

# ADAPTATION OPTIONS

## Kingston, NY





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» Jessica Grannis


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**Adaptation Tool Kit: Sea-Level Rise and Coastal Land Use**   
The Adaptation Tool Kit explores 18 different land-use tools that can be used to preemptively respond to the threats posed by sea-level rise to both public and private coastal development and infrastructure, and strives to assist governments in determining which tools to employ to meet their... more


**Coastal Inundation Toolkit**   
The Coastal Inundation Toolkit was developed by the Digital Coast Partnership Group to help communities understand and address coastal inundation issues - where water covers what is normally dry land. Information and resources are organized into 5 stages: understanding coastal inundation,... more

**Contact**



**Related Organization**

Supervising Attorney at Harrison Institute

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**GEORGETOWN CLIMATE CENTER**

The Georgetown State-Federal Climate Resource Center

<http://www.georgetownclimate.org/node/4025>

# What are my options?

## Sea-Level Rise Tool Kit

**What are our options?**

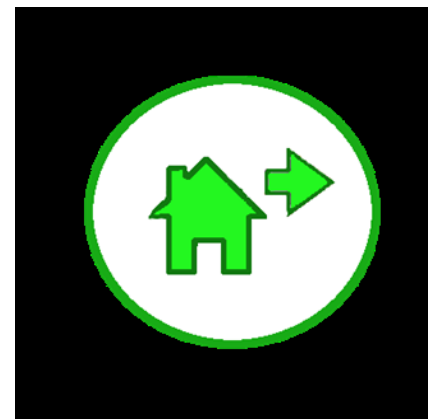
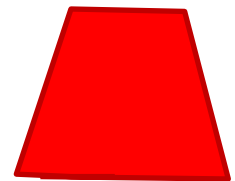
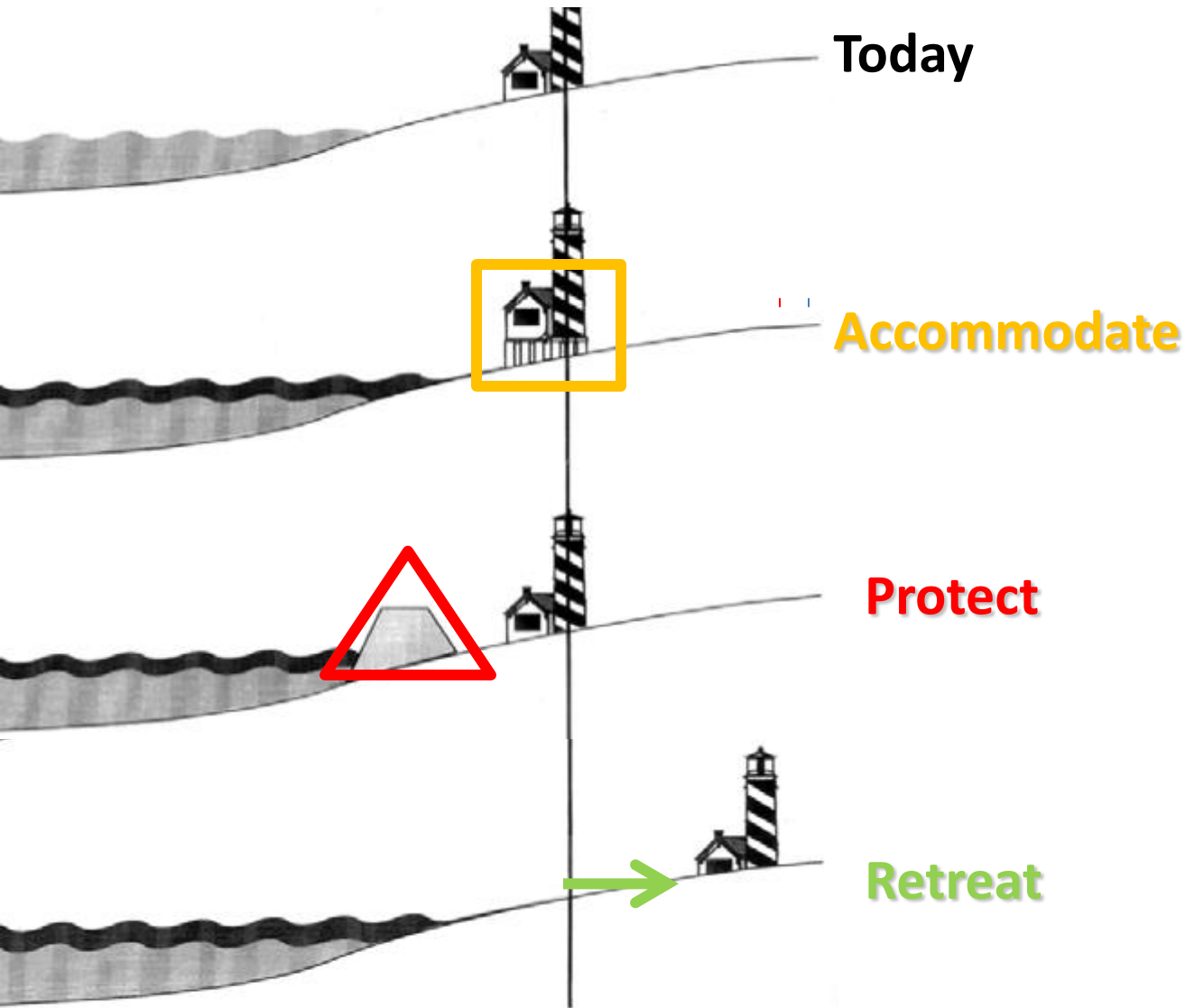
- Accommodate
- Protect (Fortify)
- Retreat

**How do we choose?**

- By power
- By type of land use
- By tradeoffs

# Adaptation Strategies

← Reference Line

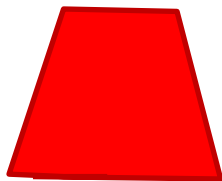


# Adaptation Tools

Planning      Spending  
Taxing      Regulating



- Building Codes and Resilient Design
- Setbacks and Buffers



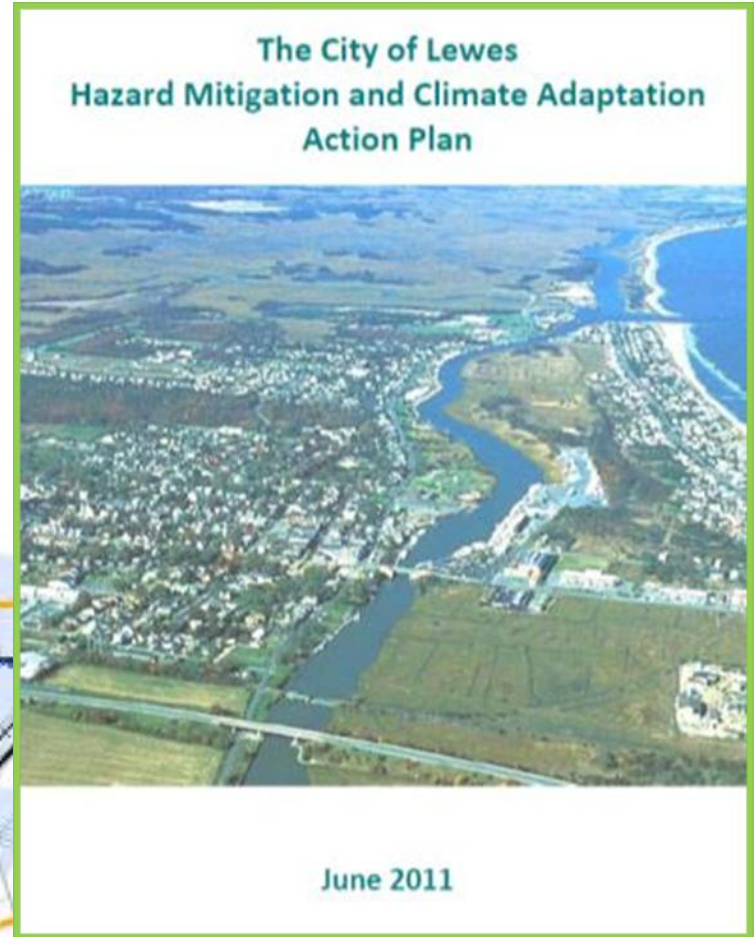
- Hard armoring permitting
- Soft armoring permitting



Acquisitions and buyouts  
Conservation easements  
Rolling conservation easements  
Transferable development credits

# Planning

- Comprehensive Plans
- Hazard Mitigation Plans
- Transportation Plans
- Capital Improvement Plans



# Planning Examples

## Tools

- Comprehensive plans
- Hazard mitigation plans
- Capital improvement plans
- Transportation plans

## Examples

- Virginia Beach, VA
- King County, WA
- Lewes, DE
- Santa Cruz, CA
- Mississippi Coastal Improvements Program (Ms-CIP)
- Groton, CT
- FHWA pilots—Cape Cod, NJ, San Francisco, WA, HI

# Spending Examples



## Tools

- Elevate public facilities
- Acquisitions / easements

## Examples

- LA, Hwy 10
- CA Coastal Conservancy guidelines

- Fund for living shoreline pilot projects

- Maryland Living Shoreline Protection Act

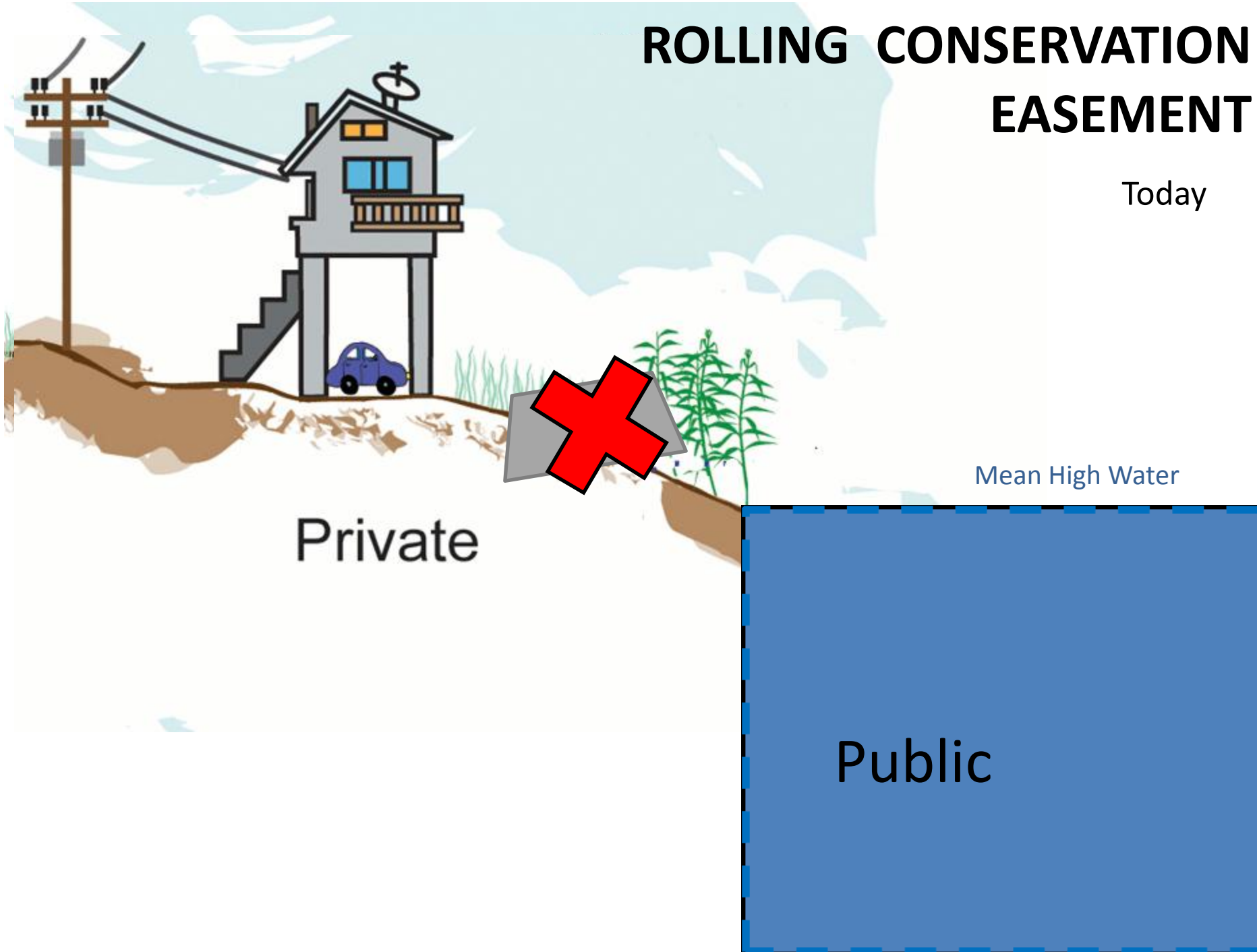
- Buyouts and acquisitions
- Limit public expenditures in vulnerable facilities
- Relocate infrastructure

- Louisiana Road Home Program
- Reroute of Hwy 1 in CA
- Pacifica, CA managed retreat



# ROLLING CONSERVATION EASEMENT

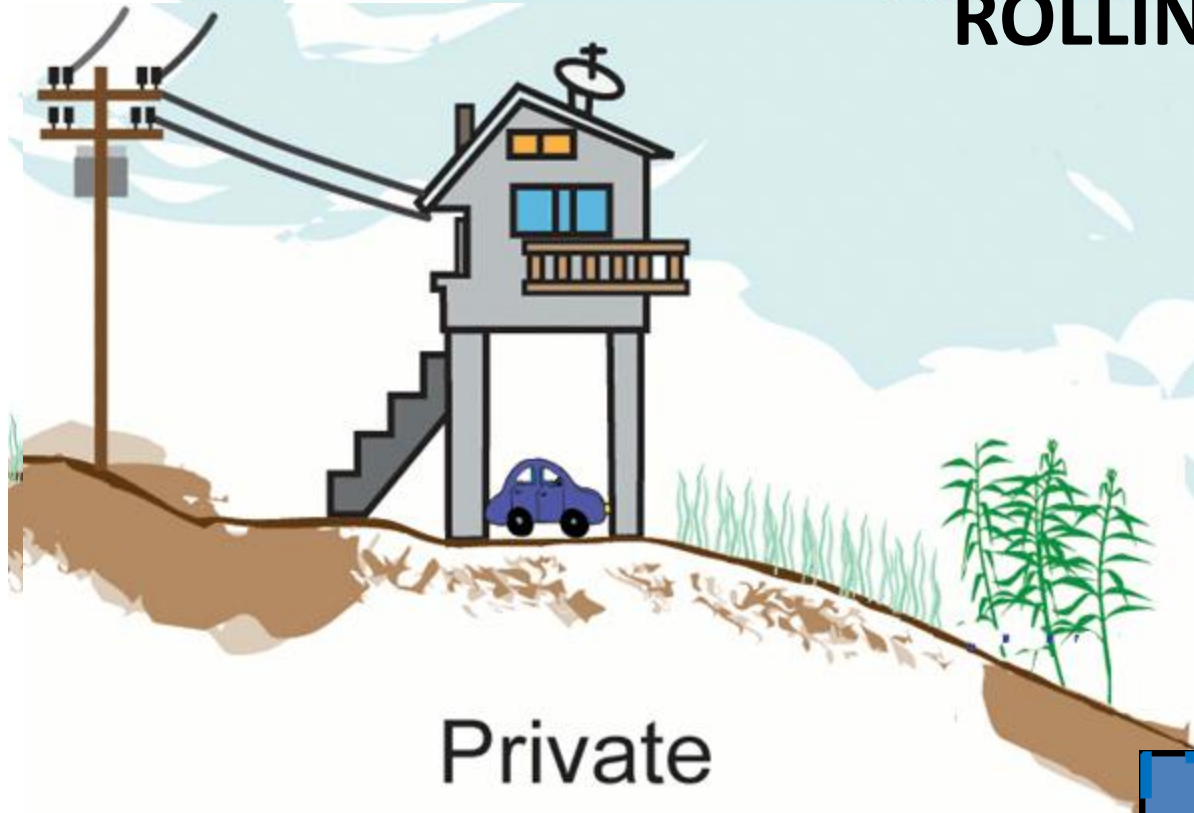
Today





# ROLLING CONSERVATION EASEMENT

+ 40 years



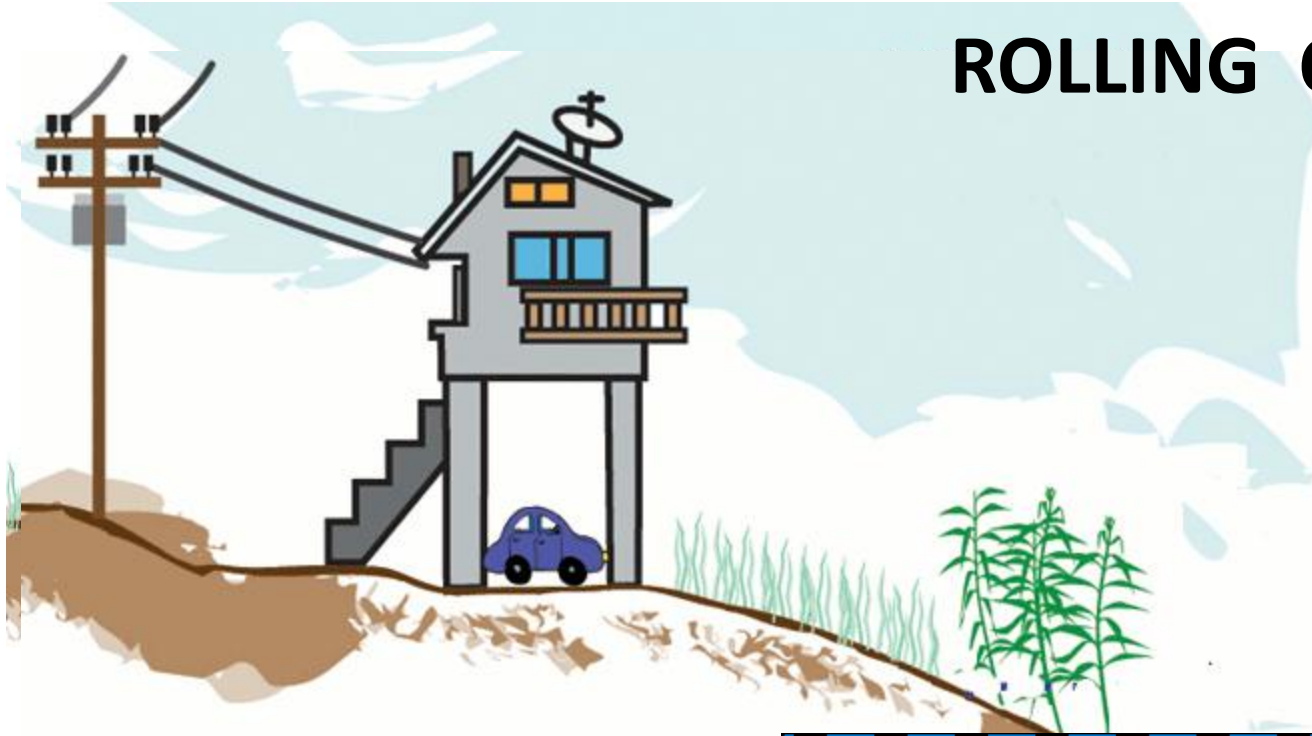
Private

Public



# ROLLING CONSERVATION EASEMENT

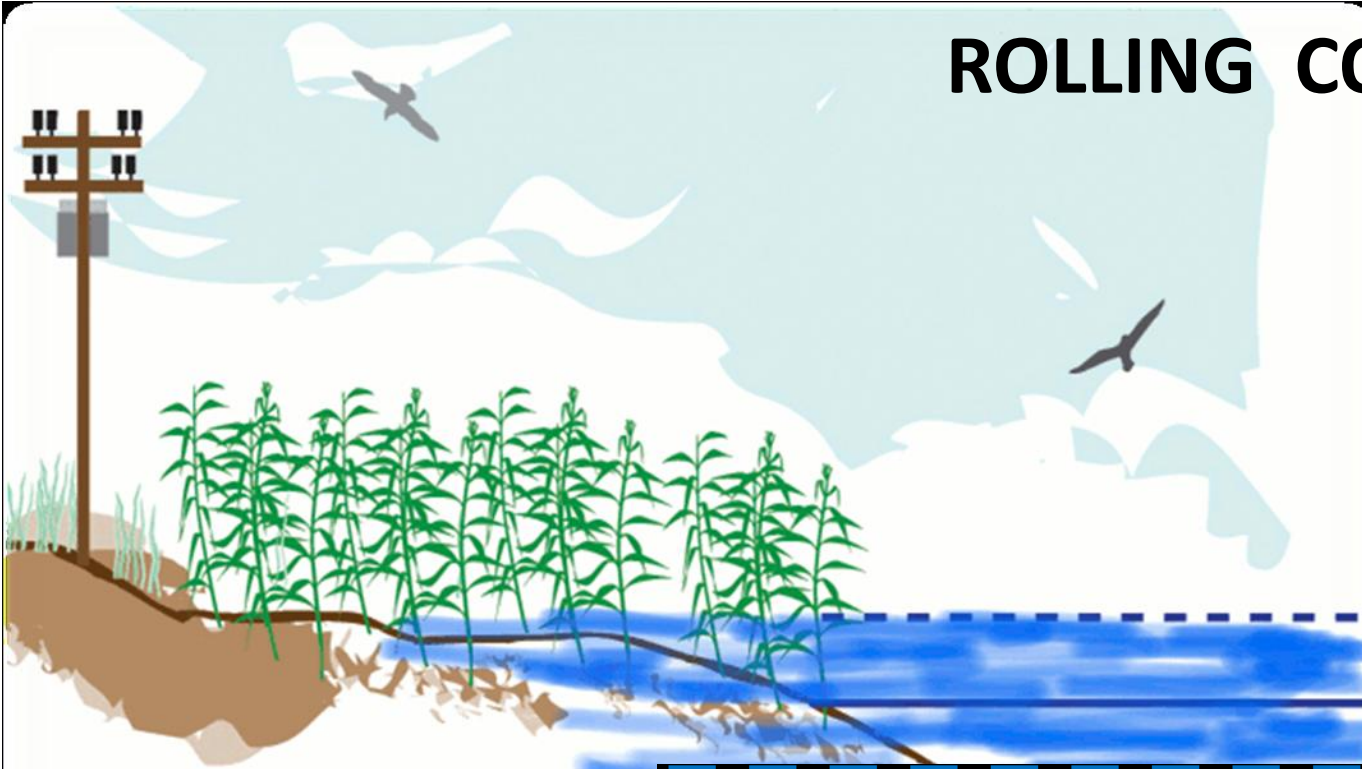
+ 80 years



Public

# ROLLING CONSERVATION EASEMENT

+ 100 years



Public

# Incentives



## Tools

- Tax incentives
- Siting incentives
- Fast-track permitting

- Streamlined permitting for living shorelines
- Low-interest loans

Real estate disclosures  
Transfer of development rights (TDR)  
Conservation easements

## Examples

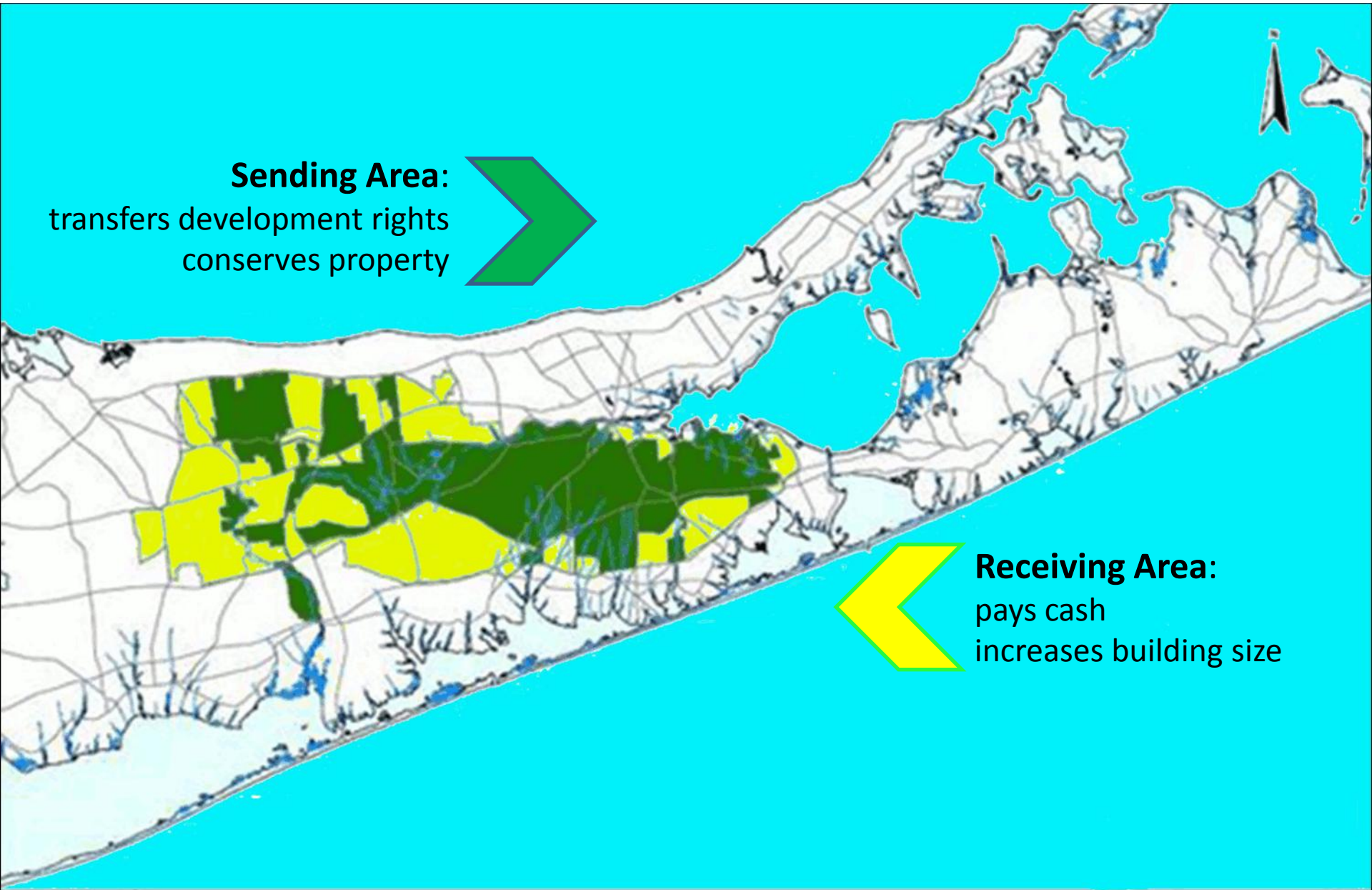
- Hull, MA

- MD Living Shorelines Act

- CA hazards disclosure
- Montgomery County, MD; NY, Pine Barrens
- VA conservation easements tax credits

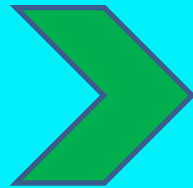


# Incentives: TDRs



## **Sending Area:**

transfers development rights  
conserves property

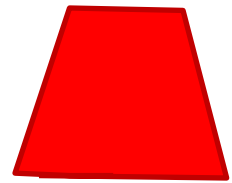


## **Receiving Area:**

pays cash  
increases building size



# Regulations



## Tools

- Increase freeboard
- Extend floodplain regulations to 500-year floodplain
- Site plan review
- Setbacks /buffers
- Limit subdivisions in floodplain
- Limit construction of armoring
- Rebuilding restrictions
- Removal requirements
- Building moratorium
- Downzoning – open space zoning or large lot zoning

## Examples

- Cedar Falls, IA
- San Francisco Bay Plan
- East Hampton, NY
- ME Sand Dune Rules
- Nags Head, NC
- Cedar Falls, IA
- MD Critical Areas Act

# Floodplain Regulations

## Accommodate Zone

Require structure resilient design

## Conservation Zone

Downzone and restrict rebuilding



## Protect Zone

Allow armoring

# Floodplain Regulations

## Accommodate Zone

Require structure resilient design

## Conservation Zone

Downzone and restrict rebuilding



## Protect Zone

Allow armoring



# Some legal issues to look out for:

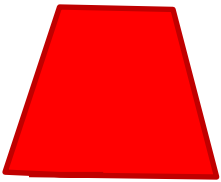


## Tools

- Freeboard
- Setbacks

## Legal Issue

- Americans with Disabilities Act
- Height limits in zoning ordinance
- Takings



- Living Shorelines

- Clean Water Act



- Rebuilding restrictions / downzonings

- Takings
- Grandfathering provisions in state laws

# How to Finance Adaptation?

## Tools

- Property Tax Assessment
- Infrastructure Bank
- Hotel Tax
- Stormwater Fee
- Real Estate Transfer Tax
- Bonds
- Impact Fees

## Examples

- King County, WA Flood Control District
- NY proposal after Sandy
- Proposed in DE
- Mecklenburg County, NC
- Town of Warwick, NY
- Radnor Township, PA
- NJ Blue Acres Program
- CA requires impact fees for armoring projects

# Other Considerations

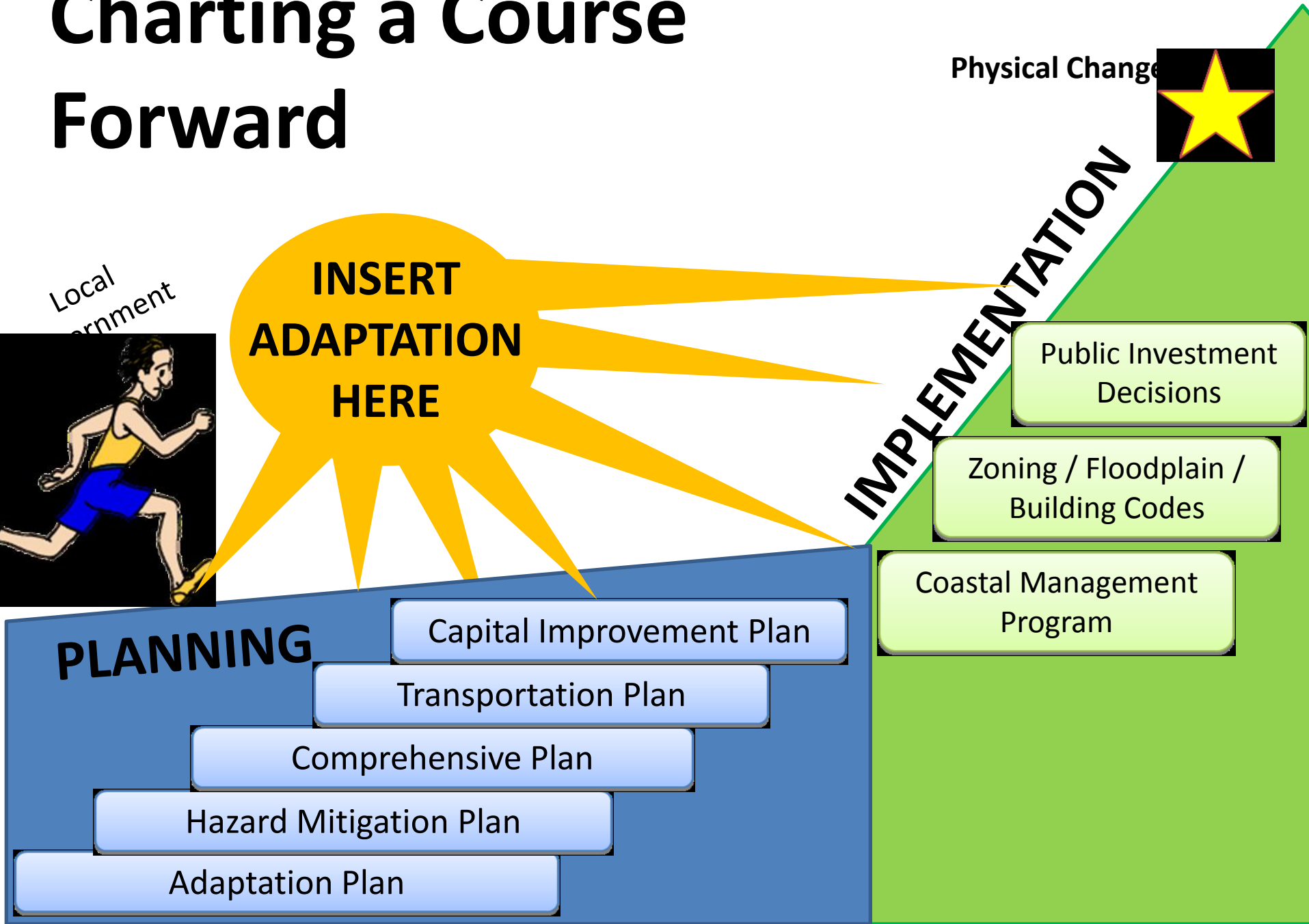
***Technical:*** What kind of technical information will be needed to implement the policy?

***Economic:*** What are the potential economic costs and benefits of implementation? How will implementation be funded?

***Political:*** What stakeholders need to be involved and what stakeholders may object to the policy?

***Social:*** Who may be adversely affected by a policy? How much long-term protection will the policy provide?

# Charting a Course Forward



# Charting a course forward

Doing Now?	Could Do?
Shoreline management	<ul style="list-style-type: none"><li>• Limit shoreline armoring</li><li>• Require mitigation or impact fees where armoring allowed</li><li>• Fund pilot living shoreline projects</li></ul>
Floodplain management	<ul style="list-style-type: none"><li>• Consider climate change effects in hazard mitigation plan and comprehensive plan</li><li>• Participate in the Community Rating System</li><li>• Increase freeboard</li><li>• Extend floodplain regulations</li></ul>
Capital improvements	<ul style="list-style-type: none"><li>• Use capital improvement plan to consider long-term financing for improvements to wastewater treatment facility, roads, buyouts</li></ul>

**For more information....**

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**[www.georgetownclimate.org/adaptation](http://www.georgetownclimate.org/adaptation)**

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**Sea Level Rise - [www.dec.ny.gov/energy/45202.html](http://www.dec.ny.gov/energy/45202.html)**

**Climate Change Adaptation - [www.dec.ny.gov/energy/82168.html](http://www.dec.ny.gov/energy/82168.html)**