

# The economic costs and uncertainties of water scarcity

5 November 2019

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A vertical strip on the left side of the slide shows a concrete dam structure with water flowing over its base, creating white foam. The water is a deep blue color.

*If something cannot go on forever, then  
it will eventually stop.*

*--Herbert Stein*

# Do physical measures of scarcity tell the whole story?

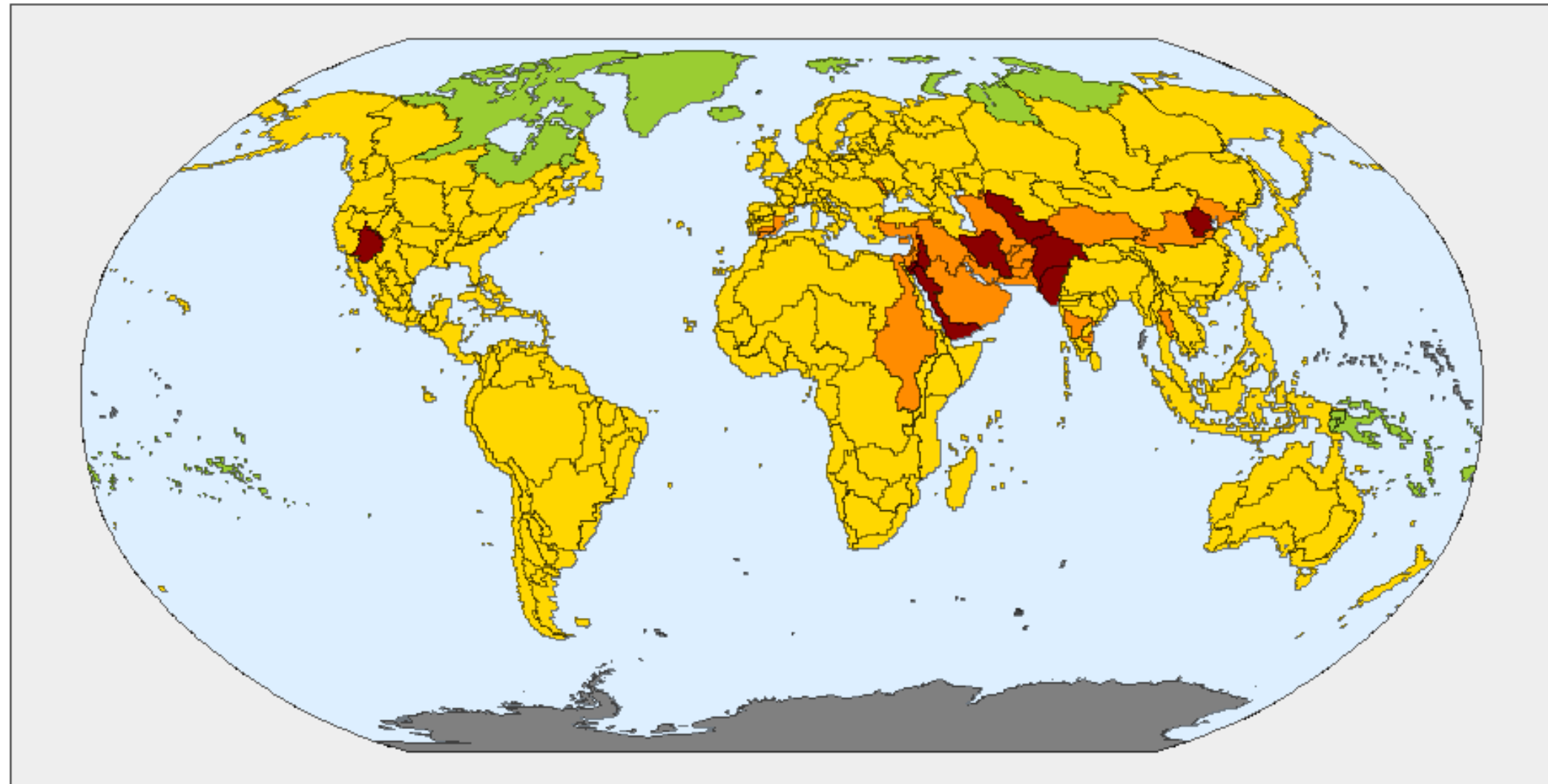
Scarcity

Nil

Low

Med

High



- Water scarcity index

- $W = \frac{D}{S}$



# Do physical measures of scarcity tell the whole story?

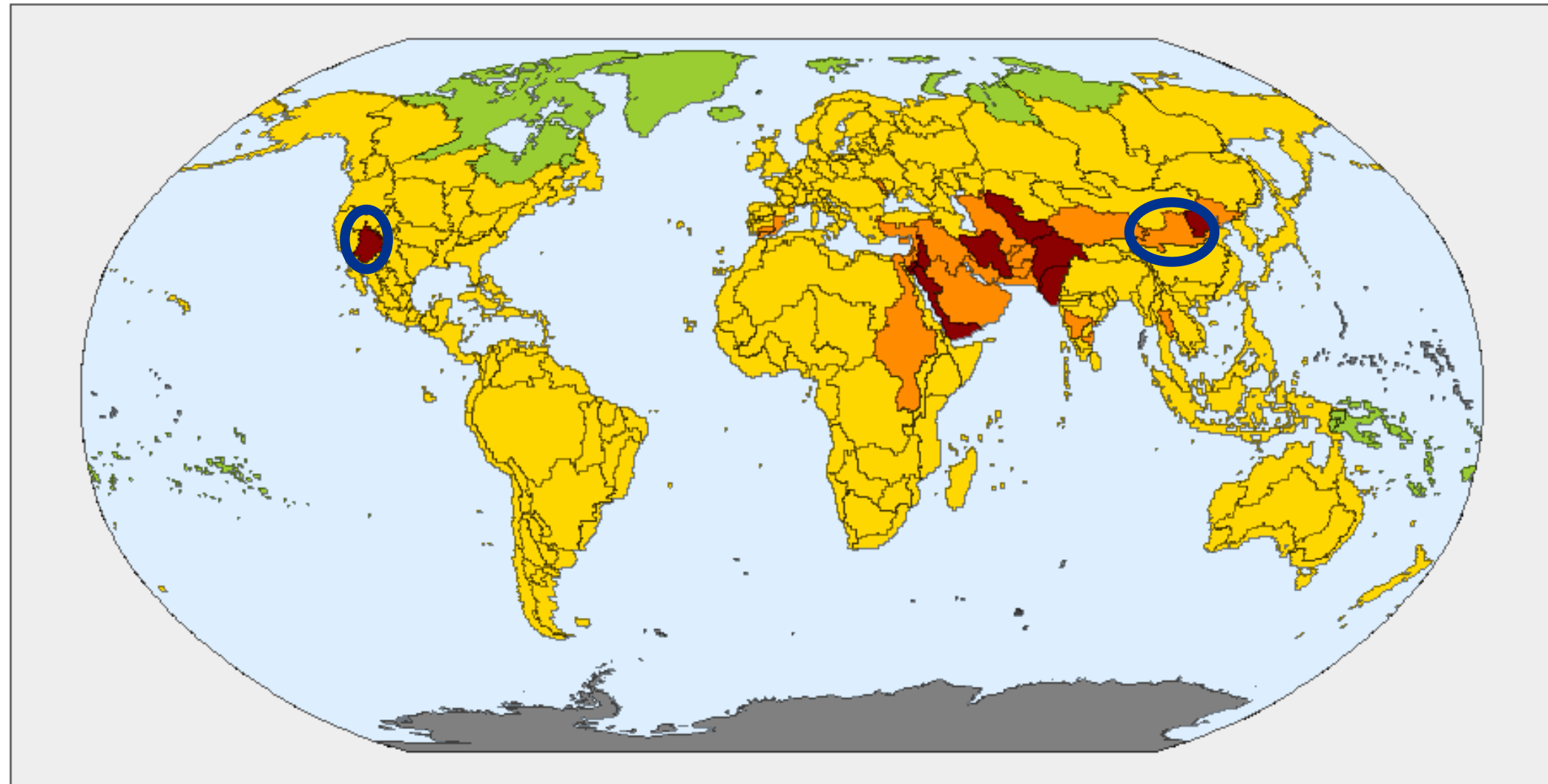
Scarcity

Nil

Low

Med

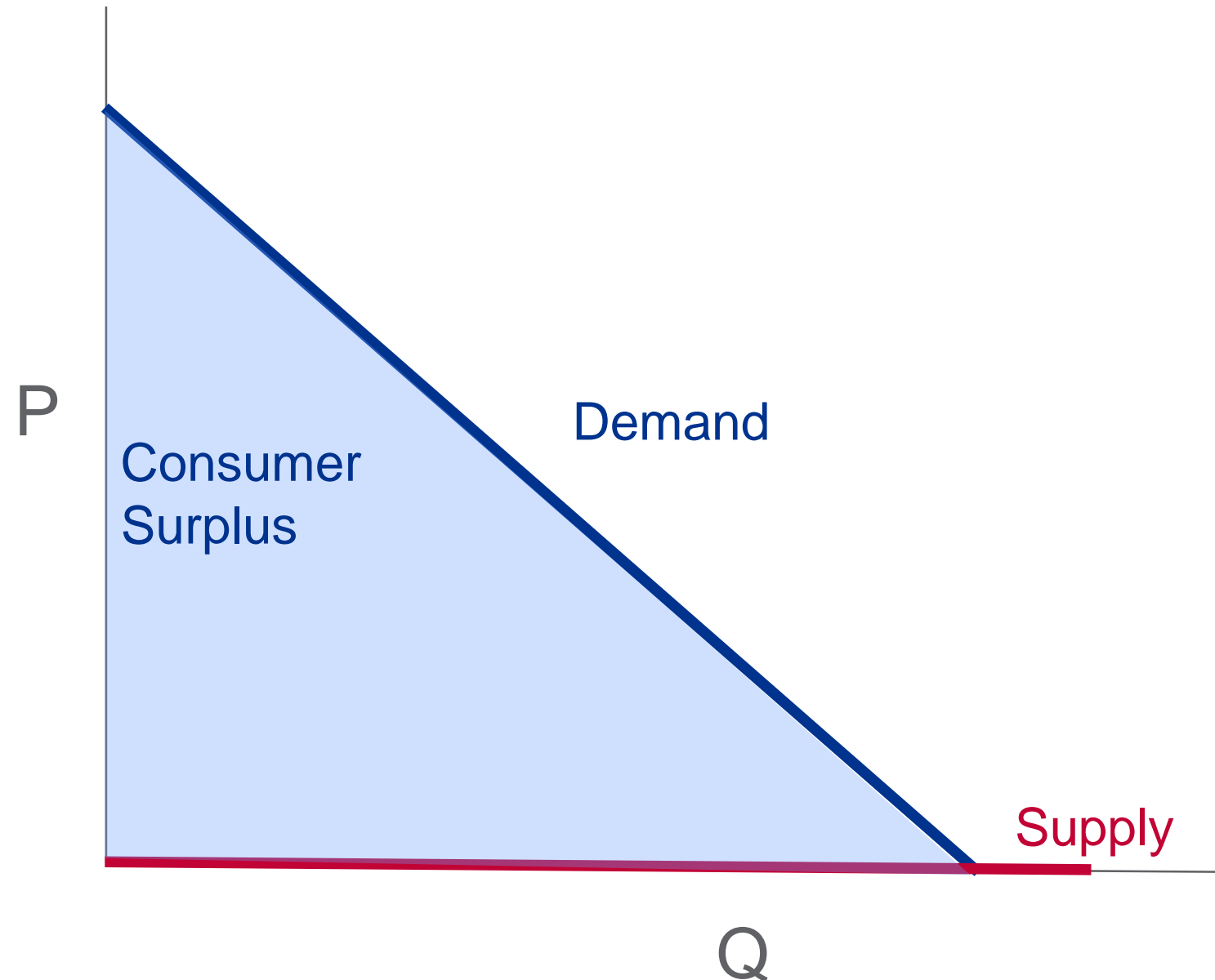
High



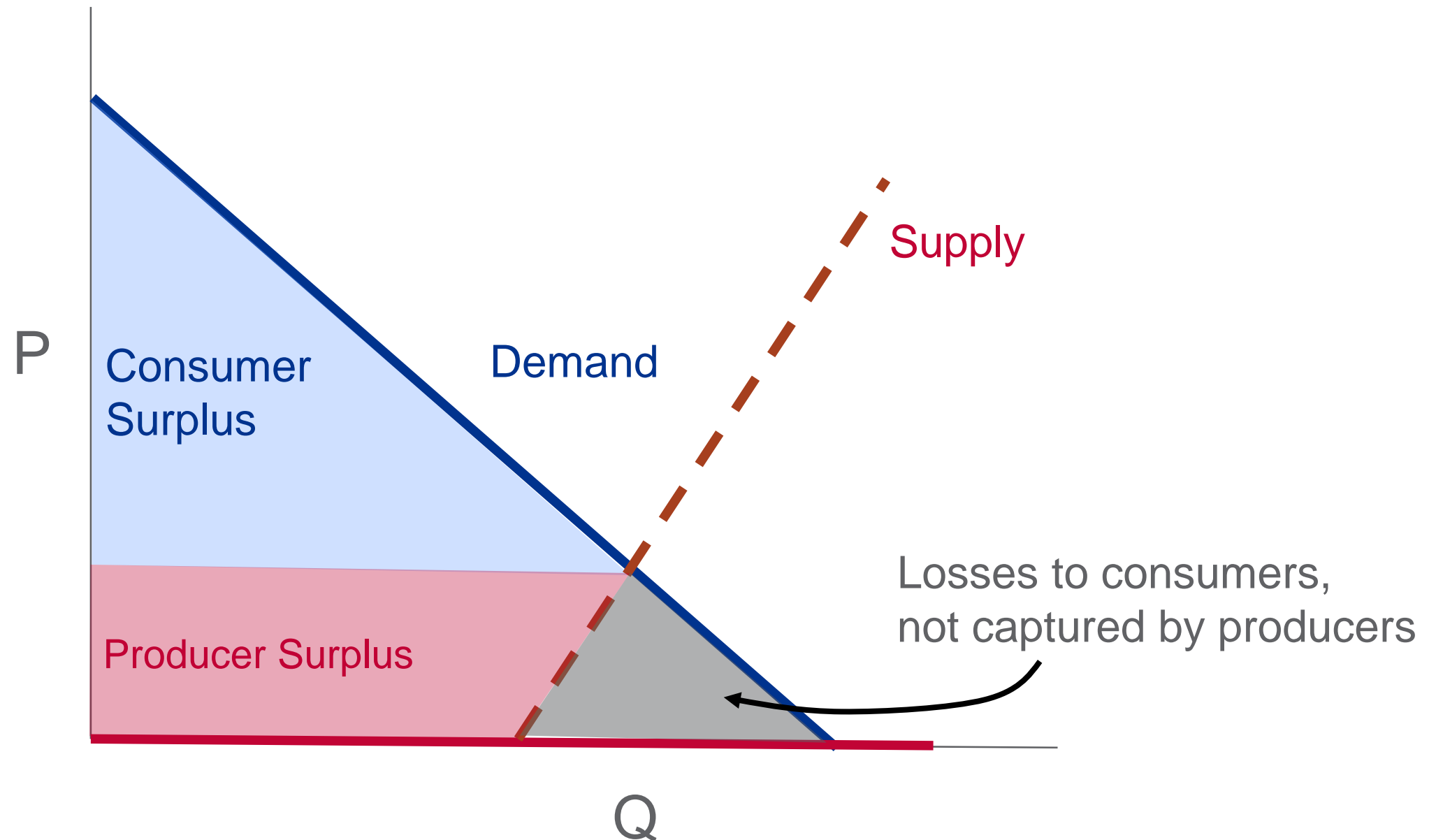
- Water scarcity index

- $W = \frac{D}{S}$

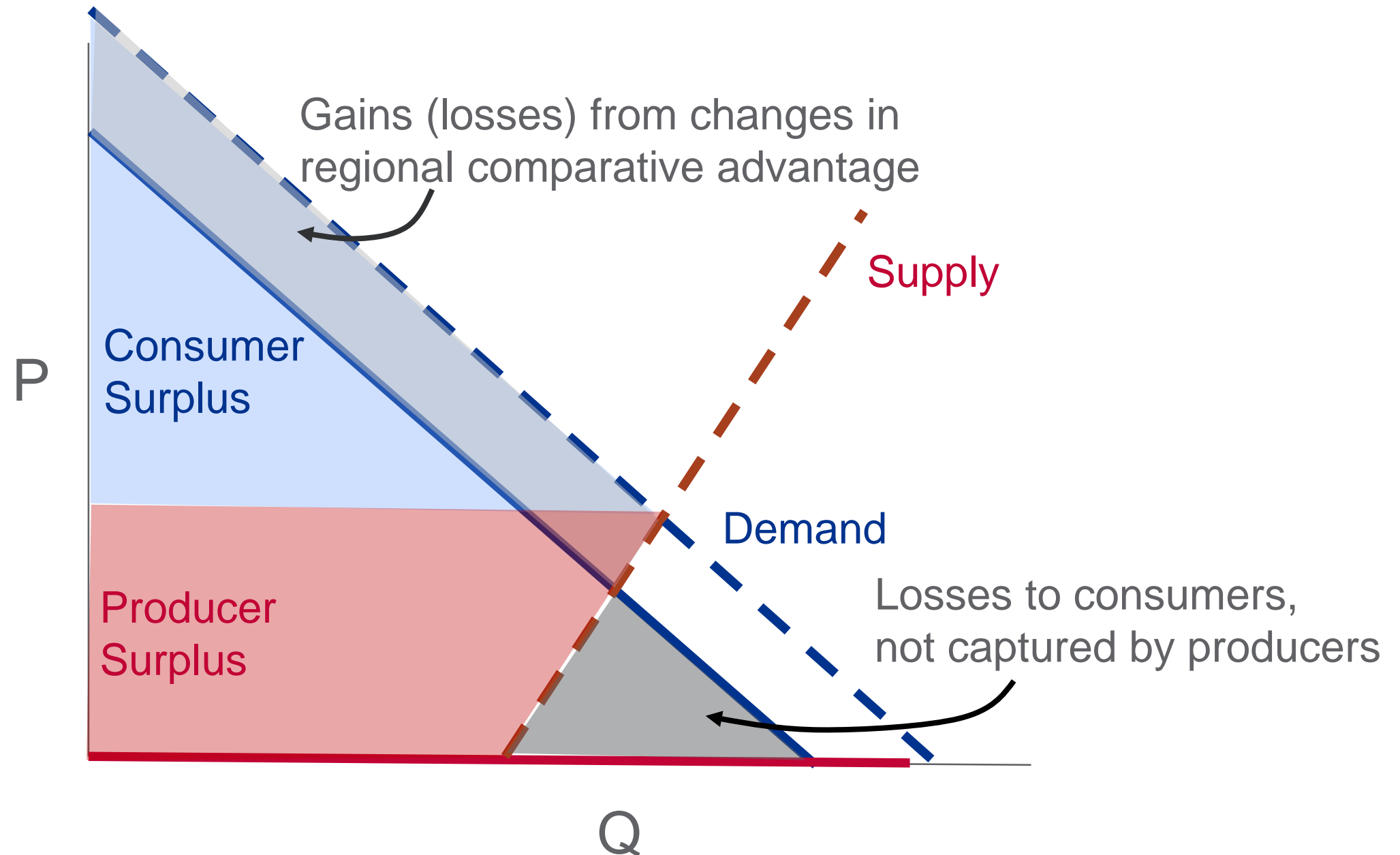
# An economic model of water scarcity



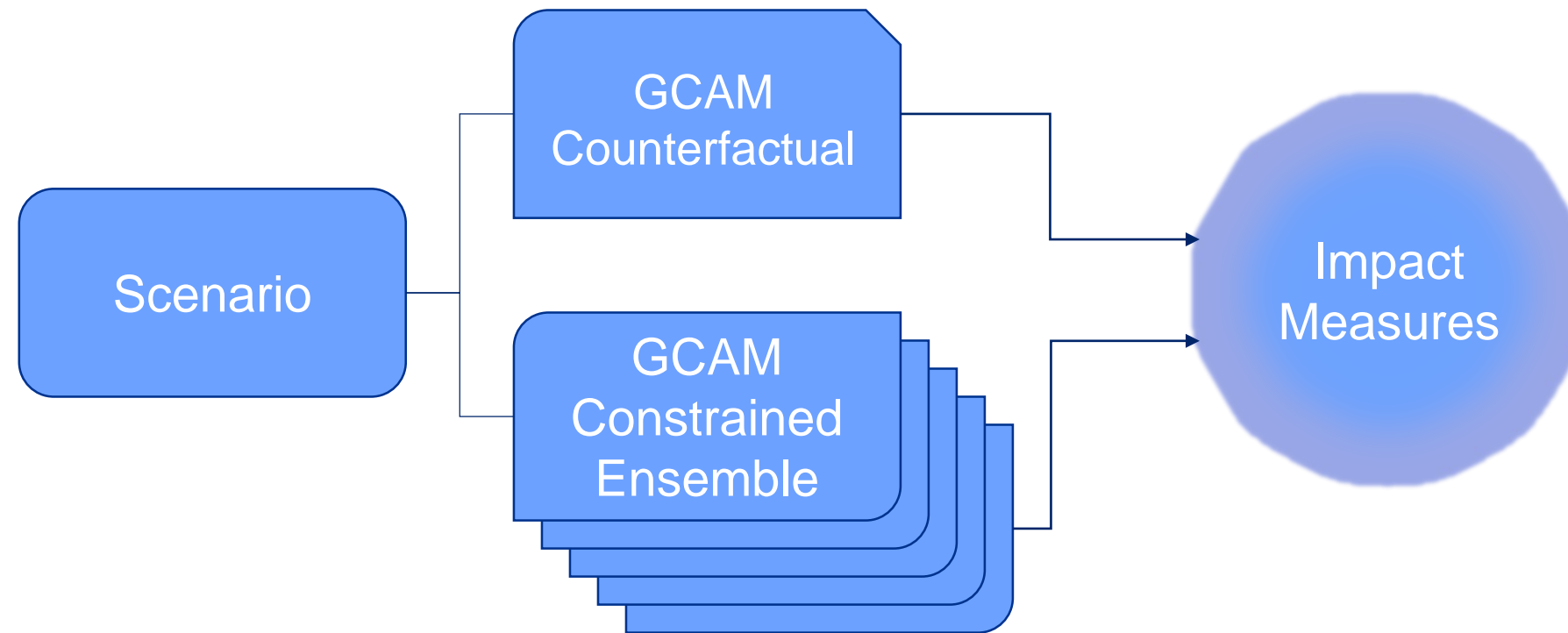
# An economic model of water scarcity



# An economic model of water scarcity



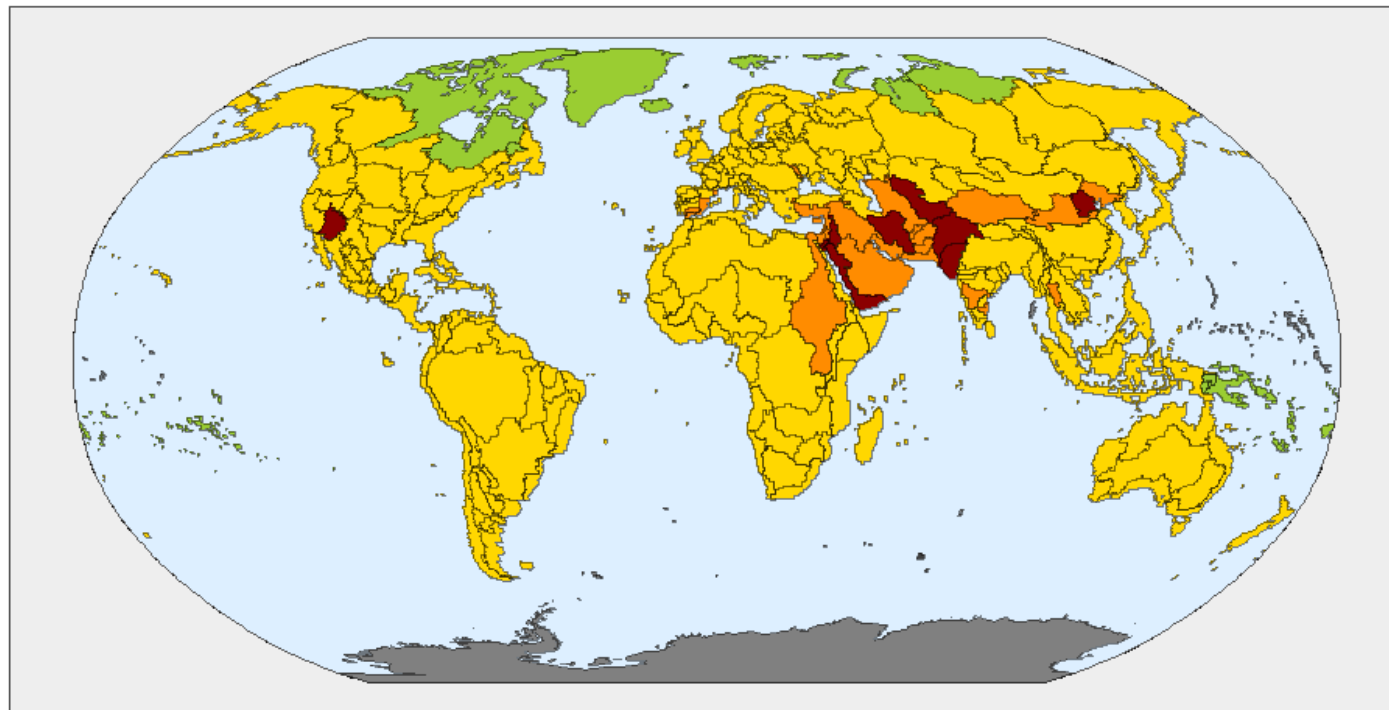
# Experiment design – impact and uncertainty





# Comparison of physical and economic scarcity measures

Physical

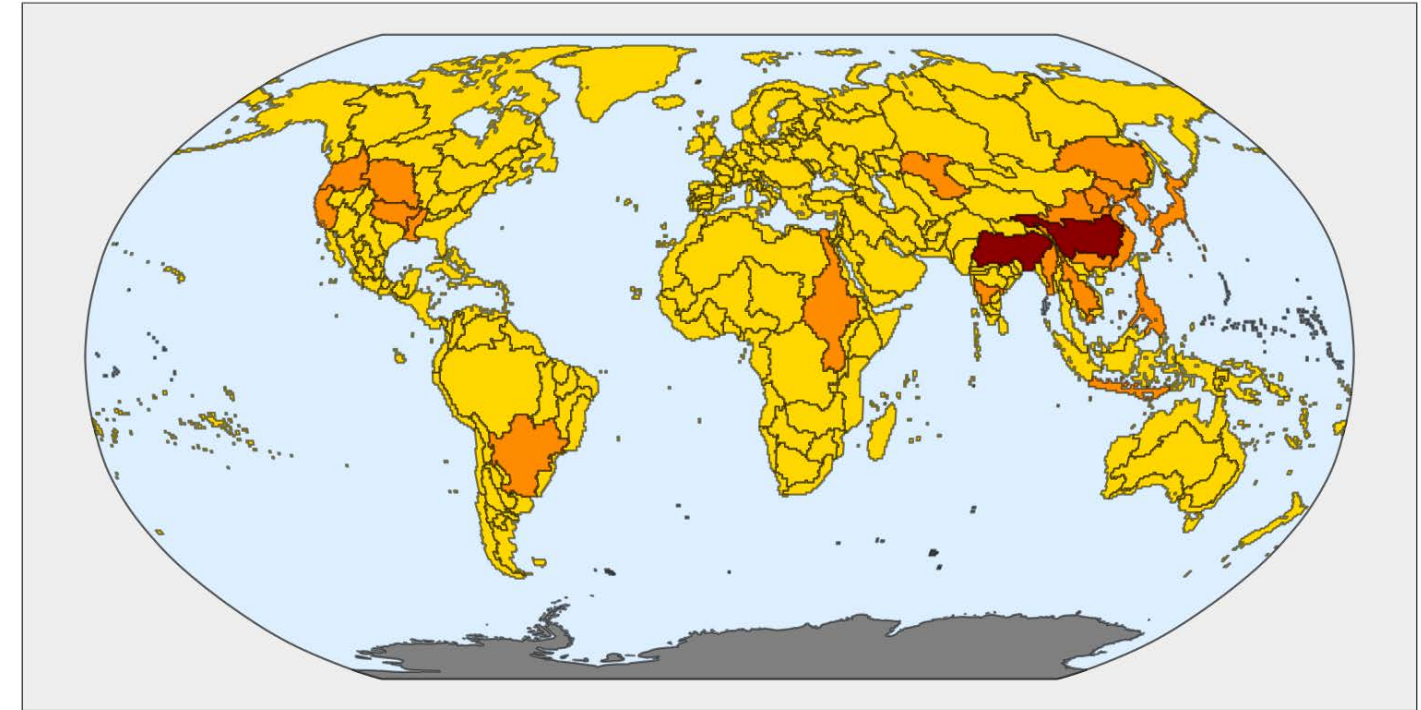


Scarcity



Nil Low Med High

Economic



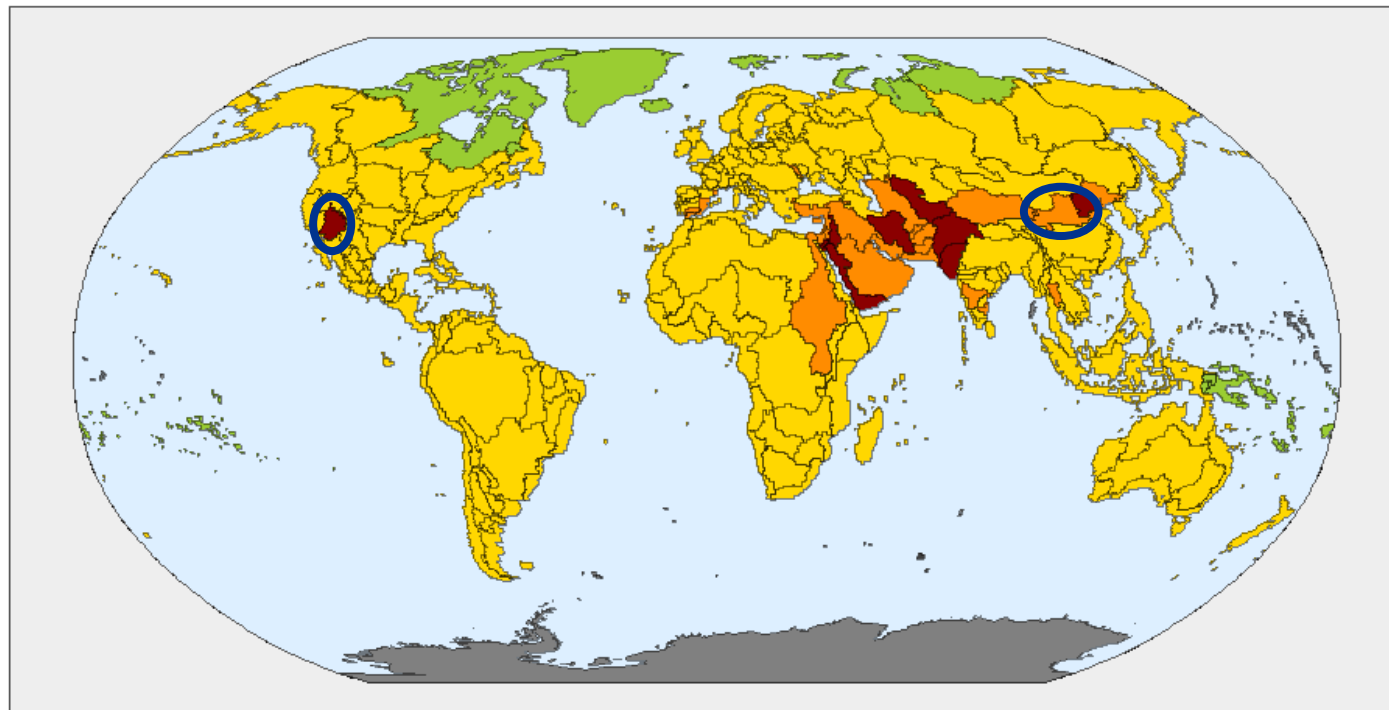
Impact



Pos. Low Med High

# Comparison of physical and economic scarcity measures

Physical

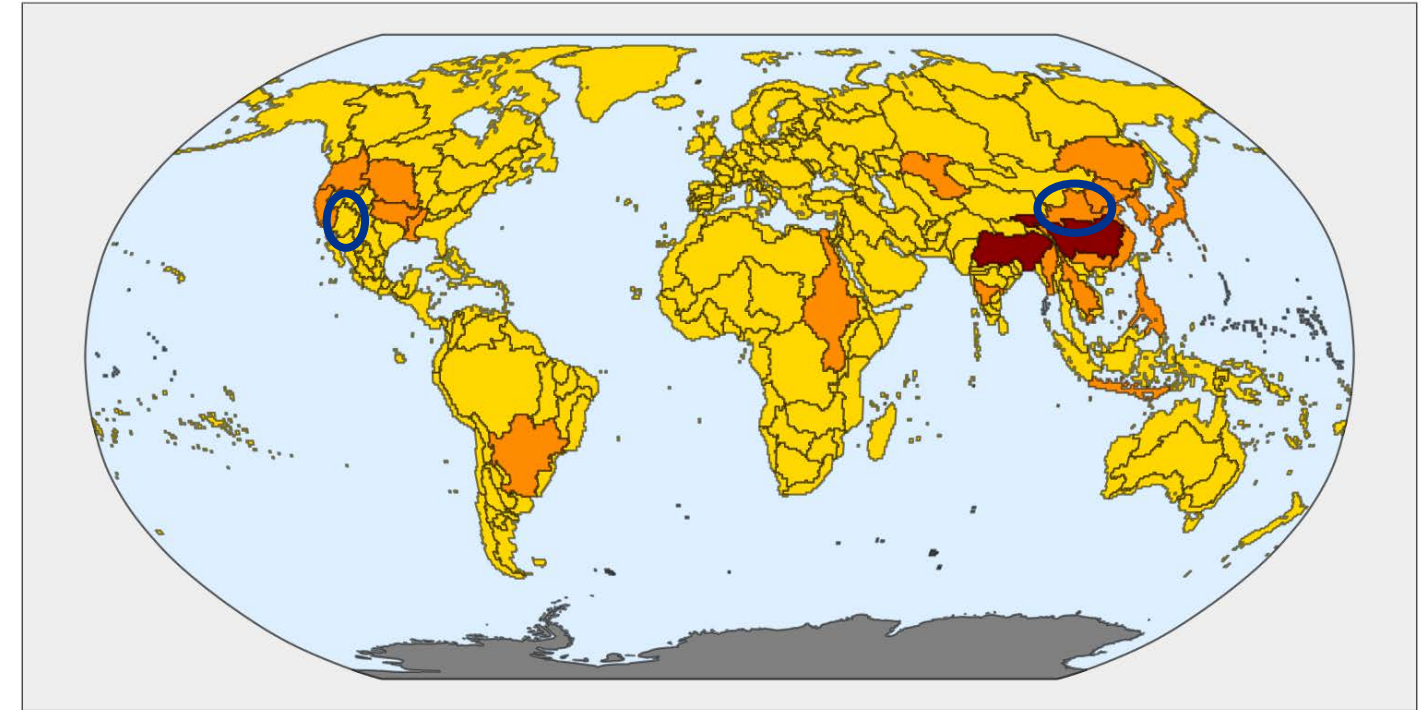


Scarcity



Nil Low Med High

Economic



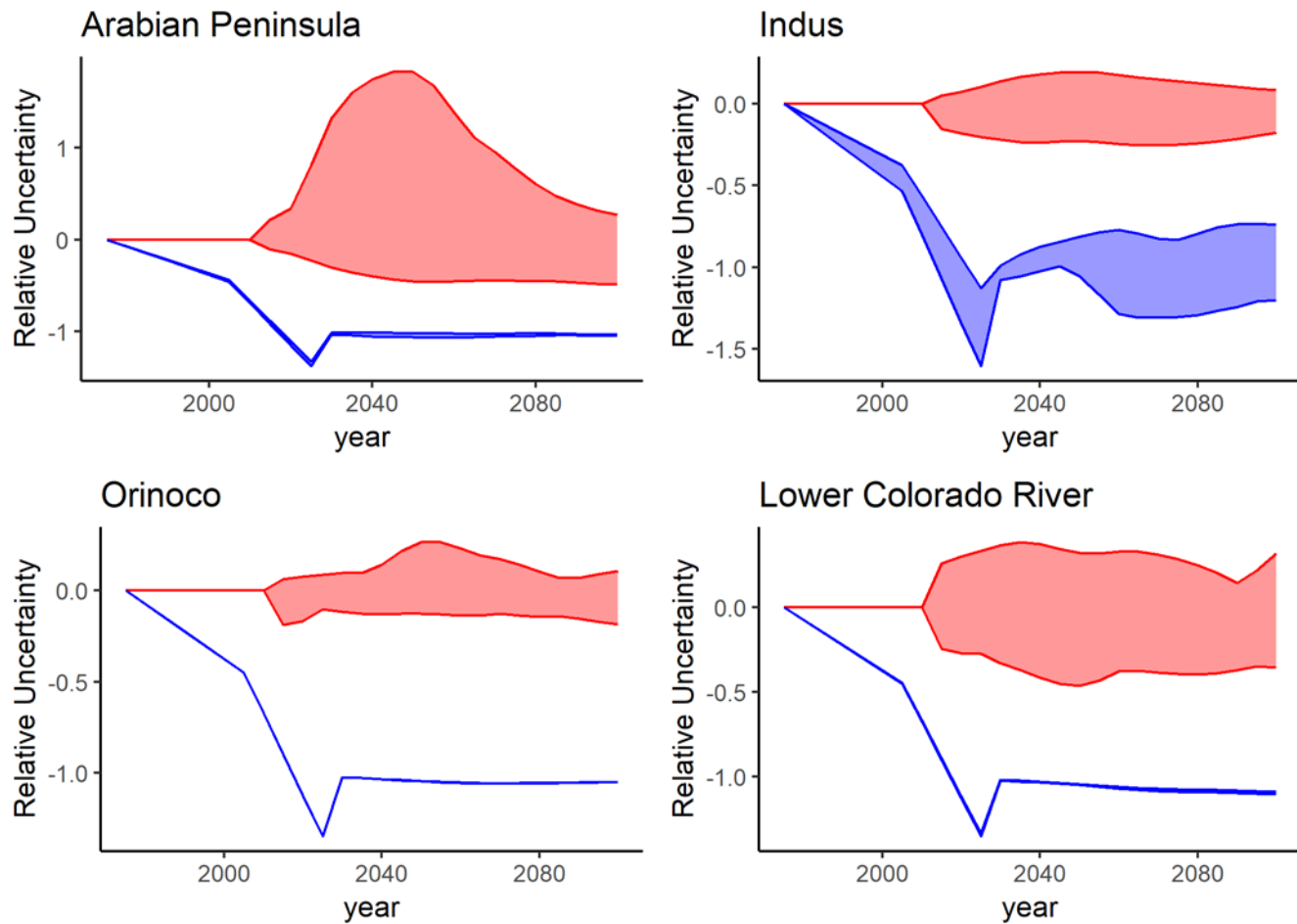
Impact



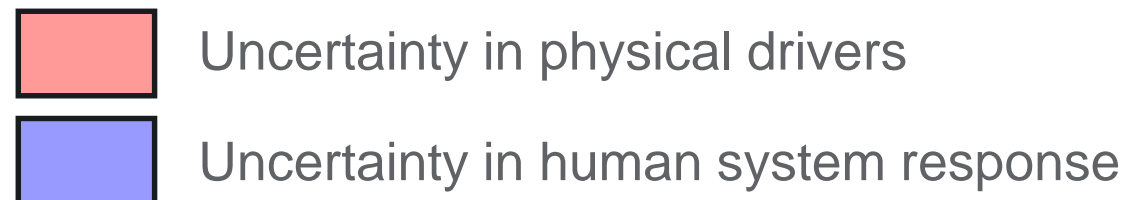
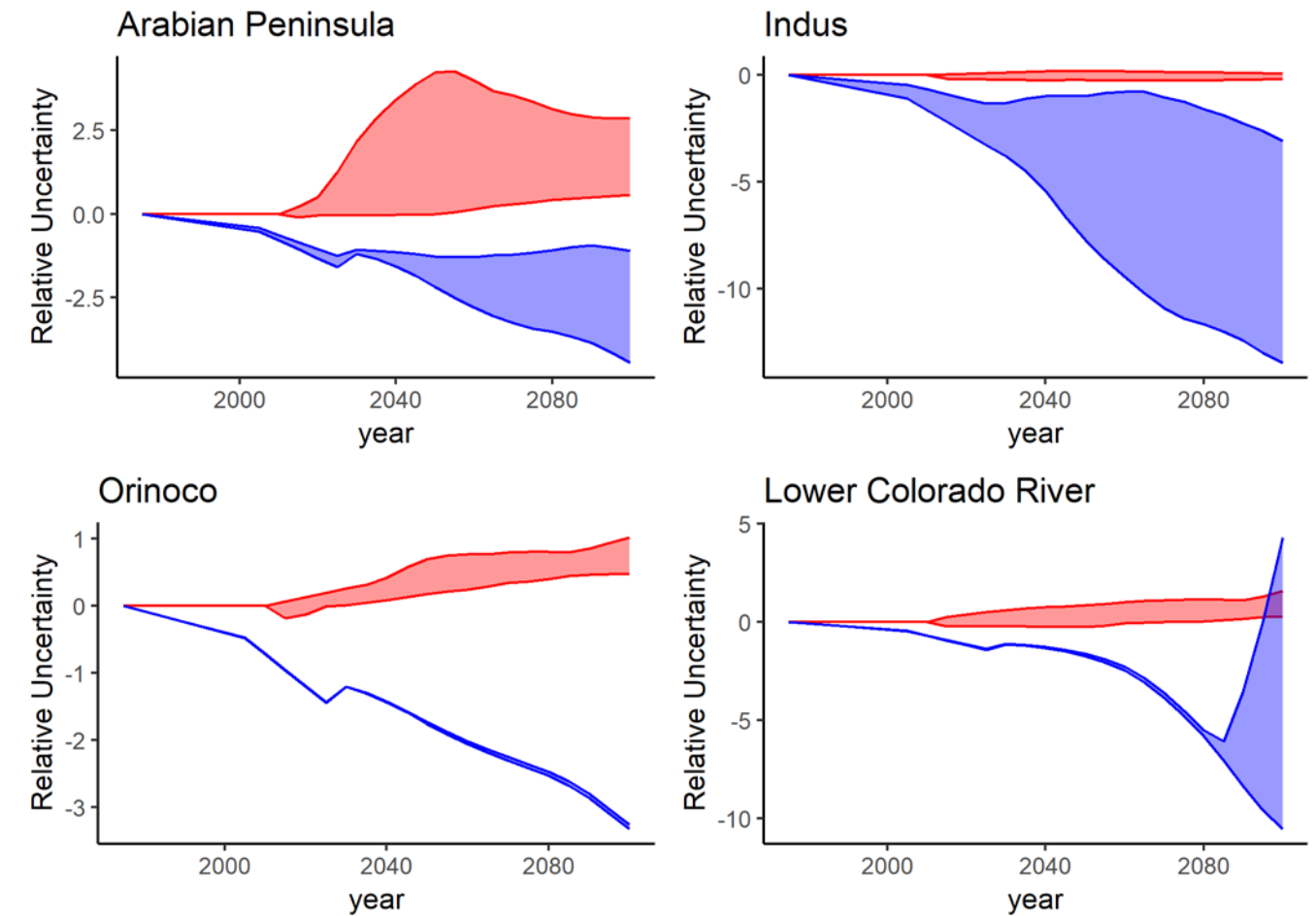
Pos. Low Med High

# The human system can amplify or suppress uncertainty from physical drivers

Scenario 1

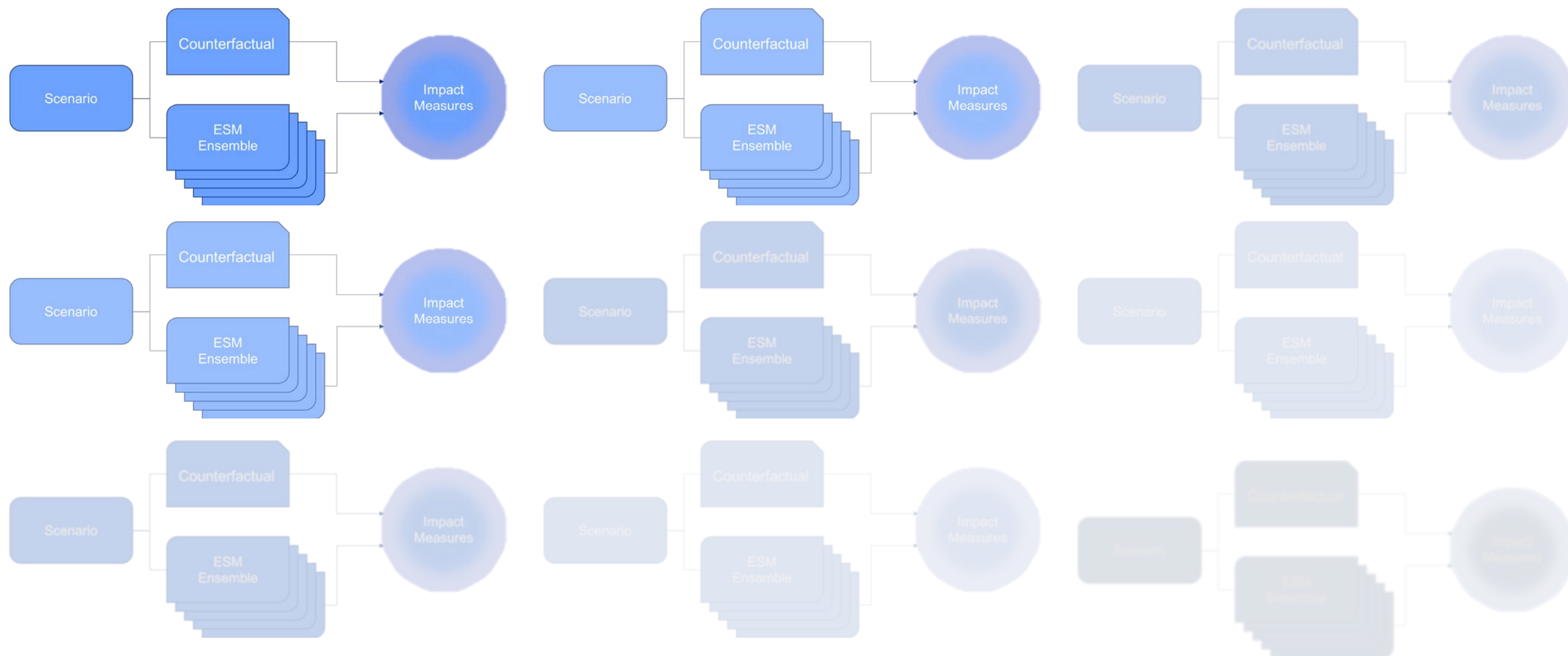


Scenario 2



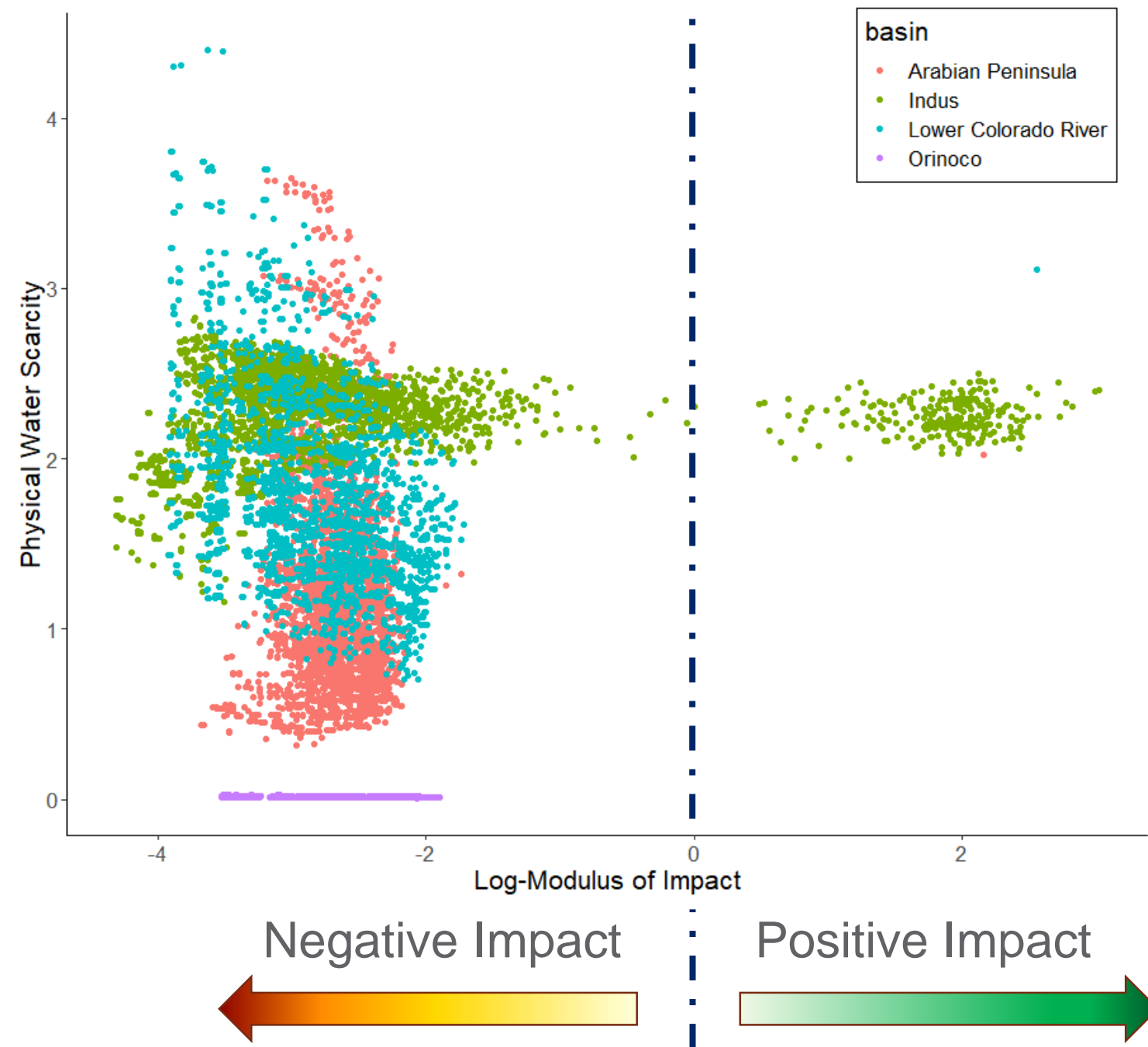


# Experiment design – scenario matrix





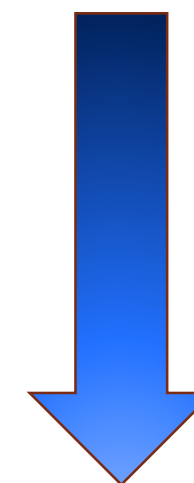
# Physical scarcity and economic scarcity can tell different stories



# Influence of scenario components

Indus	Lower Colorado	Arabian Peninsula	Orinoco
Land policy	Ground water	Pop/ GDP	Pop/ GDP
Pop/ GDP	AgLU	Land policy	AgLU
AgLU	Reservoir storage	Reservoir storage	Ground water

More important



Less important

**Thank you**