



**WATER**  **TOMORROW**

**2020 Integrated Resources Plan**

## SCENARIO PLANNING

FINALIZING DRIVERS OF CHANGE  
STEPPING INTO CONSTRUCTING SCENARIOS

**Member Agency Technical Workgroup Meeting**

June 10, 2020

# Objectives for Member Agency Technical Workgroup

- Discuss feedback on drivers of change and survey instrument
- Understanding the process as we move into constructing scenarios
- Preview data requested for 2015 retrospective



# FEEDBACK ON DRIVERS OF CHANGE AND DESCRIPTION OF SURVEY



# Feedback by the Numbers



## 3 New Drivers

- Impacts of Mandatory Groundwater Management
- Impacts on Replenishment
- Public Support

## Edits to Existing Drivers

- Neutral drivers
- Various edits

# Drivers of Change Survey

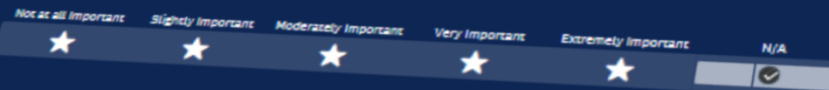


## DRAFT V3 Drivers of Change Survey - Member Agency Managers Version

### Climate Change

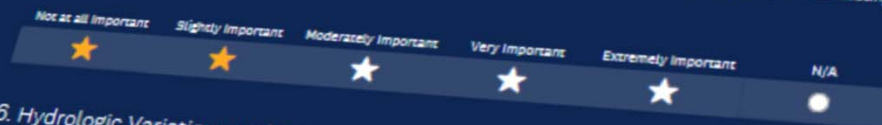
#### \* 4. Stresses on River Basin Ecosystems

Continued deterioration of the Bay Delta ecosystem, and potential deterioration of Colorado River riparian systems due to lower flows and rising temperatures, could lead to increased invasive species populations on the Colorado and uncertain State Water Project Table A allocations, as endangered species continue to decline.



#### \* 5. Rising Sea Level

A changing climate will prompt an unknown level of sea level rise by 2045 that could result in increased saltwater intrusion in coastal groundwater basins and Bay Delta, potential stranded assets under some conditions, and potential impacts on existing seawater desalination plants.



#### \* 6. Hydrologic Variations and Extremes

While California has historically had the nation's most variable weather, the future is expected to be even more variable and extreme, with impacts by 2045. The extent of this change may increase Colorado River salinity and agriculture runoff and prolong drought cycles. Existing storage may prove inadequate in wet cycles.



# Survey Context

The survey will be distributed to the following three groups with a unique statement to provide context:

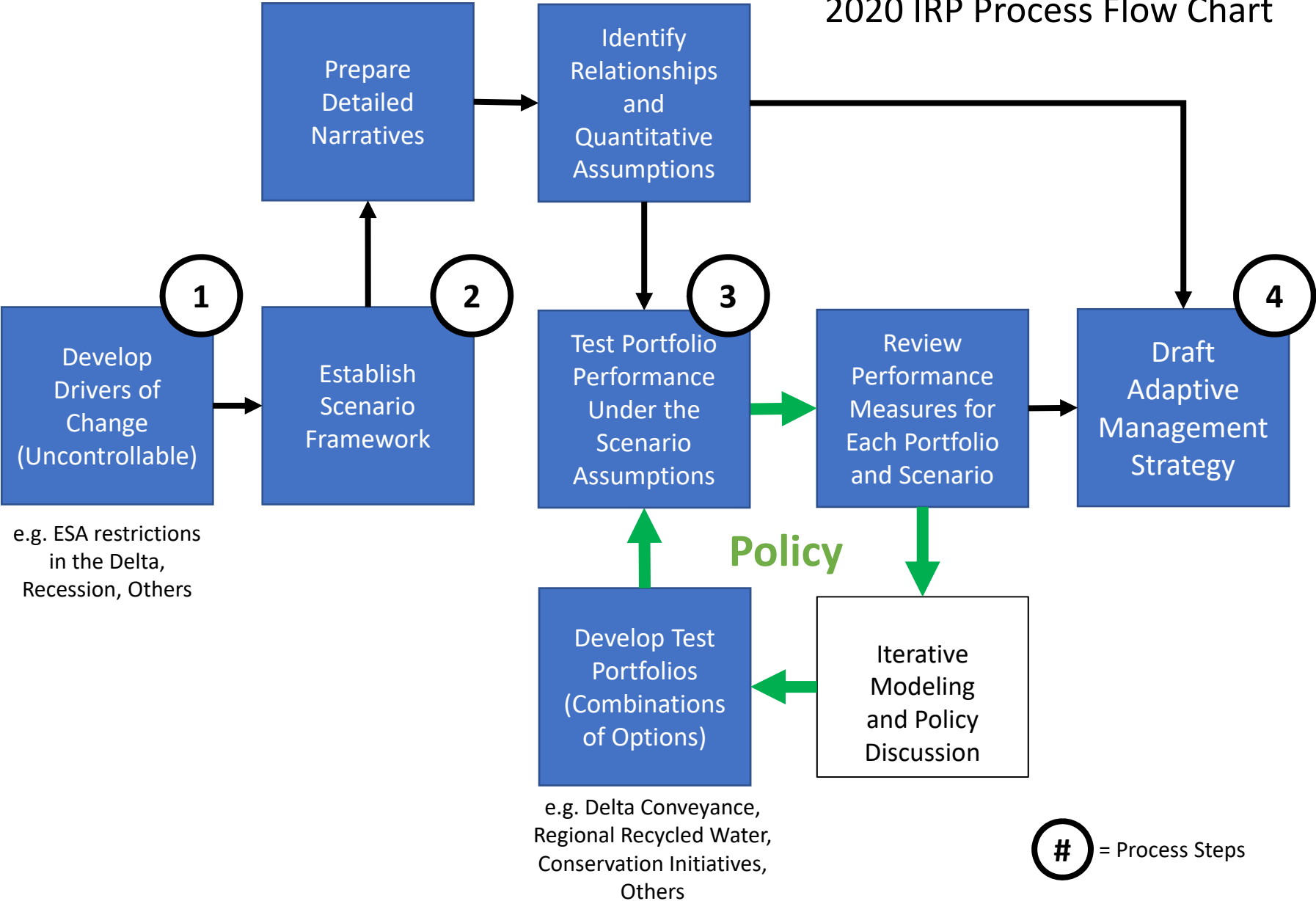
- MWD Board: Importance of the driver as it impacts the region as a whole
- Member Agency: importance of driver as it impacts only YOUR agency (which is dependent on the regional system)
- Stakeholders: importance of driver as it impacts Southern California's water supply reliability from YOUR ORGANIZATION'S perspective



# MOVING INTO CONSTRUCTING SCENARIOS

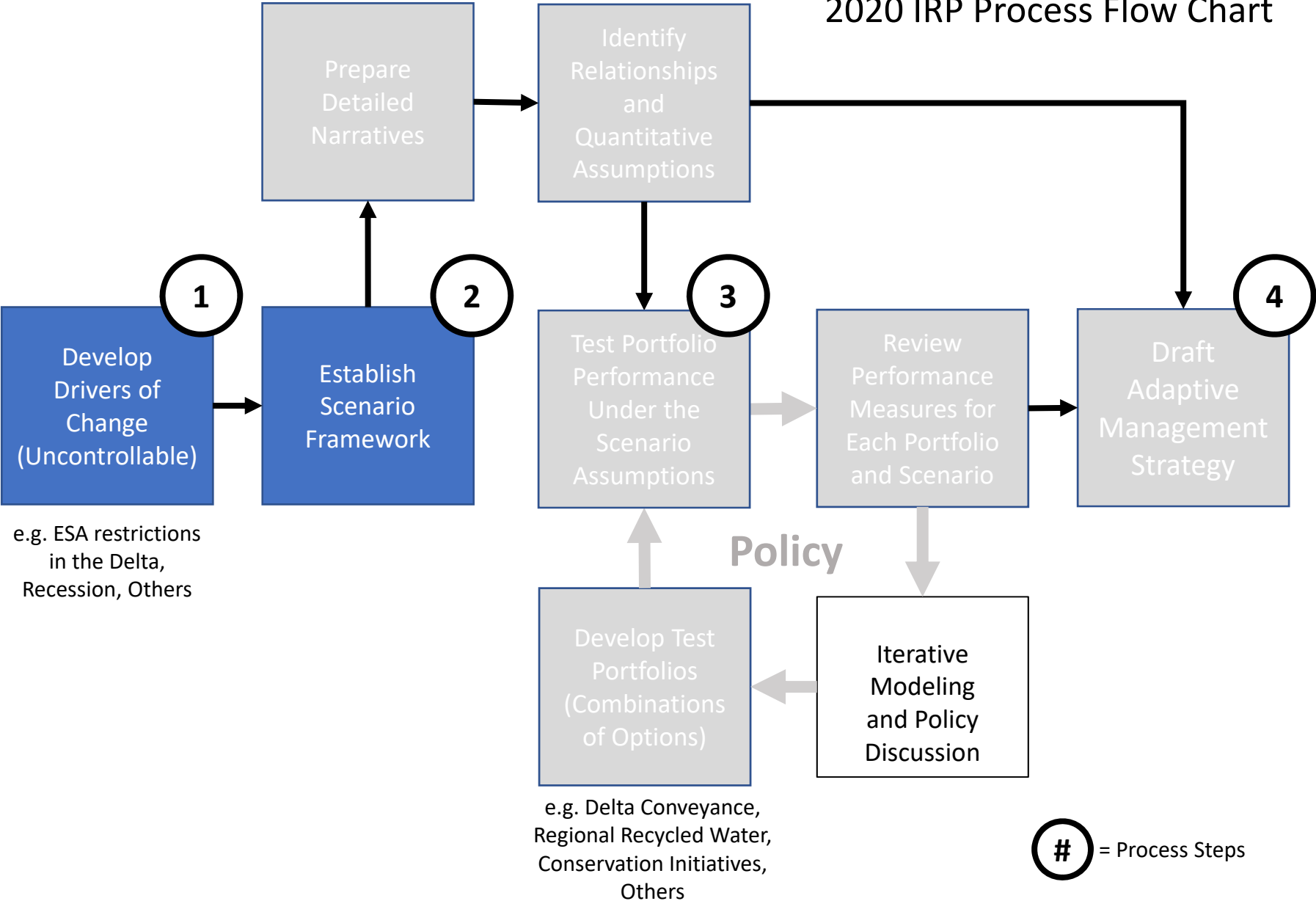


# 2020 IRP Process Flow Chart





# 2020 IRP Process Flow Chart



# = Process Steps

# Process Steps



- Identify and develop a list of drivers of change
  - Metropolitan Board updates
  - Member agency participation/feedback loop
  - Stakeholder involvement

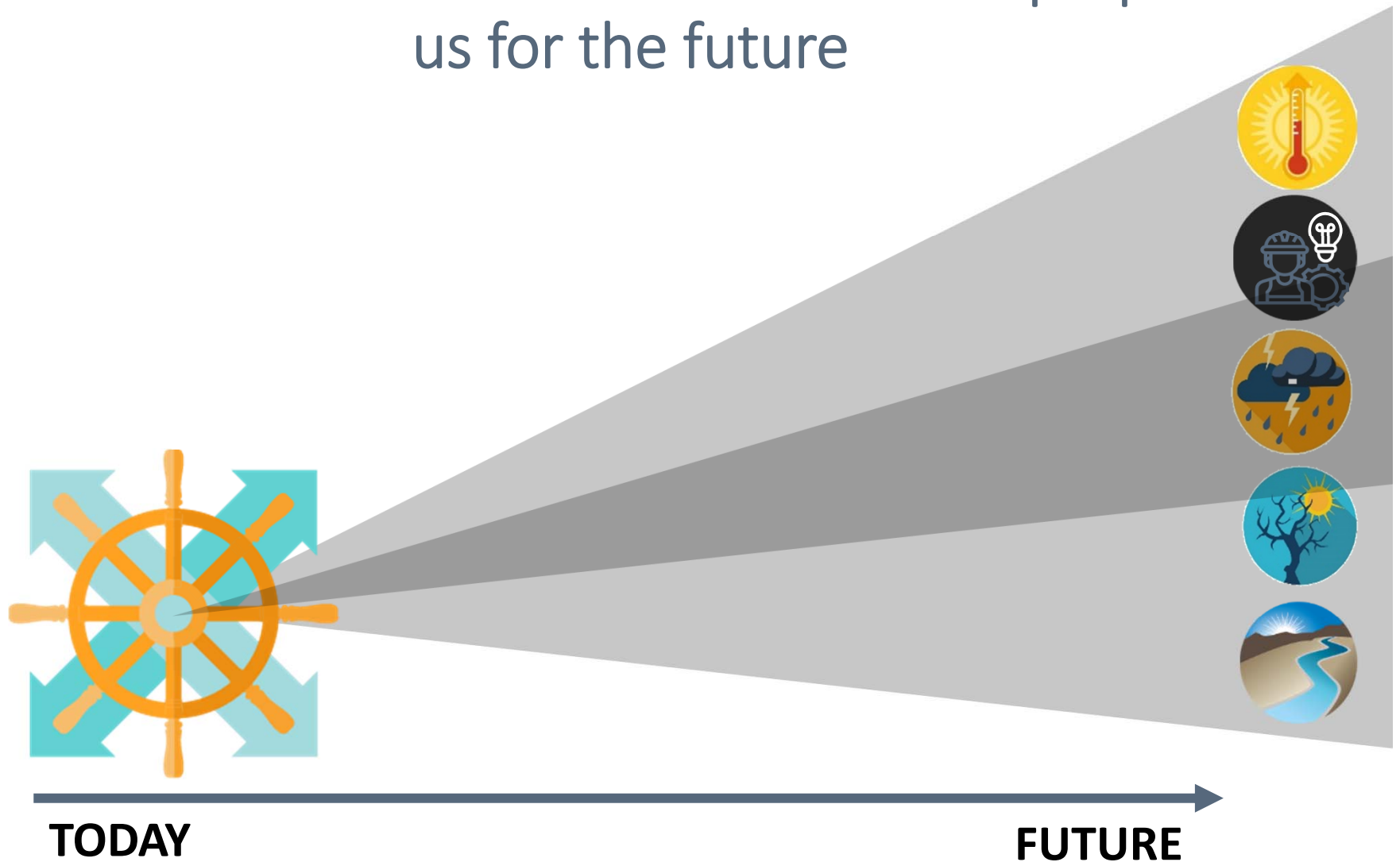
# Process Steps



- Identify scenario framework
  - Allows us to construct scenarios addressing a range of plausible futures
  - Qualitative and quantitative assessment of drivers and their impact and uncertainty

# Scenario Framework

A broad view of the future will better prepare us for the future



# Purpose of Survey

- Indication of importance of the drivers of change
  - Not voting on which drivers of change will be used
- Help to develop scenario framework
  - Basis for constructing scenario narratives



# Scenario Framework

## WERF Example

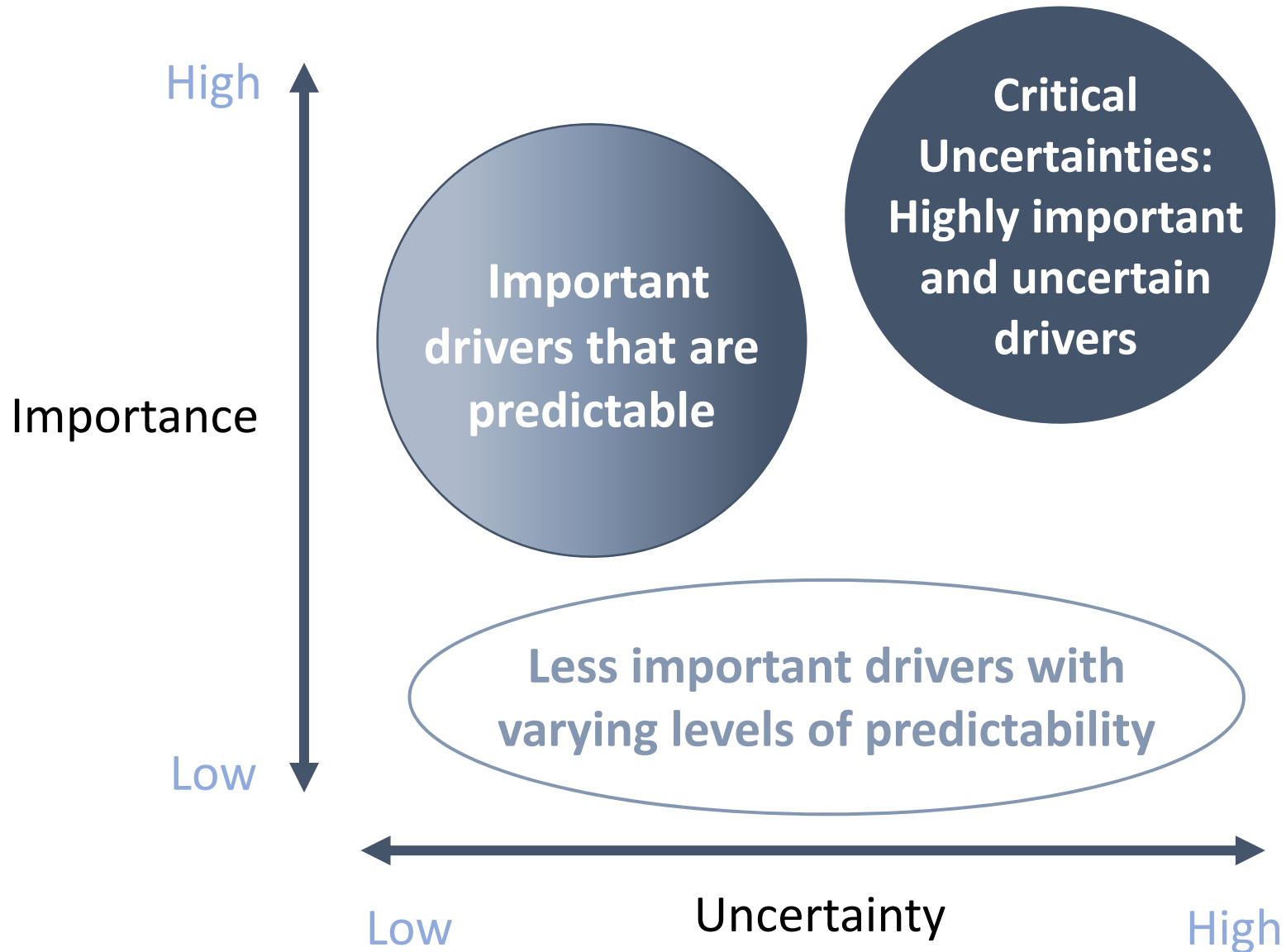
WERF Study (Brown, 2017)

The WE&RF Interim Research Plan called for “A board-driven long-term strategic visioning process . . . to define a WE&RF research strategy for 2018 and beyond.”



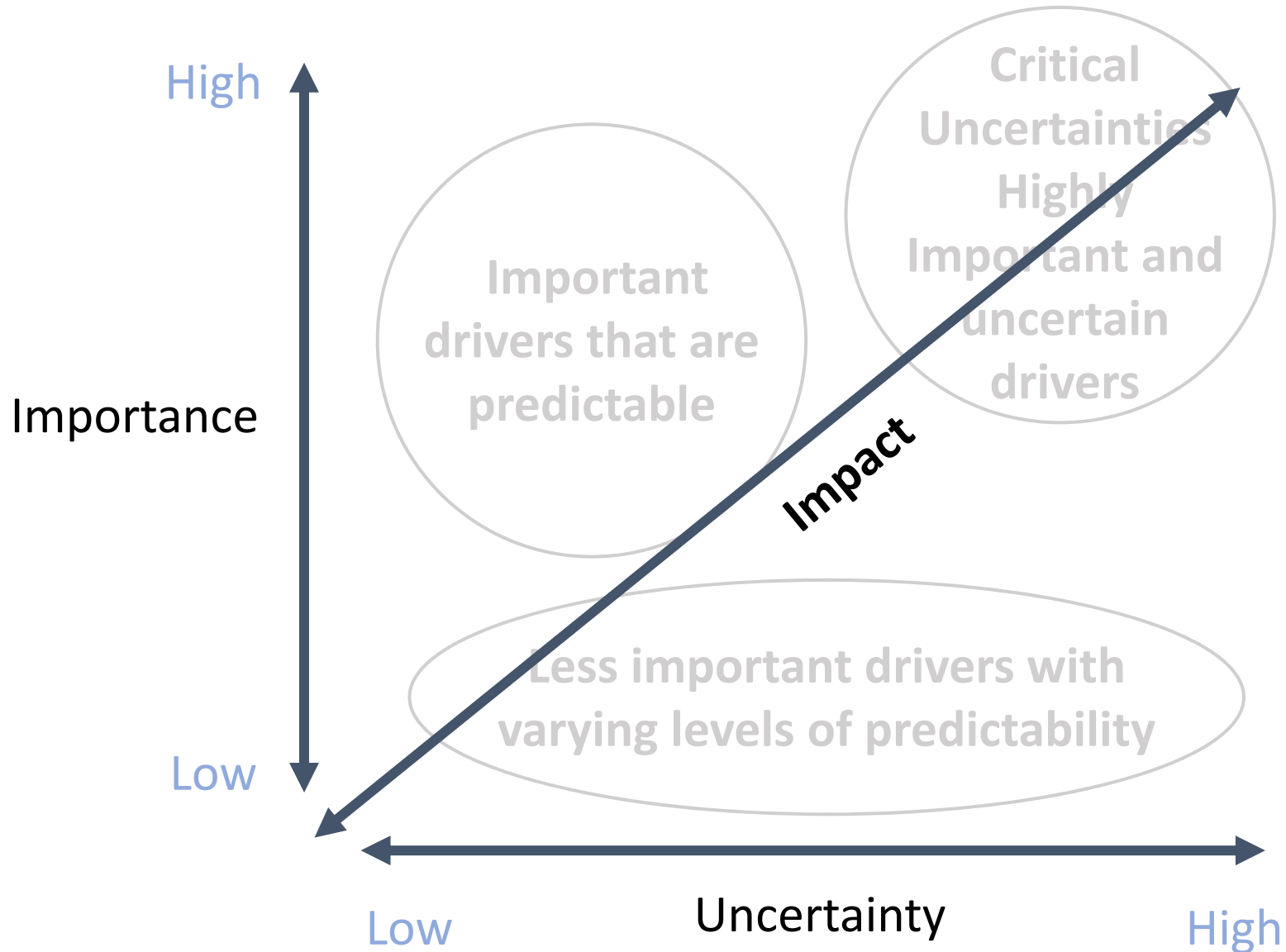
# Scenario Framework

Establishing How to Get a Broad View



# Scenario Framework

Establishing How to Get a Broad View





# Scenario Framework

## Dimensions of Impact

**Importance (I)** is a function of *survey input (i)* and the *scale* of the driver's effects on demands and supply (s).

$$I = f(i, s)$$

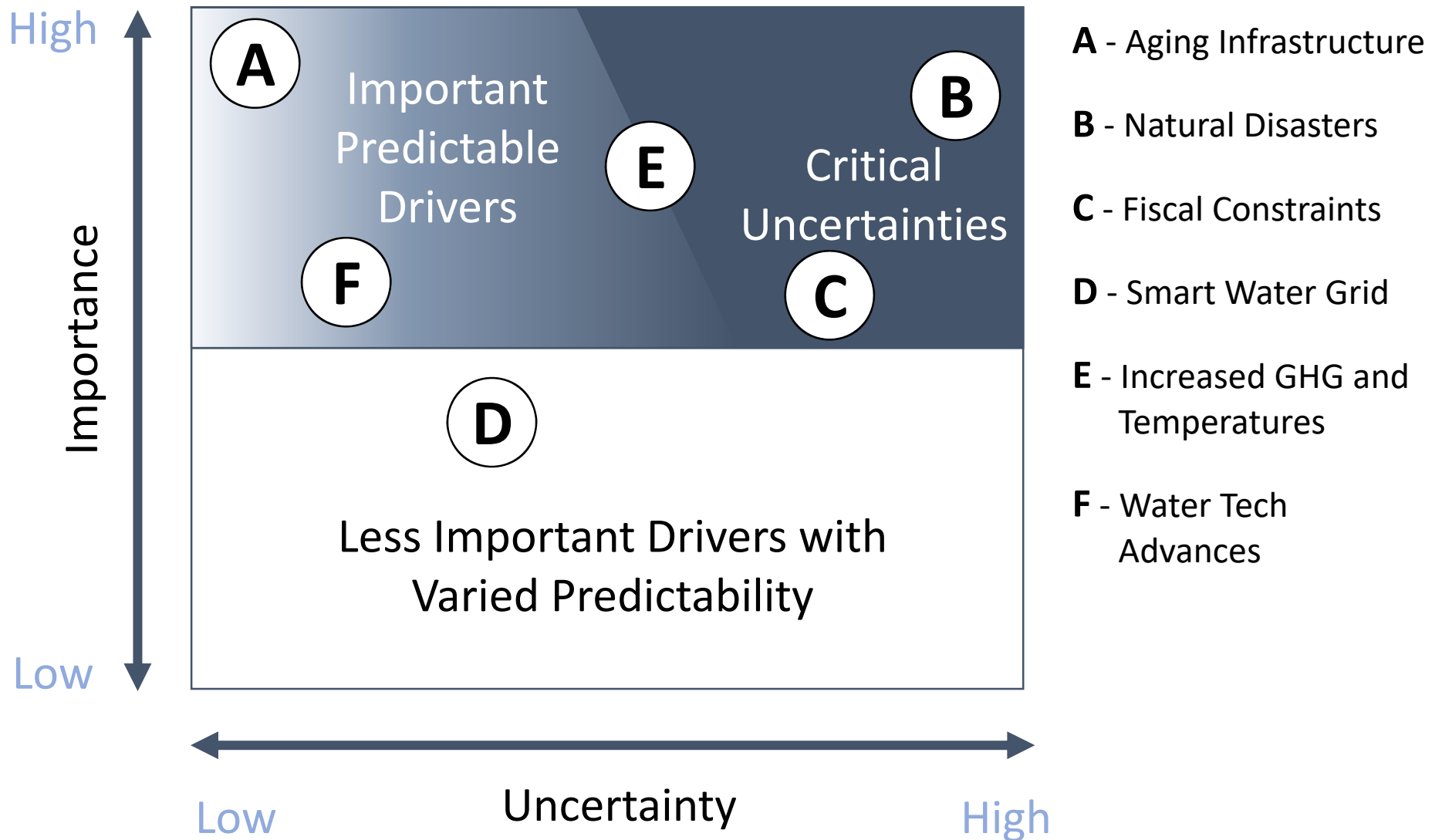
**Impact (P)** is a function of *Importance (I)* and *Uncertainty (U)*.

$$P = f(I, U)$$

**Scale of effects (s)** and **Uncertainty (U)** will be established through qualitative and quantitative assessments of the drivers, feedback from member agencies, and expert panel review.

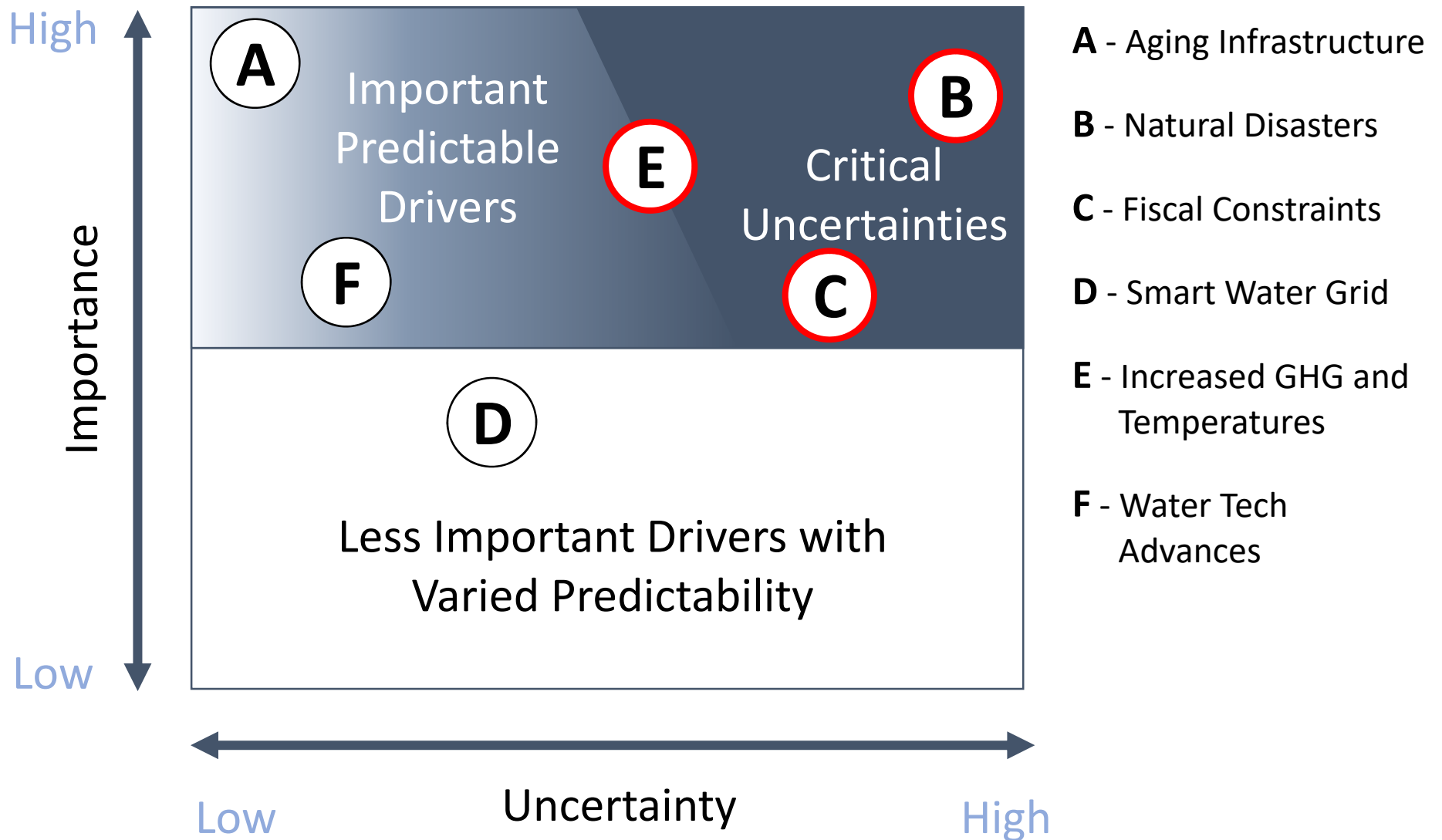
# Scenario Framework

## WRF Example



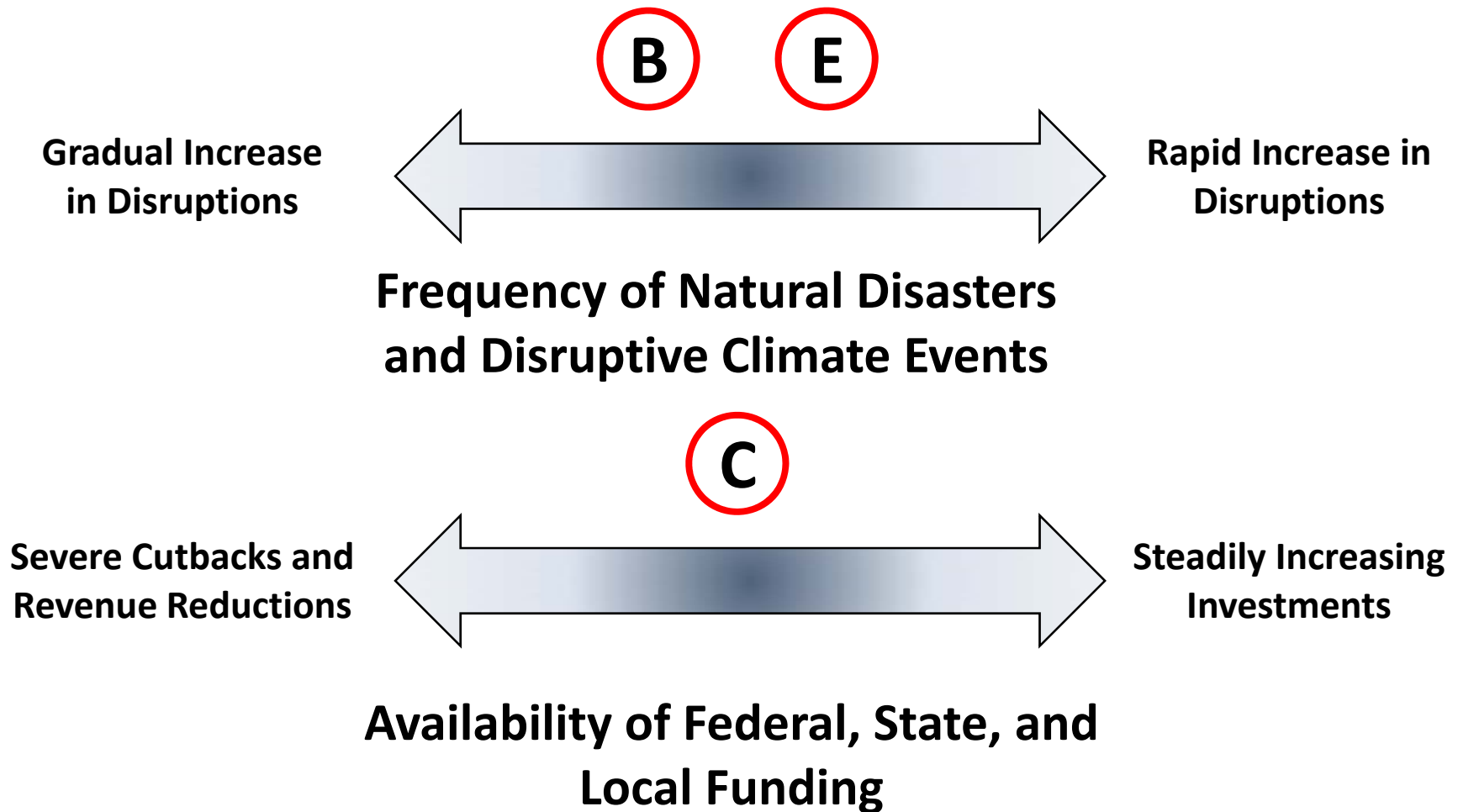
# Scenario Framework

## WRF Example

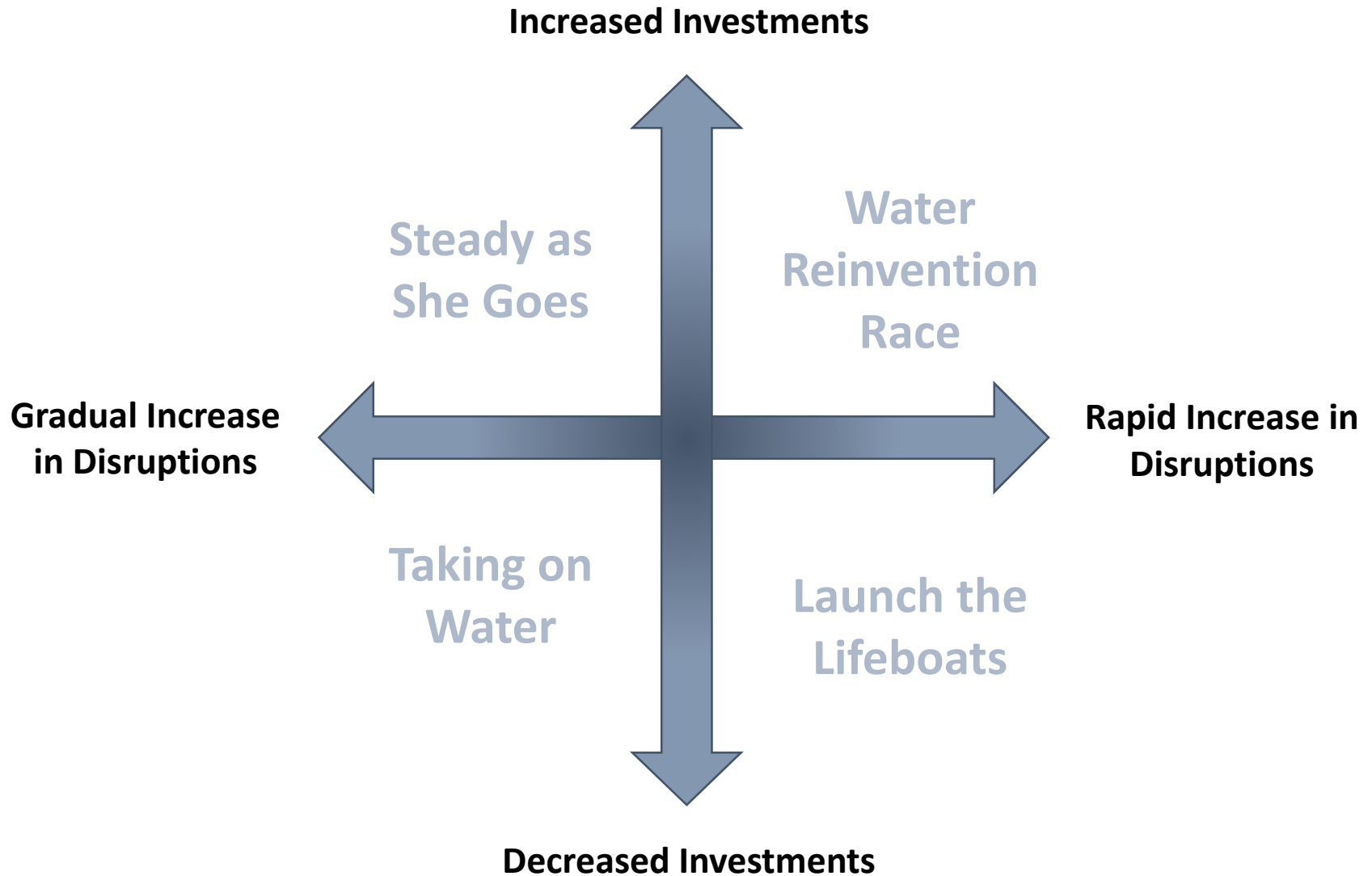


# Scenario Framework

## WRF Critical Uncertainties



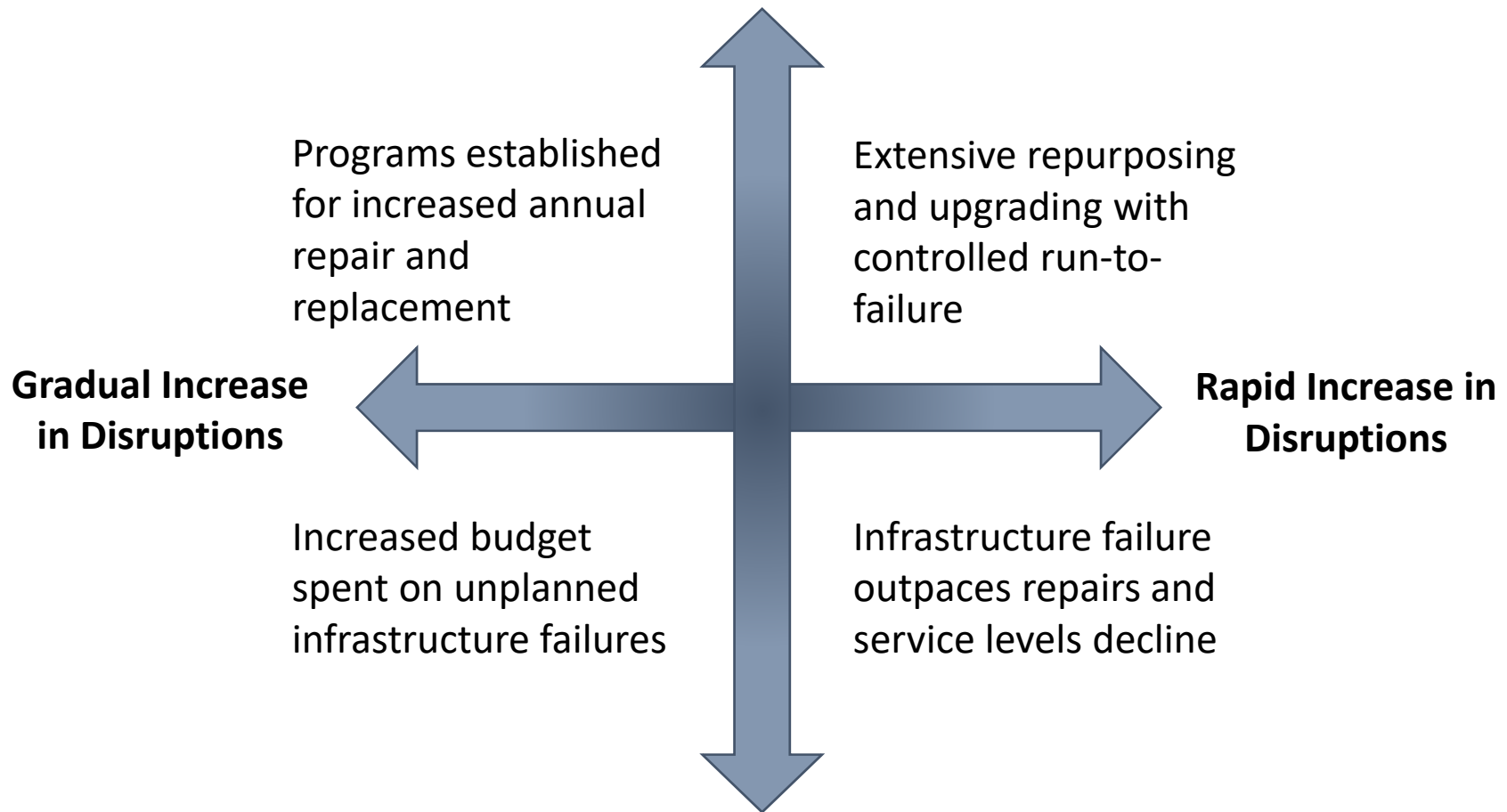
# Constructing Scenarios



# Constructing Scenarios

## A – Aging Infrastructure

Increased Investments



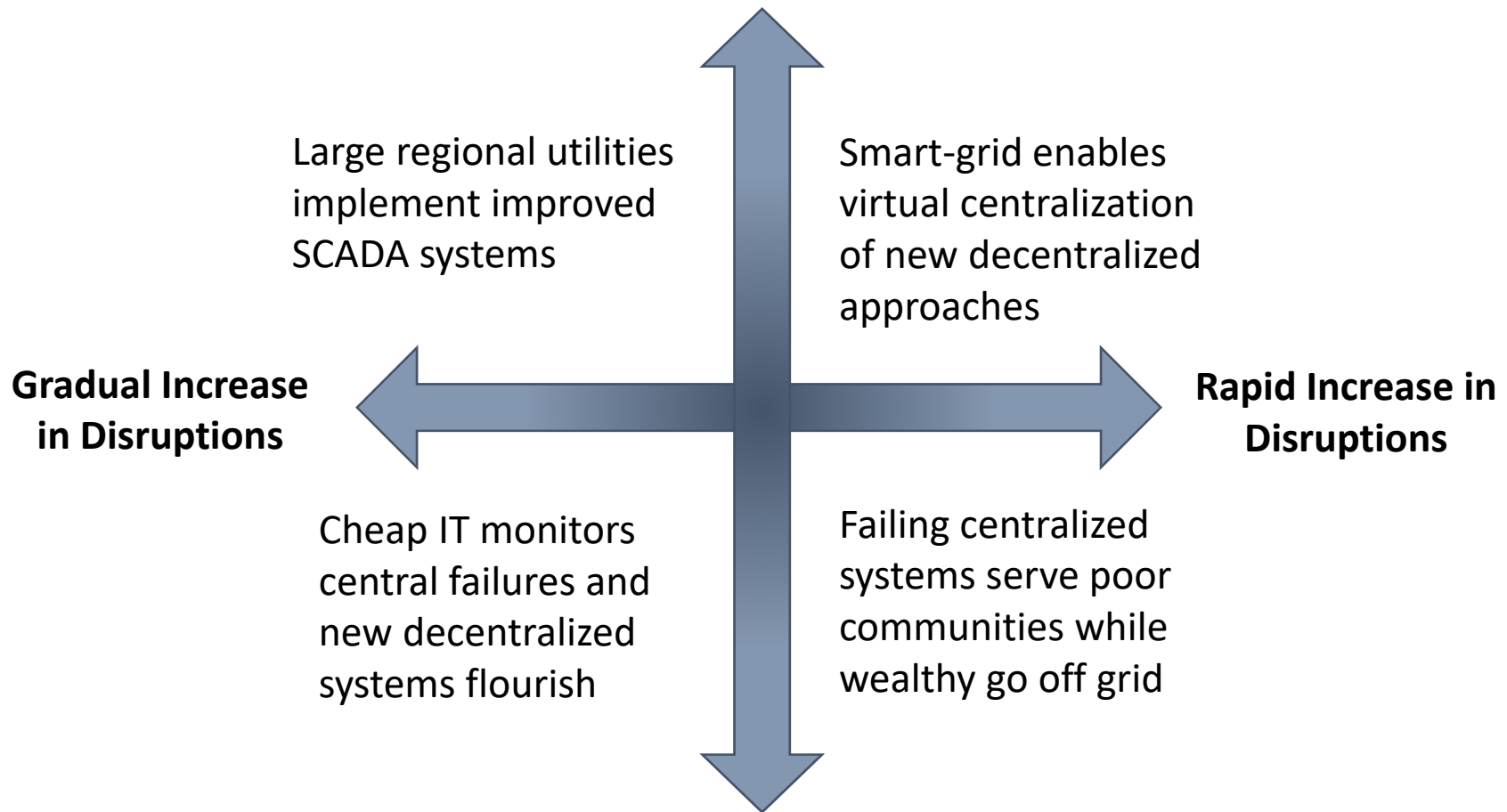
Decreased Investments

**A** - Aging Infrastructure

# Constructing Scenarios

## D – Smart Water Grid

Increased Investments



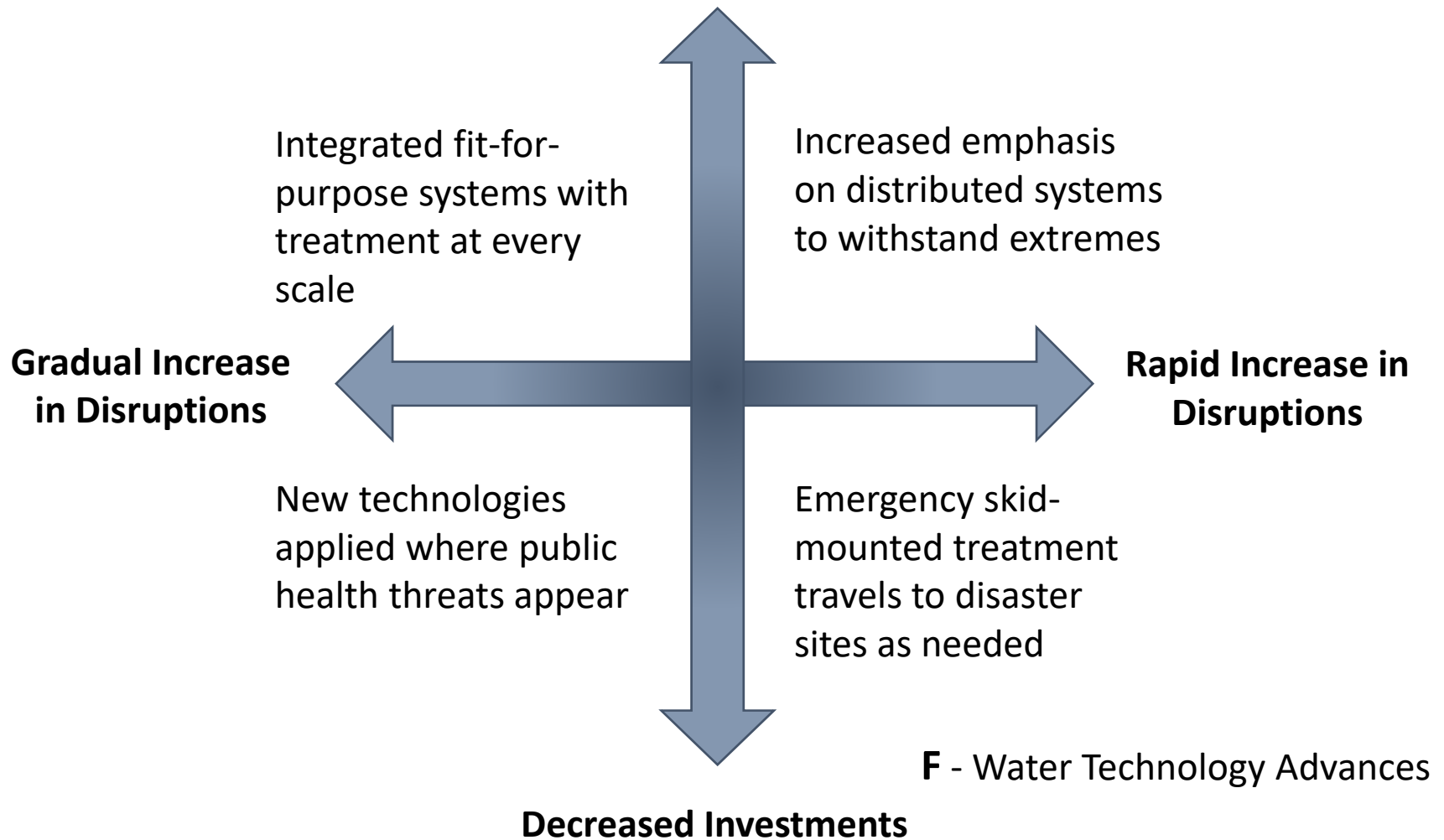
Decreased Investments

D - Smart Water Grid

# Constructing Scenarios

## F – Water Technology Advances

Increased Investments





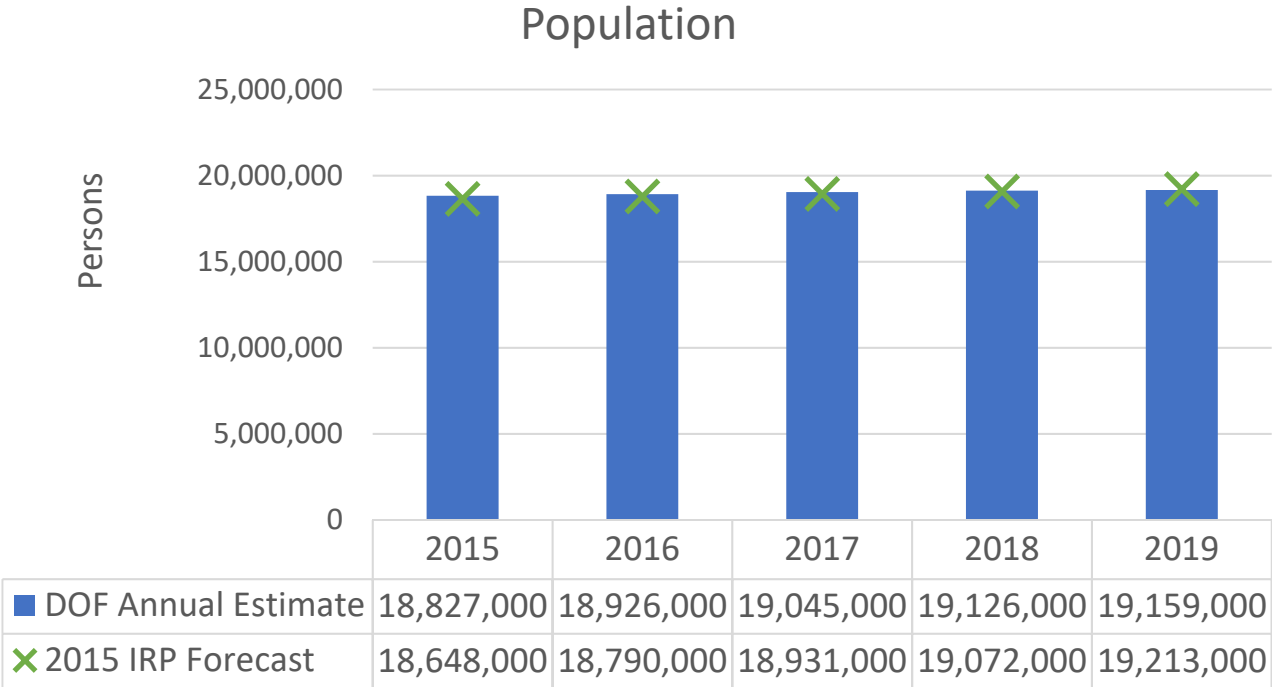


# 2015 IRP RETROSPECTIVE PREVIEW



# Demographic

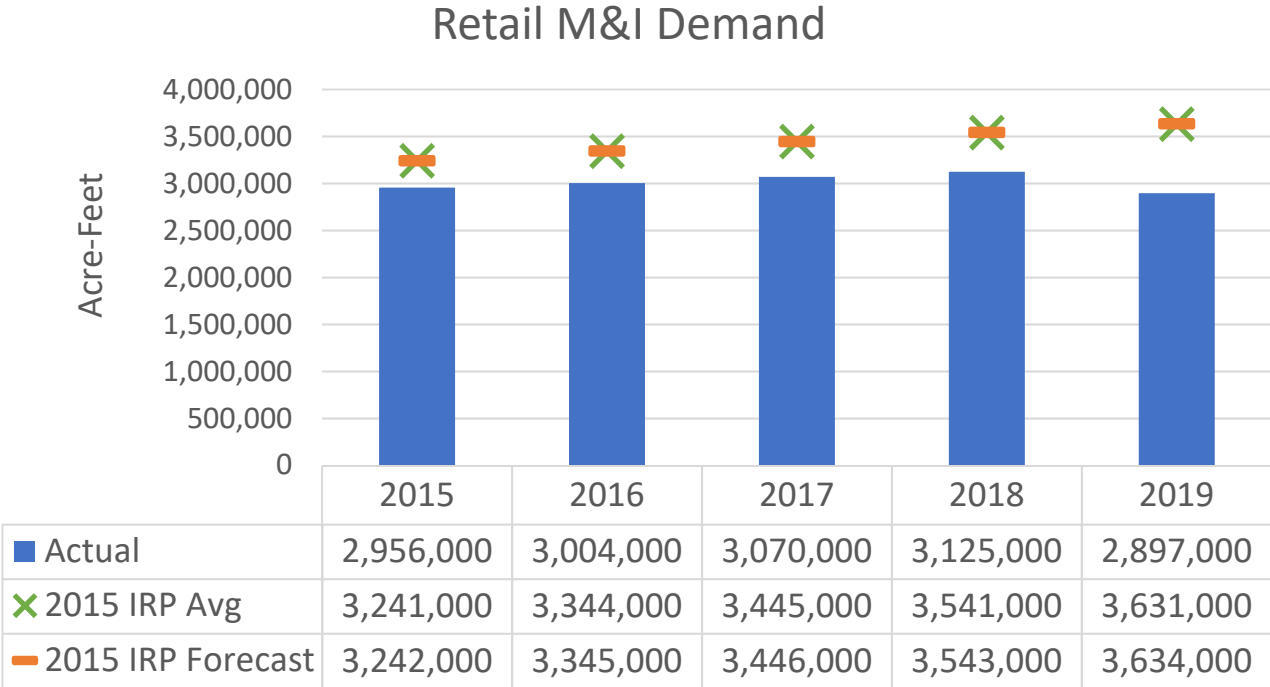
## 2015 Forecast vs. Actuals



Actuals are CA Department of Finance Annual Estimates

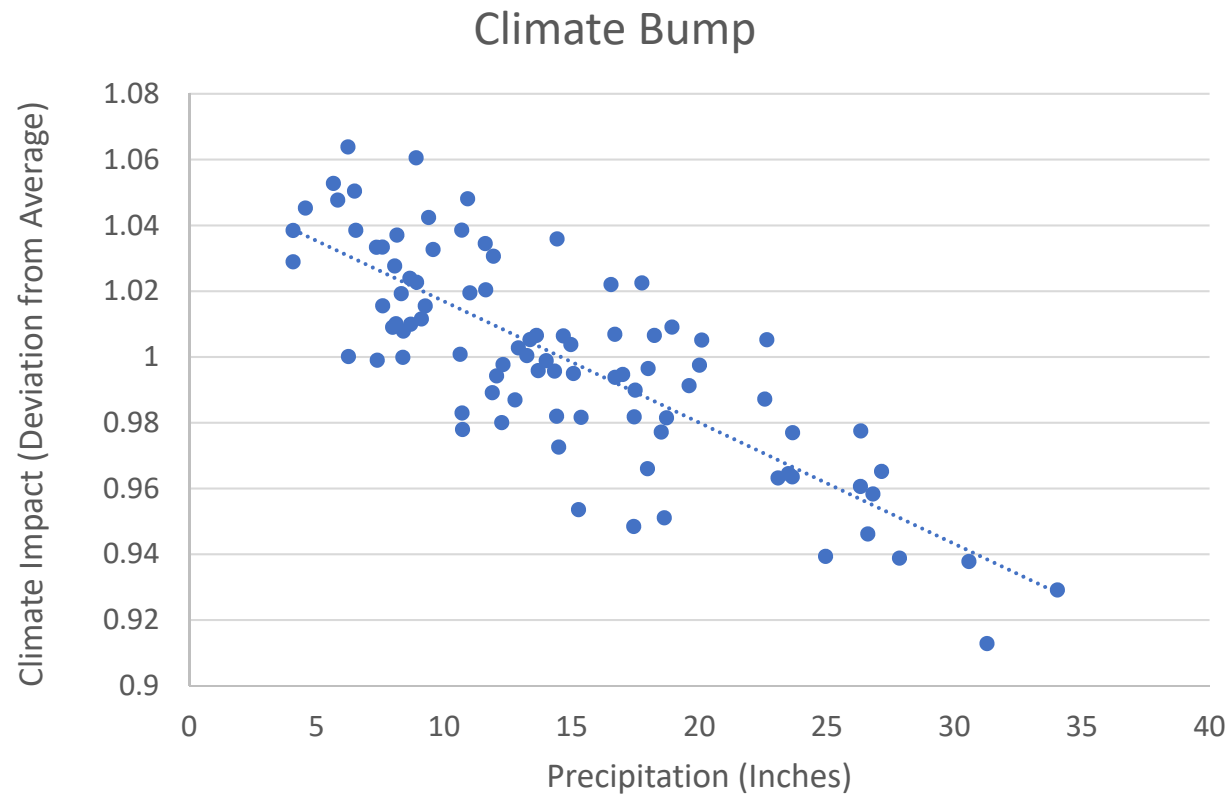
# Demand

## 2015 IRP Forecast vs. Actual



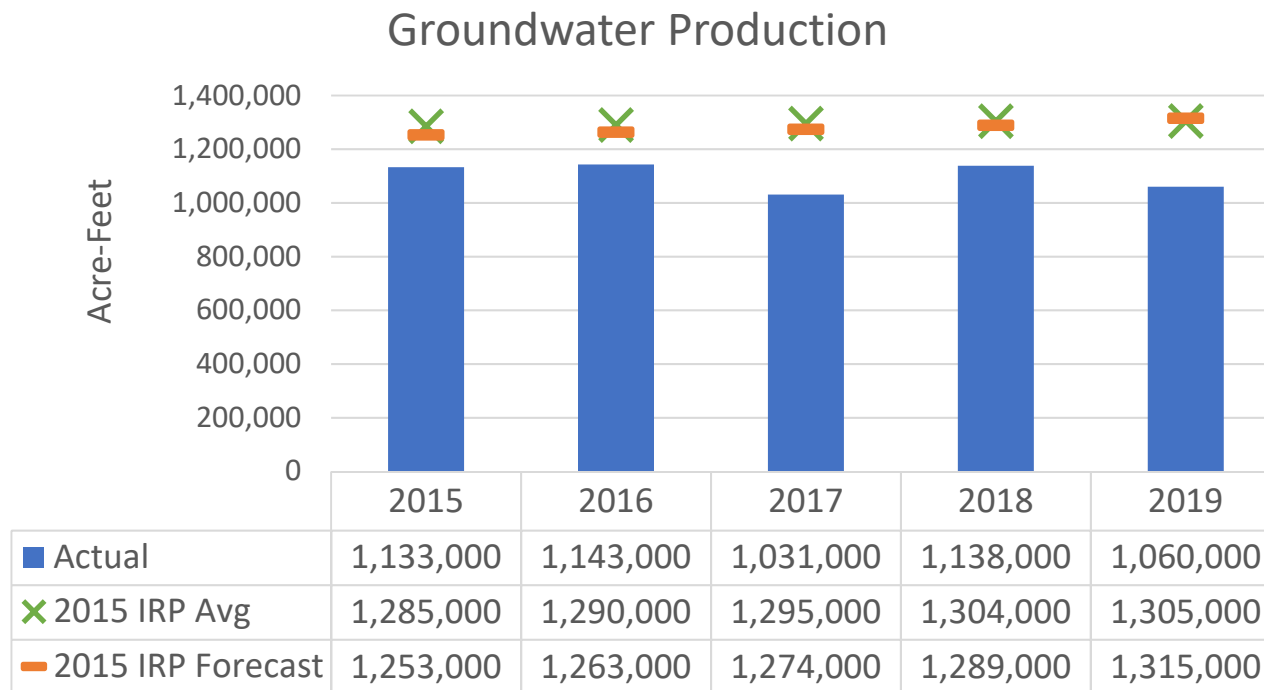
# Climate Bumps

Climate Impact vs. Precipitation



# Local Supply

## 2015 IRP Forecast vs. Actual



# WHAT'S NEXT

- Survey on drivers
- Qualitative and Quantitative Assessment of Drivers
- Construct Scenarios





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## **2020 Integrated Resources Plan**

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