



Adapting to the Impacts of Climate Change

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Statement of Task: This report, part of the *America's Climate Choices* suite of studies requested by Congress, discusses the impacts of climate change and how we as a nation can begin adapting to them in beneficial ways, exploring activities underway at the state and local levels, adaptation options, and how the nation can become better prepared to make adaptation choices.

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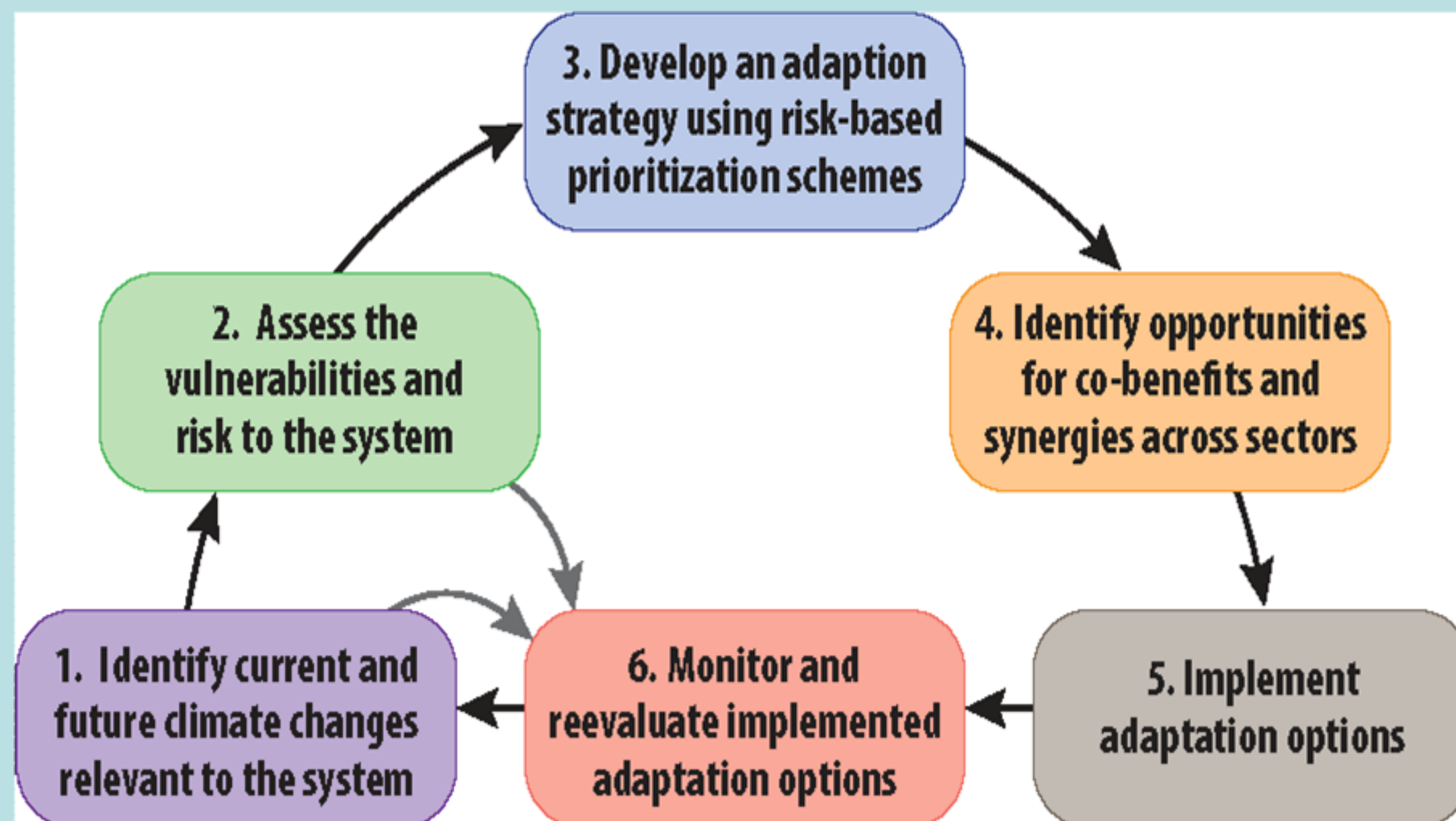
Examples of climate change impacts, binned by region

United States Census Regions	Climate-Related Impacts								
	Early Snowmelt	Degraded Air Quality	Urban Heat Island	Wildfires	Heat Waves	Drought	Tropical Storms	Extreme Rainfall with Flooding	Sea Level Rise
New England ME VT NH MA RI CT	*	*	*		*	*		*	*
Middle Atlantic NY PA NJ DE MD	*	*	*		*	*	*	*	*
East North Central WI MI IL IN OH	*	*	*		*	*		*	
West North Central ND MN SD IA NE KS MO	*		*		*	*		*	
South Atlantic WV VA NC SC GA FL DC		*	*	*	*	*	*	*	*
East South Central KY TN MS AL			*		*	*	*	*	*
West South Central TX OK AR LA		*	*	*	*	*	*	*	*
Mountain MT ID WY NV UT CO AZ NM	*	*	*	*	*	*		*	
Pacific AK CA WA OR HI	*	*	*	*	*	*	*	*	*

Examples of some adaptation options for sea level rise.
(The report contains comparable 'menus' of possible actions for numerous other types of climate change impacts).

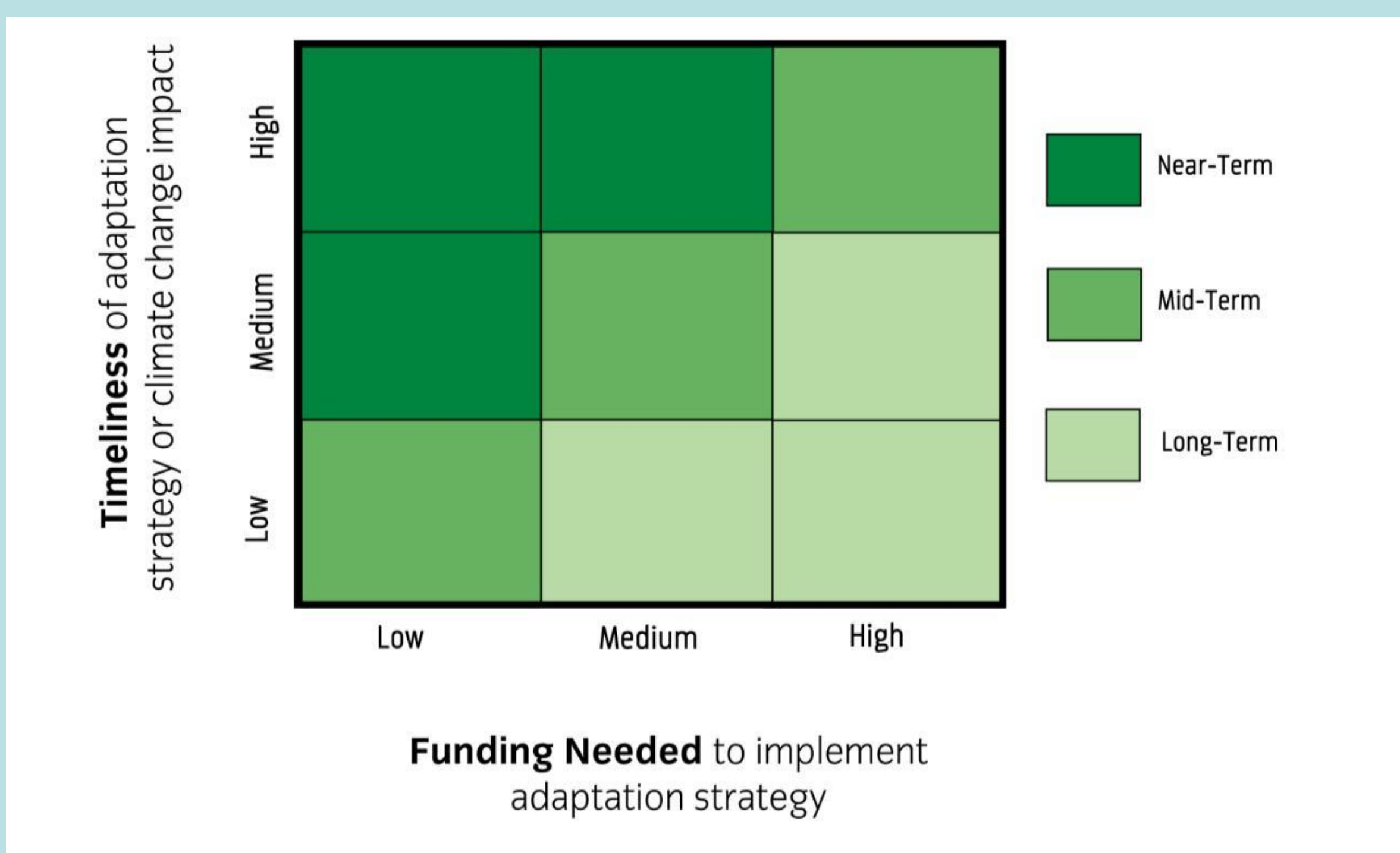
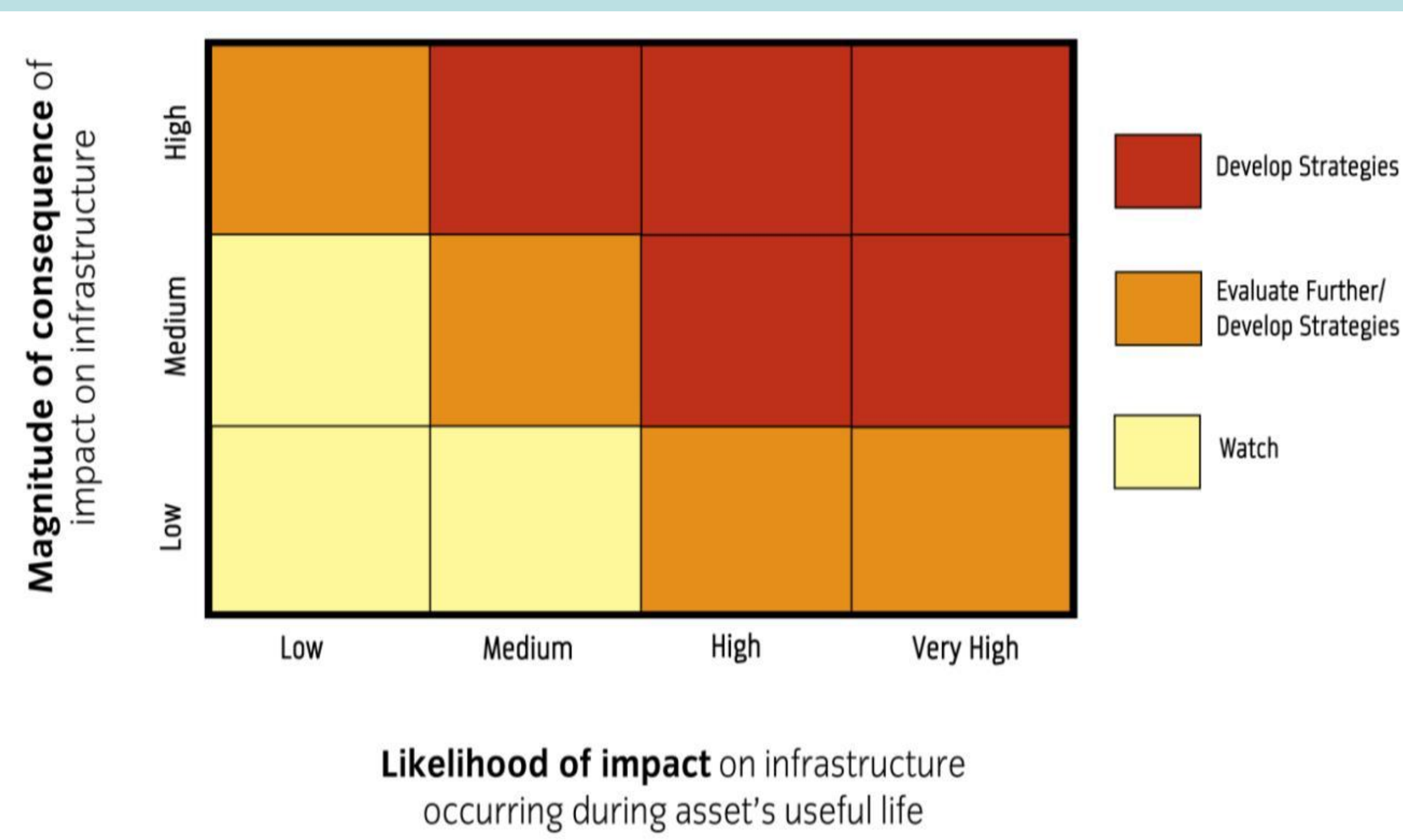
Impact:	Possible Adaptation Action:	Federal	State	Local Govt.	Private	NGO/Indiv.
Gradual inundation of low-lying land; loss of coastal habitats, especially coastal wetlands; salt water intrusion into coastal aquifers and rivers; increased shoreline erosion and loss of barrier islands; changes in navigational conditions	Site and design all future public works projects to take sea level rise into account	X	X	X		
	Eliminate public subsidies for development in high hazard areas along the coast	X	X			
	Develop strong, well-planned, shoreline retreat or relocation plans/programs (public infrastructure and private properties), and post-storm redevelopment plans			X	X	
	Retrofit/protect public infrastructure (stormwater/wastewater systems, energy facilities, roads, causeways, ports, bridges, etc.)	X	X	X		
	Use natural shorelines, setbacks, and buffer zones to allow inland migration of shore habitats and barrier islands over time (e.g. dunes and forested buffers)	X	X	X		X
	Encourage alternatives to shoreline "armoring" through "living shorelines"	X	X	X	X	

"Effective adaptation will combine a strong federal government adaptation commitment with grassroots-based, bottom-up efforts to capture the ingenuity and uniqueness of local adaptations while coordinating and communicating these efforts at a national level."



Adaptation planning is envisioned as an iterative process incorporating these six steps.

Adapting in the long-term using a risk management approach



source: City of New York 2009

Matrices such as these allow for useful visualization of risk to infrastructure (top) and implementation strategies (bottom) allowing for cost and urgency.

Recommendations

- 1: All decision makers—within national, state, tribal, and local agencies and institutions, in the private sector, and NGO's—should identify their vulnerabilities to climate change impacts and the short and longer term adaptation options that could increase their resilience to current and projected impacts.
- 2: The federal government should initiate development of a collaborative national adaptation strategy, which might take the form of a national adaptation plan. It should be developed in partnership with congressional leaders, selected high-level representatives of the relevant federal agencies, states, tribes, business and environmental organizations, and local governments and community leaders.
- 3: Federal, state, and local governments, together with nongovernmental partners, should work together to implement a national climate change adaptation program.
- 4: The federal government should undertake a climate change adaptation research effort designed to provide a reliable foundation for adapting to the impacts of climate change in a larger context of sustainability.
- 5: Adaptation planning and implementation at the state and tribal level should be initiated regardless of whether the federal government provides the necessary leadership. State and tribal governments should develop and implement climate change adaptation plans to guide policy and coordinate with federal, regional, local, and private-sector efforts.
- 6: Local governments should develop and implement climate change adaptation plans pursuant to the national climate adaptation strategy, in consultation with stakeholders in their communities.
- 7: The private sector, NGOs, and society at large should assess their own vulnerabilities and risks due to climate change and actively engage and partner with the respective governmental adaptation planning efforts to help build the nation's adaptive capacity.
- 8: The U.S. should engage as a major player in adaptation activities at the global scale, and support the establishment of a collaborative, sufficiently funded, international adaptation program that can be sustained over time.
- 9: Adaptation objectives should be incorporated into existing government programs and policies that have international components such as: agriculture, trade policy and food security; energy policy; transportation policy; international aid and disaster relief; national security; intellectual property agreements for technology transfer to other countries.
- 10: Federal, State, and local entities and the private sector should take actions now to address current, known climate change impacts and risks and to provide effective risk management.

The America's Climate Choices reports are available from National Academy Press
(<http://www.nap.edu/>)

