

CCMP Climate Change Vulnerability Assessment

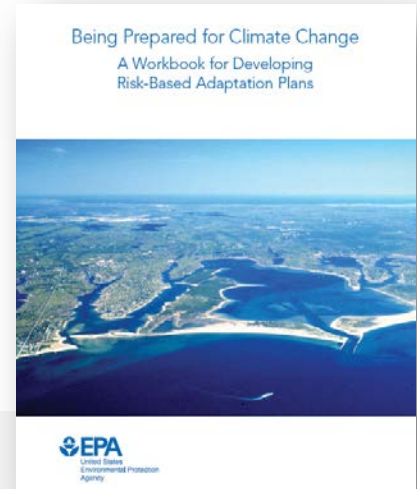
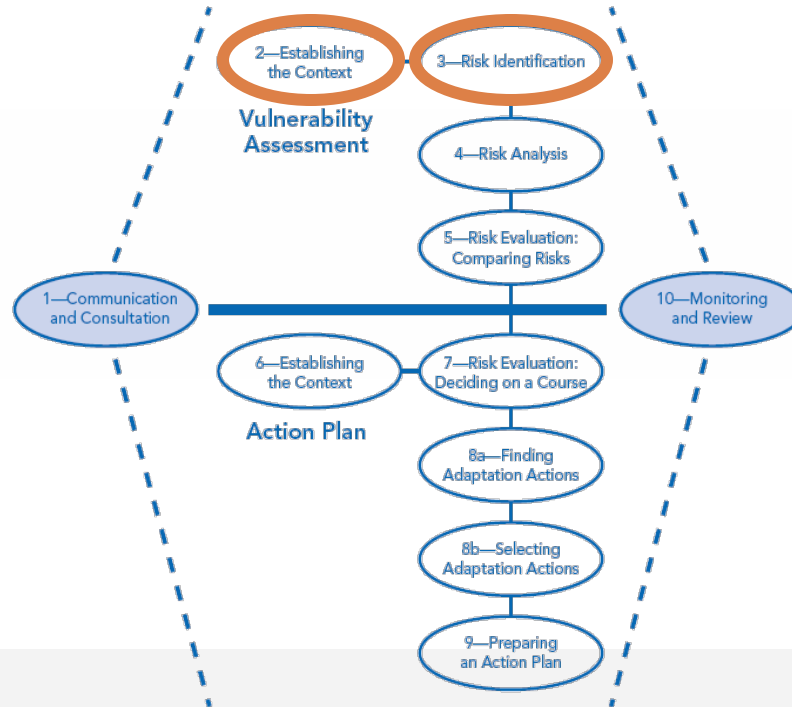
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Agency on Bay Management

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Climate Change Vulnerability



Climate Stressors

- Sea-level rise
- Precipitation – storminess
- Precipitation – drought
- Increased air temperatures
- Increased water temperatures
- Extended frost-free season
- Ocean acidification



Missing Climate Stressors?

- ?
- ?
- ?

Risk Identification

Action Plan	Goal (DRAFT)	Climate Stressor	Potential Vulnerability
Water & Sediment Quality	Maintaining nitrogen loading rates at adopted limits to provide water clarity sufficient to recover and maintain at least 38,000 acres of seagrass baywide.	Sea-Level Rise Precipitation - Storminess Increased Air Temperatures Increased Water Temperatures	<ul style="list-style-type: none">· Increased storminess may lead to increased stormwater, overloaded or offline wastewater systems, increased septic system failure and therefore increased TN loads to the bay and tributaries;· Warmer water may increase algae growth rates and decrease water clarity;· SLR may reduce shoreline vegetation and decrease their ecosystem service of TN reduction;· Increased storminess may lead to rapid stormwater runoff from roadways and impervious surfaces, washing vehicle exhaust pollutants into the bay· Increased air temperatures may lead to higher energy use for air conditioning and higher N emissions from local power plants, leading to increased N deposition on the bay and watershed;

Risk Identification

Action Plan	Goal (DRAFT)	Climate Stressor	Potential Vulnerability
Water & Sediment Quality	Reducing the amount of toxic chemicals in contaminated bay sediments and protecting relatively clean areas of the bay from contamination.	Sea-Level Rise Precipitation - Storminess Increased Water Temperatures	<ul style="list-style-type: none">· Increased storminess may lead to increased stormwater, overloaded or offline wastewater systems and thus increased toxic chemical loads;· Warmer water temperatures may increase toxicity of pollutants or higher solubility, leading to higher concentration of pollutants;· SLR may inundate contaminated sites or increase erosion from these sites.

Risk Identification

Action Plan	Goal (DRAFT)	Climate Stressor	Potential Vulnerability
Water & Sediment Quality	Reducing bacterial contamination from land-based sources in the watershed to maintain recreational uses of the bay such as fishing and swimming.	Precipitation - Storminess Increased Water Temperatures	<ul style="list-style-type: none">· Warmer water may lead to greater survival of bacteria or viruses;· Increased storminess may lead to rapid runoff from dog parks and livestock areas;· Increased storminess may lead to overloaded or offline wastewater systems and increased septic system failure and thus increased bacterial loads to the bay and watershed waterways.

Risk Identification

Action Plan	Goal (DRAFT)	Climate Stressor	Potential Vulnerability
Bay Habitats	Recovering and maintaining at least 38,000 acres of seagrass baywide and reducing propeller scarring of seagrasses.	Sea-Level Rise Precipitation - Storminess Increased Water Temperatures	<ul style="list-style-type: none">· Increased storminess may lead to increased stormwater, overloaded or offline wastewater systems, increased septic system failure and thus increased TN loads to the bay and watershed waterways, increasing algae growth and decreasing water clarity;· Warmer water may increase algae growth rates and decreased water clarity;· SLR may result in adequate light not penetrating to existing deeper seagrass

Risk Identification

Action Plan	Goal (DRAFT)	Climate Stressor	Potential Vulnerability
Bay Habitats	Restoring the historic balance of coastal wetland habitats by restoring 1,918 acres of salt marsh habitat and 840 acres of salt barren habitat over 2008 levels, and preserving 15,139 acres of existing mangrove habitat.	Sea-Level Rise Extended Frost-Free Season	<ul style="list-style-type: none">· Warmer winters may promote spread of existing or new invasive species;· SLR may increase shoreline erosion and lead to loss of beaches, wetlands and salt marshes;· SLR may cause higher salinity waters to move up-shore and upstream, promoting shifting of plant zonation.

Risk Identification

Action Plan	Goal (DRAFT)	Climate Stressor	Potential Vulnerability
Bay Habitats	Restoring the historic balance of freshwater wetlands in the Tampa Bay watershed by restoring 871 acres of forested wetlands and 2,199 acres of non-forested wetlands over 2008 levels.	Sea-Level Rise Increased Air Temperatures Extended Frost-Free Season	<ul style="list-style-type: none">· SLR may drive demand for new development pressures upstream in the watershed;· Warmer winters may promote spread of existing or new invasive species· Increased air temperatures may alter evapotranspiration rates, especially in non-forested wetlands.

Risk Identification

Action Plan	Goal (DRAFT)	Climate Stressor	Potential Vulnerability
Bay Habitats	Establishing and maintaining adequate freshwater flow to Tampa Bay and enhancing ecosystem values of tidal tributaries.	Sea-Level Rise Precipitation - Drought Increased Air Temperatures	<ul style="list-style-type: none">· Warmer air temperatures or increased drought could affect evapotranspiration rates, surface water and groundwater flow· SLR may cause upstream salinity incursions within riverine systems that require seasonally managed freshwater flow

Risk Identification

Action Plan	Goal (DRAFT)	Climate Stressor	Potential Vulnerability
Dredging & Dredged Material Management	Implementing beneficial uses of dredged material where appropriate in Tampa Bay.	Sea-Level Rise Precipitation - Storminess	<ul style="list-style-type: none">· Increased storminess may lead to greater sedimentation to the bay;· SLR may reduce the number or extent of available beneficial use placement areas

Risk Identification

Action Plan	Goal (DRAFT)	Climate Stressor	Potential Vulnerability
Fish & Wildlife	Increasing on-water enforcement of environmental regulations.	N/A	N/A

Risk Identification

Action Plan	Goal (DRAFT)	Climate Stressor	Potential Vulnerability
Fish & Wildlife	Preserving the abundance and diversity of Tampa Bay's fish and wildlife.	Precipitation - Storminess Precipitation - Drought Ocean Acidification Increased Water Temperatures	<ul style="list-style-type: none">· Warmer water may promote invasive species, parasites or disease· Warmer water may lead to changes in species composition and abundance, depending on their temperature tolerances;· Ocean acidification may impact shellfish and other calcifying organisms;· Ocean acidification may impact early life stages of fishes;· Warmer water may lead to lower dissolved oxygen;· Increased storminess may increase sedimentation, affecting benthic species;· Increasing drought may cause changes in salinity/freshwater flow timing, affecting fish spawning and early life stages

Risk Identification

Action Plan	Goal (DRAFT)	Climate Stressor	Potential Vulnerability
Fish & Wildlife	Supporting the enforcement of established manatee protection areas to protect manatees and reduce seagrass scarring.	Sea-Level Rise Increased Water Temperatures	<ul style="list-style-type: none">· SLR may affect seagrass distribution and extent, resulting in existing protection zones mismatched with seagrass areas;· Increased water temperatures may affect the spatial distribution of manatees resulting in mismatched protection zones

Risk Identification

Action Plan	Goal (DRAFT)	Climate Stressor	Potential Vulnerability
Fish & Wildlife	Restoring bay scallop populations to self-sustaining levels.	Sea-Level Rise Precipitation - Storminess Ocean Acidification Increased Water Temperatures	<ul style="list-style-type: none">· Warmer water may promote parasites or disease;· Ocean acidification may impact shellfish, including scallops;· Warmer water may lead to lower dissolved oxygen;· Increased storminess may increase sedimentation, affecting scallop feeding;· SLR may affect seagrass distribution and extent, resulting in reduced habitat for scallops

Risk Identification

Action Plan	Goal (DRAFT)	Climate Stressor	Potential Vulnerability
Spill Prevention & Response	Reducing the risk of hazardous material spills and enhancing spill response plans.	Sea-Level Rise Precipitation - Storminess	<ul style="list-style-type: none">· Increased storminess may lead to greater navigational hazards within the bay/channels;· SLR may inundate contaminated sites

Risk Identification

Action Plan	Goal (DRAFT)	Climate Stressor	Potential Vulnerability
Invasive Species	Reducing impacts of existing and potential harmful invasive species in Tampa Bay and its watershed.	Extended Frost-Free Season Increased Air Temperatures Increased Water Temperatures	<ul style="list-style-type: none">· Warmer water may promote invasive species· Increased air temperatures and warmer winters may promote spread of existing or new invasive species

Risk Identification

Action Plan	Goal (DRAFT)	Climate Stressor	Potential Vulnerability
Public Access	Fostering adequate and appropriate access and address competing uses of the bay.	Sea-Level Rise Increased Air Temperatures	<ul style="list-style-type: none">· Increased air temperatures may deter residents and visitors from participating in outdoor recreational opportunities;· SLR may reduce the amount of public lands available to provide access to the bay

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Action Plan	Goal (DRAFT)	Climate Stressor	Potential Vulnerability
Public Education & Involvement	Creating a constituency of informed, involved citizens who understand both the environmental and economic value of Tampa Bay and actively participate in restoring and protecting it.	Sea-Level Rise Precipitation – Storminess Precipitation – Drought Extended Frost-Freeze Season Increased Air Temperatures Increased Water Temperatures Ocean Acidification	<ul style="list-style-type: none">· Increased air temperatures may deter residents and visitors from participating in volunteer restoration opportunities;· Climate change may cause citizens to feel hopeless or afraid for the prospects of restoring and protecting the bay

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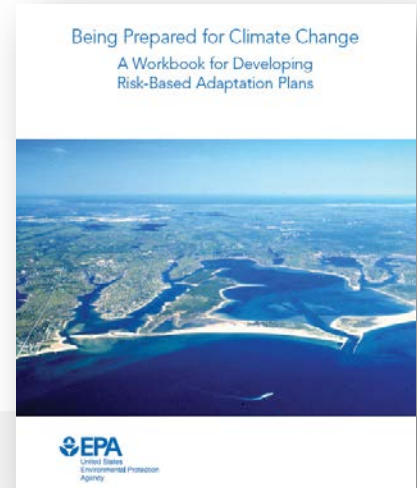
Action Plan	Goal (DRAFT)	Climate Stressor	Potential Vulnerability
Climate Change	Assessing the vulnerability of critical coastal habitats to sea level rise and supporting adaptation strategies that promote the long-term resiliency and diversity of these habitats.	N/A	N/A

Risk Identification

Action Plan	Goal (DRAFT)	Climate Stressor	Potential Vulnerability
Climate Change	Considering and incorporating the implications and effects of climate change on the Tampa Bay Comprehensive Conservation and Management Plan goals and priorities.	N/A	N/A



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Feedback Encouraged

<https://tbep.tech.org/news/206-ccmp-climate-change-vulnerability-assessment>

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