

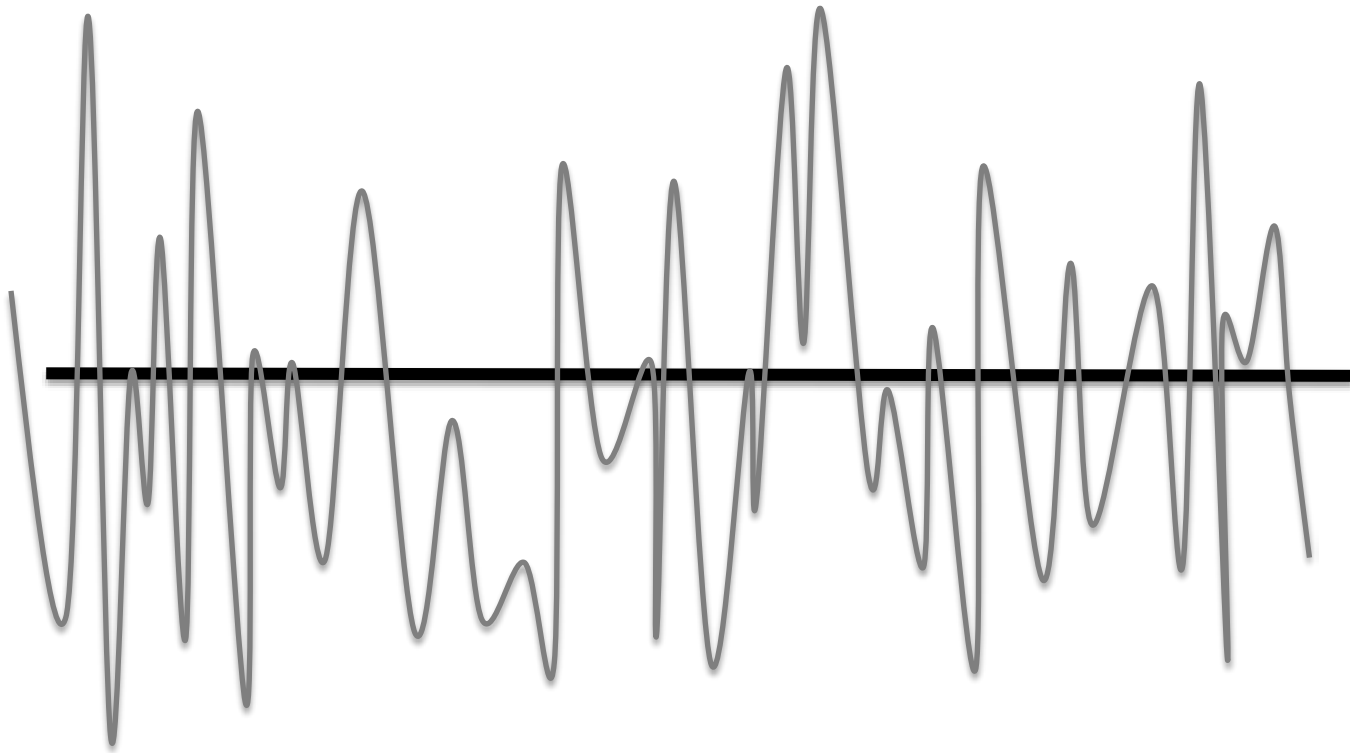
# Re-Designing for Climate Change

**Indrani Ghosh, PhD**  
**Cris Perez**

2014 Geodesign Summit  
January 30, 2013  
Redlands, CA

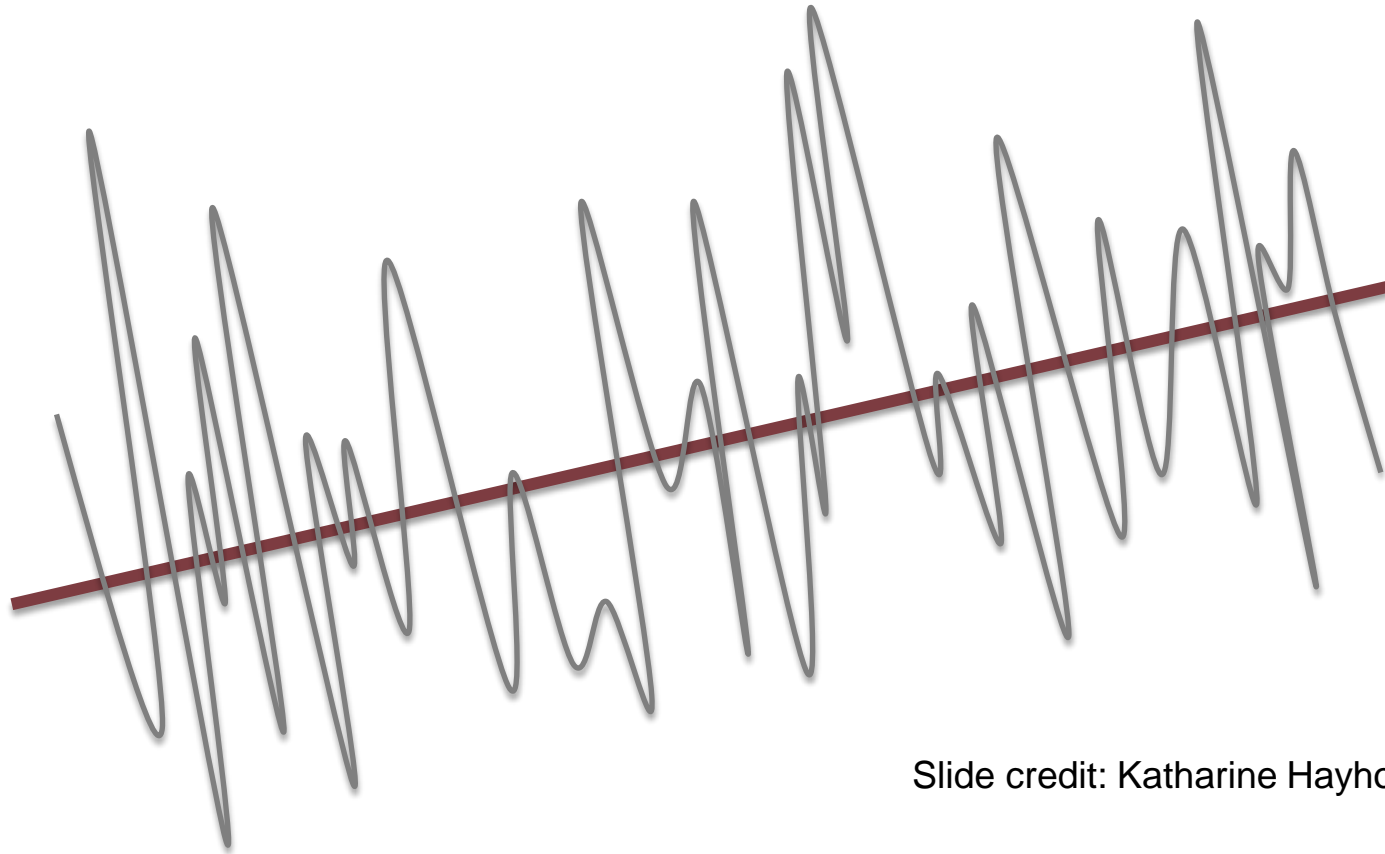


# Our infrastructure was built on the assumption of a stable climate



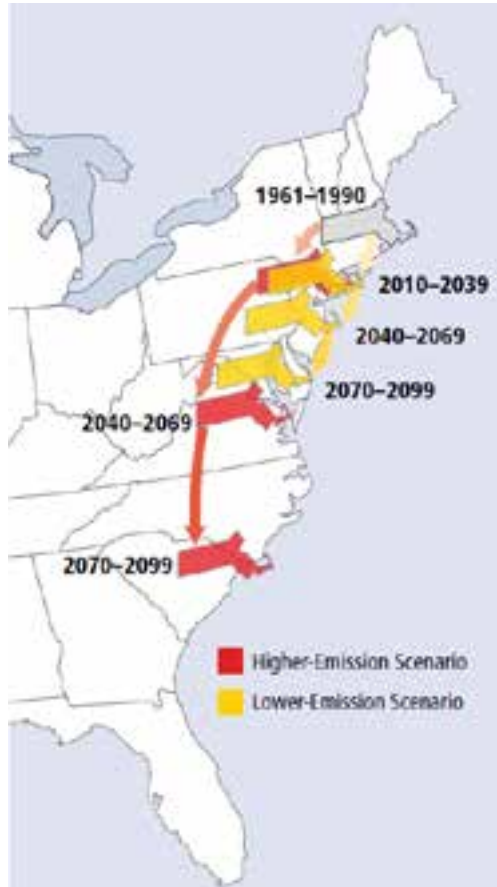
Slide credit: Katharine Hayhoe, Atmos

# What happens if that climate isn't stable any more?



Slide credit: Katharine Hayhoe, Atmos

## Temperature



## Precipitation



## Sea level rise

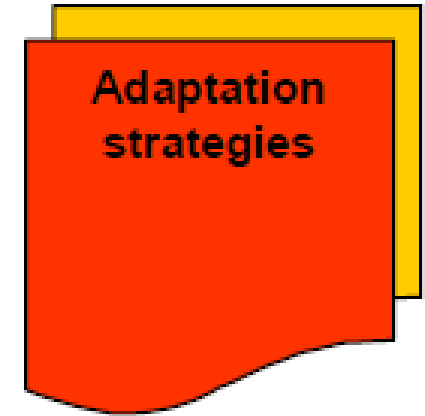
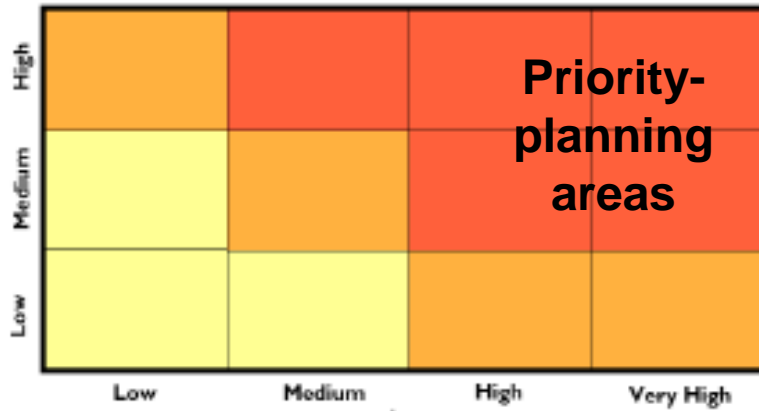


## Storm Surge



## Wind





## Step 1

**Climate Projections**

**Scenario Development**

## Step 2

**Vulnerability Assessment**

**Risk Assessment**

## Step 3

**Adaptation Planning and Design**

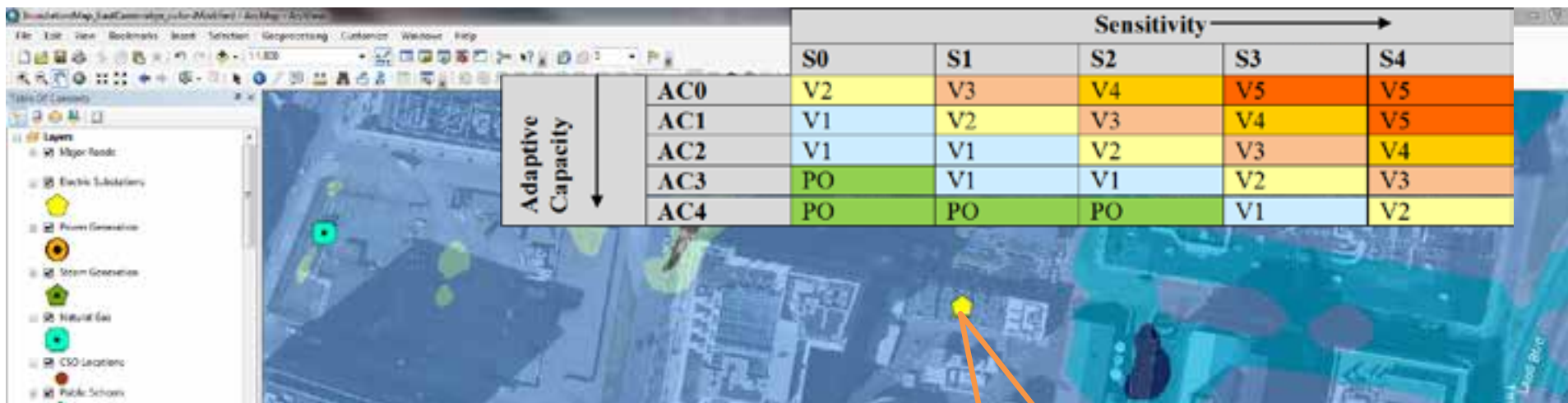
## Sea Level Rise Only

## Sea Level Rise and Storm Surge



SLR of 1.08 ft by 2038

SLR of 1.08 ft by 2038 and Storm Surge from Category 1 Hurricane



Table

Electric Substations

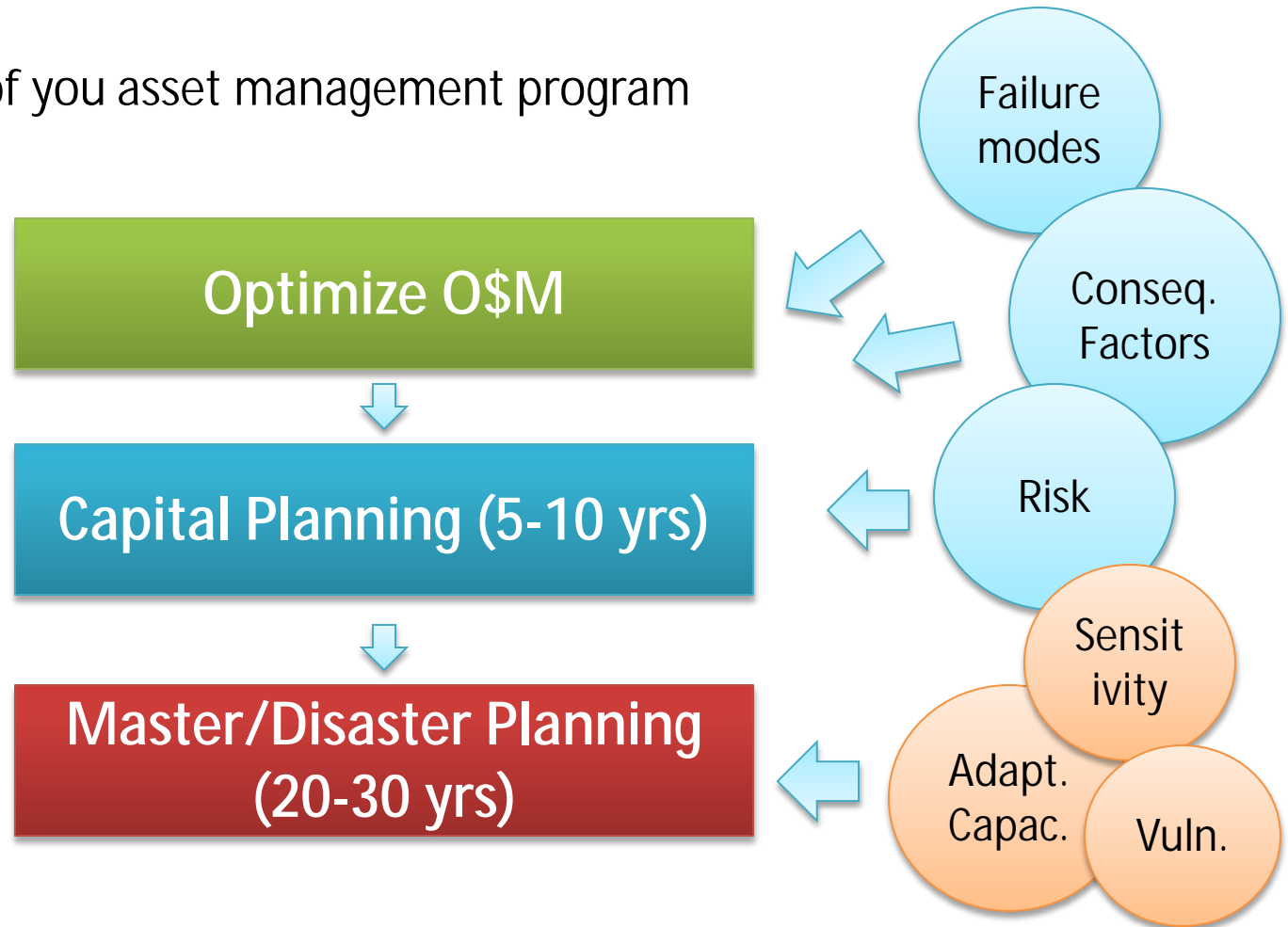
Name	Address	Capacity_MW	# Redundancies	Sensitivity_Score	AC_Score	Vulnerability_Score
NSTAR-Kendall	Athenaeum St	60	1	S3	AC2	V4
NSTAR-Putnam Av	Putnam Av	75	3	S3	AC3	V3
NSTAR-Alewife	Terminal Rd	80	2	S2	AC3	V2

(0 out of 3 Selected)

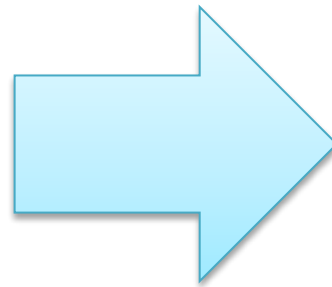




- Built on top of you asset management program



- [-] ESRI\_Local\_Government.gdb
  - [+] Address
  - [+] AdministrativeArea
  - [+] AssessmentInformation
  - [+] CadastralReference
  - [+] CapitalPlanning
  - [+] CitizenService
  - [+] Demography
  - [+] ElectionAdministration
  - [+] ElectionResults
  - [+] Elevation
  - [+] EmergencyOperations
  - [+] FacilitiesStreets
  - [+] FieldCrew
  - [+] InfrastructureOperations
  - [+] LandUseOperations
  - [+] LandUsePlanning
  - [+] ParcelEditing
  - [+] ParcelPublishing
  - [+] PublicSafetyPlanning
  - [+] ReferenceData
  - [+] SewerStormwater
  - [+] Stormwater
  - [+] Telemetry
  - [+] WaterDistribution



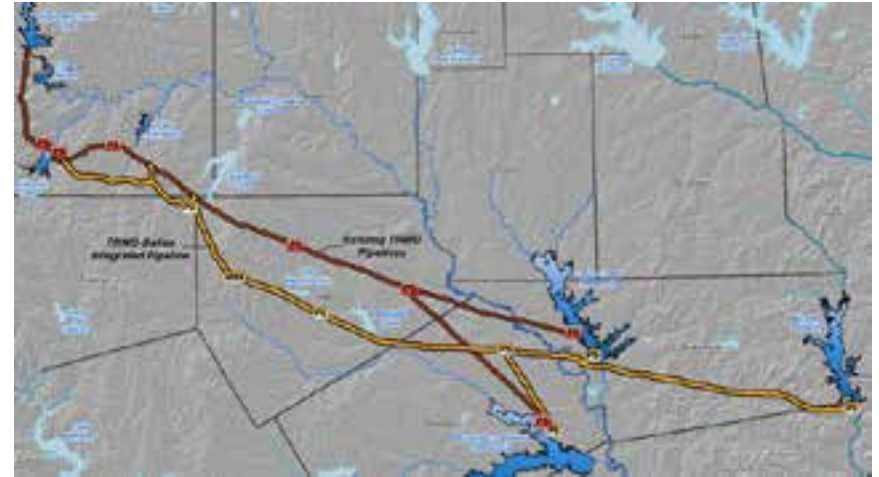
- [-] ClimateChange.gdb
  - [+] Elevation
  - [+] Facilities
  - [+] SewerStormwater
  - [+] Stormwater
  - [+] Transportation
  - [-] WaterDistribution
    - [+] wMain
    - [+] wSource
    - [+] wSourceProtectionZone
    - [+] wTank
    - [+] wTreatmentFacility
  - [+] sce\_HeatIsland\_2050
  - [+] sce\_HeatIsland\_2100
  - [+] sce\_SLR\_2050
  - [+] sce\_SLR\_2100
  - [+] sce\_SLRSS\_2050
  - [+] sce\_SLRSS\_2100
- [-] ClimateChange
  - [+] Risk
  - [+] Sensitivity\_Flooding
  - [+] Sensitivity\_HeatIsland
  - [+] Vulnerability

# Identify the Assets





Pavement asset management



Regional water supply and demand



Properly sized drainage structures



Managing runoff and energy needs

# Moving Beyond Infrastructure

