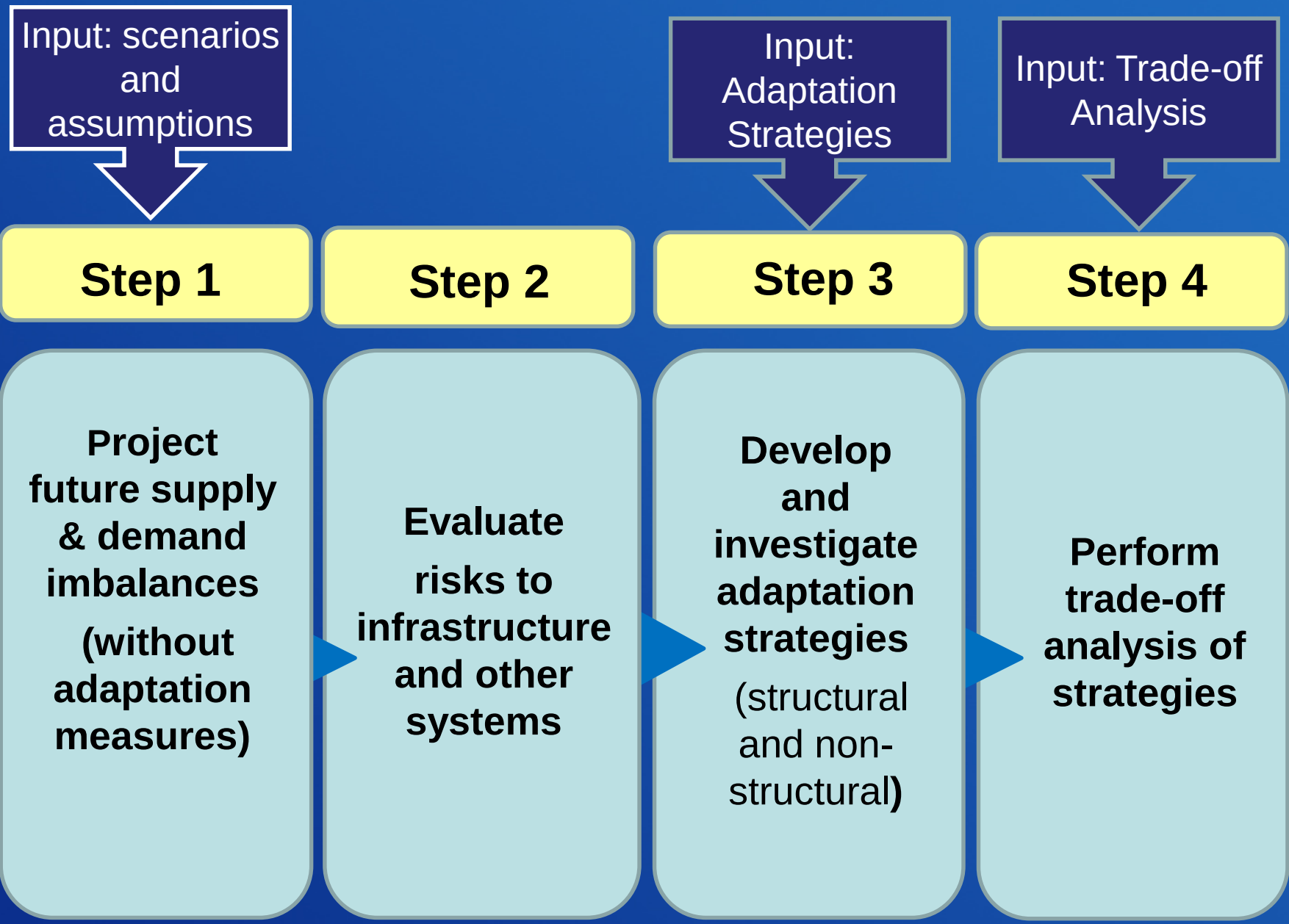
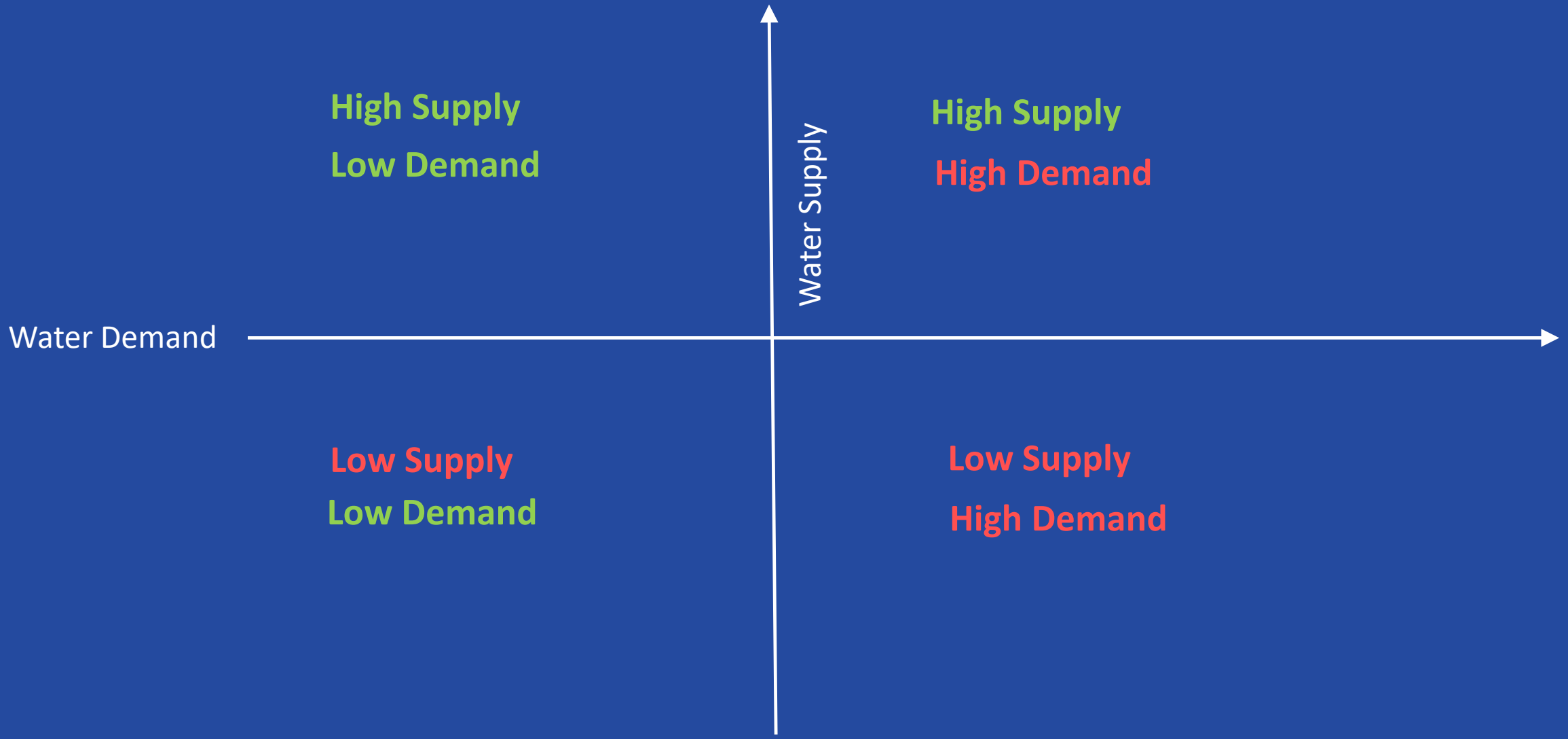
LSCR Basin Study Overview - Four required elements



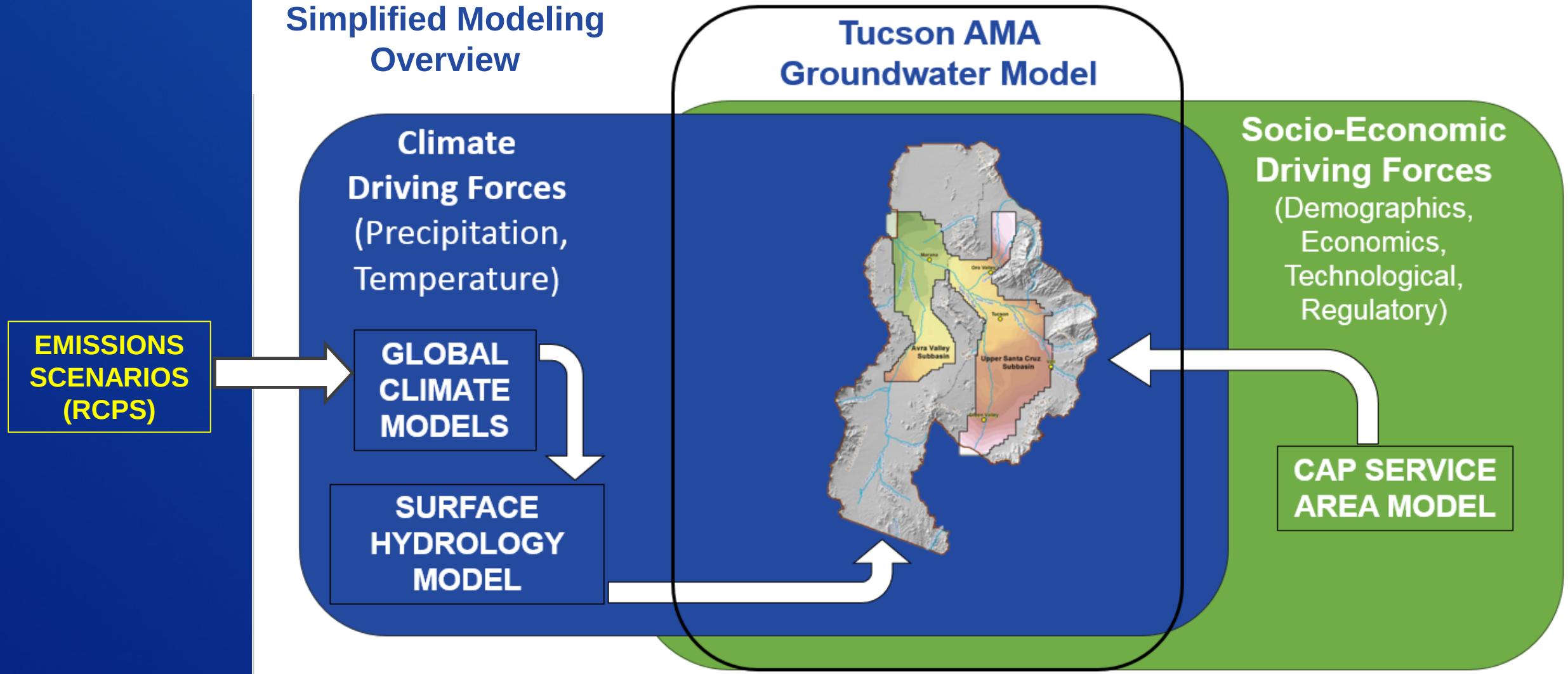
All Teams Climate Webinar
December 4th, 2018
Eve Halper
Reclamation Phoenix Area Office

RECLAMATION

Supply-Demand Scenarios (example)

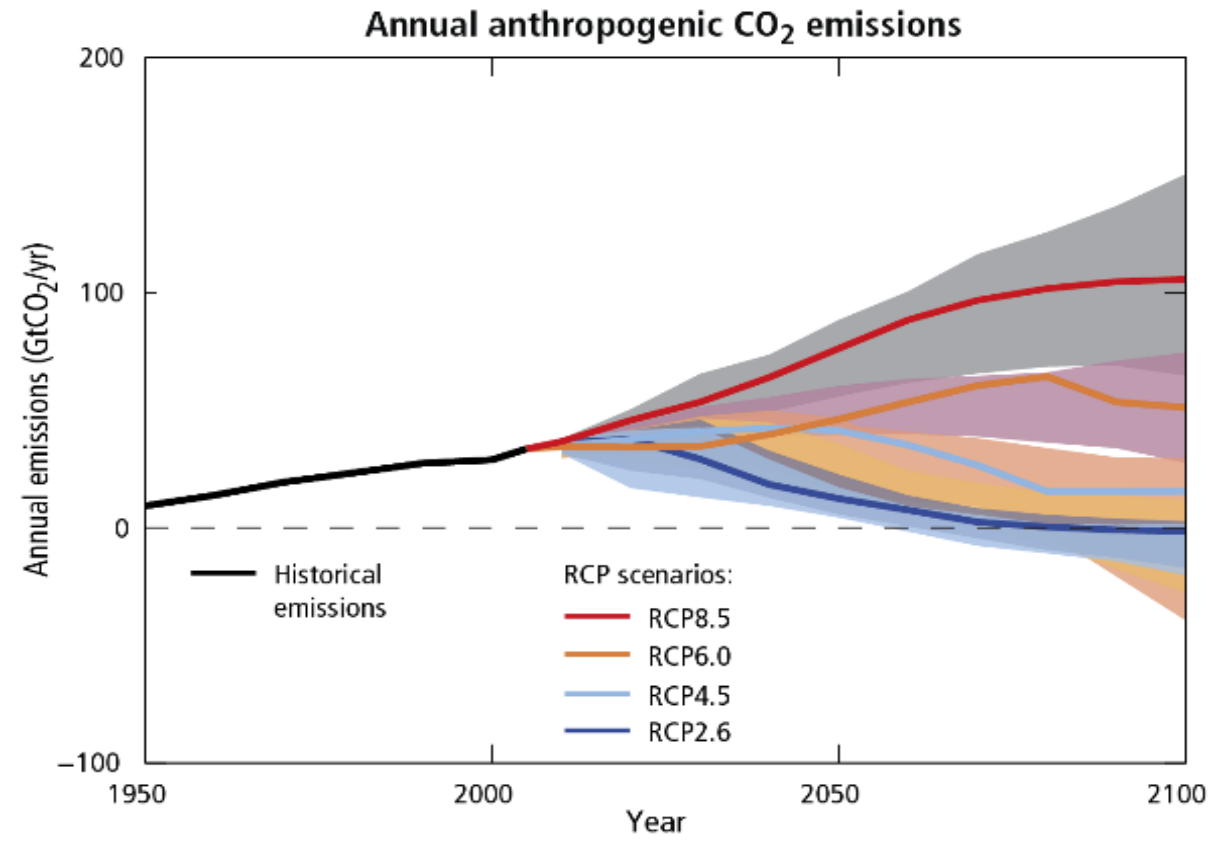


Simplified Modeling Overview



RECLAMATION

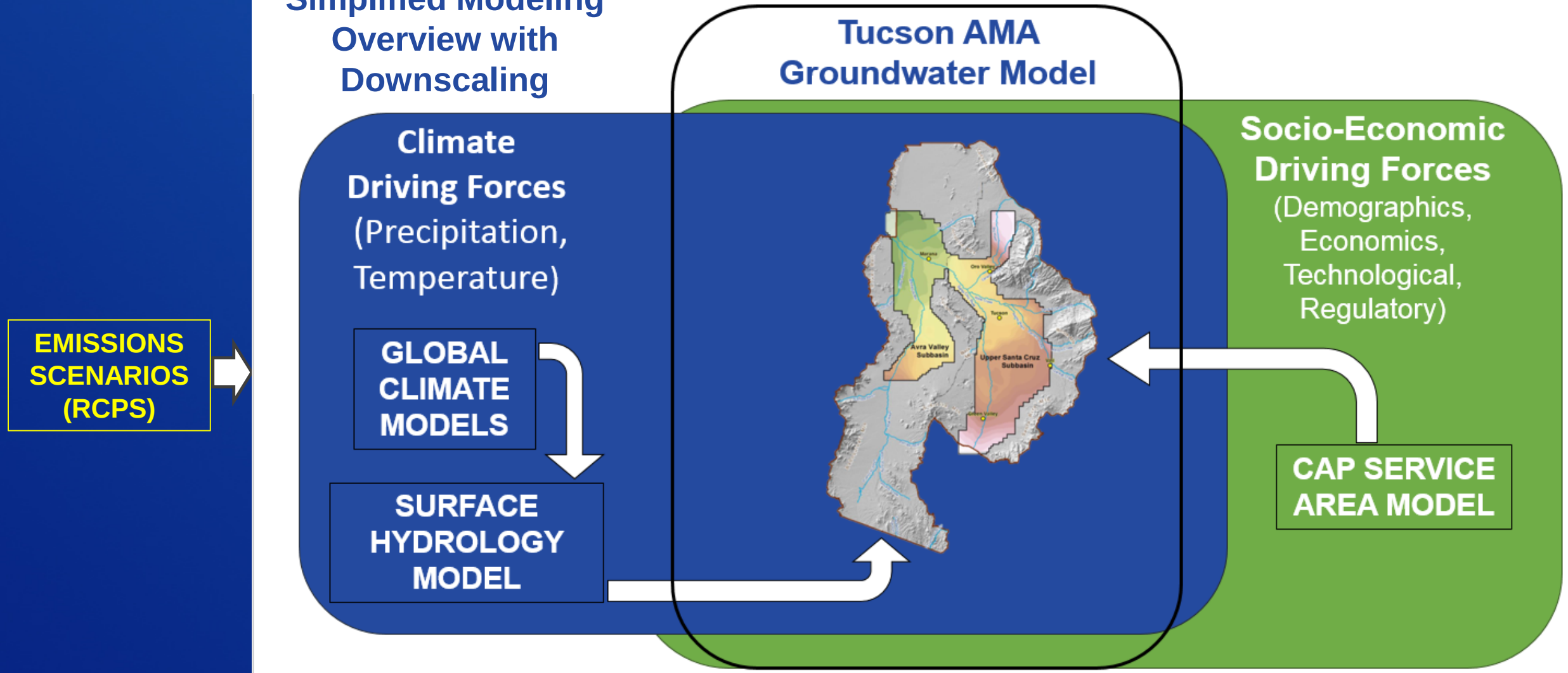
Representative Concentration Pathways (RCPs)



- Scenarios that include time series of emissions and concentrations of the full suite of greenhouse gases….
- Used to compare results of climate models
- Climate model projections available for **<u>RCP 4.5 and RCP 8.5 only</u>**
- RCP 4.5 - “Lower Risk / Best Case”
- RCP 8.5 – “Higher Risk/ Worse Case”

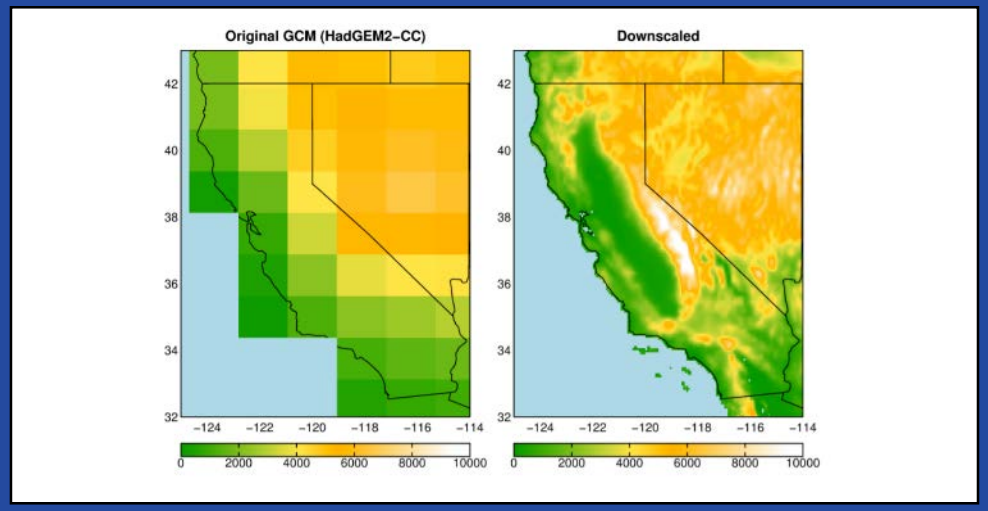
RECLAMATION

Simplified Modeling Overview with Downscaling



RECLAMATION

Downscaled Climate Projections



- Statistically Downscaled Climate Projections (LOCA) available for RCP 4.5 and RCP 8.5
- Dynamically Downscaled Climate Projections available for **<u>RCP 8.5 only</u>**

	Statistical Downscaling	Dynamical Downscaling
Pros	• Relatively easy to apply • More computationally affordable • Many existing datasets available under multiple emissions scenarios • Relatively high spatial resolution (6 km)	• Represents medium-scale physical processes in atmosphere • Does not assume relationships between GCM output and surface variables remain constant over time
Cons	• Assumes relationships between GCM output and surface variables will remain constant through time • Does not simulate medium-scale atmospheric processes	• Time consuming and expensive • Limited datasets available • Spatial resolution limited

Decision Point:

- **Focus on Risk - Best versus <u>Worse</u> (not Worst) Case**
  - *Best Case*: Lower emissions (RCP 4.5), minimal adaptation*
  - *Worse Case*: Higher emissions (RCP 8.5), high risk scenario but still within our ability to adapt*
- **Incorporate seasonality and monsoon rainfall**

- **Include dynamically downscaled climate projections**
  - Potential for higher risk than statistically downscaled (SD) projections
  - May represent key monsoon season better than SD projections

*Author's Note – the combination of emissions scenarios and adaptation in the first bullet was confusing. In the future, adaptation will be discussed separately.

Discussed at Project Team Meeting
5/20/16

Endorsed at Project Team Meeting
9/27/16

Scenarios Focus on Risk

"Base Case"
(w/o Climate Change)

Assumes current climate extends into the future

"Best Case"

RCP 4.5 Emissions Scenario Statistically Downscaled Projections (no DD available)

"Worse Case"

RCP 8.5 Emissions Scenario Includes Dynamically Downscaled Projections

Low Risk  High Risk

Decision Point:

Climate Metrics of concern

- Extreme events: intensity and frequency
  - Precipitation
  - Temperature
- Monsoon onset: timing
- Pre-monsoon dry period: timing

Discussed at:

- All Teams Climate Webinar, 12/1/2017
- Environmental Sub-team Meeting, 12/7/2017

Endorsed at:

- Project Team Meeting, 1/19/18