Shoreline Adaptations to Flooding in Urban Waterways

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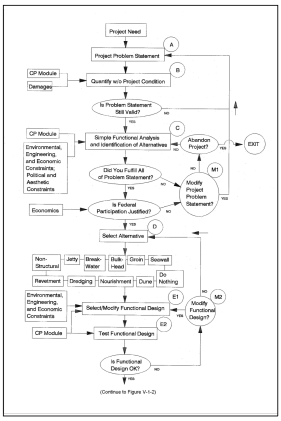
CONCEPT	In a world defined by rising sea levels, can we learn to live better in wetter cities?
TARGET PROTOCOL	In cities around the world, sea level rise adaptation is typically managed by engineering-led agencies as part of long-term capital planning and infrastructure projects. Hardened shorelines and/or green infrastructure strategies are selected to reduce the presence of water in cities, preserve a static shoreline, and frequently disconnect communities from their coastlines. We aimed to identify additional patterns — protocols — of activism, engagement, and use cases that enable vibrant and adaptive shorelines.
PHOTO/ SKETCH	 Figure V-1-1. Thought process in the planning and design of a coastal project, Part 1  Image source: US Army Corp of Engineers, Venkatesh Rao
CENTRAL TENSION	Protecting what we have today vs. Imagining alternative futures. Urban coastal adaptation today is largely concerned with protecting existing capital investments; resisting climate change-led flooding will require us to re-evaluate what we are protecting and why. Assumptions of framing and what is valued don't enable broader thinking and just delay larger culture shifts as seawalls and flooding from rainfall can't hold the same land boundaries.
LINKS	Dangerous Protocols: "Protocols are "increasingly implicit, or embedded into our consciousness, and therefore harder to detect or resist." Protocols in Emergency Time: "Protocols are designed in reaction to some troubling condition rather than being conceived of independently from their environment." Protocols Don't Build Pyramids: "...for individuals working at smaller spatial and temporal scales, the 'software' (and the protocols that mediate it) may be a more fruitful domain of intervention than the 'hardware'." Fire Protocols: Attention as Autopoietic Space: "You can look through your fire eyes at a single grove of trees or an entire watershed..."

HOW WE HOPED TO IMPROVE THE PROTOCOL	Our goal was to identify and explore adaptations that view water through a lens of opportunity and include more diverse perspectives, needs, and values in envisioning our future shorelines. We planned to develop "a toolkit featuring the varying paths that cities have taken and highlighting the critical steps and outcomes."
WHAT ACTUALLY HAPPENED?	There are surprisingly few examples of innovation in adaptation. We asked why, finding that a risk-based framing is pervasive; existing protocols create barriers to innovation. We explored improving public engagement processes, better equipping communities to participate in them, and finally focused on informal projects that shift perceptions about living with water.
WHAT WE LEARNED	1. Current shoreline adaptation protocols are primarily designed to protect existing conditions, primarily onshore capital investments and infrastructure. 2. Risk is a key calculation in adaptation planning, and nearly all global governments measure risk through economic calculations that value property, human life, and other concerns through the lens of finance. 3. Adaptation planning has improved — long-term, sea-level rise projections and nature-based solutions are now widely considered — but the focus on protection and risk hasn't changed. 4. It is also increasingly clear that efforts to keep water out and defend a static shoreline aren't sufficient to address the coming changes in coastal cities. For example, seawalls are the most used form of water management, yet seawalls create many negative downstream impacts, pushing water to less protected (often poorer) areas, create erosion, interrupting how tidal harbors flush pollutants, and will become an ever growing tax expense that often protects private properties. 5. Likewise, green infrastructure such as bioswales provide important but ultimately limited benefits that address flooding in highly urbanized environments. Some of the most progressive cities adopting these techniques are *already* running out of opportunities to expand nature-based solutions without additional changes to the urban landscape. 6. It's very hard to change the conversation and shift the framing of the dialogue. At first, we thought that addressing the planning process to incorporate more public input would be a key approach to improving the protocol. However, we encountered two problems: a broken public engagement process, and a shared focus on risk among both planners and communities. 7. Public engagement efforts often create or increase distrust between citizens and agencies and don't usually result in innovative outcomes. Planners, engineers, and public agencies often see the public as lacking important information and context about project constraints (hydrology, budget, competing interests), while community members often

	say that processes don't address their actual concerns and outcomes don't reflect their input. 8. The most common experience that shapes people's awareness or thinking about water where they live is flooding — often in storms. These negative experiences contribute to a public perception of "wetness" as a risk for urban life. This is increasingly true globally, even in formerly wet places, due to improved technology and global adoption of Western design standards. 9. The fiction that land along shorelines remains dry is a modern concept. People have been living within pulsing landscapes forever, accepting and adapting to seasonal flooding through floating and raised infrastructure and living away from flood zones. 10. In order to truly change our approach to coastal adaptation, we need to go beyond grey and green infrastructure that mitigates flooding. We need to shift our expectations and our cultural relationship to water. 11. We heard from many of the people involved in innovative adaptation planning that they got interested in alternative approaches after having personal, engaging experiences with water —e.g., boating, on-water events, art, or travel to places where relationships with water are different. This highlighted the value of these experiences and their potential to be used in changing our cultural mindset about land and water. 12. Interventions that increase familiarity with water and create new associations, possibilities or opportunities for what water is, can be, or has been in a place have the potential to disrupt the current protocols that exist around climate change adaptation.