Menu of Adaptation Strategies and Approaches

Developed for Great Lakes Coastal Ecosystem Management

Strategy 1: Maintain and enhance fundamental hydrologic processes and sediment dynamics.

1.1. Maintain and restore natural sediment transport processes.
1.2. Maintain and restore hydrological connectivity between hydrological features.
1.3. Maintain and enhance infiltration and water storage capacity of soils.

Strategy 2: Maintain and enhance water quality.

2.1. Moderate water temperature increases.
2.2. Reduce sediment deposition.
2.3. Reduce loading and export of nutrients and other pollutants.

Strategy 3: Maintain, restore, and manage coastal vegetation.

3.1. Maintain the integrity of unique plant communities, coastal wetlands and estuaries, and their integral landforms.
3.2. Minimize non-climate physical damage to coastal ecosystems and habitats.
3.3. Establish living shorelines by maintaining and restoring coastal vegetation.
3.4. Maintain and enhance species and structural diversity in coastal ecosystems.
3.5. Prevent invasive plant and animal species establishment and minimize their impacts where they occur.
3.6. Maintain and establish refugia for plants and animals.
3.7. Maintain and increase connectivity of coastal habitats.

Strategy 4: Alter coastal ecosystems to accommodate changing hydrology, storm events, and shoreline erosion.

4.1. Manage coastal ecosystems to accommodate increased frequency and duration of low water levels.
4.2. Manage coastal ecosystems to accommodate increased frequency and duration of high water levels.
4.3. Promote features that reduce the impacts of wind and wave energy or damage from coastal erosion.
4.4. Manage sediment to respond to fluctuating water levels.
4.5. Reduce or manage surface water runoff.
4.6. Maintain and create conditions for inland and waterward movement of plants and animals.
4.7. Manage impounded wetlands to accommodate changes in hydrologic variability.

Strategy 5: Facilitate transformation of coastal ecosystems by adjusting plant species composition.

5.1. Favor or restore native species and genotypes with wide moisture and temperature tolerances.
5.2. Increase genetic diversity of seed and plant mixes.
5.3. Disfavor species that are distinctly maladapted.
5.4. Introduce species that are expected to be adapted to future conditions.
5.5. Move at-risk species to locations that are expected to provide more suitable habitat.

Strategy 6: Design and modify infrastructure to accommodate future conditions.

6.1. Reinforce infrastructure to meet expected conditions.
6.2. Design infrastructure with low-impact or ecologically friendly features.
6.3. Adjust the placement, design, and planned lifespan of infrastructure.
6.4. Remove infrastructure and readjust systems.

MORE INFORMATION: *This menu of adaptation strategies and approaches can be used within the Adaptation Workbook decision-support framework found in Swanston, C.W.; Janowiak, M.K.; Brandt, L. A.; Butler, P.R.; Handler, S. D.; Shannon, P.D.; Derby Lewis, A.; Hall, K.; Fahey, R.T.; Scott, L.; Kerber, A.; Miesbauer, J.W.; Darling, L.; Parker, L.; St. Pierre, M. 2016.* ***Forest adaptation resources: climate change tools and approaches for land managers, 2nd ed.*** *Gen. Tech. Rep. NRS-GTR-87-2. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 161 p. doi.org/10.2737/NRS-GTR-87-2.*

SOURCE: *Schmitt, K.; Krska, R.; Deloria, C.; Shannon, P.D.; Cooper, M.; Eash, J.; Haugland, J.; Johnson, S.E.; Johnson, S.M.; Magee, M.R..; Mayne, G.; Nelson, C.; Nigg, C.; Sidie-Slettedahl, A.; Brandt, L., Handler, S.; Janowiak, M.; Butler-Leopold, P.; Ontl, T.; Swanston, C. 2022.* ***Strategies for Aadapting Great Lakes coastal ecosystems to climate change.*** *White Paper. Houghton, MI: U.S. Department of Agriculture, Northern Forests Climate Hub. 61 p. doi.org/10.32747/2022.7816961.ch.*

This menu was developed through a collaboration of the USDA Northern Forests Climate Hub, the U.S. Fish and Wildlife Service, and the Northern Institute of Applied Climate Science . The Northern Institute of Applied Climate Science is a collaborative, multi-institutional partnership led by the USDA Forest Service. Learn more about this menu and others at climatehubs.usda.gov/hubs/northern-forests/topic/adaptation-menus-strategies-and-approaches.