A Framework for Understanding Management Options

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Setting the Stage

- Contextualize management option categories
- Highlight key influences that affect management options (physical and non-physical)
- Provide a way of thinking about issues/strategies discussed.

Management Option Categories

Do Nothing	Adapt by Physical Protection
Adapt to Anticipated Change	Adapt to Observed Rate of Change

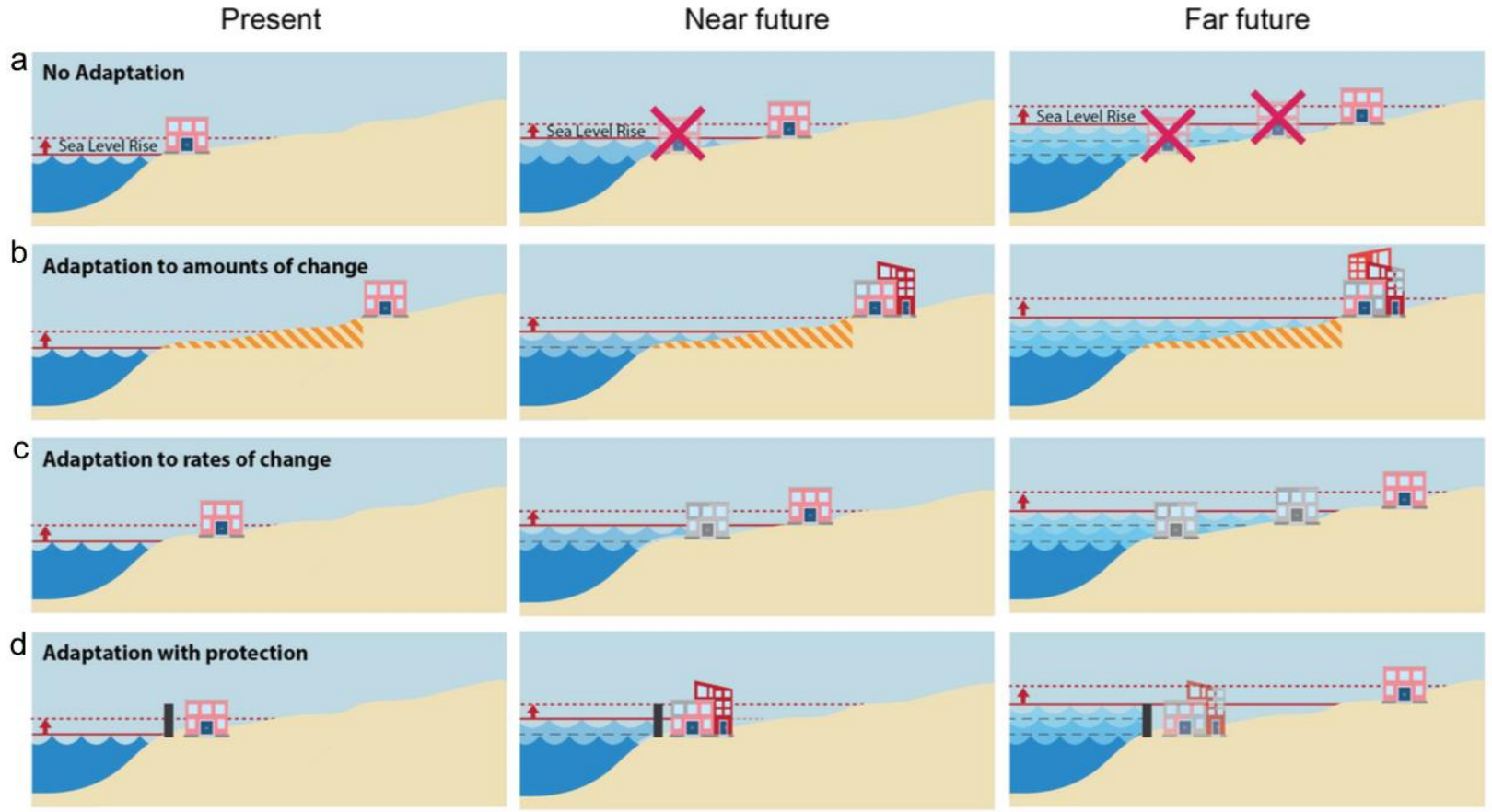

Figure 1. Choice of adaptation strategies. Investments close to the sea are more productive but at greater risk from sea-level rise. Rows represent different adaptation strategies and columns left-to-right indicate the progression of time from present to far future. (a) Strategies that ignore sea-level rise invest close to the shoreline and valuable assets are lost to the rising seas. (b) Strategies that consider adaptation only to some future amount of sea-level change produce a restricted zone that can eliminate valuable investment opportunities. (c) Strategies that consider adaptation to ongoing rates of sea-level change allow for an economically optimal outcome. (d) Strategies involving dikes or other types of coastal protection provide a temporary hold to sea-level rise but are eventually forced to adapt to ongoing rates of sea-level rise.

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Factors Affecting Option

Physical Factors

- Rate of SL Rise
- Land Slope
- Frequency/Intensity Coastal Storms
- Physical Land Inventory
  - Undeveloped
  - Developed

Socio-Econ-Pol-Cul Factors

- Development Value of Land
  - Undeveloped
  - Developed
- Amount of Development
- Amount of Open Space
- Proximity of Development to Ocean
- Life Span of Building

Do Nothing	Adapt by Physical Protection
Adapt to Anticipated Change	Adapt to Observed Rate of Change

Factors Affecting Option

Synthesized Phys/Non-Phys Key Factors

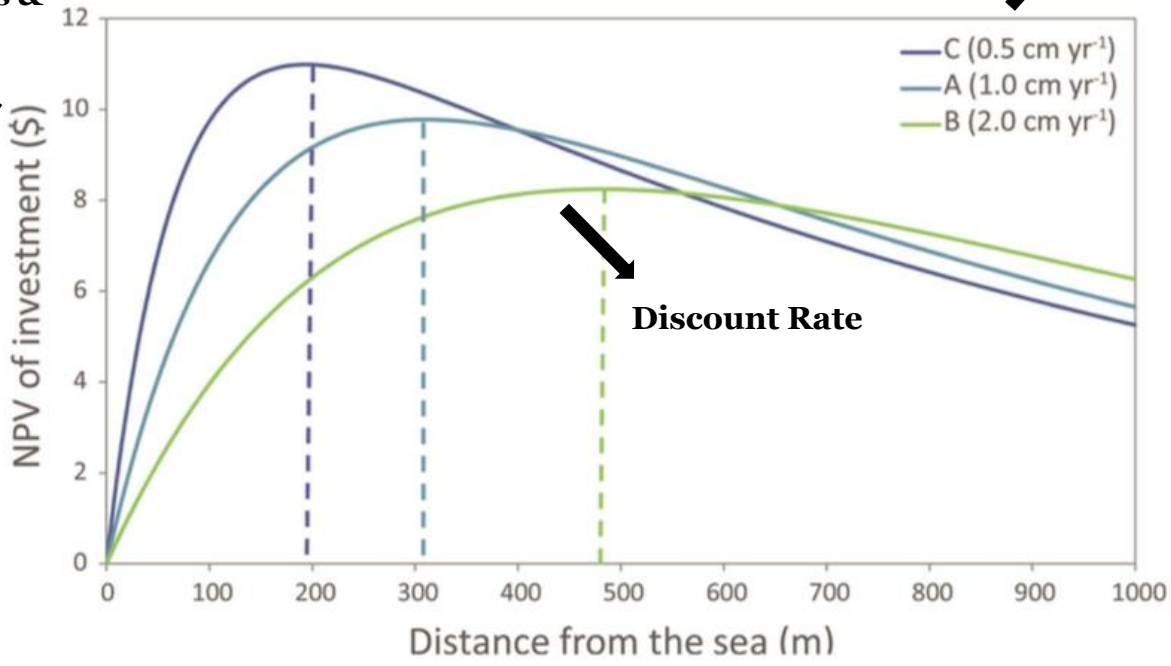
Rate of SL Rise Land Slope Freq/Intensity	→	**Inundation Rate**
Development Value (undeveloped)	→	**Land Attractiveness Rate**
Development Value (developed land)	→	**Capital Depreciation Rate**
Evidence of SL Rise Freq/Intensity	→	**Discount Rate**

Do Nothing	Adapt by Physical Protection
Adapt to Anticipated Change	Adapt to Observed Rate of Change

Example

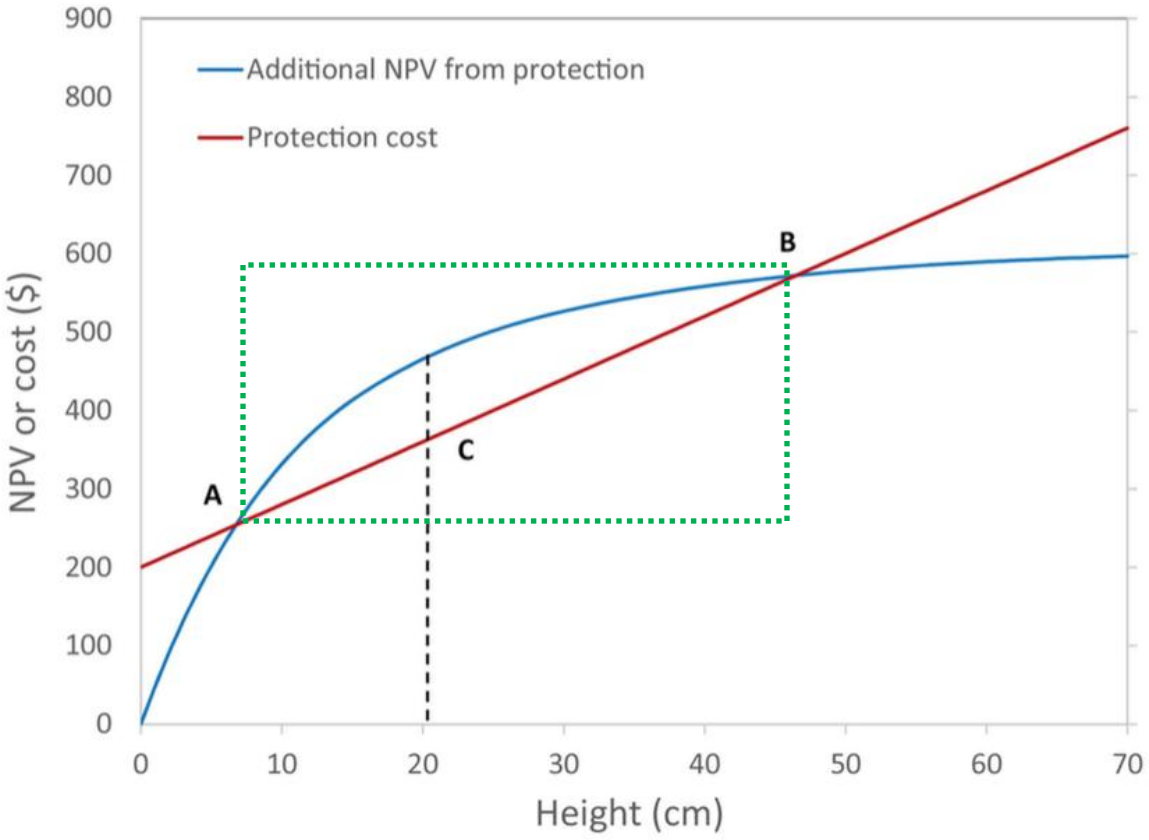
Inundation Rate

Land Attractiveness & Cap Depreciation Rates



Discount Rate

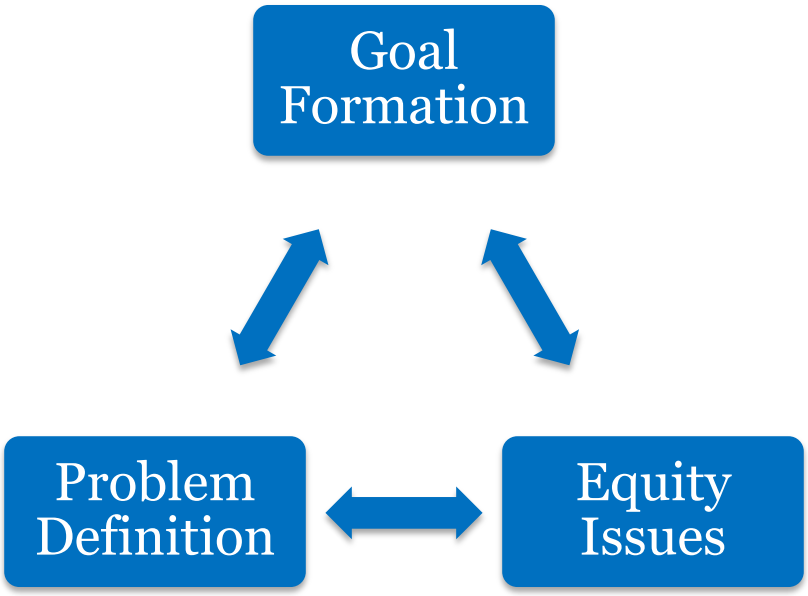
Protection


900
800
700
600
500
400
300
200
100
0
NPV or cost ($)
Additional NPV from protection
Protection cost
A
B
C
0
10
20
30
40
50
60
70
Height (cm)

The Planning Lens

- Planning for SL rise is a "Wicked" Problem
  - Consequences of choice are unknown
  - The choice will influence perception of the problem.
  - Focus on non-zero-sum solutions
    - Chance to modify choice under changing circumstances (physical, social, political, etc.)

Suggestions



- Goal Formation
  - What can we do?
  - What should we do?
- Problem Definition
  - What is? (observed condition)
  - What ought to be? (desired condition)
- Equity Issues
  - Not “a” or “the” public welfare
  - No value free, true-false answers
  - Look for degrees of freedom
    - Non-zero-sum solutions

Thank You!