Translate Climate Projections to Policy with Virtual Reality

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Climate risk assessment, Virtual Reality, Solution space

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BACKGROUND

Climate projections (e.g. Singapore's Third National Climate Change Study, V3) are generally difficult to directly translate into actionable policy due to:

- High uncertainty and complex human–environment interactions
- Psychological distance, where future climate risks feel abstract and disconnected

Traditional risk communication methods struggle to convey cascading and compounding impacts in a way that informs real-world decision-making.

AIM

- Develop a climate risk assessment framework linking extreme climate hazards to cascading impacts on urban systems
- Operationalise this framework using a Virtual Reality (VR) platform to translate abstract climate projections into immersive, experiential narratives

FINDINGS

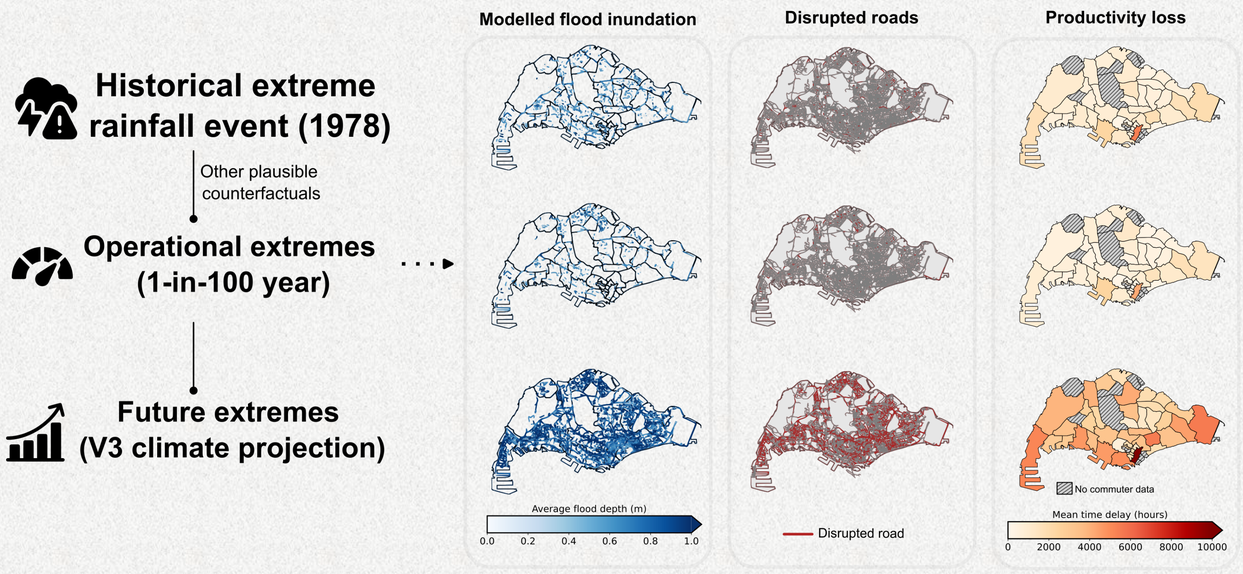


Figure 2. Modelling cascading impacts to urban systems under extreme scenarios – historical, operational, and future extremes.

(a) VR trailer

(b) Cascading impacts on roads and MRT stations

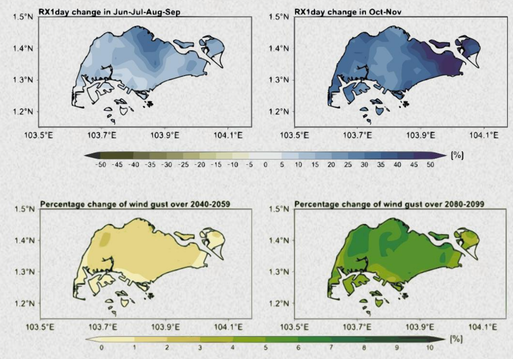
(c) Birds-eye view map

Figure 3. Video demonstrations of preliminary VR build

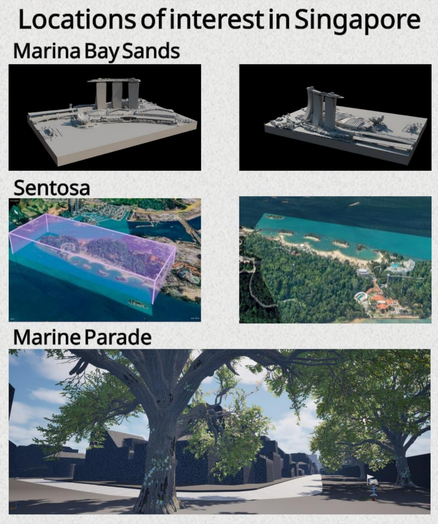
METHODS

1 Scenario Initialisation

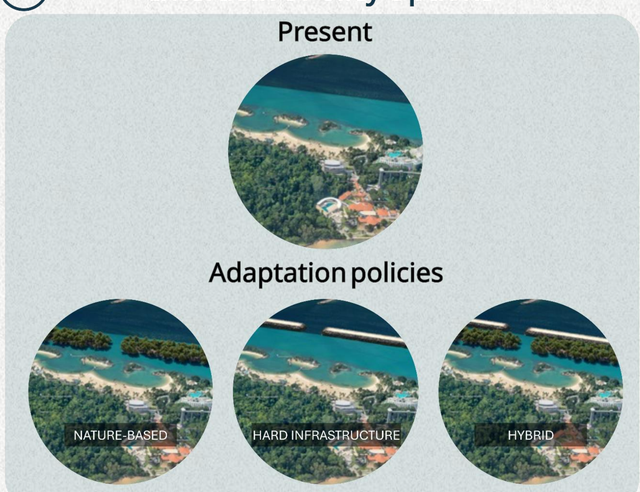
V3 climate projections & risk assessment



Locations of interest in Singapore

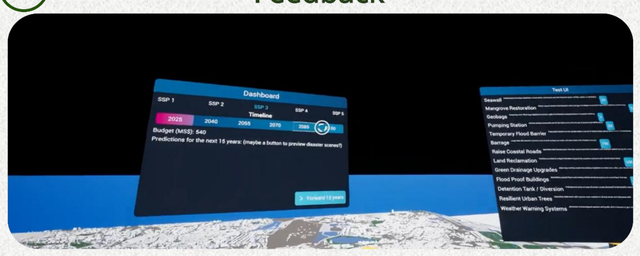


2 Interactive Policy Options



3 Climate Hazards and Cascading Impacts

4 Feedback



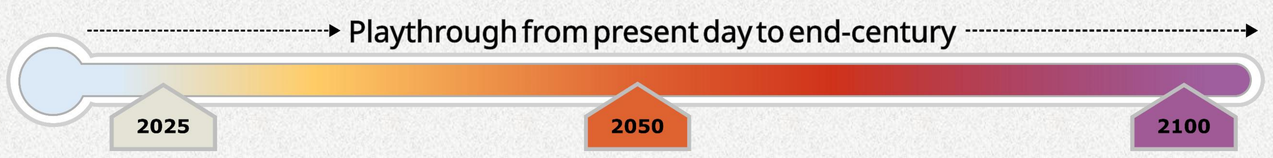


Figure 1. Interactive decision system in the VR simulation that shows the interaction between climate scenarios, adaptation policies, and climate hazards.

- Scenario initialisation: Initialise spatio-temporal probabilities of hazards, policy costs, and budget.
- Interactive policy options: Adaptation policies embedded with different costs and risk reduction attributes.
- Climate hazards: Hazards will interact with the implemented adaptation policies to visualise the manifestation of impacts.
- Feedback to backend: Decision pathways to demonstrate policy-lock ins.

CONCLUSION

VR platform provides a scalable and transferable tool for integrating climate science, risk assessment, and policy planning by:

- Enabling policymakers to interactively explore future scenarios and decisions
- Revealing policy path dependency – how early adaptation or inaction shapes long-term outcomes
- Operationalising and visualising policy trade-offs

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