Living With Water Final Report
Appendix 3a: Literature Review Search Terms

Embase: [('nature-based solutions' OR 'non-engineered') AND ('flood adaptation' OR 'flood' OR 'sea-level rise')]

PubMed: [("nature based solution*"[tw] OR non-engineered[tw]) AND (flood*[tw] OR "Floods"[Mesh])]

Web of Science: [('nature-based solutions' OR 'non-engineered') AND ('flood adaptation' OR 'flood' OR 'sea-level rise')]

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Appendix 3b: Identified Flooding Alternatives

Tier 1: Natural Buffer	**Tier 2: Eliminate Risk**	**Tier 3: Passive Risk Reduction**	**Tier 4: Active Risk Reduction**	**Tier 5: Nature-Based Risk Reduction**	**Tier 6: Harden**
● Coastal Protections ● Conservation/ Preservation/ ● Regulation (general) ● Floodplain Conservation ● Grassland Conservation ● Land Use Conservation/ Regulations ● Soil Conservation ● Wetland/ Saltwater Marsh Conservation (Coastal)	● Berm/Earth Bund Removal/ Breaching ● Floodplain Lowering ● Flow Control Structure/ Barrier Removal ● Levee/ Embankment Relocations/ Setbacks ● Managed Retreat ● Open Spaces/ Overland Flow Areas ● Opening Floodplains	● Afforestation ● Afforestation (Riparian) ● Agricultural Management ● Beach Nourishment ● Buffer Strips ● Continuous Cover Forestry ● Dune Reconstruction ● Dune Revegetation ● Dunes/Sand Dunes ● Ecosystem Restoration ● Floodplain Creation ● Floodplain Restoration/ Renaturalization ● Foreshore Accretion ● Foreshore	● Community Participation ● Emergency Response Plans ● Temporary Flood Defense Barriers	● Berms/Earth Bunds ● Bio-cleansed Pumping and Retention System ● Blue Spaces (Urban) ● Breakwaters (Detached Earthen) ● Channel Cross-Section Alterations ● Coarse Beaches ● Cribwalls (Live/Vegetated) ● Dry Wells/ Soakaways ● Dunes (Urban) ● Flood Bench ● Flow Control Structures/ Barriers/Dams (Woody Debris) ● Grating (Live/Vegetated)	● Breakwaters ● Bulkhead/ Retaining Walls ● Bypass Channels/ Diversion Channels ● Canals/Artificial Channels (Concrete/ Hardened) ● Channel Deepening ● Culverts ● Detention Basins ● Drainage Network Maintenance ● Dunes (Artificial) ● Expansion Basins ● Floodplain Retention Areas ● Floodwalls ● Flow Control Structures/ Barriers/Dams (Concrete/ Hardened)

		Accretion (Saltwater Marsh) ● Forest/ Woodlands (Riparian/ Floodplain) ● Grassland Restoration ● Lagoons ● Lake Creation ● Land Use Adaptation ● Meandering/ remeandering ● Oyster Reef Creation ● Oyster Reef Restoration ● Peatland Restoration/ Regeneration ● Polders/Ponds ● Reforestation ● Reforestation (Mangroves) ● Reforestation (Riparian) ● Restoration/ Renaturation/ Renaturalization (general) ● Retention Basins/Ponds (Natural)		● Green Facades/Walls ● Green Roofs ● Green Spaces/ Corridors ● Green Spaces/ Corridors (Urban) ● Infiltration Trenches/ Biowales (Live/Vegetated) ● Integrated Retention ● Levees/ Embankments (Vegetated) ● Living Shorelines ● Mattresses (Permeable) ● NBS Coordination and Planning Policy ● Permeable Pavement ● Pole Drains (Live/Vegetated) ● Pond/Polder Creation ● Rain Gardens/ Bioretention ● Rainwater Harvesting ● Recreational Green	● Gabions ● Infiltration Basins Infiltration Trenches/Swales ● Levee/ Embankment Heightening (Selective) ● Levee/ Embankment Maintenance ● Levees/ Embankments ● Levees/ Embankments (Riverine) ● Pier Creation ● Ravine Channeling ● Recharge (Artificial) ● Reservoir Creation ● Reservoirs ● Retention Basins/Ponds ● Revetments/ Riprap/Bank Armoring (Hardened) ● Seawalls ● Storm Surge Barriers

		• River Restoration/ Renaturation • River Widening • Sea Grass • Sea Grass Restoration • Sediment Diversion/ Detention • Sediment Removal/ Dredging • Shoreline Restoration • Soil Management • Stream Restoration/ Daylighting • Tree Planting • Vegetation (Aquatic/ Submerged) • Vegetation Management • Wetland Creation • Wetland Restoration • Wetland/ Saltwater Marsh Management (Coastal) • Wetlands/ Saltwater Marshes (Coastal)		Areas/Pathways/ Parks • Reefs (Near-shore) • Revetements • Sustainable Urban Drainage Systems (SUDS) • Terracing • Underground Storage Systems/ Stormwater Storage Tanks • Vegetation Cover • Wetlands (Sub-Surface Constructed)	

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Appendix 2c: Flood Adaptation Hierarchy Equity Considerations

Adapted from Peck et al., 2022

	Nature-Based Solutions					*Grey Infrastructure*
	Tier 1: Natural Buffer	**Tier 2: Eliminate Risk**	**Tier 3: Passive Risk Reduction**	**Tier 4: Active Risk Reduction**	**Tier 5: Nature-Based Risk Reduction**	**Tier 6: Harden**
	Protect existing and future natural coastlines and floodplains	Employ managed retreat of people and infrastructure to appropriate receiving areas and restore nature	Implement passive management techniques that manage for temporary periods of inundation	Temporarily remove or deploy infrastructure during forecasted periods of inundation	Emulate appropriate natural features to form protective buffers around systems	Build walls and other approaches to defend systems in place
Impact Considerations	How will protection and restoration change access to and cultural relevance of the floodplain?	How does managed retreat influence destination communities (managed retreat of people) and receiving locations (of infrastructure)?	How does variable performance of passive measures relate to social vulnerability?	What infrastructure is evacuated and what is left in place at times of emergency? How does protection prioritization vary across communities?	Who may experience infrastructure implementation as a loss or disruption, and who may not?	—
Resource Considerations	What local capital and natural resources may make protection and restoration more successful in certain places?	How are managed retreat program resources administered in an effective, equitable and timely manner?	Do underprivileged communities have the means and capacities to maintain risk reduction measures over time?	—	—	How can resources be allocated to minimize transboundary risks? What additional resources are necessary to protect neighboring communities?

Voice Considerations	How are representative community stakeholders included in decision-making around land protection and restoration?	What planning processes most effectively engage people (from retreating and receiving locations)?	How is tension between buyouts and passive risk reduction resolved?	How are evacuation plans developed and discussed with the public? How is public input incorporated within the preparation for and response to a flood emergency?	—	—