

Scenario Planning to Support Climate-Related Decision Making: Context

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Scenario Planning for Climate Change Adaptation Decision Making: the State of the Art

University of Arizona, Institute of the Environment, Center for Climate Adaptation Science and Solutions

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Billion Dollar Weather/Climate Disasters 1980-2012

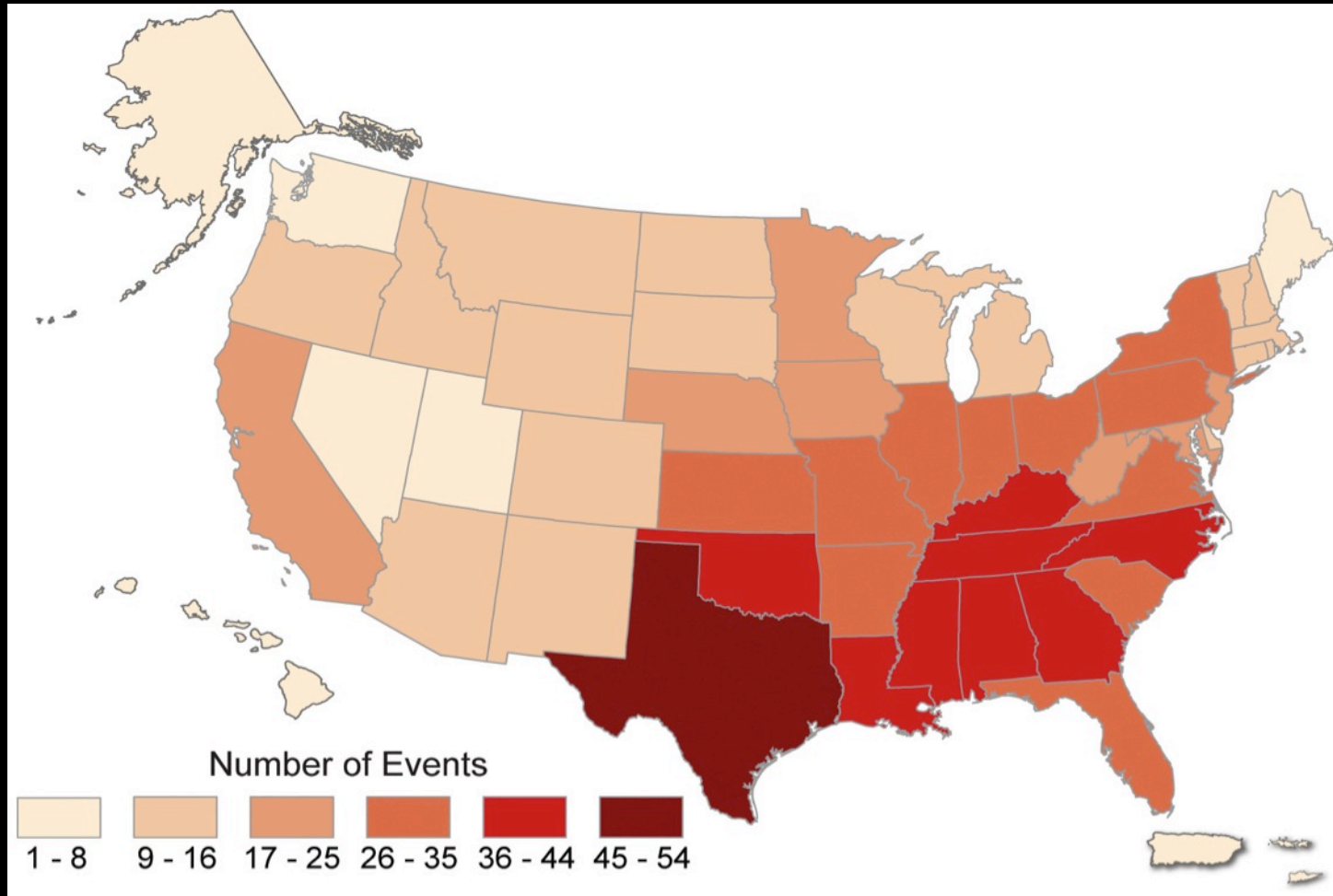


Figure source: NOAA NCDC

What are the drivers of observed impacts? Looking ahead, how could different development choices affect the map of future impacts?



Decisions Potentially Affected by Climate Change

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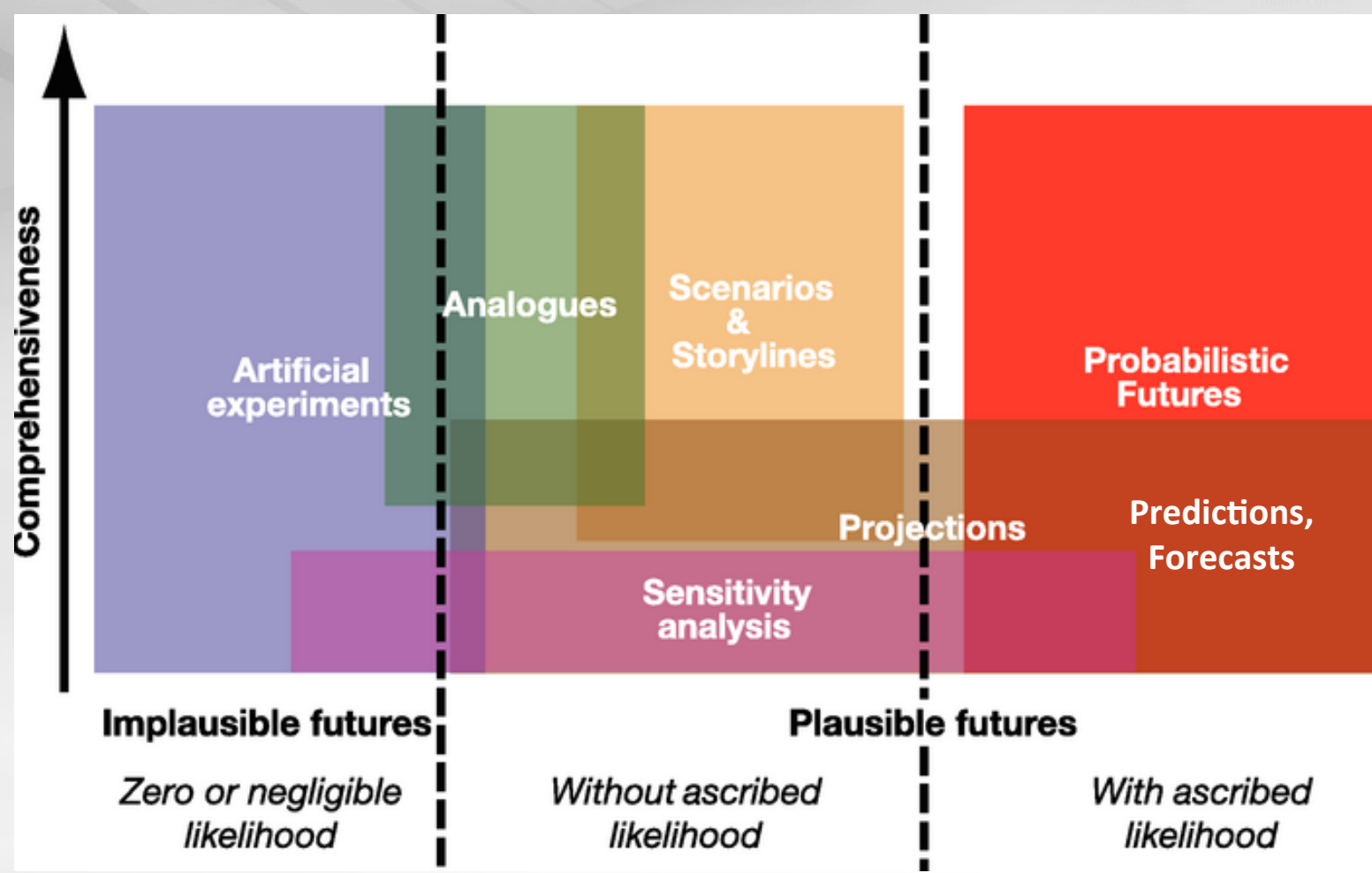
Factors of Success in Planning for Non-Stationary Climate

- ▶ Some planners/decision makers are successfully integrating climate change into ongoing decisions
- ▶ Factors of success included:
 - Weather-related crises that spurred action
 - Using available information
 - Access to local expertise, and
 - Considering climate impacts within existing planning processes
- ▶ Scenario planning: identify goals and possible ways of achieving them
- ▶ Top-down scenarios: provide context and stress tests for robustness
 - This presentation provides a brief update on developments in top-down scenarios
 - International process
 - National assessment

GAO 13-242: Climate Change—Future Federal Adaptation Efforts Could Better Support Local Infrastructure Decision Makers



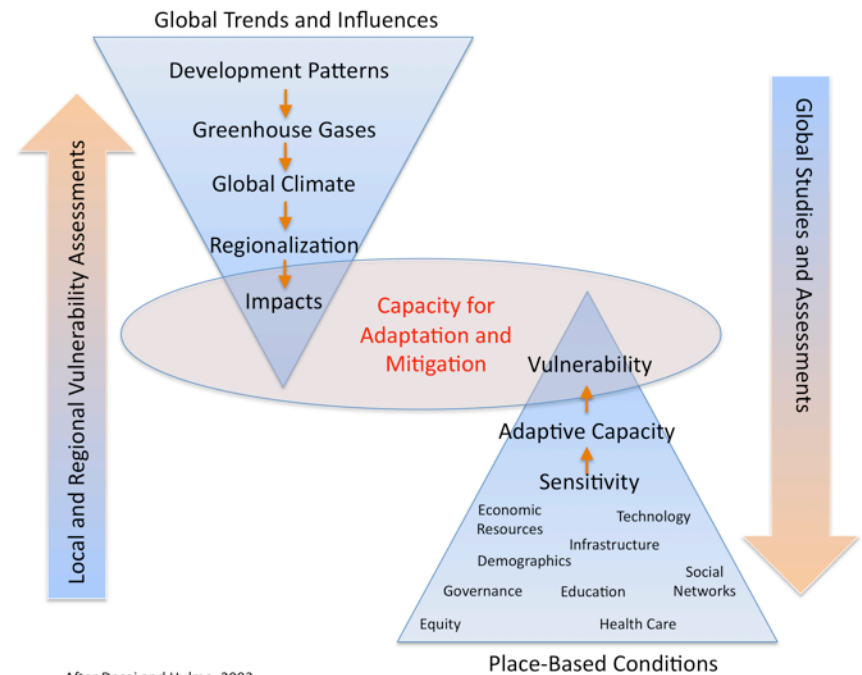
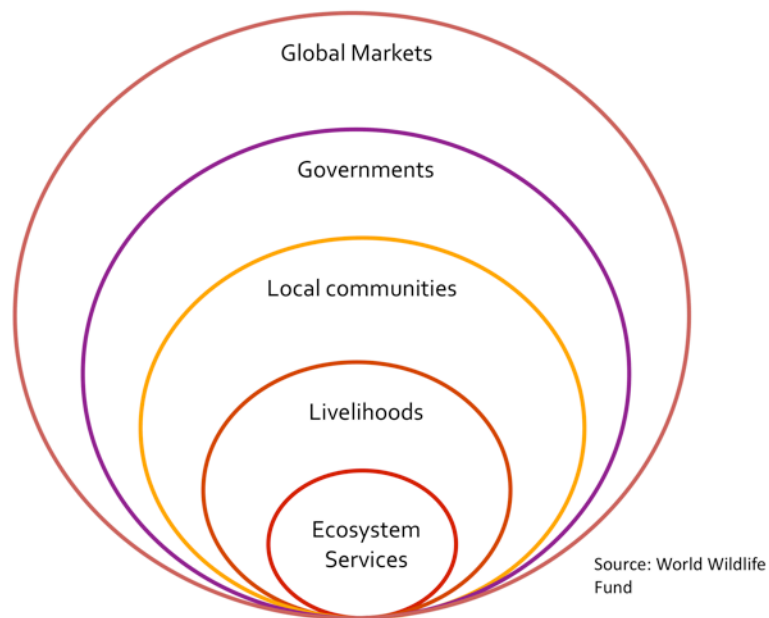
Different Ways to Characterize the Future



Carter et al., 2007. Ch 2, IPCC Fourth Assessment Report, WG2.

Nested Scenario Approaches: Interactions from Local to Global

Global, national, and regional factors influence local communities and conditions



Nested scenario approaches explore interactions and ‘the space between’

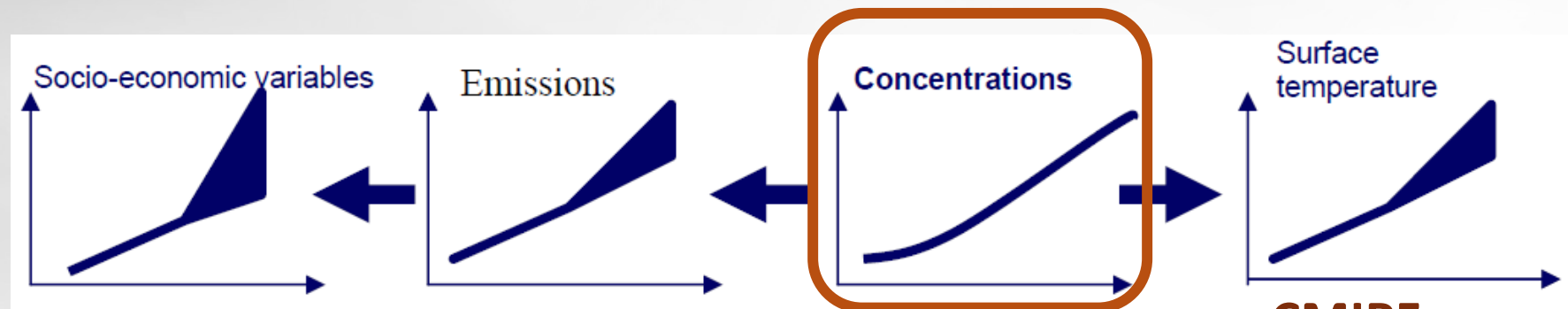
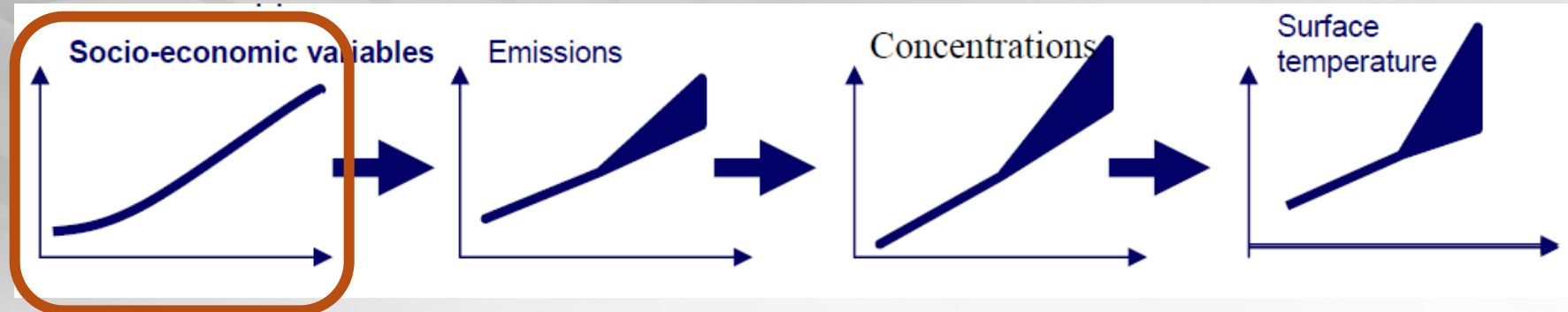


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International 'Parallel' Scenario Process

Parallel Scenario Process



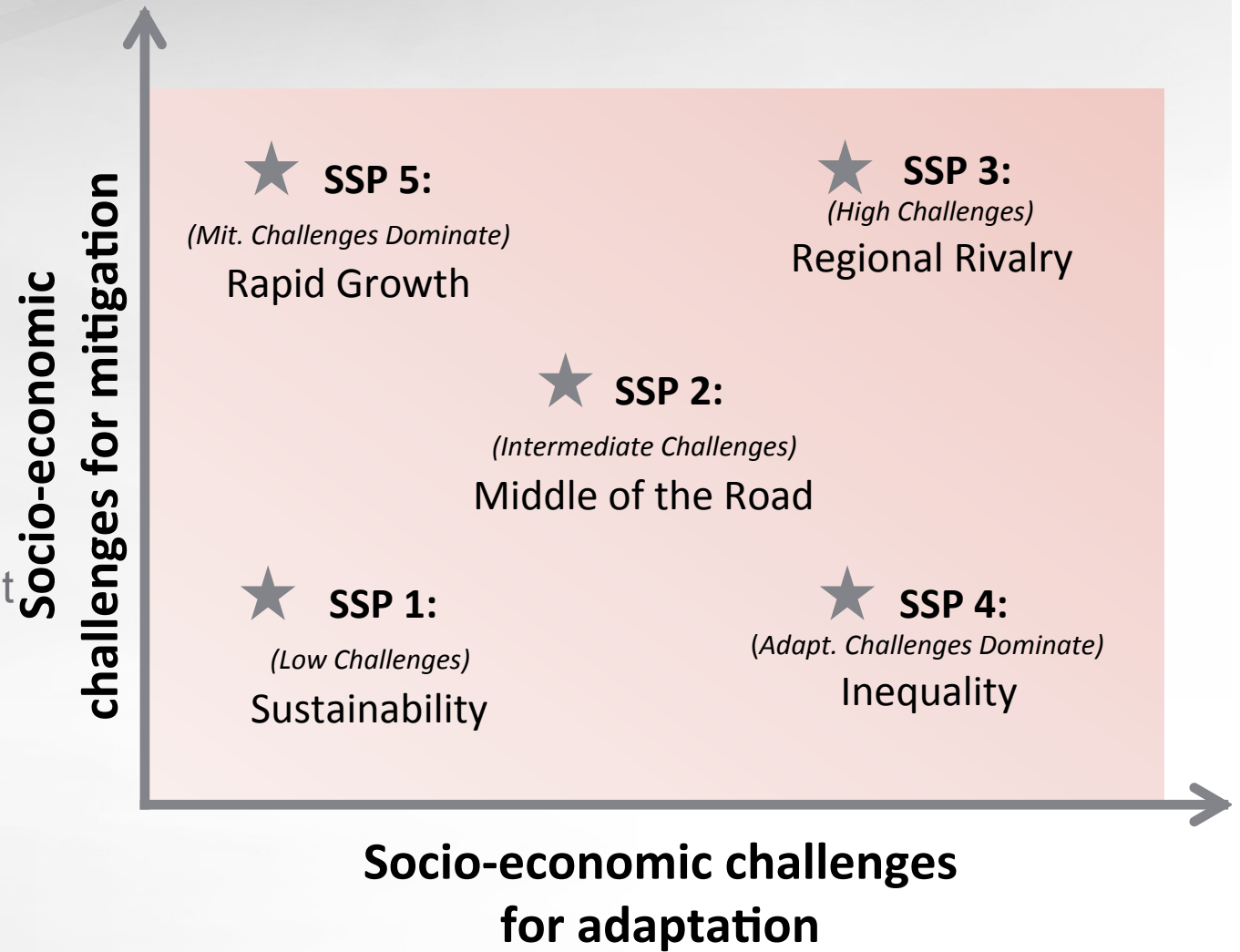
Shared Socio-economic Pathways (SSPs), Shared Policy Assumptions (SPAs) (in process)

RCPs (Complete)

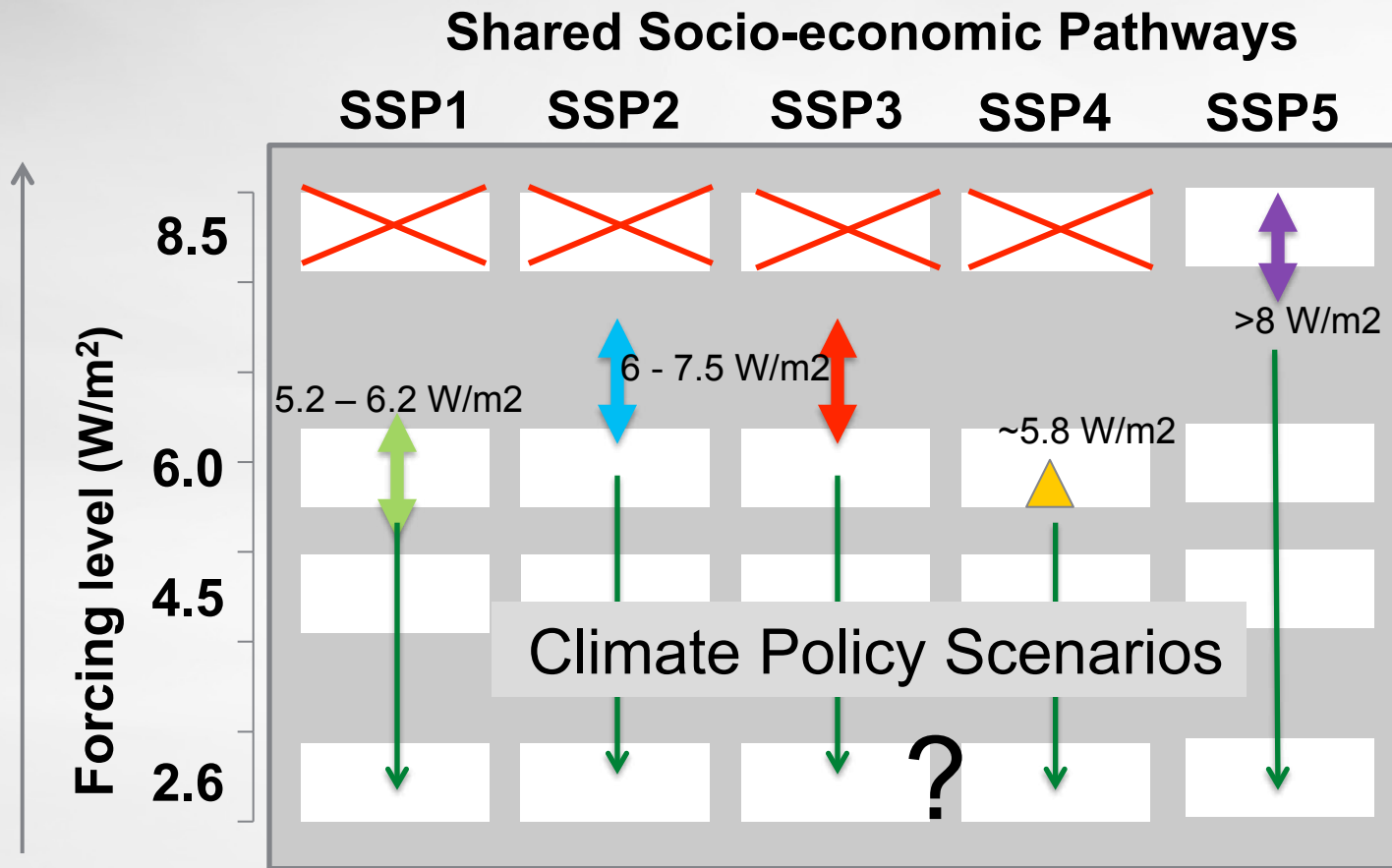
CMIP5 (Complete)

Socioeconomic Futures: Challenges to Adaptation and Mitigation

- ▶ SSPs are socio-economic 'reference' pathways (no new climate policies)
- ▶ Overarching design questions:
 - How do changes in climate *and* society affect impacts and well being?
 - How easy/difficult is it to achieve a climate target given an SSP reference scenario?



The Scenario Framework Enables Assessment of Uncertainty in Societal and Climate Futures



Source: Keywan Riahi

Socioeconomic Data (SSPs)

All data will be publicly available at the SSP database

Already available (national data)

GDP

Population (structure, education, tot)

Urbanization

IAM scenario data

Energy

Land-use

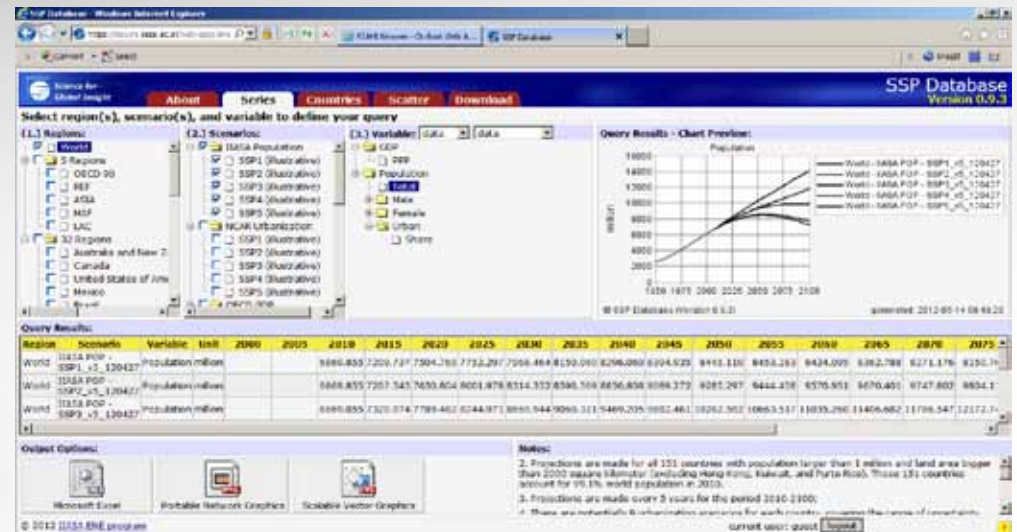
Emissions

Forcing & Temperature

Other relevant indicators (energy/carbon price, economic feedbacks, etc..)

Resolution: 5 World Regions (more details available from IAM teams 10-26 regions)

At the moment there are no concrete plans for spatial downscaling



<https://secure.iiasa.ac.at/web-apps/ene/SspDb>



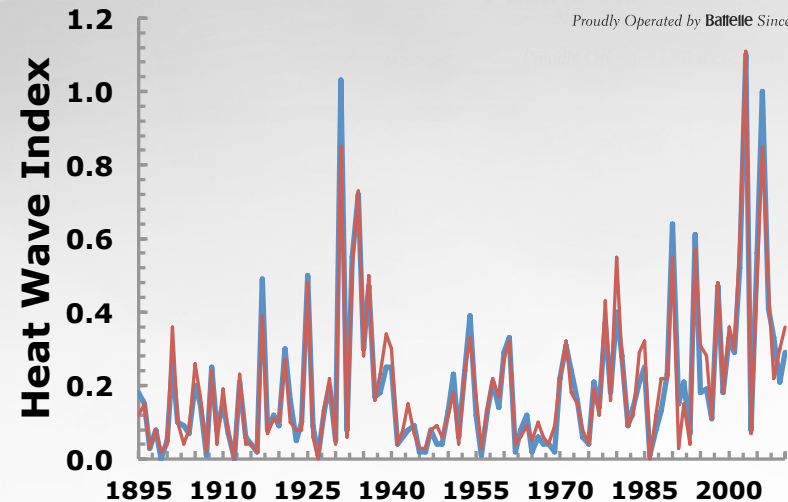
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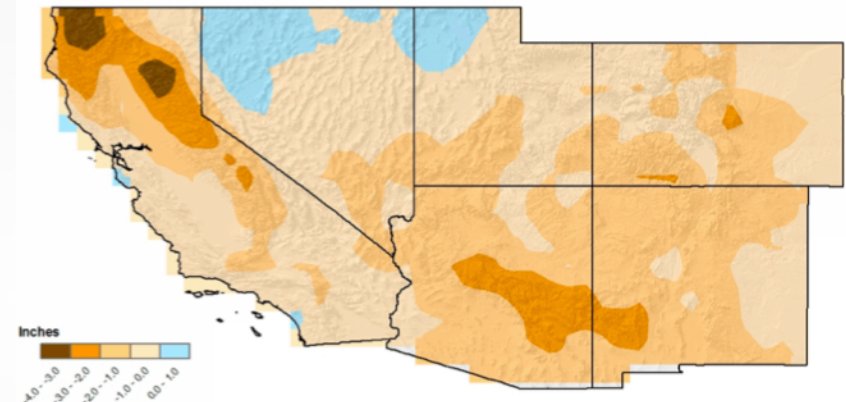
Innovations in Scenarios for the NCA3

Scenarios for NCA3

- ▶ Used existing literature:
 - High and low change climate scenarios (IPCC) using global and regional models
 - Downscaled climate data
 - Population and land cover
- ▶ What was new:
 - Climate 'outlooks'
 - Global mean sea level change scenarios *for risk framing*
 - Participatory scenario planning
- ▶ Dissemination through <http://scenarios.globalchange.gov>



NARCCAP, Change in Annual Precipitation
2041-2070 minus 1971-2000





NCA Scenario Planning Pilot

- ▶ Purpose: enable communities engaged in their own planning process to explore implications of climate change and test how this method could be supported by NCA
- ▶ Idea: Stakeholder participants (existing groups/organizations) conduct planning/visioning and consider implications of two futures with input from NCA authors
 - “The Best Chance You’ll Get” – low climate change, slow population growth, high per capita GDP, high environmental concern, compact urban areas, less disruption of ecosystems
 - “Big Problems, Low Capacity” – high climate change, high population growth, slow economic development, low environmental concern, sprawling urban development, more disruption of ecosystems
- ▶ In second stage, participants explore adaptation strategies (not just technologies) for the challenging scenario
- ▶ Results would be brought into assessment chapters

Well, We Tried...





Going Forward

- ▶ What is the state of the art in scenario planning?
- ▶ How can more widespread use of scenario planning be encouraged?
- ▶ Which aspects of top-down scenarios are useful, and which need to be improved?



Thank you!

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