

Scenarios of future climate change

NARcliM design across generations

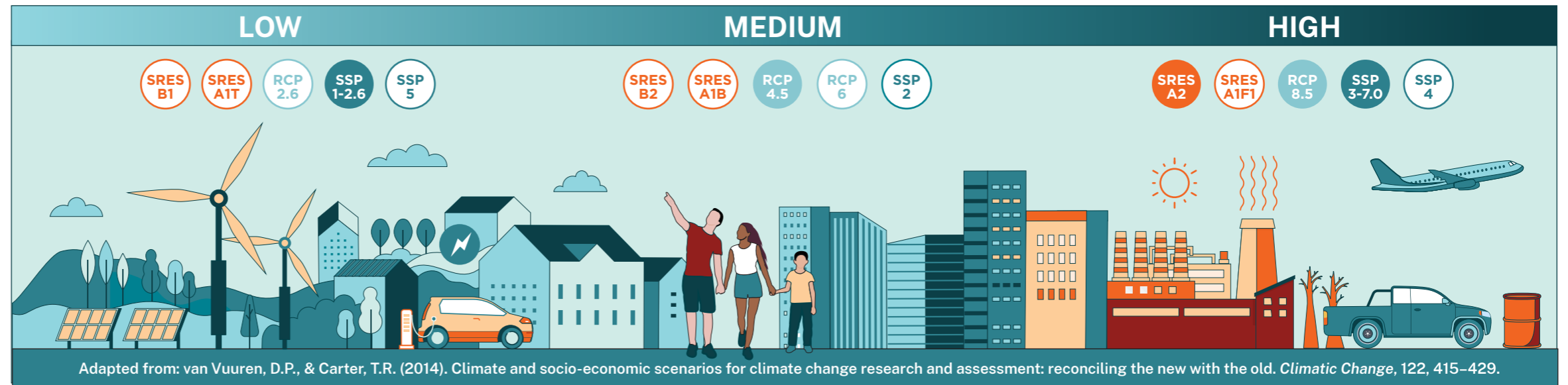
Future climate is uncertain and depends on a range of interacting social, technological, political and economic factors as these pertain to greenhouse gas (GHG) emission concentrations. To address this uncertainty, global climate models (GCMs), which form the basis of climate projections, need to have information about possible pathways for future atmospheric concentrations of GHGs such as carbon dioxide and methane. These plausible futures are captured in emissions scenarios and input into GCMs.

NARcliM data adopts the same scenarios as used in the Intergovernmental Panel on Climate Change (IPCC) comprehensive assessment reports on the state of climate change. As the science advances, new scenarios are developed. This is reflected in the evolving design of NARcliM generations, ensuring our projections are based on the best available information.

Why do NARcliM generations only include a selection of scenarios?

The simulation of regional climate projections using different scenarios is computationally demanding and financially costly, requiring careful selection of a discrete number of scenarios for each generation of NARcliM.

Challenges to adaptation captured in NARcliM data



SRES Special Report on Emissions Scenarios

Published in 2000, these were used in the IPCC's ensemble of climate models (Coupled Model Intercomparison Project, Phase 3 or CMIP3) for the IPCC's fourth assessment report. These are narrative-based scenarios assuming different development conditions that influence emissions.

SCENARIOS

NARcliM

- SRES A1B
- SRES A2
- SRES A1F1
- SRES B1
- SRES A1T
- SRES B2

reflects the 'business-as-usual' scenario and, at the time of NARcliM1.0 development, best illustrated the assumptions about how global emissions were tracking.

RCP Representative Concentration Pathway

Published in 2014, these were used in the IPCC's ensemble of climate models CMIP5 for the IPCC's fifth assessment report. These scenarios describe different future climates with varying levels of atmospheric GHG concentrations. The RCPs span a wider range of possibilities than the SRES emissions scenarios.

SCENARIOS

NARcliM

- RCP 2.6
- RCP 4.5
- RCP 6
- RCP 8.5

reflects a medium level of mitigation resulting in approximately 650ppm atmospheric CO₂ by 2100 and then stabilising.

reflects the most pessimistic pathway of the 4 RCPs and represents a very hot, dry future. It results in at least 1,370ppm atmospheric CO₂ by 2100 and continues to increase. It is most comparable to the SRES A2 scenario used in NARcliM1.0.

SSP Shared Socioeconomic Pathways

Published in 2016, these were used in the IPCC's ensemble of climate models CMIP6 for the IPCC's sixth assessment report. These scenarios examine how social, technological and economic factors might change over time, affecting emissions.

SCENARIOS

NARcliM

- SSP 1-2.6
- SSP 2
- SSP 3-7.0
- SSP 4
- SSP 5

with a radiative forcing level of 2.6 Watts per square meter in 2100, it reflects a low GHG emissions scenario with CO₂ emissions cut to net zero by around 2075 and warming held to below 2°C by 2100.

with a radiative forcing level of 7.0 Watts per square meter in 2100, it reflects no additional climate policy and is a high GHG emissions scenario, with CO₂ emissions projected to double by 2100 and warming of around 4°C.

