

Public Utilities Department

# San Diego Basin Study

*IRWM RAC Meeting*

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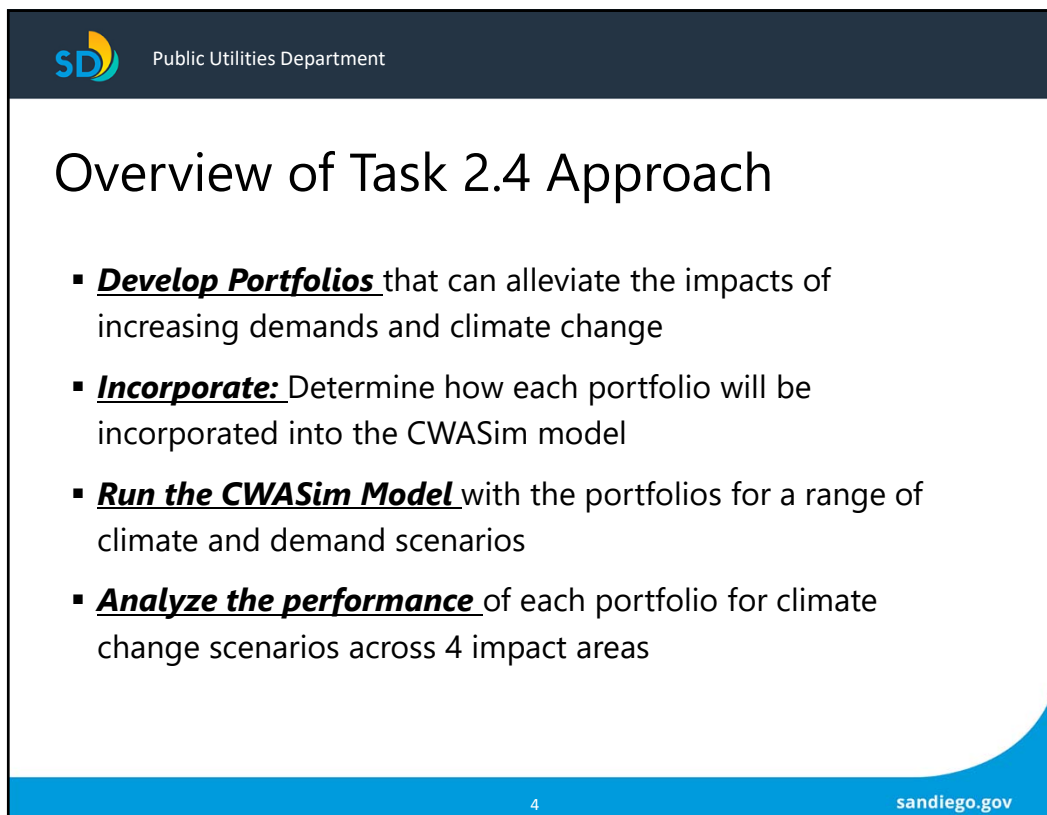
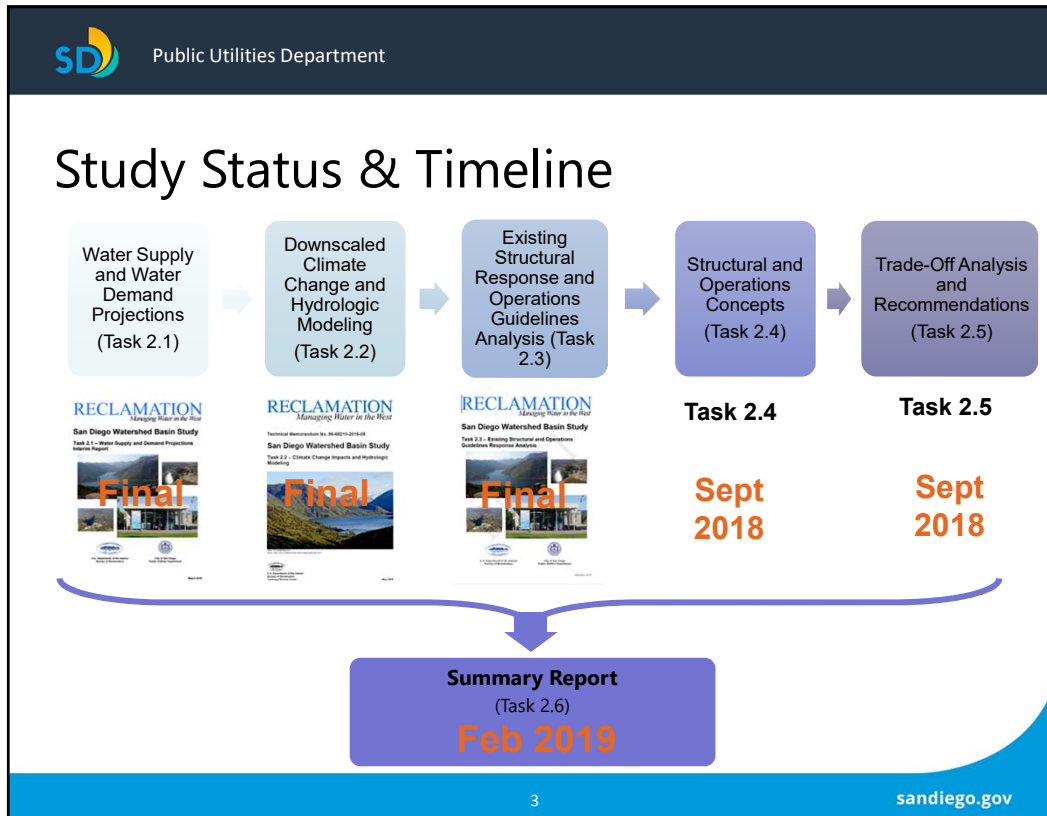
April 4<sup>th</sup>, 2018



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## Agenda

- Task 2.4 Updates
  - Review of Approach
  - Preliminary Model Results
- Task 2.5 Updates
  - Review of Approach
  - Present Evaluation Objective scoring methods
- Timeline and Next Steps



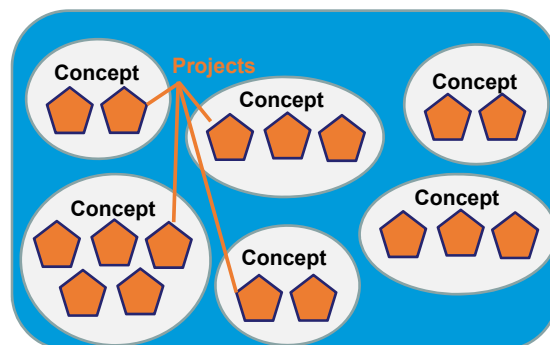
## Task 2.4 Status & Timeline

- March – August 2017
  - Developed Adaptation Portfolios and Projects List
- August – December 2017
  - Revised CWASim model to incorporate projects for adaptation portfolios
- January – April 2018
  - Ran CWASim model with adaptation portfolios
  - Performing initial analysis
  - Draft Interim Report Outline provided to STAC for review

## Overview of Task 2.4 Approach

### Portfolios

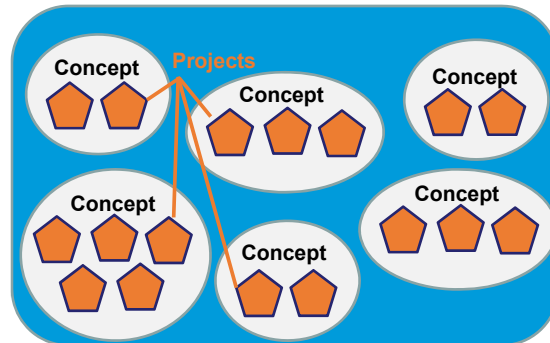
- Baseline
- Baseline +
- Increase Supplies
- Enhanced Conservation
- Optimize Existing Infrastructure
- Watershed Health/Ecosystem Restoration



## Overview of Task 2.4 Approach

### 16 Adaptation Concepts

- Conveyance Improvement
- Seawater Desalination
- Grey Water Use
- Recycled Water
- Etc.



## Baseline Portfolio (B)

Represents the system as it existed in 2015, with some minor modifications to include water supplies that have been or will be implemented (e.g., Carlsbad Desalination Plant and the full QSA annual transfer volume)

### Concepts

- Conveyance Improvements
- Drought Restriction/Allocation
- Firm Water Supply Agreements
- Groundwater
- Imported Water Purchases
- Local Surface Water Reservoirs
- Recycled Water
- Seawater Desalination
- Urban & Ag. Water Use Efficiency



## Baseline Plus Portfolio (B+)

Includes projects that are being actively pursued or have received funding as of 2017 (e.g. Pure Water San Diego Phase 1)

### Concepts

- All Baseline Portfolio Concepts
- Modified or New Concepts
  - Conveyance Improvements
  - Gray Water Use
  - Groundwater
  - Potable Reuse
  - Recycled Water
  - Stormwater Capture
  - Urban & Ag. Water Use Efficiency
  - Watershed and Ecosystem Management



## Increase Supplies Portfolio (IS)

Projects that focus on increasing regional water supplies

### Concepts

- All Baseline Plus Portfolio Concepts
- Modified or New Concepts
  - Gray Water Use
  - Groundwater
  - Imported Water Purchases
  - Potable Reuse
  - Recycled Water
  - Seawater Desalination



## Enhanced Conservation Portfolio (EC)

Looks at enhanced water conservation beyond currently planned levels. The purpose of this Portfolio is to explore the potential for demand reductions to improve delivery reliability in the future under climate and demand uncertainty.

### Concepts

- All Baseline Plus Portfolio Concepts
- Modified or New Concepts
  - Urban & Ag. Water Use Efficiency



## Optimize Existing Facilities Portfolio (OEF)

Focuses on enhancing the efficiency of existing facilities by replacing, repairing, or maintaining existing infrastructure to maximize its operation

### Concepts

- All Baseline Plus Portfolio Concepts
- Modified or New Concepts
  - Conveyance Improvements

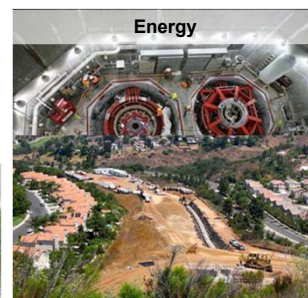
## Watershed Health/Ecosystem Restoration Portfolio (WE)

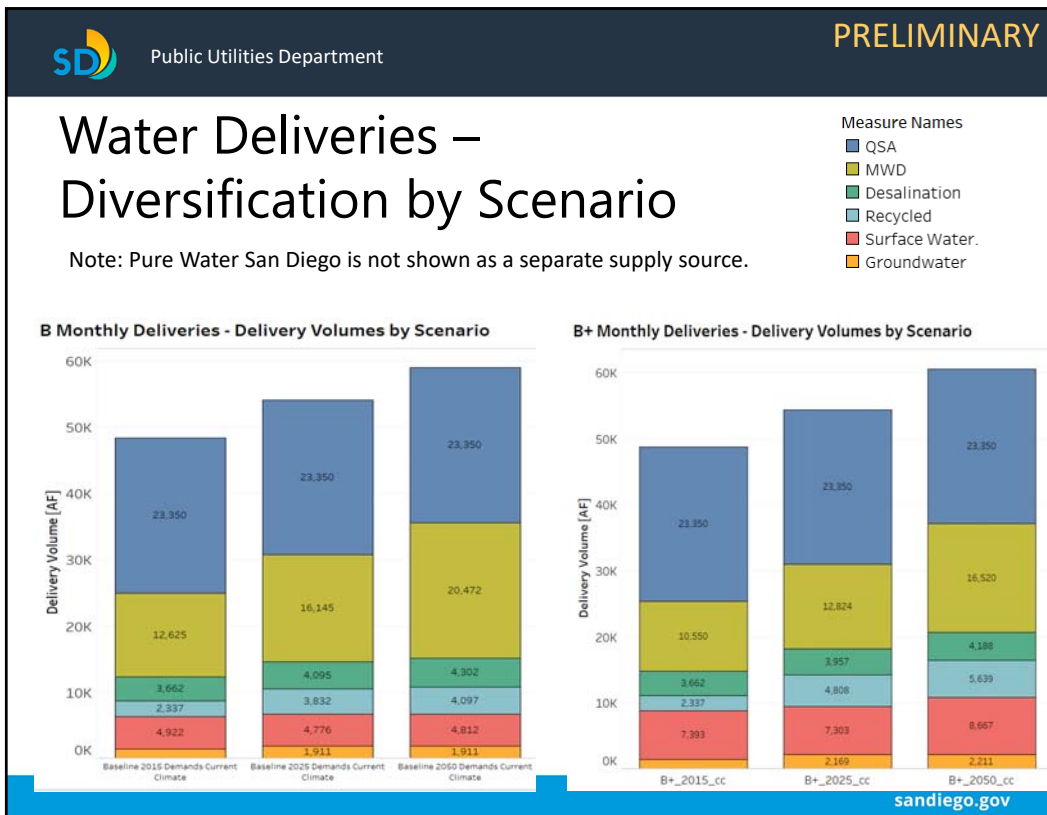
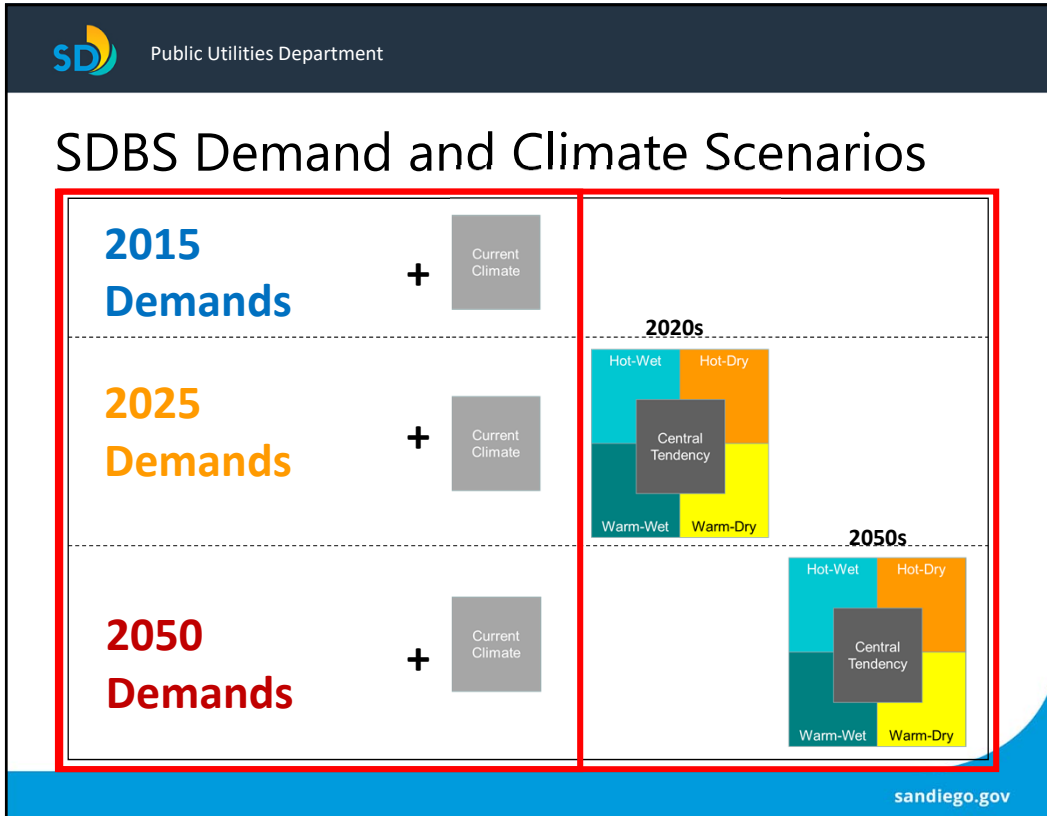
Seeks to restore or create natural habitats and minimize environmental impacts

### Concepts

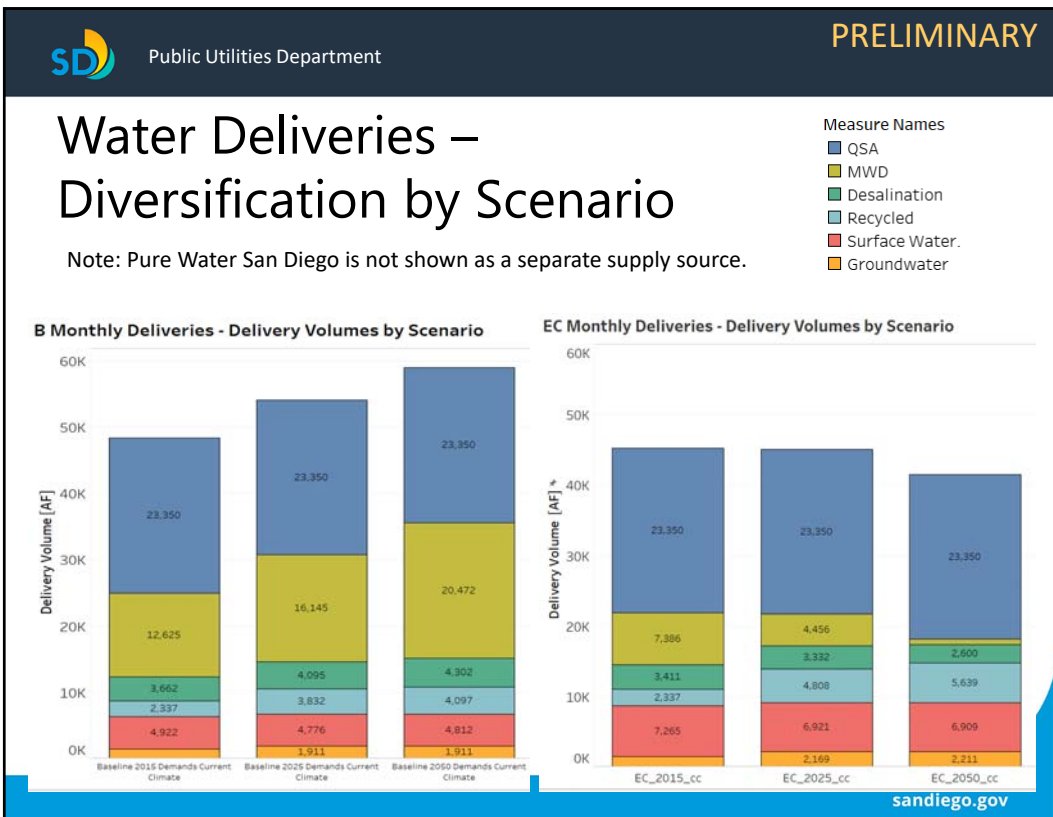
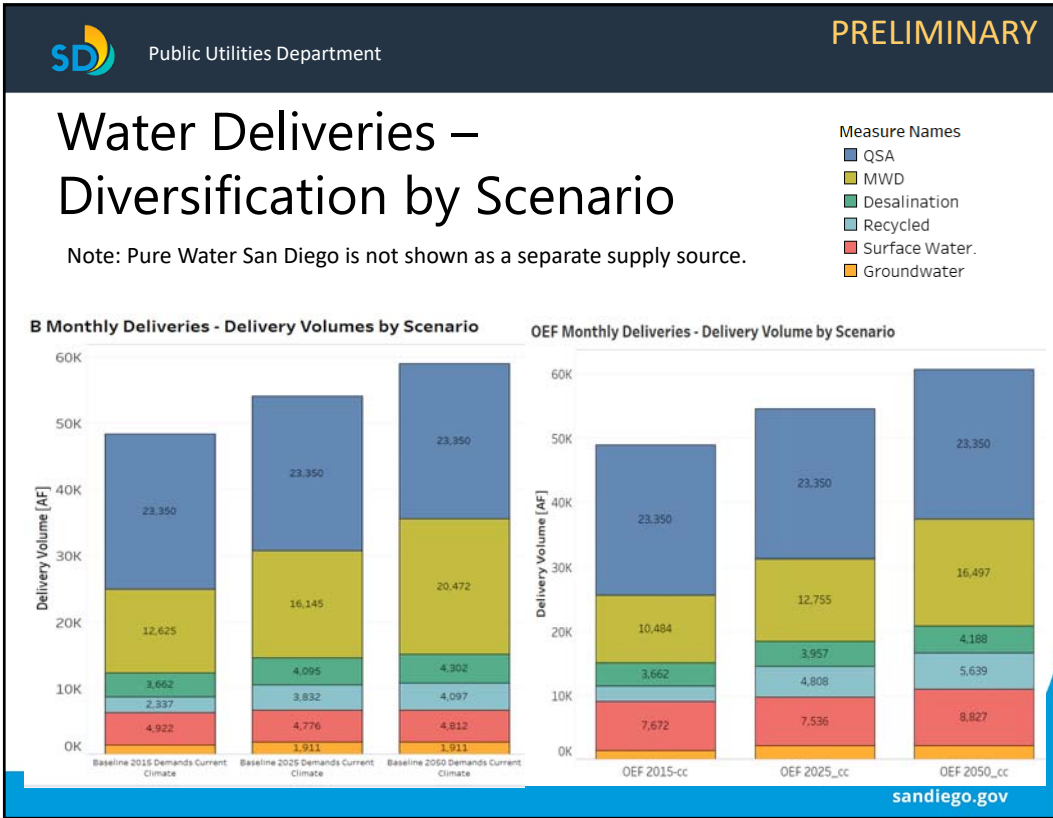
- All Baseline Plus Portfolio Concepts
- Modified or New Concepts
  - Stormwater BMPs
  - Stormwater Capture
  - Watershed and Ecosystem Management

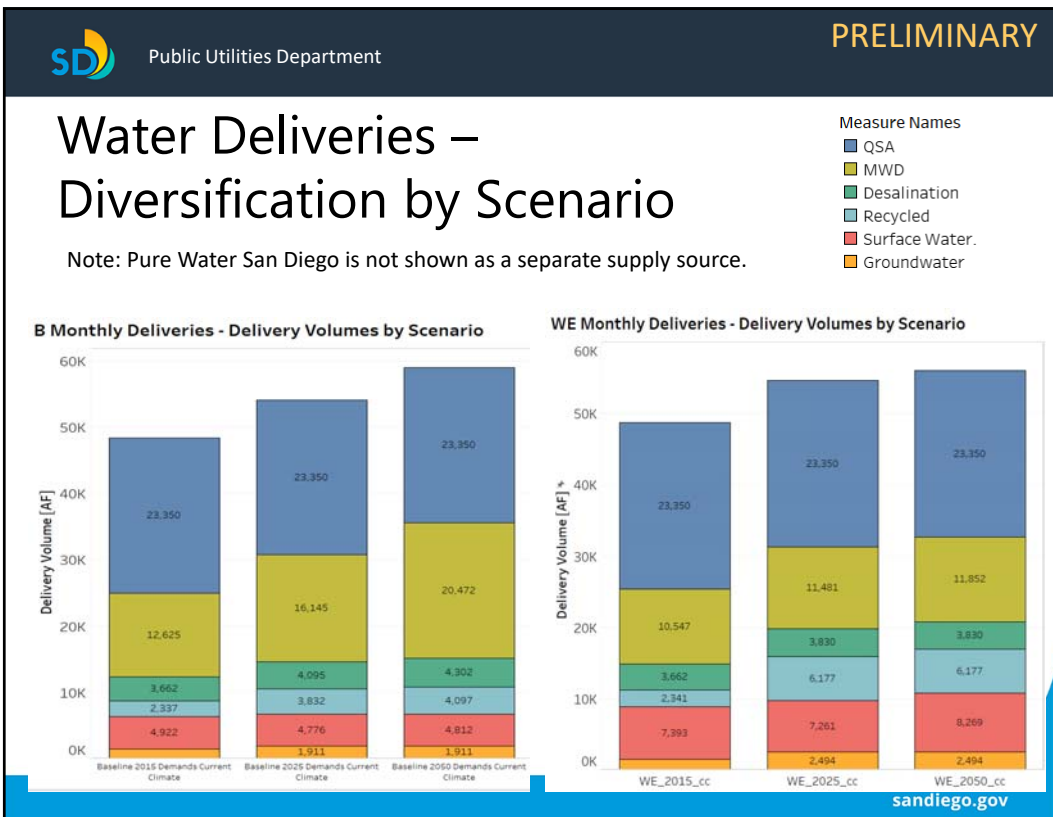
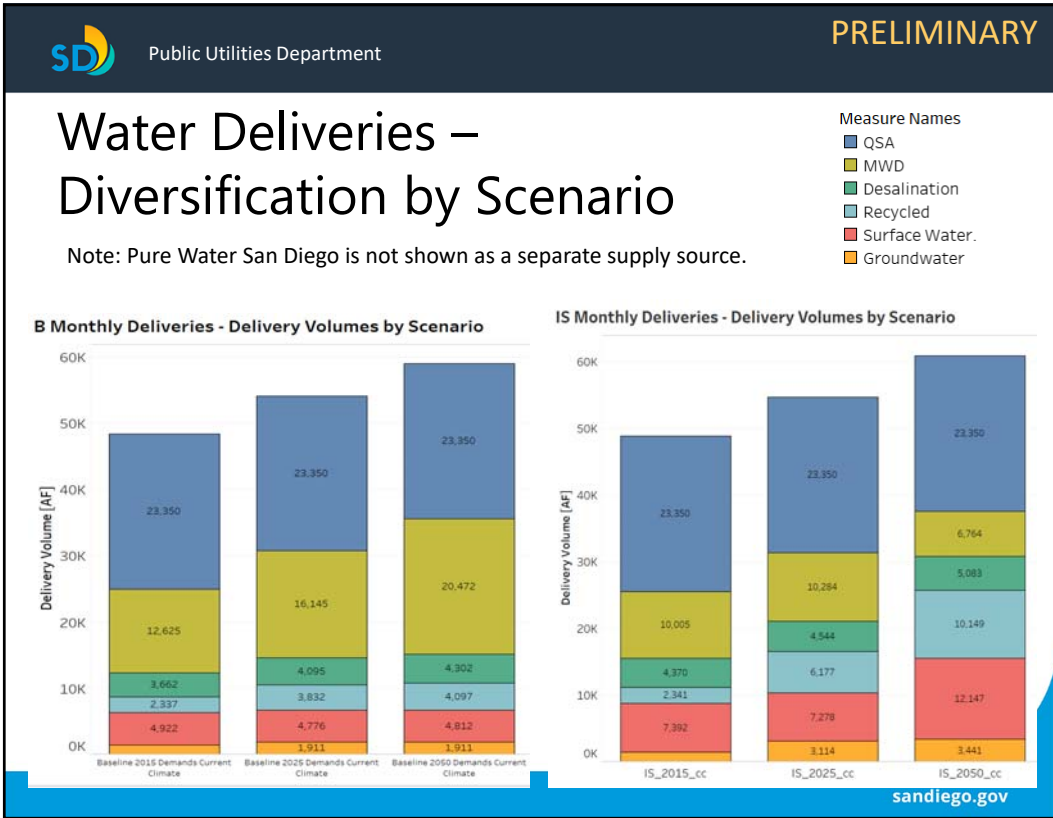
## Impacts examined in the SDBS





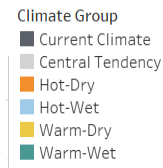




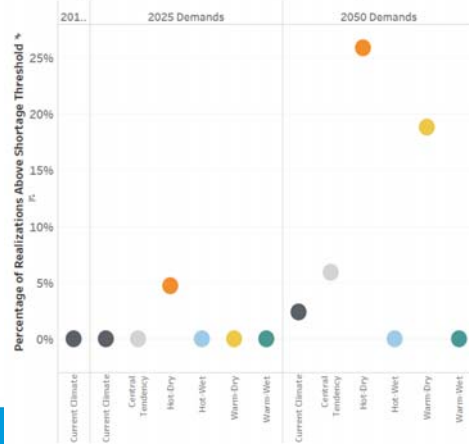


# Shortage Volume – Percentage of Realizations above Threshold

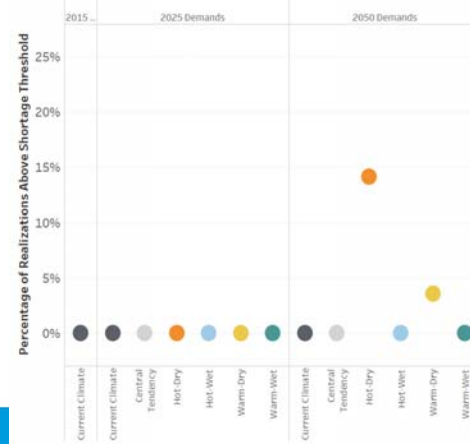
- B: Four Climate Groups with shortages for 2050 Demands
- B+: Two Climate Groups with shortages for 2050 Demands



B Percentage of Realizations Above 20,000 AF Shortage Threshold

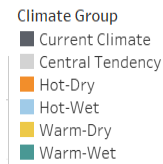


B+ Percentage of Realizations Above 20,000 AF Shortage Threshold

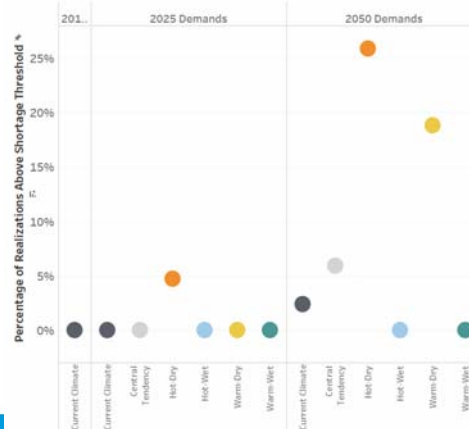


# Shortage Volume – Percentage of Realizations above Threshold

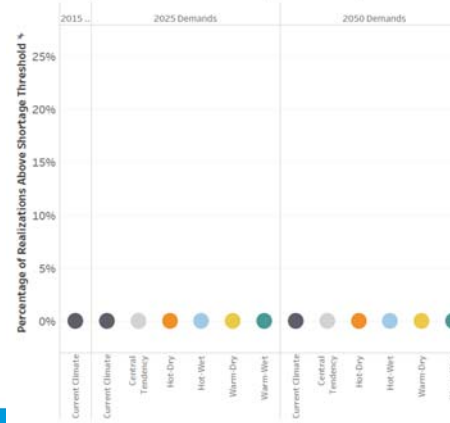
- EC: No Climate Groups with shortages



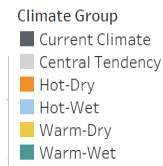
B Percentage of Realizations Above 20,000 AF Shortage Threshold



EC Percentage of Realizations Above 20,000 AF Shortage Threshold

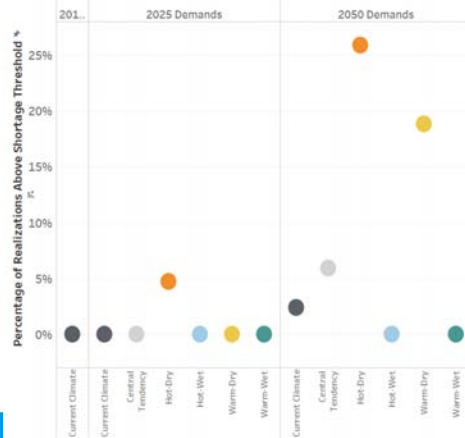


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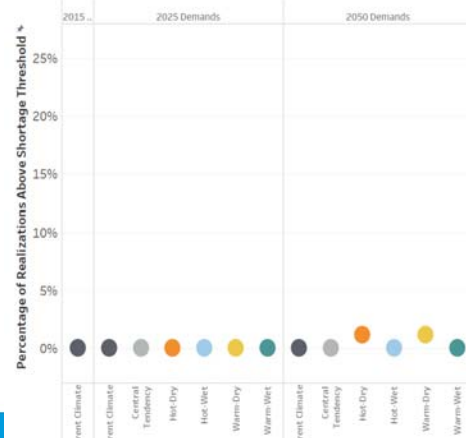


- IS: Some shortages with 2050s demands for the warmer groups

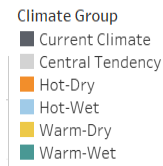
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IS Percentage of Realizations Above 20,000 AF Shortage Threshold

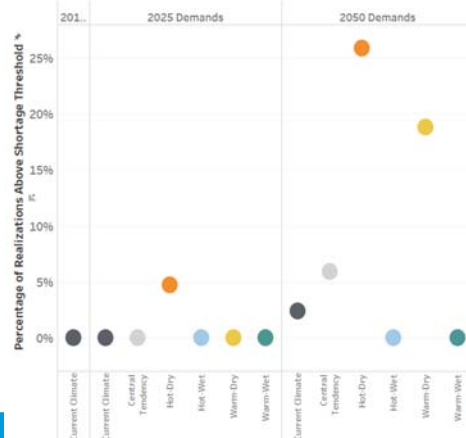


# Shortage Volume – Percentage of Realizations above Threshold

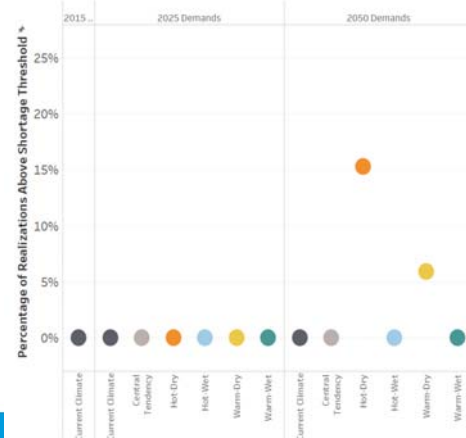


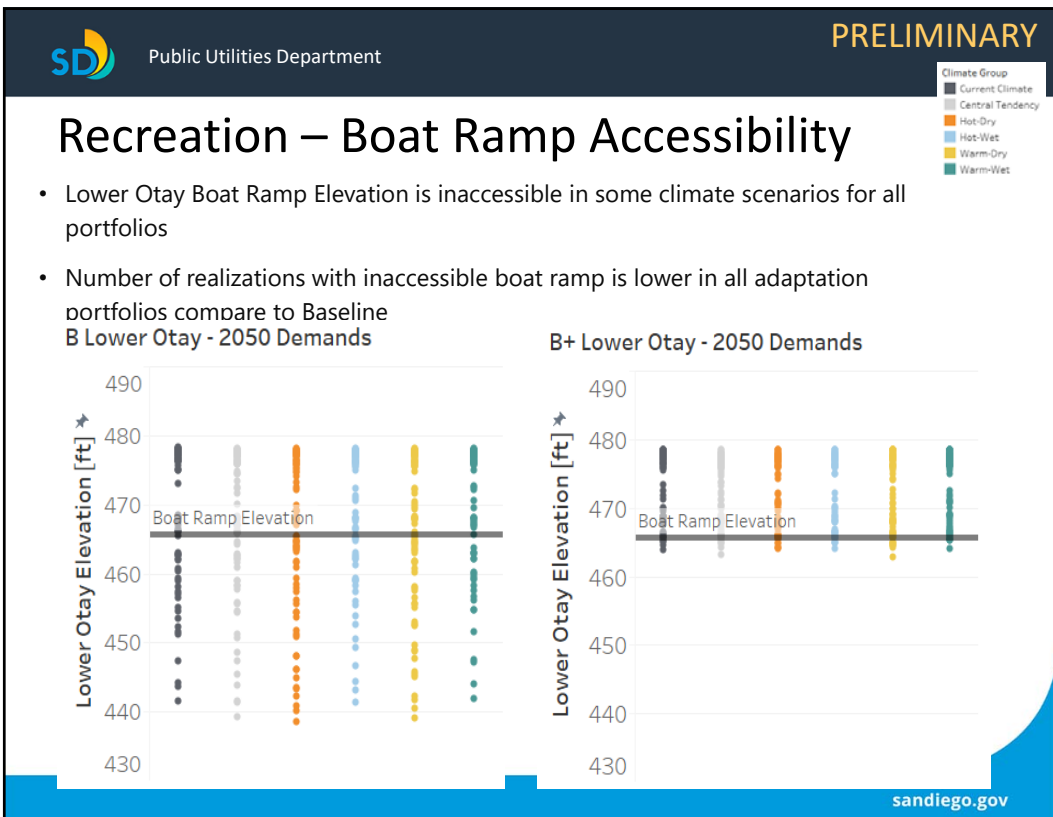
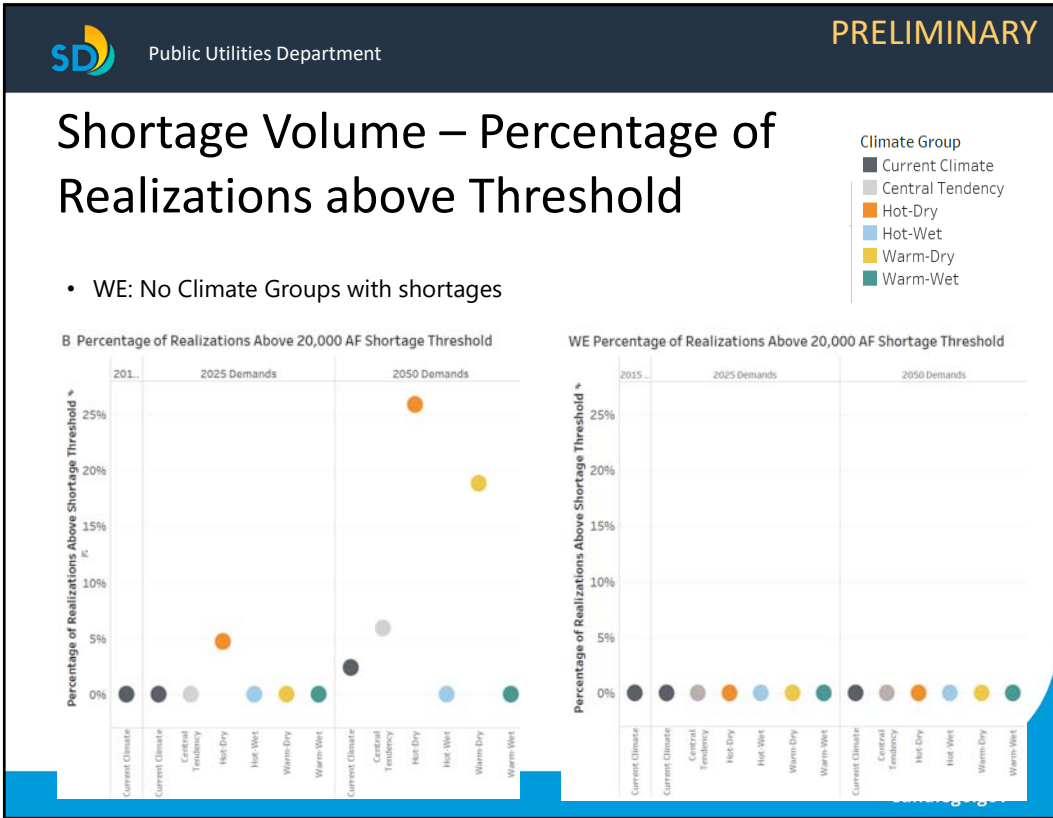
- OEF: Some shortages with 2050s demands for the warmer groups

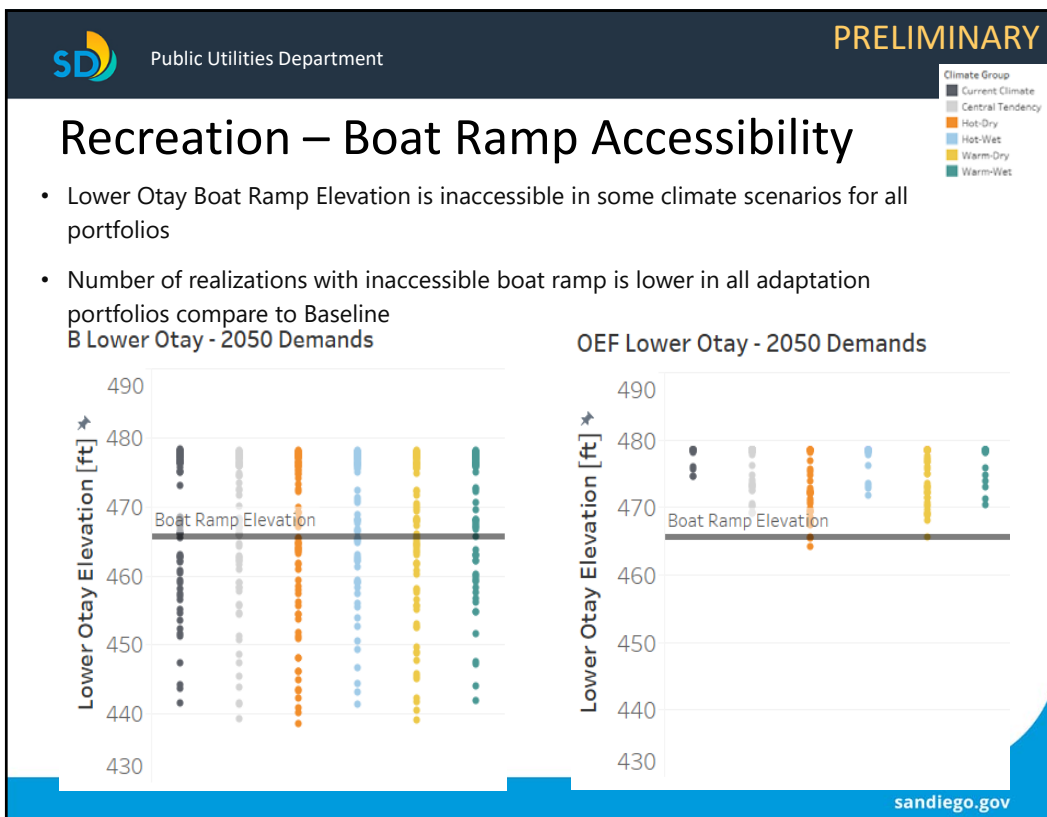
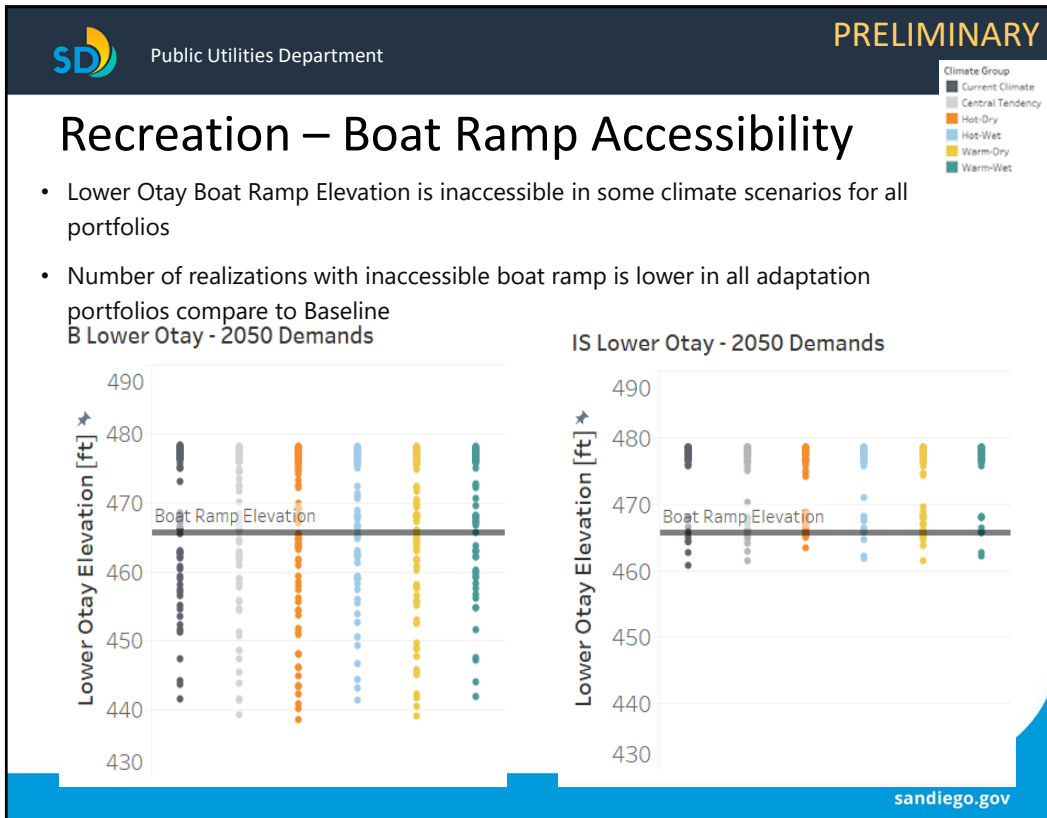
B Percentage of Realizations Above 20,000 AF Shortage Threshold

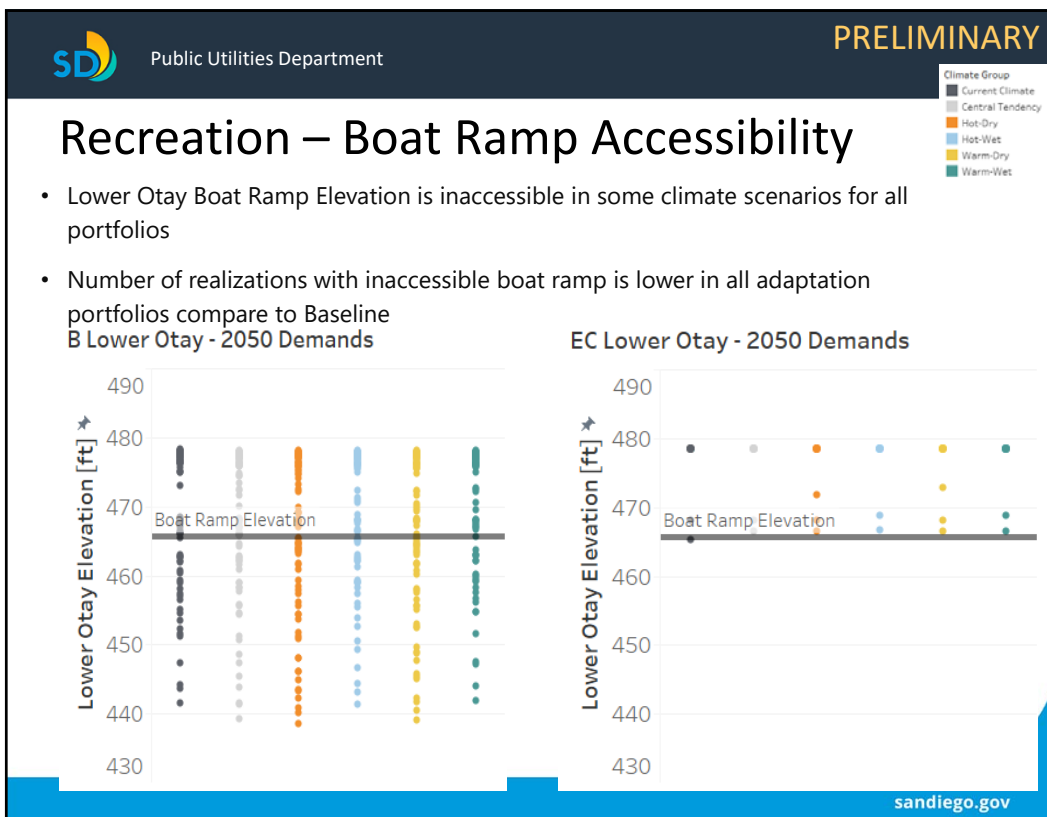
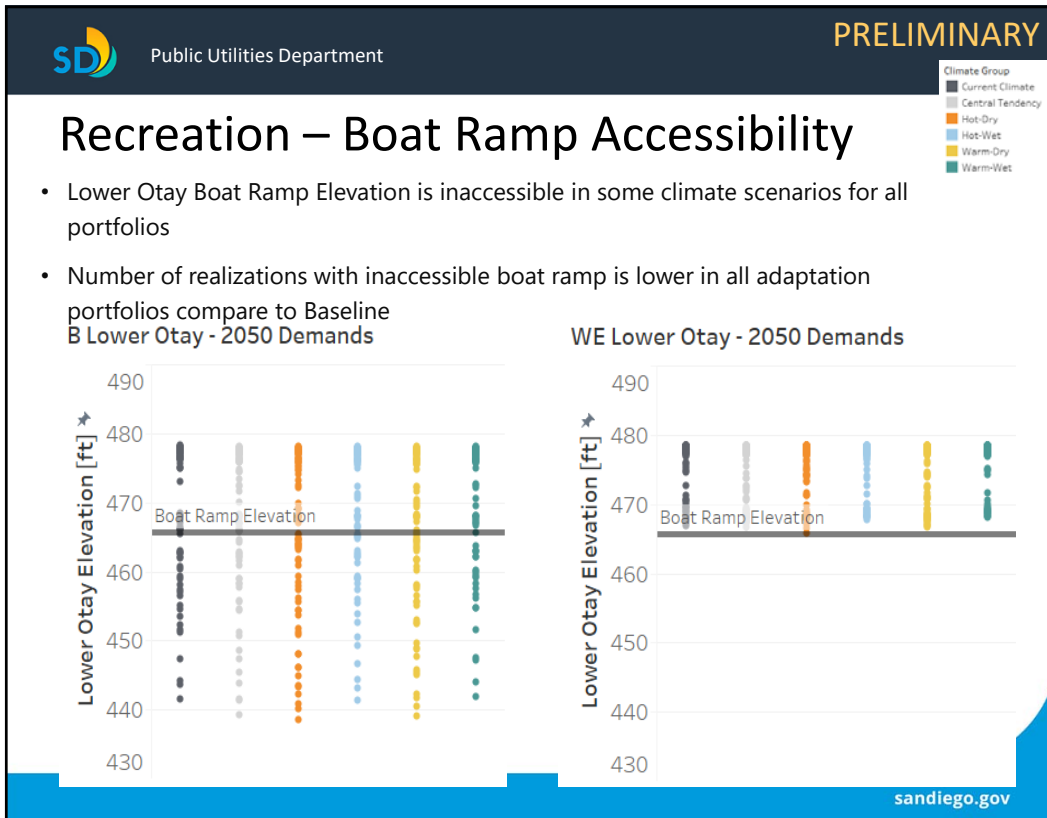


OEF Percentage of Realizations Above 20,000 AF Shortage Threshold











## Task 2.5 Status & Timeline

- Oct 4<sup>th</sup> RAC Meeting Update
  - Received feedback on Evaluation Objectives
- November – Evaluation Objective Survey Shared with stakeholders
- Dec 6<sup>th</sup> RAC Meeting Update
  - Presented final Evaluation Objectives and survey participation
  - Tradeoff Analysis Approach & Example
  - Shared Adaptation Concept Definitions
- Jan 31<sup>st</sup> STAC Meeting
  - Received feedback on Evaluation Objective scoring
- March
  - Adaptation Concept surveys sent to RAC and STAC
  - Project surveys sent to Member Agencies
- April
  - Tradeoff Analysis in progress



## Tradeoff Analysis Progress

1. Synthesis of survey responses *in progress*
2. GIS analysis *in progress*
3. Modeling *in progress*
4. Performance Measure score calculation
5. Evaluation Objective score calculation
6. Evaluation Objective score weighting
7. Tradeoff Analysis





## Survey Participation

### **Adaptation Concept Survey**

- Adaptation Concepts evaluated
- Recipients:
  - STAC, IRWM RAC
- 12 Submitted Surveys

### **Member Agency Survey**

- Projects evaluated
- Recipients:
  - Member Agencies
- 16 Surveys Submitted, representing 35 Projects
- Expect a total of 70 projects with completed surveys, ~58%

*THANK YOU FOR YOUR PARTICIPATION!!!!*

*Questions?*

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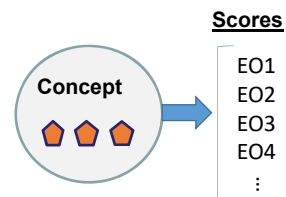
## Overview of Task 2.5 Approach

- Tradeoff Analysis will compare Adaptation Concepts using 13 Evaluation Objectives (EO)
  - Provide Reliability and Robustness
  - Optimize Local Supplies/Independence
  - Cost Effectiveness
  - Regional Integration and Coordination
  - Provide for Scalability of Implementation
  - Project Complexity
  - Quality of Life/Recreation
  - Environmental Justice
  - Regional Economic Impact
  - Climate Resilience
  - Protect Habitats and Ecosystem Services
  - Water Quality and Watersheds
  - Address Climate Change Through GHG Reduction

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## Overview of Task 2.5 Approach

- Adaptation Concepts receive a score for each EO

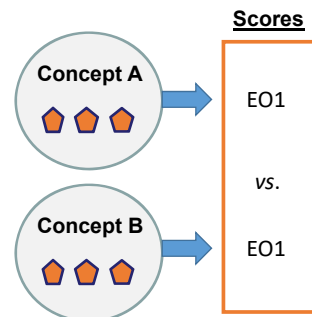


*Supplementary Material: Tradeoff Analysis Overview & Example*

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## Overview of Task 2.5 Approach

- Adaptation Concept EO scores will be compared
  - Across a single EO**
  - Across *all* EOs
  - Across a subset of EOs

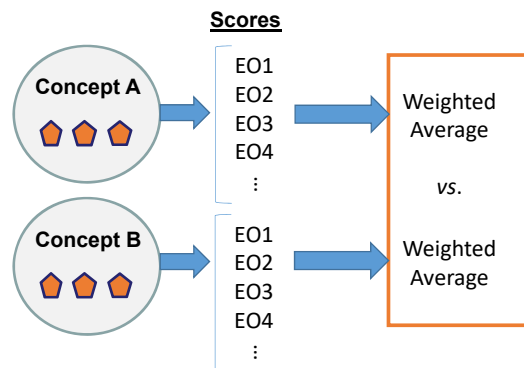


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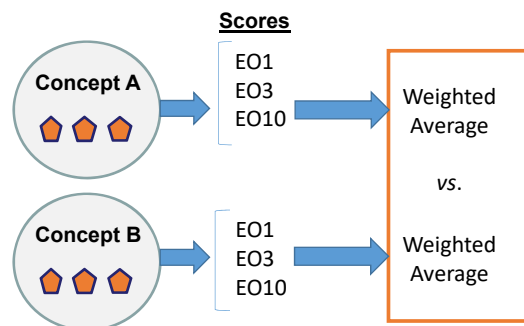
## Overview of Task 2.5 Approach

- Adaptation Concept EO scores will be compared
  - Across a single EO
  - **Across all EOs**
  - Across a subset of EOs



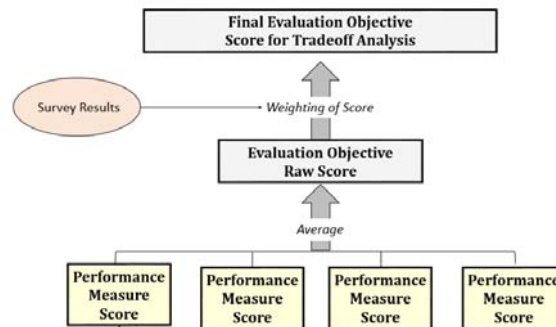
## Overview of Task 2.5 Approach

- Adaptation Concept EO scores will be compared
  - Across a single EO
  - Across all EOs
  - **Across a subset of EOs**



## How are Evaluation Objective Scores Calculated?

- Each EO is measured by one or more Performance Measures
- EO scores are weighted by their importance
- SDBS Survey results determine EO weights



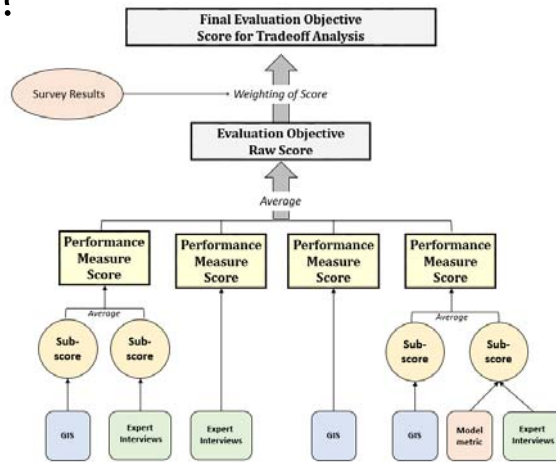
## Survey Results & Evaluation Objective Weights

- Adaptation Concepts receive a weighted score for each EO.
- Weighted EO scores will be compared in Trade off analysis

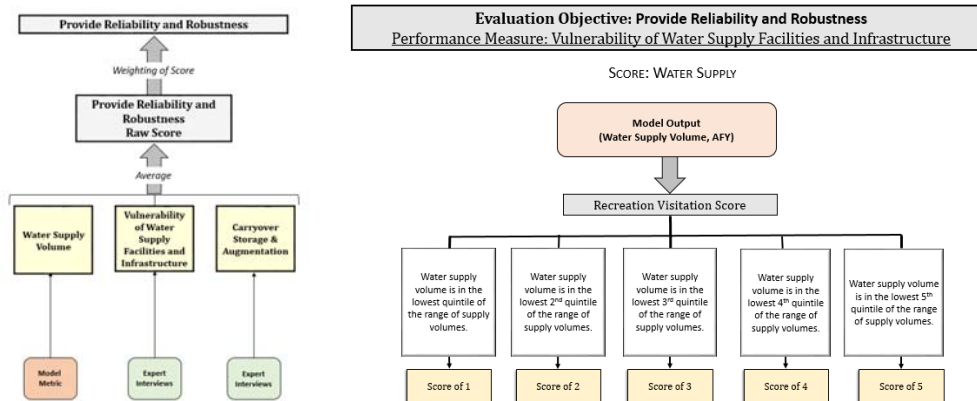
Evaluation Objective	Average of all responses	
	Average Score	Standard deviation
Reliability and Robustness	10.0	2.03
Optimize Local Supplies/ Independence	9.4	1.95
Cost Effectiveness	8.5	2.02
Regional Integration and Coordination	8.5	1.97
Provide for Scalability of Implementation	7.7	2.20
Minimize Project Complexity	7.3	2.39
Promote High Quality of Life/Recreation	7.4	2.58
Promote Environmental Justice	8.7	2.37
Support Regional Economy	7.8	2.28
Enhance Climate Resilience	9.6	1.76
Protect Habitats, Wildlife, and Ecosystem Services	9.2	2.10
Protect Water Quality and Watersheds	10.0	1.77
Address Climate Change Through Greenhouse Gas Reduction	8.2	2.60

# How are Performance Measure (PM) Scores Calculated?

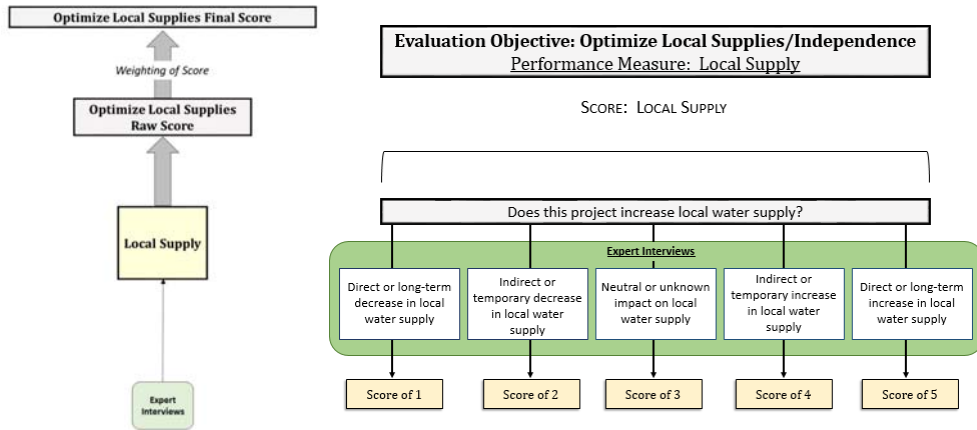
- PMs are calculated by:
  - Model Metric Results
  - Expert Interviews
    - Adaptation Concept Questionnaire
    - Project Manager Surveys and Interviews
  - Geospatial analyses (GIS)



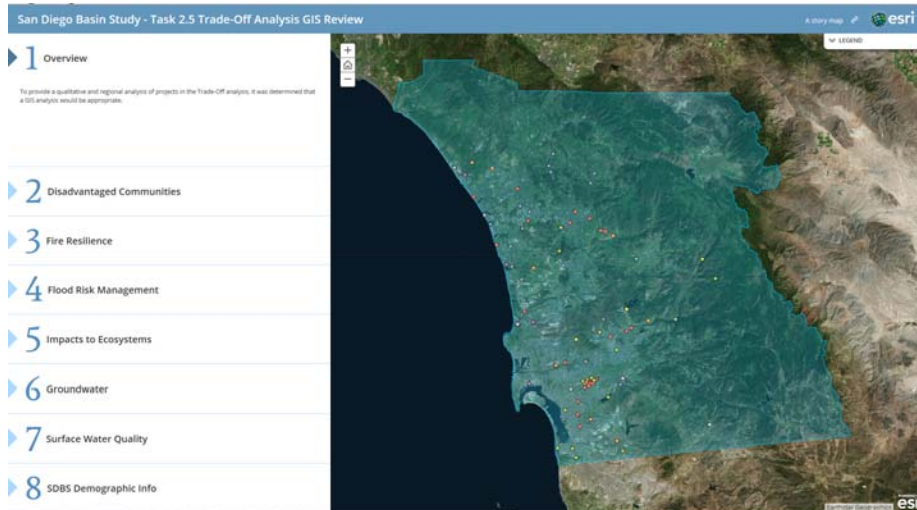
# Example: Expert Interviews



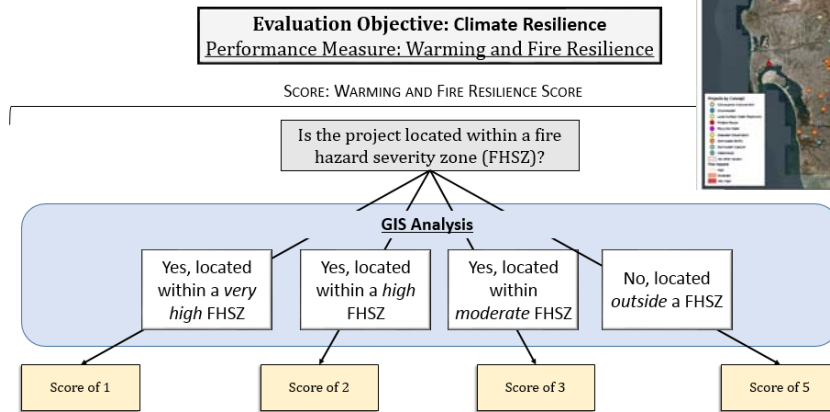
# Example: Expert Interviews



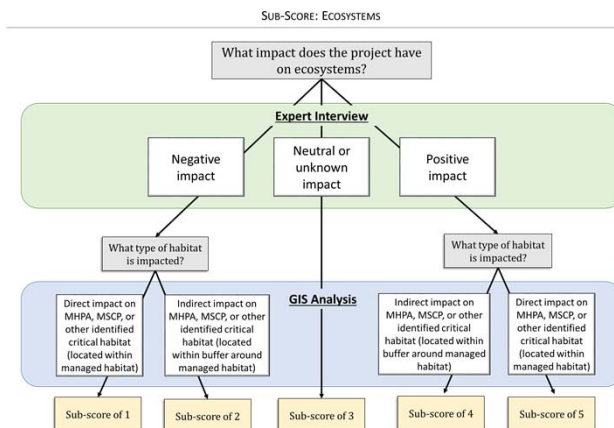
# Example: GIS Analysis



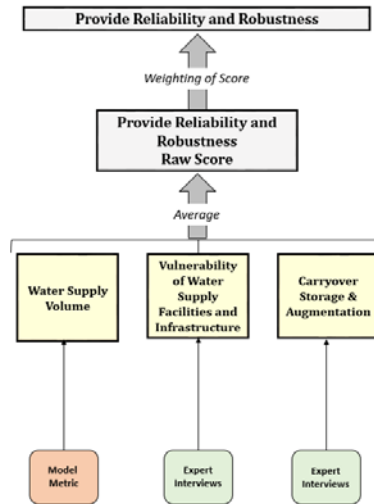
# Example: GIS Analysis



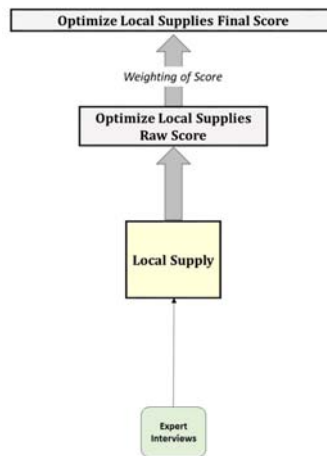
# Example: Expert Interview & GIS Analysis



## EO: Provide Reliability & Robustness

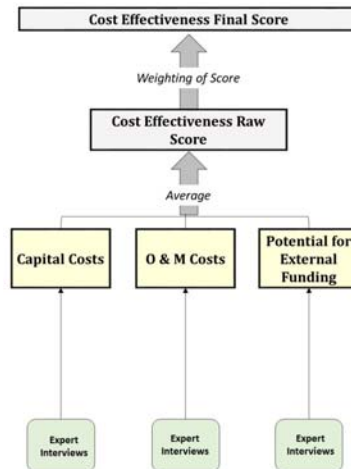


## EO: Optimize Local Supplies

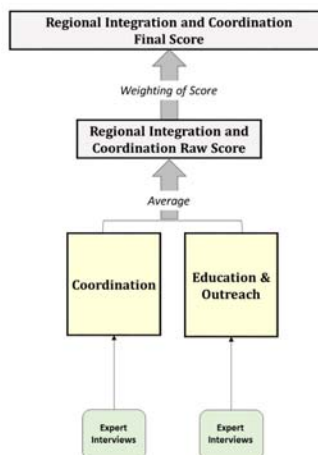




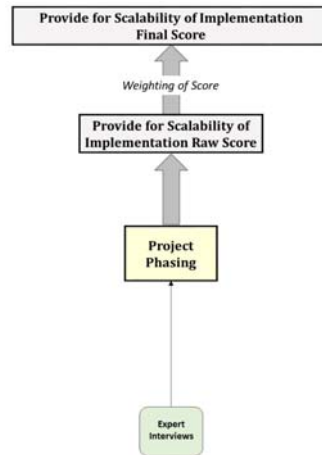
## EO: Cost Effectiveness



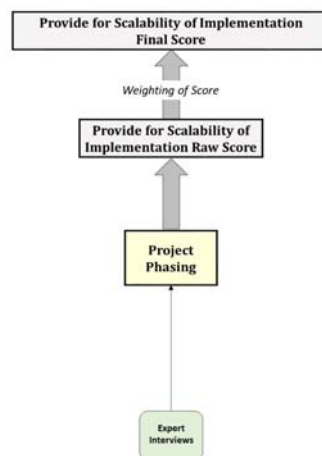
## EO: Regional Integration & Coordination



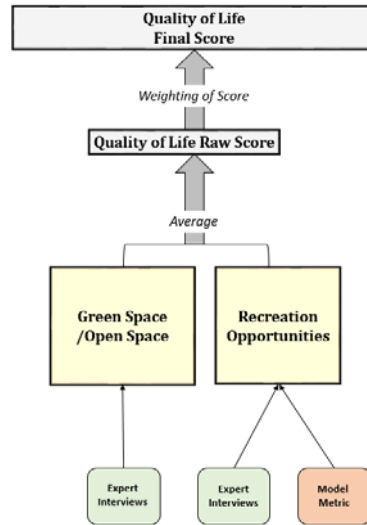
## EO: Provide for Scalability of Implementation



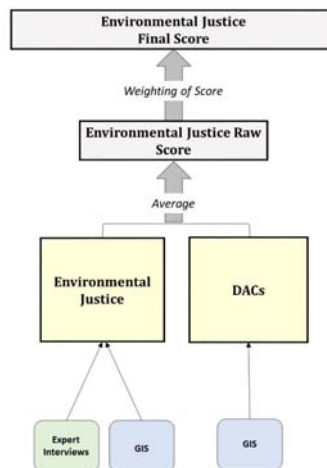
## EO: Project Complexity



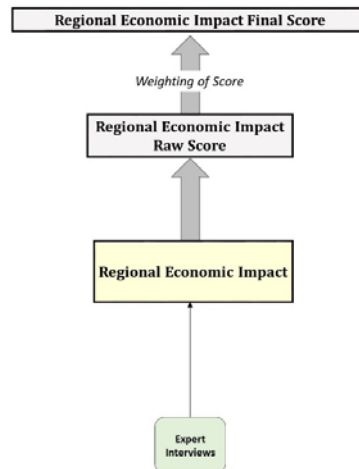
## EO: Quality of Life/Recreation



## EO: Environmental Justice

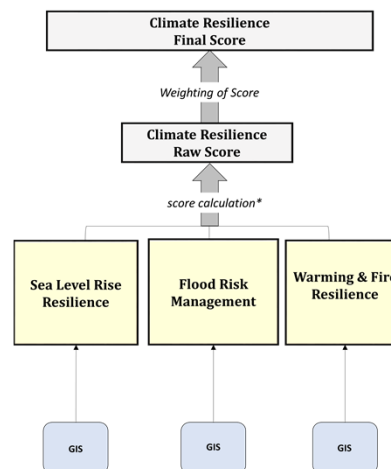


## EO: Regional Economic Impact



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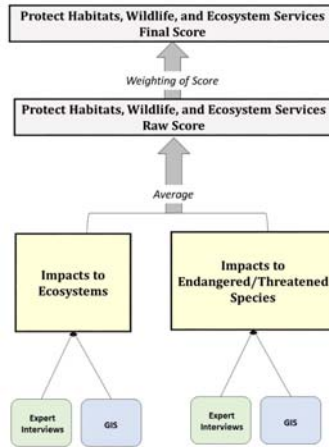
## EO: Climate Resilience



\*Climate Resilience Raw Score = (average of Sea Level Rise Resilience and Flood Risk Management Scores) X Warming and Fire Resilience Score

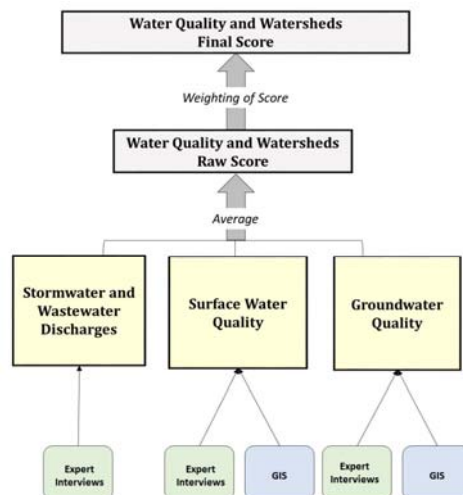
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## EO: Protect Habitats, Wildlife, & Ecosystem Services



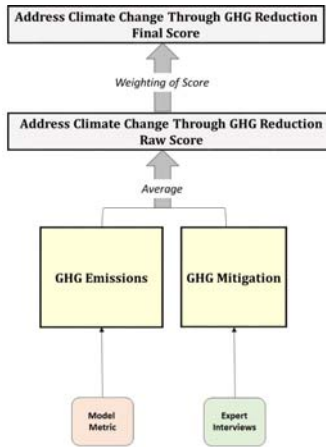
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## EO: Water Quality & Watersheds

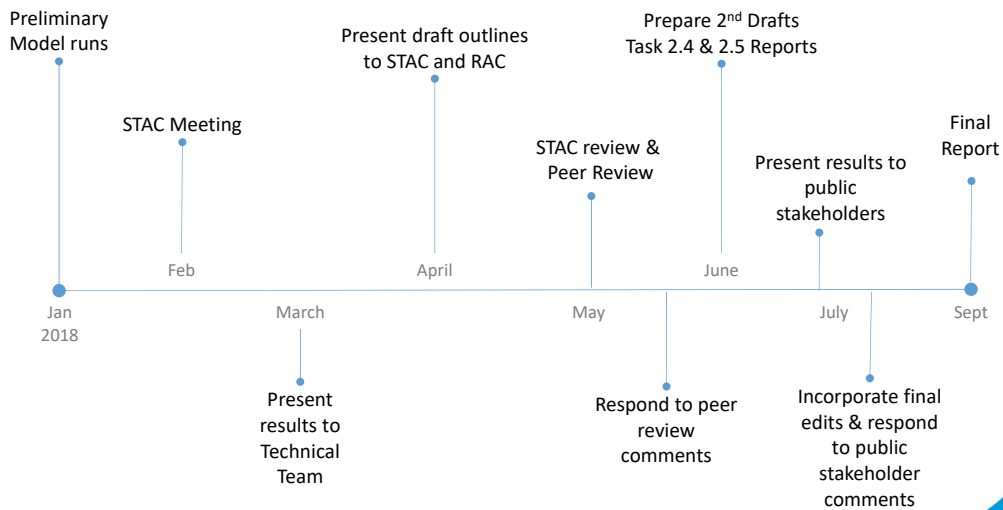


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# EO: Address Climate Change Through GHG Reduction



# Timeline and Next Steps



## Q & A



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