Climate Intervention

Juan Moreno-Cruz
Associate Professor School of Environment Enterprise and Development
Canada Research Chair in Energy Transitions
University of Waterloo

Techniques

- BECCS
- Afforestation
- Direct Air Capture
- Ocean Iron Fertilization
- Enhanced Rock Weathering
- Ocean Alkalinity Enhancement
- Ocean Pumping
- Cirrus Cloud Thinning
- Surface Albedo
- Marine Cloud Brightening
- Stratospheric Aerosol Enhancement

Technological Characteristics

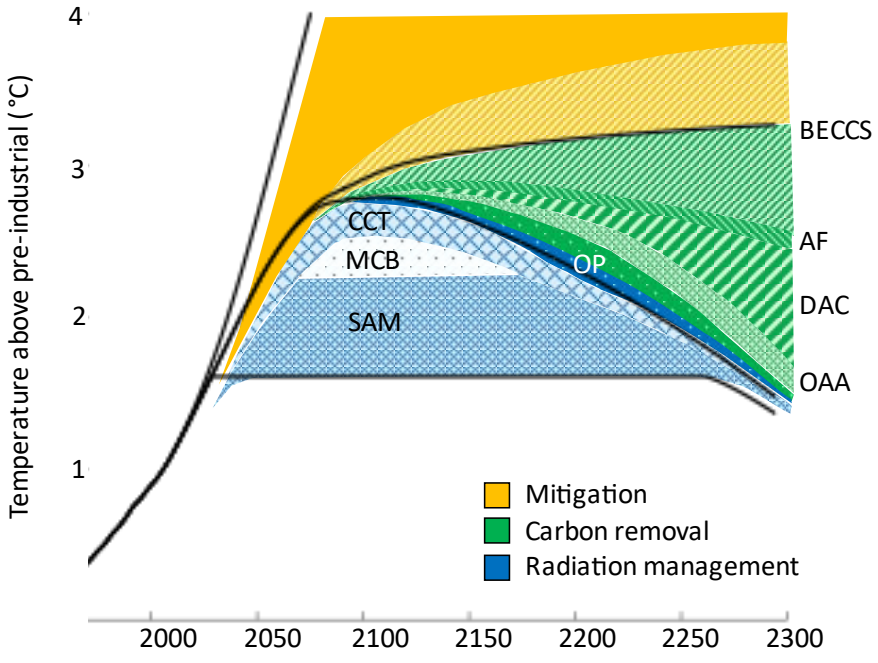
- System properties:
  - Scalability
  - Costs
- Effects:
  - Transiency
    - Latency
    - Persistence
  - Regionality
- Impacts:
  - Efficacy
  - Side-effects and co-benefits

Social Objectives

- Restoration
- Stabilization
- Harm/risk reduction
- Habitat preservation
- National economies growth

Climate Intervention

Climate Intervention **Portfolios**



Katharine Ricke, Juan Moreno-Cruz,

"Geo-Wedges: A Portfolio Approach to Geoengineering the Climate," Reference Module in Earth Systems and Environmental Sciences, Elsevier (2020)

Possible Research Questions

- Coordinated framework:
  - How to optimize across multiple objectives?
  - What are the interactions between technologies?
  - How to measure, report and verify multiple interventions?
  - How do we design framework to phase-out interventions?
  - How do climate intervention portfolios interact with mitigation techniques?
- Uncoordinated framework:
  - How to coordinate across multiple deployments?
  - How to compensate for undesired outcomes?
  - Are there counter-geoengineering technologies available?
  - How to negotiate agreements and which type of agreement works best for climate intervention portfolios?
  - How are incentives to mitigate affected by the possibility of climate intervention?
  - How do we think of politics and policy in theory and practice?