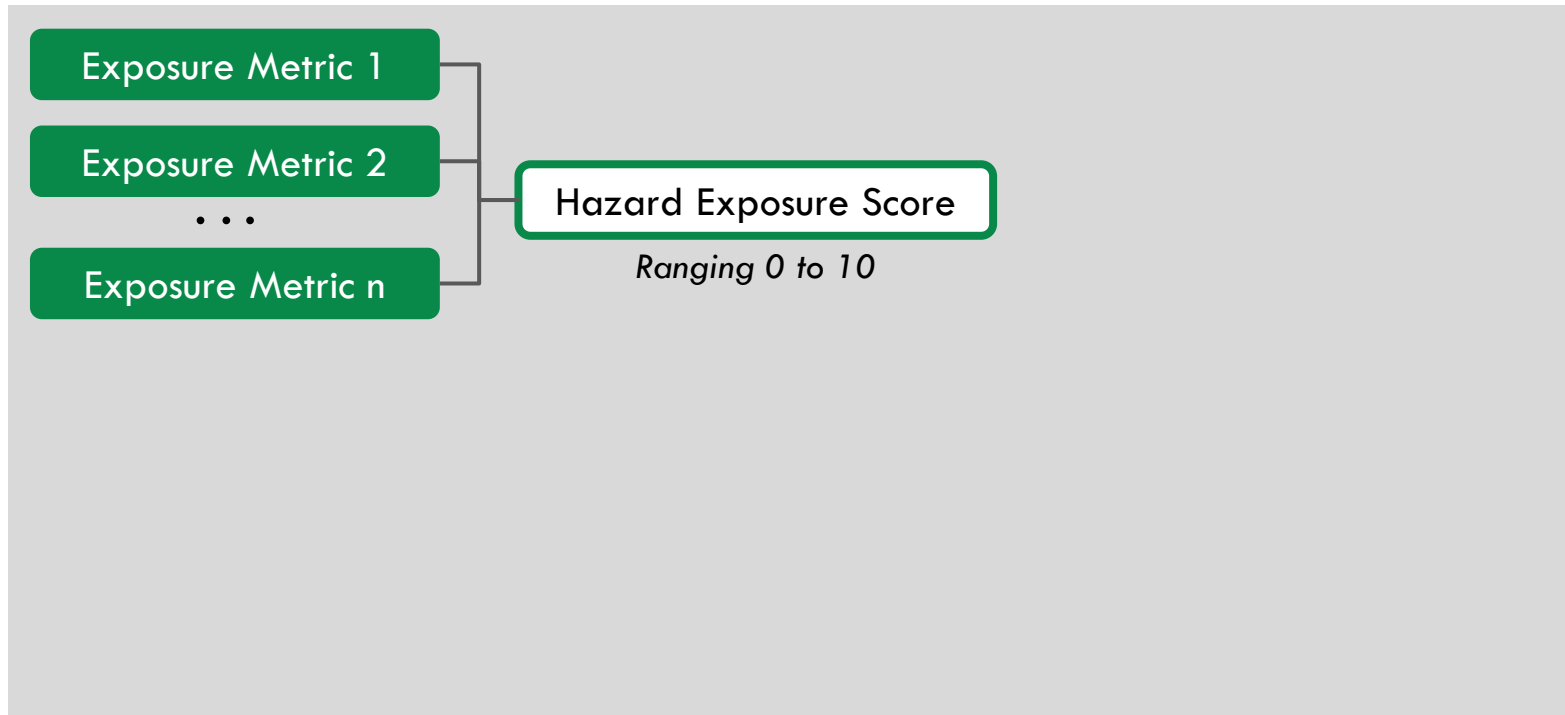


Color	Label	Score Range
Red	Very High	80 – 100
Orange	High	60 – 80
Yellow	Moderate	40 – 60
Light Green	Low	20 – 40
Dark Green	Very Low	0 - 20



Asset Vulnerability Scoring Process for Each Asset

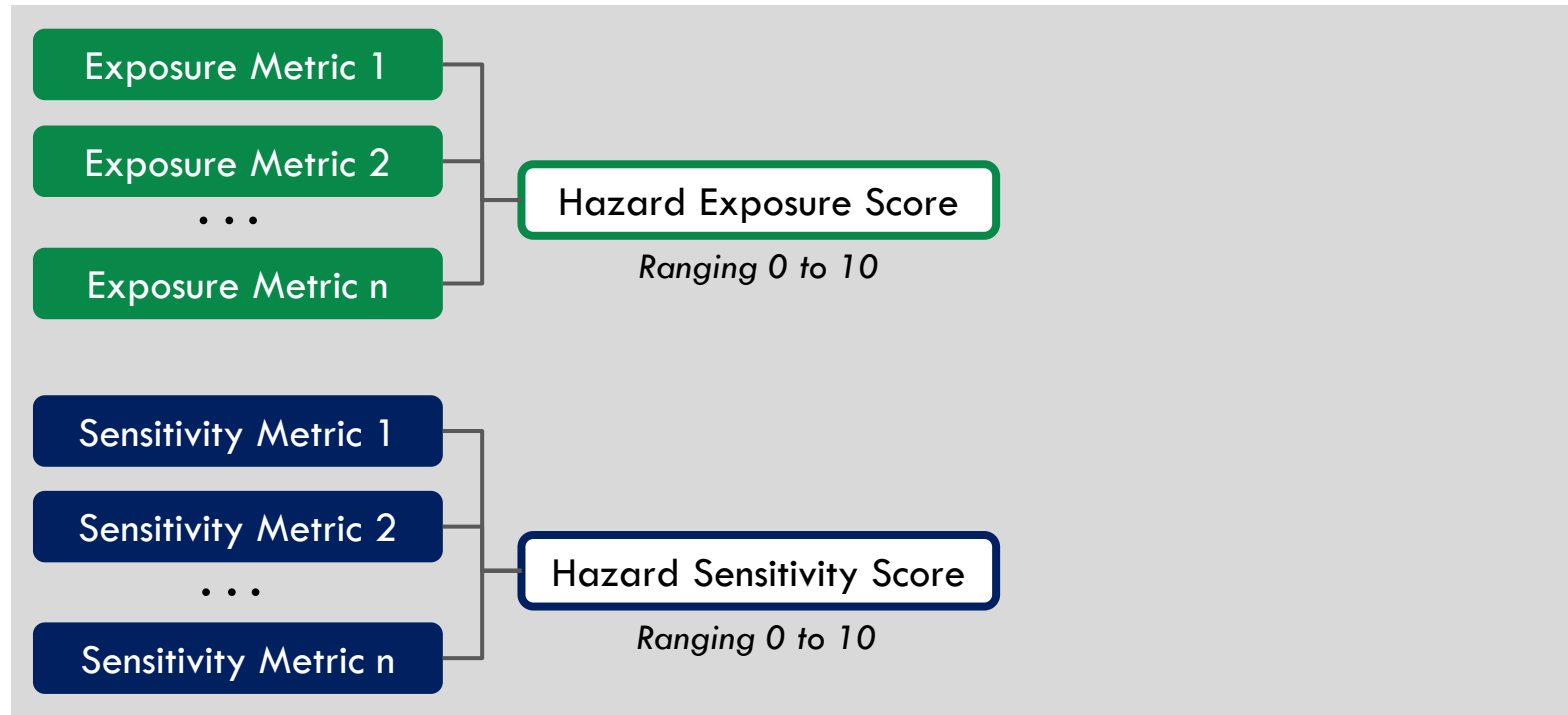
31



- » Each **Exposure** metric weighted and combined into hazard exposure score

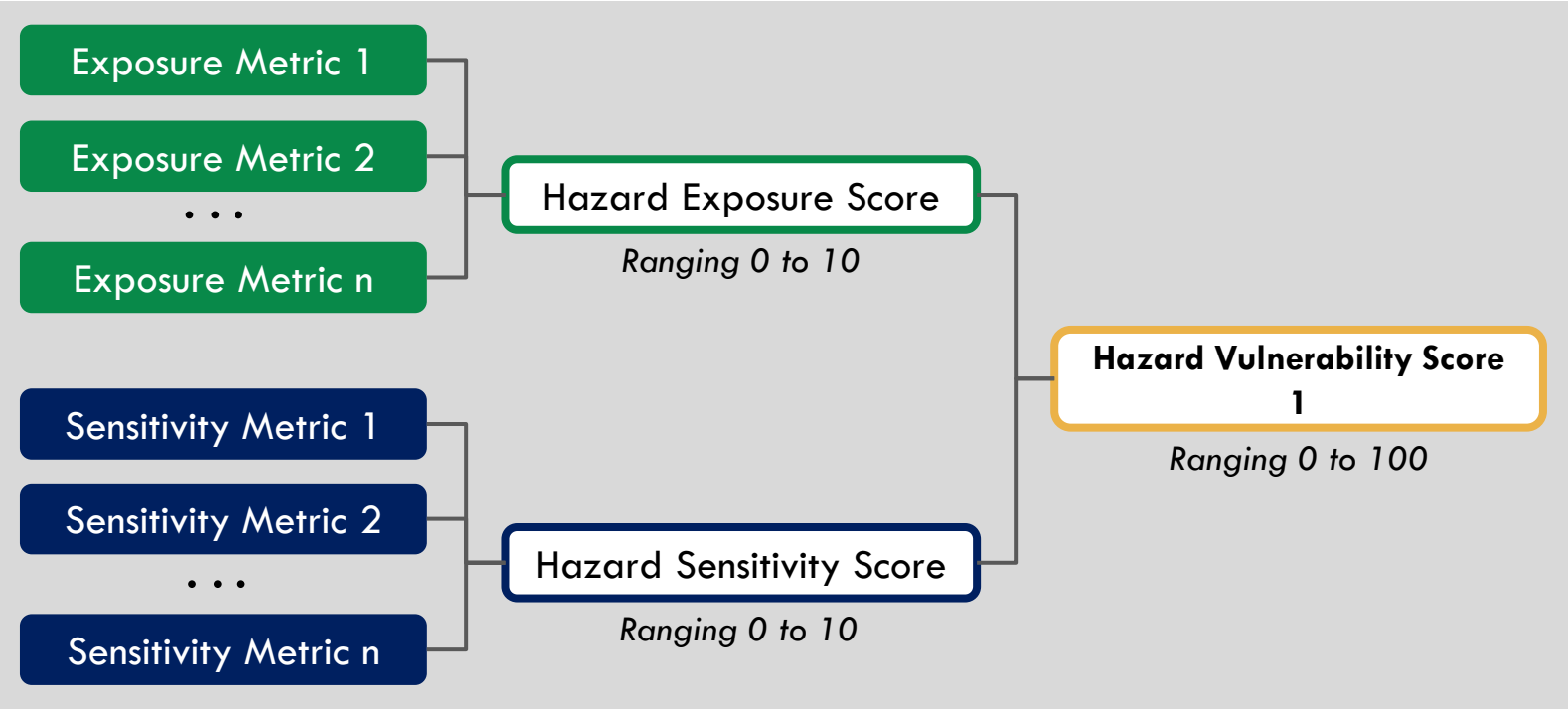
Asset Vulnerability Scoring Process for Each Asset

32

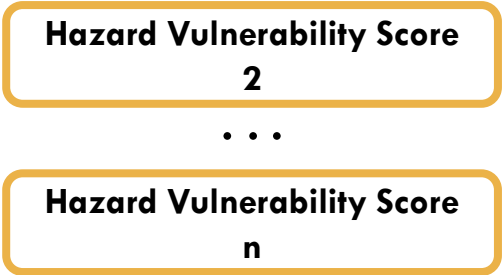


- » Each **Sensitivity** metric weighted and combined into hazard exposure score

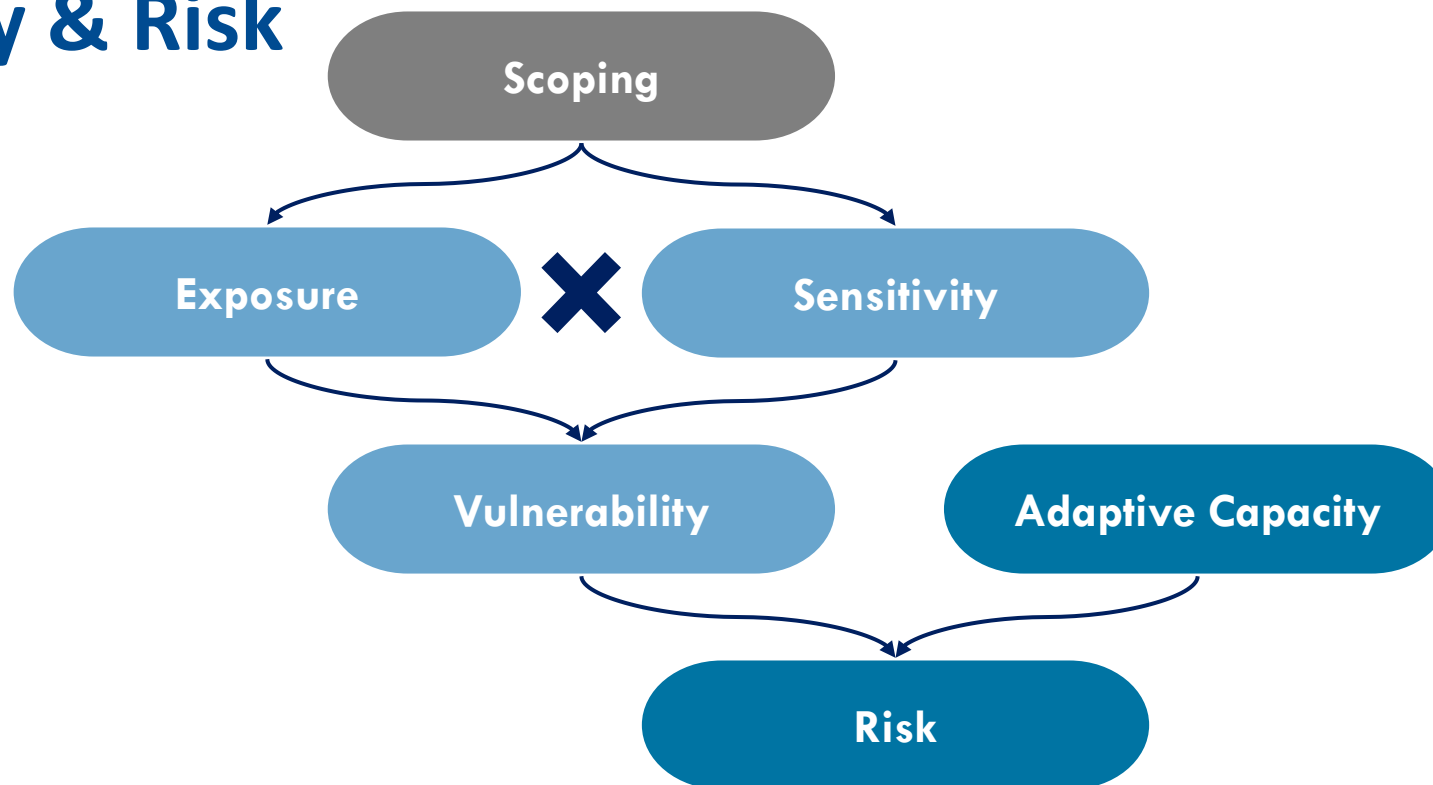
Asset Vulnerability Scoring Process for Each Asset



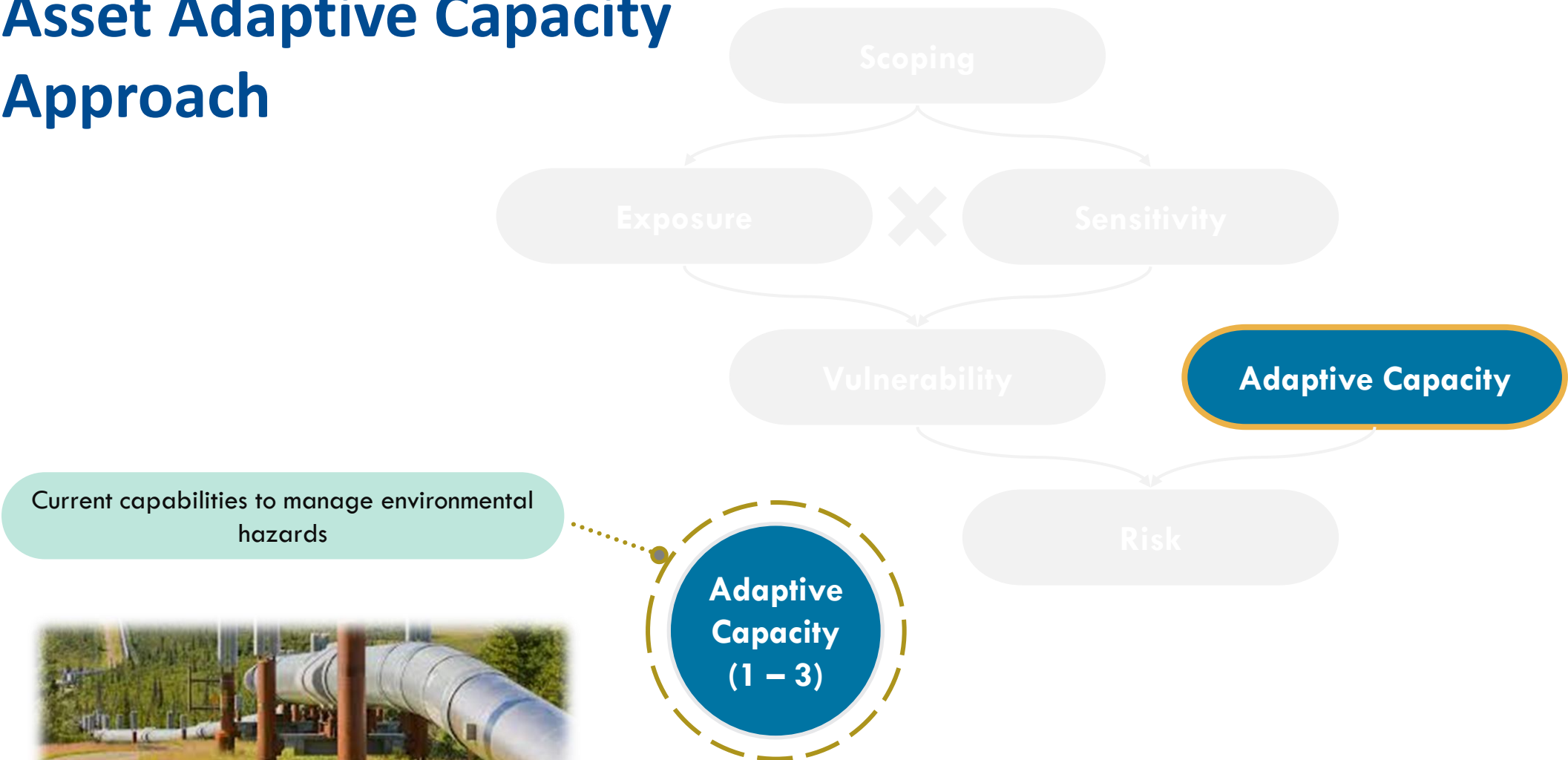
Process inside the gray box repeated for each hazard



Adaptive Capacity & Risk



Asset Adaptive Capacity Approach



P1

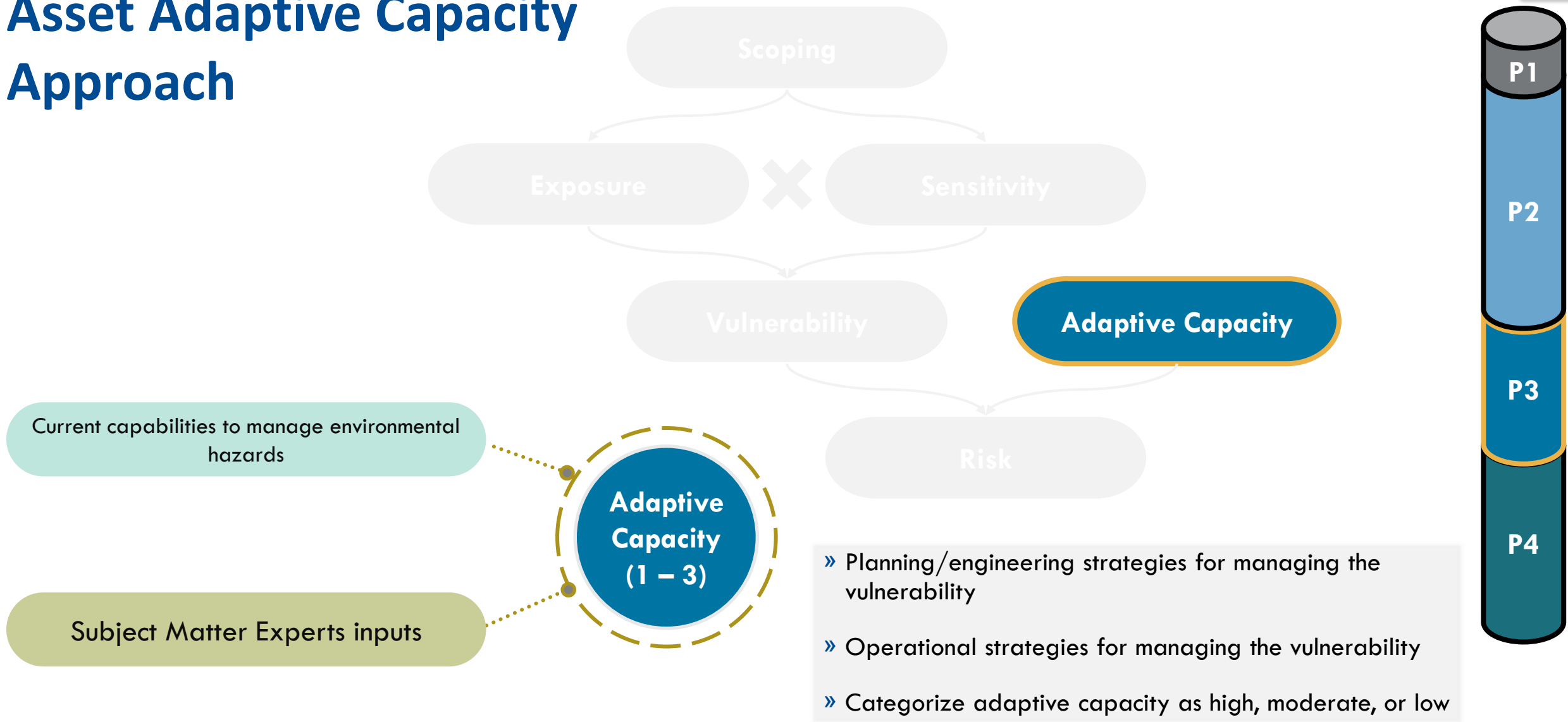
P2

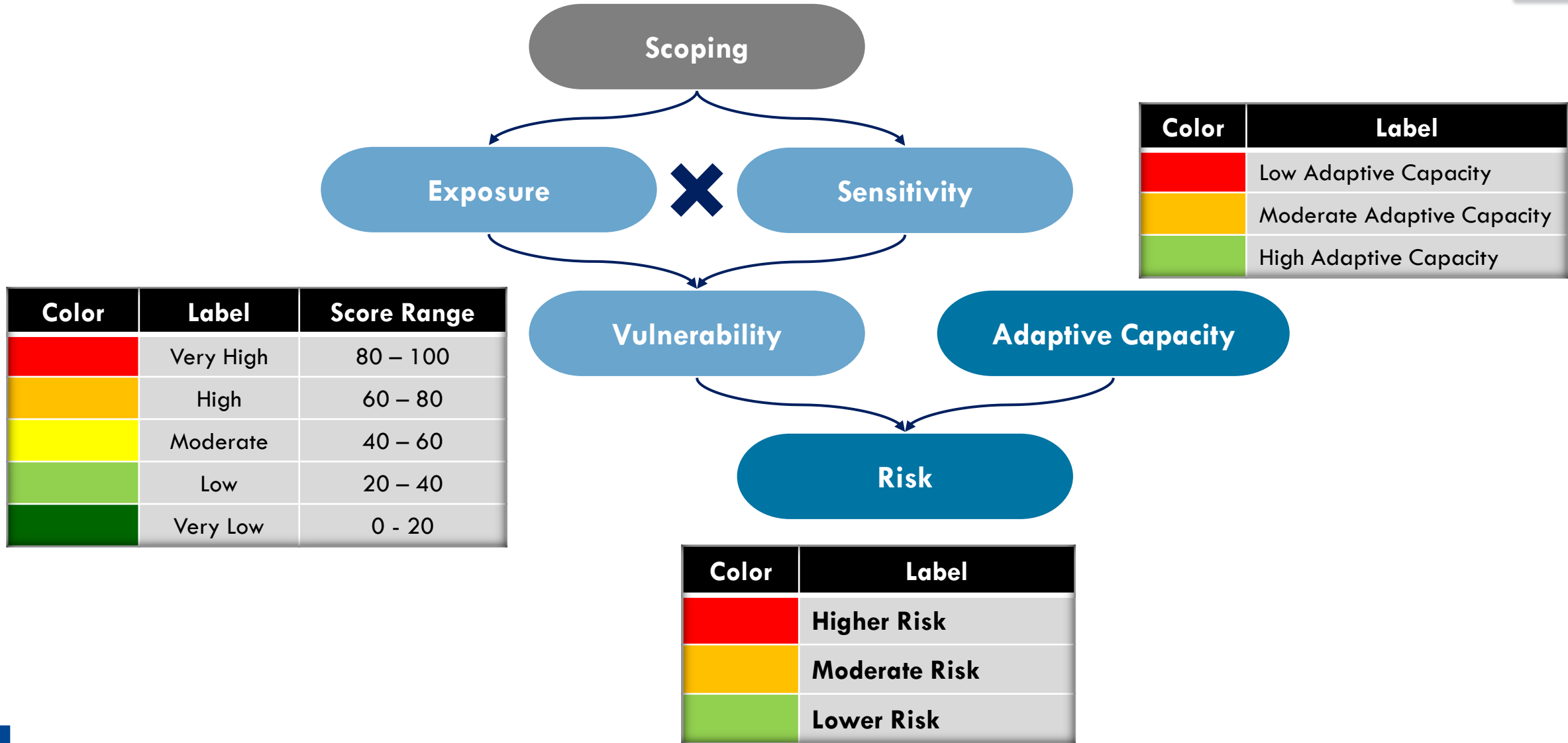
P3

P4

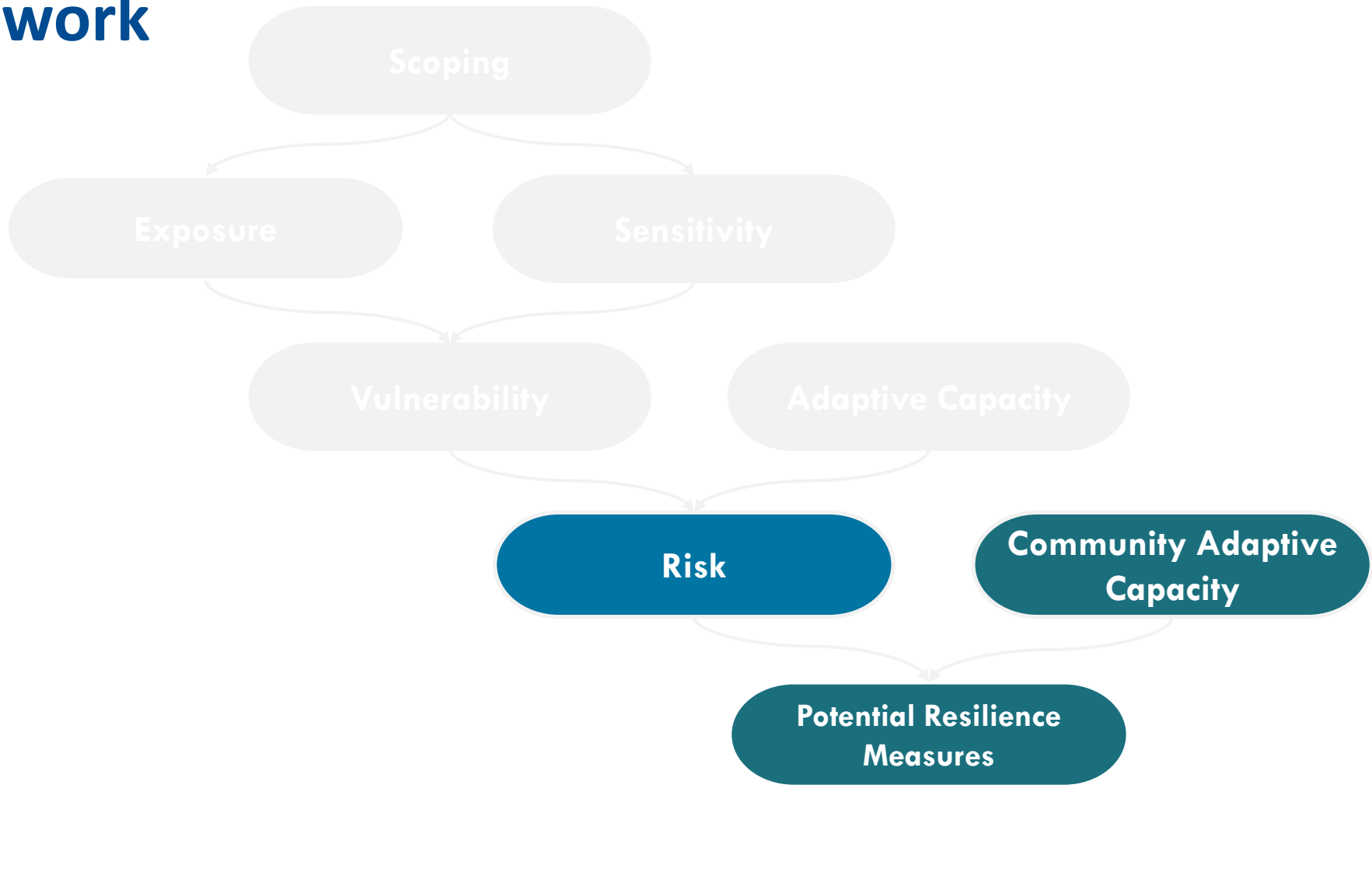


Asset Adaptive Capacity Approach

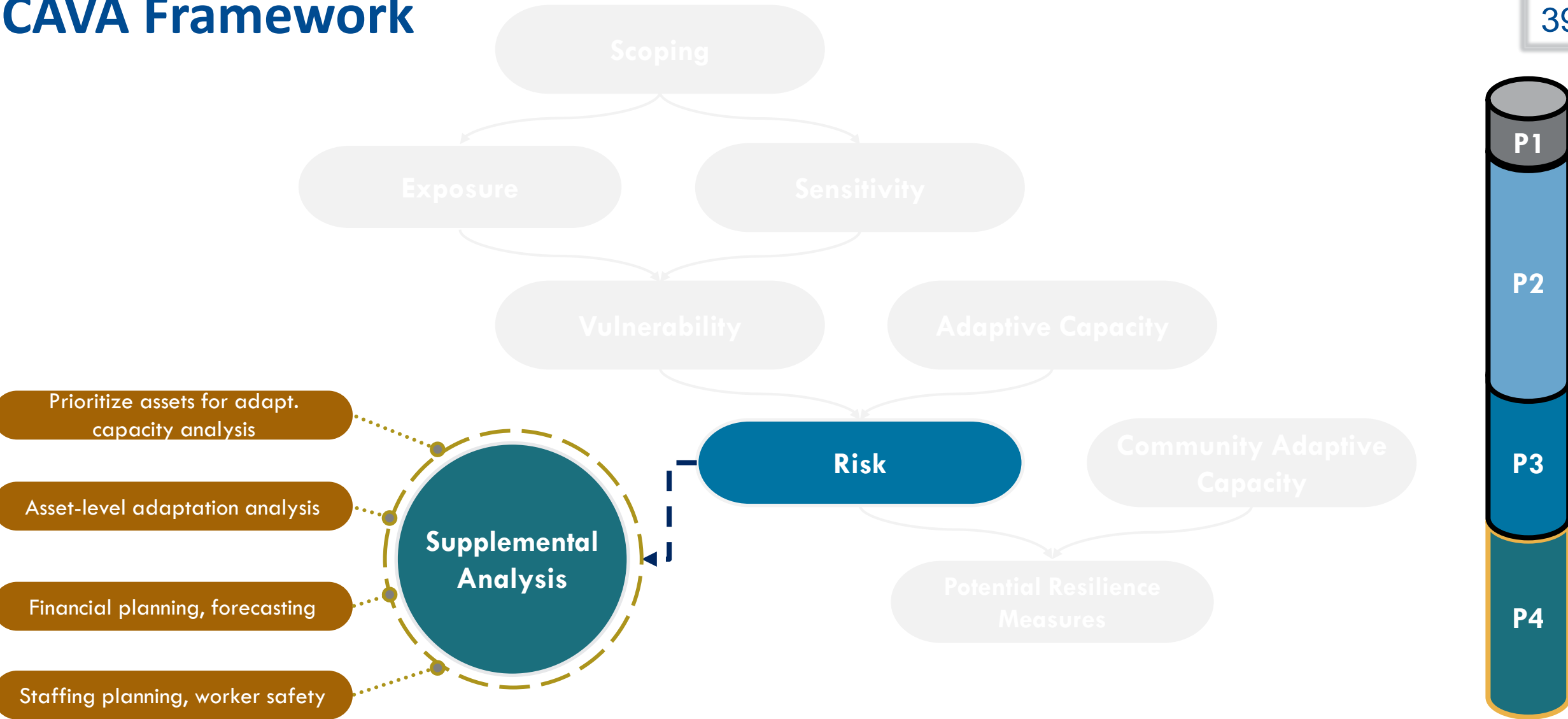




CAVA Framework



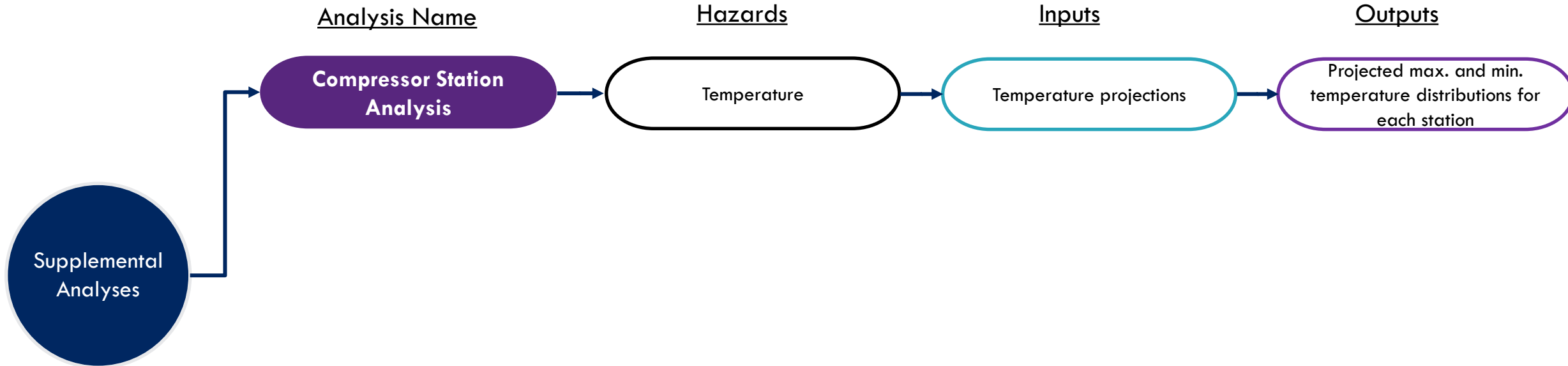
CAVA Framework



Supplemental Analyses Overview

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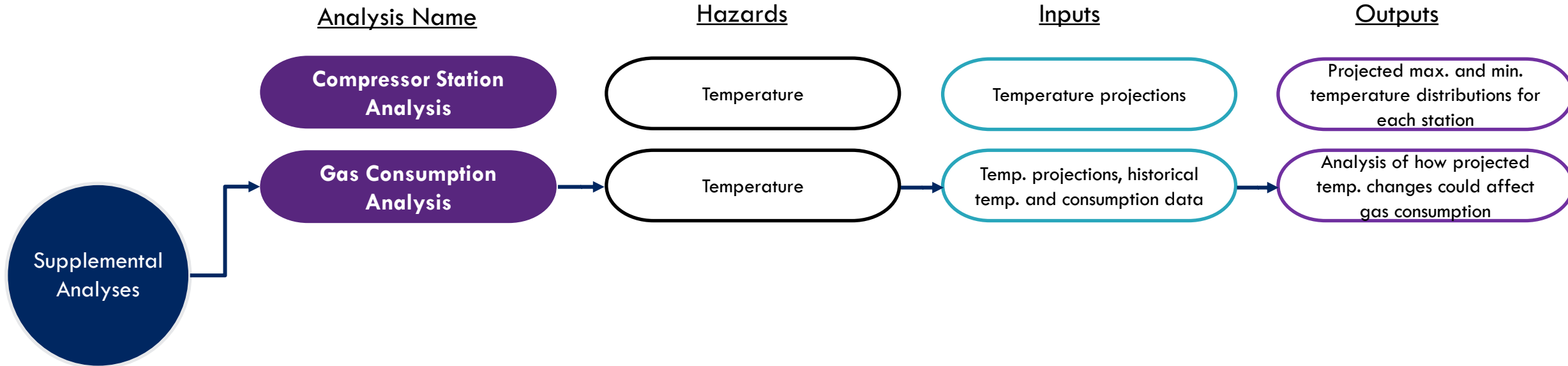
- » Several supplemental analyses conducted to make CAVA more useful and account for limitations in indicator-based asset vulnerability scoring



Supplemental Analyses Overview

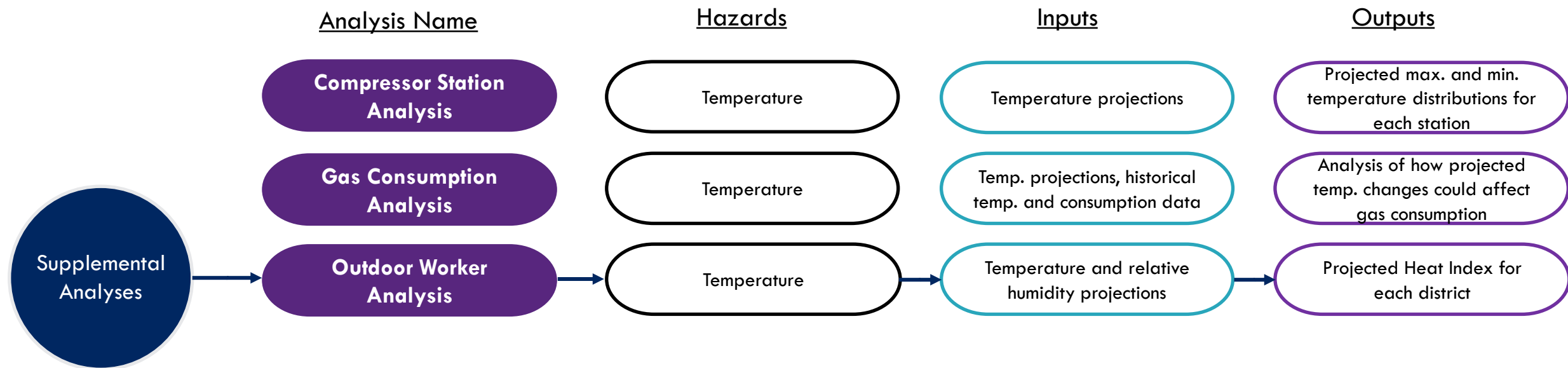
41

- » Several supplemental analyses conducted to make CAVA more useful and account for limitations in indicator-based asset vulnerability scoring



Supplemental Analyses Overview

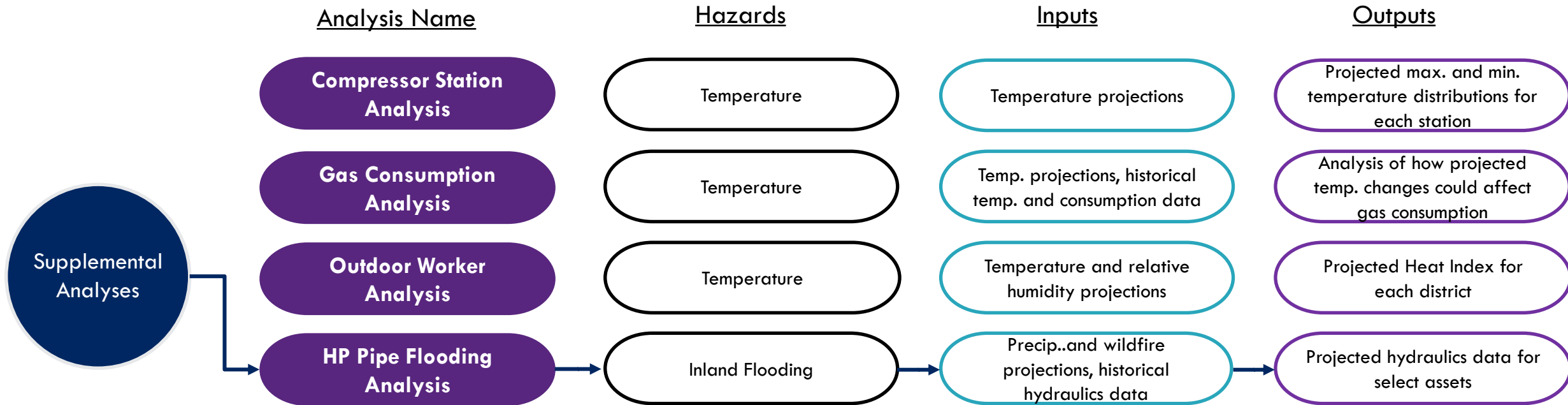
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Supplemental Analyses Overview

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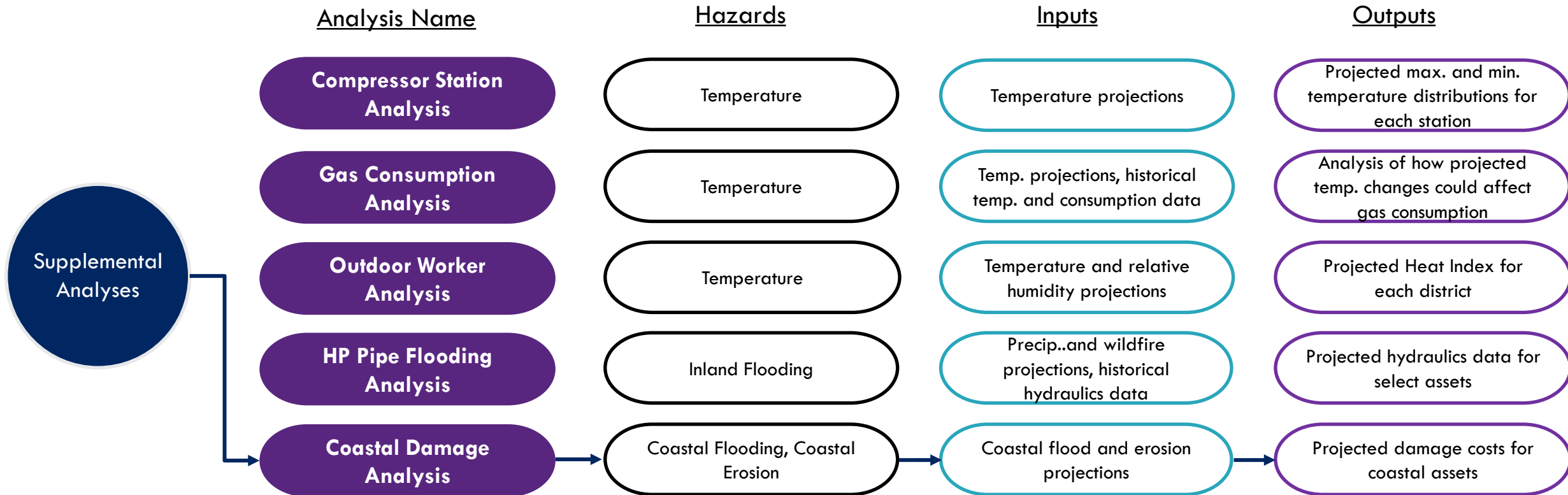
- » Several supplemental analyses conducted to make CAVA more useful and account for limitations in indicator-based asset vulnerability scoring



Supplemental Analyses Overview

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- » Several supplemental analyses conducted to make CAVA more useful and account for limitations in indicator-based asset vulnerability scoring



Key Takeaways

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Four-Phase Approach:

Climate Science, Vulnerability, Risk, Resilience Measures



How Exposed, Sensitive, & Vulnerable our assets are?

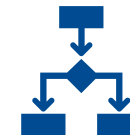


Risk: Vulnerability and how resilient are our communities & SoCalGas?



Supplemental Analysis:

Additional resources for informed decision-making



QUESTIONS & FEEDBACK

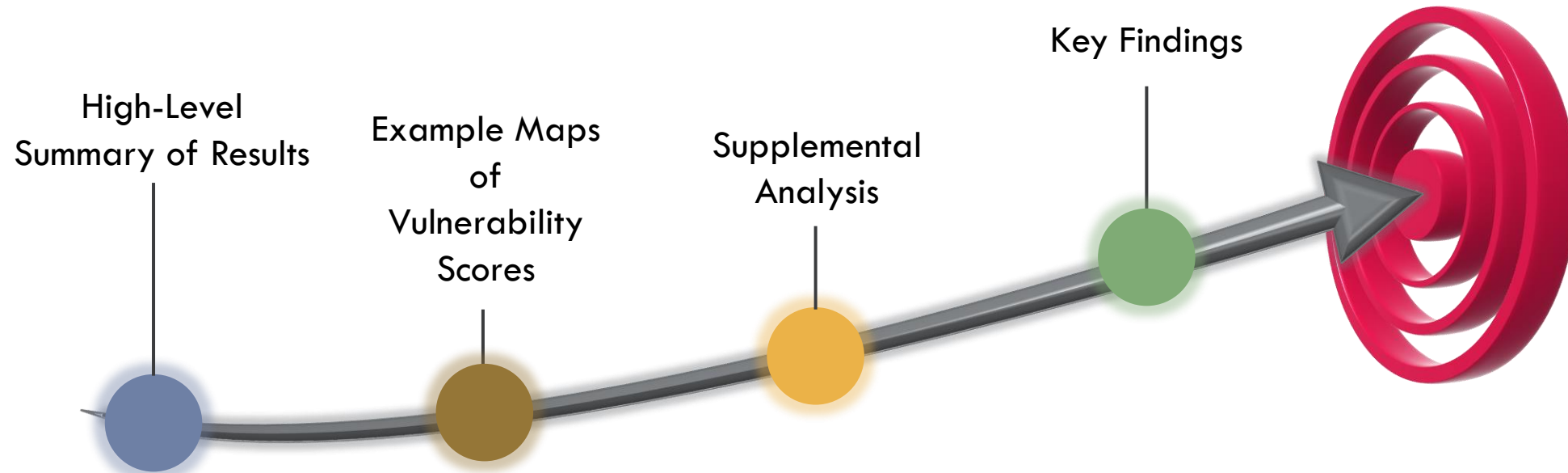


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VULNERABILITY ASSESSMENT HIGH-LEVEL RESULTS

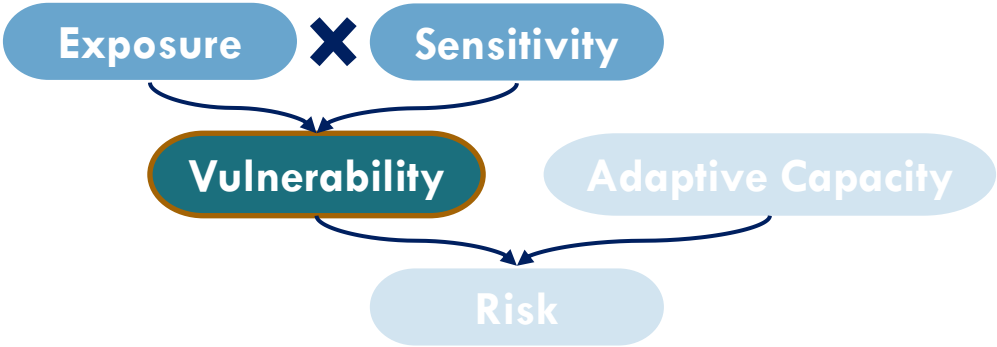
Learning Objectives

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Asset Vulnerability Scores Summary for Year 2050

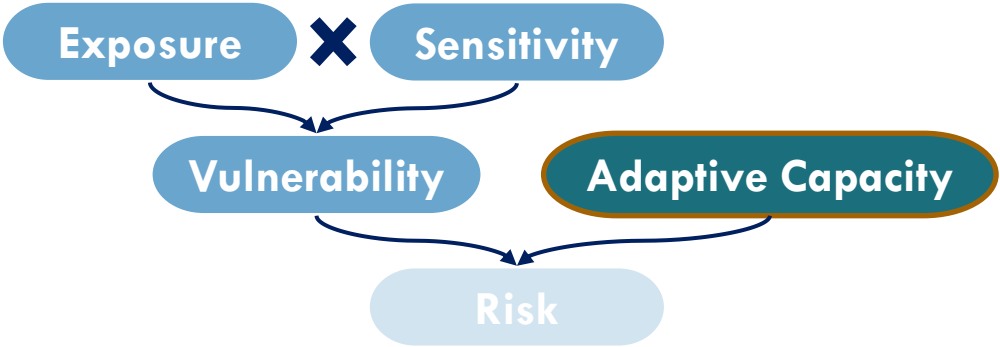
	Coastal Erosion	Coastal Flood	Inland Flood	Landslide	Wildfire
High-Pressure Pipelines					
Medium-Pressure Pipelines					
Facilities					
Regulators, Compressors, Valves					
Storage Fields					



Color	Label
	High
	Moderate
	Low
	Very Low

Asset Adaptive Capacity Summary as of 2023

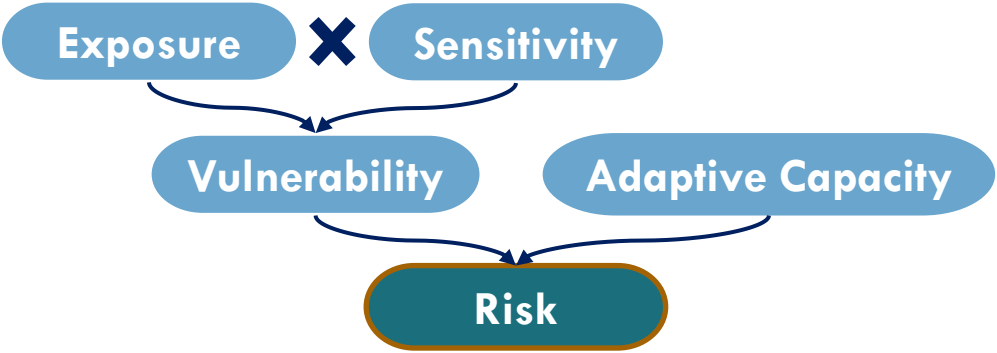
	Coastal Erosion	Coastal Flood	Inland Flood	Landslide	Wildfire
High-Pressure Pipelines					
Medium-Pressure Pipelines					
Facilities					
Regulators, Compressors, Valves					
Storage Fields					



Color	Label
	Low
	Moderate
	High

Systemwide Climate Change Risk Results for Year 2050

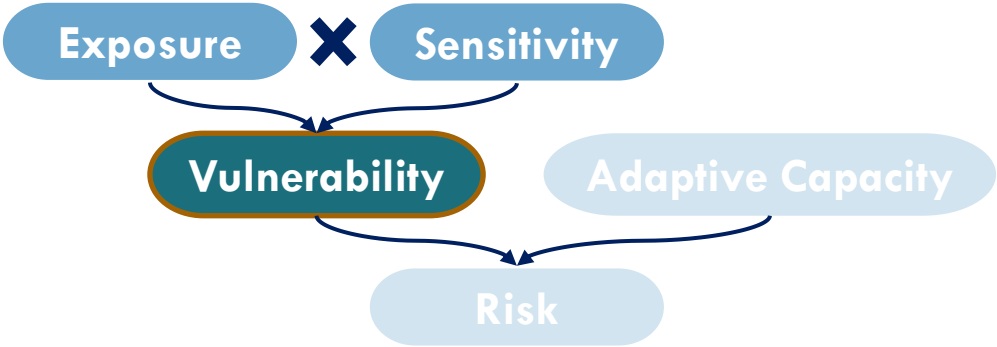
	Coastal Erosion	Coastal Flood	Inland Flood	Landslide	Wildfire
High-Pressure Pipelines					
Medium-Pressure Pipelines					
Facilities					
Regulators, Compressors, Valves					
Storage Fields					



Color	Label
	Higher Risk
	Moderate Risk
	Lower Risk

Asset Vulnerability Scores Summary for Year 2050

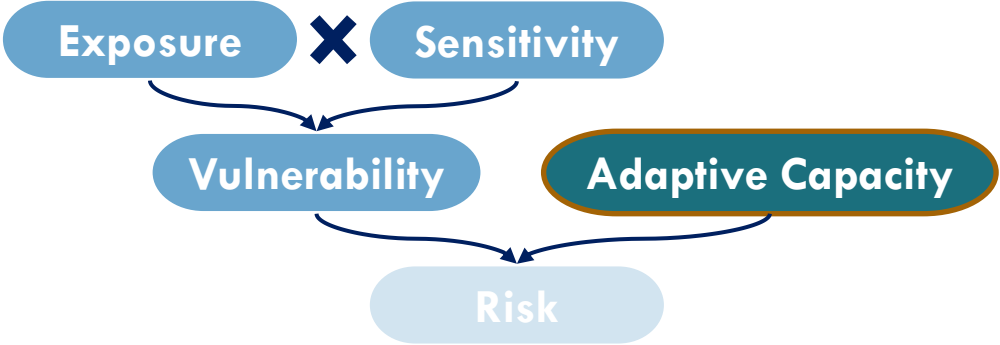
	Coastal Erosion	Coastal Flood	Inland Flood	Landslide	Wildfire
High-Pressure Pipelines					
Medium-Pressure Pipelines					
Facilities					
Regulators, Compressors, Valves					
Storage Fields					



Color	Label
	High
	Moderate
	Low
	Very Low

Asset Adaptive Capacity Summary as of 2023

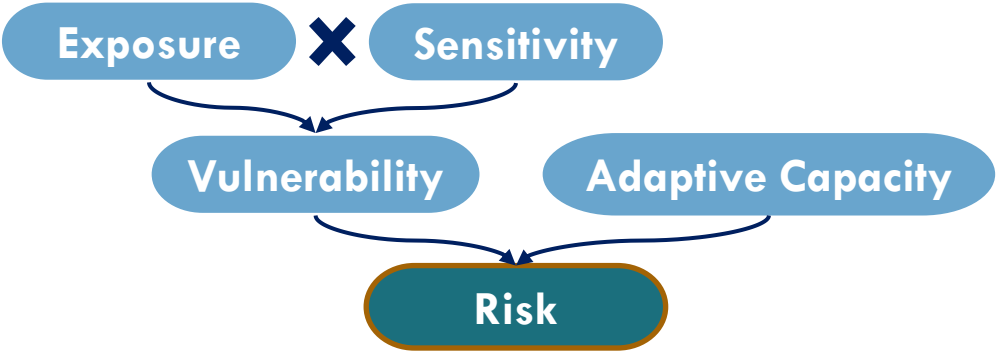
	Coastal Erosion	Coastal Flood	Inland Flood	Landslide	Wildfire
High-Pressure Pipelines					
Medium-Pressure Pipelines					
Facilities					
Regulators, Compressors, Valves					
Storage Fields					



Color	Label
	Low
	Moderate
	High

Systemwide Climate Change Risk Results for Year 2050

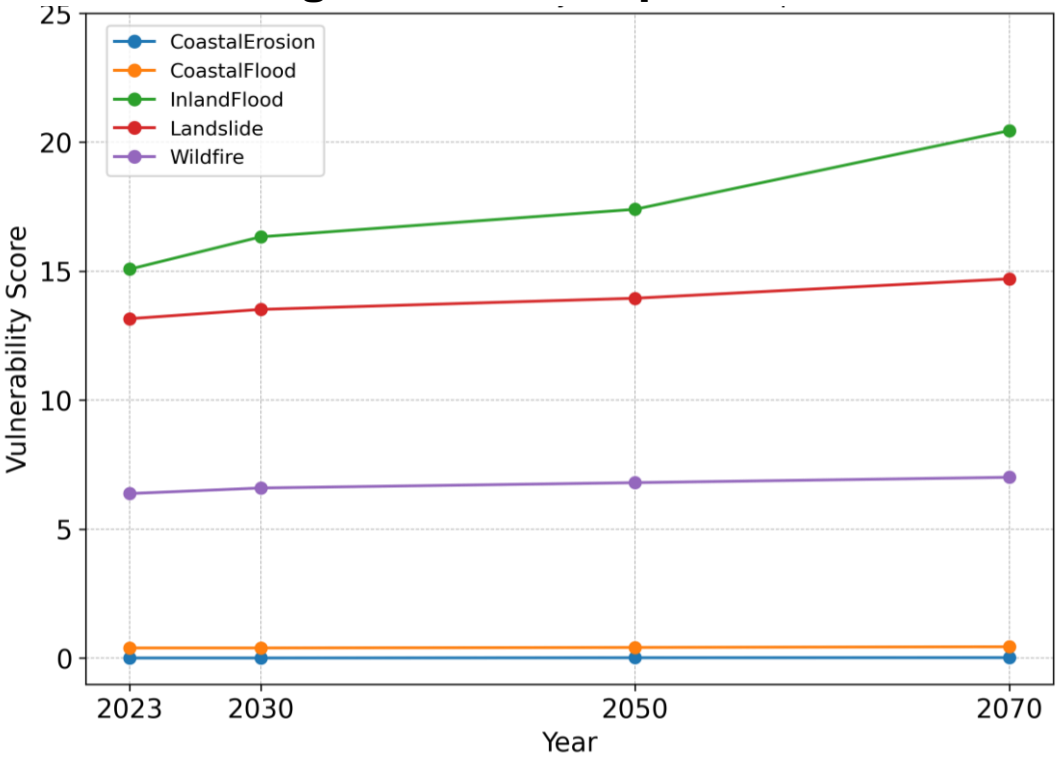
	Coastal Erosion	Coastal Flood	Inland Flood	Landslide	Wildfire
High-Pressure Pipelines					
Medium-Pressure Pipelines					
Facilities					
Regulators, Compressors, Valves					
Storage Fields					



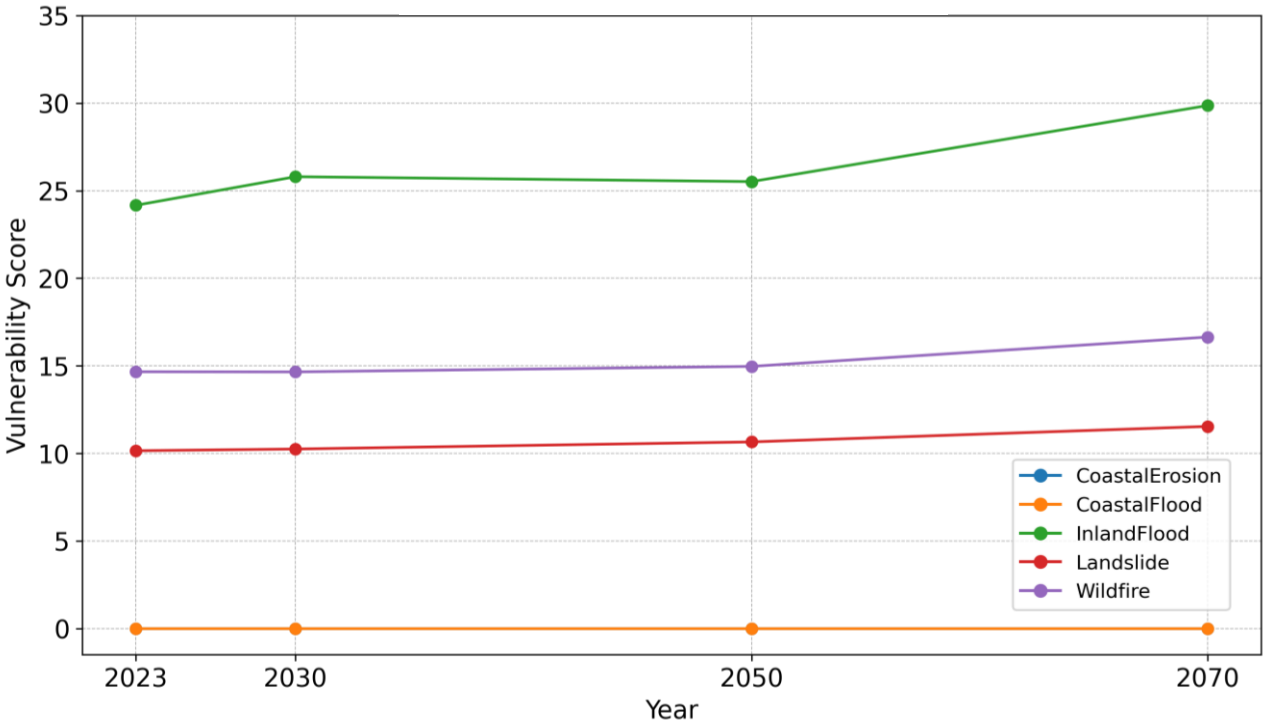
Color	Label
	Higher Risk
	Moderate Risk
	Lower Risk

Mean Vulnerability Scores

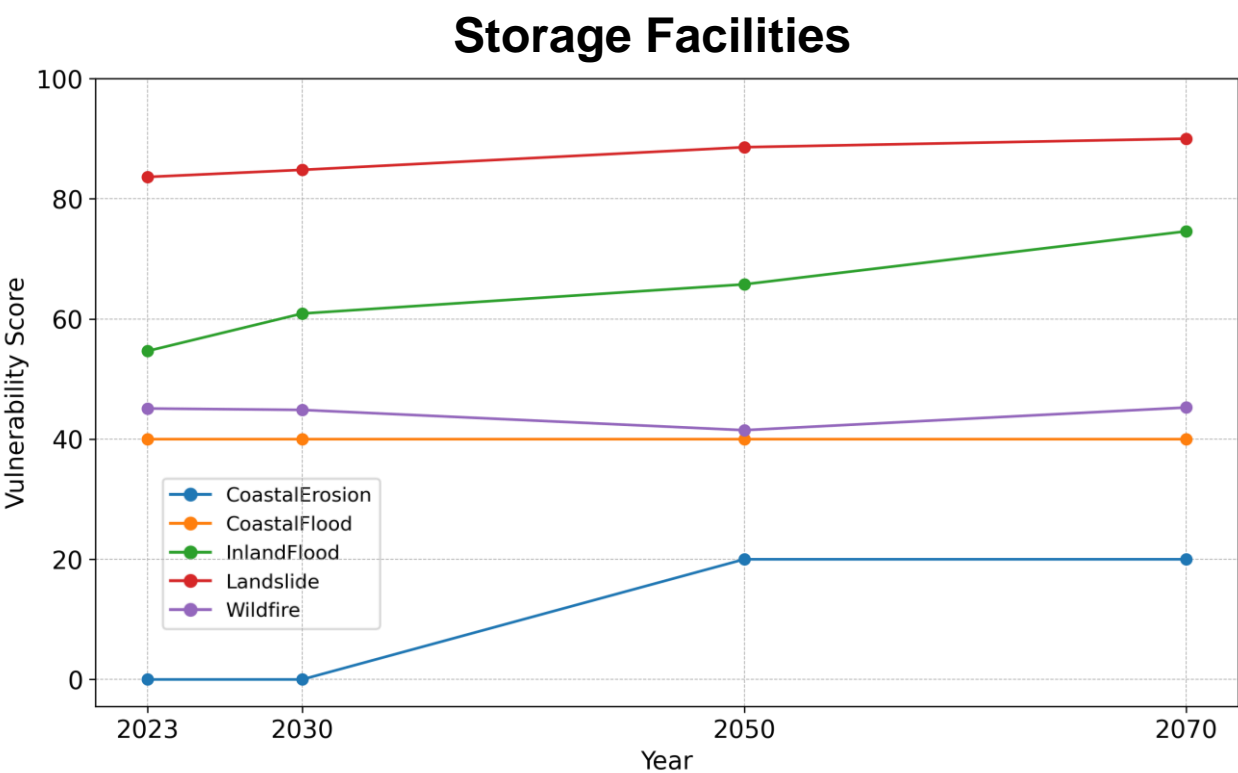
High-Pressure Pipelines



Compressor Stations



Mean Vulnerability Scores (cont.)



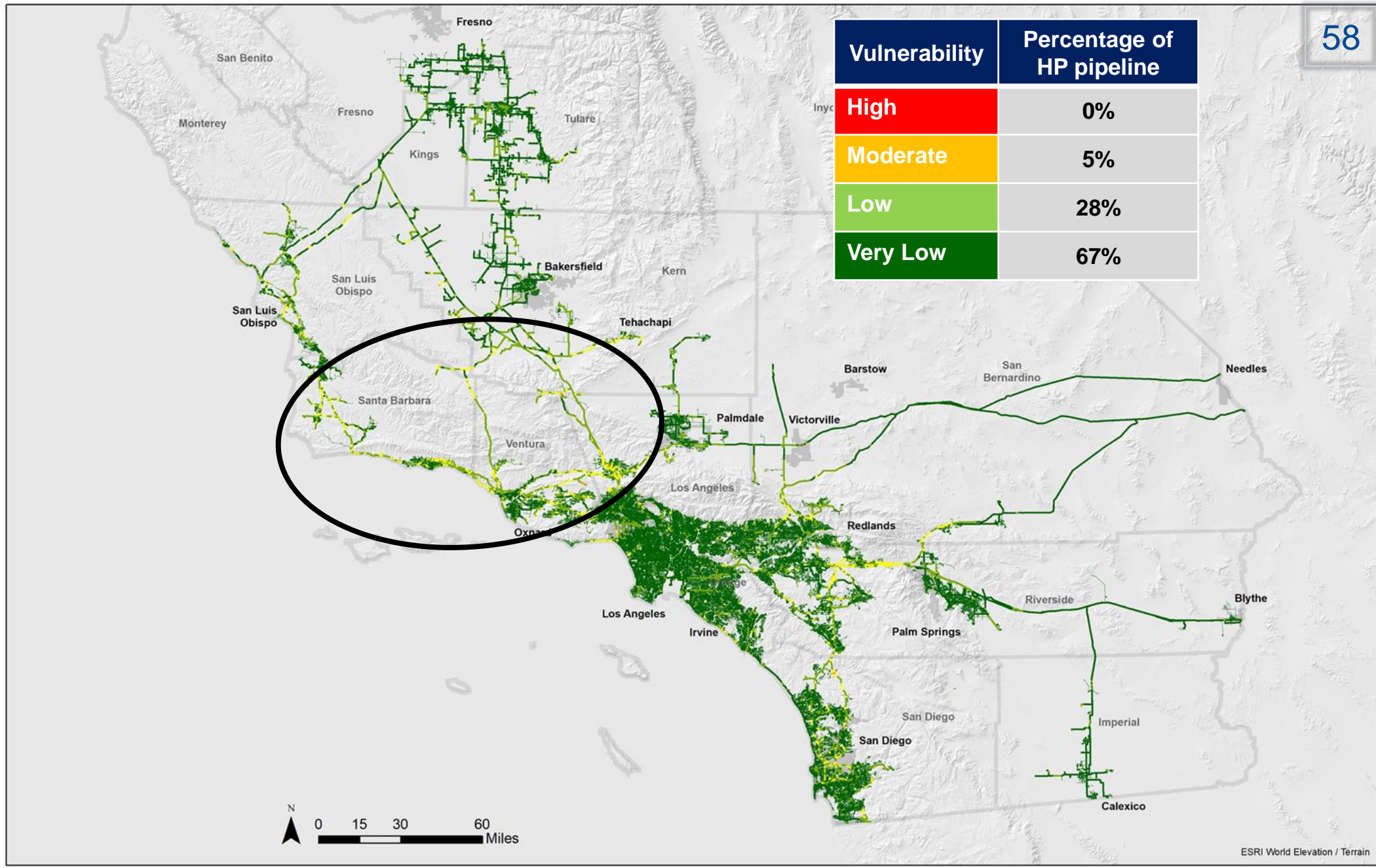
RESULTS: VULNERABILITY SCORE MAPS

Vulnerability Score Map

Year: 2023

Threat:
Inland Flood

Assets:
High-Pressure
&
Medium-Pressure
Pipelines

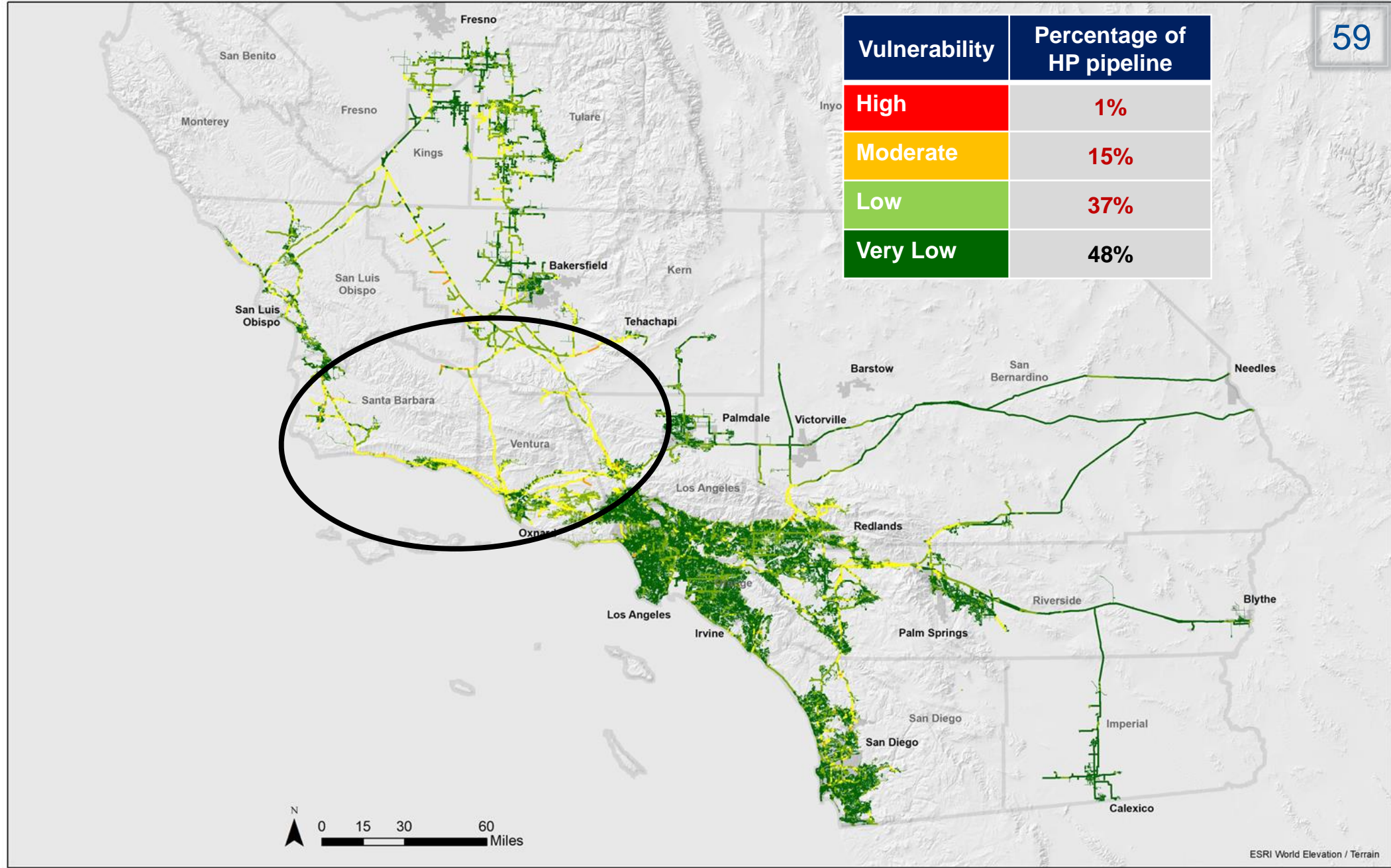


Vulnerability Score Map

Year: 2070

Threat:
Inland Flood

Assets:
High-Pressure
&
Medium-Pressure
Pipelines

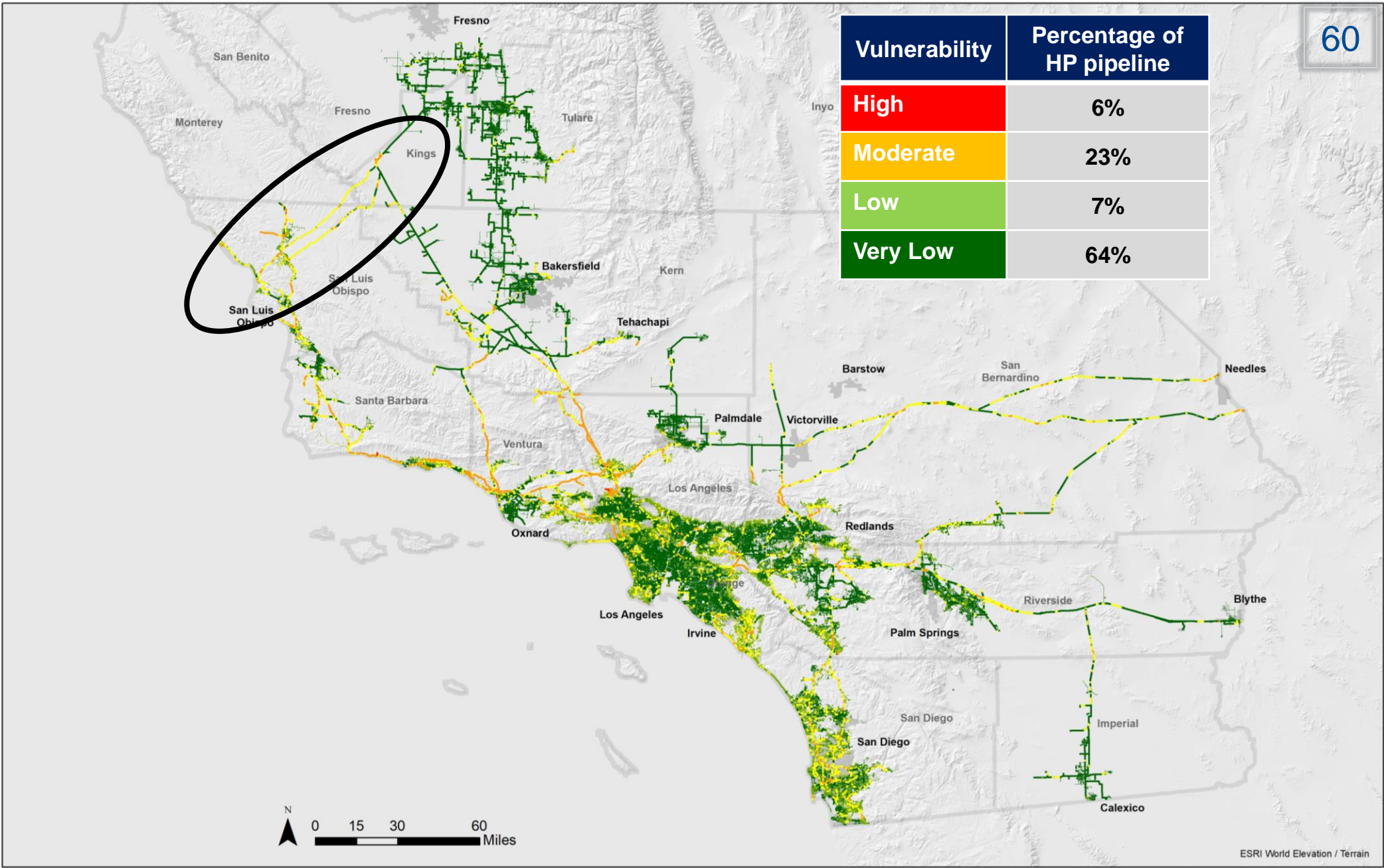


Vulnerability Score Map

Year: 2023

Threat:
Landslide

Assets:
High-Pressure
&
Medium-Pressure
Pipelines

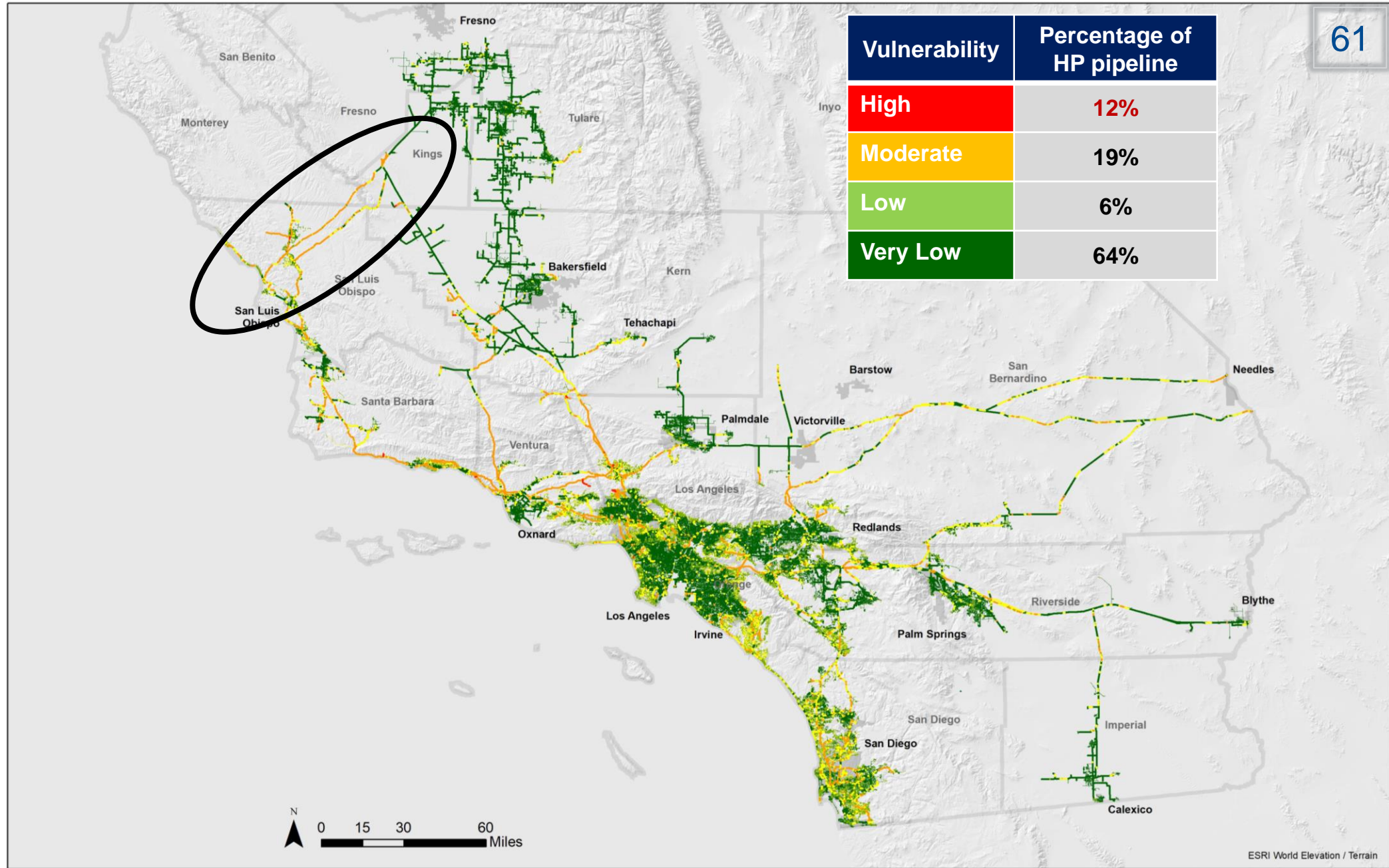


Vulnerability Score Map

Year: 2070

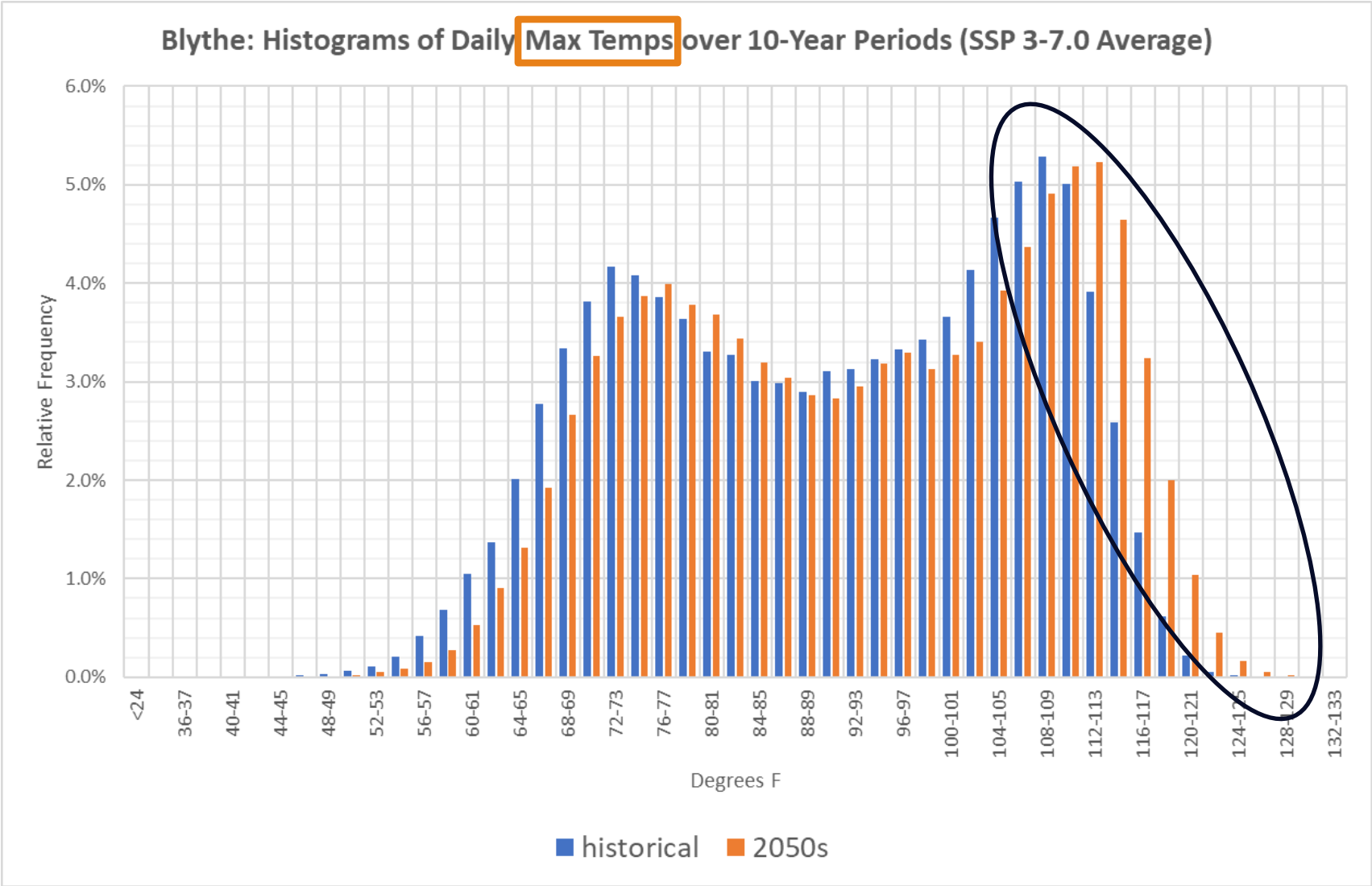
Threat: Landslide

Assets: High-Pressure & Medium-Pressure Pipelines

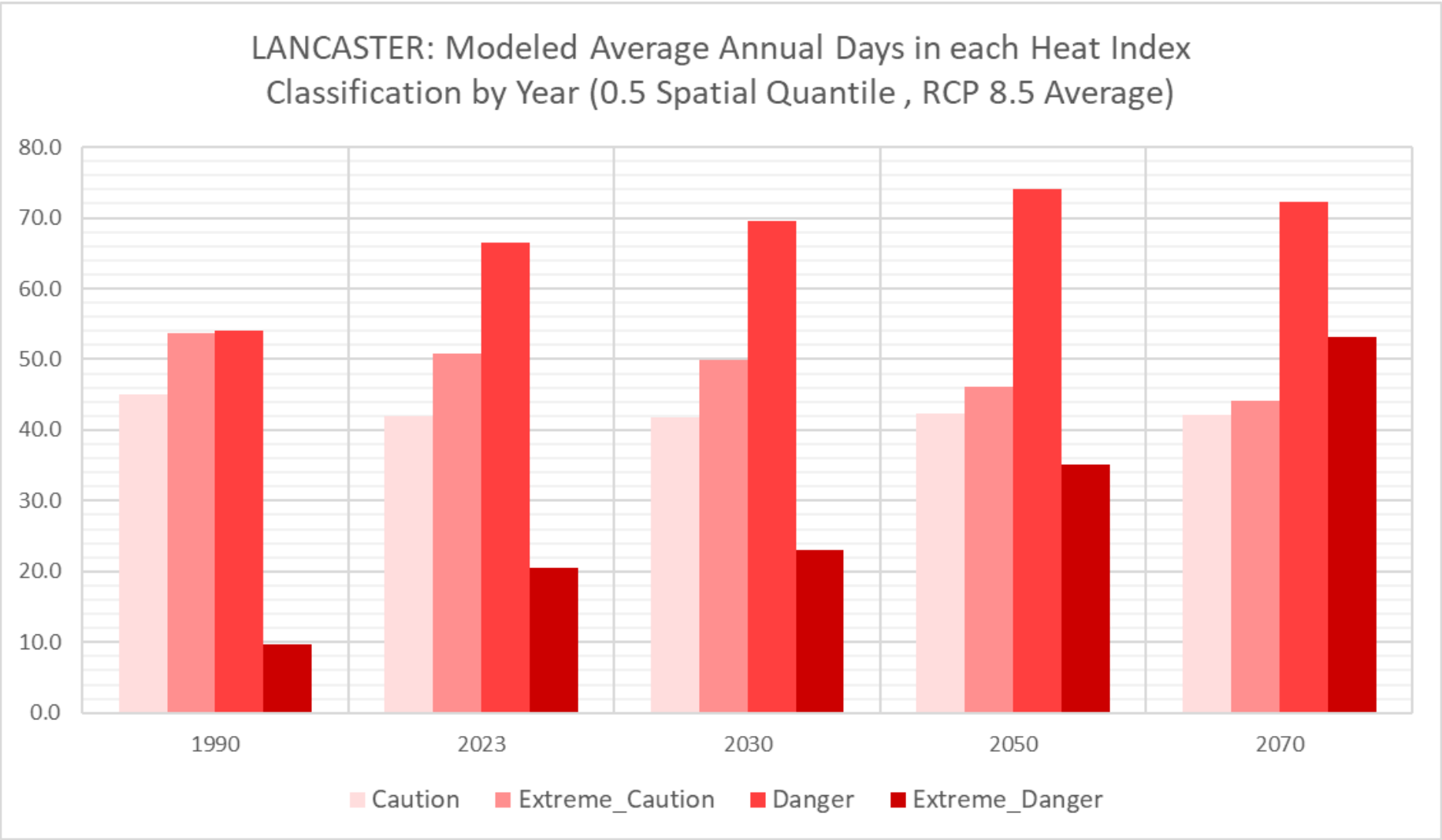


RESULTS: SUPPLEMENTAL ANALYSIS SELECTED FINDINGS

Compressors Temperature Analysis: Example Results Histogram



Outdoor Worker Analysis: Example Results Chart



RESULTS: KEY OVERALL FINDINGS

Key Findings

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Wildfire



Findings:

Wildfire exposure is projected to **increase** due to climate change, leading to higher risk of wildfire damage to **storage facilities** and **above-ground assets**.

Recommendations:

Increase SoCalGas's existing wildfire mitigation measurements, such as **clearing brush** near above-ground assets.

Landslide



Findings:

Increases in **heavy precipitation** and resulting **inland flooding**, erosion, and **landslides** may adversely impact assets such as **storage facilities**, **above-ground assets**, and **pipelines**.

Recommendations:

This finding is relevant as SoCalGas plans to take proactive measures, such as **monitoring and/or mitigating site-specific locations**, to prevent incidents from occurring.

Inland Flood



Key Findings

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Coastal Flood



Coastal Erosion



Extreme Temperature



Findings:

Sea-level rise and **associated coastal flooding** and **coastal erosion** may adversely impact **storage facilities** and a small number of other assets located near the coast.

Recommendations:

This finding will help SoCalGas prepare for the future to **protect** facilities **located near the coast**.

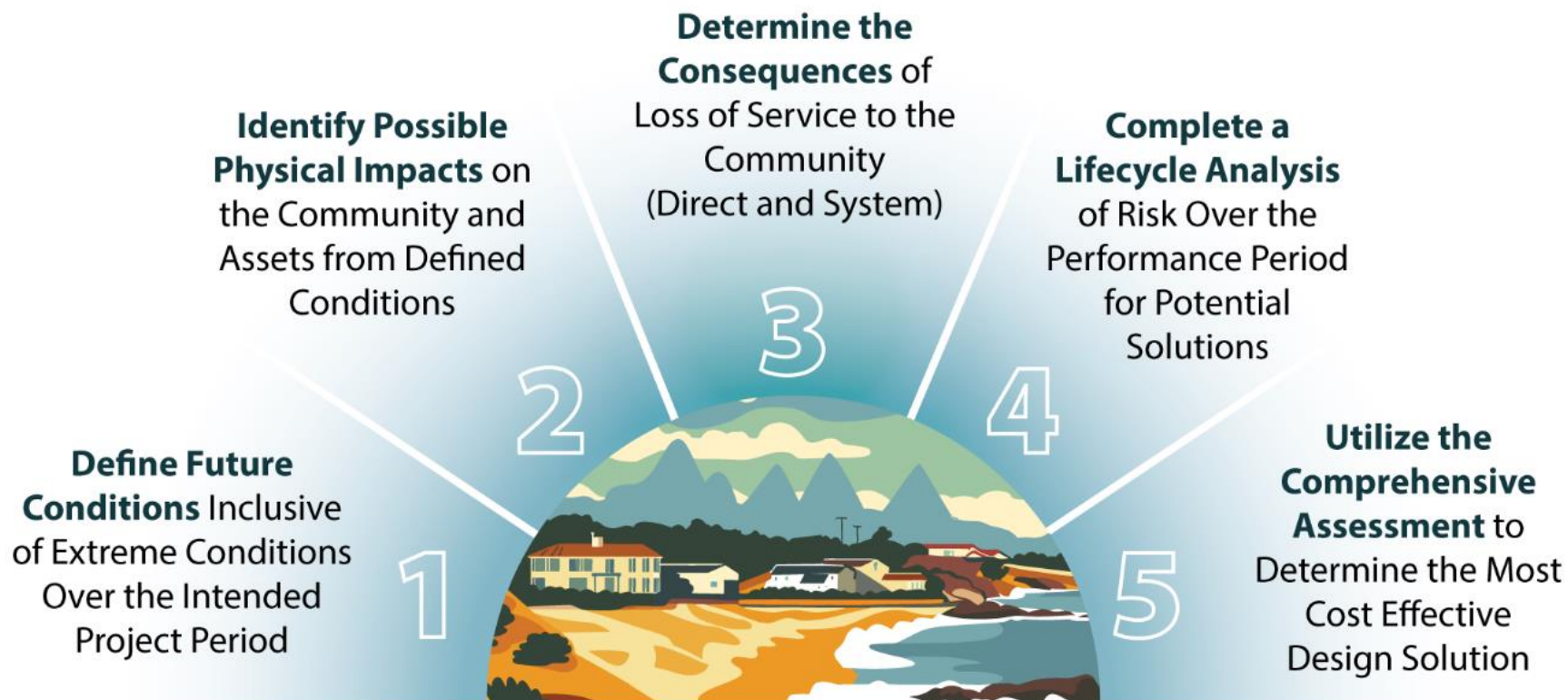
Findings:

Projected hotter temperatures are not likely to have a major impact on assets, though can affect **outdoor workers** and may decrease **natural gas demand** during cooler months.

Recommendations:

These findings will help SoCalGas with **safety** and **operational planning** to **protect the workforce** and prepare for potential **demand changes**.

Using CAVA Results to Prioritize Project-Level Adaptation Analysis



QUESTIONS & FEEDBACK

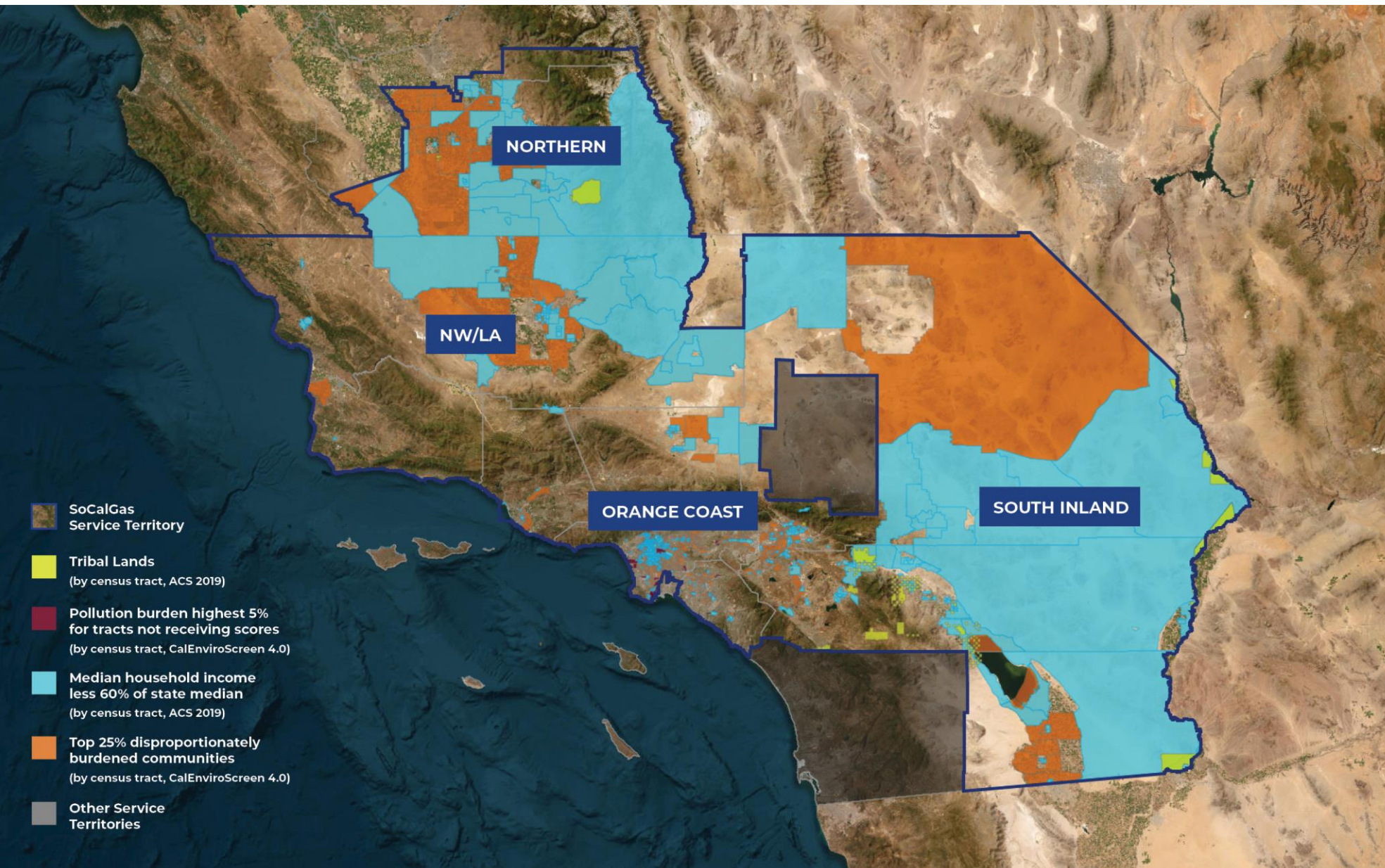


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COMMUNITY/TRIBAL OUTREACH RESULTS

Regional Approach to Engagement

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- Northern Region
- Los Angeles Region
- Orange Coast Region
- South Inland Region

SoCalGas Outreach Process for CEP Development

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Equity-First Framework

- SoCalGas's approach was grounded in DACAG Equity Framework, with a focus on Health & Safety, Access & Education
- SoCalGas worked with Del Sol Group, a services firm with expertise in community engagement and organizing

Climate Adaptation Public Survey

- Surveys were co-created with community partners
- Surveys estimated community awareness, understanding, and concerns about climate change and climate adaptation

CBO Partnerships & Regional Advisory Boards (RAB)

- Created 4 RABs comprised of CBO leaders
- Held 16 RAB workshops (topics included: background on climate adaptation, outreach process, CAVA methodology)
- Worked with CBOs to co-create outreach materials and surveys

Tribal Engagement

- Engaged 9 Tribal Governments
- Held 3 Tribal Talking Circles
- Topics discussed included:
 - Impacts of climate change, including impacts on cultural resources that may not be included in CAVA modeling
 - Tribal-led climate efforts already underway

Community Based Organization (CBO) Advisory Boards

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- » Surveyed hundreds of CBOs that provide direct services to DVCs within SoCalGas's service area.
- » Established four Regional Advisory Boards (RABs) with 27 CBOs representing the service area regions.



CBO Partners

Northern RAB	
Organization	CBO Representative
<u>Agua Dulce Women's Club</u>	Kat Hupp – President
<u>Antelope Valley Boys & Girls Club</u>	Jay Duke – Executive Director
<u>Community Action Partnership of Kern</u>	Savannah Maldonado – Advocacy & Public Relations Manager
<u>Greater Conejo Valley Chamber</u>	Danielle Borja – President & CEO
<u>El Concilio</u>	Yvonne Guitierrez – Executive Director
<u>Sequoia Valley Riverlands Trust</u>	Nadia Omar – Advancement Officer
<u>VC CoLAB</u>	Louise Lampara – Executive Director

Los Angeles RAB	
Organization	CBO Representative
<u>Habitat for Humanity of Greater LA</u>	Erin Rank – President & CEO
<u>Operation Progress LA</u>	Cristina Cuellar – Executive Director
<u>Strengths Based Community Change</u>	Colleen Mooney – Executive Director
<u>LA Chamber of Commerce</u>	Maria Salinas – Executive Director
<u>Mar Vista Family Center</u>	Blanca Hladek – Associate Director
<u>Girl + Environment</u>	Diamond Spratling -- Founder

CBO Partners

Orange Coast RAB	
Organization	CBO Representative
Asian Youth Center	Michelle Freridge – President
Boys & Girls Club of Buena Park	Todd Trout – CEO
MECCA	Yesenia Ochoa – Executive- Director
Orange County Conservation Corps	Katharyn Muniz – CEO
OC Hispanic Chamber	Reuben Franco – President & CEO
Vietnamese Community of SoCal	Khoi Vo – President, Board of Directors
Vital Link	Dihn Thai – Development Manager

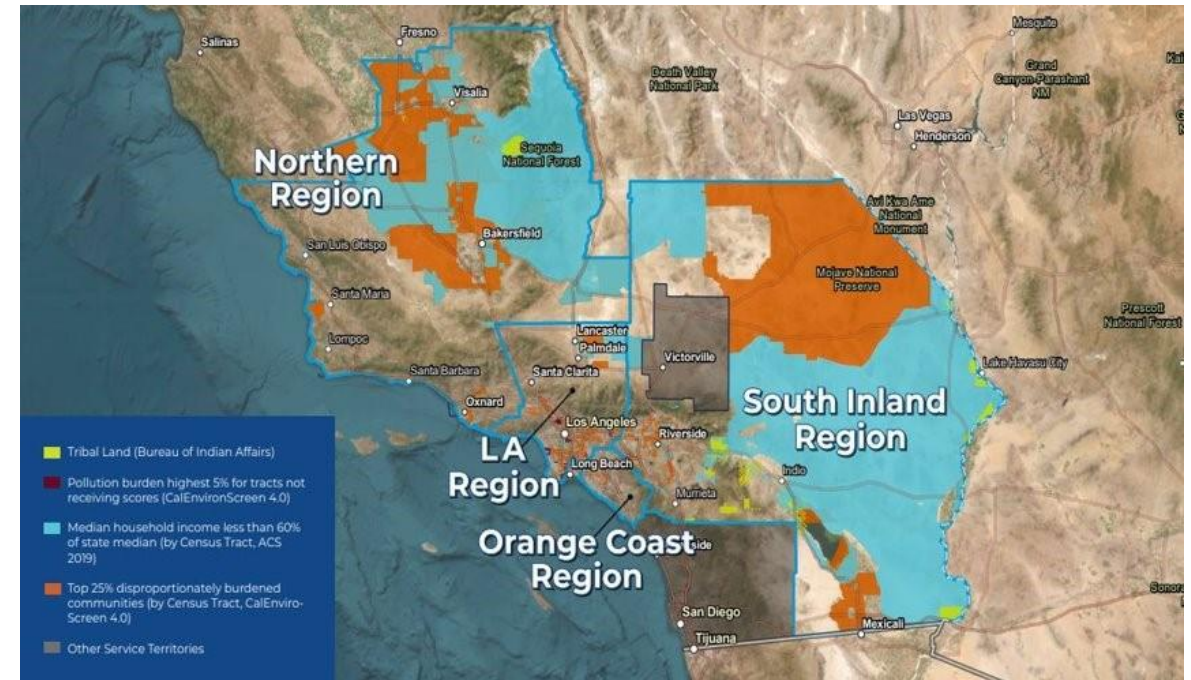
South Inland RAB	
Organization	CBO Representative
Community Access Center	Faustino Alvarez – Executive Director
FIND Food Bank	Debbie Espinoza – President and CEO
Inland Empire Economic Partnership	Jessica Barriga – Public Policy Manager
Making Hope Happen	Niki Dettman – Executive Director
Young Visionaries Youth Leadership Academy	Terrence Stone – Founder
Youth Action Project	Tremaine Mitchell – Executive Director
American Indian Chamber of Commerce	Tracy Stanhoff – President

CBO Engagement: Regional Approach

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» The RAB approach enhanced the CEP process:

- Enables nuanced understanding of target DVCs and regional concerns.
- Focused RAB conversations encourages detailed feedback.
- Centralizes resources for target communities, promoting equity.
- Builds relationships to support future SCG initiatives or next iterations.
- Meeting community leaders where they are.



Community Events

- » Attended 35+ community and tribal events across SoCalGas's service area:
 - Distributed climate adaptation educational materials
 - Asked community members to take the climate adaptation public survey
 - Discussed regional climate change concerns
 - Answered questions about climate change and disaster preparedness
 - Discussed other SCG customer programs

Tribal Engagement

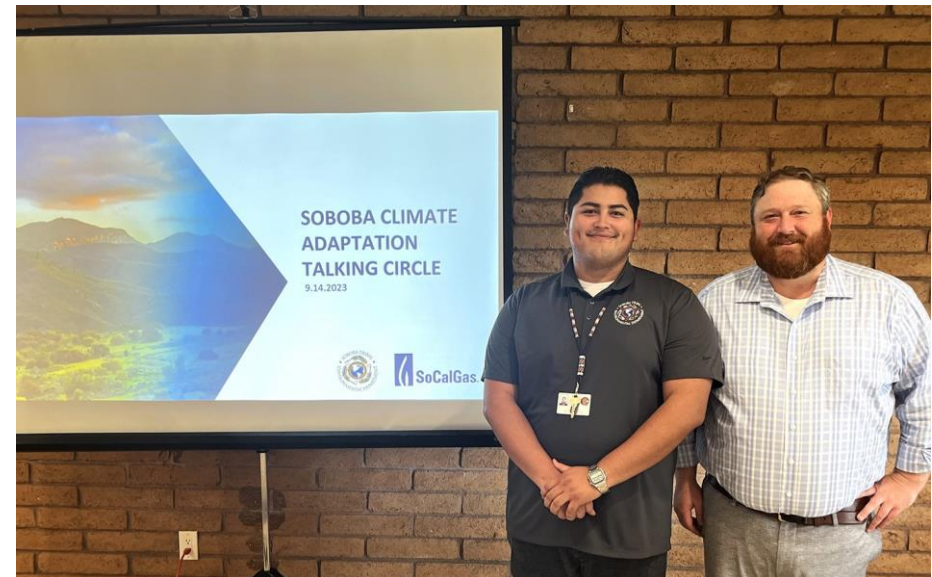
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» Engaged Tribal Governments

1. Agua Caliente Band of Cahuilla Indians
2. Augustine Band of Cahuilla Mission Indians
3. Cabazon Band of Mission Indians
4. Morongo Band of Cahuilla Mission Indians
5. Pechanga Band of Luiseño Mission Indians
6. San Manuel Band of Serrano Mission Indians
7. Santa Ynez Band of Chumash Mission Indians
8. Soboba Band of Luiseño Indians
9. Fort Mojave Indian Tribe of Arizona
10. Twenty-Nine Palms Band of Mission Indians

» Talking Circle Objectives

- Provide an overview of the OIR, CAVA & CEP
- Empower Tribes to provide feedback on SoCalGas's approach to engagement and the VA
- Encourage Tribes to bring forward their communities' concerns about climate change



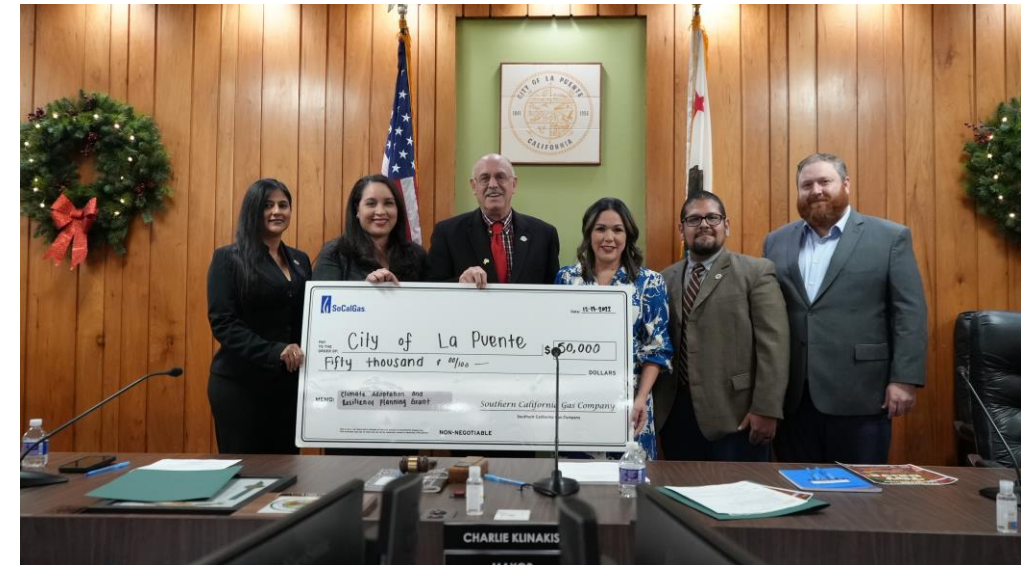
Local Government Capacity Building

Climate Adaptation & Resiliency Grants:

- Since 2018, SoCalGas has provided \$50,000 grants to 19 municipalities to support local planning efforts in preparation for and recovering from climate events:
- City of Artesia (2018)
- City of Redlands (2018)
- LA County (2019)
- City of Malibu (2019)
- City of Loma Linda (2019)
- City of Compton (2020)
- City of Palmdale (2020)
- City of Anaheim (2020)
- City of Maywood (2021)
- City of San Fernando (2021)
- City of Pico Rivera (2021)
- City of McFarland (2022)
- City of La Puente (2022)
- City of Colton (2022)
- City of Costa Mesa (2023)
- Soboba Band of Luiseno Indians (2023)
- City of Santa Ana (2024)
- City of Calipatria (2024)
- City of Carson (2024)

» LA County Adaptive Capacity Assessment

- SoCalGas awarded the LA County Department of Regional Planning with a grant to develop LA County's Adaptive Capacity Assessment



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“Thanks to you and SoCalGas for creating opportunities like the Climate Adaptation and Resilience Grant Program.

As you know, ILG works with many local governments helping them access grant funding. Your program was one of the most accessible and straight forward opportunities we have come across to date. We want to thank you for creating a program that prioritizes low capacity, disadvantaged communities and makes available gap funding that is crucial to helping them achieve their planning requirements and climate resilience goals.

Congrats on such a great program, and thanks again.

**Karalee Browne | Assistant Executive Director
INSTITUTE FOR LOCAL GOVERNMENT**

Building Trust & Meeting People Where They Are

» Feedback Highlights:

- Lack of community trust
- Climate adaptation is a technical topic and not top of mind for DVCs
- Importance of educating communities on climate adaptation before receiving meaningful feedback

How was this feedback addressed?

- Reach DVCs through trusted sources: 27 CBO partners
- CBO compensation
- 16 RAB workshops
- Co-creation of educational materials and strategies
- Share accessible educational materials before requesting feedback

Genuine & Continued Engagement

» Feedback Highlights:

- Lack of community trust
- Need for feedback loops
- Communities want to know how their input is being used

How was this feedback addressed?

- Attended community events in the service territory
- Continued engagement through partnerships with CBOs (past CEP filing)
- Established feedback loops with CBO partners
- Developed additional strategies with DACAG for continued DVC engagement during the last year of the CAVA process

Equity & Cultural Competence

» Feedback Highlights:

- Provide communication and educational materials through various sources
- Accessible information and program materials
- Cultural accuracy

How was this feedback addressed?

- Program materials and surveys were developed in collaboration with CBOs
- Online surveys are accessible to visually impaired individuals via screenreader
- SoCalGas plans to develop an infographic video to deconstruct technical information in various languages
- Program materials were translated to: Arabic, English, Korean, Punjabi, Simplified Chinese, Spanish, Tagalog, and Vietnamese
- All translations were reviewed and approved by native speakers

Climate Change and the Communities We Serve

1

Provide financial support for the development and sustained operation of community resilience centers.

2

Improve emergency notifications and community education on hazards and resources.

3

Invest in and expand existing workforce development programs.

4

Center equity in all decision-making processes, investments and programs.

5

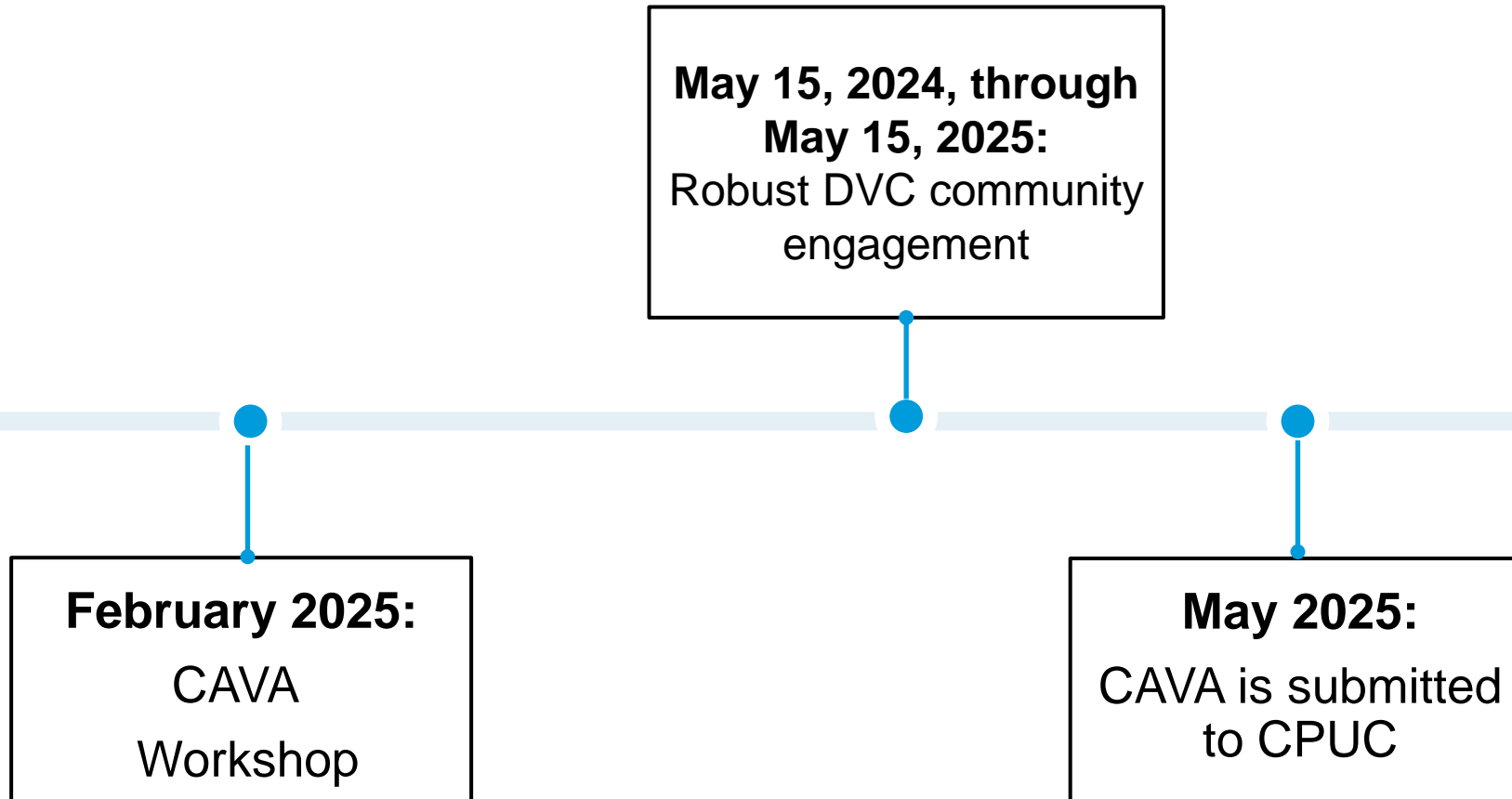
Maximize enrollment and longevity of existing SoCalGas programs in Disadvantaged and Vulnerable Communities.

6

Invest in upgrading our current infrastructure serving Disadvantaged and Vulnerable Communities.

Next Steps

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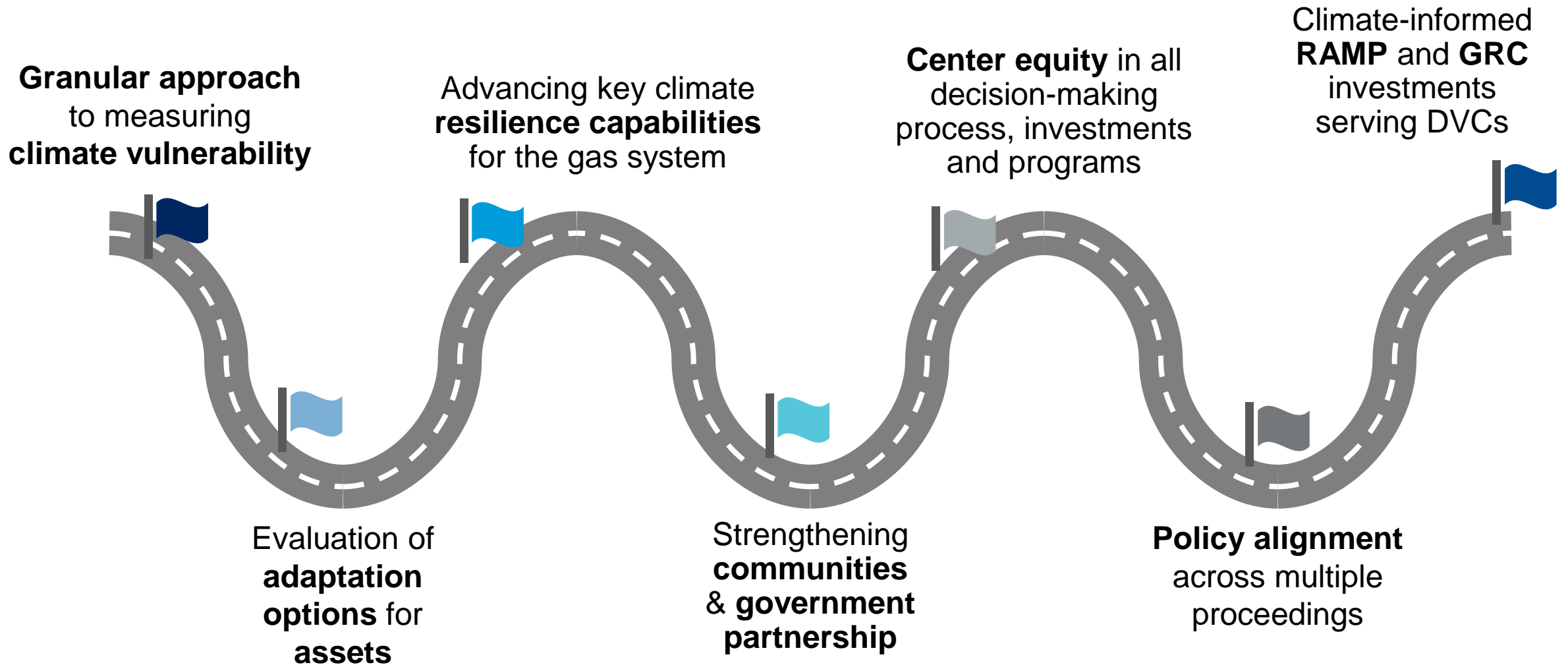
WRAP UP & WHAT'S NEXT



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CAVA Next Steps

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Contact: ClimateAdaptation@socalgas.com

Website: <https://www.socalgas.com/climate-adaptation-at-socalgas>

SHARE FEEDBACK



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