A dramatic coastal scene with waves crashing against a rocky shore under a cloudy sky. The text is overlaid on the image.

Can We Successfully Adapt to 4 degrees of Warming? Yes, No, and Maybe

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Some thoughts

- Two ways to think about adaptation
 - As a response to an impact
 - Whether that response is ‘successful’
 - Adaptation by who?
 - Adaptation for who?

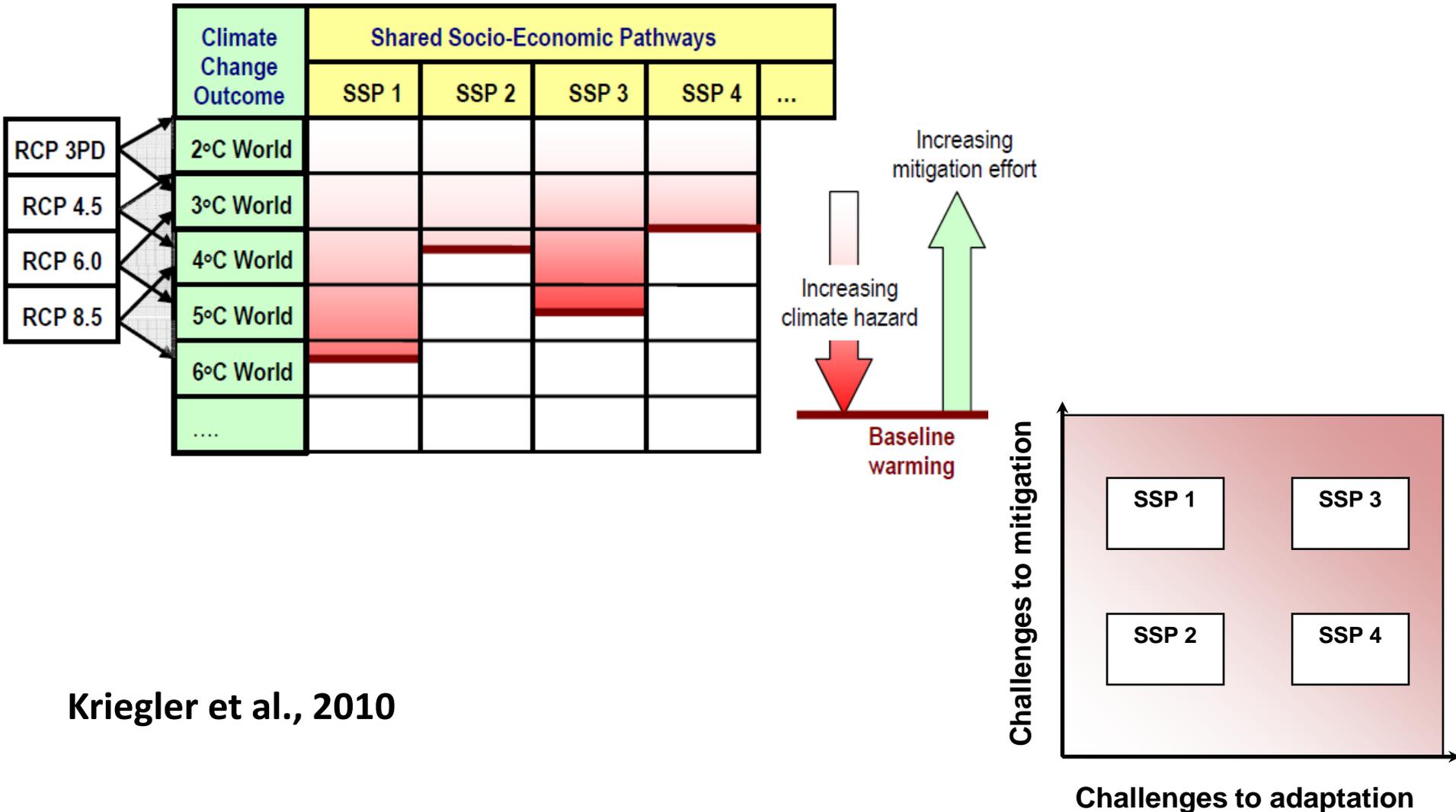
How we think about adaptation

- Adaptation as a process of decision-making
 - Whether or not adaptation is successful is determined by:
 - who has the power and responsibility to make decisions,
 - the basis on which decisions are made, and
 - the means of their implementation
- Can explore this through scenarios – socio-economic or adaptation

Context

- SRES scenarios
- Millennium Ecosystem Assessment
 - Global Orchestration (globalized with emphasis on economic growth and public goods),
 - Order from Strength (regionalized with emphasis on national security and economic growth),
 - Adapting Mosaic (regionalized with emphasis on local adaptation and flexible governance), and
 - TechnoGarden (globalized with emphasis on green technology)
- Representative concentration pathways
 - Haven't really translated into s-e scenarios

A framework for socio-economic scenarios



Kriegler et al., 2010

Regional scenarios

- Quantitative: TERI (2009) for Northern India:
 - four cases using two axes:
 1. policy approaches (market mechanisms / government policy-driven) and
 2. social values (economic / environmental goals).

Qualitative (basis for participative local discussion)

- “MedAction EU project” (Kok et al, 2003). :
 - “Big is Beautiful”,
 - “Convulsive Change”, and
 - “Knowledge is King
- NCCARF study on drought in inland towns, Albrecht et al., 2010
 1. She’ll be right mate!
 2. Chill out man! It’s all sorted!
 3. Mmmmmmm.....it’s not looking good.
 4. Up shit creek (Kalgoorlie) “We’ll all be rooned” said Hanrahan (Broken Hill)

Three scenarios

- A 'terror Australis' scenario , or MS/G (Minimal State / Growth) scenario
- A 'terroir Australis' scenario , or SDS/E (Social Development State / Equity)
- A 'new Atlantis' scenario , or PS/GJ (Purposeful State / Global Justice)

The climate, and its impacts

- The date is the 2070s
- Many ecosystems are severely threatened; some, such as coral reefs and alpine areas, no longer viable;
- Urban climates are unpleasant and, in summer at least, life-threatening;
- Bushfires are more frequent and more intense;
- More variable rainfall: lower rainfall and more frequent droughts in southern Australia; more frequent flooding;
- Sea-level rise means that coastal developments are frequently (we assume once per year) inundated; coastal wetlands experience saline intrusion.

Terror Australis

- The State:
 - Has transferred responsibility for provision of public goods to the private sector.
 - The machinery of the state is minimal: a well-funded judiciary, police, and armed forces,
 - Progressively loses legitimacy; corporate criminals are increasingly unconstrained, organized crime has increasing legitimacy.
- Society
 - Is deeply divided.
 - Freedom is the value of a small but influential upper class who practice unfettered consumption and mobility.
 - At the other end of the social spectrum is deep poverty, survival is the goal and opportunity is the desire; there is little choice

Terror Australia: adaptation policy

- Doesn't exist
- Adaptation is a series of market opportunities:
 - insurers providing services to the affluent;
 - property developers: unprecedented demand caused by fires, floods, and coastal erosion generates,
 - water traders selling water across sectors;
 - food wholesalers manipulating expectations of scarcity and bottlenecks to gain higher prices with no changes in productivity.
 - Business failures leave customers stranded with large losses to shareholders.

And how would we live?

- Cities:
 - urban sprawl,
 - rich in the inner cities with good public transport and weekend retreats,
 - poor in the outer suburbs, commuting by car, protected by fire breaks
 - nutrition poor
 - homelessness high
- Rural and remote settlements
 - Depopulation of small towns except in high amenity areas



Context

- International relations:
 - Refugees and immigration discouraged
 - An isolated state
 - Risk of food insecurity during drought
- Energy and water
 - An open market - cities buy water,
 - Irrigated agriculture has largely ceased, apart from high value commodities.
 - Water and electricity are expensive for the consumer, exacerbating health risks of heatwaves.
 - Water rationing is becoming commonplace.
 - Electricity is generated primarily by fossil fuels.

Terroir Australia

- The State
 - Is guided by the value of social justice, seeks a fair distribution of wealth; it intervenes to remedy unequal outcomes across the economy, and increasing inequalities caused by climate change.
 - Seeks full employment and subsidiarity
 - It is for the nation rather than the international community; for the present more than the future.

Terroir Australia: adaptation policy

- Is a series of adjustments to maintain regional growth over short time scales,
- Is subservient to economic policy,
- Responses are largely incremental and poorly coordinated,
- Is linked to social policy: compensation, income support, skills training, and housing assistances are used to avoid impacts on disadvantaged sectors.

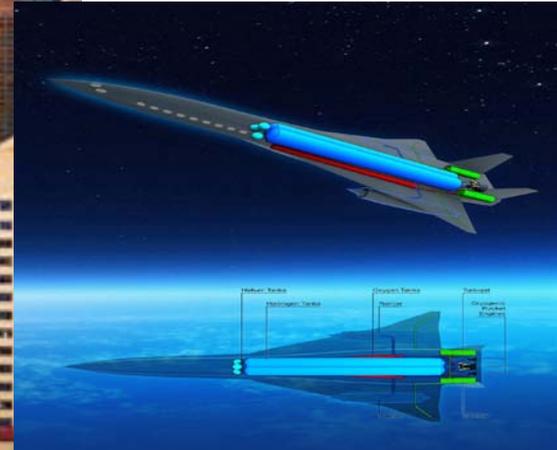
And how would we live?

Cities:

- Centre and suburbs equally served
- higher-density housing with strong reliance on air conditioning and shading
- Efforts to 'green' the city falter due to lack of water
- City living is bearable; only very severe heatwaves lead to exceptional mortality

Rural and remote settlements:

- Large, highly mechanised fly-in fly-out farms with labour.
- Policy instruments keep food prices low, rather than sustain rural communities



Context

- International relations
 - From the inside, a society that strives to be fair; from the outside, selfish and self-protecting.
 - With a shift to nuclear power, likely to meet any international emissions reduction targets
 - Less dependent on food imports than Terror Australia – less boom and bust
- Energy and water
 - 80% energy demand met by nuclear, with a mix of hydro, gas, solar, wind and coal supplying the remainder
 - Aspires to an affordable and sustainable water supply for all
 - In the trade offs between water for small rural enterprises and cities, rural enterprises lose.
 - Environmental flows are a high priority and increased where feasible.

New Atlantis

- Purposeful – in pursuit of the Good Life for all
- A partnership between the state and citizens in the pursuit of common goals
- Responding to climate change through domestic action and international leadership
- Underpinned by:
 - Large-scale investment in low-emissions energy supply and national grids for power and water
 - Delivering good quality urban living conditions



New Atlantis: adaptation policy

- Adaptation and mitigation policy merged, purposeful and planned
- The state plans for transformative change in vulnerable sectors over appropriate (decadal) time scales
 - cities are planned to reduce risks from sea-level rise, fire and heat stress in a warming climate;
 - agriculture is planned so that high production occurs in climatically appropriate zones, and shifts as zones shift.

And how would we live?

Cities

- are revolutionized
- each house a net power supplier
- green spaces are water catchments and food producing
- public transport services are dense, cars are scarce, people belong to localities
- municipalities collectively plan for change in partnership with the state, developers, and civil society



Rural and remote settlements:

- maintenance of viable rural and regional communities.



The context

- International relations
 - “New Atlantis” leads in the introduction and negotiation of international agreements, and is on course to meet its own targets
 - A substantial aid donor
 - Has built trade and technological transfer to ensure food security
 - Agricultural production continues to contribute to exports, although wheat exports have fallen
- Energy and water
 - Energy mix renewables (50%), nuclear (40%) and fossil fuels (10%) underpinned by national grid
 - Water grid
 - Irrigation efficient and regulated

Summary

Terror Australia

- Inequitable society hopelessly incapable of managing climate change risks .
- Shortages of water and food are ever-present risks.
- Urban areas are poorly equipped to deal with heatwaves.
- A society where the gap between the rich and the poor continues to grow, where the poor are disproportionately impacted by climate change

Terroir Australia

- A highly-urbanized equitable society, at least from the inside.
- A society that lives with the fear of water and even food shortages.
- Increasingly urbanised to avoid risks of fire and flood,
- Plans for a water grid, using large amounts of cheap nuclear power
- Investment in agriculture in northern regions recognized as essential to build food security

New Atlantis:

- Outward-looking;
- Internationally respected;
- Energy and water grids built, transformational change undertaken
- Resilient to the impacts of climate change through policies embedded in concepts of equity and social justice.

Conclusions

- The nature of the state matters for adaptation,
- A transformation of the state may be required if we are to successfully adapt to 4 degrees of warming
- Even at 3 degrees of warming, and with the most effective and purposeful state possible, some impacts of climate change cannot be avoided:
 - ecosystems will change,
 - some species will be lost,
 - places will change.
- What the best of all possible states *can* do is to avoid the transmission of these changes in environments into social impacts.