Adapting to SLR: Government Actions and Private Responses

Andy Keeler
UNC Coastal Studies Institute
Dept. of Economics, ECU

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University of North Carolina

Outline

- Overview of Public Policy and Climate Change Adaptation
- Importance of Focus on Private-Sector Incentives and Choices
- Three key issues
  - Timing
  - Consistency vs. Flexibility
  - Compensation, Baselines, and Adaptation

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Adaptation

- *Actions by individuals or systems to avoid, withstand, or take advantage of current and projected climate changes and impacts. Adaptation decreases a system's vulnerability, or increases its resilience to impacts*

Overview –Policy and Adaptation

- Efficient adaptation minimizes the sum of
  - Net damages from climate change
  - The cost of adaptive actions

- Adaptive actions are taken largely by
  - Private agents
  - Existing local and regional government entities

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Overview - Policy and Adaptation

- Key roles for centralized institutions
  - Public goods provision
  - Finance and resource transfers
  - Rules, regulations, and investments that affect adaptation possibilities and incentives
  - Research

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Sea Level is Rising – So What?

- One case for not making adaptivepolicy is the market / libertarian case:
  - Individuals and institutions make risk assessments and adaptive decisions all the time
  - Poor decisions in response to change will bring about bad outcomes, and spur incentives for adaptation

Overview – Rationales for Government Involvement

- Market failure paradigm
  - **Fundamental decisions about adaptation involve public goods, which are not provided by private markets**
  - Decision-making under risk, uncertainty, and ignorance prevent efficient market outcomes
  - Information, research as a public good
  - Externalities created by adaptive actions

Overview - Economics and Adaptation

- Government failure paradigm
  - **Disaster relief and moral hazard**
  - Implicit and explicit subsidies
  - Consistency and setting expectations
    - Mitigation policy
    - Adaptation policy
- Equity
  - Costs (broadly defined) visited disproportionately relative to responsibility

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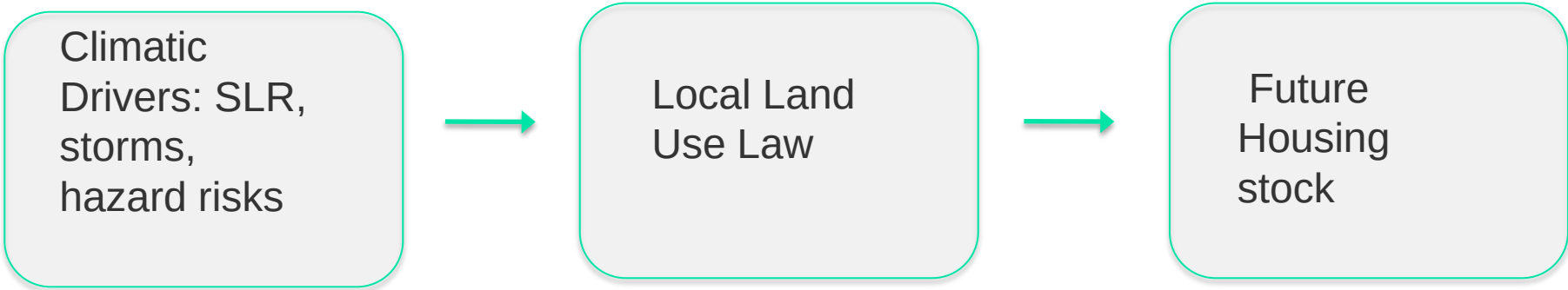
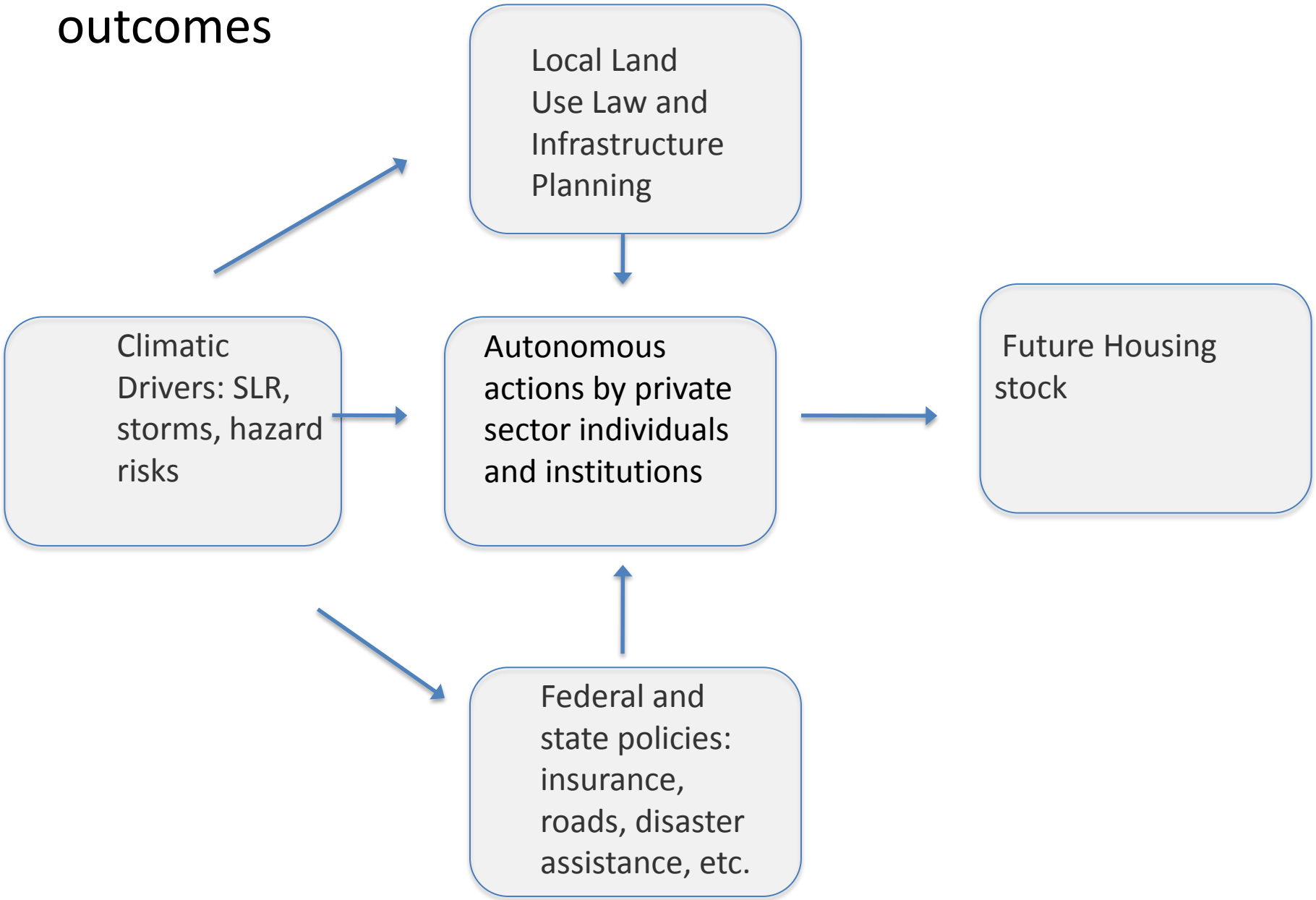
Planning-dominated approach – not much attention to private-sector actions



Example: adaptation in real estate markets

People and institutions make choices that determine outcomes



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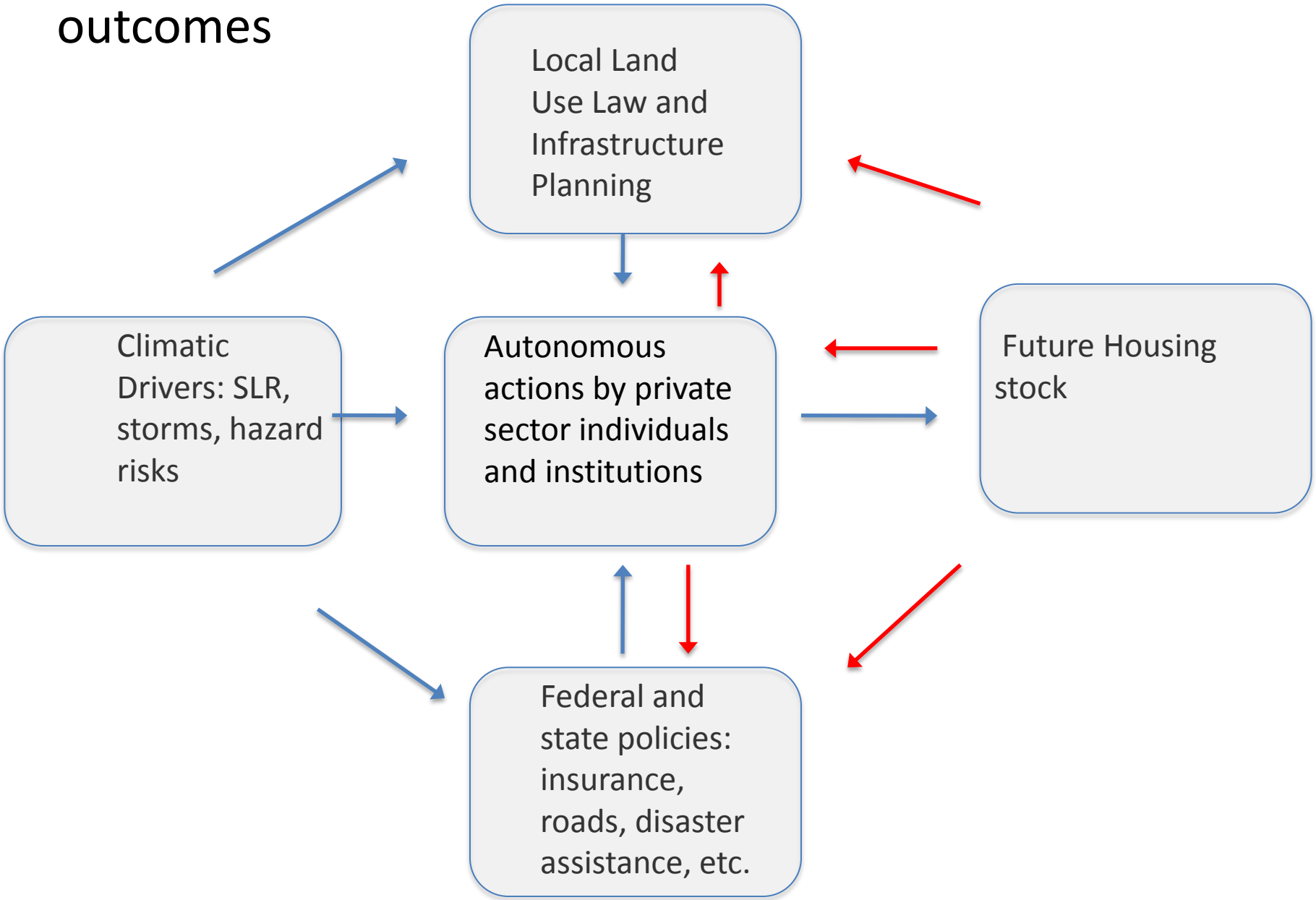

Climatic Drivers transmit incentives and rules through different but interdependent mechanisms

- Direct
  - Risk of flooding, change in growing conditions
- Policy-induced change in prices
  - Insurance
  - Energy
  - Transportation
  - Water
- Policy-induced changes in rights and obligations
  - Building codes and zoning ordinances
  - Water quality
  - Disaster assistance / relocation assistance

Timing

- The effect of policy on aspects of climate change with big demographic implications (e.g. SLR) are more about timing and transition dynamics (and costs) than about the eventual outcome
- Two important implications
  - Assuming immediate adjustment potentially imposes large costs (foregoes benefits)
  - Shielding the private sector from facing the full cost of risk potentially imposes large costs from failing to make decisions soon enough
- Path dependence – initial steps can lead to varying future adaptation paths (and policies)

Timing

- Predictions about SLR strongly imply that coastal areas will become uninhabitable at some point in the future
- Adaptive responses can be on the time scale of years, decades, or centuries
- It matters **a lot** what the timing of change is

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Highway 12 on Hatteras Island Post- Hurricane Irene

Highway 12 on Hatteras Island -- temporary solution

Photos by Don Bowers

Highway 12 Example

- Planned Responses
  - Short run – how to keep road links to the mainland open
  - Long run – when to stop leaving road links to the mainland open
    - “Now” would impose large costs on a fairly small existing population and engender very significant opposition
    - “Never” would commit a to an enormously expensive and potentially infeasible infrastructure
    - The variety of in-between answers is the essence of adaptation in this context

Three basic classes of responses

- Hold the road
- Build a more climate resistant road at higher up-front cost
- Give up on the road link and rely on ferries and planes

All might be relied on at some point – but the choice and timing is absolutely critical to individual and community

Law and Policy and Private-sector responses: Interrelated and Endogenous

- Existing and *anticipated* choices about transportation infrastructure affect
  - Location decisions for younger residents, retirees, potential business owners, etc.
  - Housing choices – size, maintenance choices, asset specificity
  - Erosion and flood mitigation choices
- And those choices then directly affect the economic and political incentives toward future transportation infrastructure

Consistency vs. Flexibility

- The private sector likes clear signals and certainty to facilitate efficient investment and remove controllable risk
  - (climate policy, prices, and utility investment)
  - Price of hazard insurance
- Good policy under uncertainty requires that policy be changed as better information becomes available

Consistency vs. Flexibility

- This is a general conflict, but one that is particularly acute for climate change
- Technical answer is to make the principles of adaptive management clear
  - Clearly defined contingent triggers for specific policy actions
  - But this is hard to do politically and also hard to convey clearly and at level of complexity

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Inherent Difficulties with Transition Timing

- Fundamental difficulty of choosing a time path and credibility
  - In the example of Highway 12, a plausible time path is the life of the next big highway investment
    - People have to believe “this time we really mean it”
    - There is inherent uncertainty in how long the investment will last
  - Could base the timing on a number of years
  - Could base the timing on an observable trigger
    - Some specific sea level
    - Some number of breaches
    - Some number of high-impact storms
  - All these triggers are imperfect, and all are subject to the inability of government to absolutely commit

Compensation

- Ethical case for compensation is fairly clear
- Most often has come up in political debates about rich and poor countries
- And in theoretical debates about current generations vs. future generations
- BUT there is a strong case to be made that it will underlie policy – and in that context paying attention to incentives is particularly critical

Compensation and Incentives

- Providing resources in a way that does not prevent successful adaptation will be critical in some contexts – particularly SLR
- Very complex set of choices – balance between defensive expenditures and larger-scale change
  - Living with risk, and spending money to reduce the risk and its consequences, is going to be the best choice for some period of time
  - At some point, the risks become too great and discontinuous change will be the better choice
  - Murky, difficult, and subjective – but clearly some kinds of compensatory policies will affect the incentives about when to make the transition

Compensation and Incentives

- There is an equity case to be made for disaster assistance and transportation infrastructure
  - But spending on both will lower the real cost of living in an at-risk area
- Insurance is a particularly interesting policy, since it has had a strong historical role in incentives for risky property
  - Positive in that has been the available lever for changing housing characteristics
  - Negative in that is has skewed incentives when rates have been subsidized
  - The extent to which ex-ante predictions about risk are incorporated into flood (and wind) insurance is a critical economic signal in coastal areas

Compensation and Efficiency

- The economic ideal for compensation is that it
  - Does not distort incentives to take precaution or relocate
  - Does not create incentives to take action in order to qualify for compensation
  - Standard example is a straight financial transfer (lump-sum payment) that does not affect explicit or implicit prices
- Policies toward transportation infrastructure and disaster assistance are particularly difficult to implement without affecting adaptation incentives

Baselines

- If compensation is an element of public policy responses to climate change
- and if autonomous adaptation depends in part of people making optimal financial decision given expectations about climate-driven influences
- Then establishing how people could reasonably have been expected to make decisions at different dates could end up as a critical component of adaptation policy

Baseline Example

- People may receive buyouts for some fraction of real property value through FEMA or similar programs
  - What is the cutoff date where people should reasonably have considered climate change risk before building or buying?
  - Will this determination be made ex-ante through policy or ex-post through litigation?

Importance of Uncertainty

- All aspects of the problem are highly uncertain
  - GHG emissions
  - Climatic drivers
  - Physical effects
  - Social and economic reactions
  - Technology
- *Adaptation decisions must be made with respect to a range of possible outcomes*
- *Anything that reduces and/or more correctly characterizes uncertainty will lead to better decisions*

Summary

- Private sector responses are central to adaptation
- Law and policy affect responses through a variety of pathways
  - Prices, plans, regulations, spending, R&D

Summary

- Timing is critical
- The tension between certainty and adaptive management is a particularly difficult challenge
- Compensation will be one aspect of adaptation law and policy where it is important to get incentives right